

Author **APPARENT**

Class Mark **QB 8**

Book No. **610080576X**



UNIVERSITY
OF NOTTINGHAM
LIBRARY

Science Library

UNIVERSITY OF NOTTINGHAM
WITHDRAWN
FROM THE LIBRARY

UNIVERSITY OF NOTTINGHAM

6 10 080576 X

TELEPEN

WITHDRAWN
FROM THE LIBRARY

STORE

| Students and External Readers | Staff & Research Students |
|--|---------------------------|
| DATE DUE FOR RETURN | DATE OF ISSUE |
| | |
| <p>N.B. All books must be returned for the Annual Inspection in June</p> | |
| <p>Any book which you borrow remains your responsibility until the loan slip is cancelled</p> | |

SCHEINBARE ÖRTER DER FUNDAMENTALSTERNE

1986

Enthaltend die 1535 Sterne
des Vierten Fundamental-Katalogs (FK4)

Hergestellt unter der Schirmherrschaft der
Internationalen Astronomischen Union

HEIDELBERG: ASTRONOMISCHES RECHEN-INSTITUT

1985

APPARENT PLACES OF FUNDAMENTAL STARS

1986

Containing the 1535 stars in the
Fourth Fundamental Catalogue (FK4)

Produced under the auspices of the
International Astronomical Union

HEIDELBERG: ASTRONOMISCHES RECHEN-INSTITUT

1985

To be purchased from

Verlag G. Braun
Karl-Friedrich-Straße 14-18
7500 Karlsruhe 1, Germany

080576



Herausgeber: Astronomisches Rechen-Institut, Heidelberg
Verantwortlich für den Inhalt: Prof. Dr. W. Fricke, Dr. T. Lederle, Dr. H. Schwan
Verlag und Herstellung: G. Braun, Karlsruhe, Karl-Friedrich-Straße 14-18

ISSN 0174-254 X

ISBN 3 7650 00804

This issue is the forty-sixth annual volume in a series which was started with the year 1941 under the auspices of the International Astronomical Union. The compilation and publication of the first nineteen volumes was undertaken by H. M. Nautical Almanac Office, Royal Greenwich Observatory. In accordance with a recommendation of the I.A.U. (Dublin meeting 1955) this task was taken over by the Astronomisches Rechen-Institut, Heidelberg, from the twentieth volume onwards. The apparent and mean places that are given in this volume are based upon the Fourth Fundamental Catalogue (FK 4).

The volume was produced with the assistance of Miss M. Fleischer and Mrs. M. Erbach.

W. FRICKE
T. LEDERLE
H. SCHWAN

Astronomisches Rechen-Institut
Heidelberg, June 1985

Important Note Changes carried out from 1984 onwards

According to the resolutions adopted by the IAU in 1976 and 1982, the following changes concerning the mean and apparent places of stars are recommended from 1984 January 1 onwards:

(1) The FK 4 representing the fundamental reference frame in common use shall be replaced by the FK 5 (*Trans. I.A.U 16B, 59*).

(2) A correction to the zero point of right ascensions of the FK 4 (equinox correction) and a correction to the motion of the equinox of the FK 4 shall be applied; this involves a corresponding amendment of the expression for Greenwich mean sidereal time at 0^h UT (*Trans. I.A.U 16B, 59; 18B, 72*).

(3) The IAU (1976) System of Astronomical Constants shall be used, in particular the new values of precession, aberration and obliquity of the ecliptic (*Trans. I.A.U 16B, 58*).

(4) The 1980 IAU Theory of Nutation shall be introduced (*Trans. I.A.U 18B, 72*).

(5) Stellar aberration shall be computed from the total velocity of the Earth referred to the barycentre of the Solar System; furthermore, the terms depending on the ellipticity of the Earth's orbit (the so-called E-terms) shall be no longer included in the mean places, but rather in the reduction from mean to apparent places (*Trans. I.A.U 16B, 59*).

(6) Reductions to apparent places shall be computed rigorously and directly without the intermediary of the place for the beginning of the year (*Trans. I.A.U. 18B*, 72); the rigorous computation also includes relativistic effects.

From the 1984 volume onwards, items (2) — (6) are introduced in the computation of the apparent places. Item (1) cannot be applied, because the FK 5 has not yet been completed in time for introduction in this volume. The star positions as given in this and the following volumes will still be based on the FK 4 except for the equinox correction as mentioned in item (2), which is applied to all right ascensions in APFS from 1984.0 onwards. The equinox correction is

$$\Delta\alpha = E_0 + \dot{E}(T-19.50) = 0^{\circ}035 + 0^{\circ}085(T-19.50)$$

where T is counted in centuries; it was determined by Fricke (*Astron. Astrophys.* 107, L13 — L16, 1982).

When the FK 5 will be introduced in the “Apparent Places of Fundamental Stars”, tables will be given for reducing the apparent places from FK 4 to FK 5 for the preceding volumes from 1984 onwards.

The following remarks referring to the content of this volume deserve particular attention:

(i) Pages IX—XLIII (formerly VII—XLI): The wording of the five-language Introduction will not be changed until the first volume based on FK 5, although some statements have now become obsolete or should be modified according to items (2) — (6) above.

(ii) Pages 1—475: Because of the effect of the relativistic light deflection, the apparent places of a star when approaching very closely the Sun, cannot be interpolated by the user; but these exceptional cases are of no practical interest in normal applications.

(iii) Pages 476—477: As formerly, for less accurate calculations of apparent places for non-fundamental stars, the Besselian Day Numbers are still given to be used in the classical Besselian formula. But because these Day Numbers have been computed in accordance with items (2) — (5) above, it has to be noted that they are to be combined with mean places for the middle of the year (e.g. J1984.5), and which do not contain the so-called E-terms of aberration; these mean places have also to be derived by using proper motions which had been modified by applying the corrections of the precession in right ascension and declination with the opposite sign so that the apparent places would practically not be affected by the change of the precession. Furthermore, $\dot{E} = 0^{\circ}085$ has to be added to the centennial proper motions in right ascension.

(iv) Pages 478—479, Table I: dp and $d\epsilon$ are based on the 1980 IAU Theory of Nutation, see item (4) above.

(v) Pages 480—483, Table II: The Sidereal times have been calculated according to the new I.A.U. resolution (*Trans. I.A.U. 18B*, 72).

(vi) Pages 484—510: The content remains unchanged.

CONTENTS

| | Page |
|---|--------|
| Important Note: Changes carried out from 1984 onwards | V |
| Introduction, English | IX |
| French | XVI |
| German | XXIII |
| Spanish | XXX |
| Russian | XXXVII |
| Notes on Double Stars; Alternative Names | XLIV |
| Apparent Places of 1483 10-day Stars | I |
| Apparent Places of 26 northern Circumpolar Stars | 372 |
| Apparent Places of 26 southern Circumpolar Stars | 424 |
| Besselian Day Numbers for 12 ^h Sidereal Time | 476 |
| Table I — Short-period terms of Nutation | 478 |
| II — Sidereal Time at 0 ^h U.T. | 480 |
| III — Conversion of Mean Solar to Sidereal Time | 484 |
| IV — Conversion of Sidereal to Mean Solar Time | 487 |
| V — Conversion of hours, minutes and seconds to decimals of a day | 490 |
| VI — Second difference correction | 492 |
| VII — Diurnal Aberration | 499 |
| Index to Apparent Places of Stars | 501 |

INTRODUCTION

This volume, containing the mean and apparent places for 1986 of the 1535 stars in the *Fourth Fundamental Catalogue*¹ (referred to throughout by its abbreviation FK4), has been produced through the co-operation of the Astronomisches Rechen-Institut, Heidelberg, and the Bureau des Longitudes, Paris, under the auspices of the International Astronomical Union. The proposal that the question of duplicate printing in the almanacs should be considered was made at the 1932 meeting of the Union; after the adoption in 1935 of FK3 as the fundamental catalogue for the mean places of stars in astronomical ephemerides, an opportunity arose for fulfilling the practical implications of that proposal, leading to the present publication of a single volume of apparent places of stars².

During the years 1941—1959 the preparation of this volume was shared by the six principal almanac offices. At the 1955 (Dublin) meeting of the International Astronomical Union agreement was reached on a redistribution of astronomical computation for the ephemerides, the leading principle being to concentrate work of the same character in a small number of ephemeris offices. As a consequence of this agreement the Astronomisches Rechen-Institut in Heidelberg is, beginning with 1960, responsible for the production of the volume „Apparent Places of Fundamental Stars”; the ephemerides of all the 1483 10-day stars of the FK4 are also computed by the Astronomisches Rechen-Institut. The Bureau des Longitudes, Paris, has undertaken the computation of all the 52 circumpolar stars of the FK4, so that the whole work is now shared by only two ephemeris offices.

However, the totality of astronomical computation covered by international agreement includes the calculation and production of the various national ephemerides and of the „Ephemerides of the Minor Planets”, as well as of the „Apparent Places of Fundamental Stars”. The work for all these publications is shared between the six ephemeris offices at Heidelberg, Herstmonceux, Leningrad, Paris, San Fernando and Washington.

All the data in the volume “Apparent Places of Fundamental Stars” are based on the FK4, to which reference should be made for details of the star places. The 1535 stars for which mean and apparent places are given consist of 853 10-day and 20 circumpolar Auwers’ stars, and 630 10-day and 32 circumpolar additional stars.

In the reduction to apparent place the constants of precession, nutation and aberration involved are those adopted by the twelfth General Assembly of the International Astronomical Union (Resolution No. 4, Hamburg, September 1964). The Day Numbers used are based on the recommendations of the International Astronomical Union (*Trans. I.A.U.* 8, 90) and are calculated from the same formulae as the data published in “The Astronomical Ephemeris” and other national ephemerides; details of the fundamental computations are given in the Explanations.

¹ Fourth Fundamental Catalogue (FK4). *Veröffentlichungen des Astronomischen Rechen-Instituts Heidelberg* Nr. 10 (1963).

² For further details of the origin of the volume and of the relevant recommendations of the I.A.U. see *Transactions of the International Astronomical Union*, 4, 20, 222 (1932); 5, 29, 287, 370 (1935); 6 357 (1938), where a detailed account of the events leading to the present volume is given.

Little explanation of the quantities tabulated is necessary, but all essential details are given below.

Apparent Places of 10-Day Stars (Pages 1—371)

The apparent positions of the 1483 stars with declinations between $\pm 81^\circ$ are given for every tenth upper transit at Greenwich on pages 1—371. The choice of data is fixed by the moments for which on pages 476—477 the Day Numbers are tabulated (integral part of the Greenwich Sidereal Date divisible by 10). From 1960 onwards, the tabulation is given continuously for a period greater than the calendar year. The stars are arranged generally four to a page, in the order of their mean right ascension for the beginning of the year.

The number, name, magnitude and spectrum are taken generally from the FK4. In all cases where the star name does not normally contain the constellation name (such as B.D. stars), this has been appended; the constellation boundaries are in accordance with *Délimitation Scientifique des Constellations* by Delporte (Cambridge, 1930). Selected proper names are included; a list of the proper names adopted is given in the *Index to Apparent Places of Stars*, page 501. Some alternative names are given in the list on page XLVI. In the case of certain double stars an indication of the component for which the position is tabulated is given by the letters *p.* (preceding), and *f.* (following); asterisks indicate double stars for which notes are given on the pages XLIV—XLV. Variability of a star is indicated, either by giving limiting magnitudes or merely “var”, if the total amplitude reaches or exceeds $0^m.3$.

The column U.T. gives the approximate time of transit for all the stars on the page; it is rounded to the nearest tenth of a day. For transits over meridians other than that of Greenwich the column U.T. can be regarded as the (local) mean solar date.

The right ascension and declination are referred to the true equator and equinox of date, but with the omission of the short-period terms of nutation. The mean places of the FK4-stars — in common with the positions in all star catalogues — are not freed from the constant term of aberration. Accordingly in calculating the reduction to the apparent place the term in the aberration depending on the eccentricity of the Earth's orbit has not been included. Corrections for orbital motion have been applied to seven stars. The values of these corrections, together with information about the orbital elements and mass-ratios, are given on page XLIV. Beginning with 1960 corrections for parallax have been applied to 721 stars, being those in the *General Catalogue of Trigonometric Stellar Parallaxes* (Yale, 1952) that have parallaxes equal to or greater than $0''.010$ (*Trans. I.A.U.* 7, 76, 82; 8, 67). The adopted values of the parallaxes have been taken unchanged from the Yale Catalogue, column “Absolute π ”.

The hours and minutes of right ascension and the degrees and minutes of declination given at the head of the columns are adjusted so that the seconds never change sign, though this may involve their exceeding 60. First differences of the co-ordinates are given in smaller type, with algebraic signs.

Immediately below the tabulated right ascension and declination are given:

- (I) the mean place 1986.5 which is that of the tabulated star.
- (II) $\sec \delta$ and $\tan \delta$ corresponding to the mean place.
- (III) the four quantities $d\alpha(\psi)$, $d\alpha(\epsilon)$, $d\delta(\psi)$, $d\delta(\epsilon)$ required for the application of short-period terms of nutation.
- (IV) the day upon which the star transits twice.

For interpolating the right ascension and declination to intermediate transits at Greenwich and to transits over other meridians, second differences must be used. With the following notation

| Argument | Function | Differences | |
|----------|----------|--------------|--------------|
| 0 | f_0 | Δ_0'' | |
| | | Δ_1' | |
| 1 | f_1 | | Δ_1'' |

the formula to be used is Bessel's

$$f_n = f_0 + n\Delta_1' + B_n''(\Delta_0'' + \Delta_1'')$$

Table VI (pages 492—498) gives directly, with arguments interpolating factor, n , and double second difference, $\Delta_0'' + \Delta_1''$, the third term of the above formula; an example is given on page XIV. For intermediate transits at Greenwich the interpolating factor is always an exact tenth, and other observatories can easily construct special tables for the ten interpolating factors they require. It should be noted that $\Delta_0'' + \Delta_1''$ can be obtained directly as the difference between the two first differences $\Delta_{\frac{1}{2}}'$ and $\Delta_{\frac{3}{2}}'$; additional first differences are tabulated at the beginning and end of the year, so that $\Delta_0'' + \Delta_1''$ can thus be found throughout.

The correction for the effect of the short-period terms of nutation is made by means of the formulae

$$\begin{aligned} \Delta\alpha &= d\alpha(\psi) \cdot d\psi + d\alpha(\epsilon) \cdot d\epsilon && \text{seconds of time} \\ \Delta\delta &= d\delta(\psi) \cdot d\psi + d\delta(\epsilon) \cdot d\epsilon && \text{seconds of arc} \end{aligned}$$

where $d\psi$ and $d\epsilon$, the short-period terms of nutation in longitude and obliquity, ϵ , respectively, are tabulated for every day in Table I (pages 478—479) and

$$\begin{aligned} d\alpha(\psi) &= \frac{1}{15}(\cos \epsilon + \sin \alpha \tan \delta \sin \epsilon) && d\delta(\psi) = \cos \alpha \sin \epsilon \\ d\alpha(\epsilon) &= -\frac{1}{15} \cos \alpha \tan \delta && d\delta(\epsilon) = \sin \alpha \end{aligned}$$

are tabulated under each star.

All the above quantities are given to the same number of decimals as the corresponding right ascension and declination. $d\psi$ and $d\epsilon$ are tabulated, for 0^h E.T., to $0''.001$; it will be found difficult to interpolate them to full accuracy to the time of transit. It is advisable to calculate first the corrections $\Delta\alpha$ and $\Delta\delta$ for 0^h E.T. on two successive days and then to interpolate these $\Delta\alpha$, $\Delta\delta$ to the time of transit. The approximate time of transit is given by

$$\alpha + \lambda - \text{sidereal time at } 0^h$$

where λ is the west longitude; in most cases for interpolating $\Delta\alpha$ and $\Delta\delta$ the rough estimate of the time of transit, given by the fraction of the day in the U.T. column, will however suffice for $\alpha - \text{sidereal time at } 0^h$.

As an example consider the calculation of the correction for short-period terms of nutation for α Cassiopeiae (No. 21) on 1986 Jan. 7.6

| | | |
|--------------|------------------------------|-----------------------------|
| From page 10 | $d\alpha(\psi) = +0.068$ | $d\delta(\psi) = +0.39$ |
| | $d\alpha(\epsilon) = -0.099$ | $d\delta(\epsilon) = +0.17$ |

| 1986 | From page 478 | | $d\alpha(\psi) \cdot d\psi$ | $d\alpha(\epsilon) \cdot d\epsilon$ | $\Delta\alpha$ | $d\delta(\psi) \cdot d\psi$ | $d\delta(\epsilon) \cdot d\epsilon$ | $\Delta\delta$ |
|----------|---------------|-------------|-----------------------------|-------------------------------------|----------------|-----------------------------|-------------------------------------|----------------|
| | $d\psi$ | $d\epsilon$ | | | | | | |
| Jan. 7.0 | -0".277 | -0".048 | -0.0188 | +0.0048 | -0.0014 | -0.108 | -0.008 | -0".12 |
| 8.0 | -0.172 | -0.097 | -0.0117 | +0.0096 | -0.002 | -0.067 | -0.016 | -0.08 |

$$\text{Jan. 7.6:} \quad \Delta\alpha = -0.007 \quad \Delta\delta = -0".10$$

Apparent Places of Circumpolar Stars (Pages 372–475)

The apparent positions of the 52 circumpolar stars with declinations greater than $\pm 81^\circ$ are given for every upper transit at Greenwich on pages 372–475; the northern stars are given first in order of right ascension followed by the southern stars. Two facing pages are devoted to each star, the name, magnitude, catalogue number and spectrum being repeated on both pages. In the left hand column only the day of the month is given, without the fraction of the day. The right ascension and declination are referred to the true equator and equinox of date, and short-period terms of nutation are included; two decimals of a second only are given for the right ascension. On the one day during the year when there are two upper transits at Greenwich both are given.

The values of $\sec \delta$ and $\tan \delta$ are given for every month and refer to the apparent place on the 16th day of the month; they can normally be used without interpolation. The footnotes, repeated on each page, give the mean right ascension and declination and the date of double lower transit.

Besselian Day Numbers (Pages 476–477)

On these pages are given, for 12^h Greenwich Sidereal Time, the Besselian Day Numbers without short-period terms of nutation. At an interval of ten sidereal days are given A, B, C, D to 0".001, and E to 0.0001. These values are the fundamental data from which the apparent places of the 10-day stars in this volume have been computed; they are also needed for the computation of ephemerides of non-fundamental stars. The omission of the short-period terms of nutation makes interpolation possible at intervals of ten days. Hourly variations of A, B, C, D are given to 0".0001; by means of these variations the Day Numbers may be interpolated to the time of transit for each tenth transit.

Beginning with 1960, the Day Numbers are referred to the nearest beginning of a year; the corresponding equinox is given in the last column of both pages. The apparent place is obtained with these Day Numbers from the mean place at the beginning of either the current Besselian year or the next following year, according to the tabulated equinox. For any tabulated date, τ denotes the fraction of the tropical year that has elapsed since the date to which the tabulated values of the Day Numbers are referred. The hourly variation of τ is + 0.00011.

On the right page, in the last column but one the Greenwich Sidereal Date is given; the time-arguments of the tabulated Day Numbers are those dates on which the integral part of the Greenwich Sidereal Date is a multiple of 10. By this choice the arguments of the 10-day ephemerides are also fixed.

Table I (Pages 478–479)

Short-period terms of Nutation

In this table are tabulated, for 0^h E.T. on each day of the year, the short-period terms of nutation in longitude ($d\psi$) and in obliquity ($d\epsilon$), required for the correction of

the apparent places of 10-day stars. The terms from which they are computed are given in the volume *Improved Lunar Ephemeris* 1952–1959, pages IX–X (1954). An example for using these values is given on page X.

Table II (Pages 480–483)

Sidereal Time at 0^h U.T.

On these pages are given in order for 0^h U.T. on each day of the year:

- (I) the apparent (or true) sidereal time to 0^s.001
- (II) the mean (or uniform) sidereal time, given as seconds and decimals only, the hours and minutes being the same as in the first column
- (III) the long-period terms of the Equation of Equinoxes to 0^s.001
- (IV) the short-period terms of the Equation of Equinoxes to 0^s.001

The apparent sidereal time is the sum of the other three columns. In the volumes preceding 1960, the equation of equinoxes was designated as the nutation in right ascension.

Tables III and IV (Pages 484–489)

Conversion of Mean Solar to Sidereal Time

Conversion of Sidereal to Mean Solar Time

These tables are based on the following relations derived from Newcomb's value of the tropical year:

$$1 \text{ mean solar day} = 24^{\text{h}} 03^{\text{m}} 56^{\text{s}}.55536 \text{ in mean sidereal time}$$

$$1 \text{ mean sidereal day} = 23^{\text{h}} 56^{\text{m}} 04^{\text{s}}.09054 \text{ in mean solar time}$$

Table III gives, with argument mean solar time, the quantity to be *added* to the solar time interval to convert it to an equivalent interval of mean sidereal time; similarly Table IV gives, with argument mean sidereal time, the quantity to be *subtracted* from the sidereal time interval to convert it to an equivalent interval of mean solar time.

In using these tables to pass from mean solar time or from U.T. to apparent sidereal time and vice versa, if the apparent sidereal time at 0^h is taken from Table II, it must be remembered that a correction should be applied for the change in the equation of equinoxes between 0^h and the given U.T.

Thus the local apparent sidereal time at Washington at U.T. 7^h 21^m 36^s.572 on 1986 January 11 is obtained as:

| | | | |
|--|---|-------------|---|
| Mean solar interval from 0 ^h | | | 7 ^h 21 ^m 36 ^s .572 |
| Corrections to mean solar time | } | (Table III) | + 1 12.445 |
| to give sidereal time | | | + 0.100 |
| Apparent sidereal time at 0 ^h (Table II) | | | 7 20 49.706 |
| Change in the equation of equinoxes from 0 ^h to 7 ^h (Table II) | | | + 0.002 |
| Sum = Greenwich apparent sidereal time | | | 14 43 38.825 |
| Longitude, Washington – Greenwich | | | + 5 08 15.750* |
| Difference = Washington apparent sidereal time | | | 9 35 23.075 |

(The quantity marked * is approximate only.)

Similarly the U.T. on 1986 January 11 corresponding to a local apparent sidereal time at Washington of $9^{\text{h}} 35^{\text{m}} 23^{\text{s}}.075$ is obtained as:

| | | | |
|--|----------------|-----------------|----------------------|
| Washington apparent sidereal time | 9 ^h | 35 ^m | 23 ^s .075 |
| Longitude, Greenwich – Washington | – 5 | 08 | 15.750* |
| Difference = Greenwich apparent sidereal time | 14 | 43 | 38 ^s .825 |
| Apparent sidereal time at 0 ^h (Table II) | 7 | 20 | 49.706 |
| Sidereal interval | 7 | 22 | 49.119 |
| Corrections to sidereal time | – | 1 | 12.411 |
| to give mean solar time (Table IV) | – | | 0.134 |
| Change in the equation of equinoxes from 7 ^h to 0 ^h (Table II) | – | | 0.002 |
| Sum = required U.T. | 7 | 21 | 36.572 |

(The quantity marked * is approximate only.)

Table V (Pages 490–491)

Conversion of hours, minutes and seconds to decimals of a day

No explanation of this table is necessary.

Table VI (Pages 492–498)

Second difference correction

This table gives, with arguments interpolating factor, n , and double second difference, $\Delta_0'' + \Delta_1''$, the correction to be applied to the linear interpolate. The correction is always of the opposite sign to $\Delta_0'' + \Delta_1''$, and interpolation is unnecessary; the quantity is tabulated in units of the last figure of the function.

For example, the apparent position of β Eridani (No. 188) is required at upper transit at Washington ($\lambda = +5^{\text{h}} 08^{\text{m}} = +0^{\text{d}}.21$) on 1986 April 17 (local date).

The tabulated upper transits at Greenwich are on April 10 and April 20, and the interpolating factor is thus $\frac{1}{10} (7 + 0.21) = 0.721$. Referring to page 82, the double second differences of right ascension and declination are seen to be +65 and +42 respectively in units of the last figure tabulated; thus

$$\begin{aligned} \alpha &= 5^{\text{h}} 07^{\text{m}} 09^{\text{s}}.176 + (-0^{\text{s}}.112) (0.721) - 0^{\text{s}}.003 = 09^{\text{s}}.092 \\ \delta &= -5^{\circ} 06' 14''.35 + (+0''.79) (0.721) - 0''.02 = 13''.80 \end{aligned}$$

Table VII (Page 499)

Diurnal Aberration

This table gives, with arguments latitude, φ , and declination, δ , the correction to be applied to the time of transit for the effect of diurnal aberration. This correction (which is tabulated without sign) is to be *subtracted* from the observed time of transit, or alternatively *added* to the right ascension of the star, in the case of transits above pole. In the case of transits below pole, the sign of the correction must be reversed. The values are calculated from the formula

$$\text{Diurnal aberration} = 0^{\text{s}}.0213 \cos \varphi \sec \delta$$

Index to Apparent Places of Stars (Pages 501—510)

This index enables the page upon which the apparent place of any star is tabulated to be found from a knowledge of the star's name alone. In order to make the index as complete as possible, all names given to stars in this volume have been included in the index, the alternative names given in the Notes on Stars on page XLVI being distinguished by an asterisk (*) against the catalogue number. A list of the proper names used precedes the index proper.

The general method of arrangement and the order of the stars under each heading can easily be seen by reference to the pages concerned. Since all stars have been allotted a constellation name, they all appear under one of the 88 standard constellations (*Trans. I.A.U.* 4, 221, 1932), although their main name may appear under one of the other headings.

INTRODUCTION

Ce volume, fournissant les positions moyennes et apparentes pour 1986 des 1535 étoiles du *Fourth Fundamental Catalogue*¹ (désigné partout ici par son abréviation FK4), résulte de la coopération de l'Astronomisches Rechen-Institut, Heidelberg, et du Bureau des Longitudes, Paris, sous les auspices de l'Union Astronomique Internationale (U.A.I.).

La question concernant la double impression dans les diverses éphémérides fut soulevée à la Réunion de 1932 de l'Union; après l'adoption, en 1935, du FK3 comme catalogue fondamental pour les positions moyennes des étoiles dans les Éphémérides astronomiques, l'opportunité devint évidente de réaliser pratiquement cette résolution par la présente publication d'un volume unique contenant les positions apparentes des étoiles².

Pendant les années 1941—1959 la préparation de ce volume a été répartie entre les six principaux bureaux de calcul. Lors de l'Assemblée de l'U.A.I. tenue en 1955 à Dublin, il fut décidé de modifier cette répartition et de concentrer les travaux similaires sur un plus petit nombre de bureaux de calcul. Conformément à cette décision l'Astronomisches Rechen-Institut de Heidelberg est responsable de la publication du volume «Apparent Places of Fundamental Stars» à partir de 1960. Cet institut calculera les éphémérides des 1483 étoiles de 10 jours du FK4, tandis que le Bureau des Longitudes de Paris se chargera du calcul des 52 étoiles polaires du FK4.

L'entente internationale s'étend à la publication des différents annuaires nationaux, des «Ephemerides of Minor Planets» et des «Apparent Places of Fundamental Stars». Les travaux de calcul nécessaires sont répartis entre les six bureaux de calcul suivants: Heidelberg, Herstmonceux, Leningrad, Paris, San Fernando et Washington.

Toutes les données dans le volume Apparent Places of Fundamental Stars sont basées sur le FK4, auquel on peut se référer pour les détails des positions stellaires. Les 1535 étoiles, dont les positions moyennes et apparentes sont fournies, comprennent 853 étoiles de 10 jours et 20 étoiles circompolaires d'Auwers, plus 630 étoiles de 10 jours et 32 circompolaires additionnelles.

Dans les réductions aux positions apparentes les constantes de précession, nutation et aberration utilisées sont celles adoptées par la XII^e assemblée générale de l'Union astronomique internationale (Résolution No 4, Hambourg, septembre 1964). Pour les constantes de réduction utilisées, les bases sont les mêmes que pour celles publiées par l'Astronomical Ephemeris et l'American Ephemeris. On trouvera dans ces éphémérides les explications nécessaires concernant les bases de calcul.

¹ Fourth Fundamental Catalogue (FK4). *Veröffentlichungen des Astronomischen Rechen-Instituts Heidelberg* Nr 10 (1963).

² Pour plus de détails concernant l'origine du volume et les résolutions de l'U.A.I., consulter: *Transactions of the International Astronomical Union*, 4, 20, 222 (1932); 5, 29, 287, 370 (1935); 6, 357 (1938), où se trouve un compte-rendu circonstancié des discussions conduisant à la publication actuelle.

Les quantités mises en tables exigent peu d'explication, néanmoins tous les détails essentiels des diverses sections sont fournis ci-après.

Positions apparentes des étoiles de 10 jours (p. 1—371)

Les positions apparentes des 1483 étoiles de déclinaisons entre $\pm 81^\circ$ sont données pour chaque dixième passage supérieur à Greenwich, pages 1—371. Le choix des dates est déterminé par les époques pour lesquelles les constantes pour la réduction des étoiles sont données aux pages 476—477 (dates sidérales de Greenwich étant divisibles par 10). A partir de 1960, l'intervalle de dix culminations sera maintenu de façon continue au passage d'une année à la suivante. Les étoiles sont disposées généralement à raison de quatre par page, dans l'ordre de leur ascensions droites moyennes pour le commencement de l'année.

Les No, nom, magnitude et spectre sont empruntés généralement au FK4. Dans tous les cas où la dénomination de l'étoile ne contient pas le nom de la constellation (par exemple, étoiles de B.D.), celui-ci a été ajouté; les limites des constellations sont conformes à la *Délimitation Scientifique des Constellations*, par Delporte (Cambridge, 1930). Certains noms propres sont ajoutés; un relevé de ces noms propres adoptés se trouve dans *l'Index to Apparent Places of Stars (Index aux positions apparentes des étoiles)*, page 501. Quelques noms alternatifs sont indiqués dans la page XLVI. Dans le cas de certaines étoiles doubles l'indication de la composante à laquelle se rapportent les positions données est fournie par les lettres *p.* (preceding = précédente) et *f.* (following = suivante); on a indiqué par un astérisque les étoiles doubles pour lesquelles on donne des notes dans les pages XLIV—XLV. Les étoiles variables dont l'amplitude est égale ou supérieure à $0^m.3$ sont signalées par l'indication des magnitudes limites ou par l'adjonction "var".

La colonne U.T. donne l'heure approchée de passage pour toutes les étoiles de la page; elle est arrondie au dixième de jour le plus proche. Pour les passages aux méridiens autres que celui de Greenwich la colonne U.T. peut être regardée comme l'instant solaire moyen (local).

L'ascension droite et la déclinaison sont rapportées à l'équateur et à l'équinoxe vrais de la date, mais sans tenir compte des termes à courte période de la nutation. Comme dans les autres catalogues, les positions moyennes des étoiles du FK4 ne sont pas affranchies du terme constant de l'aberration. Par conséquent, dans les réductions aux positions apparentes le terme de l'aberration provenant de l'excentricité de l'orbite terrestre n'a pas été pris en considération. Les corrections dues au mouvement orbital ont été appliquées à sept étoiles. Les valeurs de ces corrections, ainsi que les références concernant les éléments d'orbite et les rapports des masses, sont données p. XLIV. A partir de l'an 1960 des corrections pour la parallaxe ont été appliquées à 721 étoiles, à savoir à celles dont la parallaxe donnée par le *General Catalogue of Trigonometric Stellar Parallaxes* (Yale 1952) atteint ou dépasse $0^m.10$. Les valeurs utilisées sont tirées sans modification de la colonne intitulée «Absolute π » du Catalogue Jenkins.

Les heures et minutes d'ascension droite ainsi que les degrés et minutes de déclinaison figurant en tête de colonnes sont choisies de manière que les secondes ne changent jamais de signe; celles-ci peuvent donc dépasser 60. Les différences premières des coordonnées sont imprimées en caractères plus petits, avec signe.

Immédiatement au-dessous des ascensions droites et déclinaisons on trouve:

- 1) — la position moyenne de l'astre pour 1986.5.
- 2) — $\sec \delta$ et $\tan \delta$ ($\text{tang} \delta$) correspondant à la position moyenne.

- 3) — les quatre quantités $d\alpha(\psi)$, $d\alpha(\varepsilon)$, $d\delta(\psi)$, $d\delta(\varepsilon)$ nécessaires pour calculer les termes à courte période de la nutation.
 4) — la date où l'astre a deux passages supérieurs.

Pour interpoler l'ascension droite et la déclinaison aux instants des passages intermédiaires à Greenwich ou aux heures des passages à d'autres méridiens, on doit tenir compte des différences secondes. Avec la notation suivante

| Argument | Fonction | Différences | |
|----------|----------|-------------|--------------|
| 0 | f_0 | Δ'_0 | Δ''_0 |
| 1 | f_1 | Δ'_1 | Δ''_1 |

il convient d'employer la formule de Bessel

$$f_n = f_0 + n\Delta'_1 + B'_n(\Delta''_0 + \Delta''_1)$$

La table VI (p. 492—498), ayant comme arguments le facteur d'interpolation, n , et la somme des différences secondes, $\Delta''_0 + \Delta''_1$, donne directement le troisième terme de la formule ci-dessus; un exemple est donné p. XXI. Pour les passages intermédiaires à Greenwich le facteur d'interpolation est toujours un dixième exact et les autres observatoires peuvent aisément construire les tables spéciales pour les dix facteurs d'interpolation dont ils ont besoin. Il faut remarquer qu'on peut obtenir $\Delta''_0 + \Delta''_1$ directement de la différence entre les deux différences premières Δ'_0 et Δ'_1 ; des différences premières additionnelles sont tabulées au début et à la fin de l'année, de sorte qu'on peut obtenir $\Delta''_0 + \Delta''_1$ partout.

La correction pour l'effet des termes à courte période de la nutation est obtenue au moyen des formules suivantes

$$\begin{aligned} \Delta\alpha &= d\alpha(\psi) \cdot d\psi + d\alpha(\varepsilon) \cdot d\varepsilon && \text{en secondes de temps} \\ \Delta\delta &= d\delta(\psi) \cdot d\psi + d\delta(\varepsilon) \cdot d\varepsilon && \text{en secondes d'arc} \end{aligned}$$

où $d\psi$ et $d\varepsilon$, termes à courte période respectifs de la nutation en longitude et obliquité, ε , sont donnés pour chaque jour dans la table I (pages 478—479) et

$$\begin{aligned} d\alpha(\psi) &= \frac{1}{15}(\cos \varepsilon + \sin \alpha \operatorname{tang} \delta \sin \varepsilon) && d\delta(\psi) = \cos \alpha \sin \varepsilon \\ d\alpha(\varepsilon) &= -\frac{1}{15} \cos \alpha \operatorname{tang} \delta && d\delta(\varepsilon) = \sin \alpha \end{aligned}$$

sont fournis au-dessous du tableau de chaque étoile.

Toutes ces quantités sont données avec le même nombre de décimales que l'ascension droite et la déclinaison correspondantes. $d\psi$ et $d\varepsilon$ sont publiés, pour 0^h T.E., à $0^m.001$. L'interpolation de ces grandeurs étant malaisée, il est recommandé de calculer les produits $\Delta\alpha$ et $\Delta\delta$ pour deux jours consécutifs à 0^h T.E., puis d'interpoler ces valeurs pour l'heure du passage. Le moment approximatif de passage est exprimé par

$$\alpha + \lambda - \text{temps sidéral à } 0^h$$

où λ désigne la longitude; pour interpoler les $\Delta\alpha$ et $\Delta\delta$ l'estimation très grossière du temps du passage, donnée par la fraction du jour dans la colonne U.T., suffit cependant pour α —temps sidéral à 0^h dans la plupart des cas.

Comme exemple, considérons le calcul de la correction due à ces termes à courte période pour α Cassiopeiae (No 21), le 1986 Janvier 7.6.

$$\begin{array}{l} \text{De la page 10} \\ d\alpha(\psi) = +0.068 \\ d\alpha(\varepsilon) = -0.099 \end{array} \quad \begin{array}{l} d\delta(\psi) = +0.39 \\ d\delta(\varepsilon) = +0.17 \end{array}$$

| 1986 | De la page 478 | | $d\alpha(\psi) \cdot d\psi$ | $d\alpha(\varepsilon) \cdot d\varepsilon$ | $\Delta\alpha$ | $d\delta(\psi) \cdot d\psi$ | $d\delta(\varepsilon) \cdot d\varepsilon$ | $\Delta\delta$ |
|-------------|----------------|----------------|-----------------------------|---|----------------|-----------------------------|---|----------------|
| | $d\psi$ | $d\varepsilon$ | | | | | | |
| Janvier 7.0 | -0".272 | -0".048 | -0.0188 | +0.0048 | -0.014 | -0.108 | -0.008 | -0".12 |
| 8.0 | -0.172 | -0.097 | -0.0117 | +0.0096 | -0.002 | -0.067 | -0.016 | -0.08 |

$$\text{Jan. 7.6:} \quad \Delta\alpha = -0.007 \quad \Delta\delta = -0".10$$

Positions apparentes des étoiles circumpolaires (p. 372-475)

Les positions apparentes des 52 étoiles circumpolaires de déclinaisons supérieures à $\pm 81^\circ$ sont fournies, pour chaque culmination supérieure à Greenwich, pages 372-475; classées par ordre d'ascension droite se trouvent d'abord les étoiles boréales, puis les étoiles australes. Deux pages en regard sont consacrées à chaque étoile, le nom, la magnitude, le No du catalogue et le spectre étant répétés sur les deux pages. Dans la colonne de gauche le jour du mois est seul fourni, sans fraction de jour. L'ascension droite et la déclinaison se rapportent à l'équateur et à l'équinoxe vrais de la date, et les termes à courte période de la nutation sont inclus; deux décimales de seconde seulement sont données en ascension droite. Pour le seul jour de l'année où se produisent deux culminations supérieures à Greenwich, celles-ci sont données toutes deux.

Les valeurs de sec δ et tang δ sont indiquées pour chaque mois et se rapportent à la position apparente correspondant au 16^e du mois; elles peuvent être utilisées sans interpolation. Les notes au bas, répétées à chaque page, donnent: l'ascension droite et la déclinaison moyennes et la date de la double culmination inférieure.

Constantes pour la réduction des étoiles (p. 476-477)

Ces pages contiennent, pour 12^h de temps sidéral à Greenwich, les constantes de Bessel sans les termes à courte période de la nutation. Les tables donnent de dix en dix jours *A*, *B*, *C*, *D* à 0".001 et *E* à 0.0001. Ces grandeurs sont nécessaires lors du calcul de la position apparente d'étoiles ne figurant pas dans les APFS. L'élimination des termes à courte période permet l'interpolation exacte dans les intervalles de dix jours. L'interpolation des constantes de réduction pour l'heure du passage est facilitée par l'emploi des variations horaires de *A*, *B*, *C*, *D*, qui sont données à 0".0001.

Dès 1960, les constantes de réduction sont référées au début d'année le plus proche de l'instant considéré. L'équinoxe correspondant est donné dans la dernière colonne de chaque page et indique si ce sont les positions moyennes du début de l'année en cours, ou celles du début de l'année suivante qui doivent être utilisées pour le calcul des coordonnées apparentes. La grandeur τ est la fraction d'année tropique écoulée depuis le commencement d'année auquel les valeurs des constantes de réduction se rapportent. La variation de τ pour 1^h est + 0.00011.

L'avant-dernière colonne de la page de droite fournit la date sidérale de Greenwich (Greenwich Sidereal Date). Les constantes de réduction sont données par la table pour les dates sidérales de Greenwich dont la partie entière est un multiple de 10. Ce choix fixe également les dates des éphémérides des étoiles de dix jours.

Table I (p. 478—479)

Termes à courte période de la nutation

Dans cette table on trouve, pour 0^h T.E. de chaque jour de l'année, les termes à courte période de la nutation en longitude ($d\psi$) et en obliquité ($d\varepsilon$) nécessaires pour la correction des positions apparentes des étoiles de 10 jours. Les expressions à l'aide desquelles ils sont calculés figurent dans le volume *Improved Lunar Ephemeris 1952—1959*, p. IX—X (1954). Un exemple pour l'usage de ces valeurs est donné p. XVII.

Table II (p. 480—483)

Temps sidéral à 0^h T.U.

Dans ces pages sont donnés pour 0^h T.U., chaque jour de l'année:

- 1) — le temps sidéral apparent (ou vrai) à 0^s001
- 2) — le temps sidéral moyen (ou uniforme) fourni en secondes et décimales seulement, les heures et minutes étant les mêmes que dans la première colonne
- 3) — les termes à longue période de la nutation en ascension droite («Equation of Equinoxes»), à 0^s001
- 4) — les termes à courte période de la nutation en ascension droite («Equation of Equinoxes»), à 0^s001

Le temps sidéral apparent est la somme des trois autres colonnes.

Tables III et IV (p. 484—489)

Conversion du temps solaire moyen en temps sidéral et vice-versa

Ces tables sont basées sur les relations suivantes déduites de la valeur de l'année tropique conclue par Newcomb:

$$\begin{aligned} 1 \text{ jour solaire moyen} &= 24^h 03^m 56^s 55536 \text{ de temps sidéral moyen} \\ 1 \text{ jour sidéral moyen} &= 23^h 56^m 04^s 09054 \text{ de temps solaire moyen} \end{aligned}$$

La table III fournit, l'argument étant le temps solaire moyen, la quantité à *ajouter* à cet intervalle de temps pour le convertir en un intervalle équivalent de temps sidéral moyen; la table analogue IV, où l'argument est le temps sidéral moyen, donne la quantité qu'il faut *retrancher* de l'intervalle considéré de temps sidéral pour convertir celui-ci en un intervalle équivalent de temps solaire moyen.

En utilisant ces tables pour passer du temps solaire moyen (ou du T.U.) au temps sidéral apparent ou vice-versa, il faut se souvenir que, si le temps sidéral apparent à 0^h est pris dans la table II, une correction devra être appliquée pour tenir compte du changement de la nutation en ascension droite («equation of equinoxes») entre 0^h et l'heure T. U. envisagée.

Ainsi le temps sidéral apparent (local) à Paris a $7^h 21^m 36^s 572$ T.U. le 11 janvier 1986, s'obtient comme il suit:

| | | | | | | |
|---|---|-------------|--------|------------|--------|--------|
| Intervalle solaire moyen, à partir de 0^h | | 7^h | 21^m | $36^s 572$ | | |
| Corrections au temps solaire moyen | } | (table III) | { | + | 1 | 12.445 |
| pour passer au temps sidéral | | | | + | | 0.100 |
| Temps sidéral apparent à 0^h (table II) | | | 7 | 20 | 49.706 | |
| Variation en nutation de 0^h à 7^h (table II) | | | + | | 0.002 | |
| | | | | | | |
| Somme = temps sidéral apparent à Greenwich | | | 14 | 43 | 38.825 | |
| Longitude, Paris — Greenwich | | | — 0 | 9 | 20.910 | |
| | | | | | | |
| Différence = temps sidéral apparent à Paris | | | 14 | 52 | 59.735 | |

D'une façon analogue le T.U., le 11 janvier 1986, correspondant à un temps sidéral apparent (local) à Paris de $14^{\text{h}} 52^{\text{m}} 59^{\text{s}}735$ s'obtient ainsi:

| | | |
|---|---|--|
| Temps sidéral apparent à Paris | | $14^{\text{h}} 52^{\text{m}} 59^{\text{s}}735$ |
| Longitude, Greenwich — Paris | | + 0 9 20.910 |
| <hr/> | | |
| Différence = temps sidéral apparent à Greenwich | | 14 43 38.825 |
| Temps sidéral apparent à 0^{h} (table II) | | 7 20 49.706 |
| <hr/> | | |
| Intervalle sidéral. | | 7 22 49.119 |
| Corrections au temps sidéral pour } (table IV) | } | - 1 12.411 |
| passer au temps solaire moyen } | | - 0.134 |
| Variation en nutation de 7^{h} à 0^{h} (table II) | | - 0.002 |
| <hr/> | | |
| Somme = T.U. | | 7 21 36.572 |

Table V (p. 490—491)

Conversion des heures, minutes et secondes en fraction décimale de jour

Cette table n'appelle aucune explication.

Table VI (p. 492—498)

Correction due aux différences secondes

Cette table donne, les arguments étant le facteur d'interpolation, n , et la somme des différences secondes, $\Delta_0'' + \Delta_1''$, la correction qui doit être appliquée à l'interpolation linéaire. La correction est toujours de signe contraire à celui de $\Delta_0'' + \Delta_1''$ et l'interpolation est inutile; la quantité est exprimée en unités de la dernière décimale de la fonction.

Par exemple, on se propose de calculer la position apparente de β Eridani ($N^{\circ} 188$), lors de son passage supérieur à Washington ($\lambda = +5^{\text{h}} 8^{\text{m}} = +0.21$) le 17 avril 1986 (date locale).

Les passages supérieurs à Greenwich figurant dans le tableau sont avril 10 et avril 20, de sorte que le facteur d'interpolation est $\frac{1}{10} (7 + 0.21) = 0.721$. Se reportant à la page 82, on trouve que les doubles différences secondes en ascension droite et déclinaison sont respectivement $+65$ et $+42$ unités de la dernière décimale fournie.

Il en résulte

$$\begin{aligned}\alpha &= 5^{\text{h}} 7^{\text{m}} 9^{\text{s}}176 + (-0^{\text{s}}112)(0.721) - 0^{\text{s}}003 = 9^{\text{s}}092 \\ \delta &= -5^{\circ} 6' 14''35 + (+0''79)(0.721) - 0''02 = 13''80\end{aligned}$$

Table VII (p. 499)

Aberration diurne

Cette table, dans laquelle on entre avec la latitude, φ , et la déclinaison, δ , comme arguments, donne la correction qui doit être appliquée au temps du passage pour tenir compte de l'aberration diurne. Cette correction (mise en table sans signe) est à *retrancher* du temps observé du passage ou, si l'on préfère, à *ajouter* à l'ascension droite de l'étoile, dans le cas des passages au-dessus du pôle. Dans le cas des passages au-dessous du pôle, on doit inverser le signe de la correction. Les quantités résultent de la formule

$$\text{Aberration diurne} = 0^{\text{s}}0213 \cos \varphi \sec \delta$$

Index aux positions apparentes des Étoiles (p. 501—510)

Cet index indique, dès que l'on connaît simplement le nom de l'astre, la page sur laquelle se trouve la position apparente d'une étoile quelconque.

Afin de réaliser un index aussi complet que possible, tous les noms attribués aux étoiles dans ce volume ont été insérés dans l'index; les autres noms figurant dans les «Notes on Stars» à la page XLVI étant distingués, par un astérisque (*), des numéros du catalogue.

Une liste des noms propres utilisés précède l'index proprement dit.

La méthode générale de disposition et l'ordre des étoiles sous chaque rubrique se reconnaissent aisément en se reportant aux pages correspondantes. Puisque toutes les étoiles ont été pourvues d'un nom de constellation, elles figurent toutes dans l'une des 88 constellations standard (*Trans. I.A.U.* 4, 221, 1932), bien que leur nom principal puisse figurer sous l'une des autres dénominations.

EINLEITUNG

Dieser Band, der für das Jahr 1986 die mittleren und scheinbaren Örter der 1535 Sterne des *Vierten Fundamental-Katalogs*¹ (FK4) enthält, ist aus der Zusammenarbeit zwischen dem Astronomischen Rechen-Institut, Heidelberg, und dem Bureau des Longitudes, Paris, hervorgegangen. — Auf der Tagung der Internationalen Astronomischen Union im Jahre 1932 wurde zum ersten Mal der Plan erörtert, bei der Berechnung und Veröffentlichung von Sternephemeriden unnötige Mehrfacharbeit zu vermeiden; eine Möglichkeit, diese Gedanken in die Tat umzusetzen, ergab sich, als 1935 der FK3 als Grundlage für die Fixsternörter aller astronomischen Jahrbücher angenommen wurde. So entstand das Ephemeridenwerk „Apparent Places of Fundamental Stars“, das die scheinbaren Örter aller Fundamentalsterne in einem Bande vereinigt².

Während der Jahre 1941 bis 1959 waren die sechs großen Ephemeriden-Institute an der Berechnung der in diesem Band enthaltenen Sternephemeriden beteiligt. Auf der IAU-Tagung in Dublin 1955 wurde ein Beschluß über die Neuverteilung der Vorausberechnungen gefaßt; leitend war dabei der Gesichtspunkt, gleichartige Arbeiten auf eine möglichst kleine Zahl von Instituten zu verteilen. Aufgrund dieses Beschlusses trägt ab Jahrgang 1960 das Astronomische Rechen-Institut in Heidelberg die Verantwortung für die Herausgabe des Bandes „Apparent Places of Fundamental Stars“; in diesem Institut werden die Ephemeriden aller 1483 10-Tage-Sterne des FK4 berechnet. Das Bureau des Longitudes hat die Berechnung der scheinbaren Örter der 52 Polsterne übernommen.

Die internationale Übereinkunft umfaßt im ganzen die Berechnung und Herausgabe der verschiedenen nationalen Ephemeriden-Werke, sowie der „Ephemerides of Minor Planets“ und der „Apparent Places of Fundamental Stars“. Die für diese Jahrbücher notwendigen Rechnungen sind auf die sechs Ephemeriden-Institute in Heidelberg, Herstmonceux, Leningrad, Paris, San Fernando und Washington verteilt.

Die in den „Apparent Places of Fundamental Stars“ gegebenen Daten beruhen auf dem FK4. Die Gesamtzahl von 1535 Sternen, für die mittlere und scheinbare Örter gegeben sind, setzt sich zusammen aus 873 Auwers-Sternen (darunter 20 Polsterne) und 662 Zusatz-Sternen (mit 32 Polsternen).

Für die in die Reduktion auf den scheinbaren Ort eingehenden Konstanten der Präzession, Nutation und Aberration sind die auf der 12. Generalversammlung der Internationalen Astronomischen Union (Hamburg, September 1964, Resolution Nr. 4) angenommenen Werte benutzt. Die verwendeten Reduktionsgrößen beruhen auf den gleichen Grundlagen wie die in der *Astronomical Ephemeris* veröffentlichten Daten; Einzelheiten über diese Berechnungsgrundlagen sind in den Erläuterungen der *Astronomical Ephemeris* und der *American Ephemeris* gegeben.

¹ Fourth Fundamental Catalogue (FK4). *Veröffentlichungen des Astronomischen Rechen-Instituts Heidelberg* Nr. 10 (1963).

² Wegen weiterer Einzelheiten über den Ursprung dieses Bandes und über die diesbezüglichen Beschlüsse der I.A.U. vgl. *Transactions of the International Astronomical Union*, 4, 20, 222 (1932); 5, 29, 287, 370 (1935); 6, 357 (1938)

Die für den Gebrauch der Ephemeriden und Tafeln notwendigen Erläuterungen sind in den folgenden Abschnitten gegeben.

Scheinbare Örter der 10-Tage-Sterne (Seite 1–371)

Auf den Seiten 1–371 sind die scheinbaren Örter der 1483 Sterne mit Deklinationen zwischen $\pm 81^\circ$ für jede zehnte obere Kulmination Greenwich gegeben. Die Wahl der Daten ist durch die Zeitpunkte festgelegt, für die die Reduktionsgrößen auf Seite 476–477 tabuliert sind (volle Zehner-Werte des Sternzeitdatums Greenwich). Das Intervall von 10 Kulminationen wird ab 1960 kontinuierlich über die Jahre hinweggeführt. Die Sterne (je vier auf einer Seite) sind nach der mittleren Rektaszension des Jahresanfangs geordnet.

Stern-Nummer, Name, Helligkeit und Spektrum sind dem FK4 entnommen. In allen Fällen, in denen der Stern-Name nicht die Bezeichnung des Sternbildes enthält (z. B. bei den B. D.-Sternen), ist diese Sternbildangabe hinzugefügt; die Sternbildergrenzen entsprechen der *Délimitation Scientifique des Constellations* von Delporte (Cambridge 1930). Für einige helle Sterne sind die gebräuchlichen Eigennamen mit angegeben; ein Verzeichnis dieser Eigennamen findet sich im Register, Seite 501. Einige Alternativ-Namen sind auf Seite XLVI gegeben. Bei einigen Doppelsternen ist durch die Buchstaben *p.* (preceding = vorangehend), und *f.* (following = nachfolgend), die Komponente gekennzeichnet, auf die sich der tabulierte Ort bezieht; ein Stern hinter dem Namen eines Doppelsterns weist auf eine Angabe in den „Notes on Stars“, Seite XLIV–XLV, hin. Veränderliche Sterne, deren Amplitude gleich oder größer 0^m_3 ist sind durch Angabe der Helligkeitsgrenzen oder durch den Zusatz „var.“ gekennzeichnet

Die mit U.T. überschriebene Spalte enthält die genäherte Kulminationszeit für alle auf der Seite aufgeführten Sterne. Für Kulminationen in anderen Meridianen als dem von Greenwich kann diese Zeitangabe als örtliche mittlere Sonnenzeit betrachtet werden. Die Zeit ist auf das nächstliegende Zehntel eines Tages abgerundet.

Die Rektaszensionen und Deklinationen sind auf den wahren momentanen Äquator und das wahre Äquinoktium bezogen, jedoch unter Ausschluß der kurzperiodischen Nutationsglieder. Die mittleren Örter der FK4-Sterne sind — wie die Örter aller Sternkataloge — von dem konstanten Glied der Aberration nicht befreit. In Übereinstimmung damit ist bei der Reduktion auf den scheinbaren Ort das von der Exzentrizität der Erdbahn abhängige Aberrationsglied nicht berücksichtigt. Korrekturen wegen Bahnbewegung sind bei sieben Doppelsternen angebracht worden. Die Werte dieser Reduktionen vom Schwerpunkt auf die Komponenten finden sich — zusammen mit Quellen-Angaben für die Bahnelemente und Massenverhältnisse — auf Seite XLIV. Ab 1960 wird der Einfluß der jährlichen Parallaxe bei allen Sternen berücksichtigt, bei denen der im *General Catalogue of Trigonometric Stellar Parallaxes* (Yale 1952) gegebene Wert gleich oder größer $0^{\prime}010$ ist (*Trans. I.A.U.* 7, 76, 82; 8, 67). Dies ist bei 721 Sternen der Fall; die Parallaxenwerte sind ungeändert dem Yale-Katalog, Spalte „Absolute π “, entnommen.

Die Stunden und Minuten der Rektaszension und die Grade und Minuten der Deklination, die im Kopf jeder Spalte stehen, sind so gewählt, daß bei den Sekunden keine Vorzeichenänderungen vorkommen, wohl aber Beträge, die 60 übersteigen. Die ersten Differenzen der Koordinaten sind, mit ihren Vorzeichen, in kleinerem Druck gegeben.

Unmittelbar unter der Rektaszension und Deklination ist für jeden Stern gegeben

1. Der mittlere Ort für 1986.5; bei Doppelsternen, bei denen Bahnbewegung berücksichtigt ist, ist der mittlere Ort der Komponente gegeben, für die die Ephemeride gilt.

2. Die Werte von $\sec \delta$ und $\operatorname{tg} \delta$ für den mittleren Ort.
3. Die Größen $d\alpha(\psi)$, $d\alpha(\varepsilon)$, $d\delta(\psi)$, $d\delta(\varepsilon)$, die bei der Berechnung der kurzperiodischen Nutationsglieder gebraucht werden.
4. Das Datum der Doppelkulmination.

Bei der Interpolation der Sternörter auf dazwischenliegende Kulminationen und auf Kulminationen in anderen Meridianen als dem von Greenwich müssen zweite Differenzen berücksichtigt werden. Es empfiehlt sich, mit folgenden Bezeichnungen

| Argument | Funktion | Differenzen |
|----------|----------|--------------|
| 0 | f_0 | Δ_0'' |
| | | Δ_1' |
| 1 | f_1 | Δ_1'' |

nach der Besselschen Formel zu rechnen:

$$f_n = f_0 + n\Delta_1' + B_n'' (\Delta_0'' + \Delta_1'')$$

Das dritte Glied dieser Formel ist in Tafel VI (Seite 492–498) gegeben; Argumente: Interpolationsfaktor n und doppelte zweite Differenz $\Delta_0'' + \Delta_1''$. Ein Beispiel für den Gebrauch dieser Tafel findet sich auf Seite XXVIII. Für Kulminationen in Greenwich ist der Interpolationsfaktor n immer ein genaues Zehntel; andere Sternwarten können sich leicht spezielle Hilfstafeln für die zehn von ihnen gebrauchten Faktoren herstellen. Der Wert von $\Delta_0'' + \Delta_1''$ kann am einfachsten als Differenz zwischen den zwei ersten Differenzen $\Delta_{\frac{1}{10}}'$ und $\Delta_{\frac{9}{10}}'$ erhalten werden; zusätzliche erste Differenzen sind am Anfang und Ende des Jahres gegeben, so daß $\Delta_0'' + \Delta_1''$ auch hier berechnet werden kann.

Die Korrektion wegen der kurzperiodischen Nutationsglieder geschieht nach den Formeln

$$\begin{aligned} \Delta\alpha &= d\alpha(\psi) \cdot d\psi + d\alpha(\varepsilon) \cdot d\varepsilon && \text{in Zeitsekunden} \\ \Delta\delta &= d\delta(\psi) \cdot d\psi + d\delta(\varepsilon) \cdot d\varepsilon && \text{in Bogensekunden} \end{aligned}$$

Die Werte von $d\psi$ und $d\varepsilon$ (kurzperiodische Nutationsglieder in Länge bzw. Schiefe ε) sind für jeden Tag in Tafel I (Seite 478–479) gegeben. Die Größen

$$\begin{aligned} d\alpha(\psi) &= \frac{1}{15} (\cos \varepsilon + \sin \alpha \operatorname{tg} \delta \sin \varepsilon) && d\delta(\psi) = \cos \alpha \sin \varepsilon \\ d\alpha(\varepsilon) &= -\frac{1}{15} \cos \alpha \operatorname{tg} \delta && d\delta(\varepsilon) = \sin \alpha \end{aligned}$$

stehen für jeden Stern unter der Ephemeride; sie haben die gleiche Stellenzahl wie die zugehörige scheinbare Rektaszension und Deklination. $d\psi$ und $d\varepsilon$ sind auf 0,001 für 0^h E.T. gegeben. Die Interpolation dieser Größen ist unbequem; es empfiehlt sich daher, zunächst die beiden Produkte $\Delta\alpha$ und $\Delta\delta$ für 0^h E.T. zweier aufeinander folgender Tage zu berechnen und dann diese $\Delta\alpha$, $\Delta\delta$ für die Durchgangszeit zu interpolieren. Der Zeitpunkt des Durchgangs ist genähert gegeben durch

$$\alpha + \lambda - \text{Sternzeit für } 0^h$$

dabei ist λ die geographische Länge; bei der Interpolation der $\Delta\alpha$ und $\Delta\delta$ genügt es jedoch in den meisten Fällen, für „ α —Sternzeit für 0^h“ den Wert einzusetzen, der als Tagesbruch in der Datumspalte der 10-Tage-Ephemeriden gegeben ist.

Beispiel: Berechnung der Korrekturen $\Delta\alpha$ und $\Delta\delta$ für α Cassiopeiae (Nr. 21), 1986 Januar 7.6.

Von Seite 10 $d\alpha(\psi) = +0.068$ $d\delta(\psi) = +0.39$
 $d\alpha(\epsilon) = -0.099$ $d\delta(\epsilon) = +0.17$

| 1986 | Von Seite 478 | | $d\alpha(\psi) \cdot d\psi$ | $d\alpha(\epsilon) \cdot d\epsilon$ | $\Delta\alpha$ | $d\delta(\psi) \cdot d\psi$ | $d\delta(\epsilon) \cdot d\epsilon$ | $\Delta\delta$ |
|-----------|---------------|-------------|-----------------------------|-------------------------------------|-------------------------|-----------------------------|-------------------------------------|----------------|
| | $d\psi$ | $d\epsilon$ | | | | | | |
| Jan. 7.0 | -0".277 | -0".048 | -0.0188 | +0.0048 | -0.0014 | -0.108 | -0.008 | -0".12 |
| 8.0 | -0.172 | -0.097 | -0.0117 | +0.0096 | -0.002 | -0.067 | -0.016 | -0.08 |
| Jan. 7.6: | | | $\Delta\alpha = -0.0007$ | | $\Delta\delta = -0".10$ | | | |

Scheinbare Örter der Polsterne (Seite 372–475)

Die scheinbaren Örter der 52 Polsterne mit Deklinationen über $\pm 81^\circ$ sind auf den Seiten 372–475 für jede obere Kulmination in Greenwich gegeben. Zuerst kommen die nördlichen Sterne in der Reihenfolge der Rektaszension, dann die südlichen. Auf zwei gegenüberstehenden Seiten findet sich je ein Stern; Nummer, Name, Helligkeit und Spektrum sind auf beiden Seiten gegeben. In der Datumspalte links sind nur die ganzen Tage, ohne Tagesbruch, gegeben. Rektaszension und Deklination beziehen sich auf den wahren momentanen Äquator und das wahre Äquinoktium; die kurzperiodischen Glieder der Nutation sind in den Koordinaten enthalten. Die Rektaszensionen sind auf 0.01 gegeben. Für den Tag der Doppelkulmination sind beide Werte angeführt.

Die Werte von $\sec \delta$ und $\operatorname{tg} \delta$ sind für jeden Monat gegeben; sie gelten streng für den scheinbaren Ort am 16. des Monats, Interpolation ist fast niemals notwendig. In der untersten Zeile jeder Seite stehen die mittlere Rektaszension und Deklination für den Jahresanfang und das Datum der doppelten unteren Kulmination.

Reduktionsgrößen (Seite 476–477)

Auf diesen Seiten sind die Besselschen Reduktionsgrößen, ohne die kurzperiodischen Nutationsglieder, für 12^h Sternzeit Greenwich gegeben. Im Intervall von 10 Sterntagen sind A, B, C, D auf 0.001, E auf 0.0001 tabuliert. Diese Werte werden bei der Ephemeridenrechnung für Nicht-Fundamentalsterne gebraucht; durch die Ausschaltung der kurzperiodischen Nutationsglieder wird die exakte Interpolation innerhalb des 10-Tage-Intervalls ermöglicht. Die stündlichen Änderungen von A, B, C, D sind auf 0.0001 gegeben; sie sollen zur Interpolation der Reduktionsgrößen für die Durchgangszeit dienen.

Ab 1960 sind die Reduktionsgrößen auf den jeweils nächstgelegenen Jahresanfang bezogen; das zugehörige Äquinoktium ist auf beiden Seiten in der letzten Spalte gegeben. Bei der Übertragung auf den scheinbaren Ort muß also – entsprechend diesen Werten für das Äquinoktium – der mittlere Ort zum Beginn des laufenden oder des folgenden Jahres als Ausgangswert genommen werden. τ bezeichnet für jedes tabulierte Datum den seit dem Jahresanfang, auf den die zugehörigen Werte der Reduktionsgrößen bezogen sind, vergangenen Bruchteil des tropischen Jahres. Die stündliche Änderung von τ beträgt +0.00011.

In der vorletzten Spalte der rechten Seite ist das Sternzeitdatum Greenwich (Greenwich Sidereal Date) gegeben; als Zeitargumente für die hier tabulierten Reduktionsgrößen sind diejenigen Daten gewählt, für die die Sternzeitdaten Greenwich auf volle Zehnerwerte enden. Durch diese Wahl sind auch die Argumente der 10-Tage-Ephemeriden festgelegt.

Tafel I (Seite 478—479)

Kurzperiodische Nutationsglieder

Diese Tafel enthält, für 0^h E.T. jedes Tages, die kurzperiodischen Nutationsglieder in Länge ($d\psi$) und Schiefe (de), die für die Berechnung der an die 10-Tage-Ephemeriden anzubringenden Korrekturen gebraucht werden. Die Formeln und numerischen Grundlagen, nach denen diese Nutationsterme berechnet sind, sind in dem Band *Improved Lunar Ephemeris* 1952—1959, Seite IX—X (1954), gegeben. Ein Beispiel für den Gebrauch dieser Werte findet sich auf Seite XXIV.

Tafel II (Seite 480—483)

Sternzeit für 0^h Weltzeit

Auf diesen Seiten sind für 0^h Weltzeit (U. T.) jedes Tages gegeben:

1. Die wahre Sternzeit (apparent sidereal time) auf 0^s001 .
2. Die sich gleichförmig ändernde mittlere Sternzeit; es sind nur die Sekunden und deren Dezimalen angegeben, Stunden und Minuten stimmen mit der ersten Spalte überein.
3. Die langperiodischen Glieder der Gleichung der Äquinoktien auf 0^s001 .
4. Die kurzperiodischen Glieder der Gleichung der Äquinoktien auf 0^s001 .

Die wahre Sternzeit ist die Summe der anderen drei Größen. Die ab 1960 „Gleichung der Äquinoktien“ genannte Nutations-Größe $d\psi \cos \epsilon$ wurde bis 1959 als „Nutation in Rektaszension“ bezeichnet.

Tafeln III und IV (Seite 484—489)

Umwandlung von mittlerer Sonnenzeit in Sternzeit und umgekehrt

Diese Tafeln basieren auf folgenden, von dem Newcomb'schen Wert des tropischen Jahres abgeleiteten, Beziehungen:

$$\begin{aligned} 1 \text{ mittlerer Sonnentag} &= 24^h 03^m 56^s 55536 \text{ mittlerer Sternzeit} \\ 1 \text{ mittlerer Sterntag} &= 23^h 56^m 04^s 09054 \text{ mittlerer Sonnenzeit} \end{aligned}$$

Tafel III gibt die Größe an, die einem als Argument gegebenen Intervall mittlerer Sonnenzeit zuzuaddieren ist, um das entsprechende Intervall mittlerer Sternzeit zu erhalten; ähnlich gibt Tafel IV die Größe an, die von einem als Argument gegebenen Intervall mittlerer Sternzeit zu subtrahieren ist, um das entsprechende Intervall mittlerer Sonnenzeit zu erhalten.

Bei Benutzung dieser Tafeln zu dem Zweck, von mittlerer Sonnenzeit auf wahre Sternzeit, bzw. umgekehrt überzugehen, ist darauf zu achten, daß falls die wahre Sternzeit für 0^h aus Tafel II entnommen wird, eine Korrektur wegen Änderung der Nutation in der zwischen 0^h und der gegebenen Welt-Zeit (U.T.) verfloßenen Zeit anzubringen ist. Man erhält z. B. für 1986 Januar 11, $7^h 21^m 36^s 572$ Welt-Zeit die wahre örtliche Sternzeit in Potsdam-Babelsberg wie folgt:

| | | | |
|--|---|---------------------|----------|
| Intervall seit 0^h Welt-Zeit (mittl. Sonnenzeit) | | $7^h 21^m 36^s 572$ | |
| Korrekturen für Umrechnung | } | + | 1 12.445 |
| auf mittlere Sternzeit | | + | 0.100 |
| Wahre Sternzeit für 0^h (Tafel II) | | 7 20 | 49.706 |
| Änderung der Nutation von 0^h auf 7^h (Tafel II) | | + | 0.002 |
| Summe = wahre Sternzeit Greenwich | | 14 43 | 38.825 |
| Länge, Babelsberg — Greenwich | | — 0 52 | 25.490 |
| Differenz = wahre Sternzeit Babelsberg | | 15 36 | 4.315 |

In ähnlicher Weise erhält man die Welt-Zeit am 11. Januar 1986, der die wahre Sternzeit $15^{\text{h}} 36^{\text{m}} 4^{\text{s}} 315$ Potsdam-Babelsberg entspricht:

| | | | | |
|--|--------------|-----------------|-----------------|--------------------|
| Wahre Sternzeit Babelsberg | | 15^{h} | 36^{m} | $4^{\text{s}} 315$ |
| Länge, Greenwich — Babelsberg | | + | 0 | 52 25.490 |
| Differenz = wahre Sternzeit Greenwich | | | 14 | 43 38.825 |
| Wahre Sternzeit für 0^{h} (Tafel II) | | | 7 | 20 49.706 |
| Sternzeitintervall seit 0^{h} U.T. | | | 7 | 22 49.119 |
| Korrekturen für Umrechnung | } (Tafel IV) | } | - | 1 12.411 |
| auf mittlere Sonnenzeit | | | - | 0.134 |
| Änderung der Nutation von 7^{h} auf 0^{h} (Tafel II) | | | - | 0.002 |
| Summe = Welt-Zeit (U.T.) | | | 7 | 21 36.572 |

Tafel V (Seite 490—491)

Umwandlung von Stunden, Minuten und Sekunden in Dezimalteile des Tages

Diese Tafel bedarf keiner Erläuterung.

Tafel VI (Seite 492—498)

Korrektur wegen zweiter Differenzen

Diese Tafel gibt — mit den Argumenten Interpolationsfaktor n und doppelter zweiter Differenz $\Delta_0'' + \Delta_1''$ — das zweite Glied der Besselschen Interpolationsformel $B''(\Delta_0'' + \Delta_1'')$; vgl. oben Seite XXV die Angaben über Interpolation mit zweiten Differenzen. Die Werte der Tafel VI sind in Einheiten der letzten Stelle der betreffenden Funktion gegeben; sie können der Tafel ohne Interpolation entnommen werden. Das Vorzeichen der Korrektur $B''(\Delta_0'' + \Delta_1'')$ ist immer dem Vorzeichen von $\Delta_0'' + \Delta_1''$ entgegengesetzt.

Beispiel: Gesucht sei der scheinbare Ort von β Eridani (Nr. 188) für die obere Kulmination in Washington ($\lambda = +5^{\text{h}} 8^{\text{m}} = +0^{\text{d}} 21$) am 17. April 1986 (Ortsdatum).

Tabuliert sind die Kulminationen in Greenwich am 10. und 20. April; der Interpolationsfaktor ist daher $\frac{1}{10}(7 + 0.21) = 0.721$. Die doppelten zweiten Differenzen in Rektaszension und Deklination (siehe Seite 82) betragen +65 und +42 in Einheiten der letzten gedruckten Stelle. Es ist also

$$\begin{aligned} \alpha &= 5^{\text{h}} 7^{\text{m}} 9^{\text{s}} 176 + (-0^{\text{s}} 112)(0.721) - 0^{\text{s}} 003 = 9^{\text{s}} 092 \\ \delta &= -5^{\circ} 6' 14'' 35 + (+0'' 79)(0.721) - 0'' 02 = 13'' 80 \end{aligned}$$

Tafel VII (Seite 499)

Tägliche Aberration

Diese Tafel gibt die Korrektur, die wegen der täglichen Aberration an die Durchgangszeit anzubringen ist, mit den beiden Argumenten geographische Breite φ und Deklination δ . Die Korrektur ist ohne Vorzeichen tabuliert; sie wird, für die oberen Kulminationen, von der beobachteten Durchgangszeit *abgezogen*, bzw. zu der Rektaszension des Sterns *addiert*. Für die unteren Kulminationen ist das Vorzeichen umzukehren. Die Werte sind nach der folgenden Formel berechnet:

$$\text{Tägliche Aberration} = 0^{\text{s}} 0213 \cos \varphi \sec \delta$$

Register für die Stern-Ephemeriden (Seite 501—510)

Das Register ist alphabetisch nach Sternbilder-Namen geordnet; es soll das Auffinden einer Ephemeride nach dem Namen des Sternes ermöglichen. Auch die in den „Notes on Stars“ auf Seite XLVI angegebenen Alternativ-Namen sind in das Register aufgenommen; sie sind hier durch einen * vor der FK4-Nummer gekennzeichnet. Die Reihenfolge, in der die Sterne innerhalb eines Bildes aufgeführt sind, ist leicht zu überschauen. Da alle Sterne mit Sternbilder-Namen versehen sind, erscheint jeder Stern hier in einer der 88 Standard-Konstellationen (*Trans. I. A. U.* 4, 221, 1932). — Am Anfang des Registers ist eine alphabetische Liste der Stern-Eigennamen gegeben.

INTRODUCCION

Este volumen, que contiene las posiciones medias y aparentes para 1986 de las 1535 estrellas del *Fourth Fundamental Catalogue*¹ (designado en adelante por FK4), es el producto de la colaboración entre el Astronomisches Rechen-Institut de Heidelberg y el Bureau des Longitudes de París. En la conferencia de la Unión Astronómica Internacional en 1932 se discutió por primera vez un plan para evitar trabajo innecesario en el cálculo y publicación de los almanaques; la primera posibilidad de traducir en hechos este proyecto se presentó en 1935, cuando el FK3 se adoptó como base para las posiciones de las estrellas fijas en todos los Anuarios astronómicos. De esta manera se formó el «Apparent Places of Fundamental Stars», que agrupa en un volumen las posiciones aparentes de todas las estrellas fundamentales².

En el cálculo de las efemérides contenidas en este volumen habían participado de los años 1941 a 1959 las seis Oficinas principales de Almanaque. En la Conferencia de la IAU 1955, celebrada en Dublín, se tomó un acuerdo sobre un nuevo reparto de las predicciones; el criterio adoptado fué el de repartir un trabajo igual entre el menor número posible de Oficinas. En virtud de este acuerdo y a partir del año 1960 el Astronomisches Rechen-Institut de Heidelberg asumió la responsabilidad de la edición del volumen «Apparent Places of Fundamental Stars»; en este Instituto fueron calculadas las efemérides de las 1483 estrellas de diez días del FK4. El Bureau des Longitudes se ha encargado del cálculo de las posiciones aparentes de las 52 estrellas circumpolares.

El acuerdo internacional comprendía el cálculo y edición de diferentes Almanaxes nacionales, de las «Ephemerides of Minor Planets» y de las «Apparent Places of Fundamental Stars». Los cálculos necesarios para éstos anuarios han sido encomendados a las seis Oficinas de Almanaque de Heidelberg, Herstmonceux, Leningrado, París, San Fernando y Washington.

Los datos contenidos en el «Apparent Places of Fundamental Stars» están basados en el FK4. Las 1535 estrellas para las cuales se dan las posiciones medias y aparentes son: 853 a intervalos de 10 días, 20 circumpolares de Auwers, y 630 de 10 días más 32 circumpolares adicionales.

Las constantes de precesión, nutación y aberración, empleadas en la reducción de las posiciones aparentes, son las adoptadas por la XII Asamblea General de la Unión Astronómica Internacional (Hamburgo, septiembre 1964, resolución 4.^a). Los números diarios de Bessel utilizados se apoyan en los acuerdos de la I.A.U. y están calculados sobre las mismas bases que los datos publicados en la Astronomical Ephemeris y otros Almanaxes nacionales; los detalles sobre estas bases de cálculo se indican en las introducciones a los Anuarios.

¹ Fourth Fundamental Catalogue (FK4). *Veröffentlichungen des Astronomischen Rechen-Instituts Heidelberg* Nr. 10 (1963).

² Para otros detalles de origen del volumen y de las recomendaciones importantes de la I.A.U. véase *Transactions of the International Astronomical Union*, 4, 20, 222 (1932); 5, 29, 287, 370 (1935); 6, 357 (1938), donde se da relación detallada sobre las particularidades conducentes al presente volumen.

Las explicaciones necesarias para el uso de las efemérides y de las tablas se dan a continuación.

Posiciones aparentes de las estrellas de 10 días (páginas 1—371)

Las posiciones aparentes de las 1483 estrellas con declinación entre $\pm 81^\circ$ se dan para cada décimo tránsito por el meridiano superior de Greenwich en las páginas 1—371. La elección de las fechas está determinada por las épocas, para las cuales se dan las constantes para la reducción de las estrellas en las págs. 476—477 (siendo los días sidéreos de Greenwich divisibles por 10). A partir de 1960 el intervalo de 10 culminaciones se continua sin interrupción a través de todo el año. Cada página comprende cuatro estrellas, ordenadas segun sus ascensiones rectas medias a principio de año.

El número, nombre, magnitud y espectro están tomados del FK4. En todos los casos en que el nombre de la estrella no contenga normalmente el de la constelación, (tal como las estrellas del B.D.), éste se ha añadido; los límites de las constelaciones están de acuerdo con la *Délimitation Scientifique des Constellations* de Delporte (Cambridge, 1930). En el caso de algunas estrellas de gran magnitud se dan los nombres propios más corrientes; una relación de estos nombres se encuentra en el índice de la página 501. Algunos otros nombres están en la pág. XLVI. En el caso de algunas estrellas dobles, la componente para la cual su posición está tabulada se indica con las letras *p*. (preceding = precedente), y *f*. (following = siguiente). Un asterisco trás el nombre de una estrella doble hace referencia a una indicación en «Notes on Stars», páginas XLIV—XLV. Las estrellas variables cuya amplitud es igual o superior a $0^m.3$ se indican por sus márgenes de magnitud o por el añadido „var.”

En la columna U.T. se indica, en días y décimos de día, el tiempo del tránsito aproximado de todas las estrellas de la página. Para pasos sobre meridianos distintos del de Greenwich la columna U.T. ha de considerarse como fecha solar media local del tránsito. La cifra decimal es la más próxima.

La ascensión recta y la declinación están referidas al ecuador y equinoccio verdaderos de la fecha, pero con la omisión de los términos de corto período de nutación. Las posiciones medias de las estrellas del FK4, están afectadas del término constante de la aberración, al igual que ocurre en todos los catálogos de estrellas. De acuerdo con esto, en la reducción a las posiciones aparentes no se incluye el término de la aberración, que depende de la excentricidad de la órbita terrestre. Se han tenido en cuenta los movimientos orbitales en siete estrellas dobles. Los valores de las reducciones del centro de gravedad a las componentes se encuentran en la página XLIV en unión de las referencias sobre los elementos de las orbitas y las relaciones de las masas. A partir de 1960 se tiene en cuenta la influencia del paralaje anual en todas las estrellas que en el *General Catalogue of Trigonometric Stellar Parallaxes* (Yale, 1952) tienen un valor igual o mayor que $0''.010$ (*Trans. I.A.U.* 7, 76, 82; 8, 67). Esto sucede con 721 estrellas; el valor de paralaje ha sido tomado sin variar de columna «Absolute π » del catálogo de Yale.

Las horas y minutos en ascensión recta y los grados y minutos en declinación contenidos en cabeza de columnas están ajustados de modo que nunca cambien de signo los segundos, aunque sea necesario para ello que estos excedan de 60. Las primeras diferencias entre las coordinadas se dan en tipo pequeño y con su signo.

Inmediatamente por debajo de las tablas de ascensión recta y declinación se da:

- (I) La posición media, para 1986.5, de la estrella tabulada; en el caso de estrellas dobles, en las cuales se tiene en cuenta la órbita, se da la posición media de los componentes para los que vale la efeméride.

- (II) $\sec \delta$ y $\tan \delta$ correspondientes a la posición media.
- (III) Las cantidades $d\alpha(\psi)$, $d\alpha(\varepsilon)$, $d\delta(\psi)$, $d\delta(\varepsilon)$, que se requieren para la aplicación de los términos de corto período de la nutación.
- (IV) El día en que la estrella tiene dos pasos.

Para interpolar la ascensión recta y declinación para pasos intermedios por Greenwich, o pasos por otros meridianos, debe hacerse uso de las segundas diferencias. Con la siguiente notación

| Argumento | Función | Diferencias | |
|-----------|---------|-------------|--------------|
| 0 | f_0 | Δ'_1 | Δ''_0 |
| 1 | f_1 | | Δ''_1 |

debe usarse la fórmula de Bessel:

$$f_n = f_0 + n\Delta'_1 + B''_n (\Delta''_0 + \Delta''_1)$$

La Tabla VI (páginas 492-498) da directamente, con los argumentos factor de interpolación, n , y doble diferencia segunda, $\Delta''_0 + \Delta''_1$, el tercer término de la fórmula anterior; un ejemplo se da en la página XXXV. Para pasos intermedios por Greenwich el factor de interpolación siempre es de una décima exacta; los demás observatorios pueden construir fácilmente tablas especiales para los diez factores de interpolación que ellos necesitan. Obsérvese que $\Delta''_0 + \Delta''_1$ puede obtenerse directamente de la diferencia entre las dos primeras diferencias Δ'_1 y Δ'_2 ; primeras diferencias adicionales se dan al principio y fin de año, para que $\Delta''_0 + \Delta''_1$ pueda hallarse todo el año.

La corrección por el efecto de los términos de corto periodo de a nutación se obtiene por medio de las fórmulas

$$\begin{aligned} \Delta\alpha &= d\alpha(\psi) \cdot d\psi + d\alpha(\varepsilon) \cdot d\varepsilon && \text{segundos de tiempo} \\ \Delta\delta &= d\delta(\psi) \cdot d\psi + d\delta(\varepsilon) \cdot d\varepsilon && \text{segundos de arco} \end{aligned}$$

en las que $d\psi$ y $d\varepsilon$ son los términos de corto período de la nutación en longitud y oblicuidad ε , respectivamente, tabulados para cada día en la Tabla I (páginas 478-9), y

$$\begin{aligned} d\alpha(\psi) &= \frac{1}{15} (\cos \varepsilon + \sen \alpha \tan \delta \sen \varepsilon) && d\delta(\psi) = \cos \alpha \sen \varepsilon \\ d\alpha(\varepsilon) &= -\frac{1}{15} \cos \alpha \tan \delta && d\delta(\varepsilon) = \sen \alpha \end{aligned}$$

se hallan tabuladas bajo cada estrella. Todas estas cantidades se dan con el mismo número de decimales que a la ascensión recta y declinación corresponden. $d\psi$ y $d\varepsilon$ están dados con 0".001 a 0^h E.T. La interpolación de estas dos cantidades es incómoda; por eso es mejor calcular primeramente ambos productos $\Delta\alpha$ y $\Delta\delta$ a 0^h E.T. en dos días seguidos, y después interpolar $\Delta\alpha$, $\Delta\delta$ para el tiempo de paso. El momento de paso está aproximadamente dado por

$$\alpha + \lambda - \text{tiempo sidéreo a } 0^h$$

donde λ es la longitud geográfica; en la interpolación de $\Delta\alpha$ y $\Delta\delta$ basta, sin embargo, en la mayoría de los casos utilizar como valor de « α —tiempo sidéreo a 0^h» el tiempo aproximado dado por la fracción de día en la columna U.T. de las efemérides de 10 días.

Ejemplo: cálculo de las correcciones $\Delta\alpha$ y $\Delta\delta$ para α Cassiopeiae (Nr. 21), 1986, Enero 7.6.

| | | |
|---------------|---------------------------------|--------------------------------|
| De la pág. 10 | $d\alpha(\psi) = +0.068$ | $d\delta(\psi) = +0.39$ |
| | $d\alpha(\varepsilon) = -0.099$ | $d\delta(\varepsilon) = +0.17$ |

| 1986 | De la páge 478 | | $d\alpha(\psi) \cdot d\psi$ | $d\alpha(\epsilon) \cdot d\epsilon$ | $\Delta\alpha$ | $d\delta(\psi) \cdot d\psi$ | $d\delta(\epsilon) \cdot d\epsilon$ | $\Delta\delta$ |
|-----------|----------------|-------------|-----------------------------|-------------------------------------|----------------|-----------------------------|-------------------------------------|----------------|
| | $d\psi$ | $d\epsilon$ | | | | | | |
| Enero 7.0 | -0".272 | -0".048 | -0.0188 | +0.0048 | -0.014 | -0.108 | -0.008 | -0".12 |
| 8.0 | -0.172 | -0.097 | -0.0117 | +0.0096 | -0.002 | -0.067 | -0.016 | -0.08 |

Enero 7.6: $\Delta\alpha = -0.007$ $\Delta\delta = -0".10$

Posiciones aparentes de las estrellas circumpolares (páginas 372-475)

Las posiciones aparentes de 52 estrellas circumpolares con declinaciones mayores de $\pm 81^\circ$ se dan para cada paso superior por Greenwich en las páginas 372-475. Primero las estrellas septentrionales en la serie de su ascensión recta, después las meridionales. A cada estrella se dedican dos páginas, expresándose en ambas el nombre, magnitud, número en el catálogo y espectro. En la columna de la izquierda sólo se da el día del mes sin la fracción de día. La ascensión recta y declinación están referidas al ecuador y equinoccio verdaderos de la fecha e incluidos los términos de corto período de nutación. Para la ascensión recta se dan sólo dos cifras decimales de segundo. En el día del año en el cual se verifican dos pasos superiores en Greenwich, se dan ambos.

Los valores de $\sec \delta$ y $\tan \delta$ son para cada mes, referidos a la posición aparente a día 16° del mes; generalmente se pueden usar sin interpolación. Las notas al pie, repetidas en cada página, dan la ascensión recta y declinación medias y la fecha del doble paso inferior.

Números diarios de Bessel (páginas 476-477)

En estas páginas se dan los números diarios de Bessel para 12^h tiempo sidéreo en Greenwich, sin los términos nutacionales de corto período. En intervalos de 10 días sidéreos son tabulados *A, B, C, D*, con 0".001 y *E* con 0.0001. Estos valores son los utilizados en el cálculo de las posiciones aparentes contenidas en este volumen. Se usan también en las reducciones de estrellas no fundamentales. La exclusión de los términos de la nutación de corto período, permite la interpolación exacta en intervalos de 10 días. Las variaciones por hora de *A, B, C, D*, son dadas con 0.0001; sirven para la interpolación de los números diarios en los tiempos de paso.

Desde 1960 las constantes de reducción están referidas al principio de año más próximo al instante considerado; el equinoccio al cual ellas están relacionadas está dado en la última columna de cada página. Su valor indica si deben utilizarse las posiciones medias del año en curso ó las del año siguiente para el cálculo de las posiciones aparentes. La magnitud τ es la fracción de año trópico que hay desde el comienzo del año al cual se refieren las constantes de reducción. La variación de τ por 1^h es +0.00011.

La penúltima columna de la página de la derecha proporciona el Día Sidereo Greenwich correspondiente; los argumentos para los que se dan las constantes de reducción tabuladas son los días Sidereos de Greenwich, cuya parte entera sea múltiplo de 10 y corresponden a los argumentos para las efemérides de las estrellas.

Tabla I (páginas 478-479)

Términos de corto período de la Nutación

Esta tabla contiene para 0^h E.T. en cada día los términos de corto período de nutación en longitud ($d\psi$) y en oblicuidad ($d\epsilon$), que son necesarios para la corrección de las posiciones aparentes de las estrellas de 10 días. Las fórmulas y bases numéricas según las

cuales han sido calculados estos términos de nutación están dados en el volumen *Improved Lunar Ephemeris* 1952-1959, páginas IX-X (1954). Un ejemplo del uso de esos valores se encuentra en la página XXXI.

Tabla II (páginas 480-483)

Tiempo sidéreo á 0^h T.U.

En estas páginas se da á 0^h T.U. para cada día sucesivo del año:

- (I) el tiempo sidéreo aparente (ó verdadero) á la 0^o001
- (II) el tiempo sidéreo medio (ó uniforme), los segundos y decimales solamente, puesto que las horas y minutos son los mismos de la primera columna
- (III) los términos de largo período de nutación en ascensión recta («Equation of Equinoxes») á la 0^o001
- (IV) los términos de corto período de nutación en ascensión recta («Equation of Equinoxes») á la 0^o001

El tiempo sidéreo aparente es la suma de las otras tres columnas.

Tablas III y IV (páginas 484-489)

Conversión de Tiempo solar medio a sidéreo y vice versa

Estas tablas están basadas en las siguientes relaciones derivadas del valor del año trópico de Newcomb:

$$\begin{aligned} 1 \text{ día solar medio} &= 24^{\text{h}} 03^{\text{m}} 56^{\text{s}} 55536 \text{ de tiempo sidéreo medio} \\ 1 \text{ día sidéreo medio} &= 23^{\text{h}} 56^{\text{m}} 04^{\text{s}} 09054 \text{ de tiempo solar medio} \end{aligned}$$

La Tabla III da, con argumento tiempo solar medio, la cantidad que ha de *sumarse* al intervalo de tiempo solar para convertirlo en un intervalo equivalente de tiempo sidéreo medio; de igual manera la Tabla IV da, con argumento tiempo sidéreo medio, la cantidad que ha de *restarse* del intervalo de tiempo sidéreo para convertirlo en un intervalo equivalente de tiempo solar medio.

En el caso en que se usen estas Tablas para pasar de tiempo solar medio (o de T.U.) a tiempo sidéreo aparente, y se haya tomado de la Tabla II el tiempo sidéreo aparente a 0^h, debe recordarse que ha de aplicarse una corrección por la variación de la nutación en ascensión recta entre 0^h y el T.U. dado.

Así el tiempo sidéreo local aparente en San Fernando á T.U. 7^h 21^m 36^s 572 en 11 de Enero de 1986 se obtiene de este modo:

| | | | |
|---|---|--|-------------|
| Intervalo solar medio desde 0 ^h | | 7 ^h 21 ^m 36 ^s 572 | |
| Correcciones al tiempo solar medio | } | + | 1 12.445 |
| para obtener el tiempo sidéreo | | + | 0.100 |
| Tiempo sidéreo aparente a 0 ^h (Tabla II) | | 7 20 | 49.706 |
| Variación de la nutación entre 0 ^h y 7 ^h (Tabla II) | | + | 0.002 |
| Suma = tiempo sidéreo aparente en Greenwich | | 14 43 | 38.825 |
| Longitud, San Fernando - Greenwich | | + | 0 24 49.300 |
| Diferencia = tiempo sidéreo aparente en San Fernando | | 14 18 | 49.525 |

De igual manera se obtiene el T.U. en 11 de Enero de 1986 que corresponde a un tiempo sidéreo aparente en San Fernando de $14^h 18^m 49^s 525$

| | |
|---|----------------------|
| Tiempo sidéreo aparente en San Fernando | $14^h 18^m 49^s 525$ |
| Longitud, Greenwich — San Fernando | $- 0 24 49.300$ |
| Diferencia = tiempo sidéreo aparente en Greenwich | $14 43 38.825$ |
| Tiempo sidéreo aparente á 0 ^h (Tabla II) | $7 20 49.706$ |
| Intervalo sidéreo | $7 22 49.119$ |
| Correcciones al tiempo sidéreo para } obtener el tiempo solar medio } (Tabla IV) | $- 1 12.411$ |
| Variación de la nutación entre 7 ^h y 0 ^h (Tabla II) | $- 0.134$ |
| Suma = T.U. requerido | $7 21 36.572$ |

Tabla V (páginas 490—491)

Conversión de horas, minutos y segundos a decimales de día

Esta tabla no requiere explicación.

Tabla VI (páginas 492—498)

Corrección por segundas diferencias

Esta tabla da, con los argumentos factor de interpolación, n , y doble diferencia segunda, $\Delta_0'' + \Delta_1''$, la corrección por segunda diferencia. La corrección siempre es de signo contrario á $\Delta_0'' + \Delta_1''$ y para hallarla es innecesaria una interpolación; la cantidad está tabulada en unidades del último orden de las de la función.

Se requiere por ejemplo la posición aparente de β Eridani (No. 188) al paso superior por Washington ($\lambda = +5^h 8^m = +0^d 21$) el 17 de Abril de 1986 (fecha local).

Los pasos superiores tabulados para Greenwich lo están en Abril 10 y Abril 20, por ello el factor de interpolación es $\frac{1}{10} (7 + 0.21) = 0.721$. Refiriéndonos a la página 82, las dobles segundas diferencias en ascensión recta y declinación se ve que son +65 y +42 respectivamente, en unidades de la última cifra tabulada; y por tanto

$$\alpha = 5^h 7^m 9^s 176 + (-0^s 112) (0.721) - 0^s 003 = 9^s 092$$

$$\delta = -5^\circ 6' 14'' 35 + (+0'' 79) (0.721) - 0'' 02 = 13'' 80$$

Tabla VII (página 499)

Aberración diurna

Esta tabla da, con argumentos latitud, φ , y declinación, δ , la corrección que debe aplicarse al tiempo del paso meridiano por efecto de la aberración diurna. Esta corrección (que está tabulada sin signo) debe *restarse* del tiempo observado del paso o *sumarse* a la ascensión recta de la estrella, para pasos superiores. Para pasos inferiores el signo de la corrección debe ser cambiado. Los valores se han calculado por la fórmula

$$\text{Aberración diurna} = 0^s 0213 \cos \varphi \sec \delta$$

Indice de las Posiciones Aparentes de las Estrellas (páginas 501—510)

El índice da a conocer la página en la cual se halla tabulada la posición aparente de cualquier estrella, con sólo conocer el nombre de ella. Con el fin de que el índice sea lo más completo posible, todos los nombres dados en este volumen a las estrellas se han incluido en él, los nombres alternos dados en «Notes on Stars» en la página XLVI se distinguen por un asterisco (*) frente al número del catálogo. Precede al índice una lista de los nombres propios utilizados.

El método general de colocación y orden de las estrellas bajo cada encabezamiento, es fácil verlo por referencia en las páginas concernientes. Puesto que a todas las estrellas se les ha asignado un nombre de constelación, todas aparecen con el de una de las 88 constelaciones tipo (*Trans. I.A.U.* 4, 221, 1932), aun cuando su nombre principal aparezca también bajo una de las otras denominaciones.

ВВЕДЕНИЕ

Настоящее издание, содержащее средние и видимые места 1535 звезд каталога *Fourth Fundamental Catalogue* (FK4)¹ на 1986 год, является результатом сотрудничества между *Astronomisches Rechen-Institut*, Гейдельберг, и *Bureau des Longitudes*, Париж. На сессии Международного Астрономического Союза (I. A. U.) в 1932 г. впервые обсуждался план о том, как избежать лишней работы при вычислении и опубликовании астрономических эфемерид. Возможность претворения этого плана в жизнь явилась в 1935 г., когда каталог FK3 был принят в качестве основы для положений звезд всех астрономических ежегодников. Таким образом возник ежегодник „Видимые места фундаментальных звезд”, объединяющий в одном томе видимые места всех фундаментальных звезд.²

В течение 1941 — 1959 гг. в вычислении содержащихся в этом томе астрономических эфемерид участвовали шесть крупных служб ежегодников. В 1955 г. на сессии МАС в Дублине было принято решение о новом распределении предварительных вычислений. При этом руководствовались идеей распределить однородные работы по возможности между немногими службами. На основе этого решения, начиная с 1960 г. *Astronomisches Rechen-Institut* в Гейдельберге несет ответственность за издание ежегодника „Видимые места фундаментальных звезд”. В этом институте вычисляются эфемериды всех 1483 десятидневных звезд каталога FK4. Видимые места 52 близполюсных звезд вычисляются *Bureau des Longitudes*.

Международное соглашение касается вычисления и издания различных национальных ежегодников, Эфемерид малых планет и Видимых мест фундаментальных звезд. Необходимые для этих ежегодников вычисления распределены между шестью эфемеридными службами в Вашингтоне, Гейдельберге, Ленинграде, Париже, Сан-Фернандо и Херстмонсу.

Данные ежегодника „Видимые места фундаментальных звезд” основаны на каталоге FK4. В общее число 1535 звезд, для которых даются средние и видимые места входят 873 звезды Auwers'a (в том числе 20 близполюсных звезд) и 662 дополнительных звезды (в том числе 32 близполюсных звезды).

В качестве постоянных прецессии, нутации и аберрации, используемых для приведения на видимое место, применяются значения, принятые на XII съезде МАС (Гамбург, сентябрь 1964, революция 4). Употребляемые редуцированные величины

¹ *Fourth Fundamental Catalogue* (FK4). *Veröffentlichungen des Astronomischen Rechen-Instituts Heidelberg* Nr. 10 (1963)

² Относительно деталей возникновения этого издания и содействия со стороны I.A.U. см *Transactions of the International Astronomical Union*, 4, 20, 222 (1932); 5, 29, 287, 370 (1935); 6, 357 (1938), где приводится подробный отчет об обстоятельствах возникновения настоящего издания.

опираются на рекомендации МАС и вычислены с помощью те же самых основных данных, что и редуцированные величины, опубликованные в ежегоднике *Astronomical Ephemeris* и других национальных ежегодниках.

Все объяснения, необходимые для пользования эфемеридами и таблицами приводятся в следующих разделах.

Видимые места десятидневных звезд (стр. 1 — 371)

На страницах 1 — 371 приводятся видимые места 1483 звезд со склонениями от $+ 81^{\circ}$ до $- 81^{\circ}$ на момент каждой десятой верхней кульминации в Гриниче. Выбор дат определяется моментами, на которые даются редуцированные величины на страницах 476 — 477. (Звездные Гриничские даты, целая часть которых оканчивается на „0"). Начиная с 1960 г. интервал в 10 кульминаций будет непрерывно переходить на следующий год. Звезды (по четыре на одной странице) расположены в порядке их прямых восхождений на начало года.

Номер звезды, название, величина и спектр взяты из каталога FK4. Во всех случаях, когда название звезды не содержит названия созвездия (напр., звезды B. D.), последнее прибавляется; границы созвездий соответствуют *Délimitation Scientifique des Constellations* Дельпорта (Кембридж, 1930). Указаны наиболее принятые собственные имена некоторых ярких звезд; список этих собственных имен находится в оглавлении, на стр. 501. Некоторые двойные названия приводятся в списке „Notes on Stars”, стр. XLVI. Для двойных звезд указывается та точка системы, среднее место которой приводится в таблице, причем буква *p.* означает — preceding = предшествующая, *f.* — following = последующая. Звездочка за названием двойной звезды указывает на примечание в „Notes on Stars” стр. XLIV—XLV.

В столбце U. T. указывается приближенный момент кульминации всех приведенных на этой странице звезд. Что касается кульминаций на других, отличных от гриничского меридианах, то за этот момент можно принять местное среднее солнечное время. Время округляется на ближайшую десятую долю суток.

Прямые восхождения и склонения отнесены к истинному экватору и равноденствию даты, но без учета коротко-периодических членов нутации. Средние места звезд каталога FK4 — равно как и всех каталогов — не освобождены от постоянного абберационного члена. В соответствии с этим в приведение на видимое место не включен абберационный член, зависящий от эксцентриситета земной орбиты. Поправки за орбитальное движение учтены у семи двойных звезд. Значения этих приведений от центра тяжести к компонентам указываются на стр. XLIV. Начиная с 1960 г. влияние годичного параллакса будет учитываться у всех звезд, если параллакс согласно каталогу *General Catalogue of Trigonometric Stellar Parallaxes* (Yale 1952) равен или больше 0.010 (*Trans. I. A. U.* 7, 76, 82; 8, 67). Это касается 721 звезды; параллаксы взяты без изменений из столбца „Absolute π ”, Йельского каталога.

Часы и минуты прямых восхождений, а также градусы и минуты склонений, указанные в заголовках столбцов, выбраны так, чтобы секунды никогда не меняли

знака; вследствие этого число секунд может превышать 60. Первые разности координат печатаются мелким шрифтом с указанием знака.

Непосредственно под прямыми восхождениями и склонениями для каждой звезды указываются:

1. Среднее место 1986.5; для двойных звезд, у которых учтено орбитальное движение, дается среднее место компоненты, к которой относится эфемериды.
2. $\sec \delta$ и $\tan \delta$, соответствующие среднему месту.
3. Величины $d\alpha(\psi)$, $d\alpha(\epsilon)$, $d\delta(\psi)$, $d\delta(\epsilon)$, необходимые для вычисления коротко-периодических членов нутации.
4. Дата двойной кульминации.

При интерполяции звездных мест на промежуточные моменты кульминации и на кульминации на меридианах, отличных от гриничского, необходимо учитывать вторые разности. Рекомендуется пользоваться обозначениями

| Аргумент | Функция | Разности |
|----------|---------|-----------------------------|
| 0 | f_0 | Δ'_0 Δ''_0 |
| 1 | f_1 | Δ'_1 Δ''_1 |

согласно формуле Бесселя:

$$f_n = f_0 + n\Delta'_1 + B''_n (\Delta''_0 + \Delta''_1)$$

Таблица VI (стр. 492 — 498) дает непосредственно, для аргументов интерполяционного множителя n и удвоенной второй разности $\Delta''_0 + \Delta''_1$, третий член вышеуказанной формулы; пример приводится на стр. XLII. Для промежуточных кульминаций в Гриниче интерполяционный множитель всегда выражается точно в десятых долях; другие обсерватории легко могут построить таблицы для требующихся им десяти интерполяционных множителей. Следует отметить, что $\Delta''_0 + \Delta''_1$ можно получить непосредственно в виде разности между двумя первыми разностями Δ'_1 и Δ'_0 ; в начале и в конце года даются дополнительные первые разности, так что $\Delta''_0 + \Delta''_1$ можно определять этим способом во всех случаях.

Поправка за влияние коротко-периодических членов нутации вычисляется при помощи формул

$$\begin{aligned} \Delta\alpha &= d\alpha(\psi) \cdot d\psi + d\alpha(\epsilon) \cdot d\epsilon && \text{в сек. времени} \\ \Delta\delta &= d\delta(\psi) \cdot d\psi + d\delta(\epsilon) \cdot d\epsilon && \text{в сек. дуги} \end{aligned}$$

$d\psi$ и $d\epsilon$ (коротко-периодические члены нутации по долготе и наклонности) табулированы на каждый день в табл. I (стр. 478 — 479).

$$\begin{aligned} d\alpha(\psi) &= \frac{1}{15} (\cos \epsilon + \sin \alpha \tan \delta \sin \epsilon) && d\delta(\psi) = \cos \alpha \sin \epsilon \\ d\alpha(\epsilon) &= -\frac{1}{15} (\cos \alpha \tan \delta) && d\delta(\epsilon) = \sin \alpha \end{aligned}$$

находятся для каждой звезды под эфемеридой. Они даются с тем же самым числом десятичных знаков, что и соответствующие видимые прямые восхождения и склонения. $d\psi$ и $d\epsilon$ даются с точностью до 0.001 для 0^h Е. Т. (эфемеридное время). Интерполяция этих величин неудобна; поэтому рекомендуется сначала вычислять оба

произведения $\Delta\alpha$ и $\Delta\delta$ для α^b Е. Т. двух последовательных суток, а затем интерполировать $\Delta\alpha$, $\Delta\delta$ на момент кульминации. Приближенный момент кульминации

$$\alpha + \lambda - \text{звездное время в } \alpha^b$$

причем λ — долгота; при интерполяции $\Delta\alpha$ и $\Delta\delta$ все же достаточно, в большинстве случаев, для „ α — звездное время в α^b ” пользоваться значением, которое дается как дробь суток в столбце У. Т.

В качестве примера рассмотрим вычисление поправок $\Delta\alpha$ и $\Delta\delta$ для α Cassiopeiae (№ 21) на январь 7.6, 1986 г.

$$\begin{aligned} \text{Стр. 10} \quad d\alpha(\psi) &= +0.068 & d\delta(\psi) &= +0.39 \\ d\alpha(\epsilon) &= -0.099 & d\delta(\epsilon) &= +0.17 \end{aligned}$$

| 1986 | Стр 478 | | $d\alpha(\psi) \cdot d\psi$ | $d\alpha(\epsilon) \cdot d\epsilon$ | $\Delta\alpha$ | $d\delta(\psi) \cdot d\psi$ | $d\delta(\epsilon) \cdot d\epsilon$ | $\Delta\delta$ |
|----------|-----------|-------------|-----------------------------|-------------------------------------|-------------------------|-----------------------------|-------------------------------------|----------------|
| | $d\psi$ | $d\epsilon$ | | | | | | |
| янв. 7.0 | -0".272 | -0".048 | -0.0188 | +0.0048 | -0.014 | -0.108 | -0.008 | -0".12 |
| 8.0 | -0.172 | -0.097 | -0.0117 | +0.0096 | -0.002 | -0.067 | -0.016 | -0.08 |
| | янв. 7.6: | | $\Delta\alpha = -0.007$ | | $\Delta\delta = -0".10$ | | | |

Видимые места близполюсных звезд (стр. 372 — 475)

На стр. 372 — 475 даются видимые места 52 близполюсных звезд со склонениями, большими $\pm 81^\circ$, для каждой верхней кульминации в Гриниче. Сначала даются северные близполюсные звезды в порядке прямого восхождения, а за ними следуют южные звезды. На каждую звезду отводятся две смежные страницы, причем название, номер по каталогу, величина и спектр повторяются на обеих страницах. В левом столбце дается только день месяца без дроби суток. Прямое восхождение и склонение отнесены к истинному экватору и истинному равноденствию даты, причем коротко-периодические члены нутации включены в координаты. Прямые восхождения даются лишь с двумя десятичными знаками. Для суток с двойной кульминацией приводятся обе кульминации.

Значения $\sec \delta$ и $\tan \delta$ даются для каждого месяца и относятся строго к видимому месту на 16-ое число каждого месяца; обычно ими можно пользоваться без интерполяции. На последней строке каждой страницы приводятся среднее прямое восхождение и склонение для начала года и дата двойной нижней кульминации.

Редукционные величины (стр. 476 — 477)

На этих страницах даются редукционные величины Бесселя для 12^b звездного времени в Гриниче без коротко-периодических членов нутации. С интервалом 10 звездных суток табулированы A, B, C, D , до 0".001, E до 0".0001. Эти значения нужны для вычисления эфемерид нефундаментальных звезд. Коротко-периодические члены нутации исключены для возможности точного интерполирования внутри 10-дневного интервала. Часовые изменения A, B, C, D даются до 0".0001; они служат для интерполяции редукционных величин на момент кульминации.

Начиная с 1960 г. редукционные величины относятся к ближайшему началу года; соответствующее равноденствие указывается на каждой странице в последнем столбце. В соответствии с этим при вычислении видимого места пользуются средним местом на начало либо текущего, либо следующего года. Величина τ означает дробь тропического года, считаемую от начала года, к которой относятся соответствующие редукционные величины. Часовое изменение τ составляет $+ 0.00011$.

В предпоследнем столбце правой страницы дается звездная гринвичская дата (Greenwich Sidereal Date); в качестве аргумента табличных значений редуцированных величин выбраны звездные гринвичские даты, целая часть которых оканчивается на „0”. Такой выбор определяет аргументы 10-дневных эфемерид.

Таблица I (стр. 478 — 479)

Коротко-периодические члены нутации

В этой таблице даются для о^h Е. Т. (эфемеридное время) каждого дня коротко-периодические члены нутации по долготе ($d\psi$) и по наклонности ($d\epsilon$), необходимые для вычисления поправок видимых мест десятидневных звезд. Формулы и численные постоянные, с помощью которых они вычислены, даны в *Improved Lunar Ephemeris 1952 — 1959*, стр. IX — X (1954). Пример пользования этими значениями приводится на стр. XXXVIII.

Таблица II (стр. 480 — 483)

Звездное время в о^h У. Т.

На этих страницах даны на о^h каждых суток года:

- (1) видимое (или истинное) звездное время до $\text{о}^{\circ}001$
- (2) среднее (или равномерное) звездное время, причем даются только секунды и десятые секунды, т. е. часы и минуты остаются те же, что и в первом столбце
- (3) долго-периодические члены нутации по прямому восхождению (*equation of equinoxes*) до $\text{о}^{\circ}001$
- (4) коротко-периодические члены нутации по прямому восхождению (*equation of equinoxes*) до $\text{о}^{\circ}001$.

Видимое звездное время теоретически представляет собою сумму остальных трех столбцов, хотя расхождения в последнем знаке могут иметь место.

Таблицы III и IV (стр. 484 — 489)

Перевод среднего солнечного в звездное время

Перевод звездного в среднее солнечное время

Эти таблицы основаны на следующих соотношениях, выведенных из значений Ньюкома для тропического года:

- 1 средние солнечные сутки = $24^h 03^m 56^s 55536$ среднего звездного времени
- 1 средние звездные сутки = $23^h 56^m 04^s 09054$ среднего солнечного времени

Таблица III с аргументом среднее солнечное время дает величину, которую надо прибавить к интервалу солнечного времени, чтобы перевести его в соответствующий интервал среднего звездного времени; подобно этому, таблица IV с аргументом среднее звездное время дает величину, которую надо вычесть из интервала звездного времени, чтобы перевести его в соответствующий интервал среднего солнечного времени.

При пользовании этими таблицами для перехода от среднего солнечного времени или от Всемирного времени к видимому звездному времени, и обратно, следует помнить, что необходимо прибавить поправку за изменение нутации по прямому восхождению между о^h и заданным всемирным временем.

Так, местное видимое звездное время в Пулкове, в $7^{\text{h}} 21^{\text{m}} 36^{\text{s}}.572$ всемирного времени 11-го января 1986 г. получается следующим образом:

| | |
|---|--|
| Интервал среднего солнечного времени от 0^{h} | $7^{\text{h}} 21^{\text{m}} 36^{\text{s}}.572$ |
| Поправка к среднему солнечному времени для перехода к звездному времени (Табл. III) | + 1 12.445 |
| Видимое звездное время в 0^{h} (Табл. II) | + 7 20 49.706 |
| Изменение нутации от 0^{h} до 7^{h} (Табл. II) | + 0.002 |
| Сумма = Гриничское видимое звездное время | 14 43 38.825 |
| Долгота Пулково — Гринич | - 2 1 18.570 |
| Равность = Пулковское видимое звездное время | 16 44 57.395 |

Подобно этому, всемирное время 10 января 1984 года, соответствующее местному звездному времени в Пулкове $16^{\text{h}} 44^{\text{m}} 57^{\text{s}}.395$ получается следующим образом:

| | |
|---|---|
| Пулковское видимое звездное время | $16^{\text{h}} 44^{\text{m}} 57^{\text{s}}.395$ |
| Долгота Гринич — Пулково | + 2 1 18.570 |
| Равность = Гриничское видимое звездное время | 14 43 38.825 |
| Видимое звездное время в 0^{h} (Табл. II) | 7 20 49.706 |
| Звездный интервал | 7 22 49.119 |
| Поправки к звездному времени для получения среднего солнечного времени (Табл. IV) | - 1 12.411 |
| Изменение нутации от 7^{h} до 0^{h} (Табл. II) | - 0.134 |
| Сумма = искомое всемирное время | - 0.002 |
| | 7 21 36.572 |

Таблица V (стр. 490 — 491)

Перевод часов, минут и секунд в доли суток

Эта таблица не требует пояснений.

Таблица VI (стр. 492 — 498)

Поправки за вторые разности

Эта таблица с аргументами: интерполяционный множитель n и удвоенная вторая разность $\Delta_0'' + \Delta_1''$, дает поправки, которые следует прибавить к значению, полученному при линейной интерполяции. Поправка дается в единицах последнего знака функции и всегда имеет знак, противоположный знаку величины $\Delta_0'' + \Delta_1''$.

Для примера вычислим видимое положение β Eridani (№ 188) в момент верхней кульминации в Вашингтоне ($\lambda = +5^{\text{h}} 08^{\text{m}} = +0^{\text{s}}.21$) 17 апреля 1986 года (местная дата).

Эфемерида дает верхние кульминации в Гриниче на 10 и 20 апреля, так что интерполяционный множитель равен $\frac{1}{10} (7 + 0.21) = 0.721$. Обращаясь к стр. 82, находим, что удвоенные вторые разности по прямому восхождению и склонению равны соответственно + 65 и + 42 в единицах последнего знака; таким образом

$$\alpha = 5^{\text{h}} 07^{\text{m}} 09^{\text{s}}.176 + (-0^{\text{s}}.112) (0.721) - 0^{\text{s}}.003 = 09^{\text{s}}.092$$

$$\delta = -5^{\circ} 06' 14''.35 + (+0''.79) (0.721) - 0''.02 = 13''.80$$

Таблица VII (стр. 499)

Суточная абберация

Эта таблица с аргументами: широта φ и склонение δ , дает поправку, которую необходимо прибавить к моменту кульминации, чтобы учесть суточную абберацию.

Эта поправка (которая дается без знака) вычитается из наблюденного времени кульминации или же прибавляется к прямому восхождению звезды в случае верхних кульминаций. В случае нижних кульминаций знак поправок меняется на обратный. Значения вычислены по формуле

$$\text{Суточная аберрация} = 0^{\circ}0213 \cos \varphi \sec \delta$$

Указатель к видимым местам звезд (стр. 501 — 510)

Этот указатель позволяет найти страницу, на которой помещается видимое место какой-нибудь звезды, по ее названию. Чтобы сделать указатель как можно более полным, в него были включены все названия звезд, встречающиеся в этом издании, причем двойные названия, даваемые в „Notes on Stars” на стр. XLVI, отмечаются звездочками против номера по каталогу. В начале указателя дается список собственных имен звезд.

Общий метод расположения и порядок, в каком звезды следуют под каждым заголовком, легко усматривается из соответствующих страниц. Так как для всех звезд прибавлено название созвездия, то все они встречаются под одним из 88 названий созвездий (*Trans. I. A. U.* 4, 221, 1932), хотя главное их название может находиться под одним из других заголовков.

COMPONENTS OF DOUBLE STARS, CORRECTIONS FOR ORBITAL MOTION

For seven double-star systems the FK4 gives the positions and proper motions of the centre of gravity; cf. *Veröffentlichungen des Astronomischen Rechen-Instituts Heidelberg* No. 10, p. 125. In producing the ephemerides of these stars the reductions from the centre of gravity to the components have been computed from the orbital elements and mass-ratios quoted in the following table. These reductions include the secular changes of the elements caused by precession and, in the case of the stars 538 and 793, by the space motion of the binary system. For the star 339 the meridian observations and, consequently, the ephemeris on page 140 refer not to the A-component (mass-ratio $f = 0.375$) but to the centre of the integrated light (c. l., $f = 0.24$). For the double star No. 462 α Crucis, which has so far no detectable curvature of orbit, the FK4 gives the mean place and proper motion of the brighter component (1^m6). The transition from the apparent place of this A-component to the B-component (2^m1) has to be made by means of a linear formula.

The following tables contain the data on components and ephemerides of these eight double stars.

Components, whose ephemerides are given in APFS

Reductions from the centre of gravity (FK4) to the component

| No | Name | Magni- tude | Reduction component minus c. g. 1986.0 1987.0 | | Elements | Mass- ratio $f =$ $\frac{M_B}{M_A + M_B}$ |
|-----|------------------------------|-------------------|--|--------------------------------|-------------|--|
| | | | R. A. | Dec. | | |
| 257 | α Canis Majoris A | -1 ^m 6 | -0 ^s 074 -0.057 | - 1 ^{''} 88 - 1.72 | Volet 1931 | 0.282 |
| 287 | α Geminorum A | 2.0 | -0.104 -0.106 | - 0.21 - 0.26 | Rabe 1957 | 0.50 |
| 291 | α Canis Minoris A | 0.5 | +0.001 -0.010 | - 1.38 - 1.38 | Strand 1951 | 0.268 |
| 339 | Bradley 1268 Lyncis c. l. | 4.1 | +0.006 +0.007 | - 0.11 - 0.08 | Baize 1954 | 0.24 |
| 538 | α Centauri A | 0.3 | +0.693 +0.693 | + 7.98 + 7.84 | Heintz 1959 | 0.449 |
| 616 | α Scorpii A | 1.2 | +0.028 +0.028 | - 0.04 - 0.04 | Heintz 1959 | 0.152 |
| 793 | 61 Cygni A | 5.6 | -0.668 -0.666 | +12.11 +12.16 | Strand 1952 | 0.487 |

Reduction from A-component to B-component

| No | Name | Magni- tude | B - A | | Position angle P and Distance d of the B-component | |
|-----|----------------------|-------------------|----------------------|-----------------------|--|--------------------|
| | | | 1986.0 | | 1986.0 | |
| | | | R. A. | Dec. | P | d |
| 287 | α Geminorum B | 2 ^m .8 | +0 ^s .207 | + 0 ^{''} .42 | 81° | 2 ^{''} .7 |
| | | | +0.212 | + 0.52 | 79 | 2.8 |
| 462 | α Crucis B | 2.1 | +0.545 | - 1.60 | 113 | 4.0 |
| | | | +0.544 | - 1.60 | 113 | 4.0 |
| 538 | α Centauri B | 1.7 | -1.543 | -17.78 | 212 | 21.1 |
| | | | -1.544 | -17.45 | 213 | 20.8 |
| 616 | α Scorpii B | 5.2 | -0.186 | + 0.26 | 276 | 2.5 |
| | | | -0.184 | + 0.26 | 276 | 2.5 |
| 793 | 61 Cygni B | 6.3 | +1.379 | -24.87 | 147 | 29.6 |
| | | | +1.369 | -24.98 | 147 | 29.7 |

NOTES ON DOUBLE STARS

MAGNITUDE, POSITION ANGLE P AND DISTANCE d OF THE COMPANION

| No. | Magn. | P | d | No. | Magn | P | d | No. | Magn. | P | d |
|------|------------------|------|------------------|------|-------------------|-----|-----------------|------|-------------------|-----|------------------|
| 37 | 9 ^m 0 | 254° | 17 ^{''} | 335 | 8 ^m .8 | 24° | 5 ^{''} | 1421 | 6 ^m .5 | 12° | 29 ^{''} |
| 1033 | 6.5 | 63 | 23 | 1233 | 7.0 | 75 | 40 | 1424 | 5.2 | 11 | 103 |
| 61 | 8.3 | 30 | 4.7 | 1241 | 9.4 | 147 | 18 | 1426 | 6.4 | 319 | 23 |
| 73 | 5.1 | 63 | 10 | 402 | 6.6 | 105 | 52 | 1428 | 8.5 | 19 | 34 |
| 1072 | 9.6 | 83 | 8 | 428 | 5.4 | 166 | 0.4 | 1436 | 9.3 | 90 | 23 |
| 1078 | 9.0 | 192 | 12 | 431 | 8.0 | 94 | 5 | 641 | 8.1 | 278 | 10 |
| 105 | 9.8 | 230 | 4.8 | 1296 | 7.9 | 150 | 29 | 670 | 6.1 | 15 | 30 |
| 106 | 4.4 | 89 | 8 | 458 | 8.0 | 259 | 11 | 683 | 9.2 | 105 | 4 |
| 122 | 9.0 | 161 | 2.4 | 473 | 6.7 | 271 | 20 | 686 | 8.6 | 154 | 3.5 |
| 147 | 7.9 | 9 | 9 | 1334 | 9.0 | 294 | 23 | 707 | 7.6 | 330 | 34 |
| 165 | 6.6 | 308 | 10 | 485 | 5.4 | 228 | 20 | 709 | 5.4 | 104 | 22 |
| 172 | 7.0 | 1 | 1.1 | 490 | 8.2 | 341 | 7 | 1497 | 9.1 | 344 | 14 |
| 1141 | 8.2 | 27 | 12 | 1347 | 6.5 | 343 | 60 | 720 | 6.2 | 122 | 0.4 |
| 191 | 8.7 | 130 | 20 | 497 | 4.0 | 150 | 15 | 1502 | 7.1 | 77 | 28 |
| 204 | 7.5 | 347 | 2.6 | 1354 | 9.7 | 353 | 31 | 1504 | 6.9 | 239 | 70 |
| 209 | 7.3 | 142 | 11 | 518 | 4.3 | 258 | 1.3 | 732 | 5.4 | 54 | 35 |
| 1167 | 7.0 | 217 | 11 | 1367 | 9.5 | 45 | 18 | 736 | 9.1 | 166 | 2.7 |
| 244 | 6.5 | 27 | 13 | 528 | 7.5 | 33 | 38 | 759 | 8.0 | 122 | 7 |
| 1189 | 5.8 | 299 | 14 | 532 | 9.4 | 280 | 4.2 | 1541 | 5.5 | 269 | 10 |
| 279 | 8.5 | 224 | 6 | 533 | 9.5 | 110 | 5 | 1551 | 9.3 | 353 | 20 |
| 280 | 6.5 | 315 | 15 | 539 | 8.8 | 235 | 16 | 1560 | 8.4 | 301 | 48 |
| 294 | 8.5 | 237 | 7 | 1391 | 8.9 | 300 | 20 | 809 | 7.8 | 250 | 14 |
| 309 | 4.8 | 220 | 41 | 1398 | 6.0 | 144 | 27 | 813 | 7.5 | 120 | 12 |
| 1221 | 7.9 | 87 | 41 | 1401 | 7.6 | 170 | 13 | 847 | 6.6 | 192 | 41 |
| 328 | 6.6 | 307 | 31 | 568 | 6.7 | 171 | 109 | 1592 | 7.8 | 172 | 30 |
| 1231 | 6.3 | 149 | 67 | 597 | 5.1 | 23 | 13 | 900 | 9.0 | 280 | 1.5 |

| No. | Name | No. | Name | No. | Name |
|------|------------------|------|---------------------|-----|-----------------------------------|
| 30 | 19 Ceti | 315 | ε Argus | 485 | 12 Canum Venaticorum ^f |
| 52 | ν Persei | 324 | e Velorum | 492 | 43 Comae Berenices |
| 77 | 6 Persei | 1227 | o Argus | 506 | i Centauri |
| 119 | e Eridani | 336 | c Carinae | 511 | i Draconis |
| 125 | f Tauri | 339 | 10 Ursae Majoris | 522 | d Bootis |
| 130 | y Eridani | 342 | c Velorum | 544 | c^1 Centauri |
| 138 | 5 H. Camelopardi | 345 | λ Argus | 546 | b Lupi |
| 143 | g Eridani | 348 | β Argus | 548 | α Librae |
| 152 | c Persei | 351 | ι Argus | 556 | γ Scorpii |
| 178 | 9 Camelopardi | 352 | 40 Lyncis | 579 | 3 H. Scorpii |
| 182 | 10 Camelopardi | 353 | κ Argus | 624 | 24 Scorpii |
| 244 | 8 Monocerotis | 355 | h Ursae Majoris | 646 | d Ophiuchi |
| 245 | α Argus | 357 | d Ursae Majoris | 650 | x Herculis |
| 252 | ν Argus | 375 | φ Argus | 659 | f Draconis |
| 263 | τ Argus | 382 | q Velorum | 696 | 2 H. Scuti |
| 1187 | 22 Monocerotis | 385 | ω Argus | 702 | 5 H. Scuti |
| 278 | π Argus | 390 | 31 Leonis Minoris | 710 | ξ Sagittarii |
| 1194 | σ Argus | 393 | s Carinae | 722 | d Sagittarii |
| 290 | f Puppis | 397 | p Carinae | 736 | h Sagittarii |
| 293 | 26 Monocerotis | 402 | x Velorum | 753 | c Sagittarii |
| 1204 | ξ Argus | 406 | θ Argus | 757 | 31 Cygni |
| 301 | a Puppis | 409 | l Leonis | 801 | 4 Piscis Austrini |
| 303 | χ Argus | 415 | i Velorum | 807 | g Cygni |
| 306 | ζ Argus | 419 | χ Hydrae | 844 | 3 Lacertae |
| 308 | ι Navis | 454 | 4 H. Draconis | 848 | 7 Lacertae |
| 309 | γ Argus | 470 | 8 Canum Venaticorum | 873 | c^2 Aquarii |
| 311 | 20 Navis | 1328 | d^2 Virginis | | |
| 313 | q Puppis | 482 | n Centauri | | |

APPARENT PLACES OF STARS, 1986

1

AT UPPER TRANSIT AT GREENWICH

| No. | 904 | | 1630 | | 905 | | 1001 | |
|--------------|--------------|--------------|--------------|------------|--------------|------------|---------------|------------|
| | 9 Octantis | | 30 Piscium | | 2 Ceti | | 45 G. Tucanae | |
| Mag.Spect. | 4.73 | K0 | 4.66 | M3 | 4.62 | A0 | 5.64 | B9 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " |
| | 0 00 | -77 08 | 0 01 | - 6 05 | 0 03 | -17 24 | 0 03 | -71 30 |
| 1 | 0.3 | 54 826 - 871 | 13 906 - 101 | 37 40 - 68 | 00 869 - 110 | 60 65 - 69 | 60 106 - 576 | 77 56 - 2 |
| 1 | 0.7 | 53 980 - 846 | 13 806 - 100 | 38 00 - 60 | 00 761 - 108 | 61 15 - 50 | 59 546 - 560 | 76 98 + 58 |
| 1 | 10.7 | 53 173 - 807 | 13 709 - 97 | 38 52 - 52 | 00 655 - 106 | 61 45 - 30 | 59 010 - 536 | 75 83 +115 |
| 1 | 20.7 | 52 439 - 734 | 13 620 - 89 | 38 93 - 41 | 00 559 - 96 | 61 51 - 6 | 58 521 - 489 | 74 08 +175 |
| 1 | 30.6 | 51 799 - 640 | 13 543 - 77 | 39 20 - 27 | 00 476 - 83 | 61 34 + 17 | 58 094 - 427 | 71 84 +224 |
| 2 | 9.6 | 51 259 - 540 | 13 480 - 63 | 39 33 - 13 | 00 408 - 68 | 60 94 + 40 | 57 733 - 361 | 69 16 +268 |
| 2 | 19.6 | 50 848 - 411 | 13 439 - 41 | 39 27 + 6 | 00 363 - 45 | 60 29 + 65 | 57 458 - 275 | 66 07 +309 |
| 3 | 1.6 | 50 570 - 278 | 13 424 + 15 | 39 02 + 25 | 00 344 - 19 | 59 40 + 89 | 57 273 - 185 | 62 71 +336 |
| 3 | 11.5 | 50 426 - 144 | 13 439 + 15 | 38 58 + 44 | 00 354 + 10 | 58 28 +112 | 57 181 - 92 | 59 11 +360 |
| 3 | 21.5 | 50 437 + 11 | 13 484 + 45 | 37 94 + 64 | 00 400 + 46 | 56 89 +139 | 57 196 + 15 | 55 36 +375 |
| 3 | 31.5 | 50 591 + 154 | 13 568 + 84 | 36 96 + 98 | 00 483 + 83 | 55 28 +161 | 57 313 + 117 | 51 57 +379 |
| 4 | 10.4 | 50 891 + 300 | 13 693 + 125 | 35 78 +118 | 00 606 + 123 | 53 46 +182 | 57 534 + 221 | 47 78 +379 |
| 4 | 20.4 | 51 342 + 451 | 13 858 + 165 | 34 35 +143 | 00 772 + 166 | 51 45 +201 | 57 863 + 329 | 44 09 +369 |
| 4 | 30.4 | 51 922 + 580 | 14 061 + 203 | 32 73 +162 | 00 975 + 203 | 49 31 +214 | 58 286 + 423 | 40 58 +351 |
| 5 | 10.4 | 52 632 + 710 | 14 300 + 239 | 30 91 +182 | 01 216 + 241 | 47 05 +226 | 58 804 + 518 | 37 30 +328 |
| 5 | 20.3 | 53 457 + 825 | 14 571 + 271 | 28 94 +197 | 01 491 + 275 | 44 72 +233 | 59 407 + 603 | 34 36 +294 |
| 5 | 30.3 | 54 370 + 913 | 14 865 + 294 | 26 87 +207 | 01 790 + 299 | 42 40 +232 | 60 074 + 667 | 31 80 +256 |
| 6 | 9.3 | 55 363 + 993 | 15 179 + 314 | 24 73 +214 | 02 111 + 321 | 40 11 +229 | 60 801 + 727 | 29 67 +213 |
| 6 | 19.3 | 56 405 +1042 | 15 504 + 325 | 22 59 +214 | 02 444 + 333 | 37 94 +217 | 61 564 + 763 | 28 04 +163 |
| 6 | 29.2 | 57 465 +1060 | 15 830 + 326 | 20 50 +209 | 02 779 + 335 | 35 92 +202 | 62 342 + 778 | 26 93 +111 |
| 7 | 9.2 | 58 529 +1064 | 16 151 + 321 | 18 51 +199 | 03 110 + 331 | 34 10 +182 | 63 123 + 781 | 26 37 + 56 |
| 7 | 19.2 | 59 554 +1025 | 16 457 + 306 | 16 67 +184 | 03 427 + 317 | 32 55 +155 | 63 876 + 753 | 26 40 - 3 |
| 7 | 29.1 | 60 516 + 962 | 16 741 + 284 | 15 04 +163 | 03 723 + 296 | 31 27 +128 | 64 585 + 709 | 26 96 - 56 |
| 8 | 8.1 | 61 392 + 876 | 16 999 + 258 | 13 62 +142 | 03 992 + 269 | 30 31 + 96 | 65 232 + 647 | 28 07 -111 |
| 8 | 18.1 | 62 144 + 752 | 17 222 + 223 | 12 47 +115 | 04 225 + 233 | 29 70 + 61 | 65 791 + 559 | 29 69 -162 |
| 8 | 28.1 | 62 759 + 615 | 17 410 + 188 | 11 59 + 88 | 04 422 + 197 | 29 40 + 30 | 66 253 + 462 | 31 72 -203 |
| 9 | 7.0 | 63 217 + 458 | 17 559 + 149 | 10 98 + 61 | 04 579 + 157 | 29 43 - 3 | 66 604 + 351 | 34 14 -242 |
| 9 | 17.0 | 63 496 + 279 | 17 668 + 109 | 10 65 + 33 | 04 693 + 114 | 29 76 - 33 | 66 828 + 224 | 36 84 -270 |
| 9 | 27.0 | 63 600 + 104 | 17 740 + 72 | 10 56 + 9 | 04 768 + 75 | 29 76 - 58 | 66 828 + 102 | 36 84 -285 |
| 10 | 7.0 | 63 521 - 79 | 17 775 + 35 | 10 70 - 14 | 04 804 + 36 | 31 14 - 80 | 66 904 - 26 | 42 63 -294 |
| 10 | 16.9 | 63 262 - 269 | 17 777 + 2 | 11 04 - 34 | 04 804 + 0 | 32 11 - 97 | 66 752 - 152 | 45 50 -287 |
| 10 | 26.9 | 62 846 - 416 | 17 753 - 24 | 11 52 - 48 | 04 776 - 28 | 33 17 -106 | 66 493 - 259 | 48 18 -268 |
| 11 | 5.9 | 62 281 - 565 | 17 704 - 49 | 12 13 - 61 | 04 720 - 56 | 34 30 -113 | 66 130 - 363 | 50 60 -242 |
| 11 | 15.8 | 61 595 - 686 | 17 636 - 68 | 12 82 - 69 | 04 644 - 76 | 35 40 -110 | 65 685 - 445 | 52 61 -201 |
| 11 | 25.8 | 60 822 - 773 | 17 555 - 81 | 13 53 - 71 | 04 554 - 90 | 36 44 -104 | 65 179 - 506 | 54 14 -153 |
| 12 | 5.8 | 59 979 - 843 | 17 462 - 93 | 14 26 - 73 | 04 452 - 102 | 37 39 - 95 | 64 625 - 554 | 55 15 -101 |
| 12 | 15.8 | 59 110 - 869 | 17 365 - 97 | 14 95 - 69 | 04 346 - 106 | 38 17 - 78 | 64 052 - 573 | 55 54 - 39 |
| 12 | 25.7 | 58 242 - 868 | 17 266 - 99 | 15 59 - 64 | 04 237 - 109 | 38 79 - 62 | 63 478 - 574 | 55 35 + 19 |
| 12 | 35.7 | 57 396 - 846 | 17 167 - 99 | 16 17 - 58 | 04 130 - 107 | 39 21 - 42 | 62 918 - 560 | 54 54 + 81 |
| | | 57 396 - 783 | 17 167 - 92 | 16 17 - 46 | 04 130 - 101 | 39 21 - 19 | 62 918 - 521 | 54 54 +141 |
| Mean Place | 55 033 | 24 50 | 16 092 | 20 64 | 02 942 | 39 93 | 60 867 | 43 36 |
| sec δ, tan δ | +4.493 | -4.380 | +1.006 | -0.107 | +1.048 | -0.314 | +3.154 | -2.991 |
| dα(ψ), dδ(ψ) | +0.061 | +0.40 | +0.061 | +0.40 | +0.061 | +0.40 | +0.060 | +0.40 |
| dα(ε), dδ(ε) | +0.292 | +0.00 | +0.007 | +0.01 | +0.021 | +0.01 | +0.199 | +0.02 |
| Dble.Trans. | September 21 | | September 21 | | September 22 | | September 22 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 1002 | | 1003 | | 1 | | 2 | | |
|----------------|--------------|-------------|--------------|-------------|--------------|-------------|---------------|-------------|------------|
| | 33 Piscium | | 9 G. Ceti | | α Andromedae | | β Cassiopeiae | | |
| Mag. Spect. | 4.68 | K0 | 6.06 | F0 | 2.15 | A0p | 2.42 | F5 | |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " | |
| | 0 04 | - 5 46 | 0 06 | - 23 10 | 0 07 | + 29 00 | 0 08 | + 59 04 | |
| 1 ^d | -9.2 | 36.519 -100 | 75.65 -68 | 06.719 -119 | 79.42 -70 | 38.810 -130 | 53.23 -27 | 24.124 -304 | 34.80 +41 |
| 1 ^s | 0.7 | 36.419 -100 | 76.25 -60 | 06.603 -116 | 79.85 -43 | 38.678 -132 | 52.67 -56 | 23.811 -313 | 34.68 -12 |
| 1 | 10.7 | 36.321 -98 | 76.78 -53 | 06.489 -114 | 80.03 -18 | 38.543 -135 | 51.82 -85 | 23.495 -316 | 34.02 -66 |
| 1 | 20.7 | 36.230 -91 | 77.20 -42 | 06.385 -104 | 79.92 +11 | 38.415 -128 | 50.69 -113 | 23.191 -304 | 32.83 -119 |
| 1 | 30.6 | 36.150 -80 | 77.48 -28 | 06.294 -91 | 79.53 +39 | 38.299 -116 | 49.37 -132 | 22.913 -278 | 31.18 -165 |
| 2 | 9.6 | 36.084 -66 | 77.63 -15 | 06.219 -75 | 78.87 +66 | 38.199 -100 | 47.88 -149 | 22.668 -245 | 29.13 -206 |
| 2 | 19.6 | 36.040 -44 | 77.58 -60 | 06.168 -60 | 77.92 +95 | 38.125 -74 | 46.31 -157 | 22.475 -193 | 26.76 -237 |
| 3 | 1.6 | 36.021 -19 | 77.35 +23 | 06.143 -25 | 76.71 +121 | 38.082 -43 | 44.73 -158 | 22.342 -133 | 24.19 -257 |
| 3 | 11.5 | 36.032 +11 | 76.93 +42 | 06.148 +5 | 75.24 +147 | 38.075 -7 | 43.20 -153 | 22.277 -65 | 21.51 -268 |
| 3 | 21.5 | 36.074 +42 | 76.31 +62 | 06.191 +43 | 73.52 +172 | 38.111 +36 | 41.82 -138 | 22.292 +15 | 18.85 -266 |
| 3 | 31.5 | 36.153 +79 | 75.35 +96 | 06.271 +80 | 71.59 +193 | 38.191 +80 | 40.66 -116 | 22.385 +93 | 16.34 -251 |
| 4 | 10.5 | 36.274 +121 | 74.17 +118 | 06.392 +121 | 69.46 +213 | 38.318 +127 | 39.76 -90 | 22.559 +174 | 14.03 -231 |
| 4 | 20.4 | 36.436 +162 | 72.77 +140 | 06.557 +165 | 67.17 +229 | 38.495 +177 | 39.21 -55 | 22.813 +254 | 12.08 -195 |
| 4 | 30.4 | 36.635 +199 | 71.16 +161 | 06.762 +205 | 64.78 +239 | 38.715 +220 | 39.02 -19 | 23.138 +325 | 10.53 -155 |
| 5 | 10.4 | 36.871 +236 | 69.35 +181 | 07.005 +243 | 62.30 +248 | 38.976 +261 | 39.21 +19 | 23.527 +389 | 09.42 -111 |
| 5 | 20.3 | 37.139 +288 | 67.38 +197 | 07.283 +278 | 59.82 +248 | 39.273 +297 | 39.82 +61 | 23.971 +444 | 08.85 -57 |
| 5 | 30.3 | 37.432 +293 | 65.31 +207 | 07.587 +304 | 57.38 +213 | 39.596 +323 | 40.80 +98 | 24.453 +482 | 08.79 -6 |
| 6 | 9.3 | 37.744 +312 | 63.17 +214 | 07.914 +327 | 55.03 +235 | 39.939 +343 | 42.14 +134 | 24.963 +510 | 09.26 +47 |
| 6 | 19.3 | 38.068 +324 | 61.02 +215 | 08.255 +341 | 52.84 +219 | 40.293 +354 | 43.83 +169 | 25.486 +523 | 10.27 +101 |
| 6 | 29.2 | 38.394 +326 | 58.93 +209 | 08.598 +343 | 50.86 +198 | 40.646 +353 | 45.78 +195 | 26.005 +519 | 11.75 +148 |
| 7 | 9.2 | 38.715 +321 | 56.92 +201 | 08.939 +341 | 49.13 +173 | 40.993 +347 | 47.98 +220 | 26.513 +508 | 13.69 +194 |
| 7 | 19.2 | 39.022 +307 | 55.06 +186 | 09.266 +327 | 47.72 +141 | 41.322 +329 | 50.36 +238 | 26.991 +478 | 16.05 +236 |
| 7 | 29.2 | 39.308 +286 | 53.40 +166 | 09.572 +306 | 46.64 +108 | 41.627 +305 | 52.85 +249 | 27.431 +440 | 18.74 +269 |
| 8 | 8.1 | 39.568 +260 | 51.96 +144 | 09.851 +279 | 45.90 +74 | 41.903 +276 | 55.42 +257 | 27.826 +395 | 21.73 +299 |
| 8 | 18.1 | 39.794 +226 | 50.78 +118 | 10.094 +243 | 45.55 +35 | 42.142 +239 | 57.99 +257 | 28.164 +338 | 24.94 +321 |
| 8 | 28.1 | 39.984 +190 | 49.87 +91 | 10.299 +205 | 45.54 +1 | 42.343 +201 | 60.51 +252 | 28.444 +280 | 28.29 +335 |
| 9 | 7.0 | 40.137 +153 | 49.23 +64 | 10.463 +164 | 45.88 -34 | 42.503 +160 | 62.96 +245 | 28.663 +219 | 31.75 +346 |
| 9 | 17.0 | 40.249 +112 | 48.88 +35 | 10.583 +120 | 46.54 -66 | 42.621 +118 | 65.26 +230 | 28.814 +151 | 35.22 +347 |
| 9 | 27.0 | 40.325 +76 | 48.76 +12 | 10.662 +79 | 47.45 -91 | 42.701 +80 | 67.39 +213 | 28.904 +90 | 38.63 +341 |
| 10 | 7.0 | 40.364 +39 | 48.88 -12 | 10.700 +38 | 48.58 -113 | 42.742 +41 | 69.34 +195 | 28.931 +27 | 41.95 +332 |
| 10 | 16.9 | 40.370 +6 | 49.20 -32 | 10.700 +0 | 49.85 -127 | 42.747 +5 | 71.03 +169 | 28.897 -34 | 45.06 +311 |
| 10 | 26.9 | 40.349 -21 | 49.67 -47 | 10.669 -31 | 51.20 -135 | 42.722 -25 | 72.49 +146 | 28.810 -87 | 47.93 +287 |
| 11 | 5.9 | 40.303 -46 | 50.27 -60 | 10.610 -59 | 52.58 -138 | 42.669 -53 | 73.68 +119 | 28.669 -141 | 50.51 +258 |
| 11 | 15.9 | 40.238 -65 | 50.94 -67 | 10.529 -81 | 53.89 -131 | 42.592 -77 | 74.55 +87 | 28.481 -188 | 52.68 +217 |
| 11 | 25.8 | 40.159 -79 | 51.64 -70 | 10.432 -97 | 55.09 -120 | 42.497 -95 | 75.15 +60 | 28.256 -225 | 54.45 +177 |
| 12 | 5.8 | 40.068 -91 | 52.37 -73 | 10.322 -110 | 56.14 -105 | 42.386 -111 | 75.41 +26 | 27.994 -262 | 55.74 +129 |
| 12 | 15.8 | 39.971 -97 | 53.06 -69 | 10.207 -115 | 56.96 -82 | 42.264 -122 | 75.36 -5 | 27.707 -287 | 56.50 +76 |
| 12 | 25.7 | 39.873 -98 | 53.70 -64 | 10.090 -117 | 57.56 -60 | 42.135 -129 | 75.00 -36 | 27.404 -303 | 56.74 +24 |
| 12 | 35.7 | 39.773 -100 | 54.28 -58 | 09.973 -117 | 57.90 -34 | 42.002 -133 | 74.32 -68 | 27.091 -313 | 56.42 -32 |
| | | 39.773 -94 | 54.28 -47 | 09.973 -109 | 57.90 -5 | 42.002 -129 | 74.32 -95 | 27.091 -307 | 56.42 -86 |
| Mean Place | 38.681 | 59.06 | 08.716 | 56.85 | 41.273 | 57.40 | 27.126 | 31.17 | |
| sec δ, tan δ | +1.005 | -0.101 | +1.088 | -0.428 | +1.144 | +0.555 | +1.946 | +1.669 | |
| dα(ψ), dδ(ψ) | +0.061 | +0.40 | +0.061 | +0.40 | +0.062 | +0.40 | +0.063 | +0.40 | |
| dα(ε), dδ(ε) | +0.007 | +0.02 | +0.029 | +0.03 | -0.037 | +0.03 | -0.111 | +0.04 | |
| Dble. Trans. | September 22 | | September 22 | | September 23 | | September 23 | | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 3 | | 4 | | 5 | | 6 | |
|--------------|--------------------------|------------|--------------------------|------------|---------------------------|------------|--------------------------|------------|
| | ε Phoenicis | | 22 Andromedae | | κ ² Sculptoris | | 9 Sculptoris | |
| Mag. Spect. | 3.94 | K0 | 5.08 | F0 | 5.56 | K0 | 5.19 | F5 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " |
| | 0 08 | -45 49 | 0 09 | +45 59 | 0 10 | -27 52 | 0 11 | -35 12 |
| 1 -9.2 | 42.102 ^s -196 | 47.98 -53 | 34.262 ^s -194 | 50.58 +12 | 51.498 ^s -128 | 53.63 -71 | 01.096 ^s -149 | 57.14 -66 |
| 1 0.7 | 41.911 -191 | 48.05 -7 | 34.062 -200 | 50.26 -32 | 51.371 127 | 54.03 -40 | 00.950 -146 | 57.42 -28 |
| 1 10.7 | 41.726 -185 | 47.67 +38 | 33.859 -203 | 49.49 -77 | 51.247 124 | 54.12 -9 | 00.807 -143 | 57.33 +9 |
| 1 20.7 | 41.557 -169 | 46.81 +86 | 33.663 196 | 48.28 -121 | 51.247 115 | 54.12 +24 | 00.676 -131 | 56.84 +49 |
| 1 30.6 | 41.409 -148 | 45.52 +129 | 33.484 -179 | 46.73 -155 | 51.031 101 | 53.32 +56 | 00.561 -115 | 55.98 +86 |
| 2 9.6 | 41.285 -124 | 43.83 +169 | 33.327 -157 | 44.86 -187 | 50.946 85 | 52.45 +87 | 00.464 -97 | 54.78 +120 |
| 2 19.6 | 41.195 -90 | 41.76 +207 | 33.205 -122 | 42.76 -210 | 50.885 -61 | 51.27 +118 | 00.393 -71 | 53.22 +156 |
| 3 1.6 | 41.141 -54 | 39.39 +237 | 33.125 -203 | 40.55 -77 | 50.852 -33 | 49.81 +146 | 00.353 -143 | 51.37 +185 |
| 3 11.5 | 41.127 -14 | 36.73 +266 | 33.092 -33 | 38.29 -226 | 50.850 -2 | 48.08 +173 | 00.346 -7 | 49.23 +214 |
| 3 21.5 | 41.161 +34 | 33.84 +289 | 33.116 +24 | 36.10 219 | 50.885 +35 | 46.10 +198 | 00.381 +35 | 46.85 +238 |
| 3 31.5 | 41.243 +82 | 30.81 +303 | 33.198 +82 | 34.10 -200 | 50.961 +76 | 43.91 +219 | 00.457 +76 | 44.29 +256 |
| 4 10.5 | 41.376 +133 | 27.66 +315 | 33.339 +141 | 32.33 -177 | 51.078 +117 | 41.53 +238 | 00.578 +121 | 41.56 +273 |
| 4 20.4 | 41.563 +187 | 24.46 +310 | 33.542 +203 | 30.92 -141 | 51.240 +162 | 39.02 +251 | 00.747 +169 | 38.73 +283 |
| 4 30.4 | 41.799 +236 | 21.31 +325 | 33.797 +255 | 29.90 -102 | 51.443 +203 | 36.42 +260 | 00.959 +212 | 35.87 +286 |
| 5 10.4 | 42.083 +284 | 18.22 +309 | 34.104 +307 | 29.31 -59 | 51.687 +244 | 33.78 +264 | 01.214 +255 | 33.00 +287 |
| 5 20.3 | 42.411 +328 | 15.30 +292 | 34.454 +350 | 29.22 -9 | 51.967 +280 | 31.16 +262 | 01.508 +294 | 30.22 +278 |
| 5 30.3 | 42.772 +361 | 12.61 +269 | 34.833 +379 | 29.59 +37 | 52.276 +309 | 28.62 +254 | 01.832 +324 | 27.59 +263 |
| 6 9.3 | 43.164 +392 | 10.19 +242 | 35.238 +405 | 30.43 +84 | 52.609 +333 | 26.21 +241 | 02.182 +350 | 25.13 +246 |
| 6 19.3 | 43.573 +409 | 08.13 +206 | 35.653 +415 | 31.74 +131 | 52.956 +347 | 24.00 +221 | 02.549 +367 | 22.95 +218 |
| 6 29.2 | 43.990 +417 | 06.45 +168 | 36.066 +413 | 33.44 +170 | 53.308 +352 | 22.04 +196 | 02.920 +371 | 21.08 +187 |
| 7 9.2 | 44.406 +416 | 05.20 +125 | 36.472 +406 | 35.52 +208 | 53.659 +351 | 20.37 +167 | 03.291 +371 | 19.56 +152 |
| 7 19.2 | 44.807 +401 | 04.44 +76 | 36.856 +384 | 37.94 +242 | 53.996 +337 | 19.06 +131 | 03.649 +358 | 18.45 +111 |
| 7 29.2 | 45.183 +376 | 04.14 +30 | 37.211 +355 | 40.59 +265 | 54.313 +317 | 18.10 +96 | 03.985 +336 | 17.75 +70 |
| 8 8.1 | 45.528 +345 | 04.32 -18 | 37.531 +320 | 43.46 +287 | 54.603 +290 | 17.54 +56 | 04.293 +309 | 17.48 +27 |
| 8 18.1 | 45.829 +301 | 04.99 -67 | 37.807 +276 | 46.47 +301 | 54.856 +253 | 17.38 +16 | 04.562 +268 | 17.66 -18 |
| 8 28.1 | 46.083 +254 | 06.07 -108 | 38.038 +231 | 49.54 +307 | 55.072 +216 | 17.59 -21 | 04.790 +228 | 18.23 -57 |
| 9 7.0 | 46.283 +200 | 07.55 -148 | 38.222 +184 | 52.65 +311 | 55.245 +173 | 18.17 -58 | 04.973 +183 | 19.18 -95 |
| 9 17.0 | 46.425 +142 | 09.36 -181 | 38.354 +132 | 55.70 +305 | 55.372 +127 | 19.08 -91 | 05.106 +133 | 20.47 -129 |
| 9 27.0 | 46.511 +86 | 11.41 -205 | 38.440 +86 | 58.64 +294 | 55.456 +84 | 20.24 -116 | 05.192 +86 | 22.01 -154 |
| 10 7.0 | 46.542 +31 | 13.63 -222 | 38.478 +38 | 61.45 +281 | 55.498 +42 | 21.62 -138 | 05.232 +40 | 23.76 -175 |
| 10 16.9 | 46.519 -23 | 15.91 -228 | 38.471 -7 | 64.03 +258 | 55.500 +2 | 23.14 -152 | 05.227 -5 | 25.62 -186 |
| 10 26.9 | 46.452 -67 | 18.15 -224 | 38.426 -45 | 66.36 +233 | 55.468 -32 | 24.71 -157 | 05.185 -42 | 27.49 -187 |
| 11 5.9 | 46.342 -110 | 20.27 -212 | 38.343 -83 | 68.39 +203 | 55.406 -62 | 26.29 -158 | 05.109 -76 | 29.33 -184 |
| 11 15.9 | 46.200 -142 | 22.16 -189 | 38.228 -115 | 70.06 +167 | 55.320 -86 | 27.77 -148 | 05.006 -103 | 31.00 -167 |
| 11 25.8 | 46.034 -166 | 23.75 -159 | 38.087 -141 | 71.36 +130 | 55.217 -103 | 29.10 -133 | 04.885 -121 | 32.47 -147 |
| 12 5.8 | 45.849 -185 | 24.99 -124 | 37.921 -166 | 72.23 +87 | 55.099 -118 | 30.24 -114 | 04.746 -139 | 33.68 -121 |
| 12 15.8 | 45.656 -193 | 25.78 -79 | 37.739 -182 | 72.64 +41 | 54.974 -125 | 31.10 -86 | 04.601 -145 | 34.54 -86 |
| 12 25.7 | 45.462 -194 | 26.14 -36 | 37.546 -193 | 72.62 -2 | 54.847 -127 | 31.69 -59 | 04.454 -147 | 35.06 -52 |
| 12 35.7 | 45.270 -192 | 26.04 +10 | 37.345 -201 | 72.12 -50 | 54.720 -127 | 31.98 -29 | 04.307 -147 | 35.20 -14 |
| | 45.270 -178 | 26.04 +59 | 37.345 -196 | 72.12 -83 | 54.720 -120 | 31.98 +5 | 04.307 -138 | 35.20 +26 |
| Mean Place | 43.772 | 18.82 | 36.930 | 49.89 | 53.398 | 29.65 | 02.910 | 30.83 |
| sec δ, tan δ | +1.435 | -1.029 | +1.439 | +1.035 | +1.131 | -0.529 | +1.224 | -0.706 |
| dα(ψ), dδ(ψ) | +0.060 | +0.40 | +0.062 | +0.40 | +0.060 | +0.40 | +0.060 | +0.40 |
| dα(ε), dδ(ε) | +0.069 | +0.04 | -0.069 | +0.04 | +0.035 | +0.05 | +0.047 | +0.05 |
| Dble. Trans. | September 23 | | September 23 | | September 24 | | September 24 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 7 | | 1004 | | 1005 | | 1006 | |
|--------------|--------------------------|------------------------|--------------------------|------------------------|--------------------------|-----------------------|---------------------------------------|------------------------|
| | γ Pegasi | | χ Pegasi | | σ Andromedae | | Piazzī 0 ^h 38 (Andromedae) | |
| Mag. Spect. | 2.87 | B2 | 4.94 | M0 | 4.51 | A2 | 5.80 | A0 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " |
| | 0 12 | + 15 06 | 0 13 | + 20 07 | 0 17 | + 36 42 | 0 17 | + 31 26 |
| 1 -9.2 | 30.077 ^s -106 | 22.06 ^o -47 | 51.830 ^s -111 | 47.06 ^o -38 | 34.681 ^s -150 | 36.29 ^o -3 | 53.388 ^s -133 | 29.26 ^o -14 |
| 1 0.7 | 29.969 -108 | 21.44 -62 | 51.715 -115 | 46.47 -59 | 34.526 -155 | 35.91 -38 | 53.249 -139 | 28.81 -45 |
| 1 10.7 | 29.859 -110 | 20.67 -77 | 51.598 -117 | 45.68 -79 | 34.366 -160 | 35.15 -76 | 53.107 -142 | 28.04 -77 |
| 1 20.7 | 29.754 -105 | 19.78 -89 | 51.486 -112 | 44.72 -96 | 34.210 -156 | 34.05 -110 | 52.968 -139 | 26.97 -107 |
| 1 30.6 | 29.659 -95 | 18.82 -99 | 51.383 -103 | 43.64 -108 | 34.066 -144 | 32.67 -138 | 52.840 -128 | 25.69 -128 |
| 2 9.6 | 29.577 -82 | 17.82 -100 | 51.294 -89 | 42.47 -117 | 33.939 -127 | 31.05 -162 | 52.727 -113 | 24.20 -149 |
| 2 19.6 | 29.517 -60 | 16.85 -97 | 51.228 -66 | 41.28 -119 | 33.839 -100 | 29.27 -178 | 52.639 -88 | 22.59 -161 |
| 3 1.6 | 29.483 -34 | 15.95 -90 | 51.189 -39 | 40.14 -114 | 33.772 -67 | 27.42 -185 | 52.582 -57 | 20.96 -163 |
| 3 11.5 | 29.479 -4 | 15.18 -77 | 51.181 -8 | 39.09 -105 | 33.745 -27 | 25.56 -186 | 52.561 -21 | 19.34 -162 |
| 3 21.5 | 29.513 +34 | 14.60 -58 | 51.213 +32 | 38.22 -87 | 33.766 +21 | 23.81 -175 | 52.584 +23 | 17.85 -149 |
| 3 31.5 | 29.585 +72 | 14.24 -36 | 51.285 +72 | 37.57 -65 | 33.836 +70 | 22.25 -156 | 52.653 +69 | 16.56 -129 |
| 4 10.5 | 29.700 +115 | 14.12 -12 | 51.400 +115 | 37.16 -41 | 33.957 +121 | 20.92 -133 | 52.771 +118 | 15.51 -105 |
| 4 20.4 | 29.861 +161 | 14.33 +21 | 51.562 +162 | 37.08 -8 | 34.133 +176 | 19.93 -99 | 52.939 +168 | 14.80 -71 |
| 4 30.4 | 30.061 +200 | 14.85 +52 | 51.766 +204 | 37.33 +25 | 34.356 +223 | 19.31 -62 | 53.153 +214 | 14.44 +36 |
| 5 10.4 | 30.300 +239 | 15.69 +84 | 52.009 +243 | 37.92 +59 | 34.626 +270 | 19.09 -22 | 53.411 +258 | 14.46 +2 |
| 5 20.3 | 30.573 +273 | 16.85 +116 | 52.287 +278 | 38.87 +95 | 34.935 +309 | 19.31 +22 | 53.706 +295 | 14.91 +45 |
| 5 30.3 | 30.870 +297 | 18.28 +143 | 52.591 +304 | 40.12 +125 | 35.274 +339 | 19.94 +63 | 54.030 +324 | 15.74 +83 |
| 6 9.3 | 31.189 +319 | 19.98 +170 | 52.916 +325 | 41.68 +156 | 35.636 +362 | 20.99 +105 | 54.377 +347 | 16.94 +120 |
| 6 19.3 | 31.519 +330 | 21.88 +190 | 53.252 +336 | 43.50 +182 | 36.011 +375 | 22.45 +146 | 54.735 +358 | 18.51 +157 |
| 6 29.2 | 31.850 +331 | 23.94 +206 | 53.590 +338 | 45.50 +200 | 36.386 +375 | 24.23 +178 | 55.095 +360 | 20.37 +186 |
| 7 9.2 | 32.178 +328 | 26.11 +217 | 53.923 +333 | 47.68 +218 | 36.756 +370 | 26.32 +209 | 55.451 +356 | 22.49 +212 |
| 7 19.2 | 32.490 +312 | 28.34 +223 | 54.241 +318 | 49.96 +228 | 37.109 +353 | 28.68 +236 | 55.790 +339 | 24.83 +234 |
| 7 29.2 | 32.782 +292 | 30.55 +221 | 54.538 +297 | 52.27 +231 | 37.438 +329 | 31.20 +252 | 56.107 +317 | 27.30 +247 |
| 8 8.1 | 33.047 +265 | 32.73 +218 | 54.808 +270 | 54.59 +232 | 37.737 +299 | 33.89 +269 | 56.395 +288 | 29.88 +258 |
| 8 18.1 | 33.278 +231 | 34.80 +207 | 55.044 +236 | 56.85 +226 | 37.997 +260 | 36.64 +275 | 56.647 +252 | 32.49 +261 |
| 8 28.1 | 33.475 +197 | 36.73 +193 | 55.244 +200 | 59.00 +215 | 38.219 +222 | 39.40 +276 | 56.861 +214 | 35.07 +258 |
| 9 7.0 | 33.634 +159 | 38.51 +178 | 55.407 +163 | 61.02 +202 | 38.399 +180 | 42.15 +275 | 57.036 +175 | 37.60 +253 |
| 9 17.0 | 33.754 +120 | 40.08 +157 | 55.529 +122 | 62.87 +185 | 38.533 +134 | 44.80 +265 | 57.167 +131 | 40.01 +241 |
| 9 27.0 | 33.837 +83 | 41.44 +136 | 55.615 +86 | 64.52 +165 | 38.626 +93 | 47.32 +252 | 57.260 +93 | 42.27 +226 |
| 10 7.0 | 33.885 +48 | 42.59 +115 | 55.664 +49 | 65.96 +144 | 38.679 +53 | 49.68 +236 | 57.314 +54 | 44.36 +209 |
| 10 16.9 | 33.900 +15 | 43.49 +90 | 55.680 +16 | 67.17 +121 | 38.691 +12 | 51.81 +213 | 57.330 +16 | 46.21 +185 |
| 10 26.9 | 33.888 -12 | 44.19 +70 | 55.667 -13 | 68.15 +98 | 38.671 -20 | 53.70 +189 | 57.315 -15 | 47.83 +162 |
| 11 5.9 | 33.849 -39 | 44.66 +47 | 55.628 -39 | 68.89 +74 | 38.618 -53 | 55.32 +162 | 57.270 -45 | 49.17 +134 |
| 11 15.9 | 33.789 -60 | 44.91 +25 | 55.566 -62 | 69.38 +49 | 38.537 -81 | 56.61 +129 | 57.200 -70 | 50.22 +105 |
| 11 25.8 | 33.714 -75 | 44.96 +5 | 55.488 -78 | 69.64 +26 | 38.435 -102 | 57.58 +97 | 57.109 -91 | 50.97 +75 |
| 12 5.8 | 33.624 -90 | 44.80 -16 | 55.394 -94 | 69.65 +1 | 38.310 -125 | 58.18 +60 | 56.999 -110 | 51.39 +42 |
| 12 15.8 | 33.525 -99 | 44.45 -35 | 55.290 -104 | 69.42 -23 | 38.171 -139 | 58.40 +22 | 56.875 -124 | 51.47 +8 |
| 12 25.7 | 33.421 -104 | 43.94 -51 | 55.180 -110 | 68.98 -44 | 38.022 -149 | 58.26 -14 | 56.743 -132 | 51.23 -24 |
| 12 35.7 | 33.312 -109 | 43.26 -68 | 55.064 -116 | 68.31 -67 | 37.866 -156 | 57.73 -53 | 56.603 -140 | 50.65 -58 |
| | 33.312 -106 | 43.26 -81 | 55.064 -112 | 68.31 -85 | 37.866 -156 | 57.73 -88 | 56.603 -138 | 50.65 -87 |
| Mean Place | 32.374 | 30.82 | 54.170 | 54.05 | 37.179 | 37.88 | 55.825 | 32.43 |
| sec δ, tan δ | +1.036 | +0.270 | +1.065 | +0.367 | +1.247 | +0.746 | +1.172 | +0.611 |
| dα(ψ), dδ(ψ) | +0.062 | +0.40 | +0.062 | +0.40 | +0.063 | +0.40 | +0.062 | +0.40 |
| dα(ε), dδ(ε) | -0.018 | +0.05 | -0.024 | +0.06 | -0.050 | +0.08 | -0.041 | +0.08 |
| Dble. Trans. | September 24 | | September 24 | | September 25 | | September 25 | |

APPARENT PLACES OF STARS, 1986

5

AT UPPER TRANSIT AT GREENWICH

| No. | 9 | | 1007 | | 10 | | 1008 | |
|----------------|--------------------------|------------|--------------------------|------------|--------------------------|-------------|-------------------------|------------|
| | ι Ceti | | B.D. -18° 41 (Ceti) | | ζ Tucanae | | 41 Piscium | |
| Mag.Spect. | 3.75 | K0 | 6.88 | K0 | 4.34 | F8 | 5.58 | K0 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " |
| | 0 18 | - 8 53 | 0 19 | -17 46 | 0 19 | -64 56 | 0 19 | + 8 06 |
| 1 ^d | 42.356 ^s -101 | 72.34 -72 | 20.010 ^s -109 | 51.49 -76 | 21.498 ^s -397 | 108.02 -31 | 51.941 ^s -99 | 44.26 -55 |
| 1 | 0.7 42.254 -102 | 72.95 -61 | 19.900 -110 | 52.05 -56 | 21.107 -391 | 107.75 +27 | 51.839 -102 | 43.64 -62 |
| 1 | 10.7 42.151 -103 | 73.46 -34 | 19.789 -111 | 52.40 -35 | 20.727 -380 | 106.92 +83 | 51.734 -105 | 42.94 -70 |
| 1 | 20.7 42.053 -98 | 73.80 -34 | 19.685 -104 | 52.51 -11 | 20.374 -353 | 105.50 +142 | 51.633 -101 | 42.21 -73 |
| 1 | 30.7 41.964 -89 | 73.99 -19 | 19.591 -94 | 52.37 +14 | 20.060 -314 | 103.58 +192 | 51.541 -92 | 41.48 -73 |
| 2 | 9.6 41.888 -76 | 74.00 -1 | 19.510 -81 | 51.99 +38 | 19.789 -271 | 101.19 +239 | 51.460 -81 | 40.76 -72 |
| 2 | 19.6 41.831 -57 | 73.81 +19 | 19.449 -61 | 51.34 +65 | 19.576 -213 | 98.37 +282 | 51.399 -61 | 40.13 -63 |
| 3 | 1.6 41.798 -33 | 73.40 +41 | 19.413 -36 | 50.45 +89 | 19.427 -149 | 95.25 +312 | 51.362 -37 | 39.61 -52 |
| 3 | 11.5 41.794 -4 | 72.79 +61 | 19.406 -7 | 49.32 +113 | 19.344 -83 | 91.84 +341 | 51.354 -8 | 39.24 -57 |
| 3 | 21.5 41.823 +29 | 71.95 +84 | 19.434 +28 | 47.92 +140 | 19.341 -3 | 88.23 +361 | 51.383 +29 | 39.10 -14 |
| 3 | 31.5 41.887 +64 | 70.84 +111 | 19.498 +64 | 46.30 +162 | 19.414 +73 | 84.54 +369 | 51.443 +60 | 39.17 +7 |
| 4 | 10.5 41.993 +106 | 69.49 +135 | 19.604 +106 | 44.44 +186 | 19.567 +153 | 80.78 +376 | 51.551 +108 | 39.43 +26 |
| 4 | 20.4 42.141 +148 | 67.91 +158 | 19.753 +149 | 42.40 +204 | 19.805 +238 | 77.07 +371 | 51.702 +151 | 40.04 +61 |
| 4 | 30.4 42.328 +187 | 66.15 +174 | 19.941 +188 | 40.22 +218 | 20.118 +313 | 73.49 +358 | 51.892 +190 | 40.92 +88 |
| 5 | 10.4 42.554 +226 | 64.21 +196 | 20.169 +228 | 37.91 +231 | 20.507 +389 | 70.07 +342 | 52.120 +228 | 42.08 +116 |
| 5 | 20.4 42.813 +259 | 62.13 +208 | 20.432 +263 | 35.53 +238 | 20.965 +458 | 66.94 +313 | 52.383 +263 | 43.51 +143 |
| 5 | 30.3 43.099 +286 | 59.97 +216 | 20.723 +291 | 33.16 +237 | 21.477 +512 | 64.15 +279 | 52.671 +288 | 45.15 +164 |
| 6 | 9.3 43.408 +309 | 57.76 +221 | 21.038 +315 | 30.81 +235 | 22.040 +563 | 61.73 +242 | 52.982 +311 | 47.00 +185 |
| 6 | 19.3 43.730 +322 | 55.58 +218 | 21.367 +329 | 28.56 +225 | 22.636 +596 | 59.79 +194 | 53.305 +323 | 48.99 +199 |
| 6 | 29.2 44.057 +327 | 53.47 +200 | 21.701 +334 | 26.48 +208 | 23.248 +612 | 58.33 +146 | 53.631 +326 | 51.07 +208 |
| 7 | 9.2 44.382 +325 | 51.47 +200 | 22.035 +334 | 24.60 +188 | 23.866 +618 | 57.40 +93 | 53.955 +324 | 53.20 +213 |
| 7 | 19.2 44.695 +313 | 49.66 +181 | 22.357 +322 | 22.98 +162 | 24.468 +602 | 57.04 +36 | 54.266 +311 | 55.32 +212 |
| 7 | 29.2 44.989 +294 | 48.06 +160 | 22.660 +303 | 21.65 +133 | 25.040 +572 | 57.22 -18 | 54.557 +291 | 57.36 +204 |
| 8 | 8.1 45.259 +270 | 46.71 +135 | 22.939 +279 | 20.64 +101 | 25.569 +529 | 57.95 -73 | 54.824 +267 | 59.31 +195 |
| 8 | 18.1 45.497 +238 | 45.65 +106 | 23.184 +245 | 19.98 +66 | 26.034 +465 | 59.21 -126 | 55.059 +235 | 61.10 +179 |
| 8 | 28.1 45.700 +203 | 44.88 +77 | 23.395 +211 | 19.65 +33 | 26.428 +394 | 60.91 -170 | 55.260 +201 | 62.70 +160 |
| 9 | 7.1 45.867 +167 | 44.40 +48 | 23.567 +172 | 19.66 -1 | 26.741 +313 | 63.04 -213 | 55.426 +166 | 64.11 +141 |
| 9 | 17.0 45.993 +126 | 44.22 +18 | 23.697 +130 | 19.99 -33 | 26.960 +219 | 65.49 -245 | 55.552 +126 | 65.28 +117 |
| 9 | 27.0 46.083 +90 | 44.30 -8 | 23.789 +92 | 20.58 -59 | 27.088 +128 | 68.15 -266 | 55.643 +91 | 66.23 +95 |
| 10 | 7.0 46.136 +53 | 44.61 -31 | 23.841 +52 | 21.42 -84 | 27.122 +34 | 70.95 -280 | 55.699 +56 | 66.95 +72 |
| 10 | 16.9 46.155 +19 | 45.13 -52 | 23.858 +17 | 22.43 -101 | 27.063 -59 | 73.75 -280 | 55.721 +22 | 67.45 +50 |
| 10 | 26.9 46.146 -9 | 45.79 -66 | 23.844 -14 | 23.56 -113 | 26.922 -141 | 76.43 -268 | 55.717 -4 | 67.75 +30 |
| 11 | 5.9 46.110 -36 | 46.56 -77 | 23.802 -42 | 24.75 -119 | 26.703 -219 | 78.90 -247 | 55.686 -31 | 67.85 +10 |
| 11 | 15.9 46.053 -57 | 47.40 -84 | 23.737 -65 | 25.93 -118 | 26.420 -283 | 81.03 -213 | 55.635 -51 | 67.77 -8 |
| 11 | 25.8 45.980 -73 | 48.24 -84 | 23.656 -81 | 27.06 -113 | 26.089 -331 | 82.74 -171 | 55.567 -68 | 67.56 -21 |
| 12 | 5.8 45.893 -87 | 49.07 -83 | 23.560 -96 | 28.08 -102 | 25.718 -371 | 83.97 -123 | 55.484 -83 | 67.19 -37 |
| 12 | 15.8 45.798 -95 | 49.84 -77 | 23.456 -104 | 28.95 -87 | 25.328 -390 | 84.63 -66 | 55.392 -92 | 66.72 -47 |
| 12 | 25.8 45.698 -100 | 50.51 -67 | 23.347 -109 | 29.63 -68 | 24.931 -397 | 84.73 -10 | 55.294 -98 | 66.15 -57 |
| 12 | 35.7 45.595 -103 | 51.09 -58 | 23.236 -111 | 30.11 -48 | 24.537 -394 | 84.24 +49 | 55.191 -103 | 65.49 -66 |
| | 45.595 -100 | 51.09 -43 | 23.236 -107 | 30.11 -25 | 24.537 -372 | 84.24 +108 | 55.191 -101 | 65.49 -70 |
| Mean Place | 44.396 | 55.17 | 21.956 | 31.20 | 22.480 | 74.62 | 54.134 | 55.28 |
| sec δ, tan δ | +1.012 | -0.157 | +1.050 | -0.321 | +2.362 | -2.140 | +1.010 | +0.143 |
| dα(ψ), dδ(ψ) | +0.061 | +0.40 | +0.060 | +0.40 | +0.056 | +0.40 | +0.061 | +0.40 |
| dα(ε), dδ(ε) | +0.010 | +0.08 | +0.021 | +0.08 | +0.142 | +0.08 | -0.009 | +0.09 |
| Dbles.Trans. | September 26 | | September 26 | | September 26 | | September 26 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 1009 | | 1010 | | 11 | | 12 | |
|----------------|---------------------|--------------------------|---------------------|-------------------------|---------------------|-------------------------|---------------------|-------------------------|
| | g Andromedae | | 44 Piscium | | β Hydri | | α Phoenicis | |
| Mag. Spect. | 5.20 | F5 | 5.99 | G5 | 2.90 | G0 | 2.44 | K0 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° ′ | h m | ° ′ | h m | ° ′ | h m | ° ′ |
| | 0 20 | + 37 53 | 0 24 | + 1 51 | 0 24 | - 77 19 | 0 25 | - 42 22 |
| 1 ^d | 21.935 ^s | 36.99 ^o - 152 | 40.544 ^s | 40.79 ^o - 97 | 64.119 ^s | 82.90 ^o - 15 | 35.631 ^s | 72.77 ^o - 75 |
| 1 | 21.775 | 36.64 - 35 | 40.445 | 40.16 - 63 | 63.249 | 82.44 + 46 | 35.453 | 73.07 - 30 |
| 1 | 21.611 | 35.92 - 164 | 40.342 | 39.52 - 64 | 62.400 | 81.37 + 107 | 35.277 | 72.95 + 12 |
| 1 | 21.450 | 34.84 - 161 | 40.242 | 38.92 - 60 | 61.607 | 79.68 + 169 | 35.111 | 72.36 + 59 |
| 1 | 21.301 | 33.47 - 149 | 40.151 | 38.38 - 54 | 60.895 | 77.48 + 220 | 34.961 | 71.34 + 102 |
| 2 | 21.168 | 31.84 - 133 | 40.069 | 37.92 - 46 | 60.272 | 74.79 + 269 | 34.830 | 69.92 + 142 |
| 2 | 21.063 | 30.04 - 105 | 40.007 | 37.58 - 34 | 59.769 | 71.69 + 310 | 34.727 | 68.11 + 181 |
| 3 | 20.991 | 28.16 - 72 | 39.968 | 37.40 - 18 | 59.393 | 68.28 + 361 | 34.657 | 65.97 + 214 |
| 3 | 20.959 | 26.26 - 32 | 39.958 | 37.40 + 0 | 59.149 | 64.61 + 347 | 34.622 | 63.53 + 244 |
| 3 | 20.976 | 24.46 + 17 | 39.985 | 37.62 + 22 | 59.058 | 60.78 + 383 | 34.632 | 60.83 + 270 |
| 3 | 21.043 | 22.83 + 67 | 40.034 | 37.98 + 36 | 59.114 | 56.89 + 389 | 34.688 | 57.95 + 288 |
| 4 | 21.163 | 21.44 + 120 | 40.139 | 38.72 + 74 | 59.320 | 52.98 + 391 | 34.793 | 54.91 + 304 |
| 4 | 21.337 | 20.38 + 174 | 40.283 | 39.69 + 97 | 59.683 | 49.16 + 382 | 34.950 | 51.79 + 312 |
| 4 | 21.561 | 19.69 + 224 | 40.467 | 40.90 + 121 | 60.185 | 45.53 + 363 | 35.156 | 48.66 + 206 |
| 5 | 21.832 | 19.39 + 271 | 40.688 | 42.35 + 145 | 60.828 | 42.12 + 643 | 35.410 | 45.56 + 310 |
| 5 | 22.143 | 19.54 + 311 | 40.945 | 44.02 + 167 | 61.599 | 39.03 + 309 | 35.708 | 42.59 + 297 |
| 5 | 22.485 | 20.11 + 342 | 41.228 | 45.86 + 184 | 62.471 | 36.33 + 872 | 36.041 | 39.80 + 279 |
| 6 | 22.850 | 21.10 + 365 | 41.534 | 47.85 + 199 | 63.439 | 34.06 + 968 | 36.406 | 37.23 + 257 |
| 6 | 23.229 | 22.51 + 379 | 41.853 | 49.93 + 208 | 64.473 | 32.30 + 1034 | 36.792 | 35.00 + 223 |
| 6 | 23.609 | 24.25 + 380 | 42.177 | 52.03 + 210 | 65.542 | 31.06 + 1069 | 37.187 | 33.11 + 189 |
| 7 | 23.985 | 26.31 + 376 | 42.500 | 54.12 + 209 | 66.631 | 30.38 + 1089 | 37.586 | 31.63 + 399 |
| 7 | 24.343 | 28.64 + 358 | 42.811 | 56.14 + 202 | 67.699 | 30.30 + 1068 | 37.974 | 30.61 + 388 |
| 7 | 24.677 | 31.16 + 334 | 43.104 | 58.03 + 189 | 68.719 | 30.77 + 1020 | 38.342 | 30.04 + 368 |
| 8 | 24.982 | 33.85 + 305 | 43.373 | 59.78 + 175 | 69.669 | 31.82 + 950 | 38.683 | 29.96 + 341 |
| 8 | 25.249 | 36.61 + 267 | 43.611 | 61.31 + 153 | 70.507 | 33.39 - 157 | 38.985 | 30.36 - 40 |
| 8 | 25.475 | 39.40 + 226 | 43.816 | 62.62 + 131 | 71.218 | 35.40 - 201 | 39.245 | 31.19 - 83 |
| 9 | 25.660 | 42.19 + 185 | 43.986 | 63.69 + 107 | 71.781 | 37.84 - 244 | 39.457 | 32.44 - 125 |
| 9 | 25.800 | 44.88 + 140 | 44.117 | 64.50 + 81 | 72.169 | 40.57 - 273 | 39.615 | 34.05 - 161 |
| 9 | 25.898 | 47.46 + 98 | 44.212 | 65.07 + 57 | 72.383 | 43.49 - 292 | 39.722 | 35.93 - 188 |
| 10 | 25.954 | 49.88 + 56 | 44.272 | 65.41 + 34 | 72.412 | 46.52 - 303 | 39.776 | 38.03 - 210 |
| 10 | 25.970 | 52.07 + 16 | 44.299 | 65.53 + 12 | 72.254 | 49.50 - 298 | 39.780 | 40.24 - 221 |
| 10 | 25.952 | 54.04 - 18 | 44.299 | 65.46 - 7 | 71.931 | 52.33 - 323 | 39.741 | 42.45 - 221 |
| 11 | 25.901 | 55.72 - 51 | 44.272 | 65.23 - 23 | 71.445 | 54.90 - 486 | 39.661 | 44.60 - 215 |
| 11 | 25.821 | 57.08 - 80 | 44.224 | 64.86 - 37 | 70.822 | 57.07 - 623 | 39.548 | 46.56 - 196 |
| 11 | 25.718 | 58.12 - 103 | 44.160 | 64.40 - 46 | 70.095 | 58.77 - 727 | 39.409 | 48.27 - 171 |
| 12 | 25.593 | 58.78 - 125 | 44.080 | 63.84 - 56 | 69.279 | 59.93 - 816 | 39.249 | 49.67 - 140 |
| 12 | 25.452 | 59.06 - 141 | 43.991 | 63.25 - 59 | 68.416 | 60.47 - 863 | 39.077 | 50.66 - 99 |
| 12 | 25.300 | 58.97 - 152 | 43.895 | 62.62 - 9 | 67.536 | 60.40 - 880 | 38.900 | 51.25 - 59 |
| 12 | 25.139 | 58.48 - 161 | 43.794 | 61.98 - 64 | 66.658 | 59.70 - 878 | 38.720 | 51.39 - 14 |
| | 25.139 | 58.48 - 160 | 43.794 | 61.98 - 100 | 66.658 | 59.70 + 133 | 38.720 | 51.39 + 32 |
| Mean Place | 24.440 | 38.15 | 42.651 | 53.88 | 63.592 | 48.76 | 37.163 | 45.27 |
| sec δ, tan δ | +1.267 | +0.778 | +1.001 | +0.033 | +4.559 | -4.448 | +1.354 | -0.912 |
| dα(ψ), dδ(ψ) | +0.063 | +0.40 | +0.061 | +0.40 | +0.048 | +0.40 | +0.058 | +0.40 |
| dα(ε), dδ(ε) | -0.052 | +0.09 | -0.002 | +0.11 | +0.295 | +0.11 | +0.060 | +0.11 |
| Dble. Trans. | September 26 | | September 27 | | September 27 | | September 27 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 1011 | | 1012 | | 13 | | 14 | | |
|--------------|------------------------------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|------------|
| | Piazzi 0 ^h 78 (Ceti) | | 48 Piscium | | 12 Ceti | | 49 G. Ceti | | |
| Mag. Spect. | 7.54 | M3 | 6.46 | K2 | 6.05 | K5 | 5.23 | A3 | |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " | |
| | 0 27 | - 11 43 | 0 27 | + 16 21 | 0 29 | - 4 01 | 0 29 | - 23 51 | |
| 1 | -9.2 | 17 503 -101 | 78 11 - 77 | 28.306 -103 | 65.89 - 40 | 18 980 - 96 | 69.53 - 70 | 40.441 -118 | 65.96 - 84 |
| 1 | 0.7 | 17 398 -105 | 78 73 - 62 | 28 197 -109 | 65.34 - 55 | 18 880 -100 | 70.17 - 64 | 40 320 -121 | 66 52 - 56 |
| 1 | 10.7 | 17 292 -106 | 79 21 - 48 | 28 084 -113 | 64.63 - 71 | 18 776 -104 | 70.75 - 58 | 40 198 -122 | 66.80 + 2 |
| 1 | 20.7 | 17 189 -103 | 79 50 - 29 | 27 972 -112 | 63.78 - 85 | 18 675 -101 | 71.22 - 47 | 40 080 -118 | 66.78 + 28 |
| 1 | 30.7 | 17 094 -95 | 79 59 - 9 | 27 868 -104 | 62.86 - 92 | 18 582 -93 | 71.57 - 35 | 39 972 -108 | 66.46 + 32 |
| 2 | 9.6 | 17 011 - 83 | 79 50 + 9 | 27 775 - 93 | 61 87 - 99 | 18 499 - 83 | 71 80 - 23 | 39 877 - 95 | 65 85 + 61 |
| 2 | 19.6 | 16 946 - 65 | 79 17 + 33 | 27 702 - 73 | 60 89 - 98 | 18 434 - 65 | 71 85 - 5 | 39 802 - 75 | 64 92 + 93 |
| 3 | 1.6 | 16 905 - 41 | 78 62 + 55 | 27 653 - 49 | 59 97 - 92 | 18 392 - 42 | 71 71 + 14 | 39 752 - 50 | 63 72 +120 |
| 3 | 11.5 | 16 891 - 14 | 77 84 + 78 | 27 634 - 19 | 59 15 - 82 | 18 377 - 15 | 71 38 + 33 | 39 730 - 22 | 62 25 +147 |
| 3 | 21.5 | 16 911 + 20 | 76 82 +102 | 27 653 + 19 | 58 51 - 64 | 18 397 + 20 | 70 84 + 54 | 39 745 + 15 | 60 50 +175 |
| 3 | 31.5 | 16 967 + 56 | 75 55 +127 | 27 710 + 57 | 58 08 - 43 | 18 449 + 52 | 70 06 + 78 | 39 797 + 52 | 58 54 +196 |
| 4 | 10.5 | 17 064 + 97 | 74 04 +151 | 27 810 +100 | 57 88 - 20 | 18 544 + 95 | 68 98 +108 | 39 892 + 95 | 56 35 +219 |
| 4 | 20.4 | 17 203 + 139 | 72 30 +174 | 27 957 + 147 | 57 98 + 10 | 18 682 + 138 | 67 67 +131 | 40 031 + 139 | 54 00 +235 |
| 4 | 30.4 | 17 383 + 180 | 70 40 +190 | 27 957 + 188 | 58 39 + 41 | 18 860 + 178 | 66 15 +152 | 40 212 + 181 | 51 53 +247 |
| 5 | 10.4 | 17 602 + 219 | 68 33 +207 | 28 374 + 229 | 59 12 + 73 | 19 077 + 217 | 64 43 +172 | 40 434 + 222 | 48 97 +266 |
| 5 | 20.4 | 17 856 + 254 | 66 14 +219 | 28 639 + 265 | 60 17 +105 | 19 329 + 252 | 62 52 +191 | 40 695 + 261 | 46 38 +259 |
| 5 | 30.3 | 18 139 + 283 | 63 89 +225 | 28 931 + 292 | 61 50 +133 | 19 609 + 280 | 60 50 +202 | 40 985 + 290 | 43 84 +254 |
| 6 | 9.3 | 18 445 + 306 | 61 62 +227 | 29 247 + 316 | 63 10 +160 | 19 912 + 303 | 58 38 +212 | 41 301 + 316 | 41 37 +247 |
| 6 | 19.3 | 18 767 + 322 | 59 39 +223 | 29 576 + 329 | 64 93 +183 | 20 230 + 318 | 56 23 +215 | 41 635 + 334 | 39 06 +231 |
| 6 | 29.2 | 19 095 + 328 | 57 26 +213 | 29 909 + 333 | 66 91 +198 | 20 554 + 324 | 54 10 +213 | 41 977 + 342 | 36 96 +210 |
| 7 | 9.2 | 19 422 + 327 | 55 27 +199 | 30 241 + 332 | 69 04 +213 | 20 878 + 324 | 52 04 +206 | 42 320 + 343 | 35 11 +185 |
| 7 | 19.2 | 19 740 + 318 | 53 50 +177 | 30 560 + 319 | 71 23 +219 | 21 191 + 313 | 50 12 +192 | 42 653 + 333 | 33 58 +153 |
| 7 | 29.2 | 20 039 + 293 | 51 96 +154 | 30 860 + 300 | 73 43 +220 | 21 487 + 296 | 48 37 +175 | 42 969 + 316 | 32 39 +119 |
| 8 | 8.1 | 20 316 + 277 | 50 69 +127 | 31 136 + 276 | 75 61 +218 | 21 760 + 273 | 46 82 +155 | 43 262 + 293 | 31 56 + 83 |
| 8 | 18.1 | 20 562 + 246 | 49 74 + 95 | 31 380 + 244 | 77 69 +208 | 22 003 + 243 | 45 54 +128 | 43 522 + 260 | 31 13 + 43 |
| 8 | 28.1 | 20 774 + 212 | 49 09 + 65 | 31 590 + 210 | 79 66 +197 | 22 213 + 210 | 44 51 +103 | 43 747 + 225 | 31 07 + 6 |
| 9 | 7.1 | 20 950 + 176 | 48 75 + 34 | 31 764 + 174 | 81 48 +182 | 22 388 + 175 | 43 75 + 76 | 43 934 + 187 | 31 37 - 30 |
| 9 | 17.0 | 21 085 + 135 | 48 72 + 3 | 31 900 + 136 | 83 11 +163 | 22 523 + 135 | 43 28 + 47 | 44 077 + 143 | 32 03 - 66 |
| 9 | 27.0 | 21 184 + 99 | 48 96 - 24 | 32 000 + 100 | 84 54 +143 | 22 623 + 100 | 43 06 + 22 | 44 180 + 103 | 32 96 - 93 |
| 10 | 7.0 | 21 246 + 62 | 49 45 - 49 | 32 064 + 64 | 85 76 +122 | 22 688 + 65 | 43 08 - 2 | 44 243 + 63 | 34 14 -118 |
| 10 | 16.9 | 21 272 + 26 | 50 14 - 69 | 32 095 + 31 | 86 74 + 98 | 22 719 + 31 | 43 32 - 24 | 44 266 + 23 | 35 49 -135 |
| 10 | 26.9 | 21 270 - 2 | 50 96 - 82 | 32 097 - 2 | 87 52 + 78 | 22 721 + 2 | 43 73 - 41 | 44 257 - 9 | 36 94 -145 |
| 11 | 5.9 | 21 239 - 31 | 51 90 - 94 | 32 073 - 24 | 88 08 + 56 | 22 697 - 24 | 44 28 - 55 | 44 217 - 40 | 38 44 -150 |
| 11 | 15.9 | 21 186 - 53 | 52 87 - 97 | 32 025 - 48 | 88.41 + 33 | 22 650 - 47 | 44 92 - 64 | 44 152 - 65 | 39 89 -145 |
| 11 | 25.8 | 21 117 - 69 | 53 83 - 96 | 31 959 - 66 | 88.55 + 14 | 22 587 - 63 | 45 62 - 70 | 44 067 - 85 | 41 23 -134 |
| 12 | 5.8 | 21 031 - 86 | 54 76 - 93 | 31 876 - 83 | 88 47 - 8 | 22 508 - 79 | 46 35 - 73 | 43 965 - 102 | 42 43 -120 |
| 12 | 15.8 | 20 936 - 95 | 55 59 - 83 | 31 782 - 94 | 88 20 - 27 | 22 418 - 90 | 47 06 - 71 | 43 853 - 112 | 43 40 - 97 |
| 12 | 25.8 | 20 835 - 101 | 56 30 - 71 | 31 679 - 103 | 87 76 - 44 | 22 322 - 96 | 47 73 - 67 | 43 735 - 118 | 44 13 - 73 |
| 12 | 35.7 | 20 729 - 106 | 56 87 - 57 | 31 568 - 111 | 87 14 - 62 | 22 220 - 102 | 48 35 - 62 | 43 612 - 123 | 44 59 - 46 |
| | | - 104 | - 40 | - 110 | - 75 | - 100 | - 53 | - 119 | - 15 |
| Mean Place | 19.456 | 60.23 | 30.539 | 73.72 | 21.000 | 54.49 | 42.228 | 44.00 | |
| sec δ, tan δ | +1.021 | -0.208 | +1.042 | +0.294 | +1.002 | -0.070 | +1.093 | -0.442 | |
| da(ψ), dδ(ψ) | +0.061 | +0.39 | +0.062 | +0.39 | +0.061 | +0.39 | +0.060 | +0.39 | |
| da(ε), dδ(ε) | +0.014 | +0.12 | -0.019 | +0.12 | +0.005 | +0.13 | +0.029 | +0.13 | |
| Dble. Trans. | September 28 | | September 28 | | September 28 | | September 28 | | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 15 | | 16 | | 1013 | | 1014 | | |
|---|----------------------|-------------|----------------------|-------------|------------------|-------------|-----------------|-------------|------------|
| | λ' Phoenicis | | κ Cassiopeiae | | 77 G. Sculptoris | | 58 G. Phoenicis | | |
| Mag. Spect. | 4.88 | A2 | 4.24 | B0 | 5.62 | K0 | 5.55 | F5 | |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " | |
| | 0 30 | -48 52 | 0 32 | +62 51 | 0 32 | -29 37 | 0 33 | -52 26 | |
| 1 | -9.2 | 44.767 -215 | 69.87 -73 | 10.499 -339 | 31.58 +82 | 59.401 -131 | 81.25 -86 | 48.278 -241 | 81.28 -73 |
| 1 | 0.7 | 44.551 -216 | 70.11 -24 | 10.139 -360 | 31.86 +28 | 59.267 -134 | 81.78 -53 | 48.035 -243 | 81.49 -21 |
| 1 | 10.7 | 44.337 -214 | 69.88 +23 | 09.766 -373 | 31.58 -28 | 59.132 -135 | 81.99 -21 | 47.793 -242 | 81.21 +28 |
| 1 | 20.7 | 44.133 -204 | 69.12 +76 | 09.396 -370 | 30.73 -85 | 59.001 -131 | 81.83 +16 | 47.562 -231 | 80.38 +83 |
| 1 | 30.7 | 43.948 -185 | 67.91 +121 | 09.047 -349 | 29.39 -134 | 58.881 -120 | 81.32 +51 | 47.352 -210 | 79.07 +131 |
| 2 | 9.6 | 43.784 -164 | 66.26 +165 | 08.728 -319 | 27.58 -181 | 58.774 -107 | 80.47 +85 | 47.165 -187 | 77.31 +176 |
| 2 | 19.6 | 43.652 -132 | 64.18 +208 | 08.461 -267 | 25.38 -220 | 58.689 -85 | 79.28 +119 | 47.012 -153 | 75.11 +220 |
| 3 | 1.6 | 43.557 -95 | 61.77 +241 | 08.257 -204 | 22.92 -246 | 58.629 -60 | 77.79 +149 | 46.898 -114 | 72.57 +254 |
| 3 | 11.6 | 43.501 -56 | 59.04 +273 | 08.126 -131 | 20.27 -265 | 58.599 -30 | 76.02 +177 | 46.828 -70 | 69.71 +266 |
| 3 | 21.5 | 43.496 -5 | 56.05 +299 | 08.083 -43 | 17.56 -271 | 58.607 +8 | 73.96 +206 | 46.812 -16 | 66.59 +312 |
| 3 | 31.5 | 43.542 +46 | 52.90 +315 | 08.129 +46 | 14.93 -263 | 58.655 +48 | 71.69 +227 | 46.850 +38 | 63.31 +328 |
| 4 | 10.5 | 43.641 +99 | 49.60 +330 | 08.266 +137 | 12.43 -250 | 58.746 +91 | 69.21 +248 | 46.946 +96 | 59.89 +342 |
| 4 | 20.4 | 43.798 +157 | 46.24 +336 | 08.498 +232 | 10.22 -221 | 58.883 +137 | +263 | 47.103 +157 | 56.42 +347 |
| 4 | 30.4 | 44.009 +211 | 42.91 +333 | 08.812 +314 | 08.37 -185 | 59.064 +181 | +271 | 47.318 +215 | 52.99 +343 |
| 5 | 10.4 | 44.273 +264 | 39.64 +327 | 09.204 +392 | 06.92 -145 | 59.288 +224 | +277 | 47.591 +273 | 49.64 +335 |
| 5 | 20.4 | 44.588 +315 | 36.53 +311 | 09.665 +461 | 05.97 -95 | 59.552 +264 | +276 | 47.917 +326 | 46.47 +317 |
| 5 | 30.3 | 44.942 +354 | 33.64 +289 | 10.174 +509 | 05.53 -44 | 59.848 +296 | +267 | 48.286 +369 | 43.54 +293 |
| 6 | 9.3 | 45.332 +390 | 31.02 +262 | 10.723 +549 | 05.60 +7 | 60.172 +324 | +255 | 48.695 +409 | 40.90 +264 |
| 6 | 19.3 | 45.747 +415 | 28.77 +225 | 11.295 +572 | 06.22 +62 | 60.515 +343 | +234 | 49.131 +436 | 38.65 +225 |
| 6 | 29.3 | 46.174 +427 | 26.92 +185 | 11.871 +576 | 07.33 +111 | 60.867 +352 | +208 | 49.581 +450 | 36.81 +184 |
| 7 | 9.2 | 46.607 +433 | 25.50 +142 | 12.443 +572 | 08.93 +160 | 61.222 +355 | +178 | 50.039 +458 | 35.44 +137 |
| 7 | 19.2 | 47.031 +424 | 24.59 +91 | 12.990 +547 | 10.98 +205 | 61.568 +346 | +142 | 50.488 +449 | 34.59 +85 |
| 7 | 29.2 | 47.434 +403 | 24.17 +42 | 13.502 +512 | 13.40 +242 | 61.897 +329 | +104 | 50.918 +430 | 34.24 +35 |
| 8 | 8.1 | 47.810 +376 | 24.26 -9 | 13.972 +470 | 16.18 +278 | 62.203 +306 | +63 | 51.319 +401 | 34.42 -18 |
| 8 | 18.1 | 48.145 +335 | 24.86 -60 | 14.385 +413 | 19.23 +305 | 62.476 +273 | +20 | 51.677 +358 | 35.13 -71 |
| 8 | 28.1 | 48.433 +288 | 25.92 -106 | 14.738 +353 | 22.48 +325 | 62.712 +236 | -20 | 51.986 +309 | 36.30 -117 |
| 9 | 7.1 | 48.669 +236 | 27.41 -149 | 15.028 +290 | 25.91 +343 | 62.908 +196 | -59 | 52.240 +254 | 37.92 -162 |
| 9 | 17.0 | 48.845 +176 | 29.28 -187 | 15.245 +217 | 29.39 +348 | 63.059 +151 | -96 | 52.430 +190 | 39.91 -199 |
| 9 | 27.0 | 48.965 +120 | 31.41 -213 | 15.396 +151 | 32.89 +350 | 63.168 +109 | -123 | 52.558 +128 | 42.18 -227 |
| 10 | 7.0 | 49.024 +59 | 33.77 -236 | 15.477 +81 | 36.35 +346 | 63.234 +66 | -149 | 52.622 +64 | 44.66 -248 |
| 10 | 17.0 | 49.026 +2 | 36.21 -244 | 15.487 +10 | 39.66 +331 | 63.257 +23 | -165 | 52.623 +1 | 47.22 -256 |
| 10 | 26.9 | 48.978 -48 | 38.64 -243 | 15.434 -53 | 42.78 +312 | 63.246 -11 | -173 | 52.569 -54 | 49.77 -255 |
| 11 | 5.9 | 48.881 -97 | 40.98 -234 | 15.317 -117 | 45.65 +287 | 63.201 -45 | -175 | 52.461 -108 | 52.21 -244 |
| 11 | 15.9 | 48.745 -136 | 43.10 -212 | 15.141 -176 | 48.16 +251 | 63.128 -73 | -166 | 52.309 -152 | 54.40 -219 |
| 11 | 25.8 | 48.579 -166 | 44.92 -182 | 14.915 -226 | 50.30 +214 | 63.034 -94 | -151 | 52.123 -186 | 56.29 -189 |
| 12 | 5.8 | 48.386 -193 | 46.38 -146 | 14.639 -276 | 51.98 +168 | 62.921 -113 | -132 | 51.907 -216 | 57.79 -150 |
| 12 | 15.8 | 48.178 -208 | 47.39 -101 | 14.325 -314 | 53.14 +116 | 62.797 -124 | -103 | 51.673 -234 | 58.82 -103 |
| 12 | 25.8 | 47.962 -216 | 47.95 -56 | 13.983 -342 | 53.79 +65 | 62.666 -131 | -74 | 51.431 -242 | 59.36 -54 |
| 12 | 35.7 | 47.744 -218 | 48.01 -6 | 13.618 -365 | 53.86 +7 | 62.529 -137 | -41 | 51.184 -247 | 59.39 -3 |
| | | -211 | +45 | -366 | -50 | -132 | -5 | -238 | +51 |
| Mean Place | 46.069 | 40.76 | 13.455 | 26.70 | 61.075 | 57.62 | 49.426 | 51.50 | |
| sec δ , $\tan \delta$ | +1.521 | -1.145 | +2.192 | +1.951 | +1.150 | -0.569 | +1.641 | -1.301 | |
| $d\alpha(\psi)$, $d\delta(\psi)$ | +0.057 | +0.39 | +0.068 | +0.39 | +0.059 | +0.39 | +0.056 | +0.39 | |
| $d\alpha(\epsilon)$, $d\delta(\epsilon)$ | +0.076 | +0.13 | -0.129 | +0.14 | +0.038 | +0.14 | +0.086 | +0.15 | |
| Dble. Trans. | September 29 | | September 29 | | September 29 | | September 30 | | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 18 | | 17 | | 19 | | 20 | |
|--------------|--------------|------------|---------------|------------|--------------|------------|--------------|------------|
| | π Andromedae | | ζ Cassiopeiae | | ε Andromedae | | δ Andromedae | |
| Mag. Spect. | 4.47 | B3 | 3.72 | B3 | 4.52 | G5 | 3.49 | K2 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " |
| | 0 36 | + 33 38 | 0 36 | + 53 49 | 0 37 | + 29 14 | 0 38 | + 30 46 |
| 1 -9.2 | 07.056 -132 | 40.57 + 5 | 10.137 -233 | 25.18 + 61 | 48.089 -121 | 15.85 - 7 | 33.895 -123 | 71.59 - 1 |
| 1 0.7 | 06.914 -142 | 40.29 -28 | 09.888 -249 | 25.30 + 12 | 47.958 -131 | 15.51 -34 | 33.761 -134 | 71.27 -32 |
| 1 10.7 | 06.764 -150 | 39.68 -61 | 09.627 -261 | 24.92 -38 | 47.820 -138 | 14.87 -64 | 33.620 -141 | 70.66 -61 |
| 1 20.7 | 06.613 -151 | 38.74 -94 | 09.367 -260 | 24.04 -88 | 47.682 -138 | 13.96 -91 | 33.478 -142 | 69.75 -91 |
| 1 30.7 | 06.471 -142 | 37.56 -118 | 09.120 -247 | 22.72 -132 | 47.550 -132 | 12.84 -112 | 33.343 -135 | 68.62 -113 |
| 2 9.6 | 06.339 -132 | 36.15 -141 | 08.893 -227 | 21.00 -172 | 47.428 -122 | 11.53 -131 | 33.218 -125 | 67.28 -134 |
| 2 19.6 | 06.231 -108 | 34.57 -158 | 08.702 -191 | 18.95 -205 | 47.328 -100 | 10.10 -143 | 33.114 -104 | 65.81 -147 |
| 3 1.6 | 06.153 -78 | 32.93 -164 | 08.557 -145 | 16.69 -226 | 47.256 -72 | 08.64 -146 | 33.039 -75 | 64.29 -152 |
| 3 11.6 | 06.109 -44 | 31.28 -165 | 08.466 -195 | 14.29 -240 | 47.216 -40 | 07.18 -146 | 32.998 -41 | 62.77 -152 |
| 3 21.5 | 06.111 + 2 | 29.71 -157 | 08.442 -24 | 11.86 -243 | 47.218 + 2 | 05.83 -135 | 32.999 + 1 | 61.35 -142 |
| 3 31.5 | 06.159 + 48 | 28.30 -141 | 08.485 + 43 | 09.54 -232 | 47.265 + 47 | 04.66 -117 | 33.045 + 46 | 60.09 -126 |
| 4 10.5 | 06.258 + 99 | 27.11 -119 | 08.600 + 115 | 07.37 -217 | 47.359 + 94 | 03.70 -96 | 33.140 + 95 | 59.05 -104 |
| 4 20.4 | 06.409 + 151 | 26.22 -89 | 08.788 + 188 | 05.50 -187 | 47.504 + 145 | 03.04 -66 | 33.287 + 147 | 58.31 -74 |
| 4 30.4 | 06.609 + 200 | 25.67 -55 | 09.043 + 255 | 03.98 -152 | 47.696 + 192 | 02.72 -32 | 33.481 + 194 | 57.91 -40 |
| 5 10.4 | 06.856 + 247 | 25.49 -18 | 09.360 + 317 | 02.86 -112 | 47.933 + 237 | 02.74 + 2 | 33.720 + 239 | 57.85 -6 |
| 5 20.4 | 07.145 + 289 | 25.72 + 23 | 09.733 + 373 | 02.22 -64 | 48.211 + 278 | 03.16 + 42 | 34.001 + 281 | 58.20 + 35 |
| 5 30.3 | 07.465 + 320 | 26.33 + 61 | 10.146 + 413 | 02.05 -17 | 48.519 + 308 | 03.94 + 78 | 34.313 + 312 | 58.91 + 71 |
| 6 9.3 | 07.812 + 347 | 27.34 +101 | 10.594 + 448 | 02.37 + 32 | 48.853 + 334 | 05.07 +113 | 34.652 + 339 | 59.99 +108 |
| 6 19.3 | 08.174 + 362 | 28.71 +137 | 11.061 + 467 | 03.20 + 83 | 49.203 + 350 | 06.55 +148 | 35.006 + 354 | 61.43 +144 |
| 6 29.3 | 08.542 + 368 | 30.40 +169 | 11.533 + 472 | 04.47 +127 | 49.558 + 355 | 08.29 +174 | 35.366 + 360 | 63.15 +172 |
| 7 9.2 | 08.908 + 366 | 32.38 +198 | 12.002 + 469 | 06.18 +171 | 49.912 + 354 | 10.30 +201 | 35.725 + 359 | 65.13 +198 |
| 7 19.2 | 09.261 + 353 | 34.60 +222 | 12.454 + 452 | 08.29 +211 | 50.254 + 342 | 12.50 +220 | 36.072 + 347 | 67.33 +220 |
| 7 29.2 | 09.593 + 332 | 36.97 +237 | 12.878 + 424 | 10.71 +242 | 50.577 + 323 | 14.82 +232 | 36.399 + 327 | 69.67 +234 |
| 8 8.1 | 09.900 + 307 | 39.49 +252 | 13.268 + 390 | 13.44 +273 | 50.876 + 299 | 17.25 +243 | 36.702 + 303 | 72.13 +246 |
| 8 18.1 | 10.173 + 273 | 42.07 +258 | 13.614 + 346 | 16.39 +295 | 51.141 + 265 | 19.70 +245 | 36.971 + 269 | 74.62 +249 |
| 8 28.1 | 10.410 + 237 | 44.66 +259 | 13.912 + 298 | 19.48 +309 | 51.372 + 231 | 22.12 +242 | 37.206 + 235 | 77.10 +248 |
| 9 7.1 | 10.608 + 198 | 47.23 +257 | 14.160 + 248 | 22.70 +322 | 51.565 + 193 | 24.50 +238 | 37.403 + 197 | 79.54 +244 |
| 9 17.0 | 10.763 + 155 | 49.70 +247 | 14.351 + 191 | 25.93 +323 | 51.718 + 153 | 26.76 +226 | 37.559 + 156 | 81.87 +233 |
| 9 27.0 | 10.880 + 117 | 52.05 +235 | 14.489 + 138 | 29.14 +321 | 51.833 + 115 | 28.87 +211 | 37.676 + 117 | 84.07 +220 |
| 10 7.0 | 10.957 + 77 | 54.25 +220 | 14.574 + 85 | 32.28 +314 | 51.911 + 78 | 30.83 +196 | 37.756 + 80 | 86.11 +204 |
| 10 17.0 | 10.995 + 38 | 56.23 +198 | 14.604 + 30 | 35.25 +297 | 51.951 + 40 | 32.56 +173 | 37.798 + 42 | 87.94 +183 |
| 10 26.9 | 11.001 + 6 | 58.00 +177 | 14.586 - 18 | 38.02 +277 | 51.960 + 9 | 34.08 +152 | 37.808 + 10 | 89.55 +161 |
| 11 5.9 | 10.975 - 26 | 59.52 +152 | 14.520 - 66 | 40.53 +251 | 51.939 - 21 | 35.35 +127 | 37.787 - 21 | 90.92 +137 |
| 11 15.9 | 10.919 - 56 | 60.75 +123 | 14.410 - 110 | 42.70 +217 | 51.890 - 49 | 36.35 +100 | 37.738 - 49 | 92.00 +108 |
| 11 25.8 | 10.841 - 78 | 61.68 + 93 | 14.263 - 147 | 44.52 +182 | 51.819 - 71 | 37.08 + 73 | 37.667 - 71 | 92.81 + 81 |
| 12 5.8 | 10.738 - 103 | 62.29 + 61 | 14.078 - 185 | 45.92 +140 | 51.726 - 93 | 37.52 + 44 | 37.572 - 95 | 93.32 + 51 |
| 12 15.8 | 10.619 - 119 | 62.56 + 27 | 13.865 - 213 | 46.83 + 91 | 51.617 - 109 | 37.65 + 13 | 37.461 - 111 | 93.51 + 19 |
| 12 25.8 | 10.486 - 133 | 62.50 - 6 | 13.630 - 235 | 47.28 + 45 | 51.496 - 121 | 37.50 - 15 | 37.337 - 124 | 93.40 - 11 |
| 12 35.7 | 10.342 - 144 | 62.09 - 41 | 13.377 - 253 | 47.21 - 7 | 51.363 - 133 | 37.03 - 47 | 37.201 - 136 | 92.97 - 43 |
| | 10.342 - 147 | 62.09 - 73 | 13.377 - 256 | 47.21 - 57 | 51.363 - 136 | 37.03 - 74 | 37.201 - 138 | 92.97 - 73 |
| Mean Place | 09.433 | 42.50 | 12.830 | 21.89 | 50.399 | 18.96 | 36.234 | 74.27 |
| sec δ, tan δ | +1.201 | +0.666 | +1.694 | +1.367 | +1.146 | +0.560 | +1.164 | +0.596 |
| dα(ψ), dδ(ψ) | +0.064 | +0.39 | +0.067 | +0.39 | +0.064 | +0.39 | +0.064 | +0.39 |
| dα(ε), dδ(ε) | -0.044 | +0.16 | -0.090 | +0.16 | -0.037 | +0.16 | -0.039 | +0.17 |
| Dble. Trans. | September 30 | | September 30 | | October 1 | | October 1 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 21 | | 1015 | | 1016 | | 23 | | |
|---|----------------------|-------------|-----------------|-------------|------------------------------|-------------|------------------|-------------|-------------|
| | α Cassiopeiae | | μ Phoenicis | | Lacaille 181 (Sculptoris) | | η Phoenicis | | |
| Mag.Spect. | 2.47 | K0 | 4.65 | K0 | 7.21 | M0 | 4.53 | A0 | |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | |
| | h m | ° / | h m | ° / | h m | ° / | h m | ° / | |
| | 0 39 | +56 27 | 0 40 | -46 09 | 0 41 | -36 05 | 0 42 | -57 31 | |
| 1 | -9.2 | 41.382 -254 | 52.39 +72 | 40.176 -196 | 60.09 -87 | 56.910 -150 | 71.17 -93 | 44.276 -290 | 103.43 -77 |
| 1 | 0.7 | 41.110 -272 | 52.61 +22 | 39.975 -201 | 60.48 -39 | 56.756 -154 | 71.70 -53 | 43.980 -296 | 103.66 -23 |
| 1 | 10.7 | 40.823 -287 | 52.32 -29 | 39.772 -203 | 60.42 +6 | 56.599 -157 | 71.85 +27 | 43.683 -297 | 103.35 +31 |
| 1 | 20.7 | 40.537 -286 | 51.50 -82 | 39.577 -195 | 59.85 +57 | 56.446 -153 | 71.58 +15 | 43.398 -285 | 102.47 +88 |
| 1 | 30.7 | 40.263 -274 | 50.22 -128 | 39.397 -180 | 58.82 +103 | 56.304 -142 | 70.90 +68 | 43.135 -263 | 101.08 +139 |
| 2 | 9.6 | 40.011 -252 | 48.52 -170 | 39.234 -163 | 57.35 +147 | 56.175 -129 | 69.84 +106 | 42.898 -237 | 99.21 +187 |
| 2 | 19.6 | 39.797 -214 | 46.46 -206 | 39.099 -135 | 55.46 +189 | 56.068 -107 | 68.39 +145 | 42.699 -199 | 96.88 +233 |
| 3 | 1.6 | 39.632 -165 | 44.17 -229 | 38.997 -102 | 53.22 +224 | 55.989 -79 | 66.62 +177 | 42.544 -155 | 94.20 +268 |
| 3 | 11.6 | 39.525 -107 | 41.71 -246 | 38.932 -65 | 50.65 +257 | 55.941 -48 | 64.53 +209 | 42.438 -106 | 91.18 +302 |
| 3 | 21.5 | 39.489 -36 | 39.21 -250 | 38.914 -18 | 47.81 +284 | 55.933 -8 | 62.16 +237 | 42.392 -46 | 87.90 +328 |
| 3 | 31.5 | 39.525 +36 | 36.79 -242 | 38.944 +30 | 44.77 +304 | 55.967 +34 | 59.57 +259 | 42.408 +16 | 84.46 +344 |
| 4 | 10.5 | 39.638 +113 | 34.51 -228 | 39.025 +81 | 41.57 +320 | 56.046 +79 | 56.78 +279 | 42.487 +79 | 80.88 +358 |
| 4 | 20.4 | 39.829 +191 | 32.51 -200 | 39.163 +138 | 38.28 +329 | 56.175 +129 | 53.86 +292 | 42.637 +150 | 77.27 +361 |
| 4 | 30.4 | 40.091 +262 | 30.87 -164 | 39.353 +190 | 34.99 +329 | 56.351 +176 | 50.89 +297 | 42.852 +215 | 73.72 +355 |
| 5 | 10.4 | 40.421 +330 | 29.61 -126 | 39.595 +242 | 31.72 +327 | 56.573 +222 | 47.88 +301 | 43.131 +279 | 70.24 +348 |
| 5 | 20.4 | 40.810 +389 | 28.83 -78 | 39.887 +292 | 28.58 +314 | 56.839 +266 | 44.93 +295 | 43.472 +341 | 66.97 +327 |
| 5 | 30.3 | 41.242 +432 | 28.53 -30 | 40.219 +332 | 25.64 +294 | 57.140 +301 | 42.10 +283 | 43.863 +391 | 63.97 +300 |
| 6 | 9.3 | 41.712 +470 | 28.72 +19 | 40.587 +368 | 22.94 +270 | 57.473 +333 | 39.44 +266 | 44.300 +437 | 61.27 +270 |
| 6 | 19.3 | 42.203 +491 | 29.43 +71 | 40.980 +393 | 20.58 +236 | 57.828 +355 | 37.04 +240 | 44.771 +471 | 58.99 +228 |
| 6 | 29.3 | 42.700 +497 | 30.60 +117 | 41.388 +408 | 18.59 +199 | 58.195 +367 | 34.94 +210 | 45.261 +490 | 57.14 +185 |
| 7 | 9.2 | 43.195 +495 | 32.22 +162 | 41.803 +415 | 17.02 +157 | 58.567 +372 | 33.18 +176 | 45.762 +501 | 55.78 +136 |
| 7 | 19.2 | 43.672 +477 | 34.27 +205 | 42.212 +409 | 15.94 +108 | 58.933 +366 | 31.85 +133 | 46.257 +495 | 54.97 +81 |
| 7 | 29.2 | 44.121 +449 | 36.65 +238 | 42.603 +391 | 15.34 +60 | 59.283 +350 | 30.94 +91 | 46.734 +477 | 54.68 +29 |
| 8 | 8.1 | 44.536 +415 | 39.35 +270 | 42.969 +366 | 15.24 +10 | 59.610 +327 | 30.48 +46 | 47.182 +448 | 54.94 -26 |
| 8 | 18.1 | 44.904 +368 | 42.30 +295 | 43.298 +329 | 15.66 -42 | 59.904 +294 | 30.49 -1 | 47.584 +402 | 55.75 -81 |
| 8 | 28.1 | 45.223 +319 | 45.41 +311 | 43.585 +287 | 16.53 -87 | 60.161 +257 | 30.93 -44 | 47.935 +351 | 57.04 -129 |
| 9 | 7.1 | 45.489 +266 | 48.66 +325 | 43.823 +238 | 17.86 -133 | 60.376 +215 | 31.80 -87 | 48.225 +290 | 58.80 -176 |
| 9 | 17.0 | 45.695 +206 | 51.96 +330 | 44.006 +183 | 19.57 -171 | 60.543 +167 | 33.06 -126 | 48.444 +219 | 60.95 -215 |
| 9 | 27.0 | 45.846 +151 | 55.25 +329 | 44.135 +129 | 21.58 -201 | 60.665 +122 | 34.60 -154 | 48.594 +150 | 63.37 -242 |
| 10 | 7.0 | 45.939 +93 | 58.48 +323 | 44.209 +74 | 23.83 -225 | 60.741 +76 | 36.41 -181 | 48.672 +78 | 66.02 -265 |
| 10 | 17.0 | 45.974 +35 | 61.56 +308 | 44.228 +19 | 26.20 -237 | 60.770 +29 | 38.38 -197 | 48.675 +3 | 68.75 -273 |
| 10 | 26.9 | 45.958 -16 | 64.45 +289 | 44.199 -29 | 28.59 -239 | 60.760 -10 | 40.41 -203 | 48.614 -61 | 71.45 -270 |
| 11 | 5.9 | 45.889 -69 | 67.10 +265 | 44.123 -76 | 30.92 -233 | 60.712 -48 | 42.44 -203 | 48.490 -124 | 74.05 -260 |
| 11 | 15.9 | 45.772 -117 | 69.40 +230 | 44.009 -114 | 33.07 -215 | 60.632 -80 | 44.35 -191 | 48.312 -178 | 76.38 -233 |
| 11 | 25.8 | 45.613 -159 | 71.35 +195 | 43.864 -145 | 34.95 -188 | 60.527 -105 | 46.07 -172 | 48.092 -220 | 78.38 -200 |
| 12 | 5.8 | 45.413 -200 | 72.88 +153 | 43.693 -171 | 36.51 -156 | 60.400 -127 | 47.54 -147 | 47.834 -258 | 79.97 -159 |
| 12 | 15.8 | 45.181 -232 | 73.92 +104 | 43.504 -189 | 37.64 -113 | 60.258 -142 | 48.68 -114 | 47.554 -280 | 81.06 -109 |
| 12 | 25.8 | 44.925 -256 | 74.47 +55 | 43.306 -198 | 38.33 -69 | 60.108 -150 | 49.46 -78 | 47.260 -294 | 81.64 -58 |
| 12 | 35.7 | 44.648 -277 | 74.50 +3 | 43.102 -204 | 38.56 -23 | 59.950 -158 | 49.86 -40 | 46.959 -301 | 81.66 -2 |
| | | -282 | -50 | -200 | +28 | -155 | +3 | -293 | +54 |
| Mean Place | 44.119 | 48.45 | 41.416 | 32.14 | 58.382 | 45.99 | 45.056 | 73.07 | |
| sec δ , tan δ | +1.810 | +1.509 | +1.444 | -1.041 | +1.238 | -0.729 | +1.863 | -1.572 | |
| $d\alpha(\psi)$, $d\delta(\psi)$ | +0.068 | +0.39 | +0.056 | +0.39 | +0.058 | +0.39 | +0.053 | +0.39 | |
| $d\alpha(\epsilon)$, $d\delta(\epsilon)$ | -0.099 | +0.17 | +0.068 | +0.18 | +0.048 | +0.18 | +0.103 | +0.19 | |
| Dble. Trans. | October 1 | | October 1 | | October 2 | | October 2 | | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 22 | | 26 | | 25 | | 1017 | |
|--------------|---------------------------|-------------|---------------------------|-------------|---------------------------|-------------|---------------------------|-------------|
| | β Ceti | | λ ² Sculptoris | | ο Cassiopeiae | | 70 G. Phoenicis | |
| Mag.Spect. | 2.24 | K0 | 5.97 | K0 | 4.70 | B2 | 6.00 | A5 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " |
| | 0 42 | - 18 03 | 0 43 | - 38 29 | 0 43 | + 48 12 | 0 44 | - 42 44 |
| 1 -9.2 | 52 972 ^s - 105 | 57 50 - 87 | 31 589 ^s - 158 | 71 06 - 93 | 55 561 ^s - 188 | 40 62 + 52 | 17 588 ^s - 178 | 87 17 - 92 |
| 1 0.8 | 52 860 - 112 | 58 16 - 66 | 31 426 - 163 | 71 58 - 52 | 55 357 - 204 | 40 70 + 8 | 17 405 - 183 | 87 66 - 49 |
| 1 10.7 | 52 745 - 115 | 58 60 - 44 | 31 260 - 166 | 71 70 - 12 | 55 140 - 217 | 40 70 - 37 | 17 220 - 185 | 87 70 - 4 |
| 1 10.7 | 52 745 - 115 | 58 60 - 18 | 31 260 - 161 | 71 70 + 34 | 55 140 - 219 | 40 33 - 84 | 17 220 - 181 | 87 70 + 44 |
| 1 30.7 | 52 630 - 107 | 58 78 + 7 | 31 099 - 151 | 71 36 + 75 | 54 921 - 210 | 39 49 - 122 | 17 039 - 168 | 87 26 + 88 |
| 1 30.7 | 52 523 - 107 | 58 71 + 7 | 30 948 - 151 | 70 61 + 75 | 54 711 - 210 | 38 27 - 122 | 16 871 - 168 | 86 38 + 88 |
| 2 9.6 | 52 425 - 98 | 58 38 + 33 | 30 812 - 136 | 69 47 + 114 | 54 516 - 195 | 36 68 - 159 | 16 718 - 153 | 85 08 + 130 |
| 2 19.6 | 52 344 - 81 | 57 77 + 61 | 30 698 - 114 | 67 92 + 155 | 54 350 - 166 | 34 79 - 189 | 16 591 - 127 | 83 36 + 172 |
| 3 1.6 | 52 286 - 58 | 56 90 + 87 | 30 613 - 85 | 66 03 + 189 | 54 222 - 128 | 32 73 - 206 | 16 494 - 97 | 81 29 + 207 |
| 3 11.6 | 52 255 - 31 | 55 77 + 113 | 30 559 - 54 | 63 83 + 220 | 54 140 - 82 | 30 53 - 220 | 16 431 - 63 | 78 90 + 239 |
| 3 21.5 | 52 258 + 3 | 54 37 + 140 | 30 547 - 12 | 61 34 + 249 | 54 110 - 25 | 28 34 - 219 | 16 412 - 19 | 76 22 + 268 |
| 3 31.5 | 52 297 + 39 | 52 74 + 163 | 30 578 + 31 | 58 64 + 270 | 54 150 + 35 | 26 24 - 210 | 16 438 + 26 | 73 33 + 289 |
| 4 10.5 | 52 378 + 81 | 50 87 + 187 | 30 656 + 78 | 55 74 + 290 | 54 248 + 98 | 24 31 - 193 | 16 514 + 76 | 70 26 + 307 |
| 4 20.5 | 52 503 + 125 | 48 79 + 208 | 30 785 + 129 | 52 72 + 302 | 54 412 + 164 | 22 66 - 165 | 16 644 + 130 | 67 09 + 317 |
| 4 30.4 | 52 669 + 166 | 46 57 + 222 | 30 962 + 177 | 49 66 + 306 | 54 636 + 224 | 21 36 - 130 | 16 823 + 179 | 63 89 + 320 |
| 5 10.4 | 52 877 + 208 | 44 21 + 236 | 31 186 + 224 | 46 57 + 309 | 54 918 + 282 | 20 43 - 93 | 17 053 + 230 | 60 69 + 320 |
| 5 20.4 | 53 123 + 246 | 41 78 + 243 | 31 456 + 270 | 43 55 + 302 | 55 252 + 334 | 19 95 - 48 | 17 331 + 278 | 57 59 + 310 |
| 5 30.3 | 53 400 + 277 | 39 33 + 245 | 31 761 + 305 | 40 68 + 287 | 55 624 + 372 | 19 92 - 3 | 17 647 + 316 | 54 67 + 292 |
| 6 9.3 | 53 704 + 304 | 36 90 + 243 | 32 100 + 339 | 37 99 + 269 | 56 029 + 405 | 20 36 + 44 | 17 998 + 351 | 51 95 + 272 |
| 6 19.3 | 54 026 + 322 | 34 58 + 232 | 32 462 + 362 | 35 57 + 242 | 56 454 + 425 | 21 26 + 90 | 18 375 + 377 | 49 55 + 240 |
| 6 29.3 | 54 358 + 332 | 32 41 + 217 | 32 837 + 375 | 33 48 + 209 | 56 885 + 431 | 22 57 + 131 | 18 764 + 389 | 47 49 + 206 |
| 7 9.2 | 54 692 + 334 | 30 43 + 198 | 33 218 + 381 | 31 75 + 173 | 57 317 + 432 | 24 29 + 172 | 19 162 + 396 | 45 83 + 166 |
| 7 19.2 | 55 019 + 327 | 28 72 + 171 | 33 593 + 375 | 30 46 + 129 | 57 734 + 417 | 26 37 + 208 | 19 553 + 391 | 44 63 + 120 |
| 7 29.2 | 55 331 + 312 | 27 30 + 142 | 33 951 + 358 | 29 60 + 86 | 58 127 + 393 | 28 74 + 237 | 19 929 + 376 | 43 90 + 73 |
| 8 8.2 | 55 622 + 291 | 26 20 + 110 | 34 288 + 337 | 29 21 + 39 | 58 493 + 366 | 31 37 + 263 | 20 281 + 352 | 43 65 + 25 |
| 8 18.1 | 55 884 + 262 | 25 47 + 73 | 34 591 + 303 | 29 30 - 9 | 58 819 + 326 | 34 18 + 281 | 20 598 + 317 | 43 92 - 27 |
| 8 28.1 | 56 113 + 229 | 25 09 + 38 | 34 856 + 265 | 29 83 - 53 | 59 103 + 284 | 37 11 + 293 | 20 876 + 278 | 44 63 - 71 |
| 9 7.1 | 56 306 + 193 | 25 06 + 3 | 35 078 + 222 | 30 81 - 98 | 59 342 + 239 | 40 14 + 303 | 21 108 + 232 | 45 79 - 116 |
| 9 17.0 | 56 458 + 152 | 25 37 - 31 | 35 251 + 173 | 32 16 - 135 | 59 531 + 189 | 43 17 + 303 | 21 288 + 180 | 47 35 - 156 |
| 9 27.0 | 56 573 + 115 | 25 97 - 60 | 35 377 + 126 | 33 82 - 166 | 59 674 + 143 | 46 15 + 298 | 21 418 + 130 | 49 20 - 186 |
| 10 7.0 | 56 650 + 77 | 26 83 - 86 | 35 455 + 78 | 35 74 - 192 | 59 769 + 95 | 49 05 + 290 | 21 497 + 79 | 51 32 - 212 |
| 10 17.0 | 56 690 + 40 | 27 90 - 107 | 35 484 + 29 | 37 81 - 207 | 59 815 + 46 | 51 77 + 272 | 21 523 + 26 | 53 57 - 225 |
| 10 26.9 | 56 698 + 8 | 29 09 - 119 | 35 473 - 11 | 39 93 - 212 | 59 820 + 5 | 54 30 + 253 | 21 505 - 18 | 55 86 - 229 |
| 11 5.9 | 56 677 - 21 | 30 37 - 128 | 35 423 - 50 | 42 05 - 212 | 59 781 - 39 | 56 59 + 229 | 21 444 - 61 | 58 12 - 226 |
| 11 15.9 | 56 629 - 48 | 31 66 - 129 | 35 338 - 85 | 44 03 - 198 | 59 704 - 77 | 58 56 + 197 | 21 346 - 98 | 60 22 - 210 |
| 11 25.9 | 56 562 - 67 | 32 89 - 123 | 35 227 - 111 | 45 81 - 178 | 59 594 - 110 | 60 19 + 163 | 21 219 - 127 | 62 09 - 187 |
| 12 5.8 | 56 477 - 85 | 34 04 - 115 | 35 093 - 134 | 47 33 - 152 | 59 450 - 144 | 61 43 + 124 | 21 066 - 153 | 63 66 - 157 |
| 12 15.8 | 56 379 - 98 | 35 01 - 97 | 34 943 - 150 | 48 48 - 115 | 59 280 - 170 | 62 24 + 81 | 20 897 - 169 | 64 83 - 117 |
| 12 25.8 | 56 272 - 107 | 35 81 - 80 | 34 784 - 159 | 49 26 - 78 | 59 090 - 190 | 62 62 + 38 | 20 718 - 179 | 65 60 - 77 |
| 12 35.7 | 56 158 - 114 | 36 39 - 58 | 34 617 - 167 | 49 63 - 37 | 58 882 - 208 | 62 52 - 10 | 20 531 - 187 | 65 92 - 32 |
| | 56 158 - 114 | 36 39 - 33 | 34 617 - 164 | 49 63 + 7 | 58 882 - 214 | 62 52 - 55 | 20 531 - 183 | 65 92 + 16 |
| Mean Place | 54.746 | 38.05 | 33.003 | 45.22 | 58.110 | 38.38 | 18.875 | 60.34 |
| sec δ, tan δ | +1.052 | -0.326 | +1.278 | -0.795 | +1.501 | +1.119 | +1.362 | -0.924 |
| dα(ψ), dδ(ψ) | +0.060 | +0.39 | +0.057 | +0.39 | +0.067 | +0.39 | +0.056 | +0.39 |
| dα(ε), dδ(ε) | +0.021 | +0.19 | +0.052 | +0.19 | -0.073 | +0.19 | +0.060 | +0.19 |
| Dble.Trans. | October 2 | | October 2 | | October 2 | | October 2 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 24 | | 27 | | 1018 | | 1019 | | |
|--------------|----------------|-------------|--------------|-------------|------------|-------------|---------------|-------------|------------|
| | 21 Cassiopeiae | | ζ Andromedae | | 79 G. Ceti | | 96 G. Piscium | | |
| Mag.Spect. | 5.61 var. | A2 | 4.30 | K0 | 5.45 | B9 | 5.82 | G5 | |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | |
| | h m | ° / | h m | ° / | h m | ° / | h m | ° / | |
| | 0 44 | +74 54 | 0 46 | +24 11 | 0 47 | -21 47 | 0 47 | + 5 12 | |
| 1 | -9.2 | 40.885 -663 | 58.79 +132 | 35.057 -107 | 33.54 -14 | 19.345 -111 | 66.10 -93 | 38.396 -90 | 30.09 -60 |
| 1 | 0.8 | 40.178 -707 | 59.53 +74 | 34.939 -118 | 33.17 -37 | 19.228 -117 | 66.77 -67 | 38.299 -97 | 29.46 -63 |
| 1 | 10.7 | 39.439 -739 | 59.67 +14 | 34.813 -126 | 32.57 -60 | 19.105 -123 | 67.19 -42 | 38.194 -105 | 28.80 -66 |
| 1 | 20.7 | 38.701 -705 | 59.16 -51 | 34.684 -129 | 31.75 -82 | 18.984 -121 | 67.31 -12 | 38.088 -106 | 28.14 -66 |
| 1 | 30.7 | 37.996 -705 | 58.08 -108 | 34.559 -125 | 30.77 -98 | 18.869 -115 | 67.14 +17 | 37.987 -101 | 27.51 -63 |
| 2 | 9.6 | 37.342 -654 | 56.46 -162 | 34.443 -116 | 29.64 -113 | 18.762 -107 | 66.69 +45 | 37.892 -95 | 26.93 -58 |
| 2 | 19.6 | 36.779 -563 | 54.34 -212 | 34.345 -98 | 28.43 -121 | 18.674 -88 | 65.92 +77 | 37.814 -78 | 26.45 -48 |
| 3 | 1.6 | 36.329 -450 | 51.87 -247 | 34.272 -73 | 27.22 -121 | 18.608 -66 | 64.87 +105 | 37.757 -57 | 26.10 -35 |
| 3 | 11.6 | 36.007 -322 | 49.11 -326 | 34.229 -43 | 26.04 -118 | 18.568 -40 | 63.55 +132 | 37.726 -31 | 25.89 -21 |
| 3 | 21.5 | 35.840 -167 | 46.20 -291 | 34.226 -3 | 24.98 -106 | 18.564 -4 | 61.95 +160 | 37.731 +5 | 25.89 +0 |
| 3 | 31.5 | 35.829 -11 | 43.29 -291 | 34.264 +38 | 24.09 -89 | 18.597 +33 | 60.12 +183 | 37.780 +49 | 26.17 +28 |
| 4 | 10.5 | 35.978 +149 | 40.44 -285 | 34.347 +83 | 23.42 -67 | 18.671 +74 | 58.05 +207 | 37.846 +66 | 26.52 +35 |
| 4 | 20.5 | 36.291 +313 | 37.80 -264 | 34.479 +132 | 23.03 -39 | 18.790 +119 | 55.78 +227 | 37.974 +128 | 27.26 +74 |
| 4 | 30.4 | 36.748 +457 | 35.49 -231 | 34.657 +178 | 22.95 -8 | 18.952 +162 | 53.39 +239 | 38.141 +167 | 28.23 +97 |
| 5 | 10.4 | 37.340 +592 | 33.53 -196 | 34.880 +223 | 23.21 +26 | 19.156 +204 | 50.87 +252 | 38.348 +207 | 29.46 +123 |
| 5 | 20.4 | 38.051 +711 | 32.06 -147 | 35.142 +262 | 23.82 +61 | 19.400 +244 | 48.30 +257 | 38.593 +245 | 30.93 +147 |
| 5 | 30.3 | 38.848 +797 | 31.09 -97 | 35.436 +294 | 24.75 +93 | 19.676 +276 | 45.75 +255 | 38.868 +275 | 32.59 +166 |
| 6 | 9.3 | 39.718 +870 | 30.64 -45 | 35.756 +320 | 26.01 +126 | 19.980 +304 | 43.24 +300 | 39.168 +300 | 34.43 +184 |
| 6 | 19.3 | 40.632 +914 | 30.77 +13 | 36.094 +338 | 27.56 +155 | 20.305 +325 | 40.87 +237 | 39.485 +317 | 36.39 +196 |
| 6 | 29.3 | 41.559 +927 | 31.43 +66 | 36.438 +344 | 29.34 +178 | 20.639 +334 | 38.67 +220 | 39.810 +325 | 38.41 +202 |
| 7 | 9.2 | 42.486 +927 | 32.62 +119 | 36.783 +345 | 31.34 +200 | 20.978 +339 | 36.71 +196 | 40.136 +326 | 40.46 +205 |
| 7 | 19.2 | 43.381 +895 | 34.33 +171 | 37.119 +336 | 31.48 +214 | 21.311 +333 | 35.04 +167 | 40.455 +319 | 42.48 +202 |
| 7 | 29.2 | 44.226 +845 | 36.48 +215 | 37.437 +318 | 33.48 +223 | 21.629 +318 | 33.70 +134 | 40.758 +303 | 44.40 +192 |
| 8 | 8.2 | 45.009 +783 | 39.05 +257 | 37.733 +296 | 38.00 +229 | 21.927 +298 | 32.71 +99 | 41.040 +282 | 46.20 +180 |
| 8 | 18.1 | 45.704 +695 | 42.00 +295 | 37.998 +265 | 40.28 +228 | 22.196 +269 | 32.11 +60 | 41.294 +254 | 47.82 +162 |
| 8 | 28.1 | 46.306 +602 | 45.21 +321 | 38.231 +233 | 42.50 +222 | 22.432 +236 | 31.88 +23 | 41.518 +224 | 49.25 +143 |
| 9 | 7.1 | 46.806 +500 | 48.68 +347 | 38.429 +198 | 44.64 +214 | 22.632 +200 | 32.02 -14 | 41.708 +190 | 50.45 +120 |
| 9 | 17.0 | 47.188 +382 | 52.31 +363 | 38.588 +159 | 46.64 +200 | 22.792 +160 | 32.53 -51 | 41.861 +153 | 51.41 +96 |
| 9 | 27.0 | 47.457 +269 | 56.02 +371 | 38.711 +123 | 48.48 +184 | 22.912 +120 | 33.33 -80 | 41.980 +119 | 52.13 +70 |
| 10 | 7.0 | 47.605 +148 | 59.77 +375 | 38.798 +87 | 50.14 +166 | 22.994 +82 | 34.40 -107 | 42.064 +84 | 52.63 +52 |
| 10 | 17.0 | 47.626 +21 | 63.44 +367 | 38.850 +52 | 51.59 +145 | 23.037 +43 | 35.67 -127 | 42.114 +50 | 52.89 +26 |
| 10 | 26.9 | 47.532 -94 | 66.98 +354 | 38.871 +21 | 52.83 +124 | 23.047 +10 | 37.06 -139 | 42.137 +23 | 52.97 +8 |
| 11 | 5.9 | 47.317 -215 | 70.33 +335 | 38.862 -9 | 53.85 +102 | 23.026 -21 | 38.54 -148 | 42.132 -5 | 52.86 -11 |
| 11 | 15.9 | 46.987 -330 | 73.34 +301 | 38.827 -35 | 54.61 +76 | 22.978 -48 | 39.99 -145 | 42.103 -29 | 52.60 -26 |
| 11 | 25.9 | 46.556 -431 | 76.00 +266 | 38.770 -57 | 55.14 +53 | 22.908 -70 | 41.37 -138 | 42.055 -48 | 52.23 -37 |
| 12 | 5.8 | 46.024 -532 | 78.22 +222 | 38.691 -79 | 55.42 +28 | 22.819 -89 | 42.62 -125 | 41.988 -67 | 51.74 -49 |
| 12 | 15.8 | 45.413 -611 | 79.89 +167 | 38.595 -96 | 55.45 +3 | 22.716 -103 | 43.68 -106 | 41.908 -80 | 51.19 -55 |
| 12 | 25.8 | 44.742 -671 | 81.02 +113 | 38.487 -108 | 55.24 -21 | 22.604 -112 | 44.51 -83 | 41.817 -91 | 50.58 -61 |
| 12 | 35.7 | 44.022 -720 | 81.54 +52 | 38.366 -121 | 54.77 -47 | 22.484 -120 | 45.10 -59 | 41.717 -100 | 49.93 -65 |
| | | -730 | -11 | -125 | -68 | -121 | -30 | -103 | -65 |
| Mean Place | 44.444 | 52.02 | 37.274 | 38.05 | 21.021 | 45.65 | 40.441 | 40.55 | |
| sec δ, tan δ | +3.842 | +3.710 | +1.096 | +0.449 | +1.077 | -0.400 | +1.004 | +0.091 | |
| dα(ψ), dδ(ψ) | +0.080 | +0.39 | +0.064 | +0.39 | +0.059 | +0.39 | +0.062 | +0.39 | |
| dα(ε), dδ(ε) | -0.243 | +0.19 | -0.029 | +0.20 | +0.026 | +0.21 | -0.006 | +0.21 | |
| Dble.Trans. | October 2 | | October 3 | | October 3 | | October 3 | | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 28 | | 31 | | 1020 | | 1021 | | |
|--------------|-----------|--------------|------------|--------------|------------|--------------|--------------|--------------|-------------|
| | δ Piscium | | λ Hydri | | 64 Piscium | | ν Andromedae | | |
| Mag.Spect. | 4.55 | K5 | 4.96 | K5 | 5.23 | F5 | 4.42 | B3 | |
| U.T. | R.A. | | R.A. | | R.A. | | R.A. | | |
| | Dec. | | Dec. | | Dec. | | Dec. | | |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " | |
| | 0 47 | + 7 30 | 0 48 | - 74 59 | 0 48 | + 16 51 | 0 49 | + 41 00 | |
| 1 | -9.2 | 56 830 - 91 | 32 23 - 52 | 08 850 - 736 | 80 78 - 56 | 13 920 - 97 | 57 51 - 32 | 01 531 - 151 | 20 50 + 35 |
| 1 | 0.8 | 56 730 - 100 | 31 65 - 58 | 08 103 - 747 | 80 73 + 5 | 13 813 - 107 | 57 04 - 47 | 01 367 - 164 | 20 47 - 3 |
| 1 | 10.7 | 56 624 - 106 | 31 01 - 64 | 07 356 - 747 | 80 08 + 65 | 13 698 - 115 | 56 41 - 63 | 01 190 - 177 | 20 05 - 42 |
| 1 | 20.7 | 56 515 - 109 | 30 35 - 66 | 06 638 - 718 | 78 79 +129 | 13 581 - 117 | 55 64 - 77 | 01 009 - 181 | 19 23 - 82 |
| 1 | 30.7 | 56 410 - 105 | 29 70 - 65 | 05 973 - 665 | 76 95 +184 | 13 468 - 113 | 54 79 - 85 | 00 835 - 174 | 18 09 - 114 |
| 2 | 9.6 | 56 312 - 98 | 29 07 - 63 | 05 369 - 604 | 74 61 +234 | 13 362 - 106 | 53 87 - 92 | 00 671 - 164 | 16 64 - 145 |
| 2 | 19.6 | 56 231 - 81 | 28 52 - 55 | 04 853 - 516 | 71 80 +281 | 13 272 - 90 | 52 94 - 93 | 00 531 - 140 | 14 96 - 168 |
| 3 | 1.6 | 56 170 - 61 | 28 07 - 45 | 04 436 - 417 | 68 64 +316 | 13 206 - 66 | 52 05 - 89 | 00 422 - 109 | 13 13 - 183 |
| 3 | 11.6 | 56 136 - 34 | 27 76 - 31 | 04 123 - 313 | 65 16 +348 | 13 167 - 39 | 51 23 - 82 | 00 352 - 70 | 11 22 - 191 |
| 3 | 21.5 | 56 137 + 1 | 27 65 - 11 | 03 935 - 188 | 61 46 +370 | 13 166 - 1 | 50 58 - 65 | 00 332 - 20 | 09 34 - 188 |
| 3 | 31.5 | 56 178 + 41 | 27 82 + 17 | 03 871 - 64 | 57 64 +382 | 13 203 + 37 | 50 13 - 45 | 00 363 + 31 | 07 57 - 177 |
| 4 | 10.5 | 56 247 + 69 | 28 06 + 24 | 03 935 + 64 | 53 74 +390 | 13 281 + 78 | 49 89 - 24 | 00 450 + 87 | 05 98 - 159 |
| 4 | 20.5 | 56 373 + 126 | 28 66 + 60 | 04 137 + 202 | 49 87 +387 | 13 408 + 127 | 49 91 + 2 | 00 596 + 146 | 04 67 - 131 |
| 4 | 30.4 | 56 539 + 166 | 29 53 + 87 | 04 463 + 326 | 46 13 +374 | 13 579 + 171 | 50 23 + 32 | 00 796 + 200 | 03 68 - 99 |
| 5 | 10.4 | 56 745 + 206 | 30 66 +113 | 04 917 + 454 | 42 55 +358 | 13 792 + 213 | 50 86 + 63 | 01 049 + 253 | 03 06 - 62 |
| 5 | 20.4 | 56 989 + 244 | 32 05 +139 | 05 491 + 574 | 39 25 +330 | 14 044 + 252 | 51 81 + 95 | 01 349 + 300 | 02 87 - 19 |
| 5 | 30.3 | 57 262 + 273 | 33 65 +160 | 06 162 + 671 | 36 29 +296 | 14 327 + 283 | 53 04 +123 | 01 685 + 336 | 03 09 + 22 |
| 6 | 9.3 | 57 562 + 300 | 35 44 +179 | 06 928 + 766 | 33 71 +258 | 14 635 + 308 | 54 53 +149 | 02 052 + 367 | 03 73 + 64 |
| 6 | 19.3 | 57 878 + 316 | 37 38 +194 | 07 764 + 836 | 31 62 +209 | 14 961 + 326 | 56 26 +173 | 02 439 + 387 | 04 79 +106 |
| 6 | 29.3 | 58 203 + 325 | 39 40 +202 | 08 644 + 880 | 30 02 +160 | 15 294 + 333 | 58 15 +189 | 02 833 + 394 | 06 22 +143 |
| 7 | 9.2 | 58 529 + 326 | 41 48 +208 | 09 557 + 913 | 28 97 +105 | 15 628 + 334 | 60 18 +203 | 03 228 + 395 | 08 00 +178 |
| 7 | 19.2 | 58 848 + 319 | 43 54 +206 | 10 467 + 910 | 28 52 + 45 | 15 954 + 326 | 62 30 +212 | 03 612 + 384 | 10 08 +208 |
| 7 | 29.2 | 59 151 + 303 | 45 54 +200 | 11 350 + 883 | 28 63 - 11 | 16 263 + 309 | 64 43 +213 | 03 976 + 364 | 12 40 +232 |
| 8 | 8.2 | 59 434 + 283 | 47 44 +190 | 12 188 + 838 | 29 33 - 70 | 16 552 + 289 | 66 56 +213 | 04 314 + 338 | 14 93 +253 |
| 8 | 18.1 | 59 688 + 254 | 49 18 +174 | 12 944 + 756 | 30 59 -126 | 16 811 + 259 | 68 60 +204 | 04 618 + 304 | 17 59 +266 |
| 8 | 28.1 | 59 912 + 224 | 50 73 +155 | 13 604 + 660 | 32 34 -175 | 17 039 + 228 | 70 54 +194 | 04 884 + 266 | 20 32 +273 |
| 9 | 7.1 | 60 102 + 190 | 52 09 +136 | 14 147 + 543 | 34 55 -221 | 17 233 + 194 | 72 34 +180 | 05 111 + 227 | 23 10 +278 |
| 9 | 17.0 | 60 256 + 154 | 53 21 +112 | 14 549 + 402 | 37 13 -258 | 17 389 + 156 | 73 96 +162 | 05 293 + 182 | 25 84 +274 |
| 9 | 27.0 | 60 375 + 119 | 54 11 + 90 | 14 809 + 260 | 39 97 -284 | 17 511 + 122 | 75 39 +143 | 05 433 + 140 | 28 51 +267 |
| 10 | 7.0 | 60 460 + 85 | 54 78 + 67 | 14 915 + 106 | 42 99 -302 | 17 598 + 87 | 76 62 +123 | 05 531 + 98 | 31 07 +256 |
| 10 | 17.0 | 60 512 + 52 | 55 22 + 44 | 14 861 - 54 | 46 03 -304 | 17 650 + 52 | 77 63 +101 | 05 587 + 56 | 33 44 +237 |
| 10 | 26.9 | 60 535 + 23 | 55 48 + 26 | 14 663 - 198 | 48 98 -295 | 17 674 + 24 | 78 43 + 80 | 05 605 + 18 | 35 63 +219 |
| 11 | 5.9 | 60 530 - 5 | 55 54 + 6 | 14 322 - 341 | 51 76 -278 | 17 669 - 5 | 79 02 + 59 | 05 586 - 19 | 37 57 +194 |
| 11 | 15.9 | 60 502 - 28 | 55 43 - 11 | 13 855 - 467 | 54 19 -243 | 17 639 - 30 | 79 40 + 38 | 05 534 - 52 | 39 21 +164 |
| 11 | 25.9 | 60 454 - 48 | 55 20 - 23 | 13 288 - 567 | 56 20 -201 | 17 589 - 50 | 79 59 + 19 | 05 452 - 82 | 40 55 +134 |
| 12 | 5.8 | 60 387 - 67 | 54 83 - 37 | 12 631 - 657 | 57 73 -153 | 17 518 - 71 | 79 58 - 1 | 05 341 - 111 | 41 54 + 99 |
| 12 | 15.8 | 60 306 - 81 | 54 37 - 46 | 11 918 - 713 | 58 66 - 93 | 17 432 - 86 | 79 38 - 20 | 05 208 - 133 | 42 14 + 60 |
| 12 | 25.8 | 60 214 - 92 | 53 84 - 53 | 11 174 - 744 | 59 01 - 35 | 17 334 - 96 | 79 01 - 37 | 05 055 - 153 | 42 37 + 23 |
| 12 | 35.7 | 60 112 - 102 | 53 23 - 61 | 10 414 - 760 | 58 73 + 28 | 17 224 - 110 | 78 47 - 54 | 04 887 - 168 | 42 19 - 18 |
| | | 60 112 - 106 | 53 23 - 64 | 10 414 - 741 | 58 73 + 92 | 17 224 - 113 | 78 47 - 68 | 04 887 - 175 | 42 19 - 58 |
| Mean Place | 58.866 | 42.40 | 07.586 | 48.27 | 16.054 | 64.35 | 03.946 | 19.93 | |
| sec δ, tan δ | +1.009 | +0.132 | +3.863 | -3.731 | +1.045 | +0.303 | +1.325 | +0.869 | |
| δα(ψ), δδ(ψ) | +0.062 | +0.39 | +0.041 | +0.39 | +0.063 | +0.39 | +0.066 | +0.39 | |
| δα(ε), δδ(ε) | -0.009 | +0.21 | +0.243 | +0.21 | -0.020 | +0.21 | -0.057 | +0.21 | |
| Dble.Trans. | October 3 | | October 3 | | October 3 | | October 3 | | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 30 | | 29 | | 1022 | | 34 | |
|----------------|--------------------------|-------------|-----------------------------|-------------|--------------------------|-------------|---------------------------|-------------|
| | φ ² Ceti | | Bradley 82 (Cassiopeiae) | | 20 Ceti | | λ ² Tucanae | |
| Mag.Spect. | 5.24 | F5 | 5.45 | F2, A2 | 4.92 | K0 | 5.34 | K0 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° / | h m | ° / | h m | ° / | h m | ° / |
| | 0 49 | -10 42 | 0 49 | +64 10 | 0 52 | - 1 12 | 0 54 | -69 35 |
| 1 ^d | 25.207 ^s - 96 | 77.01 - 84 | 50.985 ^s - 343 | 32.85 - 107 | 17.158 ^s - 90 | 75.85 - 69 | 30.788 ^s - 513 | 91.28 - 75 |
| 1 | 0.8 - 104 | 77.70 - 69 | 50.615 - 370 | 33.39 + 54 | 17.060 - 98 | 76.50 - 65 | 30.263 - 525 | 91.43 - 15 |
| 1 | 10.7 - 110 | 78.25 - 55 | 50.223 - 392 | 33.37 - 2 | 16.955 - 105 | 77.11 - 61 | 29.733 - 530 | 91.00 + 43 |
| 1 | 20.7 - 110 | 78.62 - 37 | 49.827 - 396 | 32.76 - 61 | 16.847 - 108 | 77.64 - 53 | 29.219 - 514 | 89.93 + 107 |
| 1 | 30.7 - 106 | 78.80 - 18 | 49.445 - 382 | 31.65 - 111 | 16.743 - 104 | 78.08 - 44 | 28.740 - 479 | 88.32 + 161 |
| 2 | 9.6 - 98 | 78.78 + 2 | 49.088 - 357 | 30.04 - 161 | 16.645 - 98 | 78.41 - 33 | 28.300 - 440 | 86.20 + 212 |
| 2 | 19.6 - 82 | 78.53 + 25 | 48.780 - 308 | 28.00 - 204 | 16.563 - 82 | 78.58 - 17 | 27.921 - 379 | 83.59 + 261 |
| 3 | 1.6 - 62 | 78.05 + 48 | 48.533 - 247 | 25.66 - 234 | 16.500 - 63 | 78.59 - 1 | 27.612 - 309 | 80.62 + 297 |
| 3 | 11.6 - 35 | 77.35 + 70 | 48.359 - 174 | 23.09 - 257 | 16.463 - 37 | 78.42 + 17 | 27.377 - 235 | 77.30 + 332 |
| 3 | 21.5 - 2 | 76.40 + 95 | 48.275 - 84 | 20.40 - 269 | 16.461 - 2 | 78.03 + 39 | 27.234 - 143 | 73.73 + 357 |
| 3 | 31.5 + 33 | 75.22 + 118 | 48.284 + 9 | 17.75 - 265 | 16.493 + 32 | 77.46 + 57 | 27.182 - 52 | 70.02 + 371 |
| 4 | 10.5 + 73 | 73.78 + 144 | 48.388 + 104 | 15.18 - 257 | 16.562 + 69 | 76.57 + 89 | 27.227 + 45 | 66.19 + 383 |
| 4 | 20.5 + 117 | 72.10 + 168 | 48.593 + 205 | 12.85 - 233 | 16.678 + 116 | 75.43 + 114 | 27.377 + 150 | 62.36 + 383 |
| 4 | 30.4 + 159 | 70.25 + 185 | 48.887 + 294 | 10.85 - 200 | 16.836 + 158 | 74.08 + 135 | 27.623 + 246 | 58.61 + 375 |
| 5 | 10.4 + 199 | 68.22 + 203 | 49.267 + 380 | 09.21 - 164 | 17.034 + 198 | 72.50 + 158 | 27.966 + 343 | 54.99 + 362 |
| 5 | 20.4 + 238 | 66.05 + 217 | 49.723 + 456 | 08.05 - 116 | 17.270 + 236 | 70.73 + 177 | 28.402 + 436 | 51.62 + 337 |
| 5 | 30.3 + 269 | 63.82 + 223 | 50.235 + 512 | 07.37 - 68 | 17.537 + 267 | 68.81 + 192 | 28.915 + 513 | 48.55 + 307 |
| 6 | 9.3 + 295 | 61.53 + 229 | 50.796 + 561 | 07.19 - 18 | 17.830 + 293 | 66.77 + 204 | 29.502 + 587 | 45.84 + 271 |
| 6 | 19.3 + 314 | 59.28 + 225 | 51.386 + 590 | 07.56 + 37 | 18.142 + 312 | 64.66 + 211 | 30.144 + 642 | 43.59 + 225 |
| 6 | 29.3 + 323 | 57.11 + 217 | 51.987 + 601 | 08.42 + 86 | 18.463 + 321 | 62.55 + 211 | 30.821 + 677 | 41.81 + 178 |
| 7 | 9.2 + 327 | 55.07 + 204 | 52.590 + 603 | 09.77 + 135 | 18.787 + 324 | 60.47 + 208 | 31.524 + 703 | 40.56 + 125 |
| 7 | 19.2 + 320 | 53.22 + 185 | 53.174 + 584 | 11.60 + 183 | 19.104 + 317 | 58.49 + 198 | 32.227 + 703 | 39.90 + 66 |
| 7 | 29.2 + 306 | 51.60 + 162 | 53.727 + 553 | 13.81 + 221 | 19.408 + 304 | 56.66 + 183 | 32.911 + 684 | 39.80 + 10 |
| 8 | 8.2 + 286 | 50.25 + 135 | 54.243 + 516 | 16.40 + 259 | 19.692 + 284 | 55.00 + 166 | 33.562 + 651 | 40.28 - 48 |
| 8 | 18.1 + 258 | 49.21 + 104 | 54.703 + 460 | 19.30 + 290 | 19.948 + 256 | 53.58 + 142 | 34.153 + 591 | 41.34 - 106 |
| 8 | 28.1 + 227 | 48.47 + 74 | 55.106 + 403 | 22.43 + 313 | 20.175 + 324 | 52.40 + 118 | 34.672 + 519 | 42.89 - 155 |
| 9 | 7.1 + 193 | 48.05 + 42 | 55.446 + 340 | 25.76 + 333 | 20.369 + 297 | 51.48 + 92 | 35.106 + 434 | 44.94 - 205 |
| 9 | 17.0 + 155 | 47.96 + 9 | 55.714 + 268 | 29.20 + 344 | 20.526 + 157 | 50.84 + 64 | 35.435 + 329 | 47.37 - 243 |
| 9 | 27.0 + 119 | 48.14 - 18 | 55.914 + 200 | 32.67 + 347 | 20.648 + 122 | 50.46 + 38 | 35.660 + 225 | 50.08 - 271 |
| 10 | 7.0 + 83 | 48.58 - 44 | 56.041 + 127 | 36.15 + 348 | 20.737 + 89 | 50.32 + 14 | 35.772 + 112 | 53.02 - 294 |
| 10 | 17.0 + 48 | 49.24 - 66 | 56.094 + 53 | 39.52 + 337 | 20.791 + 54 | 50.41 - 9 | 35.766 - 6 | 56.01 - 299 |
| 10 | 26.9 + 18 | 50.06 - 82 | 56.080 - 14 | 42.74 + 322 | 20.816 + 25 | 50.68 - 27 | 35.656 - 110 | 58.96 - 295 |
| 11 | 5.9 - 11 | 51.01 - 95 | 55.996 - 84 | 45.74 + 300 | 20.814 - 2 | 51.11 - 43 | 35.639 - 217 | 61.76 - 280 |
| 11 | 15.9 - 36 | 52.01 - 100 | 55.847 - 149 | 48.42 + 268 | 20.787 - 27 | 51.66 - 55 | 35.439 - 309 | 64.26 - 250 |
| 11 | 25.9 - 55 | 53.01 - 100 | 55.640 - 207 | 50.75 + 233 | 20.740 - 47 | 52.28 - 62 | 34.747 - 383 | 66.39 - 213 |
| 12 | 5.8 - 75 | 53.99 - 98 | 55.376 - 264 | 52.65 + 190 | 20.674 - 66 | 52.96 - 68 | 34.297 - 450 | 68.05 - 166 |
| 12 | 15.8 - 87 | 54.89 - 90 | 55.065 - 311 | 54.05 + 140 | 20.595 - 79 | 53.64 - 67 | 33.802 - 495 | 69.16 - 111 |
| 12 | 25.8 - 98 | 55.67 - 78 | 54.717 - 348 | 54.95 + 90 | 20.504 - 91 | 54.31 - 68 | 33.282 - 520 | 69.69 - 53 |
| 12 | 35.7 - 107 | 56.31 - 64 | 54.339 - 378 | 55.27 + 32 | 20.402 - 102 | 54.96 - 65 | 32.746 - 536 | 69.62 + 7 |
| | - 108 | - 48 | - 388 | - 24 | - 104 | - 57 | - 527 | + 69 |
| Mean Place | 27.015 | 60.52 | 53.890 | 27.30 | 19.069 | 62.76 | 30.296 | 59.75 |
| sec δ, tan δ | +1.018 | -0.189 | +2.295 | +2.066 | +1.000 | -0.021 | +2.869 | -2.689 |
| dα(ψ), dδ(ψ) | +0.060 | +0.39 | +0.073 | +0.39 | +0.061 | +0.39 | +0.044 | +0.39 |
| dα(ε), dδ(ε) | +0.012 | +0.21 | -0.134 | +0.22 | +0.001 | +0.23 | +0.174 | +0.24 |
| Dble.Trans. | October 3 | | October 4 | | October 4 | | October 5 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 32 | | 33 | | 1023 | | 35 | | |
|--------------------------------------|----------------------|--------------|------------------|--------------|------------|--------------|---------------------|--------------|------------|
| | γ Cassiopeiae | | μ Andromedae | | 68 Piscium | | α Sculptoris | | |
| Mag.Spect. | 2.8 var. | B0p | 3.94 | A2 | 5.64 | K0 | 4.39 | B5 | |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " | |
| | 0 55 | + 60 38 | 0 55 | + 38 25 | 0 57 | + 28 54 | 0 57 | - 29 25 | |
| 1 | -9.2 | 50.384 - 285 | 42.92 +102 | 57.691 - 137 | 34.76 +33 | 03.938 - 111 | 67.17 + 6 | 55.921 - 125 | 71.45 -104 |
| 1 | 0.8 | 50.072 - 312 | 43.44 + 52 | 57.539 - 152 | 34.73 - 3 | 03.813 - 125 | 66.95 - 22 | 55.787 - 134 | 72.17 - 72 |
| 1 | 10.7 | 49.738 - 334 | - 2 | 57.374 - 165 | 34.34 - 39 | 03.677 - 136 | 66.45 - 50 | 55.646 - 141 | 72.56 - 39 |
| 1 | 20.7 | 49.398 - 340 | 43.42 - 58 | 57.204 - 170 | 34.34 - 76 | 03.677 - 140 | 66.45 - 76 | 55.646 - 140 | 72.56 - 1 |
| 1 | 30.7 | 49.068 - 330 | 42.84 -108 | 57.204 - 166 | 33.58 -107 | 03.537 - 139 | 65.69 - 97 | 55.506 - 135 | 72.57 + 36 |
| 2 | 9.7 | 48.757 - 311 | 41.76 | 57.038 | 32.51 | 03.398 | 64.72 | 55.371 | 72.21 |
| 2 | 19.6 | 48.486 - 271 | 40.22 -154 | 56.880 - 158 | 31.16 -135 | 03.267 - 131 | 63.55 -117 | 55.244 - 127 | 71.51 + 70 |
| 3 | 1.6 | 48.268 - 218 | 38.27 -195 | 56.743 - 137 | 29.59 -157 | 03.153 - 114 | 62.24 -131 | 55.136 - 108 | 70.45 +106 |
| 3 | 11.6 | 48.112 - 156 | 36.03 -224 | 56.636 - 107 | 27.89 -170 | 03.064 - 89 | 60.89 -135 | 55.050 - 86 | 69.06 +139 |
| 3 | 21.5 | 48.034 - 78 | 33.56 -247 | 56.565 - 71 | 26.11 -178 | 03.006 - 58 | 59.51 -138 | 54.992 - 58 | 67.37 +169 |
| 3 | 31.5 | 48.038 + 4 | 30.99 -257 | 56.540 - 25 | 24.36 -175 | 02.988 - 18 | 58.23 -128 | 54.970 - 22 | 65.37 +200 |
| 4 | 10.5 | 48.128 + 90 | 28.45 -254 | 56.565 + 25 | 22.73 -163 | 03.014 + 26 | 57.09 -114 | 54.987 + 17 | 63.14 +223 |
| 4 | 20.5 | 48.308 + 180 | 26.00 -245 | 56.643 + 78 | 21.27 -146 | 03.087 + 73 | 56.14 - 95 | 55.047 + 60 | 60.68 +246 |
| 4 | 30.4 | 48.568 + 260 | 23.79 -221 | 56.778 + 135 | 20.08 -119 | 03.212 + 125 | 55.46 - 68 | 55.155 + 108 | 58.04 +264 |
| 5 | 10.4 | 48.907 + 339 | 21.89 -190 | 56.967 + 189 | 19.20 -88 | 03.385 + 173 | 55.08 - 38 | 55.307 + 152 | 55.30 +274 |
| 5 | 20.4 | 49.315 + 408 | 20.34 -155 | 57.207 + 240 | 18.67 - 53 | 03.605 + 220 | 55.04 - 4 | 55.505 + 198 | 52.47 +283 |
| 5 | 30.4 | 49.776 + 461 | 19.26 -108 | 57.494 + 287 | 18.55 - 12 | 03.868 + 263 | 55.37 + 33 | 55.746 + 241 | 49.63 +284 |
| 6 | 9.3 | 50.283 + 536 | 18.65 - 61 | 57.817 + 323 | 18.83 + 28 | 04.165 + 297 | 56.04 + 67 | 56.022 + 276 | 46.86 +277 |
| 6 | 19.3 | 50.819 + 547 | 18.53 - 12 | 58.172 + 355 | 19.51 + 68 | 04.491 + 326 | 57.06 +102 | 56.330 + 308 | 44.19 +267 |
| 6 | 29.3 | 51.366 + 550 | 18.93 + 40 | 58.547 + 375 | 20.59 +108 | 04.836 + 345 | 58.41 +135 | 56.661 + 331 | 41.71 +248 |
| 7 | 9.2 | 51.916 + 536 | 19.81 + 88 | 58.931 + 384 | 22.02 +143 | 05.190 + 354 | 60.04 +163 | 57.006 + 345 | 39.47 +224 |
| 7 | 19.2 | 52.452 + 509 | 21.17 +136 | 59.317 + 386 | 23.78 +176 | 05.546 + 356 | 61.92 +188 | 57.358 + 352 | 37.52 +195 |
| 7 | 29.2 | 52.961 + 476 | 22.98 +181 | 59.694 + 377 | 25.83 +205 | 05.895 + 349 | 64.00 +208 | 57.706 + 348 | 35.93 +159 |
| 8 | 8.2 | 53.437 + 428 | 25.16 +218 | 60.052 + 358 | 28.09 +226 | 06.227 + 332 | 66.21 +221 | 58.042 + 336 | 34.72 +121 |
| 8 | 18.1 | 53.865 + 378 | 27.71 +255 | 60.387 + 335 | 30.54 +245 | 06.538 + 311 | 68.53 +232 | 58.359 + 317 | 33.92 + 80 |
| 8 | 28.1 | 54.243 + 321 | 30.54 +283 | 60.690 + 303 | 33.11 +257 | 06.820 + 282 | 70.88 +235 | 58.647 + 288 | 33.57 + 35 |
| 9 | 7.1 | 54.564 + 258 | 33.59 +305 | 60.957 + 269 | 35.73 +262 | 07.069 + 249 | 73.22 +234 | 58.902 + 255 | 33.64 - 7 |
| 9 | 17.1 | 54.822 + 196 | 36.82 +323 | 61.186 + 227 | 38.39 +266 | 07.283 + 214 | 75.53 +231 | 59.121 + 219 | 34.12 - 48 |
| 9 | 27.0 | 55.018 + 134 | 40.15 +333 | 61.373 + 187 | 41.01 +262 | 07.458 + 175 | 77.72 +219 | 59.297 + 176 | 34.99 - 87 |
| 10 | 7.0 | 55.152 + 67 | 43.51 +336 | 61.519 + 146 | 43.54 +253 | 07.597 + 139 | 79.79 +207 | 59.432 + 135 | 36.18 -119 |
| 10 | 17.0 | 55.219 + 8 | 46.87 +336 | 61.625 + 106 | 45.96 +242 | 07.699 + 102 | 81.72 +193 | 59.525 + 93 | 37.66 -148 |
| 10 | 26.9 | 55.227 - 53 | 50.11 +324 | 61.690 + 65 | 48.21 +225 | 07.764 + 65 | 83.44 +172 | 59.576 + 51 | 39.34 -168 |
| 11 | 5.9 | 55.174 - 112 | 53.21 +310 | 61.720 + 30 | 50.26 +205 | 07.797 + 33 | 84.96 +152 | 59.591 + 15 | 41.13 -179 |
| 11 | 15.9 | 55.062 - 163 | 56.09 +288 | 61.713 - 7 | 52.08 +182 | 07.798 + 1 | 86.26 +130 | 59.570 - 21 | 42.97 -184 |
| 11 | 25.9 | 54.899 - 215 | 58.66 +257 | 61.673 - 40 | 53.61 +153 | 07.771 - 27 | 87.30 +104 | 59.519 - 51 | 44.76 -179 |
| 12 | 5.8 | 54.684 - 256 | 60.89 +223 | 61.605 - 68 | 54.87 +126 | 07.719 - 52 | 88.10 + 80 | 59.443 - 76 | 46.43 -167 |
| 12 | 15.8 | 54.428 - 291 | 62.72 +183 | 61.508 - 97 | 55.79 + 92 | 07.642 - 77 | 88.63 + 53 | 59.343 - 100 | 47.91 -148 |
| 12 | 25.8 | 54.137 - 319 | 64.06 +134 | 61.388 - 120 | 56.35 + 21 | 07.545 - 97 | 88.86 + 23 | 59.228 - 115 | 49.13 -122 |
| 12 | 35.8 | 53.818 - 331 | 64.91 + 85 | 61.249 - 139 | 56.56 + 56 | 07.432 - 113 | 88.83 - 3 | 59.100 - 128 | 50.06 - 93 |
| | | | 65.23 + 32 | 61.092 - 157 | 56.39 - 17 | 07.304 - 128 | 88.50 - 33 | 59.100 - 138 | 50.06 - 60 |
| | | | - 24 | 61.092 - 163 | 56.39 - 53 | | - 60 | 58.962 - 140 | 50.66 - 23 |
| Mean Place | 53.147 | 37.80 | 60.047 | 34.72 | 06.161 | 69.85 | 57.376 | 49.12 | |
| sec δ , tan δ | +2.040 | +1.778 | +1.276 | +0.793 | +1.142 | +0.552 | +1.148 | -0.564 | |
| $da(\psi)$, $d\delta(\psi)$ | +0.073 | +0.39 | +0.066 | +0.39 | +0.065 | +0.39 | +0.057 | +0.39 | |
| $da(\epsilon)$, $d\delta(\epsilon)$ | -0.115 | +0.24 | -0.051 | +0.24 | -0.036 | +0.25 | +0.036 | +0.25 | |
| Dble.Trans. | October 5 | | October 5 | | October 5 | | October 6 | | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 1024 | | 1025 | | 1027 | | 1026 | | | | | | | | | | |
|---|------------|--------|-------------|--------|-----------------|--------|---------------------|--------|------|--------|--------|-------|------|--------|------|-------|------|
| | 98 G. Ceti | | 101 G. Ceti | | 80 G. Phoenicis | | σ Sculptoris | | | | | | | | | | |
| Mag.Spect. | 6.70 | K0 | 6.58 | G5 | 6.00 | K0 | 5.52 | A2 | | | | | | | | | |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | | | | | | | | | |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " | | | | | | | | | |
| | 0 58 | - 5 57 | 1 00 | -16 20 | 1 01 | -57 04 | 1 01 | -31 37 | | | | | | | | | |
| 1 | 9.2 | 02.898 | -90 | 33.34 | -78 | 56.815 | -99 | 33.58 | -75 | 27.220 | -282 | 58.56 | -47 | 46.410 | -140 | 51.04 | -74 |
| 1 | 0.8 | 02.799 | -99 | 34.04 | -60 | 56.707 | -108 | 34.33 | -55 | 26.928 | -300 | 59.03 | +6 | 46.270 | -147 | 51.78 | -38 |
| 1 | 10.7 | 02.692 | -107 | 34.64 | -47 | 56.591 | -116 | 34.88 | -30 | 26.628 | -295 | 58.97 | +64 | 46.123 | -148 | 52.16 | +1 |
| 1 | 20.7 | 02.582 | -110 | 35.11 | -31 | 56.473 | -118 | 35.18 | -5 | 26.333 | -279 | 58.33 | +116 | 45.975 | -142 | 52.15 | +39 |
| 1 | 30.7 | 02.475 | -102 | 35.42 | -17 | 56.358 | -110 | 35.23 | +20 | 26.054 | -259 | 57.17 | +166 | 45.833 | -134 | 51.76 | +76 |
| 2 | 9.7 | 02.373 | -87 | 35.59 | +3 | 56.248 | -94 | 35.03 | +48 | 25.795 | -226 | 55.51 | +215 | 45.699 | -116 | 51.00 | +114 |
| 2 | 19.6 | 02.286 | -68 | 35.56 | +22 | 56.154 | -74 | 34.55 | +73 | 25.569 | -185 | 53.36 | +253 | 45.583 | -93 | 49.86 | +148 |
| 3 | 1.6 | 02.218 | -43 | 35.34 | +43 | 56.080 | -50 | 33.82 | +100 | 25.384 | -141 | 50.83 | +289 | 45.490 | -66 | 48.38 | +179 |
| 3 | 11.6 | 02.175 | -9 | 34.91 | +67 | 56.030 | -16 | 32.82 | +126 | 25.243 | -82 | 47.94 | +319 | 45.424 | -28 | 46.59 | +210 |
| 3 | 21.5 | 02.166 | +25 | 34.24 | +88 | 56.014 | +19 | 31.56 | +151 | 25.161 | -23 | 44.75 | +338 | 45.396 | +11 | 44.49 | +233 |
| 3 | 31.5 | 02.191 | +64 | 33.36 | +115 | 56.033 | +60 | 30.05 | +175 | 25.138 | +40 | 41.37 | +356 | 45.407 | +55 | 42.16 | +257 |
| 4 | 10.5 | 02.255 | +109 | 32.21 | +140 | 56.093 | +105 | 28.30 | +198 | 25.178 | +111 | 37.81 | +362 | 45.462 | +103 | 39.59 | +274 |
| 4 | 20.5 | 02.364 | +151 | 30.81 | +160 | 56.198 | +147 | 26.32 | +214 | 25.289 | +176 | 34.19 | +361 | 45.565 | +149 | 36.85 | +283 |
| 4 | 30.4 | 02.515 | +192 | 29.21 | +181 | 56.345 | +189 | 24.18 | +229 | 25.465 | +243 | 30.58 | +355 | 45.714 | +195 | 34.02 | +292 |
| 5 | 10.4 | 02.707 | +231 | 27.40 | +197 | 56.534 | +230 | 21.89 | +240 | 25.708 | +308 | 27.03 | +339 | 45.909 | +240 | 31.10 | +291 |
| 5 | 20.4 | 02.938 | +263 | 25.43 | +208 | 56.764 | +263 | 19.49 | +242 | 26.016 | +360 | 23.64 | +315 | 46.149 | +276 | 28.19 | +284 |
| 5 | 30.4 | 03.201 | +290 | 23.35 | +218 | 57.027 | +292 | 17.07 | +244 | 26.376 | +411 | 20.49 | +287 | 46.425 | +309 | 25.35 | +272 |
| 6 | 9.3 | 03.491 | +310 | 21.17 | +219 | 57.319 | +313 | 14.63 | +236 | 26.787 | +449 | 17.62 | +248 | 46.734 | +344 | 22.63 | +252 |
| 6 | 19.3 | 03.801 | +320 | 18.98 | +215 | 57.632 | +325 | 12.27 | +223 | 27.236 | +473 | 15.14 | +206 | 47.068 | +348 | 20.11 | +225 |
| 6 | 29.3 | 04.121 | +324 | 16.83 | +208 | 57.957 | +331 | 10.04 | +206 | 27.709 | +490 | 13.08 | +159 | 47.416 | +357 | 17.86 | +196 |
| 7 | 9.2 | 04.445 | +319 | 14.75 | +193 | 58.288 | +327 | 07.98 | +181 | 28.199 | +490 | 11.49 | +104 | 47.773 | +354 | 15.90 | +157 |
| 7 | 19.2 | 04.764 | +306 | 12.82 | +175 | 58.615 | +315 | 06.17 | +154 | 28.689 | +477 | 10.45 | +52 | 48.127 | +342 | 14.33 | +118 |
| 7 | 29.2 | 05.070 | +289 | 11.07 | +152 | 58.930 | +297 | 04.63 | +122 | 29.166 | +455 | 09.93 | -4 | 48.469 | +324 | 13.15 | +76 |
| 8 | 8.2 | 05.359 | +261 | 09.55 | +125 | 59.227 | +270 | 03.41 | +87 | 29.621 | +415 | 09.97 | -62 | 48.793 | +295 | 12.39 | +28 |
| 8 | 18.1 | 05.620 | +232 | 08.30 | +98 | 59.497 | +240 | 02.54 | +52 | 30.036 | +313 | 10.59 | -111 | 49.088 | +262 | 12.11 | -13 |
| 8 | 28.1 | 05.852 | +199 | 07.32 | +68 | 59.737 | +207 | 02.02 | +16 | 30.404 | +246 | 11.70 | -161 | 49.350 | +226 | 12.24 | -57 |
| 9 | 7.1 | 06.051 | +163 | 06.64 | +37 | 59.944 | +169 | 01.86 | -19 | 30.717 | +180 | 13.31 | -203 | 49.576 | +182 | 12.81 | -97 |
| 9 | 17.1 | 06.214 | +128 | 06.27 | +11 | 60.113 | +133 | 02.05 | -48 | 30.963 | +109 | 15.34 | -236 | 49.758 | +141 | 13.78 | -129 |
| 9 | 27.0 | 06.342 | +94 | 06.16 | -15 | 60.246 | +96 | 02.53 | -77 | 31.143 | +37 | 17.70 | -262 | 49.899 | +98 | 15.07 | -159 |
| 10 | 7.0 | 06.436 | +58 | 06.31 | -39 | 60.342 | +59 | 03.30 | -99 | 31.252 | +29 | 20.32 | -275 | 49.997 | +54 | 16.66 | -179 |
| 10 | 17.0 | 06.494 | +30 | 06.70 | -55 | 60.401 | +27 | 04.29 | -114 | 31.289 | -93 | 23.07 | -276 | 50.051 | +17 | 18.45 | -190 |
| 10 | 26.9 | 06.524 | +0 | 07.25 | -70 | 60.428 | -3 | 05.43 | -125 | 31.260 | -150 | 25.83 | -271 | 50.068 | -20 | 20.35 | -195 |
| 11 | 5.9 | 06.524 | -24 | 07.95 | -80 | 60.425 | -31 | 06.68 | -129 | 31.167 | -196 | 28.54 | -248 | 50.048 | -52 | 22.30 | -188 |
| 11 | 15.9 | 06.500 | -45 | 08.75 | -83 | 60.394 | -52 | 07.97 | -125 | 31.017 | -238 | 31.02 | -218 | 49.996 | -78 | 24.18 | -175 |
| 11 | 25.9 | 06.455 | -65 | 09.58 | -86 | 60.342 | -73 | 09.22 | -119 | 30.821 | -267 | 33.20 | -181 | 49.918 | -103 | 25.93 | -156 |
| 12 | 5.8 | 06.390 | -80 | 10.44 | -81 | 60.269 | -89 | 10.41 | -104 | 30.583 | -287 | 35.01 | -132 | 49.815 | -120 | 27.49 | -127 |
| 12 | 15.8 | 06.310 | -91 | 11.25 | -74 | 60.180 | -101 | 11.45 | -88 | 30.316 | -300 | 36.33 | -82 | 49.695 | -133 | 28.76 | -96 |
| 12 | 25.8 | 06.219 | -103 | 11.99 | -67 | 60.079 | -112 | 12.33 | -68 | 30.029 | -299 | 37.15 | -28 | 49.562 | -144 | 29.72 | -61 |
| 12 | 35.8 | 06.116 | -107 | 12.66 | -54 | 59.967 | -116 | 13.01 | -44 | 29.729 | +30 | 37.43 | +30 | 49.418 | -147 | 30.33 | -22 |
| Mean Place | 04.715 | 18.88 | | 58.473 | 15.69 | | 27.711 | 29.43 | | 47.789 | 28.25 | | | | | | |
| sec δ , tan δ | +1.005 | -0.104 | | +1.042 | -0.293 | | +1.840 | -1.544 | | +1.174 | -0.616 | | | | | | |
| $d\alpha(\psi)$, $d\delta(\psi)$ | +0.060 | +0.39 | | +0.059 | +0.38 | | +0.050 | +0.38 | | +0.057 | +0.38 | | | | | | |
| $d\alpha(\epsilon)$, $d\delta(\epsilon)$ | +0.007 | +0.25 | | +0.019 | +0.26 | | +0.099 | +0.26 | | +0.040 | +0.27 | | | | | | |
| Dble.Trans. | October 6 | | October 6 | | October 7 | | October 7 | | | | | | | | | | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 36 | | 37 | | 1028 | | 1029 | |
|--------------|--------------------------|-------------|--------------------------|-------------|--------------------------|-------------|---------------------------|-------------|
| | ε Piscium | | 26 Ceti* | | 72 Piscium | | 106 G. Ceti | |
| Mag. Spect. | 4.45 | K0 | 6.18 | F0 | 5.65 | F2 | 6.29 | G5 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " |
| | 1 02 | + 7 48 | 1 03 | + 1 17 | 1 04 | + 14 52 | 1 05 | - 24 03 |
| 1 -9.2 | 12 546 ^s - 87 | 54 01 - 50 | 05 394 ^s - 86 | 29 05 - 65 | 20 480 ^s - 88 | 18 46 - 31 | 27 049 ^s - 111 | 72 53 - 106 |
| 1 0.8 | 12 449 - 97 | 53 45 - 56 | 05 299 - 95 | 28.41 - 64 | 20 379 - 101 | 18.02 - 44 | 26 928 - 121 | 73.31 - 78 |
| 1 10.7 | 12 341 - 108 | 52 85 - 60 | 05 193 - 106 | 27.79 - 62 | 20 266 - 113 | 17.45 - 57 | 26 799 - 129 | 73.81 - 50 |
| 1 20.7 | 12 229 - 112 | 52 21 - 64 | 05 083 - 110 | 27.23 - 56 | 20 148 - 118 | 16.77 - 68 | 26 667 - 132 | 73.98 - 17 |
| 1 30.7 | 12 119 - 110 | 51 59 - 62 | 04 975 - 108 | 26.74 - 49 | 20 031 - 117 | 16.02 - 75 | 26 539 - 128 | 73.84 + 14 |
| 2 9.7 | 12 013 - 106 | 50 98 - 61 | 04 871 - 104 | 26 33 - 41 | 19 919 - 112 | 15.23 - 79 | 26 417 - 122 | 73.38 + 46 |
| 2 19.6 | 11 921 - 92 | 50 44 - 54 | 04 781 - 90 | 26 05 - 28 | 19 820 - 99 | 14.43 - 80 | 26 310 - 107 | 72.58 + 80 |
| 3 1.6 | 11 848 - 73 | 50 01 - 43 | 04 710 - 71 | 25.92 - 13 | 19 742 - 78 | 13.68 - 75 | 26 224 - 86 | 71.48 + 110 |
| 3 11.6 | 11 801 - 47 | 49 70 - 31 | 04 663 - 47 | 25.96 + 4 | 19 689 - 53 | 13.01 - 67 | 26 164 - 80 | 70.09 + 139 |
| 3 21.5 | 11 788 - 13 | 49 58 - 12 | 04 650 - 13 | 26.20 + 24 | 19 672 - 17 | 12.48 - 53 | 26 138 - 26 | 68.40 + 169 |
| 3 31.5 | 11 814 + 26 | 49 68 + 10 | 04 674 + 24 | 26.64 + 44 | 19 693 + 21 | 12.16 - 32 | 26 149 + 11 | 66.47 + 193 |
| 4 10.5 | 11 864 + 50 | 49 94 + 26 | 04 730 + 56 | 27.31 + 67 | 19 754 + 61 | 12.06 - 10 | 26 201 + 52 | 64.29 + 218 |
| 4 20.5 | 11 981 + 117 | 50 51 + 57 | 04 837 + 107 | 28.31 + 100 | 19 863 + 109 | 12.15 + 9 | 26 300 + 99 | 61.91 + 238 |
| 4 30.4 | 12 134 + 153 | 51 34 + 83 | 04 985 + 148 | 29.51 + 120 | 20 017 + 154 | 12.55 + 40 | 26 443 + 143 | 59.40 + 251 |
| 5 10.4 | 12 328 + 194 | 52 43 + 109 | 05 176 + 191 | 30.94 + 143 | 20 215 + 198 | 13.25 + 70 | 26 630 + 187 | 56.77 + 263 |
| 5 20.4 | 12 562 + 234 | 53 77 + 134 | 05 405 + 229 | 32.59 + 165 | 20 453 + 238 | 14.24 + 99 | 26 859 + 229 | 54.09 + 268 |
| 5 30.4 | 12 827 + 265 | 55 32 + 155 | 05 666 + 261 | 34.40 + 181 | 20 723 + 270 | 15.49 + 125 | 27 123 + 264 | 51.42 + 267 |
| 6 9.3 | 13 120 + 293 | 57 07 + 175 | 05 955 + 289 | 36.35 + 195 | 21 021 + 298 | 16.98 + 149 | 27 419 + 296 | 48.81 + 261 |
| 6 19.3 | 13 432 + 312 | 58 97 + 190 | 06 264 + 309 | 38.40 + 205 | 21 340 + 319 | 18.70 + 172 | 27 738 + 319 | 46.34 + 247 |
| 6 29.3 | 13 754 + 322 | 60 96 + 199 | 06 583 + 319 | 40.48 + 208 | 21 668 + 328 | 20.56 + 186 | 28 070 + 332 | 44.07 + 227 |
| 7 9.2 | 14 081 + 327 | 63 01 + 205 | 06 908 + 325 | 42.55 + 207 | 22 001 + 333 | 22.55 + 199 | 28 411 + 341 | 42.03 + 204 |
| 7 19.2 | 14 402 + 321 | 65 05 + 204 | 07 227 + 319 | 44.55 + 200 | 22 328 + 327 | 24.60 + 205 | 28 748 + 337 | 40.31 + 172 |
| 7 29.2 | 14 709 + 307 | 67 03 + 198 | 07 533 + 306 | 46.43 + 188 | 22 641 + 313 | 26.66 + 206 | 29 074 + 326 | 38.92 + 139 |
| 8 8.2 | 14 999 + 290 | 68 91 + 188 | 07 822 + 289 | 48.16 + 173 | 22 937 + 296 | 28.70 + 204 | 29 384 + 310 | 37.92 + 100 |
| 8 18.1 | 15 262 + 263 | 70 65 + 174 | 08 085 + 263 | 49.67 + 151 | 23 206 + 269 | 30.65 + 195 | 29 666 + 282 | 37.32 + 60 |
| 8 28.1 | 15 496 + 234 | 72 21 + 156 | 08 320 + 235 | 50 96 + 129 | 23 445 + 239 | 32.48 + 183 | 29 918 + 252 | 37.12 + 20 |
| 9 7.1 | 15 699 + 203 | 73 57 + 136 | 08 522 + 202 | 52.00 + 104 | 23 653 + 208 | 34.17 + 169 | 30 136 + 218 | 37.32 - 20 |
| 9 17.1 | 15 865 + 166 | 74 69 + 112 | 08 690 + 168 | 52.78 + 78 | 23 825 + 172 | 35.66 + 149 | 30 314 + 178 | 37.90 - 58 |
| 9 27.0 | 15 999 + 134 | 75 60 + 91 | 08 823 + 133 | 53.31 + 53 | 23 964 + 139 | 36.97 + 131 | 30 453 + 139 | 38.80 - 90 |
| 10 7.0 | 16 098 + 99 | 76 28 + 68 | 08 923 + 100 | 53.59 + 28 | 24 068 + 104 | 38.07 + 110 | 30 554 + 101 | 39.99 - 119 |
| 10 17.0 | 16 164 + 66 | 76 73 + 45 | 08 989 + 66 | 53 64 + 5 | 24 138 + 70 | 38 96 + 89 | 30 615 + 61 | 41.41 - 142 |
| 10 26.9 | 16 201 + 37 | 76 99 + 26 | 09 026 + 37 | 53 51 - 13 | 24 179 + 41 | 39 65 + 69 | 30 642 + 27 | 42.96 - 155 |
| 11 5.9 | 16 210 + 9 | 77 06 + 7 | 09 035 + 9 | 53 20 - 31 | 24 191 + 12 | 40 14 + 49 | 30 635 - 7 | 44.60 - 164 |
| 11 15.9 | 16 193 - 17 | 77 06 - 9 | 09 018 - 17 | 52 76 - 44 | 24 177 - 14 | 40 43 + 29 | 30 599 - 36 | 46.22 - 162 |
| 11 25.9 | 16 156 - 37 | 76 75 - 22 | 08 980 - 38 | 52 24 - 52 | 24 141 - 36 | 40 56 + 13 | 30 539 - 60 | 47.77 - 155 |
| 12 5.8 | 16 097 - 59 | 76 40 - 35 | 08 922 - 58 | 51 64 - 60 | 24 082 - 59 | 40 50 - 6 | 30 456 - 83 | 49.19 - 142 |
| 12 15.8 | 16 023 - 74 | 75 96 - 44 | 08 848 - 74 | 51 01 - 63 | 24 006 - 76 | 40 29 - 21 | 30 355 - 101 | 50.39 - 120 |
| 12 25.8 | 15 934 - 89 | 75 45 - 51 | 08 761 - 87 | 50 37 - 64 | 23 915 - 91 | 39 94 - 35 | 30 242 - 113 | 51.35 - 96 |
| 12 35.8 | 15 833 - 101 | 74 87 - 58 | 08 661 - 100 | 49 73 - 64 | 23 810 - 105 | 39 44 - 50 | 30 116 - 126 | 52.03 - 68 |
| | 15 833 - 107 | 74 87 - 62 | 08 661 - 105 | 49 73 - 59 | 23 810 - 112 | 39 44 - 61 | 30 116 - 129 | 52.03 - 37 |
| Mean Place | 14.504 | 63.53 | 07.275 | 40.76 | 22.508 | 25.47 | 28.541 | 52.32 |
| sec δ, tan δ | +1.009 | +0.137 | +1.000 | +0.023 | +1.035 | +0.266 | +1.095 | -0.447 |
| dα(ψ), dδ(ψ) | +0.062 | +0.38 | +0.061 | +0.38 | +0.063 | +0.38 | +0.058 | +0.38 |
| dα(ε), dδ(ε) | -0.009 | +0.27 | -0.001 | +0.27 | -0.017 | +0.28 | +0.029 | +0.28 |
| Dble. Trans. | October 7 | | October 7 | | October 7 | | October 8 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 39 | | 1031 | | 1030 | | 40 | |
|--------------|-------------------|-------------------|-------------------|-------------------|-------------------|------------------|------------------|------------------|
| | ι Tucanae | | υ Phoenicis | | μ Cassiopeiae | | η Ceti | |
| Mag.Spect. | 5.32 | K0 | 5.15 | A3 | 5.26 | G5 | 3.60 | K0 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° ' | h m | ° ' | h m | ° ' | h m | ° ' |
| | 1 06 | -61 50 | 1 07 | -41 33 | 1 07 | +54 50 | 1 07 | -10 14 |
| | ^d -9.2 | ^s -342 | ^s -166 | ^s -116 | ^s -205 | ^s +90 | ^s -90 | ^s -88 |
| 1 | 46.707 | -357 | 09.880 | -177 | 57.82 | -72 | 19.241 | -231 |
| 1 | 46.350 | -365 | 09.703 | -186 | 58.54 | -29 | 19.010 | -253 |
| 1 | 45.985 | -361 | 09.517 | -186 | 58.83 | +19 | 18.757 | -263 |
| 1 | 45.624 | -342 | 09.331 | -179 | 58.64 | +65 | 18.494 | -258 |
| 1 | 45.282 | -320 | 09.152 | -170 | 57.99 | +108 | 18.236 | -247 |
| 2 | 44.962 | -281 | 08.982 | -148 | 56.91 | +151 | 17.989 | -217 |
| 2 | 44.681 | -234 | 08.834 | -122 | 55.40 | +189 | 17.772 | -176 |
| 3 | 44.447 | -183 | 08.712 | -91 | 53.51 | +224 | 17.596 | -126 |
| 3 | 44.264 | -116 | 08.621 | -50 | 51.27 | +255 | 17.470 | -62 |
| 3 | 44.148 | -49 | 08.571 | -5 | 48.72 | +279 | 17.408 | -236 |
| 3 | 44.099 | +23 | 08.566 | +43 | 45.93 | +301 | 17.415 | +80 |
| 4 | 44.122 | +104 | 08.609 | +96 | 42.92 | +315 | 17.495 | +158 |
| 4 | 44.226 | +178 | 08.705 | +147 | 39.77 | +321 | 17.653 | +229 |
| 4 | 44.404 | +253 | 08.852 | +199 | 36.56 | +325 | 17.882 | +297 |
| 5 | 44.657 | +328 | 09.051 | +249 | 33.31 | +318 | 18.179 | +361 |
| 5 | 44.985 | +389 | 09.300 | +290 | 30.13 | +304 | 18.540 | +410 |
| 5 | 45.374 | +447 | 09.590 | +328 | 27.09 | +287 | 18.950 | +452 |
| 6 | 45.821 | +492 | 09.918 | +358 | 24.22 | +268 | 19.402 | +480 |
| 6 | 46.313 | +523 | 10.276 | +375 | 21.64 | +226 | 19.882 | +493 |
| 6 | 46.836 | +544 | 10.651 | +388 | 19.38 | +188 | 20.375 | +499 |
| 7 | 47.380 | +547 | 11.039 | +387 | 17.50 | +143 | 20.874 | +490 |
| 7 | 47.927 | +535 | 11.426 | +375 | 16.07 | +98 | 21.364 | +468 |
| 7 | 48.462 | +513 | 11.801 | +358 | 15.09 | +48 | 21.832 | +442 |
| 8 | 48.975 | +470 | 12.159 | +328 | 14.61 | -4 | 22.274 | +402 |
| 8 | 49.445 | -122 | 12.487 | -71 | 14.65 | -50 | 22.676 | +266 |
| 8 | 49.864 | +357 | 12.780 | +293 | 15.15 | -98 | 23.036 | +312 |
| 9 | 50.221 | +282 | 13.032 | +252 | 16.13 | -141 | 23.036 | +312 |
| 9 | 50.503 | +206 | 13.236 | +156 | 17.54 | -174 | 23.348 | +259 |
| 9 | 50.709 | +125 | 13.392 | +107 | 19.28 | -205 | 23.607 | +207 |
| 10 | 50.834 | -39 | 13.499 | +56 | 21.33 | -224 | 23.814 | +153 |
| 10 | 50.873 | -36 | 13.555 | +12 | 23.57 | -231 | 23.967 | +153 |
| 10 | 50.837 | -113 | 13.567 | -32 | 25.88 | -234 | 24.065 | +98 |
| 11 | 50.724 | -182 | 13.535 | -72 | 28.22 | -222 | 24.113 | +48 |
| 11 | 50.542 | -238 | 13.463 | -103 | 30.44 | -202 | 24.108 | -5 |
| 11 | 50.304 | -289 | 13.360 | -133 | 32.46 | -177 | 24.054 | -54 |
| 12 | 50.015 | -325 | 13.227 | -154 | 34.23 | -139 | 24.054 | -54 |
| 12 | 49.690 | -348 | 13.073 | -170 | 35.62 | -100 | 23.957 | -97 |
| 12 | 49.342 | -366 | 12.903 | -183 | 36.62 | -57 | 23.814 | -143 |
| 12 | 48.976 | -365 | 12.720 | -186 | 37.19 | -9 | 23.635 | -211 |
| | | | | | | | 23.424 | -239 |
| | | | | | | | 23.185 | -252 |
| | | | | | | | 99.63 | +164 |
| | | | | | | | 100.82 | +119 |
| | | | | | | | 101.57 | +75 |
| | | | | | | | 101.81 | +24 |
| | | | | | | | 56.403 | -62 |
| | | | | | | | 56.324 | -79 |
| | | | | | | | 56.232 | -92 |
| | | | | | | | 56.232 | -105 |
| | | | | | | | 56.127 | -110 |
| | | | | | | | 56.480 | +67 |
| | | | | | | | 56.518 | +38 |
| | | | | | | | 56.525 | +7 |
| | | | | | | | 56.525 | -19 |
| | | | | | | | 56.310 | +138 |
| | | | | | | | 56.413 | +103 |
| | | | | | | | 56.172 | +173 |
| | | | | | | | 56.172 | +294 |
| | | | | | | | 55.550 | +270 |
| | | | | | | | 55.280 | +294 |
| | | | | | | | 55.700 | +240 |
| | | | | | | | 55.700 | +209 |
| | | | | | | | 55.999 | +173 |
| | | | | | | | 55.999 | +138 |
| | | | | | | | 55.999 | +103 |
| | | | | | | | 55.999 | +67 |
| | | | | | | | 55.999 | +38 |
| | | | | | | | 55.999 | +7 |
| | | | | | | | 55.999 | -19 |
| | | | | | | | 55.999 | -41 |
| | | | | | | | 55.999 | -62 |
| | | | | | | | 55.999 | -79 |
| | | | | | | | 55.999 | -92 |
| | | | | | | | 55.999 | -105 |
| | | | | | | | 55.999 | -110 |
| Mean Place | 46.777 | 49.73 | 10.950 | 32.58 | 22.022 | 76.26 | 54.636 | 72.84 |
| sec δ, tan δ | +2.119 | -1.869 | +1.336 | -0.887 | +1.737 | +1.420 | +1.016 | -0.181 |
| dα(ψ), dδ(ψ) | +0.047 | +0.38 | +0.054 | +0.38 | +0.072 | +0.38 | +0.060 | +0.38 |
| dα(ε), dδ(ε) | +0.119 | +0.29 | +0.057 | +0.29 | -0.091 | +0.29 | +0.012 | +0.29 |
| Dbles.Trans. | October 8 | | October 8 | | October 8 | | October 8 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 42 | | 1032 | | 43 | | 41 | | |
|--------------|--------------|-------------|------------|-------------|------------|-------------|--------------|--------------|------------|
| | β Andromedae | | χ Piscium | | τ Piscium | | 44 H. Cephei | | |
| Mag.Spect. | 2.37 | M0 | 4.89 | K0 | 4.70 | K0 | 5.68 | A0 | |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " | |
| | 1 08 | +35 32 | 1 10 | +20 57 | 1 10 | +30 00 | 1 10 | +79 35 | |
| 1 | -9.2 | 56 127 -120 | 56 88 +33 | 41 489 -92 | 42 52 -13 | 52 683 -106 | 63 64 +16 | 60 500 -928 | 76.87 +179 |
| 1 | 0.8 | 55 990 -137 | 56 89 +1 | 41 383 -106 | 42 22 -30 | 52 561 -122 | 63 53 -11 | 59 483 -1017 | 78.09 +122 |
| 1 | 10.7 | 55 837 -153 | 56 56 -33 | 41 264 -119 | 41 72 -50 | 52 424 -137 | 63 14 -39 | 58 394 -1089 | 78.71 +62 |
| 1 | 10.7 | 55 837 -160 | 56 56 -67 | 41 264 -127 | 41 72 -67 | 52 424 -145 | 63 14 -66 | 58 394 -1114 | 78.71 -5 |
| 1 | 20.7 | 55 677 -160 | 55 89 -67 | 41 137 -127 | 41 05 -67 | 52 279 -145 | 62 48 -66 | 57 280 -1090 | 78.66 -5 |
| 1 | 30.7 | 55 516 -161 | 54 95 -94 | 41 011 -126 | 40 25 -80 | 52 135 -144 | 61 59 -89 | 56 190 -1090 | 78.01 -65 |
| 2 | 9.7 | 55 362 -154 | 53 74 -121 | 40 887 -124 | 39 33 -92 | 51 994 -141 | 60 49 -110 | 55 153 -1037 | 76.76 -125 |
| 2 | 19.6 | 55 224 -138 | 52 33 -141 | 40 778 -108 | 38 34 -99 | 51 869 -125 | 59 23 -126 | 54 227 -926 | 74.96 -180 |
| 3 | 1.6 | 55 113 -111 | 52 33 -153 | 40 778 -89 | 38 34 -98 | 51 869 -102 | 59 23 -133 | 54 227 -926 | 74.96 -223 |
| 3 | 1.6 | 55 113 -90 | 50 80 -161 | 40 689 -63 | 37 36 -96 | 51 767 -73 | 57 90 -137 | 53 448 -607 | 72.73 -260 |
| 3 | 11.6 | 55 033 -35 | 49 19 -159 | 40 626 -25 | 36 40 -85 | 51 694 -32 | 56 53 -131 | 52 841 -393 | 70.13 -284 |
| 3 | 21.6 | 54 998 | 47 60 | 40 601 | 35 55 | 51 662 | 55 22 | 52 448 | 67.29 |
| 3 | 31.5 | 55 009 +11 | 46 13 -147 | 40 615 +14 | 34 87 -68 | 51 673 +11 | 54 04 -118 | 52 277 -171 | 64.35 -294 |
| 4 | 10.5 | 55 071 +62 | 44 81 -132 | 40 672 +57 | 34 39 -48 | 51 732 +59 | 53 02 -102 | 52 333 +56 | 61.39 -296 |
| 4 | 20.5 | 55 189 +118 | 43 74 -107 | 40 777 +105 | 34 14 +2 | 51 843 +111 | 52 26 -76 | 52 629 +296 | 58.57 -282 |
| 4 | 30.4 | 55 360 +171 | 42 96 -78 | 40 929 +152 | 34 16 +25 | 52 004 +161 | 51 78 -48 | 53 139 +510 | 55.98 -259 |
| 5 | 10.4 | 55 581 +221 | 42 51 -45 | 41 127 +198 | 34 50 +34 | 52 214 +210 | 51 61 -17 | 53 853 +714 | 53.70 -228 |
| 5 | 20.4 | 55 850 +269 | 42 44 -7 | 41 368 +241 | 35 16 +66 | 52 469 +255 | 51 81 +20 | 54 753 +900 | 51.83 -187 |
| 5 | 30.4 | 56 156 +306 | 42 75 +31 | 41 642 +274 | 36 11 +95 | 52 760 +291 | 52 35 +54 | 55 793 +1040 | 50.44 -139 |
| 6 | 9.3 | 56 495 +339 | 43 43 +68 | 41 946 +304 | 37 35 +124 | 53 082 +322 | 53 24 +89 | 56 957 +1164 | 49.53 -91 |
| 6 | 19.3 | 56 856 +361 | 44 49 +106 | 42 271 +325 | 38 85 +150 | 53 426 +344 | 54 46 +122 | 58 207 +1250 | 49.19 -34 |
| 6 | 29.3 | 57 229 +373 | 45 87 +138 | 42 607 +336 | 40 56 +171 | 53 781 +355 | 55 97 +151 | 59 498 +1291 | 49.37 +18 |
| 7 | 9.3 | 57 606 +377 | 47 56 +169 | 42 948 +341 | 42 46 +190 | 54 142 +361 | 57 73 +176 | 60 813 +1315 | 50.09 +72 |
| 7 | 19.2 | 57 977 +371 | 49 52 +196 | 43 284 +336 | 44 48 +202 | 54 497 +355 | 59 71 +198 | 62 108 +1295 | 51.37 +128 |
| 7 | 29.2 | 58 332 +355 | 49 52 +215 | 43 284 +324 | 44 48 +208 | 54 497 +340 | 59 71 +213 | 62 108 +1245 | 51.37 +173 |
| 8 | 8.2 | 58 667 +335 | 51 67 +232 | 43 608 +305 | 46 56 +213 | 54 837 +322 | 61 84 +225 | 63 353 +1180 | 53.10 +221 |
| 8 | 18.1 | 58 973 +306 | 53 99 +243 | 43 913 +279 | 48 69 +209 | 55 159 +294 | 64 09 +231 | 64 533 +1076 | 55.31 +263 |
| 8 | 28.1 | 59 246 +273 | 56 42 +247 | 44 192 +250 | 50 78 +203 | 55 453 +263 | 66 40 +230 | 65 609 +961 | 57.94 +296 |
| 9 | 7.1 | 59 484 +238 | 58 89 +249 | 44 442 +218 | 52 81 +193 | 55 716 +230 | 68 70 +229 | 66 570 +831 | 60.90 +327 |
| 9 | 17.1 | 59 681 +197 | 61 38 +244 | 44 660 +182 | 54 74 +178 | 55 946 +191 | 70 99 +220 | 67 401 +674 | 64.17 +351 |
| 9 | 27.0 | 59 841 +160 | 63 82 +236 | 44 842 +149 | 56 52 +162 | 56 137 +156 | 73 19 +209 | 68 075 +519 | 67.68 +365 |
| 10 | 7.0 | 59 962 +121 | 66 18 +225 | 44 991 +113 | 58 14 +145 | 56 293 +119 | 75 28 +196 | 68 594 +351 | 71.33 +377 |
| 10 | 17.0 | 60 044 +82 | 68 43 +207 | 45 104 +79 | 59 59 +125 | 56 412 +82 | 77 24 +177 | 68 945 +167 | 75.10 +370 |
| 10 | 27.0 | 60 044 +47 | 70 50 +190 | 45 183 +49 | 60 84 +105 | 56 494 +50 | 79 01 +158 | 69 112 -3 | 78.87 +377 |
| 11 | 5.9 | 60 091 +12 | 72 40 +168 | 45 232 +18 | 61 89 +85 | 56 544 +17 | 80 59 +138 | 69 109 -188 | 82.57 +358 |
| 11 | 15.9 | 60 103 -20 | 74 08 +142 | 45 250 -9 | 62 74 +63 | 56 561 -14 | 81 97 +112 | 68 921 -369 | 86.15 +331 |
| 11 | 25.9 | 60 083 -49 | 75 50 +116 | 45 241 -33 | 63 37 +43 | 56 547 -40 | 83 09 +90 | 68 552 -532 | 89.46 +302 |
| 12 | 5.8 | 60 034 -79 | 76 66 +87 | 45 208 -58 | 63 80 +22 | 56 507 -68 | 83 99 +62 | 68 020 -699 | 92.48 +262 |
| 12 | 15.8 | 59 955 -103 | 77 53 +53 | 45 150 -77 | 64 02 +2 | 56 439 -89 | 84 61 +35 | 67 321 -836 | 95.10 +212 |
| 12 | 25.8 | 59 852 -123 | 78 06 +22 | 45 073 -95 | 64 04 -18 | 56 350 -109 | 84 96 +7 | 66 485 -949 | 97.22 +160 |
| 12 | 35.8 | 59 729 -142 | 78 28 -12 | 44 978 -110 | 63 86 -39 | 56 241 -127 | 85 03 -22 | 65 536 -1045 | 98.82 +100 |
| | | 59 587 -153 | 78 16 -46 | 44 868 -120 | 63 47 -66 | 56 114 -138 | 84 81 -50 | 64 491 -1088 | 99.82 +35 |
| Mean Place | 58.387 | 57.17 | 43.557 | 47.25 | 54.860 | 65.52 | 64.392 | 69.14 | |
| sec δ, tan δ | +1.229 | +0.715 | +1.071 | +0.383 | +1.155 | +0.578 | +5.541 | +5.450 | |
| da(ψ), dδ(ψ) | +0.067 | +0.38 | +0.064 | +0.38 | +0.066 | +0.38 | +0.105 | +0.38 | |
| da(ε), dδ(ε) | -0.045 | +0.30 | -0.024 | +0.30 | -0.037 | +0.30 | -0.346 | +0.31 | |
| Dble.Trans. | October 8 | | October 9 | | October 9 | | October 9 | | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 44 | | 1033 | | 1034 | | 45 | |
|----------------|-------------------|--------|---------------|--------|------------|--------|------------|--------|
| | 102 G. Sculptoris | | ζ Piscium* ρ. | | 89 Piscium | | υ Piscium | |
| Mag. Spect. | 5.91 | A5 | 5.57 | A5 | 5.28 | A2 | 4.67 | A2 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " |
| | 1 12 | -37 55 | 1 12 | + 7 30 | 1 17 | + 3 32 | 1 18 | +27 11 |
| 1 ^d | 07.039 | -149 | 64.15 | -120 | 59.591 | -82 | 06.01 | -50 |
| 1 ^s | 07.039 | -149 | 64.15 | -120 | 59.591 | -82 | 06.01 | -50 |
| 1 | 0.8 | -160 | 64.94 | -79 | 59.497 | -94 | 05.47 | -54 |
| 1 | 10.7 | -170 | 65.34 | -40 | 59.390 | -107 | 04.87 | -60 |
| 1 | 20.7 | -173 | 65.34 | +7 | 59.277 | -113 | 04.26 | -61 |
| 1 | 30.7 | -168 | 64.78 | +49 | 59.164 | -113 | 03.66 | -60 |
| 2 | 9.7 | -160 | 63.87 | +91 | 59.053 | -111 | 03.08 | -58 |
| 2 | 19.6 | -141 | 62.53 | +134 | 58.954 | -99 | 02.57 | -51 |
| 3 | 1.6 | -118 | 60.83 | +170 | 58.874 | -80 | 02.17 | -40 |
| 3 | 11.6 | -88 | 58.78 | +205 | 58.817 | -87 | 01.88 | -29 |
| 3 | 21.6 | -50 | 56.41 | +237 | 58.794 | -23 | 01.78 | -10 |
| 3 | 31.5 | -8 | 53.80 | +261 | 58.809 | +15 | 01.88 | +10 |
| 4 | 10.5 | +38 | 50.96 | +284 | 58.825 | +16 | 01.73 | -15 |
| 4 | 20.5 | +89 | 47.95 | +301 | 58.956 | +131 | 02.74 | +101 |
| 4 | 30.4 | +139 | 44.86 | +309 | 59.099 | +143 | 03.57 | +83 |
| 5 | 10.4 | +189 | 41.71 | +315 | 59.284 | +185 | 04.65 | +108 |
| 5 | 20.4 | +237 | 38.60 | +311 | 59.510 | +226 | 04.149 | +219 |
| 5 | 30.4 | +277 | 35.59 | +301 | 59.768 | +258 | 07.51 | +153 |
| 6 | 9.3 | +314 | 32.74 | +285 | 60.056 | +288 | 09.24 | +173 |
| 6 | 19.3 | +344 | 30.13 | +261 | 60.365 | +309 | 11.12 | +188 |
| 6 | 29.3 | +360 | 27.82 | +231 | 60.685 | +320 | 13.08 | +196 |
| 7 | 9.3 | +373 | 25.85 | +197 | 61.011 | +326 | 15.10 | +202 |
| 7 | 19.2 | +373 | 24.31 | +154 | 61.334 | +323 | 17.12 | +202 |
| 7 | 29.2 | +362 | 23.21 | +110 | 61.645 | +311 | 19.07 | +195 |
| 8 | 8.2 | +347 | 22.58 | +63 | 61.940 | +295 | 20.93 | +186 |
| 8 | 18.1 | +318 | 22.45 | +13 | 62.209 | +269 | 22.64 | +171 |
| 8 | 28.1 | +285 | 22.78 | -33 | 62.452 | +243 | 24.17 | +153 |
| 9 | 7.1 | +247 | 23.58 | -80 | 62.664 | +212 | 25.50 | +133 |
| 9 | 17.1 | +202 | 24.81 | -123 | 62.841 | +177 | 26.60 | +110 |
| 9 | 27.0 | +158 | 26.38 | -157 | 62.985 | +144 | 27.47 | +87 |
| 10 | 7.0 | +112 | 28.26 | -188 | 63.096 | +111 | 28.12 | +65 |
| 10 | 17.0 | +63 | 30.35 | -209 | 63.173 | +77 | 28.54 | +42 |
| 10 | 27.0 | +23 | 32.54 | -219 | 63.222 | +49 | 28.77 | +23 |
| 11 | 5.9 | -20 | 34.78 | -224 | 63.242 | +20 | 28.82 | +5 |
| 11 | 15.9 | -56 | 36.92 | -214 | 63.235 | -7 | 28.70 | -12 |
| 11 | 25.9 | -87 | 38.91 | -199 | 63.207 | -28 | 28.46 | -24 |
| 12 | 5.8 | -115 | 40.66 | -175 | 63.156 | -51 | 28.10 | -36 |
| 12 | 15.8 | -137 | 42.07 | -141 | 63.087 | -69 | 27.65 | -45 |
| 12 | 25.8 | -153 | 43.13 | -106 | 63.002 | -85 | 27.14 | -51 |
| 12 | 35.8 | -166 | 43.78 | -65 | 62.903 | -99 | 26.56 | -58 |
| | | -171 | | -21 | | -107 | | -59 |
| Mean Place | 08.167 | 40.22 | 61.495 | 15.13 | 06.099 | 37.02 | 43.324 | 36.29 |
| sec δ, tan δ | +1.268 | -0.779 | +1.009 | +0.132 | +1.002 | +0.062 | +1.124 | +0.514 |
| dα(ψ), dδ(ψ) | +0.055 | +0.38 | +0.062 | +0.38 | +0.062 | +0.38 | +0.066 | +0.37 |
| dα(ε), dδ(ε) | +0.049 | +0.31 | -0.008 | +0.31 | -0.004 | +0.33 | -0.032 | +0.34 |
| Dble. Trans. | October 9 | | October 9 | | October 10 | | October 11 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 1035 | | 1036 | | 47 | | 1037 | |
|--------------|---------------------------|-------------------------|---------------------------|--------------------------|--------------------------|-------------------------|--------------------------|-------------------------|
| | ξ Andromedae | | 109 G. Sculptoris | | 9 Ceti | | 138 G. Ceti | |
| Mag. Spect. | 4.99 | K0 | 5.82 | K5 | 3.83 | K0 | 6.38 | G5 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° / | h m | ° / | h m | ° / | h m | ° / |
| | 1 21 | + 45 27 | 1 22 | - 31 00 | 1 23 | - 8 14 | 1 24 | - 2 54 |
| 1 -9.2 | 30.120 ^s - 146 | 32.62 ^o + 76 | 52.144 ^s - 122 | 77.86 ^o - 125 | 19.266 ^s - 83 | 84.23 ^o - 90 | 05.777 ^s - 79 | 79.29 ^o - 77 |
| 1 0.8 | 29.950 - 170 | 33.00 + 38 | 52.009 - 135 | 78.77 - 91 | 19.170 - 96 | 85.01 - 78 | 05.685 - 92 | 80.00 - 71 |
| 1 10.8 | 29.758 - 194 | 32.97 - 3 | 51.861 - 148 | 79.33 - 56 | 19.061 - 109 | 85.67 - 66 | 05.579 - 106 | 80.64 - 64 |
| 1 20.7 | 29.554 - 202 | 32.50 - 47 | 51.708 - 153 | 79.50 - 17 | 18.945 - 116 | 86.15 - 48 | 05.465 - 114 | 81.17 - 53 |
| 1 30.7 | 29.347 - 207 | 31.66 - 84 | 51.556 - 152 | 79.27 + 23 | 18.827 - 118 | 86.46 - 31 | 05.350 - 115 | 81.58 - 41 |
| 2 9.7 | 29.145 - 202 | 30.46 - 120 | 51.409 - 147 | 78.68 + 59 | 18.711 - 116 | 86.59 - 13 | 05.235 - 115 | 81.86 - 28 |
| 2 19.6 | 29.962 - 183 | 28.94 - 152 | 51.275 - 134 | 77.68 + 100 | 18.606 - 105 | 86.50 + 9 | 05.131 - 104 | 81.98 - 12 |
| 3 1.6 | 28.808 - 154 | 27.22 - 172 | 51.162 - 113 | 76.35 + 133 | 18.517 - 89 | 86.19 + 31 | 05.043 - 88 | 81.91 + 7 |
| 3 11.6 | 28.690 - 118 | 25.32 - 190 | 51.074 - 88 | 74.67 + 168 | 18.451 - 66 | 85.67 + 52 | 04.977 - 66 | 81.65 + 26 |
| 3 21.6 | 28.623 - 67 | 23.36 - 196 | 51.021 - 53 | 72.68 + 199 | 18.416 - 35 | 84.89 + 78 | 04.943 - 34 | 81.17 + 48 |
| 3 31.5 | 28.611 - 12 | 21.45 - 191 | 51.006 - 15 | 70.42 + 226 | 18.416 + 0 | 83.89 + 100 | 04.944 + 1 | 80.48 + 69 |
| 4 10.5 | 28.657 + 46 | 19.63 - 182 | 51.035 + 29 | 67.92 + 250 | 18.454 + 38 | 82.64 + 125 | 04.982 + 38 | 79.57 + 91 |
| 4 20.5 | 28.769 + 112 | 18.02 - 161 | 51.111 + 76 | 65.22 + 270 | 18.536 + 82 | 81.13 + 151 | 05.065 + 83 | 78.37 + 120 |
| 4 30.5 | 28.941 + 172 | 16.69 - 133 | 51.235 + 124 | 62.39 + 283 | 18.662 + 126 | 79.43 + 170 | 05.191 + 126 | 76.95 + 142 |
| 5 10.4 | 29.173 + 232 | 15.67 - 102 | 51.406 + 171 | 59.47 + 292 | 18.831 + 169 | 77.52 + 191 | 05.361 + 170 | 75.32 + 163 |
| 5 20.4 | 29.460 + 287 | 15.04 - 63 | 51.624 + 218 | 56.52 + 295 | 19.042 + 211 | 75.46 + 206 | 05.572 + 211 | 73.50 + 182 |
| 5 30.4 | 29.791 + 331 | 14.81 - 23 | 51.880 + 256 | 53.62 + 290 | 19.287 + 245 | 73.30 + 216 | 05.817 + 245 | 71.55 + 195 |
| 6 9.3 | 30.162 + 371 | 14.99 + 18 | 52.172 + 292 | 50.81 + 281 | 19.563 + 276 | 71.07 + 223 | 06.093 + 276 | 69.48 + 207 |
| 6 19.3 | 30.560 + 398 | 15.61 + 62 | 52.492 + 320 | 48.19 + 262 | 19.862 + 299 | 68.82 + 225 | 06.393 + 300 | 67.35 + 213 |
| 6 29.3 | 30.973 + 413 | 16.61 + 100 | 52.830 + 338 | 45.81 + 238 | 20.176 + 314 | 66.62 + 220 | 06.706 + 313 | 65.23 + 212 |
| 7 9.3 | 31.395 + 422 | 17.99 + 138 | 53.181 + 351 | 43.72 + 209 | 20.499 + 323 | 64.51 + 211 | 07.028 + 322 | 63.14 + 209 |
| 7 19.2 | 31.811 + 416 | 19.73 + 174 | 53.532 + 351 | 41.99 + 173 | 20.820 + 321 | 62.57 + 194 | 07.348 + 320 | 61.17 + 197 |
| 7 29.2 | 32.213 + 402 | 21.74 + 201 | 53.875 + 343 | 40.65 + 134 | 21.133 + 313 | 60.83 + 174 | 07.659 + 311 | 61.17 + 182 |
| 8 8.2 | 32.596 + 383 | 24.02 + 228 | 54.205 + 330 | 39.74 + 91 | 21.431 + 298 | 59.33 + 150 | 07.957 + 298 | 59.35 + 163 |
| 8 18.2 | 32.948 + 352 | 26.50 + 248 | 54.510 + 305 | 39.30 + 44 | 21.707 + 276 | 58.13 + 120 | 08.231 + 274 | 56.34 + 138 |
| 8 28.1 | 33.265 + 317 | 29.11 + 261 | 54.785 + 275 | 39.29 + 1 | 21.956 + 249 | 57.22 + 91 | 08.480 + 249 | 55.21 + 113 |
| 9 7.1 | 33.545 + 280 | 31.83 + 272 | 55.027 + 242 | 39.74 - 45 | 22.175 + 219 | 56.63 + 59 | 08.699 + 219 | 54.36 + 85 |
| 9 17.1 | 33.781 + 236 | 34.59 + 276 | 55.229 + 202 | 40.61 - 87 | 22.360 + 185 | 56.37 + 26 | 08.884 + 185 | 53.82 + 54 |
| 9 27.0 | 33.976 + 195 | 37.32 + 273 | 55.391 + 162 | 41.83 - 122 | 22.512 + 152 | 56.39 - 2 | 09.037 + 153 | 53.53 + 29 |
| 10 7.0 | 34.127 + 151 | 40.02 + 270 | 55.511 + 120 | 43.37 - 154 | 22.630 + 118 | 56.70 - 31 | 09.157 + 120 | 53.52 + 1 |
| 10 17.0 | 34.233 + 106 | 42.59 + 257 | 55.589 + 78 | 45.15 - 178 | 22.713 + 83 | 57.25 - 55 | 09.243 + 86 | 53.74 - 22 |
| 10 27.0 | 34.298 + 65 | 45.02 + 243 | 55.630 + 41 | 47.07 - 192 | 22.766 + 53 | 57.98 - 73 | 09.299 + 56 | 54.16 - 42 |
| 11 5.9 | 34.321 + 23 | 47.26 + 224 | 55.632 + 2 | 49.08 - 201 | 22.789 + 23 | 58.87 - 89 | 09.326 + 27 | 54.73 - 57 |
| 11 15.9 | 34.303 - 18 | 49.24 + 198 | 55.601 - 31 | 51.05 - 197 | 22.784 - 5 | 59.84 - 97 | 09.326 + 0 | 54.73 - 70 |
| 11 25.9 | 34.250 - 53 | 50.95 + 171 | 55.541 - 60 | 52.92 - 187 | 22.756 - 28 | 60.85 - 101 | 09.303 - 23 | 55.43 - 75 |
| 12 5.9 | 34.159 - 91 | 52.33 + 138 | 55.453 - 88 | 54.62 - 170 | 22.705 - 51 | 61.86 - 101 | 09.256 - 47 | 56.98 - 80 |
| 12 15.8 | 34.035 - 124 | 53.34 + 101 | 55.344 - 109 | 56.04 - 142 | 22.634 - 71 | 62.80 - 84 | 09.190 - 66 | 57.77 - 79 |
| 12 25.8 | 33.884 - 151 | 53.97 + 63 | 55.218 - 126 | 57.17 - 113 | 22.548 - 86 | 63.66 - 96 | 09.108 - 82 | 58.52 - 75 |
| 12 35.8 | 33.706 - 178 | 54.19 + 22 | 55.076 - 142 | 57.96 - 79 | 22.447 - 101 | 64.40 - 74 | 09.010 - 98 | 59.21 - 69 |
| | 33.706 - 193 | 54.19 - 20 | 55.076 - 149 | 57.96 - 40 | 22.447 - 111 | 64.40 - 59 | 09.010 - 107 | 59.21 - 60 |
| Mean Place | 32.450 | 30.00 | 53.348 | 56.60 | 20.893 | 70.32 | 07.478 | 67.14 |
| sec δ, tan δ | +1.426 | +1.016 | +1.167 | -0.601 | +1.010 | -0.145 | +1.001 | -0.051 |
| dα(ψ), dδ(ψ) | +0.071 | +0.37 | +0.056 | +0.37 | +0.060 | +0.37 | +0.061 | +0.37 |
| dα(ε), dδ(ε) | -0.063 | +0.35 | +0.037 | +0.35 | +0.009 | +0.36 | +0.003 | +0.36 |
| Dble. Trans. | October 12 | | October 12 | | October 12 | | October 12 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 1038 | | 48 | | 46 | | 1039 | |
|---|-------------|----------------|----------------------|----------------|--------------------|----------------|-------------|----------------|
| | 9 G. Hydri | | δ Cassiopeiae | | ψ Cassiopeiae | | 94 Piscium | |
| Mag.Spect. | 5.82 | K5 | 2.80 | A5 | 4.97 | K0 | 5.63 | K0 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | $^{\circ}$ ' " | h m | $^{\circ}$ ' " | h m | $^{\circ}$ ' " | h m | $^{\circ}$ ' " |
| | 1 24 | - 64 26 | 1 24 | + 60 09 | 1 24 | + 68 03 | 1 25 | + 19 10 |
| 1 ^d | s | " | s | " | s | " | s | " |
| 1 -9.2 | 37.939 -377 | 50.86 -123 | 52.865 -245 | 61.45 +132 | 55.173 -365 | 42.66 +159 | 55.827 -82 | 10.02 -13 |
| 1 0.8 | 37.538 -401 | 51.52 -66 | 52.583 -282 | 62.28 +83 | 54.759 -414 | 43.73 +107 | 55.728 -99 | 09.74 -28 |
| 1 10.8 | 37.120 -418 | 51.62 -10 | 52.270 -313 | 62.61 +33 | 54.303 -456 | 44.25 +52 | 55.614 -114 | 09.29 -45 |
| 1 20.7 | 36.701 -419 | 51.09 +53 | 51.939 -331 | 62.39 -22 | 53.825 -478 | 44.17 -8 | 55.489 -125 | 08.68 -61 |
| 1 30.7 | 36.296 -405 | 50.01 +108 | 51.606 -333 | 61.66 -73 | 53.348 -477 | 43.54 -63 | 55.361 -128 | 07.97 -71 |
| 2 9.7 | 35.910 -386 | 48.39 +162 | 51.282 -324 | 60.46 -120 | 52.884 -464 | 42.37 -117 | 55.233 -128 | 07.16 -81 |
| 2 19.6 | 35.562 -348 | 46.24 +215 | 50.987 -295 | 58.81 -165 | 52.462 -422 | 40.70 -167 | 55.117 -116 | 06.30 -86 |
| 3 1.6 | 35.261 -301 | 43.68 +256 | 50.736 -251 | 56.83 -198 | 52.102 -360 | 38.64 -206 | 55.018 -99 | 05.43 -87 |
| 3 11.6 | 35.013 -248 | 40.72 +296 | 50.539 -197 | 54.57 -226 | 51.816 -286 | 36.25 -239 | 54.944 -74 | 04.60 -83 |
| 3 21.6 | 34.834 -179 | 37.44 +328 | 50.415 -124 | 52.14 -243 | 51.628 -188 | 33.65 -260 | 54.905 -39 | 03.87 -73 |
| 3 31.5 | 34.728 -106 | 33.94 +350 | 50.369 -46 | 49.69 -245 | 51.545 -83 | 30.97 -268 | 54.904 -1 | 03.30 -57 |
| 4 10.5 | 34.700 -28 | 30.26 +368 | 50.406 +37 | 47.25 -244 | 51.572 +27 | 28.29 -268 | 54.946 +42 | 02.92 -38 |
| 4 20.5 | 34.759 +59 | 26.48 +378 | 50.533 +127 | 44.98 -227 | 51.719 +147 | 25.74 -255 | 55.033 +87 | 02.77 -15 |
| 4 30.5 | 34.899 +140 | 22.72 +376 | 50.744 +211 | 42.97 -201 | 51.974 +255 | 23.43 -231 | 55.170 +137 | 02.85 +8 |
| 5 10.4 | 35.124 +225 | 18.99 +373 | 51.036 +292 | 41.25 -172 | 52.335 +361 | 21.41 -202 | 55.352 +182 | 03.23 +38 |
| 5 20.4 | 35.433 +309 | 15.44 +355 | 51.404 +368 | 39.94 -131 | 52.794 +459 | 19.79 -162 | 55.579 +227 | 03.92 +69 |
| 5 30.4 | 35.811 +378 | 12.12 +332 | 51.832 +428 | 39.06 -88 | 53.330 +536 | 18.62 -117 | 55.840 +261 | 04.88 +96 |
| 6 9.3 | 36.258 +447 | 09.08 +304 | 52.312 +480 | 38.64 -42 | 53.934 +604 | 17.91 -71 | 56.134 +294 | 06.11 +123 |
| 6 19.3 | 36.760 +502 | 06.45 +263 | 52.831 +519 | 38.71 +7 | 54.588 +654 | 17.73 -18 | 56.450 +316 | 07.59 +148 |
| 6 29.3 | 37.301 +541 | 04.25 +220 | 53.370 +539 | 39.25 +54 | 55.268 +680 | 18.04 +31 | 56.780 +330 | 09.26 +167 |
| 7 9.3 | 37.873 +572 | 02.53 +172 | 53.922 +552 | 40.26 +101 | 55.965 +697 | 18.86 +82 | 57.118 +338 | 11.09 +183 |
| 7 19.2 | 38.456 +583 | 01.38 +115 | 54.469 +547 | 41.72 +146 | 56.657 +692 | 20.17 +131 | 57.454 +336 | 13.04 +195 |
| 7 29.2 | 39.033 +577 | 00.77 +61 | 54.998 +529 | 43.57 +185 | 57.327 +670 | 21.19 +174 | 57.779 +325 | 15.04 +200 |
| 8 8.2 | 39.593 +560 | 00.76 +1 | 55.503 +506 | 45.79 +222 | 57.967 +640 | 24.08 +217 | 58.090 +311 | 17.07 +203 |
| 8 18.2 | 40.115 +522 | 01.35 -59 | 55.968 +465 | 48.33 +254 | 58.557 +580 | 26.61 +253 | 58.376 +266 | 19.06 +199 |
| 8 28.1 | 40.587 +472 | 02.46 -111 | 56.390 +422 | 51.11 +278 | 59.092 +535 | 29.44 +283 | 58.635 +259 | 20.97 +191 |
| 9 7.1 | 40.998 +411 | 04.12 -166 | 56.763 +373 | 54.11 +300 | 59.564 +472 | 32.54 +310 | 58.865 +230 | 22.77 +180 |
| 9 17.1 | 41.332 +334 | 06.23 -211 | 57.077 +314 | 57.25 +314 | 59.960 +396 | 35.82 +328 | 59.061 +196 | 24.43 +166 |
| 9 27.0 | 41.586 +254 | 08.70 -247 | 57.335 +258 | 60.46 +321 | 60.283 +323 | 39.22 +340 | 59.224 +163 | 25.92 +149 |
| 10 7.0 | 41.753 +167 | 11.48 -278 | 57.532 +197 | 63.72 +326 | 60.525 +242 | 42.71 +349 | 59.353 +129 | 27.24 +132 |
| 10 17.0 | 41.827 +74 | 14.42 -294 | 57.666 +134 | 66.91 +319 | 60.682 +157 | 46.18 +347 | 59.449 +96 | 28.35 +111 |
| 10 27.0 | 41.816 -11 | 17.40 -298 | 57.741 +75 | 70.00 +309 | 60.759 +77 | 49.56 +338 | 59.514 +65 | 29.29 +94 |
| 11 5.9 | 41.718 -98 | 20.34 -294 | 57.753 +12 | 72.95 +295 | 60.750 -9 | 52.82 +326 | 59.549 +35 | 30.02 +73 |
| 11 15.9 | 41.540 -178 | 23.06 -272 | 57.704 -49 | 75.63 +268 | 60.656 -94 | 55.82 +300 | 59.555 +6 | 30.56 +54 |
| 11 25.9 | 41.295 -245 | 25.50 -244 | 57.600 -104 | 78.03 +240 | 60.486 -170 | 58.54 +272 | 59.536 -19 | 30.92 +36 |
| 12 5.9 | 40.987 -308 | 27.55 -205 | 57.439 -161 | 80.07 +204 | 60.236 -250 | 60.90 +236 | 59.492 -44 | 31.09 +17 |
| 12 15.8 | 40.633 -354 | 29.10 -155 | 57.228 -211 | 81.67 +160 | 59.917 -319 | 62.79 +189 | 59.425 -67 | 31.08 -1 |
| 12 25.8 | 40.245 -388 | 30.13 -103 | 56.974 -254 | 82.83 +116 | 59.541 -376 | 64.21 +142 | 59.340 -85 | 30.90 -18 |
| 12 35.8 | 39.831 -414 | 30.59 -46 | 56.681 -293 | 83.47 +64 | 59.112 -429 | 65.07 +86 | 59.235 -105 | 30.54 -36 |
| | -420 | +16 | -315 | +11 | -459 | +29 | -116 | -51 |
| Mean Place | 37.403 | 22.19 | 55.471 | 55.68 | 58.003 | 35.77 | 57.800 | 14.70 |
| sec δ , tan δ | +2.318 | -2.091 | +2.010 | +1.744 | +2.676 | +2.483 | +1.059 | +0.348 |
| $d\alpha(\psi)$, $d\delta(\psi)$ | +0.041 | +0.37 | +0.078 | +0.37 | +0.085 | +0.37 | +0.065 | +0.37 |
| $d\alpha(\epsilon)$, $d\delta(\epsilon)$ | +0.130 | +0.36 | -0.108 | +0.36 | -0.154 | +0.36 | -0.022 | +0.37 |
| Dbles.Trans. | October 12 | | October 12 | | October 12 | | October 13 | |

AT UPPER TRANSIT AT GREENWICH

| No. | 1041 | | 1040 | | 49 | | 1043 | |
|--------------|--------------|------------|--------------|------------|--------------|------------|--------------|------------|
| Name | 47 Ceti | | ω Andromedae | | γ Phoenicis | | 48 Ceti | |
| Mag.Spect. | 5.68 | F0 | 4.96 | F5 | 3.40 | K5 | 5.13 | A0 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " |
| | 1 26 | -13 07 | 1 26 | +45 19 | 1 27 | -43 22 | 1 28 | -21 41 |
| 1 -9.2 | 10.059 - 86 | 50.86 -101 | 48.259 - 141 | 77.37 + 80 | 46.054 - 168 | 97.81 -137 | 55.925 - 98 | 74.02 -118 |
| 1 0.8 | 09.959 - 100 | 51.70 - 84 | 48.094 - 165 | 77.79 + 42 | 45.870 - 184 | 98.74 - 93 | 55.813 - 112 | 74.93 - 91 |
| 1 10.8 | 09.846 - 113 | 52.36 - 66 | 47.905 - 189 | 77.80 + 1 | 45.672 - 198 | 99.22 - 48 | 55.687 - 126 | 75.59 - 66 |
| 1 20.7 | 09.725 - 121 | 52.80 - 44 | 47.703 - 202 | 77.80 - 41 | 45.468 - 204 | 99.20 + 2 | 55.554 - 133 | 75.94 - 35 |
| 1 30.7 | 09.603 - 122 | 53.01 - 21 | 47.497 - 206 | 77.39 - 79 | 45.268 - 200 | 98.71 + 49 | 55.420 - 134 | 75.98 - 4 |
| 2 9.7 | 09.482 - 121 | 53.00 + 1 | 47.294 - 203 | 75.44 -116 | 45.074 - 194 | 97.76 + 95 | 55.288 - 132 | 75.71 + 27 |
| 2 19.6 | 09.372 - 110 | 52.72 + 28 | 47.108 - 186 | 73.98 -146 | 44.897 - 177 | 96.34 +142 | 55.167 - 121 | 75.11 + 60 |
| 3 1.6 | 09.279 - 93 | 52.19 + 53 | 46.951 - 157 | 72.29 -169 | 44.745 - 152 | 94.52 +182 | 55.064 - 103 | 74.20 + 91 |
| 3 11.6 | 09.207 - 72 | 51.42 + 77 | 46.829 - 122 | 70.43 -186 | 44.622 - 123 | 92.33 +219 | 54.982 - 82 | 73.00 +120 |
| 3 21.6 | 09.167 - 40 | 50.37 +105 | 46.756 - 73 | 68.49 -194 | 44.539 - 83 | 89.79 +254 | 54.933 - 49 | 71.50 +150 |
| 3 31.5 | 09.162 - 5 | 49.09 +128 | 46.738 - 18 | 66.59 -190 | 44.501 - 38 | 87.00 +279 | 54.920 - 13 | 69.74 +176 |
| 4 10.5 | 09.195 + 33 | 47.55 +154 | 46.779 + 41 | 64.78 -181 | 44.511 + 10 | 83.96 +304 | 54.947 + 27 | 67.73 +201 |
| 4 20.5 | 09.273 + 78 | 45.77 +178 | 46.884 + 105 | 63.16 -162 | 44.577 + 66 | 80.76 +320 | 55.020 + 73 | 65.49 +224 |
| 4 30.5 | 09.395 + 122 | 43.80 +197 | 47.050 + 166 | 61.82 -134 | 44.696 + 119 | 77.47 +329 | 55.138 + 118 | 63.08 +241 |
| 5 10.4 | 09.560 + 165 | 41.65 +215 | 47.276 + 226 | 60.77 -105 | 44.869 + 173 | 74.13 +334 | 55.300 + 162 | 60.53 +255 |
| 5 20.4 | 09.768 + 208 | 39.37 +228 | 47.558 + 282 | 60.11 - 66 | 45.096 + 227 | 70.84 +329 | 55.507 + 207 | 57.90 +263 |
| 5 30.4 | 10.011 + 243 | 37.02 +235 | 47.886 + 328 | 59.84 - 27 | 45.368 + 272 | 67.68 +316 | 55.751 + 244 | 55.25 +265 |
| 6 9.3 | 10.286 + 275 | 34.63 +239 | 48.253 + 367 | 59.97 + 13 | 45.682 + 314 | 64.67 +301 | 56.028 + 277 | 52.62 +263 |
| 6 19.3 | 10.585 + 299 | 32.27 +236 | 48.649 + 396 | 60.54 + 57 | 46.030 + 348 | 61.95 +272 | 56.333 + 305 | 50.10 +252 |
| 6 29.3 | 10.900 + 315 | 30.00 +227 | 49.062 + 413 | 61.49 + 95 | 46.401 + 371 | 59.54 +241 | 56.653 + 320 | 47.74 +236 |
| 7 9.3 | 11.225 + 325 | 27.86 +214 | 49.483 + 421 | 62.82 +133 | 46.790 + 389 | 57.50 +204 | 56.986 + 333 | 45.58 +216 |
| 7 19.2 | 11.549 + 324 | 25.93 +193 | 49.902 + 419 | 64.50 +168 | 47.182 + 392 | 55.93 +157 | 57.320 + 334 | 43.72 +186 |
| 7 29.2 | 11.866 + 317 | 24.25 +168 | 50.307 + 405 | 66.46 +196 | 47.568 + 386 | 54.82 +111 | 57.646 + 326 | 42.17 +155 |
| 8 8.2 | 12.168 + 302 | 22.85 +140 | 50.693 + 386 | 68.68 +222 | 47.941 + 373 | 54.22 + 60 | 57.959 + 313 | 40.98 +119 |
| 8 18.2 | 12.449 + 281 | 21.79 +106 | 51.050 + 357 | 71.11 +243 | 48.287 + 346 | 54.15 + 7 | 58.250 + 291 | 40.19 + 79 |
| 8 28.1 | 12.703 + 254 | 21.07 + 72 | 51.373 + 323 | 73.67 +256 | 48.602 + 315 | 54.58 - 43 | 58.514 + 264 | 39.79 + 40 |
| 9 7.1 | 12.927 + 224 | 20.69 + 38 | 51.660 + 287 | 76.35 +268 | 48.878 + 276 | 55.51 - 93 | 58.747 + 233 | 39.80 - 1 |
| 9 17.1 | 13.116 + 189 | 20.66 + 3 | 51.904 + 244 | 79.06 +271 | 49.108 + 230 | 56.90 -139 | 58.944 + 197 | 40.20 - 40 |
| 9 27.0 | 13.272 + 156 | 20.95 - 29 | 52.107 + 203 | 81.77 +271 | 49.291 + 183 | 58.67 -177 | 59.106 + 162 | 40.94 - 74 |
| 10 7.0 | 13.393 + 121 | 21.53 - 58 | 52.266 + 159 | 84.44 +267 | 49.425 + 134 | 60.77 -210 | 59.230 + 124 | 41.99 -105 |
| 10 17.0 | 13.478 + 85 | 22.35 - 82 | 52.381 + 115 | 86.99 +255 | 49.506 + 81 | 63.09 -232 | 59.316 + 86 | 43.30 -131 |
| 10 27.0 | 13.533 + 55 | 23.36 -101 | 52.456 + 75 | 89.41 +242 | 49.541 + 35 | 65.54 -245 | 59.369 + 53 | 44.78 -148 |
| 11 5.9 | 13.556 + 23 | 24.51 -115 | 52.488 + 32 | 91.65 +224 | 49.529 - 12 | 68.03 -249 | 59.387 + 18 | 46.38 -160 |
| 11 15.9 | 13.550 - 6 | 25.73 -122 | 52.478 - 10 | 93.63 +198 | 49.474 - 55 | 70.43 -240 | 59.375 - 12 | 48.01 -163 |
| 11 25.9 | 13.520 - 30 | 26.95 -122 | 52.433 - 45 | 95.35 +172 | 49.383 - 91 | 72.65 -222 | 59.337 - 38 | 49.58 -157 |
| 12 5.9 | 13.467 - 53 | 28.14 -119 | 52.349 - 84 | 96.76 +141 | 49.257 - 126 | 74.63 -198 | 59.273 - 64 | 51.07 -149 |
| 12 15.8 | 13.393 - 74 | 29.22 -108 | 52.232 - 117 | 97.80 +104 | 49.103 - 154 | 76.23 -160 | 59.188 - 85 | 52.37 -130 |
| 12 25.8 | 13.303 - 90 | 30.17 - 95 | 52.086 - 146 | 98.47 + 67 | 48.930 - 173 | 77.45 -122 | 59.086 - 102 | 53.45 -108 |
| 12 35.8 | 13.197 - 106 | 30.95 - 78 | 51.913 - 173 | 98.73 + 26 | 48.738 - 192 | 78.22 - 77 | 58.968 - 118 | 54.28 - 83 |
| | - 114 | - 57 | - 191 | - 15 | - 200 | - 28 | - 128 | - 54 |
| Mean Place | 11.593 | 35.38 | 50.578 | 74.57 | 46.837 | 73.65 | 57.288 | 55.94 |
| sec δ, tan δ | +1.027 | -0.233 | +1.423 | +1.012 | +1.376 | -0.945 | +1.076 | -0.398 |
| dα(ψ), dδ(ψ) | +0.059 | +0.37 | +0.071 | +0.37 | +0.052 | +0.37 | +0.057 | +0.37 |
| dα(ε), dδ(ε) | +0.014 | +0.37 | -0.063 | +0.37 | +0.058 | +0.37 | +0.025 | +0.38 |
| Dble.Trans. | October 13 | | October 13 | | October 13 | | October 14 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 1042 | | 1044 | | 50 | | 53 | |
|--|--------------------|----------------|--------------------|----------------|-------------------|----------------|--------------------|----------------|
| | 38 Cassiopeiae | | δ Phoenicis | | η Piscium | | 14 G. Hydri | |
| Mag. Spect. | 5.95 | F5 | 3.96 | K0 | 3.72 | G5 | 6.06 | G5 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | $^{\circ}$ ' " | h m | $^{\circ}$ ' " | h m | $^{\circ}$ ' " | h m | $^{\circ}$ ' " |
| | 1 30 | + 70 11 | 1 30 | - 49 08 | 1 30 | + 15 16 | 1 33 | - 78 34 |
| 1 ^d | ^s - 405 | " +172 | ^s - 201 | " -139 | ^s - 77 | " - 24 | ^s - 962 | " -113 |
| 1 | -9.2 | 09 648 | 51.38 | 40 939 | 58.69 | 43 668 | 29.59 | 37 880 |
| 1 | 0.8 | 09 188 | 52.57 | 40 720 | 59.60 | 43 575 | 29.23 | 36 861 |
| 1 | 10.8 | 08 678 | 53.20 | 40 486 | 60.03 | 43 465 | 28.75 | 35 802 |
| 1 | 20.7 | 08 141 | 53.23 | 40 247 | 59.91 | 43 345 | 28.16 | 34 740 |
| 1 | 30.7 | 07 604 | 52.69 | 40 011 | 59.28 | 43 221 | 27.51 | 33 714 |
| 2 | 9.7 | 07 079 | 51.59 | 39 783 | 58.17 | 43 096 | 26.79 | 32 737 |
| 2 | 19.6 | 06 599 | 49.97 | 39 575 | 56.56 | 42 980 | 26.07 | 31 846 |
| 3 | 1.6 | 06 186 | 47.95 | 39 394 | 54.54 | 42 882 | 25.37 | 31 064 |
| 3 | 11.6 | 05 853 | 45.57 | 39 246 | 52.13 | 42 807 | 24.73 | 30 399 |
| 3 | 21.6 | 05 629 | 42.96 | 39 143 | 49.36 | 42 764 | 24.22 | 29 884 |
| 3 | 31.5 | 05 518 | 40.25 | 39 089 | 46.35 | 42 760 | 23.87 | 29 523 |
| 4 | 10.5 | 05 529 | 37.51 | 39 087 | 43.09 | 42 797 | 23.74 | 29 324 |
| 4 | 20.5 | 05 671 | 34.88 | 39 146 | 39.68 | 42 875 | 23.81 | 29 306 |
| 4 | 30.5 | 05 933 | 32.47 | 39 262 | 36.22 | 43 005 | 24.09 | 29 457 |
| 5 | 10.4 | 06 312 | 30.35 | 39 438 | 32.72 | 43 180 | 24.68 | 29 782 |
| 5 | 20.4 | 06 800 | 28.61 | 39 673 | 29.29 | 43 398 | 25.56 | 30 282 |
| 5 | 30.4 | 07 373 | 27.31 | 39 957 | 26.02 | 43 652 | 26.69 | 30 930 |
| 6 | 9.3 | 08 023 | 26.47 | 40 289 | 22.94 | 43 937 | 28.06 | 31 725 |
| 6 | 19.3 | 08 730 | 26.16 | 40 659 | 20.18 | 44 246 | 29.64 | 32 644 |
| 6 | 29.3 | 09 467 | 26.34 | 41 055 | 17.77 | 44 569 | 31.38 | 33 654 |
| 7 | 9.3 | 10 226 | 27.04 | 41 472 | 15.76 | 44 902 | 33.26 | 34 744 |
| 7 | 19.2 | 10 982 | 28.24 | 41 894 | 14.25 | 45 232 | 35.20 | 35 871 |
| 7 | 29.2 | 11 716 | 29.88 | 42 311 | 13.23 | 45 554 | 37.17 | 37 003 |
| 8 | 8.2 | 12 420 | 31.96 | 42 716 | 12.75 | 45 861 | 39.12 | 38 116 |
| 8 | 18.2 | 13 073 | 34.43 | 43 093 | 12.83 | 46 146 | 41.00 | 39 164 |
| 8 | 28.1 | 13 666 | 37.20 | 43 436 | 13.42 | 46 405 | 42.77 | 40 120 |
| 9 | 7.1 | 14 193 | 40.27 | 43 738 | 14.54 | 46 636 | 44.41 | 40 957 |
| 9 | 17.1 | 14 638 | 43.55 | 43 989 | 16.13 | 46 833 | 45.86 | 41 635 |
| 9 | 27.0 | 15 003 | 46.95 | 44 188 | 18.10 | 46 998 | 47.14 | 42 144 |
| 10 | 7.0 | 15 281 | 50.47 | 44 332 | 20.41 | 47 131 | 48.23 | 42 464 |
| 10 | 17.0 | 15 463 | 53.98 | 44 417 | 22.93 | 47 229 | 49.10 | 42 576 |
| 10 | 27.0 | 15 558 | 57.43 | 44 449 | 25.57 | 47 299 | 49.80 | 42 492 |
| 11 | 5.9 | 15 557 | 60.77 | 44 427 | 28.23 | 47 338 | 50.30 | 42 204 |
| 11 | 15.9 | 15 460 | 63.86 | 44 356 | 30.78 | 47 350 | 50.61 | 41 726 |
| 11 | 25.9 | 15 278 | 66.69 | 44 243 | 33.12 | 47 336 | 50.77 | 41 086 |
| 12 | 5.9 | 15 004 | 69.16 | 44 090 | 35.18 | 47 297 | 50.77 | 40 294 |
| 12 | 15.8 | 14 653 | 71.17 | 43 906 | 36.83 | 47 236 | 50.62 | 39 386 |
| 12 | 25.8 | 14 235 | 72.70 | 43 699 | 38.05 | 47 156 | 50.34 | 38 397 |
| 12 | 35.8 | 13 756 | 73.69 | 43 471 | 38.79 | 47 057 | 49.92 | 37 345 |
| Mean Place | 12.540 | 44.06 | 41.453 | 33.21 | 45.570 | 35.35 | 33.370 | 23.22 |
| sec δ , tan δ | +2.952 | +2.777 | +1.529 | -1.156 | +1.037 | +0.273 | +5.048 | -4.947 |
| da(ψ), d δ (ψ) | +0.089 | +0.37 | +0.049 | +0.37 | +0.064 | +0.37 | +0.009 | +0.37 |
| d α (ϵ), d δ (ϵ) | -0.171 | +0.38 | +0.071 | +0.39 | -0.017 | +0.39 | +0.303 | +0.40 |
| Dble. Trans. | October 14 | | October 14 | | October 14 | | October 15 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 1045 | | 1046 | | 52 | | 54 | |
|--------------|--------------|------------|-------------|------------|---------------|------------|-------------------------|-------------|
| | υ Andromedae | | π Piscium | | 51 Andromedae | | α Eridani (Achernar) | |
| Mag.Spect. | 4.18 | G0 | 5.63 | F0 | 3.77 | K0 | 0.60 | B5 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° ' | h m | ° ' | h m | ° ' | h m | ° ' |
| | 1 35 | +41 20 | 1 36 | +12 04 | 1 37 | +48 33 | 1 37 | -57 17 |
| 1 -9.2 | 57.846 -120 | 19.98 +71 | 21.068 -73 | 15.78 -33 | 07.224 -147 | 40.52 +101 | 12.925 -268 | 104.56 -144 |
| 1 0.8 | 57.702 -144 | 20.34 +36 | 20.979 -89 | 15.36 -42 | 07.048 -176 | 41.13 +61 | 12.633 -292 | 105.48 -92 |
| 1 10.8 | 57.534 -168 | 20.34 +0 | 20.873 -106 | 14.85 -51 | 06.845 -203 | 41.32 +19 | 12.322 -311 | 105.87 -39 |
| 1 20.7 | 57.351 -183 | 19.95 -39 | 20.754 -119 | 14.28 -57 | 06.624 -221 | 41.05 -27 | 12.004 -318 | 105.67 +20 |
| 1 30.7 | 57.162 -189 | 19.23 -72 | 20.632 -122 | 13.68 -60 | 06.397 -227 | 40.38 -67 | 11.692 -312 | 104.92 +75 |
| 2 9.7 | 56.973 -189 | 18.18 -105 | 20.507 -125 | 13.05 -63 | 06.170 -227 | 39.32 -106 | 11.389 -303 | 103.64 +128 |
| 2 19.7 | 56.798 -175 | 16.85 -133 | 20.391 -116 | 12.44 -61 | 05.960 -210 | 37.90 -142 | 11.111 -278 | 101.84 +180 |
| 3 1.6 | 56.646 -152 | 15.32 -153 | 20.291 -106 | 11.88 -56 | 05.777 -183 | 36.22 -168 | 10.866 -245 | 99.61 +223 |
| 3 11.6 | 56.526 -120 | 13.63 -169 | 20.213 -78 | 11.41 -47 | 05.632 -145 | 34.33 -189 | 10.661 -205 | 96.97 +284 |
| 3 21.6 | 56.451 -75 | 11.88 -175 | 20.167 -46 | 11.07 -34 | 05.537 -95 | 32.32 -201 | 10.508 -153 | 93.97 +300 |
| 3 31.5 | 56.426 -25 | 10.18 -170 | 20.157 -10 | 10.91 -16 | 05.500 -37 | 30.32 -200 | 10.414 -94 | 90.72 +325 |
| 4 10.5 | 56.455 +29 | 08.56 -162 | 20.189 +32 | 10.96 +5 | 05.524 +24 | 28.36 -196 | 10.382 -32 | 87.24 +348 |
| 4 20.5 | 56.545 +90 | 07.13 -143 | 20.254 +65 | 11.20 +24 | 05.618 +94 | 26.58 -178 | 10.421 +39 | 83.62 +362 |
| 4 30.5 | 56.693 +148 | 05.95 -118 | 20.382 +128 | 11.69 +49 | 05.776 +158 | 25.04 -154 | 10.528 +107 | 79.96 +366 |
| 5 10.4 | 56.898 +205 | 05.06 -89 | 20.549 +167 | 12.45 +76 | 05.998 +222 | 23.78 -126 | 10.705 +177 | 76.29 +367 |
| 5 20.4 | 57.158 +260 | 04.53 -53 | 20.759 +210 | 13.49 +104 | 06.282 +284 | 22.89 -89 | 10.953 +248 | 72.73 +356 |
| 5 30.4 | 57.461 +303 | 04.37 -16 | 21.005 +246 | 14.74 +125 | 06.614 +332 | 22.39 -50 | 11.260 +307 | 69.36 +337 |
| 6 9.4 | 57.804 +343 | 04.59 +22 | 21.283 +278 | 16.22 +148 | 06.990 +376 | 22.30 -9 | 11.625 +365 | 66.21 +315 |
| 6 19.3 | 58.177 +373 | 05.21 +62 | 21.586 +303 | 17.89 +167 | 07.400 +410 | 22.65 +35 | 12.037 +412 | 63.42 +279 |
| 6 29.3 | 58.566 +389 | 06.19 +98 | 21.904 +318 | 19.69 +180 | 07.828 +428 | 23.39 +74 | 12.484 +447 | 61.01 +241 |
| 7 9.3 | 58.966 +400 | 07.51 +132 | 22.232 +328 | 21.59 +190 | 08.269 +441 | 24.54 +115 | 12.957 +473 | 59.05 +196 |
| 7 19.2 | 59.365 +399 | 09.15 +164 | 22.559 +327 | 23.53 +194 | 08.708 +439 | 26.06 +152 | 13.442 +485 | 57.62 +143 |
| 7 29.2 | 59.752 +387 | 11.04 +189 | 22.878 +319 | 25.47 +194 | 09.136 +428 | 27.88 +182 | 13.925 +483 | 56.71 +91 |
| 8 8.2 | 60.124 +372 | 13.17 +213 | 23.185 +307 | 27.36 +189 | 09.547 +411 | 30.00 +212 | 14.396 +471 | 56.38 +33 |
| 8 18.2 | 60.469 +345 | 15.47 +230 | 23.470 +285 | 29.14 +178 | 09.930 +383 | 32.36 +236 | 14.838 +442 | 56.64 -26 |
| 8 28.1 | 60.784 +315 | 17.88 +241 | 23.730 +260 | 30.79 +165 | 10.279 +349 | 34.89 +253 | 15.242 +404 | 57.43 -79 |
| 9 7.1 | 61.066 +282 | 20.38 +250 | 23.962 +232 | 32.29 +150 | 10.592 +313 | 37.57 +268 | 15.599 +357 | 58.77 -134 |
| 9 17.1 | 61.308 +242 | 22.90 +252 | 24.162 +200 | 33.58 +129 | 10.861 +269 | 40.32 +275 | 15.897 +298 | 60.60 -183 |
| 9 27.1 | 61.512 +204 | 25.40 +250 | 24.330 +168 | 34.67 +109 | 11.087 +226 | 43.09 +277 | 16.133 +236 | 62.82 -222 |
| 10 7.0 | 61.676 +164 | 27.84 +244 | 24.467 +137 | 35.57 +90 | 11.270 +183 | 45.86 +277 | 16.302 +169 | 65.38 -256 |
| 10 17.0 | 61.798 +122 | 30.17 +233 | 24.570 +103 | 36.24 +67 | 11.404 +134 | 48.55 +269 | 16.398 +96 | 68.16 -278 |
| 10 27.0 | 61.883 +85 | 32.36 +219 | 24.644 +74 | 36.73 +49 | 11.496 +92 | 51.11 +256 | 16.428 +30 | 71.03 -287 |
| 11 5.9 | 61.928 +45 | 34.38 +202 | 24.689 +45 | 37.03 +30 | 11.542 +46 | 53.53 +242 | 16.390 -38 | 73.92 -289 |
| 11 15.9 | 61.934 +6 | 36.16 +178 | 24.705 +16 | 37.16 +13 | 11.543 +1 | 55.70 +217 | 16.288 -102 | 76.65 -273 |
| 11 25.9 | 61.907 -27 | 37.71 +155 | 24.696 -9 | 37.15 -1 | 11.504 -39 | 57.62 +192 | 16.133 -155 | 79.16 -251 |
| 12 5.9 | 61.842 -65 | 38.96 +125 | 24.662 -34 | 37.00 -15 | 11.422 -82 | 59.23 +161 | 15.925 -208 | 81.34 -218 |
| 12 15.8 | 61.745 -97 | 39.89 +93 | 24.606 -56 | 36.73 -27 | 11.302 -120 | 60.48 +125 | 15.678 -247 | 83.08 -174 |
| 12 25.8 | 61.621 -124 | 40.48 +59 | 24.529 -77 | 36.37 -36 | 11.148 -154 | 61.35 +87 | 15.400 -278 | 84.34 -126 |
| 12 35.8 | 61.468 -153 | 40.70 +22 | 24.434 -95 | 35.90 -47 | 10.963 -185 | 61.80 +45 | 15.097 -303 | 85.07 -73 |
| | 61.468 -170 | | 24.434 -109 | | | | | |
| Mean Place | 60.042 | 17.75 | 22.899 | 22.36 | 09.528 | 36.70 | 12.849 | 78.09 |
| sec δ, tan δ | +1.332 | +0.880 | +1.023 | +0.214 | +1.511 | +1.133 | +1.851 | -1.558 |
| dα(ψ), dδ(ψ) | +0.071 | +0.36 | +0.063 | +0.36 | +0.074 | +0.36 | +0.044 | +0.36 |
| dα(ε), dδ(ε) | -0.054 | +0.41 | -0.013 | +0.41 | -0.069 | +0.41 | +0.095 | +0.41 |
| Dble.Trans. | October 15 | | October 15 | | October 16 | | October 16 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 51 | | 56 | | 1047 | | 55 | |
|--------------|----------------|---------|------------|--------|------------------------------|---------|----------------|---------|
| | 40 Cassiopeiae | | v Piscium | | B.D. +34° 297 (Trianguli) | | 43 Cassiopeiae | |
| Mag. Spect. | 5.50 | K0 | 4.68 | K0 | 5.45 | B8 | 5.54 | A0p |
| U.T. | R.A. | | R.A. | | R.A. | | R.A. | |
| | h m | Dec. | h m | Dec. | h m | Dec. | h m | Dec. |
| | 1 37 | + 72 58 | 1 40 | + 5 24 | 1 41 | + 35 10 | 1 41 | + 67 58 |
| 1 -9.2 | 22 028 | 25 88 | 41 944 | 62 10 | 14 361 | 40 77 | 16 984 | 38 06 |
| 1 0.8 | 21 489 | 27 24 | 41 858 | 61 54 | 14 241 | 41 00 | 16 594 | 39 32 |
| 1 10.8 | 20 888 | 28 05 | 41 755 | 60 95 | 14 097 | 40 92 | 16 155 | 40 05 |
| 1 20.7 | 20 253 | 28 23 | 41 640 | 60 39 | 13 938 | 40 52 | 15 684 | 40 19 |
| 1 30.7 | 19 612 | 27 83 | 41 520 | 59 86 | 13 772 | 39 85 | 15 206 | 39 77 |
| 2 9.7 | 18 984 | 26 86 | 41 398 | 59 38 | 13 605 | 38 91 | 14 733 | 38 81 |
| 2 19.7 | 18 404 | 25 34 | 41 283 | 58 98 | 13 447 | 37 74 | 14 294 | 37 33 |
| 3 1.6 | 17 899 | 23 38 | 41 183 | 58 70 | 13 310 | 36 42 | 13 910 | 35 44 |
| 3 11.6 | 17 485 | 21 04 | 41 104 | 58 54 | 13 200 | 34 98 | 13 595 | 33 18 |
| 3 21.6 | 17 194 | 18 43 | 41 055 | 58 57 | 13 130 | 33 53 | 13 372 | 30 68 |
| 3 31.5 | 17 034 | 15 69 | 41 042 | 58 78 | 13 105 | 32 13 | 13 252 | 28 07 |
| 4 10.5 | 17 013 | 12 89 | 41 070 | 59 17 | 13 130 | 30 84 | 13 240 | 25 41 |
| 4 20.5 | 17 143 | 10 18 | 41 134 | 59 80 | 13 210 | 29 74 | 13 347 | 22 84 |
| 4 30.5 | 17 412 | 07 66 | 41 249 | 60 75 | 13 344 | 28 88 | 13 564 | 20 47 |
| 5 10.4 | 17 817 | 05 39 | 41 408 | 61 89 | 13 531 | 28 31 | 13 889 | 18 35 |
| 5 20.4 | 18 349 | 03 51 | 41 610 | 63 26 | 13 770 | 28 07 | 14 317 | 16 60 |
| 5 30.4 | 18 982 | 02 04 | 41 847 | 64 82 | 14 051 | 28 17 | 14 827 | 15 27 |
| 6 9.4 | 19 705 | 01 03 | 42 118 | 66 56 | 14 370 | 28 62 | 15 410 | 14 38 |
| 6 19.3 | 20 497 | 00 54 | 42 413 | 68 43 | 14 717 | 29 43 | 16 049 | 14 00 |
| 6 29.3 | 21 329 | 00 55 | 42 724 | 70 37 | 15 081 | 30 55 | 16 722 | 14 11 |
| 7 9.3 | 22 189 | 01 07 | 43 046 | 72 35 | 15 456 | 31 97 | 17 418 | 14 70 |
| 7 19.2 | 23 051 | 02 12 | 43 368 | 74 31 | 15 831 | 33 66 | 18 116 | 15 80 |
| 7 29.2 | 23 892 | 03 62 | 43 684 | 76 20 | 16 197 | 35 54 | 18 799 | 17 33 |
| 8 8.2 | 24 703 | 05 58 | 43 987 | 77 98 | 16 550 | 37 61 | 19 458 | 19 28 |
| 8 18.2 | 25 459 | 07 94 | 44 271 | 79 59 | 16 878 | 39 80 | 20 075 | 21 63 |
| 8 28.1 | 26 152 | 10 64 | 44 530 | 81 01 | 17 179 | 42 06 | 20 640 | 24 27 |
| 9 7.1 | 26 771 | 13 65 | 44 762 | 82 22 | 17 449 | 44 36 | 21 149 | 27 21 |
| 9 17.1 | 27 299 | 16 90 | 44 962 | 83 18 | 17 683 | 46 63 | 21 586 | 30 37 |
| 9 27.1 | 27 736 | 20 31 | 45 132 | 83 90 | 17 883 | 48 85 | 21 953 | 33 66 |
| 10 7.0 | 28 075 | 23 85 | 45 269 | 84 39 | 18 045 | 50 99 | 22 242 | 37 07 |
| 10 17.0 | 28 303 | 27 42 | 45 374 | 84 65 | 18 170 | 53 00 | 22 447 | 40 48 |
| 10 27.0 | 28 429 | 30 95 | 45 450 | 84 72 | 18 260 | 54 86 | 22 573 | 43 86 |
| 11 5.9 | 28 442 | 34 39 | 45 496 | 84 61 | 18 314 | 56 54 | 22 613 | 47 13 |
| 11 15.9 | 28 342 | 37 61 | 45 514 | 84 35 | 18 333 | 58 01 | 22 566 | 50 19 |
| 11 25.9 | 28 140 | 40 58 | 45 508 | 83 98 | 18 320 | 59 26 | 22 440 | 53 00 |
| 12 5.9 | 27 828 | 43 21 | 45 477 | 83 52 | 18 274 | 60 25 | 22 230 | 55 47 |
| 12 15.8 | 27 422 | 45 39 | 45 423 | 82 99 | 18 198 | 60 96 | 21 946 | 57 52 |
| 12 25.8 | 26 935 | 47 10 | 45 350 | 82 44 | 18 096 | 61 38 | 21 598 | 59 11 |
| 12 35.8 | 26 373 | 48 25 | 45 257 | 81 85 | 17 967 | 61 49 | 21 190 | 60 17 |
| Mean Place | 24.978 | 18.17 | 43.668 | 70.64 | 16.458 | 40.17 | 19.690 | 30.85 |
| sec δ, tan δ | +3.415 | +3.265 | +1.004 | +0.095 | +1.223 | +0.705 | +2.667 | +2.472 |
| dα(v), dδ(v) | +0.097 | +0.36 | +0.062 | +0.36 | +0.069 | +0.36 | +0.089 | +0.36 |
| dα(ε), dδ(ε) | -0.198 | +0.41 | -0.006 | +0.43 | -0.042 | +0.43 | -0.149 | +0.43 |
| Dble. Trans. | October 16 | | October 16 | | October 17 | | October 17 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 58 | | 1048 | | 1049 | | 57 | |
|--------------|-------------------|------------|--------------|------------|-------------|------------|-------------|------------|
| | 129 G. Sculptoris | | π Sculptoris | | 175 G. Ceti | | φ Persei | |
| Mag.Spect. | 5.64 | A0 | 5.28 | K0 | 5.27 | G5 | 4.19 | B0p |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " |
| | 1 41 | -36 53 | 1 41 | -32 23 | 1 42 | - 3 45 | 1 42 | +50 37 |
| 1 -9.2 | 26 411 -133 | 82 51 -146 | 31 028 -119 | 61.42 -141 | 00.940 -72 | 39.94 -84 | 46.215 -152 | 20.36 +113 |
| 1 0.8 | 26 259 -152 | 83 58 -107 | 30 892 -136 | 62.48 -106 | 00.852 -88 | 40.69 -75 | 46.031 -184 | 21.09 +73 |
| 1 10.8 | 26 091 -168 | 84 26 -68 | 30.740 -152 | 63.19 -71 | 00.748 -104 | 41.36 -67 | 45.817 -214 | 21.39 +30 |
| 1 20.7 | 25 913 -178 | 84 49 -23 | 30.578 -162 | 63.49 -30 | 00.633 -115 | 41.36 -55 | 45.817 -235 | 21.39 -17 |
| 1 30.7 | 25 734 -179 | 84.28 +21 | 30.415 -163 | 63.37 +12 | 00.512 -121 | 42.33 -42 | 45.340 -242 | 20.63 -59 |
| 2 9.7 | 25 557 -177 | 83 64 +64 | 30.252 -163 | 62.87 +50 | 00.390 -122 | 42.60 -27 | 45.098 -242 | 19.62 -101 |
| 2 19.7 | 25 392 -165 | 82 56 +108 | 30 100 -152 | 61.95 +92 | 00.274 -116 | 42.70 -10 | 44.871 -227 | 18.24 -138 |
| 3 1.6 | 25 247 -145 | 81 09 +147 | 29.966 -134 | 60.66 +129 | 00.174 -100 | 42.61 +9 | 44.672 -199 | 16.57 -167 |
| 3 11.6 | 25 126 -121 | 79 25 +184 | 29.856 -110 | 59.01 +165 | 00.092 -82 | 42.32 +29 | 44.511 -161 | 14.67 -190 |
| 3 21.6 | 25 041 -85 | 77 06 +219 | 29.779 -77 | 57.03 +198 | 00.041 -51 | 41.81 +51 | 44.402 -109 | 12.63 -204 |
| 3 31.5 | 24 996 -45 | 74 59 +247 | 29.740 -39 | 54.76 +227 | 00.024 -17 | 41.08 +73 | 44.353 -49 | 10.56 -207 |
| 4 10.5 | 24 995 -1 | 71 86 +273 | 29.744 +4 | 52.24 +252 | 00.045 +21 | 40.13 +95 | 44.368 +15 | 08.52 -204 |
| 4 20.5 | 25 045 +50 | 68 92 +121 | 29.797 +53 | 49.49 +121 | 00.109 +64 | 38.92 +64 | 44.455 +87 | 06.64 -188 |
| 4 30.5 | 25 145 +100 | 65 86 +306 | 29.897 +100 | 46 62 +287 | 00.218 +109 | 37.48 +144 | 44.609 +154 | 04.98 -166 |
| 5 10.4 | 25 296 +151 | 62.70 +316 | 30.047 +150 | 43.62 +300 | 00.371 +153 | 35.83 +165 | 44.831 +222 | 03.60 -138 |
| 5 20.4 | 25 498 +202 | 59 53 +317 | 30.246 +199 | 40 59 +303 | 00.566 +195 | 33.99 +184 | 45 116 +285 | 02.58 -102 |
| 5 30.4 | 25 743 +245 | 56 44 +309 | 30 485 +239 | 37.61 +298 | 00.798 +232 | 32.02 +197 | 45 454 +338 | 01.95 -63 |
| 6 9.4 | 26 029 +286 | 53 44 +300 | 30.764 +279 | 34.70 +291 | 01.063 +265 | 29.94 +208 | 45 838 +384 | 01.72 -23 |
| 6 19.3 | 26 348 +319 | 50 67 +277 | 31 074 +310 | 31.97 +273 | 01.354 +291 | 27.80 +214 | 46 258 +420 | 01.93 +21 |
| 6 29.3 | 26 690 +342 | 48 16 +251 | 31 405 +331 | 29.48 +249 | 01.661 +307 | 25.67 +213 | 46 698 +440 | 02.56 +63 |
| 7 9.3 | 27 050 +360 | 45 97 +219 | 31 753 +348 | 27 27 +221 | 01 979 +318 | 23 58 +209 | 47 153 +455 | 03 59 +103 |
| 7 19.2 | 27 415 +365 | 44 19 +178 | 32 105 +352 | 25 44 +183 | 02 300 +321 | 21 60 +198 | 47 609 +456 | 05 01 +142 |
| 7 29.2 | 27 776 +361 | 42 83 +136 | 32 453 +348 | 24 00 +144 | 02 613 +313 | 19 78 +182 | 48 053 +444 | 06 75 +174 |
| 8 8.2 | 28 127 +351 | 41 93 +90 | 32 791 +338 | 23 00 +100 | 02 916 +303 | 18 16 +162 | 48 482 +429 | 08 81 +206 |
| 8 18.2 | 28 456 +329 | 41 55 +38 | 33 107 +316 | 22 48 +52 | 02 919 +283 | 16 79 +137 | 48 882 +400 | 11 13 +232 |
| 8 28.1 | 28 757 +301 | 41 65 -10 | 33 397 +290 | 22 41 +7 | 03 458 +259 | 15 69 +110 | 49 249 +367 | 13 64 +251 |
| 9 7.1 | 29 027 +270 | 42 23 -58 | 33 656 +259 | 22 82 -41 | 03 691 +233 | 14 87 +82 | 49 580 +331 | 16 32 +268 |
| 9 17.1 | 29 255 +228 | 43 29 -106 | 33 876 +220 | 23 68 -86 | 03 891 +200 | 14 36 +51 | 49 866 +286 | 19 09 +277 |
| 9 27.1 | 29 443 +188 | 44 72 -143 | 34 058 +182 | 24 91 -123 | 04 060 +169 | 14 13 +23 | 50 109 +243 | 21 91 +282 |
| 10 7.0 | 29 587 +144 | 46 52 -180 | 34 200 +142 | 26 50 -159 | 04 197 +137 | 14 17 -4 | 50 306 +197 | 24 74 +283 |
| 10 17.0 | 29 685 +98 | 48 57 -205 | 34 298 +98 | 28 35 -185 | 04 301 +104 | 14 47 -30 | 50 454 +148 | 27 50 +276 |
| 10 27.0 | 29 743 +58 | 50 78 -221 | 34 358 +60 | 30 37 -202 | 04 375 +74 | 14 96 -49 | 50 557 +103 | 30 16 +266 |
| 11 5.9 | 29 758 +15 | 53 09 -231 | 34 379 +21 | 32 49 -212 | 04 419 +44 | 15 62 -66 | 50 612 +55 | 32 68 +252 |
| 11 15.9 | 29 733 -25 | 55 37 -228 | 34 363 -16 | 34 61 -212 | 04 434 +15 | 16 40 -78 | 50 619 +7 | 34 98 +230 |
| 11 25.9 | 29 675 -58 | 57 52 -215 | 34 316 -47 | 36 63 -202 | 04 425 -9 | 17 23 -83 | 50 583 -36 | 37 03 +205 |
| 12 5.9 | 29 584 -91 | 59 48 -196 | 34 238 -78 | 38 49 -186 | 04 391 -34 | 18 11 -88 | 50 501 -82 | 38 77 +174 |
| 12 15.8 | 29 466 -118 | 61 14 -186 | 34 135 -103 | 40 08 -159 | 04 334 -57 | 18 96 -85 | 50 377 -124 | 40 14 +137 |
| 12 25.8 | 29 326 -140 | 62 47 -133 | 34 010 -125 | 41 37 -129 | 04 259 -75 | 19 77 -81 | 50 218 -159 | 41 14 +100 |
| 12 35.8 | 29 166 -160 | 63 41 -94 | 33 866 -144 | 42 32 -95 | 04 164 -107 | 20 51 -74 | 50 023 -195 | 41 70 +56 |
| | 29 166 -171 | 63.41 -50 | 33.866 -155 | 42.32 -54 | | | 50.023 -218 | 41.70 +11 |
| Mean Place | 27.284 | 60.94 | 32.035 | 41.08 | 02.525 | 28.48 | 48.520 | 16.02 |
| sec δ, tan δ | +1.250 | -0.751 | +1.184 | -0.634 | +1.002 | -0.066 | +1.576 | +1.218 |
| da(ψ), dδ(ψ) | +0.053 | +0.36 | +0.054 | +0.36 | +0.060 | +0.36 | +0.075 | +0.36 |
| da(ε), dδ(ε) | +0.045 | +0.43 | +0.038 | +0.43 | +0.004 | +0.43 | -0.073 | +0.43 |
| Dble.Trans. | October 17 | | October 17 | | October 17 | | October 17 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 59 | | 60 | | 61 | | 1050 | | |
|--------------|------------|--------------|-------------|--------------|---------------|--------------|-------------|--------------|-------------|
| | τ Ceti | | ο Piscium | | ε Sculptoris* | | 4 Arietis | | |
| Mag.Spect. | 3.65 | K0 | 4.50 | K0 | 5.42 | F0 | 5.73 | A0 | |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " | |
| | 1 43 | - 16 00 | 1 44 | + 9 05 | 1 44 | - 25 06 | 1 47 | + 16 53 | |
| 1 | -9.2 | 25.140 - 88 | 45.49 - 111 | 39.013 - 66 | 17.22 - 43 | 59.678 - 98 | 89.26 - 133 | 25.034 - 68 | 14.77 - 15 |
| 1 | 0.8 | 25.036 - 104 | 46.40 - 91 | 38.927 - 86 | 16.74 - 48 | 59.563 - 115 | 90.31 - 105 | 24.946 - 88 | 14.50 - 27 |
| 1 | 10.8 | 24.917 - 119 | 47.10 - 70 | 38.824 - 103 | 16.21 - 53 | 59.431 - 132 | 91.07 - 76 | 24.838 - 108 | 14.10 - 40 |
| 1 | 20.7 | 24.787 - 130 | 47.54 - 44 | 38.708 - 116 | 15.65 - 56 | 59.289 - 142 | 91.47 - 40 | 24.716 - 122 | 13.57 - 53 |
| 1 | 30.7 | 24.654 - 133 | 47.72 - 18 | 38.586 - 122 | 15.09 - 56 | 59.143 - 146 | 91.54 - 7 | 24.587 - 129 | 12.97 - 60 |
| 2 | 9.7 | 24.520 - 134 | 47.63 + 9 | 38.461 - 125 | 14.54 - 55 | 58.997 - 146 | 91.26 + 28 | 24.455 - 132 | 12.29 - 68 |
| 2 | 19.7 | 24.394 - 126 | 47.26 + 37 | 38.343 - 118 | 14.04 - 50 | 58.859 - 138 | 90.61 + 65 | 24.329 - 126 | 11.57 - 72 |
| 3 | 1.6 | 24.284 - 110 | 46.60 + 66 | 38.240 - 103 | 13.62 - 42 | 58.738 - 121 | 89.64 + 97 | 24.218 - 111 | 10.87 - 70 |
| 3 | 11.6 | 24.193 - 91 | 45.68 + 92 | 38.156 - 84 | 13.29 - 33 | 58.637 - 101 | 88.34 + 130 | 24.128 - 90 | 10.19 - 68 |
| 3 | 21.6 | 24.134 - 59 | 44.47 + 121 | 38.103 - 53 | 13.12 - 17 | 58.568 - 69 | 86.71 + 163 | 24.070 - 58 | 09.62 - 57 |
| 3 | 31.5 | 24.109 - 25 | 43.01 + 146 | 38.086 - 17 | 13.13 + 1 | 58.535 - 33 | 84.82 + 189 | 24.049 - 21 | 09.19 - 43 |
| 4 | 10.5 | 24.122 + 13 | 41.30 + 171 | 38.111 + 25 | 13.33 + 20 | 58.542 + 7 | 82.66 + 216 | 24.069 + 20 | 08.94 - 25 |
| 4 | 20.5 | 24.181 + 59 | 39.34 + 196 | 38.169 + 58 | 13.64 + 31 | 58.595 + 53 | 80.27 + 239 | 24.134 + 65 | 08.95 + 1 |
| 4 | 30.5 | 24.284 + 103 | 37.20 + 214 | 38.285 + 116 | 14.42 + 78 | 58.694 + 99 | 77.72 + 255 | 24.246 + 112 | 09.07 + 12 |
| 5 | 10.4 | 24.431 + 147 | 34.88 + 232 | 38.443 + 158 | 15.34 + 92 | 58.840 + 146 | 75.01 + 271 | 24.407 + 161 | 09.52 + 45 |
| 5 | 20.4 | 24.623 + 192 | 32.45 + 243 | 38.645 + 202 | 16.51 + 117 | 59.033 + 193 | 72.24 + 277 | 24.613 + 206 | 10.25 + 73 |
| 5 | 30.4 | 24.852 + 229 | 29.96 + 249 | 38.882 + 237 | 17.89 + 138 | 59.265 + 232 | 69.46 + 278 | 24.857 + 244 | 11.23 + 98 |
| 6 | 9.4 | 25.115 + 263 | 27.45 + 251 | 39.153 + 271 | 19.46 + 157 | 59.533 + 268 | 66.71 + 275 | 25.134 + 277 | 12.46 + 123 |
| 6 | 19.3 | 25.405 + 290 | 24.98 + 247 | 39.449 + 296 | 21.20 + 174 | 59.831 + 296 | 64.08 + 263 | 25.438 + 304 | 13.91 + 145 |
| 6 | 29.3 | 25.712 + 307 | 22.63 + 235 | 39.762 + 313 | 23.04 + 184 | 60.149 + 318 | 61.62 + 246 | 25.759 + 321 | 15.53 + 162 |
| 7 | 9.3 | 26.033 + 321 | 20.43 + 220 | 40.086 + 324 | 24.96 + 192 | 60.482 + 333 | 59.40 + 222 | 26.091 + 332 | 17.29 + 176 |
| 7 | 19.2 | 26.356 + 323 | 18.47 + 196 | 40.411 + 325 | 24.96 + 194 | 60.820 + 338 | 57.49 + 191 | 26.424 + 333 | 19.16 + 187 |
| 7 | 29.2 | 26.673 + 317 | 16.77 + 170 | 40.729 + 318 | 26.90 + 190 | 61.153 + 333 | 55.91 + 158 | 26.751 + 327 | 21.05 + 189 |
| 8 | 8.2 | 26.979 + 306 | 15.39 + 138 | 41.037 + 308 | 30.62 + 182 | 61.476 + 323 | 54.72 + 119 | 27.067 + 316 | 22.96 + 191 |
| 8 | 18.2 | 27.265 + 286 | 14.37 + 102 | 41.324 + 287 | 32.32 + 170 | 61.779 + 303 | 53.97 + 75 | 27.362 + 295 | 24.81 + 185 |
| 8 | 28.1 | 27.526 + 261 | 13.70 + 67 | 41.587 + 263 | 33.85 + 153 | 62.057 + 278 | 53.63 + 34 | 27.634 + 272 | 26.57 + 176 |
| 9 | 7.1 | 27.759 + 233 | 13.41 + 29 | 41.824 + 237 | 35.20 + 135 | 62.307 + 250 | 53.72 - 9 | 27.879 + 245 | 28.22 + 165 |
| 9 | 17.1 | 27.959 + 200 | 13.50 - 9 | 42.029 + 205 | 36.34 + 114 | 62.520 + 213 | 54.24 - 52 | 28.092 + 213 | 29.70 + 148 |
| 9 | 27.1 | 28.125 + 166 | 13.92 - 42 | 42.204 + 175 | 37.26 + 92 | 62.699 + 179 | 55.13 - 89 | 28.275 + 183 | 31.02 + 132 |
| 10 | 7.0 | 28.257 + 132 | 14.66 - 74 | 42.348 + 144 | 37.96 + 70 | 62.841 + 142 | 56.35 - 122 | 28.426 + 151 | 32.16 + 114 |
| 10 | 17.0 | 28.353 + 96 | 15.66 - 100 | 42.459 + 111 | 38.44 + 48 | 62.943 + 102 | 57.85 - 150 | 28.543 + 117 | 33.10 + 94 |
| 10 | 27.0 | 28.417 + 64 | 16.84 - 118 | 42.540 + 81 | 38.73 + 29 | 63.011 + 68 | 59.53 - 168 | 28.632 + 89 | 33.87 + 77 |
| 11 | 5.9 | 28.449 + 32 | 18.18 - 134 | 42.592 + 52 | 38.84 + 11 | 63.043 + 32 | 61.35 - 182 | 28.690 + 58 | 34.46 + 59 |
| 11 | 15.9 | 28.450 + 1 | 19.58 - 140 | 42.616 + 24 | 38.78 - 6 | 63.042 - 1 | 63.18 - 183 | 28.718 + 28 | 34.86 + 40 |
| 11 | 25.9 | 28.425 - 25 | 20.97 - 139 | 42.614 - 2 | 38.61 - 17 | 63.012 - 30 | 64.97 - 179 | 28.720 + 2 | 35.11 + 25 |
| 12 | 5.9 | 28.374 - 51 | 22.31 - 134 | 42.587 - 27 | 38.32 - 29 | 62.953 - 59 | 66.65 - 168 | 28.694 - 26 | 35.20 + 9 |
| 12 | 15.8 | 28.301 - 73 | 23.51 - 120 | 42.536 - 51 | 37.93 - 39 | 62.870 - 83 | 68.13 - 148 | 28.643 - 51 | 35.14 - 6 |
| 12 | 25.8 | 28.209 - 92 | 24.55 - 104 | 42.465 - 71 | 37.49 - 44 | 62.767 - 103 | 69.36 - 123 | 28.570 - 73 | 34.94 - 20 |
| 12 | 35.8 | 28.098 - 111 | 25.40 - 85 | 42.373 - 92 | 36.98 - 51 | 62.644 - 123 | 70.32 - 96 | 28.475 - 95 | 34.61 - 33 |
| | | - 122 | - 60 | - 106 | - 54 | - 134 | - 62 | - 111 | - 45 |
| Mean Place | 26.463 | 29.57 | 40.768 | 24.38 | 60.855 | 71.26 | 26.875 | 19.29 | |
| sec δ, tan δ | +1.040 | -0.287 | +1.013 | +0.160 | +1.104 | -0.469 | +1.045 | +0.304 | |
| da(ψ), dδ(ψ) | +0.058 | +0.36 | +0.063 | +0.36 | +0.056 | +0.36 | +0.065 | +0.35 | |
| da(ε), dδ(ε) | +0.017 | +0.44 | -0.010 | +0.44 | +0.028 | +0.44 | -0.018 | +0.45 | |
| Dble.Trans. | October 17 | | October 17 | | October 18 | | October 18 | | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 1051 | | 62 | | 1052 | | 64 | |
|--------------|-----------------------------------|--------------------------------------|-----------------------------------|--------------------------------------|-----------------------------------|--------------------------------------|-----------------------------------|--------------------------------------|
| | χ Ceti | | ζ Ceti | | 2 Persei | | α Trianguli | |
| Mag. Spect. | 4.77 | F0 | 3.92 | K0 | 5.64 | B9 | 3.58 | F5 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | ^h ^m 1 48 | ^o ['] - 10 44 | ^h ^m 1 50 | ^o ['] - 10 23 | ^h ^m 1 51 | ^o ['] + 50 43 | ^h ^m 1 52 | ^o ['] + 29 30 |
| 1 -9.2 | ^s 53.851 - 75 | 83.66 -105 | ^s 46.188 - 72 | 78.20 -104 | ^s 15.198 - 143 | 40.14 +121 | ^s 16.577 - 79 | 48.13 + 35 |
| 1 0.8 | 53.760 - 91 | 84.55 - 89 | 46.097 - 91 | 79.09 - 89 | 15.020 - 178 | 40.95 + 81 | 16.475 - 102 | 48.24 + 11 |
| 1 10.8 | 53.651 - 109 | 85.29 - 74 | 45.990 - 107 | 79.84 - 75 | 14.810 - 210 | 41.34 + 39 | 16.350 - 125 | 48.10 - 14 |
| 1 20.7 | 53.530 - 121 | 85.83 - 54 | 45.869 - 121 | 80.38 - 54 | 14.577 - 233 | 41.26 - 8 | 16.207 - 143 | 47.71 - 39 |
| 1 30.7 | 53.403 - 127 | 86.16 - 33 | 45.743 - 126 | 80.72 - 34 | 14.333 - 244 | 40.77 - 49 | 16.056 - 151 | 47.10 - 61 |
| 2 9.7 | 53.274 - 129 | 86.28 - 12 | 45.614 - 129 | 80.85 - 13 | 14.087 - 246 | 39.85 - 92 | 15.901 - 155 | 46.28 - 82 |
| 2 19.7 | 53.152 - 122 | 86.14 + 14 | 45.491 - 123 | 80.73 + 12 | 13.854 - 233 | 38.55 - 130 | 15.752 - 149 | 45.29 - 99 |
| 3 1.6 | 53.043 - 109 | 85.78 + 36 | 45.381 - 110 | 80.38 + 35 | 13.647 - 207 | 36.96 - 159 | 15.621 - 131 | 44.19 - 110 |
| 3 11.6 | 52.953 - 90 | 85.16 + 62 | 45.290 - 91 | 79.79 + 59 | 13.476 - 171 | 35.11 - 185 | 15.512 - 109 | 43.02 - 117 |
| 3 21.6 | 52.893 - 60 | 84.29 + 87 | 45.229 - 61 | 78.94 + 85 | 13.356 - 120 | 33.12 - 199 | 15.440 - 72 | 41.85 - 117 |
| 3 31.6 | 52.866 - 27 | 83.18 +111 | 45.201 - 28 | 77.84 +110 | 13.295 - 61 | 31.08 - 204 | 15.408 - 32 | 40.75 - 110 |
| 4 10.5 | 52.877 + 11 | 81.81 +137 | 45.210 + 9 | 76.51 +133 | 13.297 + 2 | 29.05 - 203 | 15.423 + 15 | 39.77 - 98 |
| 4 20.5 | 52.933 + 56 | 80.20 +161 | 45.264 + 54 | 74.92 +159 | 13.371 + 74 | 27.15 - 190 | 15.489 + 66 | 38.98 - 79 |
| 4 30.5 | 53.032 + 99 | 78.39 +181 | 45.362 + 98 | 73.12 +180 | 13.514 + 143 | 25.47 - 168 | 15.606 + 117 | 38.42 - 56 |
| 5 10.4 | 53.176 + 144 | 76.37 +202 | 45.505 + 143 | 71.13 +199 | 13.724 + 210 | 24.04 - 143 | 15.775 + 169 | 38.11 - 31 |
| 5 20.4 | 53.364 + 188 | 74.21 +216 | 45.691 + 186 | 68.98 +215 | 14.000 + 276 | 22.96 - 108 | 15.993 + 218 | 38.12 + 1 |
| 5 30.4 | 53.589 + 225 | 71.95 +226 | 45.915 + 224 | 66.74 +224 | 14.330 + 330 | 22.25 - 71 | 16.253 + 260 | 38.43 + 31 |
| 6 9.4 | 53.848 + 259 | 69.62 +233 | 46.173 + 258 | 64.42 +232 | 14.707 + 377 | 21.93 - 32 | 16.550 + 297 | 39.06 + 63 |
| 6 19.3 | 54.135 + 287 | 67.30 +232 | 46.459 + 286 | 62.10 +232 | 15.123 + 416 | 22.06 + 13 | 16.876 + 326 | 40.00 + 94 |
| 6 29.3 | 54.440 + 306 | 65.04 +226 | 46.764 + 306 | 59.84 +226 | 15.561 + 438 | 22.58 + 52 | 17.220 + 344 | 41.21 +121 |
| 7 9.3 | 54.758 + 318 | 62.88 +216 | 47.082 + 318 | 57.68 +216 | 16.016 + 455 | 23.51 + 93 | 17.577 + 357 | 42.67 +146 |
| 7 19.3 | 55.079 + 321 | 60.90 +198 | 47.403 + 321 | 55.69 +199 | 16.474 + 458 | 24.83 +132 | 17.936 + 359 | 44.35 +168 |
| 7 29.2 | 55.396 + 317 | 59.14 +176 | 47.720 + 317 | 53.93 +176 | 16.922 + 448 | 26.48 +165 | 18.288 + 352 | 46.18 +183 |
| 8 8.2 | 55.703 + 307 | 57.64 +150 | 48.027 + 307 | 52.41 +152 | 17.357 + 435 | 28.44 +196 | 18.628 + 340 | 48.14 +196 |
| 8 18.2 | 55.990 + 287 | 56.46 +118 | 48.316 + 289 | 51.22 +119 | 17.766 + 409 | 30.67 +223 | 18.948 + 320 | 50.17 +203 |
| 8 28.1 | 56.255 + 265 | 55.59 + 87 | 48.582 + 266 | 50.34 + 88 | 18.143 + 377 | 33.10 +243 | 19.243 + 295 | 52.22 +205 |
| 9 7.1 | 56.494 + 239 | 55.07 + 52 | 48.822 + 240 | 49.80 + 54 | 18.485 + 342 | 35.71 +261 | 19.510 + 267 | 54.27 +205 |
| 9 17.1 | 56.700 + 206 | 54.91 + 16 | 49.030 + 208 | 49.61 + 19 | 18.784 + 299 | 38.42 +271 | 19.744 + 234 | 56.26 +199 |
| 9 27.1 | 56.875 + 175 | 55.05 - 14 | 49.207 + 177 | 49.73 - 12 | 19.041 + 257 | 41.18 +276 | 19.945 + 201 | 58.17 +191 |
| 10 7.0 | 57.018 + 143 | 55.50 - 45 | 49.352 + 145 | 50.17 - 44 | 19.252 + 211 | 43.98 +280 | 20.113 + 168 | 59.98 +181 |
| 10 17.0 | 57.126 + 108 | 56.22 - 72 | 49.462 + 110 | 50.86 - 69 | 19.415 + 163 | 46.72 +274 | 20.245 + 132 | 61.64 +166 |
| 10 27.0 | 57.203 + 77 | 57.13 - 91 | 49.542 + 80 | 51.75 - 89 | 19.533 + 118 | 49.37 +265 | 20.345 + 100 | 63.14 +150 |
| 11 6.0 | 57.249 + 46 | 58.21 - 08 | 49.590 + 48 | 52.82 - 107 | 19.603 + 70 | 51.90 +253 | 20.411 + 66 | 64.49 +135 |
| 11 15.9 | 57.265 + 16 | 59.38 - 117 | 49.609 + 19 | 53.97 - 115 | 19.624 + 21 | 54.22 +232 | 20.444 + 33 | 65.63 +114 |
| 11 25.9 | 57.256 - 9 | 60.58 - 120 | 49.602 - 7 | 55.16 - 119 | 19.601 - 23 | 56.30 +208 | 20.447 + 3 | 66.58 + 95 |
| 12 5.9 | 57.220 - 36 | 61.77 - 119 | 49.568 - 34 | 56.34 - 118 | 19.531 - 70 | 58.10 +180 | 20.418 - 29 | 67.31 + 73 |
| 12 15.8 | 57.161 - 59 | 62.87 - 110 | 49.511 - 57 | 57.44 - 110 | 19.418 - 113 | 59.53 +143 | 20.360 - 58 | 67.80 + 49 |
| 12 25.8 | 57.082 - 79 | 63.87 - 100 | 49.433 - 78 | 58.43 - 99 | 19.266 - 152 | 60.61 +108 | 20.276 - 84 | 68.07 + 27 |
| 12 35.8 | 56.983 - 99 | 64.72 - 85 | 49.336 - 97 | 59.28 - 85 | 19.077 - 189 | 61.26 + 65 | 20.166 - 110 | 68.08 + 1 |
| | - 112 | - 66 | - 111 | - 67 | - 215 | + 20 | - 129 | - 24 |
| Mean Place | 55.279 | 70.37 | 47.617 | 65.11 | 17.460 | 35.56 | 18.554 | 48.61 |
| sec δ, tan δ | +1.018 | -0.190 | +1.017 | -0.184 | +1.580 | +1.223 | +1.149 | +0.566 |
| dα(ψ), dδ(ψ) | +0.059 | +0.35 | +0.059 | +0.35 | +0.076 | +0.35 | +0.068 | +0.35 |
| dα(ε), dδ(ε) | +0.011 | +0.46 | +0.011 | +0.46 | -0.072 | +0.47 | -0.033 | +0.47 |
| Dble. Trans. | October 19 | | October 19 | | October 19 | | October 19 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 65 | | | 67 | | 63 | | 1053 | |
|----------------|------------|--------|------|-------------|--------|---------------|--------|-------------|--------|
| | ξ Piscium | | | ψ Phoenicis | | ε Cassiopeiae | | φ Phoenicis | |
| Mag.Spect. | 4.84 | K0 | | 4.41 | M3 | 3.44 | B3 | 5.00 | B9 |
| U.T. | R.A. | Dec. | | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° ' " | | h m | ° ' " | h m | ° ' " | h m | ° ' " |
| | 1 52 | + 3 07 | | 1 53 | -46 21 | 1 53 | +63 35 | 1 53 | -42 33 |
| 1 ^d | 49.714 | 07.89 | -63 | 05.977 | -172 | 22.287 | +245 | 47.884 | -152 |
| 1 ^s | 49.632 | 07.27 | -62 | 05.781 | -196 | 21.990 | -297 | 47.711 | -173 |
| 1 | 49.531 | 06.66 | -61 | 05.566 | -215 | 21.647 | -343 | 47.517 | -194 |
| 1 | 49.417 | 06.09 | -57 | 05.338 | -228 | 21.272 | -375 | 47.312 | -205 |
| 1 | 49.295 | 05.60 | -49 | 05.108 | -230 | 20.884 | -388 | 47.103 | -209 |
| 2 | 49.169 | 05.17 | -43 | 04.879 | -229 | 20.494 | -390 | 46.894 | -209 |
| 2 | 49.049 | 04.86 | -31 | 04.663 | -216 | 20.126 | -368 | 46.697 | -197 |
| 3 | 48.941 | 04.67 | -19 | 04.469 | -194 | 19.799 | -327 | 46.520 | -177 |
| 3 | 48.853 | 04.63 | -8 | 04.302 | -167 | 19.525 | -274 | 46.367 | -153 |
| 3 | 48.793 | 04.77 | +4 | 04.175 | -127 | 19.326 | -199 | 46.252 | -115 |
| 3 | 48.768 | 05.10 | +33 | 04.093 | -82 | 19.210 | -116 | 46.179 | -73 |
| 4 | 48.781 | 05.63 | +53 | 04.060 | -33 | 19.185 | -25 | 46.153 | -26 |
| 4 | 48.836 | 06.39 | +76 | 04.084 | +24 | 19.261 | +76 | 46.181 | +28 |
| 4 | 48.936 | 07.43 | +100 | 04.165 | +81 | 19.432 | +171 | 46.262 | +81 |
| 5 | 49.082 | 08.69 | +146 | 04.303 | +138 | 19.697 | +265 | 46.399 | +137 |
| 5 | 49.272 | 10.15 | +190 | 04.500 | +197 | 20.052 | +355 | 46.591 | +192 |
| 5 | 49.499 | 11.79 | +227 | 04.747 | +247 | 20.480 | +428 | 46.830 | +239 |
| 6 | 49.760 | 13.59 | +180 | 05.043 | +296 | 20.975 | +495 | 47.115 | +285 |
| 6 | 50.048 | 15.51 | +192 | 05.380 | +337 | 21.522 | +547 | 47.439 | +324 |
| 6 | 50.353 | 17.47 | +196 | 05.745 | +365 | 22.101 | +579 | 47.790 | +351 |
| 7 | 50.671 | 19.47 | +200 | 06.134 | +389 | 22.704 | +603 | 48.163 | +373 |
| 7 | 50.992 | 21.42 | +195 | 06.535 | +401 | 23.313 | +609 | 48.545 | +382 |
| 7 | 51.308 | 23.28 | +186 | 06.934 | +399 | 23.912 | +599 | 48.927 | +382 |
| 8 | 51.615 | 25.01 | +173 | 07.327 | +393 | 24.495 | +583 | 49.302 | +375 |
| 8 | 51.902 | 26.55 | +154 | 07.699 | +372 | 25.044 | +549 | 49.656 | +354 |
| 8 | 52.168 | 27.88 | +133 | 08.043 | +344 | 25.552 | +508 | 49.984 | +328 |
| 9 | 52.408 | 28.98 | +110 | 08.352 | +309 | 26.014 | +462 | 50.280 | +296 |
| 9 | 52.618 | 29.82 | +84 | 08.617 | +265 | 26.418 | +404 | 50.533 | +253 |
| 9 | 52.798 | 30.41 | +59 | 08.836 | +219 | 26.763 | +345 | 50.744 | +211 |
| 10 | 52.948 | 30.76 | +35 | 09.005 | +169 | 27.046 | +283 | 50.908 | +164 |
| 10 | 53.064 | 30.86 | +10 | 09.120 | +115 | 27.258 | +212 | 51.023 | +115 |
| 10 | 53.152 | 30.78 | -8 | 09.185 | +65 | 27.405 | +147 | 51.091 | +68 |
| 11 | 53.210 | 30.51 | -27 | 09.199 | +14 | 27.480 | +75 | 51.113 | +22 |
| 11 | 53.239 | 30.10 | -41 | 09.164 | -35 | 27.483 | +3 | 51.089 | -24 |
| 11 | 53.243 | 29.59 | -51 | 09.087 | -77 | 27.418 | -65 | 51.027 | -62 |
| 12 | 53.220 | 29.01 | -58 | 08.969 | -118 | 27.282 | -136 | 50.926 | -101 |
| 12 | 53.174 | 28.39 | -62 | 08.816 | -153 | 27.081 | -201 | 50.792 | -134 |
| 12 | 53.106 | 27.76 | -63 | 08.635 | -181 | 26.823 | -258 | 50.633 | -159 |
| 12 | 53.017 | 27.12 | -64 | 08.429 | -206 | 26.509 | -314 | 50.449 | -184 |
| | | | -59 | | -220 | | -350 | | -198 |
| Mean Place | 51.342 | 16.54 | | 06.357 | 66.27 | 24.782 | 74.81 | 48.433 | 46.62 |
| sec δ, tan δ | +1.001 | +0.055 | | +1.449 | -1.049 | +2.249 | +2.015 | +1.358 | -0.918 |
| da(ψ), dδ(ψ) | +0.062 | +0.35 | | +0.048 | +0.35 | +0.087 | +0.35 | +0.050 | +0.35 |
| da(ε), dδ(ε) | -0.003 | +0.47 | | +0.062 | +0.47 | -0.118 | +0.47 | +0.054 | +0.48 |
| Dble.Trans. | October 20 | | | October 20 | | October 20 | | October 20 | |

APPARENT PLACES OF STARS, 1986

31

AT UPPER TRANSIT AT GREENWICH

| No. | 66 | | 69 | | 68 | | 72 | | |
|--------------|------------|--------------|----------------------|--------------|-------------|--------------|-------------|--------------|-------------|
| | β Arietis | | η ² Hydri | | χ Eridani | | α Hydri | | |
| Mag. Spect. | 2.72 | A5 | 4.72 | K0 | 3.73 | G5 | 3.02 | F0 | |
| U.T. | R.A. | | R.A. | | R.A. | | R.A. | | |
| | Dec. | | Dec. | | Dec. | | Dec. | | |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " | |
| | 1 53 | + 20 44 | 1 54 | - 67 42 | 1 55 | - 51 40 | 1 58 | - 61 37 | |
| 1 | -9.2 | 51.667 - 67 | 29.59 + 0 | 37.192 - 423 | 75.06 - 157 | 25.927 - 205 | 56.84 - 166 | 21.562 - 307 | 92.19 - 167 |
| 1 | 0.8 | 51.578 - 89 | 29.45 - 14 | 36.728 - 464 | 76.07 - 101 | 25.697 - 230 | 58.01 - 117 | 21.220 - 342 | 92.34 - 115 |
| 1 | 10.8 | 51.468 - 110 | 29.13 - 32 | 36.231 - 497 | 76.53 + 46 | 25.444 - 253 | 58.69 - 68 | 20.850 - 370 | 93.94 - 60 |
| 1 | 20.7 | 51.342 - 126 | 28.66 - 47 | 35.719 - 512 | 76.35 + 18 | 25.178 - 266 | 58.82 - 13 | 20.464 - 386 | 93.94 + 0 |
| 1 | 30.7 | 51.207 - 135 | 28.07 - 59 | 35.212 - 507 | 75.59 + 76 | 24.911 - 267 | 58.41 + 41 | 20.079 - 385 | 93.37 + 57 |
| 2 | 9.7 | 51.068 - 139 | 27.36 - 71 | 34.715 - 497 | 74.26 + 133 | 24.646 - 265 | 57.49 + 92 | 19.699 - 380 | 92.24 + 113 |
| 2 | 19.7 | 50.935 - 133 | 26.57 - 79 | 34.251 - 464 | 72.38 + 188 | 24.396 - 250 | 56.04 + 145 | 19.341 - 358 | 90.56 + 168 |
| 3 | 1.6 | 50.816 - 119 | 25.76 - 81 | 33.834 - 417 | 70.04 + 234 | 24.172 - 224 | 54.14 + 190 | 19.017 - 324 | 88.42 + 214 |
| 3 | 11.6 | 50.718 - 98 | 24.94 - 82 | 33.468 - 366 | 67.27 + 277 | 23.978 - 194 | 51.83 + 231 | 18.734 - 283 | 85.84 + 258 |
| 3 | 21.6 | 50.653 - 65 | 24.19 - 75 | 33.176 - 292 | 64.13 + 314 | 23.828 - 150 | 49.12 + 271 | 18.508 - 226 | 82.87 + 297 |
| 3 | 31.6 | 50.625 - 28 | 23.55 - 64 | 32.962 - 214 | 60.72 + 341 | 23.726 - 102 | 46.13 + 299 | 18.344 - 164 | 79.63 + 324 |
| 4 | 10.5 | 50.640 + 15 | 23.07 - 48 | 32.833 - 129 | 57.08 + 364 | 23.679 - 47 | 42.88 + 325 | 18.249 - 95 | 76.12 + 351 |
| 4 | 20.5 | 50.702 + 62 | 22.82 - 25 | 32.801 - 32 | 53.31 + 377 | 23.695 + 16 | 39.43 + 345 | 18.233 - 16 | 72.46 + 366 |
| 4 | 30.5 | 50.809 + 107 | 22.75 - 7 | 32.863 + 62 | 49.49 + 382 | 23.772 + 77 | 35.90 + 353 | 18.294 + 61 | 68.73 + 373 |
| 5 | 10.4 | 50.969 + 160 | 22.94 + 19 | 33.023 + 160 | 45.68 + 381 | 23.912 + 140 | 32.30 + 360 | 18.434 + 140 | 64.97 + 376 |
| 5 | 20.4 | 51.174 + 205 | 23.43 + 49 | 33.281 + 258 | 41.99 + 369 | 24.117 + 205 | 28.75 + 355 | 18.656 + 222 | 61.29 + 368 |
| 5 | 30.4 | 51.418 + 244 | 24.19 + 76 | 33.625 + 344 | 38.50 + 349 | 24.377 + 260 | 25.34 + 341 | 18.948 + 292 | 57.79 + 350 |
| 6 | 9.4 | 51.698 + 280 | 25.22 + 103 | 34.053 + 428 | 35.25 + 325 | 24.690 + 313 | 22.09 + 325 | 19.310 + 362 | 54.50 + 329 |
| 6 | 19.3 | 52.005 + 307 | 26.49 + 127 | 34.555 + 502 | 32.37 + 288 | 25.049 + 359 | 19.14 + 295 | 19.731 + 421 | 51.55 + 295 |
| 6 | 29.3 | 52.330 + 325 | 27.97 + 148 | 35.111 + 556 | 29.90 + 247 | 25.441 + 392 | 16.53 + 261 | 20.197 + 466 | 48.98 + 257 |
| 7 | 9.3 | 52.668 + 338 | 29.62 + 165 | 35.715 + 604 | 27.90 + 200 | 25.861 + 420 | 14.32 + 221 | 20.702 + 505 | 46.85 + 213 |
| 7 | 19.3 | 53.008 + 340 | 31.41 + 179 | 36.346 + 631 | 26.45 + 145 | 26.294 + 433 | 12.61 + 171 | 21.227 + 525 | 45.25 + 160 |
| 7 | 29.2 | 53.341 + 333 | 33.27 + 186 | 36.984 + 638 | 25.56 + 89 | 26.728 + 434 | 11.39 + 122 | 21.758 + 531 | 44.19 + 106 |
| 8 | 8.2 | 53.664 + 323 | 35.17 + 190 | 37.618 + 634 | 25.26 + 30 | 27.156 + 428 | 10.72 + 67 | 22.285 + 527 | 43.71 + 48 |
| 8 | 18.2 | 53.968 + 304 | 37.06 + 189 | 38.222 + 604 | 25.58 - 32 | 27.563 + 407 | 10.64 + 8 | 22.789 + 504 | 43.85 - 14 |
| 8 | 28.1 | 54.248 + 280 | 38.90 + 184 | 38.783 + 561 | 26.46 - 88 | 27.939 + 376 | 11.09 - 45 | 23.256 + 467 | 44.55 - 70 |
| 9 | 7.1 | 54.502 + 254 | 40.66 + 176 | 39.287 + 504 | 27.92 - 146 | 28.279 + 340 | 12.10 - 101 | 23.679 + 423 | 45.82 - 127 |
| 9 | 17.1 | 54.725 + 223 | 42.28 + 162 | 39.713 + 426 | 29.89 - 197 | 28.569 + 290 | 13.62 - 152 | 24.039 + 360 | 47.61 - 179 |
| 9 | 27.1 | 54.917 + 192 | 43.77 + 149 | 40.055 + 342 | 32.27 - 238 | 28.808 + 239 | 15.57 - 195 | 24.334 + 295 | 49.83 - 222 |
| 10 | 7.0 | 55.077 + 160 | 45.10 + 133 | 40.305 + 250 | 35.01 - 274 | 28.992 + 184 | 17.89 - 232 | 24.555 + 221 | 52.43 - 260 |
| 10 | 17.0 | 55.204 + 127 | 46.26 + 116 | 40.450 + 145 | 37.98 - 297 | 29.115 + 123 | 20.49 - 260 | 24.695 + 140 | 55.29 - 286 |
| 10 | 27.0 | 55.300 + 96 | 47.24 + 98 | 40.496 + 46 | 41.06 - 308 | 29.181 + 66 | 23.23 - 274 | 24.758 + 63 | 58.27 - 398 |
| 11 | 6.0 | 55.366 + 66 | 48.05 + 81 | 40.440 - 56 | 44.16 - 310 | 29.189 + 8 | 26.05 - 282 | 24.741 - 17 | 61.31 - 304 |
| 11 | 15.9 | 55.400 + 34 | 48.67 + 62 | 40.285 - 155 | 47.10 - 294 | 29.141 - 48 | 26.05 - 274 | 24.741 - 94 | 61.31 - 292 |
| 11 | 25.9 | 55.408 + 8 | 49.14 + 47 | 40.045 - 240 | 49.80 - 270 | 29.045 - 96 | 31.35 - 256 | 24.647 - 161 | 64.23 - 271 |
| 12 | 5.9 | 55.386 - 22 | 49.42 + 28 | 39.722 - 323 | 52.16 - 236 | 28.901 - 144 | 33.66 - 231 | 24.260 - 226 | 69.35 - 241 |
| 12 | 15.8 | 55.337 - 49 | 49.53 + 11 | 39.332 - 390 | 54.04 - 188 | 28.718 - 183 | 35.58 - 192 | 23.981 - 279 | 71.31 - 196 |
| 12 | 25.8 | 55.265 - 72 | 49.48 - 5 | 38.892 - 440 | 55.43 - 139 | 28.503 - 215 | 37.07 - 149 | 23.660 - 321 | 72.81 - 150 |
| 12 | 35.8 | 55.169 - 96 | 49.26 - 22 | 38.408 - 484 | 56.25 - 82 | 28.261 - 242 | 38.07 - 100 | 23.301 - 359 | 73.77 - 96 |
| | | - 114 | - 37 | - 506 | - 20 | - 258 | - 46 | - 377 | - 36 |
| Mean Place | 53.532 | 32.63 | 35.578 | 48.56 | 26.034 | 32.83 | 20.761 | 66.90 | |
| sec δ, tan δ | +1.069 | +0.379 | +2.637 | -2.440 | +1.613 | -1.265 | +2.105 | -1.852 | |
| dα(ψ), δδ(ψ) | +0.066 | +0.35 | +0.030 | +0.35 | +0.045 | +0.35 | +0.037 | +0.35 | |
| dα(ε), δδ(ε) | -0.022 | +0.48 | +0.143 | +0.48 | +0.074 | +0.48 | +0.107 | +0.49 | |
| Dbie. Trans. | October 20 | | October 20 | | October 20 | | October 21 | | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 71 | | 1054 | | 70 | | 73 | | |
|--------------|------------|--------------|-------------|--------------|----------------|--------------|------------------|--------------|-------------|
| | υ Ceti | | 4 Persei | | 50 Cassiopeiae | | γ Andromedae* p. | | |
| Mag.Spect. | 4.18 | M0 | 4.99 | B8 | 4.06 | A2 | 2.28 | K0 | |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | |
| | h m | ° / | h m | ° / | h m | ° / | h m | ° / | |
| | 1 59 | -21 08 | 2 01 | +54 25 | 2 02 | +72 21 | 2 03 | +42 15 | |
| 1 | -9.2 | 20.972 - 83 | 50.21 - 135 | 21.477 - 153 | 27.60 + 143 | 13.012 - 392 | 32.04 + 212 | 01.902 - 97 | 58.50 + 94 |
| 1 | 0.8 | 20.869 - 103 | 51.31 - 110 | 21.284 - 193 | 28.63 + 103 | 12.541 - 471 | 33.67 + 163 | 01.773 - 129 | 59.12 + 62 |
| 1 | 10.8 | 20.748 - 121 | 52.16 - 85 | 21.053 - 231 | 29.23 + 60 | 11.998 - 543 | 34.78 + 111 | 01.615 - 158 | 59.39 + 27 |
| 1 | 20.8 | 20.612 - 136 | 52.69 - 53 | 20.794 - 259 | 29.33 + 10 | 11.404 - 594 | 35.29 + 51 | 01.433 - 182 | 59.28 - 11 |
| 1 | 30.7 | 20.470 - 142 | 52.92 - 23 | 20.521 - 273 | 28.99 - 34 | 10.789 - 615 | 35.22 - 7 | 01.239 - 194 | 58.83 - 45 |
| 2 | 9.7 | 20.325 - 145 | 52.83 + 9 | 20.242 - 279 | 28.20 - 79 | 10.171 - 618 | 34.58 - 64 | 01.038 - 201 | 58.03 - 80 |
| 2 | 19.7 | 20.185 - 140 | 52.40 + 43 | 19.975 - 267 | 26.98 - 122 | 09.584 - 587 | 33.36 - 122 | 00.844 - 194 | 56.93 - 110 |
| 3 | 1.6 | 20.058 - 127 | 51.65 + 75 | 19.735 - 240 | 25.42 - 156 | 09.055 - 529 | 31.68 - 168 | 00.669 - 175 | 55.60 - 133 |
| 3 | 11.6 | 19.950 - 108 | 50.60 + 105 | 19.532 - 203 | 23.57 - 185 | 08.603 - 452 | 29.58 - 210 | 00.521 - 148 | 54.06 - 154 |
| 3 | 21.6 | 19.871 - 79 | 49.22 + 138 | 19.383 - 149 | 21.52 - 205 | 08.260 - 343 | 27.16 - 242 | 00.414 - 107 | 52.42 - 164 |
| 3 | 31.6 | 19.826 - 45 | 47.58 + 164 | 19.297 - 86 | 19.39 - 213 | 08.039 - 221 | 24.55 - 261 | 00.356 - 58 | 50.76 - 166 |
| 4 | 10.5 | 19.819 - 7 | 45.67 + 191 | 19.279 - 18 | 17.23 - 216 | 07.947 - 92 | 21.82 - 273 | 00.351 - 5 | 49.14 - 162 |
| 4 | 20.5 | 19.859 + 40 | 43.51 + 216 | 19.339 + 60 | 15.17 - 206 | 08.002 + 55 | 19.11 - 271 | 00.408 + 57 | 47.65 - 149 |
| 4 | 30.5 | 19.943 + 84 | 41.16 + 235 | 19.474 + 135 | 13.29 - 188 | 08.193 + 191 | 16.54 - 257 | 00.524 + 116 | 46.36 - 129 |
| 5 | 10.4 | 20.074 + 131 | 38.65 + 251 | 19.682 + 208 | 11.64 - 165 | 08.520 + 327 | 14.17 - 237 | 00.700 + 176 | 45.31 - 105 |
| 5 | 20.4 | 20.251 + 177 | 36.02 + 263 | 19.963 + 281 | 10.32 - 132 | 08.978 + 458 | 12.11 - 206 | 00.934 + 234 | 44.58 - 73 |
| 5 | 30.4 | 20.468 + 217 | 33.36 + 266 | 20.302 + 339 | 09.37 - 95 | 09.543 + 565 | 10.44 - 167 | 01.217 + 283 | 44.19 - 39 |
| 6 | 9.4 | 20.722 + 254 | 30.69 + 267 | 20.696 + 394 | 08.80 - 57 | 10.205 + 662 | 09.17 - 127 | 01.544 + 327 | 44.15 - 4 |
| 6 | 19.3 | 21.007 + 285 | 28.09 + 260 | 21.133 + 437 | 08.68 - 12 | 10.946 + 741 | 08.40 - 77 | 01.906 + 362 | 44.50 + 35 |
| 6 | 29.3 | 21.313 + 306 | 25.64 + 245 | 21.596 + 463 | 08.97 + 29 | 11.738 + 792 | 08.10 - 30 | 02.291 + 385 | 45.18 + 68 |
| 7 | 9.3 | 21.636 + 323 | 23.36 + 228 | 22.081 + 485 | 09.68 + 71 | 12.570 + 832 | 08.30 + 20 | 02.693 + 402 | 46.22 + 104 |
| 7 | 19.3 | 21.965 + 329 | 21.37 + 199 | 22.571 + 490 | 10.81 + 113 | 13.417 + 847 | 09.01 + 71 | 03.099 + 406 | 47.58 + 136 |
| 7 | 29.2 | 22.292 + 327 | 19.67 + 170 | 23.055 + 484 | 12.29 + 148 | 14.256 + 839 | 10.18 + 117 | 03.500 + 401 | 49.20 + 162 |
| 8 | 8.2 | 22.612 + 320 | 18.32 + 135 | 23.527 + 472 | 14.12 + 183 | 14.256 + 823 | 11.81 + 163 | 03.500 + 391 | 51.08 + 188 |
| 8 | 18.2 | 22.914 + 302 | 17.38 + 94 | 23.973 + 446 | 16.25 + 213 | 15.860 + 781 | 13.86 + 205 | 04.260 + 369 | 53.15 + 207 |
| 8 | 28.1 | 23.194 + 280 | 16.84 + 54 | 24.389 + 416 | 18.61 + 236 | 16.588 + 728 | 16.26 + 240 | 04.603 + 343 | 55.36 + 221 |
| 9 | 7.1 | 23.448 + 254 | 16.71 + 13 | 24.769 + 380 | 21.18 + 257 | 17.257 + 669 | 19.01 + 275 | 04.918 + 315 | 57.68 + 232 |
| 9 | 17.1 | 23.670 + 222 | 17.00 - 29 | 25.104 + 335 | 23.91 + 273 | 17.844 + 587 | 22.02 + 301 | 05.196 + 278 | 60.06 + 238 |
| 9 | 27.1 | 23.859 + 189 | 17.66 - 66 | 25.395 + 291 | 26.72 + 281 | 18.351 + 507 | 25.23 + 321 | 05.439 + 243 | 62.45 + 239 |
| 10 | 7.0 | 24.014 + 155 | 18.66 - 100 | 25.638 + 243 | 29.60 + 288 | 18.768 + 417 | 28.61 + 338 | 05.644 + 205 | 64.83 + 238 |
| 10 | 17.0 | 24.132 + 118 | 19.95 - 129 | 25.829 + 191 | 32.46 + 286 | 19.081 + 313 | 32.07 + 346 | 05.807 + 163 | 67.14 + 231 |
| 10 | 27.0 | 24.217 + 85 | 21.44 - 149 | 25.972 + 143 | 35.26 + 280 | 19.297 + 216 | 35.54 + 347 | 05.934 + 127 | 69.34 + 220 |
| 11 | 6.0 | 24.268 + 51 | 23.10 - 166 | 26.061 + 89 | 37.97 + 271 | 19.404 + 107 | 38.97 + 343 | 06.019 + 85 | 71.41 + 207 |
| 11 | 15.9 | 24.285 + 17 | 24.81 - 171 | 26.096 + 35 | 40.48 + 251 | 19.399 - 5 | 42.24 + 327 | 06.064 + 45 | 73.30 + 189 |
| 11 | 25.9 | 24.274 - 11 | 26.51 - 170 | 26.081 - 15 | 42.78 + 230 | 19.290 - 109 | 45.31 + 307 | 06.071 + 7 | 74.98 + 168 |
| 12 | 5.9 | 24.233 - 41 | 28.14 - 163 | 26.012 - 69 | 44.80 + 202 | 19.069 - 221 | 48.09 + 278 | 06.038 - 33 | 76.41 + 143 |
| 12 | 15.8 | 24.167 - 66 | 29.60 - 146 | 25.894 - 118 | 46.46 + 166 | 18.746 - 323 | 50.47 + 238 | 05.967 - 71 | 77.54 + 113 |
| 12 | 25.8 | 24.078 - 89 | 30.87 - 127 | 25.732 - 162 | 47.76 + 130 | 18.334 - 412 | 52.42 + 195 | 05.862 - 105 | 78.37 + 83 |
| 12 | 35.8 | 23.967 - 111 | 31.89 - 102 | 25.525 - 207 | 48.62 + 86 | 17.837 - 497 | 53.86 + 144 | 05.723 - 139 | 78.85 + 48 |
| | | 23.967 - 126 | 31.89 - 73 | 25.525 - 238 | 48.62 + 40 | 17.837 - 557 | 53.86 + 87 | 05.723 - 164 | 78.85 + 11 |
| Mean Place | 22.136 | 34.43 | 23.748 | 22.10 | 15.705 | 24.02 | 03.990 | 55.47 | |
| sec δ, tan δ | +1.072 | -0.387 | +1.719 | +1.398 | +3.299 | +3.144 | +1.351 | +0.909 | |
| da(ψ), dδ(ψ) | +0.056 | +0.35 | +0.080 | +0.34 | +0.104 | +0.34 | +0.073 | +0.34 | |
| da(ε), dδ(ε) | +0.022 | +0.50 | -0.080 | +0.51 | -0.180 | +0.51 | -0.052 | +0.51 | |
| Dbie.Trans. | October 21 | | October 22 | | October 22 | | October 22 | | |

AT UPPER TRANSIT AT GREENWICH

| No. | 1055 | | 74 | | 75 | | 1056 | |
|--------------|-------------------------|-------------------------|-------------------------|------------------------|-------------------------|------------------------|-------------------------|-----------------------|
| | v Fornacis | | α Arietis | | β Trianguli | | 15 Arietis | |
| Mag.Spect. | 4.74 | A0p | 2.23 | K2 | 3.08 | A5 | 5.92 | M0 |
| U.T. | R.A. | | R.A. | | R.A. | | R.A. | |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " |
| | 2 03 | -29 21 | 2 06 | +23 23 | 2 08 | +34 55 | 2 09 | +19 26 |
| 1 -9.2 | 52.238 ^s -99 | 58.48 ["] -154 | 22.758 ^s -60 | 54.74 ["] +15 | 42.232 ^s -74 | 27.36 ["] +66 | 50.799 ^s -54 | 10.74 ["] -1 |
| 1 0.8 | 52.118 -120 | 59.71 -123 | 22.673 -85 | 54.72 -2 | 42.129 -103 | 27.75 +39 | 50.720 -79 | 10.61 -13 |
| 1 10.8 | 51.978 -140 | 60.61 -90 | 22.564 -109 | 54.52 -20 | 41.998 -131 | 27.86 +11 | 50.616 -104 | 10.33 -28 |
| 1 20.8 | 51.823 -155 | 61.12 -51 | 22.436 -128 | 54.13 -39 | 41.845 -153 | 27.67 -19 | 50.494 -122 | 09.92 -41 |
| 1 30.7 | 51.661 -162 | 61.24 -12 | 22.296 -140 | 53.60 -53 | 41.678 -167 | 27.21 -46 | 50.360 -134 | 09.40 -52 |
| 2 9.7 | 51.495 -166 | 60.98 +26 | 22.150 -146 | 52.93 -67 | 41.504 -174 | 26.48 -73 | 50.219 -141 | 08.78 -62 |
| 2 19.7 | 51.336 -159 | 60.32 +66 | 22.007 -143 | 52.14 -79 | 41.335 -169 | 25.52 -96 | 50.080 -139 | 08.09 -69 |
| 3 1.6 | 51.191 -145 | 59.29 +103 | 21.877 -130 | 51.29 -85 | 41.180 -155 | 24.39 -113 | 49.953 -127 | 07.38 -71 |
| 3 11.6 | 51.065 -126 | 57.90 +139 | 21.767 -110 | 50.41 -88 | 41.048 -132 | 23.12 -127 | 49.844 -109 | 06.67 -71 |
| 3 21.6 | 50.969 -96 | 56.16 +174 | 21.688 -79 | 49.57 -84 | 40.952 -96 | 21.78 -134 | 49.765 -79 | 06.02 -65 |
| 3 31.6 | 50.909 -60 | 54.12 +204 | 21.647 -41 | 48.81 -76 | 40.898 -54 | 20.47 -131 | 49.722 -43 | 05.47 -55 |
| 4 10.5 | 50.889 -20 | 51.81 +231 | 22.007 +2 | 48.18 -63 | 40.892 -6 | 19.22 -125 | 49.720 -2 | 05.06 -41 |
| 4 20.5 | 50.917 +28 | 49.25 +256 | 21.700 +51 | 47.75 -43 | 40.942 +50 | 18.12 -110 | 49.766 +46 | 04.88 -18 |
| 4 30.5 | 50.992 +75 | 46.53 +272 | 21.796 +96 | 47.52 -23 | 41.045 +103 | 17.22 -90 | 49.854 +88 | 04.88 +0 |
| 5 10.5 | 51.116 +124 | 43.65 +288 | 21.945 +149 | 47.51 -1 | 41.203 +158 | 16.56 -66 | 49.996 +142 | 05.08 +20 |
| 5 20.4 | 51.289 +173 | 40.70 +295 | 22.143 +198 | 47.80 +29 | 41.416 +213 | 16.19 -37 | 50.186 +190 | 05.58 +50 |
| 5 30.4 | 51.504 +215 | 37.76 +294 | 22.381 +238 | 48.36 +56 | 41.674 +258 | 16.14 -5 | 50.415 +229 | 06.34 +76 |
| 6 9.4 | 51.760 +256 | 34.84 +292 | 22.657 +276 | 49.19 +83 | 41.973 +299 | 16.40 +26 | 50.681 +266 | 07.34 +100 |
| 6 19.3 | 52.049 +289 | 32.07 +277 | 22.963 +306 | 50.28 +109 | 42.305 +332 | 17.00 +60 | 50.978 +297 | 08.58 +124 |
| 6 29.3 | 52.362 +313 | 29.49 +258 | 23.288 +325 | 51.60 +132 | 42.659 +354 | 17.90 +90 | 51.294 +316 | 10.01 +143 |
| 7 9.3 | 52.695 +333 | 27.16 +233 | 23.628 +340 | 53.11 +151 | 43.030 +371 | 19.09 +119 | 51.626 +332 | 11.60 +159 |
| 7 19.3 | 53.036 +341 | 25.17 +199 | 23.973 -345 | 54.78 +167 | 43.406 +376 | 20.54 +145 | 51.963 +337 | 13.31 +171 |
| 7 29.2 | 53.376 +340 | 23.54 +163 | 24.313 +340 | 56.55 +177 | 43.777 +371 | 22.20 +166 | 52.296 +333 | 15.09 +178 |
| 8 8.2 | 53.711 +335 | 22.32 +122 | 24.645 +332 | 58.40 +185 | 44.140 +363 | 24.04 +184 | 52.622 +326 | 16.91 +182 |
| 8 18.2 | 54.029 +318 | 21.57 +75 | 24.959 +314 | 60.26 +186 | 44.484 +344 | 26.01 +197 | 52.931 +309 | 18.70 +179 |
| 8 28.2 | 54.324 +295 | 21.27 +30 | 25.252 +293 | 62.10 +184 | 44.805 +321 | 28.05 +204 | 53.219 +288 | 20.43 +173 |
| 9 7.1 | 54.593 +289 | 21.44 -17 | 25.520 +268 | 63.88 +178 | 45.101 +296 | 30.16 +211 | 53.484 +265 | 22.08 +165 |
| 9 17.1 | 54.827 +234 | 22.07 -63 | 25.757 +237 | 65.56 +168 | 45.363 +262 | 32.26 +210 | 53.719 +235 | 23.59 +151 |
| 9 27.1 | 55.028 +201 | 23.10 -103 | 25.965 +208 | 67.13 +157 | 45.593 +230 | 34.33 +207 | 53.925 +206 | 24.96 +137 |
| 10 7.0 | 55.191 +163 | 24.50 -140 | 26.141 +176 | 68.57 +144 | 45.789 +196 | 36.34 +201 | 54.102 +177 | 26.18 +122 |
| 10 17.0 | 55.313 +122 | 26.21 -171 | 26.284 +143 | 69.84 +127 | 45.949 +160 | 38.25 +191 | 54.245 +143 | 27.22 +104 |
| 10 27.0 | 55.400 +87 | 28.11 -190 | 26.397 +113 | 70.96 +112 | 46.075 +126 | 40.04 +179 | 54.360 +115 | 28.10 +88 |
| 11 6.0 | 55.448 +48 | 30.17 -206 | 26.478 +81 | 71.92 +96 | 46.165 +90 | 41.69 +165 | 54.443 +83 | 28.81 +71 |
| 11 15.9 | 55.460 +12 | 32.26 -209 | 26.527 +49 | 72.70 +78 | 46.218 +53 | 43.16 +147 | 54.495 +52 | 29.35 +54 |
| 11 25.9 | 55.440 -20 | 34.30 -204 | 26.547 +20 | 73.32 +62 | 46.238 +20 | 44.44 +128 | 54.519 +24 | 29.75 +40 |
| 12 5.9 | 55.387 -53 | 36.23 -193 | 26.536 -11 | 73.75 +43 | 46.221 -17 | 45.51 +107 | 54.512 -7 | 29.98 +23 |
| 12 15.9 | 55.305 -82 | 37.92 -169 | 26.496 -40 | 74.01 +26 | 46.171 -50 | 46.32 +81 | 54.477 -35 | 30.07 +9 |
| 12 25.8 | 55.200 -105 | 39.36 -144 | 26.430 -66 | 74.10 +9 | 46.090 -81 | 46.89 +57 | 54.416 -61 | 30.02 -5 |
| 12 35.8 | 55.071 -129 | 40.48 -112 | 26.336 -94 | 74.00 -10 | 45.977 -113 | 47.16 +27 | 54.329 -87 | 29.81 -21 |
| | 55.071 -146 | 40.48 -75 | 26.336 -114 | 74.00 -27 | 45.977 -137 | 47.16 -1 | 54.329 -109 | 29.81 -33 |
| Mean Place | 53.158 | 40.70 | 24.601 | 56.47 | 44.206 | 25.95 | 52.569 | 13.53 |
| sec δ, tan δ | +1.147 | -0.563 | +1.090 | +0.433 | +1.220 | +0.698 | +1.060 | +0.353 |
| dα(ψ), dδ(ψ) | +0.053 | +0.34 | +0.067 | +0.34 | +0.071 | +0.34 | +0.066 | +0.34 |
| dα(ε), dδ(ε) | +0.032 | +0.51 | -0.025 | +0.52 | -0.039 | +0.53 | -0.020 | +0.54 |
| Dble.Trans. | October 22 | | October 23 | | October 24 | | October 24 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 1058 | | 78 | | 1057 | | 77 | | |
|--------------|---------------------|--------|------------|---------|------------|---------|-----------------------------|---------|-------|
| | ξ ¹ Ceti | | μ Fornacis | | 19 Arietis | | Bradley 299 (Andromedae) | | |
| Mag. Spect. | 4.54 | G5 | 5.24 | A0 | 5.99 | K5 | 5.40 | K0 | |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " | |
| | 2 12 | + 8 46 | 2 12 | - 30 46 | 2 12 | + 15 12 | 2 12 | + 51 00 | |
| 1 | -9.2 | 15 366 | 56 06 | 18 029 | 89 99 | 17 302 | 57 31 | 39 921 | 18 41 |
| 1 | 0.8 | 15 293 | 55 59 | 17 907 | 91 29 | 17 227 | 57 04 | 39 762 | 19 41 |
| 1 | 10.8 | 15 197 | 55 08 | 17 764 | 92 25 | 17 128 | 56 67 | 39 565 | 20 01 |
| 1 | 20.8 | 15 083 | 54 56 | 17 604 | 92 82 | 17 011 | 56 22 | 39 338 | 20 17 |
| 1 | 30.7 | 14 957 | 54 05 | 17 436 | 92 98 | 16 881 | 55 71 | 39 095 | 19 90 |
| 2 | 9.7 | 14 824 | 53 56 | 17 263 | 92 75 | 16 744 | 55 14 | 38 842 | 19 21 |
| 2 | 19.7 | 14 693 | 53 11 | 17 095 | 92 09 | 16 609 | 54 55 | 38 596 | 18 13 |
| 3 | 1.6 | 14 572 | 52 74 | 16 940 | 91 06 | 16 484 | 53 97 | 38 372 | 16 72 |
| 3 | 11.6 | 14 468 | 52 46 | 16 804 | 89 66 | 16 377 | 53 43 | 38 178 | 15 04 |
| 3 | 21.6 | 14 392 | 52 33 | 16 698 | 87 89 | 16 298 | 52 98 | 38 033 | 13 16 |
| 3 | 31.6 | 14 349 | 52 35 | 16 627 | 85 82 | 16 255 | 52 66 | 37 943 | 11 19 |
| 4 | 10.5 | 14 345 | 52 55 | 16 596 | 83 47 | 16 251 | 52 49 | 37 916 | 09 19 |
| 4 | 20.5 | 14 388 | 52 93 | 16 613 | 80 86 | 16 296 | 52 56 | 37 960 | 07 28 |
| 4 | 30.5 | 14 466 | 53 56 | 16 678 | 78 09 | 16 372 | 52 78 | 38 074 | 05 53 |
| 5 | 10.5 | 14 598 | 54 46 | 16 792 | 75 16 | 16 513 | 53 25 | 38 258 | 03 99 |
| 5 | 20.4 | 14 775 | 55 58 | 16 957 | 72 15 | 16 696 | 53 99 | 38 510 | 02 77 |
| 5 | 30.4 | 14 991 | 56 88 | 17 165 | 69 15 | 16 919 | 54 96 | 38 819 | 01 88 |
| 6 | 9.4 | 15 244 | 58 38 | 17 415 | 66 18 | 17 178 | 56 15 | 39 180 | 01 36 |
| 6 | 19.3 | 15 525 | 60 04 | 17 700 | 63 36 | 17 467 | 57 55 | 39 585 | 01 25 |
| 6 | 29.3 | 15 827 | 61 79 | 18 011 | 60 73 | 17 776 | 59 11 | 40 017 | 01 53 |
| 7 | 9.3 | 16 144 | 63 63 | 18 342 | 58 35 | 18 100 | 60 79 | 40 471 | 02 21 |
| 7 | 19.3 | 16 467 | 65 48 | 18 684 | 56 32 | 18 431 | 62 56 | 40 933 | 03 27 |
| 7 | 29.2 | 16 787 | 67 30 | 19 027 | 54 67 | 18 758 | 64 34 | 41 392 | 04 67 |
| 8 | 8.2 | 17 101 | 69 05 | 19 365 | 53 43 | 19 078 | 66 13 | 41 842 | 06 38 |
| 8 | 18.2 | 17 399 | 70 66 | 19 688 | 52 67 | 19 383 | 67 85 | 42 270 | 08 38 |
| 8 | 28.2 | 17 677 | 72 12 | 19 990 | 52 37 | 19 667 | 69 47 | 42 671 | 10 59 |
| 9 | 7.1 | 17 933 | 73 41 | 20 267 | 52 56 | 19 928 | 70 97 | 43 042 | 13 00 |
| 9 | 17.1 | 18 160 | 74 46 | 20 510 | 53 22 | 20 161 | 72 30 | 43 372 | 15 54 |
| 9 | 27.1 | 18 359 | 75 31 | 20 719 | 54 29 | 20 365 | 73 47 | 43 663 | 18 16 |
| 10 | 7.0 | 18 529 | 75 94 | 20 891 | 55 74 | 20 540 | 74 45 | 43 911 | 20 84 |
| 10 | 17.0 | 18 668 | 76 35 | 21 022 | 57 51 | 20 683 | 75 24 | 44 112 | 23 50 |
| 10 | 27.0 | 18 778 | 76 57 | 21 117 | 59 50 | 20 798 | 75 85 | 44 268 | 26 11 |
| 11 | 6.0 | 18 858 | 76 62 | 21 173 | 61 64 | 20 881 | 76 30 | 44 376 | 28 63 |
| 11 | 15.9 | 18 908 | 76 51 | 21 190 | 63 82 | 20 935 | 76 58 | 44 434 | 30 98 |
| 11 | 25.9 | 18 932 | 76 29 | 21 175 | 65 96 | 20 961 | 76 73 | 44 446 | 33 13 |
| 12 | 5.9 | 18 927 | 75 96 | 21 125 | 67 98 | 20 956 | 76 74 | 44 407 | 35 03 |
| 12 | 15.9 | 18 894 | 75 56 | 21 045 | 69 77 | 20 925 | 76 63 | 44 321 | 36 62 |
| 12 | 25.8 | 18 838 | 75 10 | 20 939 | 71 28 | 20 867 | 76 42 | 44 191 | 37 86 |
| 12 | 35.8 | 18 756 | 74 60 | 20 808 | 72 48 | 20 784 | 76 10 | 44 019 | 38 71 |
| Mean Place | 16.978 | 61.90 | 18.847 | 72.49 | 19.006 | 61.22 | 42.099 | 13.22 | |
| sec δ, tan δ | +1.012 | +0.155 | +1.164 | -0.596 | +1.036 | +0.272 | +1.589 | +1.235 | |
| dα(ψ), dδ(ψ) | +0.063 | +0.33 | +0.053 | +0.33 | +0.065 | +0.33 | +0.079 | +0.33 | |
| dα(ε), dδ(ε) | -0.009 | +0.55 | +0.033 | +0.55 | -0.015 | +0.55 | -0.069 | +0.55 | |
| Dble. Trans. | October 24 | | October 24 | | October 24 | | October 25 | | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 76 | | 1060 | | 1059 | | 82 | |
|--------------|-----------------------------------|-------------------------------------|-----------------------------------|-------------------------------------|-----------------------------------|-------------------------------------|-----------------------------------|-------------------------------------|
| | 55 Cassiopeiae | | 135 G. Phoenicis | | 21 Arietis | | φ Eridani | |
| Mag. Spect. | 6.15 | F5, A2 | 5.86 | K0 | 5.64 | F5 | 3.78 | B8 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | ^h ^m 2 13 | [°] ['] +66 27 | ^h ^m 2 13 | [°] ['] -41 13 | ^h ^m 2 14 | [°] ['] +24 58 | ^h ^m 2 15 | [°] ['] -51 34 |
| 1 -9.2 | 22.243 - 248 | 50.18 +201 | 58.744 - 133 | 65.39 -180 | 54.855 - 56 | 50.62 + 24 | 61.857 - 191 | 49.69 -189 |
| 1 0.8 | 21.930 - 373 | 51.74 +156 | 58.584 - 160 | 66.79 -140 | 54.773 - 82 | 50.69 + 7 | 61.635 - 222 | 51.12 -143 |
| 1 10.8 | 21.557 - 373 | 52.81 +107 | 58.584 - 183 | 67.77 - 98 | 54.664 - 109 | 50.57 - 12 | 61.384 - 251 | 52.07 - 95 |
| 1 20.8 | 21.140 - 417 | 52.81 + 52 | 58.401 - 202 | 67.77 - 50 | 54.664 - 129 | 50.57 - 31 | 61.115 - 269 | 52.46 - 39 |
| 1 30.7 | 20.700 - 440 | 53.33 - 3 | 58.199 - 209 | 68.27 - 2 | 54.535 - 143 | 50.26 - 47 | 61.115 - 278 | 52.33 + 13 |
| 2 9.7 | 20.249 - 451 | 52.74 - 56 | 57.777 - 213 | 67.84 + 45 | 54.240 - 152 | 49.15 - 64 | 60.557 - 280 | 51.67 + 66 |
| 2 19.7 | 19.815 - 434 | 51.64 -110 | 57.570 - 207 | 66.91 + 93 | 54.091 - 149 | 48.38 - 77 | 60.287 - 270 | 50.47 +120 |
| 3 1.7 | 19.419 - 396 | 51.64 -153 | 57.570 - 191 | 66.91 +137 | 54.091 - 138 | 48.38 - 85 | 60.287 - 250 | 50.47 +167 |
| 3 11.6 | 19.075 - 344 | 50.11 -194 | 57.379 - 169 | 65.54 +178 | 53.953 - 120 | 47.53 - 91 | 60.037 - 224 | 48.80 +211 |
| 3 21.6 | 18.809 - 266 | 48.17 -224 | 57.210 - 136 | 63.76 +218 | 53.833 - 88 | 46.62 - 88 | 59.813 - 183 | 46.69 +253 |
| 3 31.6 | 18.633 - 176 | 45.93 -243 | 57.074 - 97 | 61.58 +249 | 53.745 - 51 | 45.74 - 83 | 59.630 - 136 | 44.16 +285 |
| 4 10.5 | 18.554 - 79 | 43.50 -254 | 56.977 - 52 | 59.09 +279 | 53.694 - 9 | 44.91 - 71 | 59.494 - 85 | 41.31 +314 |
| 4 20.5 | 18.586 + 32 | 40.96 -252 | 56.925 + 2 | 56.30 +303 | 53.685 + 41 | 44.20 - 53 | 59.409 - 22 | 38.17 +337 |
| 4 30.5 | 18.586 + 139 | 38.44 -239 | 56.927 + 54 | 53.27 +318 | 53.726 + 89 | 43.67 - 33 | 59.387 + 40 | 34.80 +349 |
| 5 10.5 | 18.969 + 244 | 36.05 -221 | 56.981 + 108 | 50.09 +331 | 53.815 + 140 | 43.34 - 13 | 59.427 + 103 | 31.31 +359 |
| 5 20.4 | 19.317 + 348 | 33.84 -191 | 57.089 + 165 | 46.78 +334 | 53.955 + 191 | 43.21 + 16 | 59.530 + 169 | 27.72 +357 |
| 5 30.4 | 19.750 + 433 | 31.93 -156 | 57.254 + 213 | 43.44 +329 | 54.146 + 233 | 43.37 + 43 | 59.699 + 226 | 24.15 +349 |
| 6 9.4 | 20.263 + 513 | 30.37 -117 | 57.467 + 261 | 40.15 +319 | 54.379 + 271 | 43.80 + 71 | 59.925 + 283 | 20.66 +334 |
| 6 19.4 | 20.263 + 577 | 29.20 - 70 | 57.728 + 301 | 36.96 +299 | 54.650 + 303 | 44.51 + 98 | 60.208 + 333 | 17.32 +308 |
| 6 29.3 | 20.840 + 620 | 28.50 - 25 | 58.029 + 332 | 33.97 +273 | 54.953 + 325 | 45.49 +120 | 60.541 + 370 | 14.24 +277 |
| 7 9.3 | 22.115 + 655 | 28.46 + 21 | 58.717 + 356 | 28.83 +241 | 55.619 + 341 | 48.11 +142 | 61.313 + 402 | 11.47 +239 |
| 7 19.3 | 22.784 + 669 | 29.16 + 70 | 59.088 + 371 | 26.84 +199 | 55.965 + 346 | 49.69 +158 | 61.734 + 421 | 09.08 +191 |
| 7 29.2 | 23.451 + 667 | 30.28 +112 | 59.462 + 374 | 25.28 +156 | 56.309 + 344 | 51.39 +170 | 62.161 + 427 | 07.17 +143 |
| 8 8.2 | 24.107 + 656 | 31.83 +155 | 59.833 + 371 | 24.22 +106 | 56.646 + 337 | 53.19 +180 | 62.589 + 428 | 05.74 + 88 |
| 8 18.2 | 24.734 + 627 | 33.78 +195 | 60.189 + 356 | 23.70 + 52 | 56.967 + 321 | 55.02 +183 | 62.589 + 411 | 04.86 + 29 |
| 8 28.2 | 25.323 + 589 | 36.05 +227 | 60.522 + 333 | 23.69 + 1 | 57.267 + 300 | 56.84 +182 | 63.387 + 387 | 04.83 - 26 |
| 9 7.1 | 25.868 + 545 | 38.63 +258 | 60.828 + 306 | 24.22 - 53 | 57.544 + 277 | 58.63 +179 | 63.387 + 355 | 05.66 - 83 |
| 9 17.1 | 26.354 + 486 | 41.47 +284 | 61.096 + 268 | 25.26 -104 | 57.790 + 246 | 60.34 +171 | 63.742 + 310 | 05.66 -137 |
| 9 27.1 | 26.780 + 426 | 44.48 +301 | 61.325 + 229 | 26.74 -148 | 58.008 + 218 | 61.94 +160 | 64.052 + 264 | 07.03 -183 |
| 10 7.0 | 27.139 + 359 | 47.65 +317 | 61.511 + 186 | 28.64 -190 | 58.196 + 188 | 63.43 +149 | 64.316 + 211 | 08.86 -225 |
| 10 17.0 | 27.422 + 283 | 50.88 +323 | 61.649 + 138 | 30.85 -221 | 58.350 + 154 | 64.77 +134 | 64.527 + 151 | 11.11 -257 |
| 10 27.0 | 27.633 + 211 | 54.13 +325 | 61.744 + 95 | 33.27 -242 | 58.474 + 124 | 65.97 +120 | 64.678 + 96 | 13.68 -276 |
| 11 6.0 | 27.764 + 131 | 57.34 +321 | 61.792 + 48 | 35.83 -256 | 58.566 + 92 | 67.02 +105 | 64.774 + 38 | 16.44 -288 |
| 11 15.9 | 27.811 + 47 | 60.40 +306 | 61.795 + 3 | 38.40 -257 | 58.624 + 58 | 67.89 + 87 | 64.812 - 20 | 19.32 -285 |
| 11 25.9 | 27.780 - 31 | 63.27 +287 | 61.758 - 37 | 40.87 -247 | 58.653 + 29 | 68.60 + 71 | 64.792 - 72 | 22.17 -272 |
| 12 5.9 | 27.664 - 116 | 65.89 +262 | 61.680 - 78 | 43.17 -230 | 58.650 - 3 | 69.14 + 54 | 64.598 - 122 | 27.39 -250 |
| 12 15.9 | 27.470 - 194 | 68.13 +224 | 61.567 - 113 | 45.18 -201 | 58.615 - 35 | 69.50 + 36 | 64.432 - 166 | 27.39 -213 |
| 12 25.8 | 27.205 - 265 | 69.98 +185 | 61.425 - 142 | 46.84 -166 | 58.553 - 62 | 69.68 + 18 | 64.230 - 202 | 29.52 -174 |
| 12 35.8 | 26.870 - 335 | 71.36 +138 | 61.254 - 171 | 48.11 -127 | 58.461 - 92 | 69.67 - 1 | 64.230 - 237 | 31.26 -127 |
| | | | | | | | 63.993 - 258 | 32.53 - 74 |
| Mean Place | 24.669 | 42.63 | 59.162 | 45.52 | 56.667 | 51.60 | 61.694 | 27.87 |
| sec δ, tan δ | +2.504 | +2.296 | +1.330 | -0.876 | +1.103 | +0.466 | +1.609 | -1.261 |
| dα(ψ), dδ(ψ) | +0.095 | +0.33 | +0.048 | +0.33 | +0.068 | +0.33 | +0.042 | +0.33 |
| dα(ε), dδ(ε) | -0.128 | +0.55 | +0.049 | +0.55 | -0.026 | +0.56 | +0.070 | +0.56 |
| Dble. Trans. | October 25 | | October 25 | | October 25 | | October 25 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 80 | | 79 | | 1062 | | 1061 | | |
|--------------|-----------------------------------|-------------------------------------|-----------------------------------|--------------------------------------|-----------------------------------|--------------------------------------|-----------------------------------|-------------------------------------|-------------|
| | 67 Ceti | | γ Trianguli | | 21 G. Fornacis | | 232 G. Ceti | | |
| Mag.Spect. | 5.70 | G5 | 4.07 | A0 | 6.74 | G5 | 5.82 | F8 | |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | |
| | ^h ^m 2 16 | ^o ['] - 6 28 | ^h ^m 2 16 | ^o ['] + 33 46 | ^h ^m 2 16 | ^o ['] - 36 02 | ^h ^m 2 17 | ^o ['] + 1 41 | |
| | ^d | ^s | ^s | ["] | ^s | ["] | ^s | ["] | |
| 1 | -9.2 | 17.233 - 54 | 72.38 - 101 | 28.590 - 66 | 68.51 + 64 | 44.985 - 111 | 60.98 - 175 | 17.778 - 48 | 32.02 - 71 |
| 1 | 0.8 | 17.156 - 77 | 73.28 - 90 | 28.494 - 96 | 68.90 + 39 | 44.849 - 136 | 62.37 - 139 | 17.707 - 71 | 31.35 - 67 |
| 1 | 10.8 | 17.057 - 99 | 74.07 - 79 | 28.370 - 124 | 69.03 + 13 | 44.689 - 160 | 63.39 - 102 | 17.613 - 94 | 30.72 - 63 |
| 1 | 20.8 | 16.941 - 116 | 74.70 - 63 | 28.221 - 149 | 68.87 - 16 | 44.511 - 178 | 63.96 - 57 | 17.501 - 112 | 30.15 - 57 |
| 1 | 30.7 | 16.814 - 127 | 75.15 - 45 | 28.059 - 162 | 68.46 - 41 | 44.325 - 186 | 64.09 - 13 | 17.377 - 124 | 29.68 - 47 |
| 2 | 9.7 | 16.679 - 135 | 75.42 - 27 | 27.886 - 173 | 67.80 - 66 | 44.133 - 192 | 63.79 + 30 | 17.245 - 132 | 29.29 - 39 |
| 2 | 19.7 | 16.546 - 133 | 75.49 - 7 | 27.716 - 170 | 66.91 - 89 | 43.945 - 188 | 63.02 + 77 | 17.114 - 131 | 29.03 - 26 |
| 3 | 1.7 | 16.422 - 124 | 75.34 + 15 | 27.560 - 156 | 65.85 - 106 | 43.772 - 173 | 61.84 + 118 | 16.993 - 121 | 28.91 - 12 |
| 3 | 11.6 | 16.314 - 108 | 74.99 + 35 | 27.424 - 136 | 64.66 - 119 | 43.617 - 155 | 60.27 + 157 | 16.887 - 106 | 28.94 + 3 |
| 3 | 21.6 | 16.231 - 83 | 74.38 + 61 | 27.323 - 101 | 63.41 - 125 | 43.494 - 123 | 58.32 + 195 | 16.808 - 79 | 29.16 + 22 |
| 3 | 31.6 | 16.181 - 50 | 73.55 + 83 | 27.263 - 60 | 62.17 - 124 | 43.407 - 87 | 56.05 + 227 | 16.760 - 48 | 29.57 + 41 |
| 4 | 10.5 | 16.168 - 13 | 72.49 + 106 | 27.250 - 13 | 60.99 - 118 | 43.363 - 44 | 53.48 + 257 | 16.750 - 10 | 30.18 + 61 |
| 4 | 20.5 | 16.197 + 29 | 71.18 + 131 | 27.291 + 41 | 59.95 - 104 | 43.368 + 5 | 50.66 + 282 | 16.784 + 34 | 31.01 + 83 |
| 4 | 30.5 | 16.271 + 74 | 69.65 + 153 | 27.385 + 94 | 59.11 - 84 | 43.423 + 55 | 47.68 + 298 | 16.860 + 76 | 32.07 + 106 |
| 5 | 10.5 | 16.389 + 118 | 67.91 + 174 | 27.533 + 148 | 58.49 - 62 | 43.530 + 107 | 44.55 + 313 | 16.983 + 123 | 33.37 + 130 |
| 5 | 20.4 | 16.554 + 165 | 65.99 + 192 | 27.736 + 203 | 58.15 - 34 | 43.690 + 160 | 41.36 + 319 | 17.151 + 168 | 34.88 + 151 |
| 5 | 30.4 | 16.757 + 203 | 63.94 + 205 | 27.984 + 248 | 58.10 - 5 | 43.896 + 206 | 38.20 + 316 | 17.359 + 208 | 36.54 + 166 |
| 6 | 9.4 | 16.997 + 240 | 61.79 + 215 | 28.274 + 230 | 58.37 + 27 | 44.147 + 251 | 35.09 + 311 | 17.603 + 244 | 38.36 + 182 |
| 6 | 19.4 | 17.268 + 271 | 59.59 + 220 | 28.599 + 325 | 58.97 + 60 | 44.436 + 289 | 32.15 + 294 | 17.877 + 274 | 40.28 + 192 |
| 6 | 29.3 | 17.560 + 292 | 57.41 + 218 | 28.946 + 347 | 59.84 + 87 | 44.753 + 317 | 29.45 + 270 | 18.172 + 295 | 42.24 + 196 |
| 7 | 9.3 | 17.870 + 310 | 55.29 + 212 | 29.311 + 365 | 61.00 + 116 | 45.093 + 340 | 27.02 + 243 | 18.484 + 312 | 44.23 + 199 |
| 7 | 19.3 | 18.186 + 316 | 53.29 + 200 | 29.682 + 371 | 62.41 + 141 | 45.447 + 354 | 24.98 + 204 | 18.802 + 318 | 46.16 + 193 |
| 7 | 29.2 | 18.502 + 316 | 51.47 + 182 | 30.051 + 369 | 64.01 + 160 | 45.803 + 356 | 23.34 + 164 | 19.119 + 317 | 47.99 + 183 |
| 8 | 8.2 | 18.812 + 310 | 49.86 + 161 | 30.412 + 361 | 65.78 + 177 | 46.156 + 353 | 22.15 + 119 | 19.431 + 312 | 49.69 + 170 |
| 8 | 18.2 | 19.108 + 296 | 48.53 + 133 | 30.756 + 344 | 67.68 + 190 | 46.495 + 339 | 21.48 + 67 | 19.727 + 296 | 51.18 + 149 |
| 8 | 28.2 | 19.385 + 277 | 47.50 + 103 | 31.079 + 323 | 69.65 + 197 | 46.813 + 318 | 21.30 + 18 | 20.005 + 278 | 52.46 + 128 |
| 9 | 7.1 | 19.641 + 256 | 46.77 + 73 | 31.377 + 298 | 71.67 + 202 | 47.105 + 292 | 21.64 - 34 | 20.261 + 256 | 53.49 + 103 |
| 9 | 17.1 | 19.867 + 226 | 46.38 + 39 | 31.643 + 266 | 73.69 + 202 | 47.363 + 258 | 22.47 - 83 | 20.490 + 229 | 54.24 + 75 |
| 9 | 27.1 | 20.066 + 199 | 46.30 + 8 | 31.879 + 236 | 75.66 + 197 | 47.585 + 222 | 23.73 - 126 | 20.691 + 201 | 54.74 + 50 |
| 10 | 7.1 | 20.235 + 169 | 46.52 - 22 | 32.082 + 203 | 77.58 + 192 | 47.767 + 182 | 25.41 - 168 | 20.863 + 172 | 54.98 + 24 |
| 10 | 17.0 | 20.372 + 137 | 47.01 - 49 | 32.249 + 167 | 79.40 + 182 | 47.907 + 140 | 27.40 - 199 | 21.003 + 140 | 54.97 - 1 |
| 10 | 27.0 | 20.479 + 107 | 47.71 - 70 | 32.383 + 134 | 81.10 + 170 | 48.006 + 99 | 29.61 - 221 | 21.115 + 112 | 54.76 - 21 |
| 11 | 6.0 | 20.556 + 77 | 48.60 - 89 | 32.481 + 98 | 82.67 + 157 | 48.063 + 57 | 29.61 - 238 | 21.197 + 82 | 54.37 - 39 |
| 11 | 15.9 | 20.602 + 46 | 49.61 - 101 | 32.544 + 63 | 84.07 + 140 | 48.079 + 16 | 31.99 - 239 | 21.197 + 52 | 53.37 - 53 |
| 11 | 25.9 | 20.621 + 19 | 50.68 - 107 | 32.573 + 29 | 85.29 + 122 | 48.058 - 21 | 34.38 - 234 | 21.249 + 26 | 53.84 - 62 |
| 12 | 5.9 | 20.611 - 10 | 51.78 - 110 | 32.566 - 47 | 86.31 + 102 | 48.000 - 58 | 38.92 - 220 | 21.271 - 4 | 52.53 - 69 |
| 12 | 15.9 | 20.574 - 37 | 52.83 - 105 | 32.524 - 72 | 87.10 + 79 | 47.908 - 92 | 40.85 - 193 | 21.241 - 30 | 51.82 - 71 |
| 12 | 25.8 | 20.513 - 61 | 53.81 - 98 | 32.450 - 74 | 87.65 + 55 | 47.789 - 119 | 42.49 - 164 | 21.187 - 54 | 51.12 - 70 |
| 12 | 35.8 | 20.428 - 85 | 54.69 - 88 | 32.344 - 106 | 87.94 + 29 | 47.642 - 147 | 43.76 - 127 | 21.107 - 80 | 50.44 - 68 |
| | | - 104 | - 72 | - 131 | + 1 | - 167 | - 84 | - 99 | - 61 |
| Mean Place | 18.587 | 62.21 | 30.512 | 67.13 | 45.596 | 42.55 | 19.275 | 39.94 | |
| sec δ, tan δ | +1.006 | -0.114 | +1.203 | +0.669 | +1.237 | -0.728 | +1.000 | +0.030 | |
| dα(ψ), dδ(ψ) | +0.059 | +0.33 | +0.071 | +0.33 | +0.050 | +0.33 | +0.062 | +0.33 | |
| dα(ε), dδ(ε) | +0.006 | +0.56 | -0.037 | +0.56 | +0.040 | +0.56 | -0.002 | +0.56 | |
| Dble.Trans. | October 26 | | October 26 | | October 26 | | October 26 | | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 81 | | 1063 | | 1064 | | 1065 | |
|--------------|--------------------------|------------|--------------------------|------------|--------------------------|-------------------------|---------------------------|-------------------------|
| | ♁ Arietis | | 62 Andromedae | | 239 G. Ceti | | ♁ Hydri | |
| Mag. Spect. | 5.69 | A0 | 5.12 | A0 | 5.99 | K0 | 4.26 | A2 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " |
| | 2 17 | +19 50 | 2 18 | +47 18 | 2 21 | -17 43 | 2 21 | -68 42 |
| 1 -9.2 | 20 621 ^s - 50 | 18.70 + 3 | 22.136 ^s - 99 | 70 16 +125 | 25 709 ^s - 65 | 36 81 ["] -139 | 32 853 ^s - 420 | 98 00 ["] -190 |
| 1 0.8 | 20 546 - 75 | 18 59 - 11 | 21 999 - 137 | 71.08 + 92 | 25 621 - 88 | 37.98 - 117 | 32 378 - 475 | 99 36 - 136 |
| 1 10.8 | 20 445 - 101 | 18 35 - 24 | 21 826 - 173 | 71.63 + 55 | 25 510 - 111 | 38.93 - 95 | 31.857 - 521 | 100.17 - 81 |
| 1 20.8 | 20.323 - 122 | 17.98 - 37 | 21.624 - 202 | 71.76 + 13 | 25 381 - 129 | 39.61 - 68 | 31.308 - 549 | 100 36 - 19 |
| 1 30.7 | 20.189 - 134 | 17.50 - 48 | 21.404 - 220 | 71.51 - 25 | 25.241 - 140 | 40.00 - 39 | 30.750 - 558 | 99.96 + 40 |
| 2 9.7 | 20.045 - 144 | 16.90 - 60 | 21.174 - 230 | 70.87 - 64 | 25.092 - 149 | 40.10 - 10 | 30.194 - 566 | 98.99 + 97 |
| 2 19.7 | 19.902 - 143 | 16.24 - 66 | 20.948 - 226 | 69.87 -100 | 24.946 - 146 | 39.88 + 22 | 29.660 - 534 | 97.43 +156 |
| 3 1.7 | 19.770 - 132 | 15.55 - 69 | 20.740 - 208 | 68.57 -130 | 24.809 - 137 | 39.36 + 52 | 29.166 - 494 | 95.38 +205 |
| 3 11.6 | 19.655 - 115 | 14.84 - 71 | 20.558 - 182 | 67.02 -155 | 24.687 - 122 | 38.55 + 81 | 28.718 - 448 | 92.88 +250 |
| 3 21.6 | 19.569 - 86 | 14.19 - 65 | 20.420 - 138 | 65.29 -173 | 24.591 - 96 | 37.42 +113 | 28.340 - 378 | 89.95 +293 |
| 3 31.6 | 19.519 - 50 | 13.64 - 55 | 20.333 - 87 | 63.49 -180 | 24.527 - 64 | 36.02 +140 | 28.039 - 301 | 86.73 +322 |
| 4 10.5 | 19.510 - 9 | 13.21 - 43 | 20.303 - 30 | 61.67 -182 | 24.501 - 26 | 34.35 +167 | 27.823 - 216 | 83.22 +351 |
| 4 20.5 | 19.548 + 38 | 12.99 - 22 | 20.339 + 36 | 59.94 -173 | 24.518 + 17 | 32.43 +192 | 27.706 - 117 | 79.53 +369 |
| 4 30.5 | 19.629 + 81 | 12.99 + 0 | 20.441 +102 | 58.37 -157 | 24.580 + 62 | 30.30 +213 | 27.687 - 19 | 75.75 +378 |
| 5 10.5 | 19.764 +135 | 13.12 +13 | 20.608 +167 | 57.00 -137 | 24.689 +109 | 27.97 +233 | 27.771 + 84 | 71.92 +383 |
| 5 20.4 | 19.947 +183 | 13.57 +45 | 20.839 +231 | 55.93 -107 | 24.844 +155 | 25.51 +246 | 27.961 +190 | 68.17 +375 |
| 5 30.4 | 20.171 +224 | 14.27 +70 | 21.125 +286 | 55.19 - 74 | 25.040 +196 | 22.98 +253 | 28.245 +284 | 64.56 +361 |
| 6 9.4 | 20.432 +261 | 15.22 +95 | 21.461 +336 | 54.79 - 40 | 25.275 +235 | 20.39 +259 | 28.623 +378 | 61.16 +340 |
| 6 19.4 | 20.725 +293 | 16.41 +119 | 21.838 +377 | 54.79 + 0 | 25.544 +269 | 17.85 +254 | 29.087 +464 | 58.08 +308 |
| 6 29.3 | 21.039 +314 | 17.78 +137 | 22.242 +404 | 55.15 +36 | 25.835 +291 | 15.40 +245 | 29.616 +529 | 55.38 +270 |
| 7 9.3 | 21.369 +330 | 19.32 +154 | 22.668 +426 | 55.88 + 73 | 26.146 +311 | 13.10 +230 | 30.206 +590 | 53.11 +227 |
| 7 19.3 | 21.705 +336 | 20.99 +167 | 23.103 +435 | 56.97 +109 | 26.466 +320 | 11.03 +207 | 30.836 +630 | 51.38 +173 |
| 7 29.2 | 22.040 +335 | 22.72 +173 | 23.535 +432 | 58.36 +139 | 26.788 +322 | 09.23 +180 | 31.485 +649 | 50.19 +119 |
| 8 8.2 | 22.368 +328 | 24.49 +177 | 23.960 +425 | 60.05 +169 | 27.105 +317 | 07.74 +149 | 32.143 +658 | 49.59 + 60 |
| 8 18.2 | 22.680 +312 | 26.25 +176 | 24.366 +406 | 61.98 +193 | 27.410 +305 | 06.63 +111 | 32.783 +640 | 49.62 - 3 |
| 8 28.2 | 22.972 +292 | 27.96 +171 | 24.747 +381 | 64.11 +213 | 27.696 +286 | 05.90 + 73 | 33.389 +606 | 50.23 - 61 |
| 9 7.1 | 23.243 +271 | 29.58 +162 | 25.100 +353 | 66.40 +229 | 27.960 +264 | 05.57 +33 | 33.948 +559 | 51.44 -121 |
| 9 17.1 | 23.484 +241 | 31.08 +150 | 25.417 +317 | 68.81 +241 | 28.195 +235 | 05.66 - 9 | 34.435 +487 | 53.20 -176 |
| 9 27.1 | 23.698 +214 | 32.45 +137 | 25.697 +280 | 71.27 +246 | 28.401 +206 | 06.11 - 45 | 34.843 +408 | 55.42 -222 |
| 10 7.1 | 23.882 +184 | 33.66 +121 | 25.939 +242 | 73.78 +251 | 28.575 +174 | 06.91 - 80 | 35.160 +317 | 58.06 -264 |
| 10 17.0 | 24.034 +152 | 34.71 +105 | 26.136 +197 | 76.26 +248 | 28.715 +140 | 08.03 -112 | 35.372 +212 | 60.99 -293 |
| 10 27.0 | 24.157 +123 | 35.59 + 88 | 26.293 +157 | 78.67 +241 | 28.823 +108 | 09.37 -134 | 35.482 +110 | 64.09 -310 |
| 11 6.0 | 24.248 + 91 | 36.32 + 73 | 26.405 +112 | 81.00 +233 | 28.898 + 75 | 10.89 -152 | 35.483 + 1 | 67.27 -318 |
| 11 15.9 | 24.308 + 60 | 36.88 + 56 | 26.472 + 67 | 83.16 +216 | 28.941 + 43 | 12.51 -162 | 35.377 -106 | 70.37 -310 |
| 11 25.9 | 24.340 + 32 | 37.29 + 41 | 26.495 + 23 | 85.14 +198 | 28.953 + 12 | 14.15 -164 | 35.175 -202 | 73.27 -290 |
| 12 5.9 | 24.340 + 0 | 37.55 + 26 | 26.472 - 23 | 86.88 +174 | 28.935 - 18 | 15.76 -161 | 34.878 -297 | 75.89 -262 |
| 12 15.9 | 24.310 - 30 | 37.67 + 12 | 26.404 - 68 | 88.33 +145 | 28.888 - 47 | 17.24 -148 | 34.501 -377 | 78.08 -219 |
| 12 25.8 | 24.254 - 56 | 37.65 - 2 | 26.296 -108 | 89.46 +113 | 28.817 - 71 | 18.56 -132 | 34.059 -442 | 79.80 -172 |
| 12 35.8 | 24.169 - 86 | 37.48 - 17 | 26.147 -149 | 90.24 + 78 | 28.719 - 98 | 19.67 -111 | 33.559 -500 | 80.98 -118 |
| | 24.169 -106 | 37.48 -30 | 26.147 -181 | 90.24 + 38 | 28.719 -117 | 19.67 - 85 | 33.559 -535 | 80.98 - 56 |
| Mean Place | 22.360 | 21.06 | 24.214 | 65.67 | 26.807 | 23.69 | 30.488 | 74.17 |
| sec δ, tan δ | +1.063 | +0.361 | +1.475 | +1.084 | +1.050 | -0.320 | +2.755 | -2.568 |
| dα(ψ), dδ(ψ) | +0.067 | +0.33 | +0.077 | +0.33 | +0.056 | +0.32 | +0.022 | +0.32 |
| dα(ε), dδ(ε) | -0.020 | +0.56 | -0.060 | +0.57 | +0.017 | +0.58 | +0.140 | +0.58 |
| Dble. Trans. | October 26 | | October 26 | | October 27 | | October 27 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 83 | | 1067 | | 84 | | 1066 | |
|----------------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|
| | κ Fornacis | | κ Hydri | | λ Horologii | | ρ Ceti | |
| Mag. Spect. | 5.37 | F5 | 6.00 | K0 | 5.47 | F2 | 4.90 | A0 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | ^h ^m | [°] ['] | ^h ^m | [°] ['] | ^h ^m | [°] ['] | ^h ^m | [°] ['] |
| | 2 21 | -23 52 | 2 22 | -73 42 | 2 24 | -60 21 | 2 25 | -12 20 |
| 1 ^d 1 ^s | -9.2 54 546 | -76 53 27 | -155 50 910 | -579 48 91 | -186 32 359 | -299 101 96 | -199 16 631 | -55 74 75 |
| 1 | 0.8 54 446 | -100 54 55 | -128 50 260 | -650 49 57 | -131 50 22 | -310 32 049 | -149 103 45 | -79 75 82 |
| 1 | 10.8 54 324 | -122 55 56 | -101 49 551 | -709 50 98 | -76 31 702 | -347 104 43 | -98 16 450 | -102 76 72 |
| 1 | 20.8 54 183 | -141 56 23 | -67 48 805 | -746 51 10 | -12 31 329 | -373 104 81 | -38 16 328 | -122 77 40 |
| 1 | 30.7 54 031 | -152 56 55 | -32 48 051 | -754 50 62 | +48 30 948 | +19 104 62 | +19 16 195 | -44 77 84 |
| 2 | 9.7 53 872 | -159 56 54 | +1 47 301 | -750 49 57 | +105 30 563 | -385 103 87 | +75 16 053 | -142 78 05 |
| 2 | 19.7 53 716 | -156 56 15 | +39 46 582 | -719 47 93 | +164 30 191 | -372 102 56 | +131 15 911 | -142 77 98 |
| 3 | 1.7 53 569 | -147 55 41 | +74 45 916 | -666 45 81 | +212 29 844 | -347 100 75 | +181 15 777 | -134 77 66 |
| 3 | 11.6 53 439 | -130 54 34 | +107 45 311 | -605 43 23 | +258 29 530 | -314 98 47 | +228 15 659 | +59 77 07 |
| 3 | 21.6 53 336 | -103 52 93 | +141 44 796 | -515 40 24 | +299 29 265 | -265 95 77 | +270 15 565 | +87 76 20 |
| 3 | 31.6 53 265 | -71 51 23 | +170 44 380 | -416 36 95 | +329 29 057 | -208 92 75 | +302 15 503 | -62 75 09 |
| 4 | 10.5 53 233 | -32 49 24 | +199 44 071 | -309 33 40 | +355 28 912 | -145 89 42 | +333 15 477 | -26 73 71 |
| 4 | 20.5 53 246 | +13 47 00 | +224 43 889 | -182 29 67 | +373 28 843 | -69 85 88 | +354 15 494 | +17 72 08 |
| 4 | 30.5 53 305 | +59 44 56 | +244 43 831 | -58 25 87 | +380 28 847 | +4 82 22 | +366 15 556 | +62 70 25 |
| 5 | 10.5 53 411 | +106 41 94 | +262 43 903 | +72 22 03 | +384 28 930 | +83 78 48 | +374 15 663 | +107 68 20 |
| 5 | 20.4 53 566 | +155 39 20 | +274 44 109 | +206 18 27 | +376 29 093 | +163 74 77 | +371 15 816 | +153 65 99 |
| 5 | 30.4 53 763 | +197 36 43 | +277 44 436 | +327 14 68 | +359 29 328 | +235 71 17 | +360 16 010 | +194 63 69 |
| 6 | 9.4 54 000 | +237 33 64 | +279 44 884 | +448 11 30 | +338 29 634 | +306 67 74 | +343 16 242 | +232 61 30 |
| 6 | 19.4 54 272 | +272 30 94 | +270 45 441 | +557 08 26 | +304 30 004 | +370 64 60 | +314 16 507 | +265 58 92 |
| 6 | 29.3 54 569 | +297 28 38 | +256 46 084 | +643 05 60 | +266 30 422 | +418 61 80 | +290 16 794 | +287 56 59 |
| 7 | 9.3 54 886 | +317 26 01 | +237 46 808 | +724 03 39 | +221 30 885 | +463 59 41 | +239 17 101 | +307 54 36 |
| 7 | 19.3 55 213 | +327 23 93 | +208 47 586 | +778 01 72 | +167 31 377 | +492 57 52 | +189 17 417 | +316 52 31 |
| 7 | 29.2 55 542 | +329 22 16 | +177 48 392 | +806 00 60 | +112 31 881 | +504 56 15 | +137 17 734 | +317 50 48 |
| 8 | 8.2 55 869 | +327 20 76 | +140 49 213 | +821 00 07 | +53 32 391 | +510 55 35 | +80 18 048 | +314 48 92 |
| 8 | 18.2 56 181 | +312 19 79 | +97 50 015 | +802 00 18 | -11 32 886 | +495 55 17 | +18 18 348 | +300 47 70 |
| 8 | 28.2 56 475 | +294 19 24 | +55 50 777 | +762 00 86 | -68 33 355 | +469 55 57 | -40 18 631 | +283 46 80 |
| 9 | 7.1 56 746 | +271 19 14 | +10 51 481 | +704 02 15 | -129 33 789 | +434 56 56 | -99 18 893 | +262 46 28 |
| 9 | 17.1 56 987 | +241 19 48 | +612 52 093 | +612 03 99 | -184 34 169 | +380 58 11 | -155 19 128 | +235 46 13 |
| 9 | 27.1 57 197 | +210 20 22 | +512 52 605 | +512 06 27 | -228 34 493 | +324 60 13 | -202 19 334 | +206 46 32 |
| 10 | 7.1 57 374 | +177 21 33 | -111 52 999 | +394 08 97 | -270 34 751 | +258 62 59 | -246 19 511 | +177 46 85 |
| 10 | 17.0 57 515 | +141 22 77 | -144 53 255 | +256 11 95 | -298 34 934 | +183 65 37 | -278 19 655 | +144 47 68 |
| 10 | 27.0 57 621 | +106 24 43 | -166 53 377 | +122 15 09 | -314 35 045 | +111 68 34 | -297 19 768 | +113 48 73 |
| 11 | 6.0 57 693 | +72 26 28 | -185 53 356 | -21 18 30 | -321 35 079 | +34 71 43 | -309 19 850 | +82 49 97 |
| 11 | 15.9 57 729 | +36 28 20 | -192 53 192 | -164 21 41 | -311 35 036 | -43 74 48 | -305 19 900 | +50 51 32 |
| 11 | 25.9 57 734 | +5 30 11 | -191 52 901 | -291 24 31 | -290 34 926 | -110 77 37 | -289 19 922 | +22 52 72 |
| 12 | 5.9 57 706 | -28 31 96 | -185 52 484 | -417 26 92 | -261 34 748 | -178 80 02 | -265 19 913 | -9 54 11 |
| 12 | 15.9 57 649 | -57 33 63 | -167 51 960 | -524 29 08 | -216 34 511 | -237 82 27 | -225 19 876 | -37 55 42 |
| 12 | 25.8 57 566 | -83 35 09 | -608 51 352 | -608 30 76 | -168 34 226 | -285 84 10 | -183 19 814 | -62 56 60 |
| 12 | 35.8 57 457 | -109 36 30 | -121 50 669 | -683 31 88 | -112 33 897 | -329 85 42 | -132 19 726 | -88 57 64 |
| | | -129 36 30 | -87 50 669 | -729 31 88 | -51 33 897 | -359 85 42 | -74 19 726 | -109 57 64 |
| Mean Place | 55 502 | 38 45 | 47 057 | 24 77 | 31 290 | 79 60 | 17 822 | 63 41 |
| sec δ, tan δ | +1.094 | -0.443 | +3.564 | -3.421 | +2.023 | -1.758 | +1.024 | -0.219 |
| dα(ψ), dδ(ψ) | +0.054 | +0.32 | +0.008 | +0.32 | +0.034 | +0.32 | +0.058 | +0.32 |
| dα(ε), dδ(ε) | +0.024 | +0.58 | +0.185 | +0.58 | +0.095 | +0.59 | +0.012 | +0.59 |
| Dble. Trans. | October 27 | | October 27 | | October 28 | | October 28 | |

APPARENT PLACES OF STARS, 1986

39

AT UPPER TRANSIT AT GREENWICH

| No. | 86 | | 1068 | | 85 | | 1069 | |
|--------------|---------------------------|-------------|--------------------------|-------------|--------------------------|-------------|--------------------------|-------------|
| | κ Eridani | | 12 Trianguli | | ξ ² Ceti | | 27 Arietis | |
| Mag.Spect. | 4.44 | B5 | 5.38 | F0 | 4.34 | A0 | 6.41 | G5 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " |
| | 2 26 | -47 45 | 2 27 | +29 36 | 2 27 | + 8 23 | 2 30 | +17 38 |
| 1 -9.1 | 29 503 ^s - 158 | 70 95 - 198 | 20 498 ^s - 50 | 35 28 + 50 | 24 842 ^s - 41 | 54 97 - 46 | 07 686 ^s - 39 | 38 26 - 5 |
| 1 0.8 | 29 313 - 190 | 72 49 - 154 | 20 417 - 81 | 35 57 + 29 | 24 777 - 65 | 54 49 - 48 | 07 619 - 67 | 38.11 - 15 |
| 1 10.8 | 29 095 - 218 | 73 59 - 110 | 20 307 - 110 | 35 64 + 7 | 24 686 - 91 | 53 99 - 50 | 07 526 - 93 | 37.84 - 27 |
| 1 20.8 | 28 854 - 241 | 73 59 - 57 | 20 307 - 135 | 35 64 - 16 | 24 686 - 111 | 53 99 - 51 | 07 526 - 117 | 37.84 - 36 |
| 1 30.7 | 27 645 - 251 | 74 16 - 6 | 20 172 - 151 | 35 48 - 37 | 24 575 - 125 | 53 48 - 49 | 07 409 - 131 | 37.48 - 45 |
| 2 9.7 | 28 603 - 258 | 74 22 + 45 | 20 021 - 163 | 35.11 - 58 | 24 450 - 136 | 52.99 - 47 | 07 278 - 143 | 37.03 - 53 |
| 2 19.7 | 28 345 - 251 | 73 77 + 99 | 19 858 - 164 | 34 53 - 77 | 24 314 - 137 | 52 52 - 41 | 07 135 - 145 | 36.50 - 57 |
| 3 1.7 | 28 094 - 235 | 72 78 + 145 | 19 694 - 153 | 33 76 - 89 | 24 177 - 128 | 52 11 - 33 | 06 990 - 136 | 35.93 - 59 |
| 3 11.6 | 27 859 - 214 | 71 33 + 189 | 19 541 - 135 | 32 87 - 100 | 24 049 - 115 | 51 78 - 25 | 06 854 - 121 | 35.34 - 59 |
| 3 21.6 | 27 645 - 177 | 69 44 + 232 | 19 406 - 105 | 31 87 - 104 | 23 934 - 88 | 51 53 - 11 | 06 733 - 95 | 34.75 - 53 |
| 3 31.6 | 27 468 - 135 | 67 12 + 265 | 19 301 - 66 | 30 83 - 101 | 23 846 - 56 | 51 42 + 4 | 06 638 - 60 | 34.22 - 43 |
| 4 10.6 | 27 333 - 88 | 64 47 + 296 | 19 235 - 23 | 29 82 - 95 | 23 790 - 18 | 51 46 + 22 | 06 578 - 22 | 33 79 - 30 |
| 4 20.5 | 27 245 - 30 | 61 51 + 321 | 19 212 + 29 | 28 87 - 81 | 23 772 + 27 | 51 68 + 41 | 06 556 + 27 | 33 49 - 11 |
| 4 30.5 | 27 215 + 28 | 58 30 + 336 | 19 241 + 79 | 28 06 - 61 | 23 799 + 67 | 52 09 + 58 | 06 583 + 69 | 33 38 + 22 |
| 5 10.5 | 27 243 + 88 | 54 94 + 349 | 19 320 + 131 | 27 45 - 42 | 23 866 + 115 | 52 67 + 91 | 06 652 + 116 | 33 60 + 13 |
| 5 20.4 | 27 331 + 150 | 51 45 + 352 | 19 451 + 185 | 27 03 - 16 | 23 981 + 164 | 53 58 + 110 | 06 768 + 171 | 33.73 + 53 |
| 5 30.4 | 27 481 + 204 | 47 93 + 344 | 19 636 + 230 | 26 87 + 12 | 24 145 + 204 | 54 68 + 128 | 06 939 + 210 | 34.26 + 77 |
| 6 9.4 | 27 685 + 259 | 44 49 + 335 | 19 866 + 272 | 26 99 + 40 | 24 349 + 241 | 55 96 + 146 | 07 149 + 250 | 35 03 + 100 |
| 6 19.4 | 27 944 + 306 | 41 14 + 312 | 20 138 + 306 | 27 39 + 69 | 24 590 + 272 | 57 42 + 162 | 07 399 + 282 | 36 03 + 121 |
| 6 29.3 | 28 250 + 343 | 38 02 + 283 | 20 444 + 330 | 28 08 + 95 | 24 862 + 295 | 59 04 + 172 | 07 681 + 304 | 37 24 + 138 |
| 7 9.3 | 28 593 + 374 | 35 19 + 250 | 20 774 + 349 | 29 03 + 119 | 25 157 + 312 | 60 76 + 180 | 07 985 + 322 | 38 62 + 152 |
| 7 19.3 | 28 967 + 393 | 32 69 + 204 | 21 123 + 357 | 30 22 + 140 | 25 469 + 320 | 62 56 + 180 | 08 307 + 332 | 40 14 + 164 |
| 7 29.3 | 29 360 + 401 | 30 65 + 158 | 21 480 + 357 | 31 62 + 156 | 25 789 + 321 | 64 36 + 178 | 08 639 + 331 | 41 78 + 168 |
| 8 8.2 | 29 761 + 403 | 29 07 + 106 | 21 837 + 351 | 33 18 + 170 | 26 110 + 315 | 66 14 + 170 | 08 970 + 327 | 43 46 + 170 |
| 8 18.2 | 30 164 + 390 | 28 01 + 48 | 22 188 + 337 | 34 88 + 178 | 26 425 + 303 | 67 84 + 157 | 09 297 + 313 | 45 16 + 167 |
| 8 28.2 | 30 554 + 368 | 27 53 - 6 | 22 525 + 317 | 36 66 + 182 | 26 728 + 285 | 69 41 + 141 | 09 610 + 296 | 46 83 + 159 |
| 9 7.1 | 30 922 + 342 | 27 59 - 63 | 22 842 + 296 | 38 48 + 184 | 27 013 + 265 | 70 82 + 123 | 09 906 + 276 | 48 42 + 150 |
| 9 17.1 | 31 264 + 302 | 28 22 - 118 | 23 138 + 266 | 40 32 + 180 | 27 278 + 238 | 72 05 + 101 | 10 182 + 249 | 49 92 + 136 |
| 9 27.1 | 31 566 + 261 | 29 40 - 165 | 23 404 + 238 | 42 12 + 174 | 27 516 + 212 | 73 06 + 80 | 10 431 + 222 | 51 28 + 121 |
| 10 7.1 | 31 827 + 214 | 31 05 - 208 | 23 642 + 208 | 43 86 + 167 | 27 728 + 184 | 73 86 + 57 | 10 653 + 195 | 52 49 + 106 |
| 10 17.0 | 32 041 + 160 | 33 13 - 242 | 23 850 + 174 | 45 53 + 155 | 27 912 + 153 | 74 43 + 35 | 10 848 + 163 | 53 55 + 87 |
| 10 27.0 | 32 201 + 111 | 35 55 - 265 | 24 024 + 143 | 47 08 + 143 | 28 065 + 126 | 74 78 + 17 | 11 011 + 135 | 54 42 + 72 |
| 11 6.0 | 32 312 + 57 | 38 20 - 280 | 24 167 + 110 | 48 51 + 131 | 28 191 + 96 | 74 95 - 1 | 11 146 + 104 | 55 14 + 56 |
| 11 15.9 | 32 369 + 4 | 41 00 - 280 | 24 277 + 75 | 49 82 + 114 | 28 287 + 65 | 74 94 - 16 | 11 250 + 73 | 55 70 + 40 |
| 11 25.9 | 32 373 - 43 | 43 80 - 271 | 24 352 + 43 | 50 96 + 98 | 28 352 + 38 | 74 78 - 27 | 11 323 + 44 | 56 10 + 28 |
| 12 5.9 | 32 330 - 91 | 46 51 - 253 | 24 395 + 7 | 51 94 + 81 | 28 390 + 7 | 74 51 - 37 | 11 367 + 12 | 56 38 + 14 |
| 12 15.9 | 32 239 - 133 | 49 04 - 220 | 24 402 - 27 | 52 75 + 62 | 28 397 - 21 | 74 14 - 43 | 11 379 - 18 | 56 52 + 1 |
| 12 25.8 | 32 106 - 170 | 51 24 - 184 | 24 375 - 58 | 53 37 + 42 | 28 376 - 47 | 73 71 - 46 | 11 361 - 46 | 56 53 - 9 |
| 12 35.8 | 31 936 - 204 | 53 08 - 140 | 24 317 - 91 | 53 79 + 19 | 28 329 - 75 | 73 25 - 51 | 11 315 - 77 | 56 44 - 21 |
| | 31 732 - 227 | 54 48 - 89 | 24 226 - 117 | 53 98 - 2 | 28 254 - 96 | 72 74 - 51 | 11 238 - 100 | 56 23 - 31 |
| Mean Place | 29.473 | 50.90 | 22.316 | 34.57 | 26.381 | 60.13 | 09.340 | 40.62 |
| sec δ, tan δ | +1.488 | -1.101 | +1.150 | +0.568 | +1.011 | +0.148 | +1.049 | +0.318 |
| dα(ψ), dδ(ψ) | +0.044 | +0.32 | +0.070 | +0.32 | +0.064 | +0.32 | +0.066 | +0.32 |
| dα(ε), dδ(ε) | +0.059 | +0.60 | -0.030 | +0.60 | -0.008 | +0.60 | -0.017 | +0.61 |
| Dble.Trans. | October 28 | | -October 28 | | October 28 | | October 29 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 1070 | | 1071 | | 90 | | 88 | |
|----------------|--------------|---------|------------|---------|------------|---------|-------------------------|---------|
| | 14 Trianguli | | σ Ceti | | μ Hydri | | λ ¹ Fornacis | |
| Mag. Spect. | 5.35 | K0 | 4.82 | F5 | 5.29 | K0 | 5.88 | K0 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " |
| | 2 31 | + 36 05 | 2 31 | - 15 17 | 2 31 | - 79 09 | 2 32 | - 34 42 |
| 1 ^d | 14.633 | 18.99 | 25.712 | 84.05 | 63.650 | 89.23 | 32.717 | 48.96 |
| 1 ^s | - 56 | + 81 | - 55 | - 136 | - 904 | - 189 | - 97 | - 186 |
| 1 | 0.8 | 14.543 | 19.56 | 85.23 | 62.633 | 90.57 | 32.593 | 50.49 |
| 1 | 10.8 | - 122 | + 30 | - 104 | - 1111 | - 79 | - 151 | - 116 |
| 1 | 20.8 | 14.421 | 19.86 | 86.21 | 61.522 | 91.36 | 32.442 | 51.65 |
| 1 | 30.7 | - 151 | + 0 | - 125 | - 1171 | - 16 | - 173 | - 73 |
| 1 | 30.7 | 14.270 | 19.86 | 86.93 | 60.351 | 91.52 | 32.269 | 52.38 |
| 1 | 30.7 | - 168 | - 27 | - 137 | - 1185 | + 44 | - 184 | - 30 |
| 1 | 30.7 | 14.102 | 19.59 | 87.38 | 59.166 | 91.08 | 32.085 | 52.68 |
| 2 | 9.7 | - 181 | - 55 | - 148 | - 1184 | + 102 | - 194 | + 13 |
| 2 | 19.7 | 13.921 | 19.04 | 87.57 | 57.982 | 90.06 | 31.891 | 52.55 |
| 2 | 19.7 | - 182 | - 80 | - 148 | - 1139 | + 161 | - 192 | + 59 |
| 2 | 19.7 | 13.739 | 18.24 | 87.46 | 56.843 | 88.45 | 31.699 | 51.96 |
| 3 | 1.7 | - 171 | - 100 | - 140 | - 1063 | + 209 | - 182 | + 100 |
| 3 | 11.6 | 13.568 | 17.24 | 87.07 | 55.780 | 86.36 | 31.517 | 50.96 |
| 3 | 11.6 | - 153 | - 117 | - 126 | - 974 | + 255 | - 165 | + 140 |
| 3 | 21.6 | 13.415 | 16.07 | 86.39 | 54.806 | 83.81 | 31.352 | 49.56 |
| 3 | 21.6 | - 119 | - 126 | - 102 | - 844 | + 296 | - 137 | + 180 |
| 3 | 21.6 | 13.296 | 14.81 | 85.41 | 53.962 | 80.85 | 31.215 | 47.76 |
| 3 | 31.6 | - 78 | - 129 | - 70 | - 700 | + 326 | - 102 | + 212 |
| 3 | 31.6 | 13.218 | 13.52 | 84.16 | 53.262 | 77.59 | 31.113 | 45.64 |
| 3 | 31.6 | - 32 | - 127 | - 35 | - 545 | + 353 | - 62 | + 244 |
| 4 | 10.6 | 13.186 | 12.25 | 82.65 | 52.717 | 74.06 | 31.051 | 43.20 |
| 4 | 10.6 | + 24 | - 116 | + 9 | - 361 | + 370 | - 13 | + 270 |
| 4 | 20.5 | 13.210 | 11.09 | 80.88 | 52.356 | 70.36 | 31.038 | 40.50 |
| 4 | 20.5 | + 79 | - 99 | + 54 | - 181 | + 376 | + 36 | + 289 |
| 4 | 30.5 | 13.289 | 10.10 | 78.90 | 52.175 | 66.58 | 31.074 | 37.61 |
| 4 | 30.5 | + 134 | - 79 | + 99 | + 8 | + 381 | + 87 | + 306 |
| 4 | 30.5 | 13.423 | 09.31 | 76.72 | 52.183 | 62.77 | 31.161 | 34.55 |
| 5 | 20.4 | + 191 | - 54 | + 146 | + 207 | + 374 | + 140 | + 314 |
| 5 | 20.4 | 13.614 | 08.77 | 74.38 | 52.390 | 59.03 | 31.301 | 31.41 |
| 5 | 20.4 | + 240 | - 25 | + 188 | + 385 | + 357 | + 188 | + 315 |
| 5 | 30.4 | 13.854 | 08.52 | 71.95 | 52.775 | 55.46 | 31.489 | 28.26 |
| 5 | 30.4 | + 284 | + 6 | + 226 | + 566 | + 337 | + 232 | + 311 |
| 6 | 9.4 | 14.138 | 08.58 | 69.46 | 53.341 | 52.09 | 31.721 | 25.15 |
| 6 | 9.4 | + 322 | + 37 | + 261 | + 734 | + 303 | + 273 | + 297 |
| 6 | 19.4 | 14.460 | 08.95 | 66.98 | 54.075 | 49.06 | 31.994 | 22.18 |
| 6 | 19.4 | + 347 | + 67 | + 285 | + 868 | + 265 | + 302 | + 277 |
| 6 | 29.3 | 14.807 | 09.62 | 64.58 | 54.943 | 46.41 | 32.296 | 19.41 |
| 7 | 9.3 | + 369 | + 96 | + 305 | + 995 | + 221 | + 328 | + 251 |
| 7 | 9.3 | 15.176 | 10.58 | 62.29 | 55.938 | 44.20 | 32.624 | 16.90 |
| 7 | 9.3 | + 378 | + 122 | + 316 | + 1087 | + 167 | + 344 | + 215 |
| 7 | 19.3 | 15.554 | 11.80 | 60.21 | 57.025 | 42.53 | 32.968 | 14.75 |
| 7 | 19.3 | + 377 | + 144 | + 318 | + 1141 | + 114 | + 348 | + 176 |
| 7 | 29.3 | 15.931 | 13.24 | 58.38 | 58.166 | 41.39 | 33.316 | 12.99 |
| 7 | 29.3 | + 374 | + 163 | + 316 | + 1176 | + 54 | + 350 | + 132 |
| 8 | 8.2 | 16.305 | 14.87 | 56.84 | 59.342 | 40.85 | 33.666 | 11.67 |
| 8 | 8.2 | + 359 | + 178 | + 304 | + 1160 | - 10 | + 331 | + 81 |
| 8 | 18.2 | 16.664 | 16.65 | 55.66 | 60.502 | 40.95 | 34.003 | 10.86 |
| 8 | 28.2 | + 339 | + 188 | + 83 | + 1112 | - 67 | + 327 | + 32 |
| 8 | 28.2 | 17.003 | 18.53 | 54.83 | 61.614 | 41.62 | 34.324 | 10.54 |
| 8 | 28.2 | + 317 | + 197 | + 267 | + 1036 | - 127 | + 291 | - 19 |
| 9 | 7.1 | + 287 | + 198 | + 240 | + 910 | - 182 | + 267 | + 311 |
| 9 | 7.1 | 17.320 | 20.50 | 54.39 | 62.650 | 42.89 | 34.621 | 10.73 |
| 9 | 17.1 | + 287 | + 198 | + 240 | + 910 | - 182 | + 267 | + 311 |
| 9 | 17.1 | 17.607 | 22.48 | 54.36 | 63.560 | 44.71 | 34.888 | 11.43 |
| 9 | 17.1 | + 257 | + 198 | + 212 | + 765 | - 228 | + 233 | - 114 |
| 9 | 27.1 | 17.864 | 24.46 | 54.68 | 64.325 | 46.99 | 35.121 | 12.57 |
| 9 | 27.1 | + 226 | + 195 | + 183 | + 594 | - 270 | + 197 | - 157 |
| 10 | 7.1 | 18.090 | 26.41 | 55.36 | 64.919 | 49.69 | 35.318 | 14.14 |
| 10 | 17.0 | + 189 | + 187 | + 149 | + 389 | - 298 | + 156 | - 192 |
| 10 | 17.0 | 18.279 | 28.28 | 56.35 | 65.308 | 52.67 | 35.474 | 16.06 |
| 10 | 17.0 | + 157 | + 179 | + 119 | + 186 | - 314 | + 117 | - 216 |
| 10 | 27.0 | 18.436 | 30.07 | 57.58 | 65.494 | 55.81 | 35.591 | 18.22 |
| 10 | 27.0 | + 120 | + 168 | + 86 | - 31 | - 323 | + 76 | - 236 |
| 11 | 6.0 | 18.556 | 31.75 | 59.00 | 65.463 | 59.04 | 35.667 | 20.58 |
| 11 | 6.0 | + 82 | + 152 | + 54 | - 253 | - 312 | + 35 | - 240 |
| 11 | 16.0 | 18.638 | 33.27 | 60.53 | 65.210 | 62.16 | 35.702 | 22.98 |
| 11 | 16.0 | + 48 | + 137 | + 24 | - 451 | - 294 | - 2 | - 238 |
| 11 | 25.9 | 18.686 | 34.64 | 62.09 | 64.759 | 65.10 | 35.700 | 25.36 |
| 12 | 5.9 | + 8 | + 118 | - 7 | - 647 | - 263 | - 41 | - 227 |
| 12 | 5.9 | 18.694 | 35.82 | 63.64 | 64.112 | 67.73 | 35.659 | 27.63 |
| 12 | 5.9 | - 30 | + 96 | - 37 | - 815 | - 219 | - 75 | - 203 |
| 12 | 15.9 | 18.664 | 36.78 | 65.09 | 63.297 | 69.92 | 35.584 | 29.66 |
| 12 | 15.9 | - 65 | + 72 | - 63 | - 951 | - 171 | - 106 | - 175 |
| 12 | 25.8 | 18.599 | 37.50 | 66.39 | 62.346 | 71.63 | 35.478 | 31.41 |
| 12 | 25.8 | - 101 | + 46 | - 90 | - 1069 | - 116 | - 137 | - 142 |
| 12 | 35.8 | 18.498 | 37.96 | 67.52 | 61.277 | 72.79 | 35.341 | 32.83 |
| 12 | 35.8 | - 130 | + 17 | - 111 | - 1143 | - 54 | - 159 | - 99 |
| Mean Place | 16.516 | 16.64 | 26.804 | 72.41 | 56.379 | 65.80 | 33.250 | 32.35 |
| sec δ, tan δ | +1.237 | +0.729 | +1.037 | -0.274 | +5.321 | -5.226 | +1.216 | -0.693 |
| dα(ψ), dδ(ψ) | +0.073 | +0.31 | +0.057 | +0.31 | -0.024 | +0.31 | +0.050 | +0.31 |
| dα(ε), dδ(ε) | -0.038 | +0.61 | +0.014 | +0.61 | +0.275 | +0.62 | +0.036 | +0.62 |
| Dbie. Trans. | October 29 | | October 29 | | October 30 | | October 30 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 1072 | | 1074 | | 1073 | | 87 | |
|--------------|--------------|-------------------|--------------|-----------------|--------------|-------------------|-------------------|--------------------|
| | v Ceti* | | 80 Ceti | | 268 G. Ceti | | 36 H. Cassiopeiae | |
| Mag.Spect. | 5.04 | G5 | 5.71 | K5 | 5.92 | K0 | 5.34 | K0 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m 2 35 | + ° ' / + 5 31 | h m 2 35 | ° ' / - 7 53 | h m 2 35 | + ° ' / + 6 49 | h m 2 36 | + ° ' / + 72 45 |
| 1 -9.1 | 08 407 - 35 | 59 78 - 58 | 18 898 - 44 | 32.92 -113 | 18.799 - 33 | 16.93 - 49 | 41.266 - 309 | 45.04 +243 |
| 1 0.8 | 08 345 - 62 | 59 20 - 58 | 18 828 - 70 | 33.92 -100 | 18.740 - 59 | 16.43 - 50 | 40.859 - 407 | 47.04 +200 |
| 1 10.8 | 08 258 - 87 | 58 62 - 54 | 18 734 - 94 | 34.79 - 87 | 18.655 - 85 | 15.93 - 50 | 40.359 - 500 | 48.57 +153 |
| 1 20.8 | 08.148 - 110 | 58.08 - 58 | 18 619 - 115 | 35.48 - 69 | 18.548 - 107 | 15.45 - 48 | 39.787 - 572 | 49.53 + 96 |
| 1 30.7 | 08.023 - 125 | 57.59 - 49 | 18.490 - 129 | 35.97 - 49 | 18.427 - 121 | 15.01 - 44 | 39.172 - 615 | 49.93 + 40 |
| 2 9.7 | 07 887 - 136 | 57 16 - 43 | 18 349 - 141 | 36.28 - 31 | 18.294 - 133 | 14.61 - 40 | 38.532 - 640 | 49.75 - 18 |
| 2 19.7 | 07 748 - 139 | 56 81 - 35 | 18 207 - 142 | 36.35 - 7 | 18.158 - 136 | 14.28 - 33 | 37.901 - 631 | 48.98 - 77 |
| 3 1.7 | 07.617 - 119 | 56.56 - 25 | 18 072 - 135 | 36.20 + 15 | 18 030 - 128 | 14.05 - 23 | 37.312 - 589 | 47.70 - 128 |
| 3 11.6 | 07.498 - 131 | 56.43 - 13 | 17.949 - 123 | 35.83 + 37 | 17.915 - 115 | 13.91 - 14 | 36.783 - 529 | 45.95 - 175 |
| 3 21.6 | 07.404 - 94 | 56.45 + 2 | 17.851 - 98 | 35.19 + 64 | 17.825 - 90 | 13.92 + 1 | 36.350 - 433 | 43.81 - 214 |
| 3 31.6 | 07.341 - 63 | 56.64 + 19 | 17.783 - 68 | 34.33 + 86 | 17.767 - 58 | 14.09 + 17 | 36.031 - 319 | 41.41 - 240 |
| 4 10.6 | 07.314 - 27 | 57.00 + 36 | 17.750 - 33 | 33.23 +110 | 17.745 - 22 | 14.44 + 35 | 35.837 - 194 | 38.80 - 261 |
| 4 20.5 | 07.332 + 18 | 57.58 + 58 | 17.760 + 10 | 31.87 +136 | 17.768 + 23 | 14.99 + 55 | 35.789 - 48 | 36.12 - 268 |
| 4 30.5 | 07.391 + 59 | 58.34 + 76 | 17.813 + 53 | 30.31 +156 | 17.833 + 65 | 15.71 + 72 | 35.882 + 93 | 33.50 - 262 |
| 5 10.5 | 07.497 + 106 | 59.37 +103 | 17.912 + 99 | 28.52 +179 | 17.944 + 111 | 16.72 +101 | 36.117 + 235 | 30.98 - 252 |
| 5 20.4 | 07.651 + 154 | 60.61 +124 | 18.058 + 146 | 26.56 +196 | 18.104 + 160 | 17.93 +121 | 36.494 + 377 | 28.70 - 228 |
| 5 30.4 | 07.845 + 194 | 62.02 +141 | 18.244 + 186 | 24.47 +209 | 18.304 + 200 | 19.32 +139 | 36.990 + 496 | 26.73 - 197 |
| 6 9.4 | 08.078 + 233 | 63.60 +158 | 18.469 + 225 | 22.28 +219 | 18.542 + 238 | 20.88 +156 | 37.599 + 609 | 25.11 - 162 |
| 6 19.4 | 08.343 + 265 | 65.31 +171 | 18.727 + 258 | 20.05 +223 | 18.813 + 271 | 22.59 +171 | 38.304 + 705 | 23.93 - 118 |
| 6 29.3 | 08.631 + 288 | 67.10 +179 | 19.009 + 282 | 17.84 +221 | 19.106 + 293 | 24.37 +178 | 39.077 + 773 | 23.18 - 75 |
| 7 9.3 | 08.937 + 306 | 68.95 +185 | 19.310 + 301 | 15.68 +216 | 19.418 + 312 | 26.22 +185 | 39.908 + 831 | 22.91 - 27 |
| 7 19.3 | 09.254 + 317 | 70.78 +183 | 19.622 + 312 | 13.66 +202 | 19.739 + 321 | 28.07 +185 | 40.773 + 865 | 23.13 + 22 |
| 7 29.3 | 09.571 + 317 | 72.55 +177 | 19.937 + 315 | 11.83 +183 | 20.061 + 322 | 29.87 +180 | 41.647 + 874 | 23.80 + 67 |
| 8 8.2 | 09.886 + 315 | 74.22 +167 | 20.249 + 312 | 10.21 +162 | 20.380 + 319 | 31.58 +171 | 42.522 + 875 | 24.93 +113 |
| 8 18.2 | 10.189 + 303 | 75.74 +152 | 20.550 + 301 | 08.89 +132 | 20.686 + 306 | 33.15 +157 | 43.372 + 850 | 26.51 +158 |
| 8 28.2 | 10.475 + 286 | 77.07 +133 | 20.835 + 285 | 07.87 +102 | 20.976 + 290 | 34.54 +139 | 44.184 + 812 | 28.46 +195 |
| 9 7.1 | 10.742 + 267 | 78.19 +112 | 21.100 + 265 | 07.17 + 70 | 21.247 + 271 | 35.74 +120 | 44.949 + 765 | 30.79 +233 |
| 9 17.1 | 10.984 + 242 | 79.07 + 88 | 21.340 + 240 | 06.83 + 34 | 21.492 + 245 | 36.70 + 96 | 45.644 + 695 | 33.44 +265 |
| 9 27.1 | 11.201 + 217 | 79.72 + 65 | 21.554 + 214 | 06.81 + 2 | 21.712 + 220 | 37.43 + 73 | 46.268 + 624 | 36.33 +289 |
| 10 7.1 | 11.390 + 189 | 80.12 + 40 | 21.739 + 185 | 07.11 - 30 | 21.904 + 192 | 37.94 + 51 | 46.809 + 541 | 39.45 +312 |
| 10 17.0 | 11.549 + 159 | 80.29 + 17 | 21.893 + 154 | 07.70 - 59 | 22.066 + 162 | 38.21 + 27 | 47.250 + 441 | 42.72 +327 |
| 10 27.0 | 11.681 + 132 | 80.27 - 2 | 22.019 + 126 | 08.51 - 81 | 22.201 + 135 | 38.30 + 9 | 47.596 + 346 | 46.06 +334 |
| 11 6.0 | 11.783 + 102 | 80.07 - 20 | 22.113 + 94 | 09.52 -101 | 22.305 + 104 | 38.21 - 9 | 47.832 + 236 | 49.44 + 338 |
| 11 16.0 | 11.855 + 72 | 79.72 - 35 | 22.177 + 64 | 10.65 -113 | 22.380 + 75 | 37.97 - 24 | 47.951 + 119 | 52.75 +331 |
| 11 25.9 | 11.898 + 43 | 79.27 - 45 | 22.212 + 35 | 11.85 -120 | 22.426 + 46 | 37.63 - 34 | 47.959 + 8 | 55.92 +317 |
| 12 5.9 | 11.912 + 14 | 78.74 - 53 | 22.216 + 4 | 13.08 -123 | 22.442 + 16 | 37.20 - 43 | 47.845 - 114 | 58.89 +297 |
| 12 15.9 | 11.896 - 16 | 78.16 - 58 | 22.191 - 25 | 14.25 -117 | 22.429 - 13 | 36.73 - 47 | 47.615 - 230 | 61.53 +264 |
| 12 25.8 | 11.853 - 43 | 77.57 - 59 | 22.140 - 51 | 15.34 -109 | 22.389 - 40 | 36.23 - 50 | 47.279 - 336 | 63.81 +228 |
| 12 35.8 | 11.782 - 94 | 76.98 - 57 | 22.061 - 101 | 16.31 - 97 | 22.320 - 91 | 35.71 - 50 | 46.838 - 441 | 65.64 +183 |
| Mean Place | 09.863 | 65.31 | 20.122 | 23.61 | 20.346 | 22.92 | 43.660 | 36.58 |
| sec δ, tan δ | +1.005 | +0.097 | +1.010 | -0.139 | +1.007 | +0.120 | +3.374 | +3.223 |
| dα(ψ), dδ(ψ) | +0.063 | +0.31 | +0.059 | +0.31 | +0.063 | +0.31 | +0.115 | +0.31 |
| dα(ε), dδ(ε) | -0.005 | +0.63 | +0.007 | +0.63 | -0.006 | +0.63 | -0.167 | +0.63 |
| Dble.Trans. | October 30 | | October 30 | | October 30 | | October 31 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 89 | | 91 | | 95 | | 1075 | | | | | | | | | | |
|--------------|------------|--------|------------|--------|------------|--------|------------|--------|--------|--------|------|-------|------|--------|------|-------|------|
| | v Arietis | | δ Ceti | | ε Hydri | | ι Eridani | | | | | | | | | | |
| Mag. Spect. | 5.36 | A2 | 4.04 | B2 | 4.26 | B9 | 4.06 | K0 | | | | | | | | | |
| U.T. | R.A. | | R.A. | | R.A. | | R.A. | | | | | | | | | | |
| | h m | Dec. | h m | Dec. | h m | Dec. | h m | Dec. | | | | | | | | | |
| | 2 37 | +21 54 | 2 38 | + 0 16 | 2 39 | -68 19 | 2 40 | -39 54 | | | | | | | | | |
| 1 | -9.1 | 61.173 | -35 | 11.83 | +16 | 45.998 | -36 | 08.00 | -81 | 25.431 | -385 | 49.84 | -211 | 07.808 | -110 | 62.97 | -201 |
| 1 | 0.8 | 61.108 | -65 | 11.86 | +3 | 45.937 | -61 | 07.24 | -76 | 24.984 | -447 | 51.45 | -161 | 07.667 | -141 | 64.62 | -165 |
| 1 | 10.8 | 61.015 | -93 | 11.74 | -12 | 45.850 | -87 | 06.53 | -71 | 24.484 | -500 | 52.53 | -108 | 07.497 | -170 | 65.87 | -125 |
| 1 | 20.8 | 60.896 | -119 | 11.48 | -26 | 45.740 | -110 | 05.92 | -61 | 23.946 | -538 | 53.00 | -47 | 07.304 | -193 | 66.65 | -78 |
| 1 | 30.7 | 60.759 | -137 | 11.10 | -38 | 45.615 | -125 | 05.42 | -50 | 23.392 | -554 | 52.88 | +12 | 07.096 | -208 | 66.96 | -31 |
| 2 | 9.7 | 60.610 | -149 | 10.60 | -50 | 45.478 | -137 | 05.03 | -39 | 22.830 | -562 | 52.18 | +70 | 06.878 | -218 | 66.81 | +15 |
| 2 | 19.7 | 60.458 | -152 | 09.99 | -61 | 45.339 | -139 | 04.78 | -25 | 22.283 | -547 | 50.89 | +129 | 06.662 | -216 | 66.16 | +65 |
| 3 | 1.7 | 60.313 | -145 | 09.33 | -66 | 45.205 | -134 | 04.69 | -9 | 21.767 | -516 | 49.09 | +180 | 06.456 | -206 | 65.07 | +109 |
| 3 | 11.6 | 60.182 | -131 | 08.63 | -70 | 45.084 | -121 | 04.75 | +6 | 21.292 | -475 | 46.81 | +228 | 06.266 | -190 | 63.55 | +152 |
| 3 | 21.6 | 60.078 | -104 | 07.94 | -69 | 44.987 | -97 | 05.01 | +26 | 20.879 | -413 | 44.08 | +273 | 06.106 | -160 | 61.61 | +194 |
| 3 | 31.6 | 60.008 | -70 | 07.32 | -62 | 44.920 | -67 | 05.46 | +45 | 20.538 | -341 | 41.02 | +306 | 05.982 | -124 | 59.33 | +228 |
| 4 | 10.6 | 59.978 | -30 | 06.80 | -52 | 44.888 | -32 | 06.11 | +65 | 20.277 | -261 | 37.65 | +337 | 05.900 | -82 | 56.72 | +261 |
| 4 | 20.5 | 59.996 | +18 | 06.43 | -37 | 44.899 | +11 | 06.99 | +88 | 20.112 | -165 | 34.05 | +360 | 05.869 | -31 | 53.84 | +288 |
| 4 | 30.5 | 60.062 | +66 | 06.28 | -15 | 44.954 | +55 | 08.07 | +108 | 20.043 | -69 | 30.34 | +371 | 05.889 | +20 | 50.77 | +307 |
| 5 | 10.5 | 60.172 | +110 | 06.27 | -1 | 45.054 | +100 | 09.39 | +132 | 20.075 | +32 | 26.53 | +381 | 05.964 | +75 | 47.54 | +323 |
| 5 | 20.4 | 60.339 | +167 | 06.51 | +24 | 45.201 | +147 | 10.92 | +153 | 20.214 | +139 | 22.75 | +378 | 06.095 | +131 | 44.23 | +331 |
| 5 | 30.4 | 60.548 | +209 | 07.01 | +50 | 45.388 | +187 | 12.59 | +167 | 20.447 | +233 | 19.09 | +366 | 06.276 | +181 | 40.93 | +330 |
| 6 | 9.4 | 60.798 | +250 | 07.75 | +74 | 45.614 | +226 | 14.42 | +183 | 20.777 | +330 | 15.59 | +350 | 06.506 | +230 | 37.68 | +325 |
| 6 | 19.4 | 61.082 | +284 | 08.73 | +98 | 45.873 | +269 | 16.33 | +191 | 21.196 | +419 | 12.38 | +321 | 06.780 | +274 | 34.60 | +308 |
| 6 | 29.3 | 61.389 | +307 | 09.91 | +118 | 46.156 | +283 | 18.29 | +196 | 21.685 | +489 | 09.52 | +286 | 07.087 | +307 | 31.74 | +286 |
| 7 | 9.3 | 61.716 | +327 | 11.26 | +135 | 46.458 | +302 | 20.26 | +197 | 22.240 | +555 | 07.06 | +246 | 07.423 | +336 | 29.17 | +257 |
| 7 | 19.3 | 62.054 | +338 | 12.76 | +150 | 46.771 | +313 | 22.17 | +191 | 22.841 | +601 | 05.12 | +194 | 07.778 | +355 | 26.98 | +219 |
| 7 | 29.3 | 62.392 | +338 | 14.35 | +159 | 47.085 | +314 | 23.97 | +180 | 23.470 | +629 | 03.71 | +141 | 08.141 | +363 | 25.21 | +177 |
| 8 | 8.2 | 62.727 | +335 | 16.00 | +165 | 47.398 | +313 | 25.62 | +165 | 24.114 | +644 | 02.87 | +84 | 08.507 | +366 | 23.91 | +130 |
| 8 | 18.2 | 63.050 | +323 | 17.66 | +166 | 47.699 | +301 | 27.07 | +145 | 24.751 | +637 | 02.67 | +20 | 08.864 | +357 | 23.15 | +76 |
| 8 | 28.2 | 63.357 | +307 | 19.29 | +163 | 47.985 | +286 | 28.28 | +121 | 25.361 | +610 | 03.06 | -39 | 09.203 | +339 | 22.90 | +25 |
| 9 | 7.1 | 63.643 | +286 | 20.87 | +158 | 48.252 | +267 | 29.23 | +95 | 25.933 | +572 | 04.06 | -100 | 09.521 | +318 | 23.20 | -30 |
| 9 | 17.1 | 63.904 | +261 | 22.35 | +148 | 48.495 | +243 | 29.90 | +67 | 26.442 | +509 | 05.64 | -158 | 09.806 | +285 | 24.04 | -84 |
| 9 | 27.1 | 64.139 | +235 | 23.71 | +136 | 48.712 | +217 | 30.30 | +40 | 26.879 | +437 | 07.71 | -207 | 10.057 | +251 | 25.34 | -130 |
| 10 | 7.1 | 64.346 | +207 | 24.95 | +124 | 48.902 | +190 | 30.42 | +12 | 27.232 | +353 | 10.24 | -253 | 10.269 | +212 | 27.10 | -176 |
| 10 | 17.0 | 64.522 | +176 | 26.04 | +109 | 49.062 | +160 | 30.29 | -13 | 27.485 | +253 | 13.10 | -286 | 10.437 | +168 | 29.21 | -211 |
| 10 | 27.0 | 64.669 | +147 | 26.99 | +95 | 49.195 | +133 | 29.95 | -34 | 27.640 | +155 | 16.17 | -307 | 10.564 | +127 | 31.58 | -237 |
| 11 | 6.0 | 64.785 | +116 | 27.80 | +81 | 49.297 | +102 | 29.42 | -53 | 27.689 | +49 | 19.38 | -321 | 10.645 | +81 | 34.15 | -257 |
| 11 | 16.0 | 64.868 | +83 | 28.46 | +66 | 49.370 | +73 | 28.74 | -68 | 27.631 | -58 | 22.55 | -317 | 10.681 | +36 | 36.77 | -262 |
| 11 | 25.9 | 64.922 | +54 | 28.98 | +52 | 49.414 | +44 | 27.99 | -75 | 27.475 | -156 | 25.58 | -303 | 10.677 | -4 | 39.35 | -258 |
| 12 | 5.9 | 64.942 | +20 | 29.36 | +38 | 49.427 | +13 | 27.16 | -83 | 27.222 | -253 | 28.36 | -278 | 10.629 | -48 | 41.81 | -246 |
| 12 | 15.9 | 64.929 | -13 | 29.60 | +24 | 49.412 | -15 | 26.34 | -82 | 26.883 | -339 | 30.75 | -239 | 10.542 | -87 | 44.01 | -220 |
| 12 | 25.8 | 64.886 | -43 | 29.71 | +11 | 49.369 | -43 | 25.54 | -80 | 26.474 | -409 | 32.70 | -195 | 10.422 | -120 | 45.90 | -189 |
| 12 | 35.8 | 64.811 | -75 | 29.67 | -4 | 49.298 | -71 | 24.78 | -76 | 26.000 | -474 | 34.14 | -144 | 10.268 | -154 | 47.43 | -153 |
| | | | -101 | 29.67 | -17 | | -94 | | -67 | | -519 | | -84 | | -179 | | -107 |
| Mean Place | 62.848 | 12.74 | | 47.355 | 14.80 | 22.831 | 28.12 | 08.078 | 45.92 | | | | | | | | |
| sec δ, tan δ | +1.078 | +0.402 | | +1.000 | +0.005 | +2.707 | -2.516 | +1.304 | -0.837 | | | | | | | | |
| dα(ψ), dδ(ψ) | +0.068 | +0.31 | | +0.061 | +0.31 | +0.018 | +0.31 | +0.047 | +0.30 | | | | | | | | |
| dα(ε), dδ(ε) | -0.021 | +0.64 | | -0.000 | +0.64 | +0.129 | +0.64 | +0.043 | +0.64 | | | | | | | | |
| Dble. Trans. | October 31 | | October 31 | | October 31 | | November 1 | | | | | | | | | | |

AT UPPER TRANSIT AT GREENWICH

| No. | 1076 | | 94 | | 1077 | | 93 | |
|--------------|--------------|-------------|--------------|-------------|--------------|-------------|--------------|-------------|
| | ζ Horologii | | 35 Arietis | | 14 Persei | | 9 Persei | |
| Mag.Spect. | 5.26 | F2 | 4.58 | B3 | 5.58 | G5 | 4.22 | F8 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° / | h m | ° / | h m | ° / | h m | ° / |
| | 2 40 | - 54 36 | 2 42 | + 27 38 | 2 43 | + 44 14 | 2 43 | + 49 10 |
| 1 9.1 | 15.127 - 195 | 46.45 - 215 | 37.690 - 36 | 61.77 + 45 | 10.195 - 61 | 29.36 + 126 | 14.318 - 75 | 24.83 + 148 |
| 1 0.8 | 14.892 - 235 | 48.15 - 170 | 36.930 - 67 | 62.05 + 28 | 10.094 - 101 | 30.33 + 97 | 14.199 - 119 | 25.99 + 116 |
| 1 10.8 | 14.621 - 271 | 49.38 - 123 | 37.525 - 98 | 62.13 + 8 | 09.953 - 141 | 30.98 + 65 | 14.035 - 164 | 26.80 + 81 |
| 1 20.8 | 14.322 - 299 | 50.05 - 67 | 37.399 - 126 | 62.02 - 11 | 09.777 - 176 | 31.27 + 29 | 13.835 - 200 | 27.21 + 41 |
| 1 30.8 | 14.008 - 314 | 50.16 - 11 | 37.253 - 146 | 61.72 - 30 | 09.579 - 198 | 31.22 - 5 | 13.611 - 224 | 27.23 + 2 |
| 2 9.7 | 13.686 - 322 | 49.74 + 42 | 37.093 - 160 | 61.24 - 48 | 09.364 - 215 | 30.81 - 41 | 13.368 - 243 | 26.86 - 37 |
| 2 19.7 | 13.368 - 318 | 48.75 + 99 | 36.930 - 163 | 60.60 - 64 | 09.146 - 218 | 30.06 - 75 | 13.123 - 245 | 26.09 - 77 |
| 3 1.7 | 13.068 - 300 | 47.27 + 148 | 36.773 - 157 | 59.84 - 76 | 08.938 - 208 | 29.03 - 103 | 12.891 - 232 | 24.99 - 110 |
| 3 11.6 | 12.790 - 278 | 45.31 + 196 | 36.632 - 141 | 58.97 - 87 | 08.751 - 187 | 27.74 - 129 | 12.681 - 210 | 23.60 - 139 |
| 3 21.6 | 12.552 - 238 | 42.90 + 241 | 36.517 - 115 | 58.08 - 89 | 08.598 - 153 | 26.27 - 147 | 12.512 - 169 | 21.98 - 162 |
| 3 31.6 | 12.361 - 191 | 40.15 + 275 | 36.439 - 78 | 57.20 - 88 | 08.491 - 107 | 24.71 - 156 | 12.392 - 120 | 20.23 - 175 |
| 4 10.6 | 12.222 - 139 | 37.07 + 308 | 36.402 - 37 | 56.38 - 82 | 08.436 - 55 | 23.09 - 162 | 12.328 - 64 | 18.41 - 182 |
| 4 20.5 | 12.148 - 74 | 33.72 + 335 | 36.415 + 13 | 55.69 - 69 | 08.442 + 6 | 21.53 - 156 | 12.332 + 4 | 16.61 - 180 |
| 4 30.5 | 12.139 + 59 | 30.22 + 350 | 36.478 + 63 | 55.17 - 52 | 08.510 + 68 | 20.09 - 144 | 12.403 + 71 | 14.92 - 169 |
| 5 10.5 | 12.198 + 59 | 26.60 + 362 | 36.591 + 113 | 54.84 - 33 | 08.640 + 130 | 18.82 - 127 | 12.543 + 140 | 13.39 - 153 |
| 5 20.5 | 12.328 + 130 | 22.95 + 365 | 36.758 + 167 | 54.73 - 11 | 08.834 + 194 | 17.79 - 103 | 12.751 + 208 | 12.11 - 128 |
| 5 30.4 | 12.522 + 194 | 19.37 + 358 | 36.972 + 214 | 54.88 + 15 | 09.083 + 249 | 17.04 - 75 | 13.019 + 268 | 11.12 - 99 |
| 6 9.4 | 12.779 + 257 | 15.90 + 347 | 37.227 + 255 | 55.30 + 42 | 09.383 + 300 | 16.60 - 44 | 13.342 + 323 | 10.44 - 68 |
| 6 19.4 | 13.093 + 314 | 12.66 + 324 | 37.519 + 292 | 55.98 + 68 | 09.726 + 343 | 16.51 - 9 | 13.712 + 370 | 10.13 - 31 |
| 6 29.3 | 13.452 + 359 | 09.73 + 293 | 37.837 + 318 | 56.90 + 92 | 10.100 + 374 | 16.75 + 24 | 14.115 + 403 | 10.17 + 4 |
| 7 9.3 | 13.852 + 400 | 07.15 + 258 | 38.175 + 338 | 58.04 + 114 | 10.500 + 400 | 17.31 + 56 | 14.546 + 431 | 10.58 + 41 |
| 7 19.3 | 14.280 + 428 | 05.04 + 211 | 38.524 + 349 | 59.37 + 133 | 10.913 + 413 | 18.21 + 90 | 14.992 + 446 | 11.34 + 76 |
| 7 29.3 | 14.721 + 441 | 03.42 + 162 | 38.875 + 351 | 60.84 + 147 | 11.330 + 417 | 19.38 + 117 | 15.441 + 449 | 12.42 + 108 |
| 8 8.2 | 15.170 + 449 | 02.34 + 108 | 39.224 + 349 | 62.43 + 159 | 11.744 + 414 | 20.82 + 144 | 15.888 + 447 | 13.81 + 139 |
| 8 18.2 | 15.609 + 439 | 01.87 + 47 | 39.562 + 338 | 64.09 + 166 | 12.145 + 401 | 22.49 + 167 | 16.321 + 433 | 15.47 + 166 |
| 8 28.2 | 16.029 + 420 | 01.97 - 10 | 39.882 + 320 | 65.78 + 169 | 12.527 + 382 | 24.34 + 185 | 16.734 + 413 | 17.34 + 187 |
| 9 7.2 | 16.423 + 394 | 02.66 - 69 | 40.183 + 301 | 67.47 + 169 | 12.887 + 360 | 26.34 + 200 | 17.123 + 389 | 19.42 + 208 |
| 9 17.1 | 16.775 + 352 | 03.93 - 127 | 40.458 + 275 | 69.11 + 164 | 13.216 + 329 | 28.45 + 211 | 17.479 + 356 | 21.65 + 223 |
| 9 27.1 | 17.081 + 306 | 05.69 - 176 | 40.707 + 249 | 70.69 + 158 | 13.514 + 298 | 30.62 + 217 | 17.801 + 322 | 23.97 + 232 |
| 10 7.1 | 17.334 + 253 | 07.92 - 223 | 40.928 + 221 | 72.19 + 150 | 13.778 + 264 | 32.84 + 222 | 18.086 + 285 | 26.37 + 240 |
| 10 17.0 | 17.527 + 193 | 10.51 - 259 | 41.116 + 188 | 73.57 + 138 | 14.003 + 225 | 35.04 + 220 | 18.327 + 241 | 28.79 + 242 |
| 10 27.0 | 17.660 + 133 | 13.34 - 283 | 41.275 + 159 | 74.84 + 127 | 14.191 + 188 | 37.21 + 217 | 18.528 + 201 | 31.19 + 240 |
| 11 6.0 | 17.730 + 70 | 16.34 - 300 | 41.401 + 126 | 75.99 + 115 | 14.338 + 147 | 39.31 + 210 | 18.684 + 156 | 33.55 + 236 |
| 11 16.0 | 17.736 + 6 | 19.35 - 301 | 41.493 + 92 | 76.99 + 100 | 14.442 + 104 | 41.29 + 198 | 18.791 + 107 | 35.78 + 223 |
| 11 25.9 | 17.684 - 52 | 22.26 - 291 | 41.553 + 60 | 77.85 + 86 | 14.504 + 62 | 43.12 + 183 | 18.852 + 61 | 37.88 + 210 |
| 12 5.9 | 17.572 - 112 | 24.99 - 273 | 41.577 + 24 | 78.57 + 72 | 14.519 + 15 | 44.77 + 165 | 18.861 + 9 | 39.78 + 190 |
| 12 15.9 | 17.407 - 165 | 27.38 - 239 | 41.566 - 11 | 79.11 + 54 | 14.490 - 29 | 46.18 + 141 | 18.821 - 40 | 41.42 + 164 |
| 12 25.9 | 17.197 - 210 | 29.39 - 201 | 41.523 - 43 | 79.50 + 39 | 14.419 - 71 | 47.33 + 115 | 18.734 - 87 | 42.79 + 137 |
| 12 35.8 | 16.945 - 252 | 30.94 - 155 | 41.444 - 79 | 79.69 + 19 | 14.304 - 115 | 48.17 + 84 | 18.599 - 135 | 43.81 + 102 |
| | 16.945 - 283 | 30.94 - 101 | 41.444 - 107 | 79.69 + 0 | 14.304 - 152 | 48.17 + 50 | 18.599 - 174 | 43.81 + 65 |
| Mean Place | 14.460 | 26.63 | 39.420 | 61.05 | 12.121 | 24.92 | 16.326 | 19.39 |
| sec δ, tan δ | +1.727 | -1.408 | +1.129 | +0.524 | +1.396 | +0.974 | +1.530 | +1.157 |
| da(ψ), dδ(ψ) | +0.037 | +0.30 | +0.070 | +0.30 | +0.078 | +0.30 | +0.081 | +0.30 |
| da(ε), dδ(ε) | +0.072 | +0.64 | -0.026 | +0.65 | -0.049 | +0.65 | -0.058 | +0.65 |
| Dble.Trans. | November 1 | | November 1 | | November 1 | | November 1 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 97 | | 1078 | | 92 | | 98 | |
|--------------|--------------------------|---------------------------------------|---------------------------------------|---------------------------------------|--|---------------------------------------|---------------------------------------|--------------------------------------|
| | π Ceti | | 43 G. Fornacis* | | Bradley 366 (Cassiopeiae) | | μ Ceti | |
| Mag. Spect. | 4.39 | B5 | 6.87 | G0 | 5.84 | A2 | 4.36 | F0 |
| U.T. | R.A. | | R.A. | | R.A. | | R.A. | |
| | h m | Dec. | h m | Dec. | h m | Dec. | h m | Dec. |
| | 2 43 | - 13 54 | 2 43 | - 25 32 | 2 43 | + 67 45 | 2 44 | + 10 03 |
| 1 -9.1 | 27 709 ^s - 45 | 65 94 ^o - 137 ['] | 37 854 ^s - 65 ['] | 81 62 ^o - 173 ['] | 36 863 ^s - 202 ['] | 73 28 ^o + 230 ['] | 11 150 ^s - 28 ['] | 23 81 ^o - 39 ['] |
| 1 0.8 | 27 637 - 72 | 67.13 - 119 | 37 762 - 92 | 83.08 - 146 | 36 582 - 281 | 75 17 + 189 | 11 094 - 56 | 23 39 - 42 |
| 1 10.8 | 27 539 - 98 | 68.15 - 102 | 37 642 - 120 | 84.27 - 119 | 36 225 - 357 | 76 62 + 145 | 11 011 - 83 | 22 94 - 45 |
| 1 20.8 | 27 418 - 121 | 68.92 - 77 | 37 500 - 142 | 85 10 - 83 | 35 907 - 418 | 77 53 + 91 | 10 903 - 108 | 22 47 - 47 |
| 1 30.8 | 27 282 - 136 | 69.44 - 52 | 37 343 - 157 | 85 57 - 47 | 35 351 - 456 | 77 92 + 39 | 10 778 - 125 | 22 01 - 46 |
| 2 9.7 | 27 134 - 148 | 69 70 - 26 | 37 174 - 169 | 85 68 - 11 | 34 869 - 482 | 77 76 - 16 | 10 640 - 138 | 21 56 - 45 |
| 2 19.7 | 26 983 - 151 | 69 67 + 3 | 37 003 - 171 | 85 40 + 28 | 34 389 - 480 | 77 05 - 71 | 10 498 - 142 | 21 15 - 41 |
| 3 1.7 | 26 839 - 144 | 69 37 + 30 | 36 840 - 163 | 84 75 + 65 | 33 937 - 452 | 75 86 - 119 | 10 362 - 136 | 20 79 - 39 |
| 3 11.6 | 26 705 - 134 | 68 79 + 58 | 36 689 - 151 | 83 75 + 100 | 33 527 - 410 | 74 22 - 201 | 10 237 - 125 | 20 50 - 26 |
| 3 21.6 | 26 596 - 109 | 67 91 + 88 | 36 563 - 126 | 82 38 + 137 | 33 189 - 338 | 72 21 - 164 | 10 136 - 101 | 20 33 - 17 |
| 3 31.6 | 26 516 - 90 | 66 77 + 114 | 36 468 - 95 | 80 71 + 167 | 32 938 - 251 | 69 95 - 226 | 10 067 - 69 | 20 29 - 4 |
| 4 10.6 | 26 470 - 46 | 65 37 + 140 | 36 409 - 59 | 78 73 + 198 | 32 784 - 154 | 67 49 - 246 | 10 033 - 34 | 20 41 + 12 |
| 4 20.5 | 26 468 - 2 | 63 70 + 167 | 36 396 - 13 | 76 47 + 226 | 32 744 - 40 | 64 98 - 251 | 10 045 + 12 | 20 72 + 31 |
| 4 30.5 | 26 510 + 42 | 61 82 + 188 | 36 428 + 32 | 74 01 + 246 | 32 817 + 73 | 62 51 - 247 | 10 102 + 97 | 21 17 + 45 |
| 5 10.5 | 26 598 + 88 | 59 73 + 209 | 36 509 + 81 | 71 35 + 266 | 33 002 + 185 | 60 15 - 236 | 10 199 + 57 | 21 92 + 75 |
| 5 20.5 | 26 733 + 135 | 57 48 + 225 | 36 639 + 130 | 68 56 + 279 | 33 301 + 299 | 58 02 - 213 | 10 349 + 150 | 22 89 + 97 |
| 5 30.4 | 26 909 + 176 | 55 12 + 236 | 36 814 + 175 | 65 72 + 284 | 33 697 + 396 | 56 19 - 183 | 10 541 + 192 | 24 03 + 114 |
| 6 9.4 | 27 126 + 217 | 52 68 + 244 | 37 031 + 217 | 62 86 + 286 | 34 184 + 487 | 54 68 - 151 | 10 772 + 231 | 25 36 + 133 |
| 6 19.4 | 27 378 + 252 | 50 24 + 244 | 37 286 + 255 | 60 06 + 280 | 34 750 + 566 | 53 60 - 108 | 11 036 + 264 | 26 84 + 148 |
| 6 29.3 | 27 655 + 277 | 47 87 + 237 | 37 569 + 283 | 57 41 + 265 | 35 371 + 621 | 52 94 - 66 | 11 324 + 288 | 28 44 + 160 |
| 7 9.3 | 27 953 + 298 | 45 58 + 229 | 37 876 + 307 | 54 93 + 248 | 36 041 + 670 | 52 72 - 22 | 11 632 + 308 | 30 13 + 169 |
| 7 19.3 | 28 265 + 312 | 43 49 + 209 | 38 198 + 322 | 52 74 + 219 | 36 698 + 698 | 52 97 + 25 | 11 951 + 319 | 31 85 + 172 |
| 7 29.3 | 28 580 + 315 | 41 63 + 186 | 38 198 + 328 | 50 87 + 187 | 36 739 + 707 | 53 64 + 67 | 12 272 + 321 | 33 55 + 170 |
| 8 8.2 | 28 896 + 316 | 40 04 + 159 | 38 526 + 329 | 49 38 + 149 | 37 446 + 709 | 53 64 + 112 | 12 272 + 320 | 33 55 + 165 |
| 8 18.2 | 29 201 + 305 | 38 79 + 125 | 39 175 + 320 | 48 32 + 106 | 38 155 + 691 | 56 28 + 152 | 12 592 + 309 | 35 20 + 153 |
| 8 28.2 | 29 492 + 291 | 37 90 + 89 | 39 479 + 304 | 47 70 + 62 | 39 507 + 661 | 58 16 + 188 | 13 194 + 293 | 38 13 + 140 |
| 9 7.2 | 29 764 + 272 | 37 38 + 52 | 39 765 + 286 | 47 54 + 16 | 40 133 + 626 | 60 39 + 223 | 13 470 + 276 | 39 36 + 123 |
| 9 17.1 | 30 011 + 247 | 37 26 + 12 | 39 765 + 258 | 47 54 - 31 | 40 133 + 573 | 60 39 + 251 | 13 470 + 251 | 39 36 + 103 |
| 9 27.1 | 30 232 + 221 | 37 50 - 24 | 40 023 + 230 | 47 85 - 74 | 40 706 + 517 | 62 90 + 275 | 13 721 + 227 | 40 39 + 82 |
| 10 7.1 | 30 426 + 194 | 38 10 - 60 | 40 253 + 199 | 48 59 - 114 | 41 223 + 454 | 65 65 + 295 | 13 948 + 201 | 41 21 + 62 |
| 10 17.0 | 30 587 + 161 | 39 01 - 91 | 40 452 + 163 | 49 73 - 149 | 41 677 + 379 | 68 60 + 308 | 14 149 + 170 | 41 83 + 40 |
| 10 27.0 | 30 718 + 131 | 40 17 - 116 | 40 615 + 130 | 51 22 - 175 | 42 056 + 305 | 71 68 + 315 | 14 319 + 144 | 42 23 + 23 |
| 11 6.0 | 30 718 + 100 | 40 17 - 136 | 40 745 + 94 | 52 97 - 196 | 42 361 + 222 | 74 83 + 319 | 14 463 + 115 | 42 46 + 5 |
| 11 16.0 | 30 818 + 67 | 41 53 - 149 | 40 839 + 58 | 54 93 - 206 | 42 583 + 132 | 78 02 + 311 | 14 578 + 83 | 42 51 - 9 |
| 11 25.9 | 30 885 + 37 | 43 02 - 153 | 40 897 + 24 | 56 99 - 207 | 42 715 + 46 | 81 13 + 299 | 14 661 + 55 | 42 42 - 20 |
| 12 5.9 | 30 922 + 5 | 44 55 - 154 | 40 921 - 11 | 59 06 - 203 | 42 761 - 48 | 84 12 + 279 | 14 716 + 24 | 42 22 - 30 |
| 12 15.9 | 30 927 - 25 | 46 09 - 145 | 40 910 - 44 | 61 09 - 186 | 42 713 - 140 | 86 91 + 249 | 14 740 - 7 | 41 92 - 37 |
| 12 25.9 | 30 902 - 54 | 47 54 - 132 | 40 866 - 73 | 62 95 - 164 | 42 573 - 224 | 89 40 + 215 | 14 733 - 36 | 41 55 - 41 |
| 12 35.8 | 30 848 - 82 | 48 86 - 115 | 40 793 - 104 | 64 59 - 139 | 42 349 - 308 | 91 55 + 173 | 14 697 - 66 | 41 14 - 45 |
| | 30 766 - 106 | 50 01 - 93 | 40 689 - 128 | 65 98 - 105 | 42 041 - 375 | 93 28 + 123 | 14 631 - 91 | 40 69 - 46 |
| Mean Place | 28.768 | 55 56 | 38 624 | 68 21 | 39 099 | 65 21 | 12 648 | 27 59 |
| sec δ, tan δ | +1.030 | -0.248 | +1.108 | -0.478 | +2.643 | +2.447 | +1.016 | +0.177 |
| da(ψ), dδ(ψ) | +0.057 | +0.30 | +0.053 | +0.30 | +0.104 | +0.30 | +0.064 | +0.30 |
| da(ε), dδ(ε) | +0.012 | +0.65 | +0.024 | +0.65 | -0.123 | +0.65 | -0.009 | +0.66 |
| Dble. Trans. | November 1 | | November 1 | | November 1 | | November 2 | |

AT UPPER TRANSIT AT GREENWICH

| No. | 101 | | 100 | | 99 | | 102 | |
|--------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|
| Name | β Fornacis | | 41 Arietis | | η Persei | | τ ⁺ Eridani | |
| Mag.Spect. | 4.50 | K0 | 3.68 | B8 | 3.95 | K0 | 4.81 | K0 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | ^h ^m | ^o ['] | ^h ^m | ^o ['] | ^h ^m | ^o ['] | ^h ^m | ^o ['] |
| | 2 48 | -32 27 | 2 49 | +27 12 | 2 49 | +55 50 | 2 50 | -21 03 |
| 1 -9.1 | ^s 31.039 - 79 | " -194 | ^s 09.489 - 29 | " +44 | ^s 40.259 - 93 | " +183 | ^s 24.695 - 52 | " -164 |
| 1 0.8 | 30.931 - 108 | 60.30 -162 | 09.427 - 62 | 20.64 +27 | 40.112 -147 | 31.24 +148 | 24.615 - 80 | 44.89 -141 |
| 1 10.8 | 30.793 -138 | 61.59 -129 | 09.333 - 94 | 20.91 +10 | 39.912 -200 | 32.72 +112 | 24.507 -108 | 46.30 -117 |
| 1 20.8 | 30.631 -162 | 62.46 - 87 | 09.210 -123 | 21.01 -10 | 39.667 -245 | 33.84 +66 | 24.376 -131 | 47.47 - 86 |
| 1 30.8 | 30.453 -178 | 62.92 - 46 | 09.066 -144 | 20.91 -26 | 39.393 -274 | 34.50 +22 | 24.228 -148 | 48.33 - 54 |
| 2 9.7 | 30.263 -190 | 62.97 - 5 | 08.907 -159 | 20.20 - 45 | 39.096 -297 | 34.49 - 23 | 24.067 -161 | 49.09 - 22 |
| 2 19.7 | 30.071 -192 | 62.57 +40 | 08.743 -164 | 19.60 -60 | 38.796 -300 | 33.80 -69 | 23.903 -164 | 48.94 +15 |
| 3 1.7 | 29.886 -185 | 61.76 + 81 | 08.585 -158 | 18.87 -73 | 38.510 -286 | 32.72 -108 | 23.744 -159 | 48.47 + 47 |
| 3 11.6 | 29.715 -171 | 60.55 +121 | 08.440 -145 | 18.06 - 81 | 38.248 -262 | 31.28 -144 | 23.597 -147 | 47.66 + 81 |
| 3 21.6 | 29.569 -146 | 58.94 +161 | 08.322 -118 | 17.20 -86 | 38.032 -216 | 29.55 -173 | 23.472 -125 | 46.51 +115 |
| 3 31.6 | 29.456 -113 | 56.99 +195 | 08.239 - 83 | 16.36 - 84 | 37.873 -159 | 27.63 -192 | 23.378 - 94 | 45.07 +144 |
| 4 10.6 | 29.380 - 76 | 54.73 +226 | 08.196 - 43 | 15.57 -79 | 37.779 - 94 | 25.58 -205 | 23.318 - 60 | 43.33 +174 |
| 4 20.5 | 29.352 - 28 | 52.18 +255 | 08.203 + 7 | 14.90 -67 | 37.762 - 17 | 23.51 -207 | 23.303 - 15 | 41.32 +201 |
| 4 30.5 | 29.371 + 19 | 49.42 +276 | 08.260 + 57 | 14.41 -49 | 37.823 + 61 | 21.52 -199 | 23.332 + 29 | 39.09 +223 |
| 5 10.5 | 29.441 + 70 | 46.48 +294 | 08.366 +106 | 14.09 -32 | 37.962 +139 | 19.65 -187 | 23.408 + 76 | 36.66 +243 |
| 5 20.5 | 29.563 +122 | 43.42 +306 | 08.527 +161 | 13.98 -11 | 38.181 +219 | 18.01 -164 | 23.533 +125 | 34.08 +258 |
| 5 30.4 | 29.733 +170 | 40.33 +309 | 08.734 +207 | 14.12 +14 | 38.468 +287 | 16.65 -136 | 23.701 +168 | 31.42 +266 |
| 6 9.4 | 29.948 +215 | 37.25 +308 | 08.984 +250 | 14.52 +40 | 38.820 +352 | 15.60 -105 | 23.911 +210 | 28.71 +271 |
| 6 19.4 | 30.204 +256 | 34.27 +298 | 09.271 +287 | 15.19 +67 | 39.227 +407 | 14.94 - 66 | 24.158 +247 | 26.03 +268 |
| 6 29.3 | 30.490 +286 | 31.47 +280 | 09.584 +313 | 16.08 +89 | 39.675 +448 | 14.64 - 30 | 24.433 +275 | 23.47 +256 |
| 7 9.3 | 30.804 +314 | 28.90 +257 | 09.919 +335 | 17.18 +110 | 40.156 +481 | 14.74 + 10 | 24.732 +299 | 21.04 +243 |
| 7 19.3 | 31.136 +332 | 26.65 +225 | 10.266 +347 | 18.47 +129 | 40.657 +501 | 15.24 + 50 | 25.047 +315 | 18.87 +217 |
| 7 29.3 | 31.476 +340 | 24.78 +187 | 10.616 +350 | 19.90 +143 | 41.164 +507 | 16.09 + 85 | 25.367 +320 | 16.97 +190 |
| 8 8.2 | 31.818 +342 | 23.32 +146 | 10.965 +349 | 21.44 +154 | 41.672 +508 | 17.30 +121 | 25.688 +321 | 15.41 +156 |
| 8 18.2 | 32.152 +334 | 22.35 + 97 | 11.303 +338 | 23.05 +161 | 42.166 +494 | 18.85 +155 | 26.001 +313 | 14.25 +116 |
| 8 28.2 | 32.472 +320 | 21.86 + 49 | 11.625 +322 | 24.68 +163 | 42.640 +474 | 20.66 +181 | 26.301 +300 | 13.50 + 75 |
| 9 7.2 | 32.773 +301 | 21.88 - 2 | 11.929 +304 | 26.31 +163 | 43.090 +450 | 22.74 +208 | 26.583 +282 | 13.18 + 32 |
| 9 17.1 | 33.046 +273 | 22.41 - 53 | 12.208 +279 | 27.90 +159 | 43.503 +413 | 25.02 +228 | 26.840 +257 | 13.31 - 13 |
| 9 27.1 | 33.289 +243 | 23.40 - 99 | 12.462 +254 | 29.42 +152 | 43.878 +375 | 27.46 +244 | 27.070 +230 | 13.85 - 54 |
| 10 7.1 | 33.499 +210 | 24.82 -142 | 12.688 +226 | 30.86 +144 | 44.213 +335 | 30.04 +258 | 27.271 +201 | 14.78 - 93 |
| 10 17.0 | 33.670 +171 | 26.62 -180 | 12.882 +194 | 32.18 +132 | 44.497 +284 | 32.68 +264 | 27.439 +168 | 16.05 -127 |
| 10 27.0 | 33.805 +135 | 28.68 -206 | 13.048 +166 | 33.40 +122 | 44.734 +237 | 35.35 +267 | 27.575 +136 | 17.59 -154 |
| 11 6.0 | 33.900 + 95 | 30.96 -228 | 13.181 +133 | 34.50 +110 | 44.918 +184 | 38.02 +267 | 27.678 +103 | 19.34 -175 |
| 11 16.0 | 33.956 + 56 | 33.32 -236 | 13.280 + 99 | 35.45 + 95 | 45.044 +126 | 40.59 +257 | 27.746 + 68 | 21.21 -187 |
| 11 25.9 | 33.974 + 18 | 35.69 -237 | 13.347 + 67 | 36.28 + 83 | 45.115 + 71 | 43.04 +245 | 27.782 + 36 | 23.11 -190 |
| 12 5.9 | 33.954 - 20 | 37.98 -229 | 13.378 + 31 | 36.97 + 69 | 45.124 + 9 | 45.31 +227 | 27.784 + 2 | 25.00 -189 |
| 12 15.9 | 33.898 - 56 | 40.07 -209 | 13.373 - 5 | 37.49 + 52 | 45.072 - 52 | 47.31 +200 | 27.753 - 31 | 26.74 -174 |
| 12 25.9 | 33.810 - 88 | 41.90 -183 | 13.336 - 37 | 37.87 + 38 | 44.965 -107 | 49.01 +170 | 27.692 - 61 | 28.32 -158 |
| 12 35.8 | 33.688 -146 | 43.43 -153 | 13.262 - 74 | 38.06 + 19 | 44.799 -166 | 50.36 +135 | 27.601 - 91 | 29.67 -135 |
| | | -113 | 13.262 -103 | 38.06 + 2 | 44.799 -214 | 50.36 + 92 | 27.601 -116 | 29.67 -105 |
| Mean Place | 31.550 | 44.01 | 11.189 | 19.73 | 42.292 | 24.64 | 25.544 | 33.22 |
| sec δ, tan δ | +1.185 | -0.636 | +1.124 | +0.514 | +1.781 | +1.474 | +1.072 | -0.385 |
| da(ψ), dδ(ψ) | +0.050 | +0.30 | +0.070 | +0.29 | +0.088 | +0.29 | +0.054 | +0.29 |
| da(ε), dδ(ε) | +0.031 | +0.67 | -0.025 | +0.67 | -0.073 | +0.67 | +0.019 | +0.68 |
| Dble.Trans. | November 3 | | November 3 | | November 3 | | November 3 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 1079 | | 103 | | 104 | | 1080 | |
|----------------|-------------------|-------------|-------------------|-------------|-------------------|-------------|-------------------|-------------|
| | σ Arietis | | τ Persei | | η Eridani | | 40 G. Eridani | |
| Mag. Spect. | 5.46 | B5 | 4.06 | G0, A5 | 4.05 | K0 | 5.27 | A2 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° ' / | h m | ° ' / | h m | ° ' / | h m | ° ' / |
| | 2 50 | + 15 01 | 2 53 | + 52 42 | 2 55 | - 8 56 | 2 55 | - 3 45 |
| 1 ^d | ^s - 23 | " - 16 | ^s - 74 | " +170 | ^s - 31 | " -124 | ^s - 27 | " -103 |
| 1 0.8 | 43 234 - 53 | 34.93 - 22 | 15 670 - 125 | 34.80 +139 | 44 917 - 59 | 73.07 -112 | 55 565 - 54 | 64.85 - 93 |
| 1 10.8 | 43 181 - 82 | 34.71 - 30 | 15.545 - 175 | 36.19 +103 | 44 858 - 87 | 74.19 - 97 | 55 511 - 83 | 65.78 - 84 |
| 1 20.8 | 43 099 - 109 | 34.41 - 36 | 15.370 - 218 | 37.22 + 61 | 44 771 - 112 | 75.16 - 77 | 55 428 - 107 | 66.62 - 70 |
| 1 30.8 | 42 990 - 127 | 34.05 - 40 | 15.152 - 246 | 37.83 + 20 | 44 659 - 130 | 75.93 - 57 | 55 321 - 126 | 67.32 - 55 |
| | 42 863 | 33.65 | 14.906 | 38.03 | 44 529 | 76.50 | 55.195 | 67.87 |
| 2 9.7 | 42 721 - 142 | 33.20 - 45 | 14 637 - 269 | 37.80 - 23 | 44 385 - 144 | 76.86 - 36 | 55 055 - 140 | 68.26 - 39 |
| 2 19.7 | 42 573 - 148 | 32.73 - 47 | 14.364 - 273 | 37.14 - 66 | 44 236 - 149 | 76.98 - 12 | 54 909 - 146 | 68.45 - 19 |
| 3 1.7 | 42 430 - 143 | 32.27 - 46 | 14.301 - 263 | 37.14 - 101 | 44 206 - 146 | 76.86 + 12 | 54 766 - 143 | 68.45 - 1 |
| 3 11.6 | 42 298 - 132 | 31.83 - 44 | 14.101 - 241 | 36.13 - 136 | 44 090 - 135 | 76.86 + 36 | 54.766 | 68.46 + 19 |
| 3 21.6 | 42 190 - 108 | 31.46 - 37 | 13.860 - 199 | 34.77 - 163 | 43 955 - 115 | 76.50 + 63 | 54.633 | 68.27 + 41 |
| | 42 113 | 31.19 | 13.661 | 33.14 | 43 840 | 75.87 | 54.522 | 67.86 |
| 3 31.6 | 42.113 - 77 | 31.19 - 27 | 13.513 - 148 | 31.34 - 180 | 43.755 - 85 | 75.01 + 86 | 54.439 - 83 | 67.24 + 62 |
| 4 10.6 | 42 073 - 40 | 31.03 - 16 | 13.425 - 88 | 29.42 - 192 | 43.703 - 52 | 73.90 +111 | 54.390 - 49 | 66.40 + 84 |
| 4 20.5 | 42 079 + 6 | 31.06 + 3 | 13.408 - 17 | 27.49 - 193 | 43.693 - 10 | 72.54 +136 | 54.383 - 7 | 65.32 +108 |
| 4 30.5 | 42.134 + 55 | 31.26 + 20 | 13.464 + 56 | 25.63 - 186 | 43.726 + 33 | 70.97 +157 | 54.420 + 37 | 64.03 +129 |
| 5 10.5 | 42.220 + 86 | 31.61 + 35 | 13.593 + 129 | 23.90 - 173 | 43.805 + 79 | 69.18 +179 | 54.501 + 81 | 62.53 +150 |
| 5 20.5 | 42.370 + 150 | 32.28 + 67 | 13.796 + 203 | 22.40 - 150 | 43.931 + 126 | 67.20 +198 | 54.629 + 128 | 60.82 +171 |
| 5 30.4 | 42.561 + 191 | 33.12 + 84 | 14.063 + 267 | 21.17 - 123 | 44.099 + 168 | 65.10 +210 | 54.800 + 171 | 58.98 +184 |
| 6 9.4 | 42.791 + 230 | 34.16 + 104 | 14.392 + 329 | 20.24 - 93 | 44.307 + 208 | 62.89 +221 | 55.010 + 210 | 57.00 +198 |
| 6 19.4 | 43.056 + 265 | 35.40 + 124 | 14.773 + 381 | 19.68 - 56 | 44.551 + 244 | 60.64 +225 | 55.255 + 245 | 54.95 +205 |
| 6 29.3 | 43.346 + 290 | 36.77 + 137 | 15.192 + 419 | 19.48 - 20 | 44.820 + 269 | 58.41 +223 | 55.526 + 271 | 52.89 +206 |
| 7 9.3 | 43.657 + 311 | 38.28 +151 | 15.643 + 451 | 19.64 + 16 | 45.113 + 293 | 56.24 +217 | 55.818 + 292 | 50.84 +205 |
| 7 19.3 | 43.980 + 323 | 39.86 +158 | 16.113 + 470 | 20.19 + 55 | 45.419 + 306 | 54.21 +203 | 56.125 + 307 | 48.89 +195 |
| 7 29.3 | 44.305 + 325 | 41.47 +161 | 16.589 + 476 | 21.07 + 88 | 45.730 + 311 | 52.36 +185 | 56.436 + 311 | 47.08 +181 |
| 8 8.2 | 44.631 + 326 | 43.08 +161 | 17.067 + 478 | 22.28 +121 | 46.043 + 313 | 50.73 +163 | 56.748 + 312 | 45.44 +164 |
| 8 18.2 | 44.946 + 315 | 44.63 +155 | 17.533 + 466 | 23.80 +152 | 46.348 + 305 | 49.41 +132 | 57.052 + 304 | 44.06 +138 |
| 8 28.2 | 45.247 + 301 | 46.08 +145 | 17.979 + 446 | 25.57 +177 | 46.640 + 292 | 48.39 +102 | 57.342 + 290 | 42.94 +112 |
| 9 7.2 | 45.531 + 284 | 47.42 +134 | 18.404 + 425 | 27.57 +200 | 46.915 + 275 | 47.72 + 67 | 57.617 + 275 | 42.11 + 83 |
| 9 17.1 | 45.791 + 260 | 48.61 +119 | 18.795 + 391 | 29.77 +220 | 47.168 + 263 | 47.41 + 31 | 57.870 + 253 | 41.61 + 50 |
| 9 27.1 | 46.028 + 237 | 49.62 +101 | 19.151 + 356 | 32.09 +232 | 47.397 + 229 | 47.43 - 2 | 58.098 + 228 | 41.41 + 20 |
| 10 7.1 | 46.239 + 211 | 50.47 + 85 | 19.470 + 319 | 34.54 +245 | 47.600 + 203 | 47.79 - 36 | 58.302 + 204 | 41.51 - 10 |
| 10 17.0 | 46.420 + 181 | 51.14 + 67 | 19.743 + 273 | 37.04 +250 | 47.772 + 172 | 48.45 - 66 | 58.476 + 174 | 41.89 - 38 |
| 10 27.0 | 46.574 + 154 | 51.64 + 50 | 19.973 + 230 | 39.55 +251 | 47.917 + 145 | 49.36 - 91 | 58.622 + 146 | 42.50 - 61 |
| 11 6.0 | 46.699 + 125 | 51.99 + 35 | 20.154 + 181 | 42.06 +251 | 48.032 + 115 | 50.48 - 112 | 58.740 + 118 | 43.31 - 81 |
| 11 16.0 | 46.792 + 93 | 52.19 + 20 | 20.282 + 128 | 44.47 +241 | 48.114 + 82 | 51.73 - 125 | 58.826 + 86 | 44.27 - 96 |
| 11 25.9 | 46.856 + 64 | 52.28 + 9 | 20.359 + 77 | 46.76 +229 | 48.167 + 53 | 53.05 - 132 | 58.883 + 57 | 45.30 - 103 |
| 12 5.9 | 46.888 + 32 | 52.26 - 2 | 20.379 + 20 | 48.87 +211 | 48.188 + 21 | 54.40 - 135 | 58.909 + 26 | 46.38 - 108 |
| 12 15.9 | 46.887 - 1 | 52.14 - 12 | 20.344 - 35 | 50.74 +187 | 48.178 - 10 | 55.70 - 130 | 58.903 - 6 | 47.44 - 106 |
| 12 25.9 | 46.856 - 31 | 51.96 - 18 | 20.255 - 89 | 52.33 +159 | 48.139 - 39 | 56.91 - 121 | 58.869 - 34 | 48.44 - 100 |
| 12 35.8 | 46.793 - 63 | 51.69 - 27 | 20.113 - 142 | 53.57 +124 | 48.069 - 70 | 57.99 - 108 | 58.804 - 65 | 49.37 - 93 |
| | 46.793 - 91 | 51.69 - 33 | 20.113 - 188 | 53.57 + 86 | 48.069 - 96 | 57.99 - 90 | 58.804 - 91 | 49.37 - 79 |
| Mean Place | 44.765 | 37.05 | 17.647 | 28.64 | 46.026 | 65.05 | 56.771 | 58.09 |
| sec δ, tan δ | +1.035 | +0.268 | +1.650 | +1.313 | +1.012 | -0.158 | +1.002 | -0.066 |
| dα(ψ), dδ(ψ) | +0.066 | +0.29 | +0.085 | +0.29 | +0.058 | +0.29 | +0.060 | +0.29 |
| dα(ε), dδ(ε) | -0.013 | +0.68 | -0.064 | +0.69 | +0.008 | +0.69 | +0.003 | +0.69 |
| Dble. Trans. | November 3 | | November 4 | | November 5 | | November 5 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 1081 | | 106 | | 1082 | | 1083 | |
|--------------|--------------|------------|----------------------|------------|--------------|------------|--------------|------------|
| | 47 Arietis | | ♁ Eridani* <i>p.</i> | | 24 Persei | | λ Ceti | |
| Mag.Spect. | 5.85 | F0 | 3.42 | A2 | 4.97 | K0 | 4.69 | B5 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° ' | h m | ° ' | h m | ° ' | h m | ° ' |
| | 2 57 | +20 36 | 2 57 | -40 21 | 2 58 | +35 07 | 2 58 | +8 51 |
| 1 -9.1 | 17.136 - 18 | 54.26 + 12 | 44.846 - 98 | 45.60 -217 | 11.525 - 28 | 49.70 + 86 | 57.997 - 17 | 11.61 - 46 |
| 1 0.8 | 17.086 - 50 | 54.27 + 1 | 44.714 - 132 | 47.41 -181 | 11.459 - 66 | 50.36 + 66 | 57.950 - 47 | 11.14 - 47 |
| 1 10.8 | 17.004 - 82 | 54.18 - 9 | 44.548 - 166 | 48.85 -144 | 11.356 - 103 | 50.79 + 43 | 57.873 - 77 | 10.66 - 48 |
| 1 20.8 | 16.893 - 111 | 53.96 - 22 | 44.355 - 193 | 49.81 - 96 | 11.220 - 136 | 50.95 + 16 | 57.770 - 103 | 10.18 - 48 |
| 1 30.8 | 16.762 - 131 | 53.65 - 31 | 44.143 - 212 | 50.31 - 50 | 11.060 - 160 | 50.87 - 8 | 57.647 - 123 | 09.73 - 45 |
| 2 9.7 | 16.614 - 148 | 53.23 - 42 | 43.918 - 225 | 50.34 - 3 | 10.881 - 179 | 50.53 - 34 | 57.508 - 139 | 09.30 - 43 |
| 2 19.7 | 16.459 - 155 | 52.72 - 51 | 43.690 - 228 | 49.86 + 48 | 10.695 - 186 | 49.94 - 59 | 57.362 - 146 | 08.93 - 37 |
| 3 1.7 | 16.308 - 151 | 52.17 - 55 | 43.469 - 221 | 48.92 + 94 | 10.514 - 181 | 49.15 - 79 | 57.219 - 143 | 08.62 - 31 |
| 3 11.7 | 16.168 - 140 | 51.58 - 58 | 43.262 - 207 | 47.55 +137 | 10.347 - 167 | 48.19 - 96 | 57.086 - 133 | 08.39 - 23 |
| 3 21.6 | 16.052 - 116 | 51.00 - 58 | 43.082 - 180 | 45.73 +182 | 10.207 - 140 | 47.10 -109 | 56.974 - 112 | 08.28 - 11 |
| 3 31.6 | 15.968 - 84 | 50.48 - 52 | 42.936 - 146 | 43.56 +217 | 10.105 - 102 | 45.95 -115 | 56.892 - 82 | 08.30 + 2 |
| 4 10.6 | 15.921 - 47 | 50.04 - 44 | 42.830 - 106 | 41.04 +252 | 10.046 - 59 | 44.80 -115 | 56.844 - 48 | 08.48 + 18 |
| 4 20.5 | 15.921 + 0 | 49.75 - 29 | 42.774 - 56 | 38.23 +281 | 10.040 - 6 | 43.72 -108 | 56.840 - 4 | 08.84 + 36 |
| 4 30.5 | 15.969 + 48 | 49.64 - 11 | 42.770 + 4 | 35.21 +302 | 10.089 + 49 | 42.76 - 96 | 56.881 + 41 | 09.37 + 53 |
| 5 10.5 | 16.057 + 88 | 49.75 + 11 | 42.820 + 50 | 32.00 +321 | 10.192 + 103 | 41.96 - 80 | 56.964 + 83 | 10.11 + 74 |
| 5 20.5 | 16.206 + 149 | 49.94 + 19 | 42.927 + 107 | 28.69 +331 | 10.352 + 160 | 41.38 - 58 | 57.098 + 134 | 11.11 +100 |
| 5 30.4 | 16.398 + 192 | 50.43 + 49 | 43.086 + 159 | 25.37 +332 | 10.563 + 211 | 41.04 - 34 | 57.275 + 177 | 12.28 +117 |
| 6 9.4 | 16.631 + 233 | 51.15 + 72 | 43.296 + 210 | 22.08 +329 | 10.822 + 259 | 40.97 - 7 | 57.492 + 217 | 13.62 +134 |
| 6 19.4 | 16.901 + 270 | 52.09 + 94 | 43.552 + 256 | 18.92 +316 | 11.121 + 299 | 41.19 + 22 | 57.744 + 252 | 15.11 +149 |
| 6 29.4 | 17.196 + 295 | 53.20 +111 | 43.843 + 291 | 15.98 +294 | 11.450 + 329 | 41.68 + 49 | 58.022 + 278 | 16.69 +158 |
| 7 9.3 | 17.514 + 318 | 54.48 +128 | 44.168 + 325 | 13.29 +269 | 11.804 + 354 | 42.43 + 75 | 58.322 + 300 | 18.36 +167 |
| 7 19.3 | 17.845 + 331 | 55.89 +141 | 44.514 + 346 | 10.98 +231 | 12.173 + 369 | 43.43 +100 | 58.635 + 313 | 20.05 +169 |
| 7 29.3 | 18.179 + 334 | 57.38 +149 | 44.872 + 358 | 09.08 +190 | 12.546 + 373 | 44.63 +120 | 58.952 + 317 | 21.71 +166 |
| 8 8.2 | 18.514 + 335 | 58.92 +154 | 45.237 + 365 | 07.65 +143 | 12.920 + 374 | 46.02 +139 | 59.270 + 318 | 23.32 +161 |
| 8 18.2 | 18.841 + 327 | 60.45 +153 | 45.596 + 359 | 06.75 + 90 | 13.285 + 365 | 47.56 +154 | 59.581 + 311 | 24.80 +148 |
| 8 28.2 | 19.153 + 312 | 61.95 +150 | 45.942 + 346 | 06.37 + 38 | 13.635 + 350 | 49.19 +163 | 59.878 + 297 | 26.13 +133 |
| 9 7.2 | 19.449 + 296 | 63.39 +144 | 46.270 + 328 | 06.55 - 18 | 13.967 + 332 | 50.91 +172 | 60.159 + 281 | 27.29 +116 |
| 9 17.1 | 19.721 + 272 | 64.73 +134 | 46.568 + 298 | 07.28 - 73 | 14.274 + 307 | 52.66 +175 | 60.419 + 260 | 28.23 + 94 |
| 9 27.1 | 19.970 + 249 | 65.94 +121 | 46.835 + 267 | 08.50 -122 | 14.555 + 281 | 54.41 +175 | 60.656 + 237 | 28.96 + 73 |
| 10 7.1 | 20.194 + 224 | 67.03 +109 | 47.066 + 231 | 10.19 -169 | 14.808 + 253 | 56.16 +175 | 60.868 + 212 | 29.48 + 52 |
| 10 17.1 | 20.388 + 194 | 67.97 + 94 | 47.255 + 189 | 12.28 -209 | 15.027 + 219 | 57.84 +168 | 61.052 + 184 | 29.78 + 30 |
| 10 27.0 | 20.555 + 167 | 68.78 + 81 | 47.402 + 147 | 14.65 -237 | 15.216 + 189 | 59.46 +162 | 61.209 + 157 | 29.89 + 11 |
| 11 6.0 | 20.691 + 136 | 69.46 + 68 | 47.505 + 103 | 17.26 -261 | 15.370 + 154 | 61.00 +154 | 61.338 + 129 | 29.84 - 5 |
| 11 16.0 | 20.795 + 104 | 69.99 + 53 | 47.561 + 56 | 19.94 -268 | 15.486 + 116 | 62.43 +143 | 61.436 + 98 | 29.84 - 20 |
| 11 25.9 | 20.869 + 74 | 70.41 + 42 | 47.575 + 14 | 22.62 -268 | 15.567 + 81 | 63.73 +130 | 61.505 + 69 | 29.34 - 30 |
| 12 5.9 | 20.908 + 39 | 70.71 + 30 | 47.544 - 31 | 25.20 -258 | 15.607 + 40 | 64.89 +116 | 61.541 + 36 | 28.95 - 39 |
| 12 15.9 | 20.913 + 5 | 70.89 + 18 | 47.471 - 73 | 27.55 -235 | 15.607 + 0 | 65.86 + 97 | 61.546 + 5 | 28.51 - 44 |
| 12 25.9 | 20.886 - 27 | 70.97 + 8 | 47.361 - 110 | 29.61 -206 | 15.568 - 30 | 66.65 + 79 | 61.520 - 26 | 28.04 - 47 |
| 12 35.8 | 20.825 - 91 | 70.92 - 5 | 47.214 - 147 | 31.31 -170 | 15.490 - 78 | 67.20 + 65 | 61.463 - 57 | 27.54 - 50 |
| | | - 15 | - 177 | -126 | - 114 | + 32 | - 85 | - 49 |
| Mean Place | 18.725 | 54.67 | 44.956 | 30.25 | 13.277 | 46.76 | 59.403 | 14.90 |
| sec δ, tan δ | +1.068 | +0.376 | +1.312 | -0.850 | +1.223 | +0.704 | +1.012 | +0.156 |
| da(ψ), dδ(ψ) | +0.068 | +0.28 | +0.045 | +0.28 | +0.074 | +0.28 | +0.064 | +0.28 |
| da(ε), dδ(ε) | -0.018 | +0.70 | +0.040 | +0.70 | -0.033 | +0.70 | -0.007 | +0.70 |
| Dble.Trans. | November 5 | | November 5 | | November 5 | | November 5 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 1084 | | 107 | | 1085 | | 113 | |
|----------------|----------------------------|---------|-------------------|--------|------------------------|---------|--------------------|---------|
| | B.D. -18° 516 (Eridani) | | α Ceti | | τ ² Eridani | | δ Hydri | |
| Mag Spect. | 7.40 | F0 | 2.82 | M0 | 4.16 | A3 | 5.52 | B8 |
| U.T. | R.A. | | R.A. | | R.A. | | R.A. | |
| | Dec. | | Dec. | | Dec. | | Dec. | |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " |
| | 3 01 | - 18 15 | 3 01 | + 4 02 | 3 01 | - 23 40 | 3 02 | - 71 56 |
| 1 ^d | ^s - 39 | " - 161 | ^s - 17 | " - 69 | ^s - 49 | " - 179 | ^s - 444 | " - 234 |
| 1 | -9.1 | 24.393 | 47.59 | 33.036 | 09.98 | 47.071 | 48.06 | 17.487 |
| 1 | 0.8 | 24.324 | 49.00 | 32.990 | 09.32 | 46.992 | 49.61 | 16.959 |
| 1 | 10.8 | 24.226 | 50.19 | 32.914 | 08.68 | 46.883 | 50.90 | 16.356 |
| 1 | 20.8 | 24.103 | 51.10 | 32.811 | 08.11 | 46.748 | 51.86 | 15.696 |
| 1 | 30.8 | 23.961 | 51.71 | 32.689 | 07.61 | 46.594 | 52.46 | 15.007 |
| 2 | 9.7 | 23.804 | 52.02 | 32.550 | 07.19 | 46.426 | 52.73 | 14.300 |
| 2 | 19.7 | 23.641 | 52.00 | 32.405 | 06.87 | 46.252 | 52.61 | 13.598 |
| 3 | 1.7 | 23.481 | 51.66 | 32.262 | 06.67 | 46.083 | 52.13 | 12.927 |
| 3 | 11.7 | 23.331 | 51.01 | 32.128 | 06.59 | 45.923 | 51.30 | 12.294 |
| 3 | 21.6 | 23.202 | 50.03 | 32.015 | 06.68 | 45.785 | 50.11 | 11.728 |
| 3 | 31.6 | 23.102 | 48.76 | 31.930 | 06.92 | 45.677 | 48.60 | 11.242 |
| 4 | 10.6 | 23.035 | 47.21 | 31.880 | 07.35 | 45.603 | 46.79 | 10.843 |
| 4 | 20.5 | 23.011 | 45.38 | 31.871 | 07.98 | 45.572 | 44.70 | 10.555 |
| 4 | 30.5 | 23.031 | 43.32 | 31.907 | 08.79 | 45.587 | 42.38 | 10.378 |
| 5 | 10.5 | 23.097 | 41.06 | 31.986 | 09.82 | 45.648 | 39.85 | 10.318 |
| 5 | 20.5 | 23.212 | 38.62 | 32.114 | 11.08 | 45.760 | 37.17 | 10.384 |
| 5 | 30.4 | 23.370 | 36.10 | 32.285 | 12.50 | 45.916 | 34.42 | 10.566 |
| 6 | 9.4 | 23.570 | 33.49 | 32.495 | 14.08 | 46.116 | 31.61 | 10.866 |
| 6 | 19.4 | 23.808 | 30.91 | 32.741 | 15.77 | 46.355 | 28.85 | 11.277 |
| 6 | 29.4 | 24.074 | 28.40 | 33.013 | 17.54 | 46.623 | 26.20 | 11.780 |
| 7 | 9.3 | 24.365 | 26.00 | 33.307 | 19.35 | 46.918 | 23.71 | 12.372 |
| 7 | 19.3 | 24.672 | 23.82 | 33.615 | 21.14 | 47.229 | 21.47 | 13.031 |
| 7 | 29.3 | 24.987 | 21.90 | 33.928 | 22.86 | 47.549 | 19.53 | 13.734 |
| 8 | 8.2 | 25.304 | 20.28 | 34.243 | 24.47 | 47.873 | 17.94 | 14.471 |
| 8 | 18.2 | 25.616 | 19.05 | 34.550 | 25.91 | 48.191 | 16.78 | 15.213 |
| 8 | 28.2 | 25.915 | 18.19 | 34.844 | 27.16 | 48.497 | 16.03 | 15.937 |
| 9 | 7.2 | 26.199 | 17.75 | 35.124 | 28.19 | 48.787 | 15.75 | 16.630 |
| 9 | 17.1 | 26.460 | 17.75 | 35.382 | 28.96 | 49.053 | 15.93 | 17.259 |
| 9 | 27.1 | 26.696 | 18.14 | 35.617 | 29.48 | 49.293 | 16.54 | 17.813 |
| 10 | 7.1 | 26.905 | 18.93 | 35.828 | 29.76 | 49.506 | 17.57 | 18.275 |
| 10 | 17.1 | 27.083 | 20.06 | 36.011 | 29.79 | 49.684 | 18.96 | 18.622 |
| 10 | 27.0 | 27.231 | 21.45 | 36.168 | 29.61 | 49.832 | 20.63 | 18.855 |
| 11 | 6.0 | 27.347 | 23.08 | 36.296 | 29.26 | 49.945 | 22.53 | 18.962 |
| 11 | 16.0 | 27.429 | 24.84 | 36.393 | 28.75 | 50.022 | 24.56 | 18.936 |
| 11 | 25.9 | 27.479 | 26.65 | 36.461 | 28.16 | 50.065 | 26.62 | 18.790 |
| 12 | 5.9 | 27.495 | 28.46 | 36.498 | 27.49 | 50.073 | 28.67 | 18.519 |
| 12 | 15.9 | 27.477 | 30.17 | 36.502 | 26.79 | 50.046 | 30.57 | 18.136 |
| 12 | 25.9 | 27.429 | 31.72 | 36.477 | 26.10 | 49.988 | 32.29 | 17.659 |
| 12 | 35.8 | 27.349 | 33.08 | 36.420 | 25.42 | 49.897 | 33.77 | 17.093 |
| Mean Place | 25.256 | 37.59 | 34.354 | 14.31 | 47.783 | 36.78 | 13.430 | 78.42 |
| sec δ, tan δ | +1.053 | -0.330 | +1.002 | +0.071 | +1.092 | -0.438 | +3.228 | -3.069 |
| dα(ψ), dδ(ψ) | +0.055 | +0.28 | +0.062 | +0.28 | +0.053 | +0.28 | +0.003 | +0.28 |
| dα(ε), dδ(ε) | +0.015 | +0.71 | -0.003 | +0.71 | +0.021 | +0.71 | +0.143 | +0.71 |
| Dble.Trans. | November 6 | | November 6 | | November 6 | | November 6 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 1086 | | 110 | | 108 | | 105 | |
|--------------|--------------------------|------------|--------------------------|-------------|-------------------------|------------|--------------------------|------------|
| Name | 58 G. Eridani | | μ Horologii | | γ Persei | | 47 H. Cephei* | |
| Mag. Spect. | 5.66 | K0 | 5.16 | F0 | 3.08 | F5, A3 | 5.72 | M0 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " |
| | 3 02 | -47 01 | 3 03 | -59 46 | 3 03 | +53 27 | 3 04 | +79 21 |
| 1 -9.1 | ^s 28.447 -124 | 55.15 -232 | ^s 19.187 -220 | 101.23 -241 | ^s 46.804 -62 | 22.06 +179 | ^s 14.579 -432 | 68.72 +286 |
| 1 0.8 | 28.284 -163 | 57.07 -192 | 18.914 -273 | 103.19 -196 | 46.688 -116 | +149 | 13.970 -609 | 71.18 +246 |
| 1 10.8 | 28.084 -200 | 58.59 -152 | 18.594 -320 | 104.68 -149 | 46.519 -169 | +115 | 13.193 -777 | 73.21 +203 |
| 1 20.8 | 27.853 -231 | 59.59 -100 | 18.235 -359 | 105.61 -93 | 46.304 -215 | +73 | 12.276 -917 | 74.68 +147 |
| 1 30.8 | 27.603 -250 | 60.09 -50 | 17.853 -382 | 105.96 -35 | 46.057 -247 | +33 | 11.269 -1007 | 75.58 +90 |
| 2 9.7 | 27.337 -266 | 60.08 +1 | 17.455 -398 | 105.77 +19 | 45.783 -274 | -10 | 10.198 -1071 | 75.88 +30 |
| 2 19.7 | 27.068 -269 | 59.52 +56 | 17.057 -398 | 104.98 +79 | 45.502 -281 | -54 | 09.119 -1079 | 75.54 -34 |
| 3 1.7 | 26.808 -260 | 58.48 +104 | 16.673 -384 | 103.67 +131 | 45.228 -274 | -92 | 08.085 -1034 | 74.64 -90 |
| 3 11.7 | 26.562 -246 | 56.97 +151 | 16.311 -362 | 101.86 +181 | 44.974 -254 | -127 | 07.126 -959 | 73.20 -144 |
| 3 21.6 | 26.345 -217 | 55.00 +197 | 15.989 -322 | 99.57 +229 | 44.760 -214 | -156 | 06.303 -823 | 71.27 -193 |
| 3 31.6 | 26.166 -179 | 52.66 +234 | 15.716 -273 | 96.91 +266 | 44.596 -164 | -175 | 05.646 -657 | 68.98 -229 |
| 4 10.6 | 26.030 -136 | 49.95 +271 | 15.499 -217 | 93.88 +303 | 44.491 -105 | -190 | 05.175 -471 | 66.40 -258 |
| 4 20.5 | 25.949 -81 | 46.95 +300 | 15.353 -146 | 90.56 +332 | 44.458 -33 | -194 | 04.927 -248 | 63.65 -275 |
| 4 30.5 | 25.923 -26 | 43.73 +322 | 15.279 -74 | 87.06 +350 | 44.498 +40 | -188 | 04.901 -26 | 60.85 -280 |
| 5 10.5 | 25.956 +33 | 40.34 +339 | 15.281 +2 | 83.40 +366 | 44.612 +114 | -178 | 05.098 +197 | 58.08 -277 |
| 5 20.5 | 26.053 +97 | 36.85 +349 | 15.365 +84 | 79.69 +371 | 44.802 +190 | -158 | 05.525 +427 | 55.46 -262 |
| 5 30.4 | 26.206 +153 | 33.37 +348 | 15.523 +158 | 76.03 +366 | 45.059 +257 | -133 | 06.150 +625 | 53.08 -238 |
| 6 9.4 | 26.416 +210 | 29.94 +343 | 15.755 +232 | 72.45 +358 | 45.379 +320 | -104 | 06.966 +816 | 50.99 -209 |
| 6 19.4 | 26.678 +262 | 26.67 +327 | 16.058 +303 | 69.09 +336 | 45.755 +376 | -69 | 07.953 +987 | 49.29 -170 |
| 6 29.4 | 26.981 +303 | 23.63 +304 | 16.416 +358 | 66.01 +308 | 46.171 +416 | -35 | 09.066 +1113 | 48.01 -128 |
| 7 9.3 | 27.322 +341 | 20.88 +275 | 16.828 +412 | 63.27 +274 | 46.623 +452 | +2 | 10.294 +1228 | 47.17 -84 |
| 7 19.3 | 27.690 +368 | 18.54 +234 | 17.280 +452 | 60.99 +228 | 47.096 +473 | +40 | 11.602 +1308 | 46.83 -34 |
| 7 29.3 | 28.073 +383 | 16.63 +191 | 17.756 +476 | 59.20 +179 | 47.579 +483 | +73 | 12.950 +1348 | 46.96 +13 |
| 8 8.2 | 28.466 +393 | 15.23 +140 | 18.249 +493 | 57.95 +125 | 48.065 +486 | +107 | 14.326 +1376 | 47.56 +60 |
| 8 18.2 | 28.856 +390 | 14.39 +84 | 18.741 +492 | 57.32 +63 | 48.543 +478 | +139 | 15.690 +1364 | 48.66 +110 |
| 8 28.2 | 29.233 +377 | 14.10 +29 | 19.220 +479 | 57.28 +4 | 49.003 +460 | +164 | 17.017 +1327 | 50.17 +151 |
| 9 7.2 | 29.592 +359 | 14.40 -30 | 19.676 +456 | 57.85 -57 | 49.443 +440 | +189 | 18.294 +1277 | 52.11 +194 |
| 9 17.1 | 29.920 +328 | 15.29 -89 | 20.093 +417 | 59.04 -119 | 49.852 +409 | +209 | 19.480 +1186 | 54.44 +233 |
| 9 27.1 | 30.213 +293 | 16.68 -139 | 20.463 +370 | 60.75 -171 | 50.228 +376 | +224 | 20.567 +1087 | 57.08 +264 |
| 10 7.1 | 30.467 +254 | 18.57 -189 | 20.777 +314 | 62.96 -221 | 50.567 +339 | +238 | 21.537 +970 | 60.04 +296 |
| 10 17.1 | 30.672 +205 | 20.86 -229 | 21.024 +247 | 65.58 -282 | 50.861 +294 | +245 | 22.356 +819 | 63.22 +318 |
| 10 27.0 | 30.830 +158 | 23.45 -259 | 21.204 +180 | 68.49 -291 | 51.112 +251 | +249 | 23.025 +669 | 66.56 +334 |
| 11 6.0 | 30.938 +108 | 26.27 -282 | 21.310 +106 | 71.61 -312 | 51.314 +202 | +249 | 23.520 +495 | 70.03 +347 |
| 11 16.0 | 30.992 +54 | 29.17 -290 | 21.339 +29 | 74.78 -317 | 51.461 +147 | +243 | 23.822 +302 | 73.50 +347 |
| 11 25.9 | 30.996 +4 | 32.05 -288 | 21.298 -41 | 77.88 -310 | 51.557 +96 | +232 | 23.936 +114 | 76.92 +342 |
| 12 5.9 | 30.950 -46 | 34.82 -277 | 21.184 -114 | 80.84 -296 | 51.594 +37 | +218 | 23.843 -93 | 80.22 +330 |
| 12 15.9 | 30.854 -96 | 37.33 -251 | 21.002 -182 | 83.48 -264 | 51.573 -21 | +194 | 23.546 -297 | 83.25 +303 |
| 12 25.9 | 30.717 -137 | 39.52 -219 | 20.762 -240 | 85.74 -286 | 51.496 -77 | +168 | 23.063 -483 | 85.97 +272 |
| 12 35.8 | 30.538 -179 | 41.32 -180 | 20.467 -295 | 87.56 -182 | 51.362 -134 | +135 | 22.392 -671 | 88.28 +231 |
| | -213 | -132 | -337 | -128 | -183 | +98 | -821 | +179 |
| Mean Place | 28.146 | 39.11 | 17.706 | 83.38 | 48.736 | 15.63 | 16.805 | 59.67 |
| sec δ, tan δ | +1.467 | -1.073 | +1.987 | -1.717 | +1.679 | +1.349 | +5.419 | +5.326 |
| dα(ψ), dδ(ψ) | +0.041 | +0.28 | +0.028 | +0.28 | +0.087 | +0.28 | +0.163 | +0.28 |
| dα(ε), dδ(ε) | +0.050 | +0.71 | +0.080 | +0.72 | -0.063 | +0.72 | -0.246 | +0.72 |
| Dble. Trans | November 6 | | November 6 | | November 7 | | November 7 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 109 | | 1087 | | 111 | | 112 | | |
|--------------|---------------------------|---|----------------------------|---|----------------------------|---|----------------------------|---|------------|
| | ♁ Persei | | ♄ G. Eridani | | β Persei (Algol) | | ♁ Persei | | |
| Mag.Spect. | 3.3 to 4.1 | M3 | 7.16 | G0 | 2.2 to 3.5 | B8 | 4.17 | G0 | |
| U.T. | R.A. | | R.A. | | R.A. | | R.A. | | |
| | h m | Dec. | h m | Dec. | h m | Dec. | h m | Dec. | |
| | 3 04 | + 38 47 | 3 06 | - 13 48 | 3 07 | + 40 54 | 3 08 | + 49 33 | |
| | ^d ^s | [°] ['] ^{''} | ^s ^{''} | [°] ['] ^{''} | ^s ^{''} | [°] ['] ^{''} | ^s ^{''} | [°] ['] ^{''} | |
| 1 | -9.1 | 16.681 - 27 | 23.03 +107 | 39.369 - 28 | 52.72 -148 | 15.406 - 27 | 20.06 +119 | 03.273 - 41 | 51.20 +162 |
| 1 | 0.8 | 16.615 - 66 | 23.87 + 84 | 39.310 - 59 | 54.03 -131 | 15.338 - 68 | 21.01 + 95 | 03.182 - 91 | 52.54 +134 |
| 1 | 10.8 | 16.508 - 107 | 24.47 + 60 | 39.222 - 88 | 55.16 -113 | 15.227 - 111 | 21.71 + 70 | 03.042 - 140 | 53.56 +102 |
| 1 | 20.8 | 16.365 - 143 | 24.77 + 30 | 39.107 - 115 | 56.06 - 90 | 15.078 - 149 | 22.10 + 39 | 02.858 - 184 | 54.21 + 65 |
| 1 | 30.8 | 16.196 - 169 | 24.80 + 3 | 38.972 - 135 | 56.69 - 63 | 14.901 - 177 | 22.19 + 9 | 02.643 - 215 | 54.48 + 27 |
| 2 | 9.7 | 16.005 - 191 | 24.54 - 26 | 38.822 - 150 | 57.07 - 38 | 14.703 - 198 | 21.98 - 21 | 02.403 - 240 | 54.37 - 11 |
| 2 | 19.7 | 15.806 - 199 | 23.99 - 55 | 38.664 - 158 | 57.15 - 8 | 14.495 - 208 | 21.45 - 53 | 02.153 - 250 | 53.86 - 51 |
| 3 | 1.7 | 15.612 - 194 | 23.20 - 79 | 38.509 - 155 | 56.95 + 20 | 14.291 - 204 | 20.66 - 79 | 01.910 - 243 | 53.00 - 86 |
| 3 | 11.7 | 15.430 - 182 | 22.18 -102 | 38.361 - 148 | 56.48 + 47 | 14.101 - 190 | 19.63 -103 | 01.682 - 228 | 51.82 -118 |
| 3 | 21.6 | 15.278 - 152 | 21.01 -117 | 38.235 - 126 | 55.70 + 78 | 13.939 - 162 | 18.42 -121 | 01.490 - 192 | 50.38 -144 |
| 3 | 31.6 | 15.163 - 115 | 19.76 -125 | 38.135 - 100 | 54.65 +105 | 13.817 - 122 | 17.10 -132 | 01.343 - 147 | 48.77 -161 |
| 4 | 10.6 | 15.093 - 70 | 18.45 -131 | 38.069 - 66 | 53.34 +131 | 13.741 - 76 | 15.72 -138 | 01.250 - 93 | 47.03 -174 |
| 4 | 20.5 | 15.079 - 14 | 17.19 -126 | 38.044 - 25 | 51.75 +159 | 13.721 - 20 | 14.36 -136 | 01.223 - 27 | 45.27 -176 |
| 4 | 30.5 | 15.121 + 42 | 16.03 -116 | 38.062 + 18 | 49.95 +180 | 13.760 + 39 | 13.09 -127 | 01.263 + 40 | 43.57 -170 |
| 5 | 10.5 | 15.221 + 100 | 15.01 -102 | 38.127 + 65 | 47.93 +202 | 13.858 + 98 | 11.95 -114 | 01.372 + 109 | 41.97 -160 |
| 5 | 20.5 | 15.381 + 160 | 14.20 - 81 | 38.239 + 112 | 45.73 +220 | 14.018 + 160 | 11.02 - 93 | 01.552 + 180 | 40.57 -140 |
| 5 | 30.4 | 15.593 + 212 | 13.63 - 57 | 38.394 + 155 | 43.42 +231 | 14.232 + 214 | 10.32 - 70 | 01.793 + 241 | 39.42 -115 |
| 6 | 9.4 | 15.856 + 263 | 13.32 - 31 | 38.590 + 196 | 41.01 +241 | 14.498 + 266 | 10.89 - 43 | 02.094 + 301 | 38.54 - 88 |
| 6 | 19.4 | 16.162 + 306 | 13.31 - 1 | 38.824 + 234 | 38.59 +242 | 14.809 + 311 | 09.76 - 13 | 02.446 + 352 | 37.99 - 55 |
| 6 | 29.4 | 16.500 + 338 | 13.58 + 27 | 39.086 + 262 | 36.21 +238 | 15.153 + 344 | 09.92 + 16 | 02.837 + 391 | 37.77 - 22 |
| 7 | 9.3 | 16.865 + 365 | 14.14 + 56 | 39.373 + 287 | 33.92 +229 | 15.525 + 372 | 10.38 + 46 | 03.261 + 424 | 37.89 + 12 |
| 7 | 19.3 | 17.247 + 382 | 14.97 + 83 | 39.675 + 302 | 31.80 +212 | 15.916 + 391 | 11.12 + 74 | 03.706 + 445 | 38.36 + 47 |
| 7 | 29.3 | 17.634 + 387 | 16.04 +107 | 39.986 + 311 | 29.90 +190 | 16.313 + 397 | 12.11 + 99 | 04.159 + 453 | 39.14 + 78 |
| 8 | 8.2 | 18.025 + 391 | 17.32 +128 | 40.299 + 313 | 28.27 +163 | 16.713 + 400 | 13.34 +123 | 04.616 + 457 | 40.23 +109 |
| 8 | 18.2 | 18.406 + 381 | 18.78 +146 | 40.608 + 309 | 26.97 +130 | 17.105 + 392 | 14.77 +143 | 05.065 + 449 | 41.59 +136 |
| 8 | 28.2 | 18.774 + 368 | 20.38 +160 | 40.904 + 296 | 26.02 + 95 | 17.483 + 378 | 16.34 +157 | 05.499 + 434 | 43.18 +159 |
| 9 | 7.2 | 19.124 + 350 | 22.10 +172 | 41.187 + 283 | 25.46 + 56 | 17.844 + 361 | 18.07 +173 | 05.915 + 416 | 44.99 +181 |
| 9 | 17.1 | 19.449 + 325 | 23.88 +178 | 41.448 + 261 | 25.30 + 16 | 18.180 + 336 | 19.88 +181 | 06.302 + 387 | 46.97 +198 |
| 9 | 27.1 | 19.748 + 299 | 25.70 +182 | 41.685 + 237 | 25.51 - 21 | 18.489 + 309 | 21.74 +186 | 06.658 + 356 | 49.08 +211 |
| 10 | 7.1 | 20.019 + 271 | 27.55 +185 | 41.898 + 213 | 26.10 - 59 | 18.770 + 281 | 23.65 +191 | 06.982 + 324 | 51.29 +221 |
| 10 | 17.1 | 20.255 + 236 | 29.37 +182 | 42.080 + 182 | 27.01 - 91 | 19.016 + 246 | 25.55 +190 | 07.264 + 282 | 53.55 +226 |
| 10 | 27.0 | 20.459 + 204 | 31.15 +178 | 42.234 + 154 | 28.19 -118 | 19.228 + 212 | 27.43 +188 | 07.508 + 244 | 55.84 +229 |
| 11 | 6.0 | 20.628 + 169 | 32.87 +172 | 42.357 + 123 | 29.60 -141 | 19.403 + 175 | 29.26 +183 | 07.708 + 200 | 58.12 +228 |
| 11 | 16.0 | 20.756 + 128 | 34.50 +163 | 42.447 + 90 | 31.14 -154 | 19.537 + 134 | 31.00 +174 | 07.858 + 150 | 60.33 +221 |
| 11 | 25.9 | 20.846 + 90 | 36.01 +151 | 42.507 + 60 | 32.75 -161 | 19.632 + 95 | 32.63 +163 | 07.961 + 103 | 62.44 +211 |
| 12 | 5.9 | 20.893 + 47 | 37.37 +136 | 42.533 + 26 | 34.39 -164 | 19.682 + 50 | 34.12 +149 | 08.011 + 50 | 64.40 +196 |
| 12 | 15.9 | 20.897 + 4 | 38.55 +118 | 42.525 - 8 | 35.94 -155 | 19.687 + 5 | 35.42 +130 | 08.007 - 4 | 66.15 +175 |
| 12 | 25.9 | 20.860 - 37 | 39.54 + 99 | 42.488 - 37 | 37.37 -143 | 19.649 - 38 | 36.52 +110 | 07.953 - 54 | 67.67 +152 |
| 12 | 35.8 | 20.780 - 80 | 40.28 + 74 | 42.418 - 70 | 38.65 -128 | 19.565 - 84 | 37.37 + 85 | 07.845 - 108 | 68.88 +121 |
| | | - 119 | + 47 | - 98 | -104 | - 123 | + 56 | - 154 | + 87 |
| Mean Place | 18.458 | 19.11 | 40.316 | 44.36 | 17.190 | 15.71 | 05.217 | 45.25 | |
| sec δ, tan δ | +1.283 | +0.804 | +1.030 | -0.246 | +1.323 | +0.866 | +1.542 | +1.173 | |
| dα(ψ), dδ(ψ) | +0.077 | +0.28 | +0.056 | +0.27 | +0.078 | +0.27 | +0.084 | +0.27 | |
| dα(ε), dδ(ε) | -0.037 | +0.72 | +0.011 | +0.73 | -0.040 | +0.73 | -0.053 | +0.73 | |
| Dble.Trans. | November 7 | | November 7 | | November 7 | | November 8 | | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 1088 | | 114 | | 116 | | 118 | |
|--------------|--------------|-------------|--------------|-------------|--------------|-------------|-----------------|-------------|
| Name | 55 Arietis | | δ Arietis | | 94 Ceti | | 38 G. Horologii | |
| Mag.Spect. | 5.60 | B9 | 4.53 | K0 | 5.14 | F8 | 5.72 | N0 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " |
| | 3 08 | +29 01 | 3 10 | +19 40 | 3 12 | - 1 14 | 3 12 | -57 21 |
| 1 -9.1 | 46.206 - 12 | 36.21 + 57 | 49.797 - 6 | 34.50 + 8 | 03.849 - 13 | 50.61 - 96 | 13.811 - 185 | 95.13 - 250 |
| 1 0.9 | 46.158 - 48 | 36.63 + 42 | 49.757 - 40 | 34.50 + 0 | 03.807 - 42 | 51.50 - 89 | 13.811 - 236 | 97.19 - 206 |
| 1 10.8 | 46.073 - 85 | 36.88 + 25 | 49.683 - 74 | 34.40 - 10 | 03.734 - 73 | 52.31 - 81 | 13.575 - 284 | 97.19 - 162 |
| 1 20.8 | 45.955 - 118 | 36.93 + 5 | 49.579 - 104 | 34.21 - 19 | 03.633 - 101 | 53.00 - 69 | 13.291 - 323 | 98.81 - 107 |
| 1 30.8 | 45.813 - 142 | 36.81 - 12 | 49.451 - 128 | 33.93 - 28 | 03.511 - 122 | 53.56 - 56 | 12.968 - 348 | 99.88 - 51 |
| 2 9.7 | 45.651 - 162 | 36.50 - 31 | 49.304 - 147 | 33.56 - 37 | 03.371 - 140 | 53.98 - 42 | 12.253 - 367 | 100.36 + 3 |
| 2 19.7 | 45.479 - 172 | 36.00 - 50 | 49.148 - 156 | 33.12 - 44 | 03.223 - 148 | 54.24 - 26 | 11.882 - 371 | 99.74 + 62 |
| 3 1.7 | 45.310 - 189 | 35.37 - 63 | 48.994 - 154 | 32.64 - 48 | 03.076 - 147 | 54.33 - 9 | 11.882 - 360 | 99.74 + 114 |
| 3 11.7 | 45.150 - 160 | 34.61 - 76 | 48.847 - 147 | 32.12 - 52 | 02.937 - 139 | 54.25 + 8 | 11.522 - 343 | 98.60 + 165 |
| 3 21.6 | 45.015 - 135 | 33.77 - 84 | 48.723 - 124 | 31.62 - 50 | 02.816 - 121 | 53.96 + 29 | 11.179 - 308 | 96.95 + 213 |
| 3 31.6 | 44.913 - 102 | 32.92 - 85 | 48.628 - 95 | 31.17 - 45 | 02.723 - 93 | 53.48 + 48 | 10.608 - 263 | 92.30 + 252 |
| 4 10.6 | 44.850 - 63 | 32.08 - 84 | 48.570 - 58 | 30.80 - 37 | 02.662 - 61 | 52.79 + 69 | 10.396 - 212 | 89.40 + 230 |
| 4 20.6 | 44.836 - 14 | 31.34 - 74 | 48.556 - 14 | 30.55 - 25 | 02.642 + 20 | 51.89 + 90 | 10.250 - 146 | 86.19 + 321 |
| 4 30.5 | 44.873 + 37 | 30.72 - 62 | 48.591 + 35 | 30.47 - 8 | 02.665 + 23 | 50.78 + 111 | 10.171 - 79 | 82.78 + 341 |
| 5 10.5 | 44.961 + 88 | 30.27 - 45 | 48.674 + 83 | 30.75 + 28 | 02.733 + 68 | 49.46 + 132 | 10.163 - 8 | 79.18 + 360 |
| 5 20.5 | 45.101 + 140 | 30.00 - 27 | 48.799 + 125 | 30.83 + 8 | 02.849 + 116 | 47.93 + 153 | 10.232 + 69 | 75.52 + 366 |
| 5 30.4 | 45.292 + 191 | 29.94 - 6 | 48.978 + 179 | 31.33 + 50 | 03.007 + 158 | 46.26 + 167 | 10.372 + 140 | 71.87 + 365 |
| 6 9.4 | 45.529 + 237 | 30.14 + 20 | 49.198 + 220 | 32.04 + 71 | 03.206 + 199 | 44.44 + 182 | 10.582 + 210 | 68.28 + 359 |
| 6 19.4 | 45.805 + 276 | 30.59 + 45 | 49.456 + 258 | 32.95 + 91 | 03.441 + 235 | 42.53 + 191 | 10.860 + 278 | 64.88 + 340 |
| 6 29.4 | 46.111 + 306 | 31.27 + 68 | 49.742 + 286 | 34.03 + 108 | 03.704 + 263 | 40.59 + 194 | 11.191 + 331 | 61.74 + 314 |
| 7 9.3 | 46.441 + 330 | 32.16 + 89 | 50.052 + 310 | 35.27 + 124 | 03.990 + 286 | 38.64 + 195 | 11.574 + 383 | 58.92 + 282 |
| 7 19.3 | 46.787 + 346 | 33.25 + 109 | 50.376 + 324 | 36.62 + 135 | 04.292 + 302 | 36.76 + 188 | 11.995 + 421 | 56.55 + 237 |
| 7 29.3 | 47.140 + 353 | 34.49 + 124 | 50.707 + 331 | 38.04 + 142 | 04.601 + 309 | 34.99 + 177 | 12.441 + 446 | 54.63 + 192 |
| 8 8.3 | 47.494 + 354 | 35.86 + 137 | 51.040 + 333 | 39.50 + 146 | 04.913 + 312 | 33.38 + 161 | 12.441 + 464 | 53.26 + 137 |
| 8 18.2 | 47.842 + 348 | 37.32 + 146 | 51.367 + 327 | 40.96 + 146 | 05.219 + 306 | 31.98 + 140 | 12.905 + 466 | 52.48 + 78 |
| 8 28.2 | 48.177 + 335 | 38.82 + 150 | 51.682 + 315 | 42.37 + 141 | 05.515 + 296 | 30.83 + 115 | 13.826 + 455 | 52.29 + 19 |
| 9 7.2 | 48.497 + 320 | 40.35 + 163 | 51.983 + 301 | 43.71 + 134 | 05.797 + 282 | 29.95 + 88 | 14.263 + 437 | 52.72 - 43 |
| 9 17.1 | 48.794 + 297 | 41.85 + 150 | 52.263 + 280 | 44.94 + 123 | 06.059 + 262 | 29.37 + 58 | 14.665 + 402 | 53.76 - 104 |
| 9 27.1 | 49.068 + 274 | 43.32 + 147 | 52.520 + 257 | 46.06 + 112 | 06.299 + 240 | 29.08 + 29 | 15.025 + 360 | 55.34 - 150 |
| 10 7.1 | 49.317 + 249 | 44.73 + 141 | 52.755 + 235 | 47.04 + 98 | 06.516 + 217 | 29.08 + 0 | 15.337 + 312 | 57.44 - 218 |
| 10 17.1 | 49.536 + 219 | 46.05 + 132 | 52.961 + 206 | 47.88 + 84 | 06.706 + 190 | 29.35 - 27 | 15.587 + 250 | 59.96 - 252 |
| 10 27.0 | 49.726 + 190 | 47.29 + 124 | 53.140 + 179 | 48.58 + 70 | 06.869 + 163 | 29.85 - 50 | 15.776 + 189 | 62.80 - 284 |
| 11 6.0 | 49.885 + 159 | 48.44 + 115 | 53.290 + 150 | 49.15 + 57 | 07.004 + 135 | 30.55 - 70 | 15.899 + 123 | 65.87 - 307 |
| 11 16.0 | 50.009 + 124 | 49.47 + 103 | 53.408 + 118 | 49.60 + 45 | 07.108 + 104 | 31.40 - 85 | 15.950 + 51 | 69.02 - 315 |
| 11 26.0 | 50.099 + 90 | 50.39 + 92 | 53.496 + 88 | 49.94 + 34 | 07.183 + 75 | 32.34 - 94 | 15.935 - 15 | 72.14 - 312 |
| 12 5.9 | 50.152 + 53 | 51.18 + 79 | 53.548 + 52 | 50.17 + 23 | 07.225 + 42 | 33.33 - 99 | 15.852 - 83 | 75.13 - 299 |
| 12 15.9 | 50.167 + 15 | 51.84 + 66 | 53.566 + 18 | 50.30 + 13 | 07.235 + 10 | 34.32 - 99 | 15.704 - 148 | 77.84 - 271 |
| 12 25.9 | 50.145 - 22 | 52.35 + 51 | 53.550 - 16 | 50.34 + 4 | 07.214 - 21 | 35.26 - 94 | 15.501 - 203 | 80.20 - 236 |
| 12 35.8 | 50.084 - 61 | 52.69 + 34 | 53.498 - 52 | 50.29 - 5 | 07.160 - 54 | 36.15 - 89 | 15.243 - 258 | 82.13 - 193 |
| | - 95 | + 16 | - 83 | - 15 | - 83 | - 77 | - 301 | - 141 |
| Mean Place | 47.846 | 34.24 | 51.317 | 34.56 | 05.042 | 45.61 | 12.535 | 78.66 |
| sec δ, tan δ | +1.144 | +0.555 | +1.062 | +0.358 | +1.000 | -0.022 | +1.855 | -1.562 |
| dα(v), dδ(v) | +0.072 | +0.27 | +0.068 | +0.27 | +0.061 | +0.27 | +0.030 | +0.27 |
| dα(ε), dδ(ε) | -0.025 | +0.73 | -0.016 | +0.74 | +0.001 | +0.74 | +0.070 | +0.74 |
| Dble.Trans. | November 8 | | November 8 | | November 9 | | November 9 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 1089 | | 1090 | | 1091 | | 1095 | |
|----------------|---------------------------|---------------------------|---------------------------|-----------------------------|------------------------------|-----------------------------|--------------------------------|-----------------------------|
| | ζ Arietis | | 79 G. Fornacis | | ζ Eridani | | ι Hydri | |
| Mag. Spect. | 4.95 | A0 | 6.85 | G0 | 4.90 | A3 | 5.53 | F2 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | ^h ^m | [°] ['] | ^h ^m | [°] ['] | ^h ^m | [°] ['] | ^h ^m | [°] ['] |
| | 3 14 | + 20 59 | 3 14 | - 35 36 | 3 15 | - 8 51 | 3 16 | - 77 25 |
| 1 ^d | ^s | ["] | ^s | ["] | ^s | ["] | ^s | ["] |
| 1 -9.1 | 05.898 - 4 | 42.62 + 15 | 07.982 ⁶⁸ - 68 | 39.97 ²²¹ - 221 | 09.594 ¹⁷ - 17 | 76.29 ⁻¹³¹ - 131 | 23.987 ⁶⁴⁸ - 648 | 94.47 ⁻²⁴³ - 243 |
| 1 0.9 | 05.860 - 38 | 42.68 + 6 | 07.879 - 103 | 41.86 ⁻¹⁸⁹ - 189 | 09.547 ⁴⁷ - 47 | 77.46 ⁻¹¹⁷ - 117 | 23.210 ⁻⁷⁷⁷ - 777 | 96.43 ⁻¹⁹⁶ - 196 |
| 1 10.8 | 05.787 - 73 | 42.64 - 4 | 07.742 - 137 | 43.42 ⁻¹⁵⁶ - 156 | 09.469 ⁷⁸ - 78 | 78.50 ⁻¹⁰⁴ - 104 | 22.319 ⁻⁸⁹¹ - 891 | 97.89 ⁻¹⁴⁶ - 146 |
| 1 20.8 | 05.682 - 105 | 42.49 - 15 | 07.574 - 168 | 44.55 ⁻¹¹³ - 113 | 09.362 ⁻¹⁰⁷ - 107 | 79.34 ⁻⁸⁴ - 84 | 21.340 ⁻⁹⁷⁹ - 979 | 98.76 ⁻⁸⁷ - 87 |
| 1 30.8 | 05.554 - 128 | 42.24 - 25 | 07.385 - 189 | 45.25 ⁻⁷⁰ - 70 | 09.235 ⁻¹²⁷ - 127 | 79.97 ⁻⁶³ - 63 | 20.313 ⁻¹⁰²⁷ - 1027 | 99.04 ⁻²⁶ - 26 |
| 2 9.7 | 05.405 - 149 | 41.89 - 35 | 07.179 - 206 | 45.51 ⁻²⁶ - 26 | 09.090 ⁻¹⁴⁵ - 145 | 80.40 ⁻⁴³ - 43 | 19.252 ⁻¹⁰⁶¹ - 1061 | 98.75 ⁺²⁹ + 29 |
| 2 19.7 | 05.247 - 158 | 41.46 - 43 | 06.965 - 214 | 45.29 ⁺²² + 22 | 08.936 ⁻¹⁵⁴ - 154 | 80.57 ⁻¹⁷ - 17 | 18.195 ⁻¹⁰⁵⁷ - 1057 | 97.85 ⁺⁹⁰ + 90 |
| 3 1.7 | 05.089 - 158 | 40.97 - 49 | 06.755 - 210 | 44.63 ⁺⁶⁶ + 66 | 08.782 ⁻¹⁵⁴ - 154 | 80.51 ⁺⁶ + 6 | 17.175 ⁻¹⁰²⁰ - 1020 | 96.43 ⁺¹⁴² + 142 |
| 3 11.7 | 04.940 - 149 | 40.43 - 54 | 06.555 - 200 | 43.54 ⁺¹⁰⁹ + 109 | 08.636 ⁻¹⁴⁶ - 146 | 80.20 ⁺³¹ + 31 | 16.203 ⁻⁹⁷² - 972 | 94.50 ⁺¹⁹³ + 193 |
| 3 21.6 | 04.811 - 129 | 39.89 - 54 | 06.377 - 178 | 42.02 ⁺¹⁵² + 152 | 08.508 ⁻¹²⁸ - 128 | 79.63 ⁺⁵⁷ + 57 | 15.320 ⁻⁸⁸³ - 883 | 92.09 ⁺²⁴¹ + 241 |
| 3 31.6 | 04.713 - 98 | 39.38 - 51 | 06.229 - 148 | 40.15 ⁺¹⁸⁷ + 187 | 08.407 ⁻¹⁰¹ - 101 | 78.82 ⁺⁸¹ + 81 | 14.544 ⁻⁷⁷⁶ - 776 | 89.31 ⁺²⁷⁸ + 278 |
| 4 10.6 | 04.650 - 63 | 38.95 - 43 | 06.118 - 111 | 37.91 ⁺²²⁴ + 224 | 08.338 ⁻⁶⁹ - 69 | 77.76 ⁺¹⁰⁶ + 106 | 13.886 ⁻⁶⁵⁸ - 658 | 86.18 ⁺³¹³ + 313 |
| 4 20.6 | 04.634 - 16 | 38.63 - 32 | 06.053 - 65 | 35.37 ⁺²⁵⁴ + 254 | 08.310 ⁻²⁸ - 28 | 76.45 ⁺¹³¹ + 131 | 13.377 ⁻⁵⁰⁹ - 509 | 82.78 ⁺³⁴⁰ + 340 |
| 4 30.5 | 04.664 + 30 | 38.47 - 16 | 06.037 - 16 | 32.59 ⁺²⁷⁸ + 278 | 08.324 ⁺¹⁴ + 14 | 74.93 ⁺¹⁵² + 152 | 13.021 ⁻³⁵⁶ - 356 | 79.21 ⁺³⁵⁷ + 357 |
| 5 10.5 | 04.744 + 80 | 38.57 + 10 | 06.071 + 34 | 29.60 ⁺²⁹⁹ + 299 | 08.383 ⁺⁵⁹ + 59 | 73.19 ⁺¹⁷⁴ + 174 | 12.826 ⁻¹⁹⁵ - 195 | 75.50 ⁺³⁷¹ + 371 |
| 5 20.5 | 04.867 + 123 | 38.66 + 9 | 06.161 + 90 | 26.47 ⁺³¹³ + 313 | 08.490 ⁺¹⁰⁷ + 107 | 71.25 ⁺¹⁹⁴ + 194 | 12.807 ⁻¹⁹ - 19 | 71.76 ⁺³⁷⁴ + 374 |
| 5 30.4 | 05.044 + 177 | 39.06 + 40 | 06.300 + 139 | 23.30 ⁺³¹⁷ + 317 | 08.640 ⁺¹⁵⁰ + 150 | 69.19 ⁺²⁰⁶ + 206 | 12.952 ⁺¹⁴⁵ + 145 | 68.08 ⁺³⁶⁸ + 368 |
| 6 9.4 | 05.263 + 219 | 39.68 + 62 | 06.488 + 188 | 20.10 ⁺³²⁰ + 320 | 08.832 ⁺¹⁹² + 192 | 67.00 ⁺²¹⁹ + 219 | 13.265 ⁺³¹³ + 313 | 64.52 ⁺³⁵⁶ + 356 |
| 6 19.4 | 05.521 + 258 | 40.51 + 83 | 06.721 + 233 | 17.00 ⁺³¹⁰ + 310 | 09.060 ⁺²²⁸ + 228 | 64.78 ⁺²²² + 222 | 13.741 ⁺⁴⁷⁶ + 476 | 61.19 ⁺³³³ + 333 |
| 6 29.4 | 05.806 + 285 | 41.51 + 100 | 06.990 + 269 | 14.06 ⁺²⁹⁴ + 294 | 09.317 ⁺²⁵⁷ + 257 | 62.56 ⁺²²² + 222 | 14.354 ⁺⁶¹³ + 613 | 58.16 ⁺³⁰³ + 303 |
| 7 9.3 | 06.116 + 310 | 42.67 + 116 | 07.292 + 302 | 11.34 ⁺²⁷² + 272 | 09.599 ⁺²⁸² + 282 | 60.38 ⁺²¹⁸ + 218 | 15.100 ⁺⁷⁴⁶ + 746 | 55.48 ⁺²⁶⁸ + 268 |
| 7 19.3 | 06.442 + 326 | 43.96 + 129 | 07.616 + 324 | 08.95 ⁺²³⁹ + 239 | 09.897 ⁺²⁹⁸ + 298 | 58.34 ⁺²⁰⁴ + 204 | 15.955 ⁺⁸⁵⁵ + 855 | 53.29 ⁺²¹⁹ + 219 |
| 7 29.3 | 06.774 + 332 | 45.33 + 137 | 07.954 + 338 | 06.92 ⁺²⁰³ + 203 | 10.204 ⁺³⁰⁷ + 307 | 56.47 ⁺¹⁸⁷ + 187 | 16.885 ⁺⁹³⁰ + 930 | 51.60 ⁺¹⁶⁹ + 169 |
| 8 8.3 | 07.109 + 335 | 46.76 + 143 | 08.300 + 346 | 05.32 ⁺¹⁶⁰ + 160 | 10.515 ⁺³¹¹ + 311 | 54.82 ⁺¹⁶⁵ + 165 | 17.878 ⁺⁹⁹³ + 993 | 50.46 ⁺¹¹⁴ + 114 |
| 8 18.2 | 07.439 + 330 | 48.19 + 143 | 08.644 + 344 | 04.22 ⁺¹¹⁰ + 110 | 10.821 ⁺³⁰⁶ + 306 | 53.47 ⁺¹³⁵ + 135 | 18.891 ⁺¹⁰¹³ + 1013 | 49.95 ⁺⁵¹ + 51 |
| 8 28.2 | 07.757 + 318 | 49.59 + 140 | 08.978 + 334 | 03.62 ⁺⁶⁰ + 60 | 11.117 ⁺²⁹⁶ + 296 | 52.42 ⁺¹⁰⁵ + 105 | 19.896 ⁺¹⁰⁰⁵ + 1005 | 50.03 ⁻⁸ - 8 |
| 9 7.2 | 08.061 + 304 | 50.94 + 135 | 09.298 + 320 | 03.56 ⁺⁶ + 6 | 11.401 ⁺²⁸⁴ + 284 | 51.71 ⁺⁷¹ + 71 | 20.868 ⁺⁹⁷² + 972 | 50.74 ⁻⁷¹ - 71 |
| 9 17.1 | 08.345 + 284 | 52.19 + 125 | 09.594 + 296 | 04.04 ⁻⁴⁸ - 48 | 11.664 ⁺²⁶³ + 263 | 51.38 ⁺³³ + 33 | 21.763 ⁺⁸⁹⁵ + 895 | 52.07 ⁻¹³³ - 133 |
| 9 27.1 | 08.607 + 262 | 53.33 + 114 | 09.862 + 268 | 05.01 ⁻⁹⁷ - 97 | 11.906 ⁺²⁴² + 242 | 51.38 ⁺⁰ + 0 | 22.559 ⁺⁷⁹⁶ + 796 | 53.91 ⁻¹⁸⁴ - 184 |
| 10 7.1 | 08.845 + 238 | 54.36 + 103 | 10.100 + 238 | 06.47 ⁻¹⁴⁶ - 146 | 12.124 ⁺²¹⁸ + 218 | 51.73 ⁻³⁵ - 35 | 23.233 ⁺⁶⁷⁴ + 674 | 56.27 ⁻²³⁶ - 236 |
| 10 17.1 | 09.056 + 211 | 55.24 + 88 | 10.301 + 201 | 08.33 ⁻¹⁸⁶ - 186 | 12.314 ⁺¹⁹⁰ + 190 | 52.39 ⁻⁶⁶ - 66 | 23.748 ⁺⁵¹⁵ + 515 | 59.02 ⁻²⁷⁵ - 275 |
| 10 27.0 | 09.240 + 184 | 56.01 + 77 | 10.465 + 164 | 10.50 ⁻²¹⁷ - 217 | 12.477 ⁺¹⁶³ + 163 | 53.31 ⁻⁹² - 92 | 24.100 ⁺³⁵² + 352 | 62.06 ⁻³⁰⁴ - 304 |
| 11 6.0 | 09.395 + 155 | 56.65 + 64 | 10.589 + 124 | 12.93 ⁻²⁴³ - 243 | 12.610 ⁺¹³³ + 133 | 54.45 ⁻¹¹⁴ - 114 | 24.271 ⁺¹⁷¹ + 171 | 65.29 ⁻³²³ - 323 |
| 11 16.0 | 09.517 + 122 | 57.16 + 51 | 10.670 + 81 | 15.49 ⁻²⁵⁶ - 256 | 12.712 ⁺¹⁰² + 102 | 55.74 ⁻¹²⁹ - 129 | 24.248 ⁻²³ - 23 | 68.57 ⁻³²⁸ - 328 |
| 11 26.0 | 09.609 + 92 | 57.58 + 42 | 10.712 + 42 | 18.08 ⁻²⁵⁹ - 259 | 12.784 ⁺⁷² + 72 | 57.11 ⁻¹³⁷ - 137 | 24.046 ⁻²⁰² - 202 | 71.76 ⁻³¹⁹ - 319 |
| 12 5.9 | 09.665 + 56 | 57.88 + 30 | 10.711 - 1 | 20.62 ⁻²⁵⁴ - 254 | 12.823 ⁺³⁹ + 39 | 58.52 ⁻¹⁴¹ - 141 | 23.659 ⁻³⁸⁷ - 387 | 74.78 ⁻³⁰² - 302 |
| 12 15.9 | 09.686 + 21 | 58.09 + 21 | 10.669 - 42 | 22.98 ⁻²³⁶ - 236 | 12.828 ⁺⁵ + 5 | 59.88 ⁻¹³⁶ - 136 | 23.103 ⁻⁵⁵⁶ - 556 | 77.46 ⁻²⁶⁸ - 268 |
| 12 25.9 | 09.672 - 14 | 58.20 + 11 | 10.589 - 80 | 25.09 ⁻²¹¹ - 211 | 12.802 ⁻²⁶ - 26 | 61.15 ⁻¹²⁷ - 127 | 22.405 ⁻⁶⁹⁸ - 698 | 79.74 ⁻²²⁸ - 228 |
| 12 35.8 | 09.622 - 50 | 58.20 + 0 | 10.472 - 117 | 26.89 ⁻¹⁸⁰ - 180 | 12.743 ⁻⁵⁹ - 59 | 62.30 ⁻¹¹⁵ - 115 | 21.571 ⁻⁸³⁴ - 834 | 81.54 ⁻¹⁸⁰ - 180 |
| | | - 83 | | - 149 | | - 88 | | - 124 |
| Mean Place | 07.416 | 42.19 | 08.206 | 27.33 | 10.615 | 69.63 | 16.800 | 76.67 |
| sec δ, tan δ | +1.071 | +0.384 | +1.230 | -0.716 | +1.012 | -0.156 | +4.598 | -4.488 |
| dα(ψ), dδ(ψ) | +0.069 | +0.26 | +0.047 | +0.26 | +0.058 | +0.26 | -0.029 | +0.26 |
| dα(ε), dδ(ε) | -0.017 | +0.75 | +0.032 | +0.75 | +0.007 | +0.75 | +0.196 | +0.76 |
| Dble. Trans. | November 9 | | November 9 | | November 9 | | November 10 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 1092 | | 115 | | 1093 | | 119 | |
|------------------------------|-----------------------------|-----------------|------------------|-----------------|------------------|-----------------|------------------|-----------------|
| | Lacaille 1044 (Fornacis) | | 48 H. Cephei | | κ Ceti | | 82 G. Eridani | |
| Mag.Spect. | 6.89 | A0 | 5.50 | F0 | 4.96 | G5 | 4.30 | G5 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " |
| | 3 16 | - 31 23 | 3 18 | + 77 40 | 3 18 | + 3 19 | 3 19 | - 43 06 |
| 1 -9.1 | 21.499 - 54 | 75.63 -211 | 32.688 - 296 | 80.71 +288 | 37.876 - 4 | 13.09 - 75 | 23.360 - 84 | 88.89 -237 |
| 1 0.9 | 21.410 - 89 | 77.46 -183 | 32.232 - 456 | 83.24 +253 | 37.840 - 36 | 12.37 - 72 | 23.236 - 124 | 90.91 -202 |
| 1 10.8 | 21.288 - 122 | 78.99 -153 | 31.622 - 610 | 30.878 +212 | 37.773 - 67 | 11.70 - 67 | 23.074 - 162 | 92.56 -165 |
| 1 20.8 | 21.136 - 152 | 80.12 -113 | 30.878 - 744 | 86.95 +159 | 37.676 - 97 | 11.10 - 60 | 22.879 - 195 | 93.72 -116 |
| 1 30.8 | 20.963 - 173 | 80.85 - 73 | 30.044 - 834 | 87.99 +104 | 37.556 - 120 | 10.60 - 50 | 22.661 - 218 | 94.40 - 68 |
| 2 9.7 | 20.772 - 191 | 81.17 - 32 | 29.141 - 903 | 88.45 + 46 | 37.418 - 138 | 10.18 - 42 | 22.425 - 236 | 94.60 - 20 |
| 2 19.7 | 20.573 - 199 | 81.04 + 13 | 28.217 - 924 | 88.29 - 16 | 37.270 - 148 | 09.88 - 30 | 22.181 - 244 | 94.27 + 33 |
| 3 1.7 | 20.377 - 196 | 80.49 + 55 | 27.318 - 899 | 87.56 - 73 | 37.122 - 148 | 09.70 - 18 | 21.941 - 162 | 93.46 + 81 |
| 3 11.7 | 20.189 - 188 | 79.54 + 95 | 26.473 - 845 | 86.29 -127 | 36.981 - 141 | 09.66 - 4 | 21.712 - 229 | 92.19 +127 |
| 3 21.6 | 20.022 - 167 | 78.18 +136 | 25.733 - 740 | 84.52 -177 | 36.858 - 123 | 09.77 + 11 | 21.508 - 204 | 90.45 +174 |
| 3 31.6 | 19.884 - 138 | 76.47 +171 | 25.130 - 603 | 82.38 -214 | 36.761 - 97 | 10.05 + 28 | 21.337 - 171 | 88.33 +212 |
| 4 10.6 | 19.781 - 103 | 74.41 +206 | 24.680 - 450 | 79.92 -246 | 36.697 - 64 | 10.50 + 45 | 21.204 - 133 | 85.84 +249 |
| 4 20.6 | 19.722 - 59 | 72.05 +236 | 24.420 - 260 | 77.25 - 273 | 36.675 + 21 | 11.16 + 66 | 21.122 - 82 | 83.03 +281 |
| 4 30.5 | 19.710 - 12 | 69.45 +260 | 24.351 - 69 | 74.52 -273 | 36.696 + 21 | 12.00 + 84 | 21.093 - 29 | 79.99 +304 |
| 5 10.5 | 19.747 + 37 | 66.63 +282 | 24.475 + 124 | 71.78 -274 | 36.761 + 65 | 13.04 +104 | 21.118 + 25 | 76.73 +326 |
| 5 20.5 | 19.837 + 90 | 63.66 +297 | 24.802 + 327 | 69.16 -262 | 36.873 + 112 | 14.30 +126 | 21.204 + 86 | 73.36 +337 |
| 5 30.4 | 19.975 + 138 | 60.63 +303 | 25.305 + 503 | 66.75 -241 | 37.030 + 157 | 15.72 +142 | 21.344 + 140 | 69.95 +341 |
| 6 9.4 | 20.160 + 185 | 57.56 +307 | 25.979 + 674 | 64.59 -216 | 37.227 + 197 | 17.29 +157 | 21.538 + 194 | 66.55 +340 |
| 6 19.4 | 20.389 + 229 | 54.56 +300 | 26.808 + 829 | 62.81 -178 | 37.461 + 234 | 18.98 +169 | 21.783 + 245 | 63.28 +327 |
| 6 29.4 | 20.651 + 262 | 51.70 +286 | 27.756 + 948 | 61.41 -140 | 37.723 + 262 | 20.73 +175 | 22.068 + 285 | 60.20 +308 |
| 7 9.3 | 20.944 + 293 | 49.02 +268 | 28.811 +1055 | 60.43 - 98 | 38.010 + 287 | 22.52 +179 | 22.390 + 322 | 57.37 +283 |
| 7 19.3 | 21.259 + 315 | 46.65 +237 | 29.943 +1132 | 59.93 - 50 | 38.312 + 302 | 22.48 +176 | 22.740 + 350 | 54.91 +246 |
| 7 29.3 | 21.587 + 328 | 44.62 +203 | 31.120 +1177 | 59.88 - 5 | 38.622 + 310 | 25.97 +169 | 23.106 + 366 | 52.85 +206 |
| 8 8.3 | 21.922 + 335 | 42.98 +164 | 32.330 +1210 | 60.30 + 42 | 38.936 + 314 | 27.55 +158 | 23.485 + 379 | 51.26 +159 |
| 8 18.2 | 22.255 + 333 | 41.83 +115 | 33.538 +1208 | 61.20 + 90 | 39.244 + 308 | 28.95 +140 | 23.863 + 378 | 50.22 +104 |
| 8 28.2 | 22.578 + 323 | 41.14 + 69 | 34.722 +1184 | 62.51 +131 | 39.543 + 299 | 30.16 +121 | 24.231 + 368 | 49.72 + 50 |
| 9 7.2 | 22.888 + 310 | 40.96 + 18 | 35.871 +1149 | 64.25 +174 | 39.829 + 286 | 31.13 + 97 | 24.586 + 355 | 49.79 - 7 |
| 9 17.1 | 23.176 + 288 | 41.31 - 35 | 36.950 +1079 | 66.39 +214 | 40.096 + 267 | 31.85 + 72 | 24.915 + 329 | 50.44 - 65 |
| 9 27.1 | 23.438 + 262 | 42.13 - 82 | 37.949 + 999 | 68.84 +245 | 40.342 + 246 | 32.31 + 46 | 25.215 + 300 | 51.60 -116 |
| 10 7.1 | 23.671 + 233 | 43.42 -129 | 38.855 + 906 | 71.61 +277 | 40.566 + 224 | 32.51 + 20 | 25.480 + 265 | 53.28 -188 |
| 10 17.1 | 23.870 + 199 | 45.12 -170 | 39.636 + 781 | 74.63 +302 | 40.763 + 197 | 32.46 - 5 | 25.703 + 223 | 55.38 -210 |
| 10 27.0 | 24.034 + 164 | 47.12 -200 | 40.292 + 656 | 77.82 +319 | 40.935 + 172 | 32.20 - 26 | 25.884 + 181 | 57.80 -242 |
| 11 6.0 | 24.161 + 127 | 49.38 -226 | 40.802 + 510 | 81.17 +335 | 41.079 + 144 | 31.76 - 44 | 26.019 + 135 | 60.50 -270 |
| 11 16.0 | 24.249 + 88 | 51.78 -240 | 41.147 + 345 | 84.55 +338 | 41.192 + 113 | 31.17 - 59 | 26.105 + 86 | 63.31 -281 |
| 11 26.0 | 24.299 + 50 | 54.22 -244 | 41.331 + 184 | 87.90 +335 | 41.276 + 84 | 30.49 - 68 | 26.145 + 40 | 66.14 -283 |
| 12 5.9 | 24.309 + 10 | 56.64 -242 | 41.335 + 4 | 91.16 +326 | 41.327 + 51 | 29.73 - 76 | 26.136 - 9 | 68.90 -276 |
| 12 15.9 | 24.279 - 30 | 58.89 -225 | 41.159 - 176 | 94.19 +303 | 41.345 + 18 | 28.97 - 76 | 26.080 - 56 | 71.44 -254 |
| 12 25.9 | 24.214 - 65 | 60.92 -203 | 40.817 - 342 | 96.95 +276 | 41.332 - 13 | 28.22 - 75 | 25.983 - 97 | 73.70 -226 |
| 12 35.8 | 24.112 - 102 | 62.67 -175 | 40.305 - 512 | 99.33 +238 | 41.284 - 48 | 28.22 - 73 | 25.983 - 140 | 75.62 -192 |
| | 24.112 - 133 | 62.67 -137 | 40.305 - 654 | 99.33 +189 | 41.284 - 77 | 27.49 - 65 | 25.843 - 176 | 75.62 -146 |
| Mean Place sec δ, tan δ | 21.879 +1.172 | 64.09 -0.610 | 34.723 +4.689 | 71.69 +4.581 | 39.127 +1.002 | 16.66 +0.058 | 23.331 +1.370 | 74.96 -0.936 |
| da(ψ), dδ(ψ) da(ε), dδ(ε) | +0.049 +0.027 | +0.26 +0.76 | +0.154 -0.198 | +0.26 +0.76 | +0.062 -0.003 | +0.26 +0.76 | +0.042 +0.040 | +0.26 +0.76 |
| Dble.Trans. | November 10 | | November 10 | | November 10 | | November 11 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 1094 | | 120 | | 1096 | | 121 | |
|--------------|--------------|-------------|--------------|-------------|---|-------------|--------------|-------------|
| | τ Arietis | | α Persei | | Piazzi 3 ^h 27 (Camelopardi) | | ο Tauri | |
| Mag.Spect. | 5.17 | B3 | 1.90 | F5 | 5.55 | K2 | 3.80 | G5 |
| U.T. | R.A. | | R.A. | | R.A. | | R.A. | |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " |
| | 3 20 | + 21 05 | 3 23 | + 49 48 | 3 23 | + 64 32 | 3 24 | + 8 58 |
| 1 -9.1 | 25.245 + 1 | 57 06 + 16 | 19 422 2/3 | 56 43 + 169 | 27 639 - 81 | 27 67 + 239 | 03 815 + 3 | 53 28 - 49 |
| 1 0.9 | 25.212 - 33 | 57 14 + 8 | 19 346 B | 57 88 + 145 | 27 477 - 162 | 29 75 + 208 | 03 785 - 30 | 52 80 - 48 |
| 1 10.8 | 25.143 - 69 | 57 12 - 2 | 19 218 126 | 59 03 + 115 | 27 236 241 | 31 48 + 173 | 03 722 - 63 | 52 32 - 48 |
| 1 20.8 | 25.042 - 101 | 56 99 13 | 19 041 111 | 59 83 + 80 | 26 924 312 | 32 74 + 126 | 03 627 - 95 | 51 86 - 46 |
| 1 30.8 | 24.915 - 127 | 56 77 - 22 | 18 829 212 | 60 26 + 43 | 26 562 362 | 33 54 + 80 | 03 509 - 118 | 51 43 - 43 |
| 2 9.8 | 24.767 - 148 | 56 45 - 32 | 18 587 - 242 | 60 31 + 5 | 26 160 402 | 33 84 + 30 | 03 371 - 138 | 51.03 - 40 |
| 2 19.7 | 24.608 - 159 | 56 05 - 40 | 18 330 - 257 | 59 97 - 34 | 25 739 421 | 33 61 23 | 03 220 - 151 | 50 68 - 35 |
| 3 1.7 | 24.448 - 160 | 55 58 - 47 | 18 076 - 254 | 59 27 - 70 | 25 326 413 | 32 90 71 | 03 069 - 151 | 50 40 - 28 |
| 3 11.7 | 24.296 - 152 | 55 06 - 52 | 17 834 - 242 | 58 23 - 104 | 24 934 392 | 31 73 117 | 02 924 - 145 | 50 19 - 21 |
| 3 21.6 | 24.163 - 133 | 54 54 - 52 | 17 623 - 211 | 56 92 - 131 | 24 590 - 344 | 30 15 - 158 | 02 796 - 128 | 50.10 - 9 |
| 3 31.6 | 24.060 - 103 | 54 05 - 49 | 17 456 - 167 | 55 40 - 152 | 24 312 - 278 | 28 27 - 188 | 02 695 - 101 | 50 12 + 2 |
| 4 10.6 | 23.992 - 68 | 53 62 - 43 | 17 339 - 117 | 53 73 - 167 | 24 110 - 202 | 26 13 - 214 | 02 626 - 69 | 50 28 + 16 |
| 4 20.6 | 23 969 - 23 | 53 30 - 32 | 17 287 - 52 | 52 01 - 172 | 24 003 - 107 | 23 85 - 228 | 02 599 - 27 | 50 61 + 33 |
| 4 30.5 | 23 994 + 25 | 53 12 - 18 | 17 302 + 15 | 50 31 - 170 | 23 994 - 9 | 21 54 - 231 | 02 617 + 18 | 51 11 + 50 |
| 5 10.5 | 24.069 + 75 | 53 17 + 5 | 17 386 + 84 | 48 68 - 163 | 24 084 + 90 | 19 25 - 229 | 02 678 + 61 | 51.78 + 67 |
| 5 20.5 | 24.183 + 114 | 53 28 + 11 | 17 541 + 155 | 47 23 - 145 | 24 279 + 195 | 17 10 - 215 | 02 787 + 109 | 52 68 + 90 |
| 5 30.5 | 24.355 + 172 | 53 65 + 37 | 17 760 + 219 | 45 98 - 125 | 24 566 + 287 | 15 16 - 194 | 02 941 + 154 | 53 77 + 109 |
| 6 9.4 | 24.569 + 214 | 54 23 + 58 | 18 039 + 279 | 44 98 - 100 | 24 942 + 376 | 13 47 - 169 | 03 138 + 197 | 55 02 + 125 |
| 6 19.4 | 24.822 + 253 | 55 02 + 79 | 18 374 + 335 | 44 30 - 68 | 25 397 + 455 | 12 12 - 135 | 03 372 + 234 | 56 41 + 139 |
| 6 29.4 | 25.103 + 281 | 55 98 + 96 | 18 749 + 375 | 43 92 - 38 | 25 913 + 516 | 11 13 - 99 | 03 634 + 262 | 57 89 + 148 |
| 7 9.3 | 25 410 + 307 | 57 11 + 113 | 19 161 + 412 | 43 86 - 6 | 26 483 + 570 | 10 52 - 61 | 03 921 + 287 | 59 46 + 157 |
| 7 19.3 | 25 734 + 324 | 58 35 + 124 | 19 598 + 437 | 44 15 + 29 | 27 093 + 610 | 10 33 - 19 | 04 225 + 304 | 61 05 + 159 |
| 7 29.3 | 26 065 + 331 | 59 68 + 133 | 20 046 + 448 | 44 74 + 59 | 27 722 + 629 | 10 53 + 20 | 04 538 + 313 | 62 61 + 156 |
| 8 8.3 | 26 400 + 335 | 61 07 + 139 | 20 503 + 457 | 45 63 + 89 | 28 367 + 645 | 11 13 + 60 | 04 854 + 316 | 64 12 + 151 |
| 8 18.2 | 26 731 + 331 | 62 46 + 139 | 20 955 + 452 | 46 80 + 117 | 29 008 + 641 | 12 13 + 100 | 05 167 + 313 | 65 52 + 140 |
| 8 28.2 | 27 051 + 320 | 63 82 + 136 | 21 395 + 440 | 48 21 + 141 | 29 636 + 628 | 13 48 + 135 | 05 471 + 304 | 66 77 + 125 |
| 9 7.2 | 27 358 + 307 | 65 14 + 132 | 21 820 + 425 | 49 84 + 163 | 30 244 + 608 | 15 16 + 168 | 05 763 + 292 | 67 84 + 107 |
| 9 17.2 | 27 646 + 288 | 66 35 + 121 | 22 220 + 400 | 51 65 + 181 | 30 817 + 573 | 17 15 + 199 | 06 036 + 273 | 68 71 + 87 |
| 9 27.1 | 27 913 + 267 | 67 47 + 112 | 22 592 + 372 | 53 61 + 196 | 31 350 + 533 | 19 39 + 224 | 06 290 + 254 | 69 37 + 66 |
| 10 7.1 | 28 158 + 245 | 68 47 + 100 | 22 934 + 342 | 55 69 + 208 | 31 838 + 488 | 21 88 + 249 | 06 522 + 232 | 69 81 + 44 |
| 10 17.1 | 28 375 + 217 | 69 33 + 86 | 23 237 + 303 | 57 84 + 215 | 32 267 + 429 | 24 53 + 265 | 06 728 + 206 | 70 04 + 23 |
| 10 27.0 | 28 566 + 191 | 70 08 + 75 | 23 502 + 265 | 60 04 + 220 | 32 637 + 370 | 27 31 + 278 | 06 910 + 182 | 70 09 + 5 |
| 11 6.0 | 28 728 + 162 | 70 70 + 62 | 23 724 + 222 | 62 26 + 222 | 32 940 + 303 | 30 19 + 288 | 07 064 + 154 | 69 97 - 12 |
| 11 16.0 | 28 857 + 129 | 71 21 + 51 | 23 898 + 174 | 64 44 + 218 | 33 165 + 225 | 33 07 + 288 | 07 187 + 123 | 69 71 - 26 |
| 11 26.0 | 28 956 + 99 | 71 62 + 41 | 24 023 + 125 | 66 55 + 211 | 33 315 + 150 | 35 91 + 284 | 07 281 + 94 | 69 35 - 36 |
| 12 5.9 | 29 019 + 63 | 71 92 + 30 | 24 095 + 72 | 68 54 + 199 | 33 379 + 64 | 38 64 + 273 | 07 341 + 60 | 68 92 - 43 |
| 12 15.9 | 29 046 + 27 | 72 13 + 21 | 24 110 + 15 | 70 35 + 181 | 33 357 22 | 41 17 + 253 | 07 367 + 26 | 68 44 - 48 |
| 12 25.9 | 29 038 - 8 | 72 25 + 12 | 24 073 - 37 | 71 95 + 160 | 33 252 105 | 43 45 + 228 | 07 361 - 6 | 67 95 - 49 |
| 12 35.9 | 28 992 - 46 | 72 27 + 2 | 23 978 - 95 | 73 28 + 133 | 33 062 190 | 45 40 + 195 | 07 319 - 42 | 67 44 - 51 |
| | 28 992 - 79 | 72 27 - 7 | 23 978 - 144 | 73 28 + 100 | 33 062 263 | 45 40 + 153 | 07 319 74 | 67 44 - 48 |
| Mean Place | 26.742 | 56.36 | 21.227 | 50.26 | 29.557 | 19.67 | 05 122 | 55.09 |
| sec δ, tan δ | +1.072 | +0.386 | +1.550 | +1.184 | +2.326 | +2.100 | +1 012 | +0.158 |
| dα(ψ), dδ(ψ) | +0.069 | +0.26 | +0.086 | +0.25 | +0.104 | +0.25 | +0 064 | +0.25 |
| dα(ε), dδ(ε) | -0.016 | +0.77 | -0.050 | +0.78 | -0.088 | +0.78 | -0.007 | +0.78 |
| Dble.Trans. | November 11 | | November 12 | | November 12 | | November 12 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 123 | | 122 | | 126 | | 124 | |
|---------------------|-------------------------|------------|--------------------------|-------------------------|---------------------------|-------------------------|--------------------------|-------------------------|
| Name | ξ Tauri | | 2 H. Camelopardi* | | χ Reticuli | | σ Persei | |
| Mag.Spect. | 3.75 | B8 | 4.44 | B9p | 4.80 | F5 | 4.55 | K0 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° / | h m | ° / | h m | ° / | h m | ° / |
| | 3 26 | + 9 41 | 3 27 | +59 53 | 3 29 | -62 58 | 3 29 | +47 56 |
| 1 ^d -9.1 | 24 857 ^s + 5 | 09.12 - 45 | 56 204 ^s - 48 | 46 51 ["] +221 | 10.615 ^s - 221 | 80.88 ["] -265 | 35.330 ^s - 10 | 64.01 ["] +162 |
| 1 0.9 | 24 830 - 27 | 08.67 - 45 | 56 088 - 116 | 48 42 +191 | 10.328 - 287 | 83.12 -224 | 35.268 - 62 | 65.40 +139 |
| 1 10.8 | 24 768 - 62 | 08.21 - 46 | 55 902 - 186 | 50.01 +159 | 09.981 - 347 | 84.91 -179 | 35.154 - 114 | 66.53 +113 |
| 1 20.8 | 24 675 - 93 | 07.77 - 44 | 55 654 - 248 | 51.18 +117 | 09.582 - 399 | 86.14 -123 | 34.992 - 162 | 67.32 +79 |
| 1 30.8 | 24 558 - 117 | 07.36 - 41 | 55 360 - 294 | 51.91 + 73 | 09.151 - 431 | 86.81 - 67 | 34.794 - 198 | 67.77 + 45 |
| 2 9.8 | 24 419 - 139 | 06.96 - 40 | 55 028 - 332 | 52.19 + 28 | 08.693 - 458 | 86.93 - 12 | 34.565 - 229 | 67.86 + 9 |
| 2 19.7 | 24 269 - 150 | 06.62 - 34 | 54 678 - 350 | 51.97 - 22 | 08.227 - 466 | 86.44 + 49 | 34.321 - 244 | 67.57 - 29 |
| 3 1.7 | 24 117 - 152 | 06.33 - 29 | 54 332 - 346 | 51.31 - 66 | 07.769 - 458 | 85.41 +103 | 34.076 - 245 | 66.94 - 63 |
| 3 11.7 | 23 970 - 147 | 06.11 - 22 | 54 001 - 331 | 50.22 -109 | 07.329 - 440 | 83.86 +155 | 33.841 - 235 | 65.99 +79 |
| 3 21.6 | 23 841 - 129 | 05.99 - 12 | 53 710 - 291 | 48.75 -147 | 06.926 - 403 | 81.80 +206 | 33.635 - 206 | 64.77 -122 |
| 3 31.6 | 23 739 - 102 | 05.98 - 1 | 53 473 - 237 | 47.01 -174 | 06.572 - 354 | 79.34 +246 | 33.468 - 167 | 63.36 -141 |
| 4 10.6 | 23 668 - 71 | 06.11 + 13 | 53 301 - 172 | 45.03 -198 | 06.274 - 298 | 76.47 +287 | 33.351 - 117 | 61.79 -157 |
| 4 20.6 | 23 640 - 28 | 06.40 + 29 | 53 211 - 90 | 42.93 -210 | 06.051 - 223 | 73.28 +319 | 33.294 - 57 | 60.17 -162 |
| 4 30.5 | 23 655 + 15 | 06.86 + 46 | 53 205 - 6 | 40.80 -213 | 05.904 - 147 | 69.87 +341 | 33.302 + 7 | 58.57 -160 |
| 5 10.5 | 23 716 + 61 | 07.48 + 62 | 53 285 + 80 | 38.71 -209 | 05 838 - 66 | 66.26 +361 | 33.375 + 8 | 57.03 -154 |
| 5 20.5 | 23 822 + 106 | 08.34 + 86 | 53 455 + 170 | 36.74 -197 | 05 862 + 24 | 62.55 +371 | 33.518 + 143 | 55.66 -137 |
| 5 30.5 | 23 975 + 153 | 09.38 +104 | 53 706 + 251 | 34.99 -175 | 05 969 + 107 | 58.85 +370 | 33.724 + 206 | 54.48 -118 |
| 6 9.4 | 24 170 + 195 | 10.58 +120 | 54 034 + 328 | 33.47 -152 | 06.160 + 191 | 55.19 +366 | 33.988 + 264 | 53.54 - 94 |
| 6 19.4 | 24 403 + 233 | 11.93 +135 | 54 432 + 398 | 32.28 -119 | 06 432 + 272 | 51.71 +348 | 34.307 + 319 | 52.89 - 65 |
| 6 29.4 | 24 665 + 262 | 13.37 +144 | 54 884 + 452 | 31.43 - 85 | 06.773 + 341 | 48.48 +323 | 34.666 + 359 | 52.54 - 35 |
| 7 9.3 | 24 952 + 287 | 14 91 +154 | 55 383 + 499 | 30.93 - 50 | 07.178 + 405 | 45.55 +293 | 35.061 + 395 | 52.49 - 5 |
| 7 19.3 | 25 256 + 304 | 16.47 +156 | 55 916 + 533 | 30.83 - 10 | 07 636 + 458 | 43.06 +249 | 35.481 + 420 | 52.77 + 28 |
| 7 29.3 | 25 568 + 312 | 18.01 +154 | 56 467 + 551 | 31.09 + 26 | 08.130 + 494 | 41.04 +202 | 35.915 + 434 | 53.33 + 56 |
| 8 8.3 | 25 886 + 318 | 19.50 +149 | 57 031 + 564 | 31.73 + 64 | 08 653 + 523 | 39.54 +150 | 36.357 + 442 | 54.18 + 85 |
| 8 18.2 | 26 200 + 314 | 20.89 +139 | 57 593 + 562 | 32.72 + 99 | 09.185 + 532 | 38.66 + 88 | 36.796 + 439 | 55.30 +112 |
| 8 28.2 | 26 505 + 305 | 22.14 +125 | 58 143 + 550 | 34.03 +131 | 09.713 + 528 | 38.37 + 29 | 37.225 + 429 | 56.63 +133 |
| 9 7.2 | 26 799 + 294 | 23.22 +108 | 58 678 + 535 | 35.64 +161 | 10 227 + 514 | 38.71 - 34 | 37.641 + 416 | 58.17 +154 |
| 9 17.2 | 27 074 + 275 | 24.10 + 88 | 59 182 + 504 | 37.54 +190 | 10 706 + 479 | 39.69 - 98 | 38.033 + 392 | 59.89 +172 |
| 9 27.1 | 27 330 + 256 | 24.78 + 68 | 59 653 + 471 | 39.64 +210 | 11 141 + 435 | 41.22 -153 | 38 400 + 367 | 61.73 +184 |
| 10 7.1 | 27 565 + 235 | 25.25 + 47 | 60 086 + 433 | 41.97 +233 | 11 522 + 381 | 43.30 -208 | 38.739 + 339 | 63.70 +197 |
| 10 17.1 | 27 775 + 210 | 25.51 + 26 | 60 469 + 383 | 44.44 +247 | 11 832 + 310 | 45.83 -253 | 39.041 + 302 | 65.73 +203 |
| 10 27.0 | 27 959 + 184 | 25.59 + 8 | 60 804 + 335 | 47.02 +258 | 12 072 + 240 | 48.70 -287 | 39.308 + 267 | 67.80 +207 |
| 11 6.0 | 28 116 + 157 | 25.50 - 9 | 61 082 + 278 | 49.68 +266 | 12 231 + 159 | 51.84 -314 | 39.534 + 226 | 69.89 +209 |
| 11 16.0 | 28 242 + 126 | 25.28 - 22 | 61 296 + 214 | 52.33 +265 | 12 304 + 73 | 55.09 -325 | 39.713 + 179 | 71.95 +206 |
| 11 26.0 | 28 340 + 98 | 24.97 - 31 | 61 446 + 150 | 54.95 +262 | 12 295 - 9 | 58.32 -323 | 39.847 + 134 | 73.95 +200 |
| 12 5.9 | 28 403 + 63 | 24.57 - 40 | 61 523 + 77 | 57 47 +252 | 12.202 - 93 | 61.46 -314 | 39.928 + 81 | 75.84 +189 |
| 12 15.9 | 28 432 + 29 | 24.13 - 44 | 61 527 + 4 | 59.80 +233 | 12.027 - 175 | 64.32 -286 | 39.956 + 28 | 77.57 +173 |
| 12 25.9 | 28 428 - 4 | 23.67 - 46 | 61 460 - 67 | 61.90 +210 | 11.782 - 245 | 66.85 -253 | 39.931 - 25 | 79.10 +153 |
| 12 35.9 | 28 388 - 40 | 23.19 - 48 | 61 319 - 141 | 63.69 +179 | 11.468 - 314 | 68.95 -210 | 39.851 - 80 | 80.39 +129 |
| | | - 72 | - 206 | +141 | - 370 | -158 | - 129 | + 98 |
| Mean Place | 26.171 | 10.65 | 58.065 | 38.97 | 08.420 | 65.71 | 37.086 | 58.05 |
| sec δ, tan δ | +1.014 | +0.171 | +1.994 | +1.725 | +2.202 | -1.961 | +1.493 | +1.109 |
| da(ν), dδ(ν) | +0.065 | +0.25 | +0.097 | +0.24 | +0.020 | +0.24 | +0.084 | +0.24 |
| da(ε), dδ(ε) | -0.007 | +0.78 | -0.071 | +0.79 | +0.080 | +0.79 | -0.045 | +0.79 |
| Dble.Trans. | November 12 | | November 13 | | November 13 | | November 13 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 1097 | | 125 | | 1098 | | 128 | |
|---|--------------|------------|--------------|------------|---------------------------|------------|-----------------|------------|
| | 17 Eridani | | 5 Tauri | | B.D. +34° 674 (Persei) | | 45 G. Horologii | |
| Mag.Spect. | 4.80 | B9 | 4.28 | K0 | 5.80 | B3 | 5.60 | K0 |
| U.T. | R.A. | | R.A. | | R.A. | | R.A. | |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " |
| | 3 29 | - 5 06 | 3 30 | + 12 53 | 3 31 | + 35 24 | 3 32 | - 50 25 |
| 1 -9.1 | 55 756 - 1 | 79.66 -120 | 06 229 + 10 | 27.26 - 28 | 46 627 + 8 | 63.33 + 96 | 11 287 - 112 | 40.11 -262 |
| 1 0.9 | 55.722 - 34 | 80.75 -109 | 06 204 - 25 | 26.95 - 31 | 46 592 - 35 | 64.12 + 79 | 11.128 - 159 | 42.36 -225 |
| 1 10.8 | 55.656 - 66 | 81.73 - 98 | 06.145 - 59 | 26.62 - 33 | 46 514 - 78 | 64.73 + 61 | 10.922 - 206 | 44.22 -186 |
| 1 20.8 | 55.558 - 98 | 82.55 - 82 | 06.053 - 92 | 26.27 - 35 | 46 396 - 119 | 65.11 + 38 | 10.676 - 246 | 45.57 -135 |
| 1 30.8 | 55.437 - 121 | 83.20 - 65 | 05.935 - 118 | 25.92 - 35 | 46 247 - 148 | 65.27 + 16 | 10.403 - 273 | 46.41 - 84 |
| 2 9.8 | 55.296 - 141 | 83.66 - 46 | 05.796 - 139 | 25.56 - 36 | 46 072 - 175 | 65.18 - 9 | 10.106 - 297 | 46.73 - 32 |
| 2 19.7 | 55.143 - 153 | 83.92 - 26 | 05.643 - 153 | 25.21 - 35 | 45 882 - 190 | 64.85 - 33 | 10.079 - 307 | 46.49 + 24 |
| 3 1.7 | 54.988 - 155 | 83.97 - 5 | 05.489 - 154 | 24.89 - 32 | 45 690 - 192 | 64.30 - 55 | 09.799 - 304 | 45.73 + 76 |
| 3 11.7 | 54.837 - 151 | 83.82 + 15 | 05.339 - 150 | 24.59 - 30 | 45 505 - 185 | 63.56 - 74 | 09.495 - 295 | 44.73 +125 |
| 3 21.6 | 54.703 - 134 | 83.43 + 39 | 05.207 - 132 | 24.37 - 22 | 45 341 - 164 | 62.66 - 90 | 09.200 - 269 | 44.48 +175 |
| 3 31.6 | 54.593 - 110 | 82.82 + 61 | 05.101 - 106 | 24.24 - 13 | 45 210 - 131 | 61.66 -100 | 08.697 - 234 | 40.57 +216 |
| 4 10.6 | 54.515 - 78 | 81.98 + 84 | 05.027 - 74 | 24.21 - 3 | 45 118 - 92 | 60.61 -105 | 08.504 - 193 | 38.01 +256 |
| 4 20.6 | 54.476 + 39 | 80.91 +107 | 04.996 - 31 | 24.33 + 12 | 45 077 - 41 | 59.57 -104 | 08.365 - 139 | 35.11 +290 |
| 4 30.5 | 54.479 + 3 | 79.63 +128 | 05 009 + 13 | 24.60 + 27 | 45 089 + 12 | 58.60 - 97 | 08.284 - 81 | 31.96 +315 |
| 5 10.5 | 54.527 + 48 | 78.14 +149 | 05.069 + 60 | 25.02 + 42 | 45 156 + 67 | 57.74 - 86 | 08.264 - 20 | 28.59 +337 |
| 5 20.5 | 54.622 + 95 | 76.44 +170 | 05.172 + 103 | 25.67 + 65 | 45 280 + 124 | 57.05 - 69 | 08.311 + 47 | 25.09 +350 |
| 5 30.5 | 54.760 + 138 | 74.61 +183 | 05.325 + 153 | 26.52 + 85 | 45 456 + 176 | 56.55 - 50 | 08.419 + 108 | 21.55 +354 |
| 6 9.4 | 54.940 + 180 | 72.64 +197 | 05.520 + 195 | 27.54 +102 | 45 684 + 228 | 56.26 - 29 | 08.589 + 170 | 18.01 +354 |
| 6 19.4 | 55.159 + 219 | 70.59 +205 | 05.520 + 234 | 28.71 +117 | 45 957 + 273 | 56.23 - 3 | 08.589 + 230 | 14.61 +340 |
| 6 29.4 | 55.406 + 247 | 68.53 +206 | 06.017 + 263 | 30.00 +129 | 46 264 + 307 | 56.44 + 21 | 09.097 + 278 | 11.40 +321 |
| 7 9.3 | 55.680 + 274 | 66.49 +204 | 06 306 + 289 | 31.39 +139 | 46 601 + 337 | 56.90 + 46 | 09.421 + 324 | 08.46 +294 |
| 7 19.3 | 55.973 + 293 | 64.53 +196 | 06 612 + 306 | 32.84 +145 | 46 959 + 358 | 57.59 + 69 | 09.781 + 360 | 05.90 +256 |
| 7 29.3 | 56.275 + 302 | 62.72 +181 | 06.927 + 315 | 34.30 +146 | 47 327 + 368 | 58.47 + 88 | 10.164 + 383 | 03.76 +214 |
| 8 8.3 | 56.584 + 309 | 61.09 +163 | 07.248 + 321 | 35.74 +144 | 47 702 + 375 | 59.53 +106 | 10.567 + 403 | 02.11 +165 |
| 8 18.2 | 56.890 + 306 | 59.71 +138 | 07.566 + 318 | 37.10 +136 | 48 075 + 373 | 60.75 +122 | 10.974 + 407 | 01.04 +107 |
| 8 28.2 | 57.188 + 298 | 58.61 +110 | 07.875 + 309 | 38.36 +126 | 48 438 + 363 | 62.07 +132 | 11.376 + 402 | 00.52 + 52 |
| 9 7.2 | 57.476 + 288 | 57.81 + 80 | 08.174 + 299 | 39.48 +112 | 48 790 + 352 | 63.49 +142 | 11.766 + 390 | 00.62 - 10 |
| 9 17.2 | 57.746 + 270 | 57.36 + 45 | 08.454 + 280 | 40.44 + 96 | 49 122 + 332 | 64.96 +147 | 12.132 + 366 | 01.32 - 70 |
| 9 27.1 | 57.997 + 251 | 57.22 + 14 | 08.716 + 262 | 41.22 + 78 | 49 433 + 311 | 66.45 +149 | 12.467 + 335 | 02.58 -126 |
| 10 7.1 | 58.227 + 230 | 57.40 - 18 | 08.957 + 241 | 41.81 + 59 | 49 720 + 287 | 67.96 +151 | 12.765 + 298 | 04.38 -180 |
| 10 17.1 | 58.430 + 203 | 57.89 - 49 | 09.173 + 216 | 42.22 + 41 | 49 978 + 258 | 69.44 +148 | 13.016 + 251 | 06.64 -226 |
| 10 27.0 | 58.608 + 178 | 58.63 - 74 | 09.364 + 191 | 42.47 + 25 | 50 207 + 229 | 70.90 +146 | 13.219 + 203 | 09.25 -261 |
| 11 6.0 | 58.758 + 150 | 59.59 - 96 | 09.527 + 163 | 42.57 + 10 | 50 403 + 196 | 72.31 +141 | 13.369 + 150 | 12.15 -304 |
| 11 16.0 | 58.877 + 119 | 60.70 -111 | 09.660 + 133 | 42.53 - 4 | 50 563 + 160 | 73.65 +134 | 13.461 + 92 | 15.19 -290 |
| 11 26.0 | 58.967 + 90 | 61.91 -121 | 09.763 + 103 | 42.41 - 12 | 50 686 + 123 | 74.91 +126 | 13.498 + 37 | 18.27 -308 |
| 12 5.9 | 59.023 + 56 | 63.17 -126 | 09.832 + 69 | 42.20 - 21 | 50 767 + 81 | 76.08 +117 | 13.477 - 21 | 21.28 -301 |
| 12 15.9 | 59.044 + 21 | 64.40 -123 | 09.866 + 34 | 41.93 - 27 | 50 805 + 38 | 77.11 +103 | 13.399 - 78 | 24.07 -279 |
| 12 25.9 | 59.034 - 10 | 65.57 -117 | 09.866 + 0 | 41.63 - 0 | 50 801 - 4 | 78.01 + 90 | 13.270 - 129 | 26.58 -251 |
| 12 35.9 | 58.988 - 46 | 66.65 -108 | 09.829 - 37 | 41.29 - 34 | 50 751 - 5 | 78.72 + 71 | 13.091 - 179 | 28.72 -214 |
| | 58.988 - 77 | 66.65 - 93 | 09.829 - 71 | 41.29 - 35 | 50 751 - 91 | 78.72 + 50 | 13.091 - 222 | 28.72 -167 |
| Mean Place | 56.794 | 75.02 | 07.576 | 27.90 | 48.250 | 59.38 | 10.521 | 27.03 |
| sec δ , $\tan \delta$ | +1.004 | -0.090 | +1.026 | +0.229 | +1.227 | +0.711 | +1.570 | -1.210 |
| $d\alpha(\psi)$, $d\delta(\psi)$ | +0.059 | +0.24 | +0.066 | +0.24 | +0.076 | +0.24 | +0.036 | +0.24 |
| $d\alpha(\epsilon)$, $d\delta(\epsilon)$ | +0.004 | +0.79 | -0.009 | +0.79 | -0.029 | +0.80 | +0.048 | +0.80 |
| Dble.Trans. | November 13 | | November 13 | | November 14 | | November 14 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 127 | | 1099 | | 1100 | | 1101 | |
|--------------|-----------------------------------|-------------------------------------|-----------------------------------|--------------------------------------|-----------------------------------|--------------------------------------|-----------------------------------|-------------------------------------|
| | ε Eridani | | τ ¹ Eridani | | 20 Eridani | | 10 Tauri | |
| Mag. Spect. | 3.81 | K0 | 4.32 | B8 | 5.32 | A0p | 4.40 | G5 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | ^h ^m 3 32 | ^o ['] - 9 29 | ^h ^m 3 33 | ^o ['] - 21 40 | ^h ^m 3 35 | ^o ['] - 17 30 | ^h ^m 3 36 | ^o ['] + 0 21 |
| 1 -9.1 | 16.717 - 8 | 77.83 -140 | 10.829 - 19 | 47.34 -191 | 39.706 - 12 | 47.16 -176 | 09.853 + 8 | 31.17 - 96 |
| 1 0.9 | 16.676 - 41 | 79.09 -126 | 10.775 - 54 | 49.03 -169 | 39.662 - 44 | 48.74 -158 | 09.827 - 26 | 30.27 - 90 |
| 1 10.8 | 16.602 - 74 | 80.20 -111 | 10.686 - 89 | 49.03 -147 | 39.582 - 80 | 50.11 -137 | 09.767 - 60 | 29.45 - 82 |
| 1 20.8 | 16.498 -104 | 81.12 - 92 | 10.686 -120 | 50.50 -116 | 39.472 -110 | 50.11 -111 | 09.767 - 91 | 29.45 - 72 |
| 1 30.8 | 16.370 -128 | 81.80 - 68 | 10.566 -143 | 51.66 - 83 | 39.472 -136 | 51.22 - 81 | 09.676 -117 | 28.73 - 58 |
| 2 9.8 | 16.222 -148 | 82.27 - 47 | 10.258 -165 | 52.99 - 50 | 39.336 -156 | 52.03 - 52 | 09.559 -138 | 28.15 - 47 |
| 2 19.7 | 16.063 -159 | 82.47 - 20 | 10.258 -177 | 52.99 -13 | 39.180 -169 | 52.55 -18 | 09.421 -152 | 27.68 - 31 |
| 3 1.7 | 15.903 -160 | 82.43 + 4 | 10.081 -177 | 53.12 + 22 | 39.011 -171 | 52.73 +13 | 09.269 -154 | 27.37 - 16 |
| 3 11.7 | 15.747 -156 | 82.43 + 29 | 09.904 -174 | 52.90 + 57 | 38.840 -167 | 52.60 + 45 | 09.115 -151 | 27.21 + 0 |
| 3 21.7 | 15.608 -139 | 81.58 + 56 | 09.730 -156 | 52.33 + 93 | 38.673 -151 | 52.15 + 78 | 08.964 -135 | 27.21 + 19 |
| 3 31.6 | 15.494 -114 | 80.77 + 81 | 09.574 -131 | 51.40 +125 | 38.522 -126 | 51.37 +108 | 08.829 -111 | 27.40 + 36 |
| 4 10.6 | 15.410 - 84 | 79.72 +105 | 09.443 -100 | 50.15 +156 | 38.396 - 96 | 50.29 +138 | 08.718 - 81 | 27.76 + 56 |
| 4 20.6 | 15.367 - 43 | 78.41 +131 | 09.343 - 60 | 48.59 +186 | 38.300 - 56 | 48.91 +166 | 08.637 - 40 | 28.32 + 76 |
| 4 30.5 | 15.366 - 1 | 78.41 +153 | 09.283 - 16 | 46.73 +210 | 38.244 - 13 | 47.25 +189 | 08.597 + 1 | 29.08 + 95 |
| 5 10.5 | 15.409 + 43 | 75.14 +174 | 09.267 + 30 | 44.63 +234 | 38.231 + 31 | 45.36 +213 | 08.598 + 46 | 30.03 +116 |
| 5 20.5 | 15.501 + 92 | 73.21 +193 | 09.297 + 80 | 42.29 +252 | 38.262 + 81 | 43.23 +232 | 08.644 + 92 | 31.19 +136 |
| 5 30.5 | 15.635 +134 | 71.14 +207 | 09.377 +125 | 39.77 +262 | 38.343 +125 | 40.91 +243 | 08.736 +137 | 32.55 +151 |
| 6 9.4 | 15.812 +177 | 68.96 +218 | 09.502 +169 | 37.15 +272 | 38.468 +168 | 38.48 +254 | 08.873 +179 | 34.06 +166 |
| 6 19.4 | 16.028 +216 | 66.73 +223 | 09.671 +211 | 34.43 +270 | 38.636 +209 | 35.94 +255 | 09.052 +217 | 35.72 +177 |
| 6 29.4 | 16.273 +245 | 64.51 +222 | 09.882 +243 | 31.73 +264 | 38.845 +241 | 33.39 +251 | 09.269 +246 | 37.49 +180 |
| 7 9.4 | 16.545 +272 | 62.34 +217 | 10.125 +243 | 29.09 +264 | 39.086 +241 | 30.88 +251 | 09.515 +246 | 39.29 +180 |
| 7 19.3 | 16.836 +291 | 60.29 +205 | 10.397 +272 | 26.57 +252 | 39.355 +269 | 28.46 +242 | 09.788 +273 | 41.13 +184 |
| 7 29.3 | 17.137 +307 | 58.43 +164 | 10.692 +295 | 24.26 +231 | 39.646 +291 | 26.23 +223 | 10.080 +292 | 42.91 +178 |
| 8 8.3 | 17.444 +305 | 56.79 +135 | 10.999 +307 | 22.22 +204 | 39.949 +303 | 24.23 +200 | 10.382 +302 | 44.60 +169 |
| 8 18.2 | 17.749 +305 | 55.44 +135 | 11.315 +316 | 20.50 +172 | 40.260 +311 | 22.52 +171 | 10.691 +309 | 46.16 +156 |
| 8 28.2 | 18.046 +297 | 54.41 +103 | 11.630 +315 | 19.18 +132 | 40.571 +311 | 21.17 +135 | 10.998 +307 | 47.52 +136 |
| 9 7.2 | 18.333 +287 | 53.72 + 69 | 11.939 +309 | 18.26 + 92 | 40.875 +304 | 20.19 + 98 | 11.297 +299 | 48.65 +113 |
| 9 17.2 | 18.601 +268 | 53.41 + 31 | 12.238 +299 | 17.78 + 48 | 41.170 +295 | 19.62 + 57 | 11.587 +290 | 49.53 + 88 |
| 9 27.1 | 18.850 +249 | 53.46 - 5 | 12.518 +280 | 17.78 + 0 | 41.448 +278 | 19.50 + 12 | 11.860 +273 | 50.11 + 58 |
| 10 7.1 | 19.077 +227 | 53.85 - 39 | 12.778 +260 | 18.21 - 43 | 41.706 +258 | 19.79 - 29 | 12.116 +256 | 50.42 + 31 |
| 10 17.1 | 19.277 +200 | 54.58 - 73 | 13.015 +237 | 19.08 - 87 | 41.941 +235 | 20.49 - 70 | 12.350 +234 | 50.45 + 3 |
| 10 27.0 | 19.450 +173 | 55.57 - 99 | 13.222 +207 | 20.34 -126 | 42.149 +208 | 21.56 -107 | 12.560 +210 | 50.20 - 25 |
| 11 6.0 | 19.596 +146 | 56.79 -122 | 13.400 +178 | 21.90 -156 | 42.330 +181 | 22.93 -137 | 12.746 +186 | 49.73 - 47 |
| 11 16.0 | 19.709 + 83 | 58.17 -138 | 13.548 +148 | 23.73 -183 | 42.480 +150 | 24.56 -163 | 12.904 +158 | 49.05 - 68 |
| 11 26.0 | 19.792 + 83 | 59.64 -147 | 13.659 +111 | 25.74 -201 | 42.597 +117 | 26.36 -180 | 13.032 +128 | 48.22 - 83 |
| 12 5.9 | 19.841 + 49 | 61.14 -150 | 13.738 + 79 | 27.81 -207 | 42.682 + 85 | 28.24 -188 | 13.131 + 99 | 47.30 - 92 |
| 12 15.9 | 19.855 + 14 | 62.60 -146 | 13.780 + 42 | 29.91 -210 | 42.731 + 49 | 30.16 -192 | 13.196 + 65 | 46.32 - 98 |
| 12 25.9 | 19.837 - 18 | 63.97 -137 | 13.784 + 4 | 31.91 -200 | 42.744 + 13 | 32.00 -184 | 13.227 + 31 | 45.33 - 99 |
| 12 35.9 | 19.784 - 84 | 65.21 -104 | 13.754 - 30 | 33.76 -185 | 42.723 - 21 | 33.71 -171 | 13.224 - 3 | 44.38 - 95 |
| | | | 13.686 - 99 | 35.41 -135 | 42.664 - 90 | 35.24 -128 | 13.186 - 70 | 43.49 - 80 |
| Mean Place | 17.630 | 72.25 | 11.453 | 39.46 | 40.437 | 40.35 | 10.967 | 33.93 |
| sec δ, tan δ | +1.014 | -0.167 | +1.076 | -0.397 | +1.049 | -0.316 | +1.000 | +0.006 |
| dα(ψ), dδ(ψ) | +0.058 | +0.24 | +0.053 | +0.24 | +0.054 | +0.23 | +0.061 | +0.23 |
| dα(ε), dδ(ε) | +0.007 | +0.80 | +0.016 | +0.80 | +0.012 | +0.81 | -0.000 | +0.81 |
| Dble. Trans. | November 14 | | November 14 | | November 15 | | November 15 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 130 | | 1102 | | 1103 | | 129 | | |
|---|-------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|----------------------------------|--------------------------|--------------------------|
| | 110 G. Eridani | | τ Fornacis | | 11 Tauri | | Groombridge 716 (Camelopardi) | | |
| Mag.Spect. | 4.58 | K0 | 6.08 | A0 | 6.15 | A0 | 5.32 | M0 | |
| U.T. | R.A. | | R.A. | | R.A. | | R.A. | | |
| | h | Dec. | h | Dec. | h | Dec. | h | Dec. | |
| | 3 36 | - 40 18 | 3 38 | - 27 58 | 3 39 | + 25 17 | 3 40 | + 63 10 | |
| 1 | ^d -9.1 | ^s 36.684 - 62 | ^s 77.54 - 248 | ^s 13.546 - 28 | ^s 80.37 - 215 | ^s 56.319 + 20 | ^s 14.16 + 40 | ^s 56.658 - 37 | ^s 34.51 + 241 |
| 1 | 0.9 | 36.580 - 104 | 79.71 - 183 | 13.482 - 64 | 82.28 - 191 | 56.300 - 19 | 14.47 + 31 | 56.542 - 116 | 36.64 + 213 |
| 1 | 10.8 | 36.436 - 144 | 81.54 - 183 | 13.382 - 100 | 83.93 - 165 | 56.242 - 58 | 14.67 + 20 | 56.346 - 196 | 38.46 + 182 |
| 1 | 20.8 | 36.255 - 181 | 82.92 - 138 | 13.249 - 133 | 85.21 - 128 | 56.146 - 96 | 14.74 + 7 | 56.076 - 270 | 39.86 + 140 |
| 1 | 30.8 | 36.049 - 206 | 83.85 - 93 | 13.090 - 159 | 86.12 - 91 | 56.021 - 125 | 14.69 - 5 | 55.751 - 325 | 40.82 + 96 |
| 2 | 9.8 | 35.819 - 230 | 84.31 - 46 | 12.909 - 181 | 86.65 - 53 | 55.870 - 151 | 14.51 - 18 | 55.381 - 370 | 41.30 + 48 |
| 2 | 19.7 | 35.578 - 241 | 84.26 + 5 | 12.716 - 193 | 86.75 - 10 | 55.703 - 167 | 14.20 - 31 | 54.985 - 396 | 41.28 - 2 |
| 3 | 1.7 | 35.337 - 241 | 83.74 + 52 | 12.522 - 194 | 86.46 + 29 | 55.533 - 170 | 13.78 - 42 | 54.589 - 396 | 40.78 - 50 |
| 3 | 11.7 | 35.102 - 235 | 82.76 + 98 | 12.331 - 191 | 85.77 + 69 | 55.366 - 167 | 13.26 - 52 | 54.206 - 383 | 39.82 - 96 |
| 3 | 21.7 | 34.887 - 215 | 81.31 + 145 | 12.157 - 174 | 84.68 + 109 | 55.217 - 149 | 12.68 - 58 | 53.862 - 344 | 38.43 - 139 |
| 3 | 31.6 | 34.701 - 186 | 79.46 + 185 | 12.009 - 148 | 83.24 + 144 | 55.096 - 121 | 12.08 - 60 | 53.576 - 286 | 36.73 - 170 |
| 4 | 10.6 | 34.551 - 150 | 77.23 + 223 | 11.892 - 117 | 81.45 + 179 | 55.009 - 87 | 11.50 - 58 | 53.357 - 219 | 34.75 - 198 |
| 4 | 20.6 | 34.447 - 104 | 74.66 + 257 | 11.818 - 74 | 79.34 + 211 | 54.967 - 42 | 10.98 - 52 | 53.227 - 130 | 32.60 - 215 |
| 4 | 30.5 | 34.392 - 55 | 71.84 + 282 | 11.787 - 31 | 76.98 + 236 | 54.972 + 5 | 10.56 - 42 | 53.188 - 39 | 30.38 - 222 |
| 5 | 10.5 | 34.391 - 1 | 68.77 + 307 | 11.804 + 17 | 74.38 + 307 | 55.028 + 56 | 10.29 - 27 | 53.244 + 56 | 28.14 - 224 |
| 5 | 20.5 | 34.447 + 56 | 65.54 + 323 | 11.872 + 68 | 71.60 + 278 | 55.132 + 104 | 10.22 - 7 | 53.399 + 155 | 26.01 - 213 |
| 5 | 30.5 | 34.556 + 109 | 62.25 + 329 | 11.988 + 116 | 68.73 + 287 | 55.286 + 154 | 10.21 - 1 | 53.645 + 246 | 24.05 - 196 |
| 6 | 9.4 | 34.718 + 162 | 58.93 + 332 | 12.150 + 162 | 65.78 + 295 | 55.489 + 203 | 10.46 + 25 | 53.977 + 332 | 22.30 - 175 |
| 6 | 19.4 | 34.930 + 212 | 55.68 + 325 | 12.356 + 206 | 62.86 + 292 | 55.733 + 244 | 10.92 + 46 | 54.389 + 412 | 20.86 - 144 |
| 6 | 29.4 | 35.183 + 253 | 52.59 + 309 | 12.597 + 241 | 60.04 + 282 | 56.010 + 277 | 11.57 + 65 | 54.864 + 475 | 19.74 - 112 |
| 7 | 9.4 | 35.474 + 291 | 49.72 + 287 | 12.870 + 273 | 57.36 + 268 | 56.314 + 304 | 12.40 + 83 | 55.394 + 530 | 18.97 - 77 |
| 7 | 19.3 | 35.794 + 320 | 47.17 + 255 | 13.168 + 298 | 54.94 + 242 | 56.639 + 325 | 13.37 + 97 | 55.967 + 573 | 18.61 - 36 |
| 7 | 29.3 | 36.134 + 340 | 44.99 + 218 | 13.480 + 312 | 52.82 + 212 | 56.974 + 335 | 14.46 + 109 | 56.565 + 598 | 18.61 + 0 |
| 8 | 8.3 | 36.487 + 353 | 43.26 + 173 | 13.803 + 323 | 51.06 + 176 | 57.317 + 343 | 15.64 + 118 | 57.182 + 617 | 18.99 + 38 |
| 8 | 18.2 | 36.844 + 357 | 42.04 + 122 | 14.127 + 324 | 49.75 + 131 | 57.658 + 341 | 16.87 + 123 | 57.802 + 620 | 19.76 + 77 |
| 8 | 28.2 | 37.196 + 352 | 41.35 + 69 | 14.446 + 319 | 48.88 + 87 | 57.991 + 333 | 18.12 + 125 | 58.413 + 611 | 20.86 + 110 |
| 9 | 7.2 | 37.539 + 343 | 41.22 + 13 | 14.756 + 310 | 48.50 + 38 | 58.315 + 324 | 19.36 + 124 | 59.011 + 598 | 22.30 + 144 |
| 9 | 17.2 | 37.861 + 322 | 41.67 - 45 | 15.048 + 292 | 48.64 - 14 | 58.622 + 307 | 20.55 + 119 | 59.580 + 569 | 24.05 + 175 |
| 9 | 27.1 | 38.157 + 296 | 42.64 - 97 | 15.318 + 270 | 49.25 - 61 | 58.911 + 289 | 21.68 + 113 | 59.580 + 537 | 24.05 + 201 |
| 10 | 7.1 | 38.425 + 268 | 44.14 - 150 | 15.565 + 247 | 50.34 - 109 | 59.179 + 268 | 22.74 + 106 | 60.117 + 497 | 26.06 + 225 |
| 10 | 17.1 | 38.655 + 230 | 46.09 - 195 | 15.780 + 215 | 51.84 - 150 | 59.421 + 242 | 23.70 + 96 | 61.059 + 445 | 30.75 + 244 |
| 10 | 27.1 | 38.848 + 193 | 48.39 - 230 | 15.966 + 186 | 53.67 - 183 | 59.638 + 217 | 24.58 + 88 | 61.452 + 393 | 33.34 + 259 |
| 11 | 6.0 | 38.999 + 151 | 51.00 - 261 | 16.117 + 151 | 55.80 - 213 | 59.827 + 189 | 25.38 + 80 | 61.783 + 331 | 36.05 + 271 |
| 11 | 16.0 | 39.103 + 104 | 53.76 - 276 | 16.230 + 113 | 58.10 - 230 | 59.982 + 155 | 26.08 + 70 | 62.042 + 269 | 38.80 + 275 |
| 11 | 26.0 | 39.164 + 61 | 56.59 - 283 | 16.308 + 78 | 60.47 - 237 | 60.106 + 124 | 26.70 + 62 | 62.229 + 187 | 41.54 + 274 |
| 12 | 5.9 | 39.177 + 13 | 59.39 - 280 | 16.346 + 38 | 62.85 - 238 | 60.192 + 86 | 27.23 + 53 | 62.336 + 107 | 44.22 + 268 |
| 12 | 15.9 | 39.143 - 34 | 62.02 - 263 | 16.344 - 2 | 65.12 - 227 | 60.239 + 47 | 27.68 + 45 | 62.357 + 21 | 46.73 + 251 |
| 12 | 25.9 | 39.067 - 76 | 64.41 - 239 | 16.305 - 39 | 67.20 - 208 | 60.248 + 9 | 28.03 + 35 | 62.298 - 59 | 49.03 + 230 |
| 12 | 35.9 | 38.946 - 121 | 66.49 - 208 | 16.226 - 79 | 69.05 - 185 | 60.215 - 33 | 28.28 + 25 | 62.153 - 145 | 51.05 + 202 |
| | | - 158 | - 166 | - 112 | - 151 | - 70 | + 14 | - 221 | + 164 |
| Mean Place | 36.552 | 66.59 | 13.944 | 71.74 | 57.798 | 11.83 | 58.458 | 26.58 | |
| sec δ , tan δ | +1.312 | -0.849 | +1.132 | -0.531 | +1.106 | +0.472 | +2.216 | +1.977 | |
| $d\alpha(\psi)$, $d\delta(\psi)$ | +0.043 | +0.23 | +0.050 | +0.23 | +0.071 | +0.23 | +0.104 | +0.23 | |
| $d\alpha(\epsilon)$, $d\delta(\epsilon)$ | +0.033 | +0.81 | +0.021 | +0.81 | -0.018 | +0.82 | -0.075 | +0.82 | |
| Dble.Trans. | November 15 | | November 15 | | November 16 | | November 16 | | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 133 | | 131 | | 135 | | 137 | |
|--------------|-----------------------------------|-------------------------------------|-----------------------------------|-------------------------------------|-----------------------------------|-------------------------------------|-----------------------------------|-------------------------------------|
| | δ Fornacis | | δ Persei | | δ Eridani | | 24 Eridani | |
| Mag.Spect. | 4.93 | B5 | 3.10 | B5 | 3.72 | K0 | 5.09 | B8 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | ^h ^m 3 41 | ^o ['] -31 58 | ^h ^m 3 41 | ^o ['] +47 44 | ^h ^m 3 42 | ^o ['] - 9 48 | ^h ^m 3 43 | ^o ['] - 1 12 |
| 1 -9.1 | 42.446 -33 | 60.55 -230 | 55.843 +8 | 49.01 +165 | 35.153 +3 | 35.78 -144 | 48.224 +14 | 20.95 -104 |
| 1 0.9 | 42.374 -72 | 62.59 -204 | 55.797 -46 | 50.44 +143 | 35.123 -30 | 37.08 -130 | 48.203 -21 | 21.92 -97 |
| 1 10.8 | 42.265 -109 | 64.34 -175 | 55.697 -100 | 51.64 +120 | 35.058 -65 | 38.24 -116 | 48.148 -55 | 22.81 -89 |
| 1 20.8 | 42.120 -145 | 65.70 -136 | 55.546 -151 | 52.51 +87 | 34.960 -98 | 39.19 -95 | 48.060 -88 | 23.57 -76 |
| 1 30.8 | 41.950 -170 | 66.66 -96 | 55.357 -189 | 53.07 +56 | 34.837 -123 | 39.91 -72 | 47.945 -115 | 24.19 -62 |
| 2 9.8 | 41.757 -193 | 67.22 -56 | 55.134 -223 | 53.27 +20 | 34.692 -145 | 40.42 -51 | 47.807 -138 | 24.67 -48 |
| 2 19.7 | 41.550 -207 | 67.31 -9 | 54.891 -243 | 53.10 -17 | 34.533 -159 | 40.66 -24 | 47.655 -152 | 24.98 -31 |
| 3 1.7 | 41.342 -208 | 66.98 +33 | 54.645 -246 | 52.59 -51 | 34.370 -163 | 40.65 +1 | 47.499 -156 | 25.11 -13 |
| 3 11.7 | 41.137 -205 | 66.23 +75 | 54.405 -240 | 51.76 -83 | 34.211 -159 | 40.39 +26 | 47.345 -154 | 25.08 +3 |
| 3 21.7 | 40.950 -187 | 65.05 +118 | 54.191 -214 | 50.65 -111 | 34.066 -145 | 39.85 +54 | 47.205 -140 | 24.85 +23 |
| 3 31.6 | 40.789 -161 | 63.50 +155 | 54.014 -177 | 49.32 -133 | 33.945 -121 | 39.06 +79 | 47.089 -116 | 24.42 +43 |
| 4 10.6 | 40.659 -130 | 61.59 +191 | 53.884 -130 | 47.83 -149 | 33.853 -92 | 38.02 +104 | 47.002 -87 | 23.80 +62 |
| 4 20.6 | 40.572 -87 | 59.35 +224 | 53.813 -71 | 46.26 -157 | 33.800 -53 | 36.72 +130 | 46.953 -49 | 22.96 +84 |
| 4 30.5 | 40.531 +204 | 56.85 +250 | 53.805 -8 | 44.69 -157 | 33.789 -11 | 35.20 +152 | 46.947 -6 | 21.93 +103 |
| 5 10.5 | 40.538 +7 | 54.10 +275 | 53.862 +57 | 43.16 -153 | 33.821 +32 | 33.47 +173 | 46.984 +37 | 20.69 +124 |
| 5 20.5 | 40.598 +60 | 51.17 +293 | 53.989 +127 | 41.76 -140 | 33.902 +81 | 31.53 +194 | 47.068 +84 | 19.26 +143 |
| 5 30.5 | 40.707 +109 | 48.16 +301 | 54.178 +189 | 40.54 -122 | 34.026 +124 | 29.47 +206 | 47.197 +129 | 17.67 +159 |
| 6 9.4 | 40.864 +157 | 45.08 +308 | 54.427 +249 | 39.54 -100 | 34.193 +167 | 27.27 +220 | 47.367 +170 | 15.93 +174 |
| 6 19.4 | 41.068 +204 | 42.03 +305 | 54.732 +306 | 38.80 -74 | 34.400 +207 | 25.02 +225 | 47.577 +210 | 14.10 +183 |
| 6 29.4 | 41.307 +239 | 39.10 +293 | 55.079 +347 | 38.35 -45 | 34.637 +237 | 22.78 +224 | 47.817 +240 | 12.23 +187 |
| 7 9.4 | 41.582 +275 | 36.34 +276 | 55.464 +385 | 38.19 -16 | 34.903 +266 | 20.58 +220 | 48.084 +267 | 10.35 +188 |
| 7 19.3 | 41.882 +300 | 33.85 +249 | 55.877 +413 | 38.34 +15 | 35.189 +286 | 18.50 +208 | 48.372 +288 | 08.52 +183 |
| 7 29.3 | 42.199 +317 | 31.68 +217 | 56.305 +428 | 38.76 +42 | 35.487 +298 | 16.60 +190 | 48.670 +298 | 06.80 +172 |
| 8 8.3 | 42.528 +329 | 29.90 +178 | 56.745 +440 | 39.47 +71 | 35.793 +306 | 14.91 +169 | 48.977 +307 | 05.22 +158 |
| 8 18.2 | 42.860 +332 | 28.59 +131 | 57.184 +439 | 40.43 +96 | 36.099 +306 | 13.52 +139 | 49.284 +307 | 03.85 +137 |
| 8 28.2 | 43.188 +328 | 27.75 +84 | 57.616 +432 | 41.62 +119 | 36.399 +300 | 12.44 +108 | 49.584 +300 | 02.72 +113 |
| 9 7.2 | 43.507 +319 | 27.43 +32 | 58.037 +421 | 43.01 +139 | 36.691 +292 | 11.71 +73 | 49.876 +292 | 01.86 +86 |
| 9 17.2 | 43.808 +301 | 27.65 -22 | 58.438 +401 | 44.58 +157 | 36.967 +276 | 11.37 +34 | 50.153 +277 | 01.31 +55 |
| 9 27.1 | 44.088 +280 | 28.36 -71 | 58.815 +377 | 46.29 +171 | 37.224 +257 | 11.38 -1 | 50.412 +259 | 01.05 +26 |
| 10 7.1 | 44.342 +254 | 29.57 -121 | 59.167 +352 | 48.12 +183 | 37.461 +237 | 11.75 -37 | 50.653 +241 | 01.09 -4 |
| 10 17.1 | 44.565 +223 | 31.21 -164 | 59.484 +317 | 50.04 +192 | 37.673 +212 | 12.46 -71 | 50.869 +216 | 01.41 -32 |
| 10 27.1 | 44.756 +191 | 33.20 -199 | 59.767 +283 | 52.01 +197 | 37.860 +187 | 13.44 -98 | 51.061 +192 | 01.96 -55 |
| 11 6.0 | 44.911 +155 | 35.49 -229 | 60.011 +244 | 54.02 +201 | 38.018 +158 | 14.67 -123 | 51.227 +166 | 02.73 -77 |
| 11 16.0 | 45.026 +115 | 37.96 -247 | 60.208 +197 | 56.01 +199 | 38.145 +127 | 16.06 -139 | 51.362 +135 | 03.65 -92 |
| 11 26.0 | 45.103 +77 | 40.51 -255 | 60.361 +153 | 57.97 +196 | 38.242 +97 | 17.55 -149 | 51.468 +106 | 04.67 -102 |
| 12 5.9 | 45.138 +35 | 43.06 -255 | 60.462 +101 | 59.84 +187 | 38.304 +62 | 19.08 -153 | 51.540 +72 | 05.76 -109 |
| 12 15.9 | 45.131 -7 | 45.48 -242 | 60.507 +45 | 61.58 +174 | 38.331 +27 | 20.57 -149 | 51.578 +38 | 06.83 -107 |
| 12 25.9 | 45.085 -46 | 47.71 -223 | 60.500 -7 | 63.14 +156 | 38.324 -7 | 21.98 -141 | 51.581 +3 | 07.87 -104 |
| 12 35.9 | 44.999 -86 | 49.68 -197 | 60.435 -65 | 64.48 +134 | 38.280 -44 | 23.26 -128 | 51.548 -33 | 08.84 -97 |
| | | -160 | -117 | +105 | -76 | -109 | -67 | -85 |
| Mean Place | 42.676 | 51.57 | 57.545 | 42.87 | 36.045 | 30.69 | 49.288 | 18.17 |
| sec δ, tan δ | +1.179 | -0.624 | +1.487 | +1.101 | +1.015 | -0.173 | +1.000 | -0.021 |
| dα(ψ), dδ(ψ) | +0.048 | +0.23 | +0.085 | +0.23 | +0.057 | +0.22 | +0.061 | +0.22 |
| dα(ε), dδ(ε) | +0.024 | +0.82 | -0.042 | +0.82 | +0.007 | +0.83 | +0.001 | +0.83 |
| Dble.Trans. | November 16 | | November 16 | | November 16 | | November 17 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 141 | | 136 | | 134 | | 1104 | | | | | | | | | | |
|---|------------------|----------------|-------------|----------------|-------------|----------------|-------------|----------------|--------|--------|------|-------|------|--------|------|-------|------|
| | β Reticuli | | 17 Tauri | | v Persei | | 29 Tauri | | | | | | | | | | |
| Mag.Spect. | 3.80 | K0 | 3.81 | B5p | 3.93 | F5 | 5.36 | B3 | | | | | | | | | |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | | | | | | | | | |
| | h m | $^{\circ}$ ' " | h m | $^{\circ}$ ' " | h m | $^{\circ}$ ' " | h m | $^{\circ}$ ' " | | | | | | | | | |
| | 3 43 | -64 50 | 3 44 | +24 04 | 3 44 | +42 32 | 3 44 | +6 00 | | | | | | | | | |
| 1 | -9.1 | 64.394 | -221 | 70.74 | -280 | 02.852 | +24 | 20.23 | +33 | 14.740 | +16 | 17.52 | +137 | 56.123 | +20 | 29.13 | -67 |
| 1 | 0.9 | 64.098 | -296 | 73.15 | -241 | 02.837 | -15 | 20.48 | +25 | 14.708 | -32 | 18.71 | +119 | 56.108 | -15 | 28.48 | -65 |
| 1 | 10.8 | 63.733 | -365 | 75.13 | -198 | 02.783 | -54 | 20.64 | +16 | 14.626 | -82 | 19.68 | +97 | 56.057 | -51 | 27.87 | -61 |
| 1 | 20.8 | 63.308 | -425 | 76.56 | -143 | 02.691 | -92 | 20.68 | +4 | 14.497 | -129 | 20.39 | +71 | 55.972 | -85 | 27.32 | -55 |
| 1 | 30.8 | 62.843 | -465 | 77.44 | -88 | 02.569 | -122 | 20.61 | -7 | 14.332 | -165 | 20.82 | +43 | 55.860 | -112 | 26.84 | -48 |
| 2 | 9.8 | 62.345 | -498 | 77.76 | -32 | 02.420 | -149 | 20.43 | -18 | 14.135 | -197 | 20.95 | +13 | 55.725 | -135 | 26.43 | -41 |
| 2 | 19.7 | 61.833 | -512 | 77.48 | +28 | 02.256 | -164 | 20.13 | -30 | 13.919 | -216 | 20.76 | -19 | 55.574 | -151 | 26.11 | -32 |
| 3 | 1.7 | 61.325 | -508 | 76.65 | +83 | 02.087 | -169 | 19.74 | -39 | 13.699 | -220 | 20.28 | -48 | 55.419 | -155 | 25.88 | -23 |
| 3 | 11.7 | 60.832 | -493 | 75.29 | +136 | 01.921 | -166 | 19.26 | -48 | 13.483 | -216 | 19.53 | -75 | 55.266 | -153 | 25.76 | -12 |
| 3 | 21.7 | 60.373 | -459 | 73.40 | +189 | 01.771 | -150 | 18.74 | -52 | 13.290 | -193 | 18.54 | -99 | 55.127 | -139 | 25.77 | +1 |
| 3 | 31.6 | 59.963 | -410 | 71.09 | +231 | 01.649 | -122 | 18.20 | -54 | 13.131 | -159 | 17.39 | -115 | 55.012 | -115 | 25.91 | +14 |
| 4 | 10.6 | 59.610 | -353 | 68.37 | +272 | 01.559 | -90 | 17.68 | -52 | 13.013 | -118 | 16.10 | -129 | 54.926 | -86 | 26.21 | +30 |
| 4 | 20.6 | 59.332 | -278 | 65.29 | +308 | 01.514 | -45 | 17.22 | -46 | 12.950 | -63 | 14.77 | -133 | 54.881 | -45 | 26.68 | +47 |
| 4 | 30.5 | 59.134 | -198 | 61.97 | +332 | 01.516 | +2 | 16.87 | -35 | 12.944 | -6 | 13.45 | -132 | 54.877 | -4 | 27.31 | +63 |
| 5 | 10.5 | 59.021 | -113 | 58.43 | +354 | 01.568 | +52 | 16.66 | -21 | 12.998 | +54 | 12.19 | -126 | 54.918 | +41 | 28.13 | +82 |
| 5 | 20.5 | 59.002 | -19 | 54.76 | +367 | 01.667 | +99 | 16.69 | +3 | 13.116 | +118 | 11.07 | -112 | 55.006 | +88 | 29.14 | +101 |
| 5 | 30.5 | 59.072 | +70 | 51.07 | +369 | 01.816 | +149 | 16.71 | +2 | 13.292 | +176 | 10.13 | -94 | 55.138 | +132 | 30.33 | +119 |
| 6 | 9.4 | 59.232 | +160 | 47.40 | +367 | 02.014 | +198 | 17.01 | +30 | 13.523 | +231 | 09.39 | -74 | 55.314 | +176 | 31.68 | +135 |
| 6 | 19.4 | 59.482 | +250 | 43.88 | +352 | 02.252 | +238 | 17.52 | +51 | 13.805 | +282 | 08.90 | -49 | 55.529 | +215 | 33.14 | +146 |
| 6 | 29.4 | 59.807 | +325 | 40.58 | +330 | 02.523 | +271 | 18.20 | +68 | 14.127 | +322 | 08.68 | -22 | 55.774 | +245 | 34.69 | +155 |
| 7 | 9.4 | 60.205 | +398 | 37.57 | +301 | 02.823 | +300 | 19.05 | +85 | 14.484 | +357 | 08.72 | +4 | 56.046 | +272 | 36.30 | +161 |
| 7 | 19.3 | 60.664 | +459 | 34.98 | +259 | 03.143 | +320 | 20.04 | +99 | 14.866 | +382 | 09.03 | +31 | 56.338 | +292 | 37.90 | +160 |
| 7 | 29.3 | 61.166 | +502 | 32.83 | +215 | 03.474 | +331 | 21.13 | +109 | 15.263 | +397 | 09.59 | +56 | 56.641 | +303 | 39.46 | +156 |
| 8 | 8.3 | 61.706 | +540 | 31.20 | +163 | 03.813 | +339 | 22.30 | +117 | 15.670 | +407 | 10.38 | +79 | 56.952 | +311 | 40.94 | +148 |
| 8 | 18.2 | 62.263 | +557 | 30.18 | +102 | 04.152 | +339 | 23.52 | +122 | 16.076 | +406 | 11.39 | +101 | 57.263 | +311 | 42.27 | +133 |
| 8 | 28.2 | 62.821 | +558 | 29.75 | +43 | 04.483 | +331 | 24.73 | +121 | 16.476 | +400 | 12.57 | +118 | 57.567 | +304 | 43.44 | +117 |
| 9 | 7.2 | 63.371 | +550 | 29.95 | -20 | 04.806 | +323 | 25.92 | +119 | 16.866 | +390 | 13.91 | +134 | 57.863 | +296 | 44.40 | +96 |
| 9 | 17.2 | 63.889 | +518 | 30.80 | -85 | 05.112 | +306 | 27.06 | +114 | 17.237 | +371 | 15.38 | +147 | 58.144 | +281 | 45.13 | +73 |
| 9 | 27.1 | 64.367 | +478 | 32.23 | -143 | 05.400 | +288 | 28.12 | +106 | 17.587 | +350 | 16.95 | +157 | 58.408 | +264 | 45.62 | +49 |
| 10 | 7.1 | 64.791 | +424 | 34.22 | -199 | 05.669 | +269 | 29.11 | +99 | 17.913 | +326 | 18.60 | +165 | 58.654 | +246 | 45.88 | +26 |
| 10 | 17.1 | 65.144 | +353 | 36.69 | -247 | 05.913 | +244 | 29.99 | +88 | 18.208 | +295 | 20.29 | +169 | 58.875 | +221 | 45.90 | +2 |
| 10 | 27.1 | 65.422 | +278 | 39.53 | -284 | 06.131 | +218 | 30.78 | +79 | 18.473 | +265 | 22.01 | +172 | 59.073 | +198 | 45.72 | -18 |
| 11 | 6.0 | 65.617 | +195 | 42.67 | -314 | 06.322 | +191 | 31.49 | +71 | 18.703 | +230 | 23.74 | +173 | 59.245 | +172 | 45.37 | -35 |
| 11 | 16.0 | 65.719 | +102 | 45.95 | -328 | 06.481 | +159 | 32.10 | +61 | 18.891 | +188 | 25.44 | +170 | 59.387 | +142 | 44.87 | -50 |
| 11 | 26.0 | 65.733 | +14 | 49.26 | -331 | 06.607 | +126 | 32.63 | +53 | 19.039 | +148 | 27.09 | +165 | 59.500 | +113 | 44.27 | -60 |
| 12 | 5.9 | 65.653 | -80 | 52.50 | -324 | 06.697 | +90 | 33.08 | +45 | 19.140 | +101 | 28.67 | +158 | 59.579 | +79 | 43.61 | -66 |
| 12 | 15.9 | 65.484 | -169 | 55.49 | -299 | 06.748 | +51 | 33.44 | +36 | 19.191 | +51 | 30.11 | +144 | 59.622 | +43 | 42.93 | -68 |
| 12 | 25.9 | 65.236 | -248 | 58.17 | -268 | 06.761 | +13 | 33.74 | +30 | 19.193 | +2 | 31.41 | +130 | 59.632 | +10 | 42.25 | -68 |
| 12 | 35.9 | 64.908 | -328 | 60.46 | -229 | 06.732 | -29 | 33.93 | +19 | 19.143 | -50 | 32.51 | +110 | 59.604 | -28 | 41.59 | -66 |
| | | | -390 | | -177 | | -67 | | +10 | | -97 | | +86 | | -63 | | -60 |
| Mean Place | 61.700 | 57.56 | | 04.303 | 17.96 | 16.387 | 12.11 | 57.312 | 30.37 | | | | | | | | |
| sec δ , tan δ | +2.353 | -2.130 | | +1.095 | +0.447 | +1.357 | +0.918 | +1.006 | +0.105 | | | | | | | | |
| $d\alpha(\psi)$, $d\delta(\psi)$ | +0.014 | +0.22 | | +0.071 | +0.22 | +0.081 | +0.22 | +0.063 | +0.22 | | | | | | | | |
| $d\alpha(\epsilon)$, $d\delta(\epsilon)$ | +0.079 | +0.83 | | -0.017 | +0.83 | -0.034 | +0.83 | -0.004 | +0.83 | | | | | | | | |
| Dble.Trans. | November 17 | | November 17 | | November 17 | | November 17 | | | | | | | | | | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 140 | | | 139 | | | 146 | | | 142 | | | | | | |
|---------------------|------------------------|-------|--------|-------------|--------|--------|-------------|------|--------|-------------|--------|--------|--------|-------|--------|------|
| | τ [*] Eridani | | | η Tauri | | | γ Hydri | | | 27 Tauri | | | | | | |
| Mag.Spect. | 4.33 | | F8 | 2.96 | | B5p | 3.17 | | M0 | 3.80 | | B8 | | | | |
| U.T. | R.A. | | Dec. | R.A. | | Dec. | R.A. | | Dec. | R.A. | | Dec. | | | | |
| | h | m | ° | h | m | ° | h | m | ° | h | m | ° | | | | |
| | 3 | 46 | -23 16 | 3 | 46 | +24 03 | 3 | 47 | -74 16 | 3 | 48 | +24 00 | | | | |
| 1 ^d -9.1 | 15 481 | - 13 | 87 25 | -205 | 39 365 | + 26 | 53 12 | + 33 | 32 202 | - 416 | 63 20 | -278 | 20 017 | + 29 | 48 82 | + 32 |
| 1 0.9 | 15 433 | - 48 | 89 09 | -184 | 39 353 | - 12 | 53 37 | + 25 | 31 667 | - 535 | 65 57 | -237 | 20 006 | - 11 | 49 08 | + 26 |
| 1 10.9 | 15 348 | - 85 | 90 70 | -161 | 39 301 | - 52 | 53 53 | + 16 | 31 025 | - 642 | 67 51 | -194 | 19 955 | - 51 | 49 24 | + 16 |
| 1 20.8 | 15 229 | - 119 | 91 98 | -128 | 39 210 | - 91 | 53 58 | + 5 | 30 291 | - 734 | 68 89 | -138 | 19 866 | - 89 | 49 29 | + 5 |
| 1 30.8 | 15 084 | - 145 | 92 93 | - 95 | 39 089 | - 121 | 53 53 | - 5 | 29 498 | - 793 | 69 70 | - 81 | 19 745 | - 121 | 49 24 | - 5 |
| 2 9.8 | 14 916 | - 168 | 93 53 | - 60 | 38 942 | - 147 | 53 36 | - 17 | 28 658 | - 840 | 69 96 | - 26 | 19 598 | - 147 | 49 08 | - 16 |
| 2 19.7 | 14 734 | - 182 | 93 75 | - 22 | 38 777 | - 165 | 53 07 | - 29 | 27 799 | - 859 | 69 61 | + 35 | 19 434 | - 164 | 48 80 | - 28 |
| 3 1.7 | 14 548 | - 186 | 93 60 | + 15 | 38 608 | - 169 | 52 69 | - 38 | 26 951 | - 848 | 68 71 | + 90 | 19 264 | - 170 | 48 43 | - 37 |
| 3 11.7 | 14 365 | - 183 | 93 09 | + 51 | 38 441 | - 167 | 52 23 | - 46 | 26 126 | - 825 | 67 28 | +143 | 19 097 | - 167 | 47 97 | - 46 |
| 3 21.7 | 14 198 | - 167 | 92 20 | + 89 | 38 290 | - 151 | 51 71 | - 52 | 25 355 | - 771 | 65 33 | +195 | 18 945 | - 152 | 47 47 | - 50 |
| 3 31.6 | 14 054 | - 144 | 90 98 | +122 | 38 166 | - 124 | 51 18 | - 53 | 24 658 | - 697 | 62 96 | +237 | 18 820 | - 125 | 46 94 | - 53 |
| 4 10.6 | 13 940 | - 114 | 89 44 | +154 | 38 074 | - 92 | 50 66 | - 52 | 24 046 | - 612 | 60 19 | +277 | 18 727 | - 93 | 46 43 | - 51 |
| 4 20.6 | 13 866 | - 74 | 87 58 | +186 | 38 026 | - 48 | 50 21 | - 45 | 23 547 | - 499 | 57 08 | +311 | 18 678 | - 49 | 45 99 | - 44 |
| 4 30.6 | 13 835 | - 31 | 85 47 | +211 | 38 025 | + 1 | 49 86 | - 35 | 23 167 | - 380 | 53 73 | +335 | 18 675 | - 3 | 45 64 | - 35 |
| 5 10.5 | 13 849 | + 14 | 83 12 | +235 | 38 074 | + 49 | 49 65 | - 21 | 22 912 | - 255 | 50 17 | +356 | 18 722 | + 47 | 45 42 | - 22 |
| 5 20.5 | 13 914 | + 65 | 80 58 | +254 | 38 171 | + 97 | 49 67 | + 2 | 22 801 | - 111 | 46 50 | +367 | 18 819 | + 97 | 45 45 | + 3 |
| 5 30.5 | 14 024 | + 110 | 77 92 | +266 | 38 316 | + 145 | 49 68 | + 1 | 22 825 | + 24 | 42 82 | +368 | 18 961 | + 142 | 45 46 | + 1 |
| 6 9.4 | 14 180 | + 156 | 75 18 | +274 | 38 512 | + 196 | 49 97 | + 29 | 22 987 | + 162 | 39 17 | +365 | 19 155 | + 194 | 45 74 | + 28 |
| 6 19.4 | 14 379 | + 199 | 72 43 | +275 | 38 748 | + 236 | 50 46 | + 49 | 23 289 | + 302 | 35 68 | +349 | 19 390 | + 236 | 46 23 | + 49 |
| 6 29.4 | 14 612 | + 233 | 69 75 | +268 | 39 017 | + 269 | 51 13 | + 67 | 23 709 | + 420 | 32 43 | +325 | 19 657 | + 267 | 46 89 | + 66 |
| 7 9.4 | 14 876 | + 264 | 67 19 | +256 | 39 315 | + 298 | 51 96 | + 83 | 24 248 | + 539 | 29 47 | +296 | 19 954 | + 297 | 47 71 | + 82 |
| 7 19.3 | 15 164 | + 288 | 64 84 | +235 | 39 634 | + 319 | 52 94 | + 98 | 24 888 | + 640 | 26 93 | +254 | 20 272 | + 318 | 48 68 | + 97 |
| 7 29.3 | 15 466 | + 302 | 62 77 | +207 | 39 964 | + 330 | 54 01 | +107 | 25 601 | + 713 | 24 85 | +208 | 20 601 | + 329 | 49 74 | +106 |
| 8 8.3 | 15 780 | + 314 | 61 01 | +176 | 40 302 | + 338 | 55 16 | +115 | 26 382 | + 781 | 23 29 | +156 | 20 940 | + 339 | 50 88 | +114 |
| 8 18.3 | 16 096 | + 316 | 59 66 | +135 | 40 641 | + 339 | 56 35 | +119 | 27 196 | + 814 | 22 34 | + 95 | 21 278 | + 338 | 52 06 | +118 |
| 8 28.2 | 16 407 | + 311 | 58 72 | + 94 | 40 973 | + 332 | 57 55 | +120 | 28 021 | + 825 | 21 99 | + 35 | 21 610 | + 332 | 53 24 | +118 |
| 9 7.2 | 16 711 | + 304 | 58 24 | + 48 | 41 296 | + 323 | 58 72 | +117 | 28 838 | + 817 | 22 27 | - 28 | 21 934 | + 324 | 54 40 | +116 |
| 9 17.2 | 16 998 | + 287 | 58 25 | - 1 | 41 604 | + 308 | 59 84 | +112 | 29 612 | + 774 | 23 19 | - 92 | 22 242 | + 308 | 55 51 | +111 |
| 9 27.1 | 17 267 | + 269 | 58 71 | - 46 | 41 894 | + 290 | 60 89 | +105 | 30 323 | + 711 | 24 68 | -149 | 22 533 | + 291 | 56 54 | +103 |
| 10 7.1 | 17 513 | + 246 | 59 62 | - 91 | 42 165 | + 271 | 61 85 | + 96 | 30 953 | + 630 | 26 74 | -206 | 22 805 | + 272 | 57 50 | + 96 |
| 10 17.1 | 17 731 | + 218 | 60 94 | -132 | 42 411 | + 246 | 62 72 | + 87 | 31 469 | + 516 | 29 27 | -253 | 23 052 | + 247 | 58 35 | + 85 |
| 10 27.1 | 17 922 | + 191 | 62 58 | -164 | 42 632 | + 221 | 63 50 | + 78 | 31 864 | + 395 | 32 15 | -288 | 23 275 | + 223 | 59 12 | + 77 |
| 11 6.0 | 18 081 | + 159 | 64 52 | -194 | 42 826 | + 194 | 64 19 | + 69 | 32 124 | + 260 | 35 33 | -318 | 23 471 | + 196 | 59 80 | + 68 |
| 11 16.0 | 18 204 | + 123 | 66 64 | -212 | 42 987 | + 161 | 64 79 | + 60 | 32 231 | + 107 | 38 64 | -331 | 23 634 | + 163 | 60 39 | + 59 |
| 11 26.0 | 18 294 | + 90 | 68 84 | -220 | 43 117 | + 130 | 65 32 | + 53 | 32 194 | - 37 | 41 96 | -332 | 23 766 | + 132 | 60 91 | + 52 |
| 12 6.0 | 18 345 | + 51 | 71 08 | -224 | 43 210 | + 93 | 65 76 | + 44 | 32 006 | - 188 | 45 20 | -324 | 23 860 | + 94 | 61 35 | + 44 |
| 12 15.9 | 18 358 | + 13 | 73 23 | -215 | 43 264 | + 54 | 66 13 | + 37 | 31 672 | - 334 | 48 19 | -299 | 23 916 | + 56 | 61 71 | + 36 |
| 12 25.9 | 18 334 | - 24 | 75 22 | -199 | 43 280 | + 16 | 66 42 | + 29 | 31 211 | - 461 | 50 84 | -265 | 23 933 | + 17 | 62 00 | + 29 |
| 12 35.9 | 18 272 | - 62 | 77 01 | -179 | 43 253 | - 27 | 66 62 | + 20 | 30 627 | - 584 | 53 09 | -225 | 23 908 | - 25 | 62 19 | + 19 |
| | 18 272 | - 98 | | -149 | | - 65 | | + 10 | | - 683 | | -173 | | - 64 | | + 11 |
| Mean Place | 15.997 | | 80.56 | | 40.807 | | 50.74 | | 26.390 | | 49.85 | | 21.452 | | 46.39 | |
| sec δ, tan δ | +1.089 | | -0.430 | | +1.095 | | +0.447 | | +3.691 | | -3.553 | | +1.095 | | +0.445 | |
| dα(ψ), dδ(ψ) | +0.052 | | +0.22 | | +0.071 | | +0.22 | | -0.018 | | +0.22 | | +0.071 | | +0.22 | |
| dα(ε), dδ(ε) | +0.016 | | +0.83 | | -0.016 | | +0.84 | | +0.129 | | +0.84 | | -0.016 | | +0.84 | |
| Dbble.Trans. | November 17 | | | November 17 | | | November 18 | | | November 18 | | | | | | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 138 | | 143 | | 1106 | | 1107 | | | | | | | | | | |
|----------------|---------------|---------|----------------|---------|----------------------------------|---------|----------------|--------|--------|--------|-------|-------|------|--------|-------|-------|------|
| | γ Camelopardi | | 138 G. Eridani | | Piazz 3 ^h 187 (Tauri) | | 145 G. Eridani | | | | | | | | | | |
| Mag.Spect. | 4.67 | A0 | 4.24 | K0 | 5.96 | F0 | 6.55 | B9 | | | | | | | | | |
| U.T. | R.A. | | R.A. | | R.A. | | R.A. | | | | | | | | | | |
| | h m | Dec. | h m | Dec. | h m | Dec. | h m | Dec. | | | | | | | | | |
| | 3 48 | + 71 17 | 3 48 | - 36 14 | 3 52 | + 17 17 | 3 52 | - 6 40 | | | | | | | | | |
| 1 ^d | -9.1 | 53 290 | - 68 | 39.74 | +278 | 56 903 | - 38 | 35.20 | -247 | 22.292 | + 31 | 16.66 | - 6 | 27.703 | + 16 | 27.28 | -134 |
| 1 ^s | 0.9 | 53.105 | - 185 | 42.25 | +251 | 56 824 | - 79 | 37.40 | -220 | 22.285 | - 7 | 16.57 | - 9 | 27.684 | - 19 | 28.52 | -124 |
| 1 | 10.9 | 52.807 | - 298 | 44.43 | +218 | 56.704 | - 120 | 39.28 | -188 | 22.240 | - 45 | 16.43 | - 14 | 27.630 | - 54 | 29.64 | -112 |
| 1 | 20.8 | 52.403 | - 404 | 46.17 | +174 | 56.547 | - 157 | 40.76 | -148 | 22.158 | - 82 | 16.26 | - 17 | 27.541 | - 89 | 30.57 | - 93 |
| 1 | 30.8 | 51.921 | - 482 | 47.42 | +125 | 56.362 | - 185 | 41.81 | -105 | 22.046 | - 112 | 16.05 | - 21 | 27.425 | - 116 | 31.31 | - 74 |
| 2 | 9.8 | 51.374 | - 547 | 48.16 | + 74 | 56 152 | - 210 | 42.42 | - 61 | 21.908 | - 138 | 15.79 | - 26 | 27.285 | - 140 | 31.86 | - 55 |
| 2 | 19.7 | 50.790 | - 584 | 48.33 | + 17 | 55.928 | - 224 | 42.55 | - 13 | 21.752 | - 156 | 15.50 | - 29 | 27.129 | - 156 | 32.18 | - 32 |
| 3 | 1.7 | 50.203 | - 587 | 47.97 | - 36 | 55.701 | - 227 | 42.22 | + 33 | 21.590 | - 162 | 15.19 | - 31 | 26.967 | - 162 | 32.27 | - 9 |
| 3 | 11.7 | 49.633 | - 570 | 47.08 | - 89 | 55.477 | - 224 | 41.44 | + 78 | 21.430 | - 160 | 14.86 | - 33 | 26.806 | - 161 | 32.14 | + 13 |
| 3 | 21.7 | 49.116 | - 517 | 45.70 | -138 | 55.270 | - 207 | 40.21 | +123 | 21.283 | - 147 | 14.55 | - 31 | 26.659 | - 147 | 31.76 | + 38 |
| 3 | 31.6 | 48.677 | - 439 | 43.93 | -177 | 55.089 | - 181 | 38.60 | +161 | 21.161 | - 122 | 14.28 | - 27 | 26.534 | - 125 | 31.15 | + 61 |
| 4 | 10.6 | 48.330 | - 347 | 41.82 | -211 | 54.940 | - 149 | 36.60 | +200 | 21.070 | - 91 | 14.07 | - 21 | 26.436 | - 98 | 30.31 | + 84 |
| 4 | 20.6 | 48.102 | - 228 | 39.47 | -235 | 54.835 | - 105 | 34.25 | +235 | 21.019 | - 51 | 13.97 | - 10 | 26.377 | - 59 | 29.22 | +109 |
| 4 | 30.6 | 47.999 | - 103 | 37.00 | -247 | 54.777 | - 58 | 31.63 | +262 | 21.013 | - 6 | 13.99 | + 2 | 26.358 | - 19 | 27.93 | +129 |
| 5 | 10.5 | 48.024 | + 25 | 34.46 | -254 | 54.768 | - 9 | 28.76 | +287 | 21.055 | + 42 | 14.14 | + 15 | 26.383 | + 25 | 26.41 | +152 |
| 5 | 20.5 | 48.189 | + 165 | 31.99 | -247 | 54.814 | + 46 | 25.70 | +306 | 21.146 | + 91 | 14.33 | + 19 | 26.456 | + 73 | 24.70 | +171 |
| 5 | 30.5 | 48.477 | + 288 | 29.66 | -233 | 54.911 | + 97 | 22.56 | +314 | 21.276 | + 130 | 14.95 | + 62 | 26.572 | + 116 | 22.84 | +186 |
| 6 | 9.4 | 48.887 | + 410 | 27.53 | -213 | 55.059 | + 148 | 19.35 | +321 | 21.458 | + 182 | 15.63 | + 68 | 26.731 | + 159 | 20.85 | +199 |
| 6 | 19.4 | 49.410 | + 523 | 25.69 | -184 | 55.256 | + 197 | 16.19 | +316 | 21.680 | + 222 | 16.47 | + 84 | 26.930 | + 199 | 18.78 | +207 |
| 6 | 29.4 | 50.022 | + 612 | 24.18 | -151 | 55.492 | + 236 | 13.15 | +304 | 21.934 | + 254 | 17.45 | + 98 | 27.160 | + 230 | 16.70 | +208 |
| 7 | 9.4 | 50.716 | + 694 | 23.03 | -115 | 55.765 | + 273 | 10.29 | +286 | 22.216 | + 282 | 18.55 | +110 | 27.420 | + 260 | 14.63 | +207 |
| 7 | 19.3 | 51.475 | + 759 | 22.30 | - 73 | 56.068 | + 303 | 07.72 | +257 | 22.519 | + 303 | 19.73 | +118 | 27.700 | + 280 | 12.66 | +197 |
| 7 | 29.3 | 52.273 | + 798 | 21.97 | - 33 | 56.389 | + 321 | 05.49 | +223 | 22.834 | + 315 | 20.96 | +123 | 27.994 | + 294 | 10.83 | +183 |
| 8 | 8.3 | 53.105 | + 832 | 22.06 | + 9 | 56.726 | + 337 | 03.67 | +182 | 23.158 | + 324 | 22.21 | +125 | 28.297 | + 303 | 09.19 | +164 |
| 8 | 18.3 | 53.948 | + 843 | 22.59 | + 53 | 57.068 | + 342 | 02.34 | +133 | 23.483 | + 325 | 23.43 | +122 | 28.602 | + 305 | 07.81 | +138 |
| 8 | 28.2 | 54.785 | + 837 | 23.50 | + 91 | 57.406 | + 338 | 01.50 | + 84 | 23.802 | + 319 | 24.58 | +115 | 28.903 | + 301 | 06.72 | +109 |
| 9 | 7.2 | 55.610 | + 825 | 24.81 | +131 | 57.738 | + 332 | 01.21 | + 29 | 24.114 | + 312 | 25.65 | +107 | 29.197 | + 294 | 05.94 | + 78 |
| 9 | 17.2 | 56.400 | + 790 | 26.49 | +168 | 58.053 | + 315 | 01.48 | - 27 | 24.412 | + 298 | 26.60 | + 95 | 29.476 | + 279 | 05.52 | + 42 |
| 9 | 27.1 | 57.147 | + 747 | 28.48 | +199 | 58.346 | + 293 | 02.27 | - 79 | 24.693 | + 281 | 27.41 | + 81 | 29.739 | + 263 | 05.44 | + 8 |
| 10 | 7.1 | 57.843 | + 696 | 30.80 | +232 | 58.614 | + 268 | 03.59 | -132 | 24.956 | + 263 | 28.09 | + 68 | 29.984 | + 245 | 05.70 | - 26 |
| 10 | 17.1 | 58.466 | + 623 | 33.36 | +256 | 58.849 | + 235 | 05.36 | -177 | 25.195 | + 239 | 28.61 | + 52 | 30.205 | + 221 | 06.29 | - 59 |
| 10 | 27.1 | 59.015 | + 549 | 36.13 | +277 | 59.050 | + 201 | 07.49 | -213 | 25.412 | + 217 | 29.00 | + 39 | 30.402 | + 197 | 07.13 | - 84 |
| 11 | 6.0 | 59.476 | + 461 | 39.07 | +294 | 59.213 | + 163 | 09.95 | -246 | 25.603 | + 191 | 29.28 | + 28 | 30.573 | + 171 | 08.22 | -109 |
| 11 | 16.0 | 59.834 | + 358 | 42.10 | +303 | 59.334 | + 121 | 12.59 | -264 | 25.762 | + 159 | 29.44 | + 16 | 30.713 | + 140 | 09.48 | -126 |
| 11 | 26.0 | 60.088 | + 254 | 45.16 | +306 | 59.414 | + 80 | 15.32 | -273 | 25.892 | + 130 | 29.52 | + 8 | 30.823 | + 110 | 10.84 | -136 |
| 12 | 6.0 | 60.225 | + 137 | 48.19 | +303 | 59.450 | + 36 | 18.05 | -273 | 25.986 | + 94 | 29.53 | + 1 | 30.899 | + 76 | 12.26 | -142 |
| 12 | 15.9 | 60.239 | + 14 | 51.06 | +287 | 59.440 | - 10 | 20.65 | -260 | 26.043 | + 57 | 29.48 | - 5 | 30.940 | + 41 | 13.65 | -139 |
| 12 | 25.9 | 60.137 | - 102 | 53.74 | +268 | 59.388 | - 52 | 23.04 | -239 | 26.064 | + 21 | 29.40 | - 8 | 30.945 | + 5 | 14.97 | -132 |
| 12 | 35.9 | 59.911 | - 226 | 56.13 | +239 | 59.293 | - 95 | 25.16 | -212 | 26.044 | - 20 | 29.27 | - 13 | 30.913 | - 32 | 16.20 | -123 |
| | | | - 334 | | +199 | | - 134 | | -174 | | - 58 | | - 17 | | - 66 | | -105 |
| Mean Place | 55.030 | 31.15 | | 56.913 | 26.33 | 23.632 | 15.31 | 28.629 | 24.06 | | | | | | | | |
| sec δ, tan δ | +3.118 | +2.953 | | +1.240 | -0.733 | +1.047 | +0.311 | +1.007 | -0.117 | | | | | | | | |
| da(ψ), dδ(ψ) | +0.127 | +0.22 | | +0.045 | +0.22 | +0.068 | +0.21 | +0.059 | +0.21 | | | | | | | | |
| da(ε), dδ(ε) | -0.107 | +0.84 | | +0.026 | +0.84 | -0.011 | +0.85 | +0.004 | +0.85 | | | | | | | | |
| Dble.Trans. | November 18 | | November 18 | | November 19 | | November 19 | | | | | | | | | | |

AT UPPER TRANSIT AT GREENWICH

| No. | 1105 | | 1108 | | 144 | | 147 | |
|---------------------|---------------------------------------|---------------------------|---|---------------------------|--|----------------------------|--|---------------------------|
| | B.D. +57° 752 (Cameiopardi) | | 55 G. Horologii | | ζ Persei | | ε Persei* | |
| Mag.Spect. | 5.79 | A0 | 5.77 | K0 | 2.91 | B1 | 2.96 | B1 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | ^h ^m | ^o ['] | ^h ^m | ^o ['] | ^h ^m | ^o ['] | ^h ^m | ^o ['] |
| | 3 52 | +57 56 | 3 53 | -46 55 | 3 53 | +31 50 | 3 56 | +39 58 |
| 1 ^d -9.1 | ^s 35.398 + ⁵ 65 | 17.01 +219 | ^s 08.827 - ⁷¹ 119 | 68.34 -274 | ^s 15.348 + ³³ 10 | 43.35 + ⁷⁸ 10 | ^s 55.096 + ³⁴ 14 | 24.33 +124 |
| 1 0.9 | 35.353 - ⁶⁶ 135 | 18.97 +196 | 08.708 - ¹¹⁹ 167 | 70.76 -242 | 15.338 - ¹⁰ 54 | 44.02 + ⁶⁷ 53 | 55.082 - ⁶³ 111 | 25.43 +110 |
| 1 10.9 | 35.198 - ²⁰¹ 135 | 20.66 +169 | 08.541 - ¹⁶⁷ 209 | 72.83 -207 | 15.284 - ⁵⁴ 97 | 44.55 + ⁵³ 37 | 55.019 - ⁶³ 111 | 26.35 +92 |
| 1 20.8 | 34.997 - ²⁵² 135 | 21.99 +133 | 08.332 - ²⁰⁹ 242 | 74.43 -160 | 15.187 - ⁹⁷ 130 | 44.92 + ³⁷ 19 | 54.908 - ¹¹¹ 149 | 26.35 +69 |
| 1 30.8 | 34.745 - ²⁵² 135 | 22.92 +93 | 08.090 - ²⁴² 285 | 75.54 -111 | 15.057 - ¹³⁰ 180 | 45.11 + ¹⁹ 1 | 54.759 - ¹⁴⁹ 183 | 27.04 +45 |
| 2 9.8 | 34.448 - ²⁹⁷ 323 | 23.43 +51 | 07.822 - ²⁶⁸ 323 | 76.16 -62 | 14.897 - ¹⁶⁰ 180 | 45.10 - ¹ 20 | 54.576 - ¹⁸³ 204 | 27.68 +19 |
| 2 19.7 | 34.125 - ³²⁹ 323 | 23.48 +5 | 07.537 - ²⁸⁵ 323 | 76.24 -8 | 14.717 - ¹⁸⁰ 186 | 44.90 - ²⁰ 37 | 54.372 - ²⁰⁴ 211 | 27.57 -11 |
| 3 1.7 | 33.796 - ³²⁹ 323 | 23.10 -38 | 07.250 - ²⁸⁷ 323 | 75.80 +44 | 14.531 - ¹⁸⁶ 184 | 44.53 - ³⁷ 55 | 54.161 - ²¹¹ 209 | 27.21 -36 |
| 3 11.7 | 33.473 - ³²³ 293 | 22.29 -81 | 06.966 - ²⁸⁴ 264 | 74.87 +93 | 14.347 - ¹⁸⁴ 167 | 43.98 - ⁵⁵ 68 | 53.952 - ²⁰⁹ 192 | 27.21 -62 |
| 3 21.7 | 33.180 - ²⁹³ 248 | 21.10 -119 | 06.702 - ²⁶⁴ 234 | 73.44 +143 | 14.180 - ¹⁶⁷ 140 | 43.30 - ⁶⁸ 77 | 53.760 - ¹⁹² 124 | 26.59 -83 |
| 3 31.6 | 32.932 - ²⁴⁸ 192 | 19.61 -149 | 06.468 - ²³⁴ 199 | 71.58 +186 | 14.040 - ¹⁴⁰ 106 | 42.53 - ⁸² 82 | 53.599 - ¹⁶¹ 124 | 24.76 -100 |
| 4 10.6 | 32.740 - ¹⁹² 120 | 17.86 -175 | 06.269 - ¹⁹⁹ 149 | 69.31 +227 | 13.934 - ¹⁰⁶ 58 | 41.71 - ⁷⁷ 82 | 53.475 - ¹²⁴ 72 | 23.63 -113 |
| 4 20.6 | 32.620 - ¹²⁰ 42 | 15.94 -192 | 06.120 - ¹⁴⁹ 97 | 66.67 +264 | 13.876 - ⁵⁸ 10 | 40.89 - ⁸² 76 | 53.403 - ⁷² 18 | 22.45 -118 |
| 4 30.6 | 32.578 + ⁴² 39 | 13.95 -199 | 06.023 - ⁹⁷ 41 | 63.75 +292 | 13.866 - ¹⁰ 44 | 40.13 - ⁷⁶ 67 | 53.385 + ¹⁸ 39 | 22.45 -117 |
| 5 10.5 | 32.617 + ³⁹ 125 | 11.94 -201 | 05.982 - ⁴¹ 20 | 60.58 +317 | 13.910 + ⁴⁴ 98 | 39.46 - ⁶⁷ 52 | 53.424 + ³⁹ 100 | 20.16 -112 |
| 5 20.5 | 32.742 + ¹²⁵ 203 | 10.01 -193 | 06.004 + ²² 80 | 57.23 +335 | 14.008 + ⁹⁸ 148 | 38.94 - ⁵² 37 | 53.524 + ¹⁰⁰ 157 | 19.16 -100 |
| 5 30.5 | 32.945 + ²⁰³ 278 | 08.24 -177 | 06.084 + ⁸⁰ 140 | 53.80 +343 | 14.156 + ¹⁴⁸ 199 | 38.57 - ³⁷ 20 | 53.681 + ¹⁵⁷ 210 | 18.32 -84 |
| 6 9.4 | 33.223 + ²⁷⁸ 349 | 06.66 -130 | 06.224 + ¹⁴⁰ 197 | 50.33 +347 | 14.355 + ¹⁹⁹ 245 | 38.37 - ²⁰ 3 | 53.891 + ²¹⁰ 262 | 17.65 -67 |
| 6 19.4 | 33.572 + ³⁴⁹ 405 | 05.36 -130 | 06.421 + ¹⁹⁷ 244 | 46.93 +340 | 14.600 + ²⁴⁵ 281 | 38.40 + ³ 23 | 54.153 + ²⁶² 302 | 17.22 -43 |
| 6 29.4 | 33.977 + ⁴⁰⁵ 70 | 04.35 -101 | 06.665 + ²⁴⁴ 289 | 43.69 +324 | 14.881 + ²⁸¹ 312 | 38.63 + ²³ 44 | 54.455 + ³⁰² 336 | 17.01 -21 |
| 7 9.4 | 34.431 + ⁴⁵⁴ 493 | 03.65 -70 | 06.954 + ²⁸⁹ 327 | 40.67 +302 | 15.193 + ³¹² 336 | 39.07 + ⁴⁴ 63 | 54.791 + ³³⁶ 364 | 17.05 +4 |
| 7 19.3 | 34.924 + ⁴⁹³ 516 | 03.31 -34 | 07.281 + ³²⁷ 351 | 37.99 +268 | 15.529 + ³³⁶ 349 | 39.70 + ⁶³ 79 | 55.155 + ³⁶⁴ 379 | 17.34 +29 |
| 7 29.3 | 35.440 + ⁵¹⁶ 535 | 03.31 +0 | 07.632 + ³⁵¹ 374 | 35.69 +230 | 15.878 + ³⁴⁹ 360 | 40.49 + ⁷⁹ 94 | 55.534 + ³⁷⁹ 391 | 17.84 +50 |
| 8 8.3 | 35.975 + ⁵³⁵ 540 | 03.64 +33 | 08.006 + ³⁷⁴ 382 | 33.84 +185 | 16.238 + ³⁶⁰ 360 | 41.43 + ⁹⁴ 105 | 55.925 + ³⁹¹ 394 | 17.84 +71 |
| 8 18.3 | 36.515 + ⁵⁴⁰ 97 | 04.33 +69 | 08.388 + ³⁸² 381 | 32.54 +130 | 16.598 + ³⁶⁰ 355 | 42.48 + ¹⁰⁵ 112 | 56.319 + ³⁹⁴ 389 | 18.55 +90 |
| 8 28.2 | 37.049 + ⁵³⁴ 525 | 05.30 +97 | 08.769 + ³⁸¹ 376 | 31.79 +75 | 16.953 + ³⁵⁵ 348 | 43.60 + ¹¹² 119 | 56.708 + ³⁸⁹ 382 | 20.50 +105 |
| 9 7.2 | 37.574 + ⁵²⁵ 504 | 06.58 +128 | 09.145 + ³⁷⁶ 357 | 31.62 +17 | 17.301 + ³⁴⁸ 331 | 44.79 + ¹¹⁹ 121 | 57.090 + ³⁸² 366 | 21.70 +120 |
| 9 17.2 | 38.078 + ⁵⁰⁴ 477 | 08.13 +155 | 09.502 + ³⁵⁷ 333 | 32.08 -46 | 17.632 + ³³¹ 315 | 46.00 + ¹²¹ 121 | 57.456 + ³⁶⁶ 347 | 22.99 +129 |
| 9 27.1 | 38.555 + ⁴⁷⁷ 447 | 09.90 +177 | 09.835 + ³³³ 304 | 33.09 -101 | 17.947 + ³¹⁵ 295 | 47.21 + ¹²¹ 121 | 57.803 + ³⁴⁷ 327 | 22.99 +138 |
| 10 7.1 | 39.002 + ⁴⁴⁷ 405 | 11.90 +200 | 10.139 + ³⁰⁴ 263 | 34.66 -157 | 18.242 + ²⁹⁵ 244 | 48.42 + ¹²¹ 114 | 58.130 + ³²⁷ 299 | 24.37 +145 |
| 10 17.1 | 39.407 + ⁴⁰⁵ 363 | 14.06 +216 | 10.402 + ²⁶³ 223 | 36.73 -207 | 18.511 + ²⁶⁹ 215 | 49.59 + ¹¹⁷ 110 | 58.429 + ²⁹⁹ 271 | 27.30 +148 |
| 10 27.1 | 39.770 + ³⁶³ 313 | 16.36 +230 | 10.625 + ²²³ 175 | 39.18 -245 | 18.755 + ²⁴⁴ 215 | 50.73 + ¹¹⁴ 110 | 58.700 + ²⁷¹ 239 | 28.81 +151 |
| 11 6.0 | 40.083 + ³¹³ 254 | 18.77 +241 | 10.800 + ¹⁷⁵ 123 | 41.97 -279 | 18.970 + ²¹⁵ 180 | 51.83 + ¹¹⁰ 105 | 58.939 + ²³⁹ 200 | 30.32 +151 |
| 11 16.0 | 40.337 + ²⁵⁴ 195 | 21.22 +245 | 10.923 + ¹²³ 73 | 44.94 -297 | 19.150 + ¹⁸⁰ 145 | 52.88 + ¹⁰⁵ 98 | 59.139 + ²⁰⁰ 162 | 30.32 +150 |
| 11 26.0 | 40.532 + ¹⁹⁵ 127 | 23.67 +245 | 10.996 + ⁷³ 17 | 48.00 -306 | 19.295 + ¹⁴⁵ 106 | 53.86 + ⁹⁸ 92 | 59.301 + ¹⁶² 116 | 31.82 +146 |
| 12 6.0 | 40.659 + ¹²⁷ 55 | 26.08 +241 | 11.013 + ¹⁷ 37 | 51.05 -305 | 19.401 + ¹⁰⁶ 63 | 54.78 + ⁹² 82 | 59.417 + ¹¹⁶ 68 | 34.68 +140 |
| 12 15.9 | 40.714 + ⁵⁵ 15 | 28.35 +227 | 10.976 - ³⁷ 88 | 53.94 -289 | 19.464 + ⁶³ 20 | 55.60 + ⁸² 73 | 59.485 + ⁶⁸ 21 | 35.99 +131 |
| 12 25.9 | 40.699 - ¹⁵ 90 | 30.45 +210 | 10.888 - ⁸⁸ 139 | 56.58 -264 | 19.484 + ²⁰ 25 | 56.33 + ⁷³ 60 | 59.506 + ²¹ 32 | 37.17 +118 |
| 12 35.9 | 40.609 - ⁹⁰ 157 | 32.31 +186 | 10.749 - ¹³⁹ 183 | 58.91 -233 | 19.459 - ²⁵ 68 | 56.93 + ⁶⁰ 45 | 59.474 - ³² 79 | 37.17 +102 |
| Mean Place | 37.120 | 09.50 | 08.199 | 58.43 | 16.856 | 39.42 | 56.672 | 19.05 |
| sec δ, tan δ | +1.884 | +1.596 | +1.464 | -1.070 | +1.177 | +0.621 | +1.305 | +0.838 |
| dα(ψ), dδ(ψ) | +0.097 | +0.21 | +0.037 | +0.21 | +0.075 | +0.21 | +0.080 | +0.20 |
| dα(ε), dδ(ε) | -0.056 | +0.85 | +0.037 | +0.85 | -0.022 | +0.85 | -0.029 | +0.86 |
| Dbles.Trans. | November 19 | | November 19 | | November 19 | | November 20 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 149 | | 148 | | 1109 | | 1110 | | |
|---|------------------|--------------|--------------|--------------|----------------|--------------|-------------------|--------------|------------|
| | γ Eridani | | ξ Persei | | 17 G. Reticuli | | δ Reticuli | | |
| Mag. Spect. | 3.19 | K5 | 4.05 | Oe5 | 6.14 | F2 | 4.41 | M0 | |
| U.T. | R.A. | | R.A. | | R.A. | | R.A. | | |
| | h m | Dec. | h m | Dec. | h m | Dec. | h m | Dec. | |
| | 3 57 | - 13 32 | 3 58 | + 35 45 | 3 58 | - 57 07 | 3 58 | - 61 25 | |
| 1 | -9.1 | 23 171 + 12 | 50 88 -170 | 03 648 + 37 | 15 40 +101 | 27 090 - 122 | 96 03 -291 | 34 048 - 159 | 88 22 -293 |
| 1 | 0.9 | 23 148 - 23 | 52.42 -154 | 03 640 - 8 | 16.28 + 88 | 26 907 - 183 | 98.59 -256 | 33 820 - 228 | 90.80 -258 |
| 1 | 10.9 | 23 089 - 59 | 53.80 -138 | 03 585 - 56 | 17.01 + 73 | 26 664 - 243 | 100.76 -217 | 33 526 - 294 | 92.97 -217 |
| 1 | 20.8 | 22 994 - 95 | 54.94 -114 | 03 484 - 101 | 17.55 + 54 | 26 368 - 296 | 102.44 -168 | 33 172 - 354 | 94.63 -166 |
| 1 | 30.8 | 22 871 - 123 | 55.82 - 88 | 03 348 - 136 | 17.88 + 33 | 26 034 - 334 | 103.59 -115 | 32 777 - 395 | 95.76 -113 |
| 2 | 9.8 | 22 724 - 147 | 56.45 - 63 | 03 179 - 169 | 17.99 + 11 | 25 668 - 366 | 104.21 - 62 | 32 346 - 431 | 96.34 - 58 |
| 2 | 19.7 | 22 560 - 164 | 56.78 - 33 | 02 990 - 189 | 17.85 - 14 | 25 283 - 385 | 104.24 - 3 | 31 896 - 450 | 96.33 + 1 |
| 3 | 1.7 | 22 390 - 170 | 56.82 - 4 | 02 793 - 197 | 17.50 - 35 | 24 895 - 388 | 103.74 + 50 | 31 445 - 451 | 95.77 + 56 |
| 3 | 11.7 | 22 220 - 170 | 56.57 + 25 | 02 596 - 197 | 16.94 - 56 | 24 513 - 382 | 102.71 +103 | 31 000 - 445 | 94.68 +109 |
| 3 | 21.7 | 22 063 - 157 | 56.02 + 55 | 02 417 - 179 | 16.20 - 74 | 24 154 - 359 | 101.14 +157 | 30 582 - 418 | 93.05 +163 |
| 3 | 31.6 | 21 928 - 135 | 55.19 + 83 | 02 266 - 151 | 15.34 - 86 | 23 831 - 323 | 99.14 +200 | 30 204 - 378 | 90.98 +207 |
| 4 | 10.6 | 21 820 - 108 | 54.08 +111 | 02 150 - 116 | 14.38 - 96 | 23 550 - 281 | 96.70 +244 | 29 874 - 330 | 88.48 +250 |
| 4 | 20.6 | 21 749 - 71 | 52.69 +139 | 02 082 - 68 | 13.39 - 99 | 23 328 - 222 | 93.88 +282 | 29 609 - 265 | 85.59 +289 |
| 4 | 30.6 | 21 720 - 29 | 51.07 +162 | 02 066 - 16 | 12.43 - 96 | 23 169 - 159 | 90.78 +310 | 29 414 - 195 | 82.43 +316 |
| 5 | 10.5 | 21 735 + 15 | 49.22 +185 | 02 105 + 39 | 11.55 - 88 | 23 076 - 93 | 87.42 +336 | 29 293 - 121 | 79.01 +342 |
| 5 | 20.5 | 21 797 + 62 | 47.17 +205 | 02 201 + 96 | 10.79 - 76 | 23 060 - 16 | 83.90 +352 | 29 258 - 35 | 75.43 +358 |
| 5 | 30.5 | 21 903 + 106 | 44.98 +219 | 02 349 + 148 | 10.18 - 61 | 23 115 + 55 | 80.30 +360 | 29 302 + 44 | 71.80 +363 |
| 6 | 9.4 | 22 053 + 150 | 42.66 +232 | 02 550 + 201 | 09.74 - 44 | 23 243 + 128 | 76.68 +362 | 29 428 + 126 | 68.14 +366 |
| 6 | 19.4 | 22 244 + 191 | 40.30 +236 | 02 800 + 250 | 09 52 - 22 | 23 443 + 200 | 73.15 +353 | 29 635 + 207 | 64.59 +355 |
| 6 | 29.4 | 22 469 + 225 | 37.95 +235 | 03 087 + 287 | 09 53 + 1 | 23 703 + 260 | 69.80 +335 | 29 911 + 276 | 61.23 +336 |
| 7 | 9.4 | 22 723 + 254 | 35.65 +230 | 03 408 + 321 | 09 75 + 22 | 24 023 + 320 | 66.69 +311 | 30 255 + 344 | 58.11 +312 |
| 7 | 19.3 | 23 000 + 277 | 33.50 +215 | 03 754 + 346 | 10 19 + 44 | 24 392 + 369 | 63.95 +274 | 30 656 + 401 | 55.38 +273 |
| 7 | 29.3 | 23 292 + 292 | 31.53 +197 | 04 115 + 361 | 10 81 + 62 | 24 796 + 404 | 61.62 +233 | 31 098 + 442 | 53.07 +231 |
| 8 | 8.3 | 23 596 + 304 | 29 81 +172 | 04 488 + 373 | 11 61 + 80 | 25 232 + 436 | 59 77 +185 | 31 577 + 479 | 51 25 +182 |
| 8 | 18.3 | 23 902 + 306 | 28 41 +140 | 04 862 + 374 | 12 57 + 96 | 25 683 + 451 | 58 50 +127 | 32 076 + 499 | 50 03 +122 |
| 8 | 28.2 | 24 205 + 303 | 27 35 +106 | 05 232 + 370 | 13 63 +106 | 26 138 + 455 | 57 81 + 69 | 32 579 + 503 | 49 38 + 65 |
| 9 | 7.2 | 24 502 + 297 | 26 67 + 68 | 05 596 + 364 | 14 79 +116 | 26 589 + 451 | 57 74 + 7 | 33 080 + 501 | 49 37 + 1 |
| 9 | 17.2 | 24 785 + 283 | 26 40 + 27 | 05 944 + 348 | 16 02 +123 | 27 020 + 431 | 58 31 - 57 | 33 558 + 478 | 50 00 - 63 |
| 9 | 27.1 | 25 052 + 267 | 26 52 - 12 | 06 275 + 331 | 17 29 +127 | 27 422 + 402 | 59 47 -116 | 34 003 + 445 | 51 23 -123 |
| 10 | 7.1 | 25 301 + 249 | 27 04 - 52 | 06 587 + 312 | 18 59 +130 | 27 788 + 366 | 61 21 -174 | 34 407 + 404 | 53 04 -181 |
| 10 | 17.1 | 25 526 + 225 | 27 93 - 89 | 06 872 + 285 | 19 89 +130 | 28 102 + 314 | 63 47 -226 | 34 752 + 345 | 55 36 -232 |
| 10 | 27.1 | 25 726 + 200 | 29 12 -119 | 07 131 + 259 | 21 19 +130 | 28 362 + 260 | 66 12 -265 | 35 035 + 283 | 58 09 -273 |
| 11 | 6.0 | 25 898 + 172 | 30 58 -146 | 07 360 + 229 | 22 48 +129 | 28 562 + 200 | 69 12 -300 | 35 246 + 211 | 61 15 -306 |
| 11 | 16.0 | 26 039 + 141 | 32 22 -164 | 07 552 + 192 | 23 73 +125 | 28 692 + 130 | 72 31 -319 | 35 378 + 132 | 64 40 -325 |
| 11 | 26.0 | 26 149 + 110 | 33 96 -174 | 07 709 + 157 | 24 93 +120 | 28 756 + 64 | 75 58 -327 | 35 432 + 54 | 67 72 -332 |
| 12 | 6.0 | 26 224 + 75 | 35 77 -181 | 07 823 + 114 | 26 08 +115 | 28 747 - 9 | 78 83 -325 | 35 403 - 29 | 71 02 -330 |
| 12 | 15.9 | 26 261 + 37 | 37 53 -176 | 07 892 + 69 | 27 14 +106 | 28 668 - 79 | 81 90 -307 | 35 293 - 110 | 74 12 -310 |
| 12 | 25.9 | 26 263 + 2 | 39 18 -165 | 07 917 + 25 | 28 09 + 95 | 28 524 - 144 | 84 70 -280 | 35 110 - 183 | 76 94 -282 |
| 12 | 35.9 | 26 226 - 37 | 40 70 -152 | 07 892 - 25 | 28 90 + 81 | 28 315 - 209 | 87 16 -246 | 34 853 - 257 | 79 41 -247 |
| | | 26 226 - 72 | 40 70 -130 | 07 892 - 70 | 28 90 + 64 | 28 315 - 265 | 87 16 -199 | 34 853 - 319 | 79 41 -198 |
| Mean Place | 23 925 | 46 83 | 05 179 | 10 73 | 25 472 | 85 60 | 31 823 | 77 42 | |
| sec δ , $\tan \delta$ | +1.029 | -0.241 | +1.232 | +0.720 | +1.843 | -1.548 | +2.092 | -1.837 | |
| $d\alpha(\psi)$, $d\delta(\psi)$ | +0.056 | +0.20 | +0.078 | +0.20 | +0.026 | +0.20 | +0.019 | +0.20 | |
| $d\alpha(\epsilon)$, $d\delta(\epsilon)$ | +0.008 | +0.86 | -0.024 | +0.86 | +0.052 | +0.86 | +0.062 | +0.86 | |
| Dble. Trans. | November 20 | | November 20 | | November 20 | | November 20 | | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 150 | | 1114 | | 1111 | | 151 | | |
|----------------|--|--|--|--|--|--|--|--|-------------|
| | λ Tauri | | 63 G. Hydri | | 35 Eridani | | ν Tauri | | |
| Mag.Spect. | 3.8 to 4.1 | B3 | 6.72 | A0 | 5.25 | B5 | 3.94 | A0 | |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | |
| | ^h ^m 3 59 | [°] ['] +12 27 | ^h ^m 4 00 | [°] ['] -71 11 | ^h ^m 4 00 | [°] ['] - 1 34 | ^h ^m 4 02 | [°] ['] + 5 57 | |
| 1 ^d | -9.1 | 54 619 + 36 | 11.36 - 35 | 52.793 - 297 | 86 68 - 293 | 49 918 + 28 | 74.28 - 112 | 25.074 + 34 | 08.99 - 71 |
| 1 | 0.9 | 54 618 - 1 | 11.02 - 34 | 52.392 - 401 | 89 24 - 256 | 49 911 - 7 | 75.32 - 104 | 25.073 - 1 | 08.31 - 68 |
| 1 | 10.9 | 54 579 - 39 | 10.67 - 35 | 51.893 - 499 | 91 38 - 214 | 49 866 - 45 | 76.26 - 94 | 25.034 - 39 | 07.67 - 64 |
| 1 | 20.8 | 54 502 - 77 | 10.33 - 34 | 51.310 - 583 | 92 99 - 161 | 49 866 - 80 | 77.08 - 82 | 24.958 - 76 | 07.10 - 57 |
| 1 | 30.8 | 54 395 - 107 | 10.01 - 32 | 50.669 - 641 | 94.05 - 106 | 49 677 - 109 | 77.74 - 66 | 24.852 - 106 | 06.61 - 49 |
| 2 | 9.8 | 54 261 - 134 | 09.69 - 32 | 49 980 - 689 | 94.56 - 51 | 49 542 - 135 | 78.26 - 52 | 24.720 - 132 | 06.20 - 41 |
| 2 | 19.8 | 54 109 - 152 | 09.40 - 29 | 49 267 - 713 | 94.47 + 9 | 49 390 - 152 | 78.60 - 34 | 24.569 - 151 | 05.88 - 32 |
| 3 | 1.7 | 53 950 - 159 | 09 14 - 26 | 49 267 - 712 | 94.47 + 65 | 49 390 - 160 | 78.60 - 16 | 24.569 - 157 | 05.88 - 21 |
| 3 | 11.7 | 53 790 - 160 | 08.91 - 23 | 48 555 - 700 | 93.82 + 118 | 49 230 - 160 | 78.76 + 1 | 24.412 - 159 | 05.67 - 12 |
| 3 | 21.7 | 53 642 - 148 | 08.75 - 16 | 47 855 - 660 | 92.64 + 173 | 49 070 - 148 | 78.75 + 22 | 24.253 - 147 | 05.55 + 1 |
| 3 | 31.6 | 53 517 - 125 | 08.66 - 9 | 46 593 - 602 | 88.75 + 216 | 48 795 - 127 | 78.13 + 40 | 23.980 - 126 | 05.70 + 14 |
| 4 | 10.6 | 53 421 - 96 | 08.67 + 1 | 46 058 - 535 | 86.16 + 259 | 48 695 - 100 | 77.52 + 61 | 23.882 - 98 | 05.99 + 29 |
| 4 | 20.6 | 53 364 - 57 | 08.80 + 13 | 45 031 - 442 | 83.20 + 296 | 48 633 - 62 | 76.70 + 82 | 23.822 - 60 | 06.44 + 45 |
| 4 | 30.6 | 53 350 - 14 | 09.07 + 27 | 45 616 - 344 | 83.20 + 322 | 48 611 - 22 | 75.69 + 101 | 23.804 - 18 | 07.06 + 62 |
| 5 | 10.5 | 53 381 + 31 | 09.49 + 42 | 45 035 - 237 | 76.51 + 347 | 48 633 + 22 | 74.48 + 121 | 23.829 + 25 | 07.84 + 78 |
| 5 | 20.5 | 53 460 + 79 | 10.05 + 56 | 44 918 - 117 | 72.89 + 362 | 48 701 + 68 | 73.07 + 141 | 23.901 + 72 | 08.81 + 97 |
| 5 | 30.5 | 53 582 + 122 | 10.83 + 78 | 44 915 - 3 | 69.23 + 366 | 48 813 + 112 | 71.51 + 156 | 24.017 + 116 | 09.94 + 113 |
| 6 | 9.5 | 53 750 + 168 | 11.78 + 95 | 45 031 + 116 | 65.56 + 367 | 48 813 + 155 | 69.80 + 171 | 24.177 + 160 | 11.24 + 130 |
| 6 | 19.4 | 53 959 + 209 | 12.85 + 107 | 45 266 + 235 | 62.02 + 354 | 48 968 + 195 | 68.00 + 180 | 24.378 + 201 | 12.65 + 141 |
| 6 | 29.4 | 54 200 + 241 | 14.03 + 118 | 45 604 + 338 | 58.68 + 334 | 49 390 + 227 | 66.16 + 184 | 24.610 + 232 | 14.14 + 149 |
| 7 | 9.4 | 54 470 + 270 | 15.30 + 127 | 46 045 + 441 | 55.60 + 308 | 49 647 + 257 | 64.30 + 186 | 24.871 + 261 | 15.69 + 155 |
| 7 | 19.3 | 54 762 + 292 | 16.63 + 133 | 46 574 + 529 | 52.92 + 268 | 49 925 + 278 | 62.49 + 181 | 25.155 + 284 | 17.23 + 154 |
| 7 | 29.3 | 55 067 + 305 | 17.95 + 132 | 47 170 + 596 | 50.67 + 225 | 50 217 + 292 | 60.79 + 170 | 25.451 + 296 | 18.74 + 151 |
| 8 | 8.3 | 55 381 + 314 | 19.26 + 131 | 47 826 + 656 | 48.92 + 175 | 50 519 + 302 | 59.23 + 156 | 25.758 + 307 | 20.16 + 142 |
| 8 | 18.3 | 55 698 + 317 | 20.48 + 122 | 48 516 + 690 | 47.78 + 114 | 50 824 + 305 | 57.88 + 135 | 26.067 + 309 | 21.44 + 128 |
| 8 | 28.2 | 56 010 + 312 | 21.60 + 112 | 49 220 + 704 | 47.21 + 57 | 51 125 + 301 | 56.78 + 110 | 26.373 + 306 | 22.55 + 111 |
| 9 | 7.2 | 56 317 + 307 | 22.59 + 99 | 49 925 + 705 | 47.29 - 8 | 51 421 + 296 | 55.94 + 84 | 26.673 + 300 | 23.46 + 91 |
| 9 | 17.2 | 56 610 + 293 | 23.40 + 81 | 50 599 + 674 | 48.03 - 74 | 51 704 + 283 | 55.42 + 52 | 26.960 + 287 | 24.13 + 67 |
| 9 | 27.2 | 56 888 + 278 | 24.04 + 64 | 51 226 + 627 | 49.34 - 131 | 51 972 + 268 | 55.18 + 24 | 27.233 + 273 | 24.58 + 45 |
| 10 | 7.1 | 57 150 + 262 | 24.49 + 45 | 51 792 + 566 | 51.25 - 191 | 52 224 + 252 | 55.26 - 8 | 27 490 + 257 | 24.78 + 20 |
| 10 | 17.1 | 57 389 + 239 | 24.76 + 27 | 52 268 + 476 | 53.66 - 241 | 52 453 + 229 | 55.63 - 37 | 27 724 + 234 | 24.74 - 4 |
| 10 | 27.1 | 57 606 + 217 | 24.87 + 11 | 52 648 + 380 | 56.46 - 280 | 52 659 + 206 | 56.24 - 61 | 27 937 + 213 | 24.51 - 23 |
| 11 | 6.0 | 57 798 + 193 | 24.84 - 3 | 52 918 + 270 | 59.60 - 314 | 52 841 + 182 | 57.07 - 83 | 28 125 + 188 | 24.10 - 41 |
| 11 | 16.0 | 57 961 + 162 | 24.68 - 16 | 53 064 + 146 | 62.91 - 331 | 52 992 + 151 | 58.06 - 99 | 28 284 + 159 | 23.54 - 56 |
| 11 | 26.0 | 58 094 + 133 | 24.44 - 24 | 53 090 + 26 | 66.27 - 336 | 53 115 + 123 | 59.15 - 109 | 28 414 + 130 | 22.89 - 65 |
| 12 | 6.0 | 58 193 + 99 | 24.13 - 31 | 52 988 - 102 | 69.59 - 332 | 53 203 + 88 | 60.31 - 116 | 28 510 + 96 | 22.17 - 72 |
| 12 | 15.9 | 58 254 + 61 | 23.78 - 35 | 52 762 - 226 | 72.70 - 311 | 53 256 + 53 | 61.46 - 115 | 28 569 + 59 | 21.44 - 73 |
| 12 | 25.9 | 58 280 - 16 | 23.42 - 36 | 52 426 - 336 | 75.52 - 282 | 53 273 + 17 | 62.57 - 111 | 28 593 + 24 | 20.72 - 72 |
| 12 | 35.9 | 58 265 - 52 | 23.05 - 37 | 51 981 - 445 | 77.97 - 245 | 53 252 - 21 | 63.60 - 103 | 28 578 - 15 | 20.03 - 69 |
| | | | 23.05 - 36 | 51 981 - 535 | 77.97 - 194 | 53 252 - 57 | 63.60 - 91 | 28 578 - 52 | 20.03 - 62 |
| Mean Place | 55.860 | 10.52 | 48.160 | 75.46 | 50.921 | 72.64 | 26.207 | 09.17 | |
| sec δ, tan δ | +1.024 | +0.221 | +3.104 | -2.938 | +1.000 | -0.028 | +1.005 | +0.104 | |
| dα(ψ), dδ(ψ) | +0.066 | +0.20 | -0.006 | +0.20 | +0.061 | +0.20 | +0.064 | +0.20 | |
| dα(ε), dδ(ε) | -0.007 | +0.87 | +0.097 | +0.87 | +0.001 | +0.87 | -0.003 | +0.87 | |
| Dble.Trans. | November 21 | | November 21 | | November 21 | | November 21 | | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 1112 | | 153 | | 1113 | | 152 | | |
|----------------|--------------------------|-------------------------|-------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------|
| | 37 Tauri | | 174 G. Eridani | | λ Persei | | 48 Persei | | |
| Mag. Spect. | 4.50 | K0 | 5.57 | A5 | 4.33 | A0 | 4.03 | B3p | |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | |
| | h m 4 03 | ° ′ + 22 02 | h m 4 05 | ° ′ - 27 40 | h m 4 05 | ° ′ + 50 18 | h m 4 07 | ° ′ + 47 40 | |
| 1 ^d | 52.358 ^s + 43 | 47.57 [°] + 21 | 03.709 ^s - 2 | 83.34 [°] - 231 | 32.802 ^s + 38 | 62.72 [°] + 182 | 39.045 ^s + 44 | 45.15 [°] + 168 | |
| 1 | 0.9 | 47.73 + 16 | 03.667 - 42 | 85.42 - 208 | 32.782 - 20 | 64.38 + 166 | 39.033 - 12 | 46.68 + 153 | |
| 1 | 10.9 | 47.82 + 9 | 03.585 - 82 | 87.25 - 183 | 32.701 - 81 | 65.82 + 144 | 38.962 - 71 | 48.01 + 133 | |
| 1 | 20.8 | 47.84 + 2 | 03.465 - 120 | 88.74 - 149 | 32.561 - 140 | 66.96 + 114 | 38.836 - 126 | 49.07 + 106 | |
| 1 | 30.8 | 47.79 - 5 | 03.315 - 150 | 89.87 - 113 | 32.374 - 187 | 67.79 + 83 | 38.664 - 172 | 49.83 + 76 | |
| 2 | 9.8 | 47.66 - 140 | 03.139 - 176 | 90.62 - 75 | 32.146 - 228 | 68.27 + 48 | 38.453 - 211 | 50.27 + 44 | |
| 2 | 19.8 | 47.44 - 160 | 02.944 - 195 | 90.95 - 33 | 31.891 - 255 | 68.37 + 10 | 38.215 - 238 | 50.35 + 8 | |
| 3 | 1.7 | 47.15 - 169 | 02.744 - 200 | 90.88 + 7 | 31.626 - 265 | 68.10 - 27 | 37.966 - 249 | 50.10 - 25 | |
| 3 | 11.7 | 46.79 - 169 | 02.543 - 201 | 90.41 + 47 | 31.362 - 264 | 67.48 - 62 | 37.718 - 248 | 49.51 - 59 | |
| 3 | 21.7 | 46.39 - 157 | 02.355 - 188 | 89.53 + 88 | 31.118 - 244 | 66.53 - 95 | 37.488 - 230 | 48.62 - 89 | |
| 3 | 31.6 | 45.99 - 133 | 02.188 - 167 | 88.28 + 125 | 30.909 - 209 | 65.32 - 121 | 37.290 - 198 | 47.49 - 113 | |
| 4 | 10.6 | 45.60 - 103 | 02.050 - 138 | 86.68 + 160 | 30.744 - 165 | 63.89 - 143 | 37.134 - 156 | 46.16 - 133 | |
| 4 | 20.6 | 45.27 - 61 | 01.951 - 99 | 84.74 + 194 | 30.637 - 107 | 62.32 - 157 | 37.033 - 101 | 44.70 - 146 | |
| 4 | 30.6 | 45.02 - 17 | 01.894 - 57 | 82.53 + 221 | 30.595 - 42 | 60.69 - 163 | 36.994 - 39 | 43.19 - 151 | |
| 5 | 10.5 | 44.90 + 31 | 01.884 - 10 | 80.05 + 248 | 30.620 + 25 | 59.05 - 164 | 37.018 + 24 | 41.68 - 151 | |
| 5 | 20.5 | 44.96 + 87 | 01.924 + 40 | 77.38 + 267 | 30.717 + 97 | 57.48 - 157 | 37.110 + 92 | 40.25 - 143 | |
| 5 | 30.5 | 45.09 + 116 | 02.011 + 87 | 74.57 + 281 | 30.880 + 163 | 56.05 - 143 | 37.267 + 157 | 38.95 - 130 | |
| 6 | 9.5 | 45.43 + 179 | 02.146 + 135 | 71.67 + 290 | 31.108 + 228 | 54.78 - 127 | 37.484 + 217 | 37.81 - 114 | |
| 6 | 19.4 | 45.95 + 219 | 02.326 + 180 | 68.76 + 291 | 31.397 + 289 | 53.76 - 102 | 37.760 + 276 | 36.91 - 90 | |
| 6 | 29.4 | 46.62 + 253 | 02.543 + 217 | 65.92 + 284 | 31.734 + 337 | 52.98 - 78 | 38.082 + 322 | 36.24 - 67 | |
| 7 | 9.4 | 47.44 + 282 | 02.795 + 252 | 63.20 + 272 | 32.116 + 382 | 52.47 - 51 | 38.446 + 364 | 35.83 - 41 | |
| 7 | 19.3 | 48.37 + 306 | 03.075 + 280 | 60.70 + 250 | 32.531 + 415 | 52.27 - 20 | 38.443 + 397 | 35.71 - 12 | |
| 7 | 29.3 | 49.38 + 320 | 03.374 + 299 | 58.49 + 221 | 32.967 + 436 | 52.35 + 8 | 38.863 + 417 | 35.71 + 14 | |
| 8 | 8.3 | 50.46 + 330 | 03.687 + 313 | 56.60 + 189 | 33.421 + 454 | 52.70 + 35 | 39.694 + 434 | 35.85 + 40 | |
| 8 | 18.3 | 51.55 + 333 | 04.007 + 320 | 55.16 + 144 | 33.881 + 480 | 53.34 + 64 | 40.133 + 439 | 36.25 + 66 | |
| 8 | 28.2 | 52.62 + 330 | 04.326 + 319 | 54.14 + 102 | 34.338 + 457 | 54.21 + 87 | 40.570 + 437 | 37.78 + 87 | |
| 9 | 7.2 | 53.65 + 324 | 04.641 + 315 | 53.62 + 52 | 34.790 + 452 | 55.32 + 111 | 41.002 + 432 | 38.86 + 108 | |
| 9 | 17.2 | 54.62 + 310 | 04.943 + 302 | 53.62 + 0 | 35.225 + 435 | 56.64 + 132 | 41.418 + 416 | 38.86 + 127 | |
| 9 | 27.2 | 55.49 + 296 | 05.228 + 285 | 54.10 - 48 | 35.641 + 416 | 58.12 + 148 | 41.817 + 399 | 40.13 + 142 | |
| 10 | 7.1 | 56.28 + 280 | 05.493 + 265 | 55.08 - 98 | 36.034 + 393 | 59.78 + 166 | 42.194 + 377 | 41.55 + 156 | |
| 10 | 17.1 | 56.95 + 257 | 05.731 + 238 | 56.50 - 142 | 36.395 + 361 | 61.57 + 179 | 42.541 + 347 | 44.79 + 168 | |
| 10 | 27.1 | 57.54 + 234 | 05.941 + 210 | 58.28 - 178 | 36.723 + 328 | 63.45 + 188 | 42.857 + 316 | 46.54 + 175 | |
| 11 | 6.0 | 58.03 + 209 | 06.120 + 179 | 60.39 - 211 | 37.012 + 289 | 65.42 + 197 | 43.137 + 280 | 48.37 + 183 | |
| 11 | 16.0 | 58.43 + 177 | 06.262 + 142 | 62.71 - 232 | 37.254 + 242 | 67.43 + 201 | 43.373 + 236 | 48.37 + 186 | |
| 11 | 26.0 | 58.78 + 147 | 06.369 + 107 | 65.15 - 244 | 37.450 + 196 | 69.44 + 201 | 43.564 + 191 | 50.23 + 186 | |
| 12 | 6.0 | 59.05 + 110 | 06.435 + 66 | 67.63 - 248 | 37.590 + 140 | 71.42 + 198 | 43.704 + 140 | 53.92 + 183 | |
| 12 | 15.9 | 59.28 + 71 | 06.459 + 24 | 70.02 - 239 | 37.670 + 80 | 73.31 + 189 | 43.787 + 83 | 55.66 + 174 | |
| 12 | 25.9 | 59.45 + 33 | 06.444 - 15 | 72.26 - 224 | 37.692 + 22 | 75.07 + 176 | 43.815 + 28 | 57.28 + 162 | |
| 12 | 35.9 | 59.57 - 11 | 06.387 - 57 | 74.29 - 203 | 37.650 - 42 | 76.63 + 156 | 43.782 - 33 | 58.72 + 144 | |
| | 53.722 | 44.86 | 04.019 | 77.51 | 34.420 | 55.99 | 40.641 | 38.70 | |
| Mean Place | sec δ, tan δ | +1.079 | +0.405 | +1.129 | -0.525 | +1.566 | +1.205 | +1.485 | +1.098 |
| dα(ψ), dδ(ψ) | +0.071 | +0.19 | +0.049 | +0.19 | +0.089 | +0.19 | +0.087 | +0.19 | |
| dα(ε), dδ(ε) | -0.013 | +0.87 | +0.017 | +0.88 | -0.038 | +0.88 | -0.034 | +0.88 | |
| Dble. Trans. | November 22 | | November 22 | | November 22 | | November 23 | | |

APPARENT PLACES OF STARS, 1986

67

AT UPPER TRANSIT AT GREENWICH

| No. | 1115 | | | 1116 | | | 154 | | 155 | | | | | | | |
|---------------------|-------------|-------|---------|-------------|--------|---------|-------------|------|-------------|-------|-------------|------|-------------|-------|-------------|------|
| | 43 Tauri | | | 44 Tauri | | | o' Eridani | | α Horologii | | | | | | | |
| Mag. Spect. | 5.67 | G5 | | 5.55 | F0 | | 4.14 | F2 | 3.83 | K0 | | | | | | |
| U.T. | R.A. | | Dec. | R.A. | | Dec. | R.A. | | Dec. | R.A. | | | | | | |
| | h m | | ° ' / | h m | | ° ' / | h m | | ° ' / | h m | | | | | | |
| | 4 08 | | + 19 34 | 4 09 | | + 26 26 | 4 11 | | - 6 52 | 4 13 | | | | | | |
| | ° ' / | | ° ' / | ° ' / | | ° ' / | ° ' / | | ° ' / | ° ' / | | | | | | |
| 1 ^d -9.1 | 21.368 | + 47 | 29.85 | + 5 | 59.022 | + 51 | 50.87 | + 46 | 11.469 | + 32 | 21.61 | -142 | 33.647 | - 30 | 45.03 | -279 |
| 1 0.9 | 21.376 | + 8 | 29.88 | + 3 | 59.030 | + 8 | 51.27 | + 40 | 11.464 | - 5 | 22.93 | -132 | 33.568 | - 79 | 47.56 | -253 |
| 1 10.9 | 21.343 | - 33 | 29.86 | - 2 | 58.995 | - 35 | 51.59 | + 32 | 11.422 | - 42 | 22.93 | -118 | 33.442 | - 126 | 49.77 | -221 |
| 1 20.8 | 21.269 | - 74 | 29.79 | - 7 | 58.918 | - 77 | 51.80 | + 21 | 11.342 | - 80 | 24.11 | -102 | 33.271 | - 171 | 51.57 | -180 |
| 1 30.8 | 21.162 | - 107 | 29.68 | - 11 | 58.805 | - 113 | 51.91 | + 11 | 11.233 | - 109 | 25.13 | - 80 | 33.066 | - 205 | 52.91 | -134 |
| 2 9.8 | 21.026 | - 136 | 29.52 | - 16 | 58.660 | - 145 | 51.89 | - 2 | 11.096 | - 137 | 26.55 | - 62 | 32.830 | - 236 | 53.79 | - 88 |
| 2 19.8 | 20.869 | - 157 | 29.29 | - 23 | 58.494 | - 166 | 51.74 | - 15 | 10.940 | - 156 | 26.92 | - 37 | 32.574 | - 256 | 54.15 | - 36 |
| 3 1.7 | 20.704 | - 165 | 29.03 | - 26 | 58.318 | - 176 | 51.47 | - 27 | 10.776 | - 164 | 26.92 | - 15 | 32.311 | - 263 | 54.02 | + 13 |
| 3 11.7 | 20.536 | - 168 | 28.72 | - 31 | 58.140 | - 178 | 51.09 | - 38 | 10.609 | - 167 | 27.07 | + 8 | 32.046 | - 265 | 53.41 | + 61 |
| 3 21.7 | 20.380 | - 156 | 28.40 | - 32 | 57.975 | - 165 | 50.62 | - 47 | 10.453 | - 156 | 26.99 | + 34 | 31.795 | - 251 | 52.30 | +111 |
| 3 31.6 | 20.247 | - 133 | 28.09 | - 31 | 57.833 | - 142 | 50.09 | - 53 | 10.317 | - 136 | 26.09 | + 56 | 31.569 | - 226 | 50.77 | +153 |
| 4 10.6 | 20.143 | - 104 | 27.81 | - 28 | 57.721 | - 112 | 49.54 | - 55 | 10.206 | - 111 | 26.09 | + 80 | 31.373 | - 196 | 48.81 | +196 |
| 4 20.6 | 20.078 | - 65 | 27.60 | - 21 | 57.651 | - 70 | 49.02 | - 52 | 10.131 | - 75 | 25.29 | +104 | 31.221 | - 152 | 46.47 | +234 |
| 4 30.6 | 20.058 | - 20 | 27.49 | - 11 | 57.628 | - 23 | 48.55 | - 47 | 10.097 | - 34 | 24.25 | +125 | 31.116 | - 105 | 43.83 | +264 |
| 5 10.5 | 20.085 | + 27 | 27.50 | + 1 | 57.654 | + 26 | 48.17 | - 38 | 10.105 | + 8 | 23.00 | +147 | 31.062 | - 54 | 40.90 | +293 |
| 5 20.5 | 20.166 | + 81 | 27.65 | + 15 | 57.733 | + 79 | 47.96 | - 21 | 10.160 | + 55 | 19.86 | +167 | 31.067 | + 5 | 37.76 | +314 |
| 5 30.5 | 20.276 | + 110 | 27.93 | + 28 | 57.854 | + 121 | 47.86 | - 10 | 10.259 | + 99 | 18.04 | +182 | 31.126 | + 59 | 34.51 | +325 |
| 6 9.5 | 20.448 | + 172 | 28.44 | + 51 | 58.030 | + 176 | 47.88 | + 2 | 10.400 | + 141 | 16.09 | +195 | 31.241 | + 115 | 31.16 | +335 |
| 6 19.4 | 20.660 | + 212 | 29.08 | + 64 | 58.250 | + 220 | 48.12 | + 24 | 10.583 | + 183 | 14.05 | +204 | 31.410 | + 169 | 27.85 | +331 |
| 6 29.4 | 20.905 | + 245 | 29.86 | + 78 | 58.506 | + 256 | 48.52 | + 40 | 10.799 | + 216 | 11.99 | +206 | 31.625 | + 215 | 24.65 | +320 |
| 7 9.4 | 21.181 | + 276 | 30.77 | + 91 | 58.793 | + 287 | 49.09 | + 57 | 11.046 | + 247 | 09.94 | +205 | 31.883 | + 258 | 21.61 | +304 |
| 7 19.3 | 21.480 | + 299 | 31.77 | +100 | 59.105 | + 312 | 49.81 | + 72 | 11.316 | + 270 | 07.98 | +196 | 32.178 | + 295 | 18.86 | +275 |
| 7 29.3 | 21.793 | + 313 | 32.83 | +106 | 59.432 | + 327 | 50.63 | + 82 | 11.602 | + 286 | 06.16 | +182 | 32.499 | + 321 | 16.46 | +240 |
| 8 8.3 | 22.117 | + 324 | 33.93 | +110 | 59.771 | + 339 | 51.56 | + 93 | 11.900 | + 298 | 04.52 | +164 | 32.842 | + 343 | 14.46 | +200 |
| 8 18.3 | 22.444 | + 327 | 35.03 | +110 | 60.114 | + 343 | 52.54 | + 98 | 12.202 | + 302 | 03.14 | +138 | 33.197 | + 355 | 12.98 | +148 |
| 8 28.2 | 22.769 | + 325 | 36.08 | +105 | 60.454 | + 340 | 53.54 | +100 | 12.503 | + 301 | 02.04 | +110 | 33.556 | + 359 | 12.01 | + 97 |
| 9 7.2 | 23.089 | + 320 | 37.07 | + 99 | 60.789 | + 335 | 54.55 | +101 | 12.799 | + 296 | 01.27 | + 77 | 33.913 | + 357 | 11.62 | + 39 |
| 9 17.2 | 23.396 | + 307 | 37.96 | + 89 | 61.113 | + 324 | 55.54 | + 99 | 13.085 | + 286 | 00.85 | + 42 | 34.257 | + 344 | 11.83 | - 21 |
| 9 27.2 | 23.690 | + 294 | 38.75 | + 79 | 61.422 | + 309 | 56.48 | + 94 | 13.357 | + 272 | 00.77 | + 8 | 34.583 | + 326 | 12.59 | - 76 |
| 10 7.1 | 23.967 | + 277 | 39.42 | + 67 | 61.715 | + 293 | 57.38 | + 90 | 13.613 | + 256 | 01.05 | - 28 | 34.886 | + 303 | 13.92 | -133 |
| 10 17.1 | 24.223 | + 256 | 39.96 | + 54 | 61.985 | + 270 | 58.20 | + 82 | 13.848 | + 235 | 01.65 | - 60 | 35.157 | + 271 | 15.76 | -184 |
| 10 27.1 | 24.457 | + 234 | 40.39 | + 43 | 62.233 | + 248 | 58.97 | + 77 | 14.060 | + 212 | 02.53 | - 88 | 35.393 | + 236 | 18.02 | -226 |
| 11 6.0 | 24.667 | + 210 | 40.72 | + 33 | 62.455 | + 222 | 59.68 | + 71 | 14.248 | + 188 | 03.67 | -114 | 35.589 | + 196 | 20.64 | -262 |
| 11 16.0 | 24.845 | + 178 | 40.96 | + 24 | 62.645 | + 190 | 60.32 | + 64 | 14.405 | + 157 | 04.98 | -131 | 35.738 | + 149 | 23.50 | -286 |
| 11 26.0 | 24.994 | + 149 | 41.14 | + 18 | 62.804 | + 159 | 60.92 | + 60 | 14.534 | + 129 | 06.40 | -142 | 35.842 | + 104 | 26.48 | -298 |
| 12 6.0 | 25.107 | + 113 | 41.25 | + 11 | 62.924 | + 120 | 61.46 | + 54 | 14.627 | + 93 | 07.89 | -149 | 35.896 | + 54 | 29.51 | -303 |
| 12 15.9 | 25.181 | + 74 | 41.31 | + 6 | 63.004 | + 80 | 61.94 | + 48 | 14.684 | + 57 | 09.36 | -147 | 35.898 | + 2 | 32.42 | -291 |
| 12 25.9 | 25.217 | + 36 | 41.34 | + 3 | 63.042 | + 38 | 62.37 | + 43 | 14.705 | + 21 | 10.76 | -140 | 35.851 | - 47 | 35.14 | -272 |
| 12 35.9 | 25.210 | - 7 | 41.33 | - 5 | 63.035 | - 49 | 62.71 | + 26 | 14.686 | - 55 | 12.06 | -130 | 35.753 | - 98 | 37.59 | -245 |
| | | | | | | | | | | | | | | | | |
| Mean Place | 22.688 | | 27.38 | | 60.415 | | 47.25 | | 12.334 | | 19.77 | | 33.232 | | 38.33 | |
| sec δ, tan δ | +1.061 | | +0.356 | | +1.117 | | +0.497 | | +1.007 | | -0.121 | | +1.353 | | -0.911 | |
| dα(ψ), dδ(ψ) | +0.069 | | +0.19 | | +0.073 | | +0.18 | | +0.058 | | +0.18 | | +0.040 | | +0.18 | |
| dα(ε), dδ(ε) | -0.011 | | +0.88 | | -0.015 | | +0.89 | | +0.004 | | +0.89 | | +0.027 | | +0.89 | |
| Dble. Trans. | November 23 | | | November 23 | | | November 24 | | November 24 | | November 24 | | November 24 | | November 24 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 1117 | | 156 | | 1118 | | 157 | | | | | | | | | |
|---|--------------|---------|-------------------|---------|-------------|--------|------------------|---------|---------|------|-------|------|---------|------|-------|------|
| | μ Persei | | α Reticuli | | μ Tauri | | γ Doradus | | | | | | | | | |
| Mag. Spect. | 4.28 | G0 | 3.36 | G5 | 4.32 | B3 | 4.36 | F5 | | | | | | | | |
| U.T. | R.A. | | R.A. | | R.A. | | R.A. | | | | | | | | | |
| | h m | Dec. | h m | Dec. | h m | Dec. | h m | Dec. | | | | | | | | |
| | 4 13 | + 48 22 | 4 14 | - 62 29 | 4 14 | + 8 51 | 4 15 | - 51 30 | | | | | | | | |
| 1 | -9.1 | 52 56.5 | 40.12 | +173 | 17 48.4 | -218 | 95.38 | -273 | 46 86.1 | +10 | 34.30 | -58 | 41.473 | -65 | 80.60 | -297 |
| 1 | 0.9 | 52 56.0 | 41.70 | +158 | 17 26.6 | -218 | 98.11 | -273 | 46 87.1 | +10 | 33.75 | -55 | 41.351 | -122 | 83.27 | -267 |
| 1 | 10.9 | 52 49.5 | 43.09 | +139 | 16 97.5 | -291 | 100.46 | -235 | 46 84.2 | -29 | 33.22 | -53 | 41.173 | -178 | 85.60 | -233 |
| 1 | 20.8 | 52 37.2 | 44.22 | +113 | 16 61.9 | -356 | 102.33 | -187 | 46 77.4 | -68 | 32.75 | -47 | 40 94.4 | -229 | 87.47 | -187 |
| 1 | 30.8 | 52 20.2 | 45.06 | +84 | 16 21.4 | -405 | 103.66 | -133 | 46 67.4 | -100 | 32.33 | -42 | 40 67.6 | -268 | 88.84 | -137 |
| 2 | 9.8 | 51 99.0 | 45.57 | +51 | 15 76.8 | -446 | 104.47 | -81 | 46 54.5 | -129 | 31.97 | -36 | 40 37.4 | -302 | 89.72 | -88 |
| 2 | 19.8 | 51 75.0 | 45.72 | +15 | 15 29.7 | -471 | 104.68 | -21 | 46 39.6 | -149 | 31.67 | -30 | 40 05.0 | -324 | 90.04 | -32 |
| 3 | 1.7 | 51 49.7 | 45.53 | -19 | 14 81.9 | -478 | 104.34 | +34 | 46 23.6 | -160 | 31.44 | -23 | 39 71.9 | -331 | 89.82 | +22 |
| 3 | 11.7 | 51 24.3 | 45.00 | -53 | 14 34.4 | -475 | 103.47 | +87 | 46 07.4 | -162 | 31.29 | -15 | 39 38.7 | -332 | 89.09 | +73 |
| 3 | 21.7 | 51 00.6 | 44.16 | -84 | 13 89.2 | -452 | 102.04 | +143 | 45 92.2 | -152 | 31.23 | -6 | 39 07.2 | -315 | 87.83 | +126 |
| 3 | 31.7 | 50 80.0 | 43.06 | -110 | 13 47.7 | -415 | 100.15 | +189 | 45 78.9 | -133 | 31.27 | +4 | 38 78.4 | -288 | 86.12 | +171 |
| 4 | 10.6 | 50 63.5 | 41.75 | -131 | 13 10.7 | -370 | 97.81 | +234 | 45 68.3 | -106 | 31.43 | +16 | 38 53.2 | -252 | 83.96 | +216 |
| 4 | 20.6 | 50 52.5 | 40.29 | -110 | 12 80.1 | -306 | 95.07 | +274 | 45 61.4 | -69 | 31.74 | +31 | 38 32.9 | -203 | 81.41 | +255 |
| 4 | 30.6 | 50 47.7 | 38.77 | -48 | 12 56.5 | -236 | 92.03 | +304 | 45 58.6 | -28 | 32.18 | +44 | 38 18.0 | -149 | 78.54 | +287 |
| 5 | 10.5 | 50 49.2 | 37.24 | +15 | 12 40.4 | -161 | 88.71 | +332 | 45 60.1 | +15 | 32.78 | +60 | 38 09.0 | -90 | 75.39 | +315 |
| 5 | 20.5 | 50 57.7 | 35.76 | +85 | 12 33.0 | -74 | 85.19 | +352 | 45 66.4 | +63 | 33.54 | +76 | 38 06.7 | -23 | 72.03 | +336 |
| 5 | 30.5 | 50 72.6 | 34.41 | +149 | 12 33.8 | +8 | 81.59 | +360 | 45 77.1 | +107 | 34.46 | +92 | 38 10.7 | +40 | 68.57 | +346 |
| 6 | 9.5 | 50 93.8 | 33.21 | +212 | 12 43.0 | +92 | 77.94 | +365 | 45 92.1 | +150 | 35.56 | +110 | 38 21.1 | +104 | 65.03 | +354 |
| 6 | 19.4 | 51 20.9 | 32.23 | +271 | 12 60.8 | +178 | 74.36 | +358 | 46 11.4 | +193 | 36.77 | +121 | 38 37.9 | +168 | 61.54 | +349 |
| 6 | 29.4 | 51 52.8 | 31.48 | +319 | 12 85.9 | +251 | 70.94 | +342 | 46 34.0 | +226 | 38.07 | +130 | 38 60.2 | +223 | 58.19 | +335 |
| 7 | 9.4 | 51 89.0 | 30.98 | +362 | 13 18.3 | +324 | 67.75 | +319 | 46 59.6 | +256 | 39.44 | +137 | 38 87.8 | +276 | 55.02 | +317 |
| 7 | 19.4 | 52 28.6 | 30.77 | +396 | 13 57.0 | +387 | 64.90 | +285 | 46 87.5 | +279 | 40.83 | +139 | 39 20.0 | +322 | 52.18 | +284 |
| 7 | 29.3 | 52 70.5 | 30.81 | +419 | 14 00.5 | +435 | 62.46 | +244 | 47 16.9 | +294 | 42.20 | +137 | 39 55.4 | +354 | 49.71 | +247 |
| 8 | 8.3 | 53 14.1 | 31.12 | +436 | 14 48.3 | +478 | 60.49 | +197 | 47 47.5 | +306 | 43.52 | +132 | 39 93.8 | +384 | 47.69 | +202 |
| 8 | 18.3 | 53 58.5 | 31.69 | +444 | 14 98.7 | +504 | 59.11 | +138 | 47 78.5 | +310 | 44.72 | +120 | 40 33.8 | +400 | 46.22 | +147 |
| 8 | 28.2 | 54 02.8 | 32.47 | +443 | 15 50.2 | +515 | 58.29 | +82 | 48 09.4 | +309 | 45.78 | +106 | 40 74.5 | +407 | 45.30 | +92 |
| 9 | 7.2 | 54 46.7 | 33.48 | +439 | 16 02.0 | +518 | 58.11 | +18 | 48 39.8 | +304 | 46.68 | +90 | 41 15.2 | +407 | 44.98 | +32 |
| 9 | 17.2 | 54 89.2 | 34.68 | +425 | 16 52.0 | +500 | 58.58 | -47 | 48 69.3 | +295 | 47.36 | +68 | 41 54.5 | +393 | 45.30 | -32 |
| 9 | 27.2 | 55 30.0 | 36.04 | +408 | 16 99.3 | +473 | 59.66 | -108 | 48 97.4 | +281 | 47.84 | +48 | 41 91.7 | +372 | 46.21 | -91 |
| 10 | 7.1 | 55 68.7 | 37.55 | +387 | 17 42.7 | +434 | 61.34 | -168 | 49 24.1 | +267 | 48.11 | +27 | 42 26.2 | +345 | 47.71 | -150 |
| 10 | 17.1 | 56 04.5 | 39.19 | +358 | 17 80.5 | +378 | 63.56 | -222 | 49 48.7 | +246 | 48.16 | +5 | 42 56.6 | +304 | 49.74 | -203 |
| 10 | 27.1 | 56 37.3 | 40.92 | +328 | 18 12.1 | +316 | 66.21 | -265 | 49 71.3 | +226 | 48.03 | -13 | 42 82.8 | +262 | 52.21 | -247 |
| 11 | 6.1 | 56 66.4 | 42.74 | +291 | 18 36.6 | +245 | 69.23 | -302 | 49 91.6 | +203 | 47.74 | -29 | 43 04.0 | +212 | 55.05 | -284 |
| 11 | 16.0 | 56 91.2 | 44.59 | +248 | 18 52.9 | +163 | 72.48 | -325 | 50 08.9 | +173 | 47.31 | -43 | 43 19.5 | +155 | 58.13 | -308 |
| 11 | 26.0 | 57 11.5 | 46.46 | +203 | 18 61.3 | +84 | 75.84 | -336 | 50 23.4 | +145 | 46.80 | -51 | 43 29.3 | +98 | 61.33 | -320 |
| 12 | 6.0 | 57 26.5 | 48.32 | +150 | 18 60.9 | -4 | 79.20 | -336 | 50 34.5 | +111 | 46.22 | -58 | 43 33.0 | +37 | 64.56 | -323 |
| 12 | 15.9 | 57 35.7 | 50.10 | +92 | 18 51.9 | -90 | 82.41 | -321 | 50 41.9 | +74 | 45.63 | -59 | 43 30.3 | -27 | 67.66 | -310 |
| 12 | 25.9 | 57 39.3 | 51.77 | +36 | 18 34.9 | -170 | 85.37 | -296 | 50 45.6 | +37 | 45.04 | -59 | 43 21.8 | -85 | 70.55 | -289 |
| 12 | 35.9 | 57 36.7 | 53.27 | -26 | 18 10.0 | -249 | 88.01 | -264 | 50 45.2 | -4 | 44.47 | -57 | 43 07.3 | -145 | 73.13 | -258 |
| | | | | -84 | | -318 | | -217 | | -42 | | -52 | | -198 | | -216 |
| Mean Place | 54.139 | 33.53 | 14.975 | 86.66 | 48.005 | 33.24 | 40.367 | 72.92 | | | | | | | | |
| sec δ , tan δ | +1.505 | +1.125 | +2.166 | -1.922 | +1.012 | +0.156 | +1.607 | -1.258 | | | | | | | | |
| $d\alpha(\psi)$, $d\delta(\psi)$ | +0.088 | +0.18 | +0.016 | +0.18 | +0.065 | +0.18 | +0.031 | +0.17 | | | | | | | | |
| $d\alpha(\epsilon)$, $d\delta(\epsilon)$ | -0.034 | +0.89 | +0.057 | +0.90 | -0.005 | +0.90 | +0.037 | +0.90 | | | | | | | | |
| Dble. Trans. | November 24 | | November 24 | | November 25 | | November 25 | | | | | | | | | |

APPARENT PLACES OF STARS, 1986

69

AT UPPER TRANSIT AT GREENWICH

| No. | 166 | | 159 | | 158 | | 1119 | |
|------------------------|-----------------------------------|---------------------------|-----------------------------------|---------------------------|-----------------------------------|---------------------------|-----------------------------------|---------------------------|
| | δ Mensae | | γ Tauri | | 54 Persei | | 208 G. Eridani | |
| Mag. Spect. | 5.62 | K0p | 3.86 | K0 | 5.10 | G5 | 6.65 | B9 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | ^h ^m 4 18 | ^o / - 80 14 | ^h ^m 4 18 | ^o / + 15 35 | ^h ^m 4 19 | ^o / + 34 32 | ^h ^m 4 19 | ^o / - 16 27 |
| ^d 1 -9.1 | ^s 63.648 - 601 | 56.21 - 298 | ^s 60.195 + 56 | " - 20 | ^s 30.457 + 63 | " + 94 | ^s 31.741 + 29 | " - 192 |
| 1 0.9 | 62.837 - 811 | 58.85 - 264 | 60.212 + 17 | 47.03 - 20 | 30.472 + 15 | 11.04 + 85 | 31.741 - 10 | 71.13 - 177 |
| 1 10.9 | 61.834 - 1003 | 58.85 - 225 | 60.212 - 25 | 46.83 - 20 | 30.472 - 33 | 11.89 + 74 | 31.731 - 49 | 72.90 - 159 |
| 1 20.8 | 60.661 - 1173 | 61.10 - 174 | 60.187 - 65 | 46.63 - 21 | 30.439 - 81 | 12.63 + 59 | 31.682 - 87 | 74.49 - 134 |
| 1 30.8 | 59.370 - 1291 | 62.84 - 122 | 60.122 - 99 | 46.42 - 21 | 30.358 - 121 | 13.22 + 41 | 31.595 - 119 | 75.83 - 106 |
| 2 9.8 | 57.982 - 1388 | 64.06 - 68 | 60.023 - 129 | 46.21 - 23 | 30.237 - 157 | 13.63 + 23 | 31.476 - 148 | 76.89 - 77 |
| 2 19.8 | 56.539 - 1443 | 64.74 - 9 | 59.894 - 152 | 45.98 - 22 | 30.080 - 182 | 13.86 + 0 | 31.328 - 168 | 77.66 - 45 |
| 3 1.7 | 55.091 - 1448 | 64.83 + 46 | 59.742 - 163 | 45.76 - 23 | 29.898 - 194 | 13.86 - 19 | 31.160 - 177 | 78.11 - 13 |
| 3 11.7 | 53.656 - 1435 | 64.37 + 99 | 59.579 - 166 | 45.53 - 23 | 29.704 - 198 | 13.67 - 40 | 30.983 - 181 | 78.24 + 18 |
| 3 21.7 | 52.284 - 1372 | 63.38 + 152 | 59.413 - 157 | 45.30 - 20 | 29.506 - 186 | 13.27 - 57 | 30.802 - 171 | 78.06 + 51 |
| 3 31.7 | 51.010 - 1274 | 61.86 + 196 | 59.256 - 136 | 45.10 - 16 | 29.320 - 163 | 12.70 - 71 | 30.631 - 153 | 77.55 + 82 |
| 4 10.6 | 49.847 - 1163 | 59.90 + 239 | 59.120 - 110 | 44.94 - 11 | 29.157 - 130 | 11.99 - 81 | 30.478 - 128 | 76.73 + 112 |
| 4 20.6 | 48.844 - 1003 | 57.51 + 277 | 59.010 - 72 | 44.83 - 1 | 29.027 - 86 | 11.18 - 87 | 30.350 - 92 | 75.61 + 141 |
| 4 30.6 | 48.014 - 830 | 54.74 + 305 | 58.938 - 30 | 44.82 + 9 | 28.941 - 37 | 10.31 - 86 | 30.258 - 53 | 74.20 + 166 |
| 5 10.5 | 47.369 - 645 | 51.69 + 331 | 58.908 + 15 | 44.91 + 22 | 28.904 + 15 | 09.45 - 82 | 30.205 - 10 | 72.54 + 192 |
| 5 20.5 | 46.942 - 427 | 44.90 + 348 | 58.988 + 65 | 45.48 + 35 | 28.919 + 72 | 07.92 - 71 | 30.195 + 38 | 70.62 + 212 |
| 5 30.5 | 46.725 - 217 | 41.36 + 354 | 59.092 + 104 | 45.48 + 48 | 28.991 + 124 | 07.92 - 59 | 30.233 + 82 | 68.50 + 226 |
| 6 9.5 | 46.728 + 3 | 37.78 + 358 | 59.246 + 154 | 45.96 + 72 | 29.115 + 176 | 07.33 - 47 | 30.315 + 127 | 66.24 + 240 |
| 6 19.4 | 46.959 + 231 | 34.30 + 348 | 59.443 + 197 | 46.68 + 83 | 29.291 + 226 | 06.86 - 27 | 30.442 + 170 | 63.84 + 246 |
| 6 29.4 | 47.392 + 433 | 30.99 + 331 | 59.674 + 231 | 47.51 + 93 | 29.517 + 265 | 06.59 - 8 | 30.612 + 204 | 61.38 + 244 |
| 7 9.4 | 48.029 + 637 | 27.92 + 307 | 59.936 + 262 | 49.48 + 104 | 30.083 + 301 | 06.62 + 11 | 30.816 + 238 | 58.94 + 239 |
| 7 19.4 | 48.852 + 823 | 25.21 + 271 | 60.222 + 286 | 50.58 + 110 | 30.412 + 329 | 06.92 + 30 | 31.054 + 263 | 56.55 + 225 |
| 7 29.3 | 49.822 + 970 | 22.90 + 231 | 60.523 + 301 | 51.72 + 114 | 30.759 + 347 | 07.39 + 47 | 31.317 + 282 | 54.30 + 205 |
| 8 8.3 | 50.928 + 1106 | 22.90 + 183 | 60.523 + 314 | 51.72 + 113 | 30.759 + 362 | 07.39 + 63 | 31.599 + 296 | 52.25 + 180 |
| 8 18.3 | 52.127 + 1199 | 21.07 + 125 | 60.837 + 319 | 52.85 + 109 | 31.121 + 368 | 08.02 + 76 | 31.895 + 304 | 50.45 + 146 |
| 8 28.2 | 53.375 + 1248 | 19.14 + 68 | 61.156 + 317 | 53.94 + 101 | 31.489 + 367 | 08.78 + 85 | 32.199 + 304 | 48.99 + 110 |
| 9 7.2 | 54.649 + 1274 | 19.08 + 6 | 61.473 + 315 | 54.95 + 90 | 31.856 + 364 | 09.63 + 95 | 32.503 + 301 | 47.89 + 71 |
| 9 17.2 | 55.888 + 1239 | 19.07 - 59 | 61.788 + 304 | 55.85 + 77 | 32.220 + 352 | 10.58 + 100 | 32.804 + 292 | 47.18 + 26 |
| 9 27.2 | 57.058 + 1170 | 19.67 - 117 | 62.092 + 292 | 56.62 + 63 | 32.572 + 340 | 11.58 + 104 | 33.096 + 279 | 46.92 - 16 |
| 10 7.1 | 58.124 + 1066 | 20.84 - 177 | 62.384 + 278 | 57.25 + 48 | 32.912 + 323 | 12.62 + 108 | 33.375 + 263 | 47.08 - 58 |
| 10 17.1 | 59.030 + 906 | 22.61 - 228 | 62.662 + 258 | 57.73 + 31 | 33.235 + 301 | 13.70 + 108 | 33.638 + 242 | 47.66 - 99 |
| 10 27.1 | 59.758 + 728 | 24.89 - 269 | 62.920 + 238 | 58.04 + 19 | 33.536 + 277 | 14.78 + 108 | 33.880 + 218 | 48.65 - 131 |
| 11 6.1 | 60.278 + 520 | 27.58 - 305 | 63.158 + 214 | 58.23 + 6 | 33.813 + 250 | 15.86 + 108 | 34.098 + 193 | 49.96 - 161 |
| 11 16.0 | 60.554 + 276 | 30.63 - 325 | 63.372 + 185 | 58.29 - 5 | 34.063 + 216 | 16.94 + 107 | 34.291 + 161 | 51.57 - 183 |
| 11 26.0 | 60.595 + 41 | 33.88 - 333 | 63.557 + 155 | 58.24 - 11 | 34.279 + 181 | 18.01 + 105 | 34.452 + 129 | 53.40 - 195 |
| 12 6.0 | 60.384 - 211 | 37.21 - 332 | 63.712 + 121 | 58.13 - 17 | 34.460 + 140 | 19.06 + 102 | 34.581 + 94 | 55.35 - 202 |
| 12 15.9 | 59.924 - 460 | 40.53 - 315 | 63.833 + 83 | 57.96 - 20 | 34.600 + 94 | 20.08 + 97 | 34.675 + 54 | 57.37 - 199 |
| 12 25.9 | 59.244 - 680 | 43.68 - 288 | 63.916 + 45 | 57.76 - 21 | 34.694 + 49 | 21.05 + 89 | 34.729 + 17 | 59.36 - 188 |
| 12 35.9 | 58.346 - 898 | 46.56 - 253 | 63.961 + 2 | 57.55 - 22 | 34.743 + 2 | 21.94 + 80 | 34.746 - 24 | 61.24 - 174 |
| | 58.346 - 1078 | 49.09 - 207 | 63.963 - 38 | 57.33 - 23 | 34.741 - 49 | 22.74 + 66 | 34.722 - 63 | 62.98 - 151 |
| Mean Place | 52.251 | 47.29 | 61.431 | 44.69 | 31.904 | 06.03 | 32.351 | 68.56 |
| sec δ, tan δ | +5.903 | -5.818 | +1.038 | +0.279 | +1.214 | +0.688 | +1.043 | -0.296 |
| dα(ψ), dδ(ψ) | -0.078 | +0.17 | +0.068 | +0.17 | +0.078 | +0.17 | +0.054 | +0.17 |
| dα(ε), dδ(ε) | +0.166 | +0.90 | -0.008 | +0.90 | -0.019 | +0.91 | +0.008 | +0.91 |
| Dbles. Trans. | November 26 | | November 26 | | November 26 | | November 26 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 161 | | 163 | | 162 | | 1120 | |
|--------------|-------------------|--------------------|--------------------|--------------------|-------------------|------------------|-------------------|--------------------|
| | 212 G. Eridani | | η Reticuli | | δ Tauri | | ξ Eridani | |
| Mag. Spect. | 5.31 | A0 | 5.18 | K0 | 3.93 | K0 | 5.23 | A2 |
| U.T. | R.A. | | R.A. | | R.A. | | R.A. | |
| | h | Dec. | h | Dec. | h | Dec. | h | Dec. |
| | 4 20 | - 20 39 | 4 21 | - 63 24 | 4 22 | + 17 30 | 4 22 | - 3 46 |
| | ^s + 23 | ^o - 211 | ^s - 137 | ^o - 312 | ^s + 60 | ^o - 8 | ^s + 46 | ^o - 131 |
| 1 | 0.9 | 03.153 | 79.70 | 47.206 | 73.64 | 08.042 | 59.557 | 33.98 |
| 1 | 10.9 | 03.138 | 81.63 | 46.989 | 76.43 | 08.062 | 59.565 | 35.19 |
| 1 | 20.8 | 03.082 | 83.37 | 46.695 | 78.87 | 08.040 | 59.534 | 36.30 |
| 1 | 30.8 | 02.987 | 84.83 | 46.331 | 80.82 | 07.976 | 59.464 | 37.26 |
| 2 | 9.8 | 02.704 | 86.80 | 45.915 | 82.25 | 07.878 | 59.363 | 38.04 |
| 2 | 19.8 | 02.528 | 87.26 | 44.965 | 83.16 | 07.748 | 59.232 | 38.64 |
| 3 | 1.7 | 02.343 | 87.37 | 44.468 | 83.24 | 07.431 | 58.917 | 39.24 |
| 3 | 11.7 | 02.154 | 87.13 | 43.970 | 82.46 | 07.262 | 58.750 | 39.25 |
| 3 | 21.7 | 01.975 | 86.53 | 43.493 | 81.12 | 07.103 | 58.591 | 39.03 |
| 3 | 31.7 | 01.814 | 85.59 | 43.054 | 79.32 | 06.964 | 58.451 | 38.60 |
| 4 | 10.6 | 01.679 | 84.33 | 42.658 | 77.06 | 06.851 | 58.334 | 37.96 |
| 4 | 20.6 | 01.579 | 82.76 | 42.327 | 74.39 | 06.776 | 58.253 | 37.10 |
| 4 | 30.6 | 01.520 | 80.92 | 42.066 | 71.41 | 06.744 | 58.211 | 36.04 |
| 5 | 10.5 | 01.504 | 78.82 | 41.881 | 68.12 | 06.757 | 58.210 | 34.77 |
| 5 | 20.5 | 01.537 | 76.50 | 41.785 | 64.64 | 06.821 | 58.257 | 33.31 |
| 5 | 30.5 | 01.615 | 74.04 | 41.772 | 61.06 | 06.923 | 58.346 | 31.70 |
| 6 | 9.5 | 01.738 | 71.46 | 41.847 | 57.41 | 07.076 | 58.479 | 29.94 |
| 6 | 19.4 | 01.905 | 68.83 | 42.011 | 53.82 | 07.273 | 58.654 | 28.09 |
| 6 | 29.4 | 02.108 | 66.23 | 42.251 | 50.38 | 07.504 | 58.862 | 26.20 |
| 7 | 9.4 | 02.345 | 63.69 | 42.567 | 47.14 | 07.767 | 59.101 | 24.30 |
| 7 | 19.4 | 02.609 | 61.33 | 42.950 | 44.24 | 08.054 | 59.365 | 22.47 |
| 7 | 29.3 | 02.893 | 59.19 | 43.385 | 41.74 | 08.357 | 59.645 | 20.75 |
| 8 | 8.3 | 03.192 | 57.33 | 43.867 | 39.71 | 08.674 | 59.939 | 19.18 |
| 8 | 18.3 | 03.498 | 55.84 | 44.379 | 38.24 | 08.995 | 60.239 | 17.84 |
| 8 | 28.2 | 03.806 | 54.74 | 44.905 | 37.35 | 09.316 | 60.540 | 16.75 |
| 9 | 7.2 | 04.111 | 54.07 | 45.437 | 37.08 | 09.634 | 60.838 | 15.95 |
| 9 | 17.2 | 04.407 | 53.88 | 45.955 | 37.48 | 09.942 | 61.127 | 15.49 |
| 9 | 27.2 | 04.690 | 54.13 | 46.446 | 38.48 | 10.239 | 61.404 | 15.34 |
| 10 | 7.1 | 04.956 | 54.84 | 46.900 | 40.10 | 10.521 | 61.667 | 15.52 |
| 10 | 17.1 | 05.200 | 55.98 | 47.298 | 42.27 | 10.784 | 61.911 | 16.01 |
| 10 | 27.1 | 05.420 | 57.46 | 47.634 | 44.88 | 11.027 | 62.134 | 16.77 |
| 11 | 6.1 | 05.613 | 59.26 | 47.899 | 47.88 | 11.246 | 62.334 | 17.76 |
| 11 | 16.0 | 05.773 | 61.29 | 48.078 | 51.12 | 11.437 | 62.505 | 18.94 |
| 11 | 26.0 | 05.900 | 63.45 | 48.176 | 54.49 | 11.597 | 62.647 | 20.22 |
| 12 | 6.0 | 05.990 | 65.67 | 48.183 | 57.88 | 11.723 | 62.755 | 21.57 |
| 12 | 15.9 | 06.040 | 67.85 | 48.100 | 61.14 | 11.810 | 62.826 | 22.92 |
| 12 | 25.9 | 06.051 | 69.92 | 47.934 | 64.16 | 11.858 | 62.860 | 24.21 |
| 12 | 35.9 | 06.020 | 71.82 | 47.684 | 66.87 | 11.863 | 62.854 | 25.43 |
| Mean Place | 03.642 | 76.56 | 44.489 | 65.86 | 09.296 | 41.70 | 60.452 | 33.63 |
| sec δ, tan δ | +1.069 | -0.377 | +2.235 | -1.999 | +1.049 | +0.316 | +1.002 | -0.066 |
| dα(ψ), dδ(ψ) | +0.052 | +0.17 | +0.013 | +0.17 | +0.069 | +0.16 | +0.060 | +0.16 |
| dα(ε), dδ(ε) | +0.011 | +0.91 | +0.055 | +0.91 | -0.009 | +0.91 | +0.002 | +0.91 |
| Dble. Trans. | November 26 | | November 26 | | November 26 | | November 27 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 1121 | | 164 | | 1123 | | 1122 | | |
|--------------|-------------|--------------|-------------|--------------|---------------------|--------------|-----------------------------|--------------|------------|
| | 43 Eridani | | ε Tauri | | Bradley 615 (Tauri) | | B.D. +69° 258 (Camelopardi) | | |
| Mag.Spect. | 4.06 | K5 | 3.63 | K0 | 5.50 | B8 | 7.02 | K0 | |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " | |
| | 4 23 | -34 02 | 4 27 | +19 09 | 4 27 | +1 21 | 4 28 | +69 20 | |
| 1 | -9.1 | 31 754 + 3 | 56 51 -262 | 48 358 + 66 | 07.71 + 0 | 49.194 + 54 | 06.41 -104 | 24.749 + 59 | 66.43 +279 |
| 1 | 0.9 | 31 712 - 42 | 58 91 -240 | 48 383 + 25 | 07.70 - 1 | 49.211 + 17 | 05.44 - 97 | 24.694 - 55 | 69.04 +261 |
| 1 | 10.9 | 31 626 - 86 | 61 05 -214 | 48 366 - 17 | 07.68 - 2 | 49.188 - 23 | 04.54 - 90 | 24.526 - 168 | 71.42 +238 |
| 1 | 20.8 | 31 497 - 129 | 62 82 -177 | 48 306 - 60 | 07.62 - 6 | 49.125 - 63 | 03.76 - 78 | 24.526 - 280 | 73.45 +203 |
| 1 | 30.8 | 31 334 - 163 | 64 19 -137 | 48 210 - 96 | 07.54 - 8 | 49.030 - 95 | 03.12 - 64 | 23.877 - 369 | 75.08 +163 |
| 2 | 9.8 | 31 140 - 194 | 65 15 - 96 | 48 081 - 129 | 07.42 - 12 | 48 903 - 127 | 02.59 - 53 | 23 429 - 448 | 76.25 +117 |
| 2 | 19.8 | 30 925 - 215 | 65 65 - 50 | 47 927 - 154 | 07.26 - 16 | 48 755 - 148 | 02.23 - 36 | 22 927 - 502 | 76.90 + 65 |
| 3 | 1.7 | 30 699 - 226 | 65 69 - 4 | 47 962 - 165 | 07.06 - 20 | 48 595 - 160 | 02.01 - 22 | 22 401 - 526 | 77.03 + 13 |
| 3 | 11.7 | 30 471 - 228 | 65 30 + 39 | 47 762 - 171 | 07.06 - 23 | 48 595 - 166 | 02.01 - 7 | 22 401 - 533 | 77.03 - 39 |
| 3 | 21.7 | 30 252 - 219 | 64 45 + 85 | 47 428 - 163 | 06.58 - 25 | 48 272 - 157 | 02.05 + 11 | 21 364 - 504 | 75.74 - 90 |
| 3 | 31.7 | 30 054 - 198 | 63 20 +125 | 47 285 - 143 | 06.33 - 25 | 48 132 - 140 | 02.31 + 26 | 20 913 - 451 | 74.40 -134 |
| 4 | 10.6 | 29 882 - 172 | 61 55 +165 | 47 167 - 118 | 06.11 - 22 | 48 015 - 117 | 02.75 + 44 | 20 532 - 381 | 72.68 -172 |
| 4 | 20.6 | 29 749 - 133 | 59 53 +202 | 47 088 - 79 | 05.94 - 17 | 47 934 - 81 | 03.38 + 63 | 20 247 - 285 | 70.64 -204 |
| 4 | 30.6 | 29 659 - 90 | 57 20 +233 | 47 050 - 38 | 05.86 - 8 | 47 892 - 42 | 04.18 + 80 | 20 068 - 179 | 68.41 -223 |
| 5 | 10.5 | 29 616 - 43 | 54 59 +261 | 47 058 + 8 | 05.87 + 1 | 47 891 - 1 | 05.17 + 99 | 20 002 - 66 | 66.02 -239 |
| 5 | 20.5 | 29 625 + 9 | 51 75 +284 | 47 118 + 60 | 06.02 + 15 | 47 937 + 46 | 06.33 +116 | 20 060 + 58 | 63.60 -242 |
| 5 | 30.5 | 29 684 + 59 | 48 78 +297 | 47 218 + 100 | 06.13 + 11 | 48 026 + 89 | 07.64 +131 | 20 235 + 175 | 61.23 -237 |
| 6 | 9.5 | 29 793 + 109 | 45 69 +309 | 47 365 + 147 | 06.72 + 59 | 48 159 + 133 | 09.11 +147 | 20 524 + 289 | 58.97 -226 |
| 6 | 19.4 | 29 951 + 158 | 42 59 +310 | 47 560 + 195 | 07.31 + 59 | 48 333 + 174 | 10.68 +157 | 20 924 + 400 | 56.92 -205 |
| 6 | 29.4 | 30 151 + 200 | 39 56 +303 | 47 789 + 229 | 08.01 + 70 | 48 541 + 208 | 12.31 +163 | 21 415 + 491 | 55.12 -180 |
| 7 | 9.4 | 30 390 + 239 | 36 65 +291 | 48 050 + 261 | 08.83 + 82 | 48 780 + 239 | 13.98 +167 | 21 992 + 577 | 53.60 -152 |
| 7 | 19.4 | 30 662 + 272 | 33 98 +267 | 48 336 + 296 | 09.73 + 90 | 49 045 + 265 | 15.61 +163 | 22 642 + 650 | 52.43 -117 |
| 7 | 29.3 | 30 957 + 295 | 31 60 +238 | 48 639 + 303 | 10.69 + 96 | 49 326 + 281 | 17.17 +156 | 23 341 + 699 | 51.62 - 81 |
| 8 | 8.3 | 31 273 + 316 | 29 58 +202 | 48 957 + 318 | 11.68 + 99 | 49 621 + 295 | 18.62 +145 | 24 086 + 745 | 51.18 - 44 |
| 8 | 18.3 | 31 600 + 327 | 28 01 +157 | 49 280 + 323 | 12.65 + 97 | 49 922 + 301 | 19.88 +126 | 24 856 + 770 | 51.15 - 3 |
| 8 | 28.2 | 31 930 + 330 | 26 92 +109 | 49 604 + 324 | 13.58 + 93 | 50 224 + 302 | 20.94 +106 | 25 635 + 779 | 51.47 + 32 |
| 9 | 7.2 | 32 260 + 330 | 26 35 + 57 | 49 926 + 322 | 14.44 + 86 | 50 524 + 300 | 21.76 + 82 | 26 419 + 784 | 52.19 + 72 |
| 9 | 17.2 | 32 580 + 320 | 26 35 + 0 | 50 239 + 313 | 15.21 + 77 | 50 816 + 292 | 22.30 + 54 | 27 187 + 768 | 53.27 +108 |
| 9 | 27.2 | 32 886 + 306 | 26 87 - 52 | 50 540 + 301 | 15.86 + 65 | 51 097 + 281 | 22.56 + 26 | 27 929 + 742 | 54.69 +142 |
| 10 | 7.1 | 33 175 + 289 | 27 93 -106 | 50 829 + 289 | 16.40 + 54 | 51 365 + 268 | 22.54 - 2 | 28 639 + 710 | 56.44 +175 |
| 10 | 17.1 | 33 436 + 261 | 29 49 -156 | 51 099 + 270 | 16.81 + 41 | 51 615 + 250 | 22.24 - 30 | 29 296 + 657 | 58.49 +205 |
| 10 | 27.1 | 33 669 + 233 | 31 45 -196 | 51 349 + 250 | 17.12 + 31 | 51 845 + 230 | 21.71 - 53 | 29 896 + 600 | 60.78 +229 |
| 11 | 6.1 | 33 869 + 200 | 33 78 -233 | 51 576 + 227 | 17.33 + 21 | 52 052 + 207 | 20.97 - 74 | 30 427 + 531 | 63.31 +253 |
| 11 | 16.0 | 34 030 + 161 | 36 36 -258 | 51 774 + 198 | 17.46 + 13 | 52 231 + 179 | 20.07 - 90 | 30 870 + 443 | 66.01 +270 |
| 11 | 26.0 | 34 153 + 123 | 39 08 -272 | 51 942 + 168 | 17.53 + 7 | 52 382 + 151 | 19.07 -100 | 31 225 + 355 | 68.81 +280 |
| 12 | 6.0 | 34 231 + 78 | 41 87 -279 | 52 076 + 134 | 17.56 + 3 | 52 500 + 118 | 18.00 -107 | 31 475 + 250 | 71.68 +287 |
| 12 | 15.9 | 34 263 + 32 | 44 59 -272 | 52 169 + 93 | 17.56 + 0 | 52 580 + 80 | 16.92 -108 | 31 611 + 136 | 74.49 +281 |
| 12 | 25.9 | 34 252 - 11 | 47 15 -256 | 52 224 + 55 | 17.54 - 2 | 52 623 + 43 | 15.89 -103 | 31 636 + 25 | 77.21 +272 |
| 12 | 35.9 | 34 193 - 59 | 49 49 -234 | 52 234 + 10 | 17.50 - 4 | 52 626 + 3 | 14.91 - 98 | 31 540 - 96 | 79.74 +253 |
| | | 34 193 - 102 | 49 49 -201 | 52 234 - 32 | 17.50 - 5 | 52 626 - 37 | 14.91 - 87 | 31 540 - 207 | 79.74 +222 |
| Mean Place | 31.740 | 51.91 | 49.618 | 04.46 | 50.179 | 05.68 | 26.204 | 58.16 | |
| sec δ, tan δ | +1.207 | -0.676 | +1.059 | +0.347 | +1.000 | +0.024 | +2.836 | +2.653 | |
| dα(ψ), dδ(ψ) | +0.045 | +0.16 | +0.070 | +0.16 | +0.062 | +0.16 | +0.126 | +0.15 | |
| dα(ε), dδ(ε) | +0.018 | +0.91 | -0.009 | +0.92 | -0.001 | +0.92 | -0.069 | +0.92 | |
| Dble.Trans. | November 27 | | November 28 | | November 28 | | November 28 | | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 167 | | 165 | | 1124 | | 1125 | | | | | | | | | | |
|---|----------------|--------------|-------------------|--------------|-------------|--------------|--------------|--------------|--------|--------|-------|-------|------|--------|-------|-------|------|
| | δ Caeli | | 1 Camelopardi* f. | | 57 Persei | | ρ Tauri | | | | | | | | | | |
| Mag.Spect. | 5.16 | B3 | 5.86 | B1 | 6.07 | F0 | 4.75 | A5 | | | | | | | | | |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | | | | | | | | | |
| | h m | $^{\circ}$ / | h m | $^{\circ}$ / | h m | $^{\circ}$ / | h m | $^{\circ}$ / | | | | | | | | | |
| | 4 30 | - 44 58 | 4 30 | + 53 52 | 4 32 | + 43 02 | 4 33 | + 14 49 | | | | | | | | | |
| 1 | -9.1 | 25 926 | - 19 | 61.05 | -296 | 55 879 | + 78 | 64.37 | +204 | 26 253 | + 80 | 15 80 | +143 | 03 668 | + 69 | 03.32 | - 27 |
| 1 | 0.9 | 25.854 | - 72 | 63.76 | -271 | 55 889 | + 10 | 66.28 | +191 | 26 279 | + 26 | 17.14 | +134 | 03 697 | + 29 | 03.06 | - 26 |
| 1 | 10.9 | 25.730 | - 124 | 66.16 | -240 | 55 830 | - 59 | 68.01 | +173 | 26 248 | - 31 | 18.35 | +121 | 03 683 | - 14 | 02.81 | - 25 |
| 1 | 20.9 | 25.557 | - 173 | 68.16 | -200 | 55 702 | - 128 | 69.47 | +146 | 26 161 | - 87 | 19.36 | +101 | 03 628 | - 55 | 02.58 | - 23 |
| 1 | 30.8 | 25.345 | - 212 | 69.71 | -155 | 55 517 | - 185 | 70.63 | +116 | 26 027 | - 134 | 20.15 | + 79 | 03 536 | - 92 | 02.36 | - 22 |
| 2 | 9.8 | 25.098 | - 247 | 70.79 | -108 | 55 282 | - 235 | 71.44 | + 81 | 25 851 | - 176 | 20.68 | + 53 | 03 412 | - 124 | 02.14 | - 22 |
| 2 | 19.8 | 24.826 | - 272 | 71.34 | - 55 | 55 009 | - 273 | 71.85 | + 41 | 25 643 | - 208 | 20.92 | + 24 | 03.263 | - 149 | 01.94 | - 20 |
| 3 | 1.7 | 24.544 | - 282 | 71.39 | - 5 | 54.719 | - 290 | 71.88 | + 3 | 25 419 | - 224 | 20.88 | - 4 | 03.101 | - 162 | 01.74 | - 20 |
| 3 | 11.7 | 24.257 | - 287 | 70.95 | + 44 | 54.423 | - 296 | 71.51 | - 37 | 25 189 | - 230 | 20.54 | - 34 | 02 933 | - 168 | 01.56 | - 18 |
| 3 | 21.7 | 23.980 | - 277 | 69.98 | + 97 | 54.140 | - 283 | 70.76 | - 75 | 24.969 | - 220 | 19.94 | - 60 | 02.772 | - 161 | 01.40 | - 16 |
| 3 | 31.7 | 23.726 | - 254 | 68.57 | +141 | 53 890 | - 250 | 69.70 | -106 | 24.774 | - 195 | 19.11 | - 83 | 02 629 | - 143 | 01.29 | - 11 |
| 4 | 10.6 | 23.501 | - 225 | 66.72 | +185 | 53 680 | - 210 | 68.35 | -135 | 24.613 | - 161 | 18.09 | -102 | 02 511 | - 118 | 01.23 | - 6 |
| 4 | 20.6 | 23.318 | - 183 | 64.46 | +226 | 53 530 | - 150 | 66.79 | -156 | 24 499 | - 114 | 16.93 | -116 | 02 428 | - 83 | 01.27 | + 4 |
| 4 | 30.6 | 23.183 | - 135 | 61.88 | +258 | 53 445 | - 85 | 65.11 | -168 | 24 438 | - 61 | 15.71 | -122 | 02 387 | - 41 | 01.40 | + 13 |
| 5 | 10.6 | 23.099 | - 84 | 58.99 | +289 | 53 429 | - 16 | 63.35 | -176 | 24 435 | - 3 | 14.46 | -125 | 02 389 | + 2 | 01.65 | + 25 |
| 5 | 20.5 | 23.074 | - 25 | 55 86 | +313 | 53 491 | + 62 | 61.60 | -175 | 24 495 | + 60 | 13.27 | -119 | 02 440 | + 51 | 02.03 | + 38 |
| 5 | 30.5 | 23.106 | + 32 | 52.59 | +327 | 53 625 | + 134 | 59.92 | -168 | 24.613 | + 118 | 12.16 | -111 | 02 534 | + 94 | 02.50 | + 47 |
| 6 | 9.5 | 23.195 | + 89 | 49.21 | +338 | 53 829 | + 204 | 58.36 | -156 | 24 790 | + 177 | 11.18 | - 98 | 03 895 | + 138 | 03.21 | + 71 |
| 6 | 19.4 | 23.342 | + 147 | 45.84 | +337 | 54 101 | + 272 | 57.00 | -136 | 25 022 | + 232 | 10.37 | - 81 | 02 856 | + 184 | 04.03 | + 82 |
| 6 | 29.4 | 23 538 | + 196 | 42.56 | +328 | 54 429 | + 328 | 55.85 | -115 | 25 300 | + 278 | 09.75 | - 62 | 03 075 | + 219 | 04.94 | + 91 |
| 7 | 9.4 | 23.781 | + 243 | 39.42 | +314 | 54 808 | + 379 | 54.95 | - 90 | 25 619 | + 319 | 09.34 | - 41 | 03 325 | + 250 | 05.95 | +101 |
| 7 | 19.4 | 24 065 | + 284 | 36.56 | +286 | 55 230 | + 422 | 54.33 | - 62 | 25 973 | + 354 | 09.17 | - 17 | 03 602 | + 277 | 07.02 | +107 |
| 7 | 29.3 | 24 380 | + 315 | 34.03 | +253 | 55 680 | + 450 | 53.99 | - 34 | 26 349 | + 376 | 09.20 | + 3 | 03 895 | + 293 | 08.10 | +108 |
| 8 | 8.3 | 24.722 | + 342 | 31.90 | +213 | 56 156 | + 476 | 53.94 | - 5 | 26 744 | + 395 | 09.45 | + 25 | 04 203 | + 308 | 09.17 | +107 |
| 8 | 18.3 | 25.081 | + 359 | 30.28 | +162 | 56 645 | + 489 | 54.18 | + 24 | 27 150 | + 406 | 09.90 | + 45 | 04 518 | + 315 | 10.20 | +103 |
| 8 | 28.3 | 25.447 | + 366 | 29.18 | +110 | 57 137 | + 492 | 54.68 | + 50 | 27 557 | + 407 | 10.52 | + 62 | 04 833 | + 315 | 11.13 | + 93 |
| 9 | 7.2 | 25.817 | + 370 | 28.65 | + 53 | 57 630 | + 493 | 55.44 | + 76 | 27 965 | + 408 | 11.31 | + 79 | 05 148 | + 315 | 11.96 | + 83 |
| 9 | 17.2 | 26.177 | + 360 | 28.75 | - 10 | 58 112 | + 482 | 56.45 | +101 | 28 363 | + 398 | 12.25 | + 94 | 05 455 | + 307 | 12.64 | + 68 |
| 9 | 27.2 | 26 522 | + 345 | 29.42 | - 67 | 58 578 | + 466 | 57.68 | +123 | 28 748 | + 385 | 13.31 | +106 | 05 751 | + 296 | 13.18 | + 54 |
| 10 | 7.1 | 26.848 | + 326 | 30.68 | -126 | 59 026 | + 448 | 59.12 | +144 | 29 119 | + 371 | 14.48 | +117 | 06 036 | + 285 | 13.55 | + 37 |
| 10 | 17.1 | 27.141 | + 293 | 32.48 | -180 | 59 444 | + 418 | 60.74 | +162 | 29 466 | + 347 | 15.75 | +127 | 06 302 | + 266 | 13.77 | + 22 |
| 10 | 27.1 | 27 401 | + 260 | 34.72 | -224 | 59 830 | + 386 | 62.52 | +178 | 29 788 | + 322 | 17.09 | +134 | 06 550 | + 248 | 13.85 | + 8 |
| 11 | 6.1 | 27.620 | + 172 | 37.37 | -265 | 60 178 | + 348 | 64.44 | +192 | 30 080 | + 292 | 18.51 | +142 | 06 775 | + 225 | 13.80 | - 5 |
| 11 | 16.0 | 27.792 | + 124 | 40.28 | -291 | 60 477 | + 299 | 66.46 | +202 | 30 334 | + 254 | 19.96 | +145 | 06 972 | + 197 | 13.65 | - 15 |
| 11 | 26.0 | 27.916 | + 124 | 43.35 | -307 | 60 726 | + 249 | 68.54 | +208 | 30 550 | + 216 | 21.45 | +149 | 07 141 | + 169 | 13.44 | - 21 |
| 12 | 6.0 | 27.988 | + 72 | 46.50 | -315 | 60 915 | + 189 | 70.65 | +211 | 30 719 | + 169 | 22.94 | +149 | 07 276 | + 135 | 13.17 | - 27 |
| 12 | 16.0 | 28 003 | + 15 | 49.56 | -306 | 61 039 | + 124 | 72.71 | +206 | 30 835 | + 116 | 24.40 | +146 | 07 372 | + 96 | 12.89 | - 28 |
| 12 | 25.9 | 27.966 | - 37 | 52.45 | -289 | 61 097 | + 58 | 74.69 | +198 | 30 899 | + 64 | 25.78 | +138 | 07 429 | + 57 | 12.61 | - 28 |
| 12 | 35.9 | 27 873 | - 93 | 55.09 | -264 | 61 082 | - 15 | 76.53 | +184 | 30 905 | + 6 | 27.06 | +128 | 07 443 | + 14 | 12.33 | - 28 |
| | | - 142 | - 227 | - 227 | - 83 | - 83 | - 83 | - 83 | +160 | - 50 | - 50 | +111 | - 28 | - 28 | - 26 | - 26 | - 26 |
| Mean Place | 25.278 | 56.11 | | 57.403 | 57.16 | 27.726 | 09.59 | 04.857 | 00.42 | | | | | | | | |
| sec δ , tan δ | +1.414 | -0.999 | | +1.697 | +1.370 | +1.368 | +0.934 | +1.034 | +0.265 | | | | | | | | |
| $d\alpha(\psi)$, $d\delta(\psi)$ | +0.037 | +0.15 | | +0.095 | +0.15 | +0.084 | +0.15 | +0.068 | +0.15 | | | | | | | | |
| $d\alpha(\epsilon)$, $d\delta(\epsilon)$ | +0.025 | +0.92 | | -0.035 | +0.93 | -0.023 | +0.93 | -0.007 | +0.93 | | | | | | | | |
| Dble.Trans. | November 29 | | November 29 | | November 29 | | November 29 | | | | | | | | | | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 171 | | 170 | | 168 | | 169 | |
|---|--------------------------|-------------------------|--------------------------|-------------------------|-------------------------------|-------------------------|--------------------------|-------------------------|
| | α Doradus | | ν^2 Eridani | | α Tauri (Aldebaran) | | ν Eridani | |
| Mag.Spect. | 3.47 | A0p | 3.88 | K0 | 1.06 | K5 | 4.12 | B2 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " |
| | 4 33 | -55 03 | 4 34 | -30 34 | 4 35 | +16 28 | 4 35 | -3 22 |
| 1 -9.1 | 43 800 ^s - 57 | 86 84 ["] -315 | 61 437 ^s + 21 | 84 98 ["] -257 | 07 487 ^s + 72 | 61 72 ["] - 17 | 37 738 ^s + 58 | 45 13 ["] -133 |
| 1 0.9 | 43 678 - 185 | 89 71 -287 | 61 415 - 22 | 87 35 -237 | 07 518 + 31 | 61 54 - 18 | 37 757 + 19 | 46 37 -124 |
| 1 10.9 | 43 493 - 245 | 92 26 -210 | 61 348 - 67 | 89 49 -180 | 07 506 - 55 | 61 37 - 16 | 37 736 - 61 | 47 50 -113 |
| 1 20.9 | 43 248 - 291 | 94 36 -162 | 61 237 - 111 | 91 29 -143 | 07 451 - 91 | 61 21 - 17 | 37 675 - 95 | 48 49 - 80 |
| 1 30.8 | 42 957 | 95 98 | 61 092 | 92 72 | 07 360 | 61 04 | 37 580 | 49 29 |
| 2 9.8 | 42 625 - 332 | 97 10 -112 | 60 914 - 178 | 93 77 -105 | 07 236 - 124 | 60 87 - 17 | 37 453 - 127 | 49 92 - 63 |
| 2 19.8 | 42 265 - 360 | 97 66 - 56 | 60 712 - 202 | 94 38 - 61 | 07 086 - 150 | 60 69 - 18 | 37 304 - 149 | 50 35 - 43 |
| 3 1.7 | 41 893 - 372 | 97 67 - 1 | 60 498 - 214 | 94 56 - 18 | 06 923 - 163 | 60 50 - 19 | 37 141 - 163 | 50 59 - 24 |
| 3 11.7 | 41 517 - 376 | 97 16 + 51 | 60 279 - 219 | 94 33 + 23 | 06 753 - 170 | 60 30 - 20 | 36 972 - 169 | 50 62 + 3 |
| 3 21.7 | 41 153 - 364 | 96 10 +106 | 60 067 - 212 | 93 65 + 68 | 06 591 - 162 | 60 12 - 18 | 36 809 - 163 | 50 44 + 18 |
| 3 31.7 | 40 816 - 337 | 94 56 +154 | 59 873 - 194 | 92 58 +107 | 06 446 - 145 | 59 96 - 16 | 36 663 - 146 | 50 06 + 38 |
| 4 10.6 | 40 513 - 303 | 92 57 +199 | 59 704 - 169 | 91 12 +146 | 06 325 - 121 | 59 84 - 12 | 36 540 - 123 | 49 47 + 59 |
| 4 20.6 | 40 259 - 254 | 90 14 +243 | 59 570 - 134 | 89 30 +182 | 06 241 - 84 | 59 80 - 4 | 36 450 - 90 | 48 65 + 82 |
| 4 30.6 | 40 061 - 198 | 87 38 +276 | 59 478 - 92 | 87 17 +213 | 06 198 - 43 | 59 85 + 5 | 36 398 - 52 | 47 64 +101 |
| 5 10.6 | 39 923 - 138 | 84 30 +308 | 59 430 - 48 | 84 75 +242 | 06 199 + 1 | 60 00 + 15 | 36 387 - 11 | 46 43 +121 |
| 5 20.5 | 39 855 - 68 | 80 99 +331 | 59 432 + 2 | 82 09 +266 | 06 250 + 51 | 60 28 + 28 | 36 422 + 35 | 45 03 +140 |
| 5 30.5 | 39 855 + 0 | 77 54 +345 | 59 483 + 51 | 79 29 +280 | 06 344 + 94 | 60 63 + 35 | 36 500 + 78 | 43 48 +155 |
| 6 9.5 | 39 924 + 69 | 73 99 +355 | 59 582 + 99 | 76 34 +295 | 06 481 + 137 | 61 24 + 61 | 36 622 + 122 | 41 78 +170 |
| 6 19.4 | 40 063 + 139 | 70 46 +353 | 59 729 + 147 | 73 37 +297 | 06 665 + 184 | 61 96 + 72 | 36 785 + 163 | 39 99 +179 |
| 6 29.4 | 40 264 + 201 | 67 04 +342 | 59 917 + 188 | 70 44 +293 | 06 885 + 220 | 62 77 + 81 | 36 983 + 198 | 38 15 +184 |
| 7 9.4 | 40 524 + 260 | 63 78 +326 | 60 142 + 225 | 67 60 +284 | 07 136 + 251 | 63 68 + 91 | 37 213 + 230 | 36 30 +185 |
| 7 19.4 | 40 838 + 314 | 60 82 +296 | 60 401 + 259 | 64 97 +263 | 07 414 + 278 | 64 65 + 97 | 37 470 + 257 | 34 50 +180 |
| 7 29.3 | 41 192 + 354 | 58 23 +259 | 60 683 + 282 | 62 60 +237 | 07 709 + 295 | 65 66 +101 | 37 744 + 274 | 32 81 +169 |
| 8 8.3 | 41 583 + 391 | 56 06 +217 | 60 986 + 303 | 60 56 +204 | 08 019 + 310 | 66 67 +101 | 38 033 + 289 | 31 26 +155 |
| 8 18.3 | 41 999 + 416 | 54 43 +163 | 61 302 + 316 | 58 95 +161 | 08 336 + 317 | 67 65 + 98 | 38 330 + 297 | 29 94 +132 |
| 8 28.3 | 42 427 + 428 | 53 35 +108 | 61 622 + 320 | 57 79 +116 | 08 654 + 318 | 68 55 + 90 | 38 629 + 299 | 28 86 +108 |
| 9 7.2 | 42 861 + 434 | 52 88 + 47 | 61 944 + 322 | 57 12 + 67 | 08 971 + 317 | 69 36 + 81 | 38 928 + 299 | 28 07 + 79 |
| 9 17.2 | 43 287 + 426 | 53 06 - 18 | 62 258 + 314 | 57 00 + 12 | 09 281 + 310 | 70 05 + 69 | 38 928 + 292 | 27 61 + 46 |
| 9 27.2 | 43 695 + 408 | 53 85 - 79 | 62 561 + 303 | 57 39 - 39 | 09 581 + 300 | 70 60 + 55 | 39 220 + 282 | 27 46 + 15 |
| 10 7.1 | 44 078 + 383 | 55 25 -140 | 62 849 + 288 | 58 31 - 92 | 09 869 + 288 | 71 01 + 41 | 39 502 + 270 | 27 64 - 18 |
| 10 17.1 | 44 421 + 343 | 57 22 -197 | 63 113 + 264 | 59 72 -141 | 10 139 + 270 | 71 27 + 26 | 40 024 + 252 | 28 13 - 49 |
| 10 27.1 | 44 721 + 300 | 59 65 -243 | 63 352 + 239 | 61 54 -182 | 10 390 + 251 | 71 41 + 14 | 40 258 + 234 | 28 89 - 76 |
| 11 6.1 | 44 969 + 248 | 62 49 -284 | 63 562 + 210 | 63 73 -219 | 10 620 + 230 | 71 44 + 3 | 40 469 + 211 | 29 89 -100 |
| 11 16.0 | 45 155 + 186 | 65 62 -313 | 63 735 + 173 | 66 18 -245 | 10 821 + 201 | 71 44 - 7 | 40 651 + 182 | 29 89 -118 |
| 11 26.0 | 45 279 + 124 | 68 90 -328 | 63 872 + 137 | 68 79 -261 | 10 993 + 172 | 71 37 - 12 | 40 651 + 155 | 31 07 -130 |
| 12 6.0 | 45 336 + 57 | 72 26 -336 | 63 967 + 95 | 71 49 -270 | 11 131 + 138 | 71 07 - 18 | 40 927 + 121 | 33 74 -137 |
| 12 16.0 | 45 322 - 14 | 75 52 -326 | 64 017 + 50 | 74 14 -265 | 11 230 + 99 | 70 88 - 19 | 41 010 + 83 | 35 11 -137 |
| 12 25.9 | 45 242 - 80 | 78 59 -307 | 64 025 + 8 | 76 66 -252 | 11 290 + 60 | 70 69 - 19 | 41 057 + 47 | 36 42 -131 |
| 12 35.9 | 45 094 - 148 | 81 39 -280 | 63 985 - 40 | 78 99 -233 | 11 306 + 16 | 70 50 - 19 | 41 061 + 4 | 37 66 -124 |
| | - 209 | -239 | - 83 | -203 | - 27 | - 19 | - 35 | -109 |
| Mean Place | 42.254 | 81.44 | 61.536 | 82.14 | 08.693 | 58.42 | 38.613 | 45.76 |
| sec δ , tan δ | +1.747 | -1.432 | +1.162 | -0.591 | +1.043 | +0.296 | +1.002 | -0.059 |
| $d\alpha(\psi)$, $d\delta(\psi)$ | +0.026 | +0.15 | +0.047 | +0.14 | +0.068 | +0.14 | +0.060 | +0.14 |
| $d\alpha(\epsilon)$, $d\delta(\epsilon)$ | +0.035 | +0.93 | +0.014 | +0.93 | -0.007 | +0.93 | +0.001 | +0.93 |
| Dble.Trans. | November 29 | | November 30 | | November 30 | | November 30 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 172 | | | 1127 | | | 1129 | | 1126 | | | | | | | | |
|--------------|-------------|---------|-------|----------------|---------|--------|------------|---------|-----------------------------------|--------|---------|-------|-------|--------|-------|-------|------|
| | 53 Eridani* | | | 258 G. Eridani | | | α Caeli | | Piazzi 4 ^h 148 (Tauri) | | | | | | | | |
| Mag.Spect. | 3.98 | K0 | | 5.59 | K0 | | 4.52 | F2 | | 5.68 | A0 | | | | | | |
| U.T. | R.A. | Dec. | | R.A. | Dec. | | R.A. | Dec. | | R.A. | Dec. | | | | | | |
| | h m | ° / | | h m | ° / | | h m | ° / | | h m | ° / | | | | | | |
| | 4 37 | - 14 19 | | 4 39 | - 24 30 | | 4 40 | - 41 52 | | 4 40 | + 28 35 | | | | | | |
| 1 | -9.1 | 33 056 | + 48 | 47.96 | -190 | 32 778 | + 36 | 31.21 | -236 | 08 013 | + 0 | 84.45 | -294 | 27 622 | + 84 | 27 60 | + 56 |
| 1 | 0.9 | 33 064 | + 8 | 49.73 | -177 | 32 772 | - 6 | 33.40 | -219 | 07 963 | - 50 | 87 17 | -272 | 27 662 | + 40 | 28 13 | + 53 |
| 1 | 10.9 | 33 031 | - 33 | 51.34 | -161 | 32 724 | - 48 | 35 38 | -198 | 07 862 | - 101 | 89 61 | -244 | 27 653 | - 9 | 28 60 | + 47 |
| 1 | 20.9 | 32 958 | - 73 | 52 72 | -138 | 32 632 | - 92 | 37 07 | -169 | 07 712 | - 150 | 91 67 | -206 | 27 597 | - 56 | 28 99 | + 39 |
| 1 | 30.8 | 32 850 | - 108 | 53 83 | -111 | 32 506 | - 126 | 38 43 | -136 | 07 522 | - 190 | 93 29 | -162 | 27 500 | - 97 | 29 29 | + 30 |
| 2 | 9.8 | 32 711 | - 139 | 54 68 | - 85 | 32 347 | - 159 | 39 45 | -102 | 07 296 | - 226 | 94 47 | -118 | 27 365 | - 135 | 29 47 | + 18 |
| 2 | 19.8 | 32 549 | - 162 | 55 22 | - 54 | 32 164 | - 183 | 40 07 | - 62 | 07 045 | - 251 | 95 15 | - 68 | 27 202 | - 163 | 29 51 | + 4 |
| 3 | 1.8 | 32 374 | - 175 | 55 47 | - 25 | 31 969 | - 195 | 40 31 | - 24 | 06 780 | - 265 | 95 33 | + 18 | 27 023 | - 179 | 29 41 | - 10 |
| 3 | 11.7 | 32 193 | - 181 | 55 41 | + 6 | 31 766 | - 203 | 40 17 | + 14 | 06 509 | - 271 | 95 03 | + 30 | 26 836 | - 187 | 29 18 | - 23 |
| 3 | 21.7 | 32 018 | - 175 | 55 04 | + 37 | 31 570 | - 196 | 39 63 | + 54 | 06 246 | - 263 | 94 22 | + 81 | 26 656 | - 180 | 28 83 | - 35 |
| 3 | 31.7 | 31 859 | - 159 | 54 37 | + 67 | 31 391 | - 179 | 38 74 | + 89 | 06 003 | - 243 | 92 97 | + 125 | 26 495 | - 161 | 28 39 | - 44 |
| 4 | 10.6 | 31 723 | - 136 | 53 42 | + 95 | 31 234 | - 157 | 37 48 | + 126 | 05 786 | - 217 | 91 29 | + 168 | 26 360 | - 135 | 27 87 | - 52 |
| 4 | 20.6 | 31 620 | - 103 | 52 18 | + 124 | 31 112 | - 122 | 35 88 | + 160 | 05 608 | - 178 | 89 19 | + 210 | 26 264 | - 96 | 27 33 | - 54 |
| 4 | 30.6 | 31 555 | - 65 | 50 69 | + 149 | 31 029 | - 83 | 34 00 | + 188 | 05 475 | - 133 | 86 76 | + 243 | 26 212 | - 52 | 26 79 | - 54 |
| 5 | 10.6 | 31 532 | - 23 | 48 96 | + 173 | 30 988 | - 41 | 31 84 | + 216 | 05 391 | - 84 | 84 02 | + 274 | 26 208 | - 4 | 26 30 | - 49 |
| 5 | 20.5 | 31 555 | + 23 | 47 01 | + 195 | 30 996 | + 8 | 29 44 | + 240 | 05 363 | - 28 | 81 02 | + 300 | 26 257 | + 49 | 25 90 | - 40 |
| 5 | 30.5 | 31 622 | + 67 | 44 91 | + 210 | 31 050 | + 54 | 26 89 | + 255 | 05 389 | + 26 | 77 88 | + 314 | 26 355 | + 98 | 25 64 | - 26 |
| 6 | 9.5 | 31 733 | + 111 | 42 66 | + 225 | 31 150 | + 100 | 24 19 | + 270 | 05 469 | + 80 | 74 60 | + 328 | 26 498 | + 143 | 25 44 | - 20 |
| 6 | 19.5 | 31 888 | + 155 | 40 35 | + 231 | 31 295 | + 145 | 21 44 | + 275 | 05 605 | + 136 | 71 31 | + 329 | 26 693 | + 195 | 25 38 | - 6 |
| 6 | 29.4 | 32 078 | + 190 | 38 02 | + 233 | 31 479 | + 184 | 18 72 | + 272 | 05 788 | + 183 | 68 09 | + 322 | 26 927 | + 234 | 25 50 | + 12 |
| 7 | 9.4 | 32 301 | + 223 | 35 72 | + 230 | 31 700 | + 221 | 16 06 | + 266 | 06 016 | + 228 | 64 98 | + 311 | 27 196 | + 269 | 25 76 | + 26 |
| 7 | 19.4 | 32 553 | + 252 | 33 55 | + 217 | 31 951 | + 251 | 13 57 | + 249 | 06 285 | + 269 | 62 13 | + 285 | 27 494 | + 298 | 26 16 | + 40 |
| 7 | 29.3 | 32 824 | + 271 | 31 55 | + 200 | 32 224 | + 273 | 11 31 | + 226 | 06 583 | + 298 | 59 58 | + 255 | 27 812 | + 318 | 26 68 | + 52 |
| 8 | 8.3 | 33 112 | + 288 | 29 77 | + 178 | 32 517 | + 293 | 09 33 | + 198 | 06 908 | + 325 | 57 41 | + 217 | 28 146 | + 334 | 27 29 | + 61 |
| 8 | 18.3 | 33 409 | + 297 | 28 30 | + 147 | 32 822 | + 305 | 07 75 | + 158 | 07 250 | + 342 | 55 73 | + 168 | 28 490 | + 344 | 27 97 | + 68 |
| 8 | 28.3 | 33 709 | + 300 | 27 17 | + 113 | 33 131 | + 309 | 06 57 | + 118 | 07 600 | + 350 | 54 55 | + 118 | 28 835 | + 345 | 28 70 | + 73 |
| 9 | 7.2 | 34 010 | + 301 | 26 42 | + 75 | 33 442 | + 311 | 05 84 | + 73 | 07 956 | + 356 | 53 92 | + 63 | 29 181 | + 346 | 29 46 | + 76 |
| 9 | 17.2 | 34 304 | + 294 | 26 10 | + 32 | 33 746 | + 304 | 05 63 | + 21 | 08 304 | + 348 | 53 91 | + 1 | 29 520 | + 339 | 30 21 | + 75 |
| 9 | 27.2 | 34 588 | + 284 | 26 18 | - 8 | 34 040 | + 294 | 05 88 | - 25 | 08 640 | + 336 | 54 46 | - 55 | 29 850 | + 330 | 30 95 | + 74 |
| 10 | 7.1 | 34 859 | + 271 | 26 68 | - 50 | 34 322 | + 282 | 06 63 | - 75 | 08 959 | + 319 | 55 60 | - 114 | 30 168 | + 318 | 31 68 | + 73 |
| 10 | 17.1 | 35 112 | + 253 | 27 57 | - 89 | 34 581 | + 259 | 07 85 | - 122 | 09 251 | + 292 | 57 28 | - 168 | 30 467 | + 299 | 32 36 | + 68 |
| 10 | 27.1 | 35 344 | + 232 | 28 80 | - 123 | 34 819 | + 238 | 09 44 | - 159 | 09 512 | + 261 | 59 40 | - 212 | 30 747 | + 280 | 33 02 | + 66 |
| 11 | 6.1 | 35 552 | + 208 | 30 33 | - 153 | 35 030 | + 211 | 11 40 | - 196 | 09 737 | + 225 | 61 94 | - 254 | 30 104 | + 257 | 33 66 | + 64 |
| 11 | 16.0 | 35 730 | + 178 | 32 08 | - 175 | 35 208 | + 178 | 13 61 | - 221 | 09 918 | + 181 | 64 77 | - 283 | 31 004 | + 226 | 33 66 | + 61 |
| 11 | 26.0 | 35 878 | + 148 | 33 97 | - 189 | 35 353 | + 145 | 15 97 | - 236 | 10 055 | + 137 | 67 77 | - 300 | 31 230 | + 195 | 34 27 | + 59 |
| 12 | 6.0 | 35 991 | + 113 | 35 95 | - 198 | 35 459 | + 106 | 18 44 | - 247 | 10 143 | + 88 | 70 86 | - 309 | 31 583 | + 158 | 35 44 | + 58 |
| 12 | 16.0 | 36 065 | + 74 | 37 91 | - 196 | 35 523 | + 64 | 20 86 | - 242 | 10 177 | + 34 | 73 90 | - 304 | 31 697 | + 114 | 36 00 | + 56 |
| 12 | 25.9 | 36 101 | + 36 | 39 78 | - 187 | 35 546 | + 23 | 23 19 | - 233 | 10 161 | - 16 | 76 78 | - 288 | 31 769 | + 72 | 36 53 | + 53 |
| 12 | 35.9 | 36 094 | - 48 | 41 53 | - 175 | 35 524 | - 22 | 25 34 | - 215 | 10 090 | - 71 | 79 44 | - 266 | 31 791 | + 22 | 37 02 | + 49 |
| | | | - 154 | | - 154 | | - 64 | | - 189 | | - 120 | | - 231 | | - 25 | | + 42 |
| Mean Place | 33.676 | 47.40 | | 33.092 | 29.54 | | 07.534 | 81.05 | | 28.955 | 22.74 | | | | | | |
| sec δ, tan δ | +1.032 | -0.255 | | +1.099 | -0.456 | | +1.343 | -0.897 | | +1.139 | +0.545 | | | | | | |
| dα(ψ), dδ(ψ) | +0.055 | +0.14 | | +0.050 | +0.14 | | +0.039 | +0.14 | | +0.075 | +0.14 | | | | | | |
| dα(ε), dδ(ε) | +0.006 | +0.94 | | +0.010 | +0.94 | | +0.020 | +0.94 | | -0.012 | +0.94 | | | | | | |
| Dble.Trans. | November 30 | | | December 1 | | | December 1 | | December 1 | | | | | | | | |

AT UPPER TRANSIT AT GREENWICH

| No. | 174 | | 1130 | | 1128 | | 177 | | |
|----------------|------------|--------------|------------|--------------|-----------------------------|--------------|------------|--------------|------------|
| | τ Tauri | | β Caeli | | Groombridge 866 (Persei) | | μ Mensae | | |
| Mag.Spect. | 4.33 | B5 | 5.08 | F5 | 5.77 | B8 | 5.69 | B9 | |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " | |
| | 4 41 | + 22 55 | 4 41 | - 37 09 | 4 42 | + 49 56 | 4 43 | - 70 56 | |
| 1 ^d | -9.1 | 24 732 + 82 | 58 82 + 21 | 34 988 + 15 | 75 85 -281 | 18 346 + 95 | 63 28 +182 | 16 756 - 185 | 86 30 -325 |
| 1 | 0.9 | 24 772 + 40 | 59 02 + 20 | 34 988 - 34 | 75 85 -260 | 18 346 + 33 | 63 28 +173 | 16 756 -302 | 86 30 -298 |
| 1 | 10.9 | 24 766 - 6 | 59 19 + 17 | 34 954 - 81 | 78 45 -235 | 18 379 - 32 | 65 01 +159 | 16 454 - 411 | 89 28 -264 |
| 1 | 20.9 | 24 714 - 52 | 59 32 + 13 | 34 744 - 129 | 80 80 -198 | 18 347 - 97 | 66 60 +136 | 16 043 - 513 | 91.92 -219 |
| 1 | 30.8 | 24 623 | 59 41 + 9 | 34 577 - 167 | 82 78 -158 | 18 250 - 152 | 67 96 +111 | 15 530 - 590 | 94.11 -169 |
| 2 | 9.8 | 24 496 - 127 | 59 43 + 2 | 34 376 - 201 | 85 52 -116 | 17 897 - 201 | 69 87 + 80 | 14 284 - 656 | 96.97 -117 |
| 2 | 19.8 | 24 342 - 154 | 59 38 - 5 | 34 149 - 227 | 86 19 - 67 | 17 657 - 240 | 69 87 + 46 | 14 284 - 702 | 96.97 - 59 |
| 3 | 1.8 | 24 172 - 170 | 59 25 - 13 | 34 109 - 240 | 86 40 - 21 | 17 657 - 259 | 70 33 + 10 | 13 582 - 720 | 97 56 - 3 |
| 3 | 11.7 | 23 995 - 177 | 59 05 - 20 | 33 663 - 246 | 86 16 + 24 | 17 398 - 269 | 70 43 + 10 | 12 862 - 728 | 97 59 + 51 |
| 3 | 21.7 | 23 823 | 58 79 - 26 | 33 423 - 240 | 85 42 + 74 | 17 129 - 259 | 70 19 - 60 | 12 134 - 707 | 97 08 +107 |
| 3 | 31.7 | 23 670 - 153 | 58 48 - 31 | 33 202 - 221 | 84 27 +115 | 16 636 - 234 | 68 70 - 89 | 10 762 - 665 | 94 45 +156 |
| 4 | 10.6 | 23 541 - 129 | 58 16 - 32 | 33 006 - 196 | 82 69 - 67 | 16 439 - 197 | 67 55 -115 | 10 148 - 614 | 92 42 +203 |
| 4 | 20.6 | 23 449 - 92 | 57 85 - 31 | 33 006 - 159 | 82 69 +197 | 16 439 - 146 | 67 55 -135 | 10 148 - 536 | 92 42 +247 |
| 4 | 30.6 | 23 399 - 50 | 57 85 - 26 | 32 847 - 117 | 80 72 +230 | 16 293 - 87 | 66 20 -148 | 09 612 - 448 | 89 95 +281 |
| 5 | 10.6 | 23 394 - 5 | 57 40 - 19 | 32 730 - 70 | 78 42 +261 | 16 206 - 24 | 64 72 -155 | 09 164 - 353 | 87 14 +313 |
| 5 | 20.5 | 23 441 + 47 | 57 32 - 8 | 32 643 - 17 | 72 96 +285 | 16 228 + 46 | 61.61 -156 | 08 573 - 238 | 80.65 +336 |
| 5 | 30.5 | 23 541 + 100 | 57 39 + 7 | 32 676 + 33 | 69 95 +301 | 16 341 + 113 | 60 12 -115 | 08 445 - 128 | 77 15 +350 |
| 6 | 9.5 | 23 667 + 126 | 57 49 + 10 | 32 762 + 86 | 66 80 +315 | 16 519 + 178 | 58 72 -140 | 08 454 - 11 | 73 55 +360 |
| 6 | 19.5 | 23 855 + 188 | 57 79 + 30 | 32 762 + 137 | 66 80 +317 | 16 519 + 241 | 57 49 -123 | 08 434 + 111 | 73 55 +358 |
| 6 | 29.4 | 24 078 + 223 | 58 22 + 43 | 33 899 + 181 | 63 63 +312 | 16 760 + 294 | 57 49 -104 | 08 545 + 218 | 69 97 +347 |
| 7 | 9.4 | 24 335 + 257 | 58 77 + 55 | 33 304 + 224 | 57 49 +302 | 17 397 + 343 | 55 63 - 82 | 09 091 + 328 | 63 21 +329 |
| 7 | 19.4 | 24 620 + 285 | 59 42 + 65 | 33 564 + 260 | 54 71 +278 | 17 780 + 383 | 55 06 - 57 | 09 529 + 429 | 60 22 +299 |
| 7 | 29.3 | 24 923 + 303 | 60 15 + 73 | 33 852 + 288 | 52 21 +250 | 18 191 + 411 | 54 74 - 32 | 10 029 + 509 | 57 59 +263 |
| 8 | 8.3 | 25 243 + 320 | 60 93 + 78 | 34 164 + 312 | 52 21 +214 | 18 191 + 435 | 54 74 - 8 | 10 029 + 586 | 57 59 +218 |
| 8 | 18.3 | 25 571 + 328 | 61 74 + 81 | 34 492 + 328 | 50 07 +168 | 18 626 + 450 | 54 84 + 18 | 10 615 + 641 | 55 41 +163 |
| 8 | 28.3 | 25 901 + 330 | 62 53 + 79 | 34 827 + 335 | 47 18 +121 | 19 531 + 455 | 55 24 + 40 | 11 930 + 674 | 52 70 +108 |
| 9 | 7.2 | 26 232 + 331 | 63 30 + 77 | 35 166 + 339 | 46 51 + 67 | 19 989 + 458 | 55 87 + 63 | 12 627 + 697 | 52 25 + 45 |
| 9 | 17.2 | 26 556 + 324 | 64 00 + 70 | 35 326 + 332 | 46 51 + 8 | 19 989 + 450 | 55 87 + 85 | 12 627 + 689 | 52 25 - 21 |
| 9 | 27.2 | 26 871 + 315 | 64 64 + 64 | 35 498 + 322 | 46 43 - 46 | 20 439 + 438 | 56 72 +103 | 13 316 + 685 | 52 46 - 83 |
| 10 | 7.2 | 27 175 + 304 | 65 20 + 56 | 36 126 + 306 | 46 89 -103 | 20 877 + 423 | 57 75 +122 | 13 981 + 625 | 53 29 -147 |
| 10 | 17.1 | 27 461 + 286 | 65 67 + 47 | 36 406 + 280 | 49 47 -155 | 21 698 + 396 | 60 35 +138 | 15 160 + 554 | 56 80 -204 |
| 10 | 27.1 | 27 729 + 268 | 66 08 + 41 | 36 660 + 254 | 51 47 -200 | 22 069 + 371 | 61 86 +151 | 15 634 + 474 | 59 31 -251 |
| 11 | 6.1 | 27 974 + 245 | 66 41 + 33 | 36 881 + 221 | 53 86 -239 | 22 069 + 339 | 61 86 +165 | 16 013 + 379 | 62 25 -294 |
| 11 | 16.0 | 28 191 + 217 | 66 69 + 28 | 37 062 + 181 | 56 54 -268 | 22 408 + 295 | 63 51 +174 | 16 013 + 262 | 62 25 -324 |
| 11 | 26.0 | 28 379 + 188 | 66 94 + 25 | 37 203 + 141 | 59 38 -284 | 22 703 + 251 | 65 25 +181 | 16 275 + 147 | 65 49 -339 |
| 12 | 6.0 | 28 531 + 152 | 67 16 + 22 | 37 298 + 95 | 62 33 -295 | 23 152 + 198 | 68 91 +185 | 16 443 + 21 | 72 35 -347 |
| 12 | 16.0 | 28 642 + 111 | 67 36 + 20 | 37 343 + 45 | 65 23 -290 | 23 290 + 138 | 70 74 +183 | 16 334 - 109 | 75 72 -337 |
| 12 | 25.9 | 28 711 + 69 | 67 56 + 20 | 37 342 - 1 | 67 99 -276 | 23 367 + 77 | 72 52 +178 | 16 106 - 228 | 78 90 -318 |
| 12 | 35.9 | 28 735 - 22 | 67 72 + 14 | 37 290 - 99 | 70 55 -222 | 23 377 + 10 | 74 18 +166 | 15 758 - 348 | 81 80 -290 |
| | | | | | | | | | |
| Mean Place | 26.000 | 54.57 | 34.777 | 72.93 | 19.816 | 56.35 | 11.890 | 81.37 | |
| sec δ, tan δ | +1.086 | +0.423 | +1.255 | -0.758 | +1.554 | +1.190 | +3.065 | -2.897 | |
| dα(ψ), dδ(ψ) | +0.072 | +0.13 | +0.042 | +0.13 | +0.091 | +0.13 | -0.011 | +0.13 | |
| dα(ε), dδ(ε) | -0.009 | +0.94 | +0.017 | +0.94 | -0.026 | +0.94 | +0.064 | +0.94 | |
| Dble.Trans. | December 1 | | December 1 | | December 2 | | December 2 | | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 1131 | | 176 | | 1132 | | 175 | |
|---|-------------------|--------|-------------------|--------|-------------------|---------|--------------------|---------|
| | 56 Eridani | | μ Eridani | | 268 G. Eridani | | 4 Camelopardi | |
| Mag. Spect. | 5.87 | B5 | 4.18 | B5 | 5.97 | A2 | 5.35 | A2 |
| U.T. | R.A. | | R.A. | | R.A. | | R.A. | |
| | h m | Dec. | h m | Dec. | h m | Dec. | h m | Dec. |
| | 4 43 | — 8 31 | 4 44 | — 3 16 | 4 45 | — 28 06 | 4 46 | + 56 44 |
| | ^s + 60 | " -163 | ^s + 66 | " -135 | ^s + 37 | " -253 | ^s + 106 | " +218 |
| 1 | -9.1 | 25 580 | 40 86 | 48 728 | 41.93 | 53 241 | 42 38 | 51 088 |
| | + 21 | -152 | + 28 | -127 | - 7 | -236 | + 32 | +208 |
| 1 | 0.9 | 25 601 | 42 38 | 48 756 | 43.20 | 53 234 | 44 74 | 51 120 |
| | - 21 | -139 | - 14 | -116 | - 51 | -214 | - 45 | +193 |
| 1 | 10.9 | 25 580 | 43 77 | 48 742 | 44.36 | 53 183 | 46 88 | 51 075 |
| | - 61 | -120 | - 55 | -101 | - 96 | -183 | -122 | +168 |
| 1 | 20.9 | 25 519 | 44 97 | 48 687 | 45.37 | 53 087 | 48 71 | 50 953 |
| | - 96 | - 99 | - 90 | - 83 | -133 | -148 | -185 | +137 |
| 1 | 30.8 | 25 423 | 45 96 | 48 597 | 46.20 | 52 954 | 50 19 | 50 768 |
| | -129 | - 77 | -123 | - 66 | -166 | -112 | - 245 | +104 |
| 2 | 9.8 | 25 294 | 46 73 | 48 474 | 46.86 | 52 788 | 51.31 | 50 523 |
| | -153 | - 51 | -148 | - 45 | -192 | - 70 | -288 | + 63 |
| 2 | 19.8 | 25 141 | 47 24 | 48 326 | 47.31 | 52 596 | 52 01 | 50 235 |
| | -167 | - 26 | -162 | - 26 | -205 | - 28 | -313 | + 22 |
| 3 | 1.8 | 24 974 | 47 50 | 48 164 | 47.57 | 52 391 | 52 29 | 49 922 |
| | -174 | - 2 | -170 | - 6 | -213 | + 11 | -324 | +20 |
| 3 | 11.7 | 24 800 | 47 52 | 47 994 | 47.63 | 52 178 | 52 18 | 49 598 |
| | -170 | + 25 | -166 | + 16 | -208 | + 55 | -314 | + 61 |
| 3 | 21.7 | 24 630 | 47 27 | 47 828 | 47.47 | 51 970 | 51.63 | 49 284 |
| | -154 | + 49 | -150 | + 36 | -192 | + 92 | -284 | - 96 |
| 3 | 31.7 | 24 476 | 46 78 | 47 678 | 47.11 | 51 778 | 50 71 | 49 000 |
| | -133 | + 74 | -129 | + 56 | -170 | +130 | -244 | -129 |
| 4 | 10.6 | 24 343 | 46 04 | 47 549 | 46.55 | 51 608 | 49 41 | 48 756 |
| | -100 | + 99 | - 96 | + 79 | -135 | +167 | -185 | -155 |
| 4 | 20.6 | 24 243 | 45 05 | 47 453 | 45.76 | 51 473 | 47 74 | 48 571 |
| | - 62 | +122 | - 59 | + 97 | - 96 | +197 | -118 | -172 |
| 4 | 30.6 | 24 181 | 43 83 | 47 394 | 44.79 | 51 377 | 45 77 | 48 453 |
| | - 23 | +144 | - 18 | +118 | - 54 | +227 | - 45 | -184 |
| 5 | 10.6 | 24 158 | 42 39 | 47 376 | 43.61 | 51 323 | 43 50 | 48 408 |
| | + 24 | +164 | + 27 | +137 | - 4 | +251 | + 36 | -188 |
| 5 | 20.5 | 24 182 | 40 75 | 47 403 | 42.24 | 51 319 | 40 99 | 48 444 |
| | + 67 | +179 | + 70 | +151 | + 43 | +267 | +113 | -184 |
| 5 | 30.5 | 24 249 | 38 96 | 47 473 | 40.73 | 51 362 | 38 32 | 48 557 |
| | +110 | +195 | +113 | +166 | + 89 | +282 | +189 | -176 |
| 6 | 9.5 | 24 359 | 37 01 | 47 586 | 39 07 | 51 451 | 35 50 | 48 746 |
| | +152 | +203 | +155 | +177 | +138 | +287 | +263 | -161 |
| 6 | 19.5 | 24 511 | 34 98 | 47 741 | 37 30 | 51 589 | 32 63 | 49 009 |
| | +188 | +206 | +191 | +180 | +176 | +284 | +324 | -140 |
| 6 | 29.4 | 24 699 | 32 92 | 47 932 | 35 50 | 51 765 | 29 79 | 49 333 |
| | +221 | +206 | +223 | +183 | +216 | +278 | +382 | -118 |
| 7 | 9.4 | 24 920 | 30 86 | 48 155 | 33 67 | 51 981 | 27 01 | 49 715 |
| | +249 | +198 | +250 | +178 | +248 | +259 | +431 | - 90 |
| 7 | 19.4 | 25 169 | 28 88 | 48 405 | 31 89 | 52 229 | 24 42 | 50 146 |
| | +268 | +184 | +269 | +167 | +272 | +236 | +466 | - 63 |
| 7 | 29.3 | 25 437 | 27 04 | 48 674 | 30 22 | 52 501 | 22 06 | 50 612 |
| | +284 | +166 | +285 | +153 | +293 | +205 | +496 | - 34 |
| 8 | 8.3 | 25 721 | 25 38 | 48 959 | 28 69 | 52 794 | 20 01 | 51 108 |
| | +294 | +139 | +295 | +130 | +307 | +164 | +515 | - 4 |
| 8 | 18.3 | 26 015 | 23 99 | 49 254 | 27 39 | 53 101 | 18 37 | 51 623 |
| | +298 | +112 | +298 | +107 | +313 | +122 | +524 | + 24 |
| 8 | 28.3 | 26 313 | 22 87 | 49 552 | 26 32 | 53 414 | 17 15 | 52 147 |
| | +299 | + 78 | +299 | + 79 | +317 | + 74 | +528 | + 52 |
| 9 | 7.2 | 26 612 | 22 09 | 49 851 | 25 53 | 53 731 | 16 41 | 52 675 |
| | +293 | + 40 | +293 | + 45 | +312 | + 21 | +522 | + 80 |
| 9 | 17.2 | 26 905 | 21 69 | 50 144 | 25 08 | 54 043 | 16 20 | 53 197 |
| | +284 | + 5 | +285 | + 15 | +302 | - 29 | +509 | +104 |
| 9 | 27.2 | 27 189 | 21 64 | 50 429 | 24 93 | 54 345 | 16 49 | 53 706 |
| | +273 | - 33 | +275 | - 19 | +289 | - 81 | +492 | +128 |
| 10 | 7.2 | 27 462 | 21 97 | 50 704 | 25 12 | 54 634 | 17 30 | 54 198 |
| | +256 | - 68 | +257 | - 50 | +269 | -130 | +464 | +151 |
| 10 | 17.1 | 27 718 | 22 65 | 50 961 | 25 62 | 54 903 | 18 60 | 54 662 |
| | +237 | - 99 | +240 | - 77 | +245 | -170 | +433 | +189 |
| 10 | 27.1 | 27 955 | 23 64 | 51 201 | 26 39 | 55 148 | 20 30 | 55 095 |
| | +216 | -126 | +219 | -102 | +219 | -208 | +393 | +189 |
| 11 | 6.1 | 28 171 | 24 90 | 51 420 | 27 41 | 55 367 | 22 38 | 55 488 |
| | +186 | -147 | +191 | -120 | +184 | -236 | +343 | +202 |
| 11 | 16.0 | 28 357 | 26 37 | 51 611 | 28 61 | 55 551 | 24 74 | 55 831 |
| | +159 | -160 | +164 | -131 | +150 | -252 | +291 | +212 |
| 11 | 26.0 | 28 516 | 27 97 | 51 775 | 29 92 | 55 701 | 27 26 | 56 122 |
| | +124 | -168 | +130 | -140 | +110 | -264 | +227 | +220 |
| 12 | 6.0 | 28 640 | 29 65 | 51 905 | 31 32 | 55 811 | 29 90 | 56 349 |
| | + 86 | -168 | + 92 | -139 | + 66 | -260 | +155 | +218 |
| 12 | 16.0 | 28 726 | 31 33 | 51 997 | 32 71 | 55 877 | 32 50 | 56 504 |
| | + 48 | -161 | + 55 | -135 | + 23 | -249 | + 84 | +214 |
| 12 | 25.9 | 28 774 | 32 94 | 52 052 | 34 06 | 55 900 | 34 99 | 56 588 |
| | + 6 | -152 | + 12 | -126 | - 24 | -232 | + 5 | +201 |
| 12 | 35.9 | 28 780 | 34 46 | 52 064 | 35 32 | 55 876 | 37 31 | 56 593 |
| | - 35 | -133 | - 28 | -112 | - 68 | -204 | - 72 | +181 |
| Mean Place | 26.330 | 41.45 | 49 587 | 43.27 | 53 416 | 41.01 | 52 547 | 03.76 |
| sec δ , tan δ | +1.011 | -0.150 | +1.002 | -0.057 | +1.134 | -0.534 | +1.823 | +1.524 |
| $d\alpha(\psi)$, $d\delta(\psi)$ | +0.057 | +0.13 | +0.060 | +0.13 | +0.048 | +0.13 | +0.100 | +0.12 |
| $d\alpha(\epsilon)$, $d\delta(\epsilon)$ | +0.003 | +0.94 | +0.001 | +0.95 | +0.011 | +0.95 | -0.032 | +0.95 |
| Dble. Trans. | December 2 | | December 2 | | December 2 | | December 3 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 173 | | 1133 | | 1134 | | 179 | |
|---|----------------------------------|------------|-------------------------|------------|-----------------|------------|-----------------|------------|
| | Groombridge 848 (Camelopardi) | | Bradley 658 (Persei) | | π^3 Orionis | | π^4 Orionis | |
| Mag.Spect. | 6.04 | F0 | 5.10 | K2 | 3.31 | F8 | 3.78 | B3 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° ' | h m | ° ' | h m | ° ' | h m | ° ' |
| | 4 46 | +75 54 | 4 48 | +37 27 | 4 49 | +6 56 | 4 50 | +5 34 |
| 1 -9.1 | 59 185 +114 | 74.96 +306 | 58 615 +99 | 61.10 +109 | 05 328 +78 | 21.29 -79 | 28.157 +79 | 60.58 -87 |
| 1 0.9 | 59 131 -54 | 77.88 +292 | 58 663 +48 | 62.14 +104 | 05 367 +39 | 20.56 -73 | 28.197 +40 | 59.77 -81 |
| 1 10.9 | 58 907 -224 | 80.61 +273 | 58 658 -5 | 63.11 +97 | 05 364 -3 | 19.89 -67 | 28.194 -3 | 59.03 -74 |
| 1 20.9 | 58 517 -390 | 83.00 +239 | 58 598 -60 | 63.94 +83 | 05 318 -46 | 19.31 -58 | 28.149 -45 | 58.38 -65 |
| 1 30.8 | 57 990 -527 | 84.99 +199 | 58 492 -106 | 64.62 +68 | 05 236 -82 | 18.82 -49 | 28.067 -82 | 57.83 -55 |
| 2 9.8 | 57 341 -649 | 86.52 +153 | 58 344 -148 | 65.10 +48 | 05 119 -117 | 18.41 -41 | 27.951 -116 | 57.38 -45 |
| 2 19.8 | 56 603 -738 | 87.50 +98 | 58 162 -182 | 65.37 +27 | 04 977 -142 | 18.10 -31 | 27.951 -143 | 57.05 -33 |
| 3 1.8 | 55 820 -783 | 87.93 +43 | 57 962 -200 | 65.41 +4 | 04 819 -158 | 17.90 -20 | 27.650 -158 | 56.83 -22 |
| 3 11.7 | 55 017 -803 | 87.80 -13 | 57 751 -211 | 65.22 -19 | 04 653 -166 | 17.78 -12 | 27.482 -168 | 56.72 -11 |
| 3 21.7 | 54 242 -775 | 87.10 -70 | 57 546 -205 | 64.82 -40 | 04 490 -163 | 17.78 +0 | 27.319 -163 | 56.73 +1 |
| 3 31.7 | 53 533 -709 | 85.91 -119 | 57 361 -185 | 64.23 -59 | 04 343 -147 | 17.89 +11 | 27.170 -149 | 56.87 +14 |
| 4 10.6 | 52 912 -621 | 84.26 -165 | 57 203 -158 | 63.48 -75 | 04 218 -125 | 18.12 +23 | 27.042 -128 | 57.13 +26 |
| 4 20.6 | 52 419 -493 | 82.22 -204 | 57 087 -116 | 62.62 -86 | 04 126 -92 | 18.50 +38 | 26.947 -95 | 57.55 +42 |
| 4 30.6 | 52 071 -348 | 79.91 -231 | 57 019 -68 | 61.70 -92 | 04 071 -55 | 19.00 +50 | 26.889 -58 | 58.11 +56 |
| 5 10.6 | 51 876 -195 | 77.38 -253 | 57 001 -18 | 60.76 -94 | 04 058 -13 | 19.65 +65 | 26.871 -18 | 58.83 +72 |
| 5 20.5 | 51 857 -19 | 74.74 -264 | 57 042 +41 | 59.86 -90 | 04 091 +33 | 20.46 +81 | 26.900 +29 | 59.70 +87 |
| 5 30.5 | 52 002 +145 | 72.11 -263 | 57 137 +95 | 59.04 -82 | 04 168 +77 | 21.39 +93 | 26.972 +72 | 60.70 +100 |
| 6 9.5 | 52 312 +310 | 69.53 -258 | 57 285 +148 | 58.67 -72 | 04 287 +119 | 22.47 +108 | 27.087 +115 | 61.85 +115 |
| 6 19.5 | 52 786 +474 | 67.11 -242 | 57 485 +200 | 57.74 -58 | 04 450 +163 | 23.67 +120 | 27.245 +158 | 63.12 +127 |
| 6 29.4 | 53 397 +611 | 64.91 -220 | 57 730 +245 | 57.31 -43 | 04 648 +198 | 24.95 +128 | 27.438 +193 | 64.46 +134 |
| 7 9.4 | 54 139 +742 | 62.97 -194 | 58 015 +285 | 57.06 -25 | 04 878 +230 | 26.28 +133 | 27.664 +226 | 65.86 +140 |
| 7 19.4 | 54 996 +857 | 61.37 -160 | 58 333 +318 | 56.98 -8 | 05 136 +258 | 27.61 +133 | 27.917 +253 | 67.25 +139 |
| 7 29.3 | 55 936 +940 | 60.12 -125 | 58 333 +341 | 57.08 +10 | 05 412 +276 | 28.91 +130 | 28.189 +272 | 68.59 +134 |
| 8 8.3 | 56 955 +1019 | 59.26 -86 | 59 035 +361 | 57.33 +25 | 05 704 +292 | 30.14 +123 | 28.478 +289 | 69.86 +127 |
| 8 18.3 | 58 024 +1069 | 58.81 -45 | 59 408 +373 | 57.73 +40 | 06 005 +301 | 31.24 +110 | 28.777 +299 | 70.99 +113 |
| 8 28.3 | 59 121 +1097 | 58.76 -5 | 59 785 +377 | 58.24 +51 | 06 310 +305 | 32.19 +95 | 29.078 +301 | 71.95 +96 |
| 9 7.2 | 60 237 +1116 | 59.13 +37 | 60 165 +380 | 58.87 +63 | 06 616 +306 | 32.94 +75 | 29.382 +304 | 72.71 +76 |
| 9 17.2 | 61 343 +1106 | 59.92 +79 | 60 539 +374 | 59.60 +73 | 06 917 +301 | 33.48 +54 | 29.681 +299 | 73.23 +52 |
| 9 27.2 | 62 422 +1079 | 61.08 +116 | 60 904 +365 | 60.39 +79 | 07 209 +292 | 33.79 +31 | 29.973 +292 | 73.52 +29 |
| 10 7.2 | 63 465 +1043 | 62.64 +156 | 61 258 +354 | 61.26 +87 | 07 492 +283 | 33.86 +7 | 30.255 +282 | 73.56 +4 |
| 10 17.1 | 64 438 +973 | 64.56 +192 | 61 593 +335 | 62.18 +92 | 07 759 +267 | 33.71 -15 | 30.521 +266 | 73.36 -20 |
| 10 27.1 | 65 335 +897 | 66.78 +222 | 61 908 +315 | 63.15 +97 | 08 009 +250 | 33.36 -35 | 30.771 +250 | 72.96 -40 |
| 11 6.1 | 66 135 +800 | 69.32 +254 | 62 198 +290 | 64.16 +101 | 08 239 +230 | 32.83 -53 | 31.001 +230 | 72.36 -60 |
| 11 16.0 | 66 811 +676 | 72.07 +275 | 62 455 +257 | 65.21 +105 | 08 442 +203 | 32.17 -66 | 31.204 +203 | 71.62 -74 |
| 11 26.0 | 67 358 +547 | 75.00 +293 | 62 677 +222 | 66.29 +108 | 08 618 +176 | 31.42 -75 | 31.381 +177 | 70.79 -83 |
| 12 6.0 | 67 752 +394 | 78.06 +306 | 62 858 +181 | 67.39 +110 | 08 760 +142 | 30.61 -81 | 31.524 +143 | 69.90 -89 |
| 12 16.0 | 67 979 +227 | 81.11 +305 | 62 991 +133 | 68.47 +108 | 08 865 +105 | 29.80 -81 | 31.630 +106 | 69.00 -90 |
| 12 25.9 | 68 043 +64 | 84.11 +300 | 63 075 +84 | 69.53 +106 | 08 932 +67 | 29.02 -78 | 31.697 +67 | 68.14 -86 |
| 12 35.9 | 67 927 -116 | 86.96 +285 | 63 104 +29 | 70.53 +100 | 08 956 +24 | 28.28 -74 | 31.722 +25 | 67.32 -82 |
| | 67 927 -283 | 86.96 +257 | 63 104 -24 | 70.53 +89 | 08 956 -18 | 28.28 -66 | 31.722 -18 | 67.32 -72 |
| Mean Place | 60.254 | 66.57 | 59.998 | 55.19 | 06.380 | 18.55 | 29.165 | 57.86 |
| sec δ , tan δ | +4.110 | +3.987 | +1.260 | +0.766 | +1.007 | +0.122 | +1.005 | +0.098 |
| $d\alpha(\psi)$, $d\delta(\psi)$ | +0.162 | +0.12 | +0.081 | +0.12 | +0.064 | +0.12 | +0.064 | +0.12 |
| $d\alpha(\epsilon)$, $d\delta(\epsilon)$ | -0.083 | +0.95 | -0.016 | +0.95 | -0.002 | +0.95 | -0.002 | +0.95 |
| Dble.Trans. | December 3 | | December 3 | | December 3 | | December 4 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 1135 | | 1136 | | 178 | | 180 | | | | | | | | | | |
|--------------|------------|---------|------------------------|---------|---------------|---------|------------------------|--------|--------|--------|-------|-------|-------|--------|-------|-------|-------|
| | 97 Tauri | | o ¹ Orionis | | α Camelopardi | | π ¹ Orionis | | | | | | | | | | |
| Mag. Spect. | 5.12 | F0 | 5.19 | M0 | 4.38 | B0 | 3.87 | B3 | | | | | | | | | |
| U.T. | R.A. | | R.A. | | R.A. | | R.A. | | | | | | | | | | |
| | h | m | h | m | h | m | h | m | | | | | | | | | |
| | 4 50 | + 18 49 | 4 51 | + 14 13 | 4 52 | + 66 19 | 4 53 | + 2 25 | | | | | | | | | |
| | s | ° | s | ° | s | ° | s | ° | | | | | | | | | |
| 1 | -9.0 | 33 809 | + 89 | 07.73 | - 6 | 44.933 | + 87 | 47.72 | - 35 | 40.742 | + 125 | 23.97 | + 266 | 31 885 | + 80 | 11.91 | - 106 |
| 1 | 0.9 | 33 856 | + 47 | 07.67 | - 6 | 44.979 | + 46 | 47.40 | - 32 | 40.765 | + 23 | 26.52 | + 255 | 31 925 | + 40 | 10.92 | - 99 |
| 1 | 10.9 | 33 859 | + 3 | 07.63 | - 4 | 44.982 | + 3 | 47.10 | - 30 | 40.683 | - 82 | 28.90 | + 238 | 31 923 | - 2 | 10.00 | - 92 |
| 1 | 20.9 | 33 816 | - 43 | 07.58 | - 5 | 44.939 | - 43 | 46.84 | - 26 | 40.496 | - 187 | 31.00 | + 210 | 31 878 | - 45 | 09.21 | - 79 |
| 1 | 30.8 | 33 733 | - 83 | 07.53 | - 5 | 44.859 | - 80 | 46.61 | - 23 | 40.222 | - 274 | 32.76 | + 176 | 31.796 | - 82 | 08.55 | - 66 |
| 2 | 9.8 | 33 615 | - 118 | 07.45 | - 8 | 44.743 | - 116 | 46.40 | - 21 | 39.868 | - 354 | 34.12 | + 136 | 31 681 | - 115 | 08.01 | - 54 |
| 2 | 19.8 | 33.467 | - 148 | 07.36 | - 9 | 44.599 | - 144 | 46.22 | - 18 | 39.455 | - 413 | 35.00 | + 88 | 31 538 | - 143 | 07.62 | - 39 |
| 3 | 1.8 | 33.304 | - 163 | 07.23 | - 13 | 44.439 | - 160 | 46.07 | - 15 | 39.009 | - 446 | 35.41 | + 41 | 31 379 | - 159 | 07.38 | - 24 |
| 3 | 11.7 | 33.131 | - 173 | 07.08 | - 15 | 44.269 | - 170 | 45.92 | - 15 | 38.546 | - 463 | 35.32 | - 9 | 31 211 | - 168 | 07.27 | - 11 |
| 3 | 21.7 | 32.962 | - 169 | 06.90 | - 18 | 44.103 | - 166 | 45.81 | - 11 | 38.095 | - 451 | 34.72 | - 60 | 31.046 | - 165 | 07.33 | + 6 |
| 3 | 31.7 | 32.808 | - 154 | 06.73 | - 17 | 43.952 | - 151 | 45.75 | - 6 | 37.683 | - 412 | 33.70 | - 102 | 30.896 | - 150 | 07.54 | + 21 |
| 4 | 10.7 | 32.677 | - 131 | 06.56 | - 17 | 43.823 | - 129 | 45.73 | - 2 | 37.322 | - 361 | 32.27 | - 143 | 30.765 | - 131 | 07.90 | + 36 |
| 4 | 20.6 | 32.581 | - 96 | 06.44 | - 12 | 43.727 | - 96 | 45.80 | + 7 | 37.038 | - 284 | 30.50 | - 177 | 30.667 | - 98 | 08.44 | + 54 |
| 4 | 30.6 | 32.525 | - 56 | 06.38 | - 6 | 43.670 | - 57 | 45.95 | + 15 | 36.844 | - 194 | 28.50 | - 200 | 30.605 | - 62 | 09.14 | + 70 |
| 5 | 10.6 | 32.512 | - 13 | 06.41 | + 3 | 43.655 | - 15 | 46.22 | + 27 | 36.744 | - 100 | 26.31 | - 219 | 30.583 | - 22 | 10.01 | + 87 |
| 5 | 20.5 | 32.549 | + 37 | 06.54 | + 13 | 43.688 | + 33 | 46.60 | + 38 | 36.753 | + 9 | 24.03 | - 228 | 30.607 | + 24 | 11.05 | + 104 |
| 5 | 30.5 | 32.633 | + 84 | 06.75 | + 21 | 43.766 | + 78 | 47.08 | + 48 | 36.864 | + 111 | 21.76 | - 227 | 30.674 | + 67 | 12.22 | + 117 |
| 6 | 9.5 | 32.752 | + 119 | 07.11 | + 36 | 43.885 | + 119 | 47.72 | + 64 | 37.077 | + 213 | 19.54 | - 222 | 30.784 | + 110 | 13.54 | + 132 |
| 6 | 19.5 | 32.926 | + 174 | 07.66 | + 55 | 44.050 | + 165 | 48.52 | + 80 | 37.390 | + 313 | 17.47 | - 207 | 30.936 | + 152 | 14.97 | + 143 |
| 6 | 29.4 | 33.135 | + 209 | 08.27 | + 61 | 44.252 | + 202 | 49.38 | + 86 | 37.788 | + 398 | 15.60 | - 187 | 31.124 | + 188 | 16.47 | + 150 |
| 7 | 9.4 | 33.378 | + 243 | 08.99 | + 72 | 44.487 | + 235 | 50.33 | + 95 | 38.267 | + 479 | 13.97 | - 163 | 31.344 | + 220 | 18.01 | + 154 |
| 7 | 19.4 | 33.649 | + 271 | 09.78 | + 79 | 44.750 | + 263 | 51.33 | + 100 | 38.814 | + 547 | 12.63 | - 134 | 31.592 | + 248 | 19.52 | + 151 |
| 7 | 29.3 | 33.939 | + 290 | 10.61 | + 83 | 45.032 | + 282 | 52.33 | + 100 | 39.412 | + 598 | 11.61 | - 102 | 31.860 | + 268 | 20.97 | + 145 |
| 8 | 8.3 | 34.246 | + 307 | 11.46 | + 85 | 45.330 | + 298 | 53.32 | + 99 | 40.057 | + 645 | 10.91 | - 70 | 32.144 | + 284 | 22.33 | + 136 |
| 8 | 18.3 | 34.563 | + 317 | 12.29 | + 83 | 45.639 | + 309 | 54.26 | + 94 | 40.731 | + 674 | 10.58 | - 33 | 32.439 | + 295 | 23.51 | + 118 |
| 8 | 28.3 | 34.883 | + 320 | 13.08 | + 79 | 45.951 | + 312 | 55.10 | + 84 | 41.421 | + 690 | 10.59 | + 1 | 32.738 | + 299 | 24.50 | + 99 |
| 9 | 7.2 | 35.206 | + 271 | 13.79 | + 71 | 46.265 | + 314 | 55.82 | + 72 | 42.123 | + 702 | 10.95 | + 36 | 33.040 | + 302 | 25.26 | + 76 |
| 9 | 17.2 | 35.523 | + 317 | 14.41 | + 62 | 46.574 | + 309 | 56.40 | + 58 | 42.818 | + 695 | 11.66 | + 71 | 33.337 | + 297 | 25.75 | + 49 |
| 9 | 27.2 | 35.833 | + 310 | 14.91 | + 50 | 46.876 | + 302 | 56.82 | + 42 | 43.499 | + 681 | 12.69 | + 103 | 33.627 | + 290 | 25.98 | + 23 |
| 10 | 7.2 | 36.133 | + 300 | 15.30 | + 39 | 47.169 | + 293 | 57.09 | + 27 | 44.160 | + 661 | 14.05 | + 136 | 33.908 | + 281 | 25.93 | - 5 |
| 10 | 17.1 | 36.417 | + 284 | 15.56 | + 26 | 47.446 | + 277 | 57.18 | + 9 | 44.782 | + 622 | 15.72 | + 167 | 34.173 | + 265 | 25.61 | - 32 |
| 10 | 27.1 | 36.684 | + 267 | 15.73 | + 17 | 47.707 | + 261 | 57.14 | - 4 | 45.362 | + 580 | 17.64 | + 192 | 34.423 | + 250 | 25.06 | - 55 |
| 11 | 6.1 | 36.931 | + 247 | 15.80 | + 7 | 47.948 | + 241 | 56.97 | - 17 | 45.887 | + 525 | 19.82 | + 218 | 34.652 | + 229 | 24.30 | - 76 |
| 11 | 16.0 | 37.151 | + 220 | 15.80 | + 0 | 48.162 | + 214 | 56.71 | - 26 | 46.342 | + 455 | 22.19 | + 237 | 34.856 | + 204 | 23.38 | - 92 |
| 11 | 26.0 | 37.342 | + 191 | 15.76 | - 4 | 48.349 | + 187 | 56.39 | - 32 | 46.723 | + 381 | 24.72 | + 253 | 35.032 | + 176 | 22.36 | - 102 |
| 12 | 6.0 | 37.499 | + 157 | 15.69 | - 7 | 48.502 | + 153 | 56.02 | - 37 | 47.015 | + 292 | 27.36 | + 264 | 35.175 | + 143 | 21.27 | - 109 |
| 12 | 16.0 | 37.616 | + 117 | 15.60 | - 9 | 48.616 | + 114 | 55.65 | - 37 | 47.208 | + 193 | 30.00 | + 264 | 35.281 | + 106 | 20.17 | - 110 |
| 12 | 25.9 | 37.693 | + 77 | 15.53 | - 7 | 48.691 | + 75 | 55.29 | - 36 | 47.302 | + 94 | 32.61 | + 261 | 35.349 | + 68 | 19.12 | - 105 |
| 12 | 35.9 | 37.725 | + 32 | 15.45 | - 8 | 48.722 | + 31 | 54.95 | - 34 | 47.288 | - 14 | 35.09 | + 248 | 35.374 | + 25 | 18.12 | - 100 |
| | | - 14 | - 7 | - 7 | - 13 | - 13 | - 30 | - 30 | - 30 | - 119 | - 119 | + 225 | - 17 | - 17 | - 88 | - 88 | - 88 |
| Mean Place | 35.010 | 03 56 | | 46.069 | 43.97 | 42.088 | 16.08 | 32.834 | 09.33 | | | | | | | | |
| sec δ, tan δ | +1.056 | +0.341 | | +1.032 | +0.254 | +2.490 | +2.280 | +1.001 | +0.042 | | | | | | | | |
| dα(ψ), dδ(ψ) | +0.070 | +0.12 | | +0.068 | +0.12 | +0.119 | +0.12 | +0.062 | +0.11 | | | | | | | | |
| dα(ε), dδ(ε) | -0.007 | +0.95 | | -0.005 | +0.96 | -0.044 | +0.96 | -0.001 | +0.96 | | | | | | | | |
| Dble. Trans. | December 4 | | December 4 | | December 4 | | December 4 | | | | | | | | | | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 1138 | | 181 | | 183 | | 1137 | |
|---------------|---------------------------|-------------------------|---------------------------|-------------------------|---------------------------|-------------------------|---------------------------|-------------------------|
| | η Mensae | | ι Aurigae | | ε Aurigae | | ζ Aurigae | |
| Mag. Spect. | 5.28 | K0 | 2.90 | K2 | 3.1 to 3.8 | F5p | 3.94 var. | K0, B1 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° ' | h m | ° ' | h m | ° ' | h m | ° ' |
| | 4 55 | -74 57 | 4 56 | +33 08 | 5 00 | +43 48 | 5 01 | +41 03 |
| 1 9.0 | 40.975 ^s - 228 | 32.32 ["] -330 | 05.429 ^s + 105 | 49.88 ["] + 82 | 58.495 ^s + 120 | 22.01 ["] +145 | 30.571 ^s + 118 | 31.87 ["] +128 |
| 1 0.9 | 40.599 - 376 | 35.37 -305 | 05.485 + 56 | 50.66 + 78 | 58.557 + 62 | 23.42 +141 | 30.634 + 63 | 33.12 +125 |
| 1 10.9 | 40.081 - 518 | 38.11 -274 | 05.490 + 5 | 51.40 + 74 | 58.560 + 3 | 24.75 +133 | 30.640 + 6 | 34.30 +118 |
| 1 20.9 | 39.431 - 650 | 40.41 -230 | 05.443 - 47 | 52.05 + 65 | 58.501 - 59 | 25.92 +117 | 30.588 - 52 | 35.35 +105 |
| 1 30.8 | 38.681 - 750 | 42.23 -182 | 05.350 - 93 | 52.59 + 54 | 58.390 - 111 | 26.91 + 99 | 30.484 - 104 | 36.23 + 88 |
| 2 9.8 | 37.844 - 837 | 43.56 -133 | 05.216 - 134 | 52.98 + 39 | 58.230 - 160 | 27.68 + 77 | 30.334 - 150 | 36.91 + 68 |
| 2 19.8 | 36.944 - 900 | 44.30 - 74 | 05.049 - 167 | 53.20 + 22 | 58.031 - 199 | 28.17 + 49 | 30.146 - 188 | 37.35 + 44 |
| 3 1.8 | 36.017 - 927 | 44.51 - 21 | 04.862 - 187 | 53.24 + 4 | 57.810 - 221 | 28.38 + 21 | 29.936 - 210 | 37.53 + 18 |
| 3 11.7 | 35.076 - 941 | 44.17 + 34 | 04.664 - 198 | 53.10 - 14 | 57.574 - 236 | 28.31 - 7 | 29.712 - 224 | 37.45 - 8 |
| 3 21.7 | 34.154 - 922 | 43.26 + 91 | 04.470 - 194 | 52.79 - 31 | 57.342 - 232 | 27.94 - 37 | 29.492 - 220 | 37.10 - 35 |
| 3 31.7 | 33.278 - 876 | 41.87 +139 | 04.292 - 178 | 52.33 - 46 | 57.129 - 213 | 27.32 - 62 | 29.289 - 203 | 36.53 - 57 |
| 4 10.7 | 32.460 - 818 | 40.00 +187 | 04.140 - 152 | 51.75 - 58 | 56.944 - 185 | 26.47 - 85 | 29.113 - 176 | 35.76 - 77 |
| 4 20.6 | 31.733 - 727 | 37.68 +232 | 04.026 - 114 | 51.08 - 67 | 56.802 - 142 | 25.44 -103 | 28.979 - 134 | 34.83 - 93 |
| 4 30.6 | 31.109 - 624 | 35.01 +267 | 03.957 - 69 | 50.37 - 71 | 56.711 - 91 | 24.30 -114 | 28.893 - 86 | 33.80 -103 |
| 5 10.6 | 30.600 - 509 | 32.01 +300 | 03.936 - 21 | 49.66 - 71 | 56.674 - 37 | 23.08 -122 | 28.859 - 34 | 32.71 -109 |
| 5 20.5 | 30.228 - 372 | 28.75 +326 | 03.969 + 33 | 49.00 - 66 | 56.700 + 26 | 21.85 -123 | 28.885 + 26 | 31.62 -109 |
| 5 30.5 | 29.993 - 235 | 25.33 +342 | 04.055 + 86 | 48.42 - 58 | 56.784 + 84 | 20.66 -119 | 28.968 + 83 | 30.59 -103 |
| 6 9.5 | 29.900 - 93 | 21.79 +354 | 04.189 + 134 | 47.94 - 48 | 56.927 + 143 | 19.55 -111 | 29.107 + 139 | 29.63 - 96 |
| 6 19.5 | 29.961 + 61 | 18.25 +354 | 04.374 + 185 | 47.55 - 39 | 57.128 + 201 | 18.56 - 99 | 29.301 + 194 | 28.78 - 85 |
| 6 29.4 | 30.159 + 198 | 14.79 +346 | 04.602 + 228 | 47.32 - 23 | 57.377 + 249 | 17.72 - 84 | 29.541 + 240 | 28.09 - 69 |
| 7 9.4 | 30.497 + 338 | 11.49 +330 | 04.869 + 267 | 47.24 - 8 | 57.672 + 295 | 17.05 - 67 | 29.826 + 285 | 27.55 - 54 |
| 7 19.4 | 30.967 + 470 | 08.46 +303 | 05.168 + 299 | 47.31 + 7 | 58.005 + 333 | 16.58 - 47 | 30.147 + 321 | 27.21 - 34 |
| 7 29.4 | 31.546 + 579 | 05.78 +268 | 05.490 + 322 | 47.52 + 21 | 58.366 + 361 | 16.30 - 28 | 30.494 + 347 | 27.03 - 18 |
| 8 8.3 | 32.228 + 682 | 03.51 +227 | 05.831 + 341 | 47.85 + 33 | 58.751 + 385 | 16.21 - 9 | 30.865 + 371 | 27.03 + 0 |
| 8 18.3 | 32.989 + 761 | 01.78 +173 | 06.185 + 354 | 48.28 + 43 | 59.152 + 401 | 16.31 + 10 | 31.251 + 386 | 27.21 + 18 |
| 8 28.3 | 33.801 + 812 | 00.60 +118 | 06.543 + 358 | 48.80 + 52 | 59.560 + 408 | 16.59 + 28 | 31.643 + 392 | 27.53 + 32 |
| 9 7.2 | 34.652 + 851 | 00.02 + 58 | 06.905 + 362 | 49.38 + 58 | 59.974 + 414 | 17.03 + 44 | 32.041 + 398 | 27.99 + 46 |
| 9 17.2 | 35.503 + 828 | 00.11 - 9 | 07.263 + 358 | 50.02 + 64 | 60.384 + 410 | 17.63 + 60 | 32.436 + 395 | 28.58 + 59 |
| 9 27.2 | 36.331 + 828 | 00.81 - 70 | 07.613 + 350 | 50.68 + 66 | 60.787 + 403 | 18.37 + 74 | 32.823 + 387 | 29.28 + 70 |
| 10 7.2 | 37.116 + 785 | 02.15 -134 | 07.954 + 341 | 51.38 + 70 | 61.181 + 394 | 19.24 + 87 | 33.202 + 379 | 30.09 + 81 |
| 10 17.1 | 37.819 + 703 | 04.08 -193 | 08.278 + 324 | 52.09 + 71 | 61.555 + 374 | 20.22 + 98 | 33.562 + 360 | 30.99 + 90 |
| 10 27.1 | 38.425 + 606 | 06.50 -242 | 08.583 + 305 | 52.82 + 73 | 61.909 + 354 | 21.32 +110 | 33.903 + 341 | 31.98 + 99 |
| 11 6.1 | 38.914 + 489 | 09.37 -287 | 08.867 + 284 | 53.57 + 75 | 62.237 + 328 | 22.53 +121 | 34.219 + 316 | 33.05 +107 |
| 11 16.1 | 39.256 + 342 | 12.55 -318 | 09.119 + 252 | 54.33 + 76 | 62.530 + 293 | 23.82 +129 | 34.502 + 283 | 34.20 +115 |
| 11 26.0 | 39.453 + 197 | 15.92 -337 | 09.340 + 221 | 55.12 + 79 | 62.785 + 255 | 25.18 +136 | 34.749 + 247 | 35.40 +120 |
| 12 6.0 | 39.490 + 37 | 19.40 -348 | 09.522 + 182 | 55.92 + 80 | 62.995 + 210 | 26.60 +142 | 34.953 + 204 | 36.66 +126 |
| 12 16.0 | 39.360 - 130 | 22.80 -340 | 09.659 + 137 | 56.72 + 80 | 63.151 + 156 | 28.03 +143 | 35.107 + 154 | 37.93 +127 |
| 12 25.9 | 39.079 - 281 | 26.04 -324 | 09.749 + 90 | 57.51 + 79 | 63.254 + 103 | 29.45 +142 | 35.208 + 101 | 39.18 +125 |
| 12 35.9 | 38.642 - 437 | 29.02 -298 | 09.788 + 39 | 58.26 + 75 | 63.295 + 41 | 30.81 +136 | 35.252 + 44 | 40.39 +121 |
| | 38.642 - 573 | 29.02 -258 | 09.788 - 13 | 58.26 + 69 | 63.295 - 19 | 30.81 +125 | 35.252 - 15 | 40.39 +111 |
| Mean Place | 34.142 | 29.11 | 06.761 | 44.17 | 59.881 | 15.43 | 31.943 | 25.46 |
| sec δ, tan δ | +3.853 | -3.721 | +1.194 | +0.653 | +1.386 | +0.959 | +1.326 | +0.871 |
| dα(ψ), dδ(ψ) | -0.034 | +0.11 | +0.078 | +0.11 | +0.086 | +0.10 | +0.084 | +0.10 |
| dα(ε), dδ(ε) | +0.069 | +0.96 | -0.012 | +0.96 | -0.016 | +0.97 | -0.015 | +0.97 |
| Dbles. Trans. | December 5 | | December 5 | | December 6 | | December 6 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 1139 | | 182 | | 184 | | 1140 | | |
|--------------|-------------|--------------|---------------|--------------|------------|--------------|------------|--------------|------------|
| | 26 G. Caeli | | β Camelopardi | | ι Tauri | | 11 Orionis | | |
| Mag. Spect. | 6.00 | K0 | 4.22 | G0p | 4.70 | A5 | 4.65 | B9 | |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | |
| | h m | ° ′ | h m | ° ′ | h m | ° ′ | h m | ° ′ | |
| | 5 01 | -31 47 | 5 02 | +60 25 | 5 02 | +21 34 | 5 03 | +15 23 | |
| 1 | -9.0 | 52.116 + 47 | 25.73 -274 | 11.417 + 139 | 33.08 +237 | 16.046 + 103 | 22.23 + 8 | 46.672 + 100 | 14.15 - 31 |
| 1 | 0.9 | 52.118 + 2 | 28.31 -258 | 11.472 + 55 | 35.36 +228 | 16.106 + 60 | 22.33 + 10 | 46.730 + 58 | 13.87 - 28 |
| 1 | 10.9 | 52.071 - 47 | 30.67 -236 | 11.441 - 31 | 37.52 +216 | 16.120 + 14 | 22.43 + 10 | 46.744 + 14 | 13.63 - 24 |
| 1 | 20.9 | 51.977 - 94 | 32.72 -205 | 11.321 - 120 | 39.45 +193 | 16.085 - 35 | 22.52 + 9 | 46.711 - 33 | 13.42 - 21 |
| 1 | 30.8 | 51.843 - 134 | 34.41 -169 | 11.127 - 194 | 41.08 +163 | 16.009 - 76 | 22.60 + 8 | 46.638 - 73 | 13.25 - 17 |
| 2 | 9.8 | 51.672 - 171 | 35.72 -131 | 10.864 - 263 | 42.37 +129 | 15.894 - 115 | 22.64 + 4 | 46.527 - 111 | 13.09 - 16 |
| 2 | 19.8 | 51.472 - 200 | 36.59 - 87 | 10.548 - 316 | 43.24 + 87 | 15.749 - 145 | 22.63 - 1 | 46.387 - 140 | 12.95 - 14 |
| 3 | 1.8 | 51.255 - 217 | 37.02 - 43 | 10.200 - 348 | 43.68 + 44 | 15.584 - 165 | 22.58 - 5 | 46.228 - 159 | 12.83 - 12 |
| 3 | 11.7 | 51.027 - 228 | 37.04 - 2 | 09.834 - 366 | 43.68 - 45 | 15.407 - 177 | 22.46 - 12 | 46.057 - 171 | 12.72 - 11 |
| 3 | 21.7 | 50.803 - 224 | 36.59 + 45 | 09.474 - 360 | 43.23 - 45 | 15.233 - 174 | 22.30 - 16 | 45.888 - 169 | 12.62 - 10 |
| 3 | 31.7 | 50.592 - 211 | 35.74 + 85 | 09.141 - 333 | 42.38 - 85 | 15.072 - 161 | 22.10 - 20 | 45.732 - 156 | 12.55 - 7 |
| 4 | 10.7 | 50.401 - 191 | 34.48 +126 | 08.848 - 293 | 41.16 -122 | 14.933 - 139 | 21.88 - 22 | 45.596 - 136 | 12.52 - 3 |
| 4 | 20.6 | 50.244 - 157 | 32.83 +165 | 08.616 - 232 | 39.62 -154 | 14.827 - 106 | 21.68 - 20 | 45.492 - 104 | 12.55 + 3 |
| 4 | 30.6 | 50.124 - 120 | 30.86 +197 | 08.456 - 160 | 37.86 -176 | 14.761 - 66 | 21.50 - 18 | 45.426 - 66 | 12.66 + 11 |
| 5 | 10.6 | 50.047 - 77 | 28.56 +230 | 08.372 - 84 | 35.93 -193 | 14.738 - 23 | 21.38 - 12 | 45.402 - 24 | 12.85 + 19 |
| 5 | 20.5 | 50.019 - 28 | 26.01 +255 | 08.377 + 5 | 33.92 -201 | 14.765 + 27 | 21.35 - 3 | 45.424 + 22 | 13.16 + 31 |
| 5 | 30.5 | 50.039 + 20 | 23.27 +274 | 08.466 + 89 | 31.90 -202 | 14.839 + 74 | 21.41 + 6 | 45.493 + 69 | 13.56 + 40 |
| 6 | 9.5 | 50.107 + 68 | 20.37 +290 | 08.639 + 173 | 29.92 -198 | 14.942 + 103 | 21.45 + 4 | 45.601 + 108 | 14.06 + 50 |
| 6 | 19.5 | 50.225 + 118 | 17.40 +297 | 08.895 + 256 | 28.07 -185 | 15.115 + 173 | 21.87 + 42 | 45.756 + 155 | 14.75 + 69 |
| 6 | 29.4 | 50.384 + 159 | 14.45 +295 | 09.221 + 326 | 26.39 -168 | 15.318 + 203 | 22.28 + 41 | 45.949 + 193 | 15.51 + 76 |
| 7 | 9.4 | 50.584 + 200 | 11.55 +290 | 09.613 + 392 | 24.92 -147 | 15.556 + 238 | 22.78 + 50 | 46.176 + 227 | 16.34 + 83 |
| 7 | 19.4 | 50.820 + 236 | 08.84 +271 | 10.063 + 450 | 23.71 -121 | 15.824 + 268 | 23.37 + 59 | 46.433 + 257 | 17.22 + 88 |
| 7 | 29.4 | 51.084 + 264 | 06.36 +248 | 10.556 + 493 | 22.77 - 94 | 16.112 + 288 | 24.02 + 65 | 46.709 + 276 | 18.12 + 90 |
| 8 | 8.3 | 51.373 + 289 | 04.19 +217 | 11.087 + 531 | 22.12 - 65 | 16.419 + 307 | 24.70 + 68 | 47.004 + 295 | 19.01 + 89 |
| 8 | 18.3 | 51.678 + 305 | 02.44 +175 | 11.644 + 557 | 21.79 - 33 | 16.738 + 319 | 25.38 + 68 | 47.310 + 306 | 19.85 + 84 |
| 8 | 28.3 | 51.994 + 316 | 01.12 +132 | 12.214 + 570 | 21.76 - 3 | 17.062 + 324 | 26.05 + 67 | 47.622 + 312 | 20.60 + 75 |
| 9 | 7.2 | 52.317 + 323 | 00.29 + 83 | 12.796 + 582 | 22.02 + 26 | 17.389 + 327 | 26.66 + 61 | 47.938 + 316 | 21.26 + 66 |
| 9 | 17.2 | 52.637 + 320 | 00.02 + 27 | 13.375 + 579 | 22.60 + 58 | 17.714 + 325 | 27.21 + 55 | 48.250 + 312 | 21.77 + 51 |
| 9 | 27.2 | 52.951 + 314 | 00.27 - 25 | 13.945 + 570 | 23.45 + 85 | 18.032 + 318 | 27.67 + 46 | 48.557 + 307 | 22.15 + 38 |
| 10 | 7.2 | 53.255 + 304 | 01.07 - 80 | 14.501 + 556 | 24.60 +115 | 18.343 + 311 | 28.05 + 38 | 48.857 + 300 | 22.37 + 22 |
| 10 | 17.1 | 53.539 + 284 | 02.39 -132 | 15.028 + 527 | 26.00 +140 | 18.640 + 297 | 28.33 + 28 | 49.143 + 286 | 22.44 + 7 |
| 10 | 27.1 | 53.801 + 262 | 04.15 -176 | 15.523 + 495 | 27.64 +164 | 18.921 + 281 | 28.54 + 21 | 49.414 + 271 | 22.39 - 5 |
| 11 | 6.1 | 54.037 + 236 | 06.33 -218 | 15.979 + 456 | 29.51 +187 | 19.182 + 261 | 28.68 + 14 | 49.666 + 252 | 22.22 - 17 |
| 11 | 16.1 | 54.238 + 201 | 08.81 -248 | 16.379 + 400 | 31.56 +205 | 19.417 + 235 | 28.77 + 9 | 49.892 + 226 | 22.22 - 26 |
| 11 | 26.0 | 54.404 + 166 | 11.48 -267 | 16.723 + 344 | 33.75 +219 | 19.624 + 207 | 28.84 + 7 | 50.092 + 200 | 21.96 - 30 |
| 12 | 6.0 | 54.528 + 124 | 14.30 -282 | 16.997 + 274 | 36.06 +231 | 19.796 + 172 | 28.89 + 5 | 50.258 + 166 | 21.32 - 34 |
| 12 | 16.0 | 54.606 + 78 | 17.10 -280 | 17.190 + 193 | 38.40 +234 | 19.928 + 132 | 28.95 + 6 | 50.385 + 127 | 20.98 - 34 |
| 12 | 25.9 | 54.639 + 33 | 19.80 -270 | 17.305 + 115 | 40.72 +232 | 20.019 + 91 | 29.02 + 7 | 50.473 + 88 | 20.66 - 32 |
| 12 | 35.9 | 54.622 - 17 | 22.35 -255 | 17.329 + 24 | 42.96 +224 | 20.063 + 44 | 29.09 + 7 | 50.515 + 42 | 20.66 - 29 |
| | | - 64 | -226 | - 62 | +205 | - 4 | + 8 | - 3 | - 25 |
| Mean Place | 52.118 | 25.79 | 12.785 | 25.53 | 17.255 | 17.34 | 47.801 | 09.74 | |
| sec δ, tan δ | +1.176 | -0.620 | +2.026 | +1.762 | +1.075 | +0.395 | +1.037 | +0.275 | |
| dα(ψ), dδ(ψ) | +0.045 | +0.10 | +0.106 | +0.10 | +0.071 | +0.10 | +0.068 | +0.10 | |
| dα(ε), dδ(ε) | +0.010 | +0.97 | -0.029 | +0.97 | -0.007 | +0.97 | -0.004 | +0.97 | |
| Dble. Trans. | December 7 | | December 7 | | December 7 | | December 7 | | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 187 | | 186 | | 189 | | 185 | |
|--------------|-----------------------------------|-------------------------------------|-----------------------------------|-------------------------------------|-----------------------------------|-------------------------------------|-----------------------------------|-------------------------------------|
| | η ¹ Pictoris | | ε Leporis | | ζ Doradus | | η Aurigae | |
| Mag.Spect. | 4.92 | K5 | 3.29 | K5 | 4.76 | F8 | 3.28 | B3 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | ^h ^m 5 04 | ^o ['] -49 35 | ^h ^m 5 04 | ^o ['] -22 22 | ^h ^m 5 05 | ^o ['] -57 28 | ^h ^m 5 05 | ^o ['] +41 13 |
| 1 -9.0 | 38.041 + 11 | 45.54 -324 | 52.979 + 65 | 77.55 -238 | 18.616 - 21 | 88.62 -335 | 32.602 + 123 | 08.45 +129 |
| 1 0.9 | 37.990 - 51 | 48.58 -304 | 53.001 + 22 | 79.80 -225 | 18.522 - 94 | 91.76 -314 | 32.671 + 69 | 09.70 +125 |
| 1 10.9 | 37.879 - 111 | 51.37 -279 | 52.978 - 23 | 81.87 -207 | 18.355 - 167 | 94.62 -286 | 32.681 + 10 | 10.90 +120 |
| 1 20.9 | 37.708 - 171 | 53.78 -241 | 52.909 - 69 | 83.67 -180 | 18.119 - 236 | 97.09 -247 | 32.682 - 49 | 11.97 +107 |
| 1 30.9 | 37.489 - 219 | 55.75 -197 | 52.802 - 107 | 85.17 -150 | 17.826 - 293 | 99.10 -201 | 32.532 - 100 | 12.87 + 90 |
| 2 9.8 | 37.225 - 264 | 57.27 -152 | 52.659 - 143 | 86.35 -118 | 17.483 - 343 | 100.64 -154 | 32.384 - 148 | 13.58 + 71 |
| 2 19.8 | 36.927 - 298 | 58.26 - 99 | 52.488 - 171 | 87.15 - 80 | 17.101 - 382 | 101.62 - 98 | 32.198 - 186 | 14.05 + 47 |
| 3 1.8 | 36.610 - 317 | 58.73 - 47 | 52.299 - 189 | 87.59 - 44 | 16.698 - 403 | 102.06 - 44 | 31.988 - 210 | 14.26 + 21 |
| 3 11.7 | 36.281 - 329 | 58.69 + 4 | 52.100 - 199 | 87.59 - 8 | 16.283 - 415 | 101.98 + 8 | 31.764 - 224 | 14.21 - 5 |
| 3 21.7 | 35.955 - 326 | 58.11 + 58 | 51.902 - 198 | 87.35 + 32 | 15.873 - 410 | 101.32 + 66 | 31.542 - 222 | 13.90 - 31 |
| 3 31.7 | 35.647 - 308 | 57.04 +107 | 51.717 - 185 | 86.69 + 66 | 15.483 - 390 | 100.17 +115 | 31.338 - 204 | 13.36 - 54 |
| 4 10.7 | 35.364 - 283 | 55.50 +154 | 51.550 - 167 | 85.67 +102 | 15.122 - 361 | 98.53 +164 | 31.159 - 179 | 12.61 - 75 |
| 4 20.6 | 35.119 - 245 | 53.50 +200 | 51.415 - 135 | 84.31 +136 | 14.806 - 316 | 96.42 +211 | 31.021 - 138 | 11.69 - 92 |
| 4 30.6 | 34.921 - 198 | 51.14 +236 | 51.316 - 99 | 82.67 +164 | 14.544 - 262 | 93.94 +248 | 30.931 - 90 | 10.67 - 102 |
| 5 10.6 | 34.773 - 148 | 48.42 +272 | 51.256 - 60 | 80.73 +194 | 14.341 - 203 | 91.09 +285 | 30.893 - 38 | 09.58 -109 |
| 5 20.6 | 34.686 - 87 | 45.40 +302 | 51.243 - 13 | 78.55 +218 | 14.209 - 132 | 87.96 +313 | 30.914 + 21 | 08.49 -109 |
| 5 30.5 | 34.657 - 29 | 42.20 +320 | 51.274 + 31 | 76.19 +236 | 14.146 - 63 | 84.64 +332 | 30.993 + 79 | 07.44 -105 |
| 6 9.5 | 34.690 + 33 | 38.84 +336 | 51.350 + 76 | 73.66 +253 | 14.155 + 9 | 81.16 +348 | 31.127 +134 | 06.46 - 98 |
| 6 19.5 | 34.786 + 96 | 35.42 +342 | 51.472 +122 | 71.06 +260 | 14.239 + 84 | 77.63 +353 | 31.317 +190 | 05.59 - 87 |
| 6 29.4 | 34.938 + 152 | 32.05 +337 | 51.633 +161 | 68.45 +261 | 14.390 +151 | 74.17 +346 | 31.554 +237 | 04.86 - 73 |
| 7 9.4 | 35.144 + 206 | 28.76 +329 | 51.831 +198 | 65.87 +258 | 14.609 +219 | 70.80 +337 | 31.835 +281 | 04.29 - 57 |
| 7 19.4 | 35.401 + 257 | 25.71 +306 | 52.061 +230 | 63.42 +245 | 14.889 +280 | 67.69 +311 | 32.154 +319 | 03.90 - 39 |
| 7 29.4 | 35.697 + 296 | 22.96 +275 | 52.316 +255 | 61.18 +224 | 15.218 +329 | 64.88 +281 | 32.499 +345 | 03.68 - 22 |
| 8 8.3 | 36.030 + 333 | 20.57 +239 | 52.593 +277 | 59.18 +200 | 15.595 +377 | 62.47 +241 | 32.868 +369 | 03.63 - 5 |
| 8 18.3 | 36.391 + 361 | 18.67 +190 | 52.885 +292 | 57.54 +164 | 16.007 +412 | 60.56 +191 | 33.253 +385 | 03.76 +13 |
| 8 28.3 | 36.768 + 377 | 17.28 +139 | 53.186 +301 | 56.28 +126 | 16.441 +434 | 59.18 +138 | 33.646 +393 | 04.03 + 27 |
| 9 7.3 | 37.159 + 391 | 16.47 + 81 | 53.492 +306 | 55.45 + 83 | 16.893 +452 | 58.40 + 78 | 34.044 +398 | 04.44 + 41 |
| 9 17.2 | 37.549 + 390 | 16.29 + 18 | 53.797 +305 | 55.11 + 34 | 17.345 +452 | 58.27 + 13 | 34.440 +396 | 04.98 + 54 |
| 9 27.2 | 37.931 + 382 | 16.71 - 42 | 54.095 +298 | 55.23 - 12 | 17.788 +443 | 58.76 - 49 | 34.830 +390 | 05.64 + 66 |
| 10 7.2 | 38.300 + 369 | 17.76 -105 | 54.386 +291 | 55.85 - 62 | 18.215 +427 | 59.90 -114 | 35.212 +382 | 06.40 + 76 |
| 10 17.1 | 38.642 + 342 | 19.41 -165 | 54.659 +273 | 56.93 -108 | 18.607 +392 | 61.64 -174 | 35.575 +363 | 07.27 + 87 |
| 10 27.1 | 38.952 + 310 | 21.55 -214 | 54.915 +256 | 58.40 -147 | 18.959 +352 | 63.89 -225 | 35.921 +346 | 08.22 + 95 |
| 11 6.1 | 39.223 + 271 | 24.16 -261 | 55.147 +232 | 60.26 -186 | 19.261 +302 | 66.63 -274 | 36.242 +321 | 09.27 +105 |
| 11 16.1 | 39.445 + 222 | 27.12 -296 | 55.350 +203 | 62.38 -212 | 19.501 +240 | 69.71 -308 | 36.529 +287 | 10.39 +112 |
| 11 26.0 | 39.616 + 171 | 30.30 -318 | 55.522 +172 | 64.70 -232 | 19.677 +176 | 73.01 -330 | 36.782 +253 | 11.58 +119 |
| 12 6.0 | 39.729 + 113 | 33.63 -333 | 55.656 +134 | 67.13 -243 | 19.781 +104 | 76.46 -345 | 36.991 +209 | 12.82 +124 |
| 12 16.0 | 39.779 + 50 | 36.94 -331 | 55.749 + 93 | 69.57 -244 | 19.808 + 27 | 79.89 -343 | 37.150 +159 | 14.08 +126 |
| 12 26.0 | 39.769 - 74 | 40.13 -319 | 55.800 + 51 | 71.93 -236 | 19.762 - 46 | 83.19 -330 | 37.257 +107 | 15.34 +126 |
| 12 35.9 | 39.695 - 135 | 43.13 -300 | 55.805 + 5 | 74.16 -223 | 19.639 -123 | 86.27 -308 | 37.305 + 48 | 16.56 +122 |
| | | -265 | -40 | -198 | -195 | -273 | -10 | +113 |
| Mean Place | 36.966 | 44.78 | 53.324 | 78.77 | 16.694 | 87.41 | 33.965 | 01.96 |
| sec δ, tan δ | +1.543 | -1.175 | +1.082 | -0.412 | +1.861 | -1.569 | +1.329 | +0.876 |
| dα(ψ), dδ(ψ) | +0.031 | +0.10 | +0.051 | +0.09 | +0.021 | +0.09 | +0.084 | +0.09 |
| dα(ε), dδ(ε) | +0.019 | +0.97 | +0.007 | +0.97 | +0.025 | +0.97 | -0.014 | +0.97 |
| Dble.Trans. | December 7 | | December 7 | | December 7 | | December 7 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 1143 | | 188 | | 190 | | 1142 | |
|---|---|------------|--------------------------|------------|--------------------------|------------|---------------------------|------------|
| | 13 G. Pictoris | | β Eridani | | λ Eridani | | 16 Orionis | |
| Mag.Spect. | 7.10 | A0 | 2.92 | A3 | 4.34 | B2 | 5.42 | A2 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° ' | h m | ° ' | h m | ° ' | h m | ° ' |
| | 5 06 | -44 49 | 5 07 | - 5 05 | 5 08 | - 8 45 | 5 08 | + 9 48 |
| 1 | ^d -9.0 ^s 62.659 + 27 | 80.16 -315 | ^s 10.317 + 85 | 68.69 -153 | ^s 29.265 + 84 | 72.05 -173 | ^s 33.982 + 101 | 51.04 -67 |
| 1 | 0.9 62.630 - 29 | 83.13 -297 | 10.362 + 45 | 70.14 -145 | 29.308 + 43 | 73.69 -164 | 34.041 + 59 | 50.43 -61 |
| 1 | 10.9 62.545 - 85 | 85.86 -273 | 10.364 + 2 | 71.47 -133 | 29.308 + 0 | 75.20 -151 | 34.057 + 16 | 49.87 -56 |
| 1 | 20.9 62.404 -141 | 88.22 -236 | 10.323 - 41 | 72.63 -116 | 29.263 - 45 | 76.52 -132 | 34.026 - 31 | 49.39 -48 |
| 1 | 30.9 62.217 -187 | 90.17 -195 | 10.243 - 80 | 73.59 - 96 | 29.181 - 82 | 77.62 -110 | 33.957 - 69 | 48.99 -40 |
| 2 | 9.8 61.987 -230 | 91.69 -152 | 10.128 -115 | 74.37 - 78 | 29.063 -118 | 78.50 - 88 | 33.850 -107 | 48.66 -33 |
| 2 | 19.8 61.725 -262 | 92.70 -101 | 09.984 -144 | 74.92 - 55 | 28.916 -147 | 79.12 - 62 | 33.713 -137 | 48.41 -25 |
| 3 | 1.8 61.444 -283 | 93.20 - 50 | 09.822 -162 | 75.25 - 33 | 28.752 -164 | 79.49 - 37 | 33.557 -156 | 48.23 -18 |
| 3 | 11.7 61.151 -291 | 93.22 - 2 | 09.650 -172 | 75.37 -12 | 28.575 -177 | 79.61 -12 | 33.389 -168 | 48.12 -11 |
| 3 | 21.7 60.860 -291 | 92.70 + 52 | 09.478 -172 | 75.24 + 13 | 28.400 -175 | 79.45 + 16 | 33.222 -167 | 48.08 - 4 |
| 3 | 31.7 60.585 -275 | 91.72 + 98 | 09.318 -160 | 74.91 + 33 | 28.236 -164 | 79.05 + 40 | 33.066 -156 | 48.13 + 5 |
| 4 | 10.7 60.332 -253 | 90.28 +144 | 09.176 -142 | 74.35 + 56 | 28.090 -146 | 78.40 + 65 | 32.929 -137 | 48.27 +14 |
| 4 | 20.6 60.116 -216 | 88.39 +189 | 09.064 -112 | 73.56 + 79 | 27.974 -116 | 77.50 + 90 | 32.823 -106 | 48.51 +24 |
| 4 | 30.6 59.942 -174 | 86.14 +225 | 08.987 - 77 | 72.58 + 90 | 27.892 - 82 | 76.37 +113 | 32.754 - 69 | 48.86 +35 |
| 5 | 10.6 59.815 -127 | 83.53 +261 | 08.949 - 38 | 71.38 +120 | 27.849 - 43 | 75.01 +136 | 32.724 - 30 | 49.33 +47 |
| 5 | 20.6 59.744 - 71 | 80.63 +290 | 08.955 + 6 | 70.00 +138 | 27.850 + 1 | 73.45 +156 | 32.739 + 15 | 49.94 +61 |
| 5 | 30.5 59.729 - 15 | 77.55 +308 | 09.004 + 49 | 68.46 +154 | 27.894 + 44 | 71.73 +172 | 32.799 + 60 | 50.65 +71 |
| 6 | 9.5 59.769 + 40 | 74.29 +326 | 09.095 + 91 | 66.77 +169 | 27.980 + 86 | 69.86 +187 | 32.900 +101 | 51.49 +84 |
| 6 | 19.5 59.867 + 98 | 70.97 +332 | 09.229 +134 | 64.99 +178 | 28.110 +130 | 67.89 +197 | 33.045 +145 | 52.46 +97 |
| 6 | 29.4 60.016 +149 | 67.68 +329 | 09.399 +170 | 63.15 +184 | 28.275 +165 | 65.88 +201 | 33.227 +182 | 53.51 +105 |
| 7 | 9.4 60.215 +199 | 64.47 +321 | 09.603 +204 | 61.30 +185 | 28.476 +201 | 63.86 +202 | 33.444 +217 | 54.62 +111 |
| 7 | 19.4 60.460 +245 | 61.48 +299 | 09.836 +233 | 59.51 +179 | 28.706 +230 | 61.91 +195 | 33.689 +245 | 55.74 +112 |
| 7 | 29.4 60.740 +280 | 58.76 +272 | 10.091 +255 | 57.82 +169 | 28.958 +252 | 60.08 +183 | 33.955 +266 | 56.85 +111 |
| 8 | 8.3 61.054 +314 | 56.40 +236 | 10.364 +273 | 56.27 +155 | 29.229 +271 | 58.43 +165 | 34.239 +284 | 57.91 +106 |
| 8 | 18.3 61.392 +338 | 54.50 +190 | 10.650 +286 | 54.96 +131 | 29.515 +286 | 57.03 +140 | 34.536 +297 | 58.87 +96 |
| 8 | 28.3 61.745 +353 | 53.10 +140 | 10.943 +293 | 53.89 +107 | 29.806 +291 | 55.91 +112 | 34.839 +303 | 59.70 +83 |
| 9 | 7.3 62.110 +365 | 52.25 + 85 | 11.240 +297 | 53.13 + 76 | 30.104 +298 | 55.12 + 79 | 35.146 +307 | 60.37 +67 |
| 9 | 17.2 62.474 +364 | 52.02 + 23 | 11.536 +296 | 52.70 + 43 | 30.399 +295 | 54.71 + 41 | 35.451 +305 | 60.84 +47 |
| 9 | 27.2 62.832 +358 | 52.38 - 36 | 11.826 +290 | 52.61 + 9 | 30.690 +291 | 54.65 + 6 | 35.752 +301 | 61.13 +29 |
| 10 | 7.2 63.178 +346 | 53.35 - 97 | 12.109 +283 | 52.86 - 25 | 30.974 +284 | 54.98 - 33 | 36.046 +294 | 61.20 + 7 |
| 10 | 17.1 63.501 +323 | 54.90 -155 | 12.378 +269 | 53.45 - 59 | 31.244 +270 | 55.68 - 70 | 36.326 +280 | 61.07 -13 |
| 10 | 27.1 63.796 +295 | 56.94 -204 | 12.632 +254 | 54.33 - 88 | 31.498 +254 | 56.69 -101 | 36.593 +267 | 60.77 -30 |
| 11 | 6.1 64.057 +261 | 59.45 -251 | 12.867 +235 | 55.48 -115 | 31.733 +235 | 57.99 -130 | 36.842 +249 | 60.31 -46 |
| 11 | 16.1 64.274 +217 | 62.30 -285 | 13.076 +209 | 56.83 -135 | 31.942 +209 | 59.52 -153 | 37.065 +223 | 60.73 -58 |
| 11 | 26.0 64.446 +172 | 65.37 -307 | 13.258 +182 | 58.31 -148 | 32.124 +182 | 61.19 -167 | 37.263 +198 | 59.08 -65 |
| 12 | 6.0 64.567 +121 | 68.60 -323 | 13.408 +150 | 59.88 -157 | 32.272 +148 | 62.96 -177 | 37.428 +165 | 58.38 -70 |
| 12 | 16.0 64.630 + 8 | 71.81 -321 | 13.519 +111 | 61.46 -158 | 32.382 +110 | 64.74 -178 | 37.556 +128 | 57.68 -70 |
| 12 | 26.0 64.638 + 63 | 74.93 -312 | 13.592 + 73 | 62.98 -152 | 32.453 + 71 | 66.46 -172 | 37.644 + 88 | 57.02 -66 |
| 12 | 35.9 64.588 - 50 | 77.85 -292 | 13.622 + 30 | 64.42 -144 | 32.481 + 28 | 68.09 -163 | 37.688 + 44 | 56.39 -63 |
| | -107 | -261 | -14 | -129 | -16 | -145 | -1 | -55 |
| Mean Place | 61.947 | 79.99 | 11.099 | 71.55 | 29.969 | 74.69 | 35.027 | 46.88 |
| sec δ , $\tan \delta$ | +1.410 | -0.994 | +1.004 | -0.089 | +1.012 | -0.154 | +1.015 | +0.173 |
| $d\alpha(\psi)$, $d\delta(\psi)$ | +0.035 | +0.09 | +0.059 | +0.09 | +0.057 | +0.09 | +0.066 | +0.09 |
| $d\alpha(\epsilon)$, $d\delta(\epsilon)$ | +0.015 | +0.97 | +0.001 | +0.97 | +0.002 | +0.97 | -0.003 | +0.97 |
| Dble.Trans. | December 8 | | December 8 | | December 8 | | December 8 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 1141 | | 1144 | | 192 | | 196 | |
|------------------------------|-----------------------------------|-------------------------------------|-----------------------------------|-------------------------------------|-----------------------------------|-------------------------------------|-----------------------------------|-------------------------------------|
| | B.D. +27° 732' ρ. (Tauri) | | μ Leporis | | μ Aurigae | | δ Doradus | |
| Mag.Spect. | 5.97 | A3 | 3.30 | A0p | 4.78 | A3 | 4.78 | K0 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | ^h ^m 5 08 | [°] ['] +28 00 | ^h ^m 5 12 | [°] ['] -16 12 | ^h ^m 5 12 | [°] ['] +38 28 | ^h ^m 5 13 | [°] ['] -67 11 |
| 1 -9.0 | 52.897 +116 | 56.54 +47 | 18.922 +79 | 72.85 -213 | 28.845 +129 | 16.25 +111 | 49.660 -64 | 62.25 -344 |
| 1 0.9 | 52.966 +69 | 57.02 +48 | 18.960 +38 | 74.86 -201 | 28.922 +77 | 17.35 +110 | 49.493 -167 | 65.49 -324 |
| 1 10.9 | 52.986 +20 | 57.48 +46 | 18.953 -7 | 76.72 -186 | 28.942 +20 | 18.40 +105 | 49.226 -267 | 68.46 -297 |
| 1 20.9 | 52.955 -31 | 57.90 +42 | 18.901 -52 | 78.35 -163 | 28.905 -37 | 19.35 +95 | 48.863 -363 | 71.04 -258 |
| 1 30.9 | 52.879 -76 | 58.26 +36 | 18.810 -91 | 79.71 -136 | 28.817 -88 | 20.18 +83 | 48.423 -440 | 73.17 -213 |
| 2 9.8 | 52.761 -118 | 58.54 +28 | 18.683 -127 | 80.80 -109 | 28.681 -136 | 20.84 +66 | 47.914 -509 | 74.83 -166 |
| 2 19.8 | 52.609 -152 | 58.71 +17 | 18.527 -156 | 81.57 -77 | 28.507 -174 | 21.29 +45 | 47.352 -562 | 75.92 -109 |
| 3 1.8 | 52.436 -173 | 58.77 +6 | 18.527 -175 | 82.01 -44 | 28.309 -198 | 21.51 +22 | 46.762 -488 | 76.47 -55 |
| 3 11.7 | 52.250 -186 | 58.70 -7 | 18.352 -187 | 82.01 -14 | 28.096 -213 | 21.51 +0 | 46.154 -608 | 76.47 +0 |
| 3 21.7 | 52.065 -185 | 58.51 -19 | 17.979 -186 | 81.94 +21 | 27.883 -213 | 21.27 -24 | 45.550 -604 | 75.91 +56 |
| 3 31.7 | 51.893 -172 | 58.21 -30 | 17.803 -176 | 81.43 +51 | 27.685 -198 | 20.82 -45 | 44.971 -579 | 74.83 +108 |
| 4 10.7 | 51.742 -151 | 57.84 -37 | 17.645 -158 | 80.61 -175 | 27.510 -137 | 20.19 -63 | 44.426 -545 | 73.26 +157 |
| 4 20.6 | 51.626 -116 | 57.41 -43 | 17.517 -128 | 80.61 +113 | 27.373 -170 | 19.40 -79 | 43.938 -488 | 71.20 +206 |
| 4 30.6 | 51.551 -75 | 56.96 -45 | 17.423 -94 | 79.48 +139 | 27.282 -91 | 18.52 -88 | 43.519 -419 | 68.76 +244 |
| 5 10.6 | 51.521 -30 | 56.52 -44 | 17.367 -56 | 76.43 +166 | 27.240 -42 | 17.58 -94 | 43.175 -344 | 65.94 +282 |
| 5 20.6 | 51.542 +21 | 56.13 -39 | 17.356 -11 | 74.54 +189 | 27.255 +15 | 16.64 -94 | 42.923 -252 | 62.81 +313 |
| 5 30.5 | 51.612 +70 | 55.83 -30 | 17.389 +33 | 72.48 +206 | 27.325 +70 | 15.73 -91 | 42.762 -161 | 59.49 +332 |
| 6 9.5 | 51.727 +115 | 55.67 -16 | 17.465 +76 | 70.26 +232 | 27.448 +123 | 14.90 -83 | 42.698 -64 | 56.00 +349 |
| 6 19.5 | 51.890 +163 | 55.48 -19 | 17.585 +120 | 67.94 +222 | 27.625 +177 | 14.15 -75 | 42.738 +40 | 52.45 +355 |
| 6 29.4 | 52.097 +207 | 55.47 -1 | 17.742 +157 | 65.60 +234 | 27.847 +222 | 13.53 -62 | 42.870 +132 | 48.95 +350 |
| 7 9.4 | 52.341 +244 | 55.58 +11 | 17.936 +194 | 63.26 +234 | 28.113 +266 | 13.06 -47 | 43.098 +228 | 45.54 +341 |
| 7 19.4 | 52.617 +276 | 55.81 +23 | 18.161 +225 | 61.04 +222 | 28.415 +302 | 12.75 -31 | 43.415 +317 | 42.38 +316 |
| 7 29.4 | 52.915 +298 | 56.13 +32 | 18.409 +248 | 58.97 +207 | 28.744 +329 | 12.58 -17 | 43.807 +392 | 39.51 +287 |
| 8 8.3 | 53.234 +319 | 56.54 +41 | 18.679 +270 | 57.11 +352 | 29.096 +352 | 12.57 -1 | 44.270 +463 | 37.03 +286 |
| 8 18.3 | 53.567 +333 | 56.99 +45 | 18.964 +285 | 55.56 +155 | 29.465 +369 | 12.69 +12 | 44.790 +520 | 35.06 +197 |
| 8 28.3 | 53.906 +339 | 57.48 +49 | 19.257 +293 | 54.34 +122 | 29.842 +377 | 12.94 +25 | 45.348 +558 | 33.61 +145 |
| 9 7.3 | 54.250 +344 | 57.99 +51 | 19.557 +300 | 53.51 +83 | 30.226 +384 | 13.30 +36 | 45.936 +588 | 32.77 +84 |
| 9 17.2 | 54.592 +342 | 58.49 +50 | 19.856 +299 | 53.12 +39 | 30.609 +383 | 13.77 +47 | 46.533 +597 | 32.58 +19 |
| 9 27.2 | 54.929 +337 | 58.98 +49 | 20.150 +294 | 53.15 -3 | 30.986 +377 | 14.32 +55 | 47.121 +588 | 33.03 -45 |
| 10 7.2 | 55.259 +330 | 59.44 +46 | 20.438 +288 | 53.62 -47 | 31.357 +371 | 14.95 +63 | 47.689 +568 | 34.13 -110 |
| 10 17.1 | 55.575 +316 | 59.88 +44 | 20.712 +274 | 54.53 -91 | 31.712 +355 | 15.67 +72 | 48.211 +522 | 35.85 -172 |
| 10 27.1 | 55.876 +301 | 60.30 +42 | 20.969 +257 | 55.79 -126 | 32.051 +339 | 16.45 +78 | 48.677 +466 | 38.10 -225 |
| 11 6.1 | 56.157 +281 | 60.71 +41 | 21.206 +237 | 57.41 -162 | 32.367 +316 | 17.31 +86 | 49.074 +397 | 40.84 -274 |
| 11 16.1 | 56.410 +253 | 61.11 +40 | 21.416 +210 | 59.28 -187 | 32.653 +286 | 18.24 +93 | 49.381 +307 | 43.95 -311 |
| 11 26.0 | 56.635 +225 | 61.52 +41 | 21.597 +181 | 61.32 -204 | 32.905 +252 | 19.23 +99 | 49.597 +216 | 47.31 -336 |
| 12 6.0 | 56.823 +188 | 61.95 +43 | 21.743 +146 | 63.49 -217 | 33.117 +212 | 20.27 +104 | 49.710 +113 | 50.83 -352 |
| 12 16.0 | 56.969 +146 | 62.39 +44 | 21.850 +107 | 65.66 -217 | 33.280 +163 | 21.35 +108 | 49.713 +3 | 54.33 -350 |
| 12 26.0 | 57.071 +102 | 62.84 +45 | 21.916 +66 | 67.78 -212 | 33.394 +114 | 22.43 +108 | 49.613 -100 | 57.73 -340 |
| 12 35.9 | 57.124 +53 | 63.29 +45 | 21.938 +22 | 69.77 -199 | 33.451 +57 | 23.50 +107 | 49.405 -208 | 60.92 -319 |
| | 57.124 +2 | 63.29 +42 | 21.938 -24 | 69.77 -180 | 33.451 +0 | 23.50 +99 | 49.405 -307 | 60.92 -284 |
| Mean Place sec δ, tan δ | 54.158 +1.133 | 50.92 +0.532 | 19.441 +1.041 | 75.24 -0.291 | 30.173 +1.277 | 09.85 +0.795 | 45.910 +2.581 | 62.04 -2.379 |
| dα(ψ), dδ(ψ) dα(ε), dδ(ε) | +0.075 -0.008 | +0.09 +0.98 | +0.054 +0.004 | +0.08 +0.98 | +0.082 -0.011 | +0.08 +0.98 | -0.001 +0.032 | +0.08 +0.98 |
| Dble.Trans. | December 8 | | December 9 | | December 9 | | December 10 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 194 | | 193 | | 195 | | 197 | |
|---|----------------------------|------------|-------------------------------|------------|----------------|------------|-------------------|------------|
| | β Orionis (Rigel) | | α Aurigae (Capella) | | τ Orionis | | σ Columbae | |
| Mag.Spect. | 0.34 | B8p | 0.21 | G0 | 3.68 | B5 | 4.91 | K0 |
| U.T. | R.A. Dec. | | R.A. Dec. | | R.A. Dec. | | R.A. Dec. | |
| | h m | ° ' | h m | ° ' | h m | ° ' | h m | ° ' |
| | 5 13 | - 8 12 | 5 15 | +45 59 | 5 16 | - 6 51 | 5 16 | -34 54 |
| 1 -9.0 | 52.594 + 90 | 56.62 -173 | 40.061 + 141 | 14.36 +154 | 56.275 + 94 | 26.46 -167 | 59.966 + 59 | 27.00 -292 |
| 1 0.9 | 52.642 + 48 | 58.25 -163 | 40.142 + 81 | 15.88 +152 | 56.327 + 52 | 28.03 -157 | 59.977 + 11 | 29.78 -278 |
| 1 10.9 | 52.647 + 5 | 59.75 -150 | 40.161 + 19 | 17.33 +145 | 56.337 + 10 | 29.48 -145 | 59.936 - 41 | 32.35 -257 |
| 1 20.9 | 52.608 - 39 | 61.07 -132 | 40.114 - 47 | 18.66 +133 | 56.301 - 36 | 30.75 -127 | 59.936 - 91 | 34.61 -226 |
| 1 30.9 | 52.529 - 79 | 62.17 -110 | 40.010 -104 | 19.80 +114 | 56.226 - 75 | 31.82 -107 | 59.845 -135 | 36.51 -190 |
| 2 9.8 | 52.415 -114 | 63.06 - 89 | 39.853 -157 | 20.73 + 93 | 56.114 -112 | 32.68 - 86 | 59.536 -174 | 38.02 -151 |
| 2 19.8 | 52.270 -145 | 63.70 - 64 | 39.653 -200 | 21.38 + 65 | 55.972 -142 | 33.30 - 62 | 59.329 -207 | 39.08 -106 |
| 3 1.8 | 52.107 -163 | 64.08 - 38 | 39.426 -227 | 21.73 + 35 | 55.811 -161 | 33.68 - 38 | 59.102 -227 | 39.69 - 61 |
| 3 11.7 | 51.932 -175 | 64.22 -175 | 39.181 -245 | 21.78 + 5 | 55.637 -174 | 33.84 - 16 | 58.862 -240 | 39.85 - 16 |
| 3 21.7 | 51.756 -176 | 64.10 +12 | 38.936 -245 | 21.52 - 26 | 55.462 -175 | 33.73 +11 | 58.622 -240 | 39.54 +31 |
| 3 31.7 | 51.591 -165 | 63.73 +37 | 38.708 -228 | 20.97 - 55 | 55.298 -164 | 33.40 +33 | 58.394 -228 | 38.80 +74 |
| 4 10.7 | 51.443 -148 | 63.12 +61 | 38.505 -203 | 20.17 - 80 | 55.150 -148 | 32.83 +57 | 58.184 -210 | 37.64 +116 |
| 4 20.6 | 51.324 -119 | 62.25 + 87 | 38.344 -161 | 19.15 -102 | 55.031 -119 | 32.02 +81 | 58.006 -178 | 36.05 +159 |
| 4 30.6 | 51.239 - 85 | 61.16 +109 | 38.234 -110 | 17.97 -118 | 54.945 - 86 | 31.00 +102 | 57.865 -141 | 34.13 +192 |
| 5 10.6 | 51.192 - 47 | 59.85 +131 | 38.178 - 56 | 16.69 -128 | 54.897 - 48 | 29.76 +124 | 57.765 -100 | 31.86 +227 |
| 5 20.6 | 51.189 - 3 | 58.34 +151 | 38.186 + 8 | 15.35 -134 | 54.893 - 4 | 28.32 +144 | 57.714 - 51 | 29.31 +255 |
| 5 30.5 | 51.229 + 40 | 56.67 +167 | 38.254 + 68 | 14.03 -132 | 54.931 + 38 | 26.73 +159 | 57.712 - 2 | 26.56 +275 |
| 6 9.5 | 51.311 + 82 | 54.84 +183 | 38.383 +129 | 12.75 -128 | 55.012 + 81 | 24.98 +175 | 57.759 + 47 | 23.62 +294 |
| 6 19.5 | 51.436 +125 | 52.91 +193 | 38.572 +189 | 11.57 -105 | 55.135 +123 | 23.13 +185 | 57.857 + 98 | 20.60 +302 |
| 6 29.4 | 51.597 +161 | 50.94 +197 | 38.812 +240 | 10.52 -105 | 55.294 +159 | 21.24 +189 | 57.999 +142 | 17.59 +301 |
| 7 9.4 | 51.793 +196 | 48.96 +198 | 39.101 +289 | 09.62 - 90 | 55.489 +195 | 19.33 +191 | 58.184 +185 | 14.61 +298 |
| 7 19.4 | 52.020 +227 | 47.04 +192 | 39.431 +330 | 08.91 - 71 | 55.713 +224 | 17.47 +186 | 58.408 +224 | 11.81 +280 |
| 7 29.4 | 52.268 +248 | 45.24 +180 | 39.792 +361 | 08.39 - 52 | 55.960 +247 | 15.73 +174 | 58.663 +255 | 09.24 +257 |
| 8 8.3 | 52.537 +269 | 43.61 +163 | 40.181 +389 | 08.06 - 33 | 56.228 +268 | 14.14 +159 | 58.946 +283 | 06.97 +227 |
| 8 18.3 | 52.820 +283 | 42.23 +138 | 40.589 +408 | 07.93 - 13 | 56.509 +281 | 12.79 +135 | 59.250 +304 | 05.11 +186 |
| 8 28.3 | 53.110 +290 | 41.12 +111 | 41.008 +419 | 07.98 + 5 | 56.799 +290 | 11.70 +109 | 59.567 +317 | 03.70 +141 |
| 9 7.3 | 53.407 +297 | 40.32 + 80 | 41.436 +428 | 08.22 + 24 | 57.095 +296 | 10.92 + 78 | 59.895 +328 | 02.79 + 91 |
| 9 17.2 | 53.703 +296 | 39.91 + 41 | 41.863 +427 | 08.63 + 41 | 57.391 +296 | 10.50 + 42 | 60.224 +329 | 02.45 + 34 |
| 9 27.2 | 53.994 +291 | 39.84 + 7 | 42.285 +422 | 09.19 + 56 | 57.683 +292 | 10.42 + 8 | 60.548 +324 | 02.65 - 20 |
| 10 7.2 | 54.280 +286 | 40.16 - 32 | 42.700 +415 | 09.92 + 73 | 57.969 +286 | 10.71 - 29 | 60.866 +318 | 03.42 - 77 |
| 10 17.1 | 54.552 +272 | 40.84 - 68 | 43.097 +397 | 10.79 + 87 | 58.243 +274 | 11.35 - 64 | 61.165 +299 | 04.74 -132 |
| 10 27.1 | 54.810 +258 | 41.83 - 99 | 43.476 +379 | 11.80 +101 | 58.503 +260 | 12.30 - 95 | 61.444 +279 | 06.53 -179 |
| 11 6.1 | 55.050 +240 | 43.12 -129 | 43.830 +354 | 12.95 +115 | 58.745 +242 | 13.53 -123 | 61.698 +254 | 08.77 -224 |
| 11 16.1 | 55.263 +213 | 44.63 -151 | 44.149 +319 | 14.22 +127 | 58.962 +217 | 14.99 -146 | 61.916 +218 | 11.34 -257 |
| 11 26.0 | 55.450 +187 | 46.28 -165 | 44.430 +281 | 15.59 +137 | 59.153 +191 | 16.58 -159 | 62.098 +182 | 14.14 -280 |
| 12 6.0 | 55.604 +154 | 48.04 -176 | 44.665 +235 | 17.04 +145 | 59.311 +158 | 18.27 -169 | 62.237 +139 | 17.10 -296 |
| 12 16.0 | 55.720 +116 | 49.81 -177 | 44.845 +180 | 18.54 +150 | 59.431 +120 | 19.98 -171 | 62.328 + 91 | 20.07 -297 |
| 12 26.0 | 55.797 + 77 | 51.52 -171 | 44.969 +124 | 20.06 +152 | 59.512 + 81 | 21.63 -165 | 62.372 + 44 | 22.97 -290 |
| 12 35.9 | 55.830 + 33 | 53.15 -163 | 45.028 + 59 | 21.54 +148 | 59.549 + 37 | 23.20 -157 | 62.372 - 9 | 22.97 -275 |
| | | -11 | -145 | - 4 | - 7 | -140 | - 59 | -247 |
| Mean Place | 53.304 | 59.73 | 41.416 | 07.31 | 57.010 | 29.91 | 59.818 | 28.83 |
| sec δ , tan δ | +1.010 | -0.144 | +1.439 | +1.035 | +1.007 | -0.120 | +1.219 | -0.698 |
| $d\alpha(\psi)$, $d\delta(\psi)$ | +0.057 | +0.08 | +0.088 | +0.08 | +0.058 | +0.07 | +0.043 | +0.07 |
| $d\alpha(\epsilon)$, $d\delta(\epsilon)$ | +0.002 | +0.98 | -0.013 | +0.98 | +0.001 | +0.98 | +0.009 | +0.98 |
| Dble.Trans. | December 10 | | December 10 | | December 10 | | December 10 | |

AT UPPER TRANSIT AT GREENWICH

| No. | 1145 | | 198 | | 1146 | | 199 | |
|--------------|--------------|------------|----------------|------------|--------------|------------|--------------|------------|
| | λ Aurigae | | 12 G. Columbae | | λ Leporis | | ζ Pictoris | |
| Mag.Spect. | 4.85 | G0 | 5.75 | A0 | 4.29 | B1 | 5.52 | F8 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° / | h m | ° / | h m | ° / | h m | ° / |
| | 5 18 | + 40 05 | 5 18 | - 27 22 | 5 18 | - 13 11 | 5 18 | - 50 36 |
| 1 -9.0 | 10.056 + 139 | 23 92 +118 | 51 231 + 72 | 53 84 -265 | 56 555 + 89 | 21 09 -201 | 63 367 + 27 | 71.46 -332 |
| 1 0.9 | 10.140 + 84 | 25 09 +117 | 51 258 + 27 | 56 35 -251 | 56 603 + 48 | 22.98 -189 | 63 331 - 36 | 74.60 -314 |
| 1 10.9 | 10.167 + 27 | 26 22 +113 | 51 238 - 20 | 58 69 -234 | 56 606 + 3 | 24.74 -176 | 63 232 - 99 | 77.52 -292 |
| 1 20.9 | 10.134 - 33 | 27 25 +103 | 51 169 - 69 | 60 75 -206 | 56 564 - 42 | 26.29 -155 | 63 069 - 163 | 80.08 -256 |
| 1 30.9 | 10.049 - 85 | 28 15 + 90 | 51 059 - 110 | 62 47 -172 | 56 483 - 81 | 27.59 -130 | 62 854 - 215 | 82.21 -213 |
| 2 9.8 | 09.914 - 135 | 28 88 + 73 | 50 911 - 148 | 63 86 -139 | 56 364 - 119 | 28 64 -105 | 62 591 - 263 | 83.91 -170 |
| 2 19.8 | 09.739 - 175 | 29 40 + 52 | 50 731 - 180 | 64 84 - 98 | 56 215 - 149 | 29 39 - 75 | 62 290 - 301 | 85.08 -117 |
| 3 1.8 | 09.539 - 200 | 29 67 + 27 | 50 531 - 200 | 65 42 - 58 | 56 046 - 169 | 29 85 - 46 | 61 967 - 323 | 85.74 - 66 |
| 3 11.8 | 09.321 - 218 | 29 71 + 4 | 50 318 - 213 | 65 60 - 18 | 55 864 - 182 | 30 02 - 17 | 61 628 - 339 | 85 88 - 14 |
| 3 21.7 | 09.103 - 218 | 29 48 - 23 | 50 104 - 214 | 65 35 + 25 | 55 681 - 183 | 29 88 + 14 | 61 289 - 339 | 85 87 + 41 |
| 3 31.7 | 08 899 - 204 | 29 04 - 44 | 49 901 - 203 | 64 72 + 63 | 55 509 - 172 | 29 45 + 43 | 60 965 - 324 | 84 58 + 89 |
| 4 10.7 | 08 718 - 143 | 28 38 - 66 | 49 715 - 186 | 63 71 +101 | 55 352 - 157 | 28 74 + 71 | 60 663 - 302 | 83 20 +138 |
| 4 20.6 | 08 575 - 98 | 27 56 - 82 | 49 559 - 156 | 62 31 +140 | 55 224 - 128 | 27 74 +100 | 60 397 - 266 | 81 34 +186 |
| 4 30.6 | 08 477 - 98 | 26 62 - 94 | 49 438 - 121 | 60 60 +171 | 55 130 - 94 | 26 49 +125 | 60 177 - 220 | 79 10 +221 |
| 5 10.6 | 08 429 - 48 | 25 60 -102 | 49 356 - 82 | 58 57 +203 | 55 073 - 57 | 24 99 +150 | 60 006 - 171 | 76 49 +261 |
| 5 20.6 | 08 440 + 11 | 24 56 -104 | 49 321 - 35 | 56 27 +230 | 55 060 - 13 | 23 27 +172 | 59 894 - 112 | 73 56 +293 |
| 5 30.5 | 08 505 + 65 | 23 55 -101 | 49 331 + 10 | 53 78 +249 | 55 090 + 30 | 21 37 +190 | 59 842 - 52 | 70 42 +314 |
| 6 9.5 | 08 625 + 120 | 22 59 - 96 | 49 387 + 56 | 51 10 +268 | 55 162 + 72 | 19 32 +205 | 59 851 + 9 | 67 09 +333 |
| 6 19.5 | 08 800 + 175 | 21 72 - 87 | 49 490 + 103 | 48 34 +276 | 55 278 + 116 | 17 16 +216 | 59 925 + 74 | 63 68 +341 |
| 6 29.5 | 09 022 + 222 | 20 97 - 75 | 49 634 + 144 | 45 57 +277 | 55 431 + 153 | 14 97 +219 | 60 055 + 130 | 60 30 +338 |
| 7 9.4 | 09 289 + 267 | 20 36 - 61 | 49 817 + 183 | 42 82 +275 | 55 620 + 189 | 12 78 +219 | 60 243 + 188 | 56 97 +333 |
| 7 19.4 | 09 594 + 305 | 19 90 - 46 | 50 037 + 220 | 40 21 +261 | 55 840 + 220 | 10 67 +211 | 60 484 + 241 | 53 86 +311 |
| 7 29.4 | 09 926 + 332 | 19 60 - 30 | 50 283 + 246 | 37 80 +241 | 56 084 + 244 | 08 70 +197 | 60 767 + 283 | 51 02 +284 |
| 8 8.3 | 10 284 + 358 | 19 46 - 14 | 50 555 + 272 | 35 66 +214 | 56 350 + 266 | 06 92 +178 | 61 091 + 324 | 48 53 +249 |
| 8 18.3 | 10 659 + 375 | 19 47 + 1 | 50 845 + 290 | 33 90 +176 | 56 630 + 280 | 05 42 +150 | 61 446 + 355 | 46 51 +202 |
| 8 28.3 | 11 043 + 384 | 19 60 + 13 | 51 147 + 302 | 32 53 +137 | 56 920 + 290 | 04 24 +118 | 61 821 + 375 | 44 98 +153 |
| 9 7.3 | 11 436 + 393 | 19 87 + 27 | 51 459 + 312 | 31 62 + 91 | 57 217 + 297 | 03 41 + 83 | 62 214 + 393 | 44 03 + 95 |
| 9 17.2 | 11 829 + 393 | 20 25 + 38 | 51 771 + 312 | 31 24 + 38 | 57 514 + 297 | 02 99 + 42 | 62 611 + 397 | 43 72 + 31 |
| 9 27.2 | 12 217 + 382 | 20 74 + 49 | 52 079 + 308 | 31 35 - 11 | 57 808 + 294 | 02 98 + 1 | 63 003 + 392 | 44 01 - 29 |
| 10 7.2 | 12 599 + 388 | 21 33 + 59 | 52 382 + 303 | 31 99 - 64 | 58 096 + 288 | 03 38 - 40 | 63 385 + 382 | 44 93 - 92 |
| 10 17.2 | 12 967 + 368 | 22 01 + 68 | 52 669 + 287 | 33 14 -115 | 58 372 + 276 | 04 19 - 81 | 63 743 + 358 | 46 47 -154 |
| 10 27.1 | 13 318 + 351 | 22 78 + 77 | 52 938 + 269 | 34 72 -158 | 58 633 + 261 | 05 35 -116 | 64 071 + 328 | 48 52 -205 |
| 11 6.1 | 13 647 + 329 | 23 65 + 87 | 53 185 + 247 | 36 72 -200 | 58 875 + 242 | 06 85 -150 | 64 363 + 292 | 51 07 -255 |
| 11 16.1 | 13 945 + 298 | 24 60 + 95 | 53 401 + 216 | 39 03 -231 | 59 091 + 216 | 08 59 -174 | 64 605 + 242 | 54 00 -293 |
| 11 26.0 | 14 210 + 265 | 25 62 +102 | 53 586 + 185 | 41 56 -253 | 59 280 + 189 | 10 50 -191 | 64 797 + 192 | 57 18 -318 |
| 12 6.0 | 14 433 + 223 | 26 72 +110 | 53 731 + 145 | 44 23 -267 | 59 435 + 155 | 12 53 -203 | 64 930 + 133 | 60 54 -336 |
| 12 16.0 | 14 606 + 173 | 27 85 +113 | 53 833 + 102 | 46 93 -270 | 59 551 + 116 | 14 58 -205 | 64 999 + 69 | 63 91 -337 |
| 12 26.0 | 14 729 + 123 | 29 01 +116 | 53 891 + 58 | 49 55 -262 | 59 628 + 77 | 16 57 -199 | 65 005 + 6 | 67 19 -328 |
| 12 35.9 | 14 794 + 65 | 30 15 +114 | 53 901 + 10 | 52 05 -250 | 59 660 + 32 | 18 46 -189 | 65 004 - 61 | 70 30 -311 |
| | | | | | | | | |
| Mean Place | 11.403 | 17.03 | 51.391 | 56.15 | 57.144 | 24.28 | 62.189 | 72.47 |
| sec δ, tan δ | +1.307 | +0.842 | +1.126 | -0.518 | +1.027 | -0.234 | +1.576 | -1.218 |
| dα(ψ), dδ(ψ) | +0.083 | +0.07 | +0.048 | +0.07 | +0.055 | +0.07 | +0.029 | +0.07 |
| dα(ε), dδ(ε) | -0.010 | +0.98 | +0.006 | +0.98 | +0.003 | +0.98 | +0.014 | +0.98 |
| Dble.Trans. | December 11 | | December 11 | | December 11 | | December 11 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 191 | | 1147 | | 201 | | 202 | | |
|--------------------------------------|--------------------------------------|---|--------------------------------------|--|--------------------------------------|--|--------------------------------------|---|------------|
| | 19 H. Camelopardi* | | 22 Orionis | | γ Orionis (Bellatrix) | | β Tauri | | |
| Mag. Spect. | 5.24 | F8 | 4.65 | B3 | 1.70 | B2 | 1.78 | B8 | |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | |
| | ^h 5 ^m 20 | ^o + 79 ['] 12 | ^h 5 ^m 21 | ^o - 0 ['] 23 | ^h 5 ^m 24 | ^o + 6 ['] 20 | ^h 5 ^m 25 | ^o + 28 ['] 35 | |
| | ^d | ^s | ^s | ^s | ^s | ^s | ^s | ^s | |
| 1 | -9.0 | 18.601 + 292 | 72.43 + 315 | 03.491 + 104 | 38.28 - 132 | 23.399 + 112 | 22.27 - 93 | 25.024 + 135 | 55.02 + 46 |
| 1 | 0.9 | 18.670 + 69 | 75.53 + 310 | 03.553 + 62 | 39.51 - 123 | 23.470 + 71 | 21.41 - 86 | 25.111 + 87 | 55.50 + 48 |
| 1 | 10.9 | 18.509 - 161 | 78.51 + 298 | 03.572 + 19 | 40.65 - 114 | 23.497 + 27 | 20.63 - 78 | 25.147 + 36 | 55.99 + 49 |
| 1 | 20.9 | 18.117 - 392 | 81.23 + 272 | 03.546 - 26 | 41.65 - 100 | 23.478 - 19 | 19.95 - 68 | 25.131 - 16 | 56.46 + 47 |
| 1 | 30.9 | 17.529 - 588 | 83.61 + 238 | 03.480 - 66 | 42.48 - 83 | 23.417 - 61 | 19.39 - 56 | 25.067 - 64 | 56.89 + 43 |
| 2 | 9.8 | 16.761 - 768 | 85.58 + 197 | 03.376 - 104 | 43.16 - 68 | 23.318 - 99 | 18.93 - 46 | 24.959 - 108 | 57.25 + 36 |
| 2 | 19.8 | 15.849 - 912 | 87.03 + 145 | 03.241 - 135 | 43.65 - 49 | 23.187 - 131 | 18.60 - 33 | 24.814 - 145 | 57.51 + 26 |
| 3 | 1.8 | 14.850 - 999 | 87.94 + 91 | 03.085 - 156 | 43.96 - 31 | 23.034 - 153 | 18.38 - 22 | 24.645 - 169 | 57.66 + 15 |
| 3 | 11.8 | 13.795 - 1055 | 88.28 + 34 | 02.916 - 169 | 44.11 - 15 | 22.867 - 167 | 18.26 - 12 | 24.458 - 187 | 57.68 + 2 |
| 3 | 21.7 | 12.743 - 1052 | 88.01 - 27 | 02.746 - 170 | 44.06 + 5 | 22.698 - 169 | 18.26 + 0 | 24.270 - 188 | 57.57 - 11 |
| 3 | 31.7 | 11.747 - 996 | 87.21 - 80 | 02.585 - 161 | 43.84 + 22 | 22.538 - 160 | 18.37 + 11 | 24.092 - 178 | 57.35 - 22 |
| 4 | 10.7 | 10.837 - 910 | 85.89 - 132 | 02.440 - 145 | 43.45 + 39 | 22.395 - 143 | 18.60 + 23 | 23.933 - 159 | 57.03 - 32 |
| 4 | 20.6 | 10.067 - 770 | 84.10 - 179 | 02.324 - 116 | 42.86 + 59 | 22.279 - 116 | 18.96 + 36 | 23.805 - 128 | 56.64 - 39 |
| 4 | 30.6 | 09.465 - 602 | 81.97 - 213 | 02.241 - 83 | 42.10 + 76 | 22.198 - 81 | 19.44 + 48 | 23.717 - 88 | 56.20 - 44 |
| 5 | 10.6 | 09.045 - 420 | 79.53 - 244 | 02.196 - 45 | 41.17 + 93 | 22.154 - 44 | 20.06 + 62 | 23.672 - 45 | 55.76 - 44 |
| 5 | 20.6 | 08.841 - 204 | 76.89 - 264 | 02.194 - 2 | 40.06 + 111 | 22.155 + 1 | 20.82 + 76 | 23.677 + 5 | 55.34 - 42 |
| 5 | 30.5 | 08.846 + 5 | 74.16 - 273 | 02.234 + 40 | 38.82 + 124 | 22.198 + 43 | 21.69 + 87 | 23.731 + 54 | 54.97 - 37 |
| 6 | 9.5 | 09.063 + 217 | 71.40 - 276 | 02.317 + 83 | 37.43 + 139 | 22.283 + 85 | 22.69 + 100 | 23.833 + 102 | 54.71 - 26 |
| 6 | 19.5 | 09.497 + 434 | 68.71 - 269 | 02.442 + 125 | 35.94 + 149 | 22.410 + 127 | 23.79 + 110 | 23.977 + 144 | 54.48 - 23 |
| 6 | 29.5 | 10.119 + 652 | 66.18 - 253 | 02.603 + 161 | 34.38 + 156 | 22.575 + 165 | 24.97 + 118 | 24.169 + 192 | 54.34 - 14 |
| 7 | 9.4 | 10.925 + 806 | 63.83 - 235 | 02.798 + 195 | 32.79 + 159 | 22.774 + 199 | 26.21 + 124 | 24.400 + 231 | 54.32 - 2 |
| 7 | 19.4 | 11.897 + 972 | 61.78 - 205 | 03.024 + 226 | 31.24 + 155 | 23.004 + 230 | 27.43 + 122 | 24.664 + 264 | 54.41 + 9 |
| 7 | 29.4 | 12.999 + 1102 | 60.03 - 175 | 03.272 + 248 | 29.75 + 149 | 23.256 + 252 | 28.62 + 119 | 24.952 + 288 | 54.58 + 17 |
| 8 | 8.3 | 14.225 + 1226 | 58.63 - 140 | 03.540 + 268 | 28.38 + 137 | 23.528 + 272 | 29.74 + 112 | 25.263 + 311 | 54.82 + 24 |
| 8 | 18.3 | 15.543 + 1318 | 57.63 - 100 | 03.823 + 283 | 27.20 + 283 | 23.814 + 286 | 30.73 + 99 | 25.590 + 327 | 55.12 + 30 |
| 8 | 28.3 | 16.921 + 1378 | 57.02 - 61 | 04.113 + 290 | 26.23 + 97 | 24.108 + 294 | 31.56 + 83 | 25.926 + 336 | 55.46 + 34 |
| 9 | 7.3 | 18.351 + 1430 | 56.82 - 20 | 04.410 + 297 | 25.51 + 72 | 24.410 + 302 | 32.20 + 64 | 26.270 + 344 | 55.81 + 35 |
| 9 | 17.2 | 19.793 + 1442 | 57.07 + 25 | 04.707 + 297 | 25.08 + 43 | 24.712 + 302 | 32.61 + 41 | 26.614 + 344 | 56.16 + 35 |
| 9 | 27.2 | 21.225 + 1432 | 57.71 + 64 | 05.001 + 294 | 24.94 + 14 | 25.011 + 299 | 32.79 + 18 | 26.956 + 342 | 56.50 + 34 |
| 10 | 7.2 | 22.633 + 1408 | 58.79 + 108 | 05.291 + 290 | 25.11 - 17 | 25.306 + 295 | 32.73 - 6 | 27.295 + 339 | 56.83 + 33 |
| 10 | 17.2 | 23.973 + 1340 | 60.28 + 149 | 05.569 + 278 | 25.59 - 48 | 25.591 + 285 | 32.44 - 29 | 27.621 + 326 | 57.14 + 31 |
| 10 | 27.1 | 25.231 + 1258 | 62.13 + 185 | 05.834 + 265 | 26.31 - 72 | 25.863 + 272 | 31.94 - 50 | 27.934 + 313 | 57.44 + 30 |
| 11 | 6.1 | 26.382 + 1151 | 64.36 + 223 | 06.083 + 249 | 27.28 - 97 | 26.119 + 256 | 31.26 - 68 | 28.230 + 296 | 57.75 + 31 |
| 11 | 16.1 | 27.384 + 1002 | 66.89 + 253 | 06.307 + 224 | 28.43 - 115 | 26.352 + 233 | 30.43 - 83 | 28.500 + 270 | 58.07 + 32 |
| 11 | 26.0 | 28.228 + 844 | 69.66 + 277 | 06.506 + 199 | 29.69 - 126 | 26.560 + 208 | 29.52 - 91 | 28.743 + 243 | 58.42 + 35 |
| 12 | 6.0 | 28.882 + 654 | 72.66 + 300 | 06.674 + 168 | 31.04 - 135 | 26.737 + 177 | 28.55 - 97 | 28.950 + 207 | 58.80 + 38 |
| 12 | 16.0 | 29.320 + 438 | 75.75 + 309 | 06.804 + 130 | 32.39 - 135 | 26.876 + 139 | 27.59 - 96 | 29.115 + 165 | 59.21 + 41 |
| 12 | 26.0 | 29.544 + 224 | 78.86 + 311 | 06.895 + 91 | 33.70 - 131 | 26.976 + 100 | 26.66 - 93 | 29.135 + 120 | 59.65 + 44 |
| 12 | 35.9 | 29.530 - 14 | 81.92 + 306 | 06.942 + 47 | 34.94 - 124 | 27.032 + 56 | 25.79 - 87 | 29.235 + 70 | 59.65 + 47 |
| | | - 245 | + 286 | + 3 | - 110 | + 10 | - 76 | + 18 | + 46 |
| Mean Place | 18.946 | 64.66 | 04.350 | 42.46 | 24.368 | 17.47 | 26.256 | 48.87 | |
| sec δ , tan δ | +5.345 | +5.251 | +1.000 | -0.007 | +1.006 | +0.111 | +1.139 | +0.545 | |
| $da(\psi)$, $d\delta(\psi)$ | +0.198 | +0.07 | +0.061 | +0.07 | +0.064 | +0.06 | +0.075 | +0.06 | |
| $da(\epsilon)$, $d\delta(\epsilon)$ | -0.060 | +0.99 | +0.000 | +0.99 | -0.001 | +0.99 | -0.005 | +0.99 | |
| Dble. Trans. | December 11 | | December 11 | | December 12 | | December 12 | | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 1148 | | 1149 | | 204 | | 203 | |
|--------------|-------------|-----------|----------------|------------|-------------|------------|----------------|------------|
| | 115 Tauri | | 18 G. Columbae | | β Leporis* | | 17 Camelopardi | |
| Mag. Spect. | 5.31 | B3 | 5.85 | A2 | 2.96 | G0 | 5.75 | K5 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " |
| | 5 26 | +17 57 | 5 26 | -40 56 | 5 27 | -20 45 | 5 28 | +63 03 |
| 1 -9.0 | 21 663 +125 | 10 42 -21 | 39 723 +60 | 74.92 -314 | 39 608 +90 | 67.21 -241 | 52 310 +202 | 33.76 +244 |
| 1 0.9 | 21 745 +82 | 10 25 -17 | 39 730 +7 | 77.91 -299 | 39 653 +45 | 69.49 -228 | 52 420 +110 | 36.18 +242 |
| 1 10.9 | 21 780 +35 | 10 12 -13 | 39 681 -49 | 80.70 -279 | 39 653 +0 | 71.63 -214 | 52 433 +13 | 38.54 +236 |
| 1 20.9 | 21 766 -14 | 10 04 -8 | 39 577 -104 | 83.17 -247 | 39 606 -47 | 73.52 -189 | 52 345 -88 | 40.71 +217 |
| 1 30.9 | 21 709 -57 | 09 99 -5 | 39 425 -152 | 85.26 -209 | 39 517 -89 | 75.12 -160 | 52 170 -175 | 42.64 +193 |
| 2 9.8 | 21 610 -99 | 09 95 -4 | 39 229 -196 | 86.95 -169 | 39 389 -128 | 76.43 -131 | 51 913 -257 | 44.25 +161 |
| 2 19.8 | 21 477 -133 | 09 93 -2 | 38 998 -231 | 88.16 -121 | 39 229 -160 | 77.37 -94 | 51 588 -325 | 45.46 +121 |
| 3 1.8 | 21 322 -155 | 09 90 -3 | 38 745 -253 | 88.90 -74 | 39 048 -181 | 77.96 -59 | 51 220 -368 | 46.24 +78 |
| 3 11.8 | 21 150 -172 | 09 85 -5 | 38 475 -270 | 89.16 -26 | 38 853 -195 | 78.21 -25 | 50 822 -398 | 46.57 +33 |
| 3 21.7 | 20 976 -174 | 09 80 -5 | 38 204 -271 | 88.91 +25 | 38 655 -198 | 78.07 +14 | 50 419 -403 | 46.43 -14 |
| 4 31.7 | 20 811 -165 | 09 74 -6 | 37 944 -260 | 88.20 +71 | 38 466 -189 | 77.60 +47 | 50 037 -382 | 45.84 -59 |
| 4 10.7 | 20 664 -147 | 09 68 -6 | 37 701 -243 | 87.03 +117 | 38 293 -173 | 76.78 +82 | 49 688 -349 | 44.85 -99 |
| 4 20.6 | 20 545 -119 | 09 65 -3 | 37 490 -211 | 85.42 +161 | 38 147 -146 | 75.61 +117 | 49 397 231 | 43.47 -138 |
| 4 30.6 | 20 463 -82 | 09 66 +1 | 37 317 -173 | 83.43 +199 | 38 035 -112 | 74.16 +145 | 49 176 -221 | 41.82 -165 |
| 5 10.6 | 20 420 -43 | 09 72 +6 | 37 187 -130 | 81.08 +235 | 37 959 -76 | 72.42 +174 | 49 033 -143 | 39.92 -190 |
| 5 20.6 | 20 423 +3 | 09 87 +15 | 37 107 -80 | 78.42 +266 | 37 928 -31 | 70.42 +200 | 48 982 -51 | 37.87 -205 |
| 5 30.5 | 20 472 +49 | 10 09 +22 | 37 079 -28 | 75.54 +288 | 37 940 +12 | 68.23 +219 | 49 020 +38 | 35.75 -212 |
| 6 9.5 | 20 566 +94 | 10 37 +28 | 37 103 +24 | 72.46 +308 | 37 996 +56 | 65.87 +236 | 49 148 +128 | 33.60 -215 |
| 6 19.5 | 20 697 +131 | 10 81 +44 | 37 181 +78 | 69.28 +318 | 38 097 +101 | 63.40 +247 | 49 367 +219 | 31.52 -208 |
| 6 29.5 | 20 873 +176 | 11 34 +53 | 37 308 +127 | 66.10 +318 | 38 237 +140 | 60.90 +250 | 49 666 +299 | 29.56 -196 |
| 7 9.4 | 21 085 +212 | 11 93 +59 | 37 482 +174 | 62.96 +314 | 38 414 +177 | 58.40 +250 | 50 040 +374 | 27.76 -180 |
| 7 19.4 | 21 328 +243 | 12 57 +64 | 37 700 +218 | 59.99 +297 | 38 626 +212 | 56.02 +238 | 50 483 +443 | 26.18 -158 |
| 7 29.4 | 21 594 +266 | 13 23 +66 | 37 953 +253 | 57.25 +274 | 38 863 +237 | 53.80 +222 | 50 978 +495 | 24.85 -133 |
| 8 8.3 | 21 880 +286 | 13 89 +66 | 38 240 +287 | 54.83 +242 | 39 125 +262 | 51.81 +199 | 51 522 +544 | 23.78 -107 |
| 8 18.3 | 22 182 +302 | 14 52 +63 | 38 552 +312 | 52.84 +199 | 39 404 +279 | 50.14 +167 | 52 103 +581 | 23.02 -76 |
| 8 28.3 | 22 492 +310 | 15 09 +57 | 38 881 +329 | 51.30 +154 | 39 695 +291 | 48.83 +131 | 52 707 +604 | 22.55 -47 |
| 9 7.3 | 22 809 +317 | 15 58 +49 | 39 225 +344 | 50.29 +101 | 39 996 +301 | 47.93 +90 | 53 332 +625 | 22.39 -16 |
| 9 17.2 | 23 127 +318 | 15 96 +38 | 39 573 +348 | 49.88 +41 | 40 299 +303 | 47.50 +43 | 53 962 +630 | 22.56 +17 |
| 9 27.2 | 23 443 +316 | 16 22 +26 | 39 918 +345 | 50.04 -16 | 40 599 +300 | 47.53 -3 | 54 590 +628 | 23.03 +47 |
| 10 7.2 | 23 756 +313 | 16 36 +14 | 40 258 +340 | 50.81 -77 | 40 896 +297 | 48.04 -51 | 55 211 +621 | 23.81 +78 |
| 10 17.2 | 24 057 +301 | 16 38 +2 | 40 579 +321 | 52.16 -135 | 41 180 +284 | 49.02 -98 | 55 809 +598 | 24.90 +109 |
| 10 27.1 | 24 347 +290 | 16 30 -8 | 40 879 +300 | 54.01 -165 | 41 449 +269 | 50.40 -138 | 56 379 +570 | 26.27 +137 |
| 11 6.1 | 24 620 +273 | 16 12 -18 | 41 152 +273 | 56.34 -233 | 41 699 +250 | 52.17 -177 | 56 912 +533 | 27.92 +165 |
| 11 16.1 | 24 870 +250 | 15 89 -23 | 41 386 +234 | 59.04 -270 | 41 922 +223 | 54.23 -206 | 57 390 +478 | 29.81 +189 |
| 11 26.0 | 25 095 +225 | 15 62 -27 | 41 581 +195 | 62.00 -296 | 42 116 +194 | 56.50 -227 | 57 810 +420 | 31.91 +210 |
| 12 6.0 | 25 287 +192 | 15 35 -27 | 41 729 +148 | 65.15 -315 | 42 274 +158 | 58.91 -241 | 58 157 +347 | 34.18 +227 |
| 12 16.0 | 25 440 +153 | 15 09 -26 | 41 824 +95 | 68.33 -318 | 42 392 +118 | 61.35 -244 | 58 418 +261 | 36.56 +238 |
| 12 26.0 | 25 553 +113 | 14 87 -22 | 41 866 +42 | 71.44 -311 | 42 468 +76 | 63.74 -239 | 58 592 +174 | 38.97 +241 |
| 12 35.9 | 25 618 +65 | 14 69 -18 | 41 852 -14 | 74.41 -297 | 42 497 +29 | 66.02 -228 | 58 668 +76 | 41.37 +240 |
| | +18 | -13 | -70 | -268 | -18 | -206 | -24 | +226 |
| Mean Place | 22.787 | 04.87 | 39.249 | 77.42 | 39.983 | 70.82 | 53.521 | 26.40 |
| sec δ, tan δ | +1.051 | +0.324 | +1.324 | -0.868 | +1.070 | -0.379 | +2.207 | +1.967 |
| dα(ψ), dδ(ψ) | +0.070 | +0.06 | +0.038 | +0.06 | +0.051 | +0.06 | +0.113 | +0.05 |
| dα(ε), dδ(ε) | -0.003 | +0.99 | +0.008 | +0.99 | +0.004 | +0.99 | -0.018 | +0.99 |
| Dble. Trans. | December 13 | | December 13 | | December 13 | | December 13 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 1152 | | 206 | | 1150 | | 1151 | | | | | | | | | | |
|---|----------------|----------------|------------------|----------------|----------------|----------------|----------------|----------------|--------|--------|-------|-------|-------|--------|-------|-------|------|
| | 20 G. Pictoris | | δ Orionis | | 18 Camelopardi | | χ Aurigae | | | | | | | | | | |
| Mag. Spect. | 5.54 | G5 | 2.48 | B0 | 6.46 | G0 | 4.88 | B1 | | | | | | | | | |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | | | | | | | | | |
| | h m | $^{\circ}$ ' " | h m | $^{\circ}$ ' " | h m | $^{\circ}$ ' " | h m | $^{\circ}$ ' " | | | | | | | | | |
| | 5 29 | -47 04 | 5 31 | - 0 18 | 5 31 | +57 12 | 5 31 | +32 10 | | | | | | | | | |
| 1 | -9.0 | 48 053 | + 52 | 70 33 | -330 | 18 122 | + 114 | 25 27 | -135 | 23 043 | + 188 | 53 52 | +213 | 49 651 | + 146 | 65 11 | + 67 |
| 1 | 1.0 | 48 045 | - 8 | 73 49 | -316 | 18 194 | + 72 | 26 53 | 126 | 23 155 | + 112 | 55 64 | +212 | 49 748 | + 97 | 65 81 | + 70 |
| 1 | 10.9 | 47 977 | - 68 | 76 44 | -295 | 18 222 | + 28 | 27 70 | 117 | 23 185 | + 30 | 57 72 | +208 | 49 792 | + 44 | 66 51 | + 70 |
| 1 | 20.9 | 47 847 | - 130 | 79 07 | -263 | 18 204 | 18 | 28 72 | 102 | 23 130 | - 55 | 59 64 | +192 | 49 780 | - 12 | 67 19 | + 68 |
| 1 | 30.9 | 47 666 | - 181 | 81 29 | -222 | 18 145 | - 59 | 29 58 | 86 | 23 000 | - 130 | 61 35 | +171 | 49 719 | - 61 | 67 81 | + 62 |
| 2 | 9.8 | 47 437 | - 229 | 83 10 | -181 | 18 047 | - 98 | 30 28 | - 70 | 22 799 | - 201 | 62 78 | +143 | 49 611 | - 108 | 68 33 | + 52 |
| 2 | 19.8 | 47 169 | - 268 | 84 40 | -130 | 17 916 | - 131 | 30 79 | - 51 | 22 541 | - 258 | 63 87 | +109 | 49 463 | - 148 | 68 73 | + 40 |
| 3 | 1.8 | 46 878 | - 291 | 85 21 | - 81 | 17 763 | - 153 | 31 13 | - 34 | 22 244 | - 297 | 64 57 | + 70 | 49 288 | - 175 | 68 98 | + 25 |
| 3 | 11.8 | 46 569 | - 309 | 85 51 | - 23 | 17 595 | - 168 | 31 29 | - 16 | 21 920 | - 324 | 64 88 | + 31 | 49 095 | - 193 | 69 08 | + 10 |
| 3 | 21.7 | 46 257 | - 312 | 85 28 | + 30 | 17 423 | - 172 | 31 26 | + 3 | 21 592 | - 328 | 64 76 | - 12 | 48 898 | - 197 | 69 00 | - 8 |
| 3 | 31.7 | 45 957 | - 300 | 84 56 | + 72 | 17 260 | - 163 | 31 07 | + 19 | 21 279 | - 313 | 64 25 | - 51 | 48 711 | - 187 | 68 78 | - 22 |
| 4 | 10.7 | 45 676 | - 281 | 83 36 | +120 | 17 112 | - 148 | 30 69 | + 38 | 20 994 | - 285 | 63 37 | - 88 | 48 542 | - 169 | 68 41 | - 37 |
| 4 | 20.7 | 45 427 | - 249 | 81 69 | +167 | 16 990 | - 122 | 30 13 | + 56 | 20 758 | - 236 | 62 15 | - 122 | 48 405 | - 137 | 67 93 | - 48 |
| 4 | 30.6 | 45 219 | - 208 | 79 64 | +205 | 16 900 | - 90 | 29 40 | + 73 | 20 581 | - 177 | 60 69 | - 146 | 48 308 | - 97 | 67 38 | - 55 |
| 5 | 10.6 | 45 056 | - 163 | 77 19 | +245 | 16 847 | - 53 | 28 50 | + 90 | 20 470 | - 111 | 59 01 | - 168 | 48 254 | - 54 | 66 79 | - 59 |
| 5 | 20.6 | 44 949 | - 107 | 74 43 | +276 | 16 837 | - 10 | 27 42 | +108 | 20 436 | - 34 | 57 20 | - 181 | 48 252 | - 2 | 66 19 | - 60 |
| 5 | 30.5 | 44 896 | - 53 | 71 43 | +300 | 16 869 | + 32 | 26 22 | +120 | 20 477 | + 41 | 55 34 | - 186 | 48 300 | + 48 | 65 62 | - 57 |
| 6 | 9.5 | 44 901 | + 5 | 68 23 | +320 | 16 942 | + 73 | 24 87 | +135 | 20 595 | + 118 | 53 46 | - 188 | 48 397 | + 97 | 65 12 | - 50 |
| 6 | 19.5 | 44 965 | + 64 | 64 93 | +330 | 17 058 | + 116 | 23 42 | +145 | 20 789 | + 194 | 51 64 | - 182 | 48 541 | + 144 | 64 69 | - 43 |
| 6 | 29.5 | 45 083 | + 118 | 61 63 | +330 | 17 210 | + 152 | 21 90 | +152 | 21 050 | + 261 | 49 94 | - 170 | 48 731 | + 190 | 64 32 | - 37 |
| 7 | 9.4 | 45 254 | + 171 | 58 37 | +326 | 17 397 | + 187 | 20 35 | +155 | 21 374 | + 324 | 48 38 | - 156 | 48 962 | + 231 | 64 06 | - 26 |
| 7 | 19.4 | 45 475 | + 221 | 55 28 | +309 | 17 615 | + 218 | 18 82 | +153 | 21 756 | + 382 | 47 02 | - 136 | 49 229 | + 267 | 63 93 | - 13 |
| 7 | 29.4 | 45 737 | + 262 | 52 45 | +283 | 17 856 | + 241 | 17 37 | +145 | 22 180 | + 424 | 45 88 | - 114 | 49 522 | + 293 | 63 89 | - 4 |
| 8 | 8.3 | 46 037 | + 300 | 49 93 | +252 | 18 118 | + 262 | 16 03 | +134 | 22 646 | + 466 | 44 97 | - 91 | 49 839 | + 317 | 63 94 | + 5 |
| 8 | 18.3 | 46 367 | + 330 | 47 86 | +207 | 18 396 | + 278 | 14 87 | +116 | 23 141 | + 495 | 44 33 | - 64 | 50 174 | + 335 | 64 07 | + 13 |
| 8 | 28.3 | 46 718 | + 351 | 46 27 | +159 | 18 683 | + 287 | 13 92 | + 95 | 23 655 | + 514 | 43 94 | - 39 | 50 519 | + 345 | 64 27 | + 20 |
| 9 | 7.3 | 47 087 | + 369 | 45 23 | +104 | 18 978 | + 295 | 13 22 | + 70 | 24 187 | + 532 | 43 82 | - 12 | 50 873 | + 354 | 64 51 | + 24 |
| 9 | 17.2 | 47 462 | + 375 | 44 81 | + 42 | 19 275 | + 297 | 12 81 | + 41 | 24 723 | + 536 | 43 98 | + 16 | 51 230 | + 357 | 64 79 | + 28 |
| 9 | 27.2 | 47 836 | + 374 | 44 98 | - 17 | 19 570 | + 295 | 12 69 | + 12 | 25 257 | + 534 | 44 39 | + 41 | 51 585 | + 355 | 65 10 | + 31 |
| 10 | 7.2 | 48 203 | + 367 | 45 79 | - 81 | 19 863 | + 293 | 12 88 | - 19 | 25 787 | + 530 | 45 06 | + 67 | 51 937 | + 352 | 65 43 | + 33 |
| 10 | 17.2 | 48 550 | + 347 | 47 20 | -141 | 20 146 | + 283 | 13 37 | - 49 | 26 298 | + 511 | 46 00 | + 94 | 52 279 | + 342 | 65 78 | + 35 |
| 10 | 27.1 | 48 873 | + 323 | 49 14 | -194 | 20 417 | + 271 | 14 12 | - 75 | 26 787 | + 489 | 47 17 | +117 | 52 607 | + 328 | 66 16 | + 38 |
| 11 | 6.1 | 49 165 | + 292 | 51 58 | -244 | 20 673 | + 256 | 15 11 | - 99 | 27 247 | + 460 | 48 59 | +142 | 52 919 | + 312 | 66 58 | + 42 |
| 11 | 16.1 | 49 413 | + 248 | 54 41 | -283 | 20 905 | + 232 | 16 28 | -117 | 27 663 | + 416 | 50 21 | +162 | 53 204 | + 285 | 67 04 | + 46 |
| 11 | 26.0 | 49 617 | + 204 | 57 52 | -311 | 21 114 | + 209 | 17 57 | -129 | 28 031 | + 368 | 52 02 | +181 | 53 462 | + 258 | 67 55 | + 51 |
| 12 | 6.0 | 49 767 | + 150 | 60 82 | -330 | 21 291 | + 177 | 18 95 | -138 | 28 340 | + 309 | 53 99 | +197 | 53 683 | + 221 | 68 12 | + 57 |
| 12 | 16.0 | 49 857 | + 90 | 64 16 | -334 | 21 431 | + 140 | 20 33 | -138 | 28 578 | + 238 | 56 05 | +206 | 53 860 | + 177 | 68 74 | + 62 |
| 12 | 26.0 | 49 889 | + 32 | 67 44 | -328 | 21 532 | + 101 | 21 67 | -134 | 28 744 | + 166 | 58 16 | +211 | 53 991 | + 131 | 69 39 | + 65 |
| 12 | 35.9 | 49 858 | - 31 | 70 58 | -314 | 21 589 | + 57 | 22 94 | -127 | 28 827 | + 83 | 60 26 | +210 | 54 070 | + 79 | 70 07 | + 68 |
| | | | - 92 | | -284 | | + 11 | | -113 | | - 1 | | +199 | | + 24 | | + 67 |
| Mean Place | 47.169 | 73.13 | | 18.973 | 30.15 | 24.324 | 46.21 | 50.899 | 58.76 | | | | | | | | |
| sec δ , tan δ | +1.469 | -1.076 | | +1.000 | -0.005 | +1.847 | +1.552 | +1.182 | +0.629 | | | | | | | | |
| $d\alpha(\psi)$, $d\delta(\psi)$ | +0.033 | +0.05 | | +0.061 | +0.05 | +0.102 | +0.05 | +0.078 | +0.05 | | | | | | | | |
| $d\alpha(\epsilon)$, $d\delta(\epsilon)$ | +0.009 | +0.99 | | +0.000 | +0.99 | -0.013 | +0.99 | -0.005 | +0.99 | | | | | | | | |
| Dble. Trans. | December 14 | | December 14 | | December 14 | | December 14 | | | | | | | | | | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 207 | | 214 | | 212 | | 208 | | |
|--------------|--------------------------|-------------------------|--------------------------|-------------------------|--------------------------|-------------------------|---------------------------|------------------------|--|
| | α Leporis | | γ Mensae | | β Doradus | | φ' Orionis | | |
| Mag.Spect. | 2.69 | F0 | 5.06 | K0 | 3.81 var. | F5p | 4.53 | B0 | |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | |
| | h m | ° ' | h m | ° ' | h m | ° ' | h m | ° ' | |
| | 5 32 | -17 49 | 5 32 | -76 20 | 5 33 | -62 29 | 5 34 | + 9 28 | |
| 1 -9.0 | 07 578 ^s + 97 | 48 64 ["] -228 | 32 684 ^s -120 | 61 93 ["] -346 | 33 162 ^s + 10 | 52 11 ["] -352 | 03 727 ^s + 125 | 57 79 ["] -76 | |
| 1 1.0 | 07 633 + 55 | 50 82 -218 | 32 391 -293 | 65 23 -330 | 33 082 -80 | 55 47 -336 | 03 810 + 83 | 57 08 -71 | |
| 1 10.9 | 07 641 + 8 | 52 85 -203 | 31 930 -461 | 68 31 -308 | 32 916 -166 | 58 62 -315 | 03 848 + 38 | 56 45 -63 | |
| 1 20.9 | 07 603 -38 | 54 65 -180 | 31 308 -622 | 71 03 -272 | 32 662 -254 | 61 42 -280 | 03 839 -9 | 55 92 -53 | |
| 1 30.9 | 07 523 -80 | 56 18 -153 | 30 557 -751 | 73 33 -230 | 32 337 -325 | 63 80 -238 | 03 786 -53 | 55 48 -44 | |
| 2 9.8 | 07 403 -120 | 57 44 -126 | 29 690 -867 | 75 19 -186 | 31 947 -390 | 65 74 -194 | 03 694 -92 | 55 13 -35 | |
| 2 19.8 | 07 251 -152 | 58 36 -92 | 28 733 -957 | 76 51 -132 | 31 505 -442 | 67 14 -140 | 03 567 -127 | 54 88 -25 | |
| 3 1.8 | 07 078 -173 | 58 94 -58 | 27 724 -1009 | 77 30 -79 | 31 031 -474 | 68 01 -87 | 03 417 -150 | 54 71 -17 | |
| 3 11.8 | 06 889 -189 | 59 21 -27 | 26 676 -1048 | 77 57 -27 | 30 534 -497 | 68 35 -34 | 03 251 -166 | 54 61 -10 | |
| 3 21.7 | 06 697 -192 | 59 12 + 9 | 25 627 -1049 | 77 26 + 31 | 30 034 -500 | 68 11 + 24 | 03 081 -170 | 54 61 + 0 | |
| 3 31.7 | 06 513 -184 | 58 71 + 41 | 24 607 -1020 | 76 45 + 81 | 29 550 -484 | 67 35 + 76 | 02 919 -162 | 54 68 + 7 | |
| 4 10.7 | 06 344 -169 | 57 97 + 74 | 23 631 -976 | 75 14 +131 | 29 088 -462 | 66 09 +126 | 02 771 -148 | 54 83 + 15 | |
| 4 20.7 | 06 201 -143 | 56 91 +106 | 22 734 -897 | 73 33 +181 | 28 671 -417 | 64 32 +177 | 02 651 -120 | 55 08 + 25 | |
| 4 30.6 | 06 091 -110 | 55 58 +133 | 21 934 -800 | 71 12 +221 | 28 308 -363 | 62 14 +218 | 02 564 -87 | 55 43 + 35 | |
| 5 10.6 | 06 017 -74 | 53 96 +162 | 21 244 -690 | 68 52 +260 | 28 005 -303 | 59 55 +259 | 02 514 -50 | 55 89 + 46 | |
| 5 20.6 | 05 986 -31 | 52 10 +186 | 20 693 -551 | 65 59 +293 | 27 778 -227 | 56 63 +292 | 02 508 -6 | 56 47 + 58 | |
| 5 30.5 | 05 998 + 12 | 50 06 +204 | 20 283 -410 | 62 44 +315 | 27 627 -151 | 53 46 +317 | 02 544 + 36 | 57 14 + 67 | |
| 6 9.5 | 06 053 + 55 | 47 84 +222 | 20 024 -259 | 59 07 +337 | 27 555 -72 | 50 08 +338 | 02 623 + 79 | 57 93 + 79 | |
| 6 19.5 | 06 153 + 100 | 45 51 +233 | 19 930 -94 | 55 62 +345 | 27 571 + 16 | 46 60 +348 | 02 744 +121 | 58 82 + 89 | |
| 6 29.5 | 06 290 + 137 | 43 15 +236 | 19 990 + 60 | 52 17 +345 | 27 665 + 94 | 43 12 +348 | 02 903 +159 | 59 80 + 98 | |
| 7 9.4 | 06 465 + 175 | 40 77 +238 | 20 210 + 220 | 48 78 +339 | 27 839 + 174 | 39 69 +343 | 03 097 + 194 | 60 82 +102 | |
| 7 19.4 | 06 673 + 208 | 38 50 +227 | 20 586 + 376 | 45 59 +319 | 28 091 + 252 | 36 45 +324 | 03 322 + 225 | 61 86 +104 | |
| 7 29.4 | 06 906 + 233 | 36 37 +213 | 21 094 + 508 | 42 67 +292 | 28 406 + 315 | 33 47 +298 | 03 570 + 248 | 62 87 +101 | |
| 8 8.4 | 07 164 + 258 | 34 45 +192 | 21 735 + 641 | 40 09 +258 | 28 785 + 379 | 30 83 +264 | 03 840 + 270 | 63 83 + 96 | |
| 8 18.3 | 07 439 + 275 | 32 84 +161 | 22 484 + 749 | 37 98 +211 | 29 215 + 430 | 28 66 +217 | 04 125 + 285 | 64 68 + 85 | |
| 8 28.3 | 07 726 + 287 | 31 56 +128 | 23 313 + 829 | 36 37 +161 | 29 682 + 467 | 27 00 +166 | 04 420 + 295 | 65 41 + 73 | |
| 9 7.3 | 08 023 + 297 | 30 66 + 90 | 24 210 + 897 | 35 34 +103 | 30 180 + 498 | 25 91 +109 | 04 723 + 303 | 65 97 + 56 | |
| 9 17.2 | 08 323 + 300 | 30 22 + 44 | 25 137 + 927 | 34 96 + 38 | 30 690 + 510 | 25 48 + 43 | 05 028 + 305 | 66 34 + 37 | |
| 9 27.2 | 08 622 + 299 | 30 21 + 1 | 26 064 + 927 | 35 20 -24 | 31 201 + 511 | 25 68 -20 | 05 332 + 304 | 66 50 + 16 | |
| 10 7.2 | 08 917 + 295 | 30 66 -45 | 26 971 + 907 | 36 09 -89 | 31 703 + 502 | 26 53 -85 | 05 633 + 301 | 66 46 -4 | |
| 10 17.2 | 09 200 + 283 | 31 56 -90 | 27 813 + 842 | 37 61 -152 | 32 174 + 471 | 28 03 -150 | 05 925 + 292 | 66 21 -25 | |
| 10 27.1 | 09 471 + 271 | 32 85 -129 | 28 569 + 756 | 39 68 -207 | 32 607 + 433 | 30 09 -206 | 06 207 + 282 | 65 79 -42 | |
| 11 6.1 | 09 723 + 252 | 34 51 -166 | 29 215 + 646 | 42 27 -259 | 32 988 + 381 | 32 68 -259 | 06 473 + 266 | 65 20 -59 | |
| 11 16.1 | 09 950 + 227 | 36 46 -195 | 29 714 + 499 | 45 26 -289 | 33 300 + 312 | 35 67 -289 | 06 718 + 245 | 64 50 -70 | |
| 11 26.1 | 10 149 + 199 | 38 60 -214 | 30 061 + 347 | 48 53 -327 | 33 540 + 240 | 38 96 -329 | 06 938 + 220 | 63 72 -78 | |
| 12 6.0 | 10 314 + 165 | 40 88 -228 | 30 236 + 175 | 52 00 -347 | 33 697 + 157 | 42 47 -351 | 07 127 + 189 | 62 91 -81 | |
| 12 16.0 | 10 439 + 125 | 43 20 -232 | 30 227 -9 | 55 50 -350 | 33 763 + 66 | 46 02 -355 | 07 279 + 152 | 62 10 -81 | |
| 12 26.0 | 10 523 + 84 | 45 47 -227 | 30 045 -182 | 58 93 -343 | 33 742 -21 | 49 51 -349 | 07 392 + 113 | 61 33 -77 | |
| 12 35.9 | 10 561 + 38 | 47 63 -216 | 29 683 -362 | 62 20 -327 | 33 628 -114 | 52 85 -334 | 07 459 + 67 | 60 62 -71 | |
| | | -197 | | -528 | | -201 | | + 21 | |
| Mean Place | 08 037 | 52 79 | 24 906 | 64 25 | 30 458 | 54 95 | 04 732 | 52 30 | |
| sec δ, tan δ | +1.050 | -0.322 | +4.238 | -4.118 | +2.166 | -1.921 | +1.014 | +0.167 | |
| dα(ψ), dδ(ψ) | +0.053 | +0.05 | -0.047 | +0.05 | +0.011 | +0.05 | +0.066 | +0.04 | |
| dα(ε), dδ(ε) | +0.003 | +0.99 | +0.033 | +0.99 | +0.015 | +0.99 | -0.001 | +0.99 | |
| Dble.Trans. | December 14 | | December 14 | | December 15 | | December 15 | | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 209 | | 210 | | 211 | | 1153 | |
|--------------|--------------|------------|--------------|------------|--------------|-----------|----------------|------------|
| | ι Orionis* | | ε Orionis | | ζ Tauri | | 35 G. Columbae | |
| Mag. Spect. | 2.89 | Oe5 | 1.75 | B0 | 3.00 | B3p | 6.75 | K2 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° / | h m | ° / | h m | +21 08 | h m | ° / |
| | 5 34 | - 5 54 | 5 35 | - 1 12 | 5 36 | | 5 37 | - 27 12 |
| 1 -9.0 | 45 57.5 +111 | 60.12 -167 | 30 83.7 +116 | 30 32 -141 | 49 09.2 +140 | 12 54 -5 | 34 50.5 +93 | 60 97 -272 |
| 1 1.0 | 45 64.5 +70 | 61.71 -159 | 30 91.3 +76 | 31 65 -133 | 49 18.6 +94 | 12 55 +1 | 34 55.1 +46 | 63.57 -260 |
| 1 10.9 | 45 67.1 +26 | 63.18 -147 | 30 94.4 +31 | 32 88 -123 | 49 23.3 +47 | 12 60 +5 | 34 54.9 -2 | 66.01 -244 |
| 1 20.9 | 45 65.0 -21 | 64.48 -130 | 30 92.8 -16 | 33 96 -108 | 49 22.9 -4 | 12 68 +8 | 34 49.7 -52 | 68 19 -218 |
| 1 30.9 | 45 58.8 -62 | 65.58 -110 | 30 87.1 -57 | 34 87 -91 | 49 17.9 -50 | 12 78 +10 | 34 40.1 -96 | 70.05 -186 |
| 2 9.8 | 45 48.7 -101 | 66.48 -90 | 30 77.5 -96 | 35 61 -74 | 49 08.5 -94 | 12 89 +11 | 34 26.4 -137 | 71.59 -154 |
| 2 19.8 | 45 35.3 -134 | 67.15 -67 | 30 64.5 -130 | 36 16 -55 | 48 95.5 -130 | 12 98 +9 | 34 09.2 -172 | 72.73 -114 |
| 3 1.8 | 45 19.7 -156 | 67.58 -43 | 30 69.3 -152 | 36 52 -36 | 48 79.9 -156 | 13 04 +6 | 33 89.7 -195 | 73.47 -74 |
| 3 11.8 | 45 02.5 -172 | 67.79 -21 | 30 32.5 -168 | 36 70 -18 | 48 62.6 -173 | 13 05 +1 | 33 68.6 -211 | 73.82 -35 |
| 3 21.7 | 44 85.0 -175 | 67.75 +4 | 30 15.3 -172 | 36 67 +3 | 48 44.8 -178 | 13 03 -2 | 33 47.1 -215 | 73.74 +8 |
| 3 31.7 | 44 68.2 -168 | 67.49 +26 | 29 98.8 -165 | 36 47 +20 | 48 27.8 -170 | 12 96 -7 | 33 26.3 -208 | 73.27 +47 |
| 4 10.7 | 44 52.8 -154 | 67.00 +49 | 29 83.8 -150 | 36 09 +38 | 48 12.4 -154 | 12 86 -10 | 33 07.0 -193 | 72.42 +85 |
| 4 20.7 | 44 40.0 -128 | 66.28 +72 | 29 71.3 -125 | 35 51 +58 | 47 99.8 -126 | 12 86 -11 | 32 90.3 -167 | 71.17 +125 |
| 4 30.6 | 44 30.4 -96 | 65.36 +92 | 29 62.1 -92 | 34 76 +75 | 47 90.7 -91 | 12 64 -11 | 32 76.9 -134 | 69.60 +157 |
| 5 10.6 | 44 24.4 -60 | 64.22 +114 | 29 56.4 -57 | 33 83 +93 | 47 85.5 -52 | 12 56 -8 | 32 67.2 -97 | 67.71 +189 |
| 5 20.6 | 44 22.6 -18 | 62.89 +133 | 29 55.0 -14 | 32 72 +111 | 47 85.0 -5 | 12 54 -2 | 32 62.0 -52 | 65.53 +218 |
| 5 30.5 | 44 25.0 +24 | 61.41 +148 | 29 57.7 +27 | 31 48 +124 | 47 89.1 +41 | 12 57 +3 | 32 61.2 -8 | 63.14 +239 |
| 6 9.5 | 44 31.5 +65 | 59.77 +164 | 29 64.6 +69 | 30 10 +138 | 47 97.8 +87 | 12 67 +10 | 32 65.0 +38 | 60.56 +258 |
| 6 19.5 | 44 42.3 +108 | 58.03 +174 | 29 75.7 +111 | 28 61 +149 | 48 09.7 +119 | 12 82 +15 | 32 73.4 +84 | 57 86 +270 |
| 6 29.5 | 44 56.8 +145 | 56.24 +179 | 29 90.4 +147 | 27 06 +155 | 48 27.1 +174 | 13 16 +34 | 32 85.9 +125 | 55.13 +273 |
| 7 9.4 | 44 74.8 +180 | 54.42 +182 | 30 08.7 +183 | 25 48 +158 | 48 47.8 +207 | 13 52 +36 | 33 02.4 +165 | 52.40 +273 |
| 7 19.4 | 44 95.9 +211 | 52.64 +178 | 30 30.1 +214 | 23 92 +156 | 48 71.8 +240 | 13 93 +41 | 33 22.6 +202 | 49 79 +261 |
| 7 29.4 | 45 19.4 +235 | 50.97 +167 | 30 53.8 +237 | 22 44 +148 | 48 98.2 +264 | 14 38 +45 | 33 45.7 +231 | 47 37 +242 |
| 8 8.4 | 45 45.1 +257 | 49.43 +154 | 30 79.7 +259 | 21 08 +136 | 49 26.8 +286 | 14 85 +47 | 33 71.5 +258 | 45 18 +219 |
| 8 18.3 | 45 72.5 +274 | 48.12 +131 | 31 07.2 +275 | 19 90 +118 | 49 57.1 +303 | 15 31 +46 | 33 99.5 +280 | 43 35 +183 |
| 8 28.3 | 46 00.9 +284 | 47.06 +106 | 31 35.7 +285 | 18 94 +96 | 49 88.3 +312 | 15 73 +42 | 34 28.8 +293 | 41 91 +144 |
| 9 7.3 | 46 30.2 +293 | 46.30 +76 | 31 65.1 +294 | 18 24 +70 | 50 20.5 +322 | 16 11 +38 | 34 59.5 +307 | 40 91 +100 |
| 9 17.2 | 46 59.7 +295 | 45 88 +42 | 31 94.8 +297 | 17 83 +41 | 50 53.0 +325 | 16 40 +29 | 34 90.6 +311 | 40 44 +47 |
| 9 27.2 | 46 89.1 +294 | 45 80 +8 | 32 24.3 +295 | 17 73 +10 | 50 85.3 +323 | 16 61 +21 | 35 21.6 +310 | 40 45 -1 |
| 10 7.2 | 47 18.3 +292 | 46 08 -28 | 32 53.6 +293 | 17 94 -21 | 51 17.5 +322 | 16 73 +12 | 35 52.4 +308 | 41 00 -55 |
| 10 17.2 | 47 46.5 +282 | 46 71 -63 | 32 82.0 +284 | 18 46 -52 | 51 48.8 +313 | 16 76 +3 | 35 82.0 +296 | 42 07 -107 |
| 10 27.1 | 47 73.6 +271 | 47 65 -94 | 33 09.3 +273 | 19 24 -78 | 51 79.0 +302 | 16 72 -4 | 36 10.1 +281 | 43 58 -151 |
| 11 6.1 | 47 99.1 +255 | 48 87 -122 | 33 35.1 +258 | 20 28 -104 | 52 07.7 +287 | 16 62 -10 | 36 36.3 +262 | 45 53 -195 |
| 11 16.1 | 48 22.3 +232 | 50 31 -144 | 33 58.7 +236 | 20 28 -122 | 52 34.1 +264 | 16 62 -13 | 36 36.3 +233 | 47 81 -228 |
| 11 26.1 | 48 43.0 +207 | 51 90 -159 | 33 79.8 +211 | 22 86 -136 | 52 58.0 +239 | 16 49 -14 | 36 59.6 +203 | 50 34 -253 |
| 12 6.0 | 48 60.5 +175 | 53 60 -170 | 33 97.8 +180 | 24 30 -144 | 52 78.7 +207 | 16 22 -13 | 36 96.5 +166 | 53 04 -270 |
| 12 16.0 | 48 74.3 +138 | 55 31 -171 | 34 12.1 +143 | 25 74 -144 | 52 95.5 +168 | 16 12 -10 | 37 08.7 +122 | 55 78 -274 |
| 12 26.0 | 48 84.2 +99 | 56 97 -166 | 34 22.6 +105 | 27 15 -141 | 53 08.1 +126 | 16 07 -5 | 37 16.6 +79 | 58 48 -270 |
| 12 35.9 | 48 89.6 +54 | 58 56 -159 | 34 28.6 +60 | 28 48 -133 | 53 15.9 +78 | 16 07 +0 | 37 19.4 +28 | 61 07 -259 |
| | | | | | | | | |
| Mean Place | 46.317 | 64.99 | 31.669 | 35.45 | 50.236 | 06.47 | 34.666 | 65.31 |
| sec δ, tan δ | +1.005 | -0.104 | +1.000 | -0.021 | +1.072 | +0.387 | +1.125 | -0.514 |
| da(ψ), dδ(ψ) | +0.058 | +0.04 | +0.061 | +0.04 | +0.071 | +0.04 | +0.048 | +0.04 |
| da(ε), dδ(ε) | +0.001 | +0.99 | +0.000 | +0.99 | -0.003 | +0.99 | +0.003 | +1.00 |
| Dble. Trans. | December 15 | | December 15 | | December 15 | | December 16 | |

APPARENT PLACES OF STARS, 1986

91

AT UPPER TRANSIT AT GREENWICH

| No. | 205 | | 215 | | 217 | | 1154 | |
|------------------------------|----------------------------------|-----------------|------------------|-----------------|------------------|-----------------|------------------|-----------------|
| | Groombridge 966 (Camelopardi) | | α Columbae | | γ Leporis | | δ Doradus | |
| Mag. Spect. | 6.36 | K5 | 2.75 | B5p | 3.80 | F8 | 4.52 | A5 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " |
| | 5 37 | +75 02 | 5 39 | -34 04 | 5 43 | -22 26 | 5 44 | -65 43 |
| 1 -9.0 | 54.345 +313 | 20 01 +295 | 09.701 +86 | 46.80 -298 | 53.694 +103 | 62.82 -254 | 48.322 +18 | 81.71 -356 |
| 1 1.0 | 54.495 -150 | 22 95 +294 | 09.738 +37 | 49.65 -285 | 53.752 +58 | 65.26 -244 | 48.239 -83 | 85.14 -343 |
| 1 10.9 | 54.477 -18 | 25 83 +288 | 09.722 -16 | 52.34 -269 | 53.762 +10 | 67.55 -229 | 48.056 -183 | 88.39 -325 |
| 1 20.9 | 54.284 -193 | 28 51 +268 | 09.654 -68 | 54.75 -241 | 53.724 -38 | 69.61 -206 | 47.774 -282 | 91.31 -292 |
| 1 30.9 | 53.939 -345 | 30.90 +239 | 09.539 -115 | 56.81 -206 | 53.641 -83 | 71.37 -176 | 47.411 -363 | 93.82 -251 |
| 2 9.8 | 53.452 -487 | 32.94 +204 | 09.381 -158 | 58.51 -170 | 53.518 -123 | 72.83 -146 | 46.973 -438 | 95.91 -209 |
| 2 19.8 | 52.848 -604 | 34.52 +158 | 09.187 -194 | 59.78 -127 | 53.360 -158 | 73.92 -109 | 46.474 -499 | 97.47 -156 |
| 3 1.8 | 52.166 -682 | 35.59 +107 | 08.969 -218 | 60.60 -82 | 53.179 -181 | 74.65 -73 | 45.937 -537 | 98.50 -103 |
| 3 11.8 | 51.430 -736 | 36.13 +54 | 08.734 -235 | 61.00 -40 | 52.981 -198 | 75.02 -37 | 45.370 -567 | 99.01 -51 |
| 3 21.7 | 50.682 -748 | 36.10 -3 | 08.495 -239 | 60.91 +9 | 52.778 -203 | 75.00 +2 | 44.797 -573 | 98.93 +8 |
| 3 31.7 | 49.962 -720 | 35.55 -55 | 08.263 -232 | 60.40 +51 | 52.581 -197 | 74.62 +38 | 44.237 -560 | 98.34 +59 |
| 4 10.7 | 49.294 -668 | 34.49 -106 | 08.046 -217 | 59.47 +93 | 52.398 -183 | 73.88 +74 | 43.699 -538 | 97.23 +111 |
| 4 20.7 | 48.718 -576 | 32.96 -153 | 07.856 -190 | 58.10 +137 | 52.240 -158 | 72.79 +109 | 43.206 -493 | 95.60 +163 |
| 4 30.6 | 48.256 -462 | 31.06 -190 | 07.701 -172 | 56.38 +172 | 52.114 -126 | 71.39 +140 | 42.770 -436 | 93.55 +205 |
| 5 10.6 | 47.922 -334 | 28.85 -221 | 07.584 -117 | 54.30 +208 | 52.023 -91 | 69.69 +170 | 42.398 -372 | 91.08 +247 |
| 5 20.6 | 47.740 -182 | 26.40 -245 | 07.514 -70 | 51.92 +238 | 51.976 -47 | 67.71 +198 | 42.106 -292 | 88.25 +283 |
| 5 30.5 | 47.710 -30 | 23.84 -266 | 07.490 -24 | 49.31 +261 | 51.971 -5 | 65.54 +217 | 41.898 -208 | 85.17 +308 |
| 6 9.5 | 47.832 +122 | 21.20 -264 | 07.513 +23 | 46.50 +281 | 52.010 +39 | 63.18 +236 | 41.777 -121 | 81.84 +333 |
| 6 19.5 | 48.114 +282 | 18.59 -261 | 07.587 +74 | 43.57 +293 | 52.094 +84 | 60.70 +248 | 41.752 -25 | 78.40 +344 |
| 6 29.5 | 48.534 +420 | 16.10 -249 | 07.705 +118 | 40.61 +296 | 52.217 +123 | 58.19 +251 | 41.815 +63 | 74.93 +347 |
| 7 9.4 | 49.090 +556 | 13.75 -235 | 07.866 +161 | 37.66 +295 | 52.379 +162 | 55.66 +253 | 41.969 +154 | 71.48 +345 |
| 7 19.4 | 49.773 +683 | 11.64 -211 | 08.067 +201 | 34.84 +282 | 52.576 +197 | 53.24 +242 | 41.969 +243 | 68.20 +328 |
| 7 29.4 | 50.554 +781 | 09.81 -183 | 08.300 +233 | 32.23 +261 | 52.801 +225 | 50.97 +227 | 42.530 +318 | 65.17 +303 |
| 8 8.4 | 51.430 +876 | 08.26 -155 | 08.565 +265 | 29.88 +235 | 53.053 +252 | 48.92 +205 | 42.923 +393 | 62.45 +272 |
| 8 18.3 | 52.379 +949 | 07.09 -117 | 08.853 +288 | 27.92 +196 | 53.325 +272 | 47.20 +172 | 43.377 +454 | 60.19 +226 |
| 8 28.3 | 53.379 +1000 | 06.26 -83 | 09.158 +305 | 26.38 +154 | 53.610 +285 | 45.84 +136 | 43.878 +501 | 58.42 +177 |
| 9 7.3 | 54.424 +1045 | 05.81 -45 | 09.477 +319 | 25.32 +106 | 53.908 +298 | 44.89 +95 | 44.419 +541 | 57.22 +120 |
| 9 17.2 | 55.487 +1063 | 05.78 -3 | 09.802 +325 | 24.82 +50 | 54.211 +303 | 44.42 +47 | 44.980 +561 | 56.67 +55 |
| 9 27.2 | 56.551 +1064 | 06.12 +34 | 10.128 +326 | 24.86 -4 | 54.514 +303 | 44.41 +1 | 45.546 +566 | 56.74 -7 |
| 10 7.2 | 57.609 +1058 | 06.87 +75 | 10.450 +322 | 25.47 -61 | 54.816 +302 | 44.91 -50 | 46.105 +559 | 57.48 -74 |
| 10 17.2 | 58.627 +1018 | 08.02 +115 | 10.759 +309 | 26.64 -117 | 55.108 +292 | 45.89 -98 | 46.635 +530 | 58.88 -140 |
| 10 27.1 | 59.597 +970 | 09.53 +151 | 11.052 +293 | 28.30 -166 | 55.386 +278 | 47.30 -141 | 47.124 +489 | 60.84 -196 |
| 11 6.1 | 60.501 +904 | 11.42 +189 | 11.324 +272 | 30.42 -212 | 55.648 +262 | 49.11 -181 | 47.557 +433 | 63.35 -251 |
| 11 16.1 | 61.306 +805 | 13.62 +220 | 11.563 +239 | 32.91 -249 | 55.883 +235 | 51.24 -213 | 47.915 +358 | 66.30 -295 |
| 11 26.1 | 62.005 +699 | 16.09 +247 | 11.769 +206 | 35.66 -275 | 56.090 +207 | 53.60 -236 | 48.192 +277 | 69.57 -327 |
| 12 6.0 | 62.574 +569 | 18.80 +271 | 11.934 +165 | 38.61 -295 | 56.262 +172 | 56.13 -253 | 48.377 +185 | 73.08 -351 |
| 12 16.0 | 62.991 +417 | 21.66 +286 | 12.051 +117 | 41.61 -300 | 56.393 +131 | 58.70 -257 | 48.458 +81 | 76.66 -358 |
| 12 26.0 | 63.254 +263 | 24.58 +292 | 12.122 +71 | 44.57 -296 | 56.482 +89 | 61.24 -254 | 48.441 -17 | 80.21 -355 |
| 12 35.9 | 63.344 +90 | 27.50 +292 | 12.139 +17 | 47.42 -285 | 56.523 +41 | 63.67 -243 | 48.319 -122 | 83.63 -342 |
| | | | | | | | | |
| Mean Place sec δ, tan δ | 55.004 +3.873 | 12.62 +3.742 | 09.585 +1.207 | 51.12 -0.677 | 54.006 +1.082 | 68.06 -0.413 | 44.967 +2.434 | 86.14 -2.219 |
| da(ψ), dδ(ψ) da(ε), dδ(ε) | +0.160 -0.024 | +0.04 +1.00 | +0.043 +0.004 | +0.04 +1.00 | +0.050 +0.002 | +0.03 +1.00 | +0.002 +0.010 | +0.03 +1.00 |
| Dble. Trans. | December 16 | | December 16 | | December 17 | | December 17 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 216 | | 219 | | 218 | | 220 | |
|----------------|---------------------|--------|---------------------|--------|---------------------|--------|---------------------|--------|
| | o Aurigae | | ζ Leporis | | 130 Tauri | | κ Orionis | |
| Mag.Spect. | 5.52 | A0 | 3.67 | A2 | 5.51 | F0 | 2.20 | B0 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° ′ | h m | ° ′ | h m | ° ′ | h m | ° ′ |
| | 5 44 | +49 49 | 5 46 | -14 49 | 5 46 | +17 43 | 5 47 | -9 40 |
| 1 ^d | 49.947 ^s | +192 | 20.044 ^s | +114 | 37.835 ^s | +146 | 06.276 ^s | +120 |
| 1 | 50.074 | +127 | 20.115 | +71 | 37.937 | +102 | 06.354 | +78 |
| 1 | 50.132 | +58 | 20.141 | +26 | 37.991 | +54 | 06.387 | +33 |
| 1 | 50.116 | -16 | 20.118 | -23 | 37.995 | +4 | 06.372 | -15 |
| 1 | 50.034 | -82 | 20.053 | -65 | 37.954 | -41 | 06.315 | -57 |
| 2 | 49.890 | -144 | 19.947 | -106 | 37.869 | -85 | 06.217 | -98 |
| 2 | 49.692 | -198 | 19.806 | -141 | 37.746 | -123 | 06.085 | -132 |
| 3 | 49.458 | -234 | 19.642 | -164 | 37.597 | -149 | 05.929 | -156 |
| 3 | 49.197 | -261 | 19.460 | -182 | 37.428 | -169 | 05.754 | -175 |
| 3 | 48.928 | -269 | 19.273 | -187 | 37.254 | -174 | 05.575 | -179 |
| 3 | 48.669 | -259 | 19.092 | -181 | 37.085 | -169 | 05.400 | -175 |
| 4 | 48.430 | -239 | 18.923 | -169 | 36.930 | -155 | 05.238 | -162 |
| 4 | 48.229 | -201 | 18.778 | -145 | 36.801 | -129 | 05.100 | -138 |
| 4 | 48.076 | -153 | 18.664 | -114 | 36.706 | -95 | 04.993 | -107 |
| 5 | 47.977 | -99 | 18.585 | -79 | 36.648 | -58 | 04.920 | -73 |
| 5 | 47.942 | -35 | 18.548 | -37 | 36.634 | -14 | 04.888 | -32 |
| 5 | 47.970 | +28 | 18.552 | +4 | 36.664 | +30 | 04.897 | +9 |
| 6 | 48.062 | +92 | 18.598 | +46 | 36.738 | +74 | 04.948 | +51 |
| 6 | 48.219 | +157 | 18.687 | +89 | 36.852 | +114 | 05.041 | +93 |
| 6 | 48.432 | +213 | 18.814 | +127 | 37.007 | +155 | 05.171 | +130 |
| 7 | 48.699 | +267 | 18.977 | +163 | 37.201 | +194 | 05.337 | +166 |
| 7 | 49.016 | +317 | 19.175 | +198 | 37.427 | +226 | 05.535 | +198 |
| 7 | 49.370 | +354 | 19.398 | +223 | 37.678 | +251 | 05.759 | +224 |
| 8 | 49.759 | +389 | 19.646 | +248 | 37.951 | +273 | 06.007 | +248 |
| 8 | 50.175 | +416 | 19.913 | +267 | 38.242 | +291 | 06.273 | +266 |
| 8 | 50.608 | +433 | 20.193 | +280 | 38.544 | +302 | 06.552 | +279 |
| 9 | 51.058 | +450 | 20.484 | +291 | 38.857 | +313 | 06.841 | +289 |
| 9 | 51.514 | +456 | 20.781 | +297 | 39.174 | +317 | 07.136 | +295 |
| 9 | 51.972 | +458 | 21.078 | +297 | 39.491 | +317 | 07.431 | +295 |
| 10 | 52.428 | +456 | 21.374 | +296 | 39.808 | +317 | 07.726 | +295 |
| 10 | 52.873 | +445 | 21.662 | +288 | 40.118 | +310 | 08.013 | +287 |
| 10 | 53.302 | +429 | 21.939 | +277 | 40.418 | +300 | 08.289 | +276 |
| 11 | 53.710 | +408 | 22.200 | +261 | 40.705 | +287 | 08.552 | +263 |
| 11 | 54.085 | +375 | 22.438 | +238 | 40.971 | +266 | 08.792 | +240 |
| 11 | 54.423 | +338 | 22.651 | +213 | 41.214 | +243 | 09.008 | +216 |
| 12 | 54.713 | +290 | 22.831 | +180 | 41.425 | +211 | 09.192 | +184 |
| 12 | 54.946 | +233 | 22.972 | +141 | 41.599 | +174 | 09.339 | +147 |
| 12 | 55.119 | +173 | 23.073 | +101 | 41.732 | +133 | 09.446 | +107 |
| 12 | 55.221 | +102 | 23.128 | +55 | 41.817 | +85 | 09.509 | +63 |
| | | +32 | | +8 | | +37 | | +15 |
| Mean Place | 51.215 | 17.38 | 20.580 | 35.06 | 38.931 | 29.46 | 06.934 | 25.72 |
| sec δ, tan δ | +1.550 | +1.184 | +1.034 | -0.265 | +1.050 | +0.320 | +1.014 | -0.170 |
| da(ψ), dδ(ψ) | +0.093 | +0.03 | +0.054 | +0.02 | +0.070 | +0.02 | +0.057 | +0.02 |
| da(ε), dδ(ε) | -0.005 | +1.00 | +0.001 | +1.00 | -0.001 | +1.00 | +0.001 | +1.00 |
| Dbble.Trans. | December 17 | | December 18 | | December 18 | | December 18 | |

AT UPPER TRANSIT AT GREENWICH

| No. | 1155 | | 1156 | | 223 | | 221 | |
|--------------|----------------|------------|-------------|------------|-------------|------------|--------------|------------|
| | 142 G. Orionis | | γ Pictoris | | β Columbae | | ν Aurigae | |
| Mag. Spect. | 5.95 | G5 | 4.38 | K0 | 3.22 | K0 | 4.18 | K0 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° ' | h m | ° ' | h m | ° ' | h m | ° ' |
| | 5 47 | - 4 05 | 5 49 | -56 09 | 5 50 | - 35 45 | 5 50 | +39 08 |
| 1 -9.0 | 53 867 + 126 | 44 77 -162 | 36 607 + 61 | 65.92 -352 | 29 181 + 97 | 77.19 -305 | 31 956 + 178 | 50.65 +104 |
| 1 1.0 | 53 952 + 85 | 46 31 -154 | 36 594 - 13 | 69.33 -341 | 29 226 + 45 | 80.15 -296 | 32 080 + 124 | 51.73 +108 |
| 1 10.9 | 53 992 + 40 | 47.74 -143 | 36 505 - 89 | 72.56 -323 | 29 219 - 63 | 82.94 -279 | 32 147 + 67 | 52.84 +111 |
| 1 20.9 | 53 984 - 8 | 49.02 -128 | 36 341 -164 | -292 | 29 156 - 63 | 85.47 -253 | 32 150 + 3 | 53.92 +108 |
| 1 30.9 | 53 934 - 50 | 50.09 -107 | 36 112 -229 | 78.02 -254 | 29 045 -111 | 87.66 -219 | 32 098 - 52 | 54.92 +100 |
| 2 9.9 | 53 842 - 92 | 50 98 - 89 | 35 824 -288 | 80.14 -212 | 28 888 -157 | 89.49 -183 | 31 992 -106 | 55.81 + 89 |
| 2 19.8 | 53 716 -126 | 51 65 - 67 | 35 486 -338 | 81.75 -161 | 28 694 -194 | 90.87 -138 | 31 839 -153 | 56.53 + 72 |
| 3 1.8 | 53 566 -150 | 52 10 - 45 | 35 116 -370 | 82.85 -110 | 28 473 -221 | 91.82 - 95 | 31 655 -184 | 57.05 + 52 |
| 3 11.8 | 53 398 -168 | 52 34 - 24 | 34 722 -394 | 83.43 - 58 | 28 233 -240 | 92.33 - 51 | 31 446 -209 | 57.35 + 30 |
| 3 21.7 | 53 224 -174 | 52.36 - 2 | 34.320 -402 | 83.45 - 2 | 27 986 -247 | 92.35 - 2 | 31 228 -218 | 57.41 + 6 |
| 3 31.7 | 53 055 -169 | 52.16 + 20 | 33.927 -393 | 82.95 + 50 | 27 745 -241 | 91.93 + 42 | 31 018 -210 | 57.25 -16 |
| 4 10.7 | 52 898 -157 | 51.76 + 40 | 33 551 -376 | 81.94 +101 | 27 517 -228 | 91.07 + 86 | 30 823 -196 | 56.86 -39 |
| 4 20.7 | 52 766 -132 | 51 14 + 62 | 33 208 -343 | 80.43 +151 | 27 315 -202 | 89.78 +129 | 30 659 -164 | 56.28 -58 |
| 4 30.6 | 52 664 -102 | 50 33 + 81 | 32 908 -300 | 78.49 +194 | 27 146 -169 | 88.11 +167 | 30 536 -123 | 55.56 -72 |
| 5 10.6 | 52 596 - 68 | 49 32 +101 | 32 658 -250 | 76.13 +236 | 27 014 -132 | 86.07 +204 | 30 456 - 80 | 54.71 +86 |
| 5 20.6 | 52 570 - 26 | 48 13 +119 | 32 469 -189 | 73.40 +273 | 26 928 - 86 | 83.71 +236 | 30 431 - 25 | 53.79 -92 |
| 5 30.6 | 52 584 + 14 | 46 79 +134 | 32 343 -126 | 70.41 +299 | 26 889 - 39 | 81.11 +260 | 30 459 + 28 | 52.85 -94 |
| 6 9.5 | 52 639 + 55 | 45 30 +149 | 32 283 - 60 | 67.18 +323 | 26 898 + 9 | 78 29 +282 | 30 539 + 80 | 51.92 -93 |
| 6 19.5 | 52 737 + 98 | 43 71 +159 | 32 295 + 12 | 63.81 +337 | 26 957 + 59 | 75 34 +295 | 30 674 +135 | 51.03 -89 |
| 6 29.5 | 52 871 +134 | 42.06 +165 | 32 372 + 77 | 60.41 +340 | 27 060 +103 | 72.34 +300 | 30 855 +181 | 50.20 -83 |
| 7 9.4 | 53 040 +169 | 40 37 +169 | 32 515 +143 | 57.01 +340 | 27 209 +149 | 69 34 +300 | 31 082 +227 | 49 45 -75 |
| 7 19.4 | 53 242 +202 | 38 72 +165 | 32 723 +208 | 53.77 +324 | 27 399 +190 | 66 46 +288 | 31 350 +268 | 48 82 -63 |
| 7 29.4 | 53 468 +226 | 37 15 +157 | 32 984 +261 | 50.76 +301 | 27 624 +225 | 63 77 +269 | 31 650 +300 | 48 30 -52 |
| 8 8.4 | 53 718 +250 | 35 71 +144 | 33 299 +315 | 48.04 +272 | 27 881 +257 | 61 34 +243 | 31 978 +328 | 47 90 -40 |
| 8 18.3 | 53 985 +267 | 34 47 +124 | 33 657 +358 | 45.77 +227 | 28 165 +284 | 59 30 +204 | 32 329 +351 | 47 63 -27 |
| 8 28.3 | 54 264 +279 | 33 47 +100 | 34 048 +391 | 43.97 +180 | 28 467 +302 | 57 66 +164 | 32 694 +365 | 47 45 -18 |
| 9 7.3 | 54 554 +290 | 32 75 + 72 | 34 468 +420 | 42.72 +125 | 28 787 +320 | 56 51 +115 | 33 074 +380 | 47 39 - 6 |
| 9 17.3 | 54 849 +295 | 32 35 + 40 | 34 903 +435 | 42.11 + 61 | 29 115 +328 | 55 92 + 59 | 33 459 +385 | 47 42 + 3 |
| 9 27.2 | 55 144 +295 | 32 27 + 8 | 35 342 +439 | 42.12 - 1 | 29 446 +331 | 55 88 + 4 | 33 846 +387 | 47 55 +13 |
| 10 7.2 | 55 440 +296 | 32 54 - 27 | 35 779 +437 | 42.78 - 66 | 29 775 +329 | 56 42 - 54 | 34 233 +387 | 47 77 +22 |
| 10 17.2 | 55 727 +287 | 33 15 - 61 | 36 197 +418 | 44.09 -131 | 30 094 +319 | 57 54 -112 | 34 612 +379 | 48 10 +33 |
| 10 27.1 | 56 005 +278 | 34 05 - 90 | 36 588 +391 | 45 97 -188 | 30 398 +304 | 59 16 -162 | 34 980 +368 | 48 52 +42 |
| 11 6.1 | 56 270 +265 | 35 23 -118 | 36 943 +355 | 48 40 -243 | 30 681 +283 | 61 26 -210 | 35 332 +352 | 49 05 +53 |
| 11 16.1 | 56 514 +244 | 36 62 -139 | 37 246 +303 | 51 27 -287 | 30 933 +252 | 63 76 -250 | 35 658 +326 | 49 69 +64 |
| 11 26.1 | 56 733 +219 | 38 16 -154 | 37 493 +247 | 54 47 -320 | 31 151 +218 | 66 54 -278 | 35 955 +297 | 50 44 +75 |
| 12 6.0 | 56 923 +190 | 39 80 -164 | 37 676 +183 | 57 91 -344 | 31 329 +178 | 69 54 -300 | 36 214 +259 | 51 31 +87 |
| 12 16.0 | 57 075 +152 | 41 46 -166 | 37 784 +108 | 61 44 -353 | 31 457 +128 | 72 61 -307 | 36 426 +212 | 52 27 +96 |
| 12 26.0 | 57 189 +114 | 43 08 -162 | 37 820 + 36 | 64 95 -351 | 31 538 + 81 | 75 66 -305 | 36 588 +162 | 53 30 +103 |
| 12 36.0 | 57 258 + 69 | 44 62 -154 | 37 778 - 42 | 68 35 -340 | 31 564 + 26 | 78 61 -295 | 36 692 +104 | 54 37 +107 |
| | 57 258 + 22 | 44 62 -139 | 37 778 -119 | 68 35 -313 | 31 564 - 29 | 78 61 -271 | 36 692 + 44 | 54 37 +108 |
| Mean Place | 54.642 | 50.78 | 34.878 | 71.20 | 28.995 | 82.56 | 33.205 | 43.87 |
| sec δ, tan δ | +1.003 | -0.072 | +1.796 | -1.492 | +1.233 | -0.721 | +1.289 | +0.814 |
| dα(ψ), dδ(ψ) | +0.059 | +0.02 | +0.022 | +0.02 | +0.042 | +0.02 | +0.083 | +0.02 |
| dα(ε), dδ(ε) | +0.000 | +1.00 | +0.005 | +1.00 | +0.002 | +1.00 | -0.002 | +1.00 |
| Dble. Trans. | December 18 | | December 19 | | December 19 | | December 19 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 1159 | | 222 | | 1158 | | 1157 | |
|--------------|----------------|------------|--------------|------------|--------------|------------|--------------|------------|
| | 37 G. Pictoris | | δ Leporis | | 136 Tauri | | ξ Aurigae | |
| Mag Spect. | 4.98 | K0 | 3.90 | K0 | 4.54 | A0 | 4.92 | A2 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° ′ | h m | ° ′ | h m | ° ′ | h m | ° ′ |
| | 5 50 | - 52 06 | 5 50 | - 20 52 | 5 52 | + 27 36 | 5 53 | + 55 42 |
| 1 -9.0 | 36.221 + 72 | 36.69 -347 | 44.040 + 114 | 40.70 -250 | 27.530 + 163 | 42.30 + 31 | 41.625 + 224 | 25.18 +197 |
| 1 1.0 | 36.225 + 4 | 40.04 -335 | 44.109 + 69 | 43.11 -241 | 27.646 + 116 | 42.66 + 36 | 41.774 + 149 | 27.20 +202 |
| 1 10.9 | 36.160 - 65 | 43.23 -319 | 44.130 + 21 | 45.38 -227 | 27.711 + 65 | 43.08 + 42 | 41.844 + 70 | 29.23 +203 |
| 1 20.9 | 36.026 - 134 | 46.11 -288 | 44.103 - 27 | 47.43 -205 | 27.722 + 11 | 43.52 + 44 | 41.829 - 15 | 31.17 +194 |
| 1 30.9 | 35.832 - 194 | 48.62 -251 | 44.031 - 72 | 49.20 -177 | 27.682 - 40 | 43.97 + 45 | 41.738 - 91 | 32.94 +177 |
| 2 9.9 | 35.582 - 250 | 50.72 -210 | 43.918 - 113 | 50.68 -148 | 27.595 - 87 | 44.38 + 41 | 41.575 - 163 | 34.50 +156 |
| 2 19.8 | 35.287 - 295 | 52.32 -160 | 43.768 - 150 | 51.80 -112 | 27.466 - 129 | 44.72 + 34 | 41.349 - 226 | 35.75 +125 |
| 3 1.8 | 34.961 - 326 | 53.41 -109 | 43.594 - 174 | 52.58 - 78 | 27.308 - 158 | 44.99 + 27 | 41.080 - 269 | 36.66 + 91 |
| 3 11.8 | 34.612 - 349 | 54.00 - 59 | 43.402 - 192 | 53.01 - 43 | 27.129 - 179 | 45.15 + 16 | 40.778 - 302 | 37.20 + 54 |
| 3 21.7 | 34.255 - 357 | 54.03 - 3 | 43.204 - 198 | 53.05 - 4 | 26.941 - 188 | 45.19 + 4 | 40.464 - 314 | 37.33 + 13 |
| 3 31.7 | 33.907 - 348 | 53.56 + 47 | 43.010 - 194 | 52.76 + 29 | 26.760 - 181 | 45.13 - 6 | 40.159 - 305 | 37.08 - 25 |
| 4 10.7 | 33.573 - 334 | 52.59 + 97 | 42.829 - 181 | 52.11 + 65 | 26.591 - 169 | 44.96 - 17 | 39.874 - 285 | 36.45 - 63 |
| 4 20.7 | 33.271 - 302 | 51.11 +148 | 42.671 - 158 | 51.12 + 99 | 26.450 - 141 | 44.71 - 25 | 39.874 - 245 | 36.45 - 97 |
| 4 30.6 | 33.008 - 263 | 49.22 +189 | 42.545 - 126 | 49.83 +129 | 26.344 - 106 | 44.40 - 31 | 39.437 - 192 | 34.23 -125 |
| 5 10.6 | 32.791 - 217 | 46.91 +231 | 42.452 - 93 | 48.23 +160 | 26.278 - 66 | 44.06 - 34 | 39.303 - 134 | 32.75 -148 |
| 5 20.6 | 32.631 - 160 | 44.24 +267 | 42.402 - 50 | 46.37 +186 | 26.258 - 20 | 43.71 - 35 | 39.241 - 62 | 31.09 -166 |
| 5 30.6 | 32.529 - 102 | 41.31 +293 | 42.394 - 8 | 44.31 +206 | 26.285 + 27 | 43.38 - 33 | 39.249 + 8 | 29.33 -176 |
| 6 9.5 | 32.487 - 42 | 38.14 +317 | 42.428 + 34 | 42.06 +225 | 26.360 + 75 | 43.11 - 27 | 39.330 + 81 | 27.52 -181 |
| 6 19.5 | 32.510 + 23 | 34.82 +332 | 42.507 + 79 | 39.68 +238 | 26.479 + 119 | 42.97 - 14 | 39.484 + 154 | 25.72 -180 |
| 6 29.5 | 32.592 + 82 | 31.47 +335 | 42.625 + 118 | 37.25 +243 | 26.638 + 159 | 42.71 - 26 | 39.703 + 219 | 24.00 -172 |
| 7 9.4 | 32.735 + 143 | 28.13 +334 | 42.781 + 156 | 34.81 +244 | 26.842 + 204 | 42.60 - 11 | 39.985 + 282 | 22.37 -163 |
| 7 19.4 | 32.935 + 200 | 24.93 +320 | 42.973 + 192 | 32.45 +236 | 27.080 + 238 | 42.58 - 2 | 40.324 + 339 | 20.90 -147 |
| 7 29.4 | 33.183 + 248 | 21.95 +298 | 43.192 + 219 | 30.24 +221 | 27.345 + 265 | 42.61 + 3 | 40.708 + 384 | 19.60 -130 |
| 8 8.4 | 33.479 + 296 | 19.27 +268 | 43.438 + 246 | 28.23 +201 | 27.636 + 291 | 42.70 + 9 | 41.135 + 427 | 18.50 -110 |
| 8 18.3 | 33.813 + 334 | 17.02 +225 | 43.705 + 267 | 26.53 +170 | 27.945 + 309 | 42.82 + 12 | 41.595 + 460 | 17.64 - 86 |
| 8 28.3 | 34.176 + 363 | 15.23 +179 | 43.986 + 281 | 25.17 +136 | 28.268 + 323 | 42.95 + 13 | 42.078 + 483 | 16.99 - 65 |
| 9 7.3 | 34.565 + 389 | 13.99 +124 | 44.281 + 295 | 24.21 + 96 | 28.602 + 334 | 43.08 + 13 | 42.582 + 504 | 16.59 - 40 |
| 9 17.3 | 34.967 + 402 | 13.37 + 62 | 44.582 + 301 | 23.72 + 49 | 28.942 + 340 | 43.20 + 12 | 43.096 + 514 | 16.44 - 15 |
| 9 27.2 | 35.373 + 406 | 13.36 + 1 | 44.885 + 303 | 23.69 + 3 | 29.284 + 342 | 43.30 + 10 | 43.614 + 518 | 16.44 + 9 |
| 10 7.2 | 35.778 + 405 | 14.00 - 64 | 45.188 + 303 | 24.14 - 45 | 29.626 + 342 | 43.38 + 8 | 44.133 + 519 | 16.88 + 35 |
| 10 17.2 | 36.165 + 387 | 15.28 -128 | 45.482 + 294 | 25.07 - 93 | 29.961 + 335 | 43.44 + 6 | 44.640 + 507 | 17.48 + 60 |
| 10 27.1 | 36.530 + 365 | 17.12 -184 | 45.765 + 283 | 26.42 -135 | 30.287 + 326 | 43.49 + 5 | 45.132 + 492 | 18.33 + 85 |
| 11 6.1 | 36.863 + 333 | 19.51 -239 | 46.032 + 267 | 28.17 -175 | 30.600 + 313 | 43.54 + 5 | 45.600 + 468 | 19.43 +110 |
| 11 16.1 | 37.151 + 288 | 22.33 -282 | 46.274 + 242 | 28.17 -207 | 30.891 + 291 | 43.62 + 8 | 46.031 + 431 | 20.76 +133 |
| 11 26.1 | 37.390 + 239 | 25.47 -314 | 46.490 + 216 | 32.54 -230 | 31.158 + 267 | 43.75 + 13 | 46.420 + 389 | 22.30 +154 |
| 12 6.0 | 37.570 + 180 | 28.86 -339 | 46.672 + 182 | 35.02 -248 | 31.391 + 233 | 43.92 + 17 | 46.756 + 336 | 24.04 +174 |
| 12 16.0 | 37.685 + 115 | 32.34 -348 | 46.814 + 142 | 37.54 -252 | 31.584 + 193 | 44.16 + 24 | 47.026 + 270 | 25.92 +188 |
| 12 26.0 | 37.734 + 49 | 35.79 -345 | 46.913 + 99 | 40.04 -250 | 31.733 + 149 | 44.47 + 31 | 47.227 + 201 | 27.89 +197 |
| 12 36.0 | 37.711 - 23 | 39.14 -335 | 46.965 + 52 | 42.45 -241 | 31.832 + 99 | 44.83 + 36 | 47.348 + 121 | 29.91 +202 |
| | - 92 | -309 | + 4 | -220 | + 45 | + 41 | + 39 | +197 |
| Mean Place | 34.927 | 42.13 | 44.420 | 46.86 | 28.713 | 35.63 | 42.834 | 18.24 |
| sec δ, tan δ | +1.628 | -1.285 | +1.070 | -0.381 | +1.129 | +0.523 | +1.775 | +1.466 |
| da(ψ), dδ(ψ) | +0.027 | +0.02 | +0.051 | +0.02 | +0.075 | +0.01 | +0.100 | +0.01 |
| da(ε), dδ(ε) | +0.004 | +1.00 | +0.001 | +1.00 | -0.001 | +1.00 | -0.003 | +1.00 |
| Dble.Trans. | December 19 | | December 19 | | December 19 | | December 20 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 224 | | 226 | | 1160 | | 1161 | |
|---|----------------------------------|------------|----------------|------------|-------------------|------------|-------------|------------|
| | α Orionis (Betelgeuse) | | η Leporis | | γ Columbae | | 60 Orionis | |
| Mag.Spect. | 0.1 to 1.2 | M0 | 3.77 | F0 | 4.36 | B3 | 5.25 | A0 |
| U.T. | R.A. | | R.A. | | R.A. | | R.A. | |
| | Dec. | | Dec. | | Dec. | | Dec. | |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " |
| | 5 54 | + 7 24 | 5 55 | - 14 09 | 5 57 | - 35 16 | 5 58 | + 0 33 |
| 1 -9.0 | 25.477 +143 | 25.67 -97 | 46.797 +124 | 64.29 -217 | 03.637 +106 | 57.00 -307 | 07.047 +141 | 15.41 -138 |
| 1 1.0 | 25.578 +101 | 24.78 -89 | 46.878 +81 | 66.38 -209 | 03.691 +54 | 59.97 -297 | 07.145 +98 | 14.10 -131 |
| 1 10.9 | 25.634 +56 | 23.98 -80 | 46.913 +35 | 68.35 -197 | 03.692 +1 | 62.81 -284 | 07.199 +54 | 12.89 -121 |
| 1 20.9 | 25.640 +6 | 23.29 -69 | 46.899 -14 | 70.12 -177 | 03.637 -55 | 65.38 -257 | 07.204 +5 | 11.83 -106 |
| 1 30.9 | 25.603 -37 | 22.73 -56 | 46.842 -57 | 71.64 -152 | 03.534 -103 | 67.62 -224 | 07.165 -39 | 10.93 -90 |
| 2 9.9 | 25.523 -80 | 22.29 -44 | 46.743 -99 | 72.91 -127 | 03.384 -150 | 69.51 -189 | 07.084 -81 | 10.20 -73 |
| 2 19.8 | 25.406 -117 | 21.97 -32 | 46.608 -135 | 73.87 -96 | 03.195 -189 | 70.97 -146 | 06.966 -118 | 09.65 -55 |
| 3 1.8 | 25.263 -143 | 21.76 -21 | 46.448 -160 | 74.54 -67 | 02.979 -216 | 72.00 -103 | 06.822 -144 | 09.28 -37 |
| 3 11.8 | 25.100 -163 | 21.65 -11 | 46.269 -179 | 74.91 -37 | 02.743 -236 | 72.59 -59 | 06.659 -163 | 09.08 -20 |
| 3 21.7 | 24.930 -170 | 21.65 +0 | 46.082 -187 | 74.95 -4 | 02.498 -245 | 72.69 -10 | 06.488 -171 | 09.05 -3 |
| 3 31.7 | 24.765 -165 | 21.75 +10 | 45.901 -181 | 74.70 +25 | 02.258 -240 | 72.36 +33 | 06.321 -167 | 09.20 +15 |
| 4 10.7 | 24.612 -153 | 21.94 +19 | 45.730 -171 | 74.16 +54 | 02.030 -228 | 71.59 +77 | 06.164 -157 | 09.50 +30 |
| 4 20.7 | 24.481 -131 | 22.26 +32 | 45.582 -148 | 73.32 +84 | 01.826 -204 | 70.38 +121 | 06.030 -134 | 09.98 +48 |
| 4 30.6 | 24.382 -99 | 22.67 +41 | 45.464 -118 | 72.21 +111 | 01.654 -172 | 68.80 +158 | 05.926 -104 | 10.62 +64 |
| 5 10.6 | 24.317 -65 | 23.20 +53 | 45.380 -84 | 70.85 +136 | 01.519 -135 | 66.84 +196 | 05.855 -71 | 11.42 +80 |
| 5 20.6 | 24.294 -23 | 23.84 +64 | 45.336 -44 | 69.25 +160 | 01.428 -91 | 64.56 +228 | 05.825 -30 | 12.38 +96 |
| 5 30.6 | 24.312 +18 | 24.59 +75 | 45.333 -3 | 67.46 +179 | 01.383 -45 | 62.03 +253 | 05.835 +10 | 13.46 +108 |
| 6 9.5 | 24.371 +59 | 25.44 +85 | 45.371 +38 | 65.50 +196 | 01.385 +2 | 59.27 +276 | 05.885 +50 | 14.67 +121 |
| 6 19.5 | 24.472 +101 | 26.38 +94 | 45.452 +81 | 63.42 +208 | 01.437 +52 | 56.37 +290 | 05.977 +92 | 15.99 +132 |
| 6 29.5 | 24.610 +138 | 27.39 +101 | 45.571 +119 | 61.29 +213 | 01.534 +97 | 53.42 +295 | 06.106 +129 | 17.37 +138 |
| 7 9.4 | 24.784 +174 | 28.46 +107 | 45.727 +156 | 59.12 +217 | 01.675 +141 | 50.45 +297 | 06.270 +164 | 18.79 +142 |
| 7 19.4 | 24.990 +206 | 29.52 +106 | 45.916 +189 | 57.03 +209 | 01.858 +183 | 47.59 +286 | 06.467 +197 | 20.19 +140 |
| 7 29.4 | 25.221 +231 | 30.54 +102 | 46.132 +216 | 55.05 +198 | 02.075 +217 | 44.91 +268 | 06.688 +221 | 21.52 +133 |
| 8 8.4 | 25.476 +255 | 31.50 +96 | 46.374 +242 | 53.24 +181 | 02.326 +251 | 42.48 +243 | 06.934 +246 | 22.76 +124 |
| 8 18.3 | 25.748 +272 | 32.34 +84 | 46.635 +261 | 51.70 +154 | 02.603 +277 | 40.42 +206 | 07.198 +264 | 23.83 +107 |
| 8 28.3 | 26.032 +284 | 33.04 +70 | 46.911 +276 | 50.46 +124 | 02.901 +298 | 38.76 +166 | 07.475 +277 | 24.70 +87 |
| 9 7.3 | 26.328 +296 | 33.55 +51 | 47.199 +288 | 49.57 +89 | 03.217 +316 | 37.59 +117 | 07.764 +289 | 25.33 +63 |
| 9 17.3 | 26.629 +301 | 33.85 +30 | 47.494 +295 | 49.09 +48 | 03.542 +325 | 36.96 +63 | 08.058 +294 | 25.68 +35 |
| 9 27.2 | 26.931 +302 | 33.93 +8 | 47.791 +297 | 49.02 +7 | 03.871 +329 | 36.88 +8 | 08.356 +298 | 25.75 +7 |
| 10 7.2 | 27.235 +304 | 33.78 -15 | 48.088 +297 | 49.38 -36 | 04.201 +330 | 37.38 -50 | 08.654 +298 | 25.53 -22 |
| 10 17.2 | 27.532 +297 | 33.39 -39 | 48.379 +291 | 50.17 -79 | 04.521 +320 | 38.46 -108 | 08.947 +293 | 25.00 -53 |
| 10 27.1 | 27.822 +290 | 32.82 -57 | 48.660 +281 | 51.33 -116 | 04.827 +306 | 40.04 -158 | 09.232 +285 | 24.22 -78 |
| 11 6.1 | 28.099 +277 | 32.06 -76 | 48.928 +268 | 52.86 -153 | 05.115 +288 | 42.12 -208 | 09.506 +274 | 23.19 -103 |
| 11 16.1 | 28.357 +258 | 31.17 -89 | 49.173 +245 | 54.66 -180 | 05.372 +257 | 44.59 -247 | 09.760 +254 | 21.98 -121 |
| 11 26.1 | 28.592 +235 | 30.20 -97 | 49.393 +220 | 56.67 -201 | 05.598 +226 | 47.36 -277 | 09.991 +231 | 20.65 -133 |
| 12 6.0 | 28.798 +206 | 29.18 -102 | 49.583 +190 | 58.83 -216 | 05.783 +185 | 50.35 -299 | 10.194 +203 | 19.23 -142 |
| 12 16.0 | 28.967 +169 | 28.17 -101 | 49.733 +150 | 61.04 -221 | 05.920 +137 | 53.43 -308 | 10.360 +166 | 17.81 -142 |
| 12 26.0 | 29.098 +131 | 27.21 -96 | 49.844 +111 | 63.21 -217 | 06.009 +89 | 56.49 -306 | 10.488 +128 | 16.43 -138 |
| 12 36.0 | 29.184 +86 | 26.32 -89 | 49.909 +65 | 65.30 -209 | 06.044 +35 | 59.47 -298 | 10.571 +83 | 15.12 -131 |
| | 29.184 +38 | 26.32 -78 | 49.909 +17 | 65.30 -191 | 06.044 -20 | 59.47 -276 | 10.571 +36 | 15.12 -118 |
| Mean Place | 26.439 | 19.19 | 47.350 | 70.56 | 03.479 | 63.36 | 07.901 | 08.76 |
| sec δ , tan δ | +1.008 | +0.130 | +1.031 | -0.252 | +1.225 | -0.708 | +1.000 | +0.010 |
| $d\alpha(\psi)$, $d\delta(\psi)$ | +0.065 | +0.01 | +0.054 | +0.01 | +0.042 | +0.01 | +0.061 | +0.00 |
| $d\alpha(\epsilon)$, $d\delta(\epsilon)$ | -0.000 | +1.00 | +0.000 | +1.00 | +0.001 | +1.00 | -0.000 | +1.00 |
| Dble.Trans. | December 20 | | December 20 | | December 21 | | December 21 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 225 | | 227 | | 229 | | 1162 | |
|---------------------|--------------------------|------------|--------------------------|-------------------------|-------------------------|-------------------------|-----------------------------|------------------------|
| | δ Aurigae | | β Aurigae | | η Columbae | | B.D. +33° 1209 (Aurigae) | |
| Mag.Spect. | 3.88 | K0 | 2.07 | A0p | 4.03 | K0 | 6.80 | A2 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " |
| | 5 58 | +54 17 | 5 58 | +44 56 | 5 58 | -42 48 | 5 59 | +33 08 |
| 1 ^d -9.0 | 23 689 ^s +227 | 12.32 +187 | 31.045 ^s +200 | 56.45 ^s +135 | 44.539 ^s +98 | 49.53 ^s -330 | 19.931 ^s +179 | 19.56 ^s +63 |
| 1 ¹ 1.0 | 23 843 +154 | 14.26 +194 | 31.185 +140 | 57.86 +141 | 44.580 +41 | 52.73 -320 | 20.061 +130 | 20.25 +69 |
| 1 ¹ 10.9 | 23 922 +79 | 16.21 +195 | 31.262 +77 | 59.30 +144 | 44.563 -17 | 55.79 -306 | 20.136 +75 | 21.00 +75 |
| 1 ¹ 20.9 | 23 917 -5 | 18.08 +187 | 31.271 +9 | 60.70 +140 | 44.484 -79 | 58.57 -278 | 20.152 +16 | 21.75 +74 |
| 1 ¹ 30.9 | 23 839 -78 | 19.81 +173 | 31.217 -54 | 62.01 +131 | 44.353 -131 | 61.00 -243 | 20.116 -36 | 22.49 +74 |
| 2 9.9 | 23 690 -149 | 21.35 +154 | 31.104 -113 | 63.18 +117 | 44.172 -181 | 63.06 -206 | 20.028 -88 | 23.16 +67 |
| 2 19.8 | 23 479 -211 | 22.59 +124 | 30.938 -166 | 64.13 +95 | 43.949 -223 | 64.66 -160 | 19.895 -133 | 23.72 +56 |
| 3 1.8 | 23 224 -255 | 23.51 +92 | 30.736 -202 | 64.85 +72 | 43.696 -253 | 65.78 -112 | 19.730 -165 | 24.16 +44 |
| 3 11.8 | 22 937 -287 | 24.08 +57 | 30.506 -230 | 65.29 +44 | 43.421 -275 | 66.44 -66 | 19.541 -189 | 24.44 +28 |
| 3 21.8 | 22 637 -300 | 24.25 +17 | 30.265 -241 | 65.43 +14 | 43.138 -283 | 66.58 -14 | 19.342 -199 | 24.54 +10 |
| 3 31.7 | 22 343 -294 | 24.05 -20 | 30.030 -235 | 65.29 -14 | 42.860 -278 | 66.24 +34 | 19.148 -194 | 24.48 -6 |
| 4 10.7 | 22 067 -276 | 23.49 -56 | 29.810 -220 | 64.87 -42 | 42.593 -267 | 65.42 +82 | 18.967 -181 | 24.26 -22 |
| 4 20.7 | 21 830 -237 | 22.58 -91 | 29.622 -188 | 64.20 -67 | 42.353 -240 | 64.13 +129 | 18.813 -154 | 23.89 -37 |
| 4 30.6 | 21 642 -188 | 21.41 -117 | 29.476 -146 | 63.32 -88 | 42.146 -207 | 62.44 +169 | 18.695 -118 | 23.42 -47 |
| 5 10.6 | 21 510 -132 | 20.00 -141 | 29.377 -99 | 62.27 -105 | 41.978 -168 | 60.35 +209 | 18.617 -78 | 22.86 -56 |
| 5 20.6 | 21 446 -64 | 18.41 -159 | 29.335 -42 | 61.10 -117 | 41.859 -119 | 57.91 +244 | 18.588 -29 | 22.25 -61 |
| 5 30.6 | 21 451 +5 | 16.73 -168 | 29.351 +16 | 59.87 -123 | 41.789 -70 | 55.21 +20 | 18.608 +20 | 21.63 -62 |
| 6 9.5 | 21 524 +73 | 14.99 -174 | 29.424 +73 | 58.61 -126 | 41.770 -19 | 52.26 +295 | 18.677 +69 | 21.02 -61 |
| 6 19.5 | 21 669 +145 | 13.25 -174 | 29.556 +132 | 57.37 -124 | 41.806 +36 | 49.16 +310 | 18.795 +118 | 20.48 -54 |
| 6 29.5 | 21 877 +208 | 11.57 -168 | 29.739 +183 | 56.19 -118 | 41.891 +85 | 46.01 +315 | 18.955 +160 | 19.95 -53 |
| 7 9.5 | 22 145 +268 | 09.98 -159 | 29.973 +234 | 55.08 -111 | 42.026 +135 | 42.84 +317 | 19.160 +205 | 19.48 -47 |
| 7 19.4 | 22 469 +324 | 08.53 -145 | 30.252 +279 | 54.10 -98 | 42.209 +183 | 39.79 +305 | 19.404 +244 | 19.11 -37 |
| 7 29.4 | 22 837 +368 | 07.25 -128 | 30.567 +315 | 53.24 -86 | 42.431 +222 | 36.94 +285 | 19.676 +272 | 18.83 -28 |
| 8 8.4 | 23 247 +410 | 06.15 -110 | 30.915 +348 | 52.52 -72 | 42.431 +261 | 34.35 +259 | 19.976 +300 | 18.61 -22 |
| 8 18.3 | 23 689 +442 | 05.27 -88 | 31.289 +374 | 51.96 -56 | 42.692 +293 | 32.15 +220 | 20.298 +322 | 18.47 -14 |
| 8 28.3 | 24 154 +465 | 04.60 -67 | 31.681 +392 | 51.54 -42 | 43.302 +317 | 30.39 +176 | 20.635 +337 | 18.38 -9 |
| 9 7.3 | 24 641 +487 | 04.15 -45 | 32.090 +409 | 51.27 -27 | 43.640 +338 | 29.13 +126 | 20.985 +350 | 18.34 -4 |
| 9 17.3 | 25 138 +497 | 03.95 -20 | 32.507 +417 | 51.16 -11 | 43.990 +350 | 28.46 +67 | 21.343 +358 | 18.34 +0 |
| 9 27.2 | 25 640 +502 | 03.97 +2 | 32.928 +421 | 51.19 +3 | 44.344 +354 | 28.37 +9 | 21.703 +360 | 18.37 +3 |
| 10 7.2 | 26 144 +504 | 04.23 +26 | 33.351 +423 | 51.38 +19 | 44.700 +356 | 28.90 -53 | 22.066 +363 | 18.44 +7 |
| 10 17.2 | 26 638 +494 | 04.74 +51 | 33.766 +415 | 51.72 +34 | 45.045 +345 | 30.04 -114 | 22.422 +356 | 18.54 +10 |
| 10 27.2 | 27 118 +480 | 05.49 +75 | 34.170 +404 | 52.22 +50 | 45.374 +329 | 31.72 -168 | 22.770 +348 | 18.70 +16 |
| 11 6.1 | 27 577 +459 | 06.48 +99 | 34.558 +388 | 52.89 +67 | 45.680 +306 | 33.92 -220 | 23.105 +335 | 18.91 +21 |
| 11 16.1 | 28 001 +424 | 07.70 +122 | 34.918 +360 | 53.72 +83 | 45.951 +271 | 36.56 -264 | 23.417 +312 | 19.20 +29 |
| 11 26.1 | 28 386 +385 | 09.12 +142 | 35.247 +329 | 54.70 +98 | 46.185 +234 | 39.51 -295 | 23.704 +267 | 19.57 +37 |
| 12 6.0 | 28 720 +334 | 10.75 +163 | 35.534 +287 | 55.84 +114 | 46.373 +188 | 42.71 -320 | 23.957 +253 | 20.03 +46 |
| 12 16.0 | 28 991 +271 | 12.52 +177 | 35.771 +237 | 57.09 +125 | 46.507 +134 | 46.01 -330 | 24.167 +210 | 20.58 +55 |
| 12 26.0 | 29 196 +205 | 14.40 +188 | 35.953 +182 | 58.44 +135 | 46.586 +79 | 49.30 -329 | 24.332 +165 | 21.21 +63 |
| 12 36.0 | 29 324 +128 | 16.33 +193 | 36.072 +119 | 59.85 +141 | 46.606 +20 | 52.50 -320 | 24.442 +110 | 21.90 +69 |
| | +48 | +190 | +52 | +140 | -41 | -297 | +54 | +72 |
| Mean Place | 24.902 | 05.36 | 32.285 | 49.58 | 43.979 | 56.07 | 21.141 | 12.74 |
| sec δ, tan δ | +1.713 | +1.391 | +1.413 | +0.998 | +1.363 | -0.927 | +1.194 | +0.653 |
| dα(ψ), dδ(ψ) | +0.098 | +0.00 | +0.088 | +0.00 | +0.037 | +0.00 | +0.078 | +0.00 |
| dα(ε), dδ(ε) | -0.001 | +1.00 | -0.000 | +1.00 | +0.000 | +1.00 | -0.000 | +1.00 |
| Dbble. Trans. | December 21 | | December 21 | | December 21 | | December 21 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 1163 | | 231 | | 230 | | 1164 | |
|--------------|-------------|-----------|-------------|------------|-------------|------------|----------------|------------|
| | 1 Geminorum | | 1 G. Puppis | | 66 Orionis | | 74 G. Columbae | |
| Mag. Spect. | 4.30 | G5 | 6.22 | F8 | 5.70 | K0 | 5.72 | A0 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " |
| | 6 03 | + 23 15 | 6 04 | - 45 01 | 6 04 | + 4 09 | 6 05 | - 29 44 |
| 1 -9.0 | 16.822 +170 | 60.76 - 1 | 05.774 +102 | 63.09 -336 | 14.614 +149 | 43.48 -120 | 34.229 +121 | 76.26 -290 |
| 1 1.0 | 16.945 +123 | 60.83 + 7 | 05.817 + 43 | 66.36 -327 | 14.722 +108 | 42.36 -112 | 34.301 + 72 | 79.08 -282 |
| 1 10.9 | 17.019 + 74 | 60.96 +13 | 05.799 - 18 | 66.36 -313 | 14.784 + 62 | 41.34 -102 | 34.323 + 22 | 81.77 -269 |
| 1 20.9 | 17.040 + 21 | 61.15 +19 | 05.717 - 82 | 69.49 -287 | 14.798 + 14 | 40.46 - 88 | 34.291 - 32 | 84.23 -246 |
| 1 30.9 | 17.012 - 28 | 61.38 +23 | 05.580 -137 | 74.87 -251 | 14.766 - 32 | 39.72 - 74 | 34.211 - 80 | 86.38 -215 |
| 2 9.9 | 16.936 - 76 | 61.62 +24 | 05.391 -189 | 77.02 -215 | 14.691 - 75 | 39.12 - 60 | 34.086 -125 | 88.21 -183 |
| 2 19.8 | 16.818 -118 | 61.85 +23 | 05.158 -233 | 78.69 -167 | 14.579 -112 | 38.68 - 44 | 33.922 -164 | 89.64 -143 |
| 3 1.8 | 16.671 -147 | 62.05 +20 | 04.894 -264 | 79.90 -121 | 14.439 -140 | 38.39 - 29 | 33.730 -192 | 90.66 -102 |
| 3 11.8 | 16.501 -170 | 62.19 +14 | 04.606 -288 | 80.62 - 72 | 14.278 -161 | 38.23 - 16 | 33.516 -214 | 91.29 - 63 |
| 3 21.8 | 16.321 -180 | 62.27 + 8 | 04.309 -297 | 80.82 - 20 | 14.109 -169 | 38.21 - 2 | 33.293 -223 | 91.47 - 18 |
| 3 31.7 | 16.145 -176 | 62.29 + 2 | 04.015 -294 | 80.53 + 29 | 13.942 -167 | 38.33 +12 | 33.074 -219 | 91.24 + 23 |
| 4 10.7 | 15.980 -165 | 62.24 - 5 | 03.733 -262 | 79.76 + 77 | 13.786 -156 | 38.57 +24 | 32.863 -211 | 90.60 + 64 |
| 4 20.7 | 15.839 -141 | 62.14 -10 | 03.476 -257 | 78.50 +126 | 13.651 -135 | 38.96 + 39 | 32.676 -187 | 89.55 +105 |
| 4 30.6 | 15.730 -109 | 62.01 -13 | 03.253 -223 | 76.83 +167 | 13.545 -106 | 39.46 + 50 | 32.518 -158 | 88.15 +140 |
| 5 10.6 | 15.658 - 72 | 61.87 -14 | 03.069 -184 | 74.74 +209 | 13.472 - 73 | 40.11 + 65 | 32.393 -125 | 86.40 +175 |
| 5 20.6 | 15.631 - 27 | 61.75 -12 | 02.934 -135 | 72.30 +244 | 13.440 - 32 | 40.89 + 78 | 32.311 - 82 | 84.33 +207 |
| 5 30.6 | 15.648 + 17 | 61.64 -11 | 02.850 - 84 | 69.58 +272 | 13.447 + 7 | 41.77 + 88 | 32.272 - 39 | 82.03 +230 |
| 6 9.5 | 15.710 + 62 | 61.58 - 6 | 02.817 - 33 | 66.61 +297 | 13.495 + 48 | 42.78 +101 | 32.277 + 5 | 79.49 +254 |
| 6 19.5 | 15.826 +116 | 61.57 - 1 | 02.841 + 24 | 63.48 +313 | 13.585 + 90 | 43.87 +109 | 32.329 + 52 | 76.82 +267 |
| 6 29.5 | 15.956 +130 | 61.62 + 5 | 02.917 + 76 | 60.28 +320 | 13.711 +126 | 45.02 +115 | 32.422 + 93 | 74.07 +275 |
| 7 9.5 | 16.144 +188 | 61.73 +11 | 03.044 +127 | 57.07 +321 | 13.873 +162 | 46.23 +121 | 32.558 +136 | 71.30 +277 |
| 7 19.4 | 16.365 +221 | 61.89 +16 | 03.221 +177 | 53.96 +311 | 14.068 +195 | 47.43 +120 | 32.732 +174 | 68.61 +269 |
| 7 29.4 | 16.612 +247 | 62.07 +18 | 03.440 +219 | 51.05 +291 | 14.288 +220 | 48.57 +114 | 32.939 +207 | 66.09 +252 |
| 8 8.4 | 16.885 +273 | 62.27 +20 | 03.700 +260 | 48.39 +266 | 14.533 +245 | 49.64 +107 | 33.177 +238 | 63.78 +231 |
| 8 18.3 | 17.178 +293 | 62.47 +20 | 03.994 +294 | 46.13 +226 | 14.796 +263 | 50.56 + 92 | 33.441 +264 | 61.80 +198 |
| 8 28.3 | 17.484 +306 | 62.64 +17 | 04.315 +321 | 44.30 +183 | 15.073 +277 | 51.31 + 75 | 33.724 +263 | 60.20 +160 |
| 9 7.3 | 17.803 +319 | 62.78 +14 | 04.659 +344 | 42.98 +132 | 15.362 +289 | 51.85 + 54 | 34.024 +300 | 59.05 +115 |
| 9 17.3 | 18.130 +327 | 62.85 + 7 | 05.017 +358 | 42.25 + 73 | 15.658 +296 | 52.15 + 30 | 34.335 +311 | 58.41 + 64 |
| 9 27.2 | 18.459 +329 | 62.86 + 1 | 05.381 +364 | 42.11 + 14 | 15.958 +300 | 52.20 + 5 | 34.651 +316 | 58.28 + 13 |
| 10 7.2 | 18.791 +332 | 62.80 - 6 | 05.747 +366 | 42.59 - 48 | 16.260 +302 | 51.99 - 21 | 34.969 +318 | 58.70 - 42 |
| 10 17.2 | 19.118 +327 | 62.68 -12 | 06.103 +356 | 43.70 -111 | 16.557 +297 | 51.51 - 48 | 35.280 +311 | 59.67 - 97 |
| 10 27.2 | 19.438 +320 | 62.51 -17 | 06.443 +340 | 45.36 -166 | 16.847 +290 | 50.81 - 70 | 35.581 +301 | 61.13 -146 |
| 11 6.1 | 19.747 +309 | 62.31 -20 | 06.760 +317 | 47.56 -220 | 17.128 +261 | 49.89 - 92 | 35.861 +285 | 63.05 -192 |
| 11 16.1 | 20.037 +290 | 62.11 -20 | 07.042 +282 | 50.21 -265 | 17.389 +261 | 48.82 -107 | 36.125 +259 | 65.36 -231 |
| 11 26.1 | 20.303 +266 | 61.93 -18 | 07.284 +242 | 53.19 -298 | 17.629 +240 | 47.65 -117 | 36.356 +231 | 67.95 -259 |
| 12 6.0 | 20.539 +236 | 61.78 -15 | 07.479 +195 | 56.43 -324 | 17.840 +211 | 46.40 -125 | 36.550 +194 | 70.76 -281 |
| 12 16.0 | 20.736 +197 | 61.70 - 8 | 07.618 +139 | 59.78 -335 | 18.015 +175 | 45.17 -123 | 36.701 +151 | 73.67 -291 |
| 12 26.0 | 20.892 +156 | 61.69 - 1 | 07.701 + 83 | 63.13 -335 | 18.153 +138 | 43.97 -120 | 36.806 +105 | 76.57 -290 |
| 12 36.0 | 20.999 +107 | 61.76 + 7 | 07.721 + 20 | 66.41 -328 | 18.245 + 92 | 42.85 -112 | 36.860 + 54 | 79.39 -282 |
| | 20.999 + 55 | 61.76 +13 | 07.721 - 43 | 66.41 -305 | 18.245 + 44 | 42.85 - 99 | 36.860 + 2 | 79.39 -262 |
| Mean Place | 17.958 | 53.81 | 05.075 | 70.14 | 15.526 | 36.47 | 34.315 | 83.60 |
| sec δ, tan δ | +1.089 | +0.430 | +1.415 | -1.001 | +1.003 | +0.073 | +1.152 | -0.572 |
| dα(ψ), dδ(ψ) | +0.073 | -0.01 | +0.035 | -0.01 | +0.063 | -0.01 | +0.046 | -0.01 |
| dα(ε), dδ(ε) | +0.000 | +1.00 | -0.001 | +1.00 | +0.000 | +1.00 | -0.001 | +1.00 |
| Dbie. Trans. | December 22 | | December 22 | | December 22 | | December 23 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 232 | | 1165 | | 1166 | | 235 | | | | | | | | | | |
|----------------------------------|-------------|------------------|---------------|----------------|-------------|------------------|-------------|----------------|--------------|------------------|------------|----------------|--------------|------------------|------------|----------------|--------------|
| | v Orionis | | 94 G. Leporis | | v Doradus | | δ Pictoris | | | | | | | | | | |
| Mag.Spect. | 4.40 | B2 | 5.46 | A0 | 5.21 | B9 | 4.84 | B1 | | | | | | | | | |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | | | | | | | | | |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " | | | | | | | | | |
| | 6 06 | + 14 46 | 6 08 | - 22 25 | 6 08 | - 68 49 | 6 09 | - 54 57 | | | | | | | | | |
| 1 ^d 1 ^s | -9.0 1.0 | 47.001 47.121 | +163 +120 | 22.21 21.74 | -56 -47 | 23.453 23.538 | +130 +85 | 20.39 22.92 | -261 -253 | 53.596 53.544 | +64 -52 | 78.18 81.73 | -362 -355 | 63.638 63.663 | +98 +25 | 47.06 50.55 | -355 -349 |
| 1 | 10.9 | 47.194 | +73 | 21.34 | -40 | 23.575 | +37 | 25.33 | -241 | 53.377 | -167 | 85.15 | -342 | 63.614 | -49 | 53.90 | -335 |
| 1 | 20.9 | 47.215 | +21 | 21.04 | -30 | 23.560 | -15 | 27.52 | -219 | 53.092 | -285 | 88.30 | -315 | 63.488 | -126 | 56.99 | -309 |
| 1 | 30.9 | 47.190 | -25 | 20.84 | -20 | 23.500 | -60 | 29.44 | -192 | 52.710 | -382 | 91.09 | -279 | 63.296 | -192 | 59.73 | -274 |
| 2 | 9.9 | 47.120 | -70 | 20.70 | -14 | 23.395 | -105 | 31.07 | -163 | 52.236 | -474 | 93.49 | -240 | 63.042 | -254 | 62.08 | -235 |
| 2 | 19.8 | 47.009 | -111 | 20.63 | -7 | 23.252 | -143 | 32.35 | -128 | 51.685 | -551 | 95.40 | -191 | 62.734 | -308 | 63.95 | -187 |
| 3 | 1.8 | 46.870 | -139 | 20.62 | -1 | 23.081 | -171 | 33.27 | -92 | 51.083 | -602 | 96.80 | -140 | 62.391 | -343 | 65.32 | -137 |
| 3 | 11.8 | 46.709 | -161 | 20.63 | +1 | 22.889 | -192 | 33.83 | -56 | 50.440 | -643 | 97.68 | -88 | 62.018 | -373 | 66.20 | -88 |
| 3 | 21.8 | 46.538 | -171 | 20.68 | +5 | 22.687 | -202 | 34.00 | -17 | 49.778 | -662 | 98.00 | -32 | 61.632 | -386 | 66.51 | -31 |
| 3 | 31.7 | 46.369 | -169 | 20.75 | +7 | 22.488 | -199 | 33.81 | +19 | 49.123 | -655 | 97.79 | +21 | 61.250 | -382 | 66.31 | +20 |
| 4 | 10.7 | 46.210 | -159 | 20.84 | +9 | 22.298 | -190 | 33.27 | +54 | 48.482 | -641 | 97.05 | +74 | 60.879 | -371 | 65.59 | +72 |
| 4 | 20.7 | 46.074 | -136 | 20.96 | +12 | 22.129 | -169 | 32.36 | +91 | 47.883 | -599 | 95.79 | +126 | 60.535 | -344 | 64.36 | +123 |
| 4 | 30.6 | 45.968 | -106 | 21.13 | +17 | 21.989 | -140 | 31.13 | +123 | 47.339 | -544 | 94.07 | +172 | 60.230 | -305 | 62.68 | +168 |
| 5 | 10.6 | 45.896 | -72 | 21.34 | +21 | 21.881 | -108 | 29.60 | +153 | 46.858 | -481 | 91.89 | +218 | 59.968 | -262 | 60.56 | +212 |
| 5 | 20.6 | 45.865 | -31 | 21.63 | +23 | 21.813 | -68 | 27.77 | +183 | 46.461 | -397 | 89.33 | +256 | 59.763 | -205 | 58.05 | +251 |
| 5 | 30.6 | 45.877 | +12 | 21.96 | +39 | 21.786 | -27 | 25.73 | +204 | 46.153 | -308 | 86.46 | -146 | 59.617 | -146 | 55.25 | +280 |
| 6 | 9.5 | 45.930 | +53 | 22.37 | +41 | 21.801 | +15 | 23.48 | +225 | 45.938 | -215 | 83.30 | +316 | 59.532 | -85 | 52.16 | +309 |
| 6 | 19.5 | 46.026 | +96 | 22.83 | +46 | 21.860 | +59 | 21.10 | +238 | 45.830 | -108 | 79.97 | +333 | 59.516 | -16 | 48.90 | +326 |
| 6 | 29.5 | 46.158 | +132 | 23.38 | +55 | 21.959 | +99 | 18.64 | +246 | 45.821 | -9 | 76.56 | +341 | 59.562 | +46 | 45.56 | +334 |
| 7 | 9.5 | 46.329 | +171 | 23.99 | +61 | 22.096 | +137 | 16.15 | +249 | 45.916 | +95 | 73.12 | +344 | 59.672 | +110 | 42.19 | +337 |
| 7 | 19.4 | 46.534 | +205 | 24.61 | +62 | 22.270 | +174 | 13.74 | +241 | 46.115 | +199 | 69.79 | +333 | 59.846 | +174 | 38.93 | +326 |
| 7 | 29.4 | 46.764 | +230 | 25.21 | +60 | 22.474 | +204 | 11.46 | +228 | 46.405 | +290 | 66.66 | +313 | 60.074 | +228 | 35.86 | +307 |
| 8 | 8.4 | 47.019 | +255 | 25.79 | +58 | 22.706 | +232 | 09.36 | +210 | 46.786 | +381 | 63.79 | +287 | 60.356 | +282 | 33.04 | +282 |
| 8 | 18.3 | 47.294 | +275 | 26.29 | +50 | 22.962 | +256 | 07.57 | +179 | 47.247 | +461 | 61.33 | +246 | 60.684 | +328 | 30.63 | +241 |
| 8 | 28.3 | 47.582 | +288 | 26.71 | +42 | 23.235 | +273 | 06.12 | +145 | 47.771 | +524 | 59.33 | +200 | 61.048 | +364 | 28.66 | +197 |
| 9 | 7.3 | 47.883 | +301 | 27.01 | +30 | 23.524 | +289 | 05.06 | +106 | 48.351 | +580 | 57.86 | +147 | 61.445 | +397 | 27.22 | +144 |
| 9 | 17.3 | 48.192 | +309 | 27.17 | +16 | 23.823 | +299 | 04.48 | +58 | 48.966 | +615 | 57.02 | +84 | 61.862 | +417 | 26.40 | +82 |
| 9 | 27.2 | 48.504 | +312 | 27.18 | +1 | 24.127 | +304 | 04.36 | +12 | 49.598 | +632 | 56.80 | +22 | 62.290 | +428 | 26.18 | +22 |
| 10 | 7.2 | 48.819 | +315 | 27.03 | -15 | 24.434 | +307 | 04.73 | -37 | 50.235 | +637 | 57.25 | -45 | 62.721 | +431 | 26.62 | -44 |
| 10 | 17.2 | 49.130 | +311 | 26.73 | -30 | 24.735 | +301 | 05.61 | -88 | 50.849 | +614 | 58.37 | -112 | 63.140 | +419 | 27.72 | -110 |
| 10 | 27.2 | 49.435 | +305 | 26.30 | -43 | 25.028 | +293 | 06.92 | -131 | 51.425 | +576 | 60.08 | -171 | 63.540 | +400 | 29.41 | -169 |
| 11 | 6.1 | 49.729 | +294 | 25.77 | -53 | 25.307 | +279 | 08.66 | -174 | 51.948 | +523 | 62.39 | -231 | 63.909 | +369 | 31.67 | -226 |
| 11 | 16.1 | 50.005 | +276 | 25.15 | -62 | 25.564 | +257 | 10.75 | -209 | 52.390 | +442 | 65.17 | -278 | 64.234 | +325 | 34.41 | -274 |
| 11 | 26.1 | 50.260 | +255 | 24.51 | -64 | 25.795 | +231 | 13.09 | -234 | 52.746 | +356 | 68.33 | -316 | 64.508 | +274 | 37.51 | -310 |
| 12 | 6.0 | 50.487 | +227 | 23.85 | -66 | 25.994 | +199 | 15.63 | -254 | 53.000 | +254 | 71.79 | -346 | 64.722 | +214 | 40.91 | -340 |
| 12 | 16.0 | 50.676 | +189 | 23.24 | -61 | 26.152 | +158 | 18.25 | -262 | 53.137 | +137 | 75.39 | -360 | 64.866 | +144 | 44.44 | -353 |
| 12 | 26.0 | 50.826 | +150 | 22.68 | -56 | 26.268 | +116 | 20.86 | -261 | 53.162 | +25 | 79.01 | -362 | 64.940 | +74 | 48.00 | -356 |
| 12 | 36.0 | 50.930 | +104 | 22.20 | -48 | 26.336 | +68 | 23.40 | -254 | 53.065 | -97 | 82.58 | -357 | 64.937 | -3 | 51.49 | -349 |
| | | 54 | | -38 | | 18 | | -234 | | -215 | | -333 | | -79 | | -328 | |
| Mean Place | 48.052 | 15.14 | | 23.792 | 27.95 | 49.521 | 86.17 | 62.100 | 55.13 | | | | | | | | |
| sec δ, tan δ | +1.034 | +0.264 | | +1.082 | -0.413 | +2.770 | -2.584 | +1.742 | -1.426 | | | | | | | | |
| dα(ψ), dδ(ψ) | +0.068 | -0.01 | | +0.050 | -0.01 | -0.007 | -0.02 | +0.023 | -0.02 | | | | | | | | |
| dα(ε), dδ(ε) | +0.001 | +1.00 | | -0.001 | +1.00 | -0.007 | +1.00 | -0.004 | +1.00 | | | | | | | | |
| Dble.Trans. | December 23 | | December 23 | | December 23 | | December 24 | | | | | | | | | | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 239 | | 233 | | 1168 | | 1167 | |
|---|-------------------------|-------------------------|--------------------------|-------------------------|--------------------------|------------------------|------------------------------|------------------------|
| | α Mensae | | 36 Camelopardi | | \times Aurigae | | Bradley 904* f. (Aurigae) | |
| Mag.Spect. | 5.14 | K0 | 5.39 | K0 | 4.45 | K0 | 6.42 | F0 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " |
| | 6 10 | -74 44 | 6 11 | +65 43 | 6 14 | +29 30 | 6 14 | +36 09 |
| 1 -9.0 | 45.190 ^s +40 | 47.54 ^s -360 | 28.651 ^s +314 | 27.84 ^s +239 | 29.899 ^s +190 | 21.20 ^s +32 | 43.223 ^s +203 | 20.05 ^s +75 |
| 1 1.0 | 45.070 -120 | 51.07 -353 | 28.864 +213 | 30.32 +248 | 30.041 +142 | 21.62 +42 | 43.373 +150 | 20.89 +84 |
| 1 11.0 | 44.793 -277 | 54.47 -340 | 28.969 +105 | 32.84 +252 | 30.131 +90 | 22.11 +49 | 43.468 +95 | 21.80 +91 |
| 1 20.9 | 44.357 -436 | 57.61 -314 | 28.958 -11 | 35.28 +244 | 30.164 +33 | 22.66 +55 | 43.501 +33 | 22.73 +93 |
| 1 30.9 | 43.791 -566 | 60.39 -278 | 28.842 -116 | 37.55 +227 | 30.144 -20 | 23.22 +56 | 43.477 -24 | 23.65 +92 |
| 2 9.9 | 43.103 -688 | 62.79 -240 | 28.625 -217 | 39.59 +204 | 30.072 -72 | 23.77 +55 | 43.399 -78 | 24.51 +86 |
| 2 19.8 | 42.314 -789 | 64.69 -190 | 28.319 -306 | 41.28 +169 | 29.956 -116 | 24.26 +49 | 43.271 -128 | 25.26 +75 |
| 3 1.8 | 41.458 -856 | 66.10 -141 | 27.949 -370 | 42.57 +129 | 29.805 -151 | 24.67 +41 | 43.107 -164 | 25.86 +60 |
| 3 11.8 | 40.547 -911 | 67.00 -90 | 27.949 -421 | 42.57 +86 | 29.629 -176 | 24.97 +30 | 42.916 -191 | 26.29 +43 |
| 3 21.8 | 39.613 -934 | 67.34 -34 | 27.084 -444 | 43.81 +38 | 29.440 -189 | 25.14 +17 | 42.711 -205 | 26.52 +23 |
| 3 31.7 | 38.687 -926 | 67.15 +19 | 26.644 -440 | 43.71 -10 | 29.253 -187 | 25.18 +4 | 42.507 -204 | 26.55 +3 |
| 4 10.7 | 37.780 -907 | 66.45 +70 | 26.222 -422 | 43.15 -56 | 29.075 -178 | 25.09 -9 | 42.313 -194 | 26.39 -16 |
| 4 20.7 | 36.926 -854 | 65.21 +124 | 25.847 -375 | 42.15 -100 | 28.921 -154 | 24.88 -21 | 42.145 -168 | 26.04 -35 |
| 4 30.7 | 36.145 -781 | 63.53 +168 | 25.537 -310 | 40.78 -137 | 28.799 -122 | 24.58 -30 | 42.011 -134 | 25.53 -51 |
| 5 10.6 | 35.447 -698 | 61.40 +213 | 25.298 -239 | 39.07 -171 | 28.713 -86 | 24.21 -37 | 41.916 -95 | 24.91 -62 |
| 5 20.6 | 34.860 -587 | 58.88 +252 | 25.151 -147 | 37.11 -196 | 28.673 -40 | 23.79 -42 | 41.870 -46 | 24.19 -72 |
| 5 30.6 | 34.391 -469 | 56.05 +283 | 25.096 -55 | 34.98 -213 | 28.680 +7 | 23.36 -43 | 41.874 +4 | 23.43 -76 |
| 6 9.5 | 34.049 -342 | 52.95 +310 | 25.136 +40 | 32.72 -226 | 28.732 +52 | 22.94 -42 | 41.927 +53 | 22.64 -79 |
| 6 19.5 | 33.851 -198 | 49.66 +329 | 25.276 +140 | 30.42 -230 | 28.834 +102 | 22.57 -37 | 42.031 +104 | 21.88 -76 |
| 6 29.5 | 33.788 -63 | 46.30 +336 | 25.505 +229 | 28.16 -226 | 28.970 +136 | 22.22 -35 | 42.179 +148 | 21.14 -74 |
| 7 9.5 | 33.870 +82 | 42.90 +340 | 25.821 +316 | 25.96 -220 | 29.154 +184 | 21.86 -36 | 42.372 +193 | 20.44 -70 |
| 7 19.4 | 34.096 +226 | 39.61 +329 | 26.220 +399 | 23.91 -205 | 29.375 +221 | 21.60 -26 | 42.607 +235 | 19.81 -63 |
| 7 29.4 | 34.450 +354 | 36.51 +310 | 26.686 +466 | 22.04 -187 | 29.625 +250 | 21.38 -22 | 42.874 +267 | 19.25 -56 |
| 8 8.4 | 34.932 +482 | 33.67 +284 | 27.216 +530 | 20.38 -166 | 29.904 +279 | 21.21 -17 | 43.171 +297 | 18.78 -47 |
| 8 18.4 | 35.528 +596 | 31.23 +244 | 27.799 +583 | 18.99 -139 | 30.204 +300 | 21.08 -13 | 43.493 +322 | 18.38 -40 |
| 8 28.3 | 36.212 +684 | 29.24 +199 | 28.420 +621 | 17.86 -113 | 30.521 +317 | 20.96 -12 | 43.832 +339 | 18.05 -33 |
| 9 7.3 | 36.978 +766 | 27.79 +145 | 29.078 +658 | 17.03 -83 | 30.853 +332 | 20.85 -11 | 44.188 +356 | 17.79 -26 |
| 9 17.3 | 37.794 +816 | 26.95 +84 | 29.758 +680 | 16.52 -51 | 31.194 +341 | 20.74 -11 | 44.554 +366 | 17.59 -20 |
| 9 27.2 | 38.634 +840 | 26.73 +22 | 30.448 +690 | 16.33 -19 | 31.541 +347 | 20.63 -11 | 44.926 +372 | 17.46 -13 |
| 10 7.2 | 39.481 +847 | 27.17 -44 | 31.146 +698 | 16.48 +15 | 31.892 +351 | 20.52 -11 | 45.303 +377 | 17.39 -7 |
| 10 17.2 | 40.295 +814 | 28.28 -111 | 31.833 +687 | 16.98 +50 | 32.240 +348 | 20.41 -11 | 45.676 +373 | 17.39 +0 |
| 10 27.2 | 41.055 +760 | 29.98 -170 | 32.502 +669 | 17.80 +82 | 32.582 +342 | 20.31 -10 | 46.043 +367 | 17.47 +8 |
| 11 6.1 | 41.737 +682 | 32.26 -228 | 33.143 +641 | 18.97 +117 | 32.915 +333 | 20.25 -6 | 46.399 +356 | 17.65 +18 |
| 11 16.1 | 42.305 +568 | 35.03 -277 | 33.736 +593 | 20.46 +149 | 33.228 +313 | 20.24 -1 | 46.734 +335 | 17.94 +29 |
| 11 26.1 | 42.751 +446 | 38.16 -313 | 34.273 +537 | 22.23 +177 | 33.518 +290 | 20.30 +6 | 47.045 +311 | 18.34 +40 |
| 12 6.1 | 43.053 +302 | 41.60 -344 | 34.738 +465 | 24.29 +206 | 33.777 +259 | 20.44 +14 | 47.322 +277 | 18.87 +53 |
| 12 16.0 | 43.193 +140 | 45.17 -357 | 35.115 +377 | 26.55 +226 | 33.996 +219 | 20.68 +24 | 47.556 +234 | 19.51 +64 |
| 12 26.0 | 43.177 -16 | 48.77 -360 | 35.398 +283 | 28.95 +240 | 34.172 +176 | 21.02 +34 | 47.743 +187 | 20.27 +76 |
| 12 36.0 | 42.995 -182 | 52.32 -355 | 35.573 +175 | 31.44 +249 | 34.297 +125 | 21.44 +42 | 47.874 +131 | 21.11 +84 |
| | 42.995 -341 | 52.32 -332 | 35.573 +62 | 31.44 +246 | 34.297 +69 | 21.44 +49 | 47.874 +72 | 21.11 +90 |
| Mean Place | 38.688 | 55.84 | 29.608 | 21.17 | 31.068 | 13.98 | 44.422 | 13.08 |
| sec δ , tan δ | +3.802 | -3.668 | +2.432 | +2.217 | +1.149 | +0.566 | +1.238 | +0.731 |
| $d\alpha(\psi)$, $d\delta(\psi)$ | -0.036 | -0.02 | +0.120 | -0.02 | +0.076 | -0.03 | +0.081 | -0.03 |
| $d\alpha(\epsilon)$, $d\delta(\epsilon)$ | -0.011 | +1.00 | +0.007 | +1.00 | +0.002 | +1.00 | +0.003 | +1.00 |
| Dble.Trans. | December 24 | | December 24 | | December 25 | | December 25 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 1169 | | 238 | | 234 | | 237 | | |
|--------------|-------------|-------------|-------------|-------------|-------------------|-------------|-------------|-------------|------------|
| | 74 Orionis | | α Columbae | | 22 H. Camelopardi | | 2 Lyncis | | |
| Mag. Spect. | 5.11 | F5 | 4.51 | K0 | 4.73 | A0 | 4.42 | A0 | |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " | |
| | 6 15 | + 12 16 | 6 16 | - 35 07 | 6 17 | + 69 19 | 6 18 | + 59 00 | |
| 1 | -9.0 | 40.102 +169 | 43.51 -74 | 04.353 +128 | 59.62 -312 | 20.857 +365 | 40.79 +252 | 24.866 +282 | 68.08 +203 |
| 1 | 1.0 | 40.228 +126 | 42.86 -65 | 04.429 +76 | 62.66 -304 | 21.104 +247 | 43.41 +262 | 25.067 +201 | 70.21 +213 |
| 1 | 11.0 | 40.307 +79 | 42.29 -57 | 04.451 +22 | 65.59 -293 | 21.226 +122 | 46.08 +267 | 25.181 +114 | 72.40 +219 |
| 1 | 20.9 | 40.335 +28 | 41.84 -45 | 04.417 -34 | 68.29 -270 | 21.214 -12 | 48.69 +261 | 25.202 +21 | 74.56 +216 |
| 1 | 30.9 | 40.317 -18 | 41.50 -34 | 04.331 -86 | 70.68 -239 | 21.079 -135 | 51.12 +243 | 25.136 -66 | 76.58 +202 |
| 2 | 9.9 | 40.253 -64 | 41.26 -24 | 04.197 -134 | 72.73 -205 | 20.826 -253 | 53.31 +219 | 24.986 -150 | 78.43 +185 |
| 2 | 19.8 | 40.148 -105 | 41.11 -15 | 04.021 -176 | 74.37 -164 | 20.469 -357 | 55.15 +184 | 24.763 -223 | 79.98 +155 |
| 3 | 1.8 | 40.013 -135 | 41.04 -7 | 03.814 -207 | 75.58 -121 | 20.036 -433 | 56.57 +142 | 24.485 -278 | 81.20 +122 |
| 3 | 11.8 | 39.856 -157 | 41.03 -1 | 03.583 -231 | 76.36 -78 | 19.543 -493 | 57.54 +97 | 24.164 -321 | 82.05 +85 |
| 3 | 21.8 | 39.687 -169 | 41.08 +5 | 03.341 -242 | 76.67 -31 | 19.019 -524 | 58.00 +46 | 23.821 -343 | 82.46 +41 |
| 3 | 31.7 | 39.519 -168 | 41.18 +10 | 03.101 -240 | 76.53 +14 | 18.497 -522 | 57.96 -4 | 23.479 -342 | 82.46 +0 |
| 4 | 10.7 | 39.360 -159 | 41.33 +15 | 02.868 -233 | 75.96 +57 | 17.993 -504 | 57.43 -53 | 23.150 -329 | 82.05 -41 |
| 4 | 20.7 | 39.221 -139 | 41.53 +20 | 02.657 -211 | 74.94 +102 | 17.540 -453 | 56.42 -101 | 22.858 -292 | 81.25 -80 |
| 4 | 30.7 | 39.112 -109 | 41.79 +26 | 02.475 -182 | 73.53 +141 | 17.158 -382 | 55.02 -140 | 22.616 -242 | 80.11 -114 |
| 5 | 10.6 | 39.034 -78 | 42.11 +32 | 02.326 -149 | 71.75 +178 | 16.858 -300 | 53.25 -177 | 22.431 -185 | 78.67 -144 |
| 5 | 20.6 | 38.997 -37 | 42.50 +39 | 02.220 -106 | 69.61 +214 | 16.660 -198 | 51.20 -205 | 22.320 -111 | 76.99 -168 |
| 5 | 30.6 | 39.001 +4 | 42.97 +47 | 02.157 -63 | 67.22 +239 | 16.569 -91 | 48.95 -225 | 22.283 -37 | 75.15 -184 |
| 6 | 9.5 | 39.045 +44 | 43.50 +53 | 02.140 -17 | 64.57 +265 | 16.585 +16 | 46.55 -240 | 22.321 +38 | 73.20 -195 |
| 6 | 19.5 | 39.132 +87 | 44.10 +60 | 02.172 +32 | 61.76 +281 | 16.718 +133 | 44.09 -246 | 22.439 +118 | 71.20 -200 |
| 6 | 29.5 | 39.255 +123 | 44.75 +65 | 02.248 +76 | 58.87 +289 | 16.954 +236 | 41.65 -244 | 22.628 +189 | 69.23 -197 |
| 7 | 9.5 | 39.415 +160 | 45.48 +73 | 02.368 +120 | 55.94 +293 | 17.293 +339 | 39.27 -238 | 22.888 +260 | 67.30 -193 |
| 7 | 19.4 | 39.609 +194 | 46.20 +72 | 02.531 +163 | 53.09 +285 | 17.730 +437 | 37.03 -224 | 23.151 +325 | 65.49 -181 |
| 7 | 29.4 | 39.830 +221 | 46.90 +70 | 02.729 +198 | 50.39 +270 | 18.246 +516 | 34.97 -206 | 23.213 +378 | 63.83 -166 |
| 8 | 8.4 | 40.076 +246 | 47.55 +65 | 02.963 +234 | 47.91 +248 | 18.840 +584 | 33.13 -184 | 24.021 +430 | 62.35 -148 |
| 8 | 18.4 | 40.342 +266 | 48.12 +57 | 03.226 +263 | 45.78 +213 | 19.498 +658 | 31.56 -157 | 24.492 +471 | 61.08 -127 |
| 8 | 28.3 | 40.622 +280 | 48.57 +45 | 03.511 +285 | 44.03 +175 | 20.203 +705 | 30.27 -129 | 24.995 +503 | 60.03 -105 |
| 9 | 7.3 | 40.916 +294 | 48.89 +32 | 03.818 +307 | 42.74 +129 | 20.954 +751 | 29.29 -98 | 25.527 +532 | 59.23 -80 |
| 9 | 17.3 | 41.219 +303 | 49.03 +14 | 04.137 +319 | 41.99 +75 | 21.733 +779 | 28.66 -63 | 26.077 +550 | 58.69 -54 |
| 9 | 27.2 | 41.527 +308 | 49.01 -2 | 04.465 +328 | 41.78 +21 | 22.527 +794 | 28.36 -30 | 26.638 +561 | 58.42 -27 |
| 10 | 7.2 | 41.839 +312 | 48.80 -21 | 04.797 +332 | 42.15 -37 | 23.332 +805 | 28.44 +8 | 27.206 +568 | 58.43 +1 |
| 10 | 17.2 | 42.149 +310 | 48.42 -38 | 05.123 +326 | 43.11 -96 | 24.125 +793 | 28.89 +45 | 27.769 +563 | 58.73 +30 |
| 10 | 27.2 | 42.453 +304 | 47.88 -54 | 05.440 +317 | 44.58 -147 | 24.899 +774 | 29.69 +80 | 28.319 +550 | 59.32 +59 |
| 11 | 6.1 | 42.749 +296 | 47.21 -67 | 05.741 +301 | 46.56 -198 | 25.642 +743 | 30.87 +118 | 28.851 +532 | 60.21 +89 |
| 11 | 16.1 | 43.027 +278 | 46.45 -76 | 06.015 +274 | 48.97 -241 | 26.328 +686 | 32.40 +153 | 29.347 +496 | 61.38 +117 |
| 11 | 26.1 | 43.285 +258 | 45.63 -82 | 06.259 +244 | 51.69 -272 | 26.951 +623 | 34.25 +185 | 29.802 +455 | 62.81 +143 |
| 12 | 6.1 | 43.516 +231 | 44.80 -83 | 06.465 +206 | 54.68 -299 | 27.491 +540 | 36.40 +215 | 30.202 +400 | 64.51 +170 |
| 12 | 16.0 | 43.710 +194 | 44.00 -80 | 06.624 +159 | 57.78 -310 | 27.928 +437 | 38.77 +237 | 30.533 +331 | 66.40 +189 |
| 12 | 26.0 | 43.866 +156 | 43.26 -74 | 06.735 +111 | 60.89 -311 | 28.256 +328 | 41.31 +254 | 30.790 +257 | 68.44 +204 |
| 12 | 36.0 | 43.976 +110 | 42.61 -65 | 06.792 +57 | 63.95 -306 | 28.459 +203 | 43.95 +264 | 30.961 +171 | 70.59 +215 |
| | | 43.976 +61 | 42.61 -54 | 06.792 +1 | 63.95 -286 | 28.459 +72 | 43.95 +262 | 30.961 +80 | 70.59 +215 |
| Mean Place | 41.124 | 36.16 | 04.232 | 68.10 | 21.639 | 34.22 | 25.958 | 61.48 | |
| sec δ, tan δ | +1.023 | +0.218 | +1.223 | -0.704 | +2.832 | +2.650 | +1.943 | +1.665 | |
| dα(ψ), dδ(ψ) | +0.067 | -0.03 | +0.043 | -0.03 | +0.131 | -0.03 | +0.105 | -0.03 | |
| dα(ε), dδ(ε) | +0.001 | +1.00 | -0.003 | +1.00 | +0.013 | +1.00 | +0.009 | +1.00 | |
| Dble. Trans. | December 25 | | December 25 | | December 26 | | December 26 | | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 1170 | | 240 | | 243 | | 241 | |
|--------------|--------------------------|------------|--------------------------|------------|--------------------------|------------|--------------------------|-----------|
| | 7 Monocerotis | | ζ Canis Majoris | | β Canis Majoris | | μ Geminorum | |
| Mag.Spect. | 5.13 | B3 | 3.10 | B3 | 1.99 | B1 | 3.19 | M0 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " |
| | 6 19 | - 7 48 | 6 19 | - 30 02 | 6 22 | - 17 56 | 6 22 | + 22 31 |
| 1 -9.0 | ^s 03.039 +153 | 51 64 -192 | ^s 47.580 +137 | 75.72 -294 | ^s 05.788 +148 | 46.51 -244 | ^s 07.500 +188 | 24.31 -14 |
| 1 1.0 | 03.150 +111 | 53.49 -185 | 47.667 +87 | 78.61 -289 | 05.892 +104 | 48.88 -237 | 07.643 +143 | 24.26 -5 |
| 1 11.0 | 03.215 +65 | 55.24 -175 | 47.704 +37 | 81.38 -277 | 05.948 +56 | 51.15 -227 | 07.737 +94 | 24.31 +5 |
| 1 20.9 | 03.230 +15 | 56.81 -157 | 47.686 -18 | 83.93 -255 | 05.953 +5 | 53.22 -207 | 07.776 +39 | 24.44 +13 |
| 1 30.9 | 03.200 -30 | 58.17 -136 | 47.618 -68 | 86.19 -226 | 05.912 -41 | 55.04 -182 | 07.765 -11 | 24.64 +20 |
| 2 9.9 | 03.126 -74 | 59.31 -114 | 47.503 -115 | 88.14 -195 | 05.826 -86 | 56.60 -156 | 07.704 -61 | 24.88 +24 |
| 2 19.8 | 03.013 -113 | 60.21 -90 | 47.347 -156 | 89.70 -156 | 05.700 -126 | 57.84 -124 | 07.600 -104 | 25.13 +25 |
| 3 1.8 | 02.872 -141 | 60.85 -64 | 47.161 -186 | 90.86 -116 | 05.545 -155 | 58.75 -91 | 07.463 -137 | 25.36 +23 |
| 3 11.8 | 02.708 -164 | 61.25 -40 | 46.951 -210 | 91.62 -76 | 05.367 -178 | 59.34 -59 | 07.300 -163 | 25.56 +20 |
| 3 21.8 | 02.532 -176 | 61.38 -13 | 46.729 -222 | 91.94 -32 | 05.177 -190 | 59.58 -24 | 07.124 -176 | 25.72 +16 |
| 3 31.7 | 02.358 -174 | 61.27 +11 | 46.507 -222 | 91.84 +10 | 04.987 -190 | 59.49 +9 | 06.948 -176 | 25.81 +9 |
| 4 10.7 | 02.190 -168 | 60.92 +35 | 46.293 -214 | 91.34 +50 | 04.804 -183 | 59.07 +42 | 06.780 -168 | 25.84 +3 |
| 4 20.7 | 02.042 -148 | 60.32 +60 | 46.099 -194 | 90.41 +93 | 04.640 -164 | 58.32 +75 | 06.632 -148 | 25.83 -1 |
| 4 30.7 | 01.920 -122 | 59.51 +81 | 45.933 -166 | 89.13 +128 | 04.502 -138 | 57.29 +103 | 06.514 -118 | 25.77 -6 |
| 5 10.6 | 01.829 -91 | 58.48 +103 | 45.798 -135 | 87.48 +165 | 04.394 -108 | 55.96 +133 | 06.430 -84 | 25.70 -7 |
| 5 20.6 | 01.776 -53 | 57.24 +124 | 45.704 -94 | 85.51 +197 | 04.325 -69 | 54.37 +159 | 06.387 -43 | 25.62 -8 |
| 5 30.6 | 01.761 -15 | 55.83 +141 | 45.651 -53 | 83.29 +222 | 04.295 -30 | 52.57 +180 | 06.388 +1 | 25.55 -7 |
| 6 9.5 | 01.785 +24 | 54.27 +156 | 45.642 -9 | 80.82 +262 | 04.304 +9 | 50.57 +200 | 06.431 +43 | 25.50 -5 |
| 6 19.5 | 01.851 +66 | 52.59 +168 | 45.679 +37 | 78.20 +247 | 04.356 +52 | 48.42 +215 | 06.522 +91 | 25.49 -1 |
| 6 29.5 | 01.954 +103 | 50.84 +175 | 45.757 +78 | 75.49 +271 | 04.446 +90 | 46.21 +221 | 06.632 +110 | 25.47 -2 |
| 7 9.5 | 02.092 +138 | 49.05 +179 | 45.877 +120 | 72.73 +276 | 04.574 +128 | 43.95 +226 | 06.808 +176 | 25.60 +13 |
| 7 19.4 | 02.265 +173 | 47.30 +175 | 46.037 +160 | 70.05 +268 | 04.737 +163 | 41.73 +222 | 07.011 +203 | 25.70 +10 |
| 7 29.4 | 02.464 +199 | 45.63 +167 | 46.230 +193 | 67.50 +255 | 04.930 +193 | 39.63 +210 | 07.242 +231 | 25.82 +12 |
| 8 8.4 | 02.689 +225 | 44.09 +154 | 46.456 +226 | 65.16 +234 | 05.151 +221 | 37.69 +194 | 07.499 +257 | 25.94 +12 |
| 8 18.4 | 02.937 +248 | 42.76 +133 | 46.710 +254 | 63.13 +203 | 05.396 +245 | 36.02 +167 | 07.778 +279 | 26.03 +9 |
| 8 28.3 | 03.200 +263 | 41.68 +108 | 46.984 +274 | 61.47 +186 | 05.658 +262 | 34.65 +137 | 08.072 +294 | 26.10 +7 |
| 9 7.3 | 03.478 +278 | 40.90 +78 | 47.279 +295 | 60.24 +123 | 05.938 +280 | 33.64 +101 | 08.383 +311 | 26.11 +1 |
| 9 17.3 | 03.766 +288 | 40.47 +43 | 47.587 +308 | 59.53 +71 | 06.229 +291 | 33.07 +57 | 08.703 +320 | 26.05 -6 |
| 9 27.2 | 04.060 +294 | 40.39 +8 | 47.902 +315 | 59.31 +22 | 06.527 +298 | 32.92 +15 | 09.029 +326 | 25.91 -14 |
| 10 7.2 | 04.359 +299 | 40.69 -30 | 48.222 +320 | 59.65 -34 | 06.831 +304 | 33.24 -32 | 09.361 +332 | 25.70 -21 |
| 10 17.2 | 04.655 +296 | 41.37 -68 | 48.538 +316 | 60.55 -90 | 07.131 +300 | 34.03 -79 | 09.692 +331 | 25.42 -28 |
| 10 27.2 | 04.946 +291 | 42.38 -101 | 48.846 +308 | 61.94 -139 | 07.426 +295 | 35.22 -119 | 10.018 +326 | 25.09 -33 |
| 11 6.1 | 05.228 +282 | 43.71 -133 | 49.141 +295 | 63.81 -187 | 07.711 +285 | 36.83 -161 | 10.336 +318 | 24.73 -36 |
| 11 16.1 | 05.492 +264 | 45.30 -159 | 49.412 +271 | 66.09 -228 | 07.976 +265 | 38.76 -193 | 10.637 +301 | 24.36 -37 |
| 11 26.1 | 05.735 +243 | 47.07 -177 | 49.656 +244 | 68.67 -258 | 08.219 +243 | 40.94 -218 | 10.918 +281 | 24.01 -35 |
| 12 6.1 | 05.949 +214 | 48.98 -191 | 49.865 +209 | 71.49 -282 | 08.432 +213 | 43.31 -237 | 11.170 +252 | 23.72 -29 |
| 12 16.0 | 06.128 +179 | 50.92 -194 | 50.031 +166 | 74.43 -294 | 08.606 +174 | 45.76 -245 | 11.385 +215 | 23.50 -22 |
| 12 26.0 | 06.268 +140 | 52.85 -193 | 50.031 +121 | 77.38 -295 | 08.740 +134 | 48.20 -244 | 11.560 +175 | 23.37 -13 |
| 12 36.0 | 06.363 +95 | 54.70 -185 | 50.152 +70 | 80.27 -289 | 08.827 +87 | 50.59 -239 | 11.686 +126 | 23.33 -4 |
| | 06.363 +48 | 54.70 -170 | 50.222 +16 | 80.27 -271 | 08.827 +38 | 50.59 -221 | 11.686 +74 | 23.33 +6 |
| Mean Place | 03.747 | 59.81 | 47.678 | 84.56 | 06.269 | 55.21 | 08.621 | 16.84 |
| sec δ, tan δ | +1.009 | -0.137 | +1.155 | -0.579 | +1.051 | -0.324 | +1.083 | +0.415 |
| dα(ψ), dδ(ψ) | +0.058 | -0.03 | +0.046 | -0.03 | +0.053 | -0.04 | +0.072 | -0.04 |
| dα(ε), dδ(ε) | -0.001 | +1.00 | -0.003 | +1.00 | -0.002 | +1.00 | +0.003 | +1.00 |
| Dble.Trans. | December 26 | | December 26 | | December 27 | | December 27 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 244 | | 1171 | | 245 | | 242 | |
|---|--------------------------|-------------------------|--------------------------|-------------------------|-------------------------------|-------------------------|--------------------------|-------------------------|
| | ϵ Monocerotis* | | 23 G. Canis Majoris | | α Carinae (Canopus) | | ψ^1 Aurigae | |
| Mag. Spect. | 4.48 | A5 | 5.39 | K0 | -0.86 | F0 | 5.10 var. | K2 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° ' / | h m | ° ' / | h m | ° ' / | h m | ° ' / |
| | 6 23 | + 4 36 | 6 23 | - 11 30 | 6 23 | - 52 40 | 6 23 | + 49 17 |
| 1 ^d -9.0 | 02 229 ^s +168 | 09 72 ^o -123 | 31 870 ^s +154 | 71 60 ^o -213 | 40 431 ^s +123 | 66 84 ^o -354 | 50 354 ^s +249 | 52 02 ^o +147 |
| 1 ^s 1.0 | 02 355 +126 | 08 56 -116 | 31 981 +111 | 73 66 -206 | 40 484 +53 | 70 34 -350 | 50 539 +185 | 53 61 +159 |
| 1 | 02 435 +80 | 07 51 -105 | 32 046 +65 | 75 62 -196 | 40 466 -18 | 73 74 -340 | 50 655 +116 | 55 28 +167 |
| 1 | 02 465 +30 | 07 51 -91 | 32 061 +15 | 77 39 -177 | 40 374 -92 | 76 91 -317 | 50 695 +40 | 56 95 +167 |
| 1 | 02 465 -16 | 06 60 -76 | 32 061 +15 | 77 39 -155 | 40 374 -158 | 76 91 -283 | 50 695 -30 | 56 95 +160 |
| 1 | 02 449 | 05 84 | 32 031 | 78 94 | 40 216 | 79 74 | 50 665 | 58 55 |
| 2 | 02 388 -61 | 05 23 -61 | 31 955 -76 | 80 26 -132 | 39 997 -219 | 82 22 -248 | 50 568 -97 | 60 03 +148 |
| 2 | 02 286 -102 | 04 78 -45 | 31 840 -115 | 81 30 -104 | 39 725 -272 | 84 23 -201 | 50 409 -159 | 61 31 +128 |
| 3 | 02 155 -131 | 04 48 -30 | 31 696 -144 | 82 06 -76 | 39 414 -311 | 85 76 -153 | 50 204 -205 | 62 34 +103 |
| 3 | 02 000 -155 | 04 31 -17 | 31 529 -167 | 82 54 -48 | 39 072 -342 | 86 81 -105 | 49 964 -240 | 63 08 +74 |
| 3 | 01 833 -167 | 04 29 -2 | 31 350 -179 | 82 73 -19 | 38 714 -358 | 87 30 -49 | 49 704 -260 | 63 49 +41 |
| 3 | 01 666 -167 | 04 39 +10 | 31 170 -180 | 82 64 +9 | 38 356 -358 | 87 29 +1 | 49 443 -261 | 63 57 +8 |
| 4 | 01 506 -160 | 04 62 +23 | 30 998 -172 | 82 28 +36 | 38 006 -350 | 86 77 +52 | 49 192 -251 | 63 32 -25 |
| 4 | 01 364 -142 | 04 98 +36 | 30 843 -155 | 81 64 +64 | 37 680 -326 | 85 72 +105 | 48 969 -223 | 62 76 -56 |
| 4 | 01 250 -114 | 05 45 +47 | 30 715 -128 | 80 76 +88 | 37 387 -293 | 84 22 +150 | 48 786 -183 | 61 93 -83 |
| 5 | 01 166 -84 | 06 05 +60 | 30 617 -98 | 79 63 +113 | 37 134 -253 | 82 28 +194 | 48 648 -138 | 60 86 -107 |
| 5 | 01 120 -46 | 06 77 +72 | 30 556 -61 | 78 27 +136 | 36 932 -202 | 79 93 +235 | 48 569 -79 | 59 60 -126 |
| 5 | 01 114 -6 | 07 59 +82 | 30 533 -23 | 76 73 +154 | 36 785 -147 | 77 27 +266 | 48 548 -21 | 58 22 -138 |
| 6 | 01 146 +32 | 08 52 +93 | 30 550 +17 | 75 01 +172 | 36 694 -91 | 74 31 +296 | 48 586 +38 | 56 74 -148 |
| 6 | 01 220 +74 | 09 53 +101 | 30 608 +58 | 73 17 +184 | 36 667 -27 | 71 15 +316 | 48 688 +102 | 55 23 -151 |
| 6 | 01 330 +110 | 10 59 +106 | 30 703 +95 | 71 26 +191 | 36 699 +32 | 67 89 +326 | 48 847 +159 | 53 73 -150 |
| 7 | 01 475 +145 | 11 71 +112 | 30 834 +131 | 69 30 +196 | 36 792 +93 | 64 57 +332 | 49 059 +212 | 52 26 -147 |
| 7 | 01 654 +179 | 12 81 +110 | 31 000 +166 | 67 38 +192 | 36 945 +153 | 61 33 +324 | 49 059 +265 | 50 89 -137 |
| 7 | 01 860 +206 | 13 87 +106 | 31 194 +194 | 65 55 +183 | 37 149 +204 | 58 25 +308 | 49 324 +307 | 50 89 -127 |
| 7 | 02 091 +231 | 14 85 +98 | 31 415 +221 | 63 87 +168 | 37 406 +257 | 55 41 +284 | 49 631 +346 | 49 62 -115 |
| 8 | 02 344 +253 | 15 69 +84 | 31 658 +243 | 62 41 +146 | 37 708 +302 | 52 93 +248 | 49 977 +379 | 48 47 -99 |
| 8 | 02 611 +267 | 16 37 +68 | 31 918 +260 | 61 23 +118 | 38 046 +338 | 50 89 +204 | 50 759 +403 | 46 64 -84 |
| 9 | 02 894 +283 | 16 84 +47 | 32 195 +277 | 60 36 +87 | 38 418 +372 | 49 34 +155 | 50 759 +427 | 46 64 -67 |
| 9 | 03 186 +292 | 17 08 +24 | 32 483 +288 | 59 88 +48 | 38 812 +394 | 48 40 +94 | 51 186 +442 | 45 97 -49 |
| 9 | 03 485 +299 | 17 07 -1 | 32 777 +294 | 59 77 +11 | 39 219 +407 | 48 05 +35 | 51 628 +451 | 45 48 -31 |
| 9 | 03 788 +303 | 16 79 -28 | 33 076 +299 | 60 08 -31 | 39 634 +415 | 48 35 -30 | 52 079 +459 | 45 17 -12 |
| 10 | 04 091 +303 | 16 26 -53 | 33 374 +298 | 60 80 -72 | 40 042 +408 | 49 32 -97 | 52 994 +456 | 45 14 +9 |
| 10 | 04 389 +298 | 15 51 -75 | 33 667 +293 | 61 88 -108 | 40 435 +393 | 50 87 -155 | 53 443 +449 | 45 43 +29 |
| 11 | 04 679 +290 | 14 55 -96 | 33 950 +283 | 63 32 -144 | 40 804 +369 | 53 01 -214 | 53 880 +437 | 45 95 +52 |
| 11 | 04 953 +274 | 13 43 -112 | 34 216 +266 | 65 04 -172 | 41 134 +330 | 55 65 -264 | 54 291 +411 | 46 69 +74 |
| 11 | 05 208 +255 | 12 20 -123 | 34 461 +245 | 66 97 -193 | 41 420 +286 | 58 67 -302 | 54 672 +381 | 47 64 +95 |
| 12 | 05 436 +228 | 10 91 -129 | 34 677 +216 | 69 07 -210 | 41 651 +231 | 62 01 -334 | 55 012 +340 | 48 80 +116 |
| 12 | 05 629 +193 | 09 63 -128 | 34 857 +180 | 71 22 -215 | 41 816 +165 | 65 52 -351 | 55 298 +286 | 50 14 +134 |
| 12 | 05 784 +155 | 08 40 -123 | 34 998 +141 | 73 35 -213 | 41 916 +100 | 69 08 -356 | 55 528 +230 | 51 64 +150 |
| 12 | 05 894 +110 | 07 24 -116 | 35 094 +96 | 75 42 -207 | 41 943 +27 | 72 60 -352 | 55 689 +161 | 53 24 +160 |
| | 05 894 +63 | 07 24 -102 | 35 094 +47 | 75 42 -191 | 41 943 -46 | 72 60 -333 | 55 689 +89 | 53 24 +164 |
| Mean Place | 03.149 | 01.70 | 32.503 | 80.23 | 39.181 | 76.67 | 51.534 | 45.33 |
| sec δ , tan δ | +1.003 | +0.080 | +1.021 | -0.204 | +1.650 | -1.312 | +1.533 | +1.162 |
| $d\alpha(\psi)$, $d\delta(\psi)$ | +0.063 | -0.04 | +0.056 | -0.04 | +0.027 | -0.04 | +0.092 | -0.04 |
| $d\alpha(\epsilon)$, $d\delta(\epsilon)$ | +0.001 | +0.99 | -0.001 | +0.99 | -0.009 | +0.99 | +0.008 | +0.99 |
| Dble. Trans. | December 27 | | December 27 | | December 27 | | December 27 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 1172 | | 246 | | 1173 | | 1174 | | |
|----------------|-------------------------------|-------------|----------------|-------------|-------------|-------------|----------------|-------------|------------|
| | Groombridge 1156 (Aurigae) | | 10 Monocerotis | | v Geminorum | | 13 Monocerotis | | |
| Mag.Spect. | 7.14 | G5 | 4.98 | B3 | 4.06 | B5 | 4.50 | A0p | |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " | |
| | 6 25 | +41 58 | 6 27 | - 4 44 | 6 28 | +20 13 | 6 32 | + 7 20 | |
| 1 ^d | -9.0 | 22 779 +228 | 11 48 +104 | 16 769 +164 | 62 43 -179 | 08 596 +191 | 24 89 -31 | 09 462 +179 | 45.24 -111 |
| 1 ^s | 1.0 | 22 952 +173 | 12 63 +115 | 16 891 +122 | 64 14 -171 | 08 743 +147 | 24 68 -21 | 09 600 +138 | 44.22 -102 |
| 1 | 11.0 | 23 064 +112 | 13 87 +124 | 16 967 +76 | 65 74 -160 | 08 841 +98 | 24 57 -11 | 09 691 +91 | 43.31 -91 |
| 1 | 20.9 | 23 109 +45 | 15 14 +127 | 16 993 +26 | 67 19 -145 | 08 885 +44 | 24 56 -1 | 09 732 +41 | 42.53 -78 |
| 1 | 30.9 | 23 092 -17 | 16 38 +124 | 16 973 -20 | 68 43 -124 | 08 879 -6 | 24 64 +8 | 09 726 -6 | 41.89 -64 |
| 2 | 9.9 | 23 014 -78 | 17 55 +117 | 16 908 -65 | 69 48 -105 | 08 825 -54 | 24 77 +13 | 09 673 -53 | 41.39 -50 |
| 2 | 19.9 | 22 882 -132 | 18 57 +102 | 16 804 -104 | 70 29 -81 | 08 726 -99 | 24 94 +17 | 09 579 -94 | 41.04 -35 |
| 3 | 1.8 | 22 709 -173 | 19 41 +84 | 16 669 -135 | 70 88 -59 | 08 594 -132 | 25 13 +19 | 09 453 -126 | 40.81 -23 |
| 3 | 11.8 | 22 503 -206 | 20 03 +62 | 16 511 -158 | 71 25 -37 | 08 436 -158 | 25 30 +17 | 09 302 -151 | 40.70 -11 |
| 3 | 21.8 | 22 280 -223 | 20 39 +36 | 16 340 -171 | 71 38 -13 | 08 263 -173 | 25 45 +15 | 09 136 -166 | 40.71 +1 |
| 3 | 31.7 | 22 057 -223 | 20 49 +10 | 16 168 -172 | 71 30 +8 | 08 090 -173 | 25 57 +12 | 08 970 -166 | 40.81 +10 |
| 4 | 10.7 | 21 841 -216 | 20 33 -16 | 16 002 -166 | 71 00 +8 | 07 923 -167 | 25 65 +8 | 08 809 -161 | 41.01 +20 |
| 4 | 20.7 | 21 650 -191 | 19 93 -40 | 15 855 -147 | 70 49 +51 | 07 775 -148 | 25 71 +6 | 08 665 -144 | 41.31 +30 |
| 4 | 30.7 | 21 494 -156 | 19 32 -61 | 15 732 -123 | 69 78 +71 | 07 656 -119 | 25 74 +3 | 08 547 -118 | 41.70 +39 |
| 5 | 10.6 | 21 379 -115 | 18 52 -80 | 15 639 -93 | 68 88 +90 | 07 569 -87 | 25 76 +2 | 08 459 -88 | 42.19 +49 |
| 5 | 20.6 | 21 315 -64 | 17 58 -94 | 15 584 -55 | 67 79 +109 | 07 522 -47 | 25 79 +3 | 08 408 -51 | 42.77 +58 |
| 5 | 30.6 | 21 303 -12 | 16 54 -104 | 15 566 -18 | 66 55 +124 | 07 517 -5 | 25 84 +5 | 08 396 -12 | 43.44 +67 |
| 6 | 9.6 | 21 343 +40 | 15 45 -109 | 15 587 +21 | 65 16 +139 | 07 554 +37 | 25 92 +8 | 08 422 +26 | 44.21 +77 |
| 6 | 19.5 | 21 439 +96 | 14 33 -112 | 15 648 +61 | 63 67 +149 | 07 636 +82 | 26 02 +10 | 08 490 +68 | 45.03 +82 |
| 6 | 29.5 | 21 584 +145 | 13 23 -110 | 15 746 +98 | 62 11 +156 | 07 749 +113 | 26 05 +3 | 08 594 +104 | 45.91 +88 |
| 7 | 9.5 | 21 776 +192 | 12 16 -107 | 15 879 +133 | 60 50 +161 | 07 907 +158 | 26 37 +32 | 08 733 +139 | 46.84 +93 |
| 7 | 19.4 | 22 014 +238 | 11 15 -101 | 16 047 +168 | 58 92 +158 | 08 101 +194 | 26 58 +21 | 08 907 +174 | 47.77 +93 |
| 7 | 29.4 | 22 289 +275 | 10 23 -92 | 16 047 +194 | 57 41 +151 | 08 101 +221 | 26 58 +21 | 08 907 +200 | 47.77 +88 |
| 8 | 8.4 | 22 597 +308 | 09 39 -84 | 16 241 +221 | 57 41 +139 | 08 322 +248 | 26 79 +20 | 09 107 +227 | 48.65 +82 |
| 8 | 18.4 | 22 935 +338 | 08 67 -72 | 16 462 +243 | 56 02 +120 | 08 570 +270 | 26 99 +16 | 09 334 +249 | 49.47 +69 |
| 8 | 28.3 | 23 293 +358 | 08 04 -63 | 16 964 +259 | 53 84 +98 | 09 126 +286 | 27 25 +10 | 09 848 +265 | 50.71 +55 |
| 9 | 7.3 | 23 671 +378 | 07 53 -51 | 17 240 +276 | 53 14 +70 | 09 429 +303 | 27 29 +4 | 10 129 +281 | 51.08 +37 |
| 9 | 17.3 | 24 063 +392 | 07 13 -40 | 17 240 +286 | 53 14 +38 | 09 429 +313 | 27 29 -7 | 10 129 +292 | 51.08 +16 |
| 9 | 27.3 | 24 463 +400 | 06 84 -29 | 17 526 +293 | 52 76 +6 | 09 742 +320 | 27 22 -15 | 10 421 +300 | 51.24 -7 |
| 10 | 7.2 | 24 870 +407 | 06 67 -17 | 17 819 +299 | 52 70 -30 | 10 062 +327 | 27 07 -26 | 10 721 +307 | 51.17 -30 |
| 10 | 17.2 | 25 276 +406 | 06 64 -3 | 18 417 +299 | 53 64 -64 | 10 715 +326 | 26 45 -36 | 11 334 +306 | 50.34 -53 |
| 10 | 27.2 | 25 676 +400 | 06 75 +11 | 18 711 +294 | 54 60 -96 | 11 038 +323 | 26 02 -43 | 11 638 +304 | 49.62 -72 |
| 11 | 6.1 | 26 066 +390 | 07 01 +26 | 18 711 +287 | 55 85 -125 | 11 354 +316 | 25 54 -48 | 11 936 +298 | 48.70 -92 |
| 11 | 16.1 | 26 066 +369 | 07 01 +43 | 18 998 +270 | 55 85 -149 | 11 354 +300 | 25 54 -50 | 11 936 +283 | 48.70 -104 |
| 11 | 26.1 | 26 435 +343 | 07 44 +59 | 19 268 +251 | 57 34 -166 | 11 654 +281 | 25 04 -50 | 12 219 +264 | 47.66 -113 |
| 11 | 26.1 | 26 778 +309 | 08 03 +77 | 19 519 +224 | 59 00 -178 | 11 935 +254 | 24 54 -45 | 12 483 +239 | 46.53 -118 |
| 12 | 6.1 | 27 087 +261 | 08 80 +92 | 19 743 +189 | 60 78 -181 | 12 189 +217 | 24 09 -39 | 12 722 +205 | 45.35 -117 |
| 12 | 16.0 | 27 348 +212 | 09 72 +106 | 19 932 +150 | 62 59 -178 | 12 406 +178 | 23 70 -30 | 12 927 +167 | 44.18 -110 |
| 12 | 26.0 | 27 560 +152 | 10 78 +117 | 20 082 +106 | 64 37 -172 | 12 584 +130 | 23 40 -20 | 13 094 +122 | 43.08 -102 |
| 12 | 36.0 | 27 712 +88 | 11 95 +122 | 20 188 +59 | 66 09 -156 | 12 714 +78 | 23 20 -9 | 13 216 +73 | 42.06 -89 |
| Mean Place | 23.977 | 04.60 | 17.542 | 71.06 | 09.693 | 17.23 | 10.423 | 36.87 | |
| sec δ, tan δ | +1.345 | +0.899 | +1.003 | -0.083 | +1.066 | +0.368 | +1.008 | +0.129 | |
| dα(w), dδ(w) | +0.085 | -0.04 | +0.059 | -0.05 | +0.071 | -0.05 | +0.065 | -0.06 | |
| dα(ε), dδ(ε) | +0.007 | +0.99 | -0.001 | +0.99 | +0.003 | +0.99 | +0.001 | +0.99 | |
| Dbles.Trans. | December 28 | | December 28 | | December 28 | | December 29 | | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 1175 | | 249 | | 247 | | 251 | |
|--------------|-------------------|------------|------------------------------|------------|--------------|------------|--------------|------------|
| | 56 G. Monocerotis | | ξ ² Canis Majoris | | 8 Lyncis | | γ Geminorum | |
| Mag. Spect. | 5.02 | B3 | 4.54 | A0 | 6.05 | G0 | 1.93 | A0 |
| U.T. | R.A. | | R.A. | | R.A. | | R.A. | |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " |
| | 6 32 | - 1 12 | 6 34 | - 22 56 | 6 36 | + 61 29 | 6 36 | + 16 24 |
| 1 -9.0 | 55 926 + 172 | 24 48 -160 | 29 023 + 157 | 62 78 -269 | 26 524 + 331 | 46 00 +204 | 54 876 + 195 | 49 89 -58 |
| 1 1.0 | 56 056 + 130 | 26 01 -153 | 29 134 + 111 | 65 43 -265 | 26 770 + 246 | 48 18 +218 | 55 027 + 151 | 49 41 -48 |
| 1 11.0 | 56 141 + 85 | 27 44 -143 | 29 197 + 63 | 67 98 -255 | 26 923 + 153 | 50 46 +229 | 55 130 + 103 | 49 04 -37 |
| 1 20.9 | 56 176 + 35 | 28 71 -127 | 29 206 + 9 | 70 33 -235 | 26 973 + 50 | 52 75 +228 | 55 181 + 51 | 48 79 -25 |
| 1 30.9 | 56 164 - 12 | 29 80 -109 | 29 168 - 38 | 72 43 -210 | 26 929 - 44 | 54 94 +219 | 55 183 + 2 | 48 64 -15 |
| 2 9.9 | 56 107 - 57 | 30 70 - 90 | 29 082 - 86 | 74 25 -182 | 26 792 - 137 | 56 97 +203 | 55 136 - 47 | 48 59 - 5 |
| 2 19.9 | 56 009 - 98 | 31 40 - 70 | 28 954 - 128 | 75 72 -147 | 26 571 - 221 | 58 74 +177 | 55 044 - 92 | 48 61 + 2 |
| 3 1.8 | 55 880 - 129 | 31 90 - 50 | 28 795 - 159 | 76 84 -112 | 26 286 - 285 | 60 18 +144 | 54 920 - 124 | 48 69 + 8 |
| 3 11.8 | 55 726 - 154 | 32 21 - 31 | 28 611 - 184 | 77 61 - 77 | 25 949 - 337 | 61 25 +107 | 54 768 - 152 | 48 80 + 11 |
| 3 21.8 | 55 558 - 168 | 32 31 - 10 | 28 611 - 199 | 77 61 - 37 | 25 582 - 367 | 61 88 + 63 | 54 600 - 168 | 48 93 + 13 |
| 3 31.7 | 55 390 - 168 | 32 23 + 8 | 28 212 - 200 | 77 99 - 1 | 25 209 - 373 | 62 08 + 20 | 54 431 - 169 | 49 06 + 13 |
| 4 10.7 | 55 226 - 164 | 31 98 + 25 | 28 016 - 196 | 77 64 + 35 | 24 844 - 365 | 61 84 - 24 | 54 266 - 165 | 49 20 + 14 |
| 4 20.7 | 55 079 - 147 | 31 54 + 44 | 27 838 - 178 | 76 91 + 73 | 24 511 - 333 | 61 17 - 67 | 54 119 - 147 | 49 35 + 15 |
| 4 30.7 | 54 957 - 122 | 30 94 + 60 | 27 684 - 154 | 75 87 +104 | 24 226 - 285 | 60 13 -104 | 53 998 - 121 | 49 50 + 15 |
| 5 10.6 | 54 864 - 93 | 30 16 + 78 | 27 560 - 124 | 74 49 +138 | 23 997 - 229 | 58 74 -139 | 53 907 - 91 | 49 67 + 17 |
| 5 20.6 | 54 808 - 56 | 29 23 + 93 | 27 472 - 88 | 72 82 +167 | 23 843 - 154 | 57 07 -167 | 53 855 - 52 | 49 87 + 20 |
| 5 30.6 | 54 789 - 19 | 28 17 +106 | 27 423 - 49 | 70 92 +190 | 23 764 - 79 | 55 19 -188 | 53 855 - 12 | 50 10 + 23 |
| 6 9.6 | 54 809 + 20 | 26 98 +119 | 27 413 - 9 | 68 78 +214 | 23 765 + 1 | 53 15 -204 | 53 843 + 28 | 50 37 + 27 |
| 6 19.5 | 54 869 + 60 | 25 68 +130 | 27 448 + 34 | 66 49 +229 | 23 851 + 96 | 51 03 -212 | 53 942 + 71 | 50 68 + 31 |
| 6 29.5 | 54 965 + 96 | 24 33 +135 | 27 521 + 73 | 64 10 +239 | 24 013 + 162 | 48 88 -215 | 54 049 + 107 | 50 98 + 30 |
| 7 9.5 | 55 096 + 131 | 22 93 +140 | 27 632 + 111 | 61 66 +244 | 24 251 + 238 | 46 75 -213 | 54 191 + 142 | 51 40 + 42 |
| 7 19.4 | 55 261 + 165 | 21 55 +138 | 27 781 + 149 | 59 26 +240 | 24 562 + 311 | 44 70 -205 | 54 371 + 180 | 51 80 + 40 |
| 7 29.4 | 55 453 + 192 | 20 23 +132 | 27 961 + 180 | 56 97 +229 | 24 933 + 371 | 42 77 -193 | 54 579 + 208 | 52 18 + 38 |
| 8 8.4 | 55 672 + 219 | 19 01 +122 | 28 172 + 211 | 54 85 +212 | 25 362 + 429 | 41 00 -177 | 54 814 + 235 | 52 52 + 34 |
| 8 18.4 | 55 913 + 241 | 17 97 +104 | 28 410 + 238 | 53 00 +185 | 25 841 + 479 | 39 43 -157 | 55 072 + 258 | 52 79 + 27 |
| 8 28.3 | 56 170 + 257 | 17 12 + 85 | 28 668 + 258 | 51 47 +153 | 26 358 + 517 | 38 08 -135 | 55 347 + 275 | 52 99 + 20 |
| 9 7.3 | 56 445 + 275 | 16 51 + 61 | 28 946 + 278 | 50 32 +115 | 26 911 + 553 | 36 97 -111 | 55 638 + 291 | 53 07 + 8 |
| 9 17.3 | 56 731 + 286 | 16 20 + 31 | 29 238 + 292 | 49 64 + 68 | 27 490 + 579 | 36 14 - 83 | 55 942 + 304 | 53 02 - 5 |
| 9 27.3 | 57 024 + 293 | 16 19 + 1 | 29 539 + 301 | 49 41 + 23 | 28 084 + 594 | 35 57 - 57 | 56 253 + 311 | 52 84 - 18 |
| 10 7.2 | 57 324 + 300 | 16 49 - 30 | 29 848 + 309 | 49 68 - 27 | 28 693 + 609 | 35 31 - 26 | 56 572 + 319 | 52 52 - 32 |
| 10 17.2 | 57 625 + 301 | 17 11 - 62 | 30 156 + 308 | 50 47 - 79 | 29 300 + 607 | 35 37 + 6 | 56 892 + 320 | 52 06 - 46 |
| 10 27.2 | 57 922 + 297 | 18 00 - 89 | 30 460 + 304 | 51 70 -123 | 29 900 + 600 | 35 73 + 36 | 57 210 + 318 | 51 49 - 57 |
| 11 6.1 | 58 213 + 291 | 19 17 -117 | 30 755 + 295 | 53 39 -169 | 30 484 + 584 | 36 43 + 70 | 57 523 + 313 | 50 83 - 66 |
| 11 16.1 | 58 489 + 276 | 20 54 -137 | 30 755 + 276 | 55 45 -206 | 31 034 + 550 | 37 45 +102 | 57 822 + 299 | 50 11 - 72 |
| 11 26.1 | 58 746 + 257 | 22 06 -152 | 31 031 + 254 | 57 79 -234 | 31 543 + 509 | 38 78 +133 | 58 102 + 280 | 49 38 - 73 |
| 12 6.1 | 58 978 + 232 | 23 68 -162 | 31 508 + 223 | 60 37 -258 | 31 997 + 454 | 40 40 +162 | 58 357 + 255 | 48 66 - 72 |
| 12 16.0 | 59 175 + 197 | 25 32 -164 | 31 692 + 184 | 63 05 -268 | 32 379 + 382 | 42 27 +187 | 58 577 + 220 | 48 01 - 65 |
| 12 26.0 | 59 334 + 159 | 26 93 -161 | 31 835 + 143 | 65 75 -270 | 32 684 + 305 | 44 34 +207 | 58 758 + 181 | 47 43 - 58 |
| 12 36.0 | 59 449 + 115 | 28 46 -153 | 31 929 + 94 | 68 41 -266 | 32 898 + 214 | 46 55 +221 | 58 893 + 135 | 46 96 - 47 |
| | 56 764 + 67 | 33 33 -139 | 29 387 + 43 | 72 80 -250 | 27 497 + 115 | 39 63 +226 | 55 940 + 85 | 41 78 - 35 |
| Mean Place | 56.764 | 33.33 | 29.387 | 72.80 | 27.497 | 39.63 | 55.940 | 41.78 |
| sec δ, tan δ | +1.000 | -0.021 | +1.086 | -0.424 | +2.095 | +1.841 | +1.042 | +0.295 |
| da(ψ), dδ(ψ) | +0.061 | -0.06 | +0.050 | -0.06 | +0.109 | -0.06 | +0.069 | -0.06 |
| da(ε), dδ(ε) | -0.000 | +0.99 | -0.004 | +0.99 | +0.019 | +0.99 | +0.003 | +0.99 |
| Dble. Trans. | December 30 | | December 30 | | December 31 | | December 31 | |

APPARENT PLACES OF STARS, 1986

105

AT UPPER TRANSIT AT GREENWICH

| No. | 252 | | 250 | | 264 | | 254 | |
|---------------|-------------|------------|-----------------|------------|-----------------|------------|-----------------|-----------|
| | v Puppis | | 51 Aurigae | | ζ Mensae | | ε Geminorum | |
| Mag. Spect. | 3.18 | B8 | 5.71 | K0 | 5.64 | A2 | 3.18 | G5 |
| U.T. | R.A. | | R.A. | | R.A. | | R.A. | |
| | h m | Dec. | h m | Dec. | h m | Dec. | h m | Dec. |
| | 6 37 | -43 10 | 6 37 | +39 24 | 6 41 | -80 47 | 6 43 | +25 08 |
| 1 9.0 | 21.319 +149 | 49 89 -338 | 42 256 +237 | 20 32 +82 | 22 800 +172 | 48 78 -353 | 04.978 +214 | 50.93 -8 |
| 1 1.0 | 21 410 +91 | 53 24 -335 | 42 440 +184 | 21 27 +95 | 22 708 -92 | 52 33 -355 | 05.146 +168 | 50.98 +5 |
| 1 11.0 | 21 441 +31 | 56 52 -328 | 42 565 +125 | 22 33 +106 | 22 355 -353 | 55 84 -351 | 05.264 +118 | 51.14 +16 |
| 1 20.9 | 21 408 -33 | 59 58 -306 | 42 625 +60 | 23 45 +112 | 21 735 -620 | 59 17 -333 | 05.326 +62 | 51.41 +27 |
| 1 30.9 | 21 316 -92 | 62 36 -278 | 42 625 +0 | 24 58 +113 | 20 889 -846 | 62 22 -305 | 05.335 +9 | 51.75 +34 |
| 2 9.9 | 21 170 -146 | 64 80 -244 | 42 564 -61 | 25 66 +108 | 19 833 -1056 | 64 96 -274 | 05.292 -43 | 52.15 +40 |
| 2 19.9 | 20 975 -195 | 66 82 -202 | 42 449 -115 | 26 65 +99 | 18 591 -1242 | 67 28 -232 | 05.201 -91 | 52.56 +41 |
| 3 1.8 | 20 743 -232 | 68 40 -158 | 42 292 -157 | 26 65 +84 | 17 219 -1372 | 69 14 -186 | 05.073 -128 | 52.95 +39 |
| 3 11.8 | 20 481 -262 | 69 52 -112 | 42 102 -190 | 27 49 +65 | 17 219 -1484 | 70 54 -140 | 04.916 -157 | 53.29 +34 |
| 3 21.8 | 20 203 -278 | 70 14 -62 | 41 892 -210 | 28 14 +43 | 15 735 -1550 | 71 41 -87 | 04.741 -175 | 53.57 +28 |
| 3 31.8 | 19 922 -281 | 70 27 -13 | 41 678 -214 | 28 77 +20 | 12 619 -1566 | 71 76 -35 | 04 562 -179 | 53.76 +19 |
| 4 10.7 | 19 645 -277 | 69 93 +34 | 41 470 -208 | 28 73 -4 | 11 055 -1564 | 71 60 +16 | 04 388 -174 | 53.86 +10 |
| 4 20.7 | 19 386 -259 | 69 09 +84 | 41 283 -187 | 28 73 -27 | 09 544 -1511 | 70 91 +69 | 04 230 -158 | 53.88 +2 |
| 4 30.7 | 19 155 -231 | 67 83 +126 | 41 127 -156 | 28 00 -46 | 08 123 -1421 | 69 74 +117 | 04 099 -131 | 53.82 -6 |
| 5 10.6 | 18 956 -199 | 66 13 +170 | 41 009 -118 | 27 35 -65 | 06 807 -1316 | 68 10 +164 | 04 000 -99 | 53.70 -12 |
| 5 20.6 | 18 800 -156 | 64 04 +209 | 40 938 -71 | 26 57 -78 | 05 646 -1161 | 66 02 +208 | 03 940 -60 | 53.53 -17 |
| 5 30.6 | 18 689 -111 | 61 64 +240 | 40 915 -23 | 25 68 -89 | 04 655 -991 | 63 59 +243 | 03 922 -18 | 53.34 -19 |
| 6 9.6 | 18 625 -64 | 58 94 +270 | 40 943 +28 | 24 73 -95 | 03 850 -805 | 60 82 +277 | 03 946 +24 | 53.15 -19 |
| 6 19.5 | 18 613 -12 | 56 04 +290 | 41 023 +80 | 24 73 -99 | 03 269 -581 | 57 80 +302 | 04 017 +71 | 52.96 -19 |
| 6 29.5 | 18 650 +37 | 53 02 +302 | 41 150 +127 | 22 76 -98 | 02 905 -364 | 54 62 +318 | 04 132 +115 | 52.87 -9 |
| 7 9.5 | 18 737 +87 | 49 91 +311 | 41 322 +172 | 21 77 -99 | 02 774 -131 | 51 33 +329 | 04 267 +135 | 52.64 -23 |
| 7 19.5 | 18 873 +136 | 46 86 +305 | 41 540 +218 | 21 77 -94 | 02 889 +115 | 48 07 +326 | 04 454 +187 | 52.47 -17 |
| 7 29.4 | 19 051 +178 | 43 94 +292 | 41 792 +252 | 19 95 -88 | 03 225 +336 | 44 91 +316 | 04 670 +216 | 52.33 -14 |
| 8 8.4 | 19 271 +220 | 41 21 +273 | 42 079 +287 | 19 13 -82 | 03 792 +567 | 41 93 +298 | 04 914 +244 | 52.19 -14 |
| 8 18.4 | 19 529 +258 | 38 82 +239 | 42 395 +316 | 18 39 -74 | 04 569 +777 | 39 28 +265 | 05 183 +269 | 52.04 -15 |
| 8 28.3 | 19 817 +288 | 36 81 +201 | 42 732 +337 | 17 73 -66 | 05 521 +952 | 37 01 +227 | 05 471 +288 | 51.86 -18 |
| 9 7.3 | 20 135 +318 | 35 27 +154 | 43 091 +359 | 17 14 -59 | 06 639 +1118 | 35 21 +180 | 05 777 +306 | 51.64 -22 |
| 9 17.3 | 20 472 +337 | 34 29 +98 | 43 464 +373 | 16 64 -50 | 07 874 +1235 | 33 98 +123 | 06 097 +320 | 51.37 -27 |
| 9 27.3 | 20 823 +351 | 33 87 +42 | 43 848 +384 | 16 23 -41 | 09 183 +1309 | 33 34 +64 | 06 426 +329 | 51.05 -32 |
| 10 7.2 | 21 185 +362 | 34 07 -20 | 44 241 +393 | 15 90 -33 | 10 539 +1356 | 33 34 +0 | 06 764 +338 | 50.68 -37 |
| 10 17.2 | 21 544 +359 | 34 89 -82 | 44 634 +393 | 15 69 -21 | 11 872 +1333 | 34 00 -66 | 07 104 +340 | 50.27 -41 |
| 10 27.2 | 21 896 +352 | 36 29 -140 | 45 025 +391 | 15 60 -9 | 13 144 +1272 | 35 28 -128 | 07 444 +340 | 49.83 -44 |
| 11 6.2 | 22 233 +337 | 38 25 -196 | 45 409 +384 | 15 64 +4 | 14 315 +1171 | 37 16 -188 | 07 779 +335 | 49.39 -44 |
| 11 16.1 | 22 542 +309 | 40 70 -245 | 45 775 +366 | 15 84 +20 | 15 320 +1005 | 39 59 -243 | 08 099 +320 | 48.97 -42 |
| 11 26.1 | 22 819 +277 | 43 53 -283 | 46 118 +343 | 16 19 +35 | 16 138 +818 | 42 44 -285 | 08 402 +303 | 48.62 -35 |
| 12 6.1 | 23 055 +236 | 46 69 -316 | 46 430 +312 | 16 72 +53 | 16 733 +595 | 45 67 -323 | 08 678 +276 | 48.34 -28 |
| 12 16.0 | 23 239 +184 | 50 02 -333 | 46 698 +268 | 17 41 +69 | 17 066 +333 | 49 12 -345 | 08 918 +240 | 48.16 -18 |
| 12 26.0 | 23 369 +130 | 53 41 -339 | 46 919 +221 | 18 25 +84 | 17 146 +80 | 52 69 -357 | 09 118 +200 | 48.11 -5 |
| 12 36.0 | 23 439 +70 | 56 79 -338 | 47 083 +164 | 19 22 +97 | 16 953 -193 | 56 28 -359 | 09 269 +151 | 48.17 +6 |
| | +7 | -322 | +102 | +106 | -461 | -347 | +98 | +18 |
| Mean Place | 20.842 | 61.17 | 43.438 | 13.29 | 11.088 | 61.62 | 06.110 | 43.17 |
| sec δ, tan δ | +1.371 | -0.939 | +1.294 | +0.822 | +6.255 | -6.174 | +1.105 | +0.469 |
| dα(ψ), dδ(ψ) | +0.037 | -0.06 | +0.083 | -0.07 | -0.100 | -0.07 | +0.073 | -0.07 |
| dα(ε), dδ(ε) | -0.010 | +0.99 | +0.009 | +0.99 | -0.074 | +0.98 | +0.006 | +0.98 |
| Dbble. Trans. | December 31 | | Jan. 0, Dec. 31 | | Jan. 0, Dec. 32 | | Jan. 1, Dec. 32 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 248 | | 256 | | 257 | | 255 | | | | | | |
|--------------|-------------------|---------------|-------------|--------|--------------------------------|--------|------------|--------------|-------|------|--------------|-------|------|
| | 23 H. Camelopardi | | ξ Geminorum | | α Canis Majoris A* (Sirius) | | ψ* Aurigae | | | | | | |
| Mag.Spect. | 5.60 | F8 | 3.40 | F5 | -1.58 | A0 | 5.34 | G0 | | | | | |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | | | | | |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " | | | | | |
| | 6 43 | +79 34 | 6 44 | +12 54 | 6 44 | -16 41 | 6 45 | +43 35 | | | | | |
| 1 | -9.0 | 57.542 + 742 | 60.38 | +274 | 30.878 + 197 | 47.89 | -83 | 32.617 + 166 | 40.17 | -248 | 44.843 + 258 | 37.43 | +103 |
| 1 | 1.0 | 58.061 + 519 | 63.29 | +291 | 31.032 + 154 | 47.16 | -73 | 32.740 + 123 | 42.59 | -242 | 45.044 + 201 | 38.60 | +117 |
| 1 | 11.0 | 58.342 + 281 | 66.31 | +302 | 31.140 + 108 | 46.54 | -62 | 32.815 + 75 | 44.91 | -232 | 45.184 + 140 | 39.90 | +130 |
| 1 | 20.9 | 58.362 + 20 | 69.32 | +301 | 31.196 + 56 | 46.06 | -48 | 32.839 + 24 | 47.04 | -213 | 45.254 + 70 | 41.27 | +137 |
| 1 | 30.9 | 58.142 - 220 | 72.19 | +287 | 31.202 + 6 | 45.70 | -36 | 32.815 - 24 | 48.94 | -190 | 45.259 + 5 | 42.63 | +136 |
| 2 | 9.9 | 57.689 - 453 | 74.85 | +266 | 31.160 - 42 | 45.47 | -23 | 32.745 - 70 | 50.58 | -164 | 45.200 - 59 | 43.95 | +132 |
| 2 | 19.9 | 57.022 - 667 | 77.15 | +230 | 31.074 - 86 | 45.34 | -13 | 32.633 - 112 | 51.91 | -133 | 45.082 - 118 | 45.15 | +120 |
| 3 | 1.8 | 56.193 - 829 | 79.02 | +187 | 30.955 - 119 | 45.30 | -4 | 32.489 - 144 | 52.92 | -101 | 44.918 - 164 | 46.18 | +103 |
| 3 | 11.8 | 55.227 - 966 | 80.41 | +139 | 30.807 - 148 | 45.33 | +3 | 32.319 - 170 | 53.62 | -70 | 44.717 - 201 | 46.99 | +81 |
| 3 | 21.8 | 54.178 - 1049 | 81.23 | +82 | 30.643 - 164 | 45.42 | +9 | 32.135 - 184 | 53.97 | -35 | 44.493 - 224 | 47.54 | +55 |
| 3 | 31.8 | 53.106 - 1072 | 81.50 | +27 | 30.476 - 167 | 45.55 | +13 | 31.948 - 187 | 54.01 | -4 | 44.264 - 229 | 47.82 | +28 |
| 4 | 10.7 | 52.041 - 1065 | 81.20 | -30 | 30.312 - 164 | 45.72 | +17 | 31.765 - 183 | 53.74 | +27 | 44.038 - 226 | 47.82 | +0 |
| 4 | 20.7 | 51.045 - 996 | 80.34 | -86 | 30.165 - 147 | 45.93 | +21 | 31.597 - 168 | 53.14 | +60 | 43.833 - 206 | 47.54 | -28 |
| 4 | 30.7 | 50.160 - 885 | 78.99 | -135 | 30.042 - 123 | 46.18 | +25 | 31.454 - 143 | 52.26 | +88 | 43.660 - 173 | 47.03 | -51 |
| 5 | 10.6 | 49.406 - 754 | 77.19 | -180 | 29.947 - 95 | 46.47 | +29 | 31.338 - 116 | 51.10 | +116 | 43.525 - 135 | 46.29 | -74 |
| 5 | 20.6 | 48.830 - 576 | 74.99 | -220 | 29.890 - 57 | 46.82 | +35 | 31.258 - 80 | 49.68 | +142 | 43.438 - 87 | 45.37 | -92 |
| 5 | 30.6 | 48.443 - 387 | 72.52 | -247 | 29.871 - 19 | 47.20 | +38 | 31.216 - 42 | 48.06 | +162 | 43.403 - 35 | 44.32 | -105 |
| 6 | 9.6 | 48.253 - 190 | 69.81 | -271 | 29.891 + 20 | 47.65 | +45 | 31.211 - 5 | 46.23 | +183 | 43.420 + 17 | 43.16 | -116 |
| 6 | 19.5 | 48.283 + 30 | 66.96 | -285 | 29.952 + 61 | 48.13 | +48 | 31.248 + 37 | 44.27 | +196 | 43.493 + 73 | 41.94 | -122 |
| 6 | 29.5 | 48.514 + 231 | 64.07 | -289 | 30.050 + 98 | 48.63 | +50 | 31.322 + 74 | 42.22 | +205 | 43.615 + 122 | 40.71 | -123 |
| 7 | 9.5 | 48.949 + 435 | 61.18 | -289 | 30.182 + 132 | 49.19 | +56 | 31.433 + 111 | 40.11 | +211 | 43.787 + 172 | 39.47 | -124 |
| 7 | 19.5 | 49.584 + 635 | 58.38 | -280 | 30.350 + 168 | 49.76 | +57 | 31.580 + 147 | 38.05 | +206 | 44.006 + 219 | 38.27 | -120 |
| 7 | 29.4 | 50.389 + 805 | 55.74 | -264 | 30.547 + 197 | 50.29 | +53 | 31.756 + 176 | 36.07 | +198 | 44.264 + 258 | 37.12 | -115 |
| 8 | 8.4 | 51.361 + 972 | 53.29 | -245 | 30.771 + 224 | 50.77 | +48 | 31.962 + 206 | 34.25 | +182 | 44.559 + 295 | 36.05 | -107 |
| 8 | 18.4 | 52.481 + 1120 | 51.13 | -216 | 31.018 + 247 | 51.16 | +39 | 32.193 + 231 | 32.67 | +158 | 44.886 + 327 | 35.08 | -97 |
| 8 | 28.3 | 53.715 + 1234 | 49.25 | -188 | 31.283 + 265 | 51.44 | +28 | 32.443 + 250 | 31.37 | +130 | 45.238 + 352 | 34.20 | -88 |
| 9 | 7.3 | 55.060 + 1345 | 47.71 | -154 | 31.565 + 282 | 51.59 | +15 | 32.714 + 271 | 30.41 | +96 | 45.613 + 375 | 33.42 | -78 |
| 9 | 17.3 | 56.481 + 1421 | 46.56 | -115 | 31.860 + 295 | 51.56 | -3 | 32.997 + 283 | 29.88 | +53 | 46.006 + 393 | 32.76 | -66 |
| 9 | 27.3 | 57.953 + 1472 | 45.79 | -77 | 32.164 + 304 | 51.37 | -19 | 33.291 + 294 | 29.75 | +13 | 46.006 + 405 | 32.22 | -54 |
| 10 | 7.2 | 59.465 + 1512 | 45.45 | -34 | 32.477 + 313 | 51.01 | -36 | 33.593 + 302 | 30.08 | -33 | 46.411 + 416 | 31.82 | -40 |
| 10 | 17.2 | 60.972 + 1507 | 45.57 | +12 | 32.792 + 315 | 50.47 | -54 | 33.895 + 302 | 30.87 | -79 | 47.245 + 418 | 31.57 | -25 |
| 10 | 27.2 | 62.454 + 1482 | 46.11 | +54 | 33.106 + 314 | 49.78 | -69 | 34.195 + 300 | 32.07 | -120 | 47.662 + 417 | 31.47 | -10 |
| 11 | 6.2 | 63.889 + 1435 | 47.11 | +100 | 33.416 + 310 | 48.97 | -81 | 34.488 + 293 | 33.67 | -160 | 48.072 + 410 | 31.56 | +9 |
| 11 | 16.1 | 65.225 + 1336 | 48.55 | +144 | 33.712 + 296 | 48.07 | -90 | 34.765 + 277 | 35.61 | -194 | 48.464 + 392 | 31.84 | +28 |
| 11 | 26.1 | 66.446 + 1221 | 50.39 | +184 | 33.992 + 280 | 47.13 | -94 | 35.021 + 256 | 37.80 | -219 | 48.833 + 369 | 32.32 | +48 |
| 12 | 6.1 | 67.515 + 1069 | 52.62 | +223 | 34.248 + 256 | 46.18 | -95 | 35.250 + 229 | 40.18 | -238 | 49.169 + 336 | 33.01 | +69 |
| 12 | 16.0 | 68.390 + 875 | 55.16 | +254 | 34.469 + 221 | 45.28 | -90 | 35.442 + 192 | 42.66 | -248 | 49.459 + 290 | 33.89 | +88 |
| 12 | 26.0 | 69.062 + 672 | 57.94 | +278 | 34.653 + 184 | 44.46 | -82 | 35.595 + 153 | 45.14 | -248 | 49.700 + 241 | 34.94 | +105 |
| 12 | 36.0 | 69.495 + 433 | 60.89 | +295 | 34.792 + 139 | 43.74 | -72 | 35.701 + 106 | 47.57 | -243 | 49.880 + 180 | 36.15 | +121 |
| | | +182 | +299 | +89 | | | -59 | | | -228 | +115 | | +130 |
| Mean Place | 56.914 | 54.37 | 31.905 | 39.23 | 33.151 | 51.08 | 46.013 | 30.74 | | | | | |
| sec δ, tan δ | +5.530 | +5.439 | +1.026 | +0.229 | +1.044 | -0.300 | +1.381 | +0.952 | | | | | |
| da(ψ), dδ(ψ) | +0.203 | -0.08 | +0.067 | -0.08 | +0.053 | -0.08 | +0.086 | -0.08 | | | | | |
| dα(ε), dδ(ε) | +0.069 | +0.98 | +0.003 | +0.98 | -0.004 | +0.98 | +0.013 | +0.98 | | | | | |
| Dble.Trans. | Jan. 1, Dec. 32 | | January 1 | | January 1 | | January 2 | | | | | | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 1177 | | 1176 | | 1178 | | 258 | |
|--------------|----------------|-------------|------------------------|-------------|--------------|-------------|----------------|-------------|
| | 16 Monocerotis | | ψ ^a Aurigae | | 31 G. Puppis | | 18 Monocerotis | |
| Mag.Spect. | 5.84 | B3 | 5.28 | K0 | 5.25 | B9 | 4.70 | K0 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " |
| | 6 45 | + 8 36 | 6 46 | + 48 48 | 6 46 | - 37 54 | 6 47 | + 2 25 |
| 1 -9.0 | 47.259 + 194 | 16 74 - 109 | 36 737 + 279 | 24 05 +131 | 53.777 + 162 | 39 81 - 324 | 08 489 + 189 | 48 93 - 145 |
| 1 1.0 | 47.411 + 152 | 15 75 - 99 | 36 953 + 216 | 25 52 +147 | 53 887 + 110 | 43 05 - 324 | 08 636 + 147 | 47 56 - 137 |
| 1 11.0 | 47.517 + 106 | 14 87 - 88 | 37 103 + 150 | 27.11 +159 | 53 941 + 54 | 46 21 - 316 | 08 738 + 102 | 46 30 - 126 |
| 1 20.9 | 47.572 + 55 | 14 12 - 75 | 37 176 + 73 | 28 77 +166 | 53 934 - 7 | 49 19 - 298 | 08 788 + 50 | 45 19 - 111 |
| 1 30.9 | 47.578 + 6 | 13 53 - 59 | 37 178 + 2 | 30 40 +163 | 53 873 - 61 | 51 89 - 270 | 08 792 + 4 | 44 26 - 93 |
| 2 9.9 | 47.537 - 41 | 13 07 - 46 | 37 110 - 68 | 31.96 +156 | 53 757 - 116 | 54 29 - 240 | 08 748 - 44 | 43 49 - 77 |
| 2 19.9 | 47.452 - 85 | 12 76 - 31 | 36 977 - 133 | 33 37 +141 | 53 594 - 163 | 56 29 - 200 | 08 662 - 86 | 42 91 - 58 |
| 3 1.8 | 47.334 - 118 | 12 57 - 19 | 36 794 - 183 | 34 56 +119 | 53 395 - 199 | 57 87 - 158 | 08 543 - 119 | 42 50 - 41 |
| 3 11.8 | 47.188 - 146 | 12 49 - 8 | 36 570 - 224 | 35 49 + 93 | 53 166 - 229 | 59 02 - 115 | 08 543 - 147 | 42 26 - 24 |
| 3 21.8 | 47.026 - 162 | 12 52 + 3 | 36 321 - 249 | 36 11 + 62 | 52 919 - 247 | 59 69 - 67 | 08 396 - 162 | 42 18 - 8 |
| 3 31.8 | 46 860 - 166 | 12 63 + 11 | 36 065 - 256 | 36 41 + 30 | 52 668 - 251 | 59 91 - 22 | 08 068 - 166 | 42 26 + 8 |
| 4 10.7 | 46 698 - 162 | 12 82 + 19 | 35 813 - 252 | 36 39 - 2 | 52 419 - 249 | 59 67 + 24 | 07 905 - 163 | 42 47 + 21 |
| 4 20.7 | 46 551 - 147 | 12 82 + 28 | 35 813 - 231 | 36 39 - 35 | 52 419 - 233 | 59 67 + 71 | 07 905 - 149 | 42 47 + 37 |
| 4 30.7 | 46 428 - 123 | 13 10 + 36 | 35 582 - 196 | 36 04 - 64 | 52 186 - 208 | 58 96 + 112 | 07 756 - 125 | 42 84 + 49 |
| 5 10.6 | 46 432 - 96 | 13 46 + 43 | 35 386 - 156 | 35 40 - 90 | 51 978 - 179 | 57 84 + 153 | 07 631 - 98 | 43 33 + 62 |
| 5 20.6 | 46 273 - 59 | 13 89 + 52 | 35 230 - 102 | 34 50 - 113 | 51 799 - 140 | 56 31 + 192 | 07 533 - 62 | 43 95 + 76 |
| 5 30.6 | 46 251 - 22 | 14 41 + 59 | 35 128 - 48 | 33 37 - 128 | 51 659 - 99 | 54 39 + 221 | 07 471 - 27 | 44 71 + 86 |
| 6 9.6 | 46 267 + 16 | 15 00 + 67 | 35 080 + 10 | 32 09 - 142 | 51 560 - 56 | 52 18 + 251 | 07 444 + 11 | 45 57 + 98 |
| 6 19.5 | 46 267 + 57 | 15 67 + 72 | 35 090 + 71 | 30 67 - 150 | 51 504 - 7 | 49 67 + 272 | 07 455 + 51 | 46 55 + 105 |
| 6 29.5 | 46 324 + 93 | 16 39 + 76 | 35 161 + 126 | 29 17 - 152 | 51 497 + 36 | 46 95 + 285 | 07 506 + 87 | 47 60 + 110 |
| 6 29.5 | 46 417 + 127 | 17 15 + 81 | 35 287 + 179 | 27 65 - 153 | 51 533 + 82 | 44 10 + 293 | 07 593 + 121 | 48 70 + 116 |
| 7 9.5 | 46 544 + 163 | 17 96 + 81 | 35 466 + 233 | 26 12 - 148 | 51 615 + 128 | 41 17 + 290 | 07 714 + 156 | 49 86 + 114 |
| 7 19.5 | 46 707 + 190 | 18 77 + 77 | 35 699 + 275 | 24 64 - 142 | 51 743 + 166 | 38 27 + 279 | 07 870 + 183 | 51 00 + 109 |
| 7 29.4 | 46 897 + 217 | 19 54 + 70 | 35 974 + 318 | 23 22 - 133 | 51 909 + 205 | 35 48 + 262 | 08 053 + 210 | 52 09 + 100 |
| 8 8.4 | 47 114 + 241 | 20 24 + 58 | 36 292 + 353 | 21 89 - 120 | 52 114 + 240 | 32 86 + 231 | 08 263 + 234 | 53 09 + 86 |
| 8 18.4 | 47 355 + 258 | 20 82 + 45 | 36 645 + 380 | 20 69 - 108 | 52 354 + 267 | 30 55 + 194 | 08 497 + 252 | 53 95 + 68 |
| 8 28.3 | 47 613 + 276 | 21 27 + 28 | 37 025 + 408 | 19 61 - 93 | 52 621 + 296 | 28 61 + 152 | 08 749 + 270 | 54 63 + 46 |
| 9 7.3 | 47 889 + 289 | 21 55 + 7 | 37 433 + 427 | 18 68 - 77 | 52 917 + 315 | 27 09 + 98 | 09 019 + 283 | 55 09 + 21 |
| 9 17.3 | 48 178 + 299 | 21 62 - 13 | 37 860 + 441 | 17 91 - 61 | 53 232 + 330 | 26 11 + 45 | 09 302 + 292 | 55 30 - 6 |
| 9 27.3 | 48 477 + 307 | 21 49 - 35 | 38 301 + 453 | 17 30 - 42 | 53 562 + 341 | 25 66 - 15 | 09 594 + 302 | 55 24 - 34 |
| 10 7.2 | 48 784 + 310 | 21 14 - 58 | 38 754 + 456 | 16 88 - 22 | 53 903 + 342 | 25 81 - 75 | 09 896 + 304 | 54 90 - 62 |
| 10 17.2 | 49 094 + 309 | 20 56 - 76 | 39 210 + 454 | 16 66 - 2 | 54 245 + 338 | 26 56 - 130 | 10 200 + 304 | 54 28 - 86 |
| 10 27.2 | 49 403 + 305 | 19 80 - 93 | 39 664 + 448 | 16 64 + 22 | 54 583 + 327 | 27 86 - 185 | 10 504 + 300 | 53 42 - 111 |
| 11 6.2 | 49 708 + 292 | 18 87 - 106 | 40 112 + 426 | 16 86 + 46 | 54 910 + 304 | 29 71 - 232 | 10 804 + 286 | 52 31 - 128 |
| 11 16.1 | 50 000 + 276 | 17 81 - 113 | 40 538 + 401 | 17 32 + 69 | 55 214 + 277 | 32 03 - 270 | 11 090 + 270 | 51 03 - 140 |
| 11 26.1 | 50 276 + 252 | 16 68 - 117 | 40 939 + 364 | 18 01 + 93 | 55 491 + 242 | 34 73 - 302 | 11 360 + 246 | 49 63 - 149 |
| 12 6.1 | 50 528 + 218 | 15 51 - 115 | 41 303 + 315 | 18 94 + 116 | 55 733 + 194 | 37 75 - 320 | 11 606 + 213 | 48 14 - 150 |
| 12 16.0 | 50 746 + 181 | 14 36 - 108 | 41 618 + 259 | 20 10 + 134 | 55 927 + 147 | 40 95 - 326 | 11 819 + 176 | 46 64 - 144 |
| 12 26.0 | 50 927 + 137 | 13 28 - 99 | 41 877 + 194 | 21 44 + 150 | 56 074 + 90 | 44 21 - 327 | 11 995 + 132 | 45 20 - 137 |
| 12 36.0 | 51 064 + 87 | 12 29 - 85 | 42 071 + 122 | 22 94 + 159 | 56 164 + 31 | 47 48 - 312 | 12 127 + 83 | 43 83 - 123 |
| Mean Place | 48 244 | 07.83 | 37.883 | 17.56 | 53.617 | 51.93 | 09.395 | 39.52 |
| sec δ, tan δ | +1.011 | +0.151 | +1.518 | +1.142 | +1.268 | -0.779 | +1.001 | +0.042 |
| dα(ψ), dδ(ψ) | +0.065 | -0.08 | +0.091 | -0.08 | +0.041 | -0.08 | +0.062 | -0.08 |
| dα(ε), dδ(ε) | +0.002 | +0.98 | +0.015 | +0.98 | -0.011 | +0.98 | +0.001 | +0.98 |
| Dble.Trans. | January 2 | | January 2 | | January 2 | | January 2 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 262 | | 1179 | | 1180 | | 263 | |
|--------------|-------------|------------|-------------------|------------|-----------------|------------|-------------|------------|
| | α Pictoris | | 80 G. Monocerotis | | κ Canis Majoris | | τ Puppis | |
| Mag.Spect. | 3.30 | A5 | 5.65 | A0 | 3.78 | B2p | 2.83 | K0 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° ' | h m | ° ' | h m | ° ' | h m | ° ' |
| | 6 48 | -61 55 | 6 48 | - 2 15 | 6 49 | -32 29 | 6 49 | -50 35 |
| 1 -9.0 | 05.457 +163 | 23.06 -363 | 34.754 +186 | 11.75 -171 | 20.101 +168 | 20.66 -307 | 37.001 +164 | 40.71 -353 |
| 1 1.0 | 05.532 + 75 | 26.72 -366 | 34.898 +144 | 13.39 -164 | 20.219 +118 | 23.73 -307 | 37.100 + 99 | 44.25 -354 |
| 1 11.0 | 05.515 - 17 | 30.33 -361 | 34.997 + 99 | 14.93 -154 | 20.285 + 66 | 26.72 -299 | 37.129 + 29 | 47.74 -349 |
| 1 21.0 | 05.402 -113 | 33.77 -344 | 35.046 + 49 | 16.32 -139 | 20.293 + 8 | 29.53 -281 | 37.086 - 43 | 51.06 -332 |
| 1 30.9 | 05.204 -198 | 36.92 -315 | 35.047 + 1 | 17.51 -119 | 20.249 - 44 | 32.07 -254 | 36.976 -110 | 54.09 -303 |
| 2 9.9 | 04.927 -277 | 39.76 -284 | 35.001 - 46 | 18.51 -100 | 20.153 - 96 | 34.33 -226 | 36.803 -173 | 56.80 -271 |
| 2 19.9 | 04.577 -350 | 42.15 -239 | 34.913 - 88 | 19.29 - 78 | 20.011 -142 | 36.20 -187 | 36.574 -229 | 59.09 -229 |
| 3 1.8 | 04.175 -402 | 44.08 -193 | 34.791 -122 | 19.86 - 57 | 19.834 -177 | 37.68 -148 | 36.302 -272 | 60.92 -183 |
| 3 11.8 | 03.728 -447 | 45.54 -147 | 34.643 -148 | 20.23 -148 | 19.629 -205 | 38.76 -108 | 35.996 -306 | 62.30 -138 |
| 3 21.8 | 03.255 -473 | 46.43 - 89 | 34.479 -164 | 20.39 - 16 | 19.405 -224 | 39.39 - 63 | 35.667 -329 | 63.14 - 84 |
| 3 31.8 | 02.774 -481 | 46.81 - 38 | 34.311 -168 | 20.35 + 4 | 19.178 -227 | 39.59 - 20 | 35.333 -334 | 63.48 - 34 |
| 4 10.7 | 02.294 -480 | 46.66 +15 | 34.146 -165 | 20.13 +22 | 18.952 -226 | 39.37 +22 | 35.000 -333 | 63.31 +17 |
| 4 20.7 | 01.835 -459 | 45.96 + 70 | 33.995 -151 | 19.71 +42 | 18.741 -211 | 38.71 +66 | 34.684 -316 | 62.62 +69 |
| 4 30.7 | 01.409 -426 | 44.78 +118 | 33.866 -129 | 19.13 +58 | 18.554 -187 | 37.66 +105 | 34.396 -288 | 61.47 +115 |
| 5 10.6 | 01.025 -384 | 43.11 +167 | 33.764 -102 | 18.37 +76 | 18.395 -159 | 36.23 +143 | 34.140 -256 | 59.85 +162 |
| 5 20.6 | 00.697 -328 | 40.99 +212 | 33.697 - 67 | 17.44 +93 | 18.272 -123 | 34.44 +179 | 33.929 -211 | 57.80 +205 |
| 5 30.6 | 00.432 -265 | 38.51 +248 | 33.666 - 31 | 16.38 +106 | 18.189 - 83 | 32.36 +208 | 33.767 -162 | 55.42 +238 |
| 6 9.6 | 00.233 -199 | 35.68 +283 | 33.672 + 6 | 15.19 +119 | 18.146 - 43 | 30.01 +235 | 33.655 -112 | 52.70 +272 |
| 6 19.5 | 00.111 -122 | 32.60 +308 | 33.718 + 46 | 13.90 +129 | 18.149 + 3 | 27.46 +255 | 33.602 - 53 | 49.73 +297 |
| 6 29.5 | 00.063 - 48 | 29.35 +325 | 33.799 + 81 | 12.54 +136 | 18.193 + 44 | 24.79 +267 | 33.603 + 1 | 46.62 +311 |
| 7 9.5 | 00.092 + 29 | 26.00 +335 | 33.915 +116 | 11.14 +140 | 18.279 + 86 | 22.03 +276 | 33.661 + 58 | 43.41 +321 |
| 7 19.5 | 00.201 +109 | 22.66 +334 | 34.065 +150 | 09.75 +139 | 18.407 +128 | 19.30 +273 | 33.777 +116 | 40.21 +320 |
| 7 29.4 | 00.380 +179 | 19.43 +323 | 34.243 +178 | 08.42 +133 | 18.571 +164 | 16.68 +262 | 33.943 +166 | 37.13 +308 |
| 8 8.4 | 00.633 +253 | 16.39 +304 | 34.448 +205 | 07.19 +123 | 18.770 +199 | 14.22 +246 | 34.160 +217 | 34.23 +290 |
| 8 18.4 | 00.952 +319 | 13.68 +271 | 34.678 +230 | 06.14 +105 | 19.002 +232 | 12.05 +217 | 34.424 +264 | 31.65 +258 |
| 8 28.3 | 01.325 +373 | 11.36 +232 | 34.925 +247 | 05.28 + 96 | 19.259 +257 | 10.22 +183 | 34.726 +302 | 29.45 +220 |
| 9 7.3 | 01.752 +427 | 09.51 +185 | 35.192 +267 | 04.68 + 60 | 19.541 +282 | 08.80 +142 | 35.066 +340 | 27.72 +173 |
| 9 17.3 | 02.217 +465 | 08.25 +126 | 35.472 +280 | 04.37 +31 | 19.842 +301 | 07.89 + 91 | 35.433 +367 | 26.55 +117 |
| 9 27.3 | 02.709 +492 | 07.59 + 66 | 35.762 +290 | 04.36 + 1 | 20.157 +315 | 07.49 + 40 | 35.819 +386 | 25.97 + 58 |
| 10 7.2 | 03.219 +510 | 07.58 + 1 | 36.061 +299 | 04.68 -32 | 20.483 +326 | 07.64 -15 | 36.219 +400 | 26.01 - 4 |
| 10 17.2 | 03.728 +509 | 08.26 - 68 | 36.363 +302 | 05.33 - 65 | 20.810 +327 | 08.38 - 74 | 36.621 +402 | 26.72 - 71 |
| 10 27.2 | 04.223 +495 | 09.56 -130 | 36.664 +301 | 06.27 - 94 | 21.135 +325 | 09.63 -125 | 37.015 +394 | 28.04 -132 |
| 11 6.2 | 04.694 +471 | 11.49 -193 | 36.962 +298 | 07.49 -122 | 21.451 +316 | 11.41 -178 | 37.394 +379 | 29.96 -192 |
| 11 16.1 | 05.118 +424 | 13.98 -249 | 37.246 +284 | 08.93 -144 | 21.747 +296 | 13.63 -222 | 37.741 +347 | 32.41 -245 |
| 11 26.1 | 05.487 +369 | 16.90 -292 | 37.514 +268 | 10.53 -160 | 22.019 +272 | 16.21 -258 | 38.053 +312 | 35.28 -287 |
| 12 6.1 | 05.788 +301 | 20.22 -332 | 37.757 +243 | 12.25 -172 | 22.259 +240 | 19.08 -287 | 38.316 +263 | 38.52 -324 |
| 12 16.0 | 06.006 +218 | 23.77 -355 | 37.967 +210 | 13.99 -174 | 22.457 +198 | 22.12 -304 | 38.520 +204 | 41.98 -346 |
| 12 26.0 | 06.140 +134 | 27.44 -367 | 38.140 +173 | 15.71 -172 | 22.609 +152 | 25.22 -310 | 38.663 +143 | 45.54 -356 |
| 12 36.0 | 06.181 + 41 | 31.15 -371 | 38.270 +130 | 17.36 -165 | 22.709 +100 | 28.31 -309 | 38.737 + 74 | 49.12 -368 |
| | - 54 | -357 | + 80 | -150 | + 44 | -295 | + 2 | -345 |
| Mean Place | 03.194 | 36.31 | 35.593 | 21.58 | 20.182 | 32.71 | 36.063 | 53.86 |
| sec δ, tan δ | +2.125 | -1.875 | +1.001 | -0.039 | +1.186 | -0.637 | +1.575 | -1.217 |
| dα(ψ), dδ(ψ) | +0.013 | -0.08 | +0.060 | -0.08 | +0.045 | -0.08 | +0.030 | -0.09 |
| dα(ε), dδ(ε) | -0.026 | +0.98 | -0.001 | +0.98 | -0.009 | +0.98 | -0.017 | +0.98 |
| Dbble.Trans. | January 2 | | January 2 | | January 3 | | January 3 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 267 | | 261 | | 259 | | 266 | |
|--------------|-------------|------------|-------------|-----------|---------------|------------|-----------------|------------|
| | ♄ Volantis | | ♊ Geminorum | | ♏ Camelopardi | | ♁ Canis Majoris | |
| Mag.Spect. | 5.52 | B8 | 3.64 | A2 | 5.13 | B5 | 4.25 | K2 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " |
| | 6 51 | -70 56 | 6 51 | +33 58 | 6 52 | +68 54 | 6 53 | -12 00 |
| 1 -9.0 | 40 811 +183 | 34.57 -362 | 52 824 +240 | 49 58 +41 | 14 566 +449 | 25.33 +228 | 33 069 +182 | 65.06 -223 |
| 1 1.0 | 40 866 +55 | 38.25 -368 | 53 014 +190 | 50 14 +56 | 14 903 +337 | 27.79 +246 | 33 209 +140 | 67.25 -219 |
| 1 11.0 | 40 791 -75 | 41.89 -364 | 53 151 +137 | 50 84 +70 | 15 120 +217 | 30.39 +260 | 33 303 +94 | 69.34 -209 |
| 1 21.0 | 40 580 -211 | 45.38 -349 | 53 226 +75 | 51.63 +79 | 15 202 +82 | 33.02 +263 | 33 346 +43 | 71.27 -193 |
| 1 30.9 | 40 251 -329 | 48.60 -322 | 53 244 +18 | 52.47 +84 | 15 159 -43 | 35.57 +255 | 33 341 -5 | 72.97 -170 |
| 2 9.9 | 39 810 -441 | 51.51 -291 | 53 204 -40 | 53.33 +86 | 14 993 -166 | 37.98 +241 | 33 289 -52 | 74.45 -148 |
| 2 19.9 | 39 270 -540 | 54.00 -249 | 53 110 -94 | 54.15 +82 | 14 712 -281 | 40.10 +212 | 33 193 -96 | 75.65 -120 |
| 3 1.8 | 38 658 -612 | 56.03 -203 | 52 976 -134 | 54.88 +73 | 14 342 -370 | 41.87 +177 | 33 064 -129 | 76.57 -92 |
| 3 11.8 | 37 983 -675 | 57.58 -155 | 52 808 -168 | 55.50 +62 | 14 342 -444 | 43.24 +137 | 32 908 -156 | 77.21 -64 |
| 3 21.8 | 37 270 -713 | 58.59 -101 | 52 618 -190 | 55.95 +45 | 13 898 -491 | 44.12 +88 | 32 735 -173 | 77.55 -34 |
| 3 31.8 | 36 545 -725 | 59.08 -49 | 52 423 -195 | 56.24 +29 | 12 900 -507 | 44.52 +40 | 32 558 -177 | 77.61 -6 |
| 4 10.7 | 35 817 -728 | 59.04 +4 | 52 229 -194 | 56.34 +10 | 12 394 -506 | 44.43 -9 | 32 382 -176 | 77.40 +21 |
| 4 20.7 | 35 115 -702 | 58.45 +59 | 52 053 -176 | 56.26 -8 | 11 921 -473 | 43.83 -60 | 32 220 -162 | 76.90 +50 |
| 4 30.7 | 34 457 -658 | 57.36 +109 | 51 904 -149 | 56.02 -24 | 11 503 -418 | 42.80 -103 | 32 079 -141 | 76.15 +75 |
| 5 10.7 | 33 851 -606 | 55.79 +157 | 51 787 -117 | 55.63 -39 | 11 503 -351 | 41.36 -144 | 31 964 -115 | 75.16 +99 |
| 5 20.6 | 33 321 -530 | 53.75 +204 | 51 713 -74 | 55.12 -51 | 10 890 -262 | 39.55 -181 | 31 884 -80 | 73.92 +124 |
| 5 30.6 | 32 876 -445 | 51.34 +241 | 51 683 -30 | 54.52 -60 | 10 725 -165 | 37.49 -206 | 31 839 -45 | 72.50 +142 |
| 6 9.6 | 32 522 -354 | 48.56 +278 | 51 698 +15 | 53.86 -66 | 10 658 -67 | 35.20 -229 | 31 830 -9 | 70.89 +161 |
| 6 19.5 | 32 277 -245 | 45.52 +304 | 51 762 +64 | 53.17 -69 | 10 702 +44 | 32.77 -243 | 31 861 +31 | 69.15 +174 |
| 6 29.5 | 32 138 -139 | 42.31 +321 | 51 869 +107 | 52.48 -69 | 10 847 +145 | 30.29 -248 | 31 928 +67 | 67.33 +182 |
| 7 9.5 | 32 110 -28 | 38.96 +335 | 52 016 +147 | 51.76 -72 | 11 093 +246 | 27.78 -251 | 32 031 +103 | 65.44 +189 |
| 7 19.5 | 32 200 +90 | 35.62 +334 | 52 207 +191 | 51.05 -71 | 11 438 +345 | 25.33 -245 | 32 169 +138 | 63.57 +187 |
| 7 29.4 | 32 395 +195 | 32.37 +325 | 52 431 +224 | 50.37 -68 | 11 867 +429 | 22.99 -234 | 32 336 +167 | 61.78 +179 |
| 8 8.4 | 32 700 +305 | 29.29 +308 | 52 688 +257 | 49.72 -65 | 12 378 +511 | 20.80 -219 | 32 532 +196 | 60.11 +167 |
| 8 18.4 | 33 106 +406 | 26.54 +275 | 52 972 +284 | 49.10 -62 | 12 961 +583 | 18.83 -197 | 32 754 +222 | 58.65 +146 |
| 8 28.4 | 33 596 +490 | 24.15 +239 | 53 279 +307 | 48.51 -59 | 13 600 +639 | 17.09 -174 | 32 996 +242 | 57.45 +120 |
| 9 7.3 | 34 168 +572 | 22.24 +191 | 53 606 +327 | 47.94 -57 | 14 296 +696 | 15.61 -148 | 33 258 +262 | 56.55 +90 |
| 9 17.3 | 34 800 +632 | 20.90 +134 | 53 950 +344 | 47.40 -54 | 15 031 +735 | 14.46 -115 | 33 535 +277 | 56.03 +52 |
| 9 27.3 | 35 472 +672 | 20.16 +74 | 54 306 +356 | 46.89 -51 | 15 793 +762 | 13.62 -84 | 33 824 +289 | 55.88 +15 |
| 10 7.2 | 36 172 +700 | 20.07 +9 | 54 673 +367 | 46.42 -47 | 16 580 +787 | 13.12 -50 | 34 123 +299 | 56.15 -27 |
| 10 17.2 | 36 870 +698 | 20.66 -59 | 55 043 +370 | 46.01 -41 | 17 371 +791 | 13.02 -10 | 34 425 +302 | 56.84 -69 |
| 10 27.2 | 37 548 +678 | 21.88 -122 | 55 414 +371 | 45.65 -36 | 18 155 +784 | 13.27 +25 | 34 727 +302 | 57.91 -107 |
| 11 6.2 | 38 187 +639 | 23.75 -187 | 55 781 +367 | 45.39 -26 | 18 924 +769 | 13.92 +65 | 35 024 +297 | 59.35 -144 |
| 11 16.1 | 38 754 +567 | 26.17 -242 | 56 133 +352 | 45.24 -15 | 19 650 +726 | 14.97 +105 | 35 309 +285 | 61.09 -174 |
| 11 26.1 | 39 240 +486 | 29.06 -289 | 56 467 +334 | 45.22 -2 | 20 326 +676 | 16.38 +141 | 35 575 +266 | 63.07 -198 |
| 12 6.1 | 39 624 +384 | 32.34 -328 | 56 774 +307 | 45.35 +13 | 20 933 +607 | 18.15 +177 | 35 817 +242 | 65.23 -216 |
| 12 16.1 | 39 885 +261 | 35.88 -354 | 57 041 +267 | 45.63 +28 | 21 446 +513 | 20.22 +207 | 36 024 +207 | 67.47 -224 |
| 12 26.0 | 40 025 +140 | 39.55 -367 | 57 266 +225 | 46.07 +44 | 21 859 +413 | 22.54 +232 | 36 194 +170 | 69.71 -224 |
| 12 36.0 | 40 031 +6 | 43.28 -373 | 57 439 +173 | 46.66 +59 | 22 154 +295 | 25.05 +251 | 36 318 +124 | 71.91 -220 |
| | -128 | -361 | +114 | +70 | +167 | +259 | +76 | -205 |
| Mean Place | 36.450 | 48.73 | 53.991 | 42.24 | 15.219 | 19.71 | 33.735 | 75.98 |
| sec δ, tan δ | +3.063 | -2.895 | +1.206 | +0.674 | +2.778 | +2.592 | +1.022 | -0.213 |
| dα(ψ), dδ(ψ) | -0.014 | -0.09 | +0.079 | -0.09 | +0.128 | -0.09 | +0.056 | -0.09 |
| dα(ε), dδ(ε) | -0.043 | +0.97 | +0.010 | +0.97 | +0.039 | +0.97 | -0.003 | +0.97 |
| Dble.Trans. | January 3 | | January 3 | | January 3 | | January 4 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 268 | | 260 | | 1181 | | 1183 | |
|--------------|-----------------|------------|-------------------|------------|--------------------|------------|-----------------|------------|
| | ε Canis Majoris | | 24 H. Camelopardi | | 101 G. Monocerotis | | σ Canis Majoris | |
| Mag. Spect. | 1.63 | B1 | 4.75 | K5 | 5.84 | A0 | 3.68 | K5 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° / | h m | ° / | h m | ° / | h m | ° / |
| | 6 58 | -28 56 | 6 57 | +76 59 | 6 59 | - 8 22 | 7 01 | -27 54 |
| 1 -9.0 | 05 472 +179 | 58 73 -296 | 66 888 +676 | 53 19 +255 | 44 033 +191 | 63 76 -208 | 10 592 +182 | 41 09 -293 |
| 1 1.0 | 05 604 +132 | 61 69 -296 | 67 389 +501 | 55 95 +276 | 44 183 +150 | 65 77 -201 | 10 727 +135 | 44 01 -292 |
| 1 11.0 | 05 684 +80 | 64 58 -289 | 67 699 +310 | 58 86 +291 | 44 287 +104 | 67 69 -192 | 10 812 +85 | 46 87 -286 |
| 1 21.0 | 05 708 +24 | 67 30 -272 | 67 798 +99 | 61 80 +294 | 44 340 +53 | 69 45 -176 | 10 841 +29 | 49 57 -270 |
| 1 30.9 | 05 681 -27 | 69 77 -247 | 67 700 -98 | 64 66 +286 | 44 345 +5 | 71 00 -155 | 10 819 -22 | 52 01 -244 |
| 2 9.9 | 05 603 -78 | 71 97 -220 | 67 408 -292 | 67 34 +268 | 44 303 -42 | 72 34 -134 | 10 746 -73 | 54 19 -218 |
| 2 19.9 | 05 479 -124 | 73 81 -184 | 66 936 -472 | 69 72 +238 | 44 217 -86 | 73 42 -108 | 10 627 -119 | 56 02 -183 |
| 3 1.8 | 05 319 -160 | 75 27 -146 | 66 323 -613 | 71 71 +199 | 44 096 -121 | 74 24 -82 | 10 472 -155 | 57 47 -149 |
| 3 11.8 | 05 129 -190 | 76 36 -109 | 65 590 -733 | 73 25 +154 | 43 948 -148 | 74 82 -58 | 10 287 -185 | 58 56 -105 |
| 3 21.8 | 04 921 -208 | 77 01 -65 | 64 778 -812 | 74 26 +101 | 43 782 -166 | 75 12 -30 | 10 083 -204 | 59 23 -67 |
| 3 31.8 | 04 708 -213 | 77 27 -26 | 63 936 -842 | 74 74 +48 | 43 610 -172 | 75 17 -5 | 09 873 -210 | 59 50 -27 |
| 4 10.7 | 04 495 -213 | 77 12 +15 | 63 090 -846 | 74 66 -8 | 43 439 -171 | 74 99 +18 | 09 664 -209 | 59 37 +13 |
| 4 20.7 | 04 294 -201 | 76 55 +57 | 62 288 -802 | 74 02 -64 | 43 281 -158 | 74 54 +45 | 09 466 -198 | 58 83 +54 |
| 4 30.7 | 04 116 -178 | 75 62 +93 | 61 567 -721 | 72 90 -112 | 43 143 -138 | 73 89 +65 | 09 290 -176 | 57 94 +89 |
| 5 10.7 | 03 964 -152 | 74 32 +130 | 60 943 -624 | 71 32 -158 | 43 030 -113 | 73 01 +88 | 09 139 -151 | 56 68 +126 |
| 5 20.6 | 03 846 -118 | 72 68 +164 | 60 456 -487 | 69 32 -200 | 42 951 -79 | 71 91 +110 | 09 023 -116 | 55 07 +161 |
| 5 30.6 | 03 766 -80 | 70 76 +192 | 60 116 -340 | 67 03 -229 | 42 906 -45 | 70 66 +125 | 08 943 -80 | 53 20 +187 |
| 6 9.6 | 03 724 -42 | 68 57 +219 | 59 930 -186 | 64 47 -256 | 42 897 -9 | 69 23 +143 | 08 901 -42 | 51 06 +214 |
| 6 19.5 | 03 726 +2 | 66 18 +239 | 59 918 -12 | 61 75 -272 | 42 927 +30 | 67 68 +155 | 08 902 +1 | 48 72 +234 |
| 6 29.5 | 03 767 +41 | 63 67 +251 | 60 067 +149 | 58 95 -280 | 42 992 +65 | 66 05 +163 | 08 942 +40 | 46 27 +245 |
| 7 9.5 | 03 848 +81 | 61 06 +261 | 60 378 +311 | 56 11 -284 | 43 093 +101 | 64 36 +169 | 09 022 +80 | 43 71 +256 |
| 7 19.5 | 03 969 +121 | 58 48 +258 | 60 852 +474 | 53 33 -278 | 43 228 +135 | 62 69 +167 | 09 141 +119 | 41 17 +254 |
| 7 29.4 | 04 125 +156 | 55 98 +250 | 61 463 +611 | 50 67 -266 | 43 292 +164 | 61 09 +160 | 09 294 +153 | 38 72 +245 |
| 8 8.4 | 04 315 +190 | 53 63 +235 | 62 212 +749 | 48 17 -250 | 43 584 +192 | 59 59 +150 | 09 481 +187 | 36 41 +231 |
| 8 18.4 | 04 536 +221 | 51 55 +208 | 63 083 +871 | 45 91 -226 | 43 802 +218 | 58 29 +130 | 09 699 +218 | 34 36 +205 |
| 8 28.4 | 04 782 +246 | 49 79 +176 | 64 050 +967 | 43 91 -200 | 44 040 +238 | 57 22 +107 | 09 942 +243 | 32 62 +174 |
| 9 7.3 | 05 054 +272 | 48 42 +137 | 65 113 +1063 | 42 21 -170 | 44 299 +259 | 56 43 +79 | 10 210 +268 | 31 26 +136 |
| 9 17.3 | 05 345 +291 | 47 53 +89 | 66 244 +1131 | 40 88 -133 | 44 574 +275 | 55 99 +44 | 10 120 +288 | 30 38 +88 |
| 9 27.3 | 05 649 +304 | 47 12 +41 | 67 423 +1179 | 39 91 -97 | 44 860 +286 | 55 90 +9 | 10 800 +302 | 29 98 +40 |
| 10 7.2 | 05 967 +218 | 47 25 -13 | 68 644 +1221 | 39 34 -57 | 45 157 +297 | 56 18 -28 | 11 115 +315 | 30 10 -12 |
| 10 17.2 | 06 288 +321 | 47 93 -68 | 69 871 +1227 | 39 20 -14 | 45 459 +302 | 56 86 -68 | 11 434 +319 | 30 77 -67 |
| 10 27.2 | 06 608 +320 | 49 12 -119 | 71 089 +1218 | 39 49 +29 | 45 762 +303 | 57 88 -102 | 11 754 +320 | 31 93 -116 |
| 11 6.2 | 06 922 +314 | 50 81 -169 | 72 280 +1191 | 40 23 +74 | 46 063 +301 | 59 24 -136 | 12 068 +314 | 33 60 -167 |
| 11 16.1 | 07 220 +298 | 52 93 -212 | 73 402 +1122 | 41 41 +118 | 46 351 +288 | 60 89 -165 | 12 366 +298 | 35 70 -210 |
| 11 26.1 | 07 496 +276 | 55 40 -247 | 74 442 +1040 | 43 00 +159 | 46 623 +272 | 62 74 -185 | 12 643 +277 | 38 14 -244 |
| 12 6.1 | 07 742 +246 | 58 16 -276 | 75 370 +928 | 44 99 +199 | 46 872 +249 | 64 76 -202 | 12 892 +249 | 40 86 -272 |
| 12 16.1 | 07 949 +207 | 61 09 -293 | 76 148 +778 | 47 33 +234 | 47 087 +215 | 66 84 -208 | 13 101 +209 | 43 75 -289 |
| 12 26.0 | 08 113 +164 | 64 08 -299 | 76 768 +620 | 49 93 +260 | 47 266 +179 | 68 92 -208 | 13 269 +168 | 46 71 -296 |
| 12 36.0 | 08 227 +114 | 67 06 -298 | 77 200 +432 | 52 75 +282 | 47 400 +134 | 70 94 -202 | 13 387 +118 | 49 66 -295 |
| | +60 | -285 | +230 | +290 | +86 | -189 | +65 | -283 |
| Mean Place | 05.710 | 71.40 | 66.720 | 47.91 | 44.786 | 74.80 | 10.874 | 53.95 |
| sec δ, tan δ | +1.143 | -0.553 | +4.444 | +4.330 | +1.011 | -0.147 | +1.132 | -0.530 |
| dα(ψ), dδ(ψ) | +0.047 | -0.10 | +0.172 | -0.10 | +0.057 | -0.10 | +0.048 | -0.10 |
| dα(ε), dδ(ε) | -0.009 | +0.97 | +0.072 | +0.97 | -0.003 | +0.97 | -0.009 | +0.96 |
| Dble. Trans. | January 5 | | January 5 | | January 5 | | January 6 | |

APPARENT PLACES OF STARS, 1986

111

AT UPPER TRANSIT AT GREENWICH

| No. | 1182 | | 270 | | 271 | | 269 | |
|----------------|--------------------------|-----------|------------------------------|-------------------------|--------------------------|-------------------------|--------------------------|------------------------|
| | ω Geminorum | | α ^s Canis Majoris | | γ Canis Majoris | | ζ Geminorum | |
| Mag.Spect. | 5.21 | K0 | 3.12 | B5p | 4.07 | B5 | 3.7 to 4.1 | G0p |
| U.T. | R.A. | | Dec. | | R.A. | | Dec. | |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " |
| | 7 01 | +24 14 | 7 02 | -23 48 | 7 03 | -15 36 | 7 03 | +20 35 |
| 1 ^d | 34.331 ^s +230 | 16.04 -22 | 27.223 ^s +185 | 34.40 ^s -278 | 08.211 ^s +190 | 33.61 ^s -243 | 17.407 ^s +225 | 35.70 ^s -45 |
| 1 | 34.517 +186 | 15.95 -9 | 27.364 +141 | 37.16 -276 | 08.358 +147 | 36.00 -239 | 17.590 +183 | 35.38 -32 |
| 1 | 34.653 +136 | 16.00 +5 | 27.455 +91 | 39.85 -269 | 08.458 +100 | 38.31 -231 | 17.725 +135 | 35.19 -19 |
| 1 | 34.734 +81 | 16.18 +18 | 27.492 +37 | 42.38 -253 | 08.507 +49 | 40.46 -215 | 17.805 +80 | 35.14 -5 |
| 1 | 34.761 +27 | 16.46 +28 | 27.479 -13 | 44.67 -229 | 08.507 +0 | 42.38 -192 | 17.833 +28 | 35.21 +7 |
| 2 | 34.735 -26 | 16.82 +36 | 27.416 -63 | 46.70 -203 | 08.458 -49 | 44.07 -169 | 17.810 -23 | 35.37 +16 |
| 2 | 34.660 -75 | 17.23 +41 | 27.307 -109 | 48.39 -169 | 08.365 -93 | 45.46 -139 | 17.737 -73 | 35.61 +24 |
| 3 | 34.545 -115 | 17.64 +41 | 27.164 -143 | 49.74 -135 | 08.238 -127 | 46.55 -109 | 17.627 -110 | 35.89 +28 |
| 3 | 34.398 -147 | 18.03 +39 | 26.991 -173 | 50.74 -100 | 08.081 -157 | 47.34 -79 | 17.484 -143 | 36.17 +28 |
| 3 | 34.231 -167 | 18.37 +34 | 26.799 -192 | 51.35 -61 | 07.906 -175 | 47.80 -46 | 17.321 -163 | 36.45 +28 |
| 3 | 34.056 -175 | 18.64 +27 | 26.600 -199 | 51.59 -24 | 07.725 -181 | 47.95 -15 | 17.151 -170 | 36.69 +24 |
| 4 | 33.881 -175 | 18.83 +19 | 26.402 -198 | 51.46 +13 | 07.544 -181 | 47.80 +15 | 16.982 -169 | 36.89 +20 |
| 4 | 33.721 -160 | 18.94 +11 | 26.216 -186 | 50.95 +51 | 07.375 -169 | 47.33 +47 | 16.825 -157 | 37.05 +16 |
| 4 | 33.584 -137 | 18.97 +3 | 26.051 -165 | 50.10 +85 | 07.227 -148 | 46.58 +75 | 16.691 -134 | 37.16 +11 |
| 5 | 33.475 -109 | 18.93 -4 | 25.910 -141 | 48.92 +118 | 07.102 -125 | 45.56 +102 | 16.584 -107 | 37.24 +8 |
| 5 | 33.403 -72 | 18.84 -9 | 25.803 -107 | 47.42 +150 | 07.011 -91 | 44.27 +129 | 16.513 -71 | 37.29 +5 |
| 5 | 33.371 +3 | 18.71 -13 | 25.731 -72 | 45.67 +175 | 06.954 -57 | 42.78 +149 | 16.480 -33 | 37.33 +4 |
| 5 | 33.378 +7 | 18.56 -15 | 25.697 -34 | 43.67 +200 | 06.933 -21 | 41.07 +171 | 16.486 +6 | 37.37 +4 |
| 5 | 33.430 +52 | 18.40 -16 | 25.704 +7 | 41.48 +219 | 06.951 +18 | 39.21 +186 | 16.535 +49 | 37.40 +3 |
| 5 | 33.523 +93 | 18.24 -16 | 25.749 +45 | 39.18 +230 | 07.006 +55 | 37.26 +195 | 16.623 +88 | 37.42 +2 |
| 7 | 33.638 +115 | 18.14 -10 | 25.831 +82 | 36.80 +238 | 07.097 +91 | 35.23 +203 | 16.733 +110 | 37.39 -3 |
| 7 | 33.810 +172 | 17.90 -24 | 25.952 +121 | 34.42 +238 | 07.223 +126 | 33.22 +201 | 16.899 +166 | 37.52 +13 |
| 7 | 34.007 +197 | 17.71 -19 | 26.053 +153 | 32.13 +229 | 07.380 +157 | 31.28 +194 | 17.089 +190 | 37.54 +2 |
| 8 | 34.234 +227 | 17.51 -20 | 26.105 +186 | 29.97 +216 | 07.566 +186 | 29.46 +182 | 17.307 +218 | 37.53 -1 |
| 8 | 34.486 +252 | 17.28 -23 | 26.506 +215 | 28.06 +191 | 07.780 +214 | 27.86 +160 | 17.552 +245 | 37.47 -6 |
| 8 | 34.759 +273 | 17.01 -27 | 26.745 +239 | 26.44 +162 | 08.016 +236 | 26.53 +133 | 17.816 +264 | 37.34 -13 |
| 9 | 35.053 +294 | 16.69 -32 | 27.008 +263 | 25.19 +125 | 08.273 +257 | 25.51 +102 | 18.100 +284 | 37.12 -22 |
| 9 | 35.362 +309 | 16.29 -40 | 27.282 +282 | 24.39 +80 | 08.548 +275 | 24.90 +61 | 18.401 +301 | 36.81 -31 |
| 9 | 35.362 +322 | 16.29 -45 | 27.290 +295 | 24.39 +35 | 08.548 +288 | 24.90 +22 | 18.401 +313 | 36.81 -41 |
| 9 | 35.684 +333 | 15.84 -52 | 27.585 +308 | 24.04 -15 | 08.836 +300 | 24.68 -22 | 18.714 +324 | 36.40 -51 |
| 10 | 36.017 +339 | 15.32 -58 | 27.893 +313 | 24.19 -66 | 09.136 +304 | 24.90 -67 | 19.038 +331 | 35.89 -60 |
| 10 | 36.356 +341 | 14.74 -60 | 28.206 +314 | 24.85 -114 | 09.440 +306 | 25.57 -108 | 19.369 +332 | 35.29 -67 |
| 10 | 36.697 +340 | 14.14 -61 | 28.520 +309 | 25.99 -161 | 09.746 +304 | 26.65 -149 | 19.701 +332 | 34.62 -72 |
| 11 | 37.037 +328 | 13.53 -59 | 28.829 +295 | 27.60 -202 | 10.050 +290 | 28.14 -183 | 20.033 +321 | 33.90 -73 |
| 11 | 37.365 +314 | 12.94 -54 | 29.124 +275 | 29.62 -232 | 10.340 +274 | 29.97 -210 | 20.354 +306 | 33.17 -71 |
| 11 | 37.679 +289 | 12.40 -45 | 29.399 +249 | 31.94 -260 | 10.614 +249 | 32.07 -231 | 20.660 +284 | 32.46 -65 |
| 12 | 37.968 +255 | 11.95 -33 | 29.648 +212 | 34.54 -275 | 10.863 +214 | 34.38 -241 | 20.944 +250 | 31.81 -55 |
| 12 | 38.223 +170 | 11.62 -21 | 29.860 +171 | 37.29 -279 | 11.077 +177 | 36.79 -244 | 21.194 +213 | 31.26 -43 |
| 12 | 38.440 +217 | 11.41 -6 | 30.031 +124 | 40.08 -279 | 11.254 +132 | 39.23 -241 | 21.407 +167 | 30.83 -31 |
| 12 | 38.610 +116 | 11.35 +7 | 30.155 +71 | 42.87 -266 | 11.386 +81 | 41.64 -228 | 21.574 +115 | 30.52 -16 |
| Mean Place | 35.459 | 07.88 | 27.634 | 47.04 | 08.827 | 45.56 | 18.515 | 27.19 |
| sec δ, tan δ | +1.097 | +0.450 | +1.093 | -0.441 | +1.038 | -0.279 | +1.068 | +0.376 |
| dα(ψ), dδ(ψ) | +0.073 | -0.11 | +0.050 | -0.11 | +0.054 | -0.11 | +0.071 | -0.11 |
| dα(ε), dδ(ε) | +0.008 | +0.96 | -0.008 | +0.96 | -0.005 | +0.96 | +0.007 | +0.96 |
| Dble.Trans. | January 6 | | January 6 | | January 6 | | January 6 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 1184 | | 272 | | 1185 | | 273 | |
|--------------|-----------|--------------|---------------|-------------|--------------------|------------|-----------------|-------------|
| | C Puppis | | 27 G. Carinae | | 2 G. Canis Minoris | | δ Canis Majoris | |
| Mag.Spect. | 5.26 | A2 | 5.30 | A0 | 5.92 | K0 | 1.98 | F8p |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " |
| | 7 03 | -42 18 | 7 04 | -56 43 | 7 07 | + 7 29 | 7 07 | -26 21 |
| 1 | -9.0 | 37.395 + 183 | 04.673 + 190 | 29.33 -360 | 04.698 + 212 | 45.14 -124 | 50.173 + 190 | 63.01 -288 |
| 1 | 1.0 | 37.522 + 127 | 04.787 + 114 | 32.98 -365 | 04.869 + 171 | 44.00 -114 | 50.317 + 144 | 65.89 -288 |
| 1 | 11.0 | 37.589 + 67 | 04.823 + 36 | 36.62 -364 | 04.995 + 126 | 42.98 -102 | 50.411 + 94 | 68.71 -282 |
| 1 | 21.0 | 37.592 + 3 | 04.774 - 49 | 40.12 -319 | 05.070 + 75 | 42.11 -87 | 50.450 + 39 | 71.37 -266 |
| 1 | 30.9 | 37.535 - 57 | 04.649 - 125 | 43.35 -323 | 05.095 + 25 | 41.40 -71 | 50.438 - 12 | 73.80 -243 |
| 2 | 9.9 | 37.421 - 114 | 04.451 - 198 | 46.30 -295 | 05.071 - 24 | 40.85 -55 | 50.375 - 63 | 75.96 -216 |
| 2 | 19.9 | 37.254 - 167 | 04.187 - 264 | 48.84 -254 | 05.002 - 69 | 40.47 -38 | 50.265 - 110 | 77.78 -182 |
| 3 | 1.9 | 37.047 - 207 | 03.873 - 314 | 50.93 -209 | 04.896 - 106 | 40.23 -24 | 50.119 - 146 | 79.25 -147 |
| 3 | 11.8 | 36.806 - 241 | 03.516 - 357 | 52.56 -163 | 04.761 - 135 | 40.11 -12 | 49.942 - 177 | 80.35 -110 |
| 3 | 21.8 | 36.543 - 263 | 03.131 - 385 | 53.66 -110 | 04.606 - 155 | 40.12 + 1 | 49.746 - 196 | 81.05 -70 |
| 3 | 31.8 | 36.272 - 271 | 02.736 - 395 | 54.25 -59 | 04.443 - 163 | 40.23 + 11 | 49.542 - 204 | 81.36 -31 |
| 4 | 10.7 | 36.001 - 271 | 02.337 - 399 | 54.31 -6 | 04.281 - 162 | 40.43 + 20 | 49.337 - 205 | 81.29 + 7 |
| 4 | 20.7 | 35.742 - 259 | 01.953 - 384 | 53.83 + 48 | 04.130 - 151 | 40.73 + 30 | 49.144 - 193 | 80.82 + 47 |
| 4 | 30.7 | 35.505 - 237 | 01.596 - 357 | 52.87 + 96 | 04.000 - 130 | 41.10 + 37 | 48.970 - 174 | 79.99 + 83 |
| 5 | 10.7 | 35.296 - 209 | 01.271 + 140 | 51.42 + 145 | 03.894 - 106 | 41.55 + 45 | 48.821 - 149 | 78.81 + 118 |
| 5 | 20.6 | 35.125 - 171 | 00.993 + 182 | 49.51 -278 | 03.822 - 72 | 42.09 + 54 | 48.704 - 117 | 77.30 + 151 |
| 5 | 30.6 | 34.994 - 131 | 00.767 + 215 | 47.22 -226 | 03.785 - 37 | 42.70 + 61 | 48.623 - 81 | 75.51 + 179 |
| 6 | 9.6 | 34.907 - 87 | 00.595 + 248 | 44.57 + 265 | 03.783 - 2 | 43.38 + 68 | 48.579 - 44 | 73.46 + 205 |
| 6 | 19.6 | 34.869 - 38 | 00.489 + 273 | 41.64 -106 | 03.821 + 38 | 44.11 + 73 | 48.577 - 2 | 71.22 + 224 |
| 6 | 29.5 | 34.878 + 9 | 00.443 + 287 | 38.53 -46 | 03.894 + 73 | 44.87 + 76 | 48.613 + 36 | 68.84 + 238 |
| 7 | 9.5 | 34.934 + 56 | 00.463 + 300 | 35.28 + 20 | 04.001 + 107 | 45.66 + 79 | 48.687 + 74 | 66.37 + 247 |
| 7 | 19.5 | 35.038 + 104 | 00.550 + 300 | 32.02 + 87 | 04.143 + 142 | 46.45 + 79 | 48.801 + 114 | 63.91 + 246 |
| 7 | 29.4 | 35.185 + 147 | 00.697 + 291 | 28.83 + 147 | 04.313 + 170 | 47.20 + 75 | 48.947 + 146 | 61.52 + 239 |
| 8 | 8.4 | 35.375 + 190 | 00.907 + 276 | 25.80 + 210 | 04.512 + 199 | 47.88 + 68 | 49.128 + 181 | 59.26 + 226 |
| 8 | 18.4 | 35.605 + 230 | 01.174 + 247 | 23.06 + 267 | 04.735 + 223 | 48.44 + 56 | 49.339 + 211 | 57.26 + 200 |
| 8 | 28.4 | 35.868 + 263 | 01.489 + 212 | 20.69 + 315 | 04.978 + 243 | 48.85 + 41 | 49.576 + 237 | 55.55 + 171 |
| 9 | 7.3 | 36.163 + 295 | 01.853 + 170 | 18.76 + 364 | 05.241 + 193 | 49.08 + 23 | 49.838 + 262 | 54.21 + 134 |
| 9 | 17.3 | 36.484 + 321 | 02.253 + 116 | 17.39 + 400 | 05.520 + 279 | 49.09 + 1 | 49.838 + 282 | 53.33 + 88 |
| 9 | 27.3 | 36.824 + 340 | 02.523 + 63 | 16.61 + 426 | 05.812 + 292 | 48.90 -19 | 50.120 + 297 | 52.92 + 41 |
| 10 | 7.3 | 37.179 + 355 | 03.126 + 2 | 16.46 + 447 | 06.116 + 304 | 48.46 -44 | 50.417 + 312 | 52.92 -10 |
| 10 | 17.2 | 37.539 + 360 | 03.579 - 61 | 16.99 + 453 | 06.425 + 309 | 47.80 -66 | 51.046 + 317 | 53.65 -63 |
| 10 | 27.2 | 37.898 + 359 | 04.026 -119 | 18.15 + 447 | 06.738 + 313 | 46.93 -87 | 51.364 + 318 | 54.78 -113 |
| 11 | 6.2 | 38.248 + 350 | 04.458 -177 | 19.94 + 432 | 07.049 + 311 | 45.88 -105 | 51.679 + 315 | 56.40 -162 |
| 11 | 16.1 | 38.577 + 329 | 04.857 -229 | 22.30 + 399 | 07.351 + 302 | 44.70 -118 | 51.979 + 300 | 58.45 -205 |
| 11 | 26.1 | 38.878 + 301 | 05.214 -270 | 25.12 + 357 | 07.640 + 289 | 43.42 -128 | 52.261 + 282 | 60.83 -238 |
| 12 | 6.1 | 39.142 + 264 | 05.518 -306 | 28.35 + 304 | 07.906 + 266 | 42.10 -132 | 52.515 + 254 | 63.50 -267 |
| 12 | 16.1 | 39.358 + 216 | 05.753 -329 | 31.85 + 235 | 08.142 + 236 | 40.81 -129 | 52.731 + 216 | 66.34 -284 |
| 12 | 26.0 | 39.524 + 166 | 05.919 -340 | 35.49 + 166 | 08.342 + 200 | 39.58 -123 | 52.907 + 176 | 69.24 -290 |
| 12 | 36.0 | 39.630 + 106 | 06.005 -344 | 39.20 + 86 | 08.498 + 156 | 38.44 -114 | 53.034 + 127 | 72.15 -291 |
| | | | | | | | | |
| Mean Place | 37.082 | 61.15 | 03.239 | 44.57 | 05.692 | 35.23 | 50.526 | 76.36 |
| sec δ, tan δ | +1.352 | -0.910 | +1.823 | -1.524 | +1.009 | +0.132 | +1.116 | -0.496 |
| dα(ψ), dδ(ψ) | +0.038 | -0.11 | +0.022 | -0.11 | +0.065 | -0.11 | +0.049 | -0.12 |
| dα(ε), dδ(ε) | -0.017 | +0.96 | -0.028 | +0.96 | +0.003 | +0.96 | -0.010 | +0.96 |
| Dble.Trans. | January 6 | | January 6 | | January 7 | | January 7 | |

APPARENT PLACES OF STARS, 1986

113

AT UPPER TRANSIT AT GREENWICH

| No. | 1189 | | 1186 | | 274 | | 1187 | |
|---|---------------------------|-------------------------|---------------------------|-------------------------|---------------------------|-------------------------|---------------------------|-------------------------|
| | γ^2 Volantis* | | 20 Monocerotis | | 63 Aurigae | | δ Monocerotis | |
| Mag.Spect. | 3.87 | K0 | 5.02 | K0 | 5.07 | K2 | 4.09 | A0 |
| U.T. | R.A. | | R.A. | | R.A. | | R.A. | |
| | h m | $^{\circ}$ ' " | h m | $^{\circ}$ ' " | h m | $^{\circ}$ ' " | h m | $^{\circ}$ ' " |
| | 7 08 | - 70 28 | 7 09 | - 4 12 | 7 10 | + 39 20 | 7 11 | - 0 27 |
| 1 ^d -9.0 | 56 024 ^s + 232 | 21.63 ["] -361 | 32 592 ^s + 203 | 44 28 ["] -188 | 42 514 ^s + 274 | 43.46 ["] + 61 | 09 585 ^s + 208 | 60.01 ["] -169 |
| 1 1.0 | 56 132 + 108 | 25 32 -369 | 32 754 + 162 | 46 10 -182 | 42 738 + 224 | 44.25 + 79 | 09 752 + 167 | 61.63 -162 |
| 1 11.0 | 56 113 - 19 | 29 03 -371 | 32 871 + 117 | 47 82 -172 | 42 904 + 166 | 45.21 + 96 | 09 875 + 123 | 63.14 -151 |
| 1 21.0 | 55 959 - 154 | 32 63 -360 | 32 938 + 67 | 49 37 -155 | 43 005 + 101 | 46.30 + 109 | 09 946 + 71 | 64.50 -136 |
| 1 30.9 | 55 687 - 272 | 35 99 -336 | 32 956 + 18 | 50 73 -136 | 43 044 + 39 | 47.46 + 116 | 09 969 + 23 | 65.66 -116 |
| 2 9.9 | 55 302 - 385 | 39 08 -309 | 32 926 - 30 | 51 90 -117 | 43 019 - 25 | 48.63 + 117 | 09 944 - 25 | 66.64 - 98 |
| 2 19.9 | 54 814 - 488 | 41 78 -270 | 32 851 - 75 | 52 82 -92 | 42 936 - 83 | 49.76 + 113 | 09 873 - 71 | 67.41 - 77 |
| 3 1.9 | 54 249 - 565 | 44 04 -226 | 32 741 - 110 | 53 52 -70 | 42 805 - 131 | 50.78 + 102 | 09 767 - 106 | 67.97 - 56 |
| 3 11.8 | 53 617 - 632 | 45 85 -181 | 32 602 - 139 | 54 00 -48 | 42 635 - 170 | 51.66 + 88 | 09 631 - 136 | 68.34 - 37 |
| 3 21.8 | 52 940 - 677 | 47 13 -128 | 32 443 - 159 | 54 24 -24 | 42 438 - 197 | 52.34 + 68 | 09 475 - 156 | 68.51 - 17 |
| 3 31.8 | 52 244 - 696 | 47 89 - 76 | 32 277 - 166 | 54 27 - 3 | 42 230 - 208 | 52.79 + 45 | 09 312 - 163 | 68.50 + 1 |
| 4 10.7 | 51 538 - 706 | 48 12 - 23 | 32 110 - 167 | 54 10 + 17 | 42 020 - 210 | 53.02 + 23 | 09 148 - 164 | 68.32 + 18 |
| 4 20.7 | 50 850 - 688 | 47 79 + 33 | 31 955 - 155 | 53 71 + 39 | 41 824 - 196 | 53.00 - 2 | 08 995 - 153 | 67.97 + 35 |
| 4 30.7 | 50 198 - 652 | 46 97 + 82 | 31 819 - 136 | 53 14 + 57 | 41 653 - 171 | 52.75 - 25 | 08 861 - 134 | 67.47 + 50 |
| 5 10.7 | 49 589 - 609 | 45 64 + 133 | 31 706 - 113 | 52 39 + 75 | 41 513 - 140 | 52.30 - 45 | 08 750 - 111 | 66.81 + 66 |
| 5 20.6 | 49 050 - 539 | 43 82 + 182 | 31 626 - 80 | 51 46 + 93 | 41 415 - 98 | 51.66 - 64 | 08 672 - 78 | 66.01 + 80 |
| 5 30.6 | 48 587 - 463 | 41 61 + 221 | 31 579 - 47 | 50 39 + 107 | 41 362 - 53 | 50.88 - 78 | 08 627 - 45 | 65.09 + 92 |
| 6 9.6 | 48 209 - 378 | 39 00 + 261 | 31 567 - 12 | 49 17 + 122 | 41 362 - 8 | 49.98 - 90 | 08 627 - 9 | 65.09 + 104 |
| 6 19.6 | 47 932 - 277 | 36 09 + 291 | 31 594 + 27 | 47 85 + 132 | 41 354 + 44 | 48.98 - 99 | 08 618 + 28 | 64.05 + 113 |
| 6 29.5 | 47 755 - 177 | 32 98 + 311 | 31 655 + 61 | 46 46 + 139 | 41 398 + 89 | 48.99 - 104 | 08 646 + 63 | 62.92 + 118 |
| 7 9.5 | 47 685 - 70 | 29 69 + 329 | 31 750 + 95 | 45 02 + 144 | 41 620 + 133 | 46.88 - 107 | 08 806 + 97 | 60.51 + 123 |
| 7 19.5 | 47 730 + 45 | 26 37 + 332 | 31 880 + 130 | 43 59 + 143 | 41 799 + 179 | 45.79 - 109 | 08 937 + 131 | 59.29 + 122 |
| 7 29.4 | 47 878 + 148 | 23 10 + 327 | 31 880 + 158 | 43 59 + 138 | 41 799 + 216 | 45.79 - 108 | 08 937 + 160 | 59.29 + 116 |
| 8 8.4 | 48 135 + 257 | 19 96 + 314 | 32 038 + 187 | 42 21 + 128 | 42 015 + 252 | 44.71 - 105 | 09 097 + 188 | 58.13 + 109 |
| 8 18.4 | 48 494 + 359 | 17 10 + 296 | 32 225 + 213 | 40 93 + 110 | 42 267 + 285 | 43.66 - 101 | 09 285 + 214 | 57.04 + 92 |
| 8 28.4 | 48 940 + 446 | 14 59 + 251 | 32 671 + 233 | 38 93 + 90 | 42 862 + 310 | 41.68 - 97 | 09 733 + 234 | 55.39 + 73 |
| 9 7.3 | 49 472 + 532 | 12 51 + 208 | 32 925 + 254 | 38 29 + 64 | 43 199 + 337 | 40.77 - 91 | 09 987 + 254 | 54.88 + 51 |
| 9 17.3 | 50 069 + 597 | 10 98 + 153 | 33 195 + 270 | 37 95 + 34 | 43 555 + 356 | 39.92 - 85 | 10 259 + 272 | 54.66 + 22 |
| 9 27.3 | 50 714 + 645 | 10 03 + 95 | 33 479 + 284 | 37 93 + 2 | 43 927 + 372 | 39.14 - 78 | 10 543 + 284 | 54.72 - 6 |
| 10 7.3 | 51 396 + 682 | 09 73 + 30 | 33 776 + 297 | 38 25 - 32 | 44 315 + 388 | 38.44 - 70 | 10 841 + 296 | 55.08 - 36 |
| 10 17.2 | 52 085 + 689 | 10 11 - 38 | 34 078 + 302 | 38 92 - 67 | 44 709 + 394 | 37.86 - 58 | 11 144 + 303 | 55.76 - 68 |
| 10 27.2 | 52 763 + 678 | 11 12 - 101 | 34 383 + 305 | 39 90 - 98 | 45 108 + 399 | 37.39 - 47 | 11 451 + 307 | 56.72 - 96 |
| 11 6.2 | 53 412 + 649 | 12 80 - 168 | 34 688 + 305 | 41 19 - 129 | 45 506 + 398 | 37.07 - 32 | 11 758 + 307 | 57.94 - 122 |
| 11 16.1 | 54 000 + 588 | 15 06 - 226 | 34 982 + 294 | 42 72 - 153 | 45 892 + 386 | 36.92 - 15 | 12 054 + 296 | 59.38 - 144 |
| 11 26.1 | 54 515 + 515 | 17 81 - 275 | 35 262 + 280 | 44 44 - 172 | 46 260 + 368 | 36.96 + 4 | 12 338 + 284 | 60.97 - 159 |
| 12 6.1 | 54 937 + 422 | 21 00 - 319 | 35 520 + 258 | 46 29 - 185 | 46 603 + 343 | 37.20 + 24 | 12 600 + 262 | 62.67 - 170 |
| 12 16.1 | 55 244 + 307 | 24 49 - 349 | 35 746 + 226 | 48 19 - 190 | 46 906 + 303 | 37.65 + 45 | 12 830 + 230 | 64.40 - 173 |
| 12 26.0 | 55 435 + 191 | 28 15 - 366 | 35 937 + 191 | 50 08 - 189 | 47 165 + 259 | 38.30 + 65 | 13 026 + 196 | 66.09 - 169 |
| 12 36.0 | 55 496 + 61 | 31 92 - 377 | 36 085 + 148 | 51 90 - 182 | 47 369 + 204 | 39.14 + 84 | 13 179 + 153 | 67.71 - 162 |
| | | | | | | | | |
| Mean Place | 52.051 | 38.07 | 33.435 | 55.40 | 43.679 | 36.52 | 10.486 | 70.93 |
| sec δ , $\tan \delta$ | +2.992 | -2.820 | +1.003 | -0.074 | +1.293 | +0.820 | +1.000 | -0.008 |
| $d\alpha(\psi)$, $d\delta(\psi)$ | -0.010 | -0.12 | +0.059 | -0.12 | +0.082 | -0.12 | +0.061 | -0.12 |
| $d\alpha(\epsilon)$, $d\delta(\epsilon)$ | -0.056 | +0.96 | -0.001 | +0.95 | +0.017 | +0.95 | -0.000 | +0.95 |
| Dble.Trans. | January 7 | | January 8 | | January 8 | | January 8 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 275 | | 1188 | | 1190 | | 278 | |
|--------------|--------------|--------------|--------------|-----------------|------------------------------|-----------------|--------------|-----------------|
| | J Puppis | | 51 Geminorum | | Groombridge 1281 (Lyncis) | | π Puppis | |
| Mag.Spect. | 4.47 | F0 | 5.31 var. | M3 | 5.55 | G0 | 2.74 | K5 |
| U.T. | R.A. | | R.A. | | R.A. | | R.A. | |
| | h | m | h | m | h | m | h | m |
| | 7 12 | | 7 12 | | 7 14 | | 7 16 | |
| | -46 43 | | +16 10 | | +47 15 | | -37 03 | |
| | ^s | ^o | ^s | ^o | ^s | ^o | ^s | ^o |
| 1 -9.0 | 11.046 | +194 55 86 | 34.704 | +227 -345 66 69 | 48.988 | +308 +250 60 41 | 39.939 | +198 +147 66 80 |
| 1 1.0 | 11.181 | +135 59 36 | 34.891 | +187 -350 66 05 | 49.238 | +187 +123 61 64 | 40.086 | +147 +147 70 07 |
| 1 11.0 | 11.252 | +71 62 85 | 35.031 | +140 -349 65 55 | 49.425 | +187 +141 63 05 | 40.178 | +92 +92 73 31 |
| 1 21.0 | 11.253 | +1 66 21 | 35.117 | +86 -336 65 20 | 49.538 | +113 +153 64 58 | 40.208 | +30 +30 76 42 |
| 1 30.9 | 11.191 | -62 69 31 | 35.152 | +35 -310 65 00 | 49.579 | +41 +159 66 17 | 40.182 | -26 -26 79 29 |
| 2 9.9 | 11.067 | -124 72 14 | 35.137 | -15 -283 64 91 | 49.550 | -29 +158 67 75 | 40.101 | -81 -81 81 89 |
| 2 19.9 | 10.886 | -181 74 58 | 35.073 | -64 -244 64 95 | 49.454 | -96 +148 69 23 | 39.968 | -133 -133 84 12 |
| 3 1.9 | 10.661 | -225 76 60 | 34.971 | -102 -202 65 06 | 49.304 | -150 +133 70 56 | 39.795 | -173 -173 85 96 |
| 3 11.8 | 10.399 | -262 78 18 | 34.836 | -135 -158 65 22 | 49.107 | -197 +112 71 68 | 39.588 | -207 -207 87 40 |
| 3 21.8 | 10.112 | -287 79 25 | 34.680 | -156 -107 65 43 | 48.880 | +84 +84 72 52 | 39.358 | -230 -230 88 38 |
| 3 31.8 | 09.815 | -297 79 84 | 34.516 | -59 -164 65 65 | 48.639 | +55 -241 73 07 | 39.118 | -240 -240 88 91 |
| 4 10.7 | 09.515 | -300 79 94 | 34.351 | -10 10 65 88 | 48.395 | +24 -244 73 31 | 38.875 | -243 -243 88 99 |
| 4 20.7 | 09.227 | -288 79 52 | 34.197 | -154 +42 66 10 | 48.164 | -8 73 23 | 38.642 | -233 -233 88 60 |
| 4 30.7 | 08.960 | -267 78 65 | 34.063 | +87 -134 66 32 | 47.961 | -203 +38 72 85 | 38.429 | -213 -213 87 80 |
| 5 10.7 | 08.719 | -241 77 31 | 33.954 | -109 +134 66 54 | 47.791 | -170 +66 72 19 | 38.239 | -190 -190 86 58 |
| 5 20.6 | 08.517 | -202 75 54 | 33.879 | -75 +177 66 77 | 47.667 | -124 -91 71 28 | 38.084 | -155 -155 84 95 |
| 5 30.6 | 08.358 | -159 73 41 | 33.840 | -39 +213 67 00 | 47.593 | -74 -111 70 17 | 37.965 | -119 -119 83 01 |
| 6 9.6 | 08.242 | -116 70 93 | 33.837 | -3 248 67 25 | 47.571 | -22 -128 68 89 | 37.885 | -80 -80 80 74 |
| 6 19.6 | 08.178 | -64 68 18 | 33.875 | +76 +275 67 51 | 47.606 | +35 -140 67 49 | 37.850 | -35 -35 78 23 |
| 6 29.5 | 08.164 | -14 65 25 | 33.951 | +38 +293 67 76 | 47.693 | +87 -148 66 01 | 37.857 | +7 +7 75 56 |
| 7 9.5 | 08.200 | +36 62 18 | 34.058 | +107 +308 67 99 | 47.832 | +139 -153 64 48 | 37.907 | +50 +50 72 75 |
| 7 19.5 | 08.289 | +89 59 10 | 34.202 | +144 +107 68 30 | 48.022 | +190 -155 62 93 | 38.002 | +95 +95 69 94 |
| 7 29.4 | 08.424 | +135 56 09 | 34.377 | +301 +175 68 55 | 48.256 | +234 -152 61 41 | 38.135 | +133 +133 67 19 |
| 8 8.4 | 08.608 | +184 53 21 | 34.582 | +288 +205 68 73 | 48.531 | +275 -148 59 93 | 38.308 | +173 +173 64 56 |
| 8 18.4 | 08.836 | +228 50 62 | 34.811 | +229 +259 68 84 | 48.845 | +314 -140 58 53 | 38.518 | +210 +210 62 20 |
| 8 28.4 | 09.102 | +266 48 36 | 35.061 | +250 +226 68 84 | 49.189 | +344 -132 57 21 | 38.759 | +241 +241 60 15 |
| 9 7.3 | 09.405 | +303 46 52 | 35.333 | +272 +184 68 73 | 49.564 | +375 -121 56 00 | 39.032 | +273 +273 58 50 |
| 9 17.3 | 09.738 | +333 45 23 | 35.621 | +288 +129 68 48 | 49.962 | +398 -109 54 91 | 39.330 | +298 +298 57 35 |
| 9 27.3 | 10.093 | +355 44 48 | 35.922 | +301 +75 68 09 | 50.379 | +417 -95 53 96 | 39.647 | +317 +317 56 71 |
| 10 7.3 | 10.467 | +374 44 34 | 36.236 | +314 +14 67 55 | 50.814 | +435 -79 53 17 | 39.981 | +334 +334 56 64 |
| 10 17.2 | 10.848 | +381 44 85 | 36.558 | +322 -51 66 88 | 51.258 | +444 -60 52 57 | 40.323 | +342 +342 57 17 |
| 10 27.2 | 11.229 | +381 45 97 | 36.883 | +325 -112 66 08 | 51.706 | +448 -41 52 16 | 40.667 | +344 +344 58 27 |
| 11 6.2 | 11.602 | +373 47 69 | 37.209 | +326 -172 65 20 | 52.153 | +447 -18 51 98 | 41.007 | +340 +340 59 92 |
| 11 16.1 | 11.952 | +350 49 96 | 37.526 | +317 -227 64 26 | 52.587 | +434 +6 52 04 | 41.331 | +324 +324 62 08 |
| 11 26.1 | 12.273 | +321 52 66 | 37.830 | +304 -270 63 31 | 53.001 | +414 +32 52 36 | 41.632 | +301 +301 64 65 |
| 12 6.1 | 12.555 | +282 55 77 | 38.113 | +283 -311 62 38 | 53.386 | +385 +58 52 94 | 41.903 | +271 +271 67 58 |
| 12 16.1 | 12.785 | +230 59 13 | 38.364 | +251 -336 61 53 | 53.726 | +340 +84 53 78 | 42.131 | +228 +228 70 73 |
| 12 26.0 | 12.961 | +176 62 62 | 38.580 | +216 -349 60 79 | 54.017 | +291 +106 54 84 | 42.313 | +182 +182 74 00 |
| 12 36.0 | 13.073 | +112 66 18 | 38.750 | +170 -356 60 17 | 54.245 | +228 +129 56 13 | 42.441 | +128 +128 77 31 |
| | | +45 -347 | | +121 -47 | | +160 +143 | | +69 -322 |
| Mean Place | 10.510 | 71.32 | 35.787 | 57.49 | 50.116 | 54.04 | 39.944 | 82.00 |
| sec δ, tan δ | +1.459 | -1.063 | +1.041 | +0.290 | +1.474 | +1.082 | +1.253 | -0.756 |
| dα(ψ), dδ(ψ) | +0.034 | -0.12 | +0.068 | -0.12 | +0.088 | -0.13 | +0.042 | -0.13 |
| dα(ε), dδ(ε) | -0.022 | +0.95 | +0.006 | +0.95 | +0.023 | +0.95 | -0.017 | +0.94 |
| Dbles.Trans. | January 8 | | January 8 | | January 9 | | January 9 | |

APPARENT PLACES OF STARS, 1986

115

AT UPPER TRANSIT AT GREENWICH

| No. | 281 | | 276 | | 277 | | 279 | | | |
|--------------|------------|--------------|------------|--------|-------------|------------|--------------|-----------|-------------|-----------|
| | δ Volantis | | 64 Aurigae | | λ Geminorum | | δ Geminorum* | | | |
| Mag.Spect. | 4.02 | F5 | 5.75 | A3 | 3.65 | A2 | 3.52 | F0 | | |
| U.T. | R.A. | | R.A. | | R.A. | | R.A. | | | |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " | | |
| | 7 16 | -67 55 | 7 17 | +40 54 | 7 17 | +16 33 | 7 19 | +22 00 | | |
| 1 | -8.9 | 53 56.4 +242 | 40.22 | -360 | 04.812 +287 | 36.78 +66 | 17.959 +231 | 65.03 -76 | 17.912 +242 | 37.44 -46 |
| 1 | 1.0 | 53 69.6 +132 | 43.93 | -371 | 05.047 +235 | 37.63 +85 | 18.150 +191 | 64.39 -64 | 18.112 +200 | 37.13 -31 |
| 1 | 11.0 | 53 71.5 +19 | 47.67 | -374 | 05.224 +177 | 38.66 +103 | 18.295 +145 | 63.90 -49 | 18.264 +152 | 36.98 -15 |
| 1 | 21.0 | 53 61.4 -101 | 51.31 | -364 | 05.334 +110 | 39.83 +117 | 18.386 +91 | 63.56 -34 | 18.361 +97 | 36.98 +0 |
| 1 | 30.9 | 53 40.4 -210 | 54.74 | -343 | 05.381 +47 | 41.08 +125 | 18.425 +39 | 63.38 -18 | 18.405 +44 | 37.12 +14 |
| 2 | 9.9 | 53 09.2 -312 | 57.91 | -317 | 05.362 -19 | 42.35 +127 | 18.413 -12 | 63.31 -7 | 18.396 -9 | 37.36 +24 |
| 2 | 19.9 | 52 68.5 -407 | 60.69 | -278 | 05.283 -79 | 43.57 +122 | 18.353 -60 | 63.37 +6 | 18.336 -60 | 37.69 +33 |
| 3 | 1.9 | 52 20.5 -480 | 63.05 | -236 | 05.154 -129 | 44.68 +111 | 18.253 -100 | 63.50 +13 | 18.235 -101 | 38.05 +36 |
| 3 | 11.8 | 51 66.3 -542 | 64.96 | -191 | 04.984 -170 | 45.65 +97 | 18.121 -132 | 63.69 +19 | 18.100 -135 | 38.43 +38 |
| 3 | 21.8 | 51 07.8 -585 | 66.35 | -139 | 04.784 -200 | 46.40 +75 | 17.967 -154 | 63.92 +23 | 17.942 -158 | 38.79 +36 |
| 3 | 31.8 | 50 47.2 -606 | 67.22 | -87 | 04.572 -212 | 46.93 +53 | 17.803 -164 | 64.15 +23 | 17.774 -168 | 39.11 +32 |
| 4 | 10.8 | 49 85.6 -616 | 67.56 | -34 | 04.357 -215 | 47.20 +27 | 17.637 -166 | 64.39 +24 | 17.603 -171 | 39.37 +26 |
| 4 | 20.7 | 49 25.3 -603 | 67.34 | +22 | 04.154 -203 | 47.22 +2 | 17.482 -155 | 64.63 +24 | 17.443 -160 | 39.57 +20 |
| 4 | 30.7 | 48 67.9 -574 | 66.62 | +72 | 03.976 -178 | 46.99 -23 | 17.347 -135 | 64.85 +22 | 17.302 -141 | 39.70 +13 |
| 5 | 10.7 | 48 14.3 -536 | 65.39 | +123 | 03.827 -149 | 46.53 -46 | 17.236 -111 | 65.07 +22 | 17.187 -115 | 39.78 +8 |
| 5 | 20.6 | 47 66.7 -476 | 63.67 | +172 | 03.720 -107 | 45.87 -66 | 17.158 -78 | 65.29 +22 | 17.106 -81 | 39.81 +3 |
| 5 | 30.6 | 47 25.7 -410 | 61.54 | +213 | 03.658 -62 | 45.04 -83 | 17.116 -42 | 65.50 +21 | 17.062 -44 | 39.80 -1 |
| 6 | 9.6 | 46 92.0 -337 | 59.01 | +253 | 03.642 -16 | 44.08 -96 | 17.110 -6 | 65.73 +23 | 17.055 -7 | 39.76 -4 |
| 6 | 19.6 | 46 67.3 -247 | 56.16 | +285 | 03.677 +35 | 43.01 -107 | 17.145 +35 | 65.96 +23 | 17.090 +35 | 39.70 -6 |
| 6 | 29.5 | 46 51.3 -160 | 53.09 | +307 | 03.759 +82 | 41.89 -112 | 17.216 +71 | 66.19 +23 | 17.163 +73 | 39.62 -8 |
| 7 | 9.5 | 46 44.7 -66 | 49.83 | +326 | 03.886 +127 | 40.71 -118 | 17.321 +105 | 66.37 +18 | 17.294 +131 | 39.45 -17 |
| 7 | 19.5 | 46 48.2 +35 | 46.53 | +330 | 04.059 -120 | 39.51 -120 | 17.460 +139 | 66.64 +27 | 17.411 +117 | 39.44 -1 |
| 7 | 29.5 | 46 60.8 +126 | 43.26 | +327 | 04.271 +212 | 38.31 -120 | 17.632 +172 | 66.85 +21 | 17.590 +179 | 39.30 -14 |
| 8 | 8.4 | 46 83.0 +222 | 40.11 | +315 | 04.521 +250 | 37.14 -117 | 17.833 +201 | 66.99 +14 | 17.797 +207 | 39.13 -17 |
| 8 | 18.4 | 47 14.4 +314 | 37.21 | +290 | 04.804 +283 | 36.00 -114 | 18.059 +226 | 67.05 +6 | 18.031 +234 | 38.90 -23 |
| 8 | 28.4 | 47 53.6 +392 | 34.66 | +255 | 05.115 +311 | 34.92 -108 | 18.307 +248 | 67.01 -4 | 18.286 +255 | 38.61 -29 |
| 9 | 7.3 | 48 00.5 +469 | 32.52 | +214 | 05.452 +337 | 33.89 -103 | 18.576 +269 | 66.86 -15 | 18.564 +278 | 38.24 -37 |
| 9 | 17.3 | 48 53.5 +530 | 30.93 | +159 | 05.812 +360 | 32.93 -96 | 18.862 +286 | 66.57 -29 | 18.859 +295 | 37.78 -46 |
| 9 | 27.3 | 49 11.0 +575 | 29.91 | +102 | 06.189 +377 | 32.06 -87 | 19.162 +300 | 66.15 -42 | 19.170 +311 | 37.23 -55 |
| 10 | 7.3 | 49 72.2 +612 | 29.52 | +39 | 06.583 +394 | 31.28 -78 | 19.477 +315 | 65.57 -58 | 19.494 +324 | 36.59 -64 |
| 10 | 17.2 | 50 34.5 +623 | 29.83 | -31 | 06.985 +402 | 30.62 -66 | 19.798 +321 | 64.87 -70 | 19.827 +333 | 35.87 -72 |
| 10 | 27.2 | 50 96.3 +618 | 30.77 | -94 | 07.392 +407 | 30.10 -52 | 20.125 +327 | 64.05 -82 | 20.165 +338 | 35.10 -77 |
| 11 | 6.2 | 51 56.0 +597 | 32.38 | -161 | 07.800 +408 | 29.75 -35 | 20.452 +327 | 63.14 -91 | 20.504 +339 | 34.29 -81 |
| 11 | 16.2 | 52 107 +547 | 34.59 | -221 | 08.197 +397 | 29.58 -17 | 20.772 +320 | 62.18 -96 | 20.835 +331 | 33.50 -79 |
| 11 | 26.1 | 52 59.3 +486 | 37.29 | -270 | 08.578 +381 | 29.62 +4 | 21.079 +307 | 61.22 -96 | 21.154 +319 | 32.74 -76 |
| 12 | 6.1 | 53 00.1 +408 | 40.45 | -316 | 08.933 +355 | 29.88 +26 | 21.365 +286 | 60.29 -93 | 21.452 +298 | 32.06 -68 |
| 12 | 16.1 | 53 30.8 +307 | 43.93 | -348 | 09.248 +315 | 30.36 +48 | 21.620 +255 | 59.43 -86 | 21.718 +266 | 31.50 -56 |
| 12 | 26.0 | 53 51.4 +206 | 47.60 | -367 | 09.519 +271 | 31.06 +70 | 21.840 +220 | 58.69 -74 | 21.948 +230 | 31.07 -43 |
| 12 | 36.0 | 53 60.5 +91 | 51.38 | -378 | 09.735 +216 | 31.96 +90 | 22.015 +175 | 58.08 -61 | 22.132 +184 | 30.79 -28 |
| | | 53 60.5 -28 | 51.38 | -373 | 09.735 +152 | 31.96 +106 | 22.015 +125 | 58.08 -46 | 22.132 +132 | 30.79 -12 |
| Mean Place | 50.409 | 57.66 | 05.969 | 30.02 | 19.047 | 55.76 | 19.037 | 28.75 | | |
| sec δ, tan δ | +2.662 | -2.467 | +1.323 | +0.866 | +1.043 | +0.297 | +1.079 | +0.404 | | |
| dα(ψ), dδ(ψ) | -0.001 | -0.13 | +0.083 | -0.13 | +0.069 | -0.13 | +0.071 | -0.13 | | |
| dα(ε), dδ(ε) | -0.054 | +0.94 | +0.019 | +0.94 | +0.007 | +0.94 | +0.009 | +0.94 | | |
| Dble.Trans. | January 10 | | January 10 | | January 10 | | January 10 | | | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 280 | | 1191 | | 283 | | 1192 | | |
|--------------|---------------|-------------|------------|-------------|-----------------|-------------|-------------------|-------------|------------|
| | 19 Lyncis* f. | | 66 Aurigae | | η Canis Majoris | | 169 G. Canis Maj. | | |
| Mag.Spect. | 5.61 | B8 | 5.28 | K0 | 2.43 | B5p | 5.82 | F0 | |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | |
| | h m | ° ' | h m | ° ' | h m | ° ' | h m | ° ' | |
| | 7 21 | +55 18 | 7 23 | +40 41 | 7 23 | -29 16 | 7 24 | -13 43 | |
| 1 | -8.9 | 45.132 +362 | 34.19 +139 | 11.309 +292 | 63.99 +60 | 33.317 +205 | 19.56 -299 | 30.377 +210 | 16.38 -238 |
| 1 | 1.0 | 45.426 +294 | 35.82 +163 | 11.551 +242 | 64.80 +81 | 33.477 +160 | 22.58 -302 | 30.545 +168 | 18.73 -235 |
| 1 | 11.0 | 45.646 +220 | 37.65 +183 | 11.736 +185 | 65.79 +99 | 33.585 +108 | 25.57 -289 | 30.669 +124 | 21.02 -229 |
| 1 | 21.0 | 45.779 +133 | 39.62 +197 | 11.854 +118 | 66.93 +114 | 33.638 +53 | 28.42 -285 | 30.740 +71 | 23.15 -213 |
| 1 | 30.9 | 45.829 +50 | 41.62 +200 | 11.908 +54 | 68.16 +123 | 33.636 -2 | 31.04 -262 | 30.762 +22 | 25.07 -192 |
| 2 | 9.9 | 45.794 -35 | 43.60 +198 | 11.897 -11 | 69.43 +127 | 33.583 -53 | 33.42 -238 | 30.735 -27 | 26.77 -170 |
| 2 | 19.9 | 45.680 -114 | 45.46 +186 | 11.824 -73 | 70.67 +124 | 33.480 -103 | 35.45 -203 | 30.661 -74 | 28.19 -142 |
| 3 | 1.9 | 45.501 -179 | 47.10 +164 | 11.702 -122 | 71.81 +114 | 33.338 -142 | 37.13 -168 | 30.550 -111 | 29.32 -113 |
| 3 | 11.8 | 45.265 -236 | 48.49 +139 | 11.536 -166 | 72.80 +99 | 33.163 -175 | 38.44 -131 | 30.408 -142 | 30.16 -84 |
| 3 | 21.8 | 44.991 -274 | 49.54 +105 | 11.341 -195 | 73.60 +80 | 32.965 -198 | 39.33 -89 | 30.244 -164 | 30.69 -53 |
| 3 | 31.8 | 44.698 -293 | 50.22 +68 | 11.132 -209 | 74.17 +57 | 32.757 -208 | 39.82 -49 | 30.071 -173 | 30.93 -24 |
| 4 | 10.8 | 44.398 -300 | 50.53 +31 | 10.918 -214 | 74.49 +32 | 32.546 -211 | 39.90 -8 | 29.894 -177 | 30.89 +4 |
| 4 | 20.7 | 44.111 -287 | 50.43 -10 | 11.824 -203 | 74.55 +6 | 32.343 -203 | 39.57 +33 | 29.726 -168 | 30.54 +35 |
| 4 | 30.7 | 43.854 -257 | 49.97 -46 | 10.715 -203 | 74.55 -18 | 32.343 -203 | 39.57 +71 | 29.726 -150 | 30.54 +61 |
| 5 | 10.7 | 43.632 -222 | 49.16 -81 | 10.535 -152 | 74.37 -41 | 32.157 -164 | 38.86 +108 | 29.576 -130 | 29.93 +87 |
| 5 | 20.6 | 43.464 -168 | 48.02 -114 | 10.272 -111 | 73.34 -62 | 31.861 -132 | 36.33 +145 | 29.346 -100 | 27.94 +112 |
| 5 | 30.6 | 43.352 -112 | 46.63 -139 | 10.205 -67 | 72.54 -80 | 31.762 -99 | 34.60 +173 | 29.279 -67 | 26.61 +133 |
| 6 | 9.6 | 43.301 -51 | 45.02 -161 | 10.183 -22 | 71.60 -94 | 31.699 -63 | 32.58 +202 | 29.244 -35 | 25.08 +153 |
| 6 | 19.6 | 43.316 +15 | 43.24 -178 | 10.211 +28 | 70.55 -105 | 31.677 -22 | 30.33 +225 | 29.248 +4 | 23.40 +168 |
| 6 | 29.5 | 43.393 +77 | 41.36 -188 | 10.286 +75 | 69.43 -112 | 31.693 +16 | 27.93 +240 | 29.286 +38 | 21.62 +178 |
| 7 | 9.5 | 43.532 +139 | 39.39 -197 | 10.406 +120 | 68.26 -117 | 31.747 +54 | 25.41 +252 | 29.359 +73 | 19.76 +186 |
| 7 | 19.5 | 43.734 +202 | 37.42 -197 | 10.571 +165 | 67.04 -122 | 31.842 +95 | 22.88 +253 | 29.466 +107 | 17.90 +186 |
| 7 | 29.5 | 43.987 +253 | 35.47 -195 | 10.775 +204 | 65.83 -121 | 31.972 +130 | 20.40 +248 | 29.604 +138 | 16.10 +180 |
| 8 | 8.4 | 44.293 +306 | 33.56 -191 | 11.016 +241 | 64.62 -121 | 32.137 +165 | 18.04 +216 | 29.772 +168 | 14.39 +171 |
| 8 | 18.4 | 44.646 +353 | 31.77 -179 | 11.293 +277 | 63.45 -117 | 32.335 +198 | 15.92 +197 | 29.969 +197 | 12.89 +150 |
| 8 | 28.4 | 45.037 +391 | 30.09 -168 | 11.596 +303 | 62.32 -113 | 32.561 +226 | 14.08 +184 | 30.188 +219 | 11.62 +127 |
| 9 | 7.3 | 45.467 +430 | 28.56 -153 | 11.928 +332 | 61.23 -109 | 32.816 +255 | 12.60 +148 | 30.432 +244 | 10.66 +96 |
| 9 | 17.3 | 45.927 +460 | 27.22 -134 | 12.283 +355 | 60.22 -101 | 33.093 +277 | 11.59 +101 | 30.695 +263 | 10.06 +60 |
| 9 | 27.3 | 46.411 +484 | 26.07 -115 | 12.655 +372 | 59.28 -94 | 33.390 +297 | 11.05 +54 | 30.975 +280 | 09.84 +22 |
| 10 | 7.3 | 46.918 +507 | 25.15 -92 | 13.046 +391 | 58.43 -85 | 33.703 +313 | 11.03 +2 | 31.269 +294 | 10.05 -21 |
| 10 | 17.2 | 47.436 +518 | 24.49 -66 | 13.447 +401 | 57.70 -73 | 34.026 +323 | 11.57 -54 | 31.573 +304 | 10.69 -64 |
| 10 | 27.2 | 47.960 +524 | 24.10 -39 | 13.853 +406 | 57.10 -60 | 34.352 +326 | 12.62 -105 | 31.881 +308 | 11.72 -103 |
| 11 | 6.2 | 48.485 +525 | 24.01 -9 | 14.262 +409 | 56.67 -43 | 34.678 +326 | 14.19 -157 | 32.190 +309 | 13.16 -144 |
| 11 | 16.2 | 48.993 +508 | 24.24 +23 | 14.661 +399 | 56.43 -24 | 34.991 +313 | 16.22 -203 | 32.490 +300 | 14.93 -177 |
| 11 | 26.1 | 49.479 +486 | 24.78 +54 | 15.044 +383 | 56.39 -4 | 35.286 +295 | 18.62 -240 | 32.777 +287 | 16.96 -203 |
| 12 | 6.1 | 49.931 +452 | 25.65 +87 | 15.403 +359 | 56.58 +19 | 35.556 +270 | 21.35 -273 | 33.042 +265 | 19.21 -225 |
| 12 | 16.1 | 50.330 +399 | 26.83 +118 | 15.724 +321 | 57.01 +43 | 35.788 +232 | 24.28 -293 | 33.275 +233 | 21.58 -237 |
| 12 | 26.0 | 50.672 +342 | 28.28 +145 | 16.001 +277 | 57.65 +64 | 35.980 +192 | 27.30 -302 | 33.473 +198 | 23.98 -240 |
| 12 | 36.0 | 50.941 +269 | 29.98 +170 | 16.224 +223 | 58.51 +86 | 36.122 +142 | 30.37 -307 | 33.627 +154 | 26.36 -238 |
| | | 50.972 +187 | 29.98 +186 | 16.224 +160 | 58.51 +103 | 36.122 +88 | 30.37 -296 | 33.627 +104 | 26.36 -225 |
| Mean Place | 46.156 | 28.63 | 12.467 | 57.23 | 33.642 | 34.64 | 31.084 | 29.66 | |
| sec δ, tan δ | +1.757 | +1.445 | +1.319 | +0.860 | +1.146 | -0.561 | +1.029 | -0.244 | |
| da(ψ), dδ(ψ) | +0.097 | -0.14 | +0.082 | -0.14 | +0.047 | -0.14 | +0.055 | -0.14 | |
| da(ε), dδ(ε) | +0.034 | +0.94 | +0.020 | +0.93 | -0.013 | +0.93 | -0.006 | +0.93 | |
| Dble.Trans. | January 11 | | January 11 | | January 11 | | January 11 | | |

APPARENT PLACES OF STARS, 1986

117

AT UPPER TRANSIT AT GREENWICH

| No. | 282 | | 285 | | 286 | | 1194 | |
|---------------------|---------------------------|-----------------------------|---------------------------|-----------------------------|---------------------------|-----------------------------|---------------------------|-----------------------------|
| Name | ι Geminorum | | β Canis Minoris | | ρ Geminorum | | σ Puppis | |
| Mag. Spect. | 3.89 | K0 | 3.09 | B8 | 4.18 | F0 | 3.28 | K5 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | ^h ^m | ^o / ['] | ^h ^m | ^o / ['] | ^h ^m | ^o / ['] | ^h ^m | ^o / ['] |
| | 7 24 | + 27 49 | 7 26 | + 8 19 | 7 28 | + 31 48 | 7 28 | - 43 15 |
| 1 ^d -8.9 | ^s 52.199 + 259 | 40.72 - 16 | ^s 24.097 + 229 | 12.61 - 127 | ^s 13.473 + 271 | " + 6 | ^s 48.370 + 215 | 68.38 - 336 |
| 1 1.0 | 52.414 + 215 | 40.74 + 2 | 24.287 + 190 | 11.44 - 117 | 13.699 + 226 | + 26 | 48.530 + 160 | 71.82 - 344 |
| 1 11.0 | 52.579 + 165 | 40.94 + 20 | 24.432 + 145 | 10.40 - 104 | 13.874 + 175 | + 43 | 48.630 + 100 | 75.27 - 345 |
| 1 21.0 | 52.687 + 108 | 41.29 + 35 | 24.526 + 94 | 09.52 - 88 | 13.989 + 115 | + 60 | 48.664 + 34 | 78.61 - 334 |
| 1 30.9 | 52.739 + 52 | 41.76 + 47 | 24.570 + 44 | 08.82 - 70 | 14.046 + 57 | + 72 | 48.636 - 28 | 81.73 - 312 |
| 2 9.9 | 52.735 - 4 | 42.33 + 57 | 24.563 - 7 | 08.28 - 54 | 14.045 - 1 | + 80 | 48.548 - 88 | 84.60 - 287 |
| 2 19.9 | 52.677 - 58 | 42.95 + 62 | 24.509 - 54 | 07.92 - 36 | 13.988 - 57 | + 83 | 48.403 - 145 | 87.11 - 251 |
| 3 1.9 | 52.576 - 101 | 43.57 + 62 | 24.417 - 92 | 07.70 - 22 | 13.886 - 102 | + 80 | 48.214 - 189 | 89.22 - 211 |
| 3 11.8 | 52.438 - 138 | 44.16 + 59 | 24.292 - 125 | 07.61 - 9 | 13.744 - 142 | + 75 | 47.987 - 227 | 90.92 - 170 |
| 3 21.8 | 52.275 - 163 | 44.68 + 52 | 24.144 - 148 | 07.64 + 3 | 13.575 - 169 | + 64 | 47.733 - 254 | 92.14 - 122 |
| 3 31.8 | 52.099 - 176 | 45.10 + 42 | 23.987 - 157 | 07.77 + 13 | 13.393 - 182 | + 49 | 47.466 - 267 | 92.89 - 75 |
| 4 10.8 | 51.920 - 179 | 45.40 + 30 | 23.825 - 162 | 07.98 + 21 | 13.207 - 186 | + 35 | 47.192 - 274 | 93.17 - 28 |
| 4 20.7 | 51.751 - 169 | 45.58 + 18 | 23.673 - 152 | 08.27 + 29 | 13.030 - 177 | + 17 | 46.927 - 265 | 92.94 + 23 |
| 4 30.7 | 51.601 - 150 | 45.63 + 5 | 23.538 - 135 | 08.63 + 36 | 12.872 - 158 | + 1 | 46.679 - 248 | 92.27 + 67 |
| 5 10.7 | 51.476 - 125 | 45.58 - 5 | 23.425 - 113 | 09.06 + 43 | 12.741 - 131 | - 14 | 46.453 - 226 | 91.14 + 113 |
| 5 20.6 | 51.387 - 89 | 45.41 - 17 | 23.342 - 83 | 09.56 + 50 | 12.644 - 97 | - 28 | 46.261 - 192 | 89.57 + 157 |
| 5 30.6 | 51.334 - 53 | 45.16 - 25 | 23.293 - 49 | 10.10 + 54 | 12.587 - 57 | + 35 | 46.107 - 154 | 87.65 + 192 |
| 6 9.6 | 51.321 - 13 | 44.84 - 32 | 23.277 - 16 | 10.71 + 61 | 12.569 - 18 | - 50 | 45.992 - 115 | 85.36 + 229 |
| 6 19.6 | 51.351 + 30 | 44.47 - 37 | 23.300 + 23 | 11.35 + 64 | 12.597 + 28 | - 58 | 45.925 - 67 | 82.80 + 256 |
| 6 29.5 | 51.421 + 70 | 44.06 - 41 | 23.357 + 57 | 12.02 + 67 | 12.665 + 68 | - 62 | 45.902 - 23 | 80.04 + 276 |
| 7 9.5 | 51.529 + 108 | 43.67 - 39 | 23.447 + 90 | 12.70 + 68 | 12.773 + 108 | - 66 | 45.925 + 23 | 77.12 + 292 |
| 7 19.5 | 51.670 + 141 | 43.16 - 51 | 23.571 + 124 | 13.37 + 67 | 12.919 + 146 | - 72 | 45.998 + 73 | 74.16 + 296 |
| 7 29.5 | 51.849 + 179 | 42.64 - 52 | 23.725 + 154 | 14.01 + 64 | 13.101 + 182 | - 75 | 46.114 + 116 | 71.24 + 292 |
| 8 8.4 | 52.060 + 211 | 42.11 - 53 | 23.907 + 182 | 14.58 + 57 | 13.316 + 215 | - 76 | 46.274 + 160 | 68.43 + 281 |
| 8 18.4 | 52.300 + 240 | 41.56 - 55 | 24.116 + 209 | 15.02 + 44 | 13.563 + 247 | - 77 | 46.478 + 204 | 65.86 + 257 |
| 8 28.4 | 52.562 + 262 | 40.97 - 59 | 24.346 + 230 | 15.32 + 30 | 13.833 + 270 | - 79 | 46.718 + 240 | 63.60 + 226 |
| 9 7.3 | 52.849 + 287 | 40.34 - 63 | 24.598 + 252 | 15.45 + 13 | 14.129 + 296 | - 80 | 46.996 + 278 | 61.73 + 187 |
| 9 17.3 | 53.155 + 306 | 39.66 - 68 | 24.869 + 271 | 15.36 - 9 | 14.446 + 317 | - 81 | 47.303 + 307 | 60.37 + 136 |
| 9 27.3 | 53.477 + 322 | 38.95 - 71 | 25.154 + 285 | 15.07 - 29 | 14.779 + 333 | - 82 | 47.635 + 332 | 59.53 + 84 |
| 10 7.3 | 53.816 + 339 | 38.20 - 75 | 25.455 + 301 | 14.56 - 51 | 15.130 + 351 | - 81 | 47.989 + 354 | 59.28 + 25 |
| 10 17.2 | 54.163 + 347 | 37.44 - 76 | 25.764 + 309 | 13.82 - 74 | 15.491 + 361 | - 78 | 48.354 + 365 | 59.66 - 38 |
| 10 27.2 | 54.517 + 354 | 36.68 - 76 | 26.080 + 316 | 12.88 - 94 | 15.859 + 368 | - 75 | 48.722 + 368 | 60.64 - 98 |
| 11 6.2 | 54.873 + 356 | 35.95 - 73 | 26.398 + 318 | 11.77 - 111 | 16.229 + 370 | - 67 | 49.089 + 367 | 62.21 - 157 |
| 11 16.2 | 55.221 + 348 | 35.29 - 66 | 26.709 + 311 | 10.52 - 125 | 16.592 + 363 | - 56 | 49.438 + 349 | 64.34 - 213 |
| 11 26.1 | 55.558 + 337 | 34.72 - 57 | 27.009 + 300 | 09.20 - 132 | 16.943 + 351 | - 43 | 49.765 + 327 | 66.91 - 257 |
| 12 6.1 | 55.873 + 315 | 34.28 - 44 | 27.290 + 281 | 07.83 - 137 | 17.273 + 330 | - 27 | 50.058 + 293 | 69.90 - 299 |
| 12 16.1 | 56.156 + 283 | 34.00 - 28 | 27.542 + 252 | 06.50 - 133 | 17.569 + 296 | - 8 | 50.306 + 248 | 73.15 - 325 |
| 12 26.0 | 56.402 + 246 | 33.88 - 12 | 27.760 + 218 | 05.24 - 126 | 17.827 + 258 | + 10 | 50.504 + 198 | 76.57 - 342 |
| 12 36.0 | 56.601 + 199 | 33.94 + 6 | 27.935 + 175 | 04.08 - 116 | 18.036 + 209 | + 30 | 50.643 + 139 | 80.07 - 350 |
| | + 144 | + 23 | + 127 | - 100 | + 153 | + 47 | + 75 | - 344 |
| Mean Place | 53.349 | 32.58 | 25.127 | 02.05 | 14.644 | 43.32 | 48.146 | 85.34 |
| sec δ, tan δ | +1.131 | +0.528 | +1.011 | +0.146 | +1.177 | +0.620 | +1.373 | -0.941 |
| da(ψ), dδ(ψ) | +0.074 | -0.14 | +0.065 | -0.15 | +0.076 | -0.15 | +0.038 | -0.15 |
| da(ε), dδ(ε) | +0.013 | +0.93 | +0.004 | +0.93 | +0.016 | +0.93 | -0.024 | +0.93 |
| Dble. Trans. | January 12 | | January 12 | | January 12 | | January 13 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 1193 | | 284 | | 288 | | 287 | | |
|--------------|-----------------|-------------|-----------------------------------|-------------|---------------|-------------|----------------------------|-------------|-----------|
| | 6 Canis Minoris | | Groombridge 1308 (Camelopardi) | | 108 G. Puppis | | α Geminorum A* (Castor) | | |
| Mag.Spect. | 4.85 | K0 | 5.80 | K0 | 4.52 | F8 | 1.99 | A0 | |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " | |
| | 7 29 | +12 02 | 7 29 | +68 29 | 7 33 | -22 15 | 7 33 | +31 55 | |
| 1 | -8.9 | 01.657 +236 | 16.97 -108 | 28.356 +526 | 45.32 +194 | 27.918 +216 | 44.32 -274 | 43.106 +276 | 15.41 +3 |
| 1 | 1.0 | 01.854 +197 | 16.02 -95 | 28.780 +424 | 47.53 +221 | 28.090 +172 | 47.08 -276 | 43.337 +231 | 15.63 +22 |
| 1 | 11.0 | 02.005 +151 | 15.20 -82 | 29.091 +311 | 49.97 +244 | 28.216 +126 | 49.80 -272 | 43.517 +180 | 16.04 +41 |
| 1 | 21.0 | 02.105 +100 | 14.55 -65 | 29.271 +180 | 52.55 +258 | 28.287 +71 | 52.38 -258 | 43.638 +121 | 16.62 +58 |
| 1 | 31.0 | 02.153 +48 | 14.06 -49 | 29.325 +54 | 55.15 +260 | 28.307 +20 | 54.75 -237 | 43.700 +62 | 17.33 +71 |
| 2 | 9.9 | 02.151 -2 | 13.73 -33 | 29.253 -72 | 57.70 +255 | 28.276 -31 | 56.89 -214 | 43.704 +4 | 18.13 +80 |
| 2 | 19.9 | 02.100 -51 | 13.55 -18 | 29.058 -195 | 60.06 +236 | 28.197 -79 | 58.72 -183 | 43.651 -53 | 18.97 +84 |
| 3 | 1.9 | 02.010 -90 | 13.50 -5 | 28.764 -294 | 62.14 +208 | 28.079 -118 | 60.22 -150 | 43.553 -98 | 19.79 +82 |
| 3 | 11.8 | 01.887 -123 | 13.54 +4 | 28.383 -381 | 63.89 +175 | 27.927 -152 | 61.39 -117 | 43.414 -139 | 20.56 +77 |
| 3 | 21.8 | 01.740 -147 | 13.68 +14 | 27.937 -446 | 65.20 +131 | 27.752 -175 | 62.18 -79 | 43.247 -167 | 21.22 +66 |
| 3 | 31.8 | 01.582 -158 | 13.87 +19 | 27.459 -478 | 66.05 +85 | 27.566 -186 | 62.62 -44 | 43.066 -181 | 21.74 +52 |
| 4 | 10.8 | 01.420 -162 | 14.11 +24 | 26.964 -495 | 66.41 +36 | 27.376 -190 | 62.72 -10 | 42.879 -187 | 22.11 +37 |
| 4 | 20.7 | 01.266 -154 | 14.39 +28 | 26.484 -480 | 66.27 -14 | 27.192 -184 | 62.43 +29 | 42.700 -179 | 22.31 +20 |
| 4 | 30.7 | 01.131 -135 | 14.70 +31 | 26.041 -443 | 65.65 -62 | 27.024 -168 | 61.83 +60 | 42.541 -159 | 22.34 +3 |
| 5 | 10.7 | 01.016 -115 | 15.05 +35 | 25.647 -394 | 64.59 -106 | 26.876 -148 | 60.90 +93 | 42.405 -136 | 22.22 -12 |
| 5 | 20.7 | 00.933 -83 | 15.42 +37 | 25.329 -318 | 63.11 -148 | 26.756 -120 | 59.64 +126 | 42.305 -100 | 21.94 -28 |
| 5 | 30.6 | 00.883 -50 | 15.82 +40 | 25.094 -235 | 61.30 -181 | 26.669 -87 | 58.14 +150 | 42.243 -62 | 21.54 -40 |
| 6 | 9.6 | 00.867 -16 | 16.26 +44 | 24.947 -147 | 59.19 -211 | 26.615 -54 | 56.37 +177 | 42.220 -23 | 21.03 -51 |
| 6 | 19.6 | 00.889 +22 | 16.71 +45 | 24.902 -45 | 56.86 -233 | 26.598 -17 | 54.41 +196 | 42.241 +21 | 20.44 -59 |
| 6 | 29.5 | 00.947 +58 | 17.16 +45 | 24.952 +50 | 54.39 -247 | 26.618 +20 | 52.31 +210 | 42.303 +62 | 19.80 -64 |
| 7 | 9.5 | 01.038 +91 | 17.61 +45 | 25.100 +148 | 51.81 -258 | 26.673 +55 | 50.11 +220 | 42.404 +101 | 19.11 -69 |
| 7 | 19.5 | 01.162 +124 | 18.06 +45 | 25.346 +246 | 49.21 -260 | 26.765 +92 | 47.88 +223 | 42.544 +140 | 18.36 -75 |
| 7 | 29.5 | 01.317 +155 | 18.49 +43 | 25.678 +332 | 46.65 -256 | 26.889 +124 | 45.71 +217 | 42.719 +175 | 17.57 -79 |
| 8 | 8.4 | 01.502 +185 | 18.84 +35 | 26.094 +416 | 44.15 -250 | 27.046 +157 | 43.64 +207 | 42.929 +210 | 16.77 -80 |
| 8 | 18.4 | 01.713 +211 | 19.08 +24 | 26.590 +496 | 41.80 -235 | 27.235 +189 | 41.77 +187 | 43.169 +240 | 15.94 -83 |
| 8 | 28.4 | 01.945 +232 | 19.20 +12 | 27.149 +559 | 39.63 -217 | 27.449 +214 | 40.17 +160 | 43.435 +266 | 15.11 -83 |
| 9 | 7.4 | 02.200 +255 | 19.17 -3 | 27.772 +623 | 37.67 -196 | 27.690 +241 | 38.89 +128 | 43.726 +291 | 14.25 -86 |
| 9 | 17.3 | 02.473 +273 | 18.95 -22 | 28.447 +675 | 35.98 -169 | 27.954 +264 | 38.03 +86 | 44.039 +313 | 13.38 -87 |
| 9 | 27.3 | 02.762 +289 | 18.57 -38 | 29.161 +714 | 34.57 -141 | 28.236 +282 | 37.60 +43 | 44.369 +330 | 12.50 -88 |
| 10 | 7.3 | 03.067 +305 | 17.99 -58 | 29.913 +752 | 33.49 -108 | 28.537 +301 | 37.65 -5 | 44.718 +349 | 11.63 -87 |
| 10 | 17.2 | 03.380 +313 | 17.22 -77 | 30.683 +770 | 32.79 -70 | 28.847 +310 | 38.20 -55 | 45.078 +360 | 10.78 -85 |
| 10 | 27.2 | 03.701 +321 | 16.30 -92 | 31.462 +779 | 32.44 -35 | 29.164 +317 | 39.22 -102 | 45.445 +367 | 09.98 -80 |
| 11 | 6.2 | 04.024 +323 | 15.24 -106 | 32.240 +778 | 32.51 +7 | 29.482 +318 | 40.71 -149 | 45.816 +371 | 09.25 -73 |
| 11 | 16.2 | 04.341 +317 | 14.08 -116 | 32.993 +753 | 33.00 +49 | 29.791 +309 | 42.61 -190 | 46.181 +365 | 08.63 -62 |
| 11 | 26.1 | 04.648 +307 | 12.88 -120 | 33.710 +717 | 33.89 +89 | 30.087 +296 | 44.84 -223 | 46.535 +354 | 08.14 -49 |
| 12 | 6.1 | 04.936 +288 | 11.67 -121 | 34.373 +663 | 35.21 +132 | 30.360 +273 | 47.37 -253 | 46.868 +333 | 07.83 -31 |
| 12 | 16.1 | 05.194 +258 | 10.52 -115 | 34.956 +583 | 36.90 +169 | 30.600 +240 | 50.06 -269 | 47.168 +300 | 07.70 -13 |
| 12 | 26.1 | 05.419 +225 | 09.46 -106 | 35.450 +494 | 38.90 +200 | 30.803 +203 | 52.84 -278 | 47.431 +263 | 07.76 +6 |
| 12 | 36.0 | 05.601 +182 | 08.52 -94 | 35.834 +384 | 41.20 +230 | 30.960 +157 | 55.64 -280 | 47.645 +214 | 08.03 +27 |
| | | 05.601 +132 | 08.52 -78 | 35.834 +261 | 41.20 +247 | 30.960 +106 | 55.64 -289 | 47.645 +159 | 08.03 +45 |
| Mean Place | 02.727 | 06.83 | 28.913 | 40.75 | 28.476 | 59.32 | 44.265 | 07.65 | |
| sec δ, tan δ | +1.022 | +0.213 | +2.728 | +2.538 | +1.081 | -0.409 | +1.178 | +0.623 | |
| dα(ψ), dδ(ψ) | +0.066 | -0.15 | +0.123 | -0.15 | +0.051 | -0.16 | +0.076 | -0.16 | |
| dα(ε), dδ(ε) | +0.005 | +0.93 | +0.064 | +0.92 | -0.011 | +0.92 | +0.017 | +0.92 | |
| Dble.Trans. | January 13 | | January 13 | | January 14 | | January 14 | | |

APPARENT PLACES OF STARS, 1986

119

AT UPPER TRANSIT AT GREENWICH

| No. | 1196 | | 1198 | | 1195 | | 1197 | |
|--------------|-------------|-----------|-------------|------------|---------------------------|------------|---------------|------------|
| | ♃ Geminorum | | ♈ Carinae | | B.D. +46° 1286 (Lycis) | | 125 G. Puppis | |
| Mag. Spect. | 4.22 | K5 | 4.92 | K5 | 5.80 | K5 | 5.66 | B3 |
| U.T. | R.A. | | R.A. | | R.A. | | R.A. | |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " |
| | 7 35 | +26 55 | 7 35 | -52 29 | 7 35 | +46 12 | 7 36 | -19 39 |
| 1 -8.9 | 04.341 +267 | 43.84 -27 | 20.445 +235 | 53.91 -350 | 31.840 +328 | 45.70 +80 | 04.782 +219 | 63.11 -264 |
| 1 1.0 | 04.565 +224 | 43.76 -8 | 20.614 +169 | 57.52 -361 | 32.114 +274 | 46.74 +104 | 04.960 +178 | 65.76 -265 |
| 1 11.0 | 04.740 +175 | 43.85 +9 | 20.713 +99 | 61.19 -367 | 32.327 +213 | 48.01 +127 | 05.091 +131 | 68.37 -261 |
| 1 21.0 | 04.859 +119 | 44.11 +26 | 20.734 +21 | 64.77 -358 | 32.468 +141 | 49.45 +144 | 05.168 +77 | 70.85 -248 |
| 1 31.0 | 04.922 +63 | 44.52 +41 | 20.683 -51 | 68.16 -339 | 32.539 +71 | 50.98 +153 | 05.195 +27 | 73.11 -226 |
| 2 9.9 | 04.929 +7 | 45.04 +52 | 20.562 -121 | 71.30 -314 | 32.539 +0 | 52.55 +157 | 05.171 -24 | 75.15 -204 |
| 2 19.9 | 04.881 -48 | 45.63 +59 | 20.376 -186 | 74.09 -279 | 32.470 -69 | 54.08 +153 | 05.099 -72 | 76.88 -173 |
| 3 1.9 | 04.790 -91 | 46.24 +61 | 20.137 -239 | 76.48 -239 | 32.344 -126 | 55.50 +142 | 04.989 -110 | 78.30 -142 |
| 3 11.8 | 04.660 -130 | 46.84 +60 | 19.854 -283 | 78.44 -196 | 32.170 -174 | 56.74 +124 | 04.845 -144 | 79.41 -111 |
| 3 21.8 | 04.503 -157 | 47.38 +54 | 19.537 -317 | 79.91 -147 | 31.960 -210 | 57.75 +101 | 04.677 -168 | 80.17 -76 |
| 3 31.8 | 04.333 -170 | 47.84 +46 | 19.204 -333 | 80.88 -97 | 31.732 -228 | 58.48 +73 | 04.498 -179 | 80.58 -41 |
| 4 10.8 | 04.156 -177 | 48.19 +35 | 18.862 -342 | 81.35 -47 | 31.496 -236 | 58.92 +44 | 04.313 -185 | 80.67 -9 |
| 4 20.7 | 03.988 -168 | 48.43 +24 | 18.525 -337 | 81.28 +7 | 31.267 -229 | 59.04 +12 | 04.135 -178 | 80.41 +26 |
| 4 30.7 | 03.837 -151 | 48.54 +11 | 18.206 -319 | 80.73 +55 | 31.061 -206 | 58.86 -18 | 03.972 -163 | 79.84 +57 |
| 5 10.7 | 03.710 -127 | 48.55 +1 | 17.910 -296 | 79.68 +105 | 30.882 -179 | 58.40 -46 | 03.829 -143 | 78.95 +89 |
| 5 20.7 | 03.615 -95 | 48.44 -11 | 17.651 -259 | 78.16 +152 | 30.745 -137 | 57.66 -74 | 03.714 -115 | 77.77 +118 |
| 5 30.6 | 03.556 -99 | 48.25 -19 | 17.433 -218 | 76.24 -47 | 30.653 -92 | 56.70 -96 | 03.629 -85 | 76.35 +142 |
| 5 9.6 | 03.535 -21 | 47.99 -26 | 17.259 -174 | 73.92 +232 | 30.608 -45 | 55.55 -115 | 03.578 -51 | 74.69 +166 |
| 5 19.6 | 03.555 +20 | 47.66 -33 | 17.139 -120 | 71.29 +263 | 30.618 +10 | 54.23 -132 | 03.563 -15 | 72.83 +186 |
| 5 29.5 | 03.615 +60 | 47.29 -37 | 17.072 -67 | 68.43 +286 | 30.677 +59 | 52.82 -141 | 03.584 +21 | 70.85 +198 |
| 7 9.5 | 03.713 +98 | 46.92 -37 | 17.060 -12 | 65.37 +306 | 30.786 +109 | 51.31 -151 | 03.639 +55 | 68.77 +208 |
| 7 19.5 | 03.840 +127 | 46.46 -46 | 17.107 +47 | 62.24 +313 | 30.945 +159 | 49.76 -155 | 03.731 +92 | 66.67 +210 |
| 7 29.5 | 04.008 +168 | 45.94 -52 | 17.207 +100 | 59.13 +311 | 31.146 +201 | 48.19 -157 | 03.854 +123 | 64.61 +206 |
| 8 8.4 | 04.207 +199 | 45.41 -53 | 17.364 +157 | 56.11 +302 | 31.391 +245 | 46.63 -156 | 04.009 +155 | 62.65 +196 |
| 8 18.4 | 04.435 +228 | 44.83 -58 | 17.575 +211 | 53.32 +279 | 31.674 +283 | 45.10 -153 | 04.194 +185 | 60.89 +176 |
| 8 28.4 | 04.687 +252 | 44.22 -61 | 17.832 +257 | 50.84 +248 | 31.990 +316 | 43.64 -146 | 04.405 +211 | 59.39 +150 |
| 9 7.4 | 04.964 +277 | 43.55 -67 | 18.137 +305 | 48.75 +209 | 32.338 +348 | 42.24 -140 | 04.643 +238 | 58.19 +120 |
| 9 17.3 | 05.262 +298 | 42.82 -73 | 18.344 +344 | 47.17 +158 | 32.713 +375 | 40.95 -129 | 04.903 +260 | 57.40 +79 |
| 9 27.3 | 05.576 +314 | 42.04 -78 | 18.481 +376 | 46.13 +104 | 32.713 +397 | 39.77 -118 | 04.903 +279 | 57.01 +39 |
| 10 7.3 | 05.909 +333 | 41.22 -82 | 19.260 +403 | 45.70 +43 | 33.110 +419 | 38.73 -104 | 05.182 +296 | 57.09 -8 |
| 10 17.2 | 06.253 +344 | 40.37 -85 | 19.677 +417 | 45.94 -24 | 33.961 +432 | 37.86 -87 | 05.786 +308 | 57.65 -56 |
| 10 27.2 | 06.604 +351 | 39.51 -86 | 20.100 +423 | 46.79 -85 | 34.402 +441 | 37.17 -69 | 06.100 +314 | 58.66 -101 |
| 11 6.2 | 06.960 +356 | 38.67 -84 | 20.419 +419 | 46.79 -150 | 34.847 +445 | 36.70 -47 | 06.417 +317 | 60.12 -146 |
| 11 16.2 | 07.310 +350 | 38.67 -77 | 20.519 +398 | 48.29 -210 | 35.284 +437 | 36.49 -21 | 06.725 +308 | 61.97 -185 |
| 11 26.1 | 07.650 +340 | 37.21 -69 | 21.287 +370 | 52.98 -259 | 35.707 +423 | 36.53 +4 | 07.021 +296 | 64.14 -217 |
| 12 6.1 | 07.971 +321 | 36.64 -57 | 21.616 +329 | 56.03 -305 | 36.104 +397 | 36.85 +32 | 07.296 +275 | 66.58 -244 |
| 12 16.1 | 08.261 +290 | 36.24 -40 | 21.890 +274 | 59.39 -336 | 36.461 +357 | 37.45 +60 | 07.539 +243 | 69.19 -261 |
| 12 26.1 | 08.515 +254 | 36.01 -23 | 22.104 +214 | 62.96 -357 | 36.773 +312 | 38.31 +86 | 07.746 +207 | 71.86 -267 |
| 12 36.0 | 08.723 +208 | 35.96 -5 | 22.249 +145 | 66.65 -369 | 37.026 +253 | 39.42 +111 | 07.908 +162 | 74.55 -269 |
| | +155 | +13 | +69 | -366 | +187 | +131 | +111 | -258 |
| Mean Place | 05.500 | 35.49 | 19.670 | 72.57 | 32.965 | 39.61 | 05.413 | 78.01 |
| sec δ, tan δ | +1.122 | +0.508 | +1.643 | -1.303 | +1.445 | +1.043 | +1.062 | -0.357 |
| dα(ψ), dδ(ψ) | +0.073 | -0.16 | +0.030 | -0.16 | +0.086 | -0.16 | +0.053 | -0.16 |
| dα(ε), dδ(ε) | +0.014 | +0.92 | -0.035 | +0.91 | +0.028 | +0.91 | -0.010 | +0.91 |
| Dble. Trans. | January 14 | | January 14 | | January 14 | | January 14 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 289 | | 290 | | 291 | | 293 | | | | | | |
|---|----------------|--------------|---------------|---------|--|--------|----------------------|--------------|-------|-------|--------------|-------|-------|
| | 25 Monocerotis | | 127 G. Puppis | | α Canis Minoris A* (Procyon) | | α Monocerotis | | | | | | |
| Mag.Spect. | 5.17 | F5 | 4.62 | B8 | 0.48 | F5 | 4.07 | K0 | | | | | |
| U.T. | R.A. | | R.A. | | R.A. | | R.A. | | | | | | |
| | Dec. | | Dec. | | Dec. | | Dec. | | | | | | |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " | | | | | |
| | 7 36 | - 4 04 | 7 36 | - 34 55 | 7 38 | + 5 15 | 7 40 | - 9 30 | | | | | |
| 1 | -8.9 | 35 496 + 226 | 36.19 | -195 | 51.904 + 221 | 58.60 | -316 | 34.751 + 232 | 47.51 | -151 | 35.291 + 227 | 55.03 | -222 |
| 1 | 1.0 | 35 684 + 188 | 38.08 | -189 | 52.076 + 172 | 61.82 | -322 | 34.945 + 194 | 46.10 | -141 | 35.478 + 187 | 57.22 | -219 |
| 1 | 11.0 | 35 828 + 144 | 39.89 | -181 | 52.195 + 119 | 65.05 | -323 | 35.094 + 149 | 44.81 | -129 | 35.621 + 143 | 59.33 | -211 |
| 1 | 21.0 | 35 921 + 93 | 41.54 | -165 | 52.254 + 59 | 68.16 | -311 | 35.193 + 99 | 43.69 | -112 | 35.713 + 92 | 61.30 | -197 |
| 1 | 31.0 | 35 964 + 43 | 42.99 | -145 | 52.257 + 3 | 71.07 | -291 | 35.242 + 49 | 42.76 | -93 | 35.756 + 43 | 63.06 | -176 |
| 2 | 9.9 | 35 959 - 5 | 44.24 | -125 | 52.205 - 52 | 73.74 | -267 | 35.241 - 1 | 42.00 | -76 | 35.749 - 7 | 64.62 | -156 |
| 2 | 19.9 | 35.906 - 53 | 45.25 | -101 | 52.099 - 106 | 76.07 | -233 | 35.192 - 49 | 41.45 | -55 | 35.694 - 55 | 65.91 | -129 |
| 3 | 1.9 | 35.814 - 92 | 46.02 | -77 | 51.952 - 147 | 78.03 | -196 | 35.104 - 88 | 41.07 | -38 | 35.601 - 93 | 66.94 | -103 |
| 3 | 11.8 | 35.690 - 124 | 46.58 | -56 | 51.768 - 184 | 79.61 | -158 | 34.982 - 122 | 40.85 | -22 | 35.474 - 127 | 67.72 | -78 |
| 3 | 21.8 | 35.543 - 147 | 46.90 | -32 | 51.558 - 210 | 80.74 | -113 | 34.837 - 145 | 40.78 | -7 | 35.324 - 150 | 68.21 | -49 |
| 3 | 31.8 | 35.384 - 159 | 47.01 | -11 | 51.335 - 223 | 81.45 | -71 | 34.681 - 156 | 40.84 | + 6 | 35.162 - 162 | 68.44 | -23 |
| 4 | 10.8 | 35.221 - 163 | 46.92 | + 9 | 51.106 - 229 | 81.73 | -28 | 34.520 - 161 | 41.01 | + 17 | 34.994 - 168 | 68.43 | + 1 |
| 4 | 20.7 | 35.064 - 157 | 46.62 | + 30 | 50.882 - 224 | 81.55 | + 18 | 34.365 - 155 | 41.30 | + 29 | 34.832 - 162 | 68.15 | + 28 |
| 4 | 30.7 | 34.923 - 141 | 46.14 | + 48 | 50.675 - 207 | 80.96 | + 59 | 34.227 - 138 | 41.67 | + 37 | 34.685 - 147 | 67.66 | + 49 |
| 5 | 10.7 | 34.801 - 122 | 45.48 | + 66 | 50.487 - 188 | 79.96 | + 100 | 34.109 - 118 | 42.14 | + 47 | 34.556 - 129 | 66.93 | + 73 |
| 5 | 20.7 | 34.707 - 94 | 44.65 | + 83 | 50.329 - 158 | 78.56 | + 140 | 34.020 - 89 | 42.70 | + 56 | 34.455 - 101 | 65.98 | + 95 |
| 5 | 30.6 | 34.644 - 63 | 43.68 | + 97 | 50.204 - 125 | 76.83 | + 173 | 33.963 - 57 | 43.32 | + 62 | 34.384 - 71 | 64.86 | + 112 |
| 6 | 9.6 | 34.613 - 31 | 42.57 | + 111 | 50.115 - 89 | 74.77 | + 206 | 33.938 - 25 | 44.01 | + 69 | 34.344 - 40 | 63.56 | + 130 |
| 6 | 19.6 | 34.618 + 5 | 41.35 | + 122 | 50.067 - 48 | 72.45 | + 232 | 33.950 + 12 | 44.76 | + 75 | 34.340 - 4 | 62.12 | + 144 |
| 6 | 29.5 | 34.656 + 38 | 40.07 | + 128 | 50.058 - 9 | 69.96 | + 249 | 33.966 + 46 | 45.53 | + 77 | 34.370 + 30 | 60.60 | + 152 |
| 7 | 9.5 | 34.727 + 71 | 38.73 | + 134 | 50.090 + 32 | 67.31 | + 265 | 34.075 + 79 | 46.32 | + 79 | 34.432 + 62 | 59.00 | + 160 |
| 7 | 19.5 | 34.832 + 105 | 37.40 | + 133 | 50.164 + 74 | 64.61 | + 270 | 34.187 + 112 | 47.08 | + 76 | 34.529 + 97 | 57.40 | + 160 |
| 7 | 29.5 | 34.966 + 134 | 36.12 | + 128 | 50.276 + 112 | 61.96 | + 265 | 34.327 + 140 | 47.82 | + 74 | 34.655 + 126 | 55.85 | + 155 |
| 8 | 8.4 | 35.129 + 163 | 34.92 | + 120 | 50.427 + 151 | 59.40 | + 256 | 34.497 + 170 | 48.47 | + 65 | 34.811 + 156 | 54.38 | + 147 |
| 8 | 18.4 | 35.320 + 191 | 33.88 | + 104 | 50.615 + 188 | 57.06 | + 234 | 34.694 + 197 | 48.99 | + 52 | 34.995 + 184 | 53.09 | + 129 |
| 8 | 28.4 | 35.533 + 213 | 33.04 | + 84 | 50.834 + 219 | 55.01 | + 205 | 34.913 + 219 | 49.35 | + 36 | 35.203 + 208 | 52.01 | + 108 |
| 9 | 7.4 | 35.770 + 237 | 32.44 | + 60 | 51.087 + 253 | 53.32 | + 169 | 35.155 + 242 | 49.52 | + 17 | 35.436 + 233 | 51.19 | + 82 |
| 9 | 17.3 | 36.027 + 257 | 32.14 | + 30 | 51.366 + 279 | 52.10 | + 122 | 35.416 + 261 | 49.45 | - 7 | 35.690 + 254 | 50.72 | + 47 |
| 9 | 27.3 | 36.300 + 273 | 32.15 | - 1 | 51.668 + 302 | 51.37 | + 73 | 35.693 + 277 | 49.16 | - 29 | 35.961 + 271 | 50.59 | + 13 |
| 10 | 7.3 | 36.591 + 291 | 32.50 | - 35 | 51.991 + 323 | 51.19 | + 18 | 35.987 + 294 | 48.60 | - 56 | 36.251 + 290 | 50.84 | - 25 |
| 10 | 17.2 | 36.891 + 300 | 33.19 | - 69 | 52.326 + 335 | 51.59 | - 40 | 36.291 + 304 | 47.80 | - 80 | 36.551 + 300 | 51.49 | - 65 |
| 10 | 27.2 | 37.199 + 308 | 34.20 | - 101 | 52.668 + 342 | 52.54 | - 95 | 36.602 + 311 | 46.76 | - 104 | 36.859 + 308 | 52.50 | - 101 |
| 11 | 6.2 | 37.511 + 312 | 35.52 | - 132 | 53.010 + 342 | 54.06 | - 152 | 36.917 + 315 | 45.52 | - 124 | 37.172 + 313 | 53.87 | - 137 |
| 11 | 16.2 | 37.817 + 306 | 37.10 | - 158 | 53.341 + 331 | 56.08 | - 202 | 37.227 + 310 | 44.11 | - 141 | 37.478 + 306 | 55.56 | - 169 |
| 11 | 26.1 | 38.113 + 296 | 38.86 | - 176 | 53.654 + 313 | 58.53 | - 245 | 37.527 + 300 | 42.60 | - 151 | 37.775 + 297 | 57.48 | - 192 |
| 12 | 6.1 | 38.390 + 277 | 40.77 | - 191 | 53.941 + 287 | 61.34 | - 281 | 37.809 + 282 | 41.03 | - 157 | 38.053 + 278 | 59.59 | - 211 |
| 12 | 16.1 | 38.639 + 249 | 42.74 | - 197 | 54.189 + 248 | 64.41 | - 307 | 38.063 + 254 | 39.46 | - 157 | 38.301 + 248 | 61.81 | - 222 |
| 12 | 26.1 | 38.854 + 215 | 44.70 | - 196 | 54.395 + 206 | 67.61 | - 320 | 38.284 + 221 | 37.96 | - 150 | 38.517 + 216 | 64.04 | - 223 |
| 12 | 36.0 | 39.027 + 173 | 46.61 | - 191 | 54.549 + 154 | 70.89 | - 328 | 38.463 + 179 | 36.55 | - 141 | 38.690 + 173 | 66.25 | - 221 |
| | | 39.027 + 126 | 46.61 | - 176 | 54.549 + 98 | 70.89 | - 322 | 38.463 + 132 | 36.55 | - 125 | 38.690 + 124 | 66.25 | - 209 |
| Mean Place | 36.402 | 48.87 | 52.099 | 75.55 | 35.739 | 35.65 | 36.127 | 68.77 | | | | | |
| sec δ , tan δ | +1.003 | -0.071 | +1.220 | -0.699 | +1.004 | +0.092 | +1.014 | -0.168 | | | | | |
| $d\alpha(\psi)$, $d\delta(\psi)$ | +0.059 | -0.16 | +0.044 | -0.16 | +0.063 | -0.17 | +0.057 | -0.17 | | | | | |
| $d\alpha(\epsilon)$, $d\delta(\epsilon)$ | -0.002 | +0.91 | -0.019 | +0.91 | +0.003 | +0.91 | -0.005 | +0.91 | | | | | |
| Dble.Trans. | January 14 | | January 15 | | January 15 | | January 16 | | | | | | |

APPARENT PLACES OF STARS, 1986

121

AT UPPER TRANSIT AT GREENWICH

| No. | 292 | | | 297 | | | 294 | | | 295 | | | |
|--------------|------------|--------|---------|------------|--------|---------|--------------|--------|---------|----------------------|-------|---------|--------|
| | 24 Lyncis | | | ζ Volantis | | | κ Geminorum* | | | β Geminorum (Pollux) | | | |
| Mag.Spect. | 4.96 | A2 | | 3.89 | K0 | | 3.70 | G5 | | 1.21 | K0 | | |
| U.T. | R.A. | | Dec. | R.A. | | Dec. | R.A. | | Dec. | R.A. | | Dec. | |
| | h | m | ° | h | m | ° | h | m | ° | h | m | ° | |
| | 7 41 | | + 58 44 | 7 41 | | - 72 33 | 7 43 | | + 24 25 | 7 44 | | + 28 03 | |
| 1 | -8.9 | 51.242 | + 419 | 39.97 | +138 | 63.746 | -350 | 36.861 | + 268 | 60.82 | + 275 | 28.314 | + 27 |
| 1 | 1.0 | 51.589 | + 347 | 41.64 | +167 | 63.958 | -367 | 37.089 | + 228 | 60.54 | - 28 | 28.547 | + 233 |
| 1 | 11.0 | 51.858 | + 269 | 43.56 | +192 | 64.033 | -378 | 37.270 | + 181 | 60.44 | - 10 | 28.732 | + 185 |
| 1 | 21.0 | 52.032 | + 174 | 45.66 | +210 | 63.956 | -277 | 37.395 | + 125 | 60.53 | + 9 | 28.860 | + 128 |
| 1 | 31.0 | 52.116 | + 84 | 47.83 | +217 | 63.744 | - 212 | 37.466 | + 71 | 60.77 | + 24 | 28.931 | + 71 |
| 2 | 9.9 | 52.107 | - 9 | 50.01 | +218 | 63.401 | -343 | 37.481 | + 15 | 61.14 | + 37 | 28.946 | + 15 |
| 2 | 19.9 | 52.007 | -100 | 52.10 | +209 | 62.935 | -466 | 37.442 | - 39 | 61.61 | + 47 | 28.905 | - 41 |
| 3 | 1.9 | 51.833 | -174 | 53.99 | +189 | 62.372 | -563 | 37.360 | - 82 | 62.14 | + 53 | 28.818 | - 87 |
| 3 | 11.9 | 51.594 | -239 | 55.63 | +164 | 61.723 | -649 | 37.238 | -122 | 62.67 | + 53 | 28.692 | -126 |
| 3 | 21.8 | 51.304 | -290 | 56.93 | +130 | 61.009 | -714 | 37.089 | -149 | 63.18 | + 51 | 28.536 | -156 |
| 3 | 31.8 | 50.989 | -315 | 57.85 | + 92 | 60.260 | -749 | 36.926 | -163 | 63.63 | + 45 | 28.366 | -170 |
| 4 | 10.8 | 50.658 | -331 | 58.37 | + 52 | 59.484 | -776 | 36.755 | -171 | 64.01 | + 38 | 28.188 | -178 |
| 4 | 20.7 | 50.334 | -324 | 58.46 | + 9 | 58.710 | -774 | 36.590 | -165 | 64.30 | + 29 | 28.016 | -172 |
| 4 | 30.7 | 50.036 | -298 | 58.14 | - 32 | 57.960 | -750 | 36.441 | -149 | 64.49 | + 19 | 27.861 | -155 |
| 5 | 10.7 | 49.771 | -265 | 57.43 | - 71 | 57.243 | -717 | 36.314 | -127 | 64.58 | + 9 | 27.727 | -134 |
| 5 | 20.7 | 49.557 | -214 | 56.34 | -109 | 56.585 | -658 | 36.217 | - 97 | 64.59 | + 1 | 27.625 | -102 |
| 5 | 30.6 | 49.401 | -156 | 54.95 | -139 | 55.999 | -586 | 36.155 | - 62 | 64.52 | - 7 | 27.558 | - 67 |
| 6 | 9.6 | 49.306 | - 95 | 53.28 | -167 | 55.494 | -505 | 36.127 | - 28 | 64.38 | -14 | 27.528 | - 30 |
| 6 | 19.6 | 49.281 | - 25 | 51.40 | -188 | 55.091 | -403 | 36.140 | + 13 | 64.18 | -20 | 27.539 | + 11 |
| 6 | 29.6 | 49.323 | + 42 | 49.37 | -203 | 54.791 | -300 | 36.191 | + 51 | 63.94 | -24 | 27.589 | + 50 |
| 7 | 9.5 | 49.431 | + 108 | 47.21 | -216 | 54.603 | -188 | 36.280 | + 89 | 63.67 | - 27 | 27.677 | + 88 |
| 7 | 19.5 | 49.608 | + 177 | 45.00 | -221 | 54.541 | - 62 | 36.394 | + 114 | 63.41 | -26 | 27.798 | + 121 |
| 7 | 29.5 | 49.843 | + 235 | 42.79 | -221 | 54.595 | + 54 | 36.550 | + 156 | 62.96 | -45 | 27.956 | + 158 |
| 8 | 8.4 | 50.138 | + 295 | 40.59 | -220 | 54.773 | + 178 | 36.737 | + 187 | 62.53 | -43 | 28.147 | + 191 |
| 8 | 18.4 | 50.487 | + 349 | 38.48 | -211 | 55.072 | + 299 | 36.953 | + 216 | 62.04 | -49 | 28.368 | + 221 |
| 8 | 28.4 | 50.881 | + 394 | 36.49 | -199 | 55.478 | + 406 | 37.193 | + 240 | 61.49 | -55 | 28.613 | + 245 |
| 9 | 7.4 | 51.322 | + 441 | 34.63 | -186 | 55.992 | + 514 | 37.458 | + 265 | 60.86 | -63 | 28.885 | + 272 |
| 9 | 17.3 | 51.800 | + 478 | 32.96 | -167 | 56.595 | + 603 | 37.744 | + 286 | 60.16 | -70 | 29.179 | + 294 |
| 9 | 27.3 | 52.309 | + 509 | 31.50 | -146 | 57.268 | + 673 | 38.048 | + 304 | 59.38 | -78 | 29.491 | + 312 |
| 10 | 7.3 | 52.848 | + 539 | 30.27 | -123 | 58.000 | + 732 | 38.371 | + 323 | 58.52 | -86 | 29.823 | + 332 |
| 10 | 17.3 | 53.405 | + 557 | 29.34 | - 93 | 58.759 | + 759 | 38.707 | + 336 | 57.61 | - 91 | 30.167 | + 344 |
| 10 | 27.2 | 53.973 | + 568 | 28.70 | - 64 | 59.525 | + 766 | 39.051 | + 344 | 56.67 | - 94 | 30.520 | + 353 |
| 11 | 6.2 | 54.547 | + 574 | 28.39 | - 31 | 60.277 | + 752 | 39.402 | + 351 | 55.72 | - 95 | 30.880 | + 360 |
| 11 | 16.2 | 55.109 | + 562 | 28.44 | + 5 | 60.978 | + 701 | 39.748 | + 346 | 54.80 | - 92 | 31.235 | + 355 |
| 11 | 26.1 | 55.651 | + 542 | 28.85 | + 41 | 61.612 | + 634 | 40.086 | + 338 | 53.96 | - 84 | 31.581 | + 346 |
| 12 | 6.1 | 56.160 | + 509 | 29.63 | + 78 | 62.156 | + 544 | 40.406 | + 320 | 53.22 | - 74 | 31.909 | + 328 |
| 12 | 16.1 | 56.616 | + 456 | 30.77 | +114 | 62.582 | + 426 | 40.697 | + 291 | 52.63 | - 59 | 32.207 | + 298 |
| 12 | 26.1 | 57.012 | + 396 | 32.22 | +145 | 62.884 | + 302 | 40.954 | + 257 | 52.20 | - 43 | 32.470 | + 263 |
| 12 | 36.0 | 57.333 | + 321 | 33.98 | +176 | 63.048 | + 164 | 41.166 | + 212 | 51.96 | - 24 | 32.687 | + 217 |
| | | | + 233 | | +196 | | + 15 | | + 161 | | - 5 | | + 164 |
| Mean Place | 52.168 | 35.12 | | 59.620 | 85.74 | | | 38.022 | 52.08 | | | 29.459 | 34.47 |
| sec δ, tan δ | +1.927 | +1.648 | | +3.339 | -3.186 | | | +1.098 | +0.454 | | | +1.133 | +0.533 |
| dα(ψ), dδ(ψ) | +0.101 | -0.17 | | -0.015 | -0.17 | | | +0.072 | -0.17 | | | +0.074 | -0.18 |
| dα(ε), dδ(ε) | +0.047 | +0.90 | | -0.091 | +0.90 | | | +0.013 | +0.90 | | | +0.016 | +0.90 |
| Dble.Trans. | January 16 | | | January 16 | | | January 16 | | | January 16 | | | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 1202 | | 1200 | | 1201 | | 1199 | | |
|---|--------------|--------------|--------------|--------------|------------------|--------------|----------------------------|--------------|------------|
| | 4 Puppis | | 81 Geminorum | | 11 Canis Minoris | | B.D. +37° 1769 (Lyncis) | | |
| Mag. Spect. | 5.11 | F0 | 5.02 | K2 | 5.30 | A0 | 5.45 | M0 | |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | |
| | h m | ° / | h m | ° / | h m | ° / | h m | ° / | |
| | 7 45 | - 14 31 | 7 45 | + 18 32 | 7 45 | + 10 48 | 7 45 | + 37 33 | |
| | ^d | ^s | ^s | ^s | ^s | ^s | ^s | ^s | |
| 1 | -8.9 | 18.766 +228 | 34.76 -244 | 19.476 +259 | 46.87 -80 | 30.568 +249 | 17.68 -122 | 44.152 +306 | 10.32 +26 |
| 1 | 1.0 | 18.955 +189 | 37.20 -244 | 19.696 +220 | 46.23 -64 | 30.778 +210 | 16.58 -110 | 44.410 +258 | 10.80 +48 |
| 1 | 11.0 | 19.099 +144 | 39.59 -239 | 19.871 +175 | 45.75 -48 | 30.944 +166 | 15.62 -96 | 44.616 +206 | 11.50 +70 |
| 1 | 21.0 | 19.191 +92 | 41.84 -225 | 19.933 +122 | 45.46 -29 | 31.059 +115 | 14.84 -78 | 44.759 +143 | 12.40 +90 |
| 1 | 31.0 | 19.233 +42 | 43.88 -204 | 20.061 +68 | 45.33 -13 | 31.123 +64 | 14.24 -60 | 44.839 +80 | 13.44 +104 |
| 2 | 9.9 | 19.225 -8 | 45.71 -183 | 20.077 +16 | 45.36 +3 | 31.136 +13 | 13.81 -43 | 44.856 +17 | 14.56 +112 |
| 2 | 19.9 | 19.169 -56 | 47.26 -155 | 20.041 -36 | 45.52 +16 | 31.099 -37 | 13.56 -25 | 44.812 -44 | 15.71 +115 |
| 3 | 1.9 | 19.073 -96 | 48.52 -126 | 19.962 -79 | 45.52 +25 | 31.021 -78 | 13.44 -12 | 44.717 -95 | 16.83 +112 |
| 3 | 11.9 | 18.943 -130 | 49.50 -98 | 19.847 -115 | 45.77 +31 | 30.908 -113 | 13.45 +1 | 44.578 -139 | 17.85 +102 |
| 3 | 21.8 | 18.789 -154 | 50.16 -66 | 19.704 -143 | 46.08 +34 | 30.769 -139 | 13.56 +11 | 44.405 -173 | 18.73 +88 |
| 3 | 31.8 | 18.622 -167 | 50.52 -36 | 19.548 -156 | 46.77 +35 | 30.617 -152 | 13.74 +18 | 44.215 -190 | 19.43 +70 |
| 4 | 10.8 | 18.449 -173 | 50.60 -8 | 19.384 -164 | 47.10 +33 | 30.459 -158 | 13.99 +25 | 44.015 -200 | 19.92 +49 |
| 4 | 20.7 | 18.280 -169 | 50.36 +24 | 19.226 -158 | 47.40 +30 | 30.305 -154 | 14.30 +31 | 43.822 -193 | 20.17 +25 |
| 4 | 30.7 | 18.126 -154 | 49.87 +49 | 19.084 -142 | 47.66 +26 | 30.167 -138 | 14.64 +34 | 43.645 -177 | 20.21 +4 |
| 5 | 10.7 | 17.989 -137 | 49.10 +77 | 18.961 -123 | 47.89 +23 | 30.048 -119 | 15.02 +38 | 43.492 -153 | 20.02 -19 |
| 5 | 20.7 | 17.879 -110 | 48.07 +103 | 18.867 -94 | 48.08 +19 | 29.956 -92 | 15.44 +42 | 43.373 -119 | 19.63 -39 |
| 5 | 30.6 | 17.799 -80 | 46.83 +124 | 18.806 -61 | 48.23 +15 | 29.896 -60 | 15.88 +44 | 43.293 -80 | 19.06 -57 |
| 6 | 9.6 | 17.750 -49 | 45.38 +145 | 18.779 -27 | 48.36 +13 | 29.868 -28 | 16.35 +47 | 43.254 -39 | 18.33 -73 |
| 6 | 19.6 | 17.736 -14 | 43.76 +162 | 18.790 +11 | 48.47 +11 | 29.876 +8 | 16.84 +49 | 43.260 +6 | 17.47 -86 |
| 6 | 29.6 | 17.756 +20 | 42.04 +172 | 18.836 +46 | 48.54 +7 | 29.918 +42 | 17.33 +49 | 43.309 +49 | 16.52 -95 |
| 7 | 9.5 | 17.809 +53 | 40.22 +182 | 18.919 +83 | 48.57 +3 | 29.994 +76 | 17.81 +48 | 43.400 +91 | 15.49 -103 |
| 7 | 19.5 | 17.897 +88 | 38.38 +184 | 19.024 +105 | 48.50 -7 | 30.102 +108 | 18.26 +45 | 43.533 +133 | 14.39 -110 |
| 7 | 29.5 | 18.015 +118 | 36.59 +179 | 19.175 +151 | 48.58 +8 | 30.239 +137 | 18.71 +45 | 43.703 +170 | 13.24 -115 |
| 8 | 8.4 | 18.164 +149 | 34.89 +170 | 19.352 +177 | 48.48 -10 | 30.407 +168 | 19.07 +36 | 43.910 +207 | 12.07 -117 |
| 8 | 18.4 | 18.343 +179 | 33.36 +153 | 19.557 +205 | 48.30 -18 | 30.602 +195 | 19.31 +24 | 44.153 +243 | 10.89 -118 |
| 8 | 28.4 | 18.546 +203 | 32.07 +129 | 19.785 +228 | 48.03 -27 | 30.820 +218 | 19.42 +11 | 44.423 +270 | 09.71 -118 |
| 9 | 7.4 | 18.776 +230 | 31.06 +101 | 20.038 +253 | 47.64 -39 | 31.062 +242 | 19.36 -6 | 44.722 +299 | 08.54 -117 |
| 9 | 17.3 | 19.028 +252 | 30.41 +65 | 20.311 +273 | 47.13 -51 | 31.324 +262 | 19.12 -24 | 45.047 +325 | 07.39 -115 |
| 9 | 27.3 | 19.299 +271 | 30.14 +27 | 20.602 +291 | 46.49 -64 | 31.604 +280 | 18.69 -43 | 45.392 +345 | 06.28 -111 |
| 10 | 7.3 | 19.589 +290 | 30.29 -15 | 20.912 +310 | 45.72 -77 | 31.902 +298 | 18.06 -63 | 45.758 +366 | 05.22 -106 |
| 10 | 17.3 | 19.891 +302 | 30.88 -59 | 21.234 +322 | 44.83 -89 | 32.212 +310 | 17.22 -84 | 46.138 +380 | 04.24 -98 |
| 10 | 27.2 | 20.202 +311 | 31.88 -100 | 21.565 +331 | 43.85 -98 | 32.531 +319 | 16.22 -100 | 46.529 +391 | 03.36 -88 |
| 11 | 6.2 | 20.517 +315 | 33.28 -140 | 21.902 +337 | 42.79 -106 | 32.856 +325 | 15.06 -116 | 46.926 +397 | 02.61 -75 |
| 11 | 16.2 | 20.827 +310 | 35.05 -177 | 22.236 +334 | 41.71 -108 | 33.177 +321 | 13.79 -127 | 47.319 +393 | 02.03 -58 |
| 11 | 26.1 | 21.126 +299 | 37.09 -204 | 22.561 +325 | 40.65 -106 | 33.490 +313 | 12.46 -133 | 47.701 +382 | 01.64 -39 |
| 12 | 6.1 | 21.406 +280 | 39.37 -228 | 22.870 +309 | 39.63 -102 | 33.787 +297 | 11.12 -134 | 48.064 +363 | 01.47 -17 |
| 12 | 16.1 | 21.657 +251 | 41.79 -242 | 23.151 +281 | 38.73 -90 | 34.056 +269 | 09.82 -130 | 48.394 +330 | 01.54 +7 |
| 12 | 26.1 | 21.874 +217 | 44.26 -247 | 23.399 +248 | 37.96 -77 | 34.294 +238 | 08.62 -120 | 48.685 +291 | 01.85 +31 |
| 12 | 36.0 | 22.049 +175 | 46.73 -247 | 23.605 +206 | 37.34 -62 | 34.490 +196 | 07.54 -108 | 48.926 +241 | 02.40 +55 |
| | | +125 | -236 | +155 | -43 | +148 | -92 | +183 | +75 |
| Mean Place | 19.535 | 49.53 | 20.613 | 37.24 | 31.656 | 06.87 | 45.324 | 03.38 | |
| sec δ , tan δ | +1.033 | -0.259 | +1.055 | +0.335 | +1.018 | +0.191 | +1.261 | +0.769 | |
| $d\alpha(\psi)$, $d\delta(\psi)$ | +0.055 | -0.18 | +0.069 | -0.18 | +0.066 | -0.18 | +0.079 | -0.18 | |
| $d\alpha(\epsilon)$, $d\delta(\epsilon)$ | -0.008 | +0.90 | +0.010 | +0.90 | +0.006 | +0.90 | +0.023 | +0.90 | |
| Dble. Trans. | January 17 | | January 17 | | January 17 | | January 17 | | |

APPARENT PLACES OF STARS, 1986

123

AT UPPER TRANSIT AT GREENWICH

| No. | 296 | | 1203 | | 1204 | | 1206 | |
|---|-----------------|--------|---------------|--------|--------------|--------|---------------|--------|
| | π Geminorum | | 187 G. Puppis | | ξ Puppis | | 61 G. Carinae | |
| Mag. Spect. | 5.29 | K2 | 5.26 | B2 | 3.47 | G0p | 5.82 | F2 |
| U.T. | R.A. | | Dec. | | R.A. | | Dec. | |
| | h | m | ° | ' | h | m | ° | ' |
| | 7 | 46 | +33 | 26 | 7 | 47 | -46 | 34 |
| | | | | | | | | |
| 1 | -8.9 | 37.037 | +293 | 66.18 | +242 | 07.296 | -339 | 09.36 |
| 1 | 1.0 | 37.286 | +249 | 66.42 | +185 | 07.481 | -351 | 12.87 |
| 1 | 11.0 | 37.484 | +198 | 66.87 | +123 | 07.604 | -357 | 16.44 |
| 1 | 21.0 | 37.623 | +139 | 67.51 | +53 | 07.657 | -351 | 19.95 |
| 1 | 31.0 | 37.702 | +79 | 68.30 | -12 | 07.645 | -331 | 23.26 |
| 2 | 9.9 | 37.721 | +19 | 69.19 | -76 | 07.569 | -310 | 26.36 |
| 2 | 19.9 | 37.681 | -40 | 70.14 | -137 | 07.432 | -276 | 29.12 |
| 3 | 1.9 | 37.592 | -89 | 71.07 | -186 | 07.246 | -237 | 31.49 |
| 3 | 11.9 | 37.461 | -131 | 71.96 | -230 | 07.016 | -198 | 33.47 |
| 3 | 21.8 | 37.299 | -162 | 72.73 | -261 | 06.755 | -150 | 34.97 |
| 3 | 31.8 | 37.120 | -179 | 73.36 | -278 | 06.477 | -102 | 35.99 |
| 4 | 10.8 | 36.932 | -188 | 73.83 | -289 | 06.188 | -55 | 36.54 |
| 4 | 20.7 | 36.750 | -182 | 74.11 | -285 | 05.903 | -3 | 36.57 |
| 4 | 30.7 | 36.584 | -166 | 74.20 | -271 | 05.632 | +43 | 36.14 |
| 5 | 10.7 | 36.441 | -143 | 74.11 | -252 | 05.380 | +91 | 35.23 |
| 5 | 20.7 | 36.330 | -111 | 73.85 | -221 | 05.159 | +137 | 33.86 |
| 5 | 30.6 | 36.256 | -74 | 73.44 | -185 | 04.974 | +176 | 32.10 |
| 6 | 9.6 | 36.220 | +8 | 72.90 | -147 | 04.827 | +215 | 29.95 |
| 6 | 19.6 | 36.228 | +8 | 72.24 | -100 | 04.727 | +246 | 27.49 |
| 6 | 29.6 | 36.277 | +49 | 71.51 | -55 | 04.672 | +269 | 24.80 |
| 7 | 9.5 | 36.365 | +88 | 70.72 | -7 | 04.665 | +290 | 21.90 |
| 7 | 19.5 | 36.492 | +127 | 69.85 | +44 | 04.709 | +176 | 18.93 |
| 7 | 29.5 | 36.654 | +162 | 68.93 | +89 | 04.798 | +297 | 15.96 |
| 8 | 8.4 | 36.852 | +198 | 67.97 | +139 | 04.937 | +290 | 13.06 |
| 8 | 18.4 | 37.083 | +231 | 67.00 | +186 | 05.123 | +269 | 10.37 |
| 8 | 28.4 | 37.340 | +257 | 66.00 | +227 | 05.350 | +241 | 07.96 |
| 9 | 7.4 | 37.625 | +285 | 64.98 | +270 | 05.620 | +204 | 05.92 |
| 9 | 17.3 | 37.934 | +309 | 63.95 | +306 | 05.926 | +155 | 04.37 |
| 9 | 27.3 | 38.263 | +329 | 62.93 | +335 | 06.261 | +104 | 03.33 |
| 10 | 7.3 | 38.612 | +349 | 61.91 | +363 | 06.624 | +46 | 02.87 |
| 10 | 17.3 | 38.975 | +363 | 60.93 | +378 | 07.002 | -19 | 03.06 |
| 10 | 27.2 | 39.348 | +373 | 60.02 | +388 | 07.390 | -79 | 03.85 |
| 11 | 6.2 | 39.728 | +380 | 59.19 | +388 | 07.778 | -142 | 05.27 |
| 11 | 16.2 | 40.104 | +376 | 58.49 | +375 | 08.153 | -200 | 05.27 |
| 11 | 26.1 | 40.470 | +366 | 57.94 | +354 | 08.507 | -248 | 09.75 |
| 12 | 6.1 | 40.818 | +348 | 57.58 | +321 | 08.828 | -294 | 12.69 |
| 12 | 16.1 | 41.135 | +317 | 57.44 | +275 | 09.103 | -325 | 15.94 |
| 12 | 26.1 | 41.415 | +280 | 57.51 | +225 | 09.328 | -346 | 19.40 |
| 12 | 36.0 | 41.647 | +232 | 57.80 | +164 | 09.492 | -360 | 23.00 |
| | | | +177 | | +97 | | -357 | |
| Mean Place | 38.214 | 58.69 | | 07.021 | 28.68 | 43.573 | 31.36 | 59.523 |
| sec δ , tan δ | +1.199 | +0.661 | | +1.455 | -1.057 | +1.102 | -0.463 | +2.015 |
| $d\alpha(\psi)$, $d\delta(\psi)$ | +0.077 | -0.18 | | +0.036 | -0.18 | +0.050 | -0.18 | +0.020 |
| $d\alpha(\epsilon)$, $d\delta(\epsilon)$ | +0.020 | +0.89 | | -0.032 | +0.89 | -0.014 | +0.89 | -0.053 |
| Dble. Trans. | January 17 | | January 17 | | January 18 | | January 18 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 1205 | | 301 | | 1207 | | 299 | |
|--------------|-----------------|------------|---------------|------------|-------------|------------|-------------|------------|
| | ζ Canis Minoris | | 213 G. Puppis | | φ Geminorum | | 26 Lyncis | |
| Mag.Spect. | 5.11 | B8 | 3.76 | G5 | 4.99 | A2 | 5.69 | K0 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " |
| | 7 50 | + 1 48 | 7 51 | - 40 32 | 7 52 | + 26 48 | 7 53 | + 47 35 |
| 1 -8.9 | 58 959 +244 | 19.56 -171 | 45 099 +240 | 07.22 -327 | 39 131 +282 | 13.81 -39 | 42 781 +355 | 67.51 +72 |
| 1 1.0 | 59.165 +206 | 17.93 -163 | 45 288 +189 | 10.60 -338 | 39 372 +241 | 13.62 -19 | 43 083 +302 | 68.51 +100 |
| 1 11.0 | 59.328 +163 | 16.42 -151 | 45 422 +134 | 14.03 -343 | 39 566 +194 | 13.63 +1 | 43 324 +241 | 69.76 +125 |
| 1 21.0 | 59.440 +112 | 15.07 -135 | 45 491 +69 | 17.38 -335 | 39 703 +137 | 13.84 +21 | 43 493 +169 | 71.23 +147 |
| 1 31.0 | 59.503 +63 | 13.91 -116 | 45 501 +10 | 20.55 -317 | 39 785 +82 | 14.21 +37 | 43 590 +97 | 72.82 +159 |
| 2 9.9 | 59.516 +13 | 12.95 -96 | 45 450 -51 | 23.50 -295 | 39 811 +26 | 14.72 +51 | 43 613 +23 | 74.49 +167 |
| 2 19.9 | 59.480 -36 | 12.20 -75 | 45 343 -107 | 26.12 -262 | 39 780 -31 | 15.32 +60 | 43 564 -49 | 76.15 +166 |
| 3 1.9 | 59.404 -76 | 11.65 -55 | 45 189 -154 | 28.38 -226 | 39 704 -76 | 15.97 +65 | 43 455 -109 | 77.71 +156 |
| 3 11.9 | 59.293 -111 | 11.29 -36 | 44 995 -194 | 30.25 -187 | 39 587 -117 | 16.63 +66 | 43 292 -163 | 79.12 +141 |
| 3 21.8 | 59.157 -136 | 11.12 -17 | 44 771 -224 | 31.66 -141 | 39 440 -147 | 17.24 +61 | 43 089 -203 | 80.31 +119 |
| 3 31.8 | 59.006 -151 | 11.10 -2 | 44 531 -240 | 32.62 -96 | 39 276 -164 | 17.78 +54 | 42 862 -227 | 81.22 +91 |
| 4 10.8 | 58.849 -157 | 11.24 +14 | 44 280 -251 | 33.14 -52 | 39 104 -172 | 18.23 +45 | 42 622 -240 | 81.83 +61 |
| 4 20.7 | 58.696 -153 | 11.52 +28 | 44 033 -247 | 33.16 -2 | 38 935 -169 | 18.55 +32 | 42 386 -236 | 82.11 +28 |
| 4 30.7 | 58.556 -140 | 11.93 +41 | 43 798 -235 | 32.74 +42 | 38 782 -153 | 18.76 +21 | 42 167 -219 | 82.08 -3 |
| 5 10.7 | 58.434 -122 | 12.46 +53 | 43 581 -217 | 31.88 +86 | 38 648 -134 | 18.84 +8 | 41 973 -194 | 81.73 -35 |
| 5 20.7 | 58.339 -95 | 13.11 +65 | 43 393 -188 | 30.58 +130 | 38 544 -104 | 18.81 -3 | 41 816 -157 | 81.07 -66 |
| 5 30.6 | 58.272 -67 | 13.84 +73 | 43 237 -156 | 28.92 +166 | 38 473 -71 | 18.67 -14 | 41 703 -113 | 80.17 -90 |
| 6 9.6 | 58.236 -36 | 14.68 +84 | 43 116 -121 | 26.89 +203 | 38 438 -35 | 18.44 -23 | 41 636 -67 | 79.03 -114 |
| 6 19.6 | 58.235 -1 | 15.59 +91 | 43 037 -79 | 24.56 +233 | 38 442 +4 | 18.13 -31 | 41 621 -15 | 77.69 -134 |
| 6 29.6 | 58.266 +31 | 16.53 +94 | 42 999 -38 | 22.02 +254 | 38 484 +42 | 17.75 -38 | 41 656 +35 | 76.22 -147 |
| 7 9.5 | 58.329 +63 | 17.51 +98 | 43 003 +4 | 19.29 +273 | 38 564 +80 | 17.33 -42 | 41 741 +85 | 74.62 -160 |
| 7 19.5 | 58.426 +97 | 18.47 +96 | 43 053 +50 | 16.48 +281 | 38 676 +112 | 16.89 -44 | 41 876 +135 | 72.95 -167 |
| 7 29.5 | 58.550 +124 | 19.39 +92 | 43 144 +91 | 13.68 +280 | 38 822 +146 | 16.29 -60 | 42 056 +180 | 71.23 -172 |
| 8 8.4 | 58.704 +154 | 20.23 +84 | 43 277 +133 | 10.94 +274 | 39 002 +180 | 15.68 -61 | 42 280 +224 | 69.49 -174 |
| 8 18.4 | 58.887 +183 | 20.94 +71 | 43 453 +176 | 08.41 +253 | 39 213 +211 | 15.01 -67 | 42 547 +267 | 67.77 -172 |
| 8 28.4 | 59.092 +205 | 21.47 +53 | 43 665 +212 | 06.15 +226 | 39 449 +236 | 14.30 -71 | 42 847 +300 | 66.09 -168 |
| 9 7.4 | 59.322 +230 | 21.80 +33 | 43 915 +250 | 04.24 +191 | 39 712 +263 | 13.51 -79 | 43 184 +337 | 64.47 -162 |
| 9 17.3 | 59.573 +251 | 21.86 +6 | 44 197 +282 | 02.80 +144 | 39 997 +285 | 12.66 -85 | 43 552 +368 | 62.94 -153 |
| 9 27.3 | 59.842 +269 | 21.68 -18 | 44 507 +310 | 01.86 +94 | 40 302 +305 | 11.75 -91 | 43 945 +393 | 61.53 -141 |
| 10 7.3 | 60.130 +288 | 21.20 -48 | 44 842 +335 | 01.47 +39 | 40 628 +326 | 10.78 -97 | 44 364 +419 | 60.25 -128 |
| 10 17.3 | 60.431 +301 | 20.43 -77 | 45 193 +351 | 01.70 -23 | 40 968 +340 | 09.78 -100 | 44 800 +436 | 59.15 -110 |
| 10 27.2 | 60.742 +311 | 19.40 -103 | 45 554 +361 | 02.51 -81 | 41 318 +350 | 08.78 -100 | 45 249 +449 | 58.25 -90 |
| 11 6.2 | 61.059 +317 | 18.12 -128 | 45 918 +364 | 03.92 -141 | 41 676 +358 | 07.79 -99 | 45 707 +458 | 57.57 -68 |
| 11 16.2 | 61.373 +314 | 16.64 -148 | 46 272 +354 | 05.88 -196 | 42 032 +356 | 06.86 -93 | 46 160 +453 | 57.17 -40 |
| 11 26.1 | 61.679 +306 | 15.02 -162 | 46 609 +337 | 08.30 -242 | 42 380 +348 | 06.03 -83 | 46 602 +442 | 57.04 -13 |
| 12 6.1 | 61.970 +291 | 13.29 -173 | 46 919 +310 | 11.15 -285 | 42 712 +332 | 05.32 -71 | 47 023 +421 | 57.23 +19 |
| 12 16.1 | 62.234 +264 | 11.55 -174 | 47 189 +270 | 14.29 -314 | 43 016 +304 | 04.79 -53 | 47 406 +383 | 57.73 +50 |
| 12 26.1 | 62.467 +233 | 09.85 -170 | 47 414 +225 | 17.63 -334 | 43 286 +270 | 04.44 -35 | 47 745 +339 | 58.52 +79 |
| 12 36.0 | 62.659 +192 | 08.22 -163 | 47 584 +170 | 21.09 -346 | 43 511 +225 | 04.30 -14 | 48 026 +281 | 59.59 +107 |
| | 62.659 +145 | 08.22 -148 | 47 584 +110 | 21.09 -342 | 43 511 +174 | 04.30 +6 | 48 026 +214 | 59.59 +132 |
| Mean Place | 59.977 | 07.12 | 45.160 | 26.26 | 40.309 | 05.36 | 43.891 | 61.87 |
| sec δ, tan δ | +1.000 | +0.031 | +1.316 | -0.855 | +1.120 | +0.505 | +1.483 | +1.095 |
| da(w), dδ(w) | +0.062 | -0.19 | +0.041 | -0.19 | +0.073 | -0.19 | +0.087 | -0.19 |
| da(e), dδ(e) | +0.001 | +0.88 | -0.027 | +0.88 | +0.016 | +0.88 | +0.035 | +0.88 |
| Dbble.Trans. | January 18 | | January 18 | | January 19 | | January 19 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 1208 | | 303 | | 1210 | | 1209 | |
|---|-------------|------------|----------------|------------|---------------|------------|---------------------------|------------|
| | 1 Cancri | | χ Carinae | | 225 G. Puppis | | Groombridge 1384 (Lyncis) | |
| Mag.Spect. | 5.96 | K0 | 3.60 | B3 | 4.85 | A2 | 6.47 | K0 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " |
| | 7 56 | +15 49 | 7 56 | -52 56 | 7 57 | -30 17 | 7 57 | +44 00 |
| 1 -8.9 | 12.361 +264 | 47.51 -101 | 26.736 +267 | 23.49 -344 | 07.338 +239 | 33.78 -301 | 18.686 +342 | 57.70 +50 |
| 1 1.1 | 12.588 +227 | 46.66 -85 | 26.939 +203 | 27.10 -361 | 07.534 +196 | 36.86 -308 | 18.978 +292 | 58.47 +77 |
| 1 11.0 | 12.771 +183 | 45.97 -69 | 27.072 +133 | 30.79 -369 | 07.680 +146 | 39.96 -310 | 19.213 +235 | 59.50 +103 |
| 1 21.0 | 12.901 +130 | 45.47 -50 | 27.127 +55 | 34.46 -367 | 07.769 +89 | 42.97 -301 | 19.380 +167 | 60.75 +125 |
| 1 31.0 | 12.979 +78 | 45.15 -32 | 27.109 -18 | 37.96 -350 | 07.804 +35 | 45.79 -282 | 19.479 +99 | 62.14 +139 |
| 2 9.9 | 13.005 +26 | 45.00 -15 | 27.019 -90 | 41.27 -331 | 07.784 -20 | 48.40 -261 | 19.509 +30 | 63.62 +148 |
| 2 19.9 | 12.978 -27 | 45.01 +1 | 26.860 -159 | 44.26 -299 | 07.711 -73 | 50.70 -230 | 19.470 -39 | 65.12 +150 |
| 3 1.9 | 12.910 +183 | 45.14 +13 | 26.645 -215 | 46.87 -261 | 07.596 -115 | 52.66 -196 | 19.375 -147 | 66.56 +144 |
| 3 11.9 | 12.803 -107 | 45.35 +21 | 26.381 -264 | 49.08 -221 | 07.443 -153 | 54.26 -160 | 19.228 -95 | 67.87 +131 |
| 3 21.8 | 12.668 -135 | 45.64 +29 | 26.079 -302 | 50.81 -173 | 07.261 -182 | 55.46 -120 | 19.043 -185 | 69.00 +113 |
| 3 31.8 | 12.518 -150 | 45.95 +31 | 25.756 -323 | 52.06 -125 | 07.064 -197 | 56.26 -80 | 18.835 -208 | 69.88 +88 |
| 4 10.8 | 12.359 -159 | 46.28 +33 | 25.419 -337 | 52.82 -76 | 06.858 -206 | 56.67 -41 | 18.614 -221 | 70.51 +63 |
| 4 20.8 | 12.204 -155 | 46.61 +33 | 25.082 -337 | 53.05 -23 | 06.654 -204 | 56.64 +3 | 18.396 -218 | 70.84 +33 |
| 4 30.7 | 12.062 -142 | 46.92 +31 | 24.758 -324 | 52.78 +27 | 06.462 -192 | 56.24 +40 | 18.194 -202 | 70.88 +4 |
| 5 10.7 | 11.938 -124 | 47.23 +31 | 24.452 -306 | 52.01 +77 | 06.287 -175 | 55.44 +80 | 18.014 -180 | 70.63 -25 |
| 5 20.7 | 11.841 -97 | 47.51 +28 | 24.177 -275 | 50.75 +126 | 06.136 -151 | 54.27 +117 | 17.869 -145 | 70.11 -52 |
| 5 30.6 | 11.774 -67 | 47.77 +26 | 23.939 -238 | 49.07 +168 | 06.016 -120 | 52.79 +148 | 17.765 -104 | 69.36 -75 |
| 6 9.6 | 11.739 +2 | 48.03 +26 | 23.742 -197 | 46.97 +210 | 05.926 -90 | 50.99 +180 | 17.703 -62 | 68.39 -97 |
| 6 19.6 | 11.741 +35 | 48.26 +23 | 23.596 -146 | 44.52 +245 | 05.874 -52 | 48.93 +206 | 17.690 -13 | 67.23 -116 |
| 6 29.6 | 11.776 +35 | 48.46 +20 | 23.500 -96 | 41.80 +272 | 05.858 -16 | 46.69 +224 | 17.724 +34 | 65.95 -128 |
| 7 9.5 | 11.845 +69 | 48.64 +18 | 23.457 -43 | 38.86 +294 | 05.878 +20 | 44.29 +240 | 17.803 +79 | 64.54 -141 |
| 7 19.5 | 11.947 +102 | 48.71 +7 | 23.472 +15 | 35.80 +306 | 05.937 +59 | 41.83 +246 | 17.929 +126 | 63.05 -149 |
| 7 29.5 | 12.076 +129 | 48.87 +16 | 23.541 +69 | 32.72 +308 | 06.031 +94 | 39.38 +245 | 17.929 +168 | 61.52 -153 |
| 8 8.5 | 12.240 +164 | 48.91 +4 | 23.666 +125 | 29.68 +304 | 06.162 +131 | 37.00 +238 | 18.306 +209 | 59.94 -158 |
| 8 18.4 | 12.431 +191 | 48.83 -8 | 23.848 +182 | 26.83 +285 | 06.328 +166 | 34.82 +218 | 18.554 +248 | 58.36 -158 |
| 8 28.4 | 12.646 +215 | 48.64 -19 | 24.080 +232 | 24.24 +259 | 06.525 +197 | 32.88 +194 | 18.835 +281 | 56.81 -155 |
| 9 7.4 | 12.886 +240 | 48.32 -32 | 24.362 +282 | 22.01 +223 | 06.754 +229 | 31.27 +161 | 19.150 +315 | 55.29 -152 |
| 9 17.3 | 13.148 +262 | 47.84 -48 | 24.689 +327 | 20.26 +175 | 07.012 +258 | 30.09 +118 | 19.494 +344 | 53.83 -146 |
| 9 27.3 | 13.429 +281 | 47.22 -62 | 25.052 +363 | 19.02 +124 | 07.294 +282 | 29.36 +73 | 19.862 +368 | 52.45 -138 |
| 10 7.3 | 13.730 +301 | 46.44 -78 | 25.449 +397 | 18.38 +64 | 07.600 +306 | 29.14 +22 | 20.256 +394 | 51.17 -128 |
| 10 17.3 | 14.045 +315 | 45.50 -94 | 25.867 +418 | 18.39 -1 | 07.920 +320 | 29.47 -33 | 20.667 +411 | 50.04 -113 |
| 10 27.2 | 14.371 +326 | 44.45 -105 | 26.295 +428 | 19.02 -63 | 08.252 +332 | 30.33 -86 | 21.091 +424 | 49.07 -97 |
| 11 6.2 | 14.705 +334 | 43.29 -116 | 26.726 +431 | 20.31 -129 | 08.589 +337 | 31.73 -140 | 21.525 +434 | 48.29 -78 |
| 11 16.2 | 15.037 +332 | 42.08 -121 | 27.142 +416 | 22.22 -191 | 08.920 +331 | 33.61 -188 | 21.955 +430 | 47.75 -54 |
| 11 26.2 | 15.362 +325 | 40.86 -122 | 27.535 +393 | 24.64 -242 | 09.238 +318 | 35.90 -229 | 22.376 +421 | 47.46 -29 |
| 12 6.1 | 15.673 +311 | 39.66 -120 | 27.892 +357 | 27.56 -292 | 09.536 +298 | 38.57 -267 | 22.778 +402 | 47.46 +0 |
| 12 16.1 | 15.958 +285 | 38.56 -110 | 28.196 +304 | 30.84 -328 | 09.801 +265 | 41.48 -291 | 23.145 +367 | 47.75 +29 |
| 12 26.1 | 16.211 +253 | 37.58 -98 | 28.443 +247 | 34.36 -352 | 10.027 +226 | 44.54 -306 | 23.471 +326 | 48.32 +57 |
| 12 36.0 | 16.424 +213 | 36.75 -83 | 28.622 +179 | 38.06 -370 | 10.206 +179 | 47.69 -315 | 23.745 +274 | 49.17 +85 |
| | +163 | -64 | +104 | -371 | +126 | -309 | +209 | +109 |
| Mean Place | 13.505 | 37.26 | 26.117 | 44.46 | 07.798 | 51.84 | 19.832 | 51.69 |
| sec δ , tan δ | +1.039 | +0.283 | +1.660 | -1.324 | +1.158 | -0.584 | +1.391 | +0.966 |
| $d\alpha(\psi)$, $d\delta(\psi)$ | +0.068 | -0.19 | +0.030 | -0.19 | +0.048 | -0.19 | +0.084 | -0.19 |
| $d\alpha(\epsilon)$, $d\delta(\epsilon)$ | +0.009 | +0.87 | -0.043 | +0.87 | -0.019 | +0.87 | +0.032 | +0.87 |
| Dble.Trans. | January 19 | | January 20 | | January 20 | | January 20 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 300 | | 304 | | 1212 | | 1211 | |
|--------------|-----------------------------------|---------|--------------------|---------|--------------------|---------|--------------------|---------|
| | Groombridge 1374 (Camelopardi) | | 27 Monocerotis | | 232 G. Puppis | | ω Cancri | |
| Mag. Spect. | 5.56 | K0 | 5.06 | K0 | 4.64 | A2 | 5.88 | K0 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° / | h m | ° / | h m | ° / | h m | ° / |
| | 7 58 | + 73 57 | 7 59 | - 3 38 | 7 59 | - 18 21 | 8 00 | + 25 25 |
| | ^s + 740 | " + 186 | ^s + 246 | " - 199 | ^s + 240 | " - 261 | ^s + 285 | " - 51 |
| 1 | -8.9 | 35.870 | 23.21 | +221 | 02.700 | +208 | 18.35 | -194 |
| 1 | 1.1 | 36.485 | 25.42 | +251 | 02.908 | +166 | 20.29 | -185 |
| 1 | 11.0 | 36.960 | 27.93 | +272 | 03.074 | +116 | 22.14 | -169 |
| 1 | 21.0 | 37.266 | 30.65 | +280 | 03.190 | +65 | 23.83 | -150 |
| 1 | 31.0 | 37.409 | 33.45 | +281 | 03.255 | +16 | 25.33 | -130 |
| 2 | 9.9 | 37.384 | 36.26 | +267 | 03.271 | -33 | 26.63 | -106 |
| 2 | 19.9 | 37.192 | 38.93 | +243 | 03.238 | -73 | 27.69 | -82 |
| 3 | 1.9 | 36.860 | 41.36 | +212 | 03.165 | -109 | 28.51 | -61 |
| 3 | 11.9 | 36.402 | 43.48 | +169 | 03.056 | -135 | 29.12 | -36 |
| 3 | 21.8 | 35.842 | 45.17 | +122 | 02.921 | -150 | 29.48 | -16 |
| 3 | 31.8 | 35.222 | 46.39 | +71 | 02.771 | -158 | 29.64 | +4 |
| 4 | 10.8 | 34.560 | 47.10 | +16 | 02.613 | -155 | 29.60 | +24 |
| 4 | 20.8 | 33.895 | 47.26 | -35 | 02.458 | -143 | 29.36 | +41 |
| 4 | 30.7 | 33.261 | 46.91 | -86 | 02.315 | -127 | 28.95 | +59 |
| 5 | 10.7 | 32.673 | 46.05 | -135 | 02.188 | -103 | 28.36 | +75 |
| 5 | 20.7 | 32.166 | 44.70 | -174 | 02.085 | -74 | 27.61 | +88 |
| 5 | 30.6 | 31.755 | 42.96 | -212 | 02.011 | -45 | 26.73 | +102 |
| 6 | 9.6 | 31.448 | 40.84 | -242 | 01.966 | -11 | 25.71 | +112 |
| 6 | 19.6 | 31.266 | 38.42 | -262 | 01.955 | +20 | 24.59 | +119 |
| 6 | 29.6 | 31.206 | 35.80 | -280 | 01.975 | +52 | 23.40 | +123 |
| 7 | 9.5 | 31.270 | 33.00 | -289 | 02.027 | +85 | 22.17 | +124 |
| 7 | 19.5 | 31.466 | 30.11 | -290 | 02.112 | +113 | 20.93 | +119 |
| 7 | 29.5 | 31.778 | 27.21 | -288 | 02.225 | +143 | 19.74 | +112 |
| 8 | 8.5 | 32.208 | 24.33 | -277 | 02.368 | +171 | 18.62 | +96 |
| 8 | 18.4 | 32.750 | 21.56 | -244 | 02.539 | +196 | 17.66 | +117 |
| 8 | 28.4 | 33.386 | 18.94 | -216 | 02.735 | +221 | 16.88 | +55 |
| 9 | 7.4 | 34.118 | 16.50 | -187 | 02.956 | +243 | 16.33 | +26 |
| 9 | 17.3 | 34.930 | 14.34 | -154 | 03.199 | +264 | 16.07 | -4 |
| 9 | 27.3 | 35.807 | 12.47 | -115 | 03.463 | +283 | 16.11 | -37 |
| 10 | 7.3 | 36.746 | 10.93 | -74 | 03.746 | +308 | 16.48 | -72 |
| 10 | 17.3 | 37.723 | 09.78 | -30 | 04.043 | +316 | 15.95 | +303 |
| 10 | 27.2 | 38.724 | 09.04 | +18 | 04.351 | +314 | 15.22 | +228 |
| 11 | 6.2 | 39.738 | 08.74 | +64 | 04.667 | +306 | 14.54 | +291 |
| 11 | 16.2 | 40.732 | 08.92 | +112 | 04.981 | +292 | 13.965 | +220 |
| 11 | 26.2 | 41.691 | 09.56 | +156 | 05.287 | +266 | 13.329 | +194 |
| 12 | 6.1 | 42.591 | 10.68 | +195 | 05.579 | +235 | 12.717 | +168 |
| 12 | 16.1 | 43.397 | 12.24 | +232 | 05.845 | +195 | 12.115 | +137 |
| 12 | 26.1 | 44.097 | 14.19 | +257 | 06.080 | +148 | 11.564 | +107 |
| 12 | 36.0 | 44.663 | 16.51 | +257 | 06.275 | +148 | 10.936 | +81 |
| Mean Place | 35.866 | 19.87 | 03.678 | 32.06 | 15.717 | 42.29 | 06.927 | 49.65 |
| sec δ, tan δ | +3.618 | +3.477 | +1.002 | -0.064 | +1.054 | -0.332 | +1.107 | +0.475 |
| dα(ψ), dδ(ψ) | +0.141 | -0.20 | +0.060 | -0.20 | +0.054 | -0.20 | +0.072 | -0.20 |
| dα(ε), dδ(ε) | +0.115 | +0.87 | -0.002 | +0.87 | -0.011 | +0.87 | +0.016 | +0.87 |
| Dble. Trans. | January 20 | | January 20 | | January 20 | | January 20 | |

APPARENT PLACES OF STARS, 1986

127

AT UPPER TRANSIT AT GREENWICH

| No. | 302 | | 1213 | | 305 | | 306 | |
|--------------|---------------------------|------------|---------------------------|------------|---------------------------|------------|---------------------------|------------|
| | 53 Camelopardi | | 161 G. Monocerotis | | χ Geminorum | | ζ Puppis | |
| Mag.Spect. | 6.00 | A2p | 6.30 | G0 | 5.04 | K0 | 2.27 | Od |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " |
| | 8 00 | + 60 21 | 8 01 | - 6 17 | 8 02 | + 27 49 | 8 03 | - 39 57 |
| 1 -8.9 | 32.676 ^s + 462 | 48 58 +128 | 45.211 ^s + 246 | 42.14 -212 | 40.229 ^s + 293 | 66.87 -40 | 06.410 ^s + 253 | 33.02 -323 |
| 1 1.1 | 33.067 + 391 | 50.17 +159 | 45.421 + 210 | 44.22 -208 | 40.481 + 252 | 66.68 -19 | 06.613 + 203 | 36.38 -336 |
| 1 11.0 | 33.379 + 312 | 52.07 +190 | 45.588 + 167 | 46.23 -201 | 40.687 + 206 | 66.71 + 3 | 06.762 + 149 | 39.81 -343 |
| 1 21.0 | 33.594 + 215 | 54.18 +211 | 45.704 + 116 | 46.23 -185 | 40.837 + 150 | 66.95 + 24 | 06.848 + 86 | 43.17 -336 |
| 1 31.0 | 33.714 + 120 | 56.42 +224 | 45.771 + 67 | 49.74 -166 | 40.930 + 93 | 67.36 + 41 | 06.874 + 26 | 46.38 -321 |
| 2 9.9 | 33.737 + 23 | 58.71 +229 | 45.787 + 16 | 51.20 -146 | 40.966 + 36 | 67.93 + 57 | 06.840 -34 | 49.38 -300 |
| 2 19.9 | 33.663 -74 | 60.93 +222 | 45.755 -32 | 52.41 -121 | 40.945 -21 | 68.60 + 67 | 06.748 -92 | 52.06 -268 |
| 3 1.9 | 33.507 -156 | 63.00 +207 | 45.682 -73 | 53.37 -96 | 40.877 -68 | 69.32 + 72 | 06.609 -139 | 54.40 -234 |
| 3 11.9 | 33.278 -229 | 64.83 +183 | 45.573 -109 | 54.09 -72 | 40.766 -111 | 70.04 + 72 | 06.428 -181 | 56.36 -196 |
| 3 21.8 | 32.991 -287 | 66.34 +151 | 45.438 -135 | 54.56 -47 | 40.624 -142 | 70.73 + 69 | 06.216 -212 | 57.87 -151 |
| 3 31.8 | 32.670 -321 | 67.48 +114 | 45.287 -151 | 54.80 -24 | 40.463 -161 | 71.34 + 61 | 05.985 -231 | 58.95 -108 |
| 4 10.8 | 32.327 -343 | 68.22 + 74 | 45.128 -159 | 54.81 -1 | 40.291 -172 | 71.85 + 51 | 05.742 -243 | 59.58 -63 |
| 4 20.8 | 31.984 -343 | 68.50 + 28 | 44.971 -157 | 54.60 + 21 | 40.121 -170 | 72.23 + 38 | 05.500 -242 | 59.73 -15 |
| 4 30.7 | 31.661 -323 | 68.36 -14 | 44.826 -145 | 54.19 + 41 | 39.965 -156 | 72.47 + 24 | 05.268 -232 | 59.44 + 29 |
| 5 10.7 | 31.366 -295 | 67.80 -56 | 44.696 -130 | 53.59 + 60 | 39.827 -138 | 72.58 + 11 | 05.052 -216 | 58.71 + 73 |
| 5 20.7 | 31.118 -248 | 66.84 -96 | 44.591 -105 | 52.79 + 80 | 39.716 -111 | 72.56 -2 | 04.862 -190 | 57.53 +118 |
| 5 30.6 | 30.926 -192 | 65.53 -131 | 44.512 -79 | 51.85 + 94 | 39.639 -77 | 72.41 -15 | 04.703 -159 | 55.99 +154 |
| 6 9.6 | 30.794 -132 | 63.92 -161 | 44.463 -49 | 50.75 +110 | 39.595 -44 | 72.15 -26 | 04.576 -127 | 54.08 +191 |
| 6 19.6 | 30.732 -62 | 62.03 -189 | 44.447 -16 | 49.53 +130 | 39.590 -5 | 71.80 -35 | 04.489 -87 | 51.85 +223 |
| 6 29.6 | 30.737 + 5 | 59.96 -207 | 44.463 + 16 | 48.23 +130 | 39.623 + 33 | 71.36 -44 | 04.441 -48 | 49.40 +245 |
| 7 9.5 | 30.810 + 73 | 57.73 -223 | 44.510 + 47 | 46.87 +136 | 39.692 + 69 | 70.86 -50 | 04.434 -7 | 46.74 +266 |
| 7 19.5 | 30.955 + 145 | 55.40 -233 | 44.590 + 80 | 45.51 +136 | 39.797 + 105 | 70.33 -53 | 04.471 + 37 | 44.00 +274 |
| 7 29.5 | 31.162 + 207 | 53.04 -236 | 44.698 + 108 | 44.18 +133 | 39.932 + 135 | 69.66 -67 | 04.549 + 78 | 41.24 +276 |
| 8 8.5 | 31.431 + 269 | 50.67 -237 | 44.837 + 139 | 42.92 +126 | 40.104 + 172 | 68.93 -73 | 04.669 + 120 | 38.53 +271 |
| 8 18.4 | 31.761 + 330 | 48.34 -233 | 45.004 + 167 | 41.83 +109 | 40.307 + 203 | 68.16 -77 | 04.831 + 162 | 36.00 +253 |
| 8 28.4 | 32.141 + 380 | 46.12 -222 | 45.196 + 192 | 40.92 + 91 | 40.536 + 229 | 67.33 -83 | 05.030 + 199 | 33.73 +227 |
| 9 7.4 | 32.572 + 431 | 44.00 -212 | 45.414 + 218 | 40.26 + 66 | 40.792 + 256 | 66.43 -90 | 05.268 + 238 | 31.78 +195 |
| 9 17.3 | 33.047 + 475 | 42.07 -193 | 45.655 + 241 | 39.90 + 36 | 41.073 + 281 | 65.47 -96 | 05.540 + 272 | 30.29 +149 |
| 9 27.3 | 33.558 + 511 | 40.34 -173 | 45.916 + 261 | 39.86 + 4 | 41.375 + 302 | 64.45 -102 | 05.840 + 300 | 29.28 +101 |
| 10 7.3 | 34.106 + 548 | 38.84 -150 | 46.198 + 282 | 40.17 -31 | 41.699 + 324 | 63.39 -106 | 06.169 + 329 | 28.81 + 47 |
| 10 17.3 | 34.678 + 572 | 37.64 -120 | 46.495 + 297 | 40.84 -67 | 42.039 + 340 | 62.30 -109 | 06.515 + 346 | 28.96 -15 |
| 10 27.2 | 35.266 + 588 | 36.73 -91 | 46.803 + 308 | 41.86 -102 | 42.391 + 352 | 61.21 -109 | 06.874 + 359 | 29.67 -71 |
| 11 6.2 | 35.867 + 601 | 36.18 -55 | 47.119 + 316 | 43.20 -134 | 42.753 + 362 | 60.14 -107 | 07.239 + 365 | 30.99 -132 |
| 11 16.2 | 36.460 + 593 | 36.00 -18 | 47.433 + 314 | 44.84 -164 | 43.114 + 361 | 59.15 -99 | 07.597 + 358 | 32.86 -187 |
| 11 26.2 | 37.038 + 578 | 36.21 + 21 | 47.740 + 307 | 46.69 -185 | 43.469 + 355 | 58.27 -88 | 07.940 + 343 | 35.21 -235 |
| 12 6.1 | 37.587 + 549 | 36.82 + 61 | 48.033 + 293 | 48.72 -203 | 43.810 + 341 | 57.53 -74 | 08.259 + 319 | 37.99 -278 |
| 12 16.1 | 38.085 + 498 | 37.82 +100 | 48.300 + 267 | 50.84 -212 | 44.123 + 313 | 56.98 -55 | 08.540 + 281 | 41.09 -310 |
| 12 26.1 | 38.525 + 440 | 39.18 +136 | 48.535 + 235 | 52.97 -213 | 44.404 + 281 | 56.62 -36 | 08.778 + 238 | 44.39 -330 |
| 12 36.0 | 38.889 + 364 | 40.88 +170 | 48.731 + 196 | 55.07 -210 | 44.641 + 237 | 56.49 -13 | 08.964 + 186 | 47.84 -345 |
| | 38.889 + 275 | 40.88 +196 | 48.731 + 149 | 55.07 -197 | 44.641 + 186 | 56.49 + 8 | 08.964 + 125 | 47.84 -343 |
| Mean Place | 33.540 | 44.39 | 46.168 | 56.48 | 41.422 | 58.53 | 06.575 | 53.04 |
| sec δ, tan δ | +2.022 | +1.758 | +1.006 | -0.110 | +1.131 | +0.528 | +1.305 | -0.838 |
| da(ψ), dδ(ψ) | +0.101 | -0.20 | +0.059 | -0.20 | +0.073 | -0.20 | +0.042 | -0.20 |
| da(ε), dδ(ε) | +0.059 | +0.86 | -0.004 | +0.86 | +0.018 | +0.86 | -0.029 | +0.86 |
| Dble.Trans. | January 21 | | January 21 | | January 21 | | January 21 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 308 | | 307 | | 309 | | 1214 | | |
|--------------|------------|-------------|------------|-------------|------------|-------------|--------------------------------------|-------------|------------|
| | ♄ Puppis | | 27 Lyncis | | γ Velorum* | | Piazzini 7 ^h 308 (Lyncis) | | |
| Mag.Spect. | 2.88 | F5 | 4.87 | A2 | 1.92 | Oap | 6.64 | F8 | |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " | |
| | 8 06 | -24 15 | 8 07 | +51 32 | 8 09 | -47 17 | 8 09 | +35 29 | |
| 1 | -8.9 | 57.470 +247 | 35.50 -281 | 25.687 +394 | 52.25 +79 | 07.139 +271 | 25.81 -334 | 17.671 +320 | 53.22 -5 |
| 1 | 1.1 | 57.676 +206 | 38.38 -288 | 26.025 +338 | 53.35 +110 | 07.355 +216 | 29.31 -350 | 17.949 +278 | 53.42 +20 |
| 1 | 11.0 | 57.836 +160 | 41.25 -287 | 26.300 +275 | 54.74 +139 | 07.510 +155 | 32.91 -360 | 18.177 +228 | 53.87 +45 |
| 1 | 21.0 | 57.942 +106 | 44.04 -279 | 26.497 +197 | 56.38 +164 | 07.595 +85 | 36.49 -358 | 18.344 +167 | 54.56 +69 |
| 1 | 31.0 | 57.995 +53 | 46.64 -260 | 26.618 +121 | 58.16 +178 | 07.614 +19 | 39.93 -344 | 18.451 +107 | 55.42 +86 |
| 2 | 10.0 | 57.996 +1 | 49.03 -239 | 26.659 +41 | 60.04 +188 | 07.566 -48 | 43.19 -326 | 18.497 +46 | 56.43 +101 |
| 2 | 19.9 | 57.945 -51 | 51.13 -210 | 26.622 -37 | 61.92 +188 | 07.455 -111 | 46.14 -295 | 18.480 -17 | 57.51 +108 |
| 3 | 1.9 | 57.851 -94 | 52.91 -178 | 26.517 -105 | 63.71 +179 | 07.291 -164 | 48.73 -259 | 18.411 -69 | 58.61 +110 |
| 3 | 11.9 | 57.721 -130 | 54.38 -147 | 26.352 -165 | 65.34 +163 | 07.081 -210 | 50.95 -115 | 18.296 -115 | 59.66 +105 |
| 3 | 21.8 | 57.561 -160 | 55.46 -108 | 26.139 -213 | 66.72 +138 | 06.834 -247 | 52.71 -176 | 18.144 -152 | 60.62 +96 |
| 3 | 31.8 | 57.386 -175 | 56.19 -73 | 25.899 -240 | 67.81 +109 | 06.566 -268 | 54.01 -130 | 17.971 -173 | 61.42 +80 |
| 4 | 10.8 | 57.200 -186 | 56.57 -38 | 25.639 -260 | 68.58 +77 | 06.283 -283 | 54.84 -83 | 17.784 -187 | 62.06 +64 |
| 4 | 20.8 | 57.015 -185 | 56.56 +1 | 25.379 -260 | 68.98 +40 | 05.998 -285 | 55.16 -32 | 17.598 -186 | 62.48 +42 |
| 4 | 30.7 | 56.840 -175 | 56.21 +35 | 25.134 -245 | 69.03 +5 | 05.722 -276 | 55.00 +16 | 17.424 -174 | 62.69 +21 |
| 5 | 10.7 | 56.680 -160 | 55.51 +70 | 24.910 -224 | 68.72 -31 | 05.461 -261 | 54.37 +63 | 17.269 -155 | 62.69 +0 |
| 5 | 20.7 | 56.543 -137 | 54.48 +103 | 24.725 -185 | 68.05 -67 | 05.227 -234 | 53.25 +112 | 17.142 -127 | 62.48 -21 |
| 5 | 30.6 | 56.433 -110 | 53.16 +132 | 24.583 -142 | 67.10 -95 | 05.024 -203 | 51.73 +152 | 17.050 -92 | 62.08 -40 |
| 6 | 9.6 | 56.353 -80 | 51.57 +159 | 24.487 -96 | 65.87 -123 | 04.856 -168 | 49.80 +193 | 16.993 -57 | 61.52 -56 |
| 6 | 19.6 | 56.307 -46 | 49.74 +183 | 24.447 -40 | 64.40 -147 | 04.732 -124 | 47.52 +228 | 16.979 -14 | 60.79 -73 |
| 6 | 29.6 | 56.294 -13 | 47.75 +199 | 24.459 +12 | 62.75 -165 | 04.650 -82 | 44.98 +254 | 17.003 +24 | 59.95 -84 |
| 7 | 9.5 | 56.315 +21 | 45.61 +214 | 24.524 +65 | 60.95 -180 | 04.614 -36 | 42.20 +278 | 17.068 +65 | 59.01 -94 |
| 7 | 19.5 | 56.372 +57 | 43.42 +219 | 24.644 +120 | 59.04 -191 | 04.628 +14 | 39.30 +290 | 17.172 +104 | 57.97 -104 |
| 7 | 29.5 | 56.462 +90 | 41.24 +218 | 24.812 +168 | 57.08 -196 | 04.688 +60 | 36.36 +294 | 17.312 +140 | 56.86 -111 |
| 8 | 8.5 | 56.585 +123 | 39.13 +211 | 25.030 +218 | 55.07 -201 | 04.798 +110 | 33.45 +291 | 17.488 +176 | 55.67 -119 |
| 8 | 18.4 | 56.741 +156 | 37.19 +194 | 25.294 +264 | 53.07 -200 | 04.957 +159 | 30.71 +274 | 17.699 +211 | 54.45 -122 |
| 8 | 28.4 | 56.927 +186 | 35.47 +172 | 25.597 +303 | 51.12 -195 | 05.159 +202 | 28.21 +250 | 17.939 +240 | 53.19 -126 |
| 9 | 7.4 | 57.143 +216 | 34.06 +141 | 25.941 +344 | 49.22 -190 | 05.408 +249 | 26.04 +217 | 18.211 +272 | 51.91 -128 |
| 9 | 17.3 | 57.387 +244 | 33.04 +102 | 26.321 +380 | 47.44 -178 | 05.697 +269 | 24.32 +172 | 18.211 +298 | 50.61 -130 |
| 9 | 27.3 | 57.655 +268 | 32.43 +61 | 26.731 +410 | 45.79 -165 | 06.020 +323 | 23.10 +122 | 18.509 +322 | 49.32 -129 |
| 10 | 7.3 | 57.946 +291 | 32.30 +13 | 27.172 +441 | 44.29 -150 | 06.376 +356 | 22.44 +66 | 19.177 +346 | 48.04 -128 |
| 10 | 17.3 | 58.254 +308 | 32.68 -38 | 27.635 +463 | 43.00 -129 | 06.754 +378 | 22.41 +3 | 19.541 +364 | 46.82 -122 |
| 10 | 27.2 | 58.574 +320 | 33.54 -86 | 28.114 +479 | 41.94 -106 | 07.146 +392 | 22.99 -58 | 19.920 +379 | 45.68 -114 |
| 11 | 6.2 | 58.902 +328 | 34.90 -136 | 28.605 +491 | 41.15 -79 | 07.545 +399 | 24.20 -121 | 20.310 +390 | 44.64 -104 |
| 11 | 16.2 | 59.227 +325 | 36.71 -181 | 29.094 +489 | 40.67 -48 | 07.935 +390 | 26.01 -181 | 20.700 +390 | 43.76 -88 |
| 11 | 26.2 | 59.543 +316 | 38.88 -217 | 29.574 +480 | 40.50 -17 | 08.309 +374 | 28.34 -233 | 21.084 +384 | 43.05 -71 |
| 12 | 6.1 | 59.842 +299 | 41.40 -252 | 30.033 +459 | 40.69 +19 | 08.656 +347 | 31.15 -281 | 21.454 +370 | 42.57 -48 |
| 12 | 16.1 | 60.112 +270 | 44.13 -273 | 30.455 +422 | 41.23 +54 | 08.959 +303 | 34.32 -317 | 21.796 +342 | 42.33 -24 |
| 12 | 26.1 | 60.346 +234 | 46.99 -286 | 30.832 +377 | 42.10 +87 | 09.213 +254 | 37.74 -342 | 22.103 +307 | 42.34 +1 |
| 12 | 36.0 | 60.538 +192 | 49.92 -293 | 31.149 +317 | 43.30 +120 | 09.409 +196 | 41.34 -360 | 22.365 +262 | 42.61 +27 |
| | | +140 | -287 | +246 | +146 | +129 | -363 | +205 | +52 |
| Mean Place | 58.133 | 53.30 | 26.747 | 47.34 | 07.008 | 47.38 | 18.876 | 46.00 | |
| sec δ, tan δ | +1.097 | -0.451 | +1.608 | +1.259 | +1.474 | -1.084 | +1.228 | +0.713 | |
| dα(w), dδ(ψ) | +0.051 | -0.21 | +0.090 | -0.21 | +0.037 | -0.21 | +0.077 | -0.21 | |
| dα(ε), dδ(ε) | -0.016 | +0.85 | +0.044 | +0.85 | -0.039 | +0.85 | +0.025 | +0.84 | |
| Dbie.Trans. | January 22 | | January 22 | | January 23 | | January 23 | | |

APPARENT PLACES OF STARS, 1986

129

AT UPPER TRANSIT AT GREENWICH

| No. | 1215 | | 311 | | 312 | | 1216 | |
|------------------------------|--------------------|-----------------|------------------|-----------------|------------------|-----------------|---------------------------|-----------------|
| | 3 H. Ursae Majoris | | 20 Puppis | | β Cancri | | B.D. +4° 1945 (Hydrae) | |
| Mag. Spect. | 5.48 | G5 | 5.05 | G5 | 3.76 | K2 | 6.68 | G0, A2 |
| U.T. | R.A. Dec. | | R.A. Dec. | | R.A. Dec. | | R.A. Dec. | |
| | h m | ° ′ | h m | ° ′ | h m | ° ′ | h m | ° ′ |
| | 8 11 | + 68 30 | 8 12 | - 15 44 | 8 15 | + 9 13 | 8 16 | + 4 15 |
| 1 -8.9 | 28.409 + 609 | 57.34 +150 | 41.849 + 252 | 32.63 -252 | 45.891 + 271 | 51.92 -144 | 34.738 + 266 | 54.20 -168 |
| 1 1.1 | 28.926 + 517 | 59.21 +187 | 42.063 + 214 | 35.17 -254 | 46.126 + 235 | 50.61 -131 | 34.969 + 231 | 52.62 -158 |
| 1 11.0 | 29.339 + 413 | 61.41 +220 | 42.233 + 170 | 37.68 -251 | 46.319 + 193 | 49.44 -117 | 35.158 + 189 | 51.16 -146 |
| 1 21.0 | 29.627 + 288 | 63.86 +245 | 42.353 + 120 | 40.07 -239 | 46.462 + 143 | 48.46 -98 | 35.298 + 140 | 49.88 -128 |
| 1 31.0 | 29.789 + 162 | 66.44 +258 | 42.422 + 69 | 42.28 -221 | 46.555 + 93 | 47.68 -78 | 35.388 + 90 | 48.79 -109 |
| 2 10.0 | 29.822 + 33 | 69.07 +263 | 42.439 + 17 | 44.28 -200 | 46.596 + 41 | 47.10 -58 | 35.427 + 39 | 47.91 -88 |
| 2 19.9 | 29.725 - 97 | 71.64 +257 | 42.407 - 32 | 46.01 -173 | 46.586 - 10 | 46.71 -39 | 35.416 - 11 | 47.24 -67 |
| 3 1.9 | 29.518 - 207 | 74.01 +237 | 42.407 - 74 | 46.01 -144 | 46.586 - 53 | 46.71 -21 | 35.416 - 54 | 47.24 -47 |
| 3 11.9 | 29.210 - 308 | 74.01 +212 | 42.333 - 112 | 47.45 -117 | 46.533 - 91 | 46.50 -6 | 35.362 - 92 | 46.77 -29 |
| 3 21.8 | 28.821 - 389 | 76.13 +176 | 42.221 - 139 | 48.62 -83 | 46.442 - 122 | 46.44 +7 | 35.270 - 121 | 46.48 -11 |
| 3 31.8 | 28.381 - 440 | 79.21 +132 | 41.925 - 157 | 49.99 -54 | 46.181 - 139 | 46.68 +17 | 35.011 - 138 | 46.39 +2 |
| 4 10.8 | 27.904 - 477 | 80.09 +88 | 41.758 - 167 | 50.24 -25 | 46.031 - 150 | 46.94 +26 | 34.861 - 150 | 46.55 +16 |
| 4 20.8 | 27.420 - 484 | 80.45 +36 | 41.592 - 166 | 50.16 +8 | 45.881 - 150 | 47.27 +33 | 34.712 - 149 | 46.84 +29 |
| 4 30.7 | 26.955 - 465 | 80.33 -12 | 41.435 - 157 | 50.16 +34 | 45.741 - 140 | 47.64 +37 | 34.572 - 140 | 47.21 +37 |
| 5 10.7 | 26.521 - 434 | 79.73 -60 | 41.291 - 144 | 49.19 +63 | 45.615 - 126 | 48.06 +42 | 34.446 - 126 | 47.68 +47 |
| 5 20.7 | 26.144 - 377 | 78.65 -108 | 41.170 - 121 | 48.30 +89 | 45.512 - 103 | 48.52 +46 | 34.342 - 104 | 48.24 +56 |
| 5 30.7 | 25.836 - 308 | 77.18 -147 | 41.075 - 95 | 47.18 +112 | 45.436 - 76 | 49.00 +48 | 34.264 - 78 | 48.86 +62 |
| 6 9.6 | 25.603 - 233 | 75.34 -184 | 41.007 - 68 | 45.84 +134 | 45.388 - 48 | 49.51 +51 | 34.214 - 50 | 49.55 +69 |
| 6 19.6 | 25.462 - 141 | 73.19 -215 | 40.972 - 35 | 44.32 +152 | 45.373 - 15 | 50.03 +52 | 34.196 - 18 | 50.29 +74 |
| 6 29.6 | 25.411 - 51 | 70.81 -238 | 40.968 - 4 | 42.67 +165 | 45.389 + 16 | 50.54 +51 | 34.208 + 12 | 51.05 +76 |
| 7 9.5 | 25.450 + 39 | 68.23 -258 | 40.995 + 27 | 40.90 +177 | 45.436 + 47 | 51.05 +51 | 34.251 + 43 | 51.82 +77 |
| 7 19.5 | 25.587 + 137 | 65.54 -269 | 41.057 + 62 | 39.11 +179 | 45.516 + 80 | 51.50 +45 | 34.327 + 76 | 52.56 +74 |
| 7 29.5 | 25.809 + 222 | 62.79 -275 | 41.148 + 91 | 37.34 +177 | 45.622 + 106 | 51.91 +41 | 34.429 + 102 | 53.26 +70 |
| 8 8.5 | 26.119 + 310 | 60.03 -276 | 41.270 + 122 | 35.63 +171 | 45.759 + 137 | 52.27 +36 | 34.561 + 132 | 53.90 +64 |
| 8 18.4 | 26.514 + 395 | 57.33 -270 | 41.423 + 153 | 34.08 +155 | 45.925 + 166 | 52.50 +23 | 34.722 + 161 | 54.40 +50 |
| 8 28.4 | 26.980 + 466 | 54.74 -259 | 41.604 + 181 | 32.74 +134 | 46.116 + 191 | 52.57 +7 | 34.908 + 186 | 54.74 +34 |
| 9 7.4 | 27.519 + 539 | 52.29 -245 | 41.812 + 208 | 31.66 +108 | 46.333 + 217 | 52.48 -9 | 35.120 + 212 | 54.88 +14 |
| 9 17.4 | 28.122 + 603 | 50.06 -223 | 42.047 + 235 | 30.94 +72 | 46.574 + 241 | 52.18 -30 | 35.356 + 236 | 54.79 -9 |
| 9 27.3 | 28.777 + 655 | 48.07 -199 | 42.305 + 258 | 30.59 +35 | 46.836 + 262 | 51.68 -50 | 35.613 + 257 | 54.46 -33 |
| 10 7.3 | 29.483 + 706 | 46.36 -171 | 42.585 + 280 | 30.65 -6 | 47.120 + 284 | 50.95 -73 | 35.892 + 279 | 53.87 -59 |
| 10 17.3 | 30.225 + 742 | 45.00 -136 | 42.883 + 298 | 31.16 -51 | 47.420 + 300 | 50.01 -94 | 36.189 + 297 | 53.01 -86 |
| 10 27.2 | 30.991 + 766 | 44.00 -100 | 43.193 + 310 | 32.09 -93 | 47.735 + 315 | 48.88 -113 | 36.498 + 309 | 51.91 -110 |
| 11 6.2 | 31.774 + 783 | 43.41 -59 | 43.513 + 320 | 33.44 -135 | 48.060 + 325 | 47.57 -131 | 36.819 + 321 | 50.58 -133 |
| 11 16.2 | 32.550 + 776 | 43.27 -14 | 43.832 + 319 | 35.17 -173 | 48.387 + 327 | 46.13 -144 | 37.142 + 323 | 49.07 -151 |
| 11 26.2 | 33.307 + 757 | 43.57 +30 | 44.145 + 313 | 37.21 -204 | 48.711 + 324 | 44.62 -151 | 37.461 + 319 | 47.43 -164 |
| 12 6.1 | 34.027 + 720 | 44.33 +76 | 44.444 + 299 | 39.51 -230 | 49.023 + 312 | 43.08 -154 | 37.768 + 307 | 45.72 -171 |
| 12 16.1 | 34.682 + 655 | 45.54 +121 | 44.716 + 272 | 41.98 -247 | 49.312 + 289 | 41.57 -151 | 38.053 + 285 | 43.99 -173 |
| 12 26.1 | 35.261 + 579 | 47.14 +160 | 44.957 + 241 | 44.54 -256 | 49.572 + 260 | 40.15 -142 | 38.308 + 255 | 42.32 -167 |
| 12 36.1 | 35.742 + 481 | 49.13 +199 | 45.157 + 200 | 47.11 -257 | 49.794 + 222 | 38.85 -130 | 38.526 + 218 | 40.75 -157 |
| | 35.742 + 364 | 49.13 +227 | 45.157 + 153 | 47.11 -250 | 49.794 + 175 | 38.85 -112 | 38.526 + 172 | 40.75 -142 |
| Mean Place sec δ, tan δ | 28.884 +2.730 | 54.15 +2.541 | 42.708 +1.039 | 49.28 -0.282 | 47.038 +1.013 | 40.03 +0.162 | 35.853 +1.003 | 41.33 +0.075 |
| dα(ψ), dδ(ψ) dα(ε), dδ(ε) | +0.118 +0.092 | -0.22 +0.84 | +0.055 -0.010 | -0.22 +0.84 | +0.065 +0.006 | -0.22 +0.83 | +0.063 +0.003 | -0.22 +0.83 |
| Dble. Trans. | January 23 | | January 24 | | January 24 | | January 25 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 310 Bradley 1147 (Camelopardi) | | | 313 | | 1218 | | 1217 χ Cancri | | | | | | | | | |
|---|--------------------------------------|--------|--------|------------|--------|--------|------------|-----------------------|--------|------------|-------|--------|--------|--------|-------|-------|------|
| | Mag. | Spect. | | | | | | | | | | | | | | | |
| | 5.73 | G5 | | 4.43 | A5 | 6.32 | A5 | 5.16 | F5 | | | | | | | | |
| U.T. | R.A. | | Dec. | R.A. | | Dec. | R.A. | | Dec. | | | | | | | | |
| | h | m | ° | h | m | ° | h | m | ° | | | | | | | | |
| | 8 | 17 | +75 47 | 8 | 18 | -36 36 | 8 | 18 | -10 07 | | | | | | | | |
| | s | " | ' | s | " | ' | s | " | ' | | | | | | | | |
| | 8 17 | 8 18 | 8 19 | 8 17 | 8 18 | 8 19 | 8 17 | 8 18 | 8 19 | | | | | | | | |
| 1 | -8.9 | 52.337 | + 873 | 61.21 | +171 | 02.577 | + 264 | 40.88 | -313 | 35.273 | + 258 | 07.49 | -231 | 13.529 | + 304 | 52.17 | - 56 |
| 1 | 1.1 | 53.077 | + 740 | 63.30 | +209 | 02.796 | + 219 | 44.14 | -326 | 35.495 | + 222 | 09.78 | -229 | 13.795 | + 266 | 51.84 | - 33 |
| 1 | 11.0 | 53.667 | + 590 | 65.75 | +245 | 02.964 | + 168 | 47.47 | -333 | 35.675 | + 180 | 12.03 | -225 | 14.016 | + 221 | 51.74 | - 10 |
| 1 | 21.0 | 54.074 | + 407 | 68.46 | +271 | 03.072 | + 108 | 50.76 | -329 | 35.805 | + 130 | 14.14 | -211 | 14.182 | + 166 | 51.87 | + 13 |
| 1 | 31.0 | 54.298 | + 224 | 71.30 | +284 | 03.122 | + 50 | 53.91 | -315 | 35.885 | + 80 | 16.07 | -193 | 14.292 | + 110 | 52.21 | + 34 |
| 2 | 10.0 | 54.335 | + 37 | 74.19 | +289 | 03.114 | - 8 | 56.86 | -295 | 35.915 | + 30 | 17.79 | -172 | 14.345 | + 53 | 52.72 | + 51 |
| 2 | 19.9 | 54.181 | - 154 | 77.00 | +281 | 03.049 | - 65 | 59.53 | -267 | 35.894 | - 21 | 19.26 | -147 | 14.341 | - 4 | 53.36 | + 64 |
| 3 | 1.9 | 53.863 | - 318 | 79.60 | +260 | 02.937 | - 112 | 61.86 | -233 | 35.832 | - 62 | 20.46 | -120 | 14.288 | - 53 | 54.07 | + 71 |
| 3 | 11.9 | 53.394 | - 469 | 81.92 | +232 | 02.782 | - 155 | 63.84 | -198 | 35.732 | - 100 | 21.41 | - 95 | 14.191 | - 97 | 54.82 | + 75 |
| 3 | 21.8 | 52.801 | - 593 | 83.83 | +191 | 02.595 | - 187 | 65.40 | -156 | 35.603 | - 129 | 22.07 | - 66 | 14.060 | - 131 | 55.55 | + 73 |
| 3 | 31.8 | 52.126 | - 675 | 85.28 | +145 | 02.388 | - 207 | 66.54 | -114 | 35.457 | - 146 | 22.47 | - 40 | 13.908 | - 152 | 56.21 | + 66 |
| 4 | 10.8 | 51.391 | - 735 | 86.24 | + 96 | 02.167 | - 221 | 67.25 | - 71 | 35.300 | - 157 | 22.62 | - 15 | 13.742 | - 166 | 56.79 | + 58 |
| 4 | 20.8 | 50.637 | - 754 | 86.63 | + 39 | 01.944 | - 223 | 67.51 | - 26 | 35.142 | - 158 | 22.51 | + 11 | 13.576 | - 166 | 57.24 | + 45 |
| 4 | 30.7 | 49.903 | - 734 | 86.50 | - 13 | 01.730 | - 214 | 67.35 | + 16 | 34.993 | - 149 | 22.17 | + 34 | 13.419 | - 157 | 57.56 | + 32 |
| 5 | 10.7 | 49.207 | - 696 | 85.84 | - 66 | 01.528 | - 202 | 66.75 | + 60 | 34.856 | - 137 | 21.60 | + 57 | 13.278 | - 141 | 57.75 | + 19 |
| 5 | 20.7 | 48.588 | - 619 | 84.66 | -118 | 01.348 | - 180 | 65.73 | +102 | 34.741 | - 115 | 20.81 | + 79 | 13.161 | - 117 | 57.79 | + 4 |
| 5 | 30.7 | 48.066 | - 522 | 83.04 | -162 | 01.196 | - 152 | 64.36 | +137 | 34.651 | - 90 | 19.84 | + 97 | 13.075 | - 86 | 57.71 | - 8 |
| 6 | 9.6 | 47.650 | - 416 | 81.02 | -202 | 01.073 | - 123 | 62.62 | +174 | 34.588 | - 63 | 18.68 | +116 | 13.020 | - 55 | 57.50 | - 21 |
| 6 | 19.6 | 47.367 | - 283 | 78.65 | -237 | 00.986 | - 87 | 60.57 | +205 | 34.556 | - 32 | 17.39 | +129 | 13.002 | - 18 | 57.18 | - 32 |
| 6 | 29.6 | 47.216 | - 151 | 76.03 | -262 | 00.935 | - 51 | 58.30 | +227 | 34.554 | - 2 | 15.99 | +140 | 13.019 | + 17 | 56.77 | - 41 |
| 7 | 9.5 | 47.200 | - 16 | 73.19 | -284 | 00.922 | - 13 | 55.82 | +248 | 34.583 | + 29 | 14.50 | +149 | 13.072 | + 53 | 56.27 | - 50 |
| 7 | 19.5 | 47.332 | + 132 | 70.21 | -298 | 00.949 | + 27 | 53.23 | +259 | 34.645 | + 62 | 13.00 | +150 | 13.072 | + 90 | 55.71 | - 56 |
| 7 | 29.5 | 47.594 | + 262 | 67.19 | -302 | 01.014 | + 65 | 50.62 | +261 | 34.735 | + 90 | 11.52 | +148 | 13.162 | + 116 | 55.05 | - 66 |
| 8 | 8.5 | 47.991 | + 397 | 64.14 | -305 | 01.119 | + 105 | 48.03 | +259 | 34.854 | + 119 | 10.10 | +142 | 13.431 | + 153 | 54.27 | - 78 |
| 8 | 18.4 | 48.519 | + 528 | 61.18 | -296 | 01.264 | + 145 | 45.61 | +242 | 35.004 | + 150 | 08.84 | +126 | 13.617 | + 186 | 53.43 | - 84 |
| 8 | 28.4 | 49.158 | + 639 | 58.33 | -285 | 01.444 | + 180 | 43.41 | +220 | 35.180 | + 176 | 07.77 | +107 | 13.829 | + 212 | 52.53 | - 90 |
| 9 | 7.4 | 49.911 | + 753 | 55.64 | -269 | 01.662 | + 218 | 41.52 | +189 | 35.384 | + 204 | 06.94 | + 83 | 14.070 | + 241 | 51.54 | - 99 |
| 9 | 17.4 | 50.763 | + 852 | 53.21 | -243 | 01.915 | + 253 | 40.05 | +147 | 35.614 | + 230 | 06.44 | + 50 | 14.337 | + 267 | 50.47 | -107 |
| 9 | 27.3 | 51.695 | + 932 | 51.05 | -216 | 02.196 | + 281 | 39.04 | +101 | 35.866 | + 252 | 06.27 | + 17 | 14.626 | + 289 | 49.34 | -113 |
| 10 | 7.3 | 52.707 | +1012 | 49.21 | -184 | 02.507 | + 311 | 38.55 | + 49 | 36.141 | + 275 | 06.47 | - 20 | 14.940 | + 314 | 48.15 | -119 |
| 10 | 17.3 | 53.773 | +1066 | 47.78 | -143 | 02.839 | + 332 | 38.64 | - 9 | 36.434 | + 293 | 07.07 | - 60 | 15.273 | + 333 | 46.92 | -123 |
| 10 | 27.2 | 54.875 | +1102 | 46.74 | -104 | 03.186 | + 347 | 39.28 | - 64 | 36.741 | + 307 | 08.04 | - 97 | 15.620 | + 347 | 45.68 | -124 |
| 11 | 6.2 | 56.004 | +1129 | 46.16 | - 58 | 03.542 | + 356 | 40.51 | -123 | 37.059 | + 318 | 09.38 | -134 | 15.981 | + 361 | 44.46 | -122 |
| 11 | 16.2 | 57.121 | +1117 | 46.07 | - 9 | 03.895 | + 353 | 42.29 | -178 | 37.377 | + 318 | 11.06 | -168 | 16.343 | + 362 | 43.30 | -116 |
| 11 | 26.2 | 58.210 | +1089 | 46.46 | + 39 | 04.238 | + 343 | 44.52 | -223 | 37.691 | + 314 | 12.99 | -193 | 16.702 | + 359 | 42.26 | -104 |
| 12 | 6.1 | 59.245 | +1035 | 47.36 | + 90 | 04.562 | + 324 | 47.20 | -268 | 37.993 | + 302 | 15.15 | -216 | 17.050 | + 348 | 41.35 | - 91 |
| 12 | 16.1 | 60.185 | + 940 | 48.75 | +139 | 04.852 | + 290 | 50.19 | -299 | 38.270 | + 277 | 17.43 | -228 | 17.374 | + 324 | 40.64 | - 71 |
| 12 | 26.1 | 61.015 | + 830 | 50.57 | +182 | 05.103 | + 251 | 53.38 | -319 | 38.518 | + 248 | 19.76 | -233 | 17.666 | + 292 | 40.14 | - 50 |
| 12 | 36.1 | 61.702 | + 687 | 52.79 | +222 | 05.306 | + 203 | 56.73 | -335 | 38.726 | + 208 | 22.08 | -232 | 17.918 | + 252 | 39.87 | - 27 |
| | | | + 518 | | +253 | | + 146 | | -335 | | + 163 | | -223 | | + 201 | | - 4 |
| Mean Place | 52.028 | 58.70 | | 02.969 | 61.57 | | | 36.241 | 23.34 | | | 14.747 | 43.53 | | | | |
| sec δ , $\tan \delta$ | +4.076 | +3.952 | | +1.246 | -0.743 | | | +1.016 | -0.179 | | | +1.125 | +0.515 | | | | |
| $d\alpha(\psi)$, $d\delta(\psi)$ | +0.148 | -0.23 | | +0.045 | -0.23 | | | +0.057 | -0.23 | | | +0.072 | -0.23 | | | | |
| $d\alpha(\epsilon)$, $d\delta(\epsilon)$ | +0.149 | +0.82 | | -0.028 | +0.82 | | | -0.007 | +0.82 | | | +0.020 | +0.82 | | | | |
| Dbie.Trans. | January 25 | | | January 25 | | | January 25 | | | January 25 | | | | | | | |

APPARENT PLACES OF STARS, 1986

131

AT UPPER TRANSIT AT GREENWICH

| No. | 1219 | | 318 | | 314 | | 315 | |
|----------------|---------------|------------|---------------------|------------|---------------------|------------|---------------------|------------|
| | 294 G. Puppis | | ♄ Chamaeleontis | | ♄ 31 Lyncis | | ε Carinae | |
| Mag.Spect. | 4.94 | K0 | 4.26 | K0 | 4.43 | K5 | 1.74 | K0, B |
| U.T. | R.A. | | R.A. | | R.A. | | R.A. | |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " |
| | 8 20 | -33 00 | 8 20 | -77 26 | 8 21 | +43 13 | 8 22 | -59 27 |
| 1 ^d | -8.9 | " -304 | 69.398 ^s | " -324 | 53.713 ^s | " +24 | 15.191 ^s | " -336 |
| 1 ^s | 50.571 +264 | 18.99 -316 | 69.811 +413 | 03.12 -352 | 53.713 +315 | 61.76 +54 | 15.191 +260 | 32.68 -359 |
| 1 | 1.1 | 22.15 -322 | 69.811 +234 | 06.64 -373 | 54.028 +263 | 62.30 +84 | 15.451 +181 | 36.27 -377 |
| 1 | 11.0 | 25.37 -317 | 70.045 +32 | 10.37 -381 | 54.291 +197 | 63.14 +110 | 15.632 +91 | 40.04 -381 |
| 1 | 21.0 | 28.54 -303 | 70.077 -155 | 14.18 -377 | 54.488 +130 | 64.24 +129 | 15.723 +6 | 43.85 -372 |
| 1 | 31.0 | 31.57 | 69.922 | 17.95 | 54.618 | 65.53 | 15.729 | 47.57 |
| 2 | 10.0 | 34.40 -283 | 69.586 -336 | 21.63 -368 | 54.680 +62 | 66.97 +144 | 15.650 -79 | 51.16 -359 |
| 2 | 19.9 | 36.95 -255 | 69.072 -514 | 25.07 -344 | 54.672 -8 | 68.48 +151 | 15.489 -161 | 54.47 -331 |
| 3 | 1.9 | 39.17 -222 | 68.413 -659 | 28.22 -315 | 54.605 -67 | 69.97 +149 | 15.260 -229 | 57.46 -299 |
| 3 | 11.9 | 41.05 -188 | 67.622 -791 | 31.03 -281 | 54.484 -121 | 71.40 +143 | 14.969 -291 | 60.08 -262 |
| 3 | 21.9 | 42.53 -148 | 66.721 -901 | 33.41 -238 | 54.321 163 | 72.66 +126 | 14.629 -340 | 62.25 -217 |
| 3 | 31.8 | 43.60 -107 | 65.748 -973 | 35.33 192 | 54.130 191 | 73.72 +106 | 14.257 -372 | 63.95 -170 |
| 4 | 10.8 | 44.27 -205 | 64.714 1034 | 36.77 144 | 53.921 -209 | 74.55 +83 | 13.860 -397 | 65.16 -121 |
| 4 | 20.8 | 44.50 -208 | 63.654 1030 | 37.67 90 | 53.709 212 | 75.09 +54 | 13.456 -404 | 65.83 -67 |
| 4 | 30.7 | 44.34 -200 | 62.598 1056 | 38.06 39 | 53.507 -202 | 75.34 +25 | 13.057 -399 | 65.99 -16 |
| 5 | 10.7 | 43.77 -188 | 61.557 1041 | 37.91 +15 | 53.321 -186 | 75.30 -4 | 12.671 -386 | 65.63 +36 |
| 5 | 20.7 | 42.79 +98 | 60.568 989 | 37.21 +70 | 53.166 -155 | 74.97 -33 | 12.311 -360 | 64.74 +89 |
| 5 | 30.7 | 41.48 +131 | 59.651 -917 | 36.04 +117 | 53.045 -121 | 74.38 -59 | 11.988 -323 | 63.39 +135 |
| 6 | 9.6 | 39.82 +166 | 58.819 -832 | 34.37 +167 | 52.962 -83 | 73.56 -82 | 11.704 -284 | 61.58 +181 |
| 6 | 19.6 | 37.87 +195 | 58.105 -714 | 32.26 +211 | 52.924 -38 | 72.51 -105 | 11.473 -231 | 59.36 +222 |
| 6 | 29.6 | 35.71 +216 | 57.516 -589 | 29.79 +247 | 52.929 +5 | 71.30 -121 | 11.296 -177 | 56.82 +254 |
| 7 | 9.6 | 33.35 +236 | 57.067 -449 | 27.00 +279 | 52.977 +48 | 69.94 -136 | 11.178 -118 | 53.99 +283 |
| 7 | 19.5 | 30.89 +246 | 56.783 -284 | 23.98 +302 | 53.071 +94 | 68.45 -149 | 11.127 -51 | 50.97 +302 |
| 7 | 29.5 | 28.41 +248 | 56.656 -127 | 20.85 +313 | 53.071 +134 | 66.88 -157 | 11.127 +12 | 47.87 +310 |
| 8 | 8.5 | 25.96 +245 | 56.700 +44 | 17.64 +321 | 53.205 +174 | 65.23 -165 | 11.139 +81 | 47.87 +313 |
| 8 | 18.4 | 23.67 +229 | 56.922 +222 | 14.53 +311 | 53.379 +215 | 63.53 -170 | 11.220 +151 | 44.74 +301 |
| 8 | 28.4 | 21.60 +207 | 57.304 +382 | 11.59 +294 | 53.842 +248 | 61.83 -170 | 11.584 +213 | 38.94 +279 |
| 9 | 7.4 | 19.83 +177 | 57.851 +547 | 08.92 +267 | 54.126 +284 | 60.13 -170 | 11.864 +280 | 36.43 +251 |
| 9 | 17.4 | 18.47 +136 | 58.544 +693 | 06.66 +226 | 54.443 +317 | 58.46 -167 | 12.204 +340 | 34.37 +206 |
| 9 | 27.3 | 17.54 +93 | 59.357 +813 | 04.87 +179 | 54.787 +344 | 56.84 -162 | 12.594 +390 | 32.79 +158 |
| 10 | 7.3 | 17.12 +42 | 60.279 +922 | 03.62 +125 | 55.160 +373 | 55.30 -154 | 13.031 +437 | 31.77 +102 |
| 10 | 17.3 | 17.26 -14 | 61.269 +990 | 03.02 +60 | 55.556 +396 | 53.88 -142 | 13.500 +469 | 31.41 +36 |
| 10 | 27.2 | 17.94 -68 | 62.297 +1028 | 03.05 -3 | 55.969 +413 | 52.61 -127 | 13.990 +490 | 31.68 -27 |
| 11 | 6.2 | 19.18 -124 | 63.335 +1038 | 03.76 -71 | 56.396 +427 | 51.53 -108 | 14.491 +501 | 32.62 -94 |
| 11 | 16.2 | 20.94 -176 | 64.331 +996 | 05.14 138 | 56.826 +430 | 50.68 -85 | 14.981 +490 | 34.22 -160 |
| 11 | 26.2 | 23.14 -220 | 65.260 +929 | 07.10 -196 | 57.253 +427 | 50.08 -60 | 15.449 +468 | 36.38 -216 |
| 12 | 6.1 | 25.76 -262 | 66.088 +828 | 09.64 -254 | 57.665 +412 | 49.77 -31 | 15.880 +431 | 39.10 -272 |
| 12 | 16.1 | 28.67 -291 | 66.772 +684 | 12.65 -301 | 58.048 +383 | 49.78 +1 | 16.254 +374 | 42.25 -315 |
| 12 | 26.1 | 31.78 -311 | 67.302 +530 | 16.02 -337 | 58.395 +347 | 50.10 +32 | 16.564 +310 | 45.72 -347 |
| 12 | 36.1 | 35.02 -324 | 67.654 +352 | 19.67 -365 | 58.693 +298 | 50.74 +64 | 16.798 +234 | 49.44 -372 |
| | 51.098 | 39.35 | 63.994 | 28.66 | 54.878 | 55.96 | 14.299 | 56.97 |
| Mean Place | +1.193 | -0.650 | +4.599 | -4.489 | +1.373 | +0.940 | +1.968 | -1.695 |
| sec δ, tan δ | +0.047 | -0.23 | -0.036 | -0.23 | +0.081 | -0.23 | +0.025 | -0.23 |
| da(ψ), dδ(ψ) | -0.025 | +0.82 | -0.173 | +0.82 | +0.036 | +0.81 | -0.066 | +0.81 |
| dα(ε), dδ(ε) | | | | | | | | |
| Dble.Trans. | January 26 | | January 26 | | January 26 | | January 26 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 1220 | | 1221 | | 316 | | 319 | | | | | | | | | | |
|---|------------|---------|-------------------|---------|--------------------------|--------|------------------|---------|--------|--------|-------|-------|-------|--------|-------|-------|-------|
| | 20 Cancri | | 302 G. Puppis* p. | | Bradley 1197 (Hydrae) | | β Volantis | | | | | | | | | | |
| Mag. Spect. | 5.88 | F0 | 5.55 | K5 | 3.95 | A0 | 3.65 | K0 | | | | | | | | | |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | | | | | | | | | |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " | | | | | | | | | |
| | 8 22 | + 18 22 | 8 24 | - 23 59 | 8 24 | - 3 51 | 8 25 | - 66 05 | | | | | | | | | |
| 1 | -8.9 | 34.304 | + 288 | 44.60 | - 102 | 27.979 | + 263 | 47.99 | - 279 | 58.095 | + 266 | 27.72 | - 206 | 37.315 | + 387 | 05.23 | - 333 |
| 1 | 1.1 | 34.557 | + 253 | 43.76 | - 84 | 28.202 | + 223 | 50.86 | - 287 | 58.326 | + 231 | 29.74 | - 202 | 37.610 | + 295 | 08.83 | - 360 |
| 1 | 11.0 | 34.768 | + 211 | 43.11 | - 65 | 28.381 | + 179 | 53.75 | - 289 | 58.516 | + 190 | 31.68 | - 194 | 37.809 | + 199 | 12.62 | - 379 |
| 1 | 21.0 | 34.928 | + 160 | 42.68 | - 43 | 28.506 | + 125 | 56.57 | - 282 | 58.657 | + 141 | 33.46 | - 178 | 37.896 | + 87 | 16.48 | - 386 |
| 1 | 31.0 | 35.035 | + 107 | 42.46 | - 22 | 28.580 | + 74 | 59.22 | - 265 | 58.748 | + 91 | 35.06 | - 160 | 37.879 | - 17 | 20.28 | - 380 |
| 2 | 10.0 | 35.088 | + 53 | 42.42 | - 4 | 28.600 | + 20 | 61.67 | - 245 | 58.789 | + 41 | 36.44 | - 138 | 37.759 | - 120 | 23.97 | - 369 |
| 2 | 19.9 | 35.087 | - 1 | 42.56 | + 14 | 28.568 | - 32 | 63.85 | - 218 | 58.780 | - 9 | 37.59 | - 115 | 37.539 | - 220 | 27.40 | - 343 |
| 3 | 1.9 | 35.041 | - 46 | 42.83 | + 27 | 28.492 | - 76 | 65.72 | - 187 | 58.728 | - 52 | 38.50 | - 91 | 37.235 | - 304 | 30.52 | - 312 |
| 3 | 11.9 | 34.953 | - 88 | 43.19 | + 36 | 28.376 | - 116 | 67.29 | - 157 | 58.639 | - 89 | 39.18 | - 68 | 36.856 | - 379 | 33.29 | - 379 |
| 3 | 21.9 | 34.833 | - 120 | 43.62 | + 43 | 28.230 | - 146 | 68.49 | - 120 | 58.519 | - 120 | 39.62 | - 44 | 36.414 | - 442 | 35.61 | - 232 |
| 3 | 31.8 | 34.693 | - 140 | 44.06 | + 44 | 28.065 | - 165 | 69.33 | - 84 | 58.382 | - 137 | 39.85 | - 23 | 35.933 | - 481 | 37.46 | - 185 |
| 4 | 10.8 | 34.540 | - 153 | 44.50 | + 44 | 27.887 | - 178 | 69.83 | - 50 | 58.232 | - 150 | 39.88 | - 3 | 35.419 | - 514 | 38.82 | - 136 |
| 4 | 20.8 | 34.386 | - 154 | 44.92 | + 42 | 27.707 | - 180 | 69.95 | - 12 | 58.081 | - 151 | 39.70 | + 18 | 34.892 | - 527 | 39.64 | - 82 |
| 4 | 30.7 | 34.241 | - 145 | 45.30 | + 38 | 27.534 | - 173 | 69.74 | + 21 | 57.938 | - 143 | 39.36 | + 34 | 34.370 | - 522 | 39.94 | - 30 |
| 5 | 10.7 | 34.109 | - 132 | 45.62 | + 32 | 27.373 | - 161 | 69.17 | + 57 | 57.807 | - 131 | 38.84 | + 52 | 33.859 | - 511 | 39.71 | + 23 |
| 5 | 20.7 | 34.001 | - 108 | 45.90 | + 28 | 27.232 | - 141 | 68.27 | + 90 | 57.697 | - 110 | 38.16 | + 68 | 33.378 | - 481 | 38.93 | + 78 |
| 5 | 30.7 | 33.920 | - 81 | 46.11 | + 21 | 27.116 | - 116 | 67.09 | + 118 | 57.611 | - 86 | 37.36 | + 80 | 32.939 | - 439 | 37.68 | + 125 |
| 6 | 9.6 | 33.867 | - 53 | 46.27 | + 16 | 27.026 | - 90 | 65.63 | + 146 | 57.550 | - 61 | 36.42 | + 94 | 32.547 | - 392 | 35.94 | + 174 |
| 6 | 19.6 | 33.848 | - 19 | 46.38 | + 11 | 26.969 | - 57 | 63.92 | + 171 | 57.521 | - 29 | 35.38 | + 104 | 32.218 | - 329 | 33.78 | + 216 |
| 6 | 29.6 | 33.862 | + 14 | 46.43 | + 5 | 26.942 | - 27 | 62.04 | + 188 | 57.521 | + 0 | 34.27 | + 111 | 31.957 | - 261 | 31.27 | + 251 |
| 7 | 9.6 | 33.908 | + 46 | 46.42 | - 1 | 26.948 | + 6 | 60.00 | + 204 | 57.551 | + 30 | 33.10 | + 117 | 31.768 | - 189 | 28.45 | + 282 |
| 7 | 19.5 | 33.990 | + 82 | 46.34 | - 8 | 26.989 | + 41 | 57.89 | + 211 | 57.612 | + 61 | 31.94 | + 116 | 31.664 | - 104 | 25.42 | + 303 |
| 7 | 29.5 | 34.082 | + 92 | 46.20 | - 14 | 27.062 | + 73 | 55.78 | + 211 | 57.701 | + 89 | 30.82 | + 112 | 31.642 | - 22 | 22.29 | + 313 |
| 8 | 8.5 | 34.230 | + 148 | 46.00 | - 20 | 27.167 | + 105 | 53.70 | + 208 | 57.819 | + 118 | 29.76 | + 106 | 31.707 | + 65 | 19.10 | + 319 |
| 8 | 18.4 | 34.400 | + 170 | 45.67 | - 33 | 27.307 | + 140 | 51.78 | + 192 | 57.967 | + 148 | 28.84 | + 92 | 31.862 | + 155 | 16.02 | + 308 |
| 8 | 28.4 | 34.595 | + 195 | 45.23 | - 44 | 27.476 | + 169 | 50.07 | + 171 | 58.140 | + 173 | 28.10 | + 74 | 32.100 | + 238 | 13.13 | + 289 |
| 9 | 7.4 | 34.817 | + 222 | 44.66 | - 57 | 27.678 | + 202 | 48.64 | + 143 | 58.341 | + 201 | 27.57 | + 53 | 32.423 | + 323 | 10.52 | + 261 |
| 9 | 17.4 | 35.064 | + 247 | 43.95 | - 71 | 27.909 | + 231 | 47.58 | + 106 | 58.567 | + 226 | 27.34 | + 23 | 32.823 | + 400 | 08.33 | + 219 |
| 9 | 27.3 | 35.333 | + 269 | 43.10 | - 85 | 28.165 | + 256 | 46.93 | + 65 | 58.815 | + 248 | 27.39 | - 5 | 33.288 | + 465 | 06.62 | + 171 |
| 10 | 7.3 | 35.626 | + 293 | 42.11 | - 99 | 28.448 | + 283 | 46.73 | + 20 | 59.088 | + 273 | 27.77 | - 38 | 33.813 | + 525 | 05.47 | + 115 |
| 10 | 17.3 | 35.938 | + 312 | 40.99 | - 112 | 28.751 | + 303 | 47.04 | - 31 | 59.378 | + 290 | 28.50 | - 73 | 34.379 | + 566 | 04.98 | + 49 |
| 10 | 27.3 | 36.264 | + 326 | 39.77 | - 122 | 29.069 | + 318 | 47.82 | - 78 | 59.683 | + 305 | 29.54 | - 104 | 34.970 | + 591 | 05.12 | - 14 |
| 11 | 6.2 | 36.603 | + 339 | 38.47 | - 130 | 29.399 | + 330 | 49.10 | - 128 | 60.001 | + 318 | 30.90 | - 136 | 35.573 | + 603 | 05.94 | - 82 |
| 11 | 16.2 | 36.945 | + 342 | 37.15 | - 132 | 29.729 | + 330 | 50.83 | - 173 | 60.320 | + 319 | 32.52 | - 162 | 36.161 | + 588 | 07.43 | - 149 |
| 11 | 26.2 | 37.285 | + 340 | 35.83 | - 132 | 30.053 | + 324 | 52.95 | - 212 | 60.637 | + 317 | 34.34 | - 182 | 36.720 | + 559 | 09.51 | - 208 |
| 12 | 6.1 | 37.614 | + 329 | 34.58 | - 125 | 30.364 | + 311 | 55.41 | - 246 | 60.944 | + 307 | 36.33 | - 199 | 37.231 | + 511 | 12.16 | - 265 |
| 12 | 16.1 | 37.921 | + 307 | 33.45 | - 113 | 30.647 | + 283 | 58.11 | - 270 | 61.227 | + 283 | 38.40 | - 207 | 37.669 | + 438 | 15.27 | - 311 |
| 12 | 26.1 | 38.200 | + 279 | 32.46 | - 99 | 30.898 | + 251 | 60.96 | - 285 | 61.483 | + 256 | 40.47 | - 207 | 38.028 | + 359 | 18.72 | - 345 |
| 12 | 36.1 | 38.440 | + 240 | 31.66 | - 80 | 31.107 | + 209 | 63.89 | - 293 | 61.701 | + 218 | 42.51 | - 204 | 38.291 | + 263 | 22.45 | - 373 |
| | | | + 192 | | - 59 | | + 160 | | - 289 | | + 173 | | - 190 | | + 157 | | - 385 |
| Mean Place | 35.514 | 34.43 | | 28.745 | 66.93 | 59.161 | 42.57 | 35.618 | 30.57 | | | | | 35.618 | 30.57 | | |
| sec δ , tan δ | +1.054 | +0.332 | | +1.095 | -0.445 | +1.002 | -0.068 | +2.467 | -2.256 | | | | | | | | |
| $d\alpha(\psi)$, $d\delta(\psi)$ | +0.068 | -0.23 | | +0.052 | -0.23 | +0.060 | -0.24 | +0.013 | -0.24 | | | | | +0.013 | -0.24 | | |
| $d\alpha(\epsilon)$, $d\delta(\epsilon)$ | +0.013 | +0.81 | | -0.017 | +0.81 | -0.003 | +0.81 | -0.089 | +0.80 | | | | | -0.089 | +0.80 | | |
| Dble. Trans. | January 26 | | January 27 | | January 27 | | January 27 | | | | | | | | | | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 1222 | | 317 | | 321 | | 320 | |
|--------------|--------------|------------|-----------------|------------|--------------|------------|------------------------------|------------|
| | 29 Cancr | | o Ursae Majoris | | η Cancr | | Groombridge 1450 (Lycnis) | |
| Mag.Spect. | 5.90 | A2 | 3.47 | G0 | 5.52 | K0 | 6.05 | K0 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " |
| | 8 27 | + 14 15 | 8 29 | + 60 45 | 8 31 | + 20 29 | 8 32 | + 38 03 |
| 1 -8.9 | 50 980 + 286 | 33.11 -125 | 08 196 + 504 | 54.71 + 98 | 54.500 + 299 | 25.35 - 98 | 01.264 + 347 | 54.84 - 11 |
| 1 1.1 | 51.231 + 251 | 32.02 -109 | 08.635 + 439 | 56.07 +136 | 54.764 + 264 | 24.58 - 77 | 01.571 + 307 | 55.02 + 18 |
| 1 11.0 | 51.442 + 211 | 31.10 - 92 | 08.999 + 364 | 57.78 +171 | 54.987 + 223 | 24.01 - 57 | 01.829 + 258 | 55.50 + 48 |
| 1 21.0 | 51.602 + 160 | 30.39 - 71 | 09.270 + 271 | 59.79 +201 | 55.156 + 171 | 23.68 - 33 | 02.027 + 198 | 56.24 + 74 |
| 1 31.0 | 51.711 + 109 | 29.89 - 50 | 09.445 + 175 | 61.98 +219 | 55.276 + 118 | 23.56 - 12 | 02.164 + 137 | 57.20 + 96 |
| 2 10.0 | 51.767 + 56 | 29.59 - 30 | 09.523 + 78 | 64.30 +232 | 55.340 + 64 | 23.64 + 8 | 02.236 + 72 | 58.34 +114 |
| 2 19.9 | 51.771 + 4 | 29.49 - 10 | 09.499 - 24 | 66.63 +233 | 55.348 + 8 | 23.90 + 26 | 02.244 + 8 | 59.59 +125 |
| 3 1.9 | 51.729 - 42 | 29.54 + 5 | 09.388 - 111 | 68.85 +222 | 55.310 - 38 | 24.28 + 38 | 02.195 - 49 | 60.87 +128 |
| 3 11.9 | 51.647 - 82 | 29.71 + 17 | 09.197 - 191 | 70.91 +206 | 55.229 - 81 | 24.75 + 47 | 02.096 - 99 | 62.13 +126 |
| 3 21.9 | 51.532 - 115 | 29.99 + 28 | 08.939 - 258 | 72.68 +177 | 55.114 - 115 | 25.28 + 53 | 01.955 - 141 | 63.30 +117 |
| 3 31.8 | 51.398 - 134 | 30.32 + 33 | 08.638 - 301 | 74.11 +143 | 54.977 - 137 | 25.81 + 53 | 01.787 - 168 | 64.31 +101 |
| 4 10.8 | 51.250 - 148 | 30.70 + 38 | 08.305 - 333 | 75.16 +105 | 54.826 - 151 | 26.33 + 52 | 01.601 - 186 | 65.14 + 83 |
| 4 20.8 | 51.100 - 150 | 31.09 + 39 | 07.962 - 343 | 75.77 + 61 | 54.671 - 155 | 26.80 + 47 | 01.410 - 191 | 65.74 + 60 |
| 4 30.7 | 50.958 - 142 | 31.48 + 39 | 07.628 - 334 | 75.94 + 17 | 54.524 - 147 | 27.20 + 40 | 01.227 - 183 | 66.10 + 36 |
| 5 10.7 | 50.829 - 129 | 31.86 + 38 | 07.313 - 315 | 75.67 - 27 | 54.389 - 135 | 27.53 + 33 | 01.058 - 169 | 66.22 + 12 |
| 5 20.7 | 50.721 - 108 | 32.23 + 37 | 07.036 - 277 | 74.97 - 70 | 54.276 - 113 | 27.79 + 26 | 00.914 - 144 | 66.09 - 13 |
| 5 30.7 | 50.639 - 82 | 32.57 + 34 | 06.807 - 229 | 73.89 -108 | 54.189 - 87 | 27.95 + 16 | 00.801 - 113 | 65.73 - 36 |
| 6 9.6 | 50.584 - 55 | 32.89 + 32 | 06.632 - 175 | 72.45 -144 | 54.130 - 59 | 28.05 + 10 | 00.721 - 80 | 65.15 - 58 |
| 6 19.6 | 50.561 - 23 | 33.18 + 29 | 06.521 - 111 | 70.69 -176 | 54.104 - 26 | 28.07 + 2 | 00.681 - 40 | 64.37 - 78 |
| 6 29.6 | 50.570 + 9 | 33.44 + 26 | 06.474 - 47 | 68.69 -200 | 54.110 + 6 | 28.01 - 6 | 00.680 - 1 | 63.44 - 93 |
| 7 9.6 | 50.609 + 39 | 33.65 + 21 | 06.492 + 18 | 66.47 -222 | 54.149 + 39 | 27.88 - 13 | 00.718 + 38 | 62.35 -109 |
| 7 19.5 | 50.682 + 73 | 33.79 + 14 | 06.581 + 89 | 64.10 -237 | 54.222 + 73 | 27.67 - 21 | 00.796 + 78 | 61.14 -121 |
| 7 29.5 | 50.778 + 96 | 33.81 + 2 | 06.731 + 150 | 61.63 -247 | 54.315 + 93 | 27.63 - 4 | 00.911 + 115 | 59.83 -131 |
| 8 8.5 | 50.907 + 129 | 33.90 + 9 | 06.946 + 215 | 59.10 -253 | 54.449 + 134 | 27.02 - 61 | 01.062 + 151 | 58.42 -141 |
| 8 18.4 | 51.068 + 161 | 33.80 - 10 | 07.224 + 278 | 56.57 -253 | 54.612 + 163 | 26.52 - 50 | 01.252 + 190 | 56.94 -148 |
| 8 28.4 | 51.253 + 185 | 33.56 - 24 | 07.555 + 331 | 54.08 -249 | 54.801 + 189 | 25.92 - 60 | 01.472 + 220 | 55.42 -152 |
| 9 7.4 | 51.465 + 212 | 33.17 - 39 | 07.942 + 387 | 51.67 -241 | 55.018 + 217 | 25.20 - 72 | 01.727 + 255 | 53.86 -156 |
| 9 17.4 | 51.703 + 238 | 32.61 - 56 | 08.380 + 438 | 49.40 -227 | 55.261 + 243 | 24.35 - 85 | 02.012 + 285 | 52.28 -158 |
| 9 27.3 | 51.963 + 260 | 31.88 - 73 | 08.860 + 480 | 47.30 -210 | 55.528 + 267 | 23.37 - 98 | 02.325 + 313 | 50.72 -156 |
| 10 7.3 | 52.247 + 284 | 30.97 - 91 | 09.383 + 523 | 45.41 -189 | 55.819 + 291 | 22.27 -110 | 02.666 + 341 | 49.17 -155 |
| 10 17.3 | 52.549 + 302 | 29.90 -107 | 09.940 + 557 | 43.80 -161 | 56.131 + 312 | 21.05 -122 | 03.030 + 364 | 47.70 -147 |
| 10 27.3 | 52.868 + 319 | 28.68 -122 | 10.521 + 581 | 42.48 -132 | 56.459 + 328 | 19.76 -129 | 03.413 + 383 | 46.32 -138 |
| 11 6.2 | 53.200 + 332 | 27.33 -135 | 11.124 + 603 | 41.51 - 97 | 56.802 + 343 | 18.41 -135 | 03.811 + 398 | 45.06 -126 |
| 11 16.2 | 53.536 + 336 | 25.91 -142 | 11.728 + 604 | 40.92 - 59 | 57.149 + 347 | 17.05 -136 | 04.215 + 404 | 43.99 -107 |
| 11 26.2 | 53.870 + 334 | 24.46 -145 | 12.326 + 598 | 40.74 - 18 | 57.496 + 347 | 15.74 -131 | 04.617 + 402 | 43.13 - 86 |
| 12 6.1 | 54.195 + 325 | 23.04 -142 | 12.904 + 578 | 40.99 + 25 | 57.834 + 338 | 14.50 -124 | 05.009 + 392 | 42.52 - 61 |
| 12 16.1 | 54.499 + 304 | 21.69 -135 | 13.439 + 535 | 41.67 + 68 | 58.150 + 316 | 13.40 -110 | 05.377 + 368 | 42.20 - 32 |
| 12 26.1 | 54.775 + 276 | 20.47 -122 | 13.923 + 484 | 42.75 +108 | 58.439 + 289 | 12.47 - 93 | 05.712 + 335 | 42.17 - 3 |
| 12 36.1 | 55.013 + 238 | 19.40 -107 | 14.337 + 414 | 44.23 +148 | 58.690 + 251 | 11.74 - 73 | 06.002 + 290 | 42.43 + 26 |
| | + 193 | - 86 | + 328 | +181 | + 204 | - 50 | + 236 | + 56 |
| Mean Place | 52.188 | 22.04 | 09.031 | 51.37 | 55.736 | 15.52 | 02.474 | 48.32 |
| sec δ, tan δ | +1.032 | +0.254 | +2.047 | +1.787 | +1.068 | +0.374 | +1.270 | +0.783 |
| da(ψ), dδ(ψ) | +0.067 | -0.24 | +0.099 | -0.24 | +0.069 | -0.24 | +0.078 | -0.24 |
| da(ε), dδ(ε) | +0.010 | +0.80 | +0.072 | +0.80 | +0.015 | +0.79 | +0.032 | +0.79 |
| Dble.Trans. | January 28 | | January 28 | | January 29 | | January 29 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 1223 | | 324 | | 1224 | | 322 | | |
|--------------|------------|-------------|---------------|-------------|------------|-------------|-----------------------------------|-------------|-------|
| | δ Hydrae | | 48 G. Velorum | | σ Hydrae | | Groombridge 1446 (Camelopardi) | | |
| Mag.Spect. | 4.18 | A0 | 4.13 | A5 | 4.54 | K0 | 6.29 | K0 | |
| U.T. | R.A. | | R.A. | | R.A. | | R.A. | | |
| | h m | Dec. | h m | Dec. | h m | Dec. | h m | Dec. | |
| | 8 36 | + 5 45 | 8 37 | -42 56 | 8 38 | + 3 23 | 8 38 | + 73 40 | |
| 1 | -8.9 | 55.336 +281 | 18.02 | 09.806 +295 | 06.13 | 01.961 +280 | 35.35 | 13.846 +818 | 43.15 |
| 1 | 1.1 | 55.585 +249 | 16.44 | 10.053 +247 | 06.13 | 01.961 +247 | 35.35 | 13.846 +711 | 43.15 |
| 1 | 11.1 | 55.794 +209 | 15.00 | 10.246 +193 | 09.49 | 02.208 +208 | 33.65 | 14.557 +586 | 44.95 |
| 1 | 21.0 | 55.954 +160 | 13.74 | 10.376 +130 | 13.00 | 02.416 +159 | 32.06 | 15.143 +432 | 47.16 |
| 1 | 31.0 | 56.065 +111 | 12.69 | 10.443 +67 | 16.51 | 02.575 +110 | 30.66 | 15.575 +274 | 49.68 |
| 2 | 10.0 | 56.125 +60 | 11.84 | 10.448 +5 | 19.93 | 02.685 +60 | 29.46 | 15.849 +110 | 52.38 |
| 2 | 19.9 | 56.133 +8 | 11.22 | 10.390 -58 | 23.19 | 02.745 +8 | 28.47 | 15.959 -61 | 55.20 |
| 3 | 1.9 | 56.097 -36 | 10.80 | 10.280 -110 | 26.20 | 02.753 -36 | 27.71 | 15.898 -209 | 58.01 |
| 3 | 11.9 | 56.021 -76 | 10.56 | 10.123 -157 | 28.89 | 02.717 -75 | 27.16 | 15.689 -348 | 60.66 |
| 3 | 21.9 | 55.914 -107 | 10.50 | 09.928 -195 | 31.24 | 02.642 -107 | 26.80 | 15.341 -467 | 63.09 |
| 3 | 31.8 | 55.786 -128 | 10.57 | 09.707 -221 | 33.16 | 02.535 -128 | 26.63 | 14.874 -548 | 65.17 |
| 4 | 10.8 | 55.644 -142 | 10.76 | 09.468 -239 | 34.66 | 02.407 -141 | 26.62 | 14.326 -613 | 66.83 |
| 4 | 20.8 | 55.499 -145 | 11.06 | 09.222 -246 | 35.72 | 02.266 -145 | 26.75 | 13.713 -640 | 68.03 |
| 4 | 30.8 | 55.360 -139 | 11.43 | 08.980 -242 | 36.30 | 02.121 -139 | 27.01 | 13.073 -635 | 68.69 |
| 5 | 10.7 | 55.232 -128 | 11.88 | 08.747 -233 | 36.42 | 01.982 -129 | 27.37 | 12.438 -613 | 68.83 |
| 5 | 20.7 | 55.122 -110 | 12.40 | 08.533 -214 | 36.08 | 01.853 -129 | 27.84 | 11.825 -558 | 68.45 |
| 5 | 30.7 | 55.037 -85 | 12.96 | 08.344 -189 | 35.28 | 01.744 -87 | 28.39 | 11.267 -482 | 67.55 |
| 6 | 9.6 | 54.976 -61 | 13.57 | 08.182 -162 | 34.08 | 01.657 -62 | 29.00 | 10.785 -398 | 66.19 |
| 6 | 19.6 | 54.945 -31 | 14.21 | 08.056 -126 | 30.49 | 01.595 -33 | 29.69 | 10.387 -290 | 64.39 |
| 6 | 29.6 | 54.943 -2 | 14.86 | 07.967 -89 | 28.24 | 01.562 -4 | 30.42 | 10.097 -181 | 62.22 |
| 7 | 9.6 | 54.971 +28 | 15.50 | 07.916 -51 | 25.73 | 01.583 +25 | 31.93 | 09.848 -68 | 57.04 |
| 7 | 19.5 | 55.029 +58 | 16.11 | 07.908 -8 | 23.07 | 01.639 +56 | 31.93 | 09.905 +76 | 54.14 |
| 7 | 29.5 | 55.114 +85 | 16.65 | 07.941 +33 | 20.34 | 01.721 +82 | 33.34 | 10.074 +68 | 51.14 |
| 8 | 8.5 | 55.227 +113 | 17.14 | 08.019 +78 | 17.58 | 01.832 +111 | 33.96 | 10.359 +62 | 48.08 |
| 8 | 18.5 | 55.370 +143 | 17.50 | 08.141 +122 | 14.95 | 01.972 +140 | 34.45 | 10.759 +49 | 45.04 |
| 8 | 28.4 | 55.539 +169 | 17.70 | 08.305 +164 | 12.52 | 02.139 +167 | 34.78 | 11.259 +33 | 42.08 |
| 9 | 7.4 | 55.736 +197 | 17.72 | 08.513 +208 | 10.35 | 02.333 +194 | 34.91 | 11.861 +602 | 39.23 |
| 9 | 17.4 | 55.958 +222 | 17.50 | 08.762 +249 | 08.60 | 02.553 +220 | 34.80 | 12.556 +695 | 36.59 |
| 9 | 27.3 | 56.204 +246 | 17.06 | 09.047 +285 | 07.29 | 02.796 +243 | 34.45 | 13.327 +771 | 34.18 |
| 10 | 7.3 | 56.474 +270 | 16.37 | 09.367 +320 | 06.50 | 03.064 +268 | 33.83 | 14.177 +850 | 32.06 |
| 10 | 17.3 | 56.764 +290 | 15.42 | 09.715 +348 | 06.31 | 03.353 +289 | 32.93 | 15.084 +907 | 30.30 |
| 10 | 27.3 | 57.072 +308 | 14.25 | 10.082 +367 | 06.70 | 03.658 +305 | 31.79 | 16.034 +950 | 28.93 |
| 11 | 6.2 | 57.393 +321 | 12.86 | 10.464 +382 | 07.71 | 03.978 +320 | 30.40 | 17.018 +984 | 27.98 |
| 11 | 16.2 | 57.720 +327 | 11.31 | 10.846 +382 | 09.31 | 04.303 +325 | 28.82 | 18.005 +987 | 27.53 |
| 11 | 26.2 | 58.046 +326 | 09.64 | 11.219 +373 | 11.43 | 04.628 +325 | 27.10 | 18.980 +975 | 27.55 |
| 12 | 6.2 | 58.364 +318 | 07.89 | 11.575 +356 | 14.04 | 04.945 +317 | 25.29 | 19.921 +941 | 28.09 |
| 12 | 16.1 | 58.663 +299 | 06.16 | 11.896 +321 | 17.03 | 05.241 +296 | 23.46 | 20.790 +869 | 29.14 |
| 12 | 26.1 | 58.935 +272 | 04.49 | 12.177 +281 | 20.29 | 05.512 +271 | 21.67 | 21.572 +782 | 30.64 |
| 12 | 36.1 | 59.171 +236 | 02.92 | 12.407 +230 | 23.77 | 05.747 +235 | 19.98 | 22.240 +668 | 32.59 |
| | | +192 | -140 | +170 | -353 | +191 | -154 | +525 | +230 |
| Mean Place | 56.525 | 04.92 | 10.130 | 29.46 | 03.139 | 21.68 | 13.808 | 41.22 | |
| sec δ, tan δ | +1.005 | +0.101 | +1.366 | -0.931 | +1.002 | +0.059 | +3.558 | +3.415 | |
| dα(ψ), dδ(ψ) | +0.063 | -0.25 | +0.042 | -0.25 | +0.062 | -0.25 | +0.131 | -0.25 | |
| dα(ε), dδ(ε) | +0.004 | +0.77 | -0.039 | +0.77 | +0.003 | +0.77 | +0.145 | +0.77 | |
| Dble.Trans. | January 30 | | January 30 | | January 30 | | January 30 | | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 323 | | 325 | | 1227 | | 1225 | |
|--------------|-------------------------------------|-------------|--------------|-------------|--------------|-------------|--------------|-------------|
| | Groombridge 1460 (Ursae Majoris) | | 6 Hydrae | | o Velorum | | 34 Lyncis | |
| Mag. Spect. | 6.03 | K0 | 5.15 | K2 | 3.68 | B3 | 5.52 | K0 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " |
| | 8 38 | + 52 45 | 8 39 | - 12 25 | 8 39 | - 52 52 | 8 40 | + 45 52 |
| 1 -8.9 | 16 845 + 434 | 39 12 + 53 | 22 031 + 273 | 20 50 - 241 | 54 572 + 328 | 00 13 - 324 | 04 141 + 390 | 60 42 + 19 |
| 1 1.1 | 17 228 + 383 | 40 01 + 89 | 22 269 + 238 | 22 93 - 243 | 54 841 + 269 | 03 63 - 350 | 04 487 + 346 | 60 96 + 54 |
| 1 11.1 | 17 551 + 323 | 41 25 + 124 | 22 467 + 198 | 25 34 - 241 | 55 047 + 206 | 07 30 - 367 | 04 780 + 293 | 61 82 + 86 |
| 1 21.0 | 17 799 + 248 | 42 81 + 156 | 22 616 + 149 | 27 63 - 229 | 55 176 + 129 | 11 04 - 374 | 05 007 + 227 | 62 99 + 117 |
| 1 31.0 | 17 969 + 170 | 44 58 + 177 | 22 715 + 99 | 29 74 - 211 | 55 232 + 56 | 14 71 - 367 | 05 166 + 159 | 64 39 + 140 |
| 2 10.0 | 18 059 + 90 | 46 52 + 194 | 22 764 + 49 | 31 66 - 192 | 55 215 - 17 | 18 25 - 354 | 05 253 + 87 | 65 97 + 158 |
| 2 19.9 | 18 065 + 6 | 48 52 + 200 | 22 761 - 3 | 33 32 - 166 | 55 126 - 89 | 21 56 - 331 | 05 267 + 14 | 67 64 + 167 |
| 3 1.9 | 17 999 - 66 | 50 48 + 196 | 22 715 - 46 | 34 71 - 139 | 54 975 - 151 | 24 56 - 300 | 05 218 - 49 | 69 32 + 168 |
| 3 11.9 | 17 866 - 133 | 52 34 + 186 | 22 629 - 86 | 35 84 - 113 | 54 769 - 206 | 27 22 - 266 | 05 110 - 108 | 70 94 + 162 |
| 3 21.9 | 17 677 - 189 | 54 00 + 166 | 22 512 - 117 | 36 67 - 83 | 54 516 - 253 | 29 44 - 222 | 04 954 - 156 | 72 41 + 147 |
| 3 31.8 | 17 452 - 225 | 55 38 + 138 | 22 375 - 137 | 37 23 - 56 | 54 234 - 282 | 31 22 - 178 | 04 765 - 189 | 73 67 + 126 |
| 4 10.8 | 17 199 - 253 | 56 46 + 108 | 22 224 - 151 | 37 53 - 30 | 53 928 - 306 | 32 53 - 131 | 04 553 - 212 | 74 68 + 101 |
| 4 20.8 | 16 936 - 263 | 57 17 + 71 | 22 068 - 156 | 37 53 + 0 | 53 611 - 317 | 33 33 - 80 | 04 333 - 220 | 75 40 + 72 |
| 4 30.8 | 16 680 - 256 | 57 51 + 34 | 21 918 - 150 | 37 30 + 23 | 53 297 - 314 | 33 63 - 30 | 04 118 - 215 | 75 79 + 39 |
| 5 10.7 | 16 438 - 242 | 57 47 - 4 | 21 778 - 140 | 36 82 + 48 | 52 989 - 308 | 33 44 + 19 | 03 917 - 201 | 75 88 + 9 |
| 5 20.7 | 16 225 - 213 | 57 05 - 42 | 21 655 - 123 | 36 10 + 72 | 52 703 - 286 | 32 73 + 71 | 03 741 - 176 | 75 63 - 25 |
| 5 30.7 | 16 050 - 175 | 56 29 - 76 | 21 555 - 100 | 35 18 + 92 | 52 443 - 260 | 31 57 + 116 | 03 599 - 142 | 75 09 - 54 |
| 6 9.6 | 15 917 - 133 | 55 20 - 109 | 21 478 - 77 | 34 06 + 112 | 52 215 - 228 | 29 96 + 161 | 03 493 - 106 | 74 27 - 82 |
| 6 19.6 | 15 834 - 83 | 53 82 - 138 | 21 430 - 48 | 32 78 + 128 | 52 027 - 188 | 27 94 + 202 | 03 430 - 63 | 73 19 - 108 |
| 6 29.6 | 15 801 - 33 | 52 21 - 161 | 21 411 - 19 | 31 38 + 140 | 51 883 - 144 | 25 60 + 234 | 03 410 - 20 | 71 90 - 129 |
| 7 9.6 | 15 819 + 18 | 50 39 - 182 | 21 420 + 9 | 29 87 + 151 | 51 784 - 99 | 22 95 + 265 | 03 434 + 24 | 70 42 - 148 |
| 7 19.5 | 15 891 + 72 | 48 40 - 199 | 21 461 + 41 | 28 33 + 154 | 51 740 - 44 | 20 11 + 284 | 03 504 + 70 | 68 79 - 163 |
| 7 29.5 | 16 013 + 122 | 46 30 - 210 | 21 530 + 69 | 26 80 + 153 | 51 746 + 6 | 17 17 + 294 | 03 616 + 112 | 67 04 - 175 |
| 8 8.5 | 16 184 + 171 | 44 10 - 220 | 21 629 + 99 | 25 32 + 148 | 51 807 + 61 | 14 18 + 299 | 03 771 + 155 | 65 19 - 185 |
| 8 18.5 | 16 406 + 222 | 41 86 - 224 | 21 758 + 129 | 23 98 + 134 | 51 926 + 119 | 11 28 + 290 | 03 968 + 197 | 63 28 - 191 |
| 8 28.4 | 16 670 + 264 | 39 63 - 223 | 21 915 + 157 | 22 82 + 116 | 52 097 + 171 | 08 57 + 271 | 04 202 + 273 | 61 34 - 194 |
| 9 7.4 | 16 979 + 309 | 37 41 - 222 | 22 101 + 186 | 21 90 + 92 | 52 324 + 227 | 06 12 + 245 | 04 475 + 234 | 59 39 - 195 |
| 9 17.4 | 17 330 + 351 | 35 28 - 213 | 22 316 + 215 | 21 29 + 61 | 52 603 + 279 | 04 07 + 205 | 04 784 + 309 | 57 47 - 192 |
| 9 27.3 | 17 717 + 387 | 33 25 - 203 | 22 556 + 240 | 21 02 + 27 | 52 927 + 324 | 02 48 + 159 | 05 125 + 341 | 55 60 - 187 |
| 10 7.3 | 18 141 + 424 | 31 36 - 189 | 22 822 + 266 | 21 14 - 12 | 53 296 + 369 | 01 43 + 105 | 05 499 + 374 | 53 82 - 178 |
| 10 17.3 | 18 595 + 454 | 29 67 - 169 | 23 109 + 287 | 21 66 - 52 | 53 696 + 400 | 01 01 + 42 | 05 899 + 400 | 52 18 - 164 |
| 10 27.3 | 19 072 + 477 | 28 21 - 146 | 23 413 + 304 | 22 57 - 91 | 54 121 + 425 | 01 19 - 18 | 06 321 + 422 | 50 70 - 148 |
| 11 6.2 | 19 570 + 498 | 27 01 - 120 | 23 731 + 318 | 23 88 - 131 | 54 561 + 440 | 02 03 - 84 | 06 763 + 442 | 49 42 - 128 |
| 11 16.2 | 20 074 + 504 | 26 15 - 86 | 24 054 + 323 | 25 55 - 167 | 55 000 + 439 | 03 51 - 148 | 07 211 + 448 | 48 41 - 101 |
| 11 26.2 | 20 577 + 503 | 25 61 - 54 | 24 376 + 322 | 27 50 - 195 | 55 426 + 426 | 05 56 - 205 | 07 659 + 448 | 47 67 - 74 |
| 12 6.2 | 21 066 + 489 | 25 47 - 14 | 24 689 + 313 | 29 71 - 221 | 55 829 + 403 | 08 15 - 259 | 08 096 + 437 | 47 27 - 40 |
| 12 16.1 | 21 524 + 458 | 25 72 + 25 | 24 979 + 290 | 32 08 - 237 | 56 189 + 380 | 11 18 - 303 | 08 508 + 412 | 47 21 - 6 |
| 12 26.1 | 21 943 + 419 | 26 34 + 62 | 25 242 + 263 | 34 53 - 245 | 56 499 + 310 | 14 54 - 336 | 08 884 + 376 | 47 50 + 29 |
| 12 36.1 | 22 306 + 363 | 27 36 + 102 | 25 469 + 227 | 36 99 - 246 | 56 749 + 250 | 18 16 - 362 | 09 213 + 329 | 48 14 + 64 |
| | + 295 | + 134 | + 180 | - 239 | + 177 | - 373 | + 268 | + 96 |
| Mean Place | 17.899 | 35.10 | 23.061 | 37.82 | 54.434 | 25.23 | 05.301 | 55.48 |
| sec δ, tan δ | +1.652 | +1.316 | +1.024 | -0.220 | +1.657 | -1.321 | +1.436 | +1.031 |
| da(ψ), dδ(ψ) | +0.088 | -0.25 | +0.057 | -0.25 | +0.034 | -0.26 | +0.082 | -0.26 |
| da(ε), dδ(ε) | +0.056 | +0.77 | -0.009 | +0.77 | -0.057 | +0.77 | +0.044 | +0.77 |
| Dble. Trans. | January 30 | | January 30 | | January 31 | | January 31 | |

AT UPPER TRANSIT AT GREENWICH

| No. | 1226 | | 331 | | 1228 | | 327 | | |
|---|---------------|-------------|----------------------|--------------|-----------------|-------------|------------------|-------------|------------|
| | 53 G. Velorum | | η Chamaeleontis | | γ Cancri | | α Pyxidid | | |
| Mag. Spect. | 4.06 | F5p | 5.62 | B9 | 4.73 | A0 | 3.70 | B2 | |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " | |
| | 8 40 | -46 35 | 8 41 | -78 54 | 8 42 | +21 30 | 8 43 | -33 07 | |
| 1 | -8.9 | 10.501 +307 | 37.15 -320 | 54.267 +738 | 25.56 -307 | 29.103 +308 | 73.26 -99 | 02.268 +286 | 52.26 -298 |
| 1 | 1.1 | 10.757 +256 | 40.57 -342 | 54.820 +553 | 28.95 -339 | 29.378 +275 | 72.48 -78 | 02.512 +244 | 55.40 -314 |
| 1 | 11.1 | 10.956 +199 | 44.14 -357 | 55.178 +358 | 32.62 -367 | 29.612 +234 | 71.92 -56 | 02.710 +198 | 58.63 -323 |
| 1 | 21.0 | 11.088 +132 | 47.76 -362 | 55.315 +137 | 36.43 -381 | 29.795 +183 | 71.61 -31 | 02.852 +142 | 61.84 -321 |
| 1 | 31.0 | 11.154 +66 | 51.28 -352 | 55.241 -74 | 40.25 -382 | 29.925 +130 | 71.52 -9 | 02.938 +86 | 64.94 -310 |
| 2 | 10.0 | 11.155 +1 | 54.67 -339 | 54.963 -278 | 44.03 -378 | 30.000 +75 | 71.65 +13 | 02.968 +30 | 67.87 -293 |
| 2 | 19.9 | 11.090 -65 | 57.81 -314 | 54.479 -484 | 47.64 -361 | 30.020 +20 | 71.96 +31 | 02.941 -27 | 70.54 -267 |
| 3 | 1.9 | 10.970 -120 | 60.63 -282 | 53.827 -652 | 50.99 -335 | 29.991 -29 | 72.40 +44 | 02.866 -75 | 72.91 -237 |
| 3 | 11.9 | 10.800 -170 | 63.12 -249 | 53.016 -811 | 54.05 -306 | 29.919 -72 | 72.94 +54 | 02.748 -118 | 74.96 -206 |
| 3 | 21.9 | 10.589 -211 | 65.18 -206 | 52.070 -946 | 56.70 -285 | 29.811 -108 | 73.54 +60 | 02.595 -153 | 76.62 -166 |
| 3 | 31.8 | 10.351 -238 | 66.80 -162 | 51.029 -1041 | 58.93 -223 | 29.679 -132 | 74.13 +59 | 02.418 -177 | 77.89 -127 |
| 4 | 10.8 | 10.093 -258 | 67.98 -118 | 49.906 -1123 | 60.71 -178 | 29.531 -148 | 74.71 +58 | 02.225 -193 | 78.76 -87 |
| 4 | 20.8 | 09.826 -267 | 68.65 -67 | 48.735 -1171 | 61.96 -125 | 29.378 -153 | 75.23 +52 | 02.025 -200 | 79.21 -45 |
| 4 | 30.8 | 09.562 -264 | 68.87 +27 | 47.553 -1182 | 62.70 -21 | 29.230 -148 | 75.68 +45 | 01.829 -196 | 79.25 -4 |
| 5 | 10.7 | 09.306 -256 | 68.60 +27 | 46.371 -1182 | 62.91 -21 | 29.093 -137 | 76.04 +36 | 01.640 -189 | 78.90 +35 |
| 5 | 20.7 | 09.069 -237 | 67.85 +75 | 45.229 -1142 | 62.56 +35 | 28.976 -117 | 76.30 +26 | 01.469 -171 | 78.13 +77 |
| 5 | 30.7 | 08.858 -211 | 66.67 +118 | 44.152 -1077 | 61.71 +85 | 28.883 -93 | 76.47 +17 | 01.321 -148 | 77.02 +111 |
| 6 | 9.6 | 08.675 -183 | 65.07 +160 | 43.155 -997 | 60.35 +136 | 28.817 -66 | 76.55 +8 | 01.197 -124 | 75.55 +147 |
| 6 | 19.6 | 08.528 -147 | 63.09 +198 | 42.276 -879 | 58.51 +184 | 28.783 -34 | 76.53 -2 | 01.104 -93 | 73.77 +178 |
| 6 | 29.6 | 08.420 -108 | 60.81 +228 | 41.526 -750 | 56.29 +222 | 28.780 -3 | 76.42 -11 | 01.042 -62 | 71.77 +200 |
| 7 | 9.6 | 08.352 -68 | 58.26 +255 | 40.924 -602 | 53.69 +260 | 28.808 +28 | 76.23 -19 | 01.013 -29 | 69.53 +224 |
| 7 | 19.5 | 08.331 +21 | 55.53 +273 | 40.500 -424 | 50.81 +288 | 28.871 +63 | 75.95 -28 | 01.022 +9 | 67.18 +235 |
| 7 | 29.5 | 08.353 +22 | 52.72 +281 | 40.249 -251 | 47.77 +304 | 28.965 +94 | 75.68 -27 | 01.064 +42 | 64.77 +241 |
| 8 | 8.5 | 08.422 +69 | 49.87 +285 | 40.191 -58 | 44.61 +316 | 29.077 +112 | 75.13 -55 | 01.144 +80 | 62.36 +241 |
| 8 | 18.5 | 08.541 +119 | 47.13 +274 | 40.335 +144 | 41.47 +314 | 29.231 +154 | 74.52 -61 | 01.261 +117 | 60.08 +228 |
| 8 | 28.4 | 08.705 +164 | 44.58 +255 | 40.664 +329 | 38.46 +301 | 29.411 +180 | 73.82 -70 | 01.414 +153 | 57.98 +210 |
| 9 | 7.4 | 08.916 +211 | 42.30 +228 | 41.187 +523 | 35.66 +280 | 29.619 +208 | 73.00 -82 | 01.603 +189 | 56.14 +184 |
| 9 | 17.4 | 09.172 +256 | 40.42 +188 | 41.888 +701 | 33.22 +244 | 29.855 +236 | 72.05 -95 | 01.829 +226 | 54.69 +145 |
| 9 | 27.3 | 09.467 +295 | 39.00 +142 | 42.737 +849 | 31.20 +202 | 30.115 +260 | 70.97 -108 | 02.085 +256 | 53.65 +104 |
| 10 | 7.3 | 09.801 +334 | 38.09 +91 | 43.725 +988 | 29.70 +150 | 30.402 +287 | 69.77 -120 | 02.374 +289 | 53.10 +55 |
| 10 | 17.3 | 10.164 +363 | 37.80 +29 | 44.809 +1084 | 28.82 +88 | 30.711 +309 | 68.48 -129 | 02.687 +313 | 53.09 +1 |
| 10 | 27.3 | 10.548 +384 | 38.10 -30 | 45.952 +1143 | 28.55 +27 | 31.038 +327 | 67.10 -138 | 02.687 +333 | 53.09 -52 |
| 11 | 6.2 | 10.948 +400 | 39.03 -93 | 47.127 +1175 | 28.96 -41 | 31.382 +344 | 65.68 -142 | 03.369 +349 | 54.70 -109 |
| 11 | 16.2 | 11.348 +400 | 40.58 -155 | 48.273 +1146 | 30.05 -109 | 31.732 +350 | 64.27 -141 | 03.720 +351 | 56.32 -162 |
| 11 | 26.2 | 11.739 +391 | 42.66 -208 | 49.359 +1086 | 31.74 -169 | 32.083 +351 | 62.90 -137 | 04.068 +348 | 58.39 -207 |
| 12 | 6.2 | 12.110 +371 | 45.26 -260 | 50.350 +991 | 34.04 -230 | 32.428 +345 | 61.62 -128 | 04.402 +334 | 60.90 -251 |
| 12 | 16.1 | 12.445 +335 | 48.27 -301 | 51.192 +842 | 36.86 -282 | 32.753 +325 | 60.49 -113 | 04.710 +308 | 63.74 -284 |
| 12 | 26.1 | 12.737 +292 | 51.57 -330 | 51.871 +679 | 40.07 -321 | 33.052 +299 | 59.55 -94 | 04.983 +273 | 66.80 -306 |
| 12 | 36.1 | 12.975 +238 | 55.11 -354 | 52.360 +489 | 43.62 -355 | 33.313 +261 | 58.82 -73 | 05.214 +231 | 66.80 -323 |
| | | +175 | -361 | +273 | -375 | +216 | -49 | +177 | -325 |
| Mean Place | 10.699 | 61.31 | 48.710 | 53.31 | 30.365 | 63.60 | 02.950 | 74.23 | |
| sec δ , tan δ | +1.455 | -1.057 | +5.201 | -5.104 | +1.075 | +0.394 | +1.194 | -0.653 | |
| $d\alpha(\psi)$, $d\delta(\psi)$ | +0.040 | -0.26 | -0.042 | -0.26 | +0.069 | -0.26 | +0.048 | -0.26 | |
| $d\alpha(\epsilon)$, $d\delta(\epsilon)$ | -0.045 | +0.77 | -0.221 | +0.76 | +0.017 | +0.76 | -0.028 | +0.76 | |
| Dble. Trans. | January 31 | | January 31 | | January 31 | | January 31 | | |

APPARENT PLACES OF STARS, 1986

137

AT UPPER TRANSIT AT GREENWICH

| No. | 326 | | 1229 | | 328 | | 1230 | | |
|--------------|------------|--------------|---------------|--------------|------------|--------------|------------|--------------|-------------|
| Name | δ Cancri | | 25 G. Pyxidis | | ι Cancri* | | 14 Hydrae | | |
| Mag.Spect. | 4.17 | K0 | 6.13 | A2 | 4.20 | G5 | 5.19 | B9 | |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | |
| | h m | ° / | h m | ° / | h m | ° / | h m | ° / | |
| | 8 43 | + 18 12 | 8 44 | - 21 06 | 8 45 | + 28 48 | 8 48 | - 3 23 | |
| 1 | -8.9 | 53 878 + 303 | 26.70 -116 | 18 011 + 278 | 46.53 -268 | 51.651 + 328 | 43.98 -66 | 39.853 + 283 | 17.14 -209 |
| 1 | 1.1 | 54 148 + 270 | 25.72 -98 | 18 253 + 242 | 49.30 -277 | 51.943 + 292 | 43.56 -42 | 40 103 + 250 | 19.19 -205 |
| 1 | 11.1 | 54 378 + 230 | 24.96 -76 | 18 453 + 200 | 52.09 -279 | 52.194 + 251 | 43.41 -15 | 40 316 + 213 | 21.17 -198 |
| 1 | 21.0 | 54.559 + 181 | 24.43 -53 | 18 602 + 149 | 54.82 -273 | 52.390 + 196 | 43.54 + 13 | 40 480 + 164 | 23.00 -183 |
| 1 | 31.0 | 54.687 + 128 | 24.13 -30 | 18.700 + 98 | 57.39 -257 | 52.532 + 142 | 43.90 + 36 | 40.596 + 116 | 24.63 -163 |
| 2 | 10.0 | 54 763 + 76 | 24.03 -10 | 18 746 + 46 | 59.78 -239 | 52 615 + 83 | 44.47 + 57 | 40 661 + 65 | 26.06 -143 |
| 2 | 19.9 | 54 783 + 20 | 24.14 + 11 | 18 739 - 7 | 61.91 -213 | 52.639 + 24 | 45.21 + 74 | 40 676 + 15 | 27.25 -119 |
| 3 | 1.9 | 54.756 - 27 | 24.40 + 26 | 18 687 - 52 | 63.75 -184 | 52.612 - 27 | 46.05 + 84 | 40.646 - 30 | 28.19 -94 |
| 3 | 11.9 | 54.686 - 70 | 24.77 + 37 | 18 595 - 92 | 65.31 -156 | 52.538 - 74 | 46.94 + 89 | 40.576 - 70 | 28.91 -72 |
| 3 | 21.9 | 54 581 - 105 | 25.23 + 46 | 18.469 - 126 | 66.52 -121 | 52.425 - 113 | 47.84 + 90 | 40.474 - 102 | 29.39 -48 |
| 3 | 31.8 | 54 454 - 127 | 25.72 + 49 | 18 323 - 146 | 67.40 - 88 | 52.286 - 139 | 48.68 + 84 | 40.351 - 123 | 29.66 -27 |
| 4 | 10.8 | 54 310 - 144 | 26.21 + 49 | 18 161 - 162 | 67.96 - 56 | 52.129 - 157 | 49.43 + 75 | 40.212 - 139 | 29.73 + 103 |
| 4 | 20.8 | 54.161 - 149 | 26.69 + 48 | 17.993 - 168 | 68.17 - 21 | 51.965 - 164 | 50.05 + 62 | 40.068 - 144 | 29.60 + 13 |
| 4 | 30.8 | 54.017 - 144 | 27.13 + 44 | 17.830 - 163 | 68.06 + 11 | 51.806 - 159 | 50.52 + 47 | 39.928 - 140 | 29.31 + 29 |
| 5 | 10.7 | 53.883 - 134 | 27.51 + 38 | 17.675 - 155 | 67.64 + 42 | 51.658 - 148 | 50.84 + 32 | 39.796 - 132 | 28.86 + 45 |
| 5 | 20.7 | 53 768 - 115 | 27.83 + 32 | 17.537 - 138 | 66.90 + 74 | 51.530 - 128 | 50.98 + 14 | 39.681 - 115 | 28.25 + 61 |
| 5 | 30.7 | 53.678 - 90 | 28.09 + 26 | 17.421 - 116 | 65.89 +101 | 51.428 - 102 | 50.96 - 2 | 39.587 - 94 | 27.52 + 73 |
| 6 | 9.6 | 53.613 - 65 | 28.28 + 19 | 17.327 - 94 | 64.62 +127 | 51.353 - 75 | 50.79 - 17 | 39.516 - 71 | 26.66 + 86 |
| 6 | 19.6 | 53.579 - 34 | 28.39 + 11 | 17.263 - 64 | 63.11 +151 | 51.313 - 40 | 50.47 - 32 | 39.472 - 44 | 25.71 + 95 |
| 6 | 29.6 | 53.575 - 4 | 28.44 + 5 | 17.227 - 36 | 61.44 +167 | 51.305 - 8 | 50.01 - 46 | 39.455 - 17 | 24.70 +101 |
| 7 | 9.6 | 53.602 + 27 | 28.42 - 2 | 17.220 - 7 | 59.61 +183 | 51.331 + 26 | 49.43 - 58 | 39.466 + 11 | 23.64 +106 |
| 7 | 19.5 | 53.661 + 59 | 28.31 - 11 | 17.247 + 27 | 57.70 +191 | 51.392 + 61 | 48.74 - 69 | 39.507 + 41 | 22.57 +107 |
| 7 | 29.5 | 53.759 + 98 | 28.09 - 22 | 17.303 + 56 | 55.78 +192 | 51.392 + 92 | 47.95 - 79 | 39.575 + 68 | 21.54 +103 |
| 8 | 8.5 | 53.859 + 100 | 27.87 - 22 | 17.303 + 87 | 55.78 +190 | 51.484 + 123 | 47.95 - 93 | 39.575 + 96 | 20.58 + 96 |
| 8 | 18.5 | 54.009 + 150 | 27.45 - 42 | 17.511 + 121 | 53.88 +176 | 51.607 + 158 | 47.02 -103 | 39.671 + 125 | 19.74 + 84 |
| 8 | 28.4 | 54.184 + 175 | 26.93 - 52 | 17.661 + 150 | 50.54 +158 | 51.951 + 186 | 44.87 -112 | 39.948 + 152 | 19.06 + 68 |
| 9 | 7.4 | 54.386 + 202 | 26.26 - 67 | 17.844 + 183 | 49.21 +133 | 52.169 + 218 | 43.66 -121 | 40.129 + 181 | 18.59 + 47 |
| 9 | 17.4 | 54.616 + 230 | 25.44 - 82 | 18.057 + 213 | 48.22 + 99 | 52.169 + 247 | 42.37 -129 | 40.337 + 208 | 18.40 + 19 |
| 9 | 27.3 | 54.871 + 255 | 24.49 - 95 | 18.298 + 241 | 47.61 + 61 | 52.416 + 273 | 42.37 -137 | 40.337 + 233 | 18.49 - 9 |
| 10 | 7.3 | 55.151 + 280 | 23.37 -112 | 18.567 + 269 | 47.42 + 19 | 52.689 + 301 | 41.00 -143 | 40.570 + 260 | 18.90 - 41 |
| 10 | 17.3 | 55.453 + 302 | 22.13 -124 | 18.859 + 292 | 47.72 - 30 | 53.315 + 325 | 38.11 -146 | 41.112 + 282 | 19.65 - 75 |
| 10 | 27.3 | 55.774 + 321 | 20.78 -135 | 19.170 + 311 | 48.46 - 74 | 53.659 + 344 | 36.65 -146 | 41.412 + 300 | 20.70 -105 |
| 11 | 6.2 | 56.111 + 337 | 19.34 -144 | 19.496 + 326 | 49.68 -122 | 54.021 + 362 | 35.22 -143 | 41.729 + 317 | 22.07 -137 |
| 11 | 16.2 | 56.455 + 344 | 17.87 -147 | 19.827 + 331 | 51.33 -165 | 54.390 + 369 | 33.87 -135 | 42.052 + 323 | 23.71 -164 |
| 11 | 26.2 | 56.800 + 345 | 16.41 -146 | 20.156 + 329 | 53.35 -202 | 54.761 + 371 | 32.64 -123 | 42.376 + 324 | 25.55 -184 |
| 12 | 6.2 | 57.138 + 338 | 15.01 -140 | 20.475 + 319 | 55.71 -236 | 55.125 + 364 | 31.58 -106 | 42.694 + 318 | 27.56 -201 |
| 12 | 16.1 | 57.458 + 320 | 13.74 -127 | 20.772 + 297 | 58.31 -260 | 55.470 + 345 | 30.74 - 84 | 42.993 + 299 | 29.66 -210 |
| 12 | 26.1 | 57.752 + 294 | 12.62 -112 | 21.039 + 267 | 61.05 -274 | 55.787 + 317 | 30.13 - 61 | 43.266 + 273 | 31.76 -210 |
| 12 | 36.1 | 58.010 + 258 | 11.69 - 93 | 21.269 + 230 | 63.87 -282 | 56.066 + 279 | 29.79 - 34 | 43.505 + 239 | 33.83 -207 |
| | | 58.010 + 212 | 11.69 - 70 | 21.269 + 182 | 63.87 -280 | 56.066 + 231 | 29.79 - 6 | 43.505 + 196 | 33.83 -194 |
| Mean Place | 55.142 | 16.19 | 18.946 | 66.05 | 52.920 | 35.87 | 41.022 | 32.72 | |
| sec δ, tan δ | +1.053 | +0.329 | +1.072 | -0.386 | +1.141 | +0.550 | +1.002 | -0.059 | |
| dα(ψ), dδ(ψ) | +0.068 | -0.26 | +0.053 | -0.26 | +0.072 | -0.26 | +0.060 | -0.27 | |
| dα(ε), dδ(ε) | +0.014 | +0.75 | -0.017 | +0.75 | +0.024 | +0.75 | -0.003 | +0.74 | |
| Dble.Trans. | February 1 | | February 1 | | February 1 | | February 2 | | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 332 | | 1231 | | 334 | | 336 | | |
|--------------|------------|-------------|---------------|-------------|------------|-------------|----------------|-------------|------------|
| | γ Pyxidis | | 80 G. Hydrae* | | ζ Hydrae | | 108 G. Carinae | | |
| Mag.Spect. | 4.19 | K2 | 5.90 | K0 | 3.30 | K0 | 3.98 | B8 | |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | |
| | h m | ° / | h m | ° / | h m | ° / | h m | ° / | |
| | 8 49 | -27 39 | 8 54 | -18 11 | 8 54 | + 5 59 | 8 54 | -60 35 | |
| 1 | -8.9 | 56.687 +285 | 12.67 -284 | 34.138 +285 | 02.44 -259 | 39.594 +293 | 64.19 -174 | 45.039 +392 | 06.79 -315 |
| 1 | 1.1 | 56.935 +248 | 15.64 -297 | 34.388 +250 | 05.10 -266 | 39.856 +262 | 62.56 -163 | 45.363 +324 | 10.26 -347 |
| 1 | 11.1 | 57.140 +205 | 18.69 -305 | 34.599 +211 | 07.78 -268 | 40.081 +225 | 61.06 -150 | 45.611 +248 | 13.97 -371 |
| 1 | 21.0 | 57.292 +152 | 21.70 -301 | 34.761 +162 | 10.39 -261 | 40.258 +177 | 59.76 -130 | 45.769 +158 | 17.80 -383 |
| 1 | 31.0 | 57.390 +98 | 24.58 -288 | 34.872 +111 | 12.84 -245 | 40.387 +129 | 58.67 -109 | 45.840 +71 | 21.62 -382 |
| 2 | 10.0 | 57.434 +44 | 27.30 -272 | 34.932 +60 | 15.11 -227 | 40.464 +77 | 57.80 -87 | 45.824 -16 | 25.37 -375 |
| 2 | 20.0 | 57.424 -10 | 29.76 -246 | 34.939 +7 | 17.14 -203 | 40.490 +26 | 57.16 -64 | 45.720 -104 | 28.92 -355 |
| 3 | 1.9 | 57.367 -57 | 31.93 -217 | 34.901 -38 | 18.88 -174 | 40.470 -20 | 56.73 -43 | 45.542 -178 | 32.20 -328 |
| 3 | 11.9 | 57.268 -99 | 33.80 -187 | 34.823 -78 | 20.35 -147 | 40.410 -60 | 56.49 -24 | 45.296 -246 | 35.17 -297 |
| 3 | 21.9 | 57.135 -133 | 35.29 -149 | 34.711 -112 | 21.49 -114 | 40.315 -95 | 56.43 -6 | 44.991 -305 | 37.73 -256 |
| 3 | 31.8 | 56.978 -157 | 36.43 -114 | 34.576 -135 | 22.33 -84 | 40.197 -118 | 56.50 +7 | 44.646 -345 | 39.85 -212 |
| 4 | 10.8 | 56.804 -174 | 37.21 -78 | 34.425 -151 | 22.86 -53 | 40.063 -134 | 56.70 +20 | 44.267 -379 | 41.51 -166 |
| 4 | 20.8 | 56.624 -180 | 37.59 -38 | 34.266 -159 | 23.07 -21 | 39.923 -140 | 57.01 +31 | 43.870 -397 | 42.65 -114 |
| 4 | 30.8 | 56.446 -178 | 37.62 -3 | 34.111 -155 | 22.99 +8 | 39.787 -136 | 57.39 +38 | 43.470 -400 | 43.28 -63 |
| 5 | 10.7 | 56.275 -171 | 37.27 +35 | 33.963 -148 | 22.61 +38 | 39.658 -129 | 57.84 +45 | 43.071 -399 | 43.39 -11 |
| 5 | 20.7 | 56.121 -154 | 36.56 +71 | 33.829 -134 | 21.94 +67 | 39.545 -113 | 58.35 +51 | 42.690 -381 | 42.96 +43 |
| 5 | 30.7 | 55.987 -134 | 35.53 +103 | 33.716 -113 | 21.03 +91 | 39.453 -92 | 58.90 +55 | 42.337 -353 | 42.05 +91 |
| 6 | 9.7 | 55.876 -111 | 34.19 +134 | 33.623 -93 | 19.87 +116 | 39.384 -69 | 59.48 +58 | 42.014 -323 | 40.64 +141 |
| 6 | 19.6 | 55.794 -82 | 32.56 +163 | 33.558 -65 | 18.50 +137 | 39.342 -42 | 60.09 +61 | 41.738 -276 | 38.79 +185 |
| 6 | 29.6 | 55.741 -53 | 30.73 +183 | 33.520 -38 | 16.98 +152 | 39.328 -14 | 60.69 +60 | 41.509 -229 | 36.56 +223 |
| 7 | 9.6 | 55.718 -23 | 28.71 +202 | 33.509 -11 | 15.31 +167 | 39.340 +12 | 61.29 +60 | 41.334 -175 | 33.98 +258 |
| 7 | 19.5 | 55.730 +12 | 26.57 +214 | 33.530 +21 | 13.57 +174 | 39.383 +43 | 61.84 +55 | 41.224 -110 | 31.16 +282 |
| 7 | 29.5 | 55.773 +43 | 24.39 +218 | 33.580 +50 | 11.82 +175 | 39.452 +69 | 62.32 +48 | 41.176 -48 | 28.18 +298 |
| 8 | 8.5 | 55.850 +77 | 22.22 +217 | 33.660 +80 | 10.09 +173 | 39.548 +96 | 62.73 +41 | 41.197 +21 | 25.09 +309 |
| 8 | 18.5 | 55.962 +112 | 20.16 +206 | 33.772 +112 | 08.48 +161 | 39.674 +126 | 63.04 +31 | 41.291 +94 | 22.06 +303 |
| 8 | 28.4 | 56.107 +145 | 18.29 +187 | 33.913 +141 | 07.05 +143 | 39.827 +153 | 63.18 +14 | 41.452 +161 | 19.16 +290 |
| 9 | 7.4 | 56.286 +179 | 16.66 +163 | 34.086 +173 | 05.85 +120 | 40.008 +181 | 63.14 -4 | 41.685 +233 | 16.48 +268 |
| 9 | 17.4 | 56.500 +214 | 15.40 +126 | 34.290 +204 | 04.97 +88 | 40.217 +209 | 62.87 -27 | 41.987 +302 | 14.18 +230 |
| 9 | 27.4 | 56.743 +243 | 14.52 +88 | 34.521 +231 | 04.45 +52 | 40.450 +233 | 62.37 -50 | 41.987 +361 | 12.30 +188 |
| 10 | 7.3 | 57.017 +274 | 14.11 +41 | 34.782 +261 | 04.33 +12 | 40.711 +261 | 61.62 -75 | 42.768 +420 | 10.94 +136 |
| 10 | 17.3 | 57.316 +299 | 14.20 -9 | 35.067 +285 | 04.67 -34 | 40.994 +283 | 60.62 -100 | 43.231 +463 | 10.20 +74 |
| 10 | 27.3 | 57.635 +319 | 14.79 -59 | 35.372 +305 | 05.43 -76 | 41.296 +302 | 59.40 -122 | 43.727 +496 | 10.08 +12 |
| 11 | 6.2 | 57.971 +336 | 15.91 -112 | 35.694 +322 | 06.65 -122 | 41.616 +320 | 57.95 -145 | 44.246 +519 | 10.63 -55 |
| 11 | 16.2 | 58.312 +341 | 17.51 -160 | 36.023 +329 | 08.27 -162 | 41.944 +328 | 56.34 -161 | 44.765 +519 | 11.85 -122 |
| 11 | 26.2 | 58.651 +339 | 19.54 -203 | 36.353 +330 | 10.25 -198 | 42.274 +330 | 54.62 -172 | 45.273 +508 | 13.67 -182 |
| 12 | 6.2 | 58.980 +329 | 21.97 -243 | 36.675 +322 | 12.54 -229 | 42.600 +326 | 52.82 -180 | 45.753 +480 | 16.09 -242 |
| 12 | 16.1 | 59.286 +306 | 24.69 -272 | 36.977 +302 | 15.05 -251 | 42.909 +309 | 51.04 -178 | 46.183 +430 | 19.00 -291 |
| 12 | 26.1 | 59.560 +274 | 27.60 -291 | 37.252 +275 | 17.69 -264 | 43.193 +284 | 49.31 -173 | 46.556 +373 | 22.29 -329 |
| 12 | 36.1 | 59.795 +235 | 30.65 -305 | 37.491 +239 | 20.41 -272 | 43.444 +251 | 47.69 -162 | 46.856 +300 | 25.90 -361 |
| | | 59.795 +186 | 30.65 -306 | 37.491 +194 | 20.41 -267 | 43.444 +208 | 47.69 -145 | 46.856 +215 | 25.90 -379 |
| Mean Place | 57.535 | 33.88 | 35.178 | 21.80 | 40.845 | 50.80 | 44.524 | 34.15 | |
| sec δ, tan δ | +1.129 | -0.524 | +1.053 | -0.329 | +1.006 | +0.105 | +2.037 | -1.774 | |
| dα(v), dδ(v) | +0.051 | -0.27 | +0.055 | -0.27 | +0.063 | -0.27 | +0.027 | -0.27 | |
| dα(ε), dδ(ε) | -0.024 | +0.74 | -0.015 | +0.72 | +0.005 | +0.72 | -0.082 | +0.72 | |
| Dble.Trans. | February 2 | | February 3 | | February 3 | | February 3 | | |

APPARENT PLACES OF STARS, 1986

139

AT UPPER TRANSIT AT GREENWICH

| No. | 1233 | | | 337 | | | 335 | | | 1232 | | | | | | | |
|--------------|-----------------|--------|------|------------|------|--------|------------------|--------|------|------------|------|--------|------|--------|------|--------|------|
| Name | 109 G. Carinae* | | | α Cancri | | | ι Ursae Majoris* | | | 64 Cancri | | | | | | | |
| Mag.Spect. | 5.29 | B3 | | 4.27 | A3 | | 3.12 | A5 | | 5.64 | G5 | | | | | | |
| U.T. | R.A. | | Dec. | R.A. | | Dec. | R.A. | | Dec. | R.A. | | Dec. | | | | | |
| | h | m | ° | ′ | ° | ′ | h | m | ° | ′ | h | m | ° | ′ | | | |
| | 8 | 56 | -59 | 10 | 8 | 57 | +11 | 54 | 8 | 58 | +48 | 05 | 8 | 58 | +32 | 28 | |
| 1 | -8.9 | 38 946 | +385 | 09 67 | -314 | 43 700 | +302 | 50 03 | -151 | 16 128 | +416 | 47 46 | +10 | 41 755 | +347 | 25 02 | -61 |
| 1 | 1.1 | 39 266 | +320 | 13 13 | -346 | 43 972 | +272 | 48 68 | -135 | 16 502 | +374 | 47 93 | +47 | 42 068 | +313 | 24 71 | -31 |
| 1 | 11.1 | 39 513 | +247 | 16 83 | -370 | 44 206 | +234 | 47 49 | -119 | 16 824 | +322 | 48 78 | +85 | 42 339 | +271 | 24 69 | -2 |
| 1 | 21.0 | 39 674 | +161 | 20 65 | -382 | 44 392 | +186 | 46 53 | -96 | 17 079 | +255 | 49 96 | +118 | 42 555 | +216 | 24 97 | +28 |
| 1 | 31.0 | 39 751 | +77 | 24 45 | -380 | 44 529 | +137 | 45 80 | -73 | 17 265 | +186 | 51 41 | +145 | 42 716 | +161 | 25 51 | +54 |
| 2 | 10.0 | 39 745 | -6 | 28 19 | -374 | 44 614 | +85 | 45 28 | -52 | 17 378 | +113 | 53 07 | +166 | 42 816 | +100 | 26 28 | +77 |
| 2 | 20.0 | 39 653 | -92 | 31 73 | -354 | 44 646 | +32 | 45 00 | -28 | 17 414 | +36 | 54 86 | +179 | 42 855 | +39 | 27 22 | +94 |
| 3 | 1.9 | 39 490 | -163 | 34 99 | -326 | 44 631 | -15 | 44 90 | -10 | 17 383 | -31 | 56 68 | +182 | 42 840 | -15 | 28 27 | +105 |
| 3 | 11.9 | 39 261 | -229 | 37 95 | -296 | 44 574 | -57 | 44 96 | +6 | 17 289 | -94 | 58 46 | +178 | 42 775 | -65 | 29 38 | +111 |
| 3 | 21.9 | 38 975 | -286 | 40 50 | -285 | 44 482 | -92 | 45 17 | +21 | 17 141 | -148 | 60 11 | +165 | 42 668 | -107 | 30 47 | +109 |
| 3 | 31.8 | 38 651 | -324 | 42 61 | -211 | 44 366 | -116 | 45 47 | +30 | 16 956 | -185 | 61 55 | +144 | 42 531 | -137 | 31 48 | +101 |
| 4 | 10.8 | 38 293 | -358 | 44 27 | -166 | 44 233 | -133 | 45 84 | +37 | 16 742 | -214 | 62 74 | +119 | 42 373 | -158 | 32 39 | +91 |
| 4 | 20.8 | 37 918 | -375 | 45 41 | -114 | 44 092 | -141 | 46 26 | +42 | 16 514 | -228 | 63 61 | +87 | 42 306 | -167 | 33 13 | +74 |
| 4 | 30.8 | 37 539 | -379 | 46 04 | -63 | 43 955 | -137 | 46 69 | +43 | 16 289 | -225 | 64 16 | +55 | 42 041 | -165 | 33 69 | +56 |
| 5 | 10.7 | 37 163 | -376 | 46 16 | -12 | 43 825 | -130 | 47 14 | +45 | 16 071 | -218 | 64 36 | +20 | 41 883 | -158 | 34 05 | +36 |
| 5 | 20.7 | 36 802 | -361 | 45 74 | +42 | 43 711 | -114 | 47 58 | +44 | 15 876 | -195 | 64 21 | -15 | 41 745 | -138 | 34 20 | +15 |
| 5 | 30.7 | 36 468 | -334 | 44 84 | +90 | 43 618 | -93 | 48 01 | +43 | 15 712 | -164 | 63 73 | -48 | 41 630 | -115 | 34 15 | -5 |
| 6 | 9.7 | 36 164 | -304 | 43 45 | +139 | 43 548 | -70 | 48 42 | +41 | 15 581 | -131 | 62 94 | -79 | 41 542 | -88 | 33 90 | -25 |
| 6 | 19.6 | 35 903 | -261 | 41 61 | +184 | 43 506 | -42 | 48 80 | +38 | 15 492 | -89 | 61 84 | -110 | 41 488 | -54 | 33 46 | -44 |
| 6 | 29.6 | 35 688 | -215 | 39 40 | +221 | 43 491 | -15 | 49 14 | +34 | 15 446 | -46 | 60 51 | -133 | 41 466 | -22 | 32 85 | -61 |
| 7 | 9.6 | 35 523 | -165 | 36 85 | +255 | 43 504 | +13 | 49 43 | +29 | 15 443 | -3 | 58 95 | -156 | 41 477 | +11 | 32 09 | -76 |
| 7 | 19.5 | 35 421 | -102 | 34 04 | +281 | 43 548 | +44 | 49 66 | +23 | 15 487 | +44 | 57 19 | -176 | 41 525 | +48 | 31 18 | -91 |
| 7 | 29.5 | 35 377 | -44 | 31 09 | +295 | 43 619 | +71 | 49 78 | +12 | 15 574 | +87 | 55 30 | -189 | 41 605 | +80 | 30 16 | -102 |
| 8 | 8.5 | 35 398 | +21 | 28 03 | +306 | 43 712 | +93 | 49 82 | +4 | 15 705 | +131 | 53 27 | -203 | 41 717 | +112 | 29 00 | -116 |
| 8 | 18.5 | 35 489 | +91 | 25 02 | +301 | 43 841 | +129 | 49 80 | -2 | 15 881 | +176 | 51 16 | -211 | 41 864 | +147 | 27 71 | -129 |
| 8 | 28.4 | 35 645 | +156 | 22 14 | +288 | 43 997 | +156 | 49 60 | -20 | 16 096 | +215 | 49 00 | -216 | 42 042 | +178 | 26 34 | -137 |
| 9 | 7.4 | 35 869 | +224 | 19 48 | +266 | 44 180 | +183 | 49 22 | -38 | 16 353 | +257 | 46 82 | -218 | 42 253 | +211 | 24 88 | -146 |
| 9 | 17.4 | 36 159 | +290 | 17 20 | +228 | 44 392 | +212 | 48 65 | -57 | 16 651 | +298 | 44 66 | -216 | 42 496 | +243 | 23 34 | -154 |
| 9 | 27.4 | 36 506 | +347 | 15 34 | +186 | 44 628 | +236 | 47 89 | -76 | 16 983 | +332 | 42 55 | -211 | 42 767 | +271 | 21 75 | -159 |
| 10 | 7.3 | 36 909 | +403 | 13 99 | +135 | 44 892 | +264 | 46 92 | -97 | 17 352 | +369 | 40 52 | -203 | 43 069 | +302 | 20 12 | -163 |
| 10 | 17.3 | 37 356 | +447 | 13 27 | +72 | 45 179 | +287 | 45 76 | -116 | 17 753 | +401 | 38 64 | -188 | 43 397 | +328 | 18 49 | -161 |
| 10 | 27.3 | 37 834 | +478 | 13 15 | +12 | 45 486 | +307 | 44 43 | -133 | 18 179 | +426 | 36 93 | -171 | 43 747 | +350 | 16 88 | -161 |
| 11 | 6.2 | 38 335 | +501 | 13 70 | -55 | 45 811 | +325 | 42 94 | -149 | 18 629 | +450 | 35 44 | -149 | 44 117 | +370 | 15 34 | -154 |
| 11 | 16.2 | 38 838 | +503 | 14 92 | -122 | 46 146 | +335 | 41 35 | -159 | 19 090 | +461 | 34 24 | -120 | 44 498 | +381 | 13 92 | -142 |
| 11 | 26.2 | 39 331 | +493 | 16 74 | -182 | 46 484 | +338 | 39 71 | -164 | 19 555 | +465 | 33 33 | -91 | 44 883 | +385 | 12 65 | -127 |
| 12 | 6.2 | 39 799 | +468 | 19 15 | -241 | 46 818 | +334 | 38 05 | -166 | 20 014 | +459 | 32 78 | -55 | 45 264 | +381 | 11 60 | -105 |
| 12 | 16.1 | 40 220 | +421 | 22 05 | -290 | 47 135 | +317 | 36 46 | -159 | 20 449 | +435 | 32 61 | -17 | 45 627 | +363 | 10 80 | -80 |
| 12 | 26.1 | 40 586 | +366 | 25 33 | -328 | 47 428 | +293 | 34 98 | -148 | 20 852 | +403 | 32 82 | +21 | 45 964 | +337 | 10 27 | -53 |
| 12 | 36.1 | 40 883 | +297 | 28 94 | -361 | 47 689 | +261 | 33 65 | -133 | 21 209 | +357 | 33 42 | +60 | 46 263 | +299 | 10 04 | -23 |
| | | +216 | | -377 | | +217 | | -112 | | +297 | | +95 | | +251 | | +7 | |
| Mean Place | 38.585 | | | 37.03 | | 44.991 | | 38.03 | | 17.256 | | 43.11 | | 43.042 | | 17.80 | |
| sec δ, tan δ | +1.952 | | | -1.676 | | +1.022 | | +0.211 | | +1.497 | | +1.114 | | +1.185 | | +0.636 | |
| da(ψ), dδ(ψ) | +0.029 | | | -0.28 | | +0.065 | | -0.28 | | +0.082 | | -0.28 | | +0.073 | | -0.28 | |
| da(ε), dδ(ε) | -0.078 | | | +0.72 | | +0.010 | | +0.71 | | +0.052 | | +0.71 | | +0.030 | | +0.71 | |
| Dble.Trans. | February 4 | | | February 4 | | | February 4 | | | February 4 | | | | | | | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 1234 | | 339 | | 1235 | | 338 | |
|--------------|---------------|------------|---------------------------------|------------|--------------|------------|-----------------|------------|
| | 91 G. Velorum | | Bradley 1268 c. l.* (Lycnis) | | 92 G. Hydrae | | γ Ursae Majoris | |
| Mag.Spect. | 4.42 | F8 | 4.09 | F5 | 5.80 | K0 | 4.99 | M0 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " |
| | 8 59 | -41 11 | 8 59 | +41 50 | 9 01 | - 0 25 | 9 01 | +67 40 |
| 1 -8.9 | 34.557 +314 | 38.68 -305 | 44.809 +383 | 18.01 -19 | 15.365 +292 | 30.66 -201 | 19.954 +665 | 60.89 +87 |
| 1 1.1 | 34.827 +270 | 41.95 -327 | 45.153 +344 | 18.16 +15 | 15.627 +262 | 32.61 -195 | 20.547 +593 | 62.21 +132 |
| 1 11.1 | 35.048 +221 | 45.38 -343 | 45.451 +298 | 18.66 +50 | 15.853 +226 | 34.46 -185 | 21.054 +507 | 63.97 +176 |
| 1 21.0 | 35.209 +161 | 48.86 -348 | 45.689 +238 | 19.49 +83 | 16.031 +178 | 36.16 -170 | 21.451 +397 | 66.10 +213 |
| 1 31.0 | 35.309 +100 | 52.27 -341 | 45.864 +175 | 20.58 +109 | 16.162 +131 | 37.65 -149 | 21.732 +281 | 68.48 +238 |
| 2 10.0 | 35.348 +39 | 55.56 -329 | 45.972 +108 | 21.89 +131 | 16.242 +80 | 38.93 -128 | 21.892 +160 | 71.06 +258 |
| 2 20.0 | 35.325 -23 | 58.63 -307 | 46.011 +39 | 23.36 +147 | 16.270 +28 | 39.97 -104 | 21.922 +30 | 73.71 +265 |
| 3 1.9 | 35.250 -75 | 61.40 -277 | 45.989 -22 | 24.88 +152 | 16.254 -16 | 40.78 -81 | 21.837 -85 | 76.29 +258 |
| 3 11.9 | 35.126 -124 | 63.86 -246 | 45.910 -79 | 26.41 +153 | 16.197 -57 | 41.37 -59 | 21.643 -194 | 78.74 +245 |
| 3 21.9 | 34.961 -165 | 65.93 -207 | 45.783 -127 | 27.86 +145 | 16.106 -91 | 41.73 -36 | 21.353 -290 | 80.93 +219 |
| 4 31.8 | 34.769 -192 | 67.59 -166 | 45.623 -160 | 29.14 +128 | 15.992 -114 | 41.91 -18 | 20.995 -358 | 82.77 +184 |
| 4 10.8 | 34.554 -215 | 68.83 -124 | 45.438 -185 | 30.24 +110 | 15.861 -131 | 41.91 +0 | 20.582 -413 | 84.21 +144 |
| 4 20.8 | 34.329 -225 | 69.61 -78 | 45.240 -198 | 31.08 +84 | 15.722 -139 | 41.74 +17 | 20.138 -444 | 85.18 +97 |
| 4 30.8 | 34.104 -225 | 69.95 -34 | 45.045 -195 | 31.65 +57 | 15.586 -136 | 41.43 +31 | 19.690 -448 | 85.67 +49 |
| 5 10.7 | 33.883 -221 | 69.84 +11 | 44.857 -188 | 31.93 +28 | 15.456 -130 | 40.99 +44 | 19.250 -440 | 85.67 +0 |
| 5 20.7 | 33.676 -207 | 69.27 +57 | 44.690 -167 | 31.91 -2 | 15.341 -115 | 40.43 +56 | 18.842 -408 | 85.16 -51 |
| 5 30.7 | 33.490 -186 | 68.30 +97 | 44.550 -140 | 31.61 -30 | 15.245 -96 | 39.78 +65 | 18.482 -360 | 84.20 -96 |
| 6 9.7 | 33.326 -164 | 66.93 +137 | 44.440 -110 | 31.04 -57 | 15.170 -75 | 39.03 +75 | 18.177 -305 | 82.81 -139 |
| 6 19.6 | 33.193 -133 | 65.18 +175 | 44.368 -72 | 30.21 -83 | 15.121 -49 | 38.21 +82 | 17.945 -232 | 81.01 -180 |
| 6 29.6 | 33.092 -101 | 63.14 +204 | 44.333 -35 | 29.17 -104 | 15.098 -23 | 37.35 +86 | 17.787 -158 | 78.90 -211 |
| 7 9.6 | 33.026 -86 | 60.83 +231 | 44.336 +3 | 27.92 -125 | 15.102 +4 | 36.46 +89 | 17.707 -80 | 76.49 -241 |
| 7 19.5 | 32.999 -27 | 58.33 +250 | 44.382 +46 | 26.49 -143 | 15.134 +32 | 35.58 +88 | 17.714 +7 | 73.86 -263 |
| 7 29.5 | 33.011 +11 | 55.74 +259 | 44.464 +82 | 24.93 -156 | 15.193 +59 | 34.74 +84 | 17.801 +87 | 71.07 -279 |
| 8 8.5 | 33.062 +52 | 53.10 +264 | 44.585 +121 | 23.23 -170 | 15.279 +86 | 33.98 +76 | 17.970 +169 | 68.16 -291 |
| 8 18.5 | 33.158 +96 | 50.53 +257 | 44.746 +161 | 21.43 -180 | 15.394 +115 | 33.33 +65 | 18.224 +254 | 65.20 -296 |
| 8 28.4 | 33.295 +137 | 48.13 +240 | 44.941 +195 | 19.56 -187 | 15.535 +141 | 32.84 +49 | 18.552 +328 | 62.26 -294 |
| 9 7.4 | 33.475 +180 | 45.96 +217 | 45.174 +233 | 17.64 -192 | 15.707 +172 | 32.55 +29 | 18.956 +404 | 59.37 -289 |
| 9 17.4 | 33.698 +223 | 44.16 +180 | 45.443 +269 | 15.70 -194 | 15.906 +199 | 32.51 +4 | 19.434 +478 | 56.61 -276 |
| 9 27.4 | 33.958 +260 | 42.77 +139 | 45.744 +301 | 13.78 -192 | 16.131 +225 | 32.74 -23 | 19.973 +539 | 54.01 -260 |
| 10 7.3 | 34.257 +299 | 41.87 +90 | 46.079 +335 | 11.88 -190 | 16.384 +253 | 33.27 -53 | 20.577 +604 | 51.63 -238 |
| 10 17.3 | 34.588 +331 | 41.55 +32 | 46.443 +364 | 10.07 -181 | 16.661 +277 | 34.10 -83 | 21.232 +655 | 49.56 -207 |
| 10 27.3 | 34.942 +354 | 41.78 -23 | 46.830 +387 | 08.38 -169 | 16.958 +297 | 35.22 -112 | 21.929 +697 | 47.80 -176 |
| 11 6.2 | 35.316 +374 | 42.62 -84 | 47.241 +411 | 06.84 -154 | 17.273 +315 | 36.62 -140 | 22.663 +734 | 46.43 -137 |
| 11 16.2 | 35.696 +380 | 44.05 -143 | 47.662 +421 | 05.53 -131 | 17.598 +325 | 38.26 -164 | 23.412 +749 | 45.51 -92 |
| 11 26.2 | 36.074 +378 | 46.00 -195 | 48.087 +425 | 04.46 -107 | 17.926 +328 | 40.08 -182 | 24.164 +752 | 45.03 -48 |
| 12 6.2 | 36.440 +366 | 48.46 -246 | 48.507 +420 | 03.69 -77 | 18.250 +324 | 42.04 -196 | 24.902 +738 | 45.05 +2 |
| 12 16.1 | 36.777 +337 | 51.31 -285 | 48.907 +400 | 03.26 -43 | 18.557 +307 | 44.06 -202 | 25.598 +696 | 45.58 +53 |
| 12 26.1 | 37.078 +301 | 54.46 -315 | 49.278 +371 | 03.16 -10 | 18.841 +284 | 46.08 -202 | 26.239 +641 | 46.59 +101 |
| 12 36.1 | 37.334 +256 | 57.85 -339 | 49.608 +330 | 03.42 +26 | 19.092 +251 | 48.03 -195 | 26.803 +564 | 48.07 +148 |
| | | | | | | | | |
| Mean Place | 35.148 | 63.30 | 46.015 | 12.58 | 16.609 | 45.79 | 20.468 | 59.40 |
| sec δ, tan δ | +1.329 | -0.875 | +1.342 | +0.895 | +1.000 | -0.007 | +2.633 | +2.436 |
| dα(v), dδ(v) | +0.045 | -0.28 | +0.078 | -0.28 | +0.061 | -0.28 | +0.107 | -0.28 |
| dα(ε), dδ(ε) | -0.041 | +0.71 | +0.042 | +0.71 | -0.000 | +0.70 | +0.116 | +0.70 |
| Dble.Trans. | February 5 | | February 5 | | February 5 | | February 5 | |

AT UPPER TRANSIT AT GREENWICH

| No. | 343 | | 341 | | 340 | | 1236 | | |
|-----------------------------|-------------------|-------------|------------------------|-------------|-------------------------------------|-------------|--------------|-------------|------------|
| | α Volantis | | κ Ursae Majoris | | Groombridge 1501 (Ursae Majoris) | | 93 G. Hydrae | | |
| Mag. Spect. | 4.18 | A5 | 3.68 | A0 | 5.68 | A2 | 6.74 | A0 | |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " | |
| | 9 02 | -66 20 | 9 02 | +47 12 | 9 02 | +54 20 | 9 03 | -5 06 | |
| 1 | -8.9 | 15.280 +463 | 03 01 -308 | 41 311 +416 | 42 62 +1 | 60.340 +470 | 19 20 +31 | 01.829 +291 | 46 53 -218 |
| 1 | 1.1 | 15.660 +380 | 06 43 -342 | 41 685 +374 | 43 01 +39 | 60.762 +422 | 19 93 +73 | 02.090 +261 | 48 69 -216 |
| 1 | 11.1 | 15.949 +289 | 10 13 -370 | 42 010 +325 | 43 77 +76 | 61.128 +366 | 21 05 +112 | 02.314 +224 | 50 78 -209 |
| 1 | 21.0 | 16.131 +182 | 13 99 -386 | 42 271 +261 | 44 88 +111 | 61.419 +291 | 22 54 +149 | 02.491 +177 | 52 74 -196 |
| 1 | 31.0 | 16.209 +78 | 17 87 -388 | 42 463 +192 | 46 27 +139 | 61.632 +213 | 24 31 +179 | 02.620 +129 | 54 51 -177 |
| 2 | 10.0 | 16.183 -26 | 21 71 -384 | 42 583 +120 | 47 88 +161 | 61.763 +131 | 26 28 +197 | 02.699 +79 | 56 08 -157 |
| 2 | 20.0 | 16.052 -131 | 25 39 -368 | 42 628 +45 | 49 63 +175 | 61 807 +44 | 28 38 +210 | 02.726 +27 | 57 41 -133 |
| 3 | 1.9 | 15.832 -220 | 28 82 -343 | 42 605 -23 | 51 42 +179 | 61 774 -33 | 30 49 +211 | 02.708 -18 | 58 48 -107 |
| 3 | 11.9 | 15.529 -303 | 31 96 -314 | 42 521 -84 | 53 19 +177 | 61 668 -106 | 32 53 +188 | 02.650 -58 | 59 33 -85 |
| 3 | 21.9 | 15.153 -376 | 34 71 -275 | 42 383 -138 | 54 84 +165 | 61 500 -168 | 34 41 +204 | 02.558 -92 | 59 91 -58 |
| 3 | 31.9 | 14.727 -426 | 37 03 -232 | 42 207 -176 | 56 30 +146 | 61 288 -212 | 36 03 +162 | 02.443 -115 | 60 28 -37 |
| 4 | 10.8 | 14.257 -470 | 38 90 -187 | 42 002 -205 | 57 52 +122 | 61 040 -248 | 37 37 +134 | 02 310 -133 | 60 43 -15 |
| 4 | 20.8 | 13.761 -496 | 40 24 -134 | 41 782 -220 | 58 44 +92 | 60 775 -265 | 38 34 +97 | 02 170 -140 | 60 37 +6 |
| 4 | 30.8 | 13.256 -505 | 41 08 -84 | 41 564 -218 | 59 04 +60 | 60 509 -266 | 38 92 +58 | 02 032 -138 | 60 14 +23 |
| 5 | 10.7 | 12.749 -507 | 41 39 -31 | 41 352 -212 | 59 30 +26 | 60 250 -259 | 39 12 +20 | 01 900 -132 | 59 72 +42 |
| 5 | 20.7 | 12.259 -490 | 41 14 +25 | 41 161 -191 | 59 22 -8 | 60 014 -236 | 38 90 -22 | 01 782 -118 | 59 14 +58 |
| 5 | 30.7 | 11.797 -462 | 40 39 +75 | 40 999 -162 | 58 81 -41 | 59 811 -203 | 38 30 -60 | 01 682 -100 | 58 42 +72 |
| 6 | 9.7 | 11.369 -428 | 39 13 +126 | 40 868 -131 | 58 09 -72 | 59 644 -167 | 37 35 -95 | 01 603 -79 | 57 57 +85 |
| 6 | 19.6 | 10.993 -376 | 37 40 +173 | 40 779 -89 | 57 06 -103 | 59 525 -119 | 36 05 -130 | 01 550 -53 | 56 61 +96 |
| 6 | 29.6 | 10.674 -319 | 35 27 +213 | 40 730 -49 | 55 80 -126 | 59 453 -72 | 34 48 -157 | 01 522 -28 | 55 57 +104 |
| 7 | 9.6 | 10.419 -255 | 32 76 +251 | 40 723 -7 | 54 30 -150 | 59 431 -22 | 32 65 -183 | 01 520 -2 | 54 47 +110 |
| 7 | 19.6 | 10.242 -177 | 29 96 +280 | 40 762 +39 | 52 60 -170 | 59 463 +32 | 30 60 -205 | 01 548 +28 | 53 37 +110 |
| 7 | 29.5 | 10.141 -101 | 26 99 +297 | 40 842 +80 | 50 76 -184 | 59 545 +82 | 28 40 -220 | 01 601 +53 | 52 29 +108 |
| 8 | 8.5 | 10.126 -15 | 23 88 +311 | 40 965 +123 | 48 78 -198 | 59 677 +132 | 26 06 -234 | 01 682 +81 | 51 26 +103 |
| 8 | 18.5 | 10.202 +76 | 20 78 +310 | 41 132 +167 | 46 70 -208 | 59 863 +186 | 23 64 -242 | 01 793 +111 | 50 36 +90 |
| 8 | 28.4 | 10.363 +161 | 17 79 +299 | 41 338 +206 | 44 56 -214 | 60 094 +231 | 21 19 -245 | 01 931 +138 | 49 62 +74 |
| 9 | 7.4 | 10.615 +252 | 15 00 +279 | 41 586 +248 | 42 39 -217 | 60 374 +280 | 18 73 -246 | 02 098 +167 | 49 08 +54 |
| 9 | 17.4 | 10.954 +339 | 12 55 +245 | 41 874 +288 | 40 23 -216 | 60 701 +327 | 16 32 -241 | 02 098 +197 | 48 82 +26 |
| 9 | 27.4 | 11.367 +413 | 10 51 +204 | 42 196 +322 | 38 11 -212 | 61 069 +368 | 14 00 -232 | 02 295 +222 | 48 85 -3 |
| 10 | 7.3 | 11.855 +488 | 08 98 +153 | 42 556 +360 | 36 06 -205 | 61 480 +411 | 11 80 -220 | 02 769 +252 | 49 20 -35 |
| 10 | 17.3 | 12.398 +543 | 08 06 +92 | 42 948 +392 | 34 14 -192 | 61 926 +446 | 09 79 -201 | 03 044 +275 | 49 90 -70 |
| 10 | 27.3 | 12.982 +584 | 07 76 +30 | 43 367 +419 | 32 39 -175 | 62 403 +477 | 08 01 -178 | 03 340 +296 | 50 92 -102 |
| 11 | 6.3 | 13.595 +613 | 08 12 -36 | 43 810 +443 | 30 84 -155 | 62 907 +504 | 06 49 -152 | 03 654 +314 | 52 28 -136 |
| 11 | 16.2 | 14.209 +614 | 09 17 -105 | 44 265 +455 | 29 56 -128 | 63 425 +518 | 05 32 -117 | 03 978 +324 | 53 92 -164 |
| 11 | 26.2 | 14.809 +600 | 10 84 -167 | 44 725 +460 | 28 58 -98 | 63 947 +522 | 04 50 -82 | 04 305 +327 | 55 79 -187 |
| 12 | 6.2 | 15.377 +568 | 13 13 -229 | 45 181 +456 | 27 95 -63 | 64 463 +516 | 04 09 -41 | 04 628 +323 | 57 85 -206 |
| 12 | 16.1 | 15.885 +508 | 15 94 -281 | 45 614 +433 | 27 69 -26 | 64 953 +490 | 04 11 +2 | 04 934 +306 | 60 02 -217 |
| 12 | 26.1 | 16.324 +439 | 19 16 -322 | 46 017 +403 | 27 81 +12 | 65 408 +455 | 04 55 +44 | 05 217 +283 | 62 21 -219 |
| 12 | 36.1 | 16.675 +351 | 22 75 -359 | 46 376 +359 | 28 33 +52 | 65 811 +403 | 05 41 +86 | 05 467 +250 | 64 39 -218 |
| | | 16.675 +250 | 22 75 -379 | 46 376 +300 | 28 33 +87 | 65 811 +337 | 05 41 +125 | 05 467 +207 | 64 39 -207 |
| Mean Place | 14.258 | 31.68 | 42.483 | 38.34 | 61.386 | 16.11 | 03.049 | 62.95 | |
| sec δ , tan δ | +2.492 | -2.283 | +1.472 | +1.080 | +1.715 | +1.394 | +1.004 | -0.090 | |
| $d\alpha(v)$, $d\delta(v)$ | +0.019 | -0.28 | +0.081 | -0.28 | +0.087 | -0.28 | +0.060 | -0.29 | |
| $d\alpha(e)$, $d\delta(e)$ | -0.109 | +0.70 | +0.052 | +0.70 | +0.067 | +0.70 | -0.004 | +0.70 | |
| Dble. Trans. | February 5 | | February 5 | | February 5 | | February 5 | | |

AT UPPER TRANSIT AT GREENWICH

| No. | 342 | | 1237 | | 1238 | | 345 | |
|----------------|---------------|--------|---------------------------------------|--------|------------|--------|------------|--------|
| | 97 G. Velorum | | Piazzi 8 ^h 245 (Lyncis) | | α Cancri | | λ Velorum | |
| Mag. Spect. | 3.69 | K0 | 4.71 | G5 | 5.14 | B8 | 2.22 | K5 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° ′ | h m | ° ′ | h m | ° ′ | h m | ° ′ |
| | 9 03 | -47 02 | 9 05 | +38 30 | 9 06 | +10 43 | 9 07 | -43 22 |
| 1 ^d | 8.9 | 334 | 373 | 39 | 306 | 160 | 327 | 303 |
| 1 | 1.1 | 287 | 338 | 7 | 277 | 145 | 283 | 328 |
| 1 | 11.1 | 233 | 354 | 28 | 241 | 129 | 234 | 346 |
| 1 | 21.0 | 167 | 363 | 60 | 194 | 107 | 171 | 354 |
| 1 | 31.0 | 102 | 358 | 178 | 144 | 84 | 110 | 348 |
| 2 | 10.0 | 36 | 349 | 114 | 94 | 61 | 48 | 339 |
| 2 | 20.0 | 31 | 328 | 48 | 41 | 37 | 17 | 318 |
| 3 | 1.9 | 89 | 290 | 11 | 6 | 18 | 71 | 290 |
| 3 | 11.9 | 141 | 279 | 65 | 49 | 0 | 121 | 259 |
| 3 | 21.9 | 186 | 229 | 112 | 85 | 16 | 165 | 221 |
| 3 | 31.9 | 217 | 188 | 145 | 109 | 26 | 194 | 180 |
| 4 | 10.8 | 242 | 144 | 170 | 129 | 35 | 218 | 139 |
| 4 | 20.8 | 256 | 96 | 182 | 136 | 41 | 232 | 91 |
| 4 | 30.8 | 257 | 166 | 181 | 136 | 43 | 233 | 47 |
| 5 | 10.7 | 255 | 3 | 175 | 129 | 47 | 231 | 1 |
| 5 | 20.7 | 242 | 48 | 156 | 115 | 47 | 218 | 46 |
| 5 | 30.7 | 221 | 90 | 132 | 95 | 45 | 200 | 88 |
| 6 | 9.7 | 197 | 134 | 104 | 75 | 45 | 177 | 130 |
| 6 | 19.6 | 166 | 175 | 70 | 48 | 42 | 148 | 169 |
| 6 | 29.6 | 131 | 207 | 35 | 22 | 39 | 116 | 199 |
| 7 | 9.6 | 94 | 238 | 0 | 5 | 34 | 82 | 229 |
| 7 | 19.6 | 50 | 259 | 40 | 35 | 28 | 42 | 250 |
| 7 | 29.5 | 8 | 272 | 74 | 61 | 18 | 3 | 262 |
| 8 | 8.5 | 38 | 280 | 109 | 85 | 6 | 39 | 268 |
| 8 | 18.5 | 87 | 274 | 148 | 117 | 4 | 86 | 262 |
| 8 | 28.4 | 134 | 259 | 181 | 145 | 16 | 127 | 248 |
| 9 | 7.4 | 183 | 237 | 217 | 174 | 34 | 174 | 227 |
| 9 | 17.4 | 231 | 200 | 252 | 202 | 54 | 219 | 190 |
| 9 | 27.4 | 275 | 110 | 283 | 228 | 74 | 259 | 151 |
| 10 | 7.3 | 318 | 110 | 316 | 256 | 95 | 300 | 101 |
| 10 | 17.3 | 352 | 51 | 345 | 281 | 117 | 334 | 45 |
| 10 | 27.3 | 380 | 7 | 370 | 303 | 134 | 361 | 12 |
| 11 | 6.3 | 402 | 70 | 393 | 322 | 152 | 383 | 73 |
| 11 | 16.2 | 408 | 132 | 404 | 332 | 164 | 391 | 133 |
| 11 | 26.2 | 405 | 188 | 410 | 338 | 170 | 389 | 188 |
| 12 | 6.2 | 391 | 242 | 408 | 336 | 173 | 379 | 239 |
| 12 | 16.1 | 360 | 286 | 388 | 320 | 167 | 350 | 282 |
| 12 | 26.1 | 321 | 319 | 363 | 298 | 158 | 315 | 314 |
| 12 | 36.1 | 270 | 348 | 324 | 266 | 143 | 268 | 340 |
| | | 210 | 360 | 273 | 224 | 122 | 212 | 352 |
| Mean Place | 41.302 | 37.33 | 40.414 | 24.35 | 61.000 | 23.08 | 29.950 | 39.70 |
| sec δ, tan δ | +1.467 | -1.074 | +1.278 | +0.796 | +1.018 | +0.189 | +1.376 | -0.945 |
| dα(ψ), dδ(ψ) | +0.041 | -0.29 | +0.076 | -0.29 | +0.065 | -0.29 | +0.044 | -0.29 |
| dα(ε), dδ(ε) | -0.051 | +0.70 | +0.038 | +0.69 | +0.009 | +0.69 | -0.046 | +0.68 |
| Dble. Trans. | February 6 | | February 6 | | February 6 | | February 7 | |

AT UPPER TRANSIT AT GREENWICH

| No. | 1240 | | 1239 | | 1241 | | 1242 | | |
|--------------|---------------|-------------|------------|-------------|------------|-------------|---------------|-------------|------------|
| | 101 G. Hydrae | | ξ Cancri | | ε Pyxidis* | | 107 G. Hydrae | | |
| Mag.Spect. | 5.81 | K0 | 5.22 | G5 | 5.63 | A3 | 5.81 | K0 | |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " | |
| | 9 08 | - 12 17 | 9 08 | + 22 05 | 9 09 | - 30 18 | 9 11 | - 19 41 | |
| 1 | -8.9 | 31.466 +293 | 50.91 -241 | 33.727 +326 | 71.59 -113 | 21.118 +304 | 12.37 -284 | 20.484 +297 | 11.11 -261 |
| 1 | 1.1 | 31.729 +263 | 53.36 -245 | 34.022 +295 | 70.68 -91 | 21.386 +268 | 15.38 -301 | 20.749 +265 | 13.82 -271 |
| 1 | 11.1 | 31.954 +225 | 55.80 -244 | 34.281 +259 | 70.01 -67 | 21.612 +226 | 18.51 -313 | 20.975 +226 | 16.56 -274 |
| 1 | 21.0 | 32.133 +179 | 58.15 -235 | 34.490 +209 | 69.62 -39 | 21.786 +174 | 21.64 -313 | 21.153 +178 | 19.26 -270 |
| 1 | 31.0 | 32.262 +129 | 60.33 -218 | 34.648 +158 | 69.49 -13 | 21.906 +120 | 24.67 -303 | 21.281 +128 | 21.82 -256 |
| 2 | 10.0 | 32.342 +80 | 62.32 -199 | 34.751 +103 | 69.59 +10 | 21.971 +65 | 27.57 -290 | 21.358 +77 | 24.22 -240 |
| 2 | 20.0 | 32.369 +27 | 64.07 -175 | 34.798 +47 | 69.91 +32 | 21.980 +9 | 30.24 -267 | 21.381 +23 | 26.38 -216 |
| 3 | 1.9 | 32.351 -18 | 65.56 -149 | 34.796 -2 | 70.40 +49 | 21.941 -39 | 32.63 -239 | 21.359 -22 | 28.26 -188 |
| 3 | 11.9 | 32.293 -58 | 66.79 -123 | 34.747 -49 | 71.00 +60 | 21.857 -84 | 34.73 -210 | 21.294 -65 | 29.87 -161 |
| 3 | 21.9 | 32.199 -94 | 67.73 -94 | 34.659 -88 | 71.68 +68 | 21.736 -121 | 36.46 -173 | 21.194 -100 | 31.16 -129 |
| 3 | 31.9 | 32.081 -118 | 68.40 -67 | 34.544 -115 | 72.38 +70 | 21.589 -147 | 37.84 -138 | 21.069 -125 | 32.14 -98 |
| 4 | 10.8 | 31.946 -135 | 68.81 -41 | 34.408 -136 | 73.07 +69 | 21.421 -168 | 38.85 -101 | 20.925 -144 | 32.81 -67 |
| 4 | 20.8 | 31.802 -144 | 68.94 -13 | 34.263 -145 | 73.71 +64 | 21.242 -179 | 39.45 -60 | 20.772 -153 | 33.15 -34 |
| 4 | 30.8 | 31.659 -143 | 68.84 +10 | 34.118 -145 | 74.26 +55 | 21.064 -178 | 39.69 -24 | 20.619 -153 | 33.19 -4 |
| 5 | 10.7 | 31.520 -139 | 68.49 +35 | 33.980 -138 | 74.73 +47 | 20.888 -176 | 39.54 +15 | 20.469 -150 | 32.92 +27 |
| 5 | 20.7 | 31.394 -126 | 67.90 +59 | 33.856 -124 | 75.08 +35 | 20.725 -163 | 39.00 +54 | 20.332 -137 | 32.36 +56 |
| 5 | 30.7 | 31.287 -107 | 67.13 +77 | 33.754 -102 | 75.31 +23 | 20.580 -145 | 38.13 +87 | 20.211 -121 | 31.54 +82 |
| 6 | 9.7 | 31.198 -89 | 66.15 +98 | 33.673 -81 | 75.43 +12 | 20.454 -126 | 36.92 +121 | 20.110 -101 | 30.46 +108 |
| 6 | 19.6 | 31.134 -64 | 65.00 +115 | 33.622 -51 | 75.43 +0 | 20.354 -100 | 35.40 +152 | 20.033 -77 | 29.15 +131 |
| 6 | 29.6 | 31.095 -39 | 63.74 +126 | 33.598 -24 | 75.32 -11 | 20.281 -73 | 33.64 +176 | 19.982 -51 | 27.67 +146 |
| 7 | 9.6 | 31.082 -13 | 62.36 +138 | 33.603 +5 | 75.10 -22 | 20.237 -44 | 31.66 +198 | 19.956 -26 | 26.03 +164 |
| 7 | 19.6 | 31.098 +16 | 60.93 +143 | 33.640 +37 | 74.75 -35 | 20.226 -11 | 29.54 +212 | 19.960 +4 | 24.30 +173 |
| 7 | 29.5 | 31.140 +42 | 59.51 +142 | 33.707 +67 | 74.32 -43 | 20.246 +20 | 27.34 +220 | 19.993 +33 | 22.53 +177 |
| 8 | 8.5 | 31.211 +71 | 58.11 +140 | 33.797 +90 | 73.80 -52 | 20.301 +55 | 25.11 +223 | 20.055 +62 | 20.78 +175 |
| 8 | 18.5 | 31.313 +102 | 56.83 +128 | 33.922 +125 | 73.04 -76 | 20.391 +90 | 22.98 +213 | 20.150 +95 | 19.13 +165 |
| 8 | 28.4 | 31.442 +129 | 55.71 +112 | 34.076 +154 | 72.20 -84 | 20.516 +125 | 20.99 +199 | 20.274 +124 | 17.63 +150 |
| 9 | 7.4 | 31.603 +161 | 54.81 +90 | 34.260 +184 | 71.23 -97 | 20.677 +161 | 19.23 +176 | 20.431 +157 | 16.36 +127 |
| 9 | 17.4 | 31.794 +191 | 54.20 +61 | 34.473 +213 | 70.12 -111 | 20.876 +199 | 17.81 +142 | 20.621 +190 | 15.40 +96 |
| 9 | 27.4 | 32.013 +219 | 53.90 +30 | 34.714 +241 | 70.12 -124 | 20.876 +231 | 16.77 +104 | 20.621 +220 | 14.78 +62 |
| 10 | 7.3 | 32.262 +249 | 53.98 -8 | 34.985 +271 | 67.51 -137 | 21.373 +266 | 16.17 +60 | 20.841 +251 | 14.56 +22 |
| 10 | 17.3 | 32.537 +275 | 54.46 -48 | 35.281 +296 | 66.04 -147 | 21.668 +295 | 16.09 +8 | 21.371 +279 | 14.80 -24 |
| 10 | 27.3 | 32.833 +296 | 55.31 -85 | 35.600 +319 | 64.49 -155 | 21.987 +319 | 16.50 -41 | 21.672 +301 | 15.47 -67 |
| 11 | 6.3 | 33.149 +316 | 56.57 -126 | 35.939 +339 | 62.89 -160 | 22.327 +340 | 17.46 -96 | 21.994 +322 | 16.60 -113 |
| 11 | 16.2 | 33.474 +325 | 58.18 -161 | 36.290 +351 | 61.30 -159 | 22.676 +349 | 18.94 -148 | 22.325 +331 | 18.16 -156 |
| 11 | 26.2 | 33.804 +330 | 60.10 -192 | 36.647 +357 | 59.75 -155 | 23.027 +351 | 20.86 -192 | 22.660 +335 | 20.08 -192 |
| 12 | 6.2 | 34.129 +325 | 62.28 -218 | 37.002 +355 | 58.31 -144 | 23.371 +344 | 23.22 -236 | 22.991 +331 | 22.35 -227 |
| 12 | 16.1 | 34.438 +309 | 64.64 -236 | 37.342 +340 | 57.03 -128 | 23.693 +322 | 25.91 -269 | 23.304 +313 | 24.86 -251 |
| 12 | 26.1 | 34.723 +285 | 67.09 -245 | 37.660 +318 | 55.95 -108 | 23.987 +294 | 28.84 -293 | 23.592 +288 | 27.53 -267 |
| 12 | 36.1 | 34.974 +209 | 69.58 -249 | 37.944 +284 | 55.10 -85 | 24.243 +256 | 31.95 -311 | 23.845 +253 | 30.30 -277 |
| | | | -243 | +240 | -58 | +208 | -315 | +209 | -275 |
| Mean Place | 32.653 | 69.37 | 35.064 | 62.06 | 22.063 | 35.32 | 21.604 | 31.54 | |
| sec δ, tan δ | +1.024 | -0.218 | +1.079 | +0.406 | +1.158 | -0.585 | +1.062 | -0.358 | |
| dα(ψ), dδ(ψ) | +0.057 | -0.29 | +0.068 | -0.29 | +0.051 | -0.29 | +0.055 | -0.29 | |
| dα(ε), dδ(ε) | -0.011 | +0.68 | +0.020 | +0.68 | -0.029 | +0.68 | -0.018 | +0.67 | |
| Dble.Trans. | February 7 | | February 7 | | February 7 | | February 8 | | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 346 | | 348 | | 347 | | 351 | |
|--------------------------|---------------------------|-------------------------|---------------------------|-------------------------|---------------------------|-------------------------|---------------------------|-------------------------|
| | 36 Lyncis | | β Carinae | | γ Hydrae | | ι Carinae | |
| Mag. Spect. | 5.30 | B8 | 1.80 | A0 | 3.84 | A0 | 2.25 | F0 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " |
| | 9 12 | + 43 16 | 9 12 | - 69 39 | 9 13 | + 2 22 | 9 16 | - 59 12 |
| 1 ^d 1 -8.9 | 54.212 ^s + 400 | 31.49 ["] - 27 | 64.793 ^s + 536 | 11.75 ["] -295 | 38.441 ^s + 301 | 32.94 ["] -195 | 43.802 ^s + 415 | 37.41 ["] -300 |
| 1 1.1 | 54.576 + 364 | 31.60 + 11 | 65.236 + 443 | 15.08 -333 | 38.715 + 274 | 31.07 -187 | 44.155 + 363 | 40.75 -334 |
| 1 11.1 | 54.894 + 318 | 32.07 + 47 | 65.579 + 343 | 18.72 -364 | 38.953 + 238 | 29.32 -175 | 44.440 + 285 | 44.38 -363 |
| 1 21.1 | 55.154 + 260 | 32.90 + 83 | 65.801 + 222 | 22.55 -383 | 39.145 + 192 | 27.73 -159 | 44.641 + 201 | 48.17 -379 |
| 1 31.0 | 55.350 + 196 | 34.02 +112 | 65.905 + 104 | 26.44 -389 | 39.290 + 145 | 26.36 -137 | 44.760 + 119 | 51.99 -382 |
| 2 10.0 | 55.479 + 129 | 35.39 +137 | 65.892 - 13 | 30.34 -390 | 39.385 + 95 | 25.21 -115 | 44.795 + 35 | 55.79 -380 |
| 2 20.0 | 55.537 + 58 | 36.93 +154 | 65.758 - 134 | 34.10 -376 | 39.427 + 42 | 24.30 -91 | 44.745 - 50 | 59.43 -364 |
| 3 1.9 | 55.532 - 5 | 38.55 +162 | 65.521 - 237 | 37.64 -354 | 39.425 - 2 | 23.62 -68 | 44.621 - 124 | 62.84 -341 |
| 3 11.9 | 55.468 - 64 | 40.19 +164 | 65.188 - 333 | 40.92 -328 | 39.380 - 45 | 23.15 -47 | 44.429 - 192 | 65.97 -313 |
| 3 21.9 | 55.352 - 116 | 41.77 +158 | 64.769 - 419 | 43.83 -291 | 39.300 - 80 | 22.90 -25 | 44.176 - 253 | 68.71 -274 |
| 3 31.9 | 55.200 - 152 | 43.19 +142 | 64.289 - 480 | 46.33 -250 | 39.195 - 105 | 22.81 - 9 | 43.881 - 295 | 71.05 -234 |
| 4 10.8 | 55.018 - 182 | 44.42 +123 | 63.754 - 535 | 48.40 -207 | 39.071 - 124 | 22.89 + 8 | 43.548 - 333 | 72.96 -191 |
| 4 20.8 | 54.822 - 196 | 45.39 + 97 | 63.183 - 571 | 49.95 -155 | 38.938 - 133 | 23.10 + 21 | 43.191 - 357 | 74.35 -139 |
| 4 30.8 | 54.624 - 198 | 46.08 + 69 | 62.598 - 585 | 51.00 -105 | 38.806 - 132 | 23.43 + 33 | 42.826 - 365 | 75.26 -91 |
| 5 10.7 | 54.431 - 193 | 46.48 + 40 | 62.003 - 595 | 51.52 - 52 | 38.678 - 128 | 23.86 + 43 | 42.456 - 370 | 75.65 - 39 |
| 5 20.7 | 54.255 - 176 | 46.55 + 7 | 61.421 - 582 | 51.48 + 4 | 38.563 - 115 | 24.38 + 52 | 42.098 - 358 | 75.50 + 15 |
| 5 30.7 | 54.104 - 151 | 46.32 - 23 | 60.865 - 556 | 50.93 + 55 | 38.466 - 97 | 24.96 + 58 | 41.759 - 339 | 74.87 + 63 |
| 6 9.7 | 53.981 - 123 | 45.79 - 53 | 60.344 - 521 | 49.85 +108 | 38.388 - 78 | 25.61 + 65 | 41.444 - 315 | 73.73 +114 |
| 6 19.6 | 53.894 - 87 | 44.98 - 81 | 59.877 - 467 | 48.27 +158 | 38.335 - 53 | 26.30 + 69 | 41.167 - 277 | 72.13 +160 |
| 6 29.6 | 53.843 - 51 | 43.93 -105 | 59.471 - 406 | 46.28 +199 | 38.306 - 29 | 27.01 + 71 | 40.931 - 236 | 70.13 +200 |
| 7 9.6 | 53.829 - 14 | 42.66 -127 | 59.135 - 336 | 43.89 +239 | 38.302 - 4 | 27.73 + 72 | 40.741 - 190 | 67.76 +237 |
| 7 19.6 | 53.857 + 28 | 41.17 -149 | 58.888 - 247 | 41.17 +272 | 38.326 + 24 | 28.43 + 70 | 40.609 - 132 | 65.10 +266 |
| 7 29.5 | 53.923 + 66 | 39.54 -163 | 58.727 - 161 | 38.25 +292 | 38.376 + 50 | 29.06 + 63 | 40.533 - 76 | 62.25 +285 |
| 8 8.5 | 54.027 + 104 | 37.74 -180 | 58.664 - 63 | 35.15 +310 | 38.453 + 77 | 29.62 + 56 | 40.520 - 13 | 59.26 +299 |
| 8 18.5 | 54.173 + 146 | 35.83 -191 | 58.708 + 44 | 32.04 +311 | 38.558 + 105 | 30.06 + 44 | 40.576 + 56 | 56.27 +299 |
| 8 28.4 | 54.354 + 181 | 33.84 -199 | 58.852 + 144 | 28.99 +305 | 38.690 + 132 | 30.37 + 31 | 40.697 + 121 | 53.37 +290 |
| 9 7.4 | 54.575 + 221 | 31.77 -207 | 59.103 + 251 | 26.11 +288 | 38.852 + 162 | 30.47 + 10 | 40.889 + 192 | 50.64 +273 |
| 9 17.4 | 54.833 + 258 | 29.69 -208 | 59.457 + 354 | 23.54 +257 | 39.043 + 191 | 30.33 - 14 | 41.148 + 259 | 48.24 +240 |
| 9 27.4 | 55.126 + 293 | 27.61 -208 | 59.902 + 445 | 21.36 +218 | 39.261 + 218 | 29.94 - 39 | 41.469 + 321 | 46.23 +201 |
| 10 7.3 | 55.455 + 329 | 25.55 -206 | 60.435 + 533 | 19.65 +171 | 39.507 + 246 | 29.28 - 66 | 41.851 + 382 | 44.71 +152 |
| 10 17.3 | 55.816 + 361 | 23.59 -196 | 61.037 + 602 | 18.54 +111 | 39.779 + 272 | 28.33 - 95 | 42.283 + 432 | 43.77 + 94 |
| 10 27.3 | 56.204 + 388 | 21.75 -184 | 61.690 + 653 | 18.04 + 50 | 40.073 + 294 | 27.13 -120 | 42.752 + 469 | 43.43 + 34 |
| 11 6.3 | 56.618 + 414 | 20.07 -168 | 62.381 + 691 | 18.20 - 16 | 40.388 + 315 | 25.67 -146 | 43.252 + 500 | 43.75 - 32 |
| 11 16.2 | 57.046 + 428 | 18.62 -145 | 63.078 + 697 | 19.05 - 85 | 40.714 + 326 | 24.00 -167 | 43.761 + 509 | 44.74 - 99 |
| 11 26.2 | 57.482 + 436 | 17.43 -119 | 63.762 + 684 | 20.54 -149 | 41.045 + 331 | 22.17 -183 | 44.266 + 505 | 46.35 -161 |
| 12 6.2 | 57.915 + 433 | 16.56 - 87 | 64.413 + 651 | 22.65 -211 | 41.375 + 330 | 20.23 -194 | 44.754 + 488 | 48.56 -221 |
| 12 16.1 | 58.331 + 416 | 16.04 - 52 | 64.999 + 586 | 25.32 -267 | 41.691 + 316 | 18.25 -198 | 45.201 + 447 | 51.29 -273 |
| 12 26.1 | 58.720 + 389 | 15.88 - 16 | 65.507 + 508 | 28.42 -310 | 41.985 + 294 | 16.31 -194 | 45.598 + 397 | 54.43 -314 |
| 12 36.1 | 59.070 + 350 | 16.11 + 23 | 65.920 + 413 | 31.92 -350 | 42.248 + 263 | 14.44 -187 | 45.931 + 333 | 57.94 -351 |
| | + 296 | + 59 | + 298 | -374 | + 221 | -171 | + 255 | -372 |
| Mean Place | 55.450 | 26.72 | 63.497 | 41.52 | 39.759 | 18.10 | 43.757 | 66.28 |
| sec δ, tan δ | +1.373 | +0.941 | +2.877 | -2.698 | +1.001 | +0.041 | +1.954 | -1.679 |
| dα(ψ), dδ(ψ) | +0.078 | -0.30 | +0.014 | -0.30 | +0.062 | -0.30 | +0.032 | -0.30 |
| dα(ε), dδ(ε) | +0.047 | +0.67 | -0.134 | +0.67 | +0.002 | +0.66 | -0.085 | +0.65 |
| Dble. Trans. | February 8 | | February 8 | | February 8 | | February 9 | |

APPARENT PLACES OF STARS, 1986

145

AT UPPER TRANSIT AT GREENWICH

| No. | 350 | | 352 | | 1243 | | 353 | | |
|---|------------|--------------|-----------------|--------------|----------------|--------------|------------------|--------------|------------|
| | 83 Cancri | | α Lyncis | | η Pyxidis | | κ Velorum | | |
| Mag.Spect. | 6.60 | F5 | 3.30 | K5 | 4.93 | M0 | 2.63 | B3 | |
| U.T. | R.A. | | R.A. | | R.A. | | R.A. | | |
| | h | m | h | m | h | m | h | m | |
| | 9 18 | + 17 45 | 9 20 | + 34 26 | 9 20 | - 25 54 | 9 21 | - 54 56 | |
| 1 | -8.9 | 12 356 + 323 | 57.59 -137 | 12 786 + 366 | 67.11 - 70 | 52 609 + 308 | 04 87 -273 | 41 450 + 392 | 41.28 -298 |
| 1 | 1.1 | 12 650 + 294 | 56.41 -118 | 13 121 + 335 | 66.72 - 39 | 52 884 + 275 | 07.75 -288 | 41 788 + 338 | 44.59 -331 |
| 1 | 11.1 | 12 909 + 259 | 55.45 -96 | 13 121 + 295 | 66.67 - 5 | 53 121 + 237 | 10.72 -297 | 42 065 + 277 | 48.17 -358 |
| 1 | 21.1 | 13 121 + 212 | 54.75 -70 | 13 416 + 242 | 66.67 + 28 | 53 307 + 186 | 13.68 -296 | 42 269 + 204 | 51.91 -374 |
| 1 | 31.0 | 13 283 + 162 | 54.31 -44 | 13 845 + 187 | 67.53 + 58 | 53 443 + 136 | 16.55 -287 | 42 397 + 128 | 55.66 -375 |
| 2 | 10.0 | 13 393 + 110 | 54.11 -20 | 13 972 + 127 | 68.36 + 83 | 53 526 + 83 | 19.27 -272 | 42 451 + 54 | 59.39 -373 |
| 2 | 20.0 | 13 448 + 55 | 54.15 + 4 | 14 035 + 63 | 69.41 +105 | 53 554 + 28 | 21.78 -251 | 42 427 - 24 | 62.97 -358 |
| 3 | 1.9 | 13 454 + 6 | 54.38 + 23 | 14 043 + 8 | 70.59 +118 | 53 534 - 20 | 24.01 -223 | 42 336 - 91 | 66.30 -333 |
| 3 | 11.9 | 13 414 - 40 | 54.76 + 38 | 13 997 - 46 | 71.85 +126 | 53 470 - 64 | 25.97 -196 | 42 182 -154 | 69.36 -306 |
| 3 | 21.9 | 13 336 - 78 | 55.26 + 50 | 13 906 - 91 | 73.10 +125 | 53 369 -101 | 27.58 -161 | 41 973 -209 | 72.04 -268 |
| 3 | 31.9 | 13 231 -105 | 55.81 + 55 | 13 781 -125 | 74.29 +119 | 53 241 -128 | 28.86 -128 | 41 725 -248 | 74.32 -228 |
| 4 | 10.8 | 13 105 -126 | 56.40 + 59 | 13 631 -150 | 75.37 +108 | 53 092 -149 | 29.80 -94 | 41 443 -282 | 76.18 -186 |
| 4 | 20.8 | 12 968 -137 | 56.98 + 58 | 13 631 -165 | 75.37 + 91 | 52 931 -161 | 30.37 -57 | 41 139 -304 | 77.54 -136 |
| 4 | 30.8 | 12 830 -138 | 57.53 + 55 | 13 466 -166 | 76.28 + 71 | 52 931 -162 | 30.37 -23 | 41 139 -312 | 78.42 -88 |
| 5 | 10.8 | 12 696 -134 | 58.02 + 49 | 13 137 -163 | 76.99 + 50 | 52 769 -161 | 30.60 + 12 | 40 827 -315 | 78.80 -38 |
| 5 | 20.7 | 12 576 -120 | 58.45 + 43 | 12 989 -148 | 77.74 + 25 | 52 457 -151 | 30.01 + 47 | 40 205 -307 | 78.65 + 15 |
| 5 | 30.7 | 12 474 -102 | 58.79 + 34 | 12 861 -128 | 77.77 + 3 | 52 322 -135 | 29.24 + 77 | 39 917 -288 | 78.03 + 62 |
| 6 | 9.7 | 12 392 -82 | 59.05 + 26 | 12 757 -104 | 77.56 -21 | 52 204 -118 | 28.15 +109 | 39 649 -268 | 76.93 +110 |
| 6 | 19.6 | 12 337 -55 | 59.22 + 17 | 12 683 -74 | 77.12 -44 | 52 110 -94 | 26.79 +136 | 39 413 -236 | 75.37 +156 |
| 6 | 29.6 | 12 307 -30 | 59.30 + 8 | 12 640 -43 | 76.49 -63 | 52 041 -69 | 25.21 +158 | 39 214 -199 | 73.43 +194 |
| 7 | 9.6 | 12 304 -3 | 59.30 + 0 | 12 629 -11 | 75.66 -83 | 51 997 -44 | 23.43 +178 | 39 055 -159 | 71.12 +231 |
| 7 | 19.6 | 12 331 + 27 | 59.18 -12 | 12 653 + 24 | 74.65 -101 | 51 984 -13 | 21.51 +192 | 38 946 -109 | 68.53 +259 |
| 7 | 29.5 | 12 386 + 55 | 58.95 -23 | 12 708 + 55 | 73.50 -115 | 52 000 + 16 | 19.53 +198 | 38 885 -61 | 65.77 +276 |
| 8 | 8.5 | 12 475 + 89 | 58.78 -17 | 12 797 + 89 | 72.18 -132 | 52 047 + 47 | 17.52 +201 | 38 879 -6 | 62.86 +291 |
| 8 | 18.5 | 12 574 + 99 | 58.16 -62 | 12 920 +123 | 70.73 -145 | 52 129 + 82 | 15.60 +192 | 38 934 + 55 | 59.96 +290 |
| 8 | 28.5 | 12 715 + 141 | 57.53 -63 | 13 076 + 156 | 69.16 -157 | 52 242 + 113 | 13.82 +178 | 39 044 + 110 | 57.14 +282 |
| 9 | 7.4 | 12 884 + 169 | 56.75 -78 | 13 266 + 190 | 67.48 -168 | 52 390 + 148 | 12.24 +158 | 39 217 + 173 | 54.50 +264 |
| 9 | 17.4 | 13 083 + 199 | 55.81 -94 | 13 266 + 225 | 65.73 -175 | 52 575 + 185 | 10.99 +125 | 39 451 + 234 | 52.18 +232 |
| 9 | 27.4 | 13 310 + 227 | 54.71 -110 | 13 491 + 255 | 63.92 -181 | 52 792 + 217 | 10.08 + 91 | 39 739 + 288 | 50.25 +193 |
| 10 | 7.3 | 13 567 + 257 | 53.44 -127 | 14 036 + 290 | 62.06 -186 | 53 043 + 251 | 09.59 + 49 | 40 083 + 344 | 48.79 +146 |
| 10 | 17.3 | 13 850 + 283 | 52.03 -141 | 14 355 + 319 | 60.21 -185 | 53 324 + 281 | 09.59 + 0 | 40 473 + 390 | 47.91 + 88 |
| 10 | 27.3 | 14 156 + 306 | 50.49 -154 | 14 700 + 345 | 58.39 -182 | 53 631 + 307 | 10.06 -47 | 40 898 + 425 | 47.61 + 30 |
| 11 | 6.3 | 14 485 + 329 | 48.86 -163 | 15 070 + 370 | 56.65 -174 | 53 960 + 329 | 11.03 -97 | 41 353 + 455 | 47.96 -35 |
| 11 | 16.2 | 14 826 + 341 | 47.18 -168 | 15 455 + 385 | 55.04 -161 | 54 301 + 341 | 12.49 -146 | 41 820 + 467 | 48.98 -102 |
| 11 | 26.2 | 15 175 + 349 | 45.51 -167 | 15 848 + 393 | 53.61 -143 | 54 646 + 345 | 14.37 -188 | 42 286 + 466 | 50.58 -160 |
| 12 | 6.2 | 15 524 + 349 | 43.89 -162 | 16 242 + 394 | 52.41 -120 | 54 988 + 342 | 16.65 -228 | 42 738 + 452 | 52.79 -221 |
| 12 | 16.2 | 15 859 + 335 | 42.40 -149 | 16 621 + 379 | 51.50 -91 | 55 312 + 324 | 19.24 -259 | 43 158 + 420 | 55.50 -271 |
| 12 | 26.1 | 16 174 + 315 | 41.06 -134 | 16 977 + 356 | 50.88 -62 | 55 611 + 299 | 22.04 -280 | 43 534 + 376 | 58.62 -312 |
| 12 | 36.1 | 16 458 + 284 | 39.93 -113 | 17 300 + 323 | 50.60 -28 | 55 875 + 264 | 25.00 -296 | 43 854 + 320 | 62.09 -347 |
| | | 16 458 + 242 | 39.93 -87 | 17 300 + 275 | 50.60 + 5 | 55 875 + 219 | 25.00 -299 | 43 854 + 251 | 62.09 -366 |
| Mean Place | 13.719 | 46.91 | 14.105 | 60.63 | 53.712 | 27.30 | 41.745 | 69.84 | |
| sec δ , tan δ | +1.050 | +0.320 | +1.213 | +0.686 | +1.112 | -0.486 | +1.741 | -1.426 | |
| $d\alpha(\psi)$, $d\delta(\psi)$ | +0.067 | -0.30 | +0.073 | -0.30 | +0.053 | -0.31 | +0.037 | -0.31 | |
| $d\alpha(\epsilon)$, $d\delta(\epsilon)$ | +0.016 | +0.65 | +0.035 | +0.64 | -0.025 | +0.64 | -0.073 | +0.64 | |
| Dble.Trans. | February 9 | | February 10 | | February 10 | | February 10 | | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 1244 | | 1245 | | 354 | | 356 | |
|--------------|-------------|------------|-------------|------------|-------------|------------|-------------|------------|
| | α Leonis | | 28 Hydrae | | α Hydrae | | ε Antliae | |
| Mag. Spect. | 4.61 | K0 | 5.81 | K5 | 2.16 | K2 | 4.64 | K2 |
| U.T. | R.A. | | R.A. | | R.A. | | R.A. | |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " |
| | 9 23 | + 26 14 | 9 24 | - 5 03 | 9 26 | - 8 35 | 9 28 | - 35 53 |
| 1 -8.9 | 50.832 +343 | 35.96 -107 | 42.199 +304 | 14.91 -220 | 54.123 +304 | 41.04 -231 | 40.249 +328 | 06.41 -284 |
| 1 1.1 | 51.148 +316 | 35.15 -81 | 42.476 +277 | 17.11 -220 | 54.400 +277 | 43.36 -232 | 40.541 +292 | 09.48 -307 |
| 1 11.1 | 51.426 +278 | 34.62 -53 | 42.718 +242 | 19.25 -214 | 54.642 +242 | 45.66 -230 | 40.792 +251 | 12.73 -325 |
| 1 21.1 | 51.657 +231 | 34.40 -22 | 42.915 +197 | 21.25 -200 | 54.839 +197 | 47.85 -219 | 40.989 +197 | 16.04 -331 |
| 1 31.0 | 51.835 +178 | 34.46 +6 | 43.065 +150 | 23.07 -182 | 54.989 +150 | 49.87 -202 | 41.130 +141 | 19.30 -326 |
| 2 10.0 | 51.958 +123 | 34.78 +32 | 43.166 +101 | 24.69 -162 | 55.090 +101 | 51.70 -183 | 41.215 +85 | 22.48 -318 |
| 2 20.0 | 52.024 +66 | 35.34 +56 | 43.216 +50 | 26.07 -138 | 55.139 +49 | 53.29 -159 | 41.241 +26 | 25.45 -297 |
| 3 1.9 | 52.036 +12 | 36.05 +71 | 43.219 +3 | 27.20 -113 | 55.142 +3 | 54.62 -133 | 41.215 -26 | 28.17 -272 |
| 3 11.9 | 52.001 -35 | 36.90 +85 | 43.181 -38 | 28.09 -89 | 55.104 -38 | 55.71 -109 | 41.141 -74 | 30.61 -244 |
| 3 21.9 | 51.923 -78 | 37.80 +90 | 43.107 -74 | 28.72 -63 | 55.029 -75 | 56.52 -81 | 41.026 -115 | 32.70 -209 |
| 4 31.9 | 51.814 -109 | 38.71 +91 | 43.007 -100 | 29.13 -41 | 54.928 -101 | 57.09 -57 | 40.881 -145 | 34.42 -172 |
| 4 10.8 | 51.682 -132 | 39.58 +87 | 42.887 -120 | 29.33 -20 | 54.807 -121 | 57.43 -34 | 40.712 -169 | 35.77 -135 |
| 4 20.8 | 51.537 -145 | 40.36 +78 | 42.756 -131 | 29.32 +1 | 54.675 -132 | 57.52 -9 | 40.527 -185 | 36.68 -91 |
| 4 30.8 | 51.390 -147 | 41.02 +66 | 42.624 -132 | 29.13 +19 | 54.541 -134 | 57.41 +11 | 40.338 -189 | 37.21 -53 |
| 5 10.8 | 51.246 -144 | 41.55 +53 | 42.494 -130 | 28.77 +36 | 54.409 -132 | 57.09 +32 | 40.148 -190 | 37.32 -11 |
| 5 20.7 | 51.114 -132 | 41.92 +37 | 42.375 -119 | 28.25 +52 | 54.287 -122 | 56.58 +51 | 39.967 -181 | 37.00 +32 |
| 5 30.7 | 51.002 -112 | 42.13 +21 | 42.272 -103 | 27.60 +65 | 54.180 -107 | 55.90 +68 | 39.800 -167 | 36.31 +69 |
| 6 9.7 | 50.910 -92 | 42.18 +5 | 42.185 -87 | 26.81 +79 | 54.089 -91 | 55.06 +84 | 39.649 -151 | 35.24 +107 |
| 6 19.6 | 50.845 -85 | 42.06 -12 | 42.121 -64 | 25.92 +89 | 54.021 -68 | 54.08 +98 | 39.522 -127 | 33.81 +143 |
| 6 29.6 | 50.807 -38 | 41.79 -27 | 42.080 -41 | 24.96 +96 | 53.975 -46 | 53.01 +107 | 39.421 -101 | 32.10 +171 |
| 7 9.6 | 50.798 -9 | 41.37 -42 | 42.062 -18 | 23.93 +103 | 53.953 -22 | 51.85 +116 | 39.347 -74 | 30.12 +198 |
| 7 19.6 | 50.820 +22 | 40.80 -57 | 42.072 +10 | 22.89 +104 | 53.958 +5 | 50.66 +119 | 39.306 -41 | 27.94 +218 |
| 7 29.5 | 50.871 +51 | 40.11 -69 | 42.106 +34 | 21.88 +101 | 53.988 +30 | 49.47 +119 | 39.297 -9 | 25.64 +230 |
| 8 8.5 | 50.951 +80 | 39.29 -82 | 42.167 +61 | 20.92 +96 | 54.044 +56 | 48.32 +115 | 39.324 +27 | 23.27 +237 |
| 8 18.5 | 51.062 +111 | 38.28 -101 | 42.257 +90 | 20.07 +85 | 54.131 +87 | 47.29 +103 | 39.390 +66 | 20.95 +232 |
| 8 28.5 | 51.203 +141 | 37.15 -113 | 42.374 +117 | 19.37 +70 | 54.244 +113 | 46.39 +90 | 39.492 +102 | 18.74 +221 |
| 9 7.4 | 51.376 +173 | 35.88 -127 | 42.522 +148 | 18.87 +50 | 54.388 +144 | 45.70 +69 | 39.636 +144 | 16.72 +202 |
| 9 17.4 | 51.581 +205 | 34.49 -139 | 42.700 +178 | 18.63 +24 | 54.564 +176 | 45.28 +42 | 39.820 +184 | 15.02 +170 |
| 9 27.4 | 51.816 +235 | 33.00 -149 | 42.906 +206 | 18.67 -4 | 54.769 +205 | 45.15 +13 | 40.043 +223 | 13.68 +134 |
| 10 7.3 | 52.082 +266 | 31.39 -161 | 43.143 +237 | 19.02 -35 | 55.004 +235 | 45.36 -21 | 40.306 +263 | 12.78 +90 |
| 10 17.3 | 52.377 +295 | 29.71 -168 | 43.407 +264 | 19.73 -71 | 55.268 +264 | 45.93 -57 | 40.602 +296 | 12.41 +37 |
| 10 27.3 | 52.697 +320 | 27.99 -172 | 43.696 +289 | 20.75 -102 | 55.556 +288 | 46.86 -93 | 40.928 +326 | 12.55 -14 |
| 11 6.3 | 53.041 +344 | 26.25 -174 | 44.006 +310 | 22.10 -135 | 55.866 +310 | 48.15 -129 | 41.279 +351 | 13.26 -71 |
| 11 16.2 | 53.400 +359 | 24.57 -168 | 44.329 +323 | 23.74 -164 | 56.190 +324 | 49.76 -161 | 41.644 +365 | 14.52 -126 |
| 11 26.2 | 53.767 +367 | 22.98 -159 | 44.659 +330 | 25.62 -188 | 56.521 +331 | 51.64 -188 | 42.013 +369 | 16.29 -177 |
| 12 6.2 | 54.136 +369 | 21.52 -146 | 44.989 +330 | 27.69 -207 | 56.852 +331 | 53.76 -212 | 42.378 +365 | 18.55 -226 |
| 12 16.2 | 54.492 +356 | 20.28 -124 | 45.306 +317 | 29.88 -219 | 57.169 +317 | 56.03 -227 | 42.724 +346 | 21.19 -264 |
| 12 26.1 | 54.828 +336 | 19.28 -100 | 45.603 +297 | 32.10 -222 | 57.466 +297 | 58.37 -234 | 43.043 +319 | 24.14 -295 |
| 12 36.1 | 55.132 +304 | 18.54 -74 | 45.870 +267 | 34.32 -222 | 57.733 +267 | 60.73 -236 | 43.323 +280 | 24.14 -319 |
| | 55.132 +261 | 18.54 -43 | 45.870 +226 | 34.32 -211 | 57.733 +226 | 60.73 -228 | 43.323 +232 | 27.33 -330 |
| Mean Place | 52.206 | 27.52 | 43.526 | 31.87 | 55.438 | 59.01 | 41.248 | 31.61 |
| sec δ, tan δ | +1.115 | +0.493 | +1.004 | -0.089 | +1.011 | -0.151 | +1.234 | -0.724 |
| dα(ψ), dδ(ψ) | +0.069 | -0.31 | +0.060 | -0.31 | +0.059 | -0.31 | +0.049 | -0.31 |
| dα(ε), dδ(ε) | +0.026 | +0.63 | -0.005 | +0.63 | -0.008 | +0.62 | -0.038 | +0.61 |
| Dble. Trans. | February 11 | | February 11 | | February 11 | | February 12 | |

APPARENT PLACES OF STARS, 1986

147

AT UPPER TRANSIT AT GREENWICH

| No. | 355 | | 361 | | 1246 | | 362 | |
|----------------|---------------------|--------|---------------------|--------|---------------------|--------|---------------------|--------|
| | 23 Ursae Majoris | | N Velorum | | ξ Leonis | | H Carinae | |
| Mag.Spect. | 3.75 | F0 | 3.04 | K5 | 5.12 | G5 | 5.52 | K2 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " |
| | 9 30 | +63 07 | 9 30 | -56 57 | 9 31 | +11 21 | 9 31 | -73 00 |
| 1 ^d | 27.665 ^s | 18.74 | 48.356 ^s | 59.18 | 11.736 ^s | 48.59 | 32.125 ^s | 44.56 |
| 1 1.1 | +550 | +32 | +415 | -290 | +320 | -169 | +659 | -274 |
| 1 11.1 | +487 | +81 | +362 | -326 | +294 | -154 | +568 | -316 |
| 1 21.1 | +400 | +128 | +300 | -356 | +260 | -135 | +444 | -351 |
| 1 31.0 | +306 | +172 | +223 | -374 | +217 | -113 | +308 | -378 |
| | 29.408 | 24.59 | 49.387 | 73.53 | 12.675 | 43.70 | 33.606 | 58.89 |
| 2 10.0 | 29.613 | 26.90 | 49.455 | 77.31 | 12.794 | 43.06 | 33.641 | 62.83 |
| 2 20.0 | +205 | +231 | +68 | -378 | +119 | -64 | +35 | -394 |
| 3 2.0 | +96 | +248 | -14 | -366 | +65 | -38 | -106 | -387 |
| 3 11.9 | -4 | +250 | -84 | -343 | +18 | -17 | -230 | -369 |
| 3 21.9 | -99 | +247 | -150 | -318 | -27 | +3 | -346 | -348 |
| | 29.709 | 31.88 | 49.357 | 84.40 | 12.877 | 42.51 | 33.305 | 70.39 |
| | 29.606 | 34.35 | 49.207 | 87.58 | 12.850 | 42.54 | 32.959 | 73.87 |
| | 29.419 | 36.64 | 48.998 | 90.39 | 12.785 | 42.73 | 32.507 | 77.02 |
| 3 31.9 | -252 | +202 | -252 | -243 | -93 | +31 | -532 | -277 |
| 4 10.8 | -307 | +170 | -290 | -200 | -114 | +40 | -604 | -237 |
| 4 20.8 | -341 | +129 | -316 | -152 | -127 | +46 | -658 | -188 |
| 4 30.8 | -355 | +86 | -326 | -103 | -130 | +48 | -685 | -138 |
| 5 10.8 | -359 | +39 | -333 | -54 | -127 | +51 | -707 | -86 |
| | 27.805 | 42.90 | 47.481 | 97.91 | 12.194 | 44.89 | 29.321 | 86.28 |
| 5 20.7 | -341 | -9 | -327 | +0 | -117 | +49 | -705 | -30 |
| 5 30.7 | -309 | -54 | -311 | +48 | -102 | +47 | -683 | +22 |
| 6 9.7 | -273 | -99 | -293 | +98 | -84 | +44 | -655 | +76 |
| 6 19.7 | -220 | -141 | -260 | +145 | -61 | +40 | -601 | +128 |
| 6 29.6 | -165 | -175 | -225 | +184 | -38 | +35 | -536 | +173 |
| | 26.497 | 38.12 | 46.065 | 93.16 | 11.792 | 47.04 | 26.141 | 82.59 |
| 7 9.6 | -107 | -210 | -185 | +223 | -14 | +29 | -461 | +218 |
| 7 19.6 | -38 | -237 | -134 | +254 | +14 | +21 | -363 | +253 |
| 7 29.5 | +24 | -258 | -84 | +274 | +39 | +11 | -262 | +280 |
| 8 8.5 | +89 | -277 | -27 | +290 | +67 | -2 | -149 | +302 |
| 8 18.5 | +160 | -288 | +37 | +292 | +85 | -11 | -23 | +310 |
| | 26.390 | 36.02 | 45.880 | 90.93 | 11.778 | 47.33 | 25.680 | 80.41 |
| | 26.352 | 33.65 | 45.746 | 88.39 | 11.792 | 47.54 | 25.317 | 77.88 |
| | 26.376 | 31.07 | 45.662 | 85.65 | 11.831 | 47.65 | 25.055 | 75.08 |
| | 26.465 | 28.30 | 45.635 | 82.75 | 11.898 | 47.63 | 24.906 | 72.06 |
| | 26.625 | 25.42 | 45.672 | 79.83 | 11.983 | 47.52 | 24.883 | 68.96 |
| 8 28.5 | +220 | -293 | +97 | +286 | +124 | -23 | +98 | +307 |
| 9 7.4 | +287 | -296 | +163 | +271 | +151 | -45 | +229 | +298 |
| 9 17.4 | +352 | -289 | +228 | +241 | +181 | -66 | +357 | +271 |
| 9 27.4 | +408 | -280 | +288 | +205 | +209 | -84 | +470 | +238 |
| 10 7.4 | +469 | -266 | +348 | +159 | +240 | -106 | +584 | +194 |
| | 27.132 | 19.53 | 45.932 | 74.26 | 12.258 | 46.84 | 25.210 | 62.91 |
| | 27.484 | 16.64 | 46.160 | 71.85 | 12.439 | 46.18 | 25.567 | 60.20 |
| | 27.892 | 13.84 | 46.448 | 69.80 | 12.648 | 45.34 | 26.037 | 57.82 |
| | 28.361 | 11.18 | 46.796 | 68.21 | 12.888 | 44.28 | 26.621 | 55.88 |
| 10 17.3 | +520 | -241 | +398 | +101 | +267 | -128 | +675 | +137 |
| 10 27.3 | +565 | -216 | +438 | +43 | +293 | -145 | +743 | +80 |
| 11 6.3 | +607 | -183 | +472 | -20 | +316 | -162 | +799 | +14 |
| 11 16.2 | +630 | -142 | +487 | -88 | +331 | -173 | +817 | -55 |
| 11 26.2 | +645 | -100 | +488 | -148 | +340 | -181 | +811 | -119 |
| | 30.053 | 04.78 | 48.104 | 66.97 | 13.764 | 39.93 | 28.838 | 53.57 |
| | 30.683 | 03.36 | 48.591 | 67.85 | 14.095 | 38.20 | 29.655 | 54.12 |
| | 31.328 | 02.36 | 49.079 | 69.33 | 14.435 | 36.39 | 30.466 | 55.31 |
| 12 6.2 | +645 | -52 | +477 | -210 | +342 | -182 | +781 | -184 |
| 12 16.2 | +621 | -2 | +443 | -262 | +331 | -177 | +713 | -242 |
| 12 26.1 | +586 | +47 | +401 | -305 | +313 | -166 | +629 | -291 |
| 12 36.1 | +529 | +97 | +344 | -342 | +285 | -150 | +524 | -335 |
| | 31.973 | 01.84 | 49.556 | 71.43 | 14.777 | 34.57 | 31.247 | 57.15 |
| | 32.594 | 01.82 | 49.999 | 74.05 | 15.108 | 32.80 | 31.960 | 59.57 |
| | 33.180 | 02.29 | 50.400 | 77.10 | 15.421 | 31.14 | 32.589 | 62.48 |
| | 33.709 | 03.26 | 50.744 | 80.52 | 15.706 | 29.64 | 33.113 | 65.83 |
| | +453 | +143 | +272 | -366 | +244 | -129 | +394 | -364 |
| Mean Place | 28.467 | 17.77 | 48.678 | 88.64 | 13.145 | 36.17 | 30.728 | 76.04 |
| sec δ, tan δ | +2.212 | +1.973 | +1.835 | -1.538 | +1.020 | +0.201 | +3.424 | -3.275 |
| dα(v), dδ(v) | +0.093 | -0.32 | +0.036 | -0.32 | +0.064 | -0.32 | +0.009 | -0.32 |
| dα(ε), dδ(ε) | +0.105 | +0.61 | -0.082 | +0.61 | +0.011 | +0.60 | -0.174 | +0.60 |
| Dble.Trans. | February 12 | | February 12 | | February 13 | | February 13 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 358 | | 1247 | | 357 | | 360 | |
|--------------|---------------------------|------------|---------------------------|------------|---------------------------|------------|---------------------------|------------|
| | 9 Ursae Majoris | | 160 G. Hydrae | | 24 Ursae Majoris | | 10 Leonis Minoris | |
| Mag.Spect. | 3.26 | F8p | 5.16 | K0 | 4.57 | G0 | 4.62 | G5 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " |
| | 9 31 | + 51 44 | 9 32 | - 21 02 | 9 33 | + 69 53 | 9 33 | + 36 27 |
| 1 -8.9 | ^s 56.473 + 464 | 24.91 - 13 | ^s 33.870 + 311 | 58.70 -261 | ^s 17.874 + 759 | 25.91 + 53 | ^s 22.586 + 381 | 34.64 - 74 |
| 1 1.1 | 56.900 + 427 | 25.20 + 29 | 34.152 + 282 | 61.42 -272 | 18.568 + 694 | 26.95 +104 | 22.937 + 351 | 34.23 - 41 |
| 1 11.1 | 57.278 + 378 | 25.20 + 73 | 34.397 + 245 | -280 | 19.613 + 613 | 28.48 +153 | 23.512 + 314 | 34.18 - 5 |
| 1 21.1 | 57.592 + 314 | 25.93 +114 | 34.397 + 199 | 64.22 -277 | 19.181 + 502 | 28.48 +198 | 23.251 + 261 | 34.18 + 32 |
| 1 31.0 | 57.835 + 243 | 27.07 +148 | 34.596 + 150 | 66.99 -266 | 19.683 + 381 | 30.46 +231 | 23.512 + 206 | 34.50 + 63 |
| | | 28.55 | 34.746 | 69.65 | 20.064 | 32.77 | 23.718 | 35.13 |
| 2 10.0 | 58.002 + 167 | 30.30 +175 | 34.844 + 98 | 72.16 -251 | 20.317 + 253 | 35.34 +257 | 23.863 + 145 | 36.04 + 91 |
| 2 20.0 | 58.087 + 85 | 32.25 +195 | 34.890 + 46 | 74.45 -229 | 20.429 + 112 | 38.07 +273 | 23.944 + 81 | 37.19 +115 |
| 3 2.0 | 58.098 + 11 | 32.25 +204 | 34.888 - 2 | 76.48 -203 | 20.411 - 18 | 40.80 +273 | 23.967 + 23 | 38.48 +129 |
| 3 11.9 | 58.037 - 61 | 34.29 +206 | 34.843 - 45 | 78.25 -177 | 20.268 - 143 | 43.47 +267 | 23.935 - 32 | 39.86 +138 |
| 3 21.9 | 57.914 - 123 | 36.34 +195 | 34.760 - 83 | 79.69 -144 | 20.010 - 258 | 45.93 +246 | 23.854 - 81 | 41.25 +139 |
| 3 31.9 | 57.743 - 171 | 40.06 +177 | 34.650 - 110 | 80.83 -114 | 19.665 - 345 | 48.08 +215 | 23.737 - 117 | 42.57 +132 |
| 4 10.8 | 57.533 - 210 | 41.59 +153 | 34.518 - 132 | 81.65 - 82 | 19.245 - 420 | 49.88 +180 | 23.591 - 146 | 43.79 +122 |
| 4 20.8 | 57.299 - 234 | 42.80 +121 | 34.373 - 145 | 82.15 - 50 | 18.776 - 469 | 51.21 +133 | 23.428 - 163 | 44.82 +103 |
| 4 30.8 | 57.057 - 242 | 43.66 + 86 | 34.225 - 148 | 82.34 - 19 | 18.286 - 490 | 52.07 + 86 | 23.262 - 167 | 45.64 + 82 |
| 5 10.8 | 56.814 - 243 | 44.16 + 50 | 34.077 - 148 | 82.22 + 12 | 17.787 - 499 | 52.42 + 35 | 23.094 - 167 | 46.22 + 58 |
| 5 20.7 | 56.586 - 228 | 44.25 + 9 | 33.938 - 139 | 81.79 + 43 | 17.308 - 479 | 52.24 - 18 | 22.938 - 156 | 46.55 + 33 |
| 5 30.7 | 56.381 - 205 | 43.97 - 28 | 33.813 - 125 | 81.09 + 70 | 16.866 - 442 | 51.58 - 66 | 22.802 - 136 | 46.61 + 6 |
| 6 9.7 | 56.204 - 177 | 43.31 - 66 | 33.702 - 111 | 80.13 + 96 | 16.470 - 396 | 50.43 -115 | 22.686 - 116 | 46.42 - 19 |
| 6 19.7 | 56.065 - 139 | 42.29 -102 | 33.614 - 88 | 78.92 +121 | 16.142 - 328 | 48.83 -160 | 22.600 - 86 | 45.98 - 44 |
| 6 29.6 | 55.966 - 99 | 40.96 -133 | 33.548 - 66 | 77.53 +139 | 15.886 - 256 | 46.85 -198 | 22.543 - 57 | 45.30 - 68 |
| 7 9.6 | 55.908 - 58 | 39.34 -162 | 33.505 - 43 | 75.95 +158 | 15.707 - 179 | 44.52 -233 | 22.517 - 26 | 44.41 - 89 |
| 7 19.6 | 55.898 - 10 | 37.46 -188 | 33.491 - 14 | 74.27 +168 | 15.619 - 88 | 41.89 -263 | 22.526 + 9 | 43.31 -110 |
| 7 29.5 | 55.931 + 33 | 35.38 -208 | 33.503 + 12 | 72.53 +174 | 15.614 - 5 | 39.05 -284 | 22.566 + 40 | 42.04 -127 |
| 8 8.5 | 56.011 + 80 | 33.11 -227 | 33.544 + 41 | 70.78 +175 | 15.698 + 84 | 36.02 -303 | 22.640 + 74 | 40.60 -144 |
| 8 18.5 | 56.139 + 128 | 30.71 -240 | 33.617 + 73 | 69.11 +167 | 15.875 + 177 | 32.88 -314 | 22.750 + 110 | 39.00 -160 |
| 8 28.5 | 56.311 + 172 | 28.23 -248 | 33.721 + 104 | 67.58 +153 | 16.136 + 261 | 29.71 -317 | 22.892 + 142 | 37.28 -172 |
| 9 7.4 | 56.530 + 219 | 25.67 -256 | 33.858 + 137 | 66.24 +134 | 16.486 + 350 | 26.53 -318 | 23.070 + 178 | 35.44 -184 |
| 9 17.4 | 56.795 + 265 | 23.11 -256 | 34.030 + 172 | 65.20 +104 | 16.921 + 435 | 23.44 -309 | 23.285 + 215 | 33.52 -192 |
| 9 27.4 | 57.102 + 307 | 20.59 -252 | 34.233 + 203 | 64.48 + 72 | 17.432 + 511 | 20.49 -295 | 23.532 + 247 | 31.54 -198 |
| 10 7.4 | 57.455 + 353 | 18.13 -246 | 34.472 + 239 | 64.15 + 33 | 18.022 + 590 | 17.71 -278 | 23.815 + 283 | 29.52 -202 |
| 10 17.3 | 57.847 + 392 | 15.82 -231 | 34.740 + 268 | 64.28 - 13 | 18.679 + 657 | 15.21 -250 | 24.131 + 316 | 27.51 -201 |
| 10 27.3 | 58.274 + 427 | 13.69 -213 | 35.035 + 295 | 64.83 - 55 | 19.393 + 714 | 13.02 -219 | 24.476 + 345 | 25.55 -196 |
| 11 6.3 | 58.734 + 460 | 11.78 -191 | 35.354 + 319 | 65.85 -102 | 20.161 + 768 | 11.21 -181 | 24.848 + 372 | 23.67 -188 |
| 11 16.2 | 59.214 + 480 | 10.19 -159 | 35.687 + 333 | 67.32 -147 | 20.958 + 797 | 09.85 -136 | 25.238 + 390 | 21.94 -173 |
| 11 26.2 | 59.707 + 493 | 08.93 -126 | 36.028 + 341 | 69.17 -185 | 21.773 + 815 | 08.94 - 91 | 25.639 + 401 | 20.42 -152 |
| 12 6.2 | 60.202 + 495 | 08.06 - 87 | 36.367 + 339 | 71.39 -222 | 22.588 + 815 | 08.56 - 38 | 26.044 + 405 | 19.13 -129 |
| 12 16.2 | 60.681 + 479 | 07.62 - 44 | 36.692 + 325 | 73.87 -248 | 23.372 + 784 | 08.73 + 17 | 26.436 + 392 | 18.16 - 97 |
| 12 26.1 | 61.133 + 452 | 07.61 - 1 | 36.996 + 304 | 76.54 -267 | 24.109 + 737 | 09.41 + 68 | 26.809 + 373 | 17.51 - 65 |
| 12 36.1 | 61.544 + 411 | 08.06 + 45 | 37.267 + 271 | 79.34 -280 | 24.776 + 667 | 10.63 +122 | 27.149 + 340 | 17.22 - 29 |
| | + 354 | + 86 | + 229 | -281 | + 568 | + 168 | + 294 | + 7 |
| Mean Place | 57.563 | 21.93 | 35.113 | 80.27 | 18.244 | 25.83 | 23.935 | 28.82 |
| sec δ, tan δ | +1.615 | +1.268 | +1.072 | -0.385 | +2.909 | +2.731 | +1.243 | +0.739 |
| dα(ψ), dδ(ψ) | +0.081 | -0.32 | +0.055 | -0.32 | +0.104 | -0.32 | +0.073 | -0.32 |
| dα(ε), dδ(ε) | +0.068 | +0.60 | -0.021 | +0.60 | +0.146 | +0.60 | +0.040 | +0.60 |
| Dble.Trans. | February 13 | | February 13 | | February 13 | | February 13 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 1248 | | 1249 | | 1250 | | 364 | |
|--------------|---------------|------------|-----------------------|------------|-------------|------------|-------------|------------|
| | 17 G. Antliae | | Bradley 1352 (Hydrae) | | ι Hydrae | | κ Hydrae | |
| Mag. Spect. | 5.63 | K0 | 4.78 | K0 | 4.10 | K0 | 4.96 | B3 |
| U.T. | R.A. | | R.A. | | R.A. | | R.A. | |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " |
| | 9 36 | -32 06 | 9 37 | + 4 42 | 9 39 | - 1 04 | 9 39 | -14 15 |
| 1 8.9 | 33.872 +327 | 39 13 -276 | 43.661 +316 | 52.64 -194 | 08.591 +313 | 36.16 -211 | 38.150 +312 | 54.59 -245 |
| 1 1.1 | 34.167 +295 | 42 11 -298 | 43.952 +291 | 50.80 -184 | 08.879 +288 | 38.23 -207 | 38.687 +285 | 57.11 -252 |
| 1 11.1 | 34.422 +255 | 45.24 -313 | 44.211 +259 | 49.09 -171 | 09.134 +255 | 40.22 -199 | 38.435 +252 | 59.66 -255 |
| 1 21.1 | 34.627 +205 | 48.43 -319 | 44.426 +215 | 47.57 -152 | 09.347 +213 | 42.05 -183 | 38.894 +207 | 62.14 -234 |
| 1 31.0 | 34.779 +152 | 51.56 -313 | 44.595 +189 | 46.28 -129 | 09.514 +167 | 43.68 -163 | 39.054 +160 | 64.48 -248 |
| 2 10.0 | 34.876 +97 | 54.59 -303 | 44.716 +121 | 45.22 -106 | 09.632 +118 | 45.10 -142 | 39.165 +111 | 66.65 -217 |
| 2 20.0 | 34.917 +41 | 57.43 -284 | 44.784 +68 | 44.41 -81 | 09.698 +66 | 46.27 -117 | 39.224 +59 | 68.60 -195 |
| 3 2.0 | 34.907 -10 | 60.02 -259 | 44.805 +21 | 43.83 -58 | 09.718 +20 | 47.20 -93 | 39.236 +12 | 70.29 -169 |
| 3 11.9 | 34.851 -56 | 62.34 -232 | 44.783 -22 | 43.47 -36 | 09.696 -22 | 47.89 -69 | 39.206 -30 | 71.72 -143 |
| 3 21.9 | 34.753 -98 | 64.31 -197 | 44.723 -60 | 43.32 -15 | 09.636 -46 | 48.35 -46 | 39.137 -69 | 72.86 -114 |
| 3 31.9 | 34.626 -127 | 65.94 -163 | 44.636 -87 | 43.33 +1 | 09.548 -88 | 48.60 -25 | 39.042 -95 | 73.73 -87 |
| 4 10.8 | 34.475 -151 | 67.21 -127 | 44.527 -109 | 43.49 +16 | 09.439 -109 | 48.67 -7 | 38.924 -118 | 74.33 -60 |
| 4 20.8 | 34.308 -167 | 68.08 -87 | 44.404 -123 | 43.77 +28 | 09.317 -122 | 48.57 +10 | 38.793 -131 | 74.65 -32 |
| 4 30.8 | 34.135 -173 | 68.58 -50 | 44.279 -125 | 44.14 +37 | 09.192 -125 | 48.32 +25 | 38.658 -135 | 74.71 -6 |
| 5 10.8 | 33.962 -173 | 68.69 -11 | 44.154 -125 | 44.59 +45 | 09.067 -125 | 47.94 +38 | 38.523 -135 | 74.53 +18 |
| 5 20.7 | 33.795 -167 | 68.40 +29 | 44.038 -116 | 45.10 +51 | 08.951 -116 | 47.44 +50 | 38.395 -128 | 74.09 +44 |
| 5 30.7 | 33.641 -154 | 67.77 +63 | 43.937 -101 | 45.64 +54 | 08.848 -103 | 46.85 +59 | 38.281 -114 | 73.45 +66 |
| 6 9.7 | 33.502 -139 | 66.78 +99 | 43.850 -87 | 46.23 +59 | 08.760 -88 | 46.16 +69 | 38.180 -101 | 72.59 +86 |
| 6 19.7 | 33.384 -118 | 65.45 +133 | 43.785 -65 | 46.83 +60 | 08.692 -68 | 45.42 +74 | 38.099 -81 | 71.55 +104 |
| 6 29.6 | 33.290 -94 | 63.87 +158 | 43.742 -43 | 47.42 +59 | 08.646 -46 | 44.63 +79 | 38.040 -59 | 70.37 +118 |
| 7 9.6 | 33.221 -69 | 62.02 +185 | 43.721 -21 | 48.00 +58 | 08.621 -25 | 43.81 +82 | 38.002 -38 | 69.05 +132 |
| 7 19.6 | 33.182 -39 | 60.00 +202 | 43.727 +6 | 48.53 +53 | 08.623 +2 | 43.00 +7 | 37.991 -11 | 67.67 +138 |
| 7 29.5 | 33.173 -9 | 57.86 +214 | 43.756 +29 | 49.00 +47 | 08.648 +25 | 42.23 +77 | 38.004 +13 | 66.25 +142 |
| 8 8.5 | 33.197 +24 | 55.66 +220 | 43.812 +56 | 49.37 +37 | 08.699 +51 | 41.53 +70 | 38.044 +40 | 64.85 +140 |
| 8 18.5 | 33.258 +61 | 53.50 +216 | 43.893 +81 | 49.61 +24 | 08.778 +79 | 40.96 +57 | 38.114 +70 | 63.54 +131 |
| 8 28.5 | 33.353 +95 | 51.46 +204 | 44.002 +109 | 49.75 +14 | 08.883 +106 | 40.50 +46 | 38.213 +99 | 62.36 +118 |
| 9 7.4 | 33.487 +134 | 49.59 +187 | 44.142 +140 | 49.68 -7 | 09.018 +135 | 40.24 +26 | 38.344 +131 | 61.37 +99 |
| 9 17.4 | 33.660 +173 | 48.03 +156 | 44.313 +171 | 49.37 -31 | 09.185 +167 | 40.24 +0 | 38.507 +163 | 60.66 +71 |
| 9 27.4 | 33.870 +210 | 46.82 +121 | 44.511 +198 | 48.84 -53 | 09.381 +196 | 40.48 -24 | 38.702 +195 | 60.25 +41 |
| 10 7.4 | 34.119 +249 | 46.02 +80 | 44.741 +230 | 48.04 -80 | 09.609 +228 | 41.02 -54 | 38.930 +228 | 60.20 +5 |
| 10 17.3 | 34.402 +283 | 45.73 +29 | 45.000 +259 | 46.98 -106 | 09.865 +256 | 41.87 -85 | 39.189 +259 | 60.55 -35 |
| 10 27.3 | 34.715 +313 | 45.93 -20 | 45.284 +284 | 45.69 -129 | 10.147 +282 | 43.01 -114 | 39.474 +285 | 61.29 -74 |
| 11 6.3 | 35.053 +338 | 46.67 -74 | 45.593 +309 | 44.15 -154 | 10.453 +306 | 44.44 -143 | 39.784 +310 | 62.43 -114 |
| 11 16.2 | 35.407 +354 | 47.94 -127 | 45.917 +324 | 42.43 -172 | 10.776 +323 | 46.12 -168 | 40.110 +326 | 63.96 -153 |
| 11 26.2 | 35.768 +361 | 49.69 -175 | 46.251 +334 | 40.57 -186 | 11.108 +332 | 48.00 -188 | 40.444 +334 | 65.82 -186 |
| 12 6.2 | 36.127 +359 | 51.90 -221 | 46.588 +337 | 38.61 -196 | 11.442 +334 | 50.03 -203 | 40.780 +336 | 67.97 -215 |
| 12 16.2 | 36.470 +343 | 54.48 -258 | 46.915 +327 | 36.64 -197 | 11.766 +324 | 52.15 -212 | 41.105 +325 | 70.34 -237 |
| 12 26.1 | 36.789 +319 | 57.34 -286 | 47.224 +309 | 34.72 -192 | 12.073 +307 | 54.27 -212 | 41.410 +305 | 72.83 -249 |
| 12 36.1 | 37.073 +284 | 60.43 -309 | 47.506 +282 | 32.89 -183 | 12.352 +279 | 56.35 -208 | 41.686 +276 | 75.41 -258 |
| | 37.073 +237 | 60.43 -318 | 47.506 +244 | 32.89 -166 | 12.352 +241 | 56.35 -195 | 41.686 +236 | 75.41 -254 |
| Mean Place | 35.010 | 63.79 | 45.084 | 38.28 | 10.010 | 52.25 | 39.501 | 74.53 |
| sec δ, tan δ | +1.181 | -0.628 | +1.003 | +0.082 | +1.000 | -0.019 | +1.032 | -0.254 |
| dα(ψ), dδ(ψ) | +0.051 | -0.32 | +0.062 | -0.32 | +0.061 | -0.33 | +0.057 | -0.33 |
| dα(ε), dδ(ε) | -0.034 | +0.59 | +0.004 | +0.58 | -0.001 | +0.58 | -0.014 | +0.57 |
| Dble. Trans. | February 14 | | February 14 | | February 15 | | February 15 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 365 | | 363 | | 1251 | | 1252 | | |
|--------------|-------------|-------------|-------------------------------------|-------------|-------------|-------------|-------------|-------------|------------|
| | o Leonis | | Groombridge 1564 (Ursae Majoris) | | 15 Leonis | | ψ Leonis | | |
| Mag. Spect. | 3.76 | F5, A3 | 5.74 | K0 | 5.73 | A2 | 5.62 | M0 | |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " | |
| | 9 40 | + 9 57 | 9 41 | + 69 17 | 9 42 | + 30 02 | 9 42 | + 14 04 | |
| 1 | -8.8 | 24.421 +323 | 27.84 -177 | 05.983 +749 | 58.81 +39 | 44.493 +363 | 20.47 -107 | 58.396 +329 | 73.63 -165 |
| 1 | 1.1 | 24.718 +297 | 26.20 -164 | 06.673 +690 | 59.72 +91 | 44.830 +337 | 19.69 -78 | 58.701 +305 | 72.16 -147 |
| 1 | 11.1 | 24.984 +266 | 24.74 -146 | 07.286 +613 | 61.14 +142 | 45.133 +303 | 19.24 -45 | 58.975 +274 | 70.89 -127 |
| 1 | 21.1 | 25.206 +222 | 23.50 -124 | 07.794 +508 | 63.01 +187 | 45.388 +256 | 19.13 -11 | 59.204 +229 | 69.88 -101 |
| 1 | 31.0 | 25.382 +176 | 22.51 -99 | 08.188 +394 | 65.24 +223 | 45.591 +203 | 19.33 +20 | 59.387 +183 | 69.12 -76 |
| 2 | 10.0 | 25.508 +126 | 21.77 -74 | 08.457 +269 | 67.76 +252 | 45.739 +148 | 19.83 +50 | 59.520 +133 | 68.63 -49 |
| 2 | 20.0 | 25.582 +74 | 21.28 -49 | 08.589 +132 | 70.45 +269 | 45.827 +88 | 20.58 +75 | 59.599 +79 | 68.40 -23 |
| 3 | 2.0 | 25.608 +26 | 21.02 -6 | 08.595 +6 | 73.17 +272 | 45.861 +34 | 21.51 +93 | 59.629 +30 | 68.39 -1 |
| 3 | 11.9 | 25.590 -18 | 20.97 -25 | 08.478 -117 | 75.86 +269 | 45.843 -18 | 22.58 +107 | 59.614 -15 | 68.57 +18 |
| 3 | 21.9 | 25.532 -58 | 21.09 +12 | 08.247 -231 | 78.35 +249 | 45.779 -64 | 23.71 +113 | 59.559 -55 | 68.91 +34 |
| 3 | 31.9 | 25.446 -86 | 21.35 +26 | 07.929 -318 | 80.56 +221 | 45.681 -98 | 24.83 +112 | 59.475 -84 | 69.35 +44 |
| 4 | 10.9 | 25.338 -108 | 21.71 +36 | 07.535 -394 | 82.43 +187 | 45.555 -126 | 25.90 +107 | 59.367 -108 | 69.87 +52 |
| 4 | 20.8 | 25.216 -122 | 22.15 +44 | 07.089 -446 | 83.85 +142 | 45.412 -143 | 26.87 +97 | 59.244 -123 | 70.43 +56 |
| 4 | 30.8 | 25.090 -126 | 22.62 +47 | 06.620 -469 | 84.80 +95 | 45.264 -148 | 27.67 +80 | 59.117 -127 | 70.99 +56 |
| 5 | 10.8 | 24.964 -126 | 23.13 +51 | 06.138 -482 | 85.26 +46 | 45.115 -149 | 28.32 +65 | 58.990 -127 | 71.54 +56 |
| 5 | 20.7 | 24.848 -116 | 23.64 +51 | 05.671 -467 | 85.19 -7 | 44.975 -140 | 28.76 +44 | 58.872 -118 | 72.06 +52 |
| 5 | 30.7 | 24.745 -103 | 24.14 +50 | 05.238 -433 | 84.63 -56 | 44.851 -124 | 28.99 +23 | 58.767 -105 | 72.51 +45 |
| 6 | 9.7 | 24.658 -87 | 24.62 +48 | 04.845 -393 | 83.58 -105 | 44.745 -106 | 29.02 +3 | 58.678 -89 | 72.92 +41 |
| 6 | 19.7 | 24.592 -66 | 25.07 +45 | 04.515 -330 | 82.07 -151 | 44.664 -81 | 28.84 -18 | 58.611 -67 | 73.24 +32 |
| 6 | 29.6 | 24.549 -43 | 25.46 +39 | 04.252 -263 | 80.17 -190 | 44.609 -55 | 28.46 -38 | 58.566 -45 | 73.49 +25 |
| 7 | 9.6 | 24.528 -21 | 25.82 +36 | 04.062 -190 | 77.91 -226 | 44.580 -29 | 27.89 -57 | 58.544 -22 | 73.66 +17 |
| 7 | 19.6 | 24.534 +6 | 26.08 +26 | 03.956 -106 | 75.33 -258 | 44.583 +3 | 27.13 -76 | 58.548 +4 | 73.72 +6 |
| 7 | 29.6 | 24.564 +30 | 26.26 +18 | 03.931 -25 | 72.53 -280 | 44.614 +31 | 26.22 -91 | 58.578 +30 | 73.67 -5 |
| 8 | 8.5 | 24.621 +57 | 26.32 +6 | 03.991 +60 | 69.52 -301 | 44.675 +61 | 25.14 -108 | 58.635 +57 | 73.50 -17 |
| 8 | 18.5 | 24.698 +77 | 26.20 -12 | 04.142 +151 | 66.39 -313 | 44.768 +93 | 23.88 -126 | 58.701 -66 | 73.32 -18 |
| 8 | 28.5 | 24.811 +113 | 26.08 -12 | 04.373 +231 | 63.21 -318 | 44.891 +123 | 22.48 -140 | 58.824 +123 | 72.76 -56 |
| 9 | 7.4 | 24.953 +142 | 25.69 -39 | 04.691 +318 | 59.99 -322 | 45.048 +157 | 20.94 -154 | 58.966 +142 | 72.11 -65 |
| 9 | 17.4 | 25.124 +171 | 25.09 -60 | 05.093 +402 | 56.85 -314 | 45.239 +191 | 19.27 -167 | 59.138 +172 | 71.28 -83 |
| 9 | 27.4 | 25.324 +200 | 24.28 -81 | 05.570 +477 | 53.83 -302 | 45.462 +223 | 17.50 -177 | 59.339 +201 | 70.27 -101 |
| 10 | 7.4 | 25.556 +232 | 23.25 -103 | 06.126 +556 | 50.96 -287 | 45.720 +258 | 15.64 -186 | 59.572 +233 | 69.05 -122 |
| 10 | 17.3 | 25.816 +260 | 22.00 -125 | 06.751 +625 | 48.37 -259 | 46.010 +290 | 13.73 -191 | 59.835 +263 | 67.65 -140 |
| 10 | 27.3 | 26.103 +287 | 20.56 -144 | 07.434 +683 | 46.06 -231 | 46.328 +318 | 11.80 -193 | 59.835 +289 | 66.09 -156 |
| 11 | 6.3 | 26.414 +311 | 18.92 -164 | 08.172 +738 | 44.12 -194 | 46.674 +346 | 09.88 -192 | 60.124 +315 | 66.09 -171 |
| 11 | 16.3 | 26.742 +328 | 17.16 -176 | 08.944 +772 | 42.63 -149 | 47.039 +365 | 08.05 -183 | 60.439 +333 | 64.38 -180 |
| 11 | 26.2 | 27.081 +339 | 15.31 -185 | 09.735 +791 | 41.58 -105 | 47.417 +378 | 06.35 -170 | 60.772 +344 | 62.58 -183 |
| 12 | 6.2 | 27.423 +342 | 13.43 -188 | 10.532 +797 | 41.06 -52 | 47.799 +382 | 04.83 -152 | 61.464 +348 | 58.92 -183 |
| 12 | 16.2 | 27.756 +333 | 11.58 -185 | 11.302 +770 | 41.09 +3 | 48.172 +373 | 03.56 -127 | 61.803 +339 | 57.18 -174 |
| 12 | 26.1 | 28.071 +315 | 09.84 -174 | 12.032 +730 | 41.64 +55 | 48.528 +356 | 02.56 -100 | 62.126 +323 | 55.57 -161 |
| 12 | 36.1 | 28.360 +289 | 08.23 -161 | 12.696 +664 | 42.73 +109 | 48.855 +327 | 01.88 -68 | 62.422 +296 | 54.14 -143 |
| | | +250 | -140 | +571 | +158 | +286 | -34 | +257 | -119 |
| Mean Place | 25.862 | 15.01 | 06.419 | 58.90 | 45.909 | 13.19 | 59.856 | 62.02 | |
| sec δ, tan δ | +1.015 | +0.176 | +2.829 | +2.646 | +1.155 | +0.578 | +1.031 | +0.251 | |
| da(ψ), dδ(ψ) | +0.064 | -0.33 | +0.101 | -0.33 | +0.070 | -0.33 | +0.065 | -0.33 | |
| da(ε), dδ(ε) | +0.010 | +0.57 | +0.145 | +0.57 | +0.032 | +0.56 | +0.014 | +0.56 | |
| Dble. Trans. | February 15 | | February 15 | | February 16 | | February 16 | | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 366 | | 1254 | | 367 | | 1253 | |
|---------------|-------------|------------|-------------|------------|-------------|------------|----------------------------|------------|
| | ♁ Antliae | | I Carinae | | ε Leonis | | B.D. +19° 2254 (Leonis) | |
| Mag. Spect. | 4.98 | F5p | 3.6 to 4.8 | G0 | 3.12 | G0p | 6.92 | K0 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° ' | h m | ° ' | h m | ° ' | h m | ° ' |
| | 9 43 | -27 42 | 9 44 | -62 26 | 9 45 | +23 50 | 9 45 | +18 44 |
| 1 -8.8 | 34.715 +324 | 02.86 -268 | 52.307 +485 | 12.52 -274 | 03.758 +348 | 21.50 -132 | 05.571 +337 | 56.52 -150 |
| 1 1.1 | 35.010 +295 | 05.73 -287 | 52.731 +424 | 15.67 -315 | 04.081 +323 | 20.44 -106 | 05.885 +314 | 55.23 -129 |
| 1 11.1 | 35.268 +258 | 08.72 -299 | 53.087 +356 | 19.17 -350 | 04.372 +291 | 19.65 -79 | 06.166 +281 | 54.19 -104 |
| 1 21.1 | 35.479 +211 | 11.75 -303 | 53.356 +269 | 22.90 -373 | 04.618 +246 | 19.18 -47 | 06.404 +238 | 53.43 -76 |
| 1 31.0 | 35.639 +160 | 14.71 -296 | 53.538 +182 | 26.74 -384 | 04.814 +196 | 19.00 -18 | 06.594 +190 | 52.95 -48 |
| 2 10.0 | 35.746 +107 | 17.56 -285 | 53.631 +93 | 30.62 -388 | 04.957 +143 | 19.11 +11 | 06.733 +139 | 52.74 -21 |
| 2 20.0 | 35.799 +53 | 20.21 -265 | 53.630 -1 | 34.42 -380 | 05.044 +87 | 19.49 +38 | 06.817 +84 | 52.79 +5 |
| 3 2.0 | 35.802 +3 | 22.61 -240 | 53.547 -83 | 38.04 -362 | 05.079 +35 | 20.06 +57 | 06.851 +34 | 53.06 +27 |
| 3 11.9 | 35.760 -42 | 24.75 -214 | 53.387 -160 | 41.44 -340 | 05.065 -14 | 20.79 +73 | 06.838 -13 | 53.51 +45 |
| 3 21.9 | 35.678 -82 | 26.55 -180 | 53.156 -231 | 44.51 -307 | 05.008 -57 | 21.63 +84 | 06.784 -54 | 54.09 +58 |
| 3 31.9 | 35.567 -111 | 28.03 -148 | 52.871 -285 | 47.21 -270 | 04.919 -89 | 22.51 +88 | 06.699 -85 | 54.75 +66 |
| 4 10.9 | 35.431 -136 | 29.18 -115 | 52.539 -332 | 49.51 -230 | 04.804 -115 | 23.39 +88 | 06.589 -110 | 55.45 +70 |
| 4 20.8 | 35.280 -151 | 29.95 -77 | 52.171 -368 | 51.33 -182 | 04.673 -131 | 24.22 +83 | 06.463 -126 | 56.14 +69 |
| 4 30.8 | 35.123 -157 | 30.38 -43 | 51.786 -385 | 52.66 -133 | 04.536 -137 | 24.95 +73 | 06.333 -130 | 56.79 +65 |
| 5 10.8 | 34.963 -160 | 30.46 -8 | 51.386 -400 | 53.50 -84 | 04.399 -137 | 25.58 +63 | 06.203 -130 | 57.39 +60 |
| 5 20.7 | 34.810 -153 | 30.17 +29 | 50.986 -400 | 53.78 -28 | 04.270 -129 | 26.07 +49 | 06.080 -123 | 57.90 +51 |
| 5 30.7 | 34.669 -141 | 29.57 +60 | 50.599 -387 | 53.57 +21 | 04.156 -114 | 26.41 +34 | 05.972 -108 | 58.30 +40 |
| 6 9.7 | 34.541 -128 | 28.64 +93 | 50.229 -370 | 52.83 +74 | 04.058 -98 | 26.61 +20 | 05.879 -93 | 58.61 +31 |
| 6 19.7 | 34.434 -107 | 27.41 +123 | 49.889 -340 | 51.59 +124 | 03.983 -75 | 26.64 +3 | 05.809 -70 | 58.80 +19 |
| 6 29.6 | 34.348 -86 | 25.95 +146 | 49.588 -301 | 49.92 +167 | 03.932 -51 | 26.51 -13 | 05.761 -48 | 58.87 +7 |
| 7 9.6 | 34.285 -63 | 24.25 +170 | 49.329 -259 | 47.83 +209 | 03.906 -26 | 26.24 -27 | 05.737 -24 | 58.83 -4 |
| 7 19.6 | 34.250 -35 | 22.40 +185 | 49.128 -201 | 45.38 +245 | 03.909 +3 | 25.80 -44 | 05.740 +3 | 58.66 -17 |
| 7 29.6 | 34.243 -7 | 20.45 +195 | 48.984 -144 | 42.69 +269 | 03.938 +29 | 25.23 -57 | 05.769 +29 | 58.36 -30 |
| 8 8.5 | 34.266 +23 | 18.45 +200 | 48.907 -77 | 39.79 +290 | 03.995 +57 | 24.52 -71 | 05.826 +57 | 57.94 -42 |
| 8 18.5 | 34.323 +57 | 16.50 +195 | 48.905 -2 | 36.81 +298 | 04.080 +85 | 23.63 -89 | 05.906 +80 | 57.40 -54 |
| 8 28.5 | 34.412 +89 | 14.65 +185 | 48.975 +70 | 33.85 +296 | 04.195 +115 | 22.57 -106 | 06.017 +111 | 56.60 -80 |
| 9 7.4 | 34.539 +127 | 12.99 +166 | 49.125 +150 | 30.99 +286 | 04.342 +147 | 21.36 -121 | 06.160 +143 | 55.68 -92 |
| 9 17.4 | 34.702 +163 | 11.62 +137 | 49.355 +230 | 28.39 +260 | 04.522 +180 | 20.00 -136 | 06.334 +174 | 54.59 -109 |
| 9 27.4 | 34.902 +200 | 10.58 +104 | 49.657 +302 | 26.13 +226 | 04.732 +210 | 18.50 -150 | 06.538 +204 | 53.34 -125 |
| 10 7.4 | 35.139 +237 | 09.93 +65 | 50.034 +377 | 24.29 +184 | 04.976 +244 | 16.87 -163 | 06.775 +237 | 51.91 -143 |
| 10 17.3 | 35.409 +270 | 09.77 +16 | 50.475 +441 | 23.00 +129 | 05.251 +275 | 15.13 -174 | 07.042 +267 | 50.34 -157 |
| 10 27.3 | 35.709 +300 | 10.07 -30 | 50.965 +490 | 22.28 +72 | 05.554 +303 | 13.32 -181 | 07.336 +294 | 48.65 -169 |
| 11 6.3 | 36.036 +327 | 10.88 -81 | 51.499 +534 | 22.20 +8 | 05.884 +330 | 11.46 -186 | 07.657 +321 | 46.86 -179 |
| 11 16.3 | 36.379 +343 | 12.18 -130 | 52.054 +555 | 22.80 -60 | 06.232 +348 | 09.62 -184 | 07.996 +339 | 45.04 -182 |
| 11 26.2 | 36.731 +352 | 13.94 -176 | 52.614 +560 | 24.03 -123 | 06.593 +361 | 07.84 -178 | 08.347 +351 | 43.22 -182 |
| 12 6.2 | 37.084 +353 | 16.11 -217 | 53.164 +550 | 25.90 -187 | 06.959 +366 | 06.18 -166 | 08.702 +355 | 41.46 -176 |
| 12 16.2 | 37.423 +339 | 18.63 -252 | 53.679 +515 | 28.34 -244 | 07.317 +358 | 04.70 -148 | 09.050 +348 | 39.83 -163 |
| 12 26.1 | 37.740 +317 | 21.40 -277 | 54.147 +468 | 31.24 -290 | 07.658 +341 | 03.45 -125 | 09.381 +331 | 38.38 -145 |
| 12 36.1 | 38.024 +284 | 24.36 -296 | 54.552 +405 | 34.57 -333 | 07.972 +314 | 02.46 -99 | 09.686 +305 | 37.16 -122 |
| | 38.024 +242 | 24.36 -303 | 54.552 +326 | 34.57 -362 | 07.972 +274 | 02.46 -69 | 09.686 +265 | 37.16 -96 |
| Mean Place | 35.965 | 26.59 | 52.538 | 43.62 | 05.206 | 12.65 | 07.035 | 46.24 |
| sec δ, tan δ | +1.130 | -0.525 | +2.162 | -1.917 | +1.093 | +0.442 | +1.056 | +0.339 |
| da(ψ), dδ(ψ) | +0.053 | -0.33 | +0.033 | -0.33 | +0.068 | -0.33 | +0.066 | -0.33 |
| da(ε), dδ(ε) | -0.029 | +0.56 | -0.106 | +0.56 | +0.024 | +0.56 | +0.019 | +0.56 |
| Dbble. Trans. | February 16 | | February 16 | | February 16 | | February 16 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 1255 | | 368 | | 370 | | 1256 | |
|---------------------|---------------------------------|-------------|---------------------------|-------------|---------------------------|-------------|---------------------------|-------------|
| | Bradley 1369 (Ursae Majoris) | | v Ursae Majoris | | 6 Sextantis | | 162 G. Velorum | |
| Mag. Spect. | 5.20 | G0 | 3.89 | F0 | 6.00 | A2 | 5.72 | K0 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " |
| | 9 47 | + 46 04 | 9 50 | + 59 05 | 9 50 | - 4 10 | 9 50 | - 46 07 |
| 1 ^d -8.8 | 42.115 ^s + 435 | 67.27 - 52 | 01.282 ^s + 553 | 71.06 - 8 | 31.739 ^s + 317 | 29.85 - 221 | 47.371 ^s + 377 | 21.22 - 276 |
| 1 1.1 | 42.520 + 405 | 67.17 - 10 | 01.796 + 514 | 71.47 + 41 | 32.033 + 294 | 32.05 - 210 | 47.709 + 338 | 24.31 - 309 |
| 1 11.1 | 42.884 + 364 | 67.49 + 32 | 02.258 + 462 | 72.37 + 90 | 32.295 + 262 | 34.19 - 224 | 48.002 + 293 | 27.67 - 336 |
| 1 21.1 | 43.193 + 309 | 68.23 + 74 | 02.649 + 391 | 73.73 + 136 | 32.516 + 221 | 36.21 - 202 | 48.236 + 234 | 31.19 - 352 |
| 1 31.0 | 43.440 + 247 | 69.33 + 110 | 02.958 + 309 | 75.46 + 173 | 32.692 + 176 | 38.03 - 182 | 48.410 + 174 | 34.75 - 356 |
| 2 10.0 | 43.619 + 179 | 70.74 + 141 | 03.181 + 223 | 77.51 + 205 | 32.820 + 128 | 39.66 - 163 | 48.520 + 110 | 38.29 - 354 |
| 2 20.0 | 43.725 + 106 | 72.40 + 166 | 03.307 + 126 | 79.79 + 228 | 32.896 + 76 | 41.05 - 139 | 48.564 + 44 | 41.71 - 342 |
| 3 2.0 | 43.764 + 39 | 74.19 + 179 | 03.345 + 38 | 82.16 + 237 | 32.926 + 30 | 42.18 - 113 | 48.550 - 14 | 44.91 - 320 |
| 3 11.9 | 43.739 - 25 | 76.05 + 186 | 03.295 - 50 | 84.55 + 239 | 32.913 - 13 | 43.07 - 89 | 48.480 - 70 | 47.88 - 297 |
| 3 21.9 | 43.655 - 84 | 77.89 + 184 | 03.167 - 126 | 86.85 + 230 | 32.862 - 51 | 43.71 - 64 | 48.360 - 120 | 50.50 - 262 |
| 3 31.9 | 43.526 - 129 | 79.61 + 172 | 02.976 - 191 | 88.93 + 208 | 32.783 - 79 | 44.13 - 42 | 48.203 - 157 | 52.76 - 226 |
| 4 10.9 | 43.361 - 165 | 81.16 + 155 | 02.733 - 243 | 90.76 + 183 | 32.681 - 102 | 44.35 - 22 | 48.014 - 189 | 54.65 - 189 |
| 4 20.8 | 43.171 - 190 | 82.45 + 129 | 02.454 - 279 | 92.22 + 146 | 32.564 - 117 | 44.35 + 0 | 47.803 - 211 | 56.08 - 143 |
| 4 30.8 | 42.971 - 200 | 83.45 + 100 | 02.158 - 296 | 93.29 + 107 | 32.442 - 122 | 44.20 + 15 | 47.580 - 223 | 57.08 - 100 |
| 5 10.8 | 42.768 - 203 | 84.14 + 69 | 01.854 - 304 | 93.94 + 65 | 32.318 - 124 | 43.88 + 32 | 47.350 - 230 | 57.62 - 54 |
| 5 20.7 | 42.574 - 194 | 84.46 + 32 | 01.559 - 295 | 94.13 + 19 | 32.201 - 117 | 43.41 + 47 | 47.122 - 228 | 57.68 - 6 |
| 5 30.7 | 42.398 - 176 | 84.45 - 1 | 01.286 - 273 | 93.87 - 26 | 32.095 - 106 | 42.83 + 58 | 46.905 - 217 | 57.31 + 37 |
| 6 9.7 | 42.244 - 154 | 84.09 - 36 | 01.039 - 247 | 93.19 - 68 | 32.002 - 93 | 42.13 + 70 | 46.700 - 183 | 56.49 + 82 |
| 6 19.7 | 42.120 - 124 | 83.39 - 70 | 00.834 - 205 | 92.08 - 111 | 31.928 - 74 | 41.33 + 80 | 46.517 - 185 | 55.24 + 125 |
| 6 29.6 | 42.029 - 91 | 82.39 - 100 | 00.673 - 161 | 90.60 - 148 | 31.874 - 54 | 40.48 + 85 | 46.358 - 159 | 53.63 + 161 |
| 7 9.6 | 41.971 - 58 | 81.10 - 129 | 00.558 - 115 | 88.78 - 182 | 31.839 - 35 | 39.56 + 92 | 46.227 - 131 | 51.66 + 197 |
| 7 19.6 | 41.954 - 17 | 79.54 - 156 | 00.498 - 60 | 86.64 - 214 | 31.829 - 10 | 38.64 + 92 | 46.131 - 96 | 49.42 + 224 |
| 7 29.6 | 41.973 + 19 | 77.78 - 176 | 00.491 - 7 | 84.27 - 237 | 31.843 + 14 | 37.74 + 90 | 46.072 - 59 | 46.98 + 244 |
| 8 8.5 | 42.031 + 58 | 75.81 - 197 | 00.538 + 47 | 81.67 - 260 | 31.881 + 38 | 36.90 + 84 | 46.052 + 20 | 44.39 + 259 |
| 8 18.5 | 42.131 + 100 | 73.66 - 215 | 00.645 + 107 | 78.92 - 275 | 31.947 + 66 | 36.17 + 73 | 46.080 - 28 | 41.78 + 261 |
| 8 28.5 | 42.270 + 139 | 71.40 - 226 | 00.806 + 161 | 76.07 - 285 | 32.039 + 92 | 35.57 + 60 | 46.151 + 71 | 39.22 + 256 |
| 9 7.4 | 42.450 + 180 | 69.03 - 237 | 01.025 + 219 | 73.14 - 293 | 32.039 + 123 | 35.14 + 43 | 46.151 + 122 | 39.22 + 242 |
| 9 17.4 | 42.674 + 224 | 66.60 - 243 | 01.302 + 277 | 70.22 - 292 | 32.162 + 155 | 34.97 + 17 | 46.273 + 174 | 36.80 + 216 |
| 9 27.4 | 42.936 + 262 | 64.16 - 244 | 01.631 + 329 | 67.34 - 288 | 32.503 + 186 | 35.07 - 10 | 46.667 + 220 | 32.82 + 182 |
| 10 7.4 | 43.241 + 305 | 61.72 - 244 | 02.018 + 387 | 64.56 - 278 | 32.721 + 218 | 35.47 - 40 | 46.939 + 272 | 31.42 + 140 |
| 10 17.3 | 43.585 + 344 | 59.37 - 235 | 02.455 + 437 | 61.96 - 260 | 32.970 + 249 | 36.20 - 73 | 47.254 + 315 | 30.55 + 87 |
| 10 27.3 | 43.963 + 378 | 57.14 - 223 | 02.936 + 481 | 59.57 - 239 | 33.246 + 276 | 37.24 - 104 | 47.607 + 353 | 30.22 + 33 |
| 11 6.3 | 44.375 + 412 | 55.07 - 207 | 03.461 + 525 | 57.46 - 211 | 33.548 + 302 | 38.61 - 137 | 47.993 + 386 | 30.48 - 26 |
| 11 16.3 | 44.810 + 435 | 53.25 - 182 | 04.013 + 552 | 55.72 - 174 | 33.868 + 320 | 40.25 - 164 | 48.398 + 405 | 31.37 - 89 |
| 11 26.2 | 45.259 + 449 | 51.71 - 154 | 04.585 + 572 | 54.36 - 136 | 34.200 + 332 | 42.13 - 188 | 48.813 + 415 | 32.82 - 145 |
| 12 6.2 | 45.716 + 457 | 50.52 - 119 | 05.165 + 580 | 53.45 - 91 | 34.536 + 336 | 44.21 - 208 | 49.227 + 414 | 34.83 - 201 |
| 12 16.2 | 46.162 + 446 | 49.72 - 80 | 05.732 + 567 | 53.03 - 42 | 34.864 + 328 | 46.39 - 218 | 49.622 + 395 | 37.34 - 251 |
| 12 26.1 | 46.588 + 426 | 49.32 - 40 | 06.272 + 540 | 53.10 + 7 | 35.175 + 311 | 48.62 - 223 | 49.988 + 366 | 40.24 - 280 |
| 12 36.1 | 46.981 + 393 | 49.36 + 4 | 06.770 + 498 | 53.68 + 58 | 35.460 + 285 | 50.84 - 222 | 50.314 + 326 | 43.48 - 324 |
| | 46.981 + 343 | 49.36 + 47 | 06.770 + 434 | 53.68 + 106 | 35.460 + 249 | 50.84 - 212 | 50.314 + 273 | 43.48 - 345 |
| Mean Place | 43.402 | 63.87 | 02.250 | 70.09 | 33.207 | 46.99 | 48.377 | 49.71 |
| sec δ, tan δ | +1.442 | +1.039 | +1.947 | +1.671 | +1.003 | -0.073 | +1.443 | -1.040 |
| dα(ψ), dδ(ψ) | +0.076 | -0.33 | +0.085 | -0.34 | +0.060 | -0.34 | +0.046 | -0.34 |
| dα(ε), dδ(ε) | +0.058 | +0.55 | +0.094 | +0.54 | -0.004 | +0.54 | -0.059 | +0.53 |
| Dble. Trans. | February 17 | | February 17 | | February 17 | | February 18 | |

AT UPPER TRANSIT AT GREENWICH

| No. | 371 | | 373 | | 1257 | | 375 | |
|--------------|-------------|------------|---------------|------------|-----------------|------------|-------------|------------|
| | μ Leonis | | 183 G. Hydrae | | 18 G. Sextantis | | φ Velorum | |
| Mag.Spect. | 4.10 | K0 | 5.16 | M0 | 7.03 | K0 | 3.70 | B5 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " |
| | 9 51 | +26 04 | 9 54 | -18 56 | 9 55 | - 7 34 | 9 56 | -54 29 |
| 1 -8.8 | 58 418 +356 | 23 62 -129 | 12 555 +322 | 20 72 -252 | 26 253 +319 | 33 35 -229 | 22 425 +427 | 41.08 -269 |
| 1 1.1 | 58 750 +332 | 22 60 -102 | 12 851 +296 | 23 35 -263 | 26 548 +295 | 35 66 -231 | 22 807 +382 | 44.16 -308 |
| 1 11.1 | 59 049 +299 | 21 88 -72 | 13 115 +264 | 26 06 -271 | 26 814 +266 | 37 95 -229 | 23 136 +329 | 47.57 -341 |
| 1 21.1 | 59 305 +256 | 21 50 -38 | 13 336 +221 | 28 75 -269 | 27 037 +223 | 40 14 -219 | 23 398 +262 | 51.20 -363 |
| 1 31.1 | 59 510 +205 | 21 43 -7 | 13 509 +173 | 31 33 -258 | 27 216 +179 | 42 16 -202 | 23 589 +191 | 54.92 -372 |
| 2 10.0 | 59 663 +153 | 21 65 +22 | 13 633 +124 | 33 78 -245 | 27 347 +131 | 44 00 -184 | 23 708 +119 | 58 67 -375 |
| 2 20.0 | 59 758 +95 | 22 15 +50 | 13 705 +72 | 36 01 -223 | 27 426 +79 | 45 59 -159 | 23 751 +43 | 62 34 -367 |
| 3 2.0 | 59 800 +42 | 22 85 +70 | 13 729 +24 | 38 00 -199 | 27 459 +33 | 46 93 -134 | 23 725 -26 | 65 82 -348 |
| 3 11.9 | 59 792 -8 | 23 71 +86 | 13 709 -20 | 39 73 -173 | 27 450 -93 | 48 03 -110 | 23 635 -90 | 69 09 -327 |
| 3 21.9 | 59 740 -52 | 24 68 +97 | 13 650 -59 | 41 16 -143 | 27 401 -49 | 48 86 -83 | 23 486 -149 | 72 04 -295 |
| 3 31.9 | 59 654 -86 | 25 67 +99 | 13 562 -88 | 42 31 -115 | 27 324 -77 | 49 46 -60 | 23 292 -194 | 74 62 -258 |
| 4 10.9 | 59 540 -114 | 26 65 +98 | 13 450 -112 | 43 16 -85 | 27 223 -101 | 49 83 -37 | 23 059 -233 | 76 83 -221 |
| 4 20.8 | 59 409 -131 | 27 57 +92 | 13 322 -128 | 43 70 -54 | 27 107 -116 | 49 96 -13 | 22 797 -262 | 78 56 -173 |
| 4 30.8 | 59 271 -138 | 28 37 +80 | 13 188 -134 | 43 95 -25 | 26 986 -121 | 49 91 +5 | 22 519 -278 | 79 85 -129 |
| 5 10.8 | 59 131 -140 | 29 05 +68 | 13 050 -138 | 43 93 +2 | 26 861 -125 | 49 66 +25 | 22 228 -291 | 80 65 -80 |
| 5 20.7 | 58 998 -133 | 29 56 +51 | 12 917 -133 | 43 61 +32 | 26 742 -119 | 49 23 +43 | 21 937 -291 | 80 94 -29 |
| 5 30.7 | 58 879 -119 | 29 90 +34 | 12 795 -122 | 43 05 +56 | 26 634 -108 | 48 65 +58 | 21 655 -282 | 80 75 +19 |
| 6 9.7 | 58 775 -104 | 30 07 +17 | 12 684 -111 | 42 23 +82 | 26 537 -97 | 47 92 +73 | 21 384 -271 | 80 07 +68 |
| 6 19.7 | 58 694 -81 | 30 05 -2 | 12 591 -93 | 41 19 +104 | 26 459 -78 | 47 07 +85 | 21 136 -248 | 78 91 +116 |
| 6 29.6 | 58 637 -57 | 29 86 -19 | 12 517 -74 | 39 97 +122 | 26 399 -60 | 46 13 +94 | 20 916 -220 | 77 35 +156 |
| 7 9.6 | 58 604 -33 | 29 49 -37 | 12 463 -54 | 38 58 +139 | 26 358 -41 | 45 11 +102 | 20 727 -189 | 75 38 +197 |
| 7 19.6 | 58 599 -5 | 28 94 -56 | 12 434 -29 | 37 08 +150 | 26 342 -16 | 44 06 +105 | 20 580 -147 | 73 08 +230 |
| 7 29.6 | 58 621 +22 | 28 24 -70 | 12 430 -4 | 35 53 +155 | 26 348 +6 | 43 01 +105 | 20 476 -104 | 70 54 +254 |
| 8 8.5 | 58 671 +50 | 27 39 -85 | 12 452 +22 | 33 95 +158 | 26 379 +31 | 41 99 +102 | 20 422 -54 | 67 80 +274 |
| 8 18.5 | 58 750 +79 | 26 36 -103 | 12 505 +53 | 32 43 +152 | 26 439 +60 | 41 08 +91 | 20 424 +2 | 65 00 +280 |
| 8 28.5 | 58 859 +109 | 25 16 -120 | 12 587 +82 | 31 04 +139 | 26 525 +86 | 40 30 +78 | 20 482 +58 | 62 21 +279 |
| 9 7.4 | 59 001 +142 | 23 79 -137 | 12 703 +116 | 29 81 +123 | 26 642 +117 | 39 69 +61 | 20 601 +119 | 59 52 +269 |
| 9 17.4 | 59 176 +175 | 22 29 -150 | 12 853 +150 | 28 85 +96 | 26 792 +150 | 39 34 +35 | 20 783 +182 | 57 08 +244 |
| 9 27.4 | 59 383 +207 | 20 66 -163 | 13 037 +184 | 28 20 +65 | 26 972 +180 | 39 26 +8 | 21 024 +241 | 54 96 +212 |
| 10 7.4 | 59 624 +241 | 18 90 -176 | 13 257 +220 | 27 91 +29 | 27 187 +215 | 39 50 -24 | 21 326 +302 | 53 25 +171 |
| 10 17.3 | 59 897 +273 | 17 05 -185 | 13 509 +252 | 28 04 -13 | 27 433 +246 | 40 09 -59 | 21 681 +355 | 52 07 +118 |
| 10 27.3 | 60 200 +303 | 15 14 -191 | 13 791 +282 | 28 58 -54 | 27 707 +274 | 41 01 -92 | 22 082 +401 | 51 44 +63 |
| 11 6.3 | 60 531 +331 | 13 20 -194 | 14 101 +310 | 29 56 -98 | 28 008 +301 | 42 29 -128 | 22 522 +440 | 51 43 +1 |
| 11 16.3 | 60 882 +351 | 11 31 -189 | 14 101 +328 | 30 97 -141 | 28 328 +320 | 43 88 -159 | 22 522 +462 | 51 43 -64 |
| 11 26.2 | 61 248 +366 | 09 50 -181 | 14 769 +340 | 32 75 -178 | 28 660 +332 | 45 74 -186 | 23 457 +473 | 52 07 -124 |
| 12 6.2 | 61 619 +371 | 07 82 -168 | 15 112 +343 | 34 88 -213 | 28 997 +337 | 47 84 -210 | 23 928 +471 | 55 17 -186 |
| 12 16.2 | 61 984 +365 | 06 36 -146 | 15 446 +334 | 37 28 -240 | 29 326 +329 | 50 09 -225 | 24 376 +448 | 57 57 -240 |
| 12 26.1 | 62 333 +349 | 05 14 -122 | 15 762 +316 | 39 86 -258 | 29 639 +313 | 52 41 -232 | 24 791 +415 | 60 42 -285 |
| 12 36.1 | 62 656 +323 | 04 21 -93 | 16 050 +288 | 42 57 -271 | 29 927 +288 | 54 75 -234 | 25 159 +368 | 63 68 -326 |
| | 62 656 +283 | 04 21 -61 | 16 050 +248 | 42 57 -272 | 29 927 +250 | 54 75 -228 | 25 159 +306 | 63 68 -352 |
| Mean Place | 59 873 | 15.44 | 13 968 | 42.37 | 27 735 | 51.59 | 23 260 | 71.49 |
| sec δ, tan δ | +1.113 | +0.489 | +1.057 | -0.343 | +1.009 | -0.133 | +1.722 | -1.402 |
| dα(ψ), dδ(ψ) | +0.068 | -0.34 | +0.056 | -0.34 | +0.059 | -0.34 | +0.042 | -0.34 |
| dα(ε), dδ(ε) | +0.028 | +0.53 | -0.020 | +0.52 | -0.008 | +0.52 | -0.080 | +0.51 |
| Dble.Trans. | February 18 | | February 18 | | February 19 | | February 19 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 374 | | 372 | | 377 | | 376 | |
|--------------|-------------------|-------------|-------------------------------------|------------|-------------|------------|--------------|------------|
| | 19 Leonis Minoris | | Groombridge 1586 (Ursae Majoris) | | η Antliae | | 12 Sextantis | |
| Mag. Spect. | 5.19 | F5 | 5.96 | K0 | 5.25 | F0 | 6.63 | A5 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " |
| | 9 56 | +41 06 | 9 57 | +72 56 | 9 58 | -35 49 | 9 58 | +3 26 |
| 1 | -8.8 | 50.285 +411 | 11.550 +895 | 38.55 +29 | 16.138 +349 | 07.76 -268 | 59.555 +324 | 73.49 -203 |
| 1 | 1.1 | 50.670 +385 | 12.382 +832 | 39.38 +83 | 16.456 +318 | 10.71 -295 | 59.858 +303 | 71.54 -195 |
| 1 | 11.1 | 51.019 +349 | 13.132 +750 | 40.75 +137 | 16.737 +281 | 13.87 -316 | 60.131 +273 | 69.71 -183 |
| 1 | 21.1 | 51.318 +299 | 13.764 +632 | 42.61 +186 | 16.968 +231 | 17.14 -327 | 60.364 +233 | 68.07 -164 |
| 1 | 31.1 | 51.560 +242 | 14.264 +500 | 44.87 +226 | 17.146 +178 | 20.39 -325 | 60.552 +188 | 66.64 -143 |
| 2 | 10.0 | 51.740 +180 | 14.621 +357 | 47.44 +257 | 17.269 +123 | 23.60 -321 | 60.693 +141 | 65.45 -119 |
| 2 | 20.0 | 51.853 +113 | 14.817 +196 | 50.23 +279 | 17.334 +65 | 26.65 -305 | 60.782 +89 | 64.52 -93 |
| 3 | 2.0 | 51.903 +50 | 14.861 +44 | 53.07 +284 | 17.346 +12 | 29.47 -282 | 60.824 +42 | 63.84 -68 |
| 3 | 11.9 | 51.894 -9 | 14.757 -104 | 55.90 +283 | 17.309 -37 | 32.05 -258 | 60.823 -1 | 63.38 -46 |
| 3 | 21.9 | 51.830 +168 | 14.511 -246 | 58.56 +266 | 17.228 -81 | 34.31 -226 | 60.782 -41 | 63.15 -23 |
| 3 | 31.9 | 51.724 -106 | 14.154 -357 | 60.94 +238 | 17.114 -114 | 36.22 -191 | 60.711 -71 | 63.09 -6 |
| 4 | 10.9 | 51.583 -141 | 13.698 -456 | 62.99 +205 | 16.971 -143 | 37.79 -157 | 60.617 -94 | 63.20 +11 |
| 4 | 20.8 | 51.418 -165 | 13.169 -529 | 64.60 +161 | 16.809 -162 | 38.94 -115 | 60.506 -111 | 63.45 +25 |
| 4 | 30.8 | 51.243 -175 | 12.600 -569 | 65.72 +112 | 16.637 -172 | 39.72 -78 | 60.389 -117 | 63.79 +34 |
| 5 | 10.8 | 51.063 -180 | 12.007 -593 | 66.34 +62 | 16.459 -178 | 40.10 -38 | 60.270 -119 | 64.23 +44 |
| 5 | 20.8 | 50.890 -173 | 11.420 -587 | 66.40 +6 | 16.284 -175 | 40.05 +5 | 60.155 -115 | 64.74 +51 |
| 5 | 30.7 | 50.732 -158 | 10.862 -558 | 65.95 -45 | 16.117 -167 | 39.64 +41 | 60.052 -103 | 65.29 +55 |
| 6 | 9.7 | 50.591 -141 | 10.345 -517 | 64.99 -96 | 15.961 -156 | 38.84 +80 | 59.960 -92 | 65.88 +59 |
| 6 | 19.7 | 50.477 -114 | 09.893 -452 | 63.53 -146 | 15.823 -138 | 37.68 +116 | 59.886 -74 | 66.49 +61 |
| 6 | 29.6 | 50.391 -86 | 09.516 -377 | 61.65 -188 | 15.706 -117 | 36.22 +146 | 59.831 -55 | 67.10 +61 |
| 7 | 9.6 | 50.334 -57 | 09.221 -295 | 59.37 -228 | 15.611 -95 | 34.46 +176 | 59.795 -36 | 67.71 +61 |
| 7 | 19.6 | 50.312 -128 | 09.224 -197 | 56.74 -263 | 15.545 -66 | 32.47 +199 | 59.784 -11 | 68.27 +56 |
| 7 | 29.6 | 50.323 +11 | 08.922 -102 | 53.86 -288 | 15.508 -37 | 30.34 +213 | 59.795 +11 | 68.76 +49 |
| 8 | 8.5 | 50.367 +44 | 08.921 -1 | 50.74 -312 | 15.504 -4 | 28.10 +224 | 59.795 +35 | 69.17 +41 |
| 8 | 18.5 | 50.450 +83 | 09.029 +108 | 47.48 -326 | 15.537 +33 | 25.85 +225 | 59.892 +62 | 69.43 +26 |
| 8 | 28.5 | 50.567 +117 | 09.235 +206 | 44.13 -335 | 15.606 +69 | 23.68 +217 | 59.977 +85 | 69.58 +15 |
| 9 | 7.5 | 50.724 +157 | 09.548 +313 | 40.74 -339 | 15.716 +110 | 21.65 +203 | 60.096 +119 | 69.56 -2 |
| 9 | 17.4 | 50.920 +196 | 09.965 +417 | 37.41 -333 | 15.870 +154 | 19.89 +176 | 60.247 +151 | 69.29 -27 |
| 9 | 27.4 | 51.152 +232 | 10.475 +510 | 34.18 -323 | 16.064 +194 | 18.45 +144 | 60.427 +180 | 68.79 -50 |
| 10 | 7.4 | 51.426 +274 | 11.085 +610 | 31.11 -307 | 16.301 +237 | 17.40 +105 | 60.640 +213 | 68.02 -77 |
| 10 | 17.3 | 51.737 +311 | 11.782 +697 | 28.31 -280 | 16.577 +276 | 16.85 +55 | 60.884 +244 | 66.97 -105 |
| 10 | 27.3 | 52.082 +345 | 12.553 +771 | 25.80 -251 | 16.888 +311 | 16.79 +6 | 61.157 +273 | 65.68 -129 |
| 11 | 6.3 | 52.461 +379 | 13.398 +845 | 23.66 -214 | 17.230 +342 | 17.28 -49 | 61.477 +300 | 64.14 -154 |
| 11 | 16.3 | 52.863 +402 | 13.288 +890 | 21.98 -168 | 17.592 +362 | 18.33 -105 | 61.557 +320 | 62.14 -175 |
| 11 | 26.2 | 53.281 +418 | 15.210 +922 | 20.77 -121 | 17.965 +373 | 19.88 -155 | 62.110 +333 | 62.39 -191 |
| 12 | 6.2 | 53.708 +427 | 16.147 +937 | 20.10 -67 | 18.341 +376 | 21.93 -205 | 62.449 +339 | 58.46 -202 |
| 12 | 16.2 | 54.128 +420 | 17.061 +914 | 20.00 -10 | 18.704 +363 | 24.41 -248 | 62.782 +333 | 56.41 -205 |
| 12 | 26.2 | 54.532 +404 | 17.934 +873 | 20.46 +46 | 19.045 +341 | 27.20 -279 | 63.101 +319 | 54.39 -202 |
| 12 | 36.1 | 54.906 +374 | 18.738 +804 | 21.48 +102 | 19.354 +309 | 30.28 -308 | 63.396 +295 | 52.44 -195 |
| | | +330 | +701 | +155 | +264 | -322 | +259 | -178 |
| Mean Place | 51.646 | 73.35 | 11.664 | 39.61 | 17.413 | 34.15 | 61.080 | 58.66 |
| sec δ, tan δ | +1.327 | +0.873 | +3.409 | +3.260 | +1.233 | -0.722 | +1.002 | +0.060 |
| dα(ψ), dδ(ψ) | +0.073 | -0.34 | +0.105 | -0.34 | +0.051 | -0.34 | +0.062 | -0.34 |
| dα(ε), dδ(ε) | +0.050 | +0.51 | +0.187 | +0.51 | -0.041 | +0.51 | +0.003 | +0.50 |
| Dble. Trans. | February 19 | | February 19 | | February 19 | | February 20 | |

AT UPPER TRANSIT AT GREENWICH

| No. | 378 | | 1258 | | 1259 | | 1260 | |
|---|---------------------------|------------|---------------------------|------------|--|------------|---------------------------|------------|
| | π Leonis | | 20 Leonis Minoris | | Piazzi 9 ^h 229 (Ursae Majoris) | | 193 G. Hydrae | |
| Mag.Spect. | 4.89 | M0 | 5.60 | G5 | 5.74 | F5 | 5.80 | F0 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " |
| | 9 59 | + 8 06 | 10 00 | + 31 59 | 10 03 | + 53 57 | 10 03 | - 24 12 |
| 1 -8.8 | 28 518 ^s + 329 | 47 10 -190 | 12 686 ^s + 374 | 32 48 -117 | 41 691 ^s + 503 | 28 37 -43 | 42 064 ^s + 332 | 48 34 -255 |
| 1 1.1 | 28 825 + 307 | 45 32 -178 | 13 038 + 352 | 31 63 -83 | 42 163 + 472 | 28 41 + 4 | 42 370 + 306 | 51.07 -273 |
| 1 11.1 | 29 103 + 278 | 43 69 -163 | 13 357 + 319 | 31 14 -49 | 42 594 + 431 | 28 41 + 52 | 42 644 + 274 | 53.93 -286 |
| 1 21.1 | 29 340 + 237 | 42 29 -140 | 13 631 + 274 | 31 02 -12 | 42 963 + 369 | 28 93 +101 | 42 875 + 231 | 56.81 -288 |
| 1 31.1 | 29 532 + 192 | 41 13 -116 | 13 854 + 223 | 31 25 + 23 | 43 264 + 301 | 29 94 +139 | 43 057 + 182 | 59.63 -282 |
| 2 10.0 | 29 676 + 144 | 40 22 -91 | 14 022 + 168 | 31 80 + 55 | 43 489 + 225 | 33 08 +175 | 43 190 + 133 | 62.35 -272 |
| 2 20.0 | 29 768 + 92 | 39 58 -64 | 14 130 + 108 | 32 63 + 83 | 43 631 + 142 | 35 09 +201 | 43 269 + 79 | 64.87 -252 |
| 3 2.0 | 29 813 + 45 | 39 18 -40 | 14 181 + 51 | 33 65 +102 | 43 693 + 62 | 37 25 +216 | 43 300 + 31 | 67.15 -228 |
| 3 11.9 | 29 813 + 0 | 39 00 -18 | 14 180 -1 | 34 84 +119 | 43 680 -13 | 39 49 +224 | 43 285 -15 | 69.20 -205 |
| 3 21.9 | 29 773 -40 | 39 03 + 3 | 14 129 -51 | 36 10 +126 | 43 595 -85 | 41 69 +220 | 43 230 -55 | 70.93 -173 |
| 3 31.9 | 29 703 -70 | 39 20 + 17 | 14 043 -86 | 37 36 +126 | 43 454 -141 | 43 74 +205 | 43 143 -87 | 72.36 -143 |
| 4 10.9 | 29 608 -95 | 39 51 + 31 | 13 925 -118 | 38 57 +121 | 43 265 -189 | 45 59 +185 | 43 031 -112 | 73.48 -112 |
| 4 20.8 | 29 497 -111 | 39 91 + 40 | 13 786 -139 | 39 67 +110 | 43 042 -223 | 47 14 +155 | 42 901 -130 | 74.26 -78 |
| 4 30.8 | 29 380 -117 | 40 37 + 46 | 13 639 -147 | 40 60 + 93 | 42 802 -240 | 48 34 +120 | 42 763 -138 | 74.72 -46 |
| 5 10.8 | 29 259 -121 | 40 88 + 51 | 13 488 -151 | 41 35 + 75 | 42 551 -251 | 49 17 + 83 | 42 619 -144 | 74.86 -14 |
| 5 20.8 | 29 144 -115 | 41 42 + 54 | 13 342 -146 | 41 88 + 53 | 42 305 -246 | 49 58 + 41 | 42 478 -141 | 74.68 + 18 |
| 5 30.7 | 29 041 -103 | 41 94 + 52 | 13 209 -133 | 42 17 + 29 | 42 075 -230 | 49 58 + 0 | 42 346 -132 | 74.20 + 48 |
| 6 9.7 | 28 949 -92 | 42 47 + 53 | 13 092 -117 | 42 24 + 7 | 41 865 -210 | 49 17 -41 | 42 223 -123 | 73.43 + 77 |
| 6 19.7 | 28 875 -74 | 42 97 + 50 | 12 997 -95 | 42 06 -18 | 41 686 -179 | 48 35 -82 | 42 116 -107 | 72.39 +104 |
| 6 29.6 | 28 821 -54 | 43 43 + 46 | 12 926 -71 | 41 66 -40 | 41 543 -143 | 47 17 -118 | 42 028 -88 | 71.12 +127 |
| 7 9.6 | 28 787 -34 | 43 84 + 41 | 12 880 -46 | 41 04 -62 | 41 437 -106 | 45 64 -153 | 41 959 -69 | 69.64 +148 |
| 7 19.6 | 28 777 -10 | 44 18 + 34 | 12 864 -16 | 40 20 -84 | 41 377 -60 | 43 79 -185 | 41 915 -44 | 68.01 +163 |
| 7 29.6 | 28 790 + 13 | 44 44 + 26 | 12 876 + 12 | 39 17 -103 | 41 359 -18 | 41 70 -209 | 41 895 -20 | 66.29 +172 |
| 8 8.5 | 28 827 + 37 | 44 58 + 14 | 12 916 + 40 | 37 96 -121 | 41 386 + 27 | 39 36 -234 | 41 903 + 8 | 64.51 +178 |
| 8 18.5 | 28 893 + 66 | 44 53 -5 | 12 990 + 74 | 36 56 -140 | 41 463 + 77 | 36 82 -254 | 41 942 + 39 | 62.77 +174 |
| 8 28.5 | 28 977 + 84 | 44 45 -8 | 13 093 + 103 | 35 00 -156 | 41 587 + 124 | 34 16 -266 | 42 012 + 70 | 61.12 +165 |
| 9 7.5 | 29 100 + 123 | 44 14 -31 | 13 231 + 138 | 33 28 -172 | 41 760 + 173 | 31 38 -278 | 42 117 + 105 | 59.63 +149 |
| 9 17.4 | 29 252 + 152 | 43 60 -54 | 13 405 + 174 | 31 42 -186 | 41 986 + 226 | 28 56 -282 | 42 259 + 142 | 58.40 +123 |
| 9 27.4 | 29 434 + 182 | 42 85 -75 | 13 613 + 208 | 29 47 -195 | 42 258 + 272 | 25 74 -282 | 42 436 + 177 | 57.47 + 93 |
| 10 7.4 | 29 650 + 216 | 41 85 -100 | 13 857 + 244 | 27 42 -205 | 42 583 + 325 | 22 95 -279 | 42 652 + 216 | 56.91 + 56 |
| 10 17.3 | 29 896 + 246 | 40 62 -123 | 14 136 + 279 | 25 32 -210 | 42 954 + 371 | 20 30 -265 | 42 904 + 252 | 56.79 + 12 |
| 10 27.3 | 30 171 + 275 | 39 18 -144 | 14 446 + 310 | 23 21 -211 | 43 369 + 415 | 17 80 -250 | 43 188 + 284 | 57.10 -31 |
| 11 6.3 | 30 473 + 302 | 37 53 -165 | 14 788 + 342 | 21 13 -208 | 43 825 + 456 | 15 52 -228 | 43 501 + 313 | 57.89 -79 |
| 11 16.3 | 30 796 + 323 | 35 72 -181 | 15 152 + 364 | 19 15 -198 | 44 311 + 486 | 13 56 -196 | 43 835 + 334 | 59.15 -126 |
| 11 26.2 | 31 132 + 336 | 33 80 -192 | 15 532 + 380 | 17 31 -184 | 44 818 + 507 | 11 94 -162 | 44 182 + 347 | 60.83 -168 |
| 12 6.2 | 31 475 + 343 | 31 82 -198 | 15 921 + 389 | 15 67 -164 | 45 338 + 520 | 10 72 -122 | 44 534 + 352 | 62.91 -208 |
| 12 16.2 | 31 812 + 337 | 29 86 -196 | 16 303 + 382 | 14 30 -137 | 45 850 + 512 | 09 97 -75 | 44 877 + 343 | 65.32 -241 |
| 12 26.2 | 32 135 + 323 | 27 98 -188 | 16 672 + 369 | 13 23 -107 | 46 343 + 493 | 09 68 -29 | 45 202 + 325 | 67.96 -264 |
| 12 36.1 | 32 434 + 299 | 26 22 -176 | 17 014 + 342 | 12 50 -73 | 46 803 + 460 | 09 89 + 21 | 45 501 + 299 | 70.78 -282 |
| | 32 434 + 264 | 26 22 -156 | 17 014 + 303 | 12 50 -37 | 46 803 + 406 | 09 89 + 69 | 45 501 + 259 | 70.78 -288 |
| Mean Place | 30.047 | 33.70 | 14.121 | 25.82 | 42.860 | 27.05 | 43 507 | 71.72 |
| sec δ , tan δ | +1.010 | +0.142 | +1.179 | +0.625 | +1.700 | +1.374 | +1.097 | -0.450 |
| $d\alpha(\psi)$, $d\delta(\psi)$ | +0.063 | -0.34 | +0.069 | -0.34 | +0.079 | -0.35 | +0.055 | -0.35 |
| $d\alpha(\epsilon)$, $d\delta(\epsilon)$ | +0.008 | +0.50 | +0.036 | +0.50 | +0.080 | +0.49 | -0.026 | +0.49 |
| Dbble.Trans. | February 20 | | February 20 | | February 21 | | February 21 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 1261 | | 379 | | 380 | | 381 | | |
|--------------|-----------------------|---------------|-------------|---------------|-----------------------|---------------|-------------|---------------|-------------|
| | v ² Hydrae | | η Leonis | | α Leonis (Regulus) | | λ Hydrae | | |
| Mag.Spect. | 4.72 | B8 | 3.58 | A0p | 1.34 | B8 | 3.83 | K0 | |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " | |
| | 10 04 | -12 59 | 10 06 | +16 49 | 10 07 | +12 01 | 10 09 | -12 16 | |
| 1 | -8.8 | 26 48.1 + 324 | 36.30 -240 | 34 31.9 + 343 | 54.48 -168 | 37 68.6 + 335 | 72.95 -183 | 54 21.9 + 326 | 53 54 -238 |
| 1 | 1.1 | 26 78.2 + 301 | 38.77 -247 | 34 64.1 + 322 | 52.99 -149 | 38 00.1 + 315 | 71.29 -166 | 54 52.3 + 304 | 55 99 -245 |
| 1 | 11.1 | 27 05.4 + 272 | 41.26 -249 | 34 93.5 + 294 | 51.74 -125 | 38 28.8 + 287 | 69.81 -148 | 54 79.8 + 275 | 58 46 -247 |
| 1 | 21.1 | 27 28.4 + 230 | 43.70 -244 | 34 93.5 + 253 | 50.77 -97 | 38 53.6 + 248 | 68.58 -123 | 55 03.2 + 234 | 60 88 -242 |
| 1 | 31.1 | 27 46.9 + 185 | 46.01 -231 | 35 18.8 + 207 | 50.09 -68 | 38 73.8 + 202 | 67.63 -95 | 55 22.2 + 190 | 63.16 -228 |
| 2 | 10.0 | 27 60.6 + 137 | 48.16 -215 | 35 55.4 + 159 | 49.70 -39 | 38 89.3 + 155 | 66.94 -69 | 55 36.5 + 143 | 65.28 -212 |
| 2 | 20.0 | 27 69.2 + 86 | 50.08 -192 | 35 65.9 + 105 | 49.59 -11 | 38 99.5 + 102 | 66.53 -41 | 55 45.7 + 92 | 67.17 -189 |
| 3 | 2.0 | 27 73.2 + 40 | 51.76 -168 | 35 71.4 + 55 | 49.72 + 13 | 39 04.8 + 53 | 66.36 -17 | 55 50.2 + 45 | 68.82 -165 |
| 3 | 11.9 | 27 72.8 - 4 | 53.19 -143 | 35 72.3 + 9 | 50.05 + 33 | 39 05.7 + 9 | 66.41 + 5 | 55 50.4 + 2 | 70.23 -141 |
| 3 | 21.9 | 27 68.4 - 44 | 54.34 -115 | 35 68.9 - 34 | 50.56 + 51 | 39 02.4 - 33 | 66.66 + 25 | 55 46.6 - 38 | 71.35 -112 |
| 3 | 31.9 | 27 61.1 - 73 | 55.22 - 88 | 35 62.3 - 66 | 51.17 + 61 | 38 95.9 - 65 | 67.03 + 37 | 55 39.8 - 68 | 72.22 - 87 |
| 4 | 10.9 | 27 51.3 - 98 | 55.85 - 63 | 35 52.9 - 94 | 51.84 + 67 | 38 86.8 - 91 | 67.52 + 49 | 55 30.4 - 94 | 72.83 - 61 |
| 4 | 20.8 | 27 39.9 - 114 | 56.21 - 36 | 35 41.8 - 111 | 52.55 + 71 | 38 76.0 - 108 | 68.07 + 55 | 55 19.4 - 110 | 73.18 - 35 |
| 4 | 30.8 | 27 27.7 - 122 | 56.34 - 13 | 35 29.8 - 120 | 53.23 + 68 | 38 64.4 - 116 | 68.64 + 57 | 55 07.5 - 119 | 73.31 - 13 |
| 5 | 10.8 | 27 15.1 - 126 | 56.23 + 11 | 35 17.4 - 124 | 53.88 + 65 | 38 52.3 - 121 | 69.22 + 58 | 54 95.1 - 124 | 73.20 + 11 |
| 5 | 20.8 | 27 02.8 - 123 | 55.88 + 35 | 35 05.5 - 119 | 54.46 + 58 | 38 40.7 - 116 | 69.79 + 57 | 54 83.0 - 121 | 72.87 + 33 |
| 5 | 30.7 | 26 91.4 - 114 | 55.35 + 53 | 34 94.6 - 109 | 54.95 + 49 | 38 30.1 - 106 | 70.31 + 52 | 54 71.7 - 113 | 72.36 + 51 |
| 6 | 9.7 | 26 81.0 - 104 | 54.62 + 73 | 34 84.9 - 97 | 55.36 + 41 | 38 20.6 - 95 | 70.79 + 48 | 54 61.3 - 104 | 71.66 + 70 |
| 6 | 19.7 | 26 72.3 - 87 | 53.71 + 91 | 34 77.0 - 79 | 55.64 + 28 | 38 12.9 - 77 | 71.19 + 40 | 54 52.4 - 89 | 70.78 + 88 |
| 6 | 29.6 | 26 65.3 - 70 | 52.67 + 104 | 34 71.0 - 60 | 55.82 + 18 | 38 07.0 - 59 | 71.53 + 34 | 54 45.3 - 71 | 69.79 + 99 |
| 7 | 9.6 | 26 60.1 - 52 | 51.51 + 116 | 34 67.1 - 39 | 55.88 + 6 | 38 03.0 - 40 | 71.78 + 25 | 54 39.8 - 55 | 68.67 + 112 |
| 7 | 19.6 | 26 57.3 - 28 | 50.27 + 124 | 34 65.6 - 15 | 55.80 - 8 | 38 01.5 - 15 | 71.93 + 15 | 54 36.7 - 31 | 67.48 + 119 |
| 7 | 29.6 | 26 56.7 - 6 | 49.00 + 127 | 34 66.5 + 9 | 55.60 - 20 | 38 02.1 + 6 | 71.97 + 4 | 54 35.7 - 10 | 66.27 + 121 |
| 8 | 8.5 | 26 58.5 + 18 | 47.74 + 126 | 34 69.9 + 34 | 55.25 - 35 | 38 05.3 + 32 | 71.89 - 8 | 54 35.7 + 14 | 66.27 + 121 |
| 8 | 18.5 | 26 63.3 + 48 | 46.56 + 118 | 34 76.2 + 63 | 54.79 - 46 | 38 11.6 + 63 | 71.63 - 26 | 54 41.4 + 43 | 63.93 + 113 |
| 8 | 28.5 | 26 70.8 + 75 | 45.49 + 107 | 34 84.3 + 81 | 54.10 - 69 | 38 18.8 + 72 | 71.31 - 32 | 54 48.4 + 70 | 62.92 + 101 |
| 9 | 7.5 | 26 81.4 + 106 | 44.59 + 90 | 34 96.2 + 119 | 53.22 - 88 | 38 30.6 + 118 | 70.70 - 61 | 54 58.5 + 101 | 62.07 + 85 |
| 9 | 17.4 | 26 95.5 + 141 | 43.95 + 64 | 35 11.4 + 152 | 52.16 - 106 | 38 45.3 + 147 | 69.92 - 78 | 54 72.0 + 135 | 61.47 + 60 |
| 9 | 27.4 | 27 12.8 + 173 | 43.58 + 37 | 35 29.5 + 181 | 50.93 - 123 | 38 62.9 + 176 | 68.94 - 98 | 54 88.8 + 168 | 61 14 + 33 |
| 10 | 7.4 | 27 33.6 + 208 | 43.55 + 3 | 35 51.1 + 216 | 49.51 - 142 | 38 84.0 + 211 | 67.73 - 121 | 55 09.1 + 203 | 61.15 - 1 |
| 10 | 17.3 | 27 57.8 + 242 | 43.90 - 35 | 35 76.0 + 249 | 47.92 - 159 | 39 08.3 + 243 | 66.33 - 140 | 55 32.9 + 238 | 61.52 - 37 |
| 10 | 27.3 | 27 85.0 + 272 | 44.62 - 72 | 36 03.8 + 278 | 46.18 - 174 | 39 35.6 + 273 | 64.73 - 160 | 55 59.7 + 268 | 62.26 - 74 |
| 11 | 6.3 | 28 15.0 + 300 | 45.73 - 111 | 36 34.6 + 308 | 44.32 - 186 | 39 65.8 + 302 | 62.97 - 176 | 55 89.4 + 297 | 63 38 - 112 |
| 11 | 16.3 | 28 47.1 + 321 | 47.22 - 149 | 36 67.6 + 330 | 42.40 - 192 | 39 98.1 + 323 | 61.09 - 188 | 56 21.3 + 319 | 64.88 - 150 |
| 11 | 26.2 | 28 80.5 + 334 | 49.02 - 180 | 37 02.1 + 345 | 40.45 - 195 | 40 31.9 + 338 | 59.15 - 194 | 56 54.6 + 333 | 66.68 - 180 |
| 12 | 6.2 | 29 14.6 + 341 | 51.12 - 210 | 37 37.5 + 354 | 38.54 - 191 | 40 66.7 + 348 | 57.18 - 197 | 56 88.7 + 341 | 68.77 - 209 |
| 12 | 16.2 | 29 47.9 + 333 | 53.43 - 231 | 37 72.5 + 350 | 36.75 - 179 | 41 00.9 + 342 | 55.27 - 191 | 57 22.1 + 334 | 71.06 - 229 |
| 12 | 26.2 | 29 79.8 + 319 | 55.87 - 244 | 38 06.3 + 338 | 35.11 - 164 | 41 34.0 + 331 | 53.48 - 179 | 57 54.2 + 321 | 73 49 - 243 |
| 12 | 36.1 | 30 09.1 + 293 | 58.40 - 253 | 38 37.7 + 314 | 33.68 - 143 | 41 64.7 + 307 | 51.85 - 163 | 57 83.8 + 296 | 75.99 - 250 |
| | | 30 09.1 + 257 | 58.40 - 249 | 38 37.7 + 279 | 33.68 - 116 | 41 64.7 + 273 | 51.85 - 140 | 57 83.8 + 261 | 75.99 - 247 |
| Mean Place | 27.997 | 56.32 | 35.870 | 43.80 | 39.240 | 60.82 | 55.766 | 73.46 | |
| sec δ, tan δ | +1.026 | -0.231 | +1.045 | +0.302 | +1.022 | +0.213 | +1.023 | -0.218 | |
| da(ψ), dδ(ψ) | +0.058 | -0.35 | +0.065 | -0.35 | +0.064 | -0.35 | +0.058 | -0.35 | |
| da(ε), dδ(ε) | -0.013 | +0.48 | +0.018 | +0.47 | +0.013 | +0.47 | -0.013 | +0.46 | |
| Dble.Trans. | February 21 | | February 22 | | February 22 | | February 22 | | |

APPARENT PLACES OF STARS, 1986

157

AT UPPER TRANSIT AT GREENWICH

| No. | 385 | | 382 | | 384 | | 383 | |
|--------------|---------------------------|------------|---------------------------|------------|---------------------------|------------|---------------------------|------------|
| | ω Carinae | | 191 G. Velorum | | ζ Leonis | | λ Ursae Majoris | |
| Mag.Spect. | 3.56 | B8 | 4.09 | A2 | 3.65 | F0 | 3.52 | A2 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° ' | h m | ° ' | h m | ° ' | h m | ° ' |
| | 10 13 | -69 57 | 10 14 | -42 02 | 10 15 | +23 28 | 10 16 | +42 58 |
| 1 -8.8 | 24 805 ^s + 657 | 41 25 -235 | 08 720 ^s + 378 | 49 38 -259 | 54 902 ^s + 358 | 74.22 -155 | 15 777 ^s + 428 | 59 15 -95 |
| 1 1.1 | 25 392 + 587 | 44.08 -263 | 09 067 + 347 | 52.30 -292 | 55 241 + 339 | 72.93 -129 | 16 182 + 405 | 58 62 -53 |
| 1 11.1 | 25 898 + 506 | 47.34 -326 | 09 376 + 309 | 55 50 -320 | 55 552 + 311 | 71.93 -100 | 16 554 + 372 | 58 53 -9 |
| 1 21.1 | 26 299 + 401 | 50 93 -359 | 09 633 + 257 | 58 87 -337 | 55 823 + 271 | 71.97 -66 | 16 879 + 325 | 58 88 + 35 |
| 1 31.1 | 26 591 + 292 | 54 72 -379 | 09 835 + 202 | 62 28 -341 | 56 048 + 225 | 70.94 -33 | 17 148 + 269 | 59 63 + 75 |
| 2 10.0 | 26 770 + 179 | 58 64 -392 | 09 980 + 145 | 65 71 -343 | 56 223 + 175 | 70.92 -2 | 17 356 + 208 | 60 74 +111 |
| 2 20.0 | 26 829 + 59 | 62 58 -394 | 10 062 + 82 | 69 02 -331 | 56 343 + 120 | 71.20 + 28 | 17 497 + 141 | 62 16 +142 |
| 3 2.0 | 26 778 -51 | 66 42 -384 | 10 088 + 26 | 72 14 -312 | 56 410 + 67 | 71.73 + 53 | 17 573 + 76 | 63 79 +163 |
| 3 12.0 | 26 624 -154 | 70 13 -371 | 10 062 -26 | 75 05 -291 | 56 429 + 19 | 72.45 + 72 | 17 587 + 14 | 65 56 +177 |
| 3 21.9 | 26 371 -253 | 73 57 -344 | 09 986 -76 | 77 65 -260 | 56 402 -27 | 73.32 + 87 | 17 543 -44 | 67 37 +181 |
| 3 31.9 | 26 039 -332 | 76 70 -313 | 09 873 -113 | 79 92 -227 | 56 340 -62 | 74.26 + 94 | 17 453 -90 | 69 14 +177 |
| 4 10.9 | 25 634 -405 | 79 48 -278 | 09 727 -146 | 81 84 -192 | 56 248 -92 | 75.24 + 98 | 17 324 -129 | 70 80 +166 |
| 4 20.8 | 25 169 -465 | 81 81 -233 | 09 557 -170 | 83 34 -150 | 56 135 -113 | 76 19 + 95 | 17 167 -157 | 72 26 +146 |
| 4 30.8 | 24 666 -503 | 83 68 -187 | 09 372 -185 | 84 44 -110 | 56 012 -123 | 77 06 + 87 | 16 994 -173 | 73 48 +122 |
| 5 10.8 | 24 129 -537 | 85 07 -139 | 09 177 -195 | 85 12 -68 | 55 883 -129 | 77.83 + 77 | 16 812 -182 | 74 42 + 94 |
| 5 20.8 | 23 577 -552 | 85 91 -84 | 08 981 -196 | 85 35 -23 | 55 757 -126 | 78 47 + 64 | 16 631 -181 | 75 04 + 62 |
| 5 30.7 | 23 025 -552 | 86 23 -32 | 08 789 -192 | 85 16 + 19 | 55 639 -118 | 78 95 + 48 | 16 462 -169 | 75 32 + 28 |
| 6 9.7 | 22 479 -546 | 86 01 + 22 | 08 605 -184 | 84 56 + 60 | 55 533 -106 | 79 28 + 33 | 16 306 -156 | 75 28 -4 |
| 6 19.7 | 21 960 -519 | 85 24 + 77 | 08 437 -168 | 83 54 +102 | 55 444 -89 | 79 42 + 14 | 16 173 -133 | 74 89 -39 |
| 6 29.7 | 21 480 -480 | 83 99 +125 | 08 287 -150 | 82 17 +137 | 55 375 -69 | 79 39 -3 | 16 066 -107 | 74 19 -70 |
| 7 9.6 | 21 046 -434 | 82 26 +173 | 08 159 -128 | 80 46 +171 | 55 326 -49 | 79 19 -20 | 15 985 -81 | 73 18 -101 |
| 7 19.6 | 20 679 -367 | 80 10 +216 | 08 060 -99 | 78 46 +200 | 55 302 -24 | 78 81 -38 | 15 938 -47 | 71 88 -130 |
| 7 29.6 | 20 385 -294 | 77 62 +248 | 07 990 -70 | 76 27 +219 | 55 301 -1 | 78 26 -55 | 15 922 -16 | 70 34 -154 |
| 8 8.5 | 20 175 -210 | 74 84 +278 | 07 955 -35 | 73 91 +236 | 55 326 + 25 | 77 53 -73 | 15 939 + 17 | 68 55 -179 |
| 8 18.5 | 20 066 -109 | 71 90 +294 | 07 961 + 6 | 71 50 +241 | 55 380 + 54 | 76 64 -89 | 15 995 + 56 | 66 56 -199 |
| 8 28.5 | 20 055 -11 | 68 88 +302 | 08 007 + 46 | 69 11 +239 | 55 459 + 79 | 75 56 -108 | 16 086 + 91 | 64 40 -216 |
| 9 7.5 | 20 154 + 99 | 65 87 +301 | 08 099 + 92 | 66 83 +228 | 55 571 + 112 | 74 27 -129 | 16 086 + 131 | 62 07 -233 |
| 9 17.4 | 20 366 + 212 | 63 03 +284 | 08 239 + 140 | 64 78 +205 | 55 718 + 147 | 72 82 -145 | 16 217 + 173 | 62 07 -243 |
| 9 27.4 | 20 683 + 317 | 60 44 +259 | 08 425 + 186 | 63 02 +176 | 55 897 + 179 | 71 22 -160 | 16 390 + 212 | 59 64 -250 |
| 10 7.4 | 21 109 + 426 | 58 21 +223 | 08 661 + 236 | 61 65 +137 | 56 112 + 215 | 69 46 -176 | 16 602 + 256 | 57 14 -255 |
| 10 17.4 | 21 630 + 521 | 56 47 +174 | 08 942 + 281 | 60 76 + 89 | 56 361 + 249 | 67 57 -189 | 16 858 + 297 | 54 59 -252 |
| 10 27.3 | 22 228 + 598 | 55 25 +122 | 09 262 + 320 | 60 38 + 38 | 56 643 + 282 | 65 60 -197 | 17 155 + 335 | 52 07 -245 |
| 11 6.3 | 22 896 + 668 | 54 65 + 60 | 09 619 + 357 | 60 55 -17 | 56 643 + 313 | 65 60 -205 | 17 490 + 335 | 49 62 -245 |
| 11 16.3 | 23 604 + 708 | 54 65 -7 | 10 001 + 382 | 61 32 -77 | 56 956 + 338 | 63 55 -204 | 17 863 + 373 | 47 27 -235 |
| 11 26.2 | 24 330 + 726 | 55 44 -72 | 10 398 + 397 | 62 63 -131 | 57 294 + 355 | 61 51 -199 | 18 264 + 401 | 45 14 -213 |
| 12 6.2 | 25 056 + 726 | 56 82 -138 | 10 801 + 403 | 64 49 -186 | 57 649 + 367 | 59 52 -189 | 18 686 + 422 | 43 24 -190 |
| 12 16.2 | 25 747 + 691 | 58 82 -200 | 11 192 + 391 | 66 82 -233 | 58 016 + 364 | 57 63 -170 | 19 121 + 435 | 41 64 -160 |
| 12 26.2 | 26 385 + 638 | 61 36 -254 | 11 562 + 370 | 69 55 -273 | 58 380 + 363 | 55 93 -148 | 19 555 + 434 | 40 43 -121 |
| 12 36.1 | 26 952 + 567 | 64 40 -304 | 11 900 + 338 | 72 62 -307 | 58 733 + 332 | 54 45 -120 | 19 976 + 395 | 39 60 -38 |
| | 26 952 + 469 | 64 40 -342 | 11 900 + 291 | 72 62 -329 | 59 065 + 297 | 53 25 -89 | 20 371 + 354 | 39 22 + 6 |
| Mean Place | 25.107 | 74.69 | 10.073 | 77.78 | 56.466 | 65.66 | 17.171 | 55.86 |
| sec δ, tan δ | +2.920 | -2.743 | +1.347 | -0.902 | +1.090 | +0.434 | +1.367 | +0.932 |
| dα(ψ), dδ(ψ) | +0.029 | -0.36 | +0.051 | -0.36 | +0.066 | -0.36 | +0.072 | -0.36 |
| dα(ε), dδ(ε) | -0.163 | +0.45 | -0.054 | +0.45 | +0.026 | +0.44 | +0.056 | +0.44 |
| Dble.Trans. | February 23 | | February 23 | | February 24 | | February 24 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 1264 | | 1263 | | 1262 | | 1265 | |
|---------------------|---------------------------|-------------|---------------------------|-------------|---------------------------|-------------|---------------------------|-------------|
| | 187 G. Carinae | | ε Sextantis | | 32 Ursae Majoris | | 59 G. Antliae | |
| Mag. Spect. | 3.44 | K5 | 5.40 | F0 | 5.74 | A3 | 5.62 | B9 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° ' " | h m | ° ' " | h m | + 65 10 | h m | ° ' " |
| | 10 16 | -61 15 | 10 16 | - 7 59 | 10 17 | | 10 17 | -28 55 |
| 1 ^d -8.8 | 36.912 ^s + 510 | 20.32 -244 | 55.926 ^s + 328 | 45.80 -230 | 03.104 ^s + 668 | 33.35 -24 | 28.880 ^s + 346 | 02.22 -254 |
| 1 ^s 1.1 | 37.373 + 461 | 23.22 -290 | 56.233 + 307 | 48.14 -234 | 03.736 + 632 | 33.65 + 30 | 29.201 + 321 | 04.98 -276 |
| 1 11.1 | 37.777 + 404 | 26.50 -328 | 56.514 + 281 | 50.46 -232 | 04.316 + 580 | 34.49 + 84 | 29.491 + 290 | 07.92 -294 |
| 1 21.1 | 38.105 + 328 | 30.09 -359 | 56.755 + 241 | 52.69 -223 | 04.818 + 502 | 35.86 + 137 | 29.738 + 247 | 10.95 -303 |
| 1 31.1 | 38.353 + 248 | 33.84 -375 | 56.953 + 198 | 54.76 -207 | 05.231 + 413 | 37.66 + 180 | 29.936 + 198 | 13.94 -299 |
| 2 10.0 | 38.518 + 165 | 37.68 -384 | 57.104 + 151 | 56.66 -190 | 05.546 + 315 | 39.84 + 218 | 30.084 + 148 | 16.87 -293 |
| 2 20.0 | 38.594 + 76 | 41.52 -384 | 57.206 + 102 | 58.31 -165 | 05.747 + 201 | 42.29 + 245 | 30.178 + 94 | 19.64 -277 |
| 3 2.0 | 38.590 - 4 | 45.22 -370 | 57.261 + 55 | 59.72 -141 | 05.841 + 94 | 44.89 + 260 | 30.221 + 43 | 22.20 -256 |
| 3 12.0 | 38.510 - 80 | 48.77 -355 | 57.272 + 11 | 60.89 -117 | 05.829 - 12 | 47.55 + 266 | 30.218 - 3 | 24.52 -232 |
| 3 21.9 | 38.356 - 154 | 52.04 -327 | 57.243 - 29 | 61.79 - 90 | 05.715 - 114 | 50.15 + 260 | 30.172 - 46 | 26.54 -202 |
| 3 31.9 | 38.146 - 210 | 54.99 -295 | 57.184 - 59 | 62.44 - 65 | 05.518 - 197 | 52.55 + 215 | 30.093 - 79 | 28.26 -172 |
| 4 10.9 | 37.884 - 262 | 57.58 -259 | 57.099 - 85 | 62.87 - 43 | 05.249 - 269 | 54.70 + 240 | 29.985 - 108 | 29.65 -139 |
| 4 20.8 | 37.581 - 303 | 59.72 -214 | 56.996 - 103 | 63.07 - 20 | 04.924 - 325 | 56.49 + 179 | 29.857 - 128 | 30.69 -104 |
| 4 30.8 | 37.252 - 329 | 61.41 -169 | 56.885 - 111 | 63.08 - 1 | 04.566 - 358 | 57.86 + 137 | 29.717 - 140 | 31.39 - 70 |
| 5 10.8 | 36.900 - 352 | 62.63 -122 | 56.767 - 118 | 62.89 + 19 | 04.186 - 380 | 58.79 + 93 | 29.570 - 147 | 31.75 - 36 |
| 5 20.8 | 36.539 - 361 | 63.31 - 68 | 56.651 - 116 | 62.52 + 37 | 03.803 - 383 | 59.21 + 42 | 29.422 - 148 | 31.74 + 1 |
| 5 30.7 | 36.180 - 359 | 63.50 - 19 | 56.543 - 85 | 62.01 + 51 | 03.436 - 367 | 59.15 - 6 | 29.280 - 142 | 31.41 + 33 |
| 6 9.7 | 35.827 - 353 | 63.17 + 33 | 56.443 - 100 | 61.34 + 67 | 03.089 - 347 | 58.61 - 54 | 29.145 - 135 | 30.75 + 66 |
| 6 19.7 | 35.493 - 334 | 62.31 + 86 | 56.357 - 86 | 60.55 + 79 | 02.782 - 307 | 57.58 -103 | 29.023 - 122 | 29.78 + 97 |
| 6 29.7 | 35.186 - 307 | 61.02 + 129 | 56.286 - 71 | 59.68 + 87 | 02.521 - 261 | 56.12 -146 | 28.919 - 104 | 28.55 + 123 |
| 7 9.6 | 34.911 - 275 | 59.26 + 176 | 56.233 - 53 | 58.71 + 97 | 02.309 - 212 | 54.26 -186 | 28.832 - 87 | 27.05 + 150 |
| 7 19.6 | 34.682 - 229 | 57.11 + 215 | 56.201 - 32 | 57.71 + 100 | 02.160 - 149 | 52.03 -223 | 28.768 - 64 | 25.37 + 168 |
| 7 29.6 | 34.502 - 180 | 54.67 + 244 | 56.189 - 12 | 56.71 + 100 | 02.071 - 89 | 49.51 -252 | 28.729 - 39 | 23.56 + 181 |
| 8 8.5 | 34.380 - 122 | 51.96 + 271 | 56.201 + 12 | 55.73 + 98 | 02.047 - 24 | 46.72 -279 | 28.718 - 11 | 21.65 + 191 |
| 8 18.5 | 34.325 - 55 | 49.11 + 285 | 56.240 + 39 | 54.85 + 88 | 02.094 + 47 | 43.72 -300 | 28.738 + 20 | 19.74 + 191 |
| 8 28.5 | 34.338 + 13 | 46.22 + 289 | 56.305 + 65 | 54.09 + 76 | 02.208 + 114 | 40.59 -313 | 28.791 + 53 | 17.90 + 184 |
| 9 7.5 | 34.426 + 88 | 43.36 + 286 | 56.401 + 96 | 53.49 + 60 | 02.394 + 186 | 37.34 -325 | 28.881 + 90 | 16.19 + 171 |
| 9 17.4 | 34.594 + 168 | 40.68 + 268 | 56.530 + 129 | 53.12 + 37 | 02.654 + 260 | 34.09 -325 | 29.011 + 130 | 14.71 + 148 |
| 9 27.4 | 34.835 + 241 | 38.28 + 240 | 56.691 + 161 | 53.02 + 10 | 02.982 + 328 | 30.86 -323 | 29.178 + 167 | 13.53 + 118 |
| 10 7.4 | 35.155 + 320 | 36.23 + 205 | 56.889 + 198 | 53.23 - 21 | 03.382 + 400 | 27.72 -314 | 29.387 + 209 | 12.71 + 82 |
| 10 17.4 | 35.543 + 388 | 34.68 + 155 | 57.120 + 231 | 53.79 - 56 | 03.850 + 468 | 24.76 -296 | 29.636 + 249 | 12.33 + 38 |
| 10 27.3 | 35.990 + 447 | 33.66 + 102 | 57.382 + 262 | 54.67 - 88 | 04.378 + 528 | 22.03 -273 | 29.919 + 283 | 12.40 - 7 |
| 11 6.3 | 36.490 + 500 | 33.25 + 41 | 57.674 + 292 | 55.91 -124 | 04.965 + 587 | 19.59 -244 | 30.236 + 317 | 12.97 - 57 |
| 11 16.3 | 37.023 + 533 | 33.50 - 25 | 57.989 + 315 | 57.47 -156 | 05.595 + 630 | 17.54 -205 | 30.576 + 340 | 14.04 -107 |
| 11 26.2 | 37.573 + 550 | 34.37 - 87 | 58.319 + 330 | 59.31 -184 | 06.257 + 662 | 15.91 -163 | 30.932 + 356 | 15.57 -153 |
| 12 6.2 | 38.127 + 554 | 35.89 -152 | 58.659 + 340 | 61.39 -208 | 06.939 + 682 | 14.76 -115 | 31.295 + 363 | 17.54 -197 |
| 12 16.2 | 38.659 + 532 | 38.00 -211 | 58.994 + 335 | 63.63 -224 | 07.615 + 676 | 14.16 - 60 | 31.651 + 356 | 19.89 -235 |
| 12 26.2 | 39.157 + 498 | 40.62 -262 | 59.317 + 323 | 65.96 -233 | 08.270 + 655 | 14.08 - 8 | 31.992 + 341 | 22.53 -264 |
| 12 36.1 | 39.604 + 447 | 43.71 -309 | 59.618 + 301 | 68.33 -237 | 08.886 + 616 | 14.58 + 50 | 32.306 + 314 | 25.41 -288 |
| | 37.834 + 378 | 52.71 -343 | 57.529 + 267 | 64.37 -231 | 03.894 + 548 | 34.28 + 103 | 30.408 + 275 | 27.25 -299 |
| Mean Place | 37.834 | 52.71 | 57.529 | 64.37 | 03.894 | 34.28 | 30.408 | 27.25 |
| sec δ, tan δ | +2.080 | -1.824 | +1.010 | -0.141 | +2.382 | +2.162 | +1.143 | -0.553 |
| dα(ψ), dδ(ψ) | +0.040 | -0.36 | +0.060 | -0.36 | +0.086 | -0.36 | +0.055 | -0.36 |
| dα(ε), dδ(ε) | -0.109 | +0.44 | -0.008 | +0.43 | +0.130 | +0.43 | -0.033 | +0.43 |
| Dble. Trans. | February 24 | | February 24 | | February 24 | | February 24 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 1266 | | 386 | | 1268 | | 1267 | |
|--------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|
| | 23 Sextantis | | μ Ursae Majoris | | 204 G. Velorum | | 27 Leonis Minoris | |
| Mag. Spect. | 6.53 | B3 | 3.21 | K5 | 4.99 | K5 | 5.83 | A3 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | ^h ^m | ^o ['] | ^h ^m | ^o ['] | ^h ^m | ^o ['] | ^h ^m | ^o ['] |
| | 10 20 | + 2 21 | 10 21 | + 41 33 | 10 21 | - 41 34 | 10 22 | + 33 58 |
| 1 -8.8 | 18 561 + 331 | 43 62 -211 | 30.268 + 422 | 67 44 -105 | 43 294 + 381 | 26 35 -253 | 18 323 + 390 | 41.20 -129 |
| 1 1.2 | 18 874 + 313 | 41 58 -204 | 30 668 + 400 | 66 81 - 63 | 43 647 + 353 | 29 22 -287 | 18 693 + 370 | 40.26 - 94 |
| 1 11.1 | 19 161 + 287 | 39 65 -193 | 31 038 + 370 | 66 61 - 20 | 43 963 + 316 | 32 36 -314 | 19 035 + 342 | 39.70 - 56 |
| 1 21.1 | 19 411 + 250 | 37 89 -176 | 31 361 + 323 | 66 85 + 24 | 44 229 + 266 | 35 70 -334 | 19 335 + 300 | 39.55 - 15 |
| 1 31.1 | 19 617 + 206 | 36 35 -154 | 31 631 + 270 | 67 49 + 64 | 44 441 + 212 | 39 08 -338 | 19 586 + 251 | 39.77 + 22 |
| 2 10.0 | 19 778 + 161 | 35 04 -131 | 31 842 + 211 | 68 51 +102 | 44 597 + 156 | 42 48 -340 | 19 782 + 196 | 40.35 + 58 |
| 2 20.0 | 19 888 + 110 | 34 00 -104 | 31 987 + 145 | 69 84 +133 | 44 691 + 94 | 45 79 -331 | 19 919 + 137 | 41.24 + 89 |
| 3 2.0 | 19 952 + 64 | 33 21 - 79 | 32 069 + 82 | 71 39 +155 | 44 729 + 38 | 48 91 -312 | 19 998 + 79 | 42.37 +113 |
| 3 12.0 | 19 971 + 19 | 32 66 - 55 | 32 090 + 21 | 73 10 +171 | 44 715 - 14 | 51 83 -292 | 20 023 + 25 | 43.69 +132 |
| 3 21.9 | 19 950 - 21 | 32 35 - 31 | 32 054 - 36 | 74 87 +177 | 44 651 - 64 | 54 45 -262 | 19 996 - 27 | 45.11 +142 |
| 3 31.9 | 19 898 - 52 | 32 23 - 12 | 31 973 - 81 | 76 61 +174 | 44 550 - 101 | 56 74 -229 | 19 929 - 67 | 46.54 +143 |
| 4 10.9 | 19 819 - 79 | 32 29 + 6 | 31 853 - 120 | 78 26 +165 | 44 414 - 136 | 58 69 -195 | 19 828 - 101 | 47.94 +140 |
| 4 20.9 | 19 722 - 97 | 32 50 + 21 | 31 704 - 149 | 79 73 +147 | 44 254 - 160 | 60 24 -155 | 19 701 - 127 | 49.23 +129 |
| 4 30.8 | 19 615 - 107 | 32 81 + 31 | 31 540 - 164 | 80 97 +124 | 44 078 - 176 | 61 39 -115 | 19 561 - 140 | 50.35 +112 |
| 5 10.8 | 19 502 - 113 | 33 23 + 42 | 31 365 - 175 | 81 95 + 98 | 43 890 - 188 | 62 13 - 74 | 19 412 - 149 | 51.28 + 93 |
| 5 20.8 | 19 391 - 111 | 33 73 + 50 | 31 191 - 174 | 82 61 + 66 | 43 699 - 191 | 62 42 - 29 | 19 264 - 148 | 51.96 + 68 |
| 5 30.7 | 19 288 - 103 | 34 27 + 54 | 31 027 - 164 | 82 96 + 35 | 43 512 - 187 | 62 31 + 11 | 19 125 - 139 | 52.40 + 44 |
| 6 9.7 | 19 192 - 96 | 34 86 + 21 | 30 876 - 151 | 82 99 + 3 | 43 331 - 181 | 61 78 + 53 | 18 997 - 128 | 52.58 + 18 |
| 6 19.7 | 19 111 - 81 | 35 48 + 62 | 30 745 - 131 | 82 67 - 32 | 43 163 - 168 | 60 84 + 94 | 18 888 - 109 | 52.48 - 10 |
| 6 29.7 | 19 046 - 65 | 36 09 + 61 | 30 639 - 106 | 82 05 - 62 | 43 013 - 150 | 59 54 +130 | 18 799 - 89 | 52.12 - 36 |
| 7 9.6 | 18 997 - 49 | 36 71 + 62 | 30 557 - 82 | 81 13 - 92 | 42 882 - 131 | 57 90 +164 | 18 733 - 66 | 51.52 - 60 |
| 7 19.6 | 18 970 - 27 | 37 28 + 57 | 30 508 - 49 | 79 92 -121 | 42 779 - 103 | 55 98 +192 | 18 694 - 39 | 50.65 - 87 |
| 7 29.6 | 18 963 - 7 | 37 79 + 51 | 30 488 - 20 | 78 46 -146 | 42 705 - 74 | 53 85 +213 | 18 682 - 12 | 49.57 -108 |
| 8 8.6 | 18 978 + 15 | 38 22 + 43 | 30 500 + 12 | 76 75 -171 | 42 663 - 42 | 51 54 +231 | 18 697 + 15 | 48.28 -179 |
| 8 18.5 | 19 020 + 42 | 38 51 + 29 | 30 549 + 49 | 74 83 -192 | 42 661 - 2 | 49 17 +237 | 18 745 + 48 | 46.77 -151 |
| 8 28.5 | 19 085 + 65 | 38 64 + 13 | 30 633 + 84 | 72 73 -210 | 42 699 + 38 | 46 82 +235 | 18 823 + 78 | 45.08 -169 |
| 9 7.5 | 19 181 + 96 | 38 67 + 3 | 30 755 + 122 | 70 47 -226 | 42 781 + 82 | 44 56 +226 | 18 936 + 113 | 43.20 -188 |
| 9 17.4 | 19 311 + 130 | 38 44 - 23 | 30 919 + 164 | 68 08 -239 | 42 912 + 131 | 42 51 +205 | 19 087 + 151 | 41.18 -202 |
| 9 27.4 | 19 471 + 160 | 37 97 - 47 | 31 121 + 202 | 65 61 -247 | 43 089 + 177 | 40 75 +176 | 19 273 + 186 | 39.04 -214 |
| 10 7.4 | 19 666 + 195 | 37 23 - 74 | 31 366 + 245 | 63 08 -253 | 43 316 + 227 | 39 36 +139 | 19 498 + 225 | 36.80 -224 |
| 10 17.4 | 19 895 + 229 | 36 20 -103 | 31 653 + 287 | 60 57 -251 | 43 589 + 273 | 38 44 + 92 | 19 762 + 264 | 34.51 -229 |
| 10 27.3 | 20 155 + 260 | 34 93 -127 | 31 977 + 324 | 58 10 -247 | 43 902 + 313 | 38 01 + 43 | 20 061 + 299 | 32.21 -230 |
| 11 6.3 | 20 445 + 290 | 33 38 -155 | 32 339 + 362 | 55 73 -237 | 44 254 + 352 | 38 14 - 13 | 20 395 + 334 | 29.93 -228 |
| 11 16.3 | 20 758 + 313 | 31 62 -176 | 32 731 + 392 | 53 54 -219 | 44 633 + 379 | 38 84 - 70 | 20 756 + 361 | 27.76 -217 |
| 11 26.3 | 21 089 + 331 | 29 69 -193 | 33 144 + 413 | 51 58 -196 | 45 028 + 395 | 40 09 -125 | 21 138 + 382 | 25.75 -201 |
| 12 6.2 | 21 429 + 340 | 27 62 -207 | 33 571 + 427 | 49 91 -167 | 45 431 + 403 | 41 89 -180 | 21 534 + 396 | 23.95 -180 |
| 12 16.2 | 21 767 + 338 | 25 50 -212 | 33 998 + 427 | 48 61 -130 | 45 824 + 393 | 44 17 -228 | 21 928 + 394 | 22.44 -151 |
| 12 26.2 | 22 095 + 328 | 23 40 -210 | 34 413 + 415 | 47 68 - 93 | 46 199 + 375 | 46 84 -267 | 22 313 + 385 | 21.25 -119 |
| 12 36.1 | 22 401 + 306 | 21 36 -204 | 34 805 + 392 | 47 19 - 49 | 46 542 + 343 | 49 86 -302 | 22 675 + 362 | 20.44 - 81 |
| | + 274 | -189 | + 352 | - 4 | + 299 | -324 | + 327 | - 42 |
| Mean Place | 20.196 | 28.41 | 31.698 | 63.98 | 44.747 | 54.84 | 19.840 | 35.76 |
| sec δ, tan δ | +1.001 | +0.041 | +1.337 | +0.887 | +1.337 | -0.887 | +1.206 | +0.674 |
| dα(ψ), dδ(ψ) | +0.062 | -0.36 | +0.071 | -0.36 | +0.051 | -0.36 | +0.069 | -0.36 |
| dα(ε), dδ(ε) | +0.002 | +0.42 | +0.054 | +0.42 | -0.054 | +0.42 | +0.041 | +0.41 |
| Dble. Trans. | February 25 | | February 25 | | February 25 | | February 26 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 388 | | 1269 | | 387 | | 391 | | |
|--------------|--------------|--------------|---------------|--------------|---------------------|--------------|-------------|--------------|-------------|
| | 25 Sextantis | | 64 G. Antliae | | 30 H. Ursae Majoris | | J Carinae | | |
| Mag.Spect. | 6.10 | B9 | 5.40 | A3 | 4.92 | A0 | 4.08 | F5 | |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | |
| | h m | ° ' | h m | ° ' | h m | ° ' | h m | ° ' | |
| | 10 22 | - 4 00 | 10 22 | - 37 56 | 10 23 | + 65 37 | 10 24 | - 73 57 | |
| 1 | -8.8 | 43.885 + 330 | 02.68 -223 | 52.235 + 370 | 00.30 -253 | 09.332 + 679 | 65.14 -31 | 07.579 + 803 | 12.02 -217 |
| 1 | 1.2 | 44.197 + 312 | 04.91 -223 | 52.578 + 343 | 03.14 -284 | 09.977 + 645 | 65.39 + 25 | 08.301 + 722 | 14.70 -268 |
| 1 | 11.1 | 44.482 + 285 | 07.09 -218 | 52.886 + 308 | 06.23 -309 | 10.573 + 596 | 66.18 + 79 | 08.928 + 627 | 17.84 -314 |
| 1 | 21.1 | 44.730 + 248 | 09.15 -206 | 53.148 + 262 | 09.48 -325 | 11.091 + 518 | 67.51 + 133 | 09.430 + 502 | 21.35 -351 |
| 1 | 31.1 | 44.935 + 205 | 11.03 -188 | 53.358 + 210 | 12.77 -329 | 11.521 + 430 | 69.28 + 177 | 09.801 + 371 | 25.09 -374 |
| 2 | 10.0 | 45.094 + 159 | 12.71 -168 | 53.513 + 155 | 16.05 -328 | 11.851 + 330 | 71.44 + 216 | 10.039 + 238 | 29.00 -391 |
| 2 | 20.0 | 45.204 + 110 | 14.15 -144 | 53.610 + 97 | 19.22 -317 | 12.068 + 217 | 73.90 + 246 | 10.130 + 91 | 32.97 -397 |
| 3 | 2.0 | 45.267 + 63 | 15.32 -117 | 53.653 + 43 | 22.19 -297 | 12.175 + 107 | 76.50 + 260 | 10.088 - 42 | 36.87 -390 |
| 3 | 12.0 | 45.287 + 20 | 16.26 -94 | 53.646 - 7 | 24.96 -277 | 12.174 - 1 | 79.19 + 269 | 09.919 - 169 | 40.67 -380 |
| 3 | 21.9 | 45.266 - 21 | 16.94 -68 | 53.591 - 55 | 27.44 -248 | 12.070 - 104 | 81.82 + 263 | 09.626 - 293 | 44.25 -358 |
| 3 | 31.9 | 45.214 - 52 | 17.40 -46 | 53.500 - 91 | 29.59 -215 | 11.880 - 190 | 84.27 + 245 | 09.234 - 392 | 47.53 -328 |
| 4 | 10.9 | 45.136 - 78 | 17.65 -25 | 53.377 - 123 | 31.41 -182 | 11.614 - 266 | 86.47 + 220 | 08.747 - 487 | 50.49 -296 |
| 4 | 20.9 | 45.039 - 97 | 17.70 -5 | 53.230 - 147 | 32.83 -142 | 11.289 - 325 | 88.32 + 185 | 08.181 - 566 | 53.02 -253 |
| 4 | 30.8 | 44.933 - 106 | 17.59 + 11 | 53.069 - 161 | 33.88 -105 | 10.929 - 360 | 89.75 + 143 | 07.562 - 619 | 55.11 -209 |
| 5 | 10.8 | 44.820 - 113 | 17.32 + 27 | 52.896 - 173 | 34.53 -65 | 10.544 - 385 | 90.74 + 99 | 06.893 - 669 | 56.72 -161 |
| 5 | 20.8 | 44.708 - 112 | 16.90 + 42 | 52.721 - 175 | 34.76 -23 | 10.153 - 391 | 91.23 + 49 | 06.197 - 696 | 57.78 -106 |
| 5 | 30.7 | 44.602 - 106 | 16.38 + 52 | 52.550 - 171 | 34.60 + 16 | 09.776 - 377 | 91.22 - 1 | 05.495 - 702 | 58.32 -54 |
| 6 | 9.7 | 44.504 - 98 | 15.75 + 63 | 52.385 - 165 | 34.05 + 55 | 09.418 - 358 | 90.73 - 49 | 04.793 - 702 | 58.32 + 0 |
| 6 | 19.7 | 44.420 - 84 | 15.04 + 71 | 52.233 - 152 | 33.11 + 94 | 09.097 - 321 | 89.74 - 99 | 04.118 - 675 | 57.75 + 57 |
| 6 | 29.7 | 44.351 - 69 | 14.27 + 77 | 52.097 - 136 | 31.85 + 126 | 08.821 - 276 | 88.33 - 141 | 03.484 - 634 | 56.69 + 106 |
| 7 | 9.6 | 44.297 - 54 | 13.45 + 82 | 51.979 - 118 | 30.26 + 159 | 08.594 - 227 | 86.50 - 183 | 02.903 - 581 | 55.12 + 157 |
| 7 | 19.6 | 44.264 - 33 | 12.62 + 83 | 51.888 - 91 | 28.42 + 184 | 08.429 - 165 | 84.28 - 222 | 02.401 - 502 | 53.10 + 202 |
| 7 | 29.6 | 44.252 - 12 | 11.82 + 80 | 51.823 - 65 | 26.38 + 204 | 08.325 - 104 | 81.77 - 251 | 01.987 - 414 | 50.73 + 237 |
| 8 | 8.6 | 44.261 + 9 | 11.05 + 77 | 51.788 - 35 | 24.19 + 219 | 08.285 - 40 | 78.97 - 280 | 01.675 - 312 | 48.02 + 271 |
| 8 | 18.5 | 44.297 + 36 | 10.40 + 65 | 51.791 + 3 | 21.95 + 224 | 08.318 + 33 | 75.95 - 302 | 01.488 - 187 | 45.11 + 291 |
| 8 | 28.5 | 44.358 + 61 | 09.89 + 51 | 51.830 + 39 | 19.74 + 221 | 08.418 + 100 | 72.80 - 315 | 01.423 - 65 | 42.09 + 302 |
| 9 | 7.5 | 44.449 + 91 | 09.52 + 37 | 51.912 + 82 | 17.63 + 211 | 08.592 + 174 | 69.52 - 328 | 01.495 + 72 | 39.04 + 305 |
| 9 | 17.4 | 44.574 + 125 | 09.38 + 14 | 52.038 + 126 | 15.74 + 189 | 08.841 + 249 | 66.22 - 330 | 01.711 + 216 | 36.12 + 292 |
| 9 | 27.4 | 44.730 + 156 | 09.50 - 12 | 52.209 + 171 | 14.13 + 161 | 09.159 + 318 | 62.95 - 327 | 02.059 + 348 | 33.42 + 270 |
| 10 | 7.4 | 44.922 + 192 | 09.91 - 41 | 52.426 + 217 | 12.88 + 125 | 09.553 + 394 | 59.75 - 320 | 02.543 + 484 | 31.04 + 238 |
| 10 | 17.4 | 45.149 + 227 | 10.65 - 74 | 52.688 + 262 | 12.10 + 78 | 10.016 + 463 | 56.73 - 302 | 03.149 + 606 | 29.13 + 191 |
| 10 | 27.3 | 45.406 + 257 | 11.68 -103 | 52.988 + 300 | 11.80 + 30 | 10.541 + 525 | 53.93 - 280 | 03.856 + 707 | 27.72 + 141 |
| 11 | 6.3 | 45.695 + 289 | 13.04 -136 | 53.968 + 338 | 12.04 - 24 | 11.128 + 587 | 51.42 - 251 | 04.651 + 795 | 26.91 + 81 |
| 11 | 16.3 | 46.007 + 312 | 14.67 -163 | 53.320 + 364 | 12.84 - 80 | 11.761 + 633 | 49.29 - 213 | 05.500 + 849 | 26.76 + 15 |
| 11 | 26.3 | 46.336 + 329 | 16.55 -188 | 54.070 + 380 | 14.15 -131 | 12.428 + 667 | 47.59 - 170 | 06.376 + 876 | 27.26 - 50 |
| 12 | 6.2 | 46.675 + 339 | 18.62 -207 | 54.459 + 389 | 15.99 -184 | 13.118 + 690 | 46.37 - 122 | 07.256 + 880 | 28.43 -117 |
| 12 | 16.2 | 47.012 + 337 | 20.82 -220 | 54.840 + 381 | 18.28 -229 | 13.805 + 687 | 45.70 - 67 | 08.098 + 842 | 30.24 -181 |
| 12 | 26.2 | 47.338 + 326 | 23.07 -225 | 55.204 + 364 | 20.94 -266 | 14.473 + 688 | 45.56 - 14 | 08.880 + 782 | 32.61 -237 |
| 12 | 36.1 | 47.643 + 305 | 25.32 -225 | 55.538 + 334 | 23.92 -298 | 15.102 + 629 | 46.00 + 44 | 09.578 + 698 | 35.50 -289 |
| | | + 273 | -216 | + 293 | -318 | + 564 | + 99 | + 583 | -331 |
| Mean Place | 45.532 | 19.98 | 53.734 | 27.95 | 10.116 | 66.35 | 07.788 | 46.26 | |
| sec δ, tan δ | +1.002 | -0.070 | +1.268 | -0.780 | +2.424 | +2.208 | +3.620 | -3.479 | |
| dα(ψ), dδ(ψ) | +0.060 | -0.36 | +0.053 | -0.36 | +0.085 | -0.36 | +0.024 | -0.36 | |
| dα(ε), dδ(ε) | -0.004 | +0.41 | -0.047 | +0.41 | +0.134 | +0.41 | -0.212 | +0.41 | |
| Dble.Trans. | February 26 | | February 26 | | February 26 | | February 26 | | |

APPARENT PLACES OF STARS, 1986

161

AT UPPER TRANSIT AT GREENWICH

| No. | 389 | | 392 | | 390 | | 393 | |
|---------------------|-------------|------------|-------------|-------------|------------------|------------|----------------|------------|
| | μ Hydrae | | α Antliae | | β Leonis Minoris | | 196 G. Carinae | |
| Mag. Spect. | 4.06 | K5 | 4.42 | K5 | 4.41 | K0 | 4.08 | F0 |
| U.T. | R.A. | | R.A. | | R.A. | | R.A. | |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " |
| | 10 25 | - 16 45 | 10 26 | - 30 59 | 10 27 | + 36 46 | 10 27 | - 58 39 |
| 1 ^d -8.8 | 24.570 +335 | 40 14 -241 | 30.404 +354 | 29 77. -250 | 04.840 +401 | " -125 | 21.671 +492 | 41.02 -236 |
| 1 ^s 1.2 | 24.884 +314 | 42 68 -264 | 30.735 +331 | 29 77. -275 | 05.222 +382 | " -87 | 22.122 +451 | 41.02 -281 |
| 1 11.1 | 25.171 +287 | 45 28 -260 | 31.035 +300 | 32 52 -295 | 05.272 +354 | 40 06 -48 | 22.522 +400 | 43.83 -321 |
| 1 21.1 | 25.419 +248 | 47 88 -260 | 31.292 +257 | 35 47 -307 | 05.576 +312 | 39 58 -4 | 22.855 +333 | 47.04 -351 |
| 1 31.1 | 25.624 +205 | 50 38 -250 | 31.501 +209 | 38 54 -305 | 05.888 +262 | 39 54 +34 | 23.114 +259 | 50.55 -368 |
| 2 10.0 | 25.781 +157 | 52 75 -237 | 31.659 +158 | 41 59 -302 | 06.150 +207 | 39 88 +72 | 23.266 +184 | 54.23 -380 |
| 2 20.0 | 25.888 +107 | 54 91 -216 | 31.763 +104 | 44 61 -287 | 06.357 +144 | 40 60 +104 | 23.298 +101 | 58.03 -378 |
| 3 2.0 | 25.948 +60 | 56 84 -193 | 31.816 +53 | 47 48 -267 | 06.501 +86 | 41 64 +128 | 23.399 +27 | 61.81 -368 |
| 3 12.0 | 25.963 +15 | 58 54 -170 | 31.821 +5 | 50 15 -246 | 06.587 +30 | 42 92 +146 | 23.426 -46 | 65.49 -353 |
| 3 21.9 | 25.938 -25 | 59 95 -141 | 31.782 -39 | 52 61 -215 | 06.617 -25 | 44 38 +156 | 23.380 -114 | 69.02 -326 |
| 3 31.9 | 25.881 -57 | 61 09 -114 | 31.709 -73 | 54 76 -185 | 06.592 -66 | 45 94 +157 | 23.266 -168 | 72.28 -295 |
| 4 10.9 | 25.796 -85 | 61 09 -87 | 31.606 -103 | 56 61 -154 | 06.526 -104 | 47 51 +152 | 23.098 -218 | 75.23 -261 |
| 4 20.9 | 25.693 -103 | 61 96 -58 | 31.606 -125 | 58 15 -117 | 06.422 -130 | 49 03 +139 | 22.880 -257 | 77.84 -218 |
| 4 30.8 | 25.578 -115 | 62 54 -33 | 31.481 -138 | 59 32 -83 | 06.292 -146 | 50 42 +119 | 22.623 -284 | 80.02 -174 |
| 5 10.8 | 25.456 -122 | 62 87 -7 | 31.343 -149 | 60 15 -48 | 06.146 -155 | 51 61 +99 | 22.339 -307 | 81.76 -128 |
| 5 20.8 | 25.334 -122 | 62 94 +19 | 31.194 -150 | 60 63 -10 | 05.991 -155 | 52 60 +72 | 22.032 -318 | 83.04 -76 |
| 5 30.7 | 25.216 -118 | 62 75 +42 | 31.044 -146 | 60 73 +23 | 05.835 -148 | 53 32 +44 | 21.714 -319 | 83.80 -28 |
| 6 9.7 | 25.106 -110 | 62 33 +64 | 30.898 -142 | 60 50 +58 | 05.687 -137 | 53 76 +15 | 21.395 -316 | 84.08 +23 |
| 6 19.7 | 25.007 -99 | 61 69 +85 | 30.756 -128 | 59 92 +91 | 05.550 -119 | 53 91 -14 | 21.079 -301 | 83.85 +75 |
| 6 29.7 | 24.924 -83 | 60 84 +101 | 30.628 -114 | 59 01 +119 | 05.431 -97 | 53 77 -43 | 20.778 -279 | 83.10 +119 |
| 7 9.6 | 24.855 -69 | 58 66 +117 | 30.417 -97 | 57 82 +146 | 05.334 -76 | 53 34 -70 | 20.499 -253 | 81.91 +164 |
| 7 19.6 | 24.808 -47 | 57 38 +128 | 30.342 -75 | 56 36 +168 | 05.258 -47 | 52 64 -98 | 20.246 -213 | 80.27 +203 |
| 7 29.6 | 24.781 -27 | 57 38 +133 | 30.342 -50 | 54 68 +182 | 05.211 -20 | 51 66 -121 | 20.033 -171 | 78.24 +234 |
| 8 8.6 | 24.778 -3 | 56 05 +137 | 30.292 -24 | 52 86 +195 | 05.191 +8 | 50 45 -145 | 19.862 -121 | 75.90 +261 |
| 8 18.5 | 24.803 +25 | 54 68 +132 | 30.268 +10 | 50 91 +196 | 05.199 +42 | 49 00 -167 | 19.741 -60 | 73.29 +276 |
| 8 28.5 | 24.855 +52 | 53 36 +123 | 30.278 +41 | 48 95 +191 | 05.241 +74 | 47 33 -185 | 19.681 +0 | 70.53 +281 |
| 9 7.5 | 24.940 +85 | 52 13 +107 | 30.319 +80 | 47 04 +181 | 05.315 +109 | 45 48 -204 | 19.681 +69 | 67.72 +281 |
| 9 17.4 | 25.060 +120 | 51 06 +85 | 30.399 +121 | 45 23 +158 | 05.424 +149 | 43 44 -218 | 19.750 +142 | 64.91 +263 |
| 9 27.4 | 25.214 +154 | 50 21 +57 | 30.520 +160 | 43 65 +130 | 05.573 +184 | 41 26 -229 | 19.892 +212 | 62.28 +238 |
| 10 7.4 | 25.407 +193 | 49 64 +25 | 30.680 +203 | 42 35 +95 | 05.757 +226 | 38 97 -238 | 20.104 +285 | 59.90 +204 |
| 10 17.4 | 25.635 +228 | 49 39 -14 | 30.883 +245 | 41 40 +50 | 05.983 +266 | 36 59 -242 | 20.389 +351 | 57.86 +157 |
| 10 27.3 | 25.898 +263 | 49 53 -53 | 31.128 +281 | 40 90 +6 | 06.249 +303 | 34 17 -240 | 20.740 +409 | 56.29 +105 |
| 11 6.3 | 26.192 +294 | 50 06 -93 | 31.409 +317 | 40 84 +45 | 06.552 +339 | 31 77 -236 | 21.149 +462 | 55.24 +46 |
| 11 16.3 | 26.511 +319 | 50 99 -135 | 31.726 +343 | 41 29 -96 | 06.891 +368 | 29 41 -223 | 21.611 +497 | 54.78 -19 |
| 11 26.3 | 26.846 +335 | 52 34 -169 | 32.069 +360 | 42 25 -143 | 07.259 +390 | 27 18 -204 | 22.108 +518 | 54.97 -80 |
| 12 6.2 | 27.192 +346 | 54 03 -204 | 32.429 +369 | 43 68 -190 | 07.649 +405 | 25 14 -181 | 22.626 +525 | 55.77 -144 |
| 12 16.2 | 27.534 +342 | 56 07 -229 | 32.798 +364 | 45 58 -229 | 08.054 +405 | 23 33 -148 | 23.151 +511 | 57.21 -203 |
| 12 26.2 | 27.864 +330 | 58 36 -247 | 33.162 +349 | 47 87 -261 | 08.459 +396 | 21 85 -115 | 23.662 +482 | 59.24 -254 |
| 12 36.1 | 28.172 +308 | 60 83 -261 | 33 511 +324 | 50 48 -287 | 08 855 +375 | 20 70 -74 | 24 144 +439 | 61 78 -301 |
| | +274 | 63 44 -262 | 33.835 +285 | 53 35 -302 | 09.230 +339 | 19 96 -33 | 24.583 +377 | 64.79 -335 |
| Mean Place | 26.211 | 61.64 | 31.996 | 55.55 | 06.342 | 36.32 | 22.891 | 73.33 |
| sec δ, tan δ | +1.044 | -0.301 | +1.167 | -0.601 | +1.248 | +0.747 | +1.923 | -1.643 |
| dα(ψ), dδ(ψ) | +0.058 | -0.36 | +0.055 | -0.37 | +0.069 | -0.37 | +0.044 | -0.37 |
| dα(ε), dδ(ε) | -0.018 | +0.40 | -0.037 | +0.40 | +0.046 | +0.39 | -0.101 | +0.39 |
| Dbble. Trans. | February 26 | | February 27 | | February 27 | | February 27 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 1270 | | 1271 | | 394 | | 1272 | |
|--------------|---------------------------------------|--|---------------------------------------|---|---------------------------------------|---|---------------------------------------|---|
| | δ Sextantis | | B.D. + 29° 2057 (Leonis Minoris) | | 36 Ursae Majoris | | 46 Leonis | |
| Mag. Spect. | 5.24 | B9 | 6.92 | K0 | 4.84 | F5 | 5.74 | M0 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | ^h ^m 10 28 | ^o ['] - 2 39 | ^h ^m 10 29 | ^o ['] + 28 38 | ^h ^m 10 29 | ^o ['] + 56 02 | ^h ^m 10 31 | ^o ['] + 14 12 |
| 1 -8.8 | ^s 45 877 + 333 | 54.18 -221 | ^s 06 826 + 375 | 69.04 -150 | ^s 44 958 + 531 | 60.63 -69 | ^s 26 937 + 346 | 35.63 -188 |
| 1 1.2 | 46.191 + 314 | 56.38 -220 | 07.183 + 357 | 67.85 -119 | 45.465 + 507 | 60.46 -17 | 27.266 + 329 | 33.93 -170 |
| 1 11.1 | 46.481 + 290 | 58.52 -214 | 07.514 + 331 | 66.99 -86 | 45.936 + 471 | 60.80 + 34 | 27.572 + 306 | 32.44 -149 |
| 1 21.1 | 46.734 + 253 | 60.53 -201 | 07.806 + 292 | 66.52 -47 | 46.349 + 413 | 61.66 + 86 | 27.840 + 268 | 31.22 -122 |
| 1 31.1 | 46.945 + 211 | 62.35 -182 | 08.052 + 246 | 66.41 -11 | 46.696 + 347 | 62.97 +131 | 28.067 + 227 | 30.30 -92 |
| 2 10.0 | 47.111 + 166 | 63.97 -162 | 08.247 + 195 | 66.65 + 24 | 46.968 + 272 | 64.68 +171 | 28.247 + 180 | 29.66 -64 |
| 2 2.0 | 47.227 + 116 | 65.33 -136 | 08.385 + 138 | 67.21 + 56 | 47.155 + 187 | 66.71 +203 | 28.375 + 128 | 29.33 -33 |
| 3 20.0 | 47.297 + 70 | 66.44 -111 | 08.470 + 85 | 68.02 + 81 | 47.260 + 105 | 68.94 +223 | 28.455 + 80 | 29.27 -6 |
| 3 12.0 | 47.324 - 27 | 67.31 -87 | 08.502 + 32 | 69.04 +102 | 47.284 + 24 | 71.30 +237 | 28.489 - 10 | 29.43 + 37 |
| 3 21.9 | 47.309 - 15 | 67.92 -61 | 08.486 - 16 | 70.21 +117 | 47.230 - 54 | 73.67 | 28.479 - 10 | 29.80 |
| 3 31.9 | 47.263 - 46 | 68.31 -39 | 08.432 - 54 | 71.42 +121 | 47.113 - 117 | 75.92 +225 | 28.436 - 43 | 30.31 + 51 |
| 4 10.9 | 47.190 - 73 | 68.50 -19 | 08.345 - 87 | 72.65 +123 | 46.941 - 172 | 78.01 +209 | 28.363 - 73 | 30.93 + 62 |
| 4 20.9 | 47.098 - 92 | 68.50 + 0 | 08.233 - 112 | 73.82 +117 | 46.725 - 216 | 79.81 +180 | 28.269 - 94 | 31.61 + 68 |
| 4 30.8 | 46.995 - 103 | 68.35 + 15 | 08.108 - 125 | 74.87 +105 | 46.484 - 241 | 81.27 +146 | 28.164 - 105 | 32.29 + 68 |
| 5 10.8 | 46.885 - 110 | 68.06 + 29 | 07.974 - 134 | 75.79 + 92 | 46.224 - 260 | 82.36 +109 | 28.051 - 113 | 32.98 + 69 |
| 5 20.8 | 46.775 - 110 | 67.63 + 43 | 07.841 - 133 | 76.51 + 72 | 45.961 - 263 | 83.02 + 66 | 27.937 - 114 | 33.62 + 64 |
| 5 30.7 | 46.671 - 104 | 67.12 + 51 | 07.714 - 127 | 77.03 + 52 | 45.706 - 255 | 83.24 + 22 | 27.830 - 107 | 34.19 + 57 |
| 6 9.7 | 46.573 - 98 | 66.50 + 62 | 07.596 - 118 | 77.34 + 31 | 45.466 - 240 | 83.03 - 21 | 27.730 - 100 | 34.69 + 50 |
| 6 19.7 | 46.488 - 85 | 65.82 + 68 | 07.495 - 101 | 77.41 + 7 | 45.251 - 215 | 82.38 - 65 | 27.644 - 86 | 35.09 + 40 |
| 6 29.7 | 46.417 - 71 | 65.10 + 72 | 07.412 - 83 | 77.26 - 15 | 45.067 - 184 | 81.32 - 106 | 27.573 - 71 | 35.38 + 29 |
| 7 9.6 | 46.361 - 56 | 64.33 + 77 | 07.348 - 64 | 76.90 - 36 | 44.917 - 150 | 79.88 -144 | 27.518 - 55 | 35.57 + 19 |
| 7 19.6 | 46.325 - 36 | 63.57 + 76 | 07.309 - 39 | 76.30 - 60 | 44.810 - 107 | 78.07 -181 | 27.485 - 33 | 35.63 + 6 |
| 7 29.6 | 46.309 - 16 | 62.84 + 73 | 07.293 - 16 | 75.50 - 80 | 44.745 - 65 | 75.97 -210 | 27.472 - 13 | 35.55 - 8 |
| 8 8.6 | 46.314 + 5 | 62.16 + 68 | 07.304 + 11 | 74.50 -100 | 44.724 - 21 | 73.58 -239 | 27.481 + 9 | 35.33 - 22 |
| 8 18.5 | 46.345 + 31 | 61.60 + 56 | 07.344 + 40 | 73.29 -121 | 44.755 + 31 | 70.96 -262 | 27.518 + 37 | 34.95 - 38 |
| 8 28.5 | 46.401 + 56 | 61.17 + 43 | 07.411 + 67 | 71.89 -140 | 44.833 + 78 | 68.17 -279 | 27.577 + 59 | 34.49 - 46 |
| 9 7.5 | 46.486 + 85 | 60.90 + 27 | 07.512 + 101 | 70.29 -160 | 44.964 + 131 | 65.22 -295 | 27.664 + 87 | 33.67 - 82 |
| 9 17.4 | 46.605 + 119 | 60.84 + 6 | 07.648 + 136 | 68.53 -176 | 45.151 + 187 | 62.20 -302 | 27.788 + 124 | 32.70 - 97 |
| 9 27.4 | 46.756 + 151 | 61.03 - 19 | 07.819 + 171 | 66.62 -191 | 45.389 + 238 | 59.16 -304 | 27.943 + 155 | 31.54 -116 |
| 10 7.4 | 46.943 + 187 | 61.52 - 49 | 08.027 + 208 | 64.57 -205 | 45.684 + 295 | 56.12 -304 | 28.134 + 191 | 30.17 -137 |
| 10 17.4 | 47.165 + 222 | 62.31 - 79 | 08.273 + 246 | 62.43 -214 | 46.034 + 350 | 53.19 -293 | 28.360 + 226 | 28.61 -156 |
| 10 27.3 | 47.419 + 254 | 63.40 -109 | 08.554 + 281 | 60.23 -220 | 46.432 + 398 | 50.40 -279 | 28.619 + 259 | 26.87 -174 |
| 11 6.3 | 47.704 + 285 | 64.79 -139 | 08.869 + 315 | 58.00 -223 | 46.880 + 448 | 47.83 -257 | 28.910 + 291 | 24.97 -190 |
| 11 16.3 | 48.014 + 310 | 66.46 -167 | 09.212 + 343 | 55.82 -218 | 47.366 + 496 | 45.57 -226 | 29.227 + 317 | 22.97 -200 |
| 11 26.3 | 48.342 + 328 | 68.35 -189 | 09.576 + 364 | 53.74 -208 | 47.881 + 515 | 43.65 -192 | 29.564 + 337 | 20.92 -205 |
| 12 6.2 | 48.682 + 340 | 70.43 -208 | 09.954 + 378 | 51.82 -192 | 48.416 + 535 | 42.15 -150 | 29.914 + 350 | 18.87 -205 |
| 12 16.2 | 49.020 + 338 | 72.61 -218 | 10.333 + 379 | 50.13 -169 | 48.951 + 535 | 41.14 -101 | 30.264 + 350 | 16.90 -197 |
| 12 26.2 | 49.348 + 328 | 74.84 -223 | 10.703 + 370 | 48.71 -142 | 49.475 + 524 | 40.61 - 53 | 30.606 + 342 | 15.06 -184 |
| 12 36.1 | 49.657 + 309 | 77.06 -222 | 11.053 + 350 | 47.63 -108 | 49.971 + 496 | 40.61 + 0 | 30.930 + 324 | 13.40 -166 |
| | + 277 | -211 | + 317 | - 73 | + 448 | + 53 | + 292 | -140 |
| Mean Place | 47.559 | 71.04 | 08.410 | 62.25 | 46.127 | 60.52 | 28.602 | 24.40 |
| sec δ, tan δ | +1.001 | -0.047 | +1.140 | +0.546 | +1.791 | +1.485 | +1.032 | +0.253 |
| dα(ψ), dδ(ψ) | +0.061 | -0.37 | +0.067 | -0.37 | +0.076 | -0.37 | +0.064 | -0.37 |
| dα(ε), dδ(ε) | -0.003 | +0.39 | +0.034 | +0.39 | +0.091 | +0.38 | +0.016 | +0.38 |
| Dble. Trans. | February 27 | | February 27 | | February 27 | | February 28 | |

AT UPPER TRANSIT AT GREENWICH

| No. | 397 | | 396 | | 1273 | | 399 | |
|--------------|----------------|-------------|--------------|-------------|----------------|-------------|--------------|-------------|
| Name | 203 G. Carinae | | ρ Leonis | | 219 G. Velorum | | 44 Hydrae | |
| Mag. Spect. | 3.58 | B5p | 3.85 | B0p | 5.14 | K0 | 5.32 | K2 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° ' | h m | ° ' | h m | ° ' | h m | ° ' |
| | 10 31 | -61 36 | 10 32 | + 9 22 | 10 32 | -46 55 | 10 33 | -23 40 |
| 1 -8.8 | 31 322 + 529 | 23.71 -228 | 04 375 + 340 | 47.68 -199 | 21.133 + 410 | 31.08 -242 | 20 610 + 345 | 07.58 -244 |
| 1 1.2 | 31 808 + 486 | 26.46 -275 | 04 699 + 324 | 45.82 -186 | 21 515 + 382 | 33.88 -280 | 20 934 + 324 | 10.21 -263 |
| 1 11.1 | 32 240 + 432 | 29.62 -316 | 05 000 + 301 | 44.13 -169 | 21 859 + 344 | 37.02 -314 | 21 232 + 298 | 12.98 -277 |
| 1 21.1 | 32 600 + 360 | 33.12 -350 | 05 264 + 264 | 42.67 -146 | 22 151 + 292 | 40.40 -338 | 21 490 + 258 | 15.80 -282 |
| 1 31.1 | 32 881 + 281 | 36.81 -369 | 05 486 + 222 | 41.48 -119 | 22 385 + 234 | 43.88 -348 | 21 703 + 213 | 18.58 -278 |
| 2 10.1 | 33 081 + 200 | 40.63 -382 | 05 662 + 176 | 40.56 -92 | 22 561 + 176 | 47.42 -354 | 21 869 + 166 | 21.28 -270 |
| 2 20.0 | 33 193 + 112 | 44.47 -384 | 05 788 + 126 | 39.92 -64 | 22 670 + 109 | 50.91 -349 | 21 983 + 114 | 23.81 -253 |
| 3 2.0 | 33 223 + 30 | 48.22 -375 | 05 867 + 79 | 39.56 -36 | 22 720 + 50 | 54.25 -334 | 22 049 + 66 | 26.13 -232 |
| 3 12.0 | 33 175 - 48 | 51.83 -361 | 05 900 + 33 | 39.43 -13 | 22 713 - 7 | 57.42 -317 | 22 069 + 20 | 28.22 -209 |
| 3 21.9 | 33 053 - 122 | 55.20 -337 | 05 891 - 9 | 39.52 + 9 | 22 653 - 60 | 60.31 -289 | 22 046 - 23 | 30.03 -181 |
| 3 31.9 | 32 871 - 182 | 58.27 -307 | 05 849 - 42 | 39.77 + 25 | 22 549 - 104 | 62.88 -257 | 21 991 - 55 | 31.54 -151 |
| 4 10.9 | 32 634 - 237 | 61.00 -273 | 05 779 - 70 | 40.16 + 39 | 22 408 - 141 | 65.12 -224 | 21 907 - 84 | 32.78 -124 |
| 4 20.9 | 32 352 - 282 | 63.31 -231 | 05 688 - 91 | 40.65 + 49 | 22 237 - 171 | 66.96 -184 | 21 801 - 106 | 33.68 -90 |
| 4 30.8 | 32 039 - 313 | 65.18 -187 | 05 586 - 102 | 41.20 + 55 | 22 046 - 191 | 68.38 -142 | 21 682 - 119 | 34.29 -61 |
| 5 10.8 | 31 699 - 340 | 66.58 -140 | 05 476 - 110 | 41.78 + 58 | 21 839 - 207 | 69.38 -100 | 21 554 - 128 | 34.60 -31 |
| 5 20.8 | 31 345 - 354 | 67.47 -89 | 05 366 - 110 | 42.37 + 59 | 21 626 - 213 | 69.91 -53 | 21 423 - 131 | 34.58 + 2 |
| 5 30.7 | 30 989 - 356 | 67.86 -39 | 05 262 - 104 | 42.93 + 56 | 21 413 - 213 | 70.01 -10 | 21 296 - 127 | 34.30 + 28 |
| 6 9.7 | 30 632 - 357 | 67.73 + 13 | 05 164 - 98 | 43.47 + 54 | 21 202 - 211 | 69.66 + 35 | 21 173 - 123 | 33.72 + 58 |
| 6 19.7 | 30 291 - 341 | 67.08 + 65 | 05 080 - 84 | 43.96 + 49 | 21 004 - 198 | 68.86 + 80 | 21 062 - 111 | 32.88 + 84 |
| 6 29.7 | 29 971 - 320 | 65.96 + 112 | 05 011 - 69 | 44.39 + 43 | 20 822 - 182 | 67.67 + 119 | 20 963 - 99 | 31.81 + 107 |
| 7 9.6 | 29 679 - 292 | 64.38 + 158 | 04 956 - 55 | 44.75 + 36 | 20 659 - 163 | 66.09 + 158 | 20 879 - 84 | 30.53 + 128 |
| 7 19.6 | 29 429 - 250 | 62.39 + 199 | 04 922 - 34 | 45.01 + 26 | 20 524 - 135 | 64.19 + 190 | 20 816 - 63 | 29.08 + 145 |
| 7 29.6 | 29 225 - 204 | 60.07 + 232 | 04 908 - 14 | 45.17 + 16 | 20 419 - 105 | 62.03 + 216 | 20 774 - 42 | 27.53 + 155 |
| 8 8.6 | 29 076 - 149 | 57.46 + 261 | 04 916 + 8 | 45.22 + 5 | 20 349 - 70 | 59.66 + 237 | 20 755 - 19 | 25.89 + 164 |
| 8 18.5 | 28 993 - 83 | 54.68 + 278 | 04 951 + 35 | 45.09 - 13 | 20 322 - 27 | 57.17 + 249 | 20 767 + 12 | 24.27 + 162 |
| 8 28.5 | 28 977 - 16 | 51.82 + 286 | 05 030 + 79 | 44.75 - 34 | 20 339 + 17 | 54.67 + 250 | 20 807 + 40 | 22.71 + 156 |
| 9 7.5 | 29 037 + 60 | 48.95 + 287 | 05 091 + 61 | 44.40 - 35 | 20 406 + 67 | 52.22 + 245 | 20 881 + 74 | 21.27 + 144 |
| 9 17.4 | 29 178 + 141 | 46.23 + 272 | 05 213 + 122 | 43.71 - 69 | 20 527 + 121 | 49.95 + 227 | 20 994 + 113 | 20.05 + 122 |
| 9 27.4 | 29 395 + 217 | 43.75 + 248 | 05 365 + 152 | 42.83 - 88 | 20 700 + 173 | 47.95 + 200 | 21 142 + 148 | 19.10 + 95 |
| 10 7.4 | 29 693 + 298 | 41.60 + 215 | 05 553 + 188 | 41.70 - 113 | 20 929 + 229 | 46.28 + 167 | 21 332 + 190 | 18.49 + 61 |
| 10 17.4 | 30 065 + 372 | 39.91 + 169 | 05 775 + 222 | 40.35 - 135 | 21 210 + 281 | 45.09 + 119 | 21 561 + 229 | 18.28 + 21 |
| 10 27.3 | 30 500 + 435 | 38.73 + 118 | 06 030 + 255 | 38.79 - 156 | 21 537 + 327 | 44.38 + 71 | 21 826 + 265 | 18.48 - 20 |
| 11 6.3 | 30 993 + 493 | 38.14 + 59 | 06 317 + 287 | 37.02 - 177 | 21 907 + 370 | 44.24 + 14 | 22 126 + 300 | 19.15 - 67 |
| 11 16.3 | 31 526 + 533 | 38.20 - 6 | 06 630 + 313 | 35.11 - 191 | 22 308 + 401 | 44.70 - 46 | 22 451 + 325 | 20.27 - 112 |
| 11 26.3 | 32 081 + 555 | 38.88 - 68 | 06 962 + 332 | 33.09 - 202 | 22 730 + 422 | 45.73 - 103 | 22 795 + 344 | 21.80 - 153 |
| 12 6.2 | 32 647 + 566 | 40.21 - 133 | 07 306 + 344 | 31.01 - 208 | 23 161 + 431 | 47.34 - 161 | 23 151 + 356 | 23.74 - 194 |
| 12 16.2 | 33 196 + 549 | 42.15 - 194 | 07 652 + 346 | 28.97 - 204 | 23 584 + 423 | 49.47 - 213 | 23 503 + 352 | 26.01 - 227 |
| 12 26.2 | 33 715 + 519 | 44.61 - 246 | 07 988 + 336 | 27.00 - 197 | 23 989 + 405 | 52.05 - 258 | 23 844 + 341 | 28.53 - 252 |
| 12 36.1 | 34 188 + 473 | 47.56 - 295 | 08 307 + 319 | 25.17 - 183 | 24 362 + 373 | 55.03 - 298 | 24 163 + 319 | 31.25 - 272 |
| | + 408 | - 332 | + 287 | - 162 | + 326 | - 325 | + 284 | - 282 |
| Mean Place | 32.534 | 56.62 | 06.059 | 34.86 | 22.654 | 61.13 | 22.297 | 31.27 |
| sec δ, tan δ | +2.104 | -1.851 | +1.014 | +0.165 | +1.464 | -1.070 | +1.092 | -0.438 |
| dα(ψ), dδ(ψ) | +0.043 | -0.37 | +0.063 | -0.37 | +0.051 | -0.37 | +0.057 | -0.37 |
| dα(ε), dδ(ε) | -0.114 | +0.38 | +0.010 | +0.37 | -0.066 | +0.37 | -0.027 | +0.37 |
| Dble. Trans. | February 28 | | February 28 | | February 28 | | February 28 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 395 | | 398 | | 401 | | 1274 | | |
|--------------|---------------|--------------|------------------|--------------|-----------------|--------------|---------------|--------------|------------|
| | 9 H. Draconis | | 37 Ursae Majoris | | γ Chamaeleontis | | 236 G. Hydrae | | |
| Mag.Spect. | 5.04 | G5 | 5.16 | F0 | 4.10 | M0 | 5.85 | F8 | |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " | |
| | 10 33 | +75 46 | 10 34 | +57 08 | 10 35 | -78 31 | 10 35 | -12 09 | |
| 1 | -8.8 | 58.396 +1069 | 55.93 - 17 | 16.760 + 546 | 68.82 - 72 | 19.019 +1095 | 40.34 -193 | 50.264 + 336 | 06 64 -235 |
| 1 | 1.2 | 59.415 +1019 | 56.36 + 43 | 17.283 + 523 | 68.62 - 20 | 20.011 + 992 | 42.81 -247 | 50.582 + 318 | 09.09 -245 |
| 1 | 11.1 | 60.362 + 947 | 57.37 +101 | 17.770 + 487 | 68.95 + 33 | 20.882 + 871 | 45.76 -295 | 50.876 + 294 | 11.56 -247 |
| 1 | 21.1 | 61.192 + 830 | 58.96 +159 | 18.200 + 430 | 69.81 + 86 | 21.589 + 707 | 49.13 -337 | 51.133 + 257 | 13.99 -243 |
| 1 | 31.1 | 61.883 + 691 | 61.00 +204 | 18.562 + 362 | 71.13 +132 | 22.122 + 533 | 52.78 -365 | 51.347 + 214 | 16.30 -231 |
| 2 | 10.1 | 62.420 + 537 | 63.45 +245 | 18.849 + 287 | 72.85 +172 | 22.478 + 356 | 56.64 -386 | 51.517 + 170 | 18.46 -216 |
| 2 | 20.0 | 62.775 + 355 | 66.20 +275 | 19.049 + 200 | 74.92 +207 | 22.638 + 160 | 60.60 -396 | 51.637 + 120 | 20.40 -194 |
| 3 | 2.0 | 62.952 + 177 | 69.09 +289 | 19.165 + 116 | 77.19 +227 | 22.617 - 19 | 64.54 -394 | 51.710 + 73 | 22.10 -170 |
| 3 | 12.0 | 62.951 - 1 | 72.05 +296 | 19.198 + 33 | 79.60 +241 | 22.420 - 21 | 68.43 -389 | 51.740 + 30 | 23.56 -146 |
| 3 | 21.9 | 62.773 - 178 | 74.93 +288 | 19.150 - 48 | 82.02 +242 | 22.051 - 369 | 72.13 -370 | 51.729 - 11 | 24.75 -119 |
| 3 | 31.9 | 62.448 - 325 | 77.60 +267 | 19.037 - 113 | 84.33 +231 | 21.539 - 512 | 75.58 -345 | 51.685 - 44 | 25.68 - 93 |
| 4 | 10.9 | 61.987 - 461 | 80.00 +240 | 18.865 - 172 | 86.47 +214 | 20.890 - 649 | 78.73 -315 | 51.615 - 70 | 26.37 - 69 |
| 4 | 20.9 | 61.416 - 571 | 81.99 +199 | 18.647 - 218 | 88.34 +187 | 20.124 - 786 | 81.49 -276 | 51.523 - 92 | 26.80 - 43 |
| 4 | 30.8 | 60.774 - 642 | 83.52 +153 | 18.401 - 246 | 89.85 +151 | 19.271 - 853 | 83.81 -232 | 51.420 - 103 | 27.02 - 22 |
| 5 | 10.8 | 60.076 - 698 | 84.57 +105 | 18.134 - 267 | 91.00 +115 | 18.339 - 932 | 85.68 -187 | 51.308 - 112 | 27.01 + 1 |
| 5 | 20.8 | 59.356 - 720 | 85.05 + 48 | 17.862 - 272 | 91.70 + 70 | 17.356 - 983 | 87.01 -133 | 51.195 - 113 | 26.78 + 23 |
| 5 | 30.8 | 58.647 - 709 | 84.99 - 6 | 17.598 - 264 | 91.97 + 27 | 16.353 -1003 | 87.83 - 82 | 51.085 - 110 | 26.38 + 40 |
| 6 | 9.7 | 57.959 - 688 | 84.40 - 59 | 18.962 - 253 | 91.80 - 17 | 15.337 -1016 | 88.09 + 26 | 50.981 - 104 | 25.79 + 59 |
| 6 | 19.7 | 57.326 - 633 | 83.26 -114 | 17.345 - 227 | 91.16 - 64 | 14.347 - 990 | 87.78 + 31 | 50.887 - 94 | 25.04 + 75 |
| 6 | 29.7 | 56.762 - 564 | 81.65 -161 | 17.118 - 196 | 90.12 -104 | 13.404 - 943 | 86.96 + 82 | 50.807 - 80 | 24.17 + 87 |
| 7 | 9.6 | 56.277 - 485 | 79.58 -207 | 16.759 - 163 | 88.68 -144 | 12.526 - 878 | 85.60 +136 | 50.740 - 67 | 23.18 + 99 |
| 7 | 19.6 | 55.894 - 383 | 77.10 -248 | 16.640 - 119 | 86.87 -181 | 11.752 - 774 | 83.77 +183 | 50.693 - 47 | 22.11 +107 |
| 7 | 29.6 | 55.615 - 279 | 74.29 -281 | 16.562 - 78 | 84.75 -212 | 11.095 - 657 | 81.54 +223 | 50.664 - 29 | 21.01 +110 |
| 8 | 8.6 | 55.446 - 169 | 71.19 -310 | 16.530 - 32 | 82.33 -242 | 10.577 - 518 | 78.95 +259 | 50.657 - 7 | 19.91 +110 |
| 8 | 18.5 | 55.402 - 44 | 67.86 -333 | 16.551 + 21 | 79.67 -266 | 10.231 - 346 | 76.10 +285 | 50.677 + 20 | 18.87 +104 |
| 8 | 28.5 | 55.475 + 73 | 64.39 -347 | 16.621 + 70 | 76.84 -283 | 10.055 - 176 | 73.11 +299 | 50.723 + 46 | 17.93 + 94 |
| 9 | 7.5 | 55.675 + 200 | 60.81 -358 | 16.744 + 123 | 73.84 -300 | 10.072 + 17 | 70.03 +308 | 50.800 + 77 | 17.14 + 79 |
| 9 | 17.5 | 56.004 + 329 | 57.22 -359 | 16.926 + 182 | 70.77 -307 | 10.290 + 218 | 67.04 +299 | 50.910 + 110 | 16.58 + 56 |
| 9 | 27.4 | 56.451 + 447 | 53.69 -353 | 17.161 + 235 | 67.66 -311 | 10.697 + 407 | 64.22 +282 | 51.055 + 145 | 16.26 + 32 |
| 10 | 7.4 | 57.025 + 574 | 50.26 -343 | 17.455 + 294 | 64.56 -310 | 11.297 + 600 | 61.68 +254 | 51.238 + 183 | 16.26 + 0 |
| 10 | 17.4 | 57.716 + 691 | 47.06 -320 | 17.805 + 350 | 61.57 -299 | 12.072 + 775 | 59.56 +212 | 51.457 + 219 | 16.62 - 36 |
| 10 | 27.3 | 58.510 + 794 | 44.12 -294 | 18.206 + 401 | 58.73 -284 | 12.992 + 920 | 57.93 +163 | 51.710 + 253 | 17.32 - 70 |
| 11 | 6.3 | 59.408 + 898 | 41.52 -260 | 18.660 + 454 | 56.10 -263 | 14.041 +1049 | 56.86 +107 | 51.997 + 287 | 18.41 -109 |
| 11 | 16.3 | 60.383 + 975 | 39.36 -216 | 19.153 + 493 | 53.78 -232 | 15.171 +1130 | 56.45 + 41 | 52.308 + 311 | 19.81 -145 |
| 11 | 26.3 | 61.415 +1032 | 37.66 -170 | 19.678 + 525 | 51.82 -196 | 16.347 +1176 | 56.68 - 23 | 52.639 + 331 | 21.61 -175 |
| 12 | 6.2 | 62.490 +1075 | 36.51 -115 | 20.225 + 547 | 50.27 -155 | 17.535 +1188 | 57.58 - 90 | 52.982 + 343 | 23.67 -206 |
| 12 | 16.2 | 63.564 +1074 | 35.95 - 56 | 20.774 + 549 | 49.22 -105 | 18.678 +1143 | 59.14 -156 | 53.324 + 342 | 25.93 -226 |
| 12 | 26.2 | 64.614 +1050 | 35.97 + 2 | 21.313 + 539 | 48.66 - 56 | 19.748 +1070 | 61.27 -213 | 53.657 + 333 | 28.34 -241 |
| 12 | 36.2 | 65.609 + 995 | 36.61 + 64 | 21.825 + 512 | 48.65 - 1 | 20.711 + 963 | 63.97 -270 | 53.970 + 313 | 30.83 -249 |
| | | + 897 | +122 | + 464 | + 52 | + 814 | -314 | + 281 | -248 |
| Mean Place | 58.236 | 58.65 | 17.932 | 69.10 | 19.031 | 75.31 | 51.998 | 27.00 | |
| sec δ, tan δ | +4.072 | +3.947 | +1.844 | +1.549 | +5.032 | -4.932 | +1.023 | -0.215 | |
| dα(ψ), dδ(ψ) | +0.100 | -0.37 | +0.076 | -0.37 | +0.014 | -0.37 | +0.059 | -0.37 | |
| dα(ε), dδ(ε) | +0.245 | +0.37 | +0.096 | +0.37 | -0.307 | +0.36 | -0.013 | +0.36 | |
| Dble.Trans. | March 1 | | March 1 | | March 1 | | March 1 | | |

AT UPPER TRANSIT AT GREENWICH

| No. | 1275 | | 402 | | 404 | | 1277 | |
|--------------|---------------------------|------------|---------------------------|------------|---------------------------|------------|---------------------------|------------|
| | 37 Leonis Minoris | | 225 G. Velorum* | | 33 Sextantis | | 78 G. Antliae | |
| Mag. Spect. | 4.77 | G0 | 4.37 | G0 | 6.40 | K0 | 5.73 | A0 |
| U.T. | R.A. | | R.A. | | R.A. | | R.A. | |
| | Dec. | | Dec. | | Dec. | | Dec. | |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " |
| | 10 37 | + 32 02 | 10 38 | - 55 31 | 10 40 | - 1 39 | 10 42 | - 32 38 |
| 1 -8.8 | ^s 56 190 + 386 | 53 35 -148 | ^s 44 521 + 472 | 26 17 -228 | ^s 41 233 + 336 | 56 67 -221 | ^s 03 844 + 365 | 14 91 -240 |
| 1 1.2 | 56 560 + 370 | 52 21 -114 | 44 959 + 438 | 28 90 -273 | 41 553 + 320 | 58 86 -219 | 04 188 + 344 | 17 60 -269 |
| 1 11.1 | 56 906 + 346 | 51 44 -77 | 45 959 + 394 | 30 90 -313 | 41 850 + 297 | 60 99 -213 | 04 504 + 316 | 20 52 -292 |
| 1 21.1 | 57 213 + 307 | 51 08 -36 | 45 353 + 334 | 32 03 -343 | 41 850 + 262 | 62 98 -199 | 04 778 + 274 | 23 57 -305 |
| 1 31.1 | 57 474 + 261 | 51 11 + 3 | 45 687 + 268 | 35 46 -360 | 42 112 + 222 | 62 98 -179 | 05 006 + 228 | 26 66 -309 |
| 2 10.1 | 57 683 + 209 | 51 50 + 39 | 46 154 + 199 | 42 77 -371 | 42 511 + 177 | 66 35 -158 | 05 184 + 178 | 29 72 -306 |
| 2 20.0 | 57 835 + 152 | 52 24 + 74 | 46 277 + 123 | 46 49 -372 | 42 639 + 128 | 67 68 -133 | 05 307 + 123 | 32 68 -296 |
| 3 2.0 | 57 931 + 96 | 53 23 + 99 | 46 330 + 53 | 50 10 -361 | 42 722 + 83 | 68 74 -106 | 05 379 + 72 | 35 45 -277 |
| 3 12.0 | 57 973 + 42 | 54 44 +121 | 46 330 - 13 | 53 57 -347 | 42 760 + 38 | 69 57 -83 | 05 403 + 24 | 38 02 -267 |
| 3 21.9 | 57 965 - 8 | 55 80 +136 | 46 239 - 78 | 56 80 -323 | 42 760 - 3 | 70 13 -56 | 05 381 - 22 | 40 31 -229 |
| 3 31.9 | 57 916 - 49 | 57 19 +139 | 46 111 - 128 | 59 72 -292 | 42 722 - 35 | 70 48 -35 | 05 324 - 57 | 42 31 -200 |
| 4 10.9 | 57 831 - 85 | 58 59 +140 | 45 935 - 176 | 62 32 -260 | 42 659 - 63 | 70 64 -16 | 05 234 - 90 | 44 01 -170 |
| 4 20.9 | 57 720 - 111 | 59 91 +132 | 45 721 - 214 | 64 50 -218 | 42 575 - 84 | 70 60 + 4 | 05 120 - 114 | 45 34 -133 |
| 4 30.8 | 57 592 - 128 | 61 09 +118 | 45 481 - 240 | 66 27 -177 | 42 479 - 96 | 70 43 + 17 | 04 989 - 131 | 46 34 -100 |
| 5 10.8 | 57 454 - 138 | 62 10 +101 | 45 218 - 263 | 67 58 -131 | 42 374 - 105 | 70 12 + 31 | 04 847 - 142 | 46 98 - 64 |
| 5 20.8 | 57 314 - 140 | 62 89 + 79 | 44 942 - 276 | 68 40 - 82 | 42 267 - 107 | 69 69 + 43 | 04 698 - 149 | 47 24 - 26 |
| 5 30.8 | 57 180 - 134 | 63 45 + 56 | 44 665 - 277 | 68 75 - 35 | 42 165 - 102 | 69 19 + 50 | 04 551 - 147 | 47 16 + 8 |
| 6 9.7 | 57 053 - 127 | 63 76 + 31 | 44 386 - 279 | 68 60 + 15 | 42 066 - 99 | 68 60 + 59 | 04 406 - 145 | 46 72 + 44 |
| 6 19.7 | 56 942 - 111 | 63 80 + 4 | 44 119 - 267 | 67 96 + 64 | 41 979 - 87 | 67 95 + 65 | 04 270 - 136 | 45 94 + 78 |
| 6 29.7 | 56 848 - 94 | 63 59 - 21 | 43 869 - 250 | 66 88 +108 | 41 904 - 75 | 67 27 + 68 | 04 147 - 123 | 44 87 +107 |
| 7 9.6 | 56 773 - 75 | 63 12 - 47 | 43 640 - 229 | 65 35 +153 | 41 843 - 61 | 66 57 + 70 | 04 037 - 110 | 43 50 +137 |
| 7 19.6 | 56 723 - 50 | 62 40 - 72 | 43 445 - 195 | 63 44 +191 | 41 800 - 43 | 65 87 + 70 | 03 948 - 89 | 41 90 +160 |
| 7 29.6 | 56 696 - 27 | 61 45 - 95 | 43 285 - 160 | 61 23 +221 | 41 775 - 25 | 65 22 + 65 | 03 882 - 66 | 40 12 +178 |
| 8 8.6 | 56 696 + 0 | 60 27 -118 | 43 168 - 117 | 58 74 +249 | 41 771 - 4 | 64 62 + 60 | 03 841 - 41 | 38 20 +192 |
| 8 18.5 | 56 725 + 29 | 58 87 -140 | 43 105 - 63 | 56 09 +265 | 41 792 + 21 | 64 13 + 49 | 03 832 - 9 | 36 23 +197 |
| 8 28.5 | 56 784 + 59 | 57 27 -160 | 43 096 - 9 | 53 37 +272 | 41 837 + 45 | 63 79 + 34 | 03 855 + 23 | 34 28 +195 |
| 9 7.5 | 56 876 + 92 | 55 47 -180 | 43 148 + 52 | 50 66 +271 | 41 910 + 73 | 63 60 + 19 | 03 917 + 62 | 32 42 +186 |
| 9 17.5 | 57 005 + 129 | 53 50 -197 | 43 268 + 120 | 48 10 +256 | 42 017 + 107 | 63 61 - 1 | 04 021 + 104 | 30 76 +166 |
| 9 27.4 | 57 170 + 165 | 51 40 -210 | 43 451 + 183 | 45 77 +233 | 42 158 + 141 | 63 87 - 26 | 04 166 + 145 | 29 34 +142 |
| 10 7.4 | 57 374 + 204 | 49 16 -224 | 43 703 + 252 | 43 76 +201 | 42 334 + 176 | 64 42 - 55 | 04 356 + 190 | 28 26 +108 |
| 10 17.4 | 57 618 + 244 | 46 85 -231 | 44 019 + 316 | 42 21 +155 | 42 547 + 213 | 65 27 - 85 | 04 591 + 235 | 27 61 + 65 |
| 10 27.3 | 57 898 + 280 | 44 49 -236 | 44 391 + 372 | 41 16 +105 | 42 792 + 245 | 66 40 -113 | 04 865 + 274 | 27 40 + 21 |
| 11 6.3 | 58 216 + 318 | 42 14 -235 | 44 815 + 424 | 40 68 + 48 | 43 072 + 280 | 67 83 -143 | 05 177 + 312 | 27 68 - 28 |
| 11 16.3 | 58 563 + 347 | 39 87 -227 | 45 275 + 460 | 40 83 - 15 | 43 377 + 305 | 69 52 -169 | 05 519 + 342 | 28 48 - 80 |
| 11 26.3 | 58 933 + 370 | 37 72 -215 | 45 759 + 484 | 41 57 - 74 | 43 702 + 325 | 71 42 -190 | 05 882 + 363 | 29 77 -129 |
| 12 6.2 | 59 320 + 387 | 35 76 -196 | 46 256 + 497 | 42 95 -138 | 44 041 + 339 | 73 51 -209 | 06 257 + 375 | 31 53 -176 |
| 12 16.2 | 59 709 + 389 | 34 07 -169 | 46 742 + 486 | 44 91 -196 | 44 382 + 341 | 75 70 -219 | 06 630 + 373 | 33 72 -219 |
| 12 26.2 | 60 091 + 382 | 32 69 -138 | 47 207 + 465 | 47 37 -246 | 44 714 + 332 | 77 92 -222 | 06 991 + 361 | 36 24 -252 |
| 12 36.2 | 60 455 + 364 | 31 66 -103 | 47 635 + 428 | 50 29 -292 | 45 029 + 315 | 80 12 -220 | 07 329 + 338 | 39 06 -282 |
| | 60 455 + 332 | 31 66 - 62 | 47 635 + 374 | 50 29 -326 | 45 029 + 285 | 80 12 -209 | 07 329 + 302 | 39 06 -299 |
| Mean Place | 57.780 | 47.74 | 46.009 | 58.18 | 42.979 | 73.20 | 05.578 | 41.39 |
| sec δ, tan δ | +1.180 | +0.626 | +1.767 | -1.457 | +1.000 | -0.029 | +1.188 | -0.641 |
| da(ψ), dδ(ψ) | +0.067 | -0.37 | +0.048 | -0.37 | +0.061 | -0.37 | +0.055 | -0.38 |
| da(ε), dδ(ε) | +0.039 | +0.35 | -0.091 | +0.35 | -0.002 | +0.34 | -0.040 | +0.33 |
| Dble. Trans. | March 2 | | March 2 | | March 2 | | March 3 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 403 | | 406 | | 405 | | 1276 | |
|--------------|---------------------------|------------------|---------------------------|------------------|---------------------------|------------------|---|------------------|
| | 35 H. Ursae Majoris | | δ Carinae | | 41 Leonis Minoris | | Piazzi 10 ^b 135 (Ursae Majoris) | |
| Mag. Spect. | 5.23 | K0 | 3.03 | B0 | 5.05 | A2 | 5.28 | F0 |
| U.T. | R.A. Dec. | | R.A. Dec. | | R.A. Dec. | | R.A. Dec. | |
| | ^h ^m | ^o ' " | ^h ^m | ^o ' " | ^h ^m | ^o ' " | ^h ^m | ^o ' " |
| | 10 42 | + 69 08 | 10 42 | - 64 18 | 10 42 | + 23 15 | 10 42 | + 46 16 |
| | ^s + 775 | " - 47 | ^s + 579 | " - 212 | ^s + 364 | " - 174 | ^s + 452 | " - 114 |
| 1 -8.8 | 06.243 | + 745 | 27.008 | + 536 | 39.342 | + 349 | 44.116 | + 434 |
| 1 1.2 | 06.988 | + 696 | 27.544 | + 480 | 39.691 | + 326 | 44.550 | + 408 |
| 1 11.1 | 07.684 | + 618 | 28.024 | + 405 | 40.017 | + 291 | 44.958 | + 363 |
| 1 21.1 | 08.302 | + 523 | 28.429 | + 322 | 40.308 | + 247 | 45.321 | + 309 |
| 1 31.1 | 08.825 | + 415 | 28.751 | + 236 | 40.555 | + 201 | 45.630 | + 249 |
| 2 10.1 | 09.240 | + 289 | 28.987 | + 141 | 40.756 | + 146 | 45.879 | + 180 |
| 2 20.0 | 09.529 | + 164 | 29.128 | + 53 | 40.902 | + 96 | 46.059 | + 114 |
| 3 2.0 | 09.693 | + 41 | 29.181 | - 31 | 40.998 | + 47 | 46.173 | + 48 |
| 3 12.0 | 09.734 | - 83 | 29.150 | - 114 | 41.045 | + 0 | 46.221 | - 16 |
| 3 21.9 | 09.651 | - 187 | 29.036 | - 181 | 41.045 | - 38 | 46.205 | - 67 |
| 3 31.9 | 09.464 | - 280 | 28.855 | - 243 | 41.007 | - 70 | 46.138 | - 113 |
| 4 10.9 | 09.184 | - 357 | 28.612 | - 296 | 40.937 | - 94 | 46.025 | - 149 |
| 4 20.9 | 08.827 | - 407 | 28.316 | - 333 | 40.843 | - 109 | 45.876 | - 171 |
| 4 30.8 | 08.420 | - 447 | 27.983 | - 367 | 40.734 | - 120 | 45.705 | - 188 |
| 5 10.8 | 07.973 | - 464 | 27.616 | - 388 | 40.614 | - 121 | 45.517 | - 192 |
| 5 20.8 | 07.509 | - 458 | 27.228 | - 395 | 40.493 | - 117 | 45.325 | - 187 |
| 5 30.8 | 07.051 | - 446 | 26.833 | - 399 | 40.376 | - 111 | 45.138 | - 180 |
| 6 9.7 | 06.605 | - 412 | 26.434 | - 388 | 40.265 | - 98 | 44.958 | - 161 |
| 6 19.7 | 06.193 | - 367 | 26.046 | - 367 | 40.167 | - 83 | 44.797 | - 140 |
| 6 29.7 | 05.826 | - 318 | 25.679 | - 342 | 40.084 | - 67 | 44.657 | - 116 |
| 7 9.6 | 05.508 | - 251 | 25.337 | - 298 | 40.017 | - 46 | 44.541 | - 85 |
| 7 19.6 | 05.257 | - 185 | 25.039 | - 251 | 39.971 | - 25 | 44.456 | - 55 |
| 7 29.6 | 05.072 | - 113 | 24.788 | - 192 | 39.946 | - 2 | 44.401 | - 22 |
| 8 8.6 | 04.959 | - 30 | 24.596 | - 121 | 39.944 | + 25 | 44.379 | + 17 |
| 8 18.5 | 04.929 | + 47 | 24.475 | - 48 | 39.969 | + 51 | 44.396 | + 53 |
| 8 28.5 | 04.976 | + 132 | 24.427 | + 35 | 40.020 | + 81 | 44.449 | + 95 |
| 9 7.5 | 05.108 | + 220 | 24.462 | + 125 | 40.101 | + 116 | 44.544 | + 140 |
| 9 17.5 | 05.328 | + 303 | 24.587 | + 210 | 40.217 | + 150 | 44.684 | + 182 |
| 9 27.4 | 05.631 | + 393 | 24.797 | + 300 | 40.367 | + 188 | 44.866 | + 231 |
| 10 7.4 | 06.024 | + 476 | 25.097 | + 384 | 40.555 | + 225 | 45.097 | + 277 |
| 10 17.4 | 06.500 | + 553 | 25.481 | + 456 | 40.780 | + 260 | 45.374 | + 321 |
| 10 27.3 | 07.053 | + 630 | 25.937 | + 522 | 41.040 | + 296 | 45.695 | + 364 |
| 11 6.3 | 07.683 | + 689 | 26.459 | + 569 | 41.336 | + 324 | 46.059 | + 401 |
| 11 16.3 | 08.372 | + 736 | 27.028 | + 598 | 41.660 | + 347 | 46.460 | + 428 |
| 11 26.3 | 09.108 | + 770 | 27.626 | + 612 | 42.007 | + 363 | 46.888 | + 449 |
| 12 6.2 | 09.878 | + 776 | 28.238 | + 599 | 42.370 | + 366 | 47.337 | + 453 |
| 12 16.2 | 10.654 | + 764 | 28.837 | + 570 | 42.736 | + 361 | 47.790 | + 447 |
| 12 26.2 | 11.418 | + 730 | 29.407 | + 523 | 43.097 | + 343 | 48.237 | + 427 |
| 12 36.2 | 12.148 | + 663 | 29.930 | + 455 | 43.440 | + 314 | 48.664 | + 390 |
| Mean Place | 06.868 | 49.78 | 28.371 | 84.69 | 41.009 | 33.60 | 45.539 | 30.29 |
| sec δ, tan δ | +2.809 | +2.625 | +2.308 | -2.080 | +1.088 | +0.430 | +1.447 | +1.046 |
| dα(ψ), dδ(ψ) | +0.084 | -0.38 | +0.043 | -0.38 | +0.065 | -0.38 | +0.070 | -0.38 |
| dα(ε), dδ(ε) | +0.165 | +0.33 | -0.131 | +0.33 | +0.027 | +0.33 | +0.066 | +0.33 |
| Dble.Trans. | March 3 | | March 3 | | March 3 | | March 3 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 407 | | 1278 | | 411 | | 1279 | |
|--------------------------------------|-------------------|------------|--------------------------|------------|--------------------------|------------|-------------|------------|
| Name | 42 Leonis Minoris | | Bradley 1493 (Leonis) | | δ^3 Chamaeleontis | | 51 Leonis | |
| Mag. Spect. | 5.37 | B9 | 6.29 | K0 | 4.62 | B3 | 5.64 | K0 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " |
| | 10 45 | + 30 44 | 10 45 | + 6 26 | 10 45 | - 80 27 | 10 45 | + 18 57 |
| 1 -8.8 | 05.357 +383 | 78.98 -158 | 21.761 +341 | 54.09 -209 | 39.548 +1318 | 32.90 -176 | 39.262 +356 | 56.05 -186 |
| 1 1.2 | 05.726 +369 | 77.73 -125 | 22.088 +327 | 52.10 -199 | 40.752 +1204 | 35.21 -231 | 39.604 +342 | 54.42 -163 |
| 1 11.1 | 06.072 +346 | 76.85 -88 | 22.393 +305 | 50.25 -185 | 41.819 +1067 | 38.03 -282 | 39.925 +321 | 53.05 -137 |
| 1 21.1 | 06.381 +309 | 76.37 -48 | 22.664 +271 | 48.61 -164 | 42.701 +882 | 41.29 -326 | 40.211 +286 | 52.00 -105 |
| 1 31.1 | 06.645 +264 | 76.28 -9 | 22.894 +230 | 47.22 -139 | 43.382 +681 | 44.86 -357 | 40.455 +244 | 51.27 -73 |
| 2 10.1 | 06.860 +215 | 76.56 +28 | 23.081 +187 | 46.09 -113 | 43.857 +475 | 48.67 -381 | 40.654 +199 | 50.87 -40 |
| 2 20.0 | 07.018 +158 | 77.20 +64 | 23.219 +138 | 45.25 -84 | 44.100 +243 | 52.61 -394 | 40.800 +146 | 50.79 -8 |
| 3 2.0 | 07.121 +103 | 78.11 +91 | 23.309 +90 | 44.68 -57 | 44.130 +30 | 56.57 -396 | 40.897 +97 | 50.99 +20 |
| 3 12.0 | 07.172 +51 | 79.24 +113 | 23.356 +47 | 44.35 -33 | 43.951 -179 | 60.50 -393 | 40.947 +50 | 51.44 +45 |
| 3 22.0 | 07.172 +0 | 80.53 +129 | 23.359 +3 | 44.27 -8 | 43.562 -389 | 64.27 -377 | 40.951 +4 | 52.09 +65 |
| 3 31.9 | 07.131 -41 | 81.89 +136 | 23.330 -29 | 44.37 +10 | 42.999 -563 | 67.81 -354 | 40.919 -32 | 52.86 +77 |
| 4 10.9 | 07.055 -76 | 83.27 +138 | 23.271 -59 | 44.62 +25 | 42.267 -732 | 71.09 -328 | 40.856 -63 | 53.72 +86 |
| 4 20.9 | 06.952 -103 | 84.58 +131 | 23.191 -80 | 45.01 +39 | 41.385 -882 | 73.99 -290 | 40.768 -88 | 54.62 +90 |
| 4 30.8 | 06.832 -120 | 85.77 +119 | 23.097 -94 | 45.47 +46 | 40.392 -993 | 76.48 -249 | 40.667 -101 | 55.49 +87 |
| 5 10.8 | 06.699 -133 | 86.81 +104 | 22.994 -103 | 46.00 +53 | 39.294 -1098 | 78.52 -204 | 40.555 -112 | 56.31 +82 |
| 5 20.8 | 06.564 -135 | 87.64 +83 | 22.888 -106 | 46.57 +57 | 38.124 -1170 | 80.03 -151 | 40.441 -114 | 57.05 +74 |
| 5 30.8 | 06.433 -131 | 88.24 +60 | 22.786 -102 | 47.14 +57 | 36.917 -1207 | 81.04 -101 | 40.330 -111 | 57.67 +62 |
| 6 9.7 | 06.308 -125 | 88.62 +38 | 22.689 -97 | 47.71 +57 | 35.685 -1232 | 81.49 -45 | 40.225 -105 | 58.17 +50 |
| 6 19.7 | 06.197 -111 | 88.73 +11 | 22.602 -87 | 48.25 +54 | 34.473 -1212 | 81.37 +12 | 40.131 -94 | 58.52 +35 |
| 6 29.7 | 06.102 -95 | 88.59 -14 | 22.527 -75 | 48.75 +50 | 33.308 -1165 | 80.72 +65 | 40.051 -80 | 58.71 +19 |
| 7 9.6 | 06.024 -78 | 88.21 -38 | 22.466 -61 | 49.21 +46 | 32.210 -1098 | 79.54 +118 | 39.986 -65 | 58.75 +4 |
| 7 19.6 | 05.969 -55 | 87.56 -65 | 22.423 -43 | 49.59 +38 | 31.230 -980 | 77.85 +169 | 39.941 -45 | 58.61 -14 |
| 7 29.6 | 05.936 -33 | 86.70 -86 | 22.398 -25 | 49.88 +29 | 30.383 -847 | 75.75 +210 | 39.916 -25 | 58.31 -30 |
| 8 8.6 | 05.929 -7 | 85.60 -110 | 22.393 -5 | 50.06 +18 | 29.698 -685 | 73.25 +250 | 39.912 -4 | 57.84 -47 |
| 8 18.5 | 05.950 +21 | 84.27 -133 | 22.414 +21 | 50.09 +3 | 29.214 -484 | 70.48 +277 | 39.935 +23 | 57.18 -66 |
| 8 28.5 | 06.000 +50 | 82.75 -152 | 22.461 +47 | 49.94 -15 | 28.934 -280 | 67.52 +296 | 39.982 +7 | 56.35 -83 |
| 9 7.5 | 06.082 +82 | 81.01 -174 | 22.522 +61 | 49.69 -25 | 28.884 -50 | 64.45 +307 | 40.057 +45 | 55.29 -106 |
| 9 17.5 | 06.201 +119 | 79.09 -192 | 22.633 +111 | 49.17 -52 | 29.077 +193 | 61.43 +302 | 40.168 +111 | 54.01 -128 |
| 9 27.4 | 06.355 +154 | 77.02 -207 | 22.771 +138 | 48.43 -74 | 29.499 +422 | 58.55 +288 | 40.312 +144 | 52.56 -145 |
| 10 7.4 | 06.549 +194 | 74.81 -221 | 22.945 +174 | 47.44 -99 | 30.158 +659 | 55.91 +264 | 40.493 +181 | 50.91 -165 |
| 10 17.4 | 06.783 +234 | 72.51 -230 | 23.155 +210 | 46.20 -124 | 31.031 +873 | 53.68 +223 | 40.711 +218 | 49.09 -182 |
| 10 27.3 | 07.054 +271 | 70.15 -236 | 23.399 +244 | 44.73 -147 | 32.085 +1054 | 51.90 +178 | 40.963 +252 | 47.13 -196 |
| 11 6.3 | 07.363 +309 | 67.77 -238 | 23.677 +278 | 43.03 -170 | 33.302 +1217 | 50.67 +123 | 40.963 +288 | 45.05 -208 |
| 11 16.3 | 07.702 +339 | 65.46 -231 | 23.982 +305 | 41.15 -188 | 34.625 +1323 | 50.08 +59 | 41.251 +317 | 42.91 -214 |
| 11 26.3 | 08.065 +363 | 63.25 -221 | 24.309 +327 | 39.13 -202 | 36.012 +1387 | 50.12 -4 | 41.568 +339 | 40.76 -215 |
| 12 6.2 | 08.446 +381 | 61.22 -203 | 24.651 +342 | 37.01 -212 | 37.424 +1412 | 50.83 -71 | 42.262 +355 | 38.65 -211 |
| 12 16.2 | 08.832 +386 | 59.45 -177 | 24.995 +344 | 34.89 -212 | 38.793 +1369 | 52.21 -138 | 42.621 +359 | 36.68 -197 |
| 12 26.2 | 09.212 +380 | 57.96 -149 | 25.333 +338 | 32.81 -208 | 40.084 +1291 | 54.18 -197 | 42.974 +353 | 34.88 -180 |
| 12 36.2 | 09.575 +363 | 56.83 -113 | 25.655 +322 | 30.84 -197 | 41.257 +1173 | 56.72 -254 | 43.312 +338 | 33.32 -156 |
| | +333 | -74 | +293 | -178 | +1004 | -302 | +308 | -126 |
| Mean Place | 06.985 | 73.13 | 23.521 | 40.40 | 39.755 | 68.25 | 40.975 | 46.55 |
| sec δ , tan δ | +1.164 | +0.595 | +1.006 | +0.113 | +6.039 | -5.956 | +1.057 | +0.344 |
| $da(\psi)$, $d\delta(\psi)$ | +0.066 | -0.38 | +0.062 | -0.38 | +0.011 | -0.38 | +0.064 | -0.38 |
| $da(\epsilon)$, $d\delta(\epsilon)$ | +0.038 | +0.32 | +0.007 | +0.32 | -0.376 | +0.32 | +0.022 | +0.32 |
| Dble. Trans. | March 3 | | March 3 | | March 3 | | March 3 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 1280 | | 409 | | 410 | | 1281 | |
|----------------|---------------|--------|-----------|--------|----------|--------|--------------|--------|
| | 250 G. Hydrae | | 53 Leonis | | v Hydrae | | 41 Sextantis | |
| Mag.Spect. | 6.86 | K0 | 5.27 | A0 | 3.32 | K0 | 5.78 | A2 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " |
| | 10 46 | -25 58 | 10 48 | +10 36 | 10 48 | -16 07 | 10 49 | - 8 49 |
| 1 ^d | 02.414 | 12.56 | 31.135 | 72.97 | 55.658 | 00.89 | 35.570 | 14.78 |
| 1 ^s | +353 | -238 | +346 | -203 | +343 | -234 | +339 | -229 |
| 1 | 02.414 | 12.56 | 31.135 | 72.97 | 55.658 | 00.89 | 35.570 | 14.78 |
| 1 | 02.748 | 15.17 | 31.466 | 71.08 | 55.984 | 03.35 | 35.893 | 17.13 |
| 1 | 03.057 | 17.95 | 31.777 | 69.38 | 56.287 | 05.90 | 36.195 | 19.48 |
| 1 | 03.327 | 20.81 | 32.054 | 67.92 | 56.555 | 08.45 | 36.462 | 21.77 |
| 1 | 03.554 | 23.66 | 32.291 | 66.74 | 56.781 | 10.90 | 36.689 | 23.91 |
| 2 | 03.734 | 26.45 | 32.484 | 65.84 | 56.963 | 13.24 | 36.873 | 25.89 |
| 2 | 03.861 | 29.10 | 32.627 | 65.25 | 57.096 | 15.39 | 37.008 | 27.64 |
| 3 | 03.940 | 31.55 | 32.722 | 64.93 | 57.182 | 17.31 | 37.097 | 29.15 |
| 3 | 03.973 | 33.79 | 32.773 | 64.86 | 57.224 | 19.00 | 37.143 | 30.42 |
| 3 | 03.963 | 35.75 | 32.780 | 65.02 | 57.224 | 20.42 | 37.147 | 31.42 |
| 3 | 03.918 | 37.43 | 32.753 | 65.35 | 57.191 | 21.57 | 37.119 | 32.18 |
| 4 | 03.843 | 38.82 | 32.696 | 65.82 | 57.129 | 22.47 | 37.062 | 32.71 |
| 4 | 03.743 | 39.88 | 32.616 | 66.39 | 57.045 | 23.10 | 36.983 | 33.01 |
| 4 | 03.630 | 40.64 | 32.523 | 67.00 | 56.947 | 23.48 | 36.890 | 33.11 |
| 5 | 03.504 | 41.08 | 32.419 | 67.64 | 56.837 | 23.61 | 36.787 | 33.02 |
| 5 | 03.374 | 41.20 | 32.313 | 68.28 | 56.724 | 23.50 | 36.681 | 32.75 |
| 5 | 03.244 | 41.03 | 32.210 | 68.88 | 56.613 | 23.17 | 36.576 | 32.33 |
| 6 | 03.117 | 40.55 | 32.110 | 69.44 | 56.503 | 22.63 | 36.474 | 31.76 |
| 6 | 02.998 | 39.79 | 32.022 | 69.93 | 56.403 | 21.90 | 36.381 | 31.07 |
| 6 | 02.891 | 38.78 | 31.945 | 70.33 | 56.313 | 21.00 | 36.299 | 30.29 |
| 7 | 02.797 | 37.54 | 31.882 | 70.66 | 56.235 | 19.95 | 36.228 | 29.41 |
| 7 | 02.721 | 36.10 | 31.837 | 70.87 | 56.174 | 18.79 | 36.175 | 28.48 |
| 7 | 02.665 | 34.54 | 31.810 | 70.97 | 56.131 | 17.57 | 36.139 | 27.54 |
| 8 | 02.632 | 32.87 | 31.804 | 70.93 | 56.109 | 16.30 | 36.123 | 26.61 |
| 8 | 02.629 | 31.19 | 31.823 | 70.73 | 56.114 | 15.08 | 36.131 | 25.76 |
| 8 | 02.654 | 29.55 | 31.869 | 70.38 | 56.144 | 13.93 | 36.165 | 25.02 |
| 9 | 02.715 | 28.01 | 31.931 | 69.87 | 56.206 | 12.91 | 36.228 | 24.42 |
| 9 | 02.814 | 26.68 | 32.037 | 69.05 | 56.303 | 12.11 | 36.324 | 24.03 |
| 9 | 02.951 | 25.59 | 32.173 | 68.06 | 56.435 | 11.54 | 36.455 | 23.88 |
| 10 | 03.130 | 24.83 | 32.346 | 66.84 | 56.607 | 11.29 | 36.624 | 24.02 |
| 10 | 03.352 | 24.47 | 32.555 | 65.40 | 56.817 | 11.40 | 36.831 | 24.51 |
| 10 | 03.611 | 24.52 | 32.798 | 63.75 | 57.063 | 11.87 | 37.072 | 25.31 |
| 11 | 03.907 | 25.03 | 33.077 | 61.91 | 57.346 | 12.75 | 37.348 | 26.47 |
| 11 | 04.232 | 26.02 | 33.383 | 59.93 | 57.656 | 14.02 | 37.652 | 27.96 |
| 11 | 04.578 | 27.43 | 33.711 | 57.85 | 57.987 | 15.63 | 37.977 | 29.73 |
| 12 | 04.938 | 29.27 | 34.056 | 55.72 | 58.333 | 17.59 | 38.317 | 31.76 |
| 12 | 05.297 | 31.47 | 34.404 | 53.63 | 58.680 | 19.80 | 38.660 | 33.97 |
| 12 | 05.646 | 33.95 | 34.746 | 51.63 | 59.020 | 22.20 | 38.996 | 36.30 |
| 12 | 05.975 | 36.67 | 35.073 | 49.78 | 59.341 | 24.74 | 39.315 | 38.68 |
| Mean Place | 04.195 | 37.03 | 32.896 | 60.75 | 57.478 | 22.11 | 37.386 | 33.67 |
| sec δ, tan δ | +1.112 | -0.487 | +1.017 | +0.187 | +1.041 | -0.289 | +1.012 | -0.155 |
| da(w), dδ(v) | +0.057 | -0.38 | +0.063 | -0.38 | +0.059 | -0.38 | +0.060 | -0.38 |
| da(ε), dδ(ε) | -0.031 | +0.32 | +0.012 | +0.31 | -0.018 | +0.31 | -0.010 | +0.30 |
| Dble.Trans. | March 4 | | March 4 | | March 4 | | March 4 | |

AT UPPER TRANSIT AT GREENWICH

| No. | 412 | | 414 | | 1282 | | 413 | |
|---------------------|---------------------------|-------------------------|---------------------------|-------------------------|---------------------------|-------------------------|---------------------------|-------------------------|
| | 46 Leonis Minoris | | Antliae | | 47 Ursae Majoris | | Bradley 1508 (Draconis) | |
| Mag.Spect. | 3.92 | K0 | 4.70 | K0 | 5.14 | G0 | 6.26 | G5 |
| U.T. | R.A. | | R.A. | | R.A. | | R.A. | |
| | h | m | h | m | h | m | h | m |
| | 10 52 | + 34 16 | 10 56 | - 37 03 | 10 58 | + 40 29 | 10 58 | + 77 50 |
| 1 ^d -8.8 | 31.920 ^s + 396 | 81.12 ^o -156 | 03.349 ^s + 384 | 26.52 ^o -230 | 41.232 ^s + 421 | 71.93 ^o -146 | 54.146 ^s +1229 | 30.11 ^o - 48 |
| 1 1.2 | 32.303 + 383 | 79.92 -120 | 03.712 + 363 | 29.15 -263 | 41.641 + 409 | 70.89 -104 | 55.338 +1192 | 30.24 + 13 |
| 1 11.1 | 32.664 + 361 | 79.12 - 80 | 04.049 + 337 | 32.05 -290 | 42.027 + 386 | 70.30 - 59 | 56.467 +1129 | 30.98 + 74 |
| 1 21.1 | 32.988 + 324 | 78.75 - 37 | 04.344 + 295 | 35.15 -310 | 42.376 + 349 | 70.18 - 12 | 57.481 +1014 | 32.33 +135 |
| 1 31.1 | 33.268 + 280 | 78.79 + 4 | 04.592 + 248 | 38.33 -318 | 42.678 + 302 | 70.51 + 33 | 58.352 + 871 | 34.19 +186 |
| 2 10.1 | 33.496 + 228 | 79.23 + 44 | 04.791 + 199 | 41.53 -320 | 42.926 + 248 | 71.27 + 76 | 59.058 + 706 | 36.51 +232 |
| 2 20.0 | 33.667 + 171 | 80.04 + 81 | 04.933 + 142 | 44.66 -313 | 43.113 + 187 | 72.41 +114 | 59.563 + 505 | 39.18 +267 |
| 3 2.0 | 33.782 + 115 | 81.13 +109 | 05.022 + 89 | 47.64 -298 | 43.240 + 127 | 73.83 +142 | 59.866 + 303 | 42.06 +288 |
| 3 12.0 | 33.842 + 60 | 82.45 +132 | 05.062 + 40 | 50.45 -281 | 43.307 + 67 | 75.49 +166 | 59.964 + 98 | 45.07 +301 |
| 3 22.0 | 33.849 + 7 | 83.93 +148 | 05.053 - 9 | 53.01 -256 | 43.316 + 9 | 77.29 +180 | 59.853 - 111 | 48.06 +299 |
| 3 31.9 | 33.812 - 37 | 85.46 +153 | 05.005 - 48 | 55.27 -226 | 43.277 - 39 | 79.13 +184 | 59.560 - 293 | 50.89 +283 |
| 4 10.9 | 33.738 - 74 | 87.00 +154 | 04.923 - 82 | 57.24 -197 | 43.196 - 81 | 80.94 +114 | 59.098 - 462 | 53.49 +260 |
| 4 20.9 | 33.633 -105 | 88.46 +146 | 04.812 -111 | 58.85 -161 | 43.080 -116 | 82.62 +168 | 58.491 - 607 | 55.72 +223 |
| 4 30.8 | 33.510 -123 | 89.77 +131 | 04.683 -129 | 60.11 -126 | 42.942 -138 | 84.12 +150 | 57.782 - 709 | 57.51 +179 |
| 5 10.8 | 33.373 -137 | 90.90 +113 | 04.537 -146 | 61.00 - 89 | 42.786 -156 | 85.39 +127 | 56.988 - 794 | 58.84 +133 |
| 5 20.8 | 33.230 -143 | 91.80 + 90 | 04.382 -155 | 61.49 - 49 | 42.624 -162 | 86.37 + 98 | 56.147 - 841 | 59.61 + 77 |
| 5 30.8 | 33.091 -139 | 92.44 + 64 | 04.225 -157 | 61.62 - 13 | 42.463 -161 | 87.03 + 66 | 55.296 - 851 | 59.84 + 23 |
| 6 9.7 | 32.956 -135 | 92.81 + 37 | 04.068 -157 | 61.36 + 26 | 42.306 -157 | 87.38 + 35 | 54.449 - 847 | 59.51 - 33 |
| 6 19.7 | 32.834 -122 | 92.88 + 7 | 03.916 -152 | 60.72 + 64 | 42.162 -144 | 87.37 - 1 | 53.646 - 803 | 58.62 - 89 |
| 6 29.7 | 32.729 -105 | 92.67 - 21 | 03.774 -142 | 59.76 + 96 | 42.035 -127 | 87.03 - 34 | 52.907 - 739 | 57.23 -139 |
| 7 9.7 | 32.639 - 90 | 92.19 - 48 | 03.645 -129 | 58.47 +129 | 41.925 -110 | 86.36 - 67 | 52.242 - 665 | 55.35 -188 |
| 7 19.6 | 32.573 - 66 | 91.42 - 77 | 03.535 -110 | 56.89 +158 | 41.841 - 84 | 85.37 - 99 | 51.684 - 558 | 53.02 -233 |
| 7 29.6 | 32.530 - 43 | 90.39 -103 | 03.446 - 89 | 55.11 +178 | 41.781 - 60 | 84.09 -128 | 51.234 - 450 | 50.32 -270 |
| 8 8.6 | 32.512 -18 | 89.12 -127 | 03.383 - 63 | 53.13 +198 | 41.748 - 33 | 82.52 -157 | 50.905 - 329 | 47.27 -305 |
| 8 18.5 | 32.524 + 12 | 87.60 -152 | 03.353 - 30 | 51.07 +206 | 41.748 + 0 | 80.69 -183 | 50.716 - 189 | 43.96 -331 |
| 8 28.5 | 32.565 + 41 | 85.87 -173 | 03.356 + 3 | 48.99 +208 | 41.780 + 32 | 78.64 -205 | 50.660 - 56 | 40.46 -350 |
| 9 7.5 | 32.640 + 75 | 83.92 -195 | 03.400 + 44 | 46.95 +204 | 41.849 + 69 | 76.36 -228 | 50.749 + 89 | 36.81 -365 |
| 9 17.5 | 32.753 + 113 | 81.79 -213 | 03.489 + 89 | 45.08 +187 | 41.959 + 110 | 73.92 -244 | 50.991 + 242 | 33.10 -371 |
| 9 27.4 | 32.903 + 150 | 79.52 -227 | 03.622 + 133 | 43.44 +164 | 42.108 + 149 | 71.35 -257 | 51.374 + 383 | 29.41 -369 |
| 10 7.4 | 33.095 + 192 | 77.12 -240 | 03.805 + 183 | 42.11 +133 | 42.303 + 195 | 68.66 -269 | 51.909 + 535 | 25.79 -362 |
| 10 17.4 | 33.327 + 232 | 74.64 -248 | 04.035 + 230 | 41.20 + 91 | 42.542 + 239 | 65.94 -272 | 52.589 + 680 | 22.35 -344 |
| 10 27.4 | 33.599 + 272 | 72.12 -252 | 04.309 + 274 | 40.72 + 48 | 42.823 + 281 | 63.23 -271 | 53.399 + 810 | 19.15 -320 |
| 11 6.3 | 33.911 + 312 | 69.61 -251 | 04.626 + 317 | 40.75 - 3 | 43.148 + 325 | 60.56 -267 | 54.342 + 943 | 16.25 -290 |
| 11 16.3 | 34.255 + 344 | 67.20 -241 | 04.975 + 349 | 41.31 - 56 | 43.509 + 361 | 58.04 -252 | 55.390 +1048 | 13.79 -246 |
| 11 26.3 | 34.626 + 371 | 64.92 -228 | 05.349 + 374 | 42.38 -107 | 43.899 + 390 | 55.72 -232 | 56.521 +1131 | 11.77 -202 |
| 12 6.2 | 35.017 + 391 | 62.85 -207 | 05.739 + 390 | 43.96 -158 | 44.311 + 412 | 53.66 -206 | 57.721 +1200 | 10.29 -148 |
| 12 16.2 | 35.414 + 397 | 61.07 -178 | 06.129 + 390 | 46.01 -205 | 44.732 + 421 | 51.95 -171 | 58.941 +1220 | 09.41 - 88 |
| 12 26.2 | 35.807 + 393 | 59.62 -145 | 06.509 + 380 | 48.44 -243 | 45.149 + 417 | 50.62 -133 | 60.154 +1213 | 09.12 - 29 |
| 12 36.2 | 36.185 + 378 | 58.54 -108 | 06.867 + 358 | 51.21 -277 | 45.553 + 404 | 49.72 - 90 | 61.326 +1172 | 09.47 + 35 |
| | 36.185 + 347 | 58.54 - 65 | 06.867 + 323 | 51.21 -300 | 45.553 + 372 | 49.72 - 42 | 61.326 +1078 | 09.47 + 97 |
| Mean Place | 33.548 | 76.35 | 05.217 | 54.41 | 42.790 | 69.23 | 53.725 | 33.90 |
| sec δ, tan δ | +1.210 | +0.682 | +1.253 | -0.755 | +1.315 | +0.854 | +4.748 | +4.642 |
| dα(ψ), dδ(ψ) | +0.066 | -0.38 | +0.056 | -0.38 | +0.067 | -0.38 | +0.094 | -0.38 |
| dα(ε), dδ(ε) | +0.044 | +0.29 | -0.048 | +0.28 | +0.055 | +0.26 | +0.299 | +0.26 |
| Dble.Trans. | March 5 | | March 6 | | March 7 | | March 7 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 1283 | | 415 | | 1284 | | 416 | |
|---|----------------------------|------------|----------------------------|------------|----------------------------|------------|----------------------------|-------------|
| | α Crateris | | 239 G. Velorum | | 58 Leonis | | β Ursae Majoris | |
| Mag. Spect. | 4.20 | K0 | 4.56 | A2 | 5.05 | K0 | 2.44 | A0 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " |
| | 10 59 | - 18 13 | 10 59 | - 42 08 | 10 59 | + 3 41 | 11 01 | + 56 26 |
| 1 -8.8 | 05 06.2 ^s + 346 | 14.30 -231 | 30 05.8 ^s + 403 | 43 00 -223 | 49 98.2 ^s + 342 | 38 96 -216 | 00 69.3 ^s + 540 | 76 89 -108 |
| 1 1.2 | 05 39.4 + 332 | 16.77 -247 | 30 44.1 + 383 | 45 60 -260 | 50 31.2 + 330 | 36 86 -210 | 01 21.8 + 525 | 76 34 -55 |
| 1 11.2 | 05 70.3 + 309 | 19.35 -258 | 30 79.5 + 354 | 48 52 -292 | 50 62.2 + 310 | 34 88 -198 | 01 71.7 + 499 | 76 33 -1 |
| 1 21.1 | 05 97.9 + 276 | 21.95 -260 | 31 10.5 + 310 | 51 68 -316 | 50 90.1 + 279 | 33 09 -179 | 02 16.7 + 450 | 76 89 + 56 |
| 1 31.1 | 06 21.3 + 234 | 24.49 -254 | 31 36.7 + 262 | 54 96 -328 | 51 14.1 + 240 | 31 52 -157 | 02 55.8 + 391 | 77.94 +105 |
| 2 10.1 | 06 40.5 + 192 | 26.93 -244 | 31 57.5 + 208 | 58 31 -335 | 51 33.9 + 198 | 30 20 -132 | 02 87.9 + 321 | 79.45 +151 |
| 2 20.0 | 06 54.7 + 142 | 29.19 -226 | 31 72.5 + 150 | 61 62 -331 | 51 49.0 + 151 | 29 17 -103 | 03 11.9 + 240 | 81.36 +191 |
| 3 2.0 | 06 64.2 + 95 | 31 24 -205 | 31 81.9 + 94 | 64 81 -319 | 51 59.4 + 104 | 28 40 -77 | 03 27.8 + 159 | 83 54 +218 |
| 3 12.0 | 06 69.4 + 52 | 33 07 -183 | 31 85.9 + 40 | 67 84 -303 | 51 65.4 + 60 | 27 89 -51 | 03 35.6 + 78 | 85 93 +239 |
| 3 22.0 | 06 70.3 + 9 | 34 63 -156 | 31 84.9 -10 | 70 63 -279 | 51 67.2 + 18 | 27 63 -26 | 03 35.4 - 2 | 88 39 +246 |
| 3 31.9 | 06 67.8 - 25 | 35 93 -130 | 31 79.7 - 52 | 73 14 -251 | 51 65.6 - 16 | 27 58 - 5 | 03 28.4 - 70 | 90 80 +241 |
| 4 10.9 | 06 62.3 - 55 | 36 96 -103 | 31 70.7 - 90 | 75 36 -222 | 51 61.0 - 46 | 27 70 + 12 | 03 15.2 - 132 | 93 10 +230 |
| 4 20.9 | 06 54.4 - 79 | 37 72 - 76 | 31 58.6 - 121 | 77 20 -184 | 51 54.1 - 69 | 27 97 + 27 | 02 97.0 - 182 | 95 17 +207 |
| 4 30.9 | 06 45.0 - 94 | 38 22 - 50 | 31 44.4 - 142 | 78 68 -148 | 51 45.7 - 84 | 28 35 + 38 | 02 75.3 - 217 | 96 93 +176 |
| 5 10.8 | 06 34.3 - 107 | 38 46 - 24 | 31 28.3 - 161 | 79 77 -109 | 51 36.2 - 95 | 28 82 + 47 | 02 50.8 - 245 | 98 35 +142 |
| 5 20.8 | 06 23.0 - 113 | 38 44 + 2 | 31 11.1 - 172 | 80 44 - 67 | 51 26.1 - 101 | 29 35 + 53 | 02 25.0 - 258 | 99 35 +100 |
| 5 30.8 | 06 11.7 - 113 | 38 20 + 24 | 30 93.5 - 176 | 80 71 - 27 | 51 16.2 - 99 | 29 50 + 55 | 01 99.2 - 258 | 99 91 + 56 |
| 6 9.7 | 06 00.5 - 112 | 37 73 + 47 | 30 75.6 - 179 | 80 56 + 15 | 51 06.5 - 97 | 30 49 + 59 | 01 99.2 - 255 | 100 04 + 13 |
| 6 19.7 | 05 89.9 - 106 | 37 04 + 69 | 30 58.2 - 174 | 80 00 + 56 | 50 97.6 - 89 | 31 07 + 58 | 01 73.7 - 238 | 99 69 - 35 |
| 6 29.7 | 05 80.3 - 96 | 36 17 + 87 | 30 41.9 - 163 | 79 08 + 92 | 50 89.7 - 79 | 31 63 + 56 | 01 49.9 - 214 | 98 92 - 77 |
| 7 9.7 | 05 71.7 - 86 | 35 13 +104 | 30 26.7 - 152 | 77 78 +130 | 50 82.8 - 69 | 32 16 + 53 | 01 09.6 - 189 | 97 72 -120 |
| 7 19.6 | 05 64.6 - 71 | 33 96 +117 | 30 13.5 - 132 | 76 17 +161 | 50 77.6 - 52 | 32 63 + 47 | 00 94.3 - 153 | 96 11 -161 |
| 7 29.6 | 05 59.3 - 53 | 32 71 +125 | 30 02.6 - 109 | 74 31 +186 | 50 73.9 - 37 | 33 03 + 40 | 00 82.8 - 115 | 96 11 -194 |
| 8 8.6 | 05 55.9 - 34 | 31 40 +131 | 29 94.5 - 81 | 72 22 +209 | 50 72.1 - 18 | 33 34 + 31 | 00 82.8 - 76 | 94 17 -229 |
| 8 18.6 | 05 55.2 - 7 | 30 11 +129 | 29 90.0 - 45 | 70 00 +222 | 50 72.8 + 7 | 33 50 + 16 | 00 75.2 - 28 | 91 88 -257 |
| 8 28.5 | 05 57.0 + 18 | 28 88 +123 | 29 89.2 - 8 | 67 75 +225 | 50 75.8 + 30 | 33 52 + 2 | 00 74.3 + 19 | 86 52 -279 |
| 9 7.5 | 05 62.0 + 50 | 27 76 +112 | 29 92.7 + 35 | 65 50 +225 | 50 81.0 + 52 | 33 22 - 30 | 00 81.3 + 70 | 83 52 -300 |
| 9 17.5 | 05 70.5 + 85 | 26 85 + 91 | 30 01.2 + 85 | 63 41 +209 | 50 90.1 + 91 | 33 02 - 20 | 00 81.3 + 127 | 83 52 -313 |
| 9 27.4 | 05 82.6 + 121 | 26 17 + 68 | 30 14.5 + 133 | 61 53 +188 | 51 02.5 + 124 | 32 43 - 59 | 00 94.0 + 181 | 80 39 -320 |
| 10 7.4 | 05 98.8 + 162 | 25 78 + 39 | 30 33.1 + 186 | 59 95 +158 | 51 18.5 + 160 | 31 58 - 85 | 01 12.1 + 240 | 77 19 -325 |
| 10 17.4 | 06 19.1 + 203 | 25 76 + 2 | 30 56.9 + 238 | 58 79 +116 | 51 38.2 + 197 | 30 46 -112 | 01 66.2 + 301 | 70 76 -318 |
| 10 27.4 | 06 43.0 + 239 | 26 12 - 36 | 30 85.5 + 286 | 58 07 + 72 | 51 61.4 + 232 | 29 09 -137 | 02 01.6 + 354 | 67 69 -307 |
| 11 6.3 | 06 70.8 + 278 | 26 87 - 75 | 31 18.6 + 331 | 57 87 + 20 | 51 88.2 + 268 | 27 47 -162 | 02 01.6 + 412 | 67 69 -290 |
| 11 16.3 | 07 01.5 + 307 | 28 04 -117 | 31 55.3 + 367 | 58 22 - 35 | 52 18.0 + 298 | 25 64 -183 | 02 42.8 + 458 | 64 79 -262 |
| 11 26.3 | 07 34.5 + 330 | 29 57 -153 | 31 94.6 + 393 | 59 11 - 89 | 52 50.1 + 321 | 23 64 -200 | 02 88.6 + 496 | 62 17 -230 |
| 12 6.3 | 07 69.2 + 347 | 31 46 -189 | 32 35.6 + 410 | 60 56 -145 | 52 84.0 + 339 | 21 51 -213 | 03 90.8 + 526 | 57 98 -189 |
| 12 16.2 | 08 04.2 + 350 | 33 63 -217 | 32 76.7 + 411 | 62 50 -194 | 53 18.3 + 343 | 19 34 -217 | 04 44.6 + 538 | 56 57 -141 |
| 12 26.2 | 08 38.6 + 344 | 36 02 -239 | 33 16.6 + 399 | 64 87 -237 | 53 52.3 + 340 | 17 18 -216 | 04 98.1 + 535 | 55 65 - 92 |
| 12 36.2 | 08 71.3 + 327 | 38 57 -255 | 33 54.4 + 378 | 67 64 -277 | 53 84.9 + 326 | 15 10 -208 | 05 49.9 + 518 | 55 29 - 36 |
| | + 298 | -260 | + 340 | -303 | + 300 | -192 | + 479 | + 20 |
| Mean Place | 06.939 | 36 24 | 31.954 | 72 21 | 51.829 | 24 51 | 01.974 | 77 92 |
| sec δ , tan δ | +1.053 | -0.329 | +1.349 | -0.905 | +1.002 | +0.064 | +1.810 | +1.508 |
| $d\alpha(\psi)$, $d\delta(\psi)$ | +0.059 | -0.38 | +0.055 | -0.38 | +0.062 | -0.38 | +0.071 | -0.38 |
| $d\alpha(\epsilon)$, $d\delta(\epsilon)$ | -0.021 | +0.26 | -0.058 | +0.26 | +0.004 | +0.26 | +0.097 | +0.25 |
| Dble. Trans. | March 7 | | March 7 | | March 7 | | March 7 | |

APPARENT PLACES OF STARS, 1986

171

AT UPPER TRANSIT AT GREENWICH

| No. | 1285 | | 417 | | 418 | | 419 | |
|---|------------------------------------|-------------------------------------|--|--------------------------------------|------------------------------------|-------------------------------------|------------------------------------|--------------------------------------|
| | 29 G. Leonis | | α Ursae Majoris (<i>Dubhe</i>) | | χ Leonis | | χ' Hydrae | |
| Mag. Spect. | 7.13 | G5 | 1.95 | K0 | 4.66 | F0 | 5.06 | F5 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | ^h ^m 11 01 | [°] ['] - 3 26 | ^h ^m 11 02 | [°] ['] + 61 49 | ^h ^m 11 04 | [°] ['] + 7 24 | ^h ^m 11 04 | [°] ['] - 27 12 |
| 1 -8.8 | ^s 53.682 + 340 | 06 61 -224 | ^s 53.075 + 612 | 24.48 - 97 | ^s 17.434 + 344 | 46.12 -213 | ^s 38.871 + 361 | 48.89 -228 |
| 1 1.2 | 54.010 + 328 | 08.85 -224 | 53.671 + 596 | 24.07 - 41 | 17.767 + 333 | 44.10 -202 | 39.217 + 346 | 51.43 -254 |
| 1 11.2 | 54.319 + 309 | 11.06 -221 | 54.237 + 566 | 24.23 + 16 | 18.082 + 315 | 42.23 -187 | 39.540 + 323 | 54.16 -273 |
| 1 21.1 | 54.596 + 277 | 13.14 -208 | 54.749 + 512 | 24.23 + 75 | 18.082 + 284 | 40.58 -165 | 39.540 + 288 | 57.00 -284 |
| 1 31.1 | 54.834 + 238 | 15.05 -191 | 55.193 + 444 | 26.23 +125 | 18.611 + 245 | 39.18 -140 | 40.073 + 245 | 59.86 -286 |
| 2 10.1 | 55.031 + 197 | 16.76 -171 | 55.559 + 366 | 27.96 +173 | 18.815 + 204 | 38.06 -112 | 40.273 + 200 | 62.68 -282 |
| 2 20.0 | 55.180 + 149 | 18.22 -146 | 55.831 + 272 | 30.08 +212 | 18.971 + 156 | 37.24 - 82 | 40.422 + 149 | 65.39 -271 |
| 3 2.0 | 55.284 + 104 | 19.42 -120 | 56.010 + 179 | 32.47 +239 | 19.080 + 109 | 36.70 - 54 | 40.523 + 101 | 67.91 -252 |
| 3 12.0 | 55.344 + 60 | 20.37 - 95 | 56.095 + 85 | 35.04 +257 | 19.145 + 65 | 36.41 - 29 | 40.578 + 55 | 70.24 -233 |
| 3 22.0 | 55.363 + 19 | 21.06 - 69 | 56.085 - 10 | 37.68 +264 | 19.167 + 22 | 36.38 - 3 | 40.588 + 10 | 72.31 -207 |
| 3 31.9 | 55.348 - 15 | 21.53 - 47 | 55.996 - 89 | 40.24 +256 | 19.155 - 12 | 36.54 + 16 | 40.563 - 25 | 74.11 -180 |
| 4 10.9 | 55.303 - 45 | 21.79 - 26 | 55.833 - 163 | 42.67 +243 | 19.111 - 44 | 36.85 + 31 | 40.505 - 58 | 75.64 -153 |
| 4 20.9 | 55.235 - 68 | 21.85 - 6 | 55.608 - 225 | 44.83 +216 | 19.044 - 67 | 37.30 + 45 | 40.421 - 84 | 76.84 -120 |
| 4 30.9 | 55.153 - 82 | 21.75 + 10 | 55.342 - 266 | 46.66 +183 | 18.961 - 83 | 37.83 + 53 | 40.320 - 101 | 77.74 - 90 |
| 5 10.8 | 55.058 - 95 | 21.51 + 24 | 55.041 - 301 | 48.10 +144 | 18.866 - 95 | 38.41 + 58 | 40.204 - 116 | 78.33 - 59 |
| 5 20.8 | 54.959 - 99 | 21.13 + 38 | 54.722 - 319 | 49.09 + 99 | 18.766 - 100 | 39.02 + 61 | 40.080 - 124 | 78.60 - 27 |
| 5 30.8 | 54.859 - 100 | 20.67 + 46 | 54.401 - 321 | 49.61 + 52 | 18.666 - 100 | 39.62 + 60 | 39.954 - 126 | 78.57 + 3 |
| 6 9.7 | 54.761 - 98 | 20.11 + 56 | 54.083 - 318 | 49.66 + 5 | 18.567 - 99 | 40.21 + 59 | 39.826 - 128 | 78.23 + 34 |
| 6 19.7 | 54.670 - 91 | 19.47 + 64 | 53.784 - 299 | 49.20 - 46 | 18.476 - 91 | 40.76 + 55 | 39.703 - 123 | 77.60 + 63 |
| 6 29.7 | 54.588 - 82 | 18.80 + 67 | 53.512 - 272 | 48.29 - 91 | 18.476 - 81 | 41.24 + 48 | 39.589 - 114 | 76.72 + 88 |
| 7 9.7 | 54.516 - 72 | 18.09 + 71 | 53.271 - 241 | 46.93 -136 | 18.324 - 71 | 41.67 + 43 | 39.484 - 105 | 75.58 +114 |
| 7 19.6 | 54.460 - 56 | 17.37 + 72 | 53.072 - 199 | 45.14 -179 | 18.269 - 55 | 42.01 + 34 | 39.395 - 89 | 74.24 +134 |
| 7 29.6 | 54.419 - 41 | 16.68 + 69 | 52.917 - 155 | 43.00 -214 | 18.229 - 40 | 42.24 + 23 | 39.324 - 71 | 72.75 +149 |
| 8 8.6 | 54.396 - 23 | 16.03 + 65 | 52.810 - 107 | 40.51 -249 | 18.208 - 21 | 42.36 + 12 | 39.274 - 50 | 71.12 +163 |
| 8 18.6 | 54.397 + 1 | 15.49 + 54 | 52.760 - 50 | 37.72 -279 | 18.211 + 3 | 42.32 - 4 | 39.251 - 23 | 69.46 +166 |
| 8 28.5 | 54.422 + 25 | 15.07 + 42 | 52.765 + 5 | 34.72 -300 | 18.238 + 27 | 42.12 - 20 | 39.257 + 6 | 67.82 +164 |
| 9 7.5 | 54.474 + 52 | 14.82 + 25 | 52.832 + 67 | 31.52 -320 | 18.294 + 56 | 42.08 - 4 | 39.297 + 40 | 66.25 +157 |
| 9 17.5 | 54.558 + 84 | 14.74 + 8 | 52.965 + 133 | 28.20 -332 | 18.273 + 79 | 41.17 - 91 | 39.377 + 80 | 64.86 +139 |
| 9 27.4 | 54.678 + 120 | 14.90 - 16 | 53.161 + 196 | 24.82 -338 | 18.492 + 119 | 40.34 - 83 | 39.495 + 118 | 63.69 +117 |
| 10 7.4 | 54.836 + 158 | 15.34 - 44 | 53.427 + 266 | 21.42 -340 | 18.649 + 157 | 39.27 -107 | 39.658 + 163 | 62.82 + 87 |
| 10 17.4 | 55.031 + 195 | 16.09 - 75 | 53.762 + 335 | 18.12 -330 | 18.842 + 193 | 37.96 -131 | 39.864 + 206 | 62.34 + 48 |
| 10 27.4 | 55.261 + 230 | 17.13 -104 | 54.159 + 397 | 14.96 -316 | 19.071 + 229 | 36.42 -154 | 40.111 + 247 | 62.25 + 9 |
| 11 6.3 | 55.528 + 267 | 18.48 -135 | 54.622 + 463 | 12.00 -296 | 19.337 + 266 | 34.66 -176 | 40.399 + 288 | 62.62 - 37 |
| 11 16.3 | 55.825 + 297 | 20.11 -163 | 55.138 + 516 | 09.36 -264 | 19.633 + 296 | 32.72 -194 | 40.719 + 320 | 63.46 - 84 |
| 11 26.3 | 56.145 + 320 | 21.97 -186 | 55.697 + 559 | 07.09 -227 | 19.953 + 320 | 30.65 -207 | 41.063 + 344 | 64.73 -127 |
| 12 6.3 | 56.482 + 337 | 24.04 -207 | 56.292 + 595 | 05.25 -184 | 20.292 + 339 | 28.48 -217 | 41.425 + 362 | 66.44 -171 |
| 12 16.2 | 56.825 + 343 | 26.24 -220 | 56.900 + 608 | 03.93 -132 | 20.638 + 346 | 26.32 -216 | 41.790 + 365 | 68.53 -209 |
| 12 26.2 | 57.163 + 338 | 28.49 -225 | 57.506 + 606 | 03.14 - 79 | 20.980 + 342 | 24.21 -211 | 42.149 + 359 | 70.92 -239 |
| 12 36.2 | 57.488 + 325 | 30.76 -227 | 58.094 + 588 | 02.93 - 21 | 21.310 + 330 | 22.21 -200 | 42.491 + 342 | 73.57 -265 |
| | | | | | | | | |
| Mean Place | 55.564 | 23.53 | 54.168 | 26.48 | 19.277 | 33.04 | 40.814 | 73.79 |
| sec δ , $\tan \delta$ | +1.002 | -0.060 | +2.118 | +1.867 | +1.008 | +0.130 | +1.125 | -0.514 |
| $d\alpha(\psi)$, $d\delta(\psi)$ | +0.061 | -0.39 | +0.073 | -0.39 | +0.062 | -0.39 | +0.058 | -0.39 |
| $d\alpha(\epsilon)$, $d\delta(\epsilon)$ | -0.004 | +0.25 | +0.121 | +0.25 | +0.008 | +0.24 | -0.033 | +0.24 |
| Dble. Trans. | March 8 | | March 8 | | March 8 | | March 8 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 1286 | | 1287 | | 1288 | | 1289 | | |
|--------------|----------------|-------------|------------|-------------|----------------|-------------|----------------|-------------|------------|
| | 11 G. Crateris | | 65 Leonis | | 259 G. Carinae | | 260 G. Carinae | | |
| Mag.Spect. | 6.14 | A3 | 5.66 | G5 | 5.80 | B3 | 4.02 | F8p | |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | |
| | h m | ° / | h m | ° / | h m | ° / | h m | ° / | |
| | 11 04 | - 11 00 | 11 06 | + 2 01 | 11 06 | - 70 47 | 11 07 | - 58 53 | |
| 1 | -8.8 | 51.379 +342 | 37.04 -228 | 11.031 +341 | 59.27 -219 | 18.639 +751 | 42.67 -170 | 58.615 +526 | 33.37 -192 |
| 1 | 1.2 | 51.710 +331 | 39.41 -237 | 11.361 +330 | 57.12 -215 | 19.344 +705 | 44.93 -226 | 59.113 +498 | 35.78 -241 |
| 1 | 11.2 | 52.020 +310 | 41.82 -241 | 11.673 +312 | 55.07 -205 | 19.989 +645 | 47.69 -276 | 59.572 +459 | 38.63 -285 |
| 1 | 21.1 | 52.298 +278 | 44.18 -236 | 11.954 +281 | 53.20 -187 | 20.546 +557 | 50.89 -320 | 59.974 +402 | 41.87 -324 |
| 1 | 31.1 | 52.538 +240 | 46.43 -225 | 12.197 +243 | 51.54 -166 | 21.004 +458 | 54.39 -350 | 60.310 +336 | 45.34 -347 |
| 2 | 10.1 | 52.736 +198 | 48.53 -210 | 12.399 +202 | 50.12 -142 | 21.358 +354 | 58.14 -375 | 60.576 +266 | 49.00 -366 |
| 2 | 20.0 | 52.886 +150 | 50.42 -189 | 12.554 +155 | 48.97 -115 | 21.594 +236 | 62.02 -388 | 60.764 +188 | 52.74 -374 |
| 2 | 2.0 | 52.991 +105 | 52.07 -165 | 12.663 +109 | 48.10 -87 | 21.719 +125 | 65.92 -390 | 60.878 +114 | 56.44 -370 |
| 3 | 12.0 | 53.052 +61 | 53.49 -142 | 12.728 +65 | 47.48 -62 | 21.737 +18 | 69.80 -388 | 60.920 +42 | 60.06 -362 |
| 3 | 22.0 | 53.072 +20 | 54.64 -115 | 12.751 +23 | 47.11 -37 | 21.645 -92 | 73.53 -373 | 60.890 -30 | 63.51 -345 |
| 3 | 31.9 | 53.057 -15 | 55.55 -91 | 12.739 -12 | 46.96 -15 | 21.461 -184 | 77.03 -350 | 60.802 -88 | 66.70 -319 |
| 4 | 10.9 | 53.013 -44 | 56.23 -68 | 12.698 -41 | 47.00 +4 | 21.191 -270 | 80.28 -325 | 60.658 -144 | 69.61 -291 |
| 4 | 20.9 | 52.945 -68 | 56.65 -42 | 12.633 -65 | 47.20 +20 | 20.841 -350 | 83.16 -288 | 60.466 -192 | 72.15 -254 |
| 4 | 30.9 | 52.862 -83 | 56.88 -23 | 12.553 -80 | 47.51 +31 | 20.433 -408 | 85.65 -249 | 60.239 -227 | 74.30 -215 |
| 5 | 10.8 | 52.766 -96 | 56.89 -1 | 12.460 -93 | 47.93 +42 | 19.968 -465 | 87.71 -206 | 59.979 -260 | 76.03 -173 |
| 5 | 20.8 | 52.664 -102 | 56.71 +18 | 12.362 -98 | 48.43 +50 | 19.463 -505 | 89.26 -155 | 59.696 -283 | 77.27 -124 |
| 5 | 30.8 | 52.562 -102 | 56.38 +33 | 12.263 -99 | 48.97 +54 | 18.934 -529 | 90.32 -106 | 59.400 -296 | 78.05 -78 |
| 6 | 9.7 | 52.459 -103 | 55.87 +51 | 12.166 -97 | 49.55 +58 | 18.386 -548 | 90.84 -52 | 59.095 -305 | 78.33 -28 |
| 6 | 19.7 | 52.363 -96 | 55.22 +65 | 12.075 -91 | 50.14 +59 | 17.839 -547 | 90.81 +3 | 58.792 -303 | 78.09 +24 |
| 6 | 29.7 | 52.275 -88 | 54.46 +76 | 11.993 -82 | 50.72 +58 | 17.307 -532 | 90.26 +55 | 58.498 -294 | 77.40 +69 |
| 7 | 9.7 | 52.196 -79 | 53.58 +88 | 11.921 -72 | 51.29 +57 | 16.799 -508 | 89.19 +107 | 58.219 -279 | 76.22 +118 |
| 7 | 19.6 | 52.132 -64 | 52.64 +94 | 11.864 -57 | 51.81 +52 | 16.337 -462 | 87.63 +156 | 57.967 -252 | 74.61 +161 |
| 7 | 29.6 | 52.083 -49 | 51.67 +97 | 11.822 -42 | 52.27 +46 | 15.931 -406 | 85.66 +197 | 57.748 -219 | 72.64 +197 |
| 8 | 8.6 | 52.053 -30 | 50.69 +98 | 11.798 -24 | 52.64 +37 | 15.594 -337 | 83.29 +237 | 57.571 -177 | 72.64 +230 |
| 8 | 18.6 | 52.047 -6 | 49.77 +92 | 11.798 +0 | 52.89 +25 | 15.349 -245 | 80.64 +265 | 57.447 -124 | 67.80 +254 |
| 8 | 28.5 | 52.065 +18 | 48.93 +84 | 11.821 +23 | 52.99 +10 | 15.197 -152 | 77.80 +284 | 57.380 -67 | 65.13 +267 |
| 9 | 7.5 | 52.113 +48 | 48.24 +69 | 11.871 +50 | 52.84 -15 | 15.154 -43 | 74.83 +297 | 57.379 -1 | 62.38 +275 |
| 9 | 17.5 | 52.194 +81 | 47.74 +50 | 11.949 +78 | 52.66 -18 | 15.231 +77 | 71.90 +293 | 57.451 +72 | 59.70 +268 |
| 9 | 27.4 | 52.309 +115 | 47.46 +28 | 12.066 +117 | 52.66 -49 | 15.423 +192 | 69.09 +281 | 57.596 +145 | 57.19 +251 |
| 10 | 7.4 | 52.464 +155 | 47.47 -1 | 12.220 +154 | 51.40 -77 | 15.737 +314 | 66.51 +258 | 57.818 +222 | 54.92 +227 |
| 10 | 17.4 | 52.659 +195 | 47.82 -35 | 12.411 +191 | 50.36 -104 | 16.168 +431 | 64.31 +220 | 58.116 +298 | 53.06 +186 |
| 10 | 27.4 | 52.890 +231 | 48.50 -68 | 12.637 +226 | 49.06 -130 | 16.701 +533 | 62.54 +177 | 58.481 +365 | 51.64 +142 |
| 11 | 6.3 | 53.158 +268 | 49.54 -104 | 12.901 +264 | 47.50 -156 | 17.329 +628 | 61.30 +124 | 58.911 +430 | 50.75 +89 |
| 11 | 16.3 | 53.457 +299 | 50.93 -139 | 13.194 +293 | 45.70 -180 | 18.027 +698 | 60.69 +61 | 59.390 +479 | 50.47 +28 |
| 11 | 26.3 | 53.780 +323 | 52.62 -169 | 13.512 +318 | 43.73 -197 | 18.773 +746 | 60.70 -1 | 59.903 +513 | 50.79 -32 |
| 12 | 6.3 | 54.120 +340 | 54.60 -198 | 13.849 +337 | 41.60 -213 | 19.549 +776 | 61.37 -67 | 60.440 +537 | 51.74 -95 |
| 12 | 16.2 | 54.465 +345 | 56.78 -218 | 14.191 +342 | 39.41 -219 | 20.318 +769 | 62.70 -133 | 60.976 +536 | 53.30 -156 |
| 12 | 26.2 | 54.806 +341 | 59.11 -233 | 14.531 +340 | 37.22 -219 | 21.061 +743 | 64.60 -190 | 61.497 +521 | 55.40 -210 |
| 12 | 36.2 | 55.133 +327 | 61.53 -242 | 14.858 +327 | 35.08 -214 | 21.755 +694 | 67.09 -249 | 61.989 +492 | 58.02 -262 |
| | | 55.133 +300 | 61.53 -241 | 14.858 +301 | 35.08 -199 | 21.755 +616 | 67.09 -295 | 61.989 +440 | 58.02 -303 |
| Mean Place | 53.303 | 56.61 | 12.904 | 44.31 | 20.476 | 77.47 | 60.591 | 66.37 | |
| sec δ, tan δ | +1.019 | -0.195 | +1.001 | +0.035 | +3.041 | -2.872 | +1.936 | -1.658 | |
| dα(w), dδ(w) | +0.060 | -0.39 | +0.061 | -0.39 | +0.043 | -0.39 | +0.051 | -0.39 | |
| dα(e), dδ(e) | -0.013 | +0.24 | +0.002 | +0.23 | -0.186 | +0.23 | -0.108 | +0.22 | |
| Dble.Trans. | March 8 | | March 9 | | March 9 | | March 9 | | |

AT UPPER TRANSIT AT GREENWICH

| No. | 420 | | 421 | | 1290 | | 1291 | |
|--------------|-----------------|------------|-------------|------------|---------------|------------|---------------|------------|
| | ψ Ursae Majoris | | β Crateris | | 275 G. Hydrae | | 9 G. Centauri | |
| Mag.Spect. | 3.15 | K0 | 4.52 | A2 | 6.46 | M0 | 5.67 | A2 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " |
| | 11 08 | +44 33 | 11 10 | -22 44 | 11 11 | -32 21 | 11 11 | -49 01 |
| 1 -8.8 | 52.907 +443 | 80.43 -148 | 57.584 +355 | 43.59 -227 | 33.663 +375 | 11.13 -221 | 53.965 +443 | 07.99 -202 |
| 1 1.2 | 53.340 +433 | 79.40 -103 | 57.926 +342 | 46.07 -248 | 34.024 +361 | 13.64 -251 | 54.389 +424 | 10.46 -247 |
| 1 11.2 | 53.753 +413 | 78.85 -56 | 58.248 +322 | 48.70 -263 | 34.361 +337 | 16.40 -276 | 54.782 +393 | 13.31 -285 |
| 1 21.1 | 54.129 +376 | 78.81 -4 | 58.536 +288 | 51.42 -272 | 34.662 +301 | 19.33 -293 | 55.130 +348 | 16.47 -316 |
| 1 31.1 | 54.457 +328 | 79.25 +44 | 58.784 +248 | 54.11 -269 | 34.921 +259 | 22.32 -299 | 55.426 +296 | 19.81 -334 |
| 2 10.1 | 54.731 +274 | 80.14 +89 | 58.990 +206 | 56.74 -263 | 35.133 +212 | 25.32 -300 | 55.665 +239 | 23.29 -348 |
| 2 20.0 | 54.941 +210 | 81.44 +130 | 59.145 +155 | 59.24 -250 | 35.293 +160 | 28.25 -293 | 55.840 +175 | 26.79 -350 |
| 3 2.0 | 55.087 +146 | 83.04 +160 | 59.254 +109 | 61.54 -230 | 35.403 +110 | 31.02 -277 | 55.954 +114 | 30.21 -342 |
| 3 12.0 | 55.171 +84 | 84.89 +185 | 59.318 +64 | 63.64 -210 | 35.466 +63 | 33.62 -260 | 55.910 +56 | 33.53 -332 |
| 3 22.0 | 55.192 +21 | 86.88 +199 | 59.339 +21 | 65.48 -184 | 35.482 +16 | 35.97 -235 | 56.009 -1 | 36.64 -311 |
| 3 31.9 | 55.161 -31 | 88.91 +203 | 59.324 -15 | 67.05 -157 | 35.460 -22 | 38.06 -209 | 55.960 -49 | 39.49 -285 |
| 4 10.9 | 55.083 +210 | 90.91 +130 | 59.278 -46 | 68.37 -132 | 35.404 -56 | 39.87 -181 | 55.868 -92 | 42.05 -256 |
| 4 20.9 | 54.965 -118 | 92.77 +186 | 59.206 -72 | 69.38 -101 | 35.320 -84 | 41.35 -148 | 55.738 -130 | 44.26 -221 |
| 4 30.9 | 54.822 -143 | 94.42 +165 | 59.117 -89 | 70.12 -74 | 35.216 -104 | 42.50 -115 | 55.581 -157 | 46.09 -183 |
| 5 10.8 | 54.657 -165 | 95.83 +141 | 59.013 -104 | 70.58 -46 | 35.095 -121 | 43.33 -83 | 55.399 -182 | 47.53 -144 |
| 5 20.8 | 54.481 -176 | 96.91 +108 | 58.900 -113 | 70.75 -17 | 34.963 -132 | 43.80 -47 | 55.201 -198 | 48.51 -98 |
| 5 30.8 | 54.305 -176 | 97.65 +74 | 58.785 -115 | 70.67 +8 | 34.828 -135 | 43.94 -14 | 54.994 -207 | 49.08 -57 |
| 6 9.7 | 54.130 -175 | 98.04 +39 | 58.668 -117 | 70.31 +36 | 34.688 -140 | 43.73 +21 | 54.780 -214 | 49.19 -11 |
| 6 19.7 | 53.966 -164 | 98.03 -1 | 58.555 -113 | 69.70 +61 | 34.553 -135 | 43.19 +54 | 54.567 -213 | 48.84 +35 |
| 6 29.7 | 53.818 -148 | 97.66 -37 | 58.450 -105 | 68.88 +82 | 34.424 -129 | 42.36 +83 | 54.363 -204 | 48.09 +75 |
| 7 9.7 | 53.686 -132 | 96.94 -72 | 58.352 -98 | 67.84 +104 | 34.304 -120 | 41.22 +114 | 54.168 -195 | 46.91 +118 |
| 7 19.6 | 53.580 -106 | 95.84 -110 | 58.269 -83 | 66.63 +121 | 34.199 -105 | 39.83 +139 | 53.994 -174 | 45.35 +156 |
| 7 29.6 | 53.499 -81 | 94.44 -140 | 58.203 -66 | 65.30 +133 | 34.112 -87 | 38.26 +157 | 53.844 -150 | 43.49 +186 |
| 8 8.6 | 53.446 -53 | 92.72 -172 | 58.155 -48 | 63.87 +143 | 34.046 -66 | 36.51 +175 | 53.723 -121 | 41.35 +214 |
| 8 18.6 | 53.428 -18 | 90.71 -201 | 58.133 -22 | 62.42 +145 | 34.009 -37 | 34.68 +183 | 53.643 -80 | 39.02 +233 |
| 8 28.5 | 53.444 +16 | 88.47 -224 | 58.137 +4 | 61.01 +141 | 34.002 -7 | 32.83 +185 | 53.604 -39 | 36.60 +242 |
| 9 7.5 | 53.498 +54 | 85.99 -248 | 58.174 +37 | 59.68 +133 | 34.032 +30 | 31.03 +180 | 53.615 +11 | 34.13 +247 |
| 9 17.5 | 53.498 +98 | 85.99 -265 | 58.174 +74 | 59.68 +115 | 34.032 +71 | 31.03 +165 | 53.615 +68 | 34.13 +236 |
| 9 17.5 | 53.596 +140 | 83.34 -278 | 58.248 +111 | 58.53 +93 | 34.103 +113 | 29.38 +143 | 53.683 +123 | 31.77 +218 |
| 9 27.4 | 53.736 +188 | 80.56 -289 | 58.359 +154 | 57.60 +64 | 34.216 +160 | 27.95 +116 | 53.806 +185 | 29.59 +192 |
| 10 7.4 | 53.924 +237 | 77.67 -291 | 58.513 +197 | 56.96 +27 | 34.376 +207 | 26.79 +77 | 53.991 +245 | 27.67 +152 |
| 10 17.4 | 54.161 +283 | 74.76 -290 | 58.710 +236 | 56.69 -10 | 34.583 +250 | 26.02 +36 | 54.236 +300 | 26.15 +109 |
| 10 27.4 | 54.444 +329 | 71.86 -282 | 58.946 +277 | 56.79 -53 | 34.833 +294 | 25.66 -11 | 54.536 +353 | 25.06 +57 |
| 11 6.3 | 54.773 +370 | 69.04 -265 | 59.223 +309 | 57.32 -96 | 35.127 +328 | 25.77 -61 | 54.889 +395 | 24.49 -1 |
| 11 16.3 | 55.143 +403 | 66.39 -243 | 59.532 +335 | 58.28 -137 | 35.455 +356 | 26.38 -107 | 55.284 +427 | 24.50 -57 |
| 11 26.3 | 55.546 +429 | 63.96 -214 | 59.867 +353 | 59.65 -176 | 35.811 +374 | 27.45 -155 | 55.711 +447 | 25.07 -115 |
| 12 6.3 | 55.975 +440 | 61.82 -175 | 60.220 +358 | 61.41 -210 | 36.185 +379 | 29.00 -199 | 56.158 +450 | 26.22 -171 |
| 12 16.2 | 56.415 +441 | 60.07 -134 | 60.578 +354 | 63.51 -236 | 36.564 +373 | 30.99 -233 | 56.608 +441 | 27.93 -220 |
| 12 26.2 | 56.856 +428 | 58.73 -86 | 60.932 +339 | 65.87 -257 | 36.937 +356 | 33.32 -264 | 57.049 +418 | 30.13 -264 |
| 12 36.2 | 57.284 +399 | 57.87 -37 | 61.271 +311 | 68.44 -269 | 37.293 +326 | 35.96 -285 | 57.467 +380 | 32.77 -299 |
| Mean Place | 54.463 | 79.02 | 59.580 | 67.05 | 35.689 | 37.58 | 56.011 | 38.91 |
| sec δ, tan δ | +1.404 | +0.985 | +1.084 | -0.419 | +1.184 | -0.634 | +1.525 | -1.151 |
| dα(ψ), dδ(ψ) | +0.067 | -0.39 | +0.059 | -0.39 | +0.058 | -0.39 | +0.055 | -0.39 |
| dα(ε), dδ(ε) | +0.064 | +0.22 | -0.027 | +0.21 | -0.041 | +0.21 | -0.075 | +0.21 |
| Dble.Trans. | March 9 | | March 10 | | March 10 | | March 10 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 422 | | 423 | | 424 | | 1292 | | |
|--------------|---------------------------|---------------------------|---------------------------|---------------------------|-------------------------------------|---------------------------|---------------------------|---------------------------|-------------|
| | δ Leonis | | θ Leonis | | Groombridge 1757 (Ursae Majoris) | | φ Leonis | | |
| Mag.Spect. | 2.58 | A3 | 3.41 | A0 | 5.97 | K0 | 4.58 | A5 | |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | |
| | ^h ^m | ^o ['] | ^h ^m | ^o ['] | ^h ^m | ^o ['] | ^h ^m | ^o ['] | |
| | 11 13 | + 20 35 | 11 13 | + 15 29 | 11 15 | + 49 32 | 11 15 | - 3 34 | |
| 1 | -8.8 | 21.672 + 362 | 60.49 -199 | 30.101 + 354 | 82.66 -206 | 54.949 + 475 | 60.32 -145 | 56.537 + 342 | 22.97 -223 |
| 1 | 1.2 | 22.025 + 353 | 58.74 -175 | 30.446 + 345 | 80.79 -187 | 55.415 + 466 | 59.37 -95 | 56.869 + 332 | 25.22 -225 |
| 1 | 11.2 | 22.361 + 336 | 57.27 -147 | 30.774 + 328 | 79.15 -164 | 55.862 + 447 | 58.93 -44 | 57.184 + 315 | 27.44 -212 |
| 1 | 21.1 | 22.667 + 306 | 56.15 -112 | 31.073 + 299 | 77.80 -135 | 56.271 + 409 | 59.03 + 10 | 57.470 + 286 | 29.54 -220 |
| 1 | 31.1 | 22.935 + 268 | 55.38 -77 | 31.334 + 261 | 76.78 -102 | 56.630 + 359 | 59.64 + 61 | 57.719 + 249 | 31.47 -193 |
| 2 | 10.1 | 23.161 + 226 | 54.96 -42 | 31.553 + 219 | 76.07 -71 | 56.932 + 302 | 60.72 + 108 | 57.928 + 209 | 33.20 -173 |
| 2 | 20.1 | 23.336 + 175 | 54.90 -6 | 31.723 + 170 | 75.71 -36 | 57.166 + 234 | 62.23 + 151 | 58.091 + 163 | 34.69 -149 |
| 3 | 2.0 | 23.462 + 126 | 55.14 + 24 | 31.847 + 124 | 75.65 -6 | 57.331 + 165 | 64.05 + 182 | 58.209 + 118 | 35.91 -122 |
| 3 | 12.0 | 23.541 + 79 | 55.66 + 52 | 31.924 + 77 | 75.86 + 21 | 57.428 + 97 | 66.12 + 207 | 58.283 + 74 | 36.89 -98 |
| 3 | 22.0 | 23.573 + 32 | 56.41 + 75 | 31.956 + 32 | 76.31 + 45 | 57.456 + 28 | 68.34 + 222 | 58.316 + 33 | 37.60 -71 |
| 3 | 31.9 | 23.567 - 6 | 57.31 + 90 | 31.952 - 4 | 76.93 + 62 | 57.425 - 31 | 70.58 + 224 | 58.314 - 2 | 38.08 -48 |
| 4 | 10.9 | 23.527 - 40 | 58.31 + 100 | 31.914 - 38 | 77.68 + 75 | 57.342 - 83 | 72.77 + 219 | 58.282 - 32 | 38.36 -28 |
| 4 | 20.9 | 23.460 - 67 | 59.36 + 105 | 31.851 - 63 | 78.50 + 82 | 57.213 - 129 | 74.81 + 204 | 58.225 - 57 | 38.43 -7 |
| 4 | 30.9 | 23.374 - 86 | 60.38 + 102 | 31.770 - 81 | 79.35 + 85 | 57.053 - 160 | 76.60 + 179 | 58.152 - 73 | 38.35 + 8 |
| 5 | 10.8 | 23.273 - 101 | 61.36 + 98 | 31.675 - 95 | 80.19 + 84 | 56.868 - 185 | 78.12 + 152 | 58.065 - 87 | 38.12 + 23 |
| 5 | 20.8 | 23.165 - 108 | 62.23 + 87 | 31.572 - 103 | 80.98 + 79 | 56.668 - 200 | 79.28 + 116 | 57.971 - 94 | 37.76 + 36 |
| 5 | 30.8 | 23.056 - 109 | 62.97 + 74 | 31.469 - 103 | 81.68 + 70 | 56.465 - 203 | 80.06 + 78 | 57.875 - 96 | 37.31 + 45 |
| 6 | 9.8 | 22.948 - 108 | 63.57 + 60 | 31.366 - 103 | 82.29 + 61 | 56.261 - 204 | 80.46 + 40 | 57.778 - 97 | 36.77 + 54 |
| 6 | 19.7 | 22.847 - 101 | 63.99 + 42 | 31.270 - 96 | 82.77 + 48 | 56.068 - 193 | 80.41 - 5 | 57.686 - 92 | 36.15 + 62 |
| 6 | 29.7 | 22.755 - 92 | 64.23 + 24 | 31.183 - 87 | 83.12 + 35 | 55.891 - 177 | 79.98 - 43 | 57.600 - 86 | 35.51 + 64 |
| 7 | 9.7 | 22.675 - 80 | 64.29 + 6 | 31.106 - 77 | 83.33 + 21 | 55.731 - 160 | 79.14 - 84 | 57.523 - 77 | 34.81 + 70 |
| 7 | 19.6 | 22.610 - 65 | 64.14 - 15 | 31.043 - 63 | 83.37 + 4 | 55.598 - 133 | 77.90 - 124 | 57.458 - 65 | 34.13 + 68 |
| 7 | 29.6 | 22.562 - 48 | 63.80 - 34 | 30.997 - 46 | 83.26 - 11 | 55.493 - 105 | 76.33 - 157 | 57.408 - 50 | 33.46 + 67 |
| 8 | 8.6 | 22.533 - 29 | 63.26 - 54 | 30.969 - 28 | 82.97 - 29 | 55.418 - 75 | 74.42 - 191 | 57.374 - 34 | 32.83 + 63 |
| 8 | 18.6 | 22.528 - 5 | 62.50 - 76 | 30.964 - 5 | 82.49 - 48 | 55.381 - 37 | 72.20 - 222 | 57.363 - 11 | 32.31 + 52 |
| 8 | 28.5 | 22.547 + 19 | 61.55 - 95 | 30.983 + 19 | 81.84 - 65 | 55.380 - 1 | 69.74 - 246 | 57.375 + 12 | 31.90 + 41 |
| 9 | 7.5 | 22.594 + 47 | 60.38 - 117 | 31.029 + 46 | 80.99 - 85 | 55.423 + 43 | 67.03 - 271 | 57.415 + 40 | 31.66 + 24 |
| 9 | 17.5 | 22.675 + 81 | 58.98 - 140 | 31.106 + 77 | 79.88 - 111 | 55.513 + 90 | 64.15 - 288 | 57.483 + 68 | 31.61 + 5 |
| 9 | 27.5 | 22.790 + 115 | 57.37 - 161 | 31.218 + 112 | 78.56 - 132 | 55.650 + 137 | 61.15 - 300 | 57.589 + 106 | 31.75 - 14 |
| 10 | 7.4 | 22.944 + 154 | 55.57 - 180 | 31.369 + 151 | 77.03 - 153 | 55.839 + 189 | 58.05 - 310 | 57.733 + 144 | 32.19 - 44 |
| 10 | 17.4 | 23.137 + 193 | 53.59 - 198 | 31.558 + 189 | 75.29 - 174 | 56.081 + 242 | 54.95 - 310 | 57.916 + 183 | 32.93 - 74 |
| 10 | 27.4 | 23.368 + 231 | 51.46 - 213 | 31.784 + 226 | 73.38 - 191 | 56.374 + 293 | 51.89 - 306 | 58.136 + 220 | 33.95 - 102 |
| 11 | 6.3 | 23.638 + 270 | 49.22 - 224 | 32.048 + 264 | 71.31 - 207 | 56.718 + 344 | 48.93 - 296 | 58.394 + 258 | 35.29 - 134 |
| 11 | 16.3 | 23.941 + 303 | 46.92 - 230 | 32.345 + 297 | 69.14 - 217 | 57.107 + 389 | 46.18 - 275 | 58.683 + 289 | 36.90 - 161 |
| 11 | 26.3 | 24.271 + 330 | 44.62 - 230 | 32.669 + 324 | 66.91 - 223 | 57.533 + 426 | 43.68 - 250 | 58.999 + 316 | 38.75 - 185 |
| 12 | 6.3 | 24.623 + 352 | 42.36 - 226 | 33.013 + 344 | 64.67 - 224 | 57.990 + 457 | 41.52 - 216 | 59.334 + 335 | 40.81 - 206 |
| 12 | 16.2 | 24.984 + 361 | 40.25 - 211 | 33.367 + 354 | 62.52 - 215 | 58.460 + 470 | 39.78 - 174 | 59.676 + 342 | 43.00 - 219 |
| 12 | 26.2 | 25.345 + 361 | 38.33 - 192 | 33.719 + 352 | 60.51 - 201 | 58.933 + 473 | 38.49 - 129 | 60.018 + 342 | 45.26 - 226 |
| 12 | 36.2 | 25.695 + 350 | 36.66 - 167 | 34.061 + 342 | 58.70 - 181 | 59.395 + 462 | 37.71 - 78 | 60.347 + 329 | 47.53 - 227 |
| | | 25.695 + 326 | 36.66 - 134 | 34.061 + 318 | 58.70 - 154 | 59.395 + 432 | 37.71 - 24 | 60.347 + 306 | 47.53 - 218 |
| Mean Place | 23.500 | 52.06 | 31.957 | 72.54 | 56.442 | 60.34 | 58.502 | 39.75 | |
| sec δ, tan δ | +1.068 | +0.376 | +1.038 | +0.277 | +1.541 | +1.173 | +1.002 | -0.063 | |
| dα(ψ), dδ(ψ) | +0.063 | -0.39 | +0.063 | -0.39 | +0.067 | -0.39 | +0.061 | -0.39 | |
| dα(ε), dδ(ε) | +0.025 | +0.20 | +0.018 | +0.20 | +0.077 | +0.19 | -0.004 | +0.19 | |
| Dble.Trans. | March 10 | | March 11 | | March 11 | | March 11 | | |

APPARENT PLACES OF STARS, 1986

175

AT UPPER TRANSIT AT GREENWICH

| No. | 425 | | 1293 | | 426 | | 428 | |
|---------------------|---------------------------|------------|---------------------------|------------|---------------------------|------------|---------------------------|------------|
| | v Ursae Majoris | | 55 Ursae Majoris | | δ Crateris | | π Centauri* | |
| Mag. Spect. | 3.71 | K0 | 4.78 | A2 | 3.82 | K0 | 4.26 | B5 |
| U.T. | R.A. | | R.A. | | R.A. | | R.A. | |
| | h | m | h | m | h | m | h | m |
| | + 33 09 | | + 38 15 | | - 14 41 | | - 54 24 | |
| 1 ^d -8.8 | 43.378 ^s + 393 | 69.31 -181 | 22.241 ^s + 411 | 37.81 -171 | 37.863 ^s + 347 | 58.95 -225 | 21.153 ^s + 487 | 28.79 -185 |
| 1 1.2 | 43.763 + 385 | 67.87 -144 | 22.645 + 404 | 36.50 -131 | 38.200 + 337 | 58.95 -238 | 21.620 + 467 | 28.79 -233 |
| 1 11.2 | 44.131 + 368 | 66.82 -105 | 23.032 + 387 | 35.62 -88 | 38.519 + 319 | 61.33 -246 | 22.620 + 436 | 31.12 -276 |
| 1 21.1 | 44.468 + 337 | 66.21 -61 | 23.387 + 355 | 35.23 -39 | 38.808 + 289 | 63.79 -246 | 22.056 + 387 | 33.88 -313 |
| 1 31.1 | 44.765 + 297 | 66.04 -17 | 23.699 + 312 | 35.29 + 6 | 39.059 + 251 | 66.25 -238 | 22.443 + 331 | 37.01 -336 |
| 2 10.1 | 45.016 + 251 | 66.28 + 24 | 23.963 + 264 | 35.80 + 51 | 39.270 + 211 | 70.89 -226 | 23.044 + 270 | 43.91 -354 |
| 2 20.1 | 45.212 + 196 | 66.93 + 65 | 24.169 + 206 | 36.72 + 92 | 39.433 + 163 | 72.97 -208 | 23.244 + 200 | 47.52 -361 |
| 3 2.0 | 45.354 + 142 | 67.90 + 97 | 24.317 + 148 | 37.97 +125 | 39.551 + 118 | 74.84 -187 | 23.378 + 134 | 51.09 -357 |
| 3 12.0 | 45.442 + 88 | 69.15 +125 | 24.409 + 92 | 39.48 +151 | 39.626 + 75 | 76.48 -164 | 23.448 + 70 | 54.60 -361 |
| 3 22.0 | 45.478 + 36 | 70.60 +145 | 24.444 + 35 | 41.19 +171 | 39.658 + 32 | 77.86 -138 | 23.454 + 6 | 57.92 -332 |
| 3 31.9 | 45.469 - 9 | 72.14 +154 | 24.432 - 12 | 42.97 +178 | 39.656 - 2 | 78.99 -113 | 23.406 - 48 | 61.01 -309 |
| 4 10.9 | 45.421 - 48 | 73.74 +160 | 24.377 - 55 | 44.78 +181 | 39.623 - 33 | 79.88 - 89 | 23.308 - 98 | 63.84 -283 |
| 4 20.9 | 45.340 - 81 | 75.30 +156 | 24.377 - 91 | 44.78 +173 | 39.623 - 58 | 79.88 - 62 | 23.308 -143 | 63.84 -247 |
| 4 30.9 | 45.237 -103 | 76.74 +144 | 24.286 -115 | 46.51 +158 | 39.565 - 76 | 80.50 - 41 | 23.165 -174 | 66.31 -210 |
| 5 10.8 | 45.116 -121 | 78.03 +129 | 24.171 -136 | 48.09 +138 | 39.489 - 90 | 80.91 - 18 | 22.991 -206 | 68.41 -170 |
| 5 20.8 | 44.984 -132 | 79.10 +107 | 23.889 -146 | 50.60 +113 | 39.300 - 99 | 81.04 + 5 | 22.557 -228 | 71.34 -123 |
| 5 30.8 | 44.851 -133 | 79.93 + 83 | 23.740 -149 | 51.43 + 83 | 39.300 -102 | 81.04 + 23 | 22.557 -241 | 71.34 - 80 |
| 6 9.8 | 44.718 -133 | 80.50 + 57 | 23.590 -150 | 51.97 + 54 | 39.198 -105 | 80.81 + 43 | 22.316 -252 | 72.14 - 33 |
| 6 19.7 | 44.592 -126 | 80.77 + 27 | 23.449 -141 | 52.15 + 18 | 39.093 -101 | 80.38 + 61 | 22.064 -263 | 72.47 + 17 |
| 6 29.7 | 44.477 -115 | 80.76 - 1 | 23.319 -130 | 52.02 - 13 | 38.992 - 95 | 79.77 + 75 | 21.811 -247 | 72.30 + 60 |
| 7 9.7 | 44.374 -103 | 80.46 - 30 | 23.203 -116 | 51.56 - 46 | 38.809 - 88 | 78.13 + 89 | 21.325 -239 | 70.63 +107 |
| 7 19.6 | 44.289 - 85 | 79.86 - 60 | 23.107 - 96 | 50.76 - 80 | 38.734 - 75 | 77.13 +100 | 21.108 -217 | 69.15 +148 |
| 7 29.6 | 44.224 - 65 | 78.99 - 87 | 23.107 - 75 | 50.76 -109 | 38.734 - 61 | 77.13 +105 | 21.108 -192 | 69.15 +182 |
| 8 8.6 | 44.180 - 44 | 77.84 -115 | 23.032 - 52 | 49.67 -139 | 38.673 - 44 | 76.08 +110 | 20.916 -159 | 67.33 +216 |
| 8 18.6 | 44.163 - 17 | 76.43 -141 | 22.980 - 22 | 48.28 -167 | 38.629 - 21 | 74.98 +107 | 20.757 -114 | 65.17 +238 |
| 8 28.5 | 44.174 + 11 | 74.79 -164 | 22.958 + 7 | 46.61 -192 | 38.608 - 21 | 73.91 +101 | 20.643 - 67 | 62.79 +252 |
| 9 7.5 | 44.216 + 42 | 72.90 -189 | 22.965 + 41 | 44.69 -215 | 38.611 + 3 | 72.90 + 89 | 20.576 - 11 | 60.27 +260 |
| 9 17.5 | 44.296 + 80 | 72.90 -210 | 23.006 + 81 | 42.54 -237 | 38.644 + 33 | 72.01 + 70 | 20.565 + 54 | 57.67 +254 |
| 9 27.5 | 44.412 + 116 | 70.80 -227 | 23.087 + 119 | 40.17 -252 | 38.710 + 102 | 71.31 + 49 | 20.619 + 117 | 55.13 +239 |
| 10 7.4 | 44.571 + 159 | 68.53 -243 | 23.206 + 165 | 37.65 -267 | 38.812 + 143 | 70.82 + 22 | 20.736 + 187 | 52.74 +216 |
| 10 17.4 | 44.773 + 202 | 63.56 -254 | 23.371 + 210 | 34.98 -274 | 38.955 + 143 | 70.60 + 22 | 20.923 + 187 | 50.58 +216 |
| 10 27.4 | 45.017 + 244 | 60.95 -261 | 23.581 + 253 | 32.24 -278 | 39.139 + 184 | 70.72 - 12 | 21.179 + 256 | 48.80 +178 |
| 11 6.3 | 45.303 + 286 | 58.32 -263 | 23.834 + 298 | 29.46 -276 | 39.361 + 222 | 71.18 - 46 | 21.497 + 318 | 47.44 +136 |
| 11 16.3 | 45.626 + 323 | 55.75 -257 | 24.132 + 337 | 26.70 -286 | 39.623 + 262 | 72.02 - 84 | 21.877 + 380 | 46.59 + 85 |
| 11 26.3 | 45.979 + 353 | 53.29 -246 | 24.469 + 370 | 21.54 -250 | 39.918 + 295 | 73.24 -122 | 22.305 + 428 | 46.33 + 26 |
| 12 6.3 | 46.358 + 379 | 51.01 -228 | 24.839 + 395 | 19.27 -227 | 40.239 + 321 | 74.78 -154 | 22.768 + 463 | 46.64 - 31 |
| 12 16.2 | 46.748 + 390 | 49.00 -201 | 25.234 + 409 | 17.33 -194 | 40.581 + 342 | 76.65 -187 | 23.258 + 490 | 47.57 - 93 |
| 12 26.2 | 47.140 + 392 | 47.31 -169 | 25.643 + 410 | 15.74 -159 | 40.929 + 348 | 78.78 -213 | 23.752 + 494 | 49.08 -151 |
| 12 36.2 | 47.522 + 382 | 45.99 -132 | 26.053 + 400 | 14.57 -117 | 41.275 + 346 | 81.08 -230 | 24.236 + 484 | 51.11 -203 |
| | 47.522 + 357 | 45.99 - 89 | 26.453 + 375 | 14.57 - 70 | 41.610 + 309 | 83.53 -247 | 24.699 + 463 | 53.64 -253 |
| Mean Place | 45.113 | 65.04 | 23.920 | 34.98 | 39.890 | 79.47 | 23.344 | 60.90 |
| sec δ, tan δ | +1.195 | +0.654 | +1.274 | +0.789 | +1.034 | -0.262 | +1.719 | -1.398 |
| dα(ψ), dδ(ψ) | +0.064 | -0.39 | +0.065 | -0.39 | +0.060 | -0.39 | +0.055 | -0.39 |
| dα(ε), dδ(ε) | +0.043 | +0.18 | +0.052 | +0.18 | -0.017 | +0.18 | -0.092 | +0.17 |
| Dble. Trans. | March 12 | | March 12 | | March 12 | | March 12 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 427 | | 429 | | 1294 | | 431 | |
|---|-------------------|--------------------|-------------------------------------|--------------------|--------------------|--------------------|--------------------|--------------------|
| | σ Leonis | | Groombridge 1771 (Ursae Majoris) | | 28 G. Centauri | | γ Crateris* | |
| Mag. Spect. | 4.13 | A0 | 5.98 | A0 | 6.42 | B3 | 4.14 | A5 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° / | h m | ° / | h m | ° / | h m | ° / |
| | 11 20 | + 6 06 | 11 22 | + 64 23 | 11 23 | - 42 35 | 11 24 | - 17 36 |
| 1 | ^d -8.8 | ^s + 345 | ^s + 655 | ^s + 655 | ^s + 414 | ^s - 201 | ^s + 351 | ^s - 222 |
| 1 | 24.491 | - 218 | 02 53.1 | - 116 | 40 93.8 | - 240 | 10 30.1 | - 239 |
| 1 | 24.828 | - 209 | 03 17.7 | - 59 | 41 33.7 | - 240 | 10 64.2 | - 239 |
| 1 | 25.150 | - 196 | 03 79.9 | + 622 | 41 71.2 | + 375 | 10 96.6 | + 324 |
| 1 | 25.443 | - 175 | 04 37.1 | + 572 | 42 04.9 | + 337 | 11 26.0 | + 294 |
| 1 | 25.700 | - 150 | 04 87.6 | + 505 | 42 34.0 | + 291 | 11 51.7 | + 257 |
| 2 | 25.917 | - 123 | 05 30.2 | + 426 | 42 58.1 | + 241 | 11 73.3 | + 216 |
| 2 | 26.088 | - 94 | 05 63.1 | + 329 | 42 76.5 | + 184 | 11 90.2 | + 169 |
| 3 | 26.214 | - 64 | 05 86.1 | + 230 | 42 89.5 | + 130 | 12 02.6 | + 124 |
| 3 | 26.296 | - 38 | 05 99.1 | + 130 | 42 97.2 | + 77 | 12 10.7 | + 81 |
| 3 | 26.334 | - 12 | 06 01.7 | + 26 | 42 99.7 | + 25 | 12 14.4 | + 37 |
| 3 | 31.9 | + 8 | 05 95.2 | - 65 | 42 97.9 | - 18 | 12 14.7 | + 3 |
| 4 | 10.9 | - 28 | 05 80.4 | - 148 | 42 92.0 | - 59 | 12 11.8 | - 29 |
| 4 | 20.9 | - 53 | 05 58.3 | - 221 | 42 82.8 | - 92 | 12 06.3 | - 55 |
| 4 | 30.9 | - 71 | 05 30.9 | - 274 | 42 71.0 | - 118 | 11 98.9 | - 74 |
| 5 | 10.8 | - 85 | 04 99.0 | - 319 | 42 56.9 | - 141 | 11 90.0 | - 89 |
| 5 | 20.8 | - 94 | 04 64.4 | - 346 | 42 41.3 | - 156 | 11 80.1 | - 99 |
| 5 | 30.8 | - 95 | 04 28.7 | - 357 | 42 24.7 | - 166 | 11 69.8 | - 103 |
| 6 | 9.8 | - 96 | 03 92.6 | - 361 | 42 07.4 | - 173 | 11 59.2 | - 106 |
| 6 | 19.7 | - 92 | 03 57.7 | - 349 | 41 90.0 | - 174 | 11 48.7 | - 105 |
| 6 | 29.7 | - 85 | 03 25.1 | - 326 | 41 73.1 | - 169 | 11 38.8 | - 99 |
| 7 | 9.7 | - 77 | 02 95.2 | - 299 | 41 56.9 | - 162 | 11 29.4 | - 94 |
| 7 | 19.6 | - 64 | 02 69.3 | - 259 | 41 42.2 | - 147 | 11 21.3 | - 81 |
| 7 | 29.6 | - 51 | 02 47.9 | - 214 | 41 29.4 | - 128 | 11 14.5 | - 68 |
| 8 | 8.6 | - 33 | 02 31.3 | - 166 | 41 18.9 | - 105 | 11 14.5 | - 52 |
| 8 | 18.6 | - 12 | 02 20.8 | - 105 | 41 11.7 | - 72 | 11 06.5 | - 28 |
| 8 | 28.5 | + 11 | 02 16.0 | - 48 | 41 08.1 | - 36 | 11 06.1 | - 4 |
| 9 | 7.5 | + 43 | 02 17.8 | + 18 | 41 08.6 | + 5 | 11 08.7 | + 26 |
| 9 | 17.5 | + 58 | 02 26.8 | + 90 | 41 14.0 | + 54 | 11 14.8 | + 61 |
| 9 | 27.5 | + 105 | 02 42.8 | + 160 | 41 24.3 | + 103 | 11 24.4 | + 96 |
| 10 | 7.4 | + 140 | 02 66.5 | + 237 | 41 40.2 | + 159 | 11 38.2 | + 138 |
| 10 | 17.4 | + 179 | 02 97.9 | + 314 | 41 61.5 | + 213 | 11 56.3 | + 181 |
| 10 | 27.4 | + 216 | 03 36.5 | + 386 | 41 88.0 | + 265 | 12 04.0 | + 220 |
| 11 | 6.3 | + 255 | 03 82.6 | + 461 | 42 19.5 | + 315 | 12 34.4 | + 261 |
| 11 | 16.3 | + 287 | 04 35.1 | + 525 | 42 55.1 | + 356 | 12 44.2 | + 296 |
| 11 | 26.3 | + 314 | 04 92.8 | + 577 | 42 93.9 | + 388 | 12 66.2 | + 322 |
| 12 | 6.3 | + 335 | 05 55.1 | + 623 | 43 34.9 | + 410 | 13 00.6 | + 344 |
| 12 | 16.2 | + 345 | 06 19.6 | + 645 | 43 76.7 | + 418 | 13 35.8 | + 352 |
| 12 | 26.2 | + 344 | 06 84.7 | + 651 | 44 17.9 | + 412 | 13 70.8 | + 350 |
| 12 | 36.2 | + 335 | 07 48.7 | + 640 | 44 57.5 | + 396 | 14 04.7 | + 339 |
| | | + 312 | | + 601 | | + 364 | | + 314 |
| Mean Place | 26.437 | 12.45 | 03.602 | 76.23 | 43.126 | 41.71 | 12.382 | 35.23 |
| sec δ , tan δ | +1.006 | +0.107 | +2.315 | +2.088 | +1.358 | -0.919 | +1.049 | -0.317 |
| $d\alpha(\psi)$, $d\delta(\psi)$ | +0.062 | -0.39 | +0.070 | -0.39 | +0.057 | -0.39 | +0.060 | -0.39 |
| $d\alpha(\epsilon)$, $d\delta(\epsilon)$ | +0.007 | +0.17 | +0.137 | +0.16 | -0.061 | +0.16 | -0.021 | +0.16 |
| Dble. Trans. | March 12 | | March 13 | | March 13 | | March 13 | |

AT UPPER TRANSIT AT GREENWICH

| No. | 1295 | | 1296 | | 1297 | | 1298 | |
|---------------------|--------------------------------------|-------------------------|---------------------------|-------------------------|---------------------------|-------------------------|---------------------------|-------------------------|
| | Piazz 11 ^h 63 (Leonis) | | 83 Leonis* | | τ Leonis | | 282 G. Hydrae | |
| Mag. Spect. | 7.15 | A2 | 6.54 | K0 | 5.18 | K0 | 6.79 | K0 |
| U.T. | R.A. | | Dec. | | R.A. | | Dec. | |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " |
| | 11 25 | + 26 48 | 11 26 | + 3 05 | 11 27 | + 2 55 | 11 28 | - 27 56 |
| 1 ^d -8.8 | 01.086 ^s + 374 | 83 72 ["] -197 | 02.374 ^s + 343 | 26 50 ["] -220 | 12.592 ^s + 344 | 64 55 ["] -221 | 55.165 ^s + 368 | 57.30 ["] -213 |
| 1 ^s 1.2 | 01.455 + 369 | 82 06 -166 | 02.709 + 335 | 24.35 -215 | 12.929 + 337 | 62.39 -216 | 55.523 + 358 | 59.71 -241 |
| 1 11.2 | 01.808 + 353 | 80.72 -134 | 03.030 + 321 | 22.30 -205 | 13.251 + 322 | 60.33 -206 | 55.863 + 340 | 62.33 -262 |
| 1 21.1 | 02.133 + 325 | 79.79 - 93 | 03.322 + 292 | 20.43 -187 | 13.546 + 295 | 58.45 -188 | 56.171 + 308 | 65.10 -277 |
| 1 31.1 | 02.421 + 288 | 79.26 - 53 | 03.580 + 258 | 18.79 -164 | 13.806 + 260 | 56.79 -166 | 56.441 + 270 | 67.90 -280 |
| 2 10.1 | 02.666 + 245 | 79.13 - 13 | 03.799 + 219 | 17.39 -140 | 14.028 + 222 | 55.38 -141 | 56.668 + 227 | 70.71 -281 |
| 2 20.1 | 02.860 + 194 | 79.39 + 26 | 03.972 + 173 | 16.29 -110 | 14.203 + 175 | 54.25 -113 | 56.846 + 178 | 73.42 -271 |
| 3 2.0 | 03.003 + 143 | 79.97 + 58 | 04.101 + 129 | 15.46 - 83 | 14.334 + 131 | 53.41 - 84 | 56.977 + 131 | 75.97 -255 |
| 3 12.0 | 03.097 + 94 | 80.85 + 88 | 04.186 + 85 | 15.46 - 57 | 14.422 + 88 | 52.82 - 59 | 57.062 + 85 | 78.36 -239 |
| 3 22.0 | 03.142 + 45 | 81.95 +110 | 04.228 + 42 | 14.59 - 30 | 14.467 + 45 | 52.51 - 31 | 57.102 + 40 | 80.51 -215 |
| 3 32.0 | 03.145 + 3 | 83.20 +125 | 04.235 + 7 | 14.51 - 8 | 14.477 + 10 | 52.41 - 10 | 57.105 + 3 | 82.41 -190 |
| 4 10.9 | 03.111 - 34 | 84.53 +133 | 04.212 - 23 | 14.61 + 10 | 14.456 - 21 | 52.49 + 8 | 57.074 - 31 | 84.05 -164 |
| 4 20.9 | 03.046 - 65 | 85.88 +136 | 04.162 - 50 | 14.88 + 27 | 14.409 - 47 | 52.75 + 26 | 57.014 - 60 | 85.38 -133 |
| 4 30.9 | 02.960 - 86 | 87.16 +128 | 04.094 - 68 | 15.26 + 38 | 14.344 - 65 | 53.12 + 37 | 56.934 - 80 | 86.43 -105 |
| 5 10.8 | 02.856 -104 | 88.35 +119 | 04.012 - 82 | 15.74 + 48 | 14.263 - 81 | 53.58 + 46 | 56.835 - 99 | 87.18 - 75 |
| 5 20.8 | 02.742 -114 | 89.39 +104 | 03.920 - 92 | 16.28 + 54 | 14.174 - 89 | 54.12 + 54 | 56.724 -111 | 87.61 - 43 |
| 5 30.8 | 02.626 -116 | 90.24 + 85 | 03.826 - 94 | 16.85 + 57 | 14.082 - 92 | 54.68 + 56 | 56.607 - 31 | 87.76 +16 |
| 6 9.8 | 02.507 -119 | 90.89 + 65 | 03.730 - 96 | 17.45 + 60 | 13.987 - 95 | 55.27 + 59 | 56.483 -124 | 87.60 +16 |
| 6 19.7 | 02.394 -113 | 91.29 + 40 | 03.637 - 93 | 18.04 + 59 | 13.895 - 92 | 55.86 + 59 | 56.360 -123 | 87.14 +46 |
| 6 29.7 | 02.290 -104 | 91.46 + 17 | 03.550 - 87 | 18.61 + 57 | 13.810 - 85 | 56.42 + 56 | 56.241 -119 | 86.43 +71 |
| 7 9.7 | 02.195 - 95 | 91.39 - 7 | 03.470 - 80 | 19.15 + 54 | 13.730 - 80 | 56.97 + 55 | 56.127 -114 | 85.45 +98 |
| 7 19.7 | 02.115 - 80 | 91.06 - 33 | 03.402 - 68 | 19.63 + 48 | 13.663 - 67 | 57.44 + 47 | 56.025 -102 | 84.26 +119 |
| 7 29.6 | 02.052 - 63 | 90.49 - 57 | 03.347 - 55 | 20.03 + 40 | 13.608 - 55 | 57.85 + 41 | 55.937 - 88 | 82.89 +137 |
| 8 8.6 | 02.007 - 45 | 89.67 - 82 | 03.307 - 40 | 20.35 + 32 | 13.569 - 39 | 58.16 + 31 | 55.867 - 70 | 81.38 +151 |
| 8 18.6 | 01.988 - 19 | 88.60 -107 | 03.289 - 18 | 20.52 + 17 | 13.551 - 18 | 58.34 + 18 | 55.821 - 46 | 79.79 +159 |
| 8 28.5 | 01.992 + 4 | 87.31 -129 | 03.294 + 5 | 20.55 + 3 | 13.556 + 5 | 58.38 + 4 | 55.803 - 18 | 78.19 +160 |
| 9 7.5 | 02.026 + 34 | 85.79 -152 | 03.327 + 33 | 20.39 - 16 | 13.588 + 32 | 58.22 - 16 | 55.817 + 14 | 76.64 +155 |
| 9 17.5 | 02.094 + 68 | 84.03 -176 | 03.376 + 49 | 20.10 - 29 | 13.588 + 49 | 58.22 - 29 | 55.817 + 54 | 75.22 +142 |
| 9 27.5 | 02.198 + 104 | 82.07 -196 | 03.479 + 103 | 19.51 - 59 | 13.637 + 103 | 57.93 - 59 | 55.871 + 92 | 75.22 +122 |
| 10 7.4 | 02.342 + 144 | 79.93 -214 | 03.613 + 134 | 18.67 - 84 | 13.740 + 134 | 57.34 - 83 | 55.963 + 139 | 74.00 +96 |
| 10 17.4 | 02.528 + 186 | 77.63 -230 | 03.786 + 173 | 17.57 -110 | 14.047 + 173 | 55.42 -109 | 56.286 + 184 | 72.43 +61 |
| 10 27.4 | 02.754 + 226 | 75.23 -240 | 03.996 + 210 | 16.23 -134 | 14.258 + 211 | 54.07 -135 | 56.514 + 228 | 72.20 +23 |
| 11 6.3 | 03.022 + 268 | 72.74 -249 | 04.245 + 249 | 14.62 -161 | 14.508 + 250 | 52.47 -160 | 56.787 + 273 | 72.40 -20 |
| 11 16.3 | 03.326 + 304 | 70.25 -249 | 04.528 + 283 | 12.79 -183 | 14.791 + 283 | 50.64 -183 | 57.096 + 309 | 73.06 -66 |
| 11 26.3 | 03.661 + 335 | 67.80 -245 | 04.838 + 310 | 10.79 -200 | 15.101 + 310 | 48.64 -200 | 57.434 + 338 | 74.16 -110 |
| 12 6.3 | 04.020 + 359 | 65.47 -233 | 05.170 + 332 | 08.64 -215 | 15.434 + 333 | 46.49 -215 | 57.795 + 361 | 75.69 -153 |
| 12 16.2 | 04.392 + 372 | 63.34 -213 | 05.511 + 341 | 06.44 -220 | 15.777 + 343 | 44.28 -221 | 58.165 + 370 | 77.61 -192 |
| 12 26.2 | 04.766 + 374 | 61.46 -188 | 05.854 + 343 | 04.24 -220 | 16.121 + 344 | 42.07 -221 | 58.533 + 368 | 79.86 -225 |
| 12 36.2 | 05.132 + 366 | 59.89 -157 | 06.187 + 335 | 02.10 -214 | 16.456 + 335 | 39.92 -215 | 58.889 + 356 | 82.38 -252 |
| | 05.132 + 343 | 59.89 -118 | 06.187 + 312 | 02.10 -199 | 16.456 + 313 | 39.92 -201 | 58.889 + 330 | 82.38 -269 |
| Mean Place | 02.914 | 77.67 | 04.342 | 12.42 | 14.595 | 50.33 | 57.339 | 82.22 |
| sec δ, tan δ | +1.121 | +0.506 | +1.001 | +0.054 | +1.001 | +0.051 | +1.132 | -0.531 |
| da(ψ), dδ(ψ) | +0.063 | -0.39 | +0.061 | -0.39 | +0.061 | -0.39 | +0.059 | -0.39 |
| da(ε), dδ(ε) | +0.033 | +0.15 | +0.004 | +0.15 | +0.003 | +0.14 | -0.035 | +0.14 |
| Dble.Trans. | March 13 | | March 14 | | March 14 | | March 14 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 432 | | 433 | | 434 | | 436 | |
|---|-------------------|------------|--------------------|-------------|-------------------|------------|--------------------|------------|
| | 58 Ursae Majoris | | λ Draconis | | ξ Hydrae | | λ Centauri | |
| Mag.Spect. | 5.88 | F8 | 4.06 | M0 | 3.72 | G5 | 3.34 | B9 |
| U.T. | R.A. | | R.A. | | R.A. | | R.A. | |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " |
| | 11 29 | +43 14 | 11 30 | +69 23 | 11 32 | -31 46 | 11 35 | -62 56 |
| | ^s +433 | " -173 | ^s +773 | " -116 | ^s +378 | " -207 | ^s +597 | " -151 |
| 1 -8.8 | 45 810 +429 | 51.81 -128 | 35.989 +767 | 76.55 -56 | 17.960 +367 | 32.11 -238 | 06 675 +574 | 08.52 -205 |
| 1 1.2 | 46.239 +415 | 50.53 -82 | 36.756 +744 | 75.99 +5 | 18.327 +349 | 34.49 -264 | 07.249 +541 | 10.57 -254 |
| 1 11.2 | 46.654 +382 | 49.71 -28 | 37.500 +689 | 76.04 +69 | 18.676 +317 | 37.13 -282 | 07.790 +485 | 13.11 -299 |
| 1 21.1 | 47.036 +341 | 49.43 +20 | 38.189 +611 | 76.73 +124 | 18.993 +277 | 39.95 -290 | 08.275 +419 | 16.10 -329 |
| 1 31.1 | 47.377 | 49.63 | 38.800 | 77.97 | 19.270 | 42.85 | 08 694 | 19.39 |
| 2 10.1 | 47.668 +291 | 50.31 +68 | 39.321 +521 | 79.75 +178 | 19.504 +234 | 45.77 -292 | 09 042 +348 | 22.94 -355 |
| 2 20.1 | 47.899 +231 | 51.44 +113 | 39.727 +406 | 81.97 +222 | 19.688 +184 | 48.64 -287 | 09.306 +264 | 26.64 -370 |
| 3 2.0 | 48.069 +170 | 52.90 +146 | 40.015 +288 | 84.50 +253 | 19.823 +135 | 51.37 -273 | 09.490 +184 | 30.37 -373 |
| 3 12.0 | 48.180 +111 | 54.66 +176 | 40.182 +167 | 87.28 +278 | 19.912 +89 | 53.96 -259 | 09.595 +105 | 34.10 -362 |
| 3 22.0 | 48.228 +48 | 56.61 +195 | 40.221 +39 | 90.15 +287 | 19.954 +42 | 56.31 -235 | 09 619 | 37.72 |
| 3 32.0 | 48.225 -3 | 58.64 +203 | 40.148 -73 | 92.98 +283 | 19.958 +4 | 58.42 -211 | 09.574 -45 | 41.14 -342 |
| 4 10.9 | 48.174 -51 | 60.68 +204 | 39.969 -179 | 95.70 +272 | 19.926 -32 | 60.26 -184 | 09 464 -110 | 44.33 -319 |
| 4 20.9 | 48.081 -93 | 62.64 +196 | 39.697 -272 | 98.16 +246 | 19.864 -62 | 61.80 -154 | 09.293 -171 | 47.20 -287 |
| 4 30.9 | 47.960 -121 | 64.41 +177 | 39.354 -343 | 100.28 +212 | 19.781 -83 | 63.04 -124 | 09.075 -218 | 49.72 -252 |
| 5 10.8 | 47.814 -146 | 66.97 +156 | 38.952 -402 | 102.02 +174 | 19.677 -104 | 63.96 -92 | 08.812 -263 | 51.84 -212 |
| 5 20.8 | 47.654 -160 | 67.24 +127 | 38.509 -443 | 103.27 +125 | 19.560 -117 | 64.54 -58 | 08.513 -299 | 53.49 -165 |
| 5 30.8 | 47.487 -167 | 68.17 +93 | 38.049 -460 | 104.02 +75 | 19.435 -125 | 64.81 -27 | 08.191 -322 | 54.69 -120 |
| 6 9.8 | 47.318 -169 | 68.77 +60 | 37.578 -471 | 104.27 +25 | 19.303 -132 | 64.75 +6 | 07.847 -344 | 55.40 -71 |
| 6 19.7 | 47.154 -164 | 68.97 +20 | 37.118 -460 | 103.97 -30 | 19.170 -133 | 64.36 +39 | 07.495 -352 | 55.58 -18 |
| 6 29.7 | 47.001 -153 | 68.82 -15 | 36.683 -435 | 103.17 -80 | 19.041 -129 | 63.69 +67 | 07.144 -351 | 55.28 +30 |
| 7 9.7 | 46.861 -140 | 68.29 -53 | 36.277 -406 | 101.86 -131 | 18.915 -126 | 62.72 +97 | 06.800 -344 | 54.47 +81 |
| 7 19.7 | 46.740 -121 | 67.39 -90 | 35.921 -356 | 100.07 -179 | 18.802 -113 | 61.49 +123 | 06.478 -322 | 53.18 +129 |
| 7 29.6 | 46.641 -99 | 66.16 -123 | 35.617 -304 | 97.88 -219 | 18.703 -99 | 60.06 +143 | 06.186 -292 | 51.48 +170 |
| 8 8.6 | 46.566 -75 | 66.16 -157 | 35.372 -245 | 95.29 -259 | 18.622 -81 | 58.46 +160 | 05.933 -253 | 49.39 +209 |
| 8 18.6 | 46.522 -44 | 62.72 -187 | 35.201 -171 | 92.37 -292 | 18.567 -55 | 56.75 +171 | 05.736 -197 | 47.00 +239 |
| 8 28.5 | 46.509 -13 | 60.58 -214 | 35.102 -99 | 89.18 -319 | 18.540 -27 | 55.01 +174 | 05.599 -137 | 44.40 +260 |
| 9 7.5 | 46.532 +23 | 58.19 -239 | 35.083 -99 | 85.76 -342 | 18.547 +7 | 53.28 +173 | 05.535 -64 | 41.65 +275 |
| 9 17.5 | 46.598 +66 | 55.58 -261 | 35.153 +70 | 82.19 -357 | 18.595 +48 | 51.68 +160 | 05.554 +19 | 38.89 +276 |
| 9 27.5 | 46.706 +108 | 52.82 -276 | 35.309 +156 | 78.55 -364 | 18.685 +90 | 50.26 +142 | 05.655 +101 | 36.22 +267 |
| 10 7.4 | 46.861 +155 | 49.91 -291 | 35.559 +250 | 74.87 -368 | 18.822 +137 | 49.09 +117 | 05.847 +192 | 33.72 +250 |
| 10 17.4 | 47.066 +205 | 46.94 -297 | 35.904 +345 | 71.27 -360 | 19.007 +185 | 48.28 +81 | 06.130 +283 | 31.56 +216 |
| 10 27.4 | 47.318 +252 | 43.96 -298 | 36.336 +432 | 67.81 -346 | 19.239 +232 | 47.85 +43 | 06.493 +363 | 29.78 +178 |
| 11 6.4 | 47.619 +301 | 41.01 -295 | 36.861 +525 | 64.56 -325 | 19.516 +277 | 47.85 +0 | 06.937 +444 | 28.49 +129 |
| 11 16.3 | 47.964 +345 | 38.20 -281 | 37.464 +603 | 61.65 -291 | 19.831 +315 | 48.35 -50 | 06.937 +507 | 27.79 +70 |
| 11 26.3 | 48.344 +380 | 35.58 -262 | 38.134 +670 | 59.11 -254 | 20.177 +346 | 49.29 -94 | 07.444 +556 | 27.66 +13 |
| 12 6.3 | 48.756 +412 | 33.23 -235 | 38.862 +728 | 57.03 -208 | 20.547 +370 | 50.71 -142 | 08.591 +591 | 28.17 -51 |
| 12 16.2 | 49.184 +428 | 31.25 -198 | 39.620 +758 | 55.50 -153 | 20.926 +379 | 52.55 -184 | 09.193 +602 | 29.31 -114 |
| 12 26.2 | 49.617 +433 | 29.66 -159 | 40.390 +770 | 54.53 -97 | 21.303 +377 | 54.74 -219 | 09.787 +594 | 31.01 -170 |
| 12 36.2 | 50.044 +427 | 28.53 -113 | 41.152 +762 | 54.19 -34 | 21.669 +366 | 57.26 -252 | 10.358 +571 | 33.28 -227 |
| | +402 | -62 | +719 | +29 | +339 | -272 | +524 | -274 |
| Mean Place | 47.468 | 50.74 | 36.804 | 80.60 | 20.176 | 58.18 | 09.224 | 42.09 |
| sec δ , tan δ | +1.373 | +0.941 | +2.843 | +2.661 | +1.176 | -0.620 | +2.199 | -1.958 |
| $d\alpha(\psi)$, $d\delta(\psi)$ | +0.064 | -0.39 | +0.070 | -0.39 | +0.059 | -0.39 | +0.056 | -0.40 |
| $d\alpha(\epsilon)$, $d\delta(\epsilon)$ | +0.062 | +0.13 | +0.176 | +0.13 | -0.041 | +0.12 | -0.130 | +0.11 |
| Dbie.Trans. | March 15 | | March 15 | | March 15 | | March 16 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 435 | | 1299 | | 437 | | 438 | |
|--------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|
| | C ² Centauri | | ♃ Crateris | | ♃ Leonis | | π Chamaeleontis | |
| Mag.Spect. | 5.42 | F0 | 4.81 | B9 | 4.47 | K0 | 5.74 | F0 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | ^h ^m | ^o ['] | ^h ^m | ^o ['] | ^h ^m | ^o ['] | ^h ^m | ^o ['] |
| | 11 35 | -47 33 | 11 35 | - 9 43 | 11 36 | - 0 44 | 11 36 | -75 48 |
| 1 -8.8 | 13.745 +444 | 29.92 -182 | 57.634 +346 | 20.56 -222 | 13.369 +343 | 41.70 -222 | 38.777 +1002 | 42.88 -118 |
| 1 1.2 | 14.174 +429 | 32.17 -225 | 57.973 +339 | 22.86 -230 | 13.707 +338 | 43.92 -222 | 39.737 +960 | 44.67 -179 |
| 1 11.2 | 14.581 +407 | 34.83 -266 | 58.298 +298 | 25.21 -235 | 14.032 +325 | 46.08 -216 | 40.638 +901 | 47.00 -233 |
| 1 21.1 | 14.949 +368 | 37.81 -298 | 58.596 +298 | 27.51 -230 | 14.330 +298 | 48.10 -202 | 41.442 +804 | 49.85 -265 |
| 1 31.1 | 15.269 +320 | 41.00 -319 | 58.860 +264 | 29.69 -218 | 14.595 +265 | 49.93 -183 | 42.130 +688 | 53.07 -322 |
| 2 10.1 | 15.538 +269 | 44.34 -334 | 59.086 +226 | 31.73 -204 | 14.823 +228 | 51.54 -161 | 42.696 +566 | 56.62 -355 |
| 2 20.1 | 15.748 +210 | 47.73 -339 | 59.267 +181 | 33.56 -183 | 15.006 +183 | 52.88 -134 | 43.116 +420 | 60.40 -378 |
| 3 2.0 | 15.899 +151 | 51.07 -334 | 59.404 +137 | 35.15 -159 | 15.144 +138 | 53.96 -108 | 43.395 +279 | 64.27 -387 |
| 3 12.0 | 15.995 +96 | 54.34 -327 | 59.499 +95 | 36.52 -137 | 15.241 +97 | 54.78 -82 | 43.535 +140 | 68.21 -394 |
| 3 22.0 | 16.034 +39 | 57.44 -310 | 59.551 +52 | 37.62 -110 | 15.295 +54 | 55.32 -54 | 43.529 -6 | 72.09 -388 |
| 3 32.0 | 16.026 -8 | 60.30 -286 | 59.569 +18 | 38.48 -86 | 15.314 +19 | 55.65 -33 | 43.395 -134 | 75.81 -372 |
| 4 10.9 | 15.974 -52 | 62.92 -262 | 59.555 -14 | 39.12 -64 | 15.301 -13 | 55.76 -11 | 43.138 -257 | 79.36 -355 |
| 4 20.9 | 15.883 -91 | 65.20 -228 | 59.515 -40 | 39.52 -40 | 15.262 -39 | 55.69 +7 | 42.762 -376 | 82.60 -324 |
| 4 30.9 | 15.762 -121 | 67.14 -194 | 59.455 -60 | 39.73 -21 | 15.204 -58 | 55.48 +21 | 42.293 -469 | 85.49 -289 |
| 5 10.8 | 15.613 -149 | 68.71 -157 | 59.380 -75 | 39.76 -3 | 15.130 -74 | 55.15 +33 | 41.732 -561 | 88.01 -252 |
| 5 20.8 | 15.444 -169 | 69.87 -116 | 59.293 -87 | 39.60 +16 | 15.046 -84 | 54.71 +44 | 41.097 -635 | 90.05 -204 |
| 5 30.8 | 15.262 -182 | 70.62 -75 | 59.201 -92 | 39.31 +29 | 14.957 -89 | 54.22 +49 | 40.410 -687 | 91.62 -157 |
| 6 9.8 | 15.067 -195 | 70.94 -32 | 59.105 -96 | 38.87 +44 | 14.864 -93 | 53.66 +56 | 39.675 -735 | 92.67 -106 |
| 6 19.7 | 14.869 -198 | 70.82 +12 | 59.009 -96 | 38.31 +56 | 14.772 -92 | 53.07 +59 | 38.920 -755 | 93.15 -48 |
| 6 29.7 | 14.673 -196 | 70.30 +52 | 58.917 -92 | 37.65 +66 | 14.684 -88 | 52.47 +60 | 38.165 -755 | 93.11 +4 |
| 7 9.7 | 14.482 -191 | 69.36 +94 | 58.829 -88 | 36.90 +75 | 14.601 -83 | 51.86 +61 | 37.421 -744 | 92.52 +59 |
| 7 19.7 | 14.304 -178 | 68.03 +133 | 58.751 -78 | 36.10 +80 | 14.528 -73 | 51.28 +58 | 36.721 -700 | 91.39 +113 |
| 7 29.6 | 14.145 -159 | 66.40 +163 | 58.684 -67 | 35.27 +83 | 14.467 -61 | 50.75 +53 | 36.081 -640 | 89.79 +160 |
| 8 8.6 | 14.010 -135 | 64.46 +194 | 58.632 -52 | 34.42 +85 | 14.420 -47 | 50.28 +47 | 35.520 -450 | 87.74 +205 |
| 8 18.6 | 13.910 -100 | 62.32 +214 | 58.601 -31 | 33.64 +78 | 14.393 -27 | 49.92 +36 | 35.070 -461 | 85.31 +243 |
| 8 28.5 | 13.848 -62 | 60.05 +227 | 58.591 -10 | 32.93 +71 | 14.388 -5 | 49.69 +23 | 34.739 -331 | 82.62 +269 |
| 9 7.5 | 13.831 -17 | 57.71 +234 | 58.609 +18 | 32.35 +58 | 14.410 +22 | 49.63 +6 | 34.548 -191 | 79.71 +291 |
| 9 17.5 | 13.868 +37 | 55.42 +229 | 58.659 +50 | 31.97 +38 | 14.458 +48 | 49.89 -26 | 34.517 -31 | 76.73 +298 |
| 9 27.5 | 13.959 +91 | 53.27 +215 | 58.743 +84 | 31.76 +21 | 14.543 +85 | 50.09 -20 | 34.641 +124 | 73.79 +294 |
| 10 7.4 | 14.110 +151 | 51.34 +193 | 58.867 +124 | 31.82 -6 | 14.668 +125 | 50.69 -60 | 34.935 +294 | 70.97 +282 |
| 10 17.4 | 14.323 +213 | 49.77 +157 | 59.034 +167 | 32.19 -37 | 14.833 +165 | 51.58 -89 | 35.393 +458 | 68.45 +252 |
| 10 27.4 | 14.593 +270 | 48.59 +118 | 59.239 +205 | 32.88 -69 | 15.036 +203 | 52.73 -115 | 35.998 +605 | 66.29 +216 |
| 11 6.4 | 14.919 +326 | 47.88 +71 | 59.486 +247 | 33.90 -102 | 15.279 +243 | 54.17 -144 | 36.744 +746 | 64.60 +169 |
| 11 16.3 | 15.292 +373 | 47.73 +15 | 59.767 +281 | 35.26 -136 | 15.557 +278 | 55.87 -170 | 37.602 +858 | 63.49 +111 |
| 11 26.3 | 15.701 +409 | 48.11 -38 | 60.077 +310 | 36.90 -164 | 15.863 +306 | 57.77 -190 | 38.541 +939 | 62.96 +53 |
| 12 6.3 | 16.137 +436 | 49.06 -95 | 60.411 +334 | 38.82 -192 | 16.194 +331 | 59.87 -210 | 39.540 +999 | 63.09 -13 |
| 12 16.2 | 16.583 +446 | 50.57 -151 | 60.756 +345 | 40.95 -213 | 16.535 +341 | 62.06 -219 | 40.552 +1012 | 63.89 -80 |
| 12 26.2 | 17.026 +443 | 52.55 -198 | 61.101 +345 | 43.21 -226 | 16.879 +344 | 64.30 -224 | 41.549 +997 | 65.29 -140 |
| 12 36.2 | 17.453 +427 | 54.99 -244 | 61.439 +338 | 45.56 -235 | 17.216 +337 | 66.53 -223 | 42.503 +954 | 67.31 -202 |
| | | | | | | | | |
| Mean Place | 16.115 | 60.34 | 59.763 | 39.14 | 15.448 | 57.02 | 41.761 | 78.09 |
| sec δ, tan δ | +1.482 | -1.094 | +1.015 | -0.171 | +1.000 | -0.013 | +4.083 | -3.958 |
| da(ψ), dδ(ψ) | +0.058 | -0.40 | +0.061 | -0.40 | +0.061 | -0.40 | +0.051 | -0.40 |
| da(ε), dδ(ε) | -0.073 | +0.11 | -0.011 | +0.10 | -0.001 | +0.10 | -0.263 | +0.10 |
| Dble.Trans. | March 16 | | March 16 | | March 16 | | March 16 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 439 | | 1300 | | 440 | | 1301 | | |
|--------------|----------|-------------|------------------|-------------|------------|-------------|------------|-------------|------------|
| | o Hydrae | | 61 Ursae Majoris | | 3 Draconis | | ζ Crateris | | |
| Mag.Spect. | 4.88 | B8 | 5.46 | G5 | 5.48 | K0 | 4.90 | G5 | |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " | |
| | 11 39 | - 34 39 | 11 40 | + 34 16 | 11 41 | + 66 48 | 11 44 | - 18 16 | |
| 1 | -8.8 | 30.108 +388 | 44.37 -198 | 18.679 +395 | 43.87 -198 | 42.628 +698 | 66.72 -138 | 02.410 +354 | 11.06 -214 |
| 1 | 1.2 | 30.486 +378 | 46.69 -232 | 19.070 +391 | 43.87 -161 | 43.326 +698 | 65.93 -79 | 02.758 +348 | 13.38 -232 |
| 1 | 11.2 | 30.847 +361 | 49.30 -261 | 19.450 +380 | 42.26 -121 | 44.008 +682 | 65.75 -18 | 03.092 +334 | 15.84 -246 |
| 1 | 21.2 | 31.176 +329 | 52.12 -282 | 19.802 +352 | 41.05 -74 | 44.644 +636 | 66.21 +46 | 03.400 +308 | 18.34 -250 |
| 1 | 31.1 | 31.465 +289 | 55.05 -293 | 20.118 +316 | 40.31 -28 | 45.216 +572 | 67.24 +103 | 03.673 +273 | 20.81 -247 |
| 2 | 10.1 | 31.712 +247 | 58.05 -300 | 20.390 +272 | 40.19 +16 | 45.710 +494 | 68.82 +158 | 03.908 +235 | 23.21 -240 |
| 2 | 20.1 | 31.907 +195 | 61.00 -295 | 20.610 +220 | 40.79 +60 | 46.103 +393 | 70.87 +205 | 04.098 +190 | 25.47 -226 |
| 3 | 2.0 | 32.054 +147 | 63.85 -285 | 20.777 +167 | 41.75 +96 | 46.392 +289 | 73.27 +240 | 04.244 +146 | 27.53 -206 |
| 3 | 12.0 | 32.153 +99 | 66.57 -272 | 20.892 +115 | 43.01 +126 | 46.574 +182 | 75.94 +267 | 04.346 +102 | 29.39 -186 |
| 3 | 22.0 | 32.204 +51 | 69.08 -251 | 20.952 +60 | 44.52 +151 | 46.642 +68 | 78.75 +281 | 04.406 +60 | 31.01 -162 |
| 3 | 32.0 | 32.215 +11 | 71.35 -227 | 20.967 +15 | 46.15 +163 | 46.609 -33 | 81.56 +281 | 04.431 +25 | 32.38 -137 |
| 4 | 10.9 | 32.190 -25 | 73.37 -202 | 20.940 -27 | 47.86 +171 | 46.481 -128 | 84.30 +274 | 04.422 -9 | 33.51 -113 |
| 4 | 20.9 | 32.133 -57 | 75.07 -170 | 20.877 -63 | 49.55 +169 | 46.267 -214 | 86.82 +252 | 04.386 -36 | 34.38 -87 |
| 4 | 30.9 | 32.052 -81 | 76.48 -141 | 20.788 -89 | 51.13 +158 | 45.988 -279 | 89.03 +221 | 04.329 -57 | 35.02 -64 |
| 5 | 10.9 | 31.949 -103 | 77.56 -108 | 20.677 -111 | 52.58 +145 | 45.652 -336 | 90.89 +186 | 04.254 -75 | 35.42 -40 |
| 5 | 20.8 | 31.830 -119 | 78.29 -73 | 20.552 -125 | 53.81 +123 | 45.276 -376 | 92.29 +140 | 04.166 -88 | 35.58 -16 |
| 5 | 30.8 | 31.702 -128 | 78.70 -41 | 20.420 -132 | 54.79 +98 | 44.881 -395 | 93.22 +93 | 04.071 -95 | 35.53 +5 |
| 6 | 9.8 | 31.565 -137 | 78.76 -6 | 20.285 -135 | 55.51 +72 | 44.471 -410 | 93.65 +43 | 03.968 -103 | 35.27 +26 |
| 6 | 19.7 | 31.425 -140 | 78.46 +30 | 20.152 -133 | 55.90 +39 | 44.067 -404 | 93.54 -11 | 03.865 -103 | 34.80 +47 |
| 6 | 29.7 | 31.287 -138 | 77.86 +60 | 20.026 -126 | 56.00 +10 | 43.681 -386 | 92.94 -60 | 03.763 -102 | 34.16 +64 |
| 7 | 9.7 | 31.151 -136 | 76.94 +92 | 19.909 -117 | 55.78 -22 | 43.316 -365 | 91.84 -110 | 03.664 -99 | 33.34 +82 |
| 7 | 19.7 | 31.027 -124 | 75.73 +121 | 19.807 -102 | 55.24 -54 | 42.990 -326 | 90.25 -159 | 03.573 -91 | 32.39 +95 |
| 7 | 29.6 | 30.916 -111 | 74.31 +142 | 19.721 -86 | 54.40 -84 | 42.707 -283 | 88.24 -201 | 03.493 -80 | 31.35 +104 |
| 8 | 8.6 | 30.823 -93 | 72.66 +165 | 19.653 -68 | 53.26 -114 | 42.472 -235 | 85.83 -241 | 03.427 -66 | 30.22 +113 |
| 8 | 18.6 | 30.756 -67 | 70.90 +176 | 19.612 -41 | 51.83 -143 | 42.300 -172 | 83.05 -278 | 03.382 -45 | 29.08 +114 |
| 8 | 28.6 | 30.717 -39 | 69.07 +183 | 19.596 -16 | 50.15 -168 | 42.188 -112 | 79.99 -306 | 03.360 -22 | 27.97 +111 |
| 9 | 7.5 | 30.714 -3 | 67.23 +184 | 19.611 +15 | 48.20 -195 | 42.147 -41 | 76.67 -332 | 03.366 +6 | 26.94 +103 |
| 9 | 17.5 | 30.753 +39 | 65.50 +173 | 19.663 +52 | 46.02 -218 | 42.184 +37 | 73.18 -349 | 03.407 +41 | 26.07 +87 |
| 9 | 27.5 | 30.835 +82 | 63.93 +157 | 19.752 +89 | 43.65 -237 | 42.298 +114 | 69.58 -360 | 03.484 +77 | 25.38 +69 |
| 10 | 7.4 | 30.967 +132 | 62.60 +133 | 19.885 +133 | 41.09 -256 | 42.496 +198 | 65.91 -367 | 03.602 +118 | 24.94 +44 |
| 10 | 17.4 | 31.149 +182 | 61.61 +99 | 20.063 +178 | 38.41 -268 | 42.782 +286 | 62.29 -362 | 03.765 +163 | 24.82 +12 |
| 10 | 27.4 | 31.379 +230 | 61.00 +61 | 20.284 +221 | 35.65 -276 | 43.149 +367 | 58.77 -352 | 03.970 +205 | 25.04 -22 |
| 11 | 6.4 | 31.657 +278 | 60.83 +17 | 20.551 +267 | 32.86 -279 | 43.601 +452 | 55.43 -334 | 04.217 +247 | 25.63 -59 |
| 11 | 16.3 | 31.976 +319 | 61.15 -32 | 20.859 +308 | 30.12 -274 | 44.129 +528 | 52.38 -305 | 04.503 +286 | 26.61 -98 |
| 11 | 26.3 | 32.328 +352 | 61.94 -79 | 21.202 +343 | 27.48 -264 | 44.720 +591 | 49.68 -270 | 04.818 +315 | 27.95 -134 |
| 12 | 6.3 | 32.705 +377 | 63.22 -128 | 21.574 +372 | 25.02 -246 | 45.369 +649 | 47.42 -226 | 05.159 +341 | 29.65 -170 |
| 12 | 16.3 | 33.093 +388 | 64.95 -173 | 21.962 +388 | 22.84 -218 | 46.050 +681 | 45.69 -173 | 05.511 +352 | 31.64 -199 |
| 12 | 26.2 | 33.481 +388 | 67.06 -211 | 22.357 +395 | 20.97 -187 | 46.748 +698 | 44.50 -119 | 05.866 +355 | 33.86 -222 |
| 12 | 36.2 | 33.858 +377 | 69.52 -246 | 22.747 +390 | 19.49 -148 | 47.442 +694 | 43.93 -57 | 06.213 +347 | 36.26 -240 |
| | | 35.1 | -271 | +369 | -104 | +662 | +6 | +326 | -249 |
| Mean Place | 32.424 | 71.18 | 20.490 | 40.38 | 43.666 | 70.82 | 04.653 | 32.47 | |
| sec δ, tan δ | +1.216 | -0.692 | +1.210 | +0.682 | +2.540 | +2.335 | +1.053 | -0.330 | |
| da(ψ), dδ(ψ) | +0.060 | -0.40 | +0.063 | -0.40 | +0.066 | -0.40 | +0.061 | -0.40 | |
| dα(ε), dδ(ε) | -0.046 | +0.09 | +0.045 | +0.09 | +0.155 | +0.08 | -0.022 | +0.07 | |
| Dble.Trans. | March 17 | | March 17 | | March 18 | | March 18 | | |

APPARENT PLACES OF STARS, 1986

181

AT UPPER TRANSIT AT GREENWICH

| No. | 442 | | 1302 | | 441 | | 443 | |
|--------------|--------------|------------|--------------|------------|-----------------|------------|----------------|------------|
| | λ Muscae | | ν Virginis | | χ Ursae Majoris | | 65 G. Centauri | |
| Mag. Spect. | 3.80 | A5 | 4.20 | M0 | 3.85 | K0 | 4.22 | G0 |
| U.T. | R.A. | | R.A. | | R.A. | | R.A. | |
| | Dec. | | Dec. | | Dec. | | Dec. | |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " |
| | 11 44 | -66 38 | 11 45 | + 6 36 | 11 45 | +47 50 | 11 45 | -61 05 |
| 1 -8.8 | 55 015 + 671 | 39 94 -130 | 07 853 + 346 | 30 73 -223 | 18 818 + 458 | 74 96 -181 | 48 566 + 573 | 38 91 -141 |
| 1 1.2 | 55 665 + 650 | 41 80 -186 | 08 195 + 342 | 28 58 -215 | 19 274 + 456 | 73 62 -134 | 49 123 + 557 | 40 86 -195 |
| 1 11.2 | 56 280 + 615 | 44 18 -238 | 08 526 + 331 | 26 56 -202 | 19 720 + 446 | 72 80 -82 | 49 651 + 528 | 43 31 -245 |
| 1 21.2 | 56 837 + 557 | 47 04 -286 | 08 833 + 307 | 24 76 -180 | 20 136 + 416 | 72 54 -26 | 50 131 + 480 | 46 20 -289 |
| 1 31.1 | 57 322 + 485 | 50 25 -321 | 09 108 + 275 | 23 22 -154 | 20 511 + 375 | 72 80 + 26 | 50 551 + 420 | 49 40 -320 |
| 2 10.1 | 57 730 + 408 | 53 74 -349 | 09 345 + 237 | 21 95 -127 | 20 836 + 325 | 73 58 + 78 | 50 905 + 354 | 52 87 -347 |
| 2 20.1 | 58 045 + 315 | 57 44 -370 | 09 539 + 194 | 21 00 -95 | 21 100 + 264 | 74 83 +125 | 51 182 + 277 | 56 49 -362 |
| 3 2.0 | 58 271 + 226 | 61 20 -226 | 09 689 + 150 | 20 34 -66 | 21 300 + 200 | 76 46 +163 | 51 384 + 202 | 60 16 -367 |
| 3 12.0 | 58 409 + 138 | 64 99 -379 | 09 796 + 107 | 19 96 -38 | 21 436 + 136 | 78 40 +194 | 51 513 + 129 | 63 84 -368 |
| 3 22.0 | 58 454 + 45 | 68 71 -372 | 09 860 + 64 | 19 86 -10 | 21 506 + 70 | 80 56 +216 | 51 565 + 52 | 67 41 -357 |
| 3 32.0 | 58 421 - 33 | 72 25 -354 | 09 888 + 28 | 19 97 + 11 | 21 518 + 12 | 82 80 +224 | 51 551 - 14 | 70 80 -339 |
| 4 10.9 | 58 310 - 111 | 75 61 -336 | 09 884 - 4 | 20 27 + 30 | 21 475 - 43 | 85 06 +226 | 51 475 - 76 | 73 98 -318 |
| 4 20.9 | 58 128 - 182 | 78 65 -304 | 09 851 - 3 | 20 72 + 45 | 21 386 - 89 | 87 23 +217 | 51 341 - 134 | 76 85 -287 |
| 4 30.9 | 57 888 - 240 | 81 36 -271 | 09 798 - 53 | 21 27 + 55 | 21 261 - 125 | 89 22 +199 | 51 160 - 181 | 79 38 -253 |
| 5 10.9 | 57 593 - 295 | 83 69 -233 | 09 728 - 70 | 21 89 + 62 | 21 106 - 155 | 90 97 +175 | 50 936 - 224 | 81 54 -216 |
| 5 20.8 | 57 252 - 341 | 85 56 -187 | 09 646 - 82 | 22 54 + 65 | 20 931 - 175 | 92 40 +143 | 50 676 - 260 | 83 25 -171 |
| 5 30.8 | 56 880 - 372 | 86 98 -142 | 09 558 - 88 | 23 19 + 65 | 20 745 - 186 | 93 48 +108 | 50 391 - 285 | 84 51 -126 |
| 6 9.8 | 56 478 - 402 | 87 90 - 92 | 09 465 - 93 | 23 83 + 64 | 20 552 - 193 | 94 18 + 70 | 50 082 - 309 | 85 30 - 79 |
| 6 19.7 | 56 062 - 416 | 88 28 - 38 | 09 373 - 92 | 24 42 + 59 | 20 552 - 191 | 94 18 + 28 | 49 763 - 319 | 85 30 - 27 |
| 6 29.7 | 55 643 - 419 | 88 17 + 1 | 09 284 - 88 | 24 96 + 54 | 20 179 - 182 | 94 33 - 13 | 49 442 - 321 | 85 37 + 20 |
| 7 9.7 | 55 227 - 416 | 87 53 + 64 | 09 198 - 86 | 25 42 + 46 | 20 007 - 172 | 93 80 - 53 | 49 122 - 320 | 84 66 + 71 |
| 7 19.7 | 54 833 - 394 | 86 39 +114 | 09 122 - 76 | 25 79 + 37 | 19 854 - 153 | 92 85 - 95 | 48 820 - 302 | 83 49 +117 |
| 7 29.6 | 54 471 - 362 | 84 81 +158 | 09 057 - 65 | 26 05 + 26 | 19 722 - 132 | 91 54 -131 | 48 543 - 277 | 81 91 +158 |
| 8 8.6 | 54 152 - 319 | 82 81 +200 | 09 004 - 53 | 26 19 + 14 | 19 615 - 107 | 89 86 -168 | 48 299 - 244 | 79 93 +198 |
| 8 18.6 | 53 895 - 257 | 80 47 +234 | 08 972 - 32 | 26 17 - 2 | 19 540 - 75 | 87 83 -203 | 48 104 - 195 | 77 64 +229 |
| 8 28.6 | 53 707 - 188 | 77 88 +259 | 08 960 - 12 | 25 99 - 18 | 19 497 - 43 | 85 53 -230 | 47 964 - 140 | 75 13 +251 |
| 9 7.5 | 53 600 - 107 | 75 11 +277 | 08 975 + 15 | 25 63 - 36 | 19 493 - 4 | 82 94 -259 | 47 889 - 75 | 72 46 +267 |
| 9 17.5 | 53 589 - 11 | 72 28 +283 | 09 019 + 44 | 25 14 - 49 | 19 534 + 41 | 80 12 -282 | 47 891 + 2 | 69 76 +270 |
| 9 27.5 | 53 673 + 84 | 69 51 +277 | 09 092 + 73 | 24 27 - 87 | 19 620 + 86 | 77 14 -298 | 47 971 + 80 | 67 14 +262 |
| 10 7.4 | 53 862 + 189 | 66 87 +264 | 09 208 + 116 | 23 20 -107 | 19 759 + 139 | 74 01 -313 | 48 136 + 165 | 64 67 +247 |
| 10 17.4 | 54 155 + 293 | 64 54 +233 | 09 364 + 156 | 21 89 -131 | 19 951 + 192 | 70 82 -319 | 48 388 + 252 | 62 51 +216 |
| 10 27.4 | 54 543 + 388 | 62 57 +197 | 09 559 + 195 | 20 35 -154 | 20 194 + 243 | 67 63 -319 | 48 718 + 330 | 60 72 +179 |
| 11 6.4 | 55 024 + 481 | 61 06 +151 | 09 795 + 236 | 18 57 -178 | 20 493 + 299 | 64 48 -315 | 49 127 + 409 | 59 39 +133 |
| 11 16.3 | 55 582 + 558 | 60 12 + 94 | 10 067 + 272 | 16 61 -196 | 20 841 + 348 | 61 49 -299 | 49 601 + 474 | 58 63 + 76 |
| 11 26.3 | 56 197 + 615 | 59 76 + 36 | 10 370 + 303 | 14 49 -212 | 21 230 + 389 | 58 72 -277 | 50 123 + 522 | 58 44 + 19 |
| 12 6.3 | 56 856 + 659 | 60 03 - 27 | 10 699 + 329 | 12 26 -223 | 21 657 + 427 | 56 24 -248 | 50 685 + 562 | 58 87 - 43 |
| 12 16.3 | 57 530 + 674 | 60 95 - 92 | 11 041 + 342 | 10 01 -225 | 22 105 + 448 | 54 15 -209 | 51 260 + 575 | 59 92 -105 |
| 12 26.2 | 58 200 + 670 | 62 46 -151 | 11 387 + 346 | 07 79 -222 | 22 562 + 457 | 52 49 -166 | 51 833 + 573 | 61 53 -161 |
| 12 36.2 | 58 848 + 648 | 64 54 -208 | 11 729 + 342 | 05 67 -212 | 23 018 + 456 | 51 33 -116 | 52 388 + 555 | 63 70 -217 |
| | 58 848 + 598 | 64 54 -259 | 11 729 + 323 | 05 67 -194 | 23 018 + 434 | 51 33 - 61 | 52 388 + 514 | 63 70 -264 |
| Mean Place | 57.878 | 73.91 | 09.934 | 18.16 | 20.457 | 75.50 | 51.305 | 72.00 |
| sec δ, tan δ | +2.523 | -2.317 | +1.007 | +0.116 | +1.490 | +1.105 | +2.069 | -1.812 |
| da(ψ), dδ(ψ) | +0.057 | -0.40 | +0.061 | -0.40 | +0.063 | -0.40 | +0.058 | -0.40 |
| da(ε), dδ(ε) | -0.154 | +0.07 | +0.008 | +0.06 | +0.074 | +0.06 | -0.121 | +0.06 |
| Dble. Trans. | March 18 | | March 19 | | March 19 | | March 19 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 1303 | | 1304 | | 1305 | | 444 | |
|---|-------------------------------------|----------------|--------------|----------------|---------------|----------------|------------------------------|----------------|
| | Groombridge 1826 (Ursae Majoris) | | 93 Leonis | | 298 G. Hydrae | | β Leonis (Denebola) | |
| Mag.Spect. | 6.64 | F0 | 4.54 | F8 | 5.45 | M3 | 2.23 | A2 |
| U.T. | R.A. | | R.A. | | R.A. | | R.A. | |
| | h | m | h | m | h | m | h | m |
| | 11 46 | + 61 28 | 11 47 | + 20 17 | 11 48 | - 26 40 | 11 48 | + 14 38 |
| | ^s | ^o / | ^s | ^o / | ^s | ^o / | ^s | ^o / |
| 1 -8.8 | 23.147 + 594 | 33.99 -156 | 15.420 + 360 | 45.95 -218 | 01.740 + 369 | 04.85 -203 | 20.291 + 351 | 60.71 -222 |
| 1 1.2 | 23.743 + 596 | 32.99 -100 | 15.777 + 357 | 44.01 -194 | 02.101 + 361 | 07.15 -230 | 20.640 + 349 | 58.67 -204 |
| 1 11.2 | 24.326 + 583 | 32.58 -41 | 16.124 + 347 | 42.34 -167 | 02.449 + 348 | 09.66 -251 | 20.978 + 338 | 56.85 -182 |
| 1 21.2 | 24.872 + 546 | 32.80 + 22 | 16.447 + 323 | 41.02 -132 | 02.769 + 320 | 12.32 -266 | 21.293 + 315 | 55.32 -153 |
| 1 31.1 | 25.364 + 492 | 33.58 + 78 | 16.738 + 291 | 40.06 -96 | 03.053 + 284 | 15.02 -270 | 21.575 + 282 | 54.11 -121 |
| 2 10.1 | 25.792 + 428 | 34.92 +134 | 16.990 + 252 | 39.48 -58 | 03.298 + 245 | 17.72 -270 | 21.821 + 246 | 53.24 -87 |
| 2 20.1 | 26.137 + 345 | 36.74 +182 | 17.197 + 207 | 39.29 -19 | 03.496 + 198 | 20.35 -263 | 22.022 + 201 | 52.73 -51 |
| 3 2.0 | 26.395 + 258 | 38.93 +219 | 17.356 + 159 | 39.44 + 15 | 03.649 + 153 | 22.82 -247 | 22.177 + 155 | 52.55 -18 |
| 3 12.0 | 26.565 + 170 | 41.41 +248 | 17.470 + 114 | 39.90 + 46 | 03.757 + 108 | 25.14 -232 | 22.289 + 112 | 52.67 + 12 |
| 3 22.0 | 26.641 + 76 | 44.07 +266 | 17.538 + 68 | 40.63 + 73 | 03.820 + 63 | 27.23 -209 | 22.355 + 66 | 53.06 + 39 |
| 3 32.0 | 26.634 - 7 | 46.75 +268 | 17.566 + 28 | 41.54 + 91 | 03.846 + 26 | 29.09 -186 | 22.384 + 29 | 53.66 + 60 |
| 4 10.9 | 26.549 - 85 | 49.41 +266 | 17.558 - 8 | 42.60 +106 | 03.838 - 8 | 30.70 -161 | 22.379 - 5 | 54.41 + 75 |
| 4 20.9 | 26.393 -156 | 51.88 +247 | 17.519 - 39 | 43.74 +114 | 03.800 - 38 | 32.03 -133 | 22.344 - 35 | 55.28 + 87 |
| 4 30.9 | 26.184 -209 | 54.09 +221 | 17.457 - 62 | 44.88 +114 | 03.739 - 61 | 33.09 -106 | 22.287 - 57 | 56.19 + 91 |
| 5 10.9 | 25.929 -255 | 55.98 +189 | 17.377 - 80 | 45.99 +111 | 03.658 - 81 | 33.87 - 78 | 22.212 - 75 | 57.11 + 92 |
| 5 20.8 | 25.641 - 288 | 57.45 +147 | 17.283 - 94 | 47.01 +102 | 03.561 - 97 | 34.35 - 48 | 22.125 - 87 | 58.00 + 89 |
| 5 30.8 | 25.336 -305 | 58.48 +103 | 17.184 - 99 | 47.91 + 90 | 03.456 -105 | 34.57 - 22 | 22.032 - 93 | 58.81 + 81 |
| 6 9.8 | 25.019 -317 | 59.05 + 57 | 17.078 -106 | 48.67 + 76 | 03.342 -114 | 34.50 + 7 | 21.933 - 99 | 59.53 + 72 |
| 6 19.7 | 24.705 -314 | 59.10 + 5 | 16.974 -104 | 49.24 + 57 | 03.224 -118 | 34.15 + 35 | 21.834 - 99 | 60.13 + 60 |
| 6 29.7 | 24.403 -302 | 58.68 - 42 | 16.874 -100 | 49.63 + 39 | 03.108 -116 | 33.56 + 59 | 21.739 - 95 | 60.58 + 45 |
| 7 9.7 | 24.117 -286 | 57.78 - 90 | 16.778 - 96 | 49.82 + 19 | 02.992 -116 | 32.72 + 84 | 21.648 - 91 | 60.89 + 31 |
| 7 19.7 | 23.861 -256 | 56.40 -138 | 16.693 - 85 | 49.78 - 4 | 02.885 -107 | 31.66 +106 | 21.566 - 82 | 61.03 + 14 |
| 7 29.6 | 23.637 -224 | 54.61 -179 | 16.620 - 73 | 49.54 -24 | 02.885 -96 | 30.44 +122 | 21.496 - 70 | 60.99 - 4 |
| 8 8.6 | 23.450 -187 | 52.41 -220 | 16.562 - 58 | 49.08 -46 | 02.789 - 81 | 30.44 +137 | 21.496 - 56 | 60.78 - 21 |
| 8 18.6 | 23.313 -137 | 49.84 -257 | 16.524 - 38 | 48.38 - 70 | 02.648 - 60 | 27.62 +145 | 21.403 - 37 | 60.36 - 42 |
| 8 28.6 | 23.223 - 90 | 46.99 -285 | 16.508 - 16 | 47.47 - 91 | 02.614 - 34 | 26.15 +147 | 21.388 - 15 | 59.75 - 61 |
| 9 7.5 | 23.190 - 33 | 43.85 -314 | 16.518 + 10 | 46.32 -115 | 02.610 - 4 | 24.70 +145 | 21.398 + 10 | 58.92 - 83 |
| 9 17.5 | 23.221 + 31 | 40.52 -333 | 16.561 + 43 | 44.93 -139 | 02.643 + 33 | 23.38 +132 | 21.438 + 40 | 57.87 -105 |
| 9 27.5 | 23.315 + 94 | 37.05 -347 | 16.636 + 75 | 43.32 -161 | 02.716 + 73 | 22.22 +116 | 21.512 + 74 | 56.57 -130 |
| 10 7.4 | 23.479 + 164 | 33.49 -356 | 16.752 + 116 | 41.48 -184 | 02.833 + 117 | 21.30 + 92 | 21.625 + 113 | 55.04 -153 |
| 10 17.4 | 23.717 + 238 | 29.94 -355 | 16.910 + 158 | 39.44 -204 | 02.998 + 165 | 20.71 + 59 | 21.779 + 154 | 53.29 -175 |
| 10 27.4 | 24.024 + 307 | 26.45 -349 | 17.107 + 197 | 37.25 -219 | 03.207 + 209 | 20.46 + 25 | 21.973 + 194 | 51.35 -194 |
| 11 6.4 | 24.404 + 380 | 23.10 -335 | 17.348 + 241 | 34.91 -234 | 03.463 + 256 | 20.63 - 17 | 22.208 + 235 | 49.22 -213 |
| 11 16.3 | 24.849 + 445 | 20.01 -309 | 17.627 + 279 | 32.49 -242 | 03.758 + 295 | 21.24 - 61 | 22.208 + 273 | 46.97 -225 |
| 11 26.3 | 25.349 + 500 | 17.22 -279 | 17.938 + 311 | 30.05 -244 | 04.086 + 328 | 22.25 -101 | 22.481 + 305 | 44.65 -232 |
| 12 6.3 | 25.900 + 551 | 14.83 -239 | 18.277 + 339 | 27.63 -242 | 04.440 + 354 | 23.70 -145 | 23.117 + 331 | 42.30 -235 |
| 12 16.3 | 26.479 + 579 | 12.93 -190 | 18.631 + 354 | 25.34 -229 | 04.807 + 367 | 25.52 -182 | 23.464 + 347 | 40.01 -229 |
| 12 26.2 | 27.074 + 595 | 11.55 -138 | 18.992 + 361 | 23.23 -211 | 05.176 + 369 | 27.65 -213 | 23.816 + 352 | 37.84 -217 |
| 12 36.2 | 27.668 + 594 | 10.77 - 78 | 19.349 + 357 | 21.37 -186 | 05.537 + 361 | 30.06 -241 | 24.164 + 348 | 35.86 -198 |
| | + 567 | - 18 | + 339 | -154 | + 339 | -259 | + 331 | -172 |
| Mean Place | 24.448 | 37.36 | 17.400 | 38.36 | 04.076 | 28.98 | 22.308 | 51.16 |
| sec δ , $\tan \delta$ | +2.094 | +1.840 | +1.066 | +0.370 | +1.119 | -0.502 | +1.034 | +0.261 |
| $d\alpha(\psi)$, $d\delta(\psi)$ | +0.064 | -0.40 | +0.062 | -0.40 | +0.060 | -0.40 | +0.062 | -0.40 |
| $d\alpha(\epsilon)$, $d\delta(\epsilon)$ | +0.122 | +0.06 | +0.025 | +0.06 | -0.033 | +0.05 | +0.017 | +0.05 |
| Dble.Trans. | March 19 | | March 19 | | March 19 | | March 19 | |

AT UPPER TRANSIT AT GREENWICH

| No. | 445 | | 1306 | | 446 | | 1307 | | |
|----------------|--------------|----------------|----------------|----------------|--------------|----------------|-------------------------------------|----------------|------------|
| | β Virginis | | 12 G. Virginis | | B Centauri | | Groombridge 1830 (Ursae Majoris) | | |
| Mag.Spect. | 3.80 | F8 | 5.81 | K0 | 4.71 | K0 | 6.46 | G5 | |
| U.T. | R.A. | | R.A. | | R.A. | | R.A. | | |
| | h | m | h | m | h | m | h | m | |
| | 11 49 | + 1 50 | 11 50 | - 5 15 | 11 50 | - 45 05 | 11 52 | + 37 48 | |
| | ^s | ^o / | ^s | ^o / | ^s | ^o / | ^s | ^o / | |
| 1 ^d | -8.8 | 57 353 + 346 | 41 12 -224 | 18 603 + 344 | 13 23 -222 | 25 406 + 433 | 25 06 -170 | 10 232 + 414 | 61.31 -218 |
| 1 | 1.2 | 57 695 + 342 | 38 91 -221 | 18 944 + 341 | 15 48 -225 | 25 829 + 423 | 27 20 -214 | 10 646 + 414 | 59 52 -179 |
| 1 | 11.2 | 58 026 + 331 | 36 78 -213 | 19 273 + 329 | 17 74 -226 | 26 235 + 406 | 29 73 -253 | 11 051 + 405 | 58.17 -135 |
| 1 | 21.2 | 58 333 + 307 | 34 82 -196 | 19 579 + 306 | 19 90 -216 | 26 606 + 371 | 32 58 -285 | 11 431 + 380 | 57.32 -85 |
| 1 | 31.1 | 58 609 + 276 | 33 07 -175 | 19 853 + 274 | 21 92 -202 | 26 935 + 329 | 35 63 -305 | 11 775 + 344 | 56.95 -37 |
| 2 | 10.1 | 58 849 + 240 | 31 56 -151 | 20 091 + 238 | 23 75 -183 | 27 216 + 281 | 38 83 -320 | 12 077 + 302 | 57.06 + 11 |
| 2 | 20.1 | 59 046 + 197 | 30 34 -122 | 20 286 + 195 | 25 35 -160 | 27 443 + 227 | 42 10 -327 | 12 326 + 249 | 57.63 + 57 |
| 3 | 2.0 | 59 199 + 153 | 29 40 -94 | 20 438 + 152 | 26 70 -135 | 27 614 + 171 | 45 32 -322 | 12 520 + 194 | 58.58 + 95 |
| 3 | 12.0 | 59 311 + 112 | 28 73 -67 | 20 548 + 110 | 27 80 -110 | 27 733 + 119 | 48 48 -316 | 12 661 + 141 | 59.87 +129 |
| 3 | 22.0 | 59 380 + 69 | 28 34 -39 | 20 616 + 68 | 28 64 -84 | 27 797 + 64 | 51 48 -300 | 12 745 + 84 | 61.40 +153 |
| 3 | 32.0 | 59 413 + 33 | 28 17 -17 | 20 649 + 33 | 29 24 -60 | 27 816 + 19 | 54 26 -278 | 12 780 + 35 | 63.07 +167 |
| 4 | 10.9 | 59 414 + 1 | 28 20 + 3 | 20 651 + 2 | 29 62 -38 | 27 791 -25 | 56 82 -256 | 12 771 -9 | 64.81 +174 |
| 4 | 20.9 | 59 387 -27 | 28 41 + 21 | 20 624 -27 | 29 79 -17 | 27 728 -63 | 59 07 -225 | 12 723 -48 | 66.54 +173 |
| 4 | 30.9 | 59 340 -47 | 28 74 + 33 | 20 577 -47 | 29 80 -1 | 27 635 -93 | 60 99 -192 | 12 645 -78 | 68.15 +161 |
| 5 | 10.9 | 59 276 -64 | 29 18 + 44 | 20 513 -64 | 29 65 + 15 | 27 513 -122 | 62 58 -159 | 12 542 -103 | 69.60 +145 |
| 5 | 20.8 | 59 199 -77 | 29 70 + 52 | 20 436 -77 | 29 36 + 29 | 27 369 -144 | 63 77 -119 | 12 421 -121 | 70.82 +122 |
| 5 | 30.8 | 59 116 -83 | 30 25 + 55 | 20 351 -85 | 28 98 + 38 | 27 210 -159 | 64 58 -81 | 12 292 -129 | 71.76 + 94 |
| 6 | 9.8 | 59 026 -90 | 30 83 + 58 | 20 261 -90 | 28 50 + 48 | 27 037 -173 | 64 98 -40 | 12 292 -137 | 72.41 + 65 |
| 6 | 19.7 | 58 936 -90 | 31 42 + 59 | 20 168 -93 | 27 94 + 56 | 26 857 -180 | 64 97 + 1 | 12 155 -136 | 72.72 + 31 |
| 6 | 29.7 | 58 849 -87 | 31 99 + 57 | 20 078 -90 | 27 33 + 61 | 26 676 -181 | 64 57 + 40 | 11 889 -130 | 72.68 -4 |
| 7 | 9.7 | 58 764 -85 | 32 53 + 54 | 19 989 -89 | 26 68 + 65 | 26 495 -181 | 63 77 + 80 | 11 765 -124 | 72.31 -37 |
| 7 | 19.7 | 58 687 -77 | 33 02 + 49 | 19 909 -80 | 26 01 + 67 | 26 325 -170 | 62 60 +117 | 11 654 -111 | 71.57 -74 |
| 7 | 29.6 | 58 621 -66 | 33 44 + 42 | 19 837 -72 | 25 35 + 66 | 26 169 -156 | 61 12 +148 | 11 560 -94 | 70.51 -106 |
| 8 | 8.6 | 58 567 -54 | 33 77 + 33 | 19 778 -59 | 24 72 + 63 | 26 032 -137 | 59 35 +177 | 11 484 -76 | 69.12 -139 |
| 8 | 18.6 | 58 532 -35 | 33 98 + 21 | 19 738 -40 | 24 17 + 55 | 25 925 -107 | 57 36 +199 | 11 433 -51 | 67.41 -171 |
| 8 | 28.6 | 58 517 -15 | 34 04 + 6 | 19 719 -19 | 23 72 + 45 | 25 852 -73 | 55 24 +212 | 11 408 -25 | 65.43 -198 |
| 9 | 7.5 | 58 528 + 11 | 33 94 -10 | 19 725 + 6 | 23 41 + 31 | 25 821 -31 | 53 03 +221 | 11 415 + 7 | 63.17 -226 |
| 9 | 17.5 | 58 579 + 51 | 33 61 -33 | 19 763 + 38 | 23 32 + 9 | 25 840 + 19 | 50 87 +216 | 11 461 + 46 | 60.66 -251 |
| 9 | 27.5 | 58 638 + 59 | 33 15 -46 | 19 829 + 66 | 23 38 -6 | 25 910 + 70 | 48 81 +206 | 11 544 + 83 | 57.96 -270 |
| 10 | 7.4 | 58 753 + 115 | 32 35 -80 | 19 940 + 111 | 23 68 -30 | 26 038 + 128 | 46 96 +185 | 11 673 + 129 | 55.07 -289 |
| 10 | 17.4 | 58 906 + 153 | 31 30 -105 | 20 093 + 153 | 24 30 -62 | 26 226 + 188 | 45 43 +153 | 11 849 + 176 | 52.06 -301 |
| 10 | 27.4 | 59 099 + 193 | 30 00 -130 | 20 286 + 192 | 25 21 -91 | 26 471 + 245 | 44 26 +117 | 12 072 + 223 | 48.99 -307 |
| 11 | 6.4 | 59 333 + 234 | 28 43 -157 | 20 518 + 233 | 26 42 -121 | 26 772 + 301 | 43 55 + 71 | 12 343 + 271 | 45 88 -311 |
| 11 | 16.3 | 59 604 + 271 | 26 64 -179 | 20 789 + 271 | 27 93 -151 | 27 121 + 349 | 43 36 + 19 | 12 658 + 315 | 42.85 -303 |
| 11 | 26.3 | 59 906 + 302 | 24 65 -199 | 21 090 + 301 | 29 68 -175 | 27 509 + 388 | 43 68 -32 | 13 011 + 353 | 39 94 -291 |
| 12 | 6.3 | 60 233 + 327 | 22 50 -215 | 21 417 + 327 | 31 67 -199 | 27 927 + 418 | 44 55 -87 | 13 397 + 386 | 37.23 -271 |
| 12 | 16.3 | 60 575 + 342 | 20 27 -223 | 21 758 + 341 | 33 82 -215 | 28 359 + 432 | 45 95 -140 | 13 803 + 406 | 34.83 -240 |
| 12 | 26.2 | 60 921 + 346 | 18 03 -224 | 22 103 + 345 | 36 06 -224 | 28 793 + 434 | 47 81 -186 | 14 218 + 415 | 32.77 -206 |
| 12 | 36.2 | 61 263 + 342 | 15 82 -221 | 22 444 + 341 | 38 34 -228 | 29 216 + 423 | 50 13 -232 | 14 632 + 414 | 31.13 -164 |
| | | 61 263 + 323 | 15 82 -207 | 22 444 + 322 | 38 34 -223 | 29 216 + 395 | 50 13 -267 | 14 632 + 395 | 31.13 -117 |
| Mean Place | 59 517 | 26 95 | 20 801 | 29 86 | 27 946 | 54 55 | 12 230 | 56 35 | |
| sec δ, tan δ | +1.001 | +0.032 | +1.004 | -0.092 | +1.417 | -1.003 | +1.266 | +0.776 | |
| dα(ψ), dδ(ψ) | +0.061 | -0.40 | +0.061 | -0.40 | +0.060 | -0.40 | +0.062 | -0.40 | |
| dα(ε), dδ(ε) | +0.002 | +0.04 | -0.006 | +0.04 | -0.067 | +0.04 | +0.052 | +0.03 | |
| Dbble.Trans. | March 20 | | March 20 | | March 20 | | March 20 | | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 447 | | 1308 | | 1309 | | 1310 | |
|---|---------------------------|--------------------------|---------------------------|--------------------------|---------------------------|--------------------------|---|--------------------------|
| | γ Ursae Majoris | | 95 Leonis | | η Crateris | | Piazzi 11 ^h 202 (Ursae Majoris) | |
| Mag. Spect. | 2.54 | A0 | 5.49 | A2 | 5.16 | A0 | 6.30 | F0 |
| U.T. | R.A. | | R.A. | | R.A. | | R.A. | |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " |
| | 11 53 | + 53 45 | 11 54 | + 15 43 | 11 55 | - 17 04 | 11 57 | + 32 20 |
| 1 -8.8 | 05.917 ^s + 501 | 69.31 ^o - 179 | 56.852 ^s + 353 | 27.75 ^o - 223 | 17.257 ^s + 353 | 11.70 ^o - 211 | 23.763 ^s + 385 | 61.00 ^o - 215 |
| 1 1.2 | 06.420 + 503 | 68.03 - 128 | 57.204 + 352 | 25.69 - 206 | 17.606 + 349 | 13.98 - 228 | 24.148 + 385 | 59.20 - 180 |
| 1 11.2 | 06.914 + 494 | 67.30 - 73 | 57.546 + 342 | 23.86 - 183 | 17.943 + 337 | 16.38 - 240 | 24.526 + 378 | 57.79 - 141 |
| 1 21.2 | 07.379 + 465 | 67.17 - 13 | 57.867 + 321 | 22.34 - 152 | 18.256 + 313 | 18.83 - 245 | 24.881 + 355 | 56.84 - 95 |
| 1 31.1 | 07.800 + 421 | 67.60 + 43 | 58.156 + 289 | 21.15 - 119 | 18.537 + 281 | 21.24 - 241 | 25.203 + 322 | 56.34 - 50 |
| 2 10.1 | 08.168 + 368 | 68.57 + 97 | 58.409 + 253 | 20.31 - 84 | 18.781 + 244 | 23.57 - 233 | 25.486 + 283 | 56.30 - 4 |
| 2 20.1 | 08.469 + 301 | 70.03 + 146 | 58.618 + 209 | 19.83 - 48 | 18.981 + 200 | 25.75 - 218 | 25.720 + 234 | 56.71 + 41 |
| 3 2.1 | 08.700 + 231 | 71.88 + 185 | 58.783 + 165 | 19.70 - 13 | 19.138 + 157 | 27.74 - 199 | 25.903 + 183 | 57.50 + 79 |
| 3 12.0 | 08.859 + 159 | 74.06 + 218 | 58.903 + 120 | 19.87 + 17 | 19.253 + 115 | 29.53 - 179 | 26.037 + 134 | 58.62 + 112 |
| 3 22.0 | 08.943 + 84 | 76.45 + 239 | 58.979 + 76 | 20.32 + 45 | 19.325 + 72 | 31.08 - 155 | 26.118 + 81 | 60.02 + 140 |
| 3 32.0 | 08.960 + 17 | 78.92 + 247 | 59.016 + 37 | 20.98 + 66 | 19.362 + 37 | 32.39 - 131 | 26.153 + 35 | 61.58 + 156 |
| 4 10.9 | 08.914 - 46 | 81.40 + 248 | 59.018 + 2 | 21.80 + 82 | 19.365 + 3 | 33.46 - 107 | 26.148 - 5 | 63.26 + 168 |
| 4 20.9 | 08.813 - 101 | 83.76 + 236 | 58.990 - 28 | 22.74 + 94 | 19.340 - 25 | 34.29 - 83 | 26.105 - 43 | 64.95 + 169 |
| 4 30.9 | 08.669 - 144 | 85.92 + 216 | 58.939 - 51 | 23.71 + 97 | 19.294 - 46 | 34.89 - 60 | 26.035 - 70 | 66.57 + 162 |
| 5 10.9 | 08.487 - 182 | 87.81 + 189 | 58.870 - 69 | 24.70 + 99 | 19.228 - 66 | 35.26 - 37 | 25.942 - 93 | 68.09 + 152 |
| 5 20.8 | 08.279 - 208 | 89.34 + 153 | 58.786 - 84 | 25.64 + 94 | 19.148 - 80 | 35.41 - 15 | 25.831 - 111 | 69.42 + 133 |
| 5 30.8 | 08.057 - 222 | 90.49 + 115 | 58.695 - 91 | 26.49 + 85 | 19.059 - 89 | 35.36 + 5 | 25.711 - 120 | 70.52 + 110 |
| 6 9.8 | 07.824 - 233 | 91.22 + 73 | 58.597 - 98 | 27.25 + 76 | 18.961 - 98 | 35.12 + 24 | 25.583 - 128 | 71.38 + 86 |
| 6 19.8 | 07.591 - 233 | 91.48 + 26 | 58.499 - 98 | 27.88 + 63 | 18.861 - 100 | 34.68 + 44 | 25.454 - 129 | 71.94 + 56 |
| 6 29.7 | 07.367 - 224 | 91.31 - 17 | 58.403 - 96 | 28.34 + 46 | 18.760 - 101 | 34.09 + 59 | 25.329 - 125 | 72.21 + 27 |
| 7 9.7 | 07.152 - 215 | 90.69 - 62 | 58.309 - 94 | 28.66 + 32 | 18.660 - 100 | 33.33 + 76 | 25.209 - 120 | 72.17 - 4 |
| 7 19.7 | 06.958 - 194 | 89.61 - 108 | 58.225 - 84 | 28.79 + 13 | 18.567 - 93 | 32.45 + 88 | 25.099 - 110 | 71.81 - 36 |
| 7 29.6 | 06.788 - 170 | 88.14 - 147 | 58.150 - 75 | 28.74 - 5 | 18.567 - 84 | 31.49 + 96 | 25.099 - 97 | 71.81 - 65 |
| 8 8.6 | 06.645 - 143 | 86.27 - 187 | 58.089 - 61 | 28.50 - 24 | 18.483 - 72 | 31.49 + 105 | 25.002 - 81 | 71.16 - 96 |
| 8 18.6 | 06.538 - 107 | 84.04 - 223 | 58.046 - 43 | 28.04 - 46 | 18.411 - 53 | 30.44 + 105 | 24.921 - 58 | 70.20 - 127 |
| 8 28.6 | 06.468 - 70 | 81.51 - 253 | 58.025 - 21 | 27.38 - 66 | 18.327 - 31 | 28.37 + 102 | 24.828 - 35 | 67.41 - 152 |
| 9 7.5 | 06.442 + 26 | 78.68 - 283 | 58.028 + 3 | 26.50 - 88 | 18.323 - 4 | 27.42 + 95 | 24.821 - 7 | 65.61 - 180 |
| 9 17.5 | 06.468 + 26 | 75.63 - 305 | 58.062 + 34 | 25.39 - 111 | 18.354 + 31 | 26.63 + 79 | 24.850 + 29 | 63.55 - 206 |
| 9 27.5 | 06.543 + 75 | 72.42 - 321 | 58.128 + 66 | 24.04 - 135 | 18.418 + 64 | 26.02 + 61 | 24.915 + 65 | 61.28 - 227 |
| 10 7.5 | 06.677 + 134 | 69.06 - 336 | 58.234 + 106 | 22.45 - 159 | 18.525 + 107 | 25.64 + 38 | 25.023 + 108 | 58.80 - 248 |
| 10 17.4 | 06.872 + 195 | 65.67 - 339 | 58.382 + 148 | 20.64 - 181 | 18.676 + 151 | 25.56 + 8 | 25.177 + 154 | 56.17 - 263 |
| 10 27.4 | 07.125 + 253 | 62.29 - 338 | 58.570 + 188 | 18.65 - 199 | 18.870 + 194 | 25.81 - 25 | 25.374 + 197 | 53.44 - 273 |
| 11 6.4 | 07.441 + 316 | 58.98 - 331 | 58.801 + 231 | 16.47 - 218 | 19.108 + 238 | 26.43 - 62 | 25.619 + 245 | 50.63 - 281 |
| 11 16.3 | 07.811 + 370 | 55.87 - 311 | 59.071 + 270 | 14.18 - 229 | 19.385 + 277 | 27.42 - 99 | 25.907 + 288 | 47.84 - 279 |
| 11 26.3 | 08.230 + 419 | 53.01 - 286 | 59.373 + 302 | 11.81 - 237 | 19.694 + 309 | 28.75 - 133 | 26.231 + 324 | 45.12 - 272 |
| 12 6.3 | 08.692 + 462 | 50.48 - 253 | 59.703 + 330 | 09.42 - 239 | 20.029 + 335 | 30.43 - 168 | 26.588 + 357 | 42.55 - 257 |
| 12 16.3 | 09.180 + 488 | 48.39 - 209 | 60.050 + 347 | 07.11 - 231 | 20.379 + 350 | 32.39 - 196 | 26.964 + 376 | 40.22 - 233 |
| 12 26.2 | 09.683 + 503 | 46.76 - 163 | 60.404 + 354 | 04.92 - 219 | 20.733 + 354 | 34.57 - 218 | 27.351 + 387 | 38.18 - 204 |
| 12 36.2 | 10.185 + 502 | 45.67 - 109 | 60.756 + 352 | 02.93 - 199 | 21.082 + 349 | 36.93 - 236 | 27.737 + 386 | 36.50 - 168 |
| | + 482 | - 50 | + 335 | - 172 | + 330 | - 243 | + 369 | - 124 |
| Mean Place | 07.479 | 71.43 | 58.917 | 18.79 | 19.574 | 32.39 | 25.675 | 57.58 |
| sec δ , tan δ | +1.692 | +1.365 | +1.039 | +0.281 | +1.046 | -0.307 | +1.184 | +0.633 |
| $d\alpha(\psi)$, $d\delta(\psi)$ | +0.062 | -0.40 | +0.061 | -0.40 | +0.061 | -0.40 | +0.061 | -0.40 |
| $d\alpha(\epsilon)$, $d\delta(\epsilon)$ | +0.091 | +0.03 | +0.019 | +0.02 | -0.020 | +0.02 | +0.042 | +0.01 |
| Dble. Trans. | March 21 | | March 21 | | March 21 | | March 22 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 1311 | | 449 | | 450 | | 451 | |
|--------------|--------------|------------|----------------|------------|--------------|------------|-----------------------------------|------------|
| Name | π Virginis | | 88 G. Centauri | | ο Virginis | | Groombridge 1852 (Camelopardi) | |
| Mag. Spect. | 4.57 | A3 | 5.28 | F0 | 4.24 | G5 | 5.96 | K0 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " |
| | 12 00 | + 6 41 | 12 02 | - 42 21 | 12 04 | + 8 48 | 12 04 | + 76 58 |
| 1 -8.8 | 08 717 + 345 | 34 48 -226 | 54 746 + 421 | 02 49 -165 | 29 130 + 345 | 39 65 -227 | 34 431 +1104 | 46 34 -146 |
| 1 1.2 | 09 061 + 344 | 32 31 -217 | 55 162 + 416 | 04 54 -205 | 29 475 + 345 | 37 49 -216 | 35 554 +1123 | 45 49 -85 |
| 1 11.2 | 09 396 + 335 | 30 27 204 | 55 563 + 401 | 06 97 -243 | 29 812 + 337 | 35 48 -201 | 36 671 +1117 | 45 29 -20 |
| 1 21.2 | 09 710 + 314 | 28 44 -183 | 55 935 + 372 | 09 71 -274 | 30 129 + 317 | 33 70 -178 | 37 735 +1064 | 45 76 + 47 |
| 1 31.1 | 09 994 + 284 | 26 86 -158 | 56 268 + 333 | 12 65 -294 | 30 416 + 287 | 32 20 -150 | 38 709 + 974 | 46 83 +107 |
| 2 10.1 | 10 243 + 249 | 25 57 -129 | 56 558 + 290 | 15 73 -308 | 30 669 + 253 | 31 00 -120 | 39 571 + 862 | 48 48 +165 |
| 2 20.1 | 10 450 + 207 | 24 59 -98 | 56 796 + 238 | 18 86 -313 | 30 881 + 212 | 30 13 -87 | 40 277 + 706 | 50 64 +216 |
| 3 2.1 | 10 614 + 164 | 23 92 -67 | 56 982 + 186 | 21 96 -310 | 31 049 + 168 | 29 58 -55 | 40 816 + 539 | 53 18 +254 |
| 3 12.0 | 10 736 + 122 | 23 54 -38 | 57 118 + 136 | 24 99 -303 | 31 176 + 127 | 29 33 -25 | 41 176 + 360 | 56 02 +284 |
| 3 22.0 | 10 816 + 80 | 23 44 -10 | 57 202 + 84 | 27 87 -288 | 31 176 + 83 | 29 33 + 3 | 41 342 + 166 | 59 02 +300 |
| 3 32.0 | 10 859 + 43 | 23 57 + 13 | 57 242 + 40 | 30 55 -268 | 31 306 + 47 | 29 62 + 26 | 41 328 - 14 | 62 03 +301 |
| 4 10.9 | 10 869 + 10 | 23 89 + 32 | 57 241 - 1 | 33 01 -246 | 31 319 + 13 | 30 07 + 45 | 41 139 - 189 | 64 98 +295 |
| 4 20.9 | 10 849 - 20 | 24 37 + 48 | 57 201 - 40 | 35 17 -216 | 31 302 - 17 | 30 67 + 60 | 40 786 - 353 | 67 72 +274 |
| 4 30.9 | 10 808 - 41 | 24 34 + 57 | 57 131 - 70 | 37 04 -187 | 31 263 - 39 | 31 35 + 68 | 40 301 - 485 | 70 14 +242 |
| 5 10.9 | 10 748 - 60 | 25 59 + 65 | 57 034 - 97 | 38 59 -155 | 31 204 - 59 | 32 10 + 75 | 39 698 - 603 | 72 19 +205 |
| 5 20.8 | 10 674 - 74 | 26 28 + 69 | 56 913 - 121 | 39 77 -118 | 31 131 - 73 | 32 87 + 77 | 39 004 - 694 | 73 76 +157 |
| 5 30.8 | 10 592 - 82 | 26 96 + 68 | 56 776 - 137 | 40 59 - 82 | 31 049 - 82 | 33 61 + 74 | 38 253 - 751 | 74 83 +107 |
| 6 9.8 | 10 503 - 89 | 27 64 + 68 | 56 624 - 152 | 41 03 - 44 | 30 959 - 90 | 34 32 + 71 | 37 459 - 794 | 75 38 + 55 |
| 6 19.8 | 10 411 - 92 | 28 26 + 62 | 56 462 - 162 | 41 08 - 5 | 30 866 - 93 | 34 96 + 64 | 36 655 - 804 | 75 35 - 3 |
| 6 29.7 | 10 320 - 91 | 28 81 + 55 | 56 297 - 165 | 40 76 + 32 | 30 774 - 92 | 35 51 + 55 | 35 866 - 789 | 74 79 - 56 |
| 7 9.7 | 10 231 - 89 | 29 29 + 48 | 56 130 - 167 | 40 07 + 69 | 30 682 - 92 | 35 97 + 46 | 35 101 - 765 | 73 68 -111 |
| 7 19.7 | 10 148 - 83 | 29 67 + 38 | 55 969 - 161 | 39 02 +105 | 30 597 - 85 | 36 30 + 33 | 34 394 - 707 | 72 05 -163 |
| 7 29.6 | 10 074 - 74 | 29 93 + 26 | 55 820 - 149 | 37 68 +134 | 30 520 - 77 | 36 50 + 20 | 33 754 - 640 | 69 97 -208 |
| 8 8.6 | 10 012 - 62 | 30 08 + 15 | 55 686 - 134 | 36 05 +163 | 30 454 - 66 | 36 56 + 6 | 33 194 - 560 | 67 44 -253 |
| 8 18.6 | 09 967 - 45 | 30 06 - 2 | 55 579 - 107 | 34 22 +183 | 30 405 - 49 | 36 44 - 12 | 32 739 - 455 | 64 52 -292 |
| 8 28.6 | 09 941 - 26 | 29 88 - 18 | 55 502 - 77 | 32 25 +197 | 30 376 - 29 | 36 15 - 29 | 32 389 - 350 | 61 29 -323 |
| 9 7.5 | 09 941 + 0 | 29 51 - 37 | 55 462 - 40 | 30 19 +206 | 30 371 - 5 | 35 67 - 48 | 32 158 - 231 | 57 79 -350 |
| 9 17.5 | 09 972 + 31 | 28 96 - 55 | 55 470 + 8 | 28 16 +203 | 30 396 + 25 | 34 98 - 69 | 32 065 - 93 | 54 09 -370 |
| 9 27.5 | 10 029 + 57 | 28 15 - 81 | 55 525 + 55 | 26 24 +192 | 30 450 + 54 | 34 05 - 93 | 32 103 + 38 | 50 28 -381 |
| 10 7.5 | 10 129 + 100 | 27 07 -108 | 55 636 + 111 | 24 49 +175 | 30 545 + 95 | 32 84 -121 | 32 289 + 186 | 46 40 -388 |
| 10 17.4 | 10 271 + 142 | 25 75 -132 | 55 805 + 169 | 23 05 +144 | 30 682 + 137 | 31 41 -143 | 32 625 + 336 | 42 57 -383 |
| 10 27.4 | 10 452 + 181 | 24 21 -154 | 56 030 + 225 | 21 95 +110 | 30 860 + 178 | 29 75 -166 | 33 103 + 478 | 38 85 -372 |
| 11 6.4 | 10 676 + 224 | 22 42 -179 | 56 311 + 281 | 21 28 + 67 | 31 080 + 220 | 27 87 -188 | 33 731 + 628 | 35 32 -353 |
| 11 16.3 | 10 938 + 262 | 20 45 -197 | 56 640 + 329 | 21 10 + 18 | 31 339 + 259 | 25 81 -206 | 34 495 + 764 | 32 11 -321 |
| 11 26.3 | 11 233 + 295 | 18 32 -213 | 57 010 + 370 | 21 42 - 32 | 31 632 + 293 | 23 61 -220 | 35 376 + 881 | 29 26 -285 |
| 12 6.3 | 11 556 + 323 | 16 08 -224 | 57 412 + 402 | 22 26 - 84 | 31 953 + 321 | 21 32 -229 | 36 366 + 990 | 26 86 -240 |
| 12 16.3 | 11 895 + 339 | 13 80 -228 | 57 830 + 418 | 23 61 -135 | 32 292 + 339 | 19 03 -229 | 37 428 +1062 | 25 03 -183 |
| 12 26.2 | 12 241 + 346 | 11 56 -224 | 58 253 + 423 | 25 40 -179 | 32 639 + 347 | 16 79 -224 | 38 535 +1107 | 23 77 -126 |
| 12 36.2 | 12 586 + 345 | 09 41 -215 | 58 670 + 417 | 27 63 -223 | 32 984 + 345 | 14 65 -214 | 39 659 +1124 | 23 15 - 62 |
| | | | | | | | | |
| Mean Place | 10 881 | 22 46 | 57 422 | 30 96 | 31 291 | 28 56 | 34 701 | 52 22 |
| sec δ, tan δ | +1.007 | +0.117 | +1.353 | -0.912 | +1.012 | +0.155 | +4.439 | +4.325 |
| dα(ψ), dδ(ψ) | +0.061 | -0.40 | +0.061 | -0.40 | +0.061 | -0.40 | +0.059 | -0.40 |
| dα(ε), dδ(ε) | +0.008 | -0.00 | -0.061 | -0.01 | +0.010 | -0.02 | +0.288 | -0.02 |
| Dble. Trans. | March 22 | | March 23 | | March 23 | | March 23 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 1312 | | 452 | | 453 | | 1313 | |
|---|---------------|----------------|-------------------|----------------|------------------|----------------|-------------------|----------------|
| | 311 G. Hydrae | | δ Centauri | | ϵ Corvi | | 3 Comae Berenices | |
| Mag. Spect. | 6.26 | B9 | 2.88 | B3p | 3.21 | K0 | 6.34 | A0 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | $^{\circ}$ ' " | h m | $^{\circ}$ ' " | h m | $^{\circ}$ ' " | h m | $^{\circ}$ ' " |
| | 12 05 | -35 36 | 12 07 | -50 38 | 12 09 | -22 32 | 12 09 | +16 52 |
| 1 ^d | -8.7 | +393 | +470 | -140 | +360 | -197 | +352 | -230 |
| 1 ^s | 12.300 | -211 | 36.429 | 19.87 | 23.246 | 18.74 | 48.239 | 71.54 |
| 1 | 1.2 | +390 | +465 | -188 | +359 | -219 | +353 | 69.44 |
| 1 | 11.2 | +377 | +449 | -232 | +350 | -238 | +347 | -187 |
| 1 | 21.2 | +350 | +417 | -271 | +326 | -250 | +328 | 67.57 |
| 1 | 31.1 | +315 | +373 | -298 | +296 | -251 | +300 | -156 |
| | 13.417 | -267 | 37.760 | 26.78 | 24.281 | 25.81 | 49.267 | 66.01 |
| | 13.732 | -281 | 38.133 | 29.76 | 24.577 | 28.32 | 49.567 | -120 |
| | | -290 | +326 | -319 | +260 | -250 | +265 | -85 |
| 2 | 10.1 | +276 | 38.459 | 32.95 | 24.837 | 30.82 | 49.832 | 63.96 |
| 2 | 20.1 | +227 | +268 | -332 | +217 | -240 | +223 | -46 |
| 3 | 2.1 | +180 | 38.727 | 36.27 | 25.054 | 33.22 | 50.055 | 63.50 |
| 3 | 12.0 | +134 | 38.937 | 39.60 | 25.228 | 35.46 | 50.234 | 63.40 |
| 3 | 22.0 | +86 | +154 | -333 | +132 | -209 | +136 | +21 |
| | 14.549 | -273 | 39.091 | 42.93 | 25.360 | 37.55 | 50.370 | 63.61 |
| | 14.635 | -256 | 39.186 | 46.15 | 25.449 | 39.41 | 50.461 | +52 |
| | | -235 | +43 | -304 | +51 | -163 | +52 | +73 |
| 3 | 32.0 | +44 | 39.229 | 49.19 | 25.500 | 41.04 | 50.513 | 64.86 |
| 4 | 11.0 | +8 | -5 | -285 | +18 | -141 | +16 | +91 |
| 4 | 20.9 | -28 | 39.224 | 52.04 | 25.518 | 42.45 | 50.529 | 65.77 |
| 4 | 30.9 | -55 | -50 | -256 | -13 | -115 | -15 | +102 |
| 5 | 10.9 | -80 | 39.174 | 54.60 | 25.505 | 43.60 | 50.514 | 66.79 |
| | 14.604 | -156 | -87 | -226 | -36 | -90 | -40 | +107 |
| | 14.524 | -126 | 39.087 | 56.86 | 25.469 | 44.50 | 50.474 | 67.86 |
| | | -92 | -122 | -193 | -59 | -67 | -60 | +108 |
| | 14.424 | -100 | 38.965 | 58.79 | 25.410 | 45.17 | 50.414 | 68.94 |
| | 14.309 | -115 | -151 | -153 | -75 | -41 | -77 | +103 |
| 5 | 20.8 | -128 | 38.814 | 60.32 | 25.335 | 45.58 | 50.337 | 69.97 |
| 5 | 30.8 | -136 | -172 | -285 | -88 | -18 | -87 | +93 |
| 6 | 9.8 | -140 | 38.642 | 61.47 | 25.247 | 45.76 | 50.250 | 70.90 |
| 6 | 19.8 | -142 | -193 | -72 | -99 | +6 | -95 | +83 |
| 6 | 29.7 | -136 | 38.449 | 62.19 | 25.148 | 45.70 | 50.155 | 71.73 |
| | 13.905 | -140 | -206 | -28 | -105 | +29 | -99 | +68 |
| | | +71 | 38.243 | 62.47 | 25.043 | 45.41 | 50.056 | 72.41 |
| | | +101 | -212 | +13 | -108 | +50 | -99 | +51 |
| | 13.763 | -142 | 38.031 | 62.34 | 24.935 | 44.91 | 49.957 | 72.92 |
| | 13.627 | -136 | -217 | +58 | -110 | +70 | -99 | +35 |
| 7 | 9.7 | -127 | 37.814 | 61.76 | 24.825 | 44.21 | 49.858 | 73.27 |
| 7 | 19.7 | -127 | -209 | +99 | -106 | +88 | -92 | +14 |
| 7 | 29.7 | -114 | 37.605 | 60.77 | 24.719 | 43.33 | 49.766 | 73.41 |
| 8 | 8.6 | -91 | -197 | +134 | -99 | +102 | -84 | -6 |
| 8 | 18.6 | -142 | 37.408 | 59.43 | 24.620 | 42.31 | 49.682 | 73.35 |
| | 13.500 | -114 | -179 | +170 | -88 | +115 | -73 | -26 |
| | 13.386 | -91 | 37.229 | 57.73 | 24.532 | 41.16 | 49.609 | 73.09 |
| | 13.295 | -85 | -147 | +197 | -70 | +120 | -55 | -49 |
| | | +175 | 37.082 | 55.76 | 24.462 | 39.96 | 49.554 | 72.60 |
| | 13.230 | -32 | -112 | +217 | -49 | +122 | -36 | -70 |
| 8 | 28.6 | -179 | 36.970 | 53.59 | 24.413 | 38.74 | 49.518 | 71.90 |
| 9 | 7.5 | +10 | -67 | +231 | -21 | +119 | -12 | -94 |
| 9 | 17.5 | +53 | 36.903 | 51.28 | 24.392 | 37.55 | 49.506 | 70.96 |
| 9 | 27.5 | +102 | -12 | +233 | +14 | +108 | +18 | -118 |
| | 13.208 | +162 | 36.891 | 48.95 | 24.406 | 36.47 | 49.524 | 69.78 |
| | 13.261 | +142 | +46 | +227 | +50 | +92 | +50 | -141 |
| 10 | 7.5 | +156 | 36.937 | 46.68 | 24.456 | 35.55 | 49.574 | 68.37 |
| | 13.363 | +112 | +110 | +213 | +93 | +71 | +90 | -166 |
| | | +78 | 37.047 | 44.55 | 24.549 | 34.84 | 49.664 | 66.71 |
| | 13.519 | +207 | -179 | +185 | +140 | +41 | +132 | -189 |
| 10 | 17.4 | +258 | 37.226 | 42.70 | 24.689 | 34.43 | 49.796 | 64.82 |
| 10 | 27.4 | +342 | +242 | +151 | +186 | +10 | +174 | -207 |
| | 13.726 | +305 | 37.468 | 41.19 | 24.875 | 34.33 | 49.970 | 62.75 |
| | 13.984 | +342 | +308 | +109 | +232 | -28 | +218 | -225 |
| | 14.289 | +373 | 37.776 | 40.10 | 25.107 | 34.61 | 50.188 | 60.50 |
| | 14.631 | +390 | +364 | +57 | +275 | -68 | +259 | -237 |
| 11 | 6.4 | +396 | 38.140 | 39.53 | 25.382 | 35.29 | 50.447 | 58.13 |
| 11 | 16.4 | +448 | +410 | +6 | +309 | -105 | +293 | -243 |
| 11 | 26.3 | +488 | 38.550 | 39.47 | 25.691 | 36.34 | 50.740 | 55.70 |
| | 15.004 | -103 | -51 | -107 | +339 | -144 | +325 | -246 |
| | 15.394 | -150 | 38.998 | 39.98 | 26.030 | 37.78 | 51.065 | 53.24 |
| | 15.790 | -189 | +467 | -107 | +356 | -178 | +344 | -237 |
| | 16.180 | -254 | 39.465 | 41.05 | 26.386 | 39.56 | 51.409 | 50.87 |
| | | -189 | +472 | -157 | +363 | -206 | +354 | -225 |
| | | -225 | 39.937 | 42.62 | 26.749 | 41.62 | 51.763 | 48.62 |
| | | -254 | +466 | -208 | +360 | -229 | +354 | -204 |
| | | | +440 | -248 | +343 | -244 | +341 | -175 |
| | | | | | | | | |
| Mean Place | 14.894 | 67.51 | 39.304 | 50.23 | 25.725 | 40.87 | 50.367 | 63.44 |
| sec δ , tan δ | +1.230 | -0.716 | +1.577 | -1.219 | +1.083 | -0.415 | +1.045 | +0.304 |
| $d\alpha(\psi)$, $d\delta(\psi)$ | +0.062 | -0.40 | +0.062 | -0.40 | +0.062 | -0.40 | +0.061 | -0.40 |
| $d\alpha(\epsilon)$, $d\delta(\epsilon)$ | -0.048 | -0.02 | -0.081 | -0.03 | -0.028 | -0.04 | +0.020 | -0.04 |
| Dble. Trans. | March 24 | | March 24 | | March 25 | | March 25 | |

APPARENT PLACES OF STARS, 1986

187

AT UPPER TRANSIT AT GREENWICH

| No. | 454 | | 1314 | | 455 | | 456 | |
|----------------|-------------------------------|--------|---------------------------------|--------|----------|--------|-----------------|--------|
| | Bradley 1634 (Camelopardi) | | Bradley 1636 (Ursae Majoris) | | δ Crucis | | δ Ursae Majoris | |
| Mag.Spect. | 5.12 | A5 | 6.26 | K0 | 3.08 | B3 | 3.44 | A2 |
| U.T. | R.A. | | R.A. | | R.A. | | R.A. | |
| | h | m | h | m | h | m | h | m |
| | +77 40 | | +53 30 | | -58 39 | | +57 05 | |
| 1 ^d | 34 44.2 | 82 28 | 01 80.9 | 32 28 | 22 13.4 | 53 89 | 44 14.1 | 83 76 |
| 1 | 35 61.5 | 81 36 | 02 30.6 | 30 74 | 22 67.7 | 55 55 | 44 67.4 | 82 31 |
| 1 | 36 78.9 | 81 07 | 02 80.1 | 29 75 | 23 20.2 | 57 70 | 45 20.5 | 81 42 |
| 1 | 37 91.2 | 81 47 | 03 27.2 | 29 37 | 23 69.2 | 60 31 | 45 71.2 | 81 15 |
| 1 | 38 94.8 | 82 48 | 03 70.7 | 29 57 | 24 13.3 | 63 25 | 46 18.0 | 81 48 |
| 2 | 39 86.9 | 84 08 | 04 09.5 | 30 33 | 24 51.9 | 66 47 | 46 59.7 | 82 38 |
| 2 | 40 63.2 | 86 20 | 04 42.0 | 31 62 | 24 83.8 | 69 89 | 46 94.7 | 83 82 |
| 3 | 41 22.2 | 88 71 | 04 67.9 | 33 34 | 25 09.0 | 73 40 | 47 22.5 | 85 68 |
| 3 | 41 62.6 | 91 54 | 04 86.9 | 35 43 | 25 27.6 | 76 94 | 47 42.8 | 87 91 |
| 3 | 41 82.5 | 94 54 | 04 98.5 | 37 78 | 25 39.1 | 80 43 | 47 54.9 | 90 40 |
| 3 | 41 83.4 | 97 57 | 05 03.5 | 40 26 | 25 44.5 | 83 77 | 47 59.8 | 93 00 |
| 4 | 41 65.7 | 100 56 | 05 02.1 | 42 80 | 25 43.9 | 86 95 | 47 57.7 | 95 64 |
| 4 | 41 30.3 | 103 33 | 04 94.9 | 45 27 | 25 37.6 | 89 87 | 47 49.0 | 98 20 |
| 4 | 40 80.7 | 105 81 | 04 83.1 | 47 56 | 25 26.6 | 92 49 | 47 35.3 | 100 56 |
| 5 | 40 18.1 | 107 93 | 04 67.2 | 49 63 | 25 11.1 | 94 79 | 47 16.9 | 102 67 |
| 5 | 39 45.3 | 109 57 | 04 48.0 | 51 36 | 24 91.6 | 96 67 | 46 95.0 | 104 43 |
| 5 | 38 66.1 | 110 72 | 04 27.0 | 52 72 | 24 69.2 | 98 15 | 46 70.9 | 105 78 |
| 6 | 37 81.8 | 111 35 | 04 04.3 | 53 68 | 24 43.9 | 99 18 | 46 45.0 | 106 72 |
| 6 | 36 95.7 | 111 40 | 03 81.0 | 54 18 | 24 16.6 | 99 72 | 46 18.4 | 107 17 |
| 6 | 36 10.7 | 110 91 | 03 58.0 | 54 24 | 23 88.4 | 99 82 | 45 92.0 | 107 16 |
| 7 | 35 27.9 | 109 88 | 03 35.4 | 53 84 | 23 59.4 | 99 42 | 45 66.2 | 106 68 |
| 7 | 34 50.7 | 108 31 | 03 14.3 | 52 97 | 23 31.1 | 98 56 | 45 42.1 | 105 70 |
| 7 | 33 80.2 | 106 28 | 02 95.0 | 51 69 | 23 04.2 | 97 28 | 45 20.1 | 104 31 |
| 8 | 33 17.8 | 103 80 | 02 78.0 | 50 00 | 22 79.6 | 95 59 | 45 00.7 | 102 48 |
| 8 | 32 66.1 | 100 92 | 02 64.3 | 47 90 | 22 58.7 | 93 57 | 44 84.9 | 100 25 |
| 8 | 32 25.4 | 97 73 | 02 53.9 | 45 49 | 22 42.2 | 91 30 | 44 72.9 | 97 70 |
| 9 | 31 97.1 | 94 24 | 02 47.6 | 42 74 | 22 31.3 | 88 81 | 44 65.4 | 94 82 |
| 9 | 31 83.3 | 90 55 | 02 46.3 | 39 74 | 22 27.2 | 86 25 | 44 63.3 | 91 68 |
| 9 | 31 83.2 | 86 74 | 02 49.9 | 36 54 | 22 30.1 | 83 71 | 44 66.6 | 88 35 |
| 10 | 31 98.6 | 82 85 | 02 59.2 | 33 16 | 22 41.0 | 81 26 | 44 76.2 | 84 86 |
| 10 | 32 30.1 | 78 99 | 02 74.8 | 29 71 | 22 60.2 | 79 07 | 44 92.5 | 81 31 |
| 10 | 32 76.6 | 75 24 | 02 96.3 | 26 24 | 22 87.2 | 77 19 | 45 15.2 | 77 76 |
| 11 | 33 39.2 | 71 66 | 03 24.3 | 22 80 | 23 22.1 | 75 71 | 45 45.0 | 74 26 |
| 11 | 34 16.3 | 68 40 | 03 58.2 | 19 53 | 23 63.8 | 74 76 | 45 81.1 | 70 96 |
| 11 | 35 06.2 | 65 48 | 03 97.3 | 16 48 | 24 11.1 | 74 33 | 46 22.8 | 67 89 |
| 12 | 36 08.0 | 63 02 | 04 41.2 | 13 73 | 24 63.0 | 74 48 | 46 69.7 | 65 16 |
| 12 | 37 18.0 | 61 11 | 04 88.4 | 11 40 | 25 17.3 | 75 25 | 47 20.2 | 62 87 |
| 12 | 38 33.2 | 59 78 | 05 37.5 | 09 52 | 25 72.4 | 76 56 | 47 72.9 | 61 05 |
| 12 | 39 50.8 | 59 09 | 05 87.4 | 08 17 | 26 26.9 | 78 42 | 48 26.4 | 59 80 |
| Mean Place | 34.632 | 88.48 | 03.467 | 34.96 | 25.350 | 85.70 | 45.716 | 87.23 |
| sec δ, tan δ | +4.691 | +4.583 | +1.682 | +1.352 | +1.923 | -1.643 | +1.841 | +1.546 |
| dα(ψ), dδ(ψ) | +0.055 | -0.40 | +0.059 | -0.40 | +0.064 | -0.40 | +0.059 | -0.40 |
| dα(ε), dδ(ε) | +0.305 | -0.05 | +0.090 | -0.06 | -0.109 | -0.06 | +0.103 | -0.06 |
| Dbble.Trans. | March 25 | | March 26 | | March 26 | | March 26 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 457 | | 458 | | 459 | | 1315 | |
|----------------|---------------------------|-------------|---------------------------|-------------|----------------------------|-------------|---------------------------|-------------|
| | γ Corvi | | 2 Canum Venat.* | | β Chamaeleontis | | 14 Virginis | |
| Mag.Spect. | 2.78 | B8 | 5.92 | K5 | 4.38 | B5 | 7.03 | K0 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° / | h m | ° / | h m | ° / | h m | ° / |
| | 12 15 | - 17 27 | 12 15 | + 40 43 | 12 17 | - 79 13 | 12 18 | - 8 50 |
| 1 ^d | 04.151 ^s + 352 | 41.18 -201 | 25.201 ^s + 410 | 67.34 -222 | 26.545 ^s + 1309 | 39.89 -53 | 36.030 ^s + 344 | 05.87 -213 |
| 1 | 04.503 + 352 | 43.38 -220 | 25.616 + 415 | 65.54 -180 | 27.841 + 1296 | 41.04 -115 | 36.376 + 346 | 08.09 -222 |
| 1 | 04.848 + 345 | 45.71 -233 | 26.028 + 412 | 64.19 -135 | 29.096 + 1255 | 42.78 -174 | 36.714 + 338 | 10.36 -227 |
| 1 | 05.172 + 324 | 48.11 -240 | 26.421 + 393 | 63.37 -82 | 30.263 + 1167 | 45.10 -232 | 37.034 + 320 | 12.59 -223 |
| 1 | 05.466 + 294 | 50.47 -236 | 26.782 + 361 | 63.07 -30 | 31.311 + 1048 | 47.86 -276 | 37.326 + 292 | 14.71 -212 |
| 2 | 05.727 + 261 | 52.78 -231 | 27.105 + 323 | 63.28 + 21 | 32.226 + 915 | 51.04 -318 | 37.586 + 260 | 16.69 -198 |
| 2 | 05.946 + 219 | 54.95 -217 | 27.377 + 272 | 64.00 + 72 | 32.976 + 750 | 54.54 -350 | 37.806 + 220 | 18.46 -177 |
| 3 | 06.123 + 177 | 56.94 -199 | 27.595 + 218 | 65.14 + 114 | 33.557 + 581 | 58.24 -370 | 37.985 + 179 | 20.01 -155 |
| 3 | 06.260 + 324 | 58.74 -180 | 27.759 + 164 | 66.65 + 151 | 33.967 + 410 | 62.09 -385 | 38.124 + 139 | 21.32 -131 |
| 3 | 06.355 + 96 | 60.31 -157 | 27.866 + 107 | 68.45 + 180 | 34.190 + 223 | 65.99 -390 | 38.222 + 98 | 22.38 -106 |
| 3 | 06.413 + 58 | 61.65 -134 | 27.921 + 55 | 70.42 + 197 | 34.243 + 53 | 69.83 -384 | 38.284 + 62 | 23.20 -82 |
| 4 | 06.438 + 25 | 62.76 -111 | 27.928 + 7 | 72.51 + 209 | 34.127 -116 | 73.59 -376 | 38.314 + 30 | 23.80 -60 |
| 4 | 06.433 - 5 | 63.63 -87 | 27.891 - 37 | 74.59 + 208 | 33.841 - 286 | 77.14 -355 | 38.314 + 0 | 24.18 -38 |
| 4 | 06.405 - 28 | 64.29 -66 | 27.820 - 71 | 76.58 + 199 | 33.413 - 428 | 80.42 -328 | 38.291 - 23 | 24.38 -20 |
| 5 | 06.355 - 50 | 64.72 -43 | 27.718 - 102 | 78.42 + 184 | 32.840 - 573 | 83.39 -297 | 38.248 - 43 | 24.41 -3 |
| 5 | 06.288 - 67 | 64.94 -22 | 27.593 - 125 | 80.03 + 161 | 32.141 - 699 | 85.95 -256 | 38.187 - 61 | 24.27 + 14 |
| 5 | 06.209 - 79 | 64.97 - 3 | 27.454 - 139 | 81.35 + 132 | 31.342 - 799 | 88.08 -213 | 38.115 - 72 | 24.02 + 25 |
| 6 | 06.119 - 90 | 64.80 + 17 | 27.302 - 152 | 82.36 + 101 | 30.449 - 893 | 89.73 -165 | 38.033 - 82 | 23.65 + 37 |
| 6 | 06.021 - 98 | 64.45 + 35 | 27.145 - 157 | 83.00 + 64 | 29.491 - 958 | 90.84 -111 | 37.943 - 90 | 23.17 + 48 |
| 6 | 05.921 - 100 | 63.94 + 51 | 26.989 - 156 | 83.29 + 29 | 28.499 - 992 | 91.42 - 58 | 37.851 - 92 | 22.62 + 56 |
| 7 | 05.817 - 104 | 63.27 + 67 | 26.835 - 154 | 83.20 - 9 | 27.485 - 1014 | 91.44 - 2 | 37.755 - 96 | 21.99 + 63 |
| 7 | 05.717 - 100 | 62.48 + 79 | 26.691 - 144 | 82.71 - 49 | 26.494 - 991 | 90.89 + 55 | 37.663 - 92 | 21.32 + 67 |
| 7 | 05.623 - 94 | 61.59 + 89 | 26.559 - 132 | 81.87 - 84 | 25.550 - 944 | 89.83 + 106 | 37.576 - 87 | 20.63 + 69 |
| 8 | 05.538 - 85 | 60.61 + 98 | 26.442 - 117 | 80.67 - 120 | 24.678 - 872 | 88.26 + 157 | 37.498 - 78 | 19.94 + 69 |
| 8 | 05.470 - 68 | 59.61 + 100 | 26.349 - 93 | 79.10 - 157 | 23.926 - 752 | 86.22 + 204 | 37.434 - 64 | 19.29 + 65 |
| 8 | 05.421 - 49 | 58.63 + 98 | 26.281 - 68 | 77.24 - 186 | 23.309 - 617 | 83.83 + 239 | 37.389 - 45 | 18.71 + 58 |
| 9 | 05.398 - 23 | 57.70 + 93 | 26.244 - 37 | 75.06 - 218 | 22.858 - 451 | 81.12 + 271 | 37.368 - 21 | 18.23 + 48 |
| 9 | 05.408 + 10 | 56.91 + 79 | 26.244 + 0 | 72.61 - 245 | 22.608 - 250 | 78.22 + 290 | 37.378 + 10 | 17.93 + 30 |
| 9 | 05.453 + 45 | 56.28 + 63 | 26.285 + 41 | 69.94 - 267 | 22.558 - 50 | 75.25 + 297 | 37.420 + 42 | 17.85 + 8 |
| 10 | 05.538 + 85 | 55.86 + 42 | 26.371 + 86 | 67.05 - 289 | 22.730 + 172 | 72.27 + 298 | 37.498 + 78 | 17.91 - 6 |
| 10 | 05.669 + 131 | 55.72 + 14 | 26.508 + 137 | 64.03 - 302 | 23.130 + 400 | 69.48 + 279 | 37.625 + 127 | 18.28 - 37 |
| 10 | 05.845 + 176 | 55.90 - 18 | 26.694 + 186 | 60.93 - 310 | 23.736 + 606 | 66.94 + 254 | 37.793 + 168 | 18.94 - 66 |
| 11 | 06.067 + 222 | 56.42 - 52 | 26.934 + 240 | 57.79 - 314 | 24.550 + 814 | 64.77 + 217 | 38.005 + 212 | 19.92 - 98 |
| 11 | 06.330 + 263 | 57.31 - 89 | 27.222 + 288 | 54.71 - 308 | 25.539 + 989 | 63.11 + 166 | 38.259 + 254 | 21.21 - 129 |
| 11 | 06.629 + 299 | 58.54 - 123 | 27.554 + 332 | 51.76 - 295 | 26.666 + 1127 | 61.97 + 114 | 38.547 + 288 | 22.78 - 157 |
| 12 | 06.958 + 329 | 60.12 - 158 | 27.924 + 370 | 49.00 - 276 | 27.907 + 1241 | 61.45 + 52 | 38.865 + 318 | 24.61 - 183 |
| 12 | 07.305 + 347 | 61.98 - 186 | 28.321 + 397 | 46.56 - 244 | 29.206 + 1299 | 61.58 - 13 | 39.203 + 338 | 26.64 - 203 |
| 12 | 07.660 + 355 | 64.07 - 209 | 28.734 + 413 | 44.47 - 209 | 30.524 + 1318 | 62.33 - 75 | 39.550 + 347 | 28.81 - 217 |
| 12 | 08.014 + 354 | 66.34 - 227 | 29.151 + 417 | 42.82 - 165 | 31.827 + 1303 | 63.72 - 139 | 39.897 + 347 | 31.08 - 227 |
| | 08.014 + 338 | 66.34 - 237 | 29.151 + 405 | 42.82 - 114 | 31.827 + 1232 | 63.72 - 198 | 39.897 + 333 | 31.08 - 226 |
| Mean Place | 06.621 | 61.39 | 27.092 | 66.92 | 32.036 | 74.26 | 38.444 | 22.92 |
| sec δ, tan δ | +1.048 | -0.315 | +1.320 | +0.861 | +5.355 | -5.261 | +1.012 | -0.156 |
| dα(w), dδ(w) | +0.062 | -0.40 | +0.060 | -0.40 | +0.072 | -0.40 | +0.061 | -0.40 |
| dα(ε), dδ(ε) | -0.021 | -0.07 | +0.057 | -0.07 | -0.350 | -0.08 | -0.010 | -0.08 |
| Dbles. Trans. | March 26 | | March 26 | | March 27 | | March 27 | |

AT UPPER TRANSIT AT GREENWICH

| No. | 1316 | | 460 | | 1317 | | 1318 | |
|--------------|----------------|------------|-------------|------------|-------------|------------|--------------------|------------|
| | 3 Canum Venat. | | η Virginis | | 16 Virginis | | 12 Comae Berenices | |
| Mag.Spect. | 5.56 | K2 | 4.00 | A0 | 5.10 | K0 | 4.78 | F5 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " |
| | 12 19 | +49 03 | 12 19 | - 0 35 | 12 19 | + 3 23 | 12 21 | + 25 54 |
| 1 -8.7 | 07.230 +452 | 30.60 -216 | 10.552 +341 | 16.57 -222 | 37.543 +340 | 28.13 -226 | 47.571 +363 | 80.16 -235 |
| 1 1.2 | 07.691 +461 | 28.92 -168 | 10.895 +343 | 18.80 -223 | 37.886 +343 | 25.90 -223 | 47.939 +368 | 78.09 -207 |
| 1 11.2 | 08.150 +459 | 27.75 -117 | 11.232 +337 | 20.98 -218 | 38.223 +337 | 23.77 -213 | 48.304 +365 | 76.35 -174 |
| 1 21.2 | 08.590 +440 | 27.17 -58 | 11.551 +319 | 23.04 -206 | 38.543 +320 | 21.81 -196 | 48.651 +347 | 75.00 -135 |
| 1 31.2 | 08.996 +406 | 27.15 -2 | 11.842 +291 | 24.90 -186 | 38.835 +292 | 20.08 -173 | 48.972 +321 | 74.08 -92 |
| 2 10.1 | 09.360 +364 | 27.68 +53 | 12.102 +260 | 26.55 -165 | 39.096 +261 | 18.59 -149 | 49.259 +287 | 73.60 -48 |
| 2 20.1 | 09.667 +307 | 28.75 +107 | 12.323 +221 | 27.93 -138 | 39.318 +222 | 17.41 -118 | 49.503 +244 | 73.56 -4 |
| 3 2.1 | 09.915 +248 | 30.25 +150 | 12.502 +179 | 29.03 -110 | 39.499 +181 | 16.53 -88 | 49.702 +199 | 73.91 +35 |
| 3 12.0 | 10.100 +185 | 32.14 +189 | 12.642 +140 | 29.86 -83 | 39.639 +140 | 15.93 -60 | 49.856 +154 | 74.62 +71 |
| 3 22.0 | 10.218 +118 | 34.30 +216 | 12.741 +99 | 30.41 -55 | 39.737 +98 | 15.62 -31 | 49.962 +106 | 75.65 +103 |
| 3 32.0 | 10.277 +59 | 36.62 +232 | 12.803 +62 | 30.73 -32 | 39.800 +63 | 15.55 -7 | 50.025 +63 | 76.89 +124 |
| 4 11.0 | 10.278 +1 | 39.03 +241 | 12.833 +30 | 30.83 -10 | 39.829 +29 | 15.68 +13 | 50.050 +25 | 78.30 +141 |
| 4 20.9 | 10.226 -52 | 41.41 +238 | 12.832 -1 | 30.74 +9 | 39.828 -1 | 16.00 +32 | 50.039 -11 | 79.79 +149 |
| 4 30.9 | 10.133 -93 | 43.63 +222 | 12.810 -22 | 30.50 +24 | 39.804 -24 | 16.44 +44 | 50.000 -39 | 81.28 +149 |
| 5 10.9 | 10.003 -130 | 45.68 +205 | 12.766 -44 | 30.14 +36 | 39.759 -45 | 16.98 +54 | 49.937 -63 | 82.74 +146 |
| 5 20.9 | 09.844 -159 | 47.42 +174 | 12.706 -60 | 29.68 +46 | 39.698 -61 | 17.59 +61 | 49.854 -83 | 84.07 +133 |
| 5 30.8 | 09.666 -178 | 48.82 +140 | 12.635 -71 | 29.17 +51 | 39.626 -72 | 18.21 +62 | 49.759 -95 | 85.24 +117 |
| 6 9.8 | 09.473 -193 | 49.86 +104 | 12.553 -82 | 28.61 +56 | 39.543 -83 | 18.86 +65 | 49.653 -106 | 86.23 +99 |
| 6 19.8 | 09.273 -200 | 50.46 +60 | 12.466 -87 | 28.03 +58 | 39.454 -89 | 19.48 +62 | 49.540 -113 | 86.98 +75 |
| 6 29.7 | 09.073 -200 | 50.65 +19 | 12.376 -90 | 27.45 +58 | 39.363 -91 | 20.06 +58 | 49.427 -113 | 87.48 +50 |
| 7 9.7 | 08.876 -197 | 50.41 -24 | 12.283 -93 | 26.87 +58 | 39.270 -93 | 20.60 +54 | 49.312 -115 | 87.72 +24 |
| 7 19.7 | 08.690 -186 | 49.72 -69 | 12.194 -89 | 26.34 +53 | 39.181 -89 | 21.06 +46 | 49.203 -109 | 87.68 -4 |
| 7 29.7 | 08.520 -170 | 48.64 -108 | 12.110 -84 | 25.86 +48 | 39.097 -84 | 21.43 +37 | 49.102 -101 | 87.37 -31 |
| 8 8.6 | 08.368 -152 | 47.14 -150 | 12.035 -75 | 25.44 +42 | 39.021 -76 | 21.71 +28 | 49.011 -91 | 86.79 -58 |
| 8 18.6 | 08.243 -125 | 45.26 -188 | 11.975 -60 | 25.14 +30 | 38.961 -60 | 21.84 +13 | 48.938 -73 | 85.91 -88 |
| 8 28.6 | 08.149 -94 | 43.05 -221 | 11.932 -43 | 24.95 +19 | 38.918 -43 | 21.82 -2 | 48.884 -54 | 84.77 -114 |
| 9 7.6 | 08.089 -186 | 40.51 -254 | 11.912 -20 | 24.92 +3 | 38.898 -20 | 21.63 -19 | 48.855 -29 | 83.36 -141 |
| 9 17.5 | 08.075 -14 | 37.70 -281 | 11.924 +12 | 25.09 -17 | 38.909 +11 | 21.24 -39 | 48.858 +3 | 81.68 -168 |
| 9 27.5 | 08.105 +30 | 34.67 -303 | 11.978 +54 | 25.23 -14 | 38.948 +39 | 20.72 -52 | 48.894 +36 | 79.76 -192 |
| 10 7.5 | 08.187 +82 | 31.45 -322 | 12.041 +63 | 26.04 -81 | 39.025 +77 | 19.80 -92 | 48.971 +77 | 77.60 -216 |
| 10 17.4 | 08.327 +140 | 28.12 -333 | 12.165 +124 | 26.93 -89 | 39.146 +121 | 18.67 -113 | 49.092 +121 | 75.24 -236 |
| 10 27.4 | 08.523 +196 | 24.75 -337 | 12.330 +165 | 28.07 -114 | 39.309 +163 | 17.30 -137 | 49.257 +165 | 72.72 -252 |
| 11 6.4 | 08.778 +255 | 21.37 -338 | 12.538 +208 | 29.49 -142 | 39.516 +207 | 15.68 -162 | 49.470 +213 | 70.06 -266 |
| 11 16.4 | 09.089 +311 | 18.13 -324 | 12.787 +249 | 31.15 -166 | 39.763 +247 | 13.84 -184 | 49.725 +255 | 67.35 -271 |
| 11 26.3 | 09.449 +360 | 15.06 -307 | 13.070 +283 | 33.03 -188 | 40.045 +282 | 11.81 -203 | 50.020 +295 | 64.65 -270 |
| 12 6.3 | 09.855 +406 | 12.25 -281 | 13.385 +315 | 35.10 -207 | 40.359 +314 | 09.64 -217 | 50.349 +329 | 62.00 -265 |
| 12 16.3 | 10.291 +436 | 09.83 -242 | 13.718 +333 | 37.29 -219 | 40.691 +332 | 07.39 -225 | 50.702 +353 | 59.52 -248 |
| 12 26.3 | 10.747 +456 | 07.82 -201 | 14.062 +344 | 39.53 -224 | 41.035 +344 | 05.12 -227 | 51.068 +366 | 57.25 -227 |
| 12 36.2 | 11.210 +463 | 06.31 -151 | 14.406 +344 | 41.76 -223 | 41.379 +344 | 02.91 -221 | 51.438 +370 | 55.28 -197 |
| | +451 | -94 | +332 | -214 | +332 | -207 | +359 | -159 |
| Mean Place | 09.002 | 32.44 | 12.889 | 30.62 | 39.838 | 15.51 | 49.668 | 75.49 |
| sec δ, tan δ | +1.526 | +1.153 | +1.000 | -0.010 | +1.002 | +0.059 | +1.112 | +0.486 |
| dα(ψ), dδ(ψ) | +0.059 | -0.40 | +0.061 | -0.40 | +0.061 | -0.40 | +0.060 | -0.40 |
| dα(ε), dδ(ε) | +0.077 | -0.08 | -0.001 | -0.08 | +0.004 | -0.09 | +0.032 | -0.10 |
| Dbble.Trans. | March 27 | | March 27 | | March 27 | | March 28 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 1319 | | 461 | | 462 | | 463 | |
|--------------|---------------|---------|----------------|---------|-------------|---------|---------------|---------|
| | 322 G. Hydrae | | 6 Canum Venat. | | α Crucis A* | | 323 G. Hydrae | |
| Mag.Spect. | 6.34 | K0 | 5.22 | K0 | 1.58 | B1 | 5.68 | A0 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° ′ | h m | ° ′ | h m | ° ′ | h m | ° ′ |
| | 12 24 | - 27 40 | 12 25 | + 39 05 | 12 25 | - 63 00 | 12 26 | - 32 44 |
| 1 | -8.7 | 33 207 | 04 61 | 09 184 | 36 85 | 46 849 | 06 082 | 54 41 |
| 1 | 1.2 | 33 578 | 06 67 | 09 591 | 34 93 | 47 459 | 06 467 | 56 39 |
| 1 | 11.2 | 33 943 | 08 97 | 09 996 | 33 45 | 48 054 | 06 844 | 58 67 |
| 1 | 21.2 | 34 286 | 11 45 | 10 385 | 32 49 | 48 612 | 07 200 | 61 17 |
| 1 | 31.2 | 34 600 | 14 01 | 10 744 | 32 04 | 49 119 | 07 526 | 63 81 |
| 2 | 10.1 | 34 880 | 16 61 | 11 068 | 32 11 | 49 569 | 07 816 | 66 53 |
| 2 | 20.1 | 35 118 | 19 16 | 11 343 | 32 69 | 49 946 | 08 062 | 69 26 |
| 3 | 2.1 | 35 312 | 21 61 | 11 568 | 33 71 | 50 249 | 08 264 | 71 92 |
| 3 | 12.0 | 35 464 | 23 93 | 11 740 | 35 11 | 50 479 | 08 422 | 74 48 |
| 3 | 22.0 | 35 572 | 26 07 | 11 857 | 36 82 | 50 631 | 08 534 | 76 87 |
| 3 | 32.0 | 35 642 | 27 99 | 11 923 | 38 72 | 50 711 | 08 607 | 79 07 |
| 4 | 11.0 | 35 677 | 29 71 | 11 943 | 40 75 | 50 723 | 08 642 | 81 07 |
| 4 | 20.9 | 35 678 | 31 16 | 11 919 | 42 82 | 50 667 | 08 642 | 82 81 |
| 4 | 30.9 | 35 654 | 32 38 | 11 861 | 44 80 | 50 555 | 08 615 | 84 29 |
| 5 | 10.9 | 35 605 | 33 34 | 11 772 | 46 67 | 50 388 | 08 562 | 85 51 |
| 5 | 20.9 | 35 535 | 34 02 | 11 659 | 48 32 | 50 172 | 08 486 | 86 42 |
| 5 | 30.8 | 35 451 | 34 45 | 11 530 | 49 70 | 49 917 | 08 393 | 87 05 |
| 6 | 9.8 | 35 351 | 34 61 | 11 387 | 50 79 | 49 624 | 08 284 | 87 38 |
| 6 | 19.8 | 35 241 | 34 50 | 11 237 | 51 53 | 49 305 | 08 163 | 87 40 |
| 6 | 29.7 | 35 126 | 34 16 | 11 086 | 51 91 | 48 970 | 08 036 | 87 13 |
| 7 | 9.7 | 35 005 | 33 55 | 10 934 | 51 94 | 48 623 | 07 902 | 86 57 |
| 7 | 19.7 | 34 885 | 32 73 | 10 790 | 51 57 | 48 279 | 07 769 | 85 74 |
| 7 | 29.7 | 34 771 | 31 71 | 10 656 | 50 85 | 47 948 | 07 642 | 84 68 |
| 8 | 8.6 | 34 665 | 30 52 | 10 536 | 49 77 | 47 640 | 07 523 | 83 39 |
| 8 | 18.6 | 34 576 | 29 22 | 10 436 | 48 33 | 47 373 | 07 423 | 81 95 |
| 8 | 28.6 | 34 508 | 27 86 | 10 360 | 46 58 | 47 155 | 07 345 | 80 41 |
| 9 | 7.6 | 34 467 | 26 47 | 10 312 | 44 51 | 46 999 | 07 296 | 78 81 |
| 9 | 17.5 | 34 462 | 25 16 | 10 302 | 42 15 | 46 920 | 07 286 | 77 26 |
| 9 | 27.5 | 34 496 | 23 97 | 10 329 | 39 57 | 46 921 | 07 316 | 75 81 |
| 10 | 7.5 | 34 574 | 22 96 | 10 401 | 36 75 | 47 014 | 07 393 | 74 52 |
| 10 | 17.4 | 34 702 | 22 22 | 10 524 | 33 78 | 47 202 | 07 523 | 73 50 |
| 10 | 27.4 | 34 878 | 21 79 | 10 695 | 30 71 | 47 481 | 07 704 | 72 79 |
| 11 | 6.4 | 35 104 | 21 73 | 10 919 | 27 57 | 47 851 | 07 937 | 72 45 |
| 11 | 16.4 | 35 376 | 22 09 | 11 193 | 24 48 | 48 302 | 08 219 | 72 55 |
| 11 | 26.3 | 35 686 | 22 84 | 11 510 | 21 49 | 48 819 | 08 540 | 73 07 |
| 12 | 6.3 | 36 030 | 24 00 | 11 868 | 18 68 | 49 390 | 08 897 | 74 04 |
| 12 | 16.3 | 36 394 | 25 56 | 12 253 | 16 15 | 49 994 | 09 274 | 75 44 |
| 12 | 26.3 | 36 768 | 27 43 | 12 655 | 13 96 | 50 610 | 09 662 | 77 21 |
| 12 | 36.2 | 37 142 | 29 61 | 13 064 | 12 19 | 51 224 | 10 049 | 79 33 |
| Mean Place | 35.882 | 27.89 | 11.135 | 36.28 | 50.494 | 87.56 | 08.846 | 79.22 |
| sec δ, tan δ | +1.129 | -0.524 | +1.288 | +0.812 | +2.205 | -1.965 | +1.189 | -0.643 |
| da(ψ), dδ(ψ) | +0.063 | -0.40 | +0.059 | -0.40 | +0.067 | -0.40 | +0.063 | -0.40 |
| da(ε), dδ(ε) | -0.035 | -0.11 | +0.054 | -0.11 | -0.130 | -0.11 | -0.043 | -0.11 |
| Dble.Trans. | March 29 | | March 29 | | March 29 | | March 29 | |

APPARENT PLACES OF STARS, 1986

191

AT UPPER TRANSIT AT GREENWICH

| No. | 464 | | 1320 | | 466 | | 465 | | |
|----------------|------------|--------|-----------------|--------|--------------------|--------|----------|--------|--------|
| | σ Centauri | | 122 G. Centauri | | 20 Comae Berenices | | δ Corvi | | |
| Mag. Spect. | 4.16 | B3 | 5.60 | B8 | 5.72 | A2 | 3.11 | A0 | |
| U.T. | R.A. | | Dec. | | R.A. | | Dec. | | |
| | h | m | h | m | h | m | h | m | |
| | 12 | 27 | 12 | 27 | 12 | 29 | 12 | 29 | |
| | ° | ' | ° | ' | ° | ' | ° | ' | |
| | 12 27 | -50 08 | 12 27 | -38 57 | 12 29 | +20 57 | 12 29 | -16 26 | |
| 1 ^d | -8.7 | 15 199 | + 467 | 52 48 | -119 | 36 293 | + 405 | 33 44 | -148 |
| 1 ^s | 1.2 | 15 666 | + 467 | 54 15 | -167 | 36 700 | + 407 | 35 31 | -223 |
| 1 | 11.2 | 16 124 | + 458 | 56 27 | -212 | 37 098 | + 398 | 37 54 | -223 |
| 1 | 21.2 | 16 555 | + 431 | 58 79 | -252 | 37 475 | + 377 | 40 06 | -252 |
| 1 | 31.2 | 16 947 | + 392 | 61 59 | -280 | 37 818 | + 343 | 42 77 | -271 |
| 2 | 10.1 | 17 296 | + 349 | 64 63 | -304 | 38 124 | + 306 | 45 62 | -285 |
| 2 | 20.1 | 17 591 | + 295 | 67 82 | -319 | 38 385 | + 261 | 48 53 | -291 |
| 3 | 2.1 | 17 832 | + 241 | 71 05 | -323 | 38 598 | + 213 | 51 42 | -289 |
| 3 | 12.0 | 18 018 | + 186 | 74 30 | -325 | 38 764 | + 166 | 54 25 | -283 |
| 3 | 22.0 | 18 147 | + 129 | 77 47 | -317 | 38 883 | + 119 | 56 94 | -269 |
| 3 | 32.0 | 18 225 | + 78 | 80 49 | -302 | 38 958 | + 75 | 59 46 | -252 |
| 4 | 11.0 | 18 254 | + 29 | 83 35 | -286 | 38 994 | + 36 | 61 79 | -233 |
| 4 | 20.9 | 18 237 | - 17 | 85 96 | -261 | 38 991 | - 3 | 63 85 | -206 |
| 4 | 30.9 | 18 182 | - 56 | 88 29 | -233 | 38 958 | - 33 | 65 66 | -181 |
| 5 | 10.9 | 18 090 | - 92 | 90 31 | -202 | 38 896 | - 62 | 67 18 | -152 |
| 5 | 20.9 | 17 965 | - 125 | 91 97 | -166 | 38 809 | - 87 | 68 36 | -118 |
| 5 | 30.8 | 17 815 | - 150 | 93 26 | -129 | 38 702 | - 107 | 69 24 | -88 |
| 6 | 9.8 | 17 640 | - 175 | 94 16 | - 90 | 38 577 | - 125 | 69 78 | - 54 |
| 6 | 19.8 | 17 448 | - 192 | 94 62 | - 46 | 38 438 | - 139 | 69 95 | - 17 |
| 6 | 29.7 | 17 246 | - 202 | 94 68 | - 6 | 38 291 | - 147 | 69 80 | + 15 |
| 7 | 9.7 | 17 033 | - 213 | 94 31 | + 37 | 38 137 | - 154 | 69 31 | + 49 |
| 7 | 19.7 | 16 823 | - 210 | 93 52 | + 79 | 37 984 | - 153 | 68 48 | + 83 |
| 7 | 29.7 | 16 620 | - 203 | 92 37 | + 115 | 37 836 | - 148 | 67 38 | + 110 |
| 8 | 8.6 | 16 430 | - 190 | 90 86 | + 151 | 37 698 | - 138 | 66 00 | + 138 |
| 8 | 18.6 | 16 267 | - 163 | 89 06 | + 180 | 37 580 | - 118 | 64 41 | + 159 |
| 8 | 28.6 | 16 136 | - 131 | 87 03 | + 203 | 37 487 | - 93 | 62 68 | + 173 |
| 9 | 7.6 | 16 045 | - 91 | 84 83 | + 220 | 37 426 | - 61 | 60 85 | + 183 |
| 9 | 17.5 | 16 008 | + 18 | 82 58 | + 223 | 37 407 | - 19 | 59 02 | + 183 |
| 9 | 27.5 | 16 026 | + 81 | 80 35 | + 223 | 37 432 | + 25 | 57 27 | + 175 |
| 10 | 7.5 | 16 107 | + 81 | 78 22 | + 213 | 37 510 | + 78 | 55 66 | + 161 |
| 10 | 17.4 | 16 258 | + 151 | 76 33 | + 189 | 37 644 | + 134 | 54 31 | + 135 |
| 10 | 27.4 | 16 473 | + 215 | 74 74 | + 159 | 37 833 | + 189 | 53 26 | + 106 |
| 11 | 6.4 | 16 756 | + 283 | 73 54 | + 120 | 38 078 | + 245 | 52 60 | + 66 |
| 11 | 16.4 | 17 100 | + 344 | 72 82 | + 72 | 38 375 | + 297 | 52 38 | + 22 |
| 11 | 26.3 | 17 492 | + 392 | 72 59 | + 23 | 38 715 | + 340 | 52 62 | - 24 |
| 12 | 6.3 | 17 928 | + 436 | 72 90 | - 31 | 39 092 | + 377 | 53 35 | - 73 |
| 12 | 16.3 | 18 388 | + 460 | 73 77 | - 87 | 39 491 | + 399 | 54 55 | -120 |
| 12 | 26.3 | 18 860 | + 472 | 75 13 | -136 | 39 900 | + 409 | 56 18 | -163 |
| 12 | 36.2 | 19 331 | + 471 | 77 00 | -187 | 40 310 | + 410 | 58 21 | -203 |
| | | | + 451 | | -228 | | + 393 | | -235 |
| Mean Place | 18.344 | 81.95 | | 39.180 | 60.01 | 02.587 | 74.63 | 09.848 | 25.42 |
| sec δ, tan δ | +1.561 | -1.198 | | +1.286 | -0.809 | +1.071 | +0.383 | +1.043 | -0.295 |
| da(ψ), dδ(ψ) | +0.065 | -0.39 | | +0.064 | -0.39 | +0.060 | -0.39 | +0.062 | -0.39 |
| da(ε), dδ(ε) | -0.079 | -0.12 | | -0.054 | -0.12 | +0.025 | -0.13 | -0.020 | -0.13 |
| Dbles. Trans. | March 29 | | March 29 | | March 30 | | March 30 | | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 467 | | 468 | | 469 | | 1321 | |
|----------------|---------------------------|--------------------------|---------------------------|-------------------------|---------------------------|-------------------------|---------------------------|--------------------------|
| | 74 Ursae Majoris | | γ Crucis | | γ Muscae | | 35 G. Corvi | |
| Mag. Spect. | 5.44 | A5 | 1.61 | M3 | 4.04 | B5 | 5.76 | G5 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " |
| | 12 29 | + 58 28 | 12 30 | - 57 01 | 12 31 | - 72 02 | 12 32 | - 12 45 |
| 1 ^d | 18.105 ^s + 528 | 43.71 ^o - 214 | 21.252 ^s + 529 | 44.91 ^o - 97 | 34.366 ^s + 843 | 57.76 ^o - 53 | 49.599 ^s + 345 | 03.76 ^o - 202 |
| 1 | 1.2 18.648 + 543 | 42.10 - 161 | 21.782 + 530 | 46.41 - 150 | 35.209 + 843 | 58.89 - 113 | 49.948 + 349 | 05.92 - 216 |
| 1 | 11.2 19.195 + 547 | 41.05 - 105 | 22.301 + 519 | 48.41 - 200 | 36.036 + 827 | 60.59 - 170 | 50.292 + 344 | 08.18 - 226 |
| 1 | 21.2 19.723 + 528 | 40.65 - 40 | 22.791 + 490 | 50.86 - 245 | 36.814 + 778 | 62.84 - 225 | 50.620 + 328 | 10.44 - 226 |
| 1 | 31.2 20.215 + 492 | 40.85 + 20 | 23.238 + 447 | 53.65 - 279 | 37.524 + 710 | 65.53 - 269 | 50.922 + 302 | 12.64 - 220 |
| 2 | 10.1 20.660 + 445 | 41.65 + 80 | 23.636 + 398 | 56.73 - 308 | 38.155 + 631 | 68.61 - 308 | 51.194 + 272 | 14.75 - 211 |
| 2 | 20.1 21.040 + 380 | 43.01 + 136 | 23.973 + 337 | 60.02 - 329 | 38.688 + 533 | 72.01 - 340 | 51.427 + 233 | 16.68 - 193 |
| 3 | 2.1 21.348 + 308 | 44.83 + 182 | 24.248 + 275 | 63.41 - 339 | 39.117 + 429 | 75.59 - 358 | 51.620 + 193 | 18.41 - 173 |
| 3 | 12.0 21.581 + 233 | 47.04 + 221 | 24.461 + 213 | 66.86 - 345 | 39.443 + 326 | 79.32 - 377 | 51.774 + 154 | 19.94 - 153 |
| 3 | 22.0 21.731 + 150 | 49.54 + 250 | 24.607 + 146 | 70.27 - 341 | 39.656 + 213 | 83.09 - 373 | 51.888 + 114 | 21.22 - 128 |
| 3 | 32.0 21.804 + 73 | 52.19 + 265 | 24.694 + 87 | 73.56 - 329 | 39.766 + 110 | 86.80 - 371 | 51.965 + 77 | 22.27 - 105 |
| 4 | 11.0 21.805 + 1 | 54.91 + 272 | 24.725 + 31 | 76.72 - 316 | 39.773 + 7 | 90.43 - 363 | 52.010 + 45 | 23.10 - 83 |
| 4 | 20.9 21.735 - 70 | 57.56 + 265 | 24.699 - 26 | 79.63 - 291 | 39.678 - 95 | 93.85 - 342 | 52.024 + 14 | 23.71 - 61 |
| 4 | 30.9 21.610 - 125 | 60.04 + 248 | 24.627 - 72 | 82.27 - 264 | 39.496 - 182 | 97.02 - 317 | 52.014 - 10 | 24.12 - 41 |
| 5 | 10.9 21.433 - 177 | 62.30 + 226 | 24.509 - 118 | 84.61 - 234 | 39.227 - 269 | 99.90 - 288 | 51.981 + 33 | 24.35 - 23 |
| 5 | 20.9 21.215 - 218 | 64.21 + 191 | 24.351 - 158 | 86.56 - 195 | 38.879 - 348 | 102.38 - 248 | 51.929 - 52 | 24.40 - 5 |
| 5 | 30.8 20.969 - 246 | 65.72 + 151 | 24.161 - 190 | 88.14 - 158 | 38.469 - 410 | 104.45 - 207 | 51.864 - 65 | 24.30 + 10 |
| 6 | 9.8 20.700 - 269 | 66.82 + 110 | 23.940 - 221 | 89.29 - 115 | 37.997 - 472 | 106.07 - 162 | 51.786 - 78 | 24.05 + 25 |
| 6 | 19.8 20.419 - 281 | 67.43 + 61 | 23.697 - 243 | 89.97 - 68 | 37.482 - 515 | 107.17 - 110 | 51.698 - 88 | 23.66 + 39 |
| 6 | 29.7 20.136 - 283 | 67.57 + 14 | 23.439 - 258 | 90.22 - 25 | 36.938 - 544 | 107.77 - 60 | 51.604 - 94 | 23.18 + 48 |
| 7 | 9.7 19.854 - 282 | 67.23 - 34 | 23.169 - 270 | 89.99 + 23 | 36.374 - 564 | 107.83 - 6 | 51.505 - 99 | 22.58 + 60 |
| 7 | 19.7 19.586 - 268 | 66.39 - 84 | 22.901 - 268 | 89.30 + 69 | 35.813 - 561 | 107.34 + 49 | 51.406 - 99 | 21.90 + 68 |
| 7 | 29.7 19.336 - 250 | 65.10 - 129 | 22.641 - 260 | 88.20 + 110 | 35.271 - 542 | 106.36 + 98 | 51.310 - 96 | 21.16 + 74 |
| 8 | 8.6 19.109 - 227 | 63.36 - 174 | 22.641 - 243 | 86.69 + 151 | 34.763 - 508 | 104.89 + 147 | 51.221 - 89 | 20.39 + 77 |
| 8 | 18.6 18.916 - 193 | 61.20 - 216 | 22.186 - 212 | 84.83 + 186 | 34.317 - 446 | 102.97 + 192 | 51.145 - 76 | 19.62 + 77 |
| 8 | 28.6 18.761 - 155 | 58.70 - 250 | 22.013 - 173 | 82.71 + 212 | 33.945 - 372 | 100.71 + 226 | 51.086 - 59 | 18.89 + 73 |
| 9 | 7.6 18.650 - 111 | 55.84 - 286 | 21.888 - 125 | 80.36 + 235 | 33.665 - 280 | 98.12 + 259 | 51.050 - 36 | 18.23 + 66 |
| 9 | 17.5 18.594 - 56 | 52.71 - 313 | 21.827 - 61 | 77.91 + 245 | 33.501 - 164 | 95.36 + 276 | 51.045 - 5 | 17.72 + 51 |
| 9 | 27.5 18.594 + 0 | 49.36 - 335 | 21.832 + 5 | 75.45 + 246 | 33.456 - 45 | 92.51 + 285 | 51.073 + 28 | 17.38 + 34 |
| 10 | 7.5 18.658 + 64 | 45.83 - 353 | 21.912 + 80 | 73.05 + 240 | 33.545 + 89 | 89.66 + 285 | 51.139 + 66 | 17.25 + 13 |
| 10 | 17.4 18.792 + 134 | 42.21 - 362 | 22.073 + 161 | 70.88 + 217 | 33.775 + 230 | 86.98 + 268 | 51.251 + 112 | 17.35 - 10 |
| 10 | 27.4 18.994 + 202 | 38.58 - 363 | 22.310 + 237 | 68.98 + 190 | 34.135 + 360 | 84.54 + 244 | 51.408 + 157 | 17.75 - 40 |
| 11 | 6.4 19.269 + 275 | 34.98 - 360 | 22.626 + 316 | 67.46 + 152 | 34.628 + 493 | 82.46 + 208 | 51.611 + 203 | 18.48 - 73 |
| 11 | 16.4 19.614 + 345 | 31.56 - 342 | 23.011 + 385 | 66.43 + 103 | 35.238 + 610 | 80.86 + 160 | 51.856 + 245 | 19.54 - 106 |
| 11 | 26.3 20.020 + 406 | 28.36 - 320 | 23.454 + 443 | 65.90 + 53 | 35.941 + 703 | 79.77 + 109 | 52.139 + 283 | 20.90 - 136 |
| 12 | 6.3 20.484 + 464 | 25.48 - 288 | 23.947 + 493 | 65.94 - 4 | 36.726 + 785 | 79.27 + 50 | 52.455 + 316 | 22.55 - 165 |
| 12 | 16.3 20.989 + 505 | 23.04 - 244 | 24.468 + 521 | 66.56 - 62 | 37.557 + 831 | 79.41 - 14 | 52.792 + 337 | 24.45 - 190 |
| 12 | 26.3 21.522 + 533 | 21.07 - 197 | 25.003 + 535 | 67.72 - 116 | 38.409 + 852 | 80.15 - 74 | 53.141 + 349 | 26.53 - 208 |
| 12 | 36.2 22.069 + 547 | 19.66 - 141 | 25.537 + 534 | 69.43 - 171 | 39.260 + 851 | 81.51 - 136 | 53.493 + 352 | 28.75 - 222 |
| | | + 538 | | + 513 | | + 815 | | + 340 |
| Mean Place | 19.709 | 47.89 | 24.690 | 75.85 | 38.969 | 90.85 | 52.152 | 21.62 |
| sec δ, tan δ | +1.913 | +1.631 | +1.838 | -1.542 | +3.246 | -3.088 | +1.025 | -0.226 |
| dα(ψ), dδ(ψ) | +0.056 | -0.39 | +0.067 | -0.39 | +0.072 | -0.39 | +0.062 | -0.39 |
| dα(ε), dδ(ε) | +0.108 | -0.13 | -0.102 | -0.13 | -0.204 | -0.14 | -0.015 | -0.14 |
| Dble. Trans. | March 30 | | March 30 | | March 30 | | March 31 | |

APPARENT PLACES OF STARS, 1986

193

AT UPPER TRANSIT AT GREENWICH

| No. | 472 | | 1322 | | 470 | | 471 | |
|---------------------|---------------------------|------------|---|-------------------------|---------------------------|-------------------------|---------------------------|-------------------------|
| | α Draconis | | Piazzi 12 ^b 122 (Canum Venaticorum) | | β Canum Venat. | | β Corvi | |
| Mag. Spect. | 3.88 | B5p | 5.43 | K0 | 4.32 | G0 | 2.84 | G5 |
| U.T. | R.A. | | R.A. | | R.A. | | R.A. | |
| | Dec. | | Dec. | | Dec. | | Dec. | |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " |
| | 12 32 | + 69 51 | 12 32 | + 33 18 | 12 33 | + 41 25 | 12 33 | - 23 18 |
| 1 ^d -8.7 | 53 531 ^s + 732 | 39 25 -200 | 57 029 ^s + 377 | 81 33 ^s -240 | 04 270 ^s + 403 | 50 04 ^s -235 | 37 885 ^s + 360 | 58 41 ^s -181 |
| 1 1.2 | 54 290 + 759 | 37 84 -141 | 57 414 + 385 | 79 27 -206 | 04 684 + 414 | 48 10 -194 | 38 248 + 363 | 60 46 -205 |
| 1 11.2 | 55 059 + 769 | 37 04 -80 | 57 799 + 385 | 77 59 -168 | 05 098 + 414 | 46 62 -148 | 38 606 + 358 | 62 72 -226 |
| 1 21.2 | 55 807 + 748 | 36 93 -11 | 58 169 + 370 | 76 39 -120 | 05 497 + 399 | 45 68 -94 | 38 946 + 340 | 65 12 -240 |
| 1 31.2 | 56 507 + 700 | 37 44 + 51 | 58 513 + 344 | 75 67 -72 | 05 868 + 371 | 45 26 -42 | 39 259 + 313 | 67 55 -243 |
| 2 10.1 | 57 143 + 636 | 38 57 +113 | 58 824 + 311 | 75 43 -24 | 06 203 + 335 | 45 38 + 12 | 39 540 + 281 | 69 99 -244 |
| 2 20.1 | 57 687 + 544 | 40 27 +170 | 59 092 + 268 | 75 70 + 27 | 06 491 + 288 | 46 04 + 66 | 39 781 + 241 | 72 35 -236 |
| 3 2.1 | 58 126 + 439 | 42 42 +215 | 59 313 + 221 | 76 39 + 69 | 06 727 + 236 | 47 13 +109 | 39 981 + 200 | 74 58 -223 |
| 3 12.1 | 58 455 + 329 | 44 97 +255 | 59 485 + 172 | 77 47 +108 | 06 910 + 183 | 48 63 +150 | 39 981 + 160 | 76 67 -209 |
| 3 22.0 | 58 659 + 204 | 47 77 +280 | 59 607 + 122 | 78 87 +140 | 07 036 + 126 | 50 45 +182 | 40 258 + 117 | 78 56 -189 |
| 3 32.0 | 58 745 + 86 | 50 69 +292 | 59 683 + 76 | 80 50 +163 | 07 110 + 74 | 52 47 +202 | 40 338 + 80 | 80 23 -167 |
| 4 11.0 | 58 718 - 27 | 53 65 +296 | 59 716 + 33 | 82 29 +179 | 07 134 + 24 | 54 63 +216 | 40 383 + 45 | 81 70 -147 |
| 4 20.9 | 58 579 -139 | 56 50 +285 | 59 708 - 8 | 84 15 +186 | 07 113 - 21 | 56 82 +219 | 40 396 + 13 | 82 92 -122 |
| 4 30.9 | 58 350 -229 | 59 12 +262 | 59 669 - 39 | 85 97 +182 | 07 055 - 58 | 58 93 +211 | 40 383 - 13 | 83 91 - 99 |
| 5 10.9 | 58 037 -313 | 61 46 +234 | 59 601 - 68 | 87 72 +175 | 06 964 - 91 | 60 91 +198 | 40 347 - 36 | 84 68 - 77 |
| 5 20.9 | 57 655 -382 | 63 40 +194 | 59 510 - 91 | 89 30 +158 | 06 846 -118 | 62 66 +175 | 40 289 - 58 | 85 20 - 52 |
| 5 30.8 | 57 226 -429 | 64 90 +150 | 59 403 -107 | 90 67 +179 | 06 710 -136 | 64 14 +148 | 40 216 - 73 | 85 50 - 30 |
| 6 9.8 | 56 758 -468 | 65 92 +102 | 59 282 -121 | 91 79 +112 | 06 559 -151 | 65 31 +117 | 40 128 - 88 | 85 57 - 7 |
| 6 19.8 | 56 269 -489 | 66 40 + 48 | 59 153 -129 | 92 61 + 82 | 06 398 -161 | 66 10 + 79 | 40 029 - 99 | 85 41 + 16 |
| 6 29.8 | 55 777 -492 | 66 37 - 3 | 59 021 -132 | 93 13 + 52 | 06 235 -163 | 66 53 + 43 | 39 923 -106 | 85 05 + 36 |
| 7 9.7 | 55 286 -491 | 65 81 - 56 | 58 886 -135 | 93 32 + 19 | 06 070 -165 | 66 58 + 5 | 39 810 -113 | 84 49 + 56 |
| 7 19.7 | 54 818 -468 | 64 70 -111 | 58 756 -130 | 93 16 - 16 | 05 912 -158 | 66 22 - 36 | 39 698 -112 | 83 73 + 70 |
| 7 29.7 | 54 381 -437 | 63 12 -158 | 58 634 -122 | 92 67 - 49 | 05 763 -149 | 65 48 - 74 | 39 588 -110 | 82 83 + 96 |
| 8 8.6 | 53 981 -400 | 61 07 -205 | 58 522 -112 | 91 86 - 81 | 05 627 -136 | 64 36 -112 | 39 588 -103 | 82 83 +104 |
| 8 18.6 | 53 638 -343 | 58 58 -249 | 58 427 - 95 | 90 70 -116 | 05 512 -115 | 62 87 -149 | 39 398 - 87 | 80 67 +112 |
| 8 28.6 | 53 354 -284 | 55 74 -284 | 58 353 - 74 | 89 25 -145 | 05 421 - 91 | 61 05 -182 | 39 329 - 69 | 79 51 +116 |
| 9 7.6 | 53 140 -214 | 52 55 -319 | 58 305 - 48 | 87 48 -177 | 05 358 - 63 | 58 91 -214 | 39 284 - 45 | 78 35 +116 |
| 9 17.5 | 53 010 -130 | 49 10 -345 | 58 290 - 15 | 85 43 -205 | 05 358 - 25 | 56 46 -245 | 39 284 - 10 | 77 28 +107 |
| 9 27.5 | 52 964 - 46 | 45 46 -364 | 58 290 + 20 | 83 14 -229 | 05 333 + 15 | 56 46 -267 | 39 274 + 25 | 77 28 + 94 |
| 10 7.5 | 53 013 + 49 | 41 66 -380 | 58 310 + 63 | 80 59 -255 | 05 348 + 60 | 53 79 -292 | 39 299 + 68 | 76 34 + 76 |
| 10 17.5 | 53 166 + 153 | 37 82 -384 | 58 483 + 110 | 77 87 -272 | 05 520 + 112 | 47 81 -306 | 39 483 + 116 | 75 08 + 50 |
| 10 27.4 | 53 417 + 251 | 34 01 -381 | 58 639 + 156 | 75 01 -286 | 05 683 + 163 | 44 64 -317 | 39 646 + 163 | 74 87 + 21 |
| 11 6.4 | 53 776 + 359 | 30 29 -372 | 58 846 + 207 | 72 04 -297 | 05 900 + 217 | 41 42 -322 | 39 859 + 213 | 75 01 - 14 |
| 11 16.4 | 54 234 + 458 | 26 80 -349 | 59 101 + 255 | 69 06 -298 | 05 900 + 269 | 38 25 -317 | 39 859 + 258 | 75 01 - 53 |
| 11 26.3 | 54 782 + 548 | 23 59 -321 | 59 398 + 297 | 66 14 -292 | 06 484 + 315 | 35 18 -307 | 40 117 + 296 | 75 54 - 89 |
| 12 6.3 | 55 416 + 634 | 20 77 -282 | 59 734 + 336 | 63 33 -281 | 06 842 + 358 | 32 31 -287 | 40 744 + 331 | 77 70 -127 |
| 12 16.3 | 56 112 + 696 | 18 44 -233 | 60 098 + 364 | 60 75 -258 | 07 230 + 388 | 29 74 -257 | 41 097 + 353 | 79 32 -162 |
| 12 26.3 | 56 852 + 740 | 16 63 -181 | 60 478 + 390 | 58 45 -300 | 07 637 + 407 | 27 52 -222 | 41 461 + 364 | 81 22 -190 |
| 12 36.2 | 57 618 + 786 | 15 44 -119 | 60 866 + 388 | 56 51 -194 | 08 054 + 417 | 25 74 -178 | 41 827 + 366 | 83 38 -216 |
| | 57 757 + 757 | - 53 | + 380 | -149 | + 409 | -128 | + 354 | -232 |
| Mean Place | 54.691 | 45.27 | 59.094 | 79.33 | 06.189 | 50.55 | 40.575 | 79.90 |
| sec δ, tan δ | +2.905 | +2.727 | +1.197 | +0.657 | +1.334 | +0.883 | +1.089 | -0.431 |
| dα(ψ), dδ(ψ) | +0.051 | -0.39 | +0.059 | -0.39 | +0.058 | -0.39 | +0.063 | -0.39 |
| dα(ε), dδ(ε) | +0.180 | -0.14 | +0.043 | -0.14 | +0.058 | -0.14 | -0.028 | -0.15 |
| Dbble. Trans. | March 31 | | March 31 | | March 31 | | March 31 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 1323 | | 473 | | 1324 | | 474 | | |
|--------------|--------------------|--------------|--------------|--------------|-------------|--------------|------------|--------------|------------|
| | 23 Comae Berenices | | 24 Comae* f. | | 25 Virginis | | α Muscae | | |
| Mag. Spect. | 4.78 | A0 | 5.18 | K0 | 5.90 | A0 | 2.94 | B3 | |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " | |
| | 12 34 | + 22 41 | 12 34 | + 18 26 | 12 36 | - 5 45 | 12 36 | - 69 03 | |
| 1 | -8.7 | 08 557 + 353 | 77 66 -242 | 24 921 + 347 | 71 20 -240 | 03 072 + 339 | 12 04 -214 | 17 735 + 744 | 08 10 -55 |
| 1 | 1.2 | 08 917 + 360 | 75 49 -217 | 25 275 + 354 | 69 00 -220 | 03 416 + 344 | 14 24 -220 | 18 481 + 746 | 09 23 -113 |
| 1 | 1.2 | 09 277 + 360 | 73 60 -189 | 25 628 + 353 | 67 04 -196 | 03 756 + 340 | 16 46 -222 | 19 214 + 733 | 10 93 -170 |
| 1 | 21.2 | 09 621 + 344 | 72 10 -150 | 25 966 + 338 | 65 42 -162 | 04 082 + 326 | 18 61 -215 | 19 908 + 694 | 13 17 -224 |
| 1 | 31.2 | 09 942 + 321 | 70 98 -112 | 26 279 + 313 | 64 16 -126 | 04 382 + 300 | 20 63 -202 | 20 543 + 635 | 15 83 -266 |
| 2 | 10.1 | 10 231 + 289 | 70 29 -69 | 26 563 + 284 | 63 28 -88 | 04 654 + 272 | 22 48 -185 | 21 112 + 569 | 18 88 -305 |
| 2 | 20.1 | 10 480 + 249 | 70 03 -26 | 26 807 + 244 | 62 81 -47 | 04 888 + 234 | 24 11 -163 | 21 595 + 483 | 22 23 -335 |
| 3 | 2.1 | 10 687 + 207 | 70 17 + 14 | 27 010 + 203 | 62 73 -8 | 05 083 + 195 | 25 48 -137 | 21 989 + 394 | 25 75 -352 |
| 3 | 12.1 | 10 850 + 163 | 70 67 + 50 | 27 171 + 161 | 62 99 + 26 | 05 239 + 156 | 26 62 -114 | 22 294 + 305 | 29 41 -366 |
| 3 | 22.0 | 10 968 + 118 | 71 50 + 83 | 27 288 + 117 | 63 58 + 59 | 05 355 + 116 | 27 48 -86 | 22 502 + 208 | 33 11 -370 |
| 3 | 32.0 | 11 045 + 77 | 72 57 +107 | 27 365 + 77 | 64 40 + 82 | 05 435 + 80 | 28 11 -63 | 22 620 + 118 | 36 75 -364 |
| 4 | 11.0 | 11 084 + 39 | 73 83 +126 | 27 406 + 41 | 65 43 +103 | 05 482 + 47 | 28 52 -41 | 22 650 + 30 | 40 31 -356 |
| 4 | 20.9 | 11 088 + 4 | 75 20 +137 | 27 413 + 7 | 66 59 +116 | 05 499 + 17 | 28 71 -19 | 22 593 - 57 | 43 66 -335 |
| 4 | 30.9 | 11 064 - 24 | 76 60 +140 | 27 393 - 20 | 67 79 +120 | 05 492 - 7 | 28 75 -4 | 22 460 - 133 | 46 76 -310 |
| 5 | 10.9 | 11 015 - 49 | 77 99 +139 | 27 350 - 43 | 69 02 +123 | 05 462 - 30 | 28 62 + 13 | 22 253 - 207 | 49 57 -281 |
| 5 | 20.9 | 10 945 - 70 | 79 30 +131 | 27 286 - 64 | 70 20 +118 | 05 414 - 48 | 28 37 + 25 | 21 977 - 276 | 51 99 -242 |
| 5 | 30.8 | 10 862 - 83 | 80 47 +117 | 27 209 - 77 | 71 28 +108 | 05 353 - 61 | 28 03 + 34 | 21 648 - 329 | 54 02 -203 |
| 6 | 9.8 | 10 765 - 97 | 81 50 +103 | 27 119 - 90 | 72 24 + 96 | 05 278 - 75 | 27 59 + 44 | 21 264 - 384 | 55 60 -158 |
| 6 | 19.8 | 10 661 - 104 | 82 31 + 81 | 27 022 - 97 | 73 03 + 79 | 05 194 - 84 | 27 08 + 51 | 20 841 - 423 | 56 67 -107 |
| 6 | 29.8 | 10 553 - 108 | 82 90 + 59 | 26 920 - 102 | 73 64 + 61 | 05 104 - 90 | 26 54 + 59 | 20 393 - 448 | 57 26 -59 |
| 7 | 9.7 | 10 441 - 112 | 83 27 + 37 | 26 815 - 105 | 74 06 + 42 | 05 009 - 95 | 25 95 + 54 | 19 924 - 469 | 57 32 -6 |
| 7 | 19.7 | 10 332 - 109 | 83 37 + 10 | 26 712 - 103 | 74 25 + 19 | 04 914 - 95 | 25 36 + 59 | 19 455 - 489 | 56 85 + 47 |
| 7 | 29.7 | 10 229 - 103 | 83 22 - 15 | 26 614 - 98 | 74 22 - 3 | 04 822 - 92 | 24 78 + 58 | 19 000 - 455 | 55 90 + 95 |
| 8 | 8.6 | 10 134 - 95 | 82 80 - 42 | 26 523 - 91 | 73 97 - 25 | 04 735 - 87 | 24 21 + 57 | 18 571 - 429 | 54 45 +145 |
| 8 | 18.6 | 10 054 - 80 | 82 11 - 69 | 26 447 - 76 | 73 46 - 51 | 04 662 - 73 | 23 72 + 49 | 18 192 - 379 | 52 58 +187 |
| 8 | 28.6 | 09 991 - 63 | 81 17 - 94 | 26 387 - 60 | 72 72 - 74 | 04 604 - 58 | 23 31 + 41 | 17 874 - 318 | 50 37 +221 |
| 9 | 7.6 | 09 951 - 40 | 79 96 -121 | 26 350 - 37 | 71 73 - 99 | 04 568 - 36 | 23 01 + 30 | 17 633 - 241 | 47 85 +252 |
| 9 | 17.5 | 09 942 - 9 | 78 47 -149 | 26 343 - 7 | 70 49 -124 | 04 563 - 5 | 23 01 + 11 | 17 490 - 143 | 45 16 +269 |
| 9 | 27.5 | 09 964 + 22 | 76 75 -172 | 26 366 + 23 | 69 00 -149 | 04 563 + 27 | 22 90 - 9 | 17 449 - 41 | 42 38 +278 |
| 10 | 7.5 | 10 026 + 62 | 74 76 -199 | 26 429 + 63 | 67 26 -174 | 04 642 + 52 | 23 24 - 25 | 17 522 + 73 | 39 60 +278 |
| 10 | 17.5 | 10 133 + 107 | 72 56 -220 | 26 534 + 105 | 65 28 -198 | 04 755 + 113 | 23 78 - 54 | 17 718 + 196 | 36 99 +261 |
| 10 | 27.4 | 10 282 + 149 | 70 18 -238 | 26 683 + 149 | 63 11 -217 | 04 906 + 151 | 24 60 - 82 | 18 028 + 310 | 34 62 +237 |
| 11 | 6.4 | 10 479 + 197 | 67 63 -255 | 26 878 + 195 | 60 75 -236 | 05 102 + 196 | 25 72 -112 | 18 454 + 426 | 32 59 +203 |
| 11 | 16.4 | 10 721 + 242 | 65 00 -263 | 27 117 + 239 | 58 28 -247 | 05 340 + 238 | 27 11 -139 | 18 984 + 530 | 31 04 +155 |
| 11 | 26.3 | 11 002 + 281 | 62 33 -267 | 27 394 + 277 | 55 74 -254 | 05 615 + 275 | 28 76 -165 | 19 599 + 615 | 30 00 +104 |
| 12 | 6.3 | 11 319 + 317 | 59 68 -265 | 27 706 + 312 | 53 17 -257 | 05 924 + 309 | 30 65 -189 | 20 286 + 687 | 29 54 + 46 |
| 12 | 16.3 | 11 660 + 341 | 57 16 -252 | 28 043 + 337 | 50 70 -247 | 06 255 + 331 | 32 71 -206 | 21 017 + 731 | 29 71 - 17 |
| 12 | 26.3 | 12 017 + 357 | 54 82 -234 | 28 394 + 351 | 48 35 -235 | 06 598 + 343 | 34 88 -217 | 21 769 + 752 | 30 46 - 75 |
| 12 | 36.2 | 12 380 + 363 | 52 73 -209 | 28 751 + 357 | 46 22 -213 | 06 944 + 346 | 37 11 -223 | 22 522 + 753 | 31 83 -137 |
| | | + 355 | -174 | + 348 | -183 | + 337 | -220 | + 725 | -192 |
| Mean Place | 10.746 | 72.36 | 27.159 | 64.47 | 05.567 | 27.32 | 22.110 | 40.59 | |
| sec δ, tan δ | +1.084 | +0.418 | +1.054 | +0.334 | +1.005 | -0.101 | +2.798 | -2.613 | |
| dα(ψ), dδ(ψ) | +0.060 | -0.39 | +0.060 | -0.39 | +0.062 | -0.39 | +0.072 | -0.39 | |
| dα(ε), dδ(ε) | +0.028 | -0.15 | +0.022 | -0.15 | -0.007 | -0.16 | -0.172 | -0.16 | |
| Dble. Trans. | March 31 | | March 31 | | March 31 | | April 1 | | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 475 | | 1325 | | 478 | | 1326 | |
|-----------------------------|-----------------|----------------|-----------------|----------------|------------------|----------------|-----------------|----------------|
| | χ Virginis | | 133 G. Centauri | | 76 Ursae Majoris | | ρ Virginis | |
| Mag.Spect. | 4.78 | K0 | 5.84 | K0 | 5.92 | A0 | 4.95 | A0 |
| U.T. | R.A. | | R.A. | | R.A. | | R.A. | |
| | h | m | h | m | h | m | h | m |
| | 12 38 | — 7 55 | 12 40 | — 46 03 | 12 40 | + 62 46 | 12 41 | + 10 18 |
| | ^s | ^o / | ^s | ^o / | ^s | ^o / | ^s | ^o / |
| 1 -8.7 | 30.372 | + 339 | 35.009 | + 439 | 57.178 | + 575 | 09.716 | + 338 |
| 1 1.2 | 30.717 | + 345 | 50.96 | -116 | 68.17 | -222 | 44.92 | -236 |
| 1 11.2 | 31.059 | + 342 | 52.57 | -161 | 66.50 | -167 | 42.67 | -225 |
| 1 21.2 | 31.386 | + 327 | 54.59 | -202 | 65.42 | -108 | 40.57 | -210 |
| 1 31.2 | 31.689 | + 303 | 56.99 | -240 | 64.99 | -43 | 38.73 | -184 |
| | | | 59.65 | -266 | 65.19 | + 20 | 37.17 | -156 |
| 2 10.1 | 31.962 | + 273 | 60.039 | + 509 | 66.00 | + 81 | 35.93 | -124 |
| 2 20.1 | 32.198 | + 236 | 62.53 | -288 | 67.41 | +141 | 35.05 | -88 |
| 3 2.1 | 32.395 | + 197 | 65.54 | -301 | 69.28 | +187 | 34.51 | -54 |
| 3 12.1 | 32.554 | + 159 | 68.59 | -305 | 71.58 | +230 | 34.29 | -22 |
| 3 22.0 | 32.672 | + 118 | 71.64 | -298 | 74.18 | +260 | 34.39 | + 10 |
| | | | 74.62 | | | | | |
| 4 1.0 | 32.755 | + 83 | 88.24 | -157 | 89.58 | +203 | 38.67 | + 92 |
| 4 11.0 | 32.805 | + 50 | 89.47 | -123 | 91.21 | +163 | 39.54 | + 87 |
| 4 20.9 | 32.824 | + 19 | 90.34 | -87 | 92.41 | +120 | 40.38 | + 84 |
| 4 30.9 | 32.819 | - 5 | 90.81 | -47 | 93.09 | + 68 | 41.12 | + 74 |
| 5 10.9 | 32.791 | - 28 | 90.92 | -11 | 93.30 | + 21 | 41.75 | + 63 |
| | | | 86.67 | -191 | 87.55 | +238 | | |
| 5 20.9 | 32.745 | - 46 | 90.62 | + 30 | 92.99 | - 31 | 42.26 | + 51 |
| 5 30.8 | 32.684 | - 61 | 89.94 | + 68 | 92.16 | - 83 | 42.62 | + 36 |
| 6 9.8 | 32.610 | - 74 | 88.93 | +101 | 90.87 | -129 | 42.83 | + 21 |
| 6 19.8 | 32.526 | - 84 | 87.57 | +136 | 89.11 | -176 | 42.88 | + 5 |
| 6 29.8 | 32.436 | - 90 | 85.94 | +163 | 86.90 | -221 | 42.72 | - 16 |
| | | | 37.303 | -174 | 59.470 | -343 | | |
| 7 9.7 | 32.339 | - 97 | 84.10 | +184 | 84.33 | -257 | 42.38 | - 34 |
| 7 19.7 | 32.243 | - 96 | 82.09 | +201 | 81.40 | -293 | 41.83 | - 55 |
| 7 29.7 | 32.149 | - 94 | 80.02 | +207 | 78.17 | -323 | 41.05 | - 78 |
| 8 8.6 | 32.060 | - 89 | 77.97 | +205 | 74.72 | -345 | 40.05 | -100 |
| 8 18.6 | 31.984 | - 76 | 76.02 | +195 | 71.07 | -365 | 38.78 | -127 |
| | | | 36.417 | -154 | 57.457 | -253 | | |
| 8 28.6 | 31.923 | - 61 | 74.29 | +173 | 67.34 | -373 | 37.26 | -152 |
| 9 7.6 | 31.885 | - 38 | 72.83 | +146 | 63.59 | -375 | 35.51 | -175 |
| 9 17.5 | 31.876 | - 9 | 71.73 | +110 | 59.88 | -371 | 33.54 | -197 |
| 9 27.5 | 31.900 | + 24 | 71.09 | + 64 | 56.35 | -353 | 31.39 | -215 |
| 10 7.5 | 31.953 | + 53 | 70.90 | + 19 | 53.05 | -330 | 29.11 | -228 |
| | | | 36.217 | -154 | 58.818 | -426 | | |
| 10 17.5 | 32.062 | + 109 | 71.23 | - 33 | 50.07 | -298 | 26.73 | -238 |
| 10 27.4 | 32.212 | + 150 | 72.08 | -132 | 47.55 | -252 | 24.35 | -238 |
| 11 6.4 | 32.407 | + 195 | 73.40 | -179 | 45.51 | -204 | 22.02 | -233 |
| 11 16.4 | 32.644 | + 237 | 75.19 | -218 | 44.05 | -83 | 19.81 | -200 |
| 11 26.3 | 32.919 | + 275 | | | | | | |
| | | | 37.856 | + 403 | 59.313 | + 495 | 12.533 | + 303 |
| 12 6.3 | 33.228 | + 331 | 38.286 | + 430 | 59.859 | + 546 | 12.861 | + 328 |
| 12 16.3 | 33.559 | + 344 | 38.731 | + 448 | 60.441 | + 603 | 13.204 | + 343 |
| 12 26.3 | 33.903 | + 348 | 39.179 | + 432 | 61.044 | + 599 | 13.552 | + 348 |
| 12 36.2 | 34.251 | + 338 | | | | | | |
| | | | | | | | | |
| Mean Place | 32.906 | 17.32 | 38.211 | 78.76 | 58.713 | 73.38 | 12.076 | 35.55 |
| sec δ , tan δ | +1.010 | -0.139 | +1.441 | -1.038 | +2.187 | +1.945 | +1.016 | +0.182 |
| $d\alpha(v)$, $d\delta(v)$ | +0.062 | -0.39 | +0.066 | -0.39 | +0.052 | -0.39 | +0.060 | -0.39 |
| $d\alpha(e)$, $d\delta(e)$ | -0.009 | -0.17 | -0.068 | -0.18 | +0.128 | -0.18 | +0.012 | -0.18 |
| Dble.Trans. | April 1 | | April 2 | | April 2 | | April 2 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 479 | | 1327 | | 1328 | | 481 | |
|--------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|
| | 330 G. Hydrae | | Y Canum Venat. | | 32 Virginis | | β Crucis | |
| Mag. Spect. | 5.73 | K2 | 4.8 to 6.0 | N3 | 5.24 | A5 | 1.50 | B1 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | ^h ^m | ^o ['] | ^h ^m | ^o ['] | ^h ^m | ^o ['] | ^h ^m | ^o ['] |
| | 12 43 | -28 14 | 12 44 | +45 30 | 12 44 | + 7 44 | 12 46 | -59 36 |
| 1 | ^d -8.7 | ^s +369 | ^s +417 | ^s -244 | ^s +335 | ^s -233 | ^s +558 | ^s -68 |
| 1 | 1.3 | +374 | +432 | -201 | +344 | -225 | +565 | -123 |
| 1 | 11.2 | +370 | +436 | -153 | +342 | -190 | +560 | -174 |
| 1 | 21.2 | +354 | +424 | -96 | +330 | -164 | +534 | -223 |
| 1 | 31.2 | +328 | +399 | -40 | +308 | -135 | +493 | -261 |
| 2 | 10.1 | +296 | +364 | +16 | +279 | -101 | +446 | -293 |
| 2 | 20.1 | +256 | +317 | +72 | +244 | -67 | +386 | -319 |
| 3 | 2.1 | +215 | +263 | +120 | +204 | -37 | +322 | -332 |
| 3 | 12.1 | +174 | +209 | +161 | +166 | -5 | +258 | -343 |
| 3 | 22.0 | +132 | +148 | +197 | +124 | +20 | +189 | -343 |
| 4 | 1.0 | +92 | +93 | +217 | +88 | +41 | +125 | -335 |
| 4 | 11.0 | +58 | +39 | +233 | +54 | +60 | +64 | -325 |
| 4 | 21.0 | +22 | -11 | +236 | +22 | +71 | +2 | -305 |
| 4 | 30.9 | -4 | -53 | +227 | -4 | +79 | +50 | -280 |
| 5 | 10.9 | -31 | -91 | +215 | -27 | +82 | -101 | -253 |
| 5 | 20.9 | -55 | -78 | +191 | -46 | +81 | -150 | -216 |
| 5 | 30.8 | -72 | -53 | +161 | -61 | +79 | -188 | -180 |
| 6 | 9.8 | -90 | -28 | +129 | -76 | +72 | -226 | -139 |
| 6 | 19.8 | -103 | -1 | +89 | -84 | +63 | -257 | -92 |
| 6 | 29.8 | -113 | +23 | +49 | -91 | +63 | -276 | -48 |
| 7 | 9.7 | -122 | +47 | +9 | -97 | +55 | -295 | -1 |
| 7 | 19.7 | -124 | +71 | -36 | -98 | +41 | -299 | +48 |
| 7 | 29.7 | -122 | +90 | -76 | -95 | +28 | -294 | +91 |
| 8 | 8.6 | -117 | +109 | -116 | -90 | +13 | -282 | +135 |
| 8 | 18.6 | -103 | +122 | -158 | -78 | -4 | -252 | +173 |
| 8 | 28.6 | -84 | +130 | -191 | -64 | -21 | -214 | +203 |
| 9 | 7.6 | -59 | +134 | -228 | -43 | -42 | -164 | +231 |
| 9 | 17.5 | -24 | +130 | -258 | -14 | -63 | -98 | +245 |
| 9 | 27.5 | +14 | +120 | -283 | +15 | -84 | -29 | +251 |
| 10 | 7.5 | +58 | +104 | -308 | +52 | -110 | +51 | +249 |
| 10 | 17.5 | +108 | +80 | -324 | +95 | -138 | +139 | +233 |
| 10 | 27.4 | +157 | +52 | -333 | +138 | -160 | +222 | +208 |
| 11 | 6.4 | +210 | +17 | -339 | +183 | -184 | +309 | +175 |
| 11 | 16.4 | +258 | -22 | -333 | +228 | -203 | +387 | +129 |
| 11 | 26.3 | +300 | -61 | -321 | +265 | -218 | +452 | +80 |
| 12 | 6.3 | +336 | +364 | -300 | +301 | -231 | +510 | +26 |
| 12 | 16.3 | +361 | +399 | -288 | +325 | -234 | +547 | -33 |
| 12 | 26.3 | +374 | +422 | -230 | +340 | -231 | +566 | -88 |
| 12 | 36.2 | +378 | +437 | -185 | +347 | -223 | +573 | -143 |
| | +367 | -226 | +431 | -131 | +339 | -204 | +554 | -195 |
| Mean Place | 17.207 | 59.95 | 29.901 | 50.28 | 56.127 | 49.18 | 55.573 | 54.35 |
| sec δ, tan δ | +1.135 | -0.537 | +1.427 | +1.018 | +1.009 | +0.136 | +1.977 | -1.705 |
| da(ψ), dδ(ψ) | +0.064 | -0.39 | +0.056 | -0.39 | +0.060 | -0.39 | +0.070 | -0.39 |
| da(ε), dδ(ε) | -0.035 | -0.19 | +0.067 | -0.19 | +0.009 | -0.19 | -0.111 | -0.20 |
| Dble. Trans. | April 2 | | April 3 | | April 3 | | April 3 | |

APPARENT PLACES OF STARS, 1986

197

AT UPPER TRANSIT AT GREENWICH

| No. | 1330 | | 1329 | | 1331 | | 1332 | |
|--------------|--------------|------------|---------------|------------|-----------------|------------|--------------------|------------|
| Name | 35 Virginis | | 332 G. Hydrae | | 143 G. Centauri | | 31 Comae Berenices | |
| Mag. Spect. | 6.66 | M0 | 6.29 | B9 | 5.01 | A0 | 5.07 | G0 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " |
| | 12 47 | + 3 38 | 12 47 | - 24 46 | 12 49 | - 33 55 | 12 51 | + 27 36 |
| 1 -8.7 | 07 687 + 334 | 57 93 -228 | 07 647 + 360 | 20 18 -168 | 54 047 + 385 | 09 20 -142 | 00 303 + 355 | 53 53 -252 |
| 1 1.3 | 08 029 + 342 | 55 69 -224 | 08 014 + 367 | 22 13 -195 | 54 437 + 390 | 10 97 -177 | 00 669 + 366 | 51 29 -224 |
| 1 11.2 | 08 371 + 329 | 53 53 -216 | 08 377 + 363 | 24 30 -217 | 54 825 + 388 | 13 05 -208 | 01 039 + 370 | 49 37 -192 |
| 1 21.2 | 08 700 + 329 | 51 54 -199 | 08 726 + 349 | 26 63 -233 | 55 196 + 371 | 15 39 -234 | 01 397 + 358 | 47 88 -149 |
| 1 31.2 | 09 006 + 306 | 49 78 -176 | 09 049 + 323 | 29 02 -239 | 55 541 + 345 | 17 89 -250 | 01 734 + 337 | 46 83 -105 |
| 2 10.1 | 09 286 + 280 | 48 27 -151 | 09 343 + 294 | 31 44 -242 | 55 855 + 314 | 20 50 -261 | 02 043 + 309 | 46 24 -59 |
| 2 20.1 | 09 529 + 243 | 47 07 -120 | 09 598 + 255 | 33 80 -236 | 56 128 + 273 | 23 14 -264 | 02 313 + 270 | 46 14 -10 |
| 3 2.1 | 09 734 + 205 | 46 17 -90 | 09 813 + 215 | 36 06 -215 | 56 358 + 230 | 25 75 -261 | 02 541 + 228 | 46 46 + 32 |
| 3 12.1 | 09 901 + 167 | 45 58 -59 | 09 989 + 176 | 38 19 -213 | 56 546 + 188 | 28 29 -254 | 02 726 + 185 | 47 18 + 72 |
| 3 22.0 | 10 028 + 127 | 45 28 -30 | 10 122 + 133 | 40 13 -194 | 56 690 + 144 | 30 70 -241 | 02 864 + 138 | 48 25 +107 |
| 4 1.0 | 10 119 + 91 | 45 23 -5 | 10 218 + 96 | 41 87 -174 | 56 794 + 104 | 32 94 -224 | 02 959 + 95 | 49 58 +133 |
| 4 11.0 | 10 176 + 57 | 45 40 + 17 | 10 280 + 62 | 43 42 -155 | 56 860 + 66 | 35 00 -206 | 03 014 + 55 | 51 11 +153 |
| 4 21.0 | 10 202 + 26 | 45 76 + 36 | 10 308 + 28 | 44 73 -110 | 56 889 + 29 | 36 83 -183 | 03 032 + 18 | 52 76 +166 |
| 4 30.9 | 10 202 + 0 | 46 25 + 49 | 10 309 + 1 | 45 83 -131 | 56 888 - 1 | 38 43 -160 | 03 018 - 14 | 54 42 +166 |
| 5 10.9 | 10 180 - 22 | 46 85 + 60 | 10 284 - 25 | 46 69 -86 | 56 859 - 29 | 39 78 -135 | 02 976 - 42 | 56 07 +165 |
| 5 20.9 | 10 137 - 43 | 47 51 + 66 | 10 237 - 47 | 47 32 -63 | 56 803 - 56 | 40 84 -106 | 02 910 - 66 | 57 61 +154 |
| 5 30.8 | 10 080 - 57 | 48 19 + 68 | 10 172 - 65 | 47 72 -40 | 56 727 - 76 | 41 64 -80 | 02 827 - 83 | 58 99 +138 |
| 6 9.8 | 10 008 - 72 | 48 89 + 70 | 10 090 - 82 | 47 90 -18 | 56 630 - 97 | 42 15 -51 | 02 727 - 100 | 60 18 +119 |
| 6 19.8 | 09 926 - 82 | 49 55 + 66 | 09 993 - 97 | 47 90 + 6 | 56 517 - 113 | 42 35 -20 | 02 616 - 111 | 61 12 + 94 |
| 6 29.8 | 09 838 - 88 | 50 16 + 61 | 09 888 - 105 | 47 57 + 27 | 56 517 - 124 | 42 27 + 8 | 02 499 - 117 | 61 80 + 68 |
| 7 9.7 | 09 742 - 96 | 50 73 + 57 | 09 773 - 115 | 47 08 + 49 | 56 257 - 136 | 41 90 + 37 | 02 375 - 124 | 62 21 + 41 |
| 7 19.7 | 09 646 - 96 | 51 20 + 47 | 09 656 - 117 | 46 40 + 68 | 56 118 - 139 | 41 24 + 66 | 02 252 - 123 | 62 29 + 8 |
| 7 29.7 | 09 551 - 95 | 51 57 + 37 | 09 540 - 116 | 45 56 + 84 | 55 980 - 138 | 40 35 + 89 | 02 133 - 119 | 62 09 - 20 |
| 8 8.7 | 09 461 - 90 | 51 84 + 27 | 09 427 - 113 | 44 55 +101 | 55 846 - 134 | 39 21 +114 | 02 019 - 114 | 61 58 - 51 |
| 8 18.6 | 09 382 - 79 | 51 97 + 13 | 09 329 - 98 | 43 45 +110 | 55 727 - 119 | 37 89 +132 | 01 919 - 100 | 60 75 - 83 |
| 8 28.6 | 09 318 - 64 | 51 94 - 3 | 09 247 - 82 | 42 29 +116 | 55 627 - 100 | 36 44 +145 | 01 835 - 84 | 59 64 -111 |
| 9 7.6 | 09 273 - 45 | 51 74 -20 | 09 189 - 58 | 41 11 +118 | 55 554 - 73 | 34 89 +155 | 01 773 - 62 | 58 22 -142 |
| 9 17.5 | 09 258 - 15 | 51 34 -40 | 09 164 - 25 | 39 99 +112 | 55 517 - 37 | 33 35 +154 | 01 742 - 31 | 56 51 -171 |
| 9 27.5 | 09 273 + 15 | 50 75 -59 | 09 174 + 10 | 38 97 +102 | 55 520 + 3 | 31 87 +148 | 01 743 + 1 | 54 54 -197 |
| 10 7.5 | 09 321 + 48 | 49 91 -84 | 09 228 + 54 | 38 12 + 85 | 55 571 + 51 | 30 52 +135 | 01 785 + 42 | 52 31 -223 |
| 10 17.5 | 09 414 + 93 | 48 77 -114 | 09 330 + 102 | 37 52 + 60 | 55 676 + 105 | 29 40 +112 | 01 871 + 86 | 49 85 -246 |
| 10 27.4 | 09 551 + 137 | 47 40 -137 | 09 480 + 150 | 37 18 + 34 | 55 832 + 156 | 28 54 + 86 | 02 003 + 132 | 47 23 -262 |
| 11 6.4 | 09 733 + 182 | 45 78 -162 | 09 682 + 202 | 37 18 + 0 | 56 045 + 213 | 28 03 + 51 | 02 185 + 182 | 44 44 -279 |
| 11 16.4 | 09 959 + 226 | 43 94 -184 | 09 931 + 249 | 37 57 - 39 | 56 309 + 264 | 27 92 + 11 | 02 414 + 229 | 41 59 -285 |
| 11 26.4 | 10 224 + 265 | 41 92 -202 | 10 221 + 290 | 38 31 - 74 | 56 618 + 309 | 28 22 - 30 | 02 686 + 272 | 38 73 -286 |
| 12 6.3 | 10 523 + 289 | 39 74 -218 | 10 548 + 327 | 39 44 -113 | 56 966 + 348 | 28 96 - 74 | 02 997 + 311 | 35 91 -282 |
| 12 16.3 | 10 847 + 324 | 37 48 -226 | 10 899 + 351 | 40 93 -149 | 57 341 + 375 | 30 13 -117 | 03 338 + 341 | 33 26 -265 |
| 12 26.3 | 11 186 + 339 | 35 21 -227 | 11 265 + 366 | 42 71 -178 | 57 731 + 390 | 31 68 -155 | 03 699 + 361 | 30 83 -243 |
| 12 36.2 | 11 532 + 346 | 32 98 -223 | 11 635 + 370 | 44 77 -206 | 58 126 + 395 | 33 58 -190 | 04 069 + 370 | 28 69 -214 |
| | 11 532 + 338 | 32 98 -210 | 11 635 + 361 | 44 77 -223 | 58 126 + 384 | 33 58 -219 | 04 069 + 367 | 28 69 -175 |
| Mean Place | 10.148 | 46 48 | 10.471 | 41 48 | 57.060 | 33 23 | 02 520 | 50 37 |
| sec δ, tan δ | +1.002 | +0.064 | +1.101 | -0.462 | +1.205 | -0.673 | +1.129 | +0.523 |
| dα(v), dδ(v) | +0.061 | -0.39 | +0.064 | -0.39 | +0.065 | -0.39 | +0.058 | -0.39 |
| dα(ε), dδ(ε) | +0.004 | -0.20 | -0.030 | -0.20 | -0.044 | -0.22 | +0.034 | -0.22 |
| Dble. Trans. | April 3 | | April 3 | | April 4 | | April 4 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 1333 | | 482 | | 1334 | | 483 | |
|----------------|--------------------------|-------------------------|--------------------------|-------------------------|--------------------------|-------------------------|--------------------------|-------------------------|
| | 32 Comae Berenices | | 150 G. Centauri | | 52 G. Corvi* | | ε Ursae Majoris | |
| Mag. Spect. | 6.53 | K5 | 4.34 | A5 | 6.84 | A0 | 1.68 | A0p |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° ' | h m | ° ' | h m | ° ' | h m | ° ' |
| | 12 51 | + 17 08 | 12 52 | - 40 05 | 12 53 | - 17 57 | 12 53 | + 56 01 |
| 1 ^d | 29.638 ^s +340 | 56.00 ^o -245 | 37.935 ^s +408 | 54.85 ^o -122 | 14.677 ^s +347 | 33.72 ^o -183 | 24.478 ^s +483 | 54.43 ^o -245 |
| 1 | 29.988 +350 | 53.72 -228 | 38.349 +414 | 56.47 -162 | 15.031 +354 | 35.74 -202 | 24.983 +505 | 52.49 -194 |
| 1 | 30.339 +361 | 51.67 -205 | 38.761 +412 | 58.46 -199 | 15.385 +364 | 37.91 -217 | 25.499 +516 | 51.09 -140 |
| 1 | 30.679 +340 | 49.94 -173 | 39.156 +395 | 60.77 -231 | 15.725 +340 | 40.17 -226 | 26.006 +507 | 50.32 -77 |
| 1 | 30.998 +319 | 48.56 -138 | 39.522 +366 | 63.30 -253 | 16.042 +317 | 42.42 -225 | 26.486 +480 | 50.16 -16 |
| 2 | 31.290 +292 | 47.55 -101 | 39.856 +334 | 66.00 -270 | 16.332 +290 | 44.63 -221 | 26.928 +442 | 50.61 +45 |
| 2 | 31.546 +256 | 46.96 -59 | 40.148 +292 | 68.79 -279 | 16.585 +253 | 46.73 -210 | 27.316 +388 | 51.66 +105 |
| 3 | 31.762 +216 | 46.75 -21 | 40.394 +246 | 71.60 -281 | 16.800 +215 | 48.67 -194 | 27.641 +325 | 53.21 +155 |
| 3 | 31.938 +176 | 46.91 +16 | 40.596 +202 | 74.38 -278 | 16.977 +177 | 50.44 -177 | 27.900 +259 | 55.21 +200 |
| 3 | 32.072 +134 | 47.40 +49 | 40.750 +154 | 77.07 -269 | 17.114 +137 | 52.01 -157 | 28.083 +183 | 57.55 +234 |
| 4 | 32.167 +95 | 48.15 +75 | 40.861 +111 | 79.61 -254 | 17.215 +101 | 53.35 -134 | 28.197 +114 | 60.10 +255 |
| 4 | 32.226 +59 | 49.12 +97 | 40.932 +71 | 82.00 -239 | 17.282 +67 | 54.50 -115 | 28.242 +45 | 62.79 +269 |
| 4 | 32.250 +24 | 50.24 +112 | 40.962 +30 | 84.16 -216 | 17.317 +35 | 55.41 -91 | 28.219 -23 | 65.48 +269 |
| 4 | 32.247 -3 | 51.43 +119 | 40.960 -2 | 86.08 -192 | 17.326 +9 | 56.13 -72 | 28.142 -77 | 68.05 +257 |
| 5 | 32.218 -29 | 52.66 +123 | 40.925 -35 | 87.75 -167 | 17.311 -15 | 56.64 -51 | 28.013 -129 | 70.45 +240 |
| 5 | 32.168 -50 | 53.86 +120 | 40.861 -64 | 89.11 -136 | 17.273 -38 | 56.96 -32 | 27.840 -173 | 72.56 +211 |
| 5 | 32.102 -66 | 54.98 +112 | 40.774 -87 | 90.17 -106 | 17.218 -55 | 57.10 -14 | 27.636 -204 | 74.32 +176 |
| 6 | 32.021 -81 | 55.99 +101 | 40.663 -111 | 90.92 -75 | 17.147 -71 | 57.06 +4 | 27.404 -232 | 75.70 +138 |
| 6 | 31.928 -93 | 56.85 +89 | 40.533 -130 | 91.31 -39 | 17.061 -86 | 56.85 +21 | 27.153 -251 | 76.61 +91 |
| 6 | 31.829 -99 | 57.54 +66 | 40.390 -143 | 91.39 -8 | 16.967 -94 | 56.50 +35 | 26.893 -260 | 77.07 +46 |
| 7 | 31.724 -105 | 58.04 +50 | 40.235 -155 | 91.11 +28 | 16.862 -105 | 55.99 +51 | 26.628 -265 | 77.05 -2 |
| 7 | 31.618 -106 | 58.32 +28 | 40.075 -160 | 90.50 +61 | 16.755 -107 | 55.35 +64 | 26.367 -261 | 76.53 -52 |
| 7 | 31.513 -105 | 58.39 +7 | 39.915 -160 | 89.60 +90 | 16.647 -108 | 54.62 +73 | 26.117 -250 | 75.56 -97 |
| 8 | 31.414 -99 | 58.24 -15 | 39.760 -155 | 88.41 +119 | 16.542 -105 | 53.79 +83 | 25.882 -235 | 74.13 -143 |
| 8 | 31.326 -88 | 57.83 -64 | 39.622 -138 | 86.97 +144 | 16.449 -93 | 52.91 +98 | 25.673 -209 | 72.26 -187 |
| 8 | 31.253 -73 | 57.19 -64 | 39.504 -118 | 85.37 +160 | 16.371 -78 | 52.03 +88 | 25.495 -178 | 70.01 -225 |
| 9 | 31.200 -53 | 56.30 -89 | 39.416 -88 | 83.61 +176 | 16.314 -57 | 51.17 +86 | 25.353 -142 | 67.37 -264 |
| 9 | 31.176 -24 | 55.15 -115 | 39.368 -48 | 81.82 +179 | 16.287 -27 | 50.41 +76 | 25.260 -93 | 64.42 -295 |
| 9 | 31.182 +6 | 53.76 -139 | 39.364 -4 | 80.06 +176 | 16.294 +7 | 49.78 +63 | 25.218 -42 | 61.22 -320 |
| 10 | 31.225 +43 | 52.10 -166 | 39.412 +48 | 78.39 +167 | 16.341 +47 | 49.34 +44 | 25.234 +16 | 57.78 -344 |
| 10 | 31.312 +87 | 50.20 -190 | 39.518 +106 | 76.94 +145 | 16.433 +92 | 49.12 +22 | 25.317 +83 | 54.20 -358 |
| 10 | 31.442 +130 | 48.09 -211 | 39.681 +163 | 75.75 +119 | 16.572 +139 | 49.16 -4 | 25.466 +149 | 50.56 -364 |
| 11 | 31.620 +178 | 45.78 -231 | 39.904 +223 | 74.89 +86 | 16.761 +189 | 49.54 -38 | 25.686 +220 | 46.89 -367 |
| 11 | 31.843 +223 | 43.33 -245 | 40.183 +279 | 74.46 +43 | 16.997 +236 | 50.25 -71 | 25.975 +289 | 43.34 -355 |
| 11 | 32.106 +263 | 40.80 -253 | 40.509 +326 | 74.45 +1 | 17.272 +275 | 51.29 -104 | 26.327 +352 | 39.97 -337 |
| 12 | 32.406 +300 | 38.22 -258 | 40.878 +369 | 74.92 -47 | 17.584 +312 | 52.67 -138 | 26.739 +412 | 36.86 -311 |
| 12 | 32.734 +328 | 35.70 -252 | 41.276 +398 | 75.85 -93 | 17.921 +337 | 54.33 -166 | 27.196 +457 | 34.14 -272 |
| 12 | 33.079 +345 | 33.30 -240 | 41.689 +413 | 77.22 -137 | 18.273 +352 | 56.23 -190 | 27.687 +491 | 31.86 -228 |
| 12 | 33.432 +353 | 31.09 -221 | 42.109 +420 | 78.99 -177 | 18.632 +359 | 58.33 -210 | 28.199 +512 | 30.10 -176 |
| | 33.432 +349 | 31.09 -193 | 42.109 +408 | 78.99 -213 | 18.632 +351 | 58.33 -221 | 28.199 +512 | 30.10 -115 |
| Mean Place | 31.975 | 49.43 | 41.119 | 80.48 | 17.444 | 52.47 | 26.278 | 58.76 |
| sec δ, tan δ | +1.047 | +0.309 | +1.307 | -0.842 | +1.051 | -0.324 | +1.790 | +1.484 |
| dα(ψ), dδ(ψ) | +0.059 | -0.39 | +0.066 | -0.39 | +0.063 | -0.39 | +0.052 | -0.39 |
| dα(ε), dδ(ε) | +0.020 | -0.22 | -0.055 | -0.23 | -0.021 | -0.23 | +0.096 | -0.23 |
| Dble. Trans. | April 4 | | April 5 | | April 5 | | April 5 | |

APPARENT PLACES OF STARS, 1986

199

AT UPPER TRANSIT AT GREENWICH

| No. | 1335 | | 484 | | 486 | | 485 | |
|--------------|--------------|------------|--------------|------------|--------------|------------|--------------------|------------|
| | ψ Virginis | | δ Virginis | | 8 Draconis | | α Canum Venat.* f. | |
| Mag.Spect. | 4.91 | M3 | 3.66 | M0 | 5.27 | F0 | 2.90 | A0p |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " |
| | 12 53 | - 9 27 | 12 54 | + 3 28 | 12 54 | + 65 30 | 12 55 | + 38 23 |
| 1 -8.7 | 36 313 + 338 | 41 13 -203 | 52 896 + 331 | 25 43 -228 | 54 937 + 604 | 35 64 -234 | 21 768 + 381 | 27 83 -266 |
| 1 1.3 | 36 658 + 345 | 43 26 -213 | 53 236 + 340 | 23 19 -224 | 55 573 + 636 | 33 86 -178 | 22 163 + 395 | 25 64 -219 |
| 1 11.2 | 37 003 + 345 | 45 45 -219 | 53 577 + 341 | 21 02 -217 | 56 226 + 653 | 32 66 -120 | 22 564 + 401 | 23 87 -177 |
| 1 21.2 | 37 335 + 332 | 47 63 -218 | 53 907 + 330 | 19 02 -200 | 56 870 + 644 | 32 13 -53 | 22 956 + 392 | 22 62 -125 |
| 1 31.2 | 37 646 + 311 | 49 71 -208 | 54 216 + 309 | 17 24 -178 | 57 483 + 613 | 32 24 + 11 | 23 326 + 370 | 21 89 -73 |
| 2 10.1 | 37 929 + 283 | 51 67 -196 | 54 498 + 282 | 15 72 -152 | 58 049 + 566 | 32 98 + 74 | 23 666 + 340 | 21 69 -20 |
| 2 20.1 | 38 178 + 249 | 53 44 -177 | 54 746 + 248 | 14 50 -122 | 58 546 + 497 | 34 34 +136 | 23 965 + 299 | 22 03 + 34 |
| 3 2.1 | 38 389 + 211 | 54 99 -155 | 54 957 + 211 | 13 59 -91 | 58 961 + 415 | 36 19 +185 | 24 217 + 252 | 22 84 + 81 |
| 3 12.1 | 38 562 + 173 | 56 31 -132 | 55 130 + 173 | 12 98 -61 | 59 288 + 327 | 38 49 +230 | 24 422 + 205 | 24 09 +125 |
| 3 22.0 | 38 697 + 135 | 57 39 -108 | 55 263 + 133 | 12 67 -31 | 59 514 + 226 | 41 11 +262 | 24 573 + 151 | 25 70 +161 |
| 4 1.0 | 38 796 + 99 | 58 23 -84 | 55 361 + 98 | 12 61 -6 | 59 645 + 131 | 43 92 +281 | 24 675 + 102 | 27 56 +186 |
| 4 11.0 | 38 862 + 66 | 58 85 -62 | 55 425 + 64 | 12 77 + 16 | 59 682 + 37 | 46 83 +291 | 24 731 + 56 | 29 61 +205 |
| 4 21.0 | 38 896 + 34 | 59 26 -41 | 55 457 + 32 | 13 14 + 37 | 59 625 -57 | 49 71 +288 | 24 742 -11 | 31 74 +213 |
| 4 30.9 | 38 906 + 10 | 59 49 -23 | 55 464 + 7 | 13 63 + 49 | 59 490 -135 | 52 43 +272 | 24 716 + 26 | 33 85 +211 |
| 5 10.9 | 38 891 -15 | 59 55 -6 | 55 447 -17 | 14 23 + 60 | 59 282 -208 | 54 94 +251 | 24 657 -59 | 35 88 +203 |
| 5 20.9 | 38 856 -35 | 59 47 + 8 | 55 409 -38 | 14 90 + 67 | 59 011 -271 | 57 10 +216 | 24 568 -89 | 37 73 +185 |
| 5 30.8 | 38 805 -51 | 59 27 + 20 | 55 355 -54 | 15 58 + 68 | 58 696 -315 | 58 87 +177 | 24 458 -110 | 39 34 +161 |
| 6 9.8 | 38 737 -68 | 58 95 + 32 | 55 286 -69 | 16 28 + 70 | 58 340 -356 | 60 20 +133 | 24 329 -129 | 40 69 +135 |
| 6 19.8 | 38 657 -80 | 58 54 + 41 | 55 206 -80 | 16 96 + 68 | 57 958 -382 | 61 02 + 82 | 24 186 -143 | 41 69 +100 |
| 6 29.8 | 38 569 -88 | 58 06 + 48 | 55 117 -89 | 17 58 + 62 | 57 566 -392 | 61 34 + 32 | 24 036 -150 | 42 35 + 66 |
| 7 9.7 | 38 472 -97 | 57 50 + 56 | 55 021 -96 | 18 15 + 57 | 57 165 -401 | 61 15 -19 | 23 880 -156 | 42 65 + 30 |
| 7 19.7 | 38 372 -100 | 56 91 + 59 | 54 923 -98 | 18 62 + 47 | 56 774 -391 | 60 42 -73 | 23 724 -156 | 42 55 -10 |
| 7 29.7 | 38 273 -99 | 56 29 + 62 | 54 825 -98 | 19 01 + 39 | 56 399 -375 | 59 21 -121 | 23 573 -151 | 42 09 -46 |
| 8 8.7 | 38 175 -98 | 55 66 + 63 | 54 729 -96 | 19 28 + 27 | 56 048 -351 | 57 51 -170 | 23 429 -144 | 41 24 -85 |
| 8 18.6 | 38 089 -96 | 55 06 + 60 | 54 645 -84 | 19 41 + 13 | 55 735 -313 | 55 34 -217 | 23 302 -127 | 40 01 -123 |
| 8 28.6 | 38 017 -72 | 54 52 + 54 | 54 574 -71 | 19 39 -2 | 55 465 -270 | 52 80 -254 | 23 193 -109 | 38 45 -156 |
| 9 7.6 | 37 965 -52 | 54 06 + 46 | 54 522 -52 | 19 20 -19 | 55 246 -219 | 49 87 -293 | 23 109 -84 | 36 54 -191 |
| 9 17.5 | 37 942 -23 | 53 75 + 31 | 54 498 -24 | 18 81 -39 | 55 094 -152 | 46 63 -324 | 23 059 -50 | 34 32 -222 |
| 9 27.5 | 37 951 + 9 | 53 61 + 14 | 54 505 + 7 | 18 22 -59 | 55 009 -85 | 43 15 -348 | 23 045 -14 | 31 83 -249 |
| 10 7.5 | 37 997 + 46 | 53 76 -15 | 54 546 + 41 | 17 41 -81 | 55 003 -6 | 39 46 -369 | 23 075 + 30 | 29 07 -276 |
| 10 17.5 | 38 083 + 86 | 53 96 -20 | 54 630 + 84 | 16 28 -113 | 55 084 + 81 | 35 67 -379 | 23 155 + 80 | 26 12 -295 |
| 10 27.4 | 38 219 + 136 | 54 53 -57 | 54 758 + 128 | 14 92 -136 | 55 250 + 166 | 31 85 -382 | 23 285 + 130 | 23 02 -310 |
| 11 6.4 | 38 402 + 183 | 55 40 -87 | 54 933 + 175 | 13 32 -160 | 55 508 + 258 | 28 05 -380 | 23 469 + 184 | 19 82 -320 |
| 11 16.4 | 38 629 + 227 | 56 57 -117 | 55 152 + 219 | 11 49 -183 | 55 857 + 349 | 24 42 -363 | 23 706 + 237 | 16 62 -320 |
| 11 26.4 | 38 895 + 266 | 58 01 -144 | 55 410 + 258 | 09 48 -201 | 56 286 + 429 | 21 01 -341 | 23 990 + 284 | 13 48 -314 |
| 12 6.3 | 39 198 + 303 | 59 72 -171 | 55 704 + 294 | 07 31 -217 | 56 795 + 509 | 17 92 -309 | 24 319 + 329 | 10 47 -301 |
| 12 16.3 | 39 525 + 327 | 61 63 -191 | 56 024 + 320 | 05 06 -225 | 57 364 + 569 | 15 28 -264 | 24 683 + 364 | 07 72 -275 |
| 12 26.3 | 39 867 + 342 | 63 70 -207 | 56 360 + 336 | 02 78 -228 | 57 979 + 615 | 13 12 -216 | 25 069 + 386 | 05 27 -245 |
| 12 36.2 | 40 216 + 349 | 65 88 -218 | 56 704 + 344 | 00 54 -224 | 58 624 + 645 | 11 55 -157 | 25 470 + 401 | 03 23 -204 |
| | 40 216 + 343 | 65 88 -219 | 56 704 + 339 | 00 54 -210 | 58 624 + 647 | 11 55 -94 | 25 470 + 398 | 03 23 -157 |
| Mean Place | 38.966 | 56.94 | 55.385 | 14.23 | 56.453 | 41.64 | 23.860 | 28.05 |
| sec δ, tan δ | +1.014 | -0.167 | +1.002 | +0.061 | +2.412 | +2.195 | +1.276 | +0.792 |
| da(ψ), dδ(ψ) | +0.062 | -0.39 | +0.061 | -0.39 | +0.047 | -0.39 | +0.056 | -0.39 |
| da(ε), dδ(ε) | -0.011 | -0.23 | +0.004 | -0.24 | +0.142 | -0.24 | +0.051 | -0.24 |
| Dble.Trans. | April 5 | | April 5 | | April 5 | | April 5 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 1336 | | 487 | | 488 | | 1337 | | |
|--------------|-------------|--------------|-------------|--------------|-------------|--------------|-----------------|--------------|-------------|
| | 44 Virginis | | δ Muscae | | ε Virginis | | 14 Canum Venat. | | |
| Mag Spect. | 5.88 | A0 | 3.63 | K2 | 2.95 | K0 | 5.11 | B9 | |
| U.T. | R.A. | | R.A. | | R.A. | | R.A. | | |
| | Dec. | | Dec. | | Dec. | | Dec. | | |
| | h m | ° / | h m | ° / | h m | ° / | h m | ° / | |
| | 12 58 | - 3 44 | 13 01 | - 71 28 | 13 01 | + 11 01 | 13 05 | + 35 51 | |
| 1 | -8.7 | 55 126 + 332 | 07 95 - 213 | 14 345 + 817 | 03 87 - 14 | 27 834 + 331 | 61 76 - 241 | 04 459 + 367 | 75 65 - 263 |
| 1 | 1.3 | 55 467 + 341 | 10 14 - 219 | 15 180 + 835 | 04 60 - 73 | 28 176 + 342 | 59 47 - 229 | 04 843 + 384 | 73 35 - 230 |
| 1 | 11.2 | 55 810 + 343 | 12 32 - 218 | 16 015 + 835 | 05 91 - 131 | 28 521 + 345 | 57 33 - 214 | 05 234 + 391 | 71 46 - 189 |
| 1 | 21.2 | 56 141 + 331 | 14 42 - 210 | 16 821 + 806 | 07 78 - 187 | 28 856 + 335 | 55 45 - 188 | 05 618 + 384 | 70 06 - 140 |
| 1 | 31.2 | 56 452 + 311 | 16 37 - 195 | 17 573 + 752 | 10 12 - 234 | 29 172 + 316 | 53 86 - 159 | 05 982 + 364 | 69 16 - 90 |
| 2 | 10.2 | 56 737 + 285 | 18 14 - 177 | 18 262 + 689 | 12 88 - 276 | 29 463 + 291 | 52 60 - 126 | 06 320 + 338 | 68 79 - 37 |
| 2 | 20.1 | 56 988 + 251 | 19 67 - 153 | 18 866 + 604 | 16 00 - 312 | 29 719 + 256 | 51 71 - 89 | 06 619 + 299 | 68.95 + 16 |
| 3 | 2.1 | 57 203 + 215 | 20 94 - 127 | 19 379 + 513 | 19 35 - 335 | 29 938 + 219 | 51 17 - 54 | 06 875 + 256 | 69 59 + 64 |
| 3 | 12.1 | 57 381 + 178 | 21 95 - 101 | 19 798 + 419 | 22 90 - 355 | 30 120 + 182 | 50 97 - 20 | 07 086 + 211 | 70 67 + 108 |
| 3 | 22.0 | 57 519 + 138 | 22 68 - 73 | 20 111 + 313 | 26 55 - 365 | 30 260 + 140 | 51 11 + 14 | 07 246 + 160 | 72 14 + 147 |
| 4 | 1.0 | 57 623 + 104 | 23 18 - 50 | 20 326 + 215 | 30 19 - 364 | 30 364 + 104 | 51 50 + 39 | 07 359 + 113 | 73 86 + 172 |
| 4 | 11.0 | 57 693 + 70 | 23 45 - 27 | 20 442 + 116 | 33 80 - 361 | 30 434 + 70 | 52 13 + 63 | 07 428 + 69 | 75 81 + 195 |
| 4 | 21.0 | 57 732 + 39 | 23 50 - 5 | 20 456 + 14 | 37 28 - 348 | 30 470 + 36 | 52 94 + 81 | 07 453 + 25 | 77 86 + 205 |
| 4 | 30.9 | 57 746 + 14 | 23 41 + 9 | 20 381 - 75 | 40 54 - 326 | 30 479 + 9 | 53 85 + 91 | 07 443 - 10 | 79 91 + 205 |
| 5 | 10.9 | 57 735 - 11 | 23 17 + 24 | 20 215 - 166 | 43 57 - 303 | 30 463 - 16 | 54 83 + 98 | 07 399 - 44 | 81 91 + 200 |
| 5 | 20.9 | 57 704 - 31 | 22 81 + 36 | 19 964 - 251 | 46 26 - 269 | 30 425 - 38 | 55 84 + 101 | 07 325 - 74 | 83 76 + 185 |
| 5 | 30.9 | 57 656 - 48 | 22 39 + 42 | 19 643 - 321 | 48 58 - 232 | 30 371 - 54 | 56 80 + 96 | 07 231 - 94 | 85 40 + 164 |
| 6 | 9.8 | 57 592 - 64 | 21 89 + 50 | 19 250 - 393 | 50 49 - 191 | 30 300 - 71 | 57 72 + 92 | 07 115 - 116 | 86 80 + 140 |
| 6 | 19.8 | 57 515 - 77 | 21 36 + 53 | 18 801 - 449 | 51 91 - 142 | 30 217 - 83 | 58 53 + 81 | 06 985 - 130 | 87 89 + 109 |
| 6 | 29.8 | 57 429 - 86 | 20 81 + 55 | 18 312 - 489 | 52 86 - 95 | 30 125 - 92 | 59 23 + 70 | 06 845 - 140 | 88 65 + 76 |
| 7 | 9.7 | 57 334 - 96 | 20 24 + 57 | 17 786 - 526 | 53 29 - 43 | 30 025 - 100 | 59 80 + 57 | 06 697 - 148 | 89 06 + 41 |
| 7 | 19.7 | 57 236 - 98 | 19 70 + 54 | 17 248 - 538 | 53 17 + 12 | 29 922 - 103 | 60 20 + 40 | 06 547 - 150 | 89 10 + 4 |
| 7 | 29.7 | 57 137 - 99 | 19 18 + 52 | 16 714 - 534 | 52 55 + 62 | 29 819 - 103 | 60 44 + 24 | 06 400 - 147 | 88 78 - 32 |
| 8 | 8.7 | 57 040 - 97 | 18 70 + 48 | 16 196 - 518 | 51 42 + 113 | 29 718 - 101 | 60 50 + 6 | 06 257 - 143 | 88 08 - 70 |
| 8 | 18.6 | 56 953 - 87 | 18 31 + 39 | 15 725 - 471 | 49 82 + 160 | 29 627 - 91 | 60 35 - 15 | 06 128 - 129 | 87 02 - 106 |
| 8 | 28.6 | 56 880 - 73 | 18 02 + 29 | 15 312 - 413 | 47 83 + 199 | 29 550 - 77 | 60 01 - 34 | 06 016 - 112 | 85 62 - 140 |
| 9 | 7.6 | 56 825 - 55 | 17 84 + 18 | 14 978 - 334 | 45 47 + 236 | 29 491 - 59 | 59 44 - 57 | 05 927 - 89 | 83 87 - 175 |
| 9 | 17.6 | 56 798 - 27 | 17 84 + 0 | 14 748 - 230 | 42 86 + 261 | 29 460 - 31 | 58 64 - 80 | 05 869 - 58 | 81 80 - 207 |
| 9 | 27.5 | 56 802 + 4 | 18 02 - 18 | 14 627 - 121 | 40 11 + 275 | 29 458 - 2 | 57 61 - 103 | 05 845 - 24 | 79 45 - 235 |
| 10 | 7.5 | 56 849 + 47 | 18 30 - 28 | 14 634 + 7 | 37 29 + 282 | 29 492 + 34 | 56 33 - 128 | 05 864 + 19 | 76 83 - 262 |
| 10 | 17.5 | 56 921 + 72 | 19 04 - 74 | 14 778 + 144 | 34 55 + 274 | 29 569 + 77 | 54 78 - 155 | 05 931 + 67 | 73 99 - 284 |
| 10 | 27.4 | 57 049 + 128 | 19 97 - 93 | 15 054 + 276 | 32 00 + 255 | 29 689 + 120 | 53 00 - 178 | 06 047 + 116 | 70 99 - 300 |
| 11 | 6.4 | 57 224 + 175 | 21 16 - 119 | 15 465 + 411 | 29 72 + 228 | 29 856 + 167 | 50 99 - 201 | 06 217 + 170 | 67 86 - 313 |
| 11 | 16.4 | 57 443 + 219 | 22 62 - 146 | 16 001 + 536 | 27 86 + 186 | 30 069 + 213 | 48 81 - 218 | 06 439 + 222 | 64 70 - 316 |
| 11 | 26.4 | 57 701 + 258 | 24 31 - 169 | 16 641 + 640 | 26 47 + 139 | 30 322 + 253 | 46 49 - 232 | 06 709 + 270 | 61 57 - 313 |
| 12 | 6.3 | 57 996 + 295 | 26 22 - 191 | 17 374 + 733 | 25 62 + 85 | 30 613 + 291 | 44 08 - 241 | 07 024 + 315 | 58 54 - 303 |
| 12 | 16.3 | 58 317 + 321 | 28 28 - 206 | 18 169 + 795 | 25 39 + 23 | 30 932 + 319 | 41 65 - 243 | 07 373 + 349 | 55 74 - 280 |
| 12 | 26.3 | 58 655 + 338 | 30 44 - 216 | 19 001 + 832 | 25 73 - 34 | 31 268 + 336 | 39 28 - 237 | 07 747 + 374 | 53 21 - 253 |
| 12 | 36.3 | 59 000 + 345 | 32 64 - 220 | 19 850 + 849 | 26 69 - 96 | 31 615 + 347 | 37 03 - 225 | 08 137 + 390 | 51 05 - 216 |
| | | + 340 | - 215 | + 831 | - 154 | + 343 | - 204 | + 389 | - 170 |
| Mean Place | 57.741 | 21.50 | 19.786 | 35.17 | 30.279 | 53.53 | 06.640 | 75.44 | |
| sec δ, tan δ | +1.002 | -0.065 | +3.148 | -2.985 | +1.019 | +0.195 | +1.234 | +0.723 | |
| dα(y), dδ(y) | +0.062 | -0.38 | +0.082 | -0.38 | +0.060 | -0.38 | +0.056 | -0.38 | |
| dα(e), dδ(e) | -0.004 | -0.25 | -0.192 | -0.26 | +0.013 | -0.27 | +0.046 | -0.28 | |
| Dble.Trans. | April 6 | | April 7 | | April 7 | | April 8 | | |

APPARENT PLACES OF STARS, 1986

201

AT UPPER TRANSIT AT GREENWICH

| No. | 1338 | | 1339 | | 489 | | 1340 | |
|---------------------|---|-------------|---------------------------|------------|---------------------------|------------|---------------------------|------------|
| | Groombridge 1956 (Canum Venaticorum) | | 39 Comae Berenices | | ξ ¹ Centauri | | 177 G. Centauri | |
| Mag.Spect. | 5.72 | K0 | 6.04 | F5 | 4.40 | B3 | 5.96 | B9 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " |
| | 13 05 | +45 19 | 13 05 | +21 13 | 13 06 | -49 49 | 13 06 | -53 22 |
| 1 ^d -8.7 | ^s 13 878 + 403 | 83 76 -264 | ^s 39 399 + 338 | 37 25 -255 | ^s 03 365 + 459 | 35 58 -76 | ^s 45 962 + 487 | 48 43 -64 |
| 1 1.3 | 14 300 + 422 | 81 55 -221 | 39 751 + 352 | 34 92 -233 | 03 834 + 469 | 36 83 -125 | 46 460 + 498 | 49 57 -114 |
| 1 11.2 | 14 732 + 432 | 79 81 -174 | 40 107 + 356 | 32 84 -208 | 04 305 + 471 | 38 52 -169 | 46 960 + 500 | 51 19 -162 |
| 1 21.2 | 15 158 + 426 | 78 63 -118 | 40 455 + 348 | 31 12 -172 | 04 760 + 455 | 40 62 -210 | 47 444 + 484 | 53 25 -206 |
| 1 31.2 | 15 563 + 405 | 78 02 -61 | 40 785 + 330 | 29 79 -133 | 05 187 + 427 | 43 04 -242 | 47 897 + 453 | 55 65 -240 |
| 2 10.2 | 15 939 + 376 | 77 98 -4 | 41 090 + 305 | 28 87 -92 | 05 579 + 392 | 45 74 -270 | 48 315 + 418 | 58 36 -271 |
| 2 20.1 | 16 273 + 334 | 78 53 + 55 | 41 360 + 270 | 28 41 -46 | 05 926 + 347 | 48 63 -289 | 48 683 + 368 | 61 30 -294 |
| 3 2.1 | 16 557 + 284 | 79 57 +104 | 41 592 + 232 | 28 36 -5 | 06 223 + 297 | 51 62 -299 | 48 999 + 316 | 64 36 -306 |
| 3 12.1 | 16 790 + 233 | 81 08 +151 | 41 784 + 192 | 28 70 + 34 | 06 471 + 248 | 54 67 -305 | 49 263 + 264 | 67 52 -316 |
| 3 22.0 | 16 964 + 174 | 82 97 +189 | 41 933 + 149 | 29 40 + 70 | 06 665 + 194 | 57 71 -304 | 49 469 + 206 | 70 67 -315 |
| 4 1.0 | 17 084 + 120 | 85 12 +215 | 42 043 + 110 | 30 37 + 97 | 06 809 + 144 | 60 65 -294 | 49 622 + 153 | 73 76 -309 |
| 4 11.0 | 17 151 + 67 | 87 46 +234 | 42 115 + 72 | 31 57 +120 | 06 905 + 96 | 63 50 -285 | 49 722 + 100 | 76 75 -299 |
| 4 21.0 | 17 166 -15 | 89 87 +241 | 42 151 + 36 | 32 94 +137 | 06 953 + 48 | 66 15 -265 | 49 770 + 48 | 79 56 -281 |
| 4 30.9 | 17 138 -26 | 92 24 +237 | 42 158 -21 | 34 36 +142 | 06 960 -34 | 68 58 -243 | 49 774 + 4 | 82 16 -260 |
| 5 10.9 | 17 069 -69 | 94 51 +227 | 42 137 -21 | 35 82 +146 | 06 926 -34 | 70 76 -218 | 49 732 -42 | 84 51 -235 |
| 5 20.9 | 16 966 -103 | 96 57 +206 | 42 092 -45 | 37 22 +140 | 06 854 -72 | 72 63 -187 | 49 648 -84 | 86 54 -203 |
| 5 30.9 | 16 837 -129 | 98 36 +179 | 42 028 -64 | 38 52 +130 | 06 750 -104 | 74 19 -156 | 49 529 -119 | 88 25 -171 |
| 6 9.8 | 16 683 -154 | 99 84 +148 | 41 947 -81 | 39 68 +116 | 06 614 -136 | 75 39 -120 | 49 374 -155 | 89 59 -134 |
| 6 19.8 | 16 512 -171 | 100 94 +110 | 41 853 -94 | 40 66 + 98 | 06 451 -163 | 76 20 -81 | 49 190 -184 | 90 52 -93 |
| 6 29.8 | 16 332 -180 | 101 64 + 70 | 41 749 -104 | 41 42 + 76 | 06 269 -182 | 76 63 -43 | 48 985 -205 | 91 05 -53 |
| 7 9.7 | 16 142 -190 | 101 94 + 30 | 41 637 -112 | 41 97 + 55 | 06 067 -202 | 76 66 -3 | 48 758 -227 | 91 15 -10 |
| 7 19.7 | 15 952 -190 | 101 79 -15 | 41 521 -116 | 42 25 + 28 | 05 857 -210 | 76 27 + 39 | 48 522 -236 | 90 82 + 33 |
| 7 29.7 | 15 767 -185 | 101 23 -56 | 41 406 -115 | 42 28 + 3 | 05 644 -213 | 75 51 + 76 | 48 283 -239 | 90 09 + 73 |
| 8 8.7 | 15 588 -179 | 100 24 -99 | 41 294 -112 | 42 05 -23 | 05 435 -209 | 74 37 +114 | 48 049 -234 | 88 95 +114 |
| 8 18.6 | 15 427 -161 | 98 83 -141 | 41 192 -102 | 41 53 -52 | 05 244 -191 | 72 91 +146 | 47 834 -215 | 87 46 +149 |
| 8 28.6 | 15 286 -141 | 97 06 -177 | 41 103 -89 | 40 75 -78 | 05 076 -168 | 71 19 +172 | 47 645 -189 | 85 68 +178 |
| 9 7.6 | 15 172 -114 | 94 91 -215 | 41 034 -69 | 39 69 -106 | 04 941 -135 | 69 23 +196 | 47 493 -152 | 83 65 +203 |
| 9 17.6 | 15 094 -78 | 92 42 -249 | 40 993 -41 | 38 35 -134 | 04 854 -87 | 67 15 +208 | 47 393 -100 | 81 46 +219 |
| 9 27.5 | 15 056 -38 | 89 66 -276 | 40 981 -12 | 36 75 -160 | 04 819 -35 | 65 02 +213 | 47 349 -44 | 79 21 +225 |
| 10 7.5 | 15 066 + 10 | 86 62 -304 | 41 008 + 27 | 34 88 -187 | 04 845 + 26 | 62 91 +211 | 47 371 + 22 | 76 96 +225 |
| 10 17.5 | 15 130 + 64 | 83 39 -323 | 41 078 + 70 | 32 77 -211 | 04 940 + 95 | 60 96 +195 | 47 468 + 97 | 74 85 +211 |
| 10 27.4 | 15 248 + 118 | 80 04 -335 | 41 193 + 115 | 30 45 -232 | 05 103 + 163 | 59 23 +173 | 47 637 + 169 | 72 96 +189 |
| 11 6.4 | 15 426 + 178 | 76 59 -345 | 41 356 + 163 | 27 93 -252 | 05 336 + 233 | 57 81 +142 | 47 883 + 246 | 71 37 +159 |
| 11 16.4 | 15 663 + 237 | 73 18 -341 | 41 567 + 211 | 25 30 -263 | 05 637 + 301 | 56 81 +100 | 48 201 + 318 | 70 19 +118 |
| 11 26.4 | 15 953 + 290 | 69 86 -332 | 41 820 + 253 | 22 60 -270 | 05 994 + 357 | 56 23 + 58 | 48 579 + 378 | 69 45 + 74 |
| 12 6.3 | 16 295 + 342 | 66 70 -316 | 42 113 + 293 | 19 88 -272 | 06 404 + 410 | 56 16 + 7 | 49 014 + 435 | 69 22 + 23 |
| 12 16.3 | 16 676 + 381 | 63 86 -284 | 42 437 + 324 | 17 25 -263 | 06 849 + 445 | 56 60 -44 | 49 486 + 472 | 69 53 -31 |
| 12 26.3 | 17 086 + 410 | 61 36 -250 | 42 781 + 344 | 14 76 -249 | 07 316 + 467 | 57 53 -93 | 49 982 + 496 | 70 34 -81 |
| 12 36.3 | 17 515 + 429 | 59 30 -206 | 43 138 + 357 | 12 51 -225 | 07 794 + 478 | 58 96 -143 | 50 489 + 507 | 71 68 -134 |
| | 17 515 + 429 | 59 30 -152 | 43 138 + 354 | 12 51 -194 | 07 794 + 468 | 58 96 -186 | 50 489 + 498 | 71 68 -179 |
| Mean Place | 15.927 | 86.07 | 41.758 | 32.56 | 07.028 | 62.83 | 49.797 | 76.41 |
| sec δ, tan δ | +1.423 | +1.012 | +1.073 | +0.388 | +1.550 | -1.185 | +1.677 | -1.346 |
| da(ψ), dδ(ψ) | +0.054 | -0.38 | +0.058 | -0.38 | +0.070 | -0.38 | +0.071 | -0.38 |
| da(ε), dδ(ε) | +0.065 | -0.28 | +0.025 | -0.28 | -0.076 | -0.28 | -0.086 | -0.29 |
| Dbles.Trans. | April 8 | | April 8 | | April 8 | | April 8 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 490 | | | 491 | | 1341 | | 492 | | | | | | | | | | |
|--------------|-------------|--------|-------|-----------------|---------|---------------|---------|-------------------|---------|--------|-------|-------|------|--------|-------|-------|------|--|
| | ♁ Virginis* | | | 17 Canum Venat. | | 342 G. Hydrae | | β Comae Berenices | | | | | | | | | | |
| Mag. Spect. | 4.46 | A0 | | 6.05 | F0 | 6.48 | A3 | 4.32 | G0 | | | | | | | | | |
| U.T. | R.A. | Dec. | | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | | | | | | | | | |
| | h m | ° | ' | h m | ° | h m | ° | h m | ° | | | | | | | | | |
| | 13 09 | - 5 27 | | 13 09 | + 38 33 | 13 10 | - 26 28 | 13 11 | + 27 56 | | | | | | | | | |
| 1 | -8.7 | 12.297 | + 330 | 48.05 | -208 | 23.919 | + 372 | 72.97 | -267 | 51.998 | + 359 | 27.97 | -148 | 12.373 | + 345 | 48.82 | -260 | |
| 1 | 1.3 | 12.637 | + 340 | 50.20 | -215 | 24.310 | + 391 | 70.66 | -231 | 52.366 | + 368 | 29.73 | -176 | 12.733 | + 360 | 46.49 | -233 | |
| 1 | 11.2 | 12.981 | + 344 | 52.36 | -216 | 24.710 | + 400 | 68.77 | -189 | 52.737 | + 371 | 31.73 | -200 | 13.099 | + 366 | 44.48 | -201 | |
| 1 | 21.2 | 13.315 | + 334 | 54.47 | -211 | 25.105 | + 395 | 67.39 | -138 | 53.098 | + 361 | 33.91 | -218 | 13.460 | + 361 | 42.90 | -158 | |
| 1 | 31.2 | 13.630 | + 315 | 56.45 | -198 | 25.480 | + 375 | 66.54 | - 85 | 53.437 | + 339 | 36.19 | -228 | 13.802 | + 342 | 41.76 | -114 | |
| 2 | 10.2 | 13.922 | + 292 | 58.27 | -182 | 25.829 | + 349 | 66.23 | - 31 | 53.750 | + 313 | 38.53 | -234 | 14.120 | + 318 | 41.10 | - 66 | |
| 2 | 20.1 | 14.180 | + 258 | 59.86 | -159 | 26.140 | + 311 | 66.47 | + 24 | 54.028 | + 278 | 40.85 | -232 | 14.402 | + 282 | 40.93 | - 17 | |
| 3 | 2.1 | 14.403 | + 223 | 61.20 | -134 | 26.406 | + 266 | 67.21 | + 74 | 54.268 | + 240 | 43.08 | -223 | 14.645 | + 243 | 41.21 | + 28 | |
| 3 | 12.1 | 14.590 | + 187 | 62.30 | -110 | 26.626 | + 220 | 68.39 | +118 | 54.471 | + 203 | 45.22 | -214 | 14.847 | + 202 | 41.92 | + 71 | |
| 3 | 22.1 | 14.739 | + 149 | 63.13 | - 83 | 26.794 | + 168 | 69.97 | +158 | 54.633 | + 162 | 47.20 | -198 | 15.003 | + 156 | 43.00 | +108 | |
| 4 | 1.0 | 14.853 | + 114 | 63.72 | - 59 | 26.914 | + 120 | 71.82 | +185 | 54.758 | + 125 | 49.00 | -180 | 15.117 | + 114 | 44.36 | +136 | |
| 4 | 11.0 | 14.934 | + 81 | 64.08 | - 36 | 26.988 | + 74 | 73.89 | +207 | 54.848 | + 90 | 50.63 | -163 | 15.191 | + 74 | 45.96 | +160 | |
| 4 | 21.0 | 14.984 | + 50 | 64.24 | - 16 | 27.015 | + 27 | 76.06 | +217 | 54.903 | + 55 | 52.04 | -141 | 15.226 | + 35 | 47.69 | +173 | |
| 4 | 30.9 | 15.007 | + 23 | 64.23 | + 1 | 27.005 | - 10 | 78.22 | +216 | 54.930 | + 27 | 53.25 | -121 | 15.229 | + 3 | 49.47 | +178 | |
| 5 | 10.9 | 15.006 | - 1 | 64.07 | + 16 | 26.959 | - 46 | 80.33 | +211 | 54.929 | - 1 | 54.25 | -100 | 15.201 | - 28 | 51.24 | +177 | |
| 5 | 20.9 | 14.983 | - 23 | 63.79 | + 28 | 26.882 | - 77 | 82.28 | +195 | 54.901 | - 28 | 55.01 | - 76 | 15.147 | - 54 | 52.93 | +169 | |
| 5 | 30.9 | 14.942 | - 41 | 63.43 | + 36 | 26.782 | - 100 | 84.00 | +172 | 54.853 | - 48 | 55.57 | - 56 | 15.073 | - 74 | 54.45 | +152 | |
| 6 | 9.8 | 14.883 | - 59 | 62.99 | + 44 | 26.659 | - 123 | 85.47 | +147 | 54.784 | - 69 | 55.90 | - 33 | 14.979 | - 94 | 55.80 | +135 | |
| 6 | 19.8 | 14.810 | - 73 | 62.50 | + 49 | 26.520 | - 139 | 86.60 | +113 | 54.696 | - 88 | 56.00 | - 10 | 14.871 | - 108 | 56.90 | +110 | |
| 6 | 29.8 | 14.726 | - 84 | 61.98 | + 52 | 26.371 | - 149 | 87.39 | + 79 | 54.595 | - 101 | 55.89 | + 11 | 14.753 | - 118 | 57.72 | + 82 | |
| 7 | 9.7 | 14.632 | - 94 | 61.43 | + 55 | 26.212 | - 159 | 87.81 | + 42 | 54.480 | - 115 | 55.55 | + 34 | 14.625 | - 128 | 58.28 | + 56 | |
| 7 | 19.7 | 14.532 | - 100 | 60.88 | + 55 | 26.051 | - 161 | 87.83 | + 2 | 54.358 | - 122 | 55.01 | + 54 | 14.625 | - 131 | 58.28 | + 22 | |
| 7 | 29.7 | 14.430 | - 102 | 60.35 | + 53 | 25.893 | - 158 | 87.48 | - 35 | 54.233 | - 125 | 54.29 | + 72 | 14.494 | - 130 | 58.50 | - 8 | |
| 8 | 8.7 | 14.328 | - 102 | 59.84 | + 51 | 25.738 | - 155 | 86.73 | - 75 | 54.108 | - 125 | 53.39 | + 90 | 14.364 | - 128 | 58.42 | - 39 | |
| 8 | 18.6 | 14.235 | - 93 | 59.41 | + 43 | 25.598 | - 140 | 85.60 | -113 | 53.992 | - 116 | 52.37 | +102 | 14.119 | - 117 | 57.30 | - 73 | |
| 8 | 28.6 | 14.153 | - 82 | 59.05 | + 36 | 25.475 | - 123 | 84.12 | -148 | 53.891 | - 101 | 51.26 | +111 | 14.016 | - 103 | 56.27 | -103 | |
| 9 | 7.6 | 14.090 | - 63 | 58.81 | + 24 | 25.374 | - 101 | 82.27 | -185 | 53.810 | - 81 | 50.09 | +117 | 13.934 | - 82 | 54.92 | -135 | |
| 9 | 17.6 | 14.054 | - 36 | 58.72 | + 9 | 25.306 | - 68 | 80.10 | -217 | 53.761 | - 49 | 48.96 | +113 | 13.879 | - 55 | 53.27 | -165 | |
| 9 | 27.5 | 14.048 | - 6 | 58.80 | - 8 | 25.274 | - 32 | 77.64 | -246 | 53.747 | - 14 | 47.89 | +107 | 13.879 | - 22 | 53.27 | -192 | |
| 10 | 7.5 | 14.084 | + 36 | 59.09 | - 29 | 25.284 | + 10 | 74.90 | -274 | 53.776 | + 29 | 46.95 | + 94 | 13.873 | + 16 | 49.14 | -221 | |
| 10 | 17.5 | 14.147 | + 63 | 59.59 | - 50 | 25.344 | + 60 | 71.95 | -295 | 53.853 | + 77 | 46.22 | + 73 | 13.935 | + 62 | 46.70 | -244 | |
| 10 | 27.4 | 14.267 | + 120 | 60.41 | - 82 | 25.455 | + 111 | 68.84 | -311 | 53.980 | + 127 | 45.73 | + 49 | 14.043 | + 108 | 44.07 | -263 | |
| 11 | 6.4 | 14.433 | + 166 | 61.49 | -108 | 25.621 | + 166 | 65.60 | -324 | 54.160 | + 180 | 45.55 | + 18 | 14.201 | + 158 | 41.27 | -280 | |
| 11 | 16.4 | 14.644 | + 211 | 62.84 | -135 | 25.841 | + 220 | 62.35 | -325 | 54.392 | + 232 | 45.72 | - 17 | 14.409 | + 208 | 38.39 | -288 | |
| 11 | 26.4 | 14.897 | + 253 | 64.42 | -158 | 26.110 | + 269 | 59.14 | -321 | 54.668 | + 276 | 46.25 | - 53 | 14.662 | + 253 | 35.48 | -291 | |
| 12 | 6.3 | 15.187 | + 290 | 66.25 | -183 | 26.427 | + 317 | 56.05 | -309 | 54.985 | + 317 | 47.16 | - 91 | 14.958 | + 296 | 32.61 | -287 | |
| 12 | 16.3 | 15.504 | + 317 | 68.24 | -199 | 26.781 | + 354 | 53.20 | -285 | 55.331 | + 346 | 48.43 | -127 | 15.286 | + 328 | 29.89 | -272 | |
| 12 | 26.3 | 15.840 | + 336 | 70.34 | -210 | 27.161 | + 380 | 50.64 | -256 | 55.696 | + 365 | 50.01 | -158 | 15.637 | + 351 | 27.37 | -252 | |
| 12 | 36.3 | 16.186 | + 342 | 72.52 | -214 | 27.558 | + 398 | 48.47 | -217 | 56.071 | + 375 | 51.88 | -187 | 16.003 | + 366 | 25.15 | -222 | |
| | | | | | | | | | | | | | | | | | | |
| Mean Place | 14.996 | 61.72 | | 26.083 | 73.66 | 55.045 | 48.53 | 14.643 | 46.99 | | | | | | | | | |
| sec δ, tan δ | +1.005 | -0.096 | | +1.279 | +0.797 | +1.117 | -0.498 | +1.132 | +0.531 | | | | | | | | | |
| dα(ψ), dδ(ψ) | +0.062 | -0.38 | | +0.055 | -0.38 | +0.065 | -0.38 | +0.057 | -0.38 | | | | | | | | | |
| dα(ε), dδ(ε) | -0.006 | -0.30 | | +0.051 | -0.30 | -0.032 | -0.30 | +0.034 | -0.31 | | | | | | | | | |
| Dble. Trans. | April 9 | | | April 9 | | April 9 | | April 9 | | | | | | | | | | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 493 | | 1342 | | 1343 | | 1344 | |
|--------------|-------------|-------------|-----------------|------------|-----------------|------------|-------------|------------|
| | η Muscae | | 195 G. Centauri | | 196 G. Centauri | | σ Virginis | |
| Mag. Spect. | 4.95 | B8 | 5.36 | K0 | 5.87 | A3p | 5.01 | M0 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " |
| | 13 14 | -67 48 | 13 16 | -31 25 | 13 16 | -43 54 | 13 16 | + 5 32 |
| 1 -8.7 | 14.185 +700 | 54.43 - 8 | 04.793 +370 | 44.59 -128 | 23.102 +419 | 05.04 - 85 | 52.756 +324 | 36.27 -232 |
| 1 1.3 | 14.906 +721 | 55.07 - 64 | 05.174 +381 | 46.19 -160 | 23.534 +432 | 06.33 -129 | 53.093 +337 | 34.00 -227 |
| 1 11.2 | 15.633 +727 | 56.28 -121 | 05.559 +385 | 48.09 -190 | 23.970 +436 | 08.01 -168 | 53.435 +342 | 31.82 -218 |
| 1 21.2 | 16.340 +707 | 58.03 -175 | 05.933 +374 | 50.23 -214 | 24.393 +423 | 10.07 -206 | 53.771 +336 | 29.82 -200 |
| 1 31.2 | 17.007 +667 | 60.24 -221 | 06.287 +354 | 52.52 -229 | 24.793 +400 | 12.39 -232 | 54.089 +318 | 28.07 -175 |
| 2 10.2 | 17.626 +619 | 62.87 -263 | 06.615 +328 | 54.91 -239 | 25.164 +371 | 14.94 -255 | 54.385 +296 | 26.59 -148 |
| 2 20.1 | 18.175 +549 | 65.85 -298 | 06.907 +292 | 57.34 -243 | 25.494 +330 | 17.64 -270 | 54.649 +264 | 25.43 -116 |
| 3 2.1 | 18.649 +474 | 69.05 -320 | 07.160 +253 | 59.73 -239 | 25.781 +287 | 20.41 -277 | 54.878 +229 | 24.60 - 83 |
| 3 12.1 | 19.047 +398 | 72.46 -341 | 07.376 +216 | 62.06 -233 | 26.024 +243 | 23.21 -280 | 55.072 +194 | 24.09 - 51 |
| 3 22.1 | 19.357 +310 | 75.96 -350 | 07.549 +173 | 64.28 -222 | 26.219 +195 | 25.98 -277 | 55.228 +156 | 23.90 - 19 |
| 4 1.0 | 19.585 +228 | 79.48 -352 | 07.685 +136 | 66.33 -205 | 26.370 +151 | 28.64 -266 | 55.348 +120 | 23.97 + 7 |
| 4 11.0 | 19.731 +146 | 82.97 -349 | 07.784 + 99 | 68.24 -191 | 26.478 +108 | 31.19 -255 | 55.435 + 87 | 24.28 +31 |
| 4 21.0 | 19.791 - 60 | 86.34 -337 | 07.846 + 62 | 69.93 -169 | 26.543 + 65 | 33.55 -236 | 55.489 + 54 | 24.79 +51 |
| 4 30.9 | 19.775 - 92 | 89.52 -318 | 07.878 + 32 | 71.42 -149 | 26.571 + 28 | 35.71 -216 | 55.516 + 27 | 25.44 +65 |
| 5 10.9 | 19.683 - 92 | 92.49 -297 | 07.880 + 2 | 72.70 -128 | 26.562 - 9 | 37.64 -193 | 55.517 + 1 | 26.18 +74 |
| 5 20.9 | 19.518 -165 | 95.14 -265 | 07.854 - 26 | 73.73 -103 | 26.519 - 43 | 39.28 -164 | 55.496 - 21 | 26.99 +81 |
| 5 30.9 | 19.290 -228 | 97.44 -230 | 07.805 - 49 | 74.53 - 80 | 26.446 - 73 | 40.64 -136 | 55.456 - 40 | 27.80 +81 |
| 6 9.8 | 19.000 -290 | 99.36 -192 | 07.733 - 72 | 75.08 - 55 | 26.344 -102 | 41.69 -105 | 55.398 - 58 | 28.61 +81 |
| 6 19.8 | 18.658 -342 | 100.81 -145 | 07.640 - 93 | 75.36 - 28 | 26.217 -127 | 42.39 - 70 | 55.324 - 74 | 29.37 +76 |
| 6 29.8 | 18.277 -381 | 101.82 -101 | 07.531 -109 | 75.40 - 4 | 26.070 -147 | 42.75 - 36 | 55.240 - 84 | 30.05 +68 |
| 7 9.8 | 17.860 -417 | 102.32 - 50 | 07.407 -124 | 75.17 + 23 | 25.904 -166 | 42.76 - 1 | 55.145 - 95 | 30.66 +61 |
| 7 19.7 | 17.426 -434 | 102.30 + 2 | 07.275 -132 | 74.69 +48 | 25.728 -176 | 42.40 +36 | 55.043 -102 | 31.15 +49 |
| 7 29.7 | 16.988 -438 | 101.80 +50 | 07.138 -137 | 73.99 +70 | 25.547 -181 | 41.71 +69 | 54.939 -104 | 31.52 +37 |
| 8 8.7 | 16.558 -430 | 100.80 +100 | 07.000 -138 | 73.07 +92 | 25.366 -181 | 40.70 +101 | 54.834 -105 | 31.76 +24 |
| 8 18.6 | 16.159 -399 | 99.34 +146 | 06.872 -128 | 71.97 +110 | 25.198 -168 | 39.39 +131 | 54.737 - 97 | 31.83 + 7 |
| 8 28.6 | 15.804 -355 | 97.49 +185 | 06.758 -114 | 70.74 +123 | 25.048 -150 | 37.86 +153 | 54.651 - 86 | 31.74 - 9 |
| 9 7.6 | 15.509 -295 | 95.27 +222 | 06.666 - 92 | 69.41 +133 | 24.925 -123 | 36.13 +173 | 54.582 - 69 | 31.46 -28 |
| 9 17.6 | 15.297 -212 | 92.80 +247 | 06.606 - 60 | 68.07 +134 | 24.843 - 82 | 34.30 +183 | 54.538 - 44 | 30.97 -49 |
| 9 27.5 | 15.174 -123 | 90.17 +263 | 06.583 - 23 | 66.77 +130 | 24.805 - 38 | 32.43 +187 | 54.523 - 15 | 30.27 -70 |
| 10 7.5 | 15.157 - 17 | 87.46 +271 | 06.606 + 23 | 65.56 +121 | 24.821 + 16 | 30.60 +183 | 54.543 + 20 | 29.34 -93 |
| 10 17.5 | 15.255 + 98 | 84.81 +265 | 06.679 + 73 | 64.55 +101 | 24.899 + 78 | 28.92 +168 | 54.605 + 62 | 28.14 -120 |
| 10 27.5 | 15.467 +212 | 82.32 +249 | 06.805 +126 | 63.76 +79 | 25.038 +139 | 27.46 +146 | 54.711 +106 | 26.69 -145 |
| 11 6.4 | 15.795 +328 | 80.09 +223 | 06.986 +181 | 63.27 +49 | 25.242 +204 | 26.28 +118 | 54.865 +154 | 24.99 -170 |
| 11 16.4 | 16.234 +439 | 78.25 +184 | 07.222 +236 | 63.15 +12 | 25.508 +266 | 25.50 + 78 | 55.064 +199 | 23.08 -191 |
| 11 26.4 | 16.766 +532 | 76.85 +140 | 07.505 +283 | 63.40 -25 | 25.828 +320 | 25.12 + 38 | 55.306 +242 | 21.00 -208 |
| 12 6.3 | 17.383 +617 | 75.97 + 88 | 07.830 +325 | 64.05 - 65 | 26.197 +369 | 25.20 - 8 | 55.587 +281 | 18.76 -224 |
| 12 16.3 | 18.060 +677 | 75.68 +29 | 08.187 +357 | 65.10 -105 | 26.602 +405 | 25.76 - 56 | 55.897 +310 | 16.46 -230 |
| 12 26.3 | 18.774 +714 | 75.95 -27 | 08.564 +377 | 66.50 -140 | 27.030 +428 | 26.76 -100 | 56.227 +330 | 14.15 -231 |
| 12 36.3 | 19.509 +735 | 76.82 - 87 | 08.952 +388 | 68.23 -173 | 27.470 +440 | 28.21 -145 | 56.570 +343 | 11.90 -225 |
| | +726 | -142 | +384 | -199 | +434 | -184 | +341 | -211 |
| Mean Place | 19.362 | 84.35 | 07.995 | 66.36 | 26.663 | 30.18 | 55.359 | 26.80 |
| sec δ, tan δ | +2.649 | -2.453 | +1.172 | -0.611 | +1.388 | -0.963 | +1.005 | +0.097 |
| da(ψ), dδ(ψ) | +0.082 | -0.38 | +0.066 | -0.38 | +0.070 | -0.38 | +0.060 | -0.38 |
| da(ε), dδ(ε) | -0.155 | -0.32 | -0.039 | -0.33 | -0.061 | -0.33 | +0.006 | -0.33 |
| Dble. Trans. | April 10 | | April 11 | | April 11 | | April 11 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 494 | | 1345 | | 495 | | 1346 | | |
|---|-----------------|----------------|-------------|----------------|-----------------|----------------|-----------------|----------------|------------|
| | 20 Canum Venat. | | 61 Virginis | | γ Hydrae | | 23 Canum Venat. | | |
| Mag.Spect. | 4.66 | F0 | 4.80 | G5 | 3.33 | G5 | 5.69 | K0 | |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | |
| | h m | $^{\circ}$ ' " | h m | $^{\circ}$ ' " | h m | $^{\circ}$ ' " | h m | $^{\circ}$ ' " | |
| | 13 16 | +40 38 | 13 17 | -18 13 | 13 18 | -23 05 | 13 19 | +40 12 | |
| 1 | -8.7 | 54.137 +375 | 35 10 -273 | 38 910 +339 | 53 36 -173 | 08 100 +349 | 43 11 -154 | 40 530 +372 | 74 73 -275 |
| 1 | 1.3 | 54.532 +395 | 32.74 -236 | 39 260 +350 | 55.29 -193 | 08 461 +361 | 44 90 -179 | 40 922 +392 | 72.34 -239 |
| 1 | 11.2 | 54.938 +406 | 30 81 -193 | 39 614 +354 | 57.38 -209 | 08 826 +365 | 46 90 -200 | 41 326 +404 | 70 38 -196 |
| 1 | 21.2 | 55.341 +403 | 29 42 -139 | 39 960 +346 | 59 55 -217 | 09 181 +355 | 49 04 -214 | 41 728 +402 | 68.95 -143 |
| 1 | 31.2 | 55.727 +386 | 28 56 -86 | 40 286 +326 | 61.74 -219 | 09 518 +337 | 51 25 -221 | 42 112 +384 | 68.05 -90 |
| 2 | 10.2 | 56.088 +361 | 28 25 -31 | 40 589 +303 | 63 90 -216 | 09 830 +312 | 53 48 -223 | 42 473 +361 | 67.70 -35 |
| 2 | 20.1 | 56.410 +322 | 28 52 +27 | 40 858 +269 | 65 95 -205 | 10 109 +279 | 55 66 -218 | 42 796 +323 | 67.94 +24 |
| 3 | 2.1 | 56.689 +279 | 29 30 +78 | 41 092 +234 | 67 87 -192 | 10 351 +242 | 57 74 -208 | 43 077 +281 | 68 67 +73 |
| 3 | 12.1 | 56.922 +233 | 30 54 +124 | 41 291 +199 | 69 62 -175 | 10 558 +207 | 59 70 -196 | 43 311 +234 | 69 88 +121 |
| 3 | 22.1 | 57.101 +179 | 32 19 +165 | 41 451 +160 | 71 18 -156 | 10 725 +167 | 61 48 -178 | 43 494 +183 | 71 50 +162 |
| 4 | 1.0 | 57.231 +130 | 34 12 +193 | 41 575 +124 | 72 53 -135 | 10 856 +131 | 63 09 -161 | 43 627 +133 | 73 40 +190 |
| 4 | 11.0 | 57.313 +82 | 36 28 +216 | 41 666 +91 | 73 69 -116 | 10 953 +97 | 64 51 -142 | 43 713 +86 | 75 54 +214 |
| 4 | 21.0 | 57.347 +34 | 38 54 +226 | 41 724 +58 | 74 63 -94 | 11 016 +63 | 65 72 -121 | 43 751 +38 | 77 79 +225 |
| 4 | 30.9 | 57.342 -5 | 40 81 +227 | 41 756 +32 | 75 38 -75 | 11 051 +35 | 66 73 -101 | 43 749 -2 | 80 05 +226 |
| 5 | 10.9 | 57.298 -44 | 43 02 +221 | 41 760 +4 | 75 95 -57 | 11 058 +7 | 67 55 -82 | 43 710 -39 | 82 26 +221 |
| 5 | 20.9 | 57 221 -77 | 45 06 +204 | 41 740 -20 | 76 33 -38 | 11 040 -18 | 68 16 -61 | 43 637 -73 | 84 32 +206 |
| 5 | 30.9 | 57 119 -102 | 46 88 +182 | 41 700 -40 | 76 55 -22 | 11 001 -39 | 68 58 -42 | 43 539 -98 | 86 14 +182 |
| 6 | 9.8 | 56 992 -127 | 48 43 +155 | 41 640 -60 | 76 60 -5 | 10 940 -61 | 68 80 -2 | 43 415 -124 | 87 71 +157 |
| 6 | 19.8 | 56 847 -145 | 49 63 +120 | 41 563 -77 | 76 49 +11 | 10 861 -79 | 68 82 -2 | 43 273 -142 | 88 94 +123 |
| 6 | 29.8 | 56 690 -157 | 50 47 +84 | 41 473 -90 | 76 25 +24 | 10 768 -93 | 68 67 +15 | 43 119 -154 | 89 81 +87 |
| 7 | 9.8 | 56 522 -168 | 50 94 +47 | 41 369 -104 | 75 86 +39 | 10 660 -108 | 68 33 +34 | 42 953 -166 | 90 31 +50 |
| 7 | 19.7 | 56 351 -171 | 50 99 +5 | 41 258 -111 | 75 35 +51 | 10 544 -116 | 67 81 +52 | 42 782 -171 | 90 39 +8 |
| 7 | 29.7 | 56 180 -171 | 50 65 -34 | 41 143 -115 | 74 74 +61 | 10 424 -120 | 67 15 +66 | 42 612 -170 | 90 09 -30 |
| 8 | 8.7 | 56 013 -167 | 49 90 -75 | 41 026 -117 | 74 03 +71 | 10 303 -121 | 66 34 +81 | 42 445 -167 | 89 38 -71 |
| 8 | 18.6 | 55 859 -154 | 48 74 -116 | 40 918 -108 | 73 27 +76 | 10 190 -113 | 65 43 +91 | 42 291 -154 | 88 26 -112 |
| 8 | 28.6 | 55 722 -137 | 47 23 -151 | 40 822 -96 | 72 49 +78 | 10 089 -101 | 64 46 +97 | 42 152 -139 | 86 78 -148 |
| 9 | 7.6 | 55 608 -114 | 45 34 -189 | 40 744 -78 | 71 72 +77 | 10 007 -82 | 63 46 +100 | 42 036 -116 | 84 92 -186 |
| 9 | 17.6 | 55 526 -82 | 43 10 -224 | 40 694 -50 | 71 02 +70 | 09 955 -52 | 62 50 +96 | 42 036 -84 | 84 92 -220 |
| 9 | 27.5 | 55 480 -46 | 40 58 -252 | 40 676 -18 | 70 43 +59 | 09 936 -19 | 61 62 +88 | 41 952 -49 | 82 72 -249 |
| 10 | 7.5 | 55 478 -2 | 37 77 -281 | 40 698 +22 | 70 01 +42 | 09 958 +22 | 60 88 +74 | 41 897 -6 | 80 23 -279 |
| 10 | 17.5 | 55 527 +49 | 34 74 -303 | 40 764 +66 | 69 82 +19 | 10 027 +69 | 60 35 +53 | 41 942 +45 | 74 43 -301 |
| 10 | 27.5 | 55 627 +100 | 31 55 -319 | 40 878 +114 | 69 82 +0 | 10 143 +116 | 60 05 +30 | 42 038 +96 | 71 26 -317 |
| 11 | 6.4 | 55 784 +157 | 28 23 -332 | 41 043 +165 | 70 13 -31 | 10 314 +171 | 60 03 +2 | 42 191 +153 | 67 95 -331 |
| 11 | 16.4 | 55 997 +213 | 24 89 -334 | 41 257 +214 | 70 78 -65 | 10 535 +221 | 60 37 -34 | 42 400 +209 | 64 62 -333 |
| 11 | 26.4 | 56 262 +265 | 21 61 -328 | 41 514 +257 | 71 74 -96 | 10 800 +265 | 61 04 -67 | 42 661 +261 | 61 33 -329 |
| 12 | 6.3 | 56 577 +315 | 18 44 -317 | 41 812 +298 | 73 02 -128 | 11 106 +306 | 62 06 -102 | 42 972 +311 | 58 15 -318 |
| 12 | 16.3 | 56 930 +353 | 15 53 -291 | 42 138 +326 | 74 58 -156 | 11 442 +336 | 63 41 -135 | 43 322 +350 | 55 22 -293 |
| 12 | 26.3 | 57 313 +383 | 12 92 -261 | 42 483 +345 | 76 38 -180 | 11 798 +356 | 65 04 -163 | 43 701 +379 | 52 59 -263 |
| 12 | 36.3 | 57 715 +402 | 10 71 -221 | 42 840 +357 | 78 39 -201 | 12 165 +367 | 66 92 -188 | 44 101 +400 | 50 34 -225 |
| | | 57 715 +406 | 10 71 -172 | 42 840 +353 | 78 39 -212 | 12 165 +364 | 66 92 -206 | 44 101 +403 | 50 34 -175 |
| Mean Place | 56.304 | 36.57 | 41.813 | 71.41 | 11.143 | 62.19 | 42.720 | 76.15 | |
| sec δ , tan δ | +1.318 | +0.858 | +1.053 | -0.329 | +1.087 | -0.427 | +1.310 | +0.846 | |
| $d\alpha(\psi)$, $d\delta(\psi)$ | +0.054 | -0.38 | +0.064 | -0.38 | +0.065 | -0.37 | +0.054 | -0.37 | |
| $d\alpha(\epsilon)$, $d\delta(\epsilon)$ | +0.054 | -0.33 | -0.021 | -0.33 | -0.027 | -0.33 | +0.053 | -0.34 | |
| Dbie.Trans. | April 11 | | April 11 | | April 11 | | April 12 | | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 496 | | 1347 | | 497 | | 498 | |
|--------------|------------------------------------|-------------------------------------|------------------------------------|-------------------------------------|------------------------------------|-------------------------------------|------------------------------------|-------------------------------------|
| | ι Centauri | | ι Centauri* | | ζ Ursae Majoris* ρ. | | α Virginis (Spica) | |
| Mag. Spect. | 2.91 | A2 | 4.62 | B5 | 2.40 | A2p | 1.21 | B2 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | ^h ^m 13 19 | ^o ['] -36 38 | ^h ^m 13 21 | ^o ['] -60 54 | ^h ^m 13 23 | ^o ['] +54 59 | ^h ^m 13 24 | ^o ['] -11 05 |
| 1 -8.7 | 46.749 +385 | 05 97 -108 | 40 532 +566 | 36 03 -20 | 21.050 +446 | 39.46 -276 | 25.956 +328 | 13.32 -188 |
| 1 1.3 | 47.147 +398 | 07 42 -145 | 41.117 +585 | 36.78 -75 | 21.527 +477 | 37.18 -228 | 26.298 +342 | 15.33 -201 |
| 1 11.2 | 47.549 +392 | 09 20 -178 | 41.710 +593 | 38.04 -126 | 22.022 +495 | 35.41 -177 | 26.646 +348 | 17.43 -210 |
| 1 21.2 | 47.941 +371 | 11 29 -209 | 42.289 +579 | 39.81 -177 | 22.519 +497 | 34.27 -114 | 26.986 +340 | 19.53 -210 |
| 1 31.2 | 48.312 +371 | 13 57 -228 | 42.837 +548 | 42.00 -219 | 22.998 +479 | 33.74 -53 | 27.310 +324 | 21.57 -204 |
| 2 10.2 | 48.655 +343 | 16 02 -245 | 43 348 +511 | 44.56 -256 | 23 451 +453 | 33.84 +10 | 27 612 +302 | 23.51 -194 |
| 2 20.1 | 48.963 +308 | 18 55 -253 | 43 806 +458 | 47 43 -287 | 23 858 +407 | 34.57 +73 | 27 883 +271 | 25.28 -177 |
| 3 2.1 | 49.231 +268 | 21 09 -254 | 44 204 +398 | 50.49 -306 | 24.211 +353 | 35.84 +127 | 28.120 +237 | 26.86 -158 |
| 3 12.1 | 49.459 +228 | 23 62 -253 | 44 543 +339 | 53.72 -323 | 24.505 +294 | 37.61 +177 | 28.323 +203 | 28.22 -136 |
| 3 22.1 | 49.643 +184 | 26 06 -244 | 44.815 +272 | 57.02 -330 | 24.730 +225 | 39.80 +219 | 28.489 +166 | 29.35 -113 |
| 4 1.0 | 49.787 +144 | 28 37 -231 | 45 022 +207 | 60.32 -330 | 24 889 +159 | 42.25 +245 | 28 620 +131 | 30.25 -90 |
| 4 11.0 | 49.892 +105 | 30 55 -218 | 45 166 +144 | 63.57 -325 | 24 982 +93 | 44.92 +267 | 28 719 +99 | 30.95 -70 |
| 4 21.0 | 49.959 +67 | 32 53 -198 | 45 244 +78 | 66.70 -313 | 25 008 +26 | 47.66 +274 | 28 785 +66 | 31.43 -48 |
| 4 30.9 | 49.993 +34 | 34 30 -177 | 45 265 +21 | 69.63 -293 | 24 977 -31 | 50.35 +269 | 28 825 +40 | 31.74 -31 |
| 5 10.9 | 49.995 +2 | 35.86 -156 | 45.227 -38 | 72.36 -273 | 24.893 -84 | 52.93 +258 | 28.839 +14 | 31.88 -14 |
| 5 20.9 | 49.966 -29 | 37.16 -130 | 45.133 -94 | 74.78 -242 | 24.760 -133 | 55.28 +235 | 28.828 -11 | 31.87 +1 |
| 5 30.9 | 49.911 -55 | 38.21 -105 | 44.991 -142 | 76.89 -211 | 24.590 -170 | 57.31 +203 | 28.798 -30 | 31.75 +12 |
| 6 9.8 | 49.831 -80 | 38.98 -77 | 44.800 -191 | 78.63 -174 | 24.385 -205 | 59.00 +169 | 28.748 -50 | 31.52 +23 |
| 6 19.8 | 49.727 -104 | 39.45 -47 | 44.567 -233 | 79.93 -130 | 24.153 -232 | 60.25 +125 | 28.680 -68 | 31.18 +34 |
| 6 29.8 | 49.607 -120 | 39.65 -20 | 44.303 -264 | 80.83 -90 | 23.906 -247 | 61.06 +81 | 28.599 -81 | 30.78 +40 |
| 7 9.8 | 49.468 -139 | 39.54 +11 | 44.008 -295 | 81.26 -43 | 23.644 -262 | 61.40 +34 | 28.505 -94 | 30.30 +48 |
| 7 19.7 | 49.320 -148 | 39.13 +41 | 43.697 -311 | 81.20 +6 | 23.378 -266 | 61.24 -16 | 28.401 -104 | 29.77 +53 |
| 7 29.7 | 49.167 -153 | 38.45 +68 | 43.379 -318 | 80.71 +49 | 23.115 -263 | 60.63 -61 | 28.294 -107 | 29.21 +56 |
| 8 8.7 | 49.013 -154 | 37.51 +94 | 43.063 -316 | 79.75 +96 | 22.858 -257 | 59.53 -110 | 28.183 -111 | 28.61 +60 |
| 8 18.6 | 48.868 -145 | 36.34 +117 | 42.767 -296 | 78.37 +138 | 22.621 -237 | 57.96 -157 | 28.079 -104 | 28.04 +57 |
| 8 28.6 | 48.739 -129 | 35.00 +134 | 42.501 -266 | 76.64 +173 | 22.407 -214 | 55.99 -197 | 27.986 -93 | 27.50 +54 |
| 9 7.6 | 48.633 -106 | 33.51 +149 | 42.277 -224 | 74.57 +207 | 22.223 -184 | 53.60 -239 | 27.909 -77 | 27.01 +49 |
| 9 17.6 | 48.561 -72 | 31.97 +154 | 42.116 -161 | 72.28 +229 | 22.083 -140 | 50.85 -275 | 27.858 -51 | 26.65 +36 |
| 9 27.5 | 48.529 -32 | 30.43 +154 | 42.021 -95 | 69.85 +243 | 21.988 -95 | 47.80 -305 | 27.837 -21 | 26.42 +23 |
| 10 7.5 | 48.545 +16 | 28.95 +148 | 42.008 -13 | 67.35 +250 | 21.949 -39 | 44.47 -333 | 27.854 +17 | 26.39 +3 |
| 10 17.5 | 48.616 +71 | 27.66 +129 | 42.085 +77 | 64.93 +242 | 21.975 +26 | 40.95 -352 | 27.905 +51 | 26.75 -36 |
| 10 27.5 | 48.742 +126 | 26.57 +109 | 42.250 +165 | 62.68 +225 | 22.065 +90 | 37.30 -365 | 28.014 +109 | 26.96 -21 |
| 11 6.4 | 48.928 +186 | 25.78 +79 | 42.510 +260 | 60.67 +201 | 22.227 +162 | 33.58 -372 | 28.169 +155 | 27.67 -71 |
| 11 16.4 | 49.170 +242 | 25.37 +41 | 42.858 +348 | 59.05 +162 | 22.460 +233 | 29.91 -367 | 28.372 +203 | 28.67 -100 |
| 11 26.4 | 49.462 +292 | 25.33 +4 | 43.283 +425 | 57.85 +120 | 22.759 +299 | 26.36 -355 | 28.617 +245 | 29.93 -126 |
| 12 6.3 | 49.801 +339 | 25.72 -39 | 43.778 +495 | 57.16 +69 | 23.123 +364 | 23.02 -334 | 28.902 +285 | 31.47 -154 |
| 12 16.3 | 50.172 +371 | 26.54 -82 | 44.324 +546 | 57.01 +15 | 23.539 +416 | 20.03 -299 | 29.217 +315 | 33.23 -176 |
| 12 26.3 | 50.565 +383 | 27.75 -121 | 44.902 +578 | 57.40 -39 | 23.996 +457 | 17.43 -260 | 29.553 +336 | 35.15 -192 |
| 12 36.3 | 50.970 +405 | 29.34 -159 | 45.500 +598 | 58.35 -95 | 24.482 +486 | 15.33 -210 | 29.901 +348 | 37.21 -206 |
| | +402 | -190 | +592 | -147 | +495 | -152 | +347 | -210 |
| Mean Place | 50.099 | 28.99 | 45.103 | 64.36 | 23.025 | 44.38 | 28.832 | 28.10 |
| sec δ, tan δ | +1.246 | -0.744 | +2.057 | -1.798 | +1.743 | +1.428 | +1.019 | -0.196 |
| da(ψ), dδ(ψ) | +0.068 | -0.37 | +0.078 | -0.37 | +0.048 | -0.37 | +0.063 | -0.37 |
| da(ε), dδ(ε) | -0.047 | -0.34 | -0.112 | -0.35 | +0.089 | -0.36 | -0.012 | -0.36 |
| Dble. Trans. | April 12 | | April 12 | | April 12 | | April 13 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 499 | | | 1348 | | 1350 | | 1349 | | | | | | | | | |
|--------------|-------------------------------------|---------|-------|-------------|---------|---------------------------------------|---------|-------------|-------|---------|--------|-------|------|--------|-------|-------|------|
| | Groombridge 2001 (Ursae Minoris) | | | 68 Virginis | | B.D. +31° 2493 (Canum Venaticorum) | | 70 Virginis | | | | | | | | | |
| Mag. Spect. | 6.07 | K5 | | 5.59 | K2 | 7.12 | K2 | | 5.16 | G0 | | | | | | | |
| U.T. | R.A. | Dec. | | R.A. | Dec. | R.A. | Dec. | | R.A. | Dec. | | | | | | | |
| | h m | ° ' " | | h m | ° ' " | h m | ° ' " | | h m | ° ' " | | | | | | | |
| | 13 25 | + 72 27 | | 13 25 | - 12 38 | 13 27 | + 31 12 | | 13 27 | + 13 50 | | | | | | | |
| 1 | -8.7 | 45.911 | + 725 | 33.69 | -258 | 57.363 | + 329 | 00.66 | -183 | 38.998 | + 342 | 68.84 | -275 | 43.635 | + 321 | 68.56 | -252 |
| 1 | 1.3 | 46.697 | + 786 | 31.64 | -205 | 57.706 | + 343 | 02.63 | -197 | 39.360 | + 362 | 66.37 | -247 | 43.972 | + 337 | 66.17 | -239 |
| 1 | 11.3 | 47.527 | + 830 | 30.19 | -145 | 58.055 | + 349 | 04.71 | -208 | 39.733 | + 373 | 64.25 | -212 | 44.317 | + 345 | 63.96 | -221 |
| 1 | 21.2 | 48.369 | + 842 | 29.41 | -78 | 58.397 | + 342 | 06.81 | -210 | 40.104 | + 371 | 62.58 | -167 | 44.658 | + 341 | 62.02 | -194 |
| 1 | 31.2 | 49.190 | + 821 | 29.30 | -11 | 58.723 | + 326 | 08.87 | -206 | 40.460 | + 356 | 61.38 | -120 | 44.984 | + 326 | 60.41 | -161 |
| 2 | 10.2 | 49.971 | + 781 | 29.85 | + 55 | 59.026 | + 303 | 10.84 | -197 | 40.795 | + 395 | 60.67 | -71 | 45.289 | + 305 | 59.14 | -127 |
| 2 | 20.1 | 50.677 | + 706 | 31.05 | +120 | 59.239 | + 273 | 12.66 | -182 | 41.098 | + 303 | 60.50 | -17 | 45.564 | + 275 | 58.28 | -86 |
| 3 | 2.1 | 51.287 | + 610 | 32.80 | +175 | 59.539 | + 240 | 14.29 | -163 | 41.362 | + 284 | 60.81 | + 31 | 45.805 | + 241 | 57.80 | -48 |
| 3 | 12.1 | 51.791 | + 504 | 35.04 | +224 | 59.744 | + 205 | 15.73 | -144 | 41.586 | + 224 | 61.57 | + 76 | 46.011 | + 206 | 57.69 | -11 |
| 3 | 22.1 | 52.166 | + 375 | 37.66 | +262 | 59.912 | + 168 | 16.94 | -121 | 41.765 | + 179 | 62.74 | +117 | 46.178 | + 167 | 57.95 | + 26 |
| 4 | 1.0 | 52.411 | + 245 | 40.53 | +287 | 60.045 | + 133 | 17.94 | -100 | 41.902 | + 137 | 64.22 | +148 | 46.308 | + 130 | 58.49 | + 54 |
| 4 | 11.0 | 52.527 | + 116 | 43.56 | +303 | 60.146 | + 101 | 18.72 | -78 | 41.997 | + 95 | 65.94 | +172 | 46.403 | + 95 | 59.28 | + 79 |
| 4 | 21.0 | 52.509 | - 18 | 46.60 | +304 | 60.215 | + 69 | 19.30 | -58 | 42.050 | + 53 | 67.83 | +189 | 46.464 | + 61 | 60.26 | + 98 |
| 4 | 31.0 | 52.374 | - 135 | 49.52 | +292 | 60.257 | + 42 | 19.69 | -39 | 42.069 | + 19 | 69.77 | +194 | 46.496 | + 32 | 61.36 | +110 |
| 5 | 10.9 | 52.126 | - 248 | 52.27 | +275 | 60.272 | + 15 | 19.93 | -24 | 42.055 | - 14 | 71.71 | +194 | 46.501 | + 5 | 62.54 | +118 |
| 5 | 20.9 | 51.777 | - 349 | 54.70 | +243 | 60.263 | - 9 | 20.00 | - 7 | 42.011 | - 44 | 73.57 | +186 | 46.480 | - 21 | 63.72 | +118 |
| 5 | 30.9 | 51.350 | - 427 | 56.75 | +205 | 60.234 | - 29 | 19.95 | + 5 | 41.944 | - 67 | 75.25 | +168 | 46.440 | - 40 | 64.86 | +114 |
| 6 | 9.8 | 50.851 | - 499 | 58.38 | +163 | 60.184 | - 50 | 19.78 | + 17 | 41.854 | - 90 | 76.75 | +150 | 46.380 | - 60 | 65.93 | +107 |
| 6 | 19.8 | 50.299 | - 552 | 59.50 | +112 | 60.117 | - 67 | 19.49 | + 29 | 41.745 | - 109 | 77.98 | +123 | 46.303 | - 77 | 66.88 | + 95 |
| 6 | 29.8 | 49.716 | - 583 | 60.10 | + 60 | 60.036 | - 81 | 19.13 | + 36 | 41.624 | - 121 | 78.92 | + 94 | 46.214 | - 89 | 67.68 | + 80 |
| 7 | 9.8 | 49.108 | - 608 | 60.19 | + 9 | 59.940 | - 96 | 18.67 | + 46 | 41.489 | - 135 | 79.56 | + 64 | 46.112 | - 102 | 68.33 | + 65 |
| 7 | 19.7 | 48.496 | - 612 | 59.70 | - 49 | 59.836 | - 104 | 18.14 | + 53 | 41.348 | - 141 | 79.85 | + 29 | 46.002 | - 110 | 68.77 | + 44 |
| 7 | 29.7 | 47.897 | - 599 | 58.71 | - 99 | 59.726 | - 110 | 17.57 | + 57 | 41.205 | - 143 | 79.80 | - 5 | 45.890 | - 112 | 69.02 | + 25 |
| 8 | 8.7 | 47.317 | - 580 | 57.20 | -151 | 59.614 | - 112 | 16.96 | + 61 | 41.062 | - 143 | 79.41 | - 39 | 45.775 | - 115 | 69.06 | + 4 |
| 8 | 18.7 | 46.780 | - 537 | 55.20 | -200 | 59.508 | - 106 | 16.34 | + 62 | 40.928 | - 134 | 78.65 | - 76 | 45.667 | - 108 | 68.86 | - 20 |
| 8 | 28.6 | 46.294 | - 486 | 52.77 | -243 | 59.412 | - 96 | 15.75 | + 59 | 40.806 | - 122 | 77.56 | -109 | 45.569 | - 98 | 68.44 | - 42 |
| 9 | 7.6 | 45.870 | - 424 | 49.92 | -285 | 59.333 | - 79 | 15.20 | + 55 | 40.702 | - 104 | 76.13 | -143 | 45.486 | - 83 | 67.77 | - 67 |
| 9 | 17.6 | 45.531 | - 339 | 46.73 | -319 | 59.279 | - 54 | 14.76 | + 44 | 40.626 | - 76 | 74.37 | -176 | 45.429 | - 57 | 66.84 | - 93 |
| 9 | 27.5 | 45.279 | - 252 | 43.26 | -347 | 59.256 | - 23 | 14.45 | + 31 | 40.581 | - 45 | 72.32 | -205 | 45.400 | - 29 | 65.68 | -116 |
| 10 | 7.5 | 45.129 | - 150 | 39.53 | -373 | 59.272 | + 16 | 14.32 | + 13 | 40.575 | - 6 | 69.98 | -234 | 45.406 | + 6 | 64.24 | -144 |
| 10 | 17.5 | 45.095 | - 34 | 35.68 | -385 | 59.327 | + 55 | 14.52 | - 20 | 40.616 | + 41 | 67.38 | -260 | 45.454 | + 48 | 62.55 | -169 |
| 10 | 27.5 | 45.176 | + 81 | 31.75 | -393 | 59.429 | + 102 | 14.71 | - 19 | 40.703 | + 87 | 64.59 | -297 | 45.546 | + 92 | 60.62 | -193 |
| 11 | 6.4 | 45.384 | + 208 | 27.81 | -394 | 59.584 | + 155 | 15.31 | - 60 | 40.843 | + 140 | 61.62 | -279 | 45.687 | + 141 | 58.46 | -216 |
| 11 | 16.4 | 45.718 | + 334 | 24.01 | -380 | 59.786 | + 202 | 16.21 | - 90 | 41.035 | + 192 | 58.56 | -306 | 45.875 | + 188 | 56.13 | -233 |
| 11 | 26.4 | 46.170 | + 452 | 20.41 | -360 | 60.031 | + 245 | 17.39 | -118 | 41.275 | + 240 | 55.48 | -308 | 46.107 | + 232 | 53.67 | -246 |
| 12 | 6.4 | 46.739 | + 569 | 17.10 | -331 | 60.316 | + 285 | 18.85 | -146 | 41.561 | + 286 | 52.45 | -303 | 46.380 | + 273 | 51.12 | -255 |
| 12 | 16.3 | 47.405 | + 666 | 14.22 | -288 | 60.632 | + 316 | 20.54 | -169 | 41.884 | + 323 | 49.57 | -288 | 46.685 | + 305 | 48.58 | -254 |
| 12 | 26.3 | 48.148 | + 743 | 11.82 | -240 | 60.969 | + 337 | 22.42 | -188 | 42.234 | + 350 | 46.91 | -266 | 47.013 | + 328 | 46.11 | -247 |
| 12 | 36.3 | 48.953 | + 805 | 09.98 | -184 | 61.318 | + 349 | 24.45 | -203 | 42.603 | + 369 | 44.56 | -235 | 47.357 | + 344 | 43.77 | -234 |
| | | | + 831 | | -118 | | + 349 | | -209 | | + 373 | | -195 | | + 345 | | -211 |
| Mean Place | 47.327 | 41.24 | | 60.271 | 15.86 | | 41.345 | 68.04 | | 46.182 | 62.08 | | | | | | |
| sec δ, tan δ | +3.318 | +3.164 | | +1.025 | -0.224 | | +1.169 | +0.606 | | +1.030 | +0.247 | | | | | | |
| dα(ψ), dδ(ψ) | +0.030 | -0.37 | | +0.063 | -0.37 | | +0.055 | -0.37 | | +0.059 | -0.37 | | | | | | |
| dα(ε), dδ(ε) | +0.196 | -0.37 | | -0.014 | -0.37 | | +0.037 | -0.37 | | +0.015 | -0.37 | | | | | | |
| Dble. Trans. | April 13 | | | April 13 | | April 14 | | April 14 | | | | | | | | | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 500 | | 1351 | | 501 | | 502 | |
|--------------|---------------------|------------|--------------|------------|--------------|------------|--------------------|------------|
| | 69 H. Ursae Majoris | | 78 Virginis | | ζ Virginis | | 17 H. Canum Venat. | |
| Mag.Spect. | 5.41 | A0 | 4.93 | A2p | 3.44 | A2 | 4.96 | F0 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " |
| | 13 27 | +60 00 | 13 33 | + 3 43 | 13 33 | - 0 31 | 13 34 | +37 14 |
| 1 -8.7 | 55 550 + 486 | 49.41 -276 | 24.128 + 316 | 49.96 -227 | 57.496 + 317 | 27.54 -216 | 09.383 + 352 | 63.64 -284 |
| 1 1.3 | 56 072 + 522 | 47.14 -227 | 24.461 + 333 | 47.70 -226 | 57.829 + 333 | 29.72 -218 | 09.758 + 375 | 61.13 -251 |
| 1 11.3 | 56 620 + 548 | 45.41 -173 | 24.801 + 340 | 45.52 -218 | 58.169 + 340 | 31.88 -216 | 10.147 + 389 | 59.02 -211 |
| 1 21.2 | 57 171 + 551 | 44.33 -108 | 25.138 + 337 | 43.49 -203 | 58.505 + 336 | 33.93 -205 | 10.537 + 390 | 57.40 -162 |
| 1 31.2 | 57.707 + 536 | 43.87 -46 | 25.460 + 322 | 41.68 -181 | 58.826 + 321 | 35.80 -187 | 10.913 + 376 | 56.30 -110 |
| 2 10.2 | 58.215 + 508 | 44.07 + 20 | 25.763 + 303 | 40.13 -155 | 59.128 + 302 | 37.46 -166 | 11.269 + 356 | 55.74 -56 |
| 2 20.1 | 58.674 + 459 | 44.91 + 84 | 26.036 + 273 | 38.89 -124 | 59.401 + 273 | 38.85 -139 | 11.592 + 323 | 55.75 + 1 |
| 3 2.1 | 59.074 + 400 | 46.30 +139 | 26.278 + 242 | 37.96 -93 | 59.642 + 241 | 39.96 -111 | 11.876 + 284 | 56.27 + 52 |
| 3 12.1 | 59.407 + 333 | 48.20 +190 | 26.485 + 207 | 37.35 -61 | 59.850 + 208 | 40.79 -83 | 12.118 + 242 | 57.27 +100 |
| 3 22.1 | 59.663 + 256 | 50.52 +232 | 26.656 + 171 | 37.05 -30 | 60.020 + 170 | 41.31 -52 | 12.311 + 193 | 58.71 +144 |
| 4 1.0 | 59.842 + 179 | 53.12 +260 | 26.793 + 137 | 37.02 -3 | 60.157 + 137 | 41.59 -28 | 12.459 + 148 | 60.46 +175 |
| 4 11.0 | 59.945 + 103 | 55.92 +280 | 26.896 + 103 | 37.24 + 22 | 60.262 + 105 | 41.62 -3 | 12.562 + 103 | 62.46 +200 |
| 4 21.0 | 59.970 - 25 | 58.79 +287 | 26.967 + 71 | 37.66 + 42 | 60.334 + 72 | 41.45 + 17 | 12.619 + 57 | 64.62 +216 |
| 4 31.0 | 59.927 - 43 | 61.59 +280 | 27.011 + 44 | 38.23 + 57 | 60.379 + 45 | 41.12 + 33 | 12.638 + 19 | 66.82 +220 |
| 5 10.9 | 59.821 - 106 | 64.28 +269 | 27.028 + 17 | 38.91 + 68 | 60.398 + 19 | 40.66 + 46 | 12.621 - 17 | 69.01 +219 |
| 5 20.9 | 59.657 - 164 | 66.70 +242 | 27.021 - 7 | 39.67 + 76 | 60.392 - 6 | 40.11 + 55 | 12.569 - 52 | 71.07 +206 |
| 5 30.9 | 59.448 - 209 | 68.80 +210 | 26.993 - 28 | 40.45 + 78 | 60.367 - 25 | 39.51 + 60 | 12.491 - 78 | 72.95 +188 |
| 6 9.8 | 59.197 - 251 | 70.54 +174 | 26.946 - 47 | 41.23 + 78 | 60.321 - 46 | 38.88 + 63 | 12.491 - 104 | 72.95 +164 |
| 6 19.8 | 58.915 - 282 | 71.81 +127 | 26.880 - 66 | 41.98 + 75 | 60.257 - 64 | 38.24 + 64 | 12.387 - 125 | 74.59 +133 |
| 6 29.8 | 58.612 - 303 | 72.63 + 82 | 26.802 - 78 | 42.67 + 69 | 60.179 - 78 | 37.63 + 61 | 12.262 - 139 | 75.92 +101 |
| 7 9.8 | 58.292 - 320 | 72.96 + 33 | 26.709 - 93 | 43.30 + 63 | 60.087 - 92 | 37.03 + 60 | 11.969 - 154 | 77.58 + 65 |
| 7 19.7 | 57.967 - 325 | 72.76 - 20 | 26.607 - 102 | 43.82 + 52 | 59.986 - 101 | 36.51 + 52 | 11.808 - 161 | 77.84 + 26 |
| 7 29.7 | 57.646 - 321 | 72.08 - 68 | 26.500 - 107 | 44.23 + 41 | 59.879 - 107 | 36.04 + 47 | 11.644 - 164 | 77.72 - 12 |
| 8 8.7 | 57.331 - 315 | 70.91 -117 | 26.390 - 110 | 44.53 + 30 | 59.769 - 110 | 35.66 + 38 | 11.479 - 165 | 77.21 - 91 |
| 8 18.7 | 57.039 - 292 | 69.24 -167 | 26.285 - 105 | 44.68 + 15 | 59.664 - 105 | 35.39 + 27 | 11.324 - 155 | 76.30 - 51 |
| 8 28.6 | 56.773 - 266 | 67.17 -207 | 26.188 - 97 | 44.67 - 1 | 59.567 - 97 | 35.24 + 15 | 11.181 - 143 | 75.03 -127 |
| 9 7.6 | 56.543 - 230 | 64.66 -251 | 26.107 - 81 | 44.49 - 18 | 59.485 - 82 | 35.22 + 2 | 11.058 - 123 | 73.38 -165 |
| 9 17.6 | 56.362 - 181 | 61.78 -288 | 26.049 - 58 | 44.11 - 38 | 59.427 - 58 | 35.40 - 18 | 11.058 - 95 | 71.38 -200 |
| 9 27.5 | 56.232 - 130 | 58.61 -317 | 26.019 - 30 | 43.52 - 59 | 59.397 - 30 | 35.75 - 35 | 10.963 - 61 | 69.08 -230 |
| 10 7.5 | 56.166 - 66 | 55.15 -346 | 26.024 + 5 | 42.71 - 81 | 59.403 + 6 | 36.31 - 56 | 10.902 - 21 | 66.47 -261 |
| 10 17.5 | 56.172 + 6 | 51.51 -364 | 26.070 + 46 | 41.65 -106 | 59.448 + 45 | 37.09 - 78 | 10.909 + 28 | 63.61 -286 |
| 10 27.5 | 56.251 + 79 | 47.76 -375 | 26.159 + 89 | 40.32 -133 | 59.538 + 90 | 38.17 -108 | 10.909 + 77 | 60.56 -305 |
| 11 6.4 | 56.410 + 159 | 43.94 -382 | 26.297 + 138 | 38.74 -158 | 59.677 + 139 | 39.50 -133 | 11.119 + 133 | 57.34 -322 |
| 11 16.4 | 56.651 + 241 | 40.19 -375 | 26.483 + 186 | 36.95 -179 | 59.863 + 186 | 41.07 -157 | 11.119 + 188 | 54.07 -327 |
| 11 26.4 | 56.966 + 315 | 36.58 -361 | 26.711 + 228 | 34.96 -199 | 60.093 + 230 | 42.84 -177 | 11.547 + 240 | 50.80 -327 |
| 12 6.4 | 57.356 + 390 | 33.19 -339 | 26.981 + 270 | 32.81 -215 | 60.363 + 270 | 44.82 -198 | 11.837 + 290 | 47.61 -319 |
| 12 16.3 | 57.806 + 450 | 30.18 -301 | 27.282 + 301 | 30.57 -224 | 60.666 + 303 | 46.91 -209 | 12.167 + 330 | 44.62 -299 |
| 12 26.3 | 58.304 + 498 | 27.58 -260 | 27.606 + 324 | 28.30 -324 | 60.990 + 324 | 49.08 -217 | 12.528 + 361 | 41.89 -273 |
| 12 36.3 | 58.838 + 534 | 25.50 -208 | 27.946 + 340 | 26.05 -225 | 61.329 + 339 | 51.27 -219 | 12.912 + 384 | 39.51 -238 |
| | 58.838 + 548 | 25.50 -148 | 27.946 + 340 | 26.05 -212 | 61.329 + 341 | 51.27 -211 | 12.912 + 390 | 39.51 -191 |
| Mean Place | 57.428 | 55.37 | 26.846 | 40.65 | 60.263 | 38.20 | 11.685 | 64.73 |
| sec δ, tan δ | +2.001 | +1.733 | +1.002 | +0.065 | +1.000 | -0.009 | +1.256 | +0.760 |
| dα(ψ), dδ(ψ) | +0.044 | -0.37 | +0.060 | -0.37 | +0.061 | -0.36 | +0.053 | -0.36 |
| dα(ε), dδ(ε) | +0.107 | -0.37 | +0.004 | -0.40 | -0.001 | -0.40 | +0.046 | -0.40 |
| Dbble.Trans. | April 14 | | April 15 | | April 15 | | April 15 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 504 | | 1354 | | 1355 | | 1356 | |
|--------------|---------------------------|------------|---------------------------|------------|---------------------------|------------|---------------------------|------------|
| | ε Centauri | | 355 G. Hydrae* | | 82 Virginis | | 253 G. Centauri | |
| Mag.Spect. | 2.56 | B1 | 6.42 | A0 | 5.16 | M0 | 6.30 | B2 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " |
| | 13 38 | -53 23 | 13 40 | -23 22 | 13 40 | - 8 37 | 13 41 | -56 41 |
| 1 -8.7 | ^s 57 316 + 474 | 27 49 - 26 | ^s 42 821 + 340 | 36 70 -139 | ^s 51 221 + 319 | 53 77 -190 | ^s 58 089 + 503 | " - 11 |
| 1 1.3 | 57 811 + 495 | 28 24 - 75 | 43 178 + 357 | 38 33 -163 | 51 556 + 335 | 55 98 -201 | 58 617 + 528 | 34.89 - 61 |
| 1 11.3 | 58 317 + 506 | 29 46 -122 | 43 543 + 365 | 40 18 -185 | 51 900 + 344 | 58 04 -206 | 59 158 + 541 | 35.50 -109 |
| 1 21.2 | 58 817 + 500 | 31 14 -168 | 43 903 + 360 | 42 18 -200 | 52 241 + 341 | 60 10 -206 | 59 693 + 535 | 36 59 -158 |
| 1 31.2 | 59 296 + 479 | 33 18 -204 | 44 249 + 346 | 44 25 -207 | 52 568 + 327 | 62 06 -196 | 60 206 + 513 | 38 17 -198 |
| 2 10.2 | 59 747 + 451 | 35 54 -236 | 44 574 + 325 | 46 37 -212 | 52 875 + 307 | 63 91 -185 | 60 691 + 485 | 42 48 -233 |
| 2 20.2 | 60 156 + 409 | 38 17 -263 | 44 870 + 296 | 48 45 -208 | 53 155 + 280 | 65 56 -165 | 61 133 + 442 | 45 10 -262 |
| 3 2.1 | 60 520 + 364 | 40 96 -279 | 45 132 + 262 | 50 44 -199 | 53 404 + 249 | 67 00 -144 | 61 526 + 393 | 47 92 -282 |
| 3 12.1 | 60 836 + 316 | 43 89 -293 | 45 361 + 229 | 52 32 -188 | 53 620 + 216 | 68 22 -122 | 61 869 + 343 | 50 89 -297 |
| 3 22.1 | 61 098 + 262 | 46 87 -298 | 45 552 + 191 | 54 05 -173 | 53 800 + 180 | 69 18 - 96 | 62 154 + 285 | 53 95 -306 |
| 4 1.0 | 61 309 + 211 | 49 83 -296 | 45 709 + 157 | 55 61 -156 | 53 947 + 147 | 69 92 - 74 | 62 383 + 229 | 57 01 -306 |
| 4 11.0 | 61 469 + 160 | 52 75 -292 | 45 832 + 123 | 57 01 -140 | 54 062 + 115 | 70 44 - 52 | 62 559 + 176 | 60 06 -305 |
| 4 21.0 | 61 576 + 107 | 55 55 -280 | 45 921 + 89 | 58 21 -120 | 54 144 + 82 | 70 74 - 30 | 62 676 + 117 | 62 99 -293 |
| 4 31.0 | 61 637 + 61 | 58 18 -263 | 45 981 + 60 | 59 23 -102 | 54 200 + 56 | 70 89 - 15 | 62 742 + 66 | 65 76 -277 |
| 5 10.9 | 61 650 + 13 | 60 62 -244 | 46 012 + 31 | 60 08 - 85 | 54 229 + 29 | 70 88 + 1 | 62 755 + 13 | 68 36 -260 |
| 5 20.9 | 61 616 - 34 | 62 79 -217 | 46 015 + 3 | 60 73 - 65 | 54 232 + 3 | 70 73 + 15 | 62 717 - 38 | 70 69 -233 |
| 5 30.9 | 61 542 - 74 | 64 68 -189 | 45 995 - 20 | 61 20 - 47 | 54 214 - 18 | 70 50 + 23 | 62 634 - 83 | 72 74 -205 |
| 6 9.9 | 61 427 - 115 | 66 26 -158 | 45 950 - 45 | 61 50 - 30 | 54 174 - 40 | 70 17 + 33 | 62 504 - 130 | 74 47 -173 |
| 6 19.8 | 61 274 - 153 | 67 46 -120 | 45 884 - 66 | 61 61 - 11 | 54 115 - 59 | 69 77 + 40 | 62 334 - 170 | 75 82 -135 |
| 6 29.8 | 61 092 - 182 | 68 30 - 84 | 45 799 - 85 | 61 55 + 6 | 54 041 - 74 | 69 33 + 44 | 62 130 - 204 | 76 78 - 96 |
| 7 9.8 | 60 881 - 211 | 68 73 - 43 | 45 697 - 102 | 61 31 + 24 | 53 950 - 91 | 68 84 + 49 | 61 894 - 236 | 77 33 - 55 |
| 7 19.7 | 60 651 - 230 | 68 73 + 0 | 45 582 - 115 | 60 91 + 40 | 53 848 - 102 | 68 33 + 51 | 61 636 - 258 | 77 42 - 9 |
| 7 29.7 | 60 411 - 240 | 68 35 + 38 | 45 459 - 123 | 60 36 + 55 | 53 740 - 108 | 67 81 + 52 | 61 366 - 270 | 77 11 + 31 |
| 8 8.7 | 60 165 - 246 | 67 55 + 80 | 45 330 - 129 | 59 66 + 70 | 53 626 - 114 | 67 29 + 52 | 61 091 - 275 | 76 36 + 75 |
| 8 18.7 | 59 929 - 236 | 66 37 +118 | 45 206 - 124 | 58 85 + 81 | 53 515 - 111 | 66 81 + 48 | 60 826 - 285 | 75 20 +116 |
| 8 28.6 | 59 713 - 216 | 64 87 +150 | 45 090 - 116 | 57 97 + 88 | 53 413 - 102 | 66 38 + 43 | 60 582 - 244 | 73 70 +150 |
| 9 7.6 | 59 525 - 188 | 63 08 +179 | 44 991 - 99 | 57 04 + 93 | 53 325 - 88 | 66 02 + 36 | 60 369 - 213 | 71 87 +183 |
| 9 17.6 | 59 384 - 141 | 61 08 +200 | 44 918 - 73 | 56 13 + 91 | 53 261 - 64 | 65 80 + 22 | 60 206 - 163 | 69 80 +207 |
| 9 27.6 | 59 294 - 90 | 58 95 +213 | 44 877 - 41 | 55 27 + 86 | 53 225 - 36 | 65 71 + 9 | 60 099 - 107 | 67 59 +221 |
| 10 7.5 | 59 268 - 26 | 56 76 +219 | 44 876 - 1 | 54 53 + 74 | 53 225 + 0 | 65 80 - 9 | 60 061 - 38 | 65 28 +231 |
| 10 17.5 | 59 315 + 47 | 54 64 +212 | 44 921 + 45 | 53 97 + 56 | 53 276 + 51 | 66 08 - 28 | 60 103 + 42 | 63 03 +225 |
| 10 27.5 | 59 436 + 121 | 52 67 +197 | 45 014 + 93 | 53 62 + 35 | 53 350 + 74 | 66 62 - 54 | 60 224 + 121 | 60 90 +213 |
| 11 6.4 | 59 636 + 200 | 50 92 +175 | 45 161 + 147 | 53 51 + 11 | 53 488 + 138 | 67 46 - 84 | 60 430 + 206 | 58 99 +191 |
| 11 16.4 | 59 912 + 276 | 49 52 +140 | 45 361 + 200 | 53 73 - 22 | 53 674 + 186 | 68 55 -109 | 60 719 + 289 | 57 41 +158 |
| 11 26.4 | 60 256 + 344 | 48 51 +101 | 45 608 + 247 | 54 27 - 54 | 53 904 + 230 | 69 89 -134 | 61 080 + 361 | 56 22 +119 |
| 12 6.4 | 60 662 + 406 | 47 95 + 56 | 45 899 + 291 | 55 14 - 87 | 54 175 + 271 | 71 48 -159 | 61 510 + 430 | 55 49 + 73 |
| 12 16.3 | 61 116 + 454 | 47 90 + 5 | 46 225 + 326 | 56 34 -120 | 54 479 + 304 | 73 27 -179 | 61 992 + 482 | 55 27 + 22 |
| 12 26.3 | 61 602 + 486 | 48 33 - 43 | 46 573 + 348 | 57 81 -147 | 54 806 + 327 | 75 20 -193 | 62 509 + 517 | 55 55 - 28 |
| 12 36.3 | 62 109 + 507 | 49 26 - 93 | 46 938 + 365 | 59 53 -172 | 55 149 + 343 | 77 25 -205 | 63 050 + 541 | 56 35 - 80 |
| | + 508 | -140 | + 366 | -191 | + 345 | -205 | + 543 | -129 |
| Mean Place | 61 599 | 53.04 | 46 037 | 54.37 | 54 157 | 66.94 | 62 643 | 60 81 |
| sec δ, tan δ | +1.677 | -1.346 | +1.089 | -0.432 | +1.011 | -0.152 | +1.821 | -1.522 |
| da(ψ), dδ(ψ) | +0.076 | -0.36 | +0.066 | -0.36 | +0.063 | -0.36 | +0.079 | -0.36 |
| da(ε), dδ(ε) | -0.082 | -0.42 | -0.026 | -0.43 | -0.009 | -0.43 | -0.092 | -0.43 |
| Dble.Trans. | April 16 | | April 17 | | April 17 | | April 17 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 1357 | | 506 | | 1358 | | 507 | |
|---|-------------|---------|------------|---------|----------|---------|---------------|---------|
| | 83 Virginis | | 1 Centauri | | 3 Bootis | | τ Bootis | |
| Mag.Spect. | 5.71 | G0 | 4.36 | F5 | 5.91 | F5 | 4.51 | F5 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " |
| | 13 43 | - 16 06 | 13 44 | - 32 58 | 13 46 | + 25 45 | 13 46 | + 17 31 |
| 1 ^d | -8.7 | " | " | " | " | " | " | " |
| 1 ^s | 42.915 | + 326 | 51.583 | + 363 | 03.224 | + 321 | 34.662 | + 312 |
| 1 | 1.3 | -164 | 12.91 | -100 | 72.33 | -277 | 29.38 | -261 |
| 1 | 11.3 | -181 | 14.24 | -133 | 03.567 | + 343 | 34.995 | + 333 |
| 1 | 21.2 | -195 | 15.88 | -164 | 69.78 | -255 | 26.92 | -246 |
| 1 | 31.2 | -202 | 17.78 | -190 | 03.923 | + 356 | 24.66 | -226 |
| 2 | 10.2 | -202 | 19.85 | -207 | 04.281 | + 358 | 22.71 | -195 |
| 2 | 20.2 | -198 | 22.06 | -221 | 04.628 | + 347 | 21.12 | -159 |
| 3 | 2.1 | -187 | 24.33 | -227 | | | | |
| 3 | 12.1 | -172 | 26.61 | -228 | 04.957 | + 329 | | |
| 3 | 22.1 | -156 | 28.86 | -217 | 05.259 | + 302 | 36.332 | + 316 |
| 4 | 1.0 | -136 | 31.03 | -205 | 05.527 | + 288 | 36.621 | + 289 |
| 4 | 11.0 | -97 | 33.08 | -192 | 05.759 | + 232 | 19.14 | -77 |
| 4 | 21.0 | -76 | 35.00 | -175 | 06.102 | + 191 | 18.78 | -36 |
| 4 | 31.0 | -58 | 36.75 | -158 | 63.21 | + 85 | 18.83 | + 44 |
| 5 | 10.9 | -43 | 39.72 | -139 | 68.27 | + 223 | 19.27 | + 75 |
| 5 | 20.9 | -25 | 40.89 | -117 | 70.01 | + 179 | 20.02 | + 103 |
| 5 | 30.9 | -13 | 41.85 | -96 | 71.80 | + 117 | 21.05 | + 103 |
| 6 | 9.9 | + 2 | 42.58 | -73 | 65.16 | + 145 | 22.28 | + 123 |
| 6 | 19.8 | + 14 | 43.06 | -48 | 66.61 | + 165 | 23.62 | + 134 |
| 6 | 29.8 | + 25 | 43.31 | -25 | 68.26 | + 175 | 23.62 | + 143 |
| 7 | 9.8 | + 36 | 43.29 | + 2 | 70.01 | + 179 | 25.05 | + 143 |
| 7 | 19.7 | + 46 | 43.29 | + 2 | 73.56 | + 176 | 26.48 | + 143 |
| 7 | 29.7 | + 53 | 43.02 | + 49 | 75.19 | + 163 | 27.84 | + 136 |
| 8 | 8.7 | + 61 | 41.79 | + 74 | 76.69 | + 150 | 27.84 | + 128 |
| 8 | 18.7 | + 64 | 40.86 | + 93 | 77.97 | + 128 | 29.12 | + 112 |
| 8 | 28.6 | + 66 | 39.76 | + 110 | 79.01 | + 104 | 30.24 | + 95 |
| 9 | 7.6 | + 65 | 38.53 | + 123 | 06.328 | - 43 | 31.19 | + 76 |
| 9 | 17.6 | + 58 | 37.24 | + 129 | 06.285 | - 67 | 31.95 | + 52 |
| 9 | 27.6 | + 48 | 35.94 | + 130 | 06.218 | - 67 | 32.47 | + 29 |
| 10 | 7.5 | + 33 | 34.69 | + 125 | 06.130 | - 88 | 32.76 | + 29 |
| 10 | 17.5 | + 10 | 33.59 | + 110 | 06.130 | - 88 | 32.80 | + 4 |
| 10 | 27.5 | - 6 | 33.59 | + 92 | 06.027 | - 103 | 32.57 | - 23 |
| 11 | 6.4 | - 32 | 32.00 | + 67 | 05.907 | - 120 | 32.09 | - 48 |
| 11 | 16.4 | - 64 | 31.65 | + 35 | 05.778 | - 129 | 32.09 | - 76 |
| 11 | 26.4 | - 92 | 31.65 | + 0 | 05.643 | - 135 | 31.33 | - 105 |
| 12 | 6.4 | - 122 | 32.03 | - 38 | 05.503 | - 140 | 30.28 | - 130 |
| 12 | 16.3 | - 148 | 32.79 | - 76 | 05.369 | - 134 | 28.98 | - 159 |
| 12 | 26.3 | - 170 | 33.90 | - 111 | 05.244 | - 125 | 27.39 | - 185 |
| 12 | 36.3 | - 187 | 35.36 | - 173 | 05.133 | - 87 | 25.54 | - 209 |
| Mean Place | 46.005 | 41.70 | 55.049 | 33.15 | 05.046 | - 58 | 36.725 | - 115 |
| sec δ , tan δ | +1.041 | -0.289 | +1.192 | -0.649 | 04.988 | - 22 | 36.725 | - 101 |
| $d\alpha(\psi)$, $d\delta(\psi)$ | +0.065 | -0.36 | +0.069 | -0.36 | 04.966 | - 22 | 36.624 | - 77 |
| $d\alpha(\epsilon)$, $d\delta(\epsilon)$ | -0.017 | -0.44 | -0.039 | -0.44 | 04.988 | - 22 | 36.547 | - 51 |
| Dble.Trans. | April 18 | | April 18 | | 04.988 | - 22 | 36.496 | - 89 |
| | | | | | 04.966 | - 22 | 37.431 | - 9 |
| | | | | | 04.988 | + 22 | 37.326 | + 78 |
| | | | | | 05.055 | + 67 | 37.210 | + 47 |
| | | | | | 05.173 | + 118 | 37.088 | + 18 |
| | | | | | 05.342 | + 169 | 36.962 | + 14 |
| | | | | | 05.560 | + 218 | 36.840 | - 47 |
| | | | | | 05.824 | + 264 | 36.840 | - 122 |
| | | | | | 06.125 | + 301 | 36.725 | - 115 |
| | | | | | 06.455 | + 351 | 36.725 | - 101 |
| | | | | | 06.806 | + 358 | 36.624 | - 77 |
| | | | | | | | 36.547 | - 51 |
| | | | | | | | 36.496 | - 89 |
| | | | | | | | 37.431 | - 9 |
| | | | | | | | 37.326 | + 78 |
| | | | | | | | 37.210 | + 47 |
| | | | | | | | 37.088 | + 18 |
| | | | | | | | 36.962 | + 14 |
| | | | | | | | 36.840 | - 47 |
| | | | | | | | 36.725 | - 115 |
| | | | | | | | 36.725 | - 101 |
| | | | | | | | 36.624 | - 77 |
| | | | | | | | 36.547 | - 51 |
| | | | | | | | 36.496 | - 89 |
| | | | | | | | 37.431 | - 9 |
| | | | | | | | 37.326 | + 78 |
| | | | | | | | 37.210 | + 47 |
| | | | | | | | 37.088 | + 18 |
| | | | | | | | 36.962 | + 14 |
| | | | | | | | 36.840 | - 47 |
| | | | | | | | 36.725 | - 115 |
| | | | | | | | 36.725 | - 101 |
| | | | | | | | 36.624 | - 77 |
| | | | | | | | 36.547 | - 51 |
| | | | | | | | 36.496 | - 89 |
| | | | | | | | 37.431 | - 9 |
| | | | | | | | 37.326 | + 78 |
| | | | | | | | 37.210 | + 47 |
| | | | | | | | 37.088 | + 18 |
| | | | | | | | 36.962 | + 14 |
| | | | | | | | 36.840 | - 47 |
| | | | | | | | 36.725 | - 115 |
| | | | | | | | 36.725 | - 101 |
| | | | | | | | 36.624 | - 77 |
| | | | | | | | 36.547 | - 51 |
| | | | | | | | 36.496 | - 89 |
| | | | | | | | 37.431 | - 9 |
| | | | | | | | 37.326 | + 78 |
| | | | | | | | 37.210 | + 47 |
| | | | | | | | 37.088 | + 18 |
| | | | | | | | 36.962 | + 14 |
| | | | | | | | 36.840 | - 47 |
| | | | | | | | 36.725 | - 115 |
| | | | | | | | 36.725 | - 101 |
| | | | | | | | 36.624 | - 77 |
| | | | | | | | 36.547 | - 51 |
| | | | | | | | 36.496 | - 89 |
| | | | | | | | 37.431 | - 9 |
| | | | | | | | 37.326 | + 78 |
| | | | | | | | 37.210 | + 47 |
| | | | | | | | 37.088 | + 18 |
| | | | | | | | 36.962 | + 14 |
| | | | | | | | 36.840 | - 47 |
| | | | | | | | 36.725 | - 115 |
| | | | | | | | 36.725 | - 101 |
| | | | | | | | 36.624 | - 77 |
| | | | | | | | 36.547 | - 51 |
| | | | | | | | 36.496 | - 89 |
| | | | | | | | 37.431 | - 9 |
| | | | | | | | 37.326 | + 78 |
| | | | | | | | 37.210 | + 47 |
| | | | | | | | 37.088 | + 18 |
| | | | | | | | 36.962 | + 14 |
| | | | | | | | 36.840 | - 47 |
| | | | | | | | 36.725 | - 115 |
| | | | | | | | 36.725 | - 101 |
| | | | | | | | 36.624 | - 77 |
| | | | | | | | 36.547 | - 51 |
| | | | | | | | 36.496 | - 89 |
| | | | | | | | 37.431 | - 9 |
| | | | | | | | 37.326 | + 78 |
| | | | | | | | 37.210 | + 47 |
| | | | | | | | 37.088 | + 18 |
| | | | | | | | 36.962 | + 14 |
| | | | | | | | 36.840 | - 47 |
| | | | | | | | 36.725 | - 115 |
| | | | | | | | 36.725 | - 101 |
| | | | | | | | 36.624 | - 77 |
| | | | | | | | 36.547 | - 51 |
| | | | | | | | 36.496 | - 89 |
| | | | | | | | 37.431 | - 9 |
| | | | | | | | 37.326 | + 78 |
| | | | | | | | 37.210 | + 47 |
| | | | | | | | 37.088 | + 18 |
| | | | | | | | 36.962 | + 14 |
| | | | | | | | 36.840 | - 47 |
| | | | | | | | 36.725 | - 115 |
| | | | | | | | 36.725 | - 101 |
| | | | | | | | 36.624 | - 77 |
| | | | | | | | 36.547 | - 51 |
| | | | | | | | 36.496 | - 89 |
| | | | | | | | 37.431 | - 9 |
| | | | | | | | 37.326 | + 78 |
| | | | | | | | 37.210 | + 47 |
| | | | | | | | 37.088 | + 18 |
| | | | | | | | 36.962 | + 14 |
| | | | | | | | 36.840 | - 47 |
| | | | | | | | 36.725 | - 115 |
| | | | | | | | 36.725 | - 101 |
| | | | | | | | 36.624 | - 77 |
| | | | | | | | 36.547 | - 51 |
| | | | | | | | 36.496 | - 89 |
| | | | | | | | 37.431 | - 9 |
| | | | | | | | 37.326 | + 78 |
| | | | | | | | 37.210 | + 47 |
| | | | | | | | 37.088 | + 18 |
| | | | | | | | 36.962 | + 14 |
| | | | | | | | 36.84 | |

AT UPPER TRANSIT AT GREENWICH

| No. | 509 | | 508 | | 1359 | | 510 | |
|--------------------|---------------------------|-------------------------|---------------------------|-------------------------|---------------------------|-------------------------|---------------------------|-------------------------|
| Name | η Ursae Majoris | | μ Centauri | | B.D. +9° 2814 (Bootis) | | 89 Virginis | |
| Mag.Spect. | 1.91 | B3 | 3.32 | B2p | 6.54 | A0 | 5.11 | K0 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° ' | h m | ° ' | h m | ° ' | h m | ° ' |
| | 13 46 | + 49 22 | 13 48 | - 42 24 | 13 49 | + 8 28 | 13 49 | - 18 03 |
| 1 ^d 8.7 | 58.392 ^s + 386 | 45.29 ^o -298 | 44.110 ^s + 398 | 02.72 ^o - 59 | 01.196 ^s + 309 | 38.06 ^o -240 | 05.004 ^s + 328 | 46.81 ^o -154 |
| 1 1.3 | 58.809 + 417 | 42.72 -257 | 44.528 + 418 | 03.71 -137 | 01.523 + 327 | 35.72 -234 | 05.348 + 344 | 48.54 -173 |
| 1 11.3 | 59.250 + 441 | 40.61 -211 | 44.958 + 430 | 05.08 -173 | 01.861 + 338 | 33.50 -222 | 05.702 + 354 | 50.43 -189 |
| 1 21.2 | 59.697 + 447 | 39.08 -153 | 45.384 + 426 | 06.81 -173 | 02.200 + 339 | 31.48 -202 | 06.054 + 352 | 52.42 -199 |
| 1 31.2 | 60.134 + 437 | 38.15 - 93 | 45.794 + 410 | 08.82 -201 | 02.527 + 327 | 29.73 -175 | 06.393 + 339 | 54.43 -201 |
| 2 10.2 | 60.554 + 420 | 37.82 - 33 | 46.182 + 388 | 11.05 -223 | 02.837 + 310 | 28.28 -145 | 06.714 + 321 | 56.42 -199 |
| 2 20.2 | 60.938 + 384 | 38.13 + 31 | 46.537 + 355 | 13.46 -241 | 03.121 + 284 | 27.18 -110 | 07.007 + 293 | 58.32 -190 |
| 3 2.1 | 61.279 + 341 | 39.00 + 87 | 46.855 + 318 | 15.94 -248 | 03.374 + 253 | 26.44 - 74 | 07.269 + 262 | 60.09 -177 |
| 3 12.1 | 61.573 + 294 | 40.41 +141 | 47.134 + 279 | 18.49 -255 | 03.595 + 221 | 26.05 - 39 | 07.498 + 229 | 61.72 -163 |
| 3 22.1 | 61.809 + 236 | 42.27 +186 | 47.370 + 236 | 21.03 -254 | 03.781 + 186 | 26.00 - 5 | 07.692 + 194 | 63.16 -144 |
| 4 1.0 | 61.989 + 180 | 44.47 +220 | 47.564 + 194 | 23.50 -247 | 03.932 + 151 | 26.25 + 25 | 07.853 + 161 | 64.41 -125 |
| 4 11.0 | 62.114 + 125 | 46.94 +247 | 47.718 + 154 | 25.89 -239 | 04.050 + 118 | 26.76 + 51 | 07.981 + 128 | 65.47 -106 |
| 4 21.0 | 62.180 + 66 | 49.55 +261 | 47.830 + 112 | 28.14 -225 | 04.135 + 85 | 27.48 + 72 | 08.076 + 95 | 66.34 - 87 |
| 4 31.0 | 62.197 + 17 | 52.18 +263 | 47.905 + 75 | 30.23 -209 | 04.191 + 56 | 28.34 + 86 | 08.143 + 67 | 67.04 - 70 |
| 5 10.9 | 62.164 - 33 | 54.78 +260 | 47.942 + 37 | 32.13 -190 | 04.220 + 29 | 29.31 + 97 | 08.181 + 38 | 67.57 - 53 |
| 5 20.9 | 62.087 - 77 | 57.20 +242 | 47.942 + 0 | 33.80 -167 | 04.222 + 2 | 30.34 +103 | 08.193 + 12 | 67.93 - 36 |
| 5 30.9 | 61.973 - 114 | 59.38 +218 | 47.910 - 32 | 35.24 -144 | 04.203 - 19 | 31.35 +101 | 08.181 - 12 | 68.16 - 23 |
| 6 9.9 | 61.824 - 149 | 61.28 +190 | 47.844 - 66 | 36.40 -116 | 04.161 - 42 | 32.35 +100 | 08.145 - 36 | 68.23 - 7 |
| 6 19.8 | 61.647 - 177 | 62.79 +151 | 47.748 - 96 | 37.26 - 86 | 04.100 - 61 | 33.26 + 91 | 08.088 - 57 | 68.17 + 6 |
| 6 29.8 | 61.450 - 197 | 63.91 +112 | 47.627 - 121 | 37.83 - 57 | 04.023 - 77 | 34.08 + 82 | 08.012 - 76 | 67.99 + 18 |
| 7 9.8 | 61.233 - 217 | 64.60 + 69 | 47.481 - 146 | 38.07 - 24 | 03.929 - 94 | 34.78 + 70 | 07.918 - 94 | 67.68 + 31 |
| 7 19.7 | 61.005 - 228 | 64.82 + 22 | 47.317 - 164 | 37.98 + 9 | 03.825 - 104 | 35.33 + 55 | 07.810 - 108 | 67.25 + 43 |
| 7 29.7 | 60.774 - 231 | 64.59 - 23 | 47.141 - 176 | 37.58 + 40 | 03.713 - 112 | 35.73 + 40 | 07.693 - 117 | 66.74 + 51 |
| 8 8.7 | 60.542 - 232 | 63.90 - 69 | 46.958 - 183 | 36.85 + 73 | 03.595 - 118 | 35.97 + 24 | 07.570 - 123 | 66.13 + 61 |
| 8 18.7 | 60.320 - 222 | 62.74 -116 | 46.780 - 178 | 35.84 +101 | 03.480 - 115 | 36.00 + 3 | 07.449 - 121 | 65.47 + 66 |
| 8 28.6 | 60.113 - 207 | 61.16 -158 | 46.613 - 167 | 34.59 +125 | 03.372 - 108 | 35.85 - 15 | 07.336 - 113 | 64.77 + 70 |
| 9 7.6 | 59.928 - 185 | 59.16 -200 | 46.467 - 146 | 33.11 +148 | 03.277 - 95 | 35.49 - 36 | 07.236 - 100 | 64.06 + 71 |
| 9 17.6 | 59.778 - 150 | 56.77 -239 | 46.355 - 112 | 31.49 +162 | 03.204 - 73 | 34.89 - 60 | 07.161 - 75 | 63.41 + 65 |
| 9 27.6 | 59.665 - 113 | 54.05 -272 | 46.283 - 72 | 29.81 +168 | 03.158 - 46 | 34.07 - 82 | 07.116 - 45 | 62.84 + 57 |
| 10 7.5 | 59.600 - 65 | 51.00 -305 | 46.260 - 23 | 28.10 +171 | 03.145 - 13 | 33.00 -107 | 07.108 - 8 | 62.40 + 44 |
| 10 17.5 | 59.592 - 8 | 47.71 -329 | 46.297 + 37 | 26.50 +160 | 03.173 + 28 | 31.67 -133 | 07.145 + 37 | 62.17 + 23 |
| 10 27.5 | 59.641 + 49 | 44.24 -347 | 46.393 + 96 | 25.05 +145 | 03.244 + 71 | 30.10 -157 | 07.223 + 78 | 62.14 + 3 |
| 11 6.4 | 59.756 + 115 | 40.63 -361 | 46.554 + 161 | 23.83 +122 | 03.364 + 120 | 28.28 -182 | 07.359 + 136 | 62.31 - 17 |
| 11 16.4 | 59.937 + 181 | 37.00 -363 | 46.780 + 226 | 22.93 + 90 | 03.533 + 169 | 26.25 -203 | 07.546 + 187 | 62.82 - 51 |
| 11 26.4 | 60.180 + 243 | 33.43 -357 | 47.064 + 284 | 22.39 + 54 | 03.747 + 214 | 24.06 -219 | 07.779 + 233 | 63.61 - 79 |
| 12 6.4 | 60.485 + 305 | 29.98 -345 | 47.401 + 337 | 22.26 + 13 | 04.003 + 256 | 21.72 -234 | 08.056 + 277 | 64.71 -110 |
| 12 16.3 | 60.841 + 356 | 26.81 -317 | 47.781 + 380 | 22.58 - 32 | 04.295 + 292 | 19.34 -238 | 08.367 + 311 | 66.09 -138 |
| 12 26.3 | 61.238 + 397 | 23.96 -285 | 48.189 + 408 | 23.30 - 72 | 04.611 + 316 | 16.96 -238 | 08.703 + 336 | 67.69 -160 |
| 12 36.3 | 61.667 + 429 | 21.55 -241 | 48.618 + 429 | 24.44 -114 | 04.947 + 336 | 14.65 -231 | 09.056 + 353 | 69.50 -181 |
| | 61.667 + 443 | 21.55 -187 | 48.618 + 432 | 24.44 -151 | 04.947 + 340 | 14.65 -214 | 09.056 + 356 | 69.50 -193 |
| Mean Place | 60.574 | 49.63 | 47.954 | 25.03 | 03.929 | 31.11 | 08.160 | 62.29 |
| sec δ, tan δ | +1.536 | +1.166 | +1.354 | -0.913 | +1.011 | +0.149 | +1.052 | -0.326 |
| dα(ψ), dδ(ψ) | +0.047 | -0.36 | +0.072 | -0.35 | +0.059 | -0.35 | +0.065 | -0.35 |
| dα(ε), dδ(ε) | +0.069 | -0.45 | -0.054 | -0.46 | +0.009 | -0.46 | -0.019 | -0.46 |
| Dble.Trans. | April 18 | | April 19 | | April 19 | | April 19 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 511 | | 513 | | 512 | | 1360 | |
|--------------------------------------|-------------|--------------|---------------|-------------|------------------|-------------|---------------------------------------|-------------|
| | 10 Draconis | | η Bootis | | ζ Centauri | | B.D. +32° 2411 (Canum Venaticorum) | |
| Mag.Spect. | 4.77 | M0 | 2.80 | G0 | 3.06 | B2p | 6.29 | F2 |
| U.T. | R.A. | | R.A. | | R.A. | | R.A. | |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " |
| | 13 51 | + 64 46 | 13 53 | + 18 27 | 13 54 | - 47 12 | 13 55 | + 32 05 |
| 1 | -8.7 | 00.339 + 511 | 59.889 + 310 | 57.84 - 266 | 37.427 + 420 | 57.32 - 33 | 32.075 + 324 | 53.05 - 291 |
| 1 | 1.3 | 00.903 + 564 | 60.220 + 331 | 55.34 - 250 | 37.871 + 444 | 58.09 - 77 | 32.424 + 349 | 50.42 - 263 |
| 1 | 11.3 | 01.506 + 603 | 60.564 + 344 | 53.05 - 229 | 38.328 + 457 | 59.28 - 119 | 32.791 + 367 | 48.12 - 230 |
| 1 | 21.2 | 02.126 + 620 | 60.910 + 346 | 51.07 - 198 | 38.784 + 456 | 60.87 - 159 | 33.162 + 371 | 46.26 - 186 |
| 1 | 31.2 | 02.740 + 614 | 61.246 + 336 | 49.45 - 162 | 39.224 + 440 | 62.78 - 191 | 33.524 + 362 | 44.88 - 138 |
| 2 | 10.2 | 03.333 + 593 | 61.566 + 320 | 48.23 - 122 | 39.643 + 419 | 64.96 - 218 | 33.870 + 346 | 44.00 - 88 |
| 2 | 20.2 | 03.880 + 547 | 61.860 + 294 | 47.46 - 77 | 40.028 + 385 | 67.37 - 241 | 34.190 + 320 | 43.68 - 32 |
| 3 | 2.1 | 04.367 + 487 | 62.122 + 262 | 47.11 - 35 | 40.373 + 345 | 69.91 - 254 | 34.476 + 286 | 43.87 + 19 |
| 3 | 12.1 | 04.785 + 418 | 62.352 + 230 | 47.18 + 7 | 40.679 + 306 | 72.56 - 265 | 34.725 + 249 | 44.54 + 67 |
| 3 | 22.1 | 05.116 + 331 | 62.545 + 193 | 47.65 + 47 | 40.939 + 260 | 75.23 - 267 | 34.933 + 208 | 45.66 + 112 |
| 4 | 1.1 | 05.361 + 245 | 62.701 + 156 | 48.43 + 78 | 41.154 + 215 | 77.87 - 264 | 35.098 + 165 | 47.13 + 147 |
| 4 | 11.0 | 05.518 + 157 | 62.822 + 121 | 49.50 + 107 | 41.326 + 172 | 80.47 - 260 | 35.224 + 126 | 48.89 + 176 |
| 4 | 21.0 | 05.581 + 63 | 62.907 + 85 | 50.78 + 128 | 41.452 + 126 | 82.95 - 248 | 35.307 + 83 | 50.85 + 196 |
| 4 | 31.0 | 05.562 - 19 | 62.961 + 54 | 52.18 + 140 | 41.538 + 86 | 85.28 - 233 | 35.355 + 48 | 52.90 + 205 |
| 5 | 10.9 | 05.463 - 99 | 62.986 + 25 | 53.67 + 149 | 41.581 + 43 | 87.44 - 216 | 35.367 + 12 | 54.99 + 209 |
| 5 | 20.9 | 05.288 - 175 | 62.982 - 4 | 55.15 + 148 | 41.583 + 2 | 89.37 - 193 | 35.345 - 22 | 57.02 + 203 |
| 5 | 30.9 | 05.054 - 234 | 62.955 - 27 | 56.57 + 142 | 41.549 - 34 | 91.05 - 168 | 35.297 - 48 | 58.90 + 188 |
| 6 | 9.9 | 04.763 - 291 | 62.904 - 51 | 57.90 + 133 | 41.477 - 72 | 92.46 - 141 | 35.221 - 76 | 60.61 + 171 |
| 6 | 19.8 | 04.426 - 337 | 62.833 - 71 | 59.07 + 117 | 41.370 - 107 | 93.54 - 108 | 35.122 - 99 | 62.06 + 145 |
| 6 | 29.8 | 04.058 - 368 | 62.745 - 88 | 60.06 + 99 | 41.234 - 136 | 94.31 - 77 | 35.006 - 116 | 63.22 + 116 |
| 7 | 9.8 | 03.661 - 397 | 62.640 - 105 | 60.84 + 78 | 41.070 - 164 | 94.73 - 42 | 34.871 - 135 | 64.08 + 86 |
| 7 | 19.8 | 03.251 - 410 | 62.524 - 116 | 61.38 + 54 | 40.885 - 185 | 94.77 - 4 | 34.724 - 147 | 64.57 + 49 |
| 7 | 29.7 | 02.838 - 413 | 62.400 - 124 | 61.68 + 30 | 40.885 - 199 | 94.48 + 29 | 34.571 - 153 | 64.72 + 15 |
| 8 | 8.7 | 02.427 - 411 | 62.271 - 129 | 61.73 + 5 | 40.686 - 208 | 94.48 + 66 | 34.571 - 159 | 64.72 - 21 |
| 8 | 18.7 | 02.036 - 391 | 62.145 - 126 | 61.48 - 25 | 40.478 - 203 | 93.82 + 100 | 34.412 - 155 | 64.51 - 59 |
| 8 | 28.6 | 01.671 - 365 | 62.026 - 119 | 60.98 - 50 | 40.083 - 192 | 91.54 + 128 | 34.111 - 146 | 62.98 - 94 |
| 9 | 7.6 | 01.342 - 329 | 61.919 - 107 | 60.19 - 79 | 39.913 - 170 | 90.00 + 154 | 33.980 - 131 | 61.67 - 131 |
| 9 | 17.6 | 01.067 - 275 | 61.835 - 84 | 59.11 - 108 | 39.780 - 133 | 88.27 + 173 | 33.873 - 107 | 60.00 - 167 |
| 9 | 27.6 | 00.848 - 219 | 61.778 - 57 | 57.77 - 134 | 39.690 - 90 | 86.43 + 184 | 33.795 - 78 | 58.03 - 197 |
| 10 | 7.5 | 00.699 - 149 | 61.755 - 23 | 56.14 - 163 | 39.653 - 37 | 84.53 + 190 | 33.754 - 41 | 55.73 - 230 |
| 10 | 17.5 | 00.633 - 66 | 61.774 + 19 | 54.23 - 191 | 39.680 + 27 | 82.70 + 183 | 33.759 + 5 | 53.16 - 257 |
| 10 | 27.5 | 00.650 + 17 | 61.836 + 62 | 52.10 - 213 | 39.772 + 92 | 80.99 + 171 | 33.811 + 52 | 50.37 - 279 |
| 11 | 6.5 | 00.760 + 110 | 61.949 + 113 | 49.72 - 238 | 39.935 + 163 | 79.50 + 149 | 33.916 + 105 | 47.37 - 300 |
| 11 | 16.4 | 00.966 + 206 | 62.111 + 162 | 47.19 - 253 | 40.167 + 232 | 78.32 + 118 | 34.076 + 160 | 44.25 - 312 |
| 11 | 26.4 | 01.262 + 296 | 62.320 + 209 | 44.53 - 266 | 40.462 + 295 | 77.49 + 83 | 34.286 + 210 | 41.09 - 316 |
| 12 | 6.4 | 01.649 + 387 | 62.574 + 254 | 41.80 - 273 | 40.816 + 354 | 77.07 + 42 | 34.546 + 260 | 37.94 - 315 |
| 12 | 16.3 | 02.113 + 464 | 62.864 + 290 | 39.10 - 270 | 41.216 + 400 | 77.12 - 5 | 34.848 + 302 | 34.93 - 301 |
| 12 | 26.3 | 02.641 + 528 | 63.183 + 319 | 36.50 - 260 | 41.648 + 432 | 77.60 - 48 | 35.182 + 334 | 32.12 - 281 |
| 12 | 36.3 | 03.222 + 581 | 63.522 + 339 | 34.06 - 244 | 42.104 + 456 | 78.53 - 93 | 35.541 + 359 | 29.59 - 253 |
| | | + 608 | + 346 | - 217 | + 461 | - 134 | + 368 | - 212 |
| Mean Place | 02.244 | 83.11 | 62.509 | 54.11 | 41.549 | 80.25 | 34.533 | 53.48 |
| sec δ , $\tan \delta$ | +2.348 | +2.124 | +1.054 | +0.334 | +1.472 | -1.081 | +1.180 | +0.627 |
| $da(\psi)$, $d\delta(\psi)$ | +0.035 | -0.35 | +0.057 | -0.35 | +0.075 | -0.35 | +0.053 | -0.35 |
| $da(\epsilon)$, $d\delta(\epsilon)$ | +0.125 | -0.47 | +0.020 | -0.48 | -0.063 | -0.48 | +0.037 | -0.48 |
| Dble.Trans. | April 19 | | April 20 | | April 20 | | April 21 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 514 | | 515 | | 1362 | | 1361 | |
|---------------|-----------------|------------|-------------|------------|-----------------|------------|-------------|------------|
| | 294 G. Centauri | | 47 Hydrae | | 204 G. Virginis | | 48 Hydrae | |
| Mag. Spect. | 4.68 | K0 | 5.17 | B8 | 6.30 | F5 | 5.80 | F0 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° ' | h m | ° ' | h m | ° ' | h m | ° ' |
| | 13 56 | -63 36 | 13 57 | -24 54 | 13 59 | - 3 28 | 13 59 | -24 56 |
| 1 -8.7 | 34.249 +586 | 49.73 +33 | 42.191 +336 | 07 16 -121 | 04.273 +307 | 53 74 -202 | 11.219 +335 | 24.95 -121 |
| 1 1.3 | 34.870 +621 | 49.94 -21 | 42.546 +355 | 08 64 -148 | 04.599 +326 | 55.82 -208 | 11.573 +354 | 26.41 -146 |
| 1 11.3 | 35.513 +643 | 50.66 -72 | 42.912 +366 | 10.34 -170 | 04.936 +337 | 57.91 -209 | 11.939 +366 | 28.10 -169 |
| 1 21.2 | 36.156 +643 | 51.92 -126 | 43.278 +366 | 12.22 -188 | 05.274 +338 | 59.94 -203 | 12.305 +366 | 29.97 -187 |
| 1 31.2 | 36.779 +623 | 53.62 -170 | 43.631 +353 | 14.19 -197 | 05.602 +328 | 61.83 -189 | 12.659 +354 | 31.94 -197 |
| 2 10.2 | 37.374 +595 | 55.74 -212 | 43.967 +336 | 16.22 -203 | 05.915 +313 | 63.54 -171 | 12.995 +336 | 33.96 -202 |
| 2 20.2 | 37.922 +548 | 58.22 -248 | 44.277 +310 | 18.24 -202 | 06.203 +288 | 65.01 -147 | 13.305 +310 | 35.98 -202 |
| 3 2.1 | 38.417 +495 | 60.97 -275 | 44.555 +278 | 20.19 -195 | 06.462 +259 | 66.23 -122 | 13.584 +279 | 37.93 -195 |
| 3 12.1 | 38.854 +437 | 63.95 -298 | 44.802 +247 | 22.07 -188 | 06.691 +229 | 67.19 -96 | 13.832 +248 | 39.80 -187 |
| 3 22.1 | 39.224 +370 | 67.07 -312 | 45.012 +210 | 23.81 -174 | 06.886 +195 | 67.86 -67 | 14.044 +212 | 41.53 -173 |
| 4 1.1 | 39.528 +304 | 70.26 -319 | 45.189 +177 | 25.40 -159 | 07.048 +162 | 68.28 -42 | 14.221 +177 | 43.12 -159 |
| 4 11.0 | 39.766 +238 | 73.49 -323 | 45.332 +143 | 26.84 -144 | 07.179 +131 | 68.46 -18 | 14.366 +145 | 44.56 -144 |
| 4 21.0 | 39.931 +165 | 76.66 -317 | 45.441 +109 | 28.10 -126 | 07.279 +100 | 68.43 +3 | 14.476 +110 | 45.82 -126 |
| 4 31.0 | 40.031 +100 | 79.71 -305 | 45.521 +80 | 29.19 -109 | 07.350 +71 | 68.25 +18 | 14.556 +80 | 46.92 -110 |
| 5 10.9 | 40.064 +33 | 82.63 -292 | 45.570 +49 | 30.12 -93 | 07.395 +45 | 67.92 +33 | 14.607 +51 | 47.85 -93 |
| 5 20.9 | 40.028 -36 | 85.30 -267 | 45.590 +20 | 30.87 -75 | 07.413 +18 | 67.48 +44 | 14.628 +21 | 48.59 -74 |
| 5 30.9 | 39.933 -95 | 87.71 -241 | 45.584 -6 | 31.45 -58 | 07.408 -5 | 66.99 +49 | 14.623 -5 | 49.18 -59 |
| 6 9.9 | 39.776 -157 | 89.80 -209 | 45.552 -32 | 31.85 -40 | 07.380 -28 | 66.44 +55 | 14.591 -32 | 49.59 -41 |
| 6 19.8 | 39.562 -214 | 91.51 -171 | 45.495 -57 | 32.07 -22 | 07.330 -50 | 65.86 +58 | 14.535 -56 | 49.81 -22 |
| 6 29.8 | 39.303 -259 | 92.83 -132 | 45.417 -78 | 32.12 -5 | 07.263 -67 | 65.30 +56 | 14.457 -78 | 49.87 -6 |
| 7 9.8 | 38.999 -304 | 93.71 -88 | 45.318 -99 | 31.99 +13 | 07.178 -85 | 64.74 +56 | 14.358 -99 | 49.75 +12 |
| 7 19.8 | 38.664 -335 | 94.10 -39 | 45.203 -115 | 31.69 +30 | 07.078 -100 | 64.21 +53 | 14.243 -115 | 49.45 +30 |
| 7 29.7 | 38.310 -354 | 94.05 +5 | 45.077 -126 | 31.23 +46 | 06.969 -109 | 63.73 +48 | 14.117 -126 | 49.00 +45 |
| 8 8.7 | 37.945 -365 | 93.52 +53 | 44.942 -135 | 30.61 +62 | 06.853 -116 | 63.30 +43 | 14.117 -135 | 48.39 +61 |
| 8 18.7 | 37.589 -356 | 92.52 +100 | 44.809 -133 | 29.86 +75 | 06.737 -116 | 62.97 +33 | 13.982 -135 | 47.66 +73 |
| 8 28.6 | 37.256 -333 | 91.12 +140 | 44.682 -127 | 29.02 +84 | 06.626 -111 | 62.72 +25 | 13.719 -128 | 46.83 +83 |
| 9 7.6 | 36.959 -297 | 89.33 +179 | 44.568 -114 | 28.11 +91 | 06.526 -100 | 62.59 +13 | 13.605 -114 | 45.92 +91 |
| 9 17.6 | 36.720 -239 | 87.23 +210 | 44.480 -88 | 27.19 +92 | 06.448 -78 | 62.61 -2 | 13.515 -90 | 45.00 +92 |
| 9 27.6 | 36.548 -172 | 84.91 +232 | 44.422 -58 | 26.30 +89 | 06.396 -52 | 62.80 -19 | 13.456 -59 | 44.11 +89 |
| 10 7.5 | 36.460 -88 | 82.43 +248 | 44.403 -19 | 25.48 +82 | 06.379 -17 | 63.18 -38 | 13.435 -21 | 43.30 +81 |
| 10 17.5 | 36.468 +8 | 79.94 +249 | 44.431 +28 | 24.83 +65 | 06.403 +24 | 63.76 -58 | 13.462 +27 | 42.66 +64 |
| 10 27.5 | 36.573 +105 | 77.51 +243 | 44.507 +76 | 24.38 +45 | 06.467 +64 | 64.58 -82 | 13.536 +74 | 42.20 +46 |
| 11 6.5 | 36.782 +209 | 75.25 +226 | 44.637 +130 | 24.13 +25 | 06.582 +115 | 65.70 -112 | 13.664 +128 | 41.95 +25 |
| 11 16.4 | 37.094 +312 | 73.28 +197 | 44.823 +186 | 24.19 -6 | 06.582 +165 | 65.70 -136 | 13.664 +184 | 41.95 -5 |
| 11 26.4 | 37.497 +403 | 71.67 +161 | 45.057 +234 | 24.56 -37 | 06.747 +210 | 67.06 -157 | 13.848 +234 | 42.00 -36 |
| 12 6.4 | 37.985 +488 | 70.50 +117 | 45.339 +282 | 25.26 -70 | 07.211 +254 | 70.41 -178 | 14.362 +280 | 43.06 -70 |
| 12 16.3 | 38.541 +556 | 69.84 +66 | 45.657 +318 | 26.28 -102 | 07.501 +290 | 72.35 -194 | 14.680 +318 | 44.07 -101 |
| 12 26.3 | 39.146 +605 | 69.70 +14 | 46.003 +346 | 27.58 -130 | 07.816 +315 | 74.39 -204 | 15.024 +344 | 45.37 -130 |
| 12 36.3 | 39.785 +639 | 70.09 -39 | 46.367 +364 | 29.15 -157 | 08.150 +334 | 76.49 -210 | 15.388 +364 | 46.93 -156 |
| | 39.719 +648 | 70.09 -94 | 46.367 +369 | 29.15 -177 | 08.150 +340 | 76.49 -206 | 15.388 +369 | 46.93 -176 |
| Mean Place | 39.719 | 75.47 | 45.562 | 24.08 | 07.233 | 64.01 | 14.594 | 41.79 |
| sec δ, tan δ | +2.251 | -2.016 | +1.103 | -0.464 | +1.002 | -0.061 | +1.103 | -0.465 |
| dα(ψ), dδ(ψ) | +0.087 | -0.35 | +0.067 | -0.35 | +0.062 | -0.35 | +0.067 | -0.35 |
| dα(ε), dδ(ε) | -0.117 | -0.49 | -0.027 | -0.49 | -0.004 | -0.50 | -0.027 | -0.50 |
| Dbles. Trans. | April 21 | | April 21 | | April 22 | | April 22 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 517 | | 516 | | 1364 | | 518 | |
|---|-------------------|----------------|-------------------|----------------|-------------------|----------------|-------------------|----------------|
| | 11 Bootis | | τ Virginis | | 307 G. Centauri | | β Centauri* | |
| Mag. Spect. | 6.12 | A3 | 4.34 | A2 | 6.44 | A0p | 0.86 | B1 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | $^{\circ}$ ' " | h m | $^{\circ}$ ' " | h m | $^{\circ}$ ' " | h m | $^{\circ}$ ' " |
| | 14 00 | +27 26 | 14 00 | + 1 36 | 14 02 | -41 21 | 14 02 | -60 18 |
| 1 ^d | ^s +313 | " -285 | ^s +303 | " -219 | ^s +385 | " -50 | ^s +532 | " +28 |
| 1 ^s | +338 | -262 | +323 | -220 | +409 | -88 | +566 | -23 |
| 1 | 31.219 | 65 88 | 54 630 | 42 65 | 33.912 | 10 69 | 46 612 | 05 57 |
| 1 | 31.557 | 63 26 | 54.953 | 40 45 | 34.321 | 11 57 | 47.178 | 06 80 |
| 1 | 31.912 | 60 92 | 55.288 | 38 29 | 34.744 | 12 83 | 47.765 | 06 53 |
| 1 | 32.271 | 58 98 | 55.625 | 36 26 | 35.167 | 14.43 | 48.355 | 07.77 |
| 1 | 32.623 | 57 48 | 55.953 | 34 42 | 35.577 | 16.30 | 48.928 | 09.43 |
| 2 | 32.960 | 56 45 | 56.265 | 32 81 | 35.969 | 18 39 | 49 476 | 11 49 |
| 2 | 33.271 | 55 94 | 56.553 | 31 48 | 36.331 | 20 65 | 49.985 | 13 89 |
| 3 | 33.551 | 55 91 | 56.812 | 30 46 | 36.658 | 23 01 | 50.445 | 16 54 |
| 3 | 33.797 | 56 36 | 57.042 | 29 74 | 36.950 | 25 42 | 50.856 | 19 40 |
| 3 | 34.004 | 57 25 | 57.237 | 29 34 | 37.200 | 27 83 | 51.206 | 22 40 |
| 4 | 34.171 | 58 48 | 57.400 | 29 21 | 37.411 | 30 19 | 51.498 | 25 46 |
| 4 | 34.301 | 60 02 | 57.531 | 29 32 | 37.582 | 32 48 | 51.731 | 28 54 |
| 4 | 34.391 | 61 76 | 57.630 | 29 66 | 37.713 | 34 64 | 51.899 | 31 57 |
| 4 | 34.448 | 63 62 | 57.701 | 30 15 | 37.806 | 36 66 | 52.010 | 34 49 |
| 5 | 34.471 | 65 54 | 57.745 | 30 77 | 37.863 | 38 52 | 52.060 | 37 27 |
| 5 | 34.462 | 67 42 | 57.762 | 31 48 | 37.881 | 40 16 | 52.050 | 39 82 |
| 5 | 34.427 | 69 19 | 57.756 | 32 23 | 37.867 | 41 58 | 51.986 | 42 12 |
| 6 | 34.366 | 70 82 | 57.727 | 32 99 | 37.819 | 42 77 | 51.865 | 44 13 |
| 6 | 34.281 | 72 23 | 57.676 | 33 74 | 37.738 | 43 66 | 51.694 | 45 77 |
| 6 | 34.179 | 73 39 | 57.608 | 34 43 | 37.630 | 44 29 | 51.480 | 47 04 |
| 7 | 34.058 | 74 27 | 57.522 | 35 08 | 37.494 | 44 61 | 51.223 | 47 89 |
| 7 | 33.924 | 74 84 | 57.422 | 35 63 | 37.339 | 44 61 | 50.937 | 48 28 |
| 7 | 33.782 | 75 09 | 57.312 | 36 10 | 37.168 | 44 32 | 50.631 | 48 25 |
| 8 | 33.634 | 75 02 | 57.195 | 36 46 | 36.988 | 43 71 | 50.312 | 47 76 |
| 8 | 33.488 | 74 58 | 57.078 | 36 69 | 36.808 | 42 82 | 49.999 | 46 82 |
| 8 | 33.349 | 73 83 | 56.966 | 36 78 | 36.638 | 41 69 | 49.702 | 45 50 |
| 9 | 33.223 | 72 73 | 56.865 | 36 71 | 36.484 | 40 34 | 49.436 | 43 81 |
| 9 | 33.120 | 71 30 | 56.785 | 36 45 | 36.362 | 38 84 | 49.220 | 41 82 |
| 9 | 33.044 | 69 56 | 56.731 | 36 00 | 36.277 | 37 25 | 49.062 | 39 62 |
| 10 | 33.004 | 67 50 | 56.710 | 35 34 | 36.239 | 35 63 | 48.978 | 37 26 |
| 10 | 33.007 | 65 17 | 56.730 | 34 44 | 36.259 | 34 08 | 48.980 | 34 90 |
| 10 | 33.056 | 62 60 | 56.792 | 33 30 | 36.337 | 32 67 | 49.069 | 32 59 |
| 11 | 33.157 | 59 81 | 56.903 | 31 89 | 36.480 | 31 47 | 49 253 | 30 44 |
| 11 | 33.310 | 56 88 | 57.063 | 30 25 | 36.688 | 30 57 | 49 531 | 28 59 |
| 11 | 33.513 | 53 87 | 57.269 | 28 42 | 36.953 | 29 99 | 49 892 | 27 07 |
| 12 | 33.764 | 50 84 | 57 519 | 26 40 | 37 275 | 29 80 | 50 332 | 25 98 |
| 12 | 34 056 | 47 91 | 57 804 | 24 26 | 37 640 | 30 03 | 50 836 | 25 38 |
| 12 | 34 379 | 45 13 | 58 116 | 22 07 | 38 037 | 30 65 | 51 385 | 25 27 |
| 12 | 34 726 | 42 60 | 58 448 | 19 88 | 38 458 | 31 68 | 51 968 | 25 69 |
| Mean Place | 33.761 | 65.18 | 57.522 | 34.13 | 37.846 | 31.57 | 51.797 | 30.20 |
| sec δ , tan δ | +1.127 | +0.519 | +1.000 | +0.028 | +1.332 | -0.880 | +2.019 | -1.754 |
| $d\alpha(\psi)$, $d\delta(\psi)$ | +0.054 | -0.34 | +0.061 | -0.34 | +0.073 | -0.34 | +0.085 | -0.34 |
| $d\alpha(\epsilon)$, $d\delta(\epsilon)$ | +0.030 | -0.50 | +0.002 | -0.50 | -0.050 | -0.51 | -0.101 | -0.51 |
| Dble. Trans. | April 22 | | April 22 | | April 22 | | April 22 | |

AT UPPER TRANSIT AT GREENWICH

| No. | 1365 | | 1363 | | 521 | | 1366 | |
|---------------|-----------------|------------|--------------|------------|-------------|-------------|-------------|------------|
| | 210 G. Virginis | | ♁ Apodis | | α Draconis | | 94 Virginis | |
| Mag. Spect. | 6.36 | K0 | 5.5 to 6.7 | M3 | 3.64 | A0p | 6.56 | A0 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " |
| | 14 03 | -14 54 | 14 03 | -76 43 | 14 03 | +64 25 | 14 05 | - 8 49 |
| 1 -8.7 | 39 819 +315 | 12.63 -158 | 50 021 +1017 | 29.90 +87 | 59 368 +484 | 77 28 -307 | 31.708 +307 | 27.88 -181 |
| 1 1.3 | 40 154 +335 | 14 38 -175 | 51 109 +1088 | 29 58 +32 | 59 909 +541 | 74.67 -261 | 32 036 +328 | 29.79 -191 |
| 1 11.3 | 40 502 +348 | 16.25 -187 | 52 246 +1137 | 29 84 -26 | 60 493 +584 | 72.59 -208 | 32 376 +340 | 31.78 -199 |
| 1 21.3 | 40 850 +348 | 18.19 -194 | 53 395 +1149 | 30.70 -86 | 61 100 +607 | 71.14 -145 | 32 718 +342 | 33.76 -198 |
| 1 31.2 | 41 188 +338 | 20.12 -193 | 54 519 +1124 | 32.08 -138 | 61 706 +606 | 70.34 -80 | 33 050 +332 | 35.66 -190 |
| 2 10.2 | 41 510 +322 | 22.00 -188 | 55 602 +1083 | 33 96 -188 | 62 298 +592 | 70.21 -13 | 33 367 +317 | 37.45 -179 |
| 2 20.2 | 41 809 +299 | 23 77 -177 | 56 609 +1007 | 36.31 -235 | 62 850 +552 | 70.76 +55 | 33 661 +294 | 39.05 -160 |
| 3 2.1 | 42 078 +269 | 25 37 -160 | 57 523 +914 | 39.02 -271 | 63 346 +496 | 71.92 +116 | 33 926 +265 | 40.45 -140 |
| 3 12.1 | 42 317 +239 | 26 82 -145 | 58 338 +815 | 42.04 -302 | 63 778 +432 | 73.64 +172 | 34 163 +237 | 41.63 -118 |
| 3 22.1 | 42 522 +205 | 28.06 -124 | 59 029 +691 | 45.32 -328 | 64 129 +351 | 75.85 +221 | 34 366 +203 | 42.56 -93 |
| 4 1.1 | 42 696 +174 | 29.09 -103 | 59 594 +565 | 48.73 -341 | 64 397 +268 | 78.41 +256 | 34 537 +171 | 43.26 -70 |
| 4 11.0 | 42 838 +142 | 29.95 -86 | 60 031 +437 | 52.27 -354 | 64 579 +182 | 81.25 +284 | 34 677 +140 | 43.75 -49 |
| 4 21.0 | 42 947 +109 | 30.60 -65 | 60 324 +293 | 55.81 -354 | 64 669 +90 | 84.22 +297 | 34 785 +108 | 44.03 -28 |
| 4 31.0 | 43 028 +81 | 31.09 -49 | 60 484 +160 | 59.29 -348 | 64 678 +9 | 87.21 +299 | 34 866 +81 | 44.15 -12 |
| 5 11.0 | 43 082 +54 | 31.42 -33 | 60 505 +21 | 62.67 -338 | 64 606 -72 | 90.13 +292 | 34 919 +53 | 44.12 +3 |
| 5 20.9 | 43 107 +25 | 31.60 -18 | 60 385 -120 | 65.84 -317 | 64 457 -149 | 92.85 +272 | 34 944 +25 | 43.96 +16 |
| 5 30.9 | 43 109 +2 | 31.67 -7 | 60 140 -245 | 68.76 -292 | 64 246 -211 | 95.28 +243 | 34 947 +3 | 43.72 +24 |
| 6 9.9 | 43 085 -24 | 31.62 +5 | 59 767 -373 | 71.37 -261 | 63 975 -271 | 97.38 +210 | 34 925 -22 | 43.39 +33 |
| 6 19.8 | 43 038 -47 | 31.46 +16 | 59 276 -491 | 73.58 -221 | 63 655 -320 | 99.04 +166 | 34 880 -45 | 43.00 +39 |
| 6 29.8 | 42 972 -66 | 31.22 +24 | 58 692 -584 | 75.37 -179 | 63 300 -355 | 100.25 +121 | 34 816 -64 | 42.58 +42 |
| 7 9.8 | 42 884 -88 | 30.88 +34 | 58 016 -676 | 76.69 -132 | 62 911 -389 | 100.98 +73 | 34 732 -84 | 42.12 +46 |
| 7 19.8 | 42 782 -102 | 30.47 +41 | 57 278 -738 | 77.47 -78 | 62 504 -407 | 101.16 +18 | 34 633 -99 | 41.64 +48 |
| 7 29.7 | 42 668 -114 | 30.00 +47 | 56 504 -774 | 77.74 -27 | 62 090 -414 | 100.85 -31 | 34 522 -111 | 41.16 +48 |
| 8 8.7 | 42 545 -123 | 29.47 +53 | 55 708 -796 | 77.46 +28 | 61 674 -416 | 100.02 -83 | 34 403 -119 | 40.68 +48 |
| 8 18.7 | 42 422 -123 | 28.91 +56 | 54 933 -775 | 76.64 +82 | 61 272 -402 | 98.66 -136 | 34 283 -120 | 40.23 +45 |
| 8 28.7 | 42 304 -118 | 28.34 +57 | 54 203 -730 | 75.33 +131 | 60 893 -379 | 96.85 -181 | 34 168 -115 | 39.84 +39 |
| 9 7.6 | 42 197 -107 | 27.79 +55 | 53 545 -658 | 73.54 +179 | 60 545 -348 | 94.58 -227 | 34 063 -105 | 39.50 +34 |
| 9 17.6 | 42 112 -85 | 27.30 +49 | 53 001 -544 | 71.35 +219 | 60 246 -299 | 91.88 -270 | 33 980 -83 | 39.29 +21 |
| 9 27.6 | 42 055 -57 | 26.91 +39 | 52 587 -414 | 68.85 +250 | 60 002 -244 | 88.84 -304 | 33 922 -58 | 39.20 +9 |
| 10 7.5 | 42 033 -22 | 26.65 +26 | 52 329 -258 | 66.11 +274 | 59 824 -178 | 85.47 -337 | 33 899 -23 | 39.27 -7 |
| 10 17.5 | 42 056 +23 | 26.58 +7 | 52 256 -73 | 63.26 +285 | 59 726 -98 | 81.85 -362 | 33 920 +21 | 39.55 -28 |
| 10 27.5 | 42 116 +60 | 26.89 -31 | 52 364 +108 | 60.42 +284 | 59 710 -16 | 78.07 -378 | 33 979 +59 | 39.93 -38 |
| 11 6.5 | 42 235 +119 | 27.06 -17 | 52 667 +303 | 57.67 +275 | 59 787 +77 | 74.17 -390 | 34 089 +110 | 40.78 -85 |
| 11 16.4 | 42 406 +171 | 27.06 -65 | 53 163 +496 | 55.17 +250 | 59 960 +173 | 70.29 -388 | 34 252 +163 | 41.80 -102 |
| 11 26.4 | 42 622 +216 | 28.63 -92 | 53 828 +665 | 53.01 +216 | 60 222 +262 | 66.49 -380 | 34 461 +209 | 43.06 -126 |
| 12 6.4 | 42 884 +262 | 29.82 -119 | 54 656 +828 | 51.26 +175 | 60 578 +356 | 62.87 -362 | 34 715 +264 | 44.55 -149 |
| 12 16.4 | 43 181 +297 | 31.26 -144 | 55 613 +957 | 50.04 +122 | 61 013 +435 | 59.57 -330 | 35 005 +290 | 46.25 -170 |
| 12 26.3 | 43 506 +325 | 32.90 -164 | 56 665 +1052 | 49.35 +69 | 61 516 +503 | 56.66 -291 | 35 321 +316 | 48.09 -184 |
| 12 36.3 | 43 850 +344 | 34.70 -180 | 57 790 +1125 | 49.24 +11 | 62 075 +559 | 54.24 -242 | 35 657 +336 | 50.05 -196 |
| | 43 850 +350 | 34.70 -190 | 57 790 +1153 | 49.24 -49 | 62 075 +592 | 54.24 -183 | 35 657 +343 | 50.05 -197 |
| Mean Place | 43.010 | 26.13 | 59.061 | 56.33 | 61.364 | 84.60 | 34.796 | 39.37 |
| sec δ, tan δ | +1.035 | -0.266 | +4.357 | -4.241 | +2.318 | +2.091 | +1.012 | -0.155 |
| dα(ψ), dδ(ψ) | +0.065 | -0.34 | +0.119 | -0.34 | +0.033 | -0.34 | +0.063 | -0.34 |
| dα(ε), dδ(ε) | -0.015 | -0.51 | -0.242 | -0.51 | +0.119 | -0.52 | -0.009 | -0.52 |
| Dbble. Trans. | April 23 | | April 23 | | April 23 | | April 23 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 519 | | 1367 | | 520 | | 1368 | |
|---|--------------|--------|--|--------|-------------------|--------|-------------|--------|
| | π Hydrae | | B.D. +39° 2720* (Canum Venaticorum) | | γ Centauri | | 9 H. Bootis | |
| Mag.Spect. | 3.48 | K0 | 7.90 | K0 | 2.26 | K0 | 5.44 | M3 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° / | h m | ° / | h m | ° / | h m | ° / |
| | 14 05 | -26 36 | 14 05 | +38 28 | 14 05 | -36 17 | 14 07 | +43 54 |
| 1 | -8.7 | +336 | +329 | -304 | +363 | -70 | +343 | -310 |
| 1 | 1.3 | +357 | +359 | -273 | +385 | -105 | +377 | -276 |
| 1 | 11.3 | +370 | +380 | -236 | +399 | -137 | +401 | -234 |
| 1 | 21.3 | +370 | +389 | -187 | +400 | -167 | +411 | -181 |
| 1 | 31.2 | +360 | +383 | -135 | +388 | -189 | +406 | -126 |
| 2 | 10.2 | +343 | +371 | -80 | +371 | -207 | +394 | -67 |
| 2 | 20.2 | +318 | +344 | -19 | +344 | -218 | +367 | -5 |
| 3 | 2.1 | +287 | +310 | +34 | +310 | -223 | +331 | +52 |
| 3 | 12.1 | +257 | +273 | +87 | +278 | -224 | +291 | +107 |
| 3 | 22.1 | +221 | +229 | +135 | +238 | -221 | +243 | +156 |
| 4 | 1.1 | +186 | +184 | +172 | +202 | -213 | +195 | +192 |
| 4 | 11.0 | +154 | +140 | +202 | +165 | -204 | +146 | +224 |
| 4 | 21.0 | +119 | +95 | +224 | +127 | -190 | +96 | +245 |
| 4 | 31.0 | +89 | +54 | +233 | +93 | -174 | +50 | +251 |
| 5 | 11.0 | +58 | +14 | +235 | +59 | -159 | +6 | +254 |
| 5 | 20.9 | +28 | -24 | +228 | +23 | -139 | -37 | +243 |
| 5 | 30.9 | +1 | -55 | +211 | -6 | -119 | -71 | +224 |
| 6 | 9.9 | -27 | -87 | +191 | -38 | -97 | -106 | +201 |
| 6 | 19.8 | -54 | -113 | +162 | -69 | -71 | -135 | +168 |
| 6 | 29.8 | -75 | -134 | +129 | -94 | -48 | -158 | +132 |
| 7 | 9.8 | -99 | -156 | +94 | -119 | -22 | -180 | +95 |
| 7 | 19.8 | -116 | -169 | +54 | -140 | +7 | -196 | +50 |
| 7 | 29.7 | -129 | -178 | +15 | -153 | +31 | -203 | +8 |
| 8 | 8.7 | -138 | -184 | -25 | -163 | +58 | -211 | -36 |
| 8 | 18.7 | -139 | -181 | -69 | -164 | +81 | -206 | -81 |
| 8 | 28.7 | -133 | -173 | -107 | -156 | +101 | -196 | -123 |
| 9 | 7.6 | -121 | -159 | -147 | -142 | +120 | -181 | -165 |
| 9 | 17.6 | -96 | -133 | -186 | -113 | +130 | -153 | -205 |
| 9 | 27.6 | -66 | -103 | -219 | -80 | +136 | -120 | -240 |
| 10 | 7.5 | -27 | -65 | -253 | -36 | +136 | -80 | -274 |
| 10 | 17.5 | +21 | -17 | -282 | +18 | +127 | -28 | -303 |
| 10 | 27.5 | +69 | +33 | -305 | +72 | +112 | +24 | -325 |
| 11 | 6.5 | +123 | +89 | -325 | +132 | +91 | +85 | -344 |
| 11 | 16.4 | +181 | +148 | -334 | +193 | +62 | +147 | -351 |
| 11 | 26.4 | +231 | +202 | -338 | +249 | +30 | +205 | -352 |
| 12 | 6.4 | +279 | +257 | -334 | +302 | -7 | +265 | -346 |
| 12 | 16.4 | +318 | +304 | -317 | +343 | -45 | +315 | -325 |
| 12 | 26.3 | +346 | +340 | -294 | +374 | -82 | +355 | -298 |
| 12 | 36.3 | +367 | +370 | -260 | +396 | -117 | +389 | -262 |
| | | +372 | +385 | -216 | +403 | -149 | +405 | -213 |
| Mean Place | 36.016 | 64.00 | 52.839 | 53.71 | 53.078 | 74.62 | 23.401 | 66.24 |
| sec δ , tan δ | +1.119 | -0.501 | +1.277 | +0.795 | +1.241 | -0.735 | +1.388 | +0.963 |
| $d\alpha(\psi)$, $d\delta(\psi)$ | +0.068 | -0.34 | +0.050 | -0.34 | +0.071 | -0.34 | +0.048 | -0.34 |
| $d\alpha(\epsilon)$, $d\delta(\epsilon)$ | -0.029 | -0.52 | +0.045 | -0.52 | -0.042 | -0.52 | +0.055 | -0.53 |
| Dble.Trans. | April 23 | | April 23 | | April 23 | | April 24 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 524 | | 522 | | 523 | | 526 | | |
|--------------|-------------------|--------------------------|-------------------------|--------------------------|-------------------------|--------------------------|---------------------|--------------------------|---------------------|
| | 4 Ursae Minoris | | 12 Bootis | | α Virginis | | α Bootis (Arcturus) | | |
| Name | | | | | | | | | |
| Mag Spect. | 5.00 | K0 | 4.82 | F5 | 4.31 | K0 | 0.24 | K0 | |
| U.T. | R.A. Dec. | | R.A. Dec. | | R.A. Dec. | | R.A. Dec. | | |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " | |
| | 14 08 | +77 36 | 14 09 | +25 08 | 14 12 | -10 12 | 14 15 | +19 14 | |
| 1 | ^d -8.7 | ^s 51.664 +825 | ^s 30.70 -295 | ^s 44.392 +304 | ^s 79.92 -284 | ^s 07.297 +305 | ^s " -173 | ^s 00.057 +295 | ^s " -276 |
| 1 | 1.3 | 52.605 +941 | -246 | 44.722 +330 | -264 | 07.623 +326 | -185 | 00.376 +319 | -262 |
| 1 | 11.3 | 53.645 +1040 | -190 | 45.069 +347 | -238 | 07.963 +340 | -193 | 00.712 +336 | -242 |
| 1 | 21.3 | 54.743 +1098 | -124 | 45.423 +354 | -201 | 08.306 +343 | -194 | 01.054 +342 | -210 |
| 1 | 31.2 | 55.854 +1111 | -59 | 45.770 +347 | -159 | 08.640 +334 | -188 | 01.390 +336 | -174 |
| 2 | 10.2 | 56.950 +1096 | +9 | 46.105 +335 | -113 | 08.961 +321 | -179 | 01.715 +325 | -133 |
| 2 | 20.2 | 57.983 +1033 | +79 | 46.416 +311 | -63 | 09.259 +298 | -162 | 02.017 +302 | -88 |
| 3 | 2.1 | 58.915 +932 | +137 | 46.698 +282 | -16 | 09.529 +270 | -142 | 02.291 +274 | -44 |
| 3 | 12.1 | 59.728 +813 | +194 | 46.947 +249 | +32 | 09.772 +243 | -122 | 02.536 +245 | 0 |
| 3 | 22.1 | 60.382 +654 | +241 | 47.159 +212 | +75 | 09.981 +209 | -98 | 02.745 +209 | +41 |
| 4 | 1.1 | 60.868 +486 | +273 | 47.334 +175 | +111 | 10.159 +178 | -75 | 02.919 +174 | +76 |
| 4 | 11.0 | 61.179 +311 | +299 | 47.472 +138 | +141 | 10.306 +147 | -56 | 03.059 +140 | +106 |
| 4 | 21.0 | 61.298 +119 | +310 | 47.573 +101 | +164 | 10.422 +116 | -35 | 03.163 +104 | +130 |
| 4 | 31.0 | 61.242 -56 | +307 | 47.640 +67 | +177 | 10.509 +87 | -18 | 03.236 +73 | +143 |
| 5 | 11.0 | 61.014 -228 | +298 | 47.674 +34 | +185 | 10.569 +60 | -4 | 03.278 +42 | +154 |
| 5 | 20.9 | 60.621 -393 | +274 | 47.677 +3 | +183 | 10.601 +32 | +9 | 03.290 +12 | +155 |
| 5 | 30.9 | 60.093 -528 | +241 | 47.653 -24 | +174 | 10.609 +8 | +19 | 03.277 -13 | +150 |
| 6 | 9.9 | 59.436 -657 | +205 | 47.602 -51 | +162 | 10.592 -17 | +27 | 03.237 -40 | +141 |
| 6 | 19.8 | 58.674 -762 | +157 | 47.527 -75 | +142 | 10.551 -41 | +34 | 03.173 -64 | +125 |
| 6 | 29.8 | 57.839 -835 | +110 | 47.433 -94 | +118 | 10.490 -61 | +38 | 03.090 -83 | +107 |
| 7 | 9.8 | 56.937 -902 | +58 | 47.319 -114 | +94 | 10.408 -82 | +43 | 02.986 -104 | +87 |
| 7 | 19.8 | 56.001 -936 | +1 | 47.191 -128 | +63 | 10.309 -99 | +46 | 02.868 -118 | +60 |
| 7 | 29.7 | 55.055 -946 | -50 | 47.053 -138 | +33 | 10.199 -110 | +47 | 02.739 -129 | +36 |
| 8 | 8.7 | 54.110 -945 | -103 | 46.907 -146 | +3 | 10.078 -121 | +48 | 02.600 -139 | +9 |
| 8 | 18.7 | 53.200 -910 | -157 | 46.762 -145 | -33 | 09.955 -123 | +46 | 02.462 -138 | -20 |
| 8 | 28.7 | 52.342 -858 | -202 | 46.622 -140 | -63 | 09.836 -119 | +43 | 02.327 -135 | -48 |
| 9 | 7.6 | 51.549 -793 | -249 | 46.494 -128 | -96 | 09.727 -109 | +38 | 02.202 -125 | -78 |
| 9 | 17.6 | 50.858 -691 | -289 | 46.387 -107 | -130 | 09.638 -89 | +27 | 02.202 -105 | -108 |
| 9 | 27.6 | 50.274 -584 | -322 | 46.306 -81 | -160 | 09.575 -63 | +16 | 02.097 -80 | -135 |
| 10 | 7.5 | 49.819 -455 | -354 | 46.259 -47 | -191 | 09.546 -29 | +0 | 01.969 -48 | -166 |
| 10 | 17.5 | 49.520 -299 | -374 | 46.254 -5 | -220 | 09.560 +14 | -19 | 01.963 -6 | -193 |
| 10 | 27.5 | 49.374 -146 | -388 | 46.295 +41 | -244 | 09.620 +60 | -26 | 02.000 +37 | -218 |
| 11 | 6.5 | 49.404 +30 | -396 | 46.386 +91 | -267 | 09.718 +98 | -76 | 02.087 +87 | -243 |
| 11 | 16.4 | 49.617 +213 | -391 | 46.530 +144 | -283 | 09.877 +159 | -92 | 02.225 +138 | -260 |
| 11 | 26.4 | 50.002 +385 | -378 | 46.722 +192 | -293 | 10.082 +205 | -116 | 02.411 +186 | -274 |
| 12 | 6.4 | 50.566 +564 | -356 | 46.964 +242 | -297 | 10.332 +250 | -140 | 02.644 +233 | -282 |
| 12 | 16.4 | 51.291 +725 | -320 | 47.247 +283 | -290 | 10.619 +287 | -160 | 02.918 +274 | -279 |
| 12 | 26.3 | 52.150 +859 | -278 | 47.561 +314 | -278 | 10.933 +314 | -177 | 03.222 +304 | -272 |
| 12 | 36.3 | 53.132 +982 | -226 | 47.901 +340 | -255 | 11.269 +336 | -189 | 03.551 +329 | -255 |
| | | +1056 | -163 | +351 | -223 | +343 | -193 | +339 | -229 |
| Mean Place | 53.182 | 39.41 | 47.004 | 78.91 | 10.447 | 40.76 | 02.726 | 68.45 | |
| sec δ, tan δ | +4.661 | +4.552 | +1.105 | +0.470 | +1.016 | -0.180 | +1.059 | +0.349 | |
| dα(ψ), dδ(ψ) | -0.003 | -0.34 | +0.054 | -0.34 | +0.064 | -0.33 | +0.056 | -0.33 | |
| dα(ε), dδ(ε) | +0.257 | -0.53 | +0.026 | -0.54 | -0.010 | -0.55 | +0.019 | -0.56 | |
| Dble.Trans. | April 24 | | April 24 | | April 25 | | April 26 | | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 525 | | 528 | | 527 | | 1370 | | | | | | | | | | |
|--------------|------------|--------|-----------|---------|----------|---------|----------|---------|--------|--------|-------|-------|-------|--------|-------|-------|-------|
| | ι Virginis | | ι Bootis* | | λ Bootis | | A Bootis | | | | | | | | | | |
| Mag. Spect. | 4.16 | F5 | 4.87 | A5 | 4.26 | A0 | 4.83 | K0 | | | | | | | | | |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | | | | | | | | | |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " | | | | | | | | | |
| | 14 15 | - 5 56 | 14 15 | + 51 25 | 14 15 | + 46 08 | 14 17 | + 35 33 | | | | | | | | | |
| 1 | -8.7 | 15.265 | + 299 | 01.14 | -190 | 38.963 | + 364 | 39.74 | -280 | 49.885 | + 342 | 55.54 | -316 | 23.046 | + 313 | 75.17 | -306 |
| 1 | 1.3 | 15.587 | + 322 | 03.13 | -199 | 39.367 | + 404 | 36.94 | -236 | 50.263 | + 378 | 52.73 | -281 | 23.389 | + 343 | 72.39 | -278 |
| 1 | 11.3 | 15.922 | + 335 | 05.15 | -202 | 39.803 | + 436 | 34.58 | -179 | 50.669 | + 406 | 50.33 | -240 | 23.755 | + 366 | 69.94 | -245 |
| 1 | 21.3 | 16.261 | + 339 | 07.13 | -198 | 40.256 | + 453 | 32.79 | -120 | 51.088 | + 419 | 48.47 | -186 | 24.131 | + 376 | 67.95 | -199 |
| 1 | 31.2 | 16.592 | + 331 | 09.01 | -188 | 40.707 | + 451 | 31.59 | -57 | 51.506 | + 418 | 47.18 | -129 | 24.504 | + 373 | 66.46 | -149 |
| 2 | 10.2 | 16.911 | + 319 | 10.75 | -174 | 41.148 | + 441 | 31.02 | + 9 | 51.912 | + 406 | 46.49 | -69 | 24.866 | + 362 | 65.50 | -96 |
| 2 | 20.2 | 17.207 | + 296 | 12.27 | -152 | 41.562 | + 414 | 31.11 | + 69 | 52.293 | + 381 | 46.44 | -5 | 25.206 | + 340 | 65.13 | -37 |
| 3 | 2.2 | 17.477 | + 270 | 13.56 | -129 | 41.937 | + 375 | 31.80 | + 126 | 52.640 | + 347 | 46.97 | + 53 | 25.514 | + 308 | 65.30 | + 17 |
| 3 | 12.1 | 17.719 | + 242 | 14.60 | -104 | 42.270 | + 333 | 33.06 | + 178 | 52.947 | + 307 | 48.06 | + 109 | 25.789 | + 275 | 65.98 | + 68 |
| 3 | 22.1 | 17.928 | + 209 | 15.38 | -78 | 42.548 | + 278 | 34.84 | + 216 | 53.205 | + 258 | 49.65 | + 159 | 26.023 | + 234 | 67.16 | + 118 |
| 4 | 1.1 | 18.106 | + 178 | 15.92 | -54 | 42.771 | + 223 | 37.00 | + 248 | 53.413 | + 208 | 51.64 | + 199 | 26.216 | + 193 | 68.72 | + 156 |
| 4 | 11.0 | 18.254 | + 148 | 16.23 | -31 | 42.937 | + 166 | 39.48 | + 269 | 53.572 | + 159 | 53.95 | + 231 | 26.367 | + 151 | 70.61 | + 189 |
| 4 | 21.0 | 18.371 | + 117 | 16.33 | -10 | 43.044 | + 107 | 42.17 | + 275 | 53.677 | + 105 | 56.47 | + 252 | 26.475 | + 108 | 72.73 | + 212 |
| 4 | 31.0 | 18.459 | + 88 | 16.27 | + 6 | 43.096 | + 52 | 44.92 | + 277 | 53.735 | + 58 | 59.08 | + 261 | 26.544 | + 69 | 74.96 | + 223 |
| 5 | 11.0 | 18.520 | + 61 | 16.06 | + 21 | 43.095 | - 1 | 47.69 | + 264 | 53.746 | + 11 | 61.72 | + 284 | 26.575 | + 31 | 77.26 | + 230 |
| 5 | 20.9 | 18.553 | + 33 | 15.74 | + 32 | 43.042 | - 53 | 50.33 | + 243 | 53.712 | - 34 | 64.25 | + 253 | 26.569 | - 6 | 79.50 | + 224 |
| 5 | 30.9 | 18.562 | + 9 | 15.35 | + 39 | 42.948 | - 94 | 52.76 | + 217 | 53.640 | - 72 | 66.60 | + 235 | 26.531 | - 38 | 81.61 | + 211 |
| 6 | 9.9 | 18.546 | - 16 | 14.90 | + 45 | 42.811 | - 137 | 54.93 | + 180 | 53.531 | - 109 | 68.71 | + 211 | 26.463 | - 68 | 83.55 | + 194 |
| 6 | 19.9 | 18.506 | - 40 | 14.41 | + 49 | 42.637 | - 174 | 56.73 | + 142 | 53.389 | - 142 | 70.49 | + 178 | 26.366 | - 97 | 85.21 | + 166 |
| 6 | 29.8 | 18.446 | - 60 | 13.91 | + 50 | 42.437 | - 200 | 58.15 | + 99 | 53.223 | - 166 | 71.91 | + 142 | 26.247 | - 119 | 86.58 | + 137 |
| 7 | 9.8 | 18.366 | - 80 | 13.40 | + 51 | 42.209 | - 228 | 59.14 | + 52 | 53.031 | - 192 | 72.93 | + 102 | 26.105 | - 142 | 87.63 | + 105 |
| 7 | 19.8 | 18.269 | - 97 | 12.91 | + 49 | 41.963 | - 246 | 59.66 | + 6 | 52.822 | - 209 | 73.51 | + 58 | 25.948 | - 157 | 88.29 | + 66 |
| 7 | 29.7 | 18.159 | - 110 | 12.45 | + 46 | 41.707 | - 256 | 59.72 | + 6 | 52.603 | - 219 | 73.65 | + 14 | 25.779 | - 169 | 88.59 | + 30 |
| 8 | 8.7 | 18.039 | - 120 | 12.02 | + 43 | 41.444 | - 263 | 59.30 | - 42 | 52.376 | - 227 | 73.34 | - 31 | 25.602 | - 177 | 88.49 | - 10 |
| 8 | 18.7 | 17.918 | - 121 | 11.65 | + 37 | 41.185 | - 259 | 58.38 | - 92 | 52.153 | - 223 | 72.55 | - 79 | 25.425 | - 177 | 87.98 | - 51 |
| 8 | 28.7 | 17.799 | - 119 | 11.36 | + 29 | 40.936 | - 249 | 57.03 | - 135 | 51.937 | - 216 | 71.35 | - 120 | 25.253 | - 172 | 87.09 | - 89 |
| 9 | 7.6 | 17.689 | - 110 | 11.15 | + 21 | 40.705 | - 231 | 55.22 | - 181 | 51.737 | - 200 | 69.71 | - 164 | 25.094 | - 159 | 85.81 | - 128 |
| 9 | 17.6 | 17.599 | - 90 | 11.08 | + 7 | 40.505 | - 200 | 52.99 | - 223 | 51.565 | - 172 | 67.64 | - 207 | 24.957 | - 137 | 84.14 | - 167 |
| 9 | 27.6 | 17.534 | - 65 | 11.15 | - 7 | 40.341 | - 164 | 50.40 | - 259 | 51.424 | - 141 | 65.23 | - 241 | 24.848 | - 109 | 82.14 | - 200 |
| 10 | 7.5 | 17.502 | - 32 | 11.40 | - 25 | 40.223 | - 118 | 47.44 | - 296 | 51.326 | - 98 | 62.45 | - 278 | 24.775 | - 73 | 79.78 | - 236 |
| 10 | 17.5 | 17.512 | + 10 | 11.85 | - 45 | 40.162 | - 61 | 44.20 | - 324 | 51.280 | - 46 | 59.38 | - 307 | 24.748 | - 27 | 77.13 | - 265 |
| 10 | 27.5 | 17.563 | + 51 | 12.47 | - 62 | 40.160 | - 2 | 40.74 | - 346 | 51.288 | + 8 | 56.09 | - 329 | 24.769 | + 21 | 74.24 | - 289 |
| 11 | 6.5 | 17.661 | + 98 | 13.43 | - 96 | 40.226 | + 66 | 37.09 | - 365 | 51.358 | + 70 | 52.59 | - 350 | 24.844 | + 75 | 71.12 | - 312 |
| 11 | 16.4 | 17.813 | + 152 | 14.62 | - 119 | 40.362 | + 136 | 33.39 | - 370 | 51.492 | + 134 | 49.02 | - 357 | 24.977 | + 133 | 67.88 | - 324 |
| 11 | 26.4 | 18.012 | + 199 | 16.02 | - 140 | 40.564 | + 202 | 29.70 | - 369 | 51.688 | + 196 | 45.44 | - 358 | 25.163 | + 186 | 64.57 | - 331 |
| 12 | 6.4 | 18.255 | + 243 | 17.65 | - 163 | 40.834 | + 270 | 26.10 | - 360 | 51.945 | + 257 | 41.91 | - 353 | 25.404 | + 241 | 61.27 | - 330 |
| 12 | 16.4 | 18.536 | + 281 | 19.45 | - 180 | 41.164 | + 330 | 22.74 | - 336 | 52.256 | + 311 | 38.60 | - 331 | 25.691 | + 287 | 58.11 | - 316 |
| 12 | 26.3 | 18.845 | + 309 | 21.38 | - 193 | 41.542 | + 378 | 19.68 | - 306 | 52.611 | + 355 | 35.56 | - 304 | 26.015 | + 324 | 55.14 | - 297 |
| 12 | 36.3 | 19.176 | + 331 | 23.39 | - 201 | 41.961 | + 419 | 17.03 | - 265 | 53.002 | + 391 | 32.89 | - 267 | 26.370 | + 355 | 52.47 | - 267 |
| | | 19.176 | + 339 | 23.39 | - 200 | 41.961 | + 442 | 17.03 | - 213 | 53.002 | + 411 | 32.89 | - 218 | 26.370 | + 370 | 52.47 | - 226 |
| Mean Place | 18.353 | 11.34 | | 41.254 | 45.24 | 52.249 | 60.02 | 25.565 | 77.19 | | | | | | | | |
| sec δ, tan δ | +1.005 | -0.104 | | +1.604 | +1.254 | +1.443 | +1.041 | +1.229 | +0.715 | | | | | | | | |
| dα(ψ), dδ(ψ) | +0.063 | -0.33 | | +0.043 | -0.33 | +0.046 | -0.33 | +0.050 | -0.33 | | | | | | | | |
| dα(ε), dδ(ε) | -0.006 | -0.56 | | +0.069 | -0.56 | +0.058 | -0.56 | +0.039 | -0.56 | | | | | | | | |
| Dble.Trans. | April 26 | | April 26 | | April 26 | | April 26 | | | | | | | | | | |

APPARENT PLACES OF STARS, 1986

219

AT UPPER TRANSIT AT GREENWICH

| No. | 1369 | | 1371 | | 1372 | | 529 | |
|--------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|
| | 236 G. Virginis | | λ Virginis | | 18 Bootis | | ν Centauri | |
| Mag. Spect. | 5.74 | A0p | 4.60 | A2 | 5.31 | F0 | 4.41 | B5 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | ^h ^m | ^o ['] | ^h ^m | ^o ['] | ^h ^m | ^o ['] | ^h ^m | ^o ['] |
| | 14 17 | -18 39 | 14 18 | -13 18 | 14 18 | +13 03 | 14 19 | -56 19 |
| 1 -8.7 | ^s 49.976 +313 | 00.74 -135 | ^s 19.409 +305 | 22.06 -158 | ^s 34.249 +291 | -255 | ^s 17.459 +474 | 07.80 +31 |
| 1 1.3 | 50.311 +335 | 02.30 -156 | 19.736 +327 | 23.79 -173 | 34.565 +316 | -245 | 17.968 +509 | 07.96 -16 |
| 1 11.3 | 50.661 +350 | 04.01 -171 | 20.078 +342 | 25.63 -184 | 34.897 +332 | -232 | 18.501 +533 | 08.58 -62 |
| 1 21.3 | 51.014 +353 | 05.84 -183 | 20.424 +346 | 27.52 -189 | 35.235 +338 | -206 | 19.042 +541 | 09.68 -110 |
| 1 31.2 | 51.360 +346 | 07.70 -186 | 20.762 +338 | 29.38 -186 | 35.568 +333 | -177 | 19.572 +530 | 11.18 -150 |
| 2 10.2 | 51.693 +333 | 09.55 -185 | 21.087 +325 | 31.18 -180 | 35.889 +321 | -142 | 20.084 +512 | 13.05 -187 |
| 2 20.2 | 52.003 +310 | 11.34 -179 | 21.391 +304 | 32.85 -167 | 36.189 +300 | -103 | 20.565 +481 | 15.24 -219 |
| 3 2.2 | 52.286 +283 | 13.00 -166 | 21.668 +277 | 34.36 -151 | 36.463 +274 | -62 | 21.005 +440 | 17.66 -242 |
| 3 12.1 | 52.540 +254 | 14.54 -154 | 21.918 +250 | 35.69 -133 | 36.708 +245 | -23 | 21.403 +398 | 20.29 -263 |
| 3 22.1 | 52.762 +222 | 15.91 -137 | 22.135 +217 | 36.80 -111 | 36.920 +212 | +16 | 21.750 +347 | 23.05 -276 |
| 4 1.1 | 52.952 +190 | 17.11 -120 | 22.320 +185 | 37.71 -91 | 37.098 +178 | +49 | 22.046 +296 | 25.86 -281 |
| 4 11.0 | 53.112 +160 | 18.14 -103 | 22.476 +156 | 38.44 -73 | 37.245 +147 | +77 | 22.292 +246 | 28.72 -286 |
| 4 21.0 | 53.239 +127 | 18.98 -84 | 22.600 +124 | 38.96 -52 | 37.358 +113 | +102 | 22.481 +189 | 31.53 -281 |
| 4 31.0 | 53.337 +98 | 19.67 -69 | 22.696 +96 | 39.33 -37 | 37.441 +83 | +117 | 22.619 +138 | 34.25 -272 |
| 5 11.0 | 53.406 +69 | 20.21 -54 | 22.764 +68 | 39.54 -21 | 37.494 +53 | +128 | 22.704 +85 | 36.85 -260 |
| 5 20.9 | 53.446 +40 | 20.60 -39 | 22.803 +39 | 39.62 -8 | 37.519 +25 | +133 | 22.733 +29 | 39.26 -241 |
| 5 30.9 | 53.460 +14 | 20.86 -26 | 22.817 +14 | 39.60 +2 | 37.518 -1 | +131 | 22.714 -19 | 41.45 -219 |
| 6 9.9 | 53.447 -13 | 21.00 -14 | 22.805 -12 | 39.48 +12 | 37.492 -26 | +126 | 22.714 -72 | 43.39 -194 |
| 6 19.9 | 53.408 -39 | 21.01 -1 | 22.767 -38 | 39.26 +22 | 37.442 -50 | +116 | 22.642 -120 | 44.99 -160 |
| 6 29.8 | 53.347 -61 | 20.91 +10 | 22.709 -58 | 38.99 +27 | 37.372 -70 | +102 | 22.522 -162 | 46.27 -128 |
| 7 9.8 | 53.262 -85 | 20.70 +21 | 22.628 -81 | 38.64 +35 | 37.281 -91 | +86 | 22.156 -204 | 47.16 -89 |
| 7 19.8 | 53.160 -102 | 20.38 +32 | 22.529 -99 | 38.24 +40 | 37.174 -107 | +67 | 22.120 -236 | 47.64 -48 |
| 7 29.7 | 53.043 -117 | 19.97 +41 | 22.417 -112 | 37.79 +45 | 37.056 -118 | +47 | 21.920 -259 | 47.73 -9 |
| 8 8.7 | 52.914 -129 | 19.47 +50 | 22.293 -124 | 37.31 +48 | 36.927 -129 | +25 | 21.385 -276 | 47.38 +35 |
| 8 18.7 | 52.783 -131 | 18.90 +57 | 22.167 -126 | 36.81 +50 | 36.797 -130 | +1 | 21.108 -277 | 46.62 +76 |
| 8 28.7 | 52.655 -128 | 18.29 +61 | 22.044 -123 | 36.33 +48 | 36.670 -127 | -21 | 20.841 -267 | 45.49 +113 |
| 9 7.6 | 52.537 -118 | 17.65 +64 | 21.929 -115 | 35.86 +47 | 36.551 -119 | -47 | 20.595 -246 | 44.00 +149 |
| 9 17.6 | 52.439 -98 | 17.05 +60 | 21.834 -95 | 35.47 +39 | 36.452 -99 | -74 | 20.389 -206 | 42.22 +178 |
| 9 27.6 | 52.368 -71 | 16.49 +56 | 21.765 -69 | 35.16 +31 | 36.376 -76 | -99 | 20.232 -157 | 40.23 +199 |
| 10 7.6 | 52.332 -36 | 16.04 +45 | 21.730 -35 | 34.99 +17 | 36.332 -44 | -126 | 20.137 -95 | 38.08 +215 |
| 10 17.5 | 52.340 +8 | 15.75 +29 | 21.738 +8 | 35.01 -2 | 36.328 -4 | -153 | 20.118 -19 | 35.89 +219 |
| 10 27.5 | 52.394 +54 | 15.68 +7 | 21.798 +60 | 35.23 -22 | 36.367 +39 | -178 | 20.177 +59 | 33.75 +214 |
| 11 6.5 | 52.494 +100 | 15.75 -7 | 21.885 +87 | 35.62 -39 | 36.454 +87 | -203 | 20.321 +144 | 31.73 +202 |
| 11 16.4 | 52.655 +161 | 16.11 -36 | 22.041 +156 | 36.34 -72 | 36.592 +138 | -223 | 20.552 +231 | 29.97 +176 |
| 11 26.4 | 52.863 +208 | 16.75 -64 | 22.243 +202 | 37.30 -96 | 36.777 +185 | -239 | 20.860 +308 | 28.52 +145 |
| 12 6.4 | 53.118 +255 | 17.68 -93 | 22.491 +248 | 38.52 -122 | 37.008 +231 | -251 | 21.244 +384 | 27.45 +107 |
| 12 16.4 | 53.412 +294 | 18.87 -119 | 22.778 +287 | 39.96 -144 | 37.279 +271 | -254 | 21.689 +445 | 26.84 +61 |
| 12 26.3 | 53.736 +324 | 20.29 -142 | 23.093 +315 | 41.58 -162 | 37.580 +301 | -252 | 22.180 +491 | 26.69 +15 |
| 12 36.3 | 54.081 +345 | 21.91 -162 | 23.430 +337 | 43.36 -178 | 37.905 +325 | -241 | 22.707 +527 | 27.02 -33 |
| | 54.081 +354 | 21.91 -176 | 23.430 +346 | 43.36 -186 | 37.905 +336 | -222 | 22.707 +540 | 27.02 -81 |
| Mean Place | 53.331 | 14.33 | 22.654 | 34.02 | 37.066 | 58.16 | 22.486 | 30.11 |
| sec δ, tan δ | +1.055 | -0.338 | +1.028 | -0.237 | +1.027 | +0.232 | +1.803 | -1.501 |
| dα(ψ), dδ(ψ) | +0.066 | -0.33 | +0.065 | -0.33 | +0.058 | -0.33 | +0.084 | -0.33 |
| dα(ε), dδ(ε) | -0.019 | -0.57 | -0.013 | -0.57 | +0.013 | -0.57 | -0.082 | -0.57 |
| Dble. Trans. | April 26 | | April 26 | | April 26 | | April 27 | |

AT UPPER TRANSIT AT GREENWICH

| No. | 1373 | | | 1374 | | 1375 | | 530 | | | | | | | | | |
|---|-----------------|--------------|-------|----------|--------------|-----------------|--------------|---------------|--------------|--------|-------|-------|------|--------|-------|-------|------|
| | ψ Centauri | | | 2 Librae | | 244 G. Virginis | | 10 G. Circini | | | | | | | | | |
| Mag. Spect. | 4.17 | A0 | | 6.30 | K0 | 5.08 | A3 | 5.71 | A2p | | | | | | | | |
| U.T. | R.A. | Dec. | | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | | | | | | | | |
| | h m | $^{\circ}$ / | | h m | $^{\circ}$ / | h m | $^{\circ}$ / | h m | $^{\circ}$ / | | | | | | | | |
| | 14 19 | - 37 49 | | 14 22 | - 11 38 | 14 23 | + 5 52 | 14 23 | - 68 07 | | | | | | | | |
| 1 | -8.7 | 39 977 | + 361 | 07 06 | - 49 | 38 699 | + 300 | 59 20 | -177 | 28 053 | + 288 | 57 17 | -231 | 51 531 | + 648 | 41 72 | + 84 |
| 1 | 1.3 | 40 363 | + 386 | 07 91 | - 85 | 39 022 | + 323 | 60 97 | -177 | 28 365 | + 312 | 57 17 | -228 | 51 531 | + 701 | 41 41 | + 31 |
| 1 | 11.3 | 40 767 | + 404 | 09 09 | -118 | 39 361 | + 339 | 62 83 | -186 | 28 693 | + 328 | 52 67 | -222 | 52 972 | + 740 | 41 61 | - 20 |
| 1 | 21.3 | 41 175 | + 408 | 10 58 | -149 | 39 704 | + 343 | 64 73 | -190 | 29 028 | + 335 | 50 63 | -204 | 53 727 | + 755 | 42 37 | - 76 |
| 1 | 31.2 | 41 574 | + 399 | 12 30 | -172 | 40 041 | + 337 | 66 58 | -185 | 29 357 | + 329 | 48 81 | -182 | 54 472 | + 745 | 43 61 | -124 |
| 2 | 10.2 | 41 958 | + 384 | 14 22 | -192 | 40 366 | + 325 | 68 35 | -177 | 29 675 | + 318 | 47 26 | -155 | 55 198 | + 726 | 45 31 | -170 |
| 2 | 20.2 | 42 318 | + 360 | 16 29 | -207 | 40 670 | + 304 | 69 97 | -162 | 29 973 | + 298 | 46 04 | -122 | 55 882 | + 684 | 47 43 | -212 |
| 3 | 2.2 | 42 647 | + 329 | 18 42 | -213 | 40 948 | + 278 | 71 41 | -144 | 30 246 | + 273 | 45 17 | - 87 | 56 511 | + 629 | 49 87 | -244 |
| 3 | 12.1 | 42 944 | + 297 | 20 60 | -218 | 41 200 | + 252 | 72 66 | -125 | 30 492 | + 246 | 44 63 | - 54 | 57 084 | + 573 | 52 62 | -275 |
| 3 | 22.1 | 43 204 | + 260 | 22 76 | -216 | 41 419 | + 219 | 73 69 | -103 | 30 705 | + 213 | 44 45 | - 18 | 57 583 | + 499 | 55 58 | -296 |
| 4 | 1.1 | 43 427 | + 223 | 24 87 | -211 | 41 608 | + 189 | 74 51 | - 82 | 30 887 | + 182 | 44 56 | + 11 | 58 008 | + 425 | 58 68 | -310 |
| 4 | 11.0 | 43 615 | + 188 | 26 91 | -204 | 41 767 | + 159 | 75 13 | - 62 | 31 039 | + 152 | 44 95 | + 39 | 58 359 | + 351 | 61 89 | -321 |
| 4 | 21.0 | 43 764 | + 149 | 28 84 | -193 | 41 894 | + 127 | 75 54 | - 41 | 31 158 | + 119 | 45 57 | + 62 | 58 623 | + 264 | 65 11 | -322 |
| 4 | 31.0 | 43 878 | + 114 | 30 64 | -180 | 41 993 | + 99 | 75 80 | - 26 | 31 249 | + 91 | 46 35 | + 78 | 58 809 | + 186 | 68 29 | -318 |
| 5 | 11.0 | 43 956 | + 78 | 32 29 | -165 | 42 065 | + 72 | 75 92 | - 12 | 31 311 | + 62 | 47 26 | + 91 | 58 911 | + 102 | 71 38 | -309 |
| 5 | 20.9 | 43 998 | + 42 | 33 76 | -147 | 42 107 | + 42 | 75 90 | + 2 | 31 345 | + 34 | 48 24 | + 98 | 58 927 | + 16 | 74 30 | -292 |
| 5 | 30.9 | 44 008 | + 10 | 35 05 | -129 | 42 125 | + 18 | 75 79 | + 11 | 31 354 | + 9 | 49 24 | +100 | 58 865 | - 62 | 77 00 | -270 |
| 6 | 9.9 | 43 983 | - 25 | 36 13 | -108 | 42 116 | - 9 | 75 59 | + 20 | 31 337 | - 17 | 50 24 | +100 | 58 722 | -143 | 79 44 | -244 |
| 6 | 19.9 | 43 925 | - 58 | 36 96 | - 83 | 42 081 | - 35 | 75 31 | + 28 | 31 297 | - 40 | 51 18 | + 94 | 58 503 | - 219 | 81 52 | -208 |
| 6 | 29.8 | 43 839 | - 86 | 37 56 | - 60 | 42 026 | - 55 | 74 99 | + 32 | 31 235 | - 62 | 52 04 | + 86 | 58 219 | - 284 | 83 24 | -172 |
| 7 | 9.8 | 43 724 | - 115 | 37 90 | - 34 | 41 947 | - 79 | 74 60 | + 39 | 31 153 | - 82 | 52 81 | + 77 | 57 872 | - 347 | 84 53 | -129 |
| 7 | 19.8 | 43 586 | - 138 | 37 95 | - 5 | 41 850 | - 97 | 74 19 | + 41 | 31 053 | -100 | 53 44 | + 63 | 57 476 | - 396 | 85 35 | - 82 |
| 7 | 29.7 | 43 431 | - 155 | 37 76 | + 19 | 41 739 | -111 | 73 74 | + 45 | 30 941 | -112 | 53 94 | + 50 | 57 046 | - 430 | 85 70 | - 35 |
| 8 | 8.7 | 43 262 | - 169 | 37 28 | + 48 | 41 616 | -123 | 73 28 | + 46 | 30 817 | -124 | 54 29 | + 35 | 56 592 | - 454 | 85 56 | + 14 |
| 8 | 18.7 | 43 091 | - 171 | 36 55 | + 73 | 41 490 | -126 | 72 82 | + 46 | 30 691 | -126 | 54 46 | + 17 | 56 139 | - 453 | 84 91 | + 65 |
| 8 | 28.7 | 42 924 | - 167 | 35 60 | + 95 | 41 365 | -125 | 72 38 | + 44 | 30 566 | -125 | 54 45 | - 1 | 55 701 | - 438 | 83 81 | +110 |
| 9 | 7.6 | 42 770 | - 154 | 34 44 | +116 | 41 249 | -116 | 71 98 | + 40 | 30 450 | -116 | 54 25 | - 20 | 55 296 | - 405 | 82 25 | +156 |
| 9 | 17.6 | 42 642 | - 128 | 33 15 | +129 | 41 152 | - 97 | 71 67 | + 31 | 30 351 | - 99 | 53 83 | - 42 | 54 953 | - 343 | 80 32 | +193 |
| 9 | 27.6 | 42 546 | - 96 | 31 78 | +137 | 41 080 | - 72 | 71 45 | + 22 | 30 276 | - 75 | 53 20 | - 63 | 54 682 | - 271 | 78 10 | +222 |
| 10 | 7.6 | 42 494 | - 52 | 30 37 | +141 | 41 041 | - 39 | 71 37 | + 8 | 30 232 | - 44 | 52 34 | - 86 | 54 503 | - 179 | 75 63 | +247 |
| 10 | 17.5 | 42 495 | + 1 | 29 02 | +135 | 41 045 | + 4 | 71 48 | - 11 | 30 228 | - 4 | 51 22 | -112 | 54 435 | - 68 | 73 05 | +258 |
| 10 | 27.5 | 42 552 | + 57 | 27 79 | +123 | 41 096 | + 51 | 71 75 | - 27 | 30 265 | + 37 | 49 87 | -135 | 54 480 | + 45 | 70 46 | +259 |
| 11 | 6.5 | 42 670 | + 118 | 26 75 | +104 | 41 182 | + 86 | 72 28 | - 53 | 30 351 | + 86 | 48 26 | -161 | 54 649 | + 169 | 67 94 | +252 |
| 11 | 16.4 | 42 851 | + 181 | 25 97 | + 78 | 41 332 | + 150 | 73 10 | - 82 | 30 487 | + 136 | 46 43 | -183 | 54 943 | + 294 | 65 64 | +230 |
| 11 | 26.4 | 43 089 | + 238 | 25 48 | + 49 | 41 529 | + 197 | 74 14 | -104 | 30 670 | + 183 | 44 41 | -202 | 55 349 | + 406 | 63 63 | +201 |
| 12 | 6.4 | 43 383 | + 294 | 25 35 | + 13 | 41 772 | + 243 | 75 44 | -130 | 30 899 | + 229 | 42 22 | -219 | 55 865 | + 516 | 62 01 | +162 |
| 12 | 16.4 | 43 722 | + 339 | 25 60 | - 25 | 42 053 | + 281 | 76 94 | -150 | 31 168 | + 269 | 39 96 | -226 | 56 470 | + 605 | 60 86 | +115 |
| 12 | 26.3 | 44 095 | + 373 | 26 20 | - 60 | 42 364 | + 311 | 78 61 | -167 | 31 466 | + 298 | 37 66 | -230 | 57 143 | + 673 | 60 19 | + 67 |
| 12 | 36.3 | 44 494 | + 399 | 27 18 | - 98 | 42 697 | + 333 | 80 42 | -181 | 31 787 | + 321 | 35 39 | -227 | 57 871 | + 728 | 60 06 | + 13 |
| | | | + 408 | | -129 | | + 343 | | -187 | | + 333 | | -214 | | + 753 | | - 42 |
| Mean Place | 43 914 | 25 55 | | 41 935 | 70 41 | 30 988 | 51 24 | 58 251 | 65 21 | | | | | | | | |
| sec δ , tan δ | +1.266 | -0.776 | | +1.021 | -0.206 | +1.005 | +0.103 | +2.685 | -2.492 | | | | | | | | |
| $d\alpha(\psi)$, $d\delta(\psi)$ | +0.073 | -0.33 | | +0.064 | -0.32 | +0.060 | -0.32 | +0.100 | -0.32 | | | | | | | | |
| $d\alpha(\epsilon)$, $d\delta(\epsilon)$ | -0.042 | -0.57 | | -0.011 | -0.58 | +0.006 | -0.59 | -0.134 | -0.59 | | | | | | | | |
| Dble. Trans. | April 27 | | | April 28 | | April 28 | | April 28 | | | | | | | | | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 1376 | | 531 | | 1377 | | 1378 | |
|--------------|--------------------------|------------|--------------------------|------------|--------------------------|------------|--------------------------|------------|
| | 3 G. Librae | | ♃ Bootis | | ♄ Lupi | | 22 Bootis | |
| Mag.Spect. | 5.39 | K0 | 4.06 | F8 | 4.65 | B3 | 5.36 | A5 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " |
| | 14 23 | -24 44 | 14 24 | +51 54 | 14 25 | -45 09 | 14 25 | +19 16 |
| 1 -8.7 | ^s 58 722 +321 | 29 33 -105 | ^s 41 894 +355 | 40 84 -327 | ^s 11 628 +390 | 19.65 -11 | ^s 46 911 +288 | 75 61 -274 |
| 1 1.3 | 59 067 +345 | 30 63 -130 | 42 292 +398 | 37 95 -289 | 12 047 +419 | 20.16 -51 | 47 225 +314 | 73 02 -259 |
| 1 11.3 | 59 428 +361 | 32 14 -151 | 42 725 +433 | 37 95 -245 | 12 047 +439 | 21.06 -90 | 47 559 +334 | 70 62 -240 |
| 1 21.3 | 59 793 +365 | 33 84 -170 | 43 726 +451 | 35 50 -189 | 12 486 +446 | 22.34 -128 | 47 900 +341 | 68 52 -210 |
| 1 31.2 | 60 152 +359 | 35 63 -179 | 43 176 +454 | 33 61 -129 | 12 932 +439 | 23.92 -158 | 48 239 +339 | 66 79 -173 |
| 2 10.2 | 60 498 +346 | 37 48 -185 | 44 075 +445 | 31 65 -67 | 13 795 +424 | 25.77 -185 | 48 567 +328 | 65 45 -134 |
| 2 20.2 | 60 822 +324 | 39 34 -186 | 44 496 +421 | 31 65 +0 | 14 193 +398 | 27.84 -207 | 48 876 +309 | 64 57 -88 |
| 3 2.2 | 61 118 +296 | 41 14 -180 | 44 881 +385 | 32 26 +61 | 14 559 +366 | 30.06 -222 | 49 158 +282 | 64 14 -43 |
| 3 12.1 | 61 387 +269 | 42 87 -173 | 45 225 +344 | 33 44 +118 | 14 891 +332 | 32.39 -233 | 49 413 +255 | 64 15 +1 |
| 3 22.1 | 61 623 +236 | 44 48 -161 | 45 515 +290 | 35 16 +172 | 15 183 +292 | 34.77 -238 | 49 633 +220 | 64 59 +44 |
| 4 1.1 | 61 826 +203 | 45 96 -148 | 45 751 +236 | 37 28 +212 | 15 435 +252 | 37.15 -238 | 49 820 +187 | 65 38 +79 |
| 4 11.0 | 61 999 +173 | 47 30 -134 | 45 930 +179 | 39 75 +247 | 15 648 +213 | 39.51 -236 | 49 974 +154 | 66 49 +111 |
| 4 21.0 | 62 137 +138 | 48 49 -119 | 46 049 +119 | 42 43 +268 | 15 817 +169 | 41.79 -228 | 50 092 +118 | 67 85 +136 |
| 4 31.0 | 62 246 +109 | 49 53 -104 | 46 113 +64 | 45 20 +277 | 15 947 +130 | 43.96 -217 | 50 179 +255 | 69 35 +150 |
| 5 11.0 | 62 324 +78 | 50 42 -89 | 46 123 +10 | 47 99 +279 | 16 037 +90 | 46.01 -205 | 50 234 +55 | 70 97 +162 |
| 5 20.9 | 62 371 +47 | 51 15 -73 | 46 080 -43 | 50 68 +269 | 16 084 +47 | 47.88 -187 | 50 259 +25 | 72 62 +165 |
| 5 30.9 | 62 390 +19 | 51 74 -59 | 45 992 -88 | 53 16 +248 | 16 094 +10 | 49.55 -167 | 50 257 -2 | 74 21 +159 |
| 6 9.9 | 62 380 -10 | 52 18 -44 | 45 860 -132 | 55 40 +224 | 16 063 -31 | 51.00 -145 | 50 227 -30 | 75 74 +153 |
| 6 19.9 | 62 342 -38 | 52 46 -28 | 45 690 -170 | 57 28 +188 | 15 995 -68 | 52.18 -118 | 50 172 -55 | 77 11 +137 |
| 6 29.8 | 62 280 -62 | 52 60 -14 | 45 490 -200 | 58 78 +150 | 15 893 -102 | 53.08 -90 | 50 096 -76 | 78 29 +118 |
| 7 9.8 | 62 192 -88 | 52 57 +3 | 45 260 -230 | 59 86 +108 | 15 757 -136 | 53 68 -60 | 49 998 -98 | 79 28 +99 |
| 7 19.8 | 62 084 -108 | 52 38 +19 | 45 011 -249 | 60 46 +60 | 15 595 -162 | 53 95 -27 | 49 883 -115 | 80 01 +73 |
| 7 29.7 | 61 960 -124 | 52 05 +33 | 44 749 -262 | 60 60 +14 | 15 412 -183 | 53 91 +4 | 49 756 -127 | 80 49 +48 |
| 8 8.7 | 61 822 -138 | 51 57 +48 | 44 477 -272 | 60 26 -34 | 15 213 -199 | 53 52 +39 | 49 617 -139 | 80 71 +22 |
| 8 18.7 | 61 681 -141 | 50 96 +61 | 44 207 -270 | 59 42 -84 | 15 011 -202 | 52.81 +71 | 49 476 -141 | 80 62 -9 |
| 8 28.7 | 61 543 -138 | 50 25 +71 | 43 947 -260 | 58 14 -128 | 14 813 -198 | 51.82 +99 | 49 337 -139 | 80 26 -36 |
| 9 7.6 | 61 413 -130 | 49 46 +79 | 43 702 -245 | 56 39 -175 | 14 629 -184 | 50 56 +126 | 49 206 -131 | 79 59 -67 |
| 9 17.6 | 61 305 -108 | 48 63 +83 | 43 702 -215 | 54 21 -218 | 14 474 -155 | 49 09 +147 | 49 094 -112 | 78 62 -97 |
| 9 27.6 | 61 225 -80 | 47 82 +81 | 43 308 -179 | 51 65 -256 | 14 356 -118 | 47 47 +162 | 49 005 -89 | 77 37 -125 |
| 10 7.6 | 61 180 -45 | 47 05 +77 | 43 173 -135 | 48 72 -293 | 14 286 -70 | 45 76 +171 | 48 948 -57 | 75 81 -156 |
| 10 17.5 | 61 182 +2 | 46 42 +63 | 43 095 -78 | 45 50 -322 | 14 275 -11 | 44 07 +169 | 48 931 -17 | 73 97 -184 |
| 10 27.5 | 61 231 +49 | 45 95 +47 | 43 077 -18 | 42 04 -346 | 14 325 +50 | 42 45 +162 | 48 957 +26 | 71 87 -210 |
| 11 6.5 | 61 332 +101 | 45 68 +27 | 43 126 +49 | 38 39 -365 | 14 444 +119 | 40 98 +147 | 49 033 +76 | 69 52 -235 |
| 11 16.4 | 61 491 +159 | 45 63 +5 | 43 246 +120 | 34 66 -373 | 14 633 +189 | 39 77 +121 | 49 160 +127 | 66 99 -253 |
| 11 26.4 | 61 702 +211 | 45 88 -25 | 43 435 +189 | 30 93 -373 | 14 885 +252 | 38 85 +92 | 49 336 +176 | 64 32 -267 |
| 12 6.4 | 61 962 +260 | 46 45 -57 | 43 692 +257 | 27 28 -365 | 15 200 +315 | 38 29 +56 | 49 561 +225 | 61 55 -277 |
| 12 16.4 | 62 263 +301 | 47 31 -86 | 44 012 +320 | 23 85 -343 | 15 565 +365 | 38 14 +15 | 49 827 +266 | 58 79 -276 |
| 12 26.3 | 62 595 +332 | 48 44 -113 | 44 382 +370 | 20 71 -314 | 15 969 +404 | 38 38 -24 | 50 125 +298 | 56 11 -268 |
| 12 36.3 | 62 951 +356 | 49 82 -138 | 44 795 +413 | 17 98 -273 | 16 402 +433 | 39 03 -65 | 50 450 +325 | 53 57 -254 |
| | 62 951 +365 | 49 82 -158 | 44 795 +440 | 17 98 -222 | 16 402 +446 | 39 03 -104 | 50 450 +338 | 53 57 -227 |
| Mean Place | 62.266 | 44.10 | 44.218 | 46.37 | 15.951 | 39.26 | 49.670 | 73.66 |
| sec δ, tan δ | +1.101 | -0.461 | +1.621 | +1.276 | +1.418 | -1.006 | +1.059 | +0.350 |
| da(ψ), dδ(ψ) | +0.068 | -0.32 | +0.041 | -0.32 | +0.077 | -0.32 | +0.056 | -0.32 |
| da(ε), dδ(ε) | -0.025 | -0.59 | +0.069 | -0.59 | -0.054 | -0.59 | +0.019 | -0.59 |
| Dble.Trans. | April 28 | | April 28 | | April 28 | | April 28 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 532 | | 533 | | 1379 | | 534 | |
|----------------|------------|---------|-------------|--------|-----------------|---------|----------|---------|
| | 52 Hydrae* | | φ Virginis* | | 5 Ursae Minoris | | ε Bootis | |
| Mag. Spect. | 5.00 | B8 | 4.99 | K0 | 4.37 | K2 | 3.78 | K0 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " |
| | 14 27 | - 29 25 | 14 27 | - 2 09 | 14 27 | + 75 44 | 14 31 | + 30 25 |
| 1 ^d | -8.7 | " - 81 | 27 266 | " -201 | 30 667 | " -314 | 12 246 | " -302 |
| 1 ^s | 19.114 | + 330 | 27 266 | + 289 | 30 667 | + 675 | 12 246 | + 293 |
| 1 | 1.3 | + 365 | 27 579 | + 313 | 31 455 | + 788 | 12 569 | + 323 |
| 1 | 11.3 | + 372 | 27 908 | + 329 | 60 44 | -206 | 12 916 | + 347 |
| 1 | 21.3 | + 378 | 28 243 | + 335 | 62 42 | -198 | 13 275 | + 359 |
| 1 | 31.2 | + 371 | 28 573 | + 330 | 64 26 | -184 | 13 632 | + 357 |
| 2 | 10.2 | + 359 | 28 893 | + 320 | 65 91 | -165 | 13 981 | + 349 |
| 2 | 20.2 | + 337 | 29 193 | + 300 | 67 32 | -141 | 14 311 | + 330 |
| 3 | 2.2 | + 309 | 29 467 | + 274 | 68 45 | -113 | 14 615 | + 304 |
| 3 | 12.1 | + 282 | 29 716 | + 249 | 69 31 | -86 | 14 888 | + 273 |
| 3 | 22.1 | + 247 | 29 934 | + 218 | 69 88 | -57 | 15 125 | + 237 |
| 4 | 1.1 | + 215 | 30 121 | + 187 | 70 18 | -30 | 15 324 | + 199 |
| 4 | 11.0 | + 182 | 30 278 | + 157 | 70 25 | -7 | 15 487 | + 163 |
| 4 | 21.0 | + 148 | 30 404 | + 126 | 70 09 | + 16 | 15 609 | + 122 |
| 4 | 31.0 | + 116 | 30 503 | + 99 | 69 77 | + 32 | 15 696 | + 87 |
| 5 | 11.0 | + 85 | 30 573 | + 70 | 69 31 | + 46 | 15 747 | + 51 |
| 5 | 20.9 | + 51 | 30 615 | + 42 | 68 74 | + 57 | 15 762 | + 15 |
| 5 | 30.9 | + 22 | 30 632 | + 17 | 68 13 | -35 | 15 748 | -14 |
| 6 | 9.9 | - 9 | 30 624 | - 8 | 67 47 | + 66 | 15 702 | -46 |
| 6 | 19.9 | - 39 | 30 590 | - 34 | 66 81 | + 66 | 15 628 | -74 |
| 6 | 29.8 | - 66 | 30 535 | - 55 | 66 18 | + 63 | 15 530 | -98 |
| 7 | 9.8 | - 92 | 30 458 | - 77 | 65 57 | + 61 | 15 409 | -121 |
| 7 | 19.8 | -115 | 30 363 | - 95 | 65 02 | + 55 | 15 269 | -140 |
| 7 | 29.7 | -132 | 30 253 | -110 | 64 53 | + 49 | 15 116 | -153 |
| 8 | 8.7 | -146 | 30 132 | -121 | 64 12 | + 41 | 14 951 | -165 |
| 8 | 18.7 | -151 | 30 007 | -125 | 63 81 | + 31 | 14 784 | -167 |
| 8 | 28.7 | -148 | 29 883 | -124 | 63 60 | + 21 | 14 619 | -165 |
| 9 | 7.6 | -139 | 29 766 | -117 | 63 52 | + 8 | 14 463 | -156 |
| 9 | 17.6 | -117 | 29 667 | -99 | 63 60 | -8 | 14 327 | -136 |
| 9 | 27.6 | -89 | 29 592 | -75 | 63 83 | -23 | 14 215 | -112 |
| 10 | 7.6 | -51 | 29 548 | -44 | 64 27 | -44 | 14 137 | -78 |
| 10 | 17.5 | -3 | 29 544 | -4 | 64 91 | -64 | 14 101 | -36 |
| 10 | 27.5 | + 46 | 29 582 | + 38 | 65 76 | -85 | 14 111 | + 10 |
| 11 | 6.5 | + 102 | 29 667 | + 85 | 66 89 | -113 | 14 173 | + 62 |
| 11 | 16.4 | + 160 | 29 804 | + 137 | 68 26 | -137 | 14 290 | + 117 |
| 11 | 26.4 | + 214 | 29 988 | + 184 | 69 83 | -157 | 14 459 | + 169 |
| 12 | 6.4 | + 266 | 30 218 | + 230 | 71 61 | -178 | 14 681 | + 222 |
| 12 | 16.4 | + 310 | 30 488 | + 270 | 73 53 | -192 | 14 948 | + 267 |
| 12 | 26.3 | + 341 | 30 787 | + 299 | 75 54 | -201 | 15 253 | + 305 |
| 12 | 36.3 | + 367 | 31 110 | + 323 | 77 61 | -207 | 15 588 | + 335 |
| | | + 377 | | + 333 | | -202 | | + 352 |
| Mean Place | 22.818 | 53 30 | 30 346 | 64 38 | 32 513 | 81.77 | 14.884 | 49 12 |
| sec δ, tan δ | +1.148 | -0.564 | +1.001 | -0.038 | +4.064 | +3.939 | +1.160 | +0.587 |
| dα(ψ), dδ(ψ) | +0.070 | -0.32 | +0.062 | -0.32 | -0.002 | -0.32 | +0.052 | -0.31 |
| dα(ε), dδ(ε) | -0.030 | -0.60 | -0.002 | -0.60 | +0.210 | -0.60 | +0.031 | -0.61 |
| Dble. Trans. | April 29 | | April 29 | | April 29 | | April 30 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 536 | | 535 | | 1380 | | 537 | |
|--------------|--------------------------------|-------------------------|--------------------------|-------------------------|--------------------------|-------------------------|--------------------------|------------------------|
| Name | Groombridge 2125 (Draconis) | | γ Bootis | | σ Bootis | | η Centauri | |
| Mag.Spect. | 6.18 | F0 | 3.00 | F0 | 4.48 | F0 | 2.65 | B3p, A2p |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " |
| | 14 31 | +60 16 | 14 31 | +38 21 | 14 34 | +29 47 | 14 34 | -42 05 |
| 1 -8.6 | 18.497 ^s +396 | 58.33 ^o -331 | 29.526 ^s +305 | 57.81 ^o -316 | 02.892 ^s +291 | 70.94 ^o -302 | 34.487 ^s +368 | 38.73 ^o -16 |
| 1 1.3 | 18.949 +452 | 55.42 -291 | 29.865 +339 | 54.92 -289 | 03.213 +321 | 68.15 -279 | 34.885 +398 | 39.26 -53 |
| 1 11.3 | 19.448 +499 | 52.98 -244 | 30.231 +366 | 52.38 -254 | 03.558 +345 | 65.63 -252 | 35.305 +420 | 40.16 -90 |
| 1 21.3 | 19.976 +528 | 51.14 -184 | 30.611 +380 | 50.31 -207 | 03.915 +357 | 63.51 -212 | 35.733 +428 | 41.40 -124 |
| 1 31.2 | 20.512 +536 | 49.92 -122 | 30.992 +381 | 48.75 -156 | 04.271 +356 | 61.84 -167 | 36.155 +422 | 42.92 -152 |
| 2 10.2 | 21.043 +531 | 49.35 -57 | 31.365 +373 | 47.74 -101 | 04.620 +349 | 60.66 -118 | 36.566 +411 | 44.68 -176 |
| 2 20.2 | 21.550 +507 | 49.48 +13 | 31.719 +354 | 47.34 -40 | 04.950 +330 | 60.02 -64 | 36.954 +388 | 46.64 -196 |
| 3 2.2 | 22.016 +466 | 50.24 +76 | 32.043 +324 | 47.50 +16 | 05.254 +304 | 59.90 -12 | 37.313 +359 | 48.71 -207 |
| 3 12.1 | 22.434 +418 | 51.60 +136 | 32.336 +293 | 48.20 +70 | 05.528 +274 | 60.29 +39 | 37.641 +328 | 50.88 -217 |
| 3 22.1 | 22.789 +355 | 53.50 +190 | 32.588 +252 | 49.42 +122 | 05.767 +239 | 61.17 +88 | 37.932 +291 | 53.09 -221 |
| 4 1.1 | 23.075 +286 | 55.81 +231 | 32.799 +211 | 51.05 +163 | 05.968 +201 | 62.44 +127 | 38.185 +253 | 55.29 -220 |
| 4 11.1 | 23.292 +217 | 58.48 +267 | 32.968 +169 | 53.03 +198 | 06.134 +166 | 64.05 +161 | 38.402 +217 | 57.46 -217 |
| 4 21.0 | 23.432 +140 | 61.36 +288 | 33.092 +124 | 55.27 +224 | 06.259 +125 | 65.93 +188 | 38.579 +177 | 59.55 -209 |
| 4 31.0 | 23.500 +68 | 64.32 +296 | 33.175 +83 | 57.63 +236 | 06.349 +90 | 67.95 +202 | 38.718 +139 | 61.54 -199 |
| 5 11.0 | 23.499 -1 | 67.30 +298 | 33.218 +43 | 60.07 +244 | 06.404 +55 | 70.08 +213 | 38.819 +101 | 63.41 -187 |
| 5 20.9 | 23.427 -72 | 70.15 +285 | 33.220 +2 | 62.48 +241 | 06.424 +20 | 72.19 +211 | 38.880 +61 | 65.12 -171 |
| 5 30.9 | 23.298 -129 | 72.78 +263 | 33.189 -31 | 64.75 +227 | 06.413 -11 | 74.22 +203 | 38.904 +24 | 66.65 -153 |
| 6 9.9 | 23.111 -187 | 75.14 +236 | 33.123 -66 | 66.85 +210 | 06.371 -42 | 76.12 +190 | 38.890 -14 | 67.98 -133 |
| 6 19.9 | 22.873 -238 | 77.12 +198 | 33.025 -98 | 68.67 +182 | 06.300 -71 | 77.80 +168 | 38.838 -52 | 69.07 -109 |
| 6 29.8 | 22.597 -276 | 78.69 +157 | 32.902 -123 | 70.19 +152 | 06.206 -94 | 79.23 +143 | 38.754 -84 | 69.92 -85 |
| 7 9.8 | 22.284 -313 | 79.81 +112 | 32.754 -148 | 71.38 +119 | 06.088 -118 | 80.38 +115 | 38.636 -118 | 70.48 -56 |
| 7 19.8 | 21.945 -339 | 80.42 +61 | 32.586 -168 | 72.16 +78 | 05.951 -137 | 81.19 +81 | 38.490 -146 | 70.75 -27 |
| 7 29.8 | 21.590 -355 | 80.54 +12 | 32.405 -181 | 72.56 +40 | 05.800 -151 | 81.68 +49 | 38.323 -167 | 70.74 +1 |
| 8 8.7 | 21.224 -366 | 80.16 -38 | 32.212 -193 | 72.55 -1 | 05.637 -163 | 81.81 +13 | 38.139 -184 | 70.41 +33 |
| 8 18.7 | 20.860 -364 | 79.24 -92 | 32.018 -194 | 72.11 -44 | 05.471 -166 | 81.55 -26 | 37.948 -191 | 69.79 +62 |
| 8 28.7 | 20.508 -352 | 77.86 -138 | 31.827 -191 | 71.26 -85 | 05.307 -164 | 80.95 -60 | 37.760 -188 | 68.91 +88 |
| 9 7.6 | 20.175 -333 | 75.99 -187 | 31.646 -181 | 70.00 -126 | 05.152 -155 | 79.98 -97 | 37.582 -178 | 67.77 +114 |
| 9 17.6 | 19.879 -296 | 73.66 -233 | 31.488 -158 | 68.34 -166 | 05.015 -137 | 78.63 -135 | 37.430 -152 | 66.45 +132 |
| 9 27.6 | 19.625 -254 | 70.96 -270 | 31.356 -132 | 66.32 -202 | 04.903 -112 | 76.96 -167 | 37.311 -119 | 64.99 +146 |
| 10 7.6 | 19.424 -201 | 67.87 -309 | 31.259 -97 | 63.93 -239 | 04.824 -79 | 74.93 -203 | 37.236 -75 | 63.44 +155 |
| 10 17.5 | 19.292 -132 | 64.49 -338 | 31.209 -50 | 61.23 -270 | 04.787 -37 | 72.61 -232 | 37.216 -20 | 61.91 +153 |
| 10 27.5 | 19.230 -62 | 60.88 -361 | 31.207 -52 | 58.27 -296 | 04.795 +8 | 70.02 -259 | 37.255 +39 | 60.45 +146 |
| 11 6.5 | 19.249 +19 | 57.07 -381 | 31.261 +4 | 55.07 -320 | 04.855 +60 | 67.18 -284 | 37.359 +104 | 59.14 +131 |
| 11 16.5 | 19.355 +106 | 53.22 -385 | 31.375 +114 | 51.74 -333 | 04.970 +115 | 64.18 -300 | 37.530 +171 | 58.06 +108 |
| 11 26.4 | 19.542 +187 | 49.37 -385 | 31.544 +169 | 48.34 -340 | 05.137 +167 | 61.07 -311 | 37.762 +232 | 57.26 +80 |
| 12 6.4 | 19.815 +273 | 45.63 -374 | 31.771 +227 | 44.94 -340 | 05.356 +219 | 57.92 -315 | 38.056 +294 | 56.79 +47 |
| 12 16.4 | 20.165 +350 | 42.14 -349 | 32.047 +276 | 41.68 -326 | 05.621 +265 | 54.84 -308 | 38.400 +344 | 56.70 +9 |
| 12 26.3 | 20.580 +415 | 38.96 -318 | 32.365 +318 | 38.61 -307 | 05.924 +303 | 51.91 -293 | 38.782 +382 | 56.98 -28 |
| 12 36.3 | 21.053 +473 | 36.22 -274 | 32.717 +352 | 35.84 -277 | 06.257 +333 | 49.20 -271 | 39.194 +412 | 57.65 -67 |
| | +509 | -220 | +372 | -235 | +351 | -235 | +427 | -102 |
| Mean Place | 20.748 | 65.51 | 32.067 | 60.98 | 05.560 | 72.19 | 38.735 | 56.76 |
| sec δ, tan δ | +2.017 | +1.752 | +1.275 | +0.792 | +1.152 | +0.573 | +1.348 | -0.904 |
| dα(ψ), dδ(ψ) | +0.033 | -0.31 | +0.048 | -0.31 | +0.052 | -0.31 | +0.076 | -0.31 |
| dα(ε), dδ(ε) | +0.092 | -0.61 | +0.042 | -0.61 | +0.030 | -0.62 | -0.047 | -0.62 |
| Dble.Trans. | April 30 | | April 30 | | April 30 | | May 1 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 1381 | | 540 | | 538 | | 541 | |
|--------------|-------------------|--------|-------------------|--------|-------------------|--------|-------------------|--------|
| | 10 G. Librae | | 33 Bootis | | α Centauri A* | | α Lupi | |
| Mag.Spect. | 6.24 | F8 | 5.39 | A0 | 0.33 | G0 | 2.89 | B2 |
| U.T. | R.A. | | R.A. | | R.A. | | R.A. | |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " |
| | 14 36 | -12 14 | 14 38 | +44 27 | 14 38 | -60 46 | 14 40 | -47 19 |
| | ^s +291 | " -154 | ^s +312 | " -329 | ^s +504 | " +64 | ^s +389 | " +14 |
| 1 | -8.6 | 13.310 | 44.62 | 17.586 | 40.27 | 35.965 | 20.18 | 57.029 |
| | +316 | -167 | +351 | -297 | +547 | +17 | +423 | -25 |
| 1 | 1.3 | 13.626 | 46.29 | 17.937 | 37.30 | 36.512 | 20.01 | 57.452 |
| | +334 | -178 | +383 | -260 | +579 | -31 | +449 | -65 |
| 1 | 11.3 | 13.960 | 48.07 | 18.320 | 34.70 | 37.091 | 20.32 | 57.901 |
| | +341 | -182 | +402 | -210 | +593 | -81 | +459 | -104 |
| 1 | 21.3 | 14.301 | 49.89 | 18.722 | 32.60 | 37.684 | 21.13 | 58.360 |
| | +337 | -178 | +405 | -154 | +585 | -124 | +456 | -137 |
| 1 | 31.2 | 14.638 | 51.67 | 19.127 | 31.06 | 38.269 | 22.37 | 58.816 |
| | +327 | -171 | +401 | -96 | +570 | -165 | +445 | -166 |
| 2 | 10.2 | 14.965 | 53.38 | 19.528 | 30.10 | 38.839 | 24.02 | 59.261 |
| | +309 | -157 | +381 | -32 | +538 | -201 | +422 | -191 |
| 2 | 20.2 | 15.274 | 54.95 | 19.909 | 29.78 | 39.377 | 26.03 | 59.683 |
| | +284 | -141 | +353 | +27 | +496 | -229 | +393 | -208 |
| 3 | 2.2 | 15.558 | 56.36 | 20.262 | 30.05 | 39.873 | 28.32 | 60.076 |
| | +260 | -121 | +319 | +85 | +452 | -253 | +360 | -223 |
| 3 | 12.1 | 15.818 | 57.57 | 20.581 | 30.90 | 40.325 | 30.85 | 60.436 |
| | +229 | -100 | +276 | +139 | +396 | -271 | +322 | -232 |
| 3 | 22.1 | 16.047 | 58.57 | 20.857 | 32.29 | 40.721 | 33.56 | 60.758 |
| | +199 | -80 | +231 | +182 | +340 | -281 | +282 | -235 |
| 4 | 1.1 | 16.246 | 59.37 | 21.088 | 34.11 | 41.061 | 36.37 | 61.040 |
| | +171 | -60 | +185 | +218 | +283 | -289 | +242 | -236 |
| 4 | 11.1 | 16.417 | 59.97 | 21.273 | 36.29 | 41.344 | 39.26 | 61.282 |
| | +140 | -41 | +134 | +245 | +219 | -288 | +198 | -232 |
| 4 | 21.0 | 16.557 | 60.38 | 21.407 | 38.74 | 41.563 | 42.14 | 61.480 |
| | +111 | -25 | +89 | +257 | +160 | -282 | +158 | -223 |
| 5 | 1.0 | 16.668 | 60.63 | 21.496 | 41.31 | 41.723 | 44.96 | 61.638 |
| | +83 | -11 | +43 | +266 | +98 | -274 | +115 | -215 |
| 5 | 11.0 | 16.751 | 60.74 | 21.539 | 43.97 | 41.821 | 47.70 | 61.753 |
| | +54 | +1 | -2 | +260 | +34 | -257 | +69 | -198 |
| 5 | 20.9 | 16.805 | 60.73 | 21.537 | 46.57 | 41.855 | 50.27 | 61.822 |
| | +28 | +11 | -42 | +245 | -25 | -237 | +29 | -181 |
| 5 | 30.9 | 16.833 | 60.62 | 21.495 | 49.02 | 41.830 | 52.64 | 61.851 |
| | +0 | +19 | -81 | +226 | -87 | -213 | -14 | -161 |
| 5 | 9.9 | 16.833 | 60.43 | 21.414 | 51.28 | 41.743 | 54.77 | 61.837 |
| | -27 | +27 | -117 | +197 | -145 | -181 | -58 | -134 |
| 6 | 19.9 | 16.806 | 60.16 | 21.297 | 53.25 | 41.598 | 56.58 | 61.779 |
| | -50 | +30 | -145 | +162 | -195 | -148 | -94 | -109 |
| 6 | 29.8 | 16.756 | 59.86 | 21.152 | 54.87 | 41.403 | 58.06 | 61.685 |
| | -75 | +37 | -175 | +127 | -246 | -110 | -133 | -79 |
| 7 | 9.8 | 16.681 | 59.49 | 20.977 | 56.14 | 41.157 | 59.16 | 61.552 |
| | -95 | +40 | -196 | +83 | -286 | -68 | -164 | -45 |
| 7 | 19.8 | 16.586 | 59.09 | 20.781 | 56.97 | 40.871 | 59.84 | 61.388 |
| | -112 | +42 | -212 | +41 | -314 | -26 | -189 | -13 |
| 7 | 29.8 | 16.474 | 58.67 | 20.569 | 57.38 | 40.557 | 60.10 | 61.199 |
| | -126 | +45 | -224 | -4 | -337 | +18 | -209 | +22 |
| 8 | 8.7 | 16.348 | 58.22 | 20.345 | 57.34 | 40.220 | 59.92 | 60.990 |
| | -131 | +45 | -227 | -51 | -341 | +63 | -216 | +56 |
| 8 | 18.7 | 16.217 | 57.77 | 20.118 | 56.83 | 39.879 | 59.29 | 60.774 |
| | -132 | +43 | -223 | -93 | -332 | +102 | -215 | +86 |
| 8 | 28.7 | 16.085 | 57.34 | 19.895 | 55.90 | 39.547 | 58.27 | 60.559 |
| | -125 | +41 | -213 | -138 | -312 | +144 | -205 | +117 |
| 9 | 7.6 | 15.960 | 56.93 | 19.682 | 54.52 | 39.235 | 56.83 | 60.354 |
| | -107 | +33 | -189 | -182 | -268 | +176 | -177 | +141 |
| 9 | 17.6 | 15.853 | 56.60 | 19.493 | 52.70 | 38.967 | 55.07 | 60.177 |
| | -85 | +24 | -162 | -219 | -215 | +202 | -141 | +160 |
| 9 | 27.6 | 15.768 | 56.36 | 19.331 | 50.51 | 38.752 | 53.05 | 60.036 |
| | -52 | +12 | -123 | -257 | -146 | +224 | -94 | +173 |
| 10 | 7.6 | 15.716 | 56.24 | 19.208 | 47.94 | 38.606 | 50.81 | 59.942 |
| | -11 | -6 | -75 | -290 | -62 | +232 | -34 | +175 |
| 10 | 17.5 | 15.705 | 56.30 | 19.133 | 45.04 | 38.544 | 48.49 | 59.908 |
| | +34 | -23 | -23 | -316 | +26 | +232 | +29 | +172 |
| 10 | 27.5 | 15.739 | 56.53 | 19.110 | 41.88 | 38.570 | 46.17 | 59.937 |
| | +75 | -38 | +37 | -340 | +122 | +224 | +100 | +161 |
| 11 | 6.5 | 15.814 | 56.91 | 19.147 | 38.48 | 38.692 | 43.93 | 60.037 |
| | +136 | -79 | +101 | -352 | +220 | +203 | +173 | +139 |
| 11 | 16.5 | 15.950 | 57.70 | 19.248 | 34.96 | 38.912 | 41.90 | 60.210 |
| | +183 | -96 | +162 | -357 | +310 | +175 | +240 | +112 |
| 11 | 26.4 | 16.133 | 58.66 | 19.410 | 31.39 | 39.222 | 40.15 | 60.450 |
| | +231 | -119 | +224 | -357 | +396 | +138 | +307 | +80 |
| 12 | 6.4 | 16.364 | 59.85 | 19.634 | 27.82 | 39.618 | 38.77 | 60.757 |
| | +271 | -141 | +280 | -340 | +469 | +94 | +362 | +40 |
| 12 | 16.4 | 16.635 | 61.26 | 19.914 | 24.42 | 40.087 | 37.83 | 61.119 |
| | +303 | -158 | +325 | -318 | +525 | +49 | +405 | +1 |
| 12 | 26.3 | 16.938 | 62.84 | 20.239 | 21.24 | 40.612 | 37.34 | 61.524 |
| | +327 | -172 | +366 | -284 | +568 | +0 | +440 | -39 |
| 12 | 36.3 | 17.265 | 64.56 | 20.605 | 18.40 | 41.180 | 37.34 | 61.964 |
| | +339 | -178 | +391 | -239 | +590 | -50 | +457 | -80 |
| Mean Place | 16.599 | 54.77 | 20.087 | 44.82 | 41.384 | 41.02 | 61.619 | 51.01 |
| sec δ, tan δ | +1.023 | -0.217 | +1.401 | +0.981 | +2.048 | -1.788 | +1.475 | -1.085 |
| dα(ψ), dδ(ψ) | +0.065 | -0.31 | +0.045 | -0.31 | +0.091 | -0.31 | +0.080 | -0.30 |
| dα(ε), dδ(ε) | -0.011 | -0.63 | +0.050 | -0.64 | -0.092 | -0.64 | -0.055 | -0.65 |
| Dble.Trans. | May 1 | | May 1 | | May 2 | | May 2 | |

APPARENT PLACES OF STARS, 1986

225

AT UPPER TRANSIT AT GREENWICH

| No. | 1382 | | 539 | | 545 | | 544 | |
|---------------|--------------|------------|--------------|------------|--------------|------------|-----------------|------------|
| | 32 Bootis | | α Circini* | | μ Virginis | | 371 G. Centauri | |
| Mag. Spect. | 5.63 | G5 | 3.42 | F0 | 3.95 | F5 | 4.13 | K0 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " |
| | 14 41 | + 11 42 | 14 41 | - 64 54 | 14 42 | - 5 35 | 14 42 | - 35 06 |
| 1 -8.6 | 01 664 + 274 | 69 36 -251 | 17 923 + 562 | 40 60 + 90 | 17 636 + 282 | 51 95 -183 | 45 677 + 335 | 42 64 -42 |
| 1 1.3 | 01 966 + 302 | 66 91 -245 | 18 539 + 616 | 40 18 + 42 | 17 944 + 308 | 53 86 -191 | 46 042 + 365 | 43 39 -75 |
| 1 11.3 | 02 289 + 323 | 64 59 -232 | 19 195 + 656 | 40 25 - 7 | 18 271 + 327 | 55 81 -195 | 46 428 + 386 | 44 44 -105 |
| 1 21.3 | 02 621 + 332 | 62 48 -211 | 19 871 + 676 | 40 85 - 60 | 18 607 + 336 | 57 72 -191 | 46 824 + 396 | 45 76 -132 |
| 1 31.3 | 02 952 + 331 | 60 65 -183 | 20 545 + 674 | 41 91 -106 | 18 939 + 332 | 59 53 -181 | 47 216 + 392 | 47 29 -153 |
| 2 10.2 | 03 275 + 323 | 59 15 -150 | 21 206 + 661 | 43 40 -149 | 19 263 + 324 | 61 20 -167 | 47 598 + 382 | 49 00 -171 |
| 2 20.2 | 03 582 + 307 | 58 04 -111 | 21 836 + 630 | 45 31 -191 | 19 570 + 307 | 62 66 -146 | 47 961 + 363 | 50 84 -184 |
| 3 2.2 | 03 865 + 283 | 57 32 - 72 | 22 423 + 587 | 47 53 -252 | 19 855 + 285 | 63 88 -122 | 48 297 + 336 | 52 72 -188 |
| 3 12.1 | 04 124 + 269 | 56 99 - 33 | 22 963 + 540 | 50 05 -262 | 20 115 + 260 | 64 86 - 98 | 48 607 + 310 | 54 65 -193 |
| 3 22.1 | 04 352 + 228 | 57 06 + 7 | 23 443 + 480 | 52 79 -274 | 20 346 + 231 | 65 56 - 70 | 48 883 + 276 | 56 56 -191 |
| 4 1.1 | 04 549 + 197 | 57 46 + 40 | 23 861 + 418 | 55 67 -288 | 20 548 + 202 | 66 03 - 47 | 49 126 + 243 | 58 42 -186 |
| 4 11.1 | 04 716 + 167 | 58 17 + 71 | 24 216 + 355 | 58 67 -300 | 20 722 + 174 | 66 26 - 23 | 49 336 + 210 | 60 22 -180 |
| 4 21.0 | 04 851 + 135 | 59 13 + 96 | 24 497 + 261 | 61 71 -304 | 20 865 + 143 | 66 28 - 2 | 49 510 + 174 | 61 92 -170 |
| 5 1.0 | 04 956 + 105 | 60 26 +113 | 24 710 + 213 | 64 72 -301 | 20 980 + 115 | 66 15 + 13 | 49 651 + 141 | 63 51 -159 |
| 5 11.0 | 05 031 + 75 | 61 53 +127 | 24 852 + 142 | 67 68 -286 | 21 067 + 87 | 65 86 + 29 | 49 758 + 107 | 64 98 -147 |
| 5 20.9 | 05 077 + 46 | 62 86 +133 | 24 916 + 64 | 70 49 -281 | 21 125 + 58 | 65 47 + 39 | 49 828 + 70 | 66 31 -133 |
| 5 30.9 | 05 095 + 18 | 64 18 +132 | 24 911 - 5 | 73 11 -262 | 21 158 + 33 | 65 02 + 45 | 49 865 + 37 | 67 48 -117 |
| 6 9.9 | 05 087 - 8 | 65 48 +130 | 24 833 - 78 | 75 51 -240 | 21 162 + 4 | 64 51 + 51 | 49 868 + 3 | 68 48 -100 |
| 6 19.9 | 05 051 - 36 | 66 68 +120 | 24 684 -149 | 77 60 -209 | 21 140 - 22 | 63 97 + 54 | 49 835 - 33 | 69 28 - 80 |
| 6 29.8 | 04 993 - 58 | 67 75 +107 | 24 474 - 210 | 79 35 -175 | 21 095 - 45 | 63 45 + 52 | 49 773 - 62 | 69 90 - 62 |
| 7 9.8 | 04 911 - 82 | 68 69 + 94 | 24 203 - 271 | 80 71 -136 | 21 025 - 70 | 62 92 + 53 | 49 678 - 95 | 70 28 - 38 |
| 7 19.8 | 04 809 -102 | 69 44 + 75 | 23 883 -320 | 81 64 - 93 | 20 934 - 91 | 62 42 + 50 | 49 557 -121 | 70 43 - 15 |
| 7 29.8 | 04 692 -117 | 70 00 + 56 | 23 526 -357 | 82 13 - 49 | 20 827 -107 | 61 96 + 46 | 49 415 -142 | 70 36 + 7 |
| 8 8.7 | 04 562 -130 | 70 35 + 35 | 23 252 -385 | 82 14 - 1 | 20 827 -122 | 61 96 + 42 | 49 415 -160 | 70 05 + 31 |
| 8 18.7 | 04 425 -137 | 70 47 + 12 | 22 747 -394 | 81 68 + 46 | 20 705 -129 | 61 54 + 34 | 49 255 -167 | 70 05 + 55 |
| 8 28.7 | 04 289 -136 | 70 36 - 11 | 22 361 -386 | 80 78 + 90 | 20 447 -129 | 60 92 + 28 | 48 920 -168 | 68 76 + 74 |
| 9 7.6 | 04 157 -132 | 70 01 - 35 | 21 996 -365 | 79 43 +135 | 20 323 -124 | 60 74 + 18 | 48 759 -161 | 67 82 + 94 |
| 9 17.6 | 04 042 -115 | 69 39 - 62 | 21 996 -318 | 77 70 +173 | 20 323 -108 | 60 74 + 5 | 48 759 -139 | 67 82 +107 |
| 9 27.6 | 03 948 - 94 | 68 54 - 85 | 21 678 -259 | 75 68 +202 | 20 215 - 87 | 60 69 - 8 | 48 620 -111 | 66 75 +116 |
| 10 7.6 | 03 884 - 64 | 67 40 -114 | 21 236 -183 | 73 39 +229 | 20 128 - 56 | 60 77 - 25 | 48 509 - 72 | 65 59 +121 |
| 10 17.5 | 03 859 - 25 | 66 00 -140 | 21 149 - 87 | 70 97 +242 | 20 056 - 16 | 61 47 - 45 | 48 414 - 23 | 63 21 +117 |
| 10 27.5 | 03 875 + 16 | 64 36 -164 | 21 160 + 11 | 68 51 +246 | 20 082 + 26 | 62 10 - 63 | 48 444 + 30 | 62 13 +108 |
| 11 6.5 | 03 938 + 63 | 62 45 -191 | 21 281 + 121 | 66 09 +242 | 20 154 + 72 | 62 96 - 86 | 48 533 + 89 | 61 21 + 92 |
| 11 16.5 | 04 053 + 115 | 60 33 -212 | 21 514 + 233 | 63 86 +223 | 20 279 + 125 | 64 11 -115 | 48 683 + 150 | 60 51 + 70 |
| 11 26.4 | 04 216 + 163 | 58 03 -230 | 21 849 + 335 | 61 88 +198 | 20 452 + 173 | 65 46 -135 | 48 891 + 208 | 60 07 + 44 |
| 12 6.4 | 04 427 + 211 | 55 60 -243 | 22 285 + 436 | 60 25 +163 | 20 673 + 221 | 67 02 -156 | 49 156 + 265 | 59 93 + 14 |
| 12 16.4 | 04 680 + 253 | 53 11 -249 | 22 806 + 521 | 59 05 +120 | 20 935 + 262 | 68 75 -173 | 49 468 + 312 | 60 14 - 21 |
| 12 26.3 | 04 966 + 286 | 50 62 -249 | 23 392 + 596 | 58 30 + 75 | 21 228 + 293 | 70 60 -185 | 49 817 + 349 | 60 67 - 53 |
| 12 36.3 | 05 279 + 313 | 48 21 -241 | 24 034 + 642 | 58 06 + 24 | 21 547 + 319 | 72 53 -193 | 50 196 + 379 | 61 52 - 85 |
| | 05 328 + 328 | 48 21 -223 | 24 034 + 670 | 58 06 - 27 | 21 547 + 333 | 72 53 -192 | 50 196 + 393 | 61 52 -115 |
| Mean Place | 04.592 | 65.97 | 24.304 | 61.87 | 20.860 | 60.16 | 49.683 | 58.40 |
| sec δ, tan δ | +1.021 | +0.207 | +2.359 | -2.136 | +1.005 | -0.098 | +1.223 | -0.703 |
| dα(ψ), dδ(ψ) | +0.058 | -0.30 | +0.098 | -0.30 | +0.063 | -0.30 | +0.073 | -0.30 |
| dα(ε), dδ(ε) | +0.011 | -0.65 | -0.109 | -0.65 | -0.005 | -0.65 | -0.036 | -0.65 |
| Dbble. Trans. | May 2 | | May 2 | | May 2 | | May 3 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 1383 | | 1384 | | 547 | | 546 | |
|---------------------|--------------------------|-------------------------|----------------------------|-------------------------|--------------------------|-------------------------|--------------------------|------------------------|
| | 34 Bootis | | B.D. +33° 2489 (Bootis) | | 109 Virginis | | 30 G. Lupi | |
| Mag. Spect. | 4.93 var. | M0 | 6.47 | M0 | 3.76 | A0 | 5.20 | K0 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " |
| | 14 42 | +26 34 | 14 44 | +32 50 | 14 45 | +1 56 | 14 45 | -52 19 |
| 1 ^d -8.6 | 47.027 ^s +279 | 64.60 ["] -297 | 37.144 ^s +284 | 40.08 ["] -313 | 30.838 ^s +274 | 62.90 ["] -213 | 59.284 ^s +417 | 18.93 ["] +42 |
| 1 1.3 | 47.337 +310 | 61.81 -279 | 37.461 +317 | 37.19 -289 | 31.139 +301 | 60.75 -215 | 59.740 +456 | 18.93 +0 |
| 1 11.3 | 47.671 +334 | 61.81 -254 | 37.461 +345 | 37.19 -261 | 31.139 +321 | 60.75 -212 | 59.740 +485 | 18.93 -43 |
| 1 21.3 | 48.019 +348 | 59.27 -218 | 37.806 +359 | 34.58 -219 | 31.460 +331 | 58.63 -200 | 60.225 +499 | 19.36 -85 |
| 1 31.3 | 48.367 +348 | 57.09 -176 | 38.165 +362 | 32.39 -173 | 31.791 +329 | 56.63 -183 | 60.724 +497 | 20.21 -122 |
| | | 55.33 | 38.527 | 30.66 | 32.120 | 54.80 | 61.221 | 21.43 |
| 2 10.2 | 48.709 +342 | 54.03 -130 | 38.884 +357 | 29.44 -122 | 32.441 +321 | 53.20 -160 | 61.708 +487 | 22.99 -156 |
| 2 20.2 | 49.034 +325 | 53.25 -78 | 39.224 +340 | 28.79 -65 | 32.746 +305 | 51.90 -130 | 62.172 +464 | 24.85 -186 |
| 3 2.2 | 49.336 +302 | 52.97 -28 | 39.540 +316 | 28.69 -10 | 33.029 +283 | 50.89 -101 | 62.605 +433 | 26.93 -208 |
| 3 12.1 | 49.611 +275 | 53.19 +22 | 39.828 +288 | 29.11 +42 | 33.289 +260 | 50.20 -69 | 63.004 +399 | 29.21 -228 |
| 3 22.1 | 49.852 +241 | 53.89 +70 | 40.080 +252 | 30.05 +94 | 33.519 +230 | 49.84 -36 | 63.361 +357 | 31.62 -241 |
| 4 1.1 | 50.058 +206 | 54.98 +109 | 40.296 +216 | 31.40 +135 | 33.721 +202 | 49.77 -7 | 63.676 +315 | 34.10 -248 |
| 4 11.1 | 50.231 +173 | 56.43 +145 | 40.474 +178 | 33.11 +171 | 33.894 +173 | 49.96 +19 | 63.947 +271 | 36.63 -253 |
| 4 21.0 | 50.366 +135 | 58.15 +172 | 40.612 +138 | 35.11 +200 | 34.035 +141 | 50.39 +43 | 64.170 +223 | 39.15 -252 |
| 5 1.0 | 50.467 +101 | 60.03 +188 | 40.713 +101 | 37.26 +215 | 34.149 +114 | 50.98 +59 | 64.346 +176 | 41.61 -246 |
| 5 11.0 | 50.534 +67 | 62.03 +200 | 40.777 +64 | 39.53 +227 | 34.235 +86 | 51.72 +74 | 64.475 +129 | 44.00 -239 |
| 5 21.0 | 50.566 +32 | 64.05 +202 | 40.803 +26 | 41.80 +227 | 34.291 +56 | 52.55 +83 | 64.553 +78 | 46.24 -224 |
| 5 30.9 | 50.568 +2 | 66.00 +195 | 40.796 -7 | 43.97 +217 | 34.321 +30 | 53.41 +86 | 64.584 +31 | 48.30 -206 |
| 6 9.9 | 50.540 -28 | 67.85 +185 | 40.757 -39 | 46.02 +205 | 34.324 +3 | 54.30 +89 | 64.566 -18 | 50.16 -186 |
| 6 19.9 | 50.483 -57 | 69.51 +166 | 40.685 -72 | 47.84 +182 | 34.300 -24 | 55.15 +85 | 64.499 -67 | 51.76 -160 |
| 6 29.8 | 50.401 -82 | 70.95 +144 | 40.589 -96 | 49.39 +155 | 34.253 -47 | 55.95 +80 | 64.390 -109 | 53.07 -131 |
| 7 9.8 | 50.294 -107 | 72.13 +118 | 40.465 -124 | 50.66 +127 | 34.181 -72 | 56.69 +74 | 64.237 -153 | 54.07 -100 |
| 7 19.8 | 50.167 -127 | 73.01 +88 | 40.321 -144 | 51.56 +90 | 34.089 -92 | 57.32 +63 | 64.048 -189 | 54.70 -63 |
| 7 29.8 | 50.024 -143 | 73.57 +56 | 40.160 -161 | 52.12 +56 | 33.980 -109 | 57.85 +53 | 63.832 -216 | 54.97 -27 |
| 8 8.7 | 49.868 -156 | 73.73 +24 | 39.986 -174 | 52.30 +18 | 33.856 -124 | 58.27 +42 | 63.592 -240 | 54.87 +10 |
| 8 18.7 | 49.706 -162 | 73.69 -12 | 39.806 -180 | 52.07 -23 | 33.726 -130 | 58.53 +26 | 63.343 -249 | 54.37 +50 |
| 8 28.7 | 49.546 -160 | 73.23 -46 | 39.628 -178 | 51.48 -59 | 33.594 -132 | 58.66 +13 | 63.095 -248 | 53.53 +84 |
| 9 7.7 | 49.391 -155 | 72.42 -81 | 39.456 -172 | 50.49 -99 | 33.467 -127 | 58.62 -4 | 62.859 -236 | 52.34 +119 |
| 9 17.6 | 49.253 -138 | 71.25 -117 | 39.302 -154 | 49.11 -138 | 33.355 -112 | 58.39 -23 | 62.652 -207 | 50.86 +148 |
| 9 27.6 | 49.139 -114 | 69.76 -149 | 39.172 -130 | 47.38 -173 | 33.264 -91 | 57.98 -41 | 62.484 -168 | 49.16 +170 |
| 10 7.6 | 49.055 -84 | 67.93 -183 | 39.074 -98 | 45.29 -209 | 33.203 -61 | 57.36 -62 | 62.368 -116 | 47.28 +188 |
| 10 17.5 | 49.012 -43 | 65.79 -214 | 39.019 -55 | 42.87 -242 | 33.180 -23 | 56.50 -86 | 62.318 -50 | 45.33 +195 |
| 10 27.5 | 49.012 +0 | 63.38 -241 | 39.009 -10 | 40.19 -268 | 33.198 +18 | 55.43 -107 | 62.338 +20 | 43.38 +195 |
| 11 6.5 | 49.063 +51 | 60.71 -267 | 39.052 +43 | 37.24 -295 | 33.263 +65 | 54.10 -133 | 62.434 +96 | 41.51 +187 |
| 11 16.5 | 49.168 +105 | 57.86 -285 | 39.152 +100 | 34.13 -311 | 33.380 +117 | 52.54 -156 | 62.612 +178 | 39.85 +166 |
| 11 26.4 | 49.325 +157 | 54.88 -298 | 39.305 +153 | 30.91 -322 | 33.544 +164 | 50.78 -176 | 62.863 +251 | 38.43 +142 |
| 12 6.4 | 49.533 +208 | 51.83 -305 | 39.513 +208 | 27.64 -327 | 33.756 +212 | 48.83 -195 | 63.188 +325 | 37.35 +108 |
| 12 16.4 | 49.787 +254 | 48.82 -301 | 39.769 +256 | 24.45 -319 | 34.009 +253 | 46.77 -206 | 63.575 +387 | 36.66 +69 |
| 12 26.4 | 50.078 +291 | 45.92 -290 | 40.066 +297 | 21.41 -304 | 34.295 +286 | 44.64 -213 | 64.010 +435 | 36.38 +28 |
| 12 36.3 | 50.400 +322 | 43.21 -271 | 40.396 +330 | 18.61 -280 | 34.607 +312 | 42.49 -215 | 64.010 +474 | 36.38 +15 |
| | | | | | | | | |
| | | | | | | | | |
| Mean Place | 49.768 | 65.24 | 39.817 | 42.26 | 33.936 | 57.14 | 64.271 | 37.75 |
| sec δ, tan δ | +1.118 | +0.500 | +1.190 | +0.646 | +1.001 | +0.034 | +1.636 | -1.295 |
| dα(ψ), dδ(ψ) | +0.053 | -0.30 | +0.050 | -0.30 | +0.061 | -0.30 | +0.084 | -0.30 |
| dα(ε), dδ(ε) | +0.025 | -0.65 | +0.032 | -0.66 | +0.002 | -0.66 | -0.065 | -0.66 |
| Dbie. Trans. | May 3 | | May 3 | | May 3 | | May 3 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 542 | | 1385 | | 1386 | | 1387 | | |
|--------------|-------------------|---------------------------|-------------------------|---------------------------|---------------------------|---------------------------|-------------------------|---------------------------|-------------------------|
| Name | α Apodis | | 56 Hydrae | | Groombridge 2152 (Bootis) | | α' Librae | | |
| Mag.Spect. | 3.81 | K5 | 5.39 | G5 | 5.98 | F0 | 5.33 | F5 | |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " | |
| | 14 45 | - 78 58 | 14 46 | - 26 01 | 14 48 | + 37 51 | 14 49 | - 15 56 | |
| 1 | ^d -8.6 | ^s 56.378 +1101 | ^s 57.18 +148 | ^s 53.663 + 309 | ^s 40.06 - 83 | ^s 32.307 + 287 | ^s 55.72 -323 | ^s 52.817 + 288 | ^s 19.92 -131 |
| 1 | 1.3 | +1222 | + 96 | + 337 | -109 | + 323 | -297 | + 316 | -149 |
| 1 | 11.3 | +1318 | + 44 | + 357 | -131 | + 353 | -265 | + 336 | -161 |
| 1 | 21.3 | +1374 | - 16 | + 367 | -150 | + 372 | -221 | + 345 | -170 |
| 1 | 31.3 | +1380 | - 70 | + 363 | -161 | + 375 | -170 | + 343 | -170 |
| 2 | 10.2 | +1370 | -121 | + 356 | -169 | + 372 | -116 | + 336 | -167 |
| 2 | 20.2 | +1316 | -173 | + 337 | -171 | + 356 | - 56 | + 320 | -158 |
| 3 | 2.2 | +1234 | -214 | + 314 | -169 | + 332 | + 2 | + 297 | -145 |
| 3 | 12.1 | +1142 | -252 | + 289 | -163 | + 302 | + 57 | + 274 | -131 |
| 3 | 22.1 | +1016 | -286 | + 259 | -154 | + 266 | +111 | + 245 | -112 |
| 4 | 1.1 | + 881 | -308 | + 228 | -143 | + 226 | +153 | + 217 | - 94 |
| 4 | 11.1 | + 740 | -328 | + 198 | -131 | + 187 | +192 | + 188 | - 78 |
| 4 | 21.0 | + 573 | -340 | + 166 | -118 | + 143 | +220 | + 158 | - 69 |
| 5 | 1.0 | + 414 | -342 | + 135 | -106 | + 102 | +236 | + 129 | - 55 |
| 5 | 11.0 | + 244 | -342 | + 105 | - 93 | + 63 | +247 | + 101 | - 32 |
| 5 | 21.0 | + 64 | -332 | + 72 | - 78 | + 21 | +246 | + 70 | - 19 |
| 5 | 30.9 | - 100 | -314 | + 42 | - 67 | - 14 | +235 | + 43 | - 9 |
| 6 | 9.9 | - 272 | -293 | + 11 | - 53 | - 50 | +220 | + 13 | + 0 |
| 6 | 19.9 | - 436 | -260 | - 20 | - 38 | - 84 | +195 | - 15 | + 9 |
| 6 | 29.8 | - 576 | -224 | - 49 | - 25 | - 112 | +166 | - 41 | + 14 |
| 7 | 9.8 | - 714 | -183 | - 77 | - 9 | - 141 | +134 | - 69 | + 23 |
| 7 | 19.8 | - 823 | -133 | - 102 | + 6 | - 163 | + 95 | - 91 | + 29 |
| 7 | 29.8 | - 900 | - 85 | - 122 | + 21 | - 180 | + 57 | - 110 | + 34 |
| 8 | 8.7 | - 960 | - 29 | - 139 | + 36 | - 194 | + 16 | - 127 | + 40 |
| 8 | 18.7 | - 973 | + 26 | - 147 | + 50 | - 200 | - 28 | - 135 | + 43 |
| 8 | 28.7 | - 953 | + 78 | - 149 | + 61 | - 199 | - 67 | - 137 | + 46 |
| 9 | 7.7 | - 900 | +132 | - 143 | + 72 | - 192 | -110 | - 133 | + 46 |
| 9 | 17.6 | - 795 | +180 | - 125 | + 78 | - 173 | -152 | - 117 | + 43 |
| 9 | 27.6 | - 663 | +218 | - 100 | + 80 | - 149 | -188 | - 95 | + 37 |
| 10 | 7.6 | - 498 | +254 | - 66 | + 78 | - 115 | -227 | - 63 | + 28 |
| 10 | 17.5 | - 291 | +276 | - 22 | + 69 | - 71 | -259 | - 23 | + 14 |
| 10 | 27.5 | - 81 | +287 | + 26 | + 57 | - 23 | -287 | + 23 | - 2 |
| 11 | 6.5 | + 152 | +290 | + 80 | + 37 | + 31 | -314 | + 98 | - 20 |
| 11 | 16.5 | + 391 | +276 | + 134 | + 18 | + 91 | -329 | + 93 | - 46 |
| 11 | 26.4 | + 608 | +255 | + 191 | - 6 | + 147 | -338 | + 177 | - 69 |
| 12 | 6.4 | + 825 | +223 | + 243 | - 36 | + 205 | -342 | + 225 | - 95 |
| 12 | 16.4 | +1008 | +178 | + 287 | - 66 | + 257 | -331 | + 267 | -117 |
| 12 | 26.4 | +1155 | +132 | + 321 | - 91 | + 300 | -314 | + 301 | -136 |
| 12 | 36.3 | +1279 | + 78 | + 350 | -117 | + 338 | -286 | + 327 | -154 |
| | +1352 | + 21 | + 363 | + 383 | -138 | + 361 | -247 | + 342 | -164 |
| Mean Place | 68.405 | 79.00 | 57.390 | 53.17 | 34.923 | 59.25 | 56.288 | 30.23 | |
| sec δ, tan δ | +5.235 | -5.139 | +1.113 | -0.488 | +1.267 | +0.778 | +1.040 | -0.286 | |
| dα(ψ), dδ(ψ) | +0.152 | -0.30 | +0.070 | -0.30 | +0.047 | -0.29 | +0.066 | -0.29 | |
| dα(ε), dδ(ε) | -0.256 | -0.66 | -0.024 | -0.67 | +0.038 | -0.67 | -0.014 | -0.68 | |
| Dble.Trans. | May 3 | | May 4 | | May 4 | | May 4 | | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 548 | | 550 | | 549 | | 1388 | |
|---|-------------------|------------|-----------------------|------------|-----------------------------|------------|--------------------------|------------|
| | α^2 Librae | | β Ursae Minoris | | Groombridge 2164 (Draconis) | | B.D. +6° 2957 (Virginis) | |
| Mag. Spect. | 2.90 | A3 | 2.24 | K5 | 5.67 | K2 | 6.69 | K0 |
| U.T. | R.A. | | R.A. | | R.A. | | R.A. | |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " |
| | 14 50 | - 15 59 | 14 50 | + 74 12 | 14 51 | + 59 20 | 14 52 | + 6 17 |
| 1 -8.6 | 04.324 + 289 | 00.17 -131 | 41.962 + 551 | 29.70 -335 | 03.383 + 356 | 47.58 -344 | 56.614 + 267 | 51.46 -229 |
| 1 1.3 | 04.639 + 315 | 01.65 -148 | 42.626 + 664 | 26.77 -293 | 03.799 + 416 | 44.50 -308 | 56.909 + 295 | 49.18 -228 |
| 1 11.3 | 04.975 + 336 | 03.26 -161 | 43.389 + 763 | 24.31 -246 | 04.266 + 467 | 41.86 -264 | 57.226 + 317 | 46.96 -222 |
| 1 21.3 | 05.321 + 346 | 04.95 -169 | 44.225 + 836 | 22.47 -184 | 04.767 + 501 | 39.78 -208 | 57.554 + 328 | 44.90 -206 |
| 1 31.3 | 05.664 + 343 | 06.65 -170 | 45.096 + 871 | 21.26 -121 | 05.283 + 516 | 38.32 -146 | 57.882 + 328 | 43.07 -183 |
| 2 10.2 | 06.000 + 336 | 08.33 -168 | 45.983 + 887 | 20.72 -54 | 05.802 + 519 | 37.50 -82 | 58.205 + 323 | 41.50 -157 |
| 2 20.2 | 06.319 + 319 | 09.91 -158 | 46.847 + 864 | 20.89 + 17 | 06.304 + 502 | 37.38 -12 | 58.513 + 308 | 40.27 -123 |
| 3 2.2 | 06.617 + 298 | 11.36 -145 | 47.656 + 809 | 21.70 + 81 | 06.773 + 469 | 37.90 + 52 | 58.799 + 286 | 39.38 -89 |
| 3 12.1 | 06.891 + 274 | 12.66 -130 | 48.394 + 738 | 23.14 +144 | 07.201 + 428 | 39.04 +114 | 59.064 + 265 | 38.84 -54 |
| 3 22.1 | 07.136 + 245 | 13.79 -113 | 49.027 + 633 | 25.14 +200 | 07.573 + 372 | 40.77 +173 | 59.299 + 235 | 38.67 -17 |
| 4 1.1 | 07.353 + 217 | 14.73 -94 | 49.542 + 515 | 27.56 +242 | 07.882 + 309 | 42.94 +217 | 59.506 + 207 | 38.81 + 14 |
| 4 11.1 | 07.542 + 189 | 15.50 -77 | 49.931 + 389 | 30.35 +279 | 08.128 + 246 | 45.50 +256 | 59.685 + 179 | 39.24 + 43 |
| 4 21.0 | 07.699 + 157 | 16.10 -60 | 50.176 + 245 | 33.36 +301 | 08.300 + 172 | 48.33 +283 | 59.833 + 148 | 39.93 + 69 |
| 5 1.0 | 07.829 + 130 | 16.55 -45 | 50.284 + 108 | 36.47 +311 | 08.403 + 103 | 51.29 +296 | 59.952 + 119 | 40.78 + 85 |
| 5 11.0 | 07.929 + 100 | 16.87 -32 | 50.255 -29 | 39.59 +312 | 08.438 + 35 | 54.31 +302 | 60.043 + 91 | 41.78 +100 |
| 5 21.0 | 08.000 + 71 | 17.06 -19 | 50.087 -168 | 42.59 +300 | 08.404 -34 | 57.25 +294 | 60.103 + 60 | 42.86 +108 |
| 5 30.9 | 08.043 + 43 | 17.16 -10 | 49.801 -286 | 45.36 +277 | 08.310 -94 | 60.01 +276 | 60.137 + 34 | 43.97 +111 |
| 6 9.9 | 08.056 + 13 | 17.16 + 0 | 49.400 -401 | 47.85 +249 | 08.156 -154 | 62.55 +254 | 60.143 + 6 | 45.07 +110 |
| 6 19.9 | 08.041 -15 | 17.08 + 8 | 48.896 -504 | 49.95 +210 | 07.949 -207 | 64.73 +218 | 60.121 -22 | 46.13 +106 |
| 6 29.8 | 08.000 -41 | 16.93 + 15 | 48.313 -583 | 51.62 +167 | 07.699 -250 | 66.52 +179 | 60.075 -46 | 47.09 +96 |
| 7 9.8 | 07.932 -68 | 16.70 + 23 | 47.655 -658 | 52.82 +120 | 07.408 -291 | 67.90 +138 | 60.004 -71 | 47.95 + 86 |
| 7 19.8 | 07.840 -92 | 16.42 + 28 | 46.945 -710 | 53.49 + 67 | 07.084 -324 | 68.77 + 87 | 59.911 -93 | 48.67 + 72 |
| 7 29.8 | 07.730 -110 | 16.08 + 34 | 46.203 -742 | 53.65 + 16 | 06.740 -344 | 69.17 + 40 | 59.800 -111 | 49.25 + 58 |
| 8 8.7 | 07.603 -127 | 15.68 + 40 | 45.436 -767 | 53.28 -37 | 06.379 -361 | 69.07 -10 | 59.674 -126 | 49.67 + 42 |
| 8 18.7 | 07.468 -135 | 15.25 + 43 | 44.673 -763 | 52.37 -91 | 06.014 -365 | 68.43 -64 | 59.540 -134 | 49.90 + 23 |
| 8 28.7 | 07.331 -137 | 14.79 + 46 | 43.928 -745 | 50.96 -141 | 05.655 -359 | 67.32 -111 | 59.404 -136 | 49.96 + 6 |
| 9 7.7 | 07.198 -133 | 14.33 + 46 | 43.214 -714 | 49.06 -190 | 05.309 -346 | 65.70 -162 | 59.271 -133 | 49.81 -15 |
| 9 17.6 | 07.081 -117 | 13.90 + 43 | 42.561 -653 | 46.69 -237 | 04.993 -316 | 63.62 -208 | 59.152 -119 | 49.43 -38 |
| 9 27.6 | 06.986 -95 | 13.53 + 37 | 41.979 -582 | 43.93 -276 | 04.715 -278 | 61.13 -249 | 59.053 -99 | 48.85 -58 |
| 10 7.6 | 06.922 -64 | 13.24 + 29 | 41.486 -493 | 40.77 -316 | 04.485 -230 | 58.23 -290 | 58.983 -70 | 48.02 -83 |
| 10 17.5 | 06.900 -22 | 13.10 + 14 | 41.107 -379 | 37.32 -345 | 04.320 -165 | 55.00 -323 | 58.950 -33 | 46.95 -107 |
| 10 27.5 | 06.922 + 22 | 13.12 -2 | 40.845 -262 | 33.64 -368 | 04.221 -99 | 51.51 -349 | 58.959 + 9 | 45.64 -131 |
| 11 6.5 | 07.019 + 97 | 13.34 -22 | 40.721 -124 | 29.78 -386 | 04.200 -21 | 47.79 -372 | 59.014 + 55 | 44.08 -156 |
| 11 16.5 | 07.113 + 94 | 13.77 -43 | 40.745 + 24 | 25.86 -392 | 04.264 + 64 | 43.97 -382 | 59.120 + 106 | 42.28 -180 |
| 11 26.4 | 07.290 + 177 | 14.46 -69 | 40.911 + 166 | 21.96 -390 | 04.409 + 145 | 40.11 -386 | 59.274 + 154 | 40.30 -198 |
| 12 6.4 | 07.515 + 225 | 15.41 -95 | 41.231 + 320 | 18.17 -379 | 04.640 + 231 | 36.31 -380 | 59.477 + 203 | 38.15 -215 |
| 12 16.4 | 07.782 + 267 | 16.57 -116 | 41.693 + 462 | 14.64 -353 | 04.949 + 309 | 32.72 -359 | 59.722 + 245 | 35.90 -225 |
| 12 26.4 | 08.083 + 301 | 17.93 -136 | 42.279 + 586 | 11.44 -320 | 05.325 + 376 | 29.41 -331 | 60.001 + 279 | 33.62 -228 |
| 12 36.3 | 08.410 + 327 | 19.47 -154 | 42.983 + 704 | 08.67 -277 | 05.763 + 438 | 26.49 -292 | 60.308 + 307 | 31.35 -227 |
| | + 342 | -163 | + 788 | -220 | + 479 | -241 | + 323 | -214 |
| Mean Place | 07.795 | 10.47 | 44.099 | 38.58 | 05.759 | 54.95 | 59.679 | 47.32 |
| sec δ , tan δ | +1.040 | -0.286 | +3.675 | +3.536 | +1.962 | +1.687 | +1.006 | +0.110 |
| $d\alpha(\psi)$, $d\delta(\psi)$ | +0.066 | -0.29 | -0.002 | -0.29 | +0.031 | -0.29 | +0.059 | -0.29 |
| $d\alpha(\epsilon)$, $d\delta(\epsilon)$ | -0.014 | -0.68 | +0.173 | -0.68 | +0.083 | -0.68 | +0.005 | -0.69 |
| Dble. Trans. | May 4 | | May 5 | | May 5 | | May 5 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 1389 | | 551 | | 1390 | | 1392 | | |
|--------------|-------------------|---------------------------|--|---------------------------|-----------------------|---------------------------|--|---------------------------|-------------|
| Name | 381 G. Centauri | | Piazzi 14 ^h 221 (Bootis) | | ξ ^z Librae | | Piazzi 14 ^h 227 (Bootis) | | |
| Mag.Spect. | 5.34 | A0 | 5.77 | A0 | 5.63 | K0 | 6.24 | A0 | |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | |
| | h m | ° / | h m | ° / | h m | ° / | h m | ° / | |
| | 14 54 | - 33 47 | 14 55 | + 14 29 | 14 55 | - 11 21 | 14 56 | + 21 36 | |
| 1 | ^d -8.6 | ^s 50 777 + 323 | 51.65 - 39 | ^s 32 018 + 264 | 63 13 - 261 | ^s 58 651 + 279 | 12 28 - 151 | ^s 24 247 + 265 | 34 03 - 285 |
| 1 | 1.3 | 51 131 + 354 | - 69 | 32 311 + 293 | 60 61 - 252 | 58 957 + 306 | - 163 | 24 543 + 296 | 31 31 - 272 |
| 1 | 11.3 | 51 508 | - 98 | 32 628 + 317 | 58 21 - 240 | 59 284 + 327 | - 173 | 24 864 + 321 | 28 78 - 253 |
| 1 | 21.3 | 51 897 + 389 | - 123 | 32 958 + 330 | 56 06 - 215 | 59 284 + 337 | - 175 | 25 199 + 335 | 26 57 - 221 |
| 1 | 31.3 | 52 284 + 387 | - 144 | 33 289 + 331 | 54 20 - 186 | 59 958 + 337 | - 172 | 25 537 + 338 | 24 72 - 185 |
| 2 | 10.2 | 52 665 + 381 | - 159 | 33 615 + 326 | 52 70 - 150 | 60 289 + 331 | - 163 | 25 871 + 334 | 23 28 - 144 |
| 2 | 20.2 | 53 029 + 364 | - 171 | 33 928 + 313 | 51.61 - 109 | 60 605 + 316 | - 150 | 26 192 + 321 | 22 32 - 96 |
| 3 | 2.2 | 53 369 + 340 | - 176 | 34 220 + 292 | 50 94 - 67 | 60 900 + 295 | - 132 | 26 491 + 299 | 21 84 - 2 |
| 3 | 12.2 | 53 684 + 315 | - 179 | 34 488 + 288 | 50 69 - 25 | 61 174 + 274 | - 113 | 26 767 + 276 | 21 82 - 48 |
| 3 | 22.1 | 53 968 + 284 | - 177 | 34 728 + 240 | 50 86 + 17 | 61 419 + 245 | - 91 | 27 013 + 246 | 22 28 + 46 |
| 4 | 1.1 | 54 221 + 253 | - 172 | 34 938 + 210 | 51.38 + 52 | 61 637 + 218 | - 70 | 27 227 + 214 | 23 12 + 84 |
| 4 | 11.1 | 54 442 + 221 | - 167 | 35 119 + 181 | 52 23 + 85 | 61 827 + 190 | - 51 | 27 410 + 183 | 24 31 + 119 |
| 4 | 21.0 | 54 629 + 187 | - 157 | 35 267 + 148 | 53 36 + 113 | 61 988 + 161 | - 31 | 27 559 + 149 | 25 79 + 148 |
| 5 | 1.0 | 54 783 + 154 | - 147 | 35 385 + 118 | 54 66 + 130 | 62 121 + 133 | - 17 | 27 675 + 116 | 27 46 + 167 |
| 5 | 11.0 | 54 903 + 120 | - 137 | 35 473 + 88 | 56 11 + 145 | 62 225 + 104 | - 2 | 27 759 + 84 | 29 26 + 180 |
| 5 | 21.0 | 54 988 + 85 | - 123 | 35 530 + 57 | 57 62 + 151 | 62 299 + 74 | + 9 | 27 810 + 51 | 31 11 + 185 |
| 5 | 30.9 | 55 039 + 51 | - 110 | 35 559 + 29 | 59 13 + 151 | 62 347 + 48 | + 17 | 27 832 + 22 | 32 93 + 182 |
| 6 | 9.9 | 55 056 + 17 | - 94 | 35 559 + 0 | 60 60 + 147 | 62 365 + 18 | + 25 | 27 823 - 9 | 34 68 + 175 |
| 6 | 19.9 | 55 036 - 20 | - 77 | 35 530 - 29 | 61 96 + 136 | 62 355 - 10 | + 30 | 27 784 - 39 | 36 28 + 160 |
| 6 | 29.9 | 54 986 - 50 | - 60 | 35 476 - 54 | 63 18 + 122 | 62 318 - 37 | + 33 | 27 720 - 64 | 37 69 + 141 |
| 7 | 9.8 | 54 902 - 84 | - 40 | 35 397 - 79 | 64 24 + 106 | 62 255 - 63 | + 37 | 27 629 - 91 | 38 90 + 121 |
| 7 | 19.8 | 54 790 - 112 | - 18 | 35 295 - 102 | 65 09 + 85 | 62 168 - 87 | + 38 | 27 516 - 113 | 39 83 + 93 |
| 7 | 29.8 | 54 655 - 135 | + 2 | 35 177 - 118 | 65 73 + 64 | 62 062 - 106 | + 39 | 27 385 - 131 | 40 49 + 66 |
| 8 | 8.7 | 54 500 - 155 | + 25 | 35 042 - 135 | 66 13 + 40 | 61 938 - 124 | + 41 | 27 239 - 146 | 40 87 + 38 |
| 8 | 18.7 | 54 335 - 165 | + 46 | 34 899 - 143 | 66 27 + 14 | 61 805 - 133 | + 39 | 27 085 - 154 | 40 91 + 4 |
| 8 | 28.7 | 54 167 - 168 | + 65 | 34 754 - 145 | 66 16 - 11 | 61 670 - 135 | + 37 | 26 928 - 157 | 40 66 - 25 |
| 9 | 7.7 | 54 004 - 163 | + 84 | 34 612 - 142 | 65 79 - 37 | 61 537 - 133 | + 34 | 26 775 - 153 | 40 08 - 58 |
| 9 | 17.6 | 53 860 - 144 | + 97 | 34 485 - 127 | 65 12 - 67 | 61 419 - 118 | + 26 | 26 637 - 138 | 39 17 - 91 |
| 9 | 27.6 | 53 742 - 118 | + 107 | 34 377 - 108 | 64 19 - 93 | 61 321 - 98 | + 17 | 26 519 - 118 | 37 95 - 122 |
| 10 | 7.6 | 53 660 - 82 | + 111 | 34 298 - 79 | 62 98 - 121 | 61 253 - 68 | + 6 | 26 430 - 89 | 36 41 - 154 |
| 10 | 17.5 | 53 625 - 35 | + 108 | 34 256 - 42 | 61 48 - 150 | 61 225 - 28 | - 11 | 26 380 - 50 | 34 56 - 185 |
| 10 | 27.5 | 53 642 + 17 | + 101 | 34 255 - 1 | 59 73 - 175 | 61 240 + 15 | - 27 | 26 371 - 9 | 32 44 - 212 |
| 11 | 6.5 | 53 717 + 75 | + 86 | 34 303 + 48 | 57 71 - 202 | 61 303 + 63 | - 42 | 26 411 + 40 | 30 05 - 239 |
| 11 | 16.5 | 53 852 + 135 | + 66 | 34 401 + 98 | 55 47 - 224 | 61 414 + 111 | - 77 | 26 504 + 93 | 27 46 - 259 |
| 11 | 26.4 | 54 044 + 192 | + 44 | 34 548 + 147 | 53 06 - 241 | 61 579 + 165 | - 96 | 26 647 + 143 | 24 71 - 275 |
| 12 | 6.4 | 54 295 + 251 | + 13 | 34 745 + 197 | 50 52 - 254 | 61 793 + 214 | - 119 | 26 841 + 194 | 21 85 - 286 |
| 12 | 16.4 | 54 593 + 298 | - 18 | 34 986 + 241 | 47 93 - 259 | 62 050 + 257 | - 137 | 27 081 + 240 | 18 99 - 286 |
| 12 | 26.4 | 54 930 + 337 | - 48 | 35 261 + 275 | 45 35 - 258 | 62 340 + 290 | - 154 | 27 358 + 277 | 16 19 - 280 |
| 12 | 36.3 | 55 298 + 368 | - 80 | 35 567 + 306 | 42 86 - 249 | 62 658 + 318 | - 168 | 27 666 + 308 | 13 54 - 265 |
| | | 55 298 + 385 | - 107 | 35 567 + 323 | 42 86 - 229 | 62 658 + 334 | - 172 | 27 666 + 328 | 13 54 - 239 |
| Mean Place | 54.817 | 65.82 | | 34.971 | 61.28 | 62.054 | 20.87 | 27.107 | 33.98 |
| sec δ, tan δ | +1.203 | -0.669 | | +1.033 | +0.259 | +1.020 | -0.201 | +1.076 | +0.396 |
| dα(ψ), dδ(ψ) | +0.073 | -0.29 | | +0.056 | -0.29 | +0.065 | -0.29 | +0.054 | -0.29 |
| dα(ε), dδ(ε) | -0.032 | -0.69 | | +0.012 | -0.69 | -0.010 | -0.69 | +0.019 | -0.70 |
| Dbble.Trans. | May 6 | | May 6 | | May 6 | | May 6 | | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 1391 | | 1393 | | 554 | | 552 | |
|--------------|---------------|----------------|----------------------------|----------------|--------------------|----------------|--------------|----------------|
| | 33 G. Librae* | | Bradley 1908 (Virginis) | | 2 H. Ursae Minoris | | β Lupi | |
| Mag. Spect. | 6.00 | K5 | 5.71 | K0 | 4.86 var. | M3 | 2.81 | B2p |
| U.T. | R.A. | | R.A. | | R.A. | | R.A. | |
| | h | m | h | m | h | m | h | m |
| | 14 56 | - 21 21 | 14 56 | - 0 06 | 14 57 | + 65 58 | 14 57 | - 43 04 |
| | ^s | ^o / | ^s | ^o / | ^s | ^o / | ^s | ^o / |
| 1 | -8.6 | + 296 | + 268 | -202 | + 398 | -347 | + 354 | + 10 |
| 1 | 1.3 | + 325 | + 295 | -206 | + 475 | -309 | + 390 | - 27 |
| 1 | 11.3 | + 345 | + 318 | -205 | + 542 | -264 | + 416 | - 61 |
| 1 | 21.3 | + 357 | + 328 | -196 | + 591 | -205 | + 431 | - 96 |
| 1 | 31.3 | + 355 | + 329 | -180 | + 614 | -144 | + 430 | -125 |
| 2 | 10.2 | + 349 | + 323 | -161 | + 624 | - 78 | + 424 | -150 |
| 2 | 20.2 | + 333 | + 309 | -133 | + 608 | - 7 | + 406 | -171 |
| 3 | 2.2 | + 310 | + 289 | -105 | + 572 | + 58 | + 380 | -186 |
| 3 | 12.2 | + 288 | + 267 | - 76 | + 525 | +122 | + 354 | -198 |
| 3 | 22.1 | + 260 | + 239 | - 44 | + 457 | +180 | + 320 | -205 |
| 4 | 1.1 | + 230 | + 211 | - 16 | + 380 | +226 | + 285 | -206 |
| 4 | 11.1 | + 202 | + 185 | + 10 | + 299 | +265 | + 250 | -207 |
| 4 | 21.0 | + 171 | + 153 | + 33 | + 206 | +292 | + 210 | -203 |
| 5 | 1.0 | + 142 | + 126 | + 50 | + 118 | +305 | + 173 | -196 |
| 5 | 11.0 | + 112 | + 98 | + 64 | + 30 | +311 | + 135 | -188 |
| 5 | 21.0 | + 80 | + 69 | + 75 | - 61 | +302 | + 92 | -175 |
| 5 | 30.9 | + 52 | + 42 | + 78 | -138 | +283 | + 54 | -161 |
| 6 | 9.9 | + 21 | + 13 | + 82 | -215 | +260 | + 12 | -144 |
| 6 | 19.9 | - 10 | - 15 | + 80 | -285 | +223 | - 29 | -122 |
| 6 | 29.9 | - 37 | - 39 | + 75 | -340 | +183 | - 65 | -100 |
| 7 | 9.8 | - 67 | - 65 | + 70 | - 394 | +140 | - 105 | - 75 |
| 7 | 19.8 | - 91 | - 88 | + 62 | -434 | + 88 | -136 | - 46 |
| 7 | 29.8 | -112 | -106 | + 53 | -459 | + 39 | -163 | - 19 |
| 8 | 8.7 | -130 | -123 | + 43 | -482 | - 13 | -186 | + 12 |
| 8 | 18.7 | -139 | -131 | + 30 | -486 | - 68 | -198 | + 42 |
| 8 | 28.7 | -142 | -135 | + 18 | -478 | -116 | -200 | + 69 |
| 9 | 7.7 | -139 | -132 | + 4 | -462 | -168 | -194 | + 97 |
| 9 | 17.6 | -122 | -117 | -14 | -424 | -215 | -173 | +119 |
| 9 | 27.6 | -100 | -98 | -31 | -379 | -256 | -143 | +136 |
| 10 | 7.6 | - 68 | - 70 | - 50 | -321 | -297 | -102 | +149 |
| 10 | 17.6 | - 26 | - 32 | - 72 | -244 | -331 | - 47 | +151 |
| 10 | 27.5 | + 20 | + 9 | - 93 | -163 | -356 | + 10 | +150 |
| 11 | 6.5 | + 72 | + 55 | -118 | - 68 | -380 | + 75 | +139 |
| 11 | 16.5 | +120 | +107 | -141 | + 34 | -388 | +144 | +121 |
| 11 | 26.4 | +180 | +155 | -162 | +134 | -391 | +208 | + 97 |
| 12 | 6.4 | +230 | +204 | -181 | +239 | -384 | +272 | + 68 |
| 12 | 16.4 | +274 | +246 | -194 | +338 | -362 | +327 | + 33 |
| 12 | 26.4 | +309 | +279 | -203 | +423 | -334 | +370 | - 2 |
| 12 | 36.3 | +337 | +308 | -206 | +503 | -293 | +405 | - 39 |
| | +353 | -150 | +324 | -200 | +559 | -240 | +426 | - 74 |
| Mean Place | 40.600 | 18.98 | 51.666 | 49.26 | 21.914 | 69.62 | 38.596 | 49.03 |
| sec δ, tan δ | +1.074 | -0.391 | +1.000 | -0.002 | +2.457 | +2.245 | +1.369 | -0.935 |
| dα(ψ), dδ(ψ) | +0.068 | -0.29 | +0.061 | -0.29 | +0.020 | -0.28 | +0.079 | -0.28 |
| dα(ε), dδ(ε) | -0.019 | -0.70 | -0.000 | -0.70 | +0.107 | -0.70 | -0.045 | -0.70 |
| Dble. Trans. | May 6 | | May 6 | | May 6 | | May 6 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 553 | | 1394 | | 555 | | 556 | |
|--------------|--------------------------|------------|--------------------------|------------|--------------------------|------------|--------------------------|------------|
| | α Centauri | | δ Librae | | β Bootis | | σ Librae | |
| Mag.Spect. | 3.35 | B3 | 4.8 to 5.9 | A0 | 3.63 | G5 | 3.41 | M3 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° / | h m | ° / | h m | ° / | h m | ° / |
| | 14 58 | -42 02 | 15 00 | - 8 27 | 15 01 | +40 26 | 15 03 | -25 13 |
| 1 -8.6 | ^s 12.319 +349 | 47 08 + 5 | ^s 11.627 +272 | 49.91 -163 | ^s 23.574 +277 | " -332 | ^s 12.883 +296 | " -78 |
| 1 1.3 | 12.704 +385 | 47 38 -30 | 11.927 +300 | 51.64 -173 | 23.892 +318 | 31.94 -307 | 12.883 +326 | 34.90 -101 |
| 1 11.3 | 13.114 +410 | 48 03 -65 | 12.249 +322 | 53.44 -180 | 24.244 +352 | 28.87 -276 | 13.209 +349 | 35.91 -122 |
| 1 21.3 | 13.539 +425 | 49 01 -98 | 12.582 +333 | 55.24 -180 | 24.618 +374 | 26.11 -229 | 13.558 +361 | 37.13 -139 |
| 1 31.3 | 13.964 +425 | 50.26 -125 | 12.916 +334 | 56.96 -172 | 25.000 +382 | 23.82 -179 | 13.919 +361 | 38.52 -150 |
| 2 10.2 | 14.382 +418 | 51.77 -151 | 13.244 +328 | 58.58 -162 | 25.382 +382 | 22.03 -124 | 14.280 +356 | 40.02 -157 |
| 2 20.2 | 14.783 +401 | 53.47 -170 | 13.559 +315 | 60.03 -145 | 25.751 +369 | 20.79 -61 | 14.636 +341 | 41.59 -159 |
| 3 2.2 | 15.159 +376 | 55.31 -184 | 13.853 +294 | 61.27 -124 | 26.097 +346 | 20.18 -3 | 14.977 +321 | 43.18 -156 |
| 3 12.2 | 15.508 +349 | 57.26 -195 | 14.126 +273 | 62.29 -102 | 26.417 +320 | 20.15 +56 | 15.298 +298 | 44.74 -150 |
| 3 22.1 | 15.825 +317 | 59.27 -201 | 14.371 +245 | 63.07 -78 | 26.700 +283 | 20.71 +111 | 15.596 +270 | 46.24 -141 |
| 4 1.1 | 16.106 +281 | 61.29 -202 | 14.590 +219 | 63.62 -55 | 26.945 +245 | 21.82 +156 | 15.866 +242 | 47.65 -131 |
| 4 11.1 | 16.354 +248 | 63.32 -203 | 14.782 +192 | 63.96 -34 | 27.149 +204 | 23.38 +197 | 16.108 +213 | 48.96 -120 |
| 4 21.0 | 16.562 +208 | 65.29 -197 | 14.944 +162 | 64.10 -14 | 27.309 +160 | 25.35 +228 | 16.321 +182 | 50.16 -107 |
| 5 1.0 | 16.734 +172 | 67.19 -190 | 15.078 +134 | 64.08 +2 | 27.427 +118 | 27.63 +245 | 16.503 +152 | 51.23 -95 |
| 5 11.0 | 16.868 +134 | 69.02 -183 | 15.185 +107 | 63.92 +16 | 27.502 +75 | 30.08 +258 | 16.655 +121 | 52.18 -84 |
| 5 21.0 | 16.960 +92 | 70.71 -169 | 15.261 +76 | 63.65 +27 | 27.534 +32 | 32.66 +259 | 16.776 +89 | 53.02 -72 |
| 5 30.9 | 17.015 +55 | 72.26 -155 | 15.311 +50 | 63.31 +34 | 27.527 -7 | 35.25 +248 | 16.865 +59 | 53.74 -61 |
| 6 9.9 | 17.030 +15 | 73.65 -139 | 15.331 +20 | 62.91 +40 | 27.482 -45 | 37.73 +234 | 16.924 +26 | 54.35 -49 |
| 6 19.9 | 17.003 -27 | 74.82 -117 | 15.323 -8 | 62.47 +44 | 27.399 -83 | 40.07 +210 | 16.950 -7 | 54.84 -37 |
| 6 29.9 | 16.941 -62 | 75.78 -96 | 15.288 -35 | 62.03 +44 | 27.286 -113 | 42.17 +179 | 16.943 -36 | 55.21 -25 |
| 7 9.8 | 16.840 -101 | 76.50 -72 | 15.227 -61 | 61.57 +46 | 27.141 -145 | 43.96 +148 | 16.907 -68 | 55.46 -12 |
| 7 19.8 | 16.707 -133 | 76.94 -44 | 15.127 -86 | 61.12 +45 | 27.111 -171 | 45.44 +107 | 16.839 -94 | 55.58 +2 |
| 7 29.8 | 16.549 -158 | 77.11 -17 | 15.141 -104 | 61.12 +43 | 26.970 -190 | 46.51 +68 | 16.745 -116 | 55.56 +14 |
| 8 8.7 | 16.367 -182 | 77.11 +13 | 15.037 -123 | 60.69 +41 | 26.880 -207 | 47.19 +26 | 16.629 -137 | 55.42 +29 |
| 8 18.7 | 16.174 -193 | 76.98 +42 | 14.914 -132 | 60.28 +37 | 26.573 -215 | 47.45 -20 | 16.492 -148 | 55.13 +41 |
| 8 28.7 | 15.978 -196 | 75.87 +69 | 14.646 -136 | 59.59 +32 | 26.358 -217 | 47.25 -61 | 16.344 -152 | 54.72 +53 |
| 9 7.7 | 15.788 -190 | 74.92 +95 | 14.464 -130 | 59.59 +25 | 26.141 -211 | 46.64 -105 | 16.192 -149 | 54.19 +62 |
| 9 17.6 | 15.618 -170 | 74.92 +116 | 14.513 -123 | 59.34 +16 | 25.930 -194 | 45.59 -149 | 16.043 -134 | 53.57 +68 |
| 9 27.6 | 15.478 -140 | 73.76 +132 | 14.393 -100 | 59.18 +5 | 25.736 -170 | 44.10 -188 | 15.909 -112 | 52.89 +72 |
| 10 7.6 | 15.378 -100 | 72.44 +144 | 14.293 -72 | 59.13 -9 | 25.566 -137 | 42.22 -227 | 15.797 -80 | 52.17 +70 |
| 10 17.6 | 15.331 -47 | 71.00 +147 | 14.221 -32 | 59.22 -26 | 25.429 -93 | 39.95 -262 | 15.717 -37 | 51.47 +63 |
| 10 27.5 | 15.341 +10 | 69.53 +144 | 14.189 +10 | 59.48 -44 | 25.336 -45 | 37.33 -291 | 15.680 +10 | 50.84 +52 |
| 11 6.5 | 15.415 +74 | 68.09 +134 | 14.199 +57 | 59.92 -63 | 25.291 +10 | 34.42 -318 | 15.690 +63 | 50.32 +34 |
| 11 16.5 | 15.556 +141 | 66.75 +115 | 14.256 +106 | 60.55 -90 | 25.301 +72 | 31.24 -336 | 15.753 +115 | 49.98 +15 |
| 11 26.4 | 15.761 +205 | 65.60 +92 | 14.362 +159 | 61.45 -113 | 25.373 +130 | 27.88 -346 | 15.868 +173 | 49.83 -3 |
| 12 6.4 | 16.029 +268 | 64.68 +63 | 14.521 +207 | 62.58 -133 | 25.503 +190 | 24.42 -351 | 16.041 +227 | 49.86 -33 |
| 12 16.4 | 16.352 +323 | 64.05 +28 | 14.728 +250 | 63.91 -152 | 25.693 +246 | 20.91 -340 | 16.268 +272 | 50.19 -59 |
| 12 26.4 | 16.717 +365 | 63.77 -6 | 14.978 +284 | 65.43 -165 | 25.939 +292 | 17.51 -324 | 16.540 +309 | 50.78 -85 |
| 12 36.3 | 17.117 +420 | 63.83 -43 | 15.262 +313 | 67.08 -176 | 26.231 +334 | 14.27 -296 | 16.849 +339 | 51.63 -109 |
| | | 64.26 -76 | 15.575 +328 | 68.84 -179 | 26.565 +361 | 11.31 -256 | 17.188 +357 | 52.72 -127 |
| Mean Place | 16.750 | 62.63 | 14.986 | 57.44 | 26.225 | 36.26 | 16.672 | 46.33 |
| sec δ, tan δ | +1.347 | -0.902 | +1.011 | -0.149 | +1.314 | +0.852 | +1.105 | -0.471 |
| da(ψ), dδ(ψ) | +0.078 | -0.28 | +0.064 | -0.28 | +0.045 | -0.28 | +0.070 | -0.28 |
| da(ε), dδ(ε) | -0.043 | -0.70 | -0.007 | -0.71 | +0.040 | -0.71 | -0.022 | -0.72 |
| Dble.Trans. | May 7 | | May 7 | | May 7 | | May 8 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 557 | | 1395 | | 1397 | | 1396 | | | | | | |
|---|---------------|-------------|-----------|--------|----------------------------|--------|-----------|-------------|-------|------|-------------|-------|------|
| | ψ Bootis | | 47 Bootis | | B.D. +55° 1730 (Bootis) | | 45 Bootis | | | | | | |
| Mag.Spect. | 4.67 | K0 | 5.59 | A0 | 5.21 | G5 | 5.03 | F0 | | | | | |
| U.T. | R.A. | | R.A. | | R.A. | | R.A. | | | | | | |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " | | | | | |
| | 15 03 | +26 59 | 15 04 | +48 11 | 15 05 | +54 36 | 15 06 | +24 54 | | | | | |
| 1 | -8.6 | 49 209 +260 | 57.78 | -302 | 56.403 +290 | 64.26 | -346 | 50.993 +309 | 21.92 | -351 | 39 618 +258 | 75.30 | -297 |
| 1 | 1.3 | 49.504 +295 | 54.93 | -285 | 56.740 +337 | 61.10 | -316 | 51.358 +365 | 18.73 | -319 | 39 909 +291 | 72.48 | -282 |
| 1 | 11.3 | 49.826 +322 | 52.29 | -264 | 57.118 +378 | 58.30 | -280 | 51.771 +413 | 15.93 | -280 | 40 228 +319 | 69.87 | -261 |
| 1 | 21.3 | 50.166 +340 | 50.01 | -228 | 57.523 +405 | 56.00 | -230 | 52.217 +446 | 13.66 | -227 | 40 565 +337 | 67.59 | -228 |
| 1 | 31.3 | 50.510 +344 | 48.14 | -187 | 57.940 +417 | 54.25 | -175 | 52.679 +462 | 11.97 | -169 | 40 906 +341 | 65.70 | -189 |
| 2 | 10.2 | 50.853 +343 | 46.72 | -142 | 58.360 +420 | 53.09 | -116 | 53.146 +467 | 10.90 | -107 | 41 245 +339 | 64.25 | -145 |
| 2 | 20.2 | 51.184 +331 | 45.83 | -89 | 58.768 +408 | 52.60 | -49 | 53.602 +456 | 10.52 | -38 | 41 573 +328 | 63.31 | -94 |
| 3 | 2.2 | 51.494 +310 | 45.45 | -38 | 59.153 +385 | 52.73 | +13 | 54.033 +431 | 10.77 | +25 | 41 882 +309 | 62.86 | -45 |
| 3 | 12.2 | 51.781 +287 | 45.59 | +14 | 59.508 +355 | 53.47 | +74 | 54.431 +398 | 11.66 | +89 | 42 168 +286 | 62.92 | +6 |
| 3 | 22.1 | 52.038 +257 | 46.22 | +63 | 59.823 +315 | 54.79 | +132 | 54.783 +352 | 13.15 | +149 | 42 424 +256 | 63.46 | +54 |
| 4 | 1.1 | 52.263 +225 | 47.27 | +105 | 60.094 +271 | 56.58 | +179 | 55.083 +300 | 15.11 | +196 | 42 649 +225 | 64.42 | +96 |
| 4 | 11.1 | 52.455 +192 | 48.70 | +143 | 60.319 +225 | 58.79 | +221 | 55.330 +247 | 17.49 | +238 | 42 843 +194 | 65.75 | +133 |
| 4 | 21.0 | 52.611 +156 | 50.43 | +173 | 60.491 +172 | 61.31 | +252 | 55.515 +185 | 20.18 | +269 | 43 002 +159 | 67.39 | +164 |
| 5 | 1.0 | 52.733 +122 | 52.35 | +192 | 60.613 +122 | 64.01 | +270 | 55.641 +126 | 23.03 | +285 | 43 127 +125 | 69.22 | +183 |
| 5 | 11.0 | 52.820 +87 | 54.42 | +207 | 60.686 +73 | 66.83 | +282 | 55.708 +67 | 26.00 | +297 | 43 219 +92 | 71.19 | +197 |
| 5 | 21.0 | 52.873 +53 | 56.53 | +211 | 60.707 +21 | 69.63 | +280 | 55.714 +6 | 28.93 | +293 | 43 277 +58 | 73.22 | +203 |
| 5 | 30.9 | 52.893 +20 | 58.59 | +206 | 60.683 -24 | 72.32 | +269 | 55.667 -47 | 31.72 | +279 | 43 303 +26 | 75.21 | +199 |
| 6 | 9.9 | 52.881 -12 | 60.57 | +198 | 60.613 -70 | 74.84 | +252 | 55.566 -101 | 34.33 | +261 | 43 297 -6 | 77.13 | +192 |
| 6 | 19.9 | 52.837 -44 | 62.37 | +180 | 60.500 -113 | 77.07 | +223 | 55.416 -150 | 36.63 | +230 | 43 259 -38 | 78.88 | +175 |
| 6 | 29.9 | 52.766 -71 | 63.96 | +159 | 60.351 -149 | 78.98 | +191 | 55.224 -192 | 38.58 | +195 | 43 195 -64 | 80.43 | +155 |
| 7 | 9.8 | 52.666 -100 | 65.30 | +134 | 60.167 -184 | 80.53 | +155 | 54.992 -232 | 40.14 | +156 | 43 102 -93 | 81.75 | +132 |
| 7 | 19.8 | 52.542 -124 | 66.33 | +103 | 59.954 -213 | 81.64 | +111 | 54.727 -265 | 41.23 | +109 | 42 984 -118 | 82.77 | +118 |
| 7 | 29.8 | 52.400 -142 | 67.05 | +72 | 59.719 -235 | 82.31 | +67 | 54.439 -288 | 41.86 | +63 | 42 848 -136 | 83.50 | +73 |
| 8 | 8.7 | 52.240 -160 | 67.45 | +40 | 59.465 -254 | 82.53 | +22 | 54.431 -308 | 42.01 | +15 | 42 694 -154 | 83.92 | +42 |
| 8 | 18.7 | 52.072 -168 | 67.47 | +2 | 59.204 -261 | 82.25 | -28 | 53.815 -316 | 41.64 | -37 | 42 531 -163 | 83.98 | +6 |
| 8 | 28.7 | 51.901 -171 | 67.15 | -32 | 58.942 -262 | 81.52 | -73 | 53.499 -316 | 40.80 | -84 | 42 365 -166 | 83.72 | -26 |
| 9 | 7.7 | 51.733 -168 | 66.47 | -68 | 58.685 -257 | 80.31 | -121 | 53.191 -308 | 39.46 | -134 | 42 200 -165 | 83.10 | -62 |
| 9 | 17.6 | 51.579 -154 | 65.42 | -105 | 58.449 -236 | 78.64 | -167 | 52.906 -285 | 37.64 | -182 | 42 050 -150 | 82.13 | -97 |
| 9 | 27.6 | 51.445 -134 | 64.04 | -138 | 58.238 -211 | 76.57 | -207 | 52.651 -255 | 35.41 | -223 | 41 919 -131 | 80.83 | -130 |
| 10 | 7.6 | 51.339 -106 | 62.30 | -174 | 58.064 -174 | 74.08 | -249 | 52.437 -214 | 32.75 | -266 | 41 816 -103 | 79.18 | -165 |
| 10 | 17.6 | 51.273 -66 | 60.24 | -206 | 57.939 -125 | 71.23 | -285 | 52.278 -159 | 29.73 | -302 | 41 751 -65 | 77.22 | -196 |
| 10 | 27.5 | 51.249 -24 | 57.89 | -235 | 57.866 -73 | 68.09 | -314 | 52.177 -101 | 26.42 | -331 | 41 729 -22 | 74.97 | -225 |
| 11 | 6.5 | 51.276 +27 | 55.27 | -262 | 57.855 -11 | 64.67 | -342 | 52.146 -31 | 22.85 | -357 | 41 755 +26 | 72.45 | -252 |
| 11 | 16.5 | 51.356 +80 | 52.44 | -283 | 57.912 +57 | 61.09 | -358 | 52.191 +45 | 19.13 | -372 | 41 836 +81 | 69.72 | -273 |
| 11 | 26.4 | 51.488 +132 | 49.47 | -297 | 58.034 +122 | 57.43 | -366 | 52.309 +118 | 15.34 | -379 | 41 967 +131 | 66.83 | -289 |
| 12 | 6.4 | 51.674 +186 | 46.39 | -308 | 58.224 +190 | 53.75 | -368 | 52.504 +195 | 11.56 | -378 | 42 151 +184 | 63.84 | -299 |
| 12 | 16.4 | 51.907 +233 | 43.35 | -304 | 58.476 +252 | 50.20 | -355 | 52.770 +266 | 07.93 | -363 | 42 382 +231 | 60.86 | -298 |
| 12 | 26.4 | 52.181 +274 | 40.39 | -296 | 58.783 +307 | 46.85 | -335 | 53.099 +329 | 04.54 | -339 | 42 653 +271 | 57.95 | -291 |
| 12 | 36.3 | 52.489 +308 | 37.61 | -278 | 59.138 +355 | 43.81 | -304 | 53.484 +385 | 01.48 | -306 | 42 958 +305 | 55.20 | -275 |
| | | +330 | -249 | +388 | -259 | +426 | -258 | | | | +327 | | -247 |
| Mean Place | 52.024 | 59.33 | 58.983 | 70.11 | 53.515 | 28.78 | 42.482 | 76.42 | | | | | |
| sec δ , tan δ | +1.122 | +0.510 | +1.500 | +1.119 | +1.727 | +1.408 | +1.103 | +0.465 | | | | | |
| $d\alpha(\psi)$, $d\delta(\psi)$ | +0.051 | -0.28 | +0.040 | -0.28 | +0.034 | -0.27 | +0.052 | -0.27 | | | | | |
| $d\alpha(\epsilon)$, $d\delta(\epsilon)$ | +0.024 | -0.72 | +0.052 | -0.72 | +0.065 | -0.73 | +0.021 | -0.73 | | | | | |
| Dble. Trans. | May 8 | | May 8 | | May 8 | | May 9 | | | | | | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 1398 | | 558 | | 559 | | 1399 | |
|--------------------|---------------------------|------------|---------------------------|------------|---------------------------|------------|---------------------------|------------|
| Name | κ ¹ Lupi* | | ζ Lupi | | ι Librae | | 1 Lupi | |
| Mag.Spect. | 4.14 | B9 | 3.50 | K0 | 4.66 | A0p | 4.95 | F0 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° / | h m | ° / | h m | ° / | h m | ° / |
| | 15 10 | -48 40 | 15 11 | -52 02 | 15 11 | -19 44 | 15 13 | -31 27 |
| 1 ^d | 54 523 ^s + 369 | 58 66 + 49 | 13 410 ^s + 391 | 38 92 + 65 | 23 317 ^s + 279 | " -102 | 43 489 ^s + 301 | " - 37 |
| 1 ^{1.4} | 54 935 + 412 | 58 54 + 12 | 13 845 + 435 | 38 65 + 27 | 23 627 + 310 | 19 20 -119 | 43 824 + 335 | 58 29 - 64 |
| 1 ^{11.3} | 55 379 + 444 | 58 80 - 26 | 14 315 + 470 | 38 78 - 13 | 23 960 + 333 | 20 39 -136 | 44 185 + 361 | 59 83 - 90 |
| 1 ^{21.3} | 55 842 + 463 | 59 44 - 64 | 14 806 + 491 | 39 32 - 54 | 24 307 + 347 | 21 75 -148 | 44 561 + 376 | 60 96 -113 |
| 1 ^{31.3} | 56 309 + 467 | 60 41 - 97 | 15 301 + 495 | 40 22 - 90 | 24 655 + 348 | 23 23 -153 | 44 940 + 379 | 62 25 -129 |
| 2 | 56 773 + 464 | 61 69 -128 | 15 794 + 493 | 41 46 -124 | 25 000 + 345 | 26 30 -154 | 45 315 + 375 | 63 69 -144 |
| 2 ^{20.2} | 57 222 + 449 | 63 25 -156 | 16 270 + 476 | 43 00 -154 | 25 332 + 332 | 27 80 -150 | 45 678 + 363 | 65 22 -153 |
| 3 | 57 646 + 424 | 65 00 -175 | 16 721 + 451 | 44 78 -178 | 25 646 + 314 | 29 21 -141 | 46 021 + 343 | 66 78 -156 |
| 3 ^{12.2} | 58 045 + 399 | 66 94 -194 | 17 145 + 424 | 46 77 -199 | 25 939 + 293 | 30 52 -131 | 46 342 + 321 | 68 36 -158 |
| 3 ^{22.1} | 58 408 + 363 | 69 02 -208 | 17 532 + 387 | 48 92 -215 | 26 206 + 267 | 31 69 -117 | 46 636 + 294 | 69 92 -156 |
| 4 | 58 735 + 327 | 71 16 -214 | 17 879 + 347 | 51 17 -225 | 26 445 + 239 | 32 71 -102 | 46 901 + 265 | 71 41 -149 |
| 4 ^{11.1} | 59 026 + 291 | 73 36 -220 | 18 187 + 308 | 53 50 -233 | 26 659 + 214 | 33 60 - 89 | 47 138 + 237 | 72 86 -145 |
| 4 ^{21.1} | 59 273 + 247 | 75 58 -222 | 18 449 + 262 | 55 85 -235 | 26 842 + 183 | 34 33 - 73 | 47 341 + 203 | 74 21 -135 |
| 5 | 59 479 + 206 | 77 75 -217 | 18 666 + 217 | 58 19 -234 | 26 998 + 156 | 34 94 - 61 | 47 514 + 173 | 75 48 -127 |
| 5 ^{11.0} | 59 642 + 163 | 79 89 -214 | 18 836 + 170 | 60 49 -230 | 27 124 + 126 | 35 43 - 49 | 47 655 + 141 | 76 66 -118 |
| 5 | 59 758 + 116 | 81 92 -203 | 18 955 + 119 | 62 69 -220 | 27 218 + 94 | 35 80 - 37 | 47 760 + 105 | 77 73 -107 |
| 5 ^{30.9} | 59 829 + 71 | 83 82 -190 | 19 026 + 71 | 64 76 -207 | 27 284 + 66 | 36 09 - 29 | 47 833 + 73 | 78 69 -96 |
| 6 | 59 853 + 24 | 85 57 -175 | 19 046 + 20 | 66 67 -191 | 27 318 + 34 | 36 28 - 19 | 47 870 + 37 | 79 52 - 83 |
| 6 ^{19.9} | 59 829 - 24 | 87 10 -153 | 19 013 - 33 | 68 36 -169 | 27 319 + 1 | 36 38 - 10 | 47 870 + 0 | 80 22 - 70 |
| 6 ^{29.9} | 59 762 - 67 | 88 41 -131 | 18 935 - 78 | 69 81 -145 | 27 292 - 27 | 36 41 - 3 | 47 838 - 32 | 80 77 - 55 |
| 7 | 59 650 - 112 | 89 45 -104 | 18 808 - 127 | 70 98 -117 | 27 234 - 58 | 36 35 + 6 | 47 771 - 67 | 81 16 - 39 |
| 7 ^{19.8} | 59 499 -151 | 90 18 - 73 | 18 640 -168 | 71 81 - 83 | 27 149 - 85 | 36 20 + 15 | 47 673 - 98 | 81 37 - 21 |
| 7 ^{29.8} | 59 317 -182 | 90 61 - 43 | 18 438 -202 | 72 32 - 51 | 27 041 -108 | 35 98 + 22 | 47 550 -123 | 81 41 - 4 |
| 8 | 59 106 -211 | 90 69 - 8 | 18 206 -232 | 72 45 - 13 | 26 913 -128 | 35 68 + 30 | 47 403 -147 | 81 26 + 15 |
| 8 ^{18.7} | 58 880 -226 | 90 42 + 27 | 17 958 -248 | 72 21 + 24 | 26 772 -141 | 35 30 + 38 | 47 243 -160 | 80 91 + 35 |
| 8 | 58 648 -232 | 89 83 + 59 | 17 705 -253 | 71 62 + 59 | 26 626 -146 | 34 87 + 43 | 47 077 -166 | 80 40 + 51 |
| 9 | 58 420 -228 | 88 91 + 92 | 17 456 -249 | 70 68 + 94 | 26 480 -146 | 34 39 + 48 | 46 911 -166 | 79 72 + 68 |
| 9 ^{17.6} | 58 214 -206 | 87 71 +120 | 17 230 -226 | 69 42 +126 | 26 348 -132 | 33 90 + 49 | 46 761 -150 | 78 92 + 80 |
| 9 ^{27.6} | 58 038 -176 | 86 28 +143 | 17 038 -192 | 67 91 +151 | 26 236 -112 | 33 42 + 48 | 46 632 -129 | 78 03 + 89 |
| 10 | 57 905 -133 | 84 66 +162 | 16 892 -146 | 66 17 +174 | 26 153 - 83 | 32 98 + 44 | 46 536 - 96 | 77 08 + 95 |
| 10 | 57 830 - 75 | 82 95 +171 | 16 808 - 84 | 64 33 +184 | 26 110 - 43 | 32 64 + 34 | 46 485 - 51 | 76 15 + 93 |
| 10 ^{27.5} | 57 818 - 12 | 81 21 +174 | 16 791 - 17 | 62 43 +190 | 26 111 + 1 | 32 43 + 21 | 46 482 + 3 | 75 28 + 87 |
| 11 | 57 877 + 59 | 79 51 +170 | 16 850 + 59 | 60 57 +186 | 26 165 + 54 | 32 41 + 2 | 46 535 + 53 | 74 54 + 74 |
| 11 ^{6.5} | 57 877 + 134 | 79 51 +155 | 16 850 + 139 | 60 57 +172 | 26 165 + 94 | 32 41 -17 | 46 535 + 111 | 74 54 + 56 |
| 11 ^{16.5} | 58 011 + 205 | 77 96 +134 | 16 989 + 215 | 58 85 +153 | 26 259 + 164 | 32 58 - 33 | 46 646 + 168 | 73 98 + 37 |
| 11 ^{26.5} | 58 216 + 205 | 76 62 +134 | 17 204 + 215 | 57 32 +153 | 26 423 + 164 | 32 91 - 33 | 46 814 + 168 | 73 61 + 37 |
| 12 | 58 492 + 276 | 75 55 +107 | 17 495 + 291 | 56 07 +125 | 26 634 + 211 | 33 54 - 63 | 47 041 + 227 | 73 50 + 11 |
| 12 ^{16.4} | 58 830 + 338 | 74 82 + 73 | 17 852 + 357 | 55 18 + 89 | 26 890 + 256 | 34 39 - 85 | 47 317 + 276 | 73 68 - 18 |
| 12 ^{26.4} | 59 218 + 388 | 74 44 + 38 | 18 262 + 410 | 54 65 + 53 | 27 182 + 292 | 35 46 -107 | 47 633 + 316 | 74 14 - 46 |
| 12 ^{36.3} | 59 649 + 431 | 74 45 - 1 | 18 717 + 455 | 54 51 + 14 | 27 505 + 323 | 36 71 -125 | 47 983 + 350 | 74 87 - 73 |
| | 59 649 + 455 | 74 45 - 40 | 18 717 + 482 | 54 51 - 29 | 27 505 + 341 | 36 71 -140 | 47 983 + 370 | 74 87 - 97 |
| Mean Place | 59 451 | 73 99 | 18 598 | 54 77 | 26 994 | 28 59 | 47 553 | 70 05 |
| sec δ, tan δ | +1.515 | -1.138 | +1.626 | -1.282 | +1.062 | -0.359 | +1.172 | -0.612 |
| da(ψ), dδ(ψ) | +0.083 | -0.27 | +0.086 | -0.27 | +0.068 | -0.27 | +0.073 | -0.26 |
| da(ε), dδ(ε) | -0.051 | -0.74 | -0.057 | -0.74 | -0.016 | -0.74 | -0.027 | -0.75 |
| Dble.Trans. | May 10 | | May 10 | | May 10 | | May 10 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 565 | | 562 | | 563 | | 564 | | |
|---|--------------------|--------------|-------------|--------------|-----------------|--------------|----------------|--------------|------------|
| | 1 H. Ursae Minoris | | 3 Serpentis | | δ Bootis | | β Librae | | |
| Mag.Spect. | 5.23 | G0 | 5.44 | K0 | 3.54 | K0 | 2.74 | B8 | |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | |
| | h m | $^{\circ}$ / | h m | $^{\circ}$ / | h m | $^{\circ}$ / | h m | $^{\circ}$ / | |
| | 15 14 | + 67 23 | 15 14 | + 4 59 | 15 14 | + 33 21 | 15 16 | - 9 19 | |
| 1 | -8.6 | 26 283 + 376 | 44 26 -356 | 27 879 + 251 | 23 26 -221 | 54 706 + 255 | 49 70 -322 | 13 302 + 260 | 54.89 -152 |
| 1 | 1.4 | 26.745 + 462 | 41.04 -322 | 28.161 + 282 | 21.05 -221 | 54.999 + 293 | 46.68 -302 | 13.594 + 292 | 56.52 -163 |
| 1 | 11.3 | 27.284 + 539 | 38.24 -280 | 28.468 + 307 | 18.88 -217 | 55.324 + 325 | 43.91 -277 | 13.909 + 315 | 58.23 -171 |
| 1 | 21.3 | 27.883 + 599 | 36.00 -224 | 28.789 + 321 | 16.85 -203 | 55.671 + 347 | 41.54 -237 | 14.238 + 329 | 59.95 -172 |
| 1 | 31.3 | 28.515 + 632 | 34.37 -163 | 29.114 + 325 | 15.03 -182 | 56.027 + 356 | 39.61 -193 | 14.571 + 333 | 61.61 -166 |
| 2 | 10.2 | 29.166 + 651 | 33.39 -98 | 29.437 + 323 | 13.44 -159 | 56.384 + 357 | 38.18 -143 | 14.901 + 330 | 63.17 -156 |
| 2 | 20.2 | 29.809 + 643 | 33.13 -26 | 29.749 + 312 | 12.18 -126 | 56.732 + 348 | 37.33 -85 | 15.219 + 318 | 64.57 -140 |
| 3 | 2.2 | 30.422 + 613 | 33.52 + 39 | 30.044 + 295 | 11.26 -92 | 57.060 + 328 | 37.03 -30 | 15.521 + 302 | 65.78 -121 |
| 3 | 12.2 | 30.993 + 571 | 34.57 +105 | 30.319 + 275 | 10.68 -58 | 57.367 + 307 | 37.29 + 26 | 15.803 + 282 | 66.78 -100 |
| 3 | 22.1 | 31.499 + 506 | 36.23 +166 | 30.569 + 250 | 10.45 -23 | 57.643 + 276 | 38.09 + 80 | 16.060 + 257 | 67.55 -77 |
| 4 | 1.1 | 31.928 + 429 | 38.36 +213 | 30.793 + 224 | 10.54 + 9 | 57.886 + 243 | 39.34 +125 | 16.292 + 232 | 68.09 -54 |
| 4 | 11.1 | 32.276 + 348 | 40.93 +257 | 30.991 + 198 | 10.93 + 39 | 58.095 + 209 | 41.00 +166 | 16.499 + 207 | 68.43 -34 |
| 4 | 21.1 | 32.528 + 252 | 43.80 +287 | 31.158 + 167 | 11.57 + 64 | 58.265 + 170 | 42.99 +199 | 16.677 + 178 | 68.57 -14 |
| 5 | 1.0 | 32.687 + 159 | 46.83 +303 | 31.298 + 140 | 12.39 + 82 | 58.398 + 133 | 45.18 +219 | 16.828 + 151 | 68.56 + 1 |
| 5 | 11.0 | 32.751 + 64 | 49.97 +314 | 31.410 + 112 | 13.36 + 97 | 58.494 + 96 | 47.53 +235 | 16.951 + 123 | 68.42 + 14 |
| 5 | 21.0 | 32.718 - 33 | 53.05 +308 | 31.491 + 81 | 14.44 +108 | 58.551 + 57 | 49.92 +239 | 17.043 + 92 | 68.16 + 26 |
| 5 | 30.9 | 32.600 -118 | 55.97 +292 | 31.545 + 54 | 15.54 +110 | 58.573 + 22 | 52.25 +233 | 17.108 + 65 | 67.84 + 32 |
| 6 | 9.9 | 32.396 -204 | 58.69 +272 | 31.569 + 24 | 16.65 +111 | 58.558 - 15 | 54.49 +224 | 17.143 + 35 | 67.46 + 38 |
| 6 | 19.9 | 32.113 -283 | 61.07 +238 | 31.564 - 5 | 17.71 +106 | 58.508 - 50 | 56.53 +204 | 17.147 + 4 | 67.04 + 42 |
| 6 | 29.9 | 31.767 -346 | 63.07 +200 | 31.532 - 32 | 18.70 + 99 | 58.428 - 80 | 58.32 +179 | 17.124 - 23 | 66.62 + 42 |
| 7 | 9.8 | 31.358 -409 | 64.65 +158 | 31.471 - 61 | 19.60 + 90 | 58.316 - 112 | 59.84 +152 | 17.071 - 53 | 66.19 + 43 |
| 7 | 19.8 | 30.901 -457 | 65.73 +108 | 31.386 - 85 | 20.36 + 76 | 58.178 - 138 | 61.01 +117 | 16.992 - 79 | 65.76 + 40 |
| 7 | 29.8 | 30.411 -490 | 66.32 + 59 | 31.280 -106 | 20.98 + 62 | 58.109 -159 | 61.83 + 82 | 16.891 -101 | 65.36 + 40 |
| 8 | 8.8 | 29.891 -520 | 66.40 + 8 | 31.156 -124 | 21.46 + 48 | 57.840 -179 | 62.27 + 44 | 16.770 -121 | 64.97 + 39 |
| 8 | 18.7 | 29.361 -530 | 65.93 - 47 | 31.019 -137 | 21.75 + 29 | 57.651 -189 | 62.30 + 3 | 16.636 -134 | 64.61 + 36 |
| 8 | 28.7 | 28.834 -527 | 64.96 - 97 | 30.878 -141 | 21.88 + 13 | 57.458 -193 | 61.95 - 35 | 16.496 -140 | 64.30 + 31 |
| 9 | 7.7 | 28.318 -516 | 63.48 -148 | 30.736 -142 | 21.81 - 7 | 57.266 -192 | 61.19 - 76 | 16.355 -141 | 64.04 + 26 |
| 9 | 17.6 | 27.837 -481 | 61.50 -198 | 30.606 -130 | 21.53 -28 | 57.088 -178 | 60.02 -117 | 16.226 -129 | 63.87 + 17 |
| 9 | 27.6 | 27.398 -439 | 59.09 -241 | 30.493 -113 | 21.05 -48 | 56.929 -159 | 58.49 -153 | 16.226 -111 | 63.87 + 8 |
| 10 | 7.6 | 27.017 -381 | 56.25 -284 | 30.406 - 87 | 20.33 -72 | 56.799 -130 | 56.56 -193 | 16.115 - 84 | 63.79 - 5 |
| 10 | 17.6 | 26.714 -303 | 53.06 -319 | 30.355 - 51 | 19.37 - 96 | 56.709 - 90 | 54.29 -227 | 15.984 - 47 | 64.05 - 21 |
| 10 | 27.5 | 26.494 -220 | 49.58 -348 | 30.344 - 11 | 18.19 -118 | 56.663 - 46 | 51.72 -257 | 15.979 - 5 | 64.42 - 37 |
| 11 | 6.5 | 26.370 -124 | 45.84 -374 | 30.379 + 35 | 16.76 -143 | 56.668 + 5 | 48.86 -286 | 16.021 + 42 | 64.98 - 56 |
| 11 | 16.5 | 26.354 - 16 | 41.98 -386 | 30.464 + 85 | 15.10 -166 | 56.730 + 62 | 45.79 -307 | 16.112 + 91 | 65.76 - 78 |
| 11 | 26.5 | 26.444 + 90 | 38.06 -392 | 30.599 + 135 | 13.24 -186 | 56.847 + 117 | 42.58 -321 | 16.255 + 143 | 66.79 -103 |
| 12 | 6.4 | 26.646 + 202 | 34.17 -389 | 30.782 + 183 | 11.20 -204 | 57.020 + 173 | 39.28 -330 | 16.448 + 193 | 68.02 -123 |
| 12 | 16.4 | 26.955 + 309 | 30.47 -370 | 31.010 + 228 | 09.05 -215 | 57.245 + 225 | 36.02 -326 | 16.686 + 238 | 69.43 -141 |
| 12 | 26.4 | 27.358 + 403 | 27.03 -344 | 31.274 + 264 | 06.85 -220 | 57.514 + 269 | 32.88 -314 | 16.960 + 274 | 70.98 -155 |
| 12 | 36.3 | 27.852 + 494 | 23.96 -307 | 31.569 + 295 | 04.65 -220 | 57.822 + 308 | 29.94 -294 | 17.264 + 304 | 72.64 -166 |
| | | + 561 | -257 | + 314 | -210 | + 335 | -260 | + 323 | -170 |
| Mean Place | 28.745 | 52.51 | 31.053 | 20.10 | 57.498 | 52.94 | 16.750 | 61.42 | |
| sec δ , $\tan \delta$ | +2.602 | +2.402 | +1.004 | +0.087 | +1.197 | +0.658 | +1.013 | -0.164 | |
| $d\alpha(\psi)$, $d\delta(\psi)$ | +0.013 | -0.26 | +0.059 | -0.26 | +0.048 | -0.26 | +0.064 | -0.26 | |
| $d\alpha(\epsilon)$, $d\delta(\epsilon)$ | +0.106 | -0.75 | +0.004 | -0.75 | +0.029 | -0.75 | -0.007 | -0.76 | |
| Dble.Trans. | May 11 | | May 11 | | May 11 | | May 11 | | |

AT UPPER TRANSIT AT GREENWICH

| No. | 561 | | 560 | | 1400 | | 1401 | |
|--------------|-------------|------------|-----------------------|------------|---------------------------------------|------------|-----------------------------|------------|
| | β Circini | | γ Trianguli Australis | | Piazzi 15 ^h 36 (Serpentis) | | B.D. +10° 2823* (Serpentis) | |
| Mag.Spect. | 4.16 | A3 | 3.06 | A0 | 5.66 | G5 | 6.71 | F8 |
| U.T. | R.A. | | R.A. | | R.A. | | R.A. | |
| | Dec. | | Dec. | | Dec. | | Dec. | |
| | h m | ° ′ | h m | ° ′ | h m | ° ′ | h m | ° ′ |
| | 15 16 | -58 44 | 15 17 | -68 37 | 15 17 | +20 36 | 15 17 | +10 28 |
| 1 -8.6 | 21.066 +438 | 49.88 +102 | 30.472 +578 | 33.27 +146 | 45.221 +245 | 77.20 -283 | 59.947 +246 | 36.85 -244 |
| 1 1.4 | 21.559 +493 | 49.27 +61 | 31.127 +655 | 32.25 +102 | 45.501 +280 | 74.47 -273 | 60.225 +278 | 34.44 -241 |
| 1 11.3 | 22.094 +535 | 49.09 +18 | 31.845 +718 | 31.69 +56 | 45.808 +307 | 71.91 -256 | 60.529 +304 | 32.12 -232 |
| 1 21.3 | 22.657 +563 | 49.35 -26 | 32.605 +760 | 31.65 +4 | 46.134 +326 | 69.63 -228 | 60.849 +320 | 29.99 -213 |
| 1 31.3 | 23.227 +570 | 50.03 -68 | 33.379 +774 | 32.08 -43 | 46.466 +332 | 67.70 -193 | 61.174 +325 | 28.12 -187 |
| 2 10.2 | 23.798 +571 | 51.10 -107 | 34.157 +778 | 32.97 -89 | 46.798 +332 | 66.16 -154 | 61.498 +324 | 26.54 -158 |
| 2 20.2 | 24.353 +555 | 52.54 -144 | 34.917 +760 | 34.31 -134 | 47.121 +323 | 65.09 -107 | 61.812 +314 | 25.35 -119 |
| 3 2.2 | 24.881 +528 | 54.27 -173 | 35.642 +725 | 36.02 -171 | 47.427 +306 | 64.50 -59 | 62.108 +296 | 24.53 -82 |
| 3 12.2 | 25.379 +498 | 56.28 -201 | 36.328 +686 | 38.08 -206 | 47.712 +285 | 64.37 -13 | 62.387 +279 | 24.11 -42 |
| 3 22.1 | 25.835 +456 | 58.51 -223 | 36.956 +628 | 40.44 -236 | 47.971 +259 | 64.72 +35 | 62.640 +253 | 24.09 -2 |
| 4 1.1 | 26.246 +411 | 60.89 -238 | 37.521 +565 | 43.03 -259 | 48.202 +231 | 65.48 +76 | 62.866 +226 | 24.42 +33 |
| 4 11.1 | 26.612 +366 | 63.40 -251 | 38.021 +500 | 45.81 -278 | 48.404 +202 | 66.60 +112 | 63.066 +200 | 25.07 +65 |
| 4 21.1 | 26.922 +310 | 65.99 -259 | 38.440 +419 | 48.71 -290 | 48.572 +168 | 68.03 +143 | 63.235 +169 | 26.00 +93 |
| 5 1.0 | 27.179 +257 | 68.59 -260 | 38.781 +341 | 51.67 -296 | 48.710 +138 | 69.66 +163 | 63.376 +141 | 27.12 +112 |
| 5 11.0 | 27.379 +200 | 71.19 -260 | 39.039 +258 | 54.67 -300 | 48.816 +106 | 71.46 +180 | 63.488 +112 | 28.40 +128 |
| 5 21.0 | 27.517 +138 | 73.71 -252 | 39.204 +165 | 57.60 -293 | 48.889 +73 | 73.33 +187 | 63.569 +81 | 29.78 +138 |
| 5 30.9 | 27.597 +80 | 76.11 -240 | 39.284 +80 | 60.42 -282 | 48.931 +42 | 75.19 +186 | 63.621 +52 | 31.17 +139 |
| 6 9.9 | 27.615 +18 | 78.36 -225 | 39.273 -11 | 63.09 -267 | 48.941 +10 | 77.00 +181 | 63.644 +23 | 32.55 +138 |
| 6 19.9 | 27.569 -102 | 80.37 -201 | 39.170 -103 | 65.51 -242 | 48.920 -21 | 78.69 +169 | 63.635 -9 | 33.86 +131 |
| 6 29.9 | 27.467 -160 | 82.13 -176 | 38.985 -185 | 67.66 -215 | 48.870 -50 | 80.20 +151 | 63.600 -35 | 35.05 +119 |
| 7 9.8 | 27.307 -211 | 83.58 -145 | 38.718 -267 | 69.46 -180 | 48.791 -79 | 81.51 +131 | 63.536 -64 | 36.11 +106 |
| 7 19.8 | 27.096 -251 | 84.67 -109 | 38.379 -339 | 70.85 -139 | 48.687 -104 | 82.57 +106 | 63.447 -89 | 37.00 +89 |
| 7 29.8 | 26.845 -288 | 85.40 -73 | 37.994 -395 | 71.83 -98 | 48.561 -126 | 83.36 +79 | 63.337 -110 | 37.70 +70 |
| 8 8.8 | 26.557 -307 | 85.71 -31 | 37.540 -444 | 72.34 -51 | 48.417 -144 | 83.88 +52 | 63.207 -130 | 38.21 +51 |
| 8 18.7 | 26.250 -307 | 85.59 +12 | 37.070 -470 | 72.35 -1 | 48.260 -157 | 84.07 +19 | 63.066 -141 | 38.48 +27 |
| 8 28.7 | 25.936 -314 | 85.07 +52 | 36.593 -477 | 71.89 +46 | 48.099 -161 | 83.96 -11 | 62.919 -147 | 38.54 +6 |
| 9 7.7 | 25.626 -310 | 84.14 +93 | 36.126 -467 | 70.94 +95 | 47.937 -162 | 83.54 -42 | 62.771 -148 | 38.35 -19 |
| 9 17.6 | 25.344 -282 | 82.84 +130 | 35.698 -428 | 69.54 +140 | 47.787 -150 | 82.78 -76 | 62.634 -137 | 37.91 -44 |
| 9 27.6 | 25.100 -244 | 81.22 +162 | 35.325 -373 | 67.77 +177 | 47.655 -132 | 81.71 -107 | 62.514 -120 | 37.22 -69 |
| 10 7.6 | 24.910 -190 | 79.33 +189 | 35.029 -296 | 65.64 +213 | 47.548 -107 | 80.31 -140 | 62.420 -94 | 36.27 -95 |
| 10 17.6 | 24.792 -118 | 77.26 +207 | 34.834 -195 | 63.28 +236 | 47.478 -70 | 78.61 -170 | 62.361 -59 | 35.05 -122 |
| 10 27.5 | 24.752 -40 | 75.10 +216 | 34.748 -86 | 60.78 +250 | 47.448 -30 | 76.62 -199 | 62.342 -19 | 33.58 -147 |
| 11 6.5 | 24.800 +48 | 72.93 +217 | 34.785 +37 | 58.20 +258 | 47.466 +18 | 74.35 -227 | 62.369 +27 | 31.85 -173 |
| 11 16.5 | 24.943 +143 | 70.87 +206 | 34.952 +167 | 55.71 +249 | 47.537 +71 | 71.86 -249 | 62.447 +78 | 31.85 -196 |
| 11 26.5 | 25.174 +231 | 68.98 +189 | 35.241 +289 | 53.38 +233 | 47.657 +120 | 69.20 -266 | 62.574 +127 | 27.74 -215 |
| 12 6.4 | 25.493 +319 | 67.36 +162 | 35.654 +413 | 51.29 +209 | 47.830 +173 | 66.40 -280 | 62.750 +176 | 25.42 -232 |
| 12 16.4 | 25.892 +399 | 66.09 +127 | 36.176 +522 | 49.57 +172 | 48.049 +219 | 63.57 -283 | 62.972 +222 | 23.02 -240 |
| 12 26.4 | 26.353 +461 | 65.20 +89 | 36.788 +612 | 48.24 +133 | 48.308 +259 | 60.78 -279 | 63.231 +259 | 20.60 -242 |
| 12 36.3 | 26.870 +517 | 64.73 +47 | 37.478 +690 | 47.37 +87 | 48.601 +293 | 58.11 -267 | 63.522 +291 | 18.22 -238 |
| | 26.870 +551 | 64.73 +2 | 37.478 +740 | 47.37 +36 | 48.601 +316 | 58.11 -244 | 63.522 +312 | 18.22 -223 |
| Mean Place | 26.989 | 66.07 | 38.195 | 50.32 | 48.179 | 77.85 | 63.047 | 35.19 |
| sec δ, tan δ | +1.928 | -1.648 | +2.744 | -2.556 | +1.068 | +0.376 | +1.017 | +0.185 |
| dα(ψ), dδ(ψ) | +0.094 | -0.26 | +0.113 | -0.26 | +0.054 | -0.26 | +0.057 | -0.26 |
| dα(ε), dδ(ε) | -0.072 | -0.76 | -0.111 | -0.76 | +0.016 | -0.76 | +0.008 | -0.76 |
| Dbble.Trans. | May 11 | | May 11 | | May 11 | | May 12 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 1402 | | 569 | | 566 | | 1404 | | |
|---|---------------|----------------|------------------------|----------------|-------------|----------------|--------------|----------------|------------|
| | δ Lupi | | γ Ursae Minoris | | ϕ Lupi | | 73 G. Librae | | |
| Mag. Spect. | 3.43 | B2 | 3.14 | A2 | 3.59 | K5 | 6.78 | K0 | |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | |
| | h m | $^{\circ}$ ' / | h m | $^{\circ}$ ' / | h m | $^{\circ}$ ' / | h m | $^{\circ}$ ' / | |
| | 15 20 | - 40 35 | 15 20 | + 71 52 | 15 20 | - 36 12 | 15 22 | - 26 38 | |
| 1 | -8.6 | 24.431 +324 | 45.36 +16 | 42.063 +410 | 46.75 -356 | 52.487 +309 | 35.25 -7 | 04.642 +283 | 18.49 -57 |
| 1 | 1.4 | 24.794 +363 | 45.52 -16 | 42.583 +520 | 43.53 -322 | 52.832 +345 | 35.61 -36 | 04.959 +317 | 19.30 -81 |
| 1 | 11.3 | 25.186 +392 | 45.99 -47 | 43.203 +620 | 40.73 -280 | 53.205 +373 | 36.26 -65 | 05.302 +343 | 20.32 -102 |
| 1 | 21.3 | 25.598 +412 | 46.77 -78 | 43.902 +699 | 38.49 -224 | 53.597 +392 | 37.18 -92 | 05.662 +360 | 21.52 -120 |
| 1 | 31.3 | 26.013 +415 | 47.81 -104 | 44.648 +746 | 36.86 -163 | 53.992 +395 | 38.31 -113 | 06.025 +363 | 22.84 -132 |
| 2 | 10.3 | 26.428 +415 | 49.08 -127 | 45.423 +775 | 35.87 -99 | 54.386 +394 | 39.63 -132 | 06.386 +361 | 24.25 -141 |
| 2 | 20.2 | 26.830 +402 | 50.55 -147 | 46.197 +774 | 35.60 -27 | 54.768 +382 | 41.10 -147 | 06.737 +351 | 25.70 -145 |
| 3 | 2.2 | 27.212 +382 | 52.14 -159 | 46.939 +742 | 35.99 +39 | 55.131 +363 | 42.65 -155 | 07.069 +332 | 27.14 -144 |
| 3 | 12.2 | 27.573 +361 | 53.84 -170 | 47.634 +695 | 37.04 +105 | 55.473 +342 | 44.27 -162 | 07.383 +314 | 28.55 -141 |
| 3 | 22.1 | 27.904 +331 | 55.61 -177 | 48.252 +618 | 38.70 +166 | 55.787 +314 | 45.91 -164 | 07.671 +288 | 29.88 -133 |
| 4 | 1.1 | 28.204 +300 | 57.40 -179 | 48.779 +527 | 40.85 +215 | 56.072 +285 | 47.54 -163 | 07.933 +262 | 31.13 -125 |
| 4 | 11.1 | 28.473 +269 | 59.20 -180 | 49.206 +427 | 43.43 +258 | 56.328 +256 | 49.15 -161 | 08.168 +235 | 32.30 -117 |
| 4 | 21.1 | 28.706 +233 | 60.98 -178 | 49.514 +308 | 46.32 +289 | 56.550 +222 | 50.71 -156 | 08.372 +204 | 33.36 -106 |
| 5 | 1.0 | 28.905 +199 | 62.71 -173 | 49.705 +191 | 49.38 +306 | 56.739 +189 | 52.21 -150 | 08.547 +175 | 34.33 -97 |
| 5 | 11.0 | 29.066 +161 | 64.38 -167 | 49.778 +73 | 52.55 +317 | 56.894 +155 | 53.64 -143 | 08.692 +145 | 35.19 -86 |
| 5 | 21.0 | 29.187 +121 | 65.95 -157 | 49.727 -51 | 55.67 +312 | 57.012 +118 | 54.97 -133 | 08.803 +111 | 35.96 -77 |
| 5 | 30.9 | 29.271 +84 | 67.42 -147 | 49.568 -159 | 58.64 +297 | 57.094 +82 | 56.19 -122 | 08.883 +80 | 36.63 -67 |
| 6 | 9.9 | 29.313 +42 | 68.76 -134 | 49.301 -267 | 61.40 +276 | 57.138 +44 | 57.29 -110 | 08.928 +45 | 37.20 -57 |
| 6 | 19.9 | 29.313 +0 | 69.93 -117 | 48.933 -368 | 63.83 +243 | 57.142 +4 | 58.24 -95 | 08.939 +11 | 37.65 -45 |
| 6 | 29.9 | 29.275 -38 | 70.92 -99 | 48.484 -449 | 65.88 +205 | 57.111 -31 | 59.04 -80 | 08.917 -22 | 38.01 -36 |
| 7 | 9.8 | 29.197 -78 | 71.70 -78 | 47.956 -528 | 67.51 +163 | 57.042 -69 | 59.64 -60 | 08.862 -55 | 38.23 -22 |
| 7 | 19.8 | 29.083 -114 | 72.24 -54 | 47.367 -589 | 68.63 +112 | 56.939 -103 | 60.04 -40 | 08.776 -86 | 38.33 -10 |
| 7 | 29.8 | 28.939 -144 | 72.54 -30 | 46.735 -632 | 69.27 +64 | 56.808 -131 | 60.24 -20 | 08.664 -112 | 38.30 +3 |
| 8 | 8.8 | 28.768 -171 | 72.57 -3 | 46.066 -669 | 69.39 +12 | 56.651 -157 | 60.20 +4 | 08.528 -136 | 38.12 +18 |
| 8 | 18.7 | 28.581 -187 | 72.32 +25 | 45.384 -682 | 68.96 -43 | 56.478 -173 | 59.93 +27 | 08.378 -150 | 37.80 +32 |
| 8 | 28.7 | 28.386 -195 | 71.83 +49 | 44.704 -680 | 68.04 -92 | 56.298 -180 | 59.45 +48 | 08.220 -158 | 37.37 +43 |
| 9 | 7.7 | 28.191 -195 | 71.07 +76 | 44.036 -668 | 66.59 -145 | 56.117 -181 | 58.75 +70 | 08.061 -159 | 36.81 +56 |
| 9 | 17.6 | 28.013 -178 | 70.10 +97 | 43.409 -627 | 64.64 -195 | 56.117 -166 | 57.88 +87 | 07.915 -146 | 36.17 +64 |
| 9 | 27.6 | 27.859 -154 | 68.96 +114 | 42.833 -576 | 62.27 -237 | 55.951 -143 | 56.88 +100 | 07.788 -127 | 35.47 +70 |
| 10 | 7.6 | 27.740 -119 | 67.68 +128 | 42.325 -508 | 59.46 -281 | 55.698 -110 | 55.77 +111 | 07.691 -97 | 34.76 +71 |
| 10 | 17.6 | 27.671 -69 | 66.35 +133 | 41.910 -415 | 56.29 -317 | 55.634 -64 | 54.64 +113 | 07.635 -56 | 34.08 +68 |
| 10 | 27.5 | 27.655 -16 | 65.02 +133 | 41.593 -317 | 52.84 -345 | 55.621 -13 | 53.53 +111 | 07.625 -10 | 33.49 +59 |
| 11 | 6.5 | 27.701 +46 | 63.75 +127 | 41.392 -201 | 49.12 -372 | 55.667 +46 | 52.51 +102 | 07.668 +43 | 33.03 +46 |
| 11 | 16.5 | 27.814 +113 | 62.63 +112 | 41.322 -70 | 45.27 -385 | 55.774 +107 | 51.65 +86 | 07.766 +98 | 32.77 +26 |
| 11 | 26.5 | 27.989 +175 | 61.70 +93 | 41.379 +57 | 41.37 -390 | 55.941 +167 | 50.98 +67 | 07.919 +153 | 32.64 +13 |
| 12 | 6.4 | 28.228 +239 | 61.02 +68 | 41.574 +195 | 37.50 -387 | 56.170 +229 | 50.55 +43 | 08.129 +210 | 32.78 -14 |
| 12 | 16.4 | 28.524 +296 | 60.65 +37 | 41.901 +327 | 33.80 -370 | 56.451 +281 | 50.42 +13 | 08.388 +259 | 33.18 -40 |
| 12 | 26.4 | 28.865 +341 | 60.59 +6 | 42.347 +446 | 30.36 -344 | 56.776 +325 | 50.58 -16 | 08.686 +298 | 33.82 -64 |
| 12 | 36.3 | 29.244 +379 | 60.85 -26 | 42.907 +560 | 27.29 -307 | 57.137 +361 | 51.04 -46 | 09.017 +331 | 34.70 -88 |
| | | +403 | -58 | +648 | -256 | +384 | -74 | +352 | -108 |
| Mean Place | 28.936 | 58.20 | 44.526 | 55.57 | 56.781 | 47.25 | 08.581 | 28.39 | |
| sec δ , tan δ | +1.317 | -0.857 | +3.216 | +3.056 | +1.239 | -0.732 | +1.119 | -0.502 | |
| $d\alpha(\psi)$, $d\delta(\psi)$ | +0.079 | -0.26 | -0.001 | -0.25 | +0.076 | -0.25 | +0.071 | -0.25 | |
| $d\alpha(\epsilon)$, $d\delta(\epsilon)$ | -0.037 | -0.77 | +0.130 | -0.77 | -0.031 | -0.77 | -0.021 | -0.77 | |
| Dble. Trans. | May 12 | | May 12 | | May 12 | | May 13 | | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 1405 | | 1403 | | 1406 | | 568 | |
|--------------|--------------|------------|---------------------|------------|--------------|------------|--------------|------------|
| Name | 30 Librae | | φ ² Lupi | | 8 Serpentis | | μ Bootis* ρ. | |
| Mag.Spect. | 6.74 | K2 | 4.69 | B3 | 6.10 | F0 | 4.47 | F0 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " |
| | 15 22 | - 15 05 | 15 22 | - 36 48 | 15 22 | - 0 58 | 15 23 | + 37 25 |
| 1 -8.6 | 12 885 + 263 | 04 14 -120 | 13 074 + 310 | 26.95 - 2 | 58 579 + 249 | 25 31 -191 | 56 046 + 248 | 22.22 -333 |
| 1 1.4 | 13 180 + 295 | 05 49 -135 | 13 420 + 346 | 27.27 - 32 | 58 858 + 279 | 27 28 -197 | 56 336 + 290 | 19.09 -313 |
| 1 11.3 | 13 500 + 320 | 06 95 -146 | 13 795 + 375 | 27.88 - 61 | 59 163 + 305 | 29.25 -197 | 56 662 + 326 | 16.24 -285 |
| 1 21.3 | 13 835 + 335 | 08 49 -154 | 14 189 + 394 | 28.76 - 88 | 59 483 + 320 | 31.14 -189 | 57 013 + 351 | 13.79 -245 |
| 1 31.3 | 14 174 + 339 | 10 03 -154 | 14 587 + 398 | 29.87 -111 | 59 808 + 325 | 32.90 -176 | 57 376 + 363 | 11.82 -197 |
| 2 10.3 | 14 512 + 338 | 11 54 -151 | 14 983 + 396 | 31.17 -130 | 60 133 + 325 | 34.47 -157 | 57 744 + 368 | 10.37 -145 |
| 2 20.2 | 14 839 + 327 | 12 95 -141 | 15 369 + 386 | 32.62 -145 | 60 447 + 314 | 35.79 -132 | 58 104 + 360 | 09.52 - 85 |
| 3 2.2 | 15 149 + 310 | 14 22 -127 | 15 734 + 365 | 34.16 -154 | 60 746 + 299 | 36.83 -104 | 58 447 + 343 | 09.25 - 27 |
| 3 12.2 | 15 441 + 292 | 15 35 -113 | 16 080 + 346 | 35.77 -161 | 61 026 + 280 | 37.58 - 75 | 58 769 + 322 | 09.56 + 31 |
| 3 22.1 | 15 709 + 268 | 16 30 - 95 | 16 398 + 318 | 37.42 -165 | 61 283 + 257 | 38.02 - 44 | 59 061 + 292 | 10.44 + 88 |
| 4 1.1 | 15 951 + 242 | 17 08 - 78 | 16 686 + 288 | 39.06 -164 | 61 515 + 232 | 38.19 - 17 | 59 318 + 257 | 11.79 +135 |
| 4 11.1 | 16 169 + 218 | 17 68 - 60 | 16 945 + 259 | 40.69 -163 | 61 722 + 207 | 38.09 + 10 | 59 541 + 223 | 13.57 +178 |
| 4 21.1 | 16 358 + 189 | 18 12 - 44 | 17 170 + 225 | 42.27 -158 | 61 901 + 179 | 37.76 + 33 | 59 723 + 182 | 15.70 +213 |
| 5 1.0 | 16 520 + 162 | 18 42 - 30 | 17 363 + 193 | 43.79 -152 | 62 052 + 151 | 37.25 + 51 | 59 866 + 143 | 18.05 +235 |
| 5 11.0 | 16 654 + 134 | 18 60 - 18 | 17 521 + 158 | 45.25 -146 | 62 176 + 124 | 36.60 + 65 | 59 969 + 103 | 20.57 +252 |
| 5 21.0 | 16 756 + 102 | 18 67 - 7 | 17 640 + 119 | 46.60 -135 | 62 270 + 94 | 35.84 + 76 | 60 030 + 61 | 23.13 +256 |
| 5 31.0 | 16 830 + 74 | 18 67 + 0 | 17 725 + 85 | 47.86 -126 | 62 336 + 66 | 35.03 + 81 | 60 054 + 24 | 25.64 +251 |
| 6 9.9 | 16 873 + 43 | 18 59 + 8 | 17 770 + 45 | 48.99 -113 | 62 373 + 37 | 34.20 + 83 | 60 038 - 16 | 28.05 +241 |
| 6 19.9 | 16 884 + 11 | 18 45 + 14 | 17 776 + 6 | 49.97 - 98 | 62 378 + 5 | 33.38 + 82 | 59 984 - 54 | 30.25 +220 |
| 6 29.9 | 16 866 - 18 | 18 28 + 17 | 17 745 - 31 | 50.79 - 82 | 62 356 - 22 | 32.60 + 78 | 59 897 - 87 | 32.19 +194 |
| 7 9.8 | 16 816 - 50 | 18 05 + 23 | 17 676 - 69 | 51.43 - 64 | 62 305 - 51 | 31.87 + 73 | 59 775 - 122 | 33.85 +166 |
| 7 19.8 | 16 739 - 77 | 17 80 + 25 | 17 573 - 103 | 51.86 - 43 | 62 227 - 78 | 31.22 + 65 | 59 625 - 150 | 35.13 +128 |
| 7 29.8 | 16 638 - 101 | 17 51 + 29 | 17 441 - 132 | 52.07 - 21 | 62 127 - 100 | 30.67 + 55 | 59 452 - 173 | 36.04 + 91 |
| 8 8.8 | 16 515 - 123 | 17 18 + 33 | 17 283 - 158 | 52.05 + 2 | 62 006 - 121 | 30.21 + 46 | 59 257 - 195 | 36.56 + 62 |
| 8 18.7 | 16 378 - 137 | 16 83 + 35 | 17 108 - 175 | 51.80 + 25 | 61 873 - 133 | 29.87 + 34 | 59 050 - 207 | 36.63 + 7 |
| 8 28.7 | 16 234 - 144 | 16 48 + 35 | 16 926 - 182 | 51.32 + 48 | 61 732 - 141 | 29.66 + 21 | 58 837 - 213 | 36.30 - 33 |
| 9 7.7 | 16 089 - 145 | 16 11 + 37 | 16 744 - 182 | 50.63 + 69 | 61 590 - 142 | 29.57 + 9 | 58 625 - 122 | 35.54 - 76 |
| 9 17.7 | 15 955 - 134 | 15 78 + 33 | 16 575 - 169 | 49.75 + 88 | 61 458 - 132 | 29.66 - 9 | 58 426 - 199 | 34.34 -120 |
| 9 27.6 | 15 838 - 117 | 15 49 + 29 | 16 430 - 145 | 48.73 +102 | 61 342 - 116 | 29.90 - 24 | 58 246 - 180 | 32.75 -159 |
| 10 7.6 | 15 748 - 90 | 15 28 + 21 | 16 318 - 112 | 47.60 +113 | 61 251 - 91 | 30.32 - 42 | 58 095 - 151 | 30.76 -199 |
| 10 17.6 | 15 697 - 51 | 15 19 + 9 | 16 252 - 66 | 46.45 +115 | 61 197 - 54 | 30.96 - 64 | 57 984 - 111 | 28.40 -236 |
| 10 27.5 | 15 687 - 10 | 15 23 - 4 | 16 238 - 14 | 45.31 +114 | 61 181 - 16 | 31.79 - 83 | 57 917 - 67 | 25.73 -267 |
| 11 6.5 | 15 728 + 41 | 15 45 - 22 | 16 281 + 43 | 44.25 +106 | 61 212 + 31 | 32.85 -106 | 57 903 - 14 | 22.75 -298 |
| 11 16.5 | 15 814 + 86 | 15 45 - 31 | 16 281 + 107 | 43.35 + 90 | 61 212 + 81 | 32.85 -128 | 57 903 + 45 | 19.56 -319 |
| 11 26.5 | 15 957 + 143 | 15 76 - 73 | 16 388 + 167 | 42.64 + 71 | 61 293 + 130 | 34.13 -150 | 57 948 + 102 | 16.23 -333 |
| 12 6.4 | 16 151 + 194 | 17 35 - 86 | 16 783 + 228 | 42.17 + 47 | 61 603 + 180 | 37.32 -169 | 58 211 + 161 | 12.81 -342 |
| 12 16.4 | 16 391 + 240 | 18 42 -107 | 17 065 + 282 | 41.99 + 18 | 61 827 + 224 | 39.15 -183 | 58 428 + 217 | 09.44 -337 |
| 12 26.4 | 16 668 + 277 | 19 65 -123 | 17 391 + 326 | 42.11 - 12 | 62 089 + 262 | 41.07 -192 | 58 691 + 263 | 06.18 -326 |
| 12 36.4 | 16 977 + 309 | 21 05 -140 | 17 753 + 362 | 42.53 - 42 | 62 381 + 292 | 43.04 -197 | 58 997 + 306 | 03.15 -303 |
| | 16 977 + 328 | 21 05 -148 | 17 753 + 386 | 42.53 - 70 | 62 381 + 313 | 43.04 -192 | 58 997 + 337 | 03.15 -288 |
| Mean Place | 16.494 | 11.49 | 17.405 | 38.88 | 61.894 | 29.37 | 58.819 | 26.60 |
| sec δ, tan δ | +1.036 | -0.270 | +1.249 | -0.748 | +1.000 | -0.017 | +1.259 | +0.765 |
| dα(ψ), dδ(ψ) | +0.067 | -0.25 | +0.076 | -0.25 | +0.062 | -0.25 | +0.045 | -0.25 |
| dα(ε), dδ(ε) | -0.011 | -0.77 | -0.032 | -0.77 | -0.001 | -0.77 | +0.032 | -0.78 |
| Dble.Trans. | May 13 | | May 13 | | May 13 | | May 13 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 571 | | 570 | | 572 | | 1407 | |
|--------------|---------------------------------------|---|---------------------------------------|---|---------------------------------------|---|---------------------------------------|---|
| | ι Draconis | | τ ¹ Serpentis | | β Coronae Borealis | | 32 Librae | |
| Mag.Spect. | 3.47 | K0 | 5.46 | M0 | 3.72 | F0p | 5.92 | K0 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | ^h ^m 15 24 | [°] ['] + 59 00 | ^h ^m 15 25 | [°] ['] + 15 28 | ^h ^m 15 27 | [°] ['] + 29 08 | ^h ^m 15 27 | [°] ['] - 16 40 |
| | ^d | ^s | ^s | ["] | ^s | ["] | ^s | ["] |
| 1 | -8.6 | + 296 | + 240 | -263 | + 239 | -311 | + 262 | -109 |
| 1 | 1.4 | + 364 | + 273 | -258 | + 278 | -297 | + 294 | -124 |
| 1 | 11.3 | + 422 | + 300 | -245 | + 309 | -275 | + 319 | -138 |
| 1 | 21.3 | + 467 | + 319 | -222 | + 331 | -240 | + 336 | -147 |
| 1 | 31.3 | + 493 | + 325 | -193 | + 342 | -200 | + 341 | -148 |
| 2 | 10.3 | + 507 | + 327 | -158 | + 345 | -153 | + 340 | -147 |
| 2 | 20.2 | + 503 | + 318 | -115 | + 337 | -99 | + 330 | -139 |
| 3 | 2.2 | + 482 | + 302 | -73 | + 322 | -46 | + 315 | -127 |
| 3 | 12.2 | + 452 | + 284 | -29 | + 303 | + 7 | + 297 | -115 |
| 3 | 22.1 | + 407 | + 260 | + 15 | + 275 | + 61 | + 273 | -98 |
| 4 | 1.1 | + 352 | + 233 | + 53 | + 246 | +105 | + 249 | -81 |
| 4 | 11.1 | + 295 | + 206 | + 88 | + 215 | +147 | + 224 | -67 |
| 4 | 21.1 | + 227 | + 175 | +119 | + 180 | +180 | + 196 | -50 |
| 5 | 1.0 | + 160 | + 146 | +139 | + 145 | +203 | + 168 | -38 |
| 5 | 11.0 | + 93 | + 116 | +156 | + 111 | +220 | + 141 | -26 |
| 5 | 21.0 | + 22 | + 84 | +164 | + 74 | +227 | + 109 | -15 |
| 5 | 31.0 | - 40 | + 54 | +166 | + 40 | +224 | + 80 | -8 |
| 6 | 9.9 | -105 | + 23 | +163 | + 4 | +218 | + 48 | + 0 |
| 6 | 19.9 | -164 | - 9 | +153 | - 31 | +201 | + 15 | + 5 |
| 6 | 29.9 | -215 | - 37 | +139 | - 61 | +179 | - 14 | +10 |
| 7 | 9.8 | - 265 | - 67 | +124 | - 94 | +155 | - 47 | +16 |
| 7 | 19.8 | -305 | - 93 | +101 | -121 | +124 | - 75 | +21 |
| 7 | 29.8 | -335 | -115 | + 79 | -144 | + 92 | -100 | +24 |
| 8 | 8.8 | -363 | -135 | + 55 | -165 | + 57 | -123 | +29 |
| 8 | 18.7 | -376 | -149 | + 27 | -178 | + 19 | -138 | +33 |
| 8 | 28.7 | -379 | -154 | + 1 | -185 | - 17 | -146 | +35 |
| 9 | 7.7 | -375 | -157 | - 26 | -186 | - 56 | -148 | +38 |
| 9 | 17.7 | -353 | -146 | - 57 | -174 | - 95 | -138 | +36 |
| 9 | 27.6 | -323 | -130 | - 85 | -158 | -130 | -121 | +33 |
| 10 | 7.6 | -282 | -105 | -115 | -131 | -168 | - 94 | +28 |
| 10 | 17.6 | -224 | - 70 | -143 | - 94 | -202 | - 56 | +16 |
| 10 | 27.5 | -161 | - 31 | -171 | - 52 | -233 | - 14 | + 5 |
| 11 | 6.5 | - 87 | + 16 | -198 | - 4 | -263 | + 35 | -12 |
| 11 | 16.5 | - 4 | + 67 | -221 | + 51 | -285 | + 88 | - 9 |
| 11 | 26.5 | + 77 | +116 | -239 | +104 | -302 | +133 | -72 |
| 12 | 6.4 | +164 | +168 | -255 | +160 | -313 | +192 | -75 |
| 12 | 16.4 | +247 | +214 | -261 | +210 | -313 | +238 | -95 |
| 12 | 26.4 | +319 | +252 | -261 | +253 | -306 | +275 | -113 |
| 12 | 36.4 | +388 | +286 | -253 | +292 | -289 | +308 | -130 |
| | +439 | -272 | +310 | -235 | +319 | -260 | +329 | -140 |
| Mean Place | 37.636 | 47.07 | 09.801 | 29.74 | 16.334 | 66.36 | 29.621 | 12.29 |
| sec δ, tan δ | +1.942 | +1.665 | +1.038 | +0.277 | +1.145 | +0.558 | +1.044 | -0.299 |
| dα(ψ), dδ(ψ) | +0.027 | -0.25 | +0.055 | -0.25 | +0.050 | -0.25 | +0.067 | -0.25 |
| dα(ε), dδ(ε) | +0.070 | -0.78 | +0.012 | -0.78 | +0.023 | -0.79 | -0.012 | -0.79 |
| Dble.Trans. | May 13 | | May 13 | | May 14 | | May 14 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 567 | | 1408 | | 573 | | 576 | |
|--------------|-----------------------|---------------------------|------------------------------|--------------------------|---------------------------|--------------------------|---------------------------|--------------------------|
| Name | α ¹ Apodis | | B.D. +9° 3055 (Serpentis) | | ν ¹ Bootis | | 9 Coronae Borealis | |
| Mag.Spect. | 5.65 | B5p | 6.46 | F2 | 5.15 | K5 | 4.17 | B5 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° ' | h m | ° ' | h m | ° ' | h m | ° ' |
| | 15 29 | -73 20 | 15 30 | + 8 37 | 15 30 | +40 52 | 15 32 | +31 23 |
| 1 | ^d -8.6 | ^s 51.822 + 678 | ^s 12.900 + 236 | ^s 30.44 - 235 | ^s 23.871 + 244 | ^s 38.12 - 343 | ^s 20.221 + 235 | ^s 71.51 - 319 |
| 1 | 1.4 | + 782 | + 270 | - 233 | + 290 | - 321 | + 275 | - 303 |
| 1 | 11.3 | + 867 | + 297 | - 226 | + 329 | - 293 | + 308 | - 281 |
| 1 | 21.3 | + 930 | + 315 | - 210 | + 358 | - 250 | + 333 | - 246 |
| 1 | 31.3 | + 956 | + 321 | - 187 | + 372 | - 202 | + 344 | - 203 |
| 2 | 10.3 | + 972 | + 323 | - 159 | + 379 | - 148 | + 350 | - 156 |
| 2 | 20.2 | + 958 | + 315 | - 123 | + 373 | - 86 | + 343 | - 100 |
| 3 | 2.2 | + 922 | + 300 | - 87 | + 358 | - 26 | + 328 | - 45 |
| 3 | 12.2 | + 880 | + 283 | - 49 | + 338 | + 34 | + 311 | + 10 |
| 3 | 22.1 | + 813 | + 260 | - 10 | + 306 | + 93 | + 283 | + 64 |
| 4 | 1.1 | + 737 | + 235 | + 25 | + 272 | + 143 | + 253 | + 111 |
| 4 | 11.1 | + 657 | + 210 | + 57 | + 236 | + 187 | + 223 | + 154 |
| 4 | 21.1 | + 557 | + 181 | + 84 | + 193 | + 223 | + 186 | + 188 |
| 5 | 1.0 | + 457 | + 153 | + 105 | + 152 | + 245 | + 152 | + 211 |
| 5 | 11.0 | + 351 | + 125 | + 121 | + 110 | + 264 | + 115 | + 230 |
| 5 | 21.0 | + 232 | + 94 | + 130 | + 65 | + 269 | + 77 | + 236 |
| 5 | 31.0 | + 120 | + 65 | + 134 | + 24 | + 263 | + 43 | + 235 |
| 6 | 9.9 | + 1 | + 35 | + 134 | - 18 | + 253 | + 5 | + 227 |
| 6 | 19.9 | - 120 | - 2 | + 127 | - 59 | + 232 | - 31 | + 210 |
| 6 | 29.9 | - 227 | + 3 | + 118 | - 94 | + 205 | - 63 | + 189 |
| 7 | 9.8 | - 337 | - 55 | + 106 | - 131 | + 175 | - 96 | + 163 |
| 7 | 19.8 | - 433 | - 83 | + 89 | - 162 | + 137 | - 125 | + 130 |
| 7 | 29.8 | - 508 | - 104 | + 73 | - 187 | + 98 | - 150 | + 97 |
| 8 | 8.8 | - 576 | - 126 | + 54 | - 210 | + 56 | - 171 | + 61 |
| 8 | 18.7 | - 614 | - 140 | + 33 | - 224 | + 11 | - 186 | + 21 |
| 8 | 28.7 | - 628 | - 148 | + 12 | - 230 | - 32 | - 192 | - 16 |
| 9 | 7.7 | - 622 | - 150 | - 10 | - 231 | - 77 | - 194 | - 56 |
| 9 | 17.7 | - 578 | - 142 | - 34 | - 218 | - 123 | - 184 | - 97 |
| 9 | 27.6 | - 512 | - 126 | - 58 | - 199 | - 163 | - 167 | - 133 |
| 10 | 7.6 | - 422 | - 102 | - 83 | - 170 | - 205 | - 141 | - 173 |
| 10 | 17.6 | - 297 | - 67 | - 110 | - 129 | - 244 | - 104 | - 209 |
| 10 | 27.5 | - 165 | - 29 | - 133 | - 84 | - 275 | - 62 | - 239 |
| 11 | 6.5 | - 13 | + 17 | - 159 | - 29 | - 307 | - 13 | - 270 |
| 11 | 16.5 | + 151 | + 67 | - 183 | + 31 | - 329 | + 42 | - 293 |
| 11 | 26.5 | + 306 | + 116 | - 201 | + 90 | - 343 | + 97 | - 310 |
| 12 | 6.4 | + 462 | + 166 | - 220 | + 152 | - 352 | + 152 | - 322 |
| 12 | 16.4 | + 604 | + 212 | - 229 | + 211 | - 347 | + 206 | - 321 |
| 12 | 26.4 | + 721 | + 250 | - 233 | + 261 | - 334 | + 249 | - 312 |
| 12 | 36.4 | + 827 | + 283 | - 231 | + 307 | - 312 | + 291 | - 297 |
| 12 | | + 900 | + 306 | - 218 | + 341 | - 274 | + 319 | - 265 |
| Mean Place | 61.352 | 38.51 | 16.078 | 29.05 | 26.642 | 43.21 | 23.099 | 74.95 |
| sec δ, tan δ | +3.489 | -3.343 | +1.011 | +0.152 | +1.323 | +0.866 | +1.172 | +0.611 |
| dα(ψ), dδ(ψ) | +0.131 | -0.24 | +0.058 | -0.24 | +0.043 | -0.24 | +0.048 | -0.24 |
| dα(ε), dδ(ε) | -0.136 | -0.79 | +0.006 | -0.79 | +0.035 | -0.79 | +0.024 | -0.80 |
| Dble.Trans. | May 15 | | May 15 | | May 15 | | May 15 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 1409 | | 578 | | 577 | | 1410 | | |
|--------------|-----------|---------|--------------------|---------|----------|---------|-------------|---------|-------|
| | 37 Librae | | α Coronae Borealis | | γ Librae | | 115 G. Lupi | | |
| Mag.Spect. | 4.83 | K0 | 2.31 | A0 | 4.02 | K0 | 5.47 | K5 | |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | |
| | h m | ° ′ | h m | ° ′ | h m | ° ′ | h m | ° ′ | |
| | 15 33 | - 10 01 | 15 34 | + 26 45 | 15 34 | - 14 44 | 15 35 | - 44 20 | |
| 1 | -8.6 | 22.788 | 02.88 | 04.024 | 32.18 | 42.513 | 36.63 | 11.575 | 56.38 |
| 1 | 1.4 | 23.070 | 04.41 | 04.294 | 29.26 | 42.800 | 37.93 | 11.943 | 56.23 |
| 1 | 11.3 | 23.378 | 06.03 | 04.596 | 26.52 | 43.113 | 39.35 | 12.345 | 56.39 |
| 1 | 21.3 | 23.703 | 07.66 | 04.921 | 24.11 | 43.443 | 40.83 | 12.772 | 56.89 |
| 1 | 31.3 | 24.033 | 09.25 | 05.257 | 22.09 | 43.779 | 42.31 | 13.206 | 57.67 |
| 2 | 10.3 | 24.364 | 10.74 | 05.597 | 20.50 | 44.116 | 43.75 | 13.643 | 58.71 |
| 2 | 20.2 | 24.687 | 12.09 | 05.930 | 19.44 | 44.445 | 45.10 | 14.071 | 59.99 |
| 3 | 2.2 | 24.995 | 13.25 | 06.250 | 18.89 | 44.759 | 46.31 | 14.481 | 61.44 |
| 3 | 12.2 | 25.287 | 14.22 | 06.552 | 18.86 | 45.056 | 47.37 | 14.871 | 63.05 |
| 3 | 22.2 | 25.557 | 14.95 | 06.828 | 19.36 | 45.332 | 48.25 | 15.233 | 64.77 |
| 4 | 1.1 | 25.803 | 15.48 | 07.076 | 20.30 | 45.583 | 48.95 | 15.565 | 66.55 |
| 4 | 11.1 | 26.025 | 15.80 | 07.296 | 21.65 | 45.811 | 49.49 | 15.866 | 68.38 |
| 4 | 21.1 | 26.219 | 15.93 | 07.481 | 23.34 | 46.011 | 49.86 | 16.129 | 70.24 |
| 5 | 1.0 | 26.388 | 15.91 | 07.634 | 25.26 | 46.184 | 50.10 | 16.357 | 72.07 |
| 5 | 11.0 | 26.528 | 15.76 | 07.754 | 27.37 | 46.330 | 50.22 | 16.546 | 73.89 |
| 5 | 21.0 | 26.639 | 15.51 | 07.837 | 29.55 | 46.445 | 50.23 | 16.691 | 75.63 |
| 5 | 31.0 | 26.721 | 15.19 | 07.887 | 31.72 | 46.530 | 50.18 | 16.796 | 77.29 |
| 6 | 9.9 | 26.772 | 14.82 | 07.902 | 33.84 | 46.584 | 50.07 | 16.856 | 78.84 |
| 6 | 19.9 | 26.790 | 14.42 | 07.882 | 35.82 | 46.605 | 49.90 | 16.869 | 80.23 |
| 6 | 29.9 | 26.780 | 14.02 | 07.832 | 37.59 | 46.596 | 49.71 | 16.840 | 81.44 |
| 7 | 9.8 | 26.738 | 13.61 | 07.748 | 39.14 | 46.554 | 49.48 | 16.766 | 82.45 |
| 7 | 19.8 | 26.667 | 13.21 | 07.637 | 40.39 | 46.483 | 49.22 | 16.651 | 83.20 |
| 7 | 29.8 | 26.572 | 12.84 | 07.501 | 41.34 | 46.387 | 48.95 | 16.502 | 83.71 |
| 8 | 8.8 | 26.454 | 12.47 | 07.344 | 41.97 | 46.266 | 48.64 | 16.321 | 83.92 |
| 8 | 18.7 | 26.320 | 12.15 | 07.172 | 42.22 | 46.130 | 48.32 | 16.120 | 83.84 |
| 8 | 28.7 | 26.178 | 11.85 | 06.993 | 42.13 | 45.985 | 48.00 | 15.908 | 83.47 |
| 9 | 7.7 | 26.032 | 11.61 | 06.812 | 41.67 | 45.836 | 47.67 | 15.693 | 82.80 |
| 9 | 17.7 | 25.896 | 11.44 | 06.640 | 40.83 | 45.696 | 47.38 | 15.491 | 81.88 |
| 9 | 27.6 | 25.775 | 11.36 | 06.484 | 39.65 | 45.573 | 47.13 | 15.314 | 80.74 |
| 10 | 7.6 | 25.679 | 11.39 | 06.353 | 38.10 | 45.474 | 46.95 | 15.171 | 79.41 |
| 10 | 17.6 | 25.618 | 11.56 | 06.258 | 36.21 | 45.412 | 46.88 | 15.079 | 77.97 |
| 10 | 27.5 | 25.598 | 11.88 | 06.203 | 34.01 | 45.392 | 46.94 | 15.042 | 76.49 |
| 11 | 6.5 | 25.625 | 12.39 | 06.197 | 31.51 | 45.420 | 47.16 | 15.069 | 75.02 |
| 11 | 16.5 | 25.702 | 13.07 | 06.244 | 28.78 | 45.500 | 47.49 | 15.166 | 73.67 |
| 11 | 26.5 | 25.828 | 14.01 | 06.342 | 25.88 | 45.625 | 48.17 | 15.330 | 72.48 |
| 12 | 6.4 | 26.008 | 15.16 | 06.496 | 22.84 | 45.808 | 49.01 | 15.561 | 71.51 |
| 12 | 16.4 | 26.233 | 16.47 | 06.699 | 19.79 | 46.037 | 50.04 | 15.855 | 70.82 |
| 12 | 26.4 | 26.495 | 17.92 | 06.946 | 16.79 | 46.304 | 51.24 | 16.198 | 70.44 |
| 12 | 36.4 | 26.790 | 19.48 | 07.231 | 13.93 | 46.605 | 52.58 | 16.584 | 70.39 |
| Mean Place | 26.335 | 08.30 | 06.968 | 34.76 | 46.167 | 42.83 | 16.382 | 68.14 | |
| sec δ, tan δ | +1.015 | -0.177 | +1.120 | +0.504 | +1.034 | -0.263 | +1.398 | -0.978 | |
| dα(ψ), dδ(ψ) | +0.065 | -0.24 | +0.050 | -0.24 | +0.067 | -0.24 | +0.082 | -0.23 | |
| dα(ε), dδ(ε) | -0.007 | -0.80 | +0.020 | -0.80 | -0.010 | -0.81 | -0.038 | -0.81 | |
| Dble.Trans. | May 15 | | May 16 | | May 16 | | May 16 | | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 574 | | 579 | | 580 | | 1411 | |
|--------------|-----------------------|------------|--------------|------------|--------------|------------|--------------|------------|
| | ε Trianguli Australis | | ν Librae | | φ Bootis | | 2 G. Normae | |
| Mag.Spect. | 4.11 | K0 | 3.78 | K2 | 5.41 | G5 | 5.48 | A0 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° / | h m | ° / | h m | ° / | h m | ° / |
| | 15 35 | -66 16 | 15 36 | -28 05 | 15 37 | +40 23 | 15 37 | -52 19 |
| 1 -8.6 | 21 070 + 506 | 07 83 +154 | 08 111 + 276 | 19 09 - 41 | 17 684 + 236 | 43 94 -343 | 43 546 + 363 | 32 09 + 91 |
| 1 1.4 | 21 651 + 581 | 06 70 +113 | 08 422 + 311 | 19 73 - 64 | 17 966 + 282 | 40 72 -322 | 43 959 + 413 | 31 53 + 56 |
| 1 11.3 | 22 294 + 643 | 05 99 + 71 | 08 761 + 339 | 19 73 - 85 | 18 287 + 321 | 37 76 -296 | 44 413 + 454 | 31 34 + 19 |
| 1 21.3 | 22 982 + 688 | 05 76 + 23 | 09 119 + 358 | 20 58 -104 | 18 639 + 352 | 35 21 -255 | 44 896 + 483 | 31 53 - 19 |
| 1 31.3 | 23 690 + 708 | 05 99 - 23 | 09 484 + 365 | 21 62 -118 | 19 006 + 367 | 33 14 -207 | 45 391 + 495 | 32 07 - 54 |
| 2 10.3 | 24 407 + 717 | 06 65 - 66 | 09 850 + 366 | 24 07 -127 | 19 381 + 375 | 31 60 -154 | 45 890 + 499 | 32 94 - 87 |
| 2 20.2 | 25 114 + 707 | 07 74 -109 | 10 207 + 357 | 25 41 -134 | 19 753 + 372 | 30 68 - 92 | 46 380 + 490 | 34 13 -119 |
| 3 2.2 | 25 796 + 682 | 09 20 -146 | 10 549 + 342 | 26 75 -134 | 20 111 + 358 | 30 35 - 33 | 46 851 + 471 | 35 57 -144 |
| 3 12.2 | 26 447 + 651 | 09 20 -181 | 10 549 + 325 | 26 75 -133 | 20 111 + 339 | 30 35 + 28 | 46 851 + 450 | 35 57 -167 |
| 3 22.2 | 27 051 + 604 | 11 01 -211 | 10 874 + 301 | 28 08 -128 | 20 450 + 309 | 30 63 + 87 | 47 301 + 419 | 37 24 -186 |
| | | 13 12 | 11 175 | 29 36 | 20 759 | 31 50 | 47 720 | 39 10 |
| 4 1.1 | 27 602 + 551 | 15 45 -233 | 11 451 + 276 | 30 57 -121 | 21 036 + 277 | 32 87 +137 | 48 103 + 383 | 41 08 -198 |
| 4 11.1 | 28 098 + 496 | 17 99 -254 | 11 702 + 251 | 31 72 -115 | 21 278 + 242 | 34 69 +182 | 48 452 + 349 | 43 18 -210 |
| 4 21.1 | 28 525 + 427 | 19 99 -269 | 11 923 + 221 | 32 78 -106 | 21 478 + 200 | 36 89 +220 | 48 756 + 304 | 45 35 -217 |
| 5 1.0 | 28 884 + 359 | 20 68 -277 | 11 923 + 191 | 32 78 -98 | 21 478 + 160 | 36 89 +244 | 48 756 + 261 | 45 35 -220 |
| 5 11.0 | 29 170 + 286 | 23 45 -282 | 12 114 + 162 | 33 76 - 91 | 21 638 + 118 | 39 33 +262 | 49 017 + 216 | 47 55 -220 |
| | | 26 27 | 12 276 | 34 67 | 21 756 | 41 95 | 49 233 | 49 75 |
| 5 21.0 | 29 372 + 202 | 29 07 -280 | 12 403 + 127 | 35 48 - 81 | 21 830 + 74 | 44 65 +270 | 49 397 + 164 | 51 91 -216 |
| 5 31.0 | 29 498 + 126 | 31 79 -272 | 12 499 + 96 | 36 21 - 73 | 21 863 + 33 | 47 30 +265 | 49 512 + 115 | 53 98 -207 |
| 6 9.9 | 29 539 + 41 | 34 39 -260 | 12 558 + 59 | 36 85 - 64 | 21 854 - 9 | 49 86 +256 | 49 573 + 61 | 55 94 -196 |
| 6 19.9 | 29 494 - 45 | 36 79 -240 | 12 581 + 23 | 37 39 - 54 | 21 803 - 51 | 49 86 +236 | 49 579 + 6 | 57 73 -179 |
| 6 29.9 | 29 373 - 121 | 38 95 -216 | 12 571 - 10 | 37 83 - 44 | 21 716 - 87 | 54 32 +210 | 49 535 - 44 | 59 32 -159 |
| 7 9.9 | 29 171 - 202 | 40 81 -186 | 12 523 - 48 | 38 15 - 32 | 21 592 - 124 | 56 13 +181 | 49 437 - 98 | 60 66 -134 |
| 7 19.8 | 28 899 - 272 | 42 29 -148 | 12 443 - 80 | 38 34 - 19 | 21 435 - 157 | 57 56 +143 | 49 291 - 146 | 61 71 -105 |
| 7 29.8 | 28 570 - 329 | 43 39 -110 | 12 335 - 108 | 38 41 - 7 | 21 253 - 182 | 58 61 +105 | 49 105 - 186 | 62 46 - 75 |
| 8 8.8 | 28 188 - 382 | 44 06 - 67 | 12 200 - 135 | 38 32 + 9 | 21 045 - 208 | 59 26 + 65 | 48 883 - 222 | 62 86 - 40 |
| 8 18.7 | 27 776 - 412 | 44 24 - 18 | 12 048 - 152 | 38 09 + 23 | 20 823 - 222 | 59 44 + 18 | 48 636 - 247 | 62 89 - 3 |
| 8 28.7 | 27 349 - 427 | 43 98 + 26 | 11 886 - 162 | 37 72 + 37 | 20 593 - 230 | 59 21 - 23 | 48 378 - 258 | 62 58 + 31 |
| 9 7.7 | 26 922 - 427 | 43 24 + 74 | 11 720 - 166 | 37 22 + 50 | 20 362 - 231 | 58 52 - 69 | 48 116 - 262 | 61 89 + 69 |
| 9 17.7 | 26 523 - 399 | 42 05 +119 | 11 564 - 156 | 36 61 + 61 | 20 362 - 221 | 57 38 -114 | 47 871 - 245 | 60 87 +102 |
| 9 27.6 | 26 168 - 355 | 40 48 +157 | 11 427 - 137 | 35 93 + 68 | 20 141 - 202 | 55 83 -155 | 47 652 - 219 | 59 57 +130 |
| 10 7.6 | 25 876 - 292 | 38 55 +193 | 11 317 - 110 | 35 20 + 73 | 19 763 - 176 | 53 85 -198 | 47 475 - 177 | 58 00 +157 |
| 10 17.6 | 25 672 - 204 | 36 36 +219 | 11 248 - 69 | 34 49 + 71 | 19 628 - 135 | 51 48 -237 | 47 356 - 119 | 56 27 +173 |
| 10 27.6 | 25 564 - 108 | 34 00 +236 | 11 224 - 24 | 33 82 + 67 | 19 538 - 90 | 48 79 -269 | 47 300 - 56 | 54 44 +183 |
| 11 6.5 | 25 564 + 0 | 31 53 +247 | 11 253 + 29 | 33 27 + 55 | 19 500 - 38 | 45 78 -301 | 47 319 + 19 | 52 58 +186 |
| 11 16.5 | 25 684 + 120 | 29 11 +242 | 11 339 + 86 | 32 89 + 38 | 19 523 + 23 | 45 78 -324 | 47 418 + 99 | 50 80 +178 |
| 11 26.5 | 25 916 + 232 | 26 81 +230 | 11 477 + 138 | 32 65 + 24 | 19 604 + 81 | 39 14 -340 | 47 595 + 177 | 49 16 +164 |
| 12 6.4 | 26 263 + 347 | 24 71 +210 | 11 676 + 199 | 32 62 + 3 | 19 748 + 144 | 35 63 -351 | 47 849 + 254 | 47 73 +143 |
| 12 16.4 | 26 714 + 451 | 22 93 +178 | 11 925 + 249 | 32 86 - 24 | 19 950 + 202 | 32 17 -346 | 48 175 + 326 | 46 60 +113 |
| 12 26.4 | 27 251 + 537 | 21 52 +141 | 12 215 + 290 | 33 34 - 48 | 20 202 + 252 | 28 82 -335 | 48 559 + 384 | 45 79 + 81 |
| 12 36.4 | 27 865 + 614 | 20 52 +100 | 12 542 + 327 | 34 05 - 71 | 20 501 + 299 | 25 69 -313 | 48 994 + 435 | 45 35 + 44 |
| | | + 53 | | - 91 | | - 279 | | + 6 |
| Mean Place | 28.451 | 22.33 | 12.163 | 27.86 | 20.490 | 49.13 | 48.969 | 44.69 |
| sec δ, tan δ | +2.485 | -2.275 | +1.134 | -0.534 | +1.313 | +0.851 | +1.636 | -1.295 |
| dα(ψ), dδ(ψ) | +0.110 | -0.23 | +0.073 | -0.23 | +0.043 | -0.23 | +0.089 | -0.23 |
| dα(ε), dδ(ε) | -0.089 | -0.81 | -0.021 | -0.81 | +0.033 | -0.81 | -0.050 | -0.81 |
| Dble.Trans. | May 16 | | May 16 | | May 16 | | May 17 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 1412 | | 1413 | | 582 | | 590 | | | | | | | | | | |
|--------------|--|--------|----------|--------|-------------|--------|-----------------|--------|--------|--------|------|-------|------|--------|-------|-------|------|
| | Piazzi 15 ^h 153 (Bootis) | | ♋ Librae | | α Serpentis | | ζ Ursae Minoris | | | | | | | | | | |
| Mag.Spect. | 5.78 | F0 | 4.96 | K5 | 2.75 | K0 | 4.34 | A2 | | | | | | | | | |
| U.T. | R.A. | | R.A. | | R.A. | | R.A. | | | | | | | | | | |
| | h | m | h | m | h | m | h | m | | | | | | | | | |
| | 15 37 | | 15 41 | | 15 43 | | 15 44 | | | | | | | | | | |
| | + 46 50 | | - 19 38 | | + 6 27 | | + 77 49 | | | | | | | | | | |
| | ° | ' | ° | ' | ° | ' | ° | ' | | | | | | | | | |
| 1 | -8.6 | 47.488 | +243 | 24.49 | -356 | 06.216 | +255 | 02.20 | -86 | 32.888 | +227 | 64.15 | -222 | 28.435 | +435 | 62.07 | -361 |
| 1 | 1.4 | 47.783 | +296 | 21.17 | -332 | 06.506 | +290 | 03.23 | -103 | 33.149 | +261 | 61.92 | -223 | 29.044 | +609 | 58.77 | -330 |
| 1 | 11.3 | 48.122 | +339 | 18.14 | -303 | 06.823 | +317 | 04.41 | -118 | 33.438 | +289 | 59.74 | -218 | 29.815 | +771 | 55.83 | -294 |
| 1 | 21.3 | 48.497 | +375 | 15.56 | -258 | 07.160 | +337 | 05.70 | -129 | 33.748 | +310 | 57.70 | -204 | 30.725 | +910 | 53.43 | -240 |
| 1 | 31.3 | 48.890 | +393 | 13.49 | -207 | 07.503 | +343 | 07.04 | -134 | 34.066 | +318 | 55.86 | -184 | 31.727 | +1002 | 51.60 | -183 |
| 2 | 10.3 | 49.295 | +405 | 11.99 | -150 | 07.848 | +345 | 08.39 | -135 | 34.387 | +321 | 54.28 | -158 | 32.798 | +1071 | 50.40 | -120 |
| 2 | 20.2 | 49.698 | +403 | 11.13 | -86 | 08.185 | +337 | 09.70 | -131 | 34.702 | +315 | 53.03 | -125 | 33.894 | +1096 | 49.90 | -50 |
| 3 | 2.2 | 50.085 | +387 | 10.91 | -22 | 08.509 | +324 | 10.93 | -123 | 35.005 | +303 | 52.12 | -91 | 34.967 | +1073 | 50.06 | +16 |
| 3 | 12.2 | 50.453 | +368 | 11.31 | +40 | 08.817 | +308 | 12.07 | -114 | 35.293 | +288 | 51.57 | -55 | 35.994 | +1027 | 50.89 | +83 |
| 3 | 22.2 | 50.789 | +336 | 12.33 | +102 | 09.103 | +286 | 13.07 | -100 | 35.560 | +267 | 51.41 | -16 | 36.928 | +934 | 52.35 | +146 |
| 4 | 1.1 | 51.087 | +298 | 13.87 | +154 | 09.366 | +263 | 13.94 | -87 | 35.804 | +244 | 51.57 | +16 | 37.740 | +812 | 54.32 | +197 |
| 4 | 11.1 | 51.346 | +259 | 15.87 | +200 | 09.606 | +240 | 14.68 | -74 | 36.024 | +220 | 52.05 | +48 | 38.416 | +676 | 56.76 | +244 |
| 4 | 21.1 | 51.558 | +212 | 18.26 | +239 | 09.818 | +212 | 15.28 | -60 | 36.217 | +193 | 52.81 | +76 | 38.923 | +507 | 59.56 | +280 |
| 5 | 1.0 | 51.723 | +165 | 20.88 | +262 | 10.002 | +184 | 15.77 | -49 | 36.383 | +166 | 53.77 | +96 | 39.258 | +335 | 62.56 | +300 |
| 5 | 11.0 | 51.841 | +118 | 23.69 | +281 | 10.159 | +157 | 16.16 | -39 | 36.522 | +139 | 54.89 | +112 | 39.416 | +158 | 65.72 | +316 |
| 5 | 21.0 | 51.908 | +67 | 26.55 | +286 | 10.284 | +125 | 16.46 | -30 | 36.629 | +107 | 56.12 | +123 | 39.386 | -30 | 68.87 | +315 |
| 5 | 31.0 | 51.928 | +20 | 29.36 | +281 | 10.379 | +95 | 16.68 | -22 | 36.708 | +79 | 57.39 | +127 | 39.186 | -200 | 71.92 | +305 |
| 6 | 9.9 | 51.901 | -27 | 32.07 | +271 | 10.441 | +62 | 16.84 | -16 | 36.756 | +48 | 58.67 | +128 | 38.818 | -368 | 74.80 | +288 |
| 6 | 19.9 | 51.827 | -74 | 34.54 | +247 | 10.469 | +28 | 16.93 | -9 | 36.771 | +15 | 59.90 | +123 | 38.288 | -530 | 77.38 | +258 |
| 6 | 29.9 | 51.714 | -113 | 36.74 | +220 | 10.464 | -5 | 16.97 | -4 | 36.757 | -14 | 61.03 | +113 | 37.627 | -661 | 79.62 | +224 |
| 7 | 9.9 | 51.559 | -155 | 38.62 | +188 | 10.426 | -38 | 16.95 | +2 | 36.712 | -45 | 62.08 | +105 | 36.837 | -790 | 81.47 | +185 |
| 7 | 19.8 | 51.368 | -191 | 40.08 | +146 | 10.356 | -70 | 16.86 | +9 | 36.638 | -74 | 62.97 | +89 | 35.944 | -893 | 82.83 | +136 |
| 7 | 29.8 | 51.150 | -218 | 41.14 | +106 | 10.259 | -97 | 16.72 | +14 | 36.539 | -99 | 63.70 | +73 | 34.976 | -968 | 83.72 | +89 |
| 8 | 8.8 | 50.906 | -244 | 41.76 | +62 | 10.136 | -123 | 16.51 | +21 | 36.417 | -122 | 64.28 | +58 | 33.941 | -1035 | 84.11 | +39 |
| 8 | 18.7 | 50.646 | -260 | 41.88 | +12 | 09.996 | -140 | 16.25 | +26 | 36.279 | -138 | 64.65 | +37 | 32.874 | -1067 | 83.96 | -15 |
| 8 | 28.7 | 50.379 | -267 | 41.56 | -32 | 09.846 | -150 | 15.92 | +33 | 36.131 | -148 | 64.83 | +18 | 31.799 | -1075 | 83.31 | -65 |
| 9 | 7.7 | 50.110 | -269 | 40.76 | -80 | 09.691 | -155 | 15.55 | +37 | 35.979 | -152 | 64.81 | -2 | 30.730 | -1069 | 82.14 | -117 |
| 9 | 17.7 | 49.854 | -256 | 39.47 | -129 | 09.544 | -147 | 15.16 | +39 | 35.834 | -145 | 64.56 | -25 | 29.707 | -1023 | 80.46 | -168 |
| 9 | 27.6 | 49.618 | -236 | 37.76 | -171 | 09.414 | -130 | 14.76 | +40 | 35.702 | -132 | 64.09 | -47 | 28.748 | -959 | 78.34 | -212 |
| 10 | 7.6 | 49.412 | -206 | 35.61 | -215 | 09.308 | -106 | 14.39 | +37 | 35.593 | -109 | 63.39 | -70 | 27.875 | -873 | 75.76 | -258 |
| 10 | 17.6 | 49.249 | -163 | 33.05 | -256 | 09.239 | -69 | 14.09 | +30 | 35.517 | -76 | 62.44 | -95 | 27.126 | -749 | 72.81 | -295 |
| 10 | 27.6 | 49.135 | -114 | 30.16 | -289 | 09.213 | -26 | 13.89 | +20 | 35.479 | -38 | 61.25 | -119 | 26.510 | -616 | 69.54 | -327 |
| 11 | 6.5 | 49.078 | -57 | 26.94 | -322 | 09.235 | +22 | 13.82 | +7 | 35.485 | +6 | 59.82 | -143 | 26.053 | -457 | 65.98 | -356 |
| 11 | 16.5 | 49.086 | +8 | 23.51 | -343 | 09.318 | +83 | 13.95 | -13 | 35.541 | +56 | 58.16 | -166 | 25.780 | -273 | 62.25 | -373 |
| 11 | 26.5 | 49.159 | +73 | 19.93 | -358 | 09.432 | +114 | 14.20 | -25 | 35.646 | +105 | 56.30 | -186 | 25.689 | -91 | 58.43 | -382 |
| 12 | 6.4 | 49.299 | +140 | 16.26 | -367 | 09.617 | +185 | 14.71 | -51 | 35.801 | +155 | 54.25 | -205 | 25.799 | +110 | 54.58 | -385 |
| 12 | 16.4 | 49.504 | +205 | 12.65 | -361 | 09.847 | +230 | 15.43 | -72 | 36.003 | +202 | 52.10 | -215 | 26.108 | +309 | 50.88 | -370 |
| 12 | 26.4 | 49.765 | +261 | 09.18 | -347 | 10.117 | +270 | 16.33 | -90 | 36.244 | +241 | 49.89 | -221 | 26.598 | +490 | 47.38 | -350 |
| 12 | 36.4 | 50.079 | +314 | 05.96 | -322 | 10.421 | +304 | 17.41 | -108 | 36.519 | +275 | 47.67 | -222 | 27.271 | +673 | 44.21 | -317 |
| | | +353 | | -284 | | +327 | | -121 | | +299 | | -211 | | +820 | | -270 | |
| Mean Place | 50.238 | 30.58 | | 10.022 | 08.88 | 36.149 | 63.13 | 31.192 | 71.21 | | | | | | | | |
| sec δ, tan δ | +1.462 | +1.066 | | +1.062 | -0.357 | +1.006 | +0.113 | +4.746 | +4.639 | | | | | | | | |
| dα(ψ), dδ(ψ) | +0.038 | -0.23 | | +0.069 | -0.23 | +0.059 | -0.22 | -0.041 | -0.22 | | | | | | | | |
| dα(ε), dδ(ε) | +0.041 | -0.81 | | -0.014 | -0.82 | +0.004 | -0.83 | +0.172 | -0.83 | | | | | | | | |
| Dble.Trans. | May 17 | | May 17 | | May 18 | | May 18 | | | | | | | | | | |

AT UPPER TRANSIT AT GREENWICH

| No. | 583 | | 587 | | 584 | | 585 | |
|---------------------|------------------------------------|--------------------------------------|------------------------------------|--------------------------------------|------------------------------------|--------------------------------------|------------------------------------|-------------------------------------|
| | β Serpentis | | 12 H. Draconis | | κ Serpentis | | μ Serpentis | |
| Mag. Spect. | 3.74 | A2 | 5.13 | A2 | 4.28 | K5 | 3.63 | A0 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | ^h ^m 15 45 | ^o ['] + 15 27 | ^h ^m 15 46 | ^o ['] + 62 38 | ^h ^m 15 48 | ^o ['] + 18 10 | ^h ^m 15 48 | ^o ['] - 3 23 |
| 1 ^d -8.6 | ^s 30.735 +221 | 47.73 -263 | ^s 24.772 +270 | 19.78 -371 | ^s 04.814 +218 | 56.21 -273 | ^s 51.433 +228 | 19.74 -172 |
| 1 1.4 | 30.993 +258 | 45.16 -257 | 25.121 +349 | 16.33 -345 | 05.069 +255 | -268 | 51.696 +263 | 21.52 -178 |
| 1 11.3 | 31.280 +287 | 42.69 -247 | 25.542 +421 | 13.23 -310 | 05.355 +286 | -255 | 51.987 +291 | 23.33 -181 |
| 1 21.3 | 31.589 +309 | 40.44 -225 | 26.023 +481 | 10.63 -260 | 05.664 +309 | -231 | 52.298 +311 | 25.10 -177 |
| 1 31.3 | 31.908 +319 | 38.47 -197 | 26.542 +519 | 08.58 -205 | 05.983 +319 | -201 | 52.617 +319 | 26.75 -165 |
| 2 10.3 | 32.232 +324 | 36.84 -163 | 27.086 +544 | 07.14 -144 | 06.308 +325 | -165 | 52.940 +323 | 28.26 -151 |
| 2 20.2 | 32.551 +319 | 35.63 -121 | 27.637 +551 | 06.41 -73 | 06.630 +322 | -120 | 53.258 +318 | 29.53 -127 |
| 3 2.2 | 32.858 +307 | 34.85 -78 | 28.173 +536 | 06.34 -7 | 06.939 +309 | -79 | 53.564 +306 | 30.56 -103 |
| 3 12.2 | 33.151 +293 | 34.50 -35 | 28.686 +513 | 06.95 +61 | 07.235 +296 | -29 | 53.856 +292 | 31.33 -77 |
| 3 22.2 | 33.422 +271 | 34.61 +11 | 29.155 +469 | 08.20 +125 | 07.509 +274 | +18 | 54.128 +272 | 31.80 -47 |
| 4 1.1 | 33.668 +246 | 35.11 +50 | 29.570 +415 | 10.00 +180 | 07.759 +250 | +59 | 54.379 +251 | 32.02 -22 |
| 4 11.1 | 33.891 +223 | 35.98 +87 | 29.926 +356 | 12.28 +228 | 07.984 +225 | +98 | 54.607 +228 | 31.98 +4 |
| 4 21.1 | 34.084 +193 | 37.17 +119 | 30.208 +282 | 14.96 +268 | 08.180 +196 | +130 | 54.810 +203 | 31.71 +27 |
| 5 1.0 | 34.249 +165 | 38.57 +140 | 30.417 +209 | 17.88 +292 | 08.346 +166 | +154 | 54.986 +176 | 31.27 +44 |
| 5 11.0 | 34.385 +136 | 40.17 +160 | 30.551 +134 | 20.99 +311 | 08.483 +137 | +173 | 55.136 +150 | 30.69 +58 |
| 5 21.0 | 34.488 +103 | 41.87 +170 | 30.603 +52 | 24.14 +315 | 08.587 +104 | +183 | 55.256 +120 | 30.00 +69 |
| 5 31.0 | 34.561 +73 | 43.59 +172 | 30.581 -22 | 27.21 +307 | 08.660 +73 | +186 | 55.347 +91 | 29.26 +74 |
| 6 9.9 | 34.601 +40 | 45.30 +171 | 30.485 -96 | 30.15 +294 | 08.699 +39 | +184 | 55.407 +60 | 28.49 +77 |
| 6 19.9 | 34.608 +7 | 46.92 +162 | 30.317 -168 | 32.84 +269 | 08.705 +6 | +179 | 55.435 -3 | 27.72 +77 |
| 6 29.9 | 34.585 -23 | 48.41 +149 | 30.087 -230 | 35.20 +236 | 08.679 -26 | -26 | 55.432 +28 | 26.99 +73 |
| 7 9.9 | 34.530 -55 | 49.74 +133 | 29.797 -290 | 37.21 +201 | 08.621 -58 | +143 | 55.397 -35 | 26.29 +70 |
| 7 19.8 | 34.446 -84 | 50.86 +112 | 29.454 -343 | 38.75 +154 | 08.534 -87 | +119 | 55.332 -65 | 25.67 +62 |
| 7 29.8 | 34.337 -109 | 51.75 +89 | 29.073 -381 | 39.85 +110 | 08.421 -113 | +95 | 55.241 -91 | 25.13 +54 |
| 8 8.8 | 34.204 -133 | 52.41 +66 | 28.656 -417 | 40.45 +60 | 08.284 -137 | +70 | 55.126 -115 | 24.67 +46 |
| 8 18.7 | 34.055 -149 | 52.79 +38 | 28.217 -439 | 40.52 +7 | 08.131 -153 | +38 | 54.993 -133 | 24.32 +35 |
| 8 28.7 | 33.897 -158 | 52.90 +11 | 27.770 -447 | 40.10 -42 | 07.967 -164 | +11 | 54.849 -144 | 24.06 +26 |
| 9 7.7 | 33.734 -163 | 52.73 -17 | 27.321 -449 | 39.15 -95 | 07.799 -168 | -20 | 54.699 -150 | 23.92 +14 |
| 9 17.7 | 33.577 -157 | 52.26 -47 | 26.891 -430 | 37.69 -146 | 07.637 -162 | -53 | 54.555 -144 | 23.92 +0 |
| 9 27.6 | 33.435 -142 | 51.51 -75 | 26.488 -403 | 35.77 -192 | 07.488 -149 | -82 | 54.425 -130 | 24.05 -13 |
| 10 7.6 | 33.314 -121 | 50.45 -106 | 26.126 -362 | 33.37 -240 | 07.362 -126 | -115 | 54.317 -108 | 24.34 -29 |
| 10 17.6 | 33.227 -87 | 49.10 -135 | 25.823 -303 | 30.56 -281 | 07.268 -94 | -146 | 54.241 -76 | 24.82 -48 |
| 10 27.6 | 33.178 -49 | 47.47 -163 | 25.586 -237 | 27.41 -315 | 07.212 -56 | -174 | 54.204 -37 | 25.47 -65 |
| 11 6.5 | 33.173 -5 | 45.57 -190 | 25.427 -159 | 23.93 -348 | 07.202 -10 | -203 | 54.211 +7 | 26.33 -86 |
| 11 16.5 | 33.220 +47 | 43.42 -215 | 25.358 -69 | 20.25 -368 | 07.242 +40 | -228 | 54.269 +58 | 27.40 -107 |
| 11 26.5 | 33.315 +95 | 41.08 -234 | 25.379 +21 | 16.43 -382 | 07.333 +91 | -247 | 54.375 +106 | 28.67 -127 |
| 12 6.4 | 33.462 +147 | 38.57 -251 | 25.496 +117 | 12.54 -389 | 07.475 +142 | -263 | 54.531 +156 | 30.15 -148 |
| 12 16.4 | 33.657 +195 | 35.99 -258 | 25.708 +212 | 08.76 -378 | 07.666 +191 | -270 | 54.735 +204 | 31.76 -161 |
| 12 26.4 | 33.892 +235 | 33.39 -260 | 26.004 +296 | 05.14 -362 | 07.898 +232 | -271 | 54.978 +243 | 33.49 -173 |
| 12 36.4 | 34.164 +272 | 30.85 -254 | 26.383 +379 | 01.81 -333 | 08.167 +269 | -263 | 55.255 +277 | 35.28 -179 |
| | +298 | -237 | +444 | -289 | +297 | -245 | +301 | -178 |
| Mean Place | 33.864 | 48.59 | 27.461 | 27.87 | 07.910 | 57.68 | 54.883 | 22.46 |
| sec δ, tan δ | +1.038 | +0.277 | +2.176 | +1.933 | +1.053 | +0.328 | +1.002 | -0.059 |
| da(ψ), dδ(ψ) | +0.055 | -0.22 | +0.018 | -0.22 | +0.054 | -0.22 | +0.062 | -0.22 |
| da(ε), dδ(ε) | +0.010 | -0.83 | +0.071 | -0.83 | +0.012 | -0.84 | -0.002 | -0.84 |
| Dble. Trans. | May 19 | | May 19 | | May 19 | | May 19 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 586 | | 588 | | 1414 | | 1416 | | |
|---|---------------------------------------|---|---------------------------------------|--|---------------------------------------|---|---------------------------------------|---|------------|
| | χ Lupi | | ϵ Serpentis | | α Coronae Borealis | | χ Herculis | | |
| Mag.Spect. | 4.11 | B9 | 3.75 | A2 | 4.77 | K0 | 4.61 | G0 | |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | |
| | ^h ^m 15 50 | ^o ['] - 33 35 | ^h ^m 15 50 | ^o ['] + 4 30 | ^h ^m 15 50 | ^o ['] + 35 41 | ^h ^m 15 52 | ^o ['] + 42 28 | |
| | ^d | ^s | ^s | ^s | ^s | ^s | ^s | ^s | |
| 1 | -8.6 | 01 563 + 275 | 04 27 - 1 | 05 224 + 222 | 65 03 -212 | 40 486 + 217 | 50 99 -334 | 09 639 + 221 | 74 00 -349 |
| 1 | 1.4 | 01 878 + 315 | 04 52 - 25 | 05 481 + 257 | 62 90 -213 | 40 748 + 262 | 47 80 -319 | 09 909 + 270 | 70.71 -329 |
| 1 | 11.4 | 02 225 + 347 | 05 02 - 50 | 05 767 + 286 | 60 80 -210 | 41 047 + 299 | 44 84 -296 | 10 222 + 313 | 67 67 -304 |
| 1 | 21.3 | 02 595 + 370 | 05 74 - 72 | 06 074 + 307 | 58 81 -199 | 41 377 + 330 | 42 24 -260 | 10 570 + 348 | 65.03 -264 |
| 1 | 31.3 | 02 974 + 379 | 06 65 - 91 | 06 390 + 316 | 57.01 -180 | 41 723 + 346 | 40 07 -217 | 10 937 + 367 | 62.87 -216 |
| 2 | 10.3 | 03 358 + 384 | 07 71 -106 | 06 710 + 320 | 55 44 -157 | 42 079 + 356 | 38 40 -167 | 11 318 + 381 | 61 24 -163 |
| 2 | 20.2 | 03 735 + 377 | 08 89 -118 | 07 025 + 315 | 54 18 -126 | 42 434 + 355 | 37 31 -109 | 11 698 + 380 | 60.23 -101 |
| 3 | 2.2 | 04 100 + 365 | 10 14 -125 | 07 329 + 304 | 53 25 - 93 | 42 777 + 343 | 36 79 - 52 | 12 068 + 370 | 59.83 - 40 |
| 3 | 12.2 | 04 449 + 349 | 11 44 -130 | 07 620 + 291 | 52 66 - 59 | 43 106 + 329 | 36 86 + 7 | 12 422 + 354 | 60.05 + 22 |
| 3 | 22.2 | 04 776 + 327 | 12 76 -132 | 07 890 + 270 | 52 43 - 23 | 43 410 + 304 | 37 51 + 65 | 12 749 + 327 | 60.88 + 83 |
| 4 | 1.1 | 05 078 + 302 | 14 06 -130 | 08 138 + 248 | 52 52 + 9 | 43 685 + 275 | 38 66 +115 | 13 044 + 295 | 62.24 +136 |
| 4 | 11.1 | 05 356 + 278 | 15 35 -129 | 08 364 + 226 | 52 92 + 40 | 43 930 + 245 | 40 26 +160 | 13 306 + 262 | 64.07 +183 |
| 4 | 21.1 | 05 603 + 247 | 16 60 -125 | 08 563 + 199 | 53 59 + 67 | 44 138 + 208 | 42 26 +200 | 13 526 + 220 | 66.31 +224 |
| 5 | 1.1 | 05 821 + 218 | 17 80 -120 | 08 736 + 173 | 54 46 + 87 | 44 309 + 171 | 44 51 +225 | 13 705 + 179 | 68.81 +250 |
| 5 | 11.0 | 06 007 + 186 | 18 96 -116 | 08 882 + 146 | 55 49 +103 | 44 443 + 134 | 46 97 +246 | 13 841 + 136 | 71.52 +271 |
| 5 | 21.0 | 06 157 + 150 | 20 05 -109 | 08 997 + 115 | 56 63 +114 | 44 536 + 93 | 49 53 +256 | 13 930 + 89 | 74.32 +280 |
| 5 | 31.0 | 06 272 + 115 | 21 08 -103 | 09 084 + 87 | 57 81 +118 | 44 591 + 55 | 52 08 +255 | 13 977 + 47 | 77.10 +278 |
| 6 | 9.9 | 06 349 + 77 | 22 03 - 95 | 09 139 + 55 | 59 02 +121 | 44 606 + 15 | 54 57 +249 | 13 979 + 2 | 79.81 +271 |
| 6 | 19.9 | 06 386 + 37 | 22 87 - 84 | 09 161 + 22 | 60 18 +116 | 44 581 - 25 | 56 89 +232 | 13 936 - 43 | 82 33 +252 |
| 6 | 29.9 | 06 385 - 1 | 23 60 - 73 | 09 154 + 7 | 61 26 +108 | 44 520 - 61 | 58 99 +210 | 13 854 - 82 | 84.60 +227 |
| 7 | 9.9 | 06 344 - 41 | 24 21 - 61 | 09 114 - 40 | 62 26 +100 | 44 422 - 98 | 60 84 +185 | 13 732 - 122 | 86 58 +198 |
| 7 | 19.8 | 06 265 - 79 | 24 65 - 44 | 09 045 - 69 | 63 12 + 86 | 44 290 - 132 | 62 34 +150 | 13 574 - 158 | 88 19 +161 |
| 7 | 29.8 | 06 155 - 110 | 24 94 - 29 | 08 951 - 94 | 63 83 + 71 | 44 132 - 158 | 63 49 +115 | 13 386 - 188 | 89 41 +122 |
| 8 | 8.8 | 06 014 - 141 | 25 03 - 9 | 08 831 - 120 | 64 41 + 58 | 43 947 - 185 | 64 26 + 77 | 13 171 - 215 | 90 22 + 81 |
| 8 | 18.8 | 05 852 - 162 | 24 94 + 9 | 08 695 - 136 | 64 79 + 38 | 43 745 - 202 | 64 60 + 34 | 12 938 - 233 | 90 56 + 34 |
| 8 | 28.7 | 05 677 - 175 | 24 66 + 28 | 08 548 - 147 | 65 01 + 22 | 43 533 - 212 | 64 55 - 5 | 12 694 - 244 | 90 48 - 8 |
| 9 | 7.7 | 05 495 - 182 | 24 19 + 47 | 08 396 - 152 | 65 04 + 3 | 43 316 - 217 | 64 07 - 48 | 12 446 - 246 | 89 92 - 56 |
| 9 | 17.7 | 05 322 - 173 | 23 56 + 63 | 08 249 - 147 | 64 86 - 18 | 43 107 - 209 | 63 15 - 92 | 12 207 - 239 | 88 90 -102 |
| 9 | 27.6 | 05 166 - 156 | 22 79 + 77 | 08 115 - 134 | 64 47 - 39 | 42 913 - 194 | 61 83 -132 | 11 984 - 223 | 87 45 -145 |
| 10 | 7.6 | 05 037 - 129 | 21 91 + 88 | 08 003 - 112 | 63 87 - 60 | 42 743 - 170 | 60 10 -173 | 11 786 - 198 | 85 56 -189 |
| 10 | 17.6 | 04 949 - 88 | 20 99 + 92 | 07 923 - 80 | 63 02 - 85 | 42 609 - 134 | 57 98 -212 | 11 628 - 158 | 83 27 -229 |
| 10 | 27.6 | 04 907 - 42 | 20 06 + 93 | 07 880 - 43 | 61 96 -106 | 42 517 - 92 | 55 52 -246 | 11 514 - 114 | 80 63 -264 |
| 11 | 6.5 | 04 921 + 14 | 19 19 + 87 | 07 882 + 2 | 60 65 -131 | 42 474 - 43 | 52 73 -279 | 11 453 - 61 | 77.64 -299 |
| 11 | 16.5 | 04 994 + 73 | 18 45 + 74 | 07 933 + 51 | 59 12 -153 | 42 488 + 14 | 49 70 -303 | 11 452 - 1 | 74 42 -322 |
| 11 | 26.5 | 05 124 + 130 | 17 85 + 60 | 08 033 + 100 | 57 39 -173 | 42 558 + 70 | 46 49 -321 | 11 512 + 60 | 71.01 -341 |
| 12 | 6.5 | 05 315 + 191 | 17 43 + 42 | 08 183 + 150 | 55 47 -192 | 42 687 + 129 | 43 13 -336 | 11 635 + 123 | 67 48 -353 |
| 12 | 16.4 | 05 562 + 247 | 17 26 + 17 | 08 380 + 197 | 53 44 -203 | 42 871 + 184 | 39 78 -335 | 11 820 + 185 | 63 98 -350 |
| 12 | 26.4 | 05 853 + 291 | 17 34 - 8 | 08 616 + 236 | 51 33 -211 | 43 104 + 233 | 36 50 -328 | 12 059 + 239 | 60 57 -341 |
| 12 | 36.4 | 06 185 + 332 | 17 67 - 33 | 08 887 + 271 | 49 21 -212 | 43 383 + 279 | 33 39 -311 | 12 348 + 289 | 57 36 -321 |
| | | 06 359 - 57 | 17 67 - 57 | 08 887 + 296 | 49 21 -205 | 43 383 + 312 | 33 39 -281 | 12 348 + 327 | 57 36 -286 |
| Mean Place | 05.893 | 12.55 | 08.539 | 64.03 | 43.385 | 55.53 | 12.500 | 80.14 | |
| sec δ , $\tan \delta$ | +1.200 | -0.664 | +1.003 | +0.079 | +1.231 | +0.719 | +1.356 | +0.916 | |
| $d\alpha(\psi)$, $d\delta(\psi)$ | +0.076 | -0.21 | +0.059 | -0.21 | +0.045 | -0.21 | +0.041 | -0.21 | |
| $d\alpha(\epsilon)$, $d\delta(\epsilon)$ | -0.024 | -0.84 | +0.003 | -0.84 | +0.026 | -0.85 | +0.032 | -0.85 | |
| Dbble.Trans. | May 20 | | May 20 | | May 20 | | May 20 | | |

APPARENT PLACES OF STARS, 1986

245

AT UPPER TRANSIT AT GREENWICH

| No. | 1415 | | 589 | | 591 | | 593 | |
|---------------------|-------------|------------|-----------------------|------------|-------------|------------|--------------------|------------|
| | λ Librae | | β Trianguli Australis | | γ Serpentis | | ε Coronae Borealis | |
| Mag.Spect. | 5.06 | B3 | 3.04 | F0 | 3.86 | F5 | 4.22 | K0 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° ′ | h m | ° ′ | h m | ° ′ | h m | ° ′ |
| | 15 52 | - 20 07 | 15 53 | - 63 23 | 15 55 | + 15 42 | 15 56 | + 26 54 |
| 1 ^d -8.6 | 29 072 +246 | 33 12 -77 | 49 737 +434 | 12.11 +157 | 46 570 +213 | 17.65 -266 | 58 688 +208 | 55.81 -307 |
| 1 ^s 1.4 | 29 354 +282 | 34.05 -93 | 50.244 +507 | 10.90 +121 | 46 819 +249 | -261 | 58 937 +249 | 52.85 -296 |
| 1 11.4 | 29 665 +311 | 35 14 -109 | 50.813 +569 | 10.08 +82 | 47 100 +281 | -252 | 59 221 +284 | 50.05 -280 |
| 1 21.3 | 29 997 +332 | 36 34 -120 | 51 428 +615 | 09 71 +37 | 47 405 +305 | -230 | 59 532 +311 | 47.55 -250 |
| 1 31.3 | 30 338 +341 | 37.58 -124 | 52.066 +638 | 09.75 -4 | 47 721 +316 | -202 | 59 857 +325 | 45.42 -213 |
| 2 10.3 | 30 683 +345 | 38 85 -127 | 52 718 +652 | 10 20 -45 | 48 043 +322 | -168 | 60 191 +334 | 43.71 -171 |
| 2 20.2 | 31 022 +339 | -123 | 53 368 +650 | -86 | 48 363 +320 | -127 | 60 525 +334 | 42.52 -119 |
| 3 2.2 | 31 350 +328 | 40 08 -116 | 53 998 +630 | 11 06 -121 | 48 672 +309 | -84 | 60 848 +323 | 41.85 -67 |
| 3 12.2 | 31 664 +314 | 41 24 -107 | 54 608 +610 | 12 27 -154 | 48 968 +296 | -39 | 61 158 +310 | 41.70 -15 |
| 3 22.2 | 31 958 +294 | 42 31 -95 | 55 179 +571 | 13 81 -184 | 49 245 +277 | +6 | 61 447 +289 | 42.10 +40 |
| 4 1.1 | 32 230 +272 | 44 08 -82 | 55 708 +529 | 17 72 -207 | 49 498 +253 | +46 | 61 710 +263 | 42.96 +86 |
| 4 11.1 | 32 480 +250 | 44 78 -70 | 56 191 +483 | 20 00 -228 | 49 729 +231 | +84 | 61 949 +334 | 44 25 +129 |
| 4 21.1 | 32 703 +223 | 45 35 -57 | 56 616 +425 | 22 44 -244 | 49 931 +202 | +116 | 62 155 +206 | 45 91 +166 |
| 5 1.1 | 32 900 +197 | 45 82 -47 | 56 982 +366 | 24 97 -253 | 50 105 +174 | +140 | 62 330 +175 | 47 83 +192 |
| 5 11.0 | 33 070 +170 | 46 19 -37 | 57 285 +303 | 27 59 -262 | 50 251 +146 | +159 | 62 473 +143 | 49 96 +213 |
| 5 21.0 | 33 207 +137 | 46 48 -29 | 57 515 +230 | 30 21 -262 | 50 363 +112 | +170 | 62 579 +106 | 52 21 +225 |
| 5 31.0 | 33 314 +107 | 46 71 -23 | 57 675 +160 | 32 79 -258 | 50 446 +83 | +173 | 62 651 +72 | 54 46 +225 |
| 6 9.9 | 33 388 +74 | 46 88 -17 | 57 760 +85 | 35 29 -250 | 50 495 +49 | +173 | 62 688 +37 | 56 70 +224 |
| 6 19.9 | 33 426 +38 | 46 98 -10 | 57 765 +5 | 37 63 -234 | 50 510 +15 | +164 | 62 687 -1 | 58 80 +210 |
| 6 29.9 | 33 432 +6 | 47 05 -7 | 57 699 -66 | 39 76 -213 | 50 495 -15 | +151 | 62 652 -35 | 60 73 +193 |
| 7 9.9 | 33 401 -31 | 47 06 -1 | 57 557 -142 | 41 64 -188 | 50 446 -49 | +136 | 62 583 -69 | 62 44 +171 |
| 7 19.8 | 33 338 -63 | 47 01 +5 | 57 346 -211 | 43 19 -155 | 50 366 -80 | +115 | 62 481 -102 | 63 87 +143 |
| 7 29.8 | 33 246 -92 | 47 01 +10 | 57 346 -267 | 44 02 -121 | 50 366 -106 | +91 | 62 383 -128 | 65 00 +113 |
| 8 8.8 | 33 126 -120 | 46 91 +17 | 57 079 -322 | 44 40 -80 | 50 260 -130 | +68 | 62 353 -155 | 65 81 +81 |
| 8 18.8 | 33 246 -139 | 46 74 +23 | 56 757 -357 | 45 20 -36 | 50 130 -149 | +40 | 62 198 -173 | 65 81 +44 |
| 8 28.7 | 32 836 -151 | 46 23 +28 | 56 023 -377 | 45 50 +6 | 49 822 -159 | +13 | 61 841 -184 | 66 35 +10 |
| 9 7.7 | 32 678 -158 | 45 89 +34 | 55 639 -384 | 44 98 +52 | 49 656 -166 | -16 | 61 651 -190 | 66 07 -28 |
| 9 17.7 | 32 526 -152 | 45 89 +37 | 55 639 -367 | 44 98 +96 | 49 656 -161 | -46 | 61 651 -185 | 66 07 -67 |
| 9 27.6 | 32 388 -138 | 45 52 +38 | 55 272 -333 | 44 02 +134 | 49 495 -148 | -75 | 61 466 -171 | 65 40 -102 |
| 10 7.6 | 32 274 -114 | 45 14 +37 | 54 939 -283 | 42 68 +171 | 49 347 -127 | -105 | 61 295 -151 | 64 38 -140 |
| 10 17.6 | 32 196 -78 | 44 77 +31 | 54 656 -283 | 40 97 +198 | 49 220 -95 | -136 | 61 144 -116 | 62 98 -175 |
| 10 27.6 | 32 158 -38 | 44 46 +23 | 54 449 -126 | 38 99 +218 | 49 125 -58 | -163 | 61 028 -79 | 61 23 -207 |
| 11 6.5 | 32 170 +12 | 44 23 +11 | 54 323 -29 | 36 81 +230 | 49 067 -14 | -191 | 60 949 -32 | 59 16 -240 |
| 11 16.5 | 32 237 +67 | 44 12 -6 | 54 294 +78 | 34 51 +230 | 49 053 +36 | -216 | 60 917 +20 | 56 76 -264 |
| 11 26.5 | 32 340 +103 | 44 18 -18 | 54 372 +180 | 32 21 +223 | 49 089 +86 | -235 | 60 937 +72 | 54 12 -285 |
| 12 6.5 | 32 517 +177 | 44 36 -45 | 54 552 +180 | 29 98 +205 | 49 175 +137 | -254 | 61 009 +127 | 51 27 -300 |
| 12 16.4 | 32 738 +221 | 44 81 -63 | 54 838 +286 | 27 93 +178 | 49 312 +186 | -261 | 61 136 +178 | 48 27 -305 |
| 12 26.4 | 32 999 +261 | 45 44 -82 | 55 221 +383 | 26 15 +146 | 49 498 +226 | -263 | 61 314 +224 | 45 22 -302 |
| 12 36.4 | 33 296 +297 | 46 26 -98 | 55 686 +538 | 24 69 +109 | 49 724 +265 | -258 | 61 538 +265 | 42 20 -291 |
| 12 36.4 | 33 296 +322 | 47 24 -111 | 56 224 +583 | 23 60 +66 | 49 989 +292 | -241 | 61 803 +295 | 39 29 -266 |
| Mean Place | 32.937 | 38.77 | 56.691 | 24.01 | 49.736 | 18.43 | 61.703 | 59.23 |
| sec δ, tan δ | +1.065 | -0.366 | +2.233 | -1.996 | +1.039 | +0.281 | +1.121 | +0.508 |
| dα(ψ), dδ(ψ) | +0.069 | -0.21 | +0.106 | -0.21 | +0.055 | -0.21 | +0.050 | -0.20 |
| dα(ε), dδ(ε) | -0.013 | -0.85 | -0.070 | -0.85 | +0.010 | -0.86 | +0.017 | -0.86 |
| Dble.Trans. | May 20 | | May 21 | | May 21 | | May 21 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 1417 | | 595 | | 592 | | 1418 | |
|----------------|--------------------------|-------------------------|--------------------------------|-------------------------|--------------------------|------------------------|--------------------------|------------------------|
| | 48 Librae | | Groombridge 2296 (Draconis) | | π Scorpii | | 144 G. Lupi | |
| Mag.Spect. | 4.68 | B3p | 4.96 | A5 | 3.00 | B2 | 5.07 | G5 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° / | h m | ° / | h m | ° / | h m | ° / |
| | 15 57 | -14 14 | 15 57 | +54 46 | 15 57 | -26 04 | 15 58 | -41 42 |
| 1 ^d | 22.195 ^s +234 | 23.99 [°] -109 | 25.347 ^s +226 | 68.00 [°] -370 | 57.935 ^s +252 | 27.25 [°] -39 | 30.151 ^s +290 | 14.70 [°] +51 |
| 1 ^s | 22.464 +269 | 25.20 -121 | 25.638 +291 | 64.53 -347 | 58.224 +289 | 27.84 -59 | 30.487 +336 | 14.47 -23 |
| 1 | 22.762 +298 | 26.52 -132 | 25.987 +349 | 61.35 -318 | 58.545 +321 | 28.62 -78 | 30.860 +373 | 14.51 -4 |
| 1 | 23.081 +319 | 27.90 -138 | 26.384 +387 | 58.62 -273 | 58.888 +343 | 29.56 -94 | 31.260 +400 | 14.85 -34 |
| 1 | 23.410 +329 | 29.27 -137 | 26.812 +428 | 56.41 -221 | 59.241 +353 | 30.60 -104 | 31.673 +413 | 15.43 -58 |
| 2 | 23.744 +334 | 30.60 -133 | 27.262 +450 | 54.78 -163 | 59.599 +358 | 31.73 -113 | 32.093 +420 | 16.25 -82 |
| 2 | 24.073 +329 | 31.82 -122 | 27.717 +465 | 53.83 -95 | 59.953 +354 | 32.89 -116 | 32.510 +417 | 17.27 -102 |
| 3 | 24.392 +319 | 32.92 -110 | 28.163 +446 | 53.53 -30 | 60.296 +343 | 34.04 -115 | 32.913 +403 | 18.45 -118 |
| 3 | 24.698 +306 | 33.86 -94 | 28.592 +429 | 53.90 +37 | 60.625 +329 | 35.16 -112 | 33.303 +390 | 19.76 -131 |
| 3 | 24.985 +287 | 34.62 -76 | 28.990 +398 | 54.91 +101 | 60.935 +310 | 36.23 -107 | 33.669 +366 | 21.17 -141 |
| 4 | 25.251 +266 | 35.20 -58 | 29.347 +357 | 56.48 +157 | 61.223 +288 | 37.22 -99 | 34.010 +341 | 22.65 -148 |
| 4 | 25.497 +246 | 35.62 -42 | 29.660 +313 | 58.56 +208 | 61.489 +266 | 38.14 -92 | 34.325 +315 | 24.18 -153 |
| 4 | 25.716 +219 | 35.87 -25 | 29.919 +259 | 61.06 +250 | 61.727 +238 | 38.98 -84 | 34.606 +281 | 25.74 -156 |
| 5 | 25.911 +195 | 36.00 -13 | 30.122 +203 | 63.83 +277 | 61.939 +212 | 39.74 -76 | 34.855 +249 | 27.30 -156 |
| 5 | 26.078 +167 | 36.01 -1 | 30.268 +146 | 66.82 +299 | 62.121 +182 | 40.44 -70 | 35.069 +214 | 28.86 -156 |
| 5 | 26.215 +137 | 35.93 +8 | 30.351 +83 | 69.89 +307 | 62.271 +150 | 41.06 -62 | 35.241 +172 | 30.38 -152 |
| 5 | 26.323 +108 | 35.80 +13 | 30.377 +26 | 72.93 +304 | 62.389 +118 | 41.63 -57 | 35.375 +134 | 31.85 -147 |
| 6 | 26.398 +75 | 35.61 +19 | 30.343 -34 | 75.88 +295 | 62.471 +82 | 42.13 -50 | 35.465 +90 | 33.24 -139 |
| 6 | 26.438 +40 | 35.40 +21 | 30.251 -92 | 78.61 +273 | 62.515 +44 | 42.56 -43 | 35.508 +43 | 34.52 -128 |
| 6 | 26.447 +9 | 35.17 +23 | 30.108 -143 | 81.05 +244 | 62.525 +10 | 42.93 -37 | 35.509 +1 | 35.68 -116 |
| 7 | 26.421 -26 | 34.92 +25 | 29.913 -195 | 83.18 +213 | 62.497 -28 | 43.21 -28 | 35.464 -45 | 36.67 -99 |
| 7 | 26.362 -59 | 34.66 +26 | 29.674 -239 | 84.88 +170 | 62.432 -65 | 43.40 -19 | 35.375 -89 | 37.46 -79 |
| 7 | 26.375 -87 | 34.40 +26 | 29.399 -275 | 86.16 +128 | 62.338 -94 | 43.49 -9 | 35.250 -125 | 38.04 -58 |
| 8 | 26.161 -114 | 34.13 +27 | 29.090 -309 | 86.98 +82 | 62.213 -125 | 43.46 +3 | 35.090 -160 | 38.38 -34 |
| 8 | 26.027 -134 | 33.85 +28 | 28.760 -330 | 87.29 +31 | 62.067 -146 | 43.32 +14 | 34.904 -186 | 38.45 -7 |
| 8 | 25.880 -147 | 33.58 +27 | 28.418 -342 | 87.12 -17 | 61.908 -159 | 43.07 +25 | 34.703 -201 | 38.27 +18 |
| 9 | 25.726 -154 | 33.32 +26 | 28.070 -348 | 86.44 -68 | 61.741 -167 | 42.70 +37 | 34.494 -209 | 37.82 +45 |
| 9 | 25.578 -148 | 33.08 +24 | 27.734 -336 | 85.25 -119 | 61.579 -162 | 42.24 +46 | 34.292 -202 | 37.12 +70 |
| 9 | 25.442 -136 | 32.88 +20 | 27.418 -316 | 83.60 -165 | 61.432 -147 | 41.71 +53 | 34.109 -183 | 36.21 +91 |
| 10 | 25.327 -115 | 32.75 +13 | 27.131 -287 | 81.47 -213 | 61.308 -124 | 41.14 +57 | 33.954 -155 | 35.10 +111 |
| 10 | 25.247 -80 | 32.71 +4 | 26.892 -239 | 78.91 -256 | 61.222 -86 | 40.57 +57 | 33.844 -110 | 33.88 +122 |
| 10 | 25.205 -42 | 32.79 -8 | 26.705 -187 | 76.00 -291 | 61.177 -45 | 40.04 +53 | 33.784 -60 | 32.59 +129 |
| 11 | 25.210 +5 | 33.02 -23 | 26.582 -123 | 72.73 -327 | 61.183 +6 | 39.59 +45 | 33.784 +0 | 31.29 +130 |
| 11 | 25.268 +58 | 33.40 -38 | 26.533 -49 | 69.21 -352 | 61.246 +63 | 39.29 +30 | 33.850 +66 | 30.06 +123 |
| 11 | 25.371 +103 | 33.94 -54 | 26.556 +23 | 65.53 -368 | 61.357 +111 | 39.18 +11 | 33.981 +131 | 28.96 +110 |
| 12 | 25.530 +159 | 34.76 -82 | 26.658 +102 | 61.74 -379 | 61.529 +172 | 39.14 +4 | 34.177 +196 | 28.03 +93 |
| 12 | 25.738 +208 | 35.73 -97 | 26.838 +180 | 58.00 -374 | 61.754 +225 | 39.38 -24 | 34.435 +258 | 27.33 +70 |
| 12 | 25.985 +247 | 36.84 -111 | 27.086 +248 | 54.39 -361 | 62.021 +267 | 39.82 -44 | 34.745 +310 | 26.90 +43 |
| 12 | 26.269 +284 | 38.09 -125 | 27.401 +315 | 51.01 -338 | 62.327 +306 | 40.47 -65 | 35.100 +355 | 26.75 +15 |
| | 26.269 +309 | 38.09 -132 | 27.401 +388 | 51.01 -298 | 62.327 +332 | 40.47 -83 | 35.100 +387 | 26.75 -15 |
| Mean Place | 25.918 | 28.11 | 28.115 | 75.44 | 62.008 | 33.41 | 34.921 | 23.24 |
| sec δ, tan δ | +1.032 | -0.254 | +1.734 | +1.417 | +1.113 | -0.489 | +1.339 | -0.891 |
| dα(ψ), dδ(ψ) | +0.067 | -0.20 | +0.029 | -0.20 | +0.072 | -0.20 | +0.082 | -0.20 |
| dα(ε), dδ(ε) | -0.009 | -0.86 | +0.048 | -0.86 | -0.017 | -0.86 | -0.030 | -0.86 |
| Dble.Trans. | May 22 | | May 22 | | May 22 | | May 22 | |

AT UPPER TRANSIT AT GREENWICH

| No. | 594 | | 1419 | | 1420 | | 598 | |
|--------------|------------------------------------|-------------------------------------|------------------------------------|-------------------------------------|------------------------------------|-------------------------------------|------------------------------------|-------------------------------------|
| | δ Scorp̄ii | | 49 Librae | | 50 Librae | | ζ Draconis | |
| Mag. Spect. | 2.54 | B0 | 5.53 | F8 | 5.55 | A0 | 4.11 | F8 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | ^h ^m 15 59 | [°] ['] -22 34 | ^h ^m 15 59 | [°] ['] -16 29 | ^h ^m 16 00 | [°] ['] - 8 22 | ^h ^m 16 01 | [°] ['] +58 35 |
| 1 -8.6 | 28.055 +244 | 56.97 -59 | 30.267 +234 | 35.02 -95 | 00.233 +224 | 23.29 -141 | 35.284 +226 | 55.96 -373 |
| 1 1.4 | 28.336 +281 | 57.74 -77 | 30.537 +270 | 36.12 -110 | 00.493 +260 | 24.79 -150 | 35.583 +299 | 52.45 -351 |
| 1 11.4 | 28.647 +311 | 58.66 -92 | 30.836 +299 | 37.34 -122 | 00.782 +289 | 26.35 -156 | 35.947 +364 | 49.25 -320 |
| 1 21.3 | 28.981 +334 | 59.72 -106 | 31.157 +321 | 38.63 -129 | 01.092 +310 | 27.92 -157 | 36.367 +420 | 46.50 -275 |
| 1 31.3 | 29.325 +344 | 60.85 -113 | 31.488 +331 | 39.94 -131 | 01.412 +320 | 29.42 -150 | 36.824 +457 | 44.29 -221 |
| 2 10.3 | 29.674 +349 | 62.03 -118 | 31.824 +336 | 41.23 -129 | 01.738 +326 | 30.83 -141 | 37.307 +483 | 42.66 -163 |
| 2 20.2 | 30.020 +346 | 63.20 -117 | 32.156 +332 | 42.45 -122 | 02.060 +322 | 32.07 -124 | 37.799 +492 | 41.71 -95 |
| 3 2.2 | 30.354 +334 | 64.32 -112 | 32.477 +321 | 43.55 -110 | 02.372 +312 | 33.11 -104 | 38.283 +484 | 41.42 -29 |
| 3 12.2 | 30.676 +322 | 65.39 -107 | 32.786 +309 | 44.53 -98 | 02.672 +300 | 33.93 -82 | 38.750 +467 | 41.81 +39 |
| 3 22.2 | 30.979 +303 | 66.35 -96 | 33.076 +290 | 45.35 -82 | 02.954 +282 | 34.52 -59 | 39.184 +434 | 42.86 +105 |
| 4 1.1 | 31.260 +281 | 67.22 -87 | 33.345 +289 | 46.01 -66 | 03.215 +281 | 34.88 -36 | 39.574 +390 | 44.47 +161 |
| 4 11.1 | 31.520 +260 | 67.98 -76 | 33.594 +249 | 46.52 -51 | 03.456 +241 | 35.04 -16 | 39.916 +342 | 46.60 +213 |
| 4 21.1 | 31.753 +233 | 68.64 -66 | 33.817 +223 | 46.89 -37 | 03.671 +215 | 34.99 +5 | 40.197 +281 | 49.15 +255 |
| 5 1.1 | 31.961 +208 | 69.21 -57 | 34.014 +197 | 47.14 -25 | 03.862 +191 | 34.79 +20 | 40.416 +219 | 51.98 +283 |
| 5 11.0 | 32.140 +179 | 69.70 -49 | 34.185 +171 | 47.29 -15 | 04.027 +165 | 34.45 +34 | 40.571 +155 | 55.03 +305 |
| 5 21.0 | 32.287 +147 | 70.11 -41 | 34.325 +140 | 47.34 -5 | 04.161 +134 | 34.02 +43 | 40.655 +84 | 58.17 +314 |
| 5 31.0 | 32.404 +117 | 70.46 -35 | 34.434 +109 | 47.35 -1 | 04.267 +106 | 33.53 +49 | 40.674 +19 | 61.28 +311 |
| 6 9.9 | 32.486 +82 | 70.76 -30 | 34.512 +78 | 47.30 +5 | 04.341 +74 | 33.01 +52 | 40.627 -117 | 64.30 +302 |
| 6 19.9 | 32.531 +45 | 71.00 -24 | 34.553 +41 | 47.21 +9 | 04.380 +39 | 32.47 +54 | 40.514 -43 | 67.09 +279 |
| 6 29.9 | 32.542 +11 | 71.19 -19 | 34.563 +10 | 47.10 +11 | 04.389 +9 | 31.95 +52 | 40.345 -169 | 69.60 +251 |
| 7 9.9 | 32.516 -26 | 71.31 -12 | 34.537 -26 | 46.96 +14 | 04.364 -25 | 31.45 +50 | 40.118 -227 | 71.78 +218 |
| 7 19.8 | 32.456 -60 | 71.37 -6 | 34.477 -60 | 46.80 +16 | 04.306 -58 | 30.98 +47 | 39.841 -277 | 73.54 +176 |
| 7 29.8 | 32.365 -91 | 71.36 +1 | 34.389 -88 | 46.62 +18 | 04.221 -85 | 30.56 +42 | 39.525 -316 | 74.86 +132 |
| 8 8.8 | 32.246 -119 | 71.26 +10 | 34.273 -116 | 46.40 +22 | 04.109 -112 | 30.17 +39 | 39.171 -354 | 75.71 +85 |
| 8 18.8 | 32.105 -141 | 71.09 +17 | 34.137 -136 | 46.17 +23 | 03.977 -132 | 29.85 +32 | 38.794 -377 | 76.04 +33 |
| 8 28.7 | 31.950 -155 | 70.83 +26 | 33.988 -149 | 45.91 +26 | 03.833 -144 | 29.58 +27 | 38.404 -390 | 75.89 -15 |
| 9 7.7 | 31.788 -162 | 70.50 +33 | 33.831 -157 | 45.64 +27 | 03.681 -152 | 29.38 +20 | 38.008 -396 | 75.22 -67 |
| 9 17.7 | 31.631 -157 | 70.11 +39 | 33.679 -152 | 45.38 +26 | 03.533 -148 | 29.27 +11 | 37.623 -385 | 74.02 -120 |
| 9 27.6 | 31.487 -144 | 69.68 +43 | 33.539 -140 | 45.13 +25 | 03.398 -135 | 29.24 +3 | 37.259 -364 | 72.36 -166 |
| 10 7.6 | 31.366 -121 | 69.24 +44 | 33.421 -118 | 44.92 +21 | 03.282 -116 | 29.34 -10 | 36.928 -331 | 70.22 -214 |
| 10 17.6 | 31.281 -85 | 68.83 +41 | 33.338 -83 | 44.80 +12 | 03.200 -82 | 29.57 -23 | 36.647 -281 | 67.64 -258 |
| 10 27.6 | 31.237 -44 | 68.47 +36 | 33.294 -44 | 44.77 +3 | 03.155 -45 | 29.95 -38 | 36.422 -225 | 64.70 -294 |
| 11 6.5 | 31.241 +4 | 68.22 +25 | 33.296 +2 | 44.88 -11 | 03.155 +0 | 30.51 -56 | 36.266 -156 | 61.40 -330 |
| 11 16.5 | 31.302 +61 | 68.13 +9 | 33.353 +57 | 45.13 -25 | 03.206 +51 | 31.24 -73 | 36.190 -76 | 57.85 -355 |
| 11 26.5 | 31.400 +98 | 68.28 -15 | 33.453 +100 | 45.51 -38 | 03.304 +98 | 32.17 -93 | 36.193 +3 | 54.13 -372 |
| 12 6.5 | 31.573 +173 | 68.40 -12 | 33.612 +159 | 46.22 -71 | 03.454 +150 | 33.31 -114 | 36.282 +89 | 50.31 -382 |
| 12 16.4 | 31.792 +219 | 68.85 -45 | 33.820 +208 | 47.05 -83 | 03.653 +199 | 34.61 -130 | 36.457 +175 | 46.54 -377 |
| 12 26.4 | 32.051 +259 | 69.48 -63 | 34.068 +248 | 48.04 -99 | 03.891 +238 | 36.04 -143 | 36.707 +250 | 42.90 -364 |
| 12 36.4 | 32.348 +297 | 70.30 -82 | 34.353 +285 | 49.18 -114 | 04.166 +275 | 37.56 -152 | 37.033 +326 | 39.49 -341 |
| | 323 | -97 | 311 | -123 | 299 | -155 | 386 | -300 |
| Mean Place | 32.019 | 62.38 | 34.032 | 39.55 | 03.826 | 26.10 | 38.044 | 63.95 |
| sec δ, tan δ | +1.083 | -0.416 | +1.043 | -0.296 | +1.011 | -0.147 | +1.919 | +1.638 |
| dα(ψ), dδ(ψ) | +0.071 | -0.20 | +0.068 | -0.20 | +0.065 | -0.20 | +0.023 | -0.20 |
| dα(ε), dδ(ε) | -0.014 | -0.87 | -0.010 | -0.87 | -0.005 | -0.87 | +0.054 | -0.87 |
| Dble. Trans. | May 22 | | May 22 | | May 22 | | May 23 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 597 | | 596 | | 599 | | 1421 | | |
|---|----------------------------|--------------|-----------------|--------------|--------------|--------------|------------------------------|--------------|-------------|
| | β Scorpii* <i>p.</i> | | δ Normae | | ζ Lupi | | κ Herculis* <i>p.</i> | | |
| Mag. Spect. | 2.90 | B1 | 4.84 | A3p | 4.33 | B3 | 5.34 | G5 | |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " | |
| | 16 04 | - 19 46 | 16 05 | - 45 08 | 16 05 | - 36 45 | 16 07 | + 17 04 | |
| 1 | -8.6 | 35 143 + 235 | 04.65 - 73 | 26.962 + 295 | 06.82 + 75 | 37.640 + 268 | 52 11 + 28 | 24.779 + 200 | 54.05 - 267 |
| 1 | 1.4 | 35 415 + 272 | 05.54 - 89 | 27.306 + 344 | 06.35 + 47 | 37.951 + 311 | 52 07 + 4 | 25 017 + 238 | 51 42 - 263 |
| 1 | 11.4 | 35 717 + 302 | 06.56 - 102 | 27.691 + 385 | 06.16 + 19 | 38 299 + 348 | 52 28 - 21 | 25 289 + 272 | 48 89 - 253 |
| 1 | 21.3 | 36 043 + 326 | 07.69 - 113 | 28 106 + 415 | 06.29 - 13 | 38.672 + 373 | 52 74 - 46 | 25 585 + 296 | 46.57 - 232 |
| 1 | 31.3 | 36 379 + 336 | 08.87 - 118 | 28 537 + 431 | 06.69 - 40 | 39.059 + 387 | 53 40 - 66 | 25 896 + 311 | 44.54 - 203 |
| 2 | 10.3 | 36.721 + 342 | 10.06 - 119 | 28.977 + 440 | 07.35 - 66 | 39.454 + 395 | 54 24 - 84 | 26 216 + 320 | 42 84 - 170 |
| 2 | 20.3 | 37.061 + 340 | 11.21 - 115 | 29 415 + 438 | 08.25 - 90 | 39.846 + 392 | 55 23 - 99 | 26 535 + 319 | 41 58 - 126 |
| 3 | 2.2 | 37.390 + 329 | 12.29 - 108 | 29 841 + 426 | 09.34 - 109 | 39.846 + 381 | 56 33 - 110 | 26 846 + 311 | 40.75 - 83 |
| 3 | 12.2 | 37.708 + 318 | 13.28 - 99 | 30.254 + 413 | 10.60 - 126 | 40 596 + 369 | 57 51 - 118 | 27 146 + 300 | 40 38 - 37 |
| 3 | 22.2 | 38.007 + 299 | 14.14 - 86 | 30.645 + 391 | 12.00 - 140 | 40.945 + 349 | 58 75 - 124 | 27.429 + 283 | 40 48 + 10 |
| 4 | 1.1 | 38.287 + 280 | 14.87 - 73 | 31.010 + 365 | 13.50 - 150 | 41.270 + 325 | 60.02 - 127 | 27.690 + 261 | 40.99 + 51 |
| 4 | 11.1 | 38.546 + 259 | 15.49 - 62 | 31.348 + 338 | 15.09 - 159 | 41.573 + 303 | 61.31 - 129 | 27.929 + 239 | 41.90 + 91 |
| 4 | 21.1 | 38.779 + 233 | 15.99 - 50 | 31.652 + 304 | 16.73 - 164 | 41.845 + 272 | 62.59 - 128 | 28.141 + 212 | 43.15 + 125 |
| 5 | 1.1 | 38.987 + 208 | 16.38 - 39 | 31.921 + 269 | 18.40 - 167 | 42.088 + 243 | 63.86 - 127 | 28.325 + 184 | 44.64 + 149 |
| 5 | 11.0 | 39.168 + 181 | 16.68 - 30 | 32.154 + 233 | 20.10 - 170 | 42.299 + 211 | 65.12 - 126 | 28.481 + 156 | 46.35 + 171 |
| 5 | 21.0 | 39.317 + 149 | 16.91 - 23 | 32.343 + 189 | 21.78 - 168 | 42.472 + 173 | 66.33 - 121 | 28.604 + 123 | 48.18 + 183 |
| 5 | 31.0 | 39.437 + 120 | 17.08 - 17 | 32.491 + 148 | 23.41 - 163 | 42.608 + 136 | 67.50 - 117 | 28.696 + 92 | 50.04 + 186 |
| 6 | 10.0 | 39.522 + 85 | 17.21 - 13 | 32.592 + 101 | 24.99 - 158 | 42.705 + 97 | 68.62 - 112 | 28.755 + 59 | 51.91 + 187 |
| 6 | 19.9 | 39.571 + 49 | 17.28 - 7 | 32.643 + 51 | 26.46 - 147 | 42.758 + 53 | 69.64 - 102 | 28.778 + 23 | 53.69 + 178 |
| 6 | 29.9 | 39.587 + 16 | 17.33 - 5 | 32.648 + 5 | 27.79 - 133 | 42.771 + 13 | 70.56 - 92 | 28.769 - 9 | 55.35 + 166 |
| 7 | 9.9 | 39.566 - 21 | 17.33 + 0 | 32.603 - 45 | 28.97 - 118 | 42.740 - 31 | 71.35 - 79 | 28.725 - 44 | 56.85 + 150 |
| 7 | 19.8 | 39.510 - 56 | 17.28 + 5 | 32.512 - 91 | 29.93 - 96 | 42.668 - 72 | 71.98 - 63 | 28.649 - 76 | 58.13 + 128 |
| 7 | 29.8 | 39.424 - 86 | 17.20 + 8 | 32.380 - 132 | 30.66 - 73 | 42.560 - 108 | 72.45 - 47 | 28.545 - 104 | 59.18 + 105 |
| 8 | 8.8 | 39.309 - 115 | 17.06 + 14 | 32.211 - 169 | 31.13 - 47 | 42.418 - 142 | 72.71 - 26 | 28.415 - 130 | 59.98 + 80 |
| 8 | 18.8 | 39.172 - 137 | 16.86 + 20 | 32.013 - 198 | 31.31 - 18 | 42.251 - 167 | 72.76 - 5 | 28.265 - 150 | 60.48 + 50 |
| 8 | 28.7 | 39.021 - 151 | 16.62 + 24 | 31.798 - 215 | 31.21 + 10 | 42.067 - 184 | 72.61 + 15 | 28.101 - 164 | 60.71 + 23 |
| 9 | 7.7 | 38.861 - 160 | 16.33 + 29 | 31.572 - 226 | 30.81 + 40 | 41.874 - 193 | 72.23 + 38 | 27.930 - 171 | 60.64 - 7 |
| 9 | 17.7 | 38.705 - 156 | 16.01 + 32 | 31.354 - 218 | 29.19 + 68 | 41.514 - 187 | 70.90 + 58 | 27.762 - 168 | 60.25 - 39 |
| 9 | 27.7 | 38.562 - 143 | 15.67 + 34 | 31.153 - 201 | 29.19 + 94 | 41.687 - 173 | 71.65 + 75 | 27.604 - 158 | 59.57 - 68 |
| 10 | 7.6 | 38.440 - 122 | 15.35 + 32 | 30.981 - 172 | 28.03 + 116 | 41.367 - 147 | 70.00 + 90 | 27.466 - 138 | 58.57 - 100 |
| 10 | 17.6 | 38.352 - 88 | 15.07 + 28 | 30.855 - 126 | 26.71 + 132 | 41.260 - 107 | 69.00 + 100 | 27.359 - 107 | 57.25 - 132 |
| 10 | 27.6 | 38.304 - 48 | 14.86 + 21 | 30.782 - 73 | 25.29 + 142 | 41.199 - 61 | 67.96 + 104 | 27.287 - 72 | 55.65 - 160 |
| 11 | 6.5 | 38.304 + 0 | 14.77 + 9 | 30.770 - 12 | 23.82 + 147 | 41.194 - 5 | 66.93 + 103 | 27.259 - 28 | 53.76 - 189 |
| 11 | 16.5 | 38.358 + 54 | 14.83 - 6 | 30.828 + 58 | 22.41 + 141 | 41.251 + 57 | 65.98 + 95 | 27.281 + 22 | 51.61 - 215 |
| 11 | 26.5 | 38.446 + 88 | 14.74 + 9 | 30.954 + 126 | 21.09 + 132 | 41.367 + 116 | 65.16 + 82 | 27.352 + 71 | 49.26 - 235 |
| 12 | 6.5 | 38.613 + 167 | 15.43 - 69 | 31.149 + 195 | 19.93 + 116 | 41.545 + 178 | 64.49 + 67 | 27.475 + 123 | 46.73 - 253 |
| 12 | 16.4 | 38.823 + 210 | 16.03 - 60 | 31.410 + 261 | 19.00 + 93 | 41.783 + 238 | 64.04 + 45 | 27.647 + 172 | 44.11 - 262 |
| 12 | 26.4 | 39.073 + 250 | 16.80 - 77 | 31.725 + 315 | 18.32 + 68 | 42.069 + 286 | 63.83 + 21 | 27.861 + 214 | 41.47 - 264 |
| 12 | 36.4 | 39.360 + 287 | 17.73 - 93 | 32.090 + 365 | 17.94 + 38 | 42.398 + 329 | 63.87 - 4 | 28.115 + 254 | 38.87 - 260 |
| | | + 314 | - 105 | + 401 | + 8 | + 361 | - 29 | + 283 | - 243 |
| Mean Place | 39.040 | 09.07 | 31.981 | 14.93 | 42.179 | 59.09 | 27.951 | 56.26 | |
| sec δ , $\tan \delta$ | +1.063 | -0.359 | +1.418 | -1.005 | +1.248 | -0.747 | +1.046 | +0.307 | |
| $d\alpha(\psi)$, $d\delta(\psi)$ | +0.070 | -0.19 | +0.085 | -0.19 | +0.079 | -0.19 | +0.054 | -0.19 | |
| $d\alpha(\epsilon)$, $d\delta(\epsilon)$ | -0.012 | -0.88 | -0.032 | -0.88 | -0.024 | -0.88 | +0.010 | -0.88 | |
| Dble. Trans. | May 23 | | May 24 | | May 24 | | May 24 | | |

APPARENT PLACES OF STARS, 1986

249

AT UPPER TRANSIT AT GREENWICH

| No. | 601 | | 1423 | | 1422 | | 606 | | |
|---------------|------------|--------------|-------------------|--------------|------------------------------|--------------|-----------------|--------------|------------|
| | φ Herculis | | τ Coronæ Borealis | | B.D. +6° 3169 (Serpentis) | | 19 Ursæ Minoris | | |
| Mag. Spect. | 4.26 | B9p | 4.94 | K0 | 6.02 | G5 | 5.51 | B8 | |
| U.T. | R.A. | | R.A. | | R.A. | | R.A. | | |
| | h | m | h | m | h | m | h | m | |
| | 16 08 | + 44 57 | 16 08 | + 36 31 | 16 08 | + 6 24 | 16 11 | + 75 54 | |
| 1 | -8.6 | 17 735 + 199 | 65 27 -357 | 25 693 + 197 | 23 34 -336 | 27 916 + 205 | 60 37 -218 | 08 796 + 286 | 34 09 -372 |
| 1 | 1.4 | 17 988 + 253 | 61 86 -341 | 25 936 + 243 | 20 11 -323 | 28 157 + 241 | 58 17 -220 | 09 240 + 444 | 30 61 -348 |
| 1 | 11.4 | 18 288 + 300 | 58 69 -317 | 26 220 + 284 | 17 08 -303 | 28 430 + 273 | 56 00 -217 | 09 836 + 596 | 27 44 -317 |
| 1 | 21.3 | 18 629 + 341 | 55 92 -277 | 26 220 + 318 | 14 40 -268 | 28 726 + 296 | 53 95 -205 | 10 566 + 730 | 24 73 -271 |
| 1 | 31.3 | 18 994 + 365 | 53 61 -231 | 26 876 + 338 | 12 14 -226 | 29 035 + 309 | 52 11 -184 | 11 392 + 826 | 22 57 -216 |
| 2 | 10.3 | 19 377 + 383 | 51 82 -179 | 27 228 + 352 | 10 36 -178 | 29 351 + 316 | 50 50 -161 | 12 295 + 903 | 20 99 -158 |
| 2 | 20.3 | 19 765 + 388 | 50 67 -115 | 27 583 + 355 | 09 16 -120 | 29 666 + 315 | 49 22 -128 | 13 239 + 944 | 20 11 -88 |
| 3 | 2.2 | 20 146 + 381 | 50 13 -54 | 27 930 + 347 | 08 54 -62 | 29 973 + 307 | 48 28 -94 | 14 182 + 943 | 19 90 -21 |
| 3 | 12.2 | 20 516 + 370 | 50 23 + 10 | 28 267 + 337 | 08 51 -3 | 30 269 + 296 | 47 71 -57 | 15 106 + 924 | 20 35 + 45 |
| 3 | 22.2 | 20 862 + 346 | 50 96 + 73 | 28 582 + 315 | 09 08 + 57 | 30 548 + 279 | 47 51 -20 | 15 966 + 860 | 21 48 +113 |
| 4 | 1.1 | 21 177 + 315 | 52 24 +128 | 28 871 + 289 | 10 16 +108 | 30 807 + 259 | 47 66 + 15 | 16 738 + 772 | 23 17 +169 |
| 4 | 11.1 | 21 461 + 284 | 54 03 +179 | 29 133 + 262 | 11 73 +157 | 31 046 + 239 | 48 13 + 47 | 17 407 + 669 | 25 37 +220 |
| 4 | 21.1 | 21 702 + 241 | 56 25 +222 | 29 359 + 226 | 13 72 +199 | 31 260 + 214 | 48 89 + 76 | 17 941 + 534 | 28 00 +263 |
| 5 | 1.1 | 21 902 + 200 | 58 76 +251 | 29 550 + 191 | 15 99 +227 | 31 449 + 189 | 49 86 + 97 | 18 334 + 393 | 30 90 +290 |
| 5 | 11.0 | 22 058 + 156 | 61 52 +276 | 29 704 + 154 | 18 50 +251 | 31 611 + 162 | 51 02 +116 | 18 581 + 247 | 34 02 +312 |
| 5 | 21.0 | 22 165 + 107 | 64 39 +287 | 29 816 + 112 | 21 13 +263 | 31 742 + 131 | 52 29 +127 | 18 666 + 85 | 37 22 +320 |
| 5 | 31.0 | 22 227 + 62 | 67 27 +288 | 29 889 + 73 | 23 78 +265 | 31 844 + 102 | 53 60 +131 | 18 602 - 64 | 40 38 +316 |
| 6 | 10.0 | 22 241 + 14 | 70 10 +283 | 29 921 + 32 | 26 40 +262 | 31 914 + 70 | 54 94 +134 | 18 387 -215 | 43 43 +305 |
| 6 | 19.9 | 22 206 - 35 | 72 76 +266 | 29 910 - 11 | 28 88 +248 | 31 950 + 36 | 56 23 +129 | 18 025 -362 | 46 26 +283 |
| 6 | 29.9 | 22 128 - 78 | 75 19 +243 | 29 862 - 48 | 31 14 +226 | 31 955 + 5 | 57 43 +120 | 17 539 -486 | 48 79 +253 |
| 7 | 9.9 | 22 006 - 122 | 77 34 +215 | 29 774 - 88 | 33 16 +202 | 31 926 - 29 | 58 54 +111 | 16 929 - 610 | 50 98 +219 |
| 7 | 19.8 | 21 844 - 162 | 79 11 +177 | 29 649 - 125 | 34 85 +169 | 31 865 - 61 | 59 50 + 96 | 16 214 - 715 | 52 72 +174 |
| 7 | 29.8 | 21 649 - 195 | 80 51 +140 | 29 494 - 155 | 36 19 +134 | 31 865 - 89 | 60 30 + 80 | 15 420 - 794 | 54 03 +131 |
| 8 | 8.8 | 21 423 - 226 | 81 49 + 98 | 29 310 - 184 | 37 17 + 98 | 31 776 - 116 | 60 30 + 64 | 14 551 - 869 | 54 85 + 82 |
| 8 | 18.8 | 21 174 - 249 | 82 00 + 51 | 29 105 - 205 | 37 70 + 53 | 31 660 - 136 | 60 94 + 43 | 14 551 - 915 | 55 13 + 28 |
| 8 | 28.7 | 20 912 - 262 | 82 06 + 6 | 28 887 - 218 | 37 84 + 14 | 31 375 - 149 | 61 61 + 24 | 12 698 - 938 | 54 93 - 20 |
| 9 | 7.7 | 20 642 - 270 | 81 65 - 41 | 28 661 - 226 | 37 55 - 29 | 31 217 - 158 | 61 65 + 4 | 11 748 - 950 | 54 20 - 73 |
| 9 | 17.7 | 20 378 - 264 | 80 75 - 90 | 28 439 - 222 | 36 80 - 75 | 31 062 - 155 | 61 45 - 20 | 10 823 - 925 | 52 94 -126 |
| 9 | 27.7 | 20 127 - 251 | 79 41 -134 | 28 230 - 209 | 35 65 -115 | 30 918 - 144 | 61 04 - 41 | 09 940 - 883 | 51 22 -172 |
| 10 | 7.6 | 19 901 - 226 | 77 61 -180 | 28 042 - 188 | 34 06 -159 | 30 792 - 126 | 60 39 - 65 | 09 117 - 823 | 49 01 -221 |
| 10 | 17.6 | 19 712 - 189 | 75 38 -223 | 27 889 - 153 | 32 08 -198 | 30 697 - 96 | 59 50 - 89 | 08 391 - 726 | 46 37 -264 |
| 10 | 27.6 | 19 566 - 146 | 72 79 -259 | 27 775 - 114 | 29 74 -234 | 30 637 - 60 | 58 37 -113 | 07 771 - 620 | 43 38 -299 |
| 11 | 6.5 | 19 474 - 92 | 69 83 -296 | 27 709 - 66 | 27 05 -269 | 30 620 - 17 | 57 00 -137 | 07 282 - 489 | 40 03 -335 |
| 11 | 16.5 | 19 443 - 31 | 66 60 -323 | 27 699 - 10 | 24 09 -296 | 30 652 + 32 | 55 40 -160 | 06 948 - 334 | 36 46 -357 |
| 11 | 26.5 | 19 473 + 30 | 63 16 -344 | 27 745 + 46 | 20 93 -316 | 30 733 + 81 | 53 60 -180 | 06 770 - 178 | 32 72 -374 |
| 12 | 6.5 | 19 570 + 97 | 59 59 -357 | 27 851 + 106 | 17 60 -333 | 30 863 + 130 | 51 61 -199 | 06 767 - 3 | 28 89 -383 |
| 12 | 16.4 | 19 731 + 161 | 56 01 -358 | 28 013 + 162 | 14 25 -335 | 31 042 + 179 | 49 50 -211 | 06 940 + 173 | 25 12 -377 |
| 12 | 26.4 | 19 949 + 218 | 52 50 -351 | 28 227 + 214 | 10 95 -330 | 31 261 + 219 | 47 32 -218 | 07 277 + 337 | 21 49 -363 |
| 12 | 36.4 | 20 222 + 273 | 49 17 -333 | 28 488 + 261 | 07 78 -317 | 31 518 + 257 | 45 13 -219 | 07 781 + 504 | 18 12 -337 |
| | | 20 222 + 317 | 49 17 -299 | 28 488 + 298 | 07 78 -287 | 31 518 + 284 | 45 13 -210 | 07 781 + 645 | 18 12 -297 |
| Mean Place | 20 619 | 71 64 | 28 645 | 28 78 | 31 260 | 60 44 | 11 809 | 43 00 | |
| sec δ, tan δ | +1.413 | +0.999 | +1.244 | +0.741 | +1.006 | +0.112 | +4.108 | +3.985 | |
| dα(ψ), dδ(ψ) | +0.038 | -0.19 | +0.044 | -0.19 | +0.059 | -0.19 | -0.033 | -0.18 | |
| dα(ε), dδ(ε) | +0.031 | -0.88 | +0.023 | -0.88 | +0.004 | -0.88 | +0.121 | -0.89 | |
| Dbble. Trans. | May 24 | | May 24 | | May 24 | | May 25 | | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 600 | | 603 | | 602 | | 1425 | | | | | | | | | | |
|--------------|----------|--------|------------|--------|-----------------------|--------|-------------|--------|--------|--------|------|-------|------|--------|------|-------|------|
| | α Normae | | δ Ophiuchi | | δ Trianguli Australis | | 17 Herculis | | | | | | | | | | |
| Mag.Spect. | 5.09 | K0 | 3.03 | M0 | 4.03 | G0 | 6.59 | K0 | | | | | | | | | |
| U.T. | R.A. | | R.A. | | R.A. | | R.A. | | | | | | | | | | |
| | h | m | h | m | h | m | h | m | | | | | | | | | |
| | 16 12 | | 16 13 | | 16 14 | | 16 15 | | | | | | | | | | |
| | — 54 35 | | — 3 39 | | — 63 38 | | + 23 09 | | | | | | | | | | |
| | ° | ' | ° | ' | ° | ' | ° | ' | | | | | | | | | |
| 1 | -8.6 | 18.721 | +332 | 39.47 | +131 | 34.700 | +207 | 35.87 | -162 | 04.958 | +401 | 59.53 | +177 | 39.042 | +190 | 17.15 | -291 |
| 1 | 1.4 | 19.113 | +392 | 38.47 | +100 | 34.945 | +245 | 37.56 | -169 | 05.438 | +480 | 58.09 | +144 | 39.272 | +230 | 14.30 | -285 |
| 1 | 11.4 | 19.557 | +444 | 37.79 | +68 | 35.220 | +275 | 39.29 | -173 | 05.986 | +548 | 57.00 | +109 | 39.538 | +266 | 11.57 | -273 |
| 1 | 21.3 | 20.040 | +483 | 37.47 | +32 | 35.519 | +299 | 40.97 | -168 | 06.588 | +602 | 56.33 | +67 | 39.833 | +295 | 09.09 | -248 |
| 1 | 31.3 | 20.544 | +504 | 37.49 | -2 | 35.829 | +310 | 42.55 | -158 | 07.220 | +632 | 56.05 | +28 | 40.144 | +311 | 06.94 | -215 |
| 2 | 10.3 | 21.063 | +519 | 37.85 | -36 | 36.148 | +319 | 43.99 | -144 | 07.874 | +654 | 56.18 | -13 | 40.467 | +323 | 05.17 | -177 |
| 2 | 20.3 | 21.584 | +521 | 38.54 | -69 | 36.465 | +317 | 45.21 | -122 | 08.533 | +659 | 56.71 | -53 | 40.792 | +325 | 03.87 | -130 |
| 3 | 2.2 | 22.093 | +509 | 39.50 | -96 | 36.775 | +310 | 46.18 | -97 | 09.181 | +648 | 57.60 | -89 | 41.110 | +318 | 03.07 | -80 |
| 3 | 12.2 | 22.589 | +496 | 40.73 | -123 | 37.075 | +300 | 46.90 | -72 | 09.813 | +632 | 58.83 | -123 | 41.420 | +310 | 02.76 | -31 |
| 3 | 22.2 | 23.061 | +472 | 42.20 | -147 | 37.359 | +284 | 47.32 | -42 | 10.415 | +602 | 60.37 | -154 | 41.712 | +292 | 02.98 | +22 |
| 4 | 1.1 | 23.502 | +441 | 43.84 | -164 | 37.624 | +265 | 47.49 | -17 | 10.978 | +563 | 62.16 | -179 | 41.983 | +271 | 03.65 | +67 |
| 4 | 11.1 | 23.913 | +411 | 45.66 | -182 | 37.870 | +246 | 47.40 | +9 | 11.501 | +523 | 64.20 | -204 | 42.232 | +249 | 04.76 | +111 |
| 4 | 21.1 | 24.282 | +369 | 47.61 | -195 | 38.092 | +222 | 47.08 | +32 | 11.969 | +468 | 66.43 | -223 | 42.452 | +220 | 06.24 | +148 |
| 5 | 1.1 | 24.609 | +327 | 49.64 | -203 | 38.291 | +199 | 46.59 | +49 | 12.381 | +412 | 68.79 | -236 | 42.644 | +192 | 08.00 | +176 |
| 5 | 11.0 | 24.891 | +282 | 51.75 | -211 | 38.464 | +173 | 45.95 | +64 | 12.732 | +351 | 71.27 | -248 | 42.806 | +162 | 09.98 | +198 |
| 5 | 21.0 | 25.119 | +228 | 53.88 | -213 | 38.606 | +142 | 45.21 | +74 | 13.010 | +278 | 73.80 | -253 | 42.934 | +128 | 12.10 | +212 |
| 5 | 31.0 | 25.295 | +176 | 55.99 | -176 | 38.721 | +115 | 44.42 | +79 | 13.219 | +209 | 76.33 | -253 | 43.029 | +95 | 14.26 | +216 |
| 6 | 10.0 | 25.413 | +118 | 58.06 | -207 | 38.803 | +82 | 43.59 | +83 | 13.350 | +131 | 78.82 | -249 | 43.088 | +59 | 16.43 | +217 |
| 6 | 19.9 | 25.469 | +56 | 60.01 | -195 | 38.851 | +48 | 42.78 | +81 | 13.399 | +49 | 81.20 | -238 | 43.110 | +22 | 18.49 | +206 |
| 6 | 29.9 | 25.467 | -2 | 61.82 | -181 | 38.868 | +17 | 42.00 | +78 | 13.374 | -25 | 83.41 | -221 | 43.098 | -12 | 20.41 | +192 |
| 7 | 9.9 | 25.405 | -62 | 63.44 | -162 | 38.849 | -19 | 41.28 | +72 | 13.267 | -107 | 85.41 | -200 | 43.050 | -48 | 22.15 | +174 |
| 7 | 19.8 | 25.284 | -121 | 64.81 | -137 | 38.798 | -51 | 40.63 | +65 | 13.086 | -181 | 87.12 | -171 | 42.967 | -83 | 23.63 | +148 |
| 7 | 29.8 | 25.115 | -169 | 65.90 | -109 | 38.717 | -81 | 40.07 | +56 | 12.842 | -244 | 88.51 | -139 | 42.856 | -111 | 24.84 | +121 |
| 8 | 8.8 | 24.898 | -217 | 66.67 | -77 | 38.609 | -108 | 39.59 | +48 | 12.537 | -305 | 89.53 | -102 | 42.715 | -141 | 25.77 | +93 |
| 8 | 18.8 | 24.646 | -252 | 67.07 | -40 | 38.479 | -130 | 39.22 | +37 | 12.188 | -349 | 90.11 | -58 | 42.554 | -161 | 26.35 | +58 |
| 8 | 28.7 | 24.372 | -274 | 67.13 | -6 | 38.334 | -145 | 38.96 | +26 | 11.812 | -376 | 90.28 | -17 | 42.378 | -176 | 26.61 | +26 |
| 9 | 7.7 | 24.085 | -287 | 66.79 | +34 | 38.180 | -154 | 38.80 | +16 | 11.420 | -392 | 89.99 | +29 | 42.193 | -185 | 26.53 | -8 |
| 9 | 17.7 | 23.806 | -279 | 66.09 | +70 | 38.028 | -152 | 38.79 | +1 | 11.038 | -382 | 89.25 | +74 | 42.010 | -183 | 26.08 | -45 |
| 9 | 27.7 | 23.547 | -259 | 65.05 | +104 | 37.886 | -142 | 38.90 | -11 | 10.682 | -356 | 88.11 | +114 | 41.837 | -173 | 25.30 | -78 |
| 10 | 7.6 | 23.321 | -226 | 63.70 | +135 | 37.762 | -124 | 39.16 | -26 | 10.370 | -312 | 86.58 | +153 | 41.682 | -155 | 24.15 | -115 |
| 10 | 17.6 | 23.150 | -171 | 62.10 | +160 | 37.669 | -93 | 39.60 | -44 | 10.128 | -242 | 84.73 | +185 | 41.558 | -124 | 22.65 | -150 |
| 10 | 27.6 | 23.040 | -110 | 60.32 | +178 | 37.612 | -57 | 40.20 | -60 | 09.964 | -164 | 82.65 | +208 | 41.469 | -89 | 20.85 | -180 |
| 11 | 6.5 | 23.003 | -37 | 58.43 | +189 | 37.597 | -15 | 41.00 | -80 | 09.893 | -71 | 80.38 | +227 | 41.424 | -45 | 18.71 | -214 |
| 11 | 16.5 | 23.050 | +47 | 56.53 | +190 | 37.632 | +35 | 42.00 | -100 | 09.929 | +36 | 78.07 | +231 | 41.429 | +5 | 16.32 | -239 |
| 11 | 26.5 | 23.178 | +128 | 54.68 | +185 | 37.714 | +82 | 43.18 | -118 | 10.067 | +138 | 75.79 | +228 | 41.485 | +56 | 13.71 | -261 |
| 12 | 6.5 | 23.389 | +211 | 52.97 | +171 | 37.847 | +133 | 44.56 | -138 | 10.313 | +246 | 73.61 | +218 | 41.594 | +109 | 10.91 | -280 |
| 12 | 16.4 | 23.678 | +289 | 51.49 | +148 | 38.029 | +182 | 46.08 | -152 | 10.660 | +347 | 71.67 | +194 | 41.754 | +160 | 08.05 | -286 |
| 12 | 26.4 | 24.035 | +357 | 50.26 | +123 | 38.251 | +222 | 47.71 | -163 | 11.094 | +434 | 69.99 | +168 | 41.959 | +205 | 05.17 | -282 |
| 12 | 36.4 | 24.453 | +418 | 49.35 | +91 | 38.511 | +260 | 49.41 | -170 | 11.607 | +513 | 68.65 | +134 | 42.206 | +247 | 02.35 | -288 |
| | | 463 | +55 | | | | +286 | | -169 | | +574 | | +94 | | +279 | | -261 |
| Mean Place | 24.578 | 47.79 | | 38.232 | 36.86 | 12.129 | 68.38 | 42.161 | 20.66 | | | | | | | | |
| sec δ, tan δ | +1.726 | -1.407 | | +1.002 | -0.064 | +2.253 | -2.019 | +1.088 | +0.428 | | | | | | | | |
| dα(ψ), dδ(ψ) | +0.094 | -0.18 | | +0.063 | -0.18 | +0.109 | -0.18 | +0.051 | -0.17 | | | | | | | | |
| dα(ε), dδ(ε) | -0.042 | -0.89 | | -0.002 | -0.89 | -0.060 | -0.90 | +0.013 | -0.90 | | | | | | | | |
| Dble.Trans. | May 25 | | May 26 | | May 26 | | May 26 | | | | | | | | | | |

APPARENT PLACES OF STARS, 1986

251

AT UPPER TRANSIT AT GREENWICH

| No. | 605 | | 612 | | 1424 | | 1426 | |
|--------------|------------|--------|-----------------|--------|------------|--------|-------------------|--------|
| Name | ε Ophiuchi | | η Ursae Minoris | | δ' Apodis* | | 55 G. Scorpii* f. | |
| Mag.Spect. | 3.34 | K0 | 5.04 | F0 | 4.78 | M3 | 5.69 | F2 |
| U.T. | R.A. | | R.A. | | R.A. | | R.A. | |
| | h | m | h | m | h | m | h | m |
| | 16 17 | | 16 17 | | 16 18 | | 16 18 | |
| | - 4 39 | | + 75 46 | | - 78 39 | | - 30 52 | |
| | ° | ' | ° | ' | ° | ' | ° | ' |
| 1 -8.6 | 32.797 | + 206 | 50.216 | + 258 | 03.982 | + 757 | 37.062 | + 242 |
| 1 1.4 | 33.039 | + 242 | 50.633 | + 417 | 04.918 | + 936 | 37.346 | + 284 |
| 1 11.4 | 33.313 | + 274 | 51.203 | + 570 | 06.012 | +1094 | 37.665 | + 319 |
| 1 21.3 | 33.610 | + 297 | 51.909 | + 706 | 07.237 | +1225 | 38.010 | + 345 |
| 1 31.3 | 33.920 | + 310 | 52.713 | + 804 | 08.543 | +1306 | 38.370 | + 360 |
| 2 10.3 | 34.239 | + 319 | 53.599 | + 886 | 09.914 | +1371 | 38.740 | + 370 |
| 2 20.3 | 34.557 | + 318 | 54.529 | + 930 | 11.309 | +1395 | 39.109 | + 369 |
| 3 2.2 | 34.868 | + 311 | 55.463 | + 934 | 12.692 | +1383 | 39.470 | + 361 |
| 3 12.2 | 35.170 | + 302 | 56.383 | + 920 | 14.051 | +1359 | 39.821 | + 351 |
| 3 22.2 | 35.456 | + 286 | 57.245 | + 862 | 15.347 | +1296 | 40.156 | + 335 |
| 4 1.2 | 35.724 | + 268 | 58.022 | + 777 | 16.559 | +1212 | 40.470 | + 314 |
| 4 11.1 | 35.974 | + 250 | 58.701 | + 679 | 17.680 | +1121 | 40.765 | + 295 |
| 4 21.1 | 36.200 | + 226 | 59.249 | + 548 | 18.673 | + 993 | 41.033 | + 268 |
| 5 1.1 | 36.403 | + 203 | 59.660 | + 411 | 19.533 | + 860 | 41.274 | + 241 |
| 5 11.0 | 36.580 | + 177 | 59.927 | + 267 | 20.246 | + 713 | 41.487 | + 213 |
| 5 21.0 | 36.723 | + 148 | 60.033 | + 106 | 20.788 | + 542 | 41.666 | + 179 |
| 5 31.0 | 36.847 | + 119 | 59.992 | - 41 | 21.164 | + 376 | 41.810 | + 144 |
| 6 10.0 | 36.934 | + 87 | 59.801 | - 191 | 21.358 | + 194 | 41.918 | + 108 |
| 6 19.9 | 36.986 | + 52 | 59.461 | - 340 | 21.363 | + 5 | 41.984 | + 66 |
| 6 29.9 | 37.007 | + 21 | 58.996 | - 465 | 21.196 | - 167 | 42.012 | + 28 |
| 7 9.9 | 36.992 | - 15 | 58.407 | - 589 | 20.847 | - 349 | 41.999 | - 13 |
| 7 19.9 | 36.943 | - 49 | 57.710 | - 697 | 20.331 | - 516 | 41.945 | - 54 |
| 7 29.8 | 36.865 | - 78 | 56.931 | - 779 | 19.677 | - 654 | 41.856 | - 89 |
| 8 8.8 | 36.758 | - 107 | 56.074 | - 857 | 18.892 | - 785 | 41.733 | - 123 |
| 8 18.8 | 36.630 | - 128 | 55.168 | - 906 | 18.014 | - 878 | 41.583 | - 150 |
| 8 28.7 | 36.486 | - 144 | 54.235 | - 933 | 17.079 | - 935 | 41.416 | - 167 |
| 9 7.7 | 36.331 | - 155 | 53.288 | - 947 | 16.112 | - 967 | 41.237 | - 179 |
| 9 17.7 | 36.179 | - 152 | 52.361 | - 927 | 15.171 | - 941 | 41.061 | - 176 |
| 9 27.7 | 36.035 | - 144 | 51.472 | - 889 | 14.287 | - 884 | 40.896 | - 165 |
| 10 7.6 | 35.910 | - 125 | 50.640 | - 832 | 13.499 | - 788 | 40.752 | - 144 |
| 10 17.6 | 35.815 | - 95 | 49.902 | - 738 | 12.860 | - 639 | 40.644 | - 108 |
| 10 27.6 | 35.755 | - 60 | 49.266 | - 636 | 12.389 | - 471 | 40.578 | - 66 |
| 11 6.6 | 35.737 | - 18 | 48.758 | - 508 | 12.118 | - 271 | 40.562 | + 273 |
| 11 16.5 | 35.769 | + 32 | 48.402 | - 356 | 12.075 | - 43 | 40.605 | + 43 |
| 11 26.5 | 35.849 | + 80 | 48.200 | - 202 | 12.253 | + 178 | 40.702 | + 97 |
| 12 6.5 | 35.979 | + 130 | 48.171 | - 29 | 12.665 | + 412 | 40.856 | + 154 |
| 12 16.4 | 36.159 | + 180 | 48.317 | + 146 | 13.299 | + 634 | 41.068 | + 212 |
| 12 26.4 | 36.379 | + 220 | 48.627 | + 310 | 14.127 | + 828 | 41.327 | + 259 |
| 12 36.4 | 36.636 | + 285 | 49.104 | + 620 | 15.138 | +1011 | 41.629 | + 302 |
| Mean Place | 36.364 | 36.99 | 53.282 | 72.23 | 17.883 | 49.18 | 41.388 | 29.49 |
| sec δ, tan δ | +1.003 | -0.082 | +4.073 | +3.948 | +5.087 | -4.988 | +1.165 | -0.598 |
| dα(ψ), dδ(ψ) | +0.063 | -0.17 | -0.033 | -0.17 | +0.181 | -0.17 | +0.075 | -0.17 |
| dα(ε), dδ(ε) | -0.002 | -0.90 | +0.113 | -0.90 | -0.143 | -0.90 | -0.017 | -0.90 |
| Dble.Trans. | May 27 | | May 27 | | May 27 | | May 27 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 604 | | 608 | | 607 | | 609 | |
|---|-------------------|--------|-------------------|--------|-------------------|--------|-------------------|--------|
| | γ^2 Normae | | τ Herculis | | σ Scorpii | | γ Herculis | |
| Mag.Spect. | 4.14 | K0 | 3.91 | B5 | 3.10 var. | B1 | 3.79 | F0 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " |
| | 16 18 | -50 07 | 16 19 | +46 20 | 16 20 | -25 33 | 16 21 | +19 10 |
| | ^s +300 | " +111 | ^s +185 | " -361 | ^s +230 | " -30 | ^s +185 | " -274 |
| 1 -8.6 | 44.132 | 17.31 | 17.135 | 35.79 | 17.854 | 36.60 | 16.277 | 60.09 |
| 1 1.4 | 44.487 | 16.47 | 17.376 | 32.33 | 18.124 | 37.08 | 16.503 | 57.39 |
| 1 11.4 | 44.890 | 15.92 | 17.668 | 29.10 | 18.428 | 37.72 | 16.763 | 54.78 |
| 1 21.3 | 45.330 | 15.71 | 18.002 | 26.24 | 18.758 | 38.50 | 17.052 | 52.39 |
| 1 31.3 | 45.790 | 15.79 | 18.365 | 23.85 | 19.101 | 39.39 | 17.357 | 50.30 |
| 2 10.3 | 46.263 | 16.17 | 18.749 | 21.97 | 19.453 | 40.34 | 17.674 | 48.55 |
| 2 20.3 | 46.739 | 16.84 | 19.141 | 20.73 | 19.806 | 41.32 | 17.993 | 47.24 |
| 3 2.2 | 47.206 | 17.74 | 19.530 | 20.11 | 20.151 | 42.29 | 18.307 | 46.38 |
| 3 12.2 | 47.662 | 18.87 | 19.909 | 20.12 | 20.487 | 43.23 | 18.612 | 46.00 |
| 3 22.2 | 48.097 | 20.20 | 20.267 | 20.79 | 20.807 | 44.11 | 18.902 | 46.11 |
| 4 1.2 | 48.505 | 21.67 | 20.596 | 22.02 | 21.108 | 44.92 | 19.172 | 46.66 |
| 4 11.1 | 48.887 | 23.28 | 20.894 | 23.77 | 21.390 | 45.67 | 19.422 | 47.62 |
| 4 21.1 | 49.233 | 25.01 | 21.151 | 25.97 | 21.647 | 46.35 | 19.645 | 48.95 |
| 5 1.1 | 49.542 | 26.80 | 21.366 | 28.49 | 21.879 | 46.96 | 19.841 | 50.54 |
| 5 11.0 | 49.811 | 28.66 | 21.536 | 31.27 | 22.084 | 47.52 | 20.009 | 52.35 |
| 5 21.0 | 50.032 | 30.54 | 21.656 | 34.20 | 22.257 | 48.03 | 20.144 | 54.31 |
| 5 31.0 | 50.207 | 32.40 | 21.729 | 37.14 | 22.398 | 48.50 | 20.248 | 56.31 |
| 6 10.0 | 50.330 | 34.23 | 21.753 | 40.05 | 22.503 | 48.93 | 20.317 | 58.33 |
| 6 19.9 | 50.397 | 35.96 | 21.725 | 42.80 | 22.569 | 49.32 | 20.349 | 60.26 |
| 6 29.9 | 50.411 | 37.57 | 21.653 | 45.33 | 22.600 | 49.66 | 20.348 | 62.07 |
| 7 9.9 | 50.370 | 39.02 | 21.534 | 47.60 | 22.590 | 49.95 | 20.310 | 63.71 |
| 7 19.9 | 50.275 | 40.25 | 21.371 | 49.50 | 22.542 | 50.16 | 20.239 | 65.13 |
| 7 29.8 | 50.134 | 41.24 | 21.174 | 51.02 | 22.460 | 50.31 | 20.137 | 66.30 |
| 8 8.8 | 49.949 | 41.95 | 20.942 | 52.12 | 22.345 | 50.36 | 20.007 | 67.22 |
| 8 18.8 | 49.730 | 42.33 | 20.686 | 52.75 | 22.205 | 50.31 | 19.855 | 67.82 |
| 8 28.7 | 49.489 | 42.40 | 20.413 | 52.94 | 22.047 | 50.16 | 19.687 | 68.13 |
| 9 7.7 | 49.234 | 42.12 | 20.131 | 52.64 | 21.878 | 49.90 | 19.510 | 68.12 |
| 9 17.7 | 48.984 | 41.51 | 19.852 | 51.84 | 21.711 | 49.56 | 19.333 | 67.78 |
| 9 27.7 | 48.750 | 40.61 | 19.586 | 50.60 | 21.554 | 49.14 | 19.166 | 67.13 |
| 10 7.6 | 48.545 | 39.41 | 19.342 | 48.89 | 21.416 | 48.66 | 19.015 | 66.13 |
| 10 17.6 | 48.388 | 38.00 | 19.134 | 46.73 | 21.313 | 48.18 | 18.894 | 64.81 |
| 10 27.6 | 48.285 | 36.43 | 18.969 | 44.20 | 21.249 | 47.70 | 18.807 | 63.20 |
| 11 6.6 | 48.249 | 34.76 | 18.857 | 41.28 | 21.233 | 47.29 | 18.763 | 61.27 |
| 11 16.5 | 48.289 | 33.08 | 18.807 | 38.08 | 21.272 | 46.99 | 18.768 | 59.09 |
| 11 26.5 | 48.401 | 31.47 | 18.818 | 34.66 | 21.365 | 46.86 | 18.823 | 56.68 |
| 12 6.5 | 48.590 | 29.98 | 18.897 | 31.07 | 21.506 | 46.80 | 18.929 | 54.09 |
| 12 16.4 | 48.851 | 28.69 | 19.042 | 27.47 | 21.709 | 46.94 | 19.086 | 51.41 |
| 12 26.4 | 49.174 | 27.65 | 19.247 | 23.92 | 21.956 | 47.28 | 19.287 | 48.69 |
| 12 36.4 | 49.553 | 26.90 | 19.509 | 20.54 | 22.242 | 47.81 | 19.528 | 46.02 |
| Mean Place | 49.578 | 24.33 | 20.052 | 42.47 | 21.983 | 40.34 | 19.460 | 63.28 |
| sec δ , $\tan \delta$ | +1.560 | -1.197 | +1.449 | +1.048 | +1.108 | -0.478 | +1.059 | +0.348 |
| $d\alpha(\psi)$, $d\delta(\psi)$ | +0.090 | -0.17 | +0.036 | -0.17 | +0.073 | -0.17 | +0.053 | -0.17 |
| $d\alpha(\epsilon)$, $d\delta(\epsilon)$ | -0.034 | -0.90 | +0.030 | -0.91 | -0.013 | -0.91 | +0.010 | -0.91 |
| Dble.Trans. | May 27 | | May 27 | | May 27 | | May 28 | |

APPARENT PLACES OF STARS, 1986

253

AT UPPER TRANSIT AT GREENWICH

| No. | 1427 | | 1428 | | 1429 | | 614 | |
|---|---------------------------|----------------|---------------------------|----------------|---------------------------|----------------|--------------------------------|----------------|
| | σ Serpentis | | 23 Herculis* | | 21 Herculis | | Groombridge 2343 (Draconis) | |
| Mag.Spect. | 4.80 | F0 | 6.30 | A2 | 5.72 | A0 | 5.66 | A2 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | ^h ^m | ^o / | ^h ^m | ^o / | ^h ^m | ^o / | ^h ^m | ^o / |
| | 16 21 | + 1 03 | 16 22 | + 32 21 | 16 23 | + 6 58 | 16 24 | + 55 13 |
| 1 -8.6 | 19 827 + 197 | 35.93 -185 | 22 325 + 180 | 45.38 -324 | 27 961 + 190 | 42.14 -216 | 04.635 + 181 | 60.29 -375 |
| 1 1.4 | 20 061 + 234 | 34.03 -190 | 22 551 + 226 | 42.20 -315 | 28 189 + 228 | 39.96 -218 | 04 885 + 250 | 56.71 -358 |
| 1 11.4 | 20 327 + 266 | 32.13 -190 | 22 817 + 266 | 39.21 -299 | 28 449 + 260 | 37.81 -215 | 05 198 + 313 | 53.37 -334 |
| 1 21.3 | 20 617 + 290 | 30.30 -183 | 23 116 + 299 | 36.52 -269 | 28 736 + 287 | 35.78 -203 | 05 567 + 369 | 50.44 -293 |
| 1 31.3 | 20 921 + 304 | 28.62 -168 | 23 436 + 320 | 34.21 -231 | 29 037 + 301 | 33.95 -183 | 05 974 + 407 | 47.99 -245 |
| 2 10.3 | 21 235 + 314 | 27.13 -149 | 23 772 + 336 | 32.34 -187 | 29 349 + 312 | 32.36 -159 | 06 411 + 437 | 46.08 -191 |
| 2 20.3 | 21 549 + 314 | 25.90 -123 | 24 113 + 341 | 31.02 -132 | 29 662 + 313 | 31.09 -127 | 06 863 + 452 | 44.84 -124 |
| 3 2.2 | 21 856 + 307 | 24.97 -93 | 24 449 + 336 | 30.24 -78 | 29 969 + 307 | 30.18 -91 | 07 313 + 450 | 44.25 -59 |
| 3 12.2 | 22 156 + 300 | 24.34 -63 | 24 777 + 328 | 30.04 -20 | 30 268 + 299 | 29.62 -56 | 07 755 + 442 | 44.32 + 7 |
| 3 22.2 | 22 440 + 284 | 24.05 -29 | 25 089 + 312 | 30.42 + 38 | 30 553 + 285 | 29.46 -16 | 08 174 + 419 | 45.08 + 76 |
| 4 1.2 | 22 707 + 267 | 24.05 + 0 | 25 377 + 288 | 31.31 + 89 | 30 820 + 267 | 29.64 + 18 | 08 558 + 384 | 46.41 +133 |
| 4 11.1 | 22 955 + 248 | 24.35 + 30 | 25 642 + 265 | 32.68 +137 | 31 068 + 248 | 30.16 + 52 | 08 905 + 347 | 48.30 +189 |
| 4 21.1 | 23 180 + 225 | 24.91 + 56 | 25 876 + 234 | 34.47 +179 | 31 293 + 225 | 30.98 + 82 | 09 201 + 296 | 50.65 +235 |
| 5 1.1 | 23 381 + 201 | 25.66 + 75 | 26 079 + 203 | 36.57 +210 | 31 494 + 201 | 32.02 +104 | 09 444 + 243 | 53.33 +268 |
| 5 11.0 | 23 557 + 176 | 26.58 + 92 | 26 247 + 168 | 38.92 +235 | 31 669 + 175 | 33.25 +123 | 09 632 + 188 | 56.29 +296 |
| 5 21.0 | 23 703 + 146 | 27.62 +104 | 26 377 + 130 | 41.41 +249 | 31 813 + 144 | 34.61 +136 | 09 757 + 125 | 59.38 +309 |
| 5 31.0 | 23 821 + 118 | 28.70 +108 | 26 470 + 93 | 43.95 +254 | 31 929 + 116 | 36.02 +141 | 09 823 + 66 | 62.50 +312 |
| 6 10.0 | 23 906 + 85 | 29.82 +112 | 26 524 + 54 | 46.49 +254 | 32 012 + 83 | 37.45 +143 | 09 828 + 5 | 65.58 +308 |
| 6 19.9 | 23 957 + 51 | 30.91 +109 | 26 537 + 13 | 48.91 +242 | 32 060 + 48 | 38.85 +140 | 09 769 - 59 | 68.50 +292 |
| 6 29.9 | 23 976 + 19 | 31.93 +102 | 26 512 - 25 | 51.15 +224 | 32 076 + 16 | 40.15 +130 | 09 656 -113 | 71.17 +267 |
| 7 9.9 | 23 960 - 16 | 32.89 + 96 | 26 447 - 65 | 53.18 +203 | 32 056 - 20 | 41.36 +121 | 09 486 - 170 | 73.57 +240 |
| 7 19.9 | 23 910 - 50 | 33.73 + 84 | 26 346 - 101 | 54.91 +173 | 32 003 - 53 | 42.41 +105 | 09 264 - 222 | 75.57 +200 |
| 7 29.8 | 23 830 - 80 | 34.45 + 72 | 26 212 - 134 | 56.33 +142 | 31 920 - 83 | 43.30 + 89 | 09 001 - 263 | 77.18 +161 |
| 8 8.8 | 23 722 - 108 | 35.04 + 59 | 26 048 - 164 | 57.40 +107 | 31 808 - 112 | 44.02 + 72 | 09 001 - 304 | 77.34 +116 |
| 8 18.8 | 23 591 - 131 | 35.48 + 44 | 25 861 - 187 | 58.07 + 67 | 31 674 - 134 | 44.53 + 51 | 08 697 - 332 | 79.00 + 66 |
| 8 28.7 | 23 445 - 146 | 35.77 + 29 | 25 659 - 202 | 58.36 + 29 | 31 524 - 150 | 44.85 + 32 | 08 014 - 351 | 79.19 + 19 |
| 9 7.7 | 23 288 - 157 | 35.90 + 13 | 25 446 - 213 | 58.24 - 12 | 31 363 - 161 | 44.95 + 10 | 07 651 - 363 | 78.86 - 33 |
| 9 17.7 | 23 132 - 156 | 35.85 - 5 | 25 235 - 211 | 57.69 - 55 | 31 203 - 160 | 44.81 - 14 | 07 293 - 358 | 78.02 - 84 |
| 9 27.7 | 22 985 - 147 | 35.64 - 21 | 25 033 - 202 | 56.76 - 93 | 31 051 - 152 | 44.46 - 35 | 06 949 - 344 | 76.70 -132 |
| 10 7.6 | 22 855 - 130 | 35.23 - 41 | 24 849 - 184 | 55.40 -136 | 30 915 - 136 | 43.86 - 60 | 06 629 - 320 | 74.88 -182 |
| 10 17.6 | 22 754 - 101 | 34.61 - 62 | 24 697 - 152 | 53.65 -175 | 30 808 - 107 | 43.02 - 84 | 06 351 - 278 | 72.60 -228 |
| 10 27.6 | 22 688 - 66 | 33.80 - 81 | 24 581 - 116 | 51.55 -210 | 30 735 - 73 | 41.94 -108 | 06 122 - 229 | 69.93 -267 |
| 11 6.6 | 22 663 - 25 | 32.77 -103 | 24 510 - 71 | 49.09 -246 | 30 703 - 32 | 40.61 -133 | 05 953 - 169 | 66.87 -306 |
| 11 16.5 | 22 687 + 24 | 31.53 -124 | 24 493 - 17 | 46.35 -274 | 30 720 + 17 | 39.05 -156 | 05 856 - 97 | 63.51 -336 |
| 11 26.5 | 22 758 + 71 | 30.10 -143 | 24 528 + 35 | 43.38 -297 | 30 784 + 64 | 37.29 -176 | 05 830 - 26 | 59.93 -358 |
| 12 6.5 | 22 880 + 122 | 28.47 -163 | 24 621 + 93 | 40.23 -315 | 30 899 + 115 | 35.33 -196 | 05 884 + 54 | 56.19 -374 |
| 12 16.4 | 23 050 + 170 | 26.71 -176 | 24 769 + 148 | 37.02 -321 | 31 062 + 163 | 33.25 -208 | 06 017 + 133 | 52.44 -375 |
| 12 26.4 | 23 261 + 211 | 24.86 -185 | 24 965 + 196 | 33.82 -310 | 31 267 + 205 | 31.11 -214 | 06 222 + 205 | 48.76 -368 |
| 12 36.4 | 23 510 + 249 | 22.96 -190 | 25 209 + 244 | 30.72 -320 | 31 511 + 244 | 28.94 -217 | 06 498 + 276 | 45.26 -350 |
| | + 278 | -185 | + 280 | -285 | + 272 | -208 | + 336 | -315 |
| Mean Place | 23.285 | 36.37 | 25.366 | 50.36 | 31.329 | 43.59 | 07.537 | 67.83 |
| sec δ , tan δ | +1.000 | +0.019 | +1.184 | +0.634 | +1.007 | +0.122 | +1.754 | +1.441 |
| $d\alpha(\psi)$, $d\delta(\psi)$ | +0.061 | -0.17 | +0.046 | -0.16 | +0.058 | -0.16 | +0.026 | -0.16 |
| $d\alpha(\epsilon)$, $d\delta(\epsilon)$ | +0.001 | -0.91 | +0.017 | -0.91 | +0.003 | -0.91 | +0.039 | -0.91 |
| Dble.Trans. | May 28 | | May 28 | | May 28 | | May 28 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 613 | | 610 | | 619 | | 616 | | | | | | | | | | |
|--|-------------------|--------------|-----------------------------|--------------|--------------|--------------|----------------------------------|--------------|--------|--------|-------|-------|------|--------|-------|-------|------|
| | ω Herculis | | ζ Trianguli Australis | | A Draconis | | α Scorpii A* (Antares) | | | | | | | | | | |
| Mag.Spect. | 4.53 | A0p | 4.93 | G0 | 4.98 | B8p | 1.22 var. | M0 | | | | | | | | | |
| U.T. | R.A. | | R.A. | | R.A. | | R.A. | | | | | | | | | | |
| | h | m | h | m | h | m | h | m | | | | | | | | | |
| | 16 24 | + 14 03 | 16 26 | - 70 03 | 16 27 | + 68 47 | 16 28 | - 26 24 | | | | | | | | | |
| | ^d | ^s | ^s | ["] | ^s | ["] | ^s | ["] | | | | | | | | | |
| 1 | -8.6 | 44.287 | + 184 | 46.80 | -250 | 51.507 | + 464 | 12.34 | +215 | 57.309 | + 192 | 42.05 | -379 | 30.539 | + 225 | 07.33 | - 20 |
| 1 | 1.4 | 44.512 | + 225 | 44.31 | -249 | 52.077 | + 570 | 12.34 | +184 | 57.609 | + 300 | 38.44 | -361 | 30.803 | + 264 | 07.71 | - 38 |
| 1 | 11.4 | 44.770 | + 258 | 41.88 | -243 | 52.740 | + 663 | 09.01 | +149 | 58.014 | + 405 | 35.09 | -335 | 31.103 | + 300 | 08.25 | - 54 |
| 1 | 21.3 | 45.055 | + 285 | 39.63 | -225 | 53.479 | + 739 | 07.95 | +106 | 58.512 | + 498 | 32.16 | -293 | 31.430 | + 327 | 08.94 | - 69 |
| 1 | 31.3 | 45.356 | + 301 | 37.63 | -200 | 54.266 | + 787 | 07.31 | + 64 | 59.079 | + 567 | 29.75 | -241 | 31.772 | + 342 | 09.73 | - 79 |
| 2 | 10.3 | 45.669 | + 313 | 35.93 | -170 | 55.089 | + 823 | 07.10 | + 21 | 59.701 | + 622 | 27.90 | -185 | 32.125 | + 353 | 10.59 | - 86 |
| 2 | 20.3 | 45.984 | + 315 | 34.63 | -130 | 55.927 | + 838 | 07.34 | - 24 | 60.355 | + 654 | 26.73 | -117 | 32.479 | + 354 | 11.49 | - 90 |
| 3 | 2.2 | 46.294 | + 310 | 33.74 | - 89 | 56.757 | + 830 | 07.98 | - 64 | 61.014 | + 659 | 26.22 | - 51 | 32.827 | + 348 | 12.39 | - 90 |
| 3 | 12.2 | 46.596 | + 302 | 33.28 | - 46 | 57.574 | + 817 | 09.01 | -103 | 61.666 | + 652 | 26.40 | + 18 | 33.167 | + 340 | 13.27 | - 88 |
| 3 | 22.2 | 46.883 | + 287 | 33.27 | - 1 | 58.358 | + 784 | 10.42 | -141 | 62.284 | + 618 | 27.27 | + 87 | 33.493 | + 326 | 14.10 | - 83 |
| 4 | 1.2 | 47.152 | + 269 | 33.66 | + 39 | 59.096 | + 738 | 12.13 | -171 | 62.848 | + 564 | 28.73 | +146 | 33.801 | + 308 | 14.88 | - 78 |
| 4 | 11.1 | 47.402 | + 250 | 34.44 | + 78 | 59.784 | + 688 | 14.15 | -202 | 63.352 | + 504 | 30.75 | +202 | 34.091 | + 290 | 15.60 | - 72 |
| 4 | 21.1 | 47.626 | + 224 | 35.55 | +111 | 60.404 | + 620 | 16.41 | -226 | 63.772 | + 420 | 33.23 | +248 | 34.357 | + 266 | 16.26 | - 66 |
| 5 | 1.1 | 47.826 | + 200 | 36.92 | +137 | 60.951 | + 547 | 18.86 | -245 | 64.104 | + 332 | 36.04 | +281 | 34.598 | + 241 | 16.87 | - 61 |
| 5 | 11.0 | 47.999 | + 173 | 38.50 | +158 | 61.419 | + 468 | 21.48 | -262 | 64.343 | + 239 | 39.13 | +309 | 34.812 | + 214 | 17.43 | - 56 |
| 5 | 21.0 | 48.140 | + 141 | 40.22 | +172 | 61.792 | + 373 | 24.19 | -271 | 64.477 | + 134 | 42.34 | +321 | 34.994 | + 182 | 17.95 | - 52 |
| 5 | 31.0 | 48.251 | + 111 | 41.99 | +177 | 62.072 | + 280 | 26.93 | -274 | 64.513 | + 36 | 45.56 | +322 | 35.144 | + 150 | 18.44 | - 49 |
| 6 | 10.0 | 48.328 | + 77 | 43.78 | +179 | 62.251 | + 179 | 29.67 | -274 | 64.448 | - 65 | 48.74 | +318 | 35.259 | + 115 | 18.90 | - 46 |
| 6 | 19.9 | 48.370 | + 42 | 45.51 | +173 | 62.320 | + 69 | 32.32 | -265 | 64.282 | - 166 | 51.73 | +299 | 35.334 | + 75 | 19.33 | - 43 |
| 6 | 29.9 | 48.378 | + 8 | 47.12 | +161 | 62.290 | - 30 | 34.82 | -250 | 64.029 | - 253 | 54.46 | +273 | 35.371 | + 37 | 19.71 | - 38 |
| 7 | 9.9 | 48.351 | - 27 | 48.60 | +148 | 62.153 | - 137 | 37.13 | -231 | 63.687 | - 342 | 56.90 | +244 | 35.368 | - 3 | 20.05 | - 34 |
| 7 | 19.9 | 48.289 | - 62 | 49.89 | +129 | 61.916 | - 237 | 39.13 | -200 | 63.267 | - 420 | 58.92 | +202 | 35.325 | - 43 | 20.31 | - 26 |
| 7 | 29.8 | 48.198 | - 91 | 50.96 | +107 | 61.594 | - 322 | 40.81 | -168 | 62.785 | - 482 | 60.52 | +160 | 35.248 | - 77 | 20.51 | - 20 |
| 8 | 8.8 | 48.078 | - 120 | 51.81 | + 85 | 61.190 | - 404 | 42.10 | -129 | 62.244 | - 541 | 61.66 | +114 | 35.136 | - 112 | 20.61 | - 10 |
| 8 | 18.8 | 47.935 | - 143 | 52.39 | + 58 | 60.727 | - 463 | 42.94 | - 84 | 61.662 | - 582 | 62.27 | + 61 | 34.997 | - 139 | 20.62 | - 1 |
| 8 | 28.7 | 47.777 | - 158 | 52.72 | + 33 | 60.223 | - 504 | 43.32 | - 38 | 61.056 | - 606 | 62.40 | + 13 | 34.839 | - 158 | 20.51 | + 11 |
| 9 | 7.7 | 47.607 | - 170 | 52.77 | + 5 | 59.695 | - 528 | 43.21 | + 11 | 60.433 | - 623 | 62.00 | - 40 | 34.668 | - 171 | 20.30 | + 21 |
| 9 | 17.7 | 47.439 | - 168 | 52.52 | - 25 | 59.175 | - 520 | 42.60 | + 61 | 59.819 | - 614 | 61.05 | - 95 | 34.497 | - 171 | 19.98 | + 32 |
| 9 | 27.7 | 47.278 | - 161 | 52.00 | - 52 | 58.684 | - 491 | 41.53 | +107 | 59.226 | - 593 | 59.63 | -142 | 34.335 | - 162 | 19.58 | + 40 |
| 10 | 7.6 | 47.134 | - 144 | 51.18 | - 82 | 58.244 | - 440 | 40.00 | +153 | 58.669 | - 557 | 57.70 | -193 | 34.192 | - 143 | 19.11 | + 47 |
| 10 | 17.6 | 47.019 | - 115 | 50.06 | -112 | 57.889 | - 355 | 38.10 | +190 | 58.174 | - 495 | 55.31 | -239 | 34.082 | - 110 | 18.61 | + 50 |
| 10 | 27.6 | 46.937 | - 82 | 48.67 | -139 | 57.630 | - 259 | 35.90 | +220 | 57.749 | - 425 | 52.52 | -279 | 34.011 | - 71 | 18.12 | + 49 |
| 11 | 6.6 | 46.897 | - 40 | 46.99 | -168 | 57.487 | - 143 | 33.46 | +244 | 57.411 | - 338 | 49.34 | -318 | 33.987 | - 24 | 17.66 | + 46 |
| 11 | 16.5 | 46.905 | + 8 | 45.07 | -192 | 57.479 | - 8 | 30.91 | +255 | 57.178 | - 233 | 45.88 | -346 | 34.018 | + 31 | 17.31 | + 35 |
| 11 | 26.5 | 46.962 | + 57 | 42.93 | -214 | 57.601 | + 122 | 28.34 | +257 | 57.052 | - 126 | 42.21 | -367 | 34.104 | + 86 | 17.09 | + 22 |
| 12 | 6.5 | 47.070 | + 108 | 40.60 | -233 | 57.861 | + 260 | 25.83 | +251 | 57.045 | - 7 | 38.39 | -382 | 34.237 | + 133 | 16.99 | + 10 |
| 12 | 16.4 | 47.227 | + 157 | 38.16 | -244 | 58.254 | + 393 | 23.52 | +231 | 57.160 | + 115 | 34.58 | -381 | 34.433 | + 196 | 17.03 | - 4 |
| 12 | 26.4 | 47.427 | + 200 | 35.67 | -249 | 58.760 | + 506 | 21.45 | +207 | 57.387 | + 227 | 30.86 | -372 | 34.674 | + 241 | 17.27 | - 24 |
| 12 | 36.4 | 47.667 | + 240 | 33.21 | -246 | 59.375 | + 615 | 19.71 | +174 | 57.730 | + 343 | 27.33 | -353 | 34.956 | + 282 | 17.70 | - 43 |
| | | | + 270 | | -234 | | + 699 | | +134 | | + 440 | | -316 | | + 313 | | - 58 |
| Mean Place | 47.552 | 49.35 | | 60.416 | 19.72 | 60.295 | 50.54 | 34.720 | 10.31 | | | | | | | | |
| sec δ , tan δ | +1.031 | +0.251 | | +2.932 | -2.756 | +2.765 | +2.578 | +1.116 | -0.496 | | | | | | | | |
| d α (ψ), d δ (ψ) | +0.055 | -0.16 | | +0.128 | -0.16 | -0.002 | -0.16 | +0.073 | -0.15 | | | | | | | | |
| d α (ϵ), d δ (ϵ) | +0.007 | -0.91 | | -0.073 | -0.92 | +0.067 | -0.92 | -0.013 | -0.92 | | | | | | | | |
| Dble.Trans. | | May 28 | | May 29 | | May 29 | | May 29 | | | | | | | | | |

AT UPPER TRANSIT AT GREENWICH

| No. | 1430 | | 618 | | 1431 | | 623 | |
|--------------|-------------------|-------------------|-------------------|-------------------|-------------------|------------------|-------------------------------------|-------------------|
| Name | 22 G. Ophiuchi | | β Herculis | | N Scorpii | | Groombridge 2373 (Ursae Minoris) | |
| Mag. Spect. | 5.75 | G0 | 2.81 | K0 | 4.33 | B3 | 6.39 | G5 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " |
| | 16 28 | - 14 31 | 16 29 | + 21 30 | 16 30 | - 34 40 | 16 31 | + 77 28 |
| 1 | ^d -8.6 | ^s +205 | ^s +176 | ^s +283 | ^s +237 | ^s +32 | ^s +212 | ^s -372 |
| 1 | 1.4 | +245 | +217 | -279 | +282 | +10 | +395 | -354 |
| 1 | 11.4 | +276 | +254 | -269 | +321 | -10 | +574 | -328 |
| 1 | 21.4 | +303 | +284 | -246 | +350 | -31 | +737 | -285 |
| 1 | 31.3 | +317 | +302 | -216 | +368 | -48 | +858 | -235 |
| 2 | 10.3 | +327 | +315 | -181 | +380 | -63 | +962 | -179 |
| 2 | 20.3 | +328 | +321 | -134 | +382 | -76 | +1026 | -111 |
| 3 | 2.2 | +323 | +309 | -88 | +376 | -84 | +1043 | -46 |
| 3 | 12.2 | +315 | +316 | -38 | +369 | -91 | +1038 | +22 |
| 3 | 22.2 | +302 | +295 | +13 | +354 | -96 | +985 | +90 |
| 4 | 1.2 | +285 | +277 | +58 | +334 | -97 | +899 | +148 |
| 4 | 11.1 | +268 | +256 | +102 | +316 | -100 | +795 | +202 |
| 4 | 21.1 | +246 | +231 | +140 | +290 | -100 | +654 | +249 |
| 5 | 1.1 | +222 | +204 | +169 | +263 | -100 | +503 | +280 |
| 5 | 11.1 | +198 | +175 | +192 | +233 | -100 | +341 | +307 |
| 5 | 21.0 | +188 | +142 | +207 | +199 | -99 | +161 | +319 |
| 5 | 31.0 | +138 | +109 | +213 | +163 | -97 | -8 | +320 |
| 6 | 10.0 | +106 | +74 | +214 | +124 | -94 | -180 | +315 |
| 6 | 19.9 | +69 | +37 | +207 | +81 | -89 | -352 | +295 |
| 6 | 29.9 | +35 | +2 | +193 | +39 | -83 | -499 | +270 |
| 7 | 9.9 | -2 | -36 | +177 | -5 | -75 | -646 | +240 |
| 7 | 19.9 | -39 | -71 | +152 | -48 | -64 | -874 | +198 |
| 7 | 29.8 | -71 | -102 | +128 | -87 | -51 | -874 | +156 |
| 8 | 8.8 | -102 | -132 | +100 | -125 | -35 | -969 | +111 |
| 8 | 18.8 | -128 | -156 | +67 | -153 | -17 | -1032 | +58 |
| 8 | 28.8 | -145 | -172 | +37 | -175 | +0 | -1069 | +10 |
| 9 | 7.7 | -158 | -184 | +3 | -189 | +20 | -1095 | -42 |
| 9 | 17.7 | -158 | -184 | -33 | -189 | +39 | -1079 | -95 |
| 9 | 27.7 | -150 | -176 | -65 | -179 | +55 | -1045 | -143 |
| 10 | 7.6 | -133 | -160 | -101 | -159 | +70 | -988 | -192 |
| 10 | 17.6 | -103 | -131 | -136 | -123 | +81 | -891 | -238 |
| 10 | 27.6 | -68 | -98 | -166 | -82 | +86 | -741 | -276 |
| 11 | 6.6 | -24 | -56 | -199 | -30 | +89 | -645 | -314 |
| 11 | 16.5 | +27 | -6 | -225 | +29 | +83 | -476 | -341 |
| 11 | 26.5 | +76 | +43 | -248 | +87 | +74 | -308 | -362 |
| 12 | 6.5 | +125 | +95 | -268 | +145 | +62 | -115 | -375 |
| 12 | 16.5 | +178 | +147 | -277 | +206 | +46 | +84 | -374 |
| 12 | 26.4 | +221 | +191 | -280 | +255 | +26 | +272 | -365 |
| 12 | 36.4 | +260 | +234 | -276 | +301 | +5 | +465 | -345 |
| | +290 | -114 | +267 | -258 | +336 | -17 | +634 | -309 |
| Mean Place | 61.061 | 18.78 | 38.359 | 66.31 | 29.882 | 32.79 | 12.706 | 26.22 |
| sec δ, tan δ | +1.033 | -0.259 | +1.075 | +0.394 | +1.216 | -0.692 | +4.611 | +4.501 |
| da(ψ), dδ(ψ) | +0.067 | -0.15 | +0.052 | -0.15 | +0.078 | -0.15 | -0.049 | -0.15 |
| da(ε), dδ(ε) | -0.007 | -0.92 | +0.010 | -0.92 | -0.018 | -0.92 | +0.113 | -0.93 |
| Dble. Trans. | May 30 | | May 30 | | May 30 | | May 30 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 611 | | 1432 | | 621 | | 620 | |
|---|-----------------|---------|---------------------------------------|---------|-------------------|---------|----------------|---------|
| | γ Apodis | | Piazzi 16 ^h 140 (Draconis) | | σ Herculis | | τ Scorpii | |
| Mag.Spect. | 3.90 | K0 | 5.85 | A0 | 4.25 | A0 | 2.91 | B0 |
| U.T. | R.A. | | R.A. | | R.A. | | R.A. | |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " |
| | 16 31 | - 78 51 | 16 32 | + 60 50 | 16 33 | + 42 27 | 16 34 | - 28 11 |
| 1 ^d | -8.6 | + 715 | + 169 | - 379 | + 165 | - 353 | + 221 | - 5 |
| 1 ^s | 06.951 | + 902 | + 252 | - 364 | + 218 | - 341 | + 262 | - 24 |
| 1 | 1.4 | +1072 | +185 | -340 | + 267 | -323 | + 299 | - 40 |
| 1 | 11.4 | +1213 | +140 | -299 | + 308 | -290 | + 327 | - 56 |
| 1 | 21.4 | +1308 | + 94 | -251 | + 337 | -247 | + 344 | - 67 |
| 1 | 31.3 | | | | | | | |
| 2 | 10.3 | +1381 | + 48 | -197 | + 359 | -199 | + 356 | - 76 |
| 2 | 12.827 | +1418 | - 4 | -129 | + 370 | -139 | + 358 | - 82 |
| 2 | 20.3 | +1415 | - 49 | - 63 | + 369 | - 79 | + 354 | - 83 |
| 3 | 2.2 | +1401 | - 93 | + 7 | + 363 | - 17 | + 347 | - 84 |
| 3 | 12.2 | +1346 | -138 | + 73 | + 347 | + 48 | + 333 | - 81 |
| 3 | 22.2 | | | | | | | |
| 4 | 1.2 | +1269 | -175 | +134 | + 323 | +104 | + 317 | - 77 |
| 4 | 19.676 | +1182 | -210 | +189 | + 297 | +157 | + 299 | - 73 |
| 4 | 11.1 | +1060 | -241 | +238 | + 262 | +203 | + 275 | - 70 |
| 4 | 21.1 | + 928 | -263 | +272 | + 224 | +238 | + 251 | - 65 |
| 5 | 1.1 | + 784 | -286 | +301 | + 186 | +266 | + 225 | - 63 |
| 5 | 11.1 | | | | | | | |
| 5 | 21.0 | + 611 | -298 | +317 | + 139 | +283 | + 191 | - 59 |
| 5 | 24.241 | + 444 | -304 | +319 | + 96 | +287 | + 160 | - 58 |
| 5 | 31.0 | + 260 | -307 | +317 | + 49 | +288 | + 123 | - 55 |
| 6 | 10.0 | + 64 | -298 | +301 | + 1 | +276 | + 82 | - 51 |
| 6 | 19.9 | - 114 | -283 | +278 | - 42 | +257 | + 45 | - 49 |
| 6 | 29.9 | | | | | | | |
| 7 | 9.9 | - 303 | -263 | +249 | - 89 | +233 | + 2 | - 42 |
| 7 | 24.592 | - 480 | -232 | +210 | - 132 | +199 | - 39 | - 36 |
| 7 | 19.9 | - 627 | -197 | +170 | - 167 | +165 | - 75 | - 29 |
| 7 | 29.8 | - 770 | -155 | +125 | - 204 | +125 | - 111 | - 18 |
| 8 | 8.8 | - 875 | -106 | + 74 | - 229 | + 81 | - 139 | - 6 |
| 8 | 18.8 | | | | | | | |
| 8 | 28.8 | - 942 | - 56 | + 26 | - 248 | + 38 | - 160 | + 5 |
| 9 | 7.7 | - 987 | - 1 | - 26 | - 262 | - 9 | - 174 | + 18 |
| 9 | 19.911 | - 972 | + 55 | - 80 | - 260 | - 57 | - 175 | + 30 |
| 9 | 17.7 | - 924 | +106 | -128 | - 252 | -101 | - 168 | + 40 |
| 9 | 27.7 | - 838 | +158 | -179 | - 234 | -147 | - 149 | + 50 |
| 10 | 7.6 | | | | | | | |
| 10 | 17.6 | - 694 | +202 | -226 | - 201 | -192 | - 117 | + 54 |
| 10 | 27.6 | - 532 | +237 | -267 | - 162 | -231 | - 78 | + 57 |
| 11 | 6.6 | - 334 | +267 | -307 | - 115 | -270 | - 32 | + 54 |
| 11 | 16.5 | - 106 | +283 | -338 | - 57 | -300 | + 25 | + 46 |
| 11 | 26.5 | + 119 | +288 | - 69 | + 2 | -325 | + 79 | + 35 |
| 12 | 6.5 | + 356 | +286 | -377 | + 64 | -344 | + 130 | + 21 |
| 12 | 16.5 | + 586 | +268 | -380 | + 127 | -350 | + 191 | + 11 |
| 12 | 26.4 | + 788 | +244 | -373 | + 183 | -347 | + 237 | - 10 |
| 12 | 36.4 | + 982 | +211 | -356 | + 239 | -336 | + 280 | - 28 |
| 12 | 18.342 | +1137 | +189 | -321 | + 284 | -308 | + 313 | - 45 |
| Mean Place | 21.205 | 67.30 | 14.060 | 65.20 | 40.043 | 51.98 | 62.437 | 19.91 |
| sec δ , $\tan \delta$ | +5.180 | -5.082 | +2.053 | +1.793 | +1.356 | +0.915 | +1.135 | -0.536 |
| $d\alpha(\psi)$, $d\delta(\psi)$ | +0.186 | -0.15 | +0.017 | -0.15 | +0.039 | -0.15 | +0.074 | -0.14 |
| $d\alpha(\epsilon)$, $d\delta(\epsilon)$ | -0.128 | -0.93 | +0.045 | -0.93 | +0.022 | -0.93 | -0.013 | -0.93 |
| Dble.Trans. | May 30 | | May 30 | | May 31 | | May 31 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 1433 | | 622 | | 1434 | | 624 | |
|--------------|--------------------------|------------|--------------------------|------------|--------------------------|---------|--------------------------|------------|
| | 12 Ophiuchi | | ζ Ophiuchi | | 42 Herculis | | Bradley 2114 (Ophiuchi) | |
| Mag.Spect. | 5.87 | K0 | 2.70 | B0 | 5.14 | M0 | 5.04 | K0 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " |
| | 16 35 | - 2 17 | 16 36 | - 10 32 | 16 38 | + 48 56 | 16 40 | - 17 43 |
| 1 -8.6 | ^s 35.273 +188 | 48.30 -163 | ^s 21.132 +194 | 25.80 -115 | ^s 19.850 +157 | " -366 | ^s 43.528 +200 | " -70 |
| 1 1.4 | 35.499 +226 | 49.99 -169 | 21.364 +232 | 27.03 -123 | 20.068 +218 | -354 | 43.767 +239 | 00.83 -81 |
| 1 11.4 | 35.758 +259 | 51.71 -172 | 21.630 +266 | 28.34 -131 | 20.341 +273 | -334 | 44.040 +273 | 01.75 -92 |
| 1 21.4 | 36.044 +286 | 53.38 -167 | 21.923 +293 | 29.66 -132 | 20.665 +324 | -300 | 44.341 +301 | 02.74 -99 |
| 1 31.3 | 36.345 +301 | 54.94 -156 | 22.230 +307 | 30.94 -128 | 21.022 +357 | -254 | 44.658 +317 | 03.74 -100 |
| 2 10.3 | 36.657 +312 | 56.34 -140 | 22.549 +319 | 32.15 -121 | 21.407 +385 | -204 | 44.986 +328 | 04.74 -100 |
| 2 20.3 | 36.972 +315 | 57.52 -118 | 22.871 +322 | 33.21 -106 | 21.807 +400 | -142 | 45.319 +333 | 05.68 -94 |
| 3 2.2 | 37.283 +311 | 58.44 -92 | 23.188 +317 | 34.11 -90 | 22.209 +402 | -79 | 45.647 +328 | 06.52 -84 |
| 3 12.2 | 37.587 +304 | 59.09 -65 | 23.499 +311 | 34.82 -71 | 22.606 +397 | -14 | 45.970 +323 | 07.26 -74 |
| 3 22.2 | 37.879 +292 | 59.44 -35 | 23.798 +299 | 35.31 -49 | 22.987 +381 | +53 | 46.281 +311 | 07.85 -59 |
| 4 1.2 | 38.155 +276 | 59.51 -7 | 24.081 +283 | 35.60 -29 | 23.341 +354 | +112 | 46.576 +295 | 08.31 -46 |
| 4 11.1 | 38.415 +260 | 59.31 +20 | 24.349 +268 | 35.70 -10 | 23.667 +326 | +167 | 46.856 +280 | 08.64 -33 |
| 4 21.1 | 38.653 +238 | 58.88 +43 | 24.595 +246 | 35.62 +8 | 23.952 +285 | +215 | 47.115 +259 | 08.85 -21 |
| 5 1.1 | 38.869 +216 | 58.26 +62 | 24.819 +224 | 35.39 +23 | 24.194 +242 | +251 | 47.351 +232 | 08.95 -10 |
| 5 11.1 | 39.061 +192 | 57.48 +78 | 25.019 +200 | 35.05 +34 | 24.392 +198 | +281 | 47.563 +216 | 08.98 -3 |
| 5 21.0 | 39.223 +162 | 56.60 +88 | 25.189 +170 | 34.62 +43 | 24.537 +145 | +298 | 47.745 +182 | 08.95 +3 |
| 5 31.0 | 39.357 +134 | 55.66 +94 | 25.331 +142 | 34.15 +47 | 24.632 +95 | +304 | 47.898 +153 | 08.88 +7 |
| 6 10.0 | 39.459 +102 | 54.70 +96 | 25.441 +110 | 33.65 +50 | 24.674 +42 | +304 | 48.017 +119 | 08.79 +9 |
| 6 19.9 | 39.525 +66 | 53.75 +95 | 25.514 +73 | 33.15 +50 | 24.660 -14 | +292 | 48.099 +82 | 08.69 +10 |
| 6 29.9 | 39.559 +34 | 52.86 +89 | 25.554 +40 | 32.67 +48 | 24.597 -63 | +271 | 48.145 +46 | 08.59 +10 |
| 7 9.9 | 39.556 -3 | 52.03 +83 | 25.556 +2 | 32.21 +46 | 24.483 -114 | +246 | 48.153 +8 | 08.49 +10 |
| 7 19.9 | 39.517 -39 | 51.29 +74 | 25.521 -35 | 31.80 +41 | 24.320 -163 | +212 | 48.121 -32 | 08.38 +11 |
| 7 29.8 | 39.448 -69 | 50.65 +64 | 25.455 -66 | 31.43 +37 | 24.117 -203 | +174 | 48.057 -64 | 08.28 +10 |
| 8 8.8 | 39.348 -100 | 50.12 +53 | 25.356 -99 | 31.10 +33 | 23.875 -242 | +134 | 47.957 -100 | 08.16 +12 |
| 8 18.8 | 39.223 -125 | 49.72 +40 | 25.232 -124 | 30.83 +27 | 23.604 -271 | +86 | 47.831 -126 | 08.04 +12 |
| 8 28.8 | 39.080 -143 | 49.43 +29 | 25.089 -143 | 30.60 +23 | 23.313 -291 | +40 | 47.686 -145 | 07.89 +15 |
| 9 7.7 | 38.925 -155 | 49.28 +15 | 24.932 -157 | 30.42 +18 | 23.007 -306 | -7 | 47.525 -161 | 07.71 +18 |
| 9 17.7 | 38.768 -157 | 49.27 +1 | 24.775 -157 | 30.30 +12 | 22.701 -306 | -59 | 47.362 -163 | 07.53 +18 |
| 9 27.7 | 38.618 -150 | 49.40 -13 | 24.624 -151 | 30.24 +6 | 22.404 -297 | -106 | 47.206 -156 | 07.35 +18 |
| 10 7.6 | 38.483 -135 | 49.69 -29 | 24.488 -136 | 30.27 -3 | 22.126 -278 | -154 | 47.065 -141 | 07.17 +18 |
| 10 17.6 | 38.376 -107 | 50.16 -47 | 24.380 -108 | 30.41 -14 | 21.883 -243 | -201 | 46.954 -111 | 07.04 +13 |
| 10 27.6 | 38.302 -74 | 50.80 -64 | 24.307 -73 | 30.66 -25 | 21.681 -202 | -241 | 46.877 -77 | 06.96 +8 |
| 11 6.6 | 38.269 -33 | 51.64 -84 | 24.275 -32 | 31.05 -39 | 21.531 -150 | -282 | 46.843 -34 | 06.97 -1 |
| 11 16.5 | 38.284 +15 | 51.64 -102 | 24.275 +18 | 31.05 -54 | 21.531 -88 | -314 | 46.843 +17 | 06.97 -13 |
| 11 26.5 | 38.346 +62 | 52.66 -120 | 24.293 +66 | 31.59 -68 | 21.443 -24 | -338 | 46.860 +69 | 07.10 -24 |
| 12 6.5 | 38.458 +112 | 55.26 -140 | 24.474 +115 | 33.14 -87 | 21.464 +45 | -358 | 47.042 +113 | 07.70 -36 |
| 12 16.5 | 38.619 +161 | 56.79 -153 | 24.641 +167 | 34.19 -105 | 21.579 +115 | -364 | 47.214 +172 | 08.33 -63 |
| 12 26.4 | 38.823 +204 | 58.43 -164 | 24.850 +209 | 35.34 -115 | 21.757 +178 | -360 | 47.429 +215 | 09.04 -71 |
| 12 36.4 | 39.065 +242 | 60.12 -169 | 25.099 +249 | 36.60 -126 | 21.998 +241 | -348 | 47.684 +255 | 09.88 -84 |
| | 39.065 +271 | 60.12 -168 | 25.099 +278 | 36.60 -129 | 21.998 +294 | -318 | 47.684 +287 | 09.88 -93 |
| Mean Place | 38.849 | 47.51 | 24.873 | 25.90 | 22.825 | 76.06 | 47.461 | 00.65 |
| sec δ, tan δ | +1.001 | -0.040 | +1.017 | -0.186 | +1.523 | +1.149 | +1.050 | -0.319 |
| dα(ψ), dδ(ψ) | +0.062 | -0.14 | +0.066 | -0.14 | +0.033 | -0.14 | +0.069 | -0.13 |
| dα(ε), dδ(ε) | -0.001 | -0.93 | -0.004 | -0.93 | +0.027 | -0.94 | -0.007 | -0.94 |
| Dble.Trans. | May 31 | | May 31 | | June 1 | | June 2 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 626 | | 627 | | 1436 | | 625 | |
|--------------|------------|--------|-----------------------------|--------|--------------|--------|-----------------------|--------|
| | η Herculis | | Groombridge 2377 (Draconis) | | 19 Ophiuchi* | | α Trianguli Australis | |
| Mag.Spect. | 3.61 | K0 | 4.88 | F0 | 6.04 | A2 | 1.88 | K2 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " |
| | 16 42 | +38 56 | 16 44 | +56 47 | 16 46 | + 2 05 | 16 47 | -69 00 |
| 1 | -8.6 | +155 | +146 | -377 | +173 | -184 | +397 | +224 |
| 1 | 1.4 | +206 | +218 | -363 | +211 | -187 | +502 | +198 |
| 1 | 11.4 | +253 | +281 | -344 | +246 | -189 | +596 | +168 |
| 1 | 21.4 | +293 | +358 | -308 | +273 | -181 | +677 | +130 |
| 1 | 31.3 | +321 | +396 | -261 | +292 | -167 | +729 | +90 |
| 2 | 10.3 | +342 | +433 | -210 | +304 | -147 | +773 | +50 |
| 2 | 20.3 | +354 | +456 | -145 | +309 | -121 | +795 | +7 |
| 3 | 2.3 | +355 | +462 | -80 | +308 | -91 | +797 | -33 |
| 3 | 12.2 | +351 | +460 | -13 | +303 | -59 | +793 | -71 |
| 3 | 22.2 | +336 | +443 | +56 | +292 | -25 | +769 | -108 |
| 4 | 1.2 | +316 | +413 | +116 | +278 | +7 | +733 | -141 |
| 4 | 11.1 | +293 | +379 | +174 | +264 | +37 | +693 | -172 |
| 4 | 21.1 | +262 | +330 | +225 | +243 | +64 | +634 | -199 |
| 5 | 1.1 | +227 | +278 | +261 | +221 | +86 | +570 | -220 |
| 5 | 11.1 | +192 | +255 | +293 | +198 | +103 | +500 | -241 |
| 5 | 21.0 | +149 | +157 | +312 | +189 | +116 | +412 | -254 |
| 5 | 31.0 | +109 | +96 | +318 | +140 | +121 | +326 | -261 |
| 6 | 10.0 | +65 | +31 | +318 | +106 | +125 | +231 | -266 |
| 6 | 20.0 | +18 | -37 | +306 | +73 | +122 | +126 | -261 |
| 6 | 29.9 | -23 | -97 | +284 | +39 | +115 | +28 | -252 |
| 7 | 9.9 | -69 | -159 | +260 | +2 | +108 | -77 | -236 |
| 7 | 19.9 | -110 | -216 | +223 | -35 | +95 | -178 | -211 |
| 7 | 29.8 | -147 | -264 | +185 | -66 | +82 | -265 | -182 |
| 8 | 8.8 | -182 | -310 | +143 | -99 | +68 | -351 | -148 |
| 8 | 18.8 | -210 | -345 | +93 | -125 | +51 | -417 | -104 |
| 8 | 28.8 | -229 | -368 | +46 | -144 | +35 | -465 | -62 |
| 9 | 7.7 | -244 | -387 | -5 | -158 | +18 | -498 | -14 |
| 9 | 17.7 | -244 | -386 | -58 | -162 | -1 | -501 | +35 |
| 9 | 27.7 | -238 | -377 | -107 | -156 | -18 | -483 | +82 |
| 10 | 7.7 | -222 | -357 | -157 | -144 | -39 | -444 | +128 |
| 10 | 17.6 | -192 | -318 | -206 | -117 | -60 | -372 | +169 |
| 10 | 27.6 | -156 | -271 | -248 | -87 | -79 | -287 | +202 |
| 11 | 6.6 | -110 | -213 | -290 | -47 | -102 | -181 | +230 |
| 11 | 16.5 | -56 | -142 | -322 | +0 | -122 | -58 | +245 |
| 11 | 26.5 | -1 | -69 | -349 | +47 | -141 | +66 | +253 |
| 12 | 6.5 | +60 | +12 | -368 | +96 | -160 | +197 | +252 |
| 12 | 16.5 | +119 | +95 | -374 | +145 | -174 | +326 | +237 |
| 12 | 26.4 | +173 | +170 | -371 | +188 | -183 | +438 | +218 |
| 12 | 36.4 | +227 | +247 | -358 | +227 | -188 | +546 | +190 |
| | +269 | -305 | +313 | -327 | +259 | -183 | +633 | +155 |
| Mean Place | 25.972 | 51.14 | 62.344 | 80.72 | 28.853 | 17.61 | 13.738 | 15.52 |
| sec δ, tan δ | +1.286 | +0.808 | +1.827 | +1.528 | +1.001 | +0.036 | +2.791 | -2.606 |
| dα(ψ), dδ(ψ) | +0.041 | -0.13 | +0.023 | -0.13 | +0.060 | -0.13 | +0.127 | -0.12 |
| dα(ε), dδ(ε) | +0.018 | -0.94 | +0.033 | -0.95 | +0.001 | -0.95 | -0.054 | -0.95 |
| Dble.Trans. | June 2 | | June 3 | | June 3 | | June 3 | |

AT UPPER TRANSIT AT GREENWICH

| No. | 1435 | | 1437 | | 1438 | | 628 | |
|--------------|-------------|------------|------------------------------|-----------|-------------|------------|-------------|-----------|
| | η Arae | | B.D. -21° 4422 (Ophiuchi) | | 20 Ophiuchi | | ε Scorpii | |
| Mag.Spect. | 3.68 | K5 | 7.60 | M0 | 4.73 | F5 | 2.36 | K0 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° / | h m | ° / | h m | ° / | h m | ° / |
| | 16 48 | -59 00 | 16 48 | -21 49 | 16 49 | -10 45 | 16 49 | -34 16 |
| 1 -8.6 | 30.383 +303 | 62.99 +178 | 42.569 +199 | 45.83 -40 | 01.387 +182 | 36.64 -108 | 12.742 +215 | 09.04 +39 |
| 1 1.4 | 30.760 +377 | 61.45 +154 | 42.807 +238 | 46.36 -53 | 01.609 +222 | 37.82 -118 | 13.004 +262 | 08.84 +20 |
| 1 11.4 | 31.202 +442 | 60.19 +126 | 43.081 +274 | 47.01 -65 | 01.866 +257 | 39.06 -124 | 13.306 +302 | 08.82 +2 |
| 1 21.4 | 31.699 +497 | 59.26 +93 | 43.384 +303 | 47.76 -75 | 01.866 +285 | 40.32 -126 | 13.641 +335 | 08.99 -17 |
| 1 31.3 | 32.231 +532 | 58.66 +60 | 43.705 +321 | 48.56 -80 | 02.151 +301 | 41.53 -121 | 13.997 +356 | 09.32 -33 |
| 2 10.3 | 32.791 +560 | 58.40 +26 | 44.039 +334 | 49.39 -83 | 02.767 +315 | 42.68 -115 | 14.367 +370 | 09.78 -46 |
| 2 20.3 | 33.365 +574 | 58.49 -9 | 44.378 +339 | 50.21 -82 | 03.087 +320 | 43.68 -100 | 14.743 +376 | 10.36 -58 |
| 3 2.3 | 33.938 +573 | 58.90 -41 | 44.714 +336 | 50.97 -76 | 03.404 +317 | 44.53 -85 | 15.117 +374 | 11.02 -72 |
| 3 12.2 | 34.507 +569 | 59.61 -71 | 45.047 +333 | 51.66 -69 | 03.717 +313 | 45.18 -65 | 15.487 +370 | 11.74 -66 |
| 3 22.2 | 35.060 +553 | 60.62 -101 | 45.369 +322 | 52.27 -61 | 04.021 +304 | 45.63 -45 | 15.845 +358 | 12.51 -77 |
| 4 1.2 | 35.587 +527 | 61.88 -126 | 45.676 +307 | 52.78 -51 | 04.310 +289 | 45.87 -24 | 16.187 +342 | 13.31 -80 |
| 4 11.1 | 36.088 +501 | 63.37 -149 | 45.969 +293 | 53.20 -42 | 04.585 +275 | 45.92 -5 | 16.514 +327 | 14.13 -82 |
| 4 21.1 | 36.549 +461 | 65.08 -171 | 46.241 +272 | 53.53 -33 | 04.840 +255 | 45.80 +12 | 16.816 +302 | 14.97 -84 |
| 5 1.1 | 36.968 +419 | 66.94 -186 | 46.491 +250 | 54.01 -27 | 05.074 +234 | 45.53 +27 | 17.094 +278 | 15.81 -84 |
| 5 11.1 | 37.340 +372 | 68.96 -202 | 46.717 +226 | 54.01 -21 | 05.286 +212 | 45.16 +37 | 17.345 +251 | 16.68 -87 |
| 5 21.0 | 37.654 +314 | 71.08 -212 | 46.913 +196 | 54.17 -16 | 05.468 +182 | 44.70 +46 | 17.561 +216 | 17.55 -87 |
| 5 31.0 | 37.909 +255 | 73.25 -217 | 47.079 +166 | 54.32 -15 | 05.622 +154 | 44.20 +50 | 17.743 +182 | 18.42 -87 |
| 6 10.0 | 38.100 +191 | 75.46 -221 | 47.210 +131 | 54.45 -13 | 05.744 +122 | 43.67 +53 | 17.886 +143 | 19.30 -88 |
| 6 20.0 | 38.218 +118 | 77.63 -217 | 47.303 +93 | 54.57 -12 | 05.829 +85 | 43.15 +52 | 17.986 +100 | 20.15 -85 |
| 6 29.9 | 38.269 +51 | 79.71 -208 | 47.358 +55 | 54.69 -12 | 05.879 +50 | 42.66 +49 | 18.044 +58 | 20.96 -81 |
| 7 9.9 | 38.246 -23 | 81.67 -196 | 47.373 +15 | 54.80 -11 | 05.892 +13 | 42.20 +46 | 18.056 +12 | 21.72 -76 |
| 7 19.9 | 38.152 -94 | 83.41 -174 | 47.348 -25 | 54.89 -9 | 05.866 -26 | 41.79 +41 | 18.022 -34 | 22.39 -67 |
| 7 29.8 | 37.995 -157 | 84.92 -151 | 47.287 -61 | 54.95 -6 | 05.806 -59 | 41.43 +36 | 18.022 -74 | 22.96 -57 |
| 8 8.8 | 37.776 -219 | 86.12 -120 | 47.190 -97 | 54.98 -3 | 05.714 -93 | 41.11 +32 | 17.948 -114 | 23.40 -48 |
| 8 18.8 | 37.508 -288 | 86.97 -85 | 47.063 -127 | 54.96 +2 | 05.594 -120 | 40.85 +26 | 17.834 -147 | 23.68 -24 |
| 8 28.8 | 37.205 -303 | 87.46 -49 | 46.915 -148 | 54.89 +7 | 05.453 -141 | 40.64 +21 | 17.517 -170 | 23.80 -12 |
| 9 7.7 | 37.909 -329 | 87.54 -8 | 46.751 -164 | 54.75 +14 | 05.297 -156 | 40.47 +17 | 17.328 -189 | 23.73 +7 |
| 9 17.7 | 36.544 -332 | 87.20 +34 | 46.583 -168 | 54.57 +18 | 05.137 -160 | 40.37 +10 | 17.136 -192 | 23.48 +25 |
| 9 27.7 | 36.223 -321 | 86.48 +72 | 46.420 -163 | 54.33 +24 | 04.982 -155 | 40.33 +4 | 16.950 -186 | 23.06 +42 |
| 10 7.7 | 35.929 -294 | 85.37 +111 | 46.272 -148 | 54.07 +26 | 04.841 -141 | 40.36 -3 | 16.780 -170 | 22.48 +58 |
| 10 17.6 | 35.686 -243 | 83.92 +145 | 46.152 -120 | 53.80 +27 | 04.726 -115 | 40.50 -14 | 16.643 -137 | 21.78 +70 |
| 10 27.6 | 35.503 -183 | 82.21 +171 | 46.067 -85 | 53.55 +25 | 04.643 -83 | 40.74 -24 | 16.544 -99 | 21.01 +77 |
| 11 6.6 | 35.395 -108 | 80.27 +194 | 46.026 -41 | 53.35 +20 | 04.601 -42 | 41.11 -37 | 16.494 -50 | 20.19 +82 |
| 11 16.5 | 35.376 -19 | 78.22 +205 | 46.036 +10 | 53.24 +11 | 04.608 +7 | 41.62 -51 | 16.502 +8 | 19.39 +80 |
| 11 26.5 | 35.445 +69 | 76.14 +208 | 46.098 +62 | 53.23 +1 | 04.662 +54 | 42.27 -65 | 16.567 +65 | 18.66 +73 |
| 12 6.5 | 35.607 +162 | 74.09 +205 | 46.186 +88 | 52.90 +33 | 04.766 +104 | 43.08 -81 | 16.691 +124 | 18.03 +63 |
| 12 16.5 | 35.860 +253 | 72.17 +192 | 46.374 +188 | 53.63 -73 | 04.920 +154 | 44.06 -98 | 16.873 +182 | 17.52 +51 |
| 12 26.4 | 36.192 +332 | 70.45 +172 | 46.588 +214 | 54.05 -42 | 05.119 +199 | 45.16 -110 | 17.107 +234 | 17.18 +34 |
| 12 36.4 | 36.600 +408 | 68.98 +147 | 46.843 +255 | 54.61 -56 | 05.357 +238 | 46.35 -119 | 17.389 +282 | 17.02 +16 |
| | 36.600 +468 | 68.98 +115 | 46.843 +288 | 54.61 -67 | 05.357 +270 | 46.35 -123 | 17.389 +318 | 17.02 -4 |
| Mean Place | 36.937 | 66.60 | 46.642 | 46.16 | 05.162 | 35.76 | 17.261 | 10.70 |
| sec δ, tan δ | +1.943 | -1.665 | +1.077 | -0.401 | +1.018 | -0.190 | +1.210 | -0.681 |
| dα(ψ), dδ(ψ) | +0.103 | -0.12 | +0.071 | -0.12 | +0.066 | -0.12 | +0.078 | -0.12 |
| dα(ε), dδ(ε) | -0.034 | -0.95 | -0.008 | -0.95 | -0.004 | -0.95 | -0.014 | -0.95 |
| Dbie.Trans. | June 4 | | June 4 | | June 4 | | June 4 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 1439 | | 1440 | | 629 | | 1441 | | |
|---|-----------------|----------------|--------------|----------------|--------------|----------------|--------------|----------------|-------------|
| | μ^1 Scorpii | | 51 Herculis | | 49 Herculis | | 53 Herculis | | |
| Mag. Spect. | 3.09 | B3p | 5.20 | K0 | 6.41 | A0p | 5.35 | F0 | |
| U.T. | R.A. | | R.A. | | R.A. | | R.A. | | |
| | h | m | h | m | h | m | h | m | |
| | 16 50 | - 38 01 | 16 51 | + 24 40 | 16 51 | + 14 59 | 16 52 | + 31 43 | |
| | ^s | ^o / | ^s | ^o / | ^s | ^o / | ^s | ^o / | |
| 1 | -8.6 | 52.507 + 222 | 29.21 + 63 | 08.485 + 152 | 37.87 - 292 | 24.635 + 158 | 42.39 - 248 | 24.174 + 145 | 18.76 - 319 |
| 1 | 1.4 | 52.778 + 271 | 28.77 + 44 | 08.680 + 195 | 34.98 - 289 | 24.833 + 198 | 39.89 - 250 | 24.367 + 193 | 15.62 - 314 |
| 1 | 11.4 | 53.092 + 314 | 28.53 + 24 | 08.915 + 235 | 32.17 - 281 | 25.069 + 236 | 37.45 - 244 | 24.603 + 236 | 12.59 - 303 |
| 1 | 21.4 | 53.440 + 348 | 28.50 + 3 | 09.184 + 269 | 29.58 - 259 | 25.335 + 266 | 35.16 - 229 | 24.876 + 273 | 09.82 - 277 |
| 1 | 31.3 | 53.810 + 370 | 28.65 - 15 | 09.476 + 292 | 27.30 - 228 | 25.621 + 286 | 33.12 - 204 | 25.174 + 298 | 07.39 - 243 |
| 2 | 10.3 | 54.197 + 387 | 28.98 - 33 | 09.785 + 309 | 25.38 - 192 | 25.923 + 302 | 31.37 - 175 | 25.493 + 319 | 05.36 - 203 |
| 2 | 20.3 | 54.590 + 393 | 29.46 - 48 | 10.104 + 319 | 23.92 - 146 | 26.232 + 309 | 30.00 - 137 | 25.823 + 330 | 03.85 - 151 |
| 3 | 2.3 | 54.982 + 392 | 30.05 - 59 | 10.423 + 319 | 22.96 - 96 | 26.541 + 309 | 29.05 - 95 | 26.155 + 332 | 02.89 - 96 |
| 3 | 12.2 | 55.370 + 388 | 30.75 - 70 | 10.739 + 316 | 22.51 - 45 | 26.847 + 306 | 28.54 - 51 | 26.485 + 330 | 02.48 - 41 |
| 3 | 22.2 | 55.747 + 377 | 31.54 - 79 | 11.045 + 306 | 22.60 + 9 | 27.143 + 296 | 28.49 - 5 | 26.804 + 319 | 02.66 + 18 |
| 4 | 1.2 | 56.107 + 360 | 32.39 - 85 | 11.335 + 290 | 23.18 + 58 | 27.424 + 281 | 28.86 + 37 | 27.107 + 303 | 03.37 + 71 |
| 4 | 11.1 | 56.450 + 343 | 33.30 - 91 | 11.608 + 273 | 24.23 + 105 | 27.691 + 267 | 29.64 + 78 | 27.391 + 284 | 04.59 + 122 |
| 4 | 21.1 | 56.770 + 320 | 34.26 - 96 | 11.857 + 249 | 25.69 + 146 | 27.935 + 244 | 30.77 + 113 | 27.648 + 257 | 06.26 + 167 |
| 5 | 1.1 | 57.063 + 293 | 35.26 - 100 | 12.081 + 224 | 27.47 + 178 | 28.156 + 221 | 32.19 + 142 | 27.877 + 229 | 08.26 + 200 |
| 5 | 11.1 | 57.328 + 265 | 36.30 - 104 | 12.276 + 195 | 29.53 + 206 | 28.353 + 197 | 33.84 + 165 | 28.075 + 198 | 10.57 + 231 |
| 5 | 21.0 | 57.557 + 229 | 37.36 - 106 | 12.438 + 162 | 31.76 + 223 | 28.518 + 165 | 35.65 + 181 | 28.236 + 161 | 13.07 + 250 |
| 5 | 31.0 | 57.750 + 193 | 38.43 - 107 | 12.567 + 129 | 34.07 + 231 | 28.518 + 136 | 37.54 + 189 | 28.362 + 126 | 15.65 + 258 |
| 6 | 10.0 | 57.902 + 152 | 39.51 - 108 | 12.659 + 92 | 36.42 + 235 | 28.654 + 101 | 39.46 + 192 | 28.447 + 85 | 18.26 + 261 |
| 6 | 20.0 | 58.008 + 106 | 40.57 - 106 | 12.711 + 52 | 38.70 + 228 | 28.820 + 65 | 41.33 + 187 | 28.491 + 44 | 20.81 + 255 |
| 6 | 29.9 | 58.070 + 62 | 41.58 - 101 | 12.727 + 16 | 40.86 + 216 | 28.850 + 30 | 43.11 + 178 | 28.494 + 3 | 23.21 + 240 |
| 7 | 9.9 | 58.084 + 14 | 42.53 - 95 | 12.703 - 24 | 42.86 + 200 | 28.841 - 9 | 44.76 + 165 | 28.456 - 38 | 25.43 + 222 |
| 7 | 19.9 | 58.049 - 35 | 43.38 - 85 | 12.640 - 63 | 44.62 + 176 | 28.796 - 45 | 46.21 + 145 | 28.376 - 80 | 27.38 + 195 |
| 7 | 29.8 | 57.973 - 76 | 44.10 - 72 | 12.543 - 97 | 46.11 + 149 | 28.718 - 78 | 47.45 + 124 | 28.262 - 114 | 29.04 + 166 |
| 8 | 8.8 | 57.853 - 120 | 44.67 - 57 | 12.413 - 130 | 47.32 + 121 | 28.606 - 112 | 48.47 + 102 | 28.112 - 150 | 30.37 + 133 |
| 8 | 18.8 | 57.700 - 153 | 45.04 - 37 | 12.256 - 157 | 48.18 + 86 | 28.469 - 137 | 49.21 + 74 | 27.934 - 178 | 31.32 + 95 |
| 8 | 28.8 | 57.521 - 179 | 45.22 - 18 | 12.079 - 177 | 48.72 + 54 | 28.312 - 157 | 49.69 + 48 | 27.736 - 198 | 31.89 + 57 |
| 9 | 7.7 | 57.323 - 198 | 45.18 + 4 | 11.886 - 193 | 48.90 + 18 | 28.139 - 173 | 49.88 + 19 | 27.522 - 214 | 32.07 + 18 |
| 9 | 17.7 | 57.121 - 202 | 44.92 + 26 | 11.690 - 196 | 48.70 - 20 | 28.139 - 176 | 49.77 - 11 | 27.522 - 218 | 32.07 - 26 |
| 9 | 27.7 | 56.924 - 197 | 44.46 + 46 | 11.499 - 191 | 48.15 - 55 | 27.963 - 172 | 49.77 - 39 | 27.304 - 213 | 31.81 - 65 |
| 10 | 7.7 | 56.745 - 179 | 43.80 + 66 | 11.320 - 179 | 47.21 - 94 | 27.632 - 159 | 48.67 - 71 | 27.091 - 200 | 31.16 - 107 |
| 10 | 17.6 | 56.600 - 145 | 42.98 + 82 | 11.167 - 153 | 45.91 - 130 | 27.497 - 135 | 47.66 - 101 | 26.718 - 173 | 28.60 - 149 |
| 10 | 27.6 | 56.494 - 106 | 42.05 + 93 | 11.046 - 121 | 44.27 - 164 | 27.393 - 104 | 46.37 - 129 | 26.577 - 141 | 26.75 - 185 |
| 11 | 6.6 | 56.439 - 55 | 41.05 + 100 | 10.965 - 81 | 42.28 - 199 | 27.328 - 65 | 44.78 - 159 | 26.478 - 99 | 24.52 - 223 |
| 11 | 16.5 | 56.445 + 6 | 40.04 + 101 | 10.932 - 33 | 40.01 - 227 | 27.310 - 18 | 42.92 - 186 | 26.428 - 49 | 21.98 - 254 |
| 11 | 26.5 | 56.509 + 64 | 39.08 + 96 | 10.948 + 16 | 37.48 - 253 | 27.339 + 29 | 40.85 - 207 | 26.431 + 2 | 19.18 - 280 |
| 12 | 6.5 | 56.636 + 127 | 38.21 + 87 | 11.017 + 69 | 34.74 - 274 | 27.419 + 80 | 38.56 - 229 | 26.489 + 58 | 16.16 - 302 |
| 12 | 16.5 | 56.823 + 187 | 37.46 + 75 | 11.138 + 121 | 31.89 - 285 | 27.548 + 129 | 36.15 - 241 | 26.602 + 113 | 13.03 - 313 |
| 12 | 26.4 | 57.065 + 242 | 36.88 + 58 | 11.306 + 168 | 28.99 - 290 | 27.721 + 173 | 33.68 - 247 | 26.765 + 163 | 09.88 - 315 |
| 12 | 36.4 | 57.356 + 291 | 36.49 + 39 | 11.519 + 213 | 26.12 - 287 | 27.937 + 216 | 31.20 - 248 | 26.976 + 211 | 06.77 - 311 |
| | | 57.356 + 331 | 36.49 + 18 | 11.519 + 249 | 26.12 - 269 | 27.937 + 249 | 31.20 - 236 | 26.976 + 252 | 06.77 - 291 |
| Mean Place | 57.241 | 30.89 | 11.682 | 42.86 | 27.949 | 46.37 | 27.301 | 24.46 | |
| sec δ , $\tan \delta$ | +1.269 | -0.782 | +1.101 | +0.459 | +1.035 | +0.268 | +1.176 | +0.618 | |
| $d\alpha(\psi)$, $d\delta(\psi)$ | +0.081 | -0.12 | +0.050 | -0.12 | +0.054 | -0.12 | +0.045 | -0.12 | |
| $d\alpha(\epsilon)$, $d\delta(\epsilon)$ | -0.015 | -0.95 | +0.009 | -0.96 | +0.005 | -0.96 | +0.012 | -0.96 | |
| Dbles. Trans. | June 4 | | June 4 | | June 4 | | June 4 | | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 1442 | | 633 | | 1444 | | 631 | |
|--------------|-------------|------------|-------------|------------|-------------|------------|-------------|------------|
| | ι Ophiuchi | | κ Ophiuchi | | 24 G. Arae | | ζ Arae | |
| Mag. Spect. | 4.29 | B8 | 3.42 | K0 | 5.70 | B9 | 3.06 | K5 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " |
| | 16 53 | + 10 10 | 16 56 | + 9 23 | 16 57 | - 50 37 | 16 57 | - 55 58 |
| 1 -8.5 | 18.743 +159 | 69 23 -225 | 58 335 +156 | 39 68 -219 | 09 644 +249 | 13 82 +138 | 23 835 +272 | 09 53 +167 |
| 1 1.4 | 18.943 +200 | 66 97 -226 | 58 532 +197 | 37 46 -222 | 09 955 +311 | 12 64 +118 | 24 176 +341 | 08 07 +146 |
| 1 11.4 | 19.178 +235 | 64 73 -224 | 58 764 +232 | 35 26 -220 | 10 320 +365 | 11 69 +95 | 24 579 +403 | 06 86 +121 |
| 1 21.4 | 19.443 +265 | 62 61 -212 | 59 027 +263 | 33 18 -208 | 10 730 +410 | 11 02 +67 | 25 033 +454 | 05 96 +90 |
| 1 31.3 | 19.728 +285 | 60 71 -190 | 59 309 +282 | 31 30 -188 | 11 169 +439 | 10 62 +40 | 25 522 +489 | 05 36 +60 |
| 2 10.3 | 20 028 +300 | 59 05 -166 | 59 607 +298 | 29 67 -163 | 11 632 +463 | 10 48 +14 | 26 037 +515 | 05 06 +30 |
| 2 20.3 | 20 335 +307 | 57 74 -131 | 59 912 +305 | 28 37 -130 | 12 106 +474 | 10 62 -14 | 26 567 +530 | 05 09 -3 |
| 3 2.3 | 20 641 +306 | 56 80 -94 | 60 217 +305 | 27 44 -93 | 12 581 +475 | 11 00 -38 | 27 099 +532 | 05 41 -32 |
| 3 12.2 | 20 945 +304 | 56 26 -54 | 60 521 +304 | 26 89 -55 | 13 054 +473 | 11 61 -61 | 27 629 +530 | 06 00 -59 |
| 3 22.2 | 21 239 +294 | 56 13 -13 | 60 815 +294 | 26 75 -14 | 13 515 +461 | 12 44 -83 | 28 145 +516 | 06 86 -86 |
| 4 1.2 | 21 519 +280 | 56 39 +26 | 61 096 +281 | 27 00 +25 | 13 957 +442 | 13 44 -100 | 28 640 +495 | 07 95 -109 |
| 4 11.2 | 21 785 +266 | 57 02 +63 | 61 363 +267 | 27 60 +60 | 14 380 +423 | 14 63 -119 | 29 113 +473 | 09 26 -131 |
| 4 21.1 | 22 030 +245 | 57 99 +97 | 61 610 +247 | 28 54 +94 | 14 773 +393 | 15 97 -134 | 29 552 +439 | 10 77 -151 |
| 5 1.1 | 22 253 +223 | 59 20 +121 | 61 835 +225 | 29 73 +119 | 15 134 +361 | 17 44 -147 | 29 953 +401 | 12 43 -166 |
| 5 11.1 | 22 453 +200 | 60 64 +144 | 62 037 +202 | 31 14 +141 | 15 459 +325 | 19 02 -158 | 30 314 +361 | 14 25 -182 |
| 5 21.0 | 22 622 +169 | 62 22 +158 | 62 210 +173 | 32 70 +156 | 15 739 +280 | 20 69 -167 | 30 622 +308 | 16 17 -192 |
| 5 31.0 | 22 763 +141 | 63 88 +166 | 62 354 +144 | 34 32 +162 | 15 973 +234 | 22 41 -172 | 30 877 +255 | 18 16 -199 |
| 6 10.0 | 22 870 +107 | 65 57 +169 | 62 465 +111 | 35 99 +167 | 16 156 +183 | 22 17 -176 | 31 074 +197 | 20 19 -203 |
| 6 20.0 | 22 941 +71 | 67 22 +165 | 62 539 +74 | 37 61 +162 | 16 281 +125 | 25 91 -174 | 31 204 +130 | 22 19 -200 |
| 6 29.9 | 22 978 +37 | 68 79 +157 | 62 579 +40 | 39 16 +155 | 16 350 +69 | 27 59 -168 | 31 272 +68 | 24 14 -195 |
| 7 9.9 | 22 977 -1 | 70 25 +146 | 62 581 +2 | 40 60 +144 | 16 359 +9 | 29 18 -159 | 31 271 -1 | 25 98 -184 |
| 7 19.9 | 22 939 -38 | 71 54 +129 | 62 546 -35 | 41 87 +127 | 16 308 -51 | 30 61 -143 | 31 202 -69 | 27 64 -166 |
| 7 29.9 | 22 869 -70 | 72 64 +110 | 62 478 -68 | 42 97 +110 | 16 205 -103 | 31 87 -126 | 31 075 -127 | 29 09 -145 |
| 8 8.8 | 22 765 -104 | 73 55 +91 | 62 376 -102 | 43 87 +90 | 16 048 -157 | 32 88 -101 | 30 888 -187 | 30 28 -119 |
| 8 18.8 | 22 635 -130 | 74 23 +68 | 62 247 -129 | 44 55 +68 | 15 848 -200 | 33 62 -74 | 30 653 -235 | 31 14 -86 |
| 8 28.8 | 22 484 -151 | 74 67 +44 | 62 098 -149 | 45 00 +45 | 15 617 -231 | 34 05 -43 | 30 383 -270 | 31 67 -53 |
| 9 7.7 | 22 319 -165 | 74 88 +21 | 61 933 -165 | 45 22 +22 | 15 361 -256 | 34 16 -11 | 30 086 -297 | 31 82 -15 |
| 9 17.7 | 22 149 -170 | 74 82 -6 | 61 763 -170 | 45 18 -4 | 15 099 -262 | 33 92 +24 | 29 783 -303 | 31 58 +24 |
| 9 27.7 | 21 983 -166 | 74 51 -31 | 61 597 -166 | 44 90 -28 | 14 844 -255 | 33 37 +55 | 29 488 -295 | 30 97 +61 |
| 10 7.7 | 21 829 -154 | 73 94 -57 | 61 442 -155 | 44 36 -54 | 14 609 -235 | 32 49 +88 | 29 215 -273 | 30 00 +97 |
| 10 17.6 | 21 700 -129 | 73 09 -86 | 61 311 -131 | 43 55 -81 | 14 413 -196 | 31 34 +115 | 28 986 -229 | 28 70 +130 |
| 10 27.6 | 21 601 -99 | 71 98 -111 | 61 210 -101 | 42 49 -106 | 14 265 -148 | 29 97 +137 | 28 812 -174 | 27 15 +155 |
| 11 6.6 | 21 540 -61 | 70 61 -137 | 61 147 -63 | 41 17 -132 | 14 177 -88 | 28 42 +155 | 28 705 -107 | 25 38 +177 |
| 11 16.6 | 21 526 -14 | 69 00 -161 | 61 131 -16 | 39 60 -157 | 14 162 -15 | 26 78 +164 | 28 679 -26 | 23 49 +189 |
| 11 26.5 | 21 558 +32 | 67 17 -183 | 61 160 +29 | 37 83 -177 | 14 219 +57 | 25 12 +166 | 28 734 +55 | 21 56 +193 |
| 12 6.5 | 21 640 +82 | 65 14 -203 | 61 239 +79 | 35 86 -197 | 14 352 +133 | 23 49 +163 | 28 875 +141 | 19 64 +192 |
| 12 16.5 | 21 772 +132 | 62 98 -216 | 61 368 +129 | 33 75 -211 | 14 560 +208 | 21 99 +150 | 29 101 +226 | 17 85 +179 |
| 12 26.4 | 21 946 +174 | 60 75 -223 | 61 539 +173 | 31 57 -218 | 14 834 +274 | 20 65 +134 | 29 400 +299 | 16 23 +162 |
| 12 36.4 | 22 162 +216 | 58 49 -226 | 61 752 +211 | 29 36 -221 | 15 170 +336 | 19 53 +112 | 29 770 +370 | 14 83 +140 |
| | 22 162 +249 | 58 49 -217 | 61 752 +246 | 29 36 -213 | 15 170 +386 | 19 53 +86 | 29 770 +427 | 14 83 +111 |
| Mean Place | 22.127 | 72.78 | 61.728 | 43.37 | 15.257 | 15.68 | 30.004 | 11.71 |
| sec δ, tan δ | +1.016 | +0.180 | +1.014 | +0.165 | +1.576 | -1.218 | +1.787 | -1.481 |
| dα(ψ), dδ(ψ) | +0.057 | -0.11 | +0.057 | -0.11 | +0.092 | -0.11 | +0.099 | -0.11 |
| dα(ε), dδ(ε) | +0.003 | -0.96 | +0.003 | -0.96 | -0.022 | -0.96 | -0.027 | -0.96 |
| Dble. Trans. | June 5 | | June 6 | | June 6 | | June 6 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 632 | | 1443 | | 634 | | 1445 | |
|--------------|-------------------|--------------------------|--------------------------|-------------------------|--------------------------|-------------------------|--------------------------|-------------------------|
| | ε' Arae | | 51 G. Apodis | | ε Herculis | | 30 Ophiuchi | |
| Mag.Spect. | 4.15 | K2 | 7.00 | F8 | 3.92 | A0 | 5.00 | K0 |
| U.T. | R.A. | | R.A. | | R.A. | | R.A. | |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " |
| | 16 58 | -53 08 | 16 58 | -76 11 | 16 59 | +30 56 | 17 00 | -4 12 |
| | ^d -8.5 | ^s 24.471 +257 | ^s 50.245 +498 | ^s 52.27 +260 | ^s 43.218 +138 | ^s 39.01 -314 | ^s 17.178 +165 | ^s 13.68 -143 |
| 1 | 1.4 | 24.793 +322 | 50.905 +660 | 49.90 +237 | 43.403 +185 | 35.90 -311 | 17.382 +204 | 15.18 -150 |
| 1 | 11.4 | 25.173 +380 | 51.712 +807 | 47.83 +207 | 43.631 +228 | 32.88 -302 | 17.622 +240 | 16.71 -153 |
| 1 | 21.4 | 25.601 +428 | 52.649 +937 | 46.14 +169 | 43.898 +267 | 30.11 -277 | 17.891 +269 | 18.22 -151 |
| 1 | 31.3 | 26.060 +459 | 53.677 +1028 | 44.86 +128 | 44.190 +292 | 27.67 -244 | 18.179 +288 | 19.63 -141 |
| 2 | 10.3 | 26.545 +485 | 54.780 +1103 | 44.01 +85 | 44.503 +313 | 25.62 -205 | 18.482 +303 | 20.91 -128 |
| 2 | 20.3 | 27.043 +498 | 55.929 +1149 | 43.62 +39 | 44.829 +326 | 24.09 -153 | 18.792 +310 | 21.99 -108 |
| 3 | 2.3 | 27.542 +499 | 57.092 +1163 | 43.67 -5 | 45.158 +329 | 23.08 -101 | 19.101 +309 | 22.83 -84 |
| 3 | 12.2 | 28.040 +498 | 58.260 +1168 | 44.16 -49 | 45.487 +329 | 22.62 -46 | 19.408 +307 | 23.42 -59 |
| 3 | 22.2 | 28.525 +485 | 59.400 +1140 | 45.08 -92 | 45.806 +319 | 22.75 +13 | 19.707 +299 | 23.74 -32 |
| 4 | 1.2 | 28.992 +467 | 60.493 +1093 | 46.37 -129 | 46.110 +304 | 23.41 +66 | 19.994 +287 | 23.79 -5 |
| 4 | 11.2 | 29.437 +445 | 61.532 +1039 | 48.04 -167 | 46.397 +287 | 24.58 +117 | 20.269 +275 | 23.59 +20 |
| 4 | 21.1 | 29.852 +415 | 62.485 +953 | 50.04 -200 | 46.658 +261 | 26.21 +163 | 20.525 +256 | 23.16 +43 |
| 5 | 1.1 | 30.232 +380 | 63.343 +858 | 52.30 -226 | 46.893 +235 | 28.18 +197 | 20.760 +235 | 22.55 +61 |
| 5 | 11.1 | 30.574 +342 | 64.096 +753 | 54.81 -251 | 47.098 +205 | 30.45 +227 | 20.974 +214 | 21.79 +76 |
| 5 | 21.0 | 30.868 +294 | 64.717 +621 | 57.52 -271 | 47.266 +168 | 32.92 +247 | 21.160 +186 | 20.93 +86 |
| 5 | 31.0 | 31.114 +246 | 65.207 +490 | 60.33 -281 | 47.399 +133 | 35.49 +257 | 21.318 +158 | 20.02 +91 |
| 6 | 10.0 | 31.305 +191 | 65.552 +345 | 63.23 -290 | 47.493 +94 | 38.10 +261 | 21.444 +126 | 19.08 +94 |
| 6 | 20.0 | 31.434 +129 | 65.738 +186 | 66.11 -288 | 47.545 +52 | 40.66 +256 | 21.534 +90 | 18.16 +92 |
| 6 | 29.9 | 31.505 +71 | 65.775 +37 | 68.91 -280 | 47.557 +12 | 43.07 +241 | 21.590 +56 | 17.29 +87 |
| 7 | 9.9 | 31.512 +7 | 65.653 -122 | 71.58 -267 | 47.527 -30 | 45.32 +225 | 21.607 +17 | 16.48 +81 |
| 7 | 19.9 | 31.455 -57 | 65.378 -275 | 74.01 -243 | 47.455 -72 | 47.30 +198 | 21.587 -20 | 15.76 +72 |
| 7 | 29.9 | 31.343 -112 | 64.969 -409 | 76.14 -213 | 47.347 -108 | 49.00 +170 | 21.532 -55 | 15.13 +63 |
| 8 | 8.8 | 31.175 -168 | 64.428 -541 | 77.92 -178 | 47.203 -144 | 50.39 +139 | 21.443 -89 | 14.61 +52 |
| 8 | 18.8 | 30.961 -214 | 63.784 -644 | 79.24 -132 | 47.030 -173 | 51.39 +100 | 21.326 -117 | 14.20 +41 |
| 8 | 28.8 | 30.714 -247 | 63.066 -718 | 80.11 -87 | 46.836 -194 | 52.03 +64 | 21.187 -139 | 13.90 +30 |
| 9 | 7.7 | 30.441 -273 | 62.290 -776 | 80.47 -36 | 46.625 -211 | 52.27 +24 | 21.032 -155 | 13.71 +19 |
| 9 | 17.7 | 30.161 -280 | 61.504 -786 | 80.28 +19 | 46.409 -216 | 52.09 -18 | 21.032 -161 | 13.66 +5 |
| 9 | 27.7 | 29.888 -273 | 60.737 -767 | 79.58 +70 | 46.196 -213 | 51.52 -57 | 20.871 -158 | 13.72 -6 |
| 10 | 7.7 | 29.636 -252 | 60.020 -717 | 78.35 +123 | 45.995 -201 | 50.52 -100 | 20.566 -147 | 13.93 -21 |
| 10 | 17.6 | 29.425 -211 | 59.401 -619 | 76.65 +170 | 45.820 -175 | 49.12 -140 | 20.444 -122 | 14.28 -35 |
| 10 | 27.6 | 29.264 -161 | 58.902 -499 | 74.57 +208 | 45.676 -144 | 47.35 -177 | 20.351 -93 | 14.79 -51 |
| 11 | 6.6 | 29.166 -98 | 58.550 -352 | 72.13 +244 | 45.572 -104 | 45.20 -215 | 20.297 -54 | 15.47 -68 |
| 11 | 16.6 | 29.145 -21 | 58.377 -173 | 69.48 +265 | 45.518 -54 | 42.73 -247 | 20.290 -7 | 16.32 -85 |
| 11 | 26.5 | 29.199 +54 | 58.382 +5 | 66.70 +278 | 45.514 -4 | 40.00 -273 | 20.329 +39 | 17.33 -101 |
| 12 | 6.5 | 29.333 +134 | 58.580 +198 | 63.88 +282 | 45.565 +51 | 37.04 -296 | 20.417 +88 | 18.51 -118 |
| 12 | 16.5 | 29.547 +214 | 58.970 +390 | 61.16 +272 | 45.670 +105 | 33.96 -308 | 20.554 +137 | 19.84 -133 |
| 12 | 26.4 | 29.830 +283 | 59.530 +560 | 58.61 +255 | 45.826 +156 | 30.85 -311 | 20.735 +181 | 21.28 -144 |
| 12 | 36.4 | 30.179 +349 | 60.257 +727 | 56.31 +230 | 46.030 +204 | 27.77 -308 | 20.956 +221 | 22.78 -150 |
| | | +402 | +99 | +866 | +194 | +244 | +253 | -150 |
| Mean Place | 30.330 | 27.04 | 62.353 | 55.13 | 46.371 | 44.85 | 20.823 | 11.18 |
| sec δ, tan δ | +1.667 | -1.334 | +4.192 | -4.071 | +1.166 | +0.600 | +1.003 | -0.073 |
| dα(ψ), dδ(ψ) | +0.095 | -0.11 | +0.165 | -0.10 | +0.046 | -0.10 | +0.063 | -0.10 |
| dα(ε), dδ(ε) | -0.024 | -0.96 | -0.071 | -0.96 | +0.010 | -0.97 | -0.001 | -0.97 |
| Dble.Trans. | June 6 | | June 6 | | June 6 | | June 6 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 1446 | | 1448 | | 635 | | 1447 | | |
|--------------|-------------|-------------|---|-------------|-------------|-------------|----------------|-------------|-----------|
| | 59 Herculis | | Piazz 16 ^h 307 (Herculis) | | 60 Herculis | | 80 G. Ophiuchi | | |
| Mag. Spect. | 5.27 | A2 | 6.36 | A0 | 4.91 | A3 | 6.20 | A0 | |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " | |
| | 17 01 | +33 34 | 17 04 | +43 49 | 17 04 | +12 45 | 17 05 | -26 29 | |
| 1 | -8.5 | 03 288 +135 | 68 08 -323 | 37 160 +121 | 41 84 -353 | 41 737 +146 | 27.07 -235 | 58.743 +188 | 45.20 +5 |
| 1 | 1.4 | 03 471 +183 | 64 88 -320 | 37 339 +179 | 38.37 -347 | 41 925 +188 | 24.71 -236 | 58.973 +230 | 45.35 -15 |
| 1 | 11.4 | 03 699 +228 | 61.79 -309 | 37 570 +231 | 35.03 -334 | 42 150 +225 | 22.38 -233 | 59.242 +269 | 45.64 -29 |
| 1 | 21.4 | 03 967 +268 | 58 95 -250 | 37 849 +279 | 31.97 -306 | 42 406 +256 | 20.18 -220 | 59 543 +301 | 46.04 -49 |
| 1 | 31.3 | 04 262 +295 | 56 45 -250 | 38 163 +314 | 29.29 -268 | 42 684 +278 | 18.19 -199 | 59 865 +322 | 46.53 -49 |
| 2 | 10.3 | 04 579 +317 | 54 36 -209 | 38 506 +343 | 27.07 -222 | 42 979 +295 | 16 48 -171 | 60 203 +338 | 47.07 -54 |
| 2 | 20.3 | 04 911 +332 | 52 79 -157 | 38 869 +363 | 25 42 -165 | 43 284 +305 | 15 12 -136 | 60 550 +347 | 47 65 -58 |
| 3 | 2.3 | 05 246 +335 | 51 77 -102 | 39 238 +369 | 24 36 -106 | 43 589 +305 | 14 16 -96 | 60 897 +347 | 48 23 -56 |
| 3 | 12.2 | 05 581 +335 | 51 32 -45 | 39 609 +371 | 23 93 -43 | 43 895 +306 | 13 61 -55 | 61 243 +346 | 48 79 -56 |
| 3 | 22.2 | 05 907 +326 | 51 47 +15 | 39 971 +362 | 24 16 +23 | 44 192 +297 | 13 51 -10 | 61 582 +339 | 49 31 -52 |
| 4 | 1.2 | 06 217 +310 | 52 17 +70 | 40 315 +344 | 24 98 +82 | 44 477 +285 | 13 82 +31 | 61 908 +326 | 49 79 -48 |
| 4 | 11.2 | 06 510 +293 | 53 38 +121 | 40 640 +325 | 26 36 +138 | 44 750 +273 | 14 51 +69 | 62 222 +314 | 50 23 -44 |
| 4 | 21.1 | 06 777 +267 | 55 07 +169 | 40 933 +293 | 28 26 +190 | 45 002 +252 | 15 57 +106 | 62 516 +294 | 50 62 -39 |
| 5 | 1.1 | 07 015 +238 | 57 12 +205 | 41 192 +259 | 30 54 +228 | 45 234 +232 | 16 90 +133 | 62 790 +274 | 50 99 -37 |
| 5 | 11.1 | 07 223 +208 | 59 47 +235 | 41 414 +222 | 33 17 +263 | 45 442 +208 | 18 46 +156 | 63 040 +250 | 51 34 -35 |
| 5 | 21.0 | 07 393 +170 | 62 04 +257 | 41 590 +176 | 36 02 +285 | 45 620 +178 | 20 19 +173 | 63 260 +220 | 51 68 -34 |
| 5 | 31.0 | 07 526 +133 | 64 69 +265 | 41 723 +133 | 38 98 +296 | 45 769 +149 | 22 00 +181 | 63 449 +189 | 52 03 -35 |
| 5 | 10.0 | 07 619 +93 | 67 40 +271 | 41 808 +85 | 41 99 +301 | 45 885 +116 | 23 86 +186 | 63 603 +154 | 52 38 -35 |
| 6 | 20.0 | 07 668 +49 | 70 05 +265 | 41 842 +34 | 44 93 +294 | 45 964 +79 | 25 68 +182 | 63 717 +114 | 52 73 -35 |
| 6 | 29.9 | 07 676 +8 | 72 55 +250 | 41 828 -14 | 47 72 +279 | 46 008 +44 | 27 41 +173 | 63 792 +75 | 53 09 -36 |
| 7 | 9.9 | 07 640 -36 | 74 88 +233 | 41 764 -64 | 50 32 +260 | 46 013 +5 | 29 02 +161 | 63 823 +31 | 53 44 -35 |
| 7 | 19.9 | 07 562 -78 | 76 94 +206 | 41 652 -112 | 52 61 +229 | 45 980 -33 | 30 46 +144 | 63 811 -12 | 53 77 -33 |
| 7 | 29.9 | 07 447 -115 | 78 70 +176 | 41 652 -153 | 52 61 +197 | 45 980 -68 | 30 46 +124 | 63 811 -52 | 53 77 -29 |
| 8 | 8.8 | 07 296 -151 | 80 14 +144 | 41 499 -195 | 54 58 +160 | 45 912 -101 | 31 70 +103 | 63 759 -91 | 54 06 -23 |
| 8 | 18.8 | 07 114 -182 | 81 18 +104 | 41 304 -227 | 56 18 +116 | 45 811 -130 | 32 73 +77 | 63 668 -124 | 54 29 -15 |
| 8 | 28.8 | 06 911 -203 | 81 84 +66 | 40 825 -252 | 58 08 +74 | 45 530 -151 | 34 03 +53 | 63 394 -150 | 54 51 -7 |
| 9 | 7.7 | 06 690 -221 | 82 10 +26 | 40 554 -271 | 58 35 +27 | 45 361 -169 | 34 29 +26 | 63 225 -169 | 54 48 +3 |
| 9 | 17.7 | 06 464 -226 | 81 91 -19 | 40 277 -155 | 58 14 -21 | 45 187 -174 | 34 27 -2 | 63 049 -176 | 54 35 +13 |
| 9 | 27.7 | 06 242 -222 | 81 31 -60 | 40 004 -273 | 57 47 -67 | 45 015 -172 | 33 97 -30 | 62 875 -174 | 54 12 +23 |
| 10 | 7.7 | 06 031 -211 | 80 28 -103 | 39 742 -262 | 56 32 -115 | 44 853 -162 | 33 39 -58 | 62 713 -162 | 53 81 +31 |
| 10 | 17.6 | 05 846 -185 | 78 83 -145 | 39 509 -233 | 54 69 -163 | 44 714 -139 | 32 51 -88 | 62 578 -135 | 53 44 +37 |
| 10 | 27.6 | 05 693 -153 | 77 00 -183 | 39 309 -200 | 52 65 -204 | 44 604 -110 | 31 36 -115 | 62 477 -101 | 53 03 +41 |
| 11 | 6.6 | 05 581 -112 | 74 77 -223 | 39 154 -155 | 50 19 -246 | 44 532 -72 | 29 93 -143 | 62 419 -58 | 52 62 +41 |
| 11 | 16.6 | 05 519 -62 | 72 22 -255 | 39 055 -99 | 47 37 -282 | 44 505 -27 | 28 24 -169 | 62 412 -7 | 52 25 +37 |
| 11 | 26.5 | 05 508 -11 | 69 41 -281 | 39 011 -44 | 44 27 -310 | 44 524 +19 | 26 33 -191 | 62 458 +46 | 51 95 +30 |
| 12 | 6.5 | 05 553 +45 | 66 35 -306 | 39 030 +19 | 40 92 -335 | 44 593 +69 | 24 20 -213 | 62 561 +103 | 51 80 +15 |
| 12 | 16.5 | 05 654 +101 | 63 18 -317 | 39 114 +84 | 37 45 -347 | 44 711 +118 | 21 95 -225 | 62 707 +146 | 51 68 +12 |
| 12 | 26.4 | 05 806 +152 | 59 98 -320 | 39 255 +141 | 33 96 -349 | 44 873 +162 | 19 62 -233 | 62 912 +205 | 51 70 -2 |
| 12 | 36.4 | 06 009 +203 | 56 81 -317 | 39 456 +201 | 30 53 -343 | 45 077 +204 | 17 27 -235 | 63 161 +249 | 51 88 -18 |
| | | 06 009 +245 | 56 81 -297 | 39 456 +251 | 30 53 -321 | 45 077 +239 | 17 27 -226 | 63 161 +284 | 51 88 -31 |
| Mean Place | 06.425 | 74.15 | 40.246 | 48.69 | 45.108 | 31.48 | 63.000 | 44.15 | |
| sec δ, tan δ | +1.200 | +0.664 | +1.386 | +0.960 | +1.025 | +0.226 | +1.117 | -0.498 | |
| da(ψ), dδ(ψ) | +0.044 | -0.10 | +0.036 | -0.10 | +0.055 | -0.09 | +0.074 | -0.09 | |
| da(ε), dδ(ε) | +0.011 | -0.97 | +0.015 | -0.97 | +0.004 | -0.97 | -0.008 | -0.97 | |
| Dble. Trans. | June 7 | | June 8 | | June 8 | | June 8 | | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 636 | | 1449 | | 639 | | 1450 | | |
|----------------|--------------------------------|-------------|----------------|-------------|------------|-------------|----------------|-------------|------------|
| | Groombridge 2415 (Herculis) | | 85 G. Ophiuchi | | ζ Draconis | | 88 G. Ophiuchi | | |
| Mag.Spect. | 6.27 | A2 | 6.14 | K0 | 3.22 | B5 | 5.58 | F5 | |
| U.T. | R.A. | | Dec. | | R.A. | | Dec. | | |
| | h | m | ° | ' | h | m | ° | ' | |
| | 17 07 | + 40 31 | 17 07 | - 17 35 | 17 08 | + 65 43 | 17 08 | - 10 30 | |
| 1 ^d | -8.5 | 17.138 +121 | 53.07 -344 | 23.793 +173 | 32.91 -63 | 41.534 +85 | 44.54 -379 | 59.328 +162 | 25.83 -103 |
| 1 ^s | 1.4 | 17.313 +175 | 49.68 -339 | 24.007 +214 | 33.61 -70 | 41.720 +196 | 40.83 -371 | 59.532 +204 | 26.94 -111 |
| 1 | 11.4 | 17.537 +224 | 46.40 -328 | 24.258 +251 | 34.39 -78 | 42.003 +283 | 37.27 -356 | 59.772 +240 | 28.11 -117 |
| 1 | 21.4 | 17.807 +270 | 43.39 -301 | 24.540 +282 | 35.22 -83 | 42.378 +375 | 34.04 -323 | 60.042 +270 | 29.29 -118 |
| 1 | 31.4 | 18.110 +303 | 40.74 -265 | 24.842 +302 | 36.07 -85 | 42.824 +446 | 31.24 -280 | 60.331 +289 | 30.42 -113 |
| 2 | 10.3 | 18.441 +331 | 38.53 -221 | 25.159 +317 | 36.90 -83 | 43.333 +509 | 28.93 -231 | 60.637 +306 | 31.48 -106 |
| 2 | 20.3 | 18.789 +348 | 36.87 -166 | 25.485 +326 | 37.67 -77 | 43.886 +553 | 27.26 -167 | 60.951 +314 | 32.39 -91 |
| 3 | 2.3 | 19.144 +355 | 35.80 -107 | 25.811 +326 | 38.35 -68 | 44.461 +575 | 26.22 -104 | 61.266 +315 | 33.15 -76 |
| 3 | 12.2 | 19.501 +357 | 35.33 -47 | 26.136 +325 | 38.91 -56 | 45.047 +586 | 25.87 -35 | 61.580 +314 | 33.71 -56 |
| 3 | 22.2 | 19.850 +349 | 35.50 +17 | 26.454 +318 | 39.34 -43 | 45.620 +573 | 26.22 +35 | 61.887 +307 | 34.06 -35 |
| 4 | 1.2 | 20.183 +333 | 36.25 +75 | 26.760 +306 | 39.64 -30 | 46.163 +543 | 27.20 +98 | 62.184 +297 | 34.21 -15 |
| 4 | 11.2 | 20.497 +314 | 37.56 +131 | 27.055 +295 | 39.81 -17 | 46.668 +505 | 28.80 +160 | 62.469 +285 | 34.17 +4 |
| 4 | 21.1 | 20.783 +286 | 39.38 +182 | 27.332 +277 | 39.86 -5 | 47.114 +446 | 30.93 +213 | 62.737 +268 | 33.95 +22 |
| 5 | 1.1 | 21.038 +255 | 41.58 +220 | 27.590 +258 | 39.82 +4 | 47.492 +378 | 33.48 +255 | 62.985 +248 | 33.59 +36 |
| 5 | 11.1 | 21.258 +220 | 44.11 +253 | 27.825 +235 | 39.71 +11 | 47.798 +306 | 36.40 +292 | 63.213 +228 | 33.12 +47 |
| 5 | 21.1 | 21.436 +178 | 46.88 +277 | 28.032 +207 | 39.55 +16 | 48.017 +219 | 39.54 +314 | 63.413 +200 | 32.57 +55 |
| 5 | 31.0 | 21.573 +137 | 49.75 +287 | 28.211 +179 | 39.38 +17 | 48.151 +134 | 42.80 +326 | 63.585 +172 | 31.98 +59 |
| 6 | 10.0 | 21.666 +93 | 52.68 +293 | 28.357 +146 | 39.19 +19 | 48.197 +46 | 46.11 +331 | 63.725 +140 | 31.38 +60 |
| 6 | 20.0 | 21.709 +43 | 55.56 +288 | 28.464 +107 | 39.02 +17 | 48.149 -48 | 49.33 +322 | 63.829 +104 | 30.79 +59 |
| 6 | 29.9 | 21.707 -2 | 58.28 +272 | 28.535 +71 | 38.87 +15 | 48.019 -130 | 52.38 +305 | 63.897 +68 | 30.24 +55 |
| 7 | 9.9 | 21.658 -49 | 60.83 +255 | 28.566 +31 | 38.74 +13 | 47.802 -217 | 55.21 +283 | 63.926 +29 | 29.73 +51 |
| 7 | 19.9 | 21.562 -96 | 63.09 +226 | 28.556 -10 | 38.63 +11 | 47.505 -297 | 57.70 +249 | 63.915 -11 | 29.28 +45 |
| 7 | 29.9 | 21.426 -136 | 65.03 +194 | 28.509 -47 | 38.54 +9 | 47.142 -363 | 59.83 +213 | 63.869 -46 | 28.90 +38 |
| 8 | 8.8 | 21.249 -177 | 66.62 +159 | 28.424 -85 | 38.46 +8 | 46.714 -428 | 61.55 +172 | 63.786 -83 | 28.57 +33 |
| 8 | 18.8 | 21.041 -208 | 67.79 +117 | 28.308 -116 | 38.38 +8 | 46.234 -480 | 62.78 +123 | 63.673 -113 | 28.31 +26 |
| 8 | 28.8 | 20.808 -233 | 68.55 +76 | 28.169 -139 | 38.30 +8 | 45.719 -515 | 63.55 +77 | 63.537 -136 | 28.11 +20 |
| 9 | 7.8 | 20.556 -252 | 68.86 +31 | 28.010 -159 | 38.20 +10 | 45.545 -545 | 63.80 +25 | 63.383 -154 | 27.96 +15 |
| 9 | 17.7 | 20.297 -259 | 68.69 -17 | 27.845 -165 | 38.09 +11 | 44.622 -552 | 63.51 -29 | 63.221 -162 | 27.88 +8 |
| 9 | 27.7 | 20.042 -255 | 68.09 -60 | 27.681 -164 | 37.98 +11 | 44.076 -546 | 63.51 -79 | 63.061 -160 | 27.86 +2 |
| 10 | 7.7 | 19.797 -245 | 67.01 -108 | 27.529 -152 | 37.87 +11 | 43.547 -529 | 61.41 -131 | 62.911 -150 | 27.92 -6 |
| 10 | 17.6 | 19.579 -218 | 65.48 -153 | 27.401 -128 | 37.79 +8 | 43.062 -485 | 59.58 -183 | 62.785 -126 | 28.07 -15 |
| 10 | 27.6 | 19.393 -186 | 63.54 -194 | 27.304 -97 | 37.75 +4 | 42.628 -434 | 57.31 -227 | 62.688 -97 | 28.31 -24 |
| 11 | 6.6 | 19.250 -143 | 61.17 -237 | 27.247 -57 | 37.77 -2 | 42.261 -367 | 54.58 -273 | 62.630 -58 | 28.68 -37 |
| 11 | 16.6 | 19.160 -90 | 58.17 -271 | 27.239 -8 | 37.88 -11 | 41.980 -281 | 51.48 -310 | 62.618 -12 | 28.68 -49 |
| 11 | 26.5 | 19.123 -37 | 55.46 -300 | 27.281 +42 | 38.09 -21 | 41.789 -191 | 48.09 -339 | 62.654 +36 | 29.80 -63 |
| 12 | 6.5 | 19.147 +24 | 52.21 -325 | 27.374 +93 | 38.39 -30 | 41.699 -90 | 44.45 -364 | 62.739 +85 | 30.56 -76 |
| 12 | 16.5 | 19.231 +84 | 48.84 -337 | 27.512 +138 | 38.89 -50 | 41.717 +18 | 40.71 -374 | 62.872 +133 | 31.48 -92 |
| 12 | 26.5 | 19.371 +140 | 45.44 -340 | 27.702 +190 | 39.51 -62 | 41.836 +119 | 36.96 -375 | 63.051 +179 | 32.52 -104 |
| 12 | 36.4 | 19.567 +196 | 42.08 -336 | 27.933 +231 | 40.22 -71 | 42.060 +224 | 33.30 -366 | 63.272 +221 | 33.63 -111 |
| | | 19.567 +244 | 42.08 -315 | 27.933 +266 | 40.22 -78 | 42.060 +319 | 33.30 -340 | 63.272 +253 | 33.63 -115 |
| Mean Place | 20.244 | 59.71 | 27.769 | 31.01 | 44.729 | 52.48 | 63.126 | 23.24 | |
| sec δ, tan δ | +1.316 | +0.855 | +1.049 | -0.317 | +2.433 | +2.218 | +1.017 | -0.185 | |
| da(ψ), dδ(ψ) | +0.039 | -0.09 | +0.069 | -0.09 | +0.004 | -0.09 | +0.066 | -0.09 | |
| da(ε), dδ(ε) | +0.013 | -0.97 | -0.005 | -0.97 | +0.033 | -0.98 | -0.003 | -0.98 | |
| Dble.Trans. | June 8 | | June 8 | | June 9 | | June 9 | | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 1451 | | 638 | | 641 | | 643 | |
|---------------------|----------------|------------|-------------|------------|-------------|------------|-------------|------------|
| | 97 G. Ophiuchi | | η Scorpii | | δ Herculis* | | π Herculis | |
| Mag. Spect. | 6.39 | K0 | 3.44 | F2 | 3.16 | A2 | 3.36 | K5 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " |
| | 17 11 | + 7 54 | 17 11 | - 43 13 | 17 14 | + 24 50 | 17 14 | + 36 49 |
| 1 ^d -8.5 | 02.701 +143 | 33.56 -207 | 06.016 +210 | 20.60 +102 | 25.379 +126 | 70.74 -288 | 31.451 +115 | 19.47 -331 |
| 1 1.4 | 02.886 +185 | 31.45 -211 | 06.281 +265 | 19.74 +86 | 25.551 +172 | 67.86 -288 | 31.618 +167 | 16.18 -329 |
| 1 11.4 | 03.107 +221 | 29.34 -211 | 06.595 +314 | 19.07 +67 | 25.764 +213 | 65.04 -282 | 31.832 +214 | 12.99 -319 |
| 1 21.4 | 03.360 +253 | 27.34 -200 | 06.949 +354 | 18.61 +46 | 26.013 +249 | 62.42 -262 | 32.090 +258 | 10.03 -296 |
| 1 31.4 | 03.635 +275 | 25.52 -182 | 07.331 +382 | 18.36 +25 | 26.289 +276 | 60.07 -235 | 32.379 +289 | 07.42 -261 |
| 2 10.3 | 03.926 +291 | 23.93 -159 | 07.735 +404 | 18.30 +6 | 26.585 +296 | 58.07 -200 | 32.695 +316 | 05.21 -221 |
| 2 20.3 | 04.227 +301 | 22.65 -128 | 08.151 +416 | 18.44 -14 | 26.896 +311 | 56.52 -155 | 33.028 +333 | 03.54 -167 |
| 3 2.3 | 04.531 +304 | 21.72 -93 | 08.569 +418 | 18.75 -31 | 27.210 +314 | 55.45 -107 | 33.369 +341 | 02.42 -112 |
| 3 12.2 | 04.835 +304 | 21.15 -57 | 08.988 +419 | 19.21 -46 | 27.527 +317 | 54.89 -56 | 33.713 +344 | 01.88 -54 |
| 3 22.2 | 05.132 +297 | 20.99 -16 | 09.399 +411 | 19.82 -61 | 27.838 +311 | 54.88 -1 | 34.050 +337 | 01.97 +9 |
| 4 1.2 | 05.418 +296 | 21.20 +21 | 09.796 +397 | 20.54 -72 | 28.136 +298 | 55.36 +48 | 34.374 +324 | 02.62 +65 |
| 4 11.2 | 05.693 +275 | 21.76 +56 | 10.178 +382 | 21.39 -85 | 28.422 +286 | 56.33 +97 | 34.682 +308 | 03.83 +121 |
| 4 21.1 | 05.950 +257 | 22.66 +90 | 10.538 +360 | 22.35 -96 | 28.687 +265 | 57.73 +140 | 34.964 +282 | 05.53 +170 |
| 5 1.1 | 06.187 +237 | 23.80 +114 | 10.871 +333 | 23.39 -104 | 28.928 +241 | 59.48 +175 | 35.219 +255 | 07.61 +208 |
| 5 11.1 | 06.401 +214 | 25.16 +136 | 11.176 +305 | 24.53 -114 | 29.144 +216 | 61.52 +204 | 35.442 +223 | 10.04 +243 |
| 5 21.1 | 06.588 +187 | 26.67 +151 | 11.443 +267 | 25.74 -121 | 29.327 +183 | 63.77 +225 | 35.627 +185 | 12.69 +265 |
| 5 31.0 | 06.746 +158 | 28.26 +159 | 11.672 +229 | 27.01 -127 | 29.478 +151 | 66.13 +236 | 35.773 +146 | 15.47 +278 |
| 6 10.0 | 06.872 +126 | 29.89 +163 | 11.857 +185 | 28.32 -131 | 29.593 +115 | 68.54 +241 | 35.877 +104 | 18.32 +285 |
| 6 20.0 | 06.962 +90 | 31.50 +161 | 11.991 +134 | 29.63 -131 | 29.667 +74 | 70.93 +239 | 35.935 +58 | 21.11 +279 |
| 6 29.9 | 07.016 +54 | 33.02 +152 | 12.078 +87 | 30.92 -129 | 29.704 +37 | 73.20 +227 | 35.950 +15 | 23.79 +268 |
| 7 9.9 | 07.032 +16 | 34.45 +143 | 12.111 +33 | 32.17 -125 | 29.698 -6 | 75.33 +213 | 35.919 -31 | 26.29 +250 |
| 7 19.9 | 07.010 -22 | 35.73 +128 | 12.090 -21 | 33.32 -115 | 29.652 -46 | 77.23 +190 | 35.842 -77 | 28.53 +224 |
| 7 29.9 | 06.953 -57 | 36.83 +110 | 12.021 -69 | 34.35 -103 | 29.569 -83 | 78.89 +166 | 35.725 -117 | 30.47 +194 |
| 8 8.8 | 06.860 -93 | 37.76 +93 | 11.902 -119 | 35.20 -85 | 29.450 -119 | 80.27 +138 | 35.569 -156 | 32.08 +161 |
| 8 18.8 | 06.739 -121 | 38.47 +71 | 11.744 -158 | 35.85 -65 | 29.300 -150 | 81.30 +103 | 35.380 -189 | 33.28 +120 |
| 8 28.8 | 06.595 -144 | 38.96 +49 | 11.555 -189 | 36.27 -42 | 29.127 -173 | 82.02 +72 | 35.167 -213 | 34.10 +82 |
| 9 7.8 | 06.433 -162 | 39.24 +28 | 11.340 -215 | 36.44 -115 | 28.935 -192 | 82.38 +36 | 34.933 -234 | 34.49 +39 |
| 9 17.7 | 06.264 -169 | 39.26 +2 | 11.117 -223 | 36.34 +10 | 28.736 -199 | 82.35 -3 | 34.693 -240 | 34.43 -6 |
| 9 27.7 | 06.097 -167 | 39.06 -20 | 10.897 -220 | 35.98 +36 | 28.538 -198 | 81.97 -38 | 34.453 -240 | 33.94 -49 |
| 10 7.7 | 05.938 -159 | 38.61 -45 | 10.690 -207 | 35.36 +62 | 28.348 -190 | 81.21 -76 | 34.223 -230 | 32.99 -95 |
| 10 17.6 | 05.802 -136 | 37.90 -71 | 10.515 -175 | 34.52 +84 | 28.181 -167 | 80.06 -115 | 34.017 -206 | 31.60 -139 |
| 10 27.6 | 05.694 -108 | 36.96 -94 | 10.381 -134 | 33.50 +102 | 28.043 -138 | 78.58 -148 | 33.841 -176 | 29.81 -179 |
| 11 6.6 | 05.622 -72 | 35.76 -120 | 10.297 -84 | 32.33 +117 | 27.942 -101 | 76.73 -185 | 33.705 -136 | 27.60 -221 |
| 11 16.6 | 05.595 -27 | 34.33 -143 | 10.276 -21 | 31.10 +123 | 27.887 -55 | 74.57 -216 | 33.620 -85 | 25.04 -256 |
| 11 26.5 | 05.613 +18 | 32.69 -164 | 10.317 +41 | 29.85 +125 | 27.879 -8 | 72.15 -242 | 33.586 -34 | 22.20 -284 |
| 12 6.5 | 05.681 +68 | 30.85 -184 | 10.424 +107 | 28.63 +122 | 27.923 +44 | 69.50 -265 | 33.609 +23 | 19.10 -310 |
| 12 16.5 | 05.797 +116 | 28.87 -198 | 10.598 +174 | 27.51 +112 | 28.019 +96 | 66.70 -280 | 33.690 +81 | 15.87 -323 |
| 12 26.5 | 05.956 +159 | 26.81 -206 | 10.830 +232 | 26.52 +99 | 28.162 +143 | 63.84 -286 | 33.824 +134 | 12.58 -329 |
| 12 36.4 | 06.158 +202 | 24.70 -211 | 11.117 +287 | 25.70 +82 | 28.352 +190 | 60.98 -286 | 34.011 +187 | 09.32 -326 |
| | 06.153 +235 | 37.89 -203 | 11.082 +333 | 20.28 +61 | 28.622 +229 | 76.43 -272 | 34.597 +233 | 26.01 -307 |
| Mean Place | 06.153 | 37.89 | 11.082 | 20.28 | 28.622 | 76.43 | 34.597 | 26.01 |
| sec δ, tan δ | +1.010 | +0.139 | +1.372 | -0.940 | +1.102 | +0.463 | +1.249 | +0.749 |
| da(ψ), dδ(ψ) | +0.058 | -0.08 | +0.086 | -0.08 | +0.049 | -0.08 | +0.042 | -0.08 |
| da(ε), dδ(ε) | +0.002 | -0.98 | -0.013 | -0.98 | +0.006 | -0.98 | +0.010 | -0.98 |
| Dble. Trans. | June 9 | | June 9 | | June 10 | | June 10 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 1453 | | 1452 | | 1454 | | 1456 | |
|----------------|------------|--------|----------------|---------|--------------------------------------|---------|-------------|---------|
| | U Ophiuchi | | 139 G. Scorpii | | Piazzi 17 ^h 68 (Herculis) | | 72 Herculis | |
| Mag.Spect. | 5.7 to 6.4 | B8 | 5.55 | F5 | 5.17 | M0 | 5.36 | G0 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " |
| | 17 15 | + 1 13 | 17 16 | - 32 38 | 17 19 | + 18 03 | 17 20 | + 32 28 |
| 1 ^d | 47.020 | 25 59 | 06 389 | 56.25 | 39 825 | 67 79 | 06 024 | 58 54 |
| 1 ^s | 47.205 | 23 84 | 06 620 | 55.97 | 39 994 | 65 21 | 06 187 | 55 36 |
| 1 | 47.427 | 22 08 | 06 894 | 55.84 | 40 203 | 62 67 | 06 395 | 52.26 |
| 1 | 47.680 | 20 38 | 07 203 | 55.86 | 40 447 | 60 27 | 06 644 | 49.38 |
| 1 | 47.955 | 18 81 | 07 536 | 55.99 | 40 715 | 58 11 | 06 923 | 46.81 |
| 2 | 48 246 | 17 42 | 07 888 | 56.24 | 41 003 | 56 25 | 07 227 | 44 62 |
| 2 | 48 547 | 16 27 | 08 252 | 56 58 | 41 305 | 54 78 | 07 548 | 42 93 |
| 3 | 48 851 | 15 41 | 08 617 | 56.98 | 41 610 | 53 74 | 07 875 | 41.77 |
| 3 | 49 155 | 14 85 | 08 984 | 57 42 | 41 919 | 53 16 | 08 207 | 41 17 |
| 3 | 49 454 | 14 63 | 09 345 | 57.90 | 42 222 | 53 07 | 08 534 | 41.16 |
| 4 | 49 743 | 14 72 | 09 694 | 58 39 | 42 515 | 53 44 | 08 848 | 41 71 |
| 4 | 50 022 | 15 11 | 10 032 | 58 91 | 42 797 | 54 23 | 09 149 | 42 78 |
| 4 | 50 283 | 15 78 | 10 351 | 59 45 | 43 060 | 55 44 | 09 428 | 44 33 |
| 5 | 50 526 | 16 66 | 10 649 | 60 01 | 43 303 | 56 95 | 09 680 | 46 26 |
| 5 | 50 748 | 17 73 | 10 923 | 60 60 | 43 523 | 58 74 | 09 905 | 48 53 |
| 5 | 50 943 | 18 92 | 11 165 | 61 22 | 43 712 | 60 73 | 10 094 | 51 02 |
| 5 | 51 111 | 20 18 | 11 376 | 61 86 | 43 872 | 62 31 | 10 248 | 53 64 |
| 6 | 51 247 | 21 47 | 11 549 | 62 54 | 43 998 | 64 95 | 10 362 | 56 33 |
| 6 | 51 346 | 22 74 | 11 678 | 63 23 | 44 085 | 67 07 | 10 432 | 58 99 |
| 6 | 51 411 | 23 94 | 11 766 | 63 93 | 44 136 | 69 09 | 10 460 | 61 53 |
| 7 | 51 437 | 25 07 | 11 808 | 64 61 | 44 147 | 71 00 | 10 445 | 63 92 |
| 7 | 51 425 | 26 08 | 11 802 | 65 25 | 44 117 | 72 71 | 10 385 | 66 06 |
| 7 | 51 377 | 26 95 | 11 753 | 65 83 | 44 051 | 74 20 | 10 287 | 67 92 |
| 8 | 51 293 | 27 69 | 11 661 | 66 32 | 43 949 | 75 45 | 10 149 | 69 47 |
| 8 | 51 179 | 28 25 | 11 533 | 66 70 | 43 816 | 76 41 | 09 980 | 70 64 |
| 8 | 51 042 | 28 66 | 11 376 | 66 94 | 43 660 | 77 09 | 09 785 | 71 45 |
| 9 | 50 886 | 28 90 | 11 196 | 67 02 | 43 484 | 77 46 | 09 570 | 71 85 |
| 9 | 50 723 | 28 96 | 11 007 | 66 95 | 43 300 | 77 50 | 09 347 | 71 82 |
| 9 | 50 559 | 28 85 | 10 819 | 66 71 | 43 116 | 77 24 | 09 124 | 71 39 |
| 10 | 50 404 | 28 55 | 10 641 | 66 33 | 42 939 | 76 63 | 08 910 | 70 53 |
| 10 | 50 271 | 28 05 | 10 491 | 65 81 | 42 784 | 75 69 | 08 717 | 69 24 |
| 10 | 50 166 | 27 37 | 10 374 | 65 20 | 42 656 | 74 45 | 08 554 | 67 57 |
| 11 | 50 097 | 26 48 | 10 301 | 64 53 | 42 564 | 72 88 | 08 429 | 65 49 |
| 11 | 50 072 | 25 39 | 10 283 | 63 84 | 42 516 | 71 03 | 08 352 | 63 08 |
| 11 | 50 093 | 24 12 | 10 318 | 63 18 | 42 514 | 68 94 | 08 323 | 60 38 |
| 12 | 50 161 | 22 67 | 10 412 | 62 59 | 42 561 | 66 61 | 08 349 | 57 43 |
| 12 | 50 279 | 21 08 | 10 560 | 62 10 | 42 659 | 64 15 | 08 431 | 54 33 |
| 12 | 50 439 | 19 39 | 10 762 | 61 69 | 42 802 | 61 60 | 08 563 | 51 17 |
| 12 | 50 641 | 17 65 | 11 013 | 61 44 | 42 989 | 59 03 | 08 745 | 48 02 |
| Mean Place | 50.586 | 29.68 | 10.894 | 54.52 | 43.151 | 73.24 | 09.218 | 64.41 |
| sec δ, tan δ | +1.000 | +0.021 | +1.188 | -0.641 | +1.052 | +0.326 | +1.185 | +0.637 |
| dα(ψ), dδ(ψ) | +0.061 | -0.08 | +0.078 | -0.08 | +0.053 | -0.07 | +0.045 | -0.07 |
| dα(ε), dδ(ε) | +0.000 | -0.98 | -0.008 | -0.98 | +0.004 | -0.98 | +0.007 | -0.98 |
| Dble.Trans. | June 10 | | June 11 | | June 11 | | June 12 | |

AT UPPER TRANSIT AT GREENWICH

| No. | 642 | | 644 | | 645 | | 1458 | |
|--------------|---------------------------|--------------------------|---------------------------|-------------------------|---------------------------|--------------------------|---------------------------|--------------------------|
| | ι Apodis | | ζ Ophiuchi | | β Arae | | 138 G. Ophiuchi | |
| Mag. Spect. | 5.60 | B8 | 3.37 | B3 | 2.80 | K2 | 6.31 | F5 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° ' | h m | ° ' | h m | ° ' | h m | ° ' |
| | 17 20 | -70 06 | 17 21 | -24 59 | 17 24 | -55 31 | 17 25 | - 1 38 |
| 1 -8.5 | 26 196 ^s + 324 | 38 91 ["] + 247 | 06 576 ^s + 159 | 15 62 ["] + 15 | 04 435 ^s + 227 | 07 37 ["] + 178 | 12 176 ^s + 138 | 31 32 ["] - 148 |
| 1 1.4 | 26 637 + 441 | 36 62 + 229 | 06 789 + 213 | 15 78 - 16 | 04 733 + 298 | 05 75 + 162 | 12 355 + 179 | 31 32 - 155 |
| 1 11.4 | 27 186 + 549 | 34 55 + 207 | 07 041 + 252 | 16 06 - 28 | 05 095 + 362 | 04 32 + 143 | 12 572 + 217 | 34 46 - 159 |
| 1 21.4 | 27 832 + 646 | 32 81 + 174 | 07 327 + 286 | 16 43 - 37 | 05 514 + 419 | 03 14 + 118 | 12 820 + 248 | 35 99 - 153 |
| 1 31.4 | 28 546 + 714 | 31 42 + 139 | 07 635 + 308 | 16 87 - 44 | 05 972 + 458 | 02 24 + 90 | 13 090 + 270 | 37 42 - 143 |
| 2 10.3 | 29 320 + 774 | 30 39 + 103 | 07 961 + 326 | 17 35 - 48 | 06 464 + 492 | 01 60 + 64 | 13 378 + 298 | 38 70 - 128 |
| 2 20.3 | 30 133 + 813 | 29 77 + 62 | 08 299 + 338 | 17 84 - 49 | 06 977 + 513 | 01 26 + 34 | 13 678 + 300 | 39 76 - 106 |
| 3 2.3 | 30 963 + 830 | 29 54 + 23 | 08 640 + 341 | 18 31 - 47 | 07 498 + 521 | 01 20 + 6 | 13 981 + 303 | 40 56 - 80 |
| 3 12.3 | 31 803 + 840 | 29 70 - 16 | 08 982 + 342 | 18 74 - 43 | 08 025 + 527 | 01 40 - 20 | 14 287 + 306 | 41 09 - 63 |
| 3 22.2 | 32 634 + 831 | 30 26 - 56 | 09 319 + 337 | 19 13 - 39 | 08 545 + 520 | 01 88 - 48 | 14 588 + 301 | 41 32 - 23 |
| 4 1.2 | 33 439 + 805 | 31 16 - 90 | 09 646 + 327 | 19 45 - 32 | 09 051 + 506 | 02 59 - 71 | 14 881 + 293 | 41 25 + 7 |
| 4 11.2 | 34 215 + 776 | 32 41 - 125 | 09 964 + 318 | 19 73 - 28 | 09 541 + 490 | 03 54 - 95 | 15 166 + 285 | 40 91 + 34 |
| 4 21.1 | 34 941 + 726 | 33 99 - 158 | 10 264 + 300 | 19 96 - 23 | 10 004 + 463 | 04 72 - 118 | 15 434 + 268 | 40 32 + 59 |
| 5 1.1 | 35 608 + 667 | 35 83 - 184 | 10 546 + 282 | 20 16 - 20 | 10 434 + 430 | 06 07 - 135 | 15 686 + 252 | 39 53 + 79 |
| 5 11.1 | 36 210 + 602 | 37 93 - 210 | 10 806 + 260 | 20 34 - 18 | 10 828 + 394 | 07 61 - 154 | 15 917 + 231 | 38 57 + 96 |
| 5 21.1 | 36 726 + 516 | 40 24 - 231 | 11 038 + 232 | 20 51 - 17 | 11 174 + 346 | 09 30 - 169 | 16 122 + 205 | 37 49 + 108 |
| 5 31.0 | 37 155 + 429 | 42 69 - 245 | 11 240 + 202 | 20 70 - 19 | 11 470 + 296 | 11 10 - 180 | 16 301 + 179 | 36 35 + 114 |
| 6 10.0 | 37 486 + 331 | 45 26 - 257 | 11 407 + 167 | 20 90 - 20 | 11 710 + 240 | 13 00 - 190 | 16 448 + 147 | 35 19 + 116 |
| 6 20.0 | 37 707 + 221 | 47 87 - 261 | 11 535 + 128 | 21 13 - 23 | 11 884 + 174 | 14 93 - 193 | 16 558 + 110 | 34 04 + 115 |
| 6 30.0 | 37 823 + 116 | 50 44 - 257 | 11 624 + 89 | 21 37 - 24 | 11 996 + 112 | 16 85 - 192 | 16 634 + 76 | 32 95 + 109 |
| 7 9.9 | 37 824 + 1 | 52 94 - 250 | 11 669 + 45 | 21 63 - 26 | 12 037 + 41 | 18 72 - 187 | 16 671 + 37 | 31 94 + 101 |
| 7 19.9 | 37 712 - 112 | 55 27 - 233 | 11 670 + 1 | 21 89 - 26 | 12 009 - 28 | 20 46 - 174 | 16 667 - 4 | 31 03 + 91 |
| 7 29.9 | 37 499 - 213 | 57 36 - 209 | 11 631 - 39 | 22 14 - 25 | 11 918 - 91 | 22 05 - 159 | 16 628 - 39 | 30 25 + 78 |
| 8 8.8 | 37 185 - 314 | 59 16 - 180 | 11 551 - 80 | 22 35 - 21 | 11 763 - 155 | 23 42 - 137 | 16 552 - 76 | 29 59 + 66 |
| 8 18.8 | 36 787 - 398 | 60 58 - 142 | 11 436 - 115 | 22 52 - 17 | 11 554 - 209 | 24 50 - 108 | 16 444 - 108 | 29 08 + 51 |
| 8 28.8 | 36 325 - 462 | 61 60 - 102 | 11 294 - 142 | 22 62 - 10 | 11 304 - 250 | 25 27 - 77 | 16 311 - 133 | 28 70 + 38 |
| 9 7.8 | 35 811 - 514 | 62 16 - 56 | 11 129 - 165 | 22 64 - 2 | 11 019 - 285 | 25 70 - 43 | 16 158 - 153 | 28 46 + 24 |
| 9 17.7 | 35 278 - 533 | 62 21 - 5 | 10 955 - 174 | 22 59 + 5 | 10 719 - 300 | 25 74 - 4 | 15 996 - 162 | 28 38 + 8 |
| 9 27.7 | 34 746 - 532 | 61 80 + 41 | 10 781 - 174 | 22 45 + 14 | 10 420 - 299 | 25 42 + 32 | 15 832 - 164 | 28 45 - 7 |
| 10 7.7 | 34 239 - 507 | 60 88 + 92 | 10 616 - 165 | 22 23 + 22 | 10 134 - 286 | 24 72 + 70 | 15 676 - 156 | 28 67 - 22 |
| 10 17.7 | 33 792 - 447 | 59 51 + 137 | 10 474 - 142 | 21 96 + 27 | 09 885 - 249 | 23 67 + 105 | 15 540 - 136 | 29 07 - 40 |
| 10 27.6 | 33 422 - 370 | 57 75 + 176 | 10 364 - 110 | 21 65 + 31 | 09 683 - 202 | 22 32 + 135 | 15 431 - 109 | 29 63 - 56 |
| 11 6.6 | 33 149 - 273 | 55 63 + 212 | 10 293 - 71 | 21 34 + 31 | 09 542 - 141 | 20 72 + 160 | 15 357 - 74 | 30 37 - 74 |
| 11 16.6 | 32 999 - 150 | 53 27 + 236 | 10 273 - 20 | 21 06 + 28 | 09 542 - 65 | 18 94 + 178 | 15 327 - 30 | 31 29 - 92 |
| 11 26.5 | 32 973 - 26 | 50 74 + 253 | 10 303 + 30 | 20 83 + 23 | 09 489 + 12 | 17 06 + 188 | 15 342 + 15 | 32 37 - 108 |
| 12 6.5 | 33 082 + 109 | 48 14 + 260 | 10 389 + 86 | 20 70 + 13 | 09 585 + 96 | 15 14 + 192 | 15 404 + 62 | 33 63 - 126 |
| 12 16.5 | 33 328 + 246 | 45 58 + 256 | 10 514 + 125 | 20 71 - 1 | 09 764 + 179 | 13 28 + 186 | 15 515 + 111 | 35 01 - 138 |
| 12 26.5 | 33 696 + 368 | 43 14 + 244 | 10 704 + 190 | 20 72 - 1 | 10 019 + 255 | 11 53 + 175 | 15 669 + 154 | 36 50 - 149 |
| 12 36.4 | 34 186 + 490 | 40 89 + 225 | 10 936 + 232 | 20 91 - 19 | 10 346 + 327 | 09 94 + 159 | 15 865 + 196 | 38 05 - 155 |
| | + 592 | + 196 | + 267 | - 29 | + 388 | + 135 | + 231 | - 154 |
| Mean Place | 35.287 | 38.25 | 10.794 | 12.85 | 10.575 | 05.75 | 15.807 | 26.76 |
| sec δ, tan δ | +2.939 | -2.764 | +1.103 | -0.466 | +1.766 | -1.456 | +1.000 | -0.029 |
| da(ψ), dδ(ψ) | +0.133 | -0.07 | +0.073 | -0.07 | +0.099 | -0.06 | +0.062 | -0.06 |
| da(ε), dδ(ε) | -0.032 | -0.99 | -0.005 | -0.99 | -0.015 | -0.99 | -0.000 | -0.99 |
| Dble. Trans. | June 12 | | June 12 | | June 13 | | June 13 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 1457 | | 1459 | | 647 | | 650 | | |
|--------------|-------------|-------------|------------|-------------|----------------|-------------|-------------|-------------|------------|
| | 44 Ophiuchi | | σ Ophiuchi | | 27 H. Ophiuchi | | 77 Herculis | | |
| Mag.Spect. | 4.28 | F0 | 4.44 | K0 | 4.61 | F0 | 5.81 | A2 | |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " | |
| | 17 25 | -24 09 | 17 25 | + 4 08 | 17 25 | - 5 04 | 17 26 | +48 15 | |
| 1 | -8.5 | 28 520 +143 | 52 62 + 3 | 47 136 +132 | 59 95 -182 | 51 169 +141 | 35 94 -129 | 19 596 + 85 | 68 50 -357 |
| 1 | 1.4 | 28 729 +209 | 52 82 -20 | 47 310 +174 | 58 08 -187 | 51 351 +182 | 37 29 -135 | 19 743 +147 | 64 94 -356 |
| 1 | 11.4 | 28 976 +247 | 53 12 -30 | 47 521 +211 | 56 20 -188 | 51 570 +219 | 38 69 -140 | 19 950 +207 | 61 48 -346 |
| 1 | 21.4 | 29 257 +281 | 53 51 -39 | 47 764 +243 | 54 39 -181 | 51 821 +251 | 40 06 -137 | 20 212 +262 | 58 27 -321 |
| 1 | 31.4 | 29 561 +304 | 53 96 -45 | 48 030 +266 | 52 73 -166 | 52 094 +273 | 41 34 -128 | 20 517 +305 | 55 42 -285 |
| 2 | 10.3 | 29 883 +322 | 54 44 -48 | 48 314 +284 | 51 26 -147 | 52 384 +290 | 42 51 -117 | 20 860 +343 | 53 00 -242 |
| 2 | 20.3 | 30 217 +334 | 54 92 -48 | 48 611 +297 | 50 07 -119 | 52 686 +302 | 43 48 -97 | 21 229 +369 | 51 15 -185 |
| 3 | 2.3 | 30 555 +338 | 55 37 -45 | 48 911 +300 | 49 18 -89 | 52 992 +306 | 44 24 -76 | 21 612 +383 | 49 90 -125 |
| 3 | 12.3 | 30 895 +340 | 55 77 -40 | 49 215 +304 | 48 63 -55 | 53 300 +308 | 44 75 -51 | 22 004 +392 | 49 28 -62 |
| 3 | 22.2 | 31 230 +335 | 56 12 -35 | 49 514 +299 | 48 44 -19 | 53 603 +303 | 44 99 -24 | 22 393 +389 | 49 34 + 6 |
| 4 | 1.2 | 31 556 +326 | 56 40 -28 | 49 804 +290 | 48 59 +15 | 53 899 +296 | 44 98 + 1 | 22 767 +374 | 50 01 + 67 |
| 4 | 11.2 | 31 874 +318 | 56 63 -23 | 50 086 +282 | 49 07 +48 | 54 185 +286 | 44 72 +26 | 23 125 +358 | 51 29 +128 |
| 4 | 21.1 | 32 175 +301 | 56 80 -17 | 50 352 +266 | 49 85 +78 | 54 457 +272 | 44 24 +48 | 23 452 +327 | 53 12 +183 |
| 5 | 1.1 | 32 457 +282 | 56 93 -13 | 50 600 +248 | 50 87 +102 | 54 711 +254 | 43 58 +66 | 23 746 +294 | 55 37 +225 |
| 5 | 11.1 | 32 719 +262 | 57 05 -12 | 50 828 +228 | 52 09 +122 | 54 945 +234 | 42 78 +80 | 24 001 +255 | 58 01 +264 |
| 5 | 21.1 | 32 952 +233 | 57 16 -11 | 51 030 +202 | 53 45 +136 | 55 153 +208 | 41 88 +90 | 24 208 +207 | 60 92 +291 |
| 5 | 31.0 | 33 157 +205 | 57 28 -12 | 51 204 +174 | 54 89 +144 | 55 335 +182 | 40 93 +95 | 24 367 +159 | 63 98 +306 |
| 6 | 10.0 | 33 327 +170 | 57 42 -14 | 51 346 +142 | 56 37 +148 | 55 485 +150 | 39 95 +98 | 24 475 +108 | 67 13 +315 |
| 6 | 20.0 | 33 458 +131 | 57 58 -16 | 51 452 +106 | 57 83 +146 | 55 599 +114 | 39 00 +95 | 24 526 + 51 | 70 25 +312 |
| 6 | 30.0 | 33 550 + 92 | 57 78 -20 | 51 523 + 71 | 59 22 +139 | 55 677 + 78 | 38 10 +90 | 24 525 - 1 | 73 25 +300 |
| 7 | 9.9 | 33 599 + 49 | 57 99 -21 | 51 555 + 32 | 60 53 +131 | 55 716 + 39 | 37 26 +84 | 24 467 - 58 | 76 08 +283 |
| 7 | 19.9 | 33 603 + 4 | 58 21 -22 | 51 547 - 8 | 61 70 +117 | 55 715 - 1 | 36 52 +74 | 24 356 -111 | 78 63 +255 |
| 7 | 29.9 | 33 568 - 35 | 58 42 -21 | 51 504 -43 | 62 72 +102 | 55 678 -37 | 35 89 +63 | 24 197 -159 | 80 87 +224 |
| 8 | 8.8 | 33 491 - 77 | 58 62 -20 | 51 423 - 81 | 63 58 + 86 | 55 603 - 75 | 35 35 +54 | 23 990 -207 | 82 75 +188 |
| 8 | 18.8 | 33 379 -112 | 58 77 -15 | 51 312 -111 | 64 25 + 67 | 55 496 -107 | 34 94 +41 | 23 745 -245 | 84 19 +144 |
| 8 | 28.8 | 33 239 -140 | 58 88 -11 | 51 176 -136 | 64 74 + 49 | 55 365 -131 | 34 63 +31 | 23 470 -278 | 85 20 +101 |
| 9 | 7.8 | 33 076 -163 | 58 91 - 3 | 51 019 -157 | 64 74 +29 | 55 365 -153 | 34 63 +20 | 23 470 -295 | 85 20 +55 |
| 9 | 17.7 | 32 903 -173 | 58 87 + 4 | 50 853 -166 | 65 03 + 8 | 55 212 -161 | 34 43 +7 | 23 171 -310 | 85 75 + 3 |
| 9 | 27.7 | 32 730 -173 | 58 76 +11 | 50 686 -167 | 65 00 -11 | 54 888 -163 | 34 40 -4 | 22 861 -311 | 85 78 -43 |
| 10 | 7.7 | 32 564 -166 | 58 58 +18 | 50 526 -160 | 64 67 -33 | 54 732 -156 | 34 57 -17 | 22 550 -303 | 85 35 -94 |
| 10 | 17.7 | 32 422 -142 | 58 35 +23 | 50 386 -140 | 64 12 -55 | 54 597 -135 | 34 87 -30 | 21 969 -278 | 82 98 -143 |
| 10 | 27.6 | 32 309 -113 | 58 09 +26 | 50 273 -113 | 63 36 -76 | 54 489 -108 | 35 31 -44 | 21 724 -245 | 81 10 -188 |
| 11 | 6.6 | 32 237 -72 | 57 83 +26 | 50 194 -79 | 62 37 -99 | 54 416 -73 | 35 31 -60 | 21 522 -202 | 78 76 -234 |
| 11 | 16.6 | 32 213 -24 | 57 59 +24 | 50 159 -35 | 62 37 -120 | 54 416 -28 | 35 91 -75 | 21 522 -147 | 76 03 -273 |
| 11 | 26.5 | 32 239 + 26 | 57 41 +18 | 50 167 + 8 | 61 17 -139 | 54 404 +16 | 37 55 -89 | 21 285 -90 | 72 99 -304 |
| 12 | 6.5 | 32 320 + 81 | 57 32 + 9 | 50 224 + 57 | 58 20 -158 | 54 469 + 65 | 38 60 -105 | 21 261 -24 | 69 65 -334 |
| 12 | 16.5 | 32 435 +115 | 57 39 - 7 | 50 329 +105 | 56 48 -172 | 54 582 +113 | 39 78 -118 | 21 305 + 44 | 66 16 -349 |
| 12 | 26.5 | 32 626 +191 | 57 43 - 4 | 50 329 +148 | 56 48 -181 | 54 582 +157 | 39 78 -129 | 21 305 +107 | 66 16 -355 |
| 12 | 36.4 | 32 852 +226 | 57 43 -21 | 50 477 +191 | 54 67 -187 | 54 739 +199 | 41 07 -136 | 21 412 +172 | 62 61 -353 |
| | | 32 852 +263 | 57 64 -32 | 50 668 +225 | 52 80 -183 | 54 938 +234 | 42 43 -136 | 21 584 +229 | 59 08 -334 |
| Mean Place | 32.714 | 49 40 | 50 665 | 64 88 | 54.861 | 31.57 | 22.736 | 75 65 | |
| sec δ, tan δ | +1.096 | -0.449 | +1.003 | +0.073 | +1.004 | -0.089 | +1.502 | +1.121 | |
| dα(ψ), dδ(ψ) | +0.073 | -0.06 | +0.059 | -0.06 | +0.063 | -0.06 | +0.032 | -0.06 | |
| dα(ε), dδ(ε) | -0.004 | -0.99 | +0.001 | -0.99 | -0.001 | -0.99 | +0.011 | -0.99 | |
| Dble.Trans. | June 13 | | June 13 | | June 13 | | June 13 | | |

AT UPPER TRANSIT AT GREENWICH

| No. | 646 | | 1455 | | 649 | | 648 | |
|--------------|--------------------------|------------------------|--------------------------|-------------------------|--------------------------|------------------------|--------------------------|-------------------------|
| | 45 Ophiuchi | | 59 G. Apodis | | υ Scorpii | | δ Arae | |
| Mag.Spect. | 4.37 | F5 | 5.93 | M3 | 2.80 | B3 | 3.79 | B8 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " |
| | 17 26 | -29 51 | 17 28 | -80 50 | 17 29 | -37 17 | 17 29 | -60 40 |
| 1 -8.5 | 25.111 ^s +164 | 23.68 ["] +30 | 37.600 ^s +522 | 58.80 ["] +293 | 45.975 ^s +174 | 12.81 ["] +75 | 45.878 ^s +236 | 27.74 ["] +208 |
| 1 1.4 | 25.327 +216 | 23.51 +17 | 38.376 +776 | 56.04 +276 | 46.201 +226 | 12.17 +64 | 46.198 +320 | 25.83 +191 |
| 1 11.4 | 25.585 +258 | 23.47 +4 | 39.389 +1013 | 53.51 +253 | 46.474 +273 | 11.68 +49 | 46.593 +395 | 24.10 +173 |
| 1 21.4 | 25.878 +293 | 23.55 -8 | 40.621 +1232 | 51.31 +220 | 46.786 +312 | 11.34 +34 | 47.055 +462 | 22.63 +147 |
| 1 31.4 | 26.195 +317 | 23.73 -18 | 42.015 +1394 | 49.49 +182 | 47.125 +339 | 11.15 +19 | 47.565 +510 | 21.46 +117 |
| 2 10.3 | 26.533 +338 | 23.99 -26 | 43.552 +1537 | 48.07 +142 | 47.488 +363 | 11.09 +6 | 48.117 +552 | 20.58 +88 |
| 2 20.3 | 26.883 +350 | 24.30 -31 | 45.192 +1640 | 47.12 +95 | 47.865 +377 | 11.17 -8 | 48.696 +579 | 20.04 +54 |
| 3 2.3 | 27.237 +354 | 24.65 -35 | 46.884 +1692 | 46.62 +50 | 48.247 +382 | 11.34 -17 | 49.287 +591 | 19.80 +24 |
| 3 12.3 | 27.594 +357 | 25.01 -36 | 48.612 +1728 | 46.56 +6 | 48.634 +387 | 11.61 -27 | 49.888 +601 | 19.89 -9 |
| 3 22.2 | 27.946 +352 | 25.38 -37 | 50.329 +1717 | 46.98 -42 | 49.016 +382 | 11.96 -35 | 50.483 +595 | 20.29 -40 |
| 4 1.2 | 28.289 +343 | 25.73 -35 | 51.999 +1670 | 47.82 -84 | 49.389 +373 | 12.38 -42 | 51.063 +580 | 20.97 -68 |
| 4 11.2 | 28.623 +334 | 26.09 -36 | 53.611 +1612 | 49.08 -126 | 49.753 +364 | 12.88 -50 | 51.627 +564 | 21.93 -96 |
| 4 21.1 | 28.940 +317 | 26.45 -36 | 55.115 +1504 | 50.74 -166 | 50.098 +345 | 13.44 -56 | 52.159 +532 | 23.16 -123 |
| 5 1.1 | 29.238 +298 | 26.81 -36 | 56.492 +1377 | 52.72 -198 | 50.423 +325 | 14.07 -63 | 52.655 +496 | 24.62 -146 |
| 5 11.1 | 29.514 +276 | 27.19 -38 | 57.725 +1233 | 55.03 -231 | 50.724 +301 | 14.77 -70 | 53.109 +454 | 26.30 -168 |
| 5 21.1 | 29.760 +246 | 27.60 -41 | 58.771 +1046 | 57.59 -256 | 50.993 +269 | 15.54 -77 | 53.507 +398 | 28.16 -186 |
| 5 31.0 | 29.975 +215 | 28.04 -44 | 59.626 +855 | 60.35 -276 | 51.229 +236 | 16.36 -82 | 53.848 +341 | 30.16 -200 |
| 6 10.0 | 30.155 +190 | 28.51 -47 | 60.268 +642 | 63.26 -291 | 51.425 +196 | 17.25 -89 | 54.123 +275 | 32.28 -212 |
| 6 20.0 | 30.293 +138 | 29.01 -50 | 60.672 +404 | 66.23 -297 | 51.576 +151 | 18.17 -92 | 54.322 +199 | 34.44 -216 |
| 6 30.0 | 30.391 +98 | 29.53 -52 | 60.850 +178 | 69.19 -296 | 51.682 +106 | 19.11 -94 | 54.449 +127 | 36.60 -216 |
| 7 9.9 | 30.442 +51 | 30.06 -53 | 60.784 -66 | 72.08 -289 | 51.739 +57 | 20.04 -93 | 54.495 +46 | 38.73 -213 |
| 7 19.9 | 30.447 +5 | 30.57 -51 | 60.476 -308 | 74.79 -271 | 51.744 +5 | 20.93 -89 | 54.460 -35 | 40.72 -199 |
| 7 29.9 | 30.410 -37 | 31.05 -48 | 59.956 -520 | 77.26 -247 | 51.703 -41 | 21.76 -83 | 54.352 -108 | 42.53 -181 |
| 8 8.8 | 30.329 -81 | 31.47 -42 | 59.222 -734 | 79.41 -215 | 51.614 -89 | 22.48 -72 | 54.169 -183 | 44.12 -159 |
| 8 18.8 | 30.210 -119 | 31.81 -34 | 58.310 -912 | 81.14 -173 | 51.484 -130 | 23.06 -58 | 53.924 -245 | 45.39 -127 |
| 8 28.8 | 30.063 -147 | 32.05 -24 | 57.262 -1048 | 82.43 -129 | 51.323 -161 | 23.49 -43 | 53.630 -294 | 46.33 -94 |
| 9 7.8 | 29.892 -171 | 32.16 -11 | 56.102 -1160 | 83.20 -77 | 51.134 -189 | 23.72 -23 | 53.295 -335 | 46.89 -56 |
| 9 17.7 | 29.709 -183 | 32.14 +2 | 54.894 -1208 | 83.41 -21 | 50.933 -201 | 23.75 -3 | 52.942 -353 | 47.02 -13 |
| 9 27.7 | 29.526 -183 | 32.14 +15 | 53.685 -1209 | 83.08 +33 | 50.731 -202 | 23.57 +18 | 52.587 -355 | 46.74 +28 |
| 10 7.7 | 29.351 -175 | 31.72 +27 | 52.516 -1169 | 82.18 +90 | 50.536 -195 | 23.19 +38 | 52.245 -342 | 46.04 +70 |
| 10 17.7 | 29.200 -151 | 31.34 +38 | 51.463 -1053 | 80.74 +144 | 50.368 -168 | 22.63 +56 | 51.943 -302 | 44.94 +110 |
| 10 27.6 | 29.080 -120 | 30.87 +47 | 50.560 -903 | 78.84 +190 | 50.233 -135 | 21.92 +71 | 51.693 -250 | 43.50 +144 |
| 11 6.6 | 29.002 -78 | 30.35 +52 | 49.849 -711 | 76.51 +233 | 50.141 -92 | 21.08 +84 | 51.511 -182 | 41.75 +175 |
| 11 16.6 | 28.975 -27 | 30.83 +52 | 49.386 -463 | 73.86 +265 | 50.105 -36 | 20.18 +90 | 51.415 -96 | 39.79 +196 |
| 11 26.5 | 29.001 +26 | 29.32 +51 | 49.175 -211 | 71.00 +286 | 50.125 +20 | 19.26 +92 | 51.406 -9 | 37.69 +210 |
| 12 6.5 | 29.082 +81 | 28.89 +43 | 49.242 +67 | 68.00 +300 | 50.206 +81 | 18.37 +89 | 51.491 +85 | 35.51 +218 |
| 12 16.5 | 29.216 +134 | 28.57 +32 | 49.597 +355 | 65.01 +299 | 50.346 +140 | 17.55 +82 | 51.673 +182 | 33.37 +214 |
| 12 26.5 | 29.401 +185 | 28.27 +30 | 50.213 +616 | 62.11 +290 | 50.540 +194 | 16.81 +74 | 51.942 +269 | 31.32 +205 |
| 12 36.4 | 29.637 +236 | 28.13 +14 | 51.092 +879 | 59.39 +272 | 50.788 +248 | 16.20 +61 | 52.295 +353 | 29.43 +189 |
| | 29.511 +274 | 28.13 +1 | 51.092 +1108 | 59.39 +243 | 50.788 +290 | 16.20 +46 | 52.295 +425 | 29.43 +164 |
| Mean Place | 29.511 | 20.65 | 54.796 | 57.07 | 50.707 | 09.68 | 52.723 | 25.49 |
| sec δ, tan δ | +1.153 | -0.574 | +6.288 | -6.208 | +1.257 | -0.761 | +2.042 | -1.780 |
| dα(ψ), dδ(ψ) | +0.076 | -0.06 | +0.224 | -0.05 | +0.081 | -0.05 | +0.108 | -0.05 |
| dα(ε), dδ(ε) | -0.006 | -0.99 | -0.056 | -0.99 | -0.007 | -0.99 | -0.016 | -0.99 |
| Dble.Trans. | June 13 | | June 14 | | June 14 | | June 14 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 653 | | 1460 | | 651 | | 655 | |
|--------------|------------|--------------|--------------|-------------|--------------|-------------|-------------------------|-------------|
| | β Draconis | | λ Herculis | | α Arae | | ν ¹ Draconis | |
| Mag.Spect. | 2.99 | G0 | 4.48 | K0 | 2.97 | B3p | 4.98 | A5 |
| U.T. | R.A. | | R.A. | | R.A. | | R.A. | |
| | h | Dec. | h | Dec. | h | Dec. | h | Dec. |
| | 17 30 | + 52 18 | 17 30 | + 26 06 | 17 30 | - 49 51 | 17 31 | + 55 11 |
| 1 | -8.5 | 04.54 + 72 | 08.30 + 109 | 66.76 - 288 | 42.286 + 199 | 62.44 + 149 | 51.353 + 63 | 28.21 - 367 |
| 1 | 1.4 | 04.594 + 140 | 08.454 + 154 | 63.86 - 290 | 42.548 + 262 | 61.08 + 136 | 51.489 + 136 | 24.55 - 366 |
| 1 | 11.4 | 04.799 + 205 | 08.650 + 196 | 61.01 - 285 | 42.867 + 319 | 59.88 + 120 | 51.696 + 207 | 20.99 - 356 |
| 1 | 21.4 | 05.066 + 267 | 08.886 + 236 | 58.33 - 268 | 43.236 + 369 | 58.91 + 97 | 51.970 + 274 | 17.68 - 331 |
| 1 | 31.4 | 05.381 + 315 | 09.150 + 264 | 55.92 - 241 | 43.641 + 405 | 58.15 + 76 | 52.297 + 327 | 14.74 - 294 |
| 2 | 10.3 | 05.739 + 358 | 09.437 + 287 | 53.84 - 208 | 44.075 + 434 | 57.63 + 52 | 52.671 + 374 | 12.23 - 251 |
| 2 | 20.3 | 06.129 + 390 | 09.742 + 305 | 52.21 - 163 | 44.529 + 454 | 57.34 + 29 | 53.080 + 409 | 10.31 - 192 |
| 3 | 2.3 | 06.535 + 406 | 10.054 + 312 | 51.06 - 115 | 44.991 + 467 | 57.28 + 6 | 53.508 + 428 | 09.00 - 131 |
| 3 | 12.3 | 06.953 + 418 | 10.371 + 317 | 50.43 - 63 | 45.458 + 462 | 57.44 - 16 | 53.950 + 442 | 08.34 - 66 |
| 3 | 22.2 | 07.369 + 416 | 10.686 + 315 | 50.35 - 8 | 45.922 + 464 | 57.81 - 37 | 54.389 + 439 | 08.38 + 4 |
| 4 | 1.2 | 07.770 + 401 | 10.991 + 305 | 50.79 + 44 | 46.374 + 452 | 58.37 - 56 | 54.814 + 425 | 09.05 + 67 |
| 4 | 11.2 | 08.153 + 383 | 11.286 + 295 | 51.72 + 93 | 46.815 + 441 | 59.12 - 75 | 55.219 + 405 | 10.34 + 129 |
| 4 | 21.1 | 08.504 + 351 | 11.562 + 276 | 53.11 + 139 | 47.233 + 418 | 60.05 - 93 | 55.589 + 370 | 12.21 + 187 |
| 5 | 1.1 | 08.817 + 313 | 11.816 + 254 | 54.86 + 175 | 47.624 + 391 | 61.14 - 109 | 55.919 + 330 | 14.53 + 232 |
| 5 | 11.1 | 09.088 + 271 | 12.046 + 230 | 56.93 + 207 | 47.985 + 361 | 62.38 - 124 | 56.203 + 284 | 17.24 + 271 |
| 5 | 21.1 | 09.306 + 218 | 12.244 + 198 | 59.23 + 230 | 48.306 + 321 | 63.76 - 138 | 56.431 + 228 | 20.25 + 301 |
| 5 | 31.0 | 09.472 + 166 | 12.410 + 166 | 61.66 + 243 | 48.584 + 278 | 65.24 - 148 | 56.601 + 170 | 23.41 + 316 |
| 6 | 10.0 | 09.582 + 110 | 12.540 + 130 | 64.17 + 251 | 48.814 + 230 | 66.82 - 158 | 56.710 + 109 | 26.69 + 328 |
| 6 | 20.0 | 09.628 + 46 | 12.629 + 89 | 66.66 + 249 | 48.986 + 172 | 68.43 - 161 | 56.752 + 42 | 29.93 + 324 |
| 6 | 30.0 | 09.618 - 10 | 12.678 + 49 | 69.06 + 240 | 49.104 + 118 | 70.06 - 163 | 56.732 - 20 | 33.06 + 313 |
| 7 | 9.9 | 09.547 - 71 | 12.685 + 7 | 71.32 + 226 | 49.159 + 55 | 71.66 - 160 | 56.648 - 84 | 36.03 + 297 |
| 7 | 19.9 | 09.416 - 131 | 12.649 - 36 | 73.37 + 205 | 49.153 - 6 | 73.17 - 151 | 56.500 - 148 | 38.71 + 268 |
| 7 | 29.9 | 09.235 - 181 | 12.575 - 74 | 75.18 + 181 | 49.089 - 64 | 74.56 - 139 | 56.299 - 201 | 41.07 + 236 |
| 8 | 8.8 | 09.002 - 233 | 12.462 - 113 | 76.71 + 153 | 48.968 - 121 | 75.77 - 121 | 56.042 - 257 | 43.06 + 199 |
| 8 | 18.8 | 08.727 - 275 | 12.316 - 146 | 77.90 + 119 | 48.797 - 171 | 76.74 - 97 | 55.742 - 300 | 44.61 + 155 |
| 8 | 28.8 | 08.420 - 307 | 12.145 - 171 | 78.76 + 86 | 48.588 - 209 | 77.46 - 72 | 55.407 - 335 | 45.71 + 110 |
| 9 | 7.8 | 08.086 - 334 | 11.952 - 193 | 79.26 + 50 | 48.346 - 242 | 77.88 - 42 | 55.043 - 364 | 46.33 + 62 |
| 9 | 17.7 | 07.740 - 346 | 11.749 - 203 | 79.37 + 11 | 48.089 - 257 | 77.97 - 9 | 54.667 - 376 | 46.43 + 10 |
| 9 | 27.7 | 07.393 - 347 | 11.544 - 205 | 79.12 - 25 | 47.830 - 259 | 77.74 + 23 | 54.289 - 378 | 46.03 - 40 |
| 10 | 7.7 | 07.054 - 339 | 11.346 - 198 | 78.47 - 65 | 47.582 - 248 | 77.18 + 56 | 53.919 - 370 | 45.11 - 92 |
| 10 | 17.7 | 06.740 - 314 | 11.167 - 179 | 77.42 - 105 | 47.364 - 218 | 76.32 + 86 | 53.576 - 343 | 43.68 - 143 |
| 10 | 27.6 | 06.460 - 280 | 11.016 - 151 | 76.03 - 139 | 47.186 - 178 | 75.21 + 111 | 53.268 - 308 | 41.78 - 190 |
| 11 | 6.6 | 06.225 - 235 | 10.899 - 117 | 74.26 - 177 | 47.061 - 125 | 73.86 + 135 | 53.006 - 262 | 39.40 - 238 |
| 11 | 16.6 | 06.048 - 177 | 10.827 - 72 | 72.16 - 210 | 47.003 - 58 | 72.36 + 150 | 52.806 - 200 | 36.62 - 278 |
| 11 | 26.5 | 05.932 - 116 | 10.801 - 26 | 69.79 - 237 | 47.013 + 10 | 70.78 + 158 | 52.671 - 135 | 33.51 - 311 |
| 12 | 6.5 | 05.886 - 46 | 10.826 + 25 | 67.16 - 263 | 47.096 + 83 | 69.16 + 162 | 52.608 - 63 | 30.09 - 342 |
| 12 | 16.5 | 05.913 + 27 | 10.904 + 78 | 64.38 - 278 | 47.253 + 157 | 67.59 + 157 | 52.624 + 16 | 26.52 - 357 |
| 12 | 26.5 | 06.009 + 96 | 11.029 + 125 | 61.51 - 287 | 47.476 + 223 | 66.12 + 147 | 52.713 + 89 | 22.87 - 365 |
| 12 | 36.4 | 06.175 + 166 | 11.202 + 173 | 58.63 - 288 | 47.764 + 288 | 64.78 + 134 | 52.878 + 165 | 19.24 - 363 |
| | | + 231 | + 213 | - 276 | + 342 | + 113 | + 234 | - 344 |
| Mean Place | 07.611 | 39.84 | 11.560 | 73.05 | 47.853 | 59.70 | 54.539 | 35.62 |
| sec δ, tan δ | +1.636 | +1.294 | +1.114 | +0.490 | +1.551 | -1.186 | +1.752 | +1.438 |
| dα(ψ), dδ(ψ) | +0.027 | -0.05 | +0.048 | -0.05 | +0.092 | -0.05 | +0.023 | -0.05 |
| dα(ε), dδ(ε) | +0.011 | -0.99 | +0.004 | -0.99 | -0.010 | -0.99 | +0.012 | -0.99 |
| Dble.Trans. | June 14 | | June 14 | | June 14 | | June 15 | |

APPARENT PLACES OF STARS, 1986

271

AT UPPER TRANSIT AT GREENWICH

| No. | 657 | | 659 | | 652 | | 1462 | |
|----------------|-------------------------|------------|--------------|-------------|--------------|------------|--------------------------------|------------|
| | v ² Draconis | | 27 Draconis | | λ Scorpii | | Groombridge 2444 (Herculis) | |
| Mag.Spect. | 4.95 | A5 | 5.21 | K0 | 1.71 | B2 | 5.82 | K0 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° ' | h m | ° ' | h m | ° ' | h m | ° ' |
| | 17 31 | +55 10 | 17 31 | +68 08 | 17 32 | -37 05 | 17 32 | +41 14 |
| 1 ^d | 56 814 + 63 | 47 20 -367 | 57 596 + 16 | 29 61 -374 | 36 765 + 170 | 45 10 + 75 | 38 356 + 87 | 62 24 -340 |
| 1 1.5 | 56 951 + 137 | 43 54 -366 | 57 725 + 129 | 25 90 -371 | 36 987 + 222 | 44 46 + 64 | 38 498 + 142 | 58 85 -339 |
| 1 11.4 | 57 158 + 207 | 39 98 -366 | 57 964 + 239 | 22 28 -362 | 37 256 + 269 | 43 96 + 50 | 38 692 + 194 | 55 52 -333 |
| 1 21.4 | 57 431 + 273 | 36 67 -331 | 58 310 + 346 | 18 93 -335 | 37 565 + 309 | 43 61 + 35 | 38 936 + 244 | 52 42 -310 |
| 1 31.4 | 57 758 + 327 | 33 72 -295 | 58 744 + 434 | 15 97 -296 | 37 902 + 337 | 43 40 + 21 | 39 216 + 280 | 49 65 -277 |
| 2 10.3 | 58 132 + 374 | 31 22 -250 | 59 256 + 512 | 13 45 -252 | 38 261 + 359 | 43 32 + 8 | 39 528 + 312 | 47 27 -238 |
| 2 20.3 | 58 540 + 408 | 29 30 -192 | 59 828 + 572 | 11 53 -192 | 38 636 + 375 | 43 37 - 5 | 39 865 + 337 | 45 43 -184 |
| 3 2.3 | 58 968 + 428 | 27 99 -131 | 60 436 + 608 | 10 24 -129 | 39 017 + 381 | 43 51 -14 | 40 213 + 348 | 44 15 -128 |
| 3 12.3 | 59 410 + 442 | 27 32 - 67 | 61 068 + 632 | 09 61 - 63 | 39 402 + 385 | 43 75 -24 | 40 570 + 357 | 43 47 - 68 |
| 3 22.2 | 59 849 + 439 | 27 36 + 4 | 61 698 + 630 | 09 68 + 7 | 39 784 + 382 | 44 07 - 32 | 40 925 + 355 | 43 44 - 3 |
| 4 1.2 | 60 274 + 425 | 28 03 + 67 | 62 306 + 608 | 10 41 + 73 | 40 157 + 373 | 44 46 - 39 | 41 269 + 344 | 44 01 + 57 |
| 4 11.2 | 60 679 + 405 | 29 33 +130 | 62 881 + 575 | 11 76 +135 | 40 521 + 364 | 44 92 - 46 | 41 600 + 331 | 45 15 +114 |
| 4 21.2 | 61 050 + 371 | 31 19 +186 | 63 399 + 518 | 13 70 +194 | 40 868 + 347 | 45 45 - 53 | 41 907 + 307 | 46 83 +168 |
| 5 1.1 | 61 379 + 329 | 33 50 +231 | 63 849 + 450 | 16 09 +239 | 41 194 + 326 | 46 04 - 59 | 42 185 + 278 | 48 93 +210 |
| 5 11.1 | 61 664 + 285 | 36 22 +272 | 64 223 + 374 | 18 88 +279 | 41 497 + 303 | 46 71 - 67 | 42 432 + 247 | 51 41 +248 |
| 5 21.1 | 61 891 + 227 | 39 23 +301 | 64 505 + 282 | 21 97 +309 | 41 768 + 271 | 47 45 - 74 | 42 639 + 207 | 54 16 +275 |
| 5 31.0 | 62 061 + 170 | 42 39 +316 | 64 695 + 190 | 25 21 +324 | 42 007 + 239 | 48 25 - 80 | 42 805 + 166 | 57 06 +290 |
| 6 10.0 | 62 171 + 110 | 45 67 +328 | 64 787 + 92 | 28 56 +335 | 42 206 + 199 | 49 11 - 86 | 42 926 + 121 | 60 07 +301 |
| 6 20.0 | 62 213 + 42 | 48 91 +324 | 64 775 - 12 | 31 88 +332 | 42 360 + 154 | 50 01 - 90 | 42 998 + 72 | 63 05 +298 |
| 6 30.0 | 62 194 - 19 | 52 04 +313 | 64 668 - 107 | 35 07 +319 | 42 469 + 109 | 50 93 - 92 | 43 022 + 24 | 65 93 +288 |
| 7 9.9 | 62 109 - 85 | 55 01 +297 | 64 463 - 205 | 38 09 +302 | 42 529 + 60 | 51 85 - 92 | 42 996 - 26 | 68 66 +273 |
| 7 19.9 | 61 962 - 147 | 57 69 +268 | 64 165 - 298 | 40 81 +272 | 42 537 + 8 | 52 74 - 80 | 42 921 + 166 | 71 13 +247 |
| 7 29.9 | 61 760 - 202 | 60 05 +236 | 63 788 - 377 | 43 21 +240 | 42 499 - 38 | 53 56 - 82 | 42 802 - 119 | 73 31 +218 |
| 8 8.8 | 61 504 - 256 | 62 04 +199 | 63 333 - 455 | 45 23 +202 | 42 413 - 86 | 54 29 - 73 | 42 639 - 163 | 75 17 +186 |
| 8 18.8 | 61 204 - 300 | 63 59 +155 | 62 815 - 518 | 46 78 +155 | 42 285 - 128 | 54 88 - 59 | 42 439 - 200 | 76 61 +144 |
| 8 28.8 | 60 869 - 335 | 64 69 +110 | 62 251 - 564 | 47 88 +110 | 42 126 - 159 | 55 32 - 44 | 42 210 - 229 | 77 65 +104 |
| 9 7.8 | 60 506 - 363 | 65 32 + 63 | 61 646 - 605 | 48 49 + 61 | 41 939 - 187 | 55 57 - 25 | 41 957 - 253 | 78 25 + 60 |
| 9 17.7 | 60 130 - 376 | 65 41 + 9 | 61 025 - 621 | 48 55 - 201 | 41 738 - 201 | 55 61 - 4 | 41 694 - 263 | 78 38 + 13 |
| 9 27.7 | 59 752 - 378 | 65 02 - 39 | 60 401 - 624 | 48 12 - 43 | 41 536 - 202 | 55 46 + 15 | 41 428 - 266 | 78 06 - 32 |
| 10 7.7 | 59 382 - 370 | 64 10 - 92 | 59 789 - 612 | 47 15 - 97 | 41 341 - 195 | 55 10 + 36 | 41 168 - 260 | 77 26 - 80 |
| 10 17.7 | 59 039 - 343 | 62 67 -143 | 59 215 - 574 | 45 66 -149 | 41 172 - 169 | 54 56 + 54 | 40 931 - 237 | 75 98 -128 |
| 10 27.6 | 58 731 - 308 | 60 77 -190 | 58 689 - 526 | 43 69 -197 | 41 035 - 137 | 53 87 + 69 | 40 722 - 209 | 74 28 -170 |
| 11 6.6 | 58 469 - 262 | 58 40 -237 | 58 229 - 460 | 41 24 -245 | 40 942 - 93 | 53 06 + 81 | 40 552 - 170 | 72 13 -215 |
| 11 16.6 | 58 269 - 200 | 55 62 -278 | 57 857 - 372 | 38 38 -286 | 40 903 - 39 | 52 17 + 89 | 40 431 - 121 | 69 61 -252 |
| 11 26.5 | 58 133 - 136 | 52 50 -312 | 57 576 - 281 | 35 19 -319 | 40 920 + 17 | 51 26 + 91 | 40 363 - 68 | 66 77 -284 |
| 12 6.5 | 58 071 - 62 | 49 09 -341 | 57 403 - 173 | 31 70 -349 | 40 997 + 77 | 50 38 + 88 | 40 352 - 11 | 63 63 -314 |
| 12 16.5 | 58 086 + 15 | 45 51 -358 | 57 346 - 57 | 28 05 -365 | 41 133 + 136 | 49 57 + 81 | 40 403 + 51 | 60 34 -329 |
| 12 26.5 | 58 175 + 89 | 41 86 -365 | 57 400 + 54 | 24 34 -371 | 41 324 + 191 | 48 82 + 75 | 40 510 + 107 | 56 96 -338 |
| 12 36.4 | 58 340 + 165 | 38 23 -363 | 57 572 + 172 | 20 65 -369 | 41 568 + 244 | 48 21 + 61 | 40 674 + 164 | 53 58 -338 |
| | 58 340 + 234 | 38 23 -343 | 57 572 + 282 | 20 65 -349 | 41 568 + 287 | 48 21 + 47 | 40 674 + 214 | 53 58 -321 |
| Mean Place | 60.000 | 54.61 | 60.986 | 37.34 | 41.487 | 41.61 | 41.521 | 69.15 |
| sec δ, tan δ | +1.751 | +1.438 | +2.686 | +2.493 | +1.254 | -0.756 | +1.330 | +0.877 |
| dα(ψ), dδ(ψ) | +0.023 | -0.05 | -0.004 | -0.05 | +0.081 | -0.05 | +0.038 | -0.05 |
| dα(ε), dδ(ε) | +0.012 | -0.99 | +0.020 | -0.99 | -0.006 | -0.99 | +0.007 | -0.99 |
| Dble.Trans. | June 15 | | June 15 | | June 15 | | June 15 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 1461 | | 656 | | 654 | | 658 | |
|----------------|-------------------------------|--------|------------|--------|-----------|--------|-------------|--------|
| | B.D. -11° 4411 (Serpentis) | | α Ophiuchi | | ♁ Scorpii | | ξ Serpentis | |
| Mag. Spect. | 5.68 | B8 | 2.14 | A5 | 2.04 | F0 | 3.64 | A5 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° ′ | h m | ° ′ | h m | ° ′ | h m | ° ′ |
| | 17 33 | -11 14 | 17 34 | +12 33 | 17 36 | -42 59 | 17 36 | -15 23 |
| 1 ^d | 57.414 | 05.68 | 15.039 | 63.44 | 15.830 | 28.44 | 44.842 | 31.97 |
| 1 ^s | +181 | -89 | +118 | -224 | +177 | +111 | +137 | -62 |
| 1 | 57.595 | 06.64 | 15.199 | 61.15 | 16.063 | 27.43 | 45.026 | 32.68 |
| 1 | +218 | -102 | +198 | -228 | +283 | +86 | +222 | -76 |
| 1 | 57.813 | 07.66 | 15.397 | 58.87 | 16.346 | 26.57 | 45.248 | 33.44 |
| 1 | +252 | -102 | +233 | -217 | +328 | +69 | +256 | -79 |
| 1 | 58.065 | 08.68 | 15.630 | 56.70 | 16.674 | 25.88 | 45.504 | 34.23 |
| 1 | +274 | -98 | +258 | -197 | +360 | +51 | +278 | -78 |
| 1 | 58.339 | 09.66 | 15.888 | 54.73 | 17.034 | 25.37 | 45.782 | 35.01 |
| 2 | +293 | -91 | +279 | -173 | +385 | +34 | +298 | -73 |
| 2 | 58.632 | 10.57 | 16.167 | 53.00 | 17.419 | 25.03 | 46.080 | 35.74 |
| 2 | +306 | -77 | +293 | -138 | +404 | +16 | +311 | -65 |
| 2 | 58.938 | 11.34 | 16.460 | 51.62 | 17.823 | 24.87 | 46.391 | 36.39 |
| 2 | +311 | -62 | +299 | -101 | +411 | +1 | +316 | -53 |
| 3 | 59.249 | 11.96 | 16.759 | 50.61 | 18.234 | 24.86 | 46.707 | 36.92 |
| 3 | +314 | -44 | +303 | -60 | +416 | -14 | +320 | -39 |
| 3 | 59.563 | 12.40 | 17.062 | 50.01 | 18.650 | 25.00 | 47.027 | 37.31 |
| 3 | +311 | -24 | +301 | -15 | +414 | -29 | +318 | -23 |
| 3 | 59.874 | 12.64 | 17.363 | 49.86 | 19.064 | 25.29 | 47.345 | 37.54 |
| 4 | +304 | -4 | +294 | +26 | +405 | -42 | +311 | -8 |
| 4 | 60.178 | 12.68 | 17.657 | 50.12 | 19.469 | 25.71 | 47.656 | 37.62 |
| 4 | +297 | +14 | +285 | +66 | +396 | -54 | +304 | +6 |
| 4 | 60.475 | 12.54 | 17.942 | 50.78 | 19.865 | 26.25 | 47.960 | 37.56 |
| 4 | +283 | +31 | +270 | +104 | +377 | -67 | +290 | +19 |
| 4 | 60.758 | 12.23 | 18.212 | 51.82 | 20.242 | 26.92 | 48.250 | 37.37 |
| 5 | +266 | +45 | +251 | +132 | +355 | -78 | +273 | +29 |
| 5 | 61.024 | 11.78 | 18.463 | 53.14 | 20.597 | 27.70 | 48.523 | 37.08 |
| 5 | +247 | +54 | +231 | +158 | +330 | -90 | +255 | +37 |
| 5 | 61.271 | 11.24 | 18.694 | 54.72 | 20.927 | 28.60 | 48.778 | 36.71 |
| 5 | +222 | +62 | +204 | +176 | +295 | -100 | +230 | +42 |
| 5 | 61.493 | 10.62 | 18.898 | 56.48 | 21.222 | 29.60 | 49.008 | 36.29 |
| 5 | +196 | +65 | +176 | +186 | +259 | -109 | +202 | +42 |
| 5 | 61.689 | 09.97 | 19.074 | 58.34 | 21.481 | 30.69 | 49.210 | 35.87 |
| 5 | +164 | +65 | +143 | +193 | +217 | -117 | +171 | +43 |
| 6 | 61.853 | 09.32 | 19.217 | 60.27 | 21.698 | 31.86 | 49.381 | 35.44 |
| 6 | +127 | +63 | +106 | +190 | +167 | -122 | +133 | +39 |
| 6 | 61.980 | 08.69 | 19.323 | 62.17 | 21.865 | 33.08 | 49.514 | 35.05 |
| 6 | +91 | +58 | +69 | +183 | +119 | -125 | +97 | +34 |
| 6 | 62.071 | 08.11 | 19.392 | 64.00 | 21.984 | 34.33 | 49.611 | 34.71 |
| 7 | +51 | +53 | +30 | +173 | +63 | -124 | +55 | +30 |
| 7 | 62.122 | 07.58 | 19.422 | 65.73 | 22.047 | 35.57 | 49.666 | 34.41 |
| 7 | +9 | +45 | -11 | +156 | +9 | -119 | +13 | +24 |
| 7 | 62.131 | 07.13 | 19.411 | 67.29 | 22.056 | 36.76 | 49.679 | 34.17 |
| 7 | -29 | +38 | -47 | +137 | -43 | -110 | -26 | +19 |
| 7 | 62.102 | 06.75 | 19.364 | 68.66 | 22.013 | 37.86 | 49.653 | 33.98 |
| 8 | -67 | +31 | -85 | +116 | -95 | -97 | -66 | +14 |
| 8 | 62.035 | 06.44 | 19.279 | 69.82 | 21.918 | 38.83 | 49.587 | 33.84 |
| 8 | -102 | +24 | -118 | +91 | -141 | -80 | -101 | +10 |
| 8 | 61.933 | 06.20 | 19.161 | 70.73 | 21.777 | 39.63 | 49.486 | 33.74 |
| 8 | -128 | +17 | -143 | +66 | -175 | -60 | -129 | +8 |
| 8 | 61.805 | 06.03 | 19.018 | 71.39 | 21.602 | 40.23 | 49.357 | 33.66 |
| 9 | -151 | +12 | -164 | +41 | -207 | -37 | -152 | +5 |
| 9 | 61.654 | 05.91 | 18.854 | 71.80 | 21.395 | 40.60 | 49.205 | 33.61 |
| 9 | -162 | +6 | -175 | +11 | -220 | -10 | -164 | +3 |
| 9 | 61.492 | 05.85 | 18.679 | 71.91 | 21.175 | 40.70 | 49.041 | 33.58 |
| 9 | -164 | +0 | -177 | -15 | -224 | +15 | -166 | +2 |
| 9 | 61.328 | 05.85 | 18.502 | 71.76 | 20.951 | 40.55 | 48.875 | 33.56 |
| 10 | -158 | -6 | -171 | -44 | -217 | +42 | -161 | +0 |
| 10 | 61.170 | 05.91 | 18.331 | 71.32 | 20.734 | 40.13 | 48.714 | 33.56 |
| 10 | -139 | -13 | -152 | -74 | -190 | +66 | -141 | -3 |
| 10 | 61.031 | 06.04 | 18.179 | 70.58 | 20.544 | 39.47 | 48.573 | 33.59 |
| 10 | -112 | -22 | -127 | -100 | -155 | +87 | -114 | -7 |
| 10 | 60.919 | 06.26 | 18.052 | 69.58 | 20.389 | 38.60 | 48.459 | 33.66 |
| 11 | -76 | -31 | -94 | -130 | -109 | +104 | -78 | +14 |
| 11 | 60.843 | 06.57 | 17.958 | 68.28 | 20.280 | 37.56 | 48.381 | 33.80 |
| 11 | -33 | -43 | -51 | -155 | -50 | +116 | -34 | -22 |
| 11 | 60.810 | 07.00 | 17.907 | 66.73 | 20.230 | 36.40 | 48.347 | 34.02 |
| 11 | +13 | -53 | -8 | -178 | +10 | +122 | +13 | -30 |
| 11 | 60.823 | 07.53 | 17.899 | 64.95 | 20.240 | 35.18 | 48.360 | 34.32 |
| 12 | +62 | -66 | +41 | -200 | +74 | +124 | +63 | -40 |
| 12 | 60.885 | 08.19 | 17.940 | 62.95 | 20.314 | 33.94 | 48.423 | 34.72 |
| 12 | +110 | -76 | +90 | -215 | +140 | +118 | +111 | -48 |
| 12 | 60.995 | 08.95 | 18.030 | 60.80 | 20.454 | 32.76 | 48.534 | 35.20 |
| 12 | +155 | -90 | +133 | -224 | +198 | +111 | +155 | -65 |
| 12 | 61.150 | 09.85 | 18.163 | 58.56 | 20.652 | 31.65 | 48.689 | 35.85 |
| 12 | +198 | -97 | +177 | -228 | +256 | +98 | +201 | -71 |
| 12 | 61.348 | 10.82 | 18.340 | 56.28 | 20.908 | 30.67 | 48.890 | 36.56 |
| | +234 | -99 | +214 | -221 | +304 | +82 | +238 | -75 |
| Mean Place | 61.248 | 00.97 | 18.457 | 69.16 | 20.885 | 24.71 | 48.779 | 27.24 |
| sec δ, tan δ | +1.020 | -0.199 | +1.025 | +0.223 | +1.367 | -0.932 | +1.037 | -0.275 |
| dα(ψ), dδ(ψ) | +0.066 | -0.04 | +0.055 | -0.04 | +0.086 | -0.04 | +0.068 | -0.04 |
| dα(ε), dδ(ε) | -0.001 | -0.99 | +0.002 | -0.99 | -0.006 | -0.99 | -0.002 | -0.99 |
| Dble. Trans. | June 15 | | June 15 | | June 16 | | June 16 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 664 | | 663 | | 660 | | 670 | |
|----------------------------------|--------------|------------|--------------|------------|--------------|---------|----------------|------------|
| | ω Draconis | | ι Herculis | | κ Scorpis | | ψ Draconis* p. | |
| Name | | | | | | | | |
| Mag. Spect. | 4.87 | F5 | 3.79 | B3 | 2.51 | B2 | 4.90 | F5 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " |
| | 17 36 | + 68 45 | 17 39 | + 46 00 | 17 41 | - 39 01 | 17 42 | + 72 08 |
| 1 ^d -8.5 ^s | 58 275 - 1 | 43 72 -372 | 01 822 + 71 | 40.11 -349 | 28 359 + 163 | " + 90 | 06 974 - 42 | " -370 |
| 1 1.5 | 58 390 + 115 | 40 01 -371 | 01 952 + 130 | 36 61 -350 | 28 575 + 216 | " + 80 | 07 068 + 94 | 69 67 -370 |
| 1 11.4 | 58 620 + 230 | 36 39 -362 | 02 140 + 188 | 33 18 -343 | 28 839 + 264 | " + 67 | 07 299 + 231 | 66 04 -363 |
| 1 21.4 | 58 961 + 341 | 33 03 -336 | 02 382 + 242 | 29 96 -322 | 29 146 + 307 | " + 53 | 07 664 + 365 | 62 66 -338 |
| 1 31.4 | 59 393 + 432 | 30.04 -299 | 02 666 + 284 | 27.08 -288 | 29 483 + 337 | " + 37 | 08 140 + 476 | 59 63 -303 |
| 2 10.3 | 59 907 + 514 | 27 49 -255 | 02 987 + 321 | 24 61 -247 | 29 845 + 362 | " + 25 | 08 718 + 578 | 57 03 -280 |
| 2 20.3 | 60 487 + 580 | 25 53 -196 | 03 337 + 350 | 22 67 -194 | 30 225 + 380 | " + 10 | 09 377 + 659 | 55 01 -202 |
| 3 2.3 | 61 104 + 617 | 24 19 -134 | 03 703 + 366 | 21 32 -135 | 30 612 + 387 | " - 1 | 10 086 + 709 | 53 61 -140 |
| 3 12.3 | 61 750 + 646 | 23 50 - 69 | 04 080 + 377 | 20 58 - 74 | 31 006 + 394 | " - 12 | 10 832 + 746 | 52 85 - 76 |
| 3 22.2 | 62 396 + 646 | 23 53 + 3 | 04 457 + 377 | 20 51 - 7 | 31 397 + 391 | " - 22 | 11 582 + 750 | 52 81 - 4 |
| 4 1.2 | 63 021 + 625 | 24 20 + 67 | 04 823 + 366 | 21 05 + 54 | 31 782 + 385 | " - 31 | 12 310 + 728 | 53 41 + 60 |
| 4 11.2 | 63 615 + 594 | 25 51 +131 | 05 177 + 354 | 22 19 +114 | 32 159 + 377 | " - 41 | 13 004 + 694 | 54 64 +123 |
| 4 21.2 | 64 151 + 536 | 27 41 +190 | 05 505 + 328 | 23 90 +171 | 32 520 + 361 | " - 49 | 13 631 + 627 | 56 47 +183 |
| 5 1.1 | 64 620 + 469 | 29 76 +235 | 05 802 + 297 | 26 05 +215 | 32 860 + 340 | " - 59 | 14 177 + 546 | 58 76 +229 |
| 5 11.1 | 65 012 + 392 | 32 54 +392 | 06 066 + 264 | 28 59 +254 | 33 178 + 318 | " - 67 | 14 634 + 457 | 61 48 +272 |
| 5 21.1 | 65 309 + 297 | 35 61 +307 | 06 286 + 220 | 31 43 +284 | 33 465 + 287 | " - 77 | 14 978 + 344 | 64 51 +303 |
| 5 31.0 | 65 512 + 203 | 38 85 +324 | 06 461 + 175 | 34 44 +301 | 33 718 + 253 | " - 85 | 15 209 + 231 | 67 72 +321 |
| 6 10.0 | 65 615 + 103 | 42 21 +336 | 06 587 + 126 | 37 57 +313 | 33 931 + 213 | " - 93 | 15 322 + 113 | 71 05 +333 |
| 6 20.0 | 65 610 - 5 | 45 54 +333 | 06 659 + 72 | 40 69 +312 | 34 099 + 168 | " - 97 | 15 307 - 15 | 74 37 +332 |
| 6 30.0 | 65 508 - 102 | 48 77 +323 | 06 680 + 21 | 43 70 +301 | 34 220 + 121 | " -102 | 15 176 - 131 | 77 59 +322 |
| 7 9.9 | 65 304 - 204 | 51 83 +306 | 06 646 - 34 | 46 58 +288 | 34 290 + 70 | " -102 | 14 925 - 251 | 80 66 +307 |
| 7 19.9 | 65 003 - 301 | 54 60 +277 | 06 559 - 87 | 49 20 +262 | 34 306 + 16 | " -100 | 14 558 - 367 | 83 45 +279 |
| 7 29.9 | 64 621 - 382 | 57 05 +245 | 06 424 - 135 | 51 52 +232 | 34 306 - 31 | " - 94 | 14 558 - 462 | 83 45 +247 |
| 8 8.9 | 64 157 - 464 | 59 13 +208 | 06 242 - 182 | 53 51 +199 | 34 275 - 83 | " - 84 | 14 096 - 559 | 85 92 +212 |
| 8 18.8 | 63 628 - 529 | 60 76 +163 | 06 019 - 223 | 55 07 +156 | 34 192 - 125 | " - 70 | 13 537 - 637 | 88 04 +166 |
| 8 28.8 | 63 049 - 579 | 61 93 +117 | 05 766 - 253 | 56 23 +116 | 33 907 - 160 | " - 54 | 12 205 - 695 | 90 93 +123 |
| 9 7.8 | 62 427 - 622 | 62 62 + 69 | 05 486 - 280 | 56 93 + 70 | 33 716 - 191 | " - 34 | 11 458 - 747 | 91 66 + 73 |
| 9 17.7 | 61 786 - 641 | 62 76 + 14 | 05 192 - 294 | 57 14 + 21 | 33 511 - 205 | " - 12 | 10 687 - 771 | 91 87 + 21 |
| 9 27.7 | 61 142 - 644 | 62 41 - 35 | 04 896 - 296 | 56 88 - 26 | 33 302 - 209 | " + 9 | 09 910 - 777 | 91 57 - 30 |
| 10 7.7 | 60 507 - 635 | 61 52 - 89 | 04 605 - 291 | 56 12 - 76 | 33 098 - 204 | " + 32 | 09 142 - 768 | 90 74 - 83 |
| 10 17.7 | 59 909 - 598 | 60 10 -142 | 04 335 - 270 | 54 86 -126 | 32 918 - 180 | " + 53 | 08 414 - 728 | 89 38 -136 |
| 10 27.6 | 59 359 - 550 | 58 21 -189 | 04 095 - 240 | 53 16 -170 | 32 771 - 147 | " + 71 | 07 739 - 675 | 87 55 -183 |
| 11 6.6 | 58 875 - 484 | 55 82 -239 | 03 894 - 201 | 51 00 -216 | 32 666 - 105 | " + 85 | 07 138 - 601 | 85 22 -233 |
| 11 16.6 | 58 479 - 396 | 53 02 -280 | 03 745 - 149 | 48 43 -257 | 32 666 - 50 | " + 96 | 06 637 - 501 | 82 47 -275 |
| 11 26.6 | 58 176 - 303 | 49 88 -314 | 03 649 - 96 | 45 53 -290 | 32 616 + 6 | " +100 | 06 243 - 394 | 79 37 -310 |
| 12 6.5 | 57 983 - 193 | 46 43 -345 | 03 616 - 33 | 42 32 -321 | 32 689 + 67 | " +101 | 05 975 - 268 | 75 95 -342 |
| 12 16.5 | 57 907 - 76 | 42 81 -362 | 03 647 + 31 | 38 94 -338 | 32 817 + 128 | " + 95 | 05 845 + 9 | 72 36 -359 |
| 12 26.5 | 57 946 + 39 | 39 11 -370 | 03 739 + 92 | 35 46 -348 | 33 000 + 183 | " + 89 | 05 848 + 3 | 68 67 -369 |
| 12 36.4 | 58 106 + 160 | 35 43 -368 | 03 893 + 154 | 31 98 -348 | 33 239 + 239 | " + 79 | 05 996 + 148 | 64 99 -368 |
| | + 273 | -349 | + 210 | -332 | + 284 | + 64 | + 263 | -351 |
| Mean Place | 61.718 | 51.48 | 04.997 | 47.21 | 33.178 | 26.69 | 10.610 | 80.77 |
| sec δ, tan δ | +2.761 | +2.573 | +1.440 | +1.036 | +1.287 | -0.810 | +3.263 | +3.106 |
| dα(ψ), dδ(ψ) | -0.007 | -0.04 | +0.034 | -0.04 | +0.083 | -0.03 | -0.021 | -0.03 |
| dα(ε), dδ(ε) | +0.017 | -0.99 | +0.006 | -1.00 | -0.004 | -1.00 | +0.016 | -1.00 |
| Dble. Trans. | June 16 | | June 16 | | June 17 | | June 17 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 1463 | | 665 | | 662 | | 661 | |
|---|---------------------|----------------|---------------------|----------------|---------------------|----------------|---------------------|----------------|
| | 58 Ophiuchi | | β Ophiuchi | | μ Arae | | η Pavonis | |
| Mag. Spect. | 4.89 | F5 | 2.94 | K0 | 5.26 | G5 | 3.58 | K0 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | $^{\circ}$ ' " | h m | $^{\circ}$ ' " | h m | $^{\circ}$ ' " | h m | $^{\circ}$ ' " |
| | 17 42 | -21 40 | 17 42 | + 4 34 | 17 42 | -51 49 | 17 44 | -64 43 |
| 1 ^d | 33.121 ^s | 44.23 | 44.789 ^s | 13.91 | 58.593 ^s | 45.02 | 16.876 ^s | 11.58 |
| 1 | +130 | -18 | +116 | -178 | +186 | +165 | +227 | +232 |
| 1 | +190 | -30 | +158 | -183 | +253 | +153 | +322 | +220 |
| 1 | +227 | -36 | +195 | -185 | +314 | +139 | +412 | +204 |
| 1 | +261 | -42 | +229 | -178 | +368 | +118 | +492 | +178 |
| 1 | +286 | -44 | +254 | -164 | +408 | +96 | +563 | +151 |
| 2 | +307 | -45 | +274 | -146 | +440 | +74 | +605 | +120 |
| 2 | +321 | -41 | +289 | -118 | +465 | +48 | +642 | +85 |
| 2 | +327 | -37 | +296 | -87 | +475 | +26 | +663 | +52 |
| 3 | +331 | -29 | +301 | -54 | +485 | +2 | +678 | +18 |
| 3 | +331 | -20 | +300 | -17 | +483 | -21 | +678 | -18 |
| 4 | +324 | -12 | +294 | +18 | +474 | -42 | +665 | -49 |
| 4 | +318 | -4 | +288 | +51 | +464 | -64 | +651 | -82 |
| 4 | +305 | +4 | +274 | +82 | +443 | -84 | +618 | -113 |
| 5 | +288 | +8 | +258 | +106 | +417 | -102 | +579 | -139 |
| 5 | +270 | +11 | +240 | +128 | +387 | -121 | +534 | -166 |
| 5 | +243 | +12 | +215 | +143 | +346 | -137 | +472 | -188 |
| 5 | +216 | +11 | +188 | +151 | +303 | -150 | +407 | -206 |
| 6 | +184 | +8 | +157 | +156 | +253 | -161 | +333 | -222 |
| 6 | +145 | +4 | +121 | +154 | +194 | -168 | +247 | -230 |
| 6 | +107 | +0 | +85 | +147 | +136 | -171 | +163 | -232 |
| 7 | +63 | -5 | +46 | +139 | +72 | -171 | +70 | -231 |
| 7 | +19 | -8 | +5 | +126 | +5 | -163 | -24 | -220 |
| 7 | -21 | -11 | -33 | +110 | -55 | -152 | -109 | -204 |
| 7 | -64 | -12 | -71 | +93 | -116 | -135 | -197 | -182 |
| 8 | -101 | -12 | -104 | +74 | -170 | -112 | -272 | -150 |
| 8 | -131 | -10 | -130 | +55 | -213 | -87 | -332 | -117 |
| 8 | -155 | -6 | -154 | +36 | -249 | -56 | -383 | -76 |
| 9 | -169 | -2 | -166 | +13 | -268 | -22 | -409 | -32 |
| 9 | -173 | +4 | -169 | -6 | -274 | +12 | -417 | +12 |
| 9 | -167 | +7 | -164 | -28 | -265 | +46 | -408 | +59 |
| 10 | -148 | +11 | -148 | -51 | -237 | +80 | -368 | +102 |
| 10 | -121 | +13 | -123 | -71 | -198 | +109 | -314 | +141 |
| 11 | -84 | +13 | -91 | -95 | -145 | +134 | -242 | +178 |
| 11 | -39 | +10 | -49 | -116 | -79 | +153 | -149 | +204 |
| 11 | +10 | +5 | -6 | -134 | -9 | +166 | -52 | +224 |
| 12 | +61 | -2 | +41 | -154 | +66 | +172 | +54 | +236 |
| 12 | +120 | +2 | +88 | -168 | +143 | +170 | +163 | +237 |
| 12 | +145 | -32 | +132 | -177 | +213 | +164 | +263 | +231 |
| 12 | +206 | -29 | +174 | -184 | +280 | +151 | +362 | +218 |
| 12 | +243 | -35 | +211 | -180 | +338 | +133 | +447 | +196 |
| Mean Place | 37.237 | 39.17 | 48.323 | 19.96 | 64.329 | 40.77 | 24.454 | 07.28 |
| sec δ , tan δ | +1.076 | -0.397 | +1.003 | +0.080 | +1.618 | -1.272 | +2.342 | -2.117 |
| $d\alpha(\psi)$, $d\delta(\psi)$ | +0.072 | -0.03 | +0.059 | -0.03 | +0.095 | -0.03 | +0.117 | -0.03 |
| $d\alpha(\epsilon)$, $d\delta(\epsilon)$ | -0.002 | -1.00 | +0.000 | -1.00 | -0.006 | -1.00 | -0.010 | -1.00 |
| Dble. Trans. | June 17 | | June 17 | | June 17 | | June 18 | |

AT UPPER TRANSIT AT GREENWICH

| No. | 667 | | 666 | | 1464 | | 668 | |
|--------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|
| | μ Herculis | | ι' Scorpii | | X Sagittarii | | γ Ophiuchi | |
| Mag.Spect. | 3.48 | G5 | 3.14 | F5p | 4.4 to 5.0 | F5 to G0 | 3.74 | A0 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | ^h ^m | [°] ['] | ^h ^m | [°] ['] | ^h ^m | [°] ['] | ^h ^m | [°] ['] |
| | 17 45 | +27 43 | 17 46 | -40 07 | 17 46 | -27 49 | 17 47 | + 2 42 |
| 1 -8.5 | ^s 52 583 + 90 | 34 57 -292 | ^s 33 517 + 158 | 27 01 + 98 | ^s 38 308 + 136 | 40 98 + 19 | ^s 09 359 + 113 | 35 77 -167 |
| 1 1.5 | 52 719 + 136 | 31 63 -294 | 33 730 + 213 | 26 12 + 89 | 38 500 + 192 | 40 80 + 18 | 09 514 + 155 | 34 05 -172 |
| 1 11.4 | 52 900 + 181 | 28 71 -292 | 33 992 + 262 | 25 35 + 77 | 38 734 + 234 | + 5 | 09 707 + 193 | 32 30 -175 |
| 1 21.4 | 53 121 + 221 | 25 95 -276 | 34 298 + 306 | 24 72 + 63 | 38 004 + 270 | 40 75 - 5 | 09 934 + 227 | 30 62 -168 |
| 1 31.4 | 53 372 + 251 | 23 45 -250 | 34 635 + 337 | 24 25 + 47 | 39 301 + 297 | 40 80 - 12 | 10 186 + 252 | 29 06 -156 |
| 2 10.4 | 53 651 + 279 | 21 27 -218 | 34 999 + 364 | 23 91 + 34 | 39 620 + 319 | 41 08 - 16 | 10 458 + 272 | 27 68 -138 |
| 2 20.3 | 53 949 + 298 | 19 54 -173 | 35 381 + 382 | 23 72 + 19 | 39 955 + 335 | 41 27 - 19 | 10 746 + 288 | 26 55 -113 |
| 3 2.3 | 54 258 + 309 | 18 30 -124 | 35 772 + 391 | 23 65 + 7 | 40 297 + 342 | 41 47 - 20 | 11 041 + 295 | 25 71 - 84 |
| 3 12.3 | 54 575 + 317 | 17 57 - 73 | 36 171 + 399 | 23 69 - 4 | 40 297 + 348 | 41 66 - 19 | 11 342 + 301 | 25 19 - 52 |
| 3 22.2 | 54 892 + 317 | 17 41 - 16 | 36 569 + 398 | 23 86 - 17 | 40 992 + 347 | 41 83 - 17 | 11 642 + 300 | 25 02 - 17 |
| 4 1.2 | 55 202 + 310 | 17 77 + 36 | 36 960 + 391 | 24 12 - 26 | 41 334 + 342 | 41 97 - 14 | 11 938 + 296 | 25 17 + 15 |
| 4 11.2 | 55 505 + 303 | 18 64 + 87 | 37 345 + 385 | 24 49 - 37 | 41 669 + 335 | 42 10 - 13 | 12 227 + 289 | 25 64 + 47 |
| 4 21.2 | 55 790 + 285 | 20 00 +136 | 37 713 + 368 | 24 96 - 47 | 41 991 + 322 | 42 22 - 12 | 12 504 + 277 | 26 41 + 77 |
| 5 1.1 | 56 056 + 266 | 21 74 +174 | 38 062 + 349 | 25 53 - 57 | 42 297 + 306 | 42 34 - 12 | 12 766 + 262 | 27 41 +100 |
| 5 11.1 | 56 298 + 242 | 23 82 +206 | 38 390 + 328 | 26 21 - 68 | 42 297 + 287 | 42 34 - 14 | 12 766 + 244 | 27 41 +121 |
| 5 21.1 | 56 509 + 211 | 26 16 +234 | 38 685 + 295 | 27 00 - 79 | 42 844 + 260 | 42 65 - 17 | 13 229 + 219 | 29 97 +135 |
| 5 31.1 | 56 688 + 179 | 28 64 +248 | 38 946 + 261 | 27 87 - 87 | 43 075 + 231 | 42 86 - 21 | 13 422 + 193 | 31 39 +142 |
| 6 10.0 | 56 831 + 143 | 31 23 +259 | 39 168 + 222 | 28 83 - 96 | 43 272 + 197 | 43 11 - 25 | 13 585 + 163 | 32 86 +147 |
| 6 20.0 | 56 932 + 101 | 33 81 +258 | 39 343 + 175 | 29 85 -102 | 43 429 + 157 | 43 42 - 31 | 13 711 + 126 | 34 31 +145 |
| 6 30.0 | 56 992 + 60 | 36 31 +250 | 39 471 + 128 | 30 91 -106 | 43 546 + 117 | 43 78 - 36 | 13 802 + 91 | 35 70 +139 |
| 7 9.9 | 57 009 + 17 | 38 69 +238 | 39 547 + 76 | 32 00 -109 | 43 617 + 71 | 44 17 - 39 | 13 853 + 51 | 37 00 +130 |
| 7 19.9 | 56 982 - 27 | 40 86 +217 | 39 569 + 22 | 33 05 -105 | 43 641 + 24 | 44 57 - 40 | 13 863 + 10 | 38 18 +118 |
| 7 29.9 | 56 915 - 67 | 42 79 +193 | 39 541 - 28 | 34 05 -100 | 43 621 - 20 | 44 57 - 42 | 13 836 - 27 | 38 18 +102 |
| 8 8.9 | 56 806 - 109 | 44 45 +166 | 39 461 - 80 | 34 96 - 91 | 43 557 - 64 | 44 99 - 38 | 13 836 - 67 | 39 20 + 88 |
| 8 18.8 | 56 663 - 143 | 45 76 +131 | 39 336 - 125 | 35 72 - 76 | 43 454 - 103 | 45 37 - 34 | 13 769 - 100 | 40 08 + 69 |
| 8 28.8 | 56 492 - 171 | 46 75 + 99 | 39 176 - 160 | 36 32 - 60 | 43 319 - 135 | 45 98 - 27 | 13 541 - 128 | 41 28 + 51 |
| 9 7.8 | 56 296 - 196 | 47 36 + 61 | 38 984 - 192 | 36 72 - 40 | 43 156 - 163 | 46 17 - 19 | 13 390 - 151 | 41 62 + 34 |
| 9 17.8 | 56 089 - 207 | 47 58 + 22 | 38 775 - 209 | 36 89 - 17 | 42 979 - 177 | 46 24 - 7 | 13 227 - 163 | 41 75 + 13 |
| 9 27.7 | 55 877 - 212 | 47 42 - 16 | 38 562 - 213 | 36 83 + 6 | 42 798 - 181 | 46 21 + 3 | 13 059 - 168 | 41 70 - 5 |
| 10 7.7 | 55 669 - 208 | 46 85 - 57 | 38 353 - 209 | 36 53 + 30 | 42 621 - 177 | 46 07 + 14 | 12 895 - 164 | 41 44 - 26 |
| 10 17.7 | 55 480 - 189 | 45 88 - 97 | 38 167 - 186 | 36 01 + 52 | 42 464 - 157 | 45 83 + 24 | 12 747 - 148 | 40 98 - 46 |
| 10 27.6 | 55 314 - 166 | 44 55 -133 | 38 013 - 154 | 35 30 + 71 | 42 334 - 130 | 45 51 + 32 | 12 623 - 124 | 40 33 - 65 |
| 11 6.6 | 55 182 - 132 | 42 82 -173 | 37 902 - 111 | 34 42 + 88 | 42 242 - 92 | 45 13 + 38 | 12 532 - 91 | 39 46 - 87 |
| 11 16.6 | 55 093 - 89 | 40 75 -207 | 37 845 - 57 | 34 43 + 99 | 42 198 - 44 | 44 73 + 40 | 12 481 - 51 | 38 40 -106 |
| 11 26.6 | 55 049 - 44 | 38 39 -236 | 37 845 + 0 | 32 38 +105 | 42 203 + 5 | 44 34 + 39 | 12 473 - 8 | 37 15 -125 |
| 12 6.5 | 55 056 + 7 | 35 75 -264 | 37 906 + 61 | 31 30 +108 | 42 263 + 60 | 43 99 + 35 | 12 511 + 38 | 35 72 -143 |
| 12 16.5 | 55 115 + 59 | 32 95 -280 | 38 030 + 124 | 30 27 +103 | 42 377 + 114 | 43 77 + 22 | 12 598 + 87 | 34 16 -156 |
| 12 26.5 | 55 222 + 107 | 30 04 -291 | 38 209 + 179 | 29 29 + 98 | 42 532 + 155 | 43 51 + 26 | 12 727 + 129 | 32 50 -166 |
| 12 36.4 | 55 377 + 155 | 27 10 -294 | 38 444 + 235 | 28 42 + 87 | 42 743 + 211 | 43 37 + 14 | 12 899 + 172 | 30 77 -173 |
| | + 198 | -283 | + 282 | + 74 | + 251 | + 3 | + 208 | -169 |
| Mean Place | 55.840 | 40.99 | 38.393 | 21.91 | 42.630 | 35.55 | 12.926 | 41.91 |
| sec δ, tan δ | +1.130 | +0.526 | +1.308 | -0.843 | +1.131 | -0.528 | +1.001 | +0.047 |
| da(ψ), dδ(ψ) | +0.047 | -0.02 | +0.083 | -0.02 | +0.075 | -0.02 | +0.060 | -0.02 |
| da(ε), dδ(ε) | +0.002 | -1.00 | -0.003 | -1.00 | -0.002 | -1.00 | +0.000 | -1.00 |
| Dble.Trans. | June 18 | | June 18 | | June 18 | | June 18 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 1465 | | 669 | | 1466 | | 675 | |
|--------------|------------------------------|-------------|-------------|-----------|-----------------------------|------------|--------------|------------|
| | B.D. +20° 3570 (Herculis) | | G Scorii | | B.D. +9° 3485 (Ophiuchi) | | 35 Draconis | |
| Mag.Spect. | 5.77 | K0 | 3.25 | K2 | 6.79 | K5 | 5.04 | F5 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " |
| | 17 47 | +20 33 | 17 48 | -37 02 | 17 49 | +9 50 | 17 49 | +76 57 |
| 1 | -8.5 | 46 657 +95 | 51 650 +151 | 29 13 +80 | 27 439 +104 | 59 65 -205 | 59 027 -141 | 47 46 -361 |
| 1 | 1.5 | 46 797 +140 | 51 854 +204 | 28 41 +72 | 27 585 +146 | 57 55 -210 | 59 071 +44 | 43 82 -364 |
| 1 | 11.4 | 46 977 +180 | 52 106 +252 | 27 80 +61 | 27 770 +185 | 55 44 -211 | 59 303 +232 | 40 23 -359 |
| 1 | 21.4 | 47 196 +219 | 52 399 +293 | 27 32 +48 | 27 990 +220 | 53 42 -202 | 59 722 +419 | 36 87 -336 |
| 1 | 31.4 | 47 442 +246 | 52 722 +323 | 26 97 +35 | 28 236 +246 | 51 56 -186 | 60 299 +577 | 33 84 -303 |
| 2 | 10.4 | 47 714 +272 | 53 071 +349 | 26 73 +24 | 28 505 +269 | 49 93 -163 | 61 023 +724 | 31 21 -263 |
| 2 | 20.3 | 48 004 +290 | 53 438 +367 | 26 61 +12 | 28 790 +285 | 48 61 -132 | 61 866 +843 | 29 15 -206 |
| 3 | 2.3 | 48 303 +299 | 53 813 +375 | 26 58 +3 | 29 083 +293 | 47 63 -98 | 62 787 +921 | 27 68 -147 |
| 3 | 12.3 | 48 610 +307 | 54 196 +383 | 26 64 -6 | 29 383 +300 | 47 04 -59 | 63 765 +978 | 26 85 -83 |
| 3 | 22.2 | 48 917 +307 | 54 579 +383 | 26 78 -14 | 29 683 +300 | 46 86 -18 | 64 757 +992 | 26 72 -13 |
| 4 | 1.2 | 49 219 +302 | 54 956 +377 | 26 99 -21 | 29 978 +295 | 47 08 +22 | 65 726 +969 | 27 23 +51 |
| 4 | 11.2 | 49 514 +295 | 55 326 +370 | 27 27 -28 | 30 268 +290 | 47 68 +60 | 66 652 +926 | 28 38 +115 |
| 4 | 21.2 | 49 794 +280 | 55 682 +356 | 27 64 -37 | 30 545 +277 | 48 63 +95 | 67 491 +839 | 30 12 +174 |
| 5 | 1.1 | 50 057 +263 | 56 020 +338 | 28 07 -43 | 30 806 +261 | 49 87 +124 | 68 222 +731 | 32 34 +222 |
| 5 | 11.1 | 50 299 +242 | 56 337 +317 | 28 60 -53 | 31 049 +243 | 51 36 +149 | 68 831 +609 | 34 99 +265 |
| 5 | 21.1 | 50 512 +213 | 56 623 +286 | 29 21 -61 | 31 266 +217 | 53 03 +167 | 69 287 +456 | 37 96 +297 |
| 5 | 31.1 | 50 697 +185 | 56 878 +255 | 29 90 -69 | 31 457 +191 | 54 80 +177 | 69 590 +303 | 41 13 +317 |
| 6 | 10.0 | 50 848 +151 | 57 095 +217 | 30 68 -78 | 31 616 +159 | 56 63 +183 | 69 730 +140 | 44 44 +331 |
| 6 | 20.0 | 50 959 +111 | 57 268 +173 | 31 52 -84 | 31 739 +123 | 58 46 +183 | 69 694 -36 | 47 75 +331 |
| 6 | 30.0 | 51 033 +74 | 57 395 +127 | 32 40 -88 | 31 826 +87 | 60 22 +176 | 69 500 -194 | 50 99 +324 |
| 7 | 9.9 | 51 065 +32 | 57 473 +78 | 33 31 -91 | 31 872 +46 | 61 89 +167 | 69 143 -357 | 54 08 +309 |
| 7 | 19.9 | 51 054 -11 | 57 498 +25 | 34 20 -89 | 31 877 +5 | 63 41 +152 | 68 628 -515 | 56 92 +284 |
| 7 | 29.9 | 51 004 -50 | 57 475 -23 | 35 06 -86 | 31 844 -33 | 64 74 +133 | 67 983 -645 | 59 47 +255 |
| 8 | 8.9 | 50 915 -89 | 57 402 -73 | 35 85 -79 | 31 772 -72 | 65 90 +116 | 67 207 -776 | 61 67 +220 |
| 8 | 18.8 | 50 791 -124 | 57 286 -116 | 36 51 -66 | 31 666 -106 | 66 81 +91 | 66 323 -884 | 63 43 +176 |
| 8 | 28.8 | 50 639 -152 | 57 135 -151 | 37 04 -53 | 31 533 -133 | 67 50 +69 | 65 359 -964 | 64 76 +133 |
| 9 | 7.8 | 50 464 -175 | 56 954 -181 | 37 40 -36 | 31 375 -158 | 67 96 +46 | 64 323 -1036 | 65 62 +86 |
| 9 | 17.8 | 50 276 -188 | 56 756 -198 | 37 56 -16 | 31 205 -170 | 68 14 +18 | 63 252 -1071 | 65 96 +34 |
| 9 | 27.7 | 50 083 -193 | 56 553 -203 | 37 52 +4 | 31 030 -175 | 68 08 -6 | 62 168 -1084 | 65 81 -15 |
| 10 | 7.7 | 49 894 -189 | 56 354 -199 | 37 28 +24 | 30 859 -171 | 67 76 -32 | 61 089 -1079 | 65 12 -69 |
| 10 | 17.7 | 49 721 -173 | 56 176 -178 | 36 84 +44 | 30 703 -156 | 67 16 -60 | 60 059 -1030 | 63 91 -121 |
| 10 | 27.6 | 49 572 -149 | 56 029 -147 | 36 24 +60 | 30 571 -132 | 66 32 -84 | 59 094 -965 | 62 22 -169 |
| 11 | 6.6 | 49 455 -117 | 55 922 -107 | 35 49 +75 | 30 470 -101 | 65 20 -112 | 58 220 -874 | 60 04 -218 |
| 11 | 16.6 | 49 380 -75 | 55 868 -54 | 34 65 +84 | 30 410 -60 | 65 20 -136 | 57 475 -745 | 57 43 -261 |
| 11 | 26.6 | 49 348 -32 | 55 868 +0 | 33 76 +89 | 30 392 -18 | 62 26 -158 | 56 867 -608 | 54 46 -297 |
| 12 | 6.5 | 49 364 +16 | 55 926 +58 | 32 87 +89 | 30 421 +29 | 60 47 -179 | 56 424 -443 | 51 15 -331 |
| 12 | 16.5 | 49 430 +66 | 56 045 +119 | 32 02 +85 | 30 497 +76 | 58 53 -194 | 56 164 -260 | 47 65 -350 |
| 12 | 26.5 | 49 542 +112 | 56 216 +171 | 31 22 +80 | 30 618 +121 | 56 48 -205 | 56 085 -79 | 44 05 -360 |
| 12 | 36.5 | 49 699 +157 | 56 441 +225 | 30 51 +71 | 30 781 +163 | 54 38 -210 | 56 202 +117 | 40 42 -363 |
| | | 49 699 +197 | 56 441 +271 | 30 51 +59 | 30 781 +201 | 54 38 -205 | 56 202 +305 | 40 42 -347 |
| Mean Place | 49.994 | 69.54 | 56.363 | 23.67 | 30.901 | 66.08 | 63.146 | 54.96 |
| sec δ, tan δ | +1.068 | +0.375 | +1.253 | -0.755 | +1.015 | +0.174 | +4.434 | +4.320 |
| dα(ψ), dδ(ψ) | +0.051 | -0.02 | +0.081 | -0.02 | +0.057 | -0.02 | -0.053 | -0.02 |
| dα(ε), dδ(ε) | +0.001 | -1.00 | -0.002 | -1.00 | +0.001 | -1.00 | +0.012 | -1.00 |
| Dble.Trans. | June 19 | | June 19 | | June 19 | | June 19 | |

AT UPPER TRANSIT AT GREENWICH

| No. | 671 | | 1467 | | 1468 | | 672 | |
|--------------|--------------------------|------------|-----------------------------|------------|--------------------------|------------|--------------------------|------------|
| | ξ Draconis | | B.D. -7° 4523 (Ophiuchi) | | 89 Herculis | | 9 Herculis | |
| Mag. Spect. | 3.90 | K0 | 6.87 | G5 | 5.48 | F5p | 3.99 | K0 |
| U.T. | R.A. | | Dec. | | R.A. | | Dec. | |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " |
| | 17 53 | + 56 51 | 17 54 | - 7 43 | 17 54 | + 26 02 | 17 55 | + 37 14 |
| 1 -8.5 | 14.404 ^s + 20 | 80 94 -361 | 10.026 ^s + 115 | 61.46 -102 | 49.201 ^s + 81 | 58.83 -279 | 44.159 ^s + 64 | 59.50 -319 |
| 1 1.5 | 14.501 + 97 | 77 29 -365 | 10.184 + 158 | 62.55 -109 | 49.328 + 127 | 55.99 -284 | 44.275 + 116 | 56.26 -324 |
| 1 11.4 | 14.673 + 172 | 73 68 -361 | 10.380 + 196 | 63.69 -114 | 49.499 + 171 | 53.16 -283 | 44.441 + 166 | 53.04 -322 |
| 1 21.4 | 14.918 + 245 | 70 28 -340 | 10.610 + 230 | 64.81 -112 | 49.710 + 211 | 50.47 -269 | 44.654 + 213 | 50.00 -304 |
| 1 31.4 | 15.222 + 304 | 67.21 -307 | 10.865 + 255 | 65.87 -106 | 49.953 + 243 | 48.02 -245 | 44.905 + 251 | 47.23 -277 |
| 2 10.4 | 15.581 + 359 | 64.54 -267 | 11.142 + 277 | 66.22 -95 | 50.223 + 270 | 45.87 -215 | 45.188 + 283 | 44.81 -242 |
| 2 20.3 | 15.983 + 402 | 62.42 -212 | 11.434 + 292 | 67.62 -80 | 50.514 + 291 | 44.15 -172 | 45.498 + 310 | 42.87 -194 |
| 3 2.3 | 16.411 + 428 | 60.89 -153 | 11.734 + 300 | 68.22 -60 | 50.816 + 302 | 42.89 -126 | 45.823 + 325 | 41.46 -141 |
| 3 12.3 | 16.861 + 450 | 60.00 -89 | 12.040 + 306 | 68.61 -39 | 51.129 + 313 | 42.14 -75 | 46.161 + 338 | 40.62 -84 |
| 3 22.2 | 17.316 + 455 | 59.81 -19 | 12.348 + 308 | 68.75 -14 | 51.443 + 314 | 41.94 -20 | 46.501 + 340 | 40.40 -22 |
| 4 1.2 | 17.763 + 447 | 60.26 + 45 | 12.651 + 303 | 68.67 + 8 | 51.753 + 310 | 42.25 + 31 | 46.837 + 336 | 40.76 + 36 |
| 4 11.2 | 18.195 + 432 | 61.35 +109 | 12.950 + 299 | 68.37 + 30 | 52.057 + 304 | 43.07 + 82 | 47.165 + 328 | 41.69 + 93 |
| 4 21.2 | 18.597 + 402 | 63.05 +170 | 13.238 + 288 | 67.87 + 50 | 52.346 + 289 | 44.37 +130 | 47.476 + 311 | 43.17 +148 |
| 5 1.1 | 18.960 + 363 | 65.22 +217 | 13.512 + 274 | 67.21 + 66 | 52.617 + 271 | 46.05 +168 | 47.764 + 288 | 45.08 +191 |
| 5 11.1 | 19.280 + 320 | 67.84 +262 | 13.770 + 258 | 66.42 + 79 | 52.867 + 250 | 48.08 +203 | 48.026 + 262 | 47.39 +231 |
| 5 21.1 | 19.543 + 263 | 70.79 +295 | 14.004 + 234 | 65.54 + 88 | 53.087 + 220 | 50.37 +229 | 48.254 + 228 | 50.00 +261 |
| 5 31.1 | 19.748 + 205 | 73.95 +316 | 14.213 + 209 | 64.63 + 91 | 53.277 + 190 | 52.81 +244 | 48.445 + 191 | 52.79 +279 |
| 6 10.0 | 19.891 + 143 | 77.25 +330 | 14.391 + 178 | 63.70 + 93 | 53.432 + 155 | 55.36 +255 | 48.596 + 151 | 55.71 +292 |
| 6 20.0 | 19.962 + 71 | 80.58 +333 | 14.534 + 143 | 62.81 + 89 | 53.545 + 113 | 57.92 +256 | 48.699 + 103 | 58.66 +295 |
| 6 30.0 | 19.969 + 7 | 83.83 +325 | 14.640 + 106 | 61.97 + 84 | 53.619 + 74 | 60.42 +250 | 48.758 + 59 | 61.53 +287 |
| 7 9.9 | 19.906 - 63 | 86.95 +312 | 14.707 + 67 | 61.20 + 77 | 53.649 + 30 | 62.81 +239 | 48.768 + 10 | 64.30 +277 |
| 7 19.9 | 19.775 -131 | 89.83 +288 | 14.731 + 24 | 60.53 + 67 | 53.635 - 14 | 65.00 +219 | 48.729 - 39 | 66.84 +254 |
| 7 29.9 | 19.584 -191 | 92.42 +259 | 14.716 - 15 | 59.96 + 57 | 53.580 - 55 | 66.97 +197 | 48.645 - 84 | 69.13 +229 |
| 8 8.9 | 19.333 -261 | 94.67 +225 | 14.660 - 56 | 59.49 + 47 | 53.484 - 96 | 68.67 +170 | 48.517 -128 | 71.12 +199 |
| 8 18.8 | 19.031 -302 | 96.48 +181 | 14.569 - 91 | 59.13 + 36 | 53.351 -133 | 70.05 +138 | 48.349 -168 | 72.74 +162 |
| 8 28.8 | 18.690 -341 | 97.88 +140 | 14.449 -120 | 58.87 + 26 | 53.190 -161 | 71.11 +106 | 48.150 -199 | 73.99 +125 |
| 9 7.8 | 18.314 -376 | 98.80 + 92 | 14.304 -145 | 58.70 + 17 | 53.003 -187 | 71.82 + 71 | 47.924 -226 | 74.83 + 84 |
| 9 17.8 | 17.919 -395 | 99.20 + 40 | 14.145 -159 | 58.64 - 6 | 52.802 -201 | 72.14 + 32 | 47.683 -241 | 75.21 + 38 |
| 9 27.7 | 17.517 -402 | 99.11 - 9 | 13.980 -165 | 58.66 - 2 | 52.596 -206 | 72.10 - 4 | 47.435 -248 | 75.17 - 4 |
| 10 7.7 | 17.117 -400 | 98.49 - 62 | 13.818 -162 | 58.78 -12 | 52.391 -205 | 71.66 -44 | 47.190 -245 | 74.67 -50 |
| 10 17.7 | 16.740 -377 | 97.33 -116 | 13.672 -146 | 59.01 -23 | 52.203 -188 | 70.82 -84 | 46.961 -229 | 73.70 -97 |
| 10 27.6 | 16.394 -346 | 95.70 -163 | 13.549 -123 | 59.33 -32 | 52.037 -166 | 69.63 -119 | 46.756 -205 | 72.31 -139 |
| 11 6.6 | 16.091 -303 | 93.57 -213 | 13.458 -91 | 59.78 -45 | 51.903 -134 | 68.04 -159 | 46.584 -172 | 70.47 -184 |
| 11 16.6 | 15.848 -243 | 90.99 -258 | 13.408 -50 | 60.35 -57 | 51.810 -93 | 66.12 -192 | 46.458 -126 | 68.25 -222 |
| 11 26.6 | 15.667 -181 | 88.05 -294 | 13.402 - 6 | 61.04 -69 | 51.761 -49 | 63.91 -221 | 46.378 -80 | 65.69 -256 |
| 12 6.5 | 15.559 -108 | 84.77 -328 | 13.442 + 40 | 61.86 -82 | 51.761 + 0 | 61.41 -250 | 46.351 -27 | 62.82 -287 |
| 12 16.5 | 15.531 -28 | 81.28 -349 | 13.531 + 89 | 62.78 -92 | 51.812 + 51 | 58.74 -267 | 46.381 + 30 | 59.75 -307 |
| 12 26.5 | 15.578 + 47 | 77.67 -361 | 13.662 +131 | 63.80 -102 | 51.911 + 99 | 55.95 -279 | 46.464 + 83 | 56.56 -319 |
| 12 36.5 | 15.705 +127 | 74.03 -364 | 13.836 +174 | 64.90 -110 | 52.057 +146 | 53.11 -284 | 46.602 +138 | 53.32 -324 |
| | + 202 | -350 | + 212 | -111 | + 188 | -275 | + 186 | -312 |
| Mean Place | 17.674 | 88.19 | 13.786 | 55.06 | 52.496 | 65.74 | 47.388 | 66.53 |
| sec δ, tan δ | +1.830 | +1.533 | +1.009 | -0.136 | +1.113 | +0.489 | +1.256 | +0.760 |
| da(ψ), dδ(ψ) | +0.021 | -0.01 | +0.065 | -0.01 | +0.048 | -0.01 | +0.041 | -0.01 |
| da(ε), dδ(ε) | +0.003 | -1.00 | -0.000 | -1.00 | +0.001 | -1.00 | +0.001 | -1.00 |
| Dble. Trans. | June 20 | | June 20 | | June 20 | | June 21 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 676 | | 674 | | 673 | | 1469 | | |
|--------------|------------|--------------|------------|--------------|------------|--------------|-------------|--------------|------------|
| | γ Draconis | | ξ Herculis | | ν Ophiuchi | | 93 Herculis | | |
| Mag Spect. | 2.42 | K5 | 3.82 | K0 | 3.50 | K0 | 4.71 | K0 | |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " | |
| | 17 56 | +51 28 | 17 57 | +29 14 | 17 58 | - 9 46 | 17 59 | +16 44 | |
| 1 | -8.5 | 14.303 + 32 | 77.56 -354 | 11.139 + 74 | 48.72 -291 | 13.182 + 113 | 28.76 -88 | 23.970 + 88 | 56.64 -236 |
| 1 | 1.5 | 14.403 + 100 | 73.99 -357 | 11.262 + 123 | 45.76 -296 | 13.338 + 156 | 29.72 -96 | 24.100 + 130 | 54.23 -241 |
| 1 | 11.4 | 14.567 + 164 | 70.45 -354 | 11.429 + 167 | 42.81 -295 | 13.533 + 195 | 30.73 -101 | 24.271 + 171 | 51.81 -242 |
| 1 | 21.4 | 14.795 + 228 | 67.10 -335 | 11.639 + 210 | 40.01 -280 | 13.762 + 229 | 31.72 -99 | 24.480 + 209 | 49.49 -232 |
| 1 | 31.4 | 15.074 + 279 | 64.07 -303 | 11.881 + 242 | 37.46 -255 | 14.017 + 255 | 32.66 -94 | 24.717 + 237 | 47.37 -212 |
| 2 | 10.4 | 15.399 + 325 | 61.42 -265 | 12.153 + 272 | 35.22 -224 | 14.294 + 277 | 33.51 -85 | 24.979 + 262 | 45.50 -187 |
| 2 | 20.3 | 15.762 + 363 | 59.30 -212 | 12.447 + 294 | 33.42 -180 | 14.586 + 292 | 34.22 -71 | 25.259 + 280 | 43.99 -151 |
| 3 | 2.3 | 16.148 + 386 | 57.77 -153 | 12.753 + 306 | 32.11 -131 | 14.887 + 301 | 34.76 -54 | 25.551 + 292 | 42.87 -112 |
| 3 | 12.3 | 16.552 + 404 | 56.85 -92 | 13.071 + 318 | 31.32 -79 | 15.195 + 308 | 35.11 -35 | 25.852 + 301 | 42.19 -68 |
| 3 | 22.2 | 16.961 + 409 | 56.62 -23 | 13.391 + 320 | 31.10 -22 | 15.505 + 310 | 35.23 -12 | 26.155 + 303 | 41.99 -20 |
| 4 | 1.2 | 17.364 + 403 | 57.03 + 41 | 13.708 + 317 | 31.42 + 32 | 15.811 + 306 | 35.15 + 8 | 26.455 + 300 | 42.24 + 25 |
| 4 | 11.2 | 17.756 + 392 | 58.06 +103 | 14.018 + 310 | 32.27 + 85 | 16.114 + 303 | 34.87 + 28 | 26.751 + 296 | 42.92 + 68 |
| 4 | 21.2 | 18.123 + 367 | 59.69 +163 | 14.313 + 295 | 33.62 +135 | 16.406 + 292 | 34.41 + 46 | 27.034 + 283 | 44.03 +111 |
| 5 | 1.1 | 18.458 + 335 | 61.79 +210 | 14.589 + 276 | 35.36 +174 | 16.685 + 279 | 33.80 + 61 | 27.302 + 268 | 45.46 +143 |
| 5 | 11.1 | 18.756 + 298 | 64.34 +255 | 14.843 + 254 | 37.48 +212 | 16.947 + 262 | 33.08 + 72 | 27.551 + 249 | 47.20 +174 |
| 5 | 21.1 | 19.007 + 251 | 67.21 +287 | 15.066 + 223 | 39.86 +238 | 17.187 + 240 | 32.29 + 79 | 27.775 + 224 | 49.16 +196 |
| 5 | 31.1 | 19.209 + 202 | 70.30 +309 | 15.258 + 192 | 42.41 +255 | 17.401 + 214 | 31.47 + 82 | 27.971 + 196 | 51.24 +208 |
| 6 | 10.0 | 19.356 + 147 | 73.53 +323 | 15.413 + 155 | 45.09 +268 | 17.585 + 184 | 30.64 + 83 | 28.135 + 164 | 53.43 +219 |
| 6 | 20.0 | 19.442 + 86 | 76.80 +327 | 15.526 + 113 | 47.77 +268 | 17.733 + 148 | 29.85 + 79 | 28.261 + 126 | 55.61 +218 |
| 6 | 30.0 | 19.471 + 29 | 79.99 +319 | 15.598 + 72 | 50.39 +262 | 17.845 + 112 | 29.12 + 73 | 28.349 + 88 | 57.73 +212 |
| 7 | 9.9 | 19.438 - 33 | 83.06 +307 | 15.626 + 28 | 52.91 +252 | 17.916 + 71 | 28.45 + 67 | 28.397 + 48 | 59.76 +203 |
| 7 | 19.9 | 19.344 - 94 | 85.90 +284 | 15.607 - 19 | 55.23 +232 | 17.945 + 29 | 27.88 + 57 | 28.402 + 5 | 61.62 +186 |
| 7 | 29.9 | 19.196 -148 | 88.46 +256 | 15.547 - 60 | 57.30 +207 | 17.934 - 11 | 27.41 + 47 | 28.367 - 35 | 63.28 +166 |
| 8 | 8.9 | 18.994 -202 | 90.69 +223 | 15.444 -103 | 59.12 +182 | 17.882 - 52 | 27.02 + 39 | 28.292 - 75 | 64.73 +145 |
| 8 | 18.8 | 18.745 -249 | 92.50 +181 | 15.305 -139 | 60.58 +146 | 17.793 - 89 | 26.73 + 29 | 28.182 -110 | 65.89 +116 |
| 8 | 28.8 | 18.460 -285 | 93.90 +140 | 15.135 -170 | 61.72 +114 | 17.675 -118 | 26.53 + 20 | 28.042 -140 | 66.79 + 90 |
| 9 | 7.8 | 18.142 -318 | 94.84 + 94 | 14.940 -195 | 62.48 + 76 | 17.531 -144 | 26.40 + 13 | 27.878 -164 | 67.40 + 61 |
| 9 | 17.8 | 17.806 -336 | 95.28 + 44 | 14.730 -210 | 62.84 + 36 | 17.372 -159 | 26.36 + 4 | 27.698 -180 | 67.69 + 29 |
| 9 | 27.7 | 17.464 -342 | 95.23 - 5 | 14.514 -216 | 62.81 - 3 | 17.207 -165 | 26.39 - 3 | 27.513 -185 | 67.68 - 1 |
| 10 | 7.7 | 17.123 -341 | 94.67 - 56 | 14.299 -215 | 62.37 - 44 | 17.044 -163 | 26.49 -10 | 27.329 -184 | 67.35 - 33 |
| 10 | 17.7 | 16.801 -322 | 93.58 -109 | 14.101 -198 | 61.50 - 87 | 16.897 -147 | 26.68 -19 | 27.160 -169 | 66.69 - 66 |
| 10 | 27.6 | 16.508 -293 | 92.03 -155 | 13.925 -176 | 60.26 -124 | 16.773 -124 | 26.95 -27 | 27.013 -147 | 65.72 - 97 |
| 11 | 6.6 | 16.253 -255 | 89.97 -206 | 13.781 -144 | 58.62 -164 | 16.680 - 93 | 27.32 -37 | 26.895 -118 | 64.44 -128 |
| 11 | 16.6 | 16.051 -202 | 87.49 -248 | 13.679 -102 | 56.61 -201 | 16.628 - 52 | 27.79 -47 | 26.818 - 77 | 62.86 -158 |
| 11 | 26.6 | 15.905 -146 | 84.64 -285 | 13.620 - 59 | 54.30 -231 | 16.619 - 9 | 28.37 -58 | 26.782 - 36 | 61.03 -183 |
| 12 | 6.5 | 15.824 - 81 | 81.45 -319 | 13.612 - 8 | 51.70 -260 | 16.658 + 39 | 29.06 - 69 | 26.793 + 11 | 58.95 -208 |
| 12 | 16.5 | 15.814 - 10 | 78.05 -340 | 13.656 + 44 | 48.91 -279 | 16.744 + 86 | 29.84 - 78 | 26.852 + 59 | 56.70 -225 |
| 12 | 26.5 | 15.870 + 56 | 74.52 -353 | 13.748 + 92 | 46.00 -291 | 16.874 + 130 | 30.73 - 89 | 26.956 + 104 | 54.35 -235 |
| 12 | 36.5 | 15.996 + 126 | 70.95 -357 | 13.890 + 142 | 43.04 -296 | 17.047 + 173 | 31.69 - 96 | 27.104 + 148 | 51.93 -242 |
| | | 15.996 + 191 | 70.95 -344 | 13.890 + 186 | 43.04 -286 | 17.047 + 210 | 31.69 - 98 | 27.104 + 187 | 51.93 -235 |
| Mean Place | 17.535 | 84.69 | 14.417 | 55.71 | 16.986 | 22.10 | 27.356 | 63.61 | |
| sec δ, tan δ | +1.606 | +1.257 | +1.146 | +0.560 | +1.015 | -0.172 | +1.044 | +0.301 | |
| dα(ψ), dδ(ψ) | +0.028 | -0.01 | +0.046 | -0.00 | +0.066 | -0.00 | +0.053 | -0.00 | |
| dα(ε), dδ(ε) | +0.001 | -1.00 | +0.000 | -1.00 | -0.000 | -1.00 | +0.000 | -1.00 | |
| Dbles.Trans. | June 21 | | June 21 | | June 21 | | June 21 | | |

AT UPPER TRANSIT AT GREENWICH

| No. | 677 | | 1470 | | 679 | | 1471 | |
|--------------|--------------------------|------------|--------------------------|-----------|--------------------------|-----------|--------------------------|------------|
| | 67 Ophiuchi | | 6 Sagittarii | | γ Sagittarii | | 9 Arae | |
| Mag. Spect. | 3.95 | B5p | 6.31 | K2 | 3.07 | K0 | 3.90 | B1p |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " |
| | 17 59 | + 2 55 | 18 00 | - 17 09 | 18 04 | - 30 25 | 18 05 | - 50 05 |
| 1 -8.5 | 54.556 ^s +101 | 46 34 -163 | 32.061 ^s +115 | 32 80 -36 | 52.051 ^s +124 | 37 81 +39 | 29.249 ^s +147 | 44.34 +162 |
| 1 1.5 | 54.698 +142 | 44 65 -169 | 32.221 +160 | 33.34 -54 | 52.223 +172 | 37.41 +40 | 29.462 +213 | 42.79 +155 |
| 1 11.4 | 54.879 +181 | 42.93 -172 | 32.424 +203 | 33.89 -55 | 52.442 +219 | 37.10 +31 | 29.735 +273 | 41.34 +145 |
| 1 21.4 | 55.094 +215 | 41.27 -166 | 32.661 +237 | 34.46 -57 | 52.701 +259 | 36.88 +22 | 30.063 +328 | 40.03 +131 |
| 1 31.4 | 55.336 +242 | 39.74 -153 | 32.925 +264 | 35.01 -55 | 52.989 +288 | 36.73 +15 | 30.432 +369 | 38.91 +112 |
| 2 10.4 | 55.600 +264 | 38.37 -137 | 33.211 +286 | 35.53 -52 | 53.303 +314 | 36.64 +9 | 30.837 +405 | 37.97 +94 |
| 2 20.3 | 55.881 +281 | 37.26 -111 | 33.513 +302 | 35.98 -45 | 53.635 +332 | 36.59 +5 | 31.270 +433 | 37.24 +73 |
| 3 2.3 | 56.171 +290 | 36.43 -83 | 33.824 +311 | 36.32 -34 | 53.978 +343 | 36.56 +3 | 31.719 +449 | 36.71 +53 |
| 3 12.3 | 56.469 +298 | 35.92 -51 | 34.144 +320 | 36.54 -22 | 54.331 +353 | 36.55 +1 | 32.181 +462 | 36.39 +32 |
| 3 22.3 | 56.769 +300 | 35.76 -16 | 34.464 +320 | 36.63 -9 | 54.686 +355 | 36.55 +0 | 32.647 +466 | 36.28 +11 |
| 4 1.2 | 57.066 +297 | 35.93 +17 | 34.782 +318 | 36.58 +5 | 55.038 +352 | 36.55 +0 | 33.110 +463 | 36.38 -10 |
| 4 11.2 | 57.359 +293 | 36.42 +49 | 35.097 +315 | 36.41 +17 | 55.388 +350 | 36.56 -1 | 33.569 +459 | 36.67 -29 |
| 4 21.2 | 57.642 +283 | 37.22 +80 | 35.401 +304 | 36.12 +29 | 55.727 +339 | 36.60 -4 | 34.012 +443 | 37.18 -51 |
| 5 1.1 | 57.911 +269 | 38.25 +103 | 35.692 +291 | 35.76 +36 | 56.051 +324 | 36.67 -7 | 34.435 +423 | 37.88 -70 |
| 5 11.1 | 58.164 +253 | 39.49 +124 | 35.967 +275 | 35.34 +42 | 56.359 +308 | 36.78 -11 | 34.833 +398 | 38.77 -89 |
| 5 21.1 | 58.393 +229 | 40.88 +139 | 36.218 +251 | 34.89 +45 | 56.640 +281 | 36.96 -18 | 35.196 +363 | 39.84 -107 |
| 5 31.1 | 58.597 +204 | 42.35 +147 | 36.444 +226 | 34.45 +44 | 56.894 +254 | 37.20 -24 | 35.520 +324 | 41.07 -123 |
| 6 10.0 | 58.771 +174 | 43.87 +152 | 36.639 +195 | 34.02 +43 | 57.114 +220 | 37.52 -32 | 35.798 +278 | 42.45 -138 |
| 6 20.0 | 58.909 +138 | 45.38 +151 | 36.797 +158 | 33.65 +37 | 57.293 +179 | 37.91 -39 | 36.021 +223 | 43.94 -149 |
| 6 30.0 | 59.012 +103 | 46.82 +144 | 36.918 +121 | 33.33 +32 | 57.431 +138 | 38.37 -46 | 36.188 +167 | 45.50 -156 |
| 7 10.0 | 59.074 +62 | 48.18 +136 | 36.997 +79 | 33.08 +25 | 57.522 +91 | 38.89 -52 | 36.293 +105 | 47.11 -161 |
| 7 19.9 | 59.095 +21 | 49.41 +123 | 37.032 +35 | 32.90 +18 | 57.564 +42 | 39.44 -55 | 36.333 +40 | 48.69 -158 |
| 7 29.9 | 59.077 -18 | 50.49 +108 | 37.025 -7 | 32.79 +11 | 57.561 -3 | 40.00 -56 | 36.312 -21 | 50.20 -151 |
| 8 8.9 | 59.019 -58 | 51.42 +93 | 36.976 -49 | 32.72 +7 | 57.509 -52 | 40.55 -55 | 36.228 -84 | 51.60 -140 |
| 8 18.8 | 58.926 -93 | 52.16 +74 | 36.888 -88 | 32.71 +1 | 57.415 -94 | 41.05 -50 | 36.088 -140 | 52.82 -122 |
| 8 28.8 | 58.804 -122 | 52.72 +56 | 36.770 -118 | 32.72 -1 | 57.286 -129 | 41.47 -42 | 35.902 -186 | 53.82 -100 |
| 9 7.8 | 58.656 -148 | 53.10 +38 | 36.624 -146 | 32.74 -2 | 57.126 -160 | 41.80 -33 | 35.675 -227 | 54.55 -73 |
| 9 17.8 | 58.494 -162 | 53.26 +16 | 36.462 -162 | 32.77 -3 | 56.947 -179 | 42.00 -20 | 35.424 -251 | 54.98 -43 |
| 9 27.7 | 58.326 -168 | 53.25 -1 | 36.293 -169 | 32.81 -4 | 56.760 -187 | 42.08 -8 | 35.163 -261 | 55.09 -11 |
| 10 7.7 | 58.160 -166 | 53.03 -22 | 36.127 -166 | 32.84 -3 | 56.575 -185 | 42.01 +7 | 34.902 -261 | 54.86 +23 |
| 10 17.7 | 58.008 -152 | 52.61 -42 | 35.976 -151 | 32.88 -4 | 56.406 -169 | 41.81 +20 | 34.662 -240 | 54.30 +56 |
| 10 27.7 | 57.878 -130 | 51.99 -62 | 35.848 -128 | 32.92 -4 | 56.262 -144 | 41.49 +32 | 34.455 -207 | 53.44 +86 |
| 11 6.6 | 57.777 -101 | 51.16 -83 | 35.753 -95 | 33.01 -9 | 56.109 -109 | 41.49 +41 | 34.294 -161 | 52.31 +113 |
| 11 16.6 | 57.717 -60 | 50.13 -103 | 35.700 -53 | 33.01 -12 | 56.153 -62 | 41.08 +48 | 34.294 -101 | 52.31 +135 |
| 11 26.6 | 57.698 -19 | 48.92 -121 | 35.692 -8 | 33.31 -18 | 56.091 -13 | 40.60 +51 | 34.193 -38 | 50.96 +151 |
| 12 6.5 | 57.724 +26 | 47.52 -140 | 35.733 +41 | 33.57 -26 | 56.118 +40 | 39.58 +51 | 34.188 +33 | 47.84 +161 |
| 12 16.5 | 57.798 +74 | 46.00 -152 | 35.824 +91 | 33.88 -31 | 56.214 +96 | 39.12 +46 | 34.294 +106 | 46.19 +165 |
| 12 26.5 | 57.914 +116 | 44.37 -163 | 35.954 +130 | 34.28 -40 | 56.354 +140 | 38.70 +42 | 34.466 +172 | 44.57 +162 |
| 12 36.5 | 58.073 +159 | 42.68 -169 | 36.135 +181 | 34.80 -52 | 56.549 +195 | 38.30 +40 | 34.705 +239 | 43.02 +155 |
| | 58.073 +197 | 42.68 -167 | 36.135 +218 | 34.80 -53 | 56.549 +237 | 38.30 +30 | 34.705 +298 | 43.02 +142 |
| Mean Place | 58.125 | 53.26 | 36.041 | 25.98 | 56.449 | 30.54 | 34.784 | 36.92 |
| sec δ, tan δ | +1.001 | +0.051 | +1.047 | -0.309 | +1.160 | -0.587 | +1.559 | -1.196 |
| dα(ψ), dδ(ψ) | +0.060 | -0.00 | +0.069 | +0.00 | +0.077 | +0.01 | +0.093 | +0.01 |
| dα(ε), dδ(ε) | +0.000 | -1.00 | +0.000 | -1.00 | +0.001 | -1.00 | +0.002 | -1.00 |
| Dble. Trans. | June 22 | | June 22 | | June 23 | | June 23 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 680 | | 681 | | 1472 | | 678 | |
|--|----------------------|------------|--------------|------------|-------------------------------|------------|--------------|------------|
| | 72 Ophiuchi | | o Hercules | | B.D. -13° 4863 (Serpentis) | | 66 G. Apodis | |
| Mag.Spect. | 3.73 | A3 | 3.83 | A0 | 6.50 | K0 | 5.69 | K5 |
| U.T. | R.A. | | R.A. | | R.A. | | R.A. | |
| | h m | Dec. | h m | Dec. | h m | Dec. | h m | Dec. |
| | 18 06 | + 9 33 | 18 06 | +28 45 | 18 08 | -13 56 | 18 09 | -75 53 |
| 1 | -8.5 39.098 + 88 | 33.24 -196 | 57.655 + 64 | 29.12 -286 | 53.483 + 106 | 22.67 -57 | 10.832 + 222 | 45.03 +286 |
| 1 | 1.5 39.229 + 131 | 31.21 -203 | 57.767 + 112 | 26.21 -291 | 53.631 + 148 | 23.34 -67 | 11.225 + 393 | 42.23 +280 |
| 1 | 11.4 39.398 + 169 | 29.16 -205 | 57.923 + 156 | 23.29 -292 | 53.820 + 189 | 24.05 -71 | 11.780 + 555 | 39.55 +268 |
| 1 | 21.4 39.603 + 205 | 27.19 -197 | 58.122 + 199 | 20.51 -278 | 54.046 + 226 | 24.76 -71 | 12.490 + 710 | 37.09 +246 |
| 1 | 31.4 39.836 + 233 | 25.38 -181 | 58.355 + 233 | 17.95 -256 | 54.298 + 252 | 25.44 -68 | 13.322 + 832 | 34.92 +217 |
| 2 | 10.4 40.093 + 257 | 23.77 -161 | 58.617 + 262 | 15.70 -225 | 54.573 + 275 | 26.06 -62 | 14.262 + 940 | 33.06 +186 |
| 2 | 20.3 40.369 + 276 | 22.47 -130 | 58.904 + 287 | 13.88 -182 | 54.865 + 292 | 26.56 -50 | 15.290 +1028 | 31.58 +148 |
| 3 | 2.3 40.655 + 286 | 21.50 -97 | 59.205 + 301 | 12.52 -136 | 55.168 + 303 | 26.94 -38 | 16.371 +1081 | 30.50 +108 |
| 3 | 12.3 40.951 + 296 | 20.90 -60 | 59.519 + 314 | 11.68 -84 | 55.479 + 311 | 27.17 -23 | 17.499 +1128 | 29.81 +69 |
| 3 | 22.3 41.250 + 299 | 20.73 -17 | 59.837 + 318 | 11.41 -27 | 55.794 + 315 | 27.22 -5 | 18.643 +1144 | 29.56 +25 |
| 4 | 1.2 41.548 + 298 | 20.93 + 20 | 60.153 + 316 | 11.67 + 26 | 56.107 + 313 | 27.10 + 12 | 19.780 +1137 | 29.71 -15 |
| 4 | 11.2 41.842 + 294 | 21.53 + 60 | 60.465 + 312 | 12.46 + 79 | 56.418 + 311 | 26.83 + 27 | 20.902 +1122 | 30.27 -56 |
| 4 | 21.2 42.126 + 284 | 22.48 + 95 | 60.764 + 299 | 13.76 +130 | 56.721 + 303 | 26.42 + 41 | 21.978 +1076 | 31.24 -97 |
| 5 | 1.1 42.396 + 270 | 23.72 +124 | 61.045 + 281 | 15.46 +170 | 57.011 + 290 | 25.90 + 52 | 22.992 +1014 | 32.56 -132 |
| 5 | 11.1 42.651 + 255 | 25.22 +150 | 61.306 + 261 | 17.53 +207 | 57.286 + 275 | 25.30 + 60 | 23.934 + 942 | 34.24 -168 |
| 5 | 21.1 42.881 + 230 | 26.91 +169 | 61.538 + 232 | 19.89 +236 | 57.539 + 253 | 24.65 + 65 | 24.772 + 838 | 36.24 -200 |
| 5 | 31.1 43.086 + 205 | 28.70 +179 | 61.739 + 201 | 22.42 +253 | 57.767 + 228 | 23.99 + 66 | 25.500 + 728 | 38.49 -225 |
| 6 | 10.0 43.260 + 174 | 30.57 +187 | 61.905 + 166 | 25.09 +267 | 57.966 + 199 | 23.35 + 64 | 26.101 + 601 | 40.98 -249 |
| 6 | 20.0 43.398 + 138 | 32.44 +187 | 62.028 + 123 | 27.78 +269 | 58.128 + 162 | 22.76 + 59 | 26.553 + 452 | 43.62 -264 |
| 6 | 30.0 43.500 + 102 | 34.25 +181 | 62.111 + 83 | 30.42 +264 | 58.254 + 126 | 22.23 + 53 | 26.859 + 306 | 46.34 -272 |
| 7 | 10.0 43.562 + 62 | 35.98 +173 | 62.149 + 38 | 32.97 +255 | 58.338 + 84 | 21.77 + 46 | 27.005 + 146 | 49.10 -276 |
| 7 | 19.9 43.581 + 19 | 37.55 +157 | 62.140 - 9 | 35.33 +236 | 58.378 + 40 | 21.40 + 37 | 27.984 - 21 | 51.78 -268 |
| 7 | 29.9 43.561 - 20 | 38.95 +140 | 62.090 - 50 | 37.46 +213 | 58.378 + 0 | 21.12 + 28 | 26.812 -172 | 54.32 -254 |
| 8 | 8.9 43.501 - 60 | 40.17 +122 | 61.996 - 94 | 39.33 +187 | 58.335 - 43 | 20.90 + 22 | 26.483 -329 | 56.66 -234 |
| 8 | 18.8 43.405 - 96 | 41.15 + 98 | 61.864 -132 | 40.87 +154 | 58.253 - 82 | 20.77 + 13 | 26.015 -468 | 58.67 -201 |
| 8 | 28.8 43.279 -126 | 41.91 + 76 | 61.701 -163 | 42.08 +121 | 58.140 -113 | 20.69 + 8 | 25.436 -579 | 60.31 -164 |
| 9 | 7.8 43.127 -152 | 42.43 + 52 | 61.510 -191 | 42.92 + 84 | 57.999 -141 | 20.66 + 3 | 24.755 -681 | 61.52 -121 |
| 9 | 17.8 42.959 -168 | 42.69 + 26 | 61.303 -207 | 43.37 + 45 | 57.840 -159 | 20.67 - 1 | 24.013 -742 | 62.23 -71 |
| 9 | 27.7 42.785 -174 | 42.71 + 2 | 61.089 -214 | 43.43 + 6 | 57.674 -166 | 20.72 - 5 | 23.242 -771 | 62.43 -20 |
| 10 | 7.7 42.611 -174 | 42.47 -24 | 60.874 -215 | 43.09 -34 | 57.508 -166 | 20.79 - 7 | 22.467 -775 | 62.08 + 35 |
| 10 | 17.7 42.451 -160 | 41.95 -52 | 60.674 -200 | 42.32 -77 | 57.357 -151 | 20.91 -12 | 21.741 -726 | 61.19 + 89 |
| 10 | 27.7 42.311 -140 | 41.19 -76 | 60.494 -180 | 41.18 -114 | 57.227 -130 | 21.06 -15 | 21.089 -652 | 59.81 +138 |
| 11 | 6.6 42.200 -111 | 40.16 -103 | 60.345 -149 | 39.63 -155 | 57.127 -100 | 21.27 -21 | 20.542 -547 | 57.96 +185 |
| 11 | 16.6 42.128 -72 | 38.89 -127 | 60.236 -109 | 37.71 -192 | 57.068 -59 | 21.54 -27 | 20.140 -402 | 55.73 +223 |
| 11 | 26.6 42.097 -31 | 37.40 -149 | 60.170 -66 | 35.49 -222 | 57.052 -16 | 21.89 -35 | 19.891 -249 | 53.20 +253 |
| 12 | 6.5 42.110 + 13 | 35.70 -170 | 60.152 -18 | 32.97 -252 | 57.083 + 31 | 22.32 -43 | 19.816 -75 | 50.44 +276 |
| 12 | 16.5 42.171 + 61 | 33.84 -186 | 60.186 + 34 | 30.24 -273 | 57.163 + 80 | 22.81 -49 | 19.927 + 111 | 47.58 +266 |
| 12 | 26.5 42.275 + 104 | 31.88 -196 | 60.268 + 82 | 27.39 -285 | 57.285 + 122 | 23.38 -57 | 20.211 + 284 | 44.71 +287 |
| 12 | 36.5 42.423 + 148 | 29.85 -203 | 60.399 + 131 | 24.47 -292 | 57.451 + 166 | 24.06 -68 | 20.672 + 461 | 41.90 +281 |
| | 42.571 + 185 | 29.85 -199 | 60.399 + 175 | 24.47 -283 | 57.451 + 206 | 24.06 -68 | 20.672 + 621 | 41.90 +262 |
| Mean Place | 42.571 | 40.58 | 60.943 | 36.30 | 57.376 | 15.10 | 22.532 | 37.20 |
| sec δ , tan δ | +1.014 | +0.168 | +1.141 | +0.549 | +1.030 | -0.248 | +4.103 | -3.979 |
| da(ψ), d δ (ψ) | +0.057 | +0.01 | +0.047 | +0.01 | +0.068 | +0.02 | +0.167 | +0.02 |
| d α (ϵ), d δ (ϵ) | -0.000 | -1.00 | -0.001 | -1.00 | +0.001 | -1.00 | +0.011 | -1.00 |
| Dble.Trans. | June 23 | | June 23 | | June 24 | | June 24 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 1473 | | 682 | | 685 | | 684 | |
|--------------|--------------|------------|--------------|-----------|-------------|------------|--------------------------|------------|
| | ε Telescopii | | μ Sagittarii | | 36 Draconis | | Groombridge 2533 (Lyrae) | |
| Name | | | | | | | | |
| Mag.Spect. | 4.60 | K0 | 4.01 | B8p | 5.03 | F5 | 5.42 | B5 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " |
| | 18 10 | -45 57 | 18 12 | -21 03 | 18 13 | +64 23 | 18 15 | +42 08 |
| 1 -8.5 | 08.452 +136 | 35 63 +139 | 53 302 +114 | 55.53 -4 | 45.602 -58 | 26.49 -357 | 10.333 +30 | 68.15 -324 |
| 1 1.5 | 08.648 +196 | 34 30 +133 | 53 445 +143 | 55.80 -27 | 45.640 +38 | 22.84 -365 | 10.418 +85 | 64.82 -333 |
| 1 11.4 | 08.899 +251 | 33 04 +126 | 53 642 +197 | 56.06 -26 | 45.774 +134 | 19.18 -366 | 10.558 +140 | 61.48 -334 |
| 1 21.4 | 09.202 +303 | 31 92 +112 | 53 875 +233 | 56.33 -27 | 46.005 +231 | 15.68 -350 | 10.751 +193 | 58.29 -319 |
| 1 31.4 | 09.542 +340 | 30.94 +98 | 54.135 +260 | 56.61 -28 | 46.317 +312 | 12.46 -322 | 10.986 +235 | 55.35 -294 |
| 2 10.4 | 09.916 +374 | 30.12 +82 | 54.419 +284 | 56.88 -27 | 46.707 +390 | 09.61 -285 | 11.262 +276 | 52.74 -261 |
| 2 20.3 | 10.316 +400 | 29.47 +65 | 54.723 +304 | 57.10 -22 | 47.161 +454 | 07.28 -233 | 11.569 +307 | 50.61 -213 |
| 3 2.3 | 10.731 +415 | 28.99 +48 | 55.037 +314 | 57.26 -16 | 47.659 +498 | 05.52 -176 | 11.899 +330 | 49.00 -161 |
| 3 12.3 | 11.159 +428 | 28.67 +32 | 55.361 +324 | 57.33 -7 | 48.194 +535 | 04.38 -114 | 12.246 +347 | 47.97 -103 |
| 3 22.3 | 11.592 +433 | 28.52 +15 | 55.689 +328 | 57.31 +2 | 48.745 +551 | 03.95 -43 | 12.602 +356 | 47.59 -38 |
| 4 1.2 | 12.023 +431 | 28.54 -2 | 56.016 +327 | 57.19 +12 | 49.293 +548 | 04.17 +22 | 12.957 +355 | 47.80 +21 |
| 4 11.2 | 12.451 +428 | 28.72 -18 | 56.341 +325 | 57.00 +19 | 49.830 +537 | 05.05 +88 | 13.308 +351 | 48.63 +83 |
| 4 21.2 | 12.866 +415 | 28.72 -35 | 56.341 +317 | 57.00 +27 | 49.830 +504 | 05.05 +152 | 13.308 +336 | 48.63 +140 |
| 5 1.1 | 13.263 +397 | 29.57 -52 | 56.658 +305 | 56.73 +31 | 50.334 +460 | 06.57 +203 | 13.644 +314 | 50.03 +187 |
| 5 11.1 | 13.639 +376 | 30.27 -68 | 56.963 +290 | 56.42 +34 | 50.794 +407 | 08.60 +251 | 13.958 +289 | 51.90 +232 |
| 5 21.1 | 13.983 +344 | 31.12 -85 | 57.521 +268 | 55.75 +33 | 51.539 +338 | 14.00 +289 | 14.500 +253 | 56.88 +266 |
| 5 31.1 | 14.292 +309 | 32.12 -100 | 57.763 +242 | 55.45 +30 | 51.803 +264 | 17.14 +314 | 14.715 +215 | 59.76 +288 |
| 6 10.0 | 14.569 +267 | 33.25 -113 | 57.975 +212 | 55.19 +26 | 51.989 +186 | 20.48 +334 | 14.887 +172 | 62.82 +306 |
| 6 20.0 | 14.776 +217 | 34.50 -125 | 58.149 +174 | 54.99 +20 | 52.085 +96 | 23.88 +340 | 15.009 +122 | 65.93 +311 |
| 6 30.0 | 14.941 +165 | 35.83 -133 | 58.286 +137 | 54.87 +12 | 52.097 +12 | 27.26 +338 | 15.083 +74 | 69.00 +307 |
| 7 10.0 | 15.050 +109 | 37.20 -137 | 58.379 +93 | 54.82 +5 | 52.022 -75 | 30.55 +329 | 15.104 +21 | 72.00 +300 |
| 7 19.9 | 15.097 +47 | 38.58 -138 | 58.426 +97 | 54.84 -2 | 51.858 -164 | 33.63 +308 | 15.071 -33 | 74.79 +279 |
| 7 29.9 | 15.087 -10 | 39.91 -133 | 58.431 +5 | 54.91 -7 | 51.619 -239 | 36.45 +282 | 14.989 -82 | 77.35 +256 |
| 8 8.9 | 15.019 -68 | 41.16 -125 | 58.390 -41 | 55.03 -12 | 51.301 -318 | 38.96 +251 | 14.857 -132 | 79.62 +227 |
| 8 18.8 | 14.898 -121 | 42.26 -110 | 58.309 -81 | 55.18 -15 | 50.917 -384 | 41.06 +210 | 14.682 -175 | 81.51 +189 |
| 8 28.8 | 14.734 -164 | 43.18 -92 | 58.195 -114 | 55.34 -16 | 50.481 -436 | 42.75 +169 | 14.471 -211 | 83.03 +152 |
| 9 7.8 | 14.530 -204 | 43.87 -69 | 58.051 -144 | 55.48 -14 | 49.996 -485 | 43.98 +123 | 14.229 -242 | 84.13 +110 |
| 9 17.8 | 14.303 -227 | 44.29 -42 | 57.888 -163 | 55.60 -12 | 49.483 -513 | 44.69 +71 | 13.966 -263 | 84.76 +63 |
| 9 27.7 | 14.065 -238 | 44.43 -14 | 57.717 -171 | 55.67 -7 | 48.955 -528 | 44.91 +22 | 13.694 -272 | 84.95 +19 |
| 10 7.7 | 13.827 -238 | 44.28 +15 | 57.545 -172 | 55.71 -4 | 48.424 -531 | 44.59 -32 | 13.420 -274 | 84.66 -29 |
| 10 17.7 | 13.607 -220 | 43.83 +45 | 57.387 -158 | 55.71 +0 | 47.912 -512 | 43.72 -87 | 13.159 -261 | 83.87 -79 |
| 10 27.7 | 13.417 -190 | 43.11 +72 | 57.251 -136 | 55.68 +3 | 47.430 -482 | 42.35 -137 | 12.920 -239 | 82.63 -124 |
| 11 6.6 | 13.268 -149 | 42.15 +96 | 57.146 -106 | 55.63 +5 | 46.994 -436 | 40.45 -190 | 12.711 -209 | 80.91 -172 |
| 11 16.6 | 13.175 -93 | 41.00 +115 | 57.083 -63 | 55.59 +4 | 46.624 -370 | 38.08 -237 | 12.547 -164 | 78.77 -214 |
| 11 26.6 | 13.140 -35 | 39.71 +129 | 57.065 -18 | 55.56 +3 | 46.325 -299 | 35.31 -277 | 12.429 -118 | 76.26 -251 |
| 12 6.5 | 13.170 +30 | 38.32 +139 | 57.095 +30 | 55.58 -2 | 46.111 -214 | 32.15 -316 | 12.365 -64 | 73.40 -286 |
| 12 16.5 | 13.267 +97 | 36.91 +141 | 57.178 +83 | 55.64 -6 | 45.993 -118 | 28.74 -341 | 12.359 -6 | 70.30 -310 |
| 12 26.5 | 13.426 +159 | 35.51 +140 | 57.294 +116 | 55.64 +0 | 45.968 -25 | 25.16 -358 | 12.409 +50 | 67.04 -326 |
| 12 36.5 | 13.646 +220 | 34.17 +134 | 57.470 +176 | 55.96 -32 | 46.044 +76 | 21.50 -366 | 12.517 +108 | 63.71 -333 |
| | +274 | +123 | +213 | -23 | +173 | -357 | +162 | -326 |
| Mean Place | 13.654 | 27.63 | 57.372 | 47.58 | 49.110 | 33.39 | 13.584 | 75.25 |
| sec δ, tan δ | +1.438 | -1.034 | +1.072 | -0.385 | +2.314 | +2.086 | +1.349 | +0.905 |
| dα(ψ), dδ(ψ) | +0.089 | +0.02 | +0.071 | +0.02 | +0.006 | +0.02 | +0.037 | +0.03 |
| dα(ε), dδ(ε) | +0.003 | -1.00 | +0.001 | -1.00 | -0.008 | -1.00 | -0.004 | -1.00 |
| Dble.Trans. | June 24 | | June 25 | | June 25 | | June 25 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 1474 | | 1475 | | 683 | | 1477 | | | | | | | | | | |
|--------------|-----------------|--------------|-----------------------------|--------------|---------------|--------------|--------------|--------------|--------|--------|-------|-------|------|--------|-------|-------|------|
| | 6 G. Telescopii | | Bradley 2292 (Serpentis) | | η Sagittarii* | | α Lyrae | | | | | | | | | | |
| Mag.Spect. | 5.54 | B5 | 6.30 | A5 | 3.16 | M3 | 4.34 | K0 | | | | | | | | | |
| U.T. | R.A. | | R.A. | | R.A. | | R.A. | | | | | | | | | | |
| | h | m | h | m | h | m | h | m | | | | | | | | | |
| | 18 15 | 56 01 | 18 16 | 9 45 | 18 16 | 36 46 | 18 19 | 36 03 | | | | | | | | | |
| | ^d | ^s | ^s | ^o | ^s | ^o | ^s | ^o | | | | | | | | | |
| 1 | -8.5 | 53 198 | + 139 | 52.39 | +196 | 35 749 | + 95 | 58.77 | - 81 | 38 184 | + 118 | 08.83 | + 84 | 20 036 | + 38 | 21 48 | -306 |
| 1 | 1.5 | 53 413 | + 215 | 50.47 | +192 | 35 886 | + 137 | 59.66 | - 89 | 38 353 | + 169 | 08.02 | + 81 | 20 125 | + 89 | 18 35 | -313 |
| 1 | 11.5 | 53 697 | + 284 | 48.63 | +184 | 36 063 | + 177 | 60.59 | - 93 | 38 571 | + 218 | 07.27 | + 75 | 20 263 | + 138 | 15 20 | -315 |
| 1 | 21.4 | 54 047 | + 350 | 46.94 | +169 | 36 276 | + 213 | 61.51 | - 92 | 38 834 | + 263 | 06.61 | + 66 | 20 449 | + 186 | 12 17 | -303 |
| 1 | 31.4 | 54 447 | + 400 | 45.45 | +149 | 36 516 | + 240 | 62.37 | - 86 | 39 131 | + 297 | 06.04 | + 57 | 20 673 | + 224 | 09 38 | -279 |
| 2 | 10.4 | 54 891 | + 444 | 44.16 | +129 | 36 780 | + 264 | 63.14 | - 77 | 39 456 | + 325 | 05.56 | + 48 | 20 934 | + 261 | 06 89 | -249 |
| 2 | 20.3 | 55 370 | + 479 | 43.11 | +105 | 37 062 | + 282 | 63.76 | - 62 | 39 804 | + 348 | 05.17 | + 39 | 21 223 | + 289 | 04 85 | -204 |
| 3 | 2.3 | 55 870 | + 500 | 42.31 | + 80 | 37 356 | + 294 | 64.22 | - 46 | 40 166 | + 362 | 04.86 | + 31 | 21 532 | + 309 | 03 31 | -154 |
| 3 | 12.3 | 56 390 | + 520 | 41.75 | + 56 | 37 659 | + 303 | 64.48 | - 26 | 40 539 | + 373 | 04.62 | + 24 | 21 858 | + 326 | 02 32 | - 99 |
| 3 | 22.3 | 56 917 | + 527 | 41.47 | + 28 | 37 967 | + 308 | 64.52 | - 4 | 40 918 | + 379 | 04.46 | + 16 | 22 192 | + 334 | 01 93 | - 39 |
| 4 | 1.2 | 57 443 | + 526 | 41.44 | + 3 | 38 275 | + 306 | 64.36 | + 16 | 41 297 | + 379 | 04.37 | + 9 | 22 526 | + 334 | 02 12 | + 19 |
| 4 | 11.2 | 57 966 | + 523 | 41.67 | - 23 | 38 582 | + 307 | 63.99 | + 37 | 41 674 | + 377 | 04.35 | + 2 | 22 858 | + 332 | 02 89 | + 77 |
| 4 | 21.2 | 58 474 | + 508 | 42.17 | - 50 | 38 881 | + 299 | 63.45 | + 54 | 42 041 | + 367 | 04.42 | - 7 | 23 177 | + 319 | 04 21 | +132 |
| 5 | 1.2 | 58 959 | + 485 | 42.91 | - 74 | 39 169 | + 288 | 62.76 | + 69 | 42 394 | + 353 | 04.59 | - 17 | 23 478 | + 301 | 05 98 | +177 |
| 5 | 11.1 | 59 419 | + 460 | 43.89 | - 98 | 39 443 | + 274 | 61.96 | + 80 | 42 731 | + 337 | 04.86 | - 27 | 23 758 | + 280 | 08 17 | +219 |
| 5 | 21.1 | 59 838 | + 419 | 45.11 | -122 | 39 696 | + 253 | 61.08 | + 88 | 43 042 | + 311 | 05 24 | - 38 | 24 006 | + 248 | 10 69 | +252 |
| 5 | 31.1 | 60 213 | + 375 | 46.52 | -141 | 39 925 | + 229 | 60.18 | + 90 | 43 323 | + 281 | 05 73 | - 49 | 24 221 | + 215 | 13 43 | +274 |
| 6 | 10.0 | 60 537 | + 324 | 48.12 | -160 | 40 126 | + 201 | 59.28 | + 90 | 43 569 | + 246 | 06 33 | - 60 | 24 398 | + 177 | 16 33 | +290 |
| 6 | 20.0 | 60 797 | + 260 | 49.86 | -174 | 40 291 | + 165 | 58.41 | + 87 | 43 771 | + 202 | 07 04 | - 71 | 24 529 | + 131 | 19 29 | +296 |
| 6 | 30.0 | 60 995 | + 198 | 51.70 | -184 | 40 420 | + 129 | 57.62 | + 79 | 43 929 | + 158 | 07 83 | - 79 | 24 616 | + 87 | 22 22 | +293 |
| 7 | 10.0 | 61 121 | + 126 | 53.59 | -189 | 40 508 | + 88 | 56.90 | + 72 | 44 038 | + 109 | 08 69 | - 86 | 24 654 | + 38 | 25 06 | +284 |
| 7 | 19.9 | 61 172 | + 51 | 55.46 | -187 | 40 552 | + 44 | 56.29 | + 61 | 44 092 | + 54 | 09 58 | - 89 | 24 642 | - 12 | 27 72 | +266 |
| 7 | 29.9 | 61 153 | - 19 | 57.27 | -181 | 40 557 | + 5 | 55.78 | + 51 | 44 097 | + 5 | 10 48 | - 90 | 24 585 | - 57 | 30 15 | +243 |
| 8 | 8.9 | 61 061 | - 92 | 58.96 | -169 | 40 518 | - 39 | 55.37 | + 41 | 44 050 | - 47 | 11 34 | - 86 | 24 480 | - 105 | 32 32 | +217 |
| 8 | 18.9 | 60 904 | - 157 | 60.45 | -149 | 40 441 | - 77 | 55.07 | + 30 | 43 955 | - 95 | 12 13 | - 79 | 24 333 | - 147 | 34 13 | +181 |
| 8 | 28.8 | 60 693 | - 211 | 61 69 | -124 | 40 332 | - 109 | 54.86 | + 21 | 43 822 | - 133 | 12 81 | - 68 | 24 152 | - 181 | 35 59 | +146 |
| 9 | 7.8 | 60 433 | - 260 | 62 63 | - 94 | 40 195 | - 137 | 54.74 | + 12 | 43 653 | - 169 | 13 34 | - 53 | 23 941 | - 211 | 36 66 | +107 |
| 9 | 17.8 | 60 143 | - 290 | 63 22 | - 59 | 40 040 | - 155 | 54.71 | + 3 | 43 462 | - 191 | 13 70 | - 36 | 23 710 | - 231 | 37 29 | + 63 |
| 9 | 27.7 | 59 837 | - 306 | 63 45 | - 23 | 39 875 | - 165 | 54.75 | - 4 | 43 260 | - 202 | 13 87 | - 17 | 23 469 | - 241 | 37 51 | + 22 |
| 10 | 7.7 | 59 528 | - 309 | 63 29 | + 16 | 39 710 | - 165 | 54.86 | - 11 | 43 056 | - 204 | 13 83 | + 4 | 23 226 | - 243 | 37 27 | - 24 |
| 10 | 17.7 | 59 241 | - 287 | 62 74 | + 55 | 39 558 | - 152 | 55.06 | - 20 | 42 868 | - 188 | 13 59 | + 24 | 22 994 | - 232 | 36 56 | - 71 |
| 10 | 27.7 | 58 987 | - 254 | 61 83 | + 91 | 39 425 | - 133 | 55.32 | - 26 | 42 705 | - 163 | 13 16 | + 43 | 22 783 | - 211 | 35 44 | -112 |
| 11 | 6.6 | 58 781 | - 206 | 60 58 | +125 | 39 321 | - 104 | 55.69 | - 37 | 42 577 | - 128 | 12 56 | + 60 | 22 601 | - 182 | 33 86 | -158 |
| 11 | 16.6 | 58 642 | - 139 | 59 05 | +153 | 39 256 | - 65 | 56.14 | - 45 | 42 497 | - 80 | 11 84 | + 72 | 22 459 | - 142 | 31 87 | -199 |
| 11 | 26.6 | 58 573 | - 69 | 57 32 | +173 | 39 232 | - 24 | 56.69 | - 55 | 42 467 | - 30 | 11 02 | + 82 | 22 360 | - 99 | 29 54 | -233 |
| 12 | 6.6 | 58 581 | + 8 | 55 42 | +190 | 39 254 | + 22 | 57.34 | - 65 | 42 494 | + 27 | 10 15 | + 87 | 22 312 | - 48 | 26 86 | -268 |
| 12 | 16.5 | 58 674 | + 93 | 53 45 | +197 | 39 323 | + 69 | 58.07 | - 73 | 42 579 | + 85 | 09 27 | + 88 | 22 317 | + 5 | 23 96 | -290 |
| 12 | 26.5 | 58 842 | + 168 | 51 47 | +198 | 39 435 | + 112 | 58.88 | - 81 | 42 717 | + 138 | 08 42 | + 85 | 22 374 | + 57 | 20 90 | -306 |
| 12 | 36.5 | 59 086 | + 244 | 49 54 | +193 | 39 589 | + 154 | 59.78 | - 90 | 42 907 | + 190 | 07 60 | + 82 | 22 484 | + 110 | 17 75 | -315 |
| | | + 313 | +180 | +180 | +193 | +193 | +193 | - 90 | +239 | +239 | +75 | +75 | +158 | +158 | | | -307 |
| Mean Place | 59.292 | 43.54 | | 39.543 | 50.66 | 42.832 | 00.21 | 23.302 | 28.74 | | | | | | | | |
| sec δ, tan δ | +1.790 | -1.484 | | +1.015 | -0.172 | +1.248 | -0.747 | +1.237 | +0.728 | | | | | | | | |
| dα(ψ), dδ(ψ) | +0.100 | +0.03 | | +0.066 | +0.03 | +0.081 | +0.03 | +0.042 | +0.03 | | | | | | | | |
| dα(ε), dδ(ε) | +0.007 | -1.00 | | +0.001 | -1.00 | +0.004 | -1.00 | -0.004 | -1.00 | | | | | | | | |
| Dble.Trans. | June 26 | | June 26 | | June 26 | | June 27 | | | | | | | | | | |

AT UPPER TRANSIT AT GREENWICH

| No. | 687 | | 1476 | | 688 | | 695 | |
|--------------|--------------|------------|--------------|-------------|--------------|-------------|--------------|-------------|
| | δ Sagittarii | | 74 Ophiuchi | | η Serpentis | | χ Draconis | |
| Mag.Spect. | 2.84 | K0 | 4.92 | G5 | 3.42 | K0 | 3.69 | F8 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° ' | h m | ° ' | h m | ° ' | h m | ° ' |
| | 18 20 | -29 50 | 18 20 | + 3 21 | 18 20 | - 2 54 | 18 21 | + 72 43 |
| 1 -8.5 | 03 477 + 110 | 14.24 + 40 | 08 059 + 81 | 65 23' -158 | 33 024 + 85 | 18 89 -124 | 14 039 -170 | 31.72 -352 |
| 1 1.5 | 03 629 + 152 | 13.84 + 40 | 08 182 + 123 | 63 59 -164 | 33 151 + 127 | 20 19 -130 | 14 009 -30 | 28.10 -362 |
| 1 11.5 | 03 832 + 203 | 13.47 + 37 | 08 343 + 161 | 61 91 -168 | 33 317 + 166 | 21 53 -134 | 14 121 + 112 | 24.45 -361 |
| 1 21.4 | 04 075 + 243 | 13.19 + 28 | 08 540 + 197 | 60 28 -163 | 33 519 + 202 | 22 83 -130 | 14 378 + 257 | 20.94 -355 |
| 1 31.4 | 04 348 + 273 | 12.95 + 24 | 08 765 + 225 | 58 78 -150 | 33 748 + 229 | 24 04 -121 | 14 760 + 382 | 17.69 -325 |
| 2 10.4 | 04 648 + 300 | 12.76 + 19 | 09 015 + 250 | 57 44 -134 | 34 001 + 253 | 25 12 -108 | 15 261 + 501 | 14.78 -291 |
| 2 20.3 | 04 970 + 322 | 12.59 + 17 | 09 284 + 269 | 56 34 -110 | 34 273 + 272 | 26 00 -88 | 15 865 + 604 | 12.38 -240 |
| 3 2.3 | 05 304 + 334 | 12.44 + 15 | 09 566 + 282 | 55 54 -80 | 34 557 + 284 | 26 65 -65 | 16 541 + 676 | 10.53 -185 |
| 3 12.3 | 05 650 + 346 | 12.29 + 15 | 09 858 + 292 | 55 04 -50 | 34 852 + 295 | 27 05 -40 | 17 277 + 736 | 09.30 -123 |
| 3 22.3 | 06 002 + 352 | 12.14 + 15 | 10 156 + 298 | 54 90 -14 | 35 152 + 300 | 27 15 -10 | 18 042 + 765 | 08.76 -54 |
| 4 1.2 | 06 353 + 351 | 12.00 + 14 | 10 454 + 298 | 55 10 + 20 | 35 452 + 300 | 26 97 + 18 | 18 806 + 764 | 08.88 + 12 |
| 4 11.2 | 06 704 + 351 | 11.85 + 15 | 10 752 + 298 | 55 62 + 52 | 35 752 + 300 | 26 53 + 44 | 19 558 + 752 | 09.66 + 78 |
| 4 21.2 | 07 047 + 343 | 11.73 + 12 | 11 042 + 290 | 56 45 + 83 | 36 044 + 292 | 25 84 + 69 | 20 261 + 703 | 11.07 + 141 |
| 5 1.2 | 07 378 + 331 | 11.64 + 9 | 11 321 + 279 | 57 53 + 108 | 36 326 + 282 | 24 95 + 89 | 20 899 + 638 | 13.00 + 193 |
| 5 11.1 | 07 694 + 316 | 11.61 + 3 | 11 586 + 265 | 58 83 + 130 | 36 594 + 268 | 23 89 + 106 | 21 459 + 560 | 15.43 + 243 |
| 5 21.1 | 07 986 + 292 | 11.64 - 3 | 11 829 + 243 | 60 29 + 146 | 36 841 + 247 | 22 71 + 118 | 21 915 + 456 | 18.25 + 282 |
| 5 31.1 | 08 252 + 266 | 11.75 - 11 | 12 049 + 220 | 61 83 + 154 | 37 065 + 224 | 21 48 + 123 | 22 262 + 347 | 21.33 + 308 |
| 6 10.0 | 08 486 + 234 | 11.94 - 19 | 12 240 + 191 | 63 44 + 161 | 37 260 + 195 | 20 21 + 127 | 22 492 + 230 | 24.64 + 331 |
| 6 20.0 | 08 680 + 194 | 12.23 - 29 | 12 396 + 156 | 65 03 + 159 | 37 420 + 160 | 18 97 + 124 | 22 591 + 99 | 28.02 + 338 |
| 6 30.0 | 08 833 + 153 | 12.60 - 37 | 12 516 + 120 | 66 57 + 154 | 37 545 + 125 | 17 79 + 118 | 22 568 - 23 | 31.39 + 337 |
| 7 10.0 | 08 939 + 106 | 13 05 - 45 | 12 596 + 80 | 68 02 + 145 | 37 630 + 85 | 16 69 + 110 | 22 418 - 150 | 34.70 + 331 |
| 7 19.9 | 08 997 + 58 | 13 55 - 50 | 12 633 + 37 | 69 34 + 132 | 37 671 + 41 | 15 72 + 97 | 22 141 - 277 | 37.81 + 311 |
| 7 29.9 | 09 007 + 10 | 14 09 - 54 | 12 631 - 2 | 70 51 + 117 | 37 673 + 2 | 14 87 + 85 | 22 111 - 386 | 40 67 + 286 |
| 8 8.9 | 08 969 - 38 | 14 63 - 54 | 12 587 - 44 | 71 52 + 101 | 37 632 - 41 | 14 16 + 71 | 21 755 - 496 | 43 25 + 258 |
| 8 18.9 | 08 887 - 82 | 15 15 - 52 | 12 505 - 82 | 72 34 + 82 | 37 554 - 78 | 13 60 + 56 | 21 259 - 591 | 45 42 + 217 |
| 8 28.8 | 08 768 - 119 | 15 62 - 47 | 12 393 - 112 | 72 97 + 63 | 37 444 - 110 | 13 19 + 41 | 20 002 - 666 | 47 20 + 178 |
| 9 7.8 | 08 615 - 153 | 16 00 - 38 | 12 252 - 141 | 73 41 + 44 | 37 306 - 138 | 12 92 + 27 | 19 267 - 735 | 48 53 + 133 |
| 9 17.8 | 08 442 - 173 | 16 27 - 27 | 12 094 - 158 | 73 64 + 23 | 37 306 - 156 | 12 92 + 11 | 19 267 - 777 | 48 53 + 81 |
| 9 27.7 | 08 258 - 184 | 16 43 - 16 | 12 094 - 168 | 73 64 + 4 | 37 150 - 165 | 12 81 - 1 | 18 490 - 799 | 49 34 + 33 |
| 10 7.7 | 08 072 - 186 | 16 45 - 2 | 11 926 - 169 | 73 68 - 17 | 36 985 - 167 | 12 82 - 17 | 17 691 - 810 | 49 67 - 21 |
| 10 17.7 | 07 899 - 173 | 16 33 + 12 | 11 757 - 157 | 73 51 - 37 | 36 818 - 155 | 12 99 - 31 | 16 881 - 787 | 49 46 - 75 |
| 10 27.7 | 07 750 - 149 | 16 10 + 23 | 11 600 - 139 | 73 14 - 57 | 36 663 - 136 | 13 30 - 45 | 16 094 - 749 | 48 71 - 126 |
| 11 6.6 | 07 632 - 118 | 15 76 + 34 | 11 461 - 112 | 72 57 - 79 | 36 527 - 108 | 13 75 - 61 | 15 345 - 691 | 47 45 - 179 |
| 11 16.6 | 07 558 - 74 | 15 34 + 42 | 11 349 - 74 | 71 78 - 98 | 36 419 - 71 | 14 36 - 75 | 14 654 - 603 | 45 66 - 226 |
| 11 26.6 | 07 531 - 27 | 14 88 + 46 | 11 275 - 36 | 70 80 - 116 | 36 348 - 32 | 15 11 - 89 | 14 051 - 506 | 43 40 - 269 |
| 12 6.6 | 07 556 + 25 | 14 39 + 49 | 11 239 - 36 | 69 64 - 134 | 36 316 + 13 | 16 00 - 104 | 13 545 - 390 | 40 71 - 308 |
| 12 16.5 | 07 636 + 80 | 13 93 + 46 | 11 248 + 9 | 68 30 - 148 | 36 329 + 60 | 17 04 - 114 | 13 155 - 255 | 37 63 - 335 |
| 12 26.5 | 07 761 + 125 | 13 54 + 39 | 11 302 + 54 | 66 82 - 158 | 36 389 + 101 | 18 18 - 123 | 12 900 - 122 | 34 28 - 354 |
| 12 36.5 | 07 935 + 174 | 13 09 + 45 | 11 399 + 97 | 65 24 - 164 | 36 490 + 144 | 19 41 - 131 | 12 778 + 25 | 30 74 - 364 |
| | 07 935 + 221 | 13 09 + 36 | 11 538 + 139 | 63 60 - 163 | 36 634 + 182 | 20 72 - 129 | 12 803 + 169 | 27 10 - 357 |
| Mean Place | 07 830 | 05 28 | 11 620 | 73 32 | 36 666 | 10 97 | 18 031 | 38 24 |
| sec δ, tan δ | +1.153 | -0.574 | +1.002 | +0.059 | +1.001 | -0.051 | +3.368 | +3.216 |
| da(ψ), dδ(ψ) | +0.076 | +0.03 | +0.060 | +0.04 | +0.063 | +0.04 | -0.024 | +0.04 |
| da(ε), dδ(ε) | +0.003 | -1.00 | -0.000 | -1.00 | +0.000 | -1.00 | -0.020 | -1.00 |
| Dble.Trans. | June 27 | | June 27 | | June 27 | | June 27 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 686 | | 690 | | 689 | | 1478 | | |
|--------------|------------|-------------|--------------|-------------|--------------|-------------|--------------------------|-------------|------------|
| | ξ Pavonis* | | 109 Herculis | | ε Sagittarii | | B.D. +7° 3682 (Ophiuchi) | | |
| Mag.Spect. | 4.25 | K2 | 3.92 | K0 | 1.95 | A0 | 5.69 | G0, A3 | |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | |
| | h m | ° / | h m | ° / | h m | ° / | h m | ° / | |
| | 18 21 | - 61 30 | 18 23 | + 21 45 | 18 23 | - 34 23 | 18 24 | + 8 01 | |
| 1 | 8.5 | 52.195 +136 | 14.52 +226 | 04.005 +58 | 39.17 -250 | 12.087 +108 | 40.55 +69 | 56.329 +71 | 17.24 -182 |
| 1 | 1.5 | 52.420 +225 | 12.30 +222 | 04.107 +102 | 36.59 -258 | 12.244 +157 | 39.86 +69 | 56.443 +114 | 15.36 -188 |
| 1 | 11.5 | 52.726 +306 | 10.15 +215 | 04.251 +144 | 33.99 -260 | 12.450 +206 | 39.21 +65 | 56.595 +152 | 13.44 -192 |
| 1 | 21.4 | 53.111 +385 | 08.16 +199 | 04.436 +185 | 31.48 -251 | 12.700 +250 | 38.64 +57 | 56.784 +189 | 11.58 -186 |
| 1 | 31.4 | 53.557 +446 | 06.37 +179 | 04.653 +217 | 29.16 -232 | 12.982 +282 | 38.14 +50 | 57.002 +218 | 09.86 -172 |
| 2 | 10.4 | 54.057 +500 | 04.80 +157 | 04.898 +245 | 27.09 -207 | 13.293 +311 | 37.71 +43 | 57.246 +244 | 08.33 -153 |
| 2 | 20.3 | 54.601 +544 | 03.51 +129 | 05.168 +270 | 25.39 -170 | 13.628 +335 | 37.35 +36 | 57.511 +265 | 07.08 -125 |
| 3 | 2.3 | 55.172 +571 | 02.50 +101 | 05.452 +284 | 24.12 -127 | 13.976 +348 | 37.03 +32 | 57.789 +278 | 06.15 -93 |
| 3 | 12.3 | 55.768 +596 | 01.77 +73 | 05.751 +299 | 23.29 -83 | 14.337 +361 | 36.77 +26 | 58.079 +290 | 05.57 -58 |
| 3 | 22.3 | 56.376 +608 | 01.37 +40 | 06.057 +306 | 22.98 -31 | 14.705 +368 | 36.55 +22 | 58.376 +297 | 05.39 -18 |
| 4 | 1.2 | 56.984 +608 | 01.27 +10 | 06.363 +306 | 23.16 +18 | 15.073 +368 | 36.38 +17 | 58.674 +298 | 05.58 +19 |
| 4 | 11.2 | 57.590 +606 | 01.47 -20 | 06.669 +306 | 23.82 +66 | 15.441 +368 | 36.26 +12 | 58.971 +297 | 06.14 +56 |
| 4 | 21.2 | 58.178 +588 | 01.99 -52 | 06.966 +297 | 24.95 +113 | 15.802 +361 | 36.22 +4 | 59.262 +291 | 07.06 +92 |
| 5 | 1.2 | 58.742 +564 | 02.79 -80 | 07.249 +283 | 26.45 +150 | 16.150 +348 | 36.24 -2 | 59.542 +280 | 08.26 +120 |
| 5 | 11.1 | 59.275 +533 | 03.88 -109 | 07.517 +268 | 28.31 +186 | 16.483 +333 | 36.35 -11 | 59.809 +267 | 09.72 +146 |
| 5 | 21.1 | 59.761 +486 | 05.25 -137 | 07.759 +242 | 30.43 +212 | 16.791 +308 | 36.57 -22 | 60.053 +244 | 11.37 +165 |
| 5 | 31.1 | 60.196 +435 | 06.84 -159 | 07.975 +216 | 32.72 +229 | 17.072 +281 | 36.89 -32 | 60.274 +221 | 13.13 +176 |
| 6 | 10.0 | 60.571 +372 | 08.64 -180 | 08.158 +183 | 35.14 +242 | 17.319 +247 | 37.32 -43 | 60.466 +192 | 14.97 +184 |
| 6 | 20.0 | 60.873 +305 | 10.61 -197 | 08.303 +145 | 37.60 +246 | 17.524 +205 | 37.86 -54 | 60.622 +156 | 16.81 +184 |
| 6 | 30.0 | 61.100 +227 | 12.68 -207 | 08.410 +107 | 40.01 +241 | 17.687 +163 | 38.49 -63 | 60.743 +121 | 18.60 +179 |
| 7 | 10.0 | 61.245 +145 | 14.83 -215 | 08.473 +63 | 42.35 +234 | 17.801 +114 | 39.20 -71 | 60.823 +80 | 20.32 +172 |
| 7 | 19.9 | 61.302 +57 | 16.96 -213 | 08.492 +19 | 44.52 +217 | 17.863 +62 | 39.95 -75 | 60.860 +37 | 21.89 +157 |
| 7 | 29.9 | 61.278 -24 | 19.01 -205 | 08.469 -23 | 46.49 +197 | 17.876 +13 | 40.73 -78 | 60.865 -3 | 23.29 +140 |
| 8 | 8.9 | 61.169 -109 | 20.94 -193 | 08.404 -65 | 48.24 +175 | 17.837 -39 | 41.50 -77 | 60.813 -44 | 24.52 +123 |
| 8 | 18.9 | 60.983 -186 | 22.64 -170 | 08.299 -105 | 49.69 +145 | 17.752 -85 | 42.22 -72 | 60.730 -83 | 25.53 +101 |
| 8 | 28.8 | 60.733 -250 | 24.08 -144 | 08.162 -137 | 50.85 +116 | 17.628 -124 | 42.85 -63 | 60.615 -115 | 26.32 +79 |
| 9 | 7.8 | 60.425 -308 | 25.19 -111 | 07.996 -166 | 51.70 +85 | 17.468 -160 | 43.37 -52 | 60.472 -143 | 26.89 +57 |
| 9 | 17.8 | 60.079 -346 | 25.90 -71 | 07.812 -184 | 52.19 +49 | 17.286 -182 | 43.73 -36 | 60.311 -161 | 27.20 +31 |
| 9 | 27.7 | 59.714 -365 | 26.22 -32 | 07.619 -193 | 52.36 +17 | 17.092 -194 | 43.93 -20 | 60.140 -171 | 27.29 +9 |
| 10 | 7.7 | 59.344 -370 | 26.09 +13 | 07.423 -196 | 52.16 -20 | 16.894 -198 | 43.95 -2 | 59.966 -174 | 27.13 -16 |
| 10 | 17.7 | 58.995 -349 | 25.52 +57 | 07.237 -186 | 51.58 -58 | 16.711 -183 | 43.79 +16 | 59.803 -163 | 26.71 -42 |
| 10 | 27.7 | 58.682 -313 | 24.55 +97 | 07.071 -166 | 50.68 -90 | 16.550 -161 | 43.47 +32 | 59.658 -145 | 26.07 -64 |
| 11 | 6.6 | 58.423 -259 | 23.19 +136 | 06.930 -141 | 49.40 -128 | 16.422 -128 | 42.99 +48 | 59.539 -119 | 25.16 -91 |
| 11 | 16.6 | 58.238 -185 | 21.50 +169 | 06.827 -103 | 47.80 -160 | 16.340 -82 | 42.38 +61 | 59.457 -82 | 24.03 -113 |
| 11 | 26.6 | 58.133 -105 | 19.56 +194 | 06.764 -63 | 45.91 -189 | 16.307 -33 | 41.70 +68 | 59.413 -44 | 22.69 -134 |
| 12 | 6.6 | 58.117 -16 | 17.42 +214 | 06.745 -19 | 43.74 -217 | 16.327 +20 | 40.96 +74 | 59.412 -1 | 21.13 -156 |
| 12 | 16.5 | 58.198 +81 | 15.18 +224 | 06.775 +30 | 41.37 -237 | 16.404 +77 | 40.22 +74 | 59.457 +45 | 19.43 -170 |
| 12 | 26.5 | 58.367 +169 | 12.91 +227 | 06.850 +75 | 38.87 -250 | 16.531 +127 | 39.51 +71 | 59.545 +88 | 17.61 -182 |
| 12 | 36.5 | 58.626 +259 | 10.67 +224 | 06.970 +120 | 36.28 -259 | 16.709 +178 | 38.80 +71 | 59.675 +130 | 15.72 -189 |
| | | 58.341 +212 | | 06.970 +162 | | 16.709 +226 | | 59.675 +169 | |
| Mean Place | 59.017 | 04.78 | 07.363 | 46.72 | 16.616 | 31.20 | 59.824 | 25.42 | |
| sec δ, tan δ | +2.096 | -1.842 | +1.077 | +0.399 | +1.212 | -0.685 | +1.010 | +0.141 | |
| dα(ψ), dδ(ψ) | +0.110 | +0.04 | +0.051 | +0.04 | +0.079 | +0.04 | +0.057 | +0.04 | |
| dα(ε), dδ(ε) | +0.012 | -1.00 | -0.003 | -0.99 | +0.005 | -0.99 | -0.001 | -0.99 | |
| Dble. Trans. | June 27 | | June 27 | | June 28 | | June 28 | | |

AT UPPER TRANSIT AT GREENWICH

| No. | 1479 | | 691 | | 692 | | 696 | |
|--------------|------------------------------|------------|--------------|------------|--------------|------------|--------------|------------|
| | B.D. +29° 3259 (Herculis) | | α Telescopii | | λ Sagittarii | | γ Scuti | |
| Mag.Spect. | 5.71 | A2 | 3.76 | B3 | 2.94 | K0 | 4.73 | A3 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° ' | h m | ° ' | h m | ° ' | h m | ° ' |
| | 18 25 | +29 48 | 18 25 | -45 58 | 18 27 | -25 25 | 18 28 | -14 34 |
| 1 -8.5 | 24.240 + 43 | 66 78 -281 | 53 244 + 114 | 46 36 +141 | 04.092 + 101 | 57.51 + 15 | 21.800 + 89 | 40.23 - 47 |
| 1 1.5 | 24.330 + 90 | 63 89 -289 | 53 418 + 174 | 44 97 +139 | 04.225 + 133 | 57.40 + 11 | 21.928 + 128 | 40.76 - 53 |
| 1 11.5 | 24.465 + 135 | 60 96 -293 | 53 647 + 229 | 43 63 +134 | 04.416 + 191 | 57.27 + 13 | 22.099 + 171 | 41.37 - 61 |
| 1 21.4 | 24.645 + 180 | 58 14 -282 | 53 930 + 283 | 42 38 +125 | 04.644 + 228 | 57.21 + 6 | 22.308 + 209 | 41.95 - 58 |
| 1 31.4 | 24.860 + 215 | 55.53 -261 | 54.253 + 323 | 41.27 +111 | 04.900 + 256 | 57.17 + 4 | 22.545 + 237 | 42.50 - 55 |
| 2 10.4 | 25.108 + 248 | 53.20 -233 | 54.611 + 358 | 40.28 + 99 | 05.184 + 284 | 57.14 + 3 | 22.807 + 262 | 42.98 - 48 |
| 2 20.4 | 25.383 + 275 | 51.28 -192 | 54.999 + 388 | 39.45 + 83 | 05.488 + 304 | 57.09 + 5 | 23.088 + 281 | 43.36 - 38 |
| 3 2.3 | 25.676 + 293 | 49.82 -146 | 55.404 + 405 | 38.78 + 67 | 05.806 + 318 | 57.02 + 7 | 23.383 + 295 | 43.61 - 25 |
| 3 12.3 | 25.985 + 309 | 48.87 - 95 | 55.826 + 422 | 38.26 + 52 | 06.136 + 330 | 56.90 + 12 | 23.690 + 307 | 43.71 - 50 |
| 3 22.3 | 26.302 + 317 | 48.48 - 39 | 56.256 + 430 | 37.91 + 35 | 06.473 + 337 | 56.73 + 17 | 24.003 + 313 | 43.65 + 6 |
| 4 1.2 | 26.621 + 319 | 48.64 + 16 | 56.687 + 431 | 37.72 + 19 | 06.811 + 338 | 56.52 + 21 | 24.317 + 314 | 43.42 + 23 |
| 4 11.2 | 26.939 + 318 | 49.34 + 70 | 57.119 + 432 | 37.70 + 2 | 07.149 + 338 | 56.27 + 25 | 24.633 + 316 | 43.05 + 37 |
| 4 21.2 | 27.248 + 309 | 50.56 +122 | 57.541 + 422 | 37.86 - 16 | 07.481 + 332 | 56.00 + 27 | 24.942 + 309 | 42.54 + 51 |
| 5 1.2 | 27.541 + 293 | 52.21 +165 | 57.948 + 407 | 38.20 - 34 | 07.803 + 322 | 55.72 + 28 | 25.242 + 300 | 41.93 + 61 |
| 5 11.1 | 27.817 + 276 | 54.25 +204 | 58.337 + 389 | 38.71 - 51 | 08.111 + 308 | 55.46 + 26 | 25.530 + 288 | 41.25 + 68 |
| 5 21.1 | 28.065 + 248 | 56.60 +235 | 58.696 + 359 | 39.41 - 70 | 08.398 + 287 | 55.24 + 22 | 25.798 + 288 | 40.53 + 72 |
| 5 31.1 | 28.283 + 218 | 59.16 +256 | 59.022 + 326 | 40.28 - 87 | 08.659 + 261 | 55.08 + 16 | 26.042 + 244 | 39.82 + 71 |
| 6 10.1 | 28.467 + 184 | 61.88 +272 | 59.309 + 287 | 41.31 -103 | 08.891 + 232 | 55.00 + 8 | 26.258 + 216 | 39.12 + 70 |
| 6 20.0 | 28.609 + 142 | 64.65 +277 | 59.546 + 237 | 42.47 -116 | 09.084 + 193 | 55.00 + 0 | 26.439 + 181 | 38.49 + 63 |
| 6 30.0 | 28.709 + 100 | 67.38 +273 | 59.732 + 186 | 43.74 -127 | 09.239 + 155 | 55.09 - 9 | 26.583 + 144 | 37.93 + 56 |
| 7 10.0 | 28.765 + 56 | 70.05 +267 | 59.861 + 129 | 45.09 -135 | 09.349 + 110 | 55.27 - 18 | 26.686 + 103 | 37.46 + 47 |
| 7 19.9 | 28.772 + 7 | 72.54 +249 | 59.928 + 67 | 46.47 -138 | 09.411 + 62 | 55.52 - 25 | 26.744 + 58 | 37.08 - 38 |
| 7 29.9 | 28.736 - 36 | 74.82 +228 | 59.938 + 10 | 47.84 -137 | 09.428 + 17 | 55.83 - 31 | 26.760 + 16 | 36.81 + 27 |
| 8 8.9 | 28.654 - 82 | 76.86 +204 | 59.888 - 50 | 49.15 -131 | 09.398 - 30 | 56.17 - 34 | 26.731 - 29 | 36.61 + 20 |
| 8 18.9 | 28.532 - 122 | 78.56 +170 | 59.782 - 106 | 50.33 -118 | 09.324 - 74 | 56.53 - 36 | 26.663 - 68 | 36.51 + 10 |
| 8 28.8 | 28.376 - 156 | 79.95 +139 | 59.630 - 152 | 51.35 -102 | 09.214 - 110 | 56.87 - 34 | 26.560 - 103 | 36.47 + 4 |
| 9 7.8 | 28.190 - 186 | 80.98 +103 | 59.436 - 194 | 52.17 - 82 | 09.072 - 142 | 57.18 - 31 | 26.426 - 134 | 36.48 - 1 |
| 9 17.8 | 27.984 - 206 | 81.60 + 62 | 59.214 - 222 | 52.73 - 56 | 08.907 - 165 | 57.42 - 24 | 26.272 - 154 | 36.53 - 5 |
| 9 27.8 | 27.768 - 216 | 81.84 + 24 | 58.978 - 236 | 53.01 - 28 | 08.732 - 175 | 57.59 - 17 | 26.108 - 164 | 36.62 - 9 |
| 10 7.7 | 27.549 - 219 | 81.66 - 18 | 58.738 - 240 | 53.00 + 1 | 08.553 - 179 | 57.67 - 8 | 25.940 - 168 | 36.73 - 11 |
| 10 17.7 | 27.340 - 209 | 81.05 - 61 | 58.512 - 226 | 52.69 + 31 | 08.386 - 167 | 57.66 + 1 | 25.783 - 157 | 36.87 - 14 |
| 10 27.7 | 27.150 - 190 | 80.06 - 99 | 58.312 - 200 | 52.10 + 59 | 08.239 - 147 | 57.57 + 9 | 25.645 - 138 | 37.03 - 16 |
| 11 6.6 | 26.986 - 164 | 78.64 -142 | 58.150 - 162 | 51.25 + 85 | 08.123 - 116 | 57.41 + 16 | 25.535 - 110 | 37.23 - 20 |
| 11 16.6 | 26.861 - 125 | 76.85 -179 | 58.041 - 109 | 50.18 +107 | 08.047 - 76 | 57.21 + 20 | 25.462 - 73 | 37.48 - 25 |
| 11 26.6 | 26.776 - 85 | 74.73 -212 | 57.987 - 54 | 48.94 +124 | 08.016 - 31 | 56.97 + 24 | 25.431 - 31 | 37.78 - 30 |
| 12 6.6 | 26.738 - 38 | 72.29 -244 | 57.996 + 9 | 47.58 +136 | 08.034 + 18 | 56.74 + 23 | 25.445 + 14 | 38.14 - 36 |
| 12 16.5 | 26.751 + 13 | 69.62 -267 | 58.072 + 76 | 46.15 +143 | 08.104 + 70 | 56.53 + 21 | 25.507 + 62 | 38.56 - 42 |
| 12 26.5 | 26.811 + 60 | 66.81 -281 | 58.209 + 137 | 44.72 +143 | 08.226 + 122 | 56.47 + 6 | 25.611 + 104 | 39.01 - 45 |
| 12 36.5 | 26.921 + 110 | 63.90 -291 | 58.407 + 198 | 43.31 +141 | 08.377 + 151 | 56.21 + 26 | 25.757 + 146 | 39.57 - 56 |
| | + 154 | -286 | + 253 | +133 | + 207 | + 12 | + 189 | - 57 |
| Mean Place | 27.539 | 74.24 | 58.400 | 36.38 | 08.274 | 48.06 | 25.687 | 31.02 |
| sec δ, tan δ | +1.153 | +0.573 | +1.439 | -1.035 | +1.107 | -0.475 | +1.033 | -0.260 |
| dα(ψ), dδ(ψ) | +0.046 | +0.04 | +0.088 | +0.04 | +0.074 | +0.05 | +0.068 | +0.05 |
| dα(ε), dδ(ε) | -0.004 | -0.99 | +0.008 | -0.99 | +0.004 | -0.99 | +0.002 | -0.99 |
| Dble.Trans. | June 28 | | June 28 | | June 29 | | June 29 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 1480 | | | 700 | | 1481 | | 697 | | | | | | | | | |
|--------------|-------------------|---------------------|-------|--------------------------------|---------|------------------------------|--------|---------------------|------|--------|---------|-------|-------|--------|-------|-------|------|
| | 60 Serpentis | | | Groombridge 2655 (Draconis) | | B.D. +16° 3529 (Herculis) | | 9 Coronae Austrinae | | | | | | | | | |
| Mag.Spect. | 5.44 | K0 | | 5.84 | K0 | 5.67 | A0 | | 4.69 | G5 | | | | | | | |
| U.T. | R.A. | Dec. | | R.A. | Dec. | | R.A. | Dec. | | R.A. | Dec. | | | | | | |
| | h m | ° / | | h m | ° / | | h m | ° / | | h m | ° / | | | | | | |
| | 18 28 | - 1 59 | | 18 30 | + 77 31 | | 18 30 | + 16 54 | | 18 32 | - 42 19 | | | | | | |
| 1 | ^d -8.5 | ^s 55.183 | + 77 | 49.97 | -124 | 19.812 | -333 | 67.67 | -341 | 25.004 | + 56 | 58.60 | -224 | 27.464 | + 103 | 34.28 | +121 |
| 1 | 1.5 | 55.302 | + 119 | 51.27 | -130 | 19.668 | -144 | 64.14 | -353 | 25.103 | + 99 | 56.28 | -232 | 27.622 | + 158 | 33.08 | +120 |
| 1 | 11.5 | 55.459 | + 157 | 52.62 | -135 | 19.721 | + 53 | 60.54 | -360 | 25.243 | + 140 | 53.92 | -226 | 27.834 | + 212 | 31.92 | +116 |
| 1 | 21.4 | 55.652 | + 193 | 53.93 | -131 | 19.978 | + 257 | 57.05 | -349 | 25.422 | + 179 | 51.65 | -227 | 28.095 | + 261 | 30.83 | +109 |
| 1 | 31.4 | 55.874 | + 222 | 55.14 | -121 | 20.414 | + 436 | 53.79 | -326 | 25.632 | + 210 | 49.53 | -212 | 28.395 | + 300 | 29.84 | + 99 |
| 2 | 10.4 | 56.121 | + 247 | 56.22 | -108 | 21.023 | + 609 | 50.84 | -295 | 25.870 | + 238 | 47.64 | -189 | 28.728 | + 333 | 28.96 | + 88 |
| 2 | 20.4 | 56.388 | + 267 | 57.10 | - 88 | 21.782 | + 759 | 48.37 | -247 | 26.131 | + 261 | 46.09 | -155 | 29.090 | + 362 | 28.19 | + 77 |
| 3 | 2.3 | 56.668 | + 280 | 57.73 | - 63 | 22.652 | + 870 | 46.43 | -194 | 26.408 | + 277 | 44.91 | -118 | 29.469 | + 379 | 27.55 | + 64 |
| 3 | 12.3 | 56.960 | + 292 | 58.11 | - 38 | 23.614 | + 962 | 45.08 | -135 | 26.700 | + 292 | 44.16 | - 75 | 29.865 | + 396 | 27.02 | + 53 |
| 3 | 22.3 | 57.259 | + 299 | 58.18 | - 7 | 24.627 | +1013 | 44.42 | - 66 | 26.999 | + 299 | 43.88 | - 28 | 30.270 | + 405 | 26.62 | + 40 |
| 4 | 1.2 | 57.560 | + 301 | 57.97 | + 21 | 25.647 | +1020 | 44.39 | - 3 | 27.300 | + 301 | 44.04 | + 16 | 30.677 | + 407 | 26.34 | + 28 |
| 4 | 11.2 | 57.861 | + 301 | 57.49 | + 48 | 26.655 | +1008 | 45.02 | + 63 | 27.602 | + 302 | 44.66 | + 62 | 31.086 | + 409 | 26.20 | + 14 |
| 4 | 21.2 | 58.157 | + 296 | 56.74 | + 75 | 27.604 | + 949 | 46.29 | +127 | 27.897 | + 295 | 45.71 | +105 | 31.488 | + 402 | 26.21 | - 1 |
| 5 | 1.2 | 58.443 | + 286 | 55.78 | + 96 | 28.466 | + 862 | 48.10 | +181 | 28.181 | + 284 | 47.10 | +139 | 31.877 | + 389 | 26.37 | - 16 |
| 5 | 11.1 | 58.717 | + 274 | 54.65 | +113 | 29.224 | + 758 | 50.40 | +230 | 28.450 | + 269 | 48.82 | +172 | 32.250 | + 373 | 26.68 | - 31 |
| 5 | 21.1 | 58.970 | + 253 | 53.39 | +126 | 29.840 | + 616 | 53.12 | +272 | 28.698 | + 248 | 50.79 | +197 | 32.597 | + 347 | 27.16 | - 48 |
| 5 | 31.1 | 59.201 | + 231 | 52.07 | +132 | 30.307 | + 467 | 56.12 | +300 | 28.919 | + 221 | 52.91 | +212 | 32.914 | + 317 | 27.79 | - 63 |
| 6 | 10.1 | 59.404 | + 203 | 50.71 | +136 | 30.614 | + 307 | 59.36 | +324 | 29.111 | + 192 | 55.16 | +225 | 33.194 | + 280 | 28.59 | - 80 |
| 6 | 20.0 | 59.573 | + 169 | 49.37 | +134 | 30.741 | + 127 | 62.71 | +335 | 29.266 | + 155 | 57.43 | +227 | 33.428 | + 234 | 29.52 | - 93 |
| 6 | 30.0 | 59.706 | + 133 | 48.10 | +127 | 30.700 | - 41 | 66.07 | +336 | 29.384 | + 118 | 59.66 | +223 | 33.615 | + 187 | 30.56 | -104 |
| 7 | 10.0 | 59.799 | + 93 | 46.90 | +120 | 30.484 | - 216 | 69.39 | +332 | 29.460 | + 76 | 61.82 | +216 | 33.748 | + 133 | 31.69 | -113 |
| 7 | 19.9 | 59.848 | + 49 | 45.84 | +106 | 30.094 | - 390 | 72.55 | +316 | 29.492 | + 32 | 63.83 | +201 | 33.823 | + 75 | 32.88 | -119 |
| 7 | 29.9 | 59.858 | + 10 | 44.90 | + 94 | 29.554 | - 540 | 75.48 | +293 | 29.482 | - 10 | 65.65 | +182 | 33.844 | + 21 | 34.07 | -119 |
| 8 | 8.9 | 59.825 | - 33 | 44.11 | + 79 | 28.861 | - 693 | 78.15 | +267 | 29.430 | - 52 | 67.26 | +161 | 33.806 | - 38 | 35.23 | -116 |
| 8 | 18.9 | 59.753 | - 72 | 43.48 | + 63 | 28.037 | - 824 | 80.45 | +230 | 29.339 | - 91 | 68.61 | +135 | 33.716 | - 90 | 36.30 | -107 |
| 8 | 28.8 | 59.649 | - 104 | 43.00 | + 48 | 27.109 | - 928 | 82.36 | +191 | 29.215 | - 124 | 69.70 | +109 | 33.581 | - 135 | 37.25 | - 95 |
| 9 | 7.8 | 59.515 | - 134 | 42.67 | + 33 | 26.082 | -1027 | 83.85 | +149 | 29.062 | - 153 | 70.50 | + 80 | 33.405 | - 176 | 38.02 | - 77 |
| 9 | 17.8 | 59.362 | - 153 | 42.51 | + 16 | 24.993 | -1089 | 84.83 | + 98 | 28.890 | - 172 | 70.98 | + 48 | 33.202 | - 203 | 38.57 | - 55 |
| 9 | 27.8 | 59.199 | - 163 | 42.49 | + 2 | 23.866 | -1127 | 85.35 | + 52 | 28.706 | - 184 | 71.16 | + 18 | 32.983 | - 219 | 38.89 | - 32 |
| 10 | 7.7 | 59.032 | - 167 | 42.63 | - 14 | 22.718 | -1148 | 85.33 | - 2 | 28.520 | - 186 | 71.02 | - 14 | 32.759 | - 224 | 38.95 | - 6 |
| 10 | 17.7 | 58.876 | - 156 | 42.92 | - 29 | 21.593 | -1125 | 84.78 | - 55 | 28.343 | - 177 | 70.55 | - 47 | 32.548 | - 211 | 38.74 | + 21 |
| 10 | 27.7 | 58.737 | - 139 | 43.35 | - 43 | 20.511 | -1082 | 83.72 | -106 | 28.183 | - 160 | 69.78 | - 77 | 32.360 | - 188 | 38.29 | + 45 |
| 11 | 6.6 | 58.625 | - 112 | 43.95 | - 60 | 19.497 | -1014 | 82.13 | -159 | 28.048 | - 135 | 68.67 | - 111 | 32.205 | - 155 | 37.60 | + 69 |
| 11 | 16.6 | 58.549 | - 76 | 44.70 | - 75 | 18.594 | - 903 | 80.05 | -208 | 27.949 | - 99 | 67.27 | -140 | 32.100 | - 105 | 36.71 | + 89 |
| 11 | 26.6 | 58.511 | - 38 | 45.60 | - 90 | 17.814 | - 780 | 77.54 | -251 | 27.888 | - 61 | 65.61 | -166 | 32.046 | - 54 | 35.66 | +105 |
| 12 | 6.6 | 58.516 | + 5 | 46.64 | -104 | 17.186 | - 628 | 74.61 | -293 | 27.871 | - 17 | 63.68 | -193 | 32.051 | + 5 | 34.50 | +116 |
| 12 | 16.5 | 58.568 | + 52 | 47.79 | -115 | 16.737 | - 449 | 71.39 | -322 | 27.900 | + 29 | 61.57 | -211 | 32.119 | + 68 | 33.29 | +121 |
| 12 | 26.5 | 58.661 | + 93 | 49.02 | -123 | 16.468 | - 269 | 67.95 | -344 | 27.972 | + 72 | 59.32 | -225 | 32.242 | + 123 | 32.06 | +123 |
| 12 | 36.5 | 58.796 | + 135 | 50.33 | -131 | 16.401 | - 67 | 64.39 | -356 | 28.089 | + 117 | 56.99 | -233 | 32.424 | + 182 | 30.83 | +123 |
| | | | + 174 | | -130 | | + 133 | | -353 | | + 157 | | -230 | | + 233 | | +116 |
| Mean Place | 58.823 | 41.22 | | 24.362 | 73.96 | | 28.398 | 66.65 | | 32.369 | 23.59 | | | | | | |
| sec δ, tan δ | +1.001 | -0.035 | | +4.634 | +4.525 | | +1.045 | +0.304 | | +1.353 | -0.911 | | | | | | |
| dα(ψ), dδ(ψ) | +0.062 | +0.05 | | -0.058 | +0.05 | | +0.053 | +0.05 | | +0.085 | +0.06 | | | | | | |
| dα(ε), dδ(ε) | +0.000 | -0.99 | | -0.040 | -0.99 | | -0.003 | -0.99 | | +0.009 | -0.99 | | | | | | |
| Dble.Trans. | June 29 | | | June 29 | | June 29 | | June 30 | | | | | | | | | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 1483 | | 1482 | | 1484 | | 701 | |
|---|-----------------------------|-------------------------|--------------------------|-------------------------|-----------------------------|-------------------------|--------------------------------|-------------------------|
| Name | Groombridge 2603 (Lyrae) | | α Scuti | | B.D. +9° 3783 (Ophiuchi) | | Groombridge 2640 (Draconis) | |
| Mag. Spect. | 6.66 | A0 | 4.06 | K0 | 5.40 | F2 | 6.00 | A3 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " |
| | 18 33 | +46 12 | 18 34 | - 8 15 | 18 35 | + 9 06 | 18 36 | +65 28 |
| 1 -8.5 | 21 495 ^s - 5 | 22 32 ^o -324 | 24 606 ^s + 77 | 24 61 ^o - 86 | 45 694 ^s + 61 | 31 71 ^o -184 | 07 136 ^s - 119 | 29 18 ^o -344 |
| 1 1 5 | 21 549 + 54 | 18 96 -336 | 24 725 + 119 | 25 53 - 92 | 45 796 + 102 | 29 81 -190 | 07 114 - 22 | 25 61 -357 |
| 1 11 5 | 21 660 + 111 | 15 55 -341 | 24 883 + 158 | 26 49 - 96 | 45 937 + 141 | 27 86 -195 | 07 192 + 78 | 21 97 -364 |
| 1 21 4 | 21 831 + 171 | 12 25 -330 | 25 078 + 195 | 27 43 - 94 | 46 116 + 179 | 25 97 -189 | 07 374 + 182 | 18 42 -355 |
| 1 31 4 | 22 050 + 219 | 09 17 -308 | 25 301 + 223 | 28 30 - 87 | 46 324 + 208 | 24 22 -175 | 07 644 + 270 | 15 11 -331 |
| 2 10 4 | 22 314 + 264 | 06 40 -277 | 25 550 + 249 | 29 07 - 77 | 46 559 + 235 | 22 65 -157 | 08 000 + 356 | 12 10 -301 |
| 2 20 4 | 22 618 + 304 | 04 09 -231 | 25 819 + 269 | 29 69 - 62 | 46 817 + 258 | 21 37 -128 | 08 431 + 431 | 09 57 -253 |
| 3 2 3 | 22 950 + 352 | 02 30 -179 | 26 102 + 283 | 30 12 - 43 | 47 090 + 273 | 20 41 - 96 | 08 916 + 485 | 07 57 -200 |
| 3 12 3 | 23 306 + 336 | 01 08 -122 | 26 398 + 296 | 30 34 - 22 | 47 376 + 286 | 19 80 - 61 | 09 448 + 532 | 06 18 -139 |
| 3 22 3 | 23 677 + 371 | 00 51 - 57 | 26 701 + 303 | 30 33 + 1 | 47 671 + 295 | 19 60 - 20 | 10 008 + 560 | 05 47 - 71 |
| 4 1 2 | 24 050 + 373 | 00 56 + 5 | 27 007 + 306 | 30 09 + 24 | 47 968 + 297 | 19 79 + 19 | 10 574 + 566 | 05 42 - 5 |
| 4 11 2 | 24 424 + 374 | 01 23 + 67 | 27 314 + 307 | 29 64 + 45 | 48 268 + 300 | 20 36 + 57 | 11 138 + 564 | 06 02 + 60 |
| 4 21 2 | 24 785 + 361 | 02 52 +129 | 27 617 + 303 | 29 00 + 64 | 48 562 + 294 | 21 29 + 93 | 11 678 + 540 | 07 29 +127 |
| 5 1 2 | 25 126 + 341 | 04 31 +179 | 27 911 + 294 | 28 19 + 81 | 48 846 + 284 | 22 52 +123 | 12 178 + 500 | 09 10 +181 |
| 5 11 1 | 25 442 + 316 | 06 58 +227 | 28 194 + 283 | 27 27 + 92 | 49 118 + 272 | 24 02 +150 | 12 631 + 453 | 11 42 +232 |
| 5 21 1 | 25 722 + 280 | 09 23 +265 | 28 457 + 263 | 26 25 +102 | 49 370 + 252 | 25 72 +170 | 13 017 + 386 | 14 17 +275 |
| 5 31 1 | 25 962 + 240 | 12 14 +291 | 28 698 + 241 | 25 21 +104 | 49 598 + 228 | 27 54 +182 | 13 330 + 313 | 17 22 +305 |
| 5 10 1 | 26 158 + 196 | 15 27 +313 | 28 911 + 213 | 24 16 +105 | 49 798 + 200 | 29 45 +191 | 13 565 + 235 | 20 52 +330 |
| 6 20 0 | 26 300 + 142 | 18 50 +323 | 29 090 + 179 | 23 15 +101 | 49 963 + 165 | 31 38 +193 | 13 708 + 143 | 23 94 +342 |
| 6 30 0 | 26 391 + 91 | 21 71 +321 | 29 234 + 144 | 22 22 + 93 | 50 093 + 130 | 33 25 +187 | 13 764 + 56 | 27 38 +344 |
| 7 10 0 | 26 425 + 34 | 24 88 +317 | 29 337 + 103 | 21 37 + 85 | 50 181 + 88 | 35 05 +180 | 13 727 - 37 | 30 78 +340 |
| 7 19 9 | 26 400 - 25 | 27 88 +300 | 29 396 + 59 | 20 64 + 73 | 50 226 + 166 | 36 71 +166 | 13 597 -130 | 34 03 +325 |
| 7 29 9 | 26 323 - 77 | 30 66 +278 | 29 414 + 18 | 20 02 + 62 | 50 231 + 5 | 38 21 +150 | 13 384 -213 | 37 05 +302 |
| 8 8 9 | 26 191 -132 | 33 17 +251 | 29 389 - 25 | 19 52 + 50 | 50 193 - 38 | 39 52 +131 | 13 087 -297 | 39 81 +276 |
| 8 18 9 | 26 011 -180 | 35 31 +214 | 29 323 - 66 | 19 15 + 37 | 50 116 - 77 | 40 61 +109 | 12 715 -372 | 42 19 +238 |
| 8 28 8 | 25 790 -221 | 37 09 +178 | 29 224 - 99 | 18 89 + 26 | 50 006 -110 | 41 47 + 86 | 12 284 -431 | 44 19 +200 |
| 9 7 8 | 25 533 -257 | 38 45 +136 | 29 094 -130 | 18 74 + 15 | 49 867 -139 | 42 11 + 64 | 11 795 -489 | 45 75 +156 |
| 9 17 8 | 25 252 -281 | 39 34 + 89 | 28 944 -150 | 18 70 + 4 | 49 707 -160 | 42 48 + 37 | 11 270 -525 | 46 81 +106 |
| 9 27 8 | 24 957 -295 | 39 77 + 43 | 28 782 -162 | 18 74 - 4 | 49 536 -171 | 42 61 + 13 | 10 723 -547 | 47 39 + 58 |
| 10 7 7 | 24 655 -302 | 39 71 - 6 | 28 616 -166 | 18 87 -13 | 49 361 -175 | 42 49 - 12 | 10 163 -560 | 47 43 + 4 |
| 10 17 7 | 24 364 -291 | 39 13 - 58 | 28 460 -156 | 19 10 - 23 | 49 195 -166 | 42 10 - 39 | 09 616 -547 | 46 92 - 51 |
| 10 27 7 | 24 091 -273 | 38 08 -105 | 28 321 -139 | 19 41 - 31 | 49 046 -149 | 41 48 - 62 | 09 092 -524 | 45 90 -102 |
| 11 6 6 | 23 847 -244 | 36 53 -155 | 28 208 -113 | 19 82 - 41 | 48 920 -126 | 40 59 - 89 | 08 607 -485 | 44 32 -158 |
| 11 16 6 | 23 645 -202 | 34 52 -201 | 28 131 - 77 | 20 33 - 51 | 48 830 - 90 | 39 46 -113 | 08 607 -423 | 44 32 -207 |
| 11 26 6 | 23 489 -156 | 32 11 -241 | 28 093 - 38 | 20 93 - 60 | 48 777 - 53 | 38 11 -135 | 08 184 -357 | 42 25 -251 |
| 12 6 6 | 23 387 -102 | 29 31 -280 | 28 098 + 5 | 21 64 - 71 | 48 766 - 11 | 36 55 -156 | 07 553 -274 | 36 80 -294 |
| 12 16 5 | 23 345 - 42 | 26 24 -307 | 28 150 + 52 | 22 42 - 78 | 48 801 + 35 | 34 83 -172 | 07 374 -179 | 33 56 -324 |
| 12 26 5 | 23 362 + 17 | 22 97 -327 | 28 243 + 93 | 23 27 - 85 | 48 877 + 76 | 32 99 -184 | 07 288 - 86 | 30 09 -347 |
| 12 36 5 | 23 439 + 137 | 19 59 -334 | 28 378 + 135 | 24 19 - 92 | 48 996 + 119 | 31 08 -191 | 07 306 + 18 | 26 48 -361 |
| | | | 28 378 + 175 | 24 19 - 93 | 48 996 + 158 | 31 08 -189 | 07 306 + 120 | 26 48 -357 |
| Mean Place | 24.782 | 29.27 | 28.351 | 15.36 | 49.171 | 40.29 | 10.738 | 35.56 |
| sec δ , $\tan \delta$ | +1.445 | +1.043 | +1.010 | -0.145 | +1.013 | +0.160 | +2.409 | +2.192 |
| $d\alpha(\psi)$, $d\delta(\psi)$ | +0.034 | +0.06 | +0.065 | +0.06 | +0.057 | +0.06 | +0.004 | +0.06 |
| $d\alpha(\epsilon)$, $d\delta(\epsilon)$ | -0.010 | -0.99 | +0.001 | -0.99 | -0.002 | -0.99 | -0.023 | -0.99 |
| Dble. Trans. | June 30 | | June 30 | | July 1 | | July 1 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 699 | | 1485 | | 698 | | 1486 | |
|-----------------------------|--------------------------|------------|------------------|------------|-----------------|------------|----------------|------------|
| | α Lyrae (Vega) | | 83 G. Sagittarii | | ζ Pavonis | | δ Scuti | |
| Mag. Spect. | 0.14 | A0 | 5.80 | A5 | 4.10 | K0 | 4.74 var. | F0 |
| U.T. | R.A. | | R.A. | | R.A. | | R.A. | |
| | h m | Dec. | h m | Dec. | h m | Dec. | h m | Dec. |
| | 18 36 | + 38 45 | 18 37 | - 21 24 | 18 41 | - 71 26 | 18 41 | - 9 03 |
| 1 -8.5 | 25 604 + 14 | 66 64 -304 | 01 910 + 87 | 45 33 - 5 | 18 826 + 97 | 41 50 +271 | 28 328 + 72 | 68 47 - 78 |
| 1 1.5 | 25 671 + 67 | 63 49 -315 | 02 026 + 116 | 45 33 + 0 | 19 056 + 230 | 38 76 +274 | 28 440 + 112 | 69 30 - 83 |
| 1 11.5 | 25 788 + 117 | 60 30 -319 | 02 204 + 178 | 45 54 - 21 | 19 411 + 355 | 36 06 +270 | 28 592 + 152 | 70 18 - 88 |
| 1 21.4 | 25 956 + 188 | 57 20 -310 | 02 414 + 210 | 45 67 - 13 | 19 890 + 479 | 33 49 +257 | 28 781 + 189 | 71 03 - 85 |
| 1 31.4 | 26 166 + 210 | 54 32 -288 | 02 654 + 240 | 45 79 - 12 | 20 468 + 578 | 31 13 +236 | 28 999 + 218 | 71 82 - 79 |
| 2 10.4 | 26 415 + 249 | 51 72 -260 | 02 920 + 266 | 45 89 - 10 | 21 137 + 669 | 29 00 +213 | 29 244 + 245 | 72 52 - 70 |
| 2 20.4 | 26 698 + 283 | 49 56 -216 | 03 209 + 289 | 45 93 - 4 | 21 884 + 747 | 27 17 +183 | 29 509 + 265 | 73 06 - 54 |
| 3 2.3 | 27 004 + 306 | 47 90 -166 | 03 511 + 302 | 45 91 + 2 | 22 683 + 799 | 25 68 +149 | 29 790 + 281 | 73 42 - 36 |
| 3 12.3 | 27 332 + 328 | 46 77 -113 | 03 828 + 317 | 45 80 + 11 | 23 529 + 846 | 24 53 +115 | 30 084 + 294 | 73 59 - 17 |
| 3 22.3 | 27 671 + 339 | 46 26 - 51 | 04 152 + 324 | 45 60 + 20 | 24 402 + 873 | 23 77 + 76 | 30 386 + 302 | 73 53 + 6 |
| 4 1.2 | 28 014 + 343 | 46 35 + 9 | 04 479 + 327 | 45 31 + 29 | 25 283 + 881 | 23 38 + 39 | 30 692 + 306 | 73 25 + 28 |
| 4 11.2 | 28 358 + 344 | 47 02 + 67 | 04 809 + 330 | 44 94 + 37 | 26 168 + 885 | 23 37 + 1 | 31 002 + 310 | 72 77 + 48 |
| 4 21.2 | 28 691 + 333 | 48 27 +125 | 05 134 + 325 | 44 50 + 44 | 27 034 + 866 | 23 77 - 40 | 31 307 + 305 | 72 10 + 67 |
| 5 1.2 | 29 009 + 318 | 50 00 +173 | 05 451 + 317 | 44 04 + 46 | 27 866 + 832 | 24 52 - 75 | 31 604 + 297 | 71 28 + 82 |
| 5 11.1 | 29 307 + 298 | 52 18 +218 | 05 756 + 305 | 43 55 + 49 | 28 657 + 791 | 25 65 -113 | 31 892 + 288 | 70 34 + 94 |
| 5 21.1 | 29 574 + 267 | 54 72 +254 | 06 042 + 286 | 43 08 + 47 | 29 382 + 725 | 27 13 -148 | 32 161 + 269 | 69 32 +102 |
| 5 31.1 | 29 807 + 233 | 57 51 +279 | 06 304 + 262 | 42 66 + 42 | 30 032 + 650 | 28 89 -176 | 32 408 + 247 | 68 28 +104 |
| 6 10.1 | 30 001 + 194 | 60 49 +298 | 06 538 + 234 | 42 30 + 36 | 30 595 + 563 | 30 95 -206 | 32 628 + 220 | 67 23 +105 |
| 6 20.0 | 30 149 + 148 | 63 56 +307 | 06 735 + 197 | 42 02 + 28 | 31 051 + 456 | 33 22 -227 | 32 814 + 186 | 66 23 +100 |
| 6 30.0 | 30 251 + 102 | 66 62 +306 | 06 895 + 160 | 41 83 + 19 | 31 398 + 347 | 35 64 -242 | 32 965 + 151 | 65 31 + 92 |
| 7 10.0 | 30 302 + 51 | 69 62 +300 | 07 012 + 117 | 41 74 + 9 | 31 624 + 226 | 38 17 -253 | 33 075 + 110 | 64 48 + 83 |
| 7 19.9 | 30 301 - 49 | 72 46 +284 | 07 083 + 71 | 41 74 + 0 | 31 720 + 96 | 40 72 -255 | 33 141 + 66 | 63 76 + 72 |
| 7 29.9 | 30 252 - 99 | 75 08 +262 | 07 109 + 26 | 41 82 - 8 | 31 694 - 26 | 43 21 -249 | 33 165 + 24 | 63 17 + 59 |
| 8 8.9 | 30 153 - 99 | 77 44 +236 | 07 088 - 21 | 41 97 - 15 | 31 541 - 153 | 45 58 -237 | 33 146 - 19 | 62 69 + 48 |
| 8 18.9 | 30 009 - 144 | 79 46 +202 | 07 025 - 63 | 42 16 - 19 | 31 270 - 271 | 47 72 -214 | 33 085 - 61 | 62 34 + 35 |
| 8 28.8 | 29 828 - 181 | 81 13 +167 | 06 924 - 101 | 42 38 - 22 | 30 900 - 370 | 49 56 -184 | 32 991 - 94 | 62 10 + 24 |
| 9 7.8 | 29 613 - 215 | 82 41 +128 | 06 791 - 133 | 42 60 - 22 | 30 438 - 462 | 51 05 -149 | 32 864 - 127 | 61 96 + 14 |
| 9 17.8 | 29 375 - 238 | 83 24 + 83 | 06 635 - 156 | 42 81 - 21 | 29 911 - 527 | 52 09 -104 | 32 716 - 148 | 61 92 + 4 |
| 9 27.8 | 29 125 - 250 | 83 65 + 41 | 06 466 - 169 | 42 98 - 17 | 29 346 - 565 | 52 68 - 59 | 32 556 - 160 | 61 97 - 5 |
| 10 7.7 | 28 869 - 256 | 83 59 - 6 | 06 293 - 173 | 43 11 - 13 | 28 761 - 585 | 52 75 - 7 | 32 390 - 166 | 62 10 - 13 |
| 10 17.7 | 28 623 - 246 | 83 05 - 54 | 06 129 - 164 | 43 19 - 8 | 28 196 - 565 | 52 30 + 45 | 32 232 - 158 | 62 31 - 21 |
| 10 27.7 | 28 394 - 229 | 82 07 - 98 | 05 983 - 146 | 43 22 - 3 | 27 672 - 524 | 51 36 + 94 | 32 091 - 141 | 62 60 - 29 |
| 11 6.6 | 28 191 - 203 | 80 62 -145 | 05 864 - 119 | 43 22 + 0 | 27 214 - 458 | 49 93 +143 | 31 975 - 116 | 62 98 - 38 |
| 11 16.6 | 28 027 - 164 | 78 74 -188 | 05 784 - 80 | 43 20 + 2 | 26 856 - 358 | 48 08 +185 | 31 894 - 81 | 63 44 - 46 |
| 11 26.6 | 27 905 - 122 | 76 49 -225 | 05 745 - 39 | 43 17 + 3 | 26 606 - 250 | 45 89 +219 | 31 851 - 43 | 63 99 - 55 |
| 12 6.6 | 27 833 - 72 | 73 87 -262 | 05 753 + 8 | 43 15 + 2 | 26 482 - 124 | 43 40 +249 | 31 851 + 0 | 64 63 - 64 |
| 12 16.5 | 27 814 + 19 | 71 00 -287 | 05 810 + 57 | 43 16 - 1 | 26 496 + 14 | 40 74 +266 | 31 897 + 46 | 65 34 - 71 |
| 12 26.5 | 27 848 + 34 | 67 94 -306 | 05 917 + 107 | 43 16 + 0 | 26 642 + 146 | 37 99 +275 | 31 984 + 87 | 66 11 - 77 |
| 12 36.5 | 27 935 + 87 | 64 77 -317 | 06 052 + 135 | 43 16 - 10 | 26 923 + 281 | 35 21 +278 | 32 114 + 130 | 66 94 - 83 |
| | 27 935 + 139 | 64 77 -313 | 06 052 + 191 | 43 26 - 10 | 26 923 + 407 | 35 21 +267 | 32 114 + 168 | 66 94 - 84 |
| Mean Place | 28.895 | 74.12 | 05.955 | 35.08 | 27.950 | 28.96 | 32.080 | 58.50 |
| sec δ , tan δ | +1.283 | +0.803 | +1.074 | -0.392 | +3.142 | -2.979 | +1.013 | -0.160 |
| $d\alpha(w)$, $d\delta(w)$ | +0.040 | +0.06 | +0.071 | +0.06 | +0.139 | +0.07 | +0.065 | +0.07 |
| $d\alpha(e)$, $d\delta(e)$ | -0.008 | -0.99 | +0.004 | -0.99 | +0.036 | -0.98 | +0.002 | -0.98 |
| Dble. Trans. | July 1 | | July 1 | | July 2 | | July 2 | |

APPARENT PLACES OF STARS, 1986

289

AT UPPER TRANSIT AT GREENWICH

| No. | 702 | | 1487 | | 703 | | 1488 | |
|--------------|--------------|------------|--------------|------------|--------------|------------|---------------------------|------------|
| | ε Scuti | | φ Sagittarii | | 110 Herculis | | B.D. +26° 3349 (Lyrae) | |
| Mag.Spect. | 5.09 | G5 | 3.30 | B8 | 4.26 | F5 | 4.92 | K0 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " |
| | 18 42 | - 8 17 | 18 44 | -27 00 | 18 45 | +20 31 | 18 45 | +26 38 |
| 1 -8.5 | 43.415 + 70 | 31 61 - 83 | 44 618 + 82 | 31.21 + 29 | 01.493 + 38 | 49.91 -234 | 28.512 + 27 | 41.52 -259 |
| 1 1.5 | 43.526 + 111 | 32 48 - 87 | 44 741 + 123 | 31 01 + 20 | 01.574 + 81 | 47.46 -245 | 28.585 + 73 | 38.83 -269 |
| 1 11.5 | 43.675 + 149 | 33 40 - 92 | 44 909 + 168 | 30 64 + 37 | 01.696 + 122 | 44.97 -249 | 28.701 + 116 | 36.08 -275 |
| 1 21.4 | 43.862 + 187 | 34 30 - 90 | 45 121 + 212 | 30 38 + 26 | 01.859 + 163 | 42.55 -242 | 28.861 + 160 | 33.40 -268 |
| 1 31.4 | 44.079 + 217 | 35 12 - 82 | 45.364 + 243 | 30.14 + 24 | 02.055 + 196 | 40.29 -226 | 29.056 + 195 | 30.90 -250 |
| 2 10.4 | 44.321 + 242 | 35 85 - 73 | 45.636 + 272 | 29.90 + 24 | 02.282 + 227 | 38.24 -205 | 29.283 + 227 | 28.64 -226 |
| 2 20.4 | 44.585 + 264 | 36 42 - 57 | 45.932 + 296 | 29.64 + 26 | 02.535 + 253 | 36.55 -169 | 29.540 + 257 | 26.75 -189 |
| 3 2.3 | 44.864 + 279 | 36 81 - 39 | 46.244 + 312 | 29.37 + 27 | 02.806 + 271 | 35.24 -131 | 29.816 + 276 | 25.29 -146 |
| 3 12.3 | 45.156 + 292 | 36 99 - 18 | 46.571 + 327 | 29.06 + 31 | 03.094 + 288 | 34.37 - 87 | 30.111 + 295 | 24.30 - 99 |
| 3 22.3 | 45.458 + 302 | 36 93 + 6 | 46.908 + 337 | 28.72 + 34 | 03.393 + 299 | 34.00 - 37 | 30.418 + 307 | 23.85 - 45 |
| 4 1.3 | 45.763 + 306 | 36 66 + 27 | 47 249 + 341 | 28.35 + 37 | 03.697 + 304 | 34.10 + 10 | 30.730 + 312 | 23.92 + 7 |
| 4 11.2 | 46.071 + 308 | 36 16 + 50 | 47.594 + 345 | 27.95 + 40 | 04.004 + 307 | 34.69 + 59 | 31.046 + 316 | 24.50 + 58 |
| 4 21.2 | 46.376 + 305 | 35 47 + 69 | 47.935 + 341 | 27.55 + 40 | 04.306 + 302 | 35.73 +104 | 31.355 + 309 | 25.61 +111 |
| 5 1.2 | 46.673 + 297 | 34 63 + 84 | 48 269 + 334 | 27.17 + 38 | 04.598 + 292 | 37.16 +143 | 31.654 + 299 | 27.13 +152 |
| 5 11.1 | 46.960 + 287 | 33 66 + 97 | 48.592 + 323 | 26.83 + 34 | 04.878 + 280 | 38.94 +178 | 31.939 + 285 | 29.04 +191 |
| 5 21.1 | 47.229 + 269 | 32 60 +106 | 48.895 + 303 | 26.55 + 28 | 05.135 + 257 | 41.01 +207 | 32.200 + 261 | 31.28 +224 |
| 5 31.1 | 47.476 + 247 | 31 52 +108 | 49.175 + 280 | 26.34 + 21 | 05.368 + 233 | 43.26 +225 | 32.435 + 235 | 33.73 +245 |
| 6 10.1 | 47.697 + 221 | 30 43 +109 | 49 426 + 251 | 26.24 + 10 | 05.571 + 203 | 45.65 +239 | 32.638 + 203 | 36.35 +262 |
| 6 20.0 | 47.883 + 186 | 29 38 +105 | 49.640 + 214 | 26.24 + 0 | 05.737 + 166 | 48.10 +245 | 32.801 + 163 | 39.04 +269 |
| 6 30.0 | 48.034 + 151 | 28 41 + 97 | 49.815 + 175 | 26.35 - 11 | 05.865 + 128 | 50.52 +242 | 32.925 + 124 | 41.71 +267 |
| 7 10.0 | 48.145 + 111 | 27 53 + 88 | 49 945 + 130 | 26.56 - 21 | 05.951 + 86 | 52.89 +237 | 33 005 + 80 | 44.34 +263 |
| 7 20.0 | 48.212 + 67 | 26 77 + 76 | 50 026 + 81 | 26.87 - 31 | 05.991 + 40 | 55.10 +221 | 33 037 + 32 | 46.82 +248 |
| 7 29.9 | 48.237 + 25 | 26 13 + 64 | 50 026 + 35 | 26.87 - 38 | 05.991 - 2 | 57.13 +203 | 33 037 - 11 | 46.82 +228 |
| 8 8.9 | 48.218 - 19 | 25 61 + 52 | 50.061 - 15 | 27.25 - 43 | 05.989 - 47 | 57.13 +183 | 33 026 - 57 | 49.10 +206 |
| 8 18.9 | 48.159 - 59 | 25 22 + 39 | 49.986 - 60 | 27.68 - 46 | 05.942 - 87 | 58.96 +154 | 32.969 - 100 | 51.16 +177 |
| 8 28.8 | 48.065 - 94 | 24 95 + 27 | 49.887 - 99 | 28.58 - 44 | 05.733 - 122 | 61.77 +127 | 32.735 - 134 | 54.39 +146 |
| 9 7.8 | 47.939 - 126 | 24 79 + 16 | 49.752 - 135 | 28.99 - 41 | 05.580 - 153 | 62.74 + 97 | 32.568 - 167 | 55.52 +113 |
| 9 17.8 | 47.791 - 148 | 24 73 + 6 | 49.752 - 160 | 28.99 - 35 | 05.580 - 175 | 62.74 + 62 | 32.568 - 190 | 55.52 + 74 |
| 9 27.8 | 47.631 - 160 | 24 73 - 4 | 49.592 - 175 | 29.34 - 26 | 05.405 - 187 | 63.36 + 30 | 32.378 - 202 | 56.26 + 39 |
| 10 7.7 | 47.465 - 166 | 24 77 - 13 | 49 417 - 181 | 29.60 - 16 | 05.218 - 194 | 63.66 - 4 | 32.176 - 209 | 56.65 + 0 |
| 10 17.7 | 47.308 - 157 | 25 12 - 22 | 49.063 - 173 | 29.76 - 16 | 05.024 - 194 | 63.62 - 4 | 31.967 - 209 | 56.65 + 0 |
| 10 27.7 | 47.167 - 141 | 25 12 - 30 | 49.063 - 155 | 29.81 - 5 | 04.838 - 186 | 63.21 - 41 | 31.765 - 202 | 56.24 - 41 |
| 11 6.7 | 47.049 - 118 | 25 42 - 40 | 48 908 - 129 | 29.75 + 6 | 04.667 - 171 | 62.47 - 74 | 31.578 - 187 | 55.45 - 79 |
| 11 16.6 | 46.968 - 81 | 25 82 - 49 | 48.779 - 89 | 29.61 + 14 | 04.518 - 149 | 61.37 -110 | 31.415 - 163 | 54.27 -118 |
| 11 26.6 | 46.923 - 45 | 26 31 - 58 | 48.690 - 48 | 29.38 + 23 | 04.404 - 114 | 59.95 -142 | 31.285 - 130 | 52.71 -156 |
| 12 6.6 | 46.922 - 1 | 27 57 - 68 | 48 643 + 1 | 28.77 + 32 | 04.291 - 35 | 58.24 -171 | 31.194 - 91 | 50.83 -188 |
| 12 16.5 | 46.966 + 44 | 28 32 - 75 | 48 695 + 52 | 28.44 + 33 | 04.302 + 11 | 56.24 -200 | 31.145 - 49 | 48.63 -220 |
| 12 26.5 | 47.052 + 86 | 29 14 - 82 | 48.795 + 100 | 28.14 + 30 | 04.356 + 54 | 54.03 -221 | 31.144 - 1 | 46.20 -243 |
| 12 36.5 | 47.179 + 166 | 30 01 - 89 | 48.932 + 190 | 27.85 + 34 | 04.454 + 141 | 51.67 -236 | 31.189 + 45 | 43.59 -261 |
| | | | | | | 49.21 -246 | 31.280 + 91 | 40.88 -271 |
| | | | | | | | 31.280 + 135 | 40.88 -269 |
| Mean Place | 47.151 | 21.60 | 48.816 | 19.87 | 04.856 | 58.06 | 31.837 | 49.48 |
| sec δ, tan δ | +1.011 | -0.146 | +1.122 | -0.510 | +1.068 | +0.375 | +1.119 | +0.502 |
| dα(ψ), dδ(ψ) | +0.065 | +0.07 | +0.074 | +0.08 | +0.051 | +0.08 | +0.048 | +0.08 |
| dα(ε), dδ(ε) | +0.002 | -0.98 | +0.007 | -0.98 | -0.005 | -0.98 | -0.007 | -0.98 |
| Dble.Trans. | July 2 | | July 3 | | July 3 | | July 3 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 1492 | | 1491 | | 1489 | | 1494 | |
|--------------|--------------------------------|--------------|--------------|-------------|--------------|-------------|--------------|-------------|
| | Groombridge 2671 (Draconis) | | 111 Herculis | | β Scuti | | 50 Draconis | |
| Mag.Spect. | 5.76 | B5 | 4.37 | A3 | 4.47 | G0 | 5.37 | A0 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " |
| | 18 46 | + 52 57 | 18 46 | + 18 09 | 18 46 | - 4 45 | 18 46 | + 75 24 |
| 1 | -8.5 | 21.627 - 50 | 22.116 + 40 | 48.34 - 223 | 23.833 + 64 | 57.08 - 102 | 44.316 - 326 | 60.99 - 331 |
| 1 | 1.5 | 21.643 + 16 | 22.198 + 82 | 46.03 - 231 | 23.937 + 104 | 58.16 - 108 | 44.150 - 166 | 57.50 - 349 |
| 1 | 11.5 | 21.727 + 84 | 22.321 + 123 | 43.66 - 237 | 24.080 + 143 | 59.27 - 111 | 44.149 - 1 | 53.91 - 359 |
| 1 | 21.4 | 21.879 + 152 | 22.485 + 164 | 41.36 - 230 | 24.260 + 180 | 60.36 - 109 | 44.324 + 175 | 50.38 - 363 |
| 1 | 31.4 | 22.090 + 211 | 22.680 + 195 | 39.21 - 215 | 24.469 + 209 | 61.37 - 101 | 44.655 + 331 | 47.04 - 334 |
| 2 | 10.4 | 22.358 + 268 | 22.905 + 225 | 37.28 - 193 | 24.705 + 236 | 62.26 - 89 | 45.136 + 481 | 43.98 - 306 |
| 2 | 20.4 | 22.675 + 317 | 23.157 + 252 | 35.67 - 161 | 24.963 + 258 | 62.97 - 71 | 45.754 + 618 | 41.35 - 263 |
| 3 | 2.3 | 23.029 + 354 | 23.426 + 269 | 34.45 - 122 | 25.236 + 273 | 63.46 - 49 | 46.474 + 720 | 39.24 - 211 |
| 3 | 12.3 | 23.415 + 396 | 23.712 + 286 | 33.63 - 82 | 25.523 + 287 | 63.72 - 26 | 47.283 + 809 | 37.69 - 155 |
| 3 | 22.3 | 23.823 + 408 | 24.008 + 296 | 33.30 - 33 | 25.821 + 298 | 63.71 + 1 | 48.146 + 863 | 36.82 - 87 |
| 4 | 1.3 | 24.237 + 414 | 24.310 + 302 | 33.43 + 13 | 26.122 + 301 | 63.44 + 27 | 49.028 + 882 | 36.59 - 23 |
| 4 | 11.2 | 24.655 + 418 | 24.615 + 305 | 34.02 + 59 | 26.427 + 305 | 62.92 + 52 | 49.911 + 883 | 37.02 + 43 |
| 4 | 21.2 | 25.061 + 406 | 24.915 + 300 | 35.05 + 103 | 26.729 + 302 | 62.16 + 76 | 50.757 + 846 | 38.11 + 109 |
| 5 | 1.2 | 25.445 + 384 | 25.206 + 291 | 36.45 + 140 | 27.024 + 295 | 61.22 + 94 | 51.538 + 781 | 39.75 + 164 |
| 5 | 11.1 | 25.803 + 358 | 25.485 + 279 | 38.19 + 174 | 27.309 + 285 | 60.12 + 110 | 52.241 + 703 | 41.93 + 218 |
| 5 | 21.1 | 26.120 + 317 | 25.744 + 259 | 40.20 + 201 | 27.576 + 267 | 58.91 + 121 | 52.832 + 591 | 44.55 + 262 |
| 5 | 31.1 | 26.391 + 271 | 25.978 + 234 | 42.38 + 218 | 27.822 + 246 | 57.65 + 126 | 53.302 + 470 | 47.49 + 294 |
| 6 | 10.1 | 26.611 + 220 | 26.183 + 205 | 44.70 + 232 | 28.042 + 220 | 56.37 + 128 | 53.640 + 338 | 50.70 + 321 |
| 6 | 20.0 | 26.770 + 159 | 26.351 + 168 | 47.06 + 236 | 28.228 + 186 | 55.12 + 125 | 53.826 + 186 | 54.07 + 337 |
| 6 | 30.0 | 26.870 + 100 | 26.483 + 132 | 49.40 + 234 | 28.379 + 151 | 53.94 + 118 | 53.870 + 44 | 57.48 + 341 |
| 7 | 10.0 | 26.905 + 35 | 26.573 + 90 | 51.67 + 227 | 28.490 + 111 | 52.85 + 109 | 53.762 - 108 | 60.90 + 342 |
| 7 | 20.0 | 26.874 - 31 | 26.617 + 44 | 53.80 + 213 | 28.557 + 67 | 51.88 + 97 | 53.503 - 259 | 64.18 + 328 |
| 7 | 29.9 | 26.782 - 92 | 26.620 + 3 | 55.76 + 196 | 28.583 + 26 | 51.04 + 84 | 53.109 - 394 | 67.28 + 310 |
| 8 | 8.9 | 26.627 - 155 | 26.579 - 41 | 57.51 + 175 | 28.565 - 18 | 50.34 + 70 | 52.580 - 529 | 70.13 + 285 |
| 8 | 18.9 | 26.416 - 211 | 26.496 - 83 | 58.99 + 148 | 28.507 - 58 | 49.79 + 55 | 51.931 - 649 | 72.64 + 251 |
| 8 | 28.8 | 26.159 - 257 | 26.380 - 116 | 60.20 + 121 | 28.414 - 93 | 49.38 + 41 | 51.184 - 747 | 74.79 + 215 |
| 9 | 7.8 | 25.859 - 300 | 26.232 - 148 | 61.13 + 93 | 28.289 - 125 | 49.11 + 27 | 50.345 - 839 | 76.53 + 174 |
| 9 | 17.8 | 25.529 - 330 | 26.063 - 169 | 61.73 + 60 | 28.143 - 146 | 48.99 + 12 | 49.442 - 903 | 77.77 + 124 |
| 9 | 27.8 | 25.181 - 348 | 25.881 - 182 | 62.03 + 30 | 27.983 - 160 | 48.98 + 1 | 48.499 - 943 | 78.56 + 79 |
| 10 | 7.7 | 24.822 - 359 | 25.692 - 189 | 61.99 - 4 | 27.817 - 166 | 49.10 - 12 | 47.529 - 970 | 78.81 + 25 |
| 10 | 17.7 | 24.471 - 351 | 25.511 - 181 | 61.61 - 38 | 27.659 - 158 | 49.35 - 25 | 46.569 - 960 | 78.52 - 29 |
| 10 | 27.7 | 24.136 - 335 | 25.345 - 166 | 60.92 - 69 | 27.516 - 143 | 49.71 + 27 | 45.638 - 931 | 77.72 - 80 |
| 11 | 6.7 | 23.829 - 307 | 25.201 - 144 | 59.89 - 103 | 27.397 - 119 | 50.21 - 50 | 44.758 - 880 | 76.36 - 136 |
| 11 | 16.6 | 23.566 - 263 | 25.090 - 111 | 58.56 - 133 | 27.312 - 85 | 50.82 - 61 | 43.965 - 793 | 74.49 - 187 |
| 11 | 26.6 | 23.351 - 215 | 25.016 - 74 | 56.94 - 162 | 27.263 - 49 | 51.55 - 73 | 43.271 - 694 | 72.17 - 232 |
| 12 | 6.6 | 23.194 - 157 | 24.984 - 32 | 55.05 - 189 | 27.256 - 7 | 52.40 - 85 | 42.700 - 571 | 69.40 - 277 |
| 12 | 16.5 | 23.103 - 91 | 24.997 + 13 | 52.97 - 208 | 27.295 + 39 | 53.35 - 95 | 42.279 - 421 | 66.30 - 310 |
| 12 | 26.5 | 23.077 - 26 | 25.053 + 56 | 50.73 - 224 | 27.374 + 79 | 54.36 - 101 | 42.007 - 272 | 62.94 - 336 |
| 12 | 36.5 | 23.121 + 44 | 25.153 + 100 | 48.40 - 233 | 27.495 + 121 | 55.44 - 108 | 41.905 - 102 | 59.41 - 353 |
| | | + 112 | + 141 | + 231 | + 159 | - 108 | + 70 | - 354 |
| Mean Place | 24.984 | 82.27 | 25.501 | 56.91 | 27.500 | 47.07 | 48.670 | 66.85 |
| sec δ, tan δ | +1.661 | +1.326 | +1.052 | +0.328 | +1.003 | -0.083 | +3.972 | +3.844 |
| da(ψ), dδ(ψ) | +0.027 | +0.08 | +0.053 | +0.08 | +0.063 | +0.08 | -0.039 | +0.08 |
| da(ε), dδ(ε) | -0.018 | -0.98 | -0.004 | -0.98 | +0.001 | -0.98 | -0.052 | -0.98 |
| Dble.Trans. | July 3 | | July 3 | | July 3 | | July 4 | |

APPARENT PLACES OF STARS, 1986

291

AT UPPER TRANSIT AT GREENWICH

| No. | 1490 | | 705 | | 1493 | | 704 | |
|--------------|----------------------------------|------------|--------------------------|------------|--------------------------|------------|--------------------------|------------|
| Name | η ¹ Coronae Austrinae | | β Lyrae | | 30 Sagittarii | | λ Pavonis | |
| Mag.Spect. | 5.59 | A2 | 3.4 to 4.3 | B8p, B2p | 6.24 | F0 | 4.42 | B2 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° ′ | h m | ° ′ | h m | ° ′ | h m | ° ′ |
| | 18 47 | -43 41 | 18 49 | +33 20 | 18 49 | -22 10 | 18 50 | -62 12 |
| 1 -8.5 | ^s 47.164 + 84 | 57.15 +130 | ^s 31.584 + 10 | 39 82 -280 | ^s 57.757 + 74 | " + 2 | ^s 51.446 + 78 | " +230 |
| 1 1.5 | 47.304 + 140 | 55.83 +132 | 31.642 + 58 | 36.89 -293 | 57.891 + 134 | 53.73 + 32 | 51.613 + 167 | 29.68 +233 |
| 1 11.5 | 47.498 + 194 | 54.52 +131 | 31.747 + 105 | 33.89 -300 | 58.025 + 134 | 53.75 - 34 | 51.865 + 252 | 27.35 +234 |
| 1 21.4 | 47.744 + 246 | 53.25 +127 | 31.898 + 127 | 30.97 -292 | 58.224 + 199 | 53.77 - 2 | 52.200 + 335 | 25.01 +224 |
| 1 31.4 | 48.031 + 287 | 52.07 +118 | 32.090 + 192 | 28.22 -275 | 58.453 + 229 | 53.77 + 0 | 52.603 + 403 | 22.77 +209 |
| 2 10.4 | 48.355 + 324 | 50.98 +109 | 32.317 + 227 | 25.73 -249 | 58.710 + 257 | 53.75 + 2 | 53.067 + 464 | 18.75 +193 |
| 2 20.4 | 48.710 + 355 | 50.00 + 98 | 32.577 + 260 | 23.63 -210 | 58.991 + 281 | 53.67 + 8 | 53.583 + 516 | 17.07 +168 |
| 3 2.3 | 49.086 + 376 | 49.15 + 85 | 32.861 + 284 | 21.98 -165 | 59.288 + 297 | 53.53 + 14 | 54.136 + 553 | 15.65 +142 |
| 3 12.3 | 49.482 + 396 | 48.40 + 75 | 33.166 + 305 | 20.83 -115 | 59.600 + 312 | 53.31 + 22 | 54.722 + 586 | 14.49 +116 |
| 3 22.3 | 49.890 + 408 | 47.80 + 60 | 33.485 + 319 | 20.27 - 56 | 59.923 + 323 | 52.99 + 32 | 55.329 + 607 | 13.64 + 85 |
| 4 1.3 | 50.304 + 414 | 47.34 + 46 | 33.810 + 325 | 20.26 - 1 | 60.250 + 327 | 52.60 + 39 | 55.945 + 616 | 13.09 + 55 |
| 4 11.2 | 50.722 + 418 | 47.02 + 32 | 34.140 + 330 | 20.82 + 56 | 60.582 + 332 | 52.14 + 46 | 56.567 + 622 | 12.86 + 23 |
| 4 21.2 | 51.136 + 414 | 46.88 - 14 | 34.463 + 323 | 21.94 +112 | 60.912 + 330 | 51.62 + 52 | 57.181 + 614 | 12.96 - 10 |
| 5 1.2 | 51.540 + 404 | 46.89 - 1 | 34.775 + 312 | 23.51 +157 | 61.235 + 323 | 51.08 + 54 | 57.777 + 596 | 13.38 - 72 |
| 5 11.1 | 51.931 + 391 | 47.09 - 20 | 35.072 + 297 | 25.53 +202 | 61.549 + 314 | 50.53 + 55 | 58.351 + 574 | 14.11 - 43 |
| 5 21.1 | 52.297 + 366 | 47.48 - 39 | 35.343 + 271 | 27.90 +237 | 61.844 + 295 | 50.01 + 52 | 58.883 + 532 | 15.16 -105 |
| 5 31.1 | 52.634 + 337 | 48.04 - 56 | 35.584 + 241 | 30.52 +262 | 62.117 + 273 | 49.54 + 47 | 59.369 + 486 | 16.48 -132 |
| 6 10.1 | 52.936 + 302 | 48.79 - 75 | 35.792 + 208 | 33.34 +282 | 62.364 + 247 | 49.15 + 39 | 59.799 + 430 | 18.07 -159 |
| 6 20.0 | 53.192 + 256 | 49.70 - 91 | 35.958 + 166 | 36.25 +291 | 62.574 + 210 | 48.85 + 30 | 60.157 + 358 | 19.88 -181 |
| 6 30.0 | 53.400 + 208 | 50.75 -105 | 36.081 + 123 | 39.17 +292 | 62.747 + 173 | 48.65 + 20 | 60.443 + 286 | 21.86 -198 |
| 7 10.0 | 53.554 + 154 | 51.92 -117 | 36.156 + 75 | 42.05 +288 | 62.878 + 131 | 48.57 + 8 | 60.646 + 203 | 23.97 -211 |
| 7 20.0 | 53.649 + 95 | 53.16 -124 | 36.182 + 26 | 44.78 +273 | 62.961 + 83 | 48.58 - 1 | 60.758 + 112 | 26.13 -216 |
| 7 29.9 | 53.687 + 38 | 54.44 -128 | 36.161 - 21 | 47.32 +254 | 62.999 + 38 | 48.70 - 12 | 60.785 + 27 | 28.28 -215 |
| 8 8.9 | 53.664 - 23 | 55.70 -126 | 36.092 - 69 | 49.64 +232 | 62.990 - 9 | 48.88 - 18 | 60.722 - 63 | 30.36 -208 |
| 8 18.9 | 53.586 - 78 | 56.90 -120 | 35.979 - 113 | 51.63 +199 | 62.936 - 54 | 49.12 - 24 | 60.575 - 147 | 32.26 -190 |
| 8 28.8 | 53.460 - 126 | 57.97 -107 | 35.828 - 151 | 53.30 +167 | 62.844 - 92 | 49.40 - 28 | 60.355 - 286 | 33.95 -169 |
| 9 7.8 | 53.290 - 170 | 58.88 - 91 | 35.643 - 185 | 54.62 +132 | 62.716 - 128 | 49.67 - 27 | 60.069 - 220 | 35.35 -140 |
| 9 17.8 | 53.088 - 202 | 59.58 - 70 | 35.434 - 209 | 55.51 + 89 | 62.565 - 151 | 49.94 - 27 | 59.734 - 335 | 36.38 -103 |
| 9 27.8 | 52.868 - 220 | 60.04 - 46 | 35.211 - 223 | 56.02 + 51 | 62.398 - 167 | 50.16 - 22 | 59.370 - 364 | 37.03 - 85 |
| 10 7.7 | 52.638 - 230 | 60.23 - 19 | 34.979 - 232 | 56.09 + 7 | 62.223 - 175 | 50.34 - 18 | 58.988 - 382 | 37.24 - 21 |
| 10 17.7 | 52.417 - 221 | 60.13 + 10 | 34.754 - 225 | 55.71 - 38 | 62.057 - 166 | 50.46 - 12 | 58.618 - 370 | 36.99 + 25 |
| 10 27.7 | 52.217 - 200 | 59.77 + 36 | 34.544 - 210 | 54.91 - 80 | 61.906 - 151 | 50.52 - 6 | 58.274 - 344 | 36.32 + 67 |
| 11 6.7 | 52.047 - 170 | 59.14 + 63 | 34.356 - 188 | 53.67 -124 | 61.780 - 126 | 50.53 - 1 | 57.974 - 300 | 35.21 +111 |
| 11 16.6 | 51.924 - 123 | 58.28 + 86 | 34.204 - 152 | 52.02 -165 | 61.691 - 89 | 50.50 + 3 | 57.742 - 232 | 33.72 +149 |
| 11 26.6 | 51.852 - 72 | 57.23 +105 | 34.089 - 115 | 50.00 -202 | 61.641 - 50 | 50.45 + 5 | 57.583 - 159 | 31.92 +180 |
| 12 6.6 | 51.837 - 15 | 56.04 +119 | 34.020 - 69 | 47.63 -237 | 61.637 - 4 | 50.39 + 6 | 57.510 - 73 | 29.86 +206 |
| 12 16.5 | 51.885 + 48 | 54.75 +129 | 34.000 - 20 | 44.99 -264 | 61.682 + 45 | 50.33 + 6 | 57.532 + 22 | 27.61 +225 |
| 12 26.5 | 51.990 + 105 | 53.41 +134 | 34.027 + 27 | 42.17 -282 | 61.774 + 92 | 50.28 + 5 | 57.642 + 110 | 25.27 +234 |
| 12 36.5 | 52.153 + 163 | 52.06 +135 | 34.105 + 78 | 39.21 -296 | 61.893 + 119 | 50.25 + 3 | 57.844 + 202 | 22.89 +238 |
| | + 217 | +133 | + 125 | -294 | + 184 | - 1 | + 288 | +232 |
| Mean Place | 52.090 | 44.59 | 34.882 | 47.38 | 61.794 | 42.25 | 58.187 | 15.97 |
| sec δ, tan δ | +1.383 | -0.955 | +1.197 | +0.658 | +1.080 | -0.408 | +2.144 | -1.897 |
| da(ψ), dδ(ψ) | +0.086 | +0.08 | +0.044 | +0.09 | +0.072 | +0.09 | +0.110 | +0.09 |
| da(ε), dδ(ε) | +0.013 | -0.98 | -0.009 | -0.98 | +0.006 | -0.98 | +0.028 | -0.98 |
| Dble.Trans. | July 4 | | July 4 | | July 4 | | July 5 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 707 | | 706 | | 714 | | 1495 | | |
|--------------|-------------|--------------|--------------|--------------|------------|--------------|-------------------|--------------|------------|
| | o Draconis* | | σ Sagittarii | | υ Draconis | | 114 G. Sagittarii | | |
| Mag.Spect. | 4.85 | K0 | 2.14 | B3 | 4.91 | K0 | 5.58 | F5 | |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " | |
| | 18 50 | +59 21 | 18 54 | -26 18 | 18 54 | +71 16 | 18 54 | -16 23 | |
| 1 | -8.5 | 56.663 - 95 | 71.77 -331 | 21.591 + 71 | 63.81 + 27 | 29.971 - 247 | 39.97 -330 | 40.486 + 65 | 49.45 - 32 |
| 1 | 1.5 | 56.646 - 17 | 68.29 -348 | 21.708 + 117 | 63.64 + 17 | 29.848 - 123 | 36.50 -347 | 40.592 + 106 | 49.75 - 30 |
| 1 | 11.5 | 56.708 + 62 | 64.71 -358 | 21.859 + 151 | 63.29 + 35 | 29.853 + 5 | 32.90 -360 | 40.734 + 142 | 50.16 - 41 |
| 1 | 21.5 | 56.854 + 146 | 61.19 -352 | 22.060 + 201 | 63.01 + 28 | 29.994 + 141 | 29.34 -356 | 40.920 + 186 | 50.53 - 37 |
| 1 | 31.4 | 57.071 + 217 | 57.87 -332 | 22.293 + 233 | 62.75 + 26 | 30.257 + 263 | 25.96 -338 | 41.136 + 216 | 50.85 - 32 |
| 2 | 10.4 | 57.358 + 287 | 54.82 -305 | 22.554 + 261 | 62.48 + 27 | 30.637 + 380 | 22.84 -312 | 41.379 + 243 | 51.11 - 26 |
| 2 | 20.4 | 57.707 + 349 | 52.21 -261 | 22.841 + 287 | 62.19 + 29 | 31.125 + 488 | 20.14 -270 | 41.645 + 266 | 51.27 - 16 |
| 3 | 2.3 | 58.103 + 396 | 50.12 -209 | 23.145 + 304 | 61.87 + 32 | 31.693 + 568 | 17.95 -219 | 41.928 + 283 | 51.31 - 4 |
| 3 | 12.3 | 58.540 + 437 | 48.61 -151 | 23.465 + 320 | 61.50 + 37 | 32.334 + 641 | 16.33 -162 | 42.227 + 299 | 51.22 + 9 |
| 3 | 22.3 | 59.004 + 464 | 47.76 - 85 | 23.797 + 332 | 61.09 + 41 | 33.021 + 687 | 15.37 - 96 | 42.536 + 309 | 50.98 + 24 |
| 4 | 1.3 | 59.478 + 474 | 47.56 - 20 | 24.135 + 338 | 60.64 + 45 | 33.726 + 705 | 15.07 - 30 | 42.851 + 315 | 50.60 + 38 |
| 4 | 11.2 | 59.957 + 479 | 48.03 + 47 | 24.478 + 343 | 60.16 + 48 | 34.438 + 712 | 15.42 + 35 | 43.172 + 321 | 50.09 + 51 |
| 4 | 21.2 | 60.422 + 465 | 49.15 +112 | 24.819 + 341 | 59.67 + 49 | 35.126 + 688 | 16.44 +102 | 43.490 + 318 | 49.46 + 63 |
| 5 | 1.2 | 60.861 + 439 | 50.82 +167 | 25.154 + 335 | 59.19 + 48 | 35.770 + 644 | 18.03 +159 | 43.803 + 313 | 48.75 + 71 |
| 5 | 11.2 | 61.267 + 406 | 53.03 +221 | 25.480 + 326 | 58.74 + 45 | 36.357 + 587 | 20.16 +213 | 44.108 + 305 | 47.98 + 77 |
| 5 | 21.1 | 61.625 + 358 | 55.68 +265 | 25.788 + 308 | 58.36 + 38 | 36.862 + 505 | 22.76 +260 | 44.395 + 287 | 47.20 + 78 |
| 5 | 31.1 | 61.927 + 302 | 58.65 +297 | 26.073 + 285 | 58.06 + 30 | 37.276 + 414 | 25.69 +293 | 44.662 + 267 | 46.44 + 76 |
| 6 | 10.1 | 62.169 + 242 | 61.89 +324 | 26.331 + 258 | 57.86 + 20 | 37.589 + 313 | 28.91 +322 | 44.902 + 240 | 45.72 + 72 |
| 6 | 20.0 | 62.338 + 169 | 65.29 +340 | 26.552 + 221 | 57.77 + 9 | 37.786 + 197 | 32.30 +339 | 45.109 + 207 | 45.08 + 64 |
| 6 | 30.0 | 62.437 + 99 | 68.72 +343 | 26.735 + 183 | 57.80 - 3 | 37.871 + 85 | 35.75 +345 | 45.279 + 170 | 44.53 + 55 |
| 7 | 10.0 | 62.461 + 24 | 72.15 +343 | 26.875 + 140 | 57.95 - 15 | 37.838 - 33 | 39.22 +347 | 45.409 + 130 | 44.09 + 44 |
| 7 | 20.0 | 62.406 - 55 | 75.45 +330 | 26.965 + 90 | 58.20 - 25 | 37.683 - 155 | 42.57 +335 | 45.492 + 83 | 43.77 + 32 |
| 7 | 29.9 | 62.280 - 126 | 78.55 +310 | 27.009 + 44 | 58.54 - 34 | 37.420 - 263 | 45.74 +317 | 45.532 + 40 | 43.55 + 22 |
| 8 | 8.9 | 62.083 - 197 | 81.41 +286 | 27.003 - 6 | 58.94 - 40 | 37.048 - 372 | 48.68 +294 | 45.526 - 6 | 43.44 + 11 |
| 8 | 18.9 | 61.820 - 263 | 83.92 +251 | 26.951 - 52 | 59.38 - 44 | 36.577 - 471 | 51.29 +261 | 45.477 - 49 | 43.42 + 2 |
| 8 | 28.8 | 61.503 - 317 | 86.06 +214 | 26.860 - 91 | 59.83 - 45 | 36.025 - 552 | 53.54 +225 | 45.390 - 87 | 43.47 - 5 |
| 9 | 7.8 | 61.135 - 368 | 87.79 +173 | 26.731 - 129 | 60.25 - 42 | 35.397 - 628 | 55.38 +184 | 45.269 - 121 | 43.58 - 11 |
| 9 | 17.8 | 60.733 - 402 | 89.02 +123 | 26.576 - 155 | 60.62 - 37 | 34.715 - 682 | 56.74 +136 | 45.124 - 145 | 43.72 - 14 |
| 9 | 27.8 | 60.308 - 425 | 89.79 + 77 | 26.404 - 172 | 60.92 - 30 | 33.997 - 718 | 57.63 + 89 | 44.963 - 161 | 43.89 - 17 |
| 10 | 7.7 | 59.870 - 438 | 90.03 + 24 | 26.225 - 179 | 61.13 - 21 | 33.256 - 741 | 57.99 + 36 | 44.795 - 168 | 44.06 - 17 |
| 10 | 17.7 | 59.438 - 432 | 89.72 - 31 | 26.052 - 173 | 61.24 - 11 | 32.520 - 736 | 57.80 - 19 | 44.633 - 162 | 44.24 - 18 |
| 10 | 27.7 | 59.023 - 415 | 88.90 - 82 | 25.894 - 158 | 61.24 + 0 | 31.804 - 716 | 57.09 - 71 | 44.486 - 147 | 44.42 - 18 |
| 11 | 6.7 | 58.637 - 386 | 87.53 -137 | 25.762 - 132 | 61.15 + 9 | 31.127 - 677 | 55.82 -127 | 44.362 - 124 | 44.61 - 19 |
| 11 | 16.6 | 58.300 - 337 | 85.65 -188 | 25.666 - 96 | 60.98 + 17 | 30.518 - 609 | 54.03 -179 | 44.272 - 90 | 44.81 - 20 |
| 11 | 26.6 | 58.015 - 285 | 83.31 -234 | 25.612 - 54 | 60.74 + 24 | 29.985 - 533 | 51.77 -226 | 44.221 - 51 | 45.02 - 21 |
| 12 | 6.6 | 57.796 - 219 | 80.54 -277 | 25.603 - 9 | 60.47 + 27 | 29.549 - 436 | 49.05 -272 | 44.212 - 9 | 45.27 - 25 |
| 12 | 16.5 | 57.653 - 143 | 77.43 -311 | 25.645 + 42 | 60.17 + 30 | 29.228 - 321 | 45.98 -307 | 44.250 + 38 | 45.54 - 27 |
| 12 | 26.5 | 57.585 - 68 | 74.08 -335 | 25.734 + 89 | 59.88 + 29 | 29.024 - 204 | 42.64 -334 | 44.331 + 81 | 45.83 - 29 |
| 12 | 36.5 | 57.600 + 15 | 70.55 -353 | 25.860 + 126 | 59.66 + 22 | 28.951 - 73 | 39.11 -353 | 44.451 + 120 | 46.13 - 30 |
| | | + 97 | -352 | + 178 | + 37 | + 60 | -355 | + 163 | - 38 |
| Mean Place | 60.138 | 77.97 | 25.739 | 51.64 | 33.964 | 45.69 | 44.366 | 38.09 | |
| sec δ, tan δ | +1.963 | +1.689 | +1.116 | -0.495 | +3.116 | +2.951 | +1.042 | -0.294 | |
| dα(ψ), dδ(ψ) | +0.017 | +0.09 | +0.074 | +0.09 | -0.015 | +0.09 | +0.069 | +0.09 | |
| dα(ε), dδ(ε) | -0.025 | -0.98 | +0.008 | -0.97 | -0.046 | -0.97 | +0.005 | -0.97 | |
| Dble.Trans. | July 5 | | July 5 | | July 5 | | July 6 | | |

APPARENT PLACES OF STARS, 1986

293

AT UPPER TRANSIT AT GREENWICH

| No. | 711 | | 709 | | 710 | | 708 | | |
|--------------|------------|--------------|-----------------|--------------|--------------|--------------|--------------|--------------|------------|
| | R Lyrae | | ♃ Serpentis* p. | | ♄ Sagittarii | | λ Telescopii | | |
| Mag.Spect. | 4.0 to 4.5 | M3 | 4.50 | A5 | 3.61 | K0 | 5.03 | B9 | |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " | |
| | 18 54 | + 43 55 | 18 55 | + 4 10 | 18 56 | - 21 07 | 18 57 | - 52 57 | |
| 1 | 8.5 | 52 155 + 25 | 33 56 -306 | 29 395 + 47 | 57 31 +150 | 51 511 + 66 | 42 82 - 3 | 17 528 + 70 | 40 20 +182 |
| 1 | 1.5 | 52 185 + 30 | 30 34 -322 | 29 483 + 88 | 55 75 -156 | 51 625 + 114 | 42 77 + 5 | 17 666 + 138 | 38 33 +187 |
| 1 | 11.5 | 52 270 + 85 | 27 04 -330 | 29 609 + 126 | 54 15 -160 | 51 762 + 137 | 42 92 - 15 | 17 870 + 204 | 36 45 +188 |
| 1 | 21.5 | 52 412 + 142 | 23 80 -324 | 29 773 + 164 | 52 58 -157 | 51 953 + 191 | 42 97 - 5 | 18 137 + 267 | 34 63 +182 |
| 1 | 31.4 | 52 601 + 189 | 20 74 -306 | 29 966 + 193 | 51 13 -145 | 52 174 + 221 | 43 00 - 3 | 18 456 + 319 | 32 90 +173 |
| 2 | 10.4 | 52 836 + 235 | 17 94 -280 | 30 188 + 222 | 49 82 -131 | 52 423 + 249 | 42 99 + 1 | 18 821 + 365 | 31 30 +160 |
| 2 | 20.4 | 53 111 + 275 | 15 56 -238 | 30 433 + 245 | 48 76 -106 | 52 697 + 274 | 42 92 + 7 | 19 226 + 405 | 29 86 +144 |
| 3 | 2.3 | 53 417 + 306 | 13 66 -190 | 30 696 + 263 | 47 98 - 78 | 52 987 + 290 | 42 76 + 16 | 19 660 + 434 | 28 60 +126 |
| 3 | 12.3 | 53 751 + 334 | 12 30 -136 | 30 975 + 279 | 47 50 - 48 | 53 294 + 307 | 42 52 + 24 | 20 120 + 460 | 27 54 +106 |
| 3 | 22.3 | 54 103 + 352 | 11 56 - 74 | 31 265 + 290 | 47 39 - 11 | 53 612 + 318 | 42 18 + 34 | 20 597 + 477 | 26 70 + 84 |
| 4 | 1.3 | 54 463 + 360 | 11 44 - 12 | 31 560 + 295 | 47 61 + 22 | 53 936 + 324 | 41 74 + 44 | 21 083 + 486 | 26 08 + 62 |
| 4 | 11.2 | 54 829 + 366 | 11 93 + 49 | 31 861 + 301 | 48 17 + 56 | 54 266 + 330 | 41 22 + 52 | 21 576 + 493 | 25 69 + 39 |
| 4 | 21.2 | 55 188 + 359 | 13 03 +110 | 32 160 + 299 | 49 05 + 88 | 54 595 + 329 | 40 64 + 58 | 22 066 + 490 | 25 57 + 12 |
| 5 | 1.2 | 55 533 + 345 | 14 65 +162 | 32 453 + 293 | 50 20 +115 | 54 918 + 323 | 40 02 + 62 | 22 544 + 478 | 25 68 - 11 |
| 5 | 11.2 | 55 859 + 326 | 16 77 +212 | 32 737 + 284 | 51 58 +138 | 55 233 + 315 | 39 39 + 63 | 23 008 + 464 | 26 06 - 38 |
| 5 | 21.1 | 56 154 + 295 | 19 29 +252 | 33 003 + 266 | 53 15 +157 | 55 530 + 297 | 38 77 + 62 | 23 442 + 434 | 26 70 - 64 |
| 5 | 31.1 | 56 414 + 260 | 22 10 +281 | 33 248 + 245 | 54 81 +166 | 55 807 + 277 | 38 21 + 56 | 23 843 + 401 | 27 58 - 88 |
| 6 | 10.1 | 56 633 + 219 | 25 16 +306 | 33 468 + 220 | 56 55 +174 | 56 057 + 250 | 37 73 + 48 | 24 203 + 360 | 28 70 -112 |
| 6 | 20.0 | 56 803 + 170 | 28 35 +319 | 33 654 + 186 | 58 30 +175 | 56 272 + 215 | 37 33 + 40 | 24 508 + 305 | 30 03 -133 |
| 6 | 30.0 | 56 924 + 121 | 31 56 +320 | 33 805 + 151 | 59 99 +169 | 56 450 + 178 | 37 05 + 28 | 24 758 + 250 | 31 52 -149 |
| 7 | 10.0 | 56 990 + 66 | 34 76 +320 | 33 917 + 112 | 61 60 +161 | 56 586 + 136 | 36 87 + 18 | 24 943 + 185 | 33 16 -164 |
| 7 | 20.0 | 56 999 + 9 | 37 83 +307 | 33 984 + 67 | 63 09 +149 | 56 676 + 90 | 36 82 + 5 | 25 057 + 114 | 34 87 -171 |
| 7 | 29.9 | 56 956 - 43 | 40 70 +287 | 34 011 + 27 | 64 42 +133 | 56 720 + 44 | 36 86 - 4 | 25 104 + 47 | 36 61 -174 |
| 8 | 8.9 | 56 858 - 98 | 43 34 +264 | 33 994 - 17 | 65 58 +116 | 56 717 - 3 | 36 99 - 13 | 25 079 - 25 | 38 33 -172 |
| 8 | 18.9 | 56 710 - 148 | 45 65 +231 | 33 936 - 58 | 66 54 + 96 | 56 669 - 48 | 37 19 - 20 | 24 987 - 92 | 39 93 -160 |
| 8 | 28.9 | 56 521 - 189 | 47 61 +196 | 33 843 - 93 | 67 31 + 77 | 56 582 - 87 | 37 43 - 24 | 24 837 - 150 | 41 38 -145 |
| 9 | 7.8 | 56 292 - 229 | 49 18 +157 | 33 718 - 125 | 67 88 + 57 | 56 460 - 122 | 37 69 - 26 | 24 632 - 205 | 42 61 -123 |
| 9 | 17.8 | 56 036 - 256 | 50 30 +112 | 33 571 - 147 | 68 23 + 35 | 56 312 - 148 | 37 95 - 26 | 24 388 - 244 | 43 56 - 95 |
| 9 | 27.8 | 55 762 - 274 | 50 98 + 68 | 33 409 - 162 | 68 38 + 15 | 56 148 - 164 | 38 18 - 23 | 24 119 - 269 | 44 20 - 64 |
| 10 | 7.7 | 55 478 - 284 | 51 18 + 20 | 33 240 - 169 | 68 31 - 7 | 55 976 - 172 | 38 38 - 20 | 23 836 - 283 | 44 48 - 28 |
| 10 | 17.7 | 55 200 - 278 | 50 88 - 30 | 33 077 - 163 | 68 03 - 28 | 55 809 - 167 | 38 53 - 15 | 23 560 - 276 | 44 39 + 9 |
| 10 | 27.7 | 54 936 - 264 | 50 10 - 78 | 32 927 - 150 | 67 55 - 48 | 55 658 - 151 | 38 63 - 10 | 23 304 - 256 | 43 94 + 45 |
| 11 | 6.7 | 54 695 - 241 | 48 82 -128 | 32 799 - 128 | 66 86 - 69 | 55 530 - 128 | 38 70 - 7 | 23 082 - 222 | 43 13 + 81 |
| 11 | 16.6 | 54 491 - 204 | 47 08 -174 | 32 703 - 96 | 65 97 - 89 | 55 437 - 93 | 38 72 - 2 | 22 912 - 170 | 42 00 +113 |
| 11 | 26.6 | 54 328 - 163 | 44 92 -216 | 32 642 - 61 | 64 90 -107 | 55 383 - 54 | 38 72 + 0 | 22 800 - 112 | 40 61 +139 |
| 12 | 6.6 | 54 213 - 115 | 42 36 -256 | 32 620 - 22 | 63 65 -125 | 55 373 - 10 | 38 72 + 0 | 22 753 - 47 | 38 98 +163 |
| 12 | 16.6 | 54 155 - 58 | 39 49 -287 | 32 643 + 23 | 62 26 -139 | 55 411 + 38 | 38 71 + 1 | 22 780 + 27 | 37 21 +177 |
| 12 | 26.5 | 54 150 + 5 | 36 40 -309 | 32 706 + 63 | 60 77 -149 | 55 494 + 83 | 38 71 + 0 | 22 876 + 96 | 35 34 +187 |
| 12 | 36.5 | 54 203 + 109 | 33 15 -325 | 32 810 + 104 | 59 20 -157 | 55 606 + 112 | 38 59 + 12 | 23 041 + 165 | 33 42 +192 |
| | | | | | | | | | |
| | | | | | | | | | |
| Mean Place | 55 461 | 40 51 | 32 919 | 67 20 | 55 504 | 30 81 | 23 089 | 26 03 | |
| sec δ, tan δ | +1.388 | +0.963 | +1.003 | +0.073 | +1.072 | -0.386 | +1.660 | -1.325 | |
| da(ψ), dδ(ψ) | +0.036 | +0.09 | +0.059 | +0.10 | +0.071 | +0.10 | +0.095 | +0.10 | |
| da(ε), dδ(ε) | -0.015 | -0.97 | -0.001 | -0.97 | +0.006 | -0.97 | +0.022 | -0.97 | |
| Dble.Trans. | July 6 | | July 6 | | July 6 | | July 6 | | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 713 | | 712 | | 716 | | 717 | | |
|--------------|---------|--------------|-------------|--------------|-------------|--------------|-------------|--------------|-------------|
| | γ Lyrae | | ε Aquilae | | ζ Aquilae | | λ Aquilae | | |
| Mag.Spect. | 3.30 | A0p | 4.21 | K0 | 3.02 | A0 | 3.55 | B9 | |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " | |
| | 18 58 | +32 39 | 18 58 | +15 02 | 19 04 | +13 50 | 19 05 | - 4 54 | |
| 1 | -8.5 | 23.001 + 1 | 66.06 -273 | 57.197 + 32 | 48.41 -202 | 43.973 + 29 | 24.54 -194 | 28.319 + 47 | 23.75 -97 |
| 1 | 1.5 | 23.051 + 50 | 63.20 -286 | 57.270 + 73 | 46.28 -213 | 44.042 + 69 | 22.50 -204 | 28.405 + 86 | 24.75 -100 |
| 1 | 11.5 | 23.146 + 95 | 60.25 -295 | 57.383 + 113 | 44.11 -217 | 44.150 + 108 | 20.40 -210 | 28.529 + 124 | 25.79 -104 |
| 1 | 21.5 | 23.288 + 142 | 57.36 -289 | 57.535 + 152 | 41.98 -213 | 44.298 + 148 | 18.35 -205 | 28.691 + 162 | 26.80 -101 |
| 1 | 31.4 | 23.470 + 182 | 54.63 -273 | 57.719 + 184 | 39.98 -200 | 44.477 + 179 | 16.42 -193 | 28.883 + 192 | 27.74 -94 |
| 2 | 10.4 | 23.688 + 218 | 52.14 -249 | 57.933 + 214 | 38.18 -180 | 44.687 + 210 | 14.67 -175 | 29.103 + 220 | 28.56 -82 |
| 2 | 20.4 | 23.940 + 252 | 50.03 -211 | 58.174 + 241 | 36.67 -151 | 44.923 + 236 | 13.21 -146 | 29.347 + 244 | 29.19 -63 |
| 3 | 2.3 | 24.216 + 276 | 48.36 -167 | 58.434 + 260 | 35.52 -115 | 45.179 + 256 | 12.09 -112 | 29.609 + 262 | 29.62 -43 |
| 3 | 12.3 | 24.515 + 299 | 47.18 -118 | 58.712 + 278 | 34.75 -77 | 45.453 + 274 | 11.35 -74 | 29.888 + 279 | 29.81 -19 |
| 3 | 22.3 | 24.829 + 314 | 46.58 -60 | 59.002 + 290 | 34.43 -32 | 45.741 + 288 | 11.05 -30 | 30.180 + 292 | 29.74 + 7 |
| 4 | 1.3 | 25.152 + 323 | 46.52 -6 | 59.299 + 297 | 34.55 + 12 | 46.037 + 296 | 11.16 + 11 | 30.478 + 298 | 29.41 + 33 |
| 4 | 11.2 | 25.480 + 328 | 47.03 + 51 | 59.602 + 303 | 35.09 + 54 | 46.339 + 302 | 11.70 + 54 | 30.783 + 305 | 28.83 + 58 |
| 4 | 21.2 | 25.804 + 324 | 48.09 + 106 | 59.903 + 301 | 36.07 + 98 | 46.641 + 302 | 12.66 + 96 | 31.089 + 306 | 28.02 + 81 |
| 5 | 1.2 | 26.119 + 315 | 49.61 + 152 | 60.198 + 295 | 37.39 + 132 | 46.937 + 296 | 13.96 + 130 | 31.390 + 301 | 27.02 + 100 |
| 5 | 11.2 | 26.419 + 300 | 51.58 + 197 | 60.482 + 284 | 39.03 + 164 | 47.224 + 287 | 15.57 + 161 | 31.684 + 294 | 25.86 + 116 |
| 5 | 21.1 | 26.696 + 277 | 53.91 + 233 | 60.748 + 266 | 40.94 + 191 | 47.493 + 289 | 17.44 + 187 | 31.962 + 278 | 24.59 + 127 |
| 5 | 31.1 | 26.945 + 249 | 56.49 + 258 | 60.992 + 244 | 43.01 + 207 | 47.741 + 248 | 19.48 + 204 | 32.221 + 259 | 23.27 + 132 |
| 6 | 10.1 | 27.161 + 216 | 59.29 + 280 | 61.209 + 217 | 45.22 + 221 | 47.963 + 222 | 21.64 + 216 | 32.456 + 235 | 21.93 + 134 |
| 6 | 20.0 | 27.336 + 175 | 62.19 + 290 | 61.390 + 181 | 47.47 + 225 | 48.151 + 188 | 23.85 + 221 | 32.658 + 202 | 20.62 + 131 |
| 6 | 30.0 | 27.469 + 133 | 65.10 + 291 | 61.536 + 146 | 49.69 + 222 | 48.302 + 151 | 26.03 + 218 | 32.826 + 168 | 19.38 + 124 |
| 7 | 10.0 | 27.555 + 86 | 67.99 + 289 | 61.641 + 105 | 51.86 + 217 | 48.414 + 112 | 28.17 + 214 | 32.955 + 129 | 18.23 + 115 |
| 7 | 20.0 | 27.591 + 36 | 70.74 + 275 | 61.701 + 60 | 53.90 + 204 | 48.480 + 66 | 30.16 + 199 | 33.039 + 84 | 17.21 + 102 |
| 7 | 29.9 | 27.581 - 10 | 73.31 + 257 | 61.719 + 18 | 55.76 + 186 | 48.505 + 25 | 32.00 + 184 | 33.082 + 43 | 16.34 + 87 |
| 8 | 8.9 | 27.522 - 59 | 75.66 + 235 | 61.692 - 27 | 57.44 + 168 | 48.485 - 20 | 33.64 + 164 | 33.080 - 2 | 15.60 + 74 |
| 8 | 18.9 | 27.418 - 104 | 77.70 + 204 | 61.624 - 68 | 58.86 + 142 | 48.423 - 62 | 35.05 + 141 | 33.035 - 45 | 15.03 + 57 |
| 8 | 28.9 | 27.276 - 142 | 79.43 + 173 | 61.521 - 103 | 60.04 + 118 | 48.326 - 97 | 36.21 + 116 | 32.955 - 80 | 14.60 + 43 |
| 9 | 7.8 | 27.099 - 177 | 80.81 + 138 | 61.386 - 135 | 60.95 + 91 | 48.326 - 131 | 36.21 + 90 | 32.955 - 115 | 14.60 + 28 |
| 9 | 17.8 | 26.896 - 203 | 81.77 + 96 | 61.226 - 160 | 61.56 + 61 | 48.195 - 155 | 37.11 + 61 | 32.840 - 139 | 14.32 + 14 |
| 9 | 27.8 | 26.678 - 218 | 82.36 + 59 | 61.053 - 173 | 61.89 + 33 | 48.040 - 170 | 37.72 + 34 | 32.701 - 155 | 14.18 + 1 |
| 10 | 7.7 | 26.450 - 228 | 82.51 + 15 | 60.871 - 182 | 61.91 + 2 | 47.870 - 179 | 38.06 + 4 | 32.546 - 163 | 14.17 - 11 |
| 10 | 17.7 | 26.227 - 223 | 82.22 - 29 | 60.694 - 177 | 61.61 - 30 | 47.691 - 179 | 38.10 + 4 | 32.383 - 163 | 14.28 - 11 |
| 10 | 27.7 | 26.227 - 209 | 82.22 - 71 | 60.694 - 164 | 61.61 - 58 | 47.516 - 163 | 37.84 - 26 | 32.223 - 160 | 14.52 - 24 |
| 10 | 27.7 | 26.018 - 189 | 81.51 - 115 | 60.530 - 144 | 61.03 - 90 | 47.353 - 143 | 37.30 - 54 | 32.076 - 147 | 14.87 - 35 |
| 11 | 6.7 | 25.829 - 155 | 80.36 - 156 | 60.386 - 112 | 60.13 - 118 | 47.210 - 113 | 36.45 - 85 | 32.076 - 127 | 14.87 - 48 |
| 11 | 16.6 | 25.674 - 119 | 78.80 - 192 | 60.274 - 77 | 58.95 - 144 | 47.097 - 79 | 35.33 - 112 | 31.949 - 96 | 15.35 - 58 |
| 11 | 26.6 | 25.555 - 76 | 76.88 - 229 | 60.197 - 38 | 57.51 - 171 | 47.018 - 40 | 33.95 - 162 | 31.853 - 61 | 15.93 - 69 |
| 12 | 6.6 | 25.479 - 26 | 74.59 - 255 | 60.159 + 6 | 55.80 - 189 | 46.978 + 3 | 32.33 - 181 | 31.770 + 22 | 17.43 - 81 |
| 12 | 16.6 | 25.453 + 19 | 72.04 - 276 | 60.165 + 48 | 53.91 - 203 | 46.981 + 43 | 30.52 - 196 | 31.792 + 62 | 18.31 - 88 |
| 12 | 26.5 | 25.472 + 69 | 69.28 - 290 | 60.213 + 90 | 51.88 - 214 | 47.024 + 86 | 28.56 - 205 | 31.854 + 102 | 19.26 - 100 |
| 12 | 36.5 | 25.541 + 115 | 66.38 - 289 | 60.303 + 130 | 49.74 - 213 | 47.110 + 126 | 26.51 - 205 | 31.956 + 141 | 20.26 - 100 |
| Mean Place | 26.304 | 73.73 | 60.598 | 57.47 | 47.381 | 33.89 | 31.956 | 12.57 | |
| sec δ, tan δ | +1.188 | +0.641 | +1.036 | +0.269 | +1.030 | +0.246 | +1.004 | -0.086 | |
| dα(ψ), dδ(ψ) | +0.045 | +0.10 | +0.054 | +0.10 | +0.055 | +0.11 | +0.063 | +0.11 | |
| dα(ε), dδ(ε) | -0.011 | -0.97 | -0.005 | -0.97 | -0.005 | -0.96 | +0.002 | -0.96 | |
| Dble.Trans. | July 6 | | July 7 | | July 8 | | July 8 | | |

APPARENT PLACES OF STARS, 1986

295

AT UPPER TRANSIT AT GREENWICH

| No. | 1497 | | 1498 | | 1496 | | 719 | |
|--------------|------------------------------------|-------------------------------------|---------------------------------------|--------------------------------------|------------------------------------|--------------------------------------|------------------------------------|--------------------------------------|
| | 21 G. Aquilae* | | Piazzi 18 ^h 318 (Lyrae) | | τ Sagittarii | | ι Lyrae | |
| Mag. Spect. | 6.72 | B8 | 5.46 | A5 | 3.42 | K0 | 5.13 | B5 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | ^h ^m 19 05 | ^o ['] - 1 22 | ^h ^m 19 06 | ^o ['] + 28 35 | ^h ^m 19 06 | ^o ['] - 27 41 | ^h ^m 19 06 | ^o ['] + 36 04 |
| 1 | ^d -8.5 | ^s 49 640 + 43 | ^s 13.92 -116 | ^s 02 272 + 3 | ^s 76 50 -254 | ^s 01.745 + 59 | ^s 40.90 + 36 | ^s 45 899 - 15 |
| 1 | 1.5 | + 83 | -121 | + 48 | -268 | + 106 | + 34 | + 33 |
| 1 | 11.5 | 49 723 + 121 | 15.13 -124 | 02 320 + 91 | 73 82 -277 | 01 851 + 141 | 40 56 + 40 | 45 932 + 81 |
| 1 | 21.5 | 49 844 + 158 | 16.37 -122 | 02 411 + 137 | 71.05 -272 | 01 992 + 191 | 40.16 + 43 | 46.013 + 131 |
| 1 | 31.4 | 50 002 + 188 | 17.59 -113 | 02 548 + 174 | 68.33 -257 | 02 183 + 224 | 39.73 + 40 | 46.144 + 172 |
| 1 | 31.4 | 50 190 | 18.72 | 02 722 | 65.76 | 02 407 | 39.33 | 46 316 |
| 2 | 10.4 | 50 406 + 216 | 19.72 -100 | 02 931 + 209 | 63.41 -235 | 02 661 + 254 | 38.92 + 41 | 46 528 + 212 |
| 2 | 20.4 | 50 647 + 241 | 20.52 -80 | 03 172 + 241 | 61.41 -200 | 02 941 + 280 | 38.48 + 44 | 46 776 + 248 |
| 3 | 2.4 | 50 906 + 259 | 21.08 -56 | 03 436 + 264 | 59.82 -159 | 03 241 + 300 | 38.02 + 46 | 47 052 + 272 |
| 3 | 12.3 | 51 182 + 276 | 21.38 -30 | 03 436 + 288 | 58.70 -112 | 03 318 | 37.52 + 50 | 47 354 + 306 |
| 3 | 22.3 | 51 471 + 289 | 21.38 + 0 | 03 724 + 304 | 58.12 -58 | 03 559 + 332 | 37.52 + 53 | 47 354 + 319 |
| 4 | 1.3 | 51 767 + 296 | 21.09 + 29 | 04 340 + 312 | 58.06 -6 | 04 230 + 339 | 36.43 + 56 | 48 003 + 330 |
| 4 | 11.2 | 52 070 + 303 | 20.51 + 58 | 04 660 + 320 | 58.54 + 48 | 04 577 + 347 | 35.86 + 57 | 48 340 + 337 |
| 4 | 21.2 | 52 373 + 303 | 19.67 + 84 | 04 978 + 318 | 59.55 + 101 | 04 924 + 347 | 35.29 + 57 | 48 675 + 335 |
| 5 | 1.2 | 52 671 + 298 | 18.60 + 107 | 05 288 + 310 | 61.01 + 146 | 05 266 + 342 | 34.75 + 54 | 49 001 + 326 |
| 5 | 11.2 | 52 963 + 292 | 17.35 + 125 | 05 587 + 299 | 62.89 + 188 | 05 600 + 334 | 34.26 + 49 | 49 313 + 312 |
| 5 | 21.1 | 53 239 + 276 | 15.95 + 140 | 05 865 + 278 | 65.12 + 223 | 05 918 + 318 | 33.85 + 41 | 49 602 + 289 |
| 5 | 31.1 | 53 495 + 256 | 14.48 + 147 | 06 117 + 252 | 67.60 + 248 | 06 215 + 297 | 33.54 + 31 | 49 861 + 259 |
| 6 | 10.1 | 53 727 + 232 | 12.97 + 151 | 06 339 + 222 | 70.28 + 268 | 06 485 + 270 | 33.34 + 20 | 50 087 + 226 |
| 6 | 20.1 | 53 926 + 199 | 11.48 + 149 | 06 522 + 183 | 73.06 + 278 | 06 719 + 234 | 33.27 + 7 | 50 271 + 184 |
| 6 | 30.0 | 54 092 + 186 | 10.04 + 144 | 06 666 + 144 | 75.85 + 279 | 06 915 + 196 | 33.34 -7 | 50 411 + 140 |
| 7 | 10.0 | 54 218 + 126 | 08.69 + 135 | 06 765 + 99 | 78.62 + 277 | 07 067 + 152 | 33.53 -19 | 50 503 + 92 |
| 7 | 20.0 | 54 300 + 82 | 07.48 + 121 | 06 816 + 51 | 81.26 + 264 | 07 169 + 102 | 33.84 -31 | 50 542 + 39 |
| 7 | 29.9 | 54 341 + 41 | 06.40 + 108 | 06 821 + 5 | 83.73 + 247 | 07 225 + 56 | 34.25 -41 | 50 534 -8 |
| 8 | 8.9 | 54 337 -4 | 05.48 + 92 | 06 779 -42 | 85.99 + 226 | 07 229 + 4 | 34.73 -48 | 50 475 -59 |
| 8 | 18.9 | 54 291 -46 | 04.74 + 74 | 06 692 -87 | 87.95 + 196 | 07 186 -43 | 35.26 -53 | 50 368 -107 |
| 8 | 28.9 | 54 209 -82 | 04.16 + 58 | 06 567 -125 | 89.63 + 168 | 07 101 -85 | 35.80 -54 | 50 222 -146 |
| 9 | 7.8 | 54 094 -115 | 03.75 + 41 | 06 407 -160 | 90.97 + 134 | 06 978 -123 | 36.32 -52 | 50 038 -184 |
| 9 | 17.8 | 53 954 -140 | 03.52 + 23 | 06 222 -185 | 91.93 + 96 | 06 826 -152 | 36.78 -46 | 49 827 -211 |
| 9 | 27.8 | 53 798 -156 | 03.44 + 8 | 06 020 -202 | 92.52 + 59 | 06 655 -171 | 37.16 -38 | 49 598 -229 |
| 10 | 7.8 | 53 634 -164 | 03.52 -8 | 05 807 -213 | 92.71 + 19 | 06 474 -181 | 37.44 -28 | 49 358 -240 |
| 10 | 17.7 | 53 473 -161 | 03.77 -25 | 05 599 -208 | 92.49 -22 | 06 298 -176 | 37.60 -16 | 49 122 -236 |
| 10 | 27.7 | 53 325 -148 | 04.15 -38 | 05 402 -197 | 91.87 -62 | 06 135 -163 | 37.64 -4 | 48 896 -226 |
| 11 | 6.7 | 53 196 -129 | 04.70 -55 | 05 224 -178 | 90.84 -103 | 05 995 -140 | 37.56 + 8 | 48 691 -206 |
| 11 | 16.6 | 53 099 -97 | 05.39 -69 | 05 078 -146 | 89.82 -142 | 05 891 -104 | 37.38 + 18 | 48 518 -173 |
| 11 | 26.6 | 53 035 -64 | 06.21 -82 | 04 967 -111 | 87.65 -177 | 05 827 -64 | 37.12 + 26 | 48 381 -137 |
| 12 | 6.6 | 53 010 -25 | 07.18 -97 | 04 897 -70 | 85.54 -211 | 05 807 -20 | 36.79 + 33 | 48 287 -94 |
| 12 | 16.6 | 53 029 + 19 | 08.25 -107 | 04 873 -24 | 83.16 -238 | 05 838 + 31 | 36.41 + 38 | 48 243 + 4 |
| 12 | 26.5 | 53 087 + 58 | 09.40 -115 | 04 892 + 19 | 80.59 -257 | 05 915 + 77 | 36.02 + 39 | 48 245 + 2 |
| 12 | 36.5 | 53 186 + 99 | 10.61 -121 | 04 959 + 67 | 77.88 -271 | 06 035 + 120 | 35.68 + 34 | 48 299 + 54 |
| | | + 137 | -120 | + 111 | -272 | + 163 | + 49 | + 102 |
| Mean Place | 53.224 | 03.03 | 05.589 | 84.62 | 05.898 | 27.64 | 49.198 | 42.77 |
| sec δ, tan δ | +1.000 | -0.024 | +1.139 | +0.545 | +1.129 | -0.525 | +1.237 | +0.729 |
| dα(ψ), dδ(ψ) | +0.062 | +0.11 | +0.047 | +0.11 | +0.075 | +0.11 | +0.043 | +0.11 |
| dα(ε), dδ(ε) | +0.000 | -0.96 | -0.010 | -0.96 | +0.010 | -0.96 | -0.014 | -0.96 |
| Dble. Trans. | July 8 | | July 8 | | July 8 | | July 9 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 718 | | 720 | | 1500 | | 723 | |
|---|----------------------------|-----------|-------------------|----------|------------|-----------|-------------------|------------|
| | α Coronae Austrinae | | π Sagittarii* | | 20 Aquilae | | δ Draconis | |
| Mag.Spect. | 4.12 | A2 | 3.02 | F2 | 5.37 | B3 | 3.24 | K0 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " |
| | 19 08 | - 37 55 | 19 08 | - 21 02 | 19 11 | - 7 57 | 19 12 | + 67 37 |
| 1 | d -8.5 | s + 58 | s + 53 | " - 1 | s + 43 | " - 77 | s - 225 | " - 316 |
| 1 | 28 764 | + 109 | 53 748 | + 100 | 53 114 | + 82 | 29 412 | - 124 |
| 1 | 28 873 | + 157 | 53 848 | + 125 | 53 196 | + 120 | 29 288 | - 19 |
| 1 | 29 030 | + 205 | 53 973 | + 181 | 53 316 | + 158 | 29 269 | + 96 |
| 1 | 29 235 | + 244 | 54 154 | + 210 | 53 474 | + 190 | 29 365 | + 197 |
| 1 | 29 479 | + 280 | 54 364 | + 238 | 53 664 | + 217 | 29 562 | + 297 |
| 2 | 29 759 | + 310 | 54 602 | + 264 | 58 19 | + 7 | 29 859 | + 391 |
| 2 | 30 069 | + 332 | 54 866 | + 282 | 58 04 | + 15 | 30 250 | + 464 |
| 3 | 30 401 | + 354 | 55 148 | + 300 | 57 81 | + 23 | 30 714 | + 530 |
| 3 | 30 755 | + 369 | 55 448 | + 314 | 57 49 | + 32 | 31 244 | + 577 |
| 3 | 31 124 | + 377 | 55 762 | + 321 | 57 06 | + 43 | 31 821 | + 600 |
| 4 | 31 501 | + 386 | 56 083 | + 330 | 56 54 | + 52 | 32 421 | + 615 |
| 4 | 31 887 | + 387 | 56 413 | + 330 | 55 93 | + 61 | 33 036 | + 604 |
| 4 | 32 274 | + 380 | 56 743 | + 326 | 55 26 | + 67 | 33 640 | + 575 |
| 5 | 32 654 | + 373 | 57 069 | + 319 | 54 55 | + 71 | 34 215 | + 537 |
| 5 | 33 027 | + 354 | 57 388 | + 304 | 53 84 | + 70 | 34 752 | + 474 |
| 5 | 33 381 | + 330 | 57 692 | + 285 | 56 763 | + 286 | 35 226 | + 404 |
| 5 | 33 711 | + 301 | 57 977 | + 259 | 57 029 | + 244 | 35 630 | + 324 |
| 6 | 34 012 | + 260 | 58 236 | + 225 | 57 273 | + 210 | 35 954 | + 228 |
| 6 | 34 272 | + 218 | 58 461 | + 190 | 57 483 | + 177 | 36 182 | + 136 |
| 6 | 34 490 | + 169 | 58 651 | + 147 | 57 660 | + 138 | 36 318 | + 37 |
| 7 | 34 659 | + 115 | 58 798 | + 101 | 57 798 | + 93 | 36 355 | + 69 |
| 7 | 34 774 | + 61 | 58 899 | + 55 | 57 891 | + 51 | 36 286 | - 161 |
| 7 | 34 835 | + 5 | 58 954 | + 8 | 57 942 | + 5 | 36 125 | - 258 |
| 8 | 34 840 | - 48 | 58 962 | - 39 | 57 947 | - 38 | 35 867 | - 347 |
| 8 | 34 792 | - 95 | 58 923 | - 78 | 57 909 | - 74 | 35 520 | - 420 |
| 8 | 34 697 | - 140 | 58 845 | - 115 | 57 835 | - 110 | 35 100 | - 491 |
| 9 | 34 557 | - 171 | 58 730 | - 143 | 57 725 | - 136 | 34 609 | - 543 |
| 9 | 34 386 | - 193 | 58 587 | - 160 | 57 589 | - 153 | 34 066 | - 579 |
| 9 | 34 193 | - 205 | 58 427 | - 171 | 57 436 | - 162 | 33 487 | - 605 |
| 10 | 33 988 | - 187 | 58 256 | - 154 | 57 274 | - 148 | 32 882 | - 607 |
| 10 | 33 786 | - 162 | 58 089 | - 133 | 57 114 | - 129 | 32 275 | - 594 |
| 10 | 33 599 | - 123 | 57 935 | - 100 | 56 966 | - 109 | 31 681 | - 568 |
| 11 | 33 437 | - 80 | 57 802 | - 63 | 56 837 | - 86 | 31 113 | - 515 |
| 11 | 33 314 | - 30 | 57 702 | - 20 | 56 739 | - 64 | 30 598 | - 456 |
| 11 | 33 234 | + 26 | 57 639 | + 0 | 56 675 | - 25 | 30 142 | - 378 |
| 12 | 33 204 | + 77 | 57 619 | + 26 | 56 650 | + 18 | 29 764 | - 285 |
| 12 | 33 230 | + 129 | 57 645 | + 71 | 56 668 | + 58 | 29 479 | - 190 |
| 12 | 33 307 | + 178 | 57 716 | + 121 | 56 726 | + 99 | 29 289 | - 83 |
| 12 | 33 436 | + 107 | 57 837 | + 141 | 56 825 | + 136 | 29 206 | + 28 |
| 12 | 33 265 | + 129 | 57 716 | + 121 | 56 726 | + 99 | 29 289 | - 83 |
| 12 | 33 436 | + 178 | 57 837 | + 141 | 56 825 | + 136 | 29 206 | + 28 |
| Mean Place | 33.300 | 35.26 | 57.705 | 45.24 | 56.789 | 46.27 | 33.242 | 76.15 |
| sec δ , tan δ | +1.268 | -0.779 | +1.071 | -0.385 | +1.010 | -0.140 | +2.628 | +2.431 |
| $d\alpha(\psi)$, $d\delta(\psi)$ | +0.081 | +0.12 | +0.071 | +0.12 | +0.065 | +0.12 | -0.000 | +0.12 |
| $d\alpha(\epsilon)$, $d\delta(\epsilon)$ | +0.015 | -0.96 | +0.008 | -0.96 | +0.003 | -0.95 | -0.050 | -0.95 |
| Dble.Trans. | July 9 | | July 9 | | July 10 | | July 10 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 1499 | | 729 | | 724 | | 726 | | | | | | | | | | |
|--------------|----------------|---------|------------|---------|---------|---------|---------|---------|--------|--------|------|-------|------|--------|------|-------|------|
| Name | 42 G. Octantis | | τ Draconis | | ♀ Lyrae | | κ Cygni | | | | | | | | | | |
| Mag.Spect. | 6.78 | A2 | 4.63 | K0 | 4.46 | K0 | 3.98 | K0 | | | | | | | | | |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | | | | | | | | | |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " | | | | | | | | | |
| | 19 14 | - 75 49 | 19 15 | + 73 19 | 19 15 | + 38 06 | 19 16 | + 53 20 | | | | | | | | | |
| 1 | -8.5 | 22.658 | +36 | 44.82 | +285 | 44.718 | -357 | 45.50 | -310 | 50.658 | +31 | 25.86 | -278 | 44.042 | -96 | 29.62 | -306 |
| 1 | 1.5 | 22.790 | +132 | 41.86 | +296 | 44.496 | -222 | 42.16 | -334 | 50.677 | +19 | 22.91 | -295 | 44.011 | -31 | 26.34 | -328 |
| 1 | 11.5 | 23.087 | +297 | 38.84 | +302 | 44.415 | -81 | 38.64 | -352 | 50.744 | +67 | 19.84 | -307 | 44.046 | +35 | 22.92 | -342 |
| 1 | 21.5 | 23.551 | +464 | 35.88 | +296 | 44.486 | +71 | 35.11 | -353 | 50.862 | +118 | 16.79 | -305 | 44.150 | +104 | 19.50 | -342 |
| 1 | 31.4 | 24.156 | +605 | 33.07 | +281 | 44.696 | +210 | 31.68 | -343 | 51.024 | +162 | 13.88 | -291 | 44.315 | +165 | 16.22 | -328 |
| 2 | 10.4 | 24.891 | +735 | 30.43 | +264 | 45.044 | +348 | 28.46 | -322 | 51.228 | +204 | 11.19 | -269 | 44.540 | +225 | 13.16 | -306 |
| 2 | 20.4 | 25.744 | +853 | 28.07 | +236 | 45.521 | +477 | 25.61 | -285 | 51.470 | +242 | 08.86 | -233 | 44.821 | +281 | 10.48 | -268 |
| 3 | 2.4 | 26.683 | +939 | 26.02 | +205 | 46.098 | +577 | 23.23 | -238 | 51.743 | +273 | 06.97 | -189 | 45.146 | +325 | 08.28 | -220 |
| 3 | 12.3 | 27.701 | +1018 | 24.30 | +172 | 46.768 | +670 | 21.37 | -186 | 52.043 | +300 | 05.57 | -140 | 45.511 | +365 | 06.59 | -169 |
| 3 | 22.3 | 28.775 | +1074 | 22.97 | +133 | 47.502 | +734 | 20.15 | -122 | 52.365 | +322 | 04.76 | -81 | 45.905 | +394 | 05.55 | -104 |
| 4 | 1.3 | 29.878 | +1103 | 22.04 | +93 | 48.270 | +768 | 19.57 | -58 | 52.698 | +333 | 04.52 | -24 | 46.315 | +410 | 05.13 | -42 |
| 4 | 11.2 | 31.005 | +1127 | 21.51 | +53 | 49.059 | +769 | 19.64 | +7 | 53.042 | +344 | 04.87 | +35 | 46.738 | +423 | 05.36 | +23 |
| 4 | 21.2 | 32.124 | +1119 | 21.42 | +9 | 49.832 | +773 | 20.39 | +75 | 53.384 | +342 | 05.81 | +94 | 47.157 | +419 | 06.24 | +88 |
| 5 | 1.2 | 33.216 | +1092 | 21.75 | -33 | 50.567 | +735 | 21.73 | +134 | 53.719 | +335 | 07.26 | +145 | 47.562 | +405 | 07.69 | +145 |
| 5 | 11.2 | 34.271 | +1055 | 22.49 | -74 | 51.248 | +681 | 23.64 | +191 | 54.042 | +323 | 09.19 | +193 | 47.948 | +386 | 09.69 | +200 |
| 5 | 21.1 | 35.254 | +983 | 23.65 | -116 | 51.846 | +598 | 26.04 | +240 | 54.340 | +298 | 11.54 | +235 | 48.299 | +351 | 12.16 | +247 |
| 5 | 31.1 | 36.154 | +900 | 25.16 | -151 | 52.348 | +502 | 28.83 | +279 | 54.611 | +271 | 14.18 | +264 | 48.609 | +310 | 14.97 | +281 |
| 6 | 10.1 | 36.954 | +800 | 27.03 | -187 | 52.744 | +396 | 31.94 | +311 | 54.848 | +237 | 17.08 | +290 | 48.872 | +263 | 18.10 | +313 |
| 6 | 20.1 | 37.623 | +669 | 29.19 | -216 | 53.013 | +269 | 35.28 | +334 | 55.041 | +193 | 20.13 | +305 | 49.076 | +204 | 21.42 | +332 |
| 6 | 30.0 | 38.160 | +537 | 31.58 | -239 | 53.159 | +146 | 38.73 | +345 | 55.190 | +149 | 23.23 | +310 | 49.221 | +145 | 24.82 | +340 |
| 7 | 10.0 | 38.544 | +384 | 34.16 | -258 | 53.174 | +15 | 42.25 | +352 | 55.291 | +101 | 26.34 | +311 | 49.303 | +82 | 28.26 | +344 |
| 7 | 20.0 | 38.762 | +218 | 36.84 | -268 | 53.052 | -122 | 45.70 | +345 | 55.337 | +46 | 29.34 | +300 | 49.316 | +13 | 31.61 | +335 |
| 7 | 29.9 | 38.823 | +61 | 39.52 | -268 | 52.808 | -244 | 49.01 | +331 | 55.334 | -3 | 32.17 | +283 | 49.266 | -50 | 34.80 | +319 |
| 8 | 8.9 | 38.714 | -109 | 42.15 | -263 | 52.439 | -369 | 52.15 | +314 | 55.279 | -55 | 34.81 | +264 | 49.151 | -115 | 37.80 | +300 |
| 8 | 18.9 | 38.444 | -270 | 44.60 | -245 | 51.954 | -485 | 54.98 | +283 | 55.175 | -104 | 37.14 | +233 | 48.974 | -177 | 40.49 | +269 |
| 8 | 28.9 | 38.035 | -409 | 46.81 | -221 | 51.374 | -580 | 57.50 | +252 | 55.029 | -146 | 39.16 | +202 | 48.747 | -227 | 42.84 | +235 |
| 9 | 7.8 | 37.490 | -545 | 48.70 | -189 | 50.701 | -673 | 59.64 | +214 | 54.844 | -185 | 40.83 | +167 | 48.471 | -276 | 44.81 | +197 |
| 9 | 17.8 | 36.843 | -647 | 50.16 | -146 | 49.960 | -741 | 61.32 | +168 | 54.630 | -214 | 42.07 | +124 | 48.159 | -312 | 46.33 | +152 |
| 9 | 27.8 | 36.124 | -719 | 51.16 | -100 | 49.171 | -789 | 62.55 | +123 | 54.396 | -234 | 42.91 | +84 | 48.822 | -337 | 47.39 | +106 |
| 10 | 7.8 | 35.355 | -769 | 51.65 | -49 | 48.344 | -827 | 63.27 | +72 | 54.149 | -247 | 43.30 | +39 | 47.467 | -355 | 47.95 | +56 |
| 10 | 17.7 | 34.585 | -770 | 51.58 | +7 | 47.512 | -832 | 63.44 | +17 | 53.903 | -246 | 43.21 | -9 | 47.113 | -354 | 47.98 | +3 |
| 10 | 27.7 | 33.845 | -740 | 50.97 | +61 | 46.692 | -820 | 63.09 | -35 | 53.668 | -235 | 42.69 | -52 | 46.768 | -345 | 47.51 | -47 |
| 11 | 6.7 | 33.163 | -682 | 49.82 | +115 | 45.903 | -789 | 62.17 | -92 | 53.450 | -218 | 41.68 | -101 | 46.443 | -325 | 46.49 | -102 |
| 11 | 16.6 | 32.587 | -576 | 48.17 | +165 | 45.177 | -726 | 60.71 | -146 | 53.263 | -187 | 40.22 | -146 | 46.155 | -288 | 44.95 | -154 |
| 11 | 26.6 | 32.133 | -454 | 46.09 | +208 | 44.526 | -651 | 58.75 | -196 | 53.112 | -151 | 38.36 | -186 | 45.909 | -246 | 42.95 | -200 |
| 12 | 6.6 | 31.823 | -310 | 43.62 | +247 | 43.971 | -555 | 56.30 | -245 | 53.003 | -109 | 36.09 | -227 | 45.714 | -195 | 40.48 | -247 |
| 12 | 16.6 | 31.683 | -140 | 40.88 | +274 | 43.538 | -433 | 53.45 | -285 | 52.943 | -60 | 33.51 | -258 | 45.580 | -134 | 37.65 | -283 |
| 12 | 26.5 | 31.706 | +23 | 37.96 | +292 | 43.228 | -310 | 50.29 | -316 | 52.931 | -12 | 30.69 | -282 | 45.508 | -72 | 34.54 | -311 |
| 12 | 36.5 | 31.903 | +197 | 34.93 | +303 | 43.060 | -168 | 46.88 | -341 | 52.969 | +38 | 27.69 | -300 | 45.504 | -4 | 31.20 | -334 |
| | | 31.903 | +366 | 34.93 | +302 | 43.060 | -20 | 46.88 | -350 | 52.969 | +89 | | -303 | 45.504 | +63 | 31.20 | -339 |
| Mean Place | 33.340 | 27.52 | | 48.967 | 50.54 | 53.960 | 33.11 | 47.454 | 35.71 | | | | | | | | |
| sec δ, tan δ | +4.083 | -3.959 | | +3.486 | +3.340 | +1.271 | +0.784 | +1.675 | +1.344 | | | | | | | | |
| dα(ψ), dδ(ψ) | +0.161 | +0.13 | | -0.023 | +0.13 | +0.041 | +0.13 | +0.028 | +0.13 | | | | | | | | |
| dα(ε), dδ(ε) | +0.084 | -0.95 | | -0.072 | -0.95 | -0.017 | -0.95 | -0.029 | -0.94 | | | | | | | | |
| Dble.Trans. | July 11 | | July 11 | | July 11 | | July 11 | | | | | | | | | | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 722 | | 725 | | 1501 | | 727 | |
|---------------------|--------------------------|------------|--------------------------|-------------|--------------------------|------------|--------------------------|------------|
| | 43 Sagittarii | | ω Aquilae | | 162 G. Sagittarii | | υ Sagittarii | |
| Mag. Spect. | 5.03 | K0 | 5.14 | A5 | 5.61 | B5 | 4.58 | B8p, F2p |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " |
| | 19 16 | -18 58 | 19 17 | +11 33 | 19 18 | -35 26 | 19 20 | -15 58 |
| 1 ^d -8.4 | 46 855 ^s + 45 | 53 56 - 12 | 07 563 ^s + 19 | 63 66 - 178 | 42 005 ^s + 45 | 64 18 - 83 | 53 467 ^s + 39 | 65 51 - 30 |
| 1 1.5 | 46 943 + 88 | 53 67 - 11 | 07 623 + 60 | 61 79 - 187 | 42 100 + 95 | 63 31 + 87 | 53 549 + 82 | 65 79 - 28 |
| 1 11.5 | 47 060 + 117 | 53 75 - 8 | 07 721 + 98 | 59 86 - 193 | 42 240 + 140 | 62 39 + 92 | 53 664 + 115 | 66 04 - 25 |
| 1 21.5 | 47 229 + 169 | 53 91 - 6 | 07 857 + 136 | 57 95 - 191 | 42 427 + 187 | 61 44 + 95 | 53 822 + 158 | 66 37 - 33 |
| 1 31.4 | 47 428 + 199 | 53 97 - 16 | 08 026 + 169 | 56 16 - 179 | 42 653 + 226 | 60 50 + 94 | 54 012 + 190 | 66 60 - 23 |
| 2 10.4 | 47 655 + 227 | 53 97 + 0 | 08 224 + 198 | 54 54 - 162 | 42 913 + 260 | 59 58 + 92 | 54 231 + 219 | 66 74 - 14 |
| 2 20.4 | 47 909 + 254 | 53 87 + 10 | 08 451 + 227 | 53 18 - 136 | 43 204 + 291 | 58 67 + 91 | 54 477 + 246 | 66 77 - 3 |
| 3 2.4 | 48 181 + 272 | 53 68 + 19 | 08 698 + 247 | 52 14 - 104 | 43 518 + 314 | 57 80 + 87 | 54 741 + 264 | 66 68 + 9 |
| 3 12.3 | 48 473 + 292 | 53 37 + 31 | 08 965 + 267 | 51 45 - 69 | 43 854 + 336 | 56 94 + 86 | 55 025 + 284 | 66 45 + 23 |
| 3 22.3 | 48 779 + 306 | 52 93 + 44 | 09 248 + 283 | 51 17 - 28 | 44 207 + 353 | 56 13 + 81 | 55 324 + 299 | 66 05 + 40 |
| 4 1.3 | 49 094 + 315 | 52 38 + 55 | 09 540 + 292 | 51 30 + 13 | 44 570 + 363 | 55 37 + 76 | 55 633 + 309 | 65 52 + 53 |
| 4 11.3 | 49 419 + 325 | 51 72 + 66 | 09 841 + 301 | 51 83 + 53 | 45 430 + 373 | 54 67 + 70 | 55 951 + 318 | 64 84 + 68 |
| 4 21.2 | 49 745 + 326 | 50 97 + 75 | 10 143 + 302 | 52 76 + 93 | 45 319 + 376 | 54 06 + 61 | 56 272 + 321 | 64 04 + 80 |
| 5 1.2 | 50 069 + 324 | 50 17 + 80 | 10 442 + 299 | 54 02 + 126 | 45 692 + 373 | 53 55 + 51 | 56 591 + 319 | 63 16 + 88 |
| 5 11.2 | 50 387 + 318 | 49 34 + 83 | 10 734 + 292 | 55 58 + 156 | 46 058 + 386 | 53 17 + 38 | 56 906 + 315 | 62 22 + 94 |
| 5 21.1 | 50 691 + 304 | 48 52 + 82 | 11 011 + 277 | 57 39 + 181 | 46 408 + 350 | 52 94 + 23 | 57 207 + 301 | 61 27 + 95 |
| 5 31.1 | 50 977 + 286 | 47 74 + 78 | 11 268 + 257 | 59 36 + 197 | 46 737 + 329 | 52 86 + 8 | 57 490 + 283 | 60 34 + 93 |
| 6 10.1 | 51 239 + 262 | 47 03 + 71 | 11 501 + 233 | 61 45 + 209 | 47 039 + 302 | 52 95 - 9 | 57 751 + 261 | 59 46 + 88 |
| 6 20.1 | 51 468 + 229 | 46 42 + 61 | 11 701 + 200 | 63 59 + 214 | 47 303 + 264 | 53 22 - 27 | 57 979 + 228 | 58 67 + 79 |
| 6 30.0 | 51 662 + 194 | 45 93 + 49 | 11 866 + 165 | 65 70 + 211 | 47 526 + 223 | 53 65 - 43 | 58 172 + 193 | 57 99 + 68 |
| 7 10.0 | 51 815 + 153 | 45 55 + 38 | 11 991 + 125 | 67 76 + 206 | 47 703 + 177 | 54 24 - 59 | 58 326 + 154 | 57 43 + 56 |
| 7 20.0 | 51 921 + 106 | 45 32 + 23 | 12 072 + 81 | 69 70 + 194 | 47 826 + 123 | 54 97 - 73 | 58 434 + 108 | 57 00 + 43 |
| 7 29.9 | 51 984 + 63 | 45 21 + 11 | 12 111 + 39 | 71 47 + 177 | 47 899 + 73 | 55 79 - 82 | 58 498 + 64 | 56 71 + 29 |
| 8 8.9 | 51 998 + 14 | 45 21 + 0 | 12 105 - 6 | 73 08 + 161 | 47 916 + 17 | 55 69 - 90 | 58 515 + 17 | 56 54 + 17 |
| 8 18.9 | 51 966 - 32 | 45 31 - 10 | 12 056 - 49 | 74 44 + 136 | 47 880 - 36 | 57 60 - 91 | 58 487 - 28 | 56 49 + 5 |
| 8 28.9 | 51 895 - 71 | 45 48 - 17 | 11 971 - 85 | 75 58 + 114 | 47 797 - 83 | 58 49 - 89 | 58 419 - 68 | 56 53 - 4 |
| 9 7.8 | 51 786 - 109 | 45 71 - 23 | 11 851 - 120 | 76 48 + 90 | 47 671 - 126 | 59 33 - 84 | 58 314 - 105 | 56 65 - 12 |
| 9 17.8 | 51 649 - 137 | 45 97 - 26 | 11 705 - 146 | 77 09 + 61 | 47 512 - 159 | 60 05 - 72 | 58 181 - 133 | 56 83 - 18 |
| 9 27.8 | 51 493 - 156 | 46 23 - 26 | 11 542 - 163 | 77 46 + 37 | 47 330 - 182 | 60 62 - 57 | 58 029 - 152 | 57 04 - 21 |
| 10 7.8 | 51 326 - 167 | 46 48 - 25 | 11 369 - 173 | 77 54 + 8 | 47 133 - 197 | 61 02 - 40 | 57 865 - 164 | 57 27 - 23 |
| 10 17.7 | 51 161 - 165 | 46 71 - 23 | 11 197 - 172 | 77 34 - 20 | 46 939 - 194 | 61 23 - 21 | 57 702 - 163 | 57 51 - 24 |
| 10 27.7 | 51 007 - 154 | 46 90 - 19 | 11 036 - 161 | 76 89 - 45 | 46 756 - 183 | 61 23 + 0 | 57 550 - 152 | 57 75 - 24 |
| 11 6.7 | 50 872 - 135 | 47 07 - 17 | 10 892 - 144 | 76 15 - 74 | 46 596 - 160 | 61 03 + 20 | 57 416 - 134 | 57 99 - 24 |
| 11 16.6 | 50 770 - 102 | 47 21 - 14 | 10 776 - 116 | 75 16 - 99 | 46 471 - 125 | 61 03 + 40 | 57 313 - 103 | 58 23 - 24 |
| 11 26.6 | 50 702 - 68 | 47 32 - 11 | 10 693 - 83 | 73 92 - 124 | 46 386 - 85 | 60 07 + 56 | 57 243 - 70 | 58 46 - 23 |
| 12 6.6 | 50 675 - 27 | 47 43 - 11 | 10 646 - 47 | 72 45 - 147 | 46 349 - 37 | 59 37 + 70 | 57 213 - 30 | 58 72 - 26 |
| 12 16.6 | 50 694 + 19 | 47 53 - 10 | 10 642 - 4 | 70 80 - 165 | 46 364 + 15 | 58 57 + 80 | 57 227 + 14 | 58 98 - 26 |
| 12 26.5 | 50 755 + 61 | 47 62 - 9 | 10 676 + 34 | 69 02 - 178 | 46 428 + 64 | 57 70 + 87 | 57 283 + 56 | 59 24 - 26 |
| 12 36.5 | 50 861 + 106 | 47 66 - 4 | 10 752 + 76 | 67 13 - 189 | 46 542 + 114 | 56 78 + 92 | 57 380 + 97 | 59 48 - 24 |
| | + 135 | - 14 | + 115 | - 189 | + 160 | + 97 | + 131 | - 27 |
| Mean Place | 50.736 | 40.12 | 10.978 | 73.68 | 46.383 | 48.86 | 57.270 | 52.08 |
| sec δ, tan δ | +1.057 | -0.344 | +1.021 | +0.205 | +1.228 | -0.712 | +1.040 | -0.286 |
| dα(ψ), dδ(ψ) | +0.070 | +0.13 | +0.056 | +0.13 | +0.079 | +0.13 | +0.068 | +0.14 |
| dα(ε), dδ(ε) | +0.008 | -0.94 | -0.005 | -0.94 | +0.016 | -0.94 | +0.007 | -0.94 |
| Dble. Trans. | July 11 | | July 11 | | July 12 | | July 12 | |

AT UPPER TRANSIT AT GREENWICH

| No. | 1502 | | 734 | | 728 | | 1503 | |
|---|-----------------------|------------|--------------------------------|------------|---------------------|------------|--------------|------------|
| | β^1 Sagittarii* | | Groombridge 2900 (Draconis) | | α Sagittarii | | 31 Aquilae | |
| Mag.Spect. | 4.31 | B8 | 6.00 | A2 | 4.11 | B8 | 5.23 | G5 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " |
| | 19 21 | -44 29 | 19 22 | +79 34 | 19 22 | -40 38 | 19 24 | +11 54 |
| 1 -8.4 | 35 372 + 40 | 23 50 +134 | 25 143 - 672 | 30 88 -297 | 52 566 + 39 | 48 37 +112 | 16 157 + 15 | 42 85 -174 |
| 1 1.5 | 35 467 + 95 | 22 08 +142 | 24 681 - 462 | 27 65 -323 | 52 658 + 92 | 47 18 +119 | 16 211 + 54 | 41 00 -185 |
| 1 11.5 | 35 616 + 149 | 20 61 +147 | 24 441 - 240 | 24 22 -343 | 52 800 + 142 | 45 93 +125 | 16 304 + 93 | 39 10 -190 |
| 1 21.5 | 35 819 + 203 | 19 11 +150 | 24 448 + 7 | 20 74 -348 | 52 992 + 192 | 44 66 +127 | 16 435 + 131 | 37 22 -188 |
| 1 31.4 | 36 066 + 247 | 17 65 +146 | 24 681 + 233 | 17 34 -340 | 53 226 + 234 | 43 41 +125 | 16 598 + 163 | 35 44 -178 |
| 2 10.4 | 36 354 + 288 | 16 24 +141 | 25 141 + 460 | 14 11 -323 | 53 498 + 272 | 42 18 +123 | 16 792 + 194 | 33 83 -161 |
| 2 20.4 | 36 678 + 324 | 14 90 +134 | 25 814 + 673 | 11 23 -288 | 53 804 + 306 | 41 00 +118 | 17 015 + 223 | 32 48 -135 |
| 3 2.4 | 37 029 + 351 | 13 65 +125 | 26 658 + 844 | 08 78 -245 | 54 135 + 331 | 39 89 +111 | 17 259 + 244 | 31 45 -103 |
| 3 12.3 | 37 406 + 377 | 12 50 +115 | 27 656 + 998 | 06 83 -195 | 54 491 + 356 | 38 84 +105 | 17 523 + 264 | 30 77 - 68 |
| 3 22.3 | 37 803 + 397 | 11 49 +101 | 28 766 +1110 | 05 50 -133 | 54 865 + 374 | 37 89 + 95 | 17 805 + 282 | 30 50 - 27 |
| 4 1.3 | 38 211 + 408 | 10 60 + 89 | 29 935 +1169 | 04 79 - 71 | 55 251 + 386 | 37 03 + 86 | 18 097 + 292 | 30 64 + 14 |
| 4 11.3 | 38 632 + 421 | 09 87 + 73 | 31 140 +1205 | 04 72 - 7 | 55 649 + 398 | 36 28 + 75 | 18 398 + 301 | 31 18 + 54 |
| 4 21.2 | 39 055 + 423 | 09 32 + 55 | 32 325 +1185 | 05 32 + 60 | 56 049 + 400 | 35 68 + 60 | 18 703 + 305 | 32 12 + 94 |
| 5 1.2 | 39 475 + 420 | 08 95 + 37 | 33 450 +1125 | 06 51 +119 | 56 447 + 398 | 35 23 + 45 | 19 005 + 302 | 33 40 +129 |
| 5 11.2 | 39 887 + 412 | 08 79 + 16 | 34 491 +1041 | 08 27 +176 | 56 839 + 392 | 34 95 + 28 | 19 301 + 296 | 34 99 +158 |
| 5 21.1 | 40 281 + 394 | 08 85 - 6 | 35 399 + 908 | 10 54 +227 | 57 213 + 374 | 34 87 + 8 | 19 583 + 282 | 36 83 +184 |
| 5 31.1 | 40 650 + 369 | 09 13 - 28 | 36 155 + 756 | 13 19 +265 | 57 565 + 352 | 34 97 - 10 | 19 845 + 262 | 38 83 +200 |
| 6 10.1 | 40 989 + 339 | 09 64 - 51 | 36 742 + 587 | 16 19 +300 | 57 889 + 324 | 35 29 - 32 | 20 084 + 239 | 40 96 +213 |
| 6 20.1 | 41 285 + 296 | 10 36 - 72 | 37 129 + 387 | 19 44 +325 | 58 172 + 283 | 35 81 - 52 | 20 291 + 207 | 43 15 +219 |
| 6 30.0 | 41 535 + 250 | 11 27 - 91 | 37 322 + 193 | 22 81 +337 | 58 413 + 241 | 36 51 - 70 | 20 463 + 172 | 45 31 +216 |
| 7 10.0 | 41 733 + 198 | 12 36 -109 | 37 309 - 13 | 26 27 +346 | 58 604 + 191 | 37 38 - 87 | 20 595 + 132 | 47 43 +212 |
| 7 20.0 | 41 870 + 137 | 13 59 -123 | 37 082 - 227 | 29 70 +343 | 58 738 + 134 | 38 39 -101 | 20 683 + 88 | 49 42 +199 |
| 7 30.0 | 41 949 + 79 | 14 90 -131 | 36 665 - 417 | 33 01 +331 | 58 817 + 79 | 39 50 -111 | 20 729 + 46 | 51 25 +183 |
| 8 8.9 | 41 966 + 17 | 16 26 -136 | 36 052 - 613 | 36 17 +316 | 58 838 + 21 | 40 67 -117 | 20 729 + 0 | 52 91 +166 |
| 8 18.9 | 41 923 - 43 | 17 60 -134 | 35 259 - 793 | 39 05 +288 | 58 801 - 37 | 41 84 -117 | 20 687 - 42 | 54 34 +143 |
| 8 28.9 | 41 827 - 96 | 18 88 -128 | 34 317 - 942 | 41 64 +259 | 58 714 - 87 | 42 97 -113 | 20 607 - 80 | 55 54 +120 |
| 9 7.8 | 41 681 - 146 | 20 03 -115 | 33 229 -1088 | 43 87 +223 | 58 580 - 134 | 44 01 -104 | 20 492 - 115 | 56 49 + 95 |
| 9 17.8 | 41 496 - 185 | 21 00 - 97 | 32 031 -1198 | 45 66 +179 | 58 409 - 171 | 44 89 - 88 | 20 351 - 141 | 57 16 + 67 |
| 9 27.8 | 41 285 - 211 | 21 74 - 74 | 30 753 -1278 | 47 03 +137 | 58 214 - 195 | 45 58 - 69 | 20 191 - 160 | 57 57 + 41 |
| 10 7.8 | 41 057 - 228 | 22 23 - 49 | 29 410 -1343 | 47 89 + 86 | 58 001 - 213 | 46 06 - 48 | 20 020 - 171 | 57 71 + 14 |
| 10 17.7 | 40 829 - 228 | 22 43 - 20 | 28 051 -1359 | 48 22 + 33 | 57 790 - 211 | 46 28 - 22 | 19 850 - 170 | 57 56 - 15 |
| 10 27.7 | 40 614 - 215 | 22 33 + 10 | 26 701 -1350 | 48 04 - 18 | 57 590 - 200 | 46 25 + 3 | 19 689 - 161 | 57 15 - 41 |
| 11 6.7 | 40 422 - 192 | 21 94 + 39 | 25 387 -1314 | 47 30 - 74 | 57 412 - 178 | 45 96 + 29 | 19 544 - 145 | 56 46 - 69 |
| 11 16.7 | 40 269 - 153 | 21 27 + 67 | 24 162 -1225 | 46 01 -129 | 57 272 - 140 | 45 42 + 54 | 19 426 - 118 | 55 50 - 96 |
| 11 26.6 | 40 162 - 107 | 20 36 + 91 | 23 045 -1117 | 44 22 -179 | 57 173 - 99 | 44 68 + 74 | 19 340 - 86 | 54 31 -119 |
| 12 6.6 | 40 107 - 55 | 19 24 +112 | 22 069 - 976 | 41 93 -229 | 57 124 - 49 | 43 74 + 94 | 19 290 - 50 | 52 87 -144 |
| 12 16.6 | 40 111 + 4 | 17 95 +129 | 21 278 - 791 | 39 23 -791 | 57 131 + 7 | 42 67 +107 | 19 281 - 9 | 51 26 -161 |
| 12 26.5 | 40 171 + 60 | 16 56 +139 | 20 678 - 600 | 36 19 -304 | 57 190 + 59 | 41 49 +118 | 19 311 + 30 | 49 50 -176 |
| 12 36.5 | 40 289 + 118 | 15 08 +148 | 20 301 - 377 | 32 87 -332 | 57 303 + 113 | 40 25 +124 | 19 381 + 70 | 47 64 -186 |
| | + 172 | +151 | - 141 | -342 | + 164 | +129 | + 110 | -187 |
| Mean Place | 40.166 | 07.07 | 30.542 | 35.43 | 57.152 | 32.20 | 19.586 | 53.42 |
| sec δ , tan δ | +1.402 | -0.982 | +5.527 | +5.436 | +1.318 | -0.858 | +1.022 | +0.211 |
| $d\alpha(\psi)$, $d\delta(\psi)$ | +0.086 | +0.14 | -0.074 | +0.14 | +0.082 | +0.14 | +0.056 | +0.14 |
| $d\alpha(\epsilon)$, $d\delta(\epsilon)$ | +0.023 | -0.94 | -0.128 | -0.94 | +0.020 | -0.94 | -0.005 | -0.93 |
| Dbble.Trans. | July 12 | | July 13 | | July 13 | | July 13 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 730 | | 1506 | | 1507 | | 1505 | | | | | | |
|---|-----------------------|--------------------------|-----------------------------|---|------------------------------|---------------------------|-----------------------|---------------------------|-------|------|--------------|-------|------|
| | Name | δ Aquilae | Groombridge 2844 (Cygni) | Piazz 19 ^h 156 (Draconis) | Bradley 2462 (Vulpeculae) | | | | | | | | |
| Mag.Spect. | 3.44 | F0 | 6.72 | G5 | 6.46 | B8 | 6.04 | K5 | | | | | |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | | | | | |
| | ^h 19 24 | ^o / + 3 04 | ^h 19 25 | ^o / + 44 53 | ^h 19 25 | ^o / + 57 59 | ^h 19 25 | ^o / + 19 51 | | | | | |
| 1 | -8.4 | 45.567 + 23 | 62.52 | -132 | 28.571 - 65 | 66.40 | -287 | 28.593 - 141 | 54.25 | -303 | 49.889 + 0 | 41.40 | -210 |
| 1 | 1.5 | 45.630 + 63 | 61.12 | -140 | 28.559 - 12 | 63.33 | -307 | 28.523 - 70 | 50.98 | -327 | 49.930 + 41 | 39.17 | -223 |
| 1 | 11.5 | 45.729 + 99 | 61.12 | -143 | 28.602 + 43 | 60.11 | -322 | 28.526 + 3 | 47.53 | -345 | 50.010 + 80 | 36.86 | -231 |
| 1 | 21.5 | 45.866 + 137 | 59.69 | -141 | 28.701 + 99 | 56.88 | -323 | 28.608 + 82 | 44.05 | -348 | 50.132 + 122 | 34.56 | -230 |
| 1 | 31.4 | 46.034 + 168 | 58.28 | -132 | 28.851 + 150 | 53.77 | -311 | 28.762 + 154 | 40.69 | -336 | 50.287 + 155 | 32.38 | -218 |
| 2 | 10.4 | 46.231 + 197 | 55.79 | -117 | 29.049 + 198 | 50.86 | -291 | 28.985 + 223 | 37.52 | -317 | 50.476 + 189 | 30.37 | -201 |
| 2 | 20.4 | 46.456 + 225 | 54.83 | -96 | 29.294 + 245 | 48.31 | -255 | 29.273 + 288 | 34.72 | -280 | 50.695 + 219 | 28.66 | -171 |
| 3 | 2.4 | 46.700 + 244 | 54.14 | -69 | 29.574 + 280 | 46.20 | -211 | 29.615 + 342 | 32.37 | -235 | 50.938 + 243 | 27.30 | -136 |
| 3 | 12.3 | 46.965 + 285 | 53.74 | -40 | 29.889 + 315 | 44.59 | -161 | 30.005 + 390 | 30.54 | -183 | 51.204 + 266 | 26.34 | -96 |
| 3 | 22.3 | 47.245 + 280 | 53.67 | -7 | 30.230 + 341 | 43.59 | -100 | 30.431 + 426 | 29.35 | -119 | 51.487 + 283 | 25.86 | -48 |
| 4 | 1.3 | 47.535 + 290 | 53.94 | +27 | 30.587 + 357 | 43.18 | -41 | 30.879 + 448 | 28.78 | -57 | 51.783 + 296 | 25.83 | -3 |
| 4 | 11.3 | 47.836 + 301 | 54.53 | +59 | 30.957 + 370 | 43.39 | +21 | 31.343 + 464 | 28.87 | +9 | 52.088 + 305 | 26.28 | +45 |
| 4 | 21.2 | 48.139 + 303 | 55.44 | +91 | 31.327 + 370 | 44.23 | +84 | 31.805 + 462 | 29.62 | +75 | 52.397 + 309 | 27.19 | +91 |
| 5 | 1.2 | 48.440 + 301 | 56.61 | +117 | 31.690 + 363 | 45.61 | +138 | 32.254 + 449 | 30.96 | +134 | 52.702 + 305 | 28.51 | +132 |
| 5 | 11.2 | 48.737 + 297 | 58.02 | +141 | 32.039 + 349 | 47.51 | +190 | 32.681 + 427 | 32.86 | +190 | 53.002 + 300 | 30.19 | +168 |
| 5 | 21.1 | 49.020 + 283 | 59.60 | +158 | 32.363 + 324 | 49.87 | +236 | 33.070 + 389 | 35.27 | +241 | 53.285 + 283 | 32.19 | +200 |
| 5 | 31.1 | 49.285 + 285 | 61.29 | +169 | 32.656 + 293 | 52.57 | +270 | 33.414 + 344 | 38.04 | +277 | 53.549 + 264 | 34.41 | +222 |
| 6 | 10.1 | 49.528 + 243 | 63.06 | +177 | 32.911 + 255 | 55.56 | +299 | 33.705 + 291 | 41.16 | +312 | 53.786 + 237 | 36.80 | +239 |
| 6 | 20.1 | 49.739 + 211 | 64.83 | +177 | 33.119 + 208 | 58.74 | +318 | 33.931 + 226 | 44.49 | +333 | 53.990 + 204 | 39.28 | +248 |
| 6 | 30.0 | 49.917 + 178 | 66.56 | +173 | 33.278 + 159 | 62.00 | +326 | 34.091 + 160 | 47.93 | +344 | 54.158 + 168 | 41.78 | +250 |
| 7 | 10.0 | 50.056 + 139 | 68.21 | +165 | 33.383 + 105 | 65.30 | +330 | 34.180 + 89 | 51.44 | +351 | 54.285 + 127 | 44.24 | +246 |
| 7 | 20.0 | 50.152 + 96 | 69.73 | +152 | 33.429 + 46 | 68.51 | +321 | 34.192 + 12 | 54.88 | +344 | 54.366 + 81 | 46.60 | +236 |
| 7 | 30.0 | 50.205 + 53 | 71.10 | +137 | 33.421 - 8 | 71.58 | +307 | 34.192 - 58 | 58.19 | +331 | 54.404 + 38 | 48.79 | +219 |
| 8 | 8.9 | 50.214 + 9 | 72.31 | +121 | 33.355 - 66 | 74.46 | +288 | 34.134 - 131 | 61.32 | +313 | 54.395 - 9 | 50.81 | +202 |
| 8 | 18.9 | 50.180 - 34 | 73.31 | +100 | 33.236 - 119 | 77.05 | +259 | 34.003 - 199 | 64.16 | +284 | 54.343 - 52 | 52.57 | +176 |
| 8 | 28.9 | 50.108 - 72 | 74.12 | +81 | 33.070 - 166 | 79.32 | +227 | 33.804 - 257 | 66.67 | +251 | 54.252 - 91 | 54.07 | +150 |
| 9 | 7.8 | 50.001 - 107 | 74.74 | +62 | 32.861 - 209 | 81.23 | +191 | 33.547 - 312 | 68.81 | +214 | 54.125 - 127 | 55.29 | +122 |
| 9 | 17.8 | 49.868 - 133 | 75.13 | +39 | 32.618 - 243 | 82.71 | +148 | 33.235 - 355 | 70.50 | +169 | 54.125 - 155 | 56.18 | +89 |
| 9 | 27.8 | 49.717 - 151 | 75.34 | +21 | 32.353 - 265 | 83.76 | +105 | 32.880 - 384 | 71.74 | +124 | 53.970 - 172 | 56.76 | +58 |
| 10 | 7.8 | 49.553 - 164 | 75.34 | +0 | 32.071 - 282 | 84.34 | +58 | 32.496 - 406 | 72.47 | +73 | 53.798 - 186 | 57.01 | +25 |
| 10 | 17.7 | 49.391 - 162 | 75.14 | -20 | 31.788 - 283 | 84.42 | +8 | 32.090 - 406 | 72.66 | +19 | 53.612 - 185 | 56.90 | -11 |
| 10 | 27.7 | 49.238 - 153 | 74.76 | -38 | 31.513 - 275 | 84.02 | -40 | 31.681 - 409 | 72.34 | -32 | 53.427 - 177 | 56.47 | -43 |
| 11 | 6.7 | 49.102 - 136 | 74.17 | -59 | 31.254 - 259 | 83.10 | -92 | 31.279 - 382 | 71.46 | -88 | 53.250 - 160 | 55.68 | -79 |
| 11 | 16.7 | 48.993 - 109 | 73.41 | -76 | 31.027 - 227 | 81.70 | -140 | 30.895 - 346 | 70.04 | -142 | 53.090 - 134 | 54.56 | -112 |
| 11 | 26.6 | 48.916 - 77 | 72.48 | -93 | 30.835 - 192 | 79.85 | -185 | 30.549 - 304 | 68.14 | -190 | 52.956 - 102 | 53.15 | -141 |
| 12 | 6.6 | 48.875 - 41 | 71.37 | -111 | 30.686 - 149 | 77.56 | -229 | 30.245 - 249 | 65.74 | -240 | 52.854 - 67 | 51.44 | -171 |
| 12 | 16.6 | 48.875 + 0 | 70.15 | -122 | 30.590 - 96 | 74.92 | -264 | 29.996 - 182 | 62.96 | -278 | 52.787 - 24 | 49.49 | -195 |
| 12 | 26.5 | 48.913 + 38 | 68.82 | -133 | 30.544 - 46 | 72.00 | -292 | 29.814 - 116 | 59.87 | -309 | 52.763 + 15 | 47.37 | -212 |
| 12 | 36.5 | 48.991 + 78 | 67.43 | -139 | 30.555 + 11 | 68.87 | -313 | 29.657 - 41 | 56.52 | -335 | 52.778 + 58 | 45.11 | -226 |
| | | +116 | -140 | -140 | +66 | -320 | +36 | -343 | +98 | +98 | +98 | -228 | -228 |
| Mean Place | 49.068 | 73.91 | 31.899 | 72.91 | 32.096 | 59.74 | 53.232 | 50.64 | | | | | |
| sec δ , tan δ | +1.001 | +0.054 | +1.412 | +0.997 | +1.887 | +1.600 | +1.063 | +0.361 | | | | | |
| $d\alpha(\psi)$, $d\delta(\psi)$ | +0.060 | +0.14 | +0.037 | +0.15 | +0.022 | +0.15 | +0.052 | +0.15 | | | | | |
| $d\alpha(\epsilon)$, $d\delta(\epsilon)$ | -0.001 | -0.93 | -0.024 | -0.93 | -0.039 | -0.93 | -0.009 | -0.93 | | | | | |
| Dble.Trans. | July 13 | | July 13 | | July 13 | | July 13 | | | | | | |

AT UPPER TRANSIT AT GREENWICH

| No. | 731 | | 1504 | | 1508 | | 733 | |
|--------------|-------------------|------------|-------------------|------------|--------------|------------|--------------|------------|
| | 186 G. Sagittarii | | 59 G. Telescopii* | | α Vulpeculae | | ι Cygni | |
| Mag.Spect. | 5.68 | B9 | 5.58 | K2 | 4.63 | M0 | 3.94 | A2 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " |
| | 19 26 | - 29 46 | 19 26 | - 54 21 | 19 28 | + 24 37 | 19 29 | + 51 41 |
| 1 -8.4 | 01.232 + 38 | 29.91 + 50 | 37.834 + 22 | 29.10 +186 | 05.315 - 11 | " -228 | 18.551 - 103 | " -294 |
| 1 1.5 | 01.316 + 84 | 29.37 + 54 | 37.925 + 91 | 27.13 +197 | 05.347 + 32 | 64.65 -242 | 18.509 - 42 | 56.46 -317 |
| 1 11.5 | 01.440 + 124 | 28.82 + 55 | 38.083 + 158 | 25.08 +205 | 05.419 + 72 | 62.23 -253 | 18.528 + 19 | 53.29 -334 |
| 1 21.5 | 01.609 + 169 | 28.16 + 66 | 38.308 + 225 | 23.02 +206 | 05.534 + 115 | 59.70 -251 | 18.528 + 86 | 49.95 -337 |
| 1 31.4 | 01.815 + 206 | 27.51 + 65 | 38.588 + 280 | 21.02 +200 | 05.685 + 151 | 57.19 -239 | 18.614 + 144 | 46.58 -326 |
| 2 10.4 | 02.053 + 238 | 26.85 + 66 | 38.920 + 332 | 19.08 +194 | 05.871 + 186 | 54.80 -222 | 18.758 + 203 | 43.32 -307 |
| 2 20.4 | 02.321 + 268 | 26.16 + 69 | 39.299 + 379 | 17.28 +180 | 06.089 + 218 | 50.68 -190 | 19.219 + 258 | 40.25 -271 |
| 3 2.4 | 02.611 + 290 | 25.46 + 70 | 39.713 + 414 | 15.64 +164 | 06.333 + 244 | 49.15 -153 | 19.521 + 302 | 37.54 -227 |
| 3 12.3 | 02.923 + 312 | 24.72 + 74 | 40.160 + 447 | 14.16 +148 | 06.602 + 269 | 48.04 -111 | 19.864 + 343 | 35.27 -176 |
| 3 22.3 | 03.252 + 329 | 23.96 + 76 | 40.633 + 473 | 12.91 +125 | 06.889 + 287 | 47.43 - 61 | 20.238 + 374 | 33.51 -114 |
| 4 1.3 | 03.592 + 340 | 23.20 + 76 | 41.121 + 488 | 11.87 +104 | 07.190 + 301 | 47.32 - 11 | 20.632 + 394 | 31.84 - 53 |
| 4 11.3 | 03.943 + 351 | 22.44 + 76 | 41.624 + 503 | 11.08 + 79 | 07.501 + 311 | 47.71 + 39 | 21.041 + 409 | 31.95 + 11 |
| 4 21.2 | 04.298 + 355 | 21.71 + 73 | 42.130 + 506 | 10.57 + 51 | 07.815 + 314 | 48.61 + 90 | 21.451 + 410 | 32.72 + 77 |
| 5 1.2 | 04.651 + 353 | 21.02 + 69 | 42.632 + 502 | 10.32 + 25 | 08.126 + 311 | 49.94 +133 | 21.851 + 400 | 34.05 +133 |
| 5 11.2 | 05.000 + 349 | 20.41 + 61 | 43.126 + 494 | 10.36 - 4 | 08.430 + 304 | 51.68 +174 | 22.236 + 385 | 35.94 +189 |
| 5 21.1 | 05.335 + 335 | 19.91 + 50 | 43.596 + 470 | 10.70 - 34 | 08.718 + 288 | 53.77 +209 | 22.591 + 355 | 38.31 +237 |
| 5 31.1 | 05.651 + 316 | 19.53 + 38 | 44.036 + 440 | 11.32 - 62 | 08.984 + 266 | 56.10 +233 | 22.909 + 318 | 41.05 +274 |
| 6 10.1 | 05.942 + 291 | 19.29 + 24 | 44.440 + 404 | 12.22 - 90 | 09.224 + 240 | 58.64 +254 | 23.184 + 275 | 44.11 +306 |
| 6 20.1 | 06.199 + 257 | 19.21 - 8 | 44.791 + 351 | 13.39 -117 | 09.429 + 205 | 61.30 +266 | 23.404 + 220 | 47.38 +327 |
| 6 30.0 | 06.418 + 219 | 19.29 - 8 | 45.088 + 297 | 14.78 -139 | 09.597 + 168 | 63.97 +267 | 23.569 + 165 | 50.76 +338 |
| 7 10.0 | 06.594 + 176 | 19.52 - 23 | 45.321 + 233 | 16.37 -159 | 09.722 + 125 | 66.64 +267 | 23.672 + 103 | 54.20 +344 |
| 7 20.0 | 06.720 + 126 | 19.89 - 37 | 45.481 + 160 | 18.09 -172 | 09.800 + 78 | 69.21 +257 | 23.709 + 37 | 57.58 +338 |
| 7 30.0 | 06.797 + 77 | 20.39 - 50 | 45.672 + 91 | 19.90 -181 | 09.833 + 33 | 71.62 +241 | 23.785 - 24 | 60.81 +323 |
| 8 8.9 | 06.822 + 25 | 20.98 - 59 | 45.588 + 16 | 21.74 -184 | 09.819 - 14 | 73.84 +222 | 23.597 - 88 | 63.88 +307 |
| 8 18.9 | 06.796 - 26 | 21.63 - 66 | 45.530 - 58 | 23.52 -178 | 09.759 - 60 | 75.80 +196 | 23.448 - 149 | 66.64 +276 |
| 8 28.9 | 06.726 - 70 | 22.30 - 67 | 45.408 - 122 | 25.19 -167 | 09.661 - 98 | 77.49 +169 | 23.248 - 200 | 69.10 +246 |
| 9 7.8 | 06.614 - 112 | 22.96 - 66 | 45.225 - 183 | 26.68 -149 | 09.526 - 135 | 78.87 +138 | 22.999 - 249 | 71.19 +209 |
| 9 17.8 | 06.470 - 144 | 23.56 - 60 | 44.994 - 231 | 27.91 -123 | 09.362 - 164 | 79.90 +103 | 22.712 - 287 | 72.83 +164 |
| 9 27.8 | 06.304 - 166 | 24.07 - 51 | 44.729 - 265 | 28.85 - 94 | 09.179 - 183 | 80.60 + 70 | 22.398 - 314 | 74.05 +122 |
| 10 7.8 | 06.123 - 181 | 24.47 - 40 | 44.441 - 288 | 29.44 - 59 | 08.983 - 196 | 80.93 + 33 | 22.065 - 333 | 74.76 + 71 |
| 10 17.7 | 05.942 - 181 | 24.73 - 26 | 44.152 - 289 | 29.64 - 20 | 08.787 - 196 | 80.87 - 6 | 21.729 - 336 | 74.96 + 20 |
| 10 27.7 | 05.772 - 170 | 24.85 - 12 | 43.874 - 278 | 29.47 + 17 | 08.599 - 188 | 80.45 - 42 | 21.400 - 329 | 74.65 - 31 |
| 11 6.7 | 05.620 - 152 | 24.82 + 3 | 43.622 - 252 | 28.90 + 57 | 08.426 - 173 | 79.64 - 81 | 21.087 - 313 | 73.80 - 85 |
| 11 16.7 | 05.502 - 118 | 24.64 + 18 | 43.416 - 206 | 27.96 + 94 | 08.281 - 145 | 78.46 -118 | 20.806 - 281 | 72.43 -137 |
| 11 26.6 | 05.420 - 82 | 24.34 + 30 | 43.263 - 153 | 26.71 +125 | 08.166 - 115 | 76.95 -151 | 20.564 - 242 | 70.59 -184 |
| 12 6.6 | 05.381 - 39 | 23.94 + 40 | 43.171 - 92 | 25.16 +155 | 08.088 - 78 | 75.10 -185 | 20.368 - 196 | 68.27 -232 |
| 12 16.6 | 05.391 + 10 | 23.45 + 49 | 43.150 - 21 | 23.39 +177 | 08.052 + 36 | 73.00 -210 | 20.230 - 138 | 65.58 -269 |
| 12 26.5 | 05.446 + 55 | 22.90 + 55 | 43.198 + 48 | 21.46 +193 | 08.058 + 6 | 70.70 -230 | 20.149 - 81 | 62.58 -300 |
| 12 36.5 | 05.548 + 102 | 22.34 + 56 | 43.316 + 118 | 19.41 +205 | 08.106 + 48 | 68.24 -246 | 20.132 - 17 | 59.34 -324 |
| | + 142 | + 63 | + 186 | + 208 | + 91 | - 249 | + 47 | - 332 |
| Mean Place | 05.374 | 14.50 | 43.307 | 11.29 | 08.629 | 73.33 | 21.949 | 62.42 |
| sec δ, tan δ | +1.152 | -0.572 | +1.716 | -1.394 | +1.100 | +0.459 | +1.614 | +1.266 |
| dα(ψ), dδ(ψ) | +0.075 | +0.15 | +0.096 | +0.15 | +0.050 | +0.15 | +0.030 | +0.15 |
| dα(ε), dδ(ε) | +0.014 | -0.93 | +0.034 | -0.93 | -0.011 | -0.93 | -0.032 | -0.92 |
| Dble.Trans. | July 13 | | July 14 | | July 14 | | July 14 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 1509 | | 732 | | 1510 | | 1511 | | |
|---|------------|--------------|-------------------|--------------|------------|--------------|---------------|--------------|------------|
| | 36 Aquilae | | β Cygni* p. | | 8 Cygni | | μ Aquilae | | |
| Mag.Spect. | 5.22 | M0 | 3.24 | K0, A0 | 4.85 | B3 | 4.65 | K0 | |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | |
| | h m | ° / | h m | ° / | h m | ° / | h m | ° / | |
| | 19 29 | - 2 49 | 19 30 | + 27 55 | 19 31 | + 34 24 | 19 33 | + 7 20 | |
| 1 | -8.4 | 53.926 + 24 | 15.89 -101 | 07.328 + 24 | 42.30 -238 | 12.903 + 36 | 78.07 -257 | 22.367 + 11 | 47.57 -151 |
| 1 | 1.5 | 53.988 + 62 | 16.93 -104 | 07.352 + 24 | 39.76 -254 | 12.913 + 10 | 75.31 -276 | 22.417 + 50 | 45.98 -159 |
| 1 | 11.5 | 54.086 + 98 | 18.00 -107 | 07.418 + 66 | 37.11 -265 | 12.968 + 55 | 72.42 -289 | 22.504 + 87 | 44.32 -166 |
| 1 | 21.5 | 54.222 + 136 | 19.05 -105 | 07.528 + 110 | 34.47 -264 | 13.071 + 103 | 69.53 -289 | 22.628 + 124 | 42.70 -162 |
| 1 | 31.5 | 54.389 + 167 | 20.02 -97 | 07.676 + 148 | 31.94 -253 | 13.215 + 144 | 66.75 -278 | 22.785 + 157 | 41.16 -154 |
| 2 | 10.4 | 54.586 + 197 | 20.87 -85 | 07.860 + 184 | 29.59 -235 | 13.400 + 185 | 64.16 -259 | 22.971 + 186 | 39.77 -139 |
| 2 | 20.4 | 54.809 + 223 | 21.53 -66 | 08.079 + 219 | 27.56 -203 | 13.622 + 222 | 61.90 -226 | 23.186 + 215 | 38.62 -115 |
| 3 | 2.4 | 55.053 + 244 | 21.97 -44 | 08.324 + 245 | 25.91 -165 | 13.875 + 253 | 60.04 -186 | 23.423 + 237 | 37.75 -87 |
| 3 | 12.3 | 55.317 + 260 | 22.16 -19 | 08.595 + 271 | 24.70 -121 | 14.156 + 281 | 58.64 -140 | 23.681 + 258 | 37.20 -55 |
| 3 | 22.3 | 55.597 + 280 | 22.06 + 10 | 08.887 + 292 | 24.01 -69 | 14.460 + 304 | 57.80 -84 | 23.957 + 276 | 37.02 -18 |
| 4 | 1.3 | 55.888 + 281 | 21.69 + 37 | 09.192 + 305 | 23.84 -17 | 14.778 + 318 | 57.51 -29 | 24.244 + 287 | 37.21 + 19 |
| 4 | 11.3 | 56.190 + 302 | 21.05 + 64 | 09.508 + 316 | 24.18 + 34 | 15.109 + 331 | 57.79 + 28 | 24.543 + 299 | 37.76 + 55 |
| 4 | 21.2 | 56.496 + 306 | 20.15 + 90 | 09.828 + 320 | 25.07 + 89 | 15.444 + 335 | 58.63 + 84 | 24.846 + 303 | 38.67 + 91 |
| 5 | 1.2 | 56.801 + 305 | 19.05 +110 | 10.145 + 317 | 26.40 +133 | 15.774 + 330 | 59.98 +135 | 25.148 + 302 | 39.88 +121 |
| 5 | 11.2 | 57.103 + 302 | 17.76 +129 | 10.455 + 310 | 28.17 +177 | 16.095 + 321 | 61.80 +182 | 25.447 + 299 | 41.36 +148 |
| 5 | 21.1 | 57.392 + 289 | 16.34 +142 | 10.747 + 292 | 30.31 +214 | 16.398 + 303 | 64.02 +222 | 25.733 + 286 | 43.07 +171 |
| 5 | 31.1 | 57.665 + 273 | 14.85 +149 | 11.018 + 271 | 32.72 +241 | 16.676 + 278 | 66.55 +253 | 26.002 + 269 | 44.91 +184 |
| 6 | 10.1 | 57.915 + 250 | 13.32 +153 | 11.261 + 243 | 35.35 +263 | 16.924 + 248 | 69.34 +279 | 26.248 + 246 | 46.86 +195 |
| 6 | 20.1 | 58.135 + 220 | 11.82 +150 | 11.468 + 207 | 38.11 +276 | 17.133 + 209 | 72.29 +295 | 26.464 + 216 | 48.84 +198 |
| 6 | 30.0 | 58.322 + 187 | 10.38 +144 | 11.636 + 168 | 40.91 +280 | 17.301 + 168 | 75.29 +300 | 26.646 + 182 | 50.79 +195 |
| 7 | 10.0 | 58.471 + 149 | 09.04 +134 | 11.761 + 125 | 43.72 +281 | 17.422 + 121 | 78.32 +303 | 26.790 + 144 | 52.69 +190 |
| 7 | 20.0 | 58.576 + 105 | 07.83 +121 | 11.838 + 77 | 46.42 +270 | 17.492 + 70 | 81.26 +294 | 26.890 + 100 | 54.46 +177 |
| 7 | 30.0 | 58.639 + 63 | 06.76 +107 | 11.869 + 31 | 48.97 +255 | 17.514 + 22 | 84.06 +280 | 26.948 + 58 | 56.07 +161 |
| 8 | 8.9 | 58.657 + 18 | 05.85 + 91 | 11.852 - 17 | 51.34 +237 | 17.485 - 29 | 86.67 +261 | 26.960 + 12 | 57.52 +145 |
| 8 | 18.9 | 58.631 - 26 | 05.13 + 72 | 11.788 - 64 | 53.44 +210 | 17.407 - 78 | 89.00 +233 | 26.930 - 30 | 58.75 +123 |
| 8 | 28.9 | 58.567 - 64 | 04.57 + 56 | 11.685 - 103 | 55.26 +182 | 17.287 - 120 | 91.04 +204 | 26.861 - 69 | 59.77 +102 |
| 9 | 7.8 | 58.467 - 100 | 04.17 + 40 | 11.543 - 142 | 56.77 +151 | 17.128 - 159 | 92.75 +171 | 26.756 - 105 | 60.57 + 80 |
| 9 | 17.8 | 58.339 - 128 | 03.95 + 22 | 11.373 - 170 | 57.91 +114 | 16.938 - 190 | 94.06 +131 | 26.756 - 132 | 61.12 + 55 |
| 9 | 27.8 | 58.192 - 147 | 03.87 + 8 | 11.183 - 190 | 58.70 + 79 | 16.727 - 211 | 94.99 + 93 | 26.624 - 152 | 61.45 + 33 |
| 10 | 7.8 | 58.032 - 160 | 03.94 - 7 | 10.979 - 204 | 59.09 + 39 | 16.501 - 226 | 95.49 + 50 | 26.308 - 164 | 61.53 + 8 |
| 10 | 17.7 | 57.873 - 159 | 04.16 - 22 | 10.774 - 205 | 59.08 - 1 | 16.273 - 228 | 95.54 + 5 | 26.143 - 165 | 61.38 - 15 |
| 10 | 27.7 | 57.722 - 151 | 04.50 - 34 | 10.576 - 198 | 58.68 - 40 | 16.053 - 220 | 95.17 - 37 | 25.986 - 157 | 61.00 - 38 |
| 11 | 6.7 | 57.587 - 135 | 04.98 - 48 | 10.394 - 182 | 57.87 - 81 | 15.847 - 206 | 94.34 - 83 | 25.843 - 143 | 60.38 - 62 |
| 11 | 16.7 | 57.479 - 108 | 05.59 - 61 | 10.239 - 155 | 56.67 -120 | 15.669 - 178 | 93.08 -126 | 25.823 - 116 | 59.54 - 84 |
| 11 | 26.6 | 57.403 - 76 | 06.31 - 72 | 10.114 - 125 | 55.11 -156 | 15.523 - 146 | 91.42 -166 | 25.640 - 87 | 58.51 -103 |
| 12 | 6.6 | 57.362 - 41 | 07.15 - 84 | 10.027 - 87 | 53.19 -192 | 15.415 - 108 | 89.36 -206 | 25.588 - 52 | 57.26 -125 |
| 12 | 16.6 | 57.362 + 0 | 08.08 - 93 | 09.982 - 45 | 51.00 -219 | 15.353 - 62 | 87.00 -236 | 25.577 - 11 | 55.87 -139 |
| 12 | 26.5 | 57.400 + 38 | 09.07 - 99 | 09.979 - 3 | 48.59 -241 | 15.334 - 19 | 84.38 -262 | 25.603 + 26 | 54.35 -152 |
| 12 | 36.5 | 57.477 + 77 | 10.11 -104 | 10.021 + 42 | 46.01 -258 | 15.362 + 28 | 81.57 -281 | 25.668 + 65 | 52.74 -161 |
| | | 57.481 + 115 | 03.54 -104 | 10.634 + 85 | 50.65 -261 | 16.201 + 76 | 85.66 -286 | 25.804 + 104 | 58.61 -161 |
| Mean Place | 57.481 | 03.54 | 10.634 | 50.65 | 16.201 | 85.66 | 25.804 | 58.61 | |
| sec δ , tan δ | +1.001 | -0.049 | +1.132 | +0.530 | +1.212 | +0.685 | +1.008 | +0.129 | |
| $d\alpha(\psi)$, $d\delta(\psi)$ | +0.062 | +0.15 | +0.048 | +0.15 | +0.044 | +0.15 | +0.058 | +0.16 | |
| $d\alpha(\epsilon)$, $d\delta(\epsilon)$ | +0.001 | -0.92 | -0.014 | -0.92 | -0.018 | -0.92 | -0.003 | -0.92 | |
| Dble.Trans. | July 14 | | July 14 | | July 15 | | July 15 | | |

AT UPPER TRANSIT AT GREENWICH

| No. | 735 | | 736 | | 738 | | 737 | |
|--------------|--------------------------|------------|--------------------------|------------|---------------------------|------------|--------------------------|------------|
| | ι Telescopii | | 52 Sagittarii* | | 9 Cygni | | α Aquilae | |
| Mag.Spect. | 5.02 | K0 | 4.66 | B9 | 4.64 | F5 | 5.04 | B0 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " |
| | 19 34 | - 48 07 | 19 35 | - 24 54 | 19 36 | + 50 10 | 19 36 | - 7 03 |
| 1 -8.4 | 08.097 ^s + 20 | 63 55 +152 | 49.261 ^s + 28 | 66 56 + 23 | 01.374 ^s - 102 | 75 68 -286 | 06.311 ^s + 21 | 42 95 - 76 |
| 1 1.5 | 08.176 + 79 | 61 91 +164 | 49.333 + 72 | 66 29 + 27 | 01.330 - 44 | 72 58 -310 | 06.370 + 59 | 43 73 - 78 |
| 1 11.5 | 08.311 + 135 | 60 20 +171 | 49.445 + 112 | 66 11 + 18 | 01.345 + 15 | 69 29 -329 | 06.466 + 96 | 44 53 - 80 |
| 1 21.5 | 08.505 + 194 | 58 44 +176 | 49.591 + 146 | 65 65 + 46 | 01.424 + 79 | 65 98 -331 | 06.598 + 132 | 45 30 - 77 |
| 1 31.5 | 08.747 + 242 | 56.71 +173 | 49.779 + 188 | 65.24 + 41 | 01.560 + 136 | 62.76 -322 | 06.763 + 165 | 46.01 - 71 |
| 2 10.4 | 09.034 + 287 | 55.02 +169 | 49.999 + 220 | 64.79 + 45 | 01.751 + 191 | 59.71 -305 | 06.958 + 195 | 46.60 - 59 |
| 2 20.4 | 09.362 + 328 | 53 40 +162 | 50.247 + 248 | 64.29 + 50 | 01.997 + 246 | 57.01 -270 | 07.180 + 222 | 47.02 - 42 |
| 3 2.4 | 09.721 + 359 | 51.89 +151 | 50.517 + 270 | 63.71 + 58 | 02.285 + 288 | 54.74 -227 | 07.422 + 242 | 47.25 - 23 |
| 3 12.3 | 10.110 + 389 | 50 50 +139 | 50.809 + 292 | 63.07 + 64 | 02.615 + 330 | 52.97 -177 | 07.686 + 264 | 47.27 - 2 |
| 3 22.3 | 10.523 + 413 | 49 26 +124 | 51.120 + 311 | 62.35 + 72 | 02.976 + 361 | 51.81 -116 | 07.966 + 280 | 47.04 + 23 |
| 4 1.3 | 10.951 + 428 | 48 19 +107 | 51.442 + 322 | 61 58 + 77 | 03.357 + 381 | 51 25 - 56 | 08.259 + 293 | 46 57 + 47 |
| 4 11.3 | 11.394 + 443 | 47 30 + 89 | 51 777 + 335 | 60 75 + 83 | 03.755 + 398 | 51 32 + 7 | 08.563 + 304 | 45 88 + 69 |
| 4 21.2 | 11.843 + 449 | 46 62 + 68 | 52 118 + 341 | 59 90 + 85 | 04.156 + 401 | 52 05 + 73 | 08.873 + 310 | 44 97 + 91 |
| 5 1.2 | 12.290 + 447 | 46 17 + 45 | 52.459 + 341 | 59 06 + 84 | 04.549 + 393 | 53.34 +129 | 09.182 + 309 | 43.90 +107 |
| 5 11.2 | 12.731 + 441 | 45 95 + 22 | 52.797 + 338 | 58.24 + 82 | 04.929 + 380 | 55.19 +185 | 09.490 + 308 | 42.68 +122 |
| 5 21.2 | 13.155 + 424 | 46 00 - 5 | 53.123 + 326 | 57 49 + 75 | 05.281 + 352 | 57.52 +233 | 09.786 + 296 | 41.36 +132 |
| 5 31.1 | 13.555 + 400 | 46 30 - 30 | 53.433 + 310 | 56 84 + 65 | 05.600 + 319 | 60.22 +270 | 10.066 + 280 | 40.01 +135 |
| 6 10.1 | 13.924 + 369 | 46 86 - 56 | 53.721 + 288 | 56 29 + 55 | 05.878 + 278 | 63.25 +303 | 10.325 + 259 | 38.64 +137 |
| 6 20.1 | 14.249 + 325 | 47 66 - 80 | 53.976 + 255 | 55 90 + 39 | 06.104 + 226 | 66.50 +325 | 10.555 + 230 | 37.33 +131 |
| 6 30.0 | 14.527 + 278 | 48 69 -103 | 54.196 + 220 | 55.65 + 25 | 06.277 + 173 | 69.86 +336 | 10.752 + 197 | 36.09 +124 |
| 7 10.0 | 14.750 + 223 | 49 92 -123 | 54.374 + 178 | 55 55 + 10 | 06.390 + 113 | 73.29 +343 | 10.910 + 158 | 34.96 +113 |
| 7 20.0 | 14.909 + 159 | 51.31 -139 | 54.505 + 131 | 55 61 - 6 | 06.439 + 49 | 76.66 +337 | 11.025 + 115 | 33.97 + 99 |
| 7 30.0 | 15.007 + 98 | 52 80 -149 | 54.589 + 84 | 55 81 - 20 | 06.429 - 10 | 79.91 +325 | 11.097 + 72 | 33.13 + 84 |
| 8 8.9 | 15.037 + 30 | 54 35 -155 | 54.623 + 34 | 56 12 - 31 | 06.429 - 73 | 82.98 +307 | 11.123 + 26 | 32.43 + 70 |
| 8 18.9 | 15.003 - 34 | 55 89 -154 | 54.608 - 15 | 56 53 - 41 | 06.223 - 133 | 85.78 +280 | 11.105 - 18 | 31.91 + 52 |
| 8 28.9 | 14.911 - 92 | 57 36 -147 | 54.550 - 58 | 57 00 - 47 | 06.040 - 183 | 88.26 +248 | 11.047 - 58 | 31 53 + 38 |
| 9 7.9 | 14.764 - 147 | 58 72 -136 | 54.450 - 100 | 57 50 - 50 | 05.808 - 232 | 90.39 +213 | 10.953 - 94 | 31 30 + 23 |
| 9 17.8 | 14.574 - 190 | 59 86 -114 | 54.318 - 132 | 57 99 - 49 | 05.538 - 270 | 92.08 +169 | 10.829 - 124 | 31 21 + 9 |
| 9 27.8 | 14.352 - 222 | 60 78 - 92 | 54.163 - 155 | 58 44 - 45 | 05.242 - 296 | 93.35 +127 | 10.685 - 144 | 31 23 - 2 |
| 10 7.8 | 14.109 - 243 | 61 40 - 62 | 53.993 - 170 | 58 84 - 40 | 04.925 - 317 | 94.13 + 78 | 10.528 - 157 | 31.36 - 13 |
| 10 17.7 | 13.863 - 246 | 61 70 - 30 | 53.822 - 171 | 59 14 - 30 | 04.604 - 321 | 94.39 + 26 | 10.370 - 158 | 31 60 - 24 |
| 10 27.7 | 13.626 - 237 | 61 68 + 2 | 53.659 - 163 | 59 35 - 21 | 04.289 - 315 | 94 16 - 23 | 10.219 - 151 | 31 91 - 31 |
| 11 6.7 | 13.410 - 216 | 61 32 + 36 | 53.512 - 147 | 59 46 - 11 | 03.988 - 301 | 93.39 - 77 | 10.083 - 136 | 32 33 - 42 |
| 11 16.7 | 13.234 - 176 | 60 63 + 69 | 53.395 - 117 | 59 47 - 1 | 03.718 - 270 | 92.10 -129 | 09.974 - 109 | 32 82 - 49 |
| 11 26.6 | 13.102 - 132 | 59 66 + 97 | 53.312 - 83 | 59 39 + 8 | 03.484 - 234 | 90.34 -176 | 09.895 - 79 | 33 38 - 56 |
| 12 6.6 | 13.023 - 79 | 58 42 +124 | 53.268 - 44 | 59 23 + 16 | 03.294 - 190 | 88.10 -224 | 09.852 - 43 | 34 03 - 65 |
| 12 16.6 | 13.006 - 17 | 56 98 +144 | 53.270 + 2 | 59 01 + 22 | 03.159 - 135 | 85.49 -261 | 09.849 - 3 | 34 73 - 70 |
| 12 26.6 | 13.047 + 41 | 55 39 +159 | 53.314 + 44 | 58 74 + 27 | 03.078 - 81 | 82.56 -293 | 09.885 + 36 | 35 48 - 75 |
| 12 36.5 | 13.149 + 102 | 53 69 +170 | 53.404 + 90 | 58 44 + 30 | 03.058 - 20 | 79.39 -317 | 09.960 + 75 | 36 25 - 77 |
| | + 161 | +176 | + 122 | + 29 | + 42 | -327 | + 112 | - 75 |
| Mean Place | 13.028 | 45.43 | 53.221 | 50.89 | 04.757 | 81.77 | 09.909 | 29.70 |
| sec δ, tan δ | +1.498 | -1.116 | +1.103 | -0.464 | +1.562 | +1.200 | +1.008 | -0.124 |
| dα(ψ), dδ(ψ) | +0.088 | +0.16 | +0.072 | +0.16 | +0.032 | +0.16 | +0.064 | +0.16 |
| dα(ε), dδ(ε) | +0.030 | -0.92 | +0.013 | -0.91 | -0.033 | -0.91 | +0.003 | -0.91 |
| Dbles.Trans. | July 16 | | July 16 | | July 16 | | July 16 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 1512 | | 1513 | | 1514 | | 1515 | |
|--------------|-------------------------|---------------|-----------------|---------------|-----------------|---------------|-----------------|---------------|
| | 54 Sagittarii | | β Sagittae | | 55 Sagittarii | | 10 Vulpeculae | |
| Mag.Spect. | 5.45 | K0 | 4.45 | K0 | 5.10 | F0 | 5.45 | G5 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° / | h m | ° / | h m | ° / | h m | ° / |
| | 19 39 | - 16 19 | 19 40 | + 17 26 | 19 41 | - 16 09 | 19 43 | + 25 43 |
| 1 | -8.4 53.274 + 22 | 44.37 - 25 | 23.228 + 31 | 28.96 -192 | 41.088 + 21 | 37.99 - 25 | 05.945 + 15 | 72.00 -222 |
| 1 | 1.5 53.337 + 63 | 44.60 - 23 | 23.259 + 31 | 26.90 -206 | 41.149 + 61 | 38.23 - 24 | 05.960 + 15 | 69.62 -238 |
| 1 | 11.5 53.438 + 101 | 44.76 - 16 | 23.328 + 69 | 24.76 -214 | 41.248 + 99 | 38.40 - 17 | 06.016 + 56 | 67.11 -251 |
| 1 | 21.5 53.572 + 134 | 44.99 - 23 | 23.436 + 108 | 22.62 -214 | 41.380 + 132 | 38.62 - 22 | 06.114 + 98 | 64.60 -251 |
| 1 | 31.5 53.745 + 173 | 45.12 - 13 | 23.579 + 143 | 20.59 -203 | 41.551 + 171 | 38.76 - 14 | 06.249 + 135 | 62.18 -242 |
| 2 | 10.4 53.947 + 202 | 45.16 - 4 | 23.754 + 175 | 18.70 -189 | 41.752 + 201 | 38.80 - 4 | 06.420 + 171 | 59.93 -225 |
| 2 | 20.4 54.178 + 231 | 45.08 + 8 | 23.960 + 206 | 17.09 -161 | 41.980 + 228 | 38.72 + 8 | 06.626 + 206 | 57.97 -196 |
| 3 | 2.4 54.429 + 251 | 44.87 + 21 | 24.191 + 231 | 15.81 -128 | 42.230 + 250 | 38.51 + 21 | 06.859 + 233 | 56.37 -160 |
| 3 | 12.3 54.702 + 273 | 44.52 + 35 | 24.447 + 256 | 14.90 - 91 | 42.501 + 271 | 38.15 + 36 | 07.119 + 260 | 55.18 -119 |
| 3 | 22.3 54.993 + 291 | 44.01 + 51 | 24.722 + 275 | 14.45 - 45 | 42.791 + 290 | 37.63 + 52 | 07.401 + 282 | 54.49 - 69 |
| 4 | 1.3 55.297 + 304 | 43.36 + 65 | 25.010 + 288 | 14.43 - 2 | 43.094 + 303 | 36.97 + 66 | 07.698 + 297 | 54.29 - 20 |
| 4 | 11.3 55.613 + 316 | 42.56 + 80 | 25.312 + 302 | 14.85 + 42 | 43.409 + 315 | 36.17 + 80 | 08.009 + 311 | 54.61 + 32 |
| 4 | 21.2 55.934 + 321 | 41.66 + 90 | 25.619 + 307 | 15.74 + 89 | 43.730 + 321 | 35.25 + 92 | 08.326 + 317 | 55.44 + 83 |
| 5 | 1.2 56.257 + 323 | 40.67 + 99 | 25.926 + 307 | 17.00 +126 | 44.053 + 323 | 34.25 +100 | 08.642 + 316 | 56.71 +127 |
| 5 | 11.2 56.578 + 321 | 39.63 +104 | 26.229 + 303 | 18.63 +163 | 44.374 + 321 | 33.19 +106 | 08.954 + 312 | 58.41 +170 |
| 5 | 21.2 56.889 + 311 | 38.58 +105 | 26.519 + 290 | 20.56 +193 | 44.685 + 311 | 32.13 +106 | 09.251 + 297 | 60.48 +207 |
| 5 | 31.1 57.183 + 294 | 37.56 +102 | 26.791 + 272 | 22.70 +214 | 44.981 + 296 | 31.09 +104 | 09.529 + 278 | 62.81 +233 |
| 6 | 10.1 57.457 + 274 | 36.59 + 97 | 27.040 + 249 | 25.01 +231 | 45.255 + 274 | 30.11 + 98 | 09.582 + 253 | 65.37 +256 |
| 6 | 20.1 57.701 + 244 | 35.73 + 86 | 27.257 + 217 | 27.42 +241 | 45.500 + 245 | 29.22 + 89 | 10.000 + 218 | 68.07 +270 |
| 6 | 30.0 57.911 + 210 | 34.98 + 75 | 27.439 + 182 | 29.84 +242 | 45.712 + 212 | 28.46 + 76 | 10.182 + 182 | 70.80 +273 |
| 7 | 10.0 58.083 + 172 | 34.37 + 61 | 27.582 + 143 | 32.24 +240 | 45.884 + 172 | 27.83 + 63 | 10.321 + 139 | 73.55 +275 |
| 7 | 20.0 58.209 + 126 | 33.91 + 46 | 27.679 + 97 | 34.53 +229 | 46.012 + 128 | 27.35 + 48 | 10.414 + 93 | 76.21 +266 |
| 7 | 30.0 58.291 + 82 | 33.60 + 31 | 27.734 + 55 | 36.67 +214 | 46.096 + 84 | 27.02 + 33 | 10.461 + 47 | 78.73 +252 |
| 8 | 8.9 58.325 + 34 | 33.42 + 18 | 27.742 + 8 | 38.64 +197 | 46.132 + 36 | 26.83 + 19 | 10.460 - 1 | 81.07 +234 |
| 8 | 18.9 58.313 - 12 | 33.38 + 4 | 27.705 - 37 | 40.36 +172 | 46.121 - 11 | 26.78 + 5 | 10.413 - 47 | 83.16 +209 |
| 8 | 28.9 58.260 - 53 | 33.45 - 7 | 27.630 - 75 | 41.85 +149 | 46.069 - 52 | 26.84 - 6 | 10.325 - 88 | 84.99 +183 |
| 9 | 7.9 58.167 - 93 | 33.60 - 15 | 27.517 - 113 | 43.06 +121 | 45.978 - 91 | 26.99 - 15 | 10.199 - 126 | 86.52 +153 |
| 9 | 17.8 58.044 - 123 | 33.82 - 22 | 27.375 - 142 | 43.97 + 91 | 45.856 - 122 | 27.21 - 22 | 10.042 - 157 | 87.69 +117 |
| 9 | 27.8 57.900 - 144 | 34.08 - 26 | 27.213 - 162 | 44.58 + 61 | 45.712 - 144 | 27.47 - 26 | 09.864 - 178 | 88.53 + 84 |
| 10 | 7.8 57.740 - 160 | 34.37 - 29 | 27.036 - 177 | 44.88 + 30 | 45.553 - 159 | 27.75 - 28 | 09.670 - 194 | 89.00 + 47 |
| 10 | 17.7 57.578 - 162 | 34.66 - 29 | 26.858 - 178 | 44.84 - 4 | 45.392 - 161 | 28.04 - 29 | 09.474 - 196 | 89.07 + 7 |
| 10 | 27.7 57.424 - 154 | 34.94 - 28 | 26.686 - 172 | 44.51 - 33 | 45.238 - 154 | 28.33 - 29 | 09.283 - 191 | 88.78 - 29 |
| 11 | 6.7 57.285 - 139 | 35.21 - 27 | 26.527 - 159 | 43.84 - 67 | 45.098 - 140 | 28.61 - 28 | 09.104 - 179 | 88.08 - 70 |
| 11 | 16.7 57.173 - 112 | 35.47 - 26 | 26.393 - 134 | 42.85 - 99 | 44.986 - 112 | 28.87 - 26 | 09.104 - 153 | 87.01 -107 |
| 11 | 26.6 57.093 - 80 | 35.71 - 24 | 26.287 - 106 | 41.59 -126 | 44.904 - 82 | 29.12 - 25 | 08.826 - 125 | 85.60 -141 |
| 12 | 6.6 57.049 - 44 | 35.95 - 24 | 26.216 - 71 | 40.04 -155 | 44.859 - 45 | 29.37 - 25 | 08.735 - 91 | 83.84 -176 |
| 12 | 16.6 57.047 - 2 | 36.18 - 23 | 26.184 - 32 | 38.27 -177 | 44.856 - 3 | 29.60 - 23 | 08.685 - 50 | 81.80 -204 |
| 12 | 26.6 57.085 + 38 | 36.39 - 21 | 26.191 + 7 | 36.33 -194 | 44.892 + 36 | 29.82 - 22 | 08.675 - 10 | 79.55 -225 |
| 12 | 36.5 57.164 + 79 | 36.59 - 20 | 26.237 + 46 | 34.24 -209 | 44.969 + 77 | 30.02 - 20 | 08.707 + 32 | 77.12 -243 |
| | + 114 | - 11 | + 87 | - 211 | + 113 | - 12 | + 75 | - 248 |
| Mean Place | 57.024 | 29.57 | 26.568 | 38.82 | 44.828 | 23.08 | 09.246 | 80.77 |
| sec δ, tan δ | +1.042 | -0.293 | +1.048 | +0.314 | +1.041 | -0.290 | +1.110 | +0.482 |
| dα(ψ), dδ(ψ) | +0.068 | +0.17 | +0.054 | +0.17 | +0.068 | +0.17 | +0.050 | +0.17 |
| dα(ε), dδ(ε) | +0.008 | -0.91 | -0.009 | -0.91 | +0.008 | -0.90 | -0.014 | -0.90 |
| Dble.Trans. | July 17 | | July 17 | | July 17 | | July 18 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 740 | | 1516 | | 1517 | | 741 | |
|---------------------|--------------------------|-------------------------|--------------------------|-------------------------|--------------------------|------------------------|-------------------------|-------------------------|
| | 15 Cygni | | 228 G. Sagittarii | | 56 Sagittarii | | γ Aquilae | |
| Mag. Spect. | 5.02 | K0 | 5.56 | B8 | 5.06 | K0 | 2.80 | K2 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " |
| | 19 43 | + 37 18 | 19 45 | - 31 56 | 19 45 | - 19 47 | 19 45 | + 10 34 |
| 1 ^d -8.4 | 44 075 ^s - 56 | 69 20 ^o -255 | 05 516 ^s + 17 | 48 43 ^o + 62 | 30 750 ^s + 17 | 55 19 ^o - 6 | 33 709 ^s - 4 | 36 25 ^o -161 |
| 1 1.5 | 44 065 + 35 | 66 43 -277 | 05 580 + 64 | 47 74 + 69 | 30 810 + 60 | 55 20 - 1 | 33 743 + 34 | 36 55 -170 |
| 1 11.5 | 44 100 + 86 | 63 50 -293 | 05 686 + 106 | 46 99 + 75 | 30 911 + 101 | 55 14 + 6 | 33 814 + 71 | 32 77 -178 |
| 1 21.5 | 44 186 + 129 | 60 54 -296 | 05 834 + 148 | 46 15 + 84 | 31 036 + 125 | 55 14 + 0 | 33 923 + 109 | 31 01 -176 |
| 1 31.5 | 44 315 + 171 | 57 68 -286 | 06 022 + 188 | 45 27 + 88 | 31 208 + 172 | 55 03 + 11 | 34 065 + 142 | 29 33 -168 |
| 2 10.4 | 44 486 + 213 | 54 98 -270 | 06 245 + 223 | 44 37 + 90 | 31 410 + 202 | 54 83 + 20 | 34 238 + 173 | 27 80 -153 |
| 2 20.4 | 44 699 + 246 | 52 59 -239 | 06 500 + 255 | 43 44 + 93 | 31 639 + 229 | 54 54 + 29 | 34 440 + 202 | 26 51 -129 |
| 3 2.4 | 44 945 + 279 | 50 60 -199 | 06 780 + 280 | 42 49 + 95 | 31 892 + 253 | 54 14 + 40 | 34 667 + 227 | 25 51 -100 |
| 3 12.4 | 45 224 + 304 | 49 06 -154 | 07 084 + 304 | 41 51 + 98 | 32 166 + 274 | 53 62 + 52 | 34 917 + 250 | 24 85 -66 |
| 3 22.3 | 45 528 + 322 | 48 08 -98 | 07 409 + 325 | 40 53 + 98 | 32 460 + 294 | 52 98 + 64 | 35 186 + 269 | 24 57 -28 |
| 4 1.3 | 45 850 + 338 | 47 66 -42 | 07 749 + 340 | 39 56 + 97 | 32 767 + 307 | 52 23 + 75 | 35 469 + 283 | 24 69 + 12 |
| 4 11.3 | 46 188 + 344 | 47 81 + 15 | 08 103 + 354 | 38 61 + 95 | 33 088 + 321 | 51 37 + 86 | 35 766 + 297 | 25 20 + 51 |
| 4 21.2 | 46 532 + 341 | 48 56 + 75 | 08 464 + 361 | 37 71 + 90 | 33 416 + 328 | 50 44 + 93 | 36 070 + 304 | 26 09 + 89 |
| 5 1.2 | 46 873 + 334 | 49 82 +126 | 08 827 + 363 | 36 88 + 83 | 33 745 + 329 | 49 46 + 98 | 36 374 + 304 | 27 32 +123 |
| 5 11.2 | 47 207 + 317 | 51 58 +176 | 09 189 + 362 | 36 15 + 73 | 34 074 + 329 | 48 46 +100 | 36 676 + 302 | 28 85 +153 |
| 5 21.2 | 47 524 + 292 | 53 78 +220 | 09 539 + 350 | 35 55 + 60 | 34 393 + 319 | 47 48 + 98 | 36 967 + 291 | 30 64 +179 |
| 5 31.1 | 47 816 + 263 | 56 31 +253 | 09 873 + 334 | 35 10 + 45 | 34 696 + 303 | 46 56 + 92 | 37 243 + 276 | 32 59 +195 |
| 6 10.1 | 48 079 + 223 | 59 13 +282 | 10 185 + 312 | 34 82 + 28 | 34 980 + 284 | 45 72 + 84 | 37 497 + 254 | 34 68 +209 |
| 6 20.1 | 48 302 + 181 | 62 13 +300 | 10 463 + 278 | 34 73 + 9 | 35 233 + 253 | 45 00 + 72 | 37 720 + 223 | 36 83 +215 |
| 6 30.1 | 48 483 + 133 | 65 22 +309 | 10 705 + 242 | 34 82 - 9 | 35 452 + 219 | 44 42 + 58 | 37 911 + 191 | 38 96 +213 |
| 7 10.0 | 48 616 + 81 | 68 36 +314 | 10 903 + 198 | 35 09 - 27 | 35 633 + 181 | 43 99 + 43 | 38 063 + 152 | 41 05 +209 |
| 7 20.0 | 48 697 + 31 | 71 44 +308 | 11 051 + 148 | 35 54 - 45 | 35 767 + 134 | 43 72 + 27 | 38 172 + 109 | 43 03 +198 |
| 7 30.0 | 48 728 - 22 | 74 38 +294 | 11 149 + 98 | 36 12 - 58 | 35 767 + 90 | 43 60 + 12 | 38 238 + 66 | 44 86 +183 |
| 8 8.9 | 48 706 - 73 | 77 15 +277 | 11 194 + 45 | 36 82 - 70 | 35 857 + 41 | 43 61 - 1 | 38 259 + 21 | 46 52 +166 |
| 8 18.9 | 48 633 - 116 | 79 66 +251 | 11 186 - 8 | 37 60 - 78 | 35 891 - 7 | 43 75 - 14 | 38 235 - 24 | 47 95 +143 |
| 8 28.9 | 48 517 - 159 | 81 89 +223 | 11 132 - 54 | 38 41 - 81 | 35 842 - 49 | 43 99 - 24 | 38 173 - 62 | 49 17 +122 |
| 9 7.9 | 48 358 - 192 | 83 78 +189 | 11 031 - 101 | 39 22 - 81 | 35 842 - 90 | 44 30 - 31 | 38 173 - 100 | 49 17 + 98 |
| 9 17.8 | 48 166 - 216 | 85 28 +150 | 10 895 - 136 | 39 98 - 76 | 35 752 - 122 | 44 30 - 35 | 38 073 - 129 | 50 15 + 71 |
| 9 27.8 | 47 950 - 233 | 86 39 +111 | 10 734 - 161 | 40 64 - 66 | 35 630 - 145 | 44 65 - 36 | 37 944 - 149 | 50 86 + 46 |
| 10 7.8 | 47 717 - 237 | 87 07 + 68 | 10 553 - 181 | 41 18 - 54 | 35 485 - 162 | 45 01 - 36 | 37 795 - 165 | 51 32 + 20 |
| 10 17.8 | 47 480 - 233 | 87 28 + 21 | 10 369 - 184 | 41 55 - 37 | 35 323 - 164 | 45 37 - 33 | 37 630 - 167 | 51 52 + 3 |
| 10 27.7 | 47 247 - 220 | 87 05 - 23 | 10 192 - 177 | 41 76 - 21 | 35 159 - 158 | 45 70 - 28 | 37 463 - 162 | 51 45 - 72 |
| 11 6.7 | 47 027 - 194 | 86 35 - 116 | 10 030 - 132 | 41 79 + 15 | 35 001 - 144 | 45 98 - 23 | 37 301 - 149 | 51 13 - 59 |
| 11 16.7 | 46 833 - 165 | 85 19 -157 | 09 898 - 98 | 41 64 + 31 | 34 857 - 116 | 46 21 - 18 | 37 152 - 125 | 50 54 - 84 |
| 11 26.6 | 46 668 - 127 | 83 62 -200 | 09 800 - 58 | 41 33 + 45 | 34 741 - 86 | 46 39 - 13 | 37 027 - 97 | 49 70 -107 |
| 12 6.6 | 46 541 - 83 | 81 62 -234 | 09 742 - 10 | 40 88 + 59 | 34 655 - 49 | 46 52 - 9 | 36 930 - 85 | 48 63 -130 |
| 12 16.6 | 46 458 - 39 | 79 28 -260 | 09 732 + 35 | 40 29 + 67 | 34 606 - 7 | 46 61 - 5 | 36 865 - 25 | 47 33 -147 |
| 12 26.6 | 46 419 + 8 | 76 68 -284 | 09 767 + 82 | 39 62 + 74 | 34 599 + 33 | 46 66 - 1 | 36 840 + 11 | 45 86 -162 |
| 12 36.5 | 46 427 + 58 | 73 84 -291 | 09 849 + 124 | 38 88 + 81 | 34 632 + 76 | 46 67 + 2 | 36 851 + 49 | 44 24 -172 |
| | | | | | 34 708 + 107 | 46 65 + 37 | 36 900 + 88 | 42 52 -174 |
| Mean Place | 47.375 | 76.44 | 09.635 | 31.05 | 34.542 | 39.52 | 37.086 | 47.27 |
| sec δ, tan δ | +1.257 | +0.762 | +1.178 | -0.623 | +1.063 | -0.360 | +1.017 | +0.187 |
| da(ψ), dδ(ψ) | +0.043 | +0.17 | +0.076 | +0.18 | +0.070 | +0.18 | +0.057 | +0.18 |
| da(ε), dδ(ε) | -0.022 | -0.90 | +0.018 | -0.90 | +0.011 | -0.90 | -0.006 | -0.90 |
| Dble. Trans. | July 18 | | July 18 | | July 18 | | July 18 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 743 | | 739 | | 744 | | 745 | |
|---|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------------------|---------------------------|
| | δ Sagittae | | ν Telescopii | | 51 Aquilae | | α Aquilae (<i>Altair</i>) | |
| Mag. Spect. | 3.78 | M0, A0 | 5.52 | A5 | 5.55 | F0 | 0.89 | A5 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | ^h ^m | [°] ['] | ^h ^m | [°] ['] | ^h ^m | [°] ['] | ^h ^m | [°] ['] |
| | 19 46 | + 18 29 | 19 46 | - 56 23 | 19 49 | - 10 47 | 19 50 | + 8 49 |
| | ^s - 16 | " - 194 | ^s - 15 | " + 191 | ^s + 11 | " - 54 | ^s - 2 | " - 150 |
| 1 | -8.4 43 836 + 23 | 51 54 - 206 | 49 873 + 57 | 66 09 + 206 | 58 657 + 49 | 69 13 - 53 | 04 089 + 35 | 43.75 - 159 |
| 1 | 1.5 43 859 + 61 | 49 48 - 217 | 49 930 + 125 | 64 03 + 219 | 58 706 + 86 | 69 66 - 51 | 04 124 + 72 | 42.16 - 165 |
| 1 | 11.5 43 920 + 101 | 47 31 - 217 | 50 055 + 196 | 61 84 + 225 | 58 792 + 121 | 70 17 - 49 | 04 196 + 109 | 40.51 - 164 |
| 1 | 21.5 44 021 + 135 | 45 14 - 207 | 50 251 + 256 | 59 59 + 222 | 58 913 + 155 | 70 66 - 44 | 04 305 + 141 | 38.87 - 155 |
| 1 | 31.5 44 156 + 169 | 43 07 - 193 | 50 507 + 313 | 57 37 + 219 | 59 068 + 185 | 71 10 - 32 | 04 446 + 173 | 37.32 - 141 |
| 2 | 10.4 44 325 + 200 | 41 14 - 166 | 50 820 + 366 | 55 18 + 207 | 59 253 + 214 | 71 42 - 17 | 04 619 + 202 | 35.91 - 118 |
| 2 | 20.4 44 525 + 226 | 39 48 - 133 | 51 186 + 406 | 53 11 + 193 | 59 467 + 236 | 71 59 - 1 | 04 821 + 226 | 34.73 - 89 |
| 3 | 2.4 44 751 + 252 | 38 15 - 96 | 51 592 + 446 | 51 18 + 177 | 59 703 + 258 | 71 60 + 19 | 05 047 + 249 | 33.84 - 57 |
| 3 | 12.4 45 003 + 272 | 37 19 - 50 | 52 038 + 477 | 49 41 + 155 | 59 961 + 278 | 71 41 + 40 | 05 296 + 269 | 33 27 - 20 |
| 3 | 22.3 45 275 + 287 | 36 69 - 6 | 52 515 + 498 | 47 86 + 133 | 60 239 + 291 | 71 01 + 59 | 05 565 + 283 | 33 07 + 18 |
| 4 | 1.3 45 562 + 302 | 36 63 + 39 | 53 013 + 520 | 46 53 + 107 | 60 530 + 305 | 70 42 + 79 | 05 848 + 297 | 33 25 + 56 |
| 4 | 11.3 45 864 + 308 | 37 02 + 86 | 53 533 + 528 | 45 46 + 78 | 60 835 + 313 | 69 63 + 96 | 06 145 + 304 | 33 81 + 93 |
| 4 | 21.2 46 172 + 308 | 37 88 + 125 | 54 061 + 528 | 44 68 + 49 | 61 148 + 316 | 68 67 + 110 | 06 449 + 305 | 34.74 + 124 |
| 5 | 1.2 46 480 + 306 | 39 13 + 162 | 54 589 + 524 | 44 19 + 17 | 61 464 + 315 | 67 57 + 121 | 06 754 + 304 | 35 98 + 154 |
| 5 | 11.2 46 786 + 294 | 40 75 + 194 | 55 113 + 504 | 44 02 - 16 | 61 779 + 306 | 66 36 + 127 | 07 058 + 293 | 37 52 + 177 |
| 5 | 21.2 47 080 + 276 | 42 69 + 216 | 55 617 + 478 | 44 18 - 46 | 62 085 + 292 | 65 09 + 128 | 07 351 + 278 | 39 29 + 193 |
| 5 | 31.1 47 356 + 254 | 44 85 + 235 | 56 095 + 442 | 44 64 - 79 | 62 377 + 273 | 63 81 + 126 | 07 629 + 256 | 41 22 + 205 |
| 6 | 10.1 47 610 + 222 | 47 20 + 245 | 56 537 + 392 | 45 43 - 109 | 62 650 + 244 | 62 55 + 109 | 07 885 + 227 | 43 27 + 209 |
| 6 | 20.1 47 832 + 188 | 49 65 + 247 | 56 929 + 336 | 46 52 - 134 | 62 894 + 213 | 61 36 + 119 | 08 112 + 195 | 45 36 + 208 |
| 6 | 30.1 48 020 + 148 | 52 12 + 246 | 57 265 + 273 | 47 86 - 159 | 63 107 + 174 | 60 27 + 97 | 08 307 + 157 | 47 44 + 203 |
| 7 | 10.0 48 168 + 103 | 54 58 + 236 | 57 538 + 197 | 49 45 - 177 | 63 281 + 131 | 59 30 + 82 | 08 464 + 113 | 49 47 + 190 |
| 7 | 20.0 48 271 + 60 | 56 94 + 222 | 57 735 + 125 | 51 22 - 188 | 63 412 + 87 | 58 48 + 67 | 08 577 + 70 | 51 37 + 176 |
| 7 | 30.0 48 331 + 13 | 59 16 + 204 | 57 860 + 45 | 53 10 - 196 | 63 499 + 41 | 57 81 + 51 | 08 647 + 26 | 53 13 + 159 |
| 8 | 8.9 48 344 - 32 | 61 20 + 181 | 57 905 - 33 | 55 06 - 194 | 63 540 - 5 | 57 30 + 35 | 08 673 - 19 | 54 72 + 136 |
| 8 | 18.9 48 312 - 72 | 63 01 + 156 | 57 872 - 103 | 57 00 - 184 | 63 535 - 45 | 56 95 + 21 | 08 654 - 58 | 56 08 + 116 |
| 8 | 28.9 48 240 - 109 | 64 57 + 129 | 57 769 - 171 | 58 84 - 170 | 63 490 - 85 | 56 74 + 8 | 08 596 - 95 | 57 24 + 91 |
| 9 | 7.9 48 131 - 140 | 65 86 + 98 | 57 598 - 226 | 60 54 - 145 | 63 405 - 115 | 56 66 - 4 | 08 501 - 125 | 58 15 + 66 |
| 9 | 17.8 47 991 - 161 | 66 84 + 68 | 57 372 - 267 | 61 99 - 116 | 63 290 - 138 | 56 70 - 12 | 08 376 - 145 | 58 81 + 43 |
| 9 | 27.8 47 830 - 176 | 67 52 + 36 | 57 105 - 297 | 63 15 - 82 | 63 152 - 154 | 56 82 - 21 | 08 231 - 161 | 59 24 + 18 |
| 10 | 7.8 47 654 - 179 | 67 90 + 2 | 56 808 - 306 | 63 97 - 42 | 62 998 - 158 | 57 03 - 27 | 08 070 - 164 | 59 42 - 8 |
| 10 | 17.8 47 475 - 174 | 67 90 - 29 | 56 502 - 300 | 64 39 - 2 | 62 840 - 152 | 57 30 - 31 | 07 906 - 158 | 59 34 - 31 |
| 10 | 27.7 47 301 - 162 | 67 61 - 63 | 56 202 - 279 | 64 41 + 40 | 62 688 - 139 | 57 61 - 36 | 07 748 - 146 | 59 03 - 56 |
| 11 | 6.7 47 139 - 139 | 66 98 - 95 | 55 923 - 238 | 64 01 + 80 | 62 549 - 114 | 57 97 - 41 | 07 602 - 123 | 58 47 - 80 |
| 11 | 16.7 47 000 - 110 | 66 03 - 125 | 55 685 - 189 | 63 21 + 117 | 62 435 - 86 | 58 38 - 43 | 07 479 - 95 | 57 67 - 100 |
| 11 | 26.6 46 890 - 78 | 64 78 - 154 | 55 496 - 129 | 62 04 + 152 | 62 349 - 51 | 58 81 - 47 | 07 384 - 62 | 56 67 - 122 |
| 12 | 6.6 46 812 - 38 | 63 24 - 177 | 55 367 - 58 | 60 52 + 178 | 62 298 - 12 | 59 28 - 50 | 07 322 - 24 | 55 45 - 137 |
| 12 | 16.6 46 774 - 1 | 61 47 - 195 | 55 309 + 11 | 58 74 + 199 | 62 286 + 25 | 59 78 - 51 | 07 298 + 12 | 54 08 - 151 |
| 12 | 26.6 46 773 + 39 | 59 52 - 210 | 55 320 + 84 | 56 75 + 216 | 62 311 + 65 | 60 29 - 50 | 07 310 + 51 | 52 57 - 161 |
| 12 | 36.5 46 812 + 78 | 57 42 - 214 | 55 404 + 155 | 54 59 + 224 | 62 376 + 101 | 60 79 - 47 | 07 361 + 88 | 50 96 - 161 |
| Mean Place | 47.159 | 61.38 | 55.355 | 45.90 | 62.269 | 54.50 | 07.494 | 55.48 |
| sec δ , tan δ | +1.054 | +0.335 | +1.807 | -1.505 | +1.018 | -0.191 | +1.012 | +0.155 |
| $d\alpha(\psi)$, $d\delta(\psi)$ | +0.053 | +0.18 | +0.097 | +0.18 | +0.066 | +0.18 | +0.058 | +0.18 |
| $d\alpha(\epsilon)$, $d\delta(\epsilon)$ | -0.010 | -0.89 | +0.045 | -0.89 | +0.006 | -0.89 | -0.005 | -0.89 |
| Dble. Trans. | July 19 | | July 19 | | July 20 | | July 20 | |

AT UPPER TRANSIT AT GREENWICH

| No. | 746 | | 1519 | | 1518 | | 1520 | |
|--------------|--------------|------------|---------------|------------|---------------|------------|--------------|------------|
| | η Aquilae | | 90 G. Aquilae | | 75 G. Pavonis | | ι Sagittarii | |
| Mag. Spect. | 3.7 to 4.4 | G0p | 5.64 | F0p, A | 6.32 | A3 | 4.21 | K0 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " |
| | 19 51 | + 0 57 | 19 52 | - 3 09 | 19 53 | - 61 12 | 19 54 | - 41 54 |
| 1 -8.4 | 43 674 + 2 | 60 46 -113 | 32 841 + 4 | 13 74 - 93 | 24 321 - 43 | 45.74 +212 | 15 493 + 1 | 36.41 +115 |
| 1 1.5 | 43 713 + 39 | 59 27 -119 | 32 883 + 42 | 14 70 - 96 | 24 358 + 37 | 43.44 +230 | 15 546 + 53 | 35.13 +128 |
| 1 11.5 | 43 787 + 74 | 58 05 -122 | 32 960 + 77 | 15 68 - 98 | 24 475 + 117 | 41.00 +244 | 15 648 + 102 | 33.74 +139 |
| 1 21.5 | 43 898 + 111 | 56 85 -120 | 33 073 + 113 | 16.63 - 95 | 24 674 + 199 | 38.49 +251 | 15 801 + 153 | 32.27 +147 |
| 1 31.5 | 44 040 + 142 | 55.73 -112 | 33.218 + 145 | 17.50 - 87 | 24 944 + 270 | 35.99 +250 | 15 998 + 197 | 30.77 +150 |
| 2 10.4 | 44 213 + 173 | 54 73 -100 | 33.394 + 176 | 18.27 - 77 | 25 281 + 337 | 33.55 +244 | 16.235 + 237 | 29.26 +151 |
| 2 20.4 | 44 415 + 202 | 53 93 - 80 | 33 598 + 204 | 18 84 - 57 | 25 680 + 399 | 31.22 +233 | 16 511 + 276 | 27.76 +150 |
| 3 2.4 | 44 639 + 224 | 53 37 - 56 | 33 825 + 227 | 19 20 - 36 | 26 128 + 448 | 29.06 +216 | 16 817 + 306 | 26.30 +146 |
| 3 12.4 | 44 887 + 248 | 53 09 - 28 | 34 074 + 249 | 19 32 - 12 | 26 622 + 494 | 27.08 +198 | 17 152 + 335 | 24.89 +141 |
| 3 22.3 | 45 155 + 268 | 53.11 + 2 | 34.343 + 269 | 19.16 + 16 | 27.155 + 533 | 25.35 +173 | 17 512 + 360 | 23.56 +133 |
| 4 1.3 | 45 436 + 281 | 53 45 + 34 | 34 627 + 284 | 18 73 + 43 | 27 715 + 560 | 23.89 +146 | 17 889 + 377 | 22.33 +123 |
| 4 11.3 | 45 732 + 296 | 54.09 + 64 | 34 925 + 298 | 18.03 + 70 | 28 299 + 584 | 22.71 +118 | 18 285 + 396 | 21.22 +111 |
| 4 21.2 | 46 036 + 304 | 55 02 + 39 | 35 230 + 305 | 17.07 + 96 | 28 894 + 595 | 21.87 + 84 | 18 690 + 405 | 20.26 + 96 |
| 5 1.2 | 46 342 + 306 | 56 21 +119 | 35 539 + 309 | 15.91 +116 | 29 491 + 597 | 21.36 + 51 | 19 097 + 407 | 19.46 + 80 |
| 5 11.2 | 46 647 + 305 | 57.61 +140 | 35 847 + 308 | 14.57 +134 | 30 084 + 593 | 21.19 + 17 | 19 505 + 408 | 18.86 + 60 |
| 5 21.2 | 46 944 + 297 | 59 19 +158 | 36 146 + 299 | 13.09 +148 | 30 655 + 571 | 21.40 - 21 | 19 901 + 396 | 18 48 + 38 |
| 5 31.1 | 47 226 + 282 | 60 86 +167 | 36 432 + 286 | 11.54 +155 | 31 197 + 542 | 21.95 - 55 | 20 279 + 378 | 18.33 + 15 |
| 6 10.1 | 47 488 + 262 | 62 61 +175 | 36 698 + 266 | 09.95 +159 | 31 699 + 502 | 22.85 - 90 | 20 633 + 354 | 18.42 - 9 |
| 6 20.1 | 47 722 + 234 | 64 36 +175 | 36 936 + 237 | 08 39 +156 | 32 145 + 446 | 24.08 -123 | 20 951 + 318 | 18.76 - 34 |
| 6 30.1 | 47 925 + 203 | 66 05 +169 | 37 143 + 208 | 06 89 +150 | 32 528 + 383 | 25.59 -151 | 21 228 + 277 | 19.32 - 56 |
| 7 10.0 | 48 090 + 165 | 67 68 +163 | 37 312 + 169 | 05 49 +140 | 32 839 + 311 | 27.37 -178 | 21 456 + 228 | 20 11 - 79 |
| 7 20.0 | 48 212 + 122 | 69 17 +149 | 37 439 + 127 | 04 22 +127 | 33 066 + 227 | 29.33 -196 | 21 629 + 173 | 21 09 - 98 |
| 7 30.0 | 48 292 + 80 | 70 51 +134 | 37 523 + 84 | 03 11 +111 | 33 210 + 144 | 31 42 -209 | 21 746 + 117 | 22 21 -112 |
| 8 8.9 | 48 327 + 35 | 71 68 +117 | 37 562 + 39 | 02 16 + 95 | 33 264 + 54 | 33 59 -217 | 21 803 + 57 | 23 45 -124 |
| 8 18.9 | 48 317 - 10 | 72 66 + 98 | 37 555 - 7 | 01 40 + 76 | 33 227 - 37 | 35 73 -214 | 21 799 - 4 | 24 74 -129 |
| 8 28.9 | 48 268 - 49 | 73 44 + 78 | 37 509 - 46 | 00 81 + 59 | 33 111 - 116 | 37 77 -204 | 21 742 - 57 | 26 03 -129 |
| 9 7.9 | 48 181 - 87 | 74 04 + 60 | 37 425 - 84 | 00 39 + 42 | 32 916 - 195 | 39 65 -188 | 21 632 - 110 | 27 26 -123 |
| 9 17.8 | 48 064 - 117 | 74 43 + 39 | 37 310 - 115 | 00 15 + 24 | 32 656 - 260 | 41 26 -161 | 21 480 - 152 | 28 37 -111 |
| 9 27.8 | 47 925 - 139 | 74 65 + 22 | 37 173 - 137 | 00 05 + 10 | 32 348 - 308 | 42 56 -130 | 21 297 - 183 | 29 32 - 95 |
| 10 7.8 | 47 771 - 154 | 74 67 + 2 | 37 021 - 152 | 00 10 - 5 | 32 002 - 346 | 43 48 - 92 | 21 090 - 207 | 30 05 - 73 |
| 10 17.8 | 47 613 - 158 | 74 52 - 15 | 36 864 - 157 | 00 30 - 20 | 31 643 - 359 | 43 96 - 48 | 20 876 - 214 | 30 53 - 48 |
| 10 27.7 | 47 460 - 153 | 74 20 - 32 | 36 713 - 151 | 00 62 - 32 | 31 288 - 355 | 44 00 - 4 | 20 667 - 209 | 30 73 - 20 |
| 11 6.7 | 47 318 - 142 | 73 71 - 49 | 36 573 - 140 | 01 07 - 45 | 30 952 - 336 | 43 58 + 42 | 20 473 - 194 | 30 65 + 8 |
| 11 16.7 | 47 201 - 117 | 73 07 - 64 | 36 457 - 116 | 01 63 - 56 | 30 661 - 291 | 42 71 + 87 | 20 309 - 164 | 30 65 + 36 |
| 11 26.6 | 47 110 - 91 | 72 28 - 79 | 36 369 - 88 | 02 30 - 67 | 30 423 - 238 | 41 43 +128 | 20 183 - 126 | 30 29 + 62 |
| 12 6.6 | 47 052 - 58 | 71 34 - 94 | 36 313 - 56 | 03 08 - 78 | 30 251 - 172 | 39 77 +166 | 20 101 - 82 | 28 81 + 86 |
| 12 16.6 | 47 032 - 20 | 70 30 -104 | 36 295 + 18 | 03 93 - 85 | 30 159 - 92 | 37 80 +197 | 20 071 - 30 | 27 74 +107 |
| 12 26.6 | 47 047 + 15 | 69 17 -113 | 36 313 + 57 | 04 84 - 91 | 30 144 + 69 | 35 59 +221 | 20 091 + 73 | 26 51 +123 |
| 12 36.5 | 47 101 + 54 | 67 99 -118 | 36 370 + 93 | 05 80 - 96 | 30 213 + 151 | 33 19 +240 | 20 164 + 73 | 25 15 +136 |
| | + 91 | -119 | | - 93 | | +250 | + 124 | +144 |
| Mean Place | 47.126 | 73.23 | 36.339 | 00.23 | 30.260 | 24.34 | 19.939 | 16.89 |
| sec δ, tan δ | +1.000 | +0.017 | +1.002 | -0.055 | +2.076 | -1.820 | +1.344 | -0.897 |
| dα(ψ), dδ(ψ) | +0.061 | +0.19 | +0.062 | +0.19 | +0.104 | +0.19 | +0.082 | +0.19 |
| dα(ε), dδ(ε) | -0.001 | -0.88 | +0.002 | -0.88 | +0.058 | -0.88 | +0.029 | -0.88 |
| Dble. Trans. | July 20 | | July 20 | | July 20 | | July 21 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 749 | | 1521 | | 1522 | | 752 | | |
|---|---------------------------|------------------|---------------------------|------------------|---------------------------|------------------|---------------------------|------------------|------|
| | β Aquilae | | η Cygni | | 61 Sagittarii | | γ Sagittae | | |
| Mag. Spect. | 3.90 | K0 | 4.03 | K0 | 5.05 | A0 | 3.71 | K5 | |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | |
| | ^h ^m | ^o ' " | ^h ^m | ^o ' " | ^h ^m | ^o ' " | ^h ^m | ^o ' " | |
| | 19 54 | + 6 21 | 19 55 | + 35 02 | 19 57 | - 15 31 | 19 58 | + 19 26 | |
| ^d | ^s | " | ^s | " | ^s | " | ^s | " | |
| 1 | -8.4 | 35.620 | -6 | 68.96 | -139 | 44.698 | -61 | 41.98 | -241 |
| 1 | 1.5 | 35.652 | +32 | 67.49 | -147 | 44.681 | -17 | 39.35 | -263 |
| 1 | 11.5 | 35.719 | +67 | 65.96 | -153 | 44.707 | +26 | 36.56 | -279 |
| 1 | 21.5 | 35.824 | +105 | 64.44 | -152 | 44.780 | +73 | 33.71 | -285 |
| 1 | 31.5 | 35.960 | +136 | 63.01 | -143 | 44.896 | +116 | 30.94 | -277 |
| 2 | 10.4 | 36.128 | +168 | 61.71 | -130 | 45.053 | +157 | 28.31 | -263 |
| 2 | 20.4 | 36.325 | +197 | 60.64 | -107 | 45.250 | +197 | 25.97 | -234 |
| 3 | 2.4 | 36.546 | +221 | 59.82 | -82 | 45.481 | +231 | 24.01 | -196 |
| 3 | 12.4 | 36.790 | +244 | 59.32 | -50 | 45.745 | +264 | 22.47 | -154 |
| 3 | 22.3 | 37.055 | +265 | 59.17 | -15 | 46.036 | +291 | 21.47 | -100 |
| 4 | 1.3 | 37.335 | +280 | 59.36 | +19 | 46.346 | +310 | 21.01 | -46 |
| 4 | 11.3 | 37.629 | +294 | 59.92 | +56 | 46.674 | +328 | 21.11 | +10 |
| 4 | 21.2 | 37.932 | +303 | 60.83 | +91 | 47.011 | +337 | 21.78 | +67 |
| 5 | 1.2 | 38.237 | +304 | 62.03 | +120 | 47.348 | +337 | 22.97 | +119 |
| 5 | 11.2 | 38.541 | +296 | 63.50 | +147 | 47.681 | +333 | 24.65 | +168 |
| 5 | 21.2 | 38.837 | +280 | 65.19 | +169 | 48.000 | +319 | 26.76 | +211 |
| 5 | 31.1 | 39.117 | +261 | 67.02 | +183 | 48.297 | +297 | 29.20 | +244 |
| 6 | 10.1 | 39.378 | +232 | 68.96 | +194 | 48.568 | +271 | 31.94 | +274 |
| 6 | 20.1 | 39.610 | +201 | 70.94 | +198 | 48.801 | +233 | 34.87 | +293 |
| 6 | 30.1 | 39.811 | +163 | 72.89 | +189 | 48.995 | +194 | 37.90 | +303 |
| 7 | 10.0 | 39.974 | +119 | 74.78 | +188 | 49.144 | +149 | 40.99 | +309 |
| 7 | 20.0 | 40.093 | +78 | 76.56 | +178 | 49.241 | +97 | 44.02 | +303 |
| 7 | 30.0 | 40.171 | +32 | 78.18 | +162 | 49.290 | +49 | 46.93 | +291 |
| 8 | 8.9 | 40.203 | -12 | 79.64 | +146 | 49.286 | -4 | 49.69 | +276 |
| 8 | 18.9 | 40.191 | -52 | 80.88 | +124 | 49.232 | -54 | 52.20 | +251 |
| 8 | 28.9 | 40.139 | -89 | 81.92 | +104 | 49.135 | -97 | 54.44 | +224 |
| 9 | 7.9 | 40.050 | -120 | 82.74 | +82 | 48.994 | -141 | 56.36 | +192 |
| 9 | 17.8 | 39.930 | -141 | 83.31 | +57 | 48.820 | -174 | 57.91 | +155 |
| 9 | 27.8 | 39.789 | -157 | 83.67 | +36 | 48.620 | -200 | 59.08 | +117 |
| 10 | 7.8 | 39.632 | -161 | 83.80 | +13 | 48.402 | -218 | 59.84 | +76 |
| 10 | 17.8 | 39.471 | -157 | 83.70 | -10 | 48.178 | -224 | 60.15 | +31 |
| 10 | 27.7 | 39.314 | -146 | 83.38 | -32 | 47.956 | -222 | 60.04 | -11 |
| 11 | 6.7 | 39.168 | -122 | 82.84 | -54 | 47.744 | -212 | 59.46 | -58 |
| 11 | 16.7 | 39.046 | -96 | 82.09 | -75 | 47.555 | -189 | 58.44 | -102 |
| 11 | 26.6 | 38.950 | -65 | 81.16 | -93 | 47.394 | -161 | 57.01 | -143 |
| 12 | 6.6 | 38.885 | -26 | 80.02 | -114 | 47.267 | -127 | 55.16 | -185 |
| 12 | 16.6 | 38.859 | +9 | 78.74 | -128 | 47.181 | -86 | 52.97 | -219 |
| 12 | 26.6 | 38.868 | +46 | 77.35 | -139 | 47.136 | +1 | 50.51 | -246 |
| 12 | 36.5 | 38.914 | +84 | 75.86 | -149 | 47.137 | +46 | 47.82 | -269 |
| Mean Place | 39.015 | 80.71 | 47.980 | 49.41 | 11.136 | 40.78 | 09.409 | 77.79 | |
| sec δ , tan δ | +1.006 | +0.112 | +1.221 | +0.701 | +1.038 | -0.278 | +1.061 | +0.353 | |
| $d\alpha(\psi)$, $d\delta(\psi)$ | +0.059 | +0.19 | +0.045 | +0.19 | +0.068 | +0.19 | +0.053 | +0.20 | |
| $d\alpha(\epsilon)$, $d\delta(\epsilon)$ | -0.004 | -0.88 | -0.023 | -0.88 | +0.009 | -0.87 | -0.012 | -0.87 | |
| Dbles. Trans. | July 21 | | July 21 | | July 21 | | July 22 | | |

AT UPPER TRANSIT AT GREENWICH

| No. | 751 | | 748 | | 1523 | | 753 | |
|--------------|-------------------------|------------|---------------------------|------------|--------------------------|------------|-------------------------|------------|
| | 3' Sagittarii | | ε Pavonis | | 15 Vulpeculae | | 62 Sagittarii | |
| Mag.Spect. | 4.39 | B3 | 4.10 | A0 | 4.74 | A5 | 4.60 | M3 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° ' | h m | ° ' | h m | ° ' | h m | ° ' |
| | 19 58 | -35 18 | 19 58 | -72 56 | 20 00 | +27 42 | 20 01 | -27 44 |
| 1 -8.4 | 47 434 ^s + 1 | 68.03 + 79 | 54 557 ^s - 153 | 73.93 +258 | 29 413 ^s - 46 | 48.39 -218 | 45 887 ^s + 3 | 71.31 + 38 |
| 1 1.6 | 47 482 + 48 | 67.13 + 90 | 54 537 + 20 | 71.13 +280 | 29 408 - 5 | 46.04 -235 | 45 932 + 45 | 70.84 + 47 |
| 1 11.5 | 47 575 + 93 | 66.14 + 99 | 54 648 + 111 | 68.16 +297 | 29 443 + 35 | 43.53 -251 | 46 018 + 86 | 70.32 + 52 |
| 1 21.5 | 47 711 + 136 | 65.07 +107 | 54 899 + 251 | 65.12 +304 | 29 520 + 77 | 40.99 -254 | 46 141 + 123 | 69.73 + 59 |
| 1 31.5 | 47 888 + 177 | 63.93 +114 | 55 271 + 372 | 62.12 +300 | 29 636 + 116 | 38.52 -247 | 46 304 + 163 | 69.01 + 72 |
| 2 10.4 | 48 103 + 215 | 62.75 +118 | 55 758 + 487 | 59.18 +294 | 29 789 + 153 | 36.18 -234 | 46 500 + 196 | 68.25 + 76 |
| 2 20.4 | 48 352 + 249 | 61.55 +120 | 56 355 + 597 | 56.41 +277 | 29 978 + 189 | 34.12 -206 | 46 729 + 229 | 67.44 + 81 |
| 3 2.4 | 48 629 + 277 | 60.35 +120 | 57 038 + 683 | 53.87 +254 | 30 197 + 219 | 32.41 -171 | 46 983 + 254 | 66.56 + 88 |
| 3 12.4 | 48 933 + 304 | 59.13 +122 | 57 802 + 764 | 51.58 +229 | 30 447 + 250 | 31.10 -131 | 47 263 + 280 | 65.61 + 95 |
| 3 22.3 | 49 261 + 328 | 57.93 +120 | 58 633 + 831 | 49.61 +197 | 30 722 + 275 | 30.28 -82 | 47 565 + 302 | 64.61 +100 |
| 4 1.3 | 49 606 + 345 | 56.77 +116 | 59 508 + 875 | 47.99 +162 | 31 015 + 293 | 29.96 -32 | 47 884 + 319 | 63.58 +103 |
| 4 11.3 | 49 968 + 362 | 55.66 +111 | 60 424 + 916 | 46.74 +125 | 31 326 + 311 | 30.15 +19 | 48 219 + 335 | 62.51 +107 |
| 4 21.3 | 50 340 + 372 | 54.63 +103 | 61 357 + 933 | 45.91 +83 | 31 646 + 320 | 30.88 +73 | 48 565 + 346 | 61.45 +106 |
| 5 1.2 | 50 716 + 376 | 53.71 +92 | 62 291 + 934 | 45.48 +43 | 31 968 + 322 | 32.07 +119 | 48 915 + 350 | 60.43 +102 |
| 5 11.2 | 51 094 + 378 | 52.92 +79 | 63 216 + 925 | 45.49 -1 | 32 288 + 320 | 33.71 +164 | 49 267 + 352 | 59.46 +97 |
| 5 21.2 | 51 462 + 368 | 52.30 +62 | 64 105 + 889 | 45.94 -45 | 32 597 + 309 | 35.74 +203 | 49 611 + 344 | 58.59 +87 |
| 5 31.1 | 51 815 + 353 | 51.86 +44 | 64 943 + 838 | 46.79 -85 | 32 888 + 291 | 38.06 +232 | 49 942 + 331 | 57.85 +74 |
| 6 10.1 | 52 147 + 332 | 51.62 +24 | 65 717 + 774 | 48.05 -126 | 33 156 + 268 | 40.64 +258 | 50 253 + 311 | 57.25 +60 |
| 6 20.1 | 52 446 + 299 | 51.60 +2 | 66 398 + 681 | 49.69 -164 | 33 390 + 234 | 43.39 +275 | 50 534 + 281 | 56.83 +23 |
| 6 30.1 | 52 708 + 262 | 51.78 -18 | 66 980 + 582 | 51.63 -194 | 33 588 + 198 | 46.20 +281 | 50 782 + 248 | 56.60 +42 |
| 7 10.0 | 52 927 + 219 | 52.18 -40 | 67 446 + 466 | 53.86 -223 | 33 745 + 157 | 49.05 +285 | 50 989 + 207 | 56.55 +5 |
| 7 20.0 | 53 094 + 167 | 52.77 -59 | 67 777 + 331 | 56.29 -243 | 33 854 + 109 | 51.83 +278 | 51 148 + 159 | 56.69 -14 |
| 7 30.0 | 53 210 + 116 | 53.52 -75 | 67 977 + 200 | 58.85 -256 | 33 917 + 63 | 54.49 +266 | 51 260 + 112 | 56.99 -30 |
| 8 9.0 | 53 271 + 61 | 54.40 -88 | 68 034 + 57 | 61.46 -261 | 33 931 + 14 | 57.00 +251 | 51 321 + 61 | 57.44 -45 |
| 8 18.9 | 53 275 + 4 | 55.36 -96 | 67 946 -88 | 64.02 -256 | 33 897 -34 | 59.26 +226 | 51 330 + 9 | 58.00 -56 |
| 8 28.9 | 53 231 -44 | 56.36 -100 | 67 731 -215 | 66.45 -243 | 33 821 -76 | 61.26 +200 | 51 293 -37 | 58.64 -64 |
| 9 7.9 | 53 138 -93 | 57.36 -100 | 67 387 -344 | 68.66 -221 | 33 705 -116 | 62.98 +172 | 51 211 + 159 | 59.32 -68 |
| 9 17.8 | 53 005 -133 | 58.29 -93 | 66 936 -451 | 70.54 -188 | 33 555 -150 | 64.33 +135 | 51 092 -119 | 60.00 -68 |
| 9 27.8 | 52 844 -161 | 59.11 -82 | 66 404 -532 | 72.04 -150 | 33 382 -173 | 65.36 +103 | 50 947 -145 | 60.63 -63 |
| 10 7.8 | 52 660 -184 | 59.78 -67 | 65 806 -598 | 73.08 -104 | 33 190 -192 | 66.00 +64 | 50 781 -166 | 61.20 -57 |
| 10 17.8 | 52 469 -191 | 60.27 -49 | 65 179 -627 | 73.60 -52 | 32 993 -197 | 66.25 +25 | 50 608 -173 | 61.65 -45 |
| 10 27.7 | 52 283 -186 | 60.55 -28 | 64 552 -627 | 73.60 +0 | 32 797 -196 | 66.11 -14 | 50 439 -169 | 61.97 -32 |
| 11 6.7 | 52 109 -174 | 60.61 -6 | 63 948 -604 | 73.05 +55 | 32 612 -185 | 65.57 -54 | 50 282 -157 | 62.16 -19 |
| 11 16.7 | 51 963 -146 | 60.45 +16 | 63 407 -541 | 71.95 +110 | 32 447 -165 | 64.63 -94 | 50 150 -132 | 62.19 -3 |
| 11 26.7 | 51 850 -113 | 60.09 +36 | 62 946 -461 | 70.38 +157 | 32 309 -138 | 63.32 -131 | 50 048 -102 | 62.10 +9 |
| 12 6.6 | 51 776 -74 | 59.53 +56 | 62 587 -359 | 68.34 +204 | 32 202 -107 | 61.65 -167 | 49 982 -66 | 61.87 +23 |
| 12 16.6 | 51 750 -26 | 58.81 +72 | 62 354 -233 | 65.94 +240 | 32 135 -67 | 59.68 -197 | 49 959 -23 | 61.53 +34 |
| 12 26.6 | 51 769 +19 | 57.96 +85 | 62 246 -108 | 63.25 +269 | 32 105 -30 | 57.47 -221 | 49 978 +19 | 61.09 +44 |
| 12 36.5 | 51 835 +66 | 56.99 +97 | 62 276 +30 | 60.33 +292 | 32 116 +11 | 55.05 -242 | 50 040 +62 | 60.57 +52 |
| | 51 835 +112 | 56.99 +105 | 62 276 +168 | 60.33 +302 | 32 116 +54 | 55.05 -249 | 50 040 +104 | 60.57 +55 |
| Mean Place | 51.586 | 49.01 | 62.942 | 51.21 | 32.691 | 56.96 | 49.796 | 53.16 |
| sec δ, tan δ | +1.225 | -0.708 | +3.410 | -3.260 | +1.130 | +0.525 | +1.130 | -0.526 |
| dα(ψ), dδ(ψ) | +0.077 | +0.20 | +0.136 | +0.20 | +0.049 | +0.20 | +0.073 | +0.20 |
| dα(ε), dδ(ε) | +0.023 | -0.87 | +0.108 | -0.87 | -0.018 | -0.86 | +0.018 | -0.86 |
| Dble. Trans. | July 22 | | July 22 | | July 22 | | July 23 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 1524 | | 755 | | 754 | | 1525 | | |
|--------------|-----------|---------------|--------------|--------------|------------|--------------|------------|--------------|------------|
| | τ Aquilae | | ξ Telescopii | | δ Pavonis | | 28 Cygni | | |
| Mag.Spect. | 5.65 | K0 | 4.86 | M0 | 3.64 | G5 | 4.82 | B2p | |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " | |
| | 20 03 | + 7 13 | 20 06 | - 52 55 | 20 07 | - 66 12 | 20 08 | + 36 47 | |
| 1 | -8.4 | 25 40.1 - 14 | 69.16 -138 | 16.430 - 35 | 35 32 +167 | 18.076 - 93 | 86 20 +225 | 52 246 - 79 | 50 82 -235 |
| 1 | 1.6 | 25 42.4 + 23 | 67.69 -147 | 16.458 + 28 | 33.45 +187 | 18.079 + 3 | 83.71 +249 | 52 211 - 35 | 48 24 -268 |
| 1 | 11.5 | 25 48.1 + 57 | 66.16 -153 | 16.547 + 89 | 31.43 +202 | 18.176 + 97 | 81.05 +266 | 52 219 + 8 | 45 45 -279 |
| 1 | 21.5 | 25 57.5 + 94 | 64.64 -152 | 16.700 + 153 | 29.31 +212 | 18.372 + 196 | 78.29 +276 | 52 274 + 55 | 42.60 -285 |
| 1 | 31.5 | 25 70.1 + 126 | 63.19 -145 | 16.908 + 208 | 27.16 +215 | 18.654 + 282 | 75.54 +275 | 52.373 + 99 | 39.79 -281 |
| 2 | 10.4 | 25.859 + 158 | 61.87 -132 | 17.168 + 260 | 25.00 +216 | 19.018 + 364 | 72.82 +272 | 52.514 + 141 | 37.10 -269 |
| 2 | 20.4 | 26.047 + 188 | 60.78 -109 | 17.479 + 311 | 22.89 +211 | 19.461 + 443 | 70.22 +260 | 52.699 + 185 | 34.67 -243 |
| 3 | 2.4 | 26.260 + 213 | 59.94 - 84 | 17.830 + 351 | 20.89 +200 | 19.965 + 504 | 67.80 +242 | 52.919 + 220 | 32.61 -206 |
| 3 | 12.4 | 26.497 + 237 | 59.41 - 53 | 18.219 + 389 | 18.99 +190 | 20.530 + 565 | 65.57 +223 | 53.175 + 256 | 30.96 -165 |
| 3 | 22.3 | 26.757 + 260 | 59.24 - 17 | 18.642 + 423 | 17.27 +172 | 21.144 + 614 | 63.63 +194 | 53.462 + 287 | 29.83 -113 |
| 4 | 1.3 | 27.033 + 276 | 59.43 + 19 | 19.089 + 447 | 15.73 +154 | 21.792 + 648 | 61.97 +166 | 53.771 + 309 | 29.25 - 58 |
| 4 | 11.3 | 27.325 + 188 | 59.97 + 54 | 19.559 + 470 | 14.40 +133 | 22.473 + 681 | 60.64 +133 | 54.100 + 329 | 29.22 - 3 |
| 4 | 21.3 | 27.626 + 301 | 60.88 + 91 | 20.043 + 484 | 13.33 +107 | 23.172 + 699 | 59.67 + 97 | 54.441 + 341 | 29.79 + 57 |
| 5 | 1.2 | 27.932 + 306 | 62.09 +121 | 20.532 + 489 | 12.52 + 81 | 23.874 + 702 | 59.08 + 59 | 54.785 + 344 | 30.88 +109 |
| 5 | 11.2 | 28.239 + 307 | 63.58 +149 | 21.022 + 490 | 12.00 + 52 | 24.574 + 700 | 58.87 + 21 | 55.127 + 342 | 32.47 +159 |
| 5 | 21.2 | 28.538 + 299 | 65.31 +173 | 21.500 + 478 | 11.81 + 19 | 25.253 + 679 | 59.07 - 20 | 55.457 + 330 | 34.52 +205 |
| 5 | 31.1 | 28.823 + 285 | 67.18 +187 | 21.958 + 458 | 11.92 - 11 | 25.898 + 645 | 59.65 - 58 | 55.767 + 310 | 36.93 +241 |
| 6 | 10.1 | 29.090 + 267 | 69.18 +200 | 22.388 + 430 | 12.35 - 43 | 26.500 + 602 | 60.62 - 97 | 56.051 + 284 | 39.65 +272 |
| 6 | 20.1 | 29.329 + 239 | 71.22 +204 | 22.775 + 387 | 13.10 - 75 | 27.037 + 537 | 61.97 -135 | 56.299 + 248 | 42.60 +295 |
| 6 | 30.1 | 29.536 + 207 | 73.24 +202 | 23.114 + 339 | 14.12 -102 | 27.503 + 466 | 63.61 -164 | 56.507 + 208 | 45.66 +306 |
| 7 | 10.0 | 29.707 + 171 | 75.22 +198 | 23.397 + 283 | 15.42 -130 | 27.885 + 382 | 65.56 -195 | 56.670 + 163 | 48.81 +315 |
| 7 | 20.0 | 29.835 + 128 | 77.08 +186 | 23.612 + 215 | 16.93 -151 | 28.169 + 284 | 67.72 -216 | 56.781 + 111 | 51.92 +311 |
| 7 | 30.0 | 29.921 + 86 | 78.79 +171 | 23.761 + 149 | 18.60 -167 | 28.357 + 188 | 70.03 -231 | 56.843 + 62 | 54.94 +302 |
| 8 | 9.0 | 29.962 + 41 | 80.34 +155 | 23.836 + 75 | 20.40 -180 | 28.438 + 81 | 72.43 -240 | 56.852 + 9 | 57.83 +289 |
| 8 | 18.9 | 29.957 - 5 | 81.67 +133 | 23.837 + 1 | 22.22 -182 | 28.412 - 26 | 74.82 -239 | 56.808 - 44 | 60.47 +264 |
| 8 | 28.9 | 29.913 - 44 | 82.80 +113 | 23.772 - 65 | 24.01 -179 | 28.291 - 121 | 77.11 -229 | 56.719 - 89 | 62.86 +239 |
| 9 | 7.9 | 29.829 - 84 | 83.70 + 90 | 23.642 - 130 | 25.71 -170 | 28.074 - 217 | 79.25 -214 | 56.586 - 133 | 64.95 +209 |
| 9 | 17.8 | 29.715 - 114 | 84.36 + 66 | 23.457 - 185 | 27.23 -152 | 27.776 - 298 | 81.09 -184 | 56.416 - 170 | 66.66 +171 |
| 9 | 27.8 | 29.578 - 137 | 84.79 + 43 | 23.230 - 227 | 28.50 -127 | 27.417 - 359 | 82.61 -152 | 56.219 - 197 | 68.00 +134 |
| 10 | 7.8 | 29.423 - 155 | 84.99 + 20 | 22.971 - 259 | 29.48 - 98 | 27.008 - 409 | 83.74 -113 | 56.001 - 218 | 68.92 + 92 |
| 10 | 17.8 | 29.263 - 160 | 84.94 - 5 | 22.698 - 273 | 30.10 - 62 | 26.577 - 431 | 84.38 - 64 | 55.774 - 227 | 69.40 + 48 |
| 10 | 27.7 | 29.106 - 157 | 84.68 - 26 | 22.427 - 271 | 30.35 - 25 | 26.144 - 433 | 84.56 - 18 | 55.547 - 227 | 69.44 + 4 |
| 11 | 6.7 | 28.959 - 147 | 84.19 - 49 | 22.168 - 259 | 30.21 + 14 | 25.727 - 417 | 84.22 + 34 | 55.327 - 220 | 69.01 - 43 |
| 11 | 16.7 | 28.833 - 126 | 83.47 - 72 | 21.942 - 226 | 29.67 + 54 | 25.356 - 371 | 83.39 + 83 | 55.128 - 199 | 68.12 - 89 |
| 11 | 26.7 | 28.731 - 102 | 82.57 - 90 | 21.757 - 185 | 28.77 + 90 | 25.043 - 313 | 82.10 +129 | 54.954 - 174 | 66.81 -131 |
| 12 | 6.6 | 28.660 - 71 | 81.45 -112 | 21.623 - 134 | 27.53 +124 | 24.802 - 241 | 80.37 +173 | 54.811 - 143 | 65.06 -175 |
| 12 | 16.6 | 28.626 - 34 | 80.19 -126 | 21.550 - 73 | 25.99 +154 | 24.653 - 149 | 78.29 +208 | 54.709 - 102 | 62.95 -211 |
| 12 | 26.6 | 28.626 + 0 | 78.81 -138 | 21.538 - 12 | 24.22 +177 | 24.594 - 59 | 75.92 +237 | 54.647 - 62 | 60.54 -241 |
| 12 | 36.5 | 28.663 + 37 | 77.32 -149 | 21.589 + 51 | 22.25 +197 | 24.632 + 38 | 73.32 +260 | 54.629 - 18 | 57.88 -266 |
| | | 28.663 + 73 | 77.32 -150 | 21.589 + 116 | 22.25 +209 | 24.632 + 137 | 73.32 +273 | 54.629 + 29 | 57.88 -279 |
| Mean Place | 28.764 | 81.26 | 21.410 | 13.33 | 24.693 | 63.57 | 55.522 | 57.93 | |
| sec δ, tan δ | +1.008 | +0.127 | +1.659 | -1.323 | +2.480 | -2.269 | +1.249 | +0.748 | |
| dα(ψ), dδ(ψ) | +0.058 | +0.20 | +0.091 | +0.21 | +0.112 | +0.21 | +0.044 | +0.21 | |
| dα(ε), dδ(ε) | -0.004 | -0.86 | +0.046 | -0.85 | +0.080 | -0.85 | -0.027 | -0.85 | |
| Dble.Trans. | July 23 | | July 24 | | July 24 | | July 24 | | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 759 | | 756 | | 758 | | 757 | | |
|--------------|-----------|---------------|-------------|--------------|-------------|--------------|-------------|--------------|-------------|
| Name | α Cephei* | | η Aquilae | | 33 Cygni | | ο² Cygni | | |
| Mag.Spect. | 4.43 | B9 | 3.37 | A0 | 4.32 | A3 | 3.95 var. | K0, B8 | |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " | |
| | 20 09 | + 77 39 | 20 10 | - 0 51 | 20 13 | + 56 31 | 20 13 | + 46 41 | |
| 1 | -8.4 | 16.552 - 710 | 73.31 - 251 | 33.100 - 12 | 57.47 - 98 | 01.579 - 193 | 29.66 - 257 | 09.049 - 125 | 54.48 - 249 |
| 1 | 1.6 | 15.999 - 553 | 70.44 - 287 | 33.124 + 24 | 58.51 - 104 | 01.447 - 132 | 26.76 - 290 | 08.973 - 76 | 51.71 - 277 |
| 1 | 11.5 | 15.617 - 382 | 67.25 - 319 | 33.182 + 58 | 59.56 - 105 | 01.378 - 69 | 23.59 - 317 | 08.948 - 25 | 48.69 - 302 |
| 1 | 21.5 | 15.435 - 182 | 63.88 - 337 | 33.276 + 94 | 60.59 - 103 | 01.382 + 4 | -331 | 08.979 + 31 | 45.56 - 313 |
| 1 | 31.5 | 15.442 + 7 | 60.46 - 342 | 33.401 + 125 | 61.54 - 95 | 01.453 + 71 | -331 | 09.063 + 84 | 42.46 - 310 |
| 2 | 10.5 | 15.645 + 203 | 57.10 - 336 | 33.557 + 156 | 62.39 - 85 | 01.593 + 140 | -323 | 09.199 + 136 | 39.45 - 301 |
| 2 | 20.4 | 16.043 + 398 | 53.95 - 315 | 33.743 + 186 | 63.04 - 65 | 01.801 + 208 | -297 | 09.388 + 189 | 36.70 - 275 |
| 3 | 2.4 | 16.606 + 563 | 51.14 - 281 | 33.954 + 211 | 63.46 - 42 | 02.068 + 267 | -262 | 09.622 + 234 | 34.32 - 238 |
| 3 | 12.4 | 17.326 + 720 | 48.73 - 241 | 34.190 + 236 | 63.64 - 18 | 02.391 + 323 | -218 | 09.899 + 277 | 32.36 - 196 |
| 3 | 22.3 | 18.174 + 848 | 46.88 - 185 | 34.447 + 257 | 63.51 + 13 | 02.763 + 372 | -161 | 10.214 + 315 | 30.95 - 141 |
| 4 | 1.3 | 19.108 + 934 | 45.61 - 127 | 34.722 + 275 | 63.10 + 41 | 03.169 + 406 | -103 | 10.557 + 343 | 30.11 - 84 |
| 4 | 11.3 | 20.112 + 1004 | 44.96 - 65 | 35.013 + 291 | 62.41 + 69 | 03.605 + 436 | -41 | 10.924 + 367 | 29.87 - 24 |
| 4 | 21.3 | 21.140 + 1028 | 44.98 + 2 | 35.316 + 303 | 61.42 + 99 | 04.055 + 450 | + 26 | 11.305 + 381 | 30.26 + 39 |
| 5 | 1.2 | 22.155 + 1015 | 45.61 + 63 | 35.623 + 307 | 60.21 + 121 | 04.506 + 451 | + 86 | 11.688 + 383 | 31.22 + 96 |
| 5 | 11.2 | 23.136 + 981 | 46.86 + 125 | 35.934 + 311 | 58.80 + 141 | 04.952 + 446 | + 146 | 12.069 + 381 | 32.75 + 153 |
| 5 | 21.2 | 24.039 + 903 | 48.68 + 182 | 36.238 + 304 | 57.22 + 158 | 05.375 + 423 | + 201 | 12.433 + 364 | 34.79 + 204 |
| 5 | 31.2 | 24.841 + 802 | 50.97 + 229 | 36.531 + 293 | 55.55 + 167 | 05.765 + 390 | + 245 | 12.774 + 341 | 37.23 + 244 |
| 6 | 10.1 | 25.527 + 686 | 53.70 + 273 | 36.807 + 276 | 53.82 + 173 | 06.115 + 350 | + 286 | 12.882 + 309 | 40.05 + 282 |
| 6 | 20.1 | 26.061 + 534 | 56.77 + 307 | 37.056 + 249 | 52.10 + 172 | 06.409 + 294 | + 317 | 13.083 + 267 | 43.13 + 308 |
| 6 | 30.1 | 26.443 + 382 | 60.07 + 330 | 37.275 + 219 | 50.43 + 167 | 06.646 + 237 | + 336 | 13.350 + 220 | 46.39 + 326 |
| 7 | 10.0 | 26.660 + 217 | 63.56 + 349 | 37.458 + 183 | 48.85 + 158 | 06.818 + 172 | + 351 | 13.739 + 169 | 49.76 + 337 |
| 7 | 20.0 | 26.696 + 36 | 67.13 + 357 | 37.599 + 141 | 47.40 + 145 | 06.918 + 100 | + 355 | 13.848 + 109 | 53.14 + 338 |
| 7 | 30.0 | 26.568 - 128 | 70.68 + 355 | 37.698 + 99 | 46.11 + 129 | 06.949 + 31 | + 350 | 13.900 + 52 | 56.45 + 331 |
| 8 | 9.0 | 26.268 - 300 | 74.18 + 350 | 37.752 + 54 | 44.98 + 113 | 06.908 - 41 | + 340 | 13.900 - 8 | 56.45 + 320 |
| 8 | 18.9 | 25.802 - 466 | 77.49 + 331 | 37.760 + 8 | 44.06 + 92 | 06.797 - 111 | + 319 | 13.892 - 66 | 59.65 + 297 |
| 8 | 28.9 | 25.193 - 609 | 80.59 + 310 | 37.727 - 33 | 43.32 + 74 | 06.624 - 173 | + 294 | 13.708 - 118 | 65.34 + 272 |
| 9 | 7.9 | 24.442 - 751 | 83.41 + 282 | 37.655 - 72 | 42.76 + 56 | 06.390 - 234 | + 263 | 13.539 - 169 | 67.75 + 241 |
| 9 | 17.8 | 23.573 - 869 | 85.85 + 244 | 37.551 - 104 | 42.41 + 35 | 06.107 - 283 | + 224 | 13.328 - 211 | 69.77 + 202 |
| 9 | 27.8 | 22.612 - 961 | 87.90 + 205 | 37.423 - 128 | 42.22 + 19 | 06.785 - 322 | + 183 | 13.087 - 241 | 71.40 + 163 |
| 10 | 7.8 | 21.567 - 1045 | 89.50 + 160 | 37.276 - 147 | 42.20 + 2 | 05.431 - 354 | + 137 | 12.819 - 268 | 72.58 + 118 |
| 10 | 17.8 | 20.479 - 1088 | 90.58 + 108 | 37.123 - 153 | 42.35 - 15 | 05.062 - 369 | + 84 | 12.539 - 280 | 73.27 + 69 |
| 10 | 27.7 | 19.368 - 1111 | 91.15 + 57 | 36.972 - 151 | 42.64 - 29 | 04.688 - 374 | + 35 | 12.258 - 281 | 73.49 + 22 |
| 11 | 6.7 | 18.256 - 1112 | 91.15 + 0 | 36.830 - 142 | 43.09 - 45 | 04.319 - 369 | - 21 | 11.982 - 276 | 73.18 - 31 |
| 11 | 16.7 | 17.186 - 1070 | 90.58 - 57 | 36.708 - 122 | 43.66 - 57 | 03.972 - 347 | - 77 | 11.782 - 256 | 73.18 - 82 |
| 11 | 26.7 | 16.177 - 1009 | 89.46 - 112 | 36.610 - 98 | 44.36 - 70 | 03.655 - 317 | - 128 | 11.497 - 229 | 72.36 - 130 |
| 12 | 6.6 | 15.256 - 921 | 87.77 - 169 | 36.542 - 68 | 45.18 - 82 | 03.377 - 278 | - 181 | 11.301 - 196 | 69.26 - 180 |
| 12 | 16.6 | 14.463 - 793 | 85.59 - 218 | 36.510 - 32 | 46.09 - 91 | 03.151 - 226 | - 228 | 11.150 - 151 | 67.05 - 221 |
| 12 | 26.6 | 13.808 - 655 | 82.98 - 261 | 36.512 + 2 | 47.07 - 98 | 02.981 - 170 | - 266 | 11.044 - 106 | 64.48 - 257 |
| 12 | 36.5 | 13.321 - 487 | 79.98 - 300 | 36.550 + 38 | 48.10 - 103 | 02.874 - 107 | - 301 | 10.988 - 56 | 61.61 - 287 |
| | | - 300 | - 323 | + 74 | - 101 | - 37 | - 320 | + 0 | - 303 |
| Mean Place | 21.699 | 76.23 | 36.516 | 43.62 | 05.090 | 34.12 | 12.391 | 60.09 | |
| sec δ, tan δ | +4.683 | +4.575 | +1.000 | -0.015 | +1.813 | +1.512 | +1.458 | +1.061 | |
| dα(ψ), dδ(ψ) | -0.041 | +0.21 | +0.062 | +0.21 | +0.028 | +0.22 | +0.038 | +0.22 | |
| dα(ε), dδ(ε) | -0.163 | -0.84 | +0.001 | -0.84 | -0.055 | -0.84 | -0.039 | -0.84 | |
| Dble.Trans. | July 24 | | July 25 | | July 25 | | July 25 | | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 1526 | | 760 | | 1527 | | 1529 | | |
|--------------|---------------------------------------|---|---------------------------------------|---|---------------------------------------|---|---------------------------------------|---|-------------|
| | α Aquilae | | 24 Vulpeculae | | α ¹ Capricorni | | 4 Capricorni | | |
| Mag. Spect. | 4.96 | A0 | 5.45 | K0 | 4.55 | G0p | 5.96 | K0 | |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | |
| | ^h ^m 20 13 | ^o ['] + 15 08 | ^h ^m 20 16 | ^o ['] + 24 37 | ^h ^m 20 16 | ^o ['] - 12 33 | ^h ^m 20 17 | ^o ['] - 21 51 | |
| 1 | -8.4 | 35.869 - 32 | 70.10 - 166 | 09.177 - 51 | 35.31 - 197 | 50.482 - 11 | 18.56 - 41 | 10.196 - 10 | 26.92 + 6 |
| 1 | 1.6 | 35.874 + 5 | 68.31 - 179 | 09.163 - 14 | 33.15 - 216 | 50.508 + 26 | 18.94 - 38 | 10.225 + 29 | 26.78 + 14 |
| 1 | 11.5 | 35.913 + 39 | 66.42 - 189 | 09.187 + 24 | 30.84 - 231 | 50.569 + 61 | 19.29 - 35 | 10.292 + 67 | 26.58 + 20 |
| 1 | 21.5 | 35.990 + 77 | 64.51 - 191 | 09.251 + 64 | 28.49 - 235 | 50.666 + 97 | 19.55 - 26 | 10.400 + 108 | 26.49 + 9 |
| 1 | 31.5 | 36.101 + 111 | 62.67 - 184 | 09.351 + 100 | 26.19 - 230 | 50.792 + 126 | 19.81 - 26 | 10.530 + 130 | 25.94 + 55 |
| 2 | 10.5 | 36.244 + 143 | 60.95 - 172 | 09.488 + 137 | 24.01 - 218 | 50.954 + 162 | 19.93 - 12 | 10.702 + 172 | 25.47 + 47 |
| 2 | 20.4 | 36.421 + 177 | 59.46 - 149 | 09.660 + 172 | 22.07 - 194 | 51.145 + 191 | 19.90 + 3 | 10.905 + 203 | 24.90 + 57 |
| 3 | 2.4 | 36.624 + 203 | 58.27 - 119 | 09.863 + 203 | 20.45 - 162 | 51.360 + 215 | 19.71 + 19 | 11.134 + 229 | 24.22 + 68 |
| 3 | 12.4 | 36.855 + 231 | 57.41 - 86 | 10.097 + 234 | 19.20 - 125 | 51.601 + 241 | 19.33 + 38 | 11.389 + 256 | 23.42 + 80 |
| 3 | 22.3 | 37.110 + 255 | 56.96 - 45 | 10.358 + 261 | 18.41 - 79 | 51.865 + 264 | 18.76 + 57 | 11.667 + 278 | 22.51 + 91 |
| 4 | 1.3 | 37.384 + 274 | 56.92 - 4 | 10.639 + 281 | 18.10 - 31 | 52.146 + 281 | 18.01 + 75 | 11.964 + 297 | 21.50 + 101 |
| 4 | 11.3 | 37.676 + 292 | 57.30 + 38 | 10.940 + 301 | 18.27 + 17 | 52.446 + 300 | 17.07 + 94 | 12.279 + 315 | 20.40 + 110 |
| 4 | 21.3 | 37.980 + 304 | 58.12 + 82 | 11.253 + 313 | 18.96 + 69 | 52.758 + 312 | 15.97 + 110 | 12.606 + 327 | 19.24 + 116 |
| 5 | 1.2 | 38.289 + 309 | 59.31 + 119 | 11.572 + 319 | 20.09 + 113 | 53.076 + 318 | 14.76 + 121 | 12.941 + 335 | 18.06 + 118 |
| 5 | 11.2 | 38.599 + 310 | 60.86 + 155 | 11.892 + 320 | 21.64 + 155 | 53.398 + 322 | 13.45 + 131 | 13.280 + 339 | 16.87 + 119 |
| 5 | 21.2 | 38.903 + 304 | 62.70 + 184 | 12.204 + 312 | 23.59 + 195 | 53.716 + 318 | 12.10 + 135 | 13.614 + 334 | 15.73 + 114 |
| 5 | 31.2 | 39.193 + 290 | 64.77 + 207 | 12.501 + 297 | 25.81 + 222 | 54.023 + 307 | 10.75 + 135 | 13.937 + 323 | 14.68 + 105 |
| 6 | 10.1 | 39.466 + 273 | 67.01 + 224 | 12.778 + 277 | 28.29 + 248 | 54.315 + 292 | 09.43 + 132 | 14.244 + 307 | 13.73 + 95 |
| 6 | 20.1 | 39.709 + 243 | 69.36 + 235 | 13.024 + 246 | 30.93 + 264 | 54.580 + 265 | 08.20 + 123 | 14.524 + 280 | 12.93 + 80 |
| 6 | 30.1 | 39.922 + 213 | 71.74 + 238 | 13.238 + 214 | 33.64 + 271 | 54.816 + 236 | 07.09 + 111 | 14.773 + 249 | 12.29 + 64 |
| 7 | 10.0 | 40.097 + 175 | 74.10 + 236 | 13.411 + 173 | 36.39 + 275 | 55.015 + 199 | 06.11 + 98 | 14.985 + 212 | 11.84 + 45 |
| 7 | 20.0 | 40.228 + 131 | 76.38 + 228 | 13.539 + 128 | 39.09 + 270 | 55.172 + 157 | 05.31 + 80 | 15.152 + 167 | 11.57 + 27 |
| 7 | 30.0 | 40.317 + 89 | 78.53 + 215 | 13.622 + 83 | 41.67 + 258 | 55.287 + 115 | 04.67 + 64 | 15.274 + 122 | 11.49 + 8 |
| 8 | 9.0 | 40.360 + 43 | 80.51 + 198 | 13.657 + 35 | 44.11 + 244 | 55.354 + 67 | 04.20 + 47 | 15.347 + 73 | 11.57 - 8 |
| 8 | 18.9 | 40.357 - 3 | 82.28 + 177 | 13.645 - 12 | 46.32 + 221 | 55.374 + 20 | 03.91 + 29 | 15.370 + 23 | 11.81 - 24 |
| 8 | 28.9 | 40.313 - 44 | 83.82 + 154 | 13.590 - 55 | 48.29 + 197 | 55.351 - 23 | 03.77 + 14 | 15.349 - 21 | 12.16 - 35 |
| 9 | 7.9 | 40.229 - 84 | 85.11 + 129 | 13.493 - 97 | 49.99 + 170 | 55.288 - 63 | 03.77 + 0 | 15.283 - 66 | 12.60 - 44 |
| 9 | 17.9 | 40.113 - 116 | 86.10 + 99 | 13.363 - 130 | 51.35 + 136 | 55.189 - 99 | 03.89 - 12 | 15.181 - 102 | 13.10 - 50 |
| 9 | 27.8 | 39.972 - 141 | 86.83 + 73 | 13.207 - 156 | 52.40 + 105 | 55.065 - 124 | 04.09 - 20 | 15.051 - 130 | 13.62 - 52 |
| 10 | 7.8 | 39.812 - 160 | 87.27 + 44 | 13.031 - 176 | 53.09 + 69 | 54.921 - 144 | 04.37 - 28 | 14.900 - 151 | 14.12 - 50 |
| 10 | 17.8 | 39.646 - 166 | 87.40 + 13 | 12.846 - 185 | 53.41 + 32 | 54.769 - 152 | 04.70 - 33 | 14.740 - 160 | 14.59 - 47 |
| 10 | 27.7 | 39.480 - 166 | 87.24 - 16 | 12.662 - 184 | 53.38 - 3 | 54.617 - 152 | 05.06 - 36 | 14.580 - 160 | 14.98 - 39 |
| 11 | 6.7 | 39.322 - 158 | 86.78 - 46 | 12.484 - 178 | 52.96 - 42 | 54.674 - 143 | 05.44 - 38 | 14.430 - 150 | 15.30 - 32 |
| 11 | 16.7 | 39.183 - 139 | 86.03 - 75 | 12.484 - 159 | 52.96 - 80 | 54.474 - 123 | 05.44 - 40 | 14.430 - 130 | 15.30 - 23 |
| 11 | 26.7 | 39.067 - 116 | 85.01 - 102 | 12.189 - 136 | 51.03 - 113 | 54.253 - 98 | 06.23 - 39 | 14.197 - 103 | 15.67 - 14 |
| 12 | 6.6 | 38.980 - 87 | 83.72 - 129 | 12.081 - 108 | 49.54 - 149 | 54.185 - 68 | 06.63 - 40 | 14.126 - 71 | 15.72 - 5 |
| 12 | 16.6 | 38.928 - 52 | 82.22 - 150 | 12.009 - 72 | 47.77 - 177 | 54.153 - 32 | 07.02 - 39 | 14.093 - 33 | 15.68 + 4 |
| 12 | 26.6 | 38.910 - 18 | 80.54 - 168 | 11.972 - 37 | 45.76 - 201 | 54.156 + 3 | 07.40 - 38 | 14.098 + 5 | 15.57 + 11 |
| 12 | 36.6 | 38.929 + 19 | 78.72 - 182 | 11.974 + 2 | 43.55 - 221 | 54.197 + 41 | 07.75 - 35 | 14.142 + 44 | 15.38 + 19 |
| | | + 57 | - 187 | + 42 | - 230 | + 77 | - 29 | + 86 | + 25 |
| Mean Place | 39.160 | 81.01 | 12.431 | 44.43 | 54.018 | 02.15 | 13.890 | 08.73 | |
| sec δ, tan δ | +1.036 | +0.271 | +1.100 | +0.458 | +1.024 | -0.223 | +1.077 | -0.401 | |
| dα(ψ), dδ(ψ) | +0.055 | +0.22 | +0.051 | +0.22 | +0.066 | +0.22 | +0.070 | +0.22 | |
| dα(ε), dδ(ε) | -0.010 | -0.83 | -0.017 | -0.83 | +0.008 | -0.83 | +0.015 | -0.83 | |
| Dble. Trans. | July 26 | | July 26 | | July 26 | | July 26 | | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 761 | | 1528 | | 1530 | | 762 | |
|--------------------------------------|------------------------------------|--------------------------------------|------------------------------------|--------------------------------------|------------------------------------|--------------------------------------|------------------------------------|--------------------------------------|
| | α^2 Capricorni | | 83 G. Telescopii | | 290 G. Sagittarii | | β Capricorni | |
| Mag. Spect. | 3.77 | G5 | 6.28 | M0 | 6.51 | K2 | 3.25 | G0, A0 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | ^h ^m 20 17 | ^o ['] - 12 35 | ^h ^m 20 17 | ^o ['] - 47 45 | ^h ^m 20 19 | ^o ['] - 35 43 | ^h ^m 20 20 | ^o ['] - 14 49 |
| 1 ⁻⁸ | 14.833 ^s - 11 | 30.84 ["] - 40 | 53.523 ^s - 37 | 34.65 ["] +137 | 55.691 ^s - 21 | 21.87 ["] + 77 | 11.663 ^s - 13 | 45.87 ["] - 29 |
| 1 ^{1.6} | 14.859 + 26 | 31.23 - 39 | 53.540 + 17 | 33.07 +158 | 55.715 + 24 | 20.96 + 91 | 11.687 + 24 | 46.13 - 26 |
| 1 ^{11.5} | 14.920 + 61 | 31.57 - 34 | 53.610 + 70 | 31.34 +173 | 55.783 + 68 | 19.92 +104 | 11.746 + 59 | 46.34 - 21 |
| 1 ^{21.5} | 15.017 + 97 | 31.82 - 25 | 53.737 + 127 | 29.47 +187 | 55.894 + 111 | 18.77 +115 | 11.842 + 96 | 46.42 - 8 |
| 1 ^{31.5} | 15.143 + 126 | 32.07 - 25 | 53.913 + 176 | 27.55 +192 | 56.045 + 151 | 17.53 +124 | 11.965 + 123 | 46.55 - 13 |
| 2 ^{10.5} | 15.305 + 162 | 32.20 - 13 | 54.135 + 222 | 25.58 +197 | 56.234 + 189 | 16.21 +132 | 12.126 + 161 | 46.52 + 3 |
| 2 ^{20.4} | 15.496 + 191 | 32.16 + 4 | 54.403 + 268 | 23.63 +195 | 56.460 + 226 | 14.85 +136 | 12.317 + 191 | 46.34 + 18 |
| 3 ^{2.4} | 15.712 + 216 | 31.96 + 20 | 54.707 + 304 | 21.72 +191 | 56.717 + 257 | 13.47 +138 | 12.532 + 215 | 46.01 + 33 |
| 3 ^{12.4} | 15.953 + 241 | 31.58 + 38 | 55.047 + 340 | 19.88 +184 | 57.003 + 286 | 12.06 +141 | 12.773 + 241 | 45.52 + 49 |
| 3 ^{22.3} | 16.217 + 264 | 31.00 + 58 | 55.420 + 373 | 18.14 +174 | 57.316 + 313 | 10.66 +140 | 13.038 + 265 | 44.85 + 67 |
| 4 ^{1.3} | 16.498 + 281 | 30.25 + 75 | 55.816 + 396 | 16.55 +159 | 57.649 + 333 | 09.29 +137 | 13.321 + 283 | 44.01 + 84 |
| 4 ^{11.3} | 16.798 + 300 | 29.31 + 94 | 56.236 + 420 | 15.11 +144 | 58.004 + 355 | 07.96 +133 | 13.622 + 301 | 43.02 + 99 |
| 4 ^{21.3} | 17.109 + 311 | 28.21 +110 | 56.672 + 436 | 13.88 +123 | 58.373 + 369 | 06.71 +125 | 13.936 + 314 | 41.89 +113 |
| 5 ^{1.2} | 17.428 + 319 | 26.99 +122 | 57.115 + 443 | 12.86 +102 | 58.750 + 377 | 05.58 +113 | 14.258 + 322 | 40.66 +123 |
| 5 ^{11.2} | 17.750 + 322 | 25.68 +131 | 57.564 + 449 | 12.10 + 76 | 59.131 + 381 | 04.58 +100 | 14.584 + 326 | 39.36 +130 |
| 5 ^{21.2} | 18.068 + 318 | 24.32 +136 | 58.004 + 440 | 11.62 + 48 | 59.508 + 377 | 03.76 + 82 | 14.906 + 322 | 38.04 +132 |
| 5 ^{31.2} | 18.375 + 307 | 22.97 +135 | 58.428 + 424 | 11.42 + 20 | 59.872 + 364 | 03.14 + 62 | 15.218 + 312 | 36.75 +129 |
| 6 ^{10.1} | 18.667 + 292 | 21.66 +131 | 58.831 + 403 | 11.52 - 10 | 60.219 + 347 | 02.73 + 41 | 15.514 + 296 | 35.50 +125 |
| 6 ^{20.1} | 18.932 + 265 | 20.43 +123 | 59.197 + 366 | 11.92 - 40 | 60.536 + 317 | 02.56 + 17 | 15.785 + 271 | 34.36 +114 |
| 6 ^{30.1} | 19.168 + 236 | 19.32 +111 | 59.522 + 325 | 12.61 - 69 | 60.818 + 282 | 02.63 - 7 | 16.026 + 241 | 33.34 +102 |
| 7 ^{10.0} | 19.368 + 200 | 18.34 + 98 | 59.797 + 275 | 13.56 - 95 | 61.059 + 241 | 02.93 - 30 | 16.232 + 206 | 32.48 + 86 |
| 7 ^{20.0} | 19.525 + 157 | 17.54 + 80 | 60.012 + 215 | 14.76 -120 | 61.249 + 190 | 03.45 - 52 | 16.394 + 162 | 31.79 + 69 |
| 7 ^{30.0} | 19.639 + 114 | 16.90 + 64 | 60.167 + 155 | 16.14 -138 | 61.389 + 140 | 04.16 - 71 | 16.513 + 119 | 31.28 + 51 |
| 8 ^{9.0} | 19.707 + 68 | 16.44 + 46 | 60.256 + 89 | 17.67 -153 | 61.473 + 84 | 05.04 - 88 | 16.585 + 72 | 30.94 + 34 |
| 8 ^{18.9} | 19.727 + 20 | 16.15 + 29 | 60.278 + 22 | 19.27 -160 | 61.501 + 28 | 06.04 -100 | 16.609 + 24 | 30.77 + 17 |
| 8 ^{28.9} | 19.705 - 22 | 16.01 + 14 | 60.239 - 39 | 20.88 -161 | 61.477 - 24 | 07.09 -105 | 16.590 - 19 | 30.75 + 2 |
| 9 ^{7.9} | 19.641 - 64 | 16.01 + 0 | 60.140 - 99 | 22.46 -158 | 61.403 - 74 | 08.18 -109 | 16.529 - 61 | 30.86 - 11 |
| 9 ^{17.9} | 19.543 - 98 | 16.13 - 12 | 59.989 - 151 | 23.90 -144 | 61.287 - 116 | 09.22 -104 | 16.433 - 96 | 31.07 - 21 |
| 9 ^{27.8} | 19.419 - 124 | 16.34 - 21 | 59.800 - 189 | 25.15 -125 | 61.138 - 149 | 10.17 - 95 | 16.310 - 123 | 31.36 - 29 |
| 10 ^{7.8} | 19.275 - 144 | 16.62 - 28 | 59.578 - 222 | 26.17 -102 | 60.962 - 176 | 10.99 - 82 | 16.166 - 144 | 31.70 - 34 |
| 10 ^{17.8} | 19.122 - 153 | 16.96 - 34 | 59.343 - 235 | 26.88 - 71 | 60.776 - 186 | 11.63 - 64 | 16.013 - 153 | 32.07 - 37 |
| 10 ^{27.7} | 18.971 - 151 | 17.31 - 35 | 59.105 - 238 | 27.28 - 40 | 60.589 - 187 | 12.06 - 43 | 15.861 - 152 | 32.45 - 38 |
| 11 ^{6.7} | 18.828 - 143 | 17.70 - 39 | 58.877 - 228 | 27.32 - 4 | 60.410 - 179 | 12.26 - 20 | 15.717 - 144 | 32.83 - 38 |
| 11 ^{16.7} | 18.705 - 123 | 18.09 - 39 | 58.677 - 200 | 27.01 + 31 | 60.255 - 155 | 12.23 + 3 | 15.592 - 125 | 33.19 - 36 |
| 11 ^{26.7} | 18.607 - 98 | 18.48 - 39 | 58.510 - 167 | 26.37 + 64 | 60.128 - 127 | 11.97 + 26 | 15.492 - 100 | 33.52 - 33 |
| 12 ^{6.6} | 18.539 - 68 | 18.89 - 41 | 58.387 - 123 | 25.41 + 96 | 60.037 - 91 | 11.49 + 48 | 15.421 - 71 | 33.85 - 33 |
| 12 ^{16.6} | 18.508 - 31 | 19.27 - 38 | 58.317 - 70 | 24.16 +125 | 59.991 - 46 | 10.81 + 68 | 15.387 - 34 | 34.13 - 28 |
| 12 ^{26.6} | 18.511 + 3 | 19.65 - 38 | 58.300 - 17 | 22.69 +147 | 59.987 - 4 | 09.96 + 85 | 15.388 + 1 | 34.39 - 26 |
| 12 ^{36.6} | 18.551 + 40 | 20.00 - 35 | 58.338 + 38 | 21.01 +168 | 60.028 + 41 | 08.97 + 99 | 15.427 + 39 | 34.61 - 22 |
| | 18.551 + 78 | 20.00 - 28 | 58.338 + 94 | 21.01 +181 | 60.028 + 87 | 08.97 +111 | 15.427 + 76 | 34.61 - 14 |
| Mean Place | 18.370 | 14.40 | 58.063 | 12.18 | 59.716 | 01.02 | 15.219 | 28.84 |
| sec δ , tan δ | +1.025 | -0.223 | +1.487 | -1.101 | +1.232 | -0.719 | +1.034 | -0.265 |
| $da(\psi)$, $d\delta(\psi)$ | +0.066 | +0.22 | +0.085 | +0.23 | +0.077 | +0.23 | +0.067 | +0.23 |
| $da(\epsilon)$, $d\delta(\epsilon)$ | +0.008 | -0.83 | +0.042 | -0.82 | +0.027 | -0.82 | +0.010 | -0.82 |
| Dble. Trans. | July 26 | | July 27 | | July 27 | | July 27 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 763 | | 765 | | 1531 | | 764 | |
|--------------|---------------------------|---------|---------|---------|----------------|--------|-----------|---------|
| | α ¹ Sagittarii | | γ Cygni | | 132 G. Aquilae | | α Pavonis | |
| Mag.Spect. | 5.64 | A0 | 2.32 | F8p | 5.41 | K0 | 2.12 | B3 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " |
| | 20 21 | - 42 05 | 20 21 | + 40 12 | 20 22 | + 5 17 | 20 24 | - 56 46 |
| 1 | -8.4 | 28.447 | 56.69 | 41.343 | 40.60 | 27.246 | 30.115 | 69.38 |
| 1 | 1.6 | 28.466 | 55.42 | 41.284 | 38.02 | 27.254 | 30.106 | 67.37 |
| 1 | 11.5 | 28.532 | 54.01 | 41.269 | 35.21 | 27.296 | 30.162 | 65.15 |
| 1 | 21.5 | 28.648 | 52.47 | 41.303 | 32.30 | 27.373 | 30.288 | 62.79 |
| 1 | 31.5 | 28.808 | 50.85 | 41.383 | 29.40 | 27.482 | 30.476 | 60.38 |
| 2 | 10.5 | 29.010 | 49.17 | 41.508 | 26.59 | 27.622 | 30.724 | 57.93 |
| 2 | 20.4 | 29.252 | 47.47 | 41.680 | 24.03 | 27.793 | 31.029 | 55.52 |
| 3 | 2.4 | 29.528 | 45.79 | 41.892 | 21.81 | 27.990 | 31.380 | 53.20 |
| 3 | 12.4 | 29.837 | 44.12 | 42.143 | 19.99 | 28.214 | 31.778 | 51.00 |
| 3 | 22.3 | 30.175 | 42.51 | 42.429 | 18.70 | 28.462 | 32.217 | 48.97 |
| 4 | 1.3 | 30.536 | 40.99 | 42.741 | 17.94 | 28.729 | 32.686 | 47.15 |
| 4 | 11.3 | 30.919 | 39.57 | 43.077 | 17.75 | 29.015 | 33.184 | 45.56 |
| 4 | 21.3 | 31.318 | 38.30 | 43.428 | 18.17 | 29.314 | 33.703 | 44.25 |
| 5 | 1.2 | 31.725 | 37.20 | 43.784 | 19.13 | 29.620 | 34.230 | 43.25 |
| 5 | 11.2 | 32.137 | 36.30 | 44.141 | 20.62 | 29.930 | 34.764 | 42.56 |
| 5 | 21.2 | 32.543 | 35.63 | 44.486 | 22.60 | 30.235 | 35.289 | 42.23 |
| 5 | 31.2 | 32.936 | 35.21 | 44.812 | 24.96 | 30.530 | 35.795 | 42.25 |
| 6 | 10.1 | 33.310 | 35.05 | 45.114 | 27.68 | 30.809 | 36.276 | 42.62 |
| 6 | 20.1 | 33.651 | 35.18 | 45.378 | 30.65 | 31.062 | 36.712 | 43.36 |
| 6 | 30.1 | 33.955 | 35.56 | 45.602 | 33.77 | 31.286 | 37.100 | 44.41 |
| 7 | 10.0 | 34.214 | 36.20 | 45.780 | 37.01 | 31.475 | 37.429 | 45.77 |
| 7 | 20.0 | 34.418 | 37.08 | 45.905 | 40.24 | 31.622 | 37.686 | 47.39 |
| 7 | 30.0 | 34.568 | 38.14 | 45.978 | 43.40 | 31.727 | 37.872 | 49.20 |
| 8 | 9.0 | 34.658 | 39.37 | 45.996 | 46.45 | 31.787 | 37.978 | 51.16 |
| 8 | 18.9 | 34.686 | 40.70 | 45.960 | 49.28 | 31.801 | 38.003 | 53.18 |
| 8 | 28.9 | 34.658 | 42.08 | 45.875 | 51.87 | 31.775 | 37.954 | 55.19 |
| 9 | 7.9 | 34.575 | 43.44 | 45.743 | 54.16 | 31.708 | 37.830 | 57.12 |
| 9 | 17.9 | 34.445 | 44.72 | 45.572 | 56.08 | 31.608 | 37.643 | 58.87 |
| 9 | 27.8 | 34.280 | 45.86 | 45.371 | 57.64 | 31.484 | 37.407 | 60.38 |
| 10 | 7.8 | 34.085 | 46.81 | 45.146 | 58.77 | 31.339 | 37.129 | 61.59 |
| 10 | 17.8 | 33.877 | 47.52 | 44.908 | 59.44 | 31.186 | 36.830 | 62.41 |
| 10 | 27.7 | 33.668 | 47.96 | 44.668 | 59.66 | 31.033 | 36.525 | 62.84 |
| 11 | 6.7 | 33.467 | 48.11 | 44.433 | 59.40 | 30.886 | 36.229 | 62.84 |
| 11 | 16.7 | 33.290 | 47.95 | 44.215 | 58.65 | 30.757 | 35.961 | 62.40 |
| 11 | 26.7 | 33.145 | 47.50 | 44.020 | 57.46 | 30.651 | 35.733 | 61.55 |
| 12 | 6.6 | 33.038 | 46.78 | 43.856 | 55.80 | 30.572 | 35.554 | 60.29 |
| 12 | 16.6 | 32.979 | 45.81 | 43.731 | 53.75 | 30.526 | 35.438 | 58.69 |
| 12 | 26.6 | 32.967 | 44.64 | 43.645 | 51.38 | 30.513 | 35.386 | 56.81 |
| 12 | 36.6 | 33.004 | 43.28 | 43.603 | 48.71 | 30.535 | 35.401 | 54.67 |
| Mean Place | 32.692 | 34.77 | 44.623 | 47.02 | 30.568 | 57.33 | 35.195 | 45.22 |
| sec δ, tan δ | +1.348 | -0.903 | +1.310 | +0.845 | +1.004 | +0.093 | +1.825 | -1.527 |
| dα(ψ), dδ(ψ) | +0.081 | +0.23 | +0.043 | +0.23 | +0.059 | +0.23 | +0.094 | +0.23 |
| dα(ε), dδ(ε) | +0.035 | -0.82 | -0.033 | -0.81 | -0.004 | -0.81 | +0.060 | -0.81 |
| Dble.Trans. | July 28 | | July 28 | | July 28 | | July 28 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 1532 | | 1535 | | 1534 | | 1533 | |
|--------------|--------------------------|-------------|--------------------------|-------------|--------------------------|-------------|--------------------------|-------------|
| | 296 G. Sagittarii | | 42 Cygni | | 41 Cygni | | 69 Aquilae | |
| Mag.Spect. | 5.97 | K0 | 5.94 | A0 | 4.09 | F5p | 5.11 | K0 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " |
| | 20 24 | - 28 42 | 20 28 | + 36 24 | 20 28 | + 30 18 | 20 28 | - 2 55 |
| 1 -8.4 | 33 562 ^s - 19 | 47 70 + 40 | 46 236 ^s - 94 | 26.34 - 217 | 47 398 ^s - 74 | 74.77 - 203 | 53 320 ^s - 24 | 66 45 - 85 |
| 1 1.6 | 33 583 + 21 | 47 18 + 52 | 46 182 - 54 | 23 90 - 244 | 47 360 + 38 | 72.50 - 227 | 53 330 + 10 | 67 32 - 87 |
| 1 11.5 | 33 645 + 62 | 46 56 + 62 | 46 169 - 13 | 21 25 - 265 | 47 361 + 1 | 70.04 - 246 | 53 373 + 43 | 68 21 - 89 |
| 1 21.5 | 33 745 + 100 | 45 86 + 70 | 46 202 + 33 | 18 49 - 276 | 47 404 + 43 | 67.50 - 254 | 53 451 + 78 | 69 05 - 84 |
| 1 31.5 | 33 881 + 136 | 45 01 + 85 | 46 278 + 76 | 15 74 - 275 | 47 486 + 82 | 64.99 - 251 | 53 559 + 108 | 69 82 - 77 |
| 2 10.5 | 34 053 + 172 | 44 09 + 92 | 46 396 + 118 | 13.07 - 267 | 47 606 + 120 | 62.57 - 242 | 53 698 + 139 | 70 50 - 68 |
| 2 20.4 | 34 260 + 207 | 43 08 + 101 | 46 557 + 161 | 10 64 - 243 | 47 766 + 160 | 60.38 - 219 | 53 869 + 171 | 70 98 - 48 |
| 3 2.4 | 34 494 + 234 | 42 01 + 107 | 46 757 + 200 | 08.53 - 212 | 47 960 + 194 | 58 50 - 188 | 54 066 + 197 | 71 26 - 28 |
| 3 12.4 | 34 757 + 263 | 40 87 + 114 | 46 994 + 237 | 06 81 - 172 | 48 189 + 229 | 57.00 - 150 | 54 289 + 223 | 71 30 - 4 |
| 3 22.4 | 35 045 + 288 | 39 66 + 121 | 47 264 + 270 | 05.58 - 123 | 48 448 + 259 | 55.98 - 102 | 54 536 + 247 | 71 06 + 24 |
| 4 1.3 | 35 353 + 308 | 38 42 + 124 | 47 561 + 297 | 04.88 - 70 | 48 732 + 284 | 55.44 - 54 | 54 802 + 266 | 70 55 + 51 |
| 4 11.3 | 35 682 + 329 | 37 15 + 127 | 47 882 + 321 | 04.72 - 16 | 49 038 + 306 | 55.43 - 1 | 55 089 + 287 | 69 77 + 78 |
| 4 21.3 | 36 025 + 343 | 35 90 + 125 | 48 219 + 337 | 05 15 + 43 | 49 359 + 321 | 55.96 + 53 | 55 389 + 300 | 68 74 + 103 |
| 5 1.2 | 36 377 + 352 | 34 68 + 122 | 48 563 + 344 | 06 09 + 94 | 49 688 + 329 | 56 97 + 101 | 55 697 + 308 | 67 48 + 126 |
| 5 11.2 | 36 734 + 357 | 33 53 + 115 | 48 910 + 347 | 07 56 + 147 | 50 020 + 332 | 58 46 + 149 | 56 011 + 314 | 66 04 + 144 |
| 5 21.2 | 37 087 + 353 | 32 50 + 103 | 49 248 + 338 | 09 49 + 193 | 50 345 + 325 | 60 38 + 192 | 56 322 + 311 | 64 46 + 158 |
| 5 31.2 | 37 430 + 343 | 31 61 + 89 | 49 570 + 322 | 11 79 + 230 | 50 656 + 311 | 62 63 + 225 | 56 624 + 302 | 62 80 + 166 |
| 6 10.1 | 37 757 + 327 | 30 88 + 73 | 49 869 + 299 | 14 43 + 264 | 50 947 + 291 | 65 19 + 256 | 56 912 + 288 | 61 09 + 171 |
| 6 20.1 | 38 057 + 300 | 30 35 + 53 | 50 135 + 266 | 17 32 + 289 | 51 207 + 260 | 67 95 + 276 | 57 175 + 263 | 59 40 + 169 |
| 6 30.1 | 38 325 + 268 | 30 03 + 32 | 50 364 + 229 | 20 34 + 302 | 51 433 + 226 | 70 83 + 288 | 57 410 + 235 | 57 77 + 163 |
| 7 10.1 | 38 555 + 230 | 29 92 + 11 | 50 550 + 186 | 23 48 + 314 | 51 618 + 185 | 73 79 + 296 | 57 610 + 200 | 56 24 + 153 |
| 7 20.0 | 38 738 + 183 | 30 02 - 10 | 50 685 + 135 | 26 61 + 313 | 51 756 + 138 | 76 72 + 293 | 57 770 + 160 | 54 85 + 139 |
| 7 30.0 | 38 874 + 136 | 30 31 - 29 | 50 771 + 86 | 29 67 + 306 | 51 848 + 92 | 79 56 + 284 | 57 887 + 117 | 53 62 + 123 |
| 8 9.0 | 38 959 + 85 | 30 79 - 48 | 50 804 + 33 | 32 62 + 295 | 51 889 + 41 | 82 29 + 273 | 57 959 + 72 | 52 57 + 105 |
| 8 18.9 | 38 991 + 32 | 31 40 - 61 | 50 785 - 19 | 35 36 + 274 | 51 881 - 8 | 84 79 + 250 | 57 985 + 26 | 51 71 + 96 |
| 8 28.9 | 38 975 - 16 | 32 11 - 71 | 50 719 - 66 | 37 86 + 250 | 51 828 - 53 | 87 06 + 227 | 57 970 - 15 | 51 04 + 67 |
| 9 7.9 | 38 911 - 64 | 32 89 - 78 | 50 607 - 112 | 40 08 + 222 | 51 732 - 96 | 89 06 + 200 | 57 914 - 56 | 50 55 + 49 |
| 9 17.9 | 38 808 - 103 | 33 68 - 79 | 50 456 - 151 | 41 94 + 186 | 51 599 - 133 | 90 71 + 165 | 57 823 - 91 | 50 26 + 29 |
| 9 27.8 | 38 675 - 133 | 34 44 - 76 | 50 276 - 180 | 43 45 + 151 | 51 438 - 161 | 92 03 + 132 | 57 707 - 116 | 50 12 + 14 |
| 10 7.8 | 38 517 - 158 | 35 14 - 70 | 50 071 - 205 | 44 56 + 111 | 51 254 - 184 | 92 98 + 95 | 57 569 - 138 | 50 14 - 2 |
| 10 17.8 | 38 349 - 168 | 35 73 - 59 | 49 855 - 216 | 45 23 + 67 | 51 059 - 195 | 93 51 + 53 | 57 422 - 147 | 50 32 - 18 |
| 10 27.8 | 38 179 - 170 | 36 18 - 45 | 49 634 - 221 | 45 47 + 24 | 50 861 - 198 | 93 66 + 15 | 57 274 - 148 | 50 60 - 28 |
| 11 6.7 | 38 017 - 162 | 36 48 - 30 | 49 418 - 216 | 45 25 - 22 | 50 667 - 194 | 93 39 - 27 | 57 132 - 142 | 51 02 - 42 |
| 11 16.7 | 37 875 - 142 | 36 61 - 13 | 49 217 - 201 | 44 57 - 68 | 50 490 - 177 | 92 69 - 70 | 57 007 - 125 | 51 55 - 53 |
| 11 26.7 | 37 760 - 115 | 36 57 + 4 | 49 038 - 179 | 43 46 - 111 | 50 333 - 157 | 91 61 - 108 | 56 903 - 104 | 52 17 - 62 |
| 12 6.6 | 37 678 - 82 | 36 38 + 19 | 48 886 - 152 | 41 91 - 155 | 50 204 - 129 | 90 13 - 148 | 56 827 - 76 | 52 89 - 72 |
| 12 16.6 | 37 635 - 43 | 36 04 + 34 | 48 771 - 115 | 39 98 - 193 | 50 109 - 95 | 88 32 - 181 | 56 784 - 43 | 53 67 - 78 |
| 12 26.6 | 37 631 - 4 | 35 57 + 47 | 48 693 - 78 | 37 74 - 224 | 50 048 - 61 | 86 23 - 209 | 56 773 - 11 | 54 50 - 83 |
| 12 36.6 | 37 669 + 38 | 34 98 + 59 | 48 656 + 37 | 35 22 - 252 | 50 027 - 21 | 83 89 - 234 | 56 796 + 23 | 55 37 - 87 |
| | 37 669 + 79 | 34 98 + 68 | 48 656 + 7 | 35 22 - 267 | 50 027 + 19 | 83 89 - 246 | 56 796 + 59 | 55 37 - 84 |
| Mean Place | 37.362 | 27.74 | 49.487 | 33.31 | 50.630 | 82.84 | 56.693 | 51.50 |
| sec δ, tan δ | +1.140 | -0.548 | +1.243 | +0.738 | +1.158 | +0.585 | +1.001 | -0.051 |
| da(ψ), dδ(ψ) | +0.073 | +0.23 | +0.046 | +0.24 | +0.049 | +0.24 | +0.062 | +0.24 |
| da(ε), dδ(ε) | +0.022 | -0.81 | -0.030 | -0.80 | -0.024 | -0.80 | +0.002 | -0.80 |
| Dbble.Trans. | July 28 | | July 29 | | July 29 | | July 29 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 767 | | 1538 | | 1536 | | 770 | | |
|--------------|----------|--------------|--------------------------------|--------------|------------------|--------------|-------------|--------------|--------------|
| | ♁ Cephei | | Groombridge 3241 (Draconis) | | 29 G. Capricorni | | 73 Draconis | | |
| Mag. Spect. | 4.28 | A5 | 6.42 | K2 | 5.82 | G5 | 5.18 | A2p | |
| U.T. | R.A. | | R.A. | | R.A. | | R.A. | | |
| | h m | ° / | h m | ° / | h m | ° / | h m | ° / | |
| | 20 29 | + 62 56 | 20 29 | + 72 28 | 20 31 | - 9 54 | 20 31 | + 74 53 | |
| 1 | -8.4 | 17.672 - 287 | 51 47 - 240 | 60.226 - 508 | 67.39 - 233 | 35.970 - 23 | 17.03 - 52 | 37.094 - 612 | 88.55 - 228 |
| 1 | 1.6 | 17.454 - 218 | 48.69 - 278 | 59.822 - 404 | 64.66 - 273 | 35.983 + 13 | 17.54 - 51 | 36.602 - 492 | 85.86 - 269 |
| 1 | 11.5 | 17.310 - 144 | 45.58 - 311 | 59.531 - 291 | 61.58 - 308 | 36.029 + 46 | 18.01 - 47 | 36.240 - 362 | 82.81 - 305 |
| 1 | 21.5 | 17.252 - 58 | 42.28 - 330 | 59.374 - 157 | 58.27 - 331 | 36.110 + 81 | 18.41 - 40 | 36.034 - 206 | 79.52 - 329 |
| 1 | 31.5 | 17.278 + 26 | 38.92 - 336 | 59.348 - 26 | 54.87 - 340 | 36.220 + 110 | 18.73 - 32 | 35.980 - 54 | 76.14 - 338 |
| 2 | 10.5 | 17.389 + 111 | 35.59 - 333 | 59.457 + 109 | 51.48 - 339 | 36.364 + 144 | 18.99 - 26 | 36.084 + 104 | 72.75 - 339 |
| 2 | 20.4 | 17.588 + 199 | 32.47 - 312 | 59.704 + 247 | 48.27 - 321 | 36.539 + 175 | 19.05 - 6 | 36.349 + 265 | 69.52 - 323 |
| 3 | 2.4 | 17.862 + 274 | 29.66 - 281 | 60.071 + 367 | 45.35 - 292 | 36.740 + 201 | 18.94 + 11 | 36.755 + 406 | 66.58 - 294 |
| 3 | 12.4 | 18.210 + 348 | 27.25 - 241 | 60.554 + 483 | 42.81 - 254 | 36.967 + 227 | 18.63 + 31 | 37.297 + 542 | 64.01 - 257 |
| 3 | 22.4 | 18.623 + 413 | 25.37 - 188 | 61.136 + 582 | 40.79 - 202 | 37.219 + 252 | 18.10 + 53 | 37.956 + 659 | 61.95 - 206 |
| 4 | 1.3 | 19.083 + 460 | 24.07 - 130 | 61.791 + 655 | 39.33 - 146 | 37.490 + 271 | 17.36 + 74 | 38.698 + 742 | 60.45 - 150 |
| 4 | 11.3 | 19.584 + 501 | 23.38 - 69 | 62.507 + 716 | 38.49 - 84 | 37.781 + 291 | 16.41 + 95 | 39.512 + 814 | 59.56 - 89 |
| 4 | 21.3 | 20.108 + 524 | + 2 | 63.255 + 748 | 38.31 - 18 | 38.087 + 306 | + 114 | 40.363 + 851 | 59.33 - 23 |
| 5 | 1.2 | 20.637 + 529 | 23.96 + 60 | 64.007 + 752 | 38.76 + 45 | 38.401 + 314 | + 128 | 41.219 + 856 | 59.72 + 39 |
| 5 | 11.2 | 21.164 + 527 | 25.18 + 122 | 64.750 + 743 | 39.83 + 107 | 38.722 + 321 | + 141 | 42.064 + 845 | 60.73 + 101 |
| 5 | 21.2 | 21.665 + 501 | 26.98 + 180 | 65.452 + 702 | 41.50 + 167 | 39.041 + 319 | + 148 | 42.860 + 796 | 62.35 + 162 |
| 5 | 31.2 | 22.130 + 485 | 29.25 + 227 | 66.094 + 642 | 43.66 + 216 | 39.351 + 310 | + 149 | 43.587 + 727 | 64.46 + 211 |
| 6 | 10.1 | 22.550 + 420 | 31.98 + 273 | 66.664 + 570 | 46.29 + 263 | 39.647 + 296 | + 149 | 44.230 + 643 | 67.04 + 258 |
| 6 | 20.1 | 22.905 + 355 | 35.06 + 308 | 67.135 + 471 | 49.30 + 301 | 39.919 + 272 | + 141 | 44.760 + 530 | 70.01 + 297 |
| 6 | 30.1 | 23.192 + 283 | 38.39 + 333 | 67.503 + 368 | 52.57 + 327 | 40.163 + 244 | + 131 | 45.171 + 411 | 73.26 + 325 |
| 7 | 10.1 | 23.404 + 212 | 41.92 + 353 | 67.758 + 255 | 56.08 + 351 | 40.372 + 209 | + 118 | 45.452 + 281 | 76.74 + 348 |
| 7 | 20.1 | 23.530 + 126 | 45.53 + 361 | 67.887 + 129 | 59.69 + 361 | 40.540 + 168 | + 101 | 45.588 + 136 | 80.33 + 359 |
| 7 | 30.1 | 23.575 + 45 | 49.14 + 361 | 67.897 + 10 | 63.32 + 363 | 40.666 + 126 | + 84 | 45.588 + 0 | 83.96 + 363 |
| 8 | 9.0 | 23.535 - 40 | 52.69 + 355 | 67.783 - 114 | 66.93 + 361 | 40.746 + 80 | + 66 | 45.445 - 143 | 87.57 + 361 |
| 8 | 18.9 | 23.410 - 125 | 56.08 + 339 | 67.545 - 238 | 70.39 + 346 | 40.778 + 32 | + 46 | 45.161 - 284 | 91.05 + 348 |
| 8 | 28.9 | 23.211 - 199 | 59.25 + 317 | 67.200 - 345 | 73.65 + 326 | 40.768 - 10 | + 30 | 44.755 - 406 | 94.33 + 328 |
| 9 | 7.9 | 22.938 - 273 | 62.15 + 290 | 66.748 - 452 | 76.67 + 302 | 40.716 - 52 | + 14 | 44.225 - 530 | 97.38 + 305 |
| 9 | 17.9 | 22.603 - 335 | 64.67 + 252 | 66.204 - 544 | 79.32 + 265 | 40.629 - 87 | + 0 | 43.590 - 635 | 100.08 + 270 |
| 9 | 27.8 | 22.220 - 383 | 66.81 + 214 | 65.588 - 616 | 81.61 + 229 | 40.515 - 114 | - 12 | 42.871 - 719 | 102.41 + 233 |
| 10 | 7.8 | 21.792 - 428 | 68.50 + 169 | 64.904 - 684 | 83.45 + 184 | 40.379 - 136 | - 23 | 42.073 - 798 | 104.31 + 190 |
| 10 | 17.8 | 21.340 - 452 | 69.67 + 117 | 64.181 - 723 | 84.79 + 134 | 40.232 - 147 | - 30 | 41.228 - 845 | 105.70 + 139 |
| 10 | 27.8 | 20.876 - 464 | 70.34 + 67 | 63.436 - 745 | 85.62 + 83 | 40.085 - 147 | - 36 | 40.355 - 873 | 106.59 + 89 |
| 11 | 6.7 | 20.410 - 466 | 70.44 + 10 | 62.681 - 755 | 85.88 + 26 | 39.943 - 142 | - 41 | 39.469 - 886 | 106.91 + 32 |
| 11 | 16.7 | 19.962 - 448 | 69.97 - 47 | 61.948 - 733 | 85.55 - 33 | 39.818 - 125 | - 45 | 38.609 - 864 | 106.65 - 26 |
| 11 | 26.7 | 19.542 - 420 | 68.96 - 101 | 61.251 - 687 | 84.68 - 87 | 39.715 - 103 | - 46 | 37.780 - 825 | 105.83 - 82 |
| 12 | 6.6 | 19.162 - 380 | 67.38 - 158 | 60.608 - 643 | 83.21 - 147 | 39.640 - 75 | - 49 | 37.015 - 765 | 104.43 - 140 |
| 12 | 16.6 | 18.839 - 323 | 65.30 - 208 | 60.047 - 561 | 81.22 - 199 | 39.598 - 42 | - 49 | 36.344 - 671 | 102.49 - 194 |
| 12 | 26.6 | 18.577 - 262 | 62.78 - 252 | 59.576 - 471 | 78.78 - 244 | 39.589 - 9 | - 50 | 35.774 - 570 | 100.09 - 240 |
| 12 | 36.6 | 18.388 - 189 | 59.87 - 291 | 59.216 - 360 | 75.91 - 287 | 39.615 + 26 | - 47 | 35.332 - 442 | 97.26 - 283 |
| | | - 107 | - 315 | - 235 | - 315 | + 63 | - 42 | - 297 | - 312 |
| Mean Place | 21.393 | 54.73 | 64.600 | 69.79 | 39.417 | 00.40 | 41.784 | 90.74 | |
| sec δ, tan δ | +2.199 | +1.958 | +3.323 | +3.169 | +1.015 | -0.175 | +3.841 | +3.708 | |
| dα(ψ), dδ(ψ) | +0.020 | +0.24 | -0.005 | +0.24 | +0.065 | +0.24 | -0.016 | +0.24 | |
| dα(ε), dδ(ε) | -0.079 | -0.80 | -0.129 | -0.79 | +0.007 | -0.79 | -0.152 | -0.79 | |
| Dble. Trans. | July 30 | | July 30 | | July 30 | | July 30 | | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 768 | | 1537 | | 769 | | 1539 | |
|--------------|--------------------------|-------------|--------------------------|-------------|--------------------------|-------------|--------------------------|-------------|
| | ε Delphini | | 9 G. Delphini | | α Indi | | 29 Vulpeculae | |
| Mag.Spect. | 3.98 | B5 | 6.68 | K0 | 3.21 | K0 | 4.78 | A0 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " |
| | 20 32 | + 11 15 | 20 33 | + 4 50 | 20 36 | - 47 20 | 20 37 | + 21 08 |
| 1 -8.4 | 30.832 ^s - 40 | 12.79 - 142 | 16.347 ^s - 33 | 53.81 - 116 | 32.988 ^s - 59 | 45.59 + 128 | 51.936 ^s - 60 | 62.11 - 172 |
| 1 1.6 | 30.825 - 7 | 11.26 - 153 | 16.347 + 0 | 52.57 - 124 | 32.982 - 6 | 44.08 + 151 | 51.910 - 26 | 60.21 - 190 |
| 1 11.5 | 30.852 + 27 | 09.63 - 163 | 16.379 + 32 | 51.27 - 130 | 33.026 + 44 | 42.37 + 171 | 51.919 + 9 | 58.15 - 206 |
| 1 21.5 | 30.914 + 62 | 07.99 - 164 | 16.446 + 67 | 49.98 - 129 | 33.124 + 98 | 40.50 + 187 | 51.965 + 46 | 56.04 - 211 |
| 1 31.5 | 31.009 + 95 | 06.41 - 158 | 16.544 + 98 | 48.77 - 121 | 33.271 + 147 | 38.53 + 197 | 52.045 + 80 | 53.97 - 207 |
| 2 10.5 | 31.135 + 126 | 04.94 - 147 | 16.674 + 130 | 47.65 - 112 | 33.464 + 193 | 36.49 + 204 | 52.161 + 116 | 51.98 - 199 |
| 2 20.4 | 31.294 + 159 | 03.67 - 127 | 16.835 + 161 | 46.73 - 92 | 33.704 + 240 | 34.43 + 206 | 52.312 + 151 | 50.21 - 177 |
| 3 2.4 | 31.481 + 187 | 02.66 - 101 | 17.023 + 188 | 46.06 - 67 | 33.982 + 278 | 32.39 + 204 | 52.494 + 182 | 48.73 - 148 |
| 3 12.4 | 31.697 + 216 | 01.96 - 70 | 17.239 + 216 | 45.65 - 41 | 34.299 + 317 | 30.38 + 201 | 52.707 + 213 | 47.58 - 115 |
| 3 22.4 | 31.939 + 242 | 01.63 - 33 | 17.480 + 241 | 45.59 - 6 | 34.650 + 351 | 28.47 + 191 | 52.950 + 243 | 46.85 - 73 |
| 4 1.3 | 32.201 + 262 | 01.68 + 5 | 17.742 + 262 | 45.85 + 26 | 35.028 + 378 | 26.67 + 180 | 53.216 + 266 | 46.57 - 28 |
| 4 11.3 | 32.485 + 284 | 02.12 + 44 | 18.024 + 282 | 46.44 + 59 | 35.433 + 405 | 25.02 + 165 | 53.504 + 288 | 46.74 + 17 |
| 4 21.3 | 32.782 + 297 | 02.96 + 84 | 18.320 + 296 | 47.38 + 94 | 35.858 + 425 | 23.56 + 146 | 53.809 + 305 | 47.38 + 64 |
| 5 1.2 | 33.089 + 307 | 04.13 + 117 | 18.625 + 305 | 48.59 + 121 | 36.294 + 436 | 22.31 + 125 | 54.122 + 313 | 48.45 + 107 |
| 5 11.2 | 33.401 + 312 | 05.63 + 150 | 18.937 + 312 | 50.08 + 149 | 36.739 + 445 | 21.31 + 100 | 54.442 + 320 | 49.93 + 148 |
| 5 21.2 | 33.709 + 308 | 07.41 + 178 | 19.246 + 309 | 51.78 + 170 | 37.181 + 442 | 20.60 + 71 | 54.758 + 316 | 51.78 + 185 |
| 5 31.2 | 34.008 + 299 | 09.39 + 198 | 19.545 + 299 | 53.63 + 185 | 37.610 + 429 | 20.18 + 42 | 55.063 + 305 | 53.90 + 212 |
| 6 10.1 | 34.291 + 283 | 11.52 + 213 | 19.830 + 285 | 55.59 + 196 | 38.022 + 412 | 20.06 + 12 | 55.352 + 289 | 56.26 + 236 |
| 6 20.1 | 34.549 + 258 | 13.75 + 223 | 20.091 + 261 | 57.60 + 201 | 38.401 + 379 | 20.28 - 22 | 55.615 + 263 | 58.79 + 253 |
| 6 30.1 | 34.778 + 229 | 15.99 + 224 | 20.324 + 233 | 59.58 + 198 | 38.742 + 341 | 20.78 - 50 | 55.847 + 232 | 61.38 + 269 |
| 7 10.1 | 34.972 + 194 | 18.22 + 223 | 20.522 + 198 | 61.51 + 193 | 39.036 + 294 | 21.59 - 81 | 56.042 + 195 | 64.03 + 265 |
| 7 20.0 | 35.124 + 152 | 20.35 + 213 | 20.679 + 157 | 63.33 + 182 | 39.272 + 236 | 22.67 - 108 | 56.194 + 152 | 66.62 + 259 |
| 7 30.0 | 35.234 + 110 | 22.35 + 200 | 20.795 + 116 | 65.00 + 167 | 39.450 + 178 | 23.96 - 129 | 56.302 + 108 | 69.11 + 249 |
| 8 9.0 | 35.299 + 65 | 24.20 + 185 | 20.865 + 70 | 66.50 + 150 | 39.563 + 113 | 25.44 - 148 | 56.364 + 62 | 71.46 + 235 |
| 8 18.9 | 35.317 + 18 | 25.83 + 163 | 20.890 + 25 | 67.80 + 130 | 39.609 + 46 | 27.04 - 160 | 56.378 + 14 | 73.60 + 214 |
| 8 28.9 | 35.294 - 23 | 27.25 + 142 | 20.873 - 17 | 68.90 + 110 | 39.594 - 15 | 28.68 - 164 | 56.349 - 29 | 75.52 + 192 |
| 9 7.9 | 35.231 - 63 | 28.44 + 119 | 20.816 - 57 | 69.78 + 88 | 39.516 - 78 | 30.31 - 163 | 56.279 - 70 | 77.19 + 167 |
| 9 17.9 | 35.133 - 98 | 29.36 + 92 | 20.725 - 91 | 70.42 + 64 | 39.386 - 130 | 31.84 - 153 | 56.172 - 107 | 77.55 + 136 |
| 9 27.8 | 35.009 - 124 | 30.03 + 67 | 20.725 - 118 | 70.42 + 44 | 39.386 - 172 | 31.84 - 138 | 56.172 - 134 | 78.55 + 107 |
| 10 7.8 | 34.864 - 145 | 30.44 + 41 | 20.607 - 139 | 71.08 + 22 | 39.214 - 208 | 33.22 - 117 | 56.038 - 156 | 79.62 + 74 |
| 10 17.8 | 34.709 - 155 | 30.58 + 14 | 20.468 - 149 | 71.08 + 0 | 39.006 - 227 | 34.39 - 87 | 55.882 - 168 | 80.36 + 40 |
| 10 27.8 | 34.552 - 157 | 30.47 - 11 | 20.319 - 151 | 71.08 - 19 | 38.779 - 232 | 35.26 - 57 | 55.714 - 172 | 80.76 + 7 |
| 11 6.7 | 34.399 - 153 | 30.09 - 38 | 20.168 - 146 | 70.89 - 40 | 38.547 - 228 | 35.83 - 23 | 55.542 - 168 | 80.83 - 28 |
| 11 16.7 | 34.263 - 136 | 29.46 - 63 | 20.022 - 130 | 70.49 - 59 | 38.319 - 206 | 36.06 + 14 | 55.374 - 153 | 80.55 - 63 |
| 11 26.7 | 34.147 - 116 | 28.60 - 86 | 19.892 - 109 | 69.90 - 75 | 38.113 - 177 | 35.92 + 49 | 55.221 - 135 | 79.92 - 93 |
| 12 6.6 | 34.056 - 91 | 27.51 - 109 | 19.783 - 84 | 68.21 - 94 | 37.936 - 138 | 35.43 + 82 | 55.086 - 110 | 78.99 - 127 |
| 12 16.6 | 33.998 - 58 | 26.23 - 128 | 19.699 - 52 | 67.15 - 106 | 37.798 - 88 | 34.61 + 113 | 54.976 - 78 | 77.72 - 153 |
| 12 26.6 | 33.971 - 27 | 24.79 - 144 | 19.647 - 21 | 67.15 - 117 | 37.710 - 40 | 33.48 + 139 | 54.898 - 46 | 76.19 - 176 |
| 12 36.6 | 33.978 + 7 | 23.23 - 156 | 19.626 + 13 | 65.98 - 125 | 37.670 + 12 | 32.09 + 163 | 54.852 - 12 | 74.43 - 196 |
| | 33.978 + 42 | 23.23 - 160 | 19.639 + 48 | 64.73 - 126 | 37.682 + 67 | 30.46 + 180 | 54.840 + 25 | 72.47 - 205 |
| Mean Place | 34.090 | 24.77 | 19.639 | 67.20 | 37.330 | 21.53 | 55.151 | 72.02 |
| sec δ, tan δ | +1.020 | +0.199 | +1.004 | +0.085 | +1.476 | -1.085 | +1.072 | +0.387 |
| dα(ψ), dδ(ψ) | +0.057 | +0.25 | +0.059 | +0.25 | +0.083 | +0.25 | +0.053 | +0.25 |
| dα(ε), dδ(ε) | -0.008 | -0.79 | -0.004 | -0.78 | +0.046 | -0.78 | -0.016 | -0.77 |
| Dbble.Trans. | July 30 | | July 31 | | July 31 | | August 1 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 772 | | 774 | | 773 | | 1540 | |
|--------------|--------------|------------|--------------|------------|--------------|------------|-------------------|------------|
| | α Delphini | | α Delphini | | υ Capricorni | | 13 G. Microscopii | |
| Mag. Spect. | 5.23 | G5 | 3.86 | B8 | 5.33 | M0 | 5.54 | K2 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " |
| | 20 38 | + 10 01 | 20 38 | + 15 51 | 20 39 | - 18 11 | 20 39 | - 33 28 |
| 1 -8.4 | 25.183 - 42 | 64.68 -134 | 57.449 - 52 | 38.91 -155 | 13.420 - 28 | 31.20 - 13 | 25.425 - 37 | 70.60 + 61 |
| 1 1.6 | 25.174 + 9 | 63.22 -146 | 57.431 + 15 | 37.22 -169 | 13.428 + 8 | 31.26 + 6 | 25.429 + 4 | 69.83 + 77 |
| 1 11.6 | 25.197 + 23 | 61.68 -154 | 57.446 + 52 | 35.40 -182 | 13.470 + 42 | 31.24 + 2 | 25.473 + 44 | 68.92 + 91 |
| 1 21.5 | 25.255 + 58 | 60.13 -155 | 57.498 + 84 | 33.55 -185 | 13.552 + 82 | 31.12 + 12 | 25.560 + 87 | 67.88 +104 |
| 1 31.5 | 25.345 + 90 | 58.63 -150 | 57.582 + 210 | 31.74 -181 | 13.650 + 98 | 30.96 + 16 | 25.683 + 123 | 66.72 +116 |
| 2 10.5 | 25.467 + 122 | 57.24 -139 | 57.699 + 117 | 30.03 -171 | 13.799 + 149 | 30.62 + 34 | 25.844 + 161 | 65.45 +127 |
| 2 20.4 | 25.622 + 155 | 56.05 -119 | 57.850 + 151 | 28.53 -150 | 13.974 + 175 | 30.17 + 45 | 26.042 + 198 | 64.10 +135 |
| 3 2.4 | 25.804 + 182 | 55.11 -94 | 58.031 + 181 | 27.30 -123 | 14.177 + 203 | 29.57 + 60 | 26.271 + 229 | 62.69 +141 |
| 3 12.4 | 26.016 + 212 | 54.47 -64 | 58.241 + 210 | 26.38 -92 | 14.406 + 229 | 28.83 + 74 | 26.532 + 261 | 61.23 +146 |
| 3 22.4 | 26.254 + 238 | 54.19 -28 | 58.480 + 239 | 25.86 -52 | 14.662 + 256 | 27.93 + 90 | 26.821 + 289 | 59.74 +149 |
| 4 1.3 | 26.513 + 259 | 54.28 + 9 | 58.741 + 261 | 25.75 -11 | 14.939 + 277 | 26.90 +103 | 27.133 + 312 | 58.25 +149 |
| 4 11.3 | 26.795 + 282 | 54.74 + 46 | 59.024 + 283 | 26.05 + 74 | 15.237 + 298 | 25.73 +117 | 27.469 + 336 | 56.77 +148 |
| 4 21.3 | 27.091 + 296 | 55.59 + 85 | 59.324 + 300 | 26.79 + 20 | 15.551 + 314 | 24.46 +127 | 27.822 + 353 | 55.35 +142 |
| 5 1.3 | 27.397 + 306 | 56.77 +118 | 59.632 + 308 | 27.92 +113 | 15.876 + 325 | 23.13 +133 | 28.187 + 365 | 54.02 +133 |
| 5 11.2 | 27.710 + 313 | 58.27 +150 | 59.947 + 315 | 29.40 +148 | 16.209 + 333 | 21.76 +137 | 28.560 + 373 | 52.79 +123 |
| 5 21.2 | 28.020 + 310 | 60.03 +176 | 60.259 + 312 | 31.21 +181 | 16.541 + 332 | 20.39 +137 | 28.932 + 372 | 51.73 +106 |
| 5 31.2 | 28.322 + 302 | 61.98 +195 | 60.562 + 303 | 33.26 +205 | 16.865 + 324 | 19.08 +131 | 29.296 + 364 | 50.86 + 87 |
| 6 10.1 | 28.609 + 287 | 64.09 +211 | 60.849 + 287 | 35.51 +225 | 17.176 + 311 | 17.86 +122 | 29.645 + 349 | 50.19 + 67 |
| 6 20.1 | 28.872 + 263 | 66.28 +219 | 61.112 + 263 | 37.88 +237 | 17.464 + 288 | 16.76 +110 | 29.968 + 323 | 49.76 + 43 |
| 6 30.1 | 29.106 + 234 | 68.48 +220 | 61.345 + 233 | 40.30 +242 | 17.724 + 260 | 15.82 + 94 | 30.261 + 293 | 49.58 + 18 |
| 7 10.1 | 29.306 + 200 | 70.67 +219 | 61.543 + 198 | 42.73 +243 | 17.950 + 226 | 15.06 + 76 | 30.514 + 253 | 49.64 - 6 |
| 7 20.0 | 29.465 + 159 | 72.76 +209 | 61.698 + 155 | 45.10 +237 | 18.133 + 183 | 14.49 + 57 | 30.721 + 207 | 49.95 - 31 |
| 7 30.0 | 29.582 + 117 | 74.71 +195 | 61.812 + 114 | 47.34 +224 | 18.273 + 140 | 14.12 + 37 | 30.878 + 157 | 50.46 - 51 |
| 8 9.0 | 29.654 + 72 | 76.52 +181 | 61.879 + 67 | 49.45 +211 | 18.365 + 92 | 13.94 + 18 | 30.983 + 105 | 51.18 - 72 |
| 8 19.0 | 29.679 + 25 | 78.10 +158 | 61.900 + 21 | 51.34 +189 | 18.408 + 43 | 13.94 + 0 | 31.031 + 48 | 52.05 - 87 |
| 8 28.9 | 29.664 - 15 | 79.48 +138 | 61.878 - 22 | 53.01 +167 | 18.407 - 1 | 14.09 - 15 | 31.029 - 2 | 53.02 - 97 |
| 9 7.9 | 29.607 - 57 | 80.63 +115 | 61.816 - 62 | 54.44 +143 | 18.361 - 46 | 14.38 - 29 | 30.976 - 53 | 54.05 -103 |
| 9 17.9 | 29.515 - 92 | 81.52 + 89 | 61.718 - 98 | 55.58 +114 | 18.277 - 84 | 14.76 - 38 | 30.880 - 96 | 55.09 -104 |
| 9 27.8 | 29.397 - 118 | 82.17 + 65 | 61.593 - 125 | 56.46 + 88 | 18.164 - 113 | 15.20 - 44 | 30.749 - 131 | 56.07 - 98 |
| 10 7.8 | 29.257 - 140 | 82.57 + 40 | 61.446 - 147 | 57.04 + 58 | 18.027 - 137 | 15.68 - 48 | 30.590 - 159 | 56.96 - 89 |
| 10 17.8 | 29.106 - 151 | 82.70 + 13 | 61.287 - 159 | 57.32 + 28 | 17.878 - 149 | 16.17 - 49 | 30.416 - 174 | 57.70 - 74 |
| 10 27.8 | 28.953 - 153 | 82.60 - 10 | 61.126 - 161 | 57.31 - 1 | 17.726 - 152 | 16.62 - 45 | 30.238 - 178 | 58.26 - 56 |
| 11 6.7 | 28.803 - 150 | 82.24 - 36 | 60.967 - 159 | 56.99 - 32 | 17.578 - 148 | 16.62 - 42 | 30.064 - 174 | 58.62 - 36 |
| 11 16.7 | 28.668 - 135 | 81.64 - 60 | 60.824 - 143 | 56.38 - 61 | 17.447 - 131 | 17.04 - 36 | 29.908 - 156 | 58.76 - 14 |
| 11 26.7 | 28.552 - 116 | 80.82 - 82 | 60.699 - 125 | 55.50 - 88 | 17.338 - 109 | 17.69 - 29 | 29.777 - 131 | 58.67 + 9 |
| 12 6.7 | 28.461 - 91 | 79.78 -104 | 60.599 - 100 | 54.34 -116 | 17.255 - 83 | 17.92 - 23 | 29.677 - 100 | 58.37 + 30 |
| 12 16.6 | 28.401 - 60 | 78.57 -121 | 60.530 - 69 | 52.96 -138 | 17.207 - 48 | 18.07 - 15 | 29.616 - 61 | 57.86 + 51 |
| 12 26.6 | 28.372 - 29 | 77.21 -136 | 60.491 - 39 | 51.38 -158 | 17.193 - 14 | 18.15 - 8 | 29.595 - 21 | 57.17 + 69 |
| 12 36.6 | 28.376 + 4 | 75.73 -148 | 60.487 - 4 | 49.64 -174 | 17.214 + 21 | 18.16 - 1 | 29.615 + 20 | 56.32 + 85 |
| | + 39 | -152 | + 31 | -180 | + 60 | + 9 | + 63 | + 99 |
| Mean Place | 28.440 | 77.05 | 60.673 | 49.97 | 16.931 | 12.48 | 29.244 | 48.71 |
| sec δ, tan δ | +1.016 | +0.177 | +1.040 | +0.284 | +1.053 | -0.329 | +1.199 | -0.661 |
| da(ψ), dδ(ψ) | +0.058 | +0.25 | +0.055 | +0.25 | +0.068 | +0.25 | +0.075 | +0.26 |
| da(ε), dδ(ε) | -0.008 | -0.77 | -0.012 | -0.77 | +0.014 | -0.77 | +0.028 | -0.77 |
| Dble. Trans. | August 1 | | August 1 | | August 1 | | August 1 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 777 | | 778 | | 776 | | 775 | |
|---|---------------------------|------------|-------------------------|------------|-------------------------|------------|--------------------------|------------|
| | α Cygni (Deneb) | | δ Delphini | | η Indi | | β Pavonis | |
| Mag. Spect. | 1.33 | A2p | 4.53 | A5 | 4.70 | F0 | 3.60 | A5 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " |
| | 20 40 | +45 13 | 20 42 | +15 01 | 20 42 | -51 58 | 20 43 | -66 15 |
| 1 -8.4 | 54 996 ^s -142 | 48 99 -220 | 46 519 ^s -52 | 20 92 -150 | 58 671 ^s -82 | 37 24 +146 | 39 413 ^s -178 | " +207 |
| 1 1.6 | 54 897 -99 | 46 47 -252 | 46 499 -20 | 19 27 -165 | 58 646 -25 | 35 51 +173 | 39 322 -91 | 36.27 +237 |
| 1 11.6 | 54 844 -53 | 43 67 -280 | 46 511 +12 | 17 51 -176 | 58 677 +31 | 33 57 +194 | 39 318 -4 | 33.90 +264 |
| 1 21.5 | 54 842 -2 | 40 71 -296 | 46 559 +48 | 15 71 -180 | 58 768 +91 | 33 57 +213 | 39 318 +92 | 31.26 +283 |
| 1 31.5 | 54 890 +48 | 37 71 -300 | 46 640 +81 | 13 96 -175 | 58 912 +144 | 29 22 +222 | 39 410 +178 | 28.43 +291 |
| 2 10.5 | 54 988 +98 | 34 76 -295 | 46 754 +114 | 12 30 -166 | 59 108 +196 | 26 91 +231 | 39 588 +263 | 25.52 +296 |
| 2 20.4 | 55 139 +151 | 32 01 -275 | 46 901 +147 | 10 85 -145 | 59 357 +249 | 24 59 +232 | 39 851 +346 | 22.56 +293 |
| 3 2.4 | 55 336 +197 | 29 57 -244 | 47 078 +177 | 09 65 -120 | 59 649 +292 | 22 31 +228 | 40 197 +414 | 19.63 +281 |
| 3 12.4 | 55 579 +243 | 27 50 -207 | 47 286 +208 | 08 77 -88 | 59 983 +334 | 20 08 +223 | 40 611 +483 | 16.82 +267 |
| 3 22.4 | 55 864 +285 | 25 94 -156 | 47 521 +235 | 08 28 -49 | 60 357 +374 | 17 97 +211 | 41 094 +543 | 14.15 +245 |
| 4 1.3 | 56 182 +318 | 24 92 -102 | 47 779 +258 | 08 19 -9 | 60 762 +405 | 16 01 +196 | 42 226 +589 | 09.51 +219 |
| 4 11.3 | 56 530 +348 | 24 46 -46 | 48 060 +281 | 08 51 +32 | 61 198 +436 | 14 23 +178 | 42 861 +635 | 07.60 +191 |
| 4 21.3 | 56 897 +367 | 24 63 +17 | 48 358 +298 | 09 25 +74 | 61 656 +458 | 12 68 +155 | 43 526 +665 | 06.05 +155 |
| 5 1.3 | 57 274 +377 | 25 36 +73 | 48 665 +307 | 10 37 +112 | 62 127 +471 | 11 39 +129 | 44 209 +683 | 04.87 +118 |
| 5 11.2 | 57 656 +382 | 26 66 +130 | 48 980 +315 | 11 85 +148 | 62 609 +482 | 10 38 +101 | 44 904 +695 | 04.07 +80 |
| 5 21.2 | 58 029 +373 | 28 49 +183 | 49 292 +312 | 13 65 +180 | 63 089 +480 | 09 70 +68 | 45 591 +687 | 03.70 +37 |
| 5 31.2 | 58 384 +355 | 30 74 +225 | 49 596 +304 | 15 67 +202 | 63 556 +467 | 09 34 +36 | 46 259 +668 | 03.74 -4 |
| 6 10.1 | 58 715 +331 | 33 39 +265 | 49 885 +289 | 17 90 +223 | 64 005 +449 | 09 33 +1 | 46 896 +637 | 04.22 -48 |
| 6 20.1 | 59 009 +294 | 36 35 +296 | 50 150 +265 | 20 25 +235 | 64 419 +414 | 09 67 -34 | 47 480 +584 | 05.11 -89 |
| 6 30.1 | 59 260 +251 | 39 51 +316 | 50 386 +236 | 22 64 +239 | 64 793 +374 | 10 34 -67 | 48 003 +523 | 06.37 -126 |
| 7 10.1 | 59 464 +204 | 42 84 +333 | 50 587 +201 | 25 04 +240 | 65 116 +323 | 11 34 -100 | 48 451 +448 | 08.00 -163 |
| 7 20.0 | 59 612 +148 | 46 21 +337 | 50 747 +160 | 27 37 +233 | 65 378 +262 | 12 62 -128 | 48 807 +356 | 09.92 -192 |
| 7 30.0 | 59 705 +93 | 49 55 +334 | 50 864 +117 | 29 58 +221 | 65 577 +199 | 14 12 -150 | 49 071 +264 | 12.07 -215 |
| 8 9.0 | 59 740 +35 | 52 82 +327 | 50 936 +72 | 31 66 +208 | 65 705 +128 | 15 83 -171 | 49 231 +160 | 14.41 -234 |
| 8 19.0 | 59 716 -24 | 55 90 +308 | 50 961 +25 | 33 52 +186 | 65 760 +55 | 17 65 -182 | 49 282 +51 | 16.82 -241 |
| 8 28.9 | 59 640 -76 | 58 77 +287 | 50 944 -17 | 35 16 +164 | 65 748 -12 | 19 50 -185 | 49 234 -48 | 19.22 -240 |
| 9 7.9 | 59 511 -129 | 61 36 +259 | 50 886 -58 | 36 57 +141 | 65 667 -81 | 21 35 -185 | 49 083 -151 | 21.54 -232 |
| 9 17.9 | 59 339 -172 | 63 60 +224 | 50 792 -94 | 37 69 +112 | 65 667 -140 | 23 07 -172 | 49 083 -241 | 23.66 -212 |
| 9 27.8 | 59 132 -207 | 65 47 +187 | 50 671 -121 | 38 55 +86 | 65 527 -188 | 24 62 -155 | 48 842 -314 | 25.51 -185 |
| 10 7.8 | 58 895 -237 | 66 93 +146 | 50 527 -144 | 39 12 +57 | 65 339 -228 | 25 93 -131 | 48 528 -378 | 27.01 -150 |
| 10 17.8 | 58 641 -254 | 67 92 +99 | 50 371 -156 | 39 40 +28 | 64 860 -251 | 26 91 -98 | 47 733 -417 | 28.07 -106 |
| 10 27.8 | 58 379 -262 | 68 45 +53 | 50 211 -160 | 39 39 -1 | 64 600 -260 | 27 54 -63 | 47 299 -434 | 28.67 -60 |
| 11 6.7 | 58 117 -262 | 68 47 +2 | 50 055 -156 | 39 09 -30 | 64 342 -258 | 27 79 -25 | 46 864 -435 | 28.77 -10 |
| 11 16.7 | 57 869 -248 | 67 97 -50 | 49 912 -143 | 38 50 -59 | 64 105 -237 | 27 63 +16 | 46 864 -407 | 28.34 +43 |
| 11 26.7 | 57 641 -228 | 67 00 -97 | 49 788 -124 | 37 65 -85 | 64 105 -206 | 27 08 +55 | 46 457 -365 | 27.42 +92 |
| 12 6.7 | 57 439 -202 | 65 53 -147 | 49 687 -101 | 36 52 -113 | 63 733 -166 | 26 15 +93 | 45 784 -308 | 26.00 +142 |
| 12 16.6 | 57 275 -164 | 63 62 -191 | 49 617 -70 | 35 18 -134 | 63 619 -114 | 24 86 +129 | 45 556 -228 | 24.16 +184 |
| 12 26.6 | 57 150 -125 | 61 33 -229 | 49 577 -7 | 33 66 -152 | 63 558 -61 | 23 28 +158 | 45 407 -149 | 21.96 +220 |
| 12 36.6 | 57 069 -81 | 58 70 -263 | 49 570 +29 | 31 97 -169 | 63 553 -5 | 21 44 +184 | 45 347 -60 | 19.44 +252 |
| | 57 069 -31 | 58 70 -284 | | 31 97 -175 | 63 553 +56 | 21 44 +204 | 45 347 +35 | 19.44 +274 |
| Mean Place | 58 298 | 54.27 | 49.731 | 32.18 | 63.195 | 12.03 | 45.261 | 09.29 |
| sec δ , tan δ | +1.420 | +1.008 | +1.035 | +0.268 | +1.623 | -1.279 | +2.483 | -2.273 |
| $d\alpha(\psi)$, $d\delta(\psi)$ | +0.041 | +0.26 | +0.056 | +0.26 | +0.087 | +0.26 | +0.107 | +0.26 |
| $d\alpha(\epsilon)$, $d\delta(\epsilon)$ | -0.043 | -0.76 | -0.012 | -0.76 | +0.056 | -0.76 | +0.099 | -0.76 |
| Dble. Trans. | August 1 | | August 2 | | August 2 | | August 2 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 783 | | 782 | | 779 | | 780 | | | | | | | | | | |
|---|---------------|--------|-------------|--------|-------------------|--------|------------------|--------|------|--------|--------|-------|--------|--------|--------|--------|------|
| | η Cephei | | 6 H. Cephei | | ψ Capricorni | | ϵ Cygni | | | | | | | | | | |
| Mag. Spect. | 3.59 | K0 | 4.63 | G0 | 4.26 | F8 | 2.64 | K0 | | | | | | | | | |
| U.T. | R.A. | | R.A. | | R.A. | | R.A. | | | | | | | | | | |
| | h m | Dec. | h m | Dec. | h m | Dec. | h m | Dec. | | | | | | | | | |
| | 20 44 | +61 46 | 20 44 | +57 31 | 20 45 | -25 19 | 20 45 | +33 54 | | | | | | | | | |
| 1 | -8.4 | 57.332 | -289 | 66.85 | -221 | 57.517 | -238 | 48.51 | -224 | 14.300 | +2 | 32.81 | +19 | 36.658 | -96 | 61.80 | -198 |
| 1 | 1.6 | 57.106 | -226 | 64.25 | -260 | 57.334 | -183 | 45.89 | -262 | 14.302 | +33 | 32.48 | +33 | 36.598 | -60 | 59.56 | -224 |
| 1 | 11.6 | 56.947 | -159 | 61.29 | -296 | 57.210 | -124 | 42.94 | -296 | 14.341 | +39 | 32.05 | +43 | 36.575 | -23 | 57.09 | -247 |
| 1 | 21.5 | 56.868 | -79 | 58.10 | -319 | 57.156 | -54 | 39.76 | -318 | 14.419 | +78 | 31.51 | +54 | 36.595 | +20 | 54.50 | -259 |
| 1 | 31.5 | 56.868 | +0 | 54.83 | -327 | 57.170 | +14 | 36.51 | -325 | 14.527 | +108 | 30.86 | +65 | 36.655 | +60 | 51.91 | -259 |
| 2 | 10.5 | 56.949 | +81 | 51.55 | -328 | 57.254 | +84 | 33.27 | -324 | 14.671 | +144 | 30.05 | +81 | 36.755 | +100 | 49.37 | -254 |
| 2 | 20.4 | 57.114 | +165 | 48.43 | -312 | 57.411 | +157 | 30.19 | -308 | 14.850 | +179 | 29.13 | +92 | 36.899 | +144 | 47.04 | -233 |
| 3 | 2.4 | 57.354 | +240 | 45.60 | -283 | 57.632 | +221 | 27.41 | -278 | 15.057 | +207 | 28.13 | +100 | 37.079 | +180 | 45.01 | -203 |
| 3 | 12.4 | 57.668 | +314 | 43.13 | -247 | 57.918 | +286 | 25.00 | -241 | 15.294 | +237 | 27.01 | +112 | 37.298 | +219 | 43.32 | -169 |
| 3 | 22.4 | 58.048 | +380 | 41.17 | -196 | 58.260 | +342 | 23.09 | -191 | 15.558 | +264 | 25.79 | +122 | 37.551 | +253 | 42.11 | -121 |
| 4 | 1.3 | 58.478 | +430 | 39.76 | -141 | 58.647 | +387 | 21.74 | -135 | 15.845 | +287 | 24.50 | +129 | 37.833 | +282 | 41.40 | -71 |
| 4 | 11.3 | 58.952 | +474 | 38.95 | -81 | 59.074 | +427 | 20.98 | -76 | 16.155 | +310 | 23.14 | +136 | 38.141 | +308 | 41.21 | -19 |
| 4 | 21.3 | 59.455 | +503 | 38.80 | -15 | 59.527 | +453 | 20.87 | -11 | 16.482 | +327 | 21.75 | +139 | 38.467 | +326 | 41.58 | +37 |
| 5 | 1.3 | 59.968 | +513 | 39.27 | +47 | 59.990 | +463 | 21.37 | +50 | 16.820 | +338 | 20.37 | +138 | 38.805 | +338 | 42.46 | +88 |
| 5 | 11.2 | 60.485 | +517 | 40.35 | +108 | 60.457 | +467 | 22.48 | +111 | 17.168 | +348 | 19.02 | +135 | 39.149 | +344 | 43.84 | +138 |
| 5 | 21.2 | 60.984 | +499 | 42.04 | +169 | 60.910 | +453 | 24.18 | +170 | 17.516 | +348 | 17.76 | +126 | 39.488 | +339 | 45.68 | +184 |
| 5 | 31.2 | 61.452 | +468 | 44.21 | +217 | 61.337 | +427 | 26.35 | +217 | 17.856 | +340 | 16.61 | +115 | 39.814 | +326 | 47.90 | +222 |
| 6 | 10.1 | 61.881 | +429 | 46.85 | +264 | 61.731 | +394 | 28.98 | +263 | 18.185 | +329 | 15.60 | +101 | 40.122 | +308 | 50.45 | +255 |
| 6 | 20.1 | 62.253 | +372 | 49.87 | +302 | 62.074 | +343 | 31.97 | +299 | 18.489 | +304 | 14.79 | +81 | 40.400 | +278 | 53.25 | +280 |
| 6 | 30.1 | 62.562 | +309 | 53.15 | +328 | 62.363 | +289 | 35.22 | +325 | 18.766 | +277 | 14.17 | +62 | 40.644 | +244 | 56.20 | +295 |
| 7 | 10.1 | 62.801 | +239 | 56.66 | +351 | 62.590 | +227 | 38.68 | +346 | 19.006 | +240 | 13.77 | +40 | 40.847 | +203 | 59.27 | +307 |
| 7 | 20.0 | 62.959 | +158 | 60.29 | +363 | 62.745 | +155 | 42.25 | +357 | 19.203 | +197 | 13.59 | +18 | 41.003 | +156 | 62.35 | +308 |
| 7 | 30.0 | 63.039 | -80 | 63.94 | +365 | 62.832 | +87 | 45.82 | +357 | 19.356 | +153 | 13.63 | -4 | 41.111 | +108 | 65.37 | +302 |
| 8 | 9.0 | 63.037 | -82 | 67.56 | +362 | 62.844 | +12 | 49.36 | +354 | 19.458 | +102 | 13.86 | -23 | 41.168 | +57 | 68.30 | +293 |
| 8 | 19.0 | 62.953 | -84 | 71.04 | +348 | 62.783 | -61 | 52.74 | +338 | 19.509 | +51 | 14.27 | -41 | 41.173 | +5 | 71.02 | +272 |
| 8 | 28.9 | 62.795 | -158 | 74.33 | +329 | 62.656 | -127 | 55.93 | +319 | 19.513 | +4 | 14.82 | -55 | 41.132 | -41 | 73.53 | +251 |
| 9 | 7.9 | 62.565 | -230 | 77.37 | +304 | 62.464 | -192 | 58.86 | +293 | 19.470 | -43 | 15.48 | -66 | 41.045 | -87 | 75.77 | +224 |
| 9 | 17.9 | 62.272 | -293 | 80.05 | +268 | 62.215 | -249 | 61.44 | +258 | 19.386 | -84 | 16.20 | -72 | 40.918 | -127 | 77.68 | +191 |
| 9 | 27.8 | 61.929 | -343 | 82.37 | +232 | 61.922 | -293 | 63.65 | +221 | 19.270 | -116 | 16.92 | -72 | 40.761 | -157 | 79.25 | +157 |
| 10 | 7.8 | 61.540 | -389 | 84.26 | +189 | 61.589 | -333 | 65.43 | +178 | 19.128 | -142 | 17.63 | -71 | 40.577 | -184 | 80.44 | +119 |
| 10 | 17.8 | 61.124 | -416 | 85.65 | +139 | 61.232 | -357 | 66.71 | +128 | 18.972 | -156 | 18.28 | -65 | 40.379 | -198 | 81.21 | +77 |
| 10 | 27.8 | 60.691 | -433 | 86.54 | +89 | 60.862 | -370 | 67.50 | +79 | 18.812 | -160 | 18.82 | -54 | 40.176 | -203 | 81.58 | +37 |
| 11 | 6.7 | 60.252 | -439 | 86.88 | +34 | 60.486 | -376 | 67.74 | +24 | 18.655 | -157 | 19.25 | -43 | 39.972 | -204 | 81.51 | -7 |
| 11 | 16.7 | 59.827 | -425 | 86.64 | -24 | 60.124 | -362 | 67.42 | -32 | 18.515 | -140 | 19.54 | -29 | 39.782 | -190 | 80.99 | -52 |
| 11 | 26.7 | 59.423 | -404 | 85.85 | -79 | 59.783 | -341 | 66.57 | -85 | 18.396 | -119 | 19.69 | -15 | 39.610 | -172 | 80.06 | -93 |
| 12 | 6.7 | 59.052 | -371 | 84.49 | -136 | 59.472 | -311 | 65.16 | -141 | 18.305 | -91 | 19.70 | -1 | 39.462 | -148 | 78.70 | -136 |
| 12 | 16.6 | 58.732 | -320 | 82.62 | -187 | 59.206 | -266 | 63.24 | -192 | 18.249 | -56 | 19.56 | +14 | 39.346 | -116 | 76.97 | -173 |
| 12 | 26.6 | 58.466 | -266 | 80.30 | -232 | 58.989 | -217 | 60.89 | -235 | 18.229 | -20 | 19.29 | +27 | 39.263 | -83 | 74.92 | -205 |
| 12 | 36.6 | 58.266 | -200 | 77.55 | -275 | 58.829 | -160 | 58.14 | -275 | 18.246 | +17 | 18.90 | +39 | 39.219 | -44 | 72.59 | -233 |
| | | | -124 | | -302 | | -93 | | -302 | | +56 | | +51 | | -4 | | -248 |
| Mean Place | 61.011 | 70.20 | | 61.040 | 51.79 | | 61.040 | 51.79 | | 17.898 | 12.29 | | 12.29 | | 39.887 | 69.26 | |
| sec δ , tan δ | +2.115 | +1.864 | | +1.863 | +1.572 | | +1.863 | +1.572 | | +1.106 | -0.473 | | -0.473 | | +1.205 | +0.672 | |
| $d\alpha(\psi)$, $d\delta(\psi)$ | +0.024 | +0.26 | | +0.030 | +0.26 | | +0.030 | +0.26 | | +0.071 | +0.26 | | +0.26 | | +0.048 | +0.26 | |
| $d\alpha(\epsilon)$, $d\delta(\epsilon)$ | -0.082 | -0.75 | | -0.069 | -0.75 | | -0.069 | -0.75 | | +0.021 | -0.75 | | -0.75 | | -0.030 | -0.75 | |
| Dble. Trans. | August 2 | | August 2 | | August 3 | | August 3 | | | | | | | | | | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 1544 | | 1541 | | 781 | | 1543 | |
|--------------|-----------------------------|-------------|--------------------------|-------------------------|--------------------------|-------------------------|--------------------------|-------------------------|
| | Groombridge 3285 (Cygni) | | γ Delphini* f. | | ε Aquarii | | 3 Aquarii | |
| Mag. Spect. | 6.43 | K0 | 4.49 | G5 | 3.83 | A0 | 4.60 | M0 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " |
| | 20 45 | + 52 56 | 20 45 | + 16 04 | 20 46 | - 9 32 | 20 46 | - 5 04 |
| 1 -8.4 | 54 296 ^s - 197 | 40.98 -221 | 58 713 ^s - 56 | 19 47 ["] -152 | 53 398 ^s - 34 | 61 82 ["] - 52 | 58 218 ^s - 36 | 55 77 ["] - 72 |
| 1 1.6 | 54 147 - 149 | 38.41 -257 | 58 689 - 24 | 17.80 -167 | 53 397 - 1 | 62.32 - 50 | 58 214 - 4 | 55 61 - 72 |
| 1 11.6 | 54 051 - 96 | 35.51 -310 | 58 697 + 8 | 15.99 -181 | 53 428 + 31 | 62.79 - 47 | 58 242 + 28 | 57.23 - 72 |
| 1 21.5 | 54 017 - 34 | 32.41 -310 | 58 741 + 44 | 14.15 -184 | 53 494 + 66 | 63.18 - 39 | 58 304 + 62 | 57.90 - 67 |
| 1 31.5 | 54 041 + 24 | 29.25 -316 | 58 818 + 77 | 12.35 -180 | 53 588 + 94 | 63.47 - 29 | 58 396 + 92 | 58.47 - 57 |
| 2 10.5 | 54 126 + 85 | 26.10 -315 | 58 928 + 110 | 10.64 -171 | 53 714 + 126 | 63.71 - 24 | 58 518 + 122 | 58.97 - 50 |
| 2 20.4 | 54 276 + 150 | 23.13 -297 | 59 072 + 144 | 09.13 -151 | 53 873 + 159 | 63.76 - 5 | 58 673 + 155 | 59.28 - 31 |
| 3 2.4 | 54 481 + 205 | 20.45 -268 | 59 247 + 175 | 07.89 -124 | 54 059 + 186 | 63.62 + 14 | 58 855 + 182 | 59.39 - 11 |
| 3 12.4 | 54 743 + 262 | 18.13 -232 | 59 451 + 204 | 06.95 - 94 | 54 272 + 213 | 63.27 + 35 | 59 064 + 209 | 59.28 + 11 |
| 3 22.4 | 55 056 + 313 | 16.33 -180 | 59 685 + 234 | 06.41 - 54 | 54 512 + 240 | 62.71 + 56 | 59 300 + 236 | 58.91 + 37 |
| 4 1.3 | 55 408 + 352 | 15.07 -126 | 59 942 + 257 | 06.28 - 13 | 54 773 + 261 | 61.93 + 78 | 59 557 + 257 | 58.29 + 62 |
| 4 11.3 | 55 796 + 388 | 14.39 - 68 | 60 222 + 280 | 06.55 + 27 | 55 057 + 284 | 60.94 + 99 | 59 837 + 280 | 57.42 + 87 |
| 4 21.3 | 56 209 + 413 | 14.36 - 3 | 60 520 + 298 | 07.27 + 72 | 55 357 + 300 | 59.75 + 119 | 59 837 + 296 | 57.42 + 112 |
| 5 1.3 | 56 632 + 423 | 14.92 + 56 | 60 828 + 308 | 08.37 + 110 | 55 669 + 312 | 58.41 + 134 | 60 441 + 308 | 55.00 + 130 |
| 5 11.2 | 57 060 + 428 | 16.08 + 116 | 61 144 + 316 | 09.84 + 147 | 55 989 + 320 | 56.95 + 146 | 60 757 + 316 | 53.52 + 148 |
| 5 21.2 | 57 477 + 417 | 17.81 + 173 | 61 457 + 313 | 11.63 + 179 | 56 310 + 321 | 55.40 + 155 | 61 074 + 317 | 51.91 + 161 |
| 5 31.2 | 57 873 + 396 | 20.00 + 219 | 61 762 + 305 | 13.66 + 203 | 56 624 + 314 | 53.84 + 156 | 61 383 + 309 | 50.25 + 166 |
| 6 10.1 | 58 240 + 367 | 22.63 + 263 | 62 053 + 291 | 15.91 + 225 | 56 926 + 302 | 52.28 + 156 | 61 682 + 299 | 48.55 + 170 |
| 6 20.1 | 58 564 + 324 | 25.61 + 298 | 62 320 + 267 | 18.28 + 237 | 57 207 + 281 | 50.79 + 149 | 61 958 + 276 | 46.89 + 166 |
| 6 30.1 | 58 839 + 275 | 28.83 + 322 | 62 558 + 238 | 20.70 + 242 | 57 461 + 254 | 49.41 + 138 | 62 207 + 249 | 45.30 + 159 |
| 7 10.1 | 59 059 + 220 | 32.25 + 342 | 62 762 + 204 | 23.15 + 245 | 57 682 + 221 | 48.15 + 126 | 62 424 + 217 | 43.82 + 148 |
| 7 20.0 | 59 214 + 155 | 35.76 + 351 | 62 924 + 162 | 25.53 + 238 | 57 863 + 181 | 47.07 + 108 | 62 601 + 177 | 42.49 + 133 |
| 7 30.0 | 59 307 + 93 | 39.27 + 351 | 63 043 + 119 | 27.79 + 226 | 58 002 + 139 | 46.17 + 90 | 62 737 + 136 | 41.33 + 116 |
| 8 9.0 | 59 334 + 27 | 42.73 + 346 | 63 117 + 74 | 29.92 + 213 | 58 096 + 94 | 45.46 + 71 | 62 828 + 91 | 40.36 + 97 |
| 8 19.0 | 59 294 - 40 | 46.04 + 331 | 63 144 + 27 | 31.84 + 192 | 58 142 + 46 | 44.94 + 52 | 62 872 + 44 | 39.58 + 78 |
| 8 28.9 | 59 194 - 100 | 49.14 + 310 | 63 129 - 15 | 33.54 + 170 | 58 146 + 4 | 44.61 + 33 | 62 873 + 1 | 39.00 + 58 |
| 9 7.9 | 59 035 - 159 | 51.98 + 284 | 63 072 - 57 | 35.00 + 146 | 58 106 - 40 | 44.44 + 17 | 62 833 - 40 | 38.60 + 40 |
| 9 17.9 | 58 825 - 210 | 54.47 + 249 | 62 979 - 93 | 36.18 + 118 | 58 106 - 76 | 44.44 + 0 | 62 833 - 77 | 38.38 + 22 |
| 9 27.8 | 58 574 - 251 | 56 59 + 212 | 62 859 - 120 | 37.09 + 91 | 58 030 - 105 | 44.44 - 11 | 62 756 - 104 | 38.31 + 7 |
| 10 7.8 | 58 287 - 287 | 58 29 + 170 | 62 715 - 144 | 37.71 + 62 | 57 925 - 128 | 44.55 - 23 | 62 652 - 128 | 38.40 - 9 |
| 10 17.8 | 57 979 - 308 | 59 50 + 121 | 62 559 - 156 | 38.02 + 31 | 57 656 - 141 | 45.10 - 32 | 62 383 - 141 | 38.61 - 21 |
| 10 27.8 | 57 660 - 319 | 60 23 + 73 | 62 399 - 160 | 38.04 + 2 | 57 511 - 145 | 45.47 - 37 | 62 239 - 144 | 38.92 - 31 |
| 11 6.7 | 57 337 - 323 | 60 42 + 19 | 62 241 - 158 | 37.76 - 28 | 57 369 - 142 | 45.91 - 44 | 62 098 - 141 | 39.34 - 42 |
| 11 16.7 | 57 027 - 310 | 60 07 - 35 | 62 096 - 145 | 37.18 - 58 | 57 242 - 127 | 46.37 - 46 | 62 098 - 127 | 39.34 - 49 |
| 11 26.7 | 56 736 - 291 | 59 20 - 87 | 61 969 - 127 | 36.33 - 85 | 57 134 - 108 | 46.85 - 48 | 61 971 - 109 | 39.83 - 57 |
| 12 6.7 | 56 473 - 263 | 57 79 - 141 | 61 866 - 103 | 35.20 - 113 | 57 050 - 84 | 47.36 - 51 | 61 778 - 84 | 41.03 - 63 |
| 12 16.6 | 56 252 - 179 | 55 89 - 190 | 61 792 - 74 | 33.84 - 136 | 56 998 - 52 | 47.86 - 50 | 61 724 - 54 | 41.70 - 67 |
| 12 26.6 | 56 073 - 221 | 53 58 - 231 | 61 749 - 43 | 32.29 - 155 | 56 976 - 22 | 48.35 - 49 | 61 701 + 9 | 42.40 - 70 |
| 12 36.6 | 55 945 - 128 | 50 88 - 270 | 61 738 + 25 | 30.57 - 172 | 56 988 + 12 | 48.83 - 48 | 61 710 + 9 | 43.11 - 71 |
| | 55 945 - 69 | 50 88 - 295 | | | 56 988 + 47 | 48.83 - 41 | 61 710 + 44 | 43.11 - 67 |
| Mean Place | 57.705 | 44.89 | 61.913 | 30.46 | 56.761 | 44.71 | 61.535 | 39.73 |
| sec δ, tan δ | +1.660 | +1.324 | +1.041 | +0.288 | +1.014 | -0.168 | +1.004 | -0.089 |
| da(ψ), dδ(ψ) | +0.035 | +0.26 | +0.055 | +0.26 | +0.064 | +0.26 | +0.063 | +0.26 |
| da(ε), dδ(ε) | -0.058 | -0.75 | -0.013 | -0.75 | +0.007 | -0.75 | +0.004 | -0.75 |
| Dble. Trans. | August 3 | | August 3 | | August 3, | | August 3 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 1542 | | 1545 | | 1546 | | 1547 | |
|----------------------------------|---------------------------|---------------------------|----------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|
| | ι Microscopii | | B.D. -1° 4057 (Aquarii) | | ω Capricorni | | μ Aquarii | |
| Mag. Spect. | 5.14 | F0 | 6.53 | M3 | 4.24 | M0 | 4.80 | A3 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | ^h ^m | [°] ['] | ^h ^m | [°] ['] | ^h ^m | [°] ['] | ^h ^m | [°] ['] |
| | 20 47 | - 44 02 | 20 48 | - 0 36 | 20 50 | - 26 58 | 20 51 | - 9 02 |
| 1 ^d 1 ^s | -8.4 30.373 | - 63 42.59 | +107 32.332 | - 40 64.19 | - 90 57.488 | - 41 34.31 | + 27 52.257 | - 38 21.50 |
| 1 | 1.6 30.358 | - 15 41.28 | +131 32.325 | - 7 65.12 | - 93 57.484 | + 40 33.91 | - 5 52.252 | - 52 22.02 |
| 1 | 11.6 30.390 | + 32 39.77 | +151 32.348 | + 23 66.08 | - 96 57.516 | + 32 33.37 | + 54 52.278 | + 26 22.51 |
| 1 | 21.5 30.471 | + 81 38.09 | +168 32.405 | + 57 67.00 | - 92 57.587 | + 71 32.72 | + 65 52.338 | + 60 22.92 |
| 1 | 31.5 30.597 | +126 36.29 | +180 32.492 | + 87 67.85 | - 85 57.689 | +102 31.96 | + 76 52.428 | + 90 23.22 |
| 2 | 10.5 30.767 | +170 34.38 | +191 32.610 | +118 68.60 | - 75 57.827 | +138 31.03 | + 93 52.547 | +119 23.48 |
| 2 | 20.4 30.981 | +214 32.42 | +196 32.759 | +149 69.18 | - 58 58.001 | +174 29.99 | +104 52.701 | +154 23.54 |
| 3 | 2.4 31.231 | +250 30.46 | +196 32.937 | +178 69.53 | - 35 58.204 | +203 28.86 | +113 52.882 | +181 23.42 |
| 3 | 12.4 31.519 | +288 28.49 | +197 33.142 | +205 69.64 | - 11 58.438 | +234 27.63 | +123 53.090 | +208 23.08 |
| 3 | 22.4 31.841 | +322 26.58 | +191 33.374 | +232 69.46 | +18 58.700 | +262 26.31 | +132 53.326 | +236 22.52 |
| 4 | 1.3 32.191 | +350 24.74 | +184 33.628 | +254 69.00 | +46 58.986 | +286 24.92 | +139 53.583 | +257 21.74 |
| 4 | 11.3 32.568 | +377 23.02 | +172 33.905 | +277 68.25 | +75 59.296 | +310 23.48 | +144 53.864 | +281 20.75 |
| 4 | 21.3 32.967 | +399 21.45 | +157 34.198 | +293 67.21 | +104 59.625 | +329 22.02 | +146 54.162 | +298 19.55 |
| 5 | 1.3 33.379 | +412 20.06 | +139 34.503 | +305 65.94 | +127 59.966 | +341 20.59 | +143 54.472 | +310 18.20 |
| 5 | 11.2 33.802 | +423 18.89 | +117 34.817 | +314 64.44 | +150 60.318 | +352 19.20 | +139 54.792 | +320 16.72 |
| 5 | 21.2 34.224 | +422 17.98 | +91 35.130 | +313 62.78 | +166 60.671 | +129 17.91 | +321 55.113 | +157 15.15 |
| 5 | 31.2 34.637 | +413 17.34 | +64 35.437 | +307 61.02 | +176 61.018 | +347 16.76 | +115 55.428 | +315 13.55 |
| 6 | 10.1 35.036 | +399 16.99 | +35 35.733 | +296 59.19 | +183 61.354 | +336 15.76 | +100 55.732 | +304 11.95 |
| 6 | 20.1 35.406 | +370 16.97 | +2 36.006 | +273 57.35 | +184 61.667 | +313 14.97 | +79 56.015 | +283 10.42 |
| 6 | 30.1 35.741 | +335 17.23 | +26 36.253 | +247 55.57 | +178 61.951 | +284 14.39 | +58 56.272 | +257 09.00 |
| 7 | 10.1 36.034 | +293 17.80 | -57 36.468 | +215 53.86 | +171 62.201 | +250 14.03 | +36 56.497 | +225 07.70 |
| 7 | 20.0 36.273 | +239 18.65 | -85 36.642 | +174 52.29 | +157 62.407 | +206 13.92 | +11 56.681 | +184 06.57 |
| 7 | 30.0 36.458 | +185 19.73 | -108 36.776 | +134 50.87 | +142 62.568 | +161 14.02 | -10 56.825 | +144 05.62 |
| 8 | 9.0 36.581 | +123 21.02 | -129 36.865 | +89 49.63 | +124 62.679 | +111 14.33 | -31 56.923 | +98 04.87 |
| 8 | 19.0 36.641 | +60 22.45 | -143 36.908 | +43 48.60 | +103 62.737 | +58 14.82 | -49 56.974 | +51 04.31 |
| 8 | 28.9 36.643 | +2 23.96 | -151 36.909 | +1 47.76 | +84 62.748 | +11 15.45 | -63 56.982 | +8 03.94 |
| 9 | 7.9 36.585 | -58 25.50 | -154 36.868 | +63 47.13 | +63 62.710 | -38 16.19 | -74 56.947 | +35 03.74 |
| 9 | 17.9 36.476 | -109 26.98 | -148 36.791 | +77 46.70 | +43 62.631 | -79 16.99 | -80 56.874 | -73 03.71 |
| 9 | 27.8 36.325 | -151 28.34 | -136 36.686 | +105 46.45 | +25 62.518 | -113 17.79 | -80 56.773 | -101 03.81 |
| 10 | 7.8 36.140 | -185 29.53 | -119 36.558 | +128 46.38 | +7 62.378 | -140 18.57 | -78 56.647 | -126 04.03 |
| 10 | 17.8 35.934 | -206 30.47 | -94 36.417 | -141 46.48 | -10 62.222 | -156 19.27 | -70 56.509 | -138 04.34 |
| 10 | 27.8 35.721 | -213 31.14 | -67 36.273 | -144 46.72 | -24 62.061 | -161 19.85 | -58 56.365 | -144 04.71 |
| 11 | 6.7 35.510 | -211 31.50 | -36 36.131 | -142 47.12 | -40 61.901 | -160 20.31 | -46 56.224 | -47 05.14 |
| 11 | 16.7 35.317 | -193 31.52 | -2 36.003 | -128 47.64 | -52 61.757 | -144 20.60 | -29 56.096 | -128 05.62 |
| 11 | 26.7 35.149 | -168 31.22 | +30 35.893 | -110 48.27 | -63 61.633 | -124 20.74 | -14 55.987 | -109 06.11 |
| 12 | 6.7 35.016 | -133 30.60 | +62 35.806 | -87 49.02 | -75 61.537 | -96 20.71 | +3 55.901 | -86 06.63 |
| 12 | 16.6 34.927 | -89 29.67 | +93 35.749 | -57 49.84 | -82 61.475 | -62 20.52 | +19 55.846 | -55 07.15 |
| 12 | 26.6 34.881 | -46 28.49 | +118 35.722 | -27 50.73 | -89 61.448 | -27 20.18 | +34 55.820 | -26 07.66 |
| 12 | 36.6 34.884 | +3 27.07 | +142 35.727 | +5 51.66 | -93 61.458 | +10 19.70 | +48 55.828 | +8 08.15 |
| | +53 | +160 | +38 | -92 | +49 | +61 | +41 | -44 |
| Mean Place | 34.470 | 18.29 | 35.605 | 49.13 | 61.078 | 13.04 | 55.591 | 04.32 |
| sec δ, tan δ | +1.391 | -0.967 | +1.000 | -0.011 | +1.122 | -0.509 | +1.013 | -0.159 |
| dα(ψ), dδ(ψ) | +0.080 | +0.27 | +0.061 | +0.27 | +0.071 | +0.27 | +0.064 | +0.27 |
| dα(ε), dδ(ε) | +0.043 | -0.74 | +0.000 | -0.74 | +0.023 | -0.73 | +0.007 | -0.73 |
| Dble.Trans. | August 3 | | August 3 | | August 4 | | August 4 | |

APPARENT PLACES OF STARS, 1986

323

AT UPPER TRANSIT AT GREENWICH

| No. | 785 | | 786 | | 788 | | 1548 | |
|----------------|---------------------------|---|---------------------------|---|---------------------------|---|---------------------------|---|
| | β Indi | | 32 Vulpeculae | | ν Cygni | | 64 G. Capricorni | |
| Mag. Spect. | 3.72 | K0 | 5.24 | K5 | 4.04 | A0 | 5.95 | A3 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | ^h ^m | [°] ['] ^{''} | ^h ^m | [°] ['] ^{''} | ^h ^m | [°] ['] ^{''} | ^h ^m | [°] ['] ^{''} |
| | 20 53 | - 58 30 | 20 53 | + 27 59 | 20 56 | + 41 06 | 20 56 | - 16 05 |
| 1 ^d | -8.4 | | | | | | | |
| 1 | 40.960 ^s -130 | 48.15 ["] +168 | 55.912 ^s - 86 | 72.64 ["] -179 | 36.943 ^s -134 | 47.77 ["] -199 | 51.980 ^s - 41 | 21.91 ["] - 24 |
| 1 | 40.895 ["] - 65 | 46.16 ["] +199 | 55.859 ["] - 53 | 70.61 ["] -203 | 36.847 ["] - 96 | 45.45 ["] -232 | 51.973 ["] - 7 | 22.07 ["] - 16 |
| 1 | 40.894 ["] - 1 | 43.91 ["] +225 | 55.841 ["] - 18 | 68.38 ["] -223 | 36.791 ["] - 56 | 42.85 ["] -260 | 51.997 ["] + 24 | 22.16 ["] - 9 |
| 1 | 21.5 | 40.965 ["] + 71 | 41.45 ["] +246 | 55.861 ["] + 20 | 66.05 ["] -233 | 36.781 ["] - 10 | 40.08 ["] -277 | 52.058 ["] + 61 |
| 1 | 31.5 | 41.100 ["] +135 | 38.87 ["] +258 | 55.917 ["] + 56 | 63.71 ["] -234 | 36.816 ["] + 35 | 37.27 ["] -281 | 52.153 ["] + 95 |
| 2 | 10.5 | 41.297 ["] +197 | 36.20 ["] +267 | 56.011 ["] + 94 | 61.43 ["] -228 | 36.897 ["] + 81 | 34.47 ["] -280 | 52.264 ["] +111 |
| 2 | 20.5 | 41.558 ["] +261 | 33.53 ["] +267 | 56.144 ["] +133 | 59.35 ["] -208 | 37.026 ["] +129 | 31.85 ["] -262 | 52.420 ["] +156 |
| 3 | 2.4 | 41.872 ["] +314 | 30.90 ["] +263 | 56.312 ["] +168 | 57.53 ["] -182 | 37.199 ["] +173 | 31.85 ["] -235 | 52.603 ["] +183 |
| 3 | 12.4 | 42.239 ["] +367 | 28.35 ["] +255 | 56.515 ["] +203 | 56.06 ["] -147 | 37.416 ["] +217 | 29.50 ["] -200 | 52.814 ["] +211 |
| 3 | 22.4 | 42.654 ["] +415 | 25.96 ["] +239 | 56.752 ["] +237 | 55.02 ["] -104 | 37.674 ["] +258 | 27.50 ["] -152 | 53.053 ["] +239 |
| 4 | 1.3 | 43.108 ["] +454 | 23.75 ["] +221 | 57.016 ["] +264 | 54.44 ["] - 58 | 37.965 ["] +291 | 24.96 ["] -102 | 53.315 ["] +262 |
| 4 | 11.3 | 43.600 ["] +492 | 21.77 ["] +198 | 57.307 ["] +291 | 54.35 ["] - 9 | 38.288 ["] +323 | 24.48 ["] -48 | 53.601 ["] +286 |
| 4 | 21.3 | 44.120 ["] +520 | 20.07 ["] +170 | 57.617 ["] +310 | 54.78 ["] +43 | 38.633 ["] +345 | 24.60 ["] +12 | 53.906 ["] +305 |
| 5 | 1.3 | 44.658 ["] +538 | 18.67 ["] +140 | 57.940 ["] +323 | 55.69 ["] +91 | 38.991 ["] +358 | 25.27 ["] +67 | 54.224 ["] +318 |
| 5 | 11.2 | 45.210 ["] +552 | 17.61 ["] +106 | 58.271 ["] +331 | 57.05 ["] +136 | 39.358 ["] +367 | 26.48 ["] +121 | 54.553 ["] +329 |
| 5 | 21.2 | 45.761 ["] +551 | 16.93 ["] +68 | 58.600 ["] +329 | 58.85 ["] +180 | 39.721 ["] +363 | 28.21 ["] +173 | 54.884 ["] +331 |
| 5 | 31.2 | 46.300 ["] +539 | 16.62 ["] +31 | 58.919 ["] +319 | 60.98 ["] +213 | 40.071 ["] +350 | 30.35 ["] +214 | 55.210 ["] +286 |
| 6 | 10.2 | 46.820 ["] +520 | 16.70 ["] - 8 | 59.224 ["] +305 | 63.41 ["] +243 | 40.402 ["] +331 | 32.89 ["] +254 | 55.526 ["] +316 |
| 6 | 20.1 | 47.302 ["] +482 | 17.19 ["] -49 | 59.502 ["] +278 | 66.07 ["] +266 | 40.701 ["] +299 | 35.74 ["] +285 | 55.821 ["] +295 |
| 6 | 30.1 | 47.739 ["] +437 | 18.04 ["] -85 | 59.749 ["] +247 | 68.85 ["] +278 | 40.964 ["] +263 | 38.79 ["] +305 | 56.090 ["] +269 |
| 7 | 10.1 | 48.120 ["] +381 | 19.24 ["] -120 | 59.959 ["] +210 | 71.73 ["] +288 | 41.183 ["] +219 | 42.01 ["] +322 | 56.327 ["] +237 |
| 7 | 20.0 | 48.430 ["] +310 | 20.77 ["] -153 | 60.124 ["] +165 | 74.61 ["] +288 | 41.351 ["] +168 | 45.28 ["] +327 | 56.524 ["] +197 |
| 7 | 30.0 | 48.669 ["] +239 | 22.54 ["] -177 | 60.245 ["] +121 | 77.41 ["] +280 | 41.468 ["] +117 | 48.53 ["] +325 | 56.678 ["] +154 |
| 8 | 9.0 | 48.826 ["] +157 | 24.52 ["] -198 | 60.318 ["] +73 | 80.12 ["] +271 | 41.531 ["] +63 | 51.73 ["] +320 | 56.786 ["] +108 |
| 8 | 19.0 | 48.899 ["] +73 | 26.63 ["] -211 | 60.340 ["] +22 | 82.63 ["] +251 | 41.537 ["] +6 | 54.75 ["] +302 | 56.846 ["] +60 |
| 8 | 28.9 | 48.892 ["] - 7 | 28.78 ["] -215 | 60.319 ["] - 21 | 84.93 ["] +230 | 41.493 ["] -44 | 57.57 ["] +282 | 56.861 ["] +15 |
| 9 | 7.9 | 48.805 ["] - 87 | 30.90 ["] -192 | 60.252 ["] - 67 | 86.97 ["] +204 | 41.398 ["] -95 | 60.14 ["] +257 | 56.831 ["] -30 |
| 9 | 17.9 | 48.646 ["] -159 | 32.89 ["] -219 | 60.147 ["] -105 | 88.70 ["] +173 | 41.261 ["] -137 | 62.38 ["] +224 | 56.762 ["] -69 |
| 9 | 27.9 | 48.429 ["] -217 | 34.68 ["] -179 | 60.012 ["] -135 | 90.12 ["] +142 | 41.088 ["] -173 | 64.27 ["] +189 | 56.663 ["] -99 |
| 10 | 7.8 | 48.160 ["] -269 | 36.19 ["] -151 | 59.851 ["] -161 | 91.19 ["] +107 | 40.885 ["] -203 | 65.77 ["] +150 | 56.537 ["] -126 |
| 10 | 17.8 | 47.860 ["] -300 | 37.33 ["] -114 | 59.675 ["] -176 | 91.87 ["] +68 | 40.664 ["] -221 | 66.83 ["] +106 | 56.397 ["] -140 |
| 10 | 27.8 | 47.544 ["] -316 | 38.07 ["] -74 | 59.493 ["] -182 | 92.19 ["] +32 | 40.434 ["] -230 | 67.45 ["] +62 | 56.251 ["] -146 |
| 11 | 6.7 | 47.226 ["] -318 | 38.38 ["] -31 | 59.310 ["] -183 | 92.11 ["] - 8 | 40.200 ["] -234 | 67.59 ["] +14 | 56.106 ["] -145 |
| 11 | 16.7 | 46.927 ["] -299 | 38.21 ["] +17 | 59.139 ["] -171 | 91.63 ["] -48 | 39.977 ["] -223 | 67.24 ["] -35 | 55.975 ["] -131 |
| 11 | 26.7 | 46.659 ["] -268 | 37.60 ["] +61 | 58.984 ["] -155 | 90.78 ["] -85 | 39.770 ["] -207 | 66.44 ["] -80 | 55.861 ["] -114 |
| 12 | 6.7 | 46.434 ["] -225 | 36.54 ["] +106 | 58.850 ["] -134 | 89.54 ["] -124 | 39.585 ["] -185 | 65.14 ["] -130 | 55.772 ["] -89 |
| 12 | 16.6 | 46.268 ["] -166 | 35.08 ["] +146 | 58.747 ["] -103 | 87.98 ["] -156 | 39.433 ["] -152 | 63.43 ["] -171 | 55.713 ["] -59 |
| 12 | 26.6 | 46.160 ["] -108 | 33.27 ["] +181 | 58.674 ["] -73 | 86.13 ["] -185 | 39.314 ["] -119 | 61.35 ["] -208 | 55.685 ["] -28 |
| 12 | 36.6 | 46.118 ["] -42 | 31.14 ["] +213 | 58.635 ["] -39 | 84.03 ["] -210 | 39.234 ["] -80 | 58.92 ["] -243 | 55.690 ["] +5 |
| | | | | | | | | |
| Mean Place | 45.781 | 21.15 | 59.089 | 81.05 | 40.182 | 53.46 | 55.367 | 02.82 |
| sec δ, tan δ | +1.914 | -1.632 | +1.133 | +0.532 | +1.327 | +0.873 | +1.041 | -0.288 |
| da(ψ), dδ(ψ) | +0.093 | +0.27 | +0.051 | +0.27 | +0.045 | +0.28 | +0.067 | +0.28 |
| da(ε), dδ(ε) | +0.075 | -0.73 | -0.024 | -0.73 | -0.041 | -0.72 | +0.013 | -0.72 |
| Dble. Trans. | August 5 | | August 5 | | August 5 | | August 5 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 1549 | | 1551 | | 789 | | 1550 | | |
|------------------------------|------------------|-----------------|------------------|-----------------|------------------|-----------------|------------------|-----------------|-------------|
| | 33 Vulpeculae | | 59 Cygni* | | 11 Aquarii | | γ Microscopii | | |
| Mag.Spect. | 5.57 | K5 | 4.88 | B0p | 6.26 | G0 | 4.71 | G5 | |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " | |
| | 20 57 | +22 15 | 20 59 | +47 27 | 20 59 | - 4 46 | 21 00 | -32 18 | |
| 1 | -8.4 | 36.967 - 75 | 74.13 - 162 | 18.682 - 169 | 60.06 - 203 | 47.952 - 44 | 74.79 - 71 | 24.309 - 54 | 63.09 + 49 |
| 1 | 1.6 | 36.924 - 43 | 72.30 - 183 | 18.554 - 128 | 57.68 - 238 | 47.938 - 14 | 75.51 - 72 | 24.293 - 16 | 62.42 + 67 |
| 1 | 11.6 | 36.912 - 12 | 70.31 - 199 | 18.469 - 85 | 54.97 - 271 | 47.954 + 16 | 76.22 - 71 | 24.314 + 21 | 61.59 + 83 |
| 1 | 21.5 | 36.937 + 25 | 68.23 - 208 | 18.437 - 32 | 52.06 - 291 | 48.004 + 50 | 76.87 - 65 | 24.376 + 62 | 60.59 + 100 |
| 1 | 31.5 | 36.996 + 59 | 66.16 - 207 | 18.456 + 19 | 49.07 - 299 | 48.083 + 79 | 77.43 - 56 | 24.473 + 97 | 59.46 + 113 |
| 2 | 10.5 | 37.090 + 94 | 64.17 - 199 | 18.527 + 71 | 46.08 - 299 | 48.192 + 109 | 77.90 - 47 | 24.606 + 133 | 58.19 + 127 |
| 2 | 20.5 | 37.220 + 130 | 62.36 - 181 | 18.654 + 127 | 43.25 - 283 | 48.333 + 141 | 78.21 - 31 | 24.777 + 171 | 56.80 + 139 |
| 3 | 2.4 | 37.383 + 163 | 60.81 - 155 | 18.831 + 177 | 40.69 - 256 | 48.503 + 170 | 78.31 - 10 | 24.980 + 203 | 55.34 + 146 |
| 3 | 12.4 | 37.579 + 196 | 59.58 - 123 | 19.058 + 227 | 38.47 - 222 | 48.701 + 198 | 78.18 + 13 | 25.215 + 235 | 53.79 + 155 |
| 3 | 22.4 | 37.808 + 229 | 58.76 - 82 | 19.333 + 275 | 36.73 - 174 | 48.927 + 226 | 77.79 + 39 | 25.482 + 267 | 52.19 + 160 |
| 4 | 1.3 | 38.062 + 254 | 58.37 - 39 | 19.645 + 312 | 35.51 - 122 | 49.177 + 250 | 77.15 + 64 | 25.775 + 293 | 50.57 + 162 |
| 4 | 11.3 | 38.343 + 281 | 58.44 + 7 | 19.993 + 348 | 34.84 - 67 | 49.450 + 273 | 76.26 + 89 | 26.094 + 319 | 48.93 + 164 |
| 4 | 21.3 | 38.643 + 300 | 58.98 + 54 | 20.366 + 373 | 34.79 - 5 | 49.742 + 292 | 75.13 + 113 | 26.434 + 340 | 47.34 + 159 |
| 5 | 1.3 | 38.956 + 313 | 59.96 + 96 | 20.753 + 387 | 35.32 + 3 | 50.047 + 305 | 73.79 + 134 | 26.788 + 354 | 45.81 + 153 |
| 5 | 11.2 | 39.279 + 323 | 61.36 + 140 | 21.149 + 396 | 36.43 + 111 | 50.363 + 316 | 72.28 + 151 | 27.156 + 368 | 44.38 + 143 |
| 5 | 21.2 | 39.601 + 322 | 63.14 + 178 | 21.540 + 391 | 38.09 + 166 | 50.681 + 318 | 70.64 + 164 | 27.526 + 370 | 43.11 + 127 |
| 5 | 31.2 | 39.915 + 314 | 65.21 + 207 | 21.916 + 376 | 40.20 + 211 | 50.995 + 314 | 68.93 + 171 | 27.891 + 365 | 42.01 + 110 |
| 6 | 10.2 | 40.216 + 301 | 67.55 + 234 | 22.270 + 354 | 42.74 + 254 | 51.298 + 303 | 67.19 + 174 | 28.245 + 354 | 41.12 + 89 |
| 6 | 20.1 | 40.492 + 276 | 70.08 + 253 | 22.589 + 319 | 45.62 + 288 | 51.581 + 283 | 65.48 + 171 | 28.578 + 333 | 40.48 + 64 |
| 6 | 30.1 | 40.740 + 248 | 72.70 + 262 | 22.866 + 277 | 48.74 + 312 | 51.840 + 259 | 63.84 + 164 | 28.882 + 304 | 40.09 + 39 |
| 7 | 10.1 | 40.954 + 214 | 75.39 + 269 | 23.096 + 230 | 52.07 + 333 | 52.067 + 227 | 62.30 + 154 | 29.151 + 269 | 39.96 + 13 |
| 7 | 20.0 | 41.124 + 170 | 78.05 + 266 | 23.270 + 174 | 55.48 + 341 | 52.254 + 187 | 60.92 + 138 | 29.375 + 224 | 40.10 - 14 |
| 7 | 30.0 | 41.252 + 128 | 80.63 + 258 | 23.388 + 118 | 58.89 + 341 | 52.401 + 147 | 59.71 + 121 | 29.552 + 177 | 40.47 - 37 |
| 8 | 9.0 | 41.333 + 81 | 83.09 + 246 | 23.446 + 58 | 62.27 + 338 | 52.504 + 103 | 58.68 + 103 | 29.678 + 126 | 41.07 - 60 |
| 8 | 19.0 | 41.366 + 33 | 85.36 + 227 | 23.442 - 4 | 65.50 + 323 | 52.560 + 56 | 57.87 + 81 | 29.748 + 70 | 41.85 - 78 |
| 8 | 28.9 | 41.356 - 10 | 87.41 + 205 | 23.384 - 58 | 68.54 + 304 | 52.574 + 14 | 57.24 + 63 | 29.768 + 20 | 42.77 - 92 |
| 9 | 7.9 | 41.302 - 54 | 89.22 + 181 | 23.271 - 113 | 71.34 + 280 | 52.544 - 30 | 56.81 + 43 | 29.766 - 32 | 43.80 - 103 |
| 9 | 17.9 | 41.211 - 91 | 90.73 + 151 | 23.110 - 161 | 73.79 + 245 | 52.478 - 66 | 56.58 + 23 | 29.736 - 76 | 44.86 - 106 |
| 9 | 27.9 | 41.090 - 121 | 91.95 + 122 | 22.911 - 199 | 75.91 + 212 | 52.382 - 96 | 56.49 + 9 | 29.660 - 113 | 45.89 - 103 |
| 10 | 7.8 | 40.944 - 146 | 92.85 + 90 | 22.678 - 233 | 77.62 + 171 | 52.262 - 120 | 56.57 - 8 | 29.403 - 144 | 46.87 - 98 |
| 10 | 17.8 | 40.783 - 161 | 93.40 + 55 | 22.423 - 255 | 78.86 + 124 | 52.127 - 135 | 56.77 - 20 | 29.241 - 162 | 47.72 - 85 |
| 10 | 27.8 | 40.616 - 167 | 93.62 + 22 | 22.157 - 266 | 79.65 + 79 | 51.986 - 141 | 57.08 - 31 | 29.070 - 171 | 48.42 - 70 |
| 11 | 6.7 | 40.448 - 168 | 93.49 - 13 | 21.885 - 272 | 79.93 + 28 | 51.846 - 140 | 57.50 - 42 | 29.070 - 170 | 48.42 - 51 |
| 11 | 16.7 | 40.292 - 156 | 93.01 - 48 | 21.623 - 262 | 79.68 - 25 | 51.846 - 128 | 57.50 - 50 | 28.900 - 157 | 48.93 - 28 |
| 11 | 26.7 | 40.151 - 141 | 92.20 - 81 | 21.376 - 247 | 78.95 - 73 | 51.718 - 111 | 58.00 - 56 | 28.743 - 137 | 49.21 - 7 |
| 12 | 6.7 | 40.031 - 120 | 91.06 - 114 | 21.152 - 224 | 77.69 - 126 | 51.517 - 90 | 59.19 - 63 | 28.496 - 110 | 49.12 + 16 |
| 12 | 16.6 | 39.939 - 92 | 89.63 - 143 | 20.963 - 189 | 75.96 - 173 | 51.456 - 61 | 59.86 - 67 | 28.421 - 75 | 48.74 + 38 |
| 12 | 26.6 | 39.877 - 62 | 87.96 - 167 | 20.809 - 154 | 73.83 - 213 | 51.424 - 32 | 60.55 - 69 | 28.381 - 40 | 48.17 + 57 |
| 12 | 36.6 | 39.846 + 5 | 86.07 - 189 | 20.699 - 110 | 71.32 - 251 | 51.422 - 2 | 61.25 - 70 | 28.379 - 2 | 47.41 + 76 |
| | | | -200 | - 61 | -276 | + 32 | - 66 | + 39 | + 93 |
| Mean Place sec δ, tan δ | 40.128 +1.081 | 83.83 +0.410 | 21.988 +1.479 | 64.55 +1.090 | 51.210 +1.003 | 58.46 -0.084 | 27.941 +1.183 | 40.12 -0.632 | |
| dα(w), dδ(w) dα(ε), dδ(ε) | +0.053 -0.019 | +0.28 -0.71 | +0.041 -0.051 | +0.28 -0.71 | +0.063 +0.004 | +0.28 -0.71 | +0.073 +0.030 | +0.28 -0.71 | |
| Dble.Trans. | August 6 | | August 6 | | August 6 | | August 6 | | |

AT UPPER TRANSIT AT GREENWICH

| No. | 790 | | 787 | | 792 | | 1552 | |
|--------------|------------------------------------|-------------------------------------|------------------------------------|-------------------------------------|------------------------------------|-------------------------------------|------------------------------------|-------------------------------------|
| | ζ Microscopii | | α Octantis | | ξ Cygni | | γ Capricorni | |
| Mag. Spect. | 5.35 | F0 | 5.24 | F2 | 3.92 | K5 | 4.19 | A0 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | ^h ^m 21 02 | [°] ['] -38 41 | ^h ^m 21 02 | [°] ['] -77 04 | ^h ^m 21 04 | [°] ['] +43 51 | ^h ^m 21 05 | [°] ['] -17 17 |
| 1 -8.4 | 02.605 ^s - 66 | 29.98 ["] + 76 | 58.872 ^s - 478 | 64.21 ["] +230 | 23.114 ^s - 153 | 80.06 ["] -195 | 08.032 ^s - 46 | 32.87 ["] - 19 |
| 1 1.6 | 02.580 - 25 | 28.99 + 99 | 58.544 - 328 | 61.54 +267 | 23.000 - 114 | 77.77 -229 | 08.017 - 15 | 32.97 - 10 |
| 1 11.6 | 02.596 + 16 | 27.80 +119 | 58.369 - 175 | 58.54 +300 | 22.925 - 75 | 75.17 -260 | 08.034 + 17 | 32.98 - 10 |
| 1 21.5 | 02.656 + 60 | 26.42 +138 | 58.368 - 1 | 55.32 +322 | 22.899 - 26 | 72.37 -280 | 08.087 + 53 | 32.88 + 1 |
| 1 31.5 | 02.756 + 100 | 24.91 +151 | 58.528 + 160 | 51.97 +335 | 22.918 + 19 | 69.50 -287 | 08.181 + 94 | 32.67 + 21 |
| 2 10.5 | 02.895 + 139 | 23.26 +165 | 58.846 + 318 | 48.56 +341 | 22.986 + 68 | 66.63 -287 | 08.278 + 97 | 32.36 + 31 |
| 2 20.5 | 03.075 + 180 | 21.51 +175 | 59.323 + 477 | 45.19 +337 | 23.106 + 120 | 63.91 -272 | 08.426 + 148 | 31.85 + 51 |
| 3 2.4 | 03.290 + 215 | 19.71 +180 | 59.935 + 612 | 41.94 +325 | 23.272 + 166 | 61.46 -245 | 08.602 + 176 | 31.20 + 65 |
| 3 12.4 | 03.540 + 250 | 17.87 +184 | 60.679 + 744 | 38.85 +309 | 23.485 + 213 | 59.33 -213 | 08.807 + 205 | 30.39 + 81 |
| 3 22.4 | 03.824 + 284 | 16.01 +186 | 61.541 + 862 | 36.02 +283 | 23.743 + 258 | 57.68 -165 | 09.041 + 234 | 29.41 + 98 |
| 4 1.4 | 04.136 + 312 | 14.18 +183 | 62.494 + 953 | 33.49 +253 | 24.037 + 294 | 56.52 -116 | 09.299 + 258 | 28.27 +114 |
| 4 11.3 | 04.477 + 341 | 12.40 +178 | 63.536 +1042 | 31.29 +220 | 24.365 + 328 | 55.91 - 61 | 09.582 + 283 | 26.99 +128 |
| 4 21.3 | 04.840 + 363 | 10.72 +168 | 64.641 +1105 | 29.52 +177 | 24.719 + 354 | 55.90 - 1 | 09.886 + 304 | 25.59 +140 |
| 5 1.3 | 05.219 + 379 | 09.17 +155 | 65.783 +1142 | 28.16 +136 | 25.088 + 369 | 56.45 + 55 | 10.204 + 318 | 24.12 +147 |
| 5 11.2 | 05.611 + 392 | 07.78 +139 | 66.954 +1171 | 27.25 + 91 | 25.467 + 379 | 57.56 +111 | 10.534 + 330 | 22.59 +153 |
| 5 21.2 | 06.006 + 395 | 06.61 +117 | 68.119 +1165 | 26.84 + 41 | 25.843 + 376 | 59.21 +165 | 10.867 + 333 | 21.06 +153 |
| 5 31.2 | 06.396 + 390 | 05.66 + 95 | 69.256 +1137 | 26.90 - 6 | 26.207 + 364 | 61.30 +209 | 11.197 + 330 | 19.57 +149 |
| 6 10.2 | 06.775 + 379 | 04.98 + 68 | 70.347 +1091 | 27.44 - 54 | 26.552 + 345 | 63.80 +250 | 11.518 + 321 | 18.17 +140 |
| 6 20.1 | 07.130 + 355 | 04.59 + 39 | 71.354 +1007 | 28.47 -103 | 26.864 + 312 | 66.63 +283 | 11.820 + 302 | 16.89 +128 |
| 6 30.1 | 07.455 + 325 | 04.48 + 11 | 72.261 + 907 | 29.91 -144 | 27.140 + 276 | 69.69 +306 | 12.096 + 276 | 15.78 +111 |
| 7 10.1 | 07.743 + 288 | 04.67 - 19 | 73.047 + 786 | 31.77 -186 | 27.371 + 231 | 72.94 +325 | 12.342 + 246 | 14.84 + 94 |
| 7 20.1 | 07.983 + 240 | 05.15 - 48 | 73.680 - 633 | 33.97 -220 | 27.550 + 179 | 76.28 +334 | 12.546 + 204 | 14.12 + 72 |
| 7 30.0 | 08.173 + 190 | 05.87 - 72 | 74.156 + 476 | 36.43 -246 | 27.676 + 126 | 79.61 +333 | 12.710 + 164 | 13.61 + 51 |
| 8 9.0 | 08.308 + 135 | 06.83 - 96 | 74.455 + 299 | 39.10 -267 | 27.746 + 70 | 82.91 +330 | 12.827 + 117 | 13.31 + 30 |
| 8 19.0 | 08.383 + 75 | 07.97 -114 | 74.566 + 111 | 41.87 -277 | 27.757 + 11 | 86.05 +314 | 12.895 + 68 | 13.22 + 9 |
| 8 28.9 | 08.404 + 21 | 09.23 -126 | 74.501 - 65 | 44.64 -277 | 27.717 - 40 | 89.00 +295 | 12.918 + 23 | 13.30 - 8 |
| 9 7.9 | 08.369 - 35 | 10.57 -134 | 74.252 - 249 | 47.32 -268 | 27.624 - 93 | 91.72 +272 | 12.896 - 22 | 13.54 - 24 |
| 9 17.9 | 08.285 - 84 | 10.57 -133 | 74.252 - 417 | 47.32 -247 | 27.624 - 140 | 91.72 +238 | 12.896 - 62 | 13.54 - 37 |
| 9 27.9 | 08.162 - 123 | 11.90 -128 | 73.835 - 557 | 49.79 -218 | 27.484 - 175 | 94.10 +205 | 12.834 - 94 | 13.91 - 46 |
| 10 7.8 | 08.004 - 158 | 13.18 -117 | 73.278 - 686 | 51.97 -179 | 27.309 - 209 | 96.15 +166 | 12.740 - 121 | 14.37 - 52 |
| 10 17.8 | 07.825 - 179 | 15.33 - 98 | 71.819 - 773 | 55.07 -131 | 26.871 - 229 | 99.01 +120 | 12.619 - 137 | 14.89 - 54 |
| 10 27.8 | 07.636 - 189 | 16.09 - 76 | 70.994 - 825 | 55.86 - 79 | 26.630 - 241 | 99.78 + 77 | 12.482 - 145 | 15.43 - 53 |
| 11 6.7 | 07.447 - 189 | 16.61 - 52 | 70.143 - 851 | 56.08 - 22 | 26.384 - 246 | 100.06 + 28 | 12.337 - 145 | 15.96 - 50 |
| 11 16.7 | 07.271 - 176 | 16.61 - 22 | 70.143 - 824 | 56.08 + 38 | 26.384 - 238 | 99.83 - 23 | 12.192 - 133 | 16.46 - 44 |
| 11 26.7 | 07.116 - 155 | 16.83 + 6 | 69.319 - 770 | 55.70 + 95 | 26.146 - 224 | 99.13 - 70 | 12.059 - 116 | 16.90 - 38 |
| 12 6.7 | 06.990 - 126 | 16.43 + 34 | 67.863 - 686 | 53.23 +152 | 25.719 - 203 | 97.92 -121 | 11.849 - 94 | 17.59 - 31 |
| 12 16.6 | 06.901 - 89 | 15.80 + 63 | 67.301 - 562 | 51.20 +203 | 25.548 - 171 | 96.27 -165 | 11.785 - 64 | 17.81 - 22 |
| 12 26.6 | 06.850 - 51 | 14.94 + 86 | 66.873 - 428 | 48.75 +245 | 25.411 - 137 | 94.23 -204 | 11.750 - 35 | 17.95 - 14 |
| 12 36.6 | 06.841 + 35 | 13.84 +129 | 66.597 - 107 | 45.90 +311 | 25.312 - 53 | 91.81 -265 | 11.748 + 33 | 17.99 + 6 |
| Mean Place | 06.378 | 05.66 | 67.024 | 34.91 | 26.367 | 85.08 | 11.387 | 13.17 |
| sec δ, tan δ | +1.281 | -0.801 | +4.471 | -4.358 | +1.387 | +0.961 | +1.047 | -0.311 |
| da(ψ), dδ(ψ) | +0.076 | +0.28 | +0.142 | +0.29 | +0.043 | +0.29 | +0.067 | +0.29 |
| da(ε), dδ(ε) | +0.038 | -0.70 | +0.208 | -0.70 | -0.046 | -0.69 | +0.015 | -0.69 |
| Dble. Trans. | August 7 | | August 7 | | August 7 | | August 8 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 795 | | 1553 | | 793 | | 791 | | |
|--------------|---------------------------|---------------------------|----------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|------------|
| | Bradley 2777 (Cephei) | | B.D. -0° 4161 (Aquarii) | | 61 Cygni A* | | A Capricorni | | |
| Mag.Spect. | 5.90 | B9 | 7.10 | K2 | 5.57 | K5 | 4.60 | M0 | |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | |
| | ^h ^m | [°] ['] | ^h ^m | [°] ['] | ^h ^m | [°] ['] | ^h ^m | [°] ['] | |
| | 21 05 | + 78 03 | 21 05 | - 0 09 | 21 06 | + 38 40 | 21 06 | - 25 03 | |
| ^d | ^s | ["] | ^s | ["] | ^s | ["] | ^s | ["] | |
| 1 | -8.4 | 41.410 - 890 | 78.12 -179 | 48 690 - 51 | 49 80 - 87 | 14.164 - 117 | 49.23 -181 | 16 967 - 52 | 58 96 + 14 |
| 1 | 1.6 | 40.649 - 761 | 75.85 -227 | 48 669 - 21 | 50.71 - 91 | 14.082 - 82 | 47.11 -212 | 16 950 - 17 | 58 67 + 29 |
| 1 | 11.6 | 40.033 - 616 | 73.14 -433 | 48 677 + 8 | 51.65 - 94 | 14.038 - 44 | 44.72 -239 | 16 967 + 17 | 58 24 + 43 |
| 1 | 21.5 | 39.600 - 433 | 70.09 -305 | 48 718 + 41 | 52.55 - 90 | 14.037 - 1 | 42.15 -257 | 17 020 + 53 | 57 68 + 56 |
| 1 | 31.5 | 39.353 - 247 | 66.86 -323 | 48 788 + 70 | 53.37 - 82 | 14.078 + 41 | 39.55 -260 | 17 106 + 86 | 57.02 + 66 |
| 2 | 10.5 | 39.302 - 51 | 63.51 -335 | 48 887 + 99 | 54.10 - 73 | 14.163 + 85 | 36.95 -260 | 17 223 + 117 | 56.17 + 85 |
| 2 | 20.5 | 39.462 + 160 | 60.22 -329 | 49 020 + 133 | 54.66 - 56 | 14.294 + 131 | 34.53 -242 | 17 377 + 154 | 55.18 + 99 |
| 3 | 2.4 | 39.810 + 348 | 57.12 -310 | 49 180 + 160 | 55.01 - 35 | 14.467 + 173 | 32.37 -216 | 17 561 + 184 | 54.08 +110 |
| 3 | 12.4 | 40.343 + 533 | 54.30 -282 | 49 371 + 191 | 55.11 - 10 | 14.683 + 216 | 30.54 -183 | 17 776 + 215 | 52.86 +122 |
| 3 | 22.4 | 41.045 + 702 | 51.91 -239 | 49 590 + 219 | 54.92 + 19 | 14.939 + 256 | 29.18 -136 | 18 021 + 245 | 51.52 +134 |
| 4 | 1.4 | 41.877 + 832 | 50.01 -190 | 49 833 + 243 | 54.45 + 47 | 15.228 + 289 | 28.30 - 88 | 18 291 + 270 | 50.10 +142 |
| 4 | 11.3 | 42.822 + 945 | 48.67 -134 | 50.100 + 267 | 53.69 + 76 | 15.549 + 321 | 27.95 - 35 | 18 587 + 296 | 48.60 +150 |
| 4 | 21.3 | 43.842 +1020 | 47.97 - 70 | 50.388 + 288 | 52.63 +106 | 15.893 + 344 | 28.18 + 23 | 18 905 + 318 | 47.06 +154 |
| 5 | 1.3 | 44.894 +1052 | 47.88 - 9 | 50.690 + 302 | 51.34 +129 | 16.251 + 358 | 28.95 + 77 | 19 237 + 332 | 45.52 +154 |
| 5 | 11.2 | 45.959 +1065 | 48.42 + 54 | 51.003 + 313 | 49.82 +152 | 16.620 + 369 | 30.25 +130 | 19 583 + 346 | 44.00 +152 |
| 5 | 21.2 | 46.988 +1029 | 49.58 +116 | 51.319 + 316 | 48.13 +169 | 16.986 + 366 | 32.05 +180 | 19 932 + 349 | 42.57 +143 |
| 5 | 31.2 | 47.953 + 965 | 51.28 +170 | 51.631 + 312 | 46.33 +180 | 17.342 + 356 | 34.26 +221 | 20 277 + 345 | 41.25 +132 |
| 6 | 10.2 | 48.833 + 880 | 53.50 +222 | 51.934 + 303 | 44.44 +189 | 17.681 + 339 | 36.85 +259 | 20 614 + 337 | 40.07 +118 |
| 6 | 20.1 | 49.590 + 757 | 56.17 +267 | 52.217 + 283 | 42.55 +189 | 17.990 + 309 | 39.74 +289 | 20 931 + 317 | 39.10 + 97 |
| 6 | 30.1 | 50.213 + 623 | 59.18 +301 | 52.475 + 258 | 40.70 +185 | 18.265 + 275 | 42.83 +309 | 21 222 + 291 | 38.33 + 77 |
| 7 | 10.1 | 50.686 + 473 | 62.51 +333 | 52.703 + 228 | 38.92 +178 | 18.500 + 235 | 46.08 +325 | 21 480 + 258 | 37.79 + 54 |
| 7 | 20.1 | 50.986 + 300 | 66.03 +352 | 52.892 + 189 | 37.28 +164 | 18.685 + 185 | 49.38 +330 | 21 697 + 217 | 37.49 + 30 |
| 7 | 30.0 | 51.122 + 136 | 69.66 +363 | 53.041 + 149 | 35.79 +149 | 18.821 + 136 | 52.66 +328 | 21 870 + 173 | 37.43 + 6 |
| 8 | 9.0 | 51.083 - 39 | 73.37 +371 | 53.146 + 105 | 34.48 +131 | 18.904 + 83 | 55.88 +322 | 21 994 + 124 | 37.58 - 15 |
| 8 | 19.0 | 50.866 - 217 | 77.02 +365 | 53.205 + 59 | 33.38 +110 | 18.932 + 28 | 58.93 +305 | 22 067 + 73 | 37.95 - 37 |
| 8 | 28.9 | 50.493 - 373 | 80.55 +353 | 53.222 + 17 | 32.48 + 90 | 18.912 - 20 | 61.79 +286 | 22 093 + 26 | 38.47 - 52 |
| 9 | 7.9 | 49.957 - 536 | 83.92 +337 | 53.196 - 26 | 31.78 + 70 | 18.842 - 70 | 64.39 +260 | 22 071 - 22 | 39.13 - 66 |
| 9 | 17.9 | 49.277 - 680 | 87.01 +309 | 53.133 - 63 | 31.30 + 48 | 18.729 - 113 | 66.67 +228 | 22 006 - 65 | 39.88 - 75 |
| 9 | 27.9 | 48.478 - 799 | 89.79 +278 | 53.040 - 93 | 31.01 + 29 | 18.583 - 146 | 68.61 +194 | 21 907 - 99 | 40.66 - 78 |
| 10 | 7.8 | 47.563 - 915 | 92.19 +240 | 52.922 - 118 | 30.90 + 11 | 18.406 - 177 | 70.18 +157 | 21 778 - 129 | 41.44 - 78 |
| 10 | 17.8 | 46.565 - 998 | 94.13 +194 | 52.790 - 132 | 30.97 - 7 | 18.210 - 196 | 71.31 +113 | 21 632 - 146 | 42.17 - 73 |
| 10 | 27.8 | 45.508 -1057 | 95.59 +146 | 52.650 - 140 | 31.19 - 22 | 18.005 - 205 | 72.02 + 71 | 21 478 - 154 | 42.82 - 65 |
| 11 | 6.8 | 44.407 -1101 | 96.52 + 93 | 52.511 - 139 | 31.56 - 37 | 17.796 - 209 | 72.27 + 25 | 21 323 - 155 | 43.36 - 54 |
| 11 | 16.7 | 43.306 -1101 | 96.85 + 33 | 52.381 - 130 | 32.06 - 50 | 17.596 - 200 | 72.05 - 22 | 21 180 - 143 | 43.75 - 39 |
| 11 | 26.7 | 42.223 -1083 | 96.62 - 23 | 52.268 - 113 | 32.67 - 61 | 17.411 - 185 | 71.39 - 66 | 21 055 - 125 | 43.99 - 24 |
| 12 | 6.7 | 41.186 -1037 | 95.78 - 84 | 52.174 - 94 | 33.39 - 72 | 17.246 - 165 | 70.26 -113 | 20 953 - 102 | 44.09 - 10 |
| 12 | 16.6 | 40.238 - 948 | 94.36 -142 | 52.108 - 66 | 34.19 - 80 | 17.111 - 135 | 68.72 -154 | 20 883 - 70 | 44.01 + 8 |
| 12 | 26.6 | 39.395 - 843 | 92.43 -193 | 52.068 - 40 | 35.06 - 87 | 17.008 - 103 | 66.83 -189 | 20 844 - 39 | 43.80 + 21 |
| 12 | 36.6 | 38.688 - 707 | 89.99 -244 | 52.059 - 9 | 35.97 - 91 | 16.942 - 66 | 64.61 -222 | 20 840 - 4 | 43.43 + 37 |
| | | - 538 | -282 | + 23 | - 89 | - 25 | -244 | + 33 | + 50 |
| Mean Place | 46.748 | 78.81 | 51.889 | 34.42 | 17.567 | 57.14 | 20.420 | 37.32 | |
| sec δ, tan δ | +4.838 | +4.734 | +1.000 | -0.003 | +1.281 | +0.801 | +1.104 | -0.468 | |
| dα(ψ), dδ(ψ) | -0.025 | +0.29 | +0.061 | +0.29 | +0.047 | +0.29 | +0.070 | +0.29 | |
| dα(ε), dδ(ε) | -0.229 | -0.69 | +0.000 | -0.69 | -0.039 | -0.69 | +0.023 | -0.69 | |
| Dble.Trans. | August 8 | | August 8 | | August 8 | | August 8 | | |

AT UPPER TRANSIT AT GREENWICH

| No. | 794 | | 1555 | | 1554 | | 797 | |
|---------------------|--------------|-------------|--------------|-------------|--------------|-------------|--------------|-------------|
| | v Aquarii | | γ Equulei | | ο Pavonis | | ζ Cygni | |
| Mag. Spect. | 4.52 | K0 | 4.76 | F0p | 5.08 | M0 | 3.40 | K0 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " |
| | 21 08 | - 11 25 | 21 09 | + 10 04 | 21 11 | - 70 10 | 21 12 | + 30 09 |
| 1 ^d -8.4 | 48 309 - 49 | 55.23 - 43 | 38.013 - 62 | 23.29 - 121 | 59.700 - 297 | 86.29 + 200 | 18.540 - 103 | 68.50 - 170 |
| 1 1.6 | 48 292 - 17 | 55.62 - 39 | 37.980 - 33 | 21.96 - 133 | 59.497 - 203 | 83.92 + 237 | 18.468 - 72 | 66.55 - 195 |
| 1 11.6 | 48 304 + 12 | 55.95 - 33 | 37.975 - 5 | 20.54 - 142 | 59.391 - 106 | 81.22 + 270 | 18.428 - 40 | 64.36 - 219 |
| 1 21.5 | 48 349 + 45 | 56.19 - 24 | 38.004 + 29 | 19.09 - 145 | 59.396 + 5 | 78.25 + 297 | 18.426 - 2 | 62.03 - 233 |
| 1 31.5 | 48 426 + 77 | 56.28 - 9 | 38.063 + 59 | 17.69 - 140 | 59.503 + 107 | 75.14 + 311 | 18.460 + 34 | 59.67 - 236 |
| 2 10.5 | 48 525 + 99 | 56.34 - 6 | 38.152 + 89 | 16.37 - 132 | 59.710 + 207 | 71.93 + 321 | 18.532 + 72 | 57.34 - 233 |
| 2 20.5 | 48 665 + 140 | 56.22 + 12 | 38.275 + 123 | 15.22 - 115 | 60.021 + 311 | 68.71 + 322 | 18.644 + 112 | 55.16 - 218 |
| 3 2.4 | 48 832 + 167 | 55.90 + 32 | 38.428 + 153 | 15.22 - 92 | 60.419 + 398 | 65.56 + 315 | 18.644 + 150 | 55.16 - 192 |
| 3 12.4 | 49 028 + 196 | 55.38 + 52 | 38.612 + 184 | 14.30 - 64 | 60.904 + 485 | 62.51 + 305 | 18.794 + 187 | 53.24 - 161 |
| 3 22.4 | 49 252 + 224 | 54.65 + 73 | 38.827 + 215 | 13.37 - 29 | 61.469 + 565 | 59.68 + 283 | 18.981 + 224 | 51.63 - 118 |
| 4 1.4 | 49 501 + 249 | 53.73 + 92 | 39.067 + 240 | 13.42 + 5 | 62.098 + 629 | 57.09 + 259 | 19.460 + 255 | 49.71 - 74 |
| 4 11.3 | 49 775 + 274 | 52.60 + 113 | 39.333 + 266 | 13.85 + 43 | 62.790 + 692 | 54.78 + 231 | 19.745 + 285 | 49.46 - 25 |
| 4 21.3 | 50.069 + 294 | 51.30 + 130 | 39.619 + 296 | 14.65 + 80 | 63.530 + 740 | 52.83 + 195 | 20.053 + 308 | 49.74 + 28 |
| 5 1.3 | 50.378 + 309 | 49.86 + 144 | 39.920 + 301 | 15.79 + 114 | 64.300 + 770 | 51.26 + 157 | 20.377 + 324 | 50.50 + 76 |
| 5 11.2 | 50.699 + 321 | 48.31 + 155 | 40.233 + 313 | 17.25 + 146 | 65.097 + 797 | 50.10 + 116 | 20.713 + 336 | 51.74 + 124 |
| 5 21.2 | 51.025 + 326 | 46.70 + 161 | 40.549 + 316 | 18.98 + 173 | 65.896 + 799 | 49.41 + 69 | 21.050 + 337 | 53.43 + 169 |
| 5 31.2 | 51.347 + 322 | 45.08 + 162 | 40.860 + 311 | 20.92 + 194 | 66.683 + 787 | 49.15 + 26 | 21.380 + 330 | 55.48 + 205 |
| 6 10.2 | 51.661 + 314 | 43.48 + 160 | 41.162 + 302 | 20.92 + 211 | 67.445 + 762 | 49.36 - 21 | 21.698 + 318 | 57.87 + 239 |
| 6 20.1 | 51.956 + 295 | 41.97 + 151 | 41.443 + 281 | 23.03 + 220 | 68.156 + 711 | 49.36 - 68 | 21.992 + 294 | 57.87 + 264 |
| 6 30.1 | 52.227 + 271 | 40.58 + 139 | 41.700 + 257 | 25.23 + 224 | 68.156 + 649 | 50.04 - 110 | 21.992 + 263 | 60.51 + 280 |
| 7 10.1 | 52.467 + 240 | 39.33 + 125 | 41.925 + 225 | 29.69 + 222 | 69.376 + 571 | 52.66 - 152 | 22.484 + 229 | 66.24 + 293 |
| 7 20.1 | 52.668 + 201 | 38.27 + 106 | 42.111 + 186 | 31.84 + 215 | 69.846 + 470 | 54.54 - 188 | 22.668 + 184 | 69.19 + 295 |
| 7 30.0 | 52.829 + 161 | 37.41 + 86 | 42.258 + 147 | 33.87 + 203 | 70.213 + 367 | 56.70 - 216 | 22.808 + 140 | 72.10 + 291 |
| 8 9.0 | 52.945 + 116 | 36.75 + 66 | 42.359 + 101 | 35.75 + 188 | 70.463 + 250 | 59.11 - 241 | 22.899 + 91 | 74.94 + 284 |
| 8 19.0 | 53.014 + 69 | 36.30 + 45 | 42.415 + 56 | 37.42 + 167 | 70.585 + 122 | 61.65 - 254 | 22.939 + 40 | 77.60 + 266 |
| 8 28.9 | 53.038 + 24 | 36.04 + 26 | 42.428 + 13 | 38.89 + 147 | 70.589 + 4 | 64.23 - 258 | 22.934 - 5 | 80.06 + 246 |
| 9 7.9 | 53.019 - 19 | 35.96 + 8 | 42.399 - 29 | 40.14 + 125 | 70.469 - 120 | 66.79 - 256 | 22.883 - 51 | 82.29 + 223 |
| 9 17.9 | 52.961 - 58 | 36.05 - 9 | 42.333 - 66 | 41.12 + 98 | 70.235 - 234 | 69.18 - 239 | 22.792 - 91 | 84.21 + 192 |
| 9 27.9 | 52.871 - 90 | 36.25 - 20 | 42.237 - 96 | 41.88 + 76 | 69.906 - 329 | 71.33 - 215 | 22.668 - 124 | 85.83 + 162 |
| 10 7.8 | 52.755 - 116 | 36.57 - 32 | 42.115 - 122 | 42.37 + 49 | 69.489 - 417 | 73.17 - 184 | 22.515 - 153 | 87.10 + 127 |
| 10 17.8 | 52.623 - 132 | 36.96 - 39 | 41.978 - 137 | 42.61 + 24 | 69.013 - 476 | 74.57 - 140 | 22.344 - 171 | 87.98 + 88 |
| 10 27.8 | 52.484 - 139 | 37.40 - 44 | 41.834 - 144 | 42.62 + 1 | 68.499 - 514 | 75.50 - 93 | 22.164 - 180 | 88.49 + 51 |
| 11 6.8 | 52.344 - 140 | 37.87 - 47 | 41.688 - 146 | 42.38 - 24 | 67.967 - 532 | 75.92 - 42 | 21.980 - 184 | 88.60 + 11 |
| 11 16.7 | 52.214 - 130 | 37.87 - 48 | 41.688 - 137 | 41.91 - 47 | 67.451 - 516 | 75.76 + 16 | 21.803 - 177 | 88.60 - 31 |
| 11 26.7 | 52.101 - 113 | 38.82 - 47 | 41.429 - 122 | 41.22 - 69 | 66.968 - 483 | 75.08 + 68 | 21.640 - 163 | 87.60 - 69 |
| 12 6.7 | 52.008 - 93 | 39.29 - 47 | 41.326 - 103 | 40.31 - 91 | 66.538 - 430 | 73.85 + 123 | 21.494 - 146 | 86.50 - 110 |
| 12 16.6 | 51.943 - 65 | 39.72 - 43 | 41.249 - 77 | 39.23 - 108 | 66.188 - 350 | 72.12 + 173 | 21.376 - 118 | 85.04 - 146 |
| 12 26.6 | 51.906 - 37 | 40.11 - 39 | 41.198 - 51 | 38.00 - 123 | 65.922 - 266 | 69.97 + 215 | 21.285 - 91 | 83.28 - 176 |
| 12 36.6 | 51.900 - 6 | 40.46 - 35 | 41.177 - 21 | 36.64 - 136 | 65.753 - 169 | 67.43 + 254 | 21.226 - 59 | 81.24 - 204 |
| | + 28 | - 27 | + 10 | - 140 | - 62 | + 283 | - 23 | - 222 |
| Mean Place | 51.583 | 36.85 | 41.155 | 35.99 | 65.574 | 56.56 | 21.679 | 76.27 |
| sec δ, tan δ | +1.020 | -0.202 | +1.016 | +0.178 | +2.950 | -2.775 | +1.157 | +0.581 |
| dα(ψ), dδ(ψ) | +0.065 | +0.29 | +0.058 | +0.29 | +0.110 | +0.30 | +0.051 | +0.30 |
| dα(ε), dδ(ε) | +0.010 | -0.68 | -0.009 | -0.68 | +0.138 | -0.67 | -0.029 | -0.67 |
| Dble. Trans. | August 9 | | August 9 | | August 9 | | August 9 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 1556 | | 796 | | 800 | | 1558 | |
|----------------|---------------------------|----------------|---------------------------|----------------|---------------------------|----------------|---------------------------|----------------|
| | 58 G. Microscopii | | 23 G. Indi | | α Equulei | | σ Cygni | |
| Mag. Spect. | 5.55 | K5 | 5.84 | A5 | 4.14 | F8, A3 | 4.28 | A0p |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | ^h ^m | ^o / | ^h ^m | ^o / | ^h ^m | ^o / | ^h ^m | ^o / |
| | 21 12 | -27 40 | 21 14 | -53 19 | 21 15 | + 5 11 | 21 16 | +39 19 |
| 1 ^d | ^s -59 | " +23 | ^s -128 | " +132 | ^s -61 | " -103 | ^s -139 | " -178 |
| 1 -8.4 | 25.982 -24 | 52.62 +41 | 44.107 -75 | 38.48 +164 | 05.826 -32 | 15.59 -112 | 49.911 -106 | 70.14 -211 |
| 1 1.6 | 25.958 +10 | 52.21 +56 | 44.032 -23 | 36.84 +194 | 05.794 -4 | 14.47 -117 | 49.805 -70 | 68.03 -240 |
| 1 11.6 | 25.968 +48 | 51.65 +72 | 44.009 +35 | 34.90 +218 | 05.790 +28 | 13.30 -117 | 49.735 -28 | 65.63 -261 |
| 1 21.5 | 26.016 +80 | 50.93 +85 | 44.044 +90 | 32.72 +234 | 05.818 +58 | 12.13 -111 | 49.707 +14 | 63.02 -267 |
| 1 31.5 | 26.096 +113 | 50.08 +102 | 44.134 +144 | 30.38 +249 | 05.876 +87 | 11.02 -102 | 49.721 +57 | 60.35 -269 |
| 2 10.5 | 26.209 +150 | 49.06 +116 | 44.278 +198 | 27.89 +255 | 05.963 +120 | 10.00 -86 | 49.778 +104 | 57.66 -255 |
| 2 20.5 | 26.359 +181 | 47.90 +127 | 44.476 +246 | 25.34 +256 | 06.083 +149 | 09.14 -63 | 49.882 +148 | 55.11 -231 |
| 3 2.4 | 26.540 +213 | 46.63 +138 | 44.722 +294 | 22.78 +255 | 06.232 +180 | 08.51 -38 | 50.030 +191 | 52.80 -200 |
| 3 12.4 | 26.753 +244 | 45.25 +149 | 45.016 +340 | 20.23 +246 | 06.412 +211 | 08.13 -6 | 50.221 +235 | 50.80 -156 |
| 3 22.4 | 26.997 +271 | 43.76 +155 | 45.356 +377 | 17.77 +233 | 06.623 +236 | 08.07 +25 | 50.456 +270 | 49.24 -109 |
| 4 1.4 | 27.268 +299 | 42.21 +161 | 45.733 +416 | 15.44 +218 | 06.859 +262 | 08.32 +59 | 50.726 +304 | 48.15 -57 |
| 4 11.3 | 27.567 +320 | 40.60 +162 | 46.149 +446 | 13.26 +194 | 07.121 +283 | 08.91 +93 | 51.030 +331 | 47.58 +0 |
| 4 21.3 | 27.887 +338 | 38.98 +161 | 46.595 +468 | 11.32 +170 | 07.404 +299 | 09.84 +121 | 51.361 +348 | 47.58 +54 |
| 5 1.3 | 28.225 +351 | 37.37 +155 | 47.063 +486 | 09.62 +140 | 07.703 +312 | 11.05 +150 | 51.709 +362 | 48.12 +108 |
| 5 11.2 | 28.576 +356 | 35.82 +144 | 47.549 +492 | 08.22 +106 | 08.015 +315 | 12.55 +172 | 52.071 +362 | 49.20 +159 |
| 5 21.2 | 28.932 +354 | 34.38 +131 | 48.041 +487 | 07.16 +72 | 08.330 +313 | 14.27 +189 | 52.433 +354 | 50.79 +201 |
| 5 31.2 | 29.286 +346 | 33.07 +113 | 48.528 +476 | 06.44 +34 | 08.643 +304 | 16.16 +201 | 52.787 +340 | 52.80 +241 |
| 6 10.2 | 29.632 +326 | 31.94 +92 | 49.004 +448 | 06.10 -5 | 08.947 +286 | 18.17 +207 | 53.127 +312 | 55.21 +274 |
| 6 20.1 | 29.958 +302 | 31.02 +69 | 49.452 +412 | 06.15 -42 | 09.233 +262 | 20.24 +207 | 53.439 +290 | 57.95 +295 |
| 6 30.1 | 30.260 +268 | 30.33 +44 | 49.864 +368 | 06.57 -79 | 09.495 +231 | 22.31 +204 | 53.719 +240 | 60.90 +314 |
| 7 10.1 | 30.528 +227 | 29.89 +18 | 50.232 +308 | 07.36 -114 | 09.726 +194 | 24.35 +192 | 53.959 +191 | 64.04 +321 |
| 7 20.1 | 30.755 +183 | 29.71 -6 | 50.540 +247 | 08.50 -141 | 09.920 +154 | 26.27 +180 | 54.150 +144 | 67.25 +322 |
| 7 30.0 | 30.938 +133 | 29.77 -29 | 50.787 +177 | 09.91 -168 | 10.074 +110 | 28.07 +163 | 54.294 +96 | 70.47 +317 |
| 8 9.0 | 31.071 +82 | 30.06 -51 | 50.964 +103 | 11.59 -186 | 10.184 +64 | 29.70 +142 | 54.384 +30 | 73.64 +304 |
| 8 19.0 | 31.153 +32 | 30.57 -67 | 51.067 +32 | 13.45 -196 | 10.248 +22 | 31.12 +122 | 54.420 -15 | 76.68 +265 |
| 8 28.9 | 31.185 -16 | 31.24 -80 | 51.099 -40 | 15.41 -201 | 10.270 -20 | 32.34 +100 | 54.405 -64 | 79.53 +283 |
| 9 7.9 | 31.169 -61 | 32.04 -88 | 51.059 -106 | 17.42 -194 | 10.250 -58 | 33.34 +76 | 54.341 -109 | 82.16 +231 |
| 9 17.9 | 31.108 -97 | 32.92 -91 | 50.953 -160 | 19.36 -181 | 10.192 -88 | 34.10 +55 | 54.232 -145 | 84.47 +200 |
| 9 27.9 | 31.011 -127 | 33.83 -90 | 50.793 -210 | 21.17 -160 | 10.104 -115 | 34.65 +33 | 54.087 -177 | 86.47 +163 |
| 10 7.8 | 30.884 -147 | 34.73 -82 | 50.583 -241 | 22.77 -130 | 09.989 -130 | 34.98 +10 | 53.910 -198 | 88.10 +120 |
| 10 17.8 | 30.737 -156 | 35.55 -72 | 50.342 -260 | 24.07 -97 | 09.859 -138 | 35.08 -9 | 53.712 -211 | 89.30 +79 |
| 10 27.8 | 30.581 -159 | 36.27 -58 | 50.082 -268 | 25.04 -57 | 09.721 -141 | 34.99 -29 | 53.501 -217 | 90.09 +32 |
| 11 6.8 | 30.422 -148 | 36.85 -41 | 49.814 -256 | 25.61 -15 | 09.580 -132 | 34.70 -47 | 53.284 -212 | 90.41 -15 |
| 11 16.7 | 30.274 -131 | 37.26 -23 | 49.558 -234 | 25.76 +27 | 09.448 -118 | 34.23 -64 | 53.072 -200 | 90.26 -59 |
| 11 26.7 | 30.143 -108 | 37.49 -4 | 49.324 -202 | 25.49 +70 | 09.330 -100 | 33.59 -80 | 52.872 -182 | 89.67 -107 |
| 12 6.7 | 30.035 -77 | 37.53 +15 | 49.122 -157 | 24.79 +111 | 09.230 -74 | 32.79 -94 | 52.690 -155 | 88.60 -150 |
| 12 16.6 | 29.958 -46 | 37.38 +31 | 48.965 -110 | 23.68 +146 | 09.156 -50 | 31.85 -104 | 52.535 -125 | 87.10 -187 |
| 12 26.6 | 29.912 -11 | 37.07 +50 | 48.855 -56 | 22.22 +179 | 09.106 -20 | 30.81 -112 | 52.410 -91 | 85.23 -222 |
| 12 36.6 | 29.901 +27 | 36.57 +65 | 48.799 +1 | 20.43 +205 | 09.086 +10 | 29.69 -115 | 52.319 -51 | 83.01 -246 |
| Mean Place | 29.437 | 30.11 | 48.294 | 10.63 | 08.963 | 29.68 | 53.094 | 75.81 |
| sec δ, tan δ | +1.129 | -0.524 | +1.674 | -1.343 | +1.004 | +0.091 | +1.293 | +0.820 |
| da(ψ), dδ(ψ) | +0.070 | +0.30 | +0.085 | +0.30 | +0.060 | +0.30 | +0.047 | +0.30 |
| da(ε), dδ(ε) | +0.026 | -0.67 | +0.067 | -0.66 | -0.005 | -0.66 | -0.041 | -0.65 |
| Dble. Trans. | August 9 | | August 10 | | August 10 | | August 11 | |

APPARENT PLACES OF STARS, 1986

329

AT UPPER TRANSIT AT GREENWICH

| No. | 1557 | | 801 | | 1559 | | 803 | |
|--------------|---------------------------|------------|--------------------------|------------|---------------------------|------------|---------------------------|------------|
| Name | 24 G. Indi | | ε Microscopii | | ν Cygni | | α Cephei | |
| Mag. Spect. | 6.70 | K0 | 4.79 | A0 | 4.42 | B3p | 2.60 | A5 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " |
| | 21 16 | -48 46 | 21 17 | -32 13 | 21 17 | +34 49 | 21 18 | +62 31 |
| 1 -8.4 | 53 728 ^s - 110 | 56 69 +112 | 03 818 ^s - 68 | 70.19 + 42 | 18 576 ^s - 122 | 76.46 -172 | 11 804 ^s - 334 | 39.65 -182 |
| 1 1.6 | 53 665 - 63 | 55 27 +142 | 03 787 + 31 | 69.57 + 62 | 18 487 - 89 | 74.44 -202 | 11 523 - 281 | 37.38 -227 |
| 1 11.6 | 53 649 - 16 | 53 57 +170 | 03 790 + 3 | 68.75 + 82 | 18 430 - 57 | 72.15 -229 | 11 303 - 220 | 34.70 -268 |
| 1 21.6 | 53 685 + 36 | 51 64 +193 | 03 832 + 42 | 67.75 +100 | 18 413 - 17 | 69.69 -246 | 11 158 - 145 | 31.71 -299 |
| 1 31.5 | 53 769 + 84 | 49 53 +211 | 03 910 + 78 | 66.61 +114 | 18 435 + 22 | 67.17 -252 | 11 090 - 68 | 28.55 -316 |
| 2 10.5 | 53 901 + 132 | 47 28 +225 | 04 022 + 112 | 65.30 +131 | 18 497 + 62 | 64.65 -252 | 11 102 + 12 | 25.29 -326 |
| 2 20.5 | 54 082 + 181 | 44 94 +234 | 04 172 + 150 | 63.85 +145 | 18 602 + 105 | 62.28 -237 | 11 202 + 100 | 22.11 -318 |
| 3 2.4 | 54 306 + 224 | 42 57 +237 | 04 356 + 184 | 62.31 +154 | 18 747 + 145 | 60.16 -212 | 11 382 + 180 | 19.14 -297 |
| 3 12.4 | 54 574 + 268 | 40 18 +239 | 04 573 + 217 | 60.67 +164 | 18 933 + 186 | 58.34 -182 | 11 643 + 261 | 16.45 -269 |
| 3 22.4 | 54 883 + 309 | 37 85 +233 | 04 823 + 260 | 58.96 +171 | 19 159 + 226 | 56.94 -140 | 11 979 + 336 | 14.20 -225 |
| 4 1.4 | 55 227 + 344 | 35 61 +224 | 05 101 + 278 | 57.22 +174 | 19 419 + 260 | 56.02 - 92 | 12 377 + 398 | 12.46 -174 |
| 4 11.3 | 55 607 + 380 | 33 48 +213 | 05 408 + 307 | 55.45 +177 | 19 711 + 292 | 55.59 - 43 | 12 832 + 455 | 11.26 -120 |
| 4 21.3 | 56 016 + 409 | 31 55 +193 | 05 739 + 331 | 53.71 +174 | 20 028 + 317 | 55.71 + 12 | 13 327 + 495 | 10.71 - 55 |
| 5 1.3 | 56 445 + 429 | 29 83 +172 | 06 088 + 349 | 52.04 +167 | 20 362 + 334 | 56.34 + 63 | 13 846 + 519 | 10.76 + 5 |
| 5 11.3 | 56 892 + 447 | 28 35 +148 | 06 452 + 364 | 50.46 +158 | 20 710 + 348 | 57.49 +115 | 14 380 + 534 | 11.43 + 67 |
| 5 21.2 | 57 345 + 453 | 27 19 +116 | 06 822 + 370 | 49.04 +142 | 21 059 + 349 | 59.12 +163 | 14 908 + 528 | 12.72 +129 |
| 5 31.2 | 57 795 + 450 | 26 33 + 86 | 07 190 + 368 | 47.79 +125 | 21 401 + 342 | 61.14 +202 | 15 416 + 508 | 14.53 +181 |
| 6 10.2 | 58 235 + 440 | 25 82 + 51 | 07 550 + 360 | 46.76 +103 | 21 730 + 329 | 63.53 +239 | 15 894 + 478 | 16.86 +233 |
| 6 20.1 | 58 651 + 416 | 25 68 - 14 | 07 891 + 341 | 45 98 + 78 | 22 033 + 303 | 66.22 +269 | 16 322 + 428 | 19.61 +275 |
| 6 30.1 | 59 035 + 384 | 25 89 - 21 | 08 207 + 316 | 45 46 + 52 | 22 307 + 274 | 69.10 +288 | 16 693 + 371 | 22.69 +308 |
| 7 10.1 | 59 377 + 342 | 26 45 - 56 | 08 489 + 282 | 45 22 + 24 | 22 543 + 236 | 72.14 +304 | 17 000 + 307 | 26.07 +338 |
| 7 20.1 | 59 666 + 289 | 27 36 - 91 | 08 728 + 239 | 45 26 - 4 | 22 733 + 190 | 75.23 +309 | 17 227 + 227 | 29.62 +355 |
| 7 30.0 | 59 899 + 233 | 28 54 -118 | 08 922 + 194 | 45 56 - 30 | 22 877 + 144 | 78.31 +308 | 17 379 + 152 | 33.26 +364 |
| 8 9.0 | 60 069 + 170 | 29 99 -145 | 09 065 + 143 | 46 11 - 55 | 22 971 + 94 | 81.33 +302 | 17 448 + 69 | 36.94 +368 |
| 8 19.0 | 60 170 + 101 | 31 63 -164 | 09 154 + 89 | 46 86 - 75 | 23 013 + 42 | 84.20 +287 | 17 432 - 16 | 40.55 +361 |
| 8 29.0 | 60 207 + 37 | 33 39 -176 | 09 192 + 38 | 47 78 - 92 | 23 007 - 6 | 86 88 +268 | 17 340 - 92 | 44.03 +348 |
| 9 7.9 | 60 177 - 30 | 35 21 -182 | 09 178 - 14 | 48 82 -104 | 22 953 - 54 | 89 34 +246 | 17 171 - 169 | 47 32 +329 |
| 9 17.9 | 60 088 - 89 | 37 01 -180 | 09 117 - 61 | 49 93 -111 | 22 856 - 97 | 91 48 +214 | 16 932 - 239 | 50 31 +299 |
| 9 27.9 | 59 950 - 138 | 38 70 -169 | 09 018 - 99 | 51 03 -110 | 22 725 - 131 | 93 31 +183 | 16 636 - 296 | 52 98 +267 |
| 10 7.8 | 59 767 - 183 | 40 22 -152 | 08 886 - 132 | 52 09 -106 | 22 564 - 161 | 94 78 +147 | 16 286 - 350 | 55 27 +229 |
| 10 17.8 | 59 555 - 212 | 41 48 -126 | 08 732 - 154 | 53 04 - 95 | 22 383 - 181 | 95 85 +107 | 15 898 - 388 | 57 08 +181 |
| 10 27.8 | 59 326 - 229 | 42 44 - 96 | 08 568 - 164 | 53 85 - 81 | 22 190 - 193 | 96 53 + 68 | 15 485 - 413 | 58 43 +135 |
| 11 6.8 | 59 091 - 235 | 43 07 - 63 | 08 400 - 168 | 54 47 - 62 | 21 992 - 198 | 96 77 + 24 | 15 053 - 432 | 59 24 + 81 |
| 11 16.7 | 58 866 - 225 | 43 29 - 22 | 08 241 - 159 | 54 86 - 39 | 21 800 - 192 | 96 56 - 21 | 15 053 - 429 | 59 24 + 23 |
| 11 26.7 | 58 661 - 205 | 43 14 + 15 | 08 100 - 141 | 55 04 - 18 | 21 620 - 180 | 95 94 - 62 | 14 204 - 420 | 59 16 - 31 |
| 12 6.7 | 58 485 - 176 | 42 60 + 54 | 07 981 - 119 | 54 97 + 7 | 21 456 - 164 | 94 87 -107 | 13 806 - 398 | 58 25 - 91 |
| 12 16.7 | 58 349 - 136 | 41 68 + 92 | 07 894 - 87 | 54 67 + 30 | 21 320 - 136 | 93 41 -146 | 13 447 - 359 | 56 79 -146 |
| 12 26.6 | 58 256 - 93 | 40 43 +125 | 07 840 - 54 | 54 16 + 51 | 21 211 - 109 | 91 61 -180 | 13 134 - 313 | 54 84 -195 |
| 12 36.6 | 58 210 - 46 | 38 87 +156 | 07 822 - 18 | 53 43 + 73 | 21 135 - 76 | 89 49 -212 | 12 877 - 257 | 52 41 -243 |
| | + 6 | +181 | + 20 | + 91 | - 38 | -233 | - 187 | -278 |
| Mean Place | 57.680 | 29.50 | 07.318 | 46.34 | 21.727 | 83.11 | 15.494 | 41.36 |
| sec δ, tan δ | +1.517 | -1.141 | +1.182 | -0.630 | +1.218 | +0.696 | +2.168 | +1.923 |
| dα(ψ), dδ(ψ) | +0.081 | +0.30 | +0.072 | +0.30 | +0.049 | +0.30 | +0.028 | +0.30 |
| dα(ε), dδ(ε) | +0.058 | -0.65 | +0.032 | -0.65 | -0.035 | -0.65 | -0.098 | -0.65 |
| Dble. Trans. | August 11 | | August 11 | | August 11 | | August 11 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 1560 | | 802 | | 804 | | 1561 | |
|---------------------|------------------------------|--------------------------|--------------------------|-------------------------|--------------------------|--------------------------|--------------------------|-------------------------|
| | Groombridge 3434* (Cygni) | | 9' Microscopii | | 1 Pegasi | | 1 Capricorni | |
| Mag. Spect. | 6.81 | K2 | 4.92 | A2p | 4.27 | K0 | 4.30 | K0 |
| U.T. | R.A. | | R.A. | | R.A. | | R.A. | |
| | Dec. | | Dec. | | Dec. | | Dec. | |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " |
| | 21 19 | + 52 59 | 21 19 | - 40 51 | 21 21 | + 19 44 | 21 21 | - 16 53 |
| 1 ^d -8.4 | 11.325 ^s - 225 | 59.29 ["] - 183 | 50.360 ^s - 87 | 88.01 ["] + 77 | 24.632 ^s - 84 | 36.46 ["] - 141 | 26.535 ^s - 57 | 53.59 ["] - 23 |
| 1 1.6 | 11.142 - 183 | 57.05 - 224 | 50.313 - 47 | 86.98 + 103 | 24.576 - 56 | 34.86 - 160 | 26.507 - 28 | 53.71 - 12 |
| 1 11.6 | 11.004 - 138 | 54.44 - 261 | 50.305 - 8 | 85.70 + 128 | 24.549 - 27 | 33.09 - 177 | 26.509 + 2 | 53.73 - 2 |
| 1 21.6 | 10.922 - 82 | 51.55 - 289 | 50.342 + 37 | 84.21 + 149 | 24.555 + 6 | 31.24 - 185 | 26.545 + 36 | 53.63 + 10 |
| 1 31.5 | 10.896 - 26 | 48.53 - 302 | 50.419 + 77 | 82.54 + 167 | 24.593 + 38 | 29.38 - 186 | 26.614 + 69 | 53.41 + 22 |
| 2 10.5 | 10.930 + 34 | 45.45 - 308 | 50.536 + 117 | 80.72 + 182 | 24.664 + 71 | 27.57 - 181 | 26.699 + 85 | 53.12 + 29 |
| 2 20.5 | 11.027 + 97 | 42.46 - 299 | 50.696 + 160 | 78.77 + 195 | 24.771 + 107 | 25.92 - 165 | 26.832 + 133 | 52.54 + 58 |
| 3 2.4 | 11.184 + 157 | 39.70 - 276 | 50.893 + 197 | 76.76 + 201 | 24.910 + 139 | 24.51 - 141 | 26.991 + 159 | 51.85 + 69 |
| 3 12.4 | 11.400 + 216 | 37.23 - 247 | 51.128 + 235 | 74.70 + 206 | 25.084 + 174 | 23.37 - 114 | 27.181 + 190 | 51.00 + 85 |
| 3 22.4 | 11.674 + 274 | 35.20 - 203 | 51.400 + 272 | 72.62 + 208 | 25.292 + 208 | 22.62 - 75 | 27.400 + 219 | 49.96 + 104 |
| 4 1.4 | 11.995 + 321 | 33.68 - 152 | 51.704 + 304 | 70.57 + 205 | 25.528 + 236 | 22.27 - 35 | 27.645 + 245 | 48.76 + 120 |
| 4 11.3 | 12.360 + 365 | 32.69 - 99 | 52.039 + 335 | 68.58 + 199 | 25.793 + 265 | 22.34 + 7 | 27.918 + 273 | 47.41 + 135 |
| 4 21.3 | 12.758 + 398 | 32.33 - 36 | 52.401 + 362 | 66.69 + 189 | 26.082 + 289 | 22.86 + 52 | 28.213 + 295 | 45.93 + 148 |
| 5 1.3 | 13.177 + 419 | 32.56 + 23 | 52.782 + 381 | 64.95 + 174 | 26.388 + 306 | 23.79 + 93 | 28.525 + 312 | 44.37 + 156 |
| 5 11.3 | 13.610 + 433 | 33.38 + 82 | 53.181 + 399 | 63.38 + 157 | 26.707 + 319 | 25.13 + 134 | 28.852 + 327 | 42.75 + 162 |
| 5 21.2 | 14.042 + 432 | 34.79 + 141 | 53.586 + 405 | 62.05 + 133 | 27.030 + 323 | 26.83 + 170 | 29.185 + 333 | 41.13 + 162 |
| 5 31.2 | 14.461 + 419 | 36.69 + 190 | 53.989 + 403 | 60.98 + 107 | 27.350 + 320 | 28.82 + 199 | 29.518 + 333 | 39.54 + 159 |
| 6 10.2 | 14.859 + 398 | 39.07 + 238 | 54.385 + 396 | 60.18 + 80 | 27.660 + 310 | 31.07 + 225 | 29.844 + 326 | 38.03 + 151 |
| 6 20.1 | 15.220 + 361 | 41.84 + 277 | 54.759 + 374 | 59.71 + 47 | 27.951 + 291 | 33.51 + 244 | 30.152 + 308 | 36.65 + 138 |
| 6 30.1 | 15.539 + 319 | 44.91 + 307 | 55.106 + 347 | 59.55 + 16 | 28.216 + 265 | 36.04 + 265 | 30.438 + 286 | 35.43 + 122 |
| 7 10.1 | 15.808 + 269 | 48.23 + 332 | 55.417 + 311 | 59.71 - 16 | 28.450 + 234 | 38.64 + 260 | 30.695 + 257 | 34.40 + 103 |
| 7 20.1 | 16.016 + 208 | 51.70 + 347 | 55.681 + 264 | 60.19 - 48 | 28.644 + 194 | 41.22 + 258 | 30.912 + 217 | 33.59 + 81 |
| 7 30.0 | 16.164 + 148 | 55.22 + 352 | 55.896 + 215 | 60.94 - 75 | 28.797 + 153 | 43.72 + 250 | 31.090 + 178 | 32.99 + 60 |
| 8 9.0 | 16.247 + 83 | 58.77 + 355 | 56.054 + 158 | 61.96 - 102 | 28.905 + 108 | 46.12 + 240 | 31.222 + 132 | 32.62 + 37 |
| 8 19.0 | 16.262 + 15 | 62.20 + 343 | 56.153 + 99 | 63.19 - 123 | 28.965 + 60 | 48.33 + 221 | 31.305 + 83 | 32.48 + 14 |
| 8 29.0 | 16.217 - 45 | 65.49 + 329 | 56.194 + 41 | 64.56 - 137 | 28.982 + 17 | 50.35 + 202 | 31.344 + 39 | 32.52 - 4 |
| 9 7.9 | 16.110 - 107 | 68.58 + 309 | 56.178 - 16 | 66.04 - 148 | 28.955 - 27 | 52.13 + 178 | 31.336 - 8 | 32.74 - 22 |
| 9 17.9 | 15.948 - 162 | 71.35 + 277 | 56.109 - 69 | 67.52 - 148 | 28.890 - 65 | 53.63 + 150 | 31.288 - 48 | 33.10 - 36 |
| 9 27.9 | 15.741 - 207 | 73.80 + 245 | 55.997 - 112 | 68.97 - 145 | 28.793 - 97 | 54.87 + 124 | 31.207 - 81 | 33.57 - 47 |
| 10 7.8 | 15.493 - 248 | 75.87 + 207 | 55.847 - 150 | 70.30 - 133 | 28.668 - 125 | 55.80 + 93 | 31.096 - 111 | 34.11 - 54 |
| 10 17.8 | 15.216 - 277 | 77.48 + 161 | 55.671 - 176 | 71.45 - 115 | 28.526 - 142 | 56.41 + 61 | 30.967 - 129 | 34.68 - 57 |
| 10 27.8 | 14.920 - 296 | 78.63 + 115 | 55.481 - 190 | 72.38 - 93 | 28.374 - 152 | 56.73 + 32 | 30.828 - 139 | 35.25 - 57 |
| 11 6.8 | 14.613 - 307 | 79.27 + 64 | 55.286 - 195 | 73.03 - 65 | 28.218 - 156 | 56.71 - 2 | 30.686 - 142 | 35.80 - 55 |
| 11 16.7 | 14.309 - 304 | 79.36 + 9 | 55.100 - 186 | 73.37 - 34 | 28.068 - 150 | 56.36 - 35 | 30.553 - 133 | 36.30 - 50 |
| 11 26.7 | 14.015 - 294 | 78.93 - 43 | 54.932 - 168 | 73.41 - 4 | 27.930 - 138 | 55.72 - 64 | 30.434 - 119 | 36.72 - 42 |
| 12 6.7 | 13.740 - 275 | 77.95 - 98 | 54.788 - 144 | 73.12 + 29 | 27.809 - 121 | 54.77 - 95 | 30.334 - 100 | 37.08 - 36 |
| 12 16.7 | 13.496 - 244 | 76.45 - 150 | 54.679 - 109 | 72.51 + 61 | 27.712 - 97 | 53.55 - 122 | 30.260 - 74 | 37.33 - 25 |
| 12 26.6 | 13.288 - 208 | 74.50 - 195 | 54.607 - 72 | 71.63 + 88 | 27.639 - 73 | 52.10 - 145 | 30.214 - 46 | 37.50 - 17 |
| 12 36.6 | 13.123 - 165 | 72.12 - 238 | 54.574 - 33 | 70.47 + 116 | 27.596 - 43 | 50.43 - 167 | 30.199 - 15 | 37.56 - 6 |
| | - 113 | - 270 | + 12 | + 139 | - 12 | - 177 | + 17 | + 5 |
| Mean Place | 14.700 | 62.31 | 54.028 | 62.12 | 27.725 | 46.79 | 29.786 | 33.33 |
| sec δ, tan δ | +1.662 | +1.327 | +1.322 | -0.865 | +1.062 | +0.359 | +1.045 | -0.304 |
| dα(ψ), dδ(ψ) | +0.038 | +0.30 | +0.076 | +0.30 | +0.055 | +0.31 | +0.066 | +0.31 |
| dα(ε), dδ(ε) | -0.068 | -0.65 | +0.044 | -0.64 | -0.018 | -0.64 | +0.016 | -0.64 |
| Dble. Trans. | August 11 | | August 11 | | August 12 | | August 12 | |

APPARENT PLACES OF STARS, 1986

331

AT UPPER TRANSIT AT GREENWICH

| No. | 1562 | | 1563 | | 805 | | 806 | |
|--------------------|------------------------------------|--------------------------------------|------------------------------------|--------------------------------------|------------------------------------|--------------------------------------|------------------------------------|--------------------------------------|
| | 18 Aquarii | | γ Indi | | γ Pavonis | | ζ Capricorni | |
| Mag. Spect. | 5.54 | A5 | 6.24 | F0 | 4.30 | F8 | 3.86 | G5p |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | ^h ^m 21 23 | ^o ['] - 12 56 | ^h ^m 21 25 | ^o ['] - 54 43 | ^h ^m 21 25 | ^o ['] - 65 25 | ^h ^m 21 25 | ^o ['] - 22 28 |
| 1 ^{-8.4} | 24.091 ^s - 57 | 30.91 ^o - 38 | 13.994 ^s - 148 | 38.48 ^o +130 | 15.550 ^s - 244 | 71.91 ^o +175 | 50.621 ^s - 64 | 34.92 ^o - 1 |
| 1 ^{1.6} | 24.062 - 29 | 31.22 - 31 | 13.897 - 97 | 36.83 +165 | 15.380 - 170 | 69.78 +213 | 50.588 - 33 | 34.79 + 13 |
| 1 ^{11.6} | 24.061 - 1 | 31.45 - 23 | 13.853 - 44 | 34.86 +197 | 15.284 - 96 | 67.30 +248 | 50.586 - 2 | 34.51 + 28 |
| 1 ^{21.6} | 24.093 + 32 | 31.58 - 13 | 13.869 + 16 | 32.63 +223 | 15.275 - 9 | 64.53 +277 | 50.618 + 32 | 34.08 + 43 |
| 1 ^{31.5} | 24.157 + 64 | 31.57 + 1 | 13.940 + 71 | 30.21 +242 | 15.347 + 72 | 61.58 +295 | 50.683 + 65 | 33.54 + 54 |
| 2 ^{10.5} | 24.236 + 79 | 31.43 + 14 | 14.066 + 126 | 27.63 +258 | 15.499 + 152 | 58.50 +308 | 50.774 + 91 | 32.84 + 70 |
| 2 ^{20.5} | 24.366 + 130 | 31.22 + 21 | 14.250 + 184 | 24.96 +267 | 15.733 + 234 | 55.36 +314 | 50.902 + 128 | 31.93 + 91 |
| 3 ^{2.4} | 24.520 + 154 | 30.76 + 46 | 14.484 + 234 | 22.28 +268 | 16.039 + 306 | 52.25 +311 | 51.062 + 160 | 30.89 +104 |
| 3 ^{12.4} | 24.703 + 183 | 30.12 + 64 | 14.769 + 285 | 19.60 +268 | 16.417 + 378 | 49.20 +305 | 51.253 + 191 | 29.71 +118 |
| 3 ^{22.4} | 24.916 + 213 | 29.26 + 86 | 15.102 + 333 | 17.00 +260 | 16.862 + 445 | 46.31 +289 | 51.475 + 222 | 28.39 +132 |
| 4 ^{1.4} | 25.155 + 239 | 28.22 +104 | 15.476 + 374 | 14.53 +247 | 17.363 + 501 | 43.62 +269 | 51.725 + 250 | 26.95 +144 |
| 4 ^{11.3} | 25.422 + 267 | 27.00 +122 | 15.892 + 416 | 12.22 +231 | 17.918 + 555 | 41.16 +246 | 52.003 + 278 | 25.40 +155 |
| 4 ^{21.3} | 25.711 + 289 | 25.60 +140 | 16.341 + 449 | 10.14 +208 | 18.518 + 600 | 39.02 +214 | 52.305 + 302 | 23.78 +162 |
| 5 ^{1.3} | 26.017 + 306 | 24.08 +152 | 16.815 + 474 | 08.31 +183 | 19.148 + 630 | 37.23 +179 | 52.625 + 320 | 22.12 +166 |
| 5 ^{11.3} | 26.339 + 322 | 22.46 +162 | 17.311 + 496 | 06.79 +152 | 19.805 + 657 | 35.80 +143 | 52.961 + 336 | 20.47 +165 |
| 5 ^{21.2} | 26.666 + 327 | 20.80 +166 | 17.815 + 504 | 05.61 +118 | 20.470 + 665 | 34.81 + 99 | 53.304 + 343 | 18.86 +161 |
| 5 ^{31.2} | 26.993 + 327 | 19.14 +166 | 18.317 + 502 | 04.80 + 81 | 21.131 + 661 | 34.25 + 56 | 53.648 + 344 | 17.35 +151 |
| 6 ^{10.2} | 27.314 + 321 | 17.51 +163 | 18.810 + 493 | 04.37 + 43 | 21.776 + 645 | 34.13 + 12 | 53.985 + 337 | 15.96 +139 |
| 6 ^{20.1} | 27.618 + 304 | 15.99 +152 | 19.276 + 466 | 04.35 + 2 | 22.385 + 609 | 34.48 - 35 | 54.306 + 321 | 14.75 +121 |
| 6 ^{30.1} | 27.900 + 282 | 14.59 +140 | 19.709 + 433 | 04.72 - 37 | 22.946 + 561 | 35.25 - 77 | 54.604 + 298 | 13.74 +101 |
| 7 ^{10.1} | 28.153 + 253 | 13.36 +123 | 20.097 + 388 | 05.48 - 76 | 23.447 + 501 | 36.44 -119 | 54.873 + 269 | 12.96 + 78 |
| 7 ^{20.1} | 28.368 + 215 | 12.33 +103 | 20.426 + 329 | 06.60 -112 | 23.868 + 421 | 38.02 -158 | 55.102 + 229 | 12.42 + 54 |
| 7 ^{30.0} | 28.544 + 176 | 11.50 + 83 | 20.693 + 267 | 08.02 -142 | 24.206 + 338 | 39.90 -188 | 55.290 + 188 | 12.13 + 29 |
| 8 ^{9.0} | 28.675 + 131 | 10.89 + 61 | 20.890 + 197 | 09.73 -171 | 24.448 + 242 | 42.06 -216 | 55.432 + 142 | 12.07 + 6 |
| 8 ^{19.0} | 28.758 + 83 | 10.50 + 39 | 21.010 + 120 | 11.63 -190 | 24.587 + 139 | 44.39 -233 | 55.523 + 91 | 12.24 - 17 |
| 8 ^{29.0} | 28.797 + 39 | 10.30 + 20 | 21.058 + 48 | 13.66 -203 | 24.627 + 40 | 46.81 -242 | 55.568 + 45 | 12.60 - 36 |
| 9 ^{7.9} | 28.792 - 5 | 10.30 + 0 | 21.030 - 28 | 15.75 -209 | 24.565 - 62 | 49.25 -244 | 55.565 - 3 | 13.13 - 53 |
| 9 ^{17.9} | 28.746 - 46 | 10.46 - 16 | 20.933 - 97 | 17.78 -203 | 24.408 - 157 | 51.58 -233 | 55.519 - 46 | 13.78 - 65 |
| 9 ^{27.9} | 28.668 - 78 | 10.75 - 29 | 20.778 - 155 | 19.69 -191 | 24.108 - 238 | 53.72 -214 | 55.438 - 81 | 14.50 - 72 |
| 10 ^{7.8} | 28.561 - 107 | 11.14 - 39 | 20.571 - 207 | 21.41 -172 | 23.858 - 312 | 55.60 -188 | 55.326 - 112 | 15.26 - 76 |
| 10 ^{17.8} | 28.436 - 125 | 11.60 - 46 | 20.327 - 244 | 22.83 -142 | 23.494 - 364 | 57.08 -148 | 55.194 - 132 | 16.01 - 75 |
| 10 ^{27.8} | 28.301 - 135 | 12.09 - 49 | 20.061 - 266 | 23.90 -107 | 23.096 - 398 | 58.15 -107 | 55.051 - 143 | 16.70 - 69 |
| 11 ^{6.8} | 28.163 - 138 | 12.61 - 52 | 19.783 - 278 | 24.59 - 69 | 22.680 - 416 | 58.74 - 59 | 54.903 - 148 | 17.32 - 62 |
| 11 ^{16.7} | 28.032 - 131 | 13.11 - 50 | 19.514 - 269 | 24.82 - 23 | 22.272 - 408 | 58.79 - 5 | 54.764 - 139 | 17.81 - 49 |
| 11 ^{26.7} | 27.915 - 117 | 13.59 - 48 | 19.264 - 250 | 24.63 + 19 | 21.889 - 383 | 58.34 + 45 | 54.637 - 127 | 18.18 - 37 |
| 12 ^{6.7} | 27.817 - 98 | 14.03 - 44 | 19.043 - 221 | 23.99 + 64 | 21.544 - 345 | 57.36 + 98 | 54.530 - 107 | 18.42 - 24 |
| 12 ^{16.7} | 27.744 - 73 | 14.42 - 39 | 18.866 - 177 | 22.92 +107 | 21.260 - 284 | 55.88 +148 | 54.451 - 79 | 18.50 - 8 |
| 12 ^{26.6} | 27.697 - 47 | 14.75 - 33 | 18.736 - 130 | 21.47 +145 | 21.040 - 220 | 53.97 +191 | 54.399 - 52 | 18.43 + 7 |
| 12 ^{36.6} | 27.680 - 17 | 15.02 - 27 | 18.658 - 78 | 19.66 +181 | 20.896 - 144 | 51.67 +230 | 54.378 - 21 | 18.22 + 21 |
| | + 14 | - 16 | - 19 | +209 | - 61 | +262 | + 13 | + 36 |
| Mean Place | 27.295 | 11.65 | 18.104 | 09.68 | 20.468 | 41.29 | 53.903 | 13.04 |
| sec δ, tan δ | +1.026 | -0.230 | +1.731 | -1.413 | +2.405 | -2.187 | +1.082 | -0.414 |
| da(ψ), dδ(ψ) | +0.065 | +0.31 | +0.085 | +0.31 | +0.097 | +0.31 | +0.068 | +0.31 |
| da(ε), dδ(ε) | +0.012 | -0.63 | +0.074 | -0.62 | +0.114 | -0.62 | +0.022 | -0.62 |
| Dble.Trans. | August 12 | | August 13 | | August 13 | | August 13 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 1564 | | 809 | | 807 | | 1565 | | |
|--------------|-------------|--------------|-------------|--------------|-------------|--------------|-------------|--------------|-------------|
| | 2 G. Pegasi | | β Cephei* | | 71 Cygni | | 2 Pegasi | | |
| Mag.Spect. | 6.66 | M0 | 3.33 | B1 | 5.34 | K0 | 4.76 | K5 | |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | |
| | h m | ° | h m | ° | h m | ° | h m | ° | |
| | 21 27 | + 8 07 | 21 28 | + 70 29 | 21 28 | + 46 28 | 21 29 | + 23 34 | |
| 1 | -8.4 | 41.848 - 70 | 57.98 - 108 | 25.240 - 528 | 64.70 - 159 | 53.781 - 183 | 46.67 - 170 | 17.110 - 95 | 36.08 - 144 |
| 1 | 1.6 | 41.804 - 44 | 56.80 - 118 | 24.781 - 459 | 62.60 - 210 | 53.633 - 148 | 44.58 - 209 | 17.041 - 69 | 34.42 - 166 |
| 1 | 11.6 | 41.787 - 17 | 55.54 - 126 | 24.401 - 380 | 60.05 - 255 | 53.522 - 111 | 42.13 - 245 | 17.001 - 40 | 32.55 - 187 |
| 1 | 21.6 | 41.800 + 13 | 54.26 - 128 | 24.125 - 276 | 57.13 - 292 | 53.458 - 64 | 39.44 - 269 | 16.994 - 7 | 30.57 - 198 |
| 1 | 31.5 | 41.843 + 43 | 53.02 - 124 | 23.955 - 170 | 53.99 - 314 | 53.440 - 18 | 36.61 - 283 | 17.019 + 25 | 28.56 - 201 |
| 2 | 10.5 | 41.916 + 73 | 51.86 - 116 | 23.900 - 55 | 50.70 - 329 | 53.472 + 32 | 33.73 - 288 | 17.078 + 59 | 26.58 - 198 |
| 2 | 20.5 | 42.021 + 105 | 50.87 - 99 | 23.969 + 69 | 47.43 - 327 | 53.559 + 87 | 30.94 - 279 | 17.175 + 97 | 24.75 - 183 |
| 3 | 2.4 | 42.156 + 135 | 50.08 - 79 | 24.155 + 186 | 44.31 - 312 | 53.696 + 137 | 28.36 - 258 | 17.306 + 131 | 23.14 - 161 |
| 3 | 12.4 | 42.324 + 168 | 49.56 - 52 | 24.456 + 301 | 41.43 - 288 | 53.885 + 189 | 26.07 - 229 | 17.473 + 167 | 21.81 - 133 |
| 3 | 22.4 | 42.523 + 199 | 49.36 - 20 | 24.868 + 412 | 38.96 - 247 | 54.124 + 239 | 24.20 - 187 | 17.675 + 202 | 20.86 - 95 |
| 4 | 1.4 | 42.750 + 227 | 49.49 + 13 | 25.368 + 500 | 36.96 - 200 | 54.406 + 282 | 22.81 - 139 | 17.909 + 234 | 20.32 - 54 |
| 4 | 11.3 | 43.005 + 255 | 49.96 + 47 | 25.950 + 582 | 35.48 - 148 | 54.728 + 322 | 21.94 - 87 | 18.174 + 265 | 20.22 - 10 |
| 4 | 21.3 | 43.284 + 279 | 50.80 + 84 | 26.592 + 642 | 34.64 - 84 | 55.083 + 355 | 21.66 + 29 | 18.464 + 290 | 20.60 + 38 |
| 5 | 1.3 | 43.579 + 295 | 51.96 + 116 | 27.269 + 677 | 34.40 - 24 | 55.459 + 376 | 21.95 - 28 | 18.772 + 308 | 21.41 + 81 |
| 5 | 11.3 | 43.890 + 311 | 53.42 + 146 | 27.968 + 699 | 34.79 + 39 | 55.851 + 392 | 22.80 + 85 | 19.095 + 323 | 22.66 + 125 |
| 5 | 21.2 | 44.206 + 316 | 55.14 + 172 | 28.662 + 694 | 35.81 + 102 | 56.245 + 394 | 24.22 + 142 | 19.424 + 329 | 24.31 + 165 |
| 5 | 31.2 | 44.522 + 316 | 57.05 + 191 | 29.329 + 667 | 37.38 + 157 | 56.632 + 387 | 26.10 + 188 | 19.749 + 325 | 26.28 + 197 |
| 6 | 10.2 | 44.831 + 299 | 59.13 + 208 | 29.957 + 628 | 39.49 + 211 | 57.004 + 372 | 28.44 + 234 | 20.067 + 318 | 28.55 + 227 |
| 6 | 20.1 | 45.122 + 291 | 61.29 + 216 | 30.519 + 562 | 42.08 + 259 | 57.346 + 342 | 31.15 + 271 | 20.364 + 297 | 31.03 + 248 |
| 6 | 30.1 | 45.391 + 269 | 63.48 + 219 | 31.006 + 487 | 45.02 + 294 | 57.653 + 307 | 34.13 + 298 | 20.637 + 273 | 33.65 + 262 |
| 7 | 10.1 | 45.631 + 240 | 65.65 + 217 | 31.406 + 400 | 48.31 + 329 | 57.918 + 265 | 37.35 + 322 | 20.878 + 241 | 36.36 + 271 |
| 7 | 20.1 | 45.834 + 203 | 67.74 + 209 | 31.702 + 296 | 51.82 + 351 | 58.131 + 213 | 40.70 + 335 | 21.079 + 201 | 39.09 + 273 |
| 7 | 30.0 | 45.998 + 164 | 69.71 + 197 | 31.897 + 195 | 55.47 + 365 | 58.290 + 159 | 44.10 + 340 | 21.238 + 159 | 41.76 + 267 |
| 8 | 9.0 | 46.118 + 120 | 71.53 + 182 | 31.984 + 87 | 59.21 + 374 | 58.393 + 103 | 47.50 + 340 | 21.352 + 114 | 44.35 + 259 |
| 8 | 19.0 | 46.193 + 75 | 73.15 + 162 | 31.956 - 28 | 62.93 + 372 | 58.435 + 42 | 50.80 + 330 | 21.418 + 66 | 46.76 + 241 |
| 8 | 29.0 | 46.225 + 32 | 74.57 + 142 | 31.827 - 129 | 66.55 + 362 | 58.422 - 13 | 53.95 + 315 | 21.439 + 21 | 48.98 + 222 |
| 9 | 7.9 | 46.215 - 10 | 75.76 + 119 | 31.593 - 234 | 70.03 + 348 | 58.355 - 67 | 56.90 + 295 | 21.416 - 23 | 50.99 + 201 |
| 9 | 17.9 | 46.166 - 49 | 76.71 + 95 | 31.263 - 330 | 73.25 + 322 | 58.237 - 118 | 59.54 + 264 | 21.353 - 63 | 52.70 + 171 |
| 9 | 27.9 | 46.086 - 80 | 77.43 + 72 | 30.854 - 409 | 76.18 + 293 | 58.078 - 159 | 61.88 + 234 | 21.257 - 96 | 54.14 + 144 |
| 10 | 7.8 | 45.978 - 108 | 77.91 + 48 | 30.366 - 488 | 78.75 + 257 | 57.882 - 196 | 63.84 + 196 | 21.133 - 124 | 55.27 + 113 |
| 10 | 17.8 | 45.853 - 125 | 78.14 + 23 | 29.821 - 545 | 80.86 + 211 | 57.659 - 223 | 65.37 + 153 | 20.989 - 144 | 56.05 + 78 |
| 10 | 27.8 | 45.718 - 135 | 78.17 + 3 | 29.234 - 587 | 82.52 + 166 | 57.419 - 240 | 66.47 + 110 | 20.833 - 156 | 56.52 + 47 |
| 11 | 6.8 | 45.579 - 139 | 77.96 - 21 | 28.612 - 622 | 83.65 + 113 | 57.169 - 250 | 67.08 + 61 | 20.672 - 161 | 56.62 + 10 |
| 11 | 16.7 | 45.445 - 134 | 77.54 - 42 | 27.984 - 628 | 84.19 + 54 | 56.920 - 249 | 67.18 + 10 | 20.516 - 156 | 56.37 - 25 |
| 11 | 26.7 | 45.324 - 121 | 76.94 - 60 | 27.360 - 624 | 84.18 - 1 | 56.680 - 240 | 66.79 - 39 | 20.370 - 146 | 55.80 - 57 |
| 12 | 6.7 | 45.217 - 107 | 76.13 - 81 | 26.756 - 604 | 83.55 - 63 | 56.455 - 225 | 65.88 - 91 | 20.238 - 132 | 54.87 - 93 |
| 12 | 16.7 | 45.134 - 83 | 75.17 - 96 | 26.199 - 557 | 82.33 - 122 | 56.257 - 198 | 64.49 - 139 | 20.130 - 108 | 53.64 - 123 |
| 12 | 26.6 | 45.075 - 59 | 74.08 - 109 | 25.697 - 502 | 80.58 - 175 | 56.088 - 169 | 62.67 - 182 | 20.045 - 85 | 52.15 - 149 |
| 12 | 36.6 | 45.042 - 33 | 72.88 - 120 | 25.269 - 428 | 78.31 - 227 | 55.955 - 133 | 60.44 - 223 | 19.988 - 57 | 50.41 - 174 |
| | | - 3 | - 124 | - 335 | - 267 | - 89 | - 252 | - 25 | - 189 |
| Mean Place | 44.921 | 71.43 | 29.408 | 65.07 | 57.025 | 50.68 | 20.180 | 45.34 | |
| sec δ, tan δ | +1.010 | +0.143 | +2.996 | +2.824 | +1.452 | +1.053 | +1.091 | +0.436 | |
| dα(v), dδ(v) | +0.059 | +0.31 | +0.015 | +0.31 | +0.044 | +0.31 | +0.054 | +0.31 | |
| dα(ε), dδ(ε) | -0.008 | -0.62 | -0.149 | -0.61 | -0.056 | -0.61 | -0.023 | -0.61 | |
| Dble.Trans. | August 13 | | August 14 | | August 14 | | August 14 | | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 808 | | 1566 | | 1567 | | 1568 | |
|--------------|------------------------------------|-------------------------------------|------------------------------------|--------------------------------------|------------------------------------|--------------------------------------|------------------------------------|--------------------------------------|
| | β Aquarii | | 6 Piscis Austrini | | 3 G. Gruis | | γ Cygni | |
| Mag.Spect. | 3.07 | G0 | 5.99 | A2 | 5.73 | K0 | 4.22 | K0 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | ^h ^m 21 30 | [°] ['] — 5 37 | ^h ^m 21 31 | [°] ['] — 34 00 | ^h ^m 21 32 | [°] ['] — 44 54 | ^h ^m 21 33 | [°] ['] + 45 31 |
| 1 -8.4 | 47 830 ^s - 63 | 69.10 - 64 | 22.381 ^s - 81 | 41.78 + 42 | 27.636 ^s - 110 | 59.62 + 86 | 25.122 ^s - 180 | 50.59 - 166 |
| 1 1.6 | 47.794 - 36 | 69.72 - 62 | 22.333 - 48 | 41.11 + 67 | 27.566 - 70 | 58.46 +116 | 24.975 - 147 | 48.56 -203 |
| 1 11.6 | 47.785 - 9 | 70.32 - 60 | 22.320 - 13 | 40.23 + 88 | 27.536 - 30 | 57.01 +145 | 24.864 - 111 | 46.16 -240 |
| 1 21.6 | 47.806 + 21 | 70.86 - 54 | 22.344 + 24 | 39.13 +110 | 27.553 + 17 | 55.30 +171 | 24.797 + 67 | 43.51 -265 |
| 1 31.5 | 47.856 + 50 | 71.29 - 43 | 22.405 + 61 | 37.86 +127 | 27.613 + 60 | 53.40 +190 | 24.776 - 21 | 40.73 -278 |
| 2 10.5 | 47.934 + 78 | 71.59 - 30 | 22.500 + 95 | 36.42 +144 | 27.716 + 103 | 51.33 +207 | 24.803 + 27 | 37.88 -285 |
| 2 20.5 | 48.043 + 109 | 71.78 - 19 | 22.634 + 134 | 34.83 +159 | 27.864 + 148 | 49.13 +220 | 24.883 + 80 | 35.13 -275 |
| 3 2.5 | 48.183 + 140 | 71.75 + 3 | 22.802 + 168 | 33.12 +171 | 28.053 + 189 | 46.85 +228 | 25.013 + 130 | 32.57 -256 |
| 3 12.4 | 48.353 + 170 | 71.50 + 25 | 23.006 + 204 | 31.32 +180 | 28.283 + 230 | 44.52 +233 | 25.194 + 181 | 30.29 -228 |
| 3 22.4 | 48.555 + 202 | 71.00 + 50 | 23.245 + 239 | 29.44 +188 | 28.555 + 272 | 42.20 +232 | 25.425 + 231 | 28.42 -187 |
| 4 1.4 | 48.783 + 228 | 70.25 + 75 | 23.515 + 270 | 27.53 +191 | 28.861 + 306 | 39.92 +228 | 25.698 + 273 | 27.02 -140 |
| 4 11.3 | 49.038 + 255 | 69.26 + 99 | 23.815 + 300 | 25.61 +192 | 29.203 + 342 | 37.72 +220 | 26.013 + 315 | 26.13 - 89 |
| 4 21.3 | 49.318 + 280 | 68.03 +123 | 24.143 + 328 | 23.72 +189 | 29.576 + 373 | 35.66 +206 | 26.360 + 347 | 25.84 - 29 |
| 5 1.3 | 49.615 + 297 | 66.60 +143 | 24.491 + 348 | 21.91 +181 | 29.971 + 395 | 33.77 +189 | 26.729 + 369 | 26.09 + 25 |
| 5 11.3 | 49.928 + 313 | 65.01 +159 | 24.857 + 366 | 20.21 +170 | 30.386 + 415 | 32.09 +168 | 27.116 + 387 | 26.91 + 82 |
| 5 21.2 | 50.248 + 320 | 63.28 +173 | 25.231 + 374 | 18.67 +154 | 30.812 + 426 | 30.68 +141 | 27.507 + 391 | 28.29 +138 |
| 5 31.2 | 50.568 + 320 | 61.49 +179 | 25.607 + 376 | 17.34 +133 | 31.237 + 425 | 29.55 +113 | 27.891 + 384 | 30.14 +185 |
| 6 10.2 | 50.884 + 316 | 59.67 +182 | 25.978 + 371 | 16.23 +111 | 31.658 + 421 | 28.75 + 80 | 28.261 + 370 | 32.43 +229 |
| 6 20.2 | 51.183 + 299 | 57.88 +179 | 26.331 + 353 | 15.39 + 84 | 32.058 + 400 | 28.30 + 45 | 28.605 + 344 | 35.10 +267 |
| 6 30.1 | 51.461 + 278 | 56.17 +171 | 26.661 + 330 | 14.84 + 55 | 32.432 + 374 | 28.19 + 11 | 28.914 + 309 | 38.05 +295 |
| 7 10.1 | 51.712 + 251 | 54.57 +160 | 26.959 + 298 | 14.58 + 26 | 32.770 + 338 | 28.44 - 25 | 29.182 + 268 | 41.23 +318 |
| 7 20.1 | 51.926 + 214 | 53.14 +143 | 27.215 + 256 | 14.63 - 5 | 33.060 + 290 | 29.05 - 61 | 29.400 + 218 | 44.55 +332 |
| 7 30.0 | 52.101 + 175 | 51.88 +126 | 27.427 + 212 | 14.95 - 32 | 33.299 + 239 | 29.95 - 90 | 29.565 + 165 | 47.91 +336 |
| 8 9.0 | 52.233 + 132 | 50.82 +106 | 27.588 + 161 | 15.55 - 60 | 33.480 + 181 | 31.13 -118 | 29.675 + 110 | 51.29 +338 |
| 8 19.0 | 52.319 + 86 | 49.98 + 84 | 27.693 + 105 | 16.38 - 83 | 33.597 + 117 | 32.55 -142 | 29.725 + 50 | 54.57 +328 |
| 8 29.0 | 52.362 + 43 | 49.35 + 63 | 27.747 + 54 | 17.38 -100 | 33.655 + 58 | 34.12 -157 | 29.722 - 3 | 57.70 +313 |
| 9 7.9 | 52.362 + 0 | 48.92 + 43 | 27.748 + 1 | 18.53 -115 | 33.650 - 5 | 35.81 -169 | 29.663 - 59 | 60.63 +293 |
| 9 17.9 | 52.322 - 40 | 48.70 + 22 | 27.699 - 49 | 19.75 -122 | 33.588 - 62 | 37.51 -170 | 29.555 - 108 | 63.27 +264 |
| 9 27.9 | 52.250 - 72 | 48.64 + 6 | 27.611 - 88 | 20.98 -123 | 33.478 - 110 | 39.15 -164 | 29.407 - 148 | 65.61 +234 |
| 10 7.9 | 52.149 - 101 | 48.74 - 10 | 27.486 - 125 | 22.18 -120 | 33.325 - 153 | 40.69 -154 | 29.220 - 187 | 67.58 +197 |
| 10 17.8 | 52.030 - 119 | 48.97 - 23 | 27.337 - 149 | 23.26 -108 | 33.142 - 183 | 42.01 -132 | 29.007 - 213 | 69.13 +155 |
| 10 27.8 | 51.901 - 129 | 49.31 - 34 | 27.174 - 163 | 24.18 - 92 | 32.940 - 202 | 43.08 -107 | 28.777 - 230 | 70.25 +112 |
| 11 6.8 | 51.767 - 134 | 49.74 - 43 | 27.003 - 171 | 24.91 - 73 | 32.729 - 211 | 43.85 - 77 | 28.535 - 242 | 70.89 + 64 |
| 11 16.7 | 51.640 - 127 | 50.23 - 49 | 26.840 - 163 | 25.39 - 48 | 32.525 - 204 | 44.27 - 42 | 28.294 - 241 | 71.02 + 13 |
| 11 26.7 | 51.524 - 116 | 50.78 - 55 | 26.690 - 150 | 25.63 - 24 | 32.335 - 190 | 44.34 - 7 | 28.060 - 234 | 70.67 - 35 |
| 12 6.7 | 51.424 - 100 | 51.37 - 59 | 26.561 - 129 | 25.60 + 3 | 32.168 - 167 | 44.04 + 30 | 27.840 - 220 | 69.81 - 86 |
| 12 16.7 | 51.348 - 76 | 51.98 - 61 | 26.461 - 100 | 25.31 + 29 | 32.036 - 132 | 43.37 + 67 | 27.646 - 194 | 68.46 -135 |
| 12 26.6 | 51.295 - 53 | 52.59 - 61 | 26.392 - 69 | 24.78 + 53 | 31.940 - 96 | 42.38 + 99 | 27.479 - 167 | 66.70 -176 |
| 12 36.6 | 51.270 + 5 | 53.19 - 60 | 26.357 + 3 | 24.00 + 78 | 31.884 - 56 | 41.07 +131 | 27.347 - 132 | 64.52 -218 |
| | | | | | | | | |
| Mean Place | 50.941 | 51.69 | 25.788 | 16.81 | 31.277 | 32.21 | 28.338 | 54.55 |
| sec δ, tan δ | +1.005 | -0.099 | +1.206 | -0.675 | +1.412 | -0.997 | +1.428 | +1.019 |
| da(ψ), dδ(ψ) | +0.063 | +0.32 | +0.072 | +0.32 | +0.077 | +0.32 | +0.045 | +0.32 |
| da(ε), dδ(ε) | +0.005 | -0.61 | +0.036 | -0.60 | +0.053 | -0.60 | -0.055 | -0.60 |
| Dble.Trans. | August 14 | | August 14 | | August 15 | | August 15 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 811 | | 1569 | | 1570 | | 813 | |
|--------------|--------------------------|-------------------------|-------------------------|------------------------|-------------------------|-------------------------|--------------------------|-------------------------|
| | 74 Cygni | | ξ Aquarii | | 5 Pegasi | | 13 H. Cephei* | |
| Mag. Spect. | 5.09 | A5 | 4.78 | A5 | 5.29 | F0 | 5.97 | Oe5 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " |
| | 21 36 | +40 20 | 21 36 | - 7 54 | 21 37 | +19 15 | 21 38 | +57 25 |
| 1 -8.4 | 21.288 ^s -154 | 64.17 ["] -159 | 58.942 ^s -66 | 72.94 ["] -56 | 04.481 ^s -91 | 16.31 ["] -129 | 29.006 ^s -282 | 38.17 ["] -159 |
| 1 1.6 | 21.164 -124 | 62.22 -195 | 58.903 -39 | 73.46 -52 | 04.416 -65 | 14.81 -150 | 28.764 -242 | 36.13 -204 |
| 1 11.6 | 21.072 -92 | 59.95 -227 | 58.890 -13 | 73.94 -48 | 04.377 -39 | 13.14 -167 | 28.569 -195 | 33.67 -246 |
| 1 21.6 | 21.021 -51 | 57.44 -251 | 58.907 +17 | 74.34 -40 | 04.370 -7 | 11.38 -176 | 28.432 -137 | 30.87 -280 |
| 1 31.5 | 21.010 -11 | 54.83 -261 | 58.953 +46 | 74.62 -28 | 04.393 +23 | 09.61 -177 | 28.357 -75 | 27.88 -289 |
| 2 10.5 | 21.042 +32 | 52.16 -267 | 59.026 +73 | 74.74 -12 | 04.448 +55 | 07.86 -175 | 28.347 -10 | 24.77 -311 |
| 2 20.5 | 21.121 +79 | 49.59 -257 | 59.128 +102 | 74.80 -6 | 04.538 +90 | 06.27 -159 | 28.410 +63 | 21.70 -307 |
| 3 2.5 | 21.246 +125 | 47.23 -236 | 59.265 +137 | 74.62 +18 | 04.662 +124 | 04.88 -112 | 28.541 +131 | 18.79 -291 |
| 3 12.4 | 21.416 +170 | 45.14 -209 | 59.431 +166 | 74.23 +39 | 04.820 +158 | 03.76 -119 | 28.742 +201 | 16.13 -266 |
| 3 22.4 | 21.633 +217 | 43.45 -169 | 59.628 +197 | 73.59 +64 | 05.013 +193 | 03.01 -75 | 29.011 +269 | 13.87 -226 |
| 4 1.4 | 21.889 +256 | 42.22 -123 | 59.853 +225 | 72.73 +86 | 05.238 +225 | 02.63 -38 | 29.336 +325 | 12.07 -180 |
| 4 11.3 | 22.183 +294 | 41.49 -73 | 60.106 +253 | 71.63 +110 | 05.493 +255 | 02.67 +4 | 29.716 +380 | 10.80 -127 |
| 4 21.3 | 22.508 +325 | 41.32 -17 | 60.384 +278 | 70.33 +130 | 05.774 +281 | 03.15 +48 | 30.139 +423 | 10.14 -66 |
| 5 1.3 | 22.854 +346 | 41.68 +36 | 60.681 +297 | 68.84 +149 | 06.075 +301 | 04.03 +88 | 30.589 +450 | 10.06 -8 |
| 5 11.3 | 23.219 +365 | 42.59 +91 | 60.995 +314 | 67.21 +163 | 06.392 +317 | 05.31 +128 | 31.060 +471 | 10.60 +54 |
| 5 21.2 | 23.588 +369 | 44.02 +143 | 61.317 +322 | 65.47 +174 | 06.715 +323 | 06.96 +165 | 31.535 +475 | 11.74 +114 |
| 5 31.2 | 23.952 +364 | 45.89 +187 | 61.640 +323 | 63.69 +178 | 07.038 +323 | 08.90 +194 | 31.999 +464 | 13.40 +166 |
| 6 10.2 | 24.306 +354 | 48.18 +229 | 61.959 +319 | 61.90 +179 | 07.355 +317 | 11.11 +221 | 32.445 +446 | 15.57 +217 |
| 6 20.2 | 24.636 +330 | 50.82 +264 | 62.264 +305 | 60.16 +174 | 07.654 +299 | 13.50 +239 | 32.855 +410 | 18.19 +262 |
| 6 30.1 | 24.935 +299 | 53.70 +268 | 62.548 +284 | 58.51 +165 | 07.930 +276 | 16.00 +250 | 33.221 +366 | 21.14 +295 |
| 7 10.1 | 25.197 +262 | 56.80 +310 | 62.805 +257 | 56.99 +152 | 08.177 +247 | 18.58 +258 | 33.535 +314 | 24.40 +326 |
| 7 20.1 | 25.412 +215 | 60.01 +321 | 63.025 +220 | 55.65 +134 | 08.385 +208 | 21.14 +256 | 33.535 +250 | 27.86 +346 |
| 7 30.0 | 25.580 +168 | 63.25 +324 | 63.208 +183 | 54.50 +115 | 08.553 +168 | 23.64 +250 | 33.785 +185 | 27.86 +356 |
| 8 9.0 | 25.695 +115 | 66.48 +323 | 63.348 +140 | 53.56 +94 | 08.678 +125 | 26.04 +240 | 33.970 +115 | 31.42 +363 |
| 8 19.0 | 25.755 +60 | 69.60 +312 | 63.441 +93 | 52.84 +72 | 08.755 +77 | 28.27 +223 | 34.085 +41 | 35.05 +358 |
| 8 29.0 | 25.764 +9 | 72.57 +297 | 63.492 +51 | 52.34 +50 | 08.789 +34 | 30.30 +203 | 34.101 -25 | 42.10 +347 |
| 9 7.9 | 25.722 -42 | 75.33 +276 | 63.498 +6 | 52.03 +31 | 08.779 -10 | 32.11 +181 | 34.007 -94 | 45.41 +331 |
| 9 17.9 | 25.634 -88 | 77.80 +247 | 63.464 -34 | 51.93 +10 | 08.729 -50 | 33.65 +154 | 33.850 -157 | 48.45 +304 |
| 9 27.9 | 25.507 -127 | 79.97 +217 | 63.397 -67 | 51.98 -5 | 08.647 -82 | 34.93 +128 | 33.641 -209 | 51.19 +274 |
| 10 7.9 | 25.346 -161 | 81.80 +183 | 63.301 -96 | 52.18 -20 | 08.535 -112 | 35.92 +99 | 33.382 -259 | 53.58 +239 |
| 10 17.8 | 25.159 -187 | 83.20 +140 | 63.185 -116 | 52.49 -31 | 08.404 -131 | 36.59 +67 | 33.087 -295 | 55.51 +193 |
| 10 27.8 | 24.957 -202 | 84.21 +101 | 63.058 -127 | 52.89 -40 | 08.261 -143 | 36.97 +38 | 32.766 -321 | 57.01 +150 |
| 11 6.8 | 24.744 -213 | 84.76 +55 | 62.926 -132 | 53.36 -47 | 08.111 -150 | 37.03 +6 | 32.425 -341 | 57.99 +98 |
| 11 16.7 | 24.533 -211 | 84.83 +7 | 62.799 -127 | 53.88 -52 | 07.965 -146 | 36.78 -25 | 32.080 -345 | 58.42 +43 |
| 11 26.7 | 24.329 -204 | 84.45 -38 | 62.682 -117 | 54.41 -53 | 07.828 -137 | 36.24 -54 | 31.740 -340 | 58.32 -10 |
| 12 6.7 | 24.138 -191 | 83.59 -86 | 62.581 -101 | 54.97 -56 | 07.704 -124 | 35.38 -86 | 31.413 -277 | 57.63 -69 |
| 12 16.7 | 23.971 -167 | 82.29 -130 | 62.503 -78 | 55.51 -54 | 07.602 -102 | 34.27 -111 | 31.115 -328 | 56.41 -122 |
| 12 26.6 | 23.829 -142 | 80.59 -170 | 62.447 -56 | 56.03 -52 | 07.522 -80 | 32.92 -135 | 30.849 -266 | 54.69 -172 |
| 12 36.6 | 23.718 -111 | 78.52 -207 | 62.418 -29 | 56.53 -50 | 07.467 -55 | 31.36 -156 | 30.626 -223 | 52.48 -221 |
| | -73 | -234 | +1 | -42 | -24 | -167 | -169 | -257 |
| Mean Place | 24.437 | 69.23 | 62.036 | 54.77 | 07.520 | 26.68 | 32.461 | 39.86 |
| sec δ, tan δ | +1.312 | +0.850 | +1.010 | -0.139 | +1.059 | +0.349 | +1.857 | +1.565 |
| da(ψ), dδ(ψ) | +0.048 | +0.32 | +0.063 | +0.32 | +0.056 | +0.32 | +0.037 | +0.32 |
| dα(ε), dδ(ε) | -0.046 | -0.59 | +0.008 | -0.58 | -0.019 | -0.58 | -0.085 | -0.58 |
| Dble. Trans. | August 16 | | August 16 | | August 16 | | August 16 | |

APPARENT PLACES OF STARS, 1986

335

AT UPPER TRANSIT AT GREENWICH

| No. | 812 | | 810 | | 817 | | 815 | | |
|--------------|---------------------------|--------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|--------------------------|--------------------------|
| | γ Capricorni | | ν Octantis | | 11 Cephei | | ε Pegasi | | |
| Mag.Spect. | 3.80 | F0p | 3.74 | K0 | 4.85 | K0 | 2.54 | K0 | |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | |
| | ^h ^m | ^o / | ^h ^m | ^o / | ^h ^m | ^o / | ^h ^m | ^o / | |
| | 21 39 | - 16 43 | 21 39 | - 77 26 | 21 41 | + 71 14 | 21 43 | + 9 48 | |
| 1 | ^d -8.4 | ^s 17 518 - 68 | ^s 46 34 - 26 | ^s 54 117 - 616 | ^s 95 32 + 197 | ^s 39 426 - 568 | ^s 57 41 - 140 | ^s 28 376 - 80 | ^s 32 78 - 106 |
| 1 | 1.6 | 17 477 - 41 | 46 48 - 14 | 53 633 - 484 | 92 89 + 243 | 38 925 - 501 | 55 49 - 192 | 28 321 - 55 | 31.61 - 117 |
| 1 | 11.6 | 17 464 - 13 | 46 51 - 3 | 53 289 - 344 | 90 07 + 282 | 38 500 - 425 | 53 09 - 240 | 28 290 - 31 | 30.34 - 127 |
| 1 | 21.6 | 17 482 + 18 | 46 41 + 10 | 53 289 - 178 | 90 07 + 315 | 38 500 - 322 | 53 09 - 280 | 28 290 - 2 | 29.03 - 131 |
| 1 | 31.5 | 17 482 + 50 | 46 41 + 24 | 53 111 - 18 | 86 92 + 335 | 38 178 - 215 | 50 29 - 306 | 28 288 + 27 | 27.75 - 128 |
| 1 | 31.5 | 17 532 + 50 | 46 17 + 24 | 53 093 | 83 57 | 37 963 | 47 23 | 28 315 | 27.75 |
| 2 | 10.5 | 17 610 + 78 | 45 95 + 22 | 53 233 + 140 | 80 07 + 350 | 37 864 - 99 | 43 99 - 324 | 28 370 + 55 | 26.54 - 121 |
| 2 | 20.5 | 17 713 + 103 | 45 25 + 70 | 53 540 + 307 | 76 51 + 356 | 37 895 + 31 | 40 73 - 326 | 28 459 + 89 | 25.48 - 106 |
| 3 | 2.5 | 17 713 + 141 | 45 25 + 75 | 53 540 + 453 | 76 51 + 350 | 37 895 + 152 | 40 73 - 315 | 28 459 + 119 | 25.48 - 86 |
| 3 | 20.5 | 17 854 + 171 | 44 50 + 91 | 53 993 + 596 | 73 01 + 341 | 38 047 + 276 | 37 58 - 294 | 28 578 + 152 | 24.62 - 61 |
| 3 | 12.4 | 18 025 + 204 | 43 59 + 110 | 54 589 + 793 | 69 60 + 322 | 38 323 + 393 | 34 64 - 257 | 28 730 + 186 | 24.01 - 28 |
| 3 | 22.4 | 18 229 + 204 | 42 49 + 91 | 55 322 + 596 | 66 38 + 297 | 38 716 + 490 | 32 07 - 213 | 28 916 + 215 | 23.73 + 5 |
| 4 | 1.4 | 18 460 + 260 | 41 23 + 142 | 56 166 + 953 | 63 41 + 268 | 39 206 + 580 | 29 94 - 162 | 29 131 + 246 | 23.78 + 39 |
| 4 | 11.3 | 18 720 + 286 | 39 81 + 156 | 57 119 + 1041 | 60 73 + 230 | 39 786 + 650 | 28 32 - 100 | 29 377 + 271 | 24.17 + 78 |
| 4 | 21.3 | 19 006 + 305 | 38 25 + 165 | 58 160 + 1101 | 58 43 + 189 | 40 436 + 691 | 27 32 - 41 | 29 648 + 291 | 24.95 + 109 |
| 5 | 1.3 | 19 311 + 324 | 36 60 + 171 | 59 261 + 1156 | 56 54 + 146 | 41 127 + 722 | 26 91 + 21 | 29 939 + 309 | 26.04 + 142 |
| 5 | 11.3 | 19 635 + 332 | 34 89 + 169 | 60 417 + 1175 | 55 08 + 96 | 41 849 + 723 | 27 12 + 85 | 30 248 + 317 | 27.46 + 170 |
| 5 | 21.2 | 19 967 + 334 | 33 17 + 172 | 61 592 + 1171 | 54 12 + 48 | 42 572 + 702 | 27 97 + 141 | 30 565 + 319 | 29.16 + 191 |
| 5 | 31.2 | 20 301 + 331 | 31 48 + 161 | 62 763 + 1150 | 53 64 - 3 | 43 274 + 667 | 29 38 + 196 | 30 884 + 314 | 31.07 + 210 |
| 6 | 10.2 | 20 632 + 317 | 29 87 + 148 | 63 913 + 1089 | 53 67 - 55 | 43 941 + 605 | 31 34 + 245 | 31 198 + 299 | 33.17 + 220 |
| 6 | 20.2 | 20 949 + 296 | 28 39 + 131 | 65 002 + 1008 | 54 22 - 101 | 44 546 + 531 | 33 79 + 284 | 31 497 + 278 | 35.37 + 225 |
| 6 | 30.1 | 21 245 + 268 | 27 08 + 113 | 66 010 + 906 | 55 23 - 149 | 45 077 + 446 | 36 63 + 321 | 31 775 + 252 | 37.62 + 225 |
| 7 | 10.1 | 21 513 + 233 | 25 95 + 90 | 66 916 + 785 | 56 72 - 190 | 45 523 + 342 | 39 84 + 346 | 32 027 + 215 | 39 87 + 219 |
| 7 | 20.1 | 21 746 + 193 | 25 05 + 67 | 67 681 + 618 | 58 62 - 224 | 45 865 + 240 | 43 30 + 362 | 32 242 + 177 | 42 06 + 208 |
| 7 | 30.0 | 21 939 + 149 | 24 38 + 43 | 68 299 + 449 | 60 86 - 253 | 46 105 + 128 | 46 92 + 374 | 32 419 + 135 | 44.14 + 194 |
| 8 | 9.0 | 22 088 + 101 | 23 95 + 20 | 68 748 + 259 | 63 39 - 272 | 46 233 + 12 | 50 66 + 375 | 32 554 + 89 | 46 08 + 174 |
| 8 | 19.0 | 22 189 + 56 | 23 75 - 1 | 69 007 + 79 | 66 11 - 280 | 46 245 + 94 | 54 41 + 369 | 32 643 + 47 | 47 82 + 155 |
| 8 | 29.0 | 22 245 + 10 | 23 76 - 21 | 69 086 + 115 | 68 91 - 282 | 46 151 - 203 | 58 10 + 357 | 32 690 + 4 | 49 37 + 132 |
| 9 | 7.9 | 22 255 - 32 | 23 97 - 36 | 68 971 - 298 | 71 73 - 269 | 45 948 - 305 | 61 67 + 333 | 32 694 - 36 | 50 69 + 108 |
| 9 | 17.9 | 22 223 - 66 | 24 33 - 49 | 68 673 - 457 | 74 42 - 247 | 45 643 - 390 | 65 00 + 307 | 32 658 - 67 | 51.77 + 84 |
| 9 | 27.9 | 22 157 - 98 | 24 82 - 57 | 68 216 - 611 | 76 89 - 216 | 45 253 - 474 | 68 07 + 274 | 32 591 - 97 | 52 61 + 59 |
| 10 | 7.9 | 22 059 - 119 | 25 39 - 62 | 67 605 - 725 | 79 05 - 172 | 44 779 - 539 | 70 81 + 230 | 32 494 - 117 | 53.20 + 35 |
| 10 | 17.8 | 21 940 - 130 | 26 01 - 62 | 66 880 - 807 | 80 77 - 125 | 44 240 - 588 | 73 11 + 185 | 32 377 - 129 | 53 55 + 12 |
| 10 | 27.8 | 21 810 - 138 | 26 63 - 61 | 66 073 - 864 | 82 02 - 70 | 43 652 - 630 | 74 96 + 134 | 32 248 - 135 | 53 67 - 13 |
| 11 | 6.8 | 21 672 - 132 | 27 24 - 55 | 65 209 - 869 | 82 72 - 9 | 43 022 - 644 | 76 30 + 76 | 32 113 - 133 | 53 54 - 34 |
| 11 | 16.7 | 21 540 - 121 | 27 79 - 48 | 64 340 - 844 | 82 81 + 49 | 42 378 - 646 | 77 06 + 20 | 31 980 - 123 | 53 20 - 55 |
| 11 | 26.7 | 21 419 - 105 | 28 27 - 40 | 63 496 - 789 | 82 32 + 110 | 41 732 - 633 | 77 26 - 42 | 31 857 - 111 | 52 65 - 76 |
| 12 | 6.7 | 21 314 - 82 | 28 67 - 29 | 62 707 - 688 | 81 22 + 167 | 41 099 - 593 | 76 84 - 101 | 31 746 - 91 | 51 89 - 93 |
| 12 | 16.7 | 21 232 - 57 | 28 96 - 20 | 62 019 - 575 | 79 55 + 215 | 40 506 - 541 | 75 83 - 156 | 31 655 - 70 | 50 96 - 108 |
| 12 | 26.6 | 21 175 - 30 | 29 16 - 8 | 61 444 - 439 | 77 40 + 262 | 39 965 - 472 | 74 27 - 210 | 31 585 - 46 | 49 88 - 120 |
| 12 | 36.6 | 21 145 + 1 | 29 24 + 5 | 61 005 - 280 | 74 78 + 298 | 39 493 - 380 | 72 17 - 254 | 31 539 - 17 | 48 68 - 126 |
| Mean Place | 20.661 | 25.59 | 60.930 | 63.17 | 43.658 | 57.25 | 31.383 | 45.84 | |
| sec δ, tan δ | +1.044 | -0.300 | +4.602 | -4.492 | +3.111 | +2.946 | +1.015 | +0.173 | |
| dα(ψ), dδ(ψ) | +0.066 | +0.33 | +0.129 | +0.33 | +0.017 | +0.33 | +0.059 | +0.33 | |
| dα(ε), dδ(ε) | +0.016 | -0.58 | +0.245 | -0.57 | -0.162 | -0.57 | -0.010 | -0.56 | |
| Dble.Trans. | August 16 | | August 16 | | August 17 | | August 17 | | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 814 | | 1572 | | 1571 | | 818 | |
|--------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|
| | ι Piscis Austrini | | ν Cephei | | B.D. +35° 4626 (Cygni) | | λ Capricorni | |
| Mag. Spect. | 4.35 | A0 | 4.46 | A2p | 6.60 | K0 | 5.43 | A0 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | ^h ^m | [°] ['] | ^h ^m | [°] ['] | ^h ^m | [°] ['] | ^h ^m | [°] ['] |
| | 21 44 | -33 05 | 21 44 | +61 02 | 21 45 | +35 47 | 21 45 | -11 25 |
| 1 | 05 458 - 89 | 41.46 + 33 | 59 994 - 334 | 88 83 - 148 | 07 032 - 139 | 34 96 - 147 | 45 494 - 70 | 62 51 - 45 |
| 1 | 05 401 - 57 | 40.88 + 58 | 59 703 - 291 | 86 88 - 195 | 06 920 - 112 | 33 16 - 180 | 45 449 - 45 | 62 88 - 37 |
| 1 | 05 376 - 25 | 40.07 + 81 | 59 462 - 241 | 84 47 - 241 | 06 837 - 83 | 31.05 - 211 | 45 429 - 20 | 63 18 - 30 |
| 1 | 05 387 + 11 | 39.04 + 103 | 59 285 - 177 | 81.70 - 277 | 06 789 - 48 | 28.73 - 232 | 45 440 + 11 | 63 36 - 18 |
| 1 | 05 432 + 45 | 37.82 + 122 | 59 175 - 110 | 78.71 - 299 | 06 779 - 10 | 26.31 - 242 | 45 479 + 39 | 63 42 - 6 |
| 2 | 05 511 + 79 | 36.42 + 140 | 59 139 - 36 | 75.56 - 315 | 06 807 + 28 | 23.84 - 247 | 45 549 + 70 | 63 28 + 14 |
| 2 | 05 628 + 117 | 34.85 + 157 | 59 185 + 46 | 72.43 - 313 | 06 879 + 72 | 21.47 - 237 | 45 638 + 89 | 63 13 + 15 |
| 3 | 05 780 + 152 | 33.14 + 171 | 59 308 + 123 | 69.43 - 300 | 06 992 + 113 | 19.29 - 218 | 45 769 + 131 | 62 71 + 42 |
| 3 | 05 967 + 187 | 31.32 + 182 | 59 511 + 203 | 66.66 - 277 | 07 148 + 156 | 17.37 - 192 | 45 929 + 160 | 62 09 + 62 |
| 3 | 06 191 + 224 | 29.41 + 191 | 59 790 + 279 | 64.27 - 239 | 07 349 + 201 | 15.83 - 154 | 46 121 + 192 | 61 24 + 85 |
| 4 | 06 445 + 254 | 27.46 + 195 | 60 135 + 345 | 62.33 - 194 | 07 586 + 237 | 14.73 - 110 | 46 341 + 220 | 60 19 + 105 |
| 4 | 06 733 + 288 | 25.47 + 199 | 60 542 + 407 | 60.91 - 142 | 07 862 + 276 | 14.10 - 63 | 46 591 + 250 | 58 94 + 125 |
| 4 | 07 049 + 316 | 23.50 + 197 | 60 997 + 455 | 60.09 - 82 | 08 168 + 306 | 14.01 - 9 | 46 867 + 276 | 57 51 + 143 |
| 5 | 07 387 + 338 | 21.59 + 191 | 61 484 + 487 | 59.86 - 23 | 08 497 + 329 | 14.42 + 41 | 47 163 + 296 | 55 93 + 158 |
| 5 | 07 746 + 359 | 19.78 + 181 | 61 996 + 512 | 60.24 + 38 | 08 845 + 348 | 15.35 + 93 | 47 477 + 314 | 54 23 + 170 |
| 5 | 08 116 + 370 | 18.13 + 165 | 62 513 + 517 | 61.24 + 100 | 09 200 + 355 | 16.78 + 143 | 47 802 + 325 | 52 47 + 176 |
| 5 | 08 489 + 373 | 16.66 + 147 | 63 020 + 507 | 62.79 + 155 | 09 554 + 354 | 18.62 + 184 | 48 129 + 327 | 50 69 + 178 |
| 6 | 08 859 + 370 | 15.42 + 124 | 63 508 + 488 | 64.85 + 206 | 09 900 + 346 | 20.85 + 223 | 48 454 + 325 | 48 93 + 176 |
| 6 | 09 215 + 356 | 14.45 + 97 | 63 956 + 448 | 67.39 + 254 | 10 225 + 325 | 23.41 + 256 | 48 766 + 312 | 47 26 + 167 |
| 6 | 09 549 + 334 | 13.76 + 69 | 64 358 + 402 | 70.28 + 289 | 10 523 + 298 | 26.20 + 279 | 49 058 + 282 | 45 71 + 155 |
| 7 | 09 854 + 305 | 13.38 + 38 | 64 703 + 345 | 73.51 + 323 | 10 788 + 265 | 29.19 + 299 | 49 324 + 266 | 44 32 + 139 |
| 7 | 10 118 + 264 | 13.30 + 8 | 64 978 + 275 | 76.96 + 345 | 11 009 + 221 | 32.27 + 308 | 49 555 + 281 | 43 12 + 120 |
| 7 | 10 340 + 222 | 13.52 - 22 | 65 183 + 205 | 80.55 + 359 | 11 186 + 177 | 35.38 + 311 | 49 749 + 194 | 42 13 + 99 |
| 8 | 10 512 + 172 | 14.02 - 50 | 65 312 + 129 | 84.23 + 368 | 11 314 + 128 | 38.46 + 308 | 49 899 + 150 | 41 37 + 76 |
| 8 | 10 630 + 118 | 14.77 - 75 | 65 360 + 48 | 87.88 + 365 | 11 389 + 75 | 41.44 + 298 | 50 003 + 104 | 40 84 + 53 |
| 8 | 10 697 + 67 | 15.72 - 95 | 65 335 - 25 | 91.44 + 356 | 11 417 + 28 | 44.25 + 281 | 50 063 + 60 | 40 53 + 31 |
| 9 | 10 712 + 15 | 16.83 - 111 | 65 235 - 100 | 94.87 + 343 | 11 395 - 22 | 46.87 + 262 | 50 078 + 15 | 40 42 + 11 |
| 9 | 10 677 - 35 | 18.04 - 121 | 65 064 - 171 | 98.04 + 317 | 11 328 - 67 | 49.21 + 234 | 50 052 - 26 | 40 50 - 8 |
| 9 | 10 601 - 76 | 19.28 - 124 | 64 836 - 228 | 100.93 + 289 | 11 225 - 103 | 51.26 + 205 | 49 993 - 59 | 40 73 - 23 |
| 10 | 10 488 - 113 | 20.51 - 123 | 64 551 - 285 | 103.47 + 254 | 11 087 - 138 | 52.98 + 172 | 49 902 - 91 | 41 09 - 36 |
| 10 | 10 349 - 139 | 21.64 - 113 | 64 223 - 328 | 105.58 + 211 | 10 925 - 162 | 54.30 + 132 | 49 790 - 112 | 41 54 - 45 |
| 10 | 10 194 - 155 | 22.63 - 99 | 63 864 - 359 | 107.24 + 166 | 10 747 - 178 | 55.25 + 95 | 49 666 - 124 | 42 04 - 50 |
| 11 | 10 029 - 165 | 23.45 - 82 | 63 480 - 384 | 108.40 + 116 | 10 559 - 188 | 55.77 + 52 | 49 534 - 132 | 42 58 - 54 |
| 11 | 09 869 - 160 | 24.02 - 57 | 63 089 - 391 | 108.99 + 59 | 10 370 - 189 | 55.85 + 8 | 49 407 - 127 | 43 13 - 55 |
| 11 | 09 720 - 149 | 24.36 - 34 | 62 700 - 389 | 109.04 + 5 | 10 188 - 182 | 55.51 - 34 | 49 288 - 119 | 43 65 - 52 |
| 12 | 09 588 - 132 | 24.44 - 8 | 62 321 - 379 | 108.50 - 54 | 10 016 - 172 | 54.72 - 79 | 49 184 - 104 | 44 16 - 51 |
| 12 | 09 483 - 105 | 24.25 + 19 | 61 970 - 351 | 107.39 - 111 | 09 866 - 150 | 53.52 - 120 | 49 101 - 83 | 44 61 - 45 |
| 12 | 09 405 - 78 | 23.81 + 44 | 61 654 - 316 | 105.77 - 162 | 09 738 - 128 | 51.96 - 156 | 49 041 - 60 | 45 01 - 40 |
| 12 | 09 360 - 45 | 23.12 + 69 | 61 382 - 272 | 103.64 - 213 | 09 638 - 100 | 50.04 - 192 | 49 006 - 35 | 45 34 - 33 |
| | 09 360 - 10 | 23.12 + 92 | 61 382 - 212 | 103.64 - 253 | 09 638 - 67 | 50.04 - 217 | 49 006 - 6 | 45 34 - 23 |
| Mean Place | 08.741 | 16.22 | 63.563 | 89.74 | 10.120 | 40.89 | 48.553 | 43.12 |
| sec δ, tan δ | +1.194 | -0.652 | +2.066 | +1.808 | +1.233 | +0.721 | +1.020 | -0.202 |
| da(ψ), dδ(ψ) | +0.071 | +0.33 | +0.035 | +0.33 | +0.051 | +0.33 | +0.064 | +0.33 |
| da(ε), dδ(ε) | +0.036 | -0.56 | -0.100 | -0.56 | -0.040 | -0.55 | +0.011 | -0.55 |
| Oble.Trans. | August 17 | | August 18 | | August 18 | | August 18 | |

APPARENT PLACES OF STARS, 1986

337

AT UPPER TRANSIT AT GREENWICH

| No. | 821 | | 819 | | 1574 | | 1573 | |
|---|------------------------------------|--------------------------------------|------------------------------------|--------------------------------------|------------------------------------|-------------------------------------|------------------------------------|--------------------------------------|
| | π^3 Cygni | | δ Capricorni | | 11 Pegasi | | 13 G. Gruis | |
| Mag.Spect. | 4.26 | B3 | 2.98 | A5 | 5.50 | A0 | 5.75 | G5 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | ^h ^m 21 46 | [°] ['] + 49 14 | ^h ^m 21 46 | [°] ['] - 16 11 | ^h ^m 21 46 | [°] ['] + 2 37 | ^h ^m 21 47 | [°] ['] - 47 21 |
| 1 -8.3 | 14.380 ^s - 211 | 45 70 -152 | 14.725 ^s - 71 | 40 94 - 29 | 29 920 ^s - 74 | 08 85 - 87 | 19 800 ^s - 132 | 84 54 + 85 |
| 1 1.6 | 14.201 - 179 | 43 77 -193 | 14.680 - 45 | 41.11 - 17 | 29 869 - 51 | 07 94 - 91 | 19 707 - 93 | 83.35 +119 |
| 1 11.6 | 14.058 - 143 | 41 45 -232 | 14.662 - 18 | 41.18 + 7 | 29 842 - 27 | 06 98 - 96 | 19 655 - 52 | 81.84 +151 |
| 1 21.6 | 13.961 - 97 | 38 82 -263 | 14.674 + 12 | 41.11 - 7 | 29 844 + 2 | 06 04 - 94 | 19 649 - 6 | 80.04 +180 |
| 1 31.5 | 13.911 - 50 | 36 03 -279 | 14.716 + 42 | 40.89 + 22 | 29 874 + 30 | 05 17 - 87 | 19 687 + 38 | 78.01 +203 |
| 2 10.5 | 13.912 + 1 | 33 13 -290 | 14.791 + 75 | 40 62 + 27 | 29.931 + 57 | 04 39 - 78 | 19.770 + 83 | 75.79 +222 |
| 2 20.5 | 13.972 + 60 | 30 27 -286 | 14.883 + 92 | 40 03 + 59 | 30.020 + 89 | 03.76 - 63 | 19.901 + 131 | 73.42 +237 |
| 3 2.5 | 14.085 + 113 | 27 58 -249 | 15.017 + 134 | 39 30 + 73 | 30.139 + 119 | 03.32 - 44 | 20.075 + 174 | 70.97 +245 |
| 3 12.4 | 14.255 + 170 | 25 14 -264 | 15.181 + 164 | 38 40 + 90 | 30.290 + 151 | 03 12 - 20 | 20.293 + 218 | 68.46 +251 |
| 3 22.4 | 14.482 + 227 | 23 09 -205 | 15.378 + 197 | 37 31 + 109 | 30.474 + 184 | 03 22 + 10 | 20.555 + 262 | 65.94 +252 |
| 4 1.4 | 14.755 + 273 | 21 49 -160 | 15.603 + 225 | 36 05 + 126 | 30 687 + 213 | 03 60 + 38 | 20 856 + 301 | 63 48 +246 |
| 4 11.4 | 15.076 + 321 | 20 39 -110 | 15 858 + 255 | 34 62 + 143 | 30 930 + 243 | 04 29 + 69 | 21 196 + 340 | 61 09 +239 |
| 4 21.3 | 15.434 + 358 | 19 88 - 51 | 16 140 + 282 | 33 05 + 157 | 31 199 + 269 | 05 30 + 101 | 21 570 + 374 | 58 86 +223 |
| 5 1.3 | 15.819 + 385 | 19 93 + 5 | 16 442 + 302 | 31 39 + 166 | 31 488 + 289 | 06 57 + 127 | 21 971 + 401 | 56 81 +205 |
| 5 11.3 | 16.225 + 406 | 20 55 + 62 | 16 762 + 320 | 29 66 + 173 | 31 794 + 306 | 08 09 + 152 | 22 396 + 425 | 54 99 +182 |
| 5 21.2 | 16.637 + 412 | 21 76 + 121 | 17 093 + 331 | 27 90 + 176 | 32 111 + 317 | 09 83 + 174 | 22 833 + 437 | 53 46 +153 |
| 5 31.2 | 17.045 + 408 | 23 45 + 169 | 17 427 + 334 | 26 19 + 171 | 32 429 + 318 | 11 71 + 188 | 23 275 + 442 | 52 23 +123 |
| 6 10.2 | 17.441 + 396 | 25 63 + 218 | 17 759 + 332 | 24 53 + 166 | 32 744 + 315 | 13 71 + 200 | 23 713 + 438 | 51 34 + 89 |
| 6 20.2 | 17.810 + 369 | 28 21 + 258 | 18 077 + 318 | 23 01 + 152 | 33 046 + 302 | 15 76 + 205 | 24 135 + 422 | 50 84 + 50 |
| 6 30.1 | 18.145 + 335 | 31 11 + 290 | 18 376 + 299 | 21 64 + 137 | 33 328 + 282 | 17 79 + 203 | 24 531 + 396 | 50 70 + 14 |
| 7 10.1 | 18.438 + 293 | 34 28 + 317 | 18 648 + 272 | 20 47 + 117 | 33 583 + 255 | 19 78 + 199 | 24 893 + 362 | 50 95 - 25 |
| 7 20.1 | 18.678 + 240 | 37 62 + 334 | 18 885 + 237 | 19 52 + 95 | 33 804 + 221 | 21 65 + 187 | 25 207 + 314 | 51 57 - 62 |
| 7 30.1 | 18.865 + 187 | 41 05 + 343 | 19 083 + 198 | 18 81 + 71 | 33 987 + 183 | 23 38 + 173 | 25 471 + 264 | 52 52 - 95 |
| 8 9.0 | 18.994 + 129 | 44 53 + 348 | 19 238 + 155 | 18 33 + 48 | 34 129 + 142 | 24 95 + 157 | 25 675 + 204 | 53 78 -126 |
| 8 19.0 | 19.059 + 65 | 47 94 + 341 | 19 345 + 107 | 18 10 + 23 | 34 225 + 96 | 26 30 + 135 | 25 814 + 139 | 55 30 -152 |
| 8 29.0 | 19 068 + 9 | 51 22 + 328 | 19 408 + 63 | 18 07 + 3 | 34 279 + 54 | 27 44 + 114 | 25 891 + 77 | 56 99 -169 |
| 9 7.9 | 19 019 - 49 | 54 35 + 313 | 19 424 + 16 | 18 25 - 18 | 34 290 + 11 | 28 37 + 93 | 25 903 + 12 | 58 82 -183 |
| 9 17.9 | 18 915 - 104 | 57 19 + 284 | 19 398 - 26 | 18 25 - 36 | 34 261 - 29 | 29 06 + 69 | 25 903 - 49 | 60 68 -186 |
| 9 27.9 | 18 768 - 147 | 59 75 + 256 | 19 338 - 60 | 18 61 - 47 | 34 261 - 61 | 29 06 + 49 | 25 854 - 100 | 62 49 -181 |
| 10 7.9 | 18 578 - 190 | 61 97 + 222 | 19 245 - 93 | 19 08 - 57 | 34 200 - 91 | 29 55 + 27 | 25 754 - 149 | 62 49 -171 |
| 10 17.8 | 18 357 - 221 | 63 75 + 178 | 19 131 - 114 | 20 28 - 63 | 33 998 - 111 | 29 89 + 7 | 25 422 - 183 | 65 69 -149 |
| 10 27.8 | 18 115 - 242 | 65 11 + 136 | 19 004 - 127 | 20 92 - 64 | 33 875 - 123 | 29 80 - 9 | 25 217 - 205 | 66 92 -123 |
| 11 6.8 | 17 856 - 259 | 65 99 + 88 | 18 870 - 134 | 21 55 - 83 | 33 745 - 130 | 29 80 - 28 | 24 998 - 219 | 67 84 - 92 |
| 11 16.8 | 17 595 - 261 | 66 35 + 36 | 18 739 - 131 | 22 13 - 58 | 33 618 - 127 | 29 52 - 42 | 24 998 - 217 | 67 84 - 55 |
| 11 26.7 | 17 337 - 258 | 66 21 - 14 | 18 618 - 121 | 22 64 - 51 | 33 500 - 118 | 29 10 - 55 | 24 781 - 206 | 68 39 - 16 |
| 12 6.7 | 17 090 - 247 | 65 54 - 67 | 18 511 - 107 | 23 07 - 43 | 33 394 - 106 | 27 86 - 69 | 24 389 - 186 | 68 32 + 23 |
| 12 16.7 | 16 866 - 224 | 64 35 - 119 | 18 427 - 84 | 23 40 - 33 | 33 309 - 85 | 27 08 - 78 | 24 236 - 153 | 67 68 + 64 |
| 12 26.6 | 16 668 - 198 | 62 72 - 163 | 18 366 - 61 | 23 63 - 23 | 33 244 - 65 | 26 22 - 86 | 24 117 - 119 | 66 69 + 99 |
| 12 36.6 | 16 504 - 164 | 60 63 - 209 | 18 331 - 35 | 23 75 - 12 | 33 203 - 41 | 25 29 - 93 | 24 039 - 78 | 66 69 +134 |
| | 16 504 - 122 | 60 63 - 242 | 18 331 - 5 | 23 75 + 2 | 33 203 - 14 | 25 29 - 92 | 24 039 - 33 | 65 35 +165 |
| Mean Place | 17.627 | 48.62 | 17.823 | 20.29 | 32.921 | 24.06 | 23.348 | 56.05 |
| sec δ , tan δ | +1.532 | +1.160 | +1.041 | -0.290 | +1.001 | +0.046 | +1.476 | -1.086 |
| $d\alpha(\psi)$, $d\delta(\psi)$ | +0.044 | +0.33 | +0.065 | +0.33 | +0.060 | +0.33 | +0.077 | +0.33 |
| $d\alpha(\epsilon)$, $d\delta(\epsilon)$ | -0.065 | -0.55 | +0.016 | -0.55 | -0.003 | -0.55 | +0.061 | -0.55 |
| Dbles. Trans. | August 18 | | August 18 | | August 18 | | August 18 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 1575 | | 820 | | 1576 | | 823 | |
|---------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|
| | 14 Pegasi | | o Indi | | 127 G. Capricorni | | 16 Pegasi | |
| Mag.Spect. | 5.00 | A0 | 5.50 | K2 | 6.85 | F8 | 5.05 | B3 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | ^h ^m | [°] ['] | ^h ^m | [°] ['] | ^h ^m | [°] ['] | ^h ^m | [°] ['] |
| | 21 49 | + 30 06 | 21 49 | - 69 41 | 21 50 | - 23 19 | 21 52 | + 25 51 |
| 1 ^d -8.3 | 11.779 ^s - 122 | 32.30 ["] - 138 | 34.911 ^s - 363 | 67.08 ["] + 163 | 35.521 ^s - 78 | 85.03 ["] - 5 | 23.866 ^s - 112 | 32.18 ["] - 131 |
| 1 1.6 | 11.682 - 97 | 30.63 - 167 | 34.626 - 285 | 65.00 + 208 | 35.469 - 52 | 84.90 + 13 | 23.778 - 88 | 30.63 - 155 |
| 1 11.6 | 11.612 - 70 | 28.70 - 193 | 34.425 - 201 | 62.51 + 249 | 35.445 - 24 | 84.61 + 29 | 23.715 - 63 | 28.83 - 180 |
| 1 21.6 | 11.574 - 38 | 26.58 - 212 | 34.321 - 104 | 59.68 + 283 | 35.453 + 8 | 84.13 + 48 | 23.683 - 32 | 26.88 - 195 |
| 1 31.5 | 11.570 - 4 | 24.39 - 219 | 34.313 - 8 | 56.62 + 306 | 35.492 + 39 | 83.49 + 64 | 23.683 + 0 | 24.88 - 200 |
| 2 10.5 | 11.601 + 31 | 22.17 - 222 | 34.399 + 86 | 53.37 + 325 | 35.559 + 67 | 82.71 + 78 | 23.715 + 32 | 22.86 - 202 |
| 2 20.5 | 11.672 + 71 | 20.05 - 212 | 34.586 + 187 | 50.02 + 335 | 35.659 + 100 | 81.69 + 102 | 23.785 + 70 | 20.95 - 191 |
| 3 2.5 | 11.780 + 108 | 18.12 - 193 | 34.862 + 276 | 46.67 + 335 | 35.793 + 134 | 80.52 + 117 | 23.891 + 106 | 19.24 - 171 |
| 3 12.4 | 11.929 + 149 | 16.46 - 166 | 35.228 + 366 | 43.35 + 332 | 35.959 + 166 | 79.20 + 132 | 24.035 + 144 | 17.77 - 147 |
| 3 22.4 | 12.118 + 189 | 15.16 - 130 | 35.681 + 453 | 40.16 + 319 | 36.160 + 201 | 77.72 + 148 | 24.218 + 183 | 16.67 - 110 |
| 4 1.4 | 12.343 + 225 | 14.27 - 89 | 36.207 + 526 | 37.17 + 299 | 36.390 + 230 | 76.12 + 160 | 24.435 + 217 | 15.96 - 71 |
| 4 11.4 | 12.604 + 261 | 13.84 - 43 | 36.805 + 598 | 34.40 + 277 | 36.652 + 262 | 74.41 + 171 | 24.687 + 252 | 15.68 - 28 |
| 4 21.3 | 12.895 + 291 | 13.90 + 6 | 37.464 + 659 | 31.96 + 244 | 36.941 + 289 | 72.63 + 178 | 24.969 + 282 | 15.87 + 19 |
| 5 1.3 | 13.208 + 313 | 14.44 + 54 | 38.168 + 704 | 29.87 + 209 | 37.253 + 312 | 70.81 + 182 | 25.273 + 304 | 16.52 + 65 |
| 5 11.3 | 13.541 + 333 | 15.46 + 102 | 38.913 + 745 | 28.16 + 171 | 37.585 + 332 | 68.99 + 182 | 25.596 + 323 | 17.61 + 109 |
| 5 21.2 | 13.882 + 341 | 16.94 + 148 | 39.679 + 766 | 26.91 + 125 | 37.928 + 343 | 67.23 + 176 | 25.929 + 333 | 19.12 + 151 |
| 5 31.2 | 14.223 + 341 | 18.79 + 185 | 40.447 + 768 | 26.11 + 80 | 38.275 + 347 | 65.57 + 166 | 26.263 + 334 | 20.98 + 186 |
| 6 10.2 | 14.558 + 335 | 21.00 + 221 | 41.210 + 763 | 25.79 + 32 | 38.621 + 346 | 64.04 + 153 | 26.592 + 329 | 23.17 + 219 |
| 6 20.2 | 14.875 + 317 | 23.50 + 250 | 41.938 + 728 | 25.97 - 18 | 38.954 + 333 | 62.70 + 134 | 26.905 + 313 | 25.62 + 245 |
| 6 30.1 | 15.167 + 292 | 26.19 + 269 | 42.621 + 683 | 26.61 - 64 | 39.267 + 313 | 61.58 + 112 | 27.196 + 291 | 28.22 + 260 |
| 7 10.1 | 15.429 + 262 | 29.04 + 285 | 43.241 + 620 | 27.72 - 111 | 39.555 + 288 | 60.70 + 88 | 27.457 + 261 | 30.97 + 275 |
| 7 20.1 | 15.651 + 222 | 31.96 + 292 | 43.775 + 534 | 29.26 - 154 | 39.806 + 251 | 60.09 + 61 | 27.680 + 223 | 33.76 + 279 |
| 7 30.1 | 15.831 + 180 | 34.88 + 292 | 44.218 + 443 | 31.15 - 189 | 40.017 + 211 | 59.74 + 35 | 27.862 + 182 | 36.52 + 276 |
| 8 9.0 | 15.965 + 134 | 37.76 + 288 | 44.553 + 335 | 33.38 - 223 | 40.184 + 167 | 59.65 + 9 | 28.000 + 138 | 39.23 + 271 |
| 8 19.0 | 16.048 + 83 | 40.51 + 275 | 44.768 + 215 | 35.82 - 244 | 40.301 + 117 | 59.82 - 17 | 28.090 + 90 | 41.80 + 257 |
| 8 29.0 | 16.086 + 38 | 43.09 + 258 | 44.867 + 99 | 38.40 - 258 | 40.372 + 71 | 60.21 - 39 | 28.135 + 45 | 44.20 + 240 |
| 9 7.9 | 16.078 - 8 | 45.48 + 239 | 44.844 - 23 | 41.05 - 265 | 40.394 + 22 | 60.79 - 58 | 28.135 + 0 | 46.39 + 219 |
| 9 17.9 | 16.026 - 52 | 47.58 + 210 | 44.703 - 141 | 43.62 - 257 | 40.371 - 23 | 61.52 - 73 | 28.093 - 42 | 48.31 + 192 |
| 9 27.9 | 15.939 - 87 | 49.41 + 183 | 44.460 - 243 | 46.04 - 242 | 40.312 - 59 | 62.34 - 82 | 28.016 - 77 | 49.96 + 165 |
| 10 7.9 | 15.819 - 120 | 50.92 + 151 | 44.120 - 340 | 48.22 - 218 | 40.218 - 94 | 63.21 - 87 | 27.907 - 109 | 51.31 + 135 |
| 10 17.8 | 15.676 - 143 | 52.07 + 115 | 43.705 - 415 | 50.01 - 179 | 40.100 - 118 | 64.09 - 88 | 27.776 - 131 | 52.32 + 101 |
| 10 27.8 | 15.517 - 159 | 52.87 + 80 | 43.237 - 468 | 51.40 - 139 | 39.967 - 133 | 64.91 - 82 | 27.630 - 146 | 53.00 + 68 |
| 11 6.8 | 15.349 - 168 | 53.28 + 41 | 42.733 - 504 | 52.29 - 89 | 39.825 - 142 | 65.65 - 74 | 27.473 - 157 | 53.32 + 32 |
| 11 16.8 | 15.181 - 168 | 53.28 + 0 | 42.223 - 510 | 52.62 - 33 | 39.687 - 138 | 66.27 - 62 | 27.317 - 156 | 53.27 - 5 |
| 11 26.7 | 15.018 - 163 | 52.91 - 37 | 41.727 - 496 | 52.41 + 21 | 39.557 - 130 | 66.74 - 47 | 27.167 - 150 | 52.88 - 39 |
| 12 6.7 | 14.867 - 151 | 52.14 - 77 | 41.263 - 464 | 51.63 + 78 | 39.442 - 115 | 67.06 - 32 | 27.027 - 140 | 52.12 - 76 |
| 12 16.7 | 14.734 - 133 | 51.00 - 114 | 40.859 - 404 | 50.30 + 133 | 39.349 - 93 | 67.20 - 14 | 26.905 - 122 | 51.04 - 108 |
| 12 26.6 | 14.623 - 111 | 49.54 - 146 | 40.521 - 338 | 48.49 + 181 | 39.281 - 68 | 67.16 + 4 | 26.803 - 102 | 49.67 - 137 |
| 12 36.6 | 14.537 - 86 | 47.77 - 177 | 40.263 - 258 | 46.22 + 227 | 39.240 - 41 | 66.95 + 21 | 26.726 - 77 | 48.02 - 165 |
| | - 55 | - 198 | - 163 | + 265 | - 10 | + 39 | - 49 | - 183 |
| Mean Place | 14.813 | 39.59 | 39.718 | 34.86 | 38.647 | 62.15 | 26.867 | 40.58 |
| sec δ, tan δ | +1.156 | +0.580 | +2.881 | -2.702 | +1.089 | -0.431 | +1.111 | +0.485 |
| dα(ψ), dδ(ψ) | +0.053 | +0.33 | +0.100 | +0.34 | +0.067 | +0.34 | +0.054 | +0.34 |
| dα(ε), dδ(ε) | -0.033 | -0.54 | +0.152 | -0.54 | +0.024 | -0.53 | -0.027 | -0.53 |
| Dble.Trans. | August 19 | | August 19 | | August 19 | | August 20 | |

AT UPPER TRANSIT AT GREENWICH

| No. | 1577 | | 1578 | | 822 | | 1579 | |
|--------------|---------------------|-------------------|--------------------------|---------|---------------------|---------|--|---------|
| Name | μ Capricorni | | Bradley 2880 (Cephei) | | γ Gruis | | Piazzi 21 ^h 339 (Pegasi) | |
| Mag.Spect. | 5.18 | F0 | 6.58 | A0 | 3.16 | B8 | 6.62 | K5 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° ' | h m | ° ' | h m | ° ' | h m | ° ' |
| | 21 52 | - 13 36 | 21 52 | + 73 37 | 21 53 | - 37 25 | 21 55 | + 21 10 |
| 1 | ^d 30.630 | ^s - 73 | ^s 33.300 | - 677 | ^s 03.616 | - 105 | ^s 43.105 | - 103 |
| 1 | 1.6 | - 49 | 32.691 | - 609 | 03.544 | - 72 | 43.025 | - 80 |
| 1 | 11.6 | - 24 | 32.165 | - 526 | 03.504 | - 40 | 42.969 | - 56 |
| 1 | 21.6 | + 6 | 31.750 | - 415 | 03.501 | - 3 | 42.942 | - 27 |
| 1 | 31.5 | + 34 | 31.457 | - 293 | 03.535 | + 34 | 42.945 | + 3 |
| 2 | 10.5 | + 67 | 31.294 | - 163 | 03.604 | + 69 | 42.979 | + 34 |
| 2 | 20.5 | + 82 | 31.280 | - 14 | 03.713 | + 109 | 43.048 | + 69 |
| 3 | 2.5 | + 127 | 31.406 | + 126 | 03.859 | + 146 | 43.152 | + 104 |
| 3 | 12.4 | + 156 | 31.675 | + 269 | 04.043 | + 184 | 43.291 | + 139 |
| 3 | 22.4 | + 188 | 32.083 | + 408 | 04.265 | + 222 | 43.469 | + 178 |
| 4 | 1.4 | + 217 | 32.605 | + 522 | 04.522 | + 257 | 43.679 | + 210 |
| 4 | 11.4 | + 248 | 33.234 | + 629 | 04.814 | + 292 | 43.923 | + 244 |
| 4 | 21.3 | + 275 | 33.948 | + 714 | 05.137 | + 323 | 44.197 | + 274 |
| 5 | 1.3 | + 296 | 34.715 | + 807 | 05.485 | + 348 | 44.493 | + 296 |
| 5 | 11.3 | + 315 | 35.522 | + 877 | 05.856 | + 371 | 44.808 | + 315 |
| 5 | 21.2 | + 327 | 36.335 | + 813 | 06.240 | + 384 | 45.134 | + 326 |
| 5 | 31.2 | + 331 | 37.130 | + 795 | 06.629 | + 389 | 45.462 | + 328 |
| 6 | 10.2 | + 330 | 37.891 | + 761 | 07.017 | + 388 | 45.787 | + 325 |
| 6 | 20.2 | + 317 | 38.585 | + 694 | 07.392 | + 375 | 46.097 | + 310 |
| 6 | 30.1 | + 298 | 39.200 | + 615 | 07.745 | + 353 | 46.385 | + 288 |
| 7 | 10.1 | + 274 | 39.723 | + 523 | 08.070 | + 325 | 46.647 | + 262 |
| 7 | 20.1 | + 238 | 40.131 | + 408 | 08.354 | + 284 | 46.871 | + 224 |
| 7 | 30.1 | + 201 | 40.425 | + 294 | 08.594 | + 240 | 47.057 | + 186 |
| 8 | 9.0 | + 159 | 40.597 | + 172 | 08.784 | + 190 | 47.200 | + 143 |
| 8 | 19.0 | + 112 | 40.637 | + 40 | 08.917 | + 133 | 47.296 | + 96 |
| 8 | 29.0 | + 68 | 40.558 | - 79 | 08.997 | + 80 | 47.348 | + 52 |
| 9 | 7.9 | + 22 | 40.355 | - 203 | 09.021 | + 24 | 47.355 | - 33 |
| 9 | 17.9 | - 19 | 40.035 | - 320 | 08.992 | - 29 | 47.322 | - 67 |
| 9 | 27.9 | - 55 | 39.616 | - 419 | 08.920 | - 72 | 47.255 | - 99 |
| 10 | 7.9 | - 86 | 39.098 | - 518 | 08.806 | - 114 | 47.156 | - 142 |
| 10 | 17.8 | - 108 | 38.501 | - 597 | 08.663 | - 143 | 47.035 | - 121 |
| 10 | 27.8 | - 122 | 37.842 | - 659 | 08.501 | - 162 | 46.900 | - 135 |
| 11 | 6.8 | - 130 | 37.130 | - 712 | 08.327 | - 174 | 46.754 | - 146 |
| 11 | 16.8 | - 128 | 36.393 | - 737 | 08.155 | - 172 | 46.609 | - 145 |
| 11 | 26.7 | - 119 | 35.647 | - 746 | 07.991 | - 164 | 46.470 | - 139 |
| 12 | 6.7 | - 107 | 34.907 | - 740 | 07.844 | - 147 | 46.340 | - 130 |
| 12 | 16.7 | - 85 | 34.206 | - 701 | 07.723 | - 121 | 46.228 | - 112 |
| 12 | 26.6 | - 64 | 33.555 | - 651 | 07.630 | - 93 | 46.135 | - 93 |
| 12 | 36.6 | - 39 | 32.978 | - 577 | 07.569 | - 61 | 46.065 | - 70 |
| | | - 11 | | - 477 | | - 24 | | - 43 |
| Mean Place | 33.672 | 56.76 | 37.774 | 78.32 | 06.882 | 43.63 | 46.077 | 31.36 |
| sec δ, tan δ | +1.029 | -0.242 | +3.550 | +3.406 | +1.259 | -0.765 | +1.072 | +0.387 |
| da(ψ), dδ(ψ) | +0.065 | +0.34 | +0.014 | +0.34 | +0.072 | +0.34 | +0.056 | +0.34 |
| dα(ε), dδ(ε) | +0.014 | -0.53 | -0.193 | -0.53 | +0.043 | -0.53 | -0.022 | -0.52 |
| Dble.Trans. | August 20 | | August 20 | | August 20 | | August 20 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 824 | | 1580 | | 826 | | 825 | | |
|---------------|-------------------|--------------------------|-------------------------|-------------------------|------------------------|-------------------------|-------------------------|--------------------------|-------------------------|
| | δ Indi | | 98 G. Aquarii | | 20 Pegasi | | ε Indi | | |
| Mag. Spect. | 4.56 | F0 | 6.42 | K0 | 5.66 | F2 | 4.74 | K5 | |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | |
| | h m | ° ' | h m | ° ' | h m | ° ' | h m | ° ' | |
| | 21 56 | -55 03 | 21 58 | -4 26 | 22 00 | +13 02 | 22 02 | -56 50 | |
| 1 | ^d -8.3 | ^s 56 753 -185 | ^s 56 89 +106 | ^s 09 808 -77 | ^s 30 80 -66 | ^s 22 939 -91 | ^s 65 50 -105 | ^s 16 187 -189 | ^s 61 14 +103 |
| 1 | 1.6 | 56 612 -141 | 55.44 +145 | 09 755 -53 | 31 44 -64 | 22 871 -68 | 64 30 -120 | 16 044 -143 | 59 69 +145 |
| 1 | 11.6 | 56 518 -94 | 53.61 +183 | 09 724 -31 | 32 06 -62 | 22 824 -47 | 62 97 -133 | 15 949 -95 | 57 85 +184 |
| 1 | 21.6 | 56 479 -39 | 51.46 +215 | 09 720 -4 | 32 62 -56 | 22 805 -19 | 61 58 -139 | 15 913 -36 | 55 67 +218 |
| 1 | 31.6 | 56 493 +14 | 49.05 +241 | 09 774 +24 | 33 07 -45 | 22 813 +8 | 60 20 -138 | 15 931 +18 | 53 24 +243 |
| 2 | 10.5 | 56 559 +66 | 46 43 +262 | 09 795 +51 | 33 40 -33 | 22 850 +37 | 58 85 -135 | 16 006 +75 | 50 58 +266 |
| 2 | 20.5 | 56 684 +125 | 43 65 +278 | 09 874 +79 | 33 55 -15 | 22 920 +70 | 57 64 -121 | 16 141 +135 | 47 78 +280 |
| 3 | 2.5 | 56 861 +177 | 40 81 +289 | 09 985 +111 | 33 58 -3 | 23 021 +101 | 56 62 -102 | 16 332 +191 | 44 90 +288 |
| 3 | 12.4 | 57 091 +230 | 37 92 +284 | 10 129 +144 | 33 35 +23 | 23 157 +136 | 55 84 +246 | 16 578 +246 | 41 98 +292 |
| 3 | 22.4 | 57 375 +284 | 35.06 +286 | 10 306 +177 | 32 86 +49 | 23 328 +171 | 55 38 -46 | 16 880 +302 | 39 10 +288 |
| 4 | 1.4 | 57 705 +330 | 32 29 +277 | 10 511 +205 | 32 12 +74 | 23 531 +203 | 55 26 -12 | 17 231 +351 | 36 32 +278 |
| 4 | 11.4 | 58 082 +377 | 29 64 +285 | 10 748 +237 | 31 13 +99 | 23 766 +235 | 55 50 +24 | 17 632 +401 | 33 67 +265 |
| 4 | 21.3 | 58 500 +418 | 27 20 +244 | 11 012 +264 | 29 89 +124 | 24 031 +265 | 56 13 +63 | 18 076 +444 | 31 25 +242 |
| 5 | 1.3 | 58 951 +451 | 25 00 +220 | 11 298 +286 | 28 44 +145 | 24 317 +286 | 57 11 +98 | 18 554 +478 | 29 07 +218 |
| 5 | 11.3 | 59 431 +480 | 23 08 +192 | 11 604 +306 | 26 80 +164 | 24 624 +307 | 58 44 +133 | 19 063 +509 | 27 20 +187 |
| 5 | 21.3 | 59 928 +497 | 21 52 +156 | 11 922 +318 | 25 02 +178 | 24 942 +318 | 60 08 +164 | 19 590 +527 | 25 69 +151 |
| 5 | 31.2 | 60 432 +504 | 20 31 +121 | 12 243 +321 | 23 16 +196 | 25 264 +322 | 61 97 +189 | 20 124 +534 | 24 55 +114 |
| 6 | 10.2 | 60 935 +503 | 19 50 +81 | 12 565 +322 | 21 25 +191 | 25 584 +320 | 64 07 +216 | 20 658 +517 | 23 82 +73 |
| 6 | 20.2 | 61 420 +485 | 19 13 +37 | 12 874 +309 | 19 36 +189 | 25 891 +307 | 66 33 +226 | 21 175 +488 | 23 55 -14 |
| 6 | 30.1 | 61 879 +459 | 19 17 -4 | 13 166 +292 | 17 53 +183 | 26 179 +288 | 68 65 +232 | 21 663 +488 | 23 69 -14 |
| 7 | 10.1 | 62 300 +421 | 19 64 -47 | 13 433 +267 | 15 80 +173 | 26 441 +262 | 71 02 +237 | 22 114 +451 | 24 28 -59 |
| 7 | 20.1 | 62 668 +368 | 20 52 -88 | 13 666 +233 | 14 24 +156 | 26 669 +228 | 73 35 +233 | 22 510 +396 | 25 29 -101 |
| 7 | 30.1 | 62 979 +311 | 21 76 -124 | 13 864 +198 | 12 85 +139 | 26 860 +191 | 75 60 +225 | 22 847 +337 | 26 66 -137 |
| 8 | 9.0 | 63 223 +244 | 23 34 -158 | 14 020 +156 | 11 66 +119 | 27 010 +150 | 77 72 +212 | 23 115 +268 | 28 38 -172 |
| 8 | 19.0 | 63 391 +168 | 25 18 -184 | 14 131 +111 | 10 70 +96 | 27 114 +104 | 79 67 +195 | 23 305 +190 | 30 37 -199 |
| 8 | 29.0 | 63 488 +97 | 27 21 -203 | 14 200 +69 | 09 96 +74 | 27 176 +62 | 81 43 +176 | 23 420 +115 | 32 54 -217 |
| 9 | 8.0 | 63 509 +21 | 29 36 -215 | 14 224 +24 | 09 43 +53 | 27 194 +18 | 82 97 +154 | 23 456 +36 | 34 85 -231 |
| 9 | 17.9 | 63 457 -52 | 31 53 -217 | 14 208 -16 | 09 13 +30 | 27 172 -22 | 84 25 +128 | 23 415 -41 | 37 17 -232 |
| 9 | 27.9 | 63 342 -115 | 33 64 -191 | 14 159 -49 | 09 01 +12 | 27 117 -55 | 85 30 +105 | 23 308 -107 | 39 42 -225 |
| 10 | 7.9 | 63 168 -174 | 35 61 -217 | 14 078 -81 | 09 06 -5 | 27 031 -86 | 86 09 +79 | 23 140 -168 | 41 52 -210 |
| 10 | 17.8 | 62 950 -218 | 37 31 -170 | 13 976 -102 | 09 27 -21 | 26 923 -108 | 86 61 +52 | 22 923 -217 | 43 35 -183 |
| 10 | 27.8 | 62 701 -249 | 38 71 -140 | 13 860 -116 | 09 58 -31 | 26 801 -122 | 86 88 +27 | 22 674 -249 | 44 87 -152 |
| 11 | 6.8 | 62 431 -270 | 39 74 -103 | 13 735 -125 | 10 01 -43 | 26 669 -132 | 86 89 +1 | 22 401 -273 | 45 99 -112 |
| 11 | 16.8 | 62 159 -272 | 40 32 -58 | 13 611 -124 | 10 52 -51 | 26 537 -132 | 86 65 -24 | 22 125 -276 | 46 66 -67 |
| 11 | 26.7 | 61 896 -263 | 40 47 -15 | 13 495 -116 | 11 08 -56 | 26 411 -126 | 86 19 -46 | 21 857 -268 | 46 87 -21 |
| 12 | 6.7 | 61 652 -244 | 40 14 +33 | 13 389 -106 | 11 69 -61 | 26 294 -117 | 85 48 -71 | 21 608 -249 | 46 59 +28 |
| 12 | 16.7 | 61 443 -209 | 39 34 +80 | 13 302 -87 | 12 32 -63 | 26 194 -100 | 84 57 -91 | 21 394 -174 | 45 82 +77 |
| 12 | 26.7 | 61 273 -170 | 38 13 +121 | 13 235 -67 | 12 95 -63 | 26 113 -81 | 83 48 -109 | 21 220 -214 | 44 62 +120 |
| 12 | 36.6 | 61 148 -125 | 36 50 +163 | 13 190 -45 | 13 57 -62 | 26 053 -60 | 82 24 -124 | 21 094 -126 | 43 00 +162 |
| | | -72 | +198 | -18 | -57 | -34 | -133 | -72 | +200 |
| Mean Place | 60.404 | 26.34 | 12.768 | 13.45 | 25.878 | 77.55 | 20.096 | 31.41 | |
| sec δ, tan δ | +1.746 | -1.431 | +1.003 | -0.078 | +1.027 | +0.232 | +1.828 | -1.531 | |
| dα(ψ), dδ(ψ) | +0.081 | +0.34 | +0.062 | +0.34 | +0.058 | +0.34 | +0.081 | +0.35 | |
| dα(ε), dδ(ε) | +0.082 | -0.51 | +0.004 | -0.51 | -0.013 | -0.50 | +0.089 | -0.49 | |
| Dbble. Trans. | August 21 | | August 21 | | August 22 | | August 22 | | |

AT UPPER TRANSIT AT GREENWICH

| No. | 830 | | 827 | | 1581 | | 828 | |
|--------------|---------------------------|-------------|--------------------------|-------------|---------------------------|-------------|--------------------------|-------------|
| | 20 Cephei | | α Aquarii | | λ Gruis | | ι Aquarii | |
| Mag.Spect. | 5.39 | K5 | 3.19 | G0 | 4.60 | K2 | 4.35 | B8 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " |
| | 22 04 | + 62 42 | 22 05 | - 0 23 | 22 05 | - 39 36 | 22 05 | - 13 56 |
| 1 -8.3 | 32 250 ^s - 371 | 70 64 - 120 | 02 540 ^s - 80 | 24 93 - 74 | 15 138 ^s - 119 | 59 34 + 44 | 39 599 ^s - 81 | 28 38 - 38 |
| 1 1.6 | 31 917 - 333 | 68 93 - 171 | 02 480 - 60 | 25 70 - 77 | 15 049 - 89 | 58 58 + 76 | 39 542 - 57 | 28 66 - 28 |
| 1 11.6 | 31 629 - 288 | 66 74 - 219 | 02 442 - 38 | 26 48 - 78 | 14 992 - 57 | 57 52 + 106 | 39 507 - 35 | 28 84 - 18 |
| 1 21.6 | 31 404 - 225 | 64 14 - 260 | 02 430 - 12 | 27 22 - 74 | 14 973 - 19 | 56 18 + 134 | 39 499 - 8 | 28 88 - 4 |
| 1 31.6 | 31 247 - 157 | 61 27 - 287 | 02 445 + 15 | 27 89 - 67 | 14 989 + 16 | 54 60 + 158 | 39 520 + 21 | 28 77 + 11 |
| 2 10.5 | 31 165 - 82 | 58 20 - 307 | 02 486 + 41 | 28 44 - 55 | 15 042 + 53 | 52 81 + 179 | 39 570 + 50 | 28 52 + 25 |
| 2 20.5 | 31 168 + 3 | 55 08 - 312 | 02 557 + 71 | 28 83 - 39 | 15 136 + 94 | 50 82 + 199 | 39 639 + 69 | 28 19 + 33 |
| 3 2.5 | 31 254 + 86 | 52 04 - 304 | 02 658 + 101 | 29 07 - 24 | 15 268 + 132 | 48 69 + 213 | 39 751 + 112 | 27 48 + 71 |
| 3 12.4 | 31 425 + 171 | 49 18 - 286 | 02 793 + 135 | 29 07 + 0 | 15 439 + 171 | 46 45 + 224 | 39 893 + 142 | 26 65 + 83 |
| 3 22.4 | 31 681 + 256 | 46 64 - 254 | 02 961 + 168 | 28 79 + 28 | 15 652 + 213 | 44 13 + 232 | 40 068 + 175 | 25 61 + 104 |
| 4 1.4 | 32 011 + 330 | 44 53 - 211 | 03 160 + 199 | 28 24 + 55 | 15 900 + 248 | 41 79 + 234 | 40 273 + 205 | 24 39 + 122 |
| 4 11.4 | 32 410 + 399 | 42 89 - 164 | 03 390 + 230 | 27 41 + 83 | 16 187 + 287 | 39 45 + 234 | 40 510 + 237 | 22 97 + 142 |
| 4 21.3 | 32 868 + 458 | 41 83 - 106 | 03 649 + 259 | 26 30 + 111 | 16 507 + 320 | 37 18 + 227 | 40 776 + 266 | 21 39 + 158 |
| 5 1.3 | 33 365 + 497 | 41 35 + 48 | 03 930 + 281 | 24 94 + 136 | 16 855 + 348 | 35 02 + 216 | 41 066 + 290 | 19 69 + 170 |
| 5 11.3 | 33 896 + 531 | 41 47 - 12 | 04 233 + 303 | 23 36 + 158 | 17 228 + 373 | 33 00 + 202 | 41 377 + 311 | 17 89 + 180 |
| 5 21.3 | 34 438 + 542 | 42 22 + 75 | 04 548 + 315 | 21 59 + 177 | 17 618 + 390 | 31 19 + 181 | 41 701 + 324 | 16 04 + 185 |
| 5 31.2 | 34 977 + 539 | 43 52 + 130 | 04 868 + 320 | 19 70 + 189 | 18 015 + 397 | 29 63 + 156 | 42 032 + 331 | 14 20 + 184 |
| 6 10.2 | 35 502 + 525 | 45 37 + 185 | 05 188 + 320 | 17 71 + 199 | 18 413 + 398 | 28 35 + 128 | 42 364 + 332 | 12 41 + 179 |
| 6 20.2 | 35 992 + 490 | 47 71 + 234 | 05 498 + 310 | 15 71 + 200 | 18 800 + 387 | 27 40 + 95 | 42 685 + 321 | 10 71 + 170 |
| 6 30.1 | 36 437 + 445 | 50 44 + 273 | 05 791 + 293 | 13 73 + 198 | 19 168 + 368 | 26 78 + 62 | 42 990 + 305 | 09 17 + 154 |
| 7 10.1 | 36 828 + 391 | 53 54 + 310 | 06 060 + 269 | 11 83 + 190 | 19 508 + 340 | 26 52 + 26 | 43 272 + 282 | 07 79 + 138 |
| 7 20.1 | 37 149 + 321 | 56 91 + 337 | 06 296 + 236 | 10 05 + 178 | 19 809 + 301 | 26 62 - 10 | 43 520 + 248 | 06 64 + 115 |
| 7 30.1 | 37 400 + 251 | 60 45 + 354 | 06 497 + 201 | 08 43 + 162 | 20 066 + 257 | 27 06 - 44 | 43 733 + 213 | 05 72 + 92 |
| 8 9.0 | 37 573 + 173 | 64 13 + 368 | 06 657 + 160 | 06 99 + 144 | 20 273 + 207 | 27 82 - 76 | 43 903 + 170 | 05 04 + 68 |
| 8 19.0 | 37 663 + 90 | 67 82 + 369 | 06 773 + 116 | 05 78 + 121 | 20 423 + 150 | 28 87 - 105 | 44 028 + 125 | 04 62 + 42 |
| 8 29.0 | 37 677 + 14 | 71 47 + 365 | 06 846 + 73 | 04 77 + 101 | 20 518 + 95 | 30 15 - 128 | 44 109 + 81 | 04 42 + 20 |
| 9 8.0 | 37 611 - 66 | 75 02 + 355 | 06 876 + 30 | 03 99 + 78 | 20 556 + 38 | 31 61 - 146 | 44 144 + 35 | 04 45 - 3 |
| 9 17.9 | 37 470 - 141 | 78 35 + 333 | 06 866 - 10 | 03 44 + 55 | 20 538 - 18 | 33 17 - 156 | 44 137 - 7 | 04 67 - 22 |
| 9 27.9 | 37 265 - 205 | 81 44 + 309 | 06 822 - 44 | 03 09 + 35 | 20 475 - 63 | 34 75 - 188 | 44 094 - 43 | 05 04 - 37 |
| 10 7.9 | 36 997 - 268 | 84 21 + 277 | 06 747 - 75 | 02 94 + 15 | 20 367 - 108 | 36 32 - 157 | 44 018 - 76 | 05 53 - 49 |
| 10 17.8 | 36 680 - 317 | 86 58 + 237 | 06 649 - 98 | 02 97 - 3 | 20 227 - 140 | 37 76 - 144 | 43 918 - 100 | 06 11 - 58 |
| 10 27.8 | 36 325 - 355 | 88 52 + 194 | 06 537 - 112 | 03 15 - 18 | 20 065 - 162 | 39 02 - 126 | 43 802 - 116 | 06 73 - 62 |
| 11 6.8 | 35 937 - 388 | 89 97 + 145 | 06 415 - 122 | 03 47 - 32 | 19 887 - 178 | 40 05 - 103 | 43 676 - 126 | 07 37 - 64 |
| 11 16.8 | 35 534 - 403 | 90 86 + 89 | 06 293 - 122 | 03 92 - 45 | 19 709 - 178 | 40 79 - 74 | 43 550 - 126 | 07 99 - 62 |
| 11 26.7 | 35 125 - 409 | 91 22 + 36 | 06 176 - 117 | 04 45 - 53 | 19 536 - 173 | 41 22 - 43 | 43 430 - 120 | 08 55 - 56 |
| 12 6.7 | 34 720 - 405 | 90 98 - 24 | 06 069 - 107 | 05 09 - 64 | 19 377 - 159 | 41 32 - 10 | 43 320 - 110 | 09 07 - 52 |
| 12 16.7 | 34 336 - 384 | 90 17 - 81 | 05 979 - 90 | 05 78 - 69 | 19 242 - 135 | 41 07 + 25 | 43 229 - 91 | 09 49 - 42 |
| 12 26.7 | 33 980 - 356 | 88 81 - 136 | 05 907 - 72 | 06 51 - 73 | 19 134 - 108 | 40 49 + 58 | 43 158 - 71 | 09 81 - 32 |
| 12 36.6 | 33 665 - 315 | 86 92 - 189 | 05 856 - 51 | 07 28 - 77 | 19 056 - 78 | 39 60 + 89 | 43 108 - 50 | 10 04 - 23 |
| | 33 665 - 259 | 86 92 - 233 | 05 856 - 26 | 07 28 - 74 | 19 056 - 41 | 39 60 + 120 | 43 108 - 22 | 10 04 - 10 |
| Mean Place | 35.847 | 70.65 | 05.453 | 08.68 | 18.306 | 31.75 | 42.546 | 07.92 |
| sec δ, tan δ | +2.182 | +1.939 | +1.000 | -0.007 | +1.298 | -0.828 | +1.030 | -0.248 |
| dα(ψ), dδ(ψ) | +0.036 | +0.35 | +0.061 | +0.35 | +0.072 | +0.35 | +0.064 | +0.35 |
| dα(ε), dδ(ε) | -0.113 | -0.48 | +0.000 | -0.48 | +0.048 | -0.48 | +0.015 | -0.48 |
| Dble.Trans. | August 23 | | August 23 | | August 23 | | August 23 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 831 | | 829 | | 832 | | 833 | |
|---|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|
| | Pegasi | | α Gruis | | μ Piscis Austrini | | 27 Pegasi | |
| Mag. Spect. | 3.96 | F5 | 2.16 | B5 | 4.62 | A2 | 5.65 | K0 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | ^h ^m | ^o ['] | ^h ^m | ^o ['] | ^h ^m | ^o ['] | ^h ^m | ^o ['] |
| | 22 06 | + 25 16 | 22 07 | - 47 01 | 22 07 | - 33 03 | 22 08 | + 33 05 |
| ^d | ^s | ["] | ^s | ["] | ^s | ["] | ^s | ["] |
| 1 -8.3 | 19.959 - 114 | 35.38 -120 | 19.952 - 148 | 65.85 + 69 | 32.839 - 104 | 43.67 + 21 | 34.701 - 139 | 75.88 -124 |
| 1 1.6 | 19.866 - 93 | 33.93 -145 | 19.839 - 113 | 64.80 +105 | 32.763 - 76 | 43.19 + 48 | 34.584 - 117 | 74.32 -156 |
| 1 11.6 | 19.795 - 71 | 32.24 -169 | 19.763 - 76 | 63.40 +140 | 32.714 - 49 | 42.45 + 74 | 34.491 - 93 | 72.45 -187 |
| 1 21.6 | 19.754 - 41 | 30.39 -185 | 19.729 - 34 | 61.67 +173 | 32.699 - 15 | 41.46 + 99 | 34.429 - 62 | 70.37 -208 |
| 1 31.6 | 19.742 - 12 | 28.47 -192 | 19.737 + 8 | 59.70 +197 | 32.717 + 18 | 40.25 +121 | 34.399 - 30 | 68.16 -221 |
| 2 10.5 | 19.762 + 20 | 26.53 -194 | 19.788 + 51 | 57.49 +221 | 32.767 + 50 | 38.83 +142 | 34.404 + 5 | 65.89 -227 |
| 2 20.5 | 19.819 + 57 | 24.69 -184 | 19.886 + 98 | 55.09 +240 | 32.854 + 87 | 37.21 +162 | 34.451 + 47 | 63.68 -221 |
| 3 2.5 | 19.911 + 92 | 23.02 -167 | 20.027 + 141 | 52.58 +251 | 32.975 + 121 | 35.44 +177 | 34.537 + 86 | 61.62 -206 |
| 3 12.4 | 20.042 + 131 | 21.58 -144 | 20.213 + 186 | 49.98 +260 | 33.134 + 159 | 33.52 +192 | 34.665 + 128 | 59.79 -183 |
| 3 22.4 | 20.212 + 170 | 20.49 -109 | 20.445 + 232 | 47.34 +264 | 33.330 + 196 | 31.48 +204 | 34.837 + 172 | 58.31 -148 |
| 4 1.4 | 20.418 + 206 | 19.77 - 72 | 20.717 + 272 | 44.73 +261 | 33.560 + 230 | 29.39 +209 | 35.049 + 212 | 57.22 -109 |
| 4 11.4 | 20.661 + 243 | 19.47 - 30 | 21.032 + 315 | 42.18 +255 | 33.826 + 266 | 27.24 +215 | 35.300 + 251 | 56.57 - 65 |
| 4 21.3 | 20.934 + 273 | 19.64 + 17 | 21.384 + 352 | 39.75 +243 | 34.125 + 299 | 25.10 +214 | 35.586 + 286 | 56.42 - 15 |
| 5 1.3 | 21.233 + 299 | 20.23 + 59 | 21.767 + 383 | 37.49 +226 | 34.449 + 324 | 23.01 +209 | 35.898 + 312 | 56.75 + 33 |
| 5 11.3 | 21.553 + 320 | 21.27 +104 | 22.177 + 410 | 35.44 +205 | 34.797 + 348 | 21.00 +201 | 36.233 + 335 | 57.57 + 82 |
| 5 21.3 | 21.885 + 332 | 22.73 +146 | 22.606 + 429 | 33.68 +176 | 35.162 + 365 | 19.14 +186 | 36.580 + 347 | 58.87 +130 |
| 5 31.2 | 22.221 + 336 | 24.54 +181 | 23.042 + 436 | 32.21 +147 | 35.533 + 371 | 17.47 +167 | 36.931 + 351 | 60.58 +171 |
| 6 10.2 | 22.554 + 333 | 26.68 +214 | 23.481 + 439 | 31.09 +112 | 35.907 + 374 | 16.01 +146 | 37.279 + 348 | 62.68 +210 |
| 6 20.2 | 22.873 + 319 | 29.07 +239 | 23.908 + 427 | 30.35 + 74 | 36.270 + 363 | 14.85 +116 | 37.612 + 333 | 65.10 +242 |
| 6 30.1 | 23.172 + 299 | 31.63 +256 | 24.313 + 405 | 29.99 + 36 | 36.616 + 346 | 13.96 + 89 | 37.923 + 311 | 67.75 +265 |
| 7 10.1 | 23.444 + 272 | 34.33 +270 | 24.688 + 375 | 30.03 - 4 | 36.936 + 320 | 13.40 + 56 | 38.204 + 281 | 70.60 +285 |
| 7 20.1 | 23.679 + 235 | 37.09 +276 | 25.020 + 332 | 30.48 - 45 | 37.219 + 283 | 13.17 + 23 | 38.447 + 243 | 73.56 +296 |
| 7 30.1 | 23.875 + 196 | 39.83 +274 | 25.304 + 284 | 31.27 - 79 | 37.463 + 244 | 13.25 - 8 | 38.648 + 201 | 76.56 +300 |
| 8 9.0 | 24.028 + 153 | 42.52 +269 | 25.532 + 228 | 32.41 -114 | 37.659 + 196 | 13.65 - 40 | 38.804 + 156 | 79.55 +299 |
| 8 19.0 | 24.133 + 105 | 45.08 +256 | 25.696 + 164 | 33.85 -144 | 37.802 + 143 | 14.34 - 69 | 38.909 + 105 | 82.44 +289 |
| 8 29.0 | 24.194 + 61 | 47.47 +239 | 25.800 + 104 | 35.49 -164 | 37.895 + 93 | 15.25 - 91 | 38.968 + 59 | 85.20 +276 |
| 9 8.0 | 24.210 + 16 | 49.67 +220 | 25.839 + 39 | 37.32 -183 | 37.936 + 41 | 16.36 -111 | 38.979 + 11 | 87.78 +258 |
| 9 17.9 | 24.183 - 27 | 51.61 +194 | 25.816 - 23 | 39.21 -189 | 37.925 - 11 | 17.61 -125 | 38.944 - 35 | 90.10 +232 |
| 9 27.9 | 24.121 - 62 | 53.29 +168 | 25.739 - 77 | 41.10 -189 | 37.873 - 52 | 18.92 -131 | 38.873 - 71 | 92.16 +206 |
| 10 7.9 | 24.026 - 95 | 54.67 +138 | 25.613 - 126 | 42.92 -182 | 37.780 - 93 | 20.25 -133 | 38.766 - 107 | 93.92 +176 |
| 10 17.8 | 23.907 - 119 | 55.73 +106 | 25.449 - 164 | 44.55 -163 | 37.658 - 122 | 21.51 -126 | 38.632 - 134 | 95.30 +138 |
| 10 27.8 | 23.772 - 135 | 56.46 + 73 | 25.258 - 191 | 45.95 -140 | 37.516 - 142 | 22.65 -114 | 38.480 - 152 | 96.35 +105 |
| 11 6.8 | 23.624 - 148 | 56.85 + 39 | 25.048 - 210 | 47.06 -111 | 37.360 - 156 | 23.62 - 97 | 38.313 - 167 | 96.99 + 64 |
| 11 16.8 | 23.475 - 149 | 56.88 + 3 | 24.835 - 213 | 47.06 - 74 | 37.202 - 158 | 24.62 - 75 | 38.143 - 170 | 96.99 + 23 |
| 11 26.7 | 23.329 - 146 | 56.58 - 30 | 24.628 - 207 | 48.16 - 36 | 37.051 - 151 | 24.87 - 50 | 37.975 - 168 | 97.06 - 16 |
| 12 6.7 | 23.190 - 139 | 55.92 - 66 | 24.435 - 193 | 48.12 + 4 | 36.912 - 139 | 25.10 - 23 | 37.812 - 163 | 96.47 - 59 |
| 12 16.7 | 23.067 - 123 | 54.94 - 98 | 24.270 - 165 | 47.67 + 45 | 36.795 - 117 | 25.04 + 6 | 37.666 - 146 | 95.49 - 98 |
| 12 26.7 | 22.962 - 105 | 53.67 -127 | 24.134 - 136 | 46.83 + 84 | 36.701 - 94 | 24.72 + 32 | 37.536 - 130 | 94.16 -133 |
| 12 36.6 | 22.878 - 84 | 52.13 -154 | 24.033 - 101 | 45.62 +121 | 36.635 - 66 | 24.12 + 60 | 37.429 - 107 | 92.48 -168 |
| | - 56 | -173 | - 59 | +156 | - 34 | + 86 | - 78 | -193 |
| Mean Place | 22.924 | 43.80 | 23.238 | 36.52 | 35.908 | 17.63 | 37.689 | 81.99 |
| sec δ , tan δ | +1.106 | +0.472 | +1.467 | -1.073 | +1.193 | -0.651 | +1.194 | +0.652 |
| $d\alpha(\psi)$, $d\delta(\psi)$ | +0.055 | +0.35 | +0.075 | +0.35 | +0.069 | +0.35 | +0.053 | +0.35 |
| $d\alpha(\epsilon)$, $d\delta(\epsilon)$ | -0.028 | -0.48 | +0.063 | -0.47 | +0.038 | -0.47 | -0.038 | -0.47 |
| Dble. Trans. | August 23 | | August 23 | | August 23 | | August 24 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 835 | | 834 | | 837 | | 836 | |
|--------------|------------------|-------------------|------------------|------------------|-------------------|------------------|-------------------|-------------------|
| | π Pegasi | | 9 Pegasi | | 24 Cephei | | ζ Cephei | |
| Mag. Spect. | 4.38 | F5 | 3.70 | A2 | 4.99 | G5 | 3.62 | K0 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " |
| | 22 09 | +33 06 | 22 09 | + 6 07 | 22 09 | +72 15 | 22 10 | +58 07 |
| 1 | ^d -83 | ^s -139 | ^s -86 | ["] -88 | ^s -629 | ["] -99 | ^s -307 | ["] -118 |
| 1 | 16 | -117 | -65 | -96 | -575 | -155 | -275 | -166 |
| 1 | 116 | -94 | -45 | -103 | -507 | -207 | -237 | -214 |
| 1 | 21.6 | -63 | -208 | -104 | -413 | -254 | -185 | -252 |
| 1 | 31.6 | -30 | -221 | -100 | -307 | -285 | -129 | -279 |
| 2 | 10.5 | + 4 | -227 | + 34 | -191 | -312 | -66 | -298 |
| 2 | 20.5 | + 46 | -220 | + 65 | -57 | -321 | + 6 | -302 |
| 3 | 2.5 | + 85 | -205 | + 95 | + 72 | -318 | + 76 | -294 |
| 3 | 12.5 | + 128 | -183 | + 128 | + 205 | -304 | + 149 | -277 |
| 3 | 22.4 | + 171 | -149 | + 164 | + 336 | -275 | + 224 | -243 |
| 4 | 1.4 | + 211 | -109 | + 194 | + 449 | -236 | + 288 | -203 |
| 4 | 11.4 | + 251 | -66 | + 228 | + 554 | -191 | + 350 | -156 |
| 4 | 21.3 | + 285 | -15 | + 257 | + 641 | -133 | + 402 | -99 |
| 5 | 1.3 | + 312 | + 33 | + 280 | + 701 | -76 | + 441 | -42 |
| 5 | 11.3 | + 335 | + 81 | + 301 | + 747 | -16 | + 471 | + 17 |
| 5 | 21.3 | + 348 | +130 | + 315 | + 764 | + 49 | + 486 | + 78 |
| 5 | 31.2 | + 351 | +171 | + 320 | + 756 | +105 | + 485 | +132 |
| 6 | 10.2 | + 348 | +209 | + 321 | + 734 | +163 | + 476 | +186 |
| 6 | 20.2 | + 334 | +242 | + 310 | + 681 | +216 | + 448 | +234 |
| 6 | 30.2 | + 311 | +265 | + 293 | + 616 | +259 | + 410 | +271 |
| 7 | 10.1 | + 282 | +285 | + 269 | + 536 | +299 | + 365 | +307 |
| 7 | 20.1 | + 244 | +296 | + 237 | + 436 | +331 | + 305 | +333 |
| 7 | 30.1 | + 202 | +300 | + 201 | + 334 | +352 | + 244 | +348 |
| 8 | 9.0 | + 156 | +299 | + 161 | + 223 | +371 | + 176 | +362 |
| 8 | 19.0 | + 107 | +290 | + 117 | + 103 | +377 | + 103 | +362 |
| 8 | 29.0 | + 60 | +276 | + 75 | - 8 | +377 | + 35 | +357 |
| 9 | 8.0 | + 11 | +258 | +117 | -123 | +371 | - 35 | +347 |
| 9 | 17.9 | - 33 | +233 | - 8 | -233 | +353 | -101 | +325 |
| 9 | 27.9 | - 71 | +206 | - 43 | -329 | +332 | -157 | +301 |
| 10 | 7.9 | -106 | +176 | - 73 | -424 | +303 | -213 | +269 |
| 10 | 17.9 | -133 | +140 | - 96 | -502 | +264 | -257 | +229 |
| 10 | 27.8 | -151 | +104 | -112 | -565 | +223 | -289 | +188 |
| 11 | 6.8 | -166 | + 66 | -122 | -621 | +174 | -319 | +139 |
| 11 | 16.8 | -170 | + 23 | -123 | -651 | +118 | -331 | + 86 |
| 11 | 26.7 | -168 | - 15 | -118 | -668 | + 64 | -337 | + 34 |
| 12 | 6.7 | -162 | - 58 | -110 | -672 | + 1 | -335 | - 25 |
| 12 | 16.7 | -147 | - 97 | - 95 | -645 | - 59 | -317 | - 80 |
| 12 | 26.7 | -130 | -133 | - 77 | -607 | -117 | -293 | -133 |
| 12 | 36.6 | -107 | -167 | - 58 | -549 | -175 | -260 | -184 |
| | | - 79 | -192 | - 32 | -465 | -224 | -213 | -227 |
| Mean Place | 23.205 | 42.00 | 31.130 | 52.10 | 33.010 | 88.81 | 23.103 | 64.09 |
| sec δ, tan δ | +1.194 | +0.652 | +1.006 | +0.107 | +3.285 | +3.129 | +1.894 | +1.609 |
| da(ψ), dδ(ψ) | +0.053 | +0.35 | +0.060 | +0.35 | +0.023 | +0.35 | +0.042 | +0.35 |
| da(ε), dδ(ε) | -0.039 | -0.46 | -0.006 | -0.46 | -0.185 | -0.46 | -0.095 | -0.46 |
| Dble. Trans. | August 24 | | August 24 | | August 24. | | August 24 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 1583 | | 838 | | 1582 | | 840 | |
|---|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|
| | 1 H. Lacertae | | λ Piscis Austrini | | 125 G. Aquarii | | η Aquarii | |
| Mag. Spect. | 4.64 | K2 | 5.40 | B9 | 6.60 | G5 | 4.32 | K0 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | ^h ^m | ^o ['] | ^h ^m | ^o ['] | ^h ^m | ^o ['] | ^h ^m | ^o ['] |
| | 22 13 | + 39 38 | 22 13 | - 27 49 | 22 13 | - 15 53 | 22 16 | - 7 50 |
| 1 ^d -8.3 | ^s 14.851 - 166 | 46.99 - 122 | ^s 30.028 - 98 | 88.14 + 1 | ^s 51.536 - 85 | 25.45 - 35 | ^s 04.464 - 83 | 81.77 - 56 |
| 1 1.6 | 14.708 - 143 | 45.40 - 159 | 29.955 - 73 | 87.89 + 25 | 51.472 - 64 | 25.67 - 22 | 04.401 - 63 | 82.27 - 50 |
| 1 11.6 | 14.589 - 119 | 43.45 - 195 | 29.906 - 49 | 87.43 + 46 | 51.431 - 41 | 25.77 - 10 | 04.358 - 43 | 82.72 - 45 |
| 1 21.6 | 14.504 - 85 | 41.23 - 222 | 29.889 - 17 | 86.72 + 71 | 51.417 - 14 | 25.71 + 6 | 04.341 - 17 | 83.06 - 34 |
| 1 31.6 | 14.454 - 50 | 38.84 - 239 | 29.901 + 12 | 85.82 + 90 | 51.429 + 12 | 25.50 + 21 | 04.349 + 8 | 83.29 - 23 |
| 2 10.5 | 14.443 - 11 | 36.35 - 249 | 29.943 + 42 | 84.72 + 110 | 51.471 + 42 | 25.13 + 37 | 04.385 + 36 | 83.38 - 9 |
| 2 20.5 | 14.477 + 34 | 33.88 - 247 | 30.019 + 76 | 83.41 + 131 | 51.539 + 68 | 24.65 + 48 | 04.450 + 65 | 83.17 + 21 |
| 3 2.5 | 14.556 + 79 | 31.55 - 213 | 30.128 + 109 | 81.91 + 150 | 51.638 + 99 | 23.82 + 83 | 04.539 + 89 | 83.06 + 11 |
| 3 12.5 | 14.682 + 126 | 29.43 - 232 | 30.272 + 144 | 80.26 + 165 | 51.773 + 135 | 22.86 + 96 | 04.668 + 129 | 82.58 + 48 |
| 3 22.4 | 14.857 + 175 | 27.65 - 178 | 30.453 + 181 | 78.45 + 181 | 51.941 + 168 | 21.70 + 116 | 04.830 + 162 | 81.86 + 72 |
| 4 1.4 | 15.075 + 218 | 26.26 - 139 | 30.667 + 214 | 76.55 + 190 | 52.141 + 200 | 20.36 + 134 | 05.022 + 192 | 80.91 + 95 |
| 4 11.4 | 15.337 + 262 | 25.32 - 94 | 30.916 + 249 | 74.55 + 200 | 52.373 + 232 | 18.84 + 152 | 05.247 + 225 | 79.73 + 118 |
| 4 21.3 | 15.638 + 301 | 24.91 - 41 | 31.197 + 281 | 72.51 + 204 | 52.636 + 263 | 17.18 + 166 | 05.502 + 255 | 78.33 + 140 |
| 5 1.3 | 15.967 + 329 | 25.01 + 10 | 31.504 + 307 | 70.46 + 205 | 52.923 + 287 | 15.41 + 177 | 05.781 + 279 | 76.75 + 158 |
| 5 11.3 | 16.321 + 354 | 25.63 + 62 | 31.836 + 332 | 68.45 + 201 | 53.234 + 311 | 13.55 + 186 | 06.083 + 302 | 75.01 + 174 |
| 5 21.3 | 16.689 + 368 | 26.77 + 114 | 32.183 + 347 | 66.53 + 192 | 53.559 + 325 | 11.67 + 188 | 06.400 + 317 | 73.16 + 185 |
| 5 31.2 | 17.060 + 371 | 28.37 + 160 | 32.539 + 356 | 64.75 + 178 | 53.892 + 333 | 09.81 + 186 | 06.724 + 324 | 71.26 + 190 |
| 6 10.2 | 17.428 + 368 | 30.40 + 203 | 32.898 + 359 | 63.15 + 160 | 54.227 + 335 | 08.01 + 180 | 07.051 + 327 | 69.34 + 192 |
| 6 20.2 | 17.780 + 352 | 32.81 + 241 | 33.248 + 350 | 61.78 + 137 | 54.553 + 326 | 06.34 + 167 | 07.369 + 318 | 67.46 + 188 |
| 6 30.2 | 18.108 + 328 | 35.49 + 268 | 33.582 + 334 | 60.66 + 112 | 54.864 + 311 | 04.83 + 151 | 07.672 + 303 | 65.68 + 178 |
| 7 10.1 | 18.405 + 297 | 38.43 + 294 | 33.892 + 310 | 59.83 + 83 | 55.153 + 289 | 03.51 + 132 | 07.953 + 281 | 64.03 + 165 |
| 7 20.1 | 18.661 + 256 | 41.53 + 310 | 34.168 + 276 | 59.31 + 52 | 55.409 + 256 | 02.42 + 109 | 08.202 + 249 | 62.55 + 148 |
| 7 30.1 | 18.873 + 212 | 44.69 + 316 | 34.406 + 238 | 59.08 + 23 | 55.630 + 221 | 01.58 + 84 | 08.417 + 215 | 61.28 + 127 |
| 8 9.0 | 19.036 + 163 | 47.90 + 321 | 34.600 + 194 | 59.16 - 8 | 55.809 + 179 | 01.00 + 58 | 08.592 + 175 | 60.23 + 105 |
| 8 19.0 | 19.145 + 109 | 51.04 + 314 | 34.744 + 144 | 59.53 - 37 | 55.943 + 134 | 00.68 + 32 | 08.723 + 131 | 59.42 + 81 |
| 8 29.0 | 19.205 + 60 | 54.07 + 303 | 34.840 + 96 | 60.13 - 60 | 56.032 + 89 | 00.59 + 9 | 08.810 + 87 | 58.84 + 58 |
| 9 8.0 | 19.214 + 9 | 56.94 + 287 | 34.886 + 46 | 60.96 - 83 | 56.076 + 44 | 00.74 - 15 | 08.854 + 44 | 58.49 + 35 |
| 9 17.9 | 19.175 - 39 | 59.57 + 263 | 34.885 - 1 | 61.94 - 98 | 56.076 + 0 | 01.08 - 34 | 08.856 + 2 | 58.37 + 12 |
| 9 27.9 | 19.095 - 80 | 61.94 + 237 | 34.843 - 42 | 63.02 - 108 | 56.039 - 37 | 01.56 - 48 | 08.823 - 33 | 58.41 - 4 |
| 10 7.9 | 18.977 - 118 | 64.00 + 206 | 34.763 - 80 | 64.16 - 114 | 55.969 - 70 | 02.17 - 61 | 08.757 - 61 | 58.63 - 22 |
| 10 17.9 | 18.829 - 148 | 65.68 + 168 | 34.654 - 109 | 65.27 - 111 | 55.873 - 96 | 02.86 - 69 | 08.667 - 90 | 58.98 - 35 |
| 10 27.8 | 18.660 - 169 | 66.99 + 131 | 34.526 - 128 | 66.32 - 105 | 55.760 - 113 | 03.57 - 71 | 08.560 - 107 | 59.42 - 44 |
| 11 6.8 | 18.474 - 186 | 67.87 + 88 | 34.384 - 142 | 67.25 - 93 | 55.636 - 124 | 04.28 - 71 | 08.442 - 118 | 59.94 - 52 |
| 11 16.8 | 18.281 - 193 | 68.30 + 43 | 34.241 - 143 | 68.01 - 76 | 55.510 - 126 | 04.95 - 67 | 08.322 - 120 | 60.50 - 56 |
| 11 26.7 | 18.089 - 192 | 68.30 + 0 | 34.102 - 139 | 68.58 - 57 | 55.389 - 121 | 05.55 - 60 | 08.207 - 115 | 61.07 - 57 |
| 12 6.7 | 17.900 - 189 | 67.82 - 48 | 33.973 - 129 | 68.94 - 36 | 55.276 - 113 | 06.07 - 52 | 08.099 - 108 | 61.66 - 59 |
| 12 16.7 | 17.727 - 173 | 66.90 - 92 | 33.864 - 109 | 69.06 - 12 | 55.181 - 95 | 06.47 - 40 | 08.006 - 93 | 62.21 - 55 |
| 12 26.7 | 17.571 - 156 | 65.57 - 133 | 33.775 - 89 | 68.95 + 11 | 55.104 - 77 | 06.76 - 29 | 07.931 - 75 | 62.73 - 52 |
| 12 36.6 | 17.437 - 134 | 63.84 - 173 | 33.711 - 64 | 68.60 + 35 | 55.049 - 55 | 06.92 - 16 | 07.876 - 55 | 63.20 - 47 |
| | - 102 | - 203 | - 35 | + 59 | - 29 | - 1 | - 31 | - 38 |
| Mean Place | 17.892 | 51.35 | 32.994 | 63.37 | 54.435 | 04.42 | 07.330 | 63.08 |
| sec δ , $\tan \delta$ | +1.299 | +0.829 | +1.131 | -0.528 | +1.040 | -0.285 | +1.009 | -0.138 |
| $d\alpha(\psi)$, $d\delta(\psi)$ | +0.051 | +0.36 | +0.067 | +0.36 | +0.065 | +0.36 | +0.063 | +0.36 |
| $d\alpha(\epsilon)$, $d\delta(\epsilon)$ | -0.049 | -0.45 | +0.031 | -0.45 | +0.017 | -0.45 | +0.008 | -0.44 |
| Dble. Trans. | August 25 | | August 25 | | August 25 | | August 26 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 841 | | 839 | | 1584 | | 843 | |
|--------------|--------------------------|-------------------------|--------------------------|-------------------------|-------------------------|------------------------|-------------------------|------------------------|
| | α Tucanae | | ε Octantis | | 47 Aquarii | | 31 Pegasi | |
| Mag.Spect. | 2.91 | K2 | 5.11 | M3 | 5.40 | K0 | 4.93 | B3p |
| U.T. | R.A. Dec. | | R.A. Dec. | | R.A. Dec. | | R.A. Dec. | |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " |
| | 22 17 | -60 19 | 22 18 | -80 30 | 22 20 | -21 39 | 22 20 | +12 07 |
| 1 -8.3 | 31.741 ^s -255 | 70.50 ^o +104 | 28.113 ^s -994 | 61.68 ^o +165 | 48.222 ^s -93 | 81.50 ^o -21 | 48.363 ^s -96 | 60.73 ^o -94 |
| 1 1.6 | 31.533 -208 | 69.01 +149 | 27.260 -853 | 59.52 +216 | 48.151 -71 | 81.51 -1 | 48.285 -78 | 59.65 -108 |
| 1 11.6 | 31.373 -160 | 67.09 +192 | 26.563 -697 | 56.89 +263 | 48.101 -50 | 81.35 +16 | 48.225 -60 | 58.45 -120 |
| 1 21.6 | 31.274 -99 | 64.78 +231 | 26.061 -502 | 53.84 +306 | 48.080 -21 | 80.99 +36 | 48.190 -35 | 57.18 -127 |
| 1 31.6 | 31.235 -39 | 62.19 +259 | 25.758 -303 | 50.51 +333 | 48.085 +5 | 80.44 +55 | 48.181 -9 | 55.91 -127 |
| 2 10.5 | 31.256 +21 | 59.34 +285 | 25.655 -103 | 46.94 +357 | 48.119 +34 | 79.71 +73 | 48.198 +17 | 54.68 -123 |
| 2 20.5 | 31.344 +88 | 56.31 +303 | 25.772 +117 | 43.23 +371 | 48.183 +64 | 78.79 +92 | 48.247 +49 | 53.57 -111 |
| 3 2.5 | 31.494 +150 | 53.18 +192 | 26.086 +314 | 39.51 +372 | 48.279 +96 | 77.64 +115 | 48.328 +81 | 52.63 -94 |
| 3 12.5 | 31.706 +212 | 49.99 +319 | 26.598 +512 | 35.80 +371 | 48.409 +130 | 76.32 +132 | 48.442 +114 | 51.91 -72 |
| 3 22.4 | 31.984 +278 | 46.83 +316 | 27.306 +708 | 32.22 +358 | 48.575 +166 | 74.81 +151 | 48.594 +152 | 51.49 -42 |
| 4 1.4 | 32.317 +333 | 43.77 +306 | 28.179 +873 | 28.85 +337 | 48.773 +198 | 73.17 +164 | 48.779 +185 | 51.39 -10 |
| 4 11.4 | 32.708 +391 | 40.83 +294 | 29.216 +1037 | 25.72 +313 | 49.006 +233 | 71.38 +179 | 48.998 +219 | 51.64 +25 |
| 4 21.3 | 33.151 +443 | 38.12 +245 | 30.395 +1179 | 22.94 +278 | 49.271 +265 | 69.48 +190 | 49.250 +252 | 52.27 +63 |
| 5 1.3 | 33.634 +483 | 35.67 +483 | 31.682 +1287 | 20.54 +240 | 49.561 +290 | 67.53 +195 | 49.526 +276 | 53.23 +96 |
| 5 11.3 | 34.157 +523 | 33.53 +214 | 33.070 +1388 | 18.55 +199 | 49.877 +316 | 65.55 +198 | 49.826 +300 | 54.53 +130 |
| 5 21.3 | 34.705 +548 | 31.76 +177 | 34.519 +1449 | 17.07 +148 | 50.209 +332 | 63.60 +195 | 50.141 +315 | 56.14 +161 |
| 5 31.2 | 35.265 +560 | 30.39 +137 | 35.994 +1475 | 16.08 +99 | 50.551 +342 | 61.73 +187 | 50.463 +322 | 57.99 +185 |
| 6 10.2 | 35.831 +566 | 29.46 +93 | 37.479 +1485 | 15.61 +47 | 50.896 +345 | 59.97 +176 | 50.787 +324 | 60.06 +207 |
| 6 20.2 | 36.384 +553 | 29.00 +46 | 38.920 +1441 | 15.70 -9 | 51.234 +338 | 58.39 +158 | 51.102 +315 | 62.27 +221 |
| 6 30.2 | 36.911 +527 | 28.99 +1 | 40.290 +1370 | 16.29 -59 | 51.557 +323 | 57.02 +137 | 51.400 +298 | 64.56 +229 |
| 7 10.1 | 37.402 +491 | 29.45 -46 | 41.559 +1269 | 17.41 -112 | 51.859 +302 | 55.89 +113 | 51.676 +276 | 66.90 +234 |
| 7 20.1 | 37.838 +436 | 30.36 -91 | 42.676 +1117 | 19.01 -160 | 52.129 +270 | 55.04 +85 | 51.920 +244 | 69.20 +230 |
| 7 30.1 | 38.213 +375 | 31.67 -131 | 43.626 +950 | 21.01 -200 | 52.363 +234 | 54.46 +58 | 52.129 +209 | 71.42 +222 |
| 8 9.0 | 38.516 +303 | 33.36 -169 | 44.376 +750 | 23.39 -238 | 52.555 +192 | 54.16 +30 | 52.298 +169 | 73.53 +211 |
| 8 19.0 | 38.736 +220 | 35.36 -200 | 44.893 +517 | 26.04 -265 | 52.700 +145 | 54.15 +1 | 52.424 +126 | 75.46 +193 |
| 8 29.0 | 38.875 +139 | 37.57 -221 | 45.180 +287 | 28.86 -282 | 52.800 +100 | 54.39 -24 | 52.507 +83 | 77.20 +174 |
| 9 8.0 | 38.927 +52 | 39.94 -237 | 45.218 +38 | 31.79 -293 | 52.852 +52 | 54.85 -46 | 52.547 +40 | 78.74 +154 |
| 9 17.9 | 38.893 -34 | 42.35 -241 | 45.004 -214 | 34.67 -288 | 52.859 +7 | 55.51 -66 | 52.546 -1 | 80.02 +128 |
| 9 27.9 | 38.785 -108 | 44.71 -236 | 44.565 -439 | 37.41 -274 | 52.827 -32 | 56.30 -79 | 52.511 -35 | 81.07 +105 |
| 10 7.9 | 38.604 -181 | 46.94 -223 | 43.903 -662 | 39.92 -251 | 52.759 -68 | 57.19 -89 | 52.444 -67 | 81.88 +81 |
| 10 17.9 | 38.365 -239 | 48.91 -197 | 43.054 -849 | 42.04 -212 | 52.664 -95 | 58.11 -92 | 52.353 -91 | 82.42 +54 |
| 10 27.8 | 38.084 -281 | 50.56 -165 | 42.061 -993 | 43.73 -169 | 52.550 -114 | 59.01 -90 | 52.244 -109 | 82.73 +31 |
| 11 6.8 | 37.769 -315 | 51.82 -126 | 40.950 -1111 | 44.89 -116 | 52.422 -128 | 59.87 -86 | 52.123 -121 | 82.79 +6 |
| 11 16.8 | 37.444 -325 | 52.60 -78 | 39.784 -1166 | 45.45 -56 | 52.290 -132 | 60.62 -75 | 51.999 -124 | 82.62 -17 |
| 11 26.7 | 37.120 -324 | 52.90 -30 | 38.606 -1178 | 45.42 +3 | 52.163 -127 | 61.24 -62 | 51.877 -122 | 82.22 -40 |
| 12 6.7 | 36.810 -310 | 52.68 +22 | 37.453 -1153 | 44.75 +67 | 52.043 -120 | 61.72 -48 | 51.760 -117 | 81.61 -61 |
| 12 16.7 | 36.532 -278 | 51.93 +75 | 36.387 -1066 | 43.46 +129 | 51.940 -103 | 62.01 -29 | 51.657 -103 | 80.80 -81 |
| 12 26.7 | 36.292 -240 | 50.72 +121 | 35.434 -953 | 41.62 +184 | 51.855 -85 | 62.13 -12 | 51.568 -89 | 79.83 -97 |
| 12 36.6 | 36.099 -193 | 49.03 +169 | 34.626 -808 | 39.24 +238 | 51.792 -63 | 62.07 +6 | 51.497 -71 | 78.70 -113 |
| | 36.099 -135 | 49.03 +209 | 34.626 -624 | 39.24 +282 | 51.792 -37 | 62.07 +27 | 51.497 -47 | 78.70 -120 |
| Mean Place | 35.231 | 38.24 | 34.100 | 27.24 | 51.092 | 58.46 | 51.206 | 72.95 |
| sec δ, tan δ | +2.020 | -1.755 | +6.064 | -5.981 | +1.076 | -0.397 | +1.023 | +0.215 |
| dα(w), dδ(w) | +0.081 | +0.36 | +0.129 | +0.36 | +0.066 | +0.36 | +0.059 | +0.36 |
| dα(ε), dδ(ε) | +0.106 | -0.43 | +0.360 | -0.43 | +0.024 | -0.42 | -0.013 | -0.42 |
| Dble.Trans. | August 26 | | August 26 | | August 27 | | August 27 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 1587 | | 845 | | 1588 | | 846 | |
|--------------|---------------------------|------------|---------------------------|-----------------------|--------------------------|------------|---------------------------|------------|
| | 72 G. Indi | | v Gruis | | 36 Pegasi | | δ' Gruis | |
| Mag.Spect. | 5.70 | A3 | 5.48 | K0 | 5.82 | K2 | 4.02 | G5 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " |
| | 22 27 | -67 33 | 22 27 | -39 11 | 22 28 | + 9 03 | 22 28 | -43 33 |
| 1 -8.3 | 35 256 ^s - 376 | 62 41 +115 | 48 997 ^s - 132 | 89 95 [†] 27 | 24 770 ^s - 95 | 22 15 - 87 | 25 050 ^s - 149 | 82 95 + 40 |
| 1 1.7 | 34 937 - 319 | 60 76 +165 | 48 891 - 106 | 89 34 + 61 | 24 691 - 79 | 21.17 - 98 | 24 930 - 120 | 82.17 + 78 |
| 1 11.6 | 34 679 - 258 | 58 64 +212 | 48 812 - 79 | 88 41 + 93 | 24 631 - 60 | 20.10 -107 | 24 839 - 91 | 81.05 +112 |
| 1 21.6 | 34 498 - 181 | 56 10 +254 | 48 767 - 45 | 87 17 +124 | 24 593 - 38 | 18.99 -111 | 24 785 - 54 | 79 58 +147 |
| 1 31.6 | 34.395 - 103 | 53.25 +285 | 48.755 - 12 | 85.65 +152 | 24.580 - 13 | 17.90 -109 | 24.768 - 17 | 77.83 +175 |
| 2 10.5 | 34.372 - 23 | 50 12 +313 | 48 778 + 23 | 83 89 +176 | 24 593 + 13 | 16 85 -105 | 24 787 + 19 | 75 82 +201 |
| 2 20.5 | 34 438 + 66 | 46 80 +332 | 48 840 + 62 | 81.91 +198 | 24 636 + 43 | 15.93 - 92 | 24 850 + 63 | 73 59 +223 |
| 3 2.5 | 34 585 + 147 | 43 40 +340 | 48 940 + 100 | 79.75 +216 | 24 710 + 74 | 15.19 - 74 | 24 953 + 103 | 71.20 +239 |
| 3 12.5 | 34 815 + 230 | 39 94 +346 | 49 080 + 140 | 77 45 +230 | 24 818 + 108 | 14.65 - 54 | 25 098 + 145 | 68 67 +253 |
| 3 22.4 | 35 130 + 315 | 36.53 +341 | 49 262 + 182 | 75.04 +241 | 24 962 + 144 | 14.41 - 24 | 25 289 + 191 | 66.06 +261 |
| 4 1.4 | 35 519 + 389 | 33 24 +329 | 49 482 + 220 | 72.58 +246 | 25 140 + 178 | 14.46 + 5 | 25 520 + 231 | 63.44 +262 |
| 4 11.4 | 35 984 + 465 | 30 10 +314 | 49 742 + 260 | 81.91 +248 | 25 353 + 213 | 14.85 + 39 | 25 794 + 274 | 60 81 +263 |
| 4 21.4 | 36 517 + 533 | 27 23 +287 | 50 040 + 298 | 67 66 +244 | 25 598 + 245 | 15 59 + 74 | 26 107 + 313 | 58 26 +255 |
| 5 1.3 | 37 103 + 586 | 24 65 +258 | 50 369 + 329 | 65 32 +234 | 25 869 + 271 | 16 64 +105 | 26 453 + 346 | 55 84 +242 |
| 5 11.3 | 37 742 + 639 | 22 42 +223 | 50 728 + 359 | 63 10 +222 | 26 165 + 296 | 18 00 +136 | 26 830 + 377 | 53 58 +226 |
| 5 21.3 | 38 415 + 673 | 20 62 +180 | 51 107 + 379 | 61 08 +202 | 26 477 + 312 | 19 65 +165 | 27 229 + 399 | 51 56 +202 |
| 5 31.2 | 39 107 + 692 | 19 24 +138 | 51 497 + 390 | 59 29 +179 | 26 797 + 320 | 21 51 +186 | 27 640 + 411 | 49 81 +175 |
| 6 10.2 | 39 809 + 702 | 18 34 + 90 | 51 895 + 398 | 57 78 +151 | 27 121 + 324 | 23 56 +205 | 28 058 + 418 | 48 38 +143 |
| 6 20.2 | 40 497 + 688 | 17 95 + 39 | 52 285 + 330 | 56 60 +118 | 27 437 + 316 | 25 73 +217 | 28 469 + 411 | 47 31 +107 |
| 6 30.2 | 41 157 + 660 | 18 05 - 10 | 52 661 + 376 | 55 76 + 84 | 27 739 + 302 | 27 95 +222 | 28 865 + 396 | 46 61 + 70 |
| 7 10.1 | 41 776 + 619 | 18 65 - 60 | 53 013 + 352 | 55 29 + 47 | 28 019 + 280 | 30 19 +224 | 29 236 + 371 | 46 31 + 30 |
| 7 20.1 | 42 329 + 553 | 19 73 -108 | 53 330 + 317 | 55 21 + 8 | 28 269 + 250 | 32 38 +219 | 29 570 + 334 | 46 41 - 10 |
| 7 30.1 | 42 808 + 479 | 21 24 -151 | 53 607 + 277 | 55 48 - 27 | 28 485 + 216 | 34 48 +210 | 29 862 + 292 | 46 88 - 47 |
| 8 9.1 | 43 199 + 391 | 23 14 -190 | 53 836 + 229 | 56 11 - 63 | 28 662 + 177 | 36 44 +196 | 30 103 + 241 | 47 73 - 85 |
| 8 19.0 | 43 486 + 287 | 25 37 -223 | 54 011 + 175 | 57 06 - 95 | 28 796 + 134 | 38 22 +178 | 30 286 + 183 | 48 90 -117 |
| 8 29.0 | 43 671 + 185 | 27 82 -245 | 54 132 + 121 | 58 26 -120 | 28 888 + 92 | 39 80 +158 | 30 413 + 127 | 50 33 -143 |
| 9 8.0 | 43 746 + 75 | 30 43 -261 | 54 197 + 65 | 59 70 -144 | 28 938 + 50 | 41 18 +138 | 30 480 + 67 | 51 98 -165 |
| 9 17.9 | 43 710 - 36 | 33 08 -265 | 54 206 + 9 | 61 28 -158 | 28 946 + 8 | 42 30 +112 | 30 487 + 7 | 53 76 -178 |
| 9 27.9 | 43 575 - 135 | 35 66 -258 | 54 168 - 38 | 62 92 -164 | 28 920 - 26 | 43 20 + 90 | 30 443 - 44 | 55 58 -182 |
| 10 7.9 | 43 343 - 232 | 38 10 -244 | 54 084 - 84 | 64 58 -166 | 28 862 - 58 | 43 86 + 66 | 30 349 - 94 | 57 40 -182 |
| 10 17.9 | 43 031 - 312 | 40 25 -215 | 53 964 - 120 | 66 15 -157 | 28 778 - 84 | 44 28 + 42 | 30 217 - 132 | 59 09 -169 |
| 10 27.8 | 42 658 - 373 | 42 05 -180 | 53 818 - 146 | 67 56 -141 | 28 677 - 101 | 44 48 + 20 | 30 056 - 161 | 60 60 -151 |
| 11 6.8 | 42 235 - 423 | 43 42 -137 | 53 652 - 166 | 68 78 -122 | 28 563 - 114 | 44 46 - 2 | 29 874 - 182 | 61 87 -127 |
| 11 16.8 | 41 790 - 445 | 44 26 - 84 | 53 480 - 172 | 69 70 - 92 | 28 444 - 119 | 44 24 - 22 | 29 874 - 191 | 62 81 - 94 |
| 11 26.8 | 41 340 - 450 | 44 57 - 31 | 53 310 - 170 | 70 33 - 63 | 28 326 - 118 | 43 83 - 41 | 29 494 - 189 | 63 41 - 60 |
| 12 6.7 | 40 901 - 439 | 44 32 + 25 | 53 147 - 163 | 70 62 - 29 | 28 213 - 113 | 43 23 - 60 | 29 313 - 181 | 63 63 - 22 |
| 12 16.7 | 40 497 - 404 | 43 49 + 83 | 53 002 - 145 | 70 55 + 7 | 28 111 - 102 | 42 48 - 75 | 29 151 - 162 | 63 45 + 18 |
| 12 26.7 | 40 139 - 358 | 42 15 +134 | 52 880 - 122 | 70 15 + 40 | 28 024 - 87 | 41 59 - 89 | 29 013 - 138 | 62 90 + 55 |
| 12 36.6 | 39 837 - 302 | 40 29 +186 | 52 783 - 97 | 69 40 + 75 | 27 952 - 72 | 40 58 -101 | 28 902 - 111 | 61 97 + 93 |
| | - 228 | +231 | - 65 | +108 | - 49 | -106 | - 75 | +129 |
| Mean Place | 38 882 | 28 79 | 51 919 | 61 89 | 27 571 | 35 28 | 28 011 | 53 70 |
| sec δ, tan δ | +2.620 | -2.421 | +1.290 | -0.816 | +1.013 | +0.159 | +1.380 | -0.951 |
| da(ψ), dδ(ψ) | +0.086 | +0.37 | +0.070 | +0.37 | +0.060 | +0.37 | +0.071 | +0.37 |
| da(ε), dδ(ε) | +0.148 | -0.39 | +0.050 | -0.39 | -0.010 | -0.39 | +0.058 | -0.39 |
| Dbles.Trans. | August 29 | | August 29 | | August 29 | | August 29 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 1589 | | 847 | | 1590 | | 1593 | | |
|--------------|---------------------------------------|--------------------------|-------------------------|--------------------------|------------------------|--------------------------|-------------------------|---------------------------|------------------------|
| | Piazz 22 ^h 120 (Pegasi) | | δ Cephei* | | 38 Pegasi | | ρ Cephei | | |
| Mag. Spect. | 5.96 | K2 | 3.7 to 4.4 | F5 to G0 | 5.51 | A0 | 5.50 | A2 | |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " | |
| | 22 28 | + 26 41 | 22 28 | + 58 20 | 22 29 | + 32 29 | 22 29 | + 78 44 | |
| 1 | ^d 8.3 | ^s 29.343 -125 | ^s 30.54 -104 | ^s 36.702 -316 | ^s 45.22 -93 | ^s 21.795 -143 | ^s 65.91 -106 | ^s 41.001 -1070 | ^s 80.58 -57 |
| 1 | 1.7 | 29.235 -108 | 29.23 -131 | 36.413 -289 | 43.79 -143 | 21.671 -124 | 64.54 -137 | 39.999 -1002 | 79.42 -116 |
| 1 | 11.6 | 29.145 -90 | 27.66 -157 | 36.156 -257 | 41.86 -193 | 21.565 -106 | 62.85 -169 | 39.085 -914 | 77.68 -174 |
| 1 | 21.6 | 29.082 -63 | 25.89 -177 | 35.946 -210 | 39.51 -235 | 21.488 -77 | 60.93 -192 | 38.308 -777 | 75.43 -225 |
| 1 | 31.6 | 29.046 -36 | 24.03 -186 | 35.788 -158 | 36.86 -265 | 21.440 -48 | 58.86 -207 | 37.688 -620 | 72.78 -265 |
| 2 | 10.5 | 29.040 -6 | 22.11 -192 | 35.690 -96 | 33.98 -288 | 21.424 -16 | 56.70 -216 | 37.245 -443 | 69.81 -297 |
| 2 | 20.5 | 29.071 +31 | 20.25 -186 | 35.664 -26 | 31.01 -297 | 21.447 +23 | 54.58 -212 | 37.012 -233 | 66.65 -316 |
| 3 | 2.5 | 29.137 +66 | 18.53 -172 | 35.707 +43 | 28.09 -292 | 21.510 +63 | 52.58 -200 | 36.983 -29 | 63.45 -320 |
| 3 | 12.5 | 29.243 +106 | 17.02 -151 | 35.824 +117 | 25.28 -281 | 21.615 +105 | 50.77 -181 | 37.167 +184 | 60.31 -314 |
| 3 | 22.4 | 29.390 +147 | 15.81 -121 | 36.018 +194 | 22.77 -251 | 21.765 +150 | 49.27 -150 | 37.564 +397 | 57.38 -293 |
| 4 | 1.4 | 29.576 +186 | 14.96 -85 | 36.280 +262 | 20.62 -215 | 21.955 +190 | 48.14 -113 | 38.146 +582 | 54.78 -260 |
| 4 | 11.4 | 29.801 +225 | 14.50 -46 | 36.608 +328 | 18.91 -171 | 22.188 +233 | 47.41 -73 | 38.904 +758 | 52.57 -221 |
| 4 | 21.4 | 30.062 +261 | 14.50 +0 | 36.994 +386 | 17.75 -116 | 22.459 +271 | 47.17 -24 | 39.808 +904 | 50.89 -168 |
| 5 | 1.3 | 30.351 +289 | 14.93 +43 | 37.423 +429 | 17.13 -62 | 22.759 +300 | 47.39 +22 | 40.816 +1008 | 49.76 -113 |
| 5 | 11.3 | 30.666 +315 | 15.80 +87 | 37.890 +467 | 17.10 -3 | 23.086 +327 | 48.09 +70 | 41.909 +1093 | 49.21 -55 |
| 5 | 21.3 | 30.997 +331 | 17.11 +131 | 38.376 +486 | 17.67 +57 | 23.431 +345 | 49.27 +118 | 43.042 +1133 | 49.29 +8 |
| 5 | 31.2 | 31.336 +339 | 18.78 +167 | 38.868 +492 | 18.79 +112 | 23.782 +351 | 50.85 +158 | 44.175 +1133 | 49.96 +67 |
| 6 | 10.2 | 31.677 +341 | 20.80 +202 | 39.357 +489 | 20.44 +165 | 24.135 +353 | 52.82 +197 | 45.287 +1112 | 51.21 +125 |
| 6 | 20.2 | 32.008 +331 | 23.10 +230 | 39.822 +465 | 22.60 +216 | 24.476 +341 | 55.13 +231 | 46.333 +1046 | 53.02 +181 |
| 6 | 30.2 | 32.321 +313 | 25.60 +250 | 40.256 +434 | 25.16 +256 | 24.799 +323 | 57.67 +254 | 47.288 +955 | 55.30 +228 |
| 7 | 10.1 | 32.610 +289 | 28.27 +267 | 40.647 +391 | 28.09 +293 | 25.097 +298 | 60.44 +277 | 48.135 +847 | 58.03 +273 |
| 7 | 20.1 | 32.865 +255 | 31.02 +275 | 40.983 +336 | 31.32 +323 | 25.359 +262 | 63.33 +289 | 48.838 +703 | 61.14 +311 |
| 7 | 30.1 | 33.084 +219 | 33.78 +276 | 41.260 +277 | 34.73 +341 | 25.581 +222 | 66.27 +294 | 49.396 +568 | 64.51 +337 |
| 8 | 9.1 | 33.260 +176 | 36.53 +275 | 41.260 +212 | 38.30 +357 | 25.581 +180 | 69.23 +286 | 49.792 +396 | 68.13 +362 |
| 8 | 19.0 | 33.390 +130 | 39.16 +263 | 41.611 +139 | 41.92 +362 | 25.891 +130 | 72.10 +130 | 50.010 +218 | 71.88 +375 |
| 8 | 29.0 | 33.476 +86 | 41.66 +250 | 41.684 +73 | 45.52 +360 | 25.976 +85 | 74.86 +276 | 50.063 +53 | 75.69 +381 |
| 9 | 8.0 | 33.516 +40 | 43.99 +233 | 41.686 +2 | 49.05 +353 | 26.013 +37 | 77.47 +261 | 49.941 -122 | 79.51 +382 |
| 9 | 17.9 | 33.513 -3 | 46.07 +208 | 41.621 -65 | 52.39 +334 | 26.005 -8 | 79.84 +237 | 49.647 -294 | 83.22 +371 |
| 9 | 27.9 | 33.473 -40 | 47.91 +184 | 41.497 -124 | 55.52 +313 | 25.959 -46 | 81.96 +184 | 49.202 -445 | 86.76 +354 |
| 10 | 7.9 | 33.398 -75 | 49.46 +155 | 41.316 -181 | 58.36 +284 | 25.876 -83 | 83.80 +212 | 48.601 -601 | 90.08 +332 |
| 10 | 17.9 | 33.296 -102 | 50.70 +124 | 41.088 -228 | 60.83 +247 | 25.764 -112 | 85.29 +149 | 47.866 -735 | 93.06 +298 |
| 10 | 27.8 | 33.175 -121 | 51.62 +92 | 40.822 -266 | 62.91 +208 | 25.631 -133 | 86.45 +116 | 47.019 -847 | 95.66 +260 |
| 11 | 6.8 | 33.037 -138 | 52.20 +58 | 40.523 -299 | 64.53 +162 | 25.480 -151 | 87.24 +79 | 46.065 -954 | 97.82 +216 |
| 11 | 16.8 | 32.894 -143 | 52.42 +22 | 40.205 -318 | 65.62 +109 | 25.322 -158 | 87.62 +38 | 45.042 -1023 | 99.44 +162 |
| 11 | 26.8 | 32.749 -145 | 52.31 -11 | 39.876 -329 | 66.21 +59 | 25.162 -160 | 87.63 +1 | 43.971 -1071 | 100.52 +108 |
| 12 | 6.7 | 32.607 -142 | 51.83 -48 | 39.544 -332 | 66.22 +1 | 25.003 -159 | 87.22 -41 | 42.872 -1099 | 100.99 +47 |
| 12 | 16.7 | 32.477 -130 | 51.01 -82 | 39.222 -322 | 65.66 -56 | 24.856 -147 | 86.43 -79 | 41.790 -1082 | 100.82 -17 |
| 12 | 26.7 | 32.359 -118 | 49.90 -111 | 38.919 -303 | 64.57 -109 | 24.722 -134 | 85.28 -115 | 40.749 -1041 | 100.06 -76 |
| 12 | 36.6 | 32.259 -100 | 48.48 -142 | 38.642 -277 | 62.94 -163 | 24.605 -117 | 83.78 -150 | 39.779 -970 | 98.68 -138 |
| | | -76 | -162 | -234 | -207 | -91 | -175 | -851 | -192 |
| Mean Place | 32.218 | 38.11 | 40.065 | 45.07 | 24.710 | 71.77 | 46.310 | 77.86 | |
| sec δ, tan δ | +1.119 | +0.503 | +1.906 | +1.622 | +1.186 | +0.637 | +5.128 | +5.030 | |
| dα(ψ), dδ(ψ) | +0.056 | +0.37 | +0.044 | +0.37 | +0.055 | +0.37 | +0.010 | +0.37 | |
| dα(ε), dδ(ε) | -0.031 | -0.39 | -0.100 | -0.39 | -0.039 | -0.39 | -0.310 | -0.38 | |
| Dble. Trans. | August 29 | | August 29 | | August 29 | | August 29 | | |

AT UPPER TRANSIT AT GREENWICH

| No. | 1591 | | 848 | | 1592 | | 1594 | |
|--------------|------------------------------------|--------------------------------------|------------------------------------|--------------------------------------|------------------------------------|--------------------------------------|------------------------------------|--------------------------------------|
| | σ Aquarii | | α Lacertae | | β Piscis Austrini* | | Groombridge 3834 (Cephei) | |
| Mag.Spect. | 4.89 | A0 | 3.85 | A0 | 4.40 | A0 | 5.74 | A0 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | ^h ^m 22 29 | ^o ['] - 10 44 | ^h ^m 22 30 | ^o ['] + 50 12 | ^h ^m 22 30 | ^o ['] - 32 24 | ^h ^m 22 31 | ^o ['] + 76 08 |
| 1 -8.3 | ^s 53 227 - 90 | " - 50 | ^s 40 849 - 234 | 44 99 - 99 | ^s 41 622 - 115 | " + 6 | ^s 57 470 - 850 | " - 59 |
| 1 1.7 | 53 157 - 70 | 70 16 - 41 | 40 849 - 212 | 43 55 - 144 | 41 530 - 92 | 81.88 + 35 | 56 674 - 796 | 87.12 - 118 |
| 1 11.6 | 53 104 - 53 | 70 57 - 32 | 40 637 - 187 | 43 55 - 189 | 41 530 - 69 | 81.88 + 62 | 56 674 - 726 | 85.94 - 174 |
| 1 21.6 | 53 104 - 28 | 70 89 - 19 | 40 450 - 149 | 41 66 - 227 | 41 461 - 38 | 81.26 + 90 | 55 948 - 617 | 84.20 - 226 |
| 1 31.6 | 53 076 - 3 | 71 08 - 6 | 40 301 - 108 | 39 39 - 251 | 41 423 - 9 | 80 36 + 114 | 55 331 - 492 | 81.94 - 265 |
| 1 31.6 | 53 073 | 71.14 | 40 193 | 36.88 | 41 414 | 79.22 | 54 839 | 79.29 |
| 2 10.5 | 53 095 + 22 | 71 04 + 10 | 40 131 - 62 | 34.17 - 271 | 41 436 + 22 | 77.84 + 138 | 54 488 - 351 | 76.32 - 297 |
| 2 20.5 | 53 153 + 58 | 70 76 + 28 | 40 125 - 6 | 31 40 - 277 | 41 493 + 57 | 76.24 + 160 | 54 305 - 183 | 73.17 - 315 |
| 3 2.5 | 53 222 + 69 | 70 34 + 42 | 40 175 + 50 | 28.71 - 269 | 41 584 + 91 | 74 45 + 179 | 54 287 - 18 | 69.99 - 318 |
| 3 12.5 | 53 338 + 116 | 69 63 + 71 | 40 284 + 109 | 26 16 - 255 | 41 712 + 128 | 72 49 + 196 | 54 441 + 154 | 66 86 - 313 |
| 3 22.4 | 53 487 + 149 | 68 71 + 92 | 40 454 + 170 | 23 91 - 225 | 41 879 + 167 | 70 39 + 210 | 54 770 + 329 | 63 95 - 291 |
| 4 1.4 | 53 668 + 181 | 67 58 + 113 | 40 680 + 226 | 22 03 - 188 | 42 083 + 204 | 68 21 + 218 | 55 249 + 479 | 61 38 - 257 |
| 4 11.4 | 53 883 + 215 | 66 24 + 134 | 40 961 + 281 | 20 58 - 145 | 42 324 + 241 | 65 94 + 227 | 55 872 + 623 | 59 19 - 219 |
| 4 21.4 | 54 130 + 247 | 64 70 + 154 | 41 291 + 330 | 19 67 - 91 | 42 600 + 276 | 63 66 + 228 | 56 618 + 746 | 57 54 - 165 |
| 5 1.3 | 54 404 + 274 | 63 01 + 184 | 41 658 + 367 | 19 29 - 38 | 42 907 + 307 | 61 42 + 224 | 57 452 + 834 | 56 44 - 110 |
| 5 11.3 | 54 702 + 298 | 61 17 + 184 | 42 058 + 400 | 19 46 + 17 | 43 241 + 334 | 59 23 + 219 | 58 358 + 906 | 55 91 - 53 |
| 5 21.3 | 55 018 + 316 | 59 26 + 191 | 42 476 + 418 | 20 22 + 76 | 43 595 + 354 | 57 18 + 205 | 59 299 + 941 | 56 03 + 12 |
| 5 31.2 | 55 343 + 325 | 57 32 + 194 | 42 901 + 425 | 21 48 + 126 | 43 961 + 366 | 55 31 + 187 | 60 244 + 945 | 56 72 + 69 |
| 6 10.2 | 55 673 + 330 | 55 38 + 194 | 43 325 + 424 | 23 25 + 177 | 44 333 + 372 | 53 65 + 166 | 60 244 + 931 | 56 72 + 128 |
| 6 20.2 | 55 997 + 324 | 53 51 + 187 | 43 732 + 407 | 25 48 + 223 | 44 699 + 366 | 52 26 + 139 | 62 054 + 879 | 59 84 + 184 |
| 6 30.2 | 56 308 + 311 | 51 77 + 174 | 44 114 + 382 | 28 06 + 258 | 45 052 + 353 | 51 17 + 109 | 62 860 + 806 | 62 14 + 230 |
| 7 10.1 | 56 600 + 292 | 50 17 + 160 | 44 461 + 347 | 30 99 + 293 | 45 383 + 331 | 50 40 + 77 | 63 580 + 720 | 64 89 + 275 |
| 7 20.1 | 56 861 + 261 | 48 78 + 139 | 44 762 + 301 | 34 15 + 316 | 45 682 + 299 | 49 99 + 41 | 63 580 + 602 | 64 89 + 312 |
| 7 30.1 | 57 089 + 228 | 47 61 + 117 | 45 015 + 253 | 37 47 + 332 | 45 943 + 261 | 49 90 + 9 | 64 182 + 483 | 68 01 + 339 |
| 8 9.1 | 57 278 + 189 | 46 68 + 93 | 45 212 + 197 | 40 91 + 344 | 46 161 + 218 | 50 15 - 25 | 65 016 + 351 | 75 03 + 363 |
| 8 19.0 | 57 422 + 144 | 46 01 + 67 | 45 349 + 137 | 44 36 + 345 | 46 328 + 167 | 50 72 - 57 | 65 220 + 204 | 78 78 + 375 |
| 8 29.0 | 57 525 + 103 | 45 58 + 43 | 45 428 + 79 | 47 76 + 340 | 46 446 + 118 | 51 55 - 83 | 65 289 + 69 | 82 59 + 381 |
| 9 8.0 | 57 583 + 58 | 45 39 + 19 | 45 449 + 21 | 51 06 + 330 | 46 511 + 65 | 52 62 - 107 | 65 289 - 75 | 82 59 + 381 |
| 9 17.9 | 57 598 + 15 | 45 42 - 3 | 45 413 - 36 | 54 16 + 310 | 46 526 + 15 | 53 86 - 124 | 65 214 - 217 | 86 40 + 369 |
| 9 27.9 | 57 578 - 20 | 45 63 - 21 | 45 328 - 85 | 57 03 + 287 | 46 498 - 28 | 55 20 - 134 | 64 997 - 340 | 90 09 + 353 |
| 10 7.9 | 57 523 - 55 | 46 00 - 37 | 45 196 - 132 | 59 61 + 258 | 46 428 - 70 | 56 59 - 139 | 64 657 - 468 | 93 62 + 330 |
| 10 17.9 | 57 442 - 81 | 46 49 - 49 | 45 025 - 171 | 61 82 + 221 | 46 325 - 103 | 57 95 - 136 | 64 189 - 577 | 96 92 + 295 |
| 10 27.8 | 57 342 - 100 | 47 05 - 56 | 44 825 - 200 | 63 65 + 183 | 46 199 - 126 | 59 21 - 126 | 63 612 - 668 | 99 87 + 258 |
| 11 6.8 | 57 229 - 113 | 47 67 - 62 | 44 825 - 227 | 63 65 + 139 | 46 199 - 144 | 59 21 - 112 | 62 944 - 755 | 102 45 + 213 |
| 11 16.8 | 57 112 - 117 | 48 30 - 63 | 44 598 - 241 | 65 04 + 89 | 46 055 - 150 | 60 33 - 91 | 62 189 - 810 | 104 58 + 159 |
| 11 26.8 | 56 996 - 116 | 48 92 - 62 | 44 357 - 247 | 65 93 + 41 | 45 905 - 148 | 61 24 - 67 | 61 379 - 849 | 106 17 + 106 |
| 12 6.7 | 56 885 - 111 | 49 51 - 59 | 43 860 - 250 | 66 21 - 13 | 45 757 - 142 | 61 91 - 40 | 60 530 - 872 | 107 23 + 44 |
| 12 16.7 | 56 789 - 96 | 50 03 - 52 | 43 621 - 239 | 66 21 - 64 | 45 615 - 126 | 62 31 - 11 | 59 658 - 858 | 107 67 - 19 |
| 12 26.7 | 56 707 - 82 | 50 48 - 45 | 43 621 - 224 | 65 57 - 113 | 45 489 - 106 | 62 42 + 18 | 58 800 - 827 | 107 48 - 77 |
| 12 36.6 | 56 643 - 64 | 50 84 - 36 | 43 397 - 201 | 64 44 - 162 | 45 383 - 84 | 62 24 + 47 | 57 973 - 770 | 106 71 - 140 |
| | 56 643 - 41 | 50 84 - 25 | 43 196 - 169 | 62 82 - 202 | 45 299 - 56 | 61 77 + 75 | 57 203 - 676 | 105 31 - 193 |
| Mean Place | 56.006 | 50.46 | 44.005 | 46.41 | 44.466 | 55.85 | 62.193 | 84.51 |
| sec δ, tan δ | +1.018 | -0.190 | +1.563 | +1.201 | +1.185 | -0.635 | +4.179 | +4.058 |
| dα(ψ), dδ(ψ) | +0.063 | +0.37 | +0.049 | +0.37 | +0.068 | +0.37 | +0.021 | +0.37 |
| dα(ε), dδ(ε) | +0.012 | -0.38 | -0.074 | -0.38 | +0.039 | -0.38 | -0.251 | -0.37 |
| Dbie.Trans. | August 29 | | August 29 | | August 29 | | August 30 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 849 | | 850 | | 851 | | 1595 | |
|--------------|--------------|-------------|--------------|-------------|--------------|--------------|--------------|-------------|
| | υ Aquarii | | η Aquarii | | 31 Cephei | | κ Aquarii | |
| Mag. Spect. | 5.29 | F5 | 4.13 | B8 | 5.22 | F0 | 5.33 | K0 |
| U.T. | R.A. | | R.A. | | R.A. | | R.A. | |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " |
| | 22 33 | - 20 46 | 22 34 | - 0 11 | 22 35 | + 73 33 | 22 37 | - 4 17 |
| 1 -8.3 | 54.651 - 97 | 62.39 - 27 | 37.021 - 90 | 30.48 - 71 | 21.793 - 699 | 85.45 - 60 | 00.731 - 90 | 69.97 - 64 |
| 1 1.7 | 54.573 - 78 | 62.48 - 9 | 36.947 - 74 | 31.20 - 72 | 21.138 - 655 | 84.28 - 117 | 00.656 - 75 | 70.58 - 61 |
| 1 11.6 | 54.515 - 58 | 62.38 + 10 | 36.899 - 58 | 31.93 - 73 | 20.539 - 599 | 82.54 - 174 | 00.599 - 57 | 71.15 - 57 |
| 1 21.6 | 54.483 - 32 | 62.08 + 30 | 36.854 - 35 | 32.62 - 69 | 20.029 - 510 | 80.30 - 224 | 00.563 - 36 | 71.65 - 50 |
| 1 31.6 | 54.476 - 7 | 61.58 + 50 | 36.843 - 11 | 33.24 - 62 | 19.622 - 407 | 77.67 - 263 | 00.551 - 12 | 72.05 - 40 |
| 2 10.6 | 54.496 + 20 | 60.90 + 68 | 36.856 + 13 | 33.75 - 51 | 19.332 - 290 | 74.72 - 295 | 00.564 + 13 | 72.33 - 28 |
| 2 20.5 | 54.547 + 51 | 60.02 + 88 | 36.899 + 43 | 34.09 - 34 | 19.181 - 151 | 71.59 - 313 | 00.607 + 43 | 72.41 - 8 |
| 3 2.5 | 54.628 + 81 | 58.91 + 111 | 36.968 + 69 | 34.26 - 17 | 19.169 - 12 | 68.43 - 316 | 00.671 + 64 | 72.31 + 10 |
| 3 12.5 | 54.743 + 115 | 57.60 + 131 | 37.072 + 104 | 34.26 + 0 | 19.300 + 131 | 65.32 - 311 | 00.777 + 106 | 72.08 + 23 |
| 3 22.4 | 54.895 + 152 | 56.11 + 149 | 37.213 + 141 | 33.96 + 30 | 19.579 + 279 | 62.44 - 288 | 00.916 + 139 | 71.53 + 55 |
| 4 1.4 | 55.080 + 185 | 54.46 + 165 | 37.386 + 173 | 33.40 + 56 | 19.987 + 408 | 59.89 - 255 | 01.088 + 172 | 70.74 + 79 |
| 4 11.4 | 55.301 + 221 | 52.65 + 181 | 37.593 + 207 | 32.56 + 84 | 20.519 + 532 | 57.73 - 216 | 01.294 + 206 | 69.70 + 104 |
| 4 21.4 | 55.555 + 254 | 50.73 + 192 | 37.833 + 240 | 31.44 + 112 | 21.156 + 637 | 56.10 - 163 | 01.532 + 238 | 68.41 + 129 |
| 5 1.3 | 55.837 + 282 | 48.75 + 198 | 38.100 + 267 | 30.07 + 137 | 21.871 + 715 | 55.01 - 109 | 01.798 + 266 | 66.90 + 151 |
| 5 11.3 | 56.145 + 308 | 46.71 + 204 | 38.392 + 292 | 28.47 + 160 | 22.650 + 779 | 54.51 - 50 | 02.090 + 292 | 65.20 + 170 |
| 5 21.3 | 56.472 + 327 | 44.70 + 201 | 38.701 + 309 | 26.68 + 179 | 23.463 + 813 | 54.64 + 13 | 02.399 + 309 | 63.35 + 185 |
| 5 31.3 | 56.811 + 339 | 42.75 + 195 | 39.020 + 319 | 24.77 + 191 | 24.282 + 819 | 55.35 + 71 | 02.719 + 320 | 61.41 + 194 |
| 6 10.2 | 57.155 + 344 | 40.90 + 185 | 39.345 + 325 | 22.75 + 202 | 25.092 + 810 | 56.64 + 129 | 03.045 + 326 | 59.41 + 200 |
| 6 20.2 | 57.494 + 339 | 39.23 + 167 | 39.663 + 318 | 20.69 + 206 | 25.861 + 769 | 58.49 + 185 | 03.365 + 320 | 57.42 + 199 |
| 6 30.2 | 57.821 + 327 | 37.76 + 147 | 39.968 + 305 | 18.67 + 202 | 26.571 + 710 | 60.80 + 231 | 03.673 + 308 | 55.48 + 194 |
| 7 10.1 | 58.128 + 307 | 36.52 + 124 | 40.254 + 286 | 16.70 + 197 | 27.208 + 637 | 63.56 + 276 | 03.962 + 289 | 53.64 + 184 |
| 7 20.1 | 58.405 + 277 | 35.56 + 96 | 40.511 + 257 | 14.86 + 184 | 27.747 + 539 | 66.68 + 312 | 04.223 + 261 | 51.96 + 168 |
| 7 30.1 | 58.648 + 243 | 34.88 + 68 | 40.735 + 224 | 13.17 + 169 | 28.184 + 437 | 70.07 + 339 | 04.451 + 228 | 50.46 + 150 |
| 8 9.1 | 58.850 + 202 | 34.49 + 39 | 40.921 + 186 | 11.66 + 151 | 28.510 + 326 | 73.70 + 363 | 04.641 + 190 | 49.17 + 129 |
| 8 19.0 | 59.007 + 157 | 34.39 + 10 | 41.064 + 143 | 10.38 + 128 | 28.712 + 202 | 77.45 + 375 | 04.788 + 147 | 48.11 + 106 |
| 8 29.0 | 59.120 + 113 | 34.55 - 16 | 41.166 + 102 | 09.32 + 106 | 28.797 + 85 | 81.24 + 379 | 04.894 + 106 | 47.29 + 82 |
| 9 8.0 | 59.185 + 65 | 34.96 - 41 | 41.226 + 60 | 08.49 + 83 | 28.760 - 37 | 85.04 + 380 | 04.957 + 63 | 46.70 + 59 |
| 9 17.9 | 59.205 + 20 | 35.57 - 61 | 41.244 + 18 | 07.89 + 60 | 28.602 - 158 | 88.72 + 368 | 04.978 + 21 | 46.35 + 35 |
| 9 27.9 | 59.187 - 18 | 36.33 - 76 | 41.227 - 17 | 07.51 + 38 | 28.338 - 264 | 92.24 + 352 | 04.964 - 14 | 46.20 + 15 |
| 10 7.9 | 59.131 - 56 | 37.21 - 88 | 41.177 - 50 | 07.33 + 18 | 27.966 - 372 | 95.52 + 328 | 04.916 - 48 | 46.24 - 4 |
| 10 17.9 | 59.047 - 84 | 38.14 - 93 | 41.101 - 76 | 07.34 - 1 | 27.501 - 465 | 98.45 + 293 | 04.842 - 74 | 46.45 - 21 |
| 10 27.8 | 58.942 - 105 | 39.07 - 93 | 41.007 - 94 | 07.50 - 16 | 26.959 - 542 | 101.01 + 256 | 04.749 - 93 | 46.78 - 33 |
| 11 6.8 | 58.821 - 121 | 39.97 - 90 | 40.899 - 108 | 07.82 - 32 | 26.344 - 615 | 103.12 + 211 | 04.641 - 108 | 47.22 - 44 |
| 11 16.8 | 58.696 - 125 | 40.77 - 80 | 40.786 - 113 | 08.25 - 43 | 25.682 - 662 | 104.70 + 158 | 04.529 - 112 | 47.74 - 52 |
| 11 26.8 | 58.571 - 125 | 41.45 - 68 | 40.674 - 112 | 08.76 - 51 | 24.987 - 695 | 105.74 + 104 | 04.417 - 112 | 48.31 - 57 |
| 12 6.7 | 58.452 - 119 | 42.00 - 55 | 40.565 - 109 | 09.38 - 62 | 24.271 - 716 | 106.18 + 44 | 04.308 - 109 | 48.93 - 62 |
| 12 16.7 | 58.346 - 106 | 42.36 - 36 | 40.468 - 97 | 10.04 - 66 | 23.566 - 705 | 105.99 - 19 | 04.211 - 97 | 49.54 - 61 |
| 12 26.7 | 58.257 - 89 | 42.55 - 19 | 40.385 - 83 | 10.73 - 69 | 22.886 - 680 | 105.21 - 78 | 04.127 - 84 | 50.15 - 61 |
| 12 36.6 | 58.186 - 71 | 42.55 + 0 | 40.317 - 68 | 11.45 - 72 | 22.252 - 634 | 103.82 - 139 | 04.059 - 68 | 50.74 - 59 |
| | - 46 | + 20 | - 46 | - 69 | - 558 | - 191 | - 46 | - 53 |
| Mean Place | 57.427 | 39.50 | 39.776 | 14.31 | 26.140 | 82.97 | 03.462 | 52.46 |
| sec δ, tan δ | +1.070 | -0.379 | +1.000 | -0.003 | +3.536 | +3.392 | +1.003 | -0.075 |
| Δα(ψ), Δδ(ψ) | +0.065 | +0.37 | +0.061 | +0.37 | +0.029 | +0.37 | +0.062 | +0.37 |
| Δα(ε), Δδ(ε) | +0.024 | -0.37 | +0.000 | -0.36 | -0.211 | -0.36 | +0.005 | -0.35 |
| Dbie. Trans. | August 30 | | August 30 | | August 30 | | August 31 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 853 | | 852 | | 854 | | 855 | |
|--------------|-------------|------------|-------------|------------|-------------------|------------|-------------|------------|
| | 30 Cephei | | 10 Lacertae | | ε Piscis Austrini | | ζ Pegasi | |
| Name | | | | | | | | |
| Mag.Spect. | 5.21 | A2 | 4.91 | Oe5 | 4.22 | B8 | 3.61 | B8 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° / | h m | ° / | h m | ° / | h m | ° / |
| | 22 38 | + 63 30 | 22 38 | + 38 58 | 22 39 | - 27 06 | 22 40 | + 10 45 |
| 1 -8.3 | 06.643 -397 | 52.06 -73 | 36.296 -169 | 43.41 -96 | 51.942 -109 | 76.19 -14 | 44.569 -100 | 25.90 -85 |
| 1 1.7 | 06.273 -370 | 50.79 -127 | 36.144 -152 | 42.07 -134 | 51.853 -89 | 76.08 +11 | 44.484 -85 | 24.94 -96 |
| 1 11.6 | 05.937 -336 | 48.99 -180 | 36.010 -134 | 40.36 -171 | 51.784 -69 | 75.72 +36 | 44.414 -70 | 23.86 -108 |
| 1 21.6 | 05.655 -282 | 46.72 -227 | 35.905 -105 | 38.35 -201 | 51.742 -42 | 75.11 +61 | 44.366 -48 | 22.72 -114 |
| 1 31.6 | 05.433 -222 | 44.12 -260 | 35.831 -74 | 36.15 -220 | 51.726 -16 | 74.28 +83 | 44.341 -25 | 21.59 -113 |
| 2 10.6 | 05.281 -152 | 41.23 -289 | 35.792 -39 | 33.80 -235 | 51.739 +13 | 73.22 +106 | 44.341 +0 | 20.48 -111 |
| 2 20.5 | 05.213 -68 | 38.21 -302 | 35.797 +5 | 31.44 -236 | 51.783 +44 | 71.93 +129 | 44.371 +30 | 19.50 -98 |
| 3 2.5 | 05.229 +16 | 35.19 -302 | 35.844 +47 | 29.17 -227 | 51.860 +77 | 70.44 +149 | 44.432 +61 | 18.68 -82 |
| 3 12.5 | 05.333 +104 | 32.25 -294 | 35.938 +94 | 27.06 -211 | 51.971 +111 | 68.75 +169 | 44.526 +94 | 18.06 -62 |
| 3 22.4 | 05.530 +197 | 29.56 -269 | 36.083 +145 | 25.24 -182 | 52.121 +150 | 66.90 +185 | 44.658 +132 | 17.71 -35 |
| 4 1.4 | 05.808 +278 | 27.22 -234 | 36.273 +190 | 23.78 -146 | 52.306 +185 | 64.91 +199 | 44.825 +167 | 17.67 -4 |
| 4 11.4 | 06.166 +358 | 25.28 -194 | 36.510 +237 | 22.73 -105 | 52.529 +223 | 62.81 +210 | 45.029 +204 | 17.96 +29 |
| 4 21.4 | 06.595 +429 | 23.87 -141 | 36.789 +279 | 22.17 -56 | 52.787 +258 | 60.65 +216 | 45.266 +237 | 18.60 +64 |
| 5 1.3 | 07.075 +480 | 23.02 -85 | 37.102 +313 | 22.10 -7 | 53.074 +287 | 58.46 +219 | 45.532 +266 | 19.57 +97 |
| 5 11.3 | 07.602 +527 | 22.73 -29 | 37.444 +342 | 22.54 +44 | 53.390 +316 | 56.28 +218 | 45.824 +292 | 20.87 +130 |
| 5 21.3 | 08.154 +552 | 23.07 +34 | 37.807 +363 | 23.49 +95 | 53.727 +337 | 54.19 +209 | 46.134 +310 | 22.46 +159 |
| 5 31.3 | 08.714 +560 | 23.97 +90 | 38.178 +371 | 24.89 +140 | 54.076 +349 | 52.21 +198 | 46.454 +320 | 24.28 +182 |
| 6 10.2 | 09.273 +559 | 25.43 +146 | 38.551 +373 | 26.74 +185 | 54.433 +357 | 50.40 +181 | 46.780 +326 | 26.31 +203 |
| 6 20.2 | 09.807 +534 | 27.42 +199 | 38.914 +363 | 28.97 +223 | 54.786 +353 | 48.82 +158 | 47.100 +320 | 28.49 +218 |
| 6 30.2 | 10.306 +499 | 29.84 +242 | 39.258 +344 | 31.50 +253 | 55.128 +342 | 47.49 +133 | 47.407 +307 | 30.73 +224 |
| 7 10.1 | 10.759 +453 | 32.67 +283 | 39.575 +317 | 34.30 +280 | 55.450 +322 | 46.45 +104 | 47.695 +288 | 33.02 +229 |
| 7 20.1 | 11.149 +390 | 35.83 +316 | 39.855 +280 | 37.28 +298 | 55.742 +292 | 45.74 +71 | 47.953 +258 | 35.27 +225 |
| 7 30.1 | 11.473 +324 | 39.22 +339 | 40.095 +240 | 40.36 +308 | 56.000 +258 | 45.33 +41 | 48.179 +226 | 37.44 +217 |
| 8 9.1 | 11.724 +251 | 42.82 +360 | 40.289 +194 | 43.51 +315 | 56.217 +217 | 45.25 +8 | 48.367 +188 | 39.50 +206 |
| 8 19.0 | 11.892 +168 | 46.49 +367 | 40.432 +143 | 46.62 +311 | 56.386 +169 | 45.49 -24 | 48.512 +145 | 41.38 +188 |
| 8 29.0 | 11.984 +92 | 50.18 +369 | 40.527 +95 | 49.65 +303 | 56.509 +123 | 46.00 -51 | 48.616 +104 | 43.08 +170 |
| 9 8.0 | 11.996 +12 | 53.85 +367 | 40.572 +45 | 52.55 +290 | 56.583 +74 | 46.76 -76 | 48.678 +62 | 44.56 +148 |
| 9 18.0 | 11.928 -68 | 57.36 +351 | 40.568 -46 | 55.24 +269 | 56.609 +26 | 47.72 -96 | 48.698 +20 | 45.80 +124 |
| 9 27.9 | 11.792 -136 | 60.68 +332 | 40.522 -46 | 57.70 +246 | 56.593 -16 | 48.81 -109 | 48.683 -15 | 46.82 +102 |
| 10 7.9 | 11.587 -205 | 63.74 +306 | 40.436 -86 | 59.87 +217 | 56.538 -55 | 50.00 -119 | 48.635 -48 | 47.59 +77 |
| 10 17.9 | 11.324 -263 | 66.45 +271 | 40.318 -118 | 61.70 +183 | 56.452 -86 | 51.20 -120 | 48.561 -74 | 48.12 +53 |
| 10 27.8 | 11.014 -310 | 68.78 +233 | 40.176 -142 | 63.18 +148 | 56.342 -110 | 52.36 -116 | 48.468 -93 | 48.42 +30 |
| 11 6.8 | 10.661 -353 | 70.65 +187 | 40.012 -164 | 64.27 +109 | 56.214 -128 | 53.43 -107 | 48.359 -109 | 48.49 +7 |
| 11 16.8 | 10.280 -381 | 72.00 +135 | 39.837 -175 | 64.92 +65 | 56.080 -134 | 54.34 -91 | 48.359 -115 | 48.49 -15 |
| 11 26.8 | 09.881 -399 | 72.84 +84 | 39.657 -180 | 65.15 +23 | 55.945 -135 | 55.07 -73 | 48.244 -116 | 48.34 -34 |
| 12 6.7 | 09.472 -409 | 73.08 +24 | 39.475 -182 | 64.92 -23 | 55.814 -131 | 55.59 -52 | 48.014 -114 | 47.45 -55 |
| 12 16.7 | 09.072 -400 | 72.74 -34 | 39.303 -172 | 64.25 -67 | 55.697 -117 | 55.86 -27 | 47.909 -105 | 46.73 -72 |
| 12 26.7 | 08.687 -395 | 71.84 -90 | 39.141 -162 | 63.18 -107 | 55.595 -102 | 55.90 -4 | 47.816 -93 | 45.86 -87 |
| 12 36.7 | 08.331 -356 | 70.36 -148 | 38.997 -144 | 61.70 -148 | 55.513 -82 | 55.68 +22 | 47.816 -79 | 44.85 -101 |
| | -311 | -196 | -119 | -181 | -57 | +48 | -59 | -108 |
| Mean Place | 10.180 | 50.71 | 39.242 | 47.27 | 54.677 | 51.24 | 47.316 | 38.35 |
| sec δ, tan δ | +2.242 | +2.007 | +1.286 | +0.809 | +1.123 | -0.512 | +1.018 | +0.190 |
| dα(ψ), dδ(ψ) | +0.043 | +0.37 | +0.054 | +0.37 | +0.066 | +0.37 | +0.059 | +0.37 |
| dα(ε), dδ(ε) | -0.125 | -0.35 | -0.051 | -0.35 | +0.032 | -0.34 | -0.012 | -0.34 |
| Dble.Trans. | August 31 | | August 31 | | September 1 | | September 1 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 856 | | 857 | | 858 | | 1596 | | |
|--------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|------------|
| | β Gruis | | η Pegasi | | 13 Lacertae | | 45 Pegasi | | |
| Mag. Spect. | 2.24 | M3 | 3.10 | G0 | 5.24 | K0 | 6.45 | K0 | |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | |
| | h m | ° ' | h m | ° ' | h m | ° ' | h m | ° ' | |
| | 22 41 | -46 57 | 22 42 | +30 08 | 22 43 | +41 44 | 22 44 | +19 17 | |
| 1 | -8.3 | 49.130 -172 | 50.24 +39 | 19.249 -137 | 55.33 -94 | 26.286 -183 | 50.44 -90 | 45.961 -113 | 33.01 -89 |
| 1 | 1.7 | 48.985 -145 | 49.44 +80 | 19.126 -123 | 54.09 -124 | 26.119 -167 | 49.14 -130 | 45.862 -99 | 31.92 -109 |
| 1 | 11.6 | 48.869 -116 | 48.25 +119 | 19.020 -106 | 52.54 -155 | 25.971 -148 | 47.45 -169 | 45.778 -84 | 30.62 -130 |
| 1 | 21.6 | 48.789 -80 | 46.69 +156 | 18.938 -82 | 50.77 -177 | 25.851 -120 | 45.43 -202 | 45.716 -62 | 29.20 -142 |
| 1 | 31.6 | 48.747 -42 | 44.81 +188 | 18.883 -55 | 48.86 -191 | 25.764 -87 | 43.19 -224 | 45.677 -39 | 27.71 -149 |
| 2 | 10.6 | 48.744 -3 | 42.65 +216 | 18.858 -25 | 46.86 -200 | 25.712 -52 | 40.78 -241 | 45.665 -12 | 26.19 -152 |
| 2 | 20.5 | 48.786 +42 | 40.25 +240 | 18.870 +12 | 44.88 -198 | 25.706 -6 | 38.34 -244 | 45.685 +20 | 24.75 -144 |
| 3 | 2.5 | 48.870 +84 | 37.67 +258 | 18.919 +9 | 43.01 -187 | 25.745 +39 | 35.96 -238 | 45.738 +53 | 23.46 -129 |
| 3 | 12.5 | 49.000 +130 | 34.94 +273 | 19.009 +40 | 41.32 -169 | 25.834 +89 | 33.73 -223 | 45.826 +88 | 22.35 -111 |
| 3 | 22.4 | 49.179 +179 | 32.13 +281 | 19.144 +135 | 39.92 -140 | 25.975 +141 | 31.78 -195 | 45.955 +129 | 21.52 -83 |
| 4 | 1.4 | 49.401 +222 | 29.30 +283 | 19.319 +175 | 38.86 -106 | 26.164 +189 | 30.19 -159 | 46.120 +165 | 21.02 -50 |
| 4 | 11.4 | 49.671 +270 | 26.48 +282 | 19.537 +218 | 38.19 -67 | 26.403 +239 | 28.99 -120 | 46.324 +204 | 20.87 -15 |
| 4 | 21.4 | 49.983 +312 | 23.75 +273 | 19.793 +256 | 37.97 -22 | 26.686 +283 | 28.29 -20 | 46.565 +241 | 21.12 +25 |
| 5 | 1.3 | 50.332 +349 | 21.17 +258 | 20.081 +288 | 38.20 +23 | 27.005 +319 | 28.09 -20 | 46.835 +270 | 21.76 +64 |
| 5 | 11.3 | 50.717 +385 | 18.76 +241 | 20.398 +317 | 38.89 +69 | 27.356 +351 | 28.40 +31 | 47.132 +297 | 22.78 +102 |
| 5 | 21.3 | 51.127 +410 | 16.61 +215 | 20.734 +336 | 40.04 +115 | 27.728 +372 | 29.24 +84 | 47.449 +317 | 24.18 +140 |
| 5 | 31.3 | 51.553 +426 | 14.76 +185 | 21.080 +346 | 41.57 +153 | 28.110 +382 | 30.55 +131 | 47.776 +327 | 25.88 +170 |
| 6 | 10.2 | 51.989 +436 | 13.25 +151 | 21.430 +350 | 43.48 +191 | 28.495 +385 | 32.32 +177 | 48.109 +333 | 27.87 +199 |
| 6 | 20.2 | 52.422 +433 | 12.13 +112 | 21.772 +342 | 45.72 +224 | 28.869 +374 | 34.50 +250 | 48.436 +327 | 30.08 +221 |
| 6 | 30.2 | 52.841 +419 | 11.40 +73 | 22.097 +325 | 48.18 +246 | 29.224 +355 | 37.00 +260 | 48.749 +313 | 32.44 +236 |
| 7 | 10.1 | 53.238 +397 | 11.10 +30 | 22.401 +304 | 50.86 +288 | 29.553 +329 | 39.79 +279 | 49.042 +293 | 34.92 +248 |
| 7 | 20.1 | 53.598 +360 | 11.23 -13 | 22.671 +270 | 53.65 +279 | 29.844 +291 | 42.79 +300 | 49.305 +263 | 37.44 +252 |
| 7 | 30.1 | 53.916 +318 | 11.76 -53 | 22.905 +234 | 56.50 +285 | 30.094 +250 | 45.91 +312 | 49.535 +230 | 39.93 +249 |
| 8 | 9.1 | 54.183 +267 | 12.69 -93 | 23.097 +192 | 59.36 +286 | 30.297 +203 | 49.13 +322 | 49.726 +191 | 42.37 +244 |
| 8 | 19.0 | 54.391 +208 | 13.97 -128 | 23.242 +145 | 62.14 +278 | 30.448 +151 | 52.32 +319 | 49.873 +147 | 44.68 +231 |
| 8 | 29.0 | 54.540 +149 | 15.52 -155 | 23.343 +101 | 64.80 +266 | 30.549 +101 | 55.46 +314 | 49.979 +106 | 46.83 +215 |
| 9 | 8.0 | 54.626 +86 | 17.32 -180 | 23.398 +55 | 67.32 +252 | 30.598 +49 | 58.48 +302 | 50.041 +62 | 48.80 +197 |
| 9 | 18.0 | 54.649 +23 | 19.27 -195 | 23.408 +10 | 69.61 +229 | 30.597 -1 | 61.30 +282 | 50.062 +21 | 50.53 +173 |
| 9 | 27.9 | 54.617 -32 | 21.27 -200 | 23.380 -28 | 71.66 +205 | 30.553 -44 | 63.90 +260 | 50.046 -16 | 52.03 +150 |
| 10 | 7.9 | 54.530 -87 | 23.27 -200 | 23.315 -65 | 73.45 +179 | 30.467 -86 | 66.22 +232 | 49.996 -50 | 53.27 +124 |
| 10 | 17.9 | 54.400 -130 | 25.14 -187 | 23.220 -95 | 74.90 +145 | 30.346 -121 | 68.19 +197 | 49.918 -78 | 54.22 +95 |
| 10 | 27.8 | 54.236 -164 | 26.82 -168 | 23.104 -116 | 76.05 +115 | 30.199 -147 | 69.82 +163 | 49.821 -97 | 54.91 +69 |
| 11 | 6.8 | 54.045 -191 | 28.25 -143 | 22.969 -135 | 76.84 +79 | 30.029 -170 | 71.04 +122 | 49.706 -115 | 55.31 +40 |
| 11 | 16.8 | 53.842 -203 | 29.33 -108 | 22.824 -145 | 77.25 +41 | 29.846 -183 | 71.82 +78 | 49.584 -122 | 55.42 +11 |
| 11 | 26.8 | 53.637 -205 | 30.04 -71 | 22.675 -149 | 77.31 +6 | 29.656 -190 | 72.17 +35 | 49.458 -126 | 55.26 -16 |
| 12 | 6.7 | 53.435 -202 | 30.34 -30 | 22.526 -149 | 76.98 -33 | 29.462 -194 | 72.04 -13 | 49.333 -125 | 54.80 -46 |
| 12 | 16.7 | 53.251 -184 | 30.19 +15 | 22.385 -141 | 76.28 -70 | 29.277 -185 | 71.45 -59 | 49.217 -116 | 54.09 -71 |
| 12 | 26.7 | 53.089 -162 | 29.65 +54 | 22.255 -130 | 75.25 -103 | 29.101 -176 | 70.43 -102 | 49.110 -107 | 53.15 -94 |
| 12 | 36.7 | 52.952 -137 | 28.68 +97 | 22.139 -116 | 73.89 -136 | 28.942 -159 | 68.97 -146 | 49.018 -92 | 51.98 -117 |
| | | -101 | +136 | -94 | -161 | -134 | -180 | -73 | -133 |
| Mean Place | 51.961 | 19.94 | 22.095 | 61.57 | 29.250 | 53.46 | 48.723 | 42.62 | |
| sec δ, tan δ | +1.465 | -1.071 | +1.156 | +0.581 | +1.340 | +0.892 | +1.060 | +0.350 | |
| dα(ψ), dδ(ψ) | +0.071 | +0.37 | +0.056 | +0.38 | +0.053 | +0.38 | +0.058 | +0.38 | |
| dα(ε), dδ(ε) | +0.067 | -0.33 | -0.037 | -0.33 | -0.056 | -0.33 | -0.022 | -0.32 | |
| Dble. Trans. | September 1 | | September 1 | | September 2 | | September 2 | | |

APPARENT PLACES OF STARS, 1986

353

AT UPPER TRANSIT AT GREENWICH

| No. | 859 | | 1598 | | 1597 | | 860 | |
|--------------|---------------------------|-------------|--------------------------|-------------|---------------------------|-------------|---------------------------|-------------|
| Name | λ Pegasi | | B.D. - 2° 5826 (Aquarii) | | 68 Aquarii | | ε Gruis | |
| Mag.Spect. | 4.14 | K0 | 7.58 | K2 | 5.43 | G5 | 3.69 | A2 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " |
| | 22 45 | +23 29 | 22 46 | - 1 51 | 22 46 | - 19 40 | 22 47 | - 51 23 |
| 1 -8.3 | 50 024 ^s - 121 | 31.57 - 91 | 45.396 ^s - 94 | 53.04 - 67 | 47.049 ^s - 102 | 84.81 - 35 | 41.893 ^s - 202 | 48.29 - 47 |
| 1 1.7 | 49 917 - 107 | 30.42 - 115 | 45.317 - 79 | 53.71 - 67 | 46.965 - 84 | 84.97 - 16 | 41.720 - 173 | 47.38 + 91 |
| 1 11.6 | 49 826 - 91 | 29.04 - 138 | 45.253 - 64 | 54.36 - 65 | 46.898 - 67 | 84.95 + 2 | 41.577 - 103 | 46.06 + 132 |
| 1 21.6 | 49 756 - 70 | 27.48 - 156 | 45.210 - 43 | 54.95 - 59 | 46.855 - 43 | 84.72 + 23 | 41.474 - 143 | 44.32 + 174 |
| 1 31.6 | 49.711 - 45 | 25.83 - 165 | 45.188 - 22 | 55.46 - 51 | 46.835 - 20 | 84.30 + 42 | 41.413 - 61 | 42.25 + 207 |
| 2 10.6 | 49 693 - 18 | 24.12 - 171 | 45.191 + 3 | 55.86 - 40 | 46.841 + 6 | 83.68 + 62 | 41.394 - 19 | 39.88 + 237 |
| 2 20.5 | 49 709 + 16 | 22.47 - 165 | 45.222 + 31 | 56.08 - 22 | 46.878 + 37 | 82.85 + 83 | 41.424 + 30 | 37.26 + 262 |
| 3 2.5 | 49.759 + 87 | 20.95 - 152 | 45.279 + 57 | 56.08 + 0 | 46.942 + 64 | 81.82 + 103 | 41.501 + 77 | 34.47 + 279 |
| 3 12.5 | 49 846 + 50 | 19.61 - 134 | 45.370 + 91 | 56.00 + 8 | 47.041 + 99 | 80.55 + 127 | 41.629 + 128 | 31.53 + 294 |
| 3 22.4 | 49.975 + 129 | 18.55 - 106 | 45.500 + 130 | 55.59 + 41 | 47.177 + 136 | 79.08 + 147 | 41.810 + 181 | 28.52 + 301 |
| 4 1.4 | 50.142 + 167 | 17.83 - 72 | 45.662 + 162 | 54.93 + 66 | 47.348 + 171 | 77.45 + 163 | 42.039 + 229 | 25.51 + 301 |
| 4 11.4 | 50.349 + 207 | 17.47 - 36 | 45.859 + 197 | 54.00 + 93 | 47.554 + 206 | 75.65 + 180 | 42.318 + 279 | 22.53 + 298 |
| 4 21.4 | 50.594 + 245 | 17.54 + 7 | 46.090 + 231 | 52.80 + 120 | 47.796 + 242 | 73.73 + 192 | 42.646 + 328 | 19.66 + 287 |
| 5 1.3 | 50.869 + 275 | 18.01 + 47 | 46.349 + 269 | 51.37 + 143 | 48.067 + 271 | 71.71 + 202 | 43.014 + 368 | 16.97 + 269 |
| 5 11.3 | 51.172 + 303 | 18.89 + 88 | 46.636 + 287 | 49.72 + 165 | 48.366 + 299 | 69.64 + 207 | 43.421 + 407 | 14.49 + 248 |
| 5 21.3 | 51.495 + 323 | 20.19 + 130 | 46.942 + 306 | 47.89 + 183 | 48.687 + 321 | 67.57 + 207 | 43.856 + 435 | 12.30 + 219 |
| 5 31.3 | 51.828 + 333 | 21.82 + 163 | 47.260 + 318 | 45.95 + 194 | 49.020 + 333 | 65.55 + 202 | 44.310 + 454 | 10.44 + 186 |
| 6 10.2 | 52.166 + 338 | 23.77 + 195 | 47.585 + 325 | 43.92 + 203 | 49.361 + 341 | 63.62 + 193 | 44.776 + 466 | 08.94 + 150 |
| 6 20.2 | 52.498 + 332 | 25.99 + 222 | 47.906 + 321 | 41.87 + 205 | 49.700 + 339 | 61.86 + 176 | 45.240 + 464 | 07.88 + 106 |
| 6 30.2 | 52.816 + 318 | 28.39 + 240 | 48.216 + 310 | 39.86 + 201 | 50.028 + 328 | 60.28 + 158 | 45.690 + 450 | 07.23 + 65 |
| 7 10.1 | 53.113 + 297 | 30.95 + 256 | 48.509 + 293 | 37.92 + 194 | 50.339 + 311 | 58.93 + 135 | 46.118 + 428 | 07.04 + 19 |
| 7 20.1 | 53.380 + 267 | 33.58 + 263 | 48.774 + 265 | 36.12 + 180 | 50.622 + 283 | 57.86 + 107 | 46.508 + 390 | 07.30 - 26 |
| 7 30.1 | 53.612 + 232 | 36.21 + 263 | 49.008 + 234 | 34.48 + 164 | 50.872 + 250 | 57.07 + 79 | 46.854 + 346 | 07.99 - 69 |
| 8 9.1 | 53.805 + 193 | 38.82 + 261 | 49.205 + 197 | 33.04 + 144 | 51.084 + 212 | 56.57 + 50 | 47.146 + 292 | 09.09 - 110 |
| 8 19.0 | 53.953 + 148 | 41.32 + 250 | 49.361 + 156 | 31.83 + 121 | 51.251 + 167 | 56.37 + 20 | 47.374 + 228 | 10.55 - 146 |
| 8 29.0 | 54.059 + 106 | 43.67 + 235 | 49.475 + 114 | 30.84 + 99 | 51.375 + 124 | 56.44 - 7 | 47.539 + 165 | 12.30 - 175 |
| 9 8.0 | 54.120 + 61 | 45.86 + 219 | 49.547 + 72 | 30.09 + 75 | 51.453 + 78 | 56.77 - 33 | 47.636 + 97 | 14.30 - 200 |
| 9 18.0 | 54.139 + 19 | 47.82 + 196 | 49.578 + 31 | 29.58 + 51 | 51.485 + 32 | 57.32 - 55 | 47.664 + 28 | 16.44 - 214 |
| 9 27.9 | 54.121 - 18 | 49.54 + 172 | 49.572 - 6 | 29.28 + 30 | 51.479 - 6 | 58.03 - 71 | 47.631 - 33 | 18.63 - 219 |
| 10 7.9 | 54.068 - 53 | 51.00 + 146 | 49.533 - 39 | 29.19 + 9 | 51.435 - 44 | 58.88 - 85 | 47.537 - 94 | 20.80 - 217 |
| 10 17.9 | 53.986 - 82 | 52.15 + 115 | 49.467 - 66 | 29.28 - 9 | 51.361 - 74 | 59.81 - 93 | 47.394 - 143 | 22.82 - 202 |
| 10 27.8 | 53.884 - 102 | 53.02 + 87 | 49.382 - 85 | 29.50 - 22 | 51.266 - 95 | 60.75 - 94 | 47.213 - 181 | 24.64 - 182 |
| 11 6.8 | 53.764 - 120 | 53.58 + 56 | 49.280 - 102 | 29.87 - 37 | 51.266 - 113 | 61.67 - 92 | 47.000 - 213 | 26.16 - 152 |
| 11 16.8 | 53.636 - 128 | 53.81 + 23 | 49.180 - 108 | 29.87 - 47 | 51.153 - 120 | 62.52 - 85 | 47.000 - 228 | 26.16 - 114 |
| 11 26.8 | 53.504 - 132 | 53.74 - 7 | 49.062 - 110 | 30.88 - 54 | 51.033 - 122 | 63.25 - 73 | 46.772 - 234 | 27.30 - 74 |
| 12 6.7 | 53.371 - 133 | 53.34 - 40 | 48.955 - 107 | 31.48 - 60 | 50.792 - 119 | 63.86 - 61 | 46.306 - 232 | 28.33 - 29 |
| 12 16.7 | 53.247 - 124 | 52.64 - 70 | 48.856 - 99 | 32.12 - 64 | 50.684 - 108 | 64.30 - 44 | 46.092 - 214 | 28.14 + 19 |
| 12 26.7 | 53.133 - 111 | 51.67 - 97 | 48.769 - 87 | 32.77 - 65 | 50.590 - 94 | 64.56 - 26 | 45.900 - 192 | 27.51 + 63 |
| 12 36.7 | 53.032 - 80 | 50.42 - 125 | 48.695 - 74 | 33.42 - 65 | 50.512 - 78 | 64.64 - 8 | 45.735 - 165 | 26.42 + 109 |
| | | -143 | - 54 | - 61 | - 56 | + 12 | - 126 | + 151 |
| Mean Place | 52.812 | 39.80 | 48.075 | 36.36 | 49.712 | 62.24 | 44.687 | 16.95 |
| sec δ, tan δ | +1.090 | +0.435 | +1.001 | -0.032 | +1.062 | -0.358 | +1.602 | -1.252 |
| da(ψ), dδ(ψ) | +0.058 | +0.38 | +0.061 | +0.38 | +0.064 | +0.38 | +0.071 | +0.38 |
| da(ε), dδ(ε) | -0.027 | -0.32 | +0.002 | -0.31 | +0.023 | -0.31 | +0.079 | -0.31 |
| Dble.Trans. | September 2 | | September 2 | | September 2 | | September 3 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 861 | | 863 | | 862 | | 1599 | |
|---------------|--------------|------------|--------------|-------------|--------------|-------------|--------------|------------|
| | τ Aquarii | | ι Cephei | | μ Pegasi | | 69 G. Gruis | |
| Mag. Spect. | 4.21 | K5 | 3.68 | K0 | 3.67 | K0 | 5.39 | K2 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° ' | h m | ° ' | h m | ° ' | h m | ° ' |
| | 22 48 | - 13 39 | 22 49 | + 66 07 | 22 49 | + 24 31 | 22 50 | - 39 13 |
| 1 -8.3 | 50.028 - 96 | 71.32 - 47 | 08.202 - 452 | 47.00 - 54 | 18.266 - 123 | 40.65 - 89 | 13.615 - 144 | 71.55 + 10 |
| 1 1.7 | 49.947 - 81 | 71.67 - 35 | 07.775 - 427 | 46.50 - 110 | 18.156 - 110 | 39.52 - 113 | 13.493 - 122 | 71.08 + 47 |
| 1 11.6 | 49.881 - 66 | 71.89 - 22 | 07.381 - 394 | 44.85 - 165 | 18.060 - 96 | 38.13 - 139 | 13.393 - 100 | 70.27 + 81 |
| 1 21.6 | 49.838 - 43 | 71.94 - 5 | 07.041 - 340 | 42.70 - 215 | 17.986 - 74 | 36.56 - 157 | 13.323 - 70 | 69.11 +116 |
| 1 31.6 | 49.818 - 20 | 71.83 + 11 | 06.767 - 274 | 40.18 - 252 | 17.936 - 50 | 34.89 - 167 | 13.284 - 39 | 67.65 +146 |
| 2 10.6 | 49.821 + 3 | 71.56 + 27 | 06.567 - 200 | 37.35 - 283 | 17.914 - 22 | 33.15 - 174 | 13.277 - 7 | 65.92 +173 |
| 2 20.5 | 49.856 + 35 | 71.09 + 47 | 06.459 - 108 | 34.34 - 301 | 17.925 + 11 | 31.46 - 169 | 13.308 + 31 | 63.93 +199 |
| 3 2.5 | 49.914 + 58 | 70.47 + 62 | 06.444 - 15 | 31.29 - 305 | 17.971 + 46 | 29.89 - 157 | 13.376 + 68 | 61.75 +218 |
| 3 12.5 | 50.008 + 94 | 69.53 + 83 | 06.527 + 83 | 28.29 - 300 | 18.055 + 84 | 28.49 - 140 | 13.484 + 108 | 59.38 +237 |
| 3 22.5 | 50.139 + 131 | 68.40 +113 | 06.712 + 185 | 25.51 - 278 | 18.180 + 125 | 27.38 - 111 | 13.636 + 152 | 56.88 +250 |
| 4 1.4 | 50.303 + 164 | 67.08 +132 | 06.990 + 278 | 23.04 - 247 | 18.345 + 165 | 26.59 - 79 | 13.828 + 192 | 54.31 +257 |
| 4 11.4 | 50.503 + 200 | 65.55 +153 | 07.359 + 369 | 20.95 - 209 | 18.550 + 205 | 26.17 - 42 | 14.062 + 234 | 51.69 +262 |
| 4 21.4 | 50.738 + 235 | 63.85 +170 | 07.807 + 448 | 19.37 - 158 | 18.794 + 244 | 26.17 + 0 | 14.337 + 275 | 49.09 +260 |
| 5 1.3 | 51.001 + 263 | 62.01 +194 | 08.316 + 509 | 18.33 - 104 | 19.068 + 274 | 26.59 + 42 | 14.646 + 309 | 46.57 +252 |
| 5 11.3 | 51.293 + 292 | 60.06 +195 | 08.879 + 563 | 17.85 - 48 | 19.372 + 304 | 27.42 + 83 | 14.989 + 343 | 44.15 +242 |
| 5 21.3 | 51.605 + 312 | 58.05 +201 | 09.474 + 595 | 18.00 + 15 | 19.695 + 323 | 28.67 +125 | 15.356 + 367 | 41.92 +223 |
| 5 31.3 | 51.931 + 326 | 56.03 +202 | 10.081 + 607 | 18.71 + 71 | 20.030 + 335 | 30.26 +159 | 15.740 + 384 | 39.93 +199 |
| 6 10.2 | 52.264 + 333 | 54.04 +199 | 10.690 + 609 | 19.99 +128 | 20.371 + 341 | 32.19 +193 | 16.135 + 395 | 38.20 +173 |
| 6 20.2 | 52.595 + 331 | 52.15 +189 | 11.277 + 587 | 21.82 +183 | 20.705 + 334 | 34.40 +221 | 16.528 + 393 | 36.80 +140 |
| 6 30.2 | 52.915 + 320 | 50.41 +174 | 11.827 + 550 | 24.10 +228 | 21.026 + 321 | 36.79 +239 | 16.911 + 383 | 35.75 +105 |
| 7 10.2 | 53.218 + 303 | 48.84 +157 | 12.331 + 504 | 26.82 +272 | 21.327 + 301 | 39.36 +257 | 17.275 + 364 | 35.08 + 67 |
| 7 20.1 | 53.495 + 277 | 47.50 +134 | 12.769 + 438 | 29.89 +307 | 21.597 + 270 | 42.00 +264 | 17.607 + 332 | 34.82 + 26 |
| 7 30.1 | 53.739 + 244 | 46.40 +110 | 13.138 + 369 | 33.22 +333 | 21.833 + 236 | 44.66 +266 | 17.903 + 296 | 34.93 - 11 |
| 8 9.1 | 53.947 + 208 | 45.57 + 83 | 13.429 + 291 | 36.78 +356 | 22.030 + 197 | 47.30 +264 | 18.154 + 251 | 35.43 - 50 |
| 8 19.0 | 54.111 + 164 | 45.02 + 55 | 13.631 + 202 | 40.46 +368 | 22.182 + 152 | 49.84 +254 | 18.353 + 199 | 36.28 - 85 |
| 8 29.0 | 54.233 + 122 | 44.72 + 30 | 13.752 + 121 | 44.18 +372 | 22.292 + 110 | 52.25 +241 | 18.500 + 147 | 37.42 -114 |
| 9 8.0 | 54.311 + 78 | 44.68 + 4 | 13.785 + 33 | 47.90 +372 | 22.357 + 65 | 54.50 +225 | 18.591 + 91 | 38.83 -141 |
| 9 18.0 | 54.346 - 35 | 44.88 - 20 | 13.731 - 54 | 51.50 +360 | 22.379 + 22 | 56.51 +201 | 18.627 + 36 | 40.43 -160 |
| 9 27.9 | 54.343 - 3 | 45.26 - 38 | 13.602 - 129 | 54.94 +344 | 22.364 - 15 | 58.30 +179 | 18.614 - 13 | 42.12 -169 |
| 10 7.9 | 54.304 - 39 | 45.80 - 54 | 13.396 - 206 | 58.14 +320 | 22.314 - 50 | 59.82 +152 | 18.614 - 61 | 43.87 -175 |
| 10 17.9 | 54.236 - 68 | 46.45 - 65 | 13.123 - 273 | 61.01 +287 | 22.235 - 79 | 61.04 +122 | 18.454 - 99 | 45.56 -169 |
| 10 27.9 | 54.148 - 88 | 47.16 - 71 | 12.795 - 328 | 63.52 +251 | 22.134 - 101 | 61.97 + 93 | 18.325 - 129 | 47.13 -157 |
| 11 6.8 | 54.042 - 106 | 47.92 - 76 | 12.415 - 380 | 65.58 +206 | 22.015 - 119 | 62.58 + 61 | 18.172 - 153 | 48.51 -138 |
| 11 16.8 | 53.929 - 113 | 48.65 - 73 | 12.000 - 415 | 67.14 +156 | 21.887 - 128 | 62.87 + 29 | 18.007 - 165 | 49.62 -111 |
| 11 26.8 | 53.815 - 114 | 49.34 - 69 | 11.561 - 439 | 68.17 +103 | 21.754 - 133 | 62.84 - 3 | 17.839 - 168 | 50.44 - 82 |
| 12 6.7 | 53.703 - 112 | 49.97 - 63 | 11.104 - 457 | 68.62 + 45 | 21.621 - 133 | 62.47 - 37 | 17.673 - 166 | 50.92 - 48 |
| 12 16.7 | 53.600 - 103 | 50.49 - 52 | 10.652 - 452 | 68.47 - 15 | 21.494 - 127 | 61.80 - 67 | 17.520 - 153 | 51.02 - 10 |
| 12 26.7 | 53.510 - 90 | 50.90 - 41 | 10.211 - 441 | 67.75 - 72 | 21.377 - 117 | 60.85 - 95 | 17.384 - 136 | 50.77 + 25 |
| 12 36.7 | 53.435 - 75 | 51.18 - 28 | 09.797 - 414 | 66.44 - 131 | 21.273 - 104 | 59.61 - 124 | 17.269 - 115 | 50.16 + 61 |
| | 53.435 - 55 | 51.18 - 14 | 09.797 - 367 | 66.44 - 183 | 21.273 - 85 | 59.61 - 144 | 17.269 - 87 | 50.16 + 97 |
| Mean Place | 52.678 | 50.65 | 11.838 | 45.44 | 21.049 | 48.47 | 16.289 | 43.06 |
| sec δ, tan δ | +1.029 | -0.243 | +2.471 | +2.260 | +1.099 | +0.456 | +1.291 | -0.816 |
| da(ψ), dδ(ψ) | +0.063 | +0.38 | +0.043 | +0.38 | +0.057 | +0.38 | +0.068 | +0.38 |
| da(ε), dδ(ε) | +0.015 | -0.31 | -0.144 | -0.30 | -0.029 | -0.30 | +0.052 | -0.30 |
| Dbble. Trans. | September 3 | | September 3 | | September 3 | | September 3 | |

AT UPPER TRANSIT AT GREENWICH

| No. | 864 | | 865 | | 866 | | 1600 | |
|--------------|--------------------------|-------------------------|---------------------------|-------------------------|---------------------------|-------------------------|------------------------------|-------------------------|
| | λ Aquarii | | ϱ Indi | | δ Aquarii | | B.D. +36° 4956 (Lacertae) | |
| Mag.Spect. | 3.84 | M0 | 6.14 | G0 | 3.51 | A2 | 6.00 | F2 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° ′ | h m | ° ′ | h m | ° ′ | h m | ° ′ |
| | 22 51 | - 7 38 | 22 53 | - 70 08 | 22 53 | - 15 53 | 22 54 | + 36 59 |
| 1 -8.3 | 51.991 ^s - 94 | 84.73 ^o - 58 | 41.063 ^s - 473 | 80.76 ^o + 93 | 53.478 ^s - 100 | 55.58 ^o - 44 | 21.996 ^s - 163 | 72.68 ^o - 81 |
| 1 1.7 | 51.910 - 81 | 85.24 - 51 | 40.642 - 421 | 79.30 +146 | 53.394 - 84 | 55.86 - 28 | 21.846 - 150 | 71.49 - 119 |
| 1 11.6 | 51.844 - 66 | 85.68 - 33 | 40.278 - 364 | 77.32 +198 | 53.324 - 70 | 56.00 - 14 | 21.712 - 134 | 69.95 - 154 |
| 1 21.6 | 51.799 - 45 | 86.01 - 45 | 39.993 - 285 | 74.87 +245 | 53.277 - 47 | 55.96 + 4 | 21.602 - 110 | 68.11 - 184 |
| 1 31.6 | 51.775 - 24 | 86.22 - 21 | 39.789 - 204 | 72.05 +282 | 53.252 - 25 | 55.73 + 23 | 21.519 - 83 | 66.07 - 204 |
| 2 10.6 | 51.775 + 0 | 86.28 - 6 | 39.670 - 119 | 68.91 +314 | 53.251 - 1 | 55.32 + 41 | 21.468 - 51 | 63.88 - 219 |
| 2 20.5 | 51.804 + 29 | 86.15 + 13 | 39.648 - 22 | 65.53 +338 | 53.280 + 29 | 54.72 + 60 | 21.458 - 10 | 61.65 - 223 |
| 3 2.5 | 51.847 + 43 | 86.86 - 71 | 39.717 + 69 | 62.01 +352 | 53.335 + 55 | 53.92 + 80 | 21.488 + 30 | 59.50 - 215 |
| 3 12.5 | 51.945 + 98 | 85.35 + 151 | 39.881 + 164 | 58.40 +361 | 53.424 + 89 | 52.86 + 106 | 21.564 + 76 | 57.48 - 202 |
| 3 22.5 | 52.071 + 126 | 84.57 + 78 | 40.144 + 263 | 54.79 +361 | 53.551 + 127 | 51.59 +127 | 21.688 + 124 | 55.73 - 175 |
| 4 1.4 | 52.230 + 159 | 83.57 +100 | 40.494 + 350 | 51.28 +351 | 53.712 + 161 | 50.13 +146 | 21.859 + 171 | 54.31 - 142 |
| 4 11.4 | 52.424 + 194 | 82.34 +123 | 40.933 + 439 | 47.89 +339 | 53.909 + 197 | 48.49 +164 | 22.076 + 217 | 53.27 - 104 |
| 4 21.4 | 52.653 + 229 | 80.88 +146 | 41.457 + 524 | 44.73 +316 | 54.141 + 232 | 46.68 +181 | 22.338 + 262 | 52.70 - 57 |
| 5 1.3 | 52.911 + 258 | 79.23 +165 | 42.048 + 591 | 41.87 +286 | 54.403 + 262 | 44.75 +193 | 22.635 + 297 | 52.59 - 31 |
| 5 11.3 | 53.197 + 286 | 77.42 +181 | 42.707 + 659 | 39.33 +254 | 54.694 + 291 | 42.73 +202 | 22.964 + 329 | 52.97 + 88 |
| 5 21.3 | 53.504 + 307 | 75.49 +193 | 43.415 + 708 | 37.21 +212 | 55.007 + 313 | 40.67 +206 | 23.316 + 352 | 53.85 + 132 |
| 5 31.3 | 53.823 + 319 | 73.49 +200 | 44.155 + 740 | 35.53 +168 | 55.334 + 327 | 38.62 +205 | 23.680 + 364 | 55.17 + 175 |
| 6 10.2 | 54.151 + 328 | 71.47 +202 | 44.918 + 763 | 34.32 +121 | 55.670 + 336 | 36.63 +199 | 24.050 + 370 | 56.92 + 213 |
| 6 20.2 | 54.477 + 326 | 69.48 +199 | 45.678 + 760 | 33.65 + 67 | 56.003 + 333 | 34.75 +188 | 24.414 + 364 | 59.05 + 243 |
| 6 30.2 | 54.792 + 315 | 67.58 +190 | 46.418 + 740 | 33.48 + 17 | 56.328 + 325 | 33.04 +171 | 24.761 + 347 | 61.47 + 212 |
| 7 10.2 | 55.091 + 299 | 65.80 +178 | 47.124 + 706 | 33.84 - 36 | 56.636 + 308 | 31.52 +152 | 25.086 + 325 | 64.17 + 270 |
| 7 20.1 | 55.363 + 272 | 64.21 +159 | 47.769 + 645 | 34.73 - 89 | 56.918 + 282 | 30.26 +126 | 25.377 + 291 | 67.04 + 287 |
| 7 30.1 | 55.604 + 241 | 62.82 +139 | 48.341 + 572 | 36.07 -134 | 57.168 + 250 | 29.25 +101 | 25.631 + 254 | 70.03 + 299 |
| 8 9.1 | 55.809 + 205 | 61.66 +116 | 48.823 + 482 | 37.86 -179 | 57.382 + 214 | 28.51 + 74 | 25.842 + 211 | 73.08 + 305 |
| 8 19.0 | 55.972 + 163 | 60.76 + 90 | 49.197 + 374 | 40.03 -217 | 57.552 + 170 | 28.08 + 43 | 26.004 + 162 | 76.11 + 303 |
| 8 29.0 | 56.094 + 122 | 60.11 + 65 | 49.461 + 264 | 42.46 -243 | 57.680 + 128 | 27.90 + 18 | 26.120 + 116 | 79.06 + 295 |
| 9 8.0 | 56.173 + 79 | 59.70 + 41 | 49.604 + 143 | 45.13 -267 | 57.763 + 83 | 27.99 - 9 | 26.187 + 67 | 81.90 + 284 |
| 9 18.0 | 56.209 + 36 | 59.53 + 17 | 49.623 + 19 | 47.88 -275 | 57.803 + 40 | 27.99 -33 | 26.207 + 20 | 84.54 + 264 |
| 9 27.9 | 56.210 + 1 | 59.56 - 3 | 49.528 - 95 | 50.62 -274 | 57.804 + 1 | 28.32 - 50 | 26.185 - 22 | 86.97 + 243 |
| 10 7.9 | 56.175 - 35 | 59.79 - 23 | 49.318 - 210 | 53.26 -264 | 57.769 - 35 | 28.82 - 67 | 26.123 - 62 | 89.13 + 216 |
| 10 17.9 | 56.112 - 63 | 60.16 - 37 | 49.009 - 309 | 55.64 -238 | 57.704 - 65 | 30.26 - 77 | 26.028 - 95 | 90.96 + 183 |
| 10 27.9 | 56.029 - 83 | 60.63 - 47 | 48.622 - 387 | 57.71 -207 | 57.617 - 87 | 31.07 - 81 | 25.908 - 120 | 92.47 + 151 |
| 11 6.8 | 55.929 - 100 | 61.20 - 57 | 48.165 - 457 | 59.37 -166 | 57.512 - 105 | 31.91 - 84 | 25.764 - 144 | 93.60 + 113 |
| 11 16.8 | 55.821 - 108 | 61.81 - 61 | 47.668 - 497 | 60.50 -113 | 57.399 - 113 | 32.70 - 79 | 25.608 - 156 | 94.32 + 72 |
| 11 26.8 | 55.711 - 110 | 62.43 - 62 | 47.151 - 517 | 61.12 - 62 | 57.284 - 115 | 33.43 - 73 | 25.443 - 165 | 94.65 + 33 |
| 12 6.7 | 55.603 - 108 | 63.06 - 63 | 46.630 - 521 | 61.14 - 2 | 57.169 - 115 | 34.07 - 64 | 25.274 - 169 | 94.54 - 11 |
| 12 16.7 | 55.503 - 100 | 63.64 - 58 | 46.134 - 496 | 60.57 + 57 | 57.064 - 105 | 34.58 - 51 | 25.110 - 164 | 94.01 - 93 |
| 12 26.7 | 55.414 - 89 | 64.18 - 54 | 45.676 - 458 | 59.44 +113 | 56.971 - 93 | 34.95 - 37 | 24.954 - 156 | 93.08 - 53 |
| 12 36.7 | 55.339 - 75 | 64.66 - 48 | 45.269 - 407 | 57.75 +169 | 56.892 - 79 | 34.95 - 22 | 24.811 - 143 | 91.76 - 132 |
| | 55.339 - 56 | 64.66 - 38 | 45.269 - 334 | 57.75 +218 | 56.892 - 59 | 35.17 - 5 | 24.811 - 122 | 91.76 - 164 |
| Mean Place | 54.628 | 66.07 | 44.072 | 46.15 | 56.091 | 34.16 | 24.866 | 76.66 |
| sec δ, tan δ | +1.009 | -0.134 | +2.944 | -2.769 | +1.040 | -0.285 | +1.252 | +0.754 |
| dα(ψ), dδ(ψ) | +0.062 | +0.38 | +0.082 | +0.38 | +0.063 | +0.38 | +0.056 | +0.38 |
| dα(ε), dδ(ε) | +0.009 | -0.29 | +0.177 | -0.29 | +0.018 | -0.28 | -0.048 | -0.28 |
| Dble.Trans. | September 4 | | September 4 | | September 4 | | September 4 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 867 | | 868 | | 869 | | 1601 | |
|---|---|------------|---------------|------------|-----------------------|------------|-----------------------|------------|
| | α Piscis Austrini (Fomalhaut) | | ζ Gruis | | \omicron Andromedae | | π Piscis Austrini | |
| Mag.Spect. | 1.29 | A3 | 4.18 | G5 | 3.63 var. | B5, A2p | 5.13 | F0 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " |
| | 22 56 | - 29 41 | 23 00 | - 52 49 | 23 01 | + 42 14 | 23 02 | - 34 49 |
| 1 -8.3 | 51.841 -119 | 64.15 -16 | 02.728 -220 | 67.89 +38 | 14.960 -187 | 69.52 -70 | 42.590 -135 | 48.75 -8 |
| 1 1.7 | 51.740 -101 | 64.03 +12 | 02.534 -194 | 67.05 +84 | 14.785 -175 | 68.40 -112 | 42.473 -117 | 48.51 +24 |
| 1 11.6 | 51.656 -84 | 63.63 +40 | 02.368 -166 | 65.76 +129 | 14.625 -160 | 66.88 -152 | 42.374 -99 | 47.94 +57 |
| 1 21.6 | 51.598 -58 | 62.94 +69 | 02.241 -127 | 64.04 +172 | 14.489 -136 | 65.00 -188 | 42.301 -73 | 47.03 +91 |
| 1 31.6 | 51.565 -33 | 61.99 +95 | 02.155 -86 | 61.97 +207 | 14.383 -106 | 62.88 -212 | 42.254 -47 | 45.84 +119 |
| 2 10.6 | 51.559 -6 | 60.79 +120 | 02.111 -44 | 59.57 +240 | 14.310 -73 | 60.57 -231 | 42.236 -18 | 44.36 +148 |
| 2 20.5 | 51.586 +27 | 59.34 +145 | 02.118 +7 | 56.89 +268 | 14.282 -28 | 58.18 -239 | 42.253 +17 | 42.62 +174 |
| 3 2.5 | 51.645 +59 | 57.68 +166 | 02.173 +55 | 54.03 +286 | 14.298 +16 | 55.82 -236 | 42.304 +51 | 40.67 +195 |
| 3 12.5 | 51.740 +95 | 55.81 +187 | 02.279 +106 | 51.00 +303 | 14.363 +65 | 53.58 -224 | 42.392 +88 | 38.51 +216 |
| 3 22.5 | 51.874 +134 | 53.77 +204 | 02.441 +162 | 47.89 +311 | 14.483 +120 | 51.58 -200 | 42.522 +130 | 36.19 +232 |
| 4 1.4 | 52.045 +171 | 51.60 +217 | 02.654 +213 | 44.77 +312 | 14.653 +170 | 49.90 -168 | 42.691 +169 | 33.76 +243 |
| 4 11.4 | 52.256 +211 | 49.32 +228 | 02.920 +266 | 41.67 +310 | 14.874 +221 | 48.59 -131 | 42.902 +211 | 31.24 +252 |
| 4 21.4 | 52.504 +248 | 46.99 +233 | 03.238 +318 | 38.68 +299 | 15.144 +270 | 47.76 -83 | 43.153 +251 | 28.70 +254 |
| 5 1.3 | 52.785 +281 | 44.65 +234 | 03.599 +361 | 35.86 +282 | 15.452 +308 | 47.40 -36 | 43.439 +286 | 26.18 +252 |
| 5 11.3 | 53.097 +312 | 42.33 +232 | 04.002 +403 | 33.24 +262 | 15.796 +344 | 47.55 +15 | 43.758 +319 | 23.73 +245 |
| 5 21.3 | 53.434 +337 | 40.11 +222 | 04.439 +437 | 30.93 +231 | 16.166 +370 | 48.22 +67 | 44.104 +346 | 21.42 +231 |
| 5 31.3 | 53.785 +351 | 38.04 +207 | 04.897 +458 | 28.94 +199 | 16.549 +383 | 49.37 +115 | 44.468 +364 | 19.30 +212 |
| 6 10.2 | 54.148 +363 | 36.15 +189 | 05.371 +474 | 27.32 +162 | 16.939 +390 | 50.97 +160 | 44.844 +376 | 17.40 +190 |
| 6 20.2 | 54.509 +361 | 34.51 +164 | 05.845 +474 | 26.15 +117 | 17.323 +384 | 53.01 +204 | 45.221 +377 | 15.81 +159 |
| 6 30.2 | 54.862 +353 | 33.15 +136 | 06.309 +464 | 25.40 +75 | 17.691 +368 | 55.38 +237 | 45.589 +368 | 14.52 +129 |
| 7 10.2 | 55.198 +336 | 32.10 +105 | 06.754 +445 | 25.13 +27 | 18.036 +345 | 58.06 +268 | 45.943 +354 | 13.59 +93 |
| 7 20.1 | 55.505 +307 | 31.40 +70 | 07.163 +409 | 25.33 -20 | 18.345 +309 | 60.97 +291 | 46.268 +325 | 13.05 +54 |
| 7 30.1 | 55.780 +275 | 31.04 +36 | 07.529 +366 | 25.96 -63 | 18.616 +271 | 64.03 +306 | 46.559 +291 | 12.87 +18 |
| 8 9.1 | 56.015 +235 | 31.03 +31 | 07.842 +313 | 27.04 -108 | 18.842 +226 | 67.20 +317 | 46.811 +252 | 13.08 -21 |
| 8 19.0 | 56.203 +188 | 31.36 -3 | 08.091 +249 | 28.50 -146 | 19.017 +175 | 70.38 +318 | 47.013 +202 | 13.64 -56 |
| 8 29.0 | 56.345 +142 | 31.99 -63 | 08.277 +186 | 30.26 -176 | 19.143 +126 | 73.53 +315 | 47.168 +155 | 14.51 -87 |
| 9 8.0 | 56.437 +92 | 32.89 -90 | 08.393 +116 | 32.30 -204 | 19.218 +75 | 76.59 +306 | 47.270 +102 | 15.67 -116 |
| 9 18.0 | 56.480 +43 | 34.00 -111 | 08.438 +45 | 34.50 -220 | 19.242 +24 | 79.47 +288 | 47.320 +50 | 17.04 -137 |
| 9 27.9 | 56.480 +0 | 35.26 -126 | 08.419 -19 | 36.78 -228 | 19.223 -19 | 82.15 +268 | 47.324 +4 | 18.56 -152 |
| 10 7.9 | 56.438 -42 | 36.62 -136 | 08.337 -82 | 39.05 -227 | 19.160 -63 | 84.58 +243 | 47.283 -41 | 20.16 -160 |
| 10 17.9 | 56.361 -77 | 38.00 -138 | 08.202 -135 | 41.19 -214 | 19.060 -100 | 86.68 +210 | 47.204 -79 | 21.75 -159 |
| 10 27.9 | 56.259 -102 | 39.32 -132 | 08.024 -178 | 43.13 -194 | 18.931 -129 | 88.46 +178 | 47.096 -108 | 23.27 -152 |
| 11 6.8 | 56.136 -123 | 40.56 -124 | 07.810 -214 | 44.78 -165 | 18.776 -155 | 89.84 +138 | 46.964 -132 | 24.65 -138 |
| 11 16.8 | 56.002 -134 | 41.61 -105 | 07.577 -233 | 46.05 -127 | 18.604 -172 | 90.80 +96 | 46.819 -145 | 25.81 -116 |
| 11 26.8 | 55.864 -138 | 42.45 -84 | 07.333 -244 | 46.92 -87 | 18.422 -182 | 91.33 +53 | 46.669 -150 | 26.72 -91 |
| 12 6.7 | 55.728 -136 | 43.06 -61 | 07.089 -244 | 47.32 -40 | 18.232 -190 | 91.39 +6 | 46.518 -151 | 27.33 -61 |
| 12 16.7 | 55.602 -126 | 43.38 -32 | 06.858 -231 | 47.23 +9 | 18.045 -187 | 90.99 -40 | 46.377 -141 | 27.61 -28 |
| 12 26.7 | 55.490 -112 | 43.43 -5 | 06.646 -212 | 46.67 +56 | 17.864 -181 | 90.16 -83 | 46.249 -128 | 27.57 +4 |
| 12 36.7 | 55.394 -96 | 43.19 +24 | 06.460 -186 | 45.64 +103 | 17.695 -169 | 88.88 -128 | 46.137 -112 | 27.18 +39 |
| | | | | | | | | |
| Mean Place | 54.450 | 38.39 | 05.333 | 36.08 | 17.868 | 71.89 | 45.126 | 21.37 |
| sec δ , tan δ | +1.151 | -0.570 | +1.655 | -1.319 | +1.351 | +0.908 | +1.218 | -0.696 |
| $d\alpha(\psi)$, $d\delta(\psi)$ | +0.065 | +0.38 | +0.070 | +0.38 | +0.055 | +0.38 | +0.066 | +0.39 |
| $d\alpha(\epsilon)$, $d\delta(\epsilon)$ | +0.037 | -0.27 | +0.085 | -0.26 | -0.059 | -0.25 | +0.045 | -0.25 |
| Dble.Trans. | September 5 | | September 6 | | September 6 | | September 6 | |

AT UPPER TRANSIT AT GREENWICH

| No. | 870 | | 1602 | | 871 | | 1603 | |
|--------------|--------------|-------------|--------------|-------------|--------------|-------------|--------------|-------------|
| | β Pegasi | | β Piscium | | α Pegasi | | 55 Pegasi | |
| Mag.Spect. | 2.61 var. | M0 | 4.58 | B5p | 2.57 | A0 | 4.69 | M0 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° ' | h m | ° ' | h m | ° ' | h m | ° ' |
| | 23 03 | + 28 00 | 23 03 | + 3 44 | 23 04 | + 15 07 | 23 06 | + 9 19 |
| 1 -8.3 | 04 362 - 133 | 27 44 - 77 | 08 781 - 99 | 35 47 - 71 | 02 616 - 109 | 46 22 - 77 | 16 829 - 103 | 58 42 - 75 |
| 1 1.7 | 04 239 - 123 | 26 37 - 107 | 08 694 - 87 | 34 71 - 76 | 02 518 - 98 | 45 28 - 94 | 16 737 - 92 | 57 58 - 84 |
| 1 11.7 | 04 128 - 111 | 25 03 - 134 | 08 618 - 58 | 33 91 - 80 | 02 431 - 87 | 44 18 - 110 | 16 655 - 82 | 56 63 - 95 |
| 1 21.6 | 04.037 - 91 | 23 46 - 157 | 08 560 - 58 | 33 12 - 79 | 02 362 - 69 | 42 99 - 119 | 16 591 - 64 | 55 64 - 99 |
| 1 31.6 | 03 970 - 67 | 21.74 - 172 | 08 523 - 37 | 32.37 - 75 | 02 314 - 48 | 41.75 - 124 | 16 547 - 44 | 54 66 - 98 |
| 2 10.6 | 03 929 - 41 | 19 93 - 181 | 08 507 - 16 | 31.70 - 67 | 02 289 - 25 | 40 50 - 125 | 16 525 - 22 | 53 70 - 96 |
| 2 20.5 | 03 922 - 7 | 18 12 - 181 | 08 520 + 13 | 31.16 - 54 | 02 294 + 5 | 39 33 - 117 | 16 531 + 6 | 52 85 - 85 |
| 3 2.5 | 03 950 + 28 | 16 41 - 171 | 08 561 + 41 | 30 81 - 35 | 02 329 + 35 | 38 30 - 103 | 16 567 + 36 | 52 16 - 69 |
| 3 12.5 | 04 018 + 68 | 14 84 - 157 | 08 632 + 71 | 30 63 - 18 | 02 399 + 70 | 37 45 - 85 | 16 635 + 68 | 51 66 - 50 |
| 3 22.5 | 04.130 + 112 | 13 54 - 130 | 08 743 + 111 | 30.69 + 6 | 02 508 + 109 | 36.85 - 60 | 16 741 + 106 | 51.40 - 26 |
| 4 1.4 | 04 283 + 153 | 12 55 - 99 | 08 889 + 146 | 31.04 + 35 | 02 654 + 146 | 36 55 - 30 | 16 885 + 144 | 51 42 + 2 |
| 4 11.4 | 04 480 + 197 | 11 91 - 64 | 09 072 + 183 | 31.68 + 64 | 02 840 + 186 | 36 57 + 2 | 17 066 + 181 | 51 75 + 33 |
| 4 21.4 | 04 717 + 237 | 11 70 - 21 | 09 290 + 218 | 32 63 + 95 | 03 063 + 223 | 36 97 + 40 | 17 284 + 218 | 52 43 + 68 |
| 5 1.4 | 04 989 + 272 | 11 91 + 21 | 09 540 + 250 | 33 84 + 121 | 03 317 + 254 | 37 71 + 74 | 17 533 + 249 | 53 41 + 98 |
| 5 11.3 | 05 292 + 303 | 12 55 + 64 | 09 818 + 278 | 35 32 + 148 | 03 602 + 285 | 38 81 + 110 | 17 812 + 279 | 54 70 + 129 |
| 5 21.3 | 05 618 + 326 | 13 63 + 108 | 10 119 + 301 | 37 03 + 171 | 03 909 + 307 | 40 23 + 142 | 18 114 + 302 | 56 27 + 157 |
| 5 31.3 | 05 958 + 340 | 15 09 + 146 | 10 434 + 315 | 38 91 + 188 | 04 230 + 321 | 41 93 + 170 | 18 430 + 316 | 58 06 + 179 |
| 6 10.2 | 06 306 + 348 | 16 91 + 182 | 10 758 + 324 | 40 94 + 203 | 04 560 + 330 | 43 89 + 196 | 18 756 + 326 | 60 05 + 199 |
| 6 20.2 | 06 651 + 345 | 19 04 + 213 | 11 081 + 323 | 43 05 + 211 | 04 887 + 327 | 46 03 + 214 | 19 080 + 324 | 62 19 + 214 |
| 6 30.2 | 06 983 + 332 | 21 40 + 236 | 11 395 + 314 | 45 18 + 213 | 05 204 + 317 | 48 30 + 227 | 19 396 + 316 | 64 39 + 220 |
| 7 10.2 | 07 297 + 314 | 23 96 + 256 | 11 693 + 298 | 47 29 + 211 | 05 506 + 302 | 50 66 + 236 | 19 696 + 300 | 66 62 + 223 |
| 7 20.1 | 07 581 + 284 | 26 64 + 268 | 11 966 + 273 | 49 31 + 202 | 05 780 + 274 | 53 02 + 236 | 19 970 + 274 | 68 83 + 221 |
| 7 30.1 | 07 832 + 251 | 29 38 + 274 | 12 210 + 244 | 51 21 + 190 | 06 024 + 244 | 55 35 + 233 | 20 215 + 245 | 70 94 + 211 |
| 8 9.1 | 08 044 + 212 | 32 13 + 275 | 12 418 + 208 | 52 96 + 175 | 06 232 + 208 | 57 60 + 225 | 20 425 + 210 | 72 95 + 201 |
| 8 19.1 | 08 212 + 168 | 34 82 + 269 | 12 586 + 168 | 54 50 + 154 | 06 399 + 167 | 59 71 + 211 | 20 594 + 169 | 74 77 + 182 |
| 8 29.0 | 08 338 + 126 | 37 39 + 257 | 12 714 + 128 | 55 83 + 133 | 06 525 + 126 | 61 66 + 195 | 20 724 + 130 | 76 41 + 164 |
| 9 8.0 | 08 418 + 80 | 39 83 + 244 | 12 801 + 87 | 56 93 + 110 | 06 609 + 84 | 63 42 + 176 | 20 812 + 88 | 77 85 + 144 |
| 9 18.0 | 08 455 + 37 | 42 06 + 223 | 12 846 + 45 | 57 79 + 86 | 06 652 + 43 | 64 94 + 152 | 20 859 + 47 | 79 04 + 119 |
| 9 27.9 | 08 453 - 2 | 44 06 + 200 | 12 856 + 10 | 58 43 + 64 | 06 659 + 7 | 66 24 + 130 | 20 870 + 11 | 80 01 + 97 |
| 10 7.9 | 08 415 - 38 | 45 81 + 175 | 12 831 - 25 | 58 84 + 41 | 06 631 - 28 | 67 29 + 105 | 20 847 - 23 | 80 74 + 73 |
| 10 17.9 | 08 345 - 70 | 47 26 + 145 | 12 779 - 52 | 59 04 + 20 | 06 574 - 57 | 68 08 + 79 | 20 795 - 52 | 81 23 + 49 |
| 10 27.9 | 08 252 - 93 | 48 42 + 116 | 12 705 - 74 | 59 07 + 3 | 06 496 - 78 | 68 64 + 56 | 20 722 - 73 | 81 52 + 29 |
| 11 6.8 | 08 137 - 115 | 49 25 + 83 | 12 613 - 92 | 58 91 - 16 | 06 399 - 97 | 68 93 + 29 | 20 631 - 91 | 81 59 + 7 |
| 11 16.8 | 08 011 - 126 | 49 74 + 49 | 12 512 - 101 | 58 60 - 31 | 06 291 - 108 | 68 98 + 5 | 20 529 - 102 | 81 46 - 13 |
| 11 26.8 | 07 877 - 134 | 49 89 + 15 | 12 406 - 106 | 58 17 - 43 | 06 179 - 112 | 68 81 - 17 | 20 422 - 107 | 81 15 - 31 |
| 12 6.8 | 07 738 - 139 | 49 69 - 20 | 12 299 - 107 | 57 61 - 56 | 06 063 - 116 | 68 38 - 43 | 20 312 - 110 | 80 66 - 49 |
| 12 16.7 | 07 604 - 134 | 49 14 - 55 | 12 198 - 101 | 56 97 - 64 | 05 952 - 111 | 67 76 - 62 | 20 207 - 105 | 80 03 - 63 |
| 12 26.7 | 07 476 - 128 | 48 28 - 86 | 12 104 - 94 | 56 25 - 72 | 05 849 - 103 | 66 94 - 82 | 20 110 - 97 | 79 27 - 76 |
| 12 36.7 | 07 358 - 118 | 47 11 - 117 | 12 022 - 82 | 55 48 - 77 | 05 755 - 94 | 65 94 - 100 | 20 022 - 88 | 78 38 - 89 |
| | 07 115 - 100 | 47 11 - 142 | 12 022 - 67 | 55 48 - 78 | 05 755 - 77 | 65 94 - 112 | 20 022 - 73 | 78 38 - 94 |
| Mean Place | 07.115 | 33.93 | 11.384 | 50.03 | 05.272 | 56.81 | 19.440 | 70.98 |
| sec δ, tan δ | +1.133 | +0.532 | +1.002 | +0.065 | +1.036 | +0.270 | +1.013 | +0.164 |
| da(ψ), dδ(ψ) | +0.058 | +0.39 | +0.061 | +0.39 | +0.059 | +0.39 | +0.060 | +0.39 |
| da(ε), dδ(ε) | -0.034 | -0.25 | -0.004 | -0.25 | -0.017 | -0.24 | -0.011 | -0.23 |
| Dble.Trans. | September 7 | | September 7 | | September 7 | | September 7 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 1604 | | 873 | | 1605 | | 1606 | | |
|--------------|--------------|---------|-------------|---------|-------------|---------|-------------|---------|-------|
| | 5 Andromedae | | 88 Aquarii | | ♄ Gruis | | 59 Pegasi | | |
| Mag.Spect. | 5.83 | F0 | 3.80 | K0 | 4.10 | K0 | 5.15 | A3 | |
| U.T. | R.A. | | R.A. | | R.A. | | R.A. | | |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " | |
| | 23 07 | + 49 12 | 23 08 | - 21 14 | 23 09 | - 45 19 | 23 11 | + 8 38 | |
| 1 | -8.3 | 05 42.0 | 79 07 | 41 20.0 | 68 03 | 33 47.7 | 41 83 | 00 69.4 | 35 31 |
| 1 | 1.7 | 05 20.2 | 78 04 | 41 10.4 | 68 21 | 33 31.9 | 41 31 | 00 60.1 | 34 50 |
| 1 | 11.7 | 04 99.9 | 76 55 | 41 02.2 | 68 19 | 33 18.2 | 40 39 | 00 51.8 | 33 58 |
| 1 | 21.6 | 04 82.3 | 74 65 | 40 96.0 | 67 93 | 33 07.5 | 39 06 | 00 45.2 | 32 63 |
| 1 | 31.6 | 04 68.0 | 72 46 | 40 91.9 | 67 44 | 33 00.0 | 37 38 | 00 40.5 | 31 69 |
| 2 | 10.6 | 04 57.6 | 70 00 | 40 90.2 | 66 74 | 32 95.9 | 35 38 | 00 37.9 | 30 78 |
| 2 | 20.5 | 04 52.3 | 67 43 | 40 91.5 | 65 80 | 32 95.9 | 33 09 | 00 38.2 | 29 99 |
| 3 | 2.5 | 04 52.1 | 64 85 | 40 95.6 | 64 65 | 32 99.9 | 30 59 | 00 41.3 | 29 35 |
| 3 | 12.5 | 04 57.7 | 62 34 | 41 03.0 | 63 27 | 33 08.3 | 27 89 | 00 47.6 | 28 89 |
| 3 | 22.5 | 04 69.4 | 60 05 | 41 14.3 | 61 66 | 33 21.6 | 25 05 | 00 57.8 | 28 67 |
| 4 | 1.4 | 04 87.0 | 58 06 | 41 29.1 | 59 89 | 33 39.3 | 22 16 | 00 71.6 | 28 73 |
| 4 | 11.4 | 05 10.5 | 56 44 | 41 47.8 | 57 95 | 33 61.9 | 19 22 | 00 89.3 | 29 10 |
| 4 | 21.4 | 05 39.5 | 55 29 | 41 70.2 | 55 88 | 33 89.1 | 16 34 | 01 10.8 | 29 80 |
| 5 | 1.4 | 05 72.9 | 54 63 | 41 95.9 | 53 72 | 34 20.2 | 13 55 | 01 35.3 | 30 80 |
| 5 | 11.3 | 06 10.4 | 54 49 | 42 24.7 | 51 51 | 34 55.4 | 10 91 | 01 63.0 | 32 11 |
| 5 | 21.3 | 06 50.7 | 54 92 | 42 56.0 | 49 31 | 34 93.6 | 08 50 | 01 93.0 | 33 69 |
| 5 | 31.3 | 06 92.6 | 55 84 | 42 89.0 | 47 17 | 35 34.0 | 06 35 | 02 24.4 | 35 49 |
| 6 | 10.2 | 07 35.4 | 57 27 | 43 23.2 | 45 12 | 35 76.0 | 04 52 | 02 57.0 | 37 48 |
| 6 | 20.2 | 07 77.4 | 59 18 | 43 57.5 | 43 25 | 36 18.2 | 03 07 | 02 89.4 | 39 60 |
| 6 | 30.2 | 08 17.7 | 61 47 | 43 91.2 | 41 58 | 36 59.8 | 02 01 | 03 21.1 | 41 79 |
| 7 | 10.2 | 08 55.6 | 64 12 | 44 23.5 | 40 16 | 36 99.8 | 01 38 | 03 51.3 | 44 01 |
| 7 | 20.1 | 08 89.6 | 67 06 | 44 53.2 | 39 03 | 37 36.8 | 01 20 | 03 79.0 | 46 19 |
| 7 | 30.1 | 09 19.3 | 70 19 | 44 80.0 | 38 20 | 37 70.2 | 01 43 | 04 03.8 | 48 28 |
| 8 | 9.1 | 09 44.2 | 73 49 | 45 03.3 | 37 68 | 37 99.2 | 02 10 | 04 25.2 | 50 26 |
| 8 | 19.1 | 09 63.5 | 76 85 | 45 22.2 | 37 49 | 38 22.6 | 03 16 | 04 42.5 | 52 05 |
| 8 | 29.0 | 09 77.4 | 80 21 | 45 36.9 | 37 58 | 38 40.7 | 04 54 | 04 56.0 | 53 66 |
| 9 | 8.0 | 09 85.7 | 83 53 | 45 47.0 | 37 96 | 38 52.7 | 06 22 | 04 65.3 | 55 06 |
| 9 | 18.0 | 09 88.3 | 86 70 | 45 52.6 | 38 59 | 38 58.6 | 08 11 | 04 70.4 | 56 21 |
| 9 | 27.9 | 09 86.1 | 89 68 | 45 54.1 | 39 40 | 38 59.1 | 10 11 | 04 72.0 | 57 14 |
| 10 | 7.9 | 09 78.9 | 92 44 | 45 51.8 | 40 36 | 38 54.2 | 12 17 | 04 70.2 | 57 84 |
| 10 | 17.9 | 09 67.5 | 94 87 | 45 46.2 | 41 41 | 38 44.6 | 14 16 | 04 65.5 | 58 31 |
| 10 | 27.9 | 09 52.6 | 96 96 | 45 38.2 | 42 48 | 38 31.3 | 16 01 | 04 58.6 | 58 57 |
| 11 | 6.8 | 09 34.6 | 98 66 | 45 28.0 | 43 54 | 38 15.0 | 17 65 | 04 49.8 | 58 61 |
| 11 | 16.8 | 09 14.4 | 99 91 | 45 16.7 | 44 50 | 37 96.8 | 18 98 | 04 39.8 | 58 47 |
| 11 | 26.8 | 08 92.7 | 100.70 | 45 04.9 | 45 35 | 37 77.7 | 19 97 | 04 29.3 | 58 16 |
| 12 | 6.8 | 08 69.9 | 100 98 | 44 92.9 | 46 06 | 37 58.3 | 20 56 | 04 18.5 | 57 67 |
| 12 | 16.7 | 08 47.1 | 100 76 | 44 81.6 | 46 56 | 37 39.8 | 20 72 | 04 08.1 | 57 04 |
| 12 | 26.7 | 08 24.8 | 100 05 | 44 71.2 | 46 87 | 37 22.6 | 20 47 | 03 98.3 | 56 30 |
| 12 | 36.7 | 08 03.6 | 98 85 | 44 62.1 | 46 97 | 37 07.4 | 19 78 | 03 89.4 | 55 45 |
| Mean Place | 08.432 | 79.62 | 43.692 | 44.89 | 35.938 | 11.70 | 03.277 | 48.03 | |
| sec δ, tan δ | +1.531 | +1.159 | +1.073 | -0.389 | +1.422 | -1.011 | +1.011 | +0.152 | |
| dα(ψ), dδ(ψ) | +0.054 | +0.39 | +0.063 | +0.39 | +0.067 | +0.39 | +0.060 | +0.39 | |
| dα(ε), dδ(ε) | -0.075 | -0.23 | +0.025 | -0.22 | +0.066 | -0.22 | -0.010 | -0.21 | |
| Dble.Trans. | September 8 | | September 8 | | September 8 | | September 9 | | |

APPARENT PLACES OF STARS, 1986

359

AT UPPER TRANSIT AT GREENWICH

| No. | 875 | | 1607 | | 1608 | | 876 | |
|--------------|-------------------------------|-------------|--------------------------|-------------|--------------------------|-------------|---------------------------|-------------|
| | Bradley 3077 (Cassiopeiae) | | φ Aquarii | | ψ ¹ Aquarii | | 25 G. Tucanae | |
| Mag. Spect. | 5.65 | K2 | 4.40 | M0 | 4.48 | K0 | 5.69 | G0 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " |
| | 23 12 | + 57 05 | 23 13 | - 6 07 | 23 15 | - 9 09 | 23 16 | - 62 04 |
| 1 -8.3 | 34.396 ^s - 296 | 38 59 - 39 | 34 920 ^s - 99 | " - 62 | 08 600 ^s - 99 | " - 59 | 07 090 ^s - 328 | " + 43 |
| 1 1.7 | 34 113 - 283 | 37 69 - 90 | 34 832 - 88 | 37 24 - 56 | 08 511 - 89 | 60 05 - 49 | 06 791 - 299 | 63 62 + 96 |
| 1 11.7 | 33 846 - 267 | 36 27 - 142 | 34 754 - 78 | 37 74 - 50 | 08 433 - 78 | 60 54 - 40 | 06 525 - 266 | 62 66 + 147 |
| 1 21.6 | 33 611 - 235 | 34 37 - 190 | 34 693 - 61 | 37 74 - 39 | 08 433 - 61 | 60 94 - 26 | 06 525 - 219 | 61.19 + 197 |
| 1 31.6 | 33 418 - 193 | 32 13 - 224 | 34 652 - 41 | 38 13 - 28 | 08 372 - 42 | 61 20 - 12 | 06 306 - 167 | 59.22 + 236 |
| 2 10.6 | 33 271 - 147 | 29 57 - 256 | 34 631 - 21 | 38 41 - 13 | 08 330 - 20 | 61 32 - 12 | 06 139 - 113 | 56.86 + 273 |
| 2 20.5 | 33 187 - 84 | 26 84 - 273 | 34 637 + 6 | 38 54 + 5 | 08 310 + 6 | 61.29 + 3 | 06 026 - 48 | 54.13 + 303 |
| 3 2.5 | 33 167 + 20 | 24 06 - 278 | 34 637 + 38 | 38 49 + 24 | 08 316 + 38 | 61.05 + 24 | 05 978 - 82 | 51.10 + 323 |
| 3 12.5 | 33 218 + 51 | 21 30 - 276 | 34 675 + 55 | 38 25 + 37 | 08 354 + 58 | 60.65 + 61 | 05 993 + 15 | 47.87 + 339 |
| 3 22.5 | 33 344 + 126 | 18 73 - 257 | 34 730 + 105 | 37 88 + 74 | 08 412 + 103 | 60.04 + 93 | 06 075 + 154 | 44.48 + 347 |
| 4 1.4 | 33 542 + 198 | 16 45 - 228 | 34 973 + 138 | 36 21 + 93 | 08 653 + 138 | 57 99 + 112 | 06 450 + 221 | 37.55 + 346 |
| 4 11.4 | 33 810 + 268 | 14 52 - 193 | 35 147 + 174 | 35 04 + 117 | 08 827 + 174 | 56 65 + 134 | 06 739 + 289 | 34.13 + 342 |
| 4 21.4 | 34 145 + 335 | 13 06 - 146 | 35 358 + 211 | 33 63 + 141 | 09 039 + 212 | 55 09 + 156 | 07 097 + 358 | 30.86 + 327 |
| 5 1.4 | 34 533 + 388 | 12 10 - 96 | 35 601 + 243 | 32 02 + 161 | 09 282 + 243 | 53 35 + 174 | 07 511 + 414 | 27.81 + 305 |
| 5 11.3 | 34 969 + 436 | 11 67 - 43 | 35 874 + 273 | 30 23 + 179 | 09 557 + 275 | 51 45 + 190 | 07 981 + 470 | 25.00 + 281 |
| 5 21.3 | 35 438 + 469 | 11 83 + 16 | 36 172 + 298 | 28 29 + 194 | 09 856 + 299 | 49 45 + 200 | 08 497 + 516 | 22.55 + 245 |
| 5 31.3 | 35 926 + 488 | 12 52 + 69 | 36 486 + 314 | 26 28 + 201 | 10 172 + 316 | 47 39 + 206 | 09 044 + 547 | 20.47 + 208 |
| 6 10.2 | 36 423 + 497 | 13 75 + 123 | 36 811 + 325 | 24 21 + 207 | 10 499 + 327 | 45 30 + 209 | 09 617 + 573 | 18.82 + 165 |
| 6 20.2 | 36 912 + 489 | 15 51 + 176 | 37 138 + 327 | 22 16 + 205 | 10 829 + 330 | 43 27 + 203 | 10 195 + 578 | 17.66 + 116 |
| 6 30.2 | 37 381 + 469 | 17 69 + 218 | 37 457 + 319 | 20 18 + 198 | 11 151 + 322 | 41 33 + 194 | 10 767 + 572 | 16.98 + 68 |
| 7 10.2 | 37 821 + 440 | 20 29 + 260 | 37 764 + 307 | 18 31 + 187 | 11 461 + 310 | 39 53 + 180 | 11 321 + 554 | 16 81 + 17 |
| 7 20.1 | 38 217 + 396 | 23 22 + 293 | 38 047 + 283 | 16 60 + 171 | 11 748 + 287 | 37 93 + 160 | 11 835 + 514 | 17 18 - 37 |
| 7 30.1 | 38 563 + 346 | 26 40 + 318 | 38 302 + 255 | 15 10 + 150 | 12 007 + 259 | 36 54 + 139 | 12 301 + 466 | 18 01 - 83 |
| 8 9.1 | 38 853 + 290 | 29 80 + 340 | 38 524 + 222 | 13 81 + 129 | 12 231 + 224 | 35 40 + 114 | 12 706 + 405 | 19 33 - 132 |
| 8 19.1 | 39 078 + 225 | 33 31 + 351 | 38 705 + 181 | 12 79 + 102 | 12 416 + 185 | 34 53 + 87 | 13 035 + 329 | 21 07 - 174 |
| 8 29.0 | 39 242 + 164 | 36 85 + 354 | 38 847 + 142 | 12 01 + 78 | 12 561 + 145 | 33 92 + 61 | 13 286 + 251 | 23 14 - 207 |
| 9 8.0 | 39 339 + 97 | 40 40 + 355 | 38 947 + 100 | 11 49 + 52 | 12 664 + 103 | 33 58 + 34 | 13 450 + 164 | 25 50 - 236 |
| 9 18.0 | 39 371 + 32 | 43 84 + 344 | 39 005 + 58 | 11 22 + 27 | 12 724 + 60 | 33 49 + 9 | 13 524 + 74 | 28 03 - 253 |
| 9 27.9 | 39 344 - 27 | 47 11 + 327 | 39 026 + 21 | 11 17 + 5 | 12 747 + 23 | 33 62 - 13 | 13 514 - 10 | 30 63 - 260 |
| 10 7.9 | 39 258 - 86 | 50 18 + 307 | 39 012 - 14 | 11 32 - 15 | 12 734 - 13 | 33 94 - 32 | 13 420 - 94 | 33 23 - 260 |
| 10 17.9 | 39 120 - 138 | 52 93 + 275 | 38 968 - 44 | 11 64 - 32 | 12 691 - 43 | 34 41 - 47 | 13 252 - 168 | 35 67 - 244 |
| 10 27.9 | 38 940 - 180 | 55 36 + 243 | 38 901 - 67 | 12 08 - 44 | 12 625 - 66 | 34 99 - 58 | 13 023 - 229 | 37 88 - 221 |
| 11 6.8 | 38 719 - 221 | 57 38 + 202 | 38 815 - 86 | 12 63 - 55 | 12 539 - 86 | 35 65 - 66 | 12 740 - 283 | 39 77 - 189 |
| 11 16.8 | 38 469 - 250 | 58 92 + 154 | 38 718 - 97 | 13 24 - 61 | 12 442 - 97 | 36 35 - 70 | 12 423 - 317 | 41 22 - 145 |
| 11 26.8 | 38 197 - 272 | 59 99 + 107 | 38 616 - 102 | 13 87 - 63 | 12 338 - 104 | 37 04 - 69 | 12 085 - 338 | 42 21 - 99 |
| 12 6.8 | 37 908 - 289 | 60 52 + 53 | 38 510 - 106 | 14 53 - 66 | 12 232 - 106 | 37 72 - 68 | 11 736 - 349 | 42 68 - 47 |
| 12 16.7 | 37 616 - 292 | 60 49 - 3 | 38 410 - 100 | 15 15 - 62 | 12 131 - 101 | 38 33 - 61 | 11 398 - 338 | 42 57 + 11 |
| 12 26.7 | 37 328 - 288 | 59 94 - 55 | 38 316 - 94 | 15 74 - 59 | 12 036 - 95 | 38 87 - 54 | 11 078 - 320 | 41 94 + 63 |
| 12 36.7 | 37 051 - 277 | 58 84 - 110 | 38 231 - 85 | 16 28 - 54 | 11 951 - 85 | 39 32 - 45 | 10 787 - 291 | 40 77 + 117 |
| | | | | | | | | |
| Mean Place | 37.718 | 37.42 | 37.423 | 18.89 | 11.095 | 41.11 | 09.445 | 30.03 |
| sec δ, tan δ | +1.841 | +1.545 | +1.006 | -0.107 | +1.013 | -0.161 | +2.135 | -1.887 |
| dα(ψ), dδ(ψ) | +0.053 | +0.39 | +0.062 | +0.39 | +0.062 | +0.39 | +0.071 | +0.39 |
| dα(ε), dδ(ε) | -0.101 | -0.21 | +0.007 | -0.20 | +0.011 | -0.19 | +0.123 | -0.19 |
| Dble. Trans. | September 9 | | September 9 | | September 10 | | September 10 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 878 | | 877 | | 879 | | 1609 | | |
|--|------------------|-------------|------------------|-------------|---------------------|-------------|------------------|-------------|------------|
| | γ Piscium | | γ Tucanae | | γ Sculptoris | | ψ^3 Aquarii | | |
| Mag Spect. | 3.85 | K0 | 4.10 | F2 | 4.51 | K0 | 5.16 | A0 | |
| U.T. | R.A. | | R.A. | | R.A. | | R.A. | | |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " | |
| | 23 16 | + 3 12 | 23 16 | -58 18 | 23 18 | -32 36 | 23 18 | - 9 40 | |
| 1 | -8.3 | 25.384 -99 | 15.70 -69 | 36.556 -281 | 68.08 +34 | 03.478 -134 | 46.82 -25 | 13.121 -100 | 83.70 -59 |
| 1 | 1.7 | 25.294 -90 | 14.98 -72 | 36.301 -255 | 67.22 +86 | 03.358 -120 | 46.74 +8 | 13.030 -91 | 84.19 -49 |
| 1 | 11.7 | 25.214 -80 | 14.23 -75 | 36.074 -227 | 65.88 +134 | 03.253 -105 | 46.35 +39 | 12.949 -81 | 84.57 -38 |
| 1 | 21.6 | 25.150 -64 | 13.48 -75 | 35.889 -185 | 64.06 +182 | 03.170 -83 | 45.62 +73 | 12.885 -64 | 84.82 -25 |
| 1 | 31.6 | 25.104 -46 | 12.79 -68 | 35.748 -141 | 61.84 +222 | 03.110 -60 | 44.59 +103 | 12.840 -45 | 84.91 -9 |
| 2 | 10.6 | 25.079 -25 | 12.17 -62 | 35.655 -93 | 59.27 +257 | 03.076 -34 | 43.28 +131 | 12.816 -24 | 84.85 +6 |
| 2 | 20.6 | 25.080 +1 | 11.69 -48 | 35.619 -36 | 56.38 +289 | 03.075 -1 | 41.69 +159 | 12.818 +2 | 84.59 +26 |
| 3 | 2.5 | 25.111 +31 | 11.39 -30 | 35.638 +19 | 53.30 +308 | 03.106 +31 | 39.87 +182 | 12.851 +33 | 84.15 +64 |
| 3 | 12.5 | 25.169 +58 | 11.29 -10 | 35.716 +78 | 50.03 +327 | 03.173 +67 | 37.82 +205 | 12.906 +55 | 83.51 +44 |
| 3 | 22.5 | 25.268 +99 | 11.37 +8 | 35.859 +143 | 46.67 +336 | 03.281 +108 | 35.58 +224 | 13.005 +99 | 82.55 +96 |
| 4 | 1.4 | 25.403 +135 | 11.76 +39 | 36.061 +202 | 43.31 +336 | 03.428 +147 | 33.21 +237 | 13.138 +133 | 81.40 +115 |
| 4 | 11.4 | 25.576 +173 | 12.42 +66 | 36.326 +265 | 39.97 +334 | 03.617 +189 | 30.72 +249 | 13.309 +171 | 80.02 +138 |
| 4 | 21.4 | 25.786 +210 | 13.39 +97 | 36.652 +326 | 36.75 +322 | 03.847 +230 | 28.18 +254 | 13.517 +208 | 78.44 +158 |
| 5 | 1.4 | 26.028 +242 | 14.62 +123 | 37.029 +377 | 33.72 +303 | 04.114 +267 | 25.65 +253 | 13.758 +241 | 76.68 +176 |
| 5 | 11.3 | 26.301 +273 | 16.11 +149 | 37.458 +429 | 30.92 +280 | 04.416 +302 | 23.14 +251 | 14.030 +272 | 74.76 +192 |
| 5 | 21.3 | 26.598 +297 | 17.83 +172 | 37.928 +470 | 28.44 +248 | 04.746 +330 | 20.74 +240 | 14.327 +297 | 72.73 +203 |
| 5 | 31.3 | 26.911 +313 | 19.71 +188 | 38.426 +498 | 26.32 +212 | 05.096 +350 | 18.50 +224 | 14.641 +314 | 70.66 +207 |
| 6 | 10.3 | 27.235 +324 | 21.74 +203 | 38.947 +521 | 24.60 +172 | 05.462 +366 | 16.47 +203 | 14.969 +328 | 68.57 +209 |
| 6 | 20.2 | 27.561 +326 | 23.85 +212 | 39.475 +528 | 23.35 +125 | 05.831 +369 | 14.71 +176 | 15.298 +329 | 66.53 +204 |
| 6 | 30.2 | 27.880 +319 | 25.97 +211 | 39.995 +520 | 22.57 +78 | 06.195 +364 | 13.25 +146 | 15.621 +323 | 64.59 +194 |
| 7 | 10.2 | 28.185 +306 | 28.08 +211 | 40.499 +504 | 22.28 +29 | 06.547 +352 | 12.12 +113 | 15.932 +311 | 62.79 +180 |
| 7 | 20.1 | 28.467 +282 | 30.09 +201 | 40.968 +469 | 22.51 -23 | 06.874 +327 | 11.38 +74 | 16.220 +288 | 61.19 +160 |
| 7 | 30.1 | 28.721 +254 | 31.98 +189 | 41.392 +424 | 23.21 -70 | 07.170 +296 | 11.00 +38 | 16.481 +261 | 59.81 +138 |
| 8 | 9.1 | 28.941 +220 | 33.72 +174 | 41.762 +370 | 24.37 -116 | 07.429 +259 | 11.01 -1 | 16.708 +227 | 58.69 +112 |
| 8 | 19.1 | 29.122 +181 | 35.24 +152 | 42.062 +300 | 25.96 -159 | 07.643 +214 | 11.39 -38 | 16.896 +188 | 57.84 +85 |
| 8 | 29.0 | 29.264 +142 | 36.56 +132 | 42.292 +230 | 27.88 -192 | 07.810 +167 | 12.10 -71 | 17.044 +148 | 57.25 +59 |
| 9 | 8.0 | 29.365 +101 | 37.64 +108 | 42.445 +153 | 30.10 -222 | 07.928 +118 | 13.11 -101 | 17.150 +106 | 56.93 +32 |
| 9 | 18.0 | 29.425 +60 | 38.48 +84 | 42.517 +72 | 32.51 -241 | 07.995 +67 | 14.37 -126 | 17.213 +63 | 56.87 +6 |
| 9 | 28.0 | 29.449 +24 | 39.09 +61 | 42.514 -3 | 35.00 -249 | 08.017 +22 | 15.79 -142 | 17.239 +26 | 57.02 -15 |
| 10 | 7.9 | 29.439 -10 | 39.48 +39 | 42.437 -77 | 37.50 -250 | 07.994 -23 | 17.34 -155 | 17.229 -10 | 57.37 -35 |
| 10 | 17.9 | 29.399 -40 | 39.66 +18 | 42.294 -143 | 39.87 -237 | 07.933 -61 | 18.91 -157 | 17.188 -41 | 57.87 -50 |
| 10 | 27.9 | 29.337 -62 | 39.66 +0 | 42.098 -196 | 42.02 -215 | 07.843 -90 | 20.45 -154 | 17.124 -64 | 58.48 -61 |
| 11 | 6.8 | 29.255 -82 | 39.49 -17 | 41.855 -243 | 43.89 -187 | 07.727 -116 | 21.88 -143 | 17.039 -85 | 59.17 -69 |
| 11 | 16.8 | 29.162 -93 | 39.17 -32 | 41.582 -273 | 45.34 -145 | 07.596 -131 | 23.12 -124 | 16.939 -96 | 59.88 -71 |
| 11 | 26.8 | 29.063 -99 | 38.74 -43 | 41.292 -290 | 46.35 -101 | 07.456 -140 | 24.14 -102 | 16.840 -103 | 60.59 -71 |
| 12 | 6.8 | 28.959 -104 | 38.19 -55 | 40.993 -299 | 46.87 -52 | 07.312 -144 | 24.89 -75 | 16.733 -107 | 61.28 -69 |
| 12 | 16.7 | 28.860 -99 | 37.56 -63 | 40.703 -290 | 46.84 +3 | 07.175 -137 | 25.32 -43 | 16.631 -102 | 61.89 -61 |
| 12 | 26.7 | 28.766 -94 | 36.88 -68 | 40.430 -273 | 46.31 +53 | 07.046 -129 | 25.44 -12 | 16.535 -96 | 62.43 -54 |
| 12 | 36.7 | 28.680 -86 | 36.14 -74 | 40.182 -248 | 45.25 +106 | 06.931 -115 | 25.23 +21 | 16.447 -88 | 62.88 -45 |
| | | -72 | -73 | -211 | +155 | -96 | +54 | -72 | -31 |
| Mean Place | 27.937 | 30.25 | 38.895 | 35.08 | 05.860 | 20.22 | 15.579 | 64.63 | |
| sec δ , tan δ | +1.002 | +0.056 | +1.904 | -1.620 | +1.187 | -0.640 | +1.014 | -0.171 | |
| d α (ψ), d δ (ψ) | +0.061 | +0.39 | +0.069 | +0.39 | +0.064 | +0.39 | +0.062 | +0.39 | |
| d α (ϵ), d δ (ϵ) | -0.004 | -0.19 | +0.106 | -0.19 | +0.042 | -0.18 | +0.011 | -0.18 | |
| Dble. Trans. | September 10 | | September 10 | | September 10 | | September 10 | | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 880 | | 1610 | | 1611 | | 1612 | |
|--------------|--------------------------|------------|--------------------------|------------|--------------------------|------------|--------------------------|------------|
| | τ Pegasi | | 12 Andromedae | | 11 G. Sculptoris | | 98 Aquarii | |
| Mag. Spect. | 4.65 | A5 | 5.75 | F5 | 5.81 | G5 | 4.20 | K0 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° / | h m | ° / | h m | ° / | h m | ° / |
| | 23 19 | + 23 39 | 23 20 | + 38 06 | 23 20 | - 27 03 | 23 22 | - 20 10 |
| 1 -8.3 | 55 440 ^s -124 | 51.53 -68 | 11 251 ^s -168 | 27 55 -56 | 30 093 ^s -122 | 63 91 -36 | 13 370 ^s -110 | 50.14 -48 |
| 1 1.7 | 55 323 -117 | 50 61 -92 | 11 091 -160 | 26 61 -94 | 29 984 -109 | 64 00 -9 | 13 269 -101 | 50.40 -26 |
| 1 11.7 | 55 214 -109 | 49 44 -117 | 10 941 -150 | 25 29 -132 | 29 887 -97 | 63 82 +18 | 13 180 -89 | 50.46 -6 |
| 1 21.6 | 55 122 -92 | 48 08 -136 | 10 809 -132 | 23 64 -165 | 29 810 -77 | 63 34 +48 | 13 109 -71 | 50.28 +18 |
| 1 31.6 | 55 050 -72 | 46 60 -148 | 10 701 -108 | 21.76 -188 | 29.754 -56 | 62 59 +75 | 13 057 -52 | 49.87 +41 |
| 2 10.6 | 55 000 -50 | 45 04 -156 | 10 622 -79 | 19 68 -208 | 29 722 -32 | 61 59 +100 | 13 027 -30 | 49.24 +63 |
| 2 20.6 | 54 982 -18 | 43 49 -155 | 10 580 -42 | 17 53 -215 | 29 720 -2 | 60 32 +127 | 13 025 -2 | 48.37 +87 |
| 3 2.5 | 54 996 +14 | 42 04 -145 | 10 579 -4 | 15 39 -214 | 29 748 +28 | 58 82 +150 | 13 052 +27 | 47.29 +108 |
| 3 12.5 | 55 046 +50 | 40 72 -132 | 10 623 +95 | 13 35 -204 | 29 810 +62 | 57 08 +174 | 13 110 +58 | 45.96 +133 |
| 3 22.5 | 55 139 +93 | 39.64 -108 | 10 718 +95 | 11.52 -183 | 29 911 +101 | 55 14 +194 | 13 206 +96 | 44.40 +156 |
| 4 1.4 | 55 272 +133 | 38 85 -79 | 10 860 +142 | 09 97 -155 | 30 050 +139 | 53 04 +210 | 13 339 +133 | 42.66 +174 |
| 4 11.4 | 55 449 +177 | 38 39 -46 | 11 053 +193 | 08 77 -120 | 30 229 +179 | 50 79 +225 | 13 511 +172 | 40.74 +192 |
| 4 21.4 | 55 667 +218 | 38 32 -7 | 11 053 +242 | 08 01 -76 | 30 449 +220 | 48 45 +234 | 13 722 +211 | 38 68 +206 |
| 5 1.4 | 55 920 +253 | 38 63 +31 | 11 576 +281 | 07 69 -32 | 30 703 +254 | 46 06 +239 | 13 966 +244 | 36 52 +216 |
| 5 11.3 | 56 207 +287 | 39 35 +72 | 11 895 +319 | 07 84 +15 | 30 992 +289 | 43 65 +241 | 14 244 +278 | 34.28 +224 |
| 5 21.3 | 56 519 +312 | 40 46 +111 | 12 243 +348 | 08 48 +64 | 31 308 +316 | 41 31 +234 | 14 549 +305 | 32 04 +220 |
| 5 31.3 | 56 848 +329 | 41 92 +146 | 12 607 +364 | 09 57 +109 | 31 644 +336 | 39 07 +224 | 14 872 +323 | 29 84 +220 |
| 6 10.3 | 57 188 +340 | 43 70 +178 | 12 983 +376 | 11 09 +152 | 31 995 +351 | 36 98 +209 | 15 209 +337 | 27 73 +211 |
| 6 20.2 | 57 528 +340 | 45 77 +207 | 13 358 +375 | 13 02 +193 | 32 349 +354 | 35 12 +186 | 15 551 +342 | 25 78 +195 |
| 6 30.2 | 57 859 +331 | 48 03 +226 | 13 721 +363 | 15 26 +224 | 32 699 +350 | 33 51 +161 | 15 887 +336 | 24 02 +176 |
| 7 10.2 | 58 176 +317 | 50 47 +244 | 14 067 +346 | 17 80 +254 | 33 037 +338 | 32 19 +132 | 16 212 +325 | 22 49 +153 |
| 7 20.1 | 58 467 +291 | 53 01 +254 | 14 383 +316 | 20 55 +275 | 33 352 +315 | 31 22 +97 | 16 514 +302 | 21 25 +124 |
| 7 30.1 | 58 727 +260 | 55 57 +256 | 14 664 +281 | 23 45 +290 | 33 638 +286 | 30 57 +65 | 16 789 +275 | 20 31 +94 |
| 8 9.1 | 58 952 +225 | 58 14 +257 | 14 906 +242 | 26 45 +300 | 33 888 +250 | 30 29 +28 | 17 029 +240 | 19 69 +62 |
| 8 19.1 | 59 136 +184 | 60 62 +248 | 15 101 +195 | 29 46 +301 | 34 095 +207 | 30 37 -8 | 17 229 +200 | 19 40 +29 |
| 8 29.0 | 59 279 +143 | 62 99 +237 | 15 250 +149 | 32 43 +297 | 34 258 +163 | 30 76 -39 | 17 387 +158 | 19 40 +0 |
| 9 8.0 | 59 379 +100 | 65 21 +222 | 15 352 +102 | 35 32 +289 | 34 375 +117 | 31 46 -70 | 17 500 +113 | 19 70 -30 |
| 9 18.0 | 59 436 +57 | 67 22 +201 | 15 406 +54 | 38 05 +273 | 34 444 +69 | 32 41 -95 | 17 569 +69 | 20 26 -56 |
| 9 28.0 | 59 456 +20 | 69 02 +180 | 15 418 +12 | 40 59 +254 | 34 470 +26 | 33 54 -113 | 17 598 +29 | 21 02 -76 |
| 10 7.9 | 59 440 -16 | 70 58 +156 | 15 388 -30 | 42 90 +231 | 34 455 -15 | 34 83 -129 | 17 588 -10 | 21 96 -94 |
| 10 17.9 | 59 392 -48 | 71 86 +128 | 15 321 -67 | 44 90 +200 | 34 404 -51 | 36 17 -134 | 17 544 -44 | 23 00 -104 |
| 10 27.9 | 59 320 -72 | 72 87 +101 | 15 226 -95 | 46 61 +171 | 34 326 -78 | 37 51 -134 | 17 475 -69 | 24 07 -107 |
| 11 6.8 | 59 226 -94 | 73 59 +72 | 15 104 -122 | 47 96 +135 | 34 223 -103 | 38 80 -129 | 17 383 -92 | 25 16 -109 |
| 11 16.8 | 59 118 -108 | 74 01 +42 | 15 104 -140 | 48 92 +96 | 34 105 -118 | 39 96 -116 | 17 278 -105 | 26 16 -100 |
| 11 26.8 | 59 000 -118 | 74 13 +12 | 14 810 -154 | 49 50 +58 | 33 980 -125 | 40 94 -98 | 17 165 -113 | 27 07 -91 |
| 12 6.8 | 58 876 -124 | 73 95 -18 | 14 647 -163 | 49 64 +14 | 33 851 -129 | 41 71 -77 | 17 048 -117 | 27 84 -77 |
| 12 16.7 | 58 753 -123 | 73 46 -49 | 14 482 -165 | 49 36 -28 | 33 726 -125 | 42 23 -52 | 16 935 -113 | 28 41 -57 |
| 12 26.7 | 58 633 -120 | 72 72 -74 | 14 319 -163 | 48 69 -67 | 33 610 -116 | 42 48 -25 | 16 829 -106 | 28 80 -39 |
| 12 36.7 | 58 520 -113 | 72 72 -102 | 14 163 -156 | 47 60 -109 | 33 504 -106 | 42 46 +2 | 16 732 -97 | 28 98 -18 |
| | 58 520 -100 | 71 70 -123 | 14 163 -140 | 47 60 -143 | 33 504 -88 | 42 46 +32 | 16 732 -81 | 28 98 +5 |
| Mean Place | 58 079 | 58 93 | 14 036 | 30 46 | 32 467 | 39 03 | 15 752 | 27 55 |
| sec δ, tan δ | +1.092 | +0.438 | +1.271 | +0.784 | +1.123 | -0.511 | +1.065 | -0.367 |
| dα(ψ), dδ(ψ) | +0.059 | +0.39 | +0.058 | +0.39 | +0.063 | +0.39 | +0.063 | +0.39 |
| dα(ε), dδ(ε) | -0.029 | -0.17 | -0.052 | -0.17 | +0.034 | -0.17 | +0.024 | -0.16 |
| Dble. Trans. | September 11 | | September 11 | | September 11 | | September 11 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 1613 | | | 882 | | | 881 | | | 883 | | |
|--------------|--------------|-------|-------------|---------------|-------|-------------|--------------|-------|-------------|--------------|-------|-------------|
| | 67 Pegasi | | | 4 Cassiopeiae | | | υ Pegasi | | | ο Gruis | | |
| Mag. Spect. | 5.46 | | A0 | 5.20 | | K5 | 4.57 | | G0 | 5.54 | | F0 |
| U.T. | R.A. | | Dec. | R.A. | | Dec. | R.A. | | Dec. | R.A. | | Dec. |
| | h | m | ° | h | m | ° | h | m | ° | h | m | ° |
| | 23 | 24 | + 32 18 | 23 | 24 | + 62 12 | 23 | 24 | + 23 19 | 23 | 25 | - 52 47 |
| 1 -8.3 | 08 36.4 | - 146 | 33 50 - 58 | 10 70.1 | - 371 | 33 77 - 13 | 39 66.2 | - 123 | 39 67 - 65 | 49 29.2 | - 232 | 78 91 + 10 |
| 1 1.7 | 08 22.3 | - 141 | 32 58 - 92 | 10 33.7 | - 364 | 33 09 - 68 | 39 54.5 | - 117 | 38 78 - 89 | 49 07.8 | - 214 | 78 32 + 59 |
| 1 11.7 | 08 09.1 | - 132 | 31 35 - 123 | 09 98.8 | - 349 | 31 86 - 123 | 39 43.6 | - 109 | 37 65 - 113 | 48 88.5 | - 193 | 77 26 + 106 |
| 1 21.6 | 07 97.6 | - 115 | 29 83 - 152 | 09 67.3 | - 315 | 30 12 - 174 | 39 34.2 | - 94 | 36 33 - 132 | 48 72.5 | - 160 | 75 73 + 153 |
| 1 31.6 | 07 88.2 | - 94 | 28 12 - 171 | 09 40.3 | - 270 | 27 96 - 216 | 39 26.7 | - 75 | 34 89 - 144 | 48 60.0 | - 125 | 73 81 + 192 |
| 2 10.6 | 07 81.2 | - 70 | 26 26 - 186 | 09 18.6 | - 217 | 25 44 - 252 | 39 21.4 | - 53 | 33 36 - 153 | 48 51.3 | - 87 | 71 52 + 229 |
| 2 20.6 | 07 77.7 | - 35 | 24 35 - 191 | 09 04.0 | - 146 | 22 68 - 276 | 39 19.2 | - 22 | 31 85 - 151 | 48 47.4 | + 39 | 68 91 + 261 |
| 3 2.5 | 07 77.8 | + 1 | 22 48 - 187 | 08 96.9 | - 71 | 19 83 - 285 | 39 20.1 | + 9 | 30 42 - 143 | 48 48.2 | + 8 | 66 07 + 284 |
| 3 12.5 | 07 82.0 | + 42 | 20 71 - 177 | 08 98.1 | + 12 | 16 94 - 289 | 39 24.7 | + 46 | 29 13 - 129 | 48 53.9 | + 57 | 63 03 + 304 |
| 3 22.5 | 07 90.9 | + 89 | 19 17 - 154 | 09 08.3 | + 102 | 14 19 - 275 | 39 33.5 | + 88 | 28 07 - 106 | 48 65.4 | + 115 | 59 85 + 318 |
| 4 1.4 | 08 04.2 | + 133 | 17 91 - 126 | 09 26.8 | + 185 | 11 69 - 250 | 39 46.4 | + 129 | 27 29 - 78 | 48 82.1 | + 167 | 56 62 + 323 |
| 4 11.4 | 08 22.3 | + 181 | 16 98 - 93 | 09 53.9 | + 271 | 09 49 - 220 | 39 63.6 | + 172 | 26 83 - 46 | 49 04.4 | + 223 | 53 37 + 325 |
| 4 21.4 | 08 44.9 | + 226 | 16 47 - 51 | 09 88.9 | + 350 | 07 75 - 174 | 39 85.0 | + 214 | 26 77 - 6 | 49 32.2 | + 278 | 50 19 + 318 |
| 5 1.4 | 08 71.3 | + 264 | 16 38 - 9 | 10 30.2 | + 413 | 06 49 - 126 | 40 09.9 | + 249 | 27 08 + 31 | 49 64.8 | + 326 | 47 16 + 303 |
| 5 11.3 | 09 01.4 | + 301 | 16 73 + 35 | 10 77.5 | + 473 | 05 74 - 75 | 40 38.3 | + 284 | 27 79 + 71 | 50 02.2 | + 374 | 44 30 + 286 |
| 5 21.3 | 09 34.2 | + 328 | 17 54 + 81 | 11 29.0 | + 515 | 05 59 - 15 | 40 69.3 | + 310 | 28 89 + 110 | 50 43.4 | + 412 | 41 71 + 259 |
| 5 31.3 | 09 68.8 | + 346 | 18 75 + 121 | 11 82.0 | + 538 | 05 98 + 39 | 41 02.1 | + 328 | 30 33 + 144 | 50 87.4 | + 440 | 39 44 + 227 |
| 6 10.3 | 10 04.6 | + 358 | 20 35 + 160 | 12 38.2 | + 554 | 06 93 + 95 | 41 36.1 | + 340 | 32 09 + 176 | 51 33.7 | + 463 | 37 52 + 192 |
| 6 20.2 | 10 40.4 | + 358 | 22 32 + 197 | 12 93.1 | + 549 | 08 44 + 151 | 41 70.1 | + 340 | 34 14 + 205 | 51 80.8 | + 471 | 36 05 + 147 |
| 6 30.2 | 10 75.3 | + 349 | 24 55 + 223 | 13 45.9 | + 528 | 10 40 + 196 | 42 03.4 | + 333 | 36 38 + 224 | 52 27.6 | + 468 | 35 00 + 105 |
| 7 10.2 | 11 08.7 | + 334 | 27 04 + 249 | 13 95.9 | + 500 | 12 81 + 241 | 42 35.3 | + 319 | 38 80 + 242 | 52 73.0 | + 454 | 34 43 + 57 |
| 7 20.1 | 11 39.3 | + 306 | 29 71 + 267 | 14 41.1 | + 452 | 15 61 + 280 | 42 64.6 | + 293 | 41 31 + 251 | 53 15.6 | + 426 | 34 36 + 7 |
| 7 30.1 | 11 66.7 | + 274 | 32 47 + 276 | 14 81.0 | + 399 | 18 70 + 309 | 42 91.1 | + 265 | 43 86 + 255 | 53 54.4 | + 388 | 34 75 - 39 |
| 8 9.1 | 11 90.4 | + 237 | 35 30 + 283 | 15 14.7 | + 337 | 22 05 + 335 | 43 14.0 | + 229 | 46 40 + 254 | 53 88.6 | + 342 | 35 61 - 86 |
| 8 19.1 | 12 09.8 | + 194 | 38 11 + 281 | 15 41.3 | + 266 | 25 57 + 352 | 43 32.9 | + 189 | 48 87 + 247 | 54 16.8 | + 282 | 36 91 - 130 |
| 8 29.0 | 12 24.9 | + 151 | 40 85 + 274 | 15 61.0 | + 197 | 29 17 + 360 | 43 47.7 | + 148 | 51 22 + 235 | 54 39.0 | + 222 | 38 55 - 164 |
| 9 8.0 | 12 35.5 | + 106 | 43 49 + 264 | 15 73.3 | + 123 | 32 82 + 365 | 43 58.3 | + 106 | 52 20 + 220 | 54 54.5 | + 155 | 40 52 - 197 |
| 9 18.0 | 12 41.5 | + 60 | 45 95 + 246 | 15 78.0 | + 47 | 36 40 + 358 | 43 64.6 | + 63 | 55 42 + 200 | 54 62.9 | + 84 | 42 71 - 219 |
| 9 28.0 | 12 43.6 | + 21 | 48 22 + 227 | 15 76.0 | - 20 | 39 86 + 346 | 43 67.2 | + 26 | 57 21 + 179 | 54 65.0 | + 21 | 45 03 - 232 |
| 10 7.9 | 12 41.7 | - 19 | 50 25 + 203 | 15 67.1 | - 89 | 43 16 + 330 | 43 66.2 | - 10 | 58 76 + 155 | 54 60.5 | - 45 | 47 40 - 237 |
| 10 17.9 | 12 36.5 | - 52 | 51 99 + 174 | 15 51.9 | - 152 | 46 16 + 300 | 43 61.9 | - 43 | 60 04 + 128 | 54 50.3 | - 102 | 49 69 - 229 |
| 10 27.9 | 12 28.5 | - 80 | 53 45 + 146 | 15 31.4 | - 205 | 48 86 + 270 | 43 55.3 | - 66 | 61 06 + 102 | 54 35.4 | - 149 | 51 82 - 213 |
| 11 6.8 | 12 18.1 | - 104 | 54 57 + 112 | 15 05.6 | - 258 | 51 18 + 232 | 43 46.3 | - 90 | 61 78 + 72 | 54 16.4 | - 190 | 53 71 - 189 |
| 11 16.8 | 12 05.9 | - 122 | 55 34 + 77 | 14 76.0 | - 296 | 53 02 + 184 | 43 35.9 | - 104 | 62 21 + 43 | 53 94.6 | - 218 | 55 25 - 154 |
| 11 26.8 | 11 92.6 | - 133 | 55 77 + 43 | 14 43.2 | - 328 | 54 40 + 138 | 43 24.5 | - 114 | 62 35 + 14 | 53 71.2 | - 234 | 56 39 - 114 |
| 12 6.8 | 11 78.3 | - 143 | 55 80 + 3 | 14 07.8 | - 354 | 55 22 + 82 | 43 12.3 | - 122 | 62 18 - 17 | 53 46.8 | - 244 | 57 08 - 69 |
| 12 16.7 | 11 63.9 | - 144 | 55 47 - 33 | 13 71.5 | - 363 | 55 47 + 25 | 43 00.1 | - 122 | 61 73 - 45 | 53 23.0 | - 238 | 57 28 - 20 |
| 12 26.7 | 11 49.7 | - 142 | 54 79 - 68 | 13 35.0 | - 365 | 55 17 - 30 | 42 88.2 | - 119 | 61 01 - 72 | 53 00.3 | - 227 | 56 99 + 29 |
| 12 36.7 | 11 36.0 | - 137 | 53 75 - 104 | 12 99.2 | - 358 | 54 28 - 89 | 42 76.9 | - 113 | 60 03 - 98 | 52 79.4 | - 209 | 56 21 + 78 |
| | | - 122 | 53 75 - 133 | | - 330 | | | - 101 | | | - 180 | 56 21 + 126 |
| Mean Place | 11.061 | | 38.03 | 14.005 | | 31.06 | 42.283 | | 47.08 | 51.495 | | 47.04 |
| sec δ, tan δ | +1.183 | | +0.632 | +2.145 | | +1.897 | +1.089 | | +0.431 | +1.654 | | -1.317 |
| dα(ψ), dδ(ψ) | +0.059 | | +0.39 | +0.053 | | +0.39 | +0.059 | | +0.39 | +0.066 | | +0.39 |
| dα(ε), dδ(ε) | -0.042 | | -0.16 | -0.125 | | -0.16 | -0.028 | | -0.15 | +0.087 | | -0.15 |
| Dble. Trans. | September 12 | | | September 12 | | | September 12 | | | September 12 | | |

AT UPPER TRANSIT AT GREENWICH

| No. | 884 | | 1614 | | 1615 | | 885 | |
|--------------|---------------------------|-------------|---------------------------|-------------|----------------------------|-------------|---------------------------|-------------|
| | α Piscium | | ♁ Piscium | | B.D. +15° 4830 (Pegasi) | | 70 Pegasi | |
| Mag.Spect. | 4.94 | A2p | 4.45 | G5 | 6.98 | A2 | 4.67 | K0 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° ' | h m | ° ' | h m | ° ' | h m | ° ' |
| | 23 26 | + 1 10 | 23 27 | + 6 17 | 23 28 | + 15 55 | 23 28 | + 12 40 |
| 1 -8.3 | 11 957 ^s - 100 | 38 69 - 67 | 14 516 ^s - 102 | 63 71 - 68 | 18 888 ^s - 111 | 67 19 - 66 | 25 778 ^s - 108 | 58 89 - 67 |
| 1 1.7 | 11 865 - 92 | 38 01 - 68 | 14 420 - 96 | 62 97 - 74 | 18 782 - 106 | 66 36 - 83 | 25 677 - 101 | 58 09 - 80 |
| 1 11.7 | 11 780 - 70 | 37 32 - 66 | 14 332 - 88 | 62 16 - 81 | 18 684 - 98 | 65 36 - 100 | 25 583 - 94 | 57 15 - 94 |
| 1 21.6 | 11 710 - 70 | 36 66 - 66 | 14 257 - 75 | 61 33 - 83 | 18 599 - 85 | 64 25 - 111 | 25 583 - 81 | 56 14 - 101 |
| 1 31.6 | 11 657 - 53 | 36 08 - 58 | 14 200 - 57 | 60 53 - 80 | 18 532 - 67 | 63 08 - 117 | 25 438 - 64 | 55 09 - 105 |
| 2 10.6 | 11 623 - 34 | 35 57 - 51 | 14 162 - 38 | 59 78 - 75 | 18 485 - 47 | 61 89 - 119 | 25 394 - 44 | 54 04 - 105 |
| 2 20.6 | 11 615 - 8 | 35 22 - 35 | 14 150 - 12 | 59 14 - 64 | 18 465 - 20 | 60 74 - 115 | 25 378 - 16 | 53 07 - 97 |
| 3 2.5 | 11 636 + 21 | 35 05 - 17 | 14 166 + 16 | 58 67 - 47 | 18 476 + 11 | 59 72 - 102 | 25 390 + 12 | 52 22 - 85 |
| 3 12.5 | 11 684 + 48 | 35 13 + 8 | 14 213 + 47 | 58 39 - 28 | 18 520 + 44 | 58 84 - 88 | 25 435 + 45 | 51 55 - 67 |
| 3 22.5 | 11 770 + 86 | 35 29 + 16 | 14 297 + 84 | 58 30 - 9 | 18 603 + 83 | 58 21 - 63 | 25 518 + 83 | 51 10 - 45 |
| 4 1.5 | 11 895 + 125 | 35 79 + 50 | 14 420 + 123 | 58 49 + 19 | 18 725 + 122 | 57 84 - 37 | 25 639 + 121 | 50 91 - 19 |
| 4 11.4 | 12 058 + 163 | 36 57 + 78 | 14 581 + 161 | 58 97 + 48 | 18 888 + 163 | 57 77 - 7 | 25 802 + 163 | 51 03 + 12 |
| 4 21.4 | 12 258 + 200 | 37 63 + 106 | 14 782 + 201 | 59 77 + 80 | 19 092 + 204 | 58 07 + 30 | 26 004 + 202 | 51 50 + 47 |
| 5 1.4 | 12 492 + 234 | 38 94 + 131 | 15 015 + 233 | 60 85 + 108 | 19 331 + 239 | 58 70 + 63 | 26 240 + 236 | 52 29 + 79 |
| 5 11.3 | 12 758 + 266 | 40 49 + 155 | 15 281 + 266 | 62 21 + 136 | 19 603 + 272 | 59 69 + 99 | 26 509 + 269 | 53 40 + 111 |
| 5 21.3 | 13 049 + 291 | 42 26 + 177 | 15 573 + 292 | 63 83 + 162 | 19 901 + 298 | 61 01 + 132 | 26 805 + 296 | 54 82 + 142 |
| 5 31.3 | 13 358 + 309 | 44 17 + 191 | 15 882 + 309 | 65 64 + 181 | 20 218 + 317 | 62 60 + 159 | 27 118 + 313 | 56 50 + 168 |
| 6 10.3 | 13 681 + 323 | 46 21 + 204 | 16 205 + 323 | 67 63 + 199 | 20 547 + 329 | 64 47 + 187 | 27 445 + 327 | 58 41 + 191 |
| 6 20.2 | 14 006 + 325 | 48 31 + 210 | 16 530 + 325 | 69 73 + 210 | 20 878 + 331 | 66 54 + 207 | 27 773 + 328 | 60 49 + 208 |
| 6 30.2 | 14 325 + 319 | 50 41 + 210 | 16 850 + 320 | 71 88 + 215 | 21 203 + 325 | 68 75 + 221 | 28 096 + 323 | 62 69 + 220 |
| 7 10.2 | 14 633 + 308 | 52 48 + 207 | 17 158 + 308 | 74 05 + 217 | 21 516 + 313 | 71 06 + 231 | 28 407 + 311 | 64 96 + 227 |
| 7 20.1 | 14 919 + 286 | 54 44 + 196 | 17 444 + 286 | 76 16 + 211 | 21 806 + 290 | 73 41 + 235 | 28 695 + 288 | 67 23 + 227 |
| 7 30.1 | 15 179 + 260 | 56 26 + 182 | 17 703 + 259 | 78 17 + 201 | 22 068 + 262 | 75 73 + 232 | 28 956 + 261 | 69 45 + 222 |
| 8 9.1 | 15 406 + 227 | 57 91 + 165 | 17 930 + 227 | 80 04 + 187 | 22 297 + 229 | 78 00 + 227 | 29 185 + 229 | 71 60 + 215 |
| 8 19.1 | 15 595 + 189 | 59 33 + 142 | 18 118 + 188 | 81 73 + 169 | 22 486 + 189 | 80 14 + 214 | 29 374 + 189 | 73 59 + 199 |
| 8 29.0 | 15 745 + 150 | 60 54 + 121 | 18 268 + 150 | 83 22 + 149 | 22 637 + 151 | 82 14 + 200 | 29 525 + 151 | 75 42 + 183 |
| 9 8.0 | 15 855 + 110 | 61 51 + 97 | 18 378 + 110 | 84 49 + 127 | 22 747 + 110 | 83 95 + 181 | 29 636 + 111 | 77 06 + 164 |
| 9 18.0 | 15 924 + 69 | 62 23 + 72 | 18 446 + 68 | 85 52 + 103 | 22 816 + 69 | 85 55 + 160 | 29 705 + 69 | 78 46 + 140 |
| 9 28.0 | 15 957 + 33 | 62 73 + 50 | 18 480 + 34 | 86 33 + 81 | 22 848 + 32 | 86 92 + 137 | 29 739 + 34 | 79 65 + 119 |
| 10 7.9 | 15 954 - 3 | 63 00 + 27 | 18 478 - 2 | 86 90 + 57 | 22 845 - 3 | 88 06 + 114 | 29 737 - 2 | 80 61 + 96 |
| 10 17.9 | 15 922 - 32 | 63 06 + 6 | 18 446 - 32 | 87 25 + 35 | 22 812 - 33 | 88 95 + 89 | 29 705 - 32 | 81 31 + 70 |
| 10 27.9 | 15 867 - 55 | 62 96 - 10 | 18 391 - 55 | 87 42 + 17 | 22 754 - 58 | 89 60 + 65 | 29 649 - 56 | 81 80 + 49 |
| 11 6.8 | 15 791 - 76 | 62 70 - 26 | 18 315 - 76 | 87 38 - 4 | 22 675 - 79 | 90 01 + 41 | 29 572 - 77 | 82 06 + 26 |
| 11 16.8 | 15 702 - 89 | 62 31 - 39 | 18 225 - 90 | 87 17 - 21 | 22 581 - 94 | 90 16 + 15 | 29 481 - 91 | 82 09 + 3 |
| 11 26.8 | 15 605 - 97 | 61 83 - 48 | 18 128 - 97 | 86 83 - 34 | 22 478 - 103 | 90 10 - 6 | 29 381 - 100 | 81 93 - 16 |
| 12 6.8 | 15 503 - 102 | 61 26 - 57 | 18 025 - 103 | 86 34 - 49 | 22 368 - 110 | 89 79 - 31 | 29 275 - 106 | 81 56 - 37 |
| 12 16.7 | 15 403 - 100 | 60 63 - 63 | 17 923 - 102 | 85 74 - 60 | 22 258 - 110 | 89 28 - 51 | 29 168 - 107 | 81 02 - 54 |
| 12 26.7 | 15 307 - 96 | 59 97 - 66 | 17 824 - 99 | 85 05 - 69 | 22 150 - 108 | 88 57 - 71 | 29 064 - 104 | 80 32 - 70 |
| 12 36.7 | 15 218 - 89 | 59 29 - 68 | 17 731 - 93 | 84 28 - 77 | 22 048 - 102 | 87 68 - 89 | 28 966 - 98 | 79 46 - 86 |
| | | | | | | | | |
| Mean Place | 14.421 | 53.72 | 16.994 | 76.90 | 21.426 | 76.97 | 28.296 | 69.83 |
| sec δ, tan δ | +1.000 | +0.021 | +1.006 | +0.110 | +1.040 | +0.286 | +1.025 | +0.225 |
| dα(ψ), dδ(ψ) | +0.061 | +0.39 | +0.061 | +0.39 | +0.060 | +0.39 | +0.060 | +0.39 |
| dα(ε), dδ(ε) | -0.001 | -0.15 | -0.007 | -0.14 | -0.019 | -0.14 | -0.015 | -0.14 |
| Dble.Trans. | September 12 | | September 13 | | September 13 | | September 13 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 886 | | | 1616 | | | 1617 | | 888 | |
|---|--------------------|-------------|------------|---------------|------------|-------------|--------------|-------------|----------------|--------|
| | β Sculptoris | | | 15 Andromedae | | | 1 Phoenicis | | 248 G. Aquarii | |
| Mag.Spect. | 4.46 | B9 | | 5.50 | A0 | | 4.80 | A2p | 6.51 | K0 |
| U.T. | R.A. | Dec. | | R.A. | Dec. | | R.A. | Dec. | R.A. | Dec. |
| | h m | ° ' " | | h m | ° ' " | | h m | ° ' " | h m | ° ' " |
| | 23 32 | - 37 53 | | 23 33 | + 40 09 | | 23 34 | - 42 41 | 23 34 | - 7 32 |
| 1 | -8.3 | 12.771 -153 | 63.62 -27 | 55 018 -175 | 41.19 -40 | 19 012 -174 | 52.53 -19 | 47 941 -101 | 39.10 -63 | |
| 1 | 1.7 | 12.629 -142 | 63.50 +12 | 54 847 -171 | 40.40 -79 | 18 851 -161 | 52.31 +22 | 47 846 -95 | 39.64 -54 | |
| 1 | 11.7 | 12.501 -128 | 63.01 +49 | 54 682 -165 | 39.20 -120 | 18 704 -147 | 51.68 +63 | 47 758 -88 | 40.10 -46 | |
| 1 | 21.6 | 12.393 -108 | 62.14 +87 | 54 534 -148 | 37.65 -155 | 18 580 -124 | 50.62 +106 | 47 684 -74 | 40.44 -34 | |
| 1 | 31.6 | 12.310 -83 | 60.92 +122 | 54.408 -126 | 35.83 -182 | 18.483 -97 | 49.20 +142 | 47 626 -58 | 40.63 -19 | |
| 2 | 10.6 | 12.252 -58 | 59.38 +154 | 54 309 -99 | 33.78 -205 | 18 413 -70 | 47.43 +177 | 47 587 -39 | 40.68 -5 | |
| 2 | 20.6 | 12.228 -24 | 57.53 +185 | 54.248 -61 | 31.62 -216 | 18 380 -33 | 45.34 +209 | 47 573 -14 | 40.53 +15 | |
| 3 | 2.5 | 12.238 +10 | 55.43 +210 | 54 227 -21 | 29.46 -216 | 18 384 +4 | 42.99 +235 | 47 587 +14 | 40.19 +34 | |
| 3 | 12.5 | 12.287 +49 | 53.09 +234 | 54.253 +26 | 27.34 -212 | 18 429 +45 | 40.41 +258 | 47 630 +43 | 39.74 +45 | |
| 3 | 22.5 | 12.378 +91 | 50.57 +252 | 54.331 +78 | 25.41 -193 | 18 520 +91 | 37.65 +276 | 47 706 +76 | 38.86 +88 | |
| 4 | 1.5 | 12.512 +134 | 47.92 +265 | 54.459 +128 | 23.74 -167 | 18 656 +136 | 34.79 +286 | 47 822 +116 | 37.82 +104 | |
| 4 | 11.4 | 12.691 +179 | 45.16 +276 | 54.640 +181 | 22.40 -134 | 18 840 +184 | 31.84 +295 | 47 976 +154 | 36.54 +128 | |
| 4 | 21.4 | 12.915 +224 | 42.37 +279 | 54.873 +233 | 21.47 -93 | 19.071 +231 | 28.88 +296 | 48 169 +193 | 35.04 +150 | |
| 5 | 1.4 | 13.179 +264 | 39.60 +277 | 55.149 +276 | 20.97 -50 | 19.345 +274 | 25.99 +289 | 48 397 +228 | 33.35 +169 | |
| 5 | 11.3 | 13.482 +303 | 36.90 +270 | 55.466 +317 | 20.94 -3 | 19.661 +316 | 23.18 +281 | 48.657 +260 | 31.47 +188 | |
| 5 | 21.3 | 13.817 +335 | 34.34 +256 | 55.814 +348 | 21.41 +47 | 20.012 +351 | 20.57 +261 | 48 945 +288 | 29.47 +200 | |
| 5 | 31.3 | 14.176 +359 | 31.98 +236 | 56.183 +369 | 22.33 +92 | 20.388 +376 | 18.19 +238 | 49.253 +308 | 27.40 +207 | |
| 6 | 10.3 | 14.555 +379 | 29.86 +212 | 56.567 +384 | 23.70 +137 | 20.785 +397 | 16.08 +211 | 49.576 +323 | 25.28 +212 | |
| 6 | 20.2 | 14.941 +386 | 28.06 +180 | 56.951 +384 | 25.48 +178 | 21.190 +405 | 14.34 +174 | 49.903 +327 | 23.18 +210 | |
| 6 | 30.2 | 15.324 +383 | 26.60 +146 | 57.327 +376 | 27.61 +213 | 21.594 +404 | 12.96 +138 | 50.228 +325 | 21.17 +201 | |
| 7 | 10.2 | 15.697 +373 | 25.51 +109 | 57.687 +360 | 30.06 +245 | 21.988 +394 | 12.00 +96 | 50 542 +314 | 19.27 +190 | |
| 7 | 20.2 | 16.048 +351 | 24.85 +66 | 58.019 +332 | 32.75 +269 | 22.359 +371 | 11.49 +51 | 50 837 +295 | 17.55 +172 | |
| 7 | 30.1 | 16.369 +321 | 24.59 +26 | 58.318 +299 | 35.60 +285 | 22.699 +340 | 11.41 +8 | 51.105 +268 | 16.04 +151 | |
| 8 | 9.1 | 16.654 +285 | 24.75 -16 | 58.578 +260 | 38.60 +300 | 23.001 +302 | 11.77 -36 | 51.343 +238 | 14.77 +127 | |
| 8 | 19.1 | 16.892 +238 | 25.32 -57 | 58.792 +214 | 41.63 +303 | 23.254 +253 | 12.56 -79 | 51.543 +200 | 13.77 +100 | |
| 8 | 29.0 | 17.083 +191 | 26.24 -92 | 58.960 +168 | 44.65 +302 | 23.457 +203 | 13.70 -114 | 51.705 +162 | 13.03 +74 | |
| 9 | 8.0 | 17.222 +139 | 27.49 -125 | 59.081 +121 | 47.61 +296 | 23.605 +148 | 15.19 -149 | 51.826 +121 | 12.56 +47 | |
| 9 | 18.0 | 17.307 +85 | 29.01 -152 | 59.153 +72 | 50.44 +283 | 23.695 +90 | 16.94 -175 | 51.905 +79 | 12.36 +20 | |
| 9 | 28.0 | 17.344 +37 | 30.70 -169 | 59.182 +29 | 53.10 +266 | 23.733 +38 | 18.85 -191 | 51.947 +42 | 12.38 -2 | |
| 10 | 7.9 | 17.333 -11 | 32.52 -182 | 59.167 -15 | 55.55 +245 | 23.718 -15 | 20.89 -204 | 51.953 +6 | 12.61 -23 | |
| 10 | 17.9 | 17.278 -55 | 34.36 -184 | 59.114 -53 | 57.70 +215 | 23.656 -62 | 22.91 -202 | 51.928 -25 | 13.02 -41 | |
| 10 | 27.9 | 17.190 -88 | 36.14 -178 | 59.030 -84 | 59.58 +189 | 23.557 -99 | 24.85 -194 | 51.878 -50 | 13.55 -53 | |
| 11 | 6.9 | 17.071 -119 | 37.80 -166 | 58.917 -113 | 61.10 +152 | 23.424 -133 | 26.64 -179 | 51.806 -72 | 14.18 -63 | |
| 11 | 16.8 | 16.932 -139 | 39.23 -143 | 58.781 -136 | 62.24 +114 | 23.268 -156 | 28.16 -152 | 51.720 -86 | 14.87 -69 | |
| 11 | 26.8 | 16.781 -151 | 40.40 -117 | 58.630 -151 | 62.99 +75 | 23.098 -170 | 29.38 -122 | 51.624 -96 | 15.57 -70 | |
| 12 | 6.8 | 16.622 -159 | 41.26 -86 | 58.464 -166 | 63.31 +32 | 22.919 -179 | 30.24 -86 | 51 522 -102 | 16.27 -70 | |
| 12 | 16.7 | 16.466 -156 | 41.74 -156 | 58.294 -170 | 63.20 -11 | 22.743 -176 | 30.68 -44 | 51 421 -101 | 16.92 -65 | |
| 12 | 26.7 | 16.317 -149 | 41.86 -12 | 58.122 -172 | 62.68 -52 | 22.574 -169 | 30.72 -4 | 51 323 -98 | 17.50 -58 | |
| 12 | 36.7 | 16.178 -139 | 41.59 +27 | 57.954 -168 | 61.72 -96 | 22.416 -158 | 30.33 +39 | 51.231 -92 | 18.02 -52 | |
| | | 16.178 -119 | 41.59 +66 | 57.954 -155 | 61.72 -132 | 22.416 -138 | 30.33 +82 | 51.231 -81 | 18.02 -39 | |
| Mean Place | 14.981 | 35.60 | | 57.768 | 43.14 | 21.165 | 23.25 | 50.297 | 21.07 | |
| sec δ , tan δ | +1.267 | -0.778 | | +1.309 | +0.844 | +1.360 | -0.922 | +1.009 | -0.132 | |
| da(ψ), d δ (ψ) | +0.064 | +0.39 | | +0.059 | +0.40 | +0.064 | +0.40 | +0.062 | +0.40 | |
| da(ϵ), d δ (ϵ) | +0.052 | -0.12 | | -0.056 | -0.11 | +0.061 | -0.11 | +0.009 | -0.11 | |
| Dble.Trans. | September 14 | | | September 14 | | | September 14 | | September 15 | |

AT UPPER TRANSIT AT GREENWICH

| No. | 890 | | 889 | | 891 | | 893 | |
|--------------|------------------------------------|-------------------------------------|------------------------------------|-------------------------------------|------------------------------------|-------------------------------------|------------------------------------|-------------------------------------|
| | λ Andromedae | | 11 G. Phoenicis | | ι Andromedae | | γ Cephei | |
| Mag.Spect. | 4.00 var. | K0 | 4.86 | A2 | 4.28 | B8 | 3.42 | K0 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | ^h ^m 23 36 | ^o ['] +46 22 | ^h ^m 23 37 | ^o ['] -45 33 | ^h ^m 23 37 | ^o ['] +43 11 | ^h ^m 23 38 | ^o ['] +77 32 |
| 1 -8.3 | ^s 51.174 -207 | 65.92 -28 | ^s 05.480 -189 | 91.63' -17 | ^s 25.528 -189 | 34.81 -32 | ^s 42.531 -938 | 90.29 +42 |
| 1 1.7 | 50.971 -203 | 65.19 -73 | 05.304 -176 | 91.35 +28 | 25.342 -186 | 34.07 -74 | 41.597 -934 | 90.09 -20 |
| 1 11.7 | 50.773 -198 | 64.00 -119 | 05.143 -161 | 90.65 +70 | 25.161 -181 | 32.91 -116 | 40.685 -912 | 89.27 -82 |
| 1 21.6 | 50.594 -179 | 62.41 -159 | 05.005 -138 | 89.50 +115 | 24.998 -163 | 31.36 -155 | 39.841 -844 | 87.84 -143 |
| 1 31.6 | 50.440 -154 | 60.50 -191 | 04.896 -109 | 87.96 +154 | 24.857 -141 | 29.52 -184 | 39.093 -748 | 85.91 -193 |
| 2 10.6 | 50.316 -124 | 58.31 -219 | 04.815 -81 | 86.07 +189 | 24.744 -113 | 27.42 -210 | 38.464 -629 | 83.51 -240 |
| 2 20.6 | 50.234 -82 | 55.97 -234 | 04.773 -42 | 83.85 +222 | 24.671 -73 | 25.19 -223 | 37.993 -471 | 80.75 -276 |
| 3 2.5 | 50.199 -35 | 53.57 -240 | 04.770 -3 | 81.37 +248 | 24.641 -30 | 22.92 -227 | 37.692 -301 | 77.79 -296 |
| 3 12.5 | 50.215 +16 | 51.20 -237 | 04.810 +40 | 78.65 +272 | 24.659 +18 | 20.68 -224 | 37.575 -117 | 74.70 -309 |
| 3 22.5 | 50.291 +76 | 48.98 -222 | 04.899 +89 | 75.76 +289 | 24.732 +73 | 18.61 -207 | 37.657 +82 | 71.64 -306 |
| 4 1.5 | 50.423 +132 | 47.02 -196 | 05.034 +135 | 72.77 +299 | 24.859 +127 | 16.80 -181 | 37.925 +268 | 68.75 -289 |
| 4 11.4 | 50.614 +191 | 45.37 -165 | 05.220 +186 | 69.70 +307 | 25.042 +183 | 15.30 -150 | 38.377 +452 | 66.09 -266 |
| 4 21.4 | 50.861 +247 | 44.14 -123 | 05.455 +235 | 66.65 +305 | 25.279 +237 | 14.21 -109 | 39.002 +625 | 63.83 -226 |
| 5 1.4 | 51.157 +296 | 43.35 -79 | 05.735 +280 | 63.67 +298 | 25.561 +282 | 13.57 -64 | 39.764 +762 | 62.01 -182 |
| 5 11.3 | 51.497 +340 | 43.05 -30 | 06.059 +324 | 60.80 +287 | 25.887 +326 | 13.39 -18 | 40.652 +888 | 60.69 -132 |
| 5 21.3 | 51.872 +375 | 43.27 +22 | 06.419 +360 | 58.15 +265 | 26.246 +359 | 13.72 +33 | 41.631 +979 | 59.95 -74 |
| 5 31.3 | 52.269 +397 | 43.97 +70 | 06.807 +388 | 55.74 +241 | 26.626 +380 | 14.52 +80 | 42.664 +1033 | 59.77 -18 |
| 6 10.3 | 52.682 +413 | 45.16 +119 | 07.217 +410 | 53.63 +211 | 27.023 +397 | 15.78 +126 | 43.731 +1067 | 60.18 +41 |
| 6 20.2 | 53.096 +414 | 46.82 +166 | 07.637 +420 | 51.91 +172 | 27.421 +398 | 17.49 +171 | 44.793 +1062 | 61.18 +100 |
| 6 30.2 | 53.500 +404 | 48.85 +203 | 08.055 +418 | 50.57 +134 | 27.810 +389 | 19.56 +207 | 45.820 +1027 | 62.70 +152 |
| 7 10.2 | 53.887 +387 | 51.26 +241 | 08.465 +410 | 49.67 +90 | 28.184 +374 | 21.98 +242 | 46.795 +975 | 64.74 +204 |
| 7 20.2 | 54.244 +357 | 53.96 +270 | 08.850 +385 | 49.23 +44 | 28.528 +344 | 24.67 +269 | 47.681 +886 | 67.25 +251 |
| 7 30.1 | 54.565 +321 | 56.86 +290 | 09.205 +355 | 49.24 -1 | 28.839 +311 | 27.54 +287 | 48.466 +785 | 70.13 +288 |
| 8 9.1 | 54.845 +280 | 59.95 +309 | 09.521 +316 | 49.71 -47 | 29.111 +272 | 30.58 +304 | 49.137 +671 | 73.37 +324 |
| 8 19.1 | 55.074 +229 | 63.13 +318 | 09.786 +285 | 50.62 -91 | 29.335 +224 | 33.68 +310 | 49.667 +530 | 76.87 +350 |
| 8 29.0 | 55.255 +181 | 66.32 +319 | 09.999 +213 | 51.89 -127 | 29.512 +177 | 36.79 +311 | 50.062 +395 | 80.55 +368 |
| 9 8.0 | 55.384 +129 | 69.51 +319 | 10.155 +156 | 51.89 -161 | 29.512 +128 | 36.79 +309 | 50.062 +248 | 80.55 +382 |
| 9 18.0 | 55.460 +76 | 69.51 +307 | 10.155 +96 | 53.50 -188 | 29.640 +77 | 39.88 +295 | 50.310 +92 | 84.37 +384 |
| 9 28.0 | 55.489 +29 | 72.58 +292 | 10.251 +40 | 55.38 -204 | 29.717 +32 | 42.83 +280 | 50.402 -50 | 88.21 +381 |
| 10 7.9 | 55.470 -19 | 75.50 +273 | 10.291 -15 | 57.42 -216 | 29.749 -13 | 45.63 +260 | 50.352 -201 | 92.02 +372 |
| 10 17.9 | 55.409 -61 | 80.67 +244 | 10.211 -65 | 59.58 -213 | 29.736 -54 | 48.23 +232 | 50.151 -344 | 95.74 +350 |
| 10 27.9 | 55.312 -97 | 82.83 +216 | 10.106 -105 | 61.71 -204 | 29.682 -86 | 50.55 +203 | 49.807 -471 | 99.24 +324 |
| 11 6.9 | 55.181 -131 | 84.63 +180 | 09.964 -142 | 63.75 -187 | 29.596 -119 | 52.58 +169 | 49.336 -599 | 102.48 +291 |
| 11 16.8 | 55.024 -157 | 86.01 +138 | 09.964 -167 | 65.62 -158 | 29.477 -143 | 54.27 +128 | 48.737 -705 | 105.39 +245 |
| 11 26.8 | 54.848 -176 | 86.99 +98 | 09.797 -183 | 67.20 -126 | 29.334 -161 | 55.55 +89 | 48.032 -792 | 107.84 +199 |
| 12 6.8 | 54.655 -193 | 87.50 +51 | 09.614 -193 | 68.46 -87 | 29.173 -177 | 56.44 +4 | 47.240 -871 | 109.83 +142 |
| 12 16.7 | 54.454 -203 | 87.53 +3 | 09.421 -191 | 69.33 -43 | 28.996 -183 | 56.88 -41 | 46.369 -911 | 111.25 +82 |
| 12 26.7 | 54.251 -201 | 87.53 -42 | 09.230 -185 | 69.76 -1 | 28.813 -185 | 56.87 -45 | 45.458 -931 | 112.07 +22 |
| 12 36.7 | 54.050 -186 | 87.11 -91 | 09.045 -173 | 69.77 +45 | 28.628 -184 | 56.42 -90 | 44.527 -926 | 112.29 -43 |
| | | 86.20 -133 | 08.872 -151 | 69.32 +90 | 28.444 -170 | 55.52 -130 | 43.601 -877 | 111.86 -104 |
| Mean Place | 54.020 | 65.95 | 07.576 | 61.65 | 28.308 | 35.85 | 47.113 | 85.25 |
| sec δ, tan δ | +1.450 | +1.050 | +1.428 | -1.020 | +1.372 | +0.939 | +4.641 | +4.532 |
| dα(ψ), dδ(ψ) | +0.058 | +0.40 | +0.064 | +0.40 | +0.059 | +0.40 | +0.050 | +0.40 |
| dα(ε), dδ(ε) | -0.070 | -0.10 | +0.068 | -0.10 | -0.062 | -0.10 | -0.301 | -0.09 |
| Dbble.Trans. | September 15 | | September 15 | | September 15 | | September 16 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 892 | | 1619 | | 1618 | | 1620 | |
|---------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|
| | ι Piscium | | α Andromedae | | μ Sculptoris | | λ Piscium | |
| Mag. Spect. | 4.28 | F8 | 4.33 | A0 | 5.33 | K0 | 4.61 | A5 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | ^h ^m | [°] ['] | ^h ^m | [°] ['] | ^h ^m | [°] ['] | ^h ^m | [°] ['] |
| | 23 39 | + 5 32 | 23 39 | + 44 15 | 23 39 | - 32 08 | 23 41 | + 1 42 |
| 1 ^d -8.3 | ^s 12.916 - 101 | " - 66 | ^s 41 641 - 194 | 32.12 - 28 | ^s 53 598 - 137 | " - 41 | ^s 19 096 - 101 | " - 66 |
| 1 1.7 | 12.819 - 97 | 57 35 - 72 | 41 449 - 192 | 31 42 - 70 | 53 470 - 128 | 78 34 - 9 | 18 999 - 97 | 06 69 - 67 |
| 1 11.7 | 12.728 - 91 | 56 57 - 78 | 41 263 - 186 | 30 27 - 115 | 53 352 - 118 | 78 43 + 25 | 18 908 - 91 | 05 01 - 68 |
| 1 21.7 | 12.649 - 79 | 55 79 - 78 | 41 093 - 170 | 28 74 - 153 | 53 251 - 101 | 77 58 + 60 | 18 829 - 79 | 04 36 - 65 |
| 1 31.6 | 12.585 - 64 | 55.04 - 75 | 40.946 - 147 | 26.90 - 184 | 53.171 - 80 | 76.66 + 92 | 18.764 - 65 | 03.77 - 59 |
| 2 10.6 | 12.538 - 47 | 54 34 - 70 | 40 827 - 119 | 24 79 - 211 | 53 113 - 58 | 75 44 +122 | 18 717 - 47 | 03 26 - 51 |
| 2 20.6 | 12.517 - 21 | 53.76 - 58 | 40.748 - 79 | 22 54 - 225 | 53 085 - 28 | 73 91 +153 | 18 695 - 22 | 02 90 - 36 |
| 3 2.5 | 12.524 + 7 | 53.33 - 43 | 40.713 + 35 | 20 24 - 230 | 53 088 + 3 | 72 14 + 202 | 18 699 + 4 | 02 70 + 4 |
| 3 12.5 | 12.561 + 37 | 53.11 - 22 | 40.728 + 15 | 17 96 - 228 | 53 126 + 38 | 70 12 +202 | 18 736 + 37 | 02 74 + 4 |
| 3 22.5 | 12.632 + 71 | 53.08 - 3 | 40.799 + 71 | 15.85 - 211 | 53.206 + 80 | 67 88 +224 | 18 800 + 64 | 02 92 + 18 |
| 4 1.5 | 12.745 + 113 | 53 29 + 21 | 40.924 + 125 | 13 98 - 187 | 53 325 + 119 | 65 48 +240 | 18 911 + 111 | 03 38 + 46 |
| 4 11.4 | 12.897 + 152 | 53 80 + 51 | 41 106 + 182 | 12 42 - 156 | 53 487 + 162 | 62 95 +253 | 19 059 + 148 | 04 12 + 74 |
| 4 21.4 | 13.088 + 191 | 54 62 + 82 | 41 344 + 238 | 11 28 - 114 | 53 692 + 205 | 60 33 +262 | 19 247 + 188 | 05 15 +103 |
| 5 1.4 | 13.314 + 226 | 55 71 +109 | 41 628 + 284 | 10 57 - 71 | 53 936 + 244 | 57 70 +263 | 19 469 + 222 | 06 42 +127 |
| 5 11.3 | 13.574 + 260 | 57 08 +137 | 41 957 + 329 | 10 33 - 24 | 54 219 + 283 | 55 08 +262 | 19 725 + 256 | 07 94 +152 |
| 5 21.3 | 13.861 + 287 | 58 69 +161 | 42 319 + 362 | 10 61 + 28 | 54 533 + 314 | 52 55 +253 | 20 009 + 284 | 09 68 +174 |
| 5 31.3 | 14.168 + 307 | 60 50 +181 | 42 705 + 386 | 11 36 + 75 | 54 871 + 338 | 50 16 +239 | 20 313 + 304 | 11 57 +189 |
| 6 10.3 | 14.490 + 322 | 62 47 +197 | 43 106 + 401 | 12 58 +122 | 55 228 + 357 | 47 95 +221 | 20 632 + 319 | 13 60 +203 |
| 6 20.2 | 14.816 + 326 | 64 55 +203 | 43 509 + 403 | 14 25 +167 | 55 593 + 365 | 46 02 +193 | 20 957 + 325 | 15 70 +210 |
| 6 30.2 | 15.138 + 322 | 66 68 +213 | 43 905 + 396 | 16 29 +204 | 55 958 + 365 | 44 38 +164 | 21 278 + 321 | 17 81 +211 |
| 7 10.2 | 15.451 + 313 | 68 82 +214 | 44 284 + 379 | 18 69 +240 | 56 314 + 356 | 43 07 +131 | 21 591 + 313 | 19 89 +208 |
| 7 20.2 | 15.743 + 292 | 70 89 +207 | 44 635 + 351 | 21 36 +267 | 56 649 + 335 | 42 15 + 92 | 21 884 + 293 | 21 88 +199 |
| 7 30.1 | 16.011 + 268 | 72 86 +197 | 44 952 + 317 | 24 24 +288 | 56 957 + 308 | 41 60 + 55 | 22 152 + 268 | 23 73 +185 |
| 8 9.1 | 16.247 + 236 | 74 70 +184 | 45 228 + 276 | 27 28 +304 | 57 232 + 275 | 41 45 + 15 | 22 390 + 238 | 25 42 +169 |
| 8 19.1 | 16.446 + 199 | 76 35 +195 | 45 457 + 229 | 30 41 +313 | 57 464 + 232 | 41 70 - 25 | 22 591 + 201 | 26 89 +147 |
| 8 29.0 | 16.608 + 162 | 77 79 +144 | 45 639 + 182 | 33 54 +313 | 57 653 + 189 | 42 30 - 60 | 22 755 + 164 | 28 13 +124 |
| 9 8.0 | 16.730 + 122 | 79 01 +122 | 45 771 + 132 | 36 66 +312 | 57 794 + 141 | 43 23 - 93 | 22 879 + 124 | 29 15 +102 |
| 9 18.0 | 16.811 + 81 | 79 99 + 98 | 45 851 + 80 | 39 66 +300 | 57 885 + 91 | 44 44 - 121 | 22 963 + 84 | 29 90 + 75 |
| 9 28.0 | 16.857 + 46 | 80 74 + 75 | 45 886 + 35 | 42 51 +285 | 57 931 + 46 | 45 86 - 142 | 23 010 + 47 | 30 44 + 54 |
| 10 7.9 | 16.868 + 11 | 81 26 + 52 | 45 875 - 11 | 45 16 +265 | 57 932 + 1 | 47 43 - 157 | 23 023 + 13 | 30 74 + 30 |
| 10 17.9 | 16.848 - 20 | 81 56 - 30 | 45 823 - 52 | 47 53 +237 | 57 894 - 38 | 49 07 - 164 | 23 004 - 19 | 30 83 + 9 |
| 10 27.9 | 16.803 - 45 | 81 68 + 12 | 45 736 - 87 | 49 62 +209 | 57 823 - 71 | 50 69 - 162 | 22 961 - 43 | 30 76 - 7 |
| 11 6.9 | 16.737 - 66 | 81 60 - 8 | 45 617 - 119 | 51 37 +175 | 57 724 - 99 | 52 24 - 155 | 22 896 - 65 | 30 52 - 24 |
| 11 16.8 | 16.656 - 81 | 81 36 - 24 | 45 472 - 145 | 52 71 +134 | 57 606 - 118 | 53 63 - 139 | 22 816 - 80 | 30 15 - 37 |
| 11 26.8 | 16.565 - 91 | 81 00 - 36 | 45 308 - 164 | 53 65 + 94 | 57 475 - 131 | 54 80 - 117 | 22 726 - 90 | 29 68 - 47 |
| 12 6.8 | 16.466 - 99 | 80 50 - 50 | 45 128 - 180 | 54 14 + 49 | 57 336 - 139 | 55 72 - 92 | 22 628 - 98 | 29 11 - 57 |
| 12 16.7 | 16.367 - 99 | 79 90 - 60 | 44 940 - 188 | 54 17 + 3 | 57 198 - 138 | 56 32 - 60 | 22 528 - 100 | 28 50 - 61 |
| 12 26.7 | 16.268 - 99 | 79 23 - 67 | 44 749 - 191 | 53 76 - 41 | 57 064 - 134 | 56 60 - 28 | 22 430 - 98 | 27 85 - 65 |
| 12 36.7 | 16.174 - 94 | 78 49 - 74 | 44 560 - 189 | 52 88 - 88 | 56 938 - 126 | 56 55 + 5 | 22 336 - 94 | 27 17 - 68 |
| | - 85 | - 76 | - 176 | - 128 | - 110 | + 40 | - 85 | - 65 |
| Mean Place | 15.342 | 71.06 | 44.432 | 32.81 | 55.760 | 52.18 | 21.465 | 20.83 |
| sec δ, tan δ | +1.005 | +0.097 | +1.396 | +0.974 | +1.181 | -0.628 | +1.000 | +0.030 |
| dα(ψ), dδ(ψ) | +0.061 | +0.40 | +0.059 | +0.40 | +0.063 | +0.40 | +0.061 | +0.40 |
| dα(ε), dδ(ε) | -0.006 | -0.09 | -0.065 | -0.09 | +0.042 | -0.09 | -0.002 | -0.08 |
| Dble. Trans. | September 16 | | September 16 | | September 16 | | September 16 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 894 | | 1621 | | 1622 | | 1623 | |
|---------------|------------------------|------------|--------------|------------|--------------|------------|--------------|------------|
| | ω ¹ Aquarii | | 106 Aquarii | | ψ Andromedae | | 20 Piscium | |
| Mag. Spect. | 4.62 | A0 | 5.26 | B8 | 5.09 | K0, A5 | 5.60 | K0 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " |
| | 23 41 | - 14 37 | 23 43 | - 18 20 | 23 45 | + 46 20 | 23 47 | - 2 50 |
| 1 -8.3 | 59.100 -106 | 30.94 -60 | 27.894 -111 | 88.33 -59 | 18.921 -206 | 43.17 -18 | 12.586 -101 | 28.02 -66 |
| 1 1.7 | 58.999 -101 | 31.39 -45 | 27.790 -104 | 88.71 -38 | 18.717 -204 | 42.55 -62 | 12.490 -96 | 28.63 -61 |
| 1 11.7 | 58.906 -90 | 31.67 -28 | 27.692 -98 | 88.89 -18 | 18.517 -200 | 41.47 -108 | 12.398 -92 | 29.21 -58 |
| 1 21.7 | 58.826 -83 | 31.75 -8 | 27.608 -84 | 88.84 +5 | 18.332 -185 | 39.98 -149 | 12.317 -81 | 29.70 -49 |
| 1 31.6 | 58.761 -65 | 31.64 +11 | 27.540 -68 | 88.56 +28 | 18.170 -162 | 38.16 -182 | 12.250 -67 | 30.10 -40 |
| 2 10.6 | 58.715 -46 | 31.32 +32 | 27.491 -49 | 82.06 +50 | 18.037 -133 | 36.05 -211 | 12.200 -50 | 30.37 -27 |
| 2 20.6 | 58.695 -20 | 30.78 +54 | 27.467 -24 | 87.31 +75 | 17.945 -92 | 33.77 -228 | 12.173 -27 | 30.48 -11 |
| 3 2.5 | 58.701 +36 | 30.02 +76 | 27.471 +4 | 86.33 +98 | 17.898 -47 | 31.42 -235 | 12.174 +1 | 30.41 +7 |
| 3 12.5 | 58.737 +36 | 29.05 +97 | 27.505 +34 | 85.12 +121 | 17.902 +4 | 29.08 -234 | 12.209 +35 | 30.13 +28 |
| 3 22.5 | 58.810 +73 | 27.80 +125 | 27.577 +72 | 83.65 +147 | 17.965 +63 | 26.88 -220 | 12.264 +55 | 29.67 +46 |
| 4 1.5 | 58.920 +110 | 26.34 +146 | 27.686 +109 | 81.98 +167 | 18.084 +119 | 24.91 -197 | 12.369 +105 | 28.88 +79 |
| 4 11.4 | 59.069 +149 | 24.67 +167 | 27.834 +148 | 80.11 +187 | 18.264 +180 | 23.23 -168 | 12.512 +143 | 27.87 +101 |
| 4 21.4 | 59.258 +189 | 22.81 +186 | 28.024 +190 | 78.07 +204 | 18.501 +237 | 21.97 -126 | 12.694 +182 | 26.60 +127 |
| 5 1.4 | 59.483 +225 | 20.81 +200 | 28.249 +225 | 75.92 +215 | 18.787 +286 | 21.13 -84 | 12.911 +217 | 25.12 +148 |
| 5 11.4 | 59.742 +259 | 18.69 +212 | 28.509 +260 | 73.67 +225 | 19.120 +333 | 20.76 -37 | 13.163 +252 | 23.41 +171 |
| 5 21.3 | 60.031 +269 | 16.49 +220 | 28.800 +291 | 71.38 +229 | 19.490 +370 | 20.92 +16 | 13.444 +281 | 21.54 +187 |
| 5 31.3 | 60.340 +309 | 14.29 +220 | 29.112 +312 | 69.11 +227 | 19.883 +393 | 21.55 +63 | 13.746 +302 | 19.54 +200 |
| 6 10.3 | 60.667 +327 | 12.10 +219 | 29.442 +330 | 66.90 +221 | 20.295 +412 | 22.66 +111 | 14.064 +318 | 17.45 +209 |
| 6 20.2 | 61.000 +333 | 10.02 +208 | 29.780 +338 | 64.82 +208 | 20.710 +415 | 24.24 +158 | 14.390 +326 | 15.33 +212 |
| 6 30.2 | 61.331 +331 | 08.07 +195 | 30.116 +336 | 62.92 +190 | 21.117 +407 | 26.21 +197 | 14.713 +323 | 13.25 +208 |
| 7 10.2 | 61.654 +323 | 06.31 +176 | 30.444 +328 | 61.24 +168 | 21.510 +393 | 28.54 +233 | 15.029 +316 | 11.24 +201 |
| 7 20.2 | 61.958 +304 | 04.80 +151 | 30.753 +309 | 59.83 +141 | 21.874 +364 | 31.18 +264 | 15.326 +297 | 09.36 +188 |
| 7 30.1 | 62.238 +290 | 03.54 +126 | 31.038 +285 | 58.71 +112 | 22.203 +329 | 34.04 +286 | 15.600 +274 | 07.65 +171 |
| 8 9.1 | 62.486 +248 | 02.58 +96 | 31.292 +254 | 57.90 +81 | 22.493 +290 | 37.09 +305 | 15.844 +244 | 06.15 +150 |
| 8 19.1 | 62.697 +211 | 01.93 +65 | 31.507 +215 | 57.43 +47 | 22.734 +241 | 40.24 +315 | 16.051 +207 | 04.89 +126 |
| 8 29.1 | 62.869 +172 | 01.57 +36 | 31.684 +177 | 57.27 +16 | 22.927 +193 | 43.42 +318 | 16.223 +172 | 03.87 +102 |
| 9 8.0 | 63.000 +131 | 01.51 +6 | 31.818 +134 | 57.43 -16 | 23.070 +143 | 46.60 +318 | 16.354 +131 | 03.11 +76 |
| 9 18.0 | 63.088 +88 | 01.73 -22 | 31.909 +91 | 57.86 -43 | 23.159 +89 | 49.68 +308 | 16.445 +91 | 02.62 +49 |
| 9 28.0 | 63.137 +49 | 02.18 -45 | 31.960 +51 | 58.52 -66 | 23.202 +43 | 52.62 +294 | 16.500 +55 | 02.35 +27 |
| 10 7.9 | 63.149 +12 | 02.83 -65 | 31.972 +12 | 59.38 -86 | 23.197 -5 | 55.39 +277 | 16.519 +19 | 02.31 +4 |
| 10 17.9 | 63.127 -22 | 03.63 -80 | 31.950 -22 | 60.37 -99 | 23.148 -49 | 57.88 +249 | 16.506 -13 | 02.47 -16 |
| 10 27.9 | 63.079 -48 | 04.51 -88 | 31.901 -49 | 61.43 -106 | 23.063 -85 | 60.09 +221 | 16.468 -38 | 02.78 -31 |
| 11 6.9 | 63.007 -72 | 05.46 -95 | 31.827 -74 | 62.52 -109 | 22.943 -120 | 61.96 +187 | 16.407 -61 | 03.23 -45 |
| 11 16.8 | 62.920 -87 | 06.39 -93 | 31.736 -91 | 63.57 -105 | 22.796 -147 | 63.43 +147 | 16.407 -77 | 03.23 -54 |
| 11 26.8 | 62.822 -98 | 07.28 -89 | 31.635 -101 | 64.54 -97 | 22.627 -169 | 64.50 +107 | 16.330 -87 | 03.77 -60 |
| 12 6.8 | 62.716 -106 | 08.09 -81 | 31.525 -110 | 65.39 -85 | 22.439 -188 | 65.11 +61 | 16.146 -97 | 05.01 -64 |
| 12 16.8 | 62.611 -105 | 08.76 -67 | 31.415 -110 | 66.08 -69 | 22.242 -197 | 65.25 +14 | 16.048 -98 | 05.65 -64 |
| 12 26.7 | 62.507 -104 | 09.30 -54 | 31.307 -108 | 66.58 -50 | 22.040 -202 | 64.93 -32 | 15.950 -98 | 06.28 -63 |
| 12 36.7 | 62.409 -98 | 09.68 -38 | 31.204 -103 | 66.88 -30 | 21.838 -202 | 64.13 -80 | 15.855 -95 | 06.89 -61 |
| | 62.409 -87 | 09.68 -19 | 31.204 -91 | 66.88 -8 | 21.838 -190 | 64.13 -123 | 15.855 -85 | 06.89 -52 |
| Mean Place | 61.368 | 10.60 | 30.123 | 66.70 | 21.720 | 43.15 | 14.895 | 11.98 |
| sec δ, tan δ | +1.033 | -0.261 | +1.054 | -0.332 | +1.449 | +1.048 | +1.001 | -0.050 |
| da(ψ), dδ(ψ) | +0.062 | +0.40 | +0.062 | +0.40 | +0.059 | +0.40 | +0.061 | +0.40 |
| da(ε), dδ(ε) | +0.017 | -0.08 | +0.022 | -0.07 | -0.070 | -0.06 | +0.003 | -0.06 |
| Dbble. Trans. | September 16 | | September 17 | | September 17 | | September 18 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 895 | | 896 | | 1624 | | 897 | | |
|--------------|--------------|--------------|--------------|--------------|--------------------------------------|--------------|----------------|--------------|-------------|
| | 41 H. Cephei | | δ Sculptoris | | Piazzi 23 ^b 194 (Aquarii) | | 268 G. Aquarii | | |
| Mag.Spect. | 5.02 | A0 | 4.64 | A0 | 7.14 | K0 | 6.08 | K0 | |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " | |
| | 23 47 | + 67 43 | 23 48 | - 28 12 | 23 48 | - 21 41 | 23 49 | - 10 02 | |
| 1 | -8.3 | 12.121 - 475 | 58.85 + 31 | 11.359 - 128 | 42.57 - 52 | 41.978 - 115 | 43.49 - 58 | 30.698 - 103 | 77.13 - 65 |
| 1 | 1.7 | 11.645 - 476 | 58.57 - 28 | 11.237 - 122 | 42.78 - 21 | 41.867 - 111 | 43.84 - 35 | 30.599 - 99 | 77.66 - 53 |
| 1 | 11.7 | 11.175 - 470 | 57.71 - 86 | 11.123 - 114 | 42.71 + 7 | 41.764 - 103 | 43.95 - 11 | 30.505 - 94 | 78.07 - 41 |
| 1 | 21.7 | 10.737 - 438 | 56.28 - 143 | 11.024 - 99 | 42.30 + 41 | 41.673 - 91 | 43.79 + 16 | 30.422 - 83 | 78.33 - 26 |
| 1 | 31.6 | 10.347 - 390 | 54.38 - 190 | 10.943 - 81 | 41.60 + 70 | 41.598 - 75 | 43.37 + 42 | 30.354 - 68 | 78.42 - 9 |
| 2 | 10.6 | 10.016 - 331 | 52.04 - 234 | 10.882 - 61 | 40.60 + 100 | 41.542 - 56 | 42.71 + 66 | 30.302 - 52 | 78.34 + 8 |
| 2 | 20.6 | 09.768 - 248 | 49.38 - 266 | 10.849 - 33 | 39.31 + 129 | 41.512 - 30 | 41.78 + 93 | 30.274 - 28 | 78.04 + 30 |
| 3 | 2.5 | 09.610 - 158 | 46.54 - 284 | 10.844 - 5 | 37.77 + 154 | 41.509 - 3 | 40.61 + 117 | 30.273 + 1 | 77.55 + 49 |
| 3 | 12.5 | 09.552 - 58 | 43.60 - 294 | 10.873 + 29 | 35.97 + 180 | 41.537 + 28 | 39.19 + 142 | 30.302 + 29 | 76.87 + 68 |
| 3 | 22.5 | 09.607 + 55 | 40.71 - 289 | 10.942 + 69 | 33.94 + 203 | 41.603 + 66 | 37.53 + 166 | 30.363 + 61 | 75.90 + 97 |
| 4 | 1.5 | 09.766 + 159 | 37.99 - 272 | 11.049 + 107 | 31.74 + 220 | 41.707 + 104 | 35.67 + 186 | 30.464 + 101 | 74.69 + 121 |
| 4 | 11.4 | 10.034 + 268 | 35.52 - 247 | 11.198 + 149 | 29.37 + 237 | 41.852 + 145 | 33.62 + 205 | 30.605 + 141 | 73.26 + 143 |
| 4 | 21.4 | 10.403 + 369 | 33.43 - 209 | 11.391 + 193 | 26.88 + 249 | 42.038 + 186 | 31.42 + 220 | 30.785 + 180 | 71.62 + 164 |
| 5 | 1.4 | 10.857 + 454 | 31.79 - 164 | 11.621 + 230 | 24.35 + 253 | 42.261 + 223 | 29.12 + 230 | 31.002 + 217 | 69.80 + 182 |
| 5 | 11.4 | 11.390 + 533 | 30.65 - 114 | 11.890 + 269 | 21.79 + 256 | 42.520 + 259 | 26.74 + 238 | 31.253 + 251 | 67.82 + 198 |
| 5 | 21.3 | 11.982 + 592 | 30.07 - 58 | 12.191 + 301 | 19.28 + 251 | 42.811 + 291 | 24.36 + 238 | 31.535 + 282 | 65.73 + 209 |
| 5 | 31.3 | 12.611 + 629 | 30.04 - 3 | 12.517 + 326 | 16.87 + 241 | 43.125 + 314 | 22.03 + 233 | 31.838 + 303 | 63.58 + 215 |
| 6 | 10.3 | 13.267 + 656 | 30.57 + 53 | 12.862 + 345 | 14.61 + 226 | 43.458 + 333 | 19.78 + 225 | 32.159 + 321 | 61.40 + 218 |
| 6 | 20.2 | 13.926 + 659 | 31.68 + 111 | 13.216 + 354 | 12.58 + 203 | 43.800 + 342 | 17.69 + 209 | 32.487 + 328 | 59.28 + 212 |
| 6 | 30.2 | 14.570 + 644 | 33.29 + 161 | 13.571 + 355 | 10.81 + 177 | 44.141 + 341 | 15.81 + 188 | 32.815 + 328 | 57.25 + 203 |
| 7 | 10.2 | 15.187 + 617 | 35.38 + 209 | 13.918 + 347 | 09.34 + 147 | 44.475 + 334 | 14.17 + 164 | 33.136 + 321 | 55.36 + 189 |
| 7 | 20.2 | 15.755 + 568 | 37.92 + 254 | 14.247 + 329 | 08.23 + 111 | 44.792 + 317 | 12.85 + 132 | 33.438 + 302 | 53.68 + 168 |
| 7 | 30.1 | 16.267 + 512 | 40.80 + 288 | 14.551 + 304 | 07.48 + 75 | 45.084 + 292 | 11.83 + 102 | 33.717 + 279 | 52.22 + 146 |
| 8 | 9.1 | 16.712 + 445 | 44.00 + 320 | 14.824 + 273 | 07.10 + 38 | 45.346 + 262 | 11.15 + 68 | 33.967 + 250 | 51.02 + 120 |
| 8 | 19.1 | 17.076 + 364 | 47.44 + 344 | 15.056 + 232 | 07.12 - 2 | 45.570 + 224 | 10.83 + 32 | 34.181 + 214 | 50.11 + 91 |
| 8 | 29.1 | 17.361 + 285 | 51.02 + 358 | 15.248 + 192 | 07.48 - 36 | 45.754 + 184 | 10.84 - 1 | 34.357 + 176 | 49.48 + 63 |
| 9 | 8.0 | 17.561 + 200 | 54.72 + 370 | 15.394 + 146 | 08.18 - 70 | 45.895 + 141 | 11.17 - 33 | 34.493 + 136 | 49.14 + 34 |
| 9 | 18.0 | 17.670 + 109 | 58.42 + 370 | 15.492 + 98 | 09.17 - 99 | 45.992 + 97 | 11.79 - 62 | 34.588 + 95 | 49.07 + 7 |
| 9 | 28.0 | 17.697 + 27 | 62.06 + 364 | 15.548 + 56 | 10.38 - 121 | 46.049 + 57 | 12.64 - 85 | 34.646 + 58 | 49.24 - 17 |
| 10 | 7.9 | 17.638 - 59 | 65.60 + 354 | 15.561 + 13 | 11.78 - 140 | 46.065 + 16 | 13.69 - 105 | 34.666 + 20 | 49.63 - 39 |
| 10 | 17.9 | 17.498 - 140 | 68.90 + 330 | 15.535 - 26 | 13.26 - 148 | 46.046 - 19 | 14.86 - 117 | 34.654 - 12 | 50.19 - 66 |
| 10 | 27.9 | 17.287 - 211 | 71.94 + 304 | 15.479 - 56 | 14.77 - 151 | 45.998 - 48 | 16.08 - 122 | 34.615 - 39 | 50.86 - 67 |
| 11 | 6.9 | 17.005 - 282 | 74.64 + 270 | 15.395 - 84 | 16.25 - 148 | 45.924 - 74 | 17.33 - 125 | 34.553 - 62 | 51.64 - 78 |
| 11 | 16.8 | 16.665 - 340 | 76.89 + 225 | 15.291 - 104 | 17.59 - 134 | 45.832 - 92 | 18.50 - 117 | 34.474 - 79 | 52.44 - 80 |
| 11 | 26.8 | 16.276 - 388 | 78.70 + 181 | 15.174 - 117 | 18.77 - 118 | 45.727 - 105 | 19.56 - 106 | 34.384 - 90 | 53.23 - 79 |
| 12 | 6.8 | 15.843 - 433 | 79.97 + 127 | 15.047 - 127 | 19.73 - 96 | 45.614 - 113 | 20.47 - 91 | 34.285 - 99 | 54.00 - 77 |
| 12 | 16.8 | 15.386 - 457 | 80.66 + 69 | 14.920 - 127 | 20.41 - 68 | 45.499 - 115 | 21.17 - 70 | 34.184 - 101 | 54.69 - 69 |
| 12 | 26.7 | 14.914 - 472 | 80.78 + 12 | 14.794 - 126 | 20.82 - 41 | 45.386 - 113 | 21.66 - 49 | 34.083 - 101 | 55.28 - 59 |
| 12 | 36.7 | 14.441 - 473 | 80.28 - 50 | 14.675 - 119 | 20.92 - 10 | 45.277 - 109 | 21.92 - 26 | 33.986 - 97 | 55.77 - 49 |
| | | 14.441 - 451 | 80.28 - 107 | 14.675 - 107 | 20.92 + 22 | 45.277 - 98 | 21.92 + 1 | 33.986 - 88 | 55.77 - 33 |
| Mean Place | 15.592 | 54.53 | 13.481 | 17.83 | 44.139 | 20.85 | 32.943 | 58.52 | |
| sec δ, tan δ | +2.639 | +2.442 | +1.135 | -0.536 | +1.076 | -0.398 | +1.016 | -0.177 | |
| dα(ψ), dδ(ψ) | +0.058 | +0.40 | +0.062 | +0.40 | +0.062 | +0.40 | +0.061 | +0.40 | |
| dα(ε), dδ(ε) | -0.163 | -0.06 | +0.036 | -0.05 | +0.026 | -0.05 | +0.012 | -0.05 | |
| Dble.Trans. | September 18 | | September 18 | | September 18 | | September 18 | | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 898 | | 1625 | | 899 | | 1626 | |
|--------------|---------------------------|------------|---------------------------|------------|---------------------------|------------|---------------------------|------------|
| | φ Pegasi | | 82 Pegasi | | g Cassiopeiae | | 27 G. Phoenicis | |
| Name | φ Pegasi | | 82 Pegasi | | g Cassiopeiae | | 27 G. Phoenicis | |
| Mag.Spect. | 5.23 | M0 | 5.39 | A3 | 4.4 to 5.1 | F8p | 6.01 | F8 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " |
| | 23 51 | + 19 02 | 23 51 | + 10 52 | 23 53 | + 57 25 | 23 53 | - 40 22 |
| 1 -8.3 | 45 564 ^s - 114 | 35 07 - 53 | 53 386 ^s - 106 | 09 36 - 60 | 39 272 ^s - 295 | 30 35 + 15 | 54 327 ^s - 166 | 59 54 - 41 |
| 1 1.7 | 45 451 - 113 | 34 34 - 73 | 53 283 - 103 | 08 65 - 71 | 38 975 - 297 | 29 98 - 37 | 54 167 - 160 | 59 54 + 0 |
| 1 11.7 | 45 340 - 101 | 33 42 - 92 | 53 183 - 100 | 07 84 - 81 | 38 680 - 295 | 29 07 - 91 | 54 017 - 150 | 59 14 + 40 |
| 1 21.7 | 45 239 - 87 | 32 35 -107 | 53 092 - 91 | 06 95 - 89 | 38 403 - 277 | 27 66 -141 | 53 885 - 132 | 58 31 + 83 |
| 1 31.6 | 45 152 | 31 18 -117 | 53 015 | 06 06 - 89 | 38 155 - 248 | 25 83 -183 | 53 774 - 111 | 57.10 +121 |
| 2 10.6 | 45 083 - 69 | 29 94 -124 | 52 954 - 61 | 05 16 - 90 | 37 944 - 211 | 23 62 -221 | 53 687 - 87 | 55 53 +157 |
| 2 20.6 | 45 039 - 44 | 28 72 -122 | 52 917 - 37 | 04 34 - 82 | 37 787 - 157 | 21 14 -248 | 53 632 - 55 | 53 62 +191 |
| 3 2.5 | 45 025 + 18 | 27 59 -113 | 52 908 + 22 | 03 63 - 71 | 37 690 - 97 | 18 52 -262 | 53 612 - 20 | 51.43 +219 |
| 3 12.5 | 45 043 + 59 | 26 57 -102 | 52 930 + 58 | 03 10 - 53 | 37 660 - 30 | 15 83 -269 | 53 629 + 17 | 48 98 +245 |
| 3 22.5 | 45 102 | 25 76 - 81 | 52 988 | 02 79 - 31 | 37 707 + 47 | 13 22 -261 | 53 692 + 63 | 46.32 +266 |
| 4 1.5 | 45 201 + 99 | 25 20 - 56 | 53 086 + 98 | 02 69 - 10 | 37 828 + 121 | 10 81 -241 | 53 799 + 107 | 43 51 +281 |
| 4 11.4 | 45 343 + 142 | 24 92 - 28 | 53 225 + 139 | 02 88 + 19 | 38 026 + 198 | 08 65 -216 | 53 952 + 153 | 40 59 +292 |
| 4 21.4 | 45 529 + 186 | 24 99 + 7 | 53 406 + 181 | 03 40 + 52 | 38 299 + 273 | 06 87 -178 | 54 155 + 203 | 37 62 +297 |
| 5 1.4 | 45 753 + 224 | 25 40 + 41 | 53 624 + 218 | 04 22 + 82 | 38 634 + 335 | 05 54 -133 | 54 401 + 246 | 34 68 +294 |
| 5 11.4 | 46 014 + 261 | 26 17 + 77 | 53 877 + 253 | 05 35 +113 | 39 028 + 394 | 04 67 - 87 | 54 690 + 289 | 31.79 +289 |
| 5 21.3 | 46 306 + 292 | 27 29 +112 | 54 160 + 283 | 06 77 +142 | 39 469 + 441 | 04 36 - 31 | 55 017 + 327 | 29 05 +274 |
| 5 31.3 | 46 619 + 313 | 28 71 +142 | 54 465 + 305 | 08 42 +165 | 39 941 + 472 | 04 56 + 20 | 55 372 + 355 | 26 52 +253 |
| 6 10.3 | 46 949 + 330 | 30 42 +171 | 54 786 + 321 | 10 30 +188 | 40 436 + 495 | 05 30 + 74 | 55 751 + 379 | 24 23 +229 |
| 6 20.2 | 47 284 + 335 | 32 38 +196 | 55 114 + 326 | 12 34 +204 | 40 937 + 501 | 06 56 +126 | 56 142 + 391 | 22 27 +196 |
| 6 30.2 | 47 618 + 334 | 34 51 +213 | 55 440 + 326 | 14 47 +213 | 41 428 + 491 | 08 28 +172 | 56 535 + 393 | 20.66 +161 |
| 7 10.2 | 47 942 + 324 | 36 78 +227 | 55 758 + 318 | 16 68 +221 | 41 904 + 476 | 10 45 +217 | 56 923 + 388 | 19 46 +120 |
| 7 20.2 | 48 246 + 304 | 39 13 +235 | 56 057 + 299 | 18 88 +220 | 42 345 + 441 | 13 00 +255 | 57 293 + 370 | 18 70 + 76 |
| 7 30.1 | 48 526 + 280 | 41 49 +236 | 56 332 + 275 | 21 02 +214 | 42 746 + 401 | 15 84 +284 | 57 636 + 343 | 18 36 + 34 |
| 8 9.1 | 48 775 + 249 | 43 83 +234 | 56 578 + 246 | 23 07 +205 | 43 100 + 354 | 18 97 +313 | 57 945 + 309 | 18 48 - 12 |
| 8 19.1 | 48 987 + 212 | 46 07 +224 | 56 787 + 209 | 24 97 +190 | 43 395 + 295 | 22 27 +330 | 58 210 + 265 | 19 04 - 56 |
| 8 29.1 | 49 162 + 175 | 48 20 +213 | 56 960 + 173 | 26 71 +174 | 43 633 + 238 | 25 68 +341 | 58 429 + 219 | 19 98 - 94 |
| 9 8.0 | 49 297 + 135 | 50 17 +197 | 57 094 + 134 | 28 25 +154 | 43 809 + 176 | 29 17 +349 | 58 597 + 168 | 21 30 -132 |
| 9 18.0 | 49 390 + 93 | 51 94 +177 | 57 188 + 94 | 29 55 +130 | 43 920 + 111 | 32 61 +344 | 58 710 + 113 | 22 90 -160 |
| 9 28.0 | 49 448 + 58 | 53 51 +157 | 57 246 + 58 | 30 65 +110 | 43 972 + 52 | 35 97 +336 | 58 773 + 63 | 24 72 -182 |
| 10 7.9 | 49 469 + 21 | 54 86 +135 | 57 269 + 23 | 31 51 + 86 | 43 963 - 9 | 39 20 +323 | 58 785 + 12 | 26 70 -198 |
| 10 17.9 | 49 457 - 12 | 55 95 +109 | 57 260 - 9 | 32 13 + 62 | 43 898 - 65 | 42 18 +298 | 58 750 - 35 | 28 72 -202 |
| 10 27.9 | 49 420 - 37 | 56 81 + 86 | 57 226 - 34 | 32 55 + 42 | 43 784 - 114 | 44 90 +272 | 58 678 - 72 | 30 70 -198 |
| 11 6.9 | 49 358 - 62 | 57 42 + 61 | 57 168 - 58 | 32 76 + 21 | 43 621 - 163 | 47 29 +239 | 58 570 - 108 | 32 57 -187 |
| 11 16.8 | 49 278 - 80 | 57 77 + 35 | 57 093 - 75 | 32 76 + 0 | 43 419 - 202 | 49 25 +196 | 58 437 - 133 | 34 21 -164 |
| 11 26.8 | 49 185 - 93 | 57 89 + 12 | 57 006 - 87 | 32 60 - 16 | 43 184 - 235 | 50 79 +154 | 58 286 - 151 | 35 58 -137 |
| 12 6.8 | 49 080 - 105 | 57 75 - 14 | 56 909 - 97 | 32 25 - 35 | 42 919 - 265 | 51 82 +103 | 58 123 - 163 | 36 63 -105 |
| 12 16.8 | 48 970 - 110 | 57 38 - 37 | 56 808 - 101 | 31 75 - 50 | 42 637 - 282 | 52 32 + 50 | 57 957 - 166 | 37 28 - 65 |
| 12 26.7 | 48 858 - 112 | 56 79 - 59 | 56 705 - 103 | 31 13 - 62 | 42 344 - 293 | 52 30 - 2 | 57 793 - 164 | 37 54 - 26 |
| 12 36.7 | 48 746 - 104 | 55 99 - 80 | 56 603 - 102 | 30 37 - 76 | 42 048 - 296 | 51 72 - 58 | 57 635 - 158 | 37 38 + 16 |
| | | - 97 | - 94 | - 83 | - 283 | - 109 | - 143 | + 59 |
| Mean Place | 48.011 | 43.14 | 55.766 | 20.32 | 42.283 | 27.58 | 56.285 | 31.25 |
| sec δ, tan δ | +1.058 | +0.345 | +1.018 | +0.192 | +1.857 | +1.565 | +1.313 | -0.850 |
| da(ψ), dδ(ψ) | +0.061 | +0.40 | +0.061 | +0.40 | +0.060 | +0.40 | +0.062 | +0.40 |
| da(ε), dδ(ε) | -0.023 | -0.04 | -0.013 | -0.04 | -0.104 | -0.03 | +0.057 | -0.03 |
| Dble.Trans. | September 19 | | September 19 | | September 19 | | September 19 | |

APPARENT PLACES OF STARS, 1986

AT UPPER TRANSIT AT GREENWICH

| No. | 1627 | | 1628 | | 1629 | | 900 | | |
|--------------|------------------------------|-------------|--|-------------|--------------|-------------|--------------|-------------|------------|
| | Groombridge 4163 (Cephei) | | Piazzi 23 ^h 235 (Pegasi) | | ψ Pegasi | | 27 Piscium* | | |
| Mag.Spect. | 6.57 | B9 | 6.30 | M0 | 4.75 | M0 | 5.07 | K0 | |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | |
| | h m | ° / | h m | ° / | h m | ° / | h m | ° / | |
| | 23 54 | +74 19 | 23 55 | +22 34 | 23 57 | +25 03 | 23 57 | - 3 37 | |
| 1 | -8.3 | 05.353 -710 | 71.29 +57 | 57.694 -119 | 16.06 -46 | 01.691 -125 | 53.17 -42 | 56.710 -100 | 67.21 -66 |
| 1 | 1.7 | 04.635 -718 | 71.25 -4 | 57.574 -120 | 15.36 -70 | 01.567 -124 | 52.49 -68 | 56.612 -98 | 67.82 -61 |
| 1 | 11.7 | 03.924 -711 | 70.60 -66 | 57.456 -118 | 14.43 -93 | 01.444 -123 | 51.55 -94 | 56.516 -96 | 68.39 -57 |
| 1 | 21.7 | 03.254 -670 | 69.33 -127 | 57.348 -108 | 13.32 -111 | 01.330 -114 | 50.39 -116 | 56.429 -87 | 68.86 -47 |
| 1 | 31.6 | 02.650 -604 | 67.55 -178 | 57.253 -95 | 12.07 -125 | 01.229 -101 | 49.08 -131 | 56.355 -74 | 69.21 -35 |
| 2 | 10.6 | 02.130 -520 | 65.29 -226 | 57.175 -78 | 10.72 -135 | 01.147 -82 | 47.65 -143 | 56.296 -59 | 69.44 -23 |
| 2 | 20.6 | 01.727 -403 | 62.66 -263 | 57.123 -52 | 09.36 -136 | 01.091 -56 | 46.19 -146 | 56.261 -35 | 69.50 -6 |
| 3 | 2.6 | 01.452 -275 | 59.80 -286 | 57.101 -22 | 08.05 -131 | 01.065 -26 | 44.76 -143 | 56.251 -10 | 69.38 +12 |
| 3 | 12.5 | 01.319 -133 | 56.78 -302 | 57.114 +13 | 06.85 -120 | 01.075 +10 | 43.42 -134 | 56.273 +22 | 69.06 +32 |
| 3 | 22.5 | 01.345 +26 | 53.76 -302 | 57.168 +54 | 05.84 -101 | 01.128 +53 | 42.28 -114 | 56.321 +48 | 68.58 +48 |
| 4 | 1.5 | 01.519 +174 | 50.88 -288 | 57.263 +95 | 05.08 -76 | 01.222 +94 | 41.37 -91 | 56.414 +93 | 67.70 +88 |
| 4 | 11.4 | 01.845 +326 | 48.21 -267 | 57.403 +140 | 04.59 -49 | 01.363 +141 | 40.74 -63 | 56.546 +132 | 66.64 +106 |
| 4 | 21.4 | 02.314 +469 | 45.90 -231 | 57.587 +184 | 04.46 -13 | 01.549 +186 | 40.47 -27 | 56.718 +172 | 65.33 +131 |
| 5 | 1.4 | 02.902 +588 | 44.01 -189 | 57.812 +225 | 04.68 +22 | 01.775 +226 | 40.56 +9 | 56.926 +208 | 63.81 +152 |
| 5 | 11.4 | 03.600 +698 | 42.60 -141 | 58.074 +262 | 05.27 +59 | 02.041 +266 | 41.03 +47 | 57.171 +245 | 62.07 +174 |
| 5 | 21.3 | 04.381 +781 | 41.75 -85 | 58.368 +294 | 06.24 +97 | 02.339 +298 | 41.90 +87 | 57.446 +275 | 60.17 +190 |
| 5 | 31.3 | 05.216 +835 | 41.45 -30 | 58.685 +317 | 07.53 +129 | 02.659 +320 | 43.11 +121 | 57.743 +297 | 58.15 +202 |
| 6 | 10.3 | 06.091 +875 | 41.72 +27 | 59.019 +334 | 09.14 +161 | 02.998 +339 | 44.66 +155 | 58.059 +316 | 56.05 +210 |
| 6 | 20.3 | 06.972 +881 | 42.59 +87 | 59.360 +341 | 11.04 +190 | 03.343 +345 | 46.51 +185 | 58.383 +324 | 53.92 +213 |
| 6 | 30.2 | 07.834 +862 | 43.97 +138 | 59.699 +339 | 13.13 +209 | 03.686 +343 | 48.58 +207 | 58.708 +325 | 51.84 +208 |
| 7 | 10.2 | 08.664 +830 | 45.87 +190 | 60.029 +330 | 15.41 +228 | 04.020 +334 | 50.86 +228 | 59.026 +318 | 49.82 +202 |
| 7 | 20.2 | 09.432 +768 | 48.25 +238 | 60.340 +311 | 17.79 +238 | 04.334 +314 | 53.27 +241 | 59.327 +301 | 47.95 +187 |
| 7 | 30.1 | 10.124 +692 | 51.00 +275 | 60.625 +285 | 20.22 +243 | 04.624 +290 | 55.75 +248 | 59.606 +279 | 46.26 +169 |
| 8 | 9.1 | 10.731 +607 | 54.13 +313 | 60.881 +256 | 22.66 +244 | 04.882 +258 | 58.26 +251 | 59.858 +252 | 44.77 +149 |
| 8 | 19.1 | 11.229 +498 | 57.53 +340 | 61.098 +217 | 25.04 +238 | 05.103 +221 | 60.72 +246 | 60.074 +216 | 43.54 +123 |
| 8 | 29.1 | 11.623 +394 | 61.12 +359 | 61.279 +181 | 27.32 +228 | 05.286 +183 | 63.11 +239 | 60.254 +180 | 42.55 +99 |
| 9 | 8.0 | 11.900 +277 | 64.87 +277 | 61.419 +140 | 29.47 +215 | 05.428 +142 | 65.38 +227 | 60.395 +141 | 41.84 +71 |
| 9 | 18.0 | 12.054 +154 | 68.66 +379 | 61.518 +99 | 31.43 +196 | 05.529 +101 | 67.47 +209 | 60.496 +101 | 41.39 +45 |
| 9 | 28.0 | 12.094 +40 | 72.44 +378 | 61.580 +62 | 33.21 +178 | 05.591 +62 | 69.38 +191 | 60.561 +65 | 41.17 +22 |
| 10 | 8.0 | 12.014 -80 | 76.14 +370 | 61.605 +25 | 34.76 +155 | 05.617 +26 | 71.08 +170 | 60.590 +29 | 41.19 -2 |
| 10 | 17.9 | 11.817 -197 | 79.65 +351 | 61.596 -9 | 36.06 +130 | 05.608 -9 | 72.52 +144 | 60.587 -3 | 41.40 -21 |
| 10 | 27.9 | 11.518 -299 | 82.92 +327 | 61.561 -35 | 37.12 +106 | 05.572 -36 | 73.72 +120 | 60.558 -29 | 41.77 -37 |
| 11 | 6.9 | 11.112 -406 | 85.88 +296 | 61.500 -61 | 37.92 +80 | 05.510 -62 | 74.65 +93 | 60.505 -53 | 42.27 -50 |
| 11 | 16.8 | 10.617 -495 | 88.41 +253 | 61.420 -80 | 38.44 +52 | 05.428 -82 | 75.28 +63 | 60.434 -71 | 42.85 -58 |
| 11 | 26.8 | 10.047 -570 | 90.50 +209 | 61.325 -95 | 38.71 +27 | 05.330 -98 | 75.64 +36 | 60.351 -83 | 43.49 -64 |
| 12 | 6.8 | 09.407 -640 | 92.05 +155 | 61.217 -108 | 38.69 -2 | 05.218 -112 | 75.70 +6 | 60.258 -93 | 44.16 -67 |
| 12 | 16.8 | 08.726 -681 | 93.00 +95 | 61.103 -114 | 38.40 -29 | 05.100 -118 | 75.47 -23 | 60.161 -97 | 44.83 -67 |
| 12 | 26.7 | 08.018 -708 | 93.37 +37 | 60.986 -117 | 37.87 -53 | 04.978 -122 | 74.97 -50 | 60.062 -99 | 45.46 -63 |
| 12 | 36.7 | 07.303 -715 | 93.10 -27 | 60.867 -119 | 37.08 -79 | 04.855 -123 | 74.18 -79 | 59.964 -98 | 46.06 -60 |
| | | -687 | -88 | -111 | -99 | -117 | -101 | -90 | -51 |
| Mean Place | 09.327 | 65.95 | 60.151 | 22.82 | 04.167 | 59.05 | 58.942 | 51.21 | |
| sec δ, tan δ | +3.704 | +3.566 | +1.083 | +0.416 | +1.104 | +0.468 | +1.002 | -0.063 | |
| dα(ψ), dδ(ψ) | +0.059 | +0.40 | +0.061 | +0.40 | +0.061 | +0.40 | +0.061 | +0.40 | |
| dα(ε), dδ(ε) | -0.238 | -0.03 | -0.028 | -0.02 | -0.031 | -0.01 | +0.004 | -0.01 | |
| Dble.Trans. | September 19 | | September 20 | | September 20 | | September 20 | | |

APPARENT PLACES OF STARS, 1986

371

AT UPPER TRANSIT AT GREENWICH

| No. | 901 | | 902 | | 903 | |
|--------------|--------------|------------|--------------|------------|--------------|------------|
| | π Phoenicis | | ω Piscium | | ε Tucanae | |
| Mag.Spect. | 5.14 | K0 | 4.03 | F5 | 4.71 | B9 |
| U.T. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " |
| | 23 58 | - 52 49 | 23 58 | + 6 47 | 23 59 | - 65 38 |
| 1 -8.3 | 12.321 -243 | 47.63 -26 | 34.752 -102 | 06.71 -62 | 12.085 -413 | 101.51 -3 |
| 1 1.7 | 12.088 -222 | 47.38 +25 | 34.652 -99 | 06.03 -68 | 11.687 -377 | 100.96 +55 |
| 1 11.7 | 11.866 -198 | 46.65 +125 | 34.553 -90 | 05.29 -76 | 11.310 -340 | 99.85 +167 |
| 1 21.7 | 11.668 -169 | 45.40 +168 | 34.463 -78 | 04.53 -74 | 10.970 -292 | 98.18 +214 |
| 1 31.6 | 11.499 | 43.72 | 34.385 | 03.79 | 10.678 | 96.04 |
| 2 10.6 | 11.362 -137 | 41.62 +210 | 34.322 -63 | 03.08 -71 | 10.437 -241 | 93.47 +257 |
| 2 20.6 | 11.268 -94 | 39.15 +247 | 34.282 -40 | 02.48 -60 | 10.262 -175 | 90.51 +296 |
| 3 2.6 | 11.217 -51 | 36.40 +275 | 34.269 -13 | 02.01 -47 | 10.155 -107 | 87.27 +324 |
| 3 12.5 | 11.215 -2 | 33.38 +302 | 34.286 +17 | 01.72 -29 | 10.120 +35 | 83.80 +347 |
| 3 22.5 | 11.269 +54 | 30.18 +320 | 34.338 +52 | 01.69 -3 | 10.167 +47 | 80.18 +362 |
| 4 1.5 | 11.377 +108 | 26.88 +330 | 34.428 +90 | 01.79 +10 | 10.293 +126 | 76.51 +367 |
| 4 11.4 | 11.543 +166 | 23.50 +338 | 34.561 +133 | 02.22 +43 | 10.501 +208 | 72.82 +369 |
| 4 21.4 | 11.769 +226 | 20.15 +335 | 34.735 +174 | 02.96 +74 | 10.792 +291 | 69.23 +359 |
| 5 1.4 | 12.047 +278 | 16.90 +325 | 34.945 +210 | 03.96 +100 | 11.156 +364 | 65.81 +342 |
| 5 11.4 | 12.378 +331 | 13.78 +312 | 35.192 +247 | 05.25 +129 | 11.594 +438 | 62.60 +321 |
| 5 21.3 | 12.756 +378 | 10.90 +288 | 35.469 +277 | 06.80 +155 | 12.096 +502 | 59.71 +289 |
| 5 31.3 | 13.168 +412 | 08.31 +259 | 35.769 +300 | 08.55 +175 | 12.647 +551 | 57.18 +253 |
| 6 10.3 | 13.612 +444 | 06.05 +226 | 36.087 +318 | 10.48 +193 | 13.242 +595 | 55.06 +212 |
| 6 20.3 | 14.072 +460 | 04.22 +183 | 36.413 +326 | 12.54 +206 | 13.861 +619 | 53.44 +162 |
| 6 30.2 | 14.537 +465 | 02.81 +141 | 36.737 +324 | 14.65 +211 | 14.489 +628 | 52.30 +114 |
| 7 10.2 | 14.998 +461 | 01.88 +93 | 37.056 +319 | 16.80 +215 | 15.114 +625 | 51.71 +59 |
| 7 20.2 | 15.439 +441 | 01.48 +40 | 37.357 +301 | 18.91 +211 | 15.713 +599 | 51.69 +2 |
| 7 30.1 | 15.851 +412 | 01.55 -7 | 37.635 +278 | 20.92 +201 | 16.273 +560 | 52.18 -49 |
| 8 9.1 | 16.223 +372 | 02.14 -59 | 37.885 +250 | 22.82 +190 | 16.780 +507 | 53.21 -103 |
| 8 19.1 | 16.542 +319 | 03.20 -106 | 38.100 +215 | 24.54 +172 | 17.214 +434 | 54.74 -153 |
| 8 29.1 | 16.806 +264 | 04.67 -147 | 38.280 +180 | 26.06 +152 | 17.570 +356 | 56.67 -193 |
| 9 8.0 | 17.007 +201 | 06.53 -186 | 38.421 +141 | 27.37 +131 | 17.836 +266 | 58.99 -232 |
| 9 18.0 | 17.140 +133 | 08.67 -214 | 38.522 +101 | 28.44 +107 | 18.004 +168 | 61.57 -258 |
| 9 28.0 | 17.209 +69 | 11.00 -233 | 38.588 +66 | 29.28 +84 | 18.077 +73 | 64.31 -274 |
| 10 8.0 | 17.212 +3 | 13.47 -247 | 38.618 +30 | 29.90 +62 | 18.052 -25 | 67.13 -282 |
| 10 17.9 | 17.154 -58 | 15.92 -245 | 38.616 -2 | 30.29 +39 | 17.935 -117 | 69.87 -274 |
| 10 27.9 | 17.045 -109 | 18.27 -235 | 38.589 -27 | 30.48 +19 | 17.737 -198 | 72.46 -259 |
| 11 6.9 | 16.888 -157 | 20.44 -217 | 38.538 -51 | 30.49 +1 | 17.465 -272 | 74.78 -232 |
| 11 16.8 | 16.695 -193 | 22.29 -185 | 38.470 -68 | 30.32 -17 | 17.135 -330 | 76.70 -192 |
| 11 26.8 | 16.477 -218 | 23.78 -149 | 38.389 -81 | 30.03 -29 | 16.763 -372 | 78.18 -148 |
| 12 6.8 | 16.240 -237 | 24.84 -106 | 38.296 -93 | 29.58 -45 | 16.360 -403 | 79.14 -96 |
| 12 16.8 | 15.997 -243 | 25.40 -56 | 38.199 -97 | 29.04 -54 | 15.947 -413 | 79.52 -38 |
| 12 26.7 | 15.757 -240 | 25.48 -8 | 38.099 -100 | 28.42 -62 | 15.537 -410 | 79.33 +19 |
| 12 36.7 | 15.524 -233 | 25.04 +44 | 37.999 -100 | 27.71 -71 | 15.140 -397 | 78.56 +77 |
| | 15.524 -212 | 25.04 +95 | 37.999 -93 | 27.71 -74 | 15.140 -364 | 78.56 +134 |
| Mean Place | 14.017 | 16.36 | 37.069 | 18.88 | 13.387 | 67.96 |
| sec δ, tan δ | +1.655 | -1.318 | +1.007 | +0.119 | +2.426 | -2.210 |
| dα(ψ), dδ(ψ) | +0.061 | +0.40 | +0.061 | +0.40 | +0.061 | +0.40 |
| dα(ε), dδ(ε) | +0.088 | -0.01 | -0.008 | -0.01 | +0.147 | -0.00 |
| Dble.Trans. | September 20 | | September 21 | | September 21 | |

APPARENT PLACES OF STARS, 1986
CIRCUMPOLAR STARS AT UPPER TRANSIT AT GREENWICH

906 43 H. Cephei ~ Mag. 4.52 Spect. K0

| Day | January | | February | | March | | April | | May | | June | |
|-----|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m 1 06 | + 86 11 | h m 1 06 | + 86 11 | h m 1 06 | + 86 11 | h m 1 06 | + 86 10 | h m 1 06 | + 86 10 | h m 1 06 | + 86 10 |
| | s " | " | s " | " | s " | " | s " | " | s " | " | s " | " |
| 1 | 32.39 | 16.19 | 22.56 | 15.90 | 15.44 | 10.82 | 12.26 | 62.07 | 14.52 | 53.57 | 21.59 | 47.61 |
| 2 | 32.04 | 16.25 | 22.31 | 15.77 | 15.30 | 10.57 | 12.25 | 61.82 | 14.63 | 53.33 | 21.87 | 47.45 |
| 3 | 31.71 | 16.29 | 22.08 | 15.67 | 15.18 | 10.35 | 12.21 | 61.56 | 14.75 | 53.06 | 22.18 | 47.29 |
| 4 | 31.40 | 16.33 | 21.84 | 15.58 | 15.04 | 10.14 | 12.17 | 61.28 | 14.88 | 52.78 | 22.50 | 47.15 |
| 5 | 31.13 | 16.37 | 21.58 | 15.51 | 14.88 | 09.93 | 12.12 | 60.98 | 15.04 | 52.50 | 22.84 | 47.02 |
| 6 | 30.87 | 16.43 | 21.30 | 15.44 | 14.69 | 09.72 | 12.08 | 60.65 | 15.22 | 52.21 | 23.19 | 46.92 |
| 7 | 30.62 | 16.51 | 20.99 | 15.35 | 14.49 | 09.50 | 12.06 | 60.31 | 15.43 | 51.93 | 23.54 | 46.84 |
| 8 | 30.35 | 16.61 | 20.66 | 15.24 | 14.27 | 09.25 | 12.07 | 59.96 | 15.66 | 51.67 | 23.88 | 46.78 |
| 9 | 30.06 | 16.72 | 20.32 | 15.10 | 14.06 | 08.97 | 12.10 | 59.61 | 15.90 | 51.42 | 24.20 | 46.74 |
| 10 | 29.73 | 16.82 | 19.99 | 14.93 | 13.86 | 08.67 | 12.17 | 59.26 | 16.15 | 51.20 | 24.51 | 46.70 |
| 11 | 29.38 | 16.90 | 19.67 | 14.74 | 13.68 | 08.35 | 12.25 | 58.93 | 16.40 | 50.99 | 24.81 | 46.66 |
| 12 | 29.00 | 16.95 | 19.38 | 14.53 | 13.53 | 08.02 | 12.34 | 58.62 | 16.65 | 50.80 | 25.09 | 46.62 |
| 13 | 28.62 | 16.97 | 19.11 | 14.31 | 13.41 | 07.69 | 12.45 | 58.33 | 16.88 | 50.62 | 25.36 | 46.58 |
| 14 | 28.25 | 16.96 | 18.86 | 14.09 | 13.31 | 07.37 | 12.55 | 58.05 | 17.10 | 50.45 | 25.62 | 46.52 |
| 15 | 27.90 | 16.92 | 18.63 | 13.87 | 13.23 | 07.06 | 12.64 | 57.79 | 17.30 | 50.28 | 25.90 | 46.44 |
| 16 | 27.56 | 16.88 | 18.42 | 13.67 | 13.16 | 06.76 | 12.72 | 57.53 | 17.49 | 50.10 | 26.19 | 46.36 |
| 17 | 27.25 | 16.82 | 18.21 | 13.48 | 13.09 | 06.48 | 12.79 | 57.27 | 17.68 | 49.91 | 26.51 | 46.28 |
| 18 | 26.95 | 16.77 | 18.01 | 13.30 | 13.02 | 06.21 | 12.85 | 57.01 | 17.86 | 49.71 | 26.87 | 46.22 |
| 19 | 26.67 | 16.73 | 17.79 | 13.13 | 12.94 | 05.95 | 12.89 | 56.74 | 18.07 | 49.49 | 27.25 | 46.17 |
| 20 | 26.39 | 16.69 | 17.56 | 12.96 | 12.85 | 05.69 | 12.94 | 56.45 | 18.30 | 49.27 | 27.65 | 46.17 |
| 21 | 26.12 | 16.67 | 17.31 | 12.79 | 12.74 | 05.43 | 12.99 | 56.15 | 18.56 | 49.05 | 28.04 | 46.19 |
| 22 | 25.84 | 16.65 | 17.05 | 12.60 | 12.62 | 05.16 | 13.07 | 55.83 | 18.86 | 48.85 | 28.41 | 46.25 |
| 23 | 25.54 | 16.64 | 16.77 | 12.40 | 12.50 | 04.86 | 13.19 | 55.50 | 19.19 | 48.68 | 28.75 | 46.32 |
| 24 | 25.23 | 16.63 | 16.50 | 12.18 | 12.37 | 04.55 | 13.34 | 55.19 | 19.52 | 48.54 | 29.06 | 46.38 |
| 25 | 24.89 | 16.61 | 16.23 | 11.93 | 12.27 | 04.22 | 13.53 | 54.90 | 19.85 | 48.44 | 29.34 | 46.43 |
| 26 | 24.54 | 16.57 | 15.98 | 11.65 | 12.20 | 03.87 | 13.73 | 54.64 | 20.14 | 48.36 | 29.61 | 46.45 |
| 27 | 24.18 | 16.51 | 15.77 | 11.37 | 12.16 | 03.52 | 13.93 | 54.41 | 20.41 | 48.27 | 29.89 | 46.46 |
| 28 | 23.82 | 16.42 | 15.59 | 11.09 | 12.16 | 03.18 | 14.12 | 54.20 | 20.65 | 48.18 | 30.18 | 46.45 |
| 29 | 23.46 | 16.31 | 15.44 | 10.82 | 12.19 | 02.87 | 14.28 | 54.00 | 20.87 | 48.06 | 30.50 | 46.43 |
| 30 | 23.13 | 16.18 | | | 12.23 | 02.59 | 14.41 | 53.79 | 21.10 | 47.93 | 30.84 | 46.42 |
| 31 | 22.83 | 16.04 | | | 12.25 | 02.32 | 14.52 | 53.57 | 21.33 | 47.77 | 31.19 | 46.42 |
| 32 | 22.56 | 15.90 | | | 12.26 | 02.07 | | | 21.59 | 47.61 | | |
| | sec δ 15.04 | tan δ 15.01 | sec δ 15.04 | tan δ 15.00 | sec δ 15.03 | tan δ 15.00 | sec δ 15.02 | tan δ 14.99 | sec δ 15.01 | tan δ 14.98 | sec δ 15.01 | tan δ 14.97 |

Mean R.A. $1^{\text{h}} 06^{\text{m}} 42.80^{\text{s}}$

Double lower transit April 8

Mean Dec. $+86^{\circ} 11' 06.78''$

APPARENT PLACES OF STARS, 1986
CIRCUMPOLAR STARS AT UPPER TRANSIT AT GREENWICH

373

906 43 H. Cephei Mag. 4.52 Spect. K0

| Day | July | | August | | September | | October | | November | | December | |
|-----|-------|----------|--------|----------|-----------|----------|---------------------------|---------------------------|----------|----------|----------|----------|
| | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | + ° / | h m | + ° / | h m | + ° / | h m | + ° / | h m | + ° / | h m | + ° / |
| | 1 06 | 86 10 | 1 06 | 86 10 | 1 06 | 86 10 | 1 06 | 86 11 | 1 06 | 86 11 | 1 06 | 86 11 |
| | s | " | s | " | s | " | s | " | s | " | s | " |
| 1 | 31.19 | 46.42 | 41.42 | 50.42 | 49.52 | 58.94 | 53.84 | 09.78 | 53.86 | 21.87 | 49.52 | 31.66 |
| 2 | 31.57 | 46.45 | 41.75 | 50.66 | 49.69 | 59.30 | 53.87 | 10.15 | 53.83 | 22.22 | 49.35 | 31.99 |
| 3 | 31.95 | 46.49 | 42.06 | 50.91 | 49.85 | 59.64 | 53.90 | 10.49 | 53.82 | 22.60 | 49.15 | 32.32 |
| 4 | 32.32 | 46.55 | 42.35 | 51.16 | 50.00 | 59.96 | 53.96 | 10.83 | 53.79 | 23.00 | 48.91 | 32.64 |
| 5 | 32.70 | 46.64 | 42.62 | 51.41 | 50.15 | 60.27 | 54.04 | 11.18 | 53.73 | 23.42 | 48.63 | 32.94 |
| 6 | 33.06 | 46.74 | 42.87 | 51.66 | 50.31 | 60.56 | 54.15 | 11.53 | 53.64 | 23.84 | 48.34 | 33.21 |
| 7 | 33.40 | 46.85 | 43.11 | 51.89 | 50.50 | 60.86 | 54.26 | 11.91 | 53.50 | 24.25 | 48.04 | 33.44 |
| 8 | 33.72 | 46.97 | 43.35 | 52.11 | 50.71 | 61.16 | ^{54.38} 54.47 | ^{12.32} 12.76 | 53.34 | 24.64 | 47.75 | 33.65 |
| 9 | 34.02 | 47.08 | 43.60 | 52.32 | 50.94 | 61.49 | 54.54 | 13.20 | 53.17 | 24.99 | 47.47 | 33.84 |
| 10 | 34.31 | 47.19 | 43.86 | 52.52 | 51.18 | 61.84 | 54.57 | 13.65 | 53.00 | 25.32 | 47.22 | 34.02 |
| 11 | 34.59 | 47.28 | 44.15 | 52.72 | 51.41 | 62.22 | 54.56 | 14.08 | 52.83 | 25.63 | 46.98 | 34.20 |
| 12 | 34.87 | 47.36 | 44.46 | 52.94 | 51.62 | 62.62 | 54.53 | 14.49 | 52.68 | 25.93 | 46.76 | 34.39 |
| 13 | 35.17 | 47.43 | 44.79 | 53.18 | 51.80 | 63.04 | 54.49 | 14.88 | 52.55 | 26.22 | 46.55 | 34.58 |
| 14 | 35.49 | 47.50 | 45.12 | 53.45 | 51.95 | 63.45 | 54.46 | 15.24 | 52.44 | 26.51 | 46.33 | 34.79 |
| 15 | 35.84 | 47.58 | 45.45 | 53.76 | 52.06 | 63.85 | 54.43 | 15.59 | 52.33 | 26.82 | 46.10 | 35.01 |
| 16 | 36.21 | 47.68 | 45.75 | 54.08 | 52.15 | 64.23 | 54.43 | 15.92 | 52.23 | 27.14 | 45.86 | 35.23 |
| 17 | 36.60 | 47.80 | 46.02 | 54.42 | 52.24 | 64.58 | 54.44 | 16.26 | 52.12 | 27.47 | 45.59 | 35.46 |
| 18 | 36.99 | 47.96 | 46.25 | 54.75 | 52.34 | 64.91 | 54.47 | 16.61 | 52.00 | 27.82 | 45.30 | 35.68 |
| 19 | 37.37 | 48.15 | 46.46 | 55.06 | 52.45 | 65.24 | 54.50 | 16.97 | 51.86 | 28.17 | 45.00 | 35.88 |
| 20 | 37.72 | 48.36 | 46.65 | 55.36 | 52.58 | 65.55 | 54.53 | 17.35 | 51.69 | 28.52 | 44.67 | 36.07 |
| 21 | 38.03 | 48.58 | 46.84 | 55.62 | 52.73 | 65.88 | 54.56 | 17.75 | 51.51 | 28.86 | 44.34 | 36.24 |
| 22 | 38.32 | 48.78 | 47.05 | 55.88 | 52.89 | 66.22 | 54.56 | 18.16 | 51.30 | 29.20 | 44.00 | 36.38 |
| 23 | 38.58 | 48.97 | 47.28 | 56.12 | 53.06 | 66.58 | 54.55 | 18.57 | 51.07 | 29.51 | 43.67 | 36.51 |
| 24 | 38.84 | 49.13 | 47.53 | 56.37 | 53.22 | 66.96 | 54.51 | 18.99 | 50.83 | 29.81 | 43.36 | 36.61 |
| 25 | 39.10 | 49.27 | 47.80 | 56.64 | 53.37 | 67.36 | 54.45 | 19.40 | 50.60 | 30.09 | 43.07 | 36.71 |
| 26 | 39.39 | 49.40 | 48.07 | 56.92 | 53.51 | 67.76 | 54.36 | 19.79 | 50.37 | 30.34 | 42.80 | 36.81 |
| 27 | 39.70 | 49.53 | 48.35 | 57.22 | 53.62 | 68.18 | 54.27 | 20.18 | 50.16 | 30.59 | 42.56 | 36.93 |
| 28 | 40.03 | 49.67 | 48.62 | 57.54 | 53.70 | 68.59 | 54.16 | 20.54 | 49.97 | 30.83 | 42.32 | 37.06 |
| 29 | 40.37 | 49.83 | 48.88 | 57.88 | 53.76 | 69.00 | 54.05 | 20.88 | 49.81 | 31.08 | 42.08 | 37.23 |
| 30 | 40.73 | 50.00 | 49.11 | 58.23 | 53.81 | 69.40 | 53.96 | 21.21 | 49.66 | 31.36 | 41.82 | 37.40 |
| 31 | 41.08 | 50.20 | 49.33 | 58.59 | 53.84 | 69.78 | 53.90 | 21.54 | 49.52 | 31.66 | 41.52 | 37.58 |
| 32 | 41.42 | 50.42 | 49.52 | 58.94 | | | 53.86 | 21.87 | | | 41.18 | 37.74 |
| | sec δ | tan δ | sec δ | tan δ | sec δ | tan δ | sec δ | tan δ | sec δ | tan δ | sec δ | tan δ |
| | 15.01 | 14.98 | 15.02 | 14.98 | 15.03 | 14.99 | 15.04 | 15.01 | 15.05 | 15.02 | 15.06 | 15.03 |

Mean R.A. 1^h 06^m 42.80^s

Double lower transit April 8

Mean Dec. +86° 11' 06.78"

APPARENT PLACES OF STARS, 1986
CIRCUMPOLAR STARS AT UPPER TRANSIT AT GREENWICH

1635 Bradley 256 (Cephei) Mag. 6.86 Spect. K0

| Day | January | | February | | March | | April | | May | | June | |
|-----|---------------|-----------------------|---------------|-----------------------|---------------|-----------------------|---------------|-----------------------|---------------|-----------------------|---------------|-----------------------|
| | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m 2 14 | + ° ' " / 83 30 | h m 2 14 | + ° ' " / 83 30 | h m 2 14 | + ° ' " / 83 30 | h m 2 14 | + ° ' " / 83 29 | h m 2 14 | + ° ' " / 83 29 | h m 2 14 | + ° ' " / 83 29 |
| 1 | s 29.86 | " 08.25 | s 24.46 | " 10.71 | s 19.71 | " 07.89 | s 16.52 | " 60.54 | s 16.40 | " 51.95 | s 19.44 | " 44.49 |
| 2 | 29.67 | 08.40 | 24.31 | 10.66 | 19.60 | 07.70 | 16.47 | 60.31 | 16.43 | 51.69 | 19.57 | 44.26 |
| 3 | 29.50 | 08.53 | 24.17 | 10.63 | 19.49 | 07.52 | 16.41 | 60.08 | 16.45 | 51.41 | 19.72 | 44.03 |
| 4 | 29.34 | 08.65 | 24.02 | 10.61 | 19.38 | 07.37 | 16.34 | 59.83 | 16.47 | 51.11 | 19.88 | 43.81 |
| 5 | 29.20 | 08.76 | 23.88 | 10.62 | 19.26 | 07.22 | 16.26 | 59.55 | 16.51 | 50.80 | 20.05 | 43.60 |
| 6 | 29.07 | 08.89 | 23.71 | 10.63 | 19.13 | 07.08 | 16.18 | 59.26 | 16.57 | 50.48 | 20.23 | 43.42 |
| 7 | 28.95 | 09.04 | 23.53 | 10.64 | 18.98 | 06.92 | 16.11 | 58.94 | 16.64 | 50.16 | 20.42 | 43.25 |
| 8 | 28.83 | 09.21 | 23.33 | 10.63 | 18.82 | 06.75 | 16.06 | 58.60 | 16.72 | 49.85 | 20.60 | 43.11 |
| 9 | 28.69 | 09.40 | 23.12 | 10.59 | 18.65 | 06.54 | 16.02 | 58.26 | 16.82 | 49.55 | 20.79 | 42.98 |
| 10 | 28.54 | 09.59 | 22.91 | 10.52 | 18.49 | 06.31 | 15.99 | 57.92 | 16.92 | 49.27 | 20.96 | 42.87 |
| 11 | 28.36 | 09.76 | 22.70 | 10.42 | 18.33 | 06.05 | 15.98 | 57.59 | 17.03 | 49.02 | 21.12 | 42.76 |
| 12 | 28.16 | 09.92 | 22.50 | 10.30 | 18.19 | 05.78 | 15.99 | 57.27 | 17.14 | 48.78 | 21.28 | 42.65 |
| 13 | 27.96 | 10.04 | 22.31 | 10.17 | 18.07 | 05.50 | 16.00 | 56.96 | 17.25 | 48.55 | 21.42 | 42.54 |
| 14 | 27.75 | 10.13 | 22.14 | 10.03 | 17.96 | 05.23 | 16.01 | 56.68 | 17.35 | 48.33 | 21.56 | 42.41 |
| 15 | 27.55 | 10.19 | 21.98 | 09.89 | 17.86 | 04.96 | 16.02 | 56.40 | 17.43 | 48.12 | 21.71 | 42.27 |
| 16 | 27.36 | 10.24 | 21.83 | 09.76 | 17.78 | 04.70 | 16.03 | 56.14 | 17.51 | 47.91 | 21.86 | 42.12 |
| 17 | 27.17 | 10.28 | 21.68 | 09.63 | 17.70 | 04.45 | 16.03 | 55.89 | 17.59 | 47.68 | 22.03 | 41.96 |
| 18 | 27.00 | 10.31 | 21.54 | 09.52 | 17.62 | 04.22 | 16.02 | 55.63 | 17.66 | 47.44 | 22.22 | 41.80 |
| 19 | 26.84 | 10.35 | 21.40 | 09.42 | 17.53 | 04.00 | 16.00 | 55.36 | 17.74 | 47.18 | 22.43 | 41.66 |
| 20 | 26.69 | 10.39 | 21.24 | 09.33 | 17.44 | 03.78 | 15.97 | 55.08 | 17.83 | 46.90 | 22.66 | 41.55 |
| 21 | 26.54 | 10.44 | 21.08 | 09.24 | 17.34 | 03.57 | 15.95 | 54.77 | 17.94 | 46.62 | 22.89 | 41.48 |
| 22 | 26.38 | 10.51 | 20.91 | 09.14 | 17.22 | 03.35 | 15.94 | 54.45 | 18.08 | 46.35 | 23.12 | 41.44 |
| 23 | 26.22 | 10.58 | 20.72 | 09.03 | 17.11 | 03.11 | 15.95 | 54.11 | 18.24 | 46.11 | 23.32 | 41.42 |
| 24 | 26.05 | 10.66 | 20.53 | 08.89 | 16.98 | 02.84 | 15.98 | 53.77 | 18.41 | 45.90 | 23.51 | 41.40 |
| 25 | 25.87 | 10.74 | 20.33 | 08.73 | 16.87 | 02.55 | 16.04 | 53.45 | 18.58 | 45.72 | 23.68 | 41.38 |
| 26 | 25.67 | 10.80 | 20.15 | 08.53 | 16.77 | 02.24 | 16.12 | 53.15 | 18.74 | 45.57 | 23.84 | 41.33 |
| 27 | 25.46 | 10.84 | 19.98 | 08.32 | 16.69 | 01.92 | 16.20 | 52.88 | 18.88 | 45.42 | 24.00 | 41.26 |
| 28 | 25.25 | 10.86 | 19.84 | 08.11 | 16.63 | 01.60 | 16.27 | 52.64 | 19.00 | 45.27 | 24.17 | 41.17 |
| 29 | 25.03 | 10.85 | 19.71 | 07.89 | 16.60 | 01.30 | 16.33 | 52.42 | 19.11 | 45.11 | 24.34 | 41.07 |
| 30 | 24.83 | 10.82 | | | 16.57 | 01.03 | 16.37 | 52.19 | 19.22 | 44.92 | 24.53 | 40.97 |
| 31 | 24.64 | 10.76 | | | 16.55 | 00.78 | 16.40 | 51.95 | 19.32 | 44.71 | 24.74 | 40.88 |
| 32 | 24.46 | 10.71 | | | 16.52 | 00.54 | | | 19.44 | 44.49 | | |
| | sec δ 8.84 | tan δ 8.78 | sec δ 8.84 | tan δ 8.78 | sec δ 8.84 | tan δ 8.78 | sec δ 8.83 | tan δ 8.78 | sec δ 8.83 | tan δ 8.77 | sec δ 8.83 | tan δ 8.77 |

Mean R.A. 2^h 14^m 34.95^s Double lower transit April 25 Mean Dec. +83° 29' 56.96"

APPARENT PLACES OF STARS, 1986
CIRCUMPOLAR STARS AT UPPER TRANSIT AT GREENWICH

375

1635 Bradley 256 (Cephei) Mag. 6.86 Spect. K0

| Day | July | | August | | September | | October | | November | | December | |
|-----|----------------------------|-------------------------------|----------------------------|-------------------------------|----------------------------|-------------------------------|--------------------------------|--------------------------------|----------------------------|-------------------------------|----------------------------|-------------------------------|
| | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | <small>h m</small> 2 14 | <small>° ' "</small> 83 29 | <small>h m</small> 2 14 | <small>° ' "</small> 83 29 | <small>h m</small> 2 14 | <small>° ' "</small> 83 29 | <small>h m</small> 2 14 | <small>° ' "</small> 83 29 | <small>h m</small> 2 14 | <small>° ' "</small> 83 30 | <small>h m</small> 2 14 | <small>° ' "</small> 83 30 |
| | <small>s</small> | <small>"</small> | <small>s</small> | <small>"</small> | <small>s</small> | <small>"</small> | <small>s</small> | <small>"</small> | <small>s</small> | <small>"</small> | <small>s</small> | <small>"</small> |
| 1 | 24.74 | 40.88 | 31.28 | 42.03 | 37.38 | 48.02 | 41.75 | 57.19 | 43.95 | 08.67 | 43.37 | 19.17 |
| 2 | 24.95 | 40.81 | 31.51 | 42.17 | 37.54 | 48.31 | 41.83 | 57.53 | 44.00 | 09.01 | 43.34 | 19.53 |
| 3 | 25.18 | 40.75 | 31.73 | 42.33 | 37.69 | 48.60 | 41.91 | 57.84 | 44.06 | 09.38 | 43.29 | 19.91 |
| 4 | 25.41 | 40.71 | 31.94 | 42.50 | 37.83 | 48.86 | 42.00 | 58.15 | 44.13 | 09.77 | 43.22 | 20.29 |
| 5 | 25.63 | 40.70 | 32.14 | 42.67 | 37.97 | 49.12 | 42.11 | 58.45 | 44.17 | 10.19 | 43.13 | 20.65 |
| 6 | 25.86 | 40.70 | 32.33 | 42.84 | 38.11 | 49.35 | 42.23 | 58.76 | 44.20 | 10.62 | 43.01 | 20.98 |
| 7 | 26.07 | 40.72 | 32.50 | 43.00 | 38.27 | 49.58 | 42.37 | 59.09 | 44.20 | 11.05 | 42.89 | 21.29 |
| 8 | 26.28 | 40.75 | 32.67 | 43.14 | 38.44 | 49.81 | 42.51 | 59.45 | 44.19 | 11.46 | 42.77 | 21.56 |
| 9 | 26.47 | 40.78 | 32.85 | 43.27 | 38.63 | 50.06 | 42.64 | 59.84 | 44.15 | 11.84 | 42.65 | 21.81 |
| 10 | 26.66 | 40.81 | 33.03 | 43.39 | 38.83 | 50.33 | 42.76 | 60.25 | 44.11 | 12.20 | 42.54 | 22.05 |
| 11 | 26.83 | 40.82 | 33.23 | 43.51 | 39.03 | 50.63 | 42.86 | 60.67 | 44.08 | 12.54 | 42.45 | 22.29 |
| 12 | 27.01 | 40.83 | 33.44 | 43.63 | 39.22 | 50.96 | 42.94 | 61.09 | 44.05 | 12.86 | 42.36 | 22.53 |
| 13 | 27.19 | 40.82 | 33.67 | 43.78 | 39.40 | 51.31 | 42.99 | 61.49 | 44.03 | 13.17 | 42.28 | 22.77 |
| 14 | 27.38 | 40.80 | 33.91 | 43.95 | 39.56 | 51.67 | 43.04 | 61.86 | 44.02 | 13.48 | 42.20 | 23.03 |
| 15 | 27.59 | 40.78 | 34.15 | 44.15 | 39.69 | 52.02 | 43.08 | 62.21 | 44.02 | 13.80 | 42.12 | 23.30 |
| 16 | 27.82 | 40.77 | 34.39 | 44.39 | 39.81 | 52.36 | 43.13 | 62.55 | 44.02 | 14.13 | 42.03 | 23.59 |
| 17 | 28.06 | 40.79 | 34.60 | 44.64 | 39.92 | 52.67 | 43.18 | 62.87 | 44.02 | 14.48 | 41.93 | 23.87 |
| 18 | 28.32 | 40.84 | 34.79 | 44.90 | 40.03 | 52.96 | 43.25 | 63.18 | 44.02 | 14.84 | 41.81 | 24.16 |
| 19 | 28.57 | 40.92 | 34.97 | 45.14 | 40.15 | 53.23 | 43.33 | 63.51 | 44.01 | 15.21 | 41.68 | 24.45 |
| 20 | 28.81 | 41.04 | 35.13 | 45.37 | 40.28 | 53.50 | 43.41 | 63.84 | 43.99 | 15.59 | 41.54 | 24.71 |
| 21 | 29.03 | 41.17 | 35.28 | 45.57 | 40.42 | 53.77 | 43.50 | 64.20 | 43.95 | 15.97 | 41.39 | 24.97 |
| 22 | 29.23 | 41.29 | 35.44 | 45.75 | 40.58 | 54.05 | 43.59 | 64.57 | 43.89 | 16.35 | 41.23 | 25.19 |
| 23 | 29.41 | 41.40 | 35.61 | 45.93 | 40.73 | 54.35 | 43.67 | 64.95 | 43.83 | 16.71 | 41.07 | 25.40 |
| 24 | 29.58 | 41.48 | 35.80 | 46.10 | 40.89 | 54.66 | 43.74 | 65.35 | 43.75 | 17.06 | 40.91 | 25.59 |
| 25 | 29.76 | 41.54 | 35.99 | 46.28 | 41.05 | 55.00 | <small>43.79 43.83</small> | <small>65.76 66.17</small> | 43.67 | 17.39 | 40.77 | 25.76 |
| 26 | 29.94 | 41.59 | 36.20 | 46.47 | 41.20 | 55.35 | 43.86 | 66.57 | 43.58 | 17.69 | 40.64 | 25.93 |
| 27 | 30.14 | 41.63 | 36.41 | 46.68 | 41.34 | 55.72 | 43.87 | 66.96 | 43.51 | 17.98 | 40.54 | 26.10 |
| 28 | 30.35 | 41.68 | 36.62 | 46.92 | 41.46 | 56.09 | 43.88 | 67.34 | 43.45 | 18.26 | 40.44 | 26.30 |
| 29 | 30.57 | 41.74 | 36.83 | 47.17 | 41.57 | 56.47 | 43.88 | 67.69 | 43.41 | 18.54 | 40.34 | 26.52 |
| 30 | 30.81 | 41.82 | 37.02 | 47.45 | 41.67 | 56.83 | 43.89 | 68.02 | 43.39 | 18.84 | 40.23 | 26.77 |
| 31 | 31.04 | 41.91 | 37.21 | 47.73 | 41.75 | 57.19 | 43.91 | 68.35 | 43.37 | 19.17 | 40.10 | 27.03 |
| 32 | 31.28 | 42.03 | 37.38 | 48.02 | | | 43.95 | 68.67 | | | 39.95 | 27.28 |
| | sec δ 8.83 | tan δ 8.77 | sec δ 8.83 | tan δ 8.77 | sec δ 8.83 | tan δ 8.77 | sec δ 8.83 | tan δ 8.78 | sec δ 8.84 | tan δ 8.78 | sec δ 8.84 | tan δ 8.79 |

Mean R.A. $2^{\text{h}} 14^{\text{m}} 34^{\text{s}}.95$

Double lower transit April 25

Mean Dec. $+83^{\circ} 29' 56''.96$

APPARENT PLACES OF STARS, 1986
CIRCUMPOLAR STARS AT UPPER TRANSIT AT GREENWICH

907 α Ursae Minoris (*Polaris*) . Mag. 2.12 var. Spect. F8v

| Day | January | | February | | March | | April | | May | | June | |
|-----|--------------------------------|---------------------------------|--------------------------------|---------------------------------|--------------------------------|---------------------------------|--------------------------------|---------------------------------|--------------------------------|---------------------------------|--------------------------------|---------------------------------|
| | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | ^h 2 ^m 16 | ⁺ 89 [°] 12 | ^h 2 ^m 15 | ⁺ 89 [°] 12 | ^h 2 ^m 15 | ⁺ 89 [°] 12 | ^h 2 ^m 15 | ⁺ 89 [°] 12 | ^h 2 ^m 15 | ⁺ 89 [°] 12 | ^h 2 ^m 15 | ⁺ 89 [°] 11 |
| | ^s " | " | ^s " | " | ^s " | " | ^s " | " | ^s " | " | ^s " | " |
| 1 | 82.46 | 24.04 | 96.26 | 27.00 | 55.63 | 24.45 | 27.73 | 17 11 | 24.89 | 08.28 | 47.26 | 60.39 |
| 2 | 80.93 | 24.21 | 94.93 | 26.97 | 54.64 | 24.26 | 27.25 | 16.88 | 25.00 | 08.02 | 48.28 | 60.15 |
| 3 | 79.48 | 24.36 | 93.66 | 26.95 | 53.68 | 24.09 | 26.66 | 16.64 | 25.14 | 07.72 | 49.42 | 59.90 |
| 4 | 78.15 | 24.49 | 92.39 | 26.95 | 52.68 | 23.94 | 26.01 | 16.39 | 25.33 | 07.41 | 50.67 | 59.67 |
| 5 | 76.93 | 24.62 | 91.05 | 26.97 | 51.59 | 23.80 | 25.33 | 16.11 | 25.62 | 07.09 | 51.99 | 59.45 |
| 6 | 75.81 | 24.77 | 89.60 | 26.99 | 50.39 | 23.66 | 24.68 | 15.80 | 26.03 | 06.75 | 53.37 | 59.24 |
| 7 | 74.72 | 24.94 | 88.00 | 27.01 | 49.09 | 23.51 | 24.10 | 15.48 | 26.56 | 06.42 | 54.78 | 59.06 |
| 8 | 73.59 | 25.13 | 86.29 | 27.01 | 47.71 | 23.33 | 23.64 | 15.14 | 27.20 | 06.10 | 56.17 | 58.90 |
| 9 | 72.34 | 25.33 | 84.51 | 26.99 | 46.32 | 23.13 | 23.30 | 14.79 | 27.92 | 05.79 | 57.52 | 58.76 |
| 10 | 70.93 | 25.54 | 82.73 | 26.93 | 44.97 | 22.90 | 23.08 | 14.44 | 28.70 | 05.50 | 58.81 | 58.63 |
| 11 | 69.37 | 25.73 | 80.99 | 26.84 | 43.71 | 22.65 | 22.97 | 14.10 | 29.50 | 05.23 | 60.02 | 58.50 |
| 12 | 67.69 | 25.90 | 79.34 | 26.73 | 42.56 | 22.38 | 22.94 | 13.78 | 30.28 | 04.97 | 61.17 | 58.38 |
| 13 | 65.96 | 26.04 | 77.79 | 26.61 | 41.52 | 22.11 | 22.95 | 13.47 | 31.02 | 04.73 | 62.28 | 58.25 |
| 14 | 64.23 | 26.15 | 76.34 | 26.48 | 40.61 | 21.83 | 22.97 | 13.17 | 31.70 | 04.51 | 63.37 | 58.11 |
| 15 | 62.55 | 26.23 | 74.99 | 26.35 | 39.78 | 21.56 | 22.97 | 12.89 | 32.32 | 04.28 | 64.49 | 57.95 |
| 16 | 60.95 | 26.30 | 73.69 | 26.22 | 39.01 | 21.30 | 22.92 | 12.62 | 32.89 | 04.05 | 65.69 | 57.78 |
| 17 | 59.43 | 26.35 | 72.44 | 26.11 | 38.27 | 21.05 | 22.82 | 12.36 | 33.42 | 03.81 | 67.01 | 57.60 |
| 18 | 57.99 | 26.40 | 71.18 | 26.01 | 37.52 | 20.82 | 22.65 | 12.09 | 33.96 | 03.55 | 68.49 | 57.43 |
| 19 | 56.62 | 26.45 | 69.90 | 25.91 | 36.73 | 20.60 | 22.44 | 11.82 | 34.56 | 03.28 | 70.12 | 57.27 |
| 20 | 55.28 | 26.51 | 68.55 | 25.83 | 35.89 | 20.39 | 22.21 | 11.52 | 35.28 | 02.99 | 71.85 | 57.14 |
| 21 | 53.95 | 26.58 | 67.13 | 25.75 | 34.98 | 20.17 | 22.01 | 11.21 | 36.16 | 02.70 | 73.59 | 57.05 |
| 22 | 52.59 | 26.66 | 65.62 | 25.66 | 34.01 | 19.94 | 21.91 | 10.88 | 37.21 | 02.41 | 75.27 | 57.00 |
| 23 | 51.17 | 26.75 | 64.04 | 25.55 | 32.99 | 19.70 | 21.97 | 10.53 | 38.40 | 02.15 | 76.81 | 56.96 |
| 24 | 49.66 | 26.84 | 62.42 | 25.42 | 31.97 | 19.44 | 22.20 | 10.18 | 39.67 | 01.92 | 78.21 | 56.93 |
| 25 | 48.06 | 26.93 | 60.83 | 25.26 | 31.02 | 19.15 | 22.61 | 09.84 | 40.90 | 01.73 | 79.48 | 56.89 |
| 26 | 46.35 | 27.01 | 59.32 | 25.08 | 30.19 | 18.84 | 23.12 | 09.54 | 42.04 | 01.56 | 80.70 | 56.82 |
| 27 | 44.58 | 27.07 | 57.94 | 24.87 | 29.54 | 18.51 | 23.65 | 09.26 | 43.03 | 01.40 | 81.94 | 56.73 |
| 28 | 42.77 | 27.10 | 56.71 | 24.66 | 29.05 | 18.19 | 24.12 | 09.01 | 43.91 | 01.24 | 83.23 | 56.63 |
| 29 | 40.99 | 27.11 | 55.63 | 24.45 | 28.70 | 17.89 | 24.48 | 08.77 | 44.72 | 01.06 | 84.62 | 56.52 |
| 30 | 39.29 | 27.09 | | | 28.41 | 17.61 | 24.73 | 08.53 | 45.51 | 00.86 | 86.12 | 56.40 |
| 31 | 37.71 | 27.05 | | | 28.11 | 17.35 | 24.89 | 08.28 | 46.34 | 00.63 | 87.72 | 56.29 |
| 32 | 36.26 | 27.00 | | | 27.73 | 17.11 | | | 47.26 | 00.39 | | |
| | sec δ 72.28 | tan δ 72.28 | sec δ 72.28 | tan δ 72.27 | sec δ 72.16 | tan δ 72.15 | sec δ 71.94 | tan δ 71.93 | sec δ 71.72 | tan δ 71.72 | sec δ 71.57 | tan δ 71.56 |

Mean R.A. $2^{\text{h}} 17^{\text{m}} 48^{\text{s}}.63$

Double lower transit April 26

Mean Dec. $+89^{\circ} 12' 12''$

APPARENT PLACES OF STARS, 1986
CIRCUMPOLAR STARS AT UPPER TRANSIT AT GREENWICH

377

907 α Ursae Minoris (*Polaris*) Mag. 2.12 var. Spect. F8v

| Day | July | | August | | September | | October | | November | | December | |
|-----|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | + o / | h m | + o / | h m | + o / | h m | + o / | h m | + o / | h m | + o / |
| | 2 16 | 89 11 | 2 17 | 89 11 | 2 18 | 89 12 | 2 18 | 89 12 | 2 18 | 89 12 | 2 18 | 89 12 |
| | s | " | s | " | s | " | s | " | s | " | s | " |
| 1 | 27.72 | 56.29 | 18.39 | 56.95 | 06.33 | 02.58 | 41.12 | 11.64 | 58.57 | 23.30 | 52.56 | 34.24 |
| 2 | 29.40 | 56.20 | 20.17 | 57.07 | 07.58 | 02.87 | 41.79 | 11.97 | 58.97 | 23.65 | 52.21 | 34.61 |
| 3 | 31.13 | 56.12 | 21.87 | 57.21 | 08.75 | 03.14 | 42.48 | 12.29 | 59.43 | 24.03 | 51.70 | 35.01 |
| 4 | 32.89 | 56.07 | 23.50 | 57.37 | 09.88 | 03.40 | 43.25 | 12.60 | 59.84 | 24.43 | 51.01 | 35.40 |
| 5 | 34.63 | 56.04 | 25.02 | 57.53 | 11.01 | 03.65 | 44.14 | 12.90 | 60.14 | 24.86 | 50.14 | 35.78 |
| 6 | 36.33 | 56.02 | 26.47 | 57.68 | 12.20 | 03.88 | 45.13 | 13.22 | 60.27 | 25.30 | 49.16 | 36.14 |
| 7 | 37.96 | 56.03 | 27.86 | 57.83 | 13.49 | 04.10 | 46.21 | 13.55 | 60.22 | 25.74 | 48.12 | 36.46 |
| 8 | 39.52 | 56.04 | 29.23 | 57.96 | 14.90 | 04.33 | 47.29 | 13.91 | 60.03 | 26.17 | 47.10 | 36.75 |
| 9 | 40.99 | 56.06 | 30.63 | 58.08 | 16.40 | 04.57 | 48.31 | 14.30 | 59.74 | 26.57 | 46.13 | 37.03 |
| 10 | 42.39 | 56.07 | 32.11 | 58.19 | 17.97 | 04.83 | 49.21 | 14.72 | 59.43 | 26.94 | 45.24 | 37.28 |
| 11 | 43.77 | 56.07 | 33.70 | 58.29 | 19.53 | 05.13 | 49.94 | 15.14 | 59.13 | 27.29 | 44.42 | 37.54 |
| 12 | 45.15 | 56.05 | 35.41 | 58.40 | 21.02 | 05.45 | 50.51 | 15.56 | 58.90 | 27.62 | 43.66 | 37.79 |
| 13 | 46.58 | 56.03 | 37.23 | 58.53 | 22.37 | 05.79 | 50.96 | 15.96 | 58.74 | 27.95 | 42.94 | 38.06 |
| 14 | 48.11 | 55.99 | 39.09 | 58.69 | 23.58 | 06.15 | 51.34 | 16.34 | 58.65 | 28.27 | 42.21 | 38.33 |
| 15 | 49.77 | 55.96 | 40.94 | 58.88 | 24.63 | 06.50 | 51.71 | 16.70 | 58.62 | 28.60 | 41.45 | 38.63 |
| 16 | 51.56 | 55.93 | 42.71 | 59.10 | 25.59 | 06.83 | 52.12 | 17.04 | 58.60 | 28.95 | 40.61 | 38.93 |
| 17 | 53.46 | 55.93 | 44.34 | 59.35 | 26.49 | 07.14 | 52.60 | 17.37 | 58.57 | 29.31 | 39.68 | 39.23 |
| 18 | 55.40 | 55.97 | 45.81 | 59.59 | 27.42 | 07.43 | 53.17 | 17.69 | 58.48 | 29.69 | 38.65 | 39.54 |
| 19 | 57.31 | 56.04 | 47.15 | 59.83 | 28.40 | 07.70 | 53.80 | 18.02 | 58.32 | 30.08 | 37.50 | 39.84 |
| 20 | 59.11 | 56.13 | 48.42 | 60.04 | 29.48 | 07.96 | 54.48 | 18.36 | 58.04 | 30.47 | 36.26 | 40.13 |
| 21 | 60.76 | 56.25 | 49.67 | 60.24 | 30.64 | 08.23 | 55.17 | 18.72 | 57.65 | 30.87 | 34.95 | 40.41 |
| 22 | 62.27 | 56.35 | 50.97 | 60.41 | 31.87 | 08.50 | 55.83 | 19.10 | 57.16 | 31.26 | 33.61 | 40.65 |
| 23 | 63.67 | 56.45 | 52.37 | 60.57 | 33.14 | 08.80 | 56.43 | 19.49 | 56.57 | 31.64 | 32.28 | 40.88 |
| 24 | 65.03 | 56.52 | 53.86 | 60.73 | 34.41 | 09.11 | 56.94 | 19.90 | 55.91 | 32.00 | 31.00 | 41.09 |
| 25 | 66.43 | 56.56 | 55.43 | 60.90 | 35.64 | 09.45 | 57.34 | 20.31 | 55.23 | 32.35 | 29.81 | 41.28 |
| 26 | 67.91 | 56.60 | 57.07 | 61.09 | 36.80 | 09.80 | 57.81 | 20.73 | 54.56 | 32.67 | 28.73 | 41.47 |
| 27 | 69.48 | 56.63 | 58.73 | 61.29 | 37.86 | 10.16 | 57.90 | 21.54 | 53.97 | 32.98 | 27.76 | 41.66 |
| 28 | 71.16 | 56.66 | 60.38 | 61.51 | 38.82 | 10.54 | 57.95 | 21.92 | 53.48 | 33.27 | 26.85 | 41.88 |
| 29 | 72.92 | 56.70 | 62.00 | 61.76 | 39.68 | 10.91 | 57.99 | 22.29 | 53.11 | 33.57 | 25.93 | 42.12 |
| 30 | 74.73 | 56.76 | 63.54 | 62.02 | 40.43 | 11.28 | 58.08 | 22.63 | 52.83 | 33.89 | 24.90 | 42.38 |
| 31 | 76.56 | 56.84 | 64.99 | 62.30 | 41.12 | 11.64 | 58.26 | 22.97 | 52.56 | 34.24 | 23.71 | 42.66 |
| 32 | 78.39 | 56.95 | 66.33 | 62.58 | | | 58.57 | 23.30 | | | 22.33 | 42.93 |
| | sec δ | tan δ | sec δ | tan δ | sec δ | tan δ | sec δ | tan δ | sec δ | tan δ | sec δ | tan δ |
| | 71.52 | 71.51 | 71.60 | 71.59 | 71.79 | 71.79 | 72.05 | 72.04 | 72.35 | 72.34 | 72.60 | 72.60 |

Mean R.A. $2^{\text{h}} 17^{\text{m}} 48.63^{\text{s}}$

Double lower transit April 26

Mean Dec. $+89^{\circ} 12' 12.42''$

APPARENT PLACES OF STARS, 1986
CIRCUMPOLAR STARS AT UPPER TRANSIT AT GREENWICH

1636 Bradley 402 (Cephei) Mag. 5.78 Spect. K0

| Day | January | | February | | March | | April | | May | | June | |
|-----|----------------|---------------------|----------------|---------------------|----------------|---------------------|----------------|---------------------|----------------|---------------------|----------------|---------------------|
| | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m 3 28 | + ° ' " 84 52 | h m 3 28 | + ° ' " 84 52 | h m 3 28 | + ° ' " 84 52 | h m 3 28 | + ° ' " 84 52 | h m 3 28 | + ° ' " 84 51 | h m 3 28 | + ° ' " 84 51 |
| | s 54.76 | " 10.10 | s 48.92 | " 15.55 | s 42.55 | " 15.57 | s 36.93 | " 10.41 | s 34.66 | " 62.39 | s 36.38 | " 53.75 |
| 1 | 54.76 | 10.10 | 48.92 | 15.55 | 42.55 | 15.57 | 36.93 | 10.41 | 34.66 | 62.39 | 36.38 | 53.75 |
| 2 | 54.58 | 10.34 | 48.72 | 15.59 | 42.37 | 15.45 | 36.82 | 10.23 | 34.62 | 62.13 | 36.48 | 53.46 |
| 3 | 54.40 | 10.56 | 48.54 | 15.65 | 42.20 | 15.35 | 36.69 | 10.04 | 34.57 | 61.86 | 36.60 | 53.16 |
| 4 | 54.24 | 10.76 | 48.37 | 15.72 | 42.03 | 15.27 | 36.54 | 09.85 | 34.53 | 61.56 | 36.73 | 52.87 |
| 5 | 54.10 | 10.96 | 48.19 | 15.82 | 41.85 | 15.21 | 36.38 | 09.63 | 34.50 | 61.23 | 36.89 | 52.58 |
| 6 | 53.98 | 11.16 | 48.00 | 15.93 | 41.65 | 15.15 | 36.21 | 09.39 | 34.49 | 60.90 | 37.06 | 52.31 |
| 7 | 53.88 | 11.37 | 47.78 | 16.04 | 41.43 | 15.09 | 36.05 | 09.12 | 34.49 | 60.56 | 37.23 | 52.06 |
| 8 | 53.77 | 11.62 | 47.54 | 16.15 | 41.20 | 15.01 | 35.90 | 08.83 | 34.52 | 60.22 | 37.42 | 51.83 |
| 9 | 53.65 | 11.88 | 47.28 | 16.23 | 40.95 | 14.91 | 35.77 | 08.52 | 34.56 | 59.89 | 37.60 | 51.62 |
| 10 | 53.51 | 12.16 | 47.00 | 16.28 | 40.70 | 14.77 | 35.66 | 08.21 | 34.62 | 59.57 | 37.77 | 51.42 |
| 11 | 53.34 | 12.43 | 46.73 | 16.30 | 40.45 | 14.61 | 35.57 | 07.90 | 34.68 | 59.27 | 37.93 | 51.24 |
| 12 | 53.14 | 12.69 | 46.46 | 16.29 | 40.22 | 14.43 | 35.50 | 07.60 | 34.75 | 58.99 | 38.09 | 51.06 |
| 13 | 52.92 | 12.92 | 46.21 | 16.27 | 40.01 | 14.23 | 35.43 | 07.31 | 34.82 | 58.73 | 38.23 | 50.87 |
| 14 | 52.70 | 13.12 | 45.97 | 16.23 | 39.81 | 14.03 | 35.38 | 07.03 | 34.88 | 58.48 | 38.36 | 50.68 |
| 15 | 52.47 | 13.30 | 45.75 | 16.19 | 39.63 | 13.82 | 35.32 | 06.78 | 34.93 | 58.23 | 38.50 | 50.47 |
| 16 | 52.26 | 13.45 | 45.54 | 16.15 | 39.46 | 13.63 | 35.26 | 06.53 | 34.96 | 57.98 | 38.64 | 50.24 |
| 17 | 52.05 | 13.58 | 45.33 | 16.12 | 39.31 | 13.45 | 35.20 | 06.29 | 34.99 | 57.73 | 38.80 | 49.99 |
| 18 | 51.86 | 13.71 | 45.14 | 16.10 | 39.15 | 13.27 | 35.12 | 06.06 | 35.02 | 57.46 | 38.99 | 49.74 |
| 19 | 51.67 | 13.84 | 44.94 | 16.09 | 38.99 | 13.12 | 35.03 | 05.81 | 35.05 | 57.17 | 39.20 | 49.50 |
| 20 | 51.50 | 13.97 | 44.73 | 16.09 | 38.83 | 12.97 | 34.93 | 05.56 | 35.09 | 56.86 | 39.44 | 49.28 |
| 21 | 51.33 | 14.11 | 44.51 | 16.10 | 38.65 | 12.82 | 34.83 | 05.28 | 35.15 | 56.53 | 39.70 | 49.09 |
| 22 | 51.16 | 14.27 | 44.28 | 16.11 | 38.46 | 12.67 | 34.74 | 04.97 | 35.25 | 56.20 | 39.95 | 48.95 |
| 23 | 50.99 | 14.44 | 44.03 | 16.10 | 38.26 | 12.51 | 34.67 | 04.64 | 35.38 | 55.89 | 40.19 | 48.82 |
| 24 | 50.80 | 14.61 | 43.76 | 16.08 | 38.05 | 12.33 | 34.62 | 04.30 | 35.53 | 55.61 | 40.40 | 48.72 |
| 25 | 50.60 | 14.79 | 43.49 | 16.02 | 37.84 | 12.11 | 34.61 | 03.97 | 35.68 | 55.35 | 40.59 | 48.60 |
| 26 | 50.38 | 14.97 | 43.23 | 15.94 | 37.65 | 11.87 | 34.63 | 03.65 | 35.83 | 55.13 | 40.77 | 48.47 |
| 27 | 50.13 | 15.13 | 42.98 | 15.83 | 37.48 | 11.60 | 34.66 | 03.36 | 35.96 | 54.93 | 40.93 | 48.32 |
| 28 | 49.88 | 15.26 | 42.75 | 15.70 | 37.34 | 11.33 | 34.68 | 03.10 | 36.06 | 54.73 | 41.11 | 48.15 |
| 29 | 49.62 | 15.37 | 42.55 | 15.57 | 37.22 | 11.07 | 34.69 | 02.86 | 36.14 | 54.51 | 41.29 | 47.96 |
| 30 | 49.37 | 15.45 | | | 37.13 | 10.83 | 34.69 | 02.63 | 36.22 | 54.28 | 41.49 | 47.76 |
| 31 | 49.13 | 15.50 | | | 37.03 | 10.61 | 34.66 | 02.39 | 36.30 | 54.02 | 41.71 | 47.57 |
| 32 | 48.92 | 15.55 | | | 36.93 | 10.41 | | | 36.38 | 53.75 | | |
| | sec δ 11.18 | tan δ 11.14 | sec δ 11.19 | tan δ 11.14 | sec δ 11.18 | tan δ 11.14 | sec δ 11.18 | tan δ 11.14 | sec δ 11.18 | tan δ 11.13 | sec δ 11.17 | tan δ 11.13 |

Mean R.A. 3^h 28^m 57.74^s

Double lower transit May 14

Mean Dec. +84° 51' 57.6"

APPARENT PLACES OF STARS, 1986
CIRCUMPOLAR STARS AT UPPER TRANSIT AT GREENWICH

379

1636 Bradley 402 (Cephei) Mag. 5.78 Spect. K0

| Day | July | | August | | September | | October | | November | | December | |
|-----|-----------------------------------|---|-----------------------------------|---|-----------------------------------|---|-----------------------------------|---|-----------------------------------|---|-----------------------------------|---|
| | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | ^h ^m 3 28 | ⁺ ^o / 84 51 | ^h ^m 3 28 | ⁺ ^o / 84 51 | ^h ^m 3 28 | ⁺ ^o / 84 51 | ^h ^m 3 29 | ⁺ ^o / 84 51 | ^h ^m 3 29 | ⁺ ^o / 84 52 | ^h ^m 3 29 | ⁺ ^o / 84 52 |
| | ^s 41.71 | " 47.57 | ^s 49.67 | " 45.25 | ^s 58.29 | " 47.77 | ^s 05.66 | " 54.22 | ^s 10.91 | " 03.79 | ^s 12.87 | " 14.59 |
| 1 | 41.95 | 47.38 | 49.97 | 45.27 | 58.55 | 47.96 | 05.83 | 54.50 | 11.04 | 04.08 | 12.93 | 14.96 |
| 2 | 42.20 | 47.21 | 50.27 | 45.30 | 58.79 | 48.15 | 06.01 | 54.76 | 11.18 | 04.38 | 12.96 | 15.36 |
| 3 | 42.46 | 47.06 | 50.56 | 45.36 | 59.02 | 48.33 | 06.19 | 55.00 | 11.35 | 04.70 | 12.96 | 15.77 |
| 4 | 42.72 | 46.93 | 50.83 | 45.42 | 59.24 | 48.49 | 06.39 | 55.22 | 11.51 | 05.06 | 12.93 | 16.18 |
| 5 | 42.98 | 46.82 | 51.09 | 45.48 | 59.47 | 48.64 | 06.61 | 55.46 | 11.67 | 05.44 | 12.88 | 16.56 |
| 6 | 43.24 | 46.73 | 51.33 | 45.54 | 59.71 | 48.77 | 06.86 | 55.71 | 11.80 | 05.85 | 12.80 | 16.92 |
| 7 | 43.49 | 46.65 | 51.57 | 45.58 | 59.98 | 48.90 | 07.11 | 55.98 | 11.90 | 06.26 | 12.72 | 17.25 |
| 8 | 43.72 | 46.58 | 51.81 | 45.61 | 60.26 | 49.03 | 07.36 | 56.29 | 11.98 | 06.67 | 12.65 | 17.56 |
| 9 | 43.94 | 46.51 | 52.05 | 45.63 | 60.56 | 49.19 | 07.60 | 56.62 | 12.03 | 07.06 | 12.58 | 17.85 |
| 10 | 44.15 | 46.43 | 52.32 | 45.63 | 60.87 | 49.38 | 07.81 | 56.98 | 12.07 | 07.42 | 12.52 | 18.13 |
| 11 | 44.36 | 46.34 | 52.60 | 45.63 | 61.18 | 49.59 | 08.00 | 57.34 | 12.11 | 07.76 | 12.48 | 18.41 |
| 12 | 44.57 | 46.23 | 52.91 | 45.65 | 61.47 | 49.84 | 08.16 | 57.69 | ^{12 15} 12.21 | ^{08 09} 08.39 | 12.44 | 18.69 |
| 13 | 44.79 | 46.11 | 53.23 | 45.69 | 61.74 | 50.10 | 08.31 | 58.02 | 12.27 | 08.70 | 12.41 | 18.99 |
| 14 | 45.03 | 45.98 | 53.56 | 45.76 | 61.98 | 50.37 | 08.44 | 58.34 | 12.35 | 09.01 | 12.38 | 19.31 |
| 15 | 45.30 | 45.85 | 53.89 | 45.87 | 62.20 | 50.63 | 08.58 | 58.63 | 12.44 | 09.33 | 12.34 | 19.64 |
| 16 | 45.59 | 45.74 | 54.20 | 46.00 | 62.41 | 50.86 | 08.73 | 58.90 | 12.52 | 09.67 | 12.28 | 19.98 |
| 17 | 45.91 | 45.66 | 54.49 | 46.15 | 62.61 | 51.08 | 08.88 | 59.17 | 12.61 | 10.02 | 12.21 | 20.32 |
| 18 | 46.22 | 45.62 | 54.75 | 46.30 | 62.81 | 51.27 | 09.06 | 59.44 | 12.68 | 10.40 | 12.13 | 20.67 |
| 19 | 46.53 | 45.61 | 54.99 | 46.43 | 63.03 | 51.46 | 09.24 | 59.71 | 12.74 | 10.78 | 12.02 | 21.01 |
| 20 | 46.81 | 45.62 | 55.22 | 46.53 | 63.27 | 51.64 | 09.43 | 60.01 | 12.79 | 11.18 | 11.90 | 21.34 |
| 21 | 47.07 | 45.63 | 55.45 | 46.62 | 63.52 | 51.82 | 09.62 | 60.32 | 12.81 | 11.57 | 11.76 | 21.65 |
| 22 | 47.31 | 45.64 | 55.70 | 46.69 | 63.78 | 52.02 | 09.81 | 60.65 | 12.82 | 11.96 | 11.62 | 21.93 |
| 23 | 47.53 | 45.63 | 55.96 | 46.75 | 64.04 | 52.24 | 09.99 | 61.01 | 12.81 | 12.33 | 11.49 | 22.20 |
| 24 | 47.76 | 45.59 | 56.24 | 46.82 | 64.31 | 52.48 | 10.15 | 61.37 | 12.79 | 12.69 | 11.36 | 22.44 |
| 25 | 47.99 | 45.54 | 56.53 | 46.90 | 64.57 | 52.75 | 10.29 | 61.74 | 12.77 | 13.03 | 11.25 | 22.68 |
| 26 | 48.23 | 45.47 | 56.83 | 46.99 | 64.82 | 53.03 | 10.42 | 62.12 | 12.75 | 13.34 | 11.17 | 22.91 |
| 27 | 48.49 | 45.40 | 57.13 | 47.10 | 65.05 | 53.32 | 10.53 | 62.49 | 12.76 | 13.65 | 11.10 | 23.16 |
| 28 | 48.77 | 45.34 | 57.44 | 47.24 | 65.27 | 53.62 | 10.62 | 62.84 | 12.78 | 13.94 | 11.03 | 23.44 |
| 29 | 49.06 | 45.29 | 57.73 | 47.40 | 65.47 | 53.93 | 10.71 | 63.18 | 12.82 | 14.26 | 10.96 | 23.75 |
| 30 | 49.36 | 45.26 | 58.02 | 47.58 | 65.66 | 54.22 | 10.81 | 63.49 | 12.87 | 14.59 | 10.87 | 24.08 |
| 31 | 49.67 | 45.25 | 58.29 | 47.77 | | | 10.91 | 63.79 | | | 10.74 | 24.41 |
| 32 | | | | | | | | | | | | |
| | sec δ 11.17 | tan δ 11.12 | sec δ 11.17 | tan δ 11.12 | sec δ 11.17 | tan δ 11.13 | sec δ 11.18 | tan δ 11.13 | sec δ 11.18 | tan δ 11.14 | sec δ 11.19 | tan δ 11.14 |

Mean R.A. ^h 3 ^m 28 ^s 57.74

Double lower transit May 14

Mean Dec. +84° 51' 57.61

APPARENT PLACES OF STARS, 1986
CIRCUMPOLAR STARS AT UPPER TRANSIT AT GREENWICH

908 Groombridge 750 (Cephei) Mag. 6.70 Spect. F8

| Day | January | | February | | March | | April | | May | | June | |
|-----|-----------------------------------|--|-----------------------------------|--|-----------------------------------|--|-----------------------------------|--|-----------------------------------|--|-----------------------------------|--|
| | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | ^h ^m 4 31 | ⁺ ^o / ^s 85 30 | ^h ^m 4 30 | ⁺ ^o / ^s 85 30 | ^h ^m 4 30 | ⁺ ^o / ^s 85 30 | ^h ^m 4 30 | ⁺ ^o / ^s 85 30 | ^h ^m 4 30 | ⁺ ^o / ^s 85 30 | ^h ^m 4 30 | ⁺ ^o / ^s 85 29 |
| 1 | 08.75 | 09.59 | 63.63 | 17.10 | 56.66 | 19.52 | 49.29 | 16.66 | 44.88 | 09.83 | 44.69 | 60.96 |
| 2 | 08.61 | 09.90 | 63.43 | 17.22 | 56.43 | 19.48 | 49.11 | 16.53 | 44.78 | 09.60 | 44.73 | 60.65 |
| 3 | 08.47 | 10.18 | 63.24 | 17.34 | 56.22 | 19.45 | 48.92 | 16.40 | 44.66 | 09.34 | 44.79 | 60.32 |
| 4 | 08.34 | 10.43 | 63.07 | 17.49 | 56.02 | 19.44 | 48.71 | 16.27 | 44.54 | 09.07 | 44.87 | 59.99 |
| 5 | 08.24 | 10.67 | 62.90 | 17.65 | 55.80 | 19.45 | 48.48 | 16.12 | 44.43 | 08.77 | 44.97 | 59.66 |
| 6 | 08.15 | 10.91 | 62.71 | 17.84 | 55.57 | 19.47 | 48.24 | 15.94 | 44.34 | 08.45 | 45.09 | 59.34 |
| 7 | 08.09 | 11.17 | 62.49 | 18.03 | 55.32 | 19.49 | 48.00 | 15.74 | 44.27 | 08.12 | 45.23 | 59.04 |
| 8 | 08.03 | 11.45 | 62.25 | 18.22 | 55.04 | 19.50 | 47.77 | 15.51 | 44.21 | 07.79 | 45.37 | 58.76 |
| 9 | 07.96 | 11.76 | 61.98 | 18.40 | 54.74 | 19.49 | 47.56 | 15.27 | 44.18 | 07.46 | 45.51 | 58.50 |
| 10 | 07.86 | 12.09 | 61.70 | 18.55 | 54.43 | 19.45 | 47.37 | 15.01 | 44.17 | 07.13 | 45.66 | 58.26 |
| 11 | 07.74 | 12.42 | 61.40 | 18.67 | 54.13 | 19.39 | 47.20 | 14.74 | 44.17 | 06.83 | 45.79 | 58.02 |
| 12 | 07.58 | 12.75 | 61.11 | 18.76 | 53.83 | 19.29 | 47.04 | 14.48 | 44.18 | 06.54 | 45.91 | 57.80 |
| 13 | 07.39 | 13.05 | 60.83 | 18.82 | 53.55 | 19.18 | 46.91 | 14.23 | 44.19 | 06.26 | 46.02 | 57.57 |
| 14 | 07.20 | 13.33 | 60.56 | 18.88 | 53.29 | 19.05 | 46.78 | 13.99 | 44.19 | 06.01 | 46.12 | 57.34 |
| 15 | 06.99 | 13.58 | 60.30 | 18.92 | 53.04 | 18.93 | 46.66 | 13.76 | 44.18 | 05.76 | 46.21 | 57.09 |
| 16 | 06.79 | 13.81 | 60.06 | 18.96 | 52.82 | 18.80 | 46.53 | 13.55 | 44.16 | 05.51 | 46.31 | 56.81 |
| 17 | 06.60 | 14.01 | 59.84 | 19.01 | 52.60 | 18.69 | 46.40 | 13.35 | 44.13 | 05.26 | 46.43 | 56.52 |
| 18 | 06.42 | 14.21 | 59.61 | 19.06 | 52.39 | 18.58 | 46.26 | 13.16 | 44.10 | 04.99 | 46.58 | 56.21 |
| 19 | 06.25 | 14.40 | 59.39 | 19.13 | 52.18 | 18.49 | 46.10 | 12.96 | 44.06 | 04.70 | 46.76 | 55.91 |
| 20 | 06.09 | 14.60 | 59.17 | 19.22 | 51.96 | 18.41 | 45.93 | 12.75 | 44.03 | 04.38 | 46.97 | 55.61 |
| 21 | 05.94 | 14.80 | 58.93 | 19.31 | 51.73 | 18.34 | 45.75 | 12.51 | 44.03 | 04.04 | 47.20 | 55.35 |
| 22 | 05.79 | 15.02 | 58.67 | 19.40 | 51.49 | 18.27 | 45.58 | 12.25 | 44.06 | 03.69 | 47.44 | 55.12 |
| 23 | 05.64 | 15.25 | 58.39 | 19.49 | 51.23 | 18.19 | 45.43 | 11.96 | 44.12 | 03.35 | 47.67 | 54.93 |
| 24 | 05.47 | 15.50 | 58.10 | 19.57 | 50.96 | 18.08 | 45.30 | 11.65 | 44.22 | 03.03 | 47.87 | 54.76 |
| 25 | 05.29 | 15.75 | 57.79 | 19.61 | 50.68 | 17.95 | 45.21 | 11.33 | 44.33 | 02.74 | 48.05 | 54.58 |
| 26 | 05.09 | 16.01 | 57.48 | 19.63 | 50.41 | 17.78 | 45.16 | 11.02 | 44.43 | 02.48 | 48.21 | 54.40 |
| 27 | 04.86 | 16.25 | 57.18 | 19.61 | 50.16 | 17.59 | 45.12 | 10.74 | 44.52 | 02.25 | 48.35 | 54.19 |
| 28 | 04.61 | 16.47 | 56.91 | 19.57 | 49.94 | 17.38 | 45.08 | 10.49 | 44.58 | 02.02 | 48.50 | 53.96 |
| 29 | 04.36 | 16.67 | 56.66 | 19.52 | 49.76 | 17.17 | 45.04 | 10.26 | 44.62 | 01.78 | 48.66 | 53.71 |
| 30 | 04.10 | 16.84 | | | 49.59 | 16.98 | 44.97 | 10.04 | 44.64 | 01.53 | 48.83 | 53.45 |
| 31 | 03.85 | 16.98 | | | 49.44 | 16.81 | 44.88 | 09.83 | 44.67 | 01.26 | 49.02 | 53.19 |
| 32 | 03.63 | 17.10 | | | 49.29 | 16.66 | | | 44.69 | 00.96 | | |
| | sec δ 12.76 | tan δ 12.72 | sec δ 12.76 | tan δ 12.72 | sec δ 12.76 | tan δ 12.72 | sec δ 12.76 | tan δ 12.72 | sec δ 12.75 | tan δ 12.71 | sec δ 12.74 | tan δ 12.70 |

Mean R.A. $4^{\text{h}} 31^{\text{m}} 08.93^{\text{s}}$

Double lower transit May 30

Mean Dec. $+85^{\circ} 29' 57.2''$

APPARENT PLACES OF STARS, 1986
CIRCUMPOLAR STARS AT UPPER TRANSIT AT GREENWICH

381

908 Groombridge 750 (Cephei) Mag. 6.70 Spect. F8

| Day | July | | August | | September | | October | | November | | December | |
|-----|-------|-------|--------|-------|-----------|-------|---------|-------|-----------------------------------|-----------------------------------|----------|-------|
| | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " |
| | 4 30 | 85 29 | 4 30 | 85 29 | 4 31 | 85 29 | 4 31 | 85 29 | 4 31 | 85 29 | 4 31 | 85 30 |
| | s | " | s | " | s | " | s | " | s | " | s | " |
| 1 | 49.02 | 53.19 | 57.12 | 48.20 | 07.09 | 47.62 | 16.62 | 51.28 | 24.60 | 58.72 | 29.27 | 08.59 |
| 2 | 49.24 | 52.93 | 57.46 | 48.11 | 07.41 | 47.72 | 16.88 | 51.49 | 24.80 | 58.96 | 29.42 | 08.94 |
| 3 | 49.47 | 52.68 | 57.79 | 48.05 | 07.72 | 47.82 | 17.13 | 51.67 | 25.04 | 59.20 | 29.54 | 09.32 |
| 4 | 49.72 | 52.44 | 58.11 | 48.00 | 08.01 | 47.91 | 17.39 | 51.84 | 25.29 | 59.46 | 29.64 | 09.72 |
| 5 | 49.97 | 52.22 | 58.42 | 47.97 | 08.29 | 47.99 | 17.66 | 51.99 | 25.56 | 59.75 | 29.70 | 10.13 |
| 6 | 50.23 | 52.03 | 58.71 | 47.94 | 08.58 | 48.05 | 17.96 | 52.13 | 25.81 | 60.07 | 29.73 | 10.53 |
| 7 | 50.49 | 51.86 | 58.99 | 47.91 | 08.87 | 48.09 | 18.28 | 52.29 | 26.05 | 60.43 | 29.73 | 10.90 |
| 8 | 50.73 | 51.70 | 59.26 | 47.87 | 09.19 | 48.11 | 18.62 | 52.47 | 26.26 | 60.79 | 29.72 | 11.25 |
| 9 | 50.97 | 51.56 | 59.53 | 47.81 | 09.53 | 48.15 | 18.97 | 52.68 | 26.44 | 61.16 | 29.71 | 11.58 |
| 10 | 51.19 | 51.41 | 59.80 | 47.73 | 09.90 | 48.19 | 19.31 | 52.93 | 26.58 | 61.52 | 29.71 | 11.88 |
| 11 | 51.40 | 51.26 | 60.09 | 47.64 | 10.28 | 48.27 | 19.62 | 53.20 | 26.71 | 61.86 | 29.71 | 12.18 |
| 12 | 51.60 | 51.10 | 60.40 | 47.54 | 10.66 | 48.38 | 19.91 | 53.49 | 26.84 | 62.18 | 29.73 | 12.47 |
| 13 | 51.80 | 50.92 | 60.74 | 47.45 | 11.03 | 48.52 | 20.17 | 53.77 | 26.96 | 62.47 | 29.76 | 12.76 |
| 14 | 52.02 | 50.72 | 61.10 | 47.38 | 11.39 | 48.68 | 20.40 | 54.04 | 27.09 | 62.75 | 29.79 | 13.07 |
| 15 | 52.25 | 50.51 | 61.48 | 47.34 | 11.71 | 48.85 | 20.62 | 54.29 | 27.24 | 63.03 | 29.83 | 13.39 |
| 16 | 52.52 | 50.29 | 61.86 | 47.33 | 12.01 | 49.02 | 20.84 | 54.52 | 27.39 | 63.30 | 29.86 | 13.73 |
| 17 | 52.81 | 50.09 | 62.23 | 47.36 | 12.29 | 49.18 | 21.07 | 54.74 | 27.56 | 63.59 | 29.88 | 14.09 |
| 18 | 53.13 | 49.90 | 62.57 | 47.40 | 12.56 | 49.31 | 21.30 | 54.94 | 27.74 | 63.89 | 29.89 | 14.46 |
| 19 | 53.47 | 49.75 | 62.88 | 47.45 | 12.83 | 49.42 | 21.55 | 55.14 | 27.91 | 64.21 | 29.87 | 14.83 |
| 20 | 53.79 | 49.64 | 63.18 | 47.49 | 13.12 | 49.52 | 21.82 | 55.34 | 28.08 | 64.55 | 29.83 | 15.20 |
| 21 | 54.11 | 49.56 | 63.45 | 47.51 | 13.42 | 49.61 | 22.10 | 55.56 | 28.24 | 64.91 | 29.77 | 15.57 |
| 22 | 54.39 | 49.48 | 63.73 | 47.51 | 13.73 | 49.70 | 22.38 | 55.80 | 28.38 | 65.28 | 29.70 | 15.92 |
| 23 | 54.65 | 49.41 | 64.01 | 47.49 | 14.06 | 49.81 | 22.66 | 56.06 | 28.49 | 65.65 | 29.61 | 16.24 |
| 24 | 54.89 | 49.32 | 64.31 | 47.45 | 14.41 | 49.93 | 22.94 | 56.34 | 28.59 | 66.03 | 29.53 | 16.55 |
| 25 | 55.12 | 49.20 | 64.63 | 47.42 | 14.75 | 50.07 | 23.20 | 56.64 | 28.67 | 66.40 | 29.45 | 16.83 |
| 26 | 55.36 | 49.06 | 64.96 | 47.39 | 15.10 | 50.23 | 23.44 | 56.96 | 28.73 | 66.76 | 29.39 | 17.10 |
| 27 | 55.61 | 48.91 | 65.31 | 47.38 | 15.43 | 50.42 | 23.67 | 57.28 | 28.79 | 67.09 | 29.35 | 17.37 |
| 28 | 55.88 | 48.75 | 65.67 | 47.38 | 15.76 | 50.62 | 23.87 | 57.60 | 28.85 | 67.40 | 29.33 | 17.64 |
| 29 | 56.16 | 48.60 | 66.04 | 47.41 | 16.06 | 50.84 | 24.06 | 57.91 | ^{28.92} _{29.02} | ^{67.69} _{67.98} | 29.33 | 17.94 |
| 30 | 56.47 | 48.45 | 66.40 | 47.46 | 16.35 | 51.06 | 24.24 | 58.20 | 29.14 | 68.27 | 29.32 | 18.28 |
| 31 | 56.79 | 48.32 | 66.75 | 47.53 | 16.62 | 51.28 | 24.41 | 58.47 | 29.27 | 68.59 | 29.29 | 18.64 |
| 32 | 57.12 | 48.20 | 67.09 | 47.62 | | | 24.60 | 58.72 | | | 29.23 | 19.01 |
| | sec δ | tan δ | sec δ | tan δ | sec δ | tan δ | sec δ | tan δ | sec δ | tan δ | sec δ | tan δ |
| | 12.74 | 12.70 | 12.74 | 12.70 | 12.74 | 12.70 | 12.74 | 12.70 | 12.75 | 12.71 | 12.76 | 12.72 |

Mean R.A. ^h4 ^m31 ^s08.93

Double lower transit May 30

Mean Dec. +85° 29' 57.28"

APPARENT PLACES OF STARS, 1986
CIRCUMPOLAR STARS AT UPPER TRANSIT AT GREENWICH

1637 B.D. +85° 74 (Cephei) Mag. 6.54 Spect. A5

| Day | January | | February | | March | | April | | May | | June | |
|-----|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m 5 26 | + ° ' 85 55 | h m 5 26 | + ° ' 85 56 | h m 5 26 | + ° ' 85 56 | h m 5 26 | + ° ' 85 56 | h m 5 26 | + ° ' 85 55 | h m 5 26 | + ° ' 85 55 |
| | s 57.74 | " 54.73 | s 54.00 | " 03.56 | s 47.09 | " 07.94 | s 38.52 | " 07.30 | s 32.19 | " 61.96 | s 29.89 | " 53.45 |
| 1 | 57.66 | 55.07 | 53.81 | 03.74 | 46.84 | 07.97 | 38.30 | 07.23 | 32.02 | 61.76 | 29.86 | 53.13 |
| 2 | 57.58 | 55.38 | 53.64 | 03.91 | 46.61 | 08.00 | 38.06 | 07.16 | 31.84 | 61.55 | 29.85 | 52.80 |
| 3 | | | | | | | | | | | | |
| 4 | 57.50 | 55.66 | 53.49 | 04.11 | 46.38 | 08.05 | 37.80 | 07.09 | 31.64 | 61.32 | 29.86 | 52.46 |
| 5 | 57.45 | 55.93 | 53.34 | 04.32 | 46.16 | 08.13 | 37.52 | 07.01 | 31.46 | 61.05 | 29.89 | 52.11 |
| 6 | 57.42 | 56.19 | 53.18 | 04.56 | 45.91 | 08.22 | 37.22 | 06.91 | 31.28 | 60.77 | 29.94 | 51.77 |
| 7 | 57.41 | 56.46 | 53.00 | 04.82 | 45.64 | 08.32 | 36.92 | 06.78 | 31.13 | 60.47 | 30.02 | 51.45 |
| 8 | 57.41 | 56.76 | 52.78 | 05.07 | 45.34 | 08.41 | 36.62 | 06.62 | 30.99 | 60.16 | 30.10 | 51.14 |
| 9 | 57.40 | 57.09 | 52.53 | 05.32 | 45.02 | 08.48 | 36.34 | 06.44 | 30.88 | 59.85 | 30.20 | 50.84 |
| 10 | 57.37 | 57.44 | 52.26 | 05.55 | 44.68 | 08.53 | 36.07 | 06.24 | 30.80 | 59.55 | 30.29 | 50.57 |
| 11 | 57.31 | 57.81 | 51.97 | 05.75 | 44.34 | 08.55 | 35.83 | 06.03 | 30.72 | 59.25 | 30.37 | 50.31 |
| 12 | 57.22 | 58.17 | 51.68 | 05.92 | 44.00 | 08.54 | 35.60 | 05.82 | 30.66 | 58.97 | 30.45 | 50.06 |
| 13 | 57.09 | 58.52 | 51.39 | 06.06 | 43.67 | 08.51 | 35.40 | 05.62 | 30.61 | 58.71 | 30.51 | 49.81 |
| 14 | 56.94 | 58.85 | 51.12 | 06.19 | 43.37 | 08.46 | 35.21 | 05.43 | 30.55 | 58.46 | 30.56 | 49.56 |
| 15 | 56.78 | 59.15 | 50.86 | 06.30 | 43.08 | 08.41 | 35.02 | 05.25 | 30.48 | 58.22 | 30.60 | 49.29 |
| 16 | 56.62 | 59.42 | 50.61 | 06.41 | 42.80 | 08.36 | 34.84 | 05.08 | 30.40 | 57.99 | 30.65 | 48.99 |
| 17 | 56.46 | 59.68 | 50.38 | 06.53 | 42.55 | 08.31 | 34.65 | 04.93 | 30.31 | 57.75 | 30.71 | 48.67 |
| 18 | 56.32 | 59.93 | 50.15 | 06.65 | 42.30 | 08.27 | 34.45 | 04.78 | 30.20 | 57.50 | 30.79 | 48.33 |
| 19 | 56.18 | 60.16 | 49.93 | 06.78 | 42.05 | 08.24 | 34.23 | 04.63 | 30.10 | 57.23 | 30.91 | 47.99 |
| 20 | 56.06 | 60.40 | 49.71 | 06.93 | 41.80 | 08.23 | 34.00 | 04.48 | 29.99 | 56.93 | 31.07 | 47.65 |
| 21 | 55.94 | 60.65 | 49.47 | 07.09 | 41.53 | 08.23 | 33.75 | 04.30 | 29.91 | 56.60 | 31.26 | 47.33 |
| 22 | 55.84 | 60.91 | 49.22 | 07.26 | 41.25 | 08.23 | 33.51 | 04.09 | 29.86 | 56.25 | 31.46 | 47.05 |
| 23 | 55.72 | 61.18 | 48.94 | 07.43 | 40.95 | 08.23 | 33.28 | 03.85 | 29.85 | 55.90 | 31.65 | 46.81 |
| 24 | 55.60 | 61.47 | 48.64 | 07.58 | 40.63 | 08.20 | 33.07 | 03.58 | 29.88 | 55.57 | 31.83 | 46.58 |
| 25 | 55.47 | 61.77 | 48.32 | 07.71 | 40.31 | 08.15 | 32.90 | 03.30 | 29.93 | 55.26 | 31.97 | 46.37 |
| 26 | 55.30 | 62.08 | 47.99 | 07.81 | 39.98 | 08.06 | 32.77 | 03.02 | 29.98 | 54.99 | 32.10 | 46.14 |
| 27 | 55.12 | 62.38 | 47.67 | 07.88 | 39.67 | 07.94 | 32.66 | 02.76 | 30.01 | 54.74 | 32.20 | 45.90 |
| 28 | 54.90 | 62.67 | 47.37 | 07.92 | 39.39 | 07.80 | 32.56 | 02.53 | 30.02 | 54.51 | 32.31 | 45.64 |
| 29 | 54.67 | 62.94 | 47.09 | 07.94 | 39.14 | 07.65 | 32.46 | 02.33 | 30.01 | 54.27 | 32.42 | 45.35 |
| 30 | 54.44 | 63.17 | | | 38.92 | 07.52 | 32.34 | 02.14 | 29.98 | 54.02 | 32.54 | 45.05 |
| 31 | 54.21 | 63.38 | | | 38.72 | 07.40 | 32.19 | 01.96 | 29.93 | 53.75 | 32.69 | 44.74 |
| 32 | 54.00 | 63.56 | | | 38.52 | 07.30 | | | 29.89 | 53.45 | | |
| | sec δ 14.10 | tan δ 14.06 | sec δ 14.11 | tan δ 14.07 | sec δ 14.11 | tan δ 14.07 | sec δ 14.11 | tan δ 14.07 | sec δ 14.10 | tan δ 14.06 | sec δ 14.09 | tan δ 14.05 |

Mean R.A. 5^h 26^m 54.^s96

Double lower transit June 13

Mean Dec. +85° 55' 43".22

APPARENT PLACES OF STARS, 1986
CIRCUMPOLAR STARS AT UPPER TRANSIT AT GREENWICH

383

1637 B.D. +85° 74 (Cephei) Mag. 6.54 Spect. A5

| Day | July | | August | | September | | October | | November | | December | |
|-----|--------------------------------|-----------------------|--------------------------------|-----------------------|--------------------------------|-----------------------|--------------------------------|-----------------------|--------------------------------|-----------------------|--------------------------------|---------------------------|
| | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | ^h 5 ^m 26 | ⁺ 85 55 | ^h 5 ^m 26 | ⁺ 85 55 | ^h 5 ^m 26 | ⁺ 85 55 | ^h 5 ^m 27 | ⁺ 85 55 | ^h 5 ^m 27 | ⁺ 85 55 | ^h 5 ^m 27 | ⁺ 85 55 |
| | ^s | " | ^s | " | ^s | " | ^s | " | ^s | " | ^s | " |
| 1 | 32.69 | 44.74 | 40.16 | 37.68 | 50.66 | 34.35 | 01.69 | 35.26 | 11.94 | 40.28 | 19.01 | 48.37 |
| 2 | 32.85 | 44.43 | 40.50 | 37.50 | 51.03 | 34.36 | 02.01 | 35.39 | 12.22 | 40.46 | 19.24 | 48.64 |
| 3 | 33.04 | 44.12 | 40.83 | 37.34 | 51.38 | 34.37 | 02.32 | 35.49 | 12.52 | 40.63 | 19.47 | 48.95 |
| 4 | 33.25 | 43.82 | 41.17 | 37.21 | 51.71 | 34.38 | 02.63 | 35.58 | 12.86 | 40.81 | 19.69 | 49.29 |
| 5 | 33.48 | 43.55 | 41.49 | 37.09 | 52.02 | 34.37 | 02.96 | 35.65 | 13.21 | 41.03 | 19.88 | 49.66 |
| 6 | 33.71 | 43.29 | 41.79 | 36.98 | 52.34 | 34.35 | 03.32 | 35.71 | 13.56 | 41.28 | 20.04 | 50.05 |
| 7 | 33.94 | 43.05 | 42.08 | 36.88 | 52.67 | 34.30 | 03.70 | 35.77 | 13.89 | 41.56 | 20.16 | 50.43 |
| 8 | 34.17 | 42.84 | 42.36 | 36.76 | 53.01 | 34.24 | 04.11 | 35.85 | 14.20 | 41.86 | 20.25 | 50.80 |
| 9 | 34.38 | 42.63 | 42.63 | 36.63 | 53.39 | 34.17 | 04.53 | 35.97 | 14.47 | 42.17 | 20.32 | 51.14 |
| 10 | 34.58 | 42.43 | 42.90 | 36.48 | 53.79 | 34.12 | 04.94 | 36.12 | 14.71 | 42.48 | 20.39 | 51.46 |
| 11 | 34.77 | 42.23 | 43.19 | 36.31 | 54.22 | 34.09 | 05.34 | 36.30 | 14.93 | 42.78 | 20.45 | 51.76 |
| 12 | 34.94 | 42.01 | 43.50 | 36.12 | 54.65 | 34.09 | 05.71 | 36.49 | 15.13 | 43.05 | 20.53 | 52.04 |
| 13 | 35.12 | 41.78 | 43.84 | 35.94 | 55.08 | 34.12 | 06.05 | 36.70 | 15.33 | 43.30 | ^{20 62} 20.72 | ^{52 32} 52.61 |
| 14 | 35.30 | 41.52 | 44.21 | 35.77 | 55.49 | 34.19 | 06.37 | 36.90 | 15.54 | 43.54 | 20.83 | 52.90 |
| 15 | 35.51 | 41.25 | 44.61 | 35.63 | 55.88 | 34.27 | 06.66 | 37.08 | 15.76 | 43.76 | 20.94 | 53.21 |
| 16 | 35.74 | 40.97 | 45.01 | 35.52 | 56.24 | 34.35 | 06.95 | 37.24 | 16.00 | 43.99 | 21.05 | 53.54 |
| 17 | 36.01 | 40.69 | 45.41 | 35.45 | 56.57 | 34.42 | 07.24 | 37.38 | 16.24 | 44.22 | 21.16 | 53.88 |
| 18 | 36.31 | 40.42 | 45.78 | 35.40 | 56.89 | 34.47 | 07.54 | 37.51 | 16.50 | 44.47 | 21.25 | 54.24 |
| 19 | 36.63 | 40.19 | 46.13 | 35.36 | 57.21 | 34.50 | 07.86 | 37.64 | 16.76 | 44.74 | 21.32 | 54.61 |
| 20 | 36.95 | 39.99 | 46.45 | 35.31 | 57.53 | 34.51 | 08.19 | 37.76 | 17.02 | 45.02 | 21.36 | 54.99 |
| 21 | 37.26 | 39.83 | 46.75 | 35.26 | 57.87 | 34.52 | 08.54 | 37.90 | 17.27 | 45.33 | 21.38 | 55.36 |
| 22 | 37.54 | 39.68 | 47.04 | 35.17 | 58.24 | 34.52 | 08.90 | 38.06 | 17.50 | 45.66 | 21.38 | 55.73 |
| 23 | 37.80 | 39.54 | 47.34 | 35.07 | 58.61 | 34.53 | 09.26 | 38.23 | 17.72 | 45.99 | 21.37 | 56.07 |
| 24 | 38.03 | 39.38 | 47.65 | 34.96 | 59.01 | 34.55 | 09.62 | 38.43 | 17.91 | 46.34 | 21.35 | 56.39 |
| 25 | 38.25 | 39.20 | 47.98 | 34.83 | 59.41 | 34.59 | 09.97 | 38.65 | 18.07 | 46.67 | 21.33 | 56.69 |
| 26 | 38.47 | 39.00 | 48.34 | 34.71 | 59.82 | 34.66 | 10.30 | 38.89 | 18.22 | 47.00 | 21.33 | 56.97 |
| 27 | 38.71 | 38.78 | 48.71 | 34.60 | 60.22 | 34.75 | 10.61 | 39.14 | 18.36 | 47.31 | 21.35 | 57.24 |
| 28 | 38.96 | 38.55 | 49.09 | 34.51 | 60.61 | 34.86 | 10.90 | 39.40 | 18.50 | 47.60 | 21.40 | 57.52 |
| 29 | 39.23 | 38.32 | 49.49 | 34.44 | 60.99 | 34.99 | 11.17 | 39.65 | 18.64 | 47.86 | 21.46 | 57.82 |
| 30 | 39.52 | 38.09 | 49.89 | 34.39 | 61.35 | 35.12 | 11.43 | 39.88 | 18.82 | 48.11 | 21.53 | 58.16 |
| 31 | 39.83 | 37.88 | 50.28 | 34.36 | 61.69 | 35.26 | 11.68 | 40.09 | 19.01 | 48.37 | 21.58 | 58.52 |
| 32 | 40.16 | 37.68 | 50.66 | 34.35 | | | 11.94 | 40.28 | | | 21.60 | 58.91 |
| | sec δ | tan δ | sec δ | tan δ | sec δ | tan δ | sec δ | tan δ | sec δ | tan δ | sec δ | tan δ |
| | 14.08 | 14.05 | 14.08 | 14.04 | 14.08 | 14.04 | 14.08 | 14.04 | 14.09 | 14.05 | 14.09 | 14.06 |

Mean R.A. ^h 5 ^m 26 ^s 54.96

Double lower transit June 13

Mean Dec. +85° 55' 43.22"

APPARENT PLACES OF STARS, 1986
CIRCUMPOLAR STARS AT UPPER TRANSIT AT GREENWICH

1638 Groombridge 944 (Cephej) Mag. 6.41 Spect. K0

| Day | January | | February | | March | | April | | May | | June | |
|-----|-----------------------------------|---------------------|-----------------------------------|---------------------|-----------------------------------|---------------------|-----------------------------------|---------------------|-----------------------------------|---------------------|-----------------------------------|---------------------|
| | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | ^h ^m 5 57 | + ° ' " 85 11 | ^h ^m 5 57 | + ° ' " 85 11 | ^h ^m 5 56 | + ° ' " 85 11 | ^h ^m 5 56 | + ° ' " 85 11 | ^h ^m 5 56 | + ° ' " 85 11 | ^h ^m 5 56 | + ° ' " 85 10 |
| | ^s 07.78 | " 05.66 | ^s 05.64 | " 14.92 | ^s 60.36 | " 20.23 | ^s 53.15 | " 20.82 | ^s 47.31 | " 16.47 | ^s 44.52 | " 68.45 |
| 1 | 07.75 | 06.00 | 05.50 | 15.12 | 60.16 | 20.28 | 52.97 | 20.78 | 47.15 | 16.30 | 44.46 | 68.15 |
| 2 | 07.71 | 06.32 | 05.39 | 15.32 | 59.97 | 20.35 | 52.76 | 20.75 | 46.98 | 16.12 | 44.42 | 67.82 |
| 3 | 07.68 | 06.61 | 05.28 | 15.53 | 59.79 | 20.44 | 52.54 | 20.72 | 46.79 | 15.91 | 44.39 | 67.48 |
| 4 | 07.66 | 06.88 | 05.19 | 15.77 | 59.61 | 20.55 | 52.29 | 20.68 | 46.61 | 15.68 | 44.38 | 67.14 |
| 5 | 07.67 | 07.14 | 05.08 | 16.03 | 59.42 | 20.67 | 52.03 | 20.62 | 46.43 | 15.43 | 44.39 | 66.80 |
| 6 | 07.69 | 07.42 | 04.95 | 16.31 | 59.20 | 20.81 | 51.76 | 20.53 | 46.27 | 15.16 | 44.42 | 66.47 |
| 7 | 07.73 | 07.72 | 04.80 | 16.59 | 58.96 | 20.94 | 51.50 | 20.42 | 46.13 | 14.87 | 44.46 | 66.16 |
| 8 | 07.76 | 08.04 | 04.62 | 16.87 | 58.70 | 21.06 | 51.24 | 20.28 | 46.00 | 14.58 | 44.51 | 65.86 |
| 9 | 07.78 | 08.40 | 04.41 | 17.13 | 58.42 | 21.15 | 51.00 | 20.12 | 45.90 | 14.29 | 44.56 | 65.58 |
| 10 | 07.77 | 08.77 | 04.19 | 17.37 | 58.14 | 21.22 | 50.77 | 19.95 | 45.81 | 14.01 | 44.61 | 65.32 |
| 11 | 07.73 | 09.14 | 03.97 | 17.58 | 57.85 | 21.26 | 50.56 | 19.77 | 45.73 | 13.75 | 44.65 | 65.06 |
| 12 | 07.66 | 09.50 | 03.74 | 17.76 | 57.58 | 21.27 | 50.37 | 19.60 | 45.66 | 13.50 | 44.67 | 64.81 |
| 13 | 07.57 | 09.85 | 03.53 | 17.92 | 57.31 | 21.27 | 50.19 | 19.44 | 45.58 | 13.27 | 44.69 | 64.56 |
| 14 | 07.47 | 10.16 | 03.32 | 18.07 | 57.07 | 21.26 | 50.02 | 19.29 | 45.50 | 13.04 | 44.69 | 64.28 |
| 15 | 07.37 | 10.46 | 03.13 | 18.22 | 56.83 | 21.24 | 49.85 | 19.15 | 45.41 | 12.83 | 44.70 | 63.99 |
| 16 | 07.26 | 10.74 | 02.95 | 18.36 | 56.61 | 21.23 | 49.67 | 19.03 | 45.31 | 12.61 | 44.71 | 63.67 |
| 17 | 07.17 | 11.00 | 02.78 | 18.51 | 56.40 | 21.23 | 49.49 | 18.92 | 45.20 | 12.38 | 44.75 | 63.32 |
| 18 | 07.08 | 11.25 | 02.61 | 18.68 | 56.20 | 21.24 | 49.29 | 18.80 | 45.08 | 12.13 | 44.82 | 62.96 |
| 19 | 07.01 | 11.50 | 02.44 | 18.86 | 55.99 | 21.27 | 49.08 | 18.68 | 44.96 | 11.84 | 44.92 | 62.61 |
| 20 | 06.94 | 11.76 | 02.26 | 19.05 | 55.77 | 21.30 | 48.86 | 18.54 | 44.85 | 11.53 | 45.04 | 62.28 |
| 21 | 06.88 | 12.04 | 02.07 | 19.26 | 55.53 | 21.34 | 48.63 | 18.37 | 44.78 | 11.20 | 45.19 | 61.98 |
| 22 | 06.82 | 12.32 | 01.85 | 19.46 | 55.28 | 21.38 | 48.41 | 18.16 | 44.74 | 10.86 | 45.33 | 61.71 |
| 23 | 06.75 | 12.63 | 01.62 | 19.66 | 55.01 | 21.40 | 48.21 | 17.93 | 44.73 | 10.53 | 45.45 | 61.47 |
| 24 | 06.67 | 12.95 | 01.36 | 19.83 | 54.73 | 21.40 | 48.04 | 17.67 | 44.74 | 10.22 | 45.55 | 61.24 |
| 25 | 06.57 | 13.28 | 01.10 | 19.97 | 54.45 | 21.36 | 47.90 | 17.42 | 44.75 | 09.95 | 45.63 | 61.01 |
| 26 | 06.45 | 13.60 | 00.84 | 20.08 | 54.18 | 21.28 | 47.79 | 17.19 | 44.76 | 09.71 | 45.69 | 60.75 |
| 27 | 06.30 | 13.92 | 00.59 | 20.16 | 53.93 | 21.18 | 47.69 | 16.98 | 44.74 | 09.48 | 45.75 | 60.48 |
| 28 | 06.14 | 14.21 | 00.36 | 20.23 | 53.71 | 21.07 | 47.58 | 16.79 | 44.71 | 09.25 | 45.81 | 60.18 |
| 29 | 05.97 | 14.47 | | | 53.51 | 20.97 | 47.46 | 16.63 | 44.65 | 09.00 | 45.89 | 59.87 |
| 30 | | | | | | | | | | | | |
| 31 | 05.80 | 14.71 | | | 53.33 | 20.88 | 47.31 | 16.47 | 44.59 | 08.74 | 45.98 | 59.55 |
| 32 | 05.64 | 14.92 | | | 53.15 | 20.82 | | | 44.52 | 08.45 | | |
| | sec δ 11.92 | tan δ 11.87 | sec δ 11.92 | tan δ 11.88 | sec δ 11.92 | tan δ 11.88 | sec δ 11.92 | tan δ 11.88 | sec δ 11.92 | tan δ 11.88 | sec δ 11.91 | tan δ 11.87 |

Mean R.A. ^h 5 ^m 57 ^s 04.57

Double lower transit June 21

Mean Dec. +85° 10' 54.98"

APPARENT PLACES OF STARS, 1986
CIRCUMPOLAR STARS AT UPPER TRANSIT AT GREENWICH

385

1638 Groombridge 944 (Cephei) Mag. 6.41 Spect. K0

| Day | July | | August | | September | | October | | November | | December | |
|-----|-----------------------------------|---|-----------------------------------|---|-----------------------------------|---|-----------------------------------|---|-----------------------------------|---|-----------------------------------|---|
| | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | ^h ^m 5 56 | ⁺ ^o / 85 10 | ^h ^m 5 56 | ⁺ ^o / 85 10 | ^h ^m 5 57 | ⁺ ^o / 85 10 | ^h ^m 5 57 | ⁺ ^o / 85 10 | ^h ^m 5 57 | ⁺ ^o / 85 10 | ^h ^m 5 57 | ⁺ ^o / 85 10 |
| | ^s 45.98 | ^s 59.55 | ^s 51.53 | ^s 51.62 | ^s 00.01 | ^s 46.95 | ^s 09.37 | ^s 46.35 | ^s 18.53 | ^s 49.91 | ^s 25.38 | ^s 56.94 |
| 1 | 46.09 | 59.22 | 51.80 | 51.40 | 00.32 | 46.90 | 09.65 | 46.43 | 18.79 | 50.05 | 25.59 | 57.18 |
| 2 | 46.21 | 58.89 | 52.06 | 51.20 | 00.61 | 46.87 | 09.93 | 46.49 | 19.06 | 50.17 | 25.83 | 57.46 |
| 3 | 46.36 | 58.57 | 52.33 | 51.03 | 00.89 | 46.83 | 10.20 | 46.54 | 19.37 | 50.31 | 26.05 | 57.77 |
| 4 | 46.52 | 58.27 | 52.59 | 50.87 | 01.16 | 46.78 | 10.48 | 46.56 | 19.69 | 50.48 | 26.26 | 58.11 |
| 5 | 46.69 | 57.99 | 52.83 | 50.72 | 01.42 | 46.71 | 10.79 | 46.56 | 20.01 | 50.68 | 26.43 | 58.47 |
| 6 | 46.86 | 57.73 | 53.06 | 50.58 | 01.69 | 46.62 | 11.12 | 46.57 | 20.32 | 50.91 | 26.57 | 58.83 |
| 7 | 47.03 | 57.48 | 53.28 | 50.43 | 01.97 | 46.51 | 11.47 | 46.60 | 20.61 | 51.17 | 26.69 | 59.18 |
| 8 | 47.19 | 57.25 | 53.49 | 50.26 | 02.28 | 46.40 | 11.84 | 46.66 | 20.88 | 51.44 | 26.79 | 59.51 |
| 9 | 47.34 | 57.03 | 53.71 | 50.07 | 02.61 | 46.29 | 12.20 | 46.75 | 21.11 | 51.71 | 26.88 | 59.81 |
| 10 | 47.47 | 56.81 | 53.93 | 49.87 | 02.97 | 46.20 | 12.56 | 46.88 | 21.32 | 51.97 | 26.96 | 60.10 |
| 11 | 47.60 | 56.57 | 54.17 | 49.64 | 03.34 | 46.14 | 12.89 | 47.02 | 21.52 | 52.21 | 27.06 | 60.37 |
| 12 | 47.72 | 56.32 | 54.44 | 49.42 | 03.70 | 46.12 | 13.20 | 47.18 | 21.72 | 52.44 | 27.17 | 60.64 |
| 13 | 47.84 | 56.04 | 54.74 | 49.20 | 04.06 | 46.13 | 13.49 | 47.33 | 21.92 | 52.64 | 27.28 | 60.90 |
| 14 | 47.99 | 55.75 | 55.06 | 49.01 | 04.39 | 46.16 | 13.75 | 47.47 | 22.13 | 52.83 | 27.41 | 61.18 |
| 15 | 48.15 | 55.44 | 55.39 | 48.85 | 04.70 | 46.19 | 14.01 | 47.59 | 22.35 | 53.02 | 27.54 | 61.47 |
| 16 | 48.35 | 55.13 | 55.71 | 48.72 | 04.98 | 46.21 | 14.27 | 47.69 | 22.59 | 53.22 | 27.67 | 61.78 |
| 17 | 48.58 | 54.83 | 56.02 | 48.63 | 05.26 | 46.22 | 14.53 | 47.78 | 22.83 | 53.43 | 27.80 | 62.10 |
| 18 | 48.82 | 54.56 | 56.31 | 48.54 | 05.52 | 46.21 | 14.81 | 47.85 | 23.08 | 53.66 | 27.91 | 62.45 |
| 19 | 49.07 | 54.32 | 56.57 | 48.46 | 05.80 | 46.17 | 15.11 | 47.93 | 23.33 | 53.91 | 28.01 | 62.81 |
| 20 | 49.32 | 54.12 | 56.82 | 48.36 | 06.09 | 46.13 | 15.42 | 48.02 | 23.58 | 54.18 | ^{28 09} 28 15 | ^{63 18} 63 54 |
| 21 | 49.54 | 53.94 | 57.05 | 48.24 | 06.39 | 46.08 | 15.74 | 48.13 | 23.81 | 54.47 | 28.19 | 63.90 |
| 22 | 49.74 | 53.77 | 57.29 | 48.10 | 06.71 | 46.04 | 16.06 | 48.25 | 24.02 | 54.77 | 28.22 | 64.24 |
| 23 | 49.92 | 53.58 | 57.54 | 47.94 | 07.05 | 46.01 | 16.38 | 48.40 | 24.22 | 55.09 | 28.23 | 64.56 |
| 24 | 50.09 | 53.38 | 57.81 | 47.77 | 07.39 | 46.00 | 16.70 | 48.58 | 24.40 | 55.40 | 28.25 | 64.86 |
| 25 | 50.25 | 53.15 | 58.09 | 47.61 | 07.74 | 46.01 | 17.01 | 48.77 | 24.56 | 55.70 | 28.28 | 65.14 |
| 26 | 50.42 | 52.90 | 58.39 | 47.45 | 08.09 | 46.05 | 17.30 | 48.97 | 24.71 | 55.99 | 28.33 | 65.40 |
| 27 | 50.61 | 52.64 | 58.71 | 47.31 | 08.43 | 46.10 | 17.57 | 49.18 | 24.85 | 56.25 | 28.41 | 65.67 |
| 28 | 50.81 | 52.37 | 59.03 | 47.18 | 08.76 | 46.18 | 17.82 | 49.39 | 25.01 | 56.49 | 28.50 | 65.96 |
| 29 | 51.04 | 52.11 | 59.36 | 47.08 | 09.07 | 46.26 | 18.06 | 49.59 | 25.18 | 56.72 | 28.59 | 66.29 |
| 30 | 51.28 | 51.86 | 59.69 | 47.00 | 09.37 | 46.35 | 18.30 | 49.76 | 25.38 | 56.94 | 28.68 | 66.64 |
| 31 | 51.53 | 51.62 | 60.01 | 46.95 | | | 18.53 | 49.91 | | | 28.74 | 67.03 |
| 32 | | | | | | | | | | | | |
| | sec δ 11.91 | tan δ 11.86 | sec δ 11.90 | tan δ 11.86 | sec δ 11.90 | tan δ 11.86 | sec δ 11.90 | tan δ 11.86 | sec δ 11.90 | tan δ 11.86 | sec δ 11.91 | tan δ 11.87 |

Mean R.A. ^h ^m ^s
5 57 04.57

Double lower transit June 21

Mean Dec. ^o ['] ^{''}
+85 10 54.98

APPARENT PLACES OF STARS, 1986
CIRCUMPOLAR STARS AT UPPER TRANSIT AT GREENWICH

909 51 H. Cephei Mag. 5.26 Spect. M0

| Day | January | | February | | March | | April | | May | | June | |
|-----|---|---|-----------------------------------|---|-----------------------------------|---|-----------------------------------|---|-----------------------------------|---|-----------------------------------|---|
| | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | ^h ^m 7 34 | ⁺ ^o / 87 03 | ^h ^m 7 34 | ⁺ ^o / 87 03 | ^h ^m 7 34 | ⁺ ^o / 87 03 | ^h ^m 7 34 | ⁺ ^o / 87 03 | ^h ^m 7 34 | ⁺ ^o / 87 03 | ^h ^m 7 34 | ⁺ ^o / 87 03 |
| | ^s 44.17 | " 11.30 | ^s 46.15 | " 21.46 | ^s 41.13 | " 29.21 | ^s 30.61 | " 33.61 | ^s 19.38 | " 32.73 | ^s 10.61 | " 26.91 |
| 1 | 44.17 | 11.30 | 46.15 | 21.46 | 41.13 | 29.21 | 30.61 | 33.61 | 19.38 | 32.73 | 10.61 | 26.91 |
| 2 | 44.34 | 11.65 | 46.06 | 21.72 | 40.85 | 29.37 | 30.30 | 33.67 | 19.04 | 32.67 | 10.35 | 26.66 |
| 3 | 44.49 | 11.98 | 45.99 | 21.97 | 40.61 | 29.54 | 29.98 | 33.76 | 18.67 | 32.59 | 10.10 | 26.38 |
| 4 | 44.60 | 12.29 | 45.95 | 22.23 | 40.39 | 29.72 | 29.62 | 33.85 | 18.27 | 32.49 | 09.86 | 26.09 |
| 5 | 44.72 | 12.58 | 45.93 | 22.51 | 40.17 | 29.93 | 29.22 | 33.94 | 17.87 | 32.38 | 09.66 | 25.78 |
| 6 | 44.84 | 12.84 | 45.90 | 22.82 | 39.94 | 30.15 | 28.80 | 34.02 | 17.47 | 32.23 | 09.49 | 25.47 |
| 7 | 44.99 | 13.09 | 45.86 | 23.15 | 39.69 | 30.40 | 28.35 | 34.08 | 17.07 | 32.06 | 09.34 | 25.16 |
| 8 | 45.18 | 13.34 | 45.79 | 23.50 | 39.40 | 30.65 | 27.89 | 34.11 | 16.70 | 31.88 | 09.22 | 24.86 |
| 9 | 45.39 | 13.61 | 45.66 | 23.86 | 39.07 | 30.89 | 27.43 | 34.11 | 16.35 | 31.68 | 09.12 | 24.57 |
| 10 | 45.61 | 13.91 | 45.50 | 24.20 | 38.70 | 31.12 | 26.98 | 34.09 | 16.03 | 31.47 | 09.03 | 24.29 |
| 11 | 45.82 | 14.24 | 45.30 | 24.53 | 38.32 | 31.33 | 26.55 | 34.06 | 15.74 | 31.27 | 08.95 | 24.03 |
| 12 | 46.00 | 14.59 | 45.08 | 24.84 | 37.91 | 31.51 | 26.14 | 34.01 | 15.47 | 31.08 | 08.85 | 23.78 |
| 13 | 46.14 | 14.96 | 44.85 | 25.13 | 37.51 | 31.66 | 25.75 | 33.95 | 15.21 | 30.89 | 08.74 | 23.54 |
| 14 | ^{46.24} ^{46.29} 46.31 | ^{15.34} ^{15.70} 16.05 | 44.61 | 25.39 | 37.12 | 31.80 | 25.39 | 33.90 | 14.97 | 30.72 | 08.62 | 23.30 |
| 15 | 46.31 | 16.05 | 44.39 | 25.64 | 36.74 | 31.91 | 25.05 | 33.86 | 14.72 | 30.56 | 08.47 | 23.04 |
| 16 | 46.32 | 16.38 | 44.18 | 25.87 | 36.39 | 32.03 | 24.71 | 33.83 | 14.45 | 30.42 | 08.31 | 22.77 |
| 17 | 46.31 | 16.69 | 43.99 | 26.11 | 36.05 | 32.14 | 24.38 | 33.81 | 14.17 | 30.27 | 08.15 | 22.46 |
| 18 | 46.32 | 16.98 | 43.81 | 26.35 | 35.73 | 32.25 | 24.04 | 33.81 | 13.87 | 30.12 | 08.02 | 22.13 |
| 19 | 46.33 | 17.26 | 43.65 | 26.59 | 35.43 | 32.38 | 23.68 | 33.81 | 13.55 | 29.95 | 07.91 | 21.77 |
| 20 | 46.35 | 17.54 | 43.49 | 26.86 | 35.12 | 32.52 | 23.29 | 33.81 | 13.21 | 29.75 | 07.86 | 21.40 |
| 21 | 46.39 | 17.83 | 43.33 | 27.13 | 34.81 | 32.67 | 22.87 | 33.79 | 12.89 | 29.51 | 07.86 | 21.04 |
| 22 | 46.45 | 18.12 | 43.14 | 27.43 | 34.48 | 32.83 | 22.44 | 33.75 | 12.59 | 29.25 | 07.90 | 20.70 |
| 23 | 46.51 | 18.42 | 42.93 | 27.73 | 34.12 | 33.00 | 21.99 | 33.67 | 12.33 | 28.96 | 07.94 | 20.39 |
| 24 | 46.57 | 18.75 | 42.69 | 28.03 | 33.72 | 33.16 | 21.57 | 33.56 | 12.13 | 28.67 | 07.98 | 20.12 |
| 25 | 46.62 | 19.09 | 42.40 | 28.32 | 33.30 | 33.29 | 21.17 | 33.42 | 11.97 | 28.40 | 08.00 | 19.86 |
| 26 | 46.64 | 19.46 | 42.09 | 28.59 | 32.85 | 33.40 | 20.82 | 33.26 | 11.83 | 28.15 | 07.97 | 19.60 |
| 27 | 46.63 | 19.83 | 41.76 | 28.83 | 32.41 | 33.47 | 20.52 | 33.11 | 11.69 | 27.93 | 07.92 | 19.34 |
| 28 | 46.58 | 20.19 | 41.43 | 29.03 | 31.99 | 33.51 | 20.24 | 32.98 | 11.53 | 27.73 | 07.85 | 19.06 |
| 29 | 46.50 | 20.55 | 41.13 | 29.21 | 31.60 | 33.53 | 19.97 | 32.88 | 11.34 | 27.54 | 07.78 | 18.75 |
| 30 | 46.39 | 20.88 | | | 31.24 | 33.54 | 19.68 | 32.80 | 11.11 | 27.35 | 07.71 | 18.43 |
| 31 | 46.27 | 21.18 | | | 30.92 | 33.56 | 19.38 | 32.73 | 10.87 | 27.14 | 07.66 | 18.08 |
| 32 | 46.15 | 21.46 | | | 30.61 | 33.61 | | | 10.61 | 26.91 | | |
| | sec δ 19.46 | tan δ 19.44 | sec δ 19.48 | tan δ 19.45 | sec δ 19.49 | tan δ 19.46 | sec δ 19.49 | tan δ 19.47 | sec δ 19.49 | tan δ 19.46 | sec δ 19.47 | tan δ 19.45 |

Mean R.A. ^h 7 ^m 34 ^s 32.75

Double lower transit July 15

Mean Dec. +87° 03' 04.57"

APPARENT PLACES OF STARS, 1986
CIRCUMPOLAR STARS AT UPPER TRANSIT AT GREENWICH

387

909 51 H. Cephei Mag. 5.26 Spect. M0

| Day | July | | August | | September | | October | | November | | December | |
|-----|-------|----------|--------|----------|-----------|----------|---------|----------|----------|----------|----------|----------|
| | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | + ° ' | h m | + ° ' | h m | + ° ' | h m | + ° ' | h m | + ° ' | h m | + ° ' |
| | 7 34 | 87 03 | 7 34 | 87 02 | 7 34 | 87 02 | 7 34 | 87 02 | 7 34 | 87 02 | 7 35 | 87 02 |
| | s | " | s | " | s | " | s | " | s | " | s | " |
| 1 | 07.66 | 18.08 | 11.36 | 68.03 | 21.24 | 59.45 | 34.72 | 54.15 | 50.22 | 52.79 | 04.16 | 55.90 |
| 2 | 07.64 | 17.72 | 11.63 | 67.70 | 21.67 | 59.26 | 35.18 | 54.07 | 50.67 | 52.79 | 04.62 | 56.02 |
| 3 | 07.64 | 17.36 | 11.91 | 67.39 | 22.08 | 59.08 | 35.62 | 53.99 | 51.15 | 52.76 | 05.10 | 56.16 |
| 4 | 07.68 | 17.00 | 12.20 | 67.10 | 22.46 | 58.90 | 36.05 | 53.88 | 51.68 | 52.74 | 05.60 | 56.35 |
| 5 | 07.75 | 16.65 | 12.49 | 66.83 | 22.83 | 58.71 | 36.48 | 53.75 | 52.24 | 52.74 | 06.09 | 56.57 |
| 6 | 07.83 | 16.31 | 12.76 | 66.57 | 23.18 | 58.51 | 36.94 | 53.61 | 52.82 | 52.77 | 06.54 | 56.82 |
| 7 | 07.93 | 15.99 | 13.02 | 66.32 | 23.53 | 58.28 | 37.44 | 53.45 | 53.41 | 52.83 | 06.94 | 57.08 |
| 8 | 08.04 | 15.68 | 13.26 | 66.06 | 23.89 | 58.04 | 37.98 | 53.30 | 53.97 | 52.93 | 07.30 | 57.35 |
| 9 | 08.14 | 15.40 | 13.48 | 65.80 | 24.29 | 57.77 | 38.55 | 53.17 | 54.51 | 53.05 | 07.62 | 57.60 |
| 10 | 08.23 | 15.12 | 13.69 | 65.52 | 24.72 | 57.51 | 39.14 | 53.08 | 55.00 | 53.19 | 07.92 | 57.84 |
| 11 | 08.30 | 14.84 | 13.90 | 65.21 | 25.20 | 57.25 | 39.73 | 53.02 | 55.46 | 53.32 | 08.21 | 58.06 |
| 12 | 08.35 | 14.56 | 14.14 | 64.88 | 25.71 | 57.02 | 40.30 | 52.99 | 55.89 | 53.44 | 08.50 | 58.26 |
| 13 | 08.39 | 14.27 | 14.42 | 64.53 | 26.23 | 56.82 | 40.83 | 52.98 | 56.30 | 53.54 | 08.80 | 58.46 |
| 14 | 08.42 | 13.95 | 14.73 | 64.19 | 26.75 | 56.65 | 41.33 | 52.97 | 56.71 | 53.62 | 09.12 | 58.65 |
| 15 | 08.47 | 13.60 | 15.09 | 63.85 | 27.26 | 56.51 | 41.80 | 52.96 | 57.12 | 53.70 | 09.45 | 58.85 |
| 16 | 08.54 | 13.23 | 15.49 | 63.55 | 27.72 | 56.38 | 42.25 | 52.94 | 57.56 | 53.76 | 09.81 | 59.06 |
| 17 | 08.66 | 12.85 | 15.89 | 63.27 | 28.16 | 56.25 | 42.69 | 52.89 | 58.02 | 53.83 | 10.17 | 59.28 |
| 18 | 08.82 | 12.46 | 16.29 | 63.03 | 28.57 | 56.12 | 43.14 | 52.83 | 58.49 | 53.90 | 10.53 | 59.53 |
| 19 | 09.03 | 12.10 | 16.66 | 62.81 | 28.96 | 55.96 | 43.59 | 52.76 | 58.99 | 53.99 | 10.88 | 59.80 |
| 20 | 09.27 | 11.76 | 17.00 | 62.60 | 29.35 | 55.79 | 44.08 | 52.69 | 59.49 | 54.10 | 11.22 | 60.09 |
| 21 | 09.51 | 11.46 | 17.30 | 62.38 | 29.75 | 55.60 | 44.58 | 52.62 | 60.00 | 54.24 | 11.54 | 60.39 |
| 22 | 09.73 | 11.19 | 17.59 | 62.14 | 30.18 | 55.40 | 45.11 | 52.56 | 60.49 | 54.39 | 11.82 | 60.71 |
| 23 | 09.92 | 10.92 | 17.86 | 61.88 | 30.63 | 55.20 | 45.66 | 52.51 | 60.98 | 54.57 | 12.07 | 61.02 |
| 24 | 10.07 | 10.66 | 18.15 | 61.61 | 31.11 | 55.00 | 46.22 | 52.49 | 61.43 | 54.76 | 12.30 | 61.32 |
| 25 | 10.20 | 10.39 | 18.45 | 61.32 | 31.61 | 54.82 | 46.78 | 52.49 | 61.87 | 54.96 | 12.50 | 61.61 |
| 26 | 10.32 | 10.09 | 18.78 | 61.02 | 32.13 | 54.66 | 47.33 | 52.52 | 62.27 | 55.16 | 12.69 | 61.88 |
| 27 | 10.44 | 09.77 | 19.14 | 60.72 | 32.66 | 54.51 | 47.87 | 52.56 | 62.65 | 55.35 | 12.89 | 62.12 |
| 28 | 10.57 | 09.44 | 19.52 | 60.43 | 33.20 | 54.40 | 48.39 | 52.62 | 63.01 | 55.51 | 13.11 | 62.34 |
| 29 | 10.72 | 09.09 | 19.93 | 60.16 | 33.73 | 54.30 | 48.88 | 52.68 | 63.37 | 55.66 | 13.36 | 62.57 |
| 30 | 10.91 | 08.73 | 20.36 | 59.90 | 34.24 | 54.22 | 49.34 | 52.74 | 63.75 | 55.78 | 13.65 | 62.80 |
| 31 | 11.12 | 08.38 | 20.80 | 59.67 | 34.72 | 54.15 | 49.78 | 52.78 | 64.16 | 55.90 | 13.96 | 63.06 |
| 32 | 11.36 | 08.03 | 21.24 | 59.45 | | | 50.22 | 52.79 | | | 14.28 | 63.36 |
| | sec δ | tan δ | sec δ | tan δ | sec δ | tan δ | sec δ | tan δ | sec δ | tan δ | sec δ | tan δ |
| | 19.46 | 19.43 | 19.44 | 19.41 | 19.42 | 19.40 | 19.42 | 19.39 | 19.42 | 19.39 | 19.43 | 19.40 |

Mean R.A. $7^{\text{h}} 34^{\text{m}} 32.75^{\text{s}}$

Double lower transit July 15

Mean Dec. $+87^{\circ} 03' 04.57''$

APPARENT PLACES OF STARS, 1986
CIRCUMPOLAR STARS AT UPPER TRANSIT AT GREENWICH

1639 Groombridge 1359 (Cameopardi) Mag. 6.39 Spect. A0

| Day | January | | February | | March | | April | | May | | June | |
|-----|----------------|-------------------|---------------|-------------------|---------------|-------------------|---------------|-------------------|---------------|-------------------|---------------|-------------------|
| | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m 8 13 | + ° / 84 06 | h m 8 13 | + ° / 84 06 | h m 8 13 | + ° / 84 06 | h m 8 13 | + ° / 84 06 | h m 8 13 | + ° / 84 06 | h m 8 13 | + ° / 84 06 |
| | s | " | s | " | s | " | s | " | s | " | s | " |
| 1 | 53.14 | 03.32 | 55.42 | 12.85 | 53.93 | 21.02 | 49.35 | 26.72 | 43.83 | 27.45 | 39.00 | 23.10 |
| 2 | 53.27 | 03.62 | 55.41 | 13.11 | 53.82 | 21.22 | 49.22 | 26.83 | 43.66 | 27.44 | 38.84 | 22.89 |
| 3 | 53.38 | 03.93 | 55.41 | 13.37 | 53.72 | 21.42 | 49.07 | 26.96 | 43.47 | 27.42 | 38.69 | 22.66 |
| 4 | 53.48 | 04.21 | 55.43 | 13.62 | 53.64 | 21.62 | 48.90 | 27.10 | 43.27 | 27.38 | 38.55 | 22.41 |
| 5 | 53.57 | 04.47 | 55.46 | 13.90 | 53.56 | 21.85 | 48.72 | 27.24 | 43.06 | 27.32 | 38.42 | 22.15 |
| 6 | 53.66 | 04.70 | 55.49 | 14.20 | 53.48 | 22.10 | 48.52 | 27.38 | 42.84 | 27.24 | 38.30 | 21.87 |
| 7 | 53.77 | 04.92 | 55.52 | 14.53 | 53.39 | 22.37 | 48.31 | 27.49 | 42.63 | 27.13 | 38.20 | 21.59 |
| 8 | 53.90 | 05.14 | 55.52 | 14.88 | 53.28 | 22.66 | 48.08 | 27.59 | 42.43 | 27.00 | 38.12 | 21.32 |
| 9 | 54.05 | 05.37 | 55.50 | 15.24 | 53.14 | 22.94 | 47.86 | 27.65 | 42.24 | 26.86 | 38.04 | 21.06 |
| 10 | 54.20 | 05.63 | 55.46 | 15.60 | 52.99 | 23.21 | 47.63 | 27.69 | 42.07 | 26.70 | 37.98 | 20.81 |
| 11 | 54.35 | 05.92 | 55.40 | 15.94 | 52.82 | 23.46 | 47.42 | 27.72 | 41.91 | 26.55 | 37.91 | 20.57 |
| 12 | 54.49 | 06.24 | 55.33 | 16.27 | 52.64 | 23.69 | 47.22 | 27.73 | 41.76 | 26.40 | 37.84 | 20.35 |
| 13 | 54.60 | 06.58 | 55.25 | 16.57 | 52.46 | 23.89 | 47.03 | 27.73 | 41.62 | 26.26 | 37.77 | 20.14 |
| 14 | 54.69 | 06.93 | 55.16 | 16.86 | 52.29 | 24.07 | 46.85 | 27.73 | 41.49 | 26.13 | 37.68 | 19.92 |
| 15 | 54.76 | 07.27 | 55.08 | 17.13 | 52.12 | 24.24 | 46.68 | 27.74 | 41.35 | 26.02 | 37.58 | 19.70 |
| 16 | 54.82 | 07.61 | 55.01 | 17.38 | 51.96 | 24.39 | 46.52 | 27.76 | 41.21 | 25.92 | 37.47 | 19.46 |
| 17 | 54.86 | 07.92 | 54.95 | 17.64 | 51.81 | 24.55 | 46.36 | 27.79 | 41.06 | 25.82 | 37.36 | 19.18 |
| 18 | 54.89 | 08.22 | 54.90 | 17.89 | 51.67 | 24.70 | 46.19 | 27.83 | 40.89 | 25.71 | 37.26 | 18.88 |
| 19 | 54.93 | 08.50 | 54.85 | 18.15 | 51.54 | 24.87 | 46.02 | 27.89 | 40.71 | 25.59 | 37.18 | 18.55 |
| 20 | 54.97 | 08.77 | 54.81 | 18.43 | 51.41 | 25.05 | 45.83 | 27.94 | 40.53 | 25.45 | 37.12 | 18.20 |
| 21 | 55.02 | 09.04 | 54.76 | 18.72 | 51.28 | 25.24 | 45.62 | 27.98 | 40.34 | 25.27 | 37.09 | 17.86 |
| 22 | 55.08 | 09.30 | 54.71 | 19.03 | 51.14 | 25.44 | 45.40 | 28.00 | 40.17 | 25.05 | 37.08 | 17.53 |
| 23 | 55.15 | 09.58 | 54.64 | 19.36 | 50.98 | 25.66 | 45.18 | 27.99 | 40.02 | 24.81 | 37.08 | 17.24 |
| 24 | 55.22 55.30 | 09.87 10.18 | 54.56 | 19.68 | 50.80 | 25.86 | 44.96 | 27.93 | 39.90 | 24.56 | 37.07 | 16.97 |
| 25 | 55.37 | 10.50 | 54.45 | 20.00 | 50.61 | 26.05 | 44.75 | 27.85 | 39.80 | 24.32 | 37.06 | 16.72 |
| 26 | 55.43 | 10.85 | 54.32 | 20.30 | 50.40 | 26.22 | 44.57 | 27.75 | 39.71 | 24.11 | 37.02 | 16.48 |
| 27 | 55.47 | 11.21 | 54.19 | 20.57 | 50.19 | 26.34 | 44.41 | 27.65 | 39.63 | 23.92 | 36.97 | 16.24 |
| 28 | 55.48 | 11.57 | 54.05 | 20.81 | 49.99 | 26.43 | 44.27 | 27.57 | 39.53 | 23.76 | 36.90 | 15.98 |
| 29 | 55.48 | 11.93 | 53.93 | 21.02 | 49.81 | 26.50 | 44.13 | 27.51 | 39.42 | 23.61 | 36.83 | 15.69 |
| 30 | 55.47 | 12.26 | | | 49.64 | 26.57 | 43.99 | 27.47 | 39.29 | 23.45 | 36.77 | 15.39 |
| 31 | 55.44 | 12.57 | | | 49.49 | 26.63 | 43.83 | 27.45 | 39.15 | 23.29 | 36.71 | 15.07 |
| 32 | 55.42 | 12.85 | | | 49.35 | 26.72 | | | 39.00 | 23.10 | | |
| | sec δ 9.73 | tan δ 9.68 | sec δ 9.74 | tan δ 9.68 | sec δ 9.74 | tan δ 9.69 | sec δ 9.74 | tan δ 9.69 | sec δ 9.74 | tan δ 9.69 | sec δ 9.74 | tan δ 9.69 |

Mean R.A. 8^h 13^m 47.82^s

Double lower transit July 26

Mean Dec. +84° 05' 58.48"

APPARENT PLACES OF STARS, 1986
CIRCUMPOLAR STARS AT UPPER TRANSIT AT GREENWICH

389

1639 Groombridge 1359 (Camelopardi) Mag. 6.39 Spect. A0

| Day | July | | August | | September | | October | | November | | December | |
|-----|---------------|-------------------|---------------|-------------------|---------------|-------------------|---------------|-------------------|---------------|-------------------|---------------|-------------------|
| | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m 8 13 | + o / 84 06 | h m 8 13 | + o / 84 05 | h m 8 13 | + o / 84 05 | h m 8 13 | + o / 84 05 | h m 8 13 | + o / 84 05 | h m 8 14 | + o / 84 05 |
| | s 36.71 | " 15.07 | s 37.56 | " 64.96 | s 41.61 | " 55.41 | s 47.77 | " 48.49 | s 55.38 | " 45.07 | s 02.77 | " 46.16 |
| 1 | 36.66 | 14.73 | 37.66 | 64.61 | 41.80 | 55.17 | 47.99 | 48.35 | 55.60 | 45.00 | 03.02 | 46.21 |
| 2 | 36.63 | 14.38 | 37.78 | 64.27 | 41.98 | 54.94 | 48.19 | 48.21 | 55.84 | 44.91 | 03.29 | 46.29 |
| 3 | 36.61 | 14.03 | 37.89 | 63.95 | 42.15 | 54.71 | 48.39 | 48.05 | 56.11 | 44.82 | 03.57 | 46.40 |
| 4 | 36.61 | 13.68 | 38.01 | 63.66 | 42.31 | 54.49 | 48.59 | 47.86 | 56.40 | 44.74 | 03.84 | 46.55 |
| 5 | 36.63 | 13.35 | 38.12 | 63.37 | 42.46 | 54.24 | 48.81 | 47.66 | 56.70 | 44.69 | 04.09 | 46.73 |
| 6 | 36.65 | 13.03 | 38.22 | 63.10 | 42.61 | 53.98 | 49.04 | 47.44 | 57.00 | 44.68 | 04.33 | 46.93 |
| 7 | 36.67 | 12.73 | 38.31 | 62.83 | 42.76 | 53.69 | 49.30 | 47.22 | 57.30 | 44.70 | 04.54 | 47.14 |
| 8 | 36.70 | 12.44 | 38.39 | 62.54 | 42.93 | 53.38 | 49.57 | 47.02 | 57.58 | 44.74 | 04.73 | 47.34 |
| 9 | 36.71 | 12.16 | 38.46 | 62.24 | 43.13 | 53.06 | 49.86 | 46.85 | 57.84 | 44.80 | 04.90 | 47.53 |
| 10 | 36.72 | 11.89 | 38.54 | 61.91 | 43.34 | 52.75 | 50.15 | 46.72 | 58.09 | 44.87 | 05.07 | 47.70 |
| 11 | 36.72 | 11.62 | 38.62 | 61.56 | 43.57 | 52.46 | 50.44 | 46.61 | 58.31 | 44.92 | 05.25 | 47.86 |
| 12 | 36.70 | 11.33 | 38.72 | 61.20 | 43.82 | 52.20 | 50.70 | 46.53 | 58.53 | 44.96 | 05.42 | 48.00 |
| 13 | 36.68 | 11.01 | 38.85 | 60.82 | 44.06 | 51.97 | 50.95 | 46.46 | 58.74 | 44.99 | 05.61 | 48.14 |
| 14 | 36.67 | 10.68 | 39.00 | 60.45 | 44.30 | 51.77 | 51.18 | 46.38 | 58.96 | 45.00 | 05.80 | 48.29 |
| 15 | 36.67 | 10.31 | 39.16 | 60.11 | 44.52 | 51.58 | 51.40 | 46.30 | 59.19 | 45.00 | 06.01 | 48.44 |
| 16 | 36.69 | 09.93 | 39.34 | 59.79 | 44.72 | 51.40 | 51.61 | 46.19 | 59.43 | 45.00 | 06.22 | 48.61 |
| 17 | 36.74 | 09.54 | 39.52 | 59.51 | 44.90 | 51.22 | 51.83 | 46.07 | 59.68 | 45.01 | 06.44 | 48.80 |
| 18 | 36.81 | 09.16 | 39.68 | 59.25 | 45.08 | 51.01 | 52.05 | 45.94 | 59.94 | 45.03 | 06.65 | 49.02 |
| 19 | 36.90 | 08.81 | 39.82 | 59.00 | 45.25 | 50.79 | 52.28 | 45.80 | 60.21 | 45.07 | 06.86 | 49.25 |
| 20 | 36.99 | 08.49 | 39.95 | 58.75 | 45.43 | 50.55 | 52.53 | 45.66 | 60.48 | 45.13 | 07.05 | 49.50 |
| 21 | 37.08 | 08.20 | 40.06 | 58.48 | 45.62 | 50.30 | 52.79 | 45.53 | 60.75 | 45.21 | 07.23 | 49.77 |
| 22 | 37.15 | 07.93 | 40.17 | 58.20 | 45.83 | 50.04 | 53.06 | 45.42 | 61.02 | 45.32 | 07.39 | 50.03 |
| 23 | 37.20 | 07.66 | 40.28 | 57.89 | 46.05 | 49.79 | 53.35 | 45.32 | 61.27 | 45.44 | 07.54 | 50.30 |
| 24 | 37.23 | 07.38 | 40.40 | 57.57 | 46.28 | 49.55 | 53.63 | 45.25 | 61.51 | 45.58 | 07.67 | 50.55 |
| 25 | 37.25 | 07.07 | 40.53 | 57.24 | 46.53 | 49.32 | 53.91 | 45.20 | 61.73 | 45.71 | 07.80 | 50.77 |
| 26 | 37.28 | 06.75 | 40.68 | 56.91 | 46.78 | 49.11 | 54.19 | 45.17 | 61.94 | 45.84 | 07.93 | 50.98 |
| 27 | 37.31 | 06.41 | 40.85 | 56.58 | 47.03 | 48.93 | 54.45 | 45.16 | 62.14 | 45.95 | 08.07 | 51.17 |
| 28 | 37.35 | 06.06 | 41.02 | 56.26 | 47.29 | 48.77 | 54.70 | 45.15 | 62.34 | 46.04 | 08.23 | 51.34 |
| 29 | 37.40 | 05.69 | 41.21 | 55.95 | 47.53 | 48.62 | 54.93 | 45.14 | 62.54 | 46.10 | 08.41 | 51.53 |
| 30 | 37.48 | 05.32 | 41.41 | 55.67 | 47.77 | 48.49 | 55.16 | 45.11 | 62.77 | 46.16 | 08.61 | 51.74 |
| 31 | 37.56 | 04.96 | 41.61 | 55.41 | | | 55.38 | 45.07 | | | 08.81 | 51.99 |
| 32 | sec δ 9.73 | tan δ 9.68 | sec δ 9.73 | tan δ 9.68 | sec δ 9.72 | tan δ 9.67 | sec δ 9.72 | tan δ 9.67 | sec δ 9.72 | tan δ 9.67 | sec δ 9.72 | tan δ 9.67 |

Mean R.A. 8^h 13^m 47.82^s

Double lower transit July 26

Mean Dec. +84° 05' 58.48"

APPARENT PLACES OF STARS, 1986
CIRCUMPOLAR STARS AT UPPER TRANSIT AT GREENWICH

1640 B.D. +84° 196 (Camelopardi) Mag. 6.26 Spect. F0

| Day | January | | February | | March | | April | | May | | June | |
|-----|---------------|-------------------|---------------------------|---------------------------|---------------|-------------------|---------------|-------------------|---------------|-------------------|---------------|-------------------|
| | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m 9 12 | + ° / 84 14 | h m 9 12 | + ° / 84 14 | h m 9 12 | + ° / 84 14 | h m 9 12 | + ° / 84 14 | h m 9 12 | + ° / 84 14 | h m 9 12 | + ° / 84 14 |
| 1 | s 47.64 | " 15.72 | s 51.55 | " 23.90 | s 51.53 | " 32.75 | s 47.98 | " 40.13 | s 42.61 | " 43.08 | s 37.03 | " 40.87 |
| 2 | 47.82 | 15.97 | 51.58 | 24.18 | 51.46 | 32.99 | 47.86 | 40.30 | 42.44 | 43.14 | 36.84 | 40.73 |
| 3 | 47.98 | 16.22 | 51.62 | 24.44 | 51.40 | 33.22 | 47.74 | 40.48 | 42.24 | 43.19 | 36.65 | 40.57 |
| 4 | 48.12 | 16.46 | 51.67 | 24.69 | 51.35 | 33.46 | 47.60 | 40.69 | 42.03 | 43.24 | 36.46 | 40.38 |
| 5 | 48.26 | 16.68 | 51.73 | 24.94 | 51.32 | 33.71 | 47.44 | 40.90 | 41.81 | 43.26 | 36.29 | 40.18 |
| 6 | 48.40 | 16.87 | 51.81 | 25.20 | 51.28 | 34.00 | 47.26 | 41.11 | 41.58 | 43.26 | 36.12 | 39.96 |
| 7 | 48.55 | 17.04 | 51.89 | 25.49 | 51.24 | 34.30 | 47.07 | 41.30 | 41.36 | 43.24 | 35.98 | 39.74 |
| 8 | 48.72 | 17.21 | ^{51 97} 52 04 | ^{25 80} 26 14 | 51.17 | 34.62 | 46.86 | 41.48 | 41.13 | 43.20 | 35.85 | 39.51 |
| 9 | 48.90 | 17.39 | 52.09 | 26.50 | 51.09 | 34.95 | 46.65 | 41.63 | 40.92 | 43.14 | 35.73 | 39.29 |
| 10 | 49.10 | 17.58 | 52.11 | 26.86 | 50.98 | 35.27 | 46.44 | 41.76 | 40.72 | 43.06 | 35.62 | 39.08 |
| 11 | 49.30 | 17.82 | 52.11 | 27.22 | 50.86 | 35.58 | 46.23 | 41.86 | 40.54 | 42.98 | 35.51 | 38.89 |
| 12 | 49.49 | 18.08 | 52.09 | 27.57 | 50.72 | 35.86 | 46.03 | 41.95 | 40.36 | 42.90 | 35.40 | 38.71 |
| 13 | 49.67 | 18.37 | 52.06 | 27.89 | 50.57 | 36.13 | 45.84 | 42.03 | 40.20 | 42.82 | 35.29 | 38.53 |
| 14 | 49.82 | 18.68 | 52.03 | 28.20 | 50.43 | 36.38 | 45.67 | 42.11 | 40.05 | 42.76 | 35.16 | 38.36 |
| 15 | 49.95 | 18.98 | 52.00 | 28.49 | 50.29 | 36.60 | 45.50 | 42.19 | 39.89 | 42.71 | 35.02 | 38.19 |
| 16 | 50.06 | 19.28 | 51.97 | 28.77 | 50.16 | 36.82 | 45.34 | 42.28 | 39.73 | 42.67 | 34.87 | 38.00 |
| 17 | 50.15 | 19.57 | 51.96 | 29.04 | 50.04 | 37.03 | 45.19 | 42.37 | 39.56 | 42.63 | 34.71 | 37.78 |
| 18 | 50.24 | 19.85 | 51.95 | 29.32 | 49.93 | 37.24 | 45.03 | 42.49 | 39.38 | 42.60 | 34.56 | 37.53 |
| 19 | 50.33 | 20.11 | 51.95 | 29.59 | 49.83 | 37.45 | 44.86 | 42.61 | 39.18 | 42.55 | 34.42 | 37.24 |
| 20 | 50.42 | 20.36 | 51.96 | 29.88 | 49.74 | 37.68 | 44.68 | 42.73 | 38.97 | 42.49 | 34.30 | 36.93 |
| 21 | 50.52 | 20.60 | 51.96 | 30.19 | 49.64 | 37.92 | 44.48 | 42.86 | 38.75 | 42.38 | 34.21 | 36.62 |
| 22 | 50.63 | 20.84 | 51.96 | 30.51 | 49.53 | 38.18 | 44.27 | 42.96 | 38.54 | 42.24 | 34.15 | 36.32 |
| 23 | 50.74 | 21.09 | 51.95 | 30.86 | 49.41 | 38.45 | 44.04 | 43.03 | 38.35 | 42.07 | 34.09 | 36.04 |
| 24 | 50.87 | 21.34 | 51.92 | 31.21 | 49.27 | 38.72 | 43.81 | 43.07 | 38.19 | 41.89 | 34.04 | 35.79 |
| 25 | 50.99 | 21.62 | 51.87 | 31.56 | 49.11 | 38.98 | 43.59 | 43.07 | 38.05 | 41.70 | 33.98 | 35.57 |
| 26 | 51.12 | 21.92 | 51.80 | 31.90 | 48.93 | 39.21 | 43.40 | 43.05 | 37.92 | 41.54 | 33.90 | 35.35 |
| 27 | 51.24 | 22.23 | 51.71 | 32.21 | 48.74 | 39.41 | 43.22 | 43.02 | 37.81 | 41.40 | 33.81 | 35.14 |
| 28 | 51.34 | 22.57 | 51.62 | 32.49 | 48.56 | 39.58 | 43.07 | 43.00 | 37.68 | 41.28 | 33.69 | 34.91 |
| 29 | 51.42 | 22.92 | 51.53 | 32.75 | 48.39 | 39.73 | 42.92 | 43.01 | 37.54 | 41.19 | 33.58 | 34.67 |
| 30 | 51.48 | 23.26 | | | 48.24 | 39.85 | 42.77 | 43.04 | 37.39 | 41.09 | 33.45 | 34.40 |
| 31 | 51.52 | 23.59 | | | 48.10 | 39.99 | 42.61 | 43.08 | 37.22 | 40.99 | 33.34 | 34.11 |
| 32 | 51.55 | 23.90 | | | 47.98 | 40.13 | | | 37.03 | 40.87 | | |
| | sec δ 9.96 | tan δ 9.91 | sec δ 9.97 | tan δ 9.92 | sec δ 9.97 | tan δ 9.92 | sec δ 9.97 | tan δ 9.92 | sec δ 9.97 | tan δ 9.92 | sec δ 9.97 | tan δ 9.92 |

Mean R.A. 9^h 12^m 41.^s57

Double lower transit August 9

Mean Dec. +84° 14' 13.93"

APPARENT PLACES OF STARS, 1986
CIRCUMPOLAR STARS AT UPPER TRANSIT AT GREENWICH

391

1640 B.D. +84° 196 (Camelopardi) Mag. 6.26 Spect. F0

| Day | July | | August | | September | | October | | November | | December | |
|-----|---------------|---------------------|---------------|---------------------|---------------|---------------------|---------------|---------------------|---------------|---------------------|---------------|---------------------|
| | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m 9 12 | + ° ' / 84 14 | h m 9 12 | + ° ' / 84 14 | h m 9 12 | + ° ' / 84 14 | h m 9 12 | + ° ' / 84 13 | h m 9 12 | + ° ' / 84 13 | h m 9 12 | + ° ' / 84 13 |
| | s " | s " | s " | s " | s " | s " | s " | s " | s " | s " | s " | s " |
| 1 | 33.34 | 34.11 | 32.42 | 24.13 | 34.77 | 13.43 | 39.69 | 64.41 | 46.69 | 58.22 | 54.26 | 56.51 |
| 2 | 33.23 | 33.81 | 32.46 | 23.76 | 34.92 | 13.12 | 39.89 | 64.19 | 46.90 | 58.06 | 54.52 | 56.47 |
| 3 | 33.14 | 33.49 | 32.51 | 23.40 | 35.06 | 12.83 | 40.07 | 63.98 | 47.13 | 57.89 | 54.80 | 56.45 |
| 4 | 33.07 | 33.16 | 32.57 | 23.05 | 35.19 | 12.55 | 40.24 | 63.74 | 47.38 | 57.70 | 55.10 | 56.46 |
| 5 | 33.01 | 32.83 | 32.63 | 22.72 | 35.31 | 12.26 | 40.41 | 63.48 | 47.65 | 57.52 | 55.40 | 56.50 |
| 6 | 32.96 | 32.51 | 32.69 | 22.41 | 35.41 | 11.97 | 40.59 | 63.20 | 47.94 | 57.36 | 55.68 | 56.59 |
| 7 | 32.93 | 32.20 | 32.74 | 22.11 | 35.51 | 11.66 | 40.78 | 62.90 | 48.25 | 57.24 | 55.95 | 56.70 |
| 8 | 32.90 | 31.90 | 32.78 | 21.81 | 35.62 | 11.32 | 41.00 | 62.60 | 48.55 | 57.15 | 56.20 | 56.82 |
| 9 | 32.87 | 31.62 | 32.81 | 21.50 | 35.73 | 10.95 | 41.24 | 62.30 | 48.83 | 57.09 | 56.42 | 56.94 |
| 10 | 32.84 | 31.35 | 32.83 | 21.18 | 35.87 | 10.58 | 41.50 | 62.03 | 49.10 | 57.05 | 56.63 | 57.05 |
| 11 | 32.79 | 31.09 | 32.85 | 20.84 | 36.03 | 10.20 | 41.77 | 61.80 | 49.36 | 57.01 | 56.83 | 57.15 |
| 12 | 32.74 | 30.83 | 32.87 | 20.47 | 36.21 | 09.83 | 42.03 | 61.59 | 49.59 | 56.98 | 57.03 | 57.24 |
| 13 | 32.67 | 30.55 | 32.91 | 20.08 | 36.41 | 09.49 | 42.28 | 61.41 | 49.81 | 56.94 | 57.23 | 57.32 |
| 14 | 32.60 | 30.26 | 32.97 | 19.67 | 36.61 | 09.18 | 42.51 | 61.24 | 50.03 | 56.88 | 57.44 | 57.39 |
| 15 | 32.53 | 29.94 | 33.05 | 19.26 | 36.81 | 08.90 | 42.73 | 61.08 | 50.25 | 56.81 | 57.66 | 57.45 |
| 16 | 32.47 | 29.59 | 33.16 | 18.87 | 37.00 | 08.63 | 42.93 | 60.91 | 50.48 | 56.72 | 57.89 | 57.53 |
| 17 | 32.42 | 29.21 | 33.28 | 18.50 | 37.16 | 08.38 | 43.13 | 60.73 | 50.72 | 56.63 | 58.14 | 57.62 |
| 18 | 32.40 | 28.82 | 33.41 | 18.17 | 37.32 | 08.13 | 43.32 | 60.53 | 50.97 | 56.55 | 58.38 | 57.73 |
| 19 | 32.41 | 28.44 | 33.52 | 17.86 | 37.45 | 07.86 | 43.52 | 60.32 | 51.24 | 56.47 | 58.63 | 57.86 |
| 20 | 32.44 | 28.07 | 33.62 | 17.56 | 37.59 | 07.58 | 43.73 | 60.09 | 51.51 | 56.41 | 58.88 | 58.01 |
| 21 | 32.47 | 27.74 | 33.70 | 17.27 | 37.73 | 07.28 | 43.95 | 59.87 | 51.80 | 56.37 | 59.12 | 58.18 |
| 22 | 32.50 | 27.43 | 33.77 | 16.97 | 37.87 | 06.96 | 44.19 | 59.64 | 52.08 | 56.35 | 59.34 | 58.37 |
| 23 | 32.52 | 27.14 | 33.82 | 16.65 | 38.03 | 06.64 | 44.44 | 59.43 | 52.36 | 56.36 | 59.55 | 58.57 |
| 24 | 32.52 | 26.87 | 33.88 | 16.31 | 38.21 | 06.31 | 44.71 | 59.23 | 52.64 | 56.38 | 59.74 | 58.77 |
| 25 | 32.51 | 26.58 | 33.94 | 15.96 | 38.40 | 05.99 | 44.98 | 59.06 | 52.90 | 56.42 | 59.92 | 58.96 |
| 26 | 32.48 | 26.28 | 34.02 | 15.59 | 38.60 | 05.68 | 45.25 | 58.91 | 53.14 | 56.47 | 60.09 | 59.13 |
| 27 | 32.44 | 25.96 | 34.11 | 15.21 | 38.82 | 05.39 | 45.52 | 58.77 | 53.37 | 56.51 | 60.25 | 59.28 |
| 28 | 32.41 | 25.62 | 34.21 | 14.83 | 39.04 | 05.11 | 45.78 | 58.66 | 53.59 | 56.54 | 60.43 | 59.41 |
| 29 | 32.39 | 25.26 | 34.34 | 14.46 | 39.27 | 04.86 | 46.02 | 58.56 | 53.80 | 56.55 | 60.62 | 59.53 |
| 30 | 32.38 | 24.89 | 34.47 | 14.10 | 39.48 | 04.63 | 46.26 | 58.46 | 54.02 | 56.54 | 60.83 | 59.65 |
| 31 | 32.39 | 24.51 | 34.62 | 13.75 | 39.69 | 04.41 | 46.48 | 58.35 | 54.26 | 56.51 | 61.07 | 59.79 |
| 32 | 32.42 | 24.13 | 34.77 | 13.43 | | | 46.69 | 58.22 | | | 61.31 | 59.96 |
| | sec δ 9.97 | tan δ 9.92 | sec δ 9.96 | tan δ 9.91 | sec δ 9.96 | tan δ 9.91 | sec δ 9.95 | tan δ 9.90 | sec δ 9.95 | tan δ 9.90 | sec δ 9.95 | tan δ 9.90 |

Mean R.A. 9^h 12^m 41.^s57

Double lower transit August 9

Mean Dec. +84° 14' 13.^{''}93

APPARENT PLACES OF STARS, 1986
CIRCUMPOLAR STARS AT UPPER TRANSIT AT GREENWICH

910 1 H. Draconis Mag. 4.58 Spect. K2

| Day | January | | February | | March | | April | | May | | June | |
|-----|-----------------------------------|--|-----------------------------------|--|-----------------------------------|--|-----------------------------------|--|-----------------------------------|--|-----------------------------------|--|
| | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | ^h ^m 9 35 | ⁺ ^o ' ^s 81 23 | ^h ^m 9 35 | ⁺ ^o ' ^s 81 23 | ^h ^m 9 35 | ⁺ ^o ' ^s 81 23 | ^h ^m 9 35 | ⁺ ^o ' ^s 81 23 | ^h ^m 9 35 | ⁺ ^o ' ^s 81 23 | ^h ^m 9 35 | ⁺ ^o ' ^s 81 23 |
| 1 | ^s 17.58 | " 15.00 | ^s 20.66 | " 22.35 | ^s 21.12 | " 31.02 | ^s 19.14 | " 38.84 | ^s 15.76 | " 42.66 | ^s 12.02 | " 41.48 |
| 2 | 17.71 | 15.22 | 20.70 | 22.62 | 21.08 | 31.27 | 19.08 | 39.03 | 15.65 | 42.74 | 11.89 | 41.38 |
| 3 | 17.83 | 15.43 | 20.74 | 22.87 | 21.06 | 31.50 | 19.00 | 39.24 | 15.52 | 42.83 | 11.75 | 41.25 |
| 4 | 17.94 | 15.64 | 20.78 | 23.11 | 21.04 | 31.75 | 18.92 | 39.46 | 15.38 | 42.91 | 11.62 | 41.10 |
| 5 | 18.04 | 15.83 | 20.84 | 23.34 | 21.03 | 32.00 | 18.83 | 39.69 | 15.24 | 42.97 | 11.50 | 40.93 |
| 6 | 18.15 | 15.99 | 20.91 | 23.58 | 21.03 | 32.29 | 18.72 | 39.93 | 15.08 | 43.01 | 11.39 | 40.75 |
| 7 | 18.26 | 16.14 | 20.99 | 23.85 | 21.01 | 32.59 | 18.60 | 40.15 | 14.93 | 43.03 | 11.28 | 40.56 |
| 8 | 18.39 | 16.27 | 21.06 | 24.15 | 20.99 | 32.92 | 18.46 | 40.36 | 14.78 | 43.02 | 11.19 | 40.36 |
| 9 | 18.53 | 16.41 | 21.12 | 24.47 | 20.94 | 33.25 | 18.33 | 40.54 | 14.64 | 43.00 | 11.11 | 40.17 |
| 10 | 18.68 | 16.58 | 21.17 | 24.82 | 20.89 | 33.59 | 18.19 | 40.70 | 14.51 | 42.96 | 11.03 | 39.99 |
| 11 | 18.83 | 16.77 | 21.20 | 25.17 | 20.82 | 33.91 | 18.06 | 40.84 | 14.39 | 42.91 | 10.95 | 39.82 |
| 12 | 18.97 | 17.00 | 21.22 | 25.52 | 20.74 | 34.21 | 17.93 | 40.96 | 14.27 | 42.86 | 10.87 | 39.66 |
| 13 | 19.11 | 17.26 | 21.22 | 25.86 | 20.65 | 34.49 | 17.82 | 41.07 | 14.17 | 42.82 | 10.79 | 39.52 |
| 14 | 19.22 | 17.53 | 21.22 21.21 | 26.18 26.49 | 20.57 | 34.76 | 17.71 | 41.17 | 14.06 | 42.79 | 10.70 | 39.37 |
| 15 | 19.32 | 17.81 | 21.21 | 26.78 | 20.49 | 35.00 | 17.60 | 41.28 | 13.96 | 42.76 | 10.60 | 39.23 |
| 16 | 19.41 | 18.09 | 21.21 | 27.05 | 20.42 | 35.23 | 17.51 | 41.39 | 13.85 | 42.75 | 10.49 | 39.07 |
| 17 | 19.49 | 18.35 | 21.21 | 27.32 | 20.35 | 35.46 | 17.41 | 41.52 | 13.74 | 42.75 | 10.38 | 38.88 |
| 18 | 19.56 | 18.61 | 21.22 | 27.59 | 20.29 | 35.68 | 17.31 | 41.65 | 13.62 | 42.75 | 10.27 | 38.66 |
| 19 | 19.63 | 18.85 | 21.24 | 27.86 | 20.23 | 35.91 | 17.21 | 41.80 | 13.48 | 42.74 | 10.17 | 38.41 |
| 20 | 19.71 | 19.07 | 21.26 | 28.15 | 20.18 | 36.15 | 17.09 | 41.96 | 13.34 | 42.71 | 10.08 | 38.13 |
| 21 | 19.79 | 19.29 | 21.28 | 28.45 | 20.13 | 36.41 | 16.97 | 42.11 | 13.19 | 42.64 | 10.01 | 37.84 |
| 22 | 19.88 | 19.51 | 21.30 | 28.77 | 20.07 | 36.68 | 16.83 | 42.25 | 13.05 | 42.54 | 09.96 | 37.56 |
| 23 | 19.97 | 19.73 | 21.31 | 29.10 | 20.00 | 36.96 | 16.68 | 42.36 | 12.92 | 42.41 | 09.92 | 37.30 |
| 24 | 20.07 | 19.96 | 21.31 | 29.45 | 19.92 | 37.25 | 16.53 | 42.43 | 12.81 | 42.26 | 09.88 | 37.07 |
| 25 | 20.17 | 20.21 | 21.29 | 29.81 | 19.83 | 37.53 | 16.39 | 42.47 | 12.71 | 42.10 | 09.83 | 36.87 |
| 26 | 20.28 | 20.49 | 21.25 | 30.15 | 19.72 | 37.79 | 16.26 | 42.48 | 12.63 | 41.97 | 09.77 | 36.68 |
| 27 | 20.37 | 20.78 | 21.21 | 30.47 | 19.60 | 38.02 | 16.15 | 42.48 | 12.55 | 41.85 | 09.70 | 36.49 |
| 28 | 20.46 | 21.09 | 21.16 | 30.76 | 19.49 | 38.21 | 16.05 | 42.50 | 12.47 | 41.77 | 09.62 | 36.29 |
| 29 | 20.53 | 21.42 | 21.12 | 31.02 | 19.38 | 38.38 | 15.96 | 42.53 | 12.37 | 41.70 | 09.53 | 36.07 |
| 30 | 20.59 | 21.74 | | | 19.29 | 38.53 | 15.86 | 42.58 | 12.27 | 41.63 | 09.44 | 35.83 |
| 31 | 20.63 | 22.06 | | | 19.21 | 38.68 | 15.76 | 42.66 | 12.15 | 41.56 | 09.35 | 35.57 |
| 32 | 20.66 | 22.35 | | | 19.14 | 38.84 | | | 12.02 | 41.48 | | |
| | sec δ 6.68 | tan δ 6.60 | sec δ 6.68 | tan δ 6.61 | sec δ 6.68 | tan δ 6.61 | sec δ 6.68 | tan δ 6.61 | sec δ 6.68 | tan δ 6.61 | sec δ 6.68 | tan δ 6.61 |

Mean R.A. ^h 9 ^m 35 ^s 14.13

Double lower transit August 15

Mean Dec. +81° 23' 14.7"

APPARENT PLACES OF STARS, 1986
CIRCUMPOLAR STARS AT UPPER TRANSIT AT GREENWICH

393

910 1 H. Draconis · Mag. 4.58 Spect. K2

| Day | July | | August | | September | | October | | November | | December | |
|-----|---------------|-----------------------|---------------|-----------------------|---------------|-----------------------|---------------|-----------------------|---------------|-----------------------|---------------|-----------------------|
| | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m 9 35 | + ° ' " / 81 23 | h m 9 35 | + ° ' " / 81 23 | h m 9 35 | + ° ' " / 81 23 | h m 9 35 | + ° ' " / 81 22 | h m 9 35 | + ° ' " / 81 22 | h m 9 35 | + ° ' " / 81 22 |
| | s | " | s | " | s | " | s | " | s | " | s | " |
| 1 | 09.35 | 35.57 | 08.39 | 26.05 | 09.57 | 15.28 | 12.52 | 65.69 | 16.99 | 58.48 | 22.08 | 55.55 |
| 2 | 09.27 | 35.29 | 08.40 | 25.69 | 09.65 | 14.96 | 12.64 | 65.45 | 17.13 | 58.29 | 22.26 | 55.47 |
| 3 | 09.20 | 34.99 | 08.43 | 25.33 | 09.74 | 14.65 | 12.75 | 65.20 | 17.28 | 58.08 | 22.46 | 55.40 |
| 4 | 09.14 | 34.69 | 08.46 | 24.98 | 09.81 | 14.36 | 12.85 | 64.94 | 17.44 | 57.86 | 22.66 | 55.37 |
| 5 | 09.09 | 34.38 | 08.49 | 24.65 | 09.88 | 14.06 | 12.96 | 64.66 | 17.62 | 57.64 | 22.87 | 55.36 |
| 6 | 09.05 | 34.08 | 08.52 | 24.34 | 09.94 | 13.76 | 13.06 | 64.35 | 17.82 | 57.43 | 23.07 | 55.40 |
| 7 | 09.02 | 33.78 | 08.54 | 24.04 | 09.99 | 13.43 | 13.19 | 64.03 | 18.02 | 57.26 | 23.26 | 55.46 |
| 8 | 08.99 | 33.50 | 08.55 | 23.75 | 10.04 | 13.08 | 13.32 | 63.69 | 18.22 | 57.13 | 23.43 | 55.54 |
| 9 | 08.96 | 33.24 | 08.56 | 23.45 | 10.11 | 12.71 | 13.48 | 63.37 | 18.41 | 57.02 | 23.59 | 55.62 |
| 10 | 08.93 | 32.98 | 08.56 | 23.13 | 10.19 | 12.32 | 13.64 | 63.07 | 18.60 | 56.94 | 23.73 | 55.70 |
| 11 | 08.89 | 32.74 | 08.55 | 22.79 | 10.28 | 11.92 | 13.82 | 62.79 | 18.76 | 56.87 | 23.87 | 55.76 |
| 12 | 08.84 | 32.49 | 08.55 | 22.43 | 10.39 | 11.54 | 13.99 | 62.55 | 18.92 | 56.80 | 24.01 | 55.81 |
| 13 | 08.79 | 32.24 | 08.56 | 22.04 | 10.51 | 11.18 | 14.15 | 62.33 | 19.07 | 56.71 | 24.15 | 55.85 |
| 14 | 08.73 | 31.96 | 08.59 | 21.63 | 10.64 | 10.84 | 14.30 | 62.13 | 19.21 | 56.62 | 24.30 | 55.89 |
| 15 | 08.67 | 31.66 | 08.64 | 21.22 | 10.76 | 10.53 | 14.43 | 61.94 | 19.36 | 56.51 | 24.46 | 55.92 |
| 16 | 08.61 | 31.33 | 08.70 | 20.83 | 10.88 | 10.25 | 14.56 | 61.74 | 19.51 | 56.39 | 24.62 | 55.95 |
| 17 | 08.57 | 30.97 | 08.77 | 20.45 | 10.98 | 09.98 | 14.68 | 61.53 | 19.67 | 56.26 | 24.80 | 56.00 |
| 18 | 08.54 | 30.60 | 08.84 | 20.11 | 11.07 | 09.71 | 14.81 | 61.30 | 19.84 | 56.14 | 24.97 | 56.07 |
| 19 | 08.54 | 30.23 | 08.90 | 19.79 | 11.15 | 09.42 | 14.93 | 61.06 | 20.02 | 56.02 | 25.15 | 56.15 |
| 20 | 08.55 | 29.87 | 08.96 | 19.49 | 11.22 | 09.12 | 15.06 | 60.80 | 20.21 | 55.91 | 25.33 | 56.26 |
| 21 | 08.56 | 29.54 | 09.00 | 19.19 | 11.30 | 08.81 | 15.21 | 60.54 | 20.40 | 55.83 | 25.50 | 56.39 |
| 22 | 08.57 | 29.24 | 09.03 | 18.89 | 11.39 | 08.47 | 15.36 | 60.28 | 20.60 | 55.77 | 25.66 | 56.54 |
| 23 | 08.58 | 28.96 | 09.05 | 18.57 | 11.48 | 08.13 | 15.52 | 60.04 | 20.79 | 55.73 | 25.81 | 56.70 |
| 24 | 08.56 | 28.69 | 09.08 | 18.23 | 11.59 | 07.78 | 15.70 | 59.80 | 20.97 | 55.71 | 25.95 | 56.86 |
| 25 | 08.54 | 28.42 | 09.10 | 17.87 | 11.71 | 07.44 | 15.87 | 59.59 | 21.15 | 55.70 | 26.08 | 57.02 |
| 26 | 08.51 | 28.13 | 09.14 | 17.50 | 11.84 | 07.10 | 16.05 | 59.39 | 21.32 | 55.71 | 26.20 | 57.16 |
| 27 | 08.47 | 27.83 | 09.19 | 17.12 | 11.97 | 06.78 | 16.23 | 59.22 | 21.48 | 55.71 | 26.32 | 57.28 |
| 28 | 08.44 | 27.50 | 09.24 | 16.73 | 12.11 | 06.48 | 16.40 | 59.07 | 21.63 | 55.70 | 26.45 | 57.37 |
| 29 | 08.41 | 27.16 | 09.31 | 16.35 | 12.25 | 06.20 | 16.56 | 58.93 | 21.77 | 55.67 | 26.59 | 57.45 |
| 30 | 08.39 | 26.80 | 09.39 | 15.98 | 12.39 | 05.93 | 16.71 | 58.79 | 21.92 | 55.62 | 26.74 | 57.54 |
| 31 | 08.39 | 26.43 | 09.48 | 15.62 | 12.52 | 05.69 | 16.85 | 58.64 | 22.08 | 55.55 | 26.91 | 57.63 |
| 32 | 08.39 | 26.05 | 09.57 | 15.28 | | | 16.99 | 58.48 | | | 27.09 | 57.77 |
| | sec δ 6.68 | tan δ 6.61 | sec δ 6.68 | tan δ 6.60 | sec δ 6.68 | tan δ 6.60 | sec δ 6.67 | tan δ 6.60 | sec δ 6.67 | tan δ 6.60 | sec δ 6.67 | tan δ 6.60 |

Mean R.A. 9^h 35^m 14.13^s

Double lower transit August 15

Mean Dec. +81° 23' 14.37"

APPARENT PLACES OF STARS, 1986
CIRCUMPOLAR STARS AT UPPER TRANSIT AT GREENWICH

911 30 H. Camelopardis Mag. 5.34 Spect. F2

| Day | January | | February | | March | | April | | May | | June | |
|-----|---------------|---------------------|----------------|---------------------|---------------|---------------------|---------------|---------------------|---------------|---------------------|---------------|---------------------|
| | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m 10 29 | + ° ' / 82 37 | h m 10 29 | + ° ' / 82 37 | h m 10 29 | + ° ' / 82 37 | h m 10 29 | + ° ' / 82 38 | h m 10 29 | + ° ' / 82 38 | h m 10 29 | + ° ' / 82 38 |
| | s " | s " | s " | s " | s " | s " | s " | s " | s " | s " | s " | s " |
| 1 | 34.96 | 38.44 | 39.39 | 44.25 | 40.97 | 52.63 | 39.67 | 01.41 | 36.23 | 06.98 | 31.73 | 07.87 |
| 2 | 35.14 | 38.59 | 39.46 | 44.50 | 40.96 | 52.89 | 39.61 | 01.63 | 36.11 | 07.13 | 31.57 | 07.83 |
| 3 | 35.30 | 38.74 | 39.54 | 44.73 | 40.96 | 53.14 | 39.55 | 01.88 | 35.97 | 07.28 | 31.40 | 07.78 |
| 4 | 35.45 | 38.89 | 39.62 | 44.94 | 40.98 | 53.40 | 39.49 | 02.14 | 35.82 | 07.42 | 31.23 | 07.70 |
| 5 | 35.59 | 39.03 | 39.72 | 45.14 | 41.00 | 53.66 | 39.41 | 02.42 | 35.66 | 07.56 | 31.06 | 07.61 |
| 6 | 35.73 | 39.14 | 39.83 | 45.36 | 41.02 | 53.95 | 39.31 | 02.71 | 35.49 | 07.68 | 30.91 | 07.49 |
| 7 | 35.88 | 39.23 | 39.95 | 45.59 | 41.04 | 54.26 | 39.20 | 02.99 | 35.32 | 07.77 | 30.76 | 07.36 |
| 8 | 36.04 | 39.31 | 40.06 | 45.86 | 41.05 | 54.60 | 39.07 | 03.25 | 35.15 | 07.85 | 30.63 | 07.23 |
| 9 | 36.22 | 39.39 | 40.17 | 46.15 | 41.05 | 54.95 | 38.94 | 03.50 | 34.98 | 07.90 | 30.51 | 07.09 |
| 10 | 36.41 | 39.48 | 40.27 | 46.47 | 41.02 | 55.30 | 38.80 | 03.73 | 34.82 | 07.93 | 30.39 | 06.96 |
| 11 | 36.60 | 39.61 | 40.35 | 46.80 | 40.98 | 55.65 | 38.67 | 03.93 | 34.67 | 07.96 | 30.28 | 06.84 |
| 12 | 36.80 | 39.77 | 40.41 | 47.13 | 40.93 | 55.99 | 38.54 | 04.12 | 34.54 | 07.97 | 30.17 | 06.73 |
| 13 | 36.98 | 39.96 | 40.46 | 47.46 | 40.87 | 56.31 | 38.42 | 04.29 | 34.40 | 07.99 | 30.06 | 06.63 |
| 14 | 37.14 | 40.17 | 40.49 | 47.78 | 40.81 | 56.61 | 38.30 | 04.46 | 34.28 | 08.02 | 29.93 | 06.54 |
| 15 | 37.29 | 40.40 | 40.53 | 48.09 | 40.74 | 56.89 | 38.20 | 04.62 | 34.16 | 08.06 | 29.80 | 06.45 |
| 16 | 37.43 | 40.63 | 40.56 | 48.37 | 40.69 | 57.16 | 38.10 | 04.79 | 34.03 | 08.11 | 29.65 | 06.35 |
| 17 | 37.55 | 40.85 | 40.59 | 48.65 | 40.64 | 57.42 | 38.00 | 04.96 | 33.90 | 08.16 | 29.50 | 06.23 |
| 18 | 37.67 | 41.06 | 40.63 | 48.92 | 40.60 | 57.68 | 37.90 | 05.15 | 33.76 | 08.23 | 29.34 | 06.07 |
| 19 | 37.78 | 41.26 | 40.67 | 49.18 | 40.56 | 57.94 | 37.80 | 05.36 | 33.60 | 08.29 | 29.19 | 05.88 |
| 20 | 37.90 | 41.45 | 40.72 | 49.45 | 40.53 | 58.21 | 37.69 | 05.57 | 33.43 | 08.33 | 29.05 | 05.66 |
| 21 | 38.01 | 41.64 | 40.78 | 49.72 | 40.50 | 58.49 | 37.56 | 05.78 | 33.25 | 08.34 | 28.94 | 05.42 |
| 22 | 38.14 | 41.81 | 40.84 | 50.01 | 40.47 | 58.78 | 37.42 | 05.99 | 33.08 | 08.32 | 28.84 | 05.18 |
| 23 | 38.28 | 41.99 | 40.90 | 50.32 | 40.43 | 59.10 | 37.26 | 06.17 | 32.91 | 08.26 | 28.76 | 04.96 |
| 24 | 38.42 | 42.17 | 40.96 | 50.65 | 40.37 | 59.42 | 37.10 | 06.32 | 32.76 | 08.18 | 28.68 | 04.77 |
| 25 | 38.57 | 42.38 | 41.00 | 50.99 | 40.29 | 59.74 | 36.94 | 06.43 | 32.63 | 08.09 | 28.60 | 04.60 |
| 26 | 38.72 | 42.60 | 41.02 | 51.35 | 40.20 | 60.05 | 36.79 | 06.51 | 32.51 | 08.01 | 28.50 | 04.44 |
| 27 | 38.86 | 42.84 | 41.02 41.01 | 51.70 52.03 | 40.09 | 60.34 | 36.66 | 06.58 | 32.40 | 07.95 | 28.39 | 04.30 |
| 28 | 39.00 | 43.11 | 40.99 | 52.35 | 39.99 | 60.59 | 36.55 | 06.66 | 32.29 | 07.91 | 28.27 | 04.14 |
| 29 | 39.12 | 43.39 | 40.97 | 52.63 | 39.89 | 60.81 | 36.44 | 06.74 | 32.17 | 07.89 | 28.14 | 03.98 |
| 30 | 39.22 | 43.69 | | | 39.80 | 61.01 | 36.34 | 06.85 | 32.04 | 07.89 | 28.00 | 03.79 |
| 31 | 39.31 | 43.97 | | | 39.73 | 61.21 | 36.23 | 06.98 | 31.89 | 07.88 | 27.86 | 03.58 |
| 32 | 39.39 | 44.25 | | | 39.67 | 61.41 | | | 31.73 | 07.87 | | |
| | sec δ 7.79 | tan δ 7.73 | sec δ 7.80 | tan δ 7.73 | sec δ 7.80 | tan δ 7.73 | sec δ 7.80 | tan δ 7.74 | sec δ 7.80 | tan δ 7.74 | sec δ 7.80 | tan δ 7.74 |

Mean R.A. 10^h 29^m 30^s.66

Double lower transit August 29

Mean Dec. +82° 37' 40.74"

APPARENT PLACES OF STARS, 1986
CIRCUMPOLAR STARS AT UPPER TRANSIT AT GREENWICH

395

911 30 H. Camelopardi Mag. 5.34 Spect. F2

| Day | July | | August | | September | | October | | November | | December | |
|-----|-------|----------|--------|----------|-----------|----------|---------|----------|----------|----------|----------|----------|
| | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | + o / | h m | + o / | h m | + o / | h m | + o / | h m | + o / | h m | + o / |
| | 10 29 | 82 37 | 10 29 | 82 37 | 10 29 | 82 37 | 10 29 | 82 37 | 10 29 | 82 37 | 10 29 | 82 37 |
| | s | " | s | " | s | " | s | " | s | " | s | " |
| 1 | 27.86 | 63.58 | 25.50 | 54.90 | 25.43 | 43.88 | 27.58 | 33.08 | 31.77 | 23.87 | 37.22 | 18.60 |
| 2 | 27.73 | 63.35 | 25.47 | 54.54 | 25.49 | 43.52 | 27.68 | 32.79 | 31.91 | 23.62 | 37.41 | 18.44 |
| 3 | 27.61 | 63.11 | 25.44 | 54.19 | 25.55 | 43.18 | 27.78 | 32.49 | 32.05 | 23.35 | 37.63 | 18.29 |
| 4 | 27.50 | 62.84 | 25.43 | 53.84 | 25.60 | 42.85 | 27.86 | 32.18 | 32.21 | 23.05 | 37.85 | 18.16 |
| 5 | 27.41 | 62.58 | 25.42 | 53.51 | 25.63 | 42.53 | 27.95 | 31.86 | 32.39 | 22.75 | 38.09 | 18.06 |
| 6 | 27.32 | 62.31 | 25.41 | 53.19 | 25.66 | 42.20 | 28.03 | 31.50 | 32.58 | 22.47 | 38.32 | 18.01 |
| 7 | 27.24 | 62.04 | 25.40 | 52.89 | 25.68 | 41.86 | 28.13 | 31.13 | 32.79 | 22.21 | 38.54 | 17.98 |
| 8 | 27.17 | 61.79 | 25.38 | 52.59 | 25.70 | 41.49 | 28.25 | 30.74 | 33.01 | 21.98 | 38.75 | 17.97 |
| 9 | 27.10 | 61.55 | 25.34 | 52.30 | 25.72 | 41.09 | 28.38 | 30.35 | 33.21 | 21.79 | 38.94 | 17.98 |
| 10 | 27.03 | 61.32 | 25.30 | 51.99 | 25.76 | 40.68 | 28.53 | 29.98 | 33.41 | 21.62 | 39.11 | 17.98 |
| 11 | 26.96 | 61.10 | 25.25 | 51.66 | 25.82 | 40.25 | 28.69 | 29.63 | 33.59 | 21.47 | 39.28 | 17.97 |
| 12 | 26.87 | 60.89 | 25.21 | 51.30 | 25.90 | 39.83 | 28.85 | 29.31 | 33.76 | 21.32 | 39.45 | 17.96 |
| 13 | 26.77 | 60.67 | 25.17 | 50.92 | 25.99 | 39.42 | 29.01 | 29.02 | 33.92 | 21.16 | 39.62 | 17.93 |
| 14 | 26.67 | 60.43 | 25.15 | 50.52 | 26.09 | 39.03 | 29.16 | 28.75 | 34.07 | 21.00 | 39.79 | 17.89 |
| 15 | 26.56 | 60.17 | 25.15 | 50.10 | 26.19 | 38.67 | 29.29 | 28.49 | 34.23 | 20.82 | 39.97 | 17.85 |
| 16 | 26.45 | 59.88 | 25.16 | 49.69 | 26.28 | 38.34 | 29.41 | 28.23 | 34.39 | 20.63 | 40.16 | 17.81 |
| 17 | 26.36 | 59.55 | 25.19 | 49.30 | 26.36 | 38.02 | 29.52 | 27.96 | 34.55 | 20.43 | 40.37 | 17.78 |
| 18 | 26.28 | 59.21 | 25.23 | 48.93 | 26.43 | 37.71 | 29.63 | 27.68 | 34.73 | 20.23 | 40.57 | 17.77 |
| 19 | 26.22 | 58.86 | 25.26 | 48.59 | 26.49 | 37.39 | 29.75 | 27.38 | 34.92 | 20.04 | 40.79 | 17.77 |
| 20 | 26.18 | 58.51 | 25.28 | 48.27 | 26.54 | 37.06 | 29.87 | 27.07 | 35.12 | 19.85 | 41.00 | 17.80 |
| 21 | 26.16 | 58.19 | 25.29 | 47.96 | 26.59 | 36.71 | 30.00 | 26.75 | 35.33 | 19.67 | 41.21 | 17.84 |
| 22 | 26.13 | 57.90 | 25.29 | 47.65 | 26.64 | 36.34 | 30.14 | 26.43 | 35.54 | 19.52 | 41.41 | 17.91 |
| 23 | 26.09 | 57.63 | 25.27 | 47.32 | 26.71 | 35.96 | 30.30 | 26.11 | 35.76 | 19.39 | 41.60 | 18.00 |
| 24 | 26.04 | 57.37 | 25.26 | 46.98 | 26.79 | 35.57 | 30.46 | 25.80 | 35.97 | 19.28 | 41.78 | 18.09 |
| 25 | 25.98 | 57.12 | 25.24 | 46.62 | 26.88 | 35.18 | 30.64 | 25.50 | 36.17 | 19.19 | 41.95 | 18.18 |
| 26 | 25.91 | 56.86 | 25.24 | 46.23 | 26.98 | 34.79 | 30.82 | 25.23 | 36.36 | 19.11 | 42.11 | 18.26 |
| 27 | 25.83 | 56.58 | 25.24 | 45.84 | 27.09 | 34.42 | 30.99 | 24.98 | 36.54 | 19.04 | 42.26 | 18.32 |
| 28 | 25.75 | 56.27 | 25.26 | 45.44 | 27.21 | 34.05 | 31.17 | 24.74 | 36.71 | 18.96 | 42.42 | 18.35 |
| 29 | 25.67 | 55.95 | 25.28 | 45.04 | 27.34 | 33.71 | 31.34 | 24.53 | 36.88 | 18.86 | 42.59 | 18.37 |
| 30 | 25.60 | 55.62 | 25.33 | 44.64 | 27.46 | 33.39 | 31.49 | 24.32 | 37.04 | 18.74 | 42.77 | 18.38 |
| 31 | 25.54 | 55.26 | 25.38 | 44.25 | 27.58 | 33.08 | 31.64 | 24.10 | 37.22 | 18.60 | 42.98 | 18.41 |
| 32 | 25.50 | 54.90 | 25.43 | 43.88 | | | 31.77 | 23.87 | | | 43.20 | 18.46 |

Mean R.A. 10^h 29^m 30^s.66

Double lower transit August 29

Mean Dec. +82° 37' 40".74

APPARENT PLACES OF STARS, 1986
CIRCUMPOLAR STARS AT UPPER TRANSIT AT GREENWICH

1641 B.D. +86° 161 (Camelopardi) Mag. 7.17 Spect. A2

| Day | January | | February | | March | | April | | May | | June | |
|-----|----------------|-----------------------|----------------|-----------------------|-----------------------------------|-----------------------------------|----------------|-----------------------|----------------|-----------------------|----------------|-----------------------|
| | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m 11 13 | + ° ' " / 85 42 | h m 11 13 | + ° ' " / 85 42 | h m 11 13 | + ° ' " / 85 42 | h m 11 13 | + ° ' " / 85 43 | h m 11 13 | + ° ' " / 85 43 | h m 11 13 | + ° ' " / 85 43 |
| 1 | 09.38 | 44.66 | 17.72 | 49.10 | 21.71 | 56.70 | 20.90 | 06.24 | 15.86 | 12.99 | 08.16 | 15.45 |
| 2 | 09.70 | 44.75 | 17.88 | 49.32 | 21.73 | 56.99 | 20.83 | 06.48 | 15.67 | 13.18 | 07.87 | 15.47 |
| 3 | 10.01 | 44.85 | 18.04 | 49.53 | 21.75 | 57.26 | 20.77 | 06.75 | 15.47 | 13.37 | 07.57 | 15.47 |
| 4 | 10.29 | 44.95 | 18.22 | 49.72 | 21.79 | 57.52 | 20.69 | 07.04 | 15.24 | 13.57 | 07.26 | 15.46 |
| 5 | 10.55 | 45.04 | 18.41 | 49.90 | 21.84 | 57.77 | 20.60 | 07.34 | 14.98 | 13.76 | 06.96 | 15.42 |
| 6 | 10.80 | 45.11 | 18.62 | 50.08 | 21.92 | 58.03 | 20.49 | 07.66 | 14.71 | 13.93 | 06.66 | 15.36 |
| 7 | 11.05 | 45.16 | 18.85 | 50.28 | 22.00 | 58.32 | 20.34 | 07.97 | 14.43 | 14.09 | 06.38 | 15.28 |
| 8 | 11.33 | 45.19 | 19.09 | 50.51 | 22.09 | 58.62 | 20.18 | 08.28 | 14.15 | 14.22 | 06.12 | 15.20 |
| 9 | 11.63 | 45.22 | 19.32 | 50.77 | 22.16 | 58.96 | 19.99 | 08.57 | 13.87 | 14.33 | 05.88 | 15.11 |
| 10 | 11.96 | 45.27 | 19.53 | 51.05 | ^{22 20} _{22 22} | ^{59 31} _{59 67} | 19.80 | 08.84 | 13.60 | 14.42 | 05.65 | 15.02 |
| 11 | 12.30 | 45.33 | 19.72 | 51.36 | 22.21 | 60.03 | 19.60 | 09.09 | 13.34 | 14.50 | 05.43 | 14.94 |
| 12 | 12.64 | 45.43 | 19.88 | 51.67 | 22.18 | 60.38 | 19.41 | 09.32 | 13.10 | 14.57 | 05.21 | 14.87 |
| 13 | 12.98 | 45.57 | 20.02 | 51.99 | 22.14 | 60.72 | 19.23 | 09.54 | 12.87 | 14.63 | 04.99 | 14.81 |
| 14 | 13.29 | 45.73 | 20.14 | 52.29 | 22.08 | 61.04 | 19.05 | 09.75 | 12.65 | 14.71 | 04.76 | 14.77 |
| 15 | 13.58 | 45.90 | 20.24 | 52.59 | 22.02 | 61.34 | 18.89 | 09.95 | 12.44 | 14.79 | 04.51 | 14.72 |
| 16 | 13.85 | 46.09 | 20.34 | 52.87 | 21.97 | 61.63 | 18.74 | 10.15 | 12.23 | 14.88 | 04.24 | 14.67 |
| 17 | 14.10 | 46.27 | 20.44 | 53.13 | 21.92 | 61.91 | 18.60 | 10.36 | 12.01 | 14.98 | 03.95 | 14.60 |
| 18 | 14.33 | 46.45 | 20.54 | 53.39 | 21.89 | 62.18 | 18.47 | 10.58 | 11.77 | 15.09 | 03.65 | 14.50 |
| 19 | 14.55 | 46.61 | 20.66 | 53.64 | 21.87 | 62.46 | 18.32 | 10.82 | 11.52 | 15.20 | 03.35 | 14.36 |
| 20 | 14.77 | 46.77 | 20.79 | 53.89 | 21.86 | 62.74 | 18.17 | 11.07 | 11.23 | 15.30 | 03.07 | 14.19 |
| 21 | 15.00 | 46.91 | 20.93 | 54.15 | 21.85 | 63.03 | 17.98 | 11.32 | 10.93 | 15.37 | 02.82 | 14.00 |
| 22 | 15.24 | 47.05 | 21.07 | 54.42 | 21.84 | 63.34 | 17.77 | 11.58 | 10.61 | 15.41 | 02.60 | 13.80 |
| 23 | 15.49 | 47.19 | 21.22 | 54.71 | 21.82 | 63.67 | 17.54 | 11.81 | 10.31 | 15.42 | 02.41 | 13.62 |
| 24 | 15.75 | 47.34 | 21.36 | 55.02 | 21.77 | 64.01 | 17.28 | 12.01 | 10.03 | 15.39 | 02.23 | 13.45 |
| 25 | 16.03 | 47.49 | 21.49 | 55.36 | 21.70 | 64.35 | 17.02 | 12.18 | 09.78 | 15.35 | 02.05 | 13.31 |
| 26 | 16.31 | 47.67 | 21.59 | 55.70 | 21.60 | 64.69 | 16.78 | 12.32 | 09.55 | 15.31 | 01.85 | 13.20 |
| 27 | 16.59 | 47.87 | 21.65 | 56.05 | 21.47 | 65.01 | 16.56 | 12.44 | 09.35 | 15.30 | 01.63 | 13.09 |
| 28 | 16.87 | 48.09 | 21.69 | 56.39 | 21.33 | 65.29 | 16.37 | 12.55 | 09.14 | 15.30 | 01.39 | 12.97 |
| 29 | 17.12 | 48.33 | 21.71 | 56.70 | 21.19 | 65.55 | 16.20 | 12.68 | 08.93 | 15.33 | 01.13 | 12.85 |
| 30 | 17.34 | 48.59 | | | 21.07 | 65.78 | 16.03 | 12.83 | 08.69 | 15.37 | 00.87 | 12.71 |
| 31 | 17.54 | 48.85 | | | 20.98 | 66.01 | 15.86 | 12.99 | 08.44 | 15.41 | 00.60 | 12.55 |
| 32 | 17.72 | 49.10 | | | 20.90 | 66.24 | | | 08.16 | 15.45 | | |
| | sec δ 13.38 | tan δ 13.34 | sec δ 13.38 | tan δ 13.35 | sec δ 13.39 | tan δ 13.35 | sec δ 13.40 | tan δ 13.36 | sec δ 13.40 | tan δ 13.36 | sec δ 13.40 | tan δ 13.36 |

Mean R.A. 11^h 13^m 01.11^s

Double lower transit September 9

Mean Dec. +85° 42' 49.25"

APPARENT PLACES OF STARS, 1986
CIRCUMPOLAR STARS AT UPPER TRANSIT AT GREENWICH

397

1641 B.D. +86° 161 (Camelopardi) Mag. 7.17 Spect. A2

| Day | July | | August | | September | | October | | November | | December | |
|-----|------------------------------------|---|------------------------------------|---|------------------------------------|---|------------------------------------|---|------------------------------------|---|------------------------------------|---|
| | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | ^h ^m 11 12 | ⁺ ^o / 85 43 | ^h ^m 11 12 | ⁺ ^o / 85 42 | ^h ^m 11 12 | ⁺ ^o / 85 42 | ^h ^m 11 12 | ⁺ ^o / 85 42 | ^h ^m 11 12 | ⁺ ^o / 85 42 | ^h ^m 11 13 | ⁺ ^o / 85 42 |
| | ^s " | " | ^s " | " | ^s " | " | ^s " | " | ^s " | " | ^s " | " |
| 1 | 60.60 | 12.55 | 54.82 | 64.78 | 52.60 | 53.90 | 54.23 | 42.51 | 59.63 | 32.06 | 07.77 | 25.15 |
| 2 | 60.33 | 12.37 | 54.69 | 64.44 | 52.63 | 53.53 | 54.36 | 42.18 | 59.81 | 31.77 | 08.07 | 24.94 |
| 3 | 60.07 | 12.17 | 54.58 | 64.09 | 52.66 | 53.17 | 54.47 | 41.86 | 60.00 | 31.45 | 08.39 | 24.73 |
| 4 | 59.83 | 11.95 | 54.49 | 63.76 | 52.68 | 52.83 | 54.56 | 41.52 | 60.21 | 31.11 | 08.74 | 24.53 |
| 5 | 59.60 | 11.72 | 54.41 | 63.43 | 52.69 | 52.50 | 54.64 | 41.17 | 60.45 | 30.77 | 09.12 | 24.37 |
| 6 | 59.40 | 11.49 | 54.33 | 63.12 | 52.67 | 52.16 | 54.72 | 40.79 | 60.72 | 30.42 | 09.49 | 24.24 |
| 7 | 59.21 | 11.25 | 54.25 | 62.83 | 52.65 | 51.81 | 54.82 | 40.39 | 61.02 | 30.10 | 09.85 | 24.15 |
| 8 | 59.04 | 11.03 | 54.16 | 62.54 | 52.61 | 51.44 | 54.94 | 39.97 | 61.33 | 29.82 | 10.19 | 24.08 |
| 9 | 58.87 | 10.81 | 54.05 | 62.25 | 52.58 | 51.04 | 55.09 | 39.55 | 61.64 | 29.56 | 10.51 | 24.02 |
| 10 | 58.70 | 10.61 | 53.92 | 61.96 | 52.57 | 50.62 | 55.27 | 39.14 | 61.94 | 29.33 | 10.81 | 23.97 |
| 11 | 58.53 | 10.42 | 53.78 | 61.65 | 52.59 | 50.18 | 55.47 | 38.74 | 62.22 | 29.12 | 11.09 | 23.91 |
| 12 | 58.34 | 10.23 | 53.63 | 61.31 | 52.63 | 49.73 | 55.69 | 38.38 | 62.48 | 28.91 | 11.37 | 23.84 |
| 13 | 58.13 | 10.05 | 53.50 | 60.95 | 52.71 | 49.30 | 55.90 | 38.04 | 62.73 | 28.71 | 11.64 | 23.76 |
| 14 | 57.91 | 09.85 | 53.38 | 60.56 | 52.80 | 48.89 | 56.10 | 37.72 | 62.96 | 28.50 | 11.92 | 23.68 |
| 15 | 57.67 | 09.62 | 53.29 | 60.15 | 52.90 | 48.50 | 56.28 | 37.42 | 63.18 | 28.28 | 12.22 | 23.58 |
| 16 | 57.43 | 09.37 | 53.24 | 59.74 | 53.00 | 48.14 | 56.44 | 37.12 | 63.42 | 28.04 | 12.53 | 23.49 |
| 17 | 57.20 | 09.08 | 53.21 | 59.35 | 53.08 | 47.80 | 56.58 | 36.82 | 63.66 | 27.79 | 12.85 | 23.40 |
| 18 | 57.00 | 08.77 | 53.20 | 58.97 | 53.14 | 47.47 | 56.72 | 36.50 | 63.92 | 27.54 | 13.19 | 23.32 |
| 19 | 56.83 | 08.45 | 53.19 | 58.62 | 53.18 | 47.13 | 56.85 | 36.17 | 64.20 | 27.29 | 13.55 | 23.26 |
| 20 | 56.69 | 08.12 | 53.16 | 58.30 | 53.21 | 46.78 | 57.00 | 35.83 | 64.50 | 27.04 | 13.91 | 23.22 |
| 21 | 56.58 | 07.82 | 53.12 | 57.99 | 53.23 | 46.42 | 57.16 | 35.47 | 64.81 | 26.81 | 14.26 | 23.20 |
| 22 | 56.47 | 07.54 | 53.06 | 57.68 | 53.26 | 46.04 | 57.34 | 35.10 | 65.14 | 26.59 | 14.61 | 23.21 |
| 23 | 56.35 | 07.29 | 52.97 | 57.36 | 53.30 | 45.64 | 57.54 | 34.74 | 65.47 | 26.40 | 14.95 | 23.23 |
| 24 | 56.22 | 07.05 | 52.88 | 57.02 | 53.36 | 45.23 | 57.76 | 34.38 | 65.80 | 26.22 | 15.26 | 23.26 |
| 25 | 56.06 | 06.82 | 52.79 | 56.66 | 53.43 | 44.81 | 58.00 | 34.04 | 66.13 | 26.07 | 15.56 | 23.30 |
| 26 | 55.89 | 06.58 | 52.71 | 56.29 | 53.53 | 44.40 | 58.25 | 33.71 | 66.44 | 25.93 | 15.83 | 23.33 |
| 27 | 55.70 | 06.32 | 52.64 | 55.90 | 53.65 | 43.99 | 58.51 | 33.40 | 66.73 | 25.80 | 16.10 | 23.35 |
| 28 | 55.51 | 06.05 | 52.59 | 55.50 | 53.79 | 43.60 | 58.76 | 33.12 | 67.00 | 25.67 | 16.37 | 23.34 |
| 29 | 55.31 | 05.76 | 52.57 | 55.09 | 53.93 | 43.22 | 59.00 | 32.85 | 67.26 | 25.52 | 16.65 | 23.31 |
| 30 | 55.13 | 05.45 | 52.56 | 54.69 | 54.08 | 42.85 | 59.23 | 32.59 | 67.51 | 25.35 | 16.96 | 23.26 |
| 31 | 54.96 | 05.12 | 52.57 | 54.29 | 54.23 | 42.51 | 59.44 | 32.33 | 67.77 | 25.15 | 17.29 | 23.23 |
| 32 | 54.82 | 04.78 | 52.60 | 53.90 | | | 59.63 | 32.06 | | | 17.66 | 23.22 |
| | sec δ 13.40 | tan δ 13.36 | sec δ 13.39 | tan δ 13.35 | sec δ 13.38 | tan δ 13.34 | sec δ 13.37 | tan δ 13.33 | sec δ 13.36 | tan δ 13.32 | sec δ 13.36 | tan δ 13.32 |

Mean R.A. 11^h 13^m 01.11^s

Double lower transit September 9

Mean Dec. +85° 42' 49.25"

APPARENT PLACES OF STARS, 1986
CIRCUMPOLAR STARS AT UPPER TRANSIT AT GREENWICH

1642 Groombridge 1850 (Camelopardi) Mag. 6.38 Spect. F5

| Day | January | | February | | March | | April | | May | | June | |
|-----|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m 12 03 | + ° ' 39 | h m 12 04 | + ° ' 39 | h m 12 04 | + ° ' 39 | h m 12 04 | + ° ' 39 | h m 12 04 | + ° ' 40 | h m 12 03 | + ° ' 40 |
| | s 58.61 | " 35.96 | s 07.58 | " 38.31 | s 12.95 | " 44.81 | s 14.03 | " 54.38 | s 10.47 | " 02.27 | s 63.48 | " 06.64 |
| 1 | 58.95 | 35.97 | 07.78 | 38.50 | 13.02 | 45.09 | 14.01 | 54.63 | 10.32 | 02.50 | 63.20 | 06.74 |
| 2 | 59.26 | 36.00 | 07.98 | 38.66 | 13.09 | 45.35 | 14.00 | 54.91 | 10.16 | 02.74 | 62.91 | 06.82 |
| 3 | | | | | | | | | | | | |
| 4 | 59.55 | 36.03 | 08.19 | 38.81 | 13.18 | 45.60 | 13.99 | 55.21 | 09.97 | 02.99 | 62.61 | 06.88 |
| 5 | 59.82 | 36.05 | 08.41 | 38.94 | 13.29 | 45.83 | 13.95 | 55.54 | 09.76 | 03.24 | 62.31 | 06.92 |
| 6 | 60.08 | 36.06 | 08.65 | 39.07 | 13.41 | 46.07 | 13.90 | 55.87 | 09.54 | 03.48 | 62.01 | 06.93 |
| 7 | 60.34 | 36.05 | 08.92 | 39.22 | 13.55 | 46.33 | 13.83 | 56.21 | 09.29 | 03.70 | 61.73 | 06.93 |
| 8 | 60.62 | 36.02 | 09.19 | 39.38 | 13.69 | 46.61 | 13.72 | 56.55 | 09.05 | 03.90 | 61.46 | 06.92 |
| 9 | 60.92 | 35.97 | 09.47 | 39.58 | 13.82 | 46.92 | 13.60 | 56.88 | 08.80 | 04.08 | 61.21 | 06.90 |
| 10 | 61.24 | 35.94 | 09.73 | 39.81 | 13.93 | 47.26 | 13.47 | 57.20 | 08.55 | 04.23 | 60.97 | 06.87 |
| 11 | 61.59 | 35.93 | 09.97 | 40.06 | 14.02 | 47.60 | 13.33 | 57.49 | 08.32 | 04.38 | 60.74 | 06.85 |
| 12 | 61.94 | 35.95 | 10.19 | 40.33 | 14.08 | 47.96 | 13.19 | 57.77 | 08.10 | 04.51 | 60.52 | 06.84 |
| 13 | 62.29 | 36.00 | 10.38 | 40.60 | 14.12 | 48.31 | 13.05 | 58.03 | 07.89 | 04.63 | 60.29 | 06.84 |
| 14 | 62.63 | 36.08 | 10.55 | 40.87 | 14.14 | 48.65 | 12.92 | 58.27 | 07.69 | 04.76 | 60.06 | 06.86 |
| 15 | 62.94 | 36.18 | 10.71 | 41.13 | 14.15 | 48.98 | 12.81 | 58.51 | 07.51 | 04.89 | 59.81 | 06.87 |
| 16 | 63.24 | 36.30 | 10.86 | 41.38 | 14.15 | 49.29 | 12.70 | 58.75 | 07.32 | 05.04 | 59.53 | 06.89 |
| 17 | 63.51 | 36.41 | 11.01 | 41.62 | 14.16 | 49.59 | 12.61 | 58.99 | 07.12 | 05.20 | 59.24 | 06.89 |
| 18 | 63.77 | 36.53 | 11.16 | 41.85 | 14.17 | 49.87 | 12.52 | 59.25 | 06.92 | 05.36 | 58.93 | 06.87 |
| 19 | 64.02 | 36.64 | 11.33 | 42.07 | 14.19 | 50.15 | 12.43 | 59.52 | 06.69 | 05.54 | 58.61 | 06.82 |
| 20 | 64.27 | 36.74 | 11.50 | 42.28 | 14.23 | 50.42 | 12.32 | 59.80 | 06.43 | 05.70 | 58.31 | 06.72 |
| 21 | 64.51 | 36.83 | 11.69 | 42.50 | 14.27 | 50.70 | 12.20 | 60.09 | 06.15 | 05.85 | 58.02 | 06.60 |
| 22 | 64.77 | 36.91 | 11.88 | 42.73 | 14.32 | 50.99 | 12.04 | 60.39 | 05.85 | 05.97 | 57.78 | 06.47 |
| 23 | 65.04 | 36.98 | 12.09 | 42.98 | 14.37 14.41 | 51.30 51.63 | 11.85 | 60.68 | 05.56 | 06.05 | 57.55 | 06.34 |
| 24 | 65.33 | 37.06 | 12.28 | 43.26 | 14.44 | 51.97 | 11.65 | 60.94 | 05.28 | 06.10 | 57.35 | 06.23 |
| 25 | 65.63 | 37.15 | 12.47 | 43.55 | 14.43 | 52.33 | 11.43 | 61.17 | 05.03 | 06.13 | 57.14 | 06.15 |
| 26 | 65.94 | 37.26 | 12.63 | 43.86 | 14.40 | 52.68 | 11.22 | 61.36 | 04.81 | 06.15 | 56.93 | 06.08 |
| 27 | 66.25 | 37.39 | 12.76 | 44.19 | 14.33 | 53.02 | 11.04 | 61.54 | 04.61 | 06.19 | 56.69 | 06.03 |
| 28 | 66.56 | 37.54 | 12.86 | 44.51 | 14.26 | 53.33 | 10.88 | 61.70 | 04.41 | 06.25 | 56.44 | 05.98 |
| 29 | 66.85 | 37.72 | 12.95 | 44.81 | 14.17 | 53.62 | 10.73 | 61.87 | 04.21 | 06.33 | 56.16 | 05.93 |
| 30 | 67.12 | 37.91 | | | 14.11 | 53.88 | 10.60 | 62.06 | 03.99 | 06.43 | 55.88 | 05.86 |
| 31 | 67.36 | 38.12 | | | 14.06 | 54.13 | 10.47 | 62.27 | 03.75 | 06.54 | 55.58 | 05.77 |
| 32 | 67.58 | 38.31 | | | 14.03 | 54.38 | | | 03.48 | 06.64 | | |
| | sec δ 13.21 | tan δ 13.18 | sec δ 13.22 | tan δ 13.18 | sec δ 13.23 | tan δ 13.19 | sec δ 13.23 | tan δ 13.20 | sec δ 13.24 | tan δ 13.20 | sec δ 13.24 | tan δ 13.20 |

Mean R.A. 12^h 03^m 51.^s59

Double lower transit September 22

Mean Dec. +85° 39' 43.0"

APPARENT PLACES OF STARS, 1986
CIRCUMPOLAR STARS AT UPPER TRANSIT AT GREENWICH

399

1642 Groombridge 1850 (Camelopardi) Mag. 6.38 Spect. F5

| Day | July | | August | | September | | October | | November | | December | |
|-----|------------------------------------|--|------------------------------------|--|------------------------------------|--|------------------------------------|--|------------------------------------|--|------------------------------------|--|
| | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | ^h ^m 12 03 | ⁺ ^o ['] 85 39 | ^h ^m 12 03 | ⁺ ^o ['] 85 39 | ^h ^m 12 03 | ⁺ ^o ['] 85 39 | ^h ^m 12 03 | ⁺ ^o ['] 85 39 | ^h ^m 12 03 | ⁺ ^o ['] 85 39 | ^h ^m 12 03 | ⁺ ^o ['] 85 39 |
| | ^s 55.58 | " 65.77 | ^s 48.46 | " 59.71 | ^s 44.18 | " 49.71 | ^s 43.54 | " 38.26 | ^s 46.75 | " 26.79 | ^s 53.33 | " 18.13 |
| 1 | 55.29 | 65.66 | 48.27 | 59.41 | 44.14 | 49.35 | 43.60 | 37.91 | 46.87 | 26.46 | 53.58 | 17.85 |
| 2 | 55.00 | 65.53 | 48.10 | 59.10 | 44.10 | 48.99 | 43.64 | 37.56 | 46.99 | 26.11 | 53.85 | 17.57 |
| 3 | | | | | | | | | | | | |
| 4 | 54.72 | 65.38 | 47.94 | 58.80 | 44.05 | 48.66 | 43.67 | 37.22 | 47.13 | 25.73 | 54.16 | 17.30 |
| 5 | 54.46 | 65.22 | 47.80 | 58.51 | 43.99 | 48.33 | 43.68 | 36.85 | 47.30 | 25.34 | 54.49 | 17.05 |
| 6 | 54.22 | 65.04 | 47.67 | 58.22 | 43.91 | 48.01 | 43.68 | 36.47 | 47.50 | 24.94 | 54.83 | 16.84 |
| 7 | 53.99 | 64.87 | 47.53 | 57.96 | 43.82 | 47.67 | 43.70 | 36.05 | 47.73 | 24.56 | 55.16 | 16.66 |
| 8 | 53.78 | 64.69 | 47.38 | 57.70 | 43.71 | 47.32 | 43.74 | 35.62 | 47.98 | 24.21 | 55.48 | 16.51 |
| 9 | 53.57 | 64.53 | 47.22 | 57.45 | 43.60 | 46.94 | 43.80 | 35.17 | 48.23 | 23.88 | 55.78 | 16.38 |
| 10 | 53.37 | 64.38 | 47.03 | 57.20 | 43.51 | 46.53 | 43.90 | 34.73 | 48.48 | 23.59 | 56.05 | 16.26 |
| 11 | 53.16 | 64.24 | 46.84 | 56.93 | 43.44 | 46.10 | 44.02 | 34.30 | 48.71 | 23.31 | 56.32 | 16.13 |
| 12 | 52.94 | 64.10 | 46.63 | 56.64 | 43.40 | 45.66 | 44.16 | 33.89 | 48.92 | 23.05 | 56.57 | 16.00 |
| 13 | 52.70 | 63.97 | 46.43 | 56.32 | 43.39 | 45.22 | 44.30 | 33.51 | 49.11 | 22.80 | 56.82 | 15.86 |
| 14 | 52.44 | 63.83 | 46.24 | 55.97 | 43.40 | 44.80 | 44.43 | 33.16 | 49.30 | 22.53 | 57.08 | 15.71 |
| 15 | 52.17 | 63.68 | 46.07 | 55.60 | 43.43 | 44.40 | 44.54 | 32.82 | 49.48 | 22.26 | 57.35 | 15.54 |
| 16 | 51.89 | 63.49 | 45.94 | 55.22 | 43.45 | 44.03 | 44.64 | 32.49 | 49.66 | 21.98 | 57.63 | 15.38 |
| 17 | 51.61 | 63.27 | 45.84 | 54.84 | 43.46 | 43.68 | 44.72 | 32.16 | 49.85 | 21.68 | 57.93 | 15.22 |
| 18 | 51.36 | 63.02 | 45.75 | 54.49 | 43.45 | 43.34 | 44.79 | 31.82 | 50.05 | 21.37 | 58.25 | 15.06 |
| 19 | 51.13 | 62.75 | 45.68 | 54.15 | 43.42 | 43.00 | 44.86 | 31.46 | 50.27 | 21.06 | 58.58 | 14.92 |
| 20 | 50.93 | 62.47 | 45.59 | 53.84 | 43.38 | 42.65 | 44.93 | 31.09 | 50.52 | 20.75 | 58.92 | 14.80 |
| 21 | 50.76 | 62.21 | 45.48 | 53.55 | 43.33 | 42.29 | 45.02 | 30.70 | 50.78 | 20.45 | 59.26 | 14.69 |
| 22 | 50.60 | 61.97 | 45.36 | 53.26 | 43.28 | 41.91 | 45.13 | 30.30 | 51.05 | 20.16 | 59.60 | 14.62 |
| 23 | 50.44 | 61.75 | 45.22 | 52.97 | 43.25 | 41.52 | 45.25 | 29.90 | 51.34 | 19.89 | 59.93 | 14.56 |
| 24 | 50.26 | 61.56 | 45.07 | 52.67 | 43.22 | 41.11 | 45.40 | 29.50 | 51.63 | 19.64 | 60.25 | 14.52 |
| 25 | 50.07 | 61.37 | 44.91 | 52.34 | 43.22 | 40.69 | 45.56 | 29.11 | 51.91 | 19.41 | 60.54 | 14.48 |
| 26 | 49.85 | 61.18 | 44.76 | 52.00 | 43.24 | 40.26 | 45.74 | 28.74 | 52.18 | 19.20 | 60.81 | 14.44 |
| 27 | 49.62 | 60.98 | 44.61 | 51.64 | 43.27 | 39.84 | 45.93 | 28.38 | 52.44 | 19.01 | 61.07 | 14.39 |
| 28 | 49.37 | 60.77 | 44.49 | 51.26 | 43.33 | 39.42 | 46.12 | 28.03 | 52.68 | 18.81 | 61.33 | 14.32 |
| 29 | 49.13 | 60.53 | 44.38 | 50.88 | 43.40 | 39.02 | 46.30 | 27.71 | 52.90 | 18.60 | 61.60 | 14.23 |
| 30 | 48.89 | 60.27 | 44.30 | 50.48 | 43.47 | 38.63 | 46.47 | 27.40 | 53.11 | 18.38 | 61.89 | 14.11 |
| 31 | 48.67 | 60.00 | 44.23 | 50.09 | 43.54 | 38.26 | 46.62 | 27.10 | 53.33 | 18.13 | 62.22 | 14.00 |
| 32 | 48.46 | 59.71 | 44.18 | 49.71 | | | 46.75 | 26.79 | | | 62.57 | 13.91 |
| | sec δ 13.24 | tan δ 13.20 | sec δ 13.23 | tan δ 13.19 | sec δ 13.22 | tan δ 13.18 | sec δ 13.21 | tan δ 13.17 | sec δ 13.20 | tan δ 13.16 | sec δ 13.20 | tan δ 13.16 |

Mean R.A. $12^{\text{h}} 03^{\text{m}} 51.59^{\text{s}}$

Double lower transit September 22

Mean Dec. $+85^{\circ} 39' 43.03''$

APPARENT PLACES OF STARS, 1986
CIRCUMPOLAR STARS AT UPPER TRANSIT AT GREENWICH

1643 Groombridge 2063 (Camelopardi) Mag. 6.16 Spect. G5

| Day | January | | February | | March | | April | | May | | June | |
|-----|------------------------------------|---|------------------------------------|---|------------------------------------|---|--------------------------------------|---|------------------------------------|---|------------------------------------|---|
| | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | ^h ^m 13 42 | ⁺ ^o / 82 48 | ^h ^m 13 42 | ⁺ ^o / 82 49 | ^h ^m 13 42 | ⁺ ^o / 82 49 | ^h ^m 13 42 | ⁺ ^o / 82 49 | ^h ^m 13 42 | ⁺ ^o / 82 49 | ^h ^m 13 42 | ⁺ ^o / 82 49 |
| | ^s 44.30 | ^s 62.35 | ^s 49.97 | ^s 00.18 | ^s 54.51 | ^s 03.50 | ^s 57.31 | ^s 11.47 | ^s 57.24 | ^s 20.73 | ^s 54.46 | ^s 28.27 |
| 1 | 44.30 | 62.35 | 49.97 | 00.18 | 54.51 | 03.50 | 57.31 | 11.47 | 57.24 | 20.73 | 54.46 | 28.27 |
| 2 | 44.49 | 62.20 | 50.13 | 00.24 | 54.62 | 03.72 | 57.36 | 11.72 | 57.22 | 21.01 | 54.33 | 28.50 |
| 3 | 44.67 | 62.07 | 50.28 | 00.30 | 54.72 | 03.92 | 57.41 | 11.97 | 57.18 | 21.32 | 54.18 | 28.72 |
| 4 | 44.84 | 61.95 | 50.44 | 00.33 | 54.83 | 04.10 | 57.47 | 12.23 | 57.13 | 21.64 | 54.03 | 28.92 |
| 5 | 45.00 | 61.84 | 50.60 | 00.35 | 54.95 | 04.27 | 57.53 | 12.52 | 57.07 | 21.96 | 53.88 | 29.11 |
| 6 | 45.16 | 61.72 | 50.77 | 00.35 | 55.09 | 04.43 | 57.59 | 12.83 | 57.00 | 22.29 | 53.73 | 29.28 |
| 7 | 45.31 | 61.59 | 50.96 | 00.36 | 55.23 | 04.61 | 57.64 | 13.16 | 56.92 | 22.61 | 53.58 | 29.42 |
| 8 | 45.46 | 61.43 | 51.16 | 00.38 | 55.37 | 04.80 | 57.67 | 13.51 | 56.82 | 22.92 | 53.43 | 29.55 |
| 9 | 45.63 | 61.25 | 51.36 | 00.43 | 55.51 | 05.02 | 57.69 | 13.86 | 56.73 | 23.20 | 53.29 | 29.66 |
| 10 | 45.82 | 61.07 | 51.56 | 00.51 | 55.65 | 05.27 | 57.69 | 14.22 | 56.64 | 23.47 | 53.16 | 29.76 |
| 11 | 46.01 | 60.89 | 51.75 | 00.63 | 55.78 | 05.54 | 57.69 | 14.57 | 56.54 | 23.72 | 53.04 | 29.87 |
| 12 | 46.22 | 60.74 | 51.93 | 00.76 | 55.89 | 05.83 | 57.68 | 14.91 | 56.46 | 23.95 | 52.91 | 29.98 |
| 13 | 46.43 | 60.62 | 52.10 | 00.91 | 55.99 | 06.13 | 57.67 | 15.23 | 56.38 | 24.18 | 52.79 | 30.10 |
| 14 | 46.64 | 60.54 | 52.25 | 01.07 | 56.08 | 06.43 | 57.65 | 15.53 | 56.30 | 24.40 | 52.67 | 30.23 |
| 15 | 46.84 | 60.48 | 52.40 | 01.23 | 56.16 | 06.72 | 57.64 | 15.82 | 56.23 | 24.62 | 52.53 | 30.37 |
| 16 | 47.03 | 60.44 | 52.55 | 01.38 | 56.23 | 07.00 | 57.64 | 16.10 | 56.17 | 24.85 | 52.38 | 30.52 |
| 17 | 47.21 | 60.41 | 52.69 | 01.53 | 56.31 | 07.27 | ^{57.64} ^{57.65} | ^{16.37} ^{16.65} | 56.10 | 25.09 | 52.22 | 30.68 |
| 18 | 47.39 | 60.39 | 52.83 | 01.66 | 56.38 | 07.52 | 57.66 | 16.92 | 56.02 | 25.35 | 52.05 | 30.81 |
| 19 | 47.55 | 60.37 | 52.97 | 01.79 | 56.46 | 07.77 | 57.67 | 17.22 | 55.93 | 25.62 | 51.87 | 30.92 |
| 20 | 47.72 | 60.34 | 53.12 | 01.90 | 56.55 | 08.00 | 57.68 | 17.53 | 55.82 | 25.90 | 51.68 | 30.99 |
| 21 | 47.88 | 60.30 | 53.28 | 02.01 | 56.64 | 08.24 | 57.67 | 17.86 | 55.70 | 26.17 | 51.51 | 31.03 |
| 22 | 48.05 | 60.25 | 53.45 | 02.13 | 56.74 | 08.48 | 57.65 | 18.21 | 55.57 | 26.43 | 51.35 | 31.05 |
| 23 | 48.23 | 60.19 | 53.62 | 02.26 | 56.84 | 08.74 | 57.61 | 18.56 | 55.43 | 26.65 | 51.21 | 31.05 |
| 24 | 48.41 | 60.12 | 53.80 | 02.42 | 56.93 | 09.02 | 57.55 | 18.90 | 55.30 | 26.84 | 51.08 | 31.06 |
| 25 | 48.61 | 60.06 | 53.97 | 02.60 | 57.02 | 09.32 | 57.49 | 19.21 | 55.17 | 26.99 | 50.95 | 31.10 |
| 26 | 48.81 | 60.01 | 54.12 | 02.80 | 57.10 | 09.65 | 57.43 | 19.50 | 55.07 | 27.14 | 50.82 | 31.15 |
| 27 | 49.02 | 59.98 | 54.27 | 03.03 | 57.15 | 09.98 | 57.37 | 19.75 | 54.97 | 27.28 | 50.68 | 31.23 |
| 28 | 49.23 | 59.97 | 54.40 | 03.27 | 57.20 | 10.32 | 57.33 | 19.99 | 54.88 | 27.44 | 50.53 | 31.31 |
| 29 | 49.43 | 59.99 | 54.51 | 03.50 | 57.22 | 10.64 | 57.29 | 20.22 | 54.79 | 27.62 | 50.36 | 31.40 |
| 30 | 49.62 | 60.04 | | | 57.25 | 10.94 | 57.27 | 20.47 | 54.69 | 27.83 | 50.19 | 31.48 |
| 31 | 49.80 | 60.10 | | | 57.27 | 11.22 | 57.24 | 20.73 | 54.58 | 28.04 | 50.01 | 31.55 |
| 32 | 49.97 | 60.18 | | | 57.31 | 11.47 | | | 54.46 | 28.27 | | |
| | sec δ 8.00 | tan δ 7.93 | sec δ 8.00 | tan δ 7.93 | sec δ 8.00 | tan δ 7.94 | sec δ 8.00 | tan δ 7.94 | sec δ 8.00 | tan δ 7.94 | sec δ 8.01 | tan δ 7.94 |

Mean R.A. ^h 13 ^m 42 ^s 42.99

Double lower transit October 17

Mean Dec. +82° 49' 13.03"

APPARENT PLACES OF STARS, 1986
CIRCUMPOLAR STARS AT UPPER TRANSIT AT GREENWICH

401

1643 Groombridge 2063 (Camelopardi) Mag. 6.16 Spect. G5

| Day | July | | August | | September | | October | | November | | December | |
|-----|---------------|-------------------|---------------|-------------------|---------------|-------------------|---------------|-------------------|---------------|-------------------|---------------|-------------------|
| | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m 13 42 | + o / 82 49 | h m 13 42 | + o / 82 49 | h m 13 42 | + o / 82 49 | h m 13 42 | + o / 82 49 | h m 13 42 | + o / 82 48 | h m 13 42 | + o / 82 48 |
| | s 50.01 | " 31.55 | s 44.84 | " 29.76 | s 40.34 | " 22.97 | s 37.51 | " 13.02 | s 36.84 | " 61.13 | s 38.74 | " 50.13 |
| 1 | 49.83 | 31.60 | 44.67 | 29.58 | 40.24 | 22.67 | 37.47 | 12.67 | 36.84 | 60.77 | 38.83 | 49.76 |
| 2 | 49.64 | 31.63 | 44.51 | 29.40 | 40.14 | 22.37 | 37.41 | 12.34 | 36.84 | 60.39 | 38.93 | 49.38 |
| 3 | 49.46 | 31.64 | 44.37 | 29.21 | 40.04 | 22.09 | 37.35 | 12.01 | 36.84 | 59.98 | 39.05 | 48.99 |
| 4 | 49.29 | 31.62 | 44.23 | 29.02 | 39.93 | 21.83 | 37.27 | 11.68 | 36.86 | 59.55 | 39.19 | 48.61 |
| 5 | 49.12 | 31.60 | 44.09 | 28.84 | 39.81 | 21.58 | 37.19 | 11.32 | 36.89 | 59.10 | 39.34 | 48.26 |
| 6 | 48.96 | 31.56 | 43.96 | 28.67 | 39.68 | 21.32 | 37.12 | 10.94 | 36.94 | 58.65 | 39.49 | 47.94 |
| 7 | 48.81 | 31.51 | 43.82 | 28.52 | 39.54 | 21.05 | 37.05 | 10.54 | 37.01 | 58.21 | 39.63 | 47.65 |
| 8 | 48.67 | 31.47 | 43.67 | 28.38 | 39.40 | 20.76 | 36.99 | 10.10 | 37.08 | 57.80 | 39.77 | 47.39 |
| 9 | 48.52 | 31.44 | 43.51 | 28.24 | 39.27 | 20.44 | 36.96 | 09.66 | 37.15 | 57.42 | 39.90 | 47.14 |
| 10 | 48.38 | 31.42 | 43.34 | 28.10 | 39.14 | 20.09 | 36.93 | 09.22 | 37.22 | 57.06 | 40.02 | 46.90 |
| 11 | 48.23 | 31.42 | 43.17 | 27.94 | 39.03 | 19.72 | 36.92 | 08.79 | 37.28 | 56.72 | 40.14 | 46.66 |
| 12 | 48.07 | 31.42 | 42.99 | 27.75 | 38.93 | 19.34 | 36.92 | 08.38 | 37.34 | 56.39 | 40.25 | 46.40 |
| 13 | 47.89 | 31.42 | 42.81 | 27.53 | 38.85 | 18.96 | 36.91 | 08.00 | 37.38 | 56.06 | 40.37 | 46.14 |
| 14 | 47.71 | 31.42 | 42.64 | 27.28 | 38.78 | 18.59 | 36.90 | 07.64 | 37.42 | 55.72 | 40.49 | 45.87 |
| 15 | 47.51 | 31.39 | 42.49 | 27.01 | 38.71 | 18.25 | 36.88 | 07.29 | 37.47 | 55.38 | 40.62 | 45.58 |
| 16 | 47.32 | 31.33 | 42.36 | 26.73 | 38.63 | 17.93 | 36.85 | 06.95 | 37.51 | 55.02 | 40.76 | 45.29 |
| 17 | 47.13 | 31.24 | 42.24 | 26.46 | 38.55 | 17.63 | 36.82 | 06.61 | 37.57 | 54.64 | 40.91 | 45.00 |
| 18 | 46.95 | 31.12 | 42.13 | 26.20 | 38.46 | 17.33 | 36.78 | 06.25 | 37.63 | 54.25 | 41.08 | 44.72 |
| 19 | 46.79 | 30.97 | 42.01 | 25.97 | 38.36 | 17.04 | 36.74 | 05.88 | 37.70 | 53.86 | 41.24 | 44.44 |
| 20 | 46.64 | 30.83 | 41.88 | 25.76 | 38.25 | 16.74 | 36.71 | 05.49 | 37.79 | 53.46 | 41.42 | 44.19 |
| 21 | 46.51 | 30.70 | 41.75 | 25.57 | 38.15 | 16.42 | 36.69 | 05.08 | 37.89 | 53.07 | 41.60 | 43.95 |
| 22 | 46.37 | 30.59 | 41.61 | 25.37 | 38.04 | 16.08 | 36.68 | 04.66 | 37.99 | 52.69 | 41.77 | 43.74 |
| 23 | 46.23 | 30.51 | 41.45 | 25.17 | 37.94 | 15.72 | 36.67 | 04.23 | 38.10 | 52.33 | 41.94 | 43.55 |
| 24 | 46.08 | 30.44 | 41.30 | 24.96 | 37.85 | 15.35 | 36.69 | 03.80 | 38.21 | 51.99 | 42.09 | 43.38 |
| 25 | 45.92 | 30.38 | 41.14 | 24.73 | 37.77 | 14.96 | 36.71 | 03.37 | 38.32 | 51.66 | 42.24 | 43.21 |
| 26 | 45.74 | 30.32 | 40.98 | 24.47 | 37.70 | 14.56 | 36.73 | 02.96 | 38.42 | 51.36 | 42.38 | 43.03 |
| 27 | 45.56 | 30.24 | 40.83 | 24.20 | 37.65 | 14.16 | 36.77 | 02.56 | 38.51 | 51.06 | 42.51 | 42.84 |
| 28 | 45.38 | 30.15 | 40.69 | 23.91 | 37.60 | 13.77 | 36.80 | 02.18 | 38.59 | 50.77 | 42.65 | 42.63 |
| 29 | 45.19 | 30.04 | 40.57 | 23.60 | 37.55 | 13.39 | 36.82 | 01.82 | 38.66 | 50.46 | 42.80 | 42.39 |
| 30 | 45.01 | 29.91 | 40.45 | 23.29 | 37.51 | 13.02 | 36.84 | 01.47 | 38.74 | 50.13 | 42.97 | 42.14 |
| 31 | 44.84 | 29.76 | 40.34 | 22.97 | | | 36.84 | 01.13 | | | 43.16 | 41.89 |
| 32 | | | | | | | | | | | | |
| | sec δ 8.01 | tan δ 7.94 | sec δ 8.01 | tan δ 7.94 | sec δ 8.00 | tan δ 7.94 | sec δ 8.00 | tan δ 7.94 | sec δ 8.00 | tan δ 7.93 | sec δ 7.99 | tan δ 7.93 |

Mean R.A. 13^h 42^m 42.99^s

Double lower transit October 17

Mean Dec. +82° 49' 13.03"

APPARENT PLACES OF STARS, 1986
CIRCUMPOLAR STARS AT UPPER TRANSIT AT GREENWICH

1644 Groombridge 2196 (Ursae-Minoris) Mag. 5.73 Spect. G0

| Day | January | | February | | March | | April | | May | | June | |
|-----|---------|-------|----------|-------|-------|-------|-------|-------|---|---|-------|-------|
| | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° ' + | h m | ° ' + | h m | ° ' + | h m | ° ' + | h m | ° ' + | h m | ° ' + |
| | 14 51 | 82 33 | 14 51 | 82 33 | 14 51 | 82 33 | 14 51 | 82 33 | 14 51 | 82 34 | 14 51 | 82 34 |
| | s | " | s | " | s | " | s | " | s | " | s | " |
| 1 | 10.45 | 52.75 | 15.47 | 47.72 | 20.24 | 48.52 | 24.07 | 54.71 | 25.39 | 03.48 | 23.95 | 12.66 |
| 2 | 10.61 | 52.51 | 15.63 | 47.70 | 20.37 | 48.67 | 24.15 | 54.93 | 25.41 | 03.74 | 23.86 | 12.95 |
| 3 | 10.76 | 52.29 | 15.78 | 47.67 | 20.50 | 48.81 | 24.24 | 55.15 | 25.43 | 04.04 | 23.76 | 13.24 |
| 4 | 10.90 | 52.09 | 15.93 | 47.62 | 20.63 | 48.93 | 24.34 | 55.37 | 25.44 | 04.35 | 23.65 | 13.53 |
| 5 | 11.04 | 51.90 | 16.09 | 47.56 | 20.77 | 49.03 | 24.44 | 55.61 | ^{25 44} _{25 43} 25.41 | ^{04 68} _{05 03} 04.35 | 23.53 | 13.80 |
| 6 | 11.16 | 51.71 | 16.25 | 47.48 | 20.92 | 49.12 | 24.54 | 55.88 | 25.41 | 05.39 | 23.42 | 14.05 |
| 7 | 11.28 | 51.50 | 16.43 | 47.39 | 21.08 | 49.22 | 24.63 | 56.18 | 25.38 | 05.74 | 23.30 | 14.27 |
| 8 | 11.41 | 51.27 | 16.62 | 47.31 | 21.25 | 49.33 | 24.71 | 56.49 | 25.34 | 06.09 | 23.18 | 14.48 |
| 9 | 11.54 | 51.02 | 16.82 | 47.25 | 21.41 | 49.46 | 24.78 | 56.82 | 25.30 | 06.42 | 23.07 | 14.68 |
| 10 | 11.69 | 50.75 | 17.02 | 47.22 | 21.58 | 49.62 | 24.84 | 57.16 | 25.25 | 06.73 | 22.97 | 14.86 |
| 11 | 11.85 | 50.48 | 17.21 | 47.23 | 21.74 | 49.82 | 24.89 | 57.50 | 25.20 | 07.03 | 22.87 | 15.03 |
| 12 | 12.03 | 50.23 | 17.40 | 47.26 | 21.88 | 50.03 | 24.93 | 57.83 | 25.16 | 07.31 | 22.77 | 15.21 |
| 13 | 12.21 | 50.01 | 17.58 | 47.31 | 22.02 | 50.26 | 24.97 | 58.15 | 25.12 | 07.57 | 22.67 | 15.39 |
| 14 | 12.39 | 49.81 | 17.75 | 47.38 | 22.15 | 50.50 | 25.00 | 58.45 | 25.08 | 07.83 | 22.58 | 15.59 |
| 15 | 12.57 | 49.65 | 17.92 | 47.45 | 22.27 | 50.74 | 25.04 | 58.74 | 25.05 | 08.09 | 22.47 | 15.81 |
| 16 | 12.74 | 49.51 | 18.07 | 47.52 | 22.38 | 50.97 | 25.08 | 59.02 | 25.02 | 08.35 | 22.36 | 16.04 |
| 17 | 12.91 | 49.39 | 18.23 | 47.59 | 22.49 | 51.19 | 25.12 | 59.28 | 25.00 | 08.62 | 22.23 | 16.28 |
| 18 | 13.07 | 49.27 | 18.38 | 47.64 | 22.60 | 51.40 | 25.17 | 59.55 | 24.96 | 08.92 | 22.08 | 16.51 |
| 19 | 13.22 | 49.16 | 18.54 | 47.69 | 22.71 | 51.59 | 25.22 | 59.81 | 24.92 | 09.23 | 21.93 | 16.72 |
| 20 | 13.37 | 49.05 | 18.70 | 47.72 | 22.83 | 51.78 | 25.27 | 60.09 | 24.86 | 09.56 | 21.77 | 16.90 |
| 21 | 13.52 | 48.93 | 18.87 | 47.75 | 22.95 | 51.96 | 25.33 | 60.39 | 24.79 | 09.89 | 21.62 | 17.04 |
| 22 | 13.67 | 48.79 | 19.04 | 47.77 | 23.08 | 52.14 | 25.37 | 60.71 | 24.70 | 10.21 | 21.48 | 17.15 |
| 23 | 13.83 | 48.65 | 19.22 | 47.81 | 23.21 | 52.34 | 25.40 | 61.06 | 24.61 | 10.51 | 21.35 | 17.24 |
| 24 | 14.00 | 48.49 | 19.41 | 47.87 | 23.34 | 52.55 | 25.42 | 61.41 | 24.51 | 10.77 | 21.23 | 17.34 |
| 25 | 14.17 | 48.33 | 19.59 | 47.95 | 23.47 | 52.79 | 25.42 | 61.77 | 24.42 | 10.99 | 21.11 | 17.45 |
| 26 | 14.36 | 48.18 | 19.77 | 48.06 | 23.59 | 53.06 | 25.40 | 62.11 | 24.35 | 11.20 | 21.00 | 17.58 |
| 27 | 14.55 | 48.04 | 19.94 | 48.20 | 23.69 | 53.35 | 25.39 | 62.43 | 24.28 | 11.40 | 20.88 | 17.73 |
| 28 | 14.74 | 47.92 | 20.10 | 48.35 | 23.78 | 53.66 | 25.38 | 62.71 | 24.22 | 11.61 | 20.75 | 17.90 |
| 29 | 14.94 | 47.84 | 20.24 | 48.52 | 23.86 | 53.95 | 25.37 | 62.97 | 24.16 | 11.85 | 20.61 | 18.08 |
| 30 | 15.12 | 47.77 | | | 23.93 | 54.23 | 25.38 | 63.22 | 24.10 | 12.10 | 20.46 | 18.25 |
| 31 | 15.30 | 47.74 | | | 23.99 | 54.48 | 25.39 | 63.48 | 24.03 | 12.37 | 20.30 | 18.42 |
| 32 | 15.47 | 47.72 | | | 24.07 | 54.71 | | | 23.95 | 12.66 | | |
| | sec δ | tan δ | sec δ | tan δ | sec δ | tan δ | sec δ | tan δ | sec δ | tan δ | sec δ | tan δ |
| | 7.73 | 7.66 | 7.73 | 7.66 | 7.73 | 7.66 | 7.73 | 7.66 | 7.73 | 7.67 | 7.73 | 7.67 |

Mean R.A. $14^{\text{h}} 51^{\text{m}} 11.06^{\text{s}}$

Double lower transit November 3

Mean Dec. $+82^{\circ} 34' 04''.83$

APPARENT PLACES OF STARS, 1986
CIRCUMPOLAR STARS AT UPPER TRANSIT AT GREENWICH

403

1644 Groombridge 2196 (Ursae Minoris) Mag. 5.73 Spect. G0

| Day | July | | August | | September | | October | | November | | December | |
|-----|---------------------------------------|---|---------------------------------------|---|---------------------------------------|---|---------------------------------------|---|---------------------------------------|---|---------------------------------------|---|
| | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | ^h ^m 14 51 | ⁺ ^o / 82 34 | ^h ^m 14 51 | ⁺ ^o / 82 34 | ^h ^m 14 51 | ⁺ ^o / 82 34 | ^h ^m 14 51 | ⁺ ^o / 82 33 | ^h ^m 14 51 | ⁺ ^o / 82 33 | ^h ^m 14 51 | ⁺ ^o / 82 33 |
| | ^s 20.30 | " 18.42 | ^s 15.21 | " 19.73 | ^s 10.01 | " 15.86 | ^s 05.90 | " 67.99 | ^s 03.52 | " 57.07 | ^s 03.70 | " 45.65 |
| 1 | 20.30 | 18.42 | 15.21 | 19.73 | 10.01 | 15.86 | 05.90 | 67.99 | 03.52 | 57.07 | 03.70 | 45.65 |
| 2 | 20.13 | 18.58 | 15.03 | 19.67 | 09.87 | 15.63 | 05.80 | 67.68 | 03.47 | 56.74 | 03.73 | 45.27 |
| 3 | 19.97 | 18.71 | 14.86 | 19.58 | 09.73 | 15.40 | 05.70 | 67.39 | 03.41 | 56.38 | 03.77 | 44.86 |
| 4 | 19.80 | 18.83 | 14.69 | 19.49 | 09.59 | 15.19 | 05.59 | 67.11 | 03.35 | 55.99 | 03.83 | 44.43 |
| 5 | 19.64 | 18.92 | 14.53 | 19.39 | 09.45 | 15.00 | 05.47 | 66.83 | 03.31 | 55.58 | 03.91 | 44.00 |
| 6 | 19.48 | 18.99 | 14.38 | 19.30 | 09.30 | 14.82 | 05.34 | 66.54 | 03.27 | 55.14 | 04.00 | 43.59 |
| 7 | 19.33 | 19.05 | 14.23 | 19.22 | 09.14 | 14.65 | 05.22 | 66.23 | 03.26 | 54.69 | 04.09 | 43.21 |
| 8 | 19.18 | 19.10 | 14.08 | 19.15 | 08.98 | 14.47 | 05.09 | 65.88 | 03.26 | 54.24 | 04.19 | 42.86 |
| 9 | 19.04 | 19.15 | 13.92 | 19.10 | 08.80 | 14.27 | 04.98 | 65.50 | 03.26 | 53.81 | 04.28 | 42.53 |
| 10 | 18.90 | 19.20 | 13.75 | 19.05 | 08.63 | 14.04 | 04.88 | 65.11 | 03.28 | 53.41 | 04.36 | 42.22 |
| 11 | 18.76 | 19.27 | 13.57 | 19.01 | 08.46 | 13.79 | 04.80 | 64.70 | 03.29 | 53.03 | 04.44 | 41.93 |
| 12 | 18.62 | 19.35 | 13.38 | 18.96 | 08.30 | 13.50 | 04.73 | 64.30 | 03.30 | 52.67 | 04.51 | 41.64 |
| 13 | 18.47 | 19.44 | 13.18 | 18.88 | 08.16 | 13.19 | 04.66 | 63.92 | 03.30 | 52.33 | 04.58 | 41.34 |
| 14 | 18.31 | 19.54 | 12.99 | 18.78 | 08.02 | 12.88 | 04.60 | 63.56 | 03.29 | 51.99 | 04.66 | 41.03 |
| 15 | 18.13 | 19.64 | 12.80 | 18.64 | 07.90 | 12.58 | 04.53 | 63.22 | 03.28 | 51.65 | 04.73 | 40.71 |
| 16 | 17.95 | 19.73 | 12.62 | 18.47 | 07.79 | 12.29 | 04.46 | 62.90 | 03.27 | 51.30 | 04.81 | 40.37 |
| 17 | 17.76 | 19.79 | 12.45 | 18.28 | 07.67 | 12.03 | 04.39 | 62.59 | 03.26 | 50.94 | 04.90 | 40.02 |
| 18 | 17.57 | 19.81 | 12.30 | 18.10 | 07.55 | 11.78 | 04.30 | 62.28 | 03.26 | 50.55 | 05.00 | 39.67 |
| 19 | 17.38 | 19.80 | 12.15 | 17.92 | 07.42 | 11.55 | 04.21 | 61.96 | 03.26 | 50.16 | 05.11 | 39.32 |
| 20 | 17.22 | 19.76 | 12.01 | 17.77 | 07.28 | 11.33 | 04.12 | 61.63 | 03.27 | 49.74 | 05.23 | 38.97 |
| 21 | 17.06 | 19.72 | 11.86 | 17.64 | 07.13 | 11.10 | 04.04 | 61.28 | 03.30 | 49.33 | 05.36 | 38.63 |
| 22 | 16.91 | 19.68 | 11.71 | 17.52 | 06.99 | 10.85 | 03.96 | 60.91 | 03.33 | 48.91 | 05.49 | 38.32 |
| 23 | 16.77 | 19.66 | 11.54 | 17.42 | 06.84 | 10.59 | 03.89 | 60.52 | 03.37 | 48.49 | 05.62 | 38.02 |
| 24 | 16.62 | 19.66 | 11.37 | 17.31 | 06.69 | 10.31 | 03.82 | 60.11 | 03.42 | 48.09 | 05.75 | 37.75 |
| 25 | 16.47 | 19.68 | 11.19 | 17.20 | 06.55 | 10.00 | 03.77 | 59.70 | 03.48 | 47.70 | 05.87 | 37.50 |
| 26 | 16.31 | 19.71 | 11.01 | 17.06 | 06.42 | 09.68 | 03.73 | 59.29 | 03.53 | 47.34 | 05.99 | 37.26 |
| 27 | 16.14 | 19.75 | 10.83 | 16.91 | 06.30 | 09.34 | 03.69 | 58.88 | 03.58 | 46.99 | 06.09 | 37.02 |
| 28 | 15.96 | 19.78 | 10.65 | 16.74 | 06.19 | 09.00 | 03.66 | 58.48 | 03.62 | 46.66 | 06.19 | 36.77 |
| 29 | 15.77 | 19.80 | 10.48 | 16.54 | 06.09 | 08.65 | 03.64 | 58.11 | 03.65 | 46.34 | 06.29 | 36.50 |
| 30 | 15.58 | 19.80 | 10.31 | 16.32 | 05.99 | 08.31 | 03.61 | 57.75 | 03.68 | 46.01 | 06.40 | 36.20 |
| 31 | 15.40 | 19.78 | 10.15 | 16.09 | 05.90 | 07.99 | 03.57 | 57.41 | 03.70 | 45.65 | 06.52 | 35.88 |
| 32 | 15.21 | 19.73 | 10.01 | 15.86 | | | 03.52 | 57.07 | | 45.66 | 06.66 | 35.55 |
| | sec δ 7.74 | tan δ 7.67 | sec δ 7.73 | tan δ 7.67 | sec δ 7.73 | tan δ 7.67 | sec δ 7.73 | tan δ 7.67 | sec δ 7.73 | tan δ 7.66 | sec δ 7.72 | tan δ 7.66 |

Mean R.A. 14^h 51^m 11.06^s

Double lower transit November 3

Mean Dec. +82° 34' 04.83"

APPARENT PLACES OF STARS, 1986
CIRCUMPOLAR STARS AT UPPER TRANSIT AT GREENWICH

1645 Groombridge 2315 (Ursae Minoris) Mag. 7.32 Spect. A2

| Day | January | | February | | March | | April | | May | | June | |
|-----|---------|-------|----------|-------|-------|-------|-------|-------|-----------------------------------|-----------------------------------|-------|-------|
| | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " |
| | 15 44 | 82 59 | 15 44 | 82 59 | 15 44 | 82 59 | 15 44 | 82 59 | 15 45 | 82 59 | 15 44 | 82 59 |
| | s | " | s | " | s | " | s | " | s | " | s | " |
| 1 | 44.63 | 08.92 | 49.21 | 01.96 | 54.25 | 00.74 | 58.98 | 05.20 | 01.43 | 13.26 | 61.04 | 23.00 |
| 2 | 44.76 | 08.61 | 49.37 | 01.88 | 54.41 | 00.84 | 59.10 | 05.38 | 01.48 | 13.52 | 60.99 | 23.33 |
| 3 | 44.89 | 08.34 | 49.52 | 01.79 | 54.56 | 00.92 | 59.22 | 05.55 | 01.53 | 13.80 | 60.92 | 23.66 |
| 4 | 45.01 | 08.08 | 49.68 | 01.68 | 54.71 | 00.99 | 59.35 | 05.73 | 01.58 | 14.10 | 60.84 | 23.99 |
| 5 | 45.13 | 07.84 | 49.83 | 01.56 | 54.87 | 01.03 | 59.48 | 05.93 | 01.63 | 14.43 | 60.75 | 24.31 |
| 6 | 45.23 | 07.61 | 49.99 | 01.41 | 55.04 | 01.06 | 59.61 | 06.15 | 01.66 | 14.78 | 60.66 | 24.61 |
| 7 | 45.33 | 07.36 | 50.17 | 01.25 | 55.21 | 01.09 | 59.74 | 06.40 | 01.68 | 15.13 | 60.56 | 24.89 |
| 8 | 45.43 | 07.09 | 50.35 | 01.10 | 55.40 | 01.13 | 59.87 | 06.67 | 01.69 | 15.49 | 60.47 | 25.16 |
| 9 | 45.54 | 06.79 | 50.55 | 00.96 | 55.59 | 01.19 | 59.98 | 06.96 | 01.70 | 15.85 | 60.38 | 25.40 |
| 10 | 45.66 | 06.48 | 50.75 | 00.85 | 55.78 | 01.27 | 60.08 | 07.27 | 01.69 | 16.20 | 60.29 | 25.63 |
| 11 | 45.80 | 06.15 | 50.96 | 00.77 | 55.97 | 01.39 | 60.18 | 07.58 | 01.68 | 16.53 | 60.20 | 25.85 |
| 12 | 45.95 | 05.84 | 51.16 | 00.72 | 56.15 | 01.54 | 60.26 | 07.88 | 01.67 | 16.85 | 60.12 | 26.07 |
| 13 | 46.11 | 05.55 | 51.35 | 00.69 | 56.32 | 01.70 | 60.34 | 08.18 | 01.65 | 17.14 | 60.05 | 26.30 |
| 14 | 46.27 | 05.28 | 51.54 | 00.68 | 56.48 | 01.88 | 60.41 | 08.47 | 01.64 | 17.43 | 59.97 | 26.54 |
| 15 | 46.44 | 05.05 | 51.71 | 00.69 | 56.63 | 02.06 | 60.48 | 08.74 | 01.64 | 17.70 | 59.89 | 26.80 |
| 16 | 46.60 | 04.84 | 51.89 | 00.69 | 56.78 | 02.24 | 60.56 | 08.99 | 01.64 | 17.97 | 59.79 | 27.08 |
| 17 | 46.76 | 04.65 | 52.05 | 00.69 | 56.92 | 02.41 | 60.64 | 09.24 | 01.64 | 18.24 | 59.69 | 27.37 |
| 18 | 46.91 | 04.47 | 52.22 | 00.68 | 57.06 | 02.57 | 60.72 | 09.48 | ^{01 64} _{01 64} | ^{18 53} _{18 83} | 59.57 | 27.67 |
| 19 | 47.05 | 04.30 | 52.39 | 00.66 | 57.20 | 02.71 | 60.80 | 09.72 | 01.64 | 19.16 | 59.43 | 27.95 |
| 20 | 47.20 | 04.13 | 52.56 | 00.62 | 57.34 | 02.85 | 60.89 | 09.97 | 01.62 | 19.50 | 59.29 | 28.20 |
| 21 | 47.34 | 03.95 | 52.73 | 00.58 | 57.49 | 02.97 | 60.98 | 10.24 | 01.58 | 19.86 | 59.15 | 28.42 |
| 22 | 47.48 | 03.75 | 52.92 | 00.54 | 57.65 | 03.10 | 61.07 | 10.53 | 01.53 | 20.22 | 59.01 | 28.60 |
| 23 | 47.62 | 03.55 | 53.11 | 00.50 | 57.81 | 03.23 | 61.14 | 10.86 | 01.47 | 20.56 | 58.89 | 28.76 |
| 24 | 47.78 | 03.33 | 53.31 | 00.47 | 57.97 | 03.39 | 61.20 | 11.20 | 01.40 | 20.86 | 58.77 | 28.91 |
| 25 | 47.94 | 03.11 | 53.51 | 00.47 | 58.13 | 03.57 | 61.25 | 11.55 | 01.33 | 21.13 | 58.67 | 29.07 |
| 26 | 48.11 | 02.89 | 53.71 | 00.50 | 58.29 | 03.78 | 61.28 | 11.89 | 01.28 | 21.38 | 58.56 | 29.26 |
| 27 | 48.29 | 02.67 | 53.90 | 00.56 | 58.43 | 04.02 | 61.30 | 12.21 | 01.23 | 21.61 | 58.46 | 29.46 |
| 28 | 48.48 | 02.47 | 54.09 | 00.65 | 58.56 | 04.27 | 61.32 | 12.50 | 01.20 | 21.85 | 58.34 | 29.69 |
| 29 | 48.67 | 02.31 | 54.25 | 00.74 | 58.67 | 04.53 | 61.35 | 12.77 | 01.17 | 22.11 | 58.22 | 29.93 |
| 30 | 48.86 | 02.17 | | | 58.78 | 04.77 | 61.38 | 13.01 | 01.13 | 22.38 | 58.08 | 30.17 |
| 31 | 49.04 | 02.05 | | | 58.88 | 05.00 | 61.43 | 13.26 | 01.09 | 22.68 | 57.94 | 30.41 |
| 32 | 49.21 | 01.96 | | | 58.98 | 05.20 | | | 01.04 | 23.00 | | |
| | sec δ | tan δ | sec δ | tan δ | sec δ | tan δ | sec δ | tan δ | sec δ | tan δ | sec δ | tan δ |
| | 8.19 | 8.13 | 8.19 | 8.13 | 8.19 | 8.13 | 8.19 | 8.13 | 8.19 | 8.13 | 8.19 | 8.13 |

Mean R.A. $15^{\text{h}} 44^{\text{m}} 46.67^{\text{s}}$

Double lower transit November 17

Mean Dec. $+82^{\circ} 59' 21.52''$

APPARENT PLACES OF STARS, 1986
CIRCUMPOLAR STARS AT UPPER TRANSIT AT GREENWICH

405

1645 Groombridge 2315 (Ursae Minoris) Mag. 7.32 Spect. A2

| Day | July | | August | | September | | October | | November | | December | |
|-----|------------------------------------|---|------------------------------------|---|------------------------------------|---|------------------------------------|---|------------------------------------|---|------------------------------------|---|
| | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | ^h ^m 15 44 | ⁺ ^o / 82 59 | ^h ^m 15 44 | ⁺ ^o / 82 59 | ^h ^m 15 44 | ⁺ ^o / 82 59 | ^h ^m 15 44 | ⁺ ^o / 82 59 | ^h ^m 15 44 | ⁺ ^o / 82 59 | ^h ^m 15 44 | ⁺ ^o / 82 58 |
| | ^s 57.94 | " 30.11 | ^s 52.79 | " 34.12 | ^s 46.88 | " 32.81 | ^s 41.62 | " 27.09 | ^s 37.80 | " 17.65 | ^s 36.56 | " 66.63 |
| 1 | 57.94 | 30.11 | 52.79 | 34.12 | 46.88 | 32.81 | 41.62 | 27.09 | 37.80 | 17.65 | 36.56 | 66.63 |
| 2 | 57.79 | 30.64 | 52.59 | 34.14 | 46.70 | 32.65 | 41.48 | 26.84 | 37.70 | 17.35 | 36.55 | 66.25 |
| 3 | 57.63 | 30.85 | 52.40 | 34.14 | 46.53 | 32.49 | 41.34 | 26.60 | 37.59 | 17.04 | 36.54 | 65.84 |
| 4 | 57.47 | 31.04 | 52.22 | 34.13 | 46.36 | 32.35 | 41.19 | 26.38 | 37.48 | 16.70 | 36.55 | 65.41 |
| 5 | 57.31 | 31.21 | 52.04 | 34.11 | 46.19 | 32.23 | 41.03 | 26.16 | 37.38 | 16.32 | 36.57 | 64.97 |
| 6 | 57.15 | 31.36 | 51.87 | 34.10 | 46.01 | 32.12 | 40.86 | 25.94 | 37.30 | 15.91 | 36.61 | 64.54 |
| 7 | 57.00 | 31.49 | 51.70 | 34.09 | 45.83 | 32.03 | 40.69 | 25.70 | 37.22 | 15.49 | 36.66 | 64.13 |
| 8 | 56.85 | 31.61 | 51.53 | 34.09 | 45.63 | 31.93 | 40.52 | 25.42 | 37.17 | 15.07 | 36.72 | 63.75 |
| 9 | 56.71 | 31.73 | 51.36 | 34.11 | 45.42 | 31.82 | 40.36 | 25.11 | 37.12 | 14.65 | 36.77 | 63.40 |
| 10 | 56.57 | 31.84 | 51.18 | 34.15 | 45.21 | 31.68 | 40.20 | 24.78 | 37.08 | 14.26 | 36.82 | 63.07 |
| 11 | 56.44 | 31.97 | 50.98 | 34.19 | 45.01 | 31.51 | 40.07 | 24.43 | 37.05 | 13.89 | 36.87 | 62.75 |
| 12 | 56.30 | 32.12 | 50.78 | 34.23 | 44.81 | 31.31 | 39.94 | 24.08 | 37.01 | 13.54 | 36.91 | 62.44 |
| 13 | 56.15 | 32.28 | 50.56 | 34.25 | 44.62 | 31.09 | 39.83 | 23.74 | 36.97 | 13.21 | 36.95 | 62.12 |
| 14 | 55.99 | 32.46 | 50.35 | 34.24 | 44.44 | 30.85 | 39.72 | 23.42 | 36.92 | 12.89 | 36.98 | 61.79 |
| 15 | 55.82 | 32.64 | 50.13 | 34.19 | 44.28 | 30.61 | 39.61 | 23.12 | 36.87 | 12.56 | 37.02 | 61.45 |
| 16 | 55.64 | 32.81 | 49.92 | 34.12 | 44.12 | 30.39 | 39.49 | 22.84 | 36.82 | 12.23 | 37.06 | 61.10 |
| 17 | 55.45 | 32.96 | 49.73 | 34.02 | 43.96 | 30.18 | 39.38 | 22.58 | 36.76 | 11.89 | 37.11 | 60.73 |
| 18 | 55.26 | 33.07 | 49.55 | 33.91 | 43.81 | 30.00 | 39.25 | 22.31 | 36.71 | 11.52 | 37.17 | 60.35 |
| 19 | 55.06 | 33.15 | 49.37 | 33.81 | 43.64 | 29.84 | 39.12 | 22.05 | 36.66 | 11.14 | 37.25 | 59.96 |
| 20 | 54.88 | 33.20 | 49.20 | 33.73 | 43.47 | 29.68 | 38.98 | 21.76 | 36.63 | 10.74 | 37.33 | 59.58 |
| 21 | 54.71 | 33.23 | 49.03 | 33.67 | 43.29 | 29.52 | 38.85 | 21.47 | 36.60 | 10.33 | 37.42 | 59.20 |
| 22 | 54.56 | 33.26 | 48.86 | 33.63 | 43.11 | 29.35 | 38.72 | 21.15 | 36.58 | 09.91 | 37.51 | 58.84 |
| 23 | 54.40 | 33.31 | 48.67 | 33.60 | 42.92 | 29.17 | 38.60 | 20.81 | 36.58 | 09.50 | 37.61 | 58.50 |
| 24 | 54.25 | 33.38 | 48.48 | 33.58 | 42.73 | 28.96 | 38.48 | 20.45 | 36.58 | 09.09 | 37.71 | 58.19 |
| 25 | 54.10 | 33.47 | 48.28 | 33.55 | 42.55 | 28.73 | 38.38 | 20.08 | 36.59 | 08.70 | 37.81 | 57.89 |
| 26 | 53.93 | 33.58 | 48.07 | 33.50 | 42.38 | 28.48 | 38.28 | 19.70 | 36.60 | 08.32 | 37.90 | 57.61 |
| 27 | 53.76 | 33.70 | 47.86 | 33.44 | 42.21 | 28.21 | 38.19 | 19.32 | 36.60 | 07.97 | 37.98 | 57.34 |
| 28 | 53.57 | 33.81 | 47.66 | 33.35 | 42.05 | 27.93 | 38.12 | 18.95 | 36.61 | 07.63 | 38.05 | 57.06 |
| 29 | 53.38 | 33.91 | 47.45 | 33.24 | 41.90 | 27.65 | 38.04 | 18.60 | 36.60 | 07.31 | 38.12 | 56.76 |
| 30 | 53.18 | 34.00 | 47.25 | 33.11 | 41.75 | 27.36 | 37.97 | 18.27 | 36.58 | 06.98 | 38.19 | 56.43 |
| 31 | 52.98 | 34.07 | 47.06 | 32.97 | 41.62 | 27.09 | 37.88 | 17.95 | 36.56 | 06.63 | 38.28 | 56.07 |
| 32 | 52.79 | 34.12 | 46.88 | 32.81 | | | 37.80 | 17.65 | | | 38.39 | 55.70 |
| | sec δ 8.20 | tan δ 8.14 | sec δ 8.20 | tan δ 8.14 | sec δ 8.20 | tan δ 8.13 | sec δ 8.19 | tan δ 8.13 | sec δ 8.19 | tan δ 8.13 | sec δ 8.19 | tan δ 8.13 |

Mean R.A. $15^{\text{h}} 44^{\text{m}} 46^{\text{s}}.67$

Double lower transit November 17

Mean Dec. $+82^{\circ} 59' 21''.52$

APPARENT PLACES OF STARS, 1986
CIRCUMPOLAR STARS AT UPPER TRANSIT AT GREENWICH

912 ε Ursae Minoris Mag. 4.40 Spect. G5

| Day | January | | February | | March | | April | | May | | June | |
|-----|---------------|---------------------|---------------|---------------------|---------------|---------------------|---------------|---------------------|---------------|---------------------|---------------------------|---------------------------|
| | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m 16 47 | + ° ' / 82 03 | h m 16 47 | + ° ' / 82 03 | h m 16 47 | + ° ' / 82 03 | h m 16 47 | + ° ' / 82 03 | h m 16 47 | + ° ' / 82 03 | h m 16 47 | + ° ' / 82 03 |
| 1 | s 15.34 | " 27.04 | s 18.45 | " 18.20 | s 22.66 | " 14.65 | s 27.31 | " 16.74 | s 30.45 | " 23.47 | s 31.39 | " 32.92 |
| 2 | 15.42 | 26.68 | 18.58 | 18.05 | 22.81 | 14.67 | 27.43 | 16.87 | 30.53 | 23.70 | 31.39 | 33.25 |
| 3 | 15.50 | 26.35 | 18.71 | 17.89 | 22.95 | 14.68 | 27.56 | 16.98 | 30.61 | 23.95 | ^{31 38} 31 36 | ^{33 60} 33 96 |
| 4 | 15.57 | 26.05 | 18.82 | 17.72 | 23.09 | 14.68 | 27.69 | 17.10 | 30.69 | 24.22 | 31.34 | 34.32 |
| 5 | 15.64 | 25.77 | 18.94 | 17.53 | 23.24 | 14.65 | 27.83 | 17.23 | 30.77 | 24.52 | 31.30 | 34.68 |
| 6 | 15.70 | 25.49 | 19.07 | 17.32 | 23.38 | 14.60 | 27.98 | 17.38 | 30.84 | 24.84 | 31.26 | 35.03 |
| 7 | 15.76 | 25.21 | 19.20 | 17.09 | 23.54 | 14.55 | 28.12 | 17.55 | 30.91 | 25.17 | 31.22 | 35.35 |
| 8 | 15.82 | 24.90 | 19.34 | 16.85 | 23.71 | 14.50 | 28.26 | 17.76 | 30.96 | 25.52 | 31.17 | 35.66 |
| 9 | 15.88 | 24.57 | 19.50 | 16.63 | 23.88 | 14.47 | 28.39 | 17.98 | 31.01 | 25.87 | 31.13 | 35.95 |
| 10 | 15.94 | 24.22 | 19.66 | 16.42 | 24.05 | 14.46 | 28.52 | 18.23 | 31.05 | 26.21 | 31.08 | 36.23 |
| 11 | 16.02 | 23.85 | 19.82 | 16.25 | 24.23 | 14.48 | 28.64 | 18.49 | 31.09 | 26.55 | 31.04 | 36.49 |
| 12 | 16.12 | 23.48 | 19.99 | 16.10 | 24.40 | 14.53 | 28.75 | 18.74 | 31.12 | 26.86 | 31.00 | 36.75 |
| 13 | 16.22 | 23.12 | 20.15 | 15.98 | 24.57 | 14.61 | 28.86 | 19.00 | 31.15 | 27.17 | 30.97 | 37.01 |
| 14 | 16.33 | 22.79 | 20.31 | 15.88 | 24.73 | 14.70 | 28.96 | 19.24 | 31.18 | 27.45 | 30.93 | 37.29 |
| 15 | 16.44 | 22.48 | 20.46 | 15.80 | 24.88 | 14.80 | 29.05 | 19.47 | 31.21 | 27.72 | 30.89 | 37.59 |
| 16 | 16.55 | 22.20 | 20.61 | 15.72 | 25.03 | 14.91 | 29.15 | 19.69 | 31.24 | 27.99 | 30.85 | 37.91 |
| 17 | 16.66 | 21.94 | 20.76 | 15.64 | 25.17 | 15.00 | 29.25 | 19.90 | 31.28 | 28.26 | 30.79 | 38.25 |
| 18 | 16.77 | 21.70 | 20.90 | 15.55 | 25.31 | 15.09 | 29.35 | 20.09 | 31.32 | 28.54 | 30.73 | 38.59 |
| 19 | 16.88 | 21.47 | 21.04 | 15.46 | 25.45 | 15.17 | 29.46 | 20.29 | 31.36 | 28.84 | 30.65 | 38.94 |
| 20 | 16.98 | 21.23 | 21.19 | 15.35 | 25.60 | 15.23 | 29.57 | 20.49 | 31.39 | 29.16 | 30.56 | 39.26 |
| 21 | 17.08 | 21.00 | 21.34 | 15.22 | 25.74 | 15.29 | 29.68 | 20.71 | 31.42 | 29.51 | 30.47 | 39.55 |
| 22 | 17.18 | 20.75 | 21.49 | 15.09 | 25.89 | 15.34 | 29.79 | 20.96 | 31.43 | 29.88 | 30.38 | 39.80 |
| 23 | 17.28 | 20.48 | 21.65 | 14.96 | 26.05 | 15.39 | 29.89 | 21.23 | 31.44 | 30.25 | 30.30 | 40.03 |
| 24 | 17.39 | 20.21 | 21.82 | 14.84 | 26.21 | 15.46 | 29.99 | 21.54 | 31.43 | 30.62 | 30.22 | 40.24 |
| 25 | 17.50 | 19.92 | 21.99 | 14.75 | 26.37 | 15.56 | 30.07 | 21.86 | 31.41 | 30.95 | 30.15 | 40.46 |
| 26 | 17.62 | 19.62 | 22.17 | 14.68 | 26.53 | 15.69 | 30.14 | 22.18 | 31.39 | 31.26 | 30.09 | 40.69 |
| 27 | 17.75 | 19.33 | 22.34 | 14.64 | 26.68 | 15.85 | 30.20 | 22.49 | 31.38 | 31.53 | 30.02 | 40.95 |
| 28 | 17.89 | 19.05 | 22.51 | 14.64 | 26.82 | 16.03 | 30.26 | 22.76 | 31.37 | 31.79 | 29.95 | 41.23 |
| 29 | 18.03 | 18.80 | 22.66 | 14.65 | 26.96 | 16.23 | 30.32 | 23.01 | 31.37 | 32.05 | 29.87 | 41.52 |
| 30 | 18.18 | 18.57 | | | 27.08 | 16.42 | 30.38 | 23.25 | 31.38 | 32.31 | 29.79 | 41.83 |
| 31 | 18.32 | 18.38 | | | 27.19 | 16.59 | 30.45 | 23.47 | 31.38 | 32.60 | 29.70 | 42.14 |
| 32 | 18.45 | 18.20 | | | 27.31 | 16.74 | | | 31.39 | 32.92 | | |
| | sec δ 7.24 | tan δ 7.17 | sec δ 7.23 | tan δ 7.16 | sec δ 7.23 | tan δ 7.16 | sec δ 7.24 | tan δ 7.17 | sec δ 7.24 | tan δ 7.17 | sec δ 7.24 | tan δ 7.17 |

Mean R.A. 16^h 47^m 19.04^s

Double lower transit December 3

Mean Dec. +82° 03' 39.31"

APPARENT PLACES OF STARS, 1986
CIRCUMPOLAR STARS AT UPPER TRANSIT AT GREENWICH

407

912 ϵ Ursae Minoris · Mag. 4.40 Spect. G5

| Day | July | | August | | September | | October | | November | | December | |
|-----|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | + o / | h m | + o / | h m | + o / | h m | + o / | h m | + o / | h m | + o / |
| | 16 47 | 82 03 | 16 47 | 82 03 | 16 47 | 82 03 | 16 47 | 82 03 | 16 47 | 82 03 | 16 47 | 82 03 |
| | s | " | s | " | s | " | s | " | s | " | s | " |
| 1 | 29.70 | 42.14 | 25.79 | 48.46 | 20.60 | 50.26 | 15.40 | 47.43 | 10.97 | 40.29 | 08.59 | 30.39 |
| 2 | 29.60 | 42.44 | 25.63 | 48.58 | 20.43 | 50.19 | 15.25 | 47.25 | 10.85 | 40.05 | 08.53 | 30.04 |
| 3 | 29.49 | 42.73 | 25.47 | 48.69 | 20.26 | 50.13 | 15.10 | 47.09 | 10.72 | 39.81 | 08.48 | 29.66 |
| 4 | 29.38 | 43.00 | 25.31 | 48.77 | 20.10 | 50.08 | 14.94 | 46.95 | 10.59 | 39.53 | 08.43 | 29.24 |
| 5 | 29.27 | 43.25 | 25.16 | 48.85 | 19.94 | 50.05 | 14.78 | 46.83 | 10.46 | 39.23 | 08.40 | 28.81 |
| 6 | 29.15 | 43.48 | 25.01 | 48.92 | 19.77 | 50.03 | 14.61 | 46.70 | 10.34 | 38.89 | 08.39 | 28.38 |
| 7 | 29.04 | 43.69 | 24.86 | 49.00 | 19.60 | 50.03 | 14.43 | 46.55 | 10.23 | 38.52 | 08.38 | 27.97 |
| 8 | 28.93 | 43.89 | 24.72 | 49.09 | 19.42 | 50.04 | 14.25 | 46.37 | 10.13 | 38.15 | 08.38 | 27.58 |
| 9 | 28.83 | 44.08 | 24.57 | 49.20 | 19.23 | 50.04 | 14.08 | 46.16 | 10.04 | 37.77 | 08.38 | 27.21 |
| 10 | 28.73 | 44.26 | 24.42 | 49.32 | 19.03 | 50.01 | 13.91 | 45.92 | 09.96 | 37.42 | 08.39 | 26.87 |
| 11 | 28.63 | 44.46 | 24.26 | 49.46 | 18.84 | 49.96 | 13.75 | 45.66 | 09.88 | 37.08 | 08.39 | 26.54 |
| 12 | 28.52 | 44.68 | 24.09 | 49.60 | 18.64 | 49.87 | 13.60 | 45.39 | 09.81 | 36.76 | 08.38 | 26.22 |
| 13 | 28.42 | 44.91 | 23.91 | 49.73 | 18.45 | 49.75 | 13.46 | 45.12 | 09.73 | 36.46 | 08.38 | 25.90 |
| 14 | 28.31 | 45.16 | 23.73 | 49.84 | 18.27 | 49.61 | 13.32 | 44.86 | 09.65 | 36.18 | 08.37 | 25.58 |
| 15 | 28.18 | 45.42 | 23.54 | 49.91 | 18.10 | 49.47 | 13.19 | 44.63 | 09.57 | 35.89 | 08.36 | 25.24 |
| 16 | 28.05 | 45.68 | 23.36 | 49.95 | 17.94 | 49.33 | 13.06 | 44.42 | 09.48 | 35.60 | 08.36 | 24.88 |
| 17 | 27.91 | 45.93 | 23.18 | 49.96 | 17.78 | 49.22 | 12.92 | 44.22 | 09.39 | 35.30 | 08.36 | 24.50 |
| 18 | 27.76 | 46.14 | 23.01 | 49.95 | 17.63 | 49.12 | 12.78 | 44.03 | 09.30 | 34.98 | 08.37 | 24.11 |
| 19 | 27.61 | 46.32 | 22.85 | 49.94 | 17.46 | 49.04 | 12.64 | 43.84 | 09.22 | 34.64 | 08.38 | 23.71 |
| 20 | 27.46 | 46.47 | 22.70 | 49.95 | 17.30 | 48.98 | 12.49 | 43.64 | 09.14 | 34.28 | 08.41 | 23.31 |
| 21 | 27.32 | 46.60 | 22.54 | 49.98 | 17.12 | 48.91 | 12.34 | 43.42 | 09.07 | 33.90 | 08.44 | 22.90 |
| 22 | 27.19 | 46.71 | 22.39 | 50.03 | 16.95 | 48.84 | 12.19 | 43.18 | 09.00 | 33.52 | 08.48 | 22.51 |
| 23 | 27.07 | 46.84 | 22.22 | 50.10 | 16.76 | 48.76 | 12.05 | 42.92 | 08.95 | 33.12 | 08.52 | 22.14 |
| 24 | 26.95 | 46.99 | 22.06 | 50.17 | 16.58 | 48.66 | 11.90 | 42.63 | 08.90 | 32.73 | 08.57 | 21.79 |
| 25 | 26.83 | 47.15 | 21.88 | 50.24 | 16.40 | 48.53 | 11.77 | 42.33 | 08.86 | 32.35 | 08.61 | 21.46 |
| 26 | 26.70 | 47.34 | 21.70 | 50.31 | 16.22 | 48.38 | 11.64 | 42.02 | 08.82 | 31.98 | 08.66 | 21.15 |
| 27 | 26.56 | 47.54 | 21.51 | 50.35 | 16.04 | 48.21 | 11.52 | 41.70 | 08.78 | 31.64 | 08.69 | 20.85 |
| 28 | 26.42 | 47.75 | 21.33 | 50.38 | 15.87 | 48.02 | 11.41 | 41.38 | 08.74 | 31.32 | 08.72 | 20.55 |
| 29 | 26.27 | 47.95 | 21.14 | 50.38 | 15.71 | 47.82 | 11.30 | 41.08 | 08.70 | 31.01 | 08.75 | 20.23 |
| 30 | 26.11 | 48.14 | 20.95 | 50.36 | 15.55 | 47.62 | 11.19 | 40.80 | 08.65 | 30.71 | 08.77 | 19.88 |
| 31 | 25.95 | 48.31 | 20.77 | 50.32 | 15.40 | 47.43 | 11.09 | 40.54 | 08.59 | 30.39 | 08.81 | 19.50 |
| 32 | 25.79 | 48.46 | 20.60 | 50.26 | | | 10.97 | 40.29 | | | 08.85 | 19.10 |
| | sec δ | tan δ | sec δ | tan δ | sec δ | tan δ | sec δ | tan δ | sec δ | tan δ | sec δ | tan δ |
| | 7.24 | 7.17 | 7.24 | 7.17 | 7.24 | 7.17 | 7.24 | 7.17 | 7.24 | 7.17 | 7.24 | 7.17 |

Mean R.A. 16^h 47^m 19.04

Double lower transit December 3

Mean Dec. +82° 03' 39.31"

APPARENT PLACES OF STARS, 1986
CIRCUMPOLAR STARS AT UPPER TRANSIT AT GREENWICH

914 λ Ursae Minoris \triangleright Mag. 6.55 Spect. M3

| Day | January | | February | | March | | April | | May | | June | |
|-----|------------------------------------|--|------------------------------------|--|------------------------------------|--|------------------------------------|--|------------------------------------|--|------------------------------------|--|
| | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | ^h ^m 17 33 | ⁺ ^o ['] 89 02 | ^h ^m 17 33 | ⁺ ^o ['] 89 02 | ^h ^m 17 34 | ⁺ ^o ['] 89 02 | ^h ^m 17 35 | ⁺ ^o ['] 89 02 | ^h ^m 17 35 | ⁺ ^o ['] 89 02 | ^h ^m 17 35 | ⁺ ^o ['] 89 02 |
| | ^s 40.88 | ^s 44.90 | ^s 57.05 | ^s 35.49 | ^s 26.80 | ^s 30.58 | ^s 04.50 | ^s 30.80 | ^s 33.54 | ^s 36.00 | ^s 46.47 | ^s 44.64 |
| 1 | 41.18 | 44.54 | 57.92 | 35.30 | 27.96 | 30.55 | 05.48 | 30.88 | 34.29 | 36.18 | 46.70 | 44.96 |
| 2 | 41.52 | 44.20 | 58.71 | 35.11 | 29.03 | 30.51 | 06.51 | 30.94 | 35.10 | 36.39 | 46.87 | 45.30 |
| 3 | 41.85 | 43.89 | 59.43 | 34.91 | 30.06 | 30.45 | 07.62 | 31.00 | 35.96 | 36.61 | 46.98 | 45.65 |
| 4 | 42.14 | 43.60 | 60.12 | 34.69 | 31.08 | 30.37 | 08.82 | 31.07 | 36.81 | 36.86 | 46.99 | 46.00 |
| 5 | 42.36 | 43.32 | 60.83 | 34.45 | 32.14 | 30.28 | 10.08 | 31.15 | 37.64 | 37.13 | 46.92 | 46.36 |
| 6 | 42.49 | 43.04 | 61.61 | 34.18 | 33.28 | 30.17 | 11.37 | 31.26 | 38.40 | 37.43 | 46.78 | 46.71 |
| 7 | 42.57 | 42.74 | 62.50 | 33.91 | 34.52 | 30.06 | 12.67 | 31.40 | 39.10 | 37.74 | 46.57 | 47.04 |
| 8 | 42.64 | 42.42 | 63.51 | 33.64 | 35.85 | 29.96 | 13.94 | 31.56 | 39.70 | 38.05 | 46.32 | 47.35 |
| 9 | 42.77 | 42.06 | 64.62 | 33.38 | 37.25 | 29.88 | 15.15 | 31.74 | 40.23 | 38.36 | 46.05 | 47.65 |
| 10 | 43.00 | 41.69 | 65.80 | 33.15 | 38.69 | 29.83 | 16.28 | 31.94 | 40.68 | 38.67 | 45.79 | 47.93 |
| 11 | 43.36 | 41.31 | 67.02 | 32.95 | 40.14 | 29.81 | 17.34 | 32.14 | 41.08 | 38.96 | 45.56 | 48.20 |
| 12 | 43.85 | 40.93 | 68.23 | 32.77 | 41.55 | 29.82 | 18.32 | 32.35 | 41.44 | 39.24 | 45.37 | 48.46 |
| 13 | 44.44 | 40.58 | 69.42 | 32.62 | 42.91 | 29.85 | 19.25 | 32.54 | 41.80 | 39.51 | 45.22 | 48.73 |
| 14 | 45.08 | 40.25 | 70.57 | 32.49 | 44.20 | 29.89 | 20.14 | 32.73 | 42.18 | 39.75 | ^{45 11} 45 00 | ^{49 01} 49 30 |
| 15 | 45.76 | 39.94 | 71.67 | 32.36 | 45.43 | 29.93 | 21.01 | 32.90 | 42.59 | 40.00 | 44.86 | 49.62 |
| 16 | 46.43 | 39.66 | 72.72 | 32.23 | 46.61 | 29.97 | 21.88 | 33.06 | 43.04 | 40.23 | 44.65 | 49.97 |
| 17 | 47.08 | 39.39 | 73.73 | 32.10 | 47.74 | 30.00 | 22.79 | 33.20 | 43.53 | 40.48 | 44.32 | 50.33 |
| 18 | 47.70 | 39.13 | 74.72 | 31.96 | 48.86 | 30.02 | 23.74 | 33.34 | 44.06 | 40.75 | 43.86 | 50.69 |
| 19 | 48.27 | 38.88 | 75.71 | 31.80 | 49.98 | 30.03 | 24.75 | 33.49 | 44.58 | 41.04 | 43.26 | 51.04 |
| 20 | 48.80 | 38.62 | 76.72 | 31.63 | 51.12 | 30.03 | 25.80 | 33.66 | 45.05 | 41.36 | 42.58 | 51.36 |
| 21 | 49.32 | 38.35 | 77.80 | 31.45 | 52.32 | 30.02 | 26.88 | 33.84 | 45.42 | 41.71 | 41.88 | 51.64 |
| 22 | 49.83 | 38.07 | 78.95 | 31.26 | 53.58 | 30.01 | 27.94 | 34.07 | 45.65 | 42.07 | 41.23 | 51.89 |
| 23 | 50.37 | 37.78 | 80.18 | 31.09 | 54.91 | 30.01 | 28.93 | 34.32 | 45.75 | 42.42 | 40.67 | 52.13 |
| 24 | 50.95 | 37.46 | 81.49 | 30.93 | 56.29 | 30.04 | 29.80 | 34.60 | 45.73 | 42.75 | 40.19 | 52.36 |
| 25 | 51.62 | 37.14 | 82.85 | 30.79 | 57.69 | 30.09 | 30.54 | 34.88 | 45.68 | 43.06 | 39.79 | 52.61 |
| 26 | 52.38 | 36.82 | 84.22 | 30.69 | 59.06 | 30.19 | 31.16 | 35.15 | 45.64 | 43.33 | 39.42 | 52.88 |
| 27 | 53.23 | 36.50 | 85.55 | 30.63 | 60.34 | 30.31 | 31.72 | 35.39 | 45.67 | 43.58 | 39.04 | 53.17 |
| 28 | 54.16 | 36.21 | 86.80 | 30.58 | 61.51 | 30.45 | 32.27 | 35.61 | 45.79 | 43.82 | 38.61 | 53.48 |
| 29 | 55.13 | 35.94 | | | 62.57 | 30.58 | 32.87 | 35.81 | 45.98 | 44.08 | 38.12 | 53.81 |
| 30 | 56.11 | 35.70 | | | 63.55 | 30.70 | 33.54 | 36.00 | 46.22 | 44.35 | 37.55 | 54.14 |
| 31 | 57.05 | 35.49 | | | 64.50 | 30.80 | | | 46.47 | 44.64 | | |
| | sec δ 59.96 | tan δ 59.95 | sec δ 59.83 | tan δ 59.82 | sec δ 59.79 | tan δ 59.78 | sec δ 59.84 | tan δ 59.83 | sec δ 59.96 | tan δ 59.96 | sec δ 60.13 | tan δ 60.12 |

Mean R.A. ^h ^m ^s
17 34 05.18

Double lower transit December 14

Mean Dec. ^o ['] ^{''}
+89 02 56.18

APPARENT PLACES OF STARS, 1986
CIRCUMPOLAR STARS AT UPPER TRANSIT AT GREENWICH

409

914 λ Ursae Minoris · Mag. 6.55 Spect. M3

| Day | July | | August | | September | | October | | November | | December | |
|-----|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | + ° / | h m | + ° / | h m | + ° / | h m | + ° / | h m | + ° / | h m | + ° / |
| | 17 35 | 89 02 | 17 34 | 89 03 | 17 33 | 89 03 | 17 32 | 89 03 | 17 32 | 89 02 | 17 32 | 89 02 |
| | s | " | s | " | s | " | s | " | s | " | s | " |
| 1 | 37.55 | 54.14 | 68.11 | 01.77 | 84.93 | 05.59 | 98.64 | 05.01 | 55.34 | 60.08 | 26.03 | 51.79 |
| 2 | 36.89 | 54.47 | 66.76 | 01.95 | 83.43 | 05.60 | 97.28 | 04.90 | 54.11 | 59.91 | 25.13 | 51.50 |
| 3 | 36.16 | 54.79 | 65.42 | 02.12 | 82.00 | 05.60 | 95.93 | 04.81 | 52.78 | 59.73 | 24.24 | 51.16 |
| 4 | 35.36 | 55.10 | 64.11 | 02.27 | 80.62 | 05.62 | 94.54 | 04.74 | 51.37 | 59.53 | 23.42 | 50.80 |
| 5 | 34.51 | 55.38 | 62.84 | 02.40 | 79.27 | 05.65 | 93.09 | 04.69 | 49.94 | 59.30 | 22.72 | 50.41 |
| 6 | 33.64 | 55.65 | 61.62 | 02.53 | 77.90 | 05.70 | 91.53 | 04.64 | 48.53 | 59.04 | 22.17 | 50.01 |
| 7 | 32.78 | 55.90 | 60.46 | 02.66 | 76.48 | 05.77 | 89.88 | 04.57 | 47.21 | 58.74 | 21.74 | 49.63 |
| 8 | 31.94 | 56.13 | 59.33 | 02.80 | 74.96 | 05.85 | 88.17 | 04.48 | 46.02 | 58.43 | 21.40 | 49.26 |
| 9 | 31.15 | 56.35 | 58.21 | 02.96 | 73.34 | 05.92 | 86.44 | 04.36 | 44.94 | 58.11 | 21.11 | 48.92 |
| 10 | 30.40 | 56.57 | 57.05 | 03.14 | 71.63 | 05.98 | 84.75 | 04.20 | 43.96 | 57.80 | 20.84 | 48.60 |
| 11 | 29.70 | 56.80 | 55.82 | 03.34 | 69.86 | 06.02 | 83.14 | 04.02 | 43.06 | 57.52 | 20.55 | 48.29 |
| 12 | 29.01 | 57.04 | 54.48 | 03.54 | 68.08 | 06.01 | 81.64 | 03.82 | 42.19 | 57.25 | 20.22 | 48.00 |
| 13 | 28.31 | 57.30 | 53.03 | 03.74 | 66.34 | 05.98 | 80.25 | 03.62 | 41.31 | 57.00 | 19.85 | 47.71 |
| 14 | 27.55 | 57.59 | 51.48 | 03.92 | 64.67 | 05.92 | 78.94 | 03.43 | 40.40 | 56.76 | 19.44 | 47.41 |
| 15 | 26.70 | 57.88 | 49.88 | 04.06 | 63.11 | 05.85 | 77.68 | 03.26 | 39.45 | 56.53 | 19.02 | 47.10 |
| 16 | 25.74 | 58.19 | 48.26 | 04.18 | 61.65 | 05.79 | 76.43 | 03.12 | 38.45 | 56.30 | 18.59 | 46.77 |
| 17 | 24.64 | 58.49 | 46.70 | 04.26 | 60.25 | 05.74 | 75.16 | 02.98 | 37.40 | 56.06 | 18.18 | 46.42 |
| 18 | 23.45 | 58.76 | 45.22 | 04.32 | 58.89 | 05.71 | 73.84 | 02.86 | 36.34 | 55.79 | 17.82 | 46.06 |
| 19 | 22.21 | 58.99 | 43.85 | 04.38 | 57.50 | 05.70 | 72.46 | 02.74 | 35.28 | 55.51 | 17.53 | 45.68 |
| 20 | 20.98 | 59.20 | 42.55 | 04.45 | 56.08 | 05.70 | 71.03 | 02.61 | 34.24 | 55.21 | 17.33 | 45.29 |
| 21 | 19.82 | 59.37 | 41.31 | 04.53 | 54.58 | 05.71 | 69.55 | 02.47 | 33.26 | 54.89 | 17.21 | 44.90 |
| 22 | 18.76 | 59.54 | 40.06 | 04.64 | 53.02 | 05.72 | 68.05 | 02.31 | 32.34 | 54.55 | 17.18 | 44.52 |
| 23 | 17.79 | 59.71 | 38.77 | 04.77 | 51.40 | 05.72 | 66.55 | 02.12 | 31.51 | 54.20 | 17.21 | 44.15 |
| 24 | 16.88 | 59.89 | 37.43 | 04.91 | 49.74 | 05.69 | 65.08 | 01.91 | 30.75 | 53.85 | 17.29 | 43.80 |
| 25 | 15.98 | 60.10 | 36.00 | 05.05 | 48.05 | 05.65 | 63.66 | 01.68 | 30.08 | 53.51 | 17.38 | 43.48 |
| 26 | 15.06 | 60.33 | 34.51 | 05.18 | 46.37 | 05.58 | 62.30 | 01.44 | 29.47 | 53.18 | 17.44 | 43.17 |
| 27 | 14.09 | 60.58 | 32.95 | 05.30 | 44.70 | 05.49 | 61.02 | 01.19 | 28.88 | 52.87 | 17.43 | 42.89 |
| 28 | 13.04 | 60.83 | 31.35 | 05.41 | 43.09 | 05.39 | 59.81 | 00.93 | 28.28 | 52.59 | 17.33 | 42.60 |
| 29 | 11.91 | 61.08 | 29.72 | 05.48 | 41.54 | 05.26 | 58.68 | 00.69 | 27.62 | 52.32 | 17.16 | 42.30 |
| 30 | 10.70 | 61.33 | 28.09 | 05.54 | 40.06 | 05.13 | 57.58 | 00.47 | 26.87 | 52.06 | 16.95 | 41.97 |
| 31 | 09.43 | 61.56 | 26.49 | 05.57 | 38.64 | 05.01 | 56.48 | 00.26 | 26.03 | 51.79 | 16.77 | 41.61 |
| 32 | 08.11 | 61.77 | 24.93 | 05.59 | | | 55.34 | 00.08 | | | 16.70 | 41.22 |
| | sec δ | tan δ | sec δ | tan δ | sec δ | tan δ | sec δ | tan δ | sec δ | tan δ | sec δ | tan δ |
| | 60.28 | 60.27 | 60.39 | 60.38 | 60.42 | 60.41 | 60.37 | 60.36 | 60.25 | 60.24 | 60.08 | 60.07 |

Mean R.A. $17^{\text{h}} 34^{\text{m}} 05^{\text{s}}.18$

Double lower transit December 14

Mean Dec. $+89^{\circ} 02' 56''.18$

APPARENT PLACES OF STARS, 1986
CIRCUMPOLAR STARS AT UPPER TRANSIT AT GREENWICH

913 δ Ursae Minoris \approx Mag. 4.44 Spect. A0

| Day | January | | February | | March | | April | | May | | June | |
|-----|------------------------------------|---|------------------------------------|---|------------------------------------|---|------------------------------------|---|------------------------------------|---|--------------------------------------|---|
| | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | ^h ^m 17 36 | ⁺ ^o ' " 86 35 | ^h ^m 17 36 | ⁺ ^o ' " 86 35 | ^h ^m 17 36 | ⁺ ^o ' " 86 35 | ^h ^m 17 36 | ⁺ ^o ' " 86 35 | ^h ^m 17 36 | ⁺ ^o ' " 86 35 | ^h ^m 17 36 | ⁺ ^o ' " 86 35 |
| | ^s | " | ^s | " | ^s | " | ^s | " | ^s | " | ^s | " |
| 1 | 23.71 | 29.47 | 28.36 | 19.86 | 36.82 | 14.79 | 47.59 | 14.93 | 55.96 | 20.14 | 59.86 | 28.91 |
| 2 | 23.79 | 29.10 | 28.60 | 19.66 | 37.16 | 14.75 | 47.87 | 15.00 | 56.18 | 20.33 | 59.93 | 29.23 |
| 3 | 23.88 | 28.75 | 28.83 | 19.46 | 37.47 | 14.71 | 48.17 | 15.06 | 56.41 | 20.54 | 59.98 | 29.57 |
| 4 | 23.98 | 28.44 | 29.04 | 19.26 | 37.76 | 14.65 | 48.49 | 15.12 | 56.65 | 20.76 | 60.02 | 29.93 |
| 5 | 24.06 | 28.14 | 29.25 | 19.03 | 38.06 | 14.57 | 48.83 | 15.19 | 56.90 | 21.02 | 60.03 | 30.29 |
| 6 | 24.13 | 27.86 | 29.46 | 18.79 | 38.37 | 14.47 | 49.19 | 15.27 | 57.13 | 21.29 | 60.02 | 30.65 |
| 7 | 24.17 | 27.57 | 29.69 | 18.52 | 38.70 | 14.35 | 49.55 | 15.38 | 57.35 | 21.59 | 60.00 | 31.00 |
| 8 | 24.20 | 27.27 | 29.94 | 18.24 | 39.05 | 14.24 | 49.92 | 15.51 | 57.55 | 21.90 | 59.95 | 31.34 |
| 9 | 24.24 | 26.93 | 30.23 | 17.96 | 39.43 | 14.14 | 50.28 | 15.68 | 57.73 | 22.22 | 59.89 | 31.66 |
| 10 | 24.28 | 26.57 | 30.54 | 17.70 | 39.82 | 14.06 | 50.62 | 15.86 | 57.89 | 22.54 | 59.83 | 31.97 |
| 11 | 24.36 | 26.19 | 30.87 | 17.46 | 40.23 | 14.00 | 50.94 | 16.06 | 58.03 | 22.85 | 59.77 | 32.25 |
| 12 | 24.46 | 25.80 | 31.21 | 17.25 | 40.63 | 13.98 | 51.25 | 16.26 | 58.15 | 23.14 | 59.72 | 32.53 |
| 13 | 24.60 | 25.42 | 31.55 | 17.07 | 41.03 | 13.98 | 51.53 | 16.47 | 58.26 | 23.43 | 59.68 | 32.80 |
| 14 | 24.77 | 25.06 | 31.89 | 16.91 | 41.41 | 14.01 | 51.80 | 16.66 | 58.38 | 23.69 | 59.64 | 33.07 |
| 15 | 24.95 | 24.72 | 32.21 | 16.77 | 41.78 | 14.04 | 52.06 | 16.85 | 58.49 | 23.95 | 59.62 | 33.35 |
| 16 | 25.14 | 24.41 | 32.52 | 16.64 | 42.13 | 14.08 | 52.31 | 17.02 | 58.62 | 24.19 | ^{59 59} ^{59 56} | ^{33 65} ^{33 98} |
| 17 | 25.32 | 24.12 | 32.82 | 16.50 | 42.47 | 14.12 | 52.57 | 17.18 | 58.75 | 24.43 | 59.51 | 34.33 |
| 18 | 25.51 | 23.85 | 33.11 | 16.37 | 42.80 | 14.15 | 52.83 | 17.32 | 58.90 | 24.69 | 59.43 | 34.70 |
| 19 | 25.68 | 23.58 | 33.40 | 16.22 | 43.12 | 14.17 | 53.11 | 17.47 | 59.05 | 24.96 | 59.31 | 35.06 |
| 20 | 25.85 | 23.32 | 33.69 | 16.06 | 43.44 | 14.18 | 53.40 | 17.62 | 59.20 | 25.25 | 59.16 | 35.42 |
| 21 | 26.00 | 23.06 | 33.98 | 15.88 | 43.77 | 14.17 | 53.70 | 17.78 | 59.34 | 25.58 | 58.98 | 35.74 |
| 22 | 26.16 | 22.79 | 34.29 | 15.70 | 44.11 | 14.16 | 54.00 | 17.97 | 59.45 | 25.93 | 58.81 | 36.03 |
| 23 | 26.31 | 22.50 | 34.61 | 15.51 | 44.47 | 14.14 | 54.30 | 18.19 | 59.52 | 26.29 | 58.64 | 36.29 |
| 24 | 26.47 | 22.20 | 34.96 | 15.32 | 44.85 | 14.14 | 54.58 | 18.45 | 59.56 | 26.65 | 58.50 | 36.53 |
| 25 | 26.64 | 21.88 | 35.33 | 15.16 | 45.24 | 14.17 | 54.83 | 18.73 | 59.58 | 26.99 | 58.37 | 36.77 |
| 26 | 26.83 | 21.55 | 35.71 | 15.02 | 45.63 | 14.22 | 55.05 | 19.01 | 59.58 | 27.29 | 58.27 | 37.03 |
| 27 | 27.05 | 21.22 | 36.10 | 14.91 | 46.01 | 14.31 | 55.24 | 19.28 | 59.58 | 27.57 | 58.17 | 37.30 |
| 28 | 27.29 | 20.90 | 36.47 | 14.84 | 46.38 | 14.43 | 55.41 | 19.53 | 59.61 | 27.83 | 58.07 | 37.60 |
| 29 | 27.55 | 20.60 | 36.82 | 14.79 | 46.71 | 14.57 | 55.58 | 19.75 | 59.65 | 28.08 | 57.96 | 37.92 |
| 30 | 27.82 | 20.32 | | | 47.02 | 14.71 | 55.76 | 19.95 | 59.71 | 28.33 | 57.83 | 38.25 |
| 31 | 28.09 | 20.08 | | | 47.31 | 14.83 | 55.96 | 20.14 | 59.78 | 28.61 | 57.67 | 38.59 |
| 32 | 28.36 | 19.86 | | | 47.59 | 14.93 | | | 59.86 | 28.91 | | |
| | sec δ 16.83 | tan δ 16.80 | sec δ 16.83 | tan δ 16.80 | sec δ 16.83 | tan δ 16.80 | sec δ 16.83 | tan δ 16.80 | sec δ 16.83 | tan δ 16.80 | sec δ 16.83 | tan δ 16.80 |

Mean R.A. $17^{\text{h}} 36^{\text{m}} 32.20^{\text{s}}$

Double lower transit December 15

Mean Dec. $+86^{\circ} 35' 40''.77$

APPARENT PLACES OF STARS, 1986
CIRCUMPOLAR STARS AT UPPER TRANSIT AT GREENWICH

411

913 δ Ursae Minoris Mag. 4.44 Spect. A0

| Day | July | | August | | September | | October | | November | | December | |
|-----|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | + ° / | h m | + ° / | h m | + ° / | h m | + ° / | h m | + ° / | h m | + ° / |
| | 17 36 | 86 35 | 17 36 | 86 35 | 17 36 | 86 35 | 17 36 | 86 35 | 17 36 | 86 35 | 17 36 | 86 35 |
| | s | " | s | " | s | " | s | " | s | " | s | " |
| 1 | 57.67 | 38.59 | 49.76 | 46.41 | 37.95 | 50.43 | 25.18 | 50.00 | 13.18 | 45.16 | 05.08 | 36.85 |
| 2 | 57.50 | 38.92 | 49.40 | 46.61 | 37.54 | 50.45 | 24.80 | 49.90 | 12.84 | 44.99 | 04.84 | 36.56 |
| 3 | 57.31 | 39.25 | 49.03 | 46.78 | 37.15 | 50.46 | 24.42 | 49.81 | 12.48 | 44.81 | 04.60 | 36.22 |
| 4 | 57.10 | 39.56 | 48.68 | 46.94 | 36.76 | 50.48 | 24.04 | 49.74 | 12.09 | 44.61 | 04.38 | 35.85 |
| 5 | 56.87 | 39.86 | 48.33 | 47.07 | 36.38 | 50.51 | 23.63 | 49.69 | 11.70 | 44.38 | 04.19 | 35.46 |
| 6 | 56.65 | 40.13 | 48.00 | 47.21 | 36.00 | 50.57 | 23.20 | 49.65 | 11.32 | 44.12 | 04.04 | 35.06 |
| 7 | 56.42 | 40.39 | 47.68 | 47.34 | 35.61 | 50.64 | 22.75 | 49.59 | 10.96 | 43.82 | 03.92 | 34.67 |
| 8 | 56.20 | 40.62 | 47.37 | 47.49 | 35.19 | 50.73 | 22.28 | 49.50 | 10.63 | 43.51 | 03.83 | 34.30 |
| 9 | 55.98 | 40.85 | 47.06 | 47.66 | 34.75 | 50.81 | 21.81 | 49.38 | 10.33 | 43.20 | 03.74 | 33.96 |
| 10 | 55.78 | 41.08 | 46.74 | 47.85 | 34.28 | 50.88 | 21.35 | 49.23 | 10.06 | 42.89 | 03.66 | 33.63 |
| 11 | 55.59 | 41.31 | 46.40 | 48.05 | 33.80 | 50.91 | 20.90 | 49.05 | 09.80 | 42.60 | 03.58 | 33.32 |
| 12 | 55.41 | 41.56 | 46.03 | 48.26 | 33.31 | 50.92 | 20.49 | 48.85 | 09.55 | 42.33 | 03.49 | 33.03 |
| 13 | 55.21 | 41.83 | 45.64 | 48.46 | 32.83 | 50.89 | 20.10 | 48.66 | 09.31 | 42.08 | 03.39 | 32.73 |
| 14 | 55.01 | 42.12 | 45.22 | 48.65 | 32.38 | 50.84 | 19.74 | 48.47 | 09.05 | 41.85 | 03.28 | 32.43 |
| 15 | 54.78 | 42.42 | 44.79 | 48.80 | 31.95 | 50.77 | 19.38 | 48.31 | 08.79 | 41.62 | 03.17 | 32.11 |
| 16 | 54.52 | 42.73 | 44.35 | 48.92 | 31.54 | 50.71 | 19.03 | 48.16 | 08.51 | 41.38 | 03.05 | 31.78 |
| 17 | 54.23 | 43.04 | 43.93 | 49.01 | 31.15 | 50.67 | 18.68 | 48.03 | 08.23 | 41.14 | 02.95 | 31.43 |
| 18 | 53.91 | 43.31 | 43.53 | 49.08 | 30.77 | 50.64 | 18.31 | 47.91 | 07.93 | 40.87 | 02.85 | 31.06 |
| 19 | 53.58 | 43.56 | 43.15 | 49.14 | 30.39 | 50.63 | 17.93 | 47.79 | 07.64 | 40.59 | 02.77 | 30.68 |
| 20 | 53.25 | 43.77 | 42.79 | 49.22 | 29.99 | 50.64 | 17.53 | 47.67 | 07.36 | 40.29 | 02.72 | 30.28 |
| 21 | 52.94 | 43.95 | 42.45 | 49.31 | 29.58 | 50.66 | 17.13 | 47.53 | 07.09 | 39.96 | 02.69 | 29.89 |
| 22 | 52.66 | 44.12 | 42.10 | 49.42 | 29.14 | 50.67 | 16.71 | 47.37 | 06.84 | 39.63 | 02.68 | 29.50 |
| 23 | 52.40 | 44.30 | 41.74 | 49.56 | 28.70 | 50.67 | 16.30 | 47.18 | 06.61 | 39.28 | 02.69 | 29.13 |
| 24 | 52.15 | 44.49 | 41.37 | 49.70 | 28.24 | 50.66 | 15.90 | 46.98 | 06.40 | 38.93 | 02.70 | 28.78 |
| 25 | 51.90 | 44.70 | 40.98 | 49.85 | 27.78 | 50.62 | 15.51 | 46.75 | 06.21 | 38.58 | 02.73 | 28.45 |
| 26 | 51.65 | 44.94 | 40.57 | 49.99 | 27.32 | 50.56 | 15.13 | 46.51 | 06.03 | 38.25 | 02.74 | 28.14 |
| 27 | 51.38 | 45.19 | 40.14 | 50.12 | 26.86 | 50.47 | 14.77 | 46.26 | 05.87 | 37.94 | 02.74 | 27.84 |
| 28 | 51.09 | 45.45 | 39.71 | 50.22 | 26.42 | 50.37 | 14.44 | 46.01 | 05.70 | 37.66 | 02.72 | 27.55 |
| 29 | 50.79 | 45.71 | 39.26 | 50.31 | 25.99 | 50.25 | 14.12 | 45.76 | 05.52 | 37.39 | 02.68 | 27.25 |
| 30 | 50.46 | 45.96 | 38.82 | 50.37 | 25.58 | 50.12 | 13.81 | 45.54 | 05.31 | 37.13 | 02.63 | 26.91 |
| 31 | 50.12 | 46.20 | 38.38 | 50.41 | 25.18 | 50.00 | 13.50 | 45.34 | 05.08 | 36.85 | 02.60 | 26.55 |
| 32 | 49.76 | 46.41 | 37.95 | 50.43 | | | 13.18 | 45.16 | | | 02.58 | 26.15 |
| | sec δ | tan δ | sec δ | tan δ | sec δ | tan δ | sec δ | tan δ | sec δ | tan δ | sec δ | tan δ |
| | 16.84 | 16.81 | 16.85 | 16.82 | 16.85 | 16.82 | 16.85 | 16.82 | 16.84 | 16.81 | 16.82 | 16.79 |

Mean R.A. $17^{\text{h}} 36^{\text{m}} 32.20^{\text{s}}$

Double lower transit December 15

Mean Dec. $+86^{\circ} 35' 40.77''$

APPARENT PLACES OF STARS, 1986
CIRCUMPOLAR STARS AT UPPER TRANSIT AT GREENWICH

1646 Bradley 2412 (Draconis) . . . Mag. 6.15 Spect. A2

| Day | January | | February | | March | | April | | May | | June | |
|-----|------------------------------------|--|------------------------------------|--|------------------------------------|--|------------------------------------|--|------------------------------------|--|--------------------------------------|--|
| | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | ^h ^m 18 25 | ⁺ ^o ['] 83 09 | ^h ^m 18 25 | ⁺ ^o ['] 83 09 | ^h ^m 18 25 | ⁺ ^o ['] 83 09 | ^h ^m 18 25 | ⁺ ^o ['] 83 09 | ^h ^m 18 26 | ⁺ ^o ['] 83 09 | ^h ^m 18 26 | ⁺ ^o ['] 83 09 |
| | ^s | ["] | ^s | ["] | ^s | ["] | ^s | ["] | ^s | ["] | ^s | ["] |
| 1 | 50.66 | 51.86 | 51.97 | 41.45 | 55.64 | 34.83 | 01.03 | 32.95 | 05.86 | 36.60 | 08.94 | 44.65 |
| 2 | 50.66 | 51.47 | 52.08 | 41.21 | 55.80 | 34.73 | 01.19 | 32.97 | 05.99 | 36.75 | 09.02 | 44.96 |
| 3 | 50.67 | 51.11 | 52.17 | 40.97 | 55.96 | 34.63 | 01.35 | 32.98 | 06.14 | 36.91 | 09.09 | 45.29 |
| 4 | 50.68 | 50.78 | 52.26 | 40.73 | 56.10 | 34.51 | 01.52 | 32.98 | 06.28 | 37.09 | 09.15 | 45.64 |
| 5 | 50.69 | 50.47 | 52.34 | 40.47 | 56.25 | 34.38 | 01.70 | 32.98 | 06.43 | 37.30 | 09.20 | 46.00 |
| 6 | 50.69 | 50.18 | 52.42 | 40.18 | 56.39 | 34.22 | 01.88 | 33.00 | 06.58 | 37.53 | 09.24 | 46.36 |
| 7 | 50.69 | 49.88 | 52.51 | 39.87 | 56.55 | 34.05 | 02.07 | 33.04 | 06.72 | 37.78 | 09.28 | 46.72 |
| 8 | 50.68 | 49.58 | 52.61 | 39.55 | 56.71 | 33.87 | 02.27 | 33.10 | 06.86 | 38.05 | 09.30 | 47.07 |
| 9 | 50.67 | 49.24 | 52.72 | 39.22 | 56.88 | 33.70 | 02.46 | 33.20 | 06.99 | 38.34 | 09.32 | 47.40 |
| 10 | 50.66 | 48.88 | 52.85 | 38.90 | 57.07 | 33.54 | 02.65 | 33.31 | 07.11 | 38.62 | 09.34 | 47.72 |
| 11 | 50.66 | 48.49 | 52.99 | 38.60 | 57.26 | 33.41 | 02.83 | 33.45 | 07.22 | 38.91 | 09.35 | 48.02 |
| 12 | 50.68 | 48.09 | 53.13 | 38.33 | 57.45 | 33.31 | 03.01 | 33.60 | 07.32 | 39.18 | 09.36 | 48.31 |
| 13 | 50.70 | 47.68 | 53.27 | 38.09 | 57.65 | 33.24 | 03.18 | 33.75 | 07.42 | 39.44 | 09.38 | 48.58 |
| 14 | 50.75 | 47.29 | 53.42 | 37.87 | 57.84 | 33.19 | 03.34 | 33.89 | 07.51 | 39.69 | 09.40 | 48.86 |
| 15 | 50.80 | 46.92 | 53.56 | 37.66 | 58.03 | 33.16 | 03.49 | 34.03 | 07.60 | 39.92 | 09.42 | 49.15 |
| 16 | 50.85 | 46.58 | 53.71 | 37.47 | 58.21 | 33.13 | 03.64 | 34.15 | 07.70 | 40.15 | 09.45 | 49.46 |
| 17 | 50.92 | 46.25 | 53.84 | 37.28 | 58.38 | 33.11 | 03.79 | 34.26 | 07.80 | 40.37 | 09.47 | 49.79 |
| 18 | 50.98 | 45.95 | 53.97 | 37.09 | 58.55 | 33.07 | 03.94 | 34.36 | 07.90 | 40.59 | 09.49 | 50.15 |
| 19 | 51.03 | 45.65 | 54.10 | 36.89 | 58.72 | 33.03 | 04.10 | 34.46 | 08.01 | 40.83 | 09.50 | 50.54 |
| 20 | 51.09 | 45.36 | 54.23 | 36.68 | 58.88 | 32.98 | 04.26 | 34.55 | 08.12 | 41.10 | 09.49 | 50.93 |
| 21 | 51.14 | 45.07 | 54.36 | 36.45 | 59.05 | 32.91 | 04.43 | 34.66 | 08.22 | 41.40 | 09.47 | 51.31 |
| 22 | 51.19 | 44.77 | 54.49 | 36.21 | 59.22 | 32.84 | 04.60 | 34.79 | 08.32 | 41.73 | 09.43 | 51.67 |
| 23 | 51.24 | 44.46 | 54.64 | 35.96 | 59.39 | 32.76 | 04.77 | 34.96 | 08.41 | 42.08 | 09.39 | 52.00 |
| 24 | 51.29 | 44.13 | 54.79 | 35.71 | 59.58 | 32.69 | 04.94 | 35.16 | 08.48 | 42.43 | 09.35 | 52.29 |
| 25 | 51.35 | 43.78 | 54.95 | 35.48 | 59.77 | 32.64 | 05.10 | 35.39 | 08.53 | 42.77 | 09.32 | 52.56 |
| 26 | 51.41 | 43.42 | 55.12 | 35.27 | 59.97 | 32.62 | 05.24 | 35.63 | 08.58 | 43.08 | 09.29 | 52.83 |
| 27 | 51.48 | 43.05 | 55.30 | 35.09 | 60.17 | 32.64 | 05.37 | 35.87 | 08.63 | 43.35 | 09.27 | 53.11 |
| 28 | 51.57 | 42.69 | 55.47 | 34.95 | 60.36 | 32.69 | 05.50 | 36.08 | 08.68 | 43.61 | | |
| 29 | 51.66 | 42.34 | 55.64 | 34.83 | 60.54 | 32.76 | 05.61 | 36.27 | 08.73 | 43.85 | ^{09 26} ^{09 25} | ^{53 40} ^{53 72} |
| 30 | 51.76 | 42.02 | | | 60.72 | 32.84 | 05.73 | 36.44 | 08.80 | 44.10 | 09.23 | 54.06 |
| 31 | 51.87 | 41.72 | | | 60.88 | 32.90 | 05.86 | 36.60 | 08.87 | 44.37 | 09.18 | 54.78 |
| 32 | 51.97 | 41.45 | | | 61.03 | 32.95 | | | 08.94 | 44.65 | | |
| | sec δ 8.40 | tan δ 8.34 | sec δ 8.40 | tan δ 8.34 | sec δ 8.40 | tan δ 8.34 | sec δ 8.40 | tan δ 8.34 | sec δ 8.40 | tan δ 8.34 | sec δ 8.40 | tan δ 8.34 |

Mean R.A. ^h 18 ^m 25 ^s 57.26

Double lower transit December 28

Mean Dec. +83° 10' 01.75"

APPARENT PLACES OF STARS, 1986
CIRCUMPOLAR STARS AT UPPER TRANSIT AT GREENWICH

413

1646 Bradley 2412 (Draconis) Mag. 6.15 Spect. A2

| Day | July | | August | | September | | October | | November | | December | |
|-----|---------------|-----------------------|---------------|-----------------------|---------------|-----------------------|---------------|-----------------------|---------------|-----------------------|---------------|-----------------------|
| | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m 18 26 | + ° ' " / 83 09 | h m 18 26 | + ° ' " / 83 10 | h m 18 25 | + ° ' " / 83 10 | h m 18 25 | + ° ' " / 83 10 | h m 18 25 | + ° ' " / 83 10 | h m 18 25 | + ° ' " / 83 09 |
| | s | " | s | " | s | " | s | " | s | " | s | " |
| 1 | 09.18 | 54.78 | 06.41 | 04.17 | 61.26 | 10.49 | 55.08 | 12.54 | 48.77 | 10.04 | 44.01 | 63.36 |
| 2 | 09.14 | 55.15 | 06.26 | 04.44 | 61.06 | 10.58 | 54.88 | 12.51 | 48.59 | 09.93 | 43.87 | 63.11 |
| 3 | 09.09 | 55.52 | 06.11 | 04.68 | 60.87 | 10.67 | 54.69 | 12.50 | 48.40 | 09.83 | 43.72 | 62.82 |
| 4 | 09.03 | 55.87 | 05.96 | 04.90 | 60.69 | 10.77 | 54.49 | 12.51 | 48.19 | 09.71 | 43.58 | 62.50 |
| 5 | 08.97 | 56.21 | 05.82 | 05.11 | 60.51 | 10.88 | 54.29 | 12.53 | 47.99 | 09.56 | 43.46 | 62.15 |
| 6 | 08.89 | 56.53 | 05.67 | 05.31 | 60.33 | 11.01 | 54.08 | 12.57 | 47.78 | 09.37 | 43.34 | 61.79 |
| 7 | 08.82 | 56.83 | 05.54 | 05.51 | 60.15 | 11.16 | 53.86 | 12.60 | 47.58 | 09.14 | 43.24 | 61.42 |
| 8 | 08.75 | 57.11 | 05.40 | 05.72 | 59.96 | 11.32 | 53.63 | 12.60 | 47.39 | 08.90 | 43.16 | 61.07 |
| 9 | 08.68 | 57.38 | 05.27 | 05.95 | 59.75 | 11.49 | 53.39 | 12.57 | 47.21 | 08.64 | 43.08 | 60.75 |
| 10 | 08.61 | 57.65 | 05.14 | 06.19 | 59.54 | 11.65 | 53.15 | 12.51 | 47.04 | 08.39 | 43.00 | 60.44 |
| 11 | 08.55 | 57.92 | 05.00 | 06.46 | 59.31 | 11.78 | 52.93 | 12.42 | 46.89 | 08.16 | 42.93 | 60.15 |
| 12 | 08.49 | 58.21 | 04.85 | 06.74 | 59.09 | 11.88 | 52.71 | 12.31 | 46.74 | 07.94 | 42.86 | 59.87 |
| 13 | 08.43 | 58.51 | 04.69 | 07.02 | 58.86 | 11.94 | 52.50 | 12.19 | 46.59 | 07.74 | 42.78 | 59.60 |
| 14 | 08.36 | 58.84 | 04.51 | 07.29 | 58.64 | 11.98 | 52.30 | 12.07 | 46.44 | 07.55 | 42.70 | 59.32 |
| 15 | 08.29 | 59.19 | 04.33 | 07.53 | 58.42 | 12.00 | 52.11 | 11.98 | 46.29 | 07.37 | 42.61 | 59.03 |
| 16 | 08.21 | 59.55 | 04.14 | 07.73 | 58.22 | 12.02 | 51.92 | 11.90 | 46.13 | 07.19 | 42.53 | 58.72 |
| 17 | 08.11 | 59.91 | 03.95 | 07.91 | 58.03 | 12.05 | 51.73 | 11.84 | 45.97 | 07.00 | 42.44 | 58.39 |
| 18 | 07.99 | 60.25 | 03.77 | 08.05 | 57.84 | 12.10 | 51.54 | 11.79 | 45.80 | 06.80 | 42.36 | 58.04 |
| 19 | 07.87 | 60.56 | 03.60 | 08.19 | 57.65 | 12.16 | 51.34 | 11.74 | 45.63 | 06.57 | 42.29 | 57.68 |
| 20 | 07.75 | 60.84 | 03.43 | 08.34 | 57.46 | 12.25 | 51.14 | 11.69 | 45.47 | 06.33 | 42.22 | 57.30 |
| 21 | 07.63 | 61.08 | 03.28 | 08.50 | 57.26 | 12.34 | 50.93 | 11.63 | 45.31 | 06.06 | 42.17 | 56.92 |
| 22 | 07.52 | 61.31 | 03.12 | 08.68 | 57.05 | 12.44 | 50.72 | 11.55 | 45.15 | 05.77 | 42.12 | 56.54 |
| 23 | 07.41 | 61.54 | 02.96 | 08.88 | 56.84 | 12.53 | 50.50 | 11.45 | 45.00 | 05.47 | 42.08 | 56.16 |
| 24 | 07.32 | 61.78 | 02.80 | 09.10 | 56.62 | 12.60 | 50.29 | 11.32 | 44.87 | 05.16 | 42.05 | 55.81 |
| 25 | 07.22 | 62.05 | 02.63 | 09.32 | 56.40 | 12.65 | 50.07 | 11.18 | 44.74 | 04.86 | 42.03 | 55.48 |
| 26 | 07.13 | 62.33 | 02.45 | 09.54 | 56.17 | 12.68 | 49.87 | 11.01 | 44.61 | 04.56 | 42.00 | 55.17 |
| 27 | 07.03 | 62.63 | 02.26 | 09.75 | 55.94 | 12.68 | 49.67 | 10.83 | 44.50 | 04.29 | 41.97 | 54.88 |
| 28 | 06.92 | 62.95 | 02.07 | 09.94 | 55.72 | 12.66 | 49.48 | 10.64 | 44.38 | 04.03 | 41.94 | 54.59 |
| 29 | 06.81 | 63.27 | 01.87 | 10.11 | 55.50 | 12.63 | 49.30 | 10.46 | 44.27 | 03.80 | 41.89 | 54.30 |
| 30 | 06.68 | 63.58 | 01.66 | 10.26 | 55.29 | 12.59 | 49.12 | 10.30 | 44.14 | 03.58 | 41.84 | 53.98 |
| 31 | 06.55 | 63.88 | 01.46 | 10.38 | 55.08 | 12.54 | 48.95 | 10.16 | 44.01 | 03.36 | 41.79 | 53.62 |
| 32 | 06.41 | 64.17 | 01.26 | 10.49 | | | 48.77 | 10.04 | | | 41.75 | 53.23 |
| | sec δ 8.40 | tan δ 8.34 | sec δ 8.41 | tan δ 8.35 | sec δ 8.41 | tan δ 8.35 | sec δ 8.41 | tan δ 8.35 | sec δ 8.41 | tan δ 8.35 | sec δ 8.40 | tan δ 8.34 |

Mean R.A. 18^h 25^m 57.^s26

Double lower transit December 28

Mean Dec. +83° 10' 01".75

APPARENT PLACES OF STARS, 1986
CIRCUMPOLAR STARS AT UPPER TRANSIT AT GREENWICH

1647 Groombridge 3212 (Draconis) Mag. 6.61 Spect. A2

| Day | January | | February | | March | | April | | May | | June | |
|-----|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | ^h 20 01 | ^m 84 37 | ^h 20 01 | ^m 84 37 | ^h 20 01 | ^m 84 37 | ^h 20 01 | ^m 84 37 | ^h 20 01 | ^m 84 37 | ^h 20 01 | ^m 84 37 |
| 1 | 15 05 | 46 04 | 13 66 | 35 86 | 16 05 | 27 36 | 21 74 | 21 94 | 28 30 | 21 98 | 34 05 | 27 33 |
| 2 | 14 94 | 45 70 | 13 70 | 35 57 | 16 20 | 27 16 | 21 93 | 21 86 | 28 50 | 22 02 | 34 22 | 27 56 |
| 3 | 14 85 | 45 37 | 13 75 | 35 29 | 16 35 | 26 97 | 22 11 | 21 76 | 28 71 | 22 07 | 34 39 | 27 82 |
| 4 | 14 77 | 45 06 | 13 78 | 35 02 | 16 48 | 26 77 | 22 31 | 21 64 | 28 93 | 22 14 | 34 55 | 28 10 |
| 5 | 14 70 | 44 76 | 13 80 | 34 74 | 16 61 | 26 55 | 22 51 | 21 52 | 29 16 | 22 22 | 34 71 | 28 39 |
| 6 | 14 62 | 44 52 | 13 81 | 34 43 | 16 74 | 26 31 | 22 73 | 21 41 | 29 39 | 22 33 | 34 86 | 28 70 |
| 7 | 14 53 | 44 27 | 13 83 | 34 09 | 16 86 | 26 05 | 22 97 | 21 30 | 29 63 | 22 46 | 35 00 | 29 01 |
| 8 | 14 43 | 44 01 | 13 85 | 33 73 | 17 00 | 25 77 | 23 21 | 21 23 | 29 86 | 22 62 | 35 12 | 29 33 |
| 9 | 14 32 | 43 73 | 13 88 | 33 36 | 17 16 | 25 49 | 23 46 | 21 17 | 30 09 | 22 79 | 35 23 | 29 63 |
| 10 | 14 21 | 43 41 | 13 95 | 32 98 | 17 33 | 25 22 | 23 71 | 21 15 | 30 30 | 22 97 | 35 33 | 29 92 |
| 11 | 14 10 | 43 07 | 14 02 | 32 62 | 17 52 | 24 97 | 23 96 | 21 14 | 30 51 | 23 16 | 35 42 | 30 19 |
| 12 | 14 00 | 42 70 | 14 11 | 32 27 | 17 72 | 24 74 | 24 20 | 21 16 | 30 70 | 23 35 | 35 52 | 30 45 |
| 13 | 13 92 | 42 32 | 14 22 | 31 94 | 17 92 | 24 54 | 24 44 | 21 18 | 30 88 | 23 53 | 35 61 | 30 70 |
| 14 | 13 86 | 41 94 | 14 32 | 31 64 | 18 13 | 24 36 | 24 66 | 21 21 | 31 05 | 23 69 | 35 71 | 30 95 |
| 15 | 13 82 | 41 57 | 14 43 | 31 36 | 18 33 | 24 19 | 24 88 | 21 23 | 31 22 | 23 85 | 35 81 | 31 20 |
| 16 | 13 79 | 41 22 | 14 54 | 31 09 | 18 54 | 24 05 | 25 08 | 21 24 | 31 39 | 23 99 | 35 93 | 31 47 |
| 17 | 13 77 | 40 88 | 14 65 | 30 83 | 18 73 | 23 91 | 25 29 | 21 24 | 31 57 | 24 13 | 36 05 | 31 76 |
| 18 | 13 76 | 40 57 | 14 74 | 30 56 | 18 91 | 23 76 | 25 49 | 21 23 | 31 75 | 24 26 | 36 17 | 32 08 |
| 19 | 13 74 | 40 26 | 14 84 | 30 30 | 19 09 | 23 62 | 25 69 | 21 21 | 31 94 | 24 41 | 36 28 | 32 43 |
| 20 | 13 73 | 39 97 | 14 92 | 30 02 | 19 27 | 23 46 | 25 90 | 21 18 | 32 14 | 24 58 | 36 37 | 32 81 |
| 21 | 13 71 | 39 67 | 15 01 | 29 73 | 19 44 | 23 28 | 26 13 | 21 16 | 32 34 | 24 78 | 36 45 | 33 19 |
| 22 | 13 68 | 39 38 | 15 10 | 29 42 | 19 61 | 23 10 | 26 36 | 21 16 | 32 55 | 25 02 | 36 50 | 33 55 |
| 23 | 13 65 | 39 07 | 15 19 | 29 09 | 19 80 | 22 90 | 26 61 | 21 19 | 32 74 | 25 28 | 36 54 | 33 89 |
| 24 | 13 61 | 38 74 | 15 30 | 28 76 | 19 99 | 22 70 | 26 86 | 21 26 | 32 91 | 25 57 | 36 57 | 34 20 |
| 25 | 13 57 | 38 39 | 15 42 | 28 43 | 20 20 | 22 52 | 27 11 | 21 36 | 33 07 | 25 85 | 36 60 | 34 48 |
| 26 | 13 54 | 38 03 | 15 56 | 28 12 | 20 43 | 22 36 | 27 34 | 21 49 | 33 20 | 26 11 | 36 65 | 34 75 |
| 27 | 13 53 | 37 65 | 15 72 | 27 84 | 20 66 | 22 24 | 27 55 | 21 62 | 33 33 | 26 34 | 36 70 | 35 03 |
| 28 | 13 52 | 37 26 | 15 88 | 27 58 | 20 90 | 22 15 | 27 75 | 21 74 | 33 45 | 26 55 | 36 77 | 35 31 |
| 29 | 13 53 | 36 88 | 16 05 | 27 36 | 21 13 | 22 09 | 27 94 | 21 84 | 33 58 | 26 74 | 36 84 | 35 61 |
| 30 | 13 56 | 36 51 | | | 21 35 | 22 05 | 28 12 | 21 92 | 33 73 | 26 92 | 36 91 | 35 94 |
| 31 | 13 61 | 36 17 | | | 21 55 | 22 00 | 28 30 | 21 98 | 33 88 | 27 12 | 36 98 | 36 28 |
| 32 | 13 66 | 35 86 | | | 21 74 | 21 94 | | | 34 05 | 27 33 | | |
| | sec δ 10 68 | tan δ 10 63 | sec δ 10 68 | tan δ 10 63 | sec δ 10 67 | tan δ 10 63 | sec δ 10 67 | tan δ 10 62 | sec δ 10 67 | tan δ 10 63 | sec δ 10 68 | tan δ 10 63 |

Mean R.A. 20 01 25^s.6

Double lower transit January 21

Mean Dec. +84° 37' 51".91

APPARENT PLACES OF STARS, 1986
CIRCUMPOLAR STARS AT UPPER TRANSIT AT GREENWICH

415

1647 Groombridge 3212 (Draconis) Mag. 6.61 Spect. A2

| Day | July | | August | | September | | October | | November | | December | |
|-----|---------------------------|---------------------------|-------------------------|-----------------------|-------------------------|-----------------------|-------------------------|-----------------------|-------------------------|-----------------------|-------------------------|-----------------------|
| | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | ^{h m} 20 01 | ⁺ 84 37 | ^{h m} 20 01 | ⁺ 84 37 | ^{h m} 20 01 | ⁺ 84 37 | ^{h m} 20 01 | ⁺ 84 38 | ^{h m} 20 01 | ⁺ 84 38 | ^{h m} 20 01 | ⁺ 84 37 |
| | ^s 36 98 | " 36 28 | ^s 36 35 | " 47 45 | ^s 32 07 | " 57 10 | ^s 25 43 | " 03 55 | ^s 17 38 | " 05 97 | ^s 09 96 | " 63 54 |
| 1 | 36 98 | 36 28 | 36 35 | 47 45 | 32 07 | 57 10 | 25 43 | 03 55 | 17 38 | 05 97 | 09 96 | 63 54 |
| 2 | 37 05 | 36 65 | 36 25 | 47 80 | 31 86 | 57 33 | 25 19 | 03 67 | 17 14 | 06 01 | 09 72 | 63 43 |
| 3 | 37 10 | 37 02 | 36 14 | 48 14 | 31 67 | 57 55 | 24 96 | 03 80 | 16 88 | 06 07 | 09 47 | 63 29 |
| 4 | 37 14 | 37 40 | 36 03 | 48 46 | 31 48 | 57 77 | 24 73 | 03 95 | 16 61 | 06 11 | 09 22 | 63 11 |
| 5 | 37 17 | 37 78 | 35 91 | 48 76 | 31 30 | 58 00 | 24 51 | 04 12 | 16 33 | 06 14 | 08 97 | 62 89 |
| 6 | 37 18 | 38 14 | 35 80 | 49 05 | 31 13 | 58 25 | 24 27 | 04 31 | 16 03 | 06 13 | 08 74 | 62 65 |
| 7 | 37 18 | 38 50 | 35 70 | 49 33 | 30 96 | 58 52 | 24 02 | 04 51 | 15 73 | 06 08 | 08 52 | 62 40 |
| 8 | 37 18 | 38 83 | 35 60 | 49 62 | 30 78 | 58 82 | 23 75 | 04 69 | 15 44 | 06 00 | 08 32 | 62 15 |
| 9 | 37 17 | 39 15 | 35 51 | 49 93 | 30 59 | 59 12 | 23 46 | 04 84 | 15 16 | 05 90 | 08 14 | 61 91 |
| 10 | 37 16 | 39 46 | 35 42 | 50 25 | 30 38 | 59 43 | 23 17 | 04 96 | 14 90 | 05 80 | 07 97 | 61 69 |
| 11 | 37 15 | 39 75 | 35 33 | 50 60 | 30 15 | 59 72 | 22 87 | 05 05 | 14 65 | 05 70 | 07 80 | 61 48 |
| 12 | 37 15 | 40 05 | 35 24 | 50 97 | 29 91 | 59 98 | 22 59 | 05 11 | 14 42 | 05 61 | 07 64 | 61 29 |
| 13 | 37 16 | 40 36 | 35 12 | 51 35 | 29 66 | 60 21 | 22 31 | 05 16 | 14 19 | 05 53 | 07 47 | 61 10 |
| 14 | 37 18 | 40 68 | 34 99 | 51 73 | 29 41 | 60 41 | 22 05 | 05 20 | 13 97 | 05 48 | 07 30 | 60 92 |
| 15 | 37 19 | 41 04 | 34 84 | 52 10 | 29 17 | 60 59 | 21 80 | 05 25 | 13 74 | 05 43 | 07 12 | 60 73 |
| 16 | 37 20 | 41 41 | 34 67 | 52 43 | 28 94 | 60 75 | 21 56 | 05 32 | 13 50 | 05 39 | 06 93 | 60 52 |
| 17 | 37 20 | 41 82 | 34 50 | 52 73 | 28 72 | 60 92 | 21 33 | 05 40 | 13 26 | 05 34 | 06 74 | 60 29 |
| 18 | 37 18 | 42 23 | 34 32 | 53 01 | 28 52 | 61 10 | 21 09 | 05 50 | 13 01 | 05 28 | 06 55 | 60 05 |
| 19 | 37 14 | 42 63 | 34 16 | 53 26 | 28 32 | 61 30 | 20 85 | 05 60 | 12 75 | 05 21 | 06 36 | 59 78 |
| 20 | 37 08 | 43 01 | 34 01 | 53 51 | 28 12 | 61 52 | 20 60 | 05 71 | 12 49 | 05 11 | 06 17 | 59 49 |
| 21 | 37 01 | 43 37 | 33 87 | 53 77 | 27 91 | 61 75 | 20 34 | 05 81 | 12 23 | 05 00 | 06 00 | 59 19 |
| 22 | ^{36 93} 36 81 | ^{43 69} 44 27 | 33 74 | 54 05 | 27 70 | 61 99 | 20 06 | 05 90 | 11 96 | 04 85 | 05 84 | 58 88 |
| 23 | ^{36 86} 36 81 | ^{43 98} 44 27 | 33 62 | 54 35 | 27 47 | 62 23 | 19 78 | 05 97 | 11 71 | 04 69 | 05 70 | 58 57 |
| 24 | 36 76 | 44 57 | 33 48 | 54 67 | 27 24 | 62 46 | 19 50 | 06 02 | 11 46 | 04 52 | 05 56 | 58 27 |
| 25 | 36 72 | 44 88 | 33 35 | 55 00 | 26 99 | 62 68 | 19 21 | 06 04 | 11 22 | 04 34 | 05 44 | 58 00 |
| 26 | 36 69 | 45 21 | 33 20 | 55 33 | 26 73 | 62 87 | 18 92 | 06 04 | 11 00 | 04 16 | 05 33 | 57 74 |
| 27 | 36 66 | 45 56 | 33 03 | 55 67 | 26 47 | 63 05 | 18 64 | 06 03 | 10 79 | 04 00 | 05 21 | 57 50 |
| 28 | 36 62 | 45 93 | 32 86 | 55 99 | 26 20 | 63 20 | 18 37 | 06 00 | 10 59 | 03 86 | 05 09 | 57 28 |
| 29 | 36 57 | 46 31 | 32 67 | 56 30 | 25 94 | 63 33 | 18 11 | 05 97 | 10 39 | 03 74 | 04 95 | 57 06 |
| 30 | 36 51 | 46 69 | 32 47 | 56 59 | 25 68 | 63 45 | 17 86 | 05 95 | 10 18 | 03 64 | 04 80 | 56 82 |
| 31 | 36 44 | 47 07 | 32 27 | 56 86 | 25 43 | 63 55 | 17 62 | 05 95 | 09 96 | 03 54 | 04 64 | 56 55 |
| 32 | 36 35 | 47 45 | 32 07 | 57 10 | | | 17 38 | 05 97 | | 04 48 | | 56 24 |
| | sec δ 10.68 | tan δ 10.63 | sec δ 10.69 | tan δ 10.64 | sec δ 10.69 | tan δ 10.65 | sec δ 10.69 | tan δ 10.65 | sec δ 10.69 | tan δ 10.65 | sec δ 10.69 | tan δ 10.65 |

Mean R.A. $20^{\text{h}} 01^{\text{m}} 25^{\text{s}}.16$

Double lower transit January 21

Mean Dec. $+84^{\circ} 37' 51''.91$

APPARENT PLACES OF STARS, 1986
CIRCUMPOLAR STARS AT UPPER TRANSIT AT GREENWICH

915 76 Draconis Mag. 5.69 Spect. A0

| Day | January | | February | | March | | April | | May | | June | |
|-----|---------------|-------------------|---------------|-------------------|---------------|-------------------|---------------|-------------------|---------------|-------------------|---------------|-------------------|
| | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m 20 43 | + ° / 82 28 | h m 20 43 | + ° / 82 28 | h m 20 43 | + ° / 82 28 | h m 20 43 | + ° / 82 28 | h m 20 43 | + ° / 82 28 | h m 20 43 | + ° / 82 28 |
| | s 29.10 | " 51.51 | s 27.30 | " 41.83 | s 28.28 | " 32.89 | s 31.86 | " 26.19 | s 36.53 | " 24.70 | s 41.13 | " 28.71 |
| 1 | 28.99 | 51.19 | 27.31 | 41.53 | 28.38 | 32.65 | 31.98 | 26.07 | 36.68 | 24.70 | 41.28 | 28.90 |
| 2 | 28.90 | 50.89 | 27.32 | 41.26 | 28.46 | 32.43 | 32.11 | 25.93 | 36.83 | 24.71 | 41.42 | 29.12 |
| 3 | 28.82 | 50.61 | 27.32 | 40.98 | 28.54 | 32.20 | 32.23 | 25.77 | 36.99 | 24.72 | 41.57 | 29.35 |
| 4 | 28.75 | 50.35 | 27.32 | 40.70 | 28.62 | 31.96 | 32.37 | 25.60 | 37.16 | 24.74 | 41.71 | 29.61 |
| 5 | 28.67 | 50.11 | 27.30 | 40.39 | 28.69 | 31.69 | 32.51 | 25.43 | 37.34 | 24.79 | 41.84 | 29.89 |
| 6 | 28.59 | 49.89 | 27.29 | 40.06 | 28.76 | 31.41 | 32.67 | 25.27 | 37.51 | 24.87 | 41.97 | 30.17 |
| 7 | 28.51 | 49.66 | 27.28 | 39.70 | 28.83 | 31.10 | 32.83 | 25.14 | 37.69 | 24.97 | 42.09 | 30.45 |
| 8 | 28.41 | 49.41 | 27.27 | 39.32 | 28.92 | 30.79 | 33.00 | 25.03 | 37.87 | 25.09 | 42.20 | 30.73 |
| 9 | 28.31 | 49.13 | 27.28 | 38.94 | 29.01 | 30.48 | 33.18 | 24.94 | 38.04 | 25.22 | 42.30 | 31.00 |
| 10 | 28.20 | 48.82 | 27.30 | 38.56 | 29.12 | 30.18 | 33.35 | 24.88 | 38.20 | 25.36 | 42.39 | 31.25 |
| 11 | 28.11 | 48.48 | 27.33 | 38.19 | 29.24 | 29.91 | 33.53 | 24.83 | 38.36 | 25.51 | 42.48 | 31.49 |
| 12 | 28.02 | 48.13 | 27.38 | 37.85 | 29.37 | 29.65 | 33.70 | 24.80 | 38.51 | 25.64 | 42.58 | 31.72 |
| 13 | 27.95 | 47.77 | 27.43 | 37.52 | 29.50 | 29.43 | 33.86 | 24.77 | 38.65 | 25.77 | 42.67 | 31.94 |
| 14 | 27.89 | 47.41 | 27.48 | 37.21 | 29.63 | 29.22 | 34.02 | 24.75 | 38.79 | 25.89 | 42.77 | 32.17 |
| 15 | 27.83 | 47.07 | 27.53 | 36.92 | 29.76 | 29.02 | 34.17 | 24.71 | 38.92 | 25.99 | 42.87 | 32.41 |
| 16 | 27.79 | 46.75 | 27.59 | 36.64 | 29.88 | 28.84 | 34.31 | 24.67 | 39.06 | 26.08 | 42.99 | 32.67 |
| 17 | 27.75 | 46.44 | 27.63 | 36.36 | 30.00 | 28.66 | 34.45 | 24.61 | 39.20 | 26.18 | 43.10 | 32.96 |
| 18 | 27.72 | 46.14 | 27.68 | 36.07 | 30.12 | 28.47 | 34.60 | 24.54 | 39.35 | 26.28 | 43.21 | 33.29 |
| 19 | 27.69 | 45.86 | 27.72 | 35.78 | 30.23 | 28.27 | 34.75 | 24.47 | 39.50 | 26.40 | 43.32 | 33.64 |
| 20 | 27.65 | 45.57 | 27.76 | 35.47 | 30.34 | 28.06 | 34.90 | 24.40 | 39.67 | 26.55 | 43.41 | 34.01 |
| 21 | 27.61 | 45.29 | 27.79 | 35.15 | 30.45 | 27.83 | 35.07 | 24.34 | 39.83 | 26.74 | 43.49 | 34.36 |
| 22 | 27.56 | 44.99 | 27.83 | 34.81 | 30.56 | 27.60 | 35.24 | 24.31 | 40.00 | 26.96 | 43.55 | 34.70 |
| 23 | 27.51 | 44.68 | 27.88 | 34.45 | 30.68 | 27.36 | 35.43 | 24.32 | 40.15 | 27.20 | 43.61 | 35.00 |
| 24 | 27.46 | 44.35 | 27.94 | 34.10 | 30.81 | 27.13 | 35.61 | 24.36 | 40.29 | 27.45 | 43.66 | 35.28 |
| 25 | 27.41 | 44.00 | 28.01 | 33.76 | 30.96 | 26.91 | 35.79 | 24.43 | 40.41 | 27.68 | 43.72 | 35.54 |
| 26 | 27.36 | 43.63 | 28.09 | 33.44 | 31.11 | 26.73 | 35.96 | 24.51 | 40.53 | 27.88 | 43.78 | 35.80 |
| 27 | 27.33 | 43.25 | 28.18 | 33.15 | 31.27 | 26.59 | 36.11 | 24.59 | 40.64 | 28.06 | 43.86 | 36.07 |
| 28 | 27.30 | 42.87 | 28.28 | 32.89 | 31.43 | 26.48 | 36.25 | 24.65 | 40.75 | 28.22 | 43.94 | 36.35 |
| 29 | 27.29 | 42.50 | | | 31.58 | 26.38 | 36.39 | 24.69 | 40.87 | 28.38 | 44.02 | 36.66 |
| 30 | 27.29 | 42.15 | | | 31.72 | 26.29 | 36.53 | 24.70 | 41.00 | 28.54 | 44.10 | 36.99 |
| 31 | 27.30 | 41.83 | | | 31.86 | 26.19 | | | 41.13 | 28.71 | | |
| 32 | | | | | | | | | | | | |
| | sec δ 7.64 | tan δ 7.58 | sec δ 7.64 | tan δ 7.57 | sec δ 7.64 | tan δ 7.57 | sec δ 7.63 | tan δ 7.57 | sec δ 7.63 | tan δ 7.57 | sec δ 7.64 | tan δ 7.57 |

Mean R.A. 20^h 43^m 37^s.38

Double lower transit January 31

Mean Dec. +82° 28' 55".99

APPARENT PLACES OF STARS, 1986
CIRCUMPOLAR STARS AT UPPER TRANSIT AT GREENWICH

417

915 76 Draconis Mag. 5.69 Spect. A0

| Day | July | | August | | September | | October | | November | | December | |
|-----|------------------------------------|---|--------------------------------------|---|------------------------------------|---|------------------------------------|---|------------------------------------|---|------------------------------------|---|
| | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | ^h ^m 20 43 | ⁺ ^o ' " 82 28 | ^h ^m 20 43 | ⁺ ^o ' " 82 28 | ^h ^m 20 43 | ⁺ ^o ' " 82 28 | ^h ^m 20 43 | ⁺ ^o ' " 82 29 | ^h ^m 20 43 | ⁺ ^o ' " 82 29 | ^h ^m 20 43 | ⁺ ^o ' " 82 29 |
| | ^s 44.10 | " 36.99 | ^s 44.80 | " 47.94 | ^s 42.73 | " 59.05 | ^s 38.72 | " 07.14 | ^s 33.37 | " 11.55 | ^s 28.06 | " 11.01 |
| 1 | 44.10 | 36.99 | 44.80 | 47.94 | 42.73 | 59.05 | 38.72 | 07.14 | 33.37 | 11.55 | 28.06 | 11.01 |
| 2 | 44.18 | 37.34 | ^{44 77} ^{44 74} | ^{48 34} ^{48 72} | 42.61 | 59.33 | 38.57 | 07.31 | 33.21 | 11.65 | 27.89 | 10.97 |
| 3 | 44.26 | 37.70 | 44.70 | 49.09 | 42.49 | 59.60 | 38.42 | 07.49 | 33.04 | 11.77 | 27.70 | 10.89 |
| 4 | 44.33 | 38.07 | 44.65 | 49.44 | 42.38 | 59.87 | 38.27 | 07.70 | 32.86 | 11.88 | 27.52 | 10.78 |
| 5 | 44.38 | 38.44 | 44.60 | 49.77 | 42.28 | 60.14 | 38.13 | 07.93 | 32.67 | 11.98 | 27.33 | 10.63 |
| 6 | 44.43 | 38.81 | 44.55 | 50.08 | 42.18 | 60.43 | 37.98 | 08.17 | 32.46 | 12.05 | 27.15 | 10.45 |
| 7 | 44.47 | 39.16 | 44.51 | 50.39 | 42.08 | 60.74 | 37.83 | 08.43 | 32.25 | 12.07 | 26.97 | 10.26 |
| 8 | 44.50 | 39.50 | 44.46 | 50.70 | 41.99 | 61.08 | 37.66 | 08.68 | 32.05 | 12.07 | 26.82 | 10.06 |
| 9 | 44.53 | 39.82 | 44.43 | 51.03 | 41.88 | 61.43 | 37.48 | 08.90 | 31.85 | 12.04 | 26.67 | 09.87 |
| 10 | 44.55 | 40.13 | 44.40 | 51.38 | 41.77 | 61.79 | 37.29 | 09.10 | 31.66 | 12.00 | 26.53 | 09.69 |
| 11 | 44.57 | 40.43 | 44.37 | 51.75 | 41.64 | 62.13 | 37.10 | 09.26 | 31.48 | 11.97 | 26.40 | 09.53 |
| 12 | 44.60 | 40.73 | 44.34 | 52.14 | 41.50 | 62.46 | 36.90 | 09.40 | 31.30 | 11.94 | 26.27 | 09.38 |
| 13 | 44.64 | 41.04 | 44.30 | 52.55 | 41.35 | 62.75 | 36.72 | 09.51 | 31.14 | 11.92 | 26.14 | 09.24 |
| 14 | 44.68 | 41.36 | 44.24 | 52.96 | 41.20 | 63.01 | 36.54 | 09.62 | 30.98 | 11.92 | 26.00 | 09.10 |
| 15 | 44.72 | 41.71 | 44.17 | 53.36 | 41.05 | 63.25 | 36.37 | 09.73 | 30.82 | 11.93 | 25.86 | 08.96 |
| 16 | 44.77 | 42.08 | 44.09 | 53.74 | 40.90 | 63.47 | 36.21 | 09.85 | 30.65 | 11.94 | 25.72 | 08.80 |
| 17 | 44.81 | 42.48 | 44.00 | 54.09 | 40.77 | 63.70 | 36.05 | 09.99 | 30.48 | 11.96 | 25.57 | 08.63 |
| 18 | 44.84 | 42.90 | 43.91 | 54.40 | 40.64 | 63.93 | 35.90 | 10.14 | 30.31 | 11.97 | 25.42 | 08.44 |
| 19 | 44.85 | 43.32 | 43.82 | 54.70 | 40.52 | 64.17 | 35.74 | 10.31 | 30.12 | 11.96 | 25.26 | 08.22 |
| 20 | 44.85 | 43.72 | 43.74 | 54.99 | 40.40 | 64.44 | 35.57 | 10.48 | 29.94 | 11.93 | 25.11 | 07.98 |
| 21 | 44.83 | 44.09 | 43.67 | 55.28 | 40.28 | 64.72 | 35.40 | 10.65 | 29.74 | 11.88 | 24.97 | 07.73 |
| 22 | 44.81 | 44.43 | 43.60 | 55.59 | 40.15 | 65.01 | 35.22 | 10.81 | 29.55 | 11.81 | 24.83 | 07.46 |
| 23 | 44.80 | 44.75 | 43.54 | 55.92 | 40.02 | 65.30 | 35.04 | 10.95 | 29.36 | 11.72 | 24.70 | 07.20 |
| 24 | 44.78 | 45.05 | 43.48 | 56.27 | 39.87 | 65.59 | 34.85 | 11.07 | 29.17 | 11.61 | 24.59 | 06.93 |
| 25 | 44.78 | 45.36 | 43.41 | 56.63 | 39.72 | 65.87 | 34.65 | 11.16 | 29.00 | 11.49 | 24.48 | 06.69 |
| 26 | 44.78 | 45.68 | 43.34 | 57.00 | 39.56 | 66.13 | 34.45 | 11.24 | 28.83 | 11.37 | 24.38 | 06.46 |
| 27 | 44.79 | 46.01 | 43.26 | 57.38 | 39.40 | 66.37 | 34.25 | 11.29 | 28.67 | 11.26 | 24.28 | 06.26 |
| 28 | 44.80 | 46.37 | 43.17 | 57.74 | 39.23 | 66.59 | 34.06 | 11.33 | 28.51 | 11.17 | 24.18 | 06.08 |
| 29 | 44.81 | 46.75 | 43.07 | 58.10 | 39.06 | 66.78 | 33.88 | 11.37 | 28.36 | 11.10 | 24.07 | 05.90 |
| 30 | 44.82 | 47.14 | 42.96 | 58.44 | 38.89 | 66.96 | 33.70 | 11.41 | 28.21 | 11.05 | 23.94 | 05.70 |
| 31 | 44.81 | 47.54 | 42.85 | 58.76 | 38.72 | 67.14 | 33.54 | 11.47 | 28.06 | 11.01 | 23.81 | 05.47 |
| 32 | 44.80 | 47.94 | 42.73 | 59.05 | | | 33.37 | 11.55 | | | 23.68 | 05.21 |
| | sec δ 7.64 | tan δ 7.57 | sec δ 7.64 | tan δ 7.58 | sec δ 7.65 | tan δ 7.58 | sec δ 7.65 | tan δ 7.58 | sec δ 7.65 | tan δ 7.58 | sec δ 7.65 | tan δ 7.58 |

Mean R.A. ^h 20 ^m 43 ^s 37.38

Double lower transit January 31

Mean Dec. ^o +82 ['] 28 ["] 55.39

APPARENT PLACES OF STARS, 1986
CIRCUMPOLAR STARS AT UPPER TRANSIT AT GREENWICH

1648 32 H. Cephei Mag. 5.38 Spect. A0

| Day | January | | February | | March | | April | | May | | June | |
|-----|------------------------------------|--|------------------------------------|--|------------------------------------|--|------------------------------------|--|------------------------------------|--|------------------------------------|--|
| | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | ^h ^m 22 14 | ⁺ ^o ['] 86 02 | ^h ^m 22 14 | ⁺ ^o ['] 86 02 | ^h ^m 22 14 | ⁺ ^o ['] 86 02 | ^h ^m 22 14 | ⁺ ^o ['] 86 01 | ^h ^m 22 14 | ⁺ ^o ['] 86 01 | ^h ^m 22 14 | ⁺ ^o ['] 86 01 |
| | ^s | ["] | ^s | ["] | ^s | ["] | ^s | ["] | ^s | ["] | ^s | ["] |
| 1 | 11.83 | 27.22 | 05.01 | 20.04 | 03.31 | 11.29 | 06.90 | 62.57 | 14.24 | 57.75 | 23.37 | 58.05 |
| 2 | 11.53 | 27.02 | 04.92 | 19.77 | 03.38 | 11.01 | 07.06 | 62.37 | 14.48 | 57.64 | 23.69 | 58.12 |
| 3 | 11.26 | 26.82 | 04.82 | 19.52 | 03.45 | 10.74 | 07.21 | 62.15 | 14.74 | 57.53 | 24.01 | 58.21 |
| 4 | 11.02 | 26.63 | 04.72 | 19.28 | 03.49 | 10.49 | 07.37 | 61.91 | 15.02 | 57.42 | 24.34 | 58.32 |
| 5 | 10.79 | 26.46 | 04.59 | 19.04 | 03.52 | 10.22 | 07.53 | 61.65 | 15.32 | 57.31 | 24.67 | 58.45 |
| 6 | 10.57 | 26.31 | 04.44 | 18.78 | 03.53 | 09.93 | 07.72 | 61.39 | 15.64 | 57.22 | 24.99 | 58.61 |
| 7 | 10.34 | 26.18 | 04.28 | 18.50 | 03.54 | 09.62 | 07.93 | 61.12 | 15.97 | 57.16 | 25.30 | 58.78 |
| 8 | 10.09 | 26.06 | 04.12 | 18.19 | 03.55 | 09.29 | 08.17 | 60.87 | 16.31 | 57.11 | 25.59 | 58.95 |
| 9 | 09.82 | 25.92 | 03.97 | 17.85 | 03.58 | 08.94 | 08.42 | 60.64 | 16.65 | 57.09 | 25.87 | 59.14 |
| 10 | 09.53 | 25.77 | 03.84 | 17.50 | 03.64 | 08.58 | 08.69 | 60.43 | 16.99 | 57.09 | 26.12 | 59.31 |
| 11 | 09.22 | 25.57 | 03.74 | 17.14 | 03.72 | 08.23 | 08.97 | 60.24 | 17.31 | 57.10 | 26.37 | 59.48 |
| 12 | 08.92 | 25.35 | 03.67 | 16.78 | 03.83 | 07.88 | 09.25 | 60.07 | 17.62 | 57.12 | 26.60 | 59.64 |
| 13 | 08.64 | 25.10 | 03.62 | 16.43 | 03.95 | 07.55 | 09.52 | 59.91 | 17.91 | 57.15 | 26.83 | 59.78 |
| 14 | 08.38 | 24.83 | 03.58 | 16.10 | 04.10 | 07.25 | 09.79 | 59.77 | 18.19 | 57.16 | 27.06 | 59.92 |
| 15 | 08.14 | 24.56 | 03.56 | 15.78 | 04.24 | 06.96 | 10.03 | 59.64 | 18.45 | 57.17 | 27.31 | 60.05 |
| 16 | 07.93 | 24.29 | 03.55 | 15.48 | 04.39 | 06.69 | 10.27 | 59.50 | 18.71 | 57.16 | 27.58 | 60.19 |
| 17 | 07.74 | 24.03 | 03.53 | 15.19 | 04.54 | 06.43 | 10.49 | 59.35 | 18.98 | 57.15 | 27.86 | 60.35 |
| 18 | 07.56 | 23.78 | 03.50 | 14.91 | 04.67 | 06.18 | 10.71 | 59.19 | 19.25 | 57.13 | 28.16 | 60.53 |
| 19 | 07.39 | 23.55 | 03.46 | 14.62 | 04.79 | 05.93 | 10.93 | 59.02 | 19.54 | 57.11 | 28.47 | 60.75 |
| 20 | 07.22 | 23.32 | 03.42 | 14.33 | 04.90 | 05.67 | 11.15 | 58.84 | 19.85 | 57.10 | 28.76 | 61.00 |
| 21 | 07.04 | 23.11 | 03.36 | 14.03 | 05.00 | 05.40 | 11.39 | 58.66 | 20.19 | 57.11 | 29.04 | 61.28 |
| 22 | 06.85 | 22.89 | 03.29 | 13.71 | 05.10 | 05.11 | 11.66 | 58.48 | 20.54 | 57.16 | 29.28 | 61.56 |
| 23 | 06.65 | 22.67 | 03.23 | 13.38 | 05.20 | 04.81 | 11.95 | 58.31 | 20.89 | 57.25 | 29.49 | 61.83 |
| 24 | 06.44 | 22.44 | 03.18 | 13.02 | 05.32 | 04.50 | 12.27 | 58.18 | 21.22 | 57.37 | 29.68 | 62.08 |
| 25 | 06.22 | 22.18 | 03.16 | 12.65 | 05.47 | 04.19 | 12.60 | 58.09 | 21.53 | 57.50 | 29.86 | 62.30 |
| 26 | 06.00 | 21.91 | 03.16 | 12.28 | 05.64 | 03.88 | 12.92 | 58.03 | 21.81 | 57.63 | 30.04 | 62.50 |
| 27 | 05.78 | 21.61 | 03.19 | 11.93 | 05.84 | 03.60 | 13.23 | 57.99 | 22.07 | 57.74 | 30.24 | 62.69 |
| 28 | 05.58 | 21.30 | 03.24 | 11.59 | 06.07 | 03.35 | 13.51 | 57.95 | 22.31 | 57.83 | 30.46 | 62.88 |
| 29 | 05.40 | 20.97 | 03.31 | 11.29 | 06.29 | 03.13 | 13.76 | 57.90 | 22.55 | 57.89 | 30.70 | 63.09 |
| 30 | 05.24 | 20.65 | | | 06.51 | 02.94 | 14.00 | 57.84 | 22.81 | 57.95 | 30.95 | 63.31 |
| 31 | 05.12 | 20.33 | | | 06.72 | 02.75 | 14.24 | 57.75 | 23.08 | 57.99 | 31.20 | 63.55 |
| 32 | 05.01 | 20.04 | | | 06.90 | 02.57 | | | 23.37 | 58.05 | | |
| | sec δ 14.48 | tan δ 14.45 | sec δ 14.47 | tan δ 14.44 | sec δ 14.46 | tan δ 14.43 | sec δ 14.46 | tan δ 14.42 | sec δ 14.45 | tan δ 14.42 | sec δ 14.46 | tan δ 14.42 |

Mean R.A. $22^{\text{h}} 14^{\text{m}} 26.05^{\text{s}}$

Double lower transit February 23

Mean Dec. $+86^{\circ} 02' 26.04''$

APPARENT PLACES OF STARS, 1986
CIRCUMPOLAR STARS AT UPPER TRANSIT AT GREENWICH

419

1648 32 H. Cephei · Mag. 5.38 Spect. A0

| Day | July | | August | | September | | October | | November | | December | |
|-----|------------------------------------|---|------------------------------------|---|------------------------------------|---|------------------------------------|---|------------------------------------|---|------------------------------------|---|
| | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | ^h ^m 22 14 | ⁺ ^o ' " 86 02 | ^h ^m 22 14 | ⁺ ^o ' " 86 02 | ^h ^m 22 14 | ⁺ ^o ' " 86 02 | ^h ^m 22 14 | ⁺ ^o ' " 86 02 | ^h ^m 22 14 | ⁺ ^o ' " 86 02 | ^h ^m 22 14 | ⁺ ^o ' " 86 02 |
| | ^s 31.20 | " 03.55 | ^s 36.07 | " 13.26 | ^s 36.26 | " 25.23 | ^s 32.12 | " 35.88 | ^s 24.35 | " 44.26 | ^s 14.76 | " 48.19 |
| 1 | 31.20 | 03.55 | 36.07 | 13.26 | 36.26 | 25.23 | 32.12 | 35.88 | 24.35 | 44.26 | 14.76 | 48.19 |
| 2 | 31.46 | 03.81 | 36.16 | 13.65 | 36.15 | 25.58 | 31.92 | 36.16 | 24.10 | 44.49 | 14.44 | 48.29 |
| 3 | 31.71 | 04.09 | 36.22 | 14.03 | 36.04 | 25.92 | 31.73 | 36.44 | 23.84 | 44.74 | 14.08 | 48.38 |
| 4 | 31.95 | 04.39 | 36.27 | 14.41 | 35.95 | 26.24 | 31.56 | 36.74 | 23.56 | 45.00 | 13.70 | 48.44 |
| 5 | 32.17 | 04.69 | 36.30 | 14.77 | 35.87 | 26.57 | 31.39 | 37.07 | 23.24 | 45.26 | 13.30 | 48.47 |
| 6 | 32.37 | 05.00 | 36.33 | 15.12 | 35.81 | 26.91 | 31.22 | 37.42 | 22.90 | 45.49 | 12.91 | 48.45 |
| 7 | 32.55 | 05.31 | 36.35 | 15.45 | 35.76 | 27.28 | 31.04 | 37.79 | 22.54 | 45.69 | 12.54 | 48.41 |
| 8 | 32.71 | 05.61 | 36.38 | 15.77 | 35.71 | 27.67 | 30.83 | 38.16 | 22.17 | 45.86 | 12.19 | 48.36 |
| 9 | 32.86 | 05.89 | 36.42 | 16.09 | 35.65 | 28.08 | 30.58 | 38.52 | 21.81 | 45.99 | 11.87 | 48.31 |
| 10 | 33.00 | 06.16 | 36.47 | 16.42 | 35.57 | 28.50 | 30.31 | 38.85 | 21.46 | 46.11 | 11.57 | 48.26 |
| 11 | 33.14 | 06.42 | 36.54 | 16.76 | 35.46 | 28.93 | 30.03 | 39.16 | 21.14 | 46.22 | 11.28 | 48.22 |
| 12 | 33.30 | 06.67 | 36.63 | 17.13 | 35.32 | 29.35 | 29.74 | 39.44 | 20.83 | 46.33 | 10.99 | 48.20 |
| 13 | 33.47 | 06.92 | 36.70 | 17.52 | 35.16 | 29.74 | 29.45 | 39.69 | 20.54 | 46.44 | 10.71 | 48.18 |
| 14 | 33.65 | 07.19 | 36.77 | 17.94 | 34.98 | 30.11 | 29.18 | 39.93 | 20.26 | 46.58 | 10.42 | 48.17 |
| 15 | 33.85 | 07.48 | 36.81 | 18.37 | 34.80 | 30.45 | 28.93 | 40.16 | 19.98 | 46.72 | 10.11 | 48.16 |
| 16 | 34.05 | 07.79 | 36.82 | 18.80 | 34.63 | 30.76 | 28.70 | 40.40 | 19.70 | 46.87 | 09.79 | 48.15 |
| 17 | 34.26 | 08.14 | 36.80 | 19.22 | 34.47 | 31.07 | 28.48 | 40.65 | 19.40 | 47.03 | 09.46 | 48.12 |
| 18 | 34.44 | 08.51 | 36.76 | 19.62 | 34.34 | 31.38 | 28.27 | 40.92 | 19.09 | 47.19 | 09.11 | 48.07 |
| 19 | 34.60 | 08.90 | 36.70 | 19.99 | 34.22 | 31.70 | 28.05 | 41.20 | 18.76 | 47.34 | 08.76 | 48.00 |
| 20 | 34.72 | 09.28 | 36.65 | 20.33 | 34.11 | 32.04 | 27.82 | 41.49 | 18.41 | 47.47 | 08.40 | 47.91 |
| 21 | 34.82 | 09.65 | 36.61 | 20.66 | 34.00 | 32.40 | 27.58 | 41.79 | 18.05 | 47.58 | 08.05 | 47.80 |
| 22 | 34.89 | 09.98 | 36.59 | 20.98 | 33.88 | 32.77 | 27.32 | 42.08 | 17.68 | 47.68 | 07.72 | 47.67 |
| 23 | 34.96 | 10.29 | 36.59 | 21.32 | 33.75 | 33.15 | 27.04 | 42.37 | 17.31 | 47.75 | 07.40 | 47.53 |
| 24 | 35.04 | 10.58 | 36.60 | 21.67 | 33.60 | 33.53 | 26.74 | 42.64 | 16.94 | 47.80 | 07.10 | 47.39 |
| 25 | 35.14 | 10.87 | ^{36 62} 36.64 | ^{22 04} 22.43 | 33.43 | 33.91 | 26.43 | 42.89 | 16.59 | 47.83 | 06.82 | 47.25 |
| 26 | 35.26 | 11.16 | 36.64 | 22.83 | 33.24 | 34.28 | 26.10 | 43.11 | 16.25 | 47.86 | 06.56 | 47.14 |
| 27 | 35.40 | 11.46 | 36.63 | 23.24 | 33.03 | 34.64 | 25.78 | 43.32 | 15.93 | 47.89 | 06.31 | 47.04 |
| 28 | 35.54 | 11.79 | 36.59 | 23.65 | 32.81 | 34.98 | 25.46 | 43.51 | 15.63 | 47.93 | 06.06 | 46.97 |
| 29 | 35.69 | 12.13 | 36.54 | 24.07 | 32.58 | 35.29 | 25.15 | 43.69 | 15.35 | 47.99 | 05.78 | 46.90 |
| 30 | 35.83 | 12.49 | 36.46 | 24.47 | 32.34 | 35.59 | 24.87 | 43.87 | 15.06 | 48.08 | 05.48 | 46.84 |
| 31 | 35.96 | 12.87 | 36.37 | 24.86 | 32.12 | 35.88 | 24.60 | 44.05 | 14.76 | 48.19 | 05.16 | 46.75 |
| 32 | 36.07 | 13.26 | 36.26 | 25.23 | | | 24.35 | 44.26 | | | 04.81 | 46.62 |
| | sec δ 14.46 | tan δ 14.43 | sec δ 14.47 | tan δ 14.44 | sec δ 14.49 | tan δ 14.45 | sec δ 14.50 | tan δ 14.46 | sec δ 14.50 | tan δ 14.47 | sec δ 14.50 | tan δ 14.47 |

Mean R.A. ^h 22 ^m 14 ^s 26.05

Double lower transit February 23

Mean Dec. +86° 02' 26.04"

APPARENT PLACES OF STARS, 1986
CIRCUMPOLAR STARS AT UPPER TRANSIT AT GREENWICH

1649 36 H. Cephei \searrow Mag. 4.96 Spect. K5

| Day | January | | February | | March | | April | | May | | June | |
|-----|------------------------------------|---|------------------------------------|---|------------------------------------|---|------------------------------------|---|------------------------------------|---|------------------------------------|---|
| | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | ^h ^m 22 54 | ⁺ ^o / 84 16 | ^h ^m 22 54 | ⁺ ^o / 84 16 | ^h ^m 22 54 | ⁺ ^o / 84 16 | ^h ^m 22 54 | ⁺ ^o / 84 16 | ^h ^m 22 54 | ⁺ ^o / 84 15 | ^h ^m 22 54 | ⁺ ^o / 84 15 |
| | ^s 23.26 | " 29.99 | ^s 17.92 | " 24.09 | ^s 15.84 | " 15.78 | ^s 17.34 | " 06.61 | ^s 21.85 | " 60.66 | ^s 28.19 | " 59.48 |
| 1 | 23.04 | 29.84 | 17.83 | 23.84 | 15.86 | 15.49 | 17.43 | 06.38 | 22.01 | 60.52 | 28.41 | 59.50 |
| 2 | 22.84 | 29.68 | 17.74 | 23.61 | 15.87 | 15.22 | 17.51 | 06.14 | 22.17 | 60.36 | 28.64 | 59.54 |
| 3 | | | | | | | | | | | | |
| 4 | 22.66 | 29.54 | 17.64 | 23.40 | 15.88 | 14.96 | 17.59 | 05.88 | 22.35 | 60.20 | 28.88 | 59.59 |
| 5 | 22.49 | 29.41 | 17.54 | 23.19 | 15.87 | 14.70 | 17.68 | 05.60 | 22.54 | 60.05 | 29.12 | 59.67 |
| 6 | 22.32 | 29.31 | 17.41 | 22.96 | 15.85 | 14.41 | 17.78 | 05.31 | 22.75 | 59.91 | 29.36 | 59.77 |
| 7 | | | | | | | | | | | | |
| 8 | 22.16 | 29.22 | 17.28 | 22.71 | 15.82 | 14.11 | 17.89 | 05.01 | 22.97 | 59.79 | 29.59 | 59.89 |
| 9 | 21.98 | 29.14 | 17.13 | 22.43 | 15.79 | 13.78 | 18.02 | 04.73 | 23.20 | 59.69 | 29.82 | 60.02 |
| 10 | 21.79 | 29.06 | 17.00 | 22.13 | 15.78 | 13.43 | 18.17 | 04.45 | 23.43 | 59.62 | 30.03 | 60.16 |
| 11 | | | | | | | | | | | | |
| 12 | 21.58 | 28.95 | 16.87 | 21.80 | 15.77 | 13.07 | 18.33 | 04.20 | 23.66 | 59.56 | 30.23 | 60.29 |
| 13 | 21.35 | 28.82 | 16.76 | 21.46 | 15.79 | 12.70 | 18.50 | 03.96 | 23.89 | 59.52 | 30.42 | 60.42 |
| 14 | 21.13 | 28.65 | 16.67 | 21.12 | 15.82 | 12.34 | 18.67 | 03.75 | 24.10 | 59.49 | 30.60 | 60.54 |
| 15 | | | | | | | | | | | | |
| 16 | 20.91 | 28.45 | 16.60 | 20.78 | 15.87 | 12.00 | 18.84 | 03.56 | 24.31 | 59.47 | 30.78 | 60.65 |
| 17 | 20.70 | 28.23 | 16.54 | 20.46 | 15.93 | 11.67 | 19.01 | 03.38 | 24.50 | 59.44 | 30.95 | 60.74 |
| 18 | 20.51 | 28.00 | 16.49 | 20.15 | 16.00 | 11.37 | 19.16 | 03.20 | 24.69 | 59.40 | 31.14 | 60.84 |
| 19 | | | | | | | | | | | | |
| 20 | 20.34 | 27.77 | 16.45 | 19.86 | 16.08 | 11.08 | 19.31 | 03.03 | 24.87 | 59.36 | 31.34 | 60.93 |
| 21 | 20.18 | 27.55 | 16.40 | 19.58 | 16.15 | 10.80 | 19.45 | 02.85 | 25.04 | 59.30 | 31.55 | 61.04 |
| 22 | 20.03 | 27.34 | 16.36 | 19.30 | 16.21 | 10.53 | 19.58 | 02.66 | 25.23 | 59.24 | 31.78 | 61.17 |
| 23 | | | | | | | | | | | | |
| 24 | 19.89 | 27.14 | 16.30 | 19.03 | 16.27 | 10.26 | 19.71 | 02.45 | 25.42 | 59.17 | 32.01 | 61.34 |
| 25 | 19.76 | 26.94 | 16.24 | 18.76 | 16.31 | 09.99 | 19.85 | 02.24 | 25.64 | 59.11 | 32.25 | 61.54 |
| 26 | 19.61 | 26.76 | 16.17 | 18.47 | 16.36 | 09.71 | 19.99 | 02.02 | 25.87 | 59.07 | 32.47 | 61.78 |
| 27 | | | | | | | | | | | | |
| 28 | 19.47 | 26.58 | 16.09 | 18.17 | 16.39 | 09.41 | 20.15 | 01.79 | 26.12 | 59.06 | 32.68 | 62.02 |
| 29 | 19.31 | 26.40 | 16.02 | 17.85 | 16.43 | 09.10 | 20.33 | 01.58 | 26.37 | 59.09 | 32.86 | 62.26 |
| 30 | 19.15 | 26.21 | 15.94 | 17.51 | 16.48 | 08.77 | 20.54 | 01.40 | 26.62 | 59.15 | 33.02 | 62.47 |
| 31 | | | | | | | | | | | | |
| 32 | 18.97 | 26.00 | 15.88 | 17.15 | 16.54 | 08.43 | 20.75 | 01.25 | 26.85 | 59.23 | 33.17 | 62.66 |
| 33 | 18.79 | 25.77 | 15.84 | 16.79 | 16.62 | 08.10 | 20.97 | 01.14 | 27.06 | 59.32 | 33.32 | 62.83 |
| 34 | 18.61 | 25.51 | 15.82 | 16.43 | 16.73 | 07.79 | 21.17 | 01.05 | 27.25 | 59.39 | 33.48 | 62.99 |
| 35 | | | | | | | | | | | | |
| 36 | 18.44 | 25.24 | 15.82 | 16.09 | 16.85 | 07.51 | 21.36 | 00.97 | 27.43 | 59.44 | 33.65 | 63.14 |
| 37 | 18.28 | 24.95 | 15.84 | 15.78 | 16.98 | 07.25 | 21.54 | 00.89 | 27.60 | 59.47 | 33.84 | 63.30 |
| 38 | 18.14 | 24.65 | | | 17.11 | 07.03 | 21.70 | 00.79 | 27.79 | 59.48 | 34.04 | 63.48 |
| 39 | | | | | | | | | | | | |
| 40 | 18.02 | 24.36 | | | 17.23 | 06.82 | 21.85 | 00.66 | 27.98 | 59.48 | 34.24 | 63.68 |
| 41 | 17.92 | 24.09 | | | 17.34 | 06.61 | | | 28.19 | 59.48 | | |
| 42 | | | | | | | | | | | | |
| | sec δ | tan δ | sec δ | tan δ | sec δ | tan δ | sec δ | tan δ | sec δ | tan δ | sec δ | tan δ |
| | 10.02 | 9.97 | 10.02 | 9.97 | 10.02 | 9.97 | 10.01 | 9.96 | 10.01 | 9.96 | 10.01 | 9.96 |

Mean R.A. $22^{\text{h}} 54^{\text{m}} 33.48^{\text{s}}$

Double lower transit March 6

Mean Dec. $+84^{\circ} 16' 26.74''$

APPARENT PLACES OF STARS, 1986
CIRCUMPOLAR STARS AT UPPER TRANSIT AT GREENWICH

421

1649 36 H. Cephei · Mag. 4.96 Spect. K5

| Day | July | | August | | September | | October | | November | | December | |
|-----|------------------------------------|---|------------------------------------|---|--------------------------------------|---|------------------------------------|---|------------------------------------|---|------------------------------------|---|
| | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | ^h ^m 22 54 | ⁺ ^o ' " 84 16 | ^h ^m 22 54 | ⁺ ^o ' " 84 16 | ^h ^m 22 54 | ⁺ ^o ' " 84 16 | ^h ^m 22 54 | ⁺ ^o ' " 84 16 | ^h ^m 22 54 | ⁺ ^o ' " 84 16 | ^h ^m 22 54 | ⁺ ^o ' " 84 16 |
| | ^s 34.24 | " 03.68 | ^s 38.76 | " 12.53 | ^s 40.39 | " 24.01 | ^s 38.84 | " 35.65 | ^s 34.60 | " 45.26 | ^s 28.66 | " 50.79 |
| 1 | 34.45 | 03.90 | 38.87 | 12.91 | 40.36 | 24.29 | 38.73 | 35.96 | 34.46 | 45.53 | 28.45 | 50.95 |
| 2 | 34.65 | 04.13 | 38.97 | 13.28 | 40.33 | 24.76 | 38.63 | 36.27 | 34.32 | 45.82 | 28.23 | 51.10 |
| 4 | 34.85 | 04.39 | 39.05 | 13.65 | ^{40 29} ^{40 27} | ^{25 11} ^{25 46} | 38.55 | 36.60 | 34.16 | 46.13 | 27.98 | 51.23 |
| 5 | 35.04 | 04.66 | 39.11 | 14.01 | 40.25 | 25.79 | 38.48 | 36.95 | 33.98 | 46.44 | 27.72 | 51.32 |
| 6 | 35.22 | 04.94 | 39.17 | 14.35 | 40.25 | 26.14 | 38.41 | 37.32 | 33.78 | 46.73 | 27.46 | 51.37 |
| 7 | 35.38 | 05.21 | 39.23 | 14.67 | 40.26 | 26.51 | 38.33 | 37.72 | 33.57 | 46.99 | 27.21 | 51.40 |
| 8 | 35.53 | 05.48 | 39.28 | 14.99 | 40.27 | 26.90 | 38.23 | 38.12 | 33.34 | 47.21 | 26.97 | 51.41 |
| 9 | 35.67 | 05.74 | 39.35 | 15.30 | 40.28 | 27.32 | 38.12 | 38.52 | 33.11 | 47.41 | 26.75 | 51.41 |
| 10 | 35.80 | 05.99 | 39.43 | 15.61 | 40.28 | 27.76 | 37.98 | 38.90 | 32.89 | 47.59 | 26.54 | 51.41 |
| 11 | 35.93 | 06.22 | 39.51 | 15.94 | 40.26 | 28.20 | 37.82 | 39.25 | 32.69 | 47.75 | 26.34 | 51.42 |
| 12 | 36.06 | 06.44 | 39.61 | 16.29 | 40.22 | 28.64 | 37.66 | 39.58 | 32.49 | 47.91 | 26.15 | 51.45 |
| 13 | 36.21 | 06.67 | 39.72 | 16.66 | 40.16 | 29.06 | 37.50 | 39.88 | 32.31 | 48.07 | 25.96 | 51.48 |
| 14 | 36.36 | 06.90 | 39.81 | 17.07 | 40.08 | 29.45 | 37.34 | 40.16 | 32.14 | 48.25 | 25.76 | 51.52 |
| 15 | 36.53 | 07.15 | 39.89 | 17.49 | 40.00 | 29.82 | 37.20 | 40.43 | 31.97 | 48.44 | 25.56 | 51.57 |
| 16 | 36.71 | 07.43 | 39.96 | 17.92 | 39.92 | 30.16 | 37.07 | 40.70 | 31.80 | 48.64 | 25.35 | 51.61 |
| 17 | 36.89 | 07.75 | 40.00 | 18.34 | 39.85 | 30.49 | 36.95 | 40.99 | 31.62 | 48.85 | 25.12 | 51.64 |
| 18 | 37.07 | 08.09 | 40.02 | 18.75 | 39.79 | 30.82 | 36.84 | 41.29 | 31.43 | 49.06 | 24.89 | 51.65 |
| 19 | 37.22 | 08.44 | 40.02 | 19.12 | 39.75 | 31.16 | 36.73 | 41.61 | 31.23 | 49.26 | 24.64 | 51.65 |
| 20 | 37.36 | 08.81 | 40.03 | 19.47 | 39.71 | 31.51 | 36.61 | 41.93 | 31.01 | 49.45 | 24.40 | 51.62 |
| 21 | 37.47 | 09.15 | 40.04 | 19.80 | 39.68 | 31.88 | 36.48 | 42.27 | 30.79 | 49.63 | 24.15 | 51.57 |
| 22 | 37.56 | 09.48 | 40.07 | 20.13 | 39.65 | 32.27 | 36.34 | 42.60 | 30.55 | 49.78 | 23.91 | 51.50 |
| 23 | 37.65 | 09.77 | 40.11 | 20.46 | 39.61 | 32.67 | 36.19 | 42.93 | 30.31 | 49.92 | 23.68 | 51.41 |
| 24 | 37.74 | 10.05 | 40.16 | 20.80 | 39.55 | 33.07 | 36.02 | 43.25 | 30.07 | 50.03 | 23.46 | 51.33 |
| 25 | 37.85 | 10.32 | 40.21 | 21.17 | 39.48 | 33.48 | 35.84 | 43.55 | 29.83 | 50.12 | 23.26 | 51.24 |
| 26 | 37.96 | 10.58 | 40.27 | 21.55 | 39.40 | 33.88 | 35.65 | 43.83 | 29.61 | 50.21 | 23.07 | 51.17 |
| 27 | 38.09 | 10.86 | 40.32 | 21.95 | 39.30 | 34.27 | 35.46 | 44.09 | 29.40 | 50.29 | 22.89 | 51.12 |
| 28 | 38.23 | 11.16 | 40.36 | 22.36 | 39.19 | 34.64 | 35.26 | 44.33 | 29.21 | 50.38 | 22.72 | 51.09 |
| 29 | 38.37 | 11.48 | 40.39 | 22.78 | 39.08 | 34.99 | 35.08 | 44.56 | 29.02 | 50.49 | 22.53 | 51.08 |
| 30 | 38.51 | 11.81 | 40.40 | 23.20 | 38.95 | 35.33 | 34.90 | 44.78 | 28.84 | 50.63 | 22.33 | 51.06 |
| 31 | 38.64 | 12.17 | 40.40 | 23.61 | 38.84 | 35.65 | 34.75 | 45.01 | 28.66 | 50.79 | 22.10 | 51.03 |
| 32 | 38.76 | 12.53 | 40.39 | 24.01 | | | 34.60 | 45.26 | | | 21.86 | 50.97 |
| | sec δ 10.01 | tan δ 9.96 | sec δ 10.02 | tan δ 9.97 | sec δ 10.02 | tan δ 9.97 | sec δ 10.03 | tan δ 9.98 | sec δ 10.03 | tan δ 9.98 | sec δ 10.04 | tan δ 9.99 |

Mean R.A. ^h 22 ^m 54 ^s 33.48

Double lower transit March 6

Mean Dec. +84° 16' 26.74"

APPARENT PLACES OF STARS, 1986
CIRCUMPOLAR STARS AT UPPER TRANSIT AT GREENWICH

1650 V Cephei Mag. 6.42 Spect. A0

| Day | January | | February | | March | | April | | May | | June | |
|-----|---------------|----------------|---------------|----------------|---------------|----------------|---------------|----------------|---------------|----------------|---------------|----------------|
| | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m 23 55 | + ° ' 83 07 | h m 23 55 | + ° ' 83 06 | h m 23 55 | + ° ' 83 06 | h m 23 55 | + ° ' 83 06 | h m 23 55 | + ° ' 83 06 | h m 23 55 | + ° ' 83 06 |
| | s 40.31 | " 04.13 | s 35.27 | " 04.13 | s 32.45 | " 05.44 | s 32.35 | " 04.12 | s 35.12 | " 06.77 | s 40.04 | " 03.36 |
| 1 | 40.12 | 04.07 | 35.17 | 04.07 | 32.42 | 05.16 | 32.39 | 04.87 | 35.22 | 06.58 | 40.22 | 03.29 |
| 2 | 39.94 | 04.00 | 35.06 | 04.00 | 32.40 | 05.90 | 32.43 | 04.62 | 35.33 | 06.37 | 40.41 | 03.24 |
| 3 | | | | | | | | | | | | |
| 4 | 39.77 | 03.93 | 34.96 | 04.04 | 32.37 | 05.66 | 32.45 | 04.33 | 35.45 | 06.15 | 40.61 | 03.21 |
| 5 | 39.62 | 03.87 | 34.84 | 05.88 | 32.33 | 05.41 | 32.48 | 04.03 | 35.58 | 05.93 | 40.81 | 03.20 |
| 6 | 39.48 | 03.84 | 34.72 | 05.72 | 32.27 | 05.15 | 32.52 | 04.71 | 35.73 | 05.71 | 41.02 | 03.21 |
| 7 | 39.34 | 03.83 | 34.57 | 05.53 | 32.21 | 05.17 | 32.56 | 04.39 | 35.88 | 05.51 | 41.23 | 03.24 |
| 8 | 39.19 | 03.83 | 34.42 | 05.32 | 32.14 | 05.16 | 32.63 | 04.06 | 36.05 | 05.34 | 41.43 | 03.29 |
| 9 | 39.02 | 03.83 | 34.27 | 05.08 | 32.07 | 05.23 | 32.71 | 04.74 | 36.23 | 05.18 | 41.62 | 03.35 |
| 10 | 38.84 | 03.81 | 34.12 | 05.82 | 32.02 | 05.09 | 32.80 | 04.43 | 36.41 | 05.04 | 41.80 | 03.41 |
| 11 | 38.65 | 03.77 | 33.99 | 05.53 | 31.98 | 05.03 | 32.90 | 04.15 | 36.58 | 04.93 | 41.97 | 03.47 |
| 12 | 38.45 | 03.70 | 33.87 | 05.24 | 31.95 | 05.17 | 33.01 | 04.08 | 36.75 | 04.82 | 42.13 | 03.52 |
| 13 | 38.25 | 03.59 | 33.76 | 05.94 | 31.94 | 04.82 | 33.11 | 04.63 | 36.91 | 04.73 | 42.29 | 03.56 |
| 14 | 38.05 | 03.46 | 33.67 | 05.65 | 31.95 | 04.48 | 33.22 | 04.40 | 37.06 | 04.63 | 42.44 | 03.59 |
| 15 | 37.87 | 03.31 | 33.59 | 05.38 | 31.96 | 04.16 | 33.32 | 04.18 | 37.21 | 04.53 | 42.61 | 03.61 |
| 16 | 37.70 | 03.16 | 33.51 | 05.11 | 31.97 | 04.86 | 33.42 | 03.96 | 37.35 | 04.43 | 42.78 | 03.63 |
| 17 | 37.54 | 03.01 | 33.44 | 05.86 | 31.99 | 04.57 | 33.50 | 03.74 | 37.48 | 04.31 | 42.96 | 03.66 |
| 18 | 37.40 | 02.86 | 33.36 | 05.62 | 32.00 | 04.29 | 33.58 | 03.51 | 37.62 | 04.18 | 43.17 | 03.71 |
| 19 | 37.26 | 02.72 | 33.28 | 05.38 | 32.01 | 04.01 | 33.66 | 03.27 | 37.77 | 04.04 | 43.38 | 03.78 |
| 20 | 37.12 | 02.60 | 33.19 | 05.15 | 32.01 | 04.74 | 33.73 | 03.01 | 37.93 | 03.90 | 43.60 | 03.90 |
| 21 | 36.99 | 02.48 | 33.10 | 05.90 | 32.01 | 04.45 | 33.81 | 02.74 | 38.11 | 03.78 | 43.82 | 04.04 |
| 22 | 36.85 | 02.37 | 33.00 | 05.65 | 31.99 | 04.16 | 33.91 | 02.46 | 38.30 | 03.68 | 44.02 | 04.21 |
| 23 | 36.70 | 02.26 | 32.89 | 05.37 | 31.98 | 04.84 | 34.03 | 02.19 | 38.51 | 03.62 | 44.20 | 04.38 |
| 24 | 36.54 | 02.14 | 32.78 | 05.07 | 31.97 | 04.51 | 34.16 | 01.94 | 38.72 | 03.59 | 44.36 | 04.54 |
| 25 | 36.38 | 02.01 | 32.68 | 05.74 | 31.97 | 04.16 | 34.31 | 01.72 | 38.92 | 03.59 | 44.51 | 04.67 |
| 26 | 36.20 | 01.86 | 32.60 | 05.41 | 31.99 | 04.81 | 34.47 | 01.54 | 39.10 | 03.60 | 44.66 | 04.78 |
| 27 | 36.02 | 01.69 | 32.53 | 05.07 | 32.03 | 04.47 | 34.62 | 01.38 | 39.27 | 03.61 | 44.81 | 04.87 |
| 28 | 35.85 | 01.49 | 32.48 | 05.75 | 32.08 | 04.15 | 34.77 | 01.24 | 39.42 | 03.59 | 44.97 | 04.96 |
| 29 | 35.68 | 01.27 | 32.45 | 05.44 | 32.15 | 04.86 | 34.90 | 01.10 | 39.57 | 03.55 | 45.14 | 05.05 |
| 30 | 35.53 | 01.04 | | | 32.23 | 04.60 | 35.01 | 00.94 | 39.71 | 03.50 | 45.33 | 05.14 |
| 31 | 35.39 | 00.80 | | | 32.29 | 04.35 | 35.12 | 00.77 | 39.87 | 03.43 | 45.52 | 05.26 |
| 32 | 35.27 | 00.58 | | | 32.35 | 04.12 | | | 40.04 | 03.36 | | |
| | sec δ 8.34 | tan δ 8.28 | sec δ 8.34 | tan δ 8.28 | sec δ 8.34 | tan δ 8.28 | sec δ 8.34 | tan δ 8.28 | sec δ 8.34 | tan δ 8.28 | sec δ 8.34 | tan δ 8.27 |

Mean R.A. $23^{\text{h}} 55^{\text{m}} 48.39^{\text{s}}$

Double lower transit March 21

Mean Dec. $+83^{\circ} 06' 57.88''$

APPARENT PLACES OF STARS, 1986
CIRCUMPOLAR STARS AT UPPER TRANSIT AT GREENWICH

423

1650 V Cephei Mag. 6.42 Spect. A0

| Day | July | | August | | September | | October | | November | | December | |
|-----|---------------------------|--|---------------------------|--|---------------------------|--|---------------------------|--|---------------------------|--|---------------------------|--|
| | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | ^h ^m | ⁺ ^o / ['] | ^h ^m | ⁺ ^o / ['] | ^h ^m | ⁺ ^o / ['] | ^h ^m | ⁺ ^o / ['] | ^h ^m | ⁺ ^o / ['] | ^h ^m | ⁺ ^o / ['] |
| | 23 55 | 83 06 | 23 55 | 83 06 | 23 55 | 83 06 | 23 55 | 83 07 | 23 55 | 83 07 | 23 55 | 83 07 |
| | ^s | " | ^s | " | ^s | " | ^s | " | ^s | " | ^s | " |
| 1 | 45.52 | 35.26 | 50.46 | 42.25 | 53.46 | 52.84 | 53.96 | 04.74 | 52.04 | 15.69 | 48.20 | 23.39 |
| 2 | 45.72 | 35.40 | 50.60 | 42.58 | 53.50 | 53.22 | 53.92 | 05.08 | 51.97 | 16.01 | 48.06 | 23.63 |
| 3 | 45.92 | 35.55 | 50.73 | 42.91 | 53.53 | 53.59 | 53.89 | 05.42 | 51.91 | 16.35 | 47.91 | 23.87 |
| 4 | 46.12 | 35.73 | 50.85 | 43.24 | 53.55 | 53.94 | 53.88 | 05.76 | 51.83 | 16.71 | 47.73 | 24.09 |
| 5 | 46.31 | 35.93 | 50.96 | 43.56 | 53.58 | 54.28 | 53.87 | 06.13 | 51.74 | 17.08 | 47.54 | 24.28 |
| 6 | 46.49 | 36.13 | 51.06 | 43.87 | 53.62 | 54.62 | 53.87 | 06.52 | 51.62 | 17.45 | 47.35 | 24.44 |
| 7 | 46.66 | 36.35 | 51.15 | 44.17 | 53.67 | 54.96 | 53.87 | 06.94 | 51.49 | 17.79 | 47.15 | 24.56 |
| 8 | 46.82 | 36.56 | 51.24 | 44.45 | 53.73 | 55.31 | 53.86 | 07.37 | 51.35 | 18.09 | 46.96 | 24.66 |
| 9 | 46.97 | 36.76 | 51.34 | 44.73 | 53.80 | 55.69 | 53.82 | 07.81 | 51.20 | 18.37 | 46.79 | 24.75 |
| 10 | 47.11 | 36.95 | 51.44 | 45.00 | 53.87 | 56.09 | 53.77 | 08.23 | 51.05 | 18.63 | 46.62 | 24.83 |
| 11 | 47.25 | 37.13 | 51.56 | 45.29 | 53.93 | 56.52 | 53.70 | 08.64 | 50.91 | 18.86 | 46.47 | 24.92 |
| 12 | 47.39 | 37.30 | 51.69 | 45.59 | 53.99 | 56.96 | 53.62 | 09.01 | 50.78 | 19.09 | 46.32 | 25.02 |
| 13 | 47.54 | 37.47 | 51.83 | 45.92 | 54.02 | 57.40 | 53.53 | 09.36 | 50.66 | 19.32 | 46.18 | 25.13 |
| 14 | 47.70 | 37.63 | 51.97 | 46.28 | 54.03 | 57.84 | 53.45 | 09.69 | 50.55 | 19.56 | 46.03 | 25.25 |
| 15 | 47.87 | 37.82 | 52.10 | 46.66 | 54.03 | 58.25 | 53.38 | 10.01 | 50.45 | 19.80 | 45.88 | 25.37 |
| 16 | 48.06 | 38.02 | 52.22 | 47.06 | 54.02 | 58.64 | 53.32 | 10.32 | 50.34 | 20.07 | 45.72 | 25.50 |
| 17 | 48.25 | 38.26 | 52.31 | 47.46 | 54.01 | 59.00 | 53.26 | 10.64 | 50.23 | 20.34 | 45.55 | 25.62 |
| 18 | 48.44 | 38.53 | 52.39 | 47.85 | 54.00 | 59.34 | 53.22 | 10.98 | 50.12 | 20.62 | 45.37 | 25.73 |
| 19 | 48.62 | 38.83 | 52.45 | 48.21 | 54.00 | 59.68 | 53.18 | 11.33 | 49.99 | 20.90 | 45.18 | 25.82 |
| 20 | 48.78 | 39.13 | 52.51 | 48.55 | ^{54 02} 54.04 | ^{60 03} 60.38 | 53.14 | 11.69 | 49.85 | 21.17 | 44.98 | 25.89 |
| 21 | 48.92 | 39.44 | 52.56 | 48.87 | 54.07 | 60.75 | 53.09 | 12.07 | 49.70 | 21.43 | 44.78 | 25.94 |
| 22 | 49.05 | 39.72 | 52.63 | 49.17 | 54.10 | 61.14 | 53.03 | 12.45 | 49.53 | 21.67 | 44.58 | 25.97 |
| 23 | 49.16 | 39.98 | 52.71 | 49.48 | 54.13 | 61.55 | 52.95 | 12.83 | 49.36 | 21.90 | 44.38 | 25.98 |
| 24 | 49.28 | 40.21 | 52.80 | 49.79 | 54.15 | 61.96 | 52.87 | 13.20 | 49.19 | 22.10 | 44.20 | 25.97 |
| 25 | 49.40 | 40.43 | 52.90 | 50.13 | 54.16 | 62.38 | 52.77 | 13.57 | 49.02 | 22.28 | 44.03 | 25.97 |
| 26 | 49.53 | 40.65 | 53.00 | 50.48 | 54.15 | 62.81 | 52.66 | 13.91 | 48.85 | 22.45 | 43.87 | 25.97 |
| 27 | 49.67 | 40.87 | 53.10 | 50.85 | 54.13 | 63.22 | 52.55 | 14.24 | 48.70 | 22.61 | 43.73 | 26.00 |
| 28 | 49.82 | 41.11 | 53.20 | 51.23 | 54.10 | 63.63 | 52.43 | 14.55 | 48.56 | 22.77 | 43.59 | 26.04 |
| 29 | 49.98 | 41.36 | 53.28 | 51.63 | 54.06 | 64.02 | 52.32 | 14.84 | 48.44 | 22.95 | 43.44 | 26.11 |
| 30 | 50.15 | 41.64 | 53.36 | 52.03 | 54.01 | 64.39 | 52.21 | 15.12 | 48.32 | 23.16 | 43.28 | 26.18 |
| 31 | 50.31 | 41.94 | 53.42 | 52.44 | 53.96 | 64.74 | 52.12 | 15.40 | 48.20 | 23.39 | 43.10 | 26.25 |
| 32 | 50.46 | 42.25 | 53.46 | 52.84 | | | 52.04 | 15.69 | | | 42.90 | 26.29 |
| | sec δ | tan δ | sec δ | tan δ | sec δ | tan δ | sec δ | tan δ | sec δ | tan δ | sec δ | tan δ |
| | 8.34 | 8.28 | 8.34 | 8.28 | 8.34 | 8.28 | 8.35 | 8.29 | 8.35 | 8.29 | 8.35 | 8.29 |

Mean R.A. ^h23 ^m55 ^s48.39

Double lower transit March 21

Mean Dec. +83° 06' 57.88"

APPARENT PLACES OF STARS, 1986
CIRCUMPOLAR STARS AT UPPER TRANSIT AT GREENWICH

1655 o Octantis Mag. 7.22 Spect. A0

| Day | January | | February | | March | | April | | May | | June | |
|-----|----------------|------------------|----------------|------------------|----------------|------------------|----------------|------------------|----------------|------------------|----------------|------------------|
| | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m 0 12 | ° ' " / 88 26 | h m 0 12 | ° ' " / 88 26 | h m 0 12 | ° ' " / 88 26 | h m 0 12 | ° ' " / 88 26 | h m 0 12 | ° ' " / 88 26 | h m 0 12 | ° ' " / 88 25 |
| | s 38.15 | " 50.78 | s 16.60 | " 44.29 | s 04.61 | " 34.78 | s 01.74 | " 22.50 | s 10.25 | " 11.37 | s 28.32 | " 62.98 |
| 1 | 37.42 | 50.69 | 15.89 | 44.01 | 04.20 | 34.39 | 01.91 | 22.06 | 10.83 | 11.04 | 28.99 | 62.82 |
| 2 | 36.64 | 50.60 | 15.19 | 43.69 | 03.83 | 33.97 | 02.13 | 21.63 | 11.38 | 10.73 | 29.62 | 62.66 |
| 3 | | | | | | | | | | | | |
| 4 | 35.79 | 50.51 | 14.54 | 43.35 | 03.53 | 33.54 | 02.40 | 21.23 | 11.91 | 10.45 | 30.22 | 62.49 |
| 5 | 34.90 | 50.38 | 13.96 | 42.99 | 03.31 | 33.10 | 02.67 | 20.85 | 12.39 | 10.17 | 30.82 | 62.32 |
| 6 | 33.98 | 50.23 | 13.47 | 42.62 | 03.17 | 32.67 | 02.92 | 20.49 | 12.83 | 09.90 | 31.43 | 62.13 |
| 7 | 33.09 | 50.04 | 13.04 | 42.26 | 03.08 | 32.25 | 03.14 | 20.14 | 13.24 | 09.62 | 32.07 | 61.94 |
| 8 | 32.25 | 49.82 | 12.66 | 41.92 | 03.02 | 31.86 | 03.31 | 19.80 | 13.64 | 09.33 | 32.75 | 61.74 |
| 9 | 31.49 | 49.59 | 12.30 | 41.60 | 02.96 | 31.48 | 03.45 | 19.46 | 14.04 | 09.03 | 33.47 | 61.53 |
| 10 | 30.81 | 49.35 | 11.92 | 41.30 | 02.88 | 31.13 | 03.57 | 19.11 | 14.46 | 08.72 | 34.25 | 61.34 |
| 11 | 30.19 | 49.13 | 11.51 | 41.01 | 02.75 | 30.78 | 03.68 | 18.75 | 14.92 | 08.40 | 35.06 | 61.16 |
| 12 | 29.59 | 48.93 | 11.05 | 40.72 | 02.59 | 30.43 | 03.80 | 18.37 | 15.42 | 08.08 | 35.91 | 61.00 |
| 13 | 28.99 | 48.75 | 10.55 | 40.43 | 02.39 | 30.08 | 03.94 | 17.98 | 15.98 | 07.75 | 36.78 | 60.86 |
| 14 | 28.36 | 48.58 | 10.02 | 40.12 | 02.17 | 29.71 | 04.13 | 17.58 | 16.58 | 07.43 | 37.63 | 60.74 |
| 15 | 27.68 | 48.41 | 09.48 | 39.80 | 01.95 | 29.33 | 04.38 | 17.17 | 17.24 | 07.13 | 38.46 | 60.64 |
| 16 | 26.96 | 48.25 | 08.95 | 39.46 | 01.76 | 28.93 | 04.68 | 16.76 | 17.93 | 06.84 | 39.24 | 60.56 |
| 17 | 26.20 | 48.07 | 08.44 | 39.10 | 01.59 | 28.52 | 05.03 | 16.37 | 18.63 | 06.58 | 39.95 | 60.48 |
| 18 | 25.42 | 47.88 | 07.98 | 38.73 | 01.48 | 28.09 | 05.44 | 15.98 | 19.32 | 06.33 | 40.60 | 60.40 |
| 19 | 24.63 | 47.66 | 07.56 | 38.34 | 01.42 | 27.66 | 05.87 | 15.61 | 19.97 | 06.11 | 41.22 | 60.30 |
| 20 | 23.84 | 47.43 | 07.20 | 37.95 | 01.42 | 27.23 | 06.31 | 15.27 | 20.57 | 05.90 | 41.83 | 60.17 |
| 21 | 23.09 | 47.17 | 06.91 | 37.55 | 01.48 | 26.80 | 06.73 | 14.94 | 21.10 | 05.68 | 42.48 | 60.02 |
| 22 | 22.37 | 46.90 | 06.66 | 37.17 | 01.58 | 26.40 | 07.10 | 14.63 | 21.58 | 05.45 | 43.21 | 59.86 |
| 23 | 21.71 | 46.62 | 06.45 | 36.80 | 01.71 | 26.01 | 07.41 | 14.33 | 22.05 | 05.20 | 44.02 | 59.70 |
| 24 | 21.10 | 46.33 | 06.24 | 36.45 | 01.82 | 25.64 | 07.65 | 14.01 | 22.54 | 04.92 | 44.91 | 59.56 |
| 25 | 20.55 | 46.04 | 06.01 | 36.12 | 01.90 | 25.28 | 07.87 | 13.67 | 23.09 | 04.61 | 45.83 | 59.46 |
| 26 | 20.04 | 45.77 | 05.74 | 35.80 | 01.93 | 24.94 | 08.10 | 13.30 | 23.74 | 04.31 | 46.74 | 59.38 |
| 27 | 19.55 | 45.50 | 05.41 | 35.48 | 01.89 | 24.59 | 08.37 | 12.91 | 24.47 | 04.02 | 47.62 | 59.34 |
| 28 | 19.05 | 45.26 | 05.02 | 35.14 | 01.80 | 24.22 | 08.73 | 12.50 | 25.25 | 03.76 | 48.45 | 59.32 |
| 29 | 18.52 | 45.02 | 04.61 | 34.78 | 01.71 | 23.82 | 09.18 | 12.10 | 26.06 | 03.52 | 49.23 | 59.31 |
| 30 | 17.93 | 44.79 | | | 01.65 | 23.39 | 09.70 | 11.72 | 26.85 | 03.32 | 49.96 | 59.30 |
| 31 | 17.29 | 44.55 | | | 01.66 | 22.95 | 10.25 | 11.37 | 27.61 | 03.14 | 50.65 | 59.28 |
| 32 | 16.60 | 44.29 | | | 01.74 | 22.50 | | | 28.32 | 02.98 | | |
| | sec δ 36.89 | tan δ 36.88 | sec δ 36.83 | tan δ 36.82 | sec δ 36.76 | tan δ 36.75 | sec δ 36.69 | tan δ 36.67 | sec δ 36.62 | tan δ 36.61 | sec δ 36.58 | tan δ 36.57 |

Mean R.A. 0^h 12^m 27^s.51

Double lower transit March 25

Mean Dec. -88° 26' 16".84

APPARENT PLACES OF STARS, 1986
CIRCUMPOLAR STARS AT UPPER TRANSIT AT GREENWICH

425

1655 \circ Octantis Mag. 7.22 Spect. A0

| Day | July | | August | | September | | October | | November | | December | |
|-----|-----------------------|-----------------------|-----------------------|-----------------------|---------------------------|---------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m 0 12 | ° ' / 88 25 | h m 0 13 | ° ' / 88 26 | h m 0 13 | ° ' / 88 26 | h m 0 13 | ° ' / 88 26 | h m 0 13 | ° ' / 88 26 | h m 0 12 | ° ' / 88 26 |
| | s | " | s | " | s | " | s | " | s | " | s | " |
| 1 | 50.65 | 59 28 | 13 50 | 00 67 | 30 36 | 06 86 | 35 59 | 16 02 | 26 26 | 24 86 | 66 26 | 29 62 |
| 2 | 51.32 | 59 26 | 14 15 | 00 78 | 30 83 | 07 11 | 35 55 | 16 37 | 25 60 | 25 10 | 65 42 | 29 63 |
| 3 | 52.00 | 59 23 | 14 83 | 00 88 | 31 31 | 07 38 | 35 44 | 16 73 | 24 92 | 25 30 | 64 65 | 29 63 |
| 4 | 52.69 | 59 18 | 15 55 | 00 99 | 31 76 | 07 68 | 35 24 | 17 07 | 24 28 | 25 48 | 63 96 | 29 63 |
| 5 | 53 41 | 59 13 | 16 30 | 01 12 | 32 16 | 07 99 | 34 98 | 17 40 | 23 70 | 25 63 | 63 32 | 29 64 |
| 6 | 54 18 | 59 08 | 17 06 | 01 27 | 32 49 | 08 32 | 34 69 | 17 70 | 23 19 | 25 79 | 62 68 | 29 68 |
| 7 | 54 99 | 59 04 | 17 82 | 01 44 | 32 74 | 08 64 | 34 41 | 17 97 | 22 72 | 25 95 | 62 01 | 29 74 |
| 8 | 55 84 | 59 01 | 18 55 | 01 64 | 32 92 | 08 96 | 34 16 | 18 22 | 22 28 | 26 14 | 61 28 | 29 81 |
| 9 | 56 71 | 58 99 | 19 23 | 01 85 | 33 05 | 09 26 | 33 97 | 18 46 | 21 82 | 26 34 | 60 50 | 29 88 |
| 10 | 57 61 | 59 00 | 19 84 | 02 07 | 33 17 | 09 53 | 33 84 | 18 70 | 21 33 | 26 56 | 59 66 | 29 95 |
| 11 | 58 49 | 59 03 | 20 38 | 02 30 | 33 30 | 09 78 | 33 74 | 18 96 | 20 77 | 26 80 | 58 78 | 29 99 |
| 12 | 59 35 | 59 08 | 20 86 | 02 51 | 33 47 | 10 02 | 33 65 | 19 24 | 20 14 | 27 03 | 57 87 | 30 02 |
| 13 | 60 16 | 59 15 | 21 30 | 02 71 | 33 71 | 10 25 | 33 53 | 19 55 | 19 46 | 27 25 | 56 95 | 30 03 |
| 14 | 60 90 | 59 23 | 21 74 | 02 88 | 33 99 | 10 50 | 33 37 | 19 87 | 18 72 | 27 46 | 56 05 | 30 01 |
| 15 | 61 58 | 59 31 | 22 21 | 03 03 | 34 31 | 10 76 | 33 13 | 20 20 | 17 96 | 27 64 | 55 18 | 29 97 |
| 16 | 62 21 | 59 37 | 22 73 | 03 17 | 34 62 | 11 05 | 32 82 | 20 54 | 17 19 | 27 81 | 54 34 | 29 92 |
| 17 | 62 82 | 59 41 | 23 32 | 03 32 | 34 90 | 11 37 | 32 45 | 20 86 | 16 43 | 27 95 | 53 55 | 29 86 |
| 18 | 63 44 | 59 43 | 23 96 | 03 48 | 35 12 | 11 71 | 32 03 | 21 17 | 15 70 | 28 08 | 52 80 | 29 80 |
| 19 | 64 11 | 59 43 | 24 63 | 03 67 | 35 26 | 12 05 | 31 59 | 21 46 | 15 01 | 28 20 | 52 09 | 29 75 |
| 20 | 64 86 | 59 43 | 25 29 | 03 89 | 35 33 | 12 40 | 31 14 | 21 73 | 14 35 | 28 31 | 51 39 | 29 70 |
| 21 | 65 68 | 59 44 | 25 90 | 04 14 | 35 34 | 12 74 | 30 70 | 21 98 | 13 72 | 28 42 | 50 70 | 29 66 |
| 22 | 66 54 | 59 47 | 26 44 | 04 41 | 35 32 | 13 06 | 30 29 | 22 22 | 13 11 | 28 54 | 49 98 | 29 64 |
| 23 | 67 42 | 59 54 | 26 91 | 04 69 | 35 28 | 13 37 | 29 92 | 22 45 | 12 52 | 28 67 | 49 23 | 29 61 |
| 24 | 68 28 | 59 64 | 27 32 | 04 96 | ^{35 23} 35 21 | ^{13 66} 13 94 | 29 57 | 22 69 | 11 91 | 28 80 | 48 43 | 29 59 |
| 25 | 69 08 | 59 77 | 27 69 | 05 23 | 35 21 | 14 21 | 29 24 | 22 93 | 11 26 | 28 95 | 47 57 | 29 56 |
| 26 | 69 82 | 59 91 | 28 02 | 05 48 | 35 25 | 14 49 | 28 93 | 23 18 | 10 57 | 29 11 | 46 65 | 29 51 |
| 27 | 70 49 | 60 05 | 28 35 | 05 72 | 35 31 | 14 76 | 28 62 | 23 44 | 09 80 | 29 26 | 45 70 | 29 43 |
| 28 | 71 12 | 60 20 | 28 70 | 05 95 | 35 40 | 15 05 | 28 28 | 23 72 | 08 97 | 29 40 | 44 76 | 29 31 |
| 29 | 71 72 | 60 33 | 29 06 | 06 17 | 35 48 | 15 36 | 27 89 | 24 01 | 08 08 | 29 51 | 43 85 | 29 16 |
| 30 | 72 30 | 60 45 | 29 46 | 06 40 | 35 56 | 15 68 | 27 42 | 24 30 | 07 16 | 29 59 | 43 02 | 28 98 |
| 31 | 72 89 | 60 57 | 29 89 | 06 62 | 35 59 | 16 02 | 26 88 | 24 59 | 06 26 | 29 62 | 42 28 | 28 79 |
| 32 | 73 50 | 60 67 | 30 36 | 06 86 | | | 26 26 | 24 86 | | | 41 61 | 28 62 |
| | sec δ 36 57 | tan δ 36 56 | sec δ 36 60 | tan δ 36 58 | sec δ 36 65 | tan δ 36 63 | sec δ 36 71 | tan δ 36 70 | sec δ 36 76 | tan δ 36 74 | sec δ 36 77 | tan δ 36 76 |

Mean R.A. $0^{\text{h}} 12^{\text{m}} 27.51^{\text{s}}$

Double lower transit March 25

Mean Dec. $-88^{\circ} 26' 16.84''$

APPARENT PLACES OF STARS, 1986
CIRCUMPOLAR STARS AT UPPER TRANSIT AT GREENWICH

916 4 G. Octantis Mag. 5.63 Spect. K0

| Day | January | | February | | March | | April | | May | | June | |
|-----|----------------|------------------|----------------|------------------|----------------|------------------|----------------|------------------|----------------|------------------|----------------|------------------|
| | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m 1 38 | ° ' " / 84 50 | h m 1 38 | ° ' " / 84 50 | h m 1 38 | ° ' " / 84 50 | h m 1 38 | ° ' " / 84 50 | h m 1 38 | ° ' " / 84 50 | h m 1 38 | ° ' " / 84 49 |
| 1 | s 19.04 | " 47.09 | s 11.43 | " 44.55 | s 05.62 | " 37.67 | s 01.65 | " 26.75 | s 01.23 | " 15.08 | s 04.31 | " 64.43 |
| 2 | 18.81 | 47.13 | 11.15 | 44.40 | 05.41 | 37.37 | 01.59 | 26.32 | 01.31 | 14.68 | 04.45 | 64.17 |
| 3 | 18.57 | 47.17 | 10.88 | 44.22 | 05.20 | 37.05 | 01.54 | 25.89 | 01.38 | 14.31 | 04.59 | 63.92 |
| 4 | 18.31 | 47.22 | 10.62 | 44.00 | 05.01 | 36.69 | 01.52 | 25.47 | 01.46 | 13.97 | 04.73 | 63.67 |
| 5 | 18.03 | 47.24 | 10.37 | 43.76 | 04.84 | 36.32 | 01.49 | 25.08 | 01.52 | 13.63 | 04.86 | 63.41 |
| 6 | 17.74 | 47.24 | 10.14 | 43.50 | 04.69 | 35.95 | 01.47 | 24.71 | 01.57 | 13.31 | 04.99 | 63.14 |
| 7 | 17.45 | 47.21 | 09.94 | 43.24 | 04.56 | 35.58 | 01.43 | 24.36 | 01.62 | 12.98 | 05.13 | 62.86 |
| 8 | 17.17 | 47.14 | 09.75 | 42.98 | 04.45 | 35.22 | 01.39 | 24.01 | 01.66 | 12.65 | 05.28 | 62.56 |
| 9 | 16.91 | 47.05 | 09.56 | 42.75 | 04.33 | 34.89 | 01.34 | 23.67 | 01.70 | 12.31 | 05.44 | 62.26 |
| 10 | 16.67 | 46.94 | 09.38 | 42.53 | 04.21 | 34.58 | 01.28 | 23.33 | 01.74 | 11.95 | 05.62 | 61.96 |
| 11 | 16.44 | 46.84 | 09.18 | 42.33 | 04.08 | 34.27 | 01.21 | 22.97 | 01.79 | 11.58 | 05.82 | 61.66 |
| 12 | 16.23 | 46.75 | 08.97 | 42.14 | 03.94 | 33.98 | 01.15 | 22.60 | 01.86 | 11.20 | 06.03 | 61.38 |
| 13 | 16.02 | 46.68 | 08.75 | 41.95 | 03.78 | 33.68 | 01.09 | 22.21 | 01.94 | 10.81 | 06.24 | 61.11 |
| 14 | 15.80 | 46.63 | 08.52 | 41.75 | 03.62 | 33.37 | 01.05 | 21.81 | 02.04 | 10.41 | 06.46 | 60.87 |
| 15 | 15.56 | 46.58 | 08.29 | 41.54 | 03.46 | 33.05 | 01.02 | 21.39 | 02.15 | 10.03 | 06.67 | 60.65 |
| 16 | 15.32 | 46.55 | 08.05 | 41.31 | 03.30 | 32.71 | 01.00 | 20.97 | 02.28 | 09.66 | 06.87 | 60.45 |
| 17 | 15.06 | 46.50 | 07.82 | 41.05 | 03.15 | 32.35 | 01.00 | 20.54 | 02.41 | 09.30 | 07.06 | 60.27 |
| 18 | 14.79 | 46.45 | 07.59 | 40.78 | 03.01 | 31.98 | 01.02 | 20.12 | 02.54 | 08.97 | 07.22 | 60.09 |
| 19 | 14.51 | 46.38 | 07.38 | 40.49 | 02.89 | 31.59 | 01.05 | 19.72 | 02.67 | 08.66 | 07.38 | 59.89 |
| 20 | 14.24 | 46.28 | 07.18 | 40.18 | 02.78 | 31.19 | 01.09 | 19.33 | 02.78 | 08.36 | 07.53 | 59.67 |
| 21 | 13.96 | 46.17 | 07.00 | 39.87 | 02.69 | 30.79 | 01.12 | 18.96 | 02.88 | 08.08 | 07.69 | 59.43 |
| 22 | 13.70 | 46.03 | 06.84 | 39.55 | 02.62 | 30.39 | 01.14 | 18.62 | 02.96 | 07.79 | 07.87 | 59.16 |
| 23 | 13.45 | 45.87 | 06.68 | 39.25 | 02.55 | 30.02 | 01.14 | 18.28 | 03.03 | 07.47 | 08.07 | 58.89 |
| 24 | 13.21 | 45.70 | 06.53 | 38.96 | 02.48 | 29.66 | 01.13 | 17.95 | 03.11 | 07.13 | 08.30 | 58.62 |
| 25 | 12.99 | 45.53 | 06.38 | 38.69 | 02.41 | 29.32 | 01.10 | 17.59 | 03.20 | 06.76 | 08.55 | 58.38 |
| 26 | 12.78 | 45.36 | 06.21 | 38.44 | 02.32 | 28.99 | 01.08 | 17.21 | 03.32 | 06.38 | 08.79 | 58.18 |
| 27 | 12.58 | 45.20 | 06.03 | 38.19 | 02.21 | 28.67 | 01.06 | 16.80 | 03.46 | 06.00 | 09.04 | 58.00 |
| 28 | 12.37 | 45.05 | 05.83 | 37.94 | 02.09 | 28.34 | 01.07 | 16.37 | 03.63 | 05.63 | 09.27 | 57.85 |
| 29 | 12.16 | 44.92 | 05.62 | 37.67 | 01.96 | 27.98 | 01.10 | 15.93 | 03.80 | 05.29 | 09.49 | 57.72 |
| 30 | 11.93 | 44.80 | | | 01.84 | 27.60 | 01.16 | 15.49 | 03.98 | 04.98 | 09.70 | 57.59 |
| 31 | 11.69 | 44.68 | | | 01.73 | 27.19 | 01.23 | 15.08 | 04.15 | 04.69 | 09.89 | 57.47 |
| 32 | 11.43 | 44.55 | | | 01.65 | 26.75 | | | 04.31 | 04.43 | | |
| | sec δ 11.13 | tan δ 11.09 | sec δ 11.13 | tan δ 11.08 | sec δ 11.12 | tan δ 11.08 | sec δ 11.12 | tan δ 11.07 | sec δ 11.11 | tan δ 11.07 | sec δ 11.10 | tan δ 11.06 |

Mean R.A. 1^h 38^m 08.^s43

Double lower transit April 16

Mean Dec. -84° 50' 17."36

APPARENT PLACES OF STARS, 1986
CIRCUMPOLAR STARS AT UPPER TRANSIT AT GREENWICH

427

916 4 G. Octantis · Mag. 5.63 Spect. K0

| Day | July | | August | | September | | October | | November | | December | |
|-----|----------------|----------------|----------------|----------------|----------------|----------------|-----------------------------------|-----------------------------------|----------------|----------------|----------------|----------------|
| | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m 1 38 | ° ' / 84 49 | h m 1 38 | ° ' / 84 49 | h m 1 38 | ° ' / 84 49 | h m 1 38 | ° ' / 84 50 | h m 1 38 | ° ' / 84 50 | h m 1 38 | ° ' / 84 50 |
| | s | " | s | " | s | " | s | " | s | " | s | " |
| 1 | 09.89 | 57.47 | 17.01 | 55.17 | 23.65 | 58.30 | 27.63 | 05.72 | 27.60 | 15.76 | 23.44 | 23.39 |
| 2 | 10.09 | 57.34 | 17.23 | 55.16 | 23.86 | 58.46 | 27.73 | 06.04 | 27.48 | 16.09 | 23.22 | 23.53 |
| 3 | 10.28 | 57.20 | 17.46 | 55.15 | 24.07 | 58.64 | 27.81 | 06.37 | 27.35 | 16.38 | 23.02 | 23.65 |
| 4 | 10.47 | 57.05 | 17.71 | 55.15 | 24.28 | 58.85 | 27.87 | 06.72 | 27.23 | 16.65 | 22.84 | 23.76 |
| 5 | 10.68 | 56.89 | 17.96 | 55.15 | 24.48 | 59.08 | 27.91 | 07.07 | 27.13 | 16.88 | 22.68 | 23.88 |
| 6 | 10.90 | 56.72 | 18.23 | 55.17 | 24.66 | 59.33 | 27.92 | 07.42 | 27.04 | 17.11 | 22.52 | 24.03 |
| 7 | 11.13 | 56.55 | 18.49 | 55.21 | 24.82 | 59.60 | 27.93 | 07.74 | 26.96 | 17.34 | 22.35 | 24.19 |
| 8 | 11.37 | 56.39 | 18.76 | 55.28 | 24.95 | 59.86 | 27.93 | 08.03 | 26.89 | 17.59 | 22.17 | 24.37 |
| 9 | 11.63 | 56.24 | 19.01 | 55.38 | 25.07 | 60.12 | 27.94 | 08.30 | 26.83 | 17.85 | 21.97 | 24.57 |
| 10 | 11.89 | 56.11 | 19.24 | 55.49 | 25.18 | 60.35 | 27.96 | 08.56 | 26.75 | 18.14 | 21.75 | 24.76 |
| 11 | 12.15 | 56.00 | 19.45 | 55.61 | 25.30 | 60.56 | 28.00 | 08.81 | 26.65 | 18.45 | 21.52 | 24.94 |
| 12 | 12.42 | 55.91 | 19.65 | 55.73 | 25.42 | 60.76 | 28.05 | 09.07 | 26.54 | 18.76 | 21.27 | 25.11 |
| 13 | 12.67 | 55.85 | 19.83 | 55.84 | 25.56 | 60.94 | 28.11 | 09.35 | 26.41 | 19.08 | 21.02 | 25.26 |
| 14 | 12.90 | 55.81 | 20.01 | 55.93 | 25.72 | 61.12 | 28.16 | 09.66 | 26.26 | 19.39 | 20.77 | 25.39 |
| 15 | 13.12 | 55.77 | 20.20 | 56.00 | 25.89 | 61.32 | 28.20 | 09.99 | 26.10 | 19.68 | 20.53 | 25.49 |
| 16 | 13.32 | 55.73 | 20.40 | 56.05 | 26.06 | 61.55 | ^{28 22} _{28 22} | ^{10 33} _{10 89} | 25.93 | 19.95 | 20.29 | 25.58 |
| 17 | 13.51 | 55.67 | 20.62 | 56.09 | 26.23 | 61.80 | 28.20 | 11.05 | 25.77 | 20.21 | 20.07 | 25.65 |
| 18 | 13.71 | 55.59 | 20.86 | 56.15 | 26.38 | 62.09 | 28.17 | 11.40 | 25.60 | 20.44 | 19.85 | 25.72 |
| 19 | 13.91 | 55.48 | 21.11 | 56.22 | 26.51 | 62.39 | 28.12 | 11.74 | 25.45 | 20.66 | 19.64 | 25.79 |
| 20 | 14.14 | 55.36 | 21.36 | 56.33 | 26.62 | 62.70 | 28.08 | 12.06 | 25.31 | 20.87 | 19.44 | 25.86 |
| 21 | 14.39 | 55.24 | 21.60 | 56.47 | 26.72 | 63.01 | 28.03 | 12.36 | 25.17 | 21.08 | 19.24 | 25.94 |
| 22 | 14.66 | 55.14 | 21.83 | 56.63 | 26.80 | 63.31 | 27.99 | 12.65 | 25.04 | 21.28 | 19.04 | 26.03 |
| 23 | 14.93 | 55.07 | 22.03 | 56.82 | 26.87 | 63.60 | 27.95 | 12.93 | 24.91 | 21.50 | 18.82 | 26.13 |
| 24 | 15.21 | 55.03 | 22.22 | 57.01 | 26.95 | 63.88 | 27.93 | 13.21 | 24.78 | 21.73 | 18.59 | 26.24 |
| 25 | 15.47 | 55.03 | 22.40 | 57.20 | 27.02 | 64.15 | 27.91 | 13.48 | 24.64 | 21.97 | 18.35 | 26.35 |
| 26 | 15.72 | 55.04 | 22.57 | 57.38 | 27.11 | 64.40 | 27.89 | 13.77 | 24.49 | 22.23 | 18.08 | 26.44 |
| 27 | 15.95 | 55.07 | 22.73 | 57.55 | 27.20 | 64.65 | 27.88 | 14.07 | 24.32 | 22.49 | 17.79 | 26.52 |
| 28 | 16.17 | 55.10 | 22.90 | 57.71 | 27.30 | 64.90 | 27.86 | 14.38 | 24.12 | 22.75 | 17.51 | 26.56 |
| 29 | 16.38 | 55.13 | 23.07 | 57.86 | 27.41 | 65.16 | 27.83 | 14.71 | 23.90 | 23.00 | 17.22 | 26.56 |
| 30 | 16.59 | 55.15 | 23.25 | 58.01 | 27.52 | 65.43 | 27.78 | 15.06 | 23.67 | 23.21 | 16.96 | 26.53 |
| 31 | 16.80 | 55.17 | 23.45 | 58.15 | 27.63 | 65.72 | 27.70 | 15.41 | 23.44 | 23.39 | 16.72 | 26.48 |
| 32 | 17.01 | 55.17 | 23.65 | 58.30 | | | 27.60 | 15.76 | | | 16.50 | 26.43 |
| | sec δ 11.11 | tan δ 11.07 | sec δ 11.11 | tan δ 11.07 | sec δ 11.11 | tan δ 11.07 | sec δ 11.11 | tan δ 11.07 | sec δ 11.11 | tan δ 11.07 | sec δ 11.11 | tan δ 11.07 |

Mean R.A. 1^h 38^m 08.43^s

Double lower transit April 16

Mean Dec. -84° 50' 17.36"

APPARENT PLACES OF STARS, 1986
CIRCUMPOLAR STARS AT UPPER TRANSIT AT GREENWICH

1657 Lacaille 1848 (Octantis) - Mag. 8.35 Spect. G5

| Day | January | | February | | March | | April | | May | | June | |
|-----|-----------------------------------|------------------------------------|-----------------------------------|------------------------------------|-----------------------------------|------------------------------------|-----------------------------------|------------------------------------|-----------------------------------|------------------------------------|-----------------------------------|------------------------------------|
| | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | ^h ^m 2 23 | ^o ['] 88 12 | ^h ^m 2 23 | ^o ['] 88 12 | ^h ^m 2 23 | ^o ['] 88 12 | ^h ^m 2 23 | ^o ['] 88 12 | ^h ^m 2 23 | ^o ['] 88 12 | ^h ^m 2 23 | ^o ['] 88 12 |
| | ^s 65.90 | ^s 51.39 | ^s 42.57 | ^s 50.79 | ^s 22.75 | ^s 45.50 | ^s 06.52 | ^s 35.85 | ^s 00.08 | ^s 24.65 | ^s 03.90 | ^s 13.65 |
| 1 | 65.27 | 51.48 | 41.72 | 50.71 | 22.00 | 45.26 | 06.14 | 35.45 | 00.13 | 24.25 | 04.21 | 13.37 |
| 2 | 64.59 | 51.59 | 40.84 | 50.60 | 21.26 | 45.00 | 05.82 | 35.04 | 00.19 | 23.87 | 04.50 | 13.09 |
| 3 | 63.85 | 51.69 | 39.97 | 50.46 | 20.54 | 44.70 | 05.56 | 34.65 | 00.25 | 23.52 | 04.75 | 12.82 |
| 4 | 63.04 | 51.79 | 39.13 | 50.28 | 19.88 | 44.38 | 05.32 | 34.27 | 00.28 | 23.18 | 05.00 | 12.54 |
| 5 | 62.19 | 51.86 | 38.35 | 50.09 | 19.28 | 44.05 | 05.09 | 33.91 | 00.30 | 22.85 | 05.24 | 12.25 |
| 6 | 61.32 | 51.90 | 37.62 | 49.88 | 18.74 | 43.73 | 04.85 | 33.58 | 00.28 | 22.53 | 05.49 | 11.94 |
| 7 | 60.45 | 51.91 | 36.95 | 49.68 | 18.24 | 43.41 | 04.59 | 33.25 | 00.25 | 22.20 | 05.77 | 11.63 |
| 8 | 59.63 | 51.88 | 36.32 | 49.50 | 17.77 | 43.11 | 04.29 | 32.94 | 00.20 | 21.86 | 06.08 | 11.30 |
| 9 | 58.87 | 51.84 | 35.69 | 49.33 | 17.29 | 42.83 | 03.97 | 32.62 | 00.16 | 21.50 | 06.44 | 10.97 |
| 10 | 58.16 | 51.79 | 35.04 | 49.18 | 16.80 | 42.57 | 03.64 | 32.29 | 00.13 | 21.13 | 06.85 | 10.64 |
| 11 | 57.50 | 51.76 | 34.37 | 49.04 | 16.27 | 42.32 | 03.29 | 31.94 | 00.13 | 20.75 | 07.29 | 10.31 |
| 12 | 56.84 | 51.75 | 33.66 | 48.91 | 15.71 | 42.06 | 02.95 | 31.58 | 00.18 | 20.35 | 07.78 | 10.01 |
| 13 | 56.18 | 51.75 | 32.92 | 48.77 | 15.12 | 41.80 | 02.64 | 31.20 | 00.27 | 19.95 | 08.28 | 09.72 |
| 14 | 55.49 | 51.76 | 32.15 | 48.62 | 14.52 | 41.53 | 02.35 | 30.81 | 00.41 | 19.55 | 08.78 | 09.46 |
| 15 | 54.76 | 51.78 | 31.36 | 48.45 | 13.92 | 41.24 | 02.12 | 30.40 | 00.60 | 19.16 | 09.26 | 09.22 |
| 16 | 54.00 | 51.80 | 30.57 | 48.26 | 13.32 | 40.93 | 01.93 | 29.99 | 00.81 | 18.79 | 09.69 | 09.00 |
| 17 | 53.19 | 51.82 | 29.80 | 48.05 | 12.75 | 40.59 | 01.79 | 29.58 | 01.05 | 18.44 | 10.08 | 08.79 |
| 18 | 52.36 | 51.81 | 29.05 | 47.82 | 12.21 | 40.25 | 01.69 | 29.18 | 01.27 | 18.11 | 10.42 | 08.57 |
| 19 | 51.52 | 51.79 | 28.34 | 47.57 | 11.73 | 39.88 | 01.62 | 28.79 | 01.47 | 17.80 | 10.73 | 08.32 |
| 20 | 50.67 | 51.75 | 27.67 | 47.31 | 11.29 | 39.52 | 01.55 | 28.43 | 01.61 | 17.50 | 11.05 | 08.05 |
| 21 | 49.83 | 51.68 | 27.05 | 47.05 | 10.89 | 39.15 | 01.47 | 28.09 | 01.70 | 17.20 | 11.41 | 07.76 |
| 22 | 49.02 | 51.59 | 26.47 | 46.79 | 10.54 | 38.80 | 01.34 | 27.76 | 01.75 | 16.88 | 11.84 | 07.45 |
| 23 | 48.25 | 51.48 | 25.92 | 46.54 | 10.19 | 38.47 | 01.15 | 27.44 | 01.80 | 16.53 | 12.35 | 07.14 |
| 24 | 47.52 | 51.37 | 25.36 | 46.32 | 09.84 | 38.16 | 00.92 | 27.10 | 01.88 | 16.16 | 12.91 | 06.85 |
| 25 | 46.82 | 51.25 | 24.78 | 46.11 | 09.46 | 37.86 | 00.66 | 26.74 | 02.02 | 15.76 | 13.51 | 06.59 |
| 26 | 46.16 | 51.14 | 24.16 | 45.91 | 09.02 | 37.58 | 00.43 | 26.35 | 02.23 | 15.36 | 14.11 | 06.37 |
| 27 | 45.51 | 51.05 | 23.48 | 45.71 | 08.53 | 37.28 | 00.24 | 25.93 | 02.52 | 14.97 | 14.70 | 06.17 |
| 28 | 44.84 | 50.97 | 22.75 | 45.50 | 08.00 | 36.97 | 00.12 | 25.50 | 02.85 | 14.60 | 15.26 | 05.99 |
| 29 | 44.13 | 50.91 | | | 07.47 | 36.62 | 00.07 | 25.07 | 03.21 | 14.26 | 15.78 | 05.82 |
| 30 | 43.38 | 50.85 | | | 06.97 | 36.25 | 00.08 | 24.65 | 03.56 | 13.94 | 16.28 | 05.65 |
| 31 | 42.57 | 50.79 | | | 06.52 | 35.85 | | | 03.90 | 13.65 | | |
| 32 | | | | | | | | | | | | |
| | sec δ 32.09 | tan δ 32.08 | sec δ 32.08 | tan δ 32.06 | sec δ 32.04 | tan δ 32.02 | sec δ 31.99 | tan δ 31.97 | sec δ 31.93 | tan δ 31.91 | sec δ 31.88 | tan δ 31.87 |

Mean R.A. ^h 2 ^m 23 ^s 19.52

Double lower transit April 28

Mean Dec. -88° 12' 25.6"

APPARENT PLACES OF STARS, 1986
CIRCUMPOLAR STARS AT UPPER TRANSIT AT GREENWICH

429

1657 Lacaille 1848 (Octantis) Mag. 8.35 Spect. G5

| Day | July | | August | | September | | October | | November | | December | |
|-----|-----------------------------------|------------------------------------|-----------------------------------|------------------------------------|-----------------------------------|------------------------------------|-----------------------------------|------------------------------------|-----------------------------------|------------------------------------|-----------------------------------|------------------------------------|
| | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | ^h ^m 2 23 | [°] ['] 88 12 | ^h ^m 2 23 | [°] ['] 88 12 | ^h ^m 2 23 | [°] ['] 88 12 | ^h ^m 2 24 | [°] ['] 88 12 | ^h ^m 2 24 | [°] ['] 88 12 | ^h ^m 2 23 | [°] ['] 88 12 |
| | ^s | " | ^s | " | ^s | " | ^s | " | ^s | " | ^s | " |
| 1 | 16.28 | 05.65 | 34.86 | 01.83 | 54.44 | 03.38 | 08.40 | 09.72 | 12.08 | 19.57 | 62.87 | 28.07 |
| 2 | 16.75 | 05.49 | 35.45 | 01.78 | 55.08 | 03.49 | 08.81 | 10.00 | 11.87 | 19.92 | 62.27 | 28.27 |
| 3 | 17.22 | 05.31 | 36.09 | 01.72 | 55.75 | 03.62 | 09.18 | 10.31 | 11.61 | 20.24 | 61.71 | 28.44 |
| 4 | 17.69 | 05.12 | 36.75 | 01.66 | 56.42 | 03.77 | 09.50 | 10.63 | 11.34 | 20.53 | 61.21 | 28.60 |
| 5 | 18.17 | 04.92 | 37.46 | 01.60 | 57.07 | 03.95 | 09.75 | 10.97 | 11.10 | 20.79 | 60.76 | 28.76 |
| 6 | 18.69 | 04.71 | 38.20 | 01.56 | 57.68 | 04.15 | 09.93 | 11.30 | 10.91 | 21.04 | 60.34 | 28.94 |
| 7 | 19.24 | 04.50 | 38.96 | 01.54 | 58.23 | 04.37 | 10.05 | 11.62 | 10.76 | 21.28 | 59.91 | 29.14 |
| 8 | 19.84 | 04.29 | 39.72 | 01.55 | 58.73 | 04.60 | 10.15 | 11.91 | 10.65 | 21.54 | 59.46 | 29.36 |
| 9 | 20.48 | 04.08 | 40.46 | 01.58 | 59.16 | 04.82 | 10.26 | 12.17 | 10.55 | 21.82 | 58.96 | 29.60 |
| 10 | 21.15 | 03.89 | 41.16 | 01.64 | 59.56 | 05.03 | 10.41 | 12.42 | 10.44 | 22.12 | 58.41 | 29.84 |
| 11 | 21.84 | 03.73 | 41.81 | 01.71 | 59.94 | 05.21 | 10.60 | 12.66 | 10.29 | 22.44 | 57.82 | 30.08 |
| 12 | 22.54 | 03.58 | 42.40 | 01.78 | 60.35 | 05.37 | 10.83 | 12.90 | 10.10 | 22.78 | 57.18 | 30.30 |
| 13 | 23.21 | 03.47 | 42.95 | 01.85 | 60.80 | 05.52 | 11.09 | 13.17 | 09.84 | 23.12 | 56.51 | 30.51 |
| 14 | 23.85 | 03.37 | 43.47 | 01.90 | 61.29 | 05.67 | 11.35 | 13.45 | 09.54 | 23.46 | 55.83 | 30.70 |
| 15 | 24.43 | 03.29 | 44.00 | 01.92 | 61.83 | 05.82 | 11.60 | 13.76 | 09.19 | 23.78 | 55.14 | 30.86 |
| 16 | 24.97 | 03.20 | 44.56 | 01.93 | 62.40 | 06.00 | 11.80 | 14.10 | 08.81 | 24.09 | 54.48 | 31.01 |
| 17 | 25.47 | 03.10 | 45.17 | 01.92 | 62.97 | 06.21 | 11.95 | 14.45 | 08.42 | 24.38 | 53.84 | 31.14 |
| 18 | 25.95 | 02.98 | 45.84 | 01.92 | 63.51 | 06.45 | 12.04 | 14.80 | 08.04 | 24.65 | 53.22 | 31.26 |
| 19 | 26.46 | 02.83 | 46.55 | 01.94 | 64.01 | 06.71 | 12.09 | 15.16 | 07.66 | 24.91 | 52.64 | 31.37 |
| 20 | 27.02 | 02.67 | 47.29 | 01.98 | 64.45 | 06.99 | 12.09 | 15.50 | 07.31 | 25.15 | 52.07 | 31.49 |
| 21 | 27.64 | 02.50 | 48.03 | 02.06 | 64.84 | 07.27 | 12.07 | 15.82 | 06.98 | 25.39 | 51.52 | 31.62 |
| 22 | 28.33 | 02.34 | 48.73 | 02.17 | 65.19 | 07.55 | 12.04 | 16.13 | 06.68 | 25.62 | 50.96 | 31.75 |
| 23 | 29.06 | 02.21 | 49.39 | 02.30 | 65.51 | 07.82 | 12.02 | 16.43 | 06.39 | 25.87 | 50.38 | 31.90 |
| 24 | 29.81 | 02.11 | 50.01 | 02.44 | 65.82 | 08.07 | 12.02 | 16.71 | 06.10 | 26.12 | 49.76 | 32.07 |
| 25 | 30.55 | 02.04 | 50.57 | 02.59 | 66.13 | 08.31 | 12.03 | 16.99 | 05.80 | 26.39 | 49.09 | 32.23 |
| 26 | 31.25 | 02.00 | 51.11 | 02.72 | 66.45 | 08.55 | 12.08 | 17.27 | 05.46 | 26.68 | 48.35 | 32.39 |
| 27 | 31.91 | 01.97 | 51.64 | 02.86 | 66.79 | 08.77 | 12.14 | 17.55 | 05.07 | 26.98 | 47.55 | 32.54 |
| 28 | 32.54 | 01.95 | 52.15 | 02.97 | 67.16 | 08.99 | ^{12.21} _{12.28} | ^{17.84} _{18.16} | 04.61 | 27.28 | 46.72 | 32.65 |
| 29 | 33.13 | 01.94 | 52.69 | 03.08 | 67.56 | 09.22 | 12.32 | 18.49 | 04.07 | 27.57 | 45.88 | 32.72 |
| 30 | 33.71 | 01.91 | 53.24 | 03.18 | 67.97 | 09.46 | 12.31 | 18.84 | 03.49 | 27.84 | 45.07 | 32.76 |
| 31 | 34.28 | 01.88 | 53.82 | 03.28 | 68.40 | 09.72 | 12.23 | 19.20 | 02.87 | 28.07 | 44.33 | 32.77 |
| 32 | 34.86 | 01.83 | 54.44 | 03.38 | | | 12.08 | 19.57 | | | 43.64 | 32.78 |
| | sec δ | tan δ | sec δ | tan δ | sec δ | tan δ | sec δ | tan δ | sec δ | tan δ | sec δ | tan δ |
| | 31.85 | 31.84 | 31.85 | 31.83 | 31.87 | 31.85 | 31.91 | 31.89 | 31.95 | 31.94 | 31.99 | 31.97 |

Mean R.A. ^h 2 ^m 23 ^s 19.52

Double lower transit April 28

Mean Dec. [°] -88 ['] 12 ["] 25.68

APPARENT PLACES OF STARS, 1986
CIRCUMPOLAR STARS AT UPPER TRANSIT AT GREENWICH

1656 Lacaille 1029 (Octantis) Mag. 7.76 Spect. F0

| Day | January | | February | | March | | April | | May | | June | |
|-----|-----------------------------------|------------------------------------|-----------------------------------|------------------------------------|-----------------------------------|------------------------------------|-----------------------------------|------------------------------------|-----------------------------------|------------------------------------|-----------------------------------|------------------------------------|
| | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | ^h ^m 2 23 | ^o ['] 85 47 | ^h ^m 2 23 | ^o ['] 85 47 | ^h ^m 2 23 | ^o ['] 85 46 | ^h ^m 2 23 | ^o ['] 85 46 | ^h ^m 2 23 | ^o ['] 85 46 | ^h ^m 2 23 | ^o ['] 85 46 |
| | ^s | ^s | ^s | ^s | ^s | ^s | ^s | ^s | ^s | ^s | ^s | ^s |
| 1 | 39.04 | 10.45 | 29.33 | 10.00 | 21.06 | 64.81 | 14.30 | 55.20 | 11.70 | 43.94 | 13.49 | 32.81 |
| 2 | 38.77 | 10.55 | 28.97 | 09.93 | 20.75 | 64.58 | 14.15 | 54.79 | 11.73 | 43.53 | 13.63 | 32.52 |
| 3 | 38.49 | 10.66 | 28.61 | 09.82 | 20.44 | 64.31 | 14.02 | 54.38 | 11.75 | 43.16 | 13.75 | 32.25 |
| 4 | 38.17 | 10.77 | 28.25 | 09.68 | 20.14 | 64.02 | 13.91 | 53.99 | 11.78 | 42.80 | 13.87 | 31.97 |
| 5 | 37.84 | 10.87 | 27.90 | 09.51 | 19.87 | 63.70 | 13.81 | 53.61 | 11.80 | 42.46 | 13.98 | 31.68 |
| 6 | 37.49 | 10.95 | 27.58 | 09.32 | 19.63 | 63.37 | 13.72 | 53.25 | 11.80 | 42.13 | 14.09 | 31.39 |
| 7 | 37.12 | 11.00 | 27.28 | 09.12 | 19.40 | 63.05 | 13.61 | 52.91 | 11.80 | 41.80 | 14.20 | 31.08 |
| 8 | 36.77 | 11.01 | 27.01 | 08.92 | 19.20 | 62.73 | 13.50 | 52.59 | 11.79 | 41.46 | 14.33 | 30.75 |
| 9 | 36.43 | 10.99 | 26.74 | 08.74 | 19.00 | 62.44 | 13.38 | 52.27 | 11.77 | 41.12 | 14.47 | 30.42 |
| 10 | 36.12 | 10.95 | 26.48 | 08.58 | 18.79 | 62.16 | 13.24 | 51.95 | 11.76 | 40.76 | 14.63 | 30.08 |
| 11 | 35.83 | 10.91 | 26.21 | 08.43 | 18.58 | 61.90 | 13.10 | 51.62 | 11.76 | 40.39 | 14.81 | 29.75 |
| 12 | 35.56 | 10.88 | 25.92 | 08.30 | 18.36 | 61.65 | 12.96 | 51.27 | 11.77 | 40.00 | 15.01 | 29.42 |
| 13 | 35.29 | 10.87 | 25.62 | 08.17 | 18.12 | 61.40 | 12.82 | 50.91 | 11.79 | 39.60 | 15.22 | 29.11 |
| 14 | 35.01 | 10.88 | 25.31 | 08.03 | 17.88 | 61.14 | 12.69 | 50.53 | 11.84 | 39.20 | 15.44 | 28.82 |
| 15 | 34.72 | 10.90 | 24.98 | 07.89 | 17.62 | 60.86 | 12.58 | 50.13 | 11.91 | 38.79 | 15.66 | 28.55 |
| 16 | 34.41 | 10.92 | 24.66 | 07.72 | 17.37 | 60.57 | 12.49 | 49.73 | 11.99 | 38.40 | 15.86 | 28.31 |
| 17 | 34.09 | 10.95 | 24.33 | 07.54 | 17.12 | 60.26 | 12.41 | 49.31 | 12.09 | 38.02 | 16.05 | 28.08 |
| 18 | 33.75 | 10.97 | 24.01 | 07.33 | 16.89 | 59.93 | 12.36 | 48.90 | 12.19 | 37.66 | 16.22 | 27.86 |
| 19 | 33.41 | 10.97 | 23.70 | 07.10 | 16.67 | 59.58 | 12.32 | 48.49 | 12.29 | 37.33 | 16.37 | 27.64 |
| 20 | 33.05 | 10.95 | 23.40 | 06.86 | 16.47 | 59.22 | 12.30 | 48.11 | 12.38 | 37.01 | 16.51 | 27.39 |
| 21 | 32.70 | 10.91 | 23.13 | 06.60 | 16.29 | 58.86 | 12.27 | 47.74 | 12.44 | 36.71 | 16.66 | 27.11 |
| 22 | 32.36 | 10.85 | 22.87 | 06.34 | 16.12 | 58.49 | 12.23 | 47.40 | 12.48 | 36.41 | 16.83 | 26.81 |
| 23 | 32.02 | 10.76 | 22.63 | 06.08 | 15.97 | 58.14 | 12.18 | 47.07 | 12.51 | 36.08 | 17.02 | 26.49 |
| 24 | 31.70 | 10.66 | 22.40 | 05.84 | 15.83 | 57.81 | 12.10 | 46.75 | 12.54 | 35.73 | 17.25 | 26.18 |
| 25 | 31.40 | 10.55 | 22.16 | 05.61 | 15.68 | 57.50 | 12.01 | 46.41 | 12.58 | 35.35 | 17.50 | 25.89 |
| 26 | 31.12 | 10.44 | 21.91 | 05.41 | 15.52 | 57.20 | 11.91 | 46.05 | 12.66 | 34.95 | 17.76 | 25.63 |
| 27 | 30.84 | 10.33 | 21.65 | 05.21 | 15.33 | 56.92 | 11.81 | 45.65 | 12.76 | 34.55 | 18.02 | 25.39 |
| 28 | 30.57 | 10.25 | 21.36 | 05.02 | 15.12 | 56.62 | 11.74 | 45.23 | 12.89 | 34.15 | 18.27 | 25.19 |
| 29 | 30.28 | 10.17 | 21.06 | 04.81 | 14.91 | 56.31 | 11.70 | 44.80 | 13.04 | 33.78 | 18.51 | 25.00 |
| 30 | 29.99 | 10.12 | | | 14.69 | 55.96 | 11.69 | 44.36 | 13.19 | 33.43 | 18.74 | 24.83 |
| 31 | 29.67 | 10.06 | | | 14.48 | 55.59 | 11.70 | 43.94 | 13.35 | 33.11 | 18.96 | 24.66 |
| 32 | 29.33 | 10.00 | | | 14.30 | 55.20 | | | 13.49 | 32.81 | | |
| | sec δ 13.61 | tan δ 13.57 | sec δ 13.61 | tan δ 13.57 | sec δ 13.60 | tan δ 13.56 | sec δ 13.59 | tan δ 13.55 | sec δ 13.58 | tan δ 13.54 | sec δ 13.57 | tan δ 13.54 |

Mean R.A. $2^{\text{h}} 23^{\text{m}} 20.6^{\text{s}}$

Double lower transit April 28

Mean Dec. $-85^{\circ} 46' 44.6''$

APPARENT PLACES OF STARS, 1986
CIRCUMPOLAR STARS AT UPPER TRANSIT AT GREENWICH

1656 Lacaille 1029 (Octantis) Mag. 7.76 Spect. F0

| Day | July | | August | | September | | October | | November | | December | |
|-----|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m 2 23 | ° ' / 85 46 | h m 2 23 | ° ' / 85 46 | h m 2 23 | ° ' / 85 46 | h m 2 23 | ° ' / 85 46 | h m 2 23 | ° ' / 85 46 | h m 2 23 | ° ' / 85 46 |
| | s | " | s | " | s | " | s | " | s | " | s | " |
| 1 | 18.96 | 24.66 | 27.07 | 20.68 | 35.57 | 22.13 | 41.62 | 28.44 | 43.29 | 38.34 | 39.55 | 46.96 |
| 2 | 19.16 | 24.48 | 27.33 | 20.62 | 35.85 | 22.23 | 41.79 | 28.72 | 43.21 | 38.69 | 39.31 | 47.16 |
| 3 | 19.37 | 24.30 | 27.61 | 20.56 | 36.13 | 22.36 | 41.95 | 29.03 | 43.10 | 39.02 | 39.08 | 47.34 |
| 4 | 19.57 | 24.11 | 27.90 | 20.49 | 36.42 | 22.51 | 42.08 | 29.35 | 43.00 | 39.31 | 38.88 | 47.50 |
| 5 | 19.79 | 23.90 | 28.21 | 20.44 | 36.70 | 22.69 | 42.19 | 29.69 | 42.91 | 39.58 | 38.70 | 47.67 |
| 6 | 20.02 | 23.69 | 28.53 | 20.39 | 36.96 | 22.89 | 42.27 | 30.02 | 42.84 | 39.83 | 38.53 | 47.85 |
| 7 | 20.26 | 23.47 | 28.85 | 20.37 | 37.19 | 23.11 | 42.33 | 30.34 | 42.78 | 40.08 | 38.35 | 48.06 |
| 8 | 20.53 | 23.25 | 29.18 | 20.37 | 37.40 | 23.33 | 42.38 | 30.63 | 42.74 | 40.34 | 38.16 | 48.29 |
| 9 | 20.81 | 23.04 | 29.50 | 20.40 | 37.59 | 23.55 | 42.43 | 30.90 | 42.71 | 40.62 | 37.95 | 48.53 |
| 10 | 21.10 | 22.85 | 29.80 | 20.45 | 37.77 | 23.76 | 42.50 | 31.15 | 42.66 | 40.92 | 37.72 | 48.77 |
| 11 | 21.40 | 22.68 | 30.07 | 20.52 | 37.94 | 23.94 | 42.59 | 31.39 | 42.60 | 41.25 | 37.47 | 49.02 |
| 12 | 21.70 | 22.53 | 30.33 | 20.59 | 38.12 | 24.10 | 42.70 | 31.63 | 42.51 | 41.59 | 37.20 | 49.25 |
| 13 | 21.99 | 22.41 | 30.57 | 20.65 | 38.32 | 24.25 | 42.81 | 31.89 | 42.41 | 41.93 | 36.93 | 49.46 |
| 14 | 22.26 | 22.31 | 30.80 | 20.69 | 38.54 | 24.39 | 42.93 | 32.18 | 42.28 | 42.27 | 36.64 | 49.65 |
| 15 | 22.52 | 22.22 | 31.03 | 20.72 | 38.77 | 24.55 | 43.03 | 32.50 | 42.14 | 42.60 | 36.36 | 49.82 |
| 16 | 22.75 | 22.12 | 31.28 | 20.72 | 39.02 | 24.72 | 43.12 | 32.83 | 41.98 | 42.92 | 36.09 | 49.97 |
| 17 | 22.97 | 22.02 | 31.55 | 20.71 | 39.26 | 24.93 | 43.18 | 33.18 | 41.83 | 43.21 | 35.83 | 50.11 |
| 18 | 23.18 | 21.90 | 31.85 | 20.70 | 39.49 | 25.17 | 43.22 | 33.54 | 41.67 | 43.49 | 35.58 | 50.23 |
| 19 | 23.41 | 21.74 | 32.16 | 20.72 | 39.70 | 25.43 | 43.24 | 33.89 | 41.52 | 43.74 | 35.34 | 50.35 |
| 20 | 23.66 | 21.57 | 32.48 | 20.76 | 39.89 | 25.71 | 43.24 | 34.24 | 41.38 | 43.99 | 35.10 | 50.47 |
| 21 | 23.94 | 21.40 | 32.79 | 20.84 | 40.06 | 25.99 | 43.24 | 34.57 | 41.25 | 44.23 | 34.87 | 50.61 |
| 22 | 24.24 | 21.24 | 33.09 | 20.94 | 40.21 | 26.27 | 43.24 | 34.88 | 41.12 | 44.47 | 34.64 | 50.75 |
| 23 | 24.56 | 21.10 | 33.37 | 21.07 | 40.35 | 26.53 | 43.23 | 35.18 | 41.01 | 44.72 | 34.40 | 50.91 |
| 24 | 24.88 | 20.99 | 33.63 | 21.21 | 40.49 | 26.79 | 43.24 | 35.46 | 40.89 | 44.98 | 34.14 | 51.07 |
| 25 | 25.20 | 20.92 | 33.88 | 21.35 | 40.62 | 27.03 | 43.25 | 35.74 | 40.76 | 45.26 | 33.85 | 51.24 |
| 26 | 25.50 | 20.88 | 34.11 | 21.49 | 40.77 | 27.26 | 43.28 | 36.02 | 40.62 | 45.55 | 33.55 | 51.41 |
| 27 | 25.78 | 20.84 | 34.34 | 21.61 | 40.92 | 27.49 | 43.31 43.34 | 36.31 36.60 | 40.46 | 45.85 | 33.21 | 51.56 |
| 28 | 26.05 | 20.82 | 34.57 | 21.73 | 41.08 | 27.71 | 43.37 | 36.92 | 40.26 | 46.16 | 32.87 | 51.68 |
| 29 | 26.31 | 20.80 | 34.80 | 21.84 | 41.26 | 27.94 | 43.39 | 37.25 | 40.04 | 46.45 | 32.53 | 51.75 |
| 30 | 26.56 | 20.77 | 35.04 | 21.93 | 41.44 | 28.18 | 43.39 | 37.61 | 39.80 | 46.73 | 32.20 | 51.80 |
| 31 | 26.81 | 20.73 | 35.30 | 22.03 | 41.62 | 28.44 | 43.36 | 37.97 | 39.55 | 46.96 | 31.89 | 51.81 |
| 32 | 27.07 | 20.68 | 35.57 | 22.13 | | | 43.29 | 38.34 | | | 31.61 | 51.83 |
| | sec δ 13.57 | tan δ 13.53 | sec δ 13.57 | tan δ 13.53 | sec δ 13.57 | tan δ 13.53 | sec δ 13.58 | tan δ 13.54 | sec δ 13.58 | tan δ 13.55 | sec δ 13.59 | tan δ 13.55 |

Mean R.A. $2^{\text{h}} 23^{\text{m}} 20.61^{\text{s}}$

Double lower transit April 28

Mean Dec. $-85^{\circ} 46' 44.69''$

APPARENT PLACES OF STARS, 1986
CIRCUMPOLAR STARS AT UPPER TRANSIT AT GREENWICH

1658 12 G. Mensae α Mag. 6.76 Spect. A2

| Day | January | | February | | March | | April | | May | | June | |
|-----|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m 4 24 | ° ' " s 82 55 | h m 4 24 | ° ' " s 82 56 | h m 4 24 | ° ' " s 82 55 | h m 4 24 | ° ' " s 82 55 | h m 4 24 | ° ' " s 82 55 | h m 4 24 | ° ' " s 82 55 |
| 1 | 37.53 | 58.22 | 32.47 | 03.58 | 26.85 | 63.92 | 20.84 | 59.50 | 16.57 | 51.28 | 14.68 | 40.68 |
| 2 | 37.41 | 58.46 | 32.26 | 03.72 | 26.62 | 63.89 | 20.65 | 59.24 | 16.48 | 50.92 | 14.68 | 40.36 |
| 3 | 37.30 | 58.73 | 32.05 | 03.84 | 26.40 | 63.84 | 20.48 | 58.97 | 16.40 | 50.57 | 14.67 | 40.05 |
| 4 | 37.16 | 59.01 | 31.83 | 03.93 | 26.17 | 63.76 | 20.32 | 58.69 | 16.32 | 50.25 | 14.66 | 39.74 |
| 5 | 37.02 | 59.29 | 31.61 | 03.99 | 25.95 | 63.65 | 20.17 | 58.42 | 16.24 | 49.95 | 14.65 | 39.43 |
| 6 | 36.86 | 59.57 | 31.40 | 04.02 | 25.74 | 63.51 | 20.03 | 58.17 | 16.15 | 49.65 | 14.63 | 39.12 |
| 7 | 36.69 | 59.82 | 31.20 | 04.02 | 25.54 | 63.36 | 19.88 | 57.93 | 16.06 | 49.37 | 14.62 | 38.78 |
| 8 | 36.52 | 60.04 | 31.01 | 04.02 | 25.36 | 63.21 | 19.74 | 57.71 | 15.97 | 49.09 | 14.60 | 38.44 |
| 9 | 36.35 | 60.23 | 30.83 | 04.02 | 25.17 | 63.07 | 19.59 | 57.51 | 15.87 | 48.80 | 14.60 | 38.07 |
| 10 | 36.19 | 60.38 | 30.65 | 04.03 | 24.99 | 62.95 | 19.43 | 57.30 | 15.78 | 48.50 | 14.60 | 37.69 |
| 11 | 36.03 | 60.52 | 30.46 | 04.06 | 24.81 | 62.84 | 19.27 | 57.10 | 15.68 | 48.18 | 14.61 | 37.30 |
| 12 | 35.89 | 60.67 | 30.28 | 04.11 | 24.62 | 62.75 | 19.11 | 56.88 | 15.59 | 47.84 | 14.64 | 36.91 |
| 13 | 35.74 | 60.82 | 30.09 | 04.17 | 24.43 | 62.67 | 18.94 | 56.64 | 15.51 | 47.48 | 14.67 | 36.52 |
| 14 | 35.60 | 60.99 | 29.89 | 04.24 | 24.24 | 62.58 | 18.78 | 56.39 | 15.43 | 47.11 | 14.71 | 36.15 |
| 15 | 35.46 | 61.18 | 29.68 | 04.29 | 24.03 | 62.49 | 18.62 | 56.11 | 15.37 | 46.72 | 14.75 | 35.80 |
| 16 | 35.31 | 61.38 | 29.47 | 04.34 | 23.83 | 62.38 | 18.47 | 55.81 | 15.31 | 46.34 | 14.80 | 35.47 |
| 17 | 35.15 | 61.59 | 29.25 | 04.37 | 23.62 | 62.26 | 18.32 | 55.50 | 15.26 | 45.95 | 14.84 | 35.17 |
| 18 | 34.98 | 61.80 | 29.03 | 04.38 | 23.41 | 62.11 | 18.19 | 55.18 | 15.22 | 45.59 | 14.87 | 34.89 |
| 19 | 34.80 | 62.01 | 28.82 | 04.36 | 23.21 | 61.93 | 18.07 | 54.85 | 15.19 | 45.24 | 14.90 | 34.61 |
| 20 | 34.62 | 62.20 | 28.60 | 04.32 | 23.01 | 61.74 | 17.95 | 54.53 | 15.15 | 44.92 | 14.91 | 34.31 |
| 21 | 34.43 | 62.37 | 28.40 | 04.26 | 22.82 | 61.53 | 17.84 | 54.23 | 15.10 | 44.62 | 14.92 | 34.00 |
| 22 | 34.24 | 62.52 | 28.20 | 04.19 | 22.65 | 61.31 | 17.73 | 53.95 | 15.05 | 44.34 | 14.94 | 33.65 |
| 23 | 34.05 | 62.65 | 28.01 | 04.11 | 22.48 | 61.09 | 17.61 | 53.70 | 14.98 | 44.04 | 14.97 | 33.27 |
| 24 | 33.86 | 62.75 | 27.82 | 04.04 | 22.31 | 60.89 | 17.49 | 53.46 | 14.91 | 43.73 | 15.02 | 32.88 |
| 25 | 33.68 | 62.83 | 27.64 | 03.98 | 22.15 | 60.70 | 17.35 | 53.22 | 14.84 | 43.38 | 15.08 | 32.49 |
| 26 | 33.51 | 62.91 | 27.45 | 03.94 | 21.98 | 60.54 | 17.21 | 52.97 | 14.78 | 42.99 | 15.15 | 32.11 |
| 27 | 33.34 | 62.98 | 27.26 | 03.93 | 21.81 | 60.40 | 17.06 | 52.68 | 14.74 | 42.59 | 15.23 | 31.77 |
| 28 | 33.17 | 63.07 | 27.06 | 03.92 | 21.62 | 60.26 | 16.92 | 52.36 | 14.71 | 42.18 | 15.31 | 31.45 |
| 29 | 33.01 | 63.17 | 26.85 | 03.92 | 21.43 | 60.11 | 16.79 | 52.01 | 14.69 | 41.77 | 15.38 | 31.15 |
| 30 | 32.84 | 63.30 | | | 21.23 | 59.94 | 16.68 | 51.65 | 14.69 | 41.39 | 15.46 | 30.87 |
| 31 | 32.66 | 63.43 | | | 21.03 | 59.74 | 16.57 | 51.28 | 14.68 | 41.02 | 15.53 | 30.61 |
| 32 | 32.47 | 63.58 | | | 20.84 | 59.50 | | | 14.68 | 40.68 | | |
| | sec δ 8.13 | tan δ 8.07 | sec δ 8.13 | tan δ 8.07 | sec δ 8.13 | tan δ 8.07 | sec δ 8.13 | tan δ 8.07 | sec δ 8.12 | tan δ 8.06 | sec δ 8.12 | tan δ 8.06 |

Mean R.A. 4^h 24^m 22.06^s

Double lower transit May 28

Mean Dec. $-82^{\circ} 55' 47.31''$

APPARENT PLACES OF STARS, 1986
CIRCUMPOLAR STARS AT UPPER TRANSIT AT GREENWICH

433

1658 12 G. Mensae · Mag. 6.76 Spect. A2

| Day | July | | August | | September | | October | | November | | December | |
|-----|---------------|----------------|---------------|----------------|---------------|----------------|---------------|----------------|---------------|----------------|---------------|----------------|
| | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m 4 24 | ° ' s 82 55 | h m 4 24 | ° ' s 82 55 | h m 4 24 | ° ' s 82 55 | h m 4 24 | ° ' s 82 55 | h m 4 24 | ° ' s 82 55 | h m 4 24 | ° ' s 82 55 |
| 1 | 15.53 | 30.61 | 18.89 | 22.67 | 23.87 | 19.22 | 28.83 | 21.40 | 32.39 | 28.88 | 32.96 | 39.10 |
| 2 | 15.60 | 30.34 | 19.02 | 22.47 | 24.05 | 19.46 | 29.00 | 21.55 | 32.46 | 29.24 | 32.90 | 39.42 |
| 3 | 15.66 | 30.07 | 19.15 | 22.26 | 24.24 | 19.11 | 29.16 | 21.74 | 32.51 | 29.60 | 32.84 | 39.71 |
| 4 | 15.72 | 29.79 | 19.30 | 22.05 | 24.43 | 19.09 | 29.32 | 21.95 | 32.55 | 29.95 | 32.79 | 39.98 |
| 5 | 15.79 | 29.49 | 19.45 | 21.83 | 24.62 | 19.08 | 29.46 | 22.18 | 32.59 | 30.27 | 32.74 | 40.24 |
| 6 | 15.86 | 29.18 | 19.61 | 21.61 | 24.81 | 19.11 | 29.60 | 22.43 | 32.62 | 30.56 | 32.71 | 40.51 |
| 7 | 15.94 | 28.85 | 19.78 | 21.41 | 24.99 | 19.17 | 29.71 | 22.68 | 32.66 | 30.83 | 32.68 | 40.80 |
| 8 | 16.03 | 28.52 | 19.95 | 21.23 | 25.16 | 19.25 | 29.83 | 22.91 | 32.70 | 31.09 | 32.64 | 41.11 |
| 9 | 16.13 | 28.19 | 20.13 | 21.08 | 25.32 | 19.34 | 29.93 | 23.11 | 32.76 | 31.35 | 32.60 | 41.45 |
| 10 | 16.23 | 27.86 | 20.30 | 20.95 | 25.47 | 19.42 | 30.05 | 23.30 | 32.82 | 31.62 | 32.54 | 41.80 |
| 11 | 16.35 | 27.54 | 20.46 | 20.85 | 25.62 | 19.49 | 30.16 | 23.46 | 32.88 | 31.92 | 32.48 | 42.16 |
| 12 | 16.47 | 27.25 | 20.62 | 20.77 | 25.77 | 19.53 | 30.29 | 23.63 | 32.93 | 32.25 | 32.41 | 42.52 |
| 13 | 16.59 | 26.98 | 20.76 | 20.69 | 25.92 | 19.55 | 30.43 | 23.80 | 32.98 | 32.59 | 32.32 | 42.87 |
| 14 | 16.71 | 26.73 | 20.90 | 20.60 | 26.08 | 19.56 | 30.56 | 23.99 | 33.02 | 32.96 | 32.24 | 43.20 |
| 15 | 16.82 | 26.51 | 21.04 | 20.50 | 26.25 | 19.57 | 30.70 | 24.21 | 33.05 | 33.33 | 32.14 | 43.52 |
| 16 | 16.92 | 26.30 | 21.18 | 20.36 | 26.43 | 19.59 | 30.84 | 24.45 | 33.06 | 33.71 | 32.05 | 43.82 |
| 17 | 17.01 | 26.09 | 21.33 | 20.21 | 26.61 | 19.64 | 30.97 | 24.73 | 33.07 | 34.07 | 31.95 | 44.09 |
| 18 | 17.10 | 25.87 | 21.49 | 20.05 | 26.80 | 19.72 | 31.08 | 25.02 | 33.08 | 34.43 | 31.86 | 44.36 |
| 19 | 17.19 | 25.61 | 21.66 | 19.89 | 26.98 | 19.83 | 31.19 | 25.32 | 33.07 | 34.76 | 31.78 | 44.61 |
| 20 | 17.29 | 25.33 | 21.84 | 19.75 | 27.15 | 19.96 | 31.29 | 25.62 | 33.07 | 35.08 | 31.69 | 44.86 |
| 21 | 17.40 | 25.03 | 22.03 | 19.64 | 27.31 | 20.11 | 31.38 | 25.91 | 33.07 | 35.39 | 31.61 | 45.11 |
| 22 | 17.52 | 24.72 | 22.21 | 19.56 | 27.47 | 20.27 | 31.46 | 26.19 | 33.08 | 35.68 | 31.53 | 45.38 |
| 23 | 17.66 | 24.43 | 22.40 | 19.52 | 27.62 | 20.43 | 31.55 | 26.46 | 33.08 | 35.97 | 31.45 | 45.66 |
| 24 | 17.80 | 24.16 | 22.57 | 19.49 | 27.76 | 20.57 | 31.64 | 26.71 | 33.09 | 36.26 | 31.36 | 45.96 |
| 25 | 17.95 | 23.92 | 22.74 | 19.48 | 27.90 | 20.71 | 31.72 | 26.95 | 33.10 | 36.56 | 31.26 | 46.28 |
| 26 | 18.09 | 23.71 | 22.90 | 19.46 | 28.05 | 20.84 | 31.82 | 27.19 | 33.11 | 36.88 | 31.15 | 46.60 |
| 27 | 18.24 | 23.52 | 23.06 | 19.45 | 28.19 | 20.95 | 31.91 | 27.43 | 33.12 | 37.22 | 31.02 | 46.93 |
| 28 | 18.37 | 23.35 | 23.21 | 19.43 | 28.34 | 21.06 | 32.02 | 27.67 | 33.10 | 37.97 | 30.88 | 47.23 |
| 29 | 18.51 | 23.19 | 23.37 | 19.39 | 28.50 | 21.17 | 32.12 | 27.94 | 33.07 | 38.36 | 30.73 | 47.51 |
| 30 | 18.63 | 23.02 | 23.53 | 19.34 | 28.66 | 21.28 | 32.22 | 28.22 | 33.02 | 38.74 | 30.58 | 47.74 |
| 31 | 18.76 | 22.85 | 23.70 | 19.29 | 28.83 | 21.40 | 32.31 | 28.54 | 32.96 | 39.10 | 30.44 | 47.95 |
| 32 | 18.89 | 22.67 | 23.87 | 19.22 | | | 32.39 | 28.88 | | | 30.30 | 48.13 |
| | sec δ 8.12 | tan δ 8.06 | sec δ 8.12 | tan δ 8.05 | sec δ 8.12 | tan δ 8.05 | sec δ 8.12 | tan δ 8.06 | sec δ 8.12 | tan δ 8.06 | sec δ 8.12 | tan δ 8.06 |

Mean R.A. 4^h 24^m 22.^s06

Double lower transit May 28

Mean Dec. -82° 55' 47".31

APPARENT PLACES OF STARS, 1986
CIRCUMPOLAR STARS AT UPPER TRANSIT AT GREENWICH

917 ξ Mensae Mag. 5.85 Spect. K0

| Day | January | | February | | March | | April | | May | | June | |
|-----|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m 5 00 | ° ' " / 82 29 | h m 5 00 | ° ' " / 82 29 | h m 5 00 | ° ' " / 82 29 | h m 5 00 | ° ' " / 82 29 | h m 5 00 | ° ' " / 82 29 | h m 5 00 | ° ' " / 82 29 |
| | s 36.41 | " 29.85 | s 32.12 | " 36.71 | s 26.91 | " 38.73 | s 20.98 | " 36.16 | s 16.40 | " 29.32 | s 13.84 | " 19.46 |
| 1 | 36.32 | 30.12 | 31.94 | 36.91 | 26.70 | 38.78 | 20.79 | 35.96 | 16.28 | 28.99 | 13.82 | 19.15 |
| 2 | 36.23 | 30.42 | 31.75 | 37.10 | 26.49 | 38.80 | 20.62 | 35.74 | 16.18 | 28.68 | 13.79 | 18.84 |
| 3 | 36.13 | 30.74 | 31.55 | 37.26 | 26.28 | 38.79 | 20.45 | 35.52 | 16.08 | 28.38 | 13.75 | 18.55 |
| 4 | 36.02 | 31.07 | 31.36 | 37.38 | 26.06 | 38.74 | 20.29 | 35.30 | 15.98 | 28.11 | 13.72 | 18.25 |
| 5 | 35.89 | 31.39 | 31.16 | 37.47 | 25.86 | 38.67 | 20.13 | 35.09 | 15.88 | 27.84 | 13.68 | 17.94 |
| 6 | 35.76 | 31.69 | 30.98 | 37.54 | 25.66 | 38.58 | 19.98 | 34.90 | 15.78 | 27.59 | 13.64 | 17.62 |
| 7 | 35.61 | 31.97 | 30.80 | 37.59 | 25.47 | 38.49 | 19.82 | 34.72 | 15.67 | 27.34 | 13.60 | 17.28 |
| 8 | 35.47 | 32.20 | 30.63 | 37.65 | 25.29 | 38.40 | 19.67 | 34.56 | 15.56 | 27.08 | 13.57 | 16.93 |
| 9 | 35.33 | 32.41 | 30.46 | 37.72 | 25.12 | 38.34 | 19.51 | 34.41 | 15.44 | 26.81 | 13.55 | 16.56 |
| 10 | 35.20 | 32.60 | 30.29 | 37.80 | 24.94 | 38.28 | 19.34 | 34.25 | 15.33 | 26.53 | 13.53 | 16.17 |
| 11 | 35.08 | 32.79 | 30.12 | 37.91 | 24.76 | 38.25 | 19.17 | 34.08 | 15.22 | 26.22 | 13.52 | 15.78 |
| 12 | 34.96 | 32.98 | 29.95 | 38.02 | 24.57 | 38.22 | 19.00 | 33.90 | 15.12 | 25.90 | 13.53 | 15.39 |
| 13 | 34.84 | 33.20 | 29.77 | 38.14 | 24.38 | 38.19 | 18.83 | 33.70 | 15.02 | 25.55 | 13.54 | 15.01 |
| 14 | 34.72 | 33.43 | 29.58 | 38.26 | 24.19 | 38.16 | 18.66 | 33.47 | 14.93 | 25.19 | 13.55 | 14.65 |
| 15 | 34.59 | 33.67 | 29.39 | 38.37 | 23.98 | 38.12 | 18.50 | 33.23 | 14.85 | 24.83 | 13.57 | 14.32 |
| 16 | 34.46 | 33.93 | 29.19 | 38.47 | 23.78 | 38.06 | 18.34 | 32.96 | 14.78 | 24.47 | 13.58 | 14.01 |
| 17 | 34.32 | 34.19 | 28.99 | 38.54 | 23.58 | 37.97 | 18.19 | 32.68 | 14.71 | 24.12 | 13.59 | 13.72 |
| 18 | 34.17 | 34.44 | 28.78 | 38.59 | 23.38 | 37.86 | 18.05 | 32.40 | 14.65 | 23.79 | 13.59 | 13.44 |
| 19 | 34.01 | 34.69 | 28.58 | 38.62 | 23.18 | 37.73 | 17.92 | 32.12 | 14.59 | 23.49 | 13.59 | 13.15 |
| 20 | 33.85 | 34.92 | 28.39 | 38.62 | 22.99 | 37.58 | 17.80 | 31.85 | 14.53 | 23.21 | 13.57 | 12.84 |
| 21 | 33.68 | 35.13 | 28.19 | 38.61 | 22.81 | 37.41 | 17.67 | 31.61 | 14.45 | 22.94 | 13.57 | 12.49 |
| 22 | 33.52 | 35.31 | 28.01 | 38.58 | 22.63 | 37.25 | 17.54 | 31.39 | 14.37 | 22.67 | 13.57 | 12.11 |
| 23 | 33.35 | 35.47 | 27.83 | 38.57 | 22.46 | 37.09 | 17.41 | 31.20 | 14.28 | 22.38 | 13.58 | 11.72 |
| 24 | 33.19 | 35.61 | 27.66 | 38.56 | 22.30 | 36.96 | 17.26 | 31.00 | 14.19 | 22.06 | 13.61 | 11.32 |
| 25 | 33.04 | 35.74 | 27.48 | 38.58 | 22.13 | 36.85 | 17.11 | 30.79 | 14.11 | 21.70 | 13.65 | 10.94 |
| 26 | 32.89 | 35.86 | 27.30 | 38.62 | 21.96 | 36.76 | 16.95 | 30.55 | 14.04 | 21.32 | 13.69 | 10.57 |
| 27 | 32.74 | 36.00 | 27.11 | 38.68 | 21.77 | 36.68 | 16.80 | 30.28 | 13.98 | 20.93 | 13.74 | 10.24 |
| 28 | 32.59 | 36.15 | 26.91 | 38.73 | 21.58 | 36.59 | 16.65 | 29.98 | 13.94 | 20.54 | 13.80 | 09.92 |
| 29 | 32.44 | 36.32 | | | 21.38 | 36.48 | 16.52 | 29.65 | 13.90 | 20.16 | 13.84 | 09.63 |
| 30 | 32.28 | 36.51 | | | 21.18 | 36.34 | 16.40 | 29.32 | 13.87 | 19.80 | 13.89 | 09.34 |
| 31 | 32.12 | 36.71 | | | 20.98 | 36.16 | | | 13.84 | 19.46 | | |
| 32 | | | | | | | | | | | | |
| | sec δ 7.65 | tan δ 7.59 | sec δ 7.66 | tan δ 7.59 | sec δ 7.66 | tan δ 7.59 | sec δ 7.65 | tan δ 7.59 | sec δ 7.65 | tan δ 7.59 | sec δ 7.65 | tan δ 7.58 |

Mean R.A. $5^{\text{h}} 00^{\text{m}} 21.32^{\text{s}}$ Double lower transit June 6 Mean Dec. $-82^{\circ} 29' 24.12''$

APPARENT PLACES OF STARS, 1986
CIRCUMPOLAR STARS AT UPPER TRANSIT AT GREENWICH

435

917 ξ Mensae Mag. 5.85 Spect. K0

| Day | July | | August | | September | | October | | November | | December | |
|-----|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|----------------|----------------|
| | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " |
| | 5 00 | 82 29 | 5 00 | 82 28 | 5 00 | 82 28 | 5 00 | 82 28 | 5 00 | 82 29 | 5 00 | 82 29 |
| | s | " | s | " | s | " | s | " | s | " | s | " |
| 1 | 13.89 | 09.34 | 16.44 | 60.62 | 20.85 | 55.85 | 25.66 | 56.64 | 29.57 | 03.08 | 30.93 | 12.76 |
| 2 | 13.93 | 09.06 | 16.55 | 60.39 | 21.01 | 55.74 | 25.82 | 56.74 | 29.66 | 03.42 | 30.90 | 13.13 |
| 3 | 13.97 | 08.78 | 16.66 | 60.15 | 21.18 | 55.64 | 25.99 | 56.87 | 29.74 | 03.76 | 30.87 | 13.48 |
| 4 | 14.01 | 08.48 | 16.78 | 59.89 | 21.36 | 55.56 | 26.15 | 57.04 | 29.80 | 04.10 | 30.84 | 13.79 |
| 5 | 14.05 | 08.18 | 16.91 | 59.64 | 21.54 | 55.50 | 26.31 | 57.23 | 29.86 | 04.42 | 30.81 | 14.07 |
| 6 | 14.10 | 07.85 | 17.04 | 59.38 | 21.72 | 55.48 | 26.45 | 57.44 | 29.91 | 04.70 | 30.79 30.78 | 14.35 14.63 |
| 7 | 14.15 | 07.51 | 17.18 | 59.13 | 21.89 | 55.48 | 26.58 | 57.65 | 29.97 | 04.96 | 30.77 | 14.93 |
| 8 | 14.20 | 07.16 | 17.33 | 58.91 | 22.06 | 55.51 | 26.70 | 57.85 | 30.04 | 05.21 | 30.76 | 15.25 |
| 9 | 14.27 | 06.81 | 17.48 | 58.71 | 22.21 | 55.56 | 26.82 | 58.03 | 30.11 | 05.45 | 30.75 | 15.60 |
| 10 | 14.35 | 06.45 | 17.63 | 58.53 | 22.36 | 55.60 | 26.94 | 58.18 | 30.18 | 05.71 | 30.73 | 15.96 |
| 11 | 14.43 | 06.11 | 17.78 | 58.39 | 22.50 | 55.62 | 27.07 | 58.32 | 30.26 | 05.99 | 30.70 | 16.34 |
| 12 | 14.52 | 05.78 | 17.92 | 58.27 | 22.65 | 55.63 | 27.20 | 58.45 | 30.34 | 06.30 | 30.66 | 16.72 |
| 13 | 14.61 | 05.48 | 18.05 | 58.15 | 22.79 | 55.61 | 27.34 | 58.58 | 30.41 | 06.63 | 30.61 | 17.09 |
| 14 | 14.70 | 05.21 | 18.17 | 58.02 | 22.94 | 55.57 | 27.48 | 58.73 | 30.48 | 06.98 | 30.55 | 17.46 |
| 15 | 14.79 | 04.96 | 18.29 | 57.88 | 23.10 | 55.53 | 27.63 | 58.91 | 30.53 | 07.34 | 30.49 | 17.80 |
| 16 | 14.87 | 04.73 | 18.41 | 57.72 | 23.27 | 55.51 | 27.77 | 59.11 | 30.58 | 07.71 | 30.43 | 18.12 |
| 17 | 14.94 | 04.50 | 18.54 | 57.53 | 23.45 | 55.50 | 27.91 | 59.35 | 30.61 | 08.07 | 30.36 | 18.43 |
| 18 | 15.01 | 04.25 | 18.68 | 57.32 | 23.63 | 55.53 | 28.04 | 59.60 | 30.64 | 08.43 | 30.30 | 18.72 |
| 19 | 15.07 | 03.98 | 18.83 | 57.12 | 23.80 | 55.59 | 28.17 | 59.87 | 30.67 | 08.76 | 30.24 | 19.00 |
| 20 | 15.14 | 03.68 | 18.99 | 56.93 | 23.97 | 55.67 | 28.28 | 60.14 | 30.69 | 09.08 | 30.18 | 19.27 |
| 21 | 15.22 | 03.35 | 19.16 | 56.77 | 24.14 | 55.77 | 28.39 | 60.41 | 30.72 | 09.39 | 30.13 | 19.55 |
| 22 | 15.32 | 03.02 | 19.32 | 56.64 | 24.29 | 55.89 | 28.49 | 60.66 | 30.74 | 09.68 | 30.07 | 19.84 |
| 23 | 15.42 | 02.69 | 19.49 | 56.54 | 24.45 | 56.00 | 28.59 | 60.91 | 30.77 | 09.97 | 30.02 | 20.15 |
| 24 | 15.54 | 02.39 | 19.65 | 56.47 | 24.59 | 56.11 | 28.69 | 61.14 | 30.80 | 10.26 | 29.95 | 20.47 |
| 25 | 15.66 | 02.11 | 19.81 | 56.41 | 24.74 | 56.21 | 28.80 | 61.35 | 30.84 | 10.56 | 29.89 | 20.82 |
| 26 | 15.78 | 01.86 | 19.96 | 56.35 | 24.88 | 56.29 | 28.90 | 61.56 | 30.87 | 10.87 | 29.80 | 21.18 |
| 27 | 15.90 | 01.64 | 20.10 | 56.29 | 25.03 | 56.37 | 29.01 | 61.77 | 30.90 | 11.21 | 29.71 | 21.54 |
| 28 | 16.01 | 01.43 | 20.25 | 56.23 | 25.18 | 56.43 | 29.12 | 61.99 | 30.93 | 11.57 | 29.60 | 21.89 |
| 29 | 16.12 | 01.23 | 20.39 | 56.15 | 25.33 | 56.50 | 29.24 | 62.22 | 30.94 | 11.96 | 29.49 | 22.21 |
| 30 | 16.23 | 01.03 | 20.54 | 56.06 | 25.49 | 56.56 | 29.35 | 62.48 | 30.94 | 12.36 | 29.37 | 22.49 |
| 31 | 16.34 | 00.83 | 20.69 | 55.96 | 25.66 | 56.64 | 29.47 | 62.77 | 30.93 | 12.76 | 29.25 | 22.74 |
| 32 | 16.44 | 00.62 | 20.85 | 55.85 | | | 29.57 | 63.08 | | | 29.14 | 22.96 |
| | sec δ | tan δ | sec δ | tan δ | sec δ | tan δ | sec δ | tan δ | sec δ | tan δ | sec δ | tan δ |
| | 7.65 | 7.58 | 7.64 | 7.58 | 7.64 | 7.58 | 7.64 | 7.58 | 7.65 | 7.58 | 7.65 | 7.58 |

Mean R.A. $5^{\text{h}} 00^{\text{m}} 21^{\text{s}}.32$

Double lower transit June 6

Mean Dec. $-82^{\circ} 29' 24''.12$

APPARENT PLACES OF STARS, 1986
CIRCUMPOLAR STARS AT UPPER TRANSIT AT GREENWICH

1659 31 G. Mensae γ Mag. 6.24 Spect. A0

| Day | January | | February | | March | | April | | May | | June | |
|-----|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m 5 33 | ° ' " s 84 47 | h m 5 32 | ° ' " s 84 47 | h m 5 32 | ° ' " s 84 47 | h m 5 32 | ° ' " s 84 47 | h m 5 32 | ° ' " s 84 47 | h m 5 32 | ° ' " s 84 47 |
| 1 | 11.99 | 41.39 | 66.40 | 49.34 | 59.06 | 52.77 | 50.23 | 51.90 | 42.89 | 46.49 | 38.13 | 37.61 |
| 2 | 11.90 | 41.69 | 66.16 | 49.59 | 58.76 | 52.87 | 49.93 | 51.75 | 42.69 | 46.20 | 38.06 | 37.31 |
| 3 | 11.80 | 42.01 | 65.90 | 49.83 | 58.45 | 52.95 | 49.65 | 51.59 | 42.51 | 45.93 | 37.98 | 37.02 |
| 4 | 11.68 | 42.35 | 65.63 | 50.04 | 58.13 | 53.00 | 49.38 | 51.41 | 42.33 | 45.66 | 37.90 | 36.74 |
| 5 | 11.55 | 42.70 | 65.35 | 50.21 | 57.82 | 53.02 | 49.13 | 51.24 | 42.16 | 45.42 | 37.82 | 36.46 |
| 6 | 11.39 | 43.05 | 65.08 | 50.36 | 57.51 | 53.00 | 48.88 | 51.08 | 41.99 | 45.19 | 37.73 | 36.18 |
| 7 | 11.22 | 43.39 | 64.81 | 50.48 | 57.22 | 52.97 | 48.65 | 50.94 | 41.82 | 44.97 | 37.64 | 35.88 |
| 8 | 11.03 | 43.70 | 64.56 | 50.58 | 56.94 | 52.93 | 48.41 | 50.81 | 41.64 | 44.76 | 37.55 | 35.56 |
| 9 | 10.84 | 43.98 | 64.31 | 50.68 | 56.67 | 52.90 | 48.17 | 50.69 | 41.45 | 44.54 | 37.46 | 35.23 |
| 10 | 10.66 | 44.22 | 64.08 | 50.80 | 56.41 | 52.88 | 47.92 | 50.58 | 41.26 | 44.31 | 37.38 | 34.87 |
| 11 | 10.48 | 44.45 | 63.85 | 50.92 | 56.15 | 52.88 | 47.67 | 50.48 | 41.06 | 44.06 | 37.31 | 34.51 |
| 12 | 10.32 | 44.67 | 63.62 | 51.07 | 55.89 | 52.89 | 47.41 | 50.36 | 40.87 | 43.80 | 37.25 | 34.13 |
| 13 | 10.16 | 44.89 | 63.38 | 51.23 | 55.62 | 52.91 | 47.14 | 50.23 | 40.68 | 43.51 | 37.21 | 33.75 |
| 14 | 10.01 | 45.13 | 63.13 | 51.40 | 55.35 | 52.94 | 46.87 | 50.08 | 40.50 | 43.20 | 37.19 | 33.38 |
| 15 | 09.86 | 45.39 | 62.87 | 51.57 | 55.06 | 52.96 | 46.60 | 49.91 | 40.33 | 42.88 | 37.17 | 33.02 |
| 16 | 09.70 | 45.67 | 62.60 | 51.73 | 54.76 | 52.98 | 46.34 | 49.71 | 40.17 | 42.55 | 37.16 | 32.69 |
| 17 | 09.53 | 45.96 | 62.32 | 51.88 | 54.46 | 52.97 | 46.08 | 49.50 | 40.03 | 42.22 | 37.15 | 32.39 |
| 18 | 09.35 | 46.25 | 62.03 | 52.01 | 54.16 | 52.95 | 45.84 | 49.27 | 39.90 | 41.89 | 37.13 | 32.11 |
| 19 | 09.16 | 46.54 | 61.74 | 52.12 | 53.86 | 52.89 | 45.61 | 49.03 | 39.78 | 41.59 | 37.10 | 31.84 |
| 20 | 08.96 | 46.83 | 61.45 | 52.20 | 53.56 | 52.82 | 45.39 | 48.79 | 39.66 | 41.31 | 37.05 | 31.56 |
| 21 | 08.74 | 47.10 | 61.17 | 52.26 | 53.26 | 52.72 | 45.18 | 48.56 | 39.54 | 41.05 | 37.00 | 31.26 |
| 22 | 08.52 | 47.35 | 60.89 | 52.30 | 52.98 | 52.62 | 44.98 | 48.36 | 39.41 | 40.81 | 36.94 | 30.93 |
| 23 | 08.29 | 47.58 | 60.62 | 52.33 | 52.72 | 52.50 | 44.77 | 48.19 | 39.26 | 40.58 | 36.90 | 30.57 |
| 24 | 08.07 | 47.78 | 60.36 | 52.36 | 52.46 | 52.39 | 44.56 | 48.03 | 39.09 | 40.32 | 36.87 | 30.18 |
| 25 | 07.84 | 47.96 | 60.11 | 52.40 | 52.21 | 52.31 | 44.33 | 47.88 | 38.93 | 40.04 | 36.86 | 29.78 |
| 26 | 07.63 | 48.13 | 59.86 | 52.47 | 51.96 | 52.24 | 44.08 | 47.72 | 38.76 | 39.72 | 36.88 | 29.40 |
| 27 | 07.42 | 48.30 | 59.61 | 52.55 | 51.70 | 52.20 | 43.83 | 47.54 | 38.62 | 39.37 | 36.90 | 29.03 |
| 28 | 07.22 | 48.47 | 59.34 | 52.66 | 51.43 | 52.17 | 43.57 | 47.32 | 38.49 | 39.00 | 36.94 | 28.69 |
| 29 | 07.03 | 48.66 | 59.06 | 52.77 | 51.14 | 52.14 | 43.33 | 47.06 | 38.38 | 38.63 | 36.98 | 28.37 |
| 30 | 06.83 | 48.87 | | | 50.84 | 52.09 | 43.10 | 46.78 | 38.29 | 38.27 | 37.02 | 28.07 |
| 31 | 06.62 | 49.10 | | | 50.53 | 52.01 | 42.89 | 46.49 | 38.21 | 37.93 | 37.05 | 27.78 |
| 32 | 06.40 | 49.34 | | | 50.23 | 51.90 | | | 38.13 | 37.61 | | |
| | sec δ 11.03 | tan δ 10.98 | sec δ 11.03 | tan δ 10.98 | sec δ 11.03 | tan δ 10.98 | sec δ 11.03 | tan δ 10.98 | sec δ 11.02 | tan δ 10.98 | sec δ 11.02 | tan δ 10.97 |

Mean R.A. $5^{\text{h}} 32^{\text{m}} 48.96^{\text{s}}$

Double lower transit June 15

Mean Dec. $-84^{\circ} 47' 40.5''$

APPARENT PLACES OF STARS, 1986
CIRCUMPOLAR STARS AT UPPER TRANSIT AT GREENWICH

1659 31 G. Mensae · Mag. 6.24 Spect. A0

| Day | July | | August | | September | | October | | November | | December | |
|-----|----------------------------|-----------------------------|----------------------------|-----------------------------|----------------------------|-----------------------------|----------------------------|-----------------------------|----------------------------|-----------------------------|-------------------------------|-------------------------------|
| | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | <small>h m</small> 5 32 | <small>° /</small> 84 47 | <small>h m</small> 5 32 | <small>° /</small> 84 47 | <small>h m</small> 5 32 | <small>° /</small> 84 47 | <small>h m</small> 5 32 | <small>° /</small> 84 47 | <small>h m</small> 5 32 | <small>° /</small> 84 47 | <small>h m</small> 5 32 | <small>° /</small> 84 47 |
| | <small>s</small> 37.05 | <small>"</small> 27.78 | <small>s</small> 39.69 | <small>"</small> 18.65 | <small>s</small> 45.38 | <small>"</small> 12.88 | <small>s</small> 52.24 | <small>"</small> 12.42 | <small>s</small> 58.38 | <small>"</small> 17.74 | <small>s</small> 61.14 | <small>"</small> 26.94 |
| 1 | 37.08 | 27.50 | 39.81 | 18.40 | 45.60 | 12.73 | 52.49 | 12.47 | 58.54 | 18.05 | 61.13 | 27.32 |
| 2 | 37.11 | 27.22 | 39.94 | 18.14 | 45.84 | 12.59 | 52.75 | 12.56 | 58.68 | 18.37 | 61.11 | 27.67 |
| 3 | 37.13 | 26.92 | 40.08 | 17.86 | 46.08 | 12.46 | 52.99 | 12.68 | 58.80 | 18.69 | 61.09 | 27.99 |
| 4 | 37.15 | 26.61 | 40.23 | 17.58 | 46.33 | 12.36 | 53.23 | 12.82 | 58.90 | 18.99 | 61.07 | 28.28 |
| 5 | 37.17 | 26.29 | 40.39 | 17.29 | 46.58 | 12.29 | 53.45 | 12.99 | 59.00 | 19.25 | 61.06 | 28.56 |
| 6 | 37.20 | 25.95 | 40.57 | 17.02 | 46.83 | 12.25 | 53.66 | 13.17 | 59.10 | 19.50 | 61.07 | 28.84 |
| 7 | 37.24 | 25.59 | 40.75 | 16.76 | 47.07 | 12.23 | 53.84 | 13.34 | 59.21 | 19.72 | 61.08 | 29.14 |
| 8 | 37.30 | 25.23 | 40.95 | 16.52 | 47.30 | 12.23 | 54.02 | 13.48 | 59.33 | 19.95 | 61.10 | 29.46 |
| 9 | 37.36 | 24.86 | 41.15 | 16.31 | 47.51 | 12.24 | 54.20 | 13.61 | 59.46 | 20.18 | 61.11 | 29.80 |
| 10 | 37.45 | 24.51 | 41.34 | 16.14 | 47.71 | 12.23 | 54.39 | 13.71 | 59.60 | 20.44 | 61.11 | 30.17 |
| 11 | 37.54 | 24.17 | 41.52 | 15.98 | 47.90 | 12.20 | 54.58 | 13.80 | 59.74 | 20.72 | 61.10 | 30.55 |
| 12 | 37.64 | 23.85 | 41.69 | 15.83 | 48.10 | 12.14 | 54.79 | 13.89 | 59.88 | 21.02 | 61.08 | 30.93 |
| 13 | 37.74 | 23.56 | 41.85 | 15.68 | 48.31 | 12.07 | 55.01 | 14.00 | 60.00 | 21.35 | <small>61.04</small> 60.99 | <small>31.31</small> 31.69 |
| 14 | 37.84 | 23.30 | 42.00 | 15.51 | 48.53 | 11.99 | 55.24 | 14.14 | 60.11 | 21.70 | 60.93 | 32.05 |
| 15 | 37.93 | 23.05 | 42.15 | 15.32 | 48.77 | 11.92 | 55.47 | 14.30 | 60.21 | 22.05 | 60.86 | 32.39 |
| 16 | 38.00 | 22.81 | 42.31 | 15.11 | 49.02 | 11.87 | 55.69 | 14.50 | 60.29 | 22.40 | 60.79 | 32.71 |
| 17 | 38.06 | 22.55 | 42.48 | 14.87 | 49.27 | 11.85 | 55.90 | 14.71 | 60.36 | 22.74 | 60.72 | 33.01 |
| 18 | 38.12 | 22.28 | 42.67 | 14.63 | 49.53 | 11.86 | 56.10 | 14.94 | 60.43 | 23.07 | 60.66 | 33.30 |
| 19 | 38.18 | 21.97 | 42.88 | 14.41 | 49.78 | 11.90 | 56.29 | 15.18 | 60.49 | 23.38 | 60.60 | 33.59 |
| 20 | 38.26 | 21.63 | 43.10 | 14.21 | 50.03 | 11.95 | 56.46 | 15.41 | 60.55 | 23.67 | 60.54 | 33.88 |
| 21 | 38.35 | 21.28 | 43.32 | 14.04 | 50.26 | 12.02 | 56.63 | 15.64 | 60.61 | 23.96 | 60.49 | 34.18 |
| 22 | 38.46 | 20.94 | 43.55 | 13.90 | 50.48 | 12.10 | 56.79 | 15.86 | 60.67 | 24.23 | 60.44 | 34.49 |
| 23 | 38.59 | 20.61 | 43.77 | 13.78 | 50.70 | 12.17 | 56.95 | 16.06 | 60.74 | 24.51 | 60.38 | 34.83 |
| 24 | 38.73 | 20.31 | 43.98 | 13.68 | 50.91 | 12.23 | 57.12 | 16.25 | 60.82 | 24.80 | 60.31 | 35.19 |
| 25 | 38.88 | 20.03 | 44.19 | 13.59 | 51.12 | 12.28 | 57.28 | 16.43 | 60.89 | 25.10 | 60.23 | 35.57 |
| 26 | 39.03 | 19.78 | 44.39 | 13.50 | 51.33 | 12.32 | 57.46 | 16.60 | 60.97 | 25.42 | 60.13 | 35.95 |
| 27 | 39.17 | 19.55 | 44.59 | 13.40 | 51.54 | 12.34 | 57.64 | 16.79 | 61.04 | 25.77 | 60.00 | 36.32 |
| 28 | 39.31 | 19.33 | 44.78 | 13.28 | 51.77 | 12.36 | 57.82 | 16.99 | 61.09 | 26.15 | 59.86 | 36.67 |
| 29 | 39.44 | 19.11 | 44.98 | 13.16 | 52.00 | 12.39 | 58.01 | 17.21 | 61.13 | 26.54 | 59.70 | 36.99 |
| 30 | 39.56 | 18.88 | 45.18 | 13.02 | 52.24 | 12.42 | 58.20 | 17.46 | 61.14 | 26.94 | 59.55 | 37.27 |
| 31 | 39.69 | 18.65 | 45.38 | 12.88 | | | 58.38 | 17.74 | | | 59.41 | 37.52 |
| 32 | | | | | | | | | | | | |
| | sec δ | tan δ | sec δ | tan δ | sec δ | tan δ | sec δ | tan δ | sec δ | tan δ | sec δ | tan δ |
| | 11.01 | 10.97 | 11.01 | 10.96 | 11.01 | 10.96 | 11.01 | 10.96 | 11.01 | 10.97 | 11.02 | 10.97 |

Mean R.A. $5^{\text{h}} 32^{\text{m}} 48.96^{\text{s}}$

Double lower transit June 15

Mean Dec. $-84^{\circ} 47' 40.50''$

APPARENT PLACES OF STARS, 1986
CIRCUMPOLAR STARS AT UPPER TRANSIT AT GREENWICH

1660 6 G. Octantis \searrow Mag. 6.74 Spect. K0

| Day | January | | February | | March | | April | | May | | June | |
|-----|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m 5 43 | ° ' " / 85 55 | h m 5 43 | ° ' " / 85 55 | h m 5 43 | ° ' " / 85 55 | h m 5 43 | ° ' " / 85 55 | h m 5 43 | ° ' " / 85 55 | h m 5 43 | ° ' " / 85 55 |
| 1 | ^s 60.25 | " 12.50 | ^s 53.37 | " 20.76 | ^s 44.09 | " 24.63 | ^s 32.73 | " 24.33 | ^s 23.08 | " 19.44 | ^s 16.57 | " 10.95 |
| 2 | 60.14 | 12.80 | 53.07 | 21.02 | 43.71 | 24.75 | 32.34 | 24.21 | 22.82 | 19.17 | 16.46 | 10.65 |
| 3 | 60.02 | 13.12 | 52.75 | 21.27 | 43.32 | 24.85 | 31.97 | 24.06 | 22.57 | 18.90 | 16.35 | 10.37 |
| 4 | 59.89 | 13.47 | 52.41 | 21.50 | 42.91 | 24.92 | 31.62 | 23.91 | 22.34 | 18.65 | 16.24 | 10.10 |
| 5 | 59.73 | 13.83 | 52.05 | 21.69 | 42.51 | 24.96 | 31.29 | 23.75 | 22.11 | 18.42 | 16.11 | 09.83 |
| 6 | 59.54 | 14.19 | 51.71 | 21.85 | 42.11 | 24.96 | 30.98 | 23.61 | 21.88 | 18.21 | 15.98 | 09.55 |
| 7 | 59.33 | 14.54 | 51.37 | 21.99 | 41.74 | 24.95 | 30.67 | 23.48 | 21.65 | 18.00 | 15.85 | 09.26 |
| 8 | 59.10 | 14.86 | 51.04 | 22.11 | 41.37 | 24.93 | 30.36 | 23.36 | 21.41 | 17.80 | 15.71 | 08.96 |
| 9 | 58.86 | 15.14 | 50.74 | 22.22 | 41.03 | 24.91 | 30.05 | 23.26 | 21.16 | 17.60 | 15.58 | 08.63 |
| 10 | 58.63 | 15.40 | 50.44 | 22.35 | 40.70 | 24.91 | 29.73 | 23.17 | 20.90 | 17.38 | 15.46 | 08.29 |
| 11 | 58.41 | 15.63 | 50.15 | 22.49 | 40.37 | 24.92 | 29.40 | 23.08 | 20.64 | 17.15 | 15.36 | 07.92 |
| 12 | 58.21 | 15.86 | 49.86 | 22.65 | 40.03 | 24.95 | 29.06 | 22.98 | 20.38 | 16.90 | 15.27 | 07.55 |
| 13 | 58.02 | 16.10 | 49.56 | 22.83 | 39.69 | 24.99 | 28.71 | 22.87 | 20.12 | 16.63 | 15.20 | 07.18 |
| 14 | 57.83 | 16.35 | 49.25 | 23.01 | 39.34 | 25.04 | 28.36 | 22.74 | 19.87 | 16.33 | 15.15 | 06.81 |
| 15 | 57.65 | 16.61 | 48.93 | 23.20 | 38.98 | 25.08 | 28.01 | 22.59 | 19.64 | 16.02 | 15.11 | 06.46 |
| 16 | 57.46 | 16.90 | 48.59 | 23.37 | 38.60 | 25.11 | 27.66 | 22.41 | 19.42 | 15.71 | 15.08 | 06.14 |
| 17 | 57.26 | 17.19 | 48.24 | 23.54 | 38.21 | 25.13 | 27.32 | 22.22 | 19.23 | 15.38 | 15.05 | 05.84 |
| 18 | 57.04 | 17.50 | 47.87 | 23.69 | 37.82 | 25.12 | 27.00 | 22.00 | 19.05 | 15.07 | 15.01 | 05.56 |
| 19 | 56.81 | 17.80 | 47.50 | 23.81 | 37.43 | 25.09 | 26.69 | 21.78 | 18.88 | 14.78 | 14.96 | 05.29 |
| 20 | 56.55 | 18.10 | 47.13 | 23.91 | 37.04 | 25.03 | 26.40 | 21.55 | 18.72 | 14.51 | 14.88 | 05.02 |
| 21 | 56.29 | 18.38 | 46.76 | 23.99 | 36.66 | 24.96 | 26.13 | 21.34 | 18.55 | 14.26 | 14.79 | 04.73 |
| 22 | 56.01 | 18.65 | 46.41 | 24.04 | 36.30 | 24.87 | 25.86 | 21.16 | 18.36 | 14.04 | 14.70 | 04.41 |
| 23 | 55.73 | 18.89 | 46.06 | 24.09 | 35.95 | 24.77 | 25.59 | 21.00 | 18.16 | 13.81 | 14.62 | 04.05 |
| 24 | 55.44 | 19.10 | 45.74 | 24.14 | 35.62 | 24.68 | 25.31 | 20.86 | 17.94 | 13.57 | 14.57 | 03.67 |
| 25 | 55.16 | 19.30 | 45.42 | 24.20 | 35.29 | 24.61 | 25.00 | 20.72 | 17.70 | 13.30 | 14.54 | 03.28 |
| 26 | 54.89 | 19.48 | 45.10 | 24.28 | 34.97 | 24.56 | 24.68 | 20.58 | 17.48 | 12.99 | 14.54 | 02.90 |
| 27 | 54.63 | 19.66 | 44.78 | 24.38 | 34.64 | 24.54 | 24.35 | 20.42 | 17.27 | 12.65 | 14.56 | 02.53 |
| 28 | 54.39 | 19.84 | 44.45 | 24.50 | 34.29 | 24.53 | 24.01 | 20.21 | 17.09 | 12.30 | 14.59 | 02.19 |
| 29 | 54.14 | 20.04 | 44.09 | 24.63 | 33.92 | 24.52 | 23.68 | 19.98 | 16.93 | 11.94 | 14.62 | 01.87 |
| 30 | 53.90 | 20.26 | | | 33.53 | 24.49 | 23.37 | 19.72 | 16.80 | 11.59 | 14.66 | 01.57 |
| 31 | 53.64 | 20.50 | | | 33.13 | 24.43 | 23.08 | 19.44 | 16.68 | 11.26 | 14.69 | 01.29 |
| 32 | 53.37 | 20.76 | | | 32.73 | 24.33 | | | 16.57 | 10.95 | | |
| | sec δ 14.06 | tan δ 14.02 | sec δ 14.07 | tan δ 14.03 | sec δ 14.07 | tan δ 14.03 | sec δ 14.06 | tan δ 14.03 | sec δ 14.06 | tan δ 14.02 | sec δ 14.05 | tan δ 14.01 |

Mean R.A. $5^{\text{h}} 43^{\text{m}} 30^{\text{s}}.28$

Double lower transit June 17

Mean Dec. $-85^{\circ} 55' 13''.25$

APPARENT PLACES OF STARS, 1986
CIRCUMPOLAR STARS AT UPPER TRANSIT AT GREENWICH

439

1660 6 G. Octantis Mag. 6.74 Spect. K0

| Day | July | | August | | September | | October | | November | | December | |
|-----|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m 5 43 | ° ' / 85 54 | h m 5 43 | ° ' / 85 54 | h m 5 43 | ° ' / 85 54 | h m 5 43 | ° ' / 85 54 | h m 5 43 | ° ' / 85 54 | h m 5 43 | ° ' / 85 54 |
| | s | " | s | " | s | " | s | " | s | " | s | " |
| 1 | 14.69 | 61.29 | 17.56 | 52.08 | 24.50 | 46.02 | 33.16 | 45.16 | 41.13 | 50.08 | 44.96 | 59.06 |
| 2 | 14.71 | 61.00 | 17.71 | 51.83 | 24.77 | 45.86 | 33.48 | 45.19 | 41.35 | 50.37 | 44.96 | 59.44 |
| 3 | 14.72 | 60.72 | 17.86 | 51.56 | 25.06 | 45.70 | 33.80 | 45.26 | 41.54 | 50.69 | 44.94 | 59.79 |
| 4 | 14.73 | 60.43 | 18.02 | 51.28 | 25.36 | 45.56 | 34.13 | 45.37 | 41.70 | 50.99 | 44.92 | 60.11 |
| 5 | 14.74 | 60.12 | 18.19 | 50.99 | 25.68 | 45.45 | 34.43 | 45.50 | 41.84 | 51.28 | 44.90 | 60.40 |
| 6 | 14.76 | 59.80 | 18.38 | 50.70 | 26.00 | 45.36 | 34.72 | 45.65 | 41.97 | 51.55 | 44.90 | 60.68 |
| 7 | 14.78 | 59.46 | 18.59 | 50.41 | 26.31 | 45.30 | 34.99 | 45.82 | 42.11 | 51.78 | 44.92 | 60.96 |
| 8 | 14.81 | 59.11 | 18.82 | 50.14 | 26.62 | 45.28 | 35.23 | 45.97 | 42.25 | 52.00 | 44.95 | 61.25 |
| 9 | 14.86 | 58.74 | 19.06 | 49.89 | 26.90 | 45.26 | 35.46 | 46.11 | 42.41 | 52.22 | 44.98 | 61.57 |
| 10 | 14.93 | 58.38 | 19.30 | 49.68 | 27.17 | 45.26 | 35.69 | 46.22 | 42.59 | 52.44 | 45.01 | 61.91 |
| 11 | 15.01 | 58.02 | 19.54 | 49.49 | 27.41 | 45.23 | 35.92 | 46.31 | 42.78 | 52.68 | 45.02 | 62.27 |
| 12 | 15.12 | 57.67 | 19.76 | 49.32 | 27.66 | 45.19 | 36.17 | 46.39 | 42.96 | 52.95 | 45.02 | 62.65 |
| 13 | 15.23 | 57.36 | 19.97 | 49.17 | 27.90 | 45.13 | 36.44 | 46.47 | 43.15 | 53.25 | 45.01 | 63.04 |
| 14 | 15.35 | 57.06 | 20.17 | 49.01 | 28.16 | 45.05 | 36.72 | 46.57 | 43.32 | 53.57 | 44.97 | 63.42 |
| 15 | 15.46 | 56.80 | 20.35 | 48.84 | 28.44 | 44.96 | 37.02 | 46.69 | 43.47 | 53.91 | 44.92 | 63.80 |
| 16 | 15.56 | 56.55 | 20.52 | 48.64 | 28.73 | 44.87 | 37.31 | 46.83 | 43.61 | 54.25 | 44.85 | 64.16 |
| 17 | 15.64 | 56.30 | 20.71 | 48.41 | 29.05 | 44.81 | 37.60 | 47.01 | 43.73 | 54.59 | 44.77 44.69 | 64.50 64.82 |
| 18 | 15.70 | 56.05 | 20.91 | 48.17 | 29.38 | 44.77 | 37.88 | 47.21 | 43.83 | 54.93 | 44.61 | 65.13 |
| 19 | 15.76 | 55.77 | 21.14 | 47.92 | 29.70 | 44.76 | 38.15 | 47.43 | 43.92 | 55.25 | 44.54 | 65.42 |
| 20 | 15.82 | 55.46 | 21.39 | 47.69 | 30.03 | 44.78 | 38.39 | 47.66 | 44.00 | 55.56 | 44.47 | 65.71 |
| 21 | 15.89 | 55.12 | 21.66 | 47.48 | 30.34 | 44.83 | 38.62 | 47.88 | 44.09 | 55.85 | 44.41 | 66.00 |
| 22 | 15.99 | 54.77 | 21.95 | 47.29 | 30.64 | 44.88 | 38.84 | 48.09 | 44.17 | 56.13 | 44.35 | 66.30 |
| 23 | 16.12 | 54.42 | 22.23 | 47.14 | 30.92 | 44.94 | 39.06 | 48.30 | 44.26 | 56.40 | 44.30 | 66.62 |
| 24 | 16.27 | 54.09 | 22.50 | 47.01 | 31.20 | 45.00 | 39.27 | 48.49 | 44.36 | 56.67 | 44.24 | 66.96 |
| 25 | 16.44 | 53.78 | 22.77 | 46.90 | 31.47 | 45.05 | 39.48 | 48.67 | 44.47 | 56.95 | 44.17 | 67.32 |
| 26 | 16.61 | 53.50 | 23.03 | 46.79 | 31.73 | 45.08 | 39.69 | 48.84 | 44.58 | 57.24 | 44.07 | 67.70 |
| 27 | 16.78 | 53.24 | 23.28 | 46.69 | 32.00 | 45.11 | 39.92 | 49.00 | 44.69 | 57.56 | 43.95 | 68.09 |
| 28 | 16.95 | 53.00 | 23.52 | 46.58 | 32.27 | 45.12 | 40.16 | 49.17 | 44.79 | 57.90 | 43.80 | 68.47 |
| 29 | 17.12 | 52.78 | 23.76 | 46.46 | 32.55 | 45.13 | 40.40 | 49.36 | 44.87 | 58.27 | 43.63 | 68.83 |
| 30 | 17.27 | 52.55 | 24.00 | 46.32 | 32.85 | 45.14 | 40.65 | 49.57 | 44.93 | 58.66 | 43.44 | 69.15 |
| 31 | 17.42 | 52.32 | 24.24 | 46.18 | 33.16 | 45.16 | 40.90 | 49.81 | 44.96 | 59.06 | 43.25 | 69.44 |
| 32 | 17.56 | 52.08 | 24.50 | 46.02 | | | 41.13 | 50.08 | | | 43.08 | 69.70 |
| | sec δ 14.04 | tan δ 14.00 | sec δ 14.03 | tan δ 14.00 | sec δ 14.03 | tan δ 13.99 | sec δ 14.03 | tan δ 14.00 | sec δ 14.04 | tan δ 14.00 | sec δ 14.05 | tan δ 14.01 |

Mean R.A. $5^{\text{h}} 43^{\text{m}} 30.28^{\text{s}}$

Double lower transit June 17

Mean Dec. $-85^{\circ} 55' 13.25''$

APPARENT PLACES OF STARS, 1986
CIRCUMPOLAR STARS AT UPPER TRANSIT AT GREENWICH

1662 A Octantis Mag. 7.75 Spect. A0

| Day | January | | February | | March | | April | | May | | June | |
|-----|----------------|------------------|----------------|------------------|----------------|------------------|----------------|------------------|----------------|------------------|----------------|------------------|
| | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m 6 40 | ° ' " / 88 43 | h m 6 40 | ° ' " / 88 43 | h m 6 39 | ° ' " / 88 44 | h m 6 39 | ° ' " / 88 44 | h m 6 38 | ° ' " / 88 43 | h m 6 38 | ° ' " / 88 43 |
| 1 | s 74.64 | " 49.31 | s 58.46 | " 59.04 | s 91.78 | " 05.19 | s 55.57 | " 07.90 | s 81.41 | " 65.78 | s 54.43 | " 59.43 |
| 2 | 74.50 | 49.62 | 57.69 | 59.37 | 90.66 | 05.41 | 54.24 | 07.88 | 80.38 | 65.59 | 53.88 | 59.18 |
| 3 | 74.35 | 49.96 | 56.83 | 59.70 | 89.47 | 05.61 | 52.96 | 07.84 | 79.42 | 65.40 | 53.32 | 58.94 |
| 4 | 74.17 | 50.33 | 55.90 | 60.01 | 88.22 | 05.78 | 51.73 | 07.78 | 78.51 | 65.22 | 52.75 | 58.71 |
| 5 | 73.92 | 50.72 | 54.90 | 60.29 | 86.95 | 05.92 | 50.58 | 07.72 | 77.63 | 65.06 | 52.15 | 58.49 |
| 6 | 73.57 | 51.11 | 53.89 | 60.53 | 85.69 | 06.03 | 49.49 | 07.66 | 76.75 | 64.92 | 51.52 | 58.26 |
| 7 | 73.12 | 51.51 | 52.89 | 60.75 | 84.48 | 06.12 | 48.43 | 07.62 | 75.87 | 64.78 | 50.87 | 58.03 |
| 8 | 72.59 | 51.88 | 51.95 | 60.95 | 83.33 | 06.19 | 47.39 | 07.59 | 74.95 | 64.66 | 50.20 | 57.77 |
| 9 | 72.01 | 52.21 | 51.06 | 61.14 | 82.23 | 06.27 | 46.35 | 07.58 | 74.01 | 64.53 | 49.52 | 57.50 |
| 10 | 71.43 | 52.52 | 50.23 | 61.34 | 81.19 | 06.35 | 45.28 | 07.58 | 73.02 | 64.39 | 48.87 | 57.20 |
| 11 | 70.88 | 52.80 | 49.43 | 61.55 | 80.17 | 06.45 | 44.17 | 07.58 | 72.01 | 64.24 | 48.25 | 56.89 |
| 12 | 70.39 | 53.08 | 48.63 | 61.78 | 79.15 | 06.56 | 43.02 | 07.57 | 70.98 | 64.08 | 47.69 | 56.56 |
| 13 | 69.94 | 53.35 | 47.82 | 62.02 | 78.11 | 06.69 | 41.83 | 07.56 | 69.95 | 63.88 | 47.19 | 56.22 |
| 14 | 69.54 | 53.64 | 46.98 | 62.28 | 77.04 | 06.83 | 40.61 | 07.53 | 68.94 | 63.67 | 46.75 | 55.89 |
| 15 | 69.15 | 53.94 | 46.08 | 62.54 | 75.91 | 06.96 | 39.37 | 07.48 | 67.97 | 63.44 | 46.38 | 55.57 |
| 16 | 68.76 | 54.26 | 45.13 | 62.80 | 74.74 | 07.09 | 38.13 | 07.40 | 67.05 | 63.19 | 46.05 | 55.26 |
| 17 | 68.33 | 54.60 | 44.12 | 63.06 | 73.52 | 07.21 | 36.91 | 07.30 | 66.19 | 62.94 | 45.74 | 54.99 |
| 18 | 67.85 | 54.95 | 43.07 | 63.30 | 72.26 | 07.31 | 35.72 | 07.18 | 65.40 | 62.69 | 45.41 | 54.74 |
| 19 | 67.32 | 55.30 | 41.97 | 63.51 | 70.99 | 07.38 | 34.59 | 07.05 | 64.66 | 62.45 | 45.02 | 54.50 |
| 20 | 66.73 | 55.65 | 40.86 | 63.71 | 69.71 | 07.43 | 33.51 | 06.91 | 63.96 | 62.24 | 44.56 | 54.27 |
| 21 | 66.07 | 55.99 | 39.74 | 63.88 | 68.45 | 07.46 | 32.50 | 06.78 | 63.25 | 62.05 | 44.04 | 54.02 |
| 22 | 65.36 | 56.32 | 38.64 | 64.02 | 67.23 | 07.47 | 31.53 | 06.67 | 62.49 | 61.89 | 43.48 | 53.74 |
| 23 | 64.61 | 56.63 | 37.59 | 64.16 | 66.06 | 07.46 | 30.58 | 06.59 | 61.66 | 61.73 | 42.93 | 53.42 |
| 24 | 63.85 | 56.91 | 36.59 | 64.29 | 64.96 | 07.47 | 29.58 | 06.53 | 60.75 | 61.56 | 42.45 | 53.07 |
| 25 | 63.09 | 57.17 | 35.64 | 64.43 | 63.90 | 07.48 | 28.52 | 06.49 | 59.79 | 61.37 | 42.07 | 52.71 |
| 26 | 62.35 | 57.42 | 34.71 | 64.59 | 62.86 | 07.52 | 27.38 | 06.44 | 58.83 | 61.13 | 41.77 | 52.35 |
| 27 | 61.65 | 57.65 | 33.79 | 64.77 | 61.81 | 07.58 | 26.17 | 06.37 | 57.90 | 60.87 | 41.56 | 52.00 |
| 28 | 61.00 | 57.89 | 32.82 | 64.97 | 60.70 | 07.67 | 24.93 | 06.27 | 57.05 | 60.58 | 41.41 | 51.67 |
| 29 | 60.38 | 58.15 | 31.78 | 65.19 | 59.51 | 07.76 | 23.70 | 06.13 | 56.29 | 60.28 | 41.29 | 51.35 |
| 30 | 59.77 | 58.42 | | | 58.24 | 07.83 | 22.52 | 05.97 | 55.61 | 59.98 | 41.17 | 51.06 |
| 31 | 59.14 | 58.72 | | | 56.92 | 07.88 | 21.41 | 05.78 | 55.00 | 59.69 | 41.05 | 50.78 |
| 32 | 58.46 | 59.04 | | | 55.57 | 07.90 | | | 54.43 | 59.43 | | |
| | sec δ 45.18 | tan δ 45.17 | sec δ 45.26 | tan δ 45.25 | sec δ 45.31 | tan δ 45.30 | sec δ 45.31 | tan δ 45.30 | sec δ 45.27 | tan δ 45.26 | sec δ 45.19 | tan δ 45.18 |

Mean R.A. ^h6 ^m39 ^s37.36

Double lower transit July 1

Mean Dec. -88° 43' 58.46"

APPARENT PLACES OF STARS, 1986
CIRCUMPOLAR STARS AT UPPER TRANSIT AT GREENWICH

1662 A Octantis Mag. 7.75 Spect. A0

| Day | July | | August | | September | | October | | November | | December | |
|-----|-------|-------|--------|-------|-----------|-------|---------|-------|----------|-------|--------------------------------------|--------------------------------------|
| | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " |
| | 6 38 | 88 43 | 6 38 | 88 43 | 6 38 | 88 43 | 6 39 | 88 43 | 6 39 | 88 43 | 6 40 | 88 43 |
| | s | " | s | " | s | " | s | " | s | " | s | " |
| 1 | 41.05 | 50.78 | 42.85 | 41.36 | 59.64 | 33.87 | 25.57 | 30.89 | 53.41 | 33.59 | 11.03 | 41.25 |
| 2 | 40.90 | 50.51 | 43.10 | 41.09 | 60.36 | 33.65 | 26.59 | 30.84 | 54.28 | 33.82 | 11.25 | 41.62 |
| 3 | 40.72 | 50.24 | 43.34 | 40.80 | 61.14 | 33.43 | 27.65 | 30.82 | 55.07 | 34.08 | 11.40 | 41.97 |
| 4 | 40.52 | 49.97 | 43.62 | 40.49 | 61.98 | 33.22 | 28.73 | 30.84 | 55.75 | 34.33 | 11.50 | 42.28 |
| 5 | 40.30 | 49.68 | 43.93 | 40.17 | 62.88 | 33.03 | 29.78 | 30.89 | 56.36 | 34.58 | 11.62 | 42.57 |
| 6 | 40.07 | 49.37 | 44.31 | 39.84 | 63.81 | 32.86 | 30.77 | 30.97 | 56.91 | 34.80 | 11.78 | 42.83 |
| 7 | 39.86 | 49.04 | 44.75 | 39.51 | 64.76 | 32.73 | 31.68 | 31.06 | 57.45 | 34.99 | 12.01 | 43.10 |
| 8 | 39.69 | 48.70 | 45.27 | 39.20 | 65.67 | 32.63 | 32.52 | 31.15 | 58.03 | 35.16 | 12.30 | 43.37 |
| 9 | 39.56 | 48.34 | 45.83 | 38.91 | 66.53 | 32.55 | 33.29 | 31.22 | 58.66 | 35.33 | 12.61 | 43.67 |
| 10 | 39.50 | 47.98 | 46.43 | 38.64 | 67.33 | 32.48 | 34.05 | 31.27 | 59.36 | 35.50 | 12.93 | 43.99 |
| 11 | 39.51 | 47.61 | 47.04 | 38.40 | 68.06 | 32.40 | 34.81 | 31.30 | 60.10 | 35.69 | 13.23 | 44.33 |
| 12 | 39.58 | 47.26 | 47.61 | 38.19 | 68.75 | 32.30 | 35.63 | 31.31 | 60.87 | 35.90 | 13.49 | 44.69 |
| 13 | 39.70 | 46.93 | 48.13 | 37.99 | 69.44 | 32.18 | 36.50 | 31.32 | 61.65 | 36.13 | 13.68 | 45.07 |
| 14 | 39.85 | 46.62 | 48.59 | 37.79 | 70.15 | 32.04 | 37.45 | 31.34 | 62.39 | 36.40 | 13.81 | 45.45 |
| 15 | 40.00 | 46.34 | 48.99 | 37.59 | 70.93 | 31.88 | 38.44 | 31.38 | 63.10 | 36.68 | 13.88 | 45.82 |
| 16 | 40.11 | 46.08 | 49.36 | 37.35 | 71.79 | 31.72 | 39.47 | 31.45 | 63.75 | 36.97 | 13.89 | 46.19 |
| 17 | 40.16 | 45.83 | 49.75 | 37.10 | 72.72 | 31.58 | 40.49 | 31.55 | 64.33 | 37.28 | 13.86 | 46.54 |
| 18 | 40.14 | 45.58 | 50.19 | 36.81 | 73.71 | 31.46 | 41.50 | 31.67 | 64.86 | 37.57 | 13.81 | 46.87 |
| 19 | 40.07 | 45.30 | 50.71 | 36.52 | 74.72 | 31.37 | 42.46 | 31.81 | 65.34 | 37.86 | 13.74 | 47.19 |
| 20 | 40.00 | 45.00 | 51.32 | 36.23 | 75.74 | 31.31 | 43.37 | 31.96 | 65.79 | 38.13 | 13.69 | 47.49 |
| 21 | 39.95 | 44.66 | 52.01 | 35.96 | 76.74 | 31.27 | 44.23 | 32.12 | 66.22 | 38.39 | 13.66 | 47.79 |
| 22 | 39.99 | 44.30 | 52.76 | 35.72 | 77.70 | 31.25 | 45.04 | 32.27 | 66.65 | 38.64 | 13.66 | 48.08 |
| 23 | 40.12 | 43.94 | 53.53 | 35.50 | 78.62 | 31.24 | 45.82 | 32.42 | 67.10 | 38.88 | 13.68 | 48.38 |
| 24 | 40.35 | 43.58 | 54.29 | 35.31 | 79.49 | 31.23 | 46.57 | 32.55 | 67.58 | 39.11 | 13.73 | 48.70 |
| 25 | 40.65 | 43.25 | 55.04 | 35.14 | 80.34 | 31.21 | 47.33 | 32.66 | 68.09 | 39.35 | 13.77 | 49.04 |
| 26 | 40.99 | 42.94 | 55.75 | 34.97 | 81.16 | 31.18 | 48.10 | 32.77 | 68.63 | 39.60 | 13.79 | 49.40 |
| 27 | 41.35 | 42.65 | 56.43 | 34.81 | 81.98 | 31.13 | 48.90 | 32.87 | 69.19 | 39.88 | 13.75 | 49.79 |
| 28 | 41.70 | 42.38 | 57.08 | 34.65 | 82.82 | 31.08 | 49.75 | 32.98 | 69.74 | 40.18 | 13.62 | 50.20 |
| 29 | 42.03 | 42.12 | 57.71 | 34.48 | 83.69 | 31.01 | 50.63 | 33.09 | 70.25 | 40.52 | 13.38 | 50.61 |
| 30 | 42.33 | 41.87 | 58.34 | 34.29 | 84.60 | 30.95 | 51.55 | 33.23 | 70.69 | 40.88 | 13.05 | 51.00 |
| 31 | 42.60 | 41.62 | 58.98 | 34.09 | 85.57 | 30.89 | 52.49 | 33.39 | 71.03 | 41.25 | 12 ⁶⁴ 12 ²¹ | 51 ³⁶ 51 ⁶⁸ |
| 32 | 42.85 | 41.36 | 59.64 | 33.87 | | | 53.41 | 33.59 | | | 11.81 | 51.98 |
| | sec δ | tan δ | sec δ | tan δ | sec δ | tan δ | sec δ | tan δ | sec δ | tan δ | sec δ | tan δ |
| | 45.10 | 45.09 | 45.01 | 45.00 | 44.96 | 44.95 | 44.96 | 44.94 | 45.01 | 45.00 | 45.10 | 45.09 |

Mean R.A. 6^h 39^m 37.^s36

Double lower transit July 1

Mean Dec. -88° 43' 58.⁴⁶"

APPARENT PLACES OF STARS, 1986
CIRCUMPOLAR STARS AT UPPER TRANSIT AT GREENWICH

1661 7 G. Octantis \approx Mag. 6.41 Spect. F2

| Day | January | | February | | March | | April | | May | | June | |
|-----|---------------------------|---------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m 6 52 | ° ' " / 87 00 | h m 6 52 | ° ' " / 87 00 | h m 6 52 | ° ' " / 87 00 | h m 6 51 | ° ' " / 87 00 | h m 6 51 | ° ' " / 87 00 | h m 6 51 | ° ' " / 87 00 |
| 1 | s 35.09 | " 20.89 | s 28.99 | " 31.29 | s 18.24 | " 37.95 | s 63.24 | " 41.28 | s 48.80 | " 39.72 | s 37.13 | " 33.78 |
| 2 | 35.04 | 21.19 | 28.69 | 31.64 | 17.78 | 38.18 | 62.69 | 41.29 | 48.36 | 39.55 | 36.88 | 33.54 |
| 3 | ^{35.00} 34.97 | ^{21.51} 21.86 | 28.36 | 31.98 | 17.30 | 38.41 | 62.15 | 41.27 | 47.94 | 39.38 | 36.63 | 33.31 |
| 4 | 34.92 | 22.23 | 27.99 | 32.31 | 16.79 | 38.60 | 61.63 | 41.23 | 47.55 | 39.21 | 36.38 | 33.09 |
| 5 | 34.84 | 22.63 | 27.60 | 32.61 | 16.27 | 38.77 | 61.14 | 41.19 | 47.16 | 39.07 | 36.12 | 32.87 |
| 6 | 34.72 | 23.03 | 27.20 | 32.88 | 15.76 | 38.90 | 60.68 | 41.15 | 46.79 | 38.93 | 35.84 | 32.66 |
| 7 | 34.57 | 23.44 | 26.80 | 33.11 | 15.26 | 39.01 | 60.23 | 41.12 | 46.41 | 38.81 | 35.56 | 32.43 |
| 8 | 34.38 | 23.82 | 26.42 | 33.33 | 14.78 | 39.10 | 59.79 | 41.11 | 46.01 | 38.70 | 35.26 | 32.18 |
| 9 | 34.17 | 24.17 | 26.06 | 33.54 | 14.32 | 39.19 | 59.35 | 41.12 | 45.61 | 38.59 | 34.97 | 31.92 |
| 10 | 33.95 | 24.49 | 25.72 | 33.75 | 13.89 | 39.29 | 58.90 | 41.13 | 45.19 | 38.47 | 34.68 | 31.63 |
| 11 | 33.75 | 24.79 | 25.40 | 33.98 | 13.46 | 39.41 | 58.43 | 41.15 | 44.76 | 38.34 | 34.41 | 31.33 |
| 12 | 33.56 | 25.07 | 25.08 | 34.22 | 13.04 | 39.54 | 57.95 | 41.17 | 44.32 | 38.18 | 34.15 | 31.00 |
| 13 | 33.40 | 25.35 | 24.75 | 34.48 | 12.61 | 39.69 | 57.45 | 41.17 | 43.88 | 38.01 | 33.92 | 30.67 |
| 14 | 33.25 | 25.65 | 24.41 | 34.76 | 12.16 | 39.84 | 56.94 | 41.16 | 43.45 | 37.81 | 33.72 | 30.35 |
| 15 | 33.10 | 25.96 | 24.05 | 35.04 | 11.70 | 40.00 | 56.42 | 41.13 | 43.03 | 37.59 | 33.54 | 30.03 |
| 16 | 32.96 | 26.30 | 23.67 | 35.32 | 11.22 | 40.15 | 55.90 | 41.08 | 42.63 | 37.36 | 33.38 | 29.73 |
| 17 | 32.80 | 26.64 | 23.27 | 35.59 | 10.72 | 40.29 | 55.38 | 41.00 | 42.25 | 37.12 | 33.24 | 29.45 |
| 18 | 32.63 | 27.00 | 22.84 | 35.84 | 10.20 | 40.41 | 54.88 | 40.90 | 41.91 | 36.88 | 33.08 | 29.21 |
| 19 | 32.43 | 27.37 | 22.40 | 36.08 | 09.67 | 40.50 | 54.39 | 40.78 | 41.58 | 36.65 | 32.91 | 28.97 |
| 20 | 32.21 | 27.73 | 21.95 | 36.30 | 09.14 | 40.58 | 53.93 | 40.66 | 41.27 | 36.45 | 32.71 | 28.75 |
| 21 | 31.96 | 28.09 | 21.50 | 36.49 | 08.62 | 40.62 | 53.50 | 40.55 | 40.96 | 36.27 | 32.48 | 28.50 |
| 22 | 31.69 | 28.43 | 21.05 | 36.65 | 08.11 | 40.65 | 53.08 | 40.46 | 40.63 | 36.12 | 32.23 | 28.23 |
| 23 | 31.40 | 28.75 | 20.62 | 36.81 | 07.62 | 40.67 | 52.67 | 40.39 | 40.28 | 35.98 | 32.00 | 27.92 |
| 24 | 31.10 | 29.05 | 20.20 | 36.96 | 07.15 | 40.69 | 52.25 | 40.35 | 39.89 | 35.82 | 31.78 | 27.58 |
| 25 | 30.81 | 29.33 | 19.81 | 37.11 | 06.70 | 40.72 | 51.81 | 40.32 | 39.48 | 35.64 | 31.60 | 27.22 |
| 26 | 30.52 | 29.59 | 19.43 | 37.29 | 06.27 | 40.78 | 51.33 | 40.29 | 39.07 | 35.42 | 31.45 | 26.86 |
| 27 | 30.24 | 29.84 | 19.05 | 37.49 | 05.83 | 40.86 | 50.82 | 40.24 | 38.67 | 35.17 | 31.34 | 26.51 |
| 28 | 29.98 | 30.09 | 18.66 | 37.71 | 05.36 | 40.97 | 50.30 | 40.16 | 38.30 | 34.89 | 31.26 | 26.18 |
| 29 | 29.74 | 30.36 | 18.24 | 37.95 | 04.87 | 41.07 | 49.78 | 40.04 | 37.96 | 34.61 | 31.19 | 25.87 |
| 30 | 29.50 | 30.65 | | | 04.35 | 41.17 | 49.28 | 39.89 | 37.66 | 34.32 | 31.12 | 25.57 |
| 31 | 29.26 | 30.96 | | | 03.80 | 41.24 | 48.80 | 39.72 | 37.38 | 34.04 | 31.05 | 25.30 |
| 32 | 28.99 | 31.29 | | | 03.24 | 41.28 | | | 37.13 | 33.78 | | |
| | sec δ 19.15 | tan δ 19.13 | sec δ 19.17 | tan δ 19.14 | sec δ 19.18 | tan δ 19.15 | sec δ 19.18 | tan δ 19.15 | sec δ 19.17 | tan δ 19.15 | sec δ 19.16 | tan δ 19.13 |

Mean R.A. $6^{\text{h}} 51^{\text{m}} 55.69^{\text{s}}$

Double lower transit July 5

Mean Dec. $-87^{\circ} 00' 31.99''$

APPARENT PLACES OF STARS, 1986
CIRCUMPOLAR STARS AT UPPER TRANSIT AT GREENWICH

443

1661 7 G. Octantis · Mag. 6.41 Spect. F2

| Day | July | | August | | September | | October | | November | | December | |
|-----|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m 6 51 | ° ' / 87 00 | h m 6 51 | ° ' / 87 00 | h m 6 51 | ° ' / 87 00 | h m 6 51 | ° ' / 87 00 | h m 6 52 | ° ' / 87 00 | h m 6 52 | ° ' / 87 00 |
| | s 31.05 | " 25.30 | s 31.35 | " 15.76 | s 38.11 | " 07.91 | s 49.03 | " 04.45 | s 01.16 | " 06.71 | s 09.31 | " 14.16 |
| 1 | 30.98 | 25.02 | 31.44 | 15.48 | 38.41 | 07.68 | 49.46 | 04.39 | 01.54 | 06.93 | 09.45 | 14.53 |
| 2 | 30.89 | 24.75 | 31.54 | 15.18 | 38.72 | 07.44 | 49.91 | 04.35 | 01.90 | 07.17 | 09.54 | 14.87 |
| 3 | 30.79 | 24.48 | 31.64 | 14.86 | 39.07 | 07.21 | 50.37 | 04.35 | 02.22 | 07.42 | 09.62 | 15.19 |
| 4 | 30.69 | 24.19 | 31.76 | 14.54 | 39.44 | 07.00 | 50.82 | 04.38 | 02.50 | 07.66 | 09.70 | 15.47 |
| 5 | 30.58 | 23.88 | 31.90 | 14.20 | 39.82 | 06.82 | 51.25 | 04.44 | 02.76 | 07.87 | 09.80 | 15.74 |
| 6 | 30.48 | 23.56 | 32.07 | 13.86 | 40.21 | 06.67 | 51.65 | 04.52 | 03.01 | 08.06 | 09.92 | 16.01 |
| 7 | 30.39 | 23.21 | 32.27 | 13.54 | 40.60 | 06.55 | 52.02 | 04.60 | 03.28 | 08.22 | 10.06 | 16.28 |
| 8 | 30.32 | 22.86 | 32.49 | 13.23 | 40.96 | 06.46 | 52.36 | 04.66 | 03.56 | 08.38 | 10.22 | 16.57 |
| 9 | 30.27 | 22.49 | 32.73 | 12.95 | 41.30 | 06.37 | 52.69 | 04.70 | 03.87 | 08.54 | 10.38 | 16.89 |
| 10 | 30.25 | 22.12 | 32.97 | 12.70 | 41.61 | 06.28 | 53.03 | 04.71 | 04.21 | 08.72 | 10.53 | 17.24 |
| 11 | 30.26 | 21.77 | 33.20 | 12.47 | 41.91 | 06.17 | 53.38 | 04.71 | 04.55 | 08.92 | 10.67 | 17.60 |
| 12 | 30.29 | 21.43 | 33.41 | 12.26 | 42.20 | 06.03 | 53.76 | 04.71 | 04.89 | 09.14 | 10.78 | 17.97 |
| 13 | 30.34 | 21.12 | 33.60 | 12.06 | 42.50 | 05.88 | 54.16 | 04.71 | 05.23 | 09.40 | 10.87 | 18.35 |
| 14 | 30.38 | 20.83 | 33.76 | 11.84 | 42.83 | 05.70 | 54.59 | 04.73 | 05.55 | 09.67 | 10.93 | 18.73 |
| 15 | 30.42 | 20.57 | 33.92 | 11.60 | 43.18 | 05.53 | 55.03 | 04.79 | 05.85 | 09.96 | 10.97 | 19.10 |
| 16 | 30.43 | 20.32 | 34.07 | 11.33 | 43.57 | 05.37 | 55.47 | 04.87 | 06.13 | 10.25 | 10.99 | 19.45 |
| 17 | 30.41 | 20.06 | 34.25 | 11.04 | 43.98 | 05.24 | 55.91 | 04.97 | 06.38 | 10.54 | 11.00 | 19.79 |
| 18 | 30.37 | 19.78 | 34.45 | 10.74 | 44.41 | 05.13 | 56.33 | 05.10 | 06.61 | 10.82 | 11.00 | 20.11 |
| 19 | 30.33 | 19.48 | 34.70 | 10.44 | 44.84 | 05.05 | 56.73 | 05.24 | 06.83 | 11.09 | 11.01 | 20.42 |
| 20 | 30.30 | 19.14 | 34.97 | 10.15 | 45.26 | 04.99 | 57.11 | 05.38 | 07.03 | 11.35 | 11.02 | 20.72 |
| 21 | 30.30 | 18.78 | 35.27 | 09.89 | 45.67 | 04.96 | 57.47 | 05.52 | 07.24 | 11.59 | 11.04 | 21.02 |
| 22 | 30.34 | 18.41 | 35.58 | 09.66 | 46.06 | 04.93 | 57.82 | 05.65 | 07.46 | 11.82 | 11.08 | 21.32 |
| 23 | 30.41 | 18.04 | 35.90 | 09.45 | 46.44 | 04.90 | 58.15 | 05.77 | 07.68 | 12.05 | 11.12 | 21.64 |
| 24 | 30.52 | 17.70 | 36.20 | 09.27 | 46.80 | 04.86 | 58.49 | 05.88 | 07.92 | 12.29 | 11.16 | 21.99 |
| 25 | 30.64 | 17.38 | 36.50 | 09.09 | 47.15 | 04.82 | 58.83 | 05.97 | 08.17 | 12.53 | 11.20 | 22.35 |
| 26 | 30.78 | 17.08 | 36.78 | 08.92 | 47.51 | 04.76 | 59.18 | 06.06 | 08.42 | 12.80 | 11.21 | 22.75 |
| 27 | 30.91 | 16.81 | 37.05 | 08.74 | 47.86 | 04.69 | 59.55 | 06.15 | 08.68 | 13.10 | 11.19 | 23.16 |
| 28 | 31.03 | 16.54 | 37.31 | 08.55 | 48.23 | 04.61 | 59.94 | 06.25 | 08.92 | 13.43 | 11.13 | 23.58 |
| 29 | 31.15 | 16.28 | 37.57 | 08.35 | 48.62 | 04.53 | 60.34 | 06.38 | 09.14 | 13.79 | 11.02 | 23.98 |
| 30 | 31.26 | 16.02 | 37.84 | 08.14 | 49.03 | 04.45 | 60.75 | 06.53 | 09.31 | 14.16 | 10.89 | 24.35 |
| 31 | 31.35 | 15.76 | 38.11 | 07.91 | | | 61.16 | 06.71 | | | 10.74 | 24.69 |
| 32 | | | | | | | | | | | | |
| | sec δ 19.14 | tan δ 19.12 | sec δ 19.13 | tan δ 19.10 | sec δ 19.12 | tan δ 19.09 | sec δ 19.12 | tan δ 19.09 | sec δ 19.12 | tan δ 19.10 | sec δ 19.14 | tan δ 19.12 |

Mean R.A. 6^h 51^m 55.^s69

Double lower transit July 5

Mean Dec. -87° 00' 31.99"

APPARENT PLACES OF STARS, 1986
CIRCUMPOLAR STARS AT UPPER TRANSIT AT GREENWICH

918 ζ Octantis Mag. 5.38 Spect. F0

| Day | January | | February | | March | | April | | May | | June | |
|-----|--------------------------------|--------------------------------|--------------------------------------|--------------------------------------|--------------------------------|--------------------------------|--------------------------------|--------------------------------|--------------------------------|--------------------------------|--------------------------------|--------------------------------|
| | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | ^h 8 ^m 59 | ^o — ['] 36 | ^h 8 ^m 59 | ^o — ['] 36 | ^h 8 ^m 58 | ^o — ['] 36 | ^h 8 ^m 58 | ^o — ['] 36 | ^h 8 ^m 58 | ^o — ['] 36 | ^h 8 ^m 58 | ^o — ['] 36 |
| | ^s | " | ^s | " | ^s | " | ^s | " | ^s | " | ^s | " |
| 1 | 07.32 | 11.55 | 08.57 | 22.77 | 65.40 | 33.39 | 58.31 | 42.46 | 49.36 | 47.09 | 40.07 | 46.83 |
| 2 | 07.43 | 11.83 | 08.56 | 23.17 | 65.25 | 33.78 | 58.00 | 42.70 | 49.03 | 47.12 | 39.82 | 46.73 |
| 3 | 07.56 | 12.13 | 08.55 | 23.59 | 65.07 | 34.18 | 57.68 | 42.90 | 48.71 | 47.14 | 39.58 | 46.63 |
| 4 | 07.69 | 12.45 | ^{08 51} ^{08 45} | ^{24 03} ^{24 47} | 64.87 | 34.56 | 57.37 | 43.08 | 48.41 | 47.16 | 39.33 | 46.55 |
| 5 | 07.83 | 12.79 | 08.37 | 24.90 | 64.65 | 34.92 | 57.07 | 43.25 | 48.13 | 47.19 | 39.09 | 46.48 |
| 6 | 07.97 | 13.17 | 08.26 | 25.29 | 64.42 | 35.24 | 56.79 | 43.40 | 47.85 | 47.24 | 38.84 | 46.41 |
| 7 | 08.09 | 13.58 | 08.14 | 25.67 | 64.18 | 35.54 | 56.52 | 43.57 | 47.58 | 47.29 | 38.57 | 46.33 |
| 8 | 08.18 | 14.00 | 08.02 | 26.01 | 63.95 | 35.82 | 56.26 | 43.74 | 47.31 | 47.35 | 38.30 | 46.24 |
| 9 | 08.25 | 14.41 | 07.91 | 26.34 | 63.73 | 36.09 | 56.00 | 43.92 | 47.03 | 47.43 | 38.02 | 46.14 |
| 10 | 08.29 | 14.81 | 07.81 | 26.67 | 63.52 | 36.35 | 55.75 | 44.12 | 46.73 | 47.50 | 37.73 | 46.02 |
| 11 | 08.32 | 15.18 | 07.73 | 27.00 | 63.33 | 36.63 | 55.49 | 44.33 | 46.43 | 47.56 | 37.44 | 45.87 |
| 12 | 08.34 | 15.52 | 07.65 | 27.34 | 63.14 | 36.92 | 55.23 | 44.54 | 46.11 | 47.61 | 37.15 | 45.70 |
| 13 | 08.36 | 15.85 | 07.58 | 27.70 | 62.96 | 37.22 | 54.94 | 44.75 | 45.79 | 47.65 | 36.88 | 45.51 |
| 14 | 08.40 | 16.16 | 07.51 | 28.07 | 62.77 | 37.54 | 54.65 | 44.95 | 45.45 | 47.66 | 36.61 | 45.32 |
| 15 | 08.45 | 16.48 | 07.43 | 28.46 | 62.58 | 37.86 | 54.34 | 45.14 | 45.12 | 47.64 | 36.37 | 45.12 |
| 16 | 08.51 | 16.82 | 07.33 | 28.86 | 62.37 | 38.19 | 54.01 | 45.31 | 44.79 | 47.61 | 36.15 | 44.93 |
| 17 | 08.57 | 17.17 | 07.23 | 29.27 | 62.14 | 38.52 | 53.68 | 45.46 | 44.46 | 47.56 | 35.94 | 44.75 |
| 18 | 08.64 | 17.53 | 07.10 | 29.67 | 61.90 | 38.84 | 53.35 | 45.58 | 44.16 | 47.50 | 35.75 | 44.61 |
| 19 | 08.70 | 17.92 | 06.95 | 30.06 | 61.64 | 39.14 | 53.02 | 45.68 | 43.87 | 47.44 | 35.55 | 44.49 |
| 20 | 08.75 | 18.32 | 06.79 | 30.43 | 61.37 | 39.42 | 52.71 | 45.76 | 43.60 | 47.39 | 35.34 | 44.38 |
| 21 | 08.79 | 18.73 | 06.62 | 30.78 | 61.10 | 39.68 | 52.41 | 45.85 | 43.35 | 47.37 | 35.10 | 44.27 |
| 22 | 08.81 | 19.15 | 06.44 | 31.11 | 60.82 | 39.91 | 52.13 | 45.94 | 43.09 | 47.38 | 34.84 | 44.14 |
| 23 | 08.81 | 19.56 | 06.26 | 31.42 | 60.54 | 40.13 | 51.86 | 46.05 | 42.83 | 47.40 | 34.57 | 43.98 |
| 24 | 08.79 | 19.96 | 06.09 | 31.72 | 60.28 | 40.34 | 51.60 | 46.19 | 42.54 | 47.43 | 34.30 | 43.78 |
| 25 | 08.76 | 20.34 | 05.94 | 32.02 | 60.04 | 40.55 | 51.33 | 46.35 | 42.23 | 47.45 | 34.04 | 43.55 |
| 26 | 08.72 | 20.71 | 05.80 | 32.33 | 59.82 | 40.78 | 51.05 | 46.52 | 41.90 | 47.44 | 33.80 | 43.30 |
| 27 | 08.67 | 21.05 | 05.67 | 32.65 | 59.60 | 41.03 | 50.74 | 46.69 | 41.57 | 47.39 | 33.59 | 43.04 |
| 28 | 08.63 | 21.39 | 05.54 | 33.01 | 59.38 | 41.31 | 50.41 | 46.84 | 41.23 | 47.30 | 33.39 | 42.80 |
| 29 | 08.59 | 21.71 | 05.40 | 33.39 | 59.15 | 41.61 | 50.06 | 46.95 | 40.91 | 47.19 | 33.21 | 42.56 |
| 30 | 08.58 | 22.05 | | | 58.89 | 41.91 | 49.71 | 47.03 | 40.61 | 47.07 | 33.05 | 42.34 |
| 31 | 08.57 | 22.39 | | | 58.61 | 42.20 | 49.36 | 47.09 | 40.33 | 46.95 | 32.89 | 42.13 |
| 32 | 08.57 | 22.77 | | | 58.31 | 42.46 | | | 40.07 | 46.83 | | |
| | sec δ | tan δ | sec δ | tan δ | sec δ | tan δ | sec δ | tan δ | sec δ | tan δ | sec δ | tan δ |
| | 13.05 | 13.01 | 13.06 | 13.02 | 13.07 | 13.03 | 13.07 | 13.03 | 13.07 | 13.04 | 13.07 | 13.03 |

Mean R.A. ^h 8 ^m 58 ^s 50.40

Double lower transit August 6

Mean Dec. — ^o 85 ['] 36 ["] 37.95

APPARENT PLACES OF STARS, 1986
CIRCUMPOLAR STARS AT UPPER TRANSIT AT GREENWICH

918 ζ Octantis Mag. 5.38 Spect. F0

| Day | July | | August | | September | | October | | November | | December | |
|-----|-------|-------|--------|-------|-----------|-------|---------|-------|----------|-------|----------|-------|
| | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° / | h m | ° / | h m | ° / | h m | ° / | h m | ° / | h m | ° / |
| | 8 58 | 85 36 | 8 58 | 85 36 | 8 58 | 85 36 | 8 58 | 85 36 | 8 58 | 85 36 | 8 58 | 85 36 |
| | s | " | s | " | s | " | s | " | s | " | s | " |
| 1 | 32.89 | 42.13 | 28.92 | 33.92 | 29.43 | 24.51 | 34.28 | 17.16 | 42.41 | 14.26 | 50.58 | 17.50 |
| 2 | 32.72 | 41.93 | 28.85 | 33.65 | 29.50 | 24.19 | 34.51 | 16.93 | 42.73 | 14.29 | 50.83 | 17.77 |
| 3 | 32.56 | 41.74 | 28.77 | 33.36 | 29.58 | 23.86 | 34.75 | 16.71 | 43.05 | 14.36 | 51.05 | 18.03 |
| 4 | 32.38 | 41.54 | 28.70 | 33.05 | 29.68 | 23.52 | 35.02 | 16.53 | 43.35 | 14.45 | 51.24 | 18.28 |
| 5 | 32.20 | 41.34 | 28.62 | 32.72 | 29.80 | 23.19 | 35.30 | 16.38 | 43.62 | 14.55 | 51.42 | 18.50 |
| 6 | 32.00 | 41.13 | 28.56 | 32.38 | 29.94 | 22.88 | 35.57 | 16.26 | 43.88 | 14.63 | 51.61 | 18.70 |
| 7 | 31.80 | 40.90 | 28.51 | 32.02 | 30.10 | 22.59 | 35.84 | 16.16 | 44.11 | 14.69 | 51.80 | 18.88 |
| 8 | 31.60 | 40.64 | 28.48 | 31.66 | 30.27 | 22.34 | 36.09 | 16.08 | 44.35 | 14.73 | 52.01 | 19.06 |
| 9 | 31.41 | 40.37 | 28.47 | 31.31 | 30.44 | 22.11 | 36.32 | 16.00 | 44.59 | 14.76 | 52.23 | 19.26 |
| 10 | 31.22 | 40.07 | 28.49 | 30.97 | 30.60 | 21.90 | 36.54 | 15.90 | 44.84 | 14.77 | 52.47 | 19.47 |
| 11 | 31.05 | 39.77 | 28.52 | 30.66 | 30.75 | 21.70 | 36.75 | 15.78 | 45.12 | 14.79 | 52.72 | 19.71 |
| 12 | 30.90 | 39.46 | 28.55 | 30.37 | 30.87 | 21.49 | 36.96 | 15.64 | 45.41 | 14.83 | 52.96 | 19.97 |
| 13 | 30.77 | 39.16 | 28.58 | 30.11 | 30.99 | 21.26 | 37.18 | 15.49 | 45.71 | 14.88 | 53.20 | 20.25 |
| 14 | 30.66 | 38.88 | 28.60 | 29.86 | 31.10 | 21.00 | 37.41 | 15.33 | 46.02 | 14.97 | 53.42 | 20.55 |
| 15 | 30.56 | 38.62 | 28.61 | 29.62 | 31.21 | 20.73 | 37.67 | 15.18 | 46.33 | 15.08 | 53.63 | 20.86 |
| 16 | 30.46 | 38.38 | 28.60 | 29.35 | 31.34 | 20.44 | 37.95 | 15.04 | 46.64 | 15.21 | 53.83 | 21.17 |
| 17 | 30.36 | 38.16 | 28.57 | 29.06 | 31.50 | 20.14 | 38.25 | 14.93 | 46.93 | 15.35 | 54.00 | 21.47 |
| 18 | 30.24 | 37.96 | 28.55 | 28.75 | 31.68 | 19.86 | 38.55 | 14.85 | 47.21 | 15.51 | 54.16 | 21.77 |
| 19 | 30.10 | 37.74 | 28.54 | 28.40 | 31.88 | 19.59 | 38.85 | 14.79 | 47.48 | 15.66 | 54.31 | 22.05 |
| 20 | 29.95 | 37.50 | 28.55 | 28.05 | 32.09 | 19.35 | 39.15 | 14.75 | 47.73 | 15.81 | 54.46 | 22.32 |
| 21 | 29.78 | 37.22 | 28.58 | 27.69 | 32.31 | 19.13 | 39.43 | 14.72 | 47.97 | 15.95 | 54.61 | 22.57 |
| 22 | 29.63 | 36.92 | 28.64 | 27.35 | 32.53 | 18.94 | 39.71 | 14.70 | 48.20 | 16.08 | 54.76 | 22.82 |
| 23 | 29.49 | 36.59 | 28.72 | 27.02 | 32.75 | 18.75 | 39.97 | 14.68 | 48.44 | 16.20 | 54.92 | 23.08 |
| 24 | 29.37 | 36.25 | 28.81 | 26.72 | 32.96 | 18.58 | 40.23 | 14.65 | 48.67 | 16.31 | 55.09 | 23.34 |
| 25 | 29.28 | 35.91 | 28.90 | 26.43 | 33.16 | 18.40 | 40.47 | 14.60 | 48.92 | 16.42 | 55.27 | 23.62 |
| 26 | 29.21 | 35.59 | 29.00 | 26.16 | 33.35 | 18.22 | 40.72 | 14.55 | 49.18 | 16.53 | 55.46 | 23.93 |
| 27 | 29.16 | 35.28 | 29.09 | 25.90 | 33.53 | 18.03 | 40.97 | 14.49 | 49.45 | 16.67 | 55.65 | 24.27 |
| 28 | 29.12 | 34.99 | 29.17 | 25.64 | 33.71 | 17.83 | 41.22 | 14.42 | 49.73 | 16.82 | 55.82 | 24.64 |
| 29 | 29.07 | 34.71 | 29.24 | 25.38 | 33.89 | 17.61 | 41.49 | 14.35 | 50.03 | 17.01 | 55.98 | 25.03 |
| 30 | 29.03 | 34.45 | 29.30 | 25.10 | 34.08 | 17.39 | 41.78 | 14.29 | 50.31 | 17.24 | 56.10 | 25.43 |
| 31 | 28.98 | 34.19 | 29.37 | 24.82 | 34.28 | 17.16 | 42.09 | 14.26 | 50.58 | 17.50 | 56.20 | 25.82 |
| 32 | 28.92 | 33.92 | 29.43 | 24.51 | | | 42.41 | 14.26 | | | 56.27 | 26.17 |
| | sec δ | tan δ | sec δ | tan δ | sec δ | tan δ | sec δ | tan δ | sec δ | tan δ | sec δ | tan δ |
| | 13.07 | 13.03 | 13.06 | 13.02 | 13.05 | 13.01 | 13.05 | 13.01 | 13.05 | 13.01 | 13.05 | 13.01 |

Mean R.A. 8^h 58^m 50^s.40

Double lower transit August 6

Mean Dec. -85° 36' 37".95

APPARENT PLACES OF STARS, 1986
CIRCUMPOLAR STARS AT UPPER TRANSIT AT GREENWICH

1663 10 G. Octantis \approx Mag. 6.74 Spect. A0

| Day | January | | February | | March | | April | | May | | June | |
|-----|------------------------------------|-------------------------|------------------------------------|---------------------------|------------------------------------|-------------------------|------------------------------------|-------------------------|------------------------------------|-------------------------|------------------------------------|-------------------------|
| | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | ^h ^m 10 31 | ^o / 86 00 | ^h ^m 10 31 | ^o / 86 00 | ^h ^m 10 31 | ^o / 86 01 | ^h ^m 10 31 | ^o / 86 01 | ^h ^m 10 31 | ^o / 86 01 | ^h ^m 10 31 | ^o / 86 01 |
| | ^s 53.79 | " 42.44 | ^s 59.19 | " 52.35 | ^s 59.94 | " 03.66 | ^s 56.18 | " 15.31 | ^s 48.92 | " 23.70 | ^s 39.51 | " 27.79 |
| 1 | 54.01 | 42.66 | 59.33 | 52.73 | 59.93 | 04.09 | 55.96 | 15.67 | 48.60 | 23.88 | 39.22 | 27.81 |
| 2 | 54.24 | 42.87 | 59.48 | 53.13 | 59.90 | 04.54 | 55.71 | 16.00 | 48.30 | 24.04 | 38.95 | 27.83 |
| 3 | | | | | | | | | | | | |
| 4 | 54.50 | 43.11 | 59.60 | 53.56 | 59.84 | 04.99 | 55.47 | 16.31 | 48.00 | 24.20 | 38.68 | 27.87 |
| 5 | 54.77 | 43.37 | 59.70 | 54.00 | 59.74 | 05.43 | 55.23 | 16.60 | 47.73 | 24.36 | 38.40 | 27.92 |
| 6 | 55.05 | 43.67 | 59.77 | 54.43 | 59.63 | 05.84 | 55.00 | 16.87 | 47.47 | 24.52 | 38.12 | 27.98 |
| 7 | 55.32 | 43.99 | 59.81 | 54.86 | 59.50 | 06.22 | 54.79 | 17.14 | 47.22 | 24.70 | 37.83 | 28.03 |
| 8 | 55.57 | 44.34 | 59.82 | 55.25 | 59.37 | 06.58 | 54.60 | 17.41 | 46.97 | 24.89 | 37.52 | 28.08 |
| 9 | 55.78 | 44.70 | 59.83 | 55.63 | 59.25 | 06.93 | 54.42 | 17.70 | 46.71 | 25.08 | 37.20 | 28.12 |
| 10 | 55.97 | 45.06 | 59.84 | 55.98 | 59.15 | 07.27 | 54.24 | 18.00 | 46.45 | 25.29 | 36.86 | 28.15 |
| 11 | 56.13 | 45.40 | 59.86 | 56.33 | 59.05 | 07.61 | 54.05 | 18.31 | 46.17 | 25.49 | 36.52 | 28.15 |
| 12 | 56.28 | 45.71 | 59.90 | 56.67 | 58.98 | 07.96 | 53.86 | 18.63 | 45.87 | 25.69 | 36.16 | 28.13 |
| 13 | 56.42 | 46.00 | 59.95 | 57.02 | 58.91 | 08.32 | 53.66 | 18.96 | 45.55 | 25.87 | 35.82 | 28.08 |
| 14 | 56.57 | 46.28 | 60.02 | 57.39 | 58.84 | 08.70 | 53.44 | 19.28 | 45.22 | 26.04 | 35.48 | 28.02 |
| 15 | 56.74 | 46.55 | 60.08 | 57.77 | 58.76 | 09.09 | 53.19 | 19.60 | 44.88 | 26.18 | 35.17 | 27.95 |
| 16 | 56.93 | 46.83 | 60.15 | 58.17 | 58.67 | 09.49 | 52.93 | 19.91 | 44.53 | 26.30 | 34.87 | 27.87 |
| 17 | 57.12 | 47.13 | 60.20 | 58.58 | 58.57 | 09.90 | 52.65 | 20.19 | 44.19 | 26.40 | 34.61 | 27.81 |
| 18 | 57.33 | 47.44 | 60.24 | 59.01 | 58.44 | 10.30 | 52.36 | 20.46 | 43.86 | 26.48 | 34.36 | 27.77 |
| 19 | 57.53 | 47.77 | 60.26 | 59.44 | 58.29 | 10.70 | 52.07 | 20.70 | 43.55 | 26.56 | 34.11 | 27.76 |
| 20 | 57.73 | 48.12 | 60.26 | 59.87 | 58.13 | 11.09 | 51.79 | 20.92 | 43.27 | 26.64 | 33.86 | 27.76 |
| 21 | 57.92 | 48.49 | 60.23 | 60.29 | 57.94 | 11.45 | 51.52 | 21.13 | 43.00 | 26.74 | 33.58 | 27.78 |
| 22 | 58.09 | 48.87 | 60.19 | 60.69 | 57.75 | 11.80 | 51.27 | 21.34 | 42.75 | 26.87 | 33.27 | 27.79 |
| 23 | 58.25 | 49.25 | 60.13 | 61.08 | 57.55 | 12.12 | 51.05 | 21.57 | 42.50 | 27.02 | 32.94 | 27.77 |
| 24 | 58.37 | 49.64 | 60.07 | 61.45 | 57.37 | 12.43 | 50.84 | 21.82 | 42.22 | 27.19 | 32.59 | 27.71 |
| 25 | 58.48 | 50.01 | 60.01 | 61.80 | 57.21 | 12.73 | 50.63 | 22.09 | 41.91 | 27.35 | 32.24 | 27.62 |
| 26 | 58.57 | 50.37 | 59.96 | 62.15 | 57.07 | 13.04 | 50.41 | 22.39 | 41.58 | 27.49 | 31.91 | 27.50 |
| 27 | 58.65 | 50.72 | 59.94 | 62.49 | 56.95 | 13.38 | 50.16 | 22.69 | 41.22 | 27.61 | 31.60 | 27.37 |
| 28 | 58.73 | 51.04 | ^{59.93} 59.94 | ^{62.86} 63.24 | 56.83 | 13.74 | 49.88 | 22.99 | 40.85 | 27.69 | 31.31 | 27.23 |
| 29 | 58.82 | 51.36 | 59.94 | 63.66 | 56.71 | 14.12 | 49.58 | 23.25 | 40.49 | 27.73 | 31.05 | 27.10 |
| 30 | 58.92 | 51.68 | | | 56.56 | 14.52 | 49.25 | 23.49 | 40.15 | 27.76 | 30.80 | 26.97 |
| 31 | 59.05 | 52.00 | | | 56.39 | 14.92 | 48.92 | 23.70 | 39.82 | 27.78 | 30.56 | 26.86 |
| 32 | 59.19 | 52.35 | | | 56.18 | 15.31 | | | 39.51 | 27.79 | | |
| | sec δ 14.38 | tan δ 14.35 | sec δ 14.39 | tan δ 14.36 | sec δ 14.40 | tan δ 14.37 | sec δ 14.42 | tan δ 14.38 | sec δ 14.42 | tan δ 14.39 | sec δ 14.42 | tan δ 14.39 |

Mean R.A. ^h 10 ^m 31 ^s 46.69

Double lower transit August 29

Mean Dec. $-86^{\circ} 01' 15.30''$

APPARENT PLACES OF STARS, 1986
CIRCUMPOLAR STARS AT UPPER TRANSIT AT GREENWICH

447

1663 10 G. Octantis Mag. 6.74 Spect. A0

| Day | July | | August | | September | | October | | November | | December | |
|-----|---------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|
| | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | ^h ^m 10 31 | ^o ['] 86 01 | ^h ^m 10 31 | ^o ['] 86 01 | ^h ^m 10 31 | ^o ['] 86 01 | ^h ^m 10 31 | ^o ['] 86 00 | ^h ^m 10 31 | ^o ['] 86 00 | ^h ^m 10 31 | ^o ['] 86 00 |
| | ^s | " | ^s | " | ^s | " | ^s | " | ^s | " | ^s | " |
| 1 | 30.56 | 26.86 | 23.53 | 21.26 | 20.56 | 12.50 | 22.72 | 63.63 | 29.83 | 57.40 | 39.25 | 56.83 |
| 2 | 30.33 | 26.75 | 23.36 | 21.04 | 20.51 | 12.17 | 22.86 | 63.32 | 30.17 | 57.29 | 39.60 | 56.98 |
| 3 | 30.09 | 26.66 | 23.18 | 20.81 | 20.46 | 11.83 | 23.03 | 63.01 | 30.52 | 57.22 | 39.91 | 57.14 |
| 4 | 29.84 | 26.57 | 22.98 | 20.57 | 20.44 | 11.48 | 23.23 | 62.72 | 30.85 | 57.17 | 40.20 | 57.29 |
| 5 | 29.58 | 26.47 | 22.79 | 20.31 | 20.44 | 11.12 | 23.46 | 62.46 | 31.16 | 57.14 | 40.46 | 57.42 |
| 6 | 29.30 | 26.37 | 22.60 | 20.02 | 20.47 | 10.77 | 23.69 | 62.23 | 31.44 | 57.12 | 40.71 | 57.52 |
| 7 | 29.01 | 26.25 | 22.41 | 19.72 | 20.53 | 10.44 | 23.93 | 62.03 | 31.70 | 57.07 | 40.98 | 57.60 |
| 8 | 28.72 | 26.12 | 22.25 | 19.40 | 20.61 | 10.13 | 24.15 | 61.85 | 31.95 | 57.01 | 41.25 | 57.68 |
| 9 | 28.42 | 25.96 | 22.12 | 19.08 | 20.69 | 09.85 | 24.35 | 61.68 | 32.20 | 56.92 | 41.55 | 57.76 |
| 10 | 28.12 | 25.77 | 22.01 | 18.77 | 20.78 | 09.59 | 24.53 | 61.50 | 32.46 | 56.82 | 41.87 | 57.85 |
| 11 | 27.84 | 25.57 | 21.92 | 18.47 | 20.85 | 09.34 | 24.69 | 61.30 | 32.75 | 56.72 | 42.21 | 57.96 |
| 12 | 27.57 | 25.36 | 21.85 | 18.20 | 20.89 | 09.10 | 24.85 | 61.08 | 33.05 | 56.62 | 42.55 | 58.10 |
| 13 | 27.33 | 25.14 | 21.79 | 17.95 | 20.92 | 08.84 | 25.01 | 60.84 | 33.38 | 56.54 | 42.89 | 58.26 |
| 14 | 27.12 | 24.94 | 21.72 | 17.72 | 20.94 | 08.56 | 25.20 | 60.58 | 33.73 | 56.48 | 43.23 | 58.44 |
| 15 | 26.92 | 24.75 | 21.63 | 17.50 | 20.95 | 08.26 | 25.40 | 60.33 | 34.08 | 56.45 | 43.55 | 58.63 |
| 16 | 26.74 | 24.58 | 21.51 | 17.27 | 20.98 | 07.93 | 25.63 | 60.08 | 34.44 | 56.43 | 43.86 | 58.84 |
| 17 | 26.56 | 24.43 | 21.38 | 17.02 | 21.02 | 07.59 | 25.89 | 59.85 | 34.78 | 56.44 | 44.15 | 59.04 |
| 18 | 26.36 | 24.30 | 21.24 | 16.74 | 21.10 | 07.25 | 26.16 | 59.64 | 35.12 | 56.46 | 44.42 | 59.25 |
| 19 | 26.14 | 24.18 | 21.10 | 16.44 | 21.20 | 06.92 | 26.44 | 59.45 | 35.45 | 56.49 | 44.67 | 59.45 |
| 20 | 25.89 | 24.03 | 20.98 | 16.11 | 21.33 | 06.60 | 26.73 | 59.28 | 35.75 | 56.52 | 44.92 | 59.63 |
| 21 | 25.62 | 23.86 | 20.88 | 15.76 | 21.47 | 06.30 | 27.01 | 59.13 | 36.05 | 56.55 | 45.16 | 59.81 |
| 22 | 25.35 | 23.65 | 20.81 | 15.42 | 21.62 | 06.02 | 27.28 | 58.99 | 36.33 | 56.57 | 45.41 | 59.97 |
| 23 | 25.09 | 23.42 | 20.77 | 15.09 | 21.77 | 05.76 | 27.53 | 58.86 | 36.60 | 56.58 | 45.66 | 60.14 |
| 24 | 24.85 | 23.16 | 20.75 | 14.77 | 21.92 | 05.51 | 27.77 | 58.72 | 36.88 | 56.58 | 45.93 | 60.30 |
| 25 | 24.63 | 22.89 | 20.74 | 14.47 | 22.05 | 05.27 | 28.01 | 58.57 | 37.17 | 56.57 | 46.22 | 60.48 |
| 26 | 24.45 | 22.63 | 20.74 | 14.18 | 22.18 | 05.02 | 28.23 | 58.42 | 37.47 | 56.56 | 46.53 | 60.69 |
| 27 | 24.28 | 22.37 | 20.73 | 13.90 | 22.29 | 04.77 | 28.46 | 58.25 | 37.80 | 56.56 | 46.84 | 60.92 |
| 28 | 24.13 | 22.13 | 20.72 | 13.63 | 22.39 | 04.51 | 28.69 | 58.08 | 38.14 | 56.58 | 47.16 | 61.19 |
| 29 | 23.98 | 21.90 | 20.69 | 13.37 | 22.49 | 04.23 | 28.94 | 57.89 | 38.51 | 56.63 | 47.46 | 61.49 |
| 30 | 23.84 | 21.68 | 20.65 | 13.09 | 22.60 | 03.93 | 29.21 | 57.71 | 38.88 | 56.71 | 47.73 | 61.81 |
| 31 | 23.69 | 21.47 | 20.61 | 12.80 | 22.72 | 03.63 | 29.51 | 57.54 | 39.25 | 56.83 | 47.96 | 62.13 |
| 32 | 23.53 | 21.26 | 20.56 | 12.50 | | | 29.83 | 57.40 | | | 48.17 | 62.44 |
| | sec δ 14.42 | tan δ 14.39 | sec δ 14.41 | tan δ 14.38 | sec δ 14.40 | tan δ 14.37 | sec δ 14.40 | tan δ 14.36 | sec δ 14.39 | tan δ 14.36 | sec δ 14.39 | tan δ 14.36 |

Mean R.A. 10^h 31^m 46.69^s

Double lower transit August 29

Mean Dec. -86° 01' 15.30"

APPARENT PLACES OF STARS, 1986
CIRCUMPOLAR STARS AT UPPER TRANSIT AT GREENWICH

1664 η Octantis Mag. 6.26 Spect. A0

| Day | January | | February | | March | | April | | May | | June | |
|-----|--------------|------------------|--------------|------------------|----------------|------------------|--------------|------------------|--------------|------------------|--------------|------------------|
| | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m 10 59 | ° ' " / 84 30 | h m 10 59 | ° ' " / 84 30 | h m 10 59 | ° ' " / 84 31 | h m 10 59 | ° ' " / 84 31 | h m 10 59 | ° ' " / 84 31 | h m 10 59 | ° ' " / 84 31 |
| | s | " | s | " | s | " | s | " | s | " | s | " |
| 1 | 24.47 | 42.75 | 29.25 | 52.05 | 30.75 | 02.84 | 29.11 | 15.30 | 24.65 | 24.50 | 18.31 | 29.67 |
| 2 | 24.64 | 42.94 | 29.39 | 52.41 | 30.79 | 03.25 | 28.98 | 15.69 | 24.44 | 24.71 | 18.10 | 29.72 |
| 3 | 24.83 | 43.13 | 29.53 | 52.79 | 30.82 | 03.69 | 28.84 | 16.05 | 24.23 | 24.91 | 17.91 | 29.78 |
| 4 | 25.03 | 43.34 | 29.66 | 53.21 | 30.84 | 04.14 | 28.69 | 16.38 | 24.04 | 25.10 | 17.72 | 29.85 |
| 5 | 25.25 | 43.57 | 29.77 | 53.63 | 30.84 | 04.60 | 28.54 | 16.69 | 23.85 | 25.29 | 17.53 | 29.93 |
| 6 | 25.48 | 43.83 | 29.86 | 54.06 | 30.81 | 05.04 | 28.40 | 16.99 | 23.68 | 25.48 | 17.33 | 30.01 |
| 7 | 25.70 | 44.13 | 29.93 | 54.48 | 30.76 30.71 | 05.46 05.86 | 28.27 | 17.28 | 23.52 | 25.69 | 17.13 | 30.10 |
| 8 | 25.92 | 44.45 | 29.97 | 54.88 | 30.65 | 06.24 | 28.16 | 17.58 | 23.35 | 25.90 | 16.92 | 30.19 |
| 9 | 26.11 | 44.79 | 30.01 | 55.25 | 30.59 | 06.60 | 28.05 | 17.88 | 23.19 | 26.13 | 16.70 | 30.27 |
| 10 | 26.28 | 45.12 | 30.05 | 55.61 | 30.54 | 06.95 | 27.95 | 18.20 | 23.02 | 26.36 | 16.46 | 30.33 |
| 11 | 26.43 | 45.44 | 30.10 | 55.95 | 30.50 | 07.29 | 27.84 | 18.53 | 22.84 | 26.60 | 16.21 | 30.38 |
| 12 | 26.56 | 45.74 | 30.15 | 56.29 | 30.48 | 07.65 | 27.74 | 18.87 | 22.64 | 26.83 | 15.96 | 30.39 |
| 13 | 26.69 | 46.02 | 30.22 | 56.63 | 30.46 | 08.02 | 27.62 | 19.22 | 22.43 | 27.05 | 15.71 | 30.39 |
| 14 | 26.83 | 46.28 | 30.30 | 56.99 | 30.44 | 08.40 | 27.49 | 19.57 | 22.21 | 27.25 | 15.47 | 30.37 |
| 15 | 26.97 | 46.53 | 30.38 | 57.36 | 30.42 | 08.80 | 27.34 | 19.92 | 21.98 | 27.44 | 15.24 | 30.33 |
| 16 | 27.13 | 46.79 | 30.46 | 57.75 | 30.39 | 09.21 | 27.18 | 20.25 | 21.74 | 27.60 | 15.02 | 30.30 |
| 17 | 27.30 | 47.06 | 30.54 | 58.16 | 30.35 | 09.63 | 27.01 | 20.57 | 21.51 | 27.74 | 14.82 | 30.27 |
| 18 | 27.47 | 47.35 | 30.60 | 58.58 | 30.30 | 10.05 | 26.83 | 20.87 | 21.28 | 27.86 | 14.64 | 30.26 |
| 19 | 27.65 | 47.66 | 30.65 | 59.00 | 30.23 | 10.47 | 26.64 | 21.15 | 21.07 | 27.97 | 14.47 | 30.27 |
| 20 | 27.82 | 47.99 | 30.69 | 59.43 | 30.14 | 10.87 | 26.45 | 21.40 | 20.87 | 28.08 | 14.29 | 30.31 |
| 21 | 27.99 | 48.33 | 30.71 | 59.86 | 30.04 | 11.26 | 26.28 | 21.64 | 20.69 | 28.21 | 14.10 | 30.36 |
| 22 | 28.15 | 48.69 | 30.72 | 60.27 | 29.93 | 11.62 | 26.12 | 21.88 | 20.52 | 28.37 | 13.88 | 30.40 |
| 23 | 28.30 | 49.06 | 30.71 | 60.66 | 29.82 | 11.97 | 25.98 | 22.13 | 20.36 | 28.55 | 13.65 | 30.42 |
| 24 | 28.43 | 49.43 | 30.69 | 61.04 | 29.71 | 12.29 | 25.85 | 22.40 | 20.18 | 28.75 | 13.40 | 30.41 |
| 25 | 28.54 | 49.79 | 30.68 | 61.40 | 29.62 | 12.61 | 25.73 | 22.70 | 19.97 | 28.95 | 13.15 | 30.36 |
| 26 | 28.64 | 50.14 | 30.68 | 61.74 | 29.55 | 12.94 | 25.60 | 23.02 | 19.75 | 29.13 | 12.90 | 30.28 |
| 27 | 28.73 | 50.48 | 30.69 | 62.09 | 29.49 | 13.29 | 25.45 | 23.35 | 19.51 | 29.29 | 12.67 | 30.19 |
| 28 | 28.81 | 50.80 | 30.71 | 62.45 | 29.44 | 13.66 | 25.27 | 23.67 | 19.25 | 29.41 | 12.45 | 30.08 |
| 29 | 28.90 | 51.10 | 30.75 | 62.84 | 29.38 | 14.06 | 25.08 | 23.98 | 19.00 | 29.50 | 12.25 | 29.98 |
| 30 | 29.01 | 51.41 | | | 29.31 | 14.47 | 24.87 | 24.25 | 18.76 | 29.57 | 12.06 | 29.88 |
| 31 | 29.12 | 51.72 | | | 29.22 | 14.89 | 24.65 | 24.50 | 18.52 | 29.62 | 11.88 | 29.80 |
| 32 | 29.25 | 52.05 | | | 29.11 | 15.30 | | | 18.31 | 29.67 | | |
| | sec δ | tan δ | sec δ | tan δ | sec δ | tan δ | sec δ | tan δ | sec δ | tan δ | sec δ | tan δ |
| | 10.46 | 10.41 | 10.46 | 10.42 | 10.47 | 10.42 | 10.48 | 10.43 | 10.48 | 10.43 | 10.48 | 10.43 |

Mean R.A. $10^{\text{h}} 59^{\text{m}} 22.65^{\text{s}}$

Double lower transit September 5

Mean Dec. $-84^{\circ} 31' 16.44''$

APPARENT PLACES OF STARS, 1986
CIRCUMPOLAR STARS AT UPPER TRANSIT AT GREENWICH

449

1664 η Octantis Mag. 6.26 Spect. A0

| Day | July | | August | | September | | October | | November | | December | |
|-----|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | ^h 10 59 | ^m 84 31 | ^h 10 59 | ^m 84 31 | ^h 10 59 | ^m 84 31 | ^h 10 59 | ^m 84 31 | ^h 10 59 | ^m 84 30 | ^h 10 59 | ^m 84 30 |
| | ^s | " | ^s | " | ^s | " | ^s | " | ^s | " | ^s | " |
| 1 | 11.88 | 29.80 | 06.45 | 25.07 | 03.66 | 16.74 | 04.53 | 07.70 | 09.18 | 60.72 | 15.99 | 59.12 |
| 2 | 11.71 | 29.72 | 06.32 | 24.88 | 03.60 | 16.42 | 04.60 | 07.37 | 09.42 | 60.57 | 16.26 | 59.23 |
| 3 | 11.53 | 29.66 | 06.17 | 24.68 | 03.54 | 16.09 | 04.70 | 07.05 | 09.66 | 60.46 | 16.51 | 59.36 |
| 4 | 11.35 | 29.59 | 06.01 | 24.46 | 03.49 | 15.74 | 04.82 | 06.74 | 09.90 | 60.38 | 16.73 | 59.47 |
| 5 | 11.16 | 29.53 | 05.85 | 24.22 | 03.46 | 15.39 | 04.96 | 06.45 | 10.13 | 60.32 | 16.93 | 59.57 |
| 6 | 10.96 | 29.46 | 05.69 | 23.96 | 03.46 | 15.03 | 05.11 | 06.20 | 10.33 | 60.26 | 17.13 | 59.65 |
| 7 | 10.74 | 29.38 | 05.54 | 23.68 | 03.47 | 14.70 | 05.27 | 05.97 | 10.52 | 60.19 | 17.33 | 59.71 |
| 8 | 10.52 | 29.28 | 05.40 | 23.38 | 03.50 | 14.38 | 05.42 | 05.77 | 10.70 | 60.10 | 17.54 | 59.75 |
| 9 | 10.30 | 29.16 | 05.27 | 23.08 | 03.54 | 14.09 | 05.55 | 05.58 | 10.88 | 59.99 | 17.76 | 59.80 |
| 10 | 10.07 | 29.01 | 05.17 | 22.78 | 03.58 | 13.83 | 05.67 | 05.38 | 11.06 | 59.86 | 18.00 | 59.85 |
| 11 | 09.85 | 28.84 | 05.08 | 22.50 | 03.62 | 13.58 | 05.77 | 05.16 | 11.26 | 59.73 | 18.25 | 59.93 |
| 12 | 09.64 | 28.66 | 05.01 | 22.24 | 03.63 | 13.33 | 05.87 | 04.93 | 11.47 | 59.60 | 18.51 | 60.02 |
| 13 | 09.46 | 28.48 | 04.95 | 22.00 | 03.64 | 13.07 | 05.97 | 04.67 | 11.70 | 59.48 | 18.77 | 60.14 |
| 14 | 09.28 | 28.30 | 04.88 | 21.78 | 03.63 | 12.80 | 06.08 | 04.40 | 11.94 | 59.38 | 19.03 | 60.29 |
| 15 | 09.13 | 28.13 | 04.80 | 21.57 | 03.61 | 12.49 | 06.21 | 04.12 | 12.20 | 59.30 | 19.29 | 60.44 |
| 16 | 08.99 | 27.99 | 04.71 | 21.36 | 03.61 | 12.17 | 06.35 | 03.85 | 12.45 | 59.25 | 19.53 | 60.62 |
| 17 | 08.85 | 27.86 | 04.60 | 21.13 | 03.61 | 11.82 | 06.52 | 03.59 | 12.71 | 59.22 | 19.76 | 60.79 |
| 18 | 08.70 | 27.76 | 04.47 | 20.87 | 03.64 | 11.47 | 06.70 | 03.35 | 12.96 | 59.20 | 19.97 | 60.97 |
| 19 | 08.54 | 27.66 | 04.35 | 20.58 | 03.69 | 11.13 | 06.89 | 03.13 | 13.20 | 59.20 | 20.18 | 61.14 |
| 20 | 08.35 | 27.55 | 04.24 | 20.27 | 03.75 | 10.80 | 07.08 | 02.93 | 13.42 | 59.20 | 20.37 | 61.30 |
| 21 | 08.15 | 27.41 | 04.14 | 19.94 | 03.83 | 10.49 | 07.27 | 02.75 | 13.64 | 59.19 | 20.57 | 61.44 |
| 22 | 07.94 | 27.24 | 04.06 | 19.60 | 03.92 | 10.20 | 07.46 | 02.58 | 13.85 | 59.18 | 20.76 | 61.58 |
| 23 | 07.73 | 27.03 | 04.01 | 19.28 | 04.01 | 09.92 | 07.63 | 02.42 | 14.05 | 59.16 | 20.96 | 61.72 |
| 24 | 07.54 | 26.81 | 03.97 | 18.96 | 04.09 | 09.65 | 07.80 | 02.26 | 14.25 | 59.13 | 21.17 | 61.86 |
| 25 | 07.37 | 26.56 | 03.94 | 18.67 | 04.17 | 09.40 | 07.96 | 02.09 | 14.46 | 59.09 | 21.39 | 62.00 |
| 26 | 07.21 | 26.32 | 03.91 | 18.38 | 04.24 | 09.14 | 08.11 | 01.91 | 14.68 | 59.04 | 21.63 | 62.17 |
| 27 | 07.07 | 26.09 | 03.88 | 18.11 | 04.30 | 08.88 | 08.26 | 01.72 | 14.91 | 59.01 | 21.88 | 62.37 |
| 28 | 06.94 | 25.87 | 03.85 | 17.84 | 04.36 | 08.61 | 08.41 | 01.52 | 15.17 | 58.99 | 22.13 | 62.60 |
| 29 | 06.82 | 25.65 | 03.82 | 17.58 | 04.41 | 08.32 | 08.58 | 01.31 | 15.44 | 59.00 | 22.38 | 62.87 |
| 30 | 06.70 | 25.45 | 03.77 | 17.31 | 04.47 | 08.02 | 08.76 | 01.10 | 15.71 | 59.04 | 22.60 | 63.16 |
| 31 | 06.58 | 25.26 | 03.72 | 17.03 | 04.53 | 07.70 | 08.96 | 00.90 | 15.99 | 59.12 | 22.80 | 63.46 |
| 32 | 06.45 | 25.07 | 03.66 | 16.74 | | | 09.18 | 00.72 | | | 22.98 | 63.74 |
| | sec δ | tan δ | sec δ | tan δ | sec δ | tan δ | sec δ | tan δ | sec δ | tan δ | sec δ | tan δ |
| | 10.48 | 10.43 | 10.48 | 10.43 | 10.47 | 10.42 | 10.47 | 10.42 | 10.46 | 10.42 | 10.47 | 10.42 |

Mean R.A. $10^{\text{h}} 59^{\text{m}} 22.65^{\text{s}}$

Double lower transit September 5

Mean Dec. $-84^{\circ} 31' 16.44''$

APPARENT PLACES OF STARS, 1986
CIRCUMPOLAR STARS AT UPPER TRANSIT AT GREENWICH

919 † Octantis Mag. 5.38 Spect. K0

| Day | January | | February | | March | | April | | May | | June | |
|-----|------------------------------------|-------------------------|------------------------------------|-------------------------|------------------------------------|-------------------------|------------------------------------|---------------------------|------------------------------------|-------------------------|------------------------------------|-------------------------|
| | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | ^h ^m 12 53 | ^o / 85 02 | ^h ^m 12 53 | ^o / 85 02 | ^h ^m 12 53 | ^o / 85 02 | ^h ^m 12 53 | ^o / 85 02 | ^h ^m 12 53 | ^o / 85 03 | ^h ^m 12 53 | ^o / 85 03 |
| | ^s 16.74 | " 28.97 | ^s 24.71 | " 34.13 | ^s 30.08 | " 42.77 | ^s 33.05 | " 54.56 | ^s 32.22 | " 06.28 | ^s 28.10 | " 15.33 |
| 1 | 16.74 | 28.97 | 24.71 | 34.13 | 30.08 | 42.77 | 33.05 | 54.56 | 32.22 | 06.28 | 28.10 | 15.33 |
| 2 | 16.98 | 29.02 | 24.97 | 34.36 | 30.27 | 43.11 | 33.09 | 55.01 | 32.10 | 06.62 | 27.93 | 15.51 |
| 3 | 17.23 | 29.07 | 25.25 | 34.61 | 30.46 | 43.48 | 33.10 | 55.45 | 31.98 | 06.94 | 27.76 | 15.70 |
| 4 | 17.51 | 29.11 | 25.52 | 34.90 | 30.65 | 43.88 | 33.10 | 55.87 | 31.86 | 07.24 | 27.61 | 15.90 |
| 5 | 17.80 | 29.17 | 25.78 | 35.21 | 30.81 | 44.29 | ^{33 08} 33.06 | ^{56 27} 56.64 | 31.76 | 07.53 | 27.46 | 16.11 |
| 6 | 18.11 | 29.26 | 26.03 | 35.54 | 30.94 | 44.71 | 33.03 | 57.00 | 31.67 | 07.82 | 27.31 | 16.32 |
| 7 | 18.44 | 29.38 | 26.24 | 35.88 | 31.05 | 45.13 | 33.01 | 57.34 | 31.59 | 08.11 | 27.15 | 16.55 |
| 8 | 18.76 | 29.53 | 26.43 | 36.21 | 31.14 | 45.52 | 33.01 | 57.68 | 31.51 | 08.42 | 26.98 | 16.78 |
| 9 | 19.07 | 29.72 | 26.60 | 36.51 | 31.22 | 45.90 | 33.02 | 58.03 | 31.44 | 08.74 | 26.80 | 17.02 |
| 10 | 19.35 | 29.91 | 26.77 | 36.80 | 31.30 | 46.25 | 33.04 | 58.38 | 31.36 | 09.07 | 26.59 | 17.24 |
| 11 | 19.60 | 30.10 | 26.93 | 37.07 | 31.38 | 46.59 | 33.07 | 58.74 | 31.28 | 09.41 | 26.38 | 17.46 |
| 12 | 19.84 | 30.28 | 27.11 | 37.33 | 31.47 | 46.92 | 33.09 | 59.12 | 31.18 | 09.75 | 26.14 | 17.65 |
| 13 | 20.06 | 30.44 | 27.30 | 37.59 | 31.58 | 47.25 | 33.11 | 59.52 | 31.06 | 10.10 | 25.90 | 17.82 |
| 14 | 20.29 | 30.59 | 27.51 | 37.85 | 31.69 | 47.59 | 33.11 | 59.92 | 30.92 | 10.44 | 25.66 | 17.97 |
| 15 | 20.52 | 30.71 | 27.72 | 38.13 | 31.82 | 47.95 | 33.10 | 60.33 | 30.77 | 10.76 | 25.43 | 18.10 |
| 16 | 20.76 | 30.84 | 27.94 | 38.42 | 31.95 | 48.32 | 33.07 | 60.75 | 30.60 | 11.07 | 25.21 | 18.21 |
| 17 | 21.02 | 30.97 | 28.16 | 38.74 | 32.07 | 48.70 | 33.02 | 61.15 | 30.43 | 11.36 | 25.02 | 18.32 |
| 18 | 21.30 | 31.11 | 28.38 | 39.07 | 32.19 | 49.10 | 32.95 | 61.54 | 30.26 | 11.62 | 24.85 | 18.44 |
| 19 | 21.58 | 31.26 | 28.59 | 39.42 | 32.29 | 49.52 | 32.88 | 61.92 | 30.09 | 11.86 | 24.69 | 18.59 |
| 20 | 21.87 | 31.44 | 28.78 | 39.78 | 32.37 | 49.94 | 32.79 | 62.27 | 29.95 | 12.10 | 24.53 | 18.75 |
| 21 | 22.15 | 31.64 | 28.95 | 40.15 | 32.44 | 50.36 | 32.71 | 62.60 | 29.83 | 12.34 | 24.37 | 18.94 |
| 22 | 22.44 | 31.86 | 29.10 | 40.52 | 32.48 | 50.78 | 32.65 | 62.91 | 29.73 | 12.60 | 24.18 | 19.14 |
| 23 | 22.71 | 32.10 | 29.24 | 40.88 | 32.51 | 51.17 | 32.61 | 63.23 | 29.64 | 12.88 | 23.96 | 19.33 |
| 24 | 22.97 | 32.34 | 29.36 | 41.22 | 32.53 | 51.55 | 32.59 | 63.56 | 29.54 | 13.19 | 23.72 | 19.50 |
| 25 | 23.20 | 32.60 | 29.48 | 41.54 | 32.55 | 51.91 | 32.59 | 63.91 | 29.43 | 13.52 | 23.46 | 19.64 |
| 26 | 23.42 | 32.85 | 29.60 | 41.85 | 32.58 | 52.26 | 32.58 | 64.30 | 29.28 | 13.85 | 23.19 | 19.74 |
| 27 | 23.63 | 33.09 | 29.74 | 42.15 | 32.63 | 52.59 | 32.56 | 64.70 | 29.10 | 14.16 | 22.94 | 19.82 |
| 28 | 23.83 | 33.32 | 29.90 | 42.45 | 32.71 | 52.94 | 32.52 | 65.12 | 28.90 | 14.45 | 22.69 | 19.87 |
| 29 | 24.03 | 33.53 | 30.08 | 42.77 | 32.79 | 53.31 | 32.44 | 65.53 | 28.70 | 14.70 | 22.47 | 19.92 |
| 30 | 24.24 | 33.73 | | | 32.89 | 53.70 | 32.34 | 65.92 | 28.49 | 14.93 | 22.26 | 19.97 |
| 31 | 24.46 | 33.92 | | | 32.98 | 54.12 | 32.22 | 66.28 | 28.29 | 15.14 | 22.06 | 20.02 |
| 32 | 24.71 | 34.13 | | | 33.05 | 54.56 | | | 28.10 | 15.33 | | |
| | sec δ 11.57 | tan δ 11.53 | sec δ 11.58 | tan δ 11.53 | sec δ 11.58 | tan δ 11.54 | sec δ 11.59 | tan δ 11.55 | sec δ 11.60 | tan δ 11.55 | sec δ 11.60 | tan δ 11.56 |

Mean R.A. ^h 12 ^m 53 ^s 27.54

Double lower transit October 4

Mean Dec. -85° 03' 01.1"

APPARENT PLACES OF STARS, 1986
CIRCUMPOLAR STARS AT UPPER TRANSIT AT GREENWICH

451

919 ι Octantis Mag. 5.38 Spect. K0

| Day | July | | August | | September | | October | | November | | December | |
|-----|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " |
| | 12 53 | 85 03 | 12 53 | 85 03 | 12 53 | 85 03 | 12 53 | 85 02 | 12 53 | 85 02 | 12 53 | 85 02 |
| | s | " | s | " | s | " | s | " | s | " | s | " |
| 1 | 22.06 | 20.02 | 15.17 | 19.78 | 09.45 | 14.52 | 06.98 | 66.10 | 08.89 | 56.93 | 14.83 | 51.11 |
| 2 | 21.86 | 20.08 | 14.96 | 19.71 | 09.28 | 14.29 | 06.94 | 65.76 | 09.07 | 56.64 | 15.12 | 51.04 |
| 3 | 21.67 | 20.15 | 14.75 | 19.64 | 09.10 | 14.04 | 06.91 | 65.41 | 09.26 | 56.39 | 15.40 | 51.00 |
| 4 | 21.48 | 20.23 | 14.52 | 19.56 | 08.93 | 13.76 | 06.92 | 65.05 | 09.46 | 56.17 | 15.66 | 50.97 |
| 5 | 21.27 | 20.32 | 14.28 | 19.47 | 08.77 | 13.47 | 06.95 | 64.71 | 09.65 | 55.98 | 15.88 | 50.93 |
| 6 | 21.05 | 20.41 | 14.03 | 19.35 | 08.64 | 13.16 | 07.00 | 64.39 | 09.83 | 55.80 | 16.10 | 50.87 |
| 7 | 20.82 | 20.49 | 13.78 | 19.21 | 08.53 | 12.86 | 07.07 | 64.09 | 09.98 | 55.62 | 16.31 | 50.79 |
| 8 | 20.57 | 20.56 | 13.54 | 19.05 | 08.45 | 12.56 | 07.14 | 63.82 | 10.12 | 55.43 | 16.52 | 50.69 |
| 9 | 20.31 | 20.61 | 13.31 | 18.87 | 08.38 | 12.28 | 07.19 | 63.57 | 10.24 | 55.22 | 16.76 | 50.59 |
| 10 | 20.04 | 20.64 | 13.10 | 18.68 | 08.33 | 12.03 | 07.23 | 63.33 | 10.37 | 54.98 | 17.01 | 50.48 |
| 11 | 19.77 | 20.65 | 12.92 | 18.49 | 08.26 | 11.80 | 07.25 | 63.08 | 10.51 | 54.73 | 17.27 | 50.37 |
| 12 | 19.51 | 20.63 | 12.76 | 18.31 | 08.19 | 11.58 | 07.26 | 62.81 | 10.67 | 54.47 | 17.56 | 50.29 |
| 13 | 19.26 | 20.60 | 12.61 | 18.15 | 08.10 | 11.37 | 07.26 | 62.52 | 10.84 | 54.22 | 17.86 | 50.22 |
| 14 | 19.03 | 20.56 | 12.47 | 18.02 | 07.99 | 11.14 | 07.26 | 62.21 | 11.04 | 53.97 | 18.16 | 50.18 |
| 15 | 18.83 | 20.52 | 12.31 | 17.90 | 07.86 | 10.88 | 07.28 | 61.88 | 11.26 | 53.73 | 18.46 | 50.16 |
| 16 | 18.64 | 20.50 | 12.14 | 17.79 | 07.73 | 10.60 | 07.33 | 61.53 | 11.49 | 53.52 | 18.75 | 50.16 |
| 17 | 18.47 | 20.50 | 11.95 | 17.67 | 07.61 | 10.29 | 07.39 | 61.19 | 11.72 | 53.33 | 19.03 | 50.17 |
| 18 | 18.29 | 20.52 | 11.74 | 17.54 | 07.51 | 09.97 | 07.48 | 60.86 | 11.95 | 53.16 | 19.30 | 50.19 |
| 19 | 18.09 | 20.56 | 11.52 | 17.37 | 07.43 | 09.63 | 07.58 | 60.54 | 12.18 | 53.00 | 19.56 | 50.21 |
| 20 | 17.88 | 20.60 | 11.29 | 17.17 | 07.38 | 09.30 | 07.69 | 60.25 | 12.39 | 52.85 | 19.80 | 50.23 |
| 21 | 17.63 | 20.63 | 11.08 | 16.95 | 07.34 | 08.97 | 07.81 | 59.97 | 12.60 | 52.71 | 20.04 | 50.23 |
| 22 | 17.37 | 20.62 | 10.89 | 16.71 | 07.32 | 08.66 | 07.92 | 59.70 | 12.79 | 52.57 | 20.27 | 50.23 |
| 23 | 17.10 | 20.59 | 10.71 | 16.46 | 07.30 | 08.36 | 08.03 | 59.45 | 12.98 | 52.42 | 20.51 | 50.22 |
| 24 | 16.83 | 20.52 | 10.56 | 16.21 | 07.29 | 08.08 | 08.13 | 59.20 | 13.16 | 52.26 | 20.76 | 50.20 |
| 25 | 16.57 | 20.43 | 10.42 | 15.98 | 07.27 | 07.81 | 08.22 | 58.95 | 13.34 | 52.09 | 21.03 | 50.18 |
| 26 | 16.34 | 20.32 | 10.30 | 15.75 | 07.24 | 07.54 | 08.30 | 58.70 | 13.54 | 51.90 | 21.32 | 50.17 |
| 27 | 16.12 | 20.21 | 10.17 | 15.53 | 07.20 | 07.28 | 08.37 | 58.43 | 13.75 | 51.71 | 21.63 | 50.19 |
| 28 | 15.92 | 20.11 | 10.05 | 15.33 | 07.16 | 07.00 | 08.44 | 58.15 | 13.98 | 51.53 | 21.96 | 50.23 |
| 29 | 15.73 | 20.01 | 09.92 | 15.13 | 07.10 | 06.72 | 08.52 | 57.86 | 14.24 | 51.36 | 22.30 | 50.31 |
| 30 | 15.54 | 19.92 | 09.77 | 14.94 | 07.04 | 06.42 | 08.62 | 57.55 | 14.53 | 51.22 | 22.62 | 50.43 |
| 31 | 15.36 | 19.85 | 09.62 | 14.73 | 06.98 | 06.10 | 08.74 | 57.24 | 14.83 | 51.11 | 22.92 | 50.57 |
| 32 | 15.17 | 19.78 | 09.45 | 14.52 | | | 08.89 | 56.93 | | | 23.19 | 50.72 |
| | sec δ | tan δ | sec δ | tan δ | sec δ | tan δ | sec δ | tan δ | sec δ | tan δ | sec δ | tan δ |
| | 11.60 | 11.56 | 11.60 | 11.56 | 11.60 | 11.55 | 11.59 | 11.55 | 11.59 | 11.54 | 11.58 | 11.54 |

Mean R.A. $12^{\text{h}} 53^{\text{m}} 27.54^{\text{s}}$

Double lower transit October 4

Mean Dec. $-85^{\circ} 03' 01''.21$

APPARENT PLACES OF STARS, 1986
CIRCUMPOLAR STARS AT UPPER TRANSIT AT GREENWICH

1665 \times Octantis Mag. 5.65 Spect. A2

| Day | January | | February | | March | | April | | May | | June | |
|-----|------------------------------------|------------------------------------|------------------------------------|------------------------------------|------------------------------------|------------------------------------|------------------------------------|------------------------------------|------------------------------------|------------------------------------|------------------------------------|------------------------------------|
| | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | ^h ^m 13 38 | ^o ['] 85 42 | ^h ^m 13 38 | ^o ['] 85 42 | ^h ^m 13 38 | ^o ['] 85 42 | ^h ^m 13 38 | ^o ['] 85 42 | ^h ^m 13 38 | ^o ['] 85 43 | ^h ^m 13 38 | ^o ['] 85 43 |
| | ^s 15.60 | ^s 34.56 | ^s 25.41 | ^s 37.66 | ^s 32.93 | ^s 44.83 | ^s 38.30 | ^s 55.72 | ^s 39.40 | ^s 07.52 | ^s 36.31 | ^s 17.54 |
| 1 | 15.60 | 34.56 | 25.41 | 37.66 | 32.93 | 44.83 | 38.30 | 55.72 | 39.40 | 07.52 | 36.31 | 17.54 |
| 2 | 15.88 | 34.55 | 25.75 | 37.82 | 33.21 | 45.12 | 38.43 | 56.15 | 39.32 | 07.89 | 36.15 | 17.77 |
| 3 | 16.17 | 34.53 | 26.10 | 38.00 | 33.49 | 45.44 | 38.52 | 56.58 | 39.24 | 08.23 | 36.00 | 18.00 |
| 4 | 16.48 | 34.51 | 26.46 | 38.22 | 33.76 | 45.79 | 38.58 | 57.00 | 39.16 | 08.55 | 35.86 | 18.24 |
| 5 | 16.82 | 34.49 | 26.81 | 38.47 | 34.01 | 46.16 | 38.63 | 57.40 | 39.09 | 08.87 | 35.73 | 18.48 |
| 6 | 17.19 | 34.50 | 27.13 | 38.74 | 34.23 | 46.54 | 38.66 | 57.78 | 39.04 | 09.18 | 35.60 | 18.74 |
| 7 | 17.58 | 34.54 | 27.43 | 39.01 | 34.43 | 46.92 | 38.70 | 58.13 | 39.00 | 09.49 | 35.46 | 19.01 |
| 8 | 17.96 | 34.61 | 27.70 | 39.29 | 34.59 | 47.29 | 38.75 | 58.47 | 38.97 | 09.81 | 35.30 | 19.29 |
| 9 | 18.33 | 34.72 | 27.94 | 39.55 | 34.75 | 47.64 | 38.80 | 58.81 | 38.95 | 10.14 | 35.13 | 19.57 |
| 10 | 18.68 | 34.85 | 28.18 | 39.79 | 34.89 | 47.97 | 38.88 | 59.14 | 38.92 | 10.49 | 34.94 | 19.84 |
| 11 | 19.00 | 34.97 | 28.41 | 40.01 | 35.04 | 48.28 | 38.96 | 59.48 | 38.88 | 10.85 | 34.73 | 20.11 |
| 12 | 19.29 | 35.09 | 28.66 | 40.22 | 35.21 | 48.58 | 39.05 | 59.84 | 38.83 | 11.22 | 34.50 | 20.37 |
| 13 | 19.57 | 35.19 | 28.92 | 40.42 | 35.38 | 48.88 | 39.15 | 60.21 | 38.75 | 11.59 | 34.26 | 20.60 |
| 14 | 19.84 | 35.28 | 29.19 | 40.63 | 35.58 | 49.18 | 39.23 | 60.60 | 38.65 | 11.97 | 34.01 | 20.81 |
| 15 | 20.13 | 35.34 | 29.48 | 40.85 | 35.78 | 49.50 | 39.31 | 61.00 | 38.54 | 12.33 | 33.77 | 21.00 |
| 16 | 20.42 | 35.41 | 29.78 | 41.09 | 35.99 | 49.83 | ^{39 36} 39.40 | ^{61 41} 61.82 | 38.40 | 12.68 | 33.55 | 21.16 |
| 17 | 20.74 | 35.47 | 30.08 | 41.34 | 36.19 | 50.18 | 39.41 | 62.24 | 38.25 | 13.00 | 33.35 | 21.33 |
| 18 | 21.07 | 35.54 | 30.38 | 41.61 | 36.39 | 50.55 | 39.40 | 62.64 | 38.11 | 13.31 | 33.18 | 21.49 |
| 19 | 21.41 | 35.62 | 30.68 | 41.91 | 36.58 | 50.94 | 39.38 | 63.03 | 37.97 | 13.59 | 33.02 | 21.67 |
| 20 | 21.77 | 35.72 | 30.95 | 42.22 | 36.74 | 51.33 | 39.35 | 63.39 | 37.85 | 13.86 | 32.88 | 21.88 |
| 21 | 22.12 | 35.85 | 31.21 | 42.54 | 36.89 | 51.73 | 39.32 | 63.74 | 37.76 | 14.12 | 32.72 | 22.12 |
| 22 | 22.48 | 35.99 | 31.44 | 42.87 | 37.01 | 52.13 | 39.30 | 64.07 | 37.69 | 14.41 | 32.54 | 22.37 |
| 23 | 22.82 | 36.16 | 31.65 | 43.19 | 37.11 | 52.52 | 39.32 | 64.39 | 37.64 | 14.72 | 32.32 | 22.62 |
| 24 | 23.15 | 36.34 | 31.85 | 43.49 | 37.20 | 52.88 | 39.35 | 64.72 | 37.58 | 15.05 | 32.07 | 22.85 |
| 25 | 23.46 | 36.54 | 32.04 | 43.78 | 37.28 | 53.23 | 39.41 | 65.07 | 37.50 | 15.41 | 31.80 | 23.06 |
| 26 | 23.75 | 36.73 | 32.23 | 44.05 | 37.38 | 53.56 | 39.47 | 65.46 | 37.39 | 15.78 | 31.52 | 23.23 |
| 27 | 24.02 | 36.92 | 32.44 | 44.31 | 37.50 | 53.88 | 39.52 | 65.87 | 37.24 | 16.13 | 31.25 | 23.37 |
| 28 | 24.28 | 37.09 | 32.67 | 44.56 | 37.64 | 54.20 | 39.53 | 66.29 | 37.07 | 16.47 | 30.98 | 23.49 |
| 29 | 24.54 | 37.24 | 32.93 | 44.83 | 37.80 | 54.54 | 39.52 | 66.72 | 36.87 | 16.77 | 30.74 | 23.59 |
| 30 | 24.81 | 37.39 | | | 37.98 | 54.91 | 39.47 | 67.13 | 36.68 | 17.05 | 30.50 | 23.70 |
| 31 | 25.10 | 37.52 | | | 38.15 | 55.30 | 39.40 | 67.52 | 36.49 | 17.31 | 30.29 | 23.80 |
| 32 | 25.41 | 37.66 | | | 38.30 | 55.72 | | | 36.31 | 17.54 | | |
| | sec δ 13.39 | tan δ 13.35 | sec δ 13.39 | tan δ 13.35 | sec δ 13.39 | tan δ 13.35 | sec δ 13.39 | tan δ 13.35 | sec δ 13.39 | tan δ 13.35 | sec δ 13.39 | tan δ 13.35 |

Mean R.A. ^h13 ^m38 ^s33.14

Double lower transit October 16

Mean Dec. $-85^{\circ} 43' 04''.03$

APPARENT PLACES OF STARS, 1986
CIRCUMPOLAR STARS AT UPPER TRANSIT AT GREENWICH

453

1665 α Octantis Mag. 5.65 Spect. A2

| Day | July | | August | | September | | October | | November | | December | |
|-----|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m 13 38 | ° ' / — 85 43 | h m 13 38 | ° ' / — 85 43 | h m 13 38 | ° ' / — 85 43 | h m 13 38 | ° ' / — 85 43 | h m 13 38 | ° ' / — 85 42 | h m 13 38 | ° ' / — 85 42 |
| | s 30.29 | " 23.80 | s 22.43 | " 25.42 | s 15.02 | " 21.80 | s 10.72 | " 14.20 | s 11.22 | " 64.76 | s 16.83 | " 57.60 |
| 1 | 30.08 | 23.91 | 22.19 | 25.41 | 14.78 | 21.62 | 10.61 | 13.88 | 11.36 | 64.44 | 17.15 | 57.47 |
| 2 | 29.88 | 24.04 | 21.93 | 25.40 | 14.54 | 21.41 | 10.52 | 13.54 | 11.54 | 64.14 | 17.45 | 57.36 |
| 3 | 29.67 | 24.17 | 21.66 | 25.39 | 14.29 | 21.19 | 10.46 | 13.19 | 11.72 | 63.88 | 17.73 | 57.27 |
| 4 | 29.45 | 24.31 | 21.37 | 25.36 | 14.07 | 20.94 | 10.43 | 12.85 | 11.90 | 63.64 | 17.97 | 57.18 |
| 5 | 29.22 | 24.46 | 21.06 | 25.31 | 13.86 | 20.67 | 10.44 | 12.52 | 12.06 | 63.43 | 18.20 | 57.07 |
| 6 | 28.97 | 24.60 | 20.76 | 25.24 | 13.69 | 20.40 | 10.46 | 12.22 | 12.20 | 63.22 | 18.42 | 56.94 |
| 7 | 28.70 | 24.74 | 20.45 | 25.14 | 13.54 | 20.13 | 10.49 | 11.94 | 12.32 | 63.00 | 18.64 | 56.78 |
| 8 | 28.41 | 24.86 | 20.16 | 25.02 | 13.42 | 19.88 | 10.50 | 11.68 | 12.42 | 62.76 | 18.89 | 56.62 |
| 9 | 28.11 | 24.96 | 19.90 | 24.89 | 13.31 | 19.65 | 10.50 | 11.44 | 12.52 | 62.50 | 19.15 | 56.45 |
| 10 | 27.80 | 25.04 | 19.66 | 24.75 | 13.20 | 19.44 | 10.48 | 11.19 | 12.63 | 62.22 | 19.43 | 56.28 |
| 11 | 27.50 | 25.09 | 19.45 | 24.62 | 13.07 | 19.25 | 10.43 | 10.93 | 12.76 | 61.92 | 19.74 | 56.13 |
| 12 | 27.22 | 25.12 | 19.25 | 24.51 | 12.93 | 19.07 | 10.38 | 10.64 | 12.92 | 61.62 | 20.06 | 55.99 |
| 13 | 26.96 | 25.14 | 19.06 | 24.41 | 12.76 | 18.87 | 10.33 | 10.33 | 13.10 | 61.33 | 20.39 | 55.87 |
| 14 | 26.72 | 25.16 | 18.87 | 24.34 | 12.57 | 18.66 | 10.30 | 10.00 | 13.30 | 61.05 | 20.72 | 55.78 |
| 15 | 26.50 | 25.19 | 18.66 | 24.28 | 12.37 | 18.41 | 10.28 | 09.66 | 13.52 | 60.78 | 21.05 | 55.71 |
| 16 | 26.31 | 25.24 | 18.41 | 24.22 | 12.18 | 18.14 | 10.30 | 09.30 | 13.74 | 60.54 | 21.36 | 55.65 |
| 17 | 26.11 | 25.31 | 18.15 | 24.15 | 12.01 | 17.85 | 10.33 | 08.96 | 13.97 | 60.31 | 21.67 | 55.61 |
| 18 | 25.89 | 25.41 | 17.86 | 24.04 | 11.86 | 17.54 | 10.39 | 08.62 | 14.20 | 60.11 | 21.95 | 55.57 |
| 19 | 25.65 | 25.51 | 17.57 | 23.91 | 11.74 | 17.22 | 10.47 | 08.30 | 14.41 | 59.91 | 22.23 | 55.52 |
| 20 | 25.37 | 25.60 | 17.30 | 23.74 | 11.64 | 16.91 | 10.55 | 08.00 | 14.62 | 59.73 | 22.49 | 55.47 |
| 21 | 25.07 | 25.67 | 17.04 | 23.55 | 11.56 | 16.62 | 10.63 | 07.72 | 14.81 | 59.54 | 22.75 | 55.41 |
| 22 | 24.76 | 25.70 | 16.80 | 23.35 | 11.49 | 16.33 | 10.70 | 07.44 | 14.98 | 59.35 | 23.02 | 55.34 |
| 23 | 24.44 | 25.71 | 16.58 | 23.15 | 11.42 | 16.06 | 10.77 | 07.18 | 15.16 | 59.14 | 23.30 | 55.25 |
| 24 | 24.14 | 25.68 | 16.39 | 22.95 | 11.35 | 15.80 | 10.82 | 06.91 | 15.33 | 58.93 | 23.60 | 55.17 |
| 25 | 23.86 | 25.64 | 16.20 | 22.77 | 11.27 | 15.55 | 10.87 | 06.65 | 15.52 | 58.70 | 23.92 | 55.09 |
| 26 | 23.59 | 25.59 | 16.02 | 22.59 | 11.18 | 15.30 | 10.90 | 06.37 | 15.72 | 58.46 | 24.28 | 55.02 |
| 27 | 23.35 | 25.54 | 15.85 | 22.43 | 11.08 | 15.05 | 10.93 | 06.07 | 15.96 | 58.22 | 24.65 | 54.99 |
| 28 | 23.11 | 25.50 | 15.66 | 22.27 | 10.96 | 14.78 | 10.97 | 05.76 | 16.22 | 57.99 | 25.04 | 54.99 |
| 29 | 22.89 | 25.46 | 15.46 | 22.12 | 10.84 | 14.50 | 11.02 | 05.44 | 16.52 | 57.78 | 25.42 | 55.03 |
| 30 | 22.66 | 25.44 | 15.25 | 21.96 | 10.72 | 14.20 | 11.10 | 05.10 | 16.83 | 57.60 | 25.78 | 55.10 |
| 31 | 22.43 | 25.42 | 15.02 | 21.80 | | | 11.22 | 04.76 | | | 26.10 | 55.17 |
| 32 | | | | | | | | | | | | |
| | sec δ 13.41 | tan δ 13.37 | sec δ 13.41 | tan δ 13.37 | sec δ 13.40 | tan δ 13.37 | sec δ 13.40 | tan δ 13.36 | sec δ 13.39 | tan δ 13.35 | sec δ 13.39 | tan δ 13.35 |

Mean R.A. 13^h 38^m 33.14^s

Double lower transit October 16

Mean Dec. $-85^{\circ} 43' 04''.03$

APPARENT PLACES OF STARS, 1986
CIRCUMPOLAR STARS AT UPPER TRANSIT AT GREENWICH

920 20 G. Octantis Mag. 6.52 Spect. A2

| Day | January | | February | | March | | April | | May | | June | |
|-----|------------------------------------|------------------------------------|------------------------------------|------------------------------------|------------------------------------|------------------------------------|------------------------------------|------------------------------------|--------------------------------------|--------------------------------------|------------------------------------|------------------------------------|
| | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | ^h ^m 15 19 | ^o ['] 88 04 | ^h ^m 15 19 | ^o ['] 88 04 | ^h ^m 15 20 | ^o ['] 88 04 | ^h ^m 15 20 | ^o ['] 88 04 | ^h ^m 15 20 | ^o ['] 88 05 | ^h ^m 15 20 | ^o ['] 88 05 |
| | ^s | ^s | ^s | ^s | ^s | ^s | ^s | ^s | ^s | ^s | ^s | ^s |
| 1 | 36.54 | 48.61 | 58.42 | 46.73 | 19.33 | 49.65 | 39.25 | 57.02 | 51.26 | 06.96 | 53.78 | 18.16 |
| 2 | 37.07 | 48.47 | 59.22 | 46.71 | 20.13 | 49.78 | 39.85 | 57.36 | 51.45 | 07.35 | 53.66 | 18.45 |
| 3 | 37.63 | 48.31 | 60.08 | 46.71 | 20.95 | 49.94 | 40.39 | 57.72 | 51.60 | 07.73 | 53.56 | 18.74 |
| 4 | 38.23 | 48.13 | 60.96 | 46.74 | 21.78 | 50.14 | 40.86 | 58.07 | 51.73 | 08.08 | 53.48 | 19.03 |
| 5 | 38.90 | 47.95 | 61.85 | 46.81 | 22.58 | 50.36 | 41.29 | 58.41 | 51.86 | 08.42 | 53.43 | 19.32 |
| 6 | 39.63 | 47.79 | 62.70 | 46.90 | 23.34 | 50.60 | 41.68 | 58.73 | 52.00 | 08.73 | 53.37 | 19.63 |
| 7 | 40.42 | 47.64 | 63.51 | 47.02 | 24.03 | 50.86 | 42.06 | 59.04 | 52.17 | 09.04 | 53.32 | 19.95 |
| 8 | 41.24 | 47.53 | 64.26 | 47.14 | 24.67 | 51.11 | 42.45 | 59.33 | 52.36 | 09.35 | 53.24 | 20.29 |
| 9 | 42.05 | 47.46 | 64.96 | 47.26 | 25.27 | 51.35 | 42.86 | 59.60 | 52.58 | 09.66 | 53.12 | 20.64 |
| 10 | 42.82 | 47.41 | 65.62 | 47.36 | 25.84 | 51.58 | 43.30 | 59.87 | 52.82 | 09.98 | 52.97 | 21.00 |
| 11 | 43.54 | 47.38 | 66.28 | 47.45 | 26.41 | 51.79 | 43.77 | 60.14 | 53.05 | 10.32 | 52.76 | 21.35 |
| 12 | 44.20 | 47.35 | 66.94 | 47.51 | 27.00 | 51.98 | 44.26 | 60.43 | ^{53 28} ^{53 47} | ^{10 68} ^{11 06} | 52.51 | 21.70 |
| 13 | 44.83 | 47.30 | 67.64 | 47.57 | 27.61 | 52.16 | 44.76 | 60.72 | 53.63 | 11.44 | 52.22 | 22.04 |
| 14 | 45.44 | 47.25 | 68.37 | 47.63 | 28.26 | 52.34 | 45.26 | 61.04 | 53.75 | 11.83 | 51.91 | 22.35 |
| 15 | 46.05 | 47.17 | 69.13 | 47.68 | 28.94 | 52.54 | 45.74 | 61.37 | 53.82 | 12.22 | 51.59 | 22.64 |
| 16 | 46.69 | 47.08 | 69.92 | 47.75 | 29.64 | 52.74 | 46.20 | 61.73 | 53.84 | 12.61 | 51.29 | 22.91 |
| 17 | 47.37 | 46.98 | 70.74 | 47.84 | 30.35 | 52.96 | 46.62 | 62.10 | 53.82 | 12.98 | 51.04 | 23.15 |
| 18 | 48.08 | 46.88 | 71.57 | 47.95 | 31.05 | 53.21 | 46.99 | 62.47 | 53.79 | 13.33 | 50.83 | 23.40 |
| 19 | 48.83 | 46.79 | 72.39 | 48.08 | 31.74 | 53.47 | 47.31 | 62.85 | 53.76 | 13.66 | 50.68 | 23.65 |
| 20 | 49.62 | 46.72 | 73.19 | 48.23 | 32.40 | 53.76 | 47.59 | 63.21 | 53.76 | 13.96 | 50.56 | 23.92 |
| 21 | 50.43 | 46.66 | 73.96 | 48.41 | 33.02 | 54.06 | 47.84 | 63.56 | 53.81 | 14.26 | 50.43 | 24.23 |
| 22 | 51.25 | 46.63 | 74.69 | 48.59 | 33.59 | 54.36 | 48.08 | 63.89 | 53.92 | 14.55 | 50.26 | 24.56 |
| 23 | 52.06 | 46.62 | 75.38 | 48.78 | 34.12 | 54.67 | 48.34 | 64.19 | 54.08 | 14.87 | 50.02 | 24.91 |
| 24 | 52.85 | 46.63 | 76.02 | 48.97 | 34.60 | 54.96 | 48.65 | 64.48 | 54.24 | 15.22 | 49.71 | 25.25 |
| 25 | 53.62 | 46.66 | 76.64 | 49.13 | 35.07 | 55.23 | 49.02 | 64.77 | 54.37 | 15.60 | 49.33 | 25.57 |
| 26 | 54.34 | 46.70 | 77.26 | 49.28 | 35.55 | 55.48 | 49.43 | 65.07 | 54.44 | 16.00 | 48.91 | 25.86 |
| 27 | 55.02 | 46.74 | 77.90 | 49.41 | 36.07 | 55.71 | 49.88 | 65.40 | 54.44 | 16.40 | 48.48 | 26.13 |
| 28 | 55.68 | 46.77 | 78.59 | 49.53 | 36.64 | 55.93 | 50.31 | 65.76 | 54.37 | 16.80 | 48.05 | 26.37 |
| 29 | 56.32 | 46.78 | 79.33 | 49.65 | 37.26 | 56.17 | 50.69 | 66.15 | 54.24 | 17.18 | 47.65 | 26.59 |
| 30 | 56.98 | 46.78 | | | 37.92 | 56.42 | 51.01 | 66.55 | 54.09 | 17.53 | 47.28 | 26.80 |
| 31 | 57.67 | 46.76 | | | 38.60 | 56.71 | 51.26 | 66.96 | 53.93 | 17.85 | 46.94 | 27.01 |
| 32 | 58.42 | 46.73 | | | 39.25 | 57.02 | | | 53.78 | 18.16 | | |
| | sec δ 29.84 | tan δ 29.83 | sec δ 29.85 | tan δ 29.83 | sec δ 29.87 | tan δ 29.85 | sec δ 29.91 | tan δ 29.89 | sec δ 29.95 | tan δ 29.94 | sec δ 30.00 | tan δ 29.98 |

Mean R.A. ^h ^m ^s 15 20 35.13

Double lower transit November 11

Mean Dec. -88° 05' 07.91"

APPARENT PLACES OF STARS, 1986
CIRCUMPOLAR STARS AT UPPER TRANSIT AT GREENWICH

455

920 20 G. Octantis Mag. 6.52 Spect. A2

| Day | July | | August | | September | | October | | November | | December | |
|-----|-------|-------|--------|-------|-----------|-------|---------|-------|----------|-------|----------|-------|
| | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " |
| | 15 20 | 88 05 | 15 20 | 88 05 | 15 19 | 88 05 | 15 19 | 88 05 | 15 19 | 88 05 | 15 19 | 88 05 |
| | s | " | s | " | s | " | s | " | s | " | s | " |
| 1 | 46.94 | 27.01 | 32.35 | 32.55 | 74.08 | 33.04 | 58.66 | 28.34 | 51.24 | 19.58 | 55.93 | 10.44 |
| 2 | 46.61 | 27.22 | 31.84 | 32.67 | 73.44 | 33.00 | 58.16 | 28.10 | 51.25 | 19.22 | 56.43 | 10.17 |
| 3 | 46.30 | 27.44 | 31.30 | 32.79 | 72.76 | 32.94 | 57.68 | 27.83 | 51.34 | 18.87 | 56.91 | 09.93 |
| 4 | 45.99 | 27.68 | 30.72 | 32.92 | 72.08 | 32.85 | 57.27 | 27.54 | 51.47 | 18.55 | 57.36 | 09.73 |
| 5 | 45.66 | 27.92 | 30.10 | 33.05 | 71.40 | 32.73 | 56.92 | 27.24 | 51.60 | 18.26 | 57.75 | 09.53 |
| 6 | 45.31 | 28.18 | 29.44 | 33.15 | 70.77 | 32.59 | 56.64 | 26.94 | 51.72 | 17.99 | 58.08 | 09.32 |
| 7 | 44.92 | 28.45 | 28.76 | 33.24 | 70.18 | 32.43 | 56.42 | 26.66 | 51.78 | 17.74 | 58.39 | 09.09 |
| 8 | 44.48 | 28.71 | 28.06 | 33.30 | 69.66 | 32.26 | 56.22 | 26.41 | 51.80 | 17.49 | 58.70 | 08.85 |
| 9 | 44.00 | 28.97 | 27.38 | 33.34 | 69.19 | 32.09 | 56.01 | 26.18 | 51.78 | 17.22 | 59.03 | 08.58 |
| 10 | 43.47 | 29.21 | 26.73 | 33.35 | 68.76 | 31.95 | 55.77 | 25.96 | 51.75 | 16.94 | 59.41 | 08.29 |
| 11 | 42.92 | 29.43 | 26.14 | 33.34 | 68.35 | 31.82 | 55.49 | 25.75 | 51.73 | 16.63 | 59.83 | 08.00 |
| 12 | 42.37 | 29.63 | 25.59 | 33.33 | 67.91 | 31.72 | 55.16 | 25.54 | 51.73 | 16.29 | 60.29 | 07.72 |
| 13 | 41.82 | 29.80 | 25.10 | 33.33 | 67.44 | 31.63 | 54.79 | 25.31 | 51.78 | 15.94 | 60.81 | 07.44 |
| 14 | 41.32 | 29.95 | 24.63 | 33.35 | 66.91 | 31.54 | 54.42 | 25.05 | 51.88 | 15.59 | 61.36 | 07.18 |
| 15 | 40.86 | 30.09 | 24.16 | 33.39 | 66.33 | 31.44 | 54.06 | 24.76 | 52.04 | 15.24 | 61.92 | 06.94 |
| 16 | 40.45 | 30.23 | 23.66 | 33.45 | 65.72 | 31.32 | 53.73 | 24.45 | 52.24 | 14.89 | 62.49 | 06.72 |
| 17 | 40.09 | 30.38 | 23.11 | 33.52 | 65.11 | 31.16 | 53.46 | 24.12 | 52.47 | 14.57 | 63.06 | 06.52 |
| 18 | 39.74 | 30.56 | 22.49 | 33.59 | 64.51 | 30.97 | 53.23 | 23.79 | 52.72 | 14.26 | 63.60 | 06.34 |
| 19 | 39.37 | 30.76 | 21.81 | 33.64 | 63.95 | 30.76 | 53.06 | 23.46 | 52.97 | 13.97 | 64.12 | 06.17 |
| 20 | 38.95 | 30.99 | 21.11 | 33.66 | 63.43 | 30.54 | 52.92 | 23.14 | 53.21 | 13.69 | 64.61 | 06.00 |
| 21 | 38.46 | 31.22 | 20.41 | 33.64 | 62.96 | 30.31 | 52.81 | 22.83 | 53.43 | 13.43 | 65.08 | 05.82 |
| 22 | 37.90 | 31.43 | 19.72 | 33.60 | 62.54 | 30.08 | 52.72 | 22.54 | 53.63 | 13.17 | 65.53 | 05.64 |
| 23 | 37.29 | 31.62 | 19.08 | 33.54 | 62.14 | 29.86 | 52.61 | 22.26 | 53.81 | 12.91 | 65.99 | 05.44 |
| 24 | 36.65 | 31.78 | 18.47 | 33.46 | 61.76 | 29.65 | 52.50 | 21.99 | 53.97 | 12.64 | 66.47 | 05.23 |
| 25 | 36.03 | 31.91 | 17.91 | 33.38 | 61.38 | 29.46 | 52.36 | 21.73 | 54.12 | 12.36 | 66.99 | 05.01 |
| 26 | 35.42 | 32.01 | 17.37 | 33.30 | 60.99 | 29.28 | 52.20 | 21.47 | 54.29 | 12.06 | 67.57 | 04.77 |
| 27 | 34.85 | 32.10 | 16.85 | 33.24 | 60.58 | 29.10 | 52.01 | 21.20 | 54.49 | 11.74 | 68.21 | 04.55 |
| 28 | 34.31 | 32.18 | 16.34 | 33.18 | 60.14 | 28.93 | 51.81 | 20.92 | 54.74 | 11.41 | 68.92 | 04.34 |
| 29 | 33.80 | 32.26 | 15.82 | 33.14 | 59.66 | 28.75 | 51.61 | 20.62 | 55.07 | 11.07 | 69.68 | 04.16 |
| 30 | 33.32 | 32.34 | 15.27 | 33.11 | 59.17 | 28.55 | 51.43 | 20.29 | 55.47 | 10.74 | 70.45 | 04.02 |
| 31 | 32.83 | 32.44 | 14.70 | 33.08 | 58.66 | 28.34 | 51.30 | 19.94 | 55.93 | 10.44 | 71.19 | 03.92 |
| 32 | 32.35 | 32.55 | 14.08 | 33.04 | | | 51.24 | 19.58 | | | 71.87 | 03.84 |
| | sec δ | tan δ | sec δ | tan δ | sec δ | tan δ | sec δ | tan δ | sec δ | tan δ | sec δ | tan δ |
| | 30.03 | 30.01 | 30.04 | 30.03 | 30.04 | 30.02 | 30.01 | 29.99 | 29.96 | 29.95 | 29.93 | 29.91 |

Mean R.A. 15^h 20^m 35^s.13

Double lower transit November 11

Mean Dec. -88° 05' 07".91

APPARENT PLACES OF STARS, 1986
CIRCUMPOLAR STARS AT UPPER TRANSIT AT GREENWICH

1666 ρ Octantis Mag. 5.66 Spect. A2

| Day | January | | February | | March | | April | | May | | June | |
|-----|------------------------------------|------------------------------------|------------------------------------|------------------------------------|------------------------------------|------------------------------------|------------------------------------|------------------------------------|------------------------------------|------------------------------------|------------------------------------|------------------------------------|
| | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | ^h ^m 15 39 | [°] ['] 84 25 | ^h ^m 15 39 | [°] ['] 84 25 | ^h ^m 15 39 | [°] ['] 84 25 | ^h ^m 15 40 | [°] ['] 84 25 | ^h ^m 15 40 | [°] ['] 84 25 | ^h ^m 15 40 | [°] ['] 84 25 |
| | ^s 38.97 | ["] 06.03 | ^s 46.58 | ["] 03.48 | ^s 54.08 | ["] 05.62 | ^s 01.50 | ["] 12.11 | ^s 06.36 | ["] 21.35 | ^s 08.08 | ["] 32.13 |
| 1 | 38.97 | 06.03 | 46.58 | 03.48 | 54.08 | 05.62 | 01.50 | 12.11 | 06.36 | 21.35 | 08.08 | 32.13 |
| 2 | 39.15 | 05.87 | 46.86 | 03.43 | 54.37 | 05.72 | 01.73 | 12.42 | 06.45 | 21.73 | 08.06 | 32.42 |
| 3 | 39.33 | 05.70 | 47.16 | 03.40 | 54.67 | 05.85 | 01.95 | 12.75 | 06.53 | 22.09 | 08.05 | 32.70 |
| 4 | 39.53 | 05.51 | 47.47 | 03.40 | 54.97 | 06.01 | 02.14 | 13.08 | 06.60 | 22.43 | 08.04 | 32.98 |
| 5 | 39.76 | 05.31 | 47.79 | 03.43 | 55.27 | 06.20 | 02.31 | 13.40 | 06.66 | 22.75 | 08.05 | 33.27 |
| 6 | 40.01 | 05.12 | 48.10 | 03.50 | 55.55 | 06.41 | 02.46 | 13.70 | 06.73 | 23.05 | 08.06 | 33.57 |
| 7 | 40.28 | 04.95 | 48.40 | 03.58 | 55.82 | 06.64 | 02.61 | 13.98 | 06.81 | 23.34 | 08.07 | 33.88 |
| 8 | 40.56 | 04.82 | 48.67 | 03.68 | 56.05 | 06.86 | 02.76 | 14.25 | 06.90 | 23.63 | 08.07 | 34.21 |
| 9 | 40.85 | 04.72 | 48.92 | 03.77 | 56.28 | 07.08 | 02.92 | 14.50 | 07.00 | 23.92 | 08.06 | 34.55 |
| 10 | 41.13 | 04.65 | 49.16 | 03.85 | 56.49 | 07.28 | 03.09 | 14.74 | 07.10 | 24.23 | 08.04 | 34.91 |
| 11 | 41.38 | 04.60 | 49.39 | 03.91 | 56.70 | 07.46 | 03.27 | 14.99 | 07.21 | 24.55 | 08.00 | 35.26 |
| 12 | 41.62 | 04.54 | 49.63 | 03.96 | 56.91 | 07.63 | 03.45 | 15.25 | 07.32 | 24.89 | 07.94 | 35.61 |
| 13 | 41.84 | 04.48 | 49.87 | 03.99 | 57.13 | 07.79 | 03.65 | 15.52 | 07.42 | 25.24 | 07.87 | 35.94 |
| 14 | 42.05 | 04.41 | 50.13 | 04.02 | 57.37 | 07.94 | 03.85 | 15.81 | 07.50 | 25.61 | 07.79 | 36.26 |
| 15 | 42.26 | 04.31 | 50.40 | 04.05 | 57.61 | 08.10 | 04.04 | 16.12 | 07.58 | 25.99 | 07.70 | 36.55 |
| 16 | 42.47 | 04.20 | 50.68 | 04.09 | 57.87 | 08.28 | 04.23 | 16.44 | 07.63 | 26.37 | 07.61 | 36.82 |
| 17 | 42.70 | 04.08 | 50.97 | 04.14 | 58.13 | 08.47 | 04.40 | 16.79 | ^{07 67} 07.69 | ^{26 75} 27.11 | 07.54 | 37.07 |
| 18 | 42.95 | 03.96 | 51.27 | 04.22 | 58.40 | 08.68 | 04.56 | 17.14 | 07.70 | 27.45 | 07.50 | 37.31 |
| 19 | 43.21 | 03.85 | 51.56 | 04.32 | 58.66 | 08.92 | 04.69 | 17.50 | 07.71 | 27.77 | 07.47 | 37.55 |
| 20 | 43.48 | 03.75 | 51.86 | 04.44 | 58.91 | 09.17 | 04.82 | 17.84 | 07.73 | 28.06 | 07.45 | 37.82 |
| 21 | 43.76 | 03.67 | 52.14 | 04.59 | 59.14 | 09.44 | 04.92 | 18.18 | 07.77 | 28.34 | 07.44 | 38.13 |
| 22 | 44.05 | 03.61 | 52.41 | 04.75 | 59.36 | 09.72 | 05.03 | 18.48 | 07.83 | 28.62 | 07.42 | 38.45 |
| 23 | 44.34 | 03.57 | 52.66 | 04.91 | 59.56 | 10.00 | 05.13 | 18.77 | 07.91 | 28.93 | 07.37 | 38.80 |
| 24 | 44.62 | 03.56 | 52.90 | 05.07 | 59.75 | 10.27 | 05.26 | 19.04 | 08.00 | 29.26 | 07.29 | 39.14 |
| 25 | 44.89 | 03.56 | 53.12 | 05.21 | 59.93 | 10.52 | 05.40 | 19.30 | 08.08 | 29.62 | 07.19 | 39.47 |
| 26 | 45.15 | 03.58 | 53.34 | 05.33 | 60.11 | 10.74 | 05.57 | 19.58 | 08.14 | 30.01 | 07.07 | 39.77 |
| 27 | 45.40 | 03.59 | 53.57 | 05.44 | 60.30 | 10.95 | 05.75 | 19.88 | 08.18 | 30.40 | 06.94 | 40.04 |
| 28 | 45.63 | 03.60 | 53.82 | 05.53 | 60.51 | 11.15 | 05.93 | 20.22 | 08.18 | 30.79 | 06.81 | 40.29 |
| 29 | 45.85 | 03.60 | 54.08 | 05.62 | 60.74 | 11.35 | 06.10 | 20.58 | 08.17 | 31.16 | 06.69 | 40.52 |
| 30 | 46.08 | 03.57 | | | 60.99 | 11.57 | 06.24 | 20.97 | 08.14 | 31.51 | 06.58 | 40.74 |
| 31 | 46.32 | 03.53 | | | 61.25 | 11.83 | 06.36 | 21.35 | 08.11 | 31.83 | 06.48 | 40.95 |
| 32 | 46.58 | 03.48 | | | 61.50 | 12.11 | | | 08.08 | 32.13 | | |
| | sec δ 10.28 | tan δ 10.23 | sec δ 10.28 | tan δ 10.23 | sec δ 10.28 | tan δ 10.23 | sec δ 10.29 | tan δ 10.24 | sec δ 10.29 | tan δ 10.24 | sec δ 10.30 | tan δ 10.25 |

Mean R.A. ^h ^m ^s
15 40 01.61

Double lower transit November 16

Mean Dec. [°] ['] ["]
-84 25 22.57

APPARENT PLACES OF STARS, 1986
CIRCUMPOLAR STARS AT UPPER TRANSIT AT GREENWICH

457

1666 ρ Octantis Mag. 5.66 Spect. A2

| Day | July | | August | | September | | October | | November | | December | |
|-----|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° / | h m | ° / | h m | ° / | h m | ° / | h m | ° / | h m | ° / |
| | 15 40 | 84 25 | 15 39 | 84 25 | 15 39 | 84 25 | 15 39 | 84 25 | 15 39 | 84 25 | 15 39 | 84 25 |
| | s | " | s | " | s | " | s | " | s | " | s | " |
| 1 | 06.48 | 40.95 | 62.06 | 46.82 | 56.04 | 47.93 | 50.63 | 43.89 | 47.72 | 35.62 | 48.99 | 26.57 |
| 2 | 06.39 | 41.16 | 61.90 | 46.95 | 55.82 | 47.91 | 50.45 | 43.67 | 47.71 | 35.27 | 49.15 | 26.29 |
| 3 | 06.31 | 41.39 | 61.74 | 47.09 | 55.59 | 47.87 | 50.27 | 43.43 | 47.72 | 34.92 | 49.32 | 26.05 |
| 4 | 06.23 | 41.62 | 61.55 | 47.24 | 55.35 | 47.81 | 50.11 | 43.16 | 47.76 | 34.61 | 49.47 | 25.83 |
| 5 | 06.14 | 41.87 | 61.36 | 47.38 | 55.12 | 47.72 | 49.98 | 42.88 | 47.80 | 34.32 | 49.60 | 25.63 |
| 6 | 06.05 | 42.14 | 61.14 | 47.51 | 54.89 | 47.60 | 49.87 | 42.59 | 47.83 | 34.06 | 49.72 | 25.42 |
| 7 | 05.94 | 42.41 | 60.92 | 47.62 | 54.68 | 47.46 | 49.78 | 42.33 | 47.85 | 33.82 | 49.82 | 25.19 |
| 8 | 05.81 | 42.68 | 60.69 | 47.70 | 54.50 | 47.32 | 49.71 | 42.09 | 47.85 | 33.57 | 49.91 | 24.94 |
| 9 | 05.67 | 42.95 | 60.46 | 47.76 | 54.34 | 47.17 | 49.63 | 41.87 | 47.84 | 33.31 | 50.01 | 24.67 |
| 10 | 05.51 | 43.21 | 60.24 | 47.79 | 54.19 | 47.04 | 49.55 | 41.67 | 47.81 | 33.04 | 50.13 | 24.38 |
| 11 | 05.34 | 43.44 | 60.04 | 47.80 | 54.05 | 46.94 | 49.45 | 41.48 | 47.79 | 32.74 | 50.26 | 24.08 |
| 12 | 05.17 | 43.65 | 59.86 | 47.81 | 53.91 | 46.85 | 49.33 | 41.28 | 47.77 | 32.41 | 50.41 | 23.78 |
| 13 | 04.99 | 43.83 | 59.70 | 47.82 | 53.75 | 46.78 | 49.20 | 41.07 | 47.77 | 32.07 | 50.57 | 23.50 |
| 14 | 04.83 | 43.99 | 59.55 | 47.86 | 53.57 | 46.72 | 49.05 | 40.83 | 47.79 | 31.72 | 50.75 | 23.22 |
| 15 | 04.69 | 44.14 | 59.40 | 47.91 | 53.37 | 46.64 | 48.91 | 40.57 | 47.82 | 31.37 | 50.94 | 22.97 |
| 16 | 04.57 | 44.29 | 59.25 | 47.99 | 53.16 | 46.54 | 48.79 | 40.28 | 47.88 | 31.03 | 51.14 | 22.74 |
| 17 | 04.46 | 44.45 | 59.07 | 48.08 | 52.94 | 46.41 | 48.67 | 39.97 | 47.95 | 30.70 | 51.33 | 22.53 |
| 18 | 04.37 | 44.63 | 58.87 | 48.17 | 52.73 | 46.25 | 48.58 | 39.65 | 48.02 | 30.39 | 51.52 | 22.33 |
| 19 | 04.26 | 44.85 | 58.65 | 48.24 | 52.52 | 46.06 | 48.50 | 39.33 | 48.10 | 30.10 | 51.69 | 22.15 |
| 20 | 04.15 | 45.08 | 58.42 | 48.29 | 52.33 | 45.86 | 48.44 | 39.02 | 48.18 | 29.83 | 51.86 | 21.97 |
| 21 | 04.00 | 45.32 | 58.18 | 48.30 | 52.16 | 45.65 | 48.39 | 38.72 | 48.25 | 29.56 | 52.02 | 21.79 |
| 22 | 03.83 | 45.55 | 57.94 | 48.28 | 52.01 | 45.44 | 48.35 | 38.44 | 48.31 | 29.31 | 52.17 | 21.59 |
| 23 | 03.64 | 45.76 | 57.72 | 48.24 | 51.86 | 45.24 | 48.31 | 38.18 | 48.36 | 29.05 | 52.32 | 21.39 |
| 24 | 03.44 | 45.93 | 57.51 | 48.18 | 51.73 | 45.05 | 48.26 | 37.92 | 48.41 | 28.79 | 52.47 | 21.17 |
| 25 | 03.24 | 46.08 | 57.32 | 48.12 | 51.60 | 44.88 | 48.21 | 37.67 | 48.45 | 28.51 | 52.64 | 20.93 |
| 26 | 03.04 | 46.20 | 57.13 | 48.07 | 51.46 | 44.71 | 48.14 | 37.43 | 48.49 | 28.21 | 52.83 | 20.68 |
| 27 | 02.85 | 46.30 | 56.96 | 48.02 | 51.31 | 44.56 | 48.07 | 37.17 | 48.54 | 27.89 | 53.04 | 20.44 |
| 28 | 02.68 | 46.39 | 56.79 | 47.98 | 51.16 | 44.40 | 47.99 | 36.91 | 48.61 | 27.56 | 53.28 | 20.21 |
| 29 | 02.51 | 46.49 | 56.62 | 47.96 | 50.99 | 44.25 | 47.90 | 36.62 | 48.71 | 27.22 | 53.55 | 20.01 |
| 30 | 02.36 | 46.59 | 56.44 | 47.95 | 50.82 | 44.08 | 47.82 | 36.31 | 48.83 | 26.88 | 53.81 | 19.85 |
| 31 | 02.21 | 46.70 | 56.25 | 47.94 | 50.63 | 43.89 | 47.76 | 35.98 | 48.99 | 26.57 | 54.08 | 19.73 |
| 32 | 02.06 | 46.82 | 56.04 | 47.93 | | | 47.72 | 35.62 | | | 54.32 | 19.63 |
| | sec δ | tan δ | sec δ | tan δ | sec δ | tan δ | sec δ | tan δ | sec δ | tan δ | sec δ | tan δ |
| | 10.30 | 10.25 | 10.30 | 10.25 | 10.30 | 10.25 | 10.30 | 10.25 | 10.29 | 10.25 | 10.29 | 10.24 |

Mean R.A. $15^{\text{h}} 40^{\text{m}} 01.61^{\text{s}}$

Double lower transit November 16

Mean Dec. $-84^{\circ} 25' 22.57''$

APPARENT PLACES OF STARS, 1986
CIRCUMPOLAR STARS AT UPPER TRANSIT AT GREENWICH

921 26 G. Octantis Mag. 6.13 Spect. A0

| Day | January | | February | | March | | April | | May | | June | |
|-----|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m 16 55 | ° ' " 86 20 | h m 16 55 | ° ' " 86 20 | h m 16 55 | ° ' " 86 20 | h m 16 55 | ° ' " 86 20 | h m 16 55 | ° ' " 86 20 | h m 16 55 | ° ' " 86 20 |
| 1 | s 06.65 | " 33.41 | s 16.48 | " 27.45 | s 27.85 | " 26.00 | s 40.63 | " 28.78 | s 50.72 | " 35.43 | s 56.79 | " 44.79 |
| 2 | 06.84 | 33.18 | 16.86 | 27.28 | 28.29 | 25.97 | 41.07 | 28.98 | 50.98 | 35.75 | 56.85 | 45.09 |
| 3 | 07.04 | 32.92 | 17.28 | 27.11 | 28.76 | 25.95 | 41.48 | 29.19 | 51.22 | 36.06 | 56.92 | 45.38 |
| 4 | 07.26 | 32.64 | 17.73 | 26.97 | 29.25 | 25.97 | 41.86 | 29.42 | 51.43 | 36.35 | 57.00 | 45.66 |
| 5 | 07.51 | 32.35 | 18.19 | 26.85 | 29.74 | 26.01 | 42.22 | 29.64 | 51.64 | 36.63 | 57.09 57.20 | 45.93 46.21 |
| 6 | 07.80 | 32.06 | 18.64 | 26.77 | 30.21 | 26.09 | 42.54 | 29.86 | 51.84 | 36.89 | 57.31 | 46.50 |
| 7 | 08.12 | 31.77 | 19.09 | 26.72 | 30.65 | 26.19 | 42.85 | 30.06 | 52.06 | 37.13 | 57.43 | 46.81 |
| 8 | 08.48 | 31.52 | 19.50 | 26.69 | 31.07 | 26.29 | 43.16 | 30.24 | 52.28 | 37.37 | 57.54 | 47.13 |
| 9 | 08.84 | 31.29 | 19.89 | 26.66 | 31.46 | 26.40 | 43.48 | 30.40 | 52.53 | 37.61 | 57.65 | 47.47 |
| 10 | 09.20 | 31.11 | 20.25 | 26.63 | 31.83 | 26.49 | 43.80 | 30.56 | 52.78 | 37.85 | 57.73 | 47.83 |
| 11 | 09.54 | 30.94 | 20.60 | 26.57 | 32.19 | 26.56 | 44.14 | 30.71 | 53.05 | 38.12 | 57.79 | 48.20 |
| 12 | 09.85 | 30.78 | 20.95 | 26.50 | 32.55 | 26.62 | 44.50 | 30.87 | 53.31 | 38.40 | 57.82 | 48.56 |
| 13 | 10.13 | 30.62 | 21.31 | 26.42 | 32.92 | 26.66 | 44.88 | 31.04 | 53.57 | 38.70 | 57.83 | 48.92 |
| 14 | 10.40 | 30.45 | 21.68 | 26.32 | 33.31 | 26.70 | 45.26 | 31.23 | 53.82 | 39.02 | 57.82 | 49.27 |
| 15 | 10.67 | 30.26 | 22.08 | 26.22 | 33.72 | 26.74 | 45.64 | 31.44 | 54.05 | 39.36 | 57.79 | 49.59 |
| 16 | 10.94 | 30.05 | 22.49 | 26.13 | 34.15 | 26.78 | 46.01 | 31.68 | 54.25 | 39.70 | 57.77 | 49.89 |
| 17 | 11.22 | 29.83 | 22.93 | 26.05 | 34.59 | 26.85 | 46.37 | 31.93 | 54.43 | 40.05 | 57.75 | 50.16 |
| 18 | 11.53 | 29.60 | 23.37 | 25.99 | 35.04 | 26.93 | 46.71 | 32.20 | 54.58 | 40.39 | 57.77 | 50.42 |
| 19 | 11.85 | 29.37 | 23.83 | 25.95 | 35.49 | 27.04 | 47.03 | 32.48 | 54.72 | 40.71 | 57.81 | 50.68 |
| 20 | 12.20 | 29.15 | 24.29 | 25.93 | 35.93 | 27.17 | 47.32 | 32.75 | 54.84 | 41.01 | 57.88 | 50.96 |
| 21 | 12.57 | 28.94 | 24.74 | 25.94 | 36.36 | 27.32 | 47.59 | 33.02 | 54.98 | 41.28 | 57.96 | 51.26 |
| 22 | 12.96 | 28.75 | 25.17 | 25.97 | 36.76 | 27.49 | 47.84 | 33.27 | 55.13 | 41.53 | 58.04 | 51.60 |
| 23 | 13.35 | 28.59 | 25.58 | 26.00 | 37.14 | 27.66 | 48.10 | 33.49 | 55.32 | 41.78 | 58.08 | 51.97 |
| 24 | 13.75 | 28.45 | 25.97 | 26.04 | 37.50 | 27.83 | 48.37 | 33.69 | 55.54 | 42.04 | 58.08 | 52.34 |
| 25 | 14.13 | 28.33 | 26.33 | 26.07 | 37.84 | 27.98 | 48.68 | 33.87 | 55.78 | 42.33 | 58.04 | 52.71 |
| 26 | 14.50 | 28.22 | 26.69 | 26.08 | 38.18 | 28.11 | 49.01 | 34.06 | 56.01 | 42.65 | 57.96 | 53.06 |
| 27 | 14.85 | 28.13 | 27.06 | 26.07 | 38.52 | 28.21 | 49.37 | 34.28 | 56.22 | 43.00 | 57.87 | 53.38 |
| 28 | 15.17 | 28.03 | 27.44 | 26.04 | 38.89 | 28.30 | 49.74 | 34.52 | 56.40 | 43.37 | 57.78 | 53.68 |
| 29 | 15.49 | 27.91 | 27.85 | 26.00 | 39.30 | 28.39 | 50.10 | 34.80 | 56.54 | 43.75 | 57.68 | 53.96 |
| 30 | 15.80 | 27.78 | | | 39.73 | 28.49 | 50.43 | 35.11 | 56.64 | 44.11 | 57.60 | 54.22 |
| 31 | 16.13 | 27.62 | | | 40.18 | 28.62 | 50.72 | 35.43 | 56.72 | 44.46 | 57.53 | 54.48 |
| 32 | 16.48 | 27.45 | | | 40.63 | 28.78 | | | 56.79 | 44.79 | | |
| | sec δ 15.67 | tan δ 15.64 | sec δ 15.67 | tan δ 15.64 | sec δ 15.67 | tan δ 15.64 | sec δ 15.67 | tan δ 15.64 | sec δ 15.68 | tan δ 15.65 | sec δ 15.70 | tan δ 15.66 |

Mean R.A. 16^h 55^m 44.02^s

Double lower transit December 5

Mean Dec. -86° 20' 39.11"

APPARENT PLACES OF STARS, 1986
CIRCUMPOLAR STARS AT UPPER TRANSIT AT GREENWICH

459

921 26 G. Octantis Mag. 6.13 Spect. A0

| Day | July | | August | | September | | October | | November | | December | |
|-----|----------------|------------------|----------------|------------------|----------------|------------------|----------------|------------------|----------------|------------------|----------------|------------------|
| | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m 16 55 | ° ' " / 86 20 | h m 16 55 | ° ' " / 86 21 | h m 16 55 | ° ' " / 86 21 | h m 16 55 | ° ' " / 86 20 | h m 16 55 | ° ' " / 86 20 | h m 16 55 | ° ' " / 86 20 |
| 1 | s 57.53 | " 54.48 | s 53.12 | " 02.40 | s 44.76 | " 06.50 | s 35.49 | " 65.32 | s 28.32 | " 58.90 | s 26.83 | " 49.77 |
| 2 | 57.48 | 54.73 | 52.93 | 02.62 | 44.44 | 06.59 | 35.15 | 65.20 | 28.18 | 58.57 | 26.96 | 49.43 |
| 3 | 57.43 | 55.00 | 52.74 | 02.84 | 44.09 | 06.66 | 34.81 | 65.05 | 28.08 | 58.24 | 27.10 | 49.13 |
| 4 | 57.39 | 55.27 | 52.52 | 03.07 | 43.73 | 06.72 | 34.49 | 64.87 | 28.01 | 57.93 | 27.24 | 48.86 |
| 5 | 57.35 | 55.56 | 52.28 | 03.31 | 43.36 | 06.74 | 34.20 | 64.66 | 27.97 | 57.64 | 27.34 | 48.61 |
| 6 | 57.30 | 55.87 | 52.02 | 03.54 | 42.99 | 06.74 | 33.95 | 64.45 | 27.92 | 57.39 | 27.42 | 48.36 |
| 7 | 57.23 | 56.19 | 51.73 | 03.75 | 42.64 | 06.70 | 33.73 | 64.24 | 27.85 | 57.15 | 27.48 | 48.09 |
| 8 | 57.14 | 56.52 | 51.43 | 03.94 | 42.33 | 06.65 | 33.53 | 64.05 | 27.75 | 56.92 | 27.52 | 47.81 |
| 9 | 57.02 | 56.85 | 51.12 | 04.11 | 42.04 | 06.60 | 33.34 | 63.89 | 27.63 | 56.69 | 27.57 | 47.50 |
| 10 | 56.88 | 57.17 | 50.82 | 04.24 | 41.78 | 06.55 | 33.14 | 63.75 | 27.50 | 56.44 | 27.63 | 47.17 |
| 11 | 56.72 | 57.48 | 50.53 | 04.35 | 41.54 | 06.53 | 32.92 | 63.62 | 27.35 | 56.16 | 27.71 | 46.83 |
| 12 | 56.54 | 57.77 | 50.28 | 04.45 | 41.30 | 06.53 | 32.68 | 63.50 | 27.21 | 55.86 | 27.81 | 46.47 |
| 13 | 56.35 | 58.03 | 50.05 | 04.55 | 41.04 | 06.54 | 32.41 | 63.36 | 27.09 | 55.53 | 27.95 | 46.12 |
| 14 | 56.18 | 58.26 | 49.84 | 04.66 | 40.75 | 06.57 | 32.12 | 63.20 | 26.99 | 55.19 | 28.11 | 45.78 |
| 15 | 56.02 | 58.48 | 49.64 | 04.80 | 40.44 | 06.59 | 31.82 | 63.01 | 26.92 | 54.84 | 28.28 | 45.46 |
| 16 | 55.90 | 58.68 | 49.44 | 04.96 | 40.09 | 06.60 | 31.54 | 62.79 | 26.88 | 54.49 | 28.47 | 45.15 |
| 17 | 55.80 | 58.90 | 49.21 | 05.14 | 39.73 | 06.58 | 31.27 | 62.55 | 26.85 | 54.15 | 28.67 | 44.87 |
| 18 | 55.72 | 59.13 | 48.95 | 05.32 | 39.37 | 06.53 | 31.02 | 62.29 | 26.85 | 53.83 | 28.86 | 44.60 |
| 19 | 55.64 | 59.39 | 48.65 | 05.50 | 39.01 | 06.45 | 30.80 | 62.03 | 26.85 | 53.52 | 29.04 | 44.34 |
| 20 | 55.54 | 59.68 | 48.33 | 05.65 | 38.67 | 06.35 | 30.60 | 61.76 | 26.86 | 53.23 | 29.20 | 44.10 |
| 21 | 55.41 | 59.99 | 47.99 | 05.78 | 38.35 | 06.23 | 30.42 | 61.51 | 26.86 | 52.95 | 29.36 | 43.85 |
| 22 | 55.24 | 60.30 | 47.64 | 05.87 | 38.05 | 06.11 | 30.26 | 61.27 | 26.85 | 52.68 | 29.50 | 43.60 |
| 23 | 55.04 | 60.59 | 47.31 | 05.94 | 37.78 | 05.99 | 30.10 | 61.04 | 26.83 | 52.41 | 29.64 | 43.33 |
| 24 | 54.80 | 60.86 | 46.99 | 05.99 | 37.51 | 05.88 | 29.93 | 60.82 | 26.79 | 52.14 | 29.78 | 43.04 |
| 25 | 54.56 | 61.10 | 46.69 | 06.03 | 37.25 | 05.78 | 29.76 | 60.62 | 26.75 | 51.86 | 29.93 | 42.74 |
| 26 | 54.32 | 61.31 | 46.41 | 06.07 | 37.00 | 05.70 | 29.58 | 60.42 | 26.70 | 51.55 | 30.12 | 42.41 |
| 27 | 54.09 | 61.50 | 46.14 | 06.11 | 36.73 | 05.62 | 29.38 | 60.21 | 26.66 | 51.23 | 30.34 | 42.08 |
| 28 | 53.87 | 61.67 | 45.88 | 06.17 | 36.45 | 05.55 | 29.16 | 60.00 | 26.65 | 50.87 | 30.60 | 41.75 |
| 29 | 53.67 | 61.85 | 45.62 | 06.23 | 36.15 | 05.49 | 28.94 | 59.77 | 26.66 | 50.50 | 30.89 | 41.45 |
| 30 | 53.48 | 62.02 | 45.35 | 06.31 | 35.83 | 05.41 | 28.71 | 59.51 | 26.72 | 50.13 | 31.21 | 41.18 |
| 31 | 53.30 | 62.21 | 45.07 | 06.40 | 35.49 | 05.32 | 28.51 | 59.21 | 26.83 | 49.77 | 31.53 | 40.95 |
| 32 | 53.12 | 62.40 | 44.76 | 06.50 | | | 28.32 | 58.90 | | | 31.84 | 40.75 |
| | sec δ 15.71 | tan δ 15.67 | sec δ 15.71 | tan δ 15.68 | sec δ 15.72 | tan δ 15.68 | sec δ 15.71 | tan δ 15.68 | sec δ 15.70 | tan δ 15.67 | sec δ 15.69 | tan δ 15.66 |

Mean R.A. 16^h 55^m 44.^s02

Double lower transit December 5

Mean Dec. -86° 20' 39".50

APPARENT PLACES OF STARS, 1986
CIRCUMPOLAR STARS AT UPPER TRANSIT AT GREENWICH

922 χ Octantis Mag. 5.22 Spect. K0

| Day | January | | February | | March | | April | | May | | June | |
|-----|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m 18 46 | ° ' " / 87 37 | h m 18 46 | ° ' " / 87 37 | h m 18 46 | ° ' " / 87 37 | h m 18 46 | ° ' " / 87 37 | h m 18 47 | ° ' " / 87 37 | h m 18 47 | ° ' " / 87 37 |
| 1 | s 09.68 | " 29.15 | s 18.31 | " 19.58 | s 32.51 | " 13.31 | s 51.89 | " 10.20 | s 10.57 | " 11.74 | s 25.87 | " 17.52 |
| 2 | 09.76 | 28.86 | 18.69 | 19.25 | 33.09 | 13.09 | 52.63 | 10.18 | 11.17 | 11.92 | 26.19 | 17.76 |
| 3 | 09.83 | 28.54 | 19.13 | 18.92 | 33.71 | 12.87 | 53.34 | 10.20 | 11.71 | 12.09 | 26.50 | 17.99 |
| 4 | 09.91 | 28.19 | 19.62 | 18.60 | 34.38 | 12.67 | 54.02 | 10.23 | 12.22 | 12.26 | 26.82 | 18.20 |
| 5 | 10.03 | 27.82 | 20.15 | 18.31 | 35.07 | 12.51 | 54.67 | 10.28 | 12.71 | 12.41 | 27.16 | 18.41 |
| 6 | 10.19 | 27.43 | 20.71 | 18.04 | 35.76 | 12.38 | 55.27 | 10.33 | 13.19 | 12.55 | 27.52 | 18.62 |
| 7 | 10.41 | 27.04 | 21.26 | 17.81 | 36.43 | 12.27 | 55.84 | 10.36 | 13.66 | 12.67 | 27.90 | 18.83 |
| 8 | 10.69 | 26.67 | 21.79 | 17.60 | 37.07 | 12.18 | 56.40 | 10.39 | 14.16 | 12.78 | 28.29 | 19.06 |
| 9 | 11.01 | 26.32 | 22.28 | 17.41 | 37.67 | 12.10 | 56.95 | 10.39 | 14.67 | 12.89 | 28.69 | 19.31 |
| 10 | 11.35 | 26.00 | 22.74 | 17.21 | 38.23 | 12.02 | 57.51 | 10.39 | 15.21 | 13.00 | 29.09 | 19.58 |
| 11 | 11.67 | 25.71 | 23.17 | 17.01 | 38.77 | 11.92 | 58.10 | 10.37 | 15.76 | 13.13 | 29.47 | 19.87 |
| 12 | 11.96 | 25.44 | 23.59 | 16.79 | 39.31 | 11.81 | 58.70 | 10.36 | 16.34 | 13.27 | 29.83 | 20.17 |
| 13 | 12.21 | 25.18 | 24.01 | 16.55 | 39.85 | 11.68 | 59.34 | 10.35 | 16.92 | 13.43 | 30.15 | 20.49 |
| 14 | 12.44 | 24.90 | 24.44 | 16.30 | 40.41 | 11.54 | 60.00 | 10.36 | 17.50 | 13.61 | 30.43 | 20.81 |
| 15 | 12.64 | 24.61 | 24.90 | 16.04 | 40.99 | 11.39 | 60.68 | 10.38 | 18.06 | 13.81 | 30.67 | 21.13 |
| 16 | 12.84 | 24.31 | 25.39 | 15.77 | 41.61 | 11.25 | 61.36 | 10.43 | 18.59 | 14.04 | 30.88 | 21.43 |
| 17 | 13.06 | 23.98 | 25.92 | 15.51 | 42.25 | 11.11 | 62.04 | 10.50 | 19.09 | 14.27 | 31.07 | 21.70 |
| 18 | 13.30 | 23.64 | 26.47 | 15.26 | 42.92 | 10.99 | 62.70 | 10.59 | 19.55 | 14.51 | 31.27 | 21.95 |
| 19 | 13.56 | 23.30 | 27.06 | 15.03 | 43.61 | 10.90 | 63.34 | 10.70 | 19.98 | 14.74 | 31.49 | 22.18 |
| 20 | 13.87 | 22.95 | 27.66 | 14.82 | 44.30 | 10.82 | 63.94 | 10.82 | 20.38 | 14.95 | 31.75 | 22.40 |
| 21 | 14.21 | 22.60 | 28.27 | 14.64 | 44.99 | 10.77 | 64.50 | 10.94 | 20.77 | 15.13 | 32.06 | 22.62 |
| 22 | 14.58 | 22.27 | 28.87 | 14.47 | 45.67 | 10.74 | 65.03 | 11.05 | 21.18 | 15.29 | 32.40 | 22.87 |
| 23 | 14.99 | 21.96 | 29.45 | 14.33 | 46.31 | 10.73 | 65.55 | 11.13 | 21.62 | 15.43 | 32.75 | 23.16 |
| 24 | 15.41 | 21.67 | 30.00 | 14.19 | 46.92 | 10.72 | 66.07 | 11.18 | 22.12 | 15.57 | 33.07 | 23.48 |
| 25 | 15.83 | 21.40 | 30.51 | 14.06 | 47.49 | 10.70 | 66.62 | 11.21 | 22.66 | 15.73 | 33.35 | 23.82 |
| 26 | 16.24 | 21.15 | 31.00 | 13.90 | 48.04 | 10.67 | 67.23 | 11.24 | 23.22 | 15.92 | 33.57 | 24.17 |
| 27 | 16.63 | 20.91 | 31.49 | 13.73 | 48.59 | 10.60 | 67.88 | 11.28 | 23.77 | 16.16 | 33.74 | 24.51 |
| 28 | 16.99 | 20.67 | 31.98 | 13.53 | 49.17 | 10.52 | 68.57 | 11.35 | 24.29 | 16.42 | 33.86 | 24.84 |
| 29 | 17.32 | 20.43 | 32.51 | 13.31 | 49.78 | 10.42 | 69.26 | 11.45 | 24.75 | 16.70 | 33.96 | 25.16 |
| 30 | 17.64 | 20.17 | | | 50.45 | 10.32 | 69.93 | 11.58 | 25.17 | 16.98 | 34.05 | 25.45 |
| 31 | 17.96 | 19.89 | | | 51.16 | 10.24 | 70.57 | 11.74 | 25.54 | 17.25 | 34.14 | 25.72 |
| 32 | 18.31 | 19.58 | | | 51.89 | 10.20 | | | 25.87 | 17.52 | | |
| | sec δ 24.12 | tan δ 24.09 | sec δ 24.09 | tan δ 24.07 | sec δ 24.08 | tan δ 24.06 | sec δ 24.08 | tan δ 24.06 | sec δ 24.09 | tan δ 24.07 | sec δ 24.11 | tan δ 24.09 |

Mean R.A. $18^{\text{h}} 47^{\text{m}} 04.41^{\text{s}}$

Double lower transit January 2

Mean Dec. $-87^{\circ} 37' 18.92''$

APPARENT PLACES OF STARS, 1986
CIRCUMPOLAR STARS AT UPPER TRANSIT AT GREENWICH

461

922 χ Octantis Mag. 5.22 Spect. K0

| Day | July | | August | | September | | October | | November | | December | |
|-----|--------------------------------------|--------------------------------------|-------------------------|---------------------------|-------------------------|---------------------------|-------------------------|---------------------------|-------------------------|---------------------------|-------------------------|---------------------------|
| | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | ^{h m} 18 47 | ^{o ' "} 87 37 | ^{h m} 18 47 | ^{o ' "} 87 37 | ^{h m} 18 47 | ^{o ' "} 87 37 | ^{h m} 18 46 | ^{o ' "} 87 37 | ^{h m} 18 46 | ^{o ' "} 87 37 | ^{h m} 18 46 | ^{o ' "} 87 37 |
| | ^s 34.14 | ^s 25.72 | ^s 34.27 | ^s 35.18 | ^s 26.00 | ^s 42.70 | ^s 72.45 | ^s 45.88 | ^s 57.69 | ^s 43.46 | ^s 48.52 | ^s 36.13 |
| 1 | 34.14 | 25.72 | 34.27 | 35.18 | 26.00 | 42.70 | 72.45 | 45.88 | 57.69 | 43.46 | 48.52 | 36.13 |
| 2 | 34.24 | 25.98 | 34.18 | 35.46 | 25.63 | 42.93 | 71.89 | 45.93 | 57.24 | 43.23 | 48.44 | 35.78 |
| 3 | 34.36 | 26.24 | 34.08 | 35.76 | 25.21 | 43.15 | 71.31 | 45.94 | 56.86 | 42.99 | 48.39 | 35.46 |
| 4 | ^{34 50} ^{34 66} | ^{26 50} ^{26 78} | 33.96 | 36.07 | 24.75 | 43.37 | 70.74 | 45.93 | 56.52 | 42.75 | 48.35 | 35.17 |
| 5 | 34.82 | 27.06 | 33.81 | 36.39 | 24.27 | 43.55 | 70.19 | 45.87 | 56.23 | 42.53 | 48.29 | 34.91 |
| 6 | 34.98 | 27.37 | 33.63 | 36.72 | 23.77 | 43.71 | 69.68 | 45.80 | 55.96 | 42.33 | 48.20 | 34.66 |
| 7 | 35.13 | 27.69 | 33.40 | 37.04 | 23.28 | 43.83 | 69.23 | 45.72 | 55.68 | 42.16 | 48.06 | 34.40 |
| 8 | 35.25 | 28.03 | 33.13 | 37.35 | 22.81 | 43.93 | 68.81 | 45.65 | 55.37 | 42.01 | 47.89 | 34.13 |
| 9 | 35.34 | 28.38 | 32.83 | 37.63 | 22.39 | 44.01 | 68.42 | 45.60 | 55.01 | 41.86 | 47.71 | 33.83 |
| 10 | 35.40 | 28.74 | 32.53 | 37.88 | 22.00 | 44.10 | 68.04 | 45.57 | 54.63 | 41.69 | 47.54 | 33.51 |
| 11 | 35.40 | 29.09 | 32.23 | 38.11 | 21.65 | 44.19 | 67.64 | 45.56 | 54.21 | 41.51 | 47.38 | 33.17 |
| 12 | 35.38 | 29.43 | 31.96 | 38.32 | 21.31 | 44.31 | 67.20 | 45.56 | 53.79 | 41.30 | 47.26 | 32.81 |
| 13 | 35.33 | 29.74 | 31.73 | 38.51 | 20.97 | 44.45 | 66.71 | 45.56 | 53.37 | 41.07 | 47.17 | 32.45 |
| 14 | 35.27 | 30.03 | 31.53 | 38.71 | 20.59 | 44.60 | 66.19 | 45.55 | 52.98 | 40.81 | 47.12 | 32.08 |
| 15 | 35.23 | 30.29 | 31.37 | 38.93 | 20.18 | 44.77 | 65.65 | 45.51 | 52.61 | 40.53 | 47.11 | 31.72 |
| 16 | 35.22 | 30.54 | 31.21 | 39.17 | 19.71 | 44.93 | 65.09 | 45.44 | 52.28 | 40.25 | 47.12 | 31.37 |
| 17 | 35.25 | 30.78 | 31.03 | 39.44 | 19.20 | 45.07 | 64.54 | 45.35 | 51.99 | 39.96 | 47.16 | 31.04 |
| 18 | 35.32 | 31.03 | 30.81 | 39.73 | 18.66 | 45.19 | 64.01 | 45.23 | 51.73 | 39.68 | 47.20 | 30.72 |
| 19 | 35.41 | 31.31 | 30.54 | 40.03 | 18.12 | 45.28 | 63.50 | 45.10 | 51.49 | 39.41 | 47.24 | 30.42 |
| 20 | 35.50 | 31.63 | 30.21 | 40.31 | 17.58 | 45.34 | 63.03 | 44.95 | 51.27 | 39.16 | 47.27 | 30.13 |
| 21 | 35.55 | 31.97 | 29.84 | 40.58 | 17.06 | 45.38 | 62.59 | 44.81 | 51.05 | 38.92 | 47.28 | 29.85 |
| 22 | 35.54 | 32.33 | 29.44 | 40.81 | 16.56 | 45.40 | 62.18 | 44.68 | 50.82 | 38.69 | 47.27 | 29.56 |
| 23 | 35.48 | 32.68 | 29.04 | 41.02 | 16.09 | 45.43 | 61.78 | 44.55 | 50.58 | 38.47 | 47.25 | 29.26 |
| 24 | 35.37 | 33.02 | 28.65 | 41.21 | 15.65 | 45.45 | 61.39 | 44.44 | 50.31 | 38.24 | 47.22 | 28.95 |
| 25 | 35.22 | 33.34 | 28.28 | 41.38 | 15.22 | 45.49 | 60.99 | 44.34 | 50.03 | 38.01 | 47.19 | 28.60 |
| 26 | 35.05 | 33.64 | 27.93 | 41.54 | 14.80 | 45.53 | 60.58 | 44.25 | 49.73 | 37.76 | 47.19 | 28.24 |
| 27 | 34.89 | 33.91 | 27.60 | 41.71 | 14.38 | 45.59 | 60.14 | 44.16 | 49.42 | 37.49 | 47.23 | 27.85 |
| 28 | 34.73 | 34.17 | 27.28 | 41.88 | 13.94 | 45.66 | 59.68 | 44.07 | 49.12 | 37.18 | 47.33 | 27.44 |
| 29 | 34.59 | 34.42 | 26.97 | 42.07 | 13.47 | 45.74 | 59.19 | 43.96 | 48.86 | 36.85 | 47.50 | 27.05 |
| 30 | 34.47 | 34.67 | 26.67 | 42.26 | 12.98 | 45.82 | 58.69 | 43.83 | 48.66 | 36.49 | 47.72 | 26.68 |
| 31 | 34.36 | 34.92 | 26.35 | 42.48 | 12.45 | 45.88 | 58.18 | 43.66 | 48.52 | 36.13 | 47.96 | 26.34 |
| 32 | 34.27 | 35.18 | 26.00 | 42.70 | | | 57.69 | 43.46 | | | 48.21 | 26.04 |
| | sec δ 24.13 | tan δ 24.11 | sec δ 24.16 | tan δ 24.14 | sec δ 24.17 | tan δ 24.15 | sec δ 24.18 | tan δ 24.15 | sec δ 24.16 | tan δ 24.14 | sec δ 24.14 | tan δ 24.11 |

Mean R.A. ^{h m s}18 47 04.41

Double lower transit January 2

Mean Dec. ^{o ' "}-87 37 18.92

APPARENT PLACES OF STARS, 1986
CIRCUMPOLAR STARS AT UPPER TRANSIT AT GREENWICH

1667 44 G. Octantis Mag. 6.32 Spect. K0

| Day | January | | February | | March | | April | | May | | June | |
|-----|---------------|------------------|---------------|------------------|---------------|------------------|---------------|------------------|---------------|------------------|---------------|------------------|
| | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m 19 53 | ° ' " s 81 23 | h m 19 53 | ° ' " s 81 23 | h m 19 53 | ° ' " s 81 23 | h m 19 53 | ° ' " s 81 23 | h m 19 53 | ° ' " s 81 23 | h m 19 53 | ° ' " s 81 23 |
| 1 | 21.05 | 28.55 | 22.31 | 18.42 | 25.43 | 10.24 | 30.34 | 03.92 | 35.68 | 01.92 | 40.71 | 04.36 |
| 2 | 21.03 | 28.27 | 22.38 | 18.06 | 25.56 | 09.93 | 30.54 | 03.77 | 35.87 | 01.97 | 40.82 | 04.52 |
| 3 | 21.01 | 27.97 | 22.46 | 17.68 | 25.71 | 09.62 | 30.74 | 03.66 | 36.04 | 02.03 | 40.94 | 04.67 |
| 4 | 20.99 | 27.65 | 22.56 | 17.30 | 25.87 | 09.32 | 30.94 | 03.57 | 36.20 | 02.09 | 41.06 | 04.80 |
| 5 | 20.98 | 27.29 | 22.67 | 16.94 | 26.04 | 09.05 | 31.11 | 03.50 | 36.35 | 02.14 | 41.18 | 04.92 |
| 6 | 20.98 | 26.91 | 22.80 | 16.61 | 26.22 | 08.81 | 31.28 | 03.44 | 36.49 | 02.17 | 41.31 | 05.04 |
| 7 | 21.00 | 26.52 | 22.93 | 16.30 | 26.39 | 08.59 | 31.44 | 03.37 | 36.64 | 02.19 | 41.45 | 05.17 |
| 8 | 21.04 | 26.13 | 23.05 | 16.03 | 26.55 | 08.41 | 31.59 | 03.28 | 36.79 | 02.20 | 41.60 | 05.30 |
| 9 | 21.10 | 25.76 | 23.16 | 15.77 | 26.70 | 08.23 | 31.74 | 03.19 | 36.95 | 02.20 | 41.75 | 05.46 |
| 10 | 21.16 | 25.42 | 23.26 | 15.51 | 26.84 | 08.05 | 31.89 | 03.07 | 37.11 | 02.20 | 41.90 | 05.63 |
| 11 | 21.22 | 25.11 | 23.35 | 15.25 | 26.97 | 07.86 | 32.05 | 02.95 | 37.28 | 02.21 | 42.05 | 05.82 |
| 12 | 21.27 | 24.82 | 23.43 | 14.98 | 27.10 | 07.66 | 32.21 | 02.82 | 37.47 | 02.23 | 42.19 | 06.04 |
| 13 | 21.31 | 24.54 | 23.51 | 14.69 | 27.23 | 07.45 | 32.39 | 02.70 | 37.65 | 02.27 | 42.33 | 06.27 |
| 14 | 21.34 | 24.25 | 23.60 | 14.38 | 27.36 | 07.21 | 32.57 | 02.58 | 37.84 | 02.34 | 42.45 | 06.51 |
| 15 | 21.36 | 23.96 | 23.69 | 14.06 | 27.50 | 06.97 | 32.76 | 02.48 | 38.02 | 02.42 | 42.56 | 06.76 |
| 16 | 21.37 | 23.65 | 23.79 | 13.73 | 27.65 | 06.73 | 32.96 | 02.40 | 38.20 | 02.53 | 42.65 | 06.99 |
| 17 | 21.39 | 23.31 | 23.90 | 13.40 | 27.81 | 06.49 | 33.16 | 02.35 | 38.37 | 02.65 | 42.74 | 07.20 |
| 18 | 21.41 | 22.96 | 24.03 | 13.07 | 27.98 | 06.26 | 33.35 | 02.31 | 38.53 | 02.79 | 42.83 | 07.39 |
| 19 | 21.45 | 22.60 | 24.16 | 12.76 | 28.16 | 06.05 | 33.54 | 02.30 | 38.67 | 02.92 | 42.93 | 07.55 |
| 20 | 21.49 | 22.23 | 24.30 | 12.46 | 28.35 | 05.86 | 33.72 | 02.30 | 38.81 | 03.03 | 43.04 | 07.70 |
| 21 | 21.54 | 21.86 | 24.45 | 12.19 | 28.53 | 05.69 | 33.89 | 02.31 | 38.94 | 03.12 | 43.16 | 07.85 |
| 22 | 21.61 | 21.49 | 24.60 | 11.94 | 28.71 | 05.55 | 34.04 | 02.31 | 39.07 | 03.19 | 43.30 | 08.01 |
| 23 | 21.69 | 21.14 | 24.74 | 11.71 | 28.88 | 05.43 | 34.19 | 02.28 | 39.22 | 03.23 | 43.45 | 08.21 |
| 24 | 21.77 | 20.81 | 24.87 | 11.49 | 29.05 | 05.31 | 34.34 | 02.23 | 39.38 | 03.26 | 43.59 | 08.44 |
| 25 | 21.86 | 20.49 | 24.99 | 11.28 | 29.20 | 05.19 | 34.50 | 02.16 | 39.56 | 03.31 | 43.71 | 08.71 |
| 26 | 21.94 | 20.20 | 25.10 | 11.05 | 29.34 | 05.05 | 34.67 | 02.07 | 39.75 | 03.39 | 43.83 | 08.99 |
| 27 | 22.02 | 19.92 | 25.20 | 10.80 | 29.47 | 04.89 | 34.86 | 01.98 | 39.94 | 03.50 | 43.92 | 09.27 |
| 28 | 22.09 | 19.65 | 25.31 | 10.53 | 29.62 | 04.71 | 35.06 | 01.92 | 40.12 | 03.65 | 44.00 | 09.55 |
| 29 | 22.15 | 19.37 | 25.43 | 10.24 | 29.77 | 04.50 | 35.27 | 01.88 | 40.29 | 03.82 | 44.07 | 09.81 |
| 30 | 22.20 | 19.08 | | | 29.95 | 04.29 | 35.48 | 01.89 | 40.44 | 04.00 | 44.13 | 10.06 |
| 31 | 22.25 | 18.76 | | | 30.14 | 04.09 | 35.68 | 01.92 | 40.58 | 04.19 | 44.19 | 10.29 |
| 32 | 22.31 | 18.42 | | | 30.34 | 03.92 | | | 40.71 | 04.36 | | |
| | sec δ 6.68 | tan δ 6.60 | sec δ 6.68 | tan δ 6.60 | sec δ 6.68 | tan δ 6.60 | sec δ 6.68 | tan δ 6.60 | sec δ 6.68 | tan δ 6.60 | sec δ 6.68 | tan δ 6.60 |

Mean R.A. 19^h 53^m 35.77^s

Double lower transit January 19

Mean Dec. -81° 23' 09".18

APPARENT PLACES OF STARS, 1986
CIRCUMPOLAR STARS AT UPPER TRANSIT AT GREENWICH

463

1667 44 G. Octantis Mag. 6.32 Spect. K0

| Day | July | | August | | September | | October | | November | | December | |
|-----|----------------|----------------|--------|-------|-----------|-------|---------|-------|----------|-------|----------|-------|
| | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " |
| | 19 53 | 81 23 | 19 53 | 81 23 | 19 53 | 81 23 | 19 53 | 81 23 | 19 53 | 81 23 | 19 53 | 81 23 |
| | s | " | s | " | s | " | s | " | s | " | s | " |
| 1 | 44.19 | 10.29 | 45.70 | 18.85 | 44.66 | 27.19 | 41.61 | 32.55 | 37.54 | 33.04 | 34.38 | 28.10 |
| 2 | 44.26 | 10.50 | 45.72 | 19.12 | 44.60 | 27.47 | 41.47 | 32.69 | 37.39 | 32.91 | 34.32 | 27.80 |
| 3 | 44.34 | 10.71 | 45.74 | 19.41 | 44.52 | 27.75 | 41.32 | 32.81 | 37.27 | 32.75 | 34.29 | 27.53 |
| 4 | 44.42 | 10.93 | 45.76 | 19.72 | 44.42 | 28.03 | 41.16 | 32.89 | 37.16 | 32.60 | 34.26 | 27.28 |
| 5 | 44.50 | 11.14 | 45.77 | 20.04 | 44.32 | 28.28 | 41.01 | 32.94 | 37.07 | 32.45 | 34.22 | 27.06 |
| 6 | 44.60 | 11.38 | 45.76 | 20.38 | 44.21 | 28.51 | 40.88 | 32.96 | 36.99 | 32.33 | 34.17 | 26.86 |
| 7 | 44.69 | 11.62 | 45.75 | 20.71 | 44.09 | 28.71 | 40.75 | 32.97 | 36.90 | 32.23 | 34.10 | 26.65 |
| 8 | 44.78 | 11.89 | 45.72 | 21.04 | 43.99 | 28.88 | 40.65 | 32.98 | 36.81 | 32.16 | 34.03 | 26.44 |
| 9 | 44.87 | 12.18 | 45.68 | 21.35 | 43.89 | 29.03 | 40.55 | 33.01 | 36.70 | 32.09 | 33.94 | 26.21 |
| 10 | 44.95 | 12.49 | 45.63 | 21.63 | 43.81 | 29.17 | 40.45 | 33.05 | 36.58 | 32.01 | 33.86 | 25.95 |
| 11 | 45.01 | 12.81 | 45.58 | 21.89 | 43.74 | 29.32 | 40.36 | 33.13 | 36.45 | 31.92 | 33.78 | 25.67 |
| 12 | 45.06 | 13.13 | 45.54 | 22.12 | 43.67 | 29.49 | 40.24 | 33.21 | 36.31 | 31.81 | 33.70 | 25.36 |
| 13 | 45.10 | 13.43 | 45.52 | 22.33 | 43.61 | 29.69 | 40.12 | 33.30 | 36.17 | 31.67 | 33.64 | 25.05 |
| 14 | 45.13 | 13.73 | 45.50 | 22.55 | 43.54 | 29.90 | 39.98 | 33.39 | 36.04 | 31.51 | 33.59 | 24.72 |
| 15 | 45.16 | 13.99 | 45.50 | 22.78 | 43.46 | 30.13 | 39.83 | 33.45 | 35.91 | 31.32 | 33.55 | 24.40 |
| 16 | 45.18 | 14.23 | 45.50 | 23.03 | 43.35 | 30.37 | 39.67 | 33.49 | 35.79 | 31.12 | 33.52 | 24.09 |
| 17 | 45.22 | 14.46 | 45.50 | 23.32 | 43.24 | 30.59 | 39.52 | 33.50 | 35.69 | 30.92 | 33.50 | 23.78 |
| 18 | 45.27 | 14.67 | 45.49 | 23.63 | 43.11 | 30.79 | 39.36 | 33.49 | 35.59 | 30.71 | 33.49 | 23.50 |
| 19 | 45.34 | 14.89 | 45.46 | 23.95 | 42.98 | 30.96 | 39.22 | 33.45 | 35.51 | 30.51 | 33.47 | 23.22 |
| 20 | 45.41 45.49 | 15.13 15.40 | 45.41 | 24.27 | 42.84 | 31.11 | 39.08 | 33.41 | 35.42 | 30.33 | 33.45 | 22.96 |
| 21 | 45.56 | 15.71 | 45.34 | 24.57 | 42.71 | 31.24 | 38.95 | 33.36 | 35.35 | 30.15 | 33.42 | 22.71 |
| 22 | 45.61 | 16.04 | 45.27 | 24.85 | 42.59 | 31.35 | 38.84 | 33.31 | 35.26 | 29.99 | 33.38 | 22.46 |
| 23 | 45.65 | 16.37 | 45.19 | 25.11 | 42.47 | 31.45 | 38.72 | 33.27 | 35.18 | 29.84 | 33.34 | 22.19 |
| 24 | 45.66 | 16.71 | 45.11 | 25.35 | 42.37 | 31.56 | 38.62 | 33.24 | 35.08 | 29.69 | 33.30 | 21.91 |
| 25 | 45.67 | 17.02 | 45.04 | 25.57 | 42.27 | 31.67 | 38.50 | 33.23 | 34.98 | 29.54 | 33.25 | 21.61 |
| 26 | 45.66 | 17.32 | 44.97 | 25.78 | 42.17 | 31.79 | 38.39 | 33.23 | 34.87 | 29.37 | 33.21 | 21.27 |
| 27 | 45.66 | 17.60 | 44.92 | 25.99 | 42.07 | 31.92 | 38.27 | 33.23 | 34.76 | 29.17 | 33.17 | 20.91 |
| 28 | 45.65 | 17.86 | 44.86 | 26.21 | 41.97 | 32.07 | 38.14 | 33.23 | 34.64 | 28.95 | 33.16 | 20.53 |
| 29 | 45.65 | 18.10 | 44.81 | 26.43 | 41.86 | 32.23 | 37.99 | 33.22 | 34.54 | 28.69 | 33.17 | 20.15 |
| 30 | 45.66 | 18.35 | 44.77 | 26.67 | 41.74 | 32.39 | 37.84 | 33.19 | 34.45 | 28.40 | 33.20 | 19.78 |
| 31 | 45.68 | 18.60 | 44.72 | 26.92 | 41.61 | 32.55 | 37.69 | 33.13 | 34.38 | 28.10 | 33.23 | 19.43 |
| 32 | 45.70 | 18.85 | 44.66 | 27.19 | | | 37.54 | 33.04 | | | 33.27 | 19.12 |
| | sec δ | tan δ | sec δ | tan δ | sec δ | tan δ | sec δ | tan δ | sec δ | tan δ | sec δ | tan δ |
| | 6.68 | 6.60 | 6.68 | 6.60 | 6.68 | 6.61 | 6.68 | 6.61 | 6.68 | 6.61 | 6.68 | 6.60 |

Mean R.A. 19^h 53^m 35.77^s

Double lower transit January 19

Mean Dec. -81° 23' 09.18"

APPARENT PLACES OF STARS, 1986
CIRCUMPOLAR STARS AT UPPER TRANSIT AT GREENWICH

1668 48 G. Octantis Mag. 7.08 Spect. A0

| Day | January | | February | | March | | April | | May | | June | |
|-----|------------------------------------|-------------------------|------------------------------------|-------------------------|------------------------------------|-------------------------|------------------------------------|-------------------------|------------------------------------|-------------------------|------------------------------------|-------------------------|
| | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | ^h ^m 20 39 | ^o / 84 27 | ^h ^m 20 39 | ^o / 84 27 | ^h ^m 20 39 | ^o / 84 27 | ^h ^m 20 39 | ^o / 84 27 | ^h ^m 20 39 | ^o / 84 27 | ^h ^m 20 39 | ^o / 84 27 |
| | ^s | " | ^s | " | ^s | " | ^s | " | ^s | " | ^s | " |
| 1 | 12.07 | 44.66 | 12.35 | 34.04 | 15.80 | 24.57 | 22.28 | 16.24 | 30.04 | 12.11 | 37.93 | 12.60 |
| 2 | 12.00 | 44.39 | 12.39 | 33.65 | 15.95 | 24.21 | 22.56 | 16.02 | 30.32 | 12.08 | 38.14 | 12.71 |
| 3 | 11.93 | 44.09 | 12.46 | 33.24 | 16.13 | 23.84 | 22.84 | 15.83 | 30.59 | 12.07 | 38.33 | 12.81 |
| 4 | 11.84 | 43.77 | 12.55 | 32.82 | 16.33 | 23.48 | 23.12 | 15.66 | 30.84 | 12.07 | 38.53 | 12.90 |
| 5 | 11.77 | 43.42 | 12.67 | 32.42 | 16.54 | 23.14 | 23.38 | 15.52 | 31.08 | 12.05 | 38.74 | 12.98 |
| 6 | 11.71 | 43.04 | 12.80 | 32.04 | 16.77 | 22.83 | 23.63 | 15.38 | 31.30 | 12.03 | 38.95 | 13.05 |
| 7 | 11.68 | 42.65 | 12.94 | 31.68 | 17.00 | 22.55 | 23.85 | 15.24 | 31.53 | 11.99 | 39.17 | 13.13 |
| 8 | 11.67 | 42.25 | 13.08 | 31.36 | 17.21 | 22.29 | 24.07 | 15.10 | 31.76 | 11.94 | 39.41 | 13.21 |
| 9 | 11.69 | 41.86 | 13.21 | 31.05 | 17.42 | 22.05 | 24.28 | 14.94 | 31.99 | 11.88 | 39.65 | 13.31 |
| 10 | 11.73 | 41.50 | 13.32 | 30.75 | 17.60 | 21.81 | 24.50 | 14.76 | 32.24 | 11.82 | 39.90 | 13.42 |
| 11 | 11.76 | 41.17 | 13.41 | 30.45 | 17.77 | 21.56 | 24.72 | 14.58 | 32.50 | 11.76 | 40.15 | 13.56 |
| 12 | 11.79 | 40.86 | 13.50 | 30.14 | 17.94 | 21.31 | 24.95 | 14.38 | 32.78 | 11.71 | 40.40 | 13.73 |
| 13 | 11.80 | 40.57 | 13.58 | 29.82 | 18.10 | 21.04 | 25.20 | 14.19 | 33.06 | 11.68 | 40.63 | 13.91 |
| 14 | 11.80 | 40.27 | 13.66 | 29.47 | 18.27 | 20.75 | 25.46 | 14.00 | 33.35 | 11.68 | 40.84 | 14.10 |
| 15 | 11.78 | 39.96 | 13.75 | 29.11 | 18.45 | 20.45 | 25.73 | 13.83 | 33.64 | 11.69 | 41.04 | 14.30 |
| 16 | 11.76 | 39.64 | 13.86 | 28.74 | 18.64 | 20.15 | 26.01 | 13.67 | 33.92 | 11.73 | 41.22 | 14.50 |
| 17 | 11.73 | 39.30 | 13.98 | 28.37 | 18.84 | 19.84 | 26.30 | 13.53 | 34.19 | 11.79 | 41.39 | 14.68 |
| 18 | 11.72 | 38.94 | 14.12 | 27.99 | 19.07 | 19.55 | 26.59 | 13.42 | 34.45 | 11.85 | 41.55 | 14.83 |
| 19 | 11.71 | 38.57 | 14.27 | 27.62 | 19.30 | 19.26 | 26.87 | 13.33 | 34.69 | 11.92 | 41.72 | 14.96 |
| 20 | 11.72 | 38.18 | 14.44 | 27.27 | 19.55 | 19.00 | 27.14 | 13.26 | 34.91 | 11.99 | 41.90 | 15.07 |
| 21 | 11.74 | 37.79 | 14.61 | 26.94 | 19.80 | 18.76 | 27.40 | 13.20 | 35.12 | 12.02 | 42.10 | 15.18 |
| 22 | 11.78 | 37.40 | 14.79 | 26.63 | 20.05 | 18.54 | 27.63 | 13.13 | 35.33 | 12.04 | 42.33 | 15.29 |
| 23 | 11.84 | 37.02 | 14.97 | 26.34 | 20.30 | 18.35 | 27.86 | 13.05 | 35.56 | 12.02 | 42.57 | 15.44 |
| 24 | 11.91 | 36.65 | 15.14 | 26.07 | 20.52 | 18.16 | 28.07 | 12.93 | 35.80 | 12.00 | 42.81 | 15.63 |
| 25 | 11.99 | 36.31 | 15.29 | 25.80 | 20.73 | 17.98 | 28.30 | 12.79 | 36.08 | 11.98 | 43.04 | 15.85 |
| 26 | 12.07 | 35.98 | 15.42 | 25.52 | 20.93 | 17.78 | 28.55 | 12.64 | 36.37 | 11.99 | 43.24 | 16.09 |
| 27 | 12.14 | 35.67 | 15.55 | 25.23 | 21.12 | 17.56 | 28.82 | 12.48 | 36.67 | 12.03 | 43.42 | 16.34 |
| 28 | 12.21 | 35.36 | 15.67 | 24.91 | 21.31 | 17.31 | 29.12 | 12.34 | 36.96 | 12.11 | 43.58 | 16.58 |
| 29 | 12.25 | 35.06 | 15.80 | 24.57 | 21.52 | 17.04 | 29.43 | 12.23 | 37.23 | 12.22 | 43.72 | 16.82 |
| 30 | 12.29 | 34.74 | | | 21.75 | 16.77 | 29.74 | 12.15 | 37.49 | 12.34 | 43.85 | 17.04 |
| 31 | 12.32 | 34.40 | | | 22.00 | 16.49 | 30.04 | 12.11 | 37.72 | 12.47 | 43.98 | 17.25 |
| 32 | 12.35 | 34.04 | | | 22.28 | 16.24 | | | 37.93 | 12.60 | | |
| | sec δ 10.36 | tan δ 10.31 | sec δ 10.35 | tan δ 10.31 | sec δ 10.35 | tan δ 10.30 | sec δ 10.35 | tan δ 10.30 | sec δ 10.35 | tan δ 10.30 | sec δ 10.35 | tan δ 10.30 |

Mean R.A. 20^h 39^m 30.^s78

Double lower transit January 30

Mean Dec. -84° 27' 20.0''

APPARENT PLACES OF STARS, 1986
CIRCUMPOLAR STARS AT UPPER TRANSIT AT GREENWICH

1668 48 G. Octantis Mag. 7.08 Spect. A0

| Day | July | | August | | September | | October | | November | | December | |
|-----|-----------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|-----------|-------|---------|-------|----------|-------|----------|-------|
| | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° / | h m | ° / | h m | ° / | h m | ° / | h m | ° / | h m | ° / |
| | 20 39 | 84 27 | 20 39 | 84 27 | 20 39 | 84 27 | 20 39 | 84 27 | 20 39 | 84 27 | 20 39 | 84 27 |
| | s | " | s | " | s | " | s | " | s | " | s | " |
| 1 | 43.98 | 17.25 | ^{47 30} _{47 37} | ^{25 13} _{25 38} | 46.87 | 34.32 | 42.90 | 41.07 | 36.63 | 43.37 | 30.93 | 39.87 |
| 2 | 44.11 | 17.44 | 47.43 | 25.66 | 46.81 | 34.63 | 42.70 | 41.27 | 36.40 | 43.30 | 30.80 | 39.60 |
| 3 | 44.25 | 17.63 | 47.50 | 25.94 | 46.73 | 34.95 | 42.49 | 41.45 | 36.18 | 43.21 | 30.69 | 39.35 |
| 4 | 44.40 | 17.81 | 47.57 | 26.25 | 46.62 | 35.26 | 42.26 | 41.60 | 35.99 | 43.10 | 30.59 | 39.12 |
| 5 | 44.56 | 18.00 | 47.62 | 26.57 | 46.50 | 35.56 | 42.04 | 41.71 | 35.82 | 43.01 | 30.49 | 38.93 |
| 6 | 44.73 | 18.21 | 47.66 | 26.91 | 46.36 | 35.84 | 41.83 | 41.80 | 35.66 | 42.93 | 30.38 | 38.75 |
| 7 | 44.90 | 18.43 | 47.68 | 27.26 | 46.22 | 36.09 | 41.64 | 41.87 | 35.51 | 42.87 | 30.24 | 38.57 |
| 8 | 45.07 | 18.66 | 47.68 | 27.60 | 46.08 | 36.31 | 41.47 | 41.93 | 35.34 | 42.84 | 30.09 | 38.39 |
| 9 | 45.24 | 18.93 | 47.66 | 27.93 | 45.95 | 36.50 | 41.32 | 42.00 | 35.16 | 42.82 | 29.93 | 38.19 |
| 10 | 45.40 | 19.21 | 47.63 | 28.23 | 45.84 | 36.69 | 41.17 | 42.10 | 34.96 | 42.80 | 29.76 | 37.97 |
| 11 | 45.54 | 19.50 | 47.60 | 28.51 | 45.75 | 36.87 | 41.03 | 42.22 | 34.75 | 42.76 | 29.59 | 37.72 |
| 12 | 45.66 | 19.80 | 47.57 | 28.76 | 45.67 | 37.08 | 40.86 | 42.36 | 34.52 | 42.71 | 29.43 | 37.45 |
| 13 | 45.76 | 20.09 | 47.55 | 29.00 | 45.59 | 37.31 | 40.68 | 42.50 | 34.28 | 42.63 | 29.28 | 37.16 |
| 14 | 45.84 | 20.38 | 47.56 | 29.23 | 45.51 | 37.56 | 40.48 | 42.64 | 34.05 | 42.52 | 29.15 | 36.87 |
| 15 | 45.92 | 20.64 | 47.58 | 29.47 | 45.41 | 37.83 | 40.26 | 42.77 | 33.83 | 42.39 | 29.04 | 36.57 |
| 16 | 46.00 | 20.87 | 47.61 | 29.73 | 45.29 | 38.10 | 40.03 | 42.87 | 33.62 | 42.24 | 28.94 | 36.27 |
| 17 | 46.08 | 21.08 | 47.64 | 30.03 | 45.14 | 38.38 | 39.79 | 42.95 | 33.42 | 42.09 | 28.86 | 35.98 |
| 18 | 46.18 | 21.28 | 47.66 | 30.35 | 44.97 | 38.63 | 39.55 | 43.00 | 33.24 | 41.93 | 28.78 | 35.71 |
| 19 | 46.31 | 21.48 | 47.65 | 30.68 | 44.79 | 38.86 | 39.32 | 43.04 | 33.07 | 41.77 | 28.70 | 35.44 |
| 20 | 46.45 | 21.71 | 47.62 | 31.02 | 44.61 | 39.07 | 39.10 | 43.05 | 32.91 | 41.63 | 28.63 | 35.20 |
| 21 | 46.60 | 21.96 | 47.57 | 31.36 | 44.43 | 39.25 | 38.89 | 43.06 | 32.76 | 41.49 | 28.54 | 34.95 |
| 22 | 46.74 | 22.24 | 47.50 | 31.67 | 44.25 | 39.42 | 38.70 | 43.07 | 32.60 | 41.37 | 28.45 | 34.71 |
| 23 | 46.86 | 22.56 | 47.41 | 31.97 | 44.09 | 39.58 | 38.52 | 43.09 | 32.44 | 41.26 | 28.34 | 34.47 |
| 24 | 46.96 | 22.88 | 47.33 | 32.24 | 43.94 | 39.73 | 38.34 | 43.11 | 32.27 | 41.15 | 28.22 | 34.21 |
| 25 | 47.03 | 23.21 | 47.25 | 32.50 | 43.80 | 39.89 | 38.16 | 43.15 | 32.09 | 41.04 | 28.10 | 33.92 |
| 26 | 47.08 | 23.53 | 47.18 | 32.74 | 43.66 | 40.06 | 37.98 | 43.20 | 31.89 | 40.91 | 27.99 | 33.61 |
| 27 | 47.11 | 23.83 | 47.11 | 32.98 | 43.52 | 40.24 | 37.79 | 43.25 | 31.69 | 40.77 | 27.88 | 33.26 |
| 28 | 47.14 | 24.11 | 47.06 | 33.22 | 43.39 | 40.44 | 37.59 | 43.31 | 31.48 | 40.59 | 27.80 | 32.89 |
| 29 | 47.17 | 24.38 | 47.01 | 33.47 | 43.24 | 40.64 | 37.37 | 43.36 | 31.27 | 40.38 | 27.74 | 32.51 |
| 30 | 47.21 | 24.63 | 46.97 | 33.74 | 43.08 | 40.86 | 37.13 | 43.40 | 31.09 | 40.13 | 27.72 | 32.13 |
| 31 | 47.25 | 24.88 | 46.92 | 34.02 | 42.90 | 41.07 | 36.88 | 43.40 | 30.93 | 39.87 | 27.72 | 31.78 |
| 32 | ^{47 30} _{47 37} | ^{25 13} _{25 39} | 46.87 | 34.32 | | | 36.63 | 43.37 | | | 27.72 | 31.46 |
| | sec δ | tan δ | sec δ | tan δ | sec δ | tan δ | sec δ | tan δ | sec δ | tan δ | sec δ | tan δ |
| | 10.35 | 10.30 | 10.36 | 10.31 | 10.36 | 10.31 | 10.36 | 10.31 | 10.36 | 10.31 | 10.36 | 10.31 |

Mean R.A. ^h20 ^m39 ^s30.78

Double lower transit January 30

Mean Dec. -84° 27' 20.09"

APPARENT PLACES OF STARS, 1986
CIRCUMPOLAR STARS AT UPPER TRANSIT AT GREENWICH

923 σ Octantis Mag. 5.48 Spect. F0

| Day | January | | February | | March | | April | | May | | June | |
|-----|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m 20 54 | ° ' / 89 00 | h m 20 54 | ° ' / 89 00 | h m 20 54 | ° ' / 89 00 | h m 20 55 | ° ' / 89 00 | h m 20 56 | ° ' / 89 00 | h m 20 56 | ° ' / 89 00 |
| 1 | s 43.83 | " 63.27 | s 41.07 | " 52.32 | s 56.80 | " 42.33 | s 29.66 | " 33.34 | s 10.70 | " 28.57 | s 53.55 | " 28.52 |
| 2 | 43.36 | 62.99 | 41.18 | 51.91 | 57.51 | 41.95 | 31.12 | 33.09 | 12.25 | 28.52 | 54.70 | 28.63 |
| 3 | 42.82 | 62.70 | 41.39 | 51.49 | 58.33 | 41.56 | 32.60 | 32.87 | 13.72 | 28.49 | 55.81 | 28.72 |
| 4 | 42.26 | 62.37 | 41.72 | 51.06 | 59.28 | 41.18 | 34.05 | 32.68 | 15.09 | 28.47 | 56.91 | 28.79 |
| 5 | 41.71 | 62.02 | 42.18 | 50.64 | 60.33 | 40.82 | 35.44 | 32.52 | 16.39 | 28.44 | 58.03 | 28.86 |
| 6 | 41.22 | 61.64 | 42.75 | 50.23 | 61.45 | 40.48 | 36.76 | 32.36 | 17.64 | 28.39 | 59.18 | 28.92 |
| 7 | 40.86 | 61.23 | 43.38 | 49.86 | 62.58 | 40.18 | 37.99 | 32.20 | 18.87 | 28.34 | 60.40 | 28.99 |
| 8 | 40.63 | 60.82 | 44.00 | 49.51 | 63.69 | 39.90 | 39.17 | 32.03 | 20.10 | 28.27 | 61.66 | 29.06 |
| 9 | 40.54 | 60.43 | 44.59 | 49.19 | 64.73 | 39.63 | 40.30 | 31.85 | 21.37 | 28.20 | 62.98 | 29.14 |
| 10 | 40.54 | 60.05 | 45.11 | 48.87 | 65.70 | 39.37 | 41.44 | 31.66 | 22.70 | 28.12 | 64.33 | 29.24 |
| 11 | 40.57 | 59.71 | 45.55 | 48.55 | 66.60 | 39.11 | 42.60 | 31.46 | 24.08 | 28.04 | 65.70 | 29.37 |
| 12 | 40.57 | 59.39 | 45.93 | 48.23 | 67.45 | 38.83 | 43.81 | 31.24 | 25.53 | 27.98 | 67.04 | 29.52 |
| 13 | 40.52 | 59.08 | 46.29 | 47.89 | 68.28 | 38.54 | 45.09 | 31.03 | 27.04 | 27.93 | 68.35 | 29.69 |
| 14 | 40.38 | 58.77 | 46.64 | 47.53 | 69.13 | 38.24 | 46.44 | 30.82 | 28.58 | 27.90 | 69.58 | 29.87 |
| 15 | 40.19 | 58.46 | 47.04 | 47.15 | 70.02 | 37.92 | 47.86 | 30.62 | 30.13 | 27.90 | 70.72 | 30.06 |
| 16 | 39.95 | 58.13 | 47.49 | 46.76 | 70.97 | 37.60 | 49.34 | 30.44 | 31.67 | 27.91 | 71.76 | 30.25 |
| 17 | 39.70 | 57.78 | 48.01 | 46.37 | 72.01 | 37.27 | 50.86 | 30.29 | 33.16 | 27.95 | 72.72 | 30.42 |
| 18 | 39.48 | 57.41 | 48.63 | 45.98 | 73.12 | 36.95 | 52.39 | 30.15 | 34.59 | 28.00 | 73.64 | 30.57 |
| 19 | 39.29 | 57.03 | 49.33 | 45.59 | 74.31 | 36.65 | 53.90 | 30.04 | 35.92 | 28.06 | 74.56 | 30.69 |
| 20 | 39.18 | 56.63 | 50.11 | 45.22 | 75.57 | 36.36 | 55.37 | 29.95 | 37.16 | 28.10 | 75.54 | 30.79 |
| 21 | 39.15 | 56.23 | 50.96 | 44.86 | 76.86 | 36.09 | 56.75 | 29.86 | 38.33 | 28.13 | 76.63 | 30.89 |
| 22 | 39.21 | 55.83 | 51.83 | 44.53 | 78.16 | 35.85 | 58.04 | 29.77 | 39.48 | 28.13 | 77.84 | 30.99 |
| 23 | 39.37 | 55.43 | 52.70 | 44.22 | 79.44 | 35.63 | 59.25 | 29.67 | 40.68 | 28.10 | 79.12 | 31.13 |
| 24 | 39.60 | 55.05 | 53.53 | 43.92 | 80.64 | 35.42 | 60.43 | 29.54 | 41.98 | 28.06 | 80.43 | 31.30 |
| 25 | 39.88 | 54.68 | 54.28 | 43.64 | 81.77 | 35.22 | 61.63 | 29.39 | 43.41 | 28.03 | 81.69 | 31.51 |
| 26 | 40.19 | 54.34 | 54.96 | 43.34 | 82.81 | 35.00 | 62.91 | 29.21 | 44.94 | 28.02 | 82.86 | 31.74 |
| 27 | 40.47 | 54.01 | 55.58 | 43.03 | 83.80 | 34.76 | 64.32 | 29.03 | 46.53 | 28.04 | 83.90 | 31.98 |
| 28 | 40.70 | 53.69 | 56.17 | 42.70 | 84.79 | 34.50 | 65.84 | 28.87 | 48.10 | 28.10 | 84.83 | 32.22 |
| 29 | 40.86 | 53.38 | 56.80 | 42.33 | 85.84 | 34.21 | 67.45 | 28.74 | 49.61 | 28.19 | 85.67 | 32.45 |
| 30 | 40.96 | 53.05 | | | 87.00 | 33.91 | 69.09 | 28.64 | 51.02 | 28.30 | 86.45 | 32.67 |
| 31 | 41.02 | 52.70 | | | 88.28 | 33.62 | 70.70 | 28.57 | 52.33 | 28.41 | 87.21 | 32.87 |
| 32 | 41.07 | 52.32 | | | 89.66 | 33.34 | | | 53.55 | 28.52 | | |
| | sec δ 58.24 | tan δ 58.23 | sec δ 58.05 | tan δ 58.04 | sec δ 57.90 | tan δ 57.89 | sec δ 57.79 | tan δ 57.78 | sec δ 57.75 | tan δ 57.74 | sec δ 57.78 | tan δ 57.78 |

Mean R.A. 20^h 56^m 12.27^s

Double lower transit February 3

Mean Dec. -89° 00' 37.15''

APPARENT PLACES OF STARS, 1986
CIRCUMPOLAR STARS AT UPPER TRANSIT AT GREENWICH

923 σ Octantis Mag. 5.48 Spect. F0

| Day | July | | August | | September | | October | | November | | December | |
|-----|------------------------------------|------------------------------------|------------------------------------|------------------------------------|------------------------------------|------------------------------------|------------------------------------|------------------------------------|------------------------------------|------------------------------------|------------------------------------|------------------------------------|
| | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | ^h ^m 20 57 | ^o ['] 89 00 | ^h ^m 20 57 | ^o ['] 89 00 | ^h ^m 20 57 | ^o ['] 89 00 | ^h ^m 20 56 | ^o ['] 89 00 | ^h ^m 20 56 | ^o ['] 89 00 | ^h ^m 20 55 | ^o ['] 89 00 |
| | ^s 27.21 | ^s 32.87 | ^s 46.71 | ^s 40.74 | ^s 45.87 | ^s 50.22 | ^s 84.80 | ^s 57.49 | ^s 49.34 | ^s 60.37 | ^s 74.82 | ^s 57.24 |
| 1 | 27.21 | 32.87 | 46.71 | 40.74 | 45.87 | 50.22 | 84.80 | 57.49 | 49.34 | 60.37 | 74.82 | 57.24 |
| 2 | 27.96 | 33.07 | 47.07 | 41.00 | 45.57 | 50.55 | 83.75 | 57.71 | 47.95 | 60.32 | 73.91 | 56.97 |
| 3 | 28.75 | 33.25 | 47.46 | 41.27 | 45.19 | 50.88 | 82.60 | 57.91 | 46.64 | 60.25 | 73.13 | 56.73 |
| 4 | 29.57 | 33.43 | 47.87 | 41.56 | 44.70 | 51.21 | 81.39 | 58.09 | 45.45 | 60.16 | 72.43 | 56.50 |
| 5 | 30.45 | 33.62 | 48.28 | 41.87 | 44.11 | 51.53 | 80.16 | 58.22 | 44.38 | 60.07 | 71.73 | 56.30 |
| 6 | 31.37 | 33.81 | ^{48 64} 48.93 | ^{42 20} 42.54 | 43.42 | 51.82 | 78.97 | 58.33 | 43.40 | 60.00 | 70.97 | 56.13 |
| 7 | 32.33 | 34.03 | 49.13 | 42.89 | 42.68 | 52.09 | 77.87 | 58.42 | 42.44 | 59.96 | 70.13 | 55.96 |
| 8 | 33.30 | 34.26 | 49.22 | 43.24 | 41.94 | 52.33 | 76.88 | 58.50 | 41.46 | 59.94 | 69.20 | 55.78 |
| 9 | 34.25 | 34.51 | 49.21 | 43.58 | 41.25 | 52.54 | 75.97 | 58.59 | 40.40 | 59.93 | 68.20 | 55.58 |
| 10 | 35.16 | 34.79 | 49.12 | 43.90 | 40.63 | 52.74 | 75.11 | 58.70 | 39.25 | 59.92 | 67.16 | 55.37 |
| 11 | 36.00 | 35.08 | 48.99 | 44.19 | 40.11 | 52.95 | 74.25 | 58.83 | 38.01 | 59.90 | 66.11 | 55.13 |
| 12 | 36.74 | 35.37 | 48.88 | 44.45 | 39.66 | 53.16 | 73.35 | 58.99 | 36.69 | 59.86 | 65.10 | 54.87 |
| 13 | 37.38 | 35.67 | 48.82 | 44.70 | 39.24 | 53.40 | 72.35 | 59.15 | 35.34 | 59.80 | 64.14 | 54.58 |
| 14 | 37.93 | 35.95 | 48.84 | 44.94 | 38.80 | 53.67 | 71.25 | 59.31 | 33.98 | 59.71 | 63.25 | 54.29 |
| 15 | 38.41 | 36.21 | 48.96 | 45.18 | 38.29 | 53.95 | 70.04 | 59.45 | 32.64 | 59.59 | 62.46 | 53.99 |
| 16 | 38.87 | 36.45 | 49.14 | 45.45 | 37.67 | 54.25 | 68.76 | 59.58 | 31.36 | 59.46 | 61.74 | 53.69 |
| 17 | 39.36 | 36.67 | 49.33 | 45.75 | 36.92 | 54.54 | 67.43 | 59.68 | 30.15 | 59.32 | 61.10 | 53.41 |
| 18 | 39.93 | 36.87 | 49.48 | 46.07 | 36.07 | 54.81 | 66.09 | 59.76 | 29.02 | 59.17 | 60.51 | 53.13 |
| 19 | 40.60 | 37.07 | 49.52 | 46.42 | 35.13 | 55.06 | 64.78 | 59.81 | 27.96 | 59.03 | 59.95 | 52.87 |
| 20 | 41.37 | 37.28 | 49.44 | 46.77 | 34.16 | 55.29 | 63.52 | 59.84 | 26.95 | 58.89 | 59.38 | 52.61 |
| 21 | 42.19 | 37.53 | 49.24 | 47.12 | 33.19 | 55.50 | 62.32 | 59.87 | 25.98 | 58.76 | 58.79 | 52.37 |
| 22 | 42.99 | 37.81 | 48.93 | 47.45 | 32.24 | 55.68 | 61.18 | 59.90 | 25.02 | 58.65 | 58.15 | 52.13 |
| 23 | 43.71 | 38.12 | 48.55 | 47.76 | 31.33 | 55.86 | 60.10 | 59.93 | 24.03 | 58.54 | 57.46 | 51.88 |
| 24 | 44.32 | 38.45 | 48.15 | 48.04 | 30.48 | 56.04 | 59.05 | 59.97 | 23.01 | 58.44 | 56.71 | 51.62 |
| 25 | 44.79 | 38.78 | 47.75 | 48.32 | 29.67 | 56.21 | 58.02 | 60.02 | 21.93 | 58.34 | 55.93 | 51.34 |
| 26 | 45.15 | 39.10 | 47.38 | 48.57 | 28.91 | 56.40 | 56.97 | 60.09 | 20.77 | 58.23 | 55.14 | 51.02 |
| 27 | 45.43 | 39.41 | 47.06 | 48.83 | 28.16 | 56.59 | 55.88 | 60.16 | 19.55 | 58.09 | 54.40 | 50.68 |
| 28 | 45.67 | 39.70 | 46.78 | 49.08 | 27.40 | 56.80 | 54.73 | 60.23 | 18.30 | 57.93 | 53.76 | 50.30 |
| 29 | 45.89 | 39.97 | 46.54 | 49.35 | 26.61 | 57.03 | 53.49 | 60.30 | 17.05 | 57.73 | 53.26 | 49.92 |
| 30 | 46.12 | 40.23 | 46.32 | 49.62 | 25.75 | 57.26 | 52.17 | 60.36 | 15.87 | 57.49 | 52.92 | 49.54 |
| 31 | 46.39 | 40.48 | 46.11 | 49.92 | 24.80 | 57.49 | 50.77 | 60.38 | 14.82 | 57.24 | 52.70 | 49.18 |
| 32 | 46.71 | 40.74 | 45.87 | 50.22 | | | 49.34 | 60.37 | | | 52.53 | 48.85 |
| | sec δ 57.88 | tan δ 57.88 | sec δ 58.03 | tan δ 58.02 | sec δ 58.18 | tan δ 58.17 | sec δ 58.26 | tan δ 58.25 | sec δ 58.26 | tan δ 58.25 | sec δ 58.17 | tan δ 58.16 |

Mean R.A. $20^{\text{h}} 56^{\text{m}} 12.27^{\text{s}}$

Double lower transit February 3

Mean Dec. $-89^{\circ} 00' 37.15''$

APPARENT PLACES OF STARS, 1986
CIRCUMPOLAR STARS AT UPPER TRANSIT AT GREENWICH

1670 ν Octantis \searrow Mag. 5.74 Spect. K0

| Day | January | | February | | March | | April | | May | | June | |
|-----|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " | h m | ° ' " |
| | 22 29 | 86 02 | 22 29 | 86 02 | 22 29 | 86 02 | 22 29 | 86 02 | 22 29 | 86 02 | 22 29 | 86 02 |
| | s | " | s | " | s | " | s | " | s | " | s | " |
| 1 | 06.54 | 46.28 | 01.89 | 36.77 | 01.79 | 26.15 | 06.06 | 14.57 | 13.87 | 05.93 | 23.95 | 01.36 |
| 2 | 06.32 | 46.08 | 01.76 | 36.40 | 01.82 | 25.73 | 06.31 | 14.20 | 14.21 | 05.73 | 24.26 | 01.33 |
| 3 | 06.09 | 45.87 | 01.65 | 35.99 | 01.87 | 25.30 | 06.57 | 13.85 | 14.54 | 05.54 | 24.55 | 01.30 |
| 4 | 05.84 | 45.64 | 01.58 | 35.57 | 01.95 | 24.85 | 06.84 | 13.53 | 14.85 | 05.37 | 24.84 | 01.25 |
| 5 | 05.58 | 45.38 | 01.53 | 35.14 | 02.07 | 24.42 | 07.10 | 13.23 | 15.14 | 05.21 | 25.13 | 01.19 |
| 6 | 05.33 | 45.09 | 01.52 | 34.73 | 02.20 | 24.00 | 07.34 | 12.95 | 15.41 | 05.04 | 25.43 | 01.12 |
| 7 | 05.10 | 44.76 | 01.53 | 34.33 | 02.36 | 23.61 | 07.56 | 12.67 | 15.67 | 04.86 | 25.75 | 01.05 |
| 8 | 04.91 | 44.42 | 01.55 | 33.95 | 02.51 | 23.24 | 07.77 | 12.40 | 15.94 | 04.66 | 26.08 | 00.98 |
| 9 | 04.75 | 44.08 | 01.57 | 33.60 | 02.64 | 22.89 | 07.96 | 12.11 | 16.21 | 04.46 | 26.43 | 00.92 |
| 10 | 04.62 | 43.75 | 01.56 | 33.27 | 02.77 | 22.56 | 08.15 | 11.82 | 16.49 | 04.25 | 26.80 | 00.87 |
| 11 | 04.51 | 43.44 | 01.54 | 32.94 | 02.87 | 22.23 | 08.34 | 11.51 | 16.80 | 04.03 | 27.17 | 00.84 |
| 12 | 04.40 | 43.15 | 01.50 | 32.60 | 02.95 | 21.89 | 08.55 | 11.19 | 17.12 | 03.82 | 27.55 | 00.84 |
| 13 | 04.27 | 42.89 | 01.45 | 32.25 | 03.03 | 21.53 | 08.77 | 10.86 | 17.46 | 03.62 | 27.92 | 00.86 |
| 14 | 04.12 | 42.63 | 01.40 | 31.89 | 03.11 | 21.17 | 09.01 | 10.53 | 17.82 | 03.43 | 28.28 | 00.90 |
| 15 | 03.96 | 42.37 | 01.34 | 31.51 | 03.20 | 20.79 | 09.27 | 10.20 | 18.18 | 03.26 | 28.62 | 00.95 |
| 16 | 03.78 | 42.10 | 01.30 | 31.11 | 03.30 | 20.39 | 09.55 | 09.88 | 18.55 | 03.12 | 28.93 | 01.01 |
| 17 | 03.59 | 41.81 | 01.28 | 30.70 | 03.42 | 19.99 | 09.85 | 09.58 | 18.92 | 03.00 | 29.22 | 01.06 |
| 18 | 03.40 | 41.50 | 01.28 | 30.29 | 03.56 | 19.58 | 10.16 | 09.30 | 19.27 | 02.89 | 29.49 | 01.09 |
| 19 | 03.21 | 41.18 | 01.30 | 29.87 | 03.73 | 19.18 | 10.47 | 09.04 | 19.60 | 02.80 | 29.76 | 01.10 |
| 20 | 03.04 | 40.83 | 01.35 | 29.45 | 03.92 | 18.79 | 10.78 | 08.80 | 19.90 | 02.71 | 30.03 | 01.09 |
| 21 | 02.89 | 40.47 | 01.41 | 29.04 | 04.12 | 18.42 | 11.06 | 08.58 | 20.18 | 02.61 | 30.34 | 01.06 |
| 22 | 02.76 | 40.10 | 01.49 | 28.65 | 04.33 | 18.06 | 11.33 | 08.36 | 20.45 | 02.48 | 30.68 | 01.03 |
| 23 | 02.66 | 39.73 | 01.58 | 28.29 | 04.54 | 17.73 | 11.57 | 08.14 | 20.73 | 02.33 | 31.04 | 01.02 |
| 24 | 02.57 | 39.37 | 01.66 | 27.94 | 04.74 | 17.42 | 11.79 | 07.89 | 21.03 | 02.15 | 31.43 | 01.05 |
| 25 | 02.51 | 39.02 | 01.72 | 27.60 | 04.92 | 17.12 | 12.01 | 07.62 | 21.36 | 01.97 | 31.80 | 01.10 |
| 26 | 02.45 | 38.68 | 01.76 | 27.26 | 05.07 | 16.81 | 12.25 | 07.33 | 21.73 | 01.80 | 32.17 | 01.19 |
| 27 | 02.40 | 38.36 | 01.78 | 26.92 | 05.21 | 16.49 | 12.52 | 07.02 | 22.12 | 01.66 | 32.50 | 01.30 |
| 28 | 02.33 | 38.05 | 01.79 | 26.55 | 05.34 | 16.14 | 12.83 | 06.71 | 22.52 | 01.55 | 32.81 | 01.42 |
| 29 | 02.24 | 37.75 | 01.79 | 26.15 | 05.47 | 15.77 | 13.16 | 06.42 | 22.91 | 01.48 | 33.09 | 01.54 |
| 30 | 02.14 | 37.44 | | | 05.64 | 15.37 | 13.51 | 06.16 | 23.28 | 01.43 | 33.36 | 01.66 |
| 31 | 02.02 | 37.12 | | | 05.83 | 14.97 | 13.87 | 05.93 | 23.63 | 01.39 | 33.62 | 01.76 |
| 32 | 01.89 | 36.77 | | | 06.06 | 14.57 | | | 23.95 | 01.36 | | |
| | sec δ | tan δ | sec δ | tan δ | sec δ | tan δ | sec δ | tan δ | sec δ | tan δ | sec δ | tan δ |
| | 14.50 | 14.46 | 14.49 | 14.45 | 14.48 | 14.44 | 14.47 | 14.43 | 14.46 | 14.42 | 14.46 | 14.42 |

Mean R.A. $22^{\text{h}} 29^{\text{m}} 18.35^{\text{s}}$

Double lower transit February 27

Mean Dec. $-86^{\circ} 02' 13.39''$

APPARENT PLACES OF STARS, 1986
CIRCUMPOLAR STARS AT UPPER TRANSIT AT GREENWICH

1670 ν Octantis Mag. 5.74 Spect. K0

| Day | July | | August | | September | | October | | November | | December | |
|-----|------------------------------------|-----------------------|------------------------------------|---------------------------|------------------------------------|-----------------------|------------------------------------|-----------------------|------------------------------------|-----------------------|------------------------------------|-----------------------|
| | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | ^h ^m 22 29 | — ° ' " | ^h ^m 22 29 | — ° ' " | ^h ^m 22 29 | — ° ' " | ^h ^m 22 29 | — ° ' " | ^h ^m 22 29 | — ° ' " | ^h ^m 22 29 | — ° ' " |
| | ^s | " | ^s | " | ^s | " | ^s | " | ^s | " | ^s | " |
| 1 | 33.62 | 01.76 | 41.33 | 06.84 | 44.94 | 15.53 | 42.99 | 24.32 | 36.11 | 30.63 | 27.24 | 31.45 |
| 2 | 33.87 | 01.85 | 41.53 | 07.04 | 45.00 | 15.86 | 42.83 | 24.63 | 35.78 | 30.73 | 26.95 | 31.31 |
| 3 | 34.13 | 01.94 | 41.73 | 07.25 | 45.03 | 16.20 | 42.64 | 24.93 | 35.46 | 30.80 | 26.69 | 31.17 |
| 4 | 34.40 | 02.01 | 41.95 | 07.47 | 45.05 | 16.55 | 42.43 | 25.21 | 35.17 | 30.84 | 26.46 | 31.05 |
| 5 | 34.69 | 02.09 | 42.17 | 07.71 | 45.03 | 16.90 | 42.20 | 25.46 | 34.91 | 30.88 | 26.24 | 30.95 |
| 6 | 34.99 | 02.17 | 42.38 | 07.97 | 44.98 | 17.24 | 41.98 | 25.67 | 34.67 | 30.92 | 26.01 | 30.87 |
| 7 | 35.30 | 02.26 | 42.58 | 08.25 | 44.91 | 17.56 | 41.77 | 25.86 | 34.45 | 30.99 | 25.75 | 30.81 |
| 8 | 35.62 | 02.38 | 42.76 | 08.55 | 44.84 | 17.84 | 41.58 | 26.04 | 34.22 | 31.08 | 25.48 | 30.75 |
| 9 | 35.95 | 02.51 | 42.92 | 08.86 | 44.77 | 18.11 | 41.42 | 26.22 | 33.98 | 31.18 | 25.17 | 30.68 |
| 10 | 36.27 | 02.66 | 43.04 | 09.17 | 44.71 | 18.35 | 41.28 | 26.42 | 33.72 | 31.29 | 24.85 | 30.59 |
| 11 | 36.58 | 02.84 | 43.14 | 09.46 | 44.68 | 18.59 | 41.15 | 26.63 | 33.43 | 31.41 | 24.53 | 30.49 |
| 12 | 36.86 | 03.03 | 43.22 | 09.73 | 44.67 | 18.84 | 41.00 | 26.86 | 33.11 | 31.51 | 24.20 | 30.36 |
| 13 | 37.12 | 03.23 | 43.30 | 09.98 | 44.68 | 19.10 | 40.84 | 27.12 | 32.78 | 31.59 | 23.88 | 30.20 |
| 14 | 37.36 | 03.43 | 43.39 | 10.21 | 44.69 | 19.39 | 40.64 | 27.38 | 32.43 | 31.65 | 23.58 | 30.03 |
| 15 | 37.57 | 03.61 | 43.50 | 10.42 | 44.68 | 19.70 | 40.42 | 27.64 | 32.09 | 31.69 | 23.29 | 29.85 |
| 16 | 37.77 | 03.78 | 43.64 | 10.64 | 44.65 | 20.04 | 40.17 | 27.88 | 31.76 | 31.71 | 23.03 | 29.66 |
| 17 | 37.98 | 03.92 | 43.80 | 10.86 | 44.59 | 20.38 | 39.91 | 28.11 | 31.44 | 31.70 | 22.79 | 29.47 |
| 18 | 38.20 | 04.04 | 43.96 | 11.12 | 44.49 | 20.71 | 39.63 | 28.32 | 31.13 | 31.69 | 22.56 | 29.28 |
| 19 | 38.45 | 04.15 | 44.13 | 11.40 | 44.37 | 21.04 | 39.36 | 28.50 | 30.85 | 31.67 | 22.34 | 29.11 |
| 20 | 38.72 | 04.27 | 44.27 | 11.71 | 44.24 | 21.34 | 39.09 | 28.66 | 30.58 | 31.66 | 22.12 | 28.95 |
| 21 | 39.02 | 04.41 | 44.39 | 12.04 | 44.09 | 21.63 | 38.84 | 28.81 | 30.32 | 31.65 | 21.90 | 28.79 |
| 22 | 39.32 | 04.59 | 44.47 | 12.37 | 43.95 | 21.90 | 38.60 | 28.96 | 30.06 | 31.65 | 21.67 | 28.65 |
| 23 | 39.61 | 04.79 | 44.52 | 12.70 | 43.82 | 22.15 | 38.37 | 29.10 | 29.80 | 31.66 | 21.41 | 28.50 |
| 24 | 39.88 | 05.03 | 44.55 | 13.02 | 43.70 | 22.40 | 38.16 | 29.25 | 29.54 | 31.68 | 21.15 | 28.34 |
| 25 | 40.12 | 05.28 | 44.57 | 13.32 | 43.59 | 22.64 | 37.95 | 29.41 | 29.25 | 31.70 | 20.86 | 28.17 |
| 26 | 40.32 | 05.53 | 44.59 | 13.60 | 43.49 | 22.89 | 37.74 | 29.58 | 28.95 | 31.72 | 20.56 | 27.97 |
| 27 | 40.50 | 05.78 | 44.61 | 13.88 | 43.41 | 23.15 | 37.52 | 29.76 | 28.62 | 31.73 | 20.27 | 27.73 |
| 28 | 40.67 | 06.01 | 44.64 | 14.14 | 43.32 | 23.42 | 37.29 | 29.95 | 28.27 | 31.71 | 19.99 | 27.46 |
| 29 | 40.83 | 06.23 | ^{44.68} 44.73 | ^{14.40} 14.66 | 43.23 | 23.70 | 37.03 | 30.14 | 27.91 | 31.66 | 19.75 | 27.17 |
| 30 | 40.99 | 06.44 | 44.80 | 14.94 | 43.12 | 24.00 | 36.75 | 30.33 | 27.56 | 31.57 | 19.54 | 26.86 |
| 31 | 41.15 | 06.65 | 44.87 | 15.23 | 42.99 | 24.32 | 36.44 | 30.49 | 27.24 | 31.45 | 19.37 | 26.57 |
| 32 | 41.33 | 06.84 | 44.94 | 15.53 | | | 36.11 | 30.63 | | | 19.22 | 26.29 |
| | sec δ 14.46 | tan δ 14.43 | sec δ 14.47 | tan δ 14.43 | sec δ 14.48 | tan δ 14.44 | sec δ 14.48 | tan δ 14.45 | sec δ 14.49 | tan δ 14.45 | sec δ 14.49 | tan δ 14.45 |

Mean R.A. $22^{\text{h}} 29^{\text{m}} 18.35^{\text{s}}$

Double lower transit February 27

Mean Dec. $-86^{\circ} 02' 13.39''$

APPARENT PLACES OF STARS, 1986
CIRCUMPOLAR STARS AT UPPER TRANSIT AT GREENWICH

1669 B Octantis Mag. 6.54 Spect. A5

| Day | January | | February | | March | | April | | May | | June | |
|-----|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m 22 38 | ° ' / 88 53 | h m 22 38 | ° ' / 88 53 | h m 22 38 | ° ' / 88 53 | h m 22 39 | ° ' / 88 53 | h m 22 39 | ° ' / 88 53 | h m 22 40 | ° ' / 88 53 |
| | s 75.85 | " 54.30 | s 56.92 | " 44.82 | s 54.41 | " 34.10 | s 07.32 | " 22.32 | s 33.22 | " 13.42 | s 07.65 | " 08.57 |
| 1 | 75.85 | 54.30 | 56.92 | 44.82 | 54.41 | 34.10 | 07.32 | 22.32 | 33.22 | 13.42 | 07.65 | 08.57 |
| 2 | 75.03 | 54.10 | 56.39 | 44.44 | 54.41 | 33.67 | 08.12 | 21.93 | 34.39 | 13.20 | 08.73 | 08.53 |
| 3 | 74.14 | 53.90 | 55.91 | 44.04 | 54.49 | 33.23 | 08.99 | 21.57 | 35.52 | 13.01 | 09.75 | 08.49 |
| 4 | 73.19 | 53.67 | 55.53 | 43.61 | 54.69 | 32.78 | 09.87 | 21.24 | 36.58 | 12.83 | 10.75 | 08.43 |
| 5 | 72.20 | 53.41 | 55.27 | 43.18 | 54.99 | 32.34 | 10.73 | 20.93 | 37.58 | 12.66 | 11.75 | 08.36 |
| 6 | 71.23 | 53.12 | 55.13 | 42.76 | 55.39 | 31.92 | 11.55 | 20.64 | 38.52 | 12.48 | 12.78 | 08.29 |
| 7 | 70.33 | 52.80 | 55.07 | 42.36 | 55.84 | 31.52 | 12.30 | 20.36 | 39.42 | 12.29 | 13.86 | 08.21 |
| 8 | 69.54 | 52.46 | 55.05 | 41.98 | 56.31 | 31.14 | 12.99 | 20.08 | 40.32 | 12.09 | 14.99 | 08.13 |
| 9 | 68.87 | 52.12 | 55.02 | 41.62 | 56.74 | 30.79 | 13.63 | 19.79 | 41.23 | 11.88 | 16.18 | 08.06 |
| 10 | 68.30 | 51.79 | 54.95 | 41.28 | 57.12 | 30.45 | 14.26 | 19.49 | 42.18 | 11.66 | 17.43 | 08.00 |
| 11 | 67.80 | 51.48 | 54.81 | 40.95 | 57.44 | 30.11 | 14.88 | 19.17 | 43.19 | 11.44 | 18.72 | 07.97 |
| 12 | 67.31 | 51.20 | 54.62 | 40.61 | 57.70 | 29.76 | 15.54 | 18.84 | 44.27 | 11.21 | 20.03 | 07.95 |
| 13 | 66.79 | 50.93 | 54.38 | 40.26 | 57.93 | 29.41 | 16.25 | 18.51 | 45.41 | 11.00 | 21.33 | 07.96 |
| 14 | 66.21 | 50.67 | 54.12 | 39.90 | 58.15 | 29.03 | 17.03 | 18.17 | 46.62 | 10.80 | 22.59 | 07.99 |
| 15 | 65.57 | 50.41 | 53.86 | 39.52 | 58.38 | 28.65 | 17.89 | 17.83 | 47.86 | 10.63 | 23.78 | 08.03 |
| 16 | 64.87 | 50.14 | 53.64 | 39.12 | 58.67 | 28.25 | 18.81 | 17.50 | 49.13 | 10.47 | 24.89 | 08.08 |
| 17 | 64.14 | 49.86 | 53.47 | 38.71 | 59.01 | 27.84 | 19.80 | 17.19 | 50.39 | 10.34 | 25.92 | 08.12 |
| 18 | 63.39 | 49.55 | 53.37 | 38.28 | 59.44 | 27.43 | 20.84 | 16.90 | 51.60 | 10.23 | 26.88 | 08.15 |
| 19 | 62.66 | 49.23 | 53.36 | 37.86 | 59.94 | 27.02 | 21.89 | 16.63 | 52.75 | 10.12 | 27.80 | 08.16 |
| 20 | 61.97 | 48.89 | 53.43 | 37.44 | 60.52 | 26.62 | 22.92 | 16.38 | 53.81 | 10.03 | 28.75 | 08.14 |
| 21 | 61.33 | 48.53 | 53.57 | 37.03 | 61.17 | 26.24 | 23.90 | 16.15 | 54.78 | 09.92 | 29.78 | 08.10 |
| 22 | 60.78 | 48.16 | 53.78 | 36.63 | 61.85 | 25.88 | 24.80 | 15.92 | 55.71 | 09.78 | 30.92 | 08.07 |
| 23 | 60.31 | 47.79 | 54.00 | 36.26 | 62.54 | 25.54 | 25.61 | 15.69 | 56.64 | 09.62 | 32.17 | 08.05 |
| 24 | 59.92 | 47.42 | 54.22 | 35.90 | 63.19 | 25.22 | 26.36 | 15.44 | 57.64 | 09.44 | 33.48 | 08.06 |
| 25 | 59.59 | 47.07 | 54.38 | 35.56 | 63.78 | 24.90 | 27.10 | 15.17 | 58.75 | 09.25 | 34.81 | 08.10 |
| 26 | 59.31 | 46.73 | 54.47 | 35.22 | 64.28 | 24.59 | 27.88 | 14.86 | 59.98 | 09.07 | 36.08 | 08.18 |
| 27 | 59.04 | 46.40 | 54.49 | 34.87 | 64.71 | 24.26 | 28.75 | 14.54 | 61.29 | 08.92 | 37.28 | 08.28 |
| 28 | 58.73 | 46.10 | 54.46 | 34.50 | 65.11 | 23.91 | 29.75 | 14.23 | 62.65 | 08.80 | 38.38 | 08.40 |
| 29 | 58.37 | 45.79 | 54.41 | 34.10 | 65.53 | 23.53 | 30.85 | 13.93 | 64.00 | 08.71 | 39.40 | 08.51 |
| 30 | 57.94 | 45.49 | | | 66.01 | 23.13 | 32.02 | 13.66 | 65.29 | 08.65 | 40.35 | 08.62 |
| 31 | 57.45 | 45.16 | | | 66.61 | 22.72 | 33.22 | 13.42 | 66.51 | 08.60 | 41.26 | 08.72 |
| 32 | 56.92 | 44.82 | | | 67.32 | 22.32 | | | 67.65 | 08.57 | | |
| | sec δ 51.96 | tan δ 51.95 | sec δ 51.82 | tan δ 51.81 | sec δ 51.68 | tan δ 51.67 | sec δ 51.54 | tan δ 51.53 | sec δ 51.45 | tan δ 51.44 | sec δ 51.42 | tan δ 51.41 |

Mean R.A. 22^h 39^m 47^s.63

Double lower transit March 2

Mean Dec. -88° 53' 21".08

APPARENT PLACES OF STARS, 1986
CIRCUMPOLAR STARS AT UPPER TRANSIT AT GREENWICH

471

1669 B Octantis Mag. 6.54 Spect. A5

| Day | July | | August | | September | | October | | November | | December | |
|-----|----------------|------------------|----------------|------------------|---------------------|---------------------|----------------|------------------|----------------|------------------|----------------|------------------|
| | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m 22 40 | ° ' " / 88 53 | h m 22 41 | ° ' " / 88 53 | h m 22 41 | ° ' " / 88 53 | h m 22 40 | ° ' " / 88 53 | h m 22 40 | ° ' " / 88 53 | h m 22 39 | ° ' " / 88 53 |
| 1 | s 41.26 | " 08.72 | s 08.76 | " 13.63 | s 22.14 22.41 | " 21.99 22.28 | s 76.53 | " 31.23 | s 52.51 | " 37.84 | s 80.14 | " 38.96 |
| 2 | 42.16 | 08.80 | 09.45 | 13.82 | 22.66 | 22.62 | 76.02 | 31.55 | 51.32 | 37.95 | 79.03 | 38.83 |
| 3 | 43.07 | 08.88 | 10.18 | 14.03 | 22.85 | 22.96 | 75.40 | 31.86 | 50.16 | 38.03 | 78.04 | 38.69 |
| 4 | 44.01 | 08.95 | 10.95 | 14.24 | 22.95 | 23.31 | 74.68 | 32.15 | 49.09 | 38.09 | 77.14 | 38.58 |
| 5 | 45.00 | 09.02 | 11.74 | 14.48 | 22.95 | 23.67 | 73.90 | 32.41 | 48.11 | 38.13 | 76.28 | 38.48 |
| 6 | 46.04 | 09.10 | 12.53 | 14.74 | 22.84 | 24.01 | 73.12 | 32.63 | 47.23 | 38.19 | 75.40 | 38.41 |
| 7 | 47.13 | 09.18 | 13.27 | 15.01 | 22.65 | 24.33 | 72.38 | 32.84 | 46.41 | 38.26 | 74.46 | 38.36 |
| 8 | 48.26 | 09.28 | 13.96 | 15.31 | 22.41 | 24.63 | 71.71 | 33.02 | 45.58 | 38.35 | 73.44 | 38.30 |
| 9 | 49.41 | 09.41 | 14.55 | 15.61 | 22.19 | 24.90 | 71.13 | 33.21 | 44.72 | 38.47 | 72.34 | 38.24 |
| 10 | 50.55 | 09.56 | 15.04 | 15.92 | 22.01 | 25.15 | 70.62 | 33.41 | 43.78 | 38.59 | 71.17 | 38.17 |
| 11 | 51.66 | 09.72 | 15.44 | 16.21 | 21.91 | 25.39 | 70.14 | 33.63 | 42.75 | 38.71 | 69.97 | 38.07 |
| 12 | 52.69 | 09.91 | 15.77 | 16.49 | 21.88 | 25.64 | 69.65 | 33.87 | 41.63 | 38.83 | 68.75 | 37.95 |
| 13 | 53.64 | 10.10 | 16.08 | 16.74 | 21.92 | 25.91 | 69.09 | 34.13 | 40.44 | 38.92 | 67.56 | 37.80 |
| 14 | 54.50 | 10.30 | 16.41 | 16.96 | 21.97 | 26.20 | 68.44 | 34.40 | 39.21 | 38.99 | 66.41 | 37.64 |
| 15 | 55.28 | 10.48 | 16.80 | 17.18 | 21.98 | 26.51 | 67.69 | 34.67 | 37.98 | 39.04 | 65.33 | 37.46 |
| 16 | 56.01 | 10.64 | 17.27 | 17.39 | 21.92 | 26.85 | 66.85 | 34.93 | 36.75 | 39.07 | 64.31 | 37.28 |
| 17 | 56.73 | 10.77 | 17.83 | 17.61 | 21.75 | 27.19 | 65.93 | 35.17 | 35.58 | 39.08 | 63.37 | 37.09 |
| 18 | 57.49 | 10.89 | 18.44 | 17.86 | 21.48 | 27.54 | 64.98 | 35.38 | 34.45 | 39.07 | 62.48 | 36.91 |
| 19 | 58.34 | 10.99 | 19.05 | 18.14 | 21.11 | 27.87 | 64.01 | 35.58 | 33.39 | 39.07 | 61.63 | 36.74 |
| 20 | 59.29 | 11.11 | 19.60 | 18.45 | 20.67 | 28.18 | 63.06 | 35.75 | 32.38 | 39.06 | 60.79 | 36.59 |
| 21 | 60.33 | 11.24 | 20.06 | 18.78 | 20.20 | 28.48 | 62.15 | 35.91 | 31.41 | 39.06 | 59.94 | 36.44 |
| 22 | 61.40 | 11.41 | 20.40 | 19.11 | 19.73 | 28.75 | 61.29 | 36.07 | 30.47 | 39.07 | 59.06 | 36.29 |
| 23 | 62.44 | 11.61 | 20.65 | 19.44 | 19.28 | 29.01 | 60.47 | 36.22 | 29.52 | 39.09 | 58.13 | 36.15 |
| 24 | 63.41 | 11.84 | 20.81 | 19.76 | 18.86 | 29.27 | 59.70 | 36.38 | 28.54 | 39.11 | 57.13 | 36.00 |
| 25 | 64.28 | 12.08 | 20.92 | 20.07 | 18.49 | 29.52 | 58.95 | 36.54 | 27.51 | 39.15 | 56.06 | 35.84 |
| 26 | 65.05 | 12.33 | 21.01 | 20.35 | 18.16 | 29.77 | 58.21 | 36.72 | 26.41 | 39.18 | 54.96 | 35.64 |
| 27 | 65.73 | 12.57 | 21.11 | 20.63 | 17.86 | 30.04 | 57.45 | 36.91 | 25.23 | 39.19 | 53.84 | 35.41 |
| 28 | 66.35 | 12.81 | 21.24 | 20.89 | 17.58 | 30.31 | 56.64 | 37.11 | 23.96 | 39.19 | 52.77 | 35.15 |
| 29 | 66.93 | 13.03 | 21.40 | 21.16 | 17.28 | 30.60 | 55.75 | 37.31 | 22.66 | 39.15 | 51.79 | 34.86 |
| 30 | 67.52 | 13.23 | 21.61 | 21.42 | 16.94 | 30.91 | 54.76 | 37.51 | 21.37 | 39.07 | 50.95 | 34.56 |
| 31 | 68.12 | 13.43 | 21.86 | 21.70 | 16.53 | 31.23 | 53.67 | 37.69 | 20.14 | 38.96 | 50.24 | 34.27 |
| 32 | 68.76 | 13.63 | 22.14 22.41 | 21.99 22.28 | | | 52.51 | 37.84 | | | 49.61 | 33.99 |
| | sec δ 51.45 | tan δ 51.44 | sec δ 51.54 | tan δ 51.53 | sec δ 51.66 | tan δ 51.65 | sec δ 51.76 | tan δ 51.75 | sec δ 51.82 | tan δ 51.81 | sec δ 51.79 | tan δ 51.78 |

Mean R.A. 22^h 39^m 47.63^s

Double lower transit March 2

Mean Dec. -88° 53' 21.08"

APPARENT PLACES OF STARS, 1986
CIRCUMPOLAR STARS AT UPPER TRANSIT AT GREENWICH

924 β Octantis Mag. 4.34 Spect. F0

| Day | January | | February | | March | | April | | May | | June | |
|-----|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m 22 44 | ° ' / 81 27 | h m 22 44 | ° ' / 81 27 | h m 22 44 | ° ' / 81 27 | h m 22 44 | ° ' / 81 27 | h m 22 44 | ° ' / 81 26 | h m 22 44 | ° ' / 81 26 |
| 1 | s 38.45 | " 43.44 | s 36.16 | " 34.69 | s 35.91 | " 24.38 | s 37.65 | " 12.66 | s 41.15 | " 63.43 | s 45.86 | " 57.96 |
| 2 | 38.35 | 43.27 | 36.10 | 34.33 | 35.91 | 23.96 | 37.77 | 12.27 | 41.31 | 63.20 | 46.00 | 57.90 |
| 3 | 38.23 | 43.09 | 36.04 | 33.95 | 35.93 | 23.53 | 37.89 | 11.91 | 41.46 | 62.99 | 46.14 | 57.83 |
| 4 | 38.11 | 42.89 | 36.00 | 33.55 | 35.96 | 23.09 | 38.01 | 11.57 | 41.60 | 62.80 | 46.28 | 57.75 |
| 5 | 37.99 | 42.66 | 35.98 | 33.14 | 36.01 | 22.66 | 38.12 | 11.25 | 41.73 | 62.61 | 46.41 | 57.66 |
| 6 | 37.87 | 42.40 | 35.97 | 32.73 | 36.07 | 22.24 | 38.22 | 10.95 | 41.85 | 62.41 | 46.56 | 57.56 |
| 7 | 37.77 | 42.11 | 35.97 | 32.35 | 36.13 | 21.84 | 38.32 | 10.66 | 41.97 | 62.20 | 46.71 | 57.46 |
| 8 | 37.68 | 41.79 | 35.97 | 31.98 | 36.20 | 21.47 | 38.40 | 10.37 | 42.09 | 61.99 | 46.87 | 57.36 |
| 9 | 37.61 | 41.48 | 35.97 | 31.64 | 36.25 | 21.12 | 38.49 | 10.08 | 42.21 | 61.76 | 47.04 | 57.26 |
| 10 | 37.55 | 41.17 | 35.96 | 31.32 | 36.30 | 20.78 | 38.57 | 09.77 | 42.35 | 61.52 | 47.22 | 57.18 |
| 11 | 37.49 | 40.89 | 35.94 | 31.00 | 36.33 | 20.45 | 38.65 | 09.44 | 42.49 | 61.28 | 47.40 | 57.12 |
| 12 | 37.44 | 40.62 | 35.92 | 30.68 | 36.36 | 20.11 | 38.74 | 09.11 | 42.64 | 61.04 | 47.58 | 57.08 |
| 13 | 37.37 | 40.38 | 35.88 | 30.35 | 36.39 | 19.76 | 38.83 | 08.76 | 42.80 | 60.81 | 47.76 | 57.06 |
| 14 | 37.30 | 40.15 | 35.85 | 30.00 | 36.42 | 19.39 | 38.94 | 08.41 | 42.97 | 60.59 | 47.93 | 57.06 |
| 15 | 37.22 | 39.91 | 35.81 | 29.63 | 36.45 | 19.01 | 39.06 | 08.06 | 43.14 | 60.39 | 48.09 | 57.08 |
| 16 | 37.13 | 39.66 | 35.79 | 29.25 | 36.49 | 18.61 | 39.19 | 07.73 | 43.31 | 60.21 | 48.24 | 57.11 |
| 17 | 37.03 | 39.40 | 35.77 | 28.85 | 36.54 | 18.21 | 39.33 | 07.40 | 43.48 | 60.06 | 48.38 | 57.13 |
| 18 | 36.94 | 39.12 | 35.76 | 28.44 | 36.60 | 17.80 | 39.47 | 07.10 | 43.64 | 59.92 | 48.51 | 57.13 |
| 19 | 36.85 | 38.82 | 35.77 | 28.03 | 36.67 | 17.39 | 39.61 | 06.82 | 43.80 | 59.80 | 48.64 | 57.11 |
| 20 | 36.76 | 38.51 | 35.78 | 27.62 | 36.75 | 16.99 | 39.74 | 06.55 | 43.94 | 59.68 | 48.78 | 57.07 |
| 21 | 36.69 | 38.17 | 35.81 | 27.22 | 36.84 | 16.61 | 39.87 | 06.31 | 44.07 | 59.55 | 48.93 | 57.01 |
| 22 | 36.63 | 37.83 | 35.84 | 26.84 | 36.93 | 16.24 | 39.99 | 06.07 | 44.19 | 59.40 | 49.10 | 56.95 |
| 23 | 36.57 | 37.48 | 35.87 | 26.47 | 37.02 | 15.90 | 40.09 | 05.83 | 44.32 | 59.22 | 49.28 | 56.90 |
| 24 | 36.53 | 37.13 | 35.90 | 26.13 | 37.10 | 15.58 | 40.19 | 05.56 | 44.47 | 59.02 | 49.47 | 56.89 |
| 25 | 36.50 | 36.80 | 35.92 | 25.79 | 37.18 | 15.26 | 40.29 | 05.27 | 44.63 | 58.80 | 49.66 | 56.91 |
| 26 | 36.47 | 36.48 | 35.92 | 25.46 | 37.24 | 14.95 | 40.40 | 04.96 | 44.80 | 58.60 | 49.83 | 56.96 |
| 27 | 36.44 | 36.17 | 35.92 | 25.12 | 37.29 | 14.62 | 40.52 | 04.63 | 44.99 | 58.42 | 49.99 | 57.04 |
| 28 | 36.40 | 35.89 | 35.92 | 24.76 | 37.34 | 14.27 | 40.67 | 04.29 | 45.18 | 58.28 | 50.14 | 57.13 |
| 29 | 36.35 | 35.60 | 35.91 | 24.38 | 37.40 | 13.89 | 40.82 | 03.98 | 45.37 | 58.17 | 50.28 | 57.22 |
| 30 | 36.30 | 35.32 | | | 37.47 | 13.48 | 40.99 | 03.69 | 45.54 | 58.08 | 50.41 | 57.30 |
| 31 | 36.23 | 35.02 | | | 37.55 | 13.07 | 41.15 | 03.43 | 45.71 | 58.02 | 50.54 | 57.38 |
| 32 | 36.16 | 34.69 | | | 37.65 | 12.66 | | | 45.86 | 57.96 | | |
| | sec δ 6.73 | tan δ 6.66 | sec δ 6.73 | tan δ 6.66 | sec δ 6.73 | tan δ 6.66 | sec δ 6.73 | tan δ 6.65 | sec δ 6.73 | tan δ 6.65 | sec δ 6.73 | tan δ 6.65 |

Mean R.A. 22^h 44^m 44.07^s

Double lower transit March 3

Mean Dec. -81° 27' 10.01"

APPARENT PLACES OF STARS, 1986
CIRCUMPOLAR STARS AT UPPER TRANSIT AT GREENWICH

473

924 β Octantis Mag. 4.34 Spect. F0

| Day | July | | August | | September | | October | | November | | December | |
|-----|------------------------------------|-------------------------|------------------------------------|-------------------------|--------------------------------------|--------------------------------------|------------------------------------|-------------------------|------------------------------------|-------------------------|------------------------------------|-------------------------|
| | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | ^h ^m 22 44 | ^o / 81 26 | ^h ^m 22 44 | ^o / 81 27 | ^h ^m 22 44 | ^o / 81 27 | ^h ^m 22 44 | ^o / 81 27 | ^h ^m 22 44 | ^o / 81 27 | ^h ^m 22 44 | ^o / 81 27 |
| | ^s 50.54 | " 57.38 | ^s 54.45 | " 01.58 | ^s 56.49 | " 09.44 | ^s 56.00 | " 18.53 | ^s 53.10 | " 25.39 | ^s 49.17 | " 27.08 |
| 1 | 50.66 | 57.44 | 54.56 | 01.76 | ^{56 54} ^{56 58} | ^{09 74} ^{10 05} | 55.93 | 18.85 | 52.95 | 25.52 | 49.05 | 26.98 |
| 2 | 50.79 | 57.49 | 54.67 | 01.94 | 56.61 | 10.39 | 55.85 | 19.16 | 52.82 | 25.61 | 48.94 | 26.87 |
| 3 | 50.93 | 57.54 | 54.78 | 02.14 | 56.62 | 10.73 | 55.76 | 19.46 | 52.69 | 25.68 | 48.84 | 26.78 |
| 4 | 51.07 | 57.58 | 54.90 | 02.35 | 56.62 | 11.07 | 55.67 | 19.72 | 52.58 | 25.75 | 48.74 | 26.70 |
| 5 | 51.22 | 57.63 | 55.01 | 02.59 | 56.61 | 11.41 | 55.57 | 19.95 | 52.48 | 25.82 | 48.63 | 26.66 |
| 6 | 51.38 | 57.70 | 55.12 | 02.85 | 56.59 | 11.72 | 55.49 | 20.16 | 52.39 | 25.90 | 48.52 | 26.62 |
| 7 | 51.54 | 57.77 | 55.21 | 03.12 | 56.57 | 12.01 | 55.42 | 20.35 | 52.29 | 26.01 | 48.39 | 26.59 |
| 8 | 51.70 | 57.87 | 55.29 | 03.41 | 56.55 | 12.27 | 55.36 | 20.54 | 52.19 | 26.14 | 48.25 | 26.56 |
| 9 | 51.86 | 58.00 | 55.36 | 03.70 | 56.54 | 12.52 | 55.30 | 20.75 | 52.07 | 26.28 | 48.10 | 26.51 |
| 10 | 52.02 | 58.14 | 55.41 | 03.97 | 56.54 | 12.75 | 55.25 | 20.97 | 51.94 | 26.42 | 47.95 | 26.44 |
| 11 | 52.16 | 58.30 | 55.46 | 04.23 | 56.55 | 13.00 | 55.20 | 21.22 | 51.80 | 26.55 | 47.80 | 26.34 |
| 12 | 52.29 | 58.47 | 55.51 | 04.46 | 56.57 | 13.26 | 55.13 | 21.48 | 51.65 | 26.67 | 47.65 | 26.22 |
| 13 | 52.40 | 58.64 | 55.57 | 04.68 | 56.59 | 13.54 | 55.05 | 21.76 | 51.50 | 26.76 | 47.51 | 26.08 |
| 14 | 52.51 | 58.80 | 55.63 | 04.87 | 56.60 | 13.85 | 54.95 | 22.03 | 51.34 | 26.83 | 47.39 | 25.93 |
| 15 | 52.61 | 58.94 | 55.71 | 05.07 | 56.59 | 14.18 | 54.85 | 22.30 | 51.19 | 26.88 | 47.27 | 25.77 |
| 16 | 52.72 | 59.05 | 55.80 | 05.28 | 56.57 | 14.52 | 54.73 | 22.55 | 51.05 | 26.90 | 47.16 | 25.62 |
| 17 | 52.83 | 59.14 | 55.90 | 05.51 | 56.54 | 14.86 | 54.61 | 22.77 | 50.92 | 26.92 | 47.05 | 25.46 |
| 18 | 52.96 | 59.23 | 55.99 | 05.77 | 56.49 | 15.19 | 54.49 | 22.98 | 50.79 | 26.93 | 46.95 | 25.32 |
| 19 | 53.11 | 59.32 | 56.07 | 06.06 | 56.44 | 15.50 | 54.38 | 23.16 | 50.67 | 26.95 | 46.85 | 25.18 |
| 20 | 53.26 | 59.43 | 56.13 | 06.38 | 56.38 | 15.79 | 54.27 | 23.33 | 50.56 | 26.97 | 46.75 | 25.06 |
| 21 | 53.41 | 59.57 | 56.18 | 06.70 | 56.33 | 16.06 | 54.17 | 23.50 | 50.45 | 26.99 | 46.64 | 24.94 |
| 22 | 53.56 | 59.75 | 56.21 | 07.01 | 56.28 | 16.32 | 54.08 | 23.66 | 50.34 | 27.03 | 46.52 | 24.82 |
| 23 | 53.70 | 59.96 | 56.24 | 07.32 | 56.24 | 16.57 | 53.99 | 23.83 | 50.22 | 27.08 | 46.40 | 24.70 |
| 24 | 53.81 | 60.18 | 56.26 | 07.61 | 56.20 | 16.82 | 53.90 | 24.01 | 50.09 | 27.14 | 46.26 | 24.56 |
| 25 | 53.92 | 60.41 | 56.28 | 07.88 | 56.17 | 17.08 | 53.82 | 24.19 | 49.95 | 27.19 | 46.12 | 24.39 |
| 26 | 54.01 | 60.63 | 56.30 | 08.15 | 56.14 | 17.34 | 53.72 | 24.39 | 49.80 | 27.23 | 45.98 | 24.19 |
| 27 | 54.10 | 60.84 | 56.33 | 08.40 | 56.12 | 17.61 | 53.62 | 24.60 | 49.64 | 27.24 | 45.86 | 23.95 |
| 28 | 54.18 | 61.04 | 56.36 | 08.65 | 56.09 | 17.91 | 53.51 | 24.82 | 49.48 | 27.23 | 45.74 | 23.69 |
| 29 | 54.27 | 61.23 | 56.40 | 08.90 | 56.05 | 18.21 | 53.38 | 25.03 | 49.32 | 27.17 | 45.65 | 23.42 |
| 30 | 54.36 | 61.41 | 56.45 | 09.17 | 56.00 | 18.53 | 53.25 | 25.22 | 49.17 | 27.08 | 45.58 | 23.15 |
| 31 | 54.45 | 61.58 | 56.49 | 09.44 | | | 53.10 | 25.39 | | | 45.51 | 22.90 |
| 32 | | | | | | | | | | | | |
| | sec δ 6.73 | tan δ 6.65 | sec δ 6.73 | tan δ 6.65 | sec δ 6.73 | tan δ 6.65 | sec δ 6.73 | tan δ 6.66 | sec δ 6.73 | tan δ 6.66 | sec δ 6.73 | tan δ 6.66 |

Mean R.A. $22^{\text{h}} 44^{\text{m}} 44.07^{\text{s}}$

Double lower transit March 3

Mean Dec. $-81^{\circ} 27' 10.01''$

APPARENT PLACES OF STARS, 1986
CIRCUMPOLAR STARS AT UPPER TRANSIT AT GREENWICH

925 τ Octantis Mag. 5.56 Spect. K0

| Day | January | | February | | March | | April | | May | | June | |
|-----|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | h m 23 26 | ° ' / 87 33 | h m 23 26 | ° ' / 87 33 | h m 23 26 | ° ' / 87 33 | h m 23 26 | ° ' / 87 33 | h m 23 26 | ° ' / 87 33 | h m 23 26 | ° ' / 87 33 |
| | s " | " | s " | " | s " | " | s " | " | s " | " | s " | " |
| 1 | 18.11 | 58.56 | 06.83 | 50.50 | 02.40 | 40.22 | 04.52 | 27.95 | 13.39 | 17.68 | 27.41 | 10.85 |
| 2 | 17.69 | 58.42 | 06.48 | 50.16 | 02.27 | 39.81 | 04.77 | 27.53 | 13.85 | 17.40 | 27.88 | 10.75 |
| 3 | 17.23 | 58.27 | 06.15 | 49.80 | 02.18 | 39.37 | 05.05 | 27.12 | 14.30 | 17.15 | 28.33 | 10.64 |
| 4 | 16.73 | 58.11 | 05.85 | 49.41 | 02.13 | 38.92 | 05.34 | 26.75 | 14.72 | 16.91 | 28.76 | 10.53 |
| 5 | 16.22 | 57.92 | 05.61 | 49.01 | 02.13 | 38.47 | 05.63 | 26.40 | 15.11 | 16.68 | 29.19 | 10.40 |
| 6 | 15.70 | 57.70 | 05.42 | 48.61 | 02.18 | 38.04 | 05.90 | 26.06 | 15.47 | 16.44 | 29.64 | 10.27 |
| 7 | 15.21 | 57.44 | 05.27 | 48.22 | 02.26 | 37.62 | 06.14 | 25.74 | 15.82 | 16.20 | 30.10 | 10.12 |
| 8 | 14.76 | 57.16 | 05.15 | 47.86 | 02.35 | 37.23 | 06.36 | 25.42 | 16.16 | 15.95 | 30.59 | 09.98 |
| 9 | 14.37 | 56.87 | 05.03 | 47.51 | 02.43 | 36.86 | 06.55 | 25.10 | 16.50 | 15.69 | 31.11 | 09.84 |
| 10 | 14.02 | 56.58 | 04.89 | 47.19 | 02.49 | 36.50 | 06.74 | 24.77 | 16.86 | 15.42 | 31.66 | 09.70 |
| 11 | 13.71 | 56.31 | 04.72 | 46.87 | 02.52 | 36.15 | 06.92 | 24.42 | 17.25 | 15.14 | 32.24 | 09.59 |
| 12 | 13.41 | 56.07 | 04.52 | 46.55 | 02.53 | 35.80 | 07.11 | 24.06 | 17.67 | 14.86 | 32.82 | 09.50 |
| 13 | 13.10 | 55.84 | 04.31 | 46.23 | 02.52 | 35.44 | 07.33 | 23.68 | 18.13 | 14.58 | 33.41 | 09.43 |
| 14 | 12.76 | 55.63 | 04.08 | 45.89 | 02.50 | 35.06 | 07.58 | 23.30 | 18.61 | 14.31 | 33.99 | 09.38 |
| 15 | 12.39 | 55.41 | 03.84 | 45.53 | 02.48 | 34.67 | 07.86 | 22.92 | 19.12 | 14.06 | 34.54 | 09.35 |
| 16 | 11.99 | 55.19 | 03.62 | 45.16 | 02.49 | 34.26 | 08.18 | 22.55 | 19.64 | 13.84 | 35.05 | 09.33 |
| 17 | 11.58 | 54.96 | 03.42 | 44.76 | 02.52 | 33.84 | 08.53 | 22.18 | 20.17 | 13.63 | 35.52 | 09.31 |
| 18 | 11.15 | 54.71 | 03.25 | 44.36 | 02.58 | 33.41 | 08.90 | 21.84 | 20.67 | 13.45 | 35.96 | 09.28 |
| 19 | 10.73 | 54.44 | 03.11 | 43.95 | 02.68 | 32.99 | 09.29 | 21.51 | 21.16 | 13.28 | 36.38 | 09.23 |
| 20 | 10.32 | 54.15 | 03.02 | 43.53 | 02.82 | 32.56 | 09.67 | 21.21 | 21.60 | 13.12 | 36.81 | 09.15 |
| 21 | 09.93 | 53.84 | 02.96 | 43.12 | 02.99 | 32.15 | 10.04 | 20.92 | 22.00 | 12.95 | 37.27 | 09.05 |
| 22 | 09.57 | 53.51 | 02.93 | 42.73 | 03.19 | 31.76 | 10.37 | 20.65 | 22.38 | 12.76 | 37.79 | 08.95 |
| 23 | 09.25 | 53.18 | 02.91 | 42.35 | 03.39 | 31.38 | 10.66 | 20.37 | 22.75 | 12.55 | 38.35 | 08.85 |
| 24 | 08.97 | 52.85 | 02.89 | 41.99 | 03.58 | 31.03 | 10.91 | 20.08 | 23.15 | 12.31 | 38.95 | 08.79 |
| 25 | 08.72 | 52.53 | 02.86 | 41.65 | 03.74 | 30.69 | 11.16 | 19.76 | 23.60 | 12.05 | 39.57 | 08.75 |
| 26 | 08.50 | 52.21 | 02.79 | 41.31 | 03.86 | 30.36 | 11.42 | 19.42 | 24.10 | 11.81 | 40.17 | 08.76 |
| 27 | 08.28 | 51.92 | 02.68 | 40.97 | 03.95 | 30.01 | 11.72 | 19.05 | 24.66 | 11.58 | 40.74 | 08.78 |
| 28 | 08.04 | 51.64 | 02.55 | 40.61 | 04.01 | 29.64 | 12.07 | 18.68 | 25.23 | 11.38 | 41.26 | 08.83 |
| 29 | 07.79 | 51.36 | 02.40 | 40.22 | 04.08 | 29.24 | 12.48 | 18.32 | 25.81 | 11.21 | 41.76 | 08.87 |
| 30 | 07.50 | 51.09 | | | 04.18 | 28.82 | 12.93 | 17.99 | 26.38 | 11.07 | 42.22 | 08.92 |
| 31 | 07.17 | 50.81 | | | 04.32 | 28.39 | 13.39 | 17.68 | 26.91 | 10.96 | 42.66 | 08.96 |
| 32 | 06.83 | 50.50 | | | 04.52 | 27.95 | | | 27.41 | 10.85 | | |
| | sec δ 23.54 | tan δ 23.52 | sec δ 23.51 | tan δ 23.49 | sec δ 23.48 | tan δ 23.46 | sec δ 23.45 | tan δ 23.43 | sec δ 23.43 | tan δ 23.41 | sec δ 23.42 | tan δ 23.40 |

Mean R.A. $23^{\text{h}} 26^{\text{m}} 22.86^{\text{s}}$

Double lower transit March 14

Mean Dec. $-87^{\circ} 33' 24.25''$

APPARENT PLACES OF STARS, 1986
CIRCUMPOLAR STARS AT UPPER TRANSIT AT GREENWICH

925 τ Octantis Mag. 5.56 Spect. K0

| Day | July | | August | | September | | October | | November | | December | |
|-----|-------------------------|---------------------------|-------------------------|---------------------------|--------------------------------------|--------------------------------------|-------------------------|---------------------------|-------------------------|---------------------------|-------------------------|---------------------------|
| | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. | R.A. | Dec. |
| | ^{h m} 23 26 | ^{o ' "} 87 33 | ^{h m} 23 26 | ^{o ' "} 87 33 | ^{h m} 23 27 | ^{o ' "} 87 33 | ^{h m} 23 26 | ^{o ' "} 87 33 | ^{h m} 23 26 | ^{o ' "} 87 33 | ^{h m} 23 26 | ^{o ' "} 87 33 |
| | ^s | " | ^s | " | ^s | " | ^s | " | ^s | " | ^s | " |
| 1 | 42.66 | 08.96 | 56.66 | 12.10 | 05.37 | 19.48 | 65.85 | 28.85 | 57.32 | 36.75 | 43.44 | 39.81 |
| 2 | 43.09 | 08.99 | 57.03 | 12.26 | 05.60 | 19.76 | 65.72 | 29.19 | 56.83 | 36.93 | 42.92 | 39.75 |
| 3 | 43.53 | 09.01 | 57.43 | 12.41 | 05.81 | 20.07 | 65.53 | 29.53 | 56.35 | 37.08 | 42.45 | 39.68 |
| 4 | 43.98 | 09.02 | 57.85 | 12.58 | 06.00 | 20.39 | 65.31 | 29.85 | 55.90 | 37.20 | 42.03 | 39.62 |
| 5 | 44.45 | 09.03 | 58.29 | 12.76 | 06.16 | 20.73 | 65.04 | 30.15 | 55.50 | 37.30 | 41.63 | 39.59 |
| 6 | 44.95 | 09.04 | 58.72 | 12.97 | 06.26 | 21.07 | 64.77 | 30.42 | 55.13 | 37.41 | 41.22 | 39.57 |
| 7 | 45.48 | 09.06 | 59.15 | 13.19 | 06.32 | 21.41 | 64.51 | 30.66 | 54.80 | 37.53 | 40.79 | 39.57 |
| 8 | 46.02 | 09.09 | 59.54 | 13.44 | 06.33 | 21.74 | 64.28 | 30.89 | 54.47 | 37.67 | 40.32 | 39.59 |
| 9 | 46.58 | 09.15 | 59.90 | 13.70 | 06.32 | 22.04 | 64.09 | 31.10 | 54.12 | 37.84 | 39.81 | 39.59 |
| 10 | 47.15 | 09.22 | 60.22 | 13.97 | 06.31 | 22.32 | 63.94 | 31.33 | 53.74 | 38.02 | 39.27 | 39.59 |
| 11 | 47.69 | 09.32 | 60.49 | 14.23 | 06.32 | 22.57 | 63.80 | 31.58 | 53.32 | 38.20 | 38.70 | 39.57 |
| 12 | 48.22 | 09.44 | 60.72 | 14.48 | 06.36 | 22.82 | 63.66 | 31.84 | 52.86 | 38.38 | 38.13 | 39.52 |
| 13 | 48.70 | 09.57 | 60.94 | 14.71 | ^{06 43} ^{06 54} | ^{23 06} ^{23 32} | 63.49 | 32.13 | 52.36 | 38.54 | 37.56 | 39.45 |
| 14 | 49.15 | 09.71 | 61.17 | 14.91 | 06.66 | 23.60 | 63.29 | 32.44 | 51.84 | 38.69 | 37.01 | 39.36 |
| 15 | 49.55 | 09.84 | 61.42 | 15.09 | 06.77 | 23.91 | 63.03 | 32.74 | 51.31 | 38.81 | 36.48 | 39.26 |
| 16 | 49.93 | 09.95 | 61.70 | 15.27 | 06.84 | 24.25 | 62.74 | 33.04 | 50.78 | 38.91 | 35.98 | 39.14 |
| 17 | 50.30 | 10.04 | 62.03 | 15.46 | 06.88 | 24.59 | 62.41 | 33.33 | 50.27 | 38.99 | 35.51 | 39.02 |
| 18 | 50.69 | 10.10 | 62.39 | 15.67 | 06.86 | 24.94 | 62.05 | 33.60 | 49.78 | 39.05 | 35.07 | 38.90 |
| 19 | 51.12 | 10.16 | 62.75 | 15.91 | 06.79 | 25.29 | 61.68 | 33.85 | 49.31 | 39.11 | 34.64 | 38.79 |
| 20 | 51.59 | 10.21 | 63.10 | 16.17 | 06.70 | 25.62 | 61.32 | 34.07 | 48.87 | 39.16 | 34.23 | 38.69 |
| 21 | 52.11 | 10.28 | 63.41 | 16.47 | 06.58 | 25.94 | 60.97 | 34.29 | 48.45 | 39.22 | 33.81 | 38.59 |
| 22 | 52.64 | 10.38 | 63.66 | 16.77 | 06.46 | 26.23 | 60.64 | 34.49 | 48.03 | 39.29 | 33.37 | 38.51 |
| 23 | 53.18 | 10.52 | 63.87 | 17.08 | 06.35 | 26.51 | 60.34 | 34.69 | 47.62 | 39.37 | 32.92 | 38.43 |
| 24 | 53.69 | 10.68 | 64.04 | 17.38 | 06.25 | 26.79 | 60.05 | 34.89 | 47.20 | 39.45 | 32.42 | 38.35 |
| 25 | 54.15 | 10.87 | 64.19 | 17.67 | 06.17 | 27.05 | 59.78 | 35.10 | 46.76 | 39.55 | 31.90 | 38.25 |
| 26 | 54.57 | 11.07 | 64.32 | 17.95 | 06.11 | 27.32 | 59.51 | 35.32 | 46.28 | 39.64 | 31.35 | 38.12 |
| 27 | 54.95 | 11.26 | 64.46 | 18.21 | 06.06 | 27.60 | 59.23 | 35.55 | 45.76 | 39.73 | 30.78 | 37.97 |
| 28 | 55.30 | 11.45 | 64.60 | 18.46 | 06.03 | 27.89 | 58.93 | 35.79 | 45.19 | 39.80 | 30.23 | 37.78 |
| 29 | 55.64 | 11.63 | 64.77 | 18.71 | 05.99 | 28.19 | 58.60 | 36.04 | 44.61 | 39.84 | 29.72 | 37.56 |
| 30 | 55.97 | 11.80 | 64.95 | 18.96 | 05.93 | 28.51 | 58.22 | 36.29 | 44.01 | 39.84 | 29.27 | 37.31 |
| 31 | 56.30 | 11.95 | 65.15 | 19.21 | 05.85 | 28.85 | 57.79 | 36.53 | 43.44 | 39.81 | 28.87 | 37.07 |
| 32 | 56.66 | 12.10 | 65.37 | 19.48 | | | 57.32 | 36.75 | | | 28.51 | 36.85 |
| | sec δ 23.42 | tan δ 23.40 | sec δ 23.43 | tan δ 23.41 | sec δ 23.46 | tan δ 23.44 | sec δ 23.48 | tan δ 23.46 | sec δ 23.50 | tan δ 23.48 | sec δ 23.50 | tan δ 23.48 |

Mean R.A. $23^{\text{h}} 26^{\text{m}} 22.86^{\text{s}}$

Double lower transit March 14

Mean Dec. $-87^{\circ} 33' 24.25''$

BESSELIAN DAY NUMBERS, 1986
FOR 12^h SIDEREAL TIME AND EQUINOX 1986.5

| Date | τ | A | Hourly variation | B | Hourly variation |
|------------|---------|----------|---------------------|---------|---------------------|
| 1986 | | | (0".0001) | | (0".0001) |
| Jan. — 8.8 | —0.2527 | —14".532 | +33 | —6".811 | — 2 |
| 1.2 | 0.499 | —13.741 | +33 | —6.899 | — 5 |
| 11.2 | 0.472 | —12.974 | +31 | —7.054 | — 8 |
| 21.2 | 0.445 | —12.250 | +29 | —7.261 | — 9 |
| 31.1 | 0.417 | —11.585 | +26 | —7.500 | —10 |
| Feb. 10.1 | —0.390 | —10.986 | +24 | —7.748 | —10 |
| 20.1 | 0.363 | —10.450 | +21 | —7.978 | — 9 |
| Mar. 2.1 | 0.336 | — 9.969 | +19 | —8.169 | — 7 |
| 12.0 | 0.308 | — 9.527 | +18 | —8.303 | — 4 |
| 22.0 | 0.281 | — 9.103 | +18 | —8.370 | — 1 |
| Apr. 1.0 | —0.254 | — 8.677 | +18 | —8.370 | + 1 |
| 10.9 | 0.226 | — 8.227 | +20 | —8.308 | + 4 |
| 20.9 | 0.199 | — 7.738 | +21 | —8.198 | + 5 |
| 30.9 | 0.172 | — 7.197 | +24 | —8.058 | + 6 |
| May 10.9 | 0.144 | — 6.599 | +26 | —7.908 | + 6 |
| 20.8 | —0.117 | — 5.945 | +28 | —7.770 | + 5 |
| 30.8 | 0.090 | — 5.242 | +30 | —7.663 | + 4 |
| June 9.8 | 0.063 | —4.503 | +31 | —7.603 | + 1 |
| 19.8 | 0.035 | —3.744 | +32 | —7.599 | — 1 |
| 29.7 | —0.008 | —2.982 | +32 | —7.655 | — 4 |
| July 9.7 | +0.019 | —2.234 | +31 | —7.770 | — 6 |
| 19.7 | 0.047 | —1.519 | +29 | —7.934 | — 8 |
| 29.6 | 0.074 | —0.848 | +27 | —8.134 | — 9 |
| Aug. 8.6 | 0.101 | —0.229 | +25 | —8.352 | — 9 |
| 18.6 | 0.129 | +0.333 | +22 | —8.569 | — 9 |
| Sept. 28.6 | +0.156 | +0.843 | +20 | —8.763 | — 7 |
| 7.5 | 0.183 | +1.310 | +19 | —8.918 | — 5 |
| 17.5 | 0.211 | +1.747 | +18 | —9.017 | — 3 |
| 27.5 | 0.238 | +2.173 | +18 | —9.053 | 0 |
| Oct. 7.5 | 0.265 | +2.608 | +19 | —9.024 | + 3 |
| 17.4 | +0.292 | +3.072 | +20 | —8.934 | + 5 |
| 27.4 | 0.320 | +3.583 | +23 | —8.797 | + 6 |
| Nov. 6.4 | 0.347 | +4.153 | +25 | —8.633 | + 7 |
| 16.3 | 0.374 | +4.788 | +28 | —8.463 | + 7 |
| 26.3 | 0.402 | +5.487 | +30 | —8.312 | + 6 |
| Dec. 6.3 | +0.429 | +6.239 | +32 | —8.202 | + 3 |
| 16.3 | 0.456 | +7.027 | +33 | —8.152 | + 1 |
| 26.2 | 0.484 | +7.831 | +34 | —8.170 | — 2 |
| 36.2 | 0.511 | +8.625 | +33 | —8.259 | — 5 |

FOR 12^h SIDEREAL TIME AND EQUINOX 1986.5

| Date | C | Hourly variation | D | Hourly variation | E | Greenwich Sidereal Date |
|------------|----------|------------------|----------|------------------|-----------|-------------------------|
| 1986 | | (0''0001) | | (0''0001) | (0''0001) | 245 |
| Jan. - 8.8 | - 0''195 | -139 | +20''831 | - 2 | -14 | 3120.5 |
| 1.2 | - 3.497 | -137 | +20.490 | - 27 | -13 | 3130.5 |
| 11.2 | - 6.717 | -131 | +19.525 | - 54 | -13 | 3140.5 |
| 21.2 | - 9.714 | -119 | +17.933 | - 78 | -12 | 3150.5 |
| 31.1 | -12.396 | -105 | +15.819 | - 98 | -12 | 3160.5 |
| Feb. 10.1 | -14.711 | - 87 | +13.222 | -118 | -11 | 3170.5 |
| 20.1 | -16.544 | - 66 | +10.222 | -132 | -11 | 3180.5 |
| Mar. 2.1 | -17.870 | - 45 | + 6.960 | -141 | -12 | 3190.5 |
| 12.0 | -18.664 | - 21 | + 3.490 | -148 | -12 | 3200.5 |
| 22.0 | -18.871 | + 3 | - 0.055 | -147 | -12 | 3210.5 |
| Apr. 1.0 | -18.537 | + 25 | - 3.547 | -144 | -13 | 3220.5 |
| 10.9 | -17.663 | + 48 | - 6.934 | -137 | -13 | 3230.5 |
| 20.9 | -16.265 | + 68 | -10.075 | -124 | -13 | 3240.5 |
| 30.9 | -14.434 | + 85 | -12.893 | -111 | -13 | 3250.5 |
| May 10.9 | -12.191 | +102 | -15.345 | - 93 | -13 | 3260.5 |
| 20.8 | - 9.609 | +113 | -17.319 | - 72 | -13 | 3270.5 |
| 30.8 | - 6.794 | +122 | -18.803 | - 52 | -12 | 3280.5 |
| June 9.8 | - 3.779 | +129 | -19.763 | - 28 | -12 | 3290.5 |
| 19.8 | - 0.674 | +130 | -20.138 | - 4 | -11 | 3300.5 |
| 29.7 | + 2.429 | +129 | -19.975 | + 18 | -10 | 3310.5 |
| July 9.7 | + 5.485 | +125 | -19.247 | + 43 | - 9 | 3320.5 |
| 19.7 | + 8.371 | +116 | -17.963 | + 64 | - 9 | 3330.5 |
| 29.6 | +11.030 | +106 | -16.202 | + 84 | - 8 | 3340.5 |
| Aug. 8.6 | +13.404 | + 92 | -13.960 | +103 | - 8 | 3350.5 |
| 18.6 | +15.386 | + 74 | -11.310 | +117 | - 8 | 3360.5 |
| 28.6 | +16.958 | + 57 | - 8.346 | +130 | - 8 | 3370.5 |
| Sept. 7.5 | +18.060 | + 35 | - 5.097 | +140 | - 8 | 3380.5 |
| 17.5 | +18.627 | + 13 | - 1.690 | +144 | - 9 | 3390.5 |
| 27.5 | +18.682 | - 9 | + 1.785 | +146 | - 9 | 3400.5 |
| Oct. 7.5 | +18.181 | - 33 | + 5.263 | +143 | -10 | 3410.5 |
| 17.4 | +17.127 | - 54 | + 8.590 | +135 | -10 | 3420.5 |
| 27.4 | +15.577 | - 75 | +11.696 | +124 | -10 | 3430.5 |
| Nov. 6.4 | +13.527 | - 95 | +14.493 | +108 | -10 | 3440.5 |
| 16.3 | +11.056 | -111 | +16.844 | + 88 | -10 | 3450.5 |
| 26.3 | + 8.247 | -124 | +18.718 | + 68 | - 9 | 3460.5 |
| Dec. 6.3 | + 5.145 | -134 | +20.030 | + 41 | - 8 | 3470.5 |
| 16.3 | + 1.890 | -138 | +20.711 | + 16 | - 8 | 3480.5 |
| 26.2 | - 1.431 | -139 | +20.783 | - 10 | - 7 | 3490.5 |
| 36.2 | - 4.733 | -135 | +20.197 | - 38 | - 6 | 3500.5 |

TABLE I, 1986
SHORT-PERIOD TERMS OF NUTATION

| Date | $d\psi$ | $d\epsilon$ | Date | $d\psi$ | $d\epsilon$ | Date | $d\psi$ | $d\epsilon$ | Date | $d\psi$ | $d\epsilon$ |
|--------|----------|-------------|---------|----------|-------------|--------|----------|-------------|--------|----------|-------------|
| | (0''001) | | | (0''001) | | | (0''001) | | | (0''001) | |
| Jan. 0 | +177 | + 15 | Feb. 15 | -195 | + 46 | Apr. 1 | + 31 | -121 | May 17 | +145 | + 31 |
| 1 | +131 | + 63 | 16 | -227 | 0 | 2 | +172 | -110 | 18 | + 85 | + 77 |
| 2 | + 42 | + 99 | 17 | -218 | - 44 | 3 | +281 | - 75 | 19 | - 14 | +109 |
| 3 | - 73 | +115 | 18 | -172 | - 82 | 4 | +335 | - 24 | 20 | -134 | +118 |
| 4 | -190 | +104 | 19 | - 97 | -105 | 5 | +330 | + 30 | 21 | -247 | + 98 |
| 5 | -279 | + 68 | 20 | - 5 | -110 | 6 | +270 | + 77 | 22 | -319 | + 50 |
| 6 | -313 | + 13 | 21 | + 87 | - 95 | 7 | +170 | +106 | 23 | -320 | - 13 |
| 7 | -277 | - 48 | 22 | +159 | - 61 | 8 | + 52 | +115 | 24 | -242 | - 75 |
| 8 | -172 | - 97 | 23 | +195 | - 14 | 9 | - 64 | +103 | 25 | - 98 | -117 |
| 9 | - 23 | -123 | 24 | +182 | + 39 | 10 | -158 | + 72 | 26 | + 73 | -127 |
| 10 | +135 | -117 | 25 | +117 | + 86 | 11 | -217 | + 30 | 27 | +227 | -104 |
| 11 | +264 | - 82 | 26 | + 13 | +115 | 12 | -235 | - 16 | 28 | +331 | - 57 |
| 12 | +334 | - 29 | 27 | -108 | +117 | 13 | -212 | - 59 | 29 | +367 | + 1 |
| 13 | +336 | + 28 | 28 | -214 | + 91 | 14 | -156 | - 91 | 30 | +336 | + 55 |
| 14 | +279 | + 76 | Mar. 1 | -275 | + 43 | 15 | - 77 | -109 | 31 | +254 | + 95 |
| 15 | +180 | +106 | 2 | -274 | - 16 | 16 | + 10 | -107 | June 1 | +142 | +114 |
| 16 | + 63 | +114 | 3 | -208 | - 71 | 17 | + 90 | - 87 | 2 | + 22 | +112 |
| 17 | - 50 | +102 | 4 | - 91 | -109 | 18 | +147 | - 50 | 3 | - 85 | + 90 |
| 18 | -143 | + 72 | 5 | + 51 | -121 | 19 | +167 | - 2 | 4 | -163 | + 53 |
| 19 | -202 | + 31 | 6 | +185 | -104 | 20 | +140 | + 50 | 5 | -203 | + 8 |
| 20 | -222 | - 15 | 7 | +283 | - 64 | 21 | + 67 | + 94 | 6 | -203 | - 36 |
| 21 | -201 | - 57 | 8 | +326 | - 11 | 22 | - 43 | +119 | 7 | -164 | - 74 |
| 22 | -144 | - 91 | 9 | +308 | + 43 | 23 | -165 | +115 | 8 | - 98 | -100 |
| 23 | - 61 | -108 | 10 | +237 | + 87 | 24 | -264 | + 82 | 9 | - 16 | -108 |
| 24 | + 33 | -107 | 11 | +130 | +111 | 25 | -306 | + 25 | 10 | + 66 | - 98 |
| 25 | +119 | - 85 | 12 | + 11 | +114 | 26 | -273 | - 39 | 11 | +132 | - 70 |
| 26 | +179 | - 46 | 13 | - 99 | + 95 | 27 | -167 | - 93 | 12 | +166 | - 29 |
| 27 | +196 | + 3 | 14 | -182 | + 60 | 28 | - 16 | -122 | 13 | +160 | + 18 |
| 28 | +163 | + 54 | 15 | -228 | + 16 | 29 | +142 | -119 | 14 | +109 | + 64 |
| 29 | + 84 | + 94 | 16 | -233 | - 30 | 30 | +270 | - 88 | 15 | + 19 | + 99 |
| 30 | - 28 | +115 | 17 | -198 | - 71 | May 1 | +344 | - 38 | 16 | - 97 | +115 |
| 31 | -147 | +110 | 18 | -132 | - 99 | 2 | +354 | + 18 | 17 | -215 | +105 |
| Feb. 1 | -244 | + 79 | 19 | - 46 | -111 | 3 | +306 | + 67 | 18 | -307 | + 69 |
| 2 | -294 | + 28 | 20 | + 44 | -103 | 4 | +213 | +101 | 19 | -342 | + 12 |
| 3 | -280 | - 31 | 21 | +123 | - 76 | 5 | + 97 | +115 | 20 | -302 | - 51 |
| 4 | -200 | - 83 | 22 | +173 | - 33 | 6 | - 21 | +108 | 21 | -187 | -103 |
| 5 | - 72 | -116 | 23 | +179 | + 19 | 7 | -122 | + 81 | 22 | - 23 | -129 |
| 6 | + 77 | -120 | 24 | +135 | + 70 | 8 | -192 | + 42 | 23 | +149 | -120 |
| 7 | +211 | - 96 | 25 | + 44 | +108 | 9 | -223 | - 3 | 24 | +285 | - 80 |
| 8 | +301 | - 50 | 26 | - 74 | +121 | 10 | -212 | - 47 | 25 | +355 | - 22 |
| 9 | +329 | + 6 | 27 | -190 | +105 | 11 | -165 | - 83 | 26 | +351 | + 38 |
| 10 | +294 | + 59 | 28 | -269 | + 61 | 12 | - 93 | -104 | 27 | +286 | + 86 |
| 11 | +209 | + 97 | 29 | -284 | + 2 | 13 | - 9 | -109 | 28 | +180 | +112 |
| 12 | + 95 | +114 | 30 | -228 | - 58 | 14 | + 72 | - 94 | 29 | + 61 | +116 |
| 13 | - 22 | +109 | 31 | -114 | -103 | 15 | +133 | - 62 | 30 | - 51 | + 98 |
| 14 | -124 | + 84 | Apr. 1 | + 31 | -121 | 16 | +160 | - 18 | July 1 | -136 | + 64 |
| 15 | -195 | + 46 | 2 | +172 | -110 | 17 | +145 | + 31 | 2 | -186 | + 20 |

Corrections to apparent places of 10-day stars are given by:

$$\Delta\alpha = d\alpha(\psi) \cdot d\psi + d\alpha(\epsilon) \cdot d\epsilon \quad \Delta\delta = d\delta(\psi) \cdot d\psi + d\delta(\epsilon) \cdot d\epsilon$$

where $d\psi$ and $d\epsilon$ are to be taken from the table above, and their coefficients are tabulated under each star.

SHORT-PERIOD TERMS OF NUTATION

| Date | $d\psi$ | $d\epsilon$ | Date | $d\psi$ | $d\epsilon$ | Date | $d\psi$ | $d\epsilon$ | Date | $d\psi$ | $d\epsilon$ |
|--------|----------|-------------|---------|----------|-------------|--------|----------|-------------|---------|----------|-------------|
| | (0''001) | | | (0''001) | | | (0''001) | | | (0''001) | |
| July 1 | -136 | + 64 | Aug. 16 | + 1 | -127 | Oct. 1 | +146 | + 63 | Nov. 16 | -204 | 0 |
| 2 | -186 | + 20 | 17 | +154 | -111 | 2 | + 60 | +101 | 17 | -192 | - 46 |
| 3 | -194 | - 26 | 18 | +271 | - 68 | 3 | - 56 | +119 | 18 | -142 | - 82 |
| 4 | -164 | - 66 | 19 | +327 | - 9 | 4 | -176 | +110 | 19 | - 68 | -104 |
| 5 | -102 | - 95 | 20 | +312 | + 50 | 5 | -270 | + 75 | 20 | + 16 | -108 |
| 6 | - 22 | -107 | 21 | +237 | + 95 | 6 | -311 | + 20 | 21 | + 93 | - 93 |
| 7 | + 63 | -101 | 22 | +125 | +118 | 7 | -283 | - 41 | 22 | +150 | - 62 |
| 8 | +134 | - 77 | 23 | + 5 | +115 | 8 | -189 | - 93 | 23 | +174 | - 20 |
| 9 | +177 | - 39 | 24 | - 99 | + 90 | 9 | - 51 | -122 | 24 | +157 | + 28 |
| 10 | +181 | + 8 | 25 | -170 | + 49 | 10 | +101 | -121 | 25 | + 99 | + 72 |
| 11 | +139 | + 55 | 26 | -199 | + 2 | 11 | +231 | - 92 | 26 | + 4 | +104 |
| 12 | + 56 | + 93 | 27 | -187 | - 44 | 12 | +312 | - 42 | 27 | -114 | +117 |
| 13 | - 56 | +113 | 28 | -139 | - 81 | 13 | +330 | + 16 | 28 | -231 | +104 |
| 14 | -176 | +109 | 29 | - 65 | -104 | 14 | +286 | + 69 | 29 | -319 | + 65 |
| 15 | -278 | + 81 | 30 | + 22 | -109 | 15 | +194 | +105 | 30 | -349 | + 6 |
| 16 | -335 | + 31 | 31 | +106 | - 94 | 16 | + 77 | +119 | Dec. 1 | -302 | - 58 |
| 17 | -327 | - 29 | Sept. 1 | +170 | - 62 | 17 | - 42 | +109 | 2 | -180 | -108 |
| 18 | -246 | - 85 | 2 | +200 | - 18 | 18 | -138 | + 78 | 3 | - 12 | -131 |
| 19 | -105 | -121 | 3 | +187 | + 32 | 19 | -198 | + 34 | 4 | +160 | -118 |
| 20 | + 62 | -127 | 4 | +127 | + 78 | 20 | -213 | - 14 | 5 | +292 | - 76 |
| 21 | +215 | -100 | 5 | + 28 | +109 | 21 | -187 | - 58 | 6 | +357 | - 16 |
| 22 | +317 | - 47 | 6 | - 92 | +118 | 22 | -128 | - 91 | 7 | +347 | + 44 |
| 23 | +346 | + 15 | 7 | -207 | +100 | 23 | - 48 | -108 | 8 | +277 | + 90 |
| 24 | +305 | + 70 | 8 | -287 | + 59 | 24 | + 37 | -106 | 9 | +168 | +115 |
| 25 | +212 | +107 | 9 | -312 | + 3 | 25 | +113 | - 86 | 10 | + 48 | +116 |
| 26 | + 94 | +119 | 10 | -271 | - 56 | 26 | +164 | - 50 | 11 | - 62 | + 95 |
| 27 | - 22 | +107 | 11 | -169 | -102 | 27 | +179 | - 4 | 12 | -142 | + 57 |
| 28 | -116 | + 76 | 12 | - 29 | -124 | 28 | +152 | + 45 | 13 | -183 | + 11 |
| 29 | -175 | + 34 | 13 | +119 | -116 | 29 | + 81 | + 87 | 14 | -182 | - 35 |
| 30 | -193 | - 13 | 14 | +242 | - 82 | 30 | - 24 | +114 | 15 | -142 | - 74 |
| 31 | -171 | - 56 | 15 | +312 | - 28 | 31 | -146 | +117 | 16 | - 74 | - 99 |
| Aug. 1 | -115 | - 89 | 16 | +317 | + 31 | Nov. 1 | -255 | + 92 | 17 | + 8 | -107 |
| 2 | - 37 | -106 | 17 | +259 | + 82 | 2 | -319 | + 42 | 18 | + 87 | - 97 |
| 3 | + 50 | -105 | 18 | +158 | +113 | 3 | -315 | - 20 | 19 | +149 | - 70 |
| 4 | +128 | - 85 | 19 | + 37 | +119 | 4 | -236 | - 79 | 20 | +181 | - 31 |
| 5 | +182 | - 49 | 20 | - 76 | +101 | 5 | - 98 | -118 | 21 | +173 | + 15 |
| 6 | +198 | - 3 | 21 | -160 | + 65 | 6 | + 66 | -127 | 22 | +123 | + 59 |
| 7 | +168 | + 45 | 22 | -205 | + 18 | 7 | +214 | -104 | 23 | + 36 | + 94 |
| 8 | + 95 | + 87 | 23 | -205 | - 29 | 8 | +314 | - 56 | 24 | - 77 | +113 |
| 9 | - 12 | +112 | 24 | -167 | - 71 | 9 | +349 | + 2 | 25 | -197 | +109 |
| 10 | -133 | +114 | 25 | - 99 | - 99 | 10 | +319 | + 57 | 26 | -300 | + 80 |
| 11 | -242 | + 90 | 26 | - 15 | -110 | 11 | +236 | + 98 | 27 | -358 | + 30 |
| 12 | -312 | + 45 | 27 | + 71 | -102 | 12 | +122 | +117 | 28 | -350 | - 31 |
| 13 | -323 | - 12 | 28 | +143 | - 75 | 13 | + 2 | +113 | 29 | -264 | - 89 |
| 14 | -267 | - 69 | 29 | +186 | - 34 | 14 | -103 | + 87 | 30 | -115 | -126 |
| 15 | -151 | -111 | 30 | +188 | + 15 | 15 | -174 | + 47 | 31 | + 64 | -130 |
| 16 | + 1 | -127 | Oct. 1 | +146 | + 63 | 16 | -204 | 0 | 32 | +225 | - 99 |

Corrections to apparent places of 10-day stars are given by:

$$\Delta\alpha = d\alpha(\psi) \cdot d\psi + d\alpha(\epsilon) \cdot d\epsilon \quad \Delta\delta = d\delta(\psi) \cdot d\psi + d\delta(\epsilon) \cdot d\epsilon$$

where $d\psi$ and $d\epsilon$ are to be taken from the table above, and their coefficients are tabulated under each star.

TABLE II, 1986
SIDEREAL TIME AT 0^h U.T.

| Date | Sidereal Time | | Equation of Equinoxes | | Date | Sidereal Time | | Equation of Equinoxes | |
|---------|---|----------------------|-----------------------|--------------|---------|---|----------------------|-----------------------|--------------|
| | Apparent | Mean | Long-Period | Short-Period | | Apparent | Mean | Long-Period | Short-Period |
| | | | (0 ^o 001) | | | | | (0 ^o 001) | |
| Jan. 0 | 6 ^h 37 ^m 27 ^s .554 | 28 ^s .121 | -578 | +11 | Feb. 15 | 9 ^h 38 ^m 49 ^s .170 | 49 ^s .668 | -486 | -12 |
| 1 | 6 41 24.110 | 24.676 | -574 | +8 | 16 | 9 42 45.723 | 46.223 | -487 | -14 |
| 2 | 6 45 20.664 | 21.232 | -571 | +3 | 17 | 9 46 42.278 | 42.779 | -487 | -13 |
| 3 | 6 49 17.215 | 17.787 | -567 | -4 | 18 | 9 50 38.836 | 39.334 | -487 | -11 |
| 4 | 6 53 13.767 | 14.343 | -564 | -12 | 19 | 9 54 35.396 | 35.889 | -488 | -6 |
| 5 | 6 57 10.321 | 10.898 | -560 | -17 | 20 | 9 58 31.956 | 32.445 | -488 | 0 |
| 6 | 7 01 06.877 | 07.453 | -557 | -19 | 21 | 10 02 28.516 | 29.000 | -489 | +5 |
| 7 | 7 05 09.438 | 04.009 | -553 | -17 | 22 | 10 06 25.075 | 25.556 | -490 | +10 |
| 8 | 7 09 00.003 | 00.564 | -550 | -11 | 23 | 10 10 21.632 | 22.111 | -491 | +12 |
| 9 | 7 12 56.571 | 57.119 | -547 | -1 | 24 | 10 14 18.186 | 18.666 | -492 | +11 |
| 10 | 7 16 53.139 | 53.675 | -544 | +8 | 25 | 10 18 14.736 | 15.222 | -493 | +7 |
| 11 | 7 20 49.706 | 50.230 | -540 | +16 | 26 | 10 22 11.284 | 11.777 | -494 | +1 |
| 12 | 7 24 46.269 | 46.785 | -537 | +20 | 27 | 10 26 07.831 | 08.332 | -495 | -7 |
| 13 | 7 28 42.827 | 43.341 | -534 | +21 | 28 | 10 30 04.379 | 04.888 | -496 | -13 |
| 14 | 7 32 39.382 | 39.896 | -531 | +17 | Mar. 1 | 10 34 00.929 | 01.443 | -497 | -17 |
| 15 | 7 36 35.934 | 36.452 | -529 | +11 | 2 | 10 37 57.483 | 57.998 | -499 | -17 |
| 16 | 7 40 32.485 | 33.007 | -526 | +4 | 3 | 10 41 54.041 | 54.554 | -500 | -13 |
| 17 | 7 44 29.036 | 29.562 | -523 | -3 | 4 | 10 45 50.602 | 51.109 | -501 | -6 |
| 18 | 7 48 25.589 | 26.118 | -520 | -9 | 5 | 10 49 47.165 | 47.665 | -503 | +3 |
| 19 | 7 52 22.143 | 22.673 | -518 | -12 | 6 | 10 53 43.727 | 44.220 | -504 | +11 |
| 20 | 7 56 18.699 | 19.228 | -515 | -14 | 7 | 10 57 40.287 | 40.775 | -506 | +17 |
| 21 | 8 00 15.258 | 15.784 | -513 | -12 | 8 | 11 01 36.843 | 37.331 | -508 | +20 |
| 22 | 8 04 11.820 | 12.339 | -511 | -9 | 9 | 11 05 33.395 | 33.886 | -509 | +19 |
| 23 | 8 08 08.382 | 08.895 | -509 | -4 | 10 | 11 09 29.945 | 30.441 | -511 | +14 |
| 24 | 8 12 04.945 | 05.450 | -507 | +2 | 11 | 11 13 26.492 | 26.997 | -513 | +8 |
| 25 | 8 16 01.508 | 02.005 | -505 | +7 | 12 | 11 17 23.038 | 23.552 | -515 | +1 |
| 26 | 8 19 58.069 | 58.561 | -503 | +11 | 13 | 11 21 19.585 | 20.108 | -517 | -6 |
| 27 | 8 23 54.627 | 55.116 | -501 | +12 | 14 | 11 25 16.133 | 16.663 | -518 | -11 |
| 28 | 8 27 51.182 | 51.671 | -499 | +10 | 15 | 11 29 12.684 | 13.218 | -520 | -14 |
| 29 | 8 31 47.734 | 48.227 | -498 | +5 | 16 | 11 33 09.237 | 09.774 | -522 | -14 |
| 30 | 8 35 44.284 | 44.782 | -496 | -2 | 17 | 11 37 05.793 | 06.329 | -524 | -12 |
| Feb. 31 | 8 39 40.834 | 41.337 | -495 | -9 | 18 | 11 41 02.350 | 02.884 | -526 | -8 |
| 1 | 8 43 37.384 | 37.893 | -494 | -16 | 19 | 11 44 58.909 | 59.440 | -528 | -3 |
| 2 | 8 47 33.938 | 34.448 | -492 | -18 | 20 | 11 48 55.468 | 55.995 | -530 | +3 |
| 3 | 8 51 30.495 | 31.004 | -491 | -17 | 21 | 11 52 52.026 | 52.550 | -532 | +8 |
| 4 | 8 55 27.056 | 27.559 | -490 | -12 | 22 | 11 56 48.583 | 49.106 | -534 | +11 |
| 5 | 8 59 23.620 | 24.114 | -489 | -4 | 23 | 12 00 45.136 | 45.661 | -536 | +11 |
| 6 | 9 03 20.186 | 20.670 | -489 | +5 | 24 | 12 04 41.687 | 42.217 | -538 | +8 |
| 7 | 9 07 16.750 | 17.225 | -488 | +13 | 25 | 12 08 38.235 | 38.772 | -540 | +3 |
| 8 | 9 11 13.311 | 13.780 | -487 | +18 | 26 | 12 12 34.781 | 35.327 | -541 | -5 |
| 9 | 9 15 09.869 | 10.336 | -487 | +20 | 27 | 12 16 31.328 | 31.883 | -543 | -12 |
| 10 | 9 19 06.422 | 06.891 | -487 | +18 | 28 | 12 20 27.876 | 28.438 | -545 | -16 |
| 11 | 9 23 02.973 | 03.446 | -486 | +13 | 29 | 12 24 24.429 | 24.993 | -547 | -17 |
| 12 | 9 26 59.521 | 60.002 | -486 | +6 | 30 | 12 28 20.986 | 21.549 | -549 | -14 |
| 13 | 9 30 56.070 | 56.557 | -486 | -1 | 31 | 12 32 17.547 | 18.104 | -551 | -7 |
| 14 | 9 34 52.619 | 53.113 | -486 | -8 | Apr. 1 | 12 36 14.109 | 14.659 | -552 | +2 |
| 15 | 9 38 49.170 | 49.668 | -486 | -12 | 2 | 12 40 10.671 | 11.215 | -554 | +11 |

TABLE II, 1986
SIDEREAL TIME AT 0^h U.T.

| Date | Sidereal Time | | Equation of Equinoxes | | Date | Sidereal Time | | Equation of Equinoxes | |
|--------|--|--|-----------------------|--------------|--------|--|--|-----------------------|--------------|
| | Apparent | Mean | Long-Period | Short-Period | | Apparent | Mean | Long-Period | Short-Period |
| | | | (0 ^o 001) | | | | | (0 ^o 001) | |
| Apr. 1 | 12 ^h 36 ^m 14 ^s .109 | 14 ^h 6 ^m 59 ^s | -552 | + 2 | May 17 | 15 ^h 37 ^m 35 ^s .655 | 36 ^h 20 ^m 6 ^s | -560 | + 9 |
| 2 | 12 40 10.671 | 11.215 | -554 | +11 | 18 | 15 41 32.208 | 32.762 | -558 | + 5 |
| 3 | 12 44 07.232 | 07.770 | -556 | +17 | 19 | 15 45 28.760 | 29.317 | -557 | - 1 |
| 4 | 12 48 03.789 | 04.326 | -557 | +21 | 20 | 15 49 25.310 | 25.872 | -555 | - 8 |
| 5 | 12 52 00.342 | 00.881 | -559 | +20 | 21 | 15 53 21.860 | 22.428 | -553 | -15 |
| 6 | 12 55 56.892 | 57.436 | -561 | +16 | 22 | 15 57 18.413 | 18.983 | -551 | -19 |
| 7 | 12 59 53.440 | 53.992 | -562 | +10 | 23 | 16 01 14.971 | 15.539 | -548 | -20 |
| 8 | 13 03 49.987 | 50.547 | -563 | + 3 | 24 | 16 05 11.533 | 12.094 | -546 | -15 |
| 9 | 13 07 46.534 | 47.102 | -565 | - 4 | 25 | 16 09 08.099 | 08.649 | -544 | - 6 |
| 10 | 13 11 43.082 | 43.658 | -566 | -10 | 26 | 16 13 04.668 | 05.205 | -541 | + 4 |
| 11 | 13 15 39.632 | 40.213 | -567 | -13 | 27 | 16 17 01.235 | 01.760 | -539 | +14 |
| 12 | 13 19 36.186 | 36.769 | -569 | -14 | 28 | 16 20 57.799 | 58.315 | -537 | +20 |
| 13 | 13 23 32.741 | 33.324 | -570 | -13 | 29 | 16 24 54.359 | 54.871 | -534 | +22 |
| 14 | 13 27 29.299 | 29.879 | -571 | -10 | 30 | 16 28 50.915 | 51.426 | -531 | +21 |
| 15 | 13 31 25.858 | 26.435 | -572 | - 5 | 31 | 16 32 47.468 | 47.982 | -529 | +16 |
| 16 | 13 35 22.418 | 22.990 | -573 | + 1 | June 1 | 16 36 44.020 | 44.537 | -526 | + 9 |
| 17 | 13 39 18.977 | 19.545 | -574 | + 6 | 2 | 16 40 40.571 | 41.092 | -523 | + 1 |
| 18 | 13 43 15.535 | 16.101 | -574 | + 9 | 3 | 16 44 37.122 | 37.648 | -520 | - 5 |
| 19 | 13 47 12.091 | 12.656 | -575 | +10 | 4 | 16 48 33.676 | 34.203 | -517 | -10 |
| 20 | 13 51 08.644 | 09.211 | -576 | + 9 | 5 | 16 52 30.232 | 30.758 | -514 | -12 |
| 21 | 13 55 05.195 | 05.767 | -576 | + 4 | 6 | 16 56 26.790 | 27.314 | -511 | -12 |
| 22 | 13 59 01.743 | 02.322 | -577 | - 3 | 7 | 17 00 23.351 | 23.869 | -508 | -10 |
| 23 | 14 02 58.290 | 58.878 | -577 | -10 | 8 | 17 04 19.913 | 20.424 | -505 | - 6 |
| 24 | 14 06 54.839 | 55.433 | -577 | -16 | 9 | 17 08 16.477 | 16.980 | -502 | - 1 |
| 25 | 14 10 51.392 | 51.988 | -578 | -19 | 10 | 17 12 13.040 | 13.535 | -499 | + 4 |
| 26 | 14 14 47.949 | 48.544 | -578 | -17 | 11 | 17 16 09.603 | 10.091 | -496 | + 8 |
| 27 | 14 18 44.511 | 45.099 | -578 | -10 | 12 | 17 20 06.163 | 06.646 | -493 | +10 |
| 28 | 14 22 41.076 | 41.654 | -578 | - 1 | 13 | 17 24 02.722 | 03.201 | -489 | +10 |
| 29 | 14 26 37.641 | 38.210 | -578 | + 9 | 14 | 17 27 59.277 | 59.757 | -486 | + 7 |
| 30 | 14 30 34.204 | 34.765 | -577 | +17 | 15 | 17 31 55.830 | 56.312 | -483 | + 1 |
| May 1 | 14 34 30.764 | 31.320 | -577 | +21 | 16 | 17 35 52.382 | 52.867 | -480 | - 6 |
| 2 | 14 38 27.321 | 27.876 | -577 | +22 | 17 | 17 39 48.933 | 49.423 | -476 | -13 |
| 3 | 14 42 23.874 | 24.431 | -576 | +19 | 18 | 17 43 45.486 | 45.978 | -473 | -19 |
| 4 | 14 46 20.424 | 20.987 | -576 | +13 | 19 | 17 47 42.043 | 42.533 | -470 | -21 |
| 5 | 14 50 16.973 | 17.542 | -575 | + 6 | 20 | 17 51 38.604 | 39.089 | -466 | -18 |
| 6 | 14 54 13.522 | 14.097 | -574 | - 1 | 21 | 17 55 35.170 | 35.644 | -463 | -11 |
| 7 | 14 58 10.072 | 10.653 | -573 | - 7 | 22 | 17 59 31.739 | 32.200 | -460 | - 1 |
| 8 | 15 02 06.624 | 07.208 | -573 | -12 | 23 | 18 03 28.308 | 28.755 | -456 | + 9 |
| 9 | 15 06 03.178 | 03.763 | -572 | -14 | 24 | 18 07 24.875 | 25.310 | -453 | +17 |
| 10 | 15 09 59.735 | 60.319 | -570 | -13 | 25 | 18 11 21.438 | 21.866 | -450 | +22 |
| 11 | 15 13 56.295 | 56.874 | -569 | -10 | 26 | 18 15 17.996 | 18.421 | -446 | +21 |
| 12 | 15 17 52.856 | 53.430 | -568 | - 6 | 27 | 18 19 14.551 | 14.976 | -443 | +17 |
| 13 | 15 21 49.418 | 49.985 | -567 | - 1 | 28 | 18 23 11.103 | 11.532 | -440 | +11 |
| 14 | 15 25 45.980 | 46.540 | -565 | + 4 | 29 | 18 27 07.655 | 08.087 | -436 | + 4 |
| 15 | 15 29 42.540 | 43.096 | -564 | + 8 | 30 | 18 31 04.206 | 04.643 | -433 | - 3 |
| 16 | 15 33 39.099 | 39.651 | -562 | +10 | July 1 | 18 35 00.760 | 01.198 | -430 | - 8 |
| 17 | 15 37 35.655 | 36.206 | -560 | + 9 | 2 | 18 38 57.315 | 57.753 | -427 | -11 |

TABLE II, 1986
SIDEREAL TIME AT 0^h U.T.

| Date | Sidereal Time | | Equation of Equinoxes | | Date | Sidereal Time | | Equation of Equinoxes | |
|--------|--|----------------------|-----------------------|--------------|---------|--|----------------------|-----------------------|--------------|
| | Apparent | Mean | Long-Period | Short-Period | | Apparent | Mean | Long-Period | Short-Period |
| | | | (0 ^o 001) | | | | | (0 ^o 001) | |
| July 1 | 18 ^h 35 ^m 00 ^s .760 | 01 ^s .198 | -430 | - 8 | Aug. 16 | 21 ^h 36 ^m 22 ^s .400 | 22 ^s .745 | -345 | 0 |
| 2 | 18 38 57.315 | 57.753 | -427 | -11 | 17 | 21 40 18.965 | 19.300 | -345 | + 9 |
| 3 | 18 42 53.873 | 54.309 | -424 | -12 | 18 | 21 44 15.527 | 15.856 | -345 | +17 |
| 4 | 18 46 50.434 | 50.864 | -420 | -10 | 19 | 21 48 12.086 | 12.411 | -345 | +20 |
| 5 | 18 50 46.996 | 47.419 | -417 | - 6 | 20 | 21 52 08.640 | 08.966 | -345 | +19 |
| 6 | 18 54 43.559 | 43.975 | -414 | - 1 | 21 | 21 56 05.190 | 05.522 | -346 | +14 |
| 7 | 18 58 40.123 | 40.530 | -411 | + 4 | 22 | 22 00 01.738 | 02.077 | -346 | + 8 |
| 8 | 19 02 36.685 | 37.085 | -408 | + 8 | 23 | 22 03 58.286 | 58.632 | -347 | 0 |
| 9 | 19 06 33.246 | 33.641 | -405 | +11 | 24 | 22 07 54.834 | 55.188 | -347 | - 6 |
| 10 | 19 10 29.805 | 30.196 | -402 | +11 | 25 | 22 11 51.385 | 51.743 | -348 | -10 |
| 11 | 19 14 26.361 | 26.752 | -400 | + 9 | 26 | 22 15 47.938 | 48.298 | -349 | -12 |
| 12 | 19 18 22.914 | 23.307 | -397 | + 3 | 27 | 22 19 44.493 | 44.854 | -349 | -11 |
| 13 | 19 22 19.465 | 19.862 | -394 | - 3 | 28 | 22 23 41.050 | 41.409 | -350 | - 8 |
| 14 | 19 26 16.016 | 16.418 | -391 | -11 | 29 | 22 27 37.609 | 37.965 | -351 | - 4 |
| 15 | 19 30 12.567 | 12.973 | -389 | -17 | 30 | 22 31 34.169 | 34.520 | -352 | + 1 |
| 16 | 19 34 09.122 | 09.528 | -386 | -20 | 31 | 22 35 30.728 | 31.075 | -353 | + 6 |
| 17 | 19 38 05.680 | 06.084 | -384 | -20 | Sept. 1 | 22 39 27.287 | 27.631 | -354 | +10 |
| 18 | 19 42 02.243 | 02.639 | -381 | -15 | 2 | 22 43 23.843 | 24.186 | -356 | +12 |
| 19 | 19 45 58.809 | 59.195 | -379 | - 6 | 3 | 22 47 20.396 | 20.741 | -357 | +11 |
| 20 | 19 49 55.377 | 55.750 | -377 | + 4 | 4 | 22 51 16.946 | 17.297 | -358 | + 8 |
| 21 | 19 53 51.944 | 52.305 | -374 | +13 | 5 | 22 55 13.494 | 13.852 | -360 | + 2 |
| 22 | 19 57 48.508 | 48.861 | -372 | +19 | 6 | 22 59 10.041 | 10.408 | -361 | - 6 |
| 23 | 20 01 45.067 | 45.416 | -370 | +21 | 7 | 23 03 06.588 | 06.963 | -362 | -13 |
| 24 | 20 05 41.622 | 41.971 | -368 | +19 | 8 | 23 07 03.137 | 03.518 | -364 | -18 |
| 25 | 20 09 38.173 | 38.527 | -366 | +13 | 9 | 23 10 59.689 | 60.074 | -366 | -19 |
| 26 | 20 13 34.723 | 35.082 | -364 | + 6 | 10 | 23 14 56.245 | 56.629 | -367 | -17 |
| 27 | 20 17 31.273 | 31.637 | -363 | - 1 | 11 | 23 18 52.805 | 53.184 | -369 | -10 |
| 28 | 20 21 27.825 | 28.193 | -361 | - 7 | 12 | 23 22 49.368 | 49.740 | -370 | - 2 |
| 29 | 20 25 24.378 | 24.748 | -359 | -11 | 13 | 23 26 45.930 | 46.295 | -372 | + 7 |
| 30 | 20 29 20.934 | 21.304 | -358 | -12 | 14 | 23 30 42.491 | 42.850 | -374 | +15 |
| 31 | 20 33 17.492 | 17.859 | -356 | -10 | 15 | 23 34 39.049 | 39.406 | -376 | +19 |
| Aug. 1 | 20 37 14.052 | 14.414 | -355 | - 7 | 16 | 23 38 35.603 | 35.961 | -377 | +19 |
| 2 | 20 41 10.614 | 10.970 | -354 | - 2 | 17 | 23 42 32.153 | 32.517 | -379 | +16 |
| 3 | 20 45 07.176 | 07.525 | -353 | + 3 | 18 | 23 46 28.700 | 29.072 | -381 | +10 |
| 4 | 20 49 03.737 | 04.080 | -351 | + 8 | 19 | 23 50 25.247 | 25.627 | -383 | + 2 |
| 5 | 20 53 00.296 | 00.636 | -350 | +11 | 20 | 23 54 21.793 | 22.183 | -385 | - 5 |
| 6 | 20 56 56.854 | 57.191 | -349 | +12 | 21 | 23 58 18.342 | 18.738 | -387 | -10 |
| 7 | 21 00 53.408 | 53.746 | -349 | +10 | 22 | 0 02 14.892 | 15.293 | -389 | -13 |
| 8 | 21 04 49.960 | 50.302 | -348 | + 6 | 23 | 0 06 11.446 | 11.849 | -390 | -13 |
| 9 | 21 08 46.509 | 46.857 | -347 | - 1 | 24 | 0 10 08.002 | 08.404 | -392 | -10 |
| 10 | 21 12 43.058 | 43.413 | -347 | - 8 | 25 | 0 14 04.559 | 04.959 | -394 | - 6 |
| 11 | 21 16 39.607 | 39.968 | -346 | -15 | 26 | 0 18 01.118 | 01.515 | -396 | - 1 |
| 12 | 21 20 36.159 | 36.523 | -346 | -19 | 27 | 0 21 57.677 | 58.070 | -398 | + 4 |
| 13 | 21 24 32.714 | 33.079 | -345 | -20 | 28 | 0 25 54.235 | 54.626 | -400 | + 9 |
| 14 | 21 28 29.273 | 29.634 | -345 | -16 | 29 | 0 29 50.791 | 51.181 | -402 | +11 |
| 15 | 21 32 25.835 | 26.189 | -345 | - 9 | 30 | 0 33 47.344 | 47.736 | -403 | +12 |
| 16 | 21 36 22.400 | 22.745 | -345 | 0 | Oct. 1 | 0 37 43.895 | 44.292 | -405 | + 9 |

TABLE II, 1986
SIDEREAL TIME AT 0^h U.T.

| Date | Sidereal Time | | Equation of Equinoxes | | Date | Sidereal Time | | Equation of Equinoxes | |
|--------|---|----------------------|-----------------------|--------------|--------|---|----------------------|-----------------------|--------------|
| | Apparent | Mean | Long-Period | Short-Period | | Apparent | Mean | Long-Period | Short-Period |
| | | | (0 ^o 001) | | | | | (0 ^o 001) | |
| Oct. 1 | 0 ^h 37 ^m 43 ^s .895 | 44 ^s .292 | -405 | + 9 | Nov.16 | 3 ^h 39 ^m 05 ^s .408 | 05 ^s .839 | -418 | -13 |
| 2 | 0 41 40.444 | 40.847 | -407 | + 4 | 17 | 3 43 01.966 | 02.394 | -416 | -12 |
| 3 | 0 45 36.990 | 37.402 | -409 | - 3 | 18 | 3 46 58.526 | 58.949 | -414 | - 9 |
| 4 | 0 49 33.537 | 33.958 | -410 | -11 | 19 | 3 50 55.088 | 55.505 | -412 | - 4 |
| 5 | 0 53 30.084 | 30.513 | -412 | -17 | 20 | 3 54 51.651 | 52.060 | -410 | + 1 |
| 6 | 0 57 26.636 | 27.069 | -414 | -19 | 21 | 3 58 48.213 | 48.615 | -408 | + 6 |
| 7 | 1 01 23.191 | 23.624 | -415 | -17 | 22 | 4 02 44.775 | 45.171 | -405 | + 9 |
| 8 | 1 05 19.751 | 20.179 | -417 | -12 | 23 | 4 06 41.334 | 41.726 | -403 | +11 |
| 9 | 1 09 16.313 | 16.735 | -418 | - 3 | 24 | 4 10 37.891 | 38.282 | -400 | +10 |
| 10 | 1 13 12.876 | 13.290 | -420 | + 6 | 25 | 4 14 34.445 | 34.837 | -398 | + 6 |
| 11 | 1 17 09.438 | 09.845 | -421 | +14 | 26 | 4 18 30.997 | 31.392 | -395 | 0 |
| 12 | 1 21 05.997 | 06.401 | -423 | +19 | 27 | 4 22 27.548 | 27.948 | -392 | - 7 |
| 13 | 1 25 02.552 | 02.956 | -424 | +20 | 28 | 4 26 24.099 | 24.503 | -389 | -14 |
| 14 | 1 28 59.104 | 59.511 | -425 | +17 | 29 | 4 30 20.652 | 21.058 | -386 | -20 |
| 15 | 1 32 55.652 | 56.067 | -426 | +12 | 30 | 4 34 17.209 | 17.614 | -383 | -21 |
| 16 | 1 36 52.199 | 52.622 | -427 | + 5 | Dec. 1 | 4 38 13.770 | 14.169 | -380 | -18 |
| 17 | 1 40 48.747 | 49.178 | -428 | - 3 | 2 | 4 42 10.336 | 10.724 | -377 | -11 |
| 18 | 1 44 45.295 | 45.733 | -429 | - 8 | 3 | 4 46 06.905 | 07.280 | -374 | - 1 |
| 19 | 1 48 41.846 | 42.288 | -430 | -12 | 4 | 4 50 03.474 | 03.835 | -371 | +10 |
| 20 | 1 52 38.400 | 38.844 | -431 | -13 | 5 | 4 54 00.041 | 00.391 | -367 | +18 |
| 21 | 1 56 34.956 | 35.399 | -432 | -11 | 6 | 4 57 56.604 | 56.946 | -364 | +22 |
| 22 | 2 00 31.514 | 31.954 | -432 | - 8 | 7 | 5 01 53.162 | 53.501 | -360 | +21 |
| 23 | 2 04 28.074 | 28.510 | -433 | - 3 | 8 | 5 05 49.717 | 50.057 | -357 | +17 |
| 24 | 2 08 24.634 | 25.065 | -433 | + 2 | 9 | 5 09 46.269 | 46.612 | -353 | +10 |
| 25 | 2 12 21.194 | 21.620 | -434 | + 7 | 10 | 5 13 42.821 | 43.167 | -349 | + 3 |
| 26 | 2 16 17.752 | 18.176 | -434 | +10 | 11 | 5 17 39.373 | 39.723 | -346 | - 4 |
| 27 | 2 20 14.308 | 14.731 | -434 | +11 | 12 | 5 21 35.927 | 36.278 | -342 | - 9 |
| 28 | 2 24 10.861 | 11.287 | -435 | + 9 | 13 | 5 25 32.484 | 32.833 | -338 | -11 |
| 29 | 2 28 07.412 | 07.842 | -435 | + 5 | 14 | 5 29 29.043 | 29.389 | -334 | -11 |
| 30 | 2 32 03.961 | 04.397 | -434 | - 1 | 15 | 5 33 25.605 | 25.944 | -330 | - 9 |
| 31 | 2 36 00.509 | 00.953 | -434 | - 9 | 16 | 5 37 22.168 | 22.500 | -327 | - 5 |
| Nov. 1 | 2 39 57.058 | 57.508 | -434 | -16 | 17 | 5 41 18.733 | 19.055 | -323 | 0 |
| 2 | 2 43 53.610 | 54.063 | -434 | -20 | 18 | 5 45 15.297 | 15.610 | -319 | + 5 |
| 3 | 2 47 50.166 | 50.619 | -433 | -19 | 19 | 5 49 11.860 | 12.166 | -315 | + 9 |
| 4 | 2 51 46.727 | 47.174 | -433 | -14 | 20 | 5 53 08.421 | 08.721 | -311 | +11 |
| 5 | 2 55 43.292 | 43.730 | -432 | - 6 | 21 | 5 57 04.980 | 05.276 | -307 | +11 |
| 6 | 2 59 39.858 | 40.285 | -431 | + 4 | 22 | 6 01 01.536 | 01.832 | -303 | + 8 |
| 7 | 3 03 36.423 | 36.840 | -430 | +13 | 23 | 6 04 58.090 | 58.387 | -299 | + 2 |
| 8 | 3 07 32.985 | 33.396 | -429 | +19 | 24 | 6 08 54.643 | 54.943 | -295 | - 5 |
| 9 | 3 11 29.544 | 29.951 | -428 | +21 | 25 | 6 12 51.195 | 51.498 | -291 | -12 |
| 10 | 3 15 26.099 | 26.506 | -427 | +19 | 26 | 6 16 47.748 | 48.053 | -287 | -18 |
| 11 | 3 19 22.650 | 23.062 | -426 | +14 | 27 | 6 20 44.303 | 44.609 | -283 | -22 |
| 12 | 3 23 19.200 | 19.617 | -425 | + 7 | 28 | 6 24 40.863 | 41.164 | -279 | -21 |
| 13 | 3 27 15.750 | 16.172 | -423 | 0 | 29 | 6 28 37.428 | 37.719 | -275 | -16 |
| 14 | 3 31 12.300 | 12.728 | -421 | - 6 | 30 | 6 32 33.996 | 34.275 | -272 | - 7 |
| 15 | 3 35 08.853 | 09.283 | -420 | -11 | 31 | 6 36 30.566 | 30.830 | -268 | + 4 |
| 16 | 3 39 05.408 | 05.839 | -418 | -13 | 32 | 6 40 27.135 | 27.385 | -264 | +14 |

TABLE III
CONVERSION OF MEAN SOLAR TO SIDEREAL TIME
CORRECTION TO BE ADDED TO A MEAN TIME INTERVAL

| | 0 ^h | 1 ^h | 2 ^h | 3 ^h | 4 ^h | 5 ^h | 6 ^h | 7 ^h | | For Seconds |
|----------------|------------------------------------|------------------------------------|------------------------------------|------------------------------------|------------------------------------|------------------------------------|------------------------------------|------------------------------------|----------------|--------------------|
| 0 ^m | 0 ^m 00 ^s 000 | 0 ^m 09 ^s 856 | 0 ^m 19 ^s 713 | 0 ^m 29 ^s 569 | 0 ^m 39 ^s 426 | 0 ^m 49 ^s 282 | 0 ^m 59 ^s 139 | 1 ^m 08 ^s 995 | 0 ^s | 0 ^s 000 |
| 1 | 00.164 | 10.021 | 19.877 | 29.734 | 39.590 | 49.447 | 59.303 | 09.160 | 1 | .003 |
| 2 | 00.329 | 10.185 | 20.041 | 29.898 | 39.754 | 49.611 | 59.467 | 09.324 | 2 | .005 |
| 3 | 00.493 | 10.349 | 20.206 | 30.062 | 39.919 | 49.775 | 59.632 | 09.488 | 3 | .008 |
| 4 | 00.657 | 10.514 | 20.370 | 30.227 | 40.083 | 49.939 | 59.796 | 09.652 | 4 | .011 |
| 5 | 00.821 | 10.678 | 20.534 | 30.391 | 40.247 | 50.104 | 59.960 | 09.817 | 5 | .014 |
| 6 | 00.986 | 10.842 | 20.699 | 30.555 | 40.412 | 50.268 | 1 00.124 | 09.981 | 6 | .016 |
| 7 | 01.150 | 11.006 | 20.863 | 30.719 | 40.576 | 50.432 | 00.289 | 10.145 | 7 | .019 |
| 8 | 01.314 | 11.171 | 21.027 | 30.884 | 40.740 | 50.597 | 00.453 | 10.310 | 8 | .022 |
| 9 | 01.478 | 11.335 | 21.191 | 31.048 | 40.904 | 50.761 | 00.617 | 10.474 | 9 | .025 |
| 10 | 01.643 | 11.499 | 21.356 | 31.212 | 41.069 | 50.925 | 1 00.782 | 1 10.638 | 10 | .027 |
| 11 | 01.807 | 11.663 | 21.520 | 31.376 | 41.233 | 51.089 | 00.946 | 10.802 | 11 | .030 |
| 12 | 01.971 | 11.828 | 21.684 | 31.541 | 41.397 | 51.254 | 01.110 | 10.967 | 12 | .033 |
| 13 | 02.136 | 11.992 | 21.849 | 31.705 | 41.561 | 51.418 | 01.274 | 11.131 | 13 | .036 |
| 14 | 02.300 | 12.156 | 22.013 | 31.869 | 41.726 | 51.582 | 01.439 | 11.295 | 14 | .038 |
| 15 | 02.464 | 12.321 | 22.177 | 32.034 | 41.890 | 51.746 | 1 01.603 | 1 11.459 | 15 | .041 |
| 16 | 02.628 | 12.485 | 22.341 | 32.198 | 42.054 | 51.911 | 01.767 | 11.624 | 16 | .044 |
| 17 | 02.793 | 12.649 | 22.506 | 32.362 | 42.219 | 52.075 | 01.932 | 11.788 | 17 | .047 |
| 18 | 02.957 | 12.813 | 22.670 | 32.526 | 42.383 | 52.239 | 02.096 | 11.952 | 18 | .049 |
| 19 | 03.121 | 12.978 | 22.834 | 32.691 | 42.547 | 52.404 | 02.260 | 12.117 | 19 | .052 |
| 20 | 03.285 | 13.142 | 22.998 | 32.855 | 42.711 | 52.568 | 1 02.424 | 1 12.281 | 20 | .055 |
| 21 | 03.450 | 13.306 | 23.163 | 33.019 | 42.876 | 52.732 | 02.589 | 12.445 | 21 | .057 |
| 22 | 03.614 | 13.471 | 23.327 | 33.183 | 43.040 | 52.896 | 02.753 | 12.609 | 22 | .060 |
| 23 | 03.778 | 13.635 | 23.491 | 33.348 | 43.204 | 53.061 | 02.917 | 12.774 | 23 | .063 |
| 24 | 03.943 | 13.799 | 23.656 | 33.512 | 43.368 | 53.225 | 03.081 | 12.938 | 24 | .066 |
| 25 | 04.107 | 13.963 | 23.820 | 33.676 | 43.533 | 53.389 | 1 03.246 | 1 13.102 | 25 | .068 |
| 26 | 04.271 | 14.128 | 23.984 | 33.841 | 43.697 | 53.554 | 03.410 | 13.266 | 26 | .071 |
| 27 | 04.435 | 14.292 | 24.148 | 34.005 | 43.861 | 53.718 | 03.574 | 13.431 | 27 | .074 |
| 28 | 04.600 | 14.456 | 24.313 | 34.169 | 44.026 | 53.882 | 03.739 | 13.595 | 28 | .077 |
| 29 | 04.764 | 14.620 | 24.477 | 34.333 | 44.190 | 54.046 | 03.903 | 13.759 | 29 | .079 |
| 30 | 04.928 | 14.785 | 24.641 | 34.498 | 44.354 | 54.211 | 1 04.067 | 1 13.924 | 30 | .082 |
| 31 | 05.093 | 14.949 | 24.805 | 34.662 | 44.518 | 54.375 | 04.231 | 14.088 | 31 | .085 |
| 32 | 05.257 | 15.113 | 24.970 | 34.826 | 44.683 | 54.539 | 04.396 | 14.252 | 32 | .088 |
| 33 | 05.421 | 15.278 | 25.134 | 34.990 | 44.847 | 54.703 | 04.560 | 14.416 | 33 | .090 |
| 34 | 05.585 | 15.442 | 25.298 | 35.155 | 45.011 | 54.868 | 04.724 | 14.581 | 34 | .093 |
| 35 | 05.750 | 15.606 | 25.463 | 35.319 | 45.176 | 55.032 | 1 04.888 | 1 14.745 | 35 | .096 |
| 36 | 05.914 | 15.770 | 25.627 | 35.483 | 45.340 | 55.196 | 05.053 | 14.909 | 36 | .099 |
| 37 | 06.078 | 15.935 | 25.791 | 35.648 | 45.504 | 55.361 | 05.217 | 15.073 | 37 | .101 |
| 38 | 06.242 | 16.099 | 25.955 | 35.812 | 45.668 | 55.525 | 05.381 | 15.238 | 38 | .104 |
| 39 | 06.407 | 16.263 | 26.120 | 35.976 | 45.833 | 55.689 | 05.546 | 15.402 | 39 | .107 |
| 40 | 06.571 | 16.427 | 26.284 | 36.140 | 45.997 | 55.853 | 1 05.710 | 1 15.566 | 40 | .110 |
| 41 | 06.735 | 16.592 | 26.448 | 36.305 | 46.161 | 56.018 | 05.874 | 15.731 | 41 | .112 |
| 42 | 06.900 | 16.756 | 26.612 | 36.469 | 46.325 | 56.182 | 06.038 | 15.895 | 42 | .115 |
| 43 | 07.064 | 16.920 | 26.777 | 36.633 | 46.490 | 56.346 | 06.203 | 16.059 | 43 | .118 |
| 44 | 07.228 | 17.085 | 26.941 | 36.798 | 46.654 | 56.510 | 06.367 | 16.223 | 44 | .120 |
| 45 | 07.392 | 17.249 | 27.105 | 36.962 | 46.818 | 56.675 | 1 06.531 | 1 16.388 | 45 | .123 |
| 46 | 07.557 | 17.413 | 27.270 | 37.126 | 46.983 | 56.839 | 06.695 | 16.552 | 46 | .126 |
| 47 | 07.721 | 17.577 | 27.434 | 37.290 | 47.147 | 57.003 | 06.860 | 16.716 | 47 | .129 |
| 48 | 07.885 | 17.742 | 27.598 | 37.455 | 47.311 | 57.168 | 07.024 | 16.880 | 48 | .131 |
| 49 | 08.049 | 17.906 | 27.762 | 37.619 | 47.475 | 57.332 | 07.188 | 17.045 | 49 | .134 |
| 50 | 08.214 | 18.070 | 27.927 | 37.783 | 47.640 | 57.496 | 1 07.353 | 1 17.209 | 50 | .137 |
| 51 | 08.378 | 18.234 | 28.091 | 37.947 | 47.804 | 57.660 | 07.517 | 17.373 | 51 | .140 |
| 52 | 08.542 | 18.399 | 28.255 | 38.112 | 47.968 | 57.825 | 07.681 | 17.538 | 52 | .142 |
| 53 | 08.707 | 18.563 | 28.419 | 38.276 | 48.132 | 57.989 | 07.845 | 17.702 | 53 | .145 |
| 54 | 08.871 | 18.727 | 28.584 | 38.440 | 48.297 | 58.153 | 08.010 | 17.866 | 54 | .148 |
| 55 | 09.035 | 18.892 | 28.748 | 38.605 | 48.461 | 58.317 | 1 08.174 | 1 18.030 | 55 | .151 |
| 56 | 09.199 | 19.056 | 28.912 | 38.769 | 48.625 | 58.482 | 08.338 | 18.195 | 56 | .153 |
| 57 | 09.364 | 19.220 | 29.077 | 38.933 | 48.790 | 58.646 | 08.502 | 18.359 | 57 | .156 |
| 58 | 09.528 | 19.384 | 29.241 | 39.097 | 48.954 | 58.810 | 08.667 | 18.523 | 58 | .159 |
| 59 | 09.692 | 19.549 | 29.405 | 39.262 | 49.118 | 58.975 | 1 08.831 | 1 18.688 | 59 | .162 |

(The argument is Mean Solar Time)

CONVERSION OF MEAN SOLAR TO SIDEREAL TIME
CORRECTION TO BE ADDED TO A MEAN TIME INTERVAL

| | 8 ^h | 9 ^h | 10 ^h | 11 ^h | 12 ^h | 13 ^h | 14 ^h | 15 ^h | For Seconds |
|----------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|----------------------|
| 0 ^m | 1 ^m 18.852 | 1 ^m 28.708 | 1 ^m 38.565 | 1 ^m 48.421 | 1 ^m 58.278 | 2 ^m 08.134 | 2 ^m 17.991 | 2 ^m 27.847 | 0 ^s 0.000 |
| 1 | 19.016 | 28.873 | 38.729 | 48.585 | 58.442 | 08.298 | 18.155 | 28.011 | 1 .003 |
| 2 | 19.180 | 29.037 | 38.893 | 48.750 | 58.606 | 08.463 | 18.319 | 28.176 | 2 .005 |
| 3 | 19.345 | 29.201 | 39.058 | 48.914 | 58.771 | 08.627 | 18.483 | 28.340 | 3 .008 |
| 4 | 19.509 | 29.365 | 39.222 | 49.078 | 58.935 | 08.791 | 18.648 | 28.504 | 4 .011 |
| 5 | 1 19.673 | 1 29.530 | 1 39.386 | 1 49.243 | 1 59.099 | 2 08.956 | 2 18.812 | 2 28.668 | 5 0.014 |
| 6 | 19.837 | 29.694 | 39.550 | 49.407 | 59.263 | 09.120 | 18.976 | 28.833 | 6 .016 |
| 7 | 20.002 | 29.858 | 39.715 | 49.571 | 59.428 | 09.284 | 19.141 | 28.997 | 7 .019 |
| 8 | 20.166 | 30.022 | 39.879 | 49.735 | 59.592 | 09.448 | 19.305 | 29.161 | 8 .022 |
| 9 | 20.330 | 30.187 | 40.043 | 49.900 | 59.756 | 09.613 | 19.469 | 29.326 | 9 .025 |
| 10 | 1 20.495 | 1 30.351 | 1 40.207 | 1 50.064 | 1 59.920 | 2 09.777 | 2 19.633 | 2 29.490 | 10 0.027 |
| 11 | 20.659 | 30.515 | 40.372 | 50.228 | 2 00.085 | 09.941 | 19.798 | 29.654 | 11 .030 |
| 12 | 20.823 | 30.680 | 40.536 | 50.393 | 00.249 | 10.105 | 19.962 | 29.818 | 12 .033 |
| 13 | 20.987 | 30.844 | 40.700 | 50.557 | 00.413 | 10.270 | 20.126 | 29.983 | 13 .036 |
| 14 | 21.152 | 31.008 | 40.865 | 50.721 | 00.578 | 10.434 | 20.290 | 30.147 | 14 .038 |
| 15 | 1 21.316 | 1 31.172 | 1 41.029 | 1 50.885 | 2 00.742 | 2 10.598 | 2 20.455 | 2 30.311 | 15 0.041 |
| 16 | 21.480 | 31.337 | 41.193 | 51.050 | 00.906 | 10.763 | 20.619 | 30.475 | 16 .044 |
| 17 | 21.644 | 31.501 | 41.357 | 51.214 | 01.070 | 10.927 | 20.783 | 30.640 | 17 .047 |
| 18 | 21.809 | 31.665 | 41.522 | 51.378 | 01.235 | 11.091 | 20.948 | 30.804 | 18 .049 |
| 19 | 21.973 | 31.829 | 41.686 | 51.542 | 01.399 | 11.255 | 21.112 | 30.968 | 19 .052 |
| 20 | 1 22.137 | 1 31.994 | 1 41.850 | 1 51.707 | 2 01.563 | 2 11.420 | 2 21.276 | 2 31.133 | 20 0.055 |
| 21 | 22.302 | 32.158 | 42.014 | 51.871 | 01.727 | 11.584 | 21.440 | 31.297 | 21 .057 |
| 22 | 22.466 | 32.322 | 42.179 | 52.035 | 01.892 | 11.748 | 21.605 | 31.461 | 22 .060 |
| 23 | 22.630 | 32.487 | 42.343 | 52.200 | 02.056 | 11.912 | 21.769 | 31.625 | 23 .063 |
| 24 | 22.794 | 32.651 | 42.507 | 52.364 | 02.220 | 12.077 | 21.933 | 31.790 | 24 .066 |
| 25 | 1 22.959 | 1 32.815 | 1 42.672 | 1 52.528 | 2 02.385 | 2 12.241 | 2 22.097 | 2 31.954 | 25 0.068 |
| 26 | 23.123 | 32.979 | 42.836 | 52.692 | 02.549 | 12.405 | 22.262 | 32.118 | 26 .071 |
| 27 | 23.287 | 33.144 | 43.000 | 52.857 | 02.713 | 12.570 | 22.426 | 32.283 | 27 .074 |
| 28 | 23.451 | 33.308 | 43.164 | 53.021 | 02.877 | 12.734 | 22.590 | 32.447 | 28 .077 |
| 29 | 23.616 | 33.472 | 43.329 | 53.185 | 03.042 | 12.898 | 22.755 | 32.611 | 29 .079 |
| 30 | 1 23.780 | 1 33.636 | 1 43.493 | 1 53.349 | 2 03.206 | 2 13.062 | 2 22.919 | 2 32.775 | 30 0.082 |
| 31 | 23.944 | 33.801 | 43.657 | 53.514 | 03.370 | 13.227 | 23.083 | 32.940 | 31 .085 |
| 32 | 24.109 | 33.965 | 43.822 | 53.678 | 03.534 | 13.391 | 23.247 | 33.104 | 32 .088 |
| 33 | 24.273 | 34.129 | 43.986 | 53.842 | 03.699 | 13.555 | 23.412 | 33.268 | 33 .090 |
| 34 | 24.437 | 34.294 | 44.150 | 54.007 | 03.863 | 13.719 | 23.576 | 33.432 | 34 .093 |
| 35 | 1 24.601 | 1 34.458 | 1 44.314 | 1 54.171 | 2 04.027 | 2 13.884 | 2 23.740 | 2 33.597 | 35 0.096 |
| 36 | 24.766 | 34.622 | 44.479 | 54.335 | 04.192 | 14.048 | 23.905 | 33.761 | 36 .099 |
| 37 | 24.930 | 34.786 | 44.643 | 54.499 | 04.356 | 14.212 | 24.069 | 33.925 | 37 .101 |
| 38 | 25.094 | 34.951 | 44.807 | 54.664 | 04.520 | 14.377 | 24.233 | 34.090 | 38 .104 |
| 39 | 25.258 | 35.115 | 44.971 | 54.828 | 04.684 | 14.541 | 24.397 | 34.254 | 39 .107 |
| 40 | 1 25.423 | 1 35.279 | 1 45.136 | 1 54.992 | 2 04.849 | 2 14.705 | 2 24.562 | 2 34.418 | 40 0.110 |
| 41 | 25.587 | 35.444 | 45.300 | 55.156 | 05.013 | 14.869 | 24.726 | 34.582 | 41 .112 |
| 42 | 25.751 | 35.608 | 45.464 | 55.321 | 05.177 | 15.034 | 24.890 | 34.747 | 42 .115 |
| 43 | 25.916 | 35.772 | 45.629 | 55.485 | 05.341 | 15.198 | 25.054 | 34.911 | 43 .118 |
| 44 | 26.080 | 35.936 | 45.793 | 55.649 | 05.506 | 15.362 | 25.219 | 35.075 | 44 .120 |
| 45 | 1 26.244 | 1 36.101 | 1 45.957 | 1 55.814 | 2 05.670 | 2 15.527 | 2 25.383 | 2 35.239 | 45 0.123 |
| 46 | 26.408 | 36.265 | 46.121 | 55.978 | 05.834 | 15.691 | 25.547 | 35.404 | 46 .126 |
| 47 | 26.573 | 36.429 | 46.286 | 56.142 | 05.999 | 15.855 | 25.712 | 35.568 | 47 .129 |
| 48 | 26.737 | 36.593 | 46.450 | 56.306 | 06.163 | 16.019 | 25.876 | 35.732 | 48 .131 |
| 49 | 26.901 | 36.758 | 46.614 | 56.471 | 06.327 | 16.184 | 26.040 | 35.897 | 49 .134 |
| 50 | 1 27.066 | 1 36.922 | 1 46.778 | 1 56.635 | 2 06.491 | 2 16.348 | 2 26.204 | 2 36.061 | 50 0.137 |
| 51 | 27.230 | 37.086 | 46.943 | 56.799 | 06.656 | 16.512 | 26.369 | 36.225 | 51 .140 |
| 52 | 27.394 | 37.251 | 47.107 | 56.963 | 06.820 | 16.676 | 26.533 | 36.389 | 52 .142 |
| 53 | 27.558 | 37.415 | 47.271 | 57.128 | 06.984 | 16.841 | 26.697 | 36.554 | 53 .145 |
| 54 | 27.723 | 37.579 | 47.436 | 57.292 | 07.149 | 17.005 | 26.861 | 36.718 | 54 .148 |
| 55 | 1 27.887 | 1 37.743 | 1 47.600 | 1 57.456 | 2 07.313 | 2 17.169 | 2 27.026 | 2 36.882 | 55 0.151 |
| 56 | 28.051 | 37.908 | 47.764 | 57.621 | 07.477 | 17.334 | 27.190 | 37.046 | 56 .153 |
| 57 | 28.215 | 38.072 | 47.928 | 57.785 | 07.641 | 17.498 | 27.354 | 37.211 | 57 .156 |
| 58 | 28.380 | 38.236 | 48.093 | 57.949 | 07.806 | 17.662 | 27.519 | 37.375 | 58 .159 |
| 59 | 1 28.544 | 1 38.400 | 1 48.257 | 1 58.113 | 2 07.970 | 2 17.826 | 2 27.683 | 2 37.539 | 59 0.162 |

(The argument is Mean Solar Time)

CONVERSION OF MEAN SOLAR TO SIDEREAL TIME
CORRECTION TO BE ADDED TO A MEAN TIME INTERVAL

| | 16 ^h | 17 ^h | 18 ^h | 19 ^h | 20 ^h | 21 ^h | 22 ^h | 23 ^h | For Seconds |
|----------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|----------------------|
| 0 ^m | 2 ^m 37.704 | 2 ^m 47.560 | 2 ^m 57.417 | 3 ^m 07.273 | 3 ^m 17.129 | 3 ^m 26.986 | 3 ^m 36.842 | 3 ^m 46.699 | 0 ^s 0.000 |
| 1 | 37.868 | 47.724 | 57.581 | 07.437 | 17.294 | 27.150 | 37.007 | 46.863 | 1 .003 |
| 2 | 38.032 | 47.889 | 57.745 | 07.602 | 17.458 | 27.314 | 37.171 | 47.027 | 2 .005 |
| 3 | 38.196 | 48.053 | 57.909 | 07.766 | 17.622 | 27.479 | 37.335 | 47.192 | 3 .008 |
| 4 | 38.361 | 48.217 | 58.074 | 07.930 | 17.787 | 27.643 | 37.500 | 47.356 | 4 .011 |
| 5 | 2 38.525 | 2 48.381 | 2 58.238 | 3 08.094 | 3 17.951 | 3 27.807 | 3 37.664 | 3 47.520 | 5 0.014 |
| 6 | 38.689 | 48.546 | 58.402 | 08.259 | 18.115 | 27.972 | 37.828 | 47.685 | 6 .016 |
| 7 | 38.853 | 48.710 | 58.566 | 08.423 | 18.279 | 28.136 | 37.992 | 47.849 | 7 .019 |
| 8 | 39.018 | 48.874 | 58.731 | 08.587 | 18.444 | 28.300 | 38.157 | 48.013 | 8 .022 |
| 9 | 39.182 | 49.039 | 58.895 | 08.751 | 18.608 | 28.464 | 38.321 | 48.177 | 9 .025 |
| 10 | 2 39.346 | 2 49.203 | 2 59.059 | 3 08.916 | 3 18.772 | 3 28.629 | 3 38.485 | 3 48.342 | 10 0.027 |
| 11 | 39.511 | 49.367 | 59.224 | 09.080 | 18.936 | 28.793 | 38.649 | 48.506 | 11 .030 |
| 12 | 39.675 | 49.531 | 59.388 | 09.244 | 19.101 | 28.957 | 38.814 | 48.670 | 12 .033 |
| 13 | 39.839 | 49.696 | 59.552 | 09.409 | 19.265 | 29.122 | 38.978 | 48.834 | 13 .036 |
| 14 | 40.003 | 49.860 | 59.716 | 09.573 | 19.429 | 29.286 | 39.142 | 48.999 | 14 .038 |
| 15 | 2 40.168 | 2 50.024 | 2 59.881 | 3 09.737 | 3 19.594 | 3 29.450 | 3 39.307 | 3 49.163 | 15 0.041 |
| 16 | 40.332 | 50.188 | 3 00.045 | 09.901 | 19.758 | 29.614 | 39.471 | 49.327 | 16 .044 |
| 17 | 40.496 | 50.353 | 00.209 | 10.066 | 19.922 | 29.779 | 39.635 | 49.492 | 17 .047 |
| 18 | 40.661 | 50.517 | 00.373 | 10.230 | 20.086 | 29.943 | 39.799 | 49.656 | 18 .049 |
| 19 | 40.825 | 50.681 | 00.538 | 10.394 | 20.251 | 30.107 | 39.964 | 49.820 | 19 .052 |
| 20 | 2 40.989 | 2 50.846 | 3 00.702 | 3 10.558 | 3 20.415 | 3 30.271 | 3 40.128 | 3 49.984 | 20 0.055 |
| 21 | 41.153 | 51.010 | 00.866 | 10.723 | 20.579 | 30.436 | 40.292 | 50.149 | 21 .057 |
| 22 | 41.318 | 51.174 | 01.031 | 10.887 | 20.744 | 30.600 | 40.456 | 50.313 | 22 .060 |
| 23 | 41.482 | 51.338 | 01.195 | 11.051 | 20.908 | 30.764 | 40.621 | 50.477 | 23 .063 |
| 24 | 41.646 | 51.503 | 01.359 | 11.216 | 21.072 | 30.929 | 40.785 | 50.641 | 24 .066 |
| 25 | 2 41.810 | 2 51.667 | 3 01.523 | 3 11.380 | 3 21.236 | 3 31.093 | 3 40.949 | 3 50.806 | 25 0.068 |
| 26 | 41.975 | 51.831 | 01.688 | 11.544 | 21.401 | 31.257 | 41.114 | 50.970 | 26 .071 |
| 27 | 42.139 | 51.995 | 01.852 | 11.708 | 21.565 | 31.421 | 41.278 | 51.134 | 27 .074 |
| 28 | 42.303 | 52.160 | 02.016 | 11.873 | 21.729 | 31.586 | 41.442 | 51.299 | 28 .077 |
| 29 | 42.468 | 52.324 | 02.180 | 12.037 | 21.893 | 31.750 | 41.606 | 51.463 | 29 .079 |
| 30 | 2 42.632 | 2 52.488 | 3 02.345 | 3 12.201 | 3 22.058 | 3 31.914 | 3 41.771 | 3 51.627 | 30 0.082 |
| 31 | 42.796 | 52.653 | 02.509 | 12.366 | 22.222 | 32.078 | 41.935 | 51.791 | 31 .085 |
| 32 | 42.960 | 52.817 | 02.673 | 12.530 | 22.386 | 32.243 | 42.099 | 51.956 | 32 .088 |
| 33 | 43.125 | 52.981 | 02.838 | 12.694 | 22.551 | 32.407 | 42.263 | 52.120 | 33 .090 |
| 34 | 43.289 | 53.145 | 03.002 | 12.858 | 22.715 | 32.571 | 42.428 | 52.284 | 34 .093 |
| 35 | 2 43.453 | 2 53.310 | 3 03.166 | 3 13.023 | 3 22.879 | 3 32.736 | 3 42.592 | 3 52.448 | 35 0.096 |
| 36 | 43.617 | 53.474 | 03.330 | 13.187 | 23.043 | 32.900 | 42.756 | 52.613 | 36 .099 |
| 37 | 43.782 | 53.638 | 03.495 | 13.351 | 23.208 | 33.064 | 42.921 | 52.777 | 37 .101 |
| 38 | 43.946 | 53.802 | 03.659 | 13.515 | 23.372 | 33.228 | 43.085 | 52.941 | 38 .104 |
| 39 | 44.110 | 53.967 | 03.823 | 13.680 | 23.536 | 33.393 | 43.249 | 53.106 | 39 .107 |
| 40 | 2 44.275 | 2 54.131 | 3 03.988 | 3 13.844 | 3 23.700 | 3 33.557 | 3 43.413 | 3 53.270 | 40 0.110 |
| 41 | 44.439 | 54.295 | 04.152 | 14.008 | 23.865 | 33.721 | 43.578 | 53.434 | 41 .112 |
| 42 | 44.603 | 54.460 | 04.316 | 14.173 | 24.029 | 33.885 | 43.742 | 53.598 | 42 .115 |
| 43 | 44.767 | 54.624 | 04.480 | 14.337 | 24.193 | 34.050 | 43.906 | 53.763 | 43 .118 |
| 44 | 44.932 | 54.788 | 04.645 | 14.501 | 24.358 | 34.214 | 44.070 | 53.927 | 44 .120 |
| 45 | 2 45.096 | 2 54.952 | 3 04.809 | 3 14.665 | 3 24.522 | 3 34.378 | 3 44.235 | 3 54.091 | 45 0.123 |
| 46 | 45.260 | 55.117 | 04.973 | 14.830 | 24.686 | 34.543 | 44.399 | 54.256 | 46 .126 |
| 47 | 45.424 | 55.281 | 05.137 | 14.994 | 24.850 | 34.707 | 44.563 | 54.420 | 47 .129 |
| 48 | 45.589 | 55.445 | 05.302 | 15.158 | 25.015 | 34.871 | 44.728 | 54.584 | 48 .131 |
| 49 | 45.753 | 55.610 | 05.466 | 15.322 | 25.179 | 35.035 | 44.892 | 54.748 | 49 .134 |
| 50 | 2 45.917 | 2 55.774 | 3 05.630 | 3 15.487 | 3 25.343 | 3 35.200 | 3 45.056 | 3 54.913 | 50 0.137 |
| 51 | 46.082 | 55.938 | 05.795 | 15.651 | 25.507 | 35.364 | 45.220 | 55.077 | 51 .140 |
| 52 | 46.246 | 56.102 | 05.959 | 15.815 | 25.672 | 35.528 | 45.385 | 55.241 | 52 .142 |
| 53 | 46.410 | 56.267 | 06.123 | 15.980 | 25.836 | 35.692 | 45.549 | 55.405 | 53 .145 |
| 54 | 46.574 | 56.431 | 06.287 | 16.144 | 26.000 | 35.857 | 45.713 | 55.570 | 54 .148 |
| 55 | 2 46.739 | 2 56.595 | 3 06.452 | 3 16.308 | 3 26.165 | 3 36.021 | 3 45.878 | 3 55.734 | 55 0.151 |
| 56 | 46.903 | 56.759 | 06.616 | 16.472 | 26.329 | 36.185 | 46.042 | 55.898 | 56 .153 |
| 57 | 47.067 | 56.924 | 06.780 | 16.637 | 26.493 | 36.350 | 46.206 | 56.063 | 57 .156 |
| 58 | 47.231 | 57.088 | 06.944 | 16.801 | 26.657 | 36.514 | 46.370 | 56.227 | 58 .159 |
| 59 | 2 47.396 | 2 57.252 | 3 07.109 | 3 16.965 | 3 26.822 | 3 36.678 | 3 46.535 | 3 56.391 | 59 0.162 |

(The argument is Mean Solar Time)

CONVERSION OF SIDEREAL TO MEAN SOLAR TIME
CORRECTION TO BE SUBTRACTED FROM A SIDEREAL TIME INTERVAL

| | 0 ^h | 1 ^h | 2 ^h | 3 ^h | 4 ^h | 5 ^h | 6 ^h | 7 ^h | For Seconds |
|----------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|----------------------|
| 0 ^m | 0 ^m 00:000 | 0 ^m 09:830 | 0 ^m 19:659 | 0 ^m 29:489 | 0 ^m 39:318 | 0 ^m 49:148 | 0 ^m 58:977 | 1 ^m 08:807 | 0 ^s 0:000 |
| 1 | 00.164 | 09.993 | 19.823 | 29.653 | 39.482 | 49.312 | 59.141 | 08.971 | 1 .003 |
| 2 | 00.328 | 10.157 | 19.987 | 29.816 | 39.646 | 49.475 | 59.305 | 09.135 | 2 .005 |
| 3 | 00.491 | 10.321 | 20.151 | 29.980 | 39.810 | 49.639 | 59.469 | 09.298 | 3 .008 |
| 4 | 00.655 | 10.485 | 20.314 | 30.144 | 39.974 | 49.803 | 59.633 | 09.462 | 4 .011 |
| 5 | 0 00.819 | 0 10.649 | 0 20.478 | 0 30.308 | 0 40.137 | 0 49.967 | 0 59.796 | 1 09.626 | 5 0.014 |
| 6 | 00.983 | 10.813 | 20.642 | 30.472 | 40.301 | 50.131 | 0 59.960 | 09.790 | 6 .016 |
| 7 | 01.147 | 10.976 | 20.806 | 30.635 | 40.465 | 50.295 | 1 00.124 | 09.954 | 7 .019 |
| 8 | 01.311 | 11.140 | 20.970 | 30.799 | 40.629 | 50.458 | 00.288 | 10.118 | 8 .022 |
| 9 | 01.474 | 11.304 | 21.134 | 30.963 | 40.793 | 50.622 | 00.452 | 10.281 | 9 025 |
| 10 | 0 01.638 | 0 11.468 | 0 21.297 | 0 31.127 | 0 40.957 | 0 50.786 | 1 00.616 | 1 10.445 | 10 0.027 |
| 11 | 01.802 | 11.632 | 21.461 | 31.291 | 41.120 | 50.950 | 00.779 | 10.609 | 11 .030 |
| 12 | 01.966 | 11.795 | 21.625 | 31.455 | 41.284 | 51.114 | 00.943 | 10.773 | 12 .033 |
| 13 | 02.130 | 11.959 | 21.789 | 31.618 | 41.448 | 51.278 | 01.107 | 10.937 | 13 .035 |
| 14 | 02.294 | 12.123 | 21.953 | 31.782 | 41.612 | 51.441 | 01.271 | 11.100 | 14 .038 |
| 15 | 0 02.457 | 0 12.287 | 0 22.117 | 0 31.946 | 0 41.776 | 0 51.605 | 1 01.435 | 1 11.264 | 15 0.041 |
| 16 | 02.621 | 12.451 | 22.280 | 32.110 | 41.939 | 51.769 | 01.599 | 11.428 | 16 .044 |
| 17 | 02.785 | 12.615 | 22.444 | 32.274 | 42.103 | 51.933 | 01.762 | 11.592 | 17 .046 |
| 18 | 02.949 | 12.778 | 22.608 | 32.438 | 42.267 | 52.097 | 01.926 | 11.756 | 18 .049 |
| 19 | 03.113 | 12.942 | 22.772 | 32.601 | 42.431 | 52.260 | 02.090 | 11.920 | 19 .052 |
| 20 | 0 03.277 | 0 13.106 | 0 22.936 | 0 32.765 | 0 42.595 | 0 52.424 | 1 02.254 | 1 12.083 | 20 0.055 |
| 21 | 03.440 | 13.270 | 23.099 | 32.929 | 42.759 | 52.588 | 02.418 | 12.247 | 21 .057 |
| 22 | 03.604 | 13.434 | 23.263 | 33.093 | 42.922 | 52.752 | 02.582 | 12.411 | 22 .060 |
| 23 | 03.768 | 13.598 | 23.427 | 33.257 | 43.086 | 52.916 | 02.745 | 12.575 | 23 .063 |
| 24 | 03.932 | 13.761 | 23.591 | 33.421 | 43.250 | 53.080 | 02.909 | 12.739 | 24 .066 |
| 25 | 0 04.096 | 0 13.925 | 0 23.755 | 0 33.584 | 0 43.414 | 0 53.243 | 1 03.073 | 1 12.903 | 25 0.068 |
| 26 | 04.259 | 14.089 | 23.919 | 33.748 | 43.578 | 53.407 | 03.237 | 13.066 | 26 .071 |
| 27 | 04.423 | 14.253 | 24.082 | 33.912 | 43.742 | 53.571 | 03.401 | 13.230 | 27 .074 |
| 28 | 04.587 | 14.417 | 24.246 | 34.076 | 43.905 | 53.735 | 03.564 | 13.394 | 28 .076 |
| 29 | 04.751 | 14.581 | 24.410 | 34.240 | 44.069 | 53.899 | 03.728 | 13.558 | 29 .079 |
| 30 | 0 04.915 | 0 14.744 | 0 24.574 | 0 34.403 | 0 44.233 | 0 54.063 | 1 03.892 | 1 13.722 | 30 0.082 |
| 31 | 05.079 | 14.908 | 24.738 | 34.567 | 44.397 | 54.226 | 04.056 | 13.886 | 31 .085 |
| 32 | 05.242 | 15.072 | 24.902 | 34.731 | 44.561 | 54.390 | 04.220 | 14.049 | 32 .087 |
| 33 | 05.406 | 15.236 | 25.065 | 34.895 | 44.725 | 54.554 | 04.384 | 14.213 | 33 .090 |
| 34 | 05.570 | 15.400 | 25.229 | 35.059 | 44.888 | 54.718 | 04.547 | 14.377 | 34 .093 |
| 35 | 0 05.734 | 0 15.563 | 0 25.393 | 0 35.223 | 0 45.052 | 0 54.882 | 1 04.711 | 1 14.541 | 35 0.096 |
| 36 | 05.898 | 15.727 | 25.557 | 35.386 | 45.216 | 55.046 | 04.875 | 14.705 | 36 .098 |
| 37 | 06.062 | 15.891 | 25.721 | 35.550 | 45.380 | 55.209 | 05.039 | 14.868 | 37 .101 |
| 38 | 06.225 | 16.055 | 25.885 | 35.714 | 45.544 | 55.373 | 05.203 | 15.032 | 38 .104 |
| 39 | 06.389 | 16.219 | 26.048 | 35.878 | 45.707 | 55.537 | 05.367 | 15.196 | 39 .106 |
| 40 | 0 06.553 | 0 16.383 | 0 26.212 | 0 36.042 | 0 45.871 | 0 55.701 | 1 05.530 | 1 15.360 | 40 0.109 |
| 41 | 06.717 | 16.546 | 26.376 | 36.206 | 46.035 | 55.865 | 05.694 | 15.524 | 41 .112 |
| 42 | 06.881 | 16.710 | 26.540 | 36.369 | 46.199 | 56.028 | 05.858 | 15.688 | 42 .115 |
| 43 | 07.045 | 16.874 | 26.704 | 36.533 | 46.363 | 56.192 | 06.022 | 15.851 | 43 .117 |
| 44 | 07.208 | 17.038 | 26.867 | 36.697 | 46.527 | 56.356 | 06.186 | 16.015 | 44 .120 |
| 45 | 0 07.372 | 0 17.202 | 0 27.031 | 0 36.861 | 0 46.690 | 0 56.520 | 1 06.350 | 1 16.179 | 45 0.123 |
| 46 | 07.536 | 17.366 | 27.195 | 37.025 | 46.854 | 56.684 | 06.513 | 16.343 | 46 .126 |
| 47 | 07.700 | 17.529 | 27.359 | 37.189 | 47.018 | 56.848 | 06.677 | 16.507 | 47 .128 |
| 48 | 07.864 | 17.693 | 27.523 | 37.352 | 47.182 | 57.011 | 06.841 | 16.671 | 48 .131 |
| 49 | 08.027 | 17.857 | 27.687 | 37.516 | 47.346 | 57.175 | 07.005 | 16.834 | 49 .134 |
| 50 | 0 08.191 | 0 18.021 | 0 27.850 | 0 37.680 | 0 47.510 | 0 57.339 | 1 07.169 | 1 16.998 | 50 0.137 |
| 51 | 08.355 | 18.185 | 28.014 | 37.844 | 47.673 | 57.503 | 07.332 | 17.162 | 51 .139 |
| 52 | 08.519 | 18.349 | 28.178 | 38.008 | 47.837 | 57.667 | 07.496 | 17.326 | 52 .142 |
| 53 | 08.683 | 18.512 | 28.342 | 38.171 | 48.001 | 57.831 | 07.660 | 17.490 | 53 .145 |
| 54 | 08.847 | 18.676 | 28.506 | 38.335 | 48.165 | 57.994 | 07.824 | 17.654 | 54 .147 |
| 55 | 0 09.010 | 0 18.840 | 0 28.670 | 0 38.499 | 0 48.329 | 0 58.158 | 1 07.988 | 1 17.817 | 55 0.150 |
| 56 | 09.174 | 19.004 | 28.833 | 38.663 | 48.493 | 58.322 | 08.152 | 17.981 | 56 .153 |
| 57 | 09.338 | 19.168 | 28.997 | 38.827 | 48.656 | 58.486 | 08.315 | 18.145 | 57 .156 |
| 58 | 09.502 | 19.331 | 29.161 | 38.991 | 48.820 | 58.650 | 08.479 | 18.309 | 58 .158 |
| 59 | 0 09.666 | 0 19.495 | 0 29.325 | 0 39.154 | 0 48.984 | 0 58.814 | 1 08.643 | 1 18.473 | 59 0.161 |

(The argument is the Sidereal Time Interval)

TABLE IV

CONVERSION OF SIDEREAL TO MEAN SOLAR TIME
CORRECTION TO BE SUBTRACTED FROM A SIDEREAL TIME INTERVAL

| | 8 ^h | 9 ^h | 10 ^h | 11 ^h | 12 ^h | 13 ^h | 14 ^h | 15 ^h | For Seconds | |
|----------------|------------------------------------|------------------------------------|------------------------------------|------------------------------------|------------------------------------|------------------------------------|------------------------------------|------------------------------------|----------------|--------------------|
| 0 ^m | 1 ^m 18 ^s 636 | 1 ^m 28 ^s 466 | 1 ^m 38 ^s 296 | 1 ^m 48 ^s 125 | 1 ^m 57 ^s 955 | 2 ^m 07 ^s 784 | 2 ^m 17 ^s 614 | 2 ^m 27 ^s 443 | 0 ^s | 0 ^s 000 |
| 1 | 18.800 | 28.630 | 38.459 | 48.289 | 58.119 | 07.948 | 17.778 | 27.607 | 1 | .003 |
| 2 | 18.964 | 28.794 | 38.623 | 48.453 | 58.282 | 08.112 | 17.942 | 27.771 | 2 | .005 |
| 3 | 19.128 | 28.958 | 38.787 | 48.617 | 58.446 | 08.276 | 18.105 | 27.935 | 3 | .008 |
| 4 | 19.292 | 29.121 | 38.951 | 48.780 | 58.610 | 08.440 | 18.269 | 28.099 | 4 | .011 |
| 5 | 19.456 | 29.285 | 39.115 | 48.944 | 58.774 | 08.603 | 18.433 | 28.263 | 5 | .014 |
| 6 | 19.619 | 29.449 | 39.279 | 49.108 | 58.938 | 08.767 | 18.597 | 28.426 | 6 | .016 |
| 7 | 19.783 | 29.613 | 39.442 | 49.272 | 59.102 | 08.931 | 18.761 | 28.590 | 7 | .019 |
| 8 | 19.947 | 29.777 | 39.606 | 49.436 | 59.265 | 09.095 | 18.924 | 28.754 | 8 | .022 |
| 9 | 20.111 | 29.940 | 39.770 | 49.600 | 59.429 | 09.259 | 19.088 | 28.918 | 9 | .025 |
| 10 | 20.275 | 30.104 | 39.934 | 49.763 | 59.593 | 09.423 | 19.252 | 29.082 | 10 | .027 |
| 11 | 20.439 | 30.268 | 40.098 | 49.927 | 59.757 | 09.586 | 19.416 | 29.245 | 11 | .030 |
| 12 | 20.602 | 30.432 | 40.262 | 50.091 | 59.921 | 09.750 | 19.580 | 29.409 | 12 | .033 |
| 13 | 20.766 | 30.596 | 40.425 | 50.255 | 00.084 | 09.914 | 19.744 | 29.573 | 13 | .035 |
| 14 | 20.930 | 30.760 | 40.589 | 50.419 | 00.248 | 10.078 | 19.907 | 29.737 | 14 | .038 |
| 15 | 21.094 | 30.923 | 40.753 | 50.583 | 00.412 | 10.242 | 20.071 | 29.901 | 15 | .041 |
| 16 | 21.258 | 31.087 | 40.917 | 50.746 | 00.576 | 10.406 | 20.235 | 30.065 | 16 | .044 |
| 17 | 21.422 | 31.251 | 41.081 | 50.910 | 00.740 | 10.569 | 20.399 | 30.228 | 17 | .046 |
| 18 | 21.585 | 31.415 | 41.244 | 51.074 | 00.904 | 10.733 | 20.563 | 30.392 | 18 | .049 |
| 19 | 21.749 | 31.579 | 41.408 | 51.238 | 01.067 | 10.897 | 20.727 | 30.556 | 19 | .052 |
| 20 | 21.913 | 31.743 | 41.572 | 51.402 | 01.231 | 2 11.061 | 2 20.890 | 2 30.720 | 20 | .055 |
| 21 | 22.077 | 31.906 | 41.736 | 51.566 | 01.395 | 11.225 | 21.054 | 30.884 | 21 | .057 |
| 22 | 22.241 | 32.070 | 41.900 | 51.729 | 01.559 | 11.388 | 21.218 | 31.048 | 22 | .060 |
| 23 | 22.404 | 32.234 | 42.064 | 51.893 | 01.723 | 11.552 | 21.382 | 31.211 | 23 | .063 |
| 24 | 22.568 | 32.398 | 42.227 | 52.057 | 01.887 | 11.716 | 21.546 | 31.375 | 24 | .066 |
| 25 | 22.732 | 32.562 | 42.391 | 52.221 | 02.050 | 2 11.880 | 2 21.710 | 2 31.539 | 25 | .068 |
| 26 | 22.896 | 32.726 | 42.555 | 52.385 | 02.214 | 12.044 | 21.873 | 31.703 | 26 | .071 |
| 27 | 23.060 | 32.889 | 42.719 | 52.548 | 02.378 | 12.208 | 22.037 | 31.867 | 27 | .074 |
| 28 | 23.224 | 33.053 | 42.883 | 52.712 | 02.542 | 12.371 | 22.201 | 32.031 | 28 | .076 |
| 29 | 23.387 | 33.217 | 43.047 | 52.876 | 02.706 | 12.535 | 22.365 | 32.194 | 29 | .079 |
| 30 | 23.551 | 33.381 | 43.210 | 53.040 | 02.870 | 2 12.699 | 2 22.529 | 2 32.358 | 30 | .082 |
| 31 | 23.715 | 33.545 | 43.374 | 53.204 | 03.033 | 12.863 | 22.692 | 32.522 | 31 | .085 |
| 32 | 23.879 | 33.708 | 43.538 | 53.368 | 03.197 | 13.027 | 22.856 | 32.686 | 32 | .087 |
| 33 | 24.043 | 33.872 | 43.702 | 53.531 | 03.361 | 13.191 | 23.020 | 32.850 | 33 | .090 |
| 34 | 24.207 | 34.036 | 43.866 | 53.695 | 03.525 | 13.354 | 23.184 | 33.013 | 34 | .093 |
| 35 | 24.370 | 34.200 | 44.030 | 53.859 | 03.689 | 2 13.518 | 2 23.348 | 2 33.177 | 35 | .096 |
| 36 | 24.534 | 34.364 | 44.193 | 54.023 | 03.852 | 13.682 | 23.512 | 33.341 | 36 | .098 |
| 37 | 24.698 | 34.528 | 44.357 | 54.187 | 04.016 | 13.846 | 23.675 | 33.505 | 37 | .101 |
| 38 | 24.862 | 34.691 | 44.521 | 54.351 | 04.180 | 14.010 | 23.839 | 33.669 | 38 | .104 |
| 39 | 25.026 | 34.855 | 44.685 | 54.514 | 04.344 | 14.174 | 24.003 | 33.833 | 39 | .106 |
| 40 | 25.190 | 35.019 | 44.849 | 54.678 | 04.508 | 2 14.337 | 2 24.167 | 2 33.996 | 40 | .109 |
| 41 | 25.353 | 35.183 | 45.012 | 54.842 | 04.672 | 14.501 | 24.331 | 34.160 | 41 | .112 |
| 42 | 25.517 | 35.347 | 45.176 | 55.006 | 04.835 | 14.665 | 24.495 | 34.324 | 42 | .115 |
| 43 | 25.681 | 35.511 | 45.340 | 55.170 | 04.999 | 14.829 | 24.658 | 34.488 | 43 | .117 |
| 44 | 25.845 | 35.674 | 45.504 | 55.334 | 05.163 | 14.993 | 24.822 | 34.652 | 44 | .120 |
| 45 | 26.009 | 35.838 | 45.668 | 55.497 | 05.327 | 2 15.156 | 2 24.986 | 2 34.816 | 45 | .123 |
| 46 | 26.172 | 36.002 | 45.832 | 55.661 | 05.491 | 15.320 | 25.150 | 34.979 | 46 | .126 |
| 47 | 26.336 | 36.166 | 45.995 | 55.825 | 05.655 | 15.484 | 25.314 | 35.143 | 47 | .128 |
| 48 | 26.500 | 36.330 | 46.159 | 55.989 | 05.818 | 15.648 | 25.478 | 35.307 | 48 | .131 |
| 49 | 26.664 | 36.494 | 46.323 | 56.153 | 05.982 | 15.812 | 25.641 | 35.471 | 49 | .134 |
| 50 | 26.828 | 36.657 | 46.487 | 56.316 | 06.146 | 2 15.976 | 2 25.805 | 2 35.635 | 50 | .137 |
| 51 | 26.992 | 36.821 | 46.651 | 56.480 | 06.310 | 16.139 | 25.969 | 35.799 | 51 | .139 |
| 52 | 27.155 | 36.985 | 46.815 | 56.644 | 06.474 | 16.303 | 26.133 | 35.962 | 52 | .142 |
| 53 | 27.319 | 37.149 | 46.978 | 56.808 | 06.638 | 16.467 | 26.297 | 36.126 | 53 | .145 |
| 54 | 27.483 | 37.313 | 47.142 | 56.972 | 06.801 | 16.631 | 26.460 | 36.290 | 54 | .147 |
| 55 | 27.647 | 37.476 | 47.306 | 57.136 | 06.965 | 2 16.795 | 2 26.624 | 2 36.454 | 55 | .150 |
| 56 | 27.811 | 37.640 | 47.470 | 57.299 | 07.129 | 16.959 | 26.788 | 36.618 | 56 | .153 |
| 57 | 27.975 | 37.804 | 47.634 | 57.463 | 07.293 | 17.122 | 26.952 | 36.781 | 57 | .156 |
| 58 | 28.138 | 37.968 | 47.798 | 57.627 | 07.457 | 17.286 | 27.116 | 36.945 | 58 | .158 |
| 59 | 28.302 | 38.132 | 47.961 | 57.791 | 07.620 | 2 17.450 | 2 27.280 | 2 37.109 | 59 | .161 |

(The argument is the Sidereal Time Interval)

CONVERSION OF SIDEREAL TO MEAN SOLAR TIME
CORRECTION TO BE SUBTRACTED FROM A SIDEREAL TIME INTERVAL

| | 16 ^h | 17 ^h | 18 ^h | 19 ^h | 20 ^h | 21 ^h | 22 ^h | 23 ^h | For Seconds |
|----------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|------------------------------------|
| 0 ^m | 2 ^m 37 ^s 27.3 | 2 ^m 47 ^s 10.3 | 2 ^m 56 ^s 9.32 | 3 ^m 06 ^s 7.62 | 3 ^m 16 ^s 5.91 | 3 ^m 26 ^s 4.21 | 3 ^m 36 ^s 2.50 | 3 ^m 46 ^s 0.80 | 0 ^s 0 ^s .000 |
| 1 | 37.437 | 47.266 | 57.096 | 06.925 | 16.755 | 26.585 | 36.414 | 46.244 | 1 .003 |
| 2 | 37.601 | 47.430 | 57.260 | 07.089 | 16.919 | 26.748 | 36.578 | 46.408 | 2 .005 |
| 3 | 37.764 | 47.594 | 57.424 | 07.253 | 17.083 | 26.912 | 36.742 | 46.571 | 3 .008 |
| 4 | 37.928 | 47.758 | 57.587 | 07.417 | 17.247 | 27.076 | 36.906 | 46.735 | 4 .011 |
| 5 | 2 38.092 | 2 47.922 | 2 57.751 | 3 07.581 | 3 17.410 | 3 27.240 | 3 37.069 | 3 46.899 | 5 0.014 |
| 6 | 38.256 | 48.085 | 57.915 | 07.745 | 17.574 | 27.404 | 37.233 | 47.063 | 6 .016 |
| 7 | 38.420 | 48.249 | 58.079 | 07.908 | 17.738 | 27.568 | 37.397 | 47.227 | 7 .019 |
| 8 | 38.584 | 48.413 | 58.243 | 08.072 | 17.902 | 27.731 | 37.561 | 47.391 | 8 .022 |
| 9 | 38.747 | 48.577 | 58.407 | 08.236 | 18.066 | 27.895 | 37.725 | 47.554 | 9 .025 |
| 10 | 2 38.911 | 2 48.741 | 2 58.570 | 3 08.400 | 3 18.229 | 3 28.059 | 3 37.889 | 3 47.718 | 10 0.027 |
| 11 | 39.075 | 48.905 | 58.734 | 08.564 | 18.393 | 28.223 | 38.052 | 47.882 | 11 .030 |
| 12 | 39.239 | 49.068 | 58.898 | 08.728 | 18.557 | 28.387 | 38.216 | 48.046 | 12 .033 |
| 13 | 39.403 | 49.232 | 59.062 | 08.891 | 18.721 | 28.551 | 38.380 | 48.210 | 13 .035 |
| 14 | 39.567 | 49.396 | 59.226 | 09.055 | 18.885 | 28.714 | 38.544 | 48.373 | 14 .038 |
| 15 | 2 39.730 | 2 49.560 | 2 59.389 | 3 09.219 | 3 19.049 | 3 28.878 | 3 38.708 | 3 48.537 | 15 0.041 |
| 16 | 39.894 | 49.724 | 59.553 | 09.383 | 19.212 | 29.042 | 38.872 | 48.701 | 16 .044 |
| 17 | 40.058 | 49.888 | 59.717 | 09.547 | 19.376 | 29.206 | 39.035 | 48.865 | 17 .046 |
| 18 | 40.222 | 50.051 | 2 59.881 | 09.711 | 19.540 | 29.370 | 39.199 | 49.029 | 18 .049 |
| 19 | 40.386 | 50.215 | 3 00.045 | 09.874 | 19.704 | 29.533 | 39.363 | 49.193 | 19 .052 |
| 20 | 2 40.549 | 2 50.379 | 3 00.209 | 3 10.038 | 3 19.868 | 3 29.697 | 3 39.527 | 3 49.356 | 20 0.055 |
| 21 | 40.713 | 50.543 | 00.372 | 10.202 | 20.032 | 29.861 | 39.691 | 49.520 | 21 .057 |
| 22 | 40.877 | 50.707 | 00.536 | 10.366 | 20.195 | 30.025 | 39.855 | 49.684 | 22 .060 |
| 23 | 41.041 | 50.871 | 00.700 | 10.530 | 20.359 | 30.189 | 40.018 | 49.848 | 23 .063 |
| 24 | 41.205 | 51.034 | 00.864 | 10.693 | 20.523 | 30.353 | 40.182 | 50.012 | 24 .066 |
| 25 | 2 41.369 | 2 51.198 | 3 01.028 | 3 10.857 | 3 20.687 | 3 30.516 | 3 40.346 | 3 50.176 | 25 0.068 |
| 26 | 41.532 | 51.362 | 01.192 | 11.021 | 20.851 | 30.680 | 40.510 | 50.339 | 26 .071 |
| 27 | 41.696 | 51.526 | 01.355 | 11.185 | 21.015 | 30.844 | 40.674 | 50.503 | 27 .074 |
| 28 | 41.860 | 51.690 | 01.519 | 11.349 | 21.178 | 31.008 | 40.837 | 50.667 | 28 .076 |
| 29 | 42.024 | 51.853 | 01.683 | 11.513 | 21.342 | 31.172 | 41.001 | 50.831 | 29 .079 |
| 30 | 2 42.188 | 2 52.017 | 3 01.847 | 3 11.676 | 3 21.506 | 3 31.336 | 3 41.165 | 3 50.995 | 30 0.082 |
| 31 | 42.352 | 52.181 | 02.011 | 11.840 | 21.670 | 31.499 | 41.329 | 51.159 | 31 .085 |
| 32 | 42.515 | 52.345 | 02.175 | 12.004 | 21.834 | 31.663 | 41.493 | 51.322 | 32 .087 |
| 33 | 42.679 | 52.509 | 02.338 | 12.168 | 21.997 | 31.827 | 41.657 | 51.486 | 33 .090 |
| 34 | 42.843 | 52.673 | 02.502 | 12.332 | 22.161 | 31.991 | 41.820 | 51.650 | 34 .093 |
| 35 | 2 43.007 | 2 52.836 | 3 02.666 | 3 12.496 | 3 22.325 | 3 32.155 | 3 41.984 | 3 51.814 | 35 0.096 |
| 36 | 43.171 | 53.000 | 02.830 | 12.659 | 22.489 | 32.319 | 42.148 | 51.978 | 36 .098 |
| 37 | 43.335 | 53.164 | 02.994 | 12.823 | 22.653 | 32.482 | 42.312 | 52.141 | 37 .101 |
| 38 | 43.498 | 53.328 | 03.157 | 12.987 | 22.817 | 32.646 | 42.476 | 52.305 | 38 .104 |
| 39 | 43.662 | 53.492 | 03.321 | 13.151 | 22.980 | 32.810 | 42.640 | 52.469 | 39 .106 |
| 40 | 2 43.826 | 2 53.656 | 3 03.485 | 3 13.315 | 3 23.144 | 3 32.974 | 3 42.803 | 3 52.633 | 40 0.109 |
| 41 | 43.990 | 53.819 | 03.649 | 13.479 | 23.308 | 33.138 | 42.967 | 52.797 | 41 .112 |
| 42 | 44.154 | 53.983 | 03.813 | 13.642 | 23.472 | 33.301 | 43.131 | 52.961 | 42 .115 |
| 43 | 44.317 | 54.147 | 03.977 | 13.806 | 23.636 | 33.465 | 43.295 | 53.124 | 43 .117 |
| 44 | 44.481 | 54.311 | 04.140 | 13.970 | 23.800 | 33.629 | 43.459 | 53.288 | 44 .120 |
| 45 | 2 44.645 | 2 54.475 | 3 04.304 | 3 14.134 | 3 23.963 | 3 33.793 | 3 43.623 | 3 53.452 | 45 0.123 |
| 46 | 44.809 | 54.639 | 04.468 | 14.298 | 24.127 | 33.957 | 43.786 | 53.616 | 46 .126 |
| 47 | 44.973 | 54.802 | 04.632 | 14.461 | 24.291 | 34.121 | 43.950 | 53.780 | 47 .128 |
| 48 | 45.137 | 54.966 | 04.796 | 14.625 | 24.455 | 34.284 | 44.114 | 53.944 | 48 .131 |
| 49 | 45.300 | 55.130 | 04.960 | 14.789 | 24.619 | 34.448 | 44.278 | 54.107 | 49 .134 |
| 50 | 2 45.464 | 2 55.294 | 3 05.123 | 3 14.953 | 3 24.783 | 3 34.612 | 3 44.442 | 3 54.271 | 50 0.137 |
| 51 | 45.628 | 55.458 | 05.287 | 15.117 | 24.946 | 34.776 | 44.605 | 54.435 | 51 .139 |
| 52 | 45.792 | 55.621 | 05.451 | 15.281 | 25.110 | 34.940 | 44.769 | 54.599 | 52 .142 |
| 53 | 45.956 | 55.785 | 05.615 | 15.444 | 25.274 | 35.104 | 44.933 | 54.763 | 53 .145 |
| 54 | 46.120 | 55.949 | 05.779 | 15.608 | 25.438 | 35.267 | 45.097 | 54.927 | 54 .147 |
| 55 | 2 46.283 | 2 56.113 | 3 05.943 | 3 15.772 | 3 25.602 | 3 35.431 | 3 45.261 | 3 55.090 | 55 0.150 |
| 56 | 46.447 | 56.277 | 06.106 | 15.936 | 25.765 | 35.595 | 45.425 | 55.254 | 56 .153 |
| 57 | 46.611 | 56.441 | 06.270 | 16.100 | 25.929 | 35.759 | 45.588 | 55.418 | 57 .156 |
| 58 | 46.775 | 56.604 | 06.434 | 16.264 | 26.093 | 35.923 | 45.752 | 55.582 | 58 .158 |
| 59 | 2 46.939 | 2 56.768 | 3 06.598 | 3 16.427 | 3 26.257 | 3 36.087 | 3 45.916 | 3 55.746 | 59 0.161 |

(The argument is the Sidereal Time Interval)

TABLE V
CONVERSION OF HOURS, MINUTES AND SECONDS
TO DECIMALS OF A DAY

| | 0 ^h | 1 ^h | 2 ^h | 3 ^h | 4 ^h | 5 ^h | SECONDS |
|----------------|----------------|----------------|----------------|----------------|----------------|----------------|------------------------|
| 0 ^m | 0.00000 | 0.04167 | 0.08333 | 0.12500 | 0.16667 | 0.20833 | 0 ^s 0.00000 |
| 1 | .00069 | .04236 | .08403 | .12569 | .16736 | .20903 | 1 .00001 |
| 2 | .00139 | .04306 | .08472 | .12639 | .16806 | .20972 | 2 .00002 |
| 3 | .00208 | .04375 | .08542 | .12708 | .16875 | .21042 | 3 .00003 |
| 4 | .00278 | .04444 | .08611 | .12778 | .16944 | .21111 | 4 .00005 |
| 5 | 0.00347 | 0.04514 | 0.08681 | 0.12847 | 0.17014 | 0.21181 | 5 0.00006 |
| 6 | .00417 | .04583 | .08750 | .12917 | .17083 | .21250 | 6 .00007 |
| 7 | .00486 | .04653 | .08819 | .12986 | .17153 | .21319 | 7 .00008 |
| 8 | .00556 | .04722 | .08889 | .13056 | .17222 | .21389 | 8 .00009 |
| 9 | .00625 | .04792 | .08958 | .13125 | .17292 | .21458 | 9 .00010 |
| 10 | 0.00694 | 0.04861 | 0.09028 | 0.13194 | 0.17361 | 0.21528 | 10 0.00012 |
| 11 | .00764 | .04931 | .09097 | .13264 | .17431 | .21597 | 11 .00013 |
| 12 | .00833 | .05000 | .09167 | .13333 | .17500 | .21667 | 12 .00014 |
| 13 | .00903 | .05069 | .09236 | .13403 | .17569 | .21736 | 13 .00015 |
| 14 | .00972 | .05139 | .09306 | .13472 | .17639 | .21806 | 14 .00016 |
| 15 | 0.01042 | 0.05208 | 0.09375 | 0.13542 | 0.17708 | 0.21875 | 15 0.00017 |
| 16 | .01111 | .05278 | .09444 | .13611 | .17778 | .21944 | 16 .00019 |
| 17 | .01181 | .05347 | .09514 | .13681 | .17847 | .22014 | 17 .00020 |
| 18 | .01250 | .05417 | .09583 | .13750 | .17917 | .22083 | 18 .00021 |
| 19 | .01319 | .05486 | .09653 | .13819 | .17986 | .22153 | 19 .00022 |
| 20 | 0.01389 | 0.05556 | 0.09722 | 0.13889 | 0.18056 | 0.22222 | 20 0.00023 |
| 21 | .01458 | .05625 | .09792 | .13958 | .18125 | .22292 | 21 .00024 |
| 22 | .01528 | .05694 | .09861 | .14028 | .18194 | .22361 | 22 .00025 |
| 23 | .01597 | .05764 | .09931 | .14097 | .18264 | .22431 | 23 .00027 |
| 24 | .01667 | .05833 | .10000 | .14167 | .18333 | .22500 | 24 .00028 |
| 25 | 0.01736 | 0.05903 | 0.10069 | 0.14236 | 0.18403 | 0.22569 | 25 0.00029 |
| 26 | .01806 | .05972 | .10139 | .14306 | .18472 | .22639 | 26 .00030 |
| 27 | .01875 | .06042 | .10208 | .14375 | .18542 | .22708 | 27 .00031 |
| 28 | .01944 | .06111 | .10278 | .14444 | .18611 | .22778 | 28 .00032 |
| 29 | .02014 | .06181 | .10347 | .14514 | .18681 | .22847 | 29 .00034 |
| 30 | 0.02083 | 0.06250 | 0.10417 | 0.14583 | 0.18750 | 0.22917 | 30 0.00035 |
| 31 | .02153 | .06319 | .10486 | .14653 | .18819 | .22986 | 31 .00036 |
| 32 | .02222 | .06389 | .10556 | .14722 | .18889 | .23056 | 32 .00037 |
| 33 | .02292 | .06458 | .10625 | .14792 | .18958 | .23125 | 33 .00038 |
| 34 | .02361 | .06528 | .10694 | .14861 | .19028 | .23194 | 34 .00039 |
| 35 | 0.02431 | 0.06597 | 0.10764 | 0.14931 | 0.19097 | 0.23264 | 35 0.00041 |
| 36 | .02500 | .06667 | .10833 | .15000 | .19167 | .23333 | 36 .00042 |
| 37 | .02569 | .06736 | .10903 | .15069 | .19236 | .23403 | 37 .00043 |
| 38 | .02639 | .06806 | .10972 | .15139 | .19306 | .23472 | 38 .00044 |
| 39 | .02708 | .06875 | .11042 | .15208 | .19375 | .23542 | 39 .00045 |
| 40 | 0.02778 | 0.06944 | 0.11111 | 0.15278 | 0.19444 | 0.23611 | 40 0.00046 |
| 41 | .02847 | .07014 | .11181 | .15347 | .19514 | .23681 | 41 .00047 |
| 42 | .02917 | .07083 | .11250 | .15417 | .19583 | .23750 | 42 .00049 |
| 43 | .02986 | .07153 | .11319 | .15486 | .19653 | .23819 | 43 .00050 |
| 44 | .03056 | .07222 | .11389 | .15556 | .19722 | .23889 | 44 .00051 |
| 45 | 0.03125 | 0.07292 | 0.11458 | 0.15625 | 0.19792 | 0.23958 | 45 0.00052 |
| 46 | .03194 | .07361 | .11528 | .15694 | .19861 | .24028 | 46 .00053 |
| 47 | .03264 | .07431 | .11597 | .15764 | .19931 | .24097 | 47 .00054 |
| 48 | .03333 | .07500 | .11667 | .15833 | .20000 | .24167 | 48 .00056 |
| 49 | .03403 | .07569 | .11736 | .15903 | .20069 | .24236 | 49 .00057 |
| 50 | 0.03472 | 0.07639 | 0.11806 | 0.15972 | 0.20139 | 0.24306 | 50 0.00058 |
| 51 | .03542 | .07708 | .11875 | .16042 | .20208 | .24375 | 51 .00059 |
| 52 | .03611 | .07778 | .11944 | .16111 | .20278 | .24444 | 52 .00060 |
| 53 | .03681 | .07847 | .12014 | .16181 | .20347 | .24514 | 53 .00061 |
| 54 | .03750 | .07917 | .12083 | .16250 | .20417 | .24583 | 54 .00062 |
| 55 | 0.03819 | 0.07986 | 0.12153 | 0.16319 | 0.20486 | 0.24653 | 55 0.00064 |
| 56 | .03889 | .08056 | .12222 | .16389 | .20556 | .24722 | 56 .00065 |
| 57 | .03958 | .08125 | .12292 | .16458 | .20625 | .24792 | 57 .00066 |
| 58 | .04028 | .08194 | .12361 | .16528 | .20694 | .24861 | 58 .00067 |
| 59 | 0.04097 | 0.08264 | 0.12431 | 0.16597 | 0.20764 | 0.24931 | 59 0.00068 |

TABLE V
CONVERSION OF HOURS, MINUTES AND SECONDS
TO DECIMALS OF A DAY

| | 6 ^h | 7 ^h | 8 ^h | 9 ^h | 10 ^h | 11 ^h | SECONDS |
|----------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| 0 ^m | 0 ^d .25000 | 0 ^d .29167 | 0 ^d .33333 | 0 ^d .37500 | 0 ^d .41667 | 0 ^d .45833 | 0 ^s .00000 |
| 1 | .25069 | .29236 | .33403 | .37569 | .41736 | .45903 | 1 .00001 |
| 2 | .25139 | .29306 | .33472 | .37639 | .41806 | .45972 | 2 .00002 |
| 3 | .25208 | .29375 | .33542 | .37708 | .41875 | .46042 | 3 .00003 |
| 4 | .25278 | .29444 | .33611 | .37778 | .41944 | .46111 | 4 .00005 |
| 5 | 0.25347 | 0.29514 | 0.33681 | 0.37847 | 0.42014 | 0.46181 | 5 0.00006 |
| 6 | .25417 | .29583 | .33750 | .37917 | .42083 | .46250 | 6 .00007 |
| 7 | .25486 | .29653 | .33819 | .37986 | .42153 | .46319 | 7 .00008 |
| 8 | .25556 | .29722 | .33889 | .38056 | .42222 | .46389 | 8 .00009 |
| 9 | .25625 | .29792 | .33958 | .38125 | .42292 | .46458 | 9 .00010 |
| 10 | 0.25694 | 0.29861 | 0.34028 | 0.38194 | 0.42361 | 0.46528 | 10 0.00012 |
| 11 | .25764 | .29931 | .34097 | .38264 | .42431 | .46597 | 11 .00013 |
| 12 | .25833 | .30000 | .34167 | .38333 | .42500 | .46667 | 12 .00014 |
| 13 | .25903 | .30069 | .34236 | .38403 | .42569 | .46736 | 13 .00015 |
| 14 | .25972 | .30139 | .34306 | .38472 | .42639 | .46806 | 14 .00016 |
| 15 | 0.26042 | 0.30208 | 0.34375 | 0.38542 | 0.42708 | 0.46875 | 15 0.00017 |
| 16 | .26111 | .30278 | .34444 | .38611 | .42778 | .46944 | 16 .00019 |
| 17 | .26181 | .30347 | .34514 | .38681 | .42847 | .47014 | 17 .00020 |
| 18 | .26250 | .30417 | .34583 | .38750 | .42917 | .47083 | 18 .00021 |
| 19 | .26319 | .30486 | .34653 | .38819 | .42986 | .47153 | 19 .00022 |
| 20 | 0.26389 | 0.30556 | 0.34722 | 0.38889 | 0.43056 | 0.47222 | 20 0.00023 |
| 21 | .26458 | .30625 | .34792 | .38958 | .43125 | .47292 | 21 .00024 |
| 22 | .26528 | .30694 | .34861 | .39028 | .43194 | .47361 | 22 .00025 |
| 23 | .26597 | .30764 | .34931 | .39097 | .43264 | .47431 | 23 .00027 |
| 24 | .26667 | .30833 | .35000 | .39167 | .43333 | .47500 | 24 .00028 |
| 25 | 0.26736 | 0.30903 | 0.35069 | 0.39236 | 0.43403 | 0.47569 | 25 0.00029 |
| 26 | .26806 | .30972 | .35139 | .39306 | .43472 | .47639 | 26 .00030 |
| 27 | .26875 | .31042 | .35208 | .39375 | .43542 | .47708 | 27 .00031 |
| 28 | .26944 | .31111 | .35278 | .39444 | .43611 | .47778 | 28 .00032 |
| 29 | .27014 | .31181 | .35347 | .39514 | .43681 | .47847 | 29 .00034 |
| 30 | 0.27083 | 0.31250 | 0.35417 | 0.39583 | 0.43750 | 0.47917 | 30 0.00035 |
| 31 | .27153 | .31319 | .35486 | .39653 | .43819 | .47986 | 31 .00036 |
| 32 | .27222 | .31389 | .35556 | .39722 | .43889 | .48056 | 32 .00037 |
| 33 | .27292 | .31458 | .35625 | .39792 | .43958 | .48125 | 33 .00038 |
| 34 | .27361 | .31528 | .35694 | .39861 | .44028 | .48194 | 34 .00039 |
| 35 | 0.27431 | 0.31597 | 0.35764 | 0.39931 | 0.44097 | 0.48264 | 35 0.00041 |
| 36 | .27500 | .31667 | .35833 | .40000 | .44167 | .48333 | 36 .00042 |
| 37 | .27569 | .31736 | .35903 | .40069 | .44236 | .48403 | 37 .00043 |
| 38 | .27639 | .31806 | .35972 | .40139 | .44306 | .48472 | 38 .00044 |
| 39 | .27708 | .31875 | .36042 | .40208 | .44375 | .48542 | 39 .00045 |
| 40 | 0.27778 | 0.31944 | 0.36111 | 0.40278 | 0.44444 | 0.48611 | 40 0.00046 |
| 41 | .27847 | .32014 | .36181 | .40347 | .44514 | .48681 | 41 .00047 |
| 42 | .27917 | .32083 | .36250 | .40417 | .44583 | .48750 | 42 .00049 |
| 43 | .27986 | .32153 | .36319 | .40486 | .44653 | .48819 | 43 .00050 |
| 44 | .28056 | .32222 | .36389 | .40556 | .44722 | .48889 | 44 .00051 |
| 45 | 0.28125 | 0.32292 | 0.36458 | 0.40625 | 0.44792 | 0.48958 | 45 0.00052 |
| 46 | .28194 | .32361 | .36528 | .40694 | .44861 | .49028 | 46 .00053 |
| 47 | .28264 | .32431 | .36597 | .40764 | .44931 | .49097 | 47 .00054 |
| 48 | .28333 | .32500 | .36667 | .40833 | .45000 | .49167 | 48 .00056 |
| 49 | .28403 | .32569 | .36736 | .40903 | .45069 | .49236 | 49 .00057 |
| 50 | 0.28472 | 0.32639 | 0.36806 | 0.40972 | 0.45139 | 0.49306 | 50 0.00058 |
| 51 | .28542 | .32708 | .36875 | .41042 | .45208 | .49375 | 51 .00059 |
| 52 | .28611 | .32778 | .36944 | .41111 | .45278 | .49444 | 52 .00060 |
| 53 | .28681 | .32847 | .37014 | .41181 | .45347 | .49514 | 53 .00061 |
| 54 | .28750 | .32917 | .37083 | .41250 | .45417 | .49583 | 54 .00062 |
| 55 | 0.28819 | 0.32986 | 0.37153 | 0.41319 | 0.45486 | 0.49653 | 55 0.00064 |
| 56 | .28889 | .33056 | .37222 | .41389 | .45556 | .49722 | 56 .00065 |
| 57 | .28958 | .33125 | .37292 | .41458 | .45625 | .49792 | 57 .00066 |
| 58 | .29028 | .33194 | .37361 | .41528 | .45694 | .49861 | 58 .00067 |
| 59 | 0.29097 | 0.33264 | 0.37431 | 0.41597 | 0.45764 | 0.49931 | 59 0.00068 |

SECOND DIFFERENCE CORRECTION $B'' (\Delta'_0 + \Delta'_1)$

| n | 10 15 20 | 25 30 35 | 40 45 50 | 55 60 65 | 70 75 80 | 85 90 95 | 100 105 110 | n |
|------|----------|----------|----------|----------|----------|----------|-------------|------|
| 0.01 | 0 0 0 | 0 0 0 | 0 0 0 | 0 0 0 | 0 0 0 | 0 0 0 | 0 0 0 | 0.99 |
| .02 | 0 0 0 | 0 0 0 | 0 0 0 | 0 0 0 | 0 0 0 | 0 0 0 | 0 1 1 | .98 |
| .03 | 0 0 0 | 0 0 0 | 0 0 0 | 0 0 0 | 1 1 1 | 1 1 1 | 1 1 1 | .97 |
| .04 | 0 0 0 | 0 0 0 | 0 0 0 | 1 1 1 | 1 1 1 | 1 1 1 | 1 1 1 | .96 |
| .05 | 0 0 0 | 0 0 0 | 0 1 1 | 1 1 1 | 1 1 1 | 1 1 1 | 1 1 1 | 0.95 |
| 0.06 | 0 0 0 | 0 0 0 | 1 1 1 | 1 1 1 | 1 1 1 | 1 1 1 | 1 1 2 | .94 |
| .07 | 0 0 0 | 0 0 1 | 1 1 1 | 1 1 1 | 1 1 1 | 1 1 2 | 2 2 2 | .93 |
| .08 | 0 0 0 | 0 1 1 | 1 1 1 | 1 1 1 | 1 1 1 | 2 2 2 | 2 2 2 | .92 |
| .09 | 0 0 0 | 1 1 1 | 1 1 1 | 1 1 1 | 1 2 2 | 2 2 2 | 2 2 2 | .91 |
| .10 | 0 0 0 | 1 1 1 | 1 1 1 | 1 1 1 | 2 2 2 | 2 2 2 | 2 2 2 | 0.90 |
| 0.11 | 0 0 0 | 1 1 1 | 1 1 1 | 1 1 2 | 2 2 2 | 2 2 2 | 2 3 3 | .89 |
| .12 | 0 0 1 | 1 1 1 | 1 1 1 | 1 2 2 | 2 2 2 | 2 2 3 | 3 3 3 | .88 |
| .13 | 0 0 1 | 1 1 1 | 1 1 1 | 2 2 2 | 2 2 2 | 2 3 3 | 3 3 3 | .87 |
| .14 | 0 0 1 | 1 1 1 | 1 1 2 | 2 2 2 | 2 2 2 | 3 3 3 | 3 3 3 | .86 |
| .15 | 0 0 1 | 1 1 1 | 1 1 2 | 2 2 2 | 2 2 3 | 3 3 3 | 3 3 4 | 0.85 |
| 0.16 | 0 1 1 | 1 1 1 | 1 2 2 | 2 2 2 | 2 3 3 | 3 3 3 | 3 4 4 | .84 |
| .17 | 0 1 1 | 1 1 1 | 1 2 2 | 2 2 2 | 2 3 3 | 3 3 3 | 4 4 4 | .83 |
| .18 | 0 1 1 | 1 1 1 | 1 2 2 | 2 2 2 | 3 3 3 | 3 3 4 | 4 4 4 | .82 |
| .19 | 0 1 1 | 1 1 1 | 2 2 2 | 2 2 3 | 3 3 3 | 3 3 4 | 4 4 4 | .81 |
| .20 | 0 1 1 | 1 1 1 | 2 2 2 | 2 2 3 | 3 3 3 | 3 4 4 | 4 4 4 | 0.80 |
| 0.21 | 0 1 1 | 1 1 1 | 2 2 2 | 2 2 3 | 3 3 3 | 4 4 4 | 4 4 5 | .79 |
| .22 | 0 1 1 | 1 1 2 | 2 2 2 | 2 3 3 | 3 3 3 | 4 4 4 | 4 5 5 | .78 |
| .23 | 0 1 1 | 1 1 2 | 2 2 2 | 2 3 3 | 3 3 4 | 4 4 4 | 4 5 5 | .77 |
| .24 | 0 1 1 | 1 1 2 | 2 2 2 | 3 3 3 | 3 3 4 | 4 4 4 | 5 5 5 | .76 |
| .25 | 0 1 1 | 1 1 2 | 2 2 2 | 3 3 3 | 3 4 4 | 4 4 4 | 5 5 5 | 0.75 |
| 0.26 | 0 1 1 | 1 1 2 | 2 2 2 | 3 3 3 | 3 4 4 | 4 4 5 | 5 5 5 | .74 |
| .27 | 0 1 1 | 1 1 2 | 2 2 2 | 3 3 3 | 3 4 4 | 4 4 5 | 5 5 5 | .73 |
| .28 | 1 1 1 | 1 2 2 | 2 2 3 | 3 3 3 | 4 4 4 | 4 5 5 | 5 5 6 | .72 |
| .29 | 1 1 1 | 1 2 2 | 2 2 3 | 3 3 3 | 4 4 4 | 4 5 5 | 5 5 6 | .71 |
| .30 | 1 1 1 | 1 2 2 | 2 2 3 | 3 3 3 | 4 4 4 | 4 5 5 | 5 6 6 | 0.70 |
| 0.31 | 1 1 1 | 1 2 2 | 2 2 3 | 3 3 3 | 4 4 4 | 5 5 5 | 5 6 6 | .69 |
| .32 | 1 1 1 | 1 2 2 | 2 2 3 | 3 3 4 | 4 4 4 | 5 5 5 | 5 6 6 | .68 |
| .33 | 1 1 1 | 1 2 2 | 2 2 3 | 3 3 4 | 4 4 4 | 5 5 5 | 6 6 6 | .67 |
| .34 | 1 1 1 | 1 2 2 | 2 3 3 | 3 3 4 | 4 4 4 | 5 5 5 | 6 6 6 | .66 |
| .35 | 1 1 1 | 1 2 2 | 2 3 3 | 3 3 4 | 4 4 5 | 5 5 5 | 6 6 6 | 0.65 |
| 0.36 | 1 1 1 | 1 2 2 | 2 3 3 | 3 3 4 | 4 4 5 | 5 5 5 | 6 6 6 | .64 |
| .37 | 1 1 1 | 1 2 2 | 2 3 3 | 3 3 4 | 4 4 5 | 5 5 6 | 6 6 6 | .63 |
| .38 | 1 1 1 | 1 2 2 | 2 3 3 | 3 4 4 | 4 4 5 | 5 5 6 | 6 6 6 | .62 |
| .39 | 1 1 1 | 1 2 2 | 2 3 3 | 3 4 4 | 4 4 5 | 5 5 6 | 6 6 7 | .61 |
| .40 | 1 1 1 | 2 2 2 | 2 3 3 | 3 4 4 | 4 4 5 | 5 5 6 | 6 6 7 | 0.60 |
| 0.41 | 1 1 1 | 2 2 2 | 2 3 3 | 3 4 4 | 4 5 5 | 5 5 6 | 6 6 7 | .59 |
| .42 | 1 1 1 | 2 2 2 | 2 3 3 | 3 4 4 | 4 5 5 | 5 5 6 | 6 6 7 | .58 |
| .43 | 1 1 1 | 2 2 2 | 2 3 3 | 3 4 4 | 4 5 5 | 5 6 6 | 6 6 7 | .57 |
| .44 | 1 1 1 | 2 2 2 | 2 3 3 | 3 4 4 | 4 5 5 | 5 6 6 | 6 6 7 | .56 |
| .45 | 1 1 1 | 2 2 2 | 2 3 3 | 3 4 4 | 4 5 5 | 5 6 6 | 6 6 7 | 0.55 |
| 0.46 | 1 1 1 | 2 2 2 | 2 3 3 | 3 4 4 | 4 5 5 | 5 6 6 | 6 7 7 | .54 |
| .47 | 1 1 1 | 2 2 2 | 2 3 3 | 3 4 4 | 4 5 5 | 5 6 6 | 6 7 7 | .53 |
| .48 | 1 1 1 | 2 2 2 | 2 3 3 | 3 4 4 | 4 5 5 | 5 6 6 | 6 7 7 | .52 |
| .49 | 1 1 1 | 2 2 2 | 2 3 3 | 3 4 4 | 4 5 5 | 5 6 6 | 6 7 7 | .51 |
| 0.50 | 1 1 1 | 2 2 2 | 2 3 3 | 3 4 4 | 4 5 5 | 5 6 6 | 6 7 7 | 0.50 |

The correction $B'' (\Delta'_0 + \Delta'_1)$ is always of the opposite sign to $\Delta'_0 + \Delta'_1$

SECOND DIFFERENCE CORRECTION $B'' (\Delta_0'' + \Delta_1'')$

| n | 115 | 120 | 125 | 130 | 135 | 140 | 145 | 150 | 155 | 160 | 165 | 170 | 175 | 180 | 185 | 190 | 195 | 200 | n |
|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|
| 0.01 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.99 |
| .02 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | .98 |
| .03 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | .97 |
| .04 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | .96 |
| .05 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 0.95 |
| 0.06 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | .94 |
| .07 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | .93 |
| .08 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 4 | 4 | .92 |
| .09 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 4 | 4 | 4 | 4 | 4 | 4 | .91 |
| .10 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 0.90 |
| 0.11 | 3 | 3 | 3 | 3 | 3 | 3 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 5 | 5 | 5 | 5 | .89 |
| .12 | 3 | 3 | 3 | 3 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 5 | 5 | 5 | 5 | 5 | 5 | .88 |
| .13 | 3 | 3 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 6 | 6 | .87 |
| .14 | 3 | 4 | 4 | 4 | 4 | 4 | 4 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 6 | 6 | 6 | 6 | .86 |
| .15 | 4 | 4 | 4 | 4 | 4 | 4 | 5 | 5 | 5 | 5 | 5 | 5 | 6 | 6 | 6 | 6 | 6 | 6 | 0.85 |
| 0.16 | 4 | 4 | 4 | 4 | 5 | 5 | 5 | 5 | 5 | 5 | 6 | 6 | 6 | 6 | 6 | 6 | 7 | 7 | .84 |
| .17 | 4 | 4 | 4 | 5 | 5 | 5 | 5 | 5 | 5 | 6 | 6 | 6 | 6 | 6 | 7 | 7 | 7 | 7 | .83 |
| .18 | 4 | 4 | 5 | 5 | 5 | 5 | 5 | 6 | 6 | 6 | 6 | 6 | 6 | 7 | 7 | 7 | 7 | 7 | .82 |
| .19 | 4 | 5 | 5 | 5 | 5 | 5 | 6 | 6 | 6 | 6 | 6 | 7 | 7 | 7 | 7 | 7 | 8 | 8 | .81 |
| .20 | 5 | 5 | 5 | 5 | 5 | 6 | 6 | 6 | 6 | 6 | 7 | 7 | 7 | 7 | 7 | 8 | 8 | 8 | 0.80 |
| 0.21 | 5 | 5 | 5 | 5 | 6 | 6 | 6 | 6 | 6 | 7 | 7 | 7 | 7 | 7 | 8 | 8 | 8 | 8 | .79 |
| .22 | 5 | 5 | 5 | 6 | 6 | 6 | 6 | 6 | 7 | 7 | 7 | 7 | 8 | 8 | 8 | 8 | 8 | 9 | .78 |
| .23 | 5 | 5 | 6 | 6 | 6 | 6 | 6 | 7 | 7 | 7 | 7 | 8 | 8 | 8 | 8 | 8 | 9 | 9 | .77 |
| .24 | 5 | 5 | 6 | 6 | 6 | 6 | 7 | 7 | 7 | 7 | 8 | 8 | 8 | 8 | 8 | 9 | 9 | 9 | .76 |
| .25 | 5 | 6 | 6 | 6 | 6 | 7 | 7 | 7 | 7 | 8 | 8 | 8 | 8 | 8 | 9 | 9 | 9 | 9 | 0.75 |
| 0.26 | 6 | 6 | 6 | 6 | 6 | 7 | 7 | 7 | 7 | 8 | 8 | 8 | 8 | 9 | 9 | 9 | 9 | 10 | .74 |
| .27 | 6 | 6 | 6 | 6 | 7 | 7 | 7 | 7 | 8 | 8 | 8 | 8 | 9 | 9 | 9 | 9 | 10 | 10 | .73 |
| .28 | 6 | 6 | 6 | 7 | 7 | 7 | 7 | 8 | 8 | 8 | 8 | 9 | 9 | 9 | 9 | 10 | 10 | 10 | .72 |
| .29 | 6 | 6 | 6 | 7 | 7 | 7 | 7 | 8 | 8 | 8 | 8 | 9 | 9 | 9 | 10 | 10 | 10 | 10 | .71 |
| .30 | 6 | 6 | 7 | 7 | 7 | 7 | 8 | 8 | 8 | 8 | 9 | 9 | 9 | 9 | 10 | 10 | 10 | 10 | 0.70 |
| 0.31 | 6 | 6 | 7 | 7 | 7 | 7 | 8 | 8 | 8 | 9 | 9 | 9 | 9 | 10 | 10 | 10 | 10 | 11 | .69 |
| .32 | 6 | 7 | 7 | 7 | 7 | 8 | 8 | 8 | 8 | 9 | 9 | 9 | 9 | 10 | 10 | 10 | 10 | 11 | .68 |
| .33 | 6 | 7 | 7 | 7 | 7 | 8 | 8 | 8 | 9 | 9 | 9 | 9 | 10 | 10 | 10 | 10 | 11 | 11 | .67 |
| .34 | 6 | 7 | 7 | 7 | 8 | 8 | 8 | 8 | 9 | 9 | 9 | 10 | 10 | 10 | 10 | 11 | 11 | 11 | .66 |
| .35 | 7 | 7 | 7 | 7 | 8 | 8 | 8 | 9 | 9 | 9 | 9 | 10 | 10 | 10 | 11 | 11 | 11 | 11 | 0.65 |
| 0.36 | 7 | 7 | 7 | 7 | 8 | 8 | 8 | 9 | 9 | 9 | 10 | 10 | 10 | 10 | 11 | 11 | 11 | 12 | .64 |
| .37 | 7 | 7 | 7 | 8 | 8 | 8 | 8 | 9 | 9 | 9 | 10 | 10 | 10 | 10 | 11 | 11 | 11 | 12 | .63 |
| .38 | 7 | 7 | 7 | 8 | 8 | 8 | 9 | 9 | 9 | 9 | 10 | 10 | 10 | 10 | 11 | 11 | 11 | 12 | .62 |
| .39 | 7 | 7 | 7 | 8 | 8 | 8 | 9 | 9 | 9 | 10 | 10 | 10 | 10 | 11 | 11 | 11 | 11 | 12 | .61 |
| .40 | 7 | 7 | 8 | 8 | 8 | 8 | 9 | 9 | 9 | 10 | 10 | 10 | 10 | 11 | 11 | 11 | 11 | 12 | 0.60 |
| 0.41 | 7 | 7 | 8 | 8 | 8 | 8 | 9 | 9 | 9 | 10 | 10 | 10 | 11 | 11 | 11 | 11 | 12 | 12 | .59 |
| .42 | 7 | 7 | 8 | 8 | 8 | 9 | 9 | 9 | 9 | 10 | 10 | 10 | 11 | 11 | 11 | 11 | 12 | 12 | .58 |
| .43 | 7 | 7 | 8 | 8 | 8 | 9 | 9 | 9 | 9 | 10 | 10 | 10 | 11 | 11 | 11 | 11 | 12 | 12 | .57 |
| .44 | 7 | 7 | 8 | 8 | 8 | 9 | 9 | 9 | 10 | 10 | 10 | 10 | 11 | 11 | 11 | 11 | 12 | 12 | .56 |
| .45 | 7 | 7 | 8 | 8 | 8 | 9 | 9 | 9 | 10 | 10 | 10 | 11 | 11 | 11 | 11 | 11 | 12 | 12 | 0.55 |
| 0.46 | 7 | 7 | 8 | 8 | 8 | 9 | 9 | 9 | 10 | 10 | 10 | 11 | 11 | 11 | 11 | 12 | 12 | 12 | .54 |
| .47 | 7 | 7 | 8 | 8 | 8 | 9 | 9 | 9 | 10 | 10 | 10 | 11 | 11 | 11 | 12 | 12 | 12 | 12 | .53 |
| .48 | 7 | 7 | 8 | 8 | 8 | 9 | 9 | 9 | 10 | 10 | 10 | 11 | 11 | 11 | 12 | 12 | 12 | 12 | .52 |
| .49 | 7 | 7 | 8 | 8 | 8 | 9 | 9 | 9 | 10 | 10 | 10 | 11 | 11 | 11 | 12 | 12 | 12 | 12 | .51 |
| 0.50 | 7 | 8 | 8 | 8 | 8 | 9 | 9 | 9 | 10 | 10 | 10 | 11 | 11 | 11 | 12 | 12 | 12 | 12 | 0.50 |

The correction $B'' (\Delta_0'' + \Delta_1'')$ is always of the opposite sign to $\Delta_0'' + \Delta_1''$

SECOND DIFFERENCE CORRECTION $B'' (\Delta_0'' + \Delta_1'')$

| n | 200 | 205 | 210 | 215 | 220 | 225 | 230 | 235 | 240 | 245 | 250 | 255 | 260 | 265 | 270 | 275 | 280 | 285 | n |
|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|
| 0.01 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0.99 |
| .02 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | .98 |
| .03 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | .97 |
| .04 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | .96 |
| .05 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 0.95 |
| 0.06 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | .94 |
| .07 | 3 | 3 | 3 | 3 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 5 | 5 | .93 |
| .08 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | .92 |
| .09 | 4 | 4 | 4 | 4 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 6 | 6 | 6 | 6 | .91 |
| .10 | 4 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 0.90 |
| 0.11 | 5 | 5 | 5 | 5 | 5 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 7 | 7 | 7 | 7 | .89 |
| .12 | 5 | 5 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 8 | .88 |
| .13 | 6 | 6 | 6 | 6 | 6 | 6 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 8 | 8 | 8 | 8 | .87 |
| .14 | 6 | 6 | 6 | 6 | 7 | 7 | 7 | 7 | 7 | 7 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 9 | .86 |
| .15 | 6 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 8 | 8 | 8 | 8 | 8 | 8 | 9 | 9 | 9 | 9 | 0.85 |
| 0.16 | 7 | 7 | 7 | 7 | 7 | 8 | 8 | 8 | 8 | 8 | 8 | 9 | 9 | 9 | 9 | 9 | 10 | 10 | .84 |
| .17 | 7 | 7 | 7 | 7 | 8 | 8 | 8 | 8 | 8 | 9 | 9 | 9 | 9 | 9 | 10 | 10 | 10 | 10 | .83 |
| .18 | 7 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 9 | 9 | 9 | 9 | 10 | 10 | 10 | 10 | 10 | 11 | .82 |
| .19 | 8 | 8 | 8 | 8 | 8 | 8 | 9 | 9 | 9 | 9 | 10 | 10 | 10 | 10 | 10 | 10 | 11 | 11 | .81 |
| .20 | 8 | 8 | 8 | 9 | 9 | 9 | 9 | 9 | 10 | 10 | 10 | 10 | 10 | 11 | 11 | 11 | 11 | 11 | 0.80 |
| 0.21 | 8 | 9 | 9 | 9 | 9 | 9 | 10 | 10 | 10 | 10 | 10 | 11 | 11 | 11 | 11 | 11 | 12 | 12 | .79 |
| .22 | 9 | 9 | 9 | 9 | 9 | 10 | 10 | 10 | 10 | 10 | 11 | 11 | 11 | 11 | 12 | 12 | 12 | 12 | .78 |
| .23 | 9 | 9 | 9 | 10 | 10 | 10 | 10 | 10 | 11 | 11 | 11 | 11 | 12 | 12 | 12 | 12 | 12 | 13 | .77 |
| .24 | 9 | 9 | 10 | 10 | 10 | 10 | 10 | 11 | 11 | 11 | 11 | 12 | 12 | 12 | 12 | 13 | 13 | 13 | .76 |
| .25 | 9 | 10 | 10 | 10 | 10 | 11 | 11 | 11 | 11 | 11 | 12 | 12 | 12 | 12 | 13 | 13 | 13 | 13 | 0.75 |
| 0.26 | 10 | 10 | 10 | 10 | 11 | 11 | 11 | 11 | 12 | 12 | 12 | 12 | 13 | 13 | 13 | 13 | 13 | 14 | .74 |
| .27 | 10 | 10 | 10 | 11 | 11 | 11 | 11 | 12 | 12 | 12 | 12 | 13 | 13 | 13 | 13 | 14 | 14 | 14 | .73 |
| .28 | 10 | 10 | 11 | 11 | 11 | 11 | 12 | 12 | 12 | 12 | 13 | 13 | 13 | 13 | 14 | 14 | 14 | 14 | .72 |
| .29 | 10 | 11 | 11 | 11 | 11 | 12 | 12 | 12 | 12 | 13 | 13 | 13 | 13 | 14 | 14 | 14 | 14 | 15 | .71 |
| .30 | 10 | 11 | 11 | 11 | 12 | 12 | 12 | 12 | 13 | 13 | 13 | 13 | 14 | 14 | 14 | 14 | 15 | 15 | 0.70 |
| 0.31 | 11 | 11 | 11 | 11 | 12 | 12 | 12 | 13 | 13 | 13 | 13 | 14 | 14 | 14 | 14 | 15 | 15 | 15 | .69 |
| .32 | 11 | 11 | 11 | 12 | 12 | 12 | 13 | 13 | 13 | 13 | 14 | 14 | 14 | 14 | 15 | 15 | 15 | 16 | .68 |
| .33 | 11 | 11 | 12 | 12 | 12 | 12 | 13 | 13 | 13 | 14 | 14 | 14 | 14 | 15 | 15 | 15 | 15 | 16 | .67 |
| .34 | 11 | 12 | 12 | 12 | 12 | 13 | 13 | 13 | 13 | 14 | 14 | 14 | 15 | 15 | 15 | 15 | 16 | 16 | .66 |
| .35 | 11 | 12 | 12 | 12 | 13 | 13 | 13 | 13 | 14 | 14 | 14 | 15 | 15 | 15 | 15 | 16 | 16 | 16 | 0.65 |
| 0.36 | 12 | 12 | 12 | 12 | 13 | 13 | 13 | 13 | 14 | 14 | 14 | 15 | 15 | 15 | 16 | 16 | 16 | 16 | .64 |
| .37 | 12 | 12 | 12 | 13 | 13 | 13 | 13 | 14 | 14 | 14 | 15 | 15 | 15 | 15 | 16 | 16 | 16 | 17 | .63 |
| .38 | 12 | 12 | 12 | 13 | 13 | 13 | 14 | 14 | 14 | 14 | 15 | 15 | 15 | 16 | 16 | 16 | 16 | 17 | .62 |
| .39 | 12 | 12 | 12 | 13 | 13 | 13 | 14 | 14 | 14 | 15 | 15 | 15 | 15 | 16 | 16 | 16 | 17 | 17 | .61 |
| .40 | 12 | 12 | 13 | 13 | 13 | 14 | 14 | 14 | 14 | 15 | 15 | 15 | 16 | 16 | 16 | 16 | 17 | 17 | 0.60 |
| 0.41 | 12 | 12 | 13 | 13 | 13 | 14 | 14 | 14 | 15 | 15 | 15 | 15 | 16 | 16 | 16 | 17 | 17 | 17 | .59 |
| .42 | 12 | 12 | 13 | 13 | 13 | 14 | 14 | 14 | 15 | 15 | 15 | 16 | 16 | 16 | 16 | 17 | 17 | 17 | .58 |
| .43 | 12 | 13 | 13 | 13 | 13 | 14 | 14 | 14 | 15 | 15 | 15 | 16 | 16 | 16 | 17 | 17 | 17 | 17 | .57 |
| .44 | 12 | 13 | 13 | 13 | 14 | 14 | 14 | 14 | 15 | 15 | 15 | 16 | 16 | 16 | 17 | 17 | 17 | 18 | .56 |
| .45 | 12 | 13 | 13 | 13 | 14 | 14 | 14 | 14 | 15 | 15 | 15 | 16 | 16 | 16 | 17 | 17 | 17 | 18 | 0.55 |
| 0.46 | 12 | 13 | 13 | 13 | 14 | 14 | 14 | 15 | 15 | 15 | 16 | 16 | 16 | 16 | 17 | 17 | 17 | 18 | .54 |
| .47 | 12 | 13 | 13 | 13 | 14 | 14 | 14 | 15 | 15 | 15 | 16 | 16 | 16 | 17 | 17 | 17 | 17 | 18 | .53 |
| .48 | 12 | 13 | 13 | 13 | 14 | 14 | 14 | 15 | 15 | 15 | 16 | 16 | 16 | 17 | 17 | 17 | 17 | 18 | .52 |
| .49 | 12 | 13 | 13 | 13 | 14 | 14 | 14 | 15 | 15 | 15 | 16 | 16 | 16 | 17 | 17 | 17 | 17 | 18 | .51 |
| 0.50 | 12 | 13 | 13 | 13 | 14 | 14 | 14 | 15 | 15 | 15 | 16 | 16 | 16 | 17 | 17 | 17 | 18 | 18 | 0.50 |

The correction $B' (\Delta_0' + \Delta_1')$ is always of the opposite sign to $\Delta_0' + \Delta_1'$

SECOND DIFFERENCE CORRECTION $B'' (\Delta''_0 + \Delta''_1)$

| n | 285 | 290 | 295 | 300 | 305 | 310 | 315 | 320 | 325 | 330 | 335 | 340 | 345 | 350 | 355 | 360 | 365 | 370 | n |
|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|
| 0.01 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0.99 |
| .02 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | .98 |
| .03 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | .97 |
| .04 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 4 | 4 | .96 |
| .05 | 3 | 3 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 0.95 |
| 0.06 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | .94 |
| .07 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | .93 |
| .08 | 5 | 5 | 5 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 7 | 7 | 7 | 7 | .92 |
| .09 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 8 | .91 |
| .10 | 6 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 0.90 |
| 0.11 | 7 | 7 | 7 | 7 | 7 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 9 | 9 | 9 | 9 | 9 | .89 |
| .12 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 10 | 10 | 10 | .88 |
| .13 | 8 | 8 | 8 | 8 | 9 | 9 | 9 | 9 | 9 | 9 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | .87 |
| .14 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 10 | 10 | 10 | 10 | 10 | 10 | 11 | 11 | 11 | 11 | 11 | .86 |
| .15 | 9 | 9 | 9 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 11 | 11 | 11 | 11 | 11 | 11 | 12 | 12 | 0.85 |
| 0.16 | 10 | 10 | 10 | 10 | 10 | 10 | 11 | 11 | 11 | 11 | 11 | 11 | 12 | 12 | 12 | 12 | 12 | 12 | .84 |
| .17 | 10 | 10 | 10 | 11 | 11 | 11 | 11 | 11 | 11 | 12 | 12 | 12 | 12 | 12 | 13 | 13 | 13 | 13 | .83 |
| .18 | 11 | 11 | 11 | 11 | 11 | 11 | 12 | 12 | 12 | 12 | 12 | 13 | 13 | 13 | 13 | 13 | 13 | 14 | .82 |
| .19 | 11 | 11 | 11 | 12 | 12 | 12 | 12 | 12 | 13 | 13 | 13 | 13 | 13 | 13 | 14 | 14 | 14 | 14 | .81 |
| .20 | 11 | 12 | 12 | 12 | 12 | 12 | 13 | 13 | 13 | 13 | 13 | 14 | 14 | 14 | 14 | 14 | 15 | 15 | 0.80 |
| 0.21 | 12 | 12 | 12 | 12 | 13 | 13 | 13 | 13 | 13 | 14 | 14 | 14 | 14 | 15 | 15 | 15 | 15 | 15 | .79 |
| .22 | 12 | 12 | 13 | 13 | 13 | 13 | 14 | 14 | 14 | 14 | 14 | 15 | 15 | 15 | 15 | 15 | 16 | 16 | .78 |
| .23 | 13 | 13 | 13 | 13 | 14 | 14 | 14 | 14 | 14 | 15 | 15 | 15 | 15 | 15 | 16 | 16 | 16 | 16 | .77 |
| .24 | 13 | 13 | 13 | 14 | 14 | 14 | 14 | 15 | 15 | 15 | 15 | 16 | 16 | 16 | 16 | 16 | 17 | 17 | .76 |
| .25 | 13 | 14 | 14 | 14 | 14 | 15 | 15 | 15 | 15 | 15 | 16 | 16 | 16 | 16 | 17 | 17 | 17 | 17 | 0.75 |
| 0.26 | 14 | 14 | 14 | 14 | 15 | 15 | 15 | 15 | 16 | 16 | 16 | 16 | 17 | 17 | 17 | 17 | 18 | 18 | .74 |
| .27 | 14 | 14 | 15 | 15 | 15 | 15 | 16 | 16 | 16 | 16 | 17 | 17 | 17 | 17 | 17 | 18 | 18 | 18 | .73 |
| .28 | 14 | 15 | 15 | 15 | 15 | 16 | 16 | 16 | 16 | 17 | 17 | 17 | 17 | 18 | 18 | 18 | 18 | 19 | .72 |
| .29 | 15 | 15 | 15 | 15 | 16 | 16 | 16 | 16 | 17 | 17 | 17 | 18 | 18 | 18 | 18 | 19 | 19 | 19 | .71 |
| .30 | 15 | 15 | 15 | 16 | 16 | 16 | 17 | 17 | 17 | 17 | 18 | 18 | 18 | 18 | 19 | 19 | 19 | 19 | 0.70 |
| 0.31 | 15 | 16 | 16 | 16 | 16 | 17 | 17 | 17 | 17 | 18 | 18 | 18 | 18 | 19 | 19 | 19 | 20 | 20 | .69 |
| .32 | 16 | 16 | 16 | 16 | 17 | 17 | 17 | 17 | 18 | 18 | 18 | 18 | 19 | 19 | 19 | 20 | 20 | 20 | .68 |
| .33 | 16 | 16 | 16 | 17 | 17 | 17 | 17 | 18 | 18 | 18 | 19 | 19 | 19 | 19 | 20 | 20 | 20 | 20 | .67 |
| .34 | 16 | 16 | 17 | 17 | 17 | 17 | 18 | 18 | 18 | 19 | 19 | 19 | 19 | 20 | 20 | 20 | 20 | 21 | .66 |
| .35 | 16 | 16 | 17 | 17 | 17 | 18 | 18 | 18 | 18 | 19 | 19 | 19 | 20 | 20 | 20 | 20 | 21 | 21 | 0.65 |
| 0.36 | 16 | 17 | 17 | 17 | 18 | 18 | 18 | 18 | 19 | 19 | 19 | 20 | 20 | 20 | 20 | 21 | 21 | 21 | .64 |
| .37 | 17 | 17 | 17 | 17 | 18 | 18 | 18 | 19 | 19 | 19 | 20 | 20 | 20 | 20 | 21 | 21 | 21 | 22 | .63 |
| .38 | 17 | 17 | 17 | 18 | 18 | 18 | 19 | 19 | 19 | 19 | 20 | 20 | 20 | 21 | 21 | 21 | 21 | 22 | .62 |
| .39 | 17 | 17 | 18 | 18 | 18 | 18 | 19 | 19 | 19 | 20 | 20 | 20 | 21 | 21 | 21 | 21 | 22 | 22 | .61 |
| .40 | 17 | 17 | 18 | 18 | 18 | 19 | 19 | 19 | 20 | 20 | 20 | 20 | 21 | 21 | 21 | 22 | 22 | 22 | 0.60 |
| 0.41 | 17 | 18 | 18 | 18 | 18 | 19 | 19 | 19 | 20 | 20 | 20 | 21 | 21 | 21 | 21 | 22 | 22 | 22 | .59 |
| .42 | 17 | 18 | 18 | 18 | 19 | 19 | 19 | 19 | 20 | 20 | 20 | 21 | 21 | 21 | 22 | 22 | 22 | 23 | .58 |
| .43 | 17 | 18 | 18 | 18 | 19 | 19 | 19 | 20 | 20 | 20 | 21 | 21 | 21 | 21 | 22 | 22 | 22 | 23 | .57 |
| .44 | 18 | 18 | 18 | 18 | 19 | 19 | 19 | 20 | 20 | 20 | 21 | 21 | 21 | 21 | 22 | 22 | 22 | 23 | .56 |
| .45 | 18 | 18 | 18 | 19 | 19 | 19 | 19 | 20 | 20 | 20 | 21 | 21 | 21 | 21 | 22 | 22 | 23 | 23 | 0.55 |
| 0.46 | 18 | 18 | 18 | 19 | 19 | 19 | 20 | 20 | 20 | 20 | 21 | 21 | 21 | 21 | 22 | 22 | 23 | 23 | .54 |
| .47 | 18 | 18 | 18 | 19 | 19 | 19 | 20 | 20 | 20 | 21 | 21 | 21 | 21 | 22 | 22 | 22 | 23 | 23 | .53 |
| .48 | 18 | 18 | 18 | 19 | 19 | 19 | 20 | 20 | 20 | 21 | 21 | 21 | 22 | 22 | 22 | 22 | 23 | 23 | .52 |
| .49 | 18 | 18 | 18 | 19 | 19 | 19 | 20 | 20 | 20 | 21 | 21 | 21 | 22 | 22 | 22 | 22 | 23 | 23 | .51 |
| 0.50 | 18 | 18 | 18 | 19 | 19 | 19 | 20 | 20 | 20 | 21 | 21 | 21 | 22 | 22 | 22 | 22 | 23 | 23 | 0.50 |

The correction $B'' (\Delta''_0 + \Delta''_1)$ is always of the opposite sign to $\Delta''_0 + \Delta''_1$

SECOND DIFFERENCE CORRECTION $B'' (\Delta'_0 + \Delta'_1)$

| n | 370 | 375 | 380 | 385 | 390 | 395 | 400 | 405 | 410 | 415 | 420 | 425 | 430 | 435 | 440 | 445 | 450 | 455 | n |
|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|
| 0.01 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0.99 |
| 0.02 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 0.98 |
| 0.03 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 0.97 |
| 0.04 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 0.96 |
| 0.05 | 4 | 4 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 0.95 |
| 0.06 | 5 | 5 | 5 | 5 | 5 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 0.94 |
| 0.07 | 6 | 6 | 6 | 6 | 6 | 6 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 0.93 |
| 0.08 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 0.92 |
| 0.09 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 0.91 |
| 0.10 | 8 | 8 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 0.90 |
| 0.11 | 9 | 9 | 9 | 9 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 11 | 11 | 11 | 11 | 11 | 11 | 0.89 |
| 0.12 | 10 | 10 | 10 | 10 | 10 | 10 | 11 | 11 | 11 | 11 | 11 | 11 | 11 | 11 | 12 | 12 | 12 | 12 | 0.88 |
| 0.13 | 10 | 11 | 11 | 11 | 11 | 11 | 11 | 11 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 13 | 13 | 13 | 0.87 |
| 0.14 | 11 | 11 | 11 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 13 | 13 | 13 | 13 | 13 | 13 | 14 | 14 | 0.86 |
| 0.15 | 12 | 12 | 12 | 12 | 12 | 13 | 13 | 13 | 13 | 13 | 13 | 14 | 14 | 14 | 14 | 14 | 14 | 15 | 0.85 |
| 0.16 | 12 | 13 | 13 | 13 | 13 | 13 | 13 | 14 | 14 | 14 | 14 | 14 | 14 | 15 | 15 | 15 | 15 | 15 | 0.84 |
| 0.17 | 13 | 13 | 13 | 14 | 14 | 14 | 14 | 14 | 14 | 15 | 15 | 15 | 15 | 15 | 16 | 16 | 16 | 16 | 0.83 |
| 0.18 | 14 | 14 | 14 | 14 | 14 | 15 | 15 | 15 | 15 | 15 | 15 | 16 | 16 | 16 | 16 | 16 | 17 | 17 | 0.82 |
| 0.19 | 14 | 14 | 15 | 15 | 15 | 15 | 15 | 16 | 16 | 16 | 16 | 16 | 17 | 17 | 17 | 17 | 17 | 18 | 0.81 |
| 0.20 | 15 | 15 | 15 | 15 | 16 | 16 | 16 | 16 | 16 | 16 | 17 | 17 | 17 | 17 | 17 | 18 | 18 | 18 | 0.80 |
| 0.21 | 15 | 16 | 16 | 16 | 16 | 16 | 17 | 17 | 17 | 17 | 17 | 18 | 18 | 18 | 18 | 18 | 19 | 19 | 0.79 |
| 0.22 | 16 | 16 | 16 | 17 | 17 | 17 | 17 | 17 | 18 | 18 | 18 | 18 | 18 | 19 | 19 | 19 | 19 | 20 | 0.78 |
| 0.23 | 16 | 17 | 17 | 17 | 17 | 17 | 18 | 18 | 18 | 18 | 19 | 19 | 19 | 19 | 19 | 20 | 20 | 20 | 0.77 |
| 0.24 | 17 | 17 | 17 | 18 | 18 | 18 | 18 | 18 | 19 | 19 | 19 | 19 | 20 | 20 | 20 | 20 | 21 | 21 | 0.76 |
| 0.25 | 17 | 18 | 18 | 18 | 18 | 19 | 19 | 19 | 19 | 19 | 20 | 20 | 20 | 20 | 21 | 21 | 21 | 21 | 0.75 |
| 0.26 | 18 | 18 | 18 | 19 | 19 | 19 | 19 | 19 | 20 | 20 | 20 | 20 | 21 | 21 | 21 | 21 | 22 | 22 | 0.74 |
| 0.27 | 18 | 18 | 19 | 19 | 19 | 19 | 20 | 20 | 20 | 20 | 21 | 21 | 21 | 21 | 22 | 22 | 22 | 22 | 0.73 |
| 0.28 | 19 | 19 | 19 | 19 | 20 | 20 | 20 | 20 | 21 | 21 | 21 | 21 | 22 | 22 | 22 | 22 | 23 | 23 | 0.72 |
| 0.29 | 19 | 19 | 20 | 20 | 20 | 20 | 21 | 21 | 21 | 21 | 22 | 22 | 22 | 22 | 23 | 23 | 23 | 23 | 0.71 |
| 0.30 | 19 | 20 | 20 | 20 | 20 | 21 | 21 | 21 | 22 | 22 | 22 | 22 | 23 | 23 | 23 | 23 | 24 | 24 | 0.70 |
| 0.31 | 20 | 20 | 20 | 21 | 21 | 21 | 21 | 22 | 22 | 22 | 22 | 23 | 23 | 23 | 24 | 24 | 24 | 24 | 0.69 |
| 0.32 | 20 | 20 | 21 | 21 | 21 | 21 | 22 | 22 | 22 | 22 | 23 | 23 | 23 | 23 | 24 | 24 | 24 | 25 | 0.68 |
| 0.33 | 20 | 21 | 21 | 21 | 22 | 22 | 22 | 22 | 23 | 23 | 23 | 23 | 24 | 24 | 24 | 25 | 25 | 25 | 0.67 |
| 0.34 | 21 | 21 | 21 | 22 | 22 | 22 | 22 | 23 | 23 | 23 | 23 | 24 | 24 | 24 | 25 | 25 | 25 | 26 | 0.66 |
| 0.35 | 21 | 21 | 22 | 22 | 22 | 22 | 23 | 23 | 23 | 24 | 24 | 24 | 24 | 25 | 25 | 25 | 26 | 26 | 0.65 |
| 0.36 | 21 | 22 | 22 | 22 | 22 | 23 | 23 | 23 | 24 | 24 | 24 | 24 | 25 | 25 | 25 | 26 | 26 | 26 | 0.64 |
| 0.37 | 22 | 22 | 22 | 22 | 23 | 23 | 23 | 24 | 24 | 24 | 24 | 25 | 25 | 25 | 26 | 26 | 26 | 27 | 0.63 |
| 0.38 | 22 | 22 | 22 | 23 | 23 | 23 | 24 | 24 | 24 | 24 | 25 | 25 | 25 | 26 | 26 | 26 | 27 | 27 | 0.62 |
| 0.39 | 22 | 22 | 23 | 23 | 23 | 23 | 24 | 24 | 24 | 25 | 25 | 25 | 26 | 26 | 26 | 26 | 27 | 27 | 0.61 |
| 0.40 | 22 | 22 | 23 | 23 | 23 | 24 | 24 | 24 | 25 | 25 | 25 | 26 | 26 | 26 | 26 | 27 | 27 | 27 | 0.60 |
| 0.41 | 22 | 23 | 23 | 23 | 24 | 24 | 24 | 24 | 25 | 25 | 25 | 26 | 26 | 26 | 27 | 27 | 27 | 28 | 0.59 |
| 0.42 | 23 | 23 | 23 | 23 | 24 | 24 | 24 | 25 | 25 | 25 | 26 | 26 | 26 | 26 | 27 | 27 | 27 | 28 | 0.58 |
| 0.43 | 23 | 23 | 23 | 24 | 24 | 24 | 25 | 25 | 25 | 25 | 26 | 26 | 26 | 27 | 27 | 27 | 28 | 28 | 0.57 |
| 0.44 | 23 | 23 | 23 | 24 | 24 | 24 | 25 | 25 | 25 | 26 | 26 | 26 | 26 | 27 | 27 | 27 | 28 | 28 | 0.56 |
| 0.45 | 23 | 23 | 24 | 24 | 24 | 24 | 25 | 25 | 25 | 26 | 26 | 26 | 27 | 27 | 27 | 28 | 28 | 28 | 0.55 |
| 0.46 | 23 | 23 | 24 | 24 | 24 | 25 | 25 | 25 | 25 | 26 | 26 | 26 | 27 | 27 | 27 | 28 | 28 | 28 | 0.54 |
| 0.47 | 23 | 23 | 24 | 24 | 24 | 25 | 25 | 25 | 26 | 26 | 26 | 26 | 27 | 27 | 27 | 28 | 28 | 28 | 0.53 |
| 0.48 | 23 | 23 | 24 | 24 | 24 | 25 | 25 | 25 | 26 | 26 | 26 | 27 | 27 | 27 | 27 | 28 | 28 | 28 | 0.52 |
| 0.49 | 23 | 23 | 24 | 24 | 24 | 25 | 25 | 25 | 26 | 26 | 26 | 27 | 27 | 27 | 27 | 28 | 28 | 28 | 0.51 |
| 0.50 | 23 | 23 | 24 | 24 | 24 | 25 | 25 | 25 | 26 | 26 | 26 | 27 | 27 | 27 | 28 | 28 | 28 | 28 | 0.50 |

The correction $B' (\Delta'_0 + \Delta'_1)$ is always of the opposite sign to $\Delta'_0 + \Delta'_1$

SECOND DIFFERENCE CORRECTION $B'' (\Delta_0'' + \Delta_1'')$

| n | 455 | 460 | 465 | 470 | 475 | 480 | 485 | 490 | 495 | 500 | 505 | 510 | 515 | 520 | 525 | 530 | 535 | 540 | n |
|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|
| 0.01 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0.99 |
| .02 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | .98 |
| .03 | 3 | 3 | 3 | 3 | 3 | 3 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | .97 |
| .04 | 4 | 4 | 4 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | .96 |
| .05 | 5 | 5 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 0.95 |
| 0.06 | 6 | 6 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 8 | 8 | .94 |
| .07 | 7 | 7 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 9 | 9 | 9 | 9 | .93 |
| .08 | 8 | 8 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 10 | 10 | 10 | 10 | 10 | .92 |
| .09 | 9 | 9 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 11 | 11 | 11 | 11 | 11 | 11 | .91 |
| .10 | 10 | 10 | 10 | 11 | 11 | 11 | 11 | 11 | 11 | 11 | 11 | 11 | 12 | 12 | 12 | 12 | 12 | 12 | 0.90 |
| 0.11 | 11 | 11 | 11 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 13 | 13 | 13 | 13 | 13 | 13 | .89 |
| .12 | 12 | 12 | 12 | 12 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 14 | 14 | 14 | 14 | 14 | 14 | .88 |
| .13 | 13 | 13 | 13 | 13 | 13 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 15 | 15 | 15 | 15 | 15 | 15 | .87 |
| .14 | 14 | 14 | 14 | 14 | 14 | 14 | 15 | 15 | 15 | 15 | 15 | 15 | 16 | 16 | 16 | 16 | 16 | 16 | .86 |
| .15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 16 | 16 | 16 | 16 | 16 | 16 | 17 | 17 | 17 | 17 | 17 | 0.85 |
| 0.16 | 15 | 15 | 16 | 16 | 16 | 16 | 16 | 16 | 17 | 17 | 17 | 17 | 17 | 17 | 18 | 18 | 18 | 18 | .84 |
| .17 | 16 | 16 | 16 | 17 | 17 | 17 | 17 | 17 | 17 | 18 | 18 | 18 | 18 | 18 | 19 | 19 | 19 | 19 | .83 |
| .18 | 17 | 17 | 17 | 17 | 18 | 18 | 18 | 18 | 18 | 18 | 19 | 19 | 19 | 19 | 19 | 20 | 20 | 20 | .82 |
| .19 | 18 | 18 | 18 | 18 | 18 | 18 | 19 | 19 | 19 | 19 | 19 | 20 | 20 | 20 | 20 | 20 | 21 | 21 | .81 |
| .20 | 18 | 18 | 19 | 19 | 19 | 19 | 19 | 20 | 20 | 20 | 20 | 20 | 21 | 21 | 21 | 21 | 21 | 22 | 0.80 |
| 0.21 | 19 | 19 | 19 | 19 | 20 | 20 | 20 | 20 | 21 | 21 | 21 | 21 | 21 | 22 | 22 | 22 | 22 | 22 | .79 |
| .22 | 20 | 20 | 20 | 20 | 20 | 21 | 21 | 21 | 21 | 21 | 22 | 22 | 22 | 22 | 23 | 23 | 23 | 23 | .78 |
| .23 | 20 | 20 | 21 | 21 | 21 | 21 | 21 | 22 | 22 | 22 | 22 | 23 | 23 | 23 | 23 | 24 | 24 | 24 | .77 |
| .24 | 21 | 21 | 21 | 21 | 22 | 22 | 22 | 22 | 23 | 23 | 23 | 23 | 23 | 24 | 24 | 24 | 24 | 25 | .76 |
| .25 | 21 | 22 | 22 | 22 | 22 | 22 | 23 | 23 | 23 | 23 | 24 | 24 | 24 | 24 | 25 | 25 | 25 | 25 | 0.75 |
| 0.26 | 22 | 22 | 22 | 23 | 23 | 23 | 23 | 24 | 24 | 24 | 24 | 25 | 25 | 25 | 25 | 25 | 26 | 26 | .74 |
| .27 | 22 | 23 | 23 | 23 | 23 | 24 | 24 | 24 | 24 | 25 | 25 | 25 | 25 | 26 | 26 | 26 | 26 | 27 | .73 |
| .28 | 23 | 23 | 23 | 24 | 24 | 24 | 24 | 25 | 25 | 25 | 25 | 26 | 26 | 26 | 26 | 27 | 27 | 27 | .72 |
| .29 | 23 | 24 | 24 | 24 | 24 | 25 | 25 | 25 | 25 | 26 | 26 | 26 | 27 | 27 | 27 | 27 | 28 | 28 | .71 |
| .30 | 24 | 24 | 24 | 25 | 25 | 25 | 25 | 26 | 26 | 26 | 27 | 27 | 27 | 28 | 28 | 28 | 28 | 28 | 0.70 |
| 0.31 | 24 | 25 | 25 | 25 | 25 | 26 | 26 | 26 | 26 | 27 | 27 | 27 | 28 | 28 | 28 | 28 | 29 | 29 | .69 |
| .32 | 25 | 25 | 25 | 26 | 26 | 26 | 26 | 27 | 27 | 27 | 28 | 28 | 28 | 28 | 29 | 29 | 29 | 29 | .68 |
| .33 | 25 | 25 | 26 | 26 | 26 | 27 | 27 | 27 | 27 | 28 | 28 | 28 | 28 | 29 | 29 | 29 | 30 | 30 | .67 |
| .34 | 26 | 26 | 26 | 26 | 27 | 27 | 27 | 27 | 28 | 28 | 28 | 29 | 29 | 29 | 29 | 30 | 30 | 30 | .66 |
| .35 | 26 | 26 | 26 | 27 | 27 | 27 | 28 | 28 | 28 | 28 | 29 | 29 | 29 | 30 | 30 | 30 | 30 | 31 | 0.65 |
| 0.36 | 26 | 26 | 27 | 27 | 27 | 28 | 28 | 28 | 29 | 29 | 29 | 29 | 30 | 30 | 30 | 31 | 31 | 31 | .64 |
| .37 | 27 | 27 | 27 | 27 | 28 | 28 | 28 | 29 | 29 | 29 | 29 | 30 | 30 | 30 | 31 | 31 | 31 | 31 | .63 |
| .38 | 27 | 27 | 27 | 28 | 28 | 28 | 29 | 29 | 29 | 29 | 30 | 30 | 30 | 31 | 31 | 31 | 31 | 32 | .62 |
| .39 | 27 | 27 | 28 | 28 | 28 | 29 | 29 | 29 | 29 | 30 | 30 | 30 | 31 | 31 | 31 | 32 | 32 | 32 | .61 |
| .40 | 27 | 28 | 28 | 28 | 28 | 29 | 29 | 29 | 30 | 30 | 30 | 31 | 31 | 31 | 32 | 32 | 32 | 32 | 0.60 |
| 0.41 | 28 | 28 | 28 | 28 | 29 | 29 | 29 | 30 | 30 | 30 | 31 | 31 | 31 | 31 | 32 | 32 | 32 | 33 | .59 |
| .42 | 28 | 28 | 28 | 29 | 29 | 29 | 30 | 30 | 30 | 30 | 31 | 31 | 31 | 31 | 32 | 32 | 32 | 33 | .58 |
| .43 | 28 | 28 | 28 | 29 | 29 | 29 | 30 | 30 | 30 | 31 | 31 | 31 | 32 | 32 | 32 | 32 | 33 | 33 | .57 |
| .44 | 28 | 28 | 29 | 29 | 29 | 30 | 30 | 30 | 30 | 31 | 31 | 31 | 32 | 32 | 32 | 33 | 33 | 33 | .56 |
| .45 | 28 | 28 | 29 | 29 | 29 | 30 | 30 | 30 | 31 | 31 | 31 | 32 | 32 | 32 | 32 | 33 | 33 | 33 | 0.55 |
| 0.46 | 28 | 29 | 29 | 29 | 29 | 30 | 30 | 30 | 31 | 31 | 31 | 32 | 32 | 32 | 33 | 33 | 33 | 34 | .54 |
| .47 | 28 | 29 | 29 | 29 | 30 | 30 | 30 | 31 | 31 | 31 | 31 | 32 | 32 | 32 | 33 | 33 | 33 | 34 | .53 |
| .48 | 28 | 29 | 29 | 29 | 30 | 30 | 30 | 31 | 31 | 31 | 32 | 32 | 32 | 32 | 33 | 33 | 33 | 34 | .52 |
| .49 | 28 | 29 | 29 | 29 | 30 | 30 | 30 | 31 | 31 | 31 | 32 | 32 | 32 | 32 | 33 | 33 | 33 | 34 | .51 |
| 0.50 | 28 | 29 | 29 | 29 | 30 | 30 | 30 | 31 | 31 | 31 | 32 | 32 | 32 | 32 | 33 | 33 | 33 | 34 | 0.50 |

The correction $B'' (\Delta_0'' + \Delta_1'')$ is always of the opposite sign to $\Delta_0'' + \Delta_1''$

SECOND DIFFERENCE CORRECTION $B'' (\Delta_0'' + \Delta_1'')$

| n | 540 | 545 | 550 | 555 | 560 | 565 | 570 | 575 | 580 | 585 | 590 | 595 | 600 | 605 | 610 | 615 | 620 | 625 | n |
|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|
| 0.01 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 0.99 |
| 0.02 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 0.98 |
| 0.03 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 5 | 5 | 0.97 |
| 0.04 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 0.96 |
| 0.05 | 6 | 6 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 0.95 |
| 0.06 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 9 | 9 | 9 | 9 | 9 | 0.94 |
| 0.07 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 0.93 |
| 0.08 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 11 | 11 | 11 | 11 | 11 | 11 | 11 | 11 | 11 | 11 | 12 | 0.92 |
| 0.09 | 11 | 11 | 11 | 11 | 11 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 13 | 13 | 13 | 0.91 |
| 0.10 | 12 | 12 | 12 | 12 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 14 | 14 | 14 | 14 | 14 | 14 | 0.90 |
| 0.11 | 13 | 13 | 13 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 0.89 |
| 0.12 | 14 | 14 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 0.88 |
| 0.13 | 15 | 15 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 18 | 18 | 0.87 |
| 0.14 | 16 | 16 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 18 | 18 | 18 | 18 | 18 | 18 | 19 | 19 | 19 | 0.86 |
| 0.15 | 17 | 17 | 18 | 18 | 18 | 18 | 18 | 18 | 18 | 19 | 19 | 19 | 19 | 19 | 19 | 20 | 20 | 20 | 0.85 |
| 0.16 | 18 | 18 | 18 | 19 | 19 | 19 | 19 | 19 | 19 | 20 | 20 | 20 | 20 | 20 | 20 | 21 | 21 | 21 | 0.84 |
| 0.17 | 19 | 19 | 19 | 20 | 20 | 20 | 20 | 20 | 20 | 21 | 21 | 21 | 21 | 21 | 22 | 22 | 22 | 22 | 0.83 |
| 0.18 | 20 | 20 | 20 | 20 | 21 | 21 | 21 | 21 | 21 | 22 | 22 | 22 | 22 | 22 | 23 | 23 | 23 | 23 | 0.82 |
| 0.19 | 21 | 21 | 21 | 21 | 22 | 22 | 22 | 22 | 22 | 23 | 23 | 23 | 23 | 23 | 23 | 24 | 24 | 24 | 0.81 |
| 0.20 | 22 | 22 | 22 | 22 | 22 | 23 | 23 | 23 | 23 | 23 | 24 | 24 | 24 | 24 | 24 | 25 | 25 | 25 | 0.80 |
| 0.21 | 22 | 23 | 23 | 23 | 23 | 23 | 24 | 24 | 24 | 24 | 24 | 25 | 25 | 25 | 25 | 26 | 26 | 26 | 0.79 |
| 0.22 | 23 | 23 | 24 | 24 | 24 | 24 | 24 | 25 | 25 | 25 | 25 | 26 | 26 | 26 | 26 | 27 | 27 | 27 | 0.78 |
| 0.23 | 24 | 24 | 24 | 25 | 25 | 25 | 25 | 25 | 26 | 26 | 26 | 26 | 27 | 27 | 27 | 27 | 28 | 28 | 0.77 |
| 0.24 | 25 | 25 | 25 | 25 | 26 | 26 | 26 | 26 | 26 | 27 | 27 | 27 | 27 | 28 | 28 | 28 | 28 | 28 | 0.76 |
| 0.25 | 25 | 26 | 26 | 26 | 26 | 26 | 27 | 27 | 27 | 27 | 28 | 28 | 28 | 28 | 29 | 29 | 29 | 29 | 0.75 |
| 0.26 | 26 | 26 | 26 | 27 | 27 | 27 | 27 | 28 | 28 | 28 | 28 | 29 | 29 | 29 | 29 | 30 | 30 | 30 | 0.74 |
| 0.27 | 27 | 27 | 27 | 27 | 28 | 28 | 28 | 28 | 29 | 29 | 29 | 29 | 30 | 30 | 30 | 30 | 31 | 31 | 0.73 |
| 0.28 | 27 | 27 | 28 | 28 | 28 | 28 | 29 | 29 | 29 | 29 | 30 | 30 | 30 | 30 | 31 | 31 | 31 | 32 | 0.72 |
| 0.29 | 28 | 28 | 28 | 29 | 29 | 29 | 29 | 30 | 30 | 30 | 31 | 31 | 31 | 31 | 31 | 32 | 32 | 32 | 0.71 |
| 0.30 | 28 | 29 | 29 | 29 | 29 | 30 | 30 | 30 | 30 | 31 | 31 | 31 | 32 | 32 | 32 | 32 | 33 | 33 | 0.70 |
| 0.31 | 29 | 29 | 29 | 30 | 30 | 30 | 30 | 31 | 31 | 31 | 32 | 32 | 32 | 32 | 33 | 33 | 33 | 33 | 0.69 |
| 0.32 | 29 | 30 | 30 | 30 | 30 | 31 | 31 | 31 | 32 | 32 | 32 | 32 | 33 | 33 | 33 | 33 | 34 | 34 | 0.68 |
| 0.33 | 30 | 30 | 30 | 31 | 31 | 31 | 32 | 32 | 32 | 32 | 33 | 33 | 33 | 33 | 34 | 34 | 34 | 35 | 0.67 |
| 0.34 | 30 | 31 | 31 | 31 | 31 | 32 | 32 | 32 | 33 | 33 | 33 | 33 | 34 | 34 | 34 | 35 | 35 | 35 | 0.66 |
| 0.35 | 31 | 31 | 31 | 32 | 32 | 32 | 32 | 33 | 33 | 33 | 34 | 34 | 34 | 34 | 35 | 35 | 35 | 36 | 0.65 |
| 0.36 | 31 | 31 | 32 | 32 | 32 | 33 | 33 | 33 | 33 | 34 | 34 | 34 | 35 | 35 | 35 | 35 | 36 | 36 | 0.64 |
| 0.37 | 31 | 32 | 32 | 32 | 33 | 33 | 33 | 34 | 34 | 34 | 34 | 35 | 35 | 35 | 36 | 36 | 36 | 36 | 0.63 |
| 0.38 | 32 | 32 | 32 | 33 | 33 | 33 | 34 | 34 | 34 | 34 | 35 | 35 | 35 | 36 | 36 | 36 | 37 | 37 | 0.62 |
| 0.39 | 32 | 32 | 33 | 33 | 33 | 34 | 34 | 34 | 34 | 35 | 35 | 35 | 36 | 36 | 36 | 37 | 37 | 37 | 0.61 |
| 0.40 | 32 | 33 | 33 | 33 | 34 | 34 | 34 | 34 | 35 | 35 | 35 | 36 | 36 | 36 | 37 | 37 | 37 | 38 | 0.60 |
| 0.41 | 33 | 33 | 33 | 34 | 34 | 34 | 34 | 35 | 35 | 35 | 36 | 36 | 36 | 37 | 37 | 37 | 37 | 38 | 0.59 |
| 0.42 | 33 | 33 | 33 | 34 | 34 | 34 | 35 | 35 | 35 | 36 | 36 | 36 | 37 | 37 | 37 | 37 | 38 | 38 | 0.58 |
| 0.43 | 33 | 33 | 34 | 34 | 34 | 35 | 35 | 35 | 36 | 36 | 36 | 36 | 37 | 37 | 37 | 38 | 38 | 38 | 0.57 |
| 0.44 | 33 | 34 | 34 | 34 | 34 | 35 | 35 | 35 | 36 | 36 | 36 | 37 | 37 | 37 | 38 | 38 | 38 | 38 | 0.56 |
| 0.45 | 33 | 34 | 34 | 34 | 35 | 35 | 35 | 36 | 36 | 36 | 37 | 37 | 37 | 37 | 38 | 38 | 38 | 39 | 0.55 |
| 0.46 | 34 | 34 | 34 | 34 | 35 | 35 | 35 | 36 | 36 | 36 | 37 | 37 | 37 | 38 | 38 | 38 | 39 | 39 | 0.54 |
| 0.47 | 34 | 34 | 34 | 35 | 35 | 35 | 35 | 36 | 36 | 36 | 37 | 37 | 37 | 38 | 38 | 38 | 39 | 39 | 0.53 |
| 0.48 | 34 | 34 | 34 | 35 | 35 | 35 | 36 | 36 | 36 | 37 | 37 | 37 | 37 | 38 | 38 | 38 | 39 | 39 | 0.52 |
| 0.49 | 34 | 34 | 34 | 35 | 35 | 35 | 36 | 36 | 36 | 37 | 37 | 37 | 37 | 38 | 38 | 38 | 39 | 39 | 0.51 |
| 0.50 | 34 | 34 | 34 | 35 | 35 | 35 | 36 | 36 | 36 | 37 | 37 | 37 | 38 | 38 | 38 | 38 | 39 | 39 | 0.50 |

The correction $B'' (\Delta_0'' + \Delta_1'')$ is always of the opposite sign to $\Delta_0'' + \Delta_1''$

TABLE VII
DIURNAL ABERRATION

Unit 0.001

| Lat. Dec. | 0° | 10° | 20° | 30° | 35° | 40° | 45° | 50° | 52° | 54° | 56° | 58° | 60° |
|--------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 0° | 21 | 21 | 20 | 18 | 17 | 16 | 15 | 14 | 13 | 13 | 12 | 11 | 11 |
| 5 | 21 | 21 | 20 | 19 | 18 | 16 | 15 | 14 | 13 | 13 | 12 | 11 | 11 |
| 10 | 22 | 21 | 20 | 19 | 18 | 17 | 15 | 14 | 13 | 13 | 12 | 11 | 11 |
| 15 | 22 | 22 | 21 | 19 | 18 | 17 | 16 | 14 | 14 | 13 | 12 | 12 | 11 |
| 20 | 23 | 22 | 21 | 20 | 19 | 17 | 16 | 15 | 14 | 13 | 13 | 12 | 11 |
| 25 | 24 | 23 | 22 | 20 | 19 | 18 | 17 | 15 | 14 | 14 | 13 | 12 | 12 |
| 30 | 25 | 24 | 23 | 21 | 20 | 19 | 17 | 16 | 15 | 14 | 14 | 13 | 12 |
| 35 | 26 | 26 | 24 | 23 | 21 | 20 | 18 | 17 | 16 | 15 | 15 | 14 | 13 |
| 40 | 28 | 27 | 26 | 24 | 23 | 21 | 20 | 18 | 17 | 16 | 16 | 15 | 14 |
| 45 | 30 | 30 | 28 | 26 | 25 | 23 | 21 | 19 | 19 | 18 | 17 | 16 | 15 |
| 50 | 33 | 33 | 31 | 29 | 27 | 25 | 23 | 21 | 20 | 20 | 19 | 18 | 17 |
| 52 | 35 | 34 | 33 | 30 | 28 | 27 | 25 | 22 | 21 | 20 | 19 | 18 | 17 |
| 54 | 36 | 36 | 34 | 31 | 30 | 28 | 26 | 23 | 22 | 21 | 20 | 19 | 18 |
| 56 | 38 | 38 | 36 | 33 | 31 | 29 | 27 | 24 | 23 | 22 | 21 | 20 | 19 |
| 58 | 40 | 40 | 38 | 35 | 33 | 31 | 28 | 26 | 25 | 24 | 23 | 21 | 20 |
| 60 | 43 | 42 | 40 | 37 | 35 | 33 | 30 | 27 | 26 | 25 | 24 | 23 | 21 |
| 62 | 45 | 45 | 43 | 39 | 37 | 35 | 32 | 29 | 28 | 27 | 25 | 24 | 23 |
| 64 | 49 | 48 | 46 | 42 | 40 | 37 | 34 | 31 | 30 | 29 | 27 | 26 | 24 |
| 66 | 52 | 52 | 49 | 45 | 43 | 40 | 37 | 34 | 32 | 31 | 29 | 28 | 26 |
| 68 | 57 | 56 | 54 | 49 | 47 | 44 | 40 | 37 | 35 | 33 | 32 | 30 | 28 |
| 70 | 62 | 61 | 59 | 54 | 51 | 48 | 44 | 40 | 38 | 37 | 35 | 33 | 31 |
| 71 | 66 | 65 | 62 | 57 | 54 | 50 | 46 | 42 | 40 | 39 | 37 | 35 | 33 |
| 72 | 69 | 68 | 65 | 60 | 57 | 53 | 49 | 44 | 43 | 41 | 39 | 37 | 35 |
| 73 | 73 | 72 | 69 | 63 | 60 | 56 | 52 | 47 | 45 | 43 | 41 | 39 | 36 |
| 74 | 77 | 76 | 73 | 67 | 63 | 59 | 55 | 50 | 48 | 45 | 43 | 41 | 39 |
| 75 | 82 | 81 | 77 | 71 | 68 | 63 | 58 | 53 | 51 | 48 | 46 | 44 | 41 |
| 76 | 88 | 87 | 83 | 76 | 72 | 68 | 62 | 57 | 54 | 52 | 49 | 47 | 44 |
| 77 | 95 | 93 | 89 | 82 | 78 | 73 | 67 | 61 | 58 | 56 | 53 | 50 | 47 |
| 78 | 103 | 101 | 96 | 89 | 84 | 79 | 73 | 66 | 63 | 60 | 57 | 54 | 51 |
| 79 | 112 | 110 | 105 | 97 | 92 | 86 | 79 | 72 | 69 | 66 | 63 | 59 | 56 |

Unit 0.01

| | | | | | | | | | | | | | |
|---------|-----|-----|-----|-----|-----|----|----|----|----|----|----|----|----|
| 80° 00' | 12 | 12 | 12 | 11 | 10 | 9 | 9 | 8 | 8 | 7 | 7 | 7 | 6 |
| 81 00 | 14 | 13 | 13 | 12 | 11 | 10 | 10 | 9 | 8 | 8 | 8 | 7 | 7 |
| 82 00 | 15 | 15 | 14 | 13 | 13 | 12 | 11 | 10 | 9 | 9 | 9 | 8 | 8 |
| 83 00 | 18 | 17 | 16 | 15 | 14 | 13 | 12 | 11 | 11 | 10 | 10 | 9 | 9 |
| 84 00 | 20 | 20 | 19 | 18 | 17 | 16 | 14 | 13 | 13 | 12 | 11 | 11 | 10 |
| 85 00 | 24 | 24 | 23 | 21 | 20 | 19 | 17 | 16 | 15 | 14 | 14 | 13 | 12 |
| 85 30 | 27 | 27 | 26 | 24 | 22 | 21 | 19 | 17 | 17 | 16 | 15 | 14 | 14 |
| 86 00 | 31 | 30 | 29 | 26 | 25 | 23 | 22 | 20 | 19 | 18 | 17 | 16 | 15 |
| 86 30 | 35 | 34 | 33 | 30 | 29 | 27 | 25 | 22 | 22 | 21 | 20 | 19 | 17 |
| 87 00 | 41 | 40 | 38 | 35 | 33 | 31 | 29 | 26 | 25 | 24 | 23 | 22 | 20 |
| 87 30 | 49 | 48 | 46 | 42 | 40 | 37 | 35 | 31 | 30 | 29 | 27 | 26 | 24 |
| 88 00 | 61 | 60 | 57 | 53 | 50 | 47 | 43 | 39 | 38 | 36 | 34 | 32 | 31 |
| 88 10 | 67 | 66 | 63 | 58 | 55 | 51 | 47 | 43 | 41 | 39 | 37 | 35 | 33 |
| 88 20 | 73 | 72 | 69 | 64 | 60 | 56 | 52 | 47 | 45 | 43 | 41 | 39 | 37 |
| 88 30 | 82 | 80 | 77 | 71 | 67 | 62 | 58 | 52 | 50 | 48 | 46 | 43 | 41 |
| 88 40 | 92 | 90 | 86 | 79 | 75 | 70 | 65 | 59 | 56 | 54 | 51 | 49 | 46 |
| 88 50 | 105 | 103 | 98 | 91 | 86 | 80 | 74 | 67 | 65 | 62 | 59 | 56 | 52 |
| 89 00 | 122 | 120 | 115 | 106 | 100 | 94 | 86 | 79 | 75 | 72 | 68 | 65 | 61 |

The unit is 0.001 for declinations less than 80°, and 0.01 for declinations of 80° and over.

This correction is to be *subtracted* from the observed time of transit for transits above pole, and *added* to the time of transit for transits below pole.

| Proper Name | Cat. No. | Constellation Name | Proper Name | Cat. No. | Constellation Name |
|-------------------|----------|--------------------|------------------|----------|--------------------------|
| <i>Achernar</i> | 54 | α Eridani | <i>Denebola</i> | 444 | β Leonis |
| <i>Aldebaran</i> | 168 | α Tauri | <i>Dubhe</i> | 417 | α Ursae Majoris |
| <i>Algol</i> | 111 | β Persei | <i>Fomalhaut</i> | 867 | α Piscis Austrini |
| <i>Altair</i> | 745 | α Aquilae | <i>Polaris</i> | 907 | α Ursae Minoris |
| <i>Antares</i> | 616 | α Scorpii | <i>Pollux</i> | 295 | β Geminorum |
| <i>Arcturus</i> | 526 | α Bootis | <i>Procyon</i> | 291 | α Canis Minoris |
| <i>Bellatrix</i> | 201 | γ Orionis | <i>Regulus</i> | 380 | α Leonis |
| <i>Betelgeuse</i> | 224 | α Orionis | <i>Rigel</i> | 194 | β Orionis |
| <i>Canopus</i> | 245 | α Carinae | <i>Sirius</i> | 257 | α Canis Majoris |
| <i>Capella</i> | 193 | α Aurigae | <i>Spica</i> | 498 | α Virginis |
| <i>Castor</i> | 287 | α Geminorum | <i>Vega</i> | 699 | α Lyrae |
| <i>Deneb</i> | 777 | α Cygni | | | |

In this list the letters "B. D." have, for reasons of space, been omitted; no confusion can, however, be caused

| Name | Cat. No. | Page | Name | Cat. No. | Page | Name | Cat. No. | Page | Name | Cat. No. | Page | |
|-----------------------|----------|------|------------|----------|------|------------|----------|------|---------------------|----------|------|-----|
| Andromedae | | | Antliae | | | Aquarii | | | Aquarii | | | |
| α | 1 | 2 | α | 392 | 161 | θ | 840 | 344 | Pi. 23 ^h | 194 | 1624 | 368 |
| β | 42 | 19 | ϵ | 356 | 146 | ι | 828 | 341 | -0° | 4161 | 1553 | 326 |
| γ | 73 | 32 | η | 377 | 154 | κ | 1595 | 350 | -1° | 4057 | 1545 | 322 |
| δ | 20 | 9 | θ | 366 | 151 | λ | 864 | 355 | -2° | 5826 | 1598 | 353 |
| ϵ | 19 | 9 | ι | 414 | 169 | μ | 1547 | 322 | | | | |
| ζ | 27 | 12 | 17 G. | 1248 | 149 | ν | 794 | 327 | | | | |
| ι | 891 | 365 | 59 G. | 1265 | 158 | ξ | 1569 | 334 | | | | |
| κ | 1619 | 366 | 64 G. | 1269 | 160 | π | 1585 | 346 | | | | |
| λ | 890 | 365 | 78 G. | 1277 | 165 | σ | 1591 | 349 | | | | |
| μ | 33 | 15 | | | | τ | 861 | 354 | | | | |
| ν | 1021 | 13 | Apodis | | | υ | 849 | 350 | | | | |
| ξ | 1035 | 21 | α | 542 | 227 | φ | 1607 | 359 | | | | |
| \omicron | 869 | 356 | γ | 611 | 256 | ψ^1 | 1608 | 359 | | | | |
| π | 18 | 9 | δ^1 | 1424 | 251 | ψ^2 | 1609 | 360 | | | | |
| ρ | 1009 | 6 | θ | 1363 | 215 | ω^2 | 894 | 367 | | | | |
| σ | 1005 | 4 | ι | 642 | 267 | θ | *873 | 358 | | | | |
| υ | 1045 | 25 | κ^1 | 567 | 239 | 3 | 1543 | 321 | | | | |
| ψ | 1622 | 367 | 51 G. | 1443 | 262 | 11 | 789 | 324 | | | | |
| ω | 1040 | 23 | 59 G. | 1455 | 269 | 18 | 1562 | 331 | | | | |
| 5 | 1604 | 358 | 66 G. | 678 | 280 | 47 | 1584 | 345 | | | | |
| 12 | 1610 | 361 | | | | 68 | 1597 | 353 | | | | |
| 15 | 1616 | 364 | Aquarii | | | 88 | 873 | 358 | | | | |
| 22 | 4 | 3 | α | 827 | 341 | 98 | 1612 | 361 | | | | |
| 51 | 52 | 25 | β | 808 | 333 | 106 | 1621 | 367 | | | | |
| 62 | 1063 | 37 | γ | 842 | 346 | 98 G. | 1580 | 340 | | | | |
| Br. 299 | 77 | 34 | δ | 866 | 355 | 125 G. | 1582 | 344 | | | | |
| Pi. o ^h 38 | 1006 | 4 | ϵ | 781 | 321 | 248 G. | 888 | 364 | | | | |
| | | | η | 850 | 350 | 268 G. | 897 | 368 | | | | |

* These names are alternative names, given only in the list on page XLVI.

INDEX TO APPARENT PLACES OF STARS, 1986

In this list the letters "B. D." have, for reasons of space, been omitted; no confusion can, however, be caused

| Name | Cat. No. | Page | Name | Cat. No. | Page | Name | Cat. No. | Page | Name | Cat. No. | Page |
|--------------|----------|------|---------------------|----------|------|---------------------|----------|------|-------------------------|----------|------|
| Arae | | | Aurigae | | | B. D. | | | Bootis | | |
| α | 651 | 270 | α | 193 | 84 | +15 $^{\circ}$ 4830 | 1615 | 363 | Pi. 14 ^h 221 | 551 | 229 |
| β | 645 | 267 | β | 227 | 96 | +10 2823 | 1401 | 235 | Pi. 14 ^h 227 | 1392 | 229 |
| δ | 648 | 269 | δ | 225 | 96 | + 9 2814 | 1359 | 211 | Pi. 15 ^h 153 | 1412 | 242 |
| ϵ^1 | 632 | 262 | ϵ | 183 | 79 | + 9 3055 | 1408 | 239 | +55 $^{\circ}$ 1730 | 1397 | 232 |
| ζ | 631 | 261 | ζ | 1137 | 79 | + 9 3485 | 1466 | 276 | +33 $^{\circ}$ 2489 | 1384 | 226 |
| η | 1435 | 259 | η | 185 | 81 | + 9 3783 | 1484 | 287 | + 9 $^{\circ}$ 2814 | 1359 | 211 |
| θ | 1471 | 279 | ι | 181 | 79 | + 7 3682 | 1478 | 284 | | | |
| μ | 662 | 274 | κ | 1168 | 99 | + 6 2957 | 1388 | 228 | | | |
| 24 G. | 1444 | 261 | λ | 1145 | 85 | + 6 3169 | 1422 | 249 | | | |
| | | | μ | 192 | 83 | + 4 1945 | 1216 | 129 | Bradley | | |
| | | | ν | 221 | 93 | - 0 4161 | 1553 | 326 | 82 | 29 | 14 |
| | | | ξ | 1157 | 94 | - 1 4057 | 1545 | 322 | 256 | 1635 | 374 |
| | | | \omicron | 216 | 92 | - 2 5826 | 1598 | 353 | 299 | 77 | 34 |
| Argus | | | χ | 1151 | 88 | - 7 4523 | 1467 | 277 | 366 | 92 | 44 |
| α | *245 | 102 | ψ^1 | 242 | 102 | -11 4411 | 1461 | 272 | 402 | 1636 | 378 |
| β | *348 | 144 | ψ^5 | 255 | 106 | -13 4863 | 1472 | 280 | 615 | 1123 | 71 |
| γ | *309 | 128 | ψ^8 | 1176 | 107 | -18 41 | 1007 | 5 | 658 | 1133 | 77 |
| ϵ | *315 | 131 | 51 | 250 | 105 | -18 516 | 1084 | 48 | 904 | 1167 | 99 |
| ζ | *306 | 127 | 63 | 274 | 113 | -21 4422 | 1437 | 259 | 1147 | 310 | 130 |
| θ | *406 | 166 | 64 | 276 | 115 | | | | 1197 | 316 | 132 |
| ι | *351 | 144 | 66 | 1191 | 116 | | | | 1268 | 339 | 140 |
| κ | *353 | 145 | Br. 904 | 1167 | 99 | | | | 1352 | 1249 | 149 |
| λ | *345 | 142 | Grb. 1156 | 1172 | 103 | | | | 1369 | 1255 | 152 |
| ν | *252 | 105 | +33 $^{\circ}$ 1209 | 1162 | 96 | | | | 1493 | 1278 | 167 |
| ξ | *1204 | 123 | | | | | | | 1508 | 413 | 169 |
| \omicron | *1227 | 135 | | | | Bootis | | | 1634 | 454 | 187 |
| π | *278 | 114 | | | | α | 526 | 217 | 1636 | 1314 | 187 |
| σ | *1194 | 117 | | | | β | 555 | 231 | 1908 | 1393 | 230 |
| τ | *263 | 108 | | | | γ | 535 | 223 | 2114 | 624 | 257 |
| ϕ | *375 | 153 | | | | δ | 563 | 234 | 2292 | 1475 | 282 |
| χ | *303 | 125 | | | | η | 513 | 212 | 2412 | 1646 | 412 |
| ω | *385 | 157 | | | | θ | 531 | 221 | 2462 | 1505 | 300 |
| | | | | | | ι | 528 | 218 | 2777 | 795 | 326 |
| | | | | | | λ | 527 | 218 | 2880 | 1578 | 339 |
| | | | | | | μ | 568 | 237 | 3077 | 875 | 359 |
| | | | | | | ν^1 | 573 | 239 | | | |
| | | | | | | ρ | 534 | 222 | | | |
| | | | | | | σ | 1380 | 223 | | | |
| | | | | | | τ | 507 | 210 | | | |
| | | | | | | φ | 580 | 241 | | | |
| | | | | | | ψ | 557 | 232 | | | |
| | | | | | | A | 1370 | 218 | | | |
| | | | | | | d | *522 | 217 | | | |
| | | | | | | 3 | 1358 | 210 | | | |
| | | | | | | 11 | 517 | 214 | | | |
| | | | | | | 12 | 522 | 217 | | | |
| | | | | | | 18 | 1372 | 219 | | | |
| | | | | | | 22 | 1378 | 221 | | | |
| | | | | | | 32 | 1382 | 225 | | | |
| | | | | | | 33 | 540 | 224 | | | |
| | | | | | | 34 | 1383 | 226 | | | |
| | | | | | | 45 | 1396 | 232 | | | |
| | | | | | | 47 | 1395 | 232 | | | |
| | | | | | | 9 H | 1368 | 216 | | | |
| | | | | | | Grb. 2152 | 1386 | 227 | | | |
| | | | | | | | | | Caeli | | |
| | | | | | | | | | α | 1129 | 74 |
| | | | | | | | | | β | 1130 | 75 |
| | | | | | | | | | δ | 167 | 72 |
| | | | | | | | | | 26 G. | 1139 | 80 |
| | | | | | | | | | | | |
| | | | | | | | | | Camelopardi | | |
| | | | | | | | | | α | 178 | 78 |
| | | | | | | | | | β | 182 | 80 |
| | | | | | | | | | γ | 138 | 62 |
| | | | | | | | | | ι | 165 | 72 |
| | | | | | | | | | 4 | 175 | 76 |
| | | | | | | | | | 9 | *178 | 78 |
| | | | | | | | | | 10 | *182 | 80 |
| | | | | | | | | | 17 | 203 | 87 |
| | | | | | | | | | 18 | 1150 | 88 |

* These names are alternative names, given only in the list on page XLVI

INDEX TO APPARENT PLACES OF STARS, 1986

In this list the letters "B. D." have, for reasons of space, been omitted; no confusion can, however, be caused

| Name | Cat. No. | Page | Name | Cat. No. | Page | Name | Cat. No. | Page | Name | Cat. No. | Page |
|-----------|----------|------|-----------------------|----------|------|-------------------|----------|------|----------------|----------|------|
| Cephei | | | Ceti | | | Columbae | | | Cygni | | |
| δ | 847 | 348 | σ | 1071 | 40 | 18 G. | 1149 | 87 | α | 777 | 319 |
| ζ | 836 | 343 | τ | 59 | 28 | 35 G. | 1153 | 91 | β | 732 | 302 |
| η | 783 | 320 | υ | 71 | 32 | 74 G. | 1164 | 97 | γ | 765 | 314 |
| θ | 767 | 316 | φ ^x | 30 | 14 | Comae Berenices | | | ε | 780 | 320 |
| ι | 863 | 354 | χ | 1051 | 29 | β | 492 | 202 | ζ | 797 | 327 |
| κ | 759 | 311 | 2 | 905 | 1 | 3 | 1313 | 186 | η | 1521 | 308 |
| ν | 1572 | 336 | 12 | 13 | 7 | 12 | 1318 | 189 | θ | 738 | 303 |
| ρ | 1593 | 348 | 19 | *30 | 14 | 20 | 466 | 191 | ι | 733 | 301 |
| V | 1650 | 422 | 20 | 1022 | 14 | 23 | 1323 | 194 | κ | 726 | 297 |
| 11 | 817 | 335 | 26 | 37 | 17 | 24 | 473 | 194 | ν | 788 | 323 |
| 20 | 830 | 341 | 47 | 1041 | 23 | 24 | 1332 | 197 | ξ | 792 | 325 |
| 24 | 837 | 343 | 48 | 1043 | 23 | 31 | 1333 | 198 | ο ¹ | 757 | 311 |
| 30 | 853 | 351 | 67 | 80 | 36 | 32 | 1339 | 201 | π ¹ | 821 | 337 |
| 31 | 851 | 350 | 80 | 1074 | 41 | 39 | *492 | 202 | ρ | 1568 | 333 |
| 6 H. | 782 | 320 | 94 | 116 | 51 | 43 | | | σ | 1558 | 328 |
| 13 H. | 813 | 334 | 9 G. | 1003 | 2 | | | | υ | 1559 | 329 |
| 32 H. | 1648 | 418 | 49 G. | 14 | 7 | Coronae Austrinae | | | ε | *807 | 332 |
| 36 H. | 1649 | 420 | 79 G. | 1018 | 12 | α | 718 | 296 | 8 | 1510 | 302 |
| 41 H. | 895 | 368 | 98 G. | 1024 | 16 | η ¹ | 1490 | 291 | 15 | 740 | 305 |
| 43 H. | 906 | 372 | 101 G. | 1025 | 16 | θ | 697 | 286 | 28 | 1525 | 310 |
| 44 H. | 41 | 19 | 106 G. | 1029 | 17 | Coronae Borealis | | | 31 | *757 | 311 |
| 47 H. | 105 | 49 | 138 G. | 1037 | 21 | α | 578 | 240 | 33 | 758 | 311 |
| 48 H. | 115 | 53 | 175 G. | 1049 | 27 | β | 572 | 238 | 41 | 1534 | 315 |
| 51 H. | 909 | 386 | 232 G. | 1061 | 36 | ε | 593 | 245 | 42 | 1535 | 315 |
| Br. 256 | 1635 | 374 | 239 G. | 1064 | 37 | θ | 576 | 239 | 59 | 1551 | 324 |
| Br. 402 | 1636 | 378 | 268 G. | 1073 | 41 | κ | 1414 | 244 | 61 | 793 | 326 |
| Br. 2777 | 795 | 326 | Pi. ο ^h 78 | 1011 | 7 | τ | 1423 | 249 | 71 | 807 | 332 |
| Br. 2880 | 1578 | 339 | -18° 41 | 1007 | 5 | Corvi | | | 74 | 811 | 334 |
| Grb. 750 | 908 | 380 | Chamaeleontis | | | β | 471 | 193 | Grb. 2844 | 1506 | 300 |
| Grb. 944 | 1638 | 384 | β | 459 | 188 | γ | 457 | 188 | Grb. 3285 | 1544 | 321 |
| Grb. 3834 | 1594 | 349 | γ | 401 | 164 | δ | 465 | 191 | Grb. 3434 | 1560 | 330 |
| Grb. 4163 | 1627 | 370 | δ ¹ | 411 | 167 | ε | 453 | 186 | +35° 4626 | 1571 | 336 |
| +85° 74 | 1637 | 382 | η | 331 | 136 | 35 G | 1321 | 192 | Delphin | | |
| | | | θ | 318 | 131 | 52 G | 1334 | 198 | α | 774 | 318 |
| | | | π | 438 | 179 | Crateris | | | γ | 1541 | 321 |
| | | | 49 G. | 503 | 208 | α | 1283 | 170 | δ | 778 | 319 |
| | | | Circini | | | β | 421 | 173 | ε | 768 | 317 |
| | | | α | 539 | 225 | γ | 431 | 176 | κ | 772 | 318 |
| | | | β | 561 | 235 | δ | 426 | 175 | 9 G. | 1537 | 317 |
| | | | 10 G. | 530 | 220 | ζ | 1301 | 180 | Doradus | | |
| | | | Columbae | | | η | 1309 | 184 | α | 171 | 73 |
| | | | α | 215 | 91 | θ | 1299 | 179 | β | 212 | 89 |
| | | | β | 223 | 93 | 11 G | 1286 | 172 | γ | 157 | 68 |
| | | | γ | 1160 | 95 | Crucis | | | δ | 1154 | 91 |
| | | | η | 229 | 96 | α | 462 | 190 | ζ | 189 | 81 |
| | | | κ | 238 | 100 | β | 481 | 196 | θ | 196 | 83 |
| | | | ο | 197 | 84 | γ | 468 | 192 | υ | 1166 | 98 |
| | | | 12 G. | 198 | 85 | δ | 455 | 187 | | | |

* These names are alternative names, given only in the list on page XLVI

INDEX TO APPARENT PLACES OF STARS, 1986

505

In this list the letters "B. D." have, for reasons of space, been omitted; no confusion can, however, be caused

| Name | Cat. No. | Page | Name | Cat. No. | Page | Name | Cat. No. | Page | Name | Cat. No. | Page |
|-------------------------|----------|------|----------------|----------|------|--------------------|----------|------|--------------------|----------|------|
| Draconis | | | Equulei | | | Fornacis | | | Groombridge | | |
| α | 521 | 215 | α | 800 | 328 | β | 101 | 45 | 1450 | 320 | 133 |
| β | 653 | 270 | γ | 1555 | 327 | δ | 133 | 59 | 1460 | 323 | 135 |
| γ | 676 | 278 | | | | κ | 83 | 38 | 1501 | 340 | 141 |
| δ | 723 | 296 | | | | λ ¹ | 88 | 40 | 1564 | 363 | 150 |
| ε | 639 | 264 | | | | μ | 78 | 34 | 1586 | 372 | 154 |
| θ | 598 | 247 | | | | ν | 1055 | 33 | 1757 | 424 | 174 |
| ι | 571 | 238 | Eridani | | | τ | 1102 | 58 | 1771 | 429 | 176 |
| κ | 472 | 193 | α | 54 | 25 | 21 G. | 1062 | 36 | 1826 | 1303 | 182 |
| λ | 433 | 178 | β | 188 | 82 | 43 G. | 1078 | 44 | 1830 | 1307 | 183 |
| ν ¹ | 655 | 270 | γ | 149 | 64 | 79 G. | 1090 | 52 | 1850 | 1642 | 398 |
| ν ² | 657 | 271 | δ | 135 | 59 | Lac. 1044 | 1092 | 53 | 1852 | 451 | 185 |
| ξ | 671 | 277 | ε | 127 | 57 | | | | 1956 | 1338 | 201 |
| ο | 707 | 292 | ζ | 1091 | 52 | | | | 2001 | 499 | 206 |
| τ | 729 | 297 | η | 104 | 46 | | | | 2017 | 1353 | 208 |
| υ | 714 | 292 | θ | 106 | 47 | Geminorum | | | 2029 | 505 | 208 |
| χ | 695 | 283 | ι | 1075 | 42 | α | 287 | 118 | 2063 | 1643 | 400 |
| ψ | 670 | 273 | κ | 86 | 39 | β | 295 | 121 | 2125 | 536 | 223 |
| ω | 664 | 273 | λ | 190 | 82 | γ | 251 | 104 | 2152 | 1386 | 227 |
| A | 619 | 254 | μ | 176 | 76 | δ | 279 | 115 | 2164 | 549 | 228 |
| f | *659 | 271 | ν | 169 | 73 | ε | 254 | 105 | 2196 | 1644 | 402 |
| i | *511 | 212 | ξ | 1120 | 70 | ζ | 269 | 111 | 2296 | 595 | 246 |
| 3 | 440 | 180 | ο ¹ | 154 | 67 | θ | 261 | 109 | 2315 | 1645 | 404 |
| 8 | 486 | 199 | τ ² | 102 | 45 | ι | 282 | 117 | 2343 | 614 | 253 |
| 10 | 511 | 212 | τ ³ | 1085 | 48 | κ | 294 | 121 | 2373 | 623 | 255 |
| 27 | 659 | 271 | τ ⁵ | 1099 | 57 | λ | 277 | 115 | 2377 | 627 | 258 |
| 35 | 675 | 276 | τ ⁶ | 140 | 61 | μ | 241 | 101 | 2415 | 636 | 264 |
| 36 | 685 | 281 | υ ² | 170 | 73 | ν | 1173 | 103 | 2444 | 1462 | 271 |
| 50 | 1494 | 290 | φ | 82 | 35 | ξ | 256 | 106 | 2533 | 684 | 281 |
| 73 | 770 | 316 | χ | 68 | 31 | π | 296 | 123 | 2603 | 1483 | 287 |
| 76 | 915 | 416 | ε | *119 | 53 | ρ | 286 | 117 | 2640 | 701 | 287 |
| 1 H | 910 | 392 | g | *143 | 62 | υ | 1196 | 119 | 2655 | 700 | 286 |
| 4 H. | *454 | 187 | y | *130 | 58 | φ | 1207 | 124 | 2671 | 1492 | 290 |
| 9 H. | 395 | 164 | 17 | 1097 | 56 | χ | 305 | 127 | 2844 | 1506 | 300 |
| 12 H. | 587 | 243 | 20 | 1100 | 57 | ω | 1182 | 111 | 2900 | 734 | 299 |
| Br. 1508 | 413 | 169 | 24 | 137 | 59 | ι | 1163 | 97 | 3212 | 1647 | 414 |
| Br. 2412 | 1646 | 412 | 35 | 1111 | 65 | 51 | 1188 | 114 | 3241 | 1538 | 316 |
| Grb. 2125 | 536 | 223 | 43 | 1121 | 71 | 81 | 1200 | 122 | 3285 | 1544 | 321 |
| Grb. 2164 | 549 | 228 | 53 | 172 | 74 | Groombridge | | | 3434 | 1560 | 330 |
| Grb. 2296 | 595 | 246 | 56 | 1131 | 76 | 716 | 129 | 58 | 3834 | 1594 | 349 |
| Grb. 2343 | 614 | 253 | 40 G. | 1080 | 46 | 750 | 908 | 380 | 4163 | 1627 | 370 |
| Grb. 2377 | 627 | 258 | 58 G. | 1086 | 49 | 848 | 173 | 77 | | | |
| Grb. 2640 | 701 | 287 | 63 G. | 1087 | 50 | 866 | 1128 | 75 | Gruis | | |
| Grb. 2655 | 700 | 286 | 82 G. | 119 | 53 | 944 | 1638 | 384 | α | 829 | 342 |
| Grb. 2671 | 1492 | 290 | 110 G. | 130 | 58 | 966 | 205 | 91 | β | 856 | 352 |
| Grb. 2900 | 734 | 299 | 138 G. | 143 | 62 | 1156 | 1172 | 103 | γ | 822 | 339 |
| Grb. 3212 | 1647 | 414 | 145 G. | 1107 | 62 | 1281 | 1190 | 114 | δ ¹ | 846 | 347 |
| Grb. 3241 | 1538 | 316 | 174 G. | 153 | 66 | 1308 | 284 | 118 | ε | 860 | 353 |
| Pi. 16 ^b 140 | 1432 | 256 | 208 G. | 1119 | 69 | 1359 | 1639 | 388 | ζ | 868 | 356 |
| Pi. 19 ^b 156 | 1507 | 300 | 212 G. | 161 | 70 | 1374 | 300 | 126 | ι | 1605 | 358 |
| | | | 258 G. | 1127 | 74 | 1384 | 1209 | 125 | λ | 1581 | 341 |
| | | | 268 G. | 1132 | 76 | 1446 | 322 | 134 | | | |
| | | | -18° 516 | 1084 | 48 | | | | | | |

* These names are alternative names, given only in the list on page XLVI

In this list the letters "B. D." have, for reasons of space, been omitted; no confusion can, however, be caused

| Name | Cat. No. | Page | Name | Cat. No. | Page | Name | Cat. No. | Page | Name | Cat. No. | Page | |
|-------------|----------|------|-----------------------|----------|------|-------------|----------|------|------------|-----------------|------|-----|
| Orionis | | | Pegasi | | | Persei | | | Pictoris | | | |
| α | 224 | 95 | χ | 1004 | 4 | 57 | 1124 | 72 | α | 262 | 108 | |
| β | 194 | 84 | ψ | 1629 | 370 | Br. 658 | 1133 | 77 | γ | 1156 | 93 | |
| γ | 201 | 86 | 1 | 804 | 330 | Grb. 866 | 1128 | 75 | δ | 235 | 98 | |
| δ | 206 | 88 | 2 | 1565 | 332 | +34° 674 | 1098 | 56 | ζ | 199 | 85 | |
| ϵ | 210 | 90 | 5 | 1570 | 334 | | | | η^2 | 187 | 81 | |
| ι | 209 | 90 | 11 | 1574 | 337 | | | | 13 G. | 1143 | 82 | |
| κ | 220 | 92 | 14 | 1575 | 338 | | | | 20 G. | 1152 | 88 | |
| ν | 232 | 98 | 16 | 823 | 338 | | | | 37 G. | 1159 | 94 | |
| σ^1 | 1136 | 78 | 20 | 826 | 340 | Phoenicis | | | | | | |
| π^2 | 1134 | 77 | 27 | 833 | 342 | α | 12 | 6 | | | | |
| π^4 | 179 | 77 | 31 | 843 | 345 | γ | 49 | 23 | | | | |
| π^5 | 180 | 78 | 36 | 1588 | 347 | δ | 1044 | 24 | Piscium | | | |
| τ | 195 | 84 | 38 | 1590 | 348 | ϵ | 3 | 3 | β | 1602 | 357 | |
| φ^1 | 208 | 89 | 45 | 1596 | 352 | η | 23 | 10 | γ | 878 | 360 | |
| 11 | 1140 | 80 | 55 | 1603 | 357 | ι | 1617 | 364 | δ | 28 | 13 | |
| 16 | 1142 | 82 | 59 | 1606 | 358 | λ^1 | 15 | 8 | ϵ | 36 | 17 | |
| 22 | 1147 | 86 | 67 | 1613 | 362 | μ | 1015 | 10 | ζ | 1033 | 20 | |
| 60 | 1161 | 95 | 70 | 885 | 363 | π | 901 | 371 | η | 50 | 24 | |
| 66 | 230 | 97 | 82 | 1625 | 369 | ν | 1031 | 18 | θ | 1614 | 363 | |
| 74 | 1169 | 100 | 2 G. | 1564 | 332 | φ | 1053 | 30 | ι | 892 | 366 | |
| 142 G. | 1155 | 93 | Pi. 21 ^h | 339 | 1579 | 339 | 11 G. | 889 | 365 | κ | 884 | 363 |
| | | | Pi. 22 ^h | 97 | 1586 | 346 | 27 G. | 1626 | 369 | λ | 1620 | 366 |
| | | | Pi. 22 ^h | 120 | 1589 | 348 | 58 G. | 1014 | 8 | ν | 56 | 26 |
| | | | Pi. 23 ^h | 235 | 1628 | 370 | 70 G. | 1017 | 11 | ξ | 65 | 30 |
| | | | +15° 483 ^o | 1615 | 363 | 80 G. | 1027 | 16 | \omicron | 60 | 28 | |
| | | | | | | 135 G. | 1060 | 35 | π | 1046 | 25 | |
| Pavonis | | | Persei | | | Piazzii | | | τ | 43 | 19 | |
| α | 764 | 314 | α | 120 | 54 | σ^b | 38 | 1006 | 4 | υ | 45 | 20 |
| β | 775 | 319 | β | 111 | 50 | σ | 78 | 1011 | 7 | χ | 1032 | 19 |
| γ | 805 | 331 | γ | 108 | 49 | 3 | 27 | 1096 | 54 | ω | 902 | 371 |
| δ | 754 | 310 | δ | 131 | 59 | 3 | 187 | 1106 | 62 | 20 | 1623 | 367 |
| ϵ | 748 | 309 | ϵ | 147 | 63 | 4 | 148 | 1126 | 74 | 27 | 900 | 370 |
| ζ | 698 | 288 | ζ | 144 | 63 | 7 | 308 | 1214 | 128 | 30 | 1630 | 1 |
| η | 661 | 274 | η | 99 | 45 | 8 | 245 | 1237 | 142 | 33 | 1002 | 2 |
| λ | 704 | 291 | θ | 93 | 43 | 9 | 229 | 1259 | 155 | 41 | 1008 | 5 |
| ξ | 686 | 284 | ι | 112 | 50 | 10 | 135 | 1276 | 166 | 44 | 1010 | 6 |
| \omicron | 1554 | 327 | λ | 1113 | 66 | 11 | 63 | 1295 | 177 | 48 | 1012 | 7 |
| 75 G. | 1518 | 307 | μ | 1117 | 68 | 11 | 202 | 1310 | 184 | 64 | 1020 | 13 |
| | | | ν | 134 | 60 | 12 | 122 | 1322 | 193 | 68 | 1023 | 15 |
| | | | ξ | 148 | 64 | 14 | 221 | 551 | 229 | 72 | 1028 | 17 |
| | | | θ | 109 | 50 | 14 | 227 | 1392 | 229 | 89 | 1034 | 20 |
| | | | σ | 124 | 55 | 15 | 36 | 1400 | 235 | 94 | 1039 | 22 |
| | | | τ | 103 | 46 | 15 | 153 | 1412 | 242 | 96 G. | 1019 | 12 |
| | | | υ | *52 | 25 | 16 | 140 | 1432 | 256 | Piscis Austrini | | |
| | | | φ | 57 | 27 | 16 | 307 | 1448 | 263 | α | 867 | 356 |
| | | | c | *152 | 66 | 17 | 68 | 1454 | 266 | β | 1592 | 349 |
| | | | 2 | 1052 | 29 | 18 | 318 | 1498 | 295 | ϵ | 854 | 351 |
| | | | 4 | 1054 | 32 | 19 | 156 | 1507 | 300 | ι | 814 | 336 |
| | | | 6 | *77 | 34 | 21 | 339 | 1579 | 339 | λ | 838 | 344 |
| α | 871 | 357 | 14 | 1077 | 43 | 22 | 97 | 1586 | 346 | μ | 832 | 342 |
| β | 870 | 357 | 24 | 1082 | 47 | 22 | 120 | 1589 | 348 | π | 1601 | 356 |
| γ | 7 | 4 | 48 | 152 | 66 | 23 | 194 | 1624 | 368 | 4 | *801 | 329 |
| ϵ | 815 | 335 | 54 | 158 | 69 | 23 | 235 | 1628 | 370 | 6 | 1566 | 333 |
| ζ | 855 | 351 | | | | | | | | | | |
| η | 857 | 352 | | | | | | | | | | |
| θ | 834 | 343 | | | | | | | | | | |
| ι | 831 | 342 | | | | | | | | | | |
| λ | 859 | 353 | | | | | | | | | | |
| μ | 862 | 354 | | | | | | | | | | |
| π | 835 | 343 | | | | | | | | | | |
| τ | 880 | 361 | | | | | | | | | | |
| υ | 881 | 362 | | | | | | | | | | |
| φ | 898 | 369 | | | | | | | | | | |

* These names are alternative names, given only in the list on page XLVI

UNIVERSITY
LIBRARY
NOTTINGHAM

