1970A&AS....2..339V

1970, *Astr. Astrophys. Suppl.*, **2**, 339-448.

THE PALOMAR-LEIDEN SURVEY OF FAINT MINOR PLANETS

C. J. VAN HOUTEN and I. VAN HOUTEN-GROENEVELD
Leiden Observatory
P. HERGET
Cincinnati Observatory
and
T. GEHRELS
Lunar and Planetary Laboratory, Tucson

Received February 20, 1970

A study of faint minor planets ($m < 20$) was undertaken to extend the McDonald Asteroid Survey beyond $m = 16.0$. Plates were taken with the 48-inch Schmidt camera of the Palomar Observatory; they cover a field of about $12^\circ \times 18^\circ$ on the sky, centred on the vernal equinox. More than 2000 asteroids were discovered, of which 1800 yielded orbits which were sufficiently accurate for statistical treatment.

Extension of the log number versus mean opposition magnitude relation to $m_0 = 20.6$ showed the increase to be linear, of slope 0.39, except for the interval $13.0 < m_0 < 17.5$, where the values of $\log N(m_0)$ are lower than those given by the linear relation. Contrary to a result from the McDonald Survey, no clear-cut differences were found in the distribution of absolute magnitudes g in different parts of the asteroid ring beyond $g = 12.0$. Moreover, the discontinuity in the $\log N(g)$ distribution appears in the present material at the same value of g for three different distance groups, again in contradiction to the McDonald Survey. The space density of asteroids at 0.28 A.U. from the plane of the ecliptic is found to be half that in the plane, at 0.8 A.U. it is very small. The Kirkwood gaps in the distribution function of semi-major axes are similar for bright and faint asteroids, and no difference in the distribution functions of eccentricities and inclinations was noticed. The phase function of the faint asteroids is shown to be different from that for the bright ones, the linear part being steeper; the opposition effect, however, is the same for bright and faint objects.

Many known groupings are represented among the fainter minor planets, *e. g.* Trojans, members of the Hilda and Hungaria groups and of the Hirayama families (except the Phocaea family). New families were also found, similar to the Hirayama families. Most of the loose groups introduced by Brouwer could not be recognized in this survey, and those which were found again had the character of small families or were part of larger ones. Apparently Brouwer's criterion for membership of these groups, the approximate constancy of the sum of the longitudes of proper node and proper perihelion, is irrelevant. The material was also searched for jet streams, as introduced by Alfvén. One may have been found, within a family for which $i > 4^\circ$; other families could not be used because of the declination cut-off of the material. Of the objects with first-class orbits 42 per cent are members of recognized families and groups. There are indications that some families occur in pairs.

1. INTRODUCTION

The statistics of the brighter minor planets have been discussed by Kuiper *et al.* (1958) from material they obtained at the McDonald Observatory between 1950 and 1952. The limiting apparent magnitude of that investigation, the McDonald Asteroid Survey (abbreviated MDS in this paper), is approximately 16.0. One of the results was that differences in the absolute magnitude-frequency relation appear to exist between the inner and outer parts of the asteroid ring. This was indicated by the statistics of the few known objects fainter than the limit of the MDS, combined with an uncertain extrapolation of the magnitude-frequency relation derived from the survey.

© European Southern Observatory • Provided by the NASA Astrophysics Data System

1970A&AS....2..339V

It was felt important by the authors of the MDS to check their results by a new investigation reaching fainter magnitudes. This investigation is dealt with in the present paper. A program involving the same area as the MDS would have been prohibitive; therefore only a small part of the ecliptic belt was studied and the connection with the MDS was made by multiplying the numbers of asteroids found by the ratio of the areas covered by the two investigations, taking into account the decrease of the number of asteroids with increasing distance from the ecliptic. The new program was initiated by G. P. Kuiper in consultation with the Hale Observatory and the authors. Because of the considerable amount of work involved it was decided to set up the survey as a joint program of three institutes: the Lunar and Planetary Laboratory at Tucson, the Cincinnati Observatory, and the Leiden Observatory. The first institute would be responsible for taking the plates, the second for the computation of orbital elements, and the last for all other parts of the investigation. Following this plan, T. Gehrels took 130 plates with the 48-inch Schmidt camera of the Palomar Observatory in 1960; the size of these plates is 35.6 × 35.6 cm and their limiting magnitude is about 20.5. They were sent to Leiden Observatory for further treatment by C. J. van Houten and I. van Houten-Groeneveld.

2. THE PROGRAM

The choice of the region to be investigated was governed by the consideration that the number of background stars should be as small as possible. Accordingly, the fields should be taken near the point of maximum distance between galactic equator and ecliptic. This condition is fulfilled near the two equinoxes; the vernal equinox was the one actually chosen.

One of the aims of the program was the determination of the orbital elements of the objects which were found, and the number of plates and spacings of exposures were adapted to that purpose. A time difference of one month between first and last exposure was judged to be sufficient to obtain reliable elements. To facilitate the identification of the same object on different plates we had planned to take two plate pairs with an interval of two days, and a third pair a week afterwards, the same to be repeated the next dark of the moon period. In order to compensate for the asteroid motion the fields were shifted by 6° in the second observing period. In this manner six positions would have been available for most of the objects found. This scheme failed because of lack of time; during each dark of the moon period the telescope had to be shared with a second observer, so that only one week per dark of the moon period was available for our program. M. L. Humason kindly exchanged one night of his observing run with one of ours, so that in the second observing period the necessary spacing could be attained. During the first observing period this was impossible, however. Many of the serious difficulties we had in identification and in obtaining reliable orbital elements were due to this cause.

The size of the region that we wanted to observe was 36° × 18°, but this had to be diminished to 18° × 12° for the reasons given above. The region is divided into six plate fields; the central stars are given in table 1.

Table 1. Plate centres

Field	Central star	Field	Central star
71	BD − 0°4547	91	BD + 6° 49
72	BD − 6°6248	92	BD + 0° 54
81	BD + 2°4752	101	BD + 8° 116
82	BD − 3°5752	102	BD + 2° 118

© European Southern Observatory • Provided by the NASA Astrophysics Data System

1970A&AS....2..339V

The plates were taken on September 23, 24, 25, 26, 27, 28, and on October 16, 21, 23, 24, 25, 1960. Use was made of Kodak 103a-O plates, exposed through a WG2 filter in order to match Baum's P_0 system. They were taken in pairs, with a time difference of about 30 minutes; in September the exposure time was 10 minutes, in October 12 minutes. Three pairs of plates were taken of each field in each month. In addition, one pair per field was taken each month on Kodak 103a-D emulsion, using a yellow Plexiglass filter to match Baum's V magnitude; the exposure times were 30 or 40 minutes. All plates were guided for mean asteroid motion. The image quality on the 103a-D plates was quite different in different parts of the same plate, indicating improper focus over large parts of the surface. Accordingly, these plates were not used for photometry, but they furnished a very welcome fourth position each month.

In addition to the six asteroid fields, plates were taken of Selected Area 68, for calibration purposes. W. A. Baum kindly sent us his unpublished measurements of magnitudes of faint stars in this Selected Area, which enabled us to extend the photometric sequence down to the plate limit. Finally, six plates were taken for the determination of trail corrections. These proved negligible for objects fainter than $m = 19$; trail corrections have been applied for all other objects. Correction for photometric field effects, of the order of $0^m.01$ - $0^m.02$ according to information furnished by L. Plaut, were neglected.

3. DISCOVERY AND IDENTIFICATION

The blinking of the plates was done with the Zeiss blink-comparator of the Heidelberg Observatory, adapted for our plates by the workshop of the observatory. In this way 97 per cent of the plate area could be covered. The blinking was done by I. van Houten-Groeneveld and C. J. van Houten, who had a roughly equal share in it. Former experience (Kuiper *et al.* 1958) showed that the discovery probability was about equal for the two of them, and this was confirmed in the present survey. In accordance with expectations, the number of minor planets found was very large; on individual plates 200-400 asteroids were detected. In order to facilitate identifications of the same object on different plates, a visual estimate was made of magnitude and displacement of each object, in both distance and position angle. From these data provisional identifications were made, and afterwards objects that were missed on one plate and found on a second one were searched for individually, using the displacement vector determined earlier. Inaccuracy of this value prevented finding of the overlooked object in some cases; other contributing factors may have been variations in the plate limit from night to night, variability of the brightness of the object, and coincidences with stellar images. The identifications within the same month (September or October) proved not to be difficult as a rule, but considerable difficulties were encountered in connecting the two months. This was done by simply extrapolating the September arc, starting with the brightest objects. Here it was mostly clear at once which arcs should go together, and these successful identifications automatically yielded an impression of the form of the arc in its unobserved part, which could be used for identification of fainter objects. Nevertheless, in many cases wrong identifications were made, or the September and October arcs of the same object were regarded as belonging to different objects. In order to solve this difficulty, P. Herget computed orbital elements and search ephemerides based on the September and October arc separately. The September arc being, in effect, too short for reliable elements, use of these ephemerides turned out not to be easy in many cases. Nevertheless, practically all incorrect identifications could be rectified in that way and a number of additional identifications could be made, including objects for which only one or two October positions were found. In order to increase the number of such identifications, which were not possible when the orbital elements based on the September arc were poor or non-existent, ephemerides were computed by P. Herget on the basis of so-called "perihelion orbits" (Väisälä 1939). In this way some additional identifications could be made.

© European Southern Observatory • Provided by the NASA Astrophysics Data System

1970A&AS....2..339V

In 127 cases the October positions of the search ephemerides were outside the field; in 583 cases nothing could be found on these positions, presumably because of the object being too faint or the orbital elements being incorrect. But in some cases the object may have been simply overlooked during blinking, and should, therefore, be recoverable. Accordingly, seven plate pairs were searched again at the predicted positions of the search ephemerides, and 62 additional images were found. Lack of time prevented a more exhaustive search along these lines.

In figure 1 we give part of field 81, on the scale of the Palomar Schmidt plates. The stars occurring in the BD catalogue are denoted by asterisks and the objects found on the four September plates by four different symbols. Positions belonging to the same object are connected by a solid line. All other objects were unidentified. The asteroids are indicated by the number of their first observation.

Figure 2 gives the same field as figure 1, but now the corresponding October field is added. Here only those objects are indicated which were found both in September and in October; the separate September and October arcs are given by a solid line. The number given at the first observation of each object is the Palomar-Leiden (PL) number of tables 7 and 8.

4. POSITIONS

The measurement of rectangular coordinates of the objects was performed at the Kapteyn Astronomical Laboratory in Groningen. A frame available there was adapted for measurements of these coordinates by adding two metal scales with millimeter division and two screws for interpolating purposes. This allowed readings in units of 0.01 mm. Only one plate of each blink pair was measured; all measurements were made by C. J. van Houten. Also measured were all the stars from the Yale catalogue that could be found on the plates. Altogether about 14000 asteroid positions and 7500 positions of standard stars were measured. The results were transmitted to the Cincinnati Observatory on punched cards, and the plate reductions were computed on the IBM 1620 at the Computing Center of the University of Cincinnati. The ideal rectangular plate coordinates were defined in terms of the measures by:

$$
\begin{aligned}
X &= a + b\,x + c\,y + d\,x\,y + e\,x^2 + f\,x\,(x^2 + y^2) \\
Y &= a' + b'x + c'y + d'x\,y + e'y^2 + f'y\,(x^2 + y^2) \\
DX &= \cos\delta \sin\Delta\alpha \\
DY &= \sin\Delta\delta + \sin\delta_0 \cos\delta\,(1 - \cos\Delta\alpha) \\
D &= \cos\Delta\delta - \cos\delta_0 \cos\delta\,(1 - \cos\Delta\alpha).
\end{aligned}
$$

The positions were determined only in terms of the unit vector whose components are $\cos\delta\cos\alpha$, $\cos\delta\sin\alpha$, and $\sin\delta$; since these would be used directly in the orbit computation. Equatorial coordinates are available upon request at the Cincinnati Observatory.

5. ORBITAL ELEMENTS

The orbits were computed on the Naval Ordnance Research Calculator (NORC) at the Naval Weapons Laboratory, Dahlgren, Virginia. The method is described by Herget (1965). All the known observations were included in each solution, and the running time averaged about 900 orbits per hour. This included the determination of each separate residual, as well as the mean-square residual for each orbit. Since the method forces zero residuals upon the first and last observation, the residuals in $\cos\delta\,\Delta\alpha$ and $\Delta\delta$ of each orbit were separately represented by a linear function in time by a least-squares solution in all cases of four or more

© European Southern Observatory • Provided by the NASA Astrophysics Data System

1970A&AS....2..339V

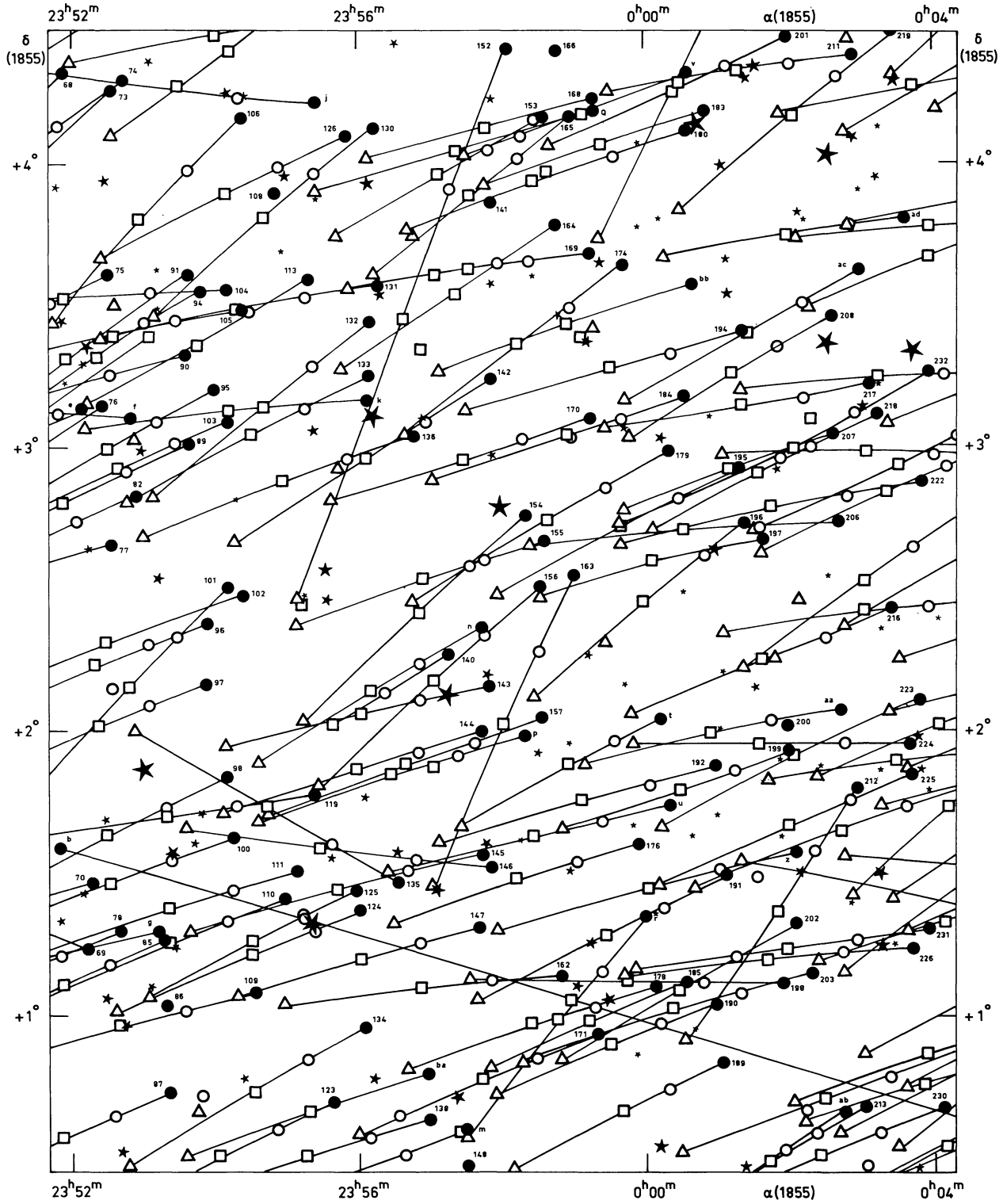

Figure 1. Part of field 81, with objects found on the September plates and stars from the BD catalogue. Positions belonging to the same object are connected by a solid line.

© European Southern Observatory • Provided by the NASA Astrophysics Data System

1970A&AS....2..339V

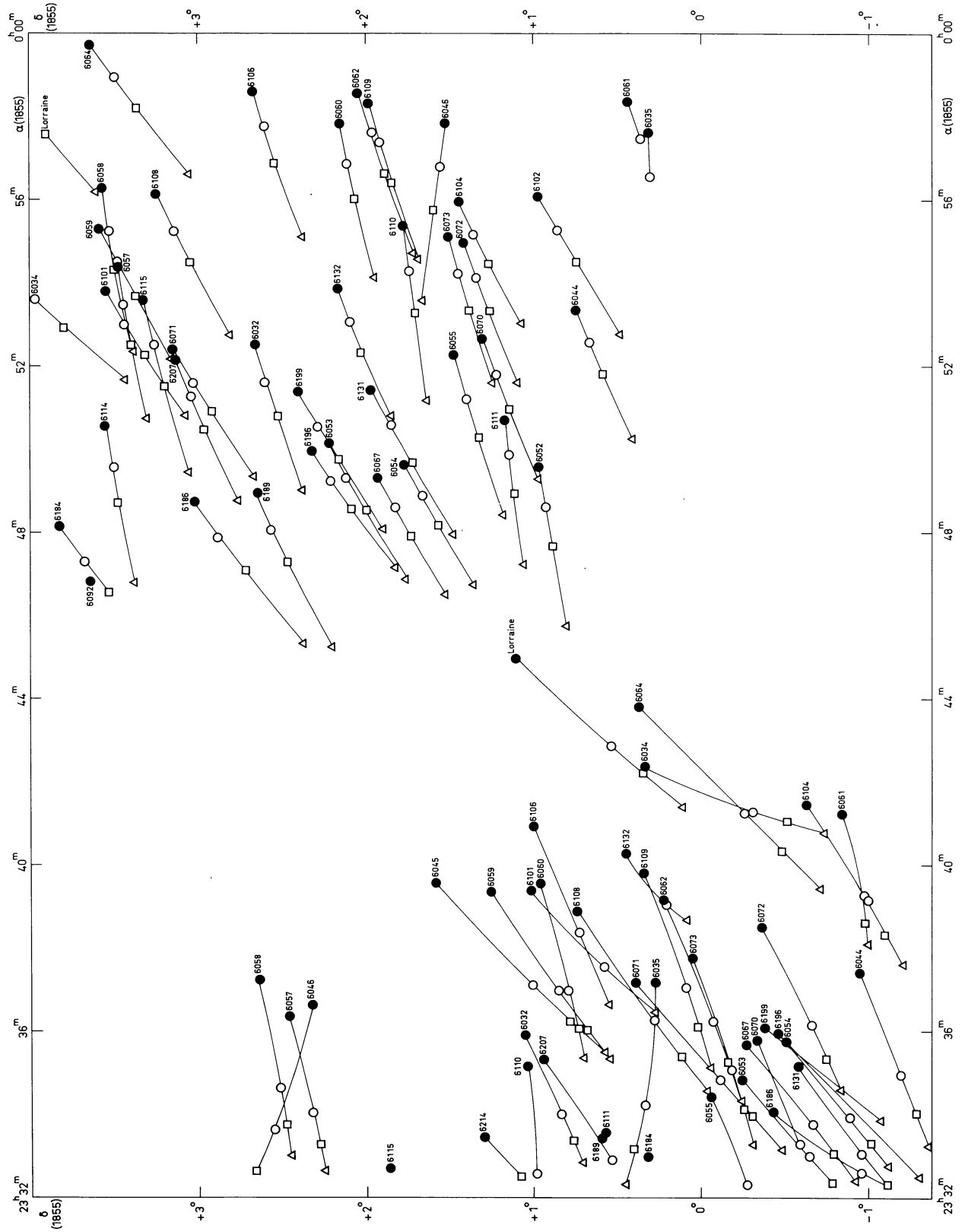

Figure 2. Part of field 81 and the corresponding October field. Only objects found both in September and October are plotted.

© European Southern Observatory • Provided by the NASA Astrophysics Data System

1970A&AS....2..339V

observations. The value of this function at the time of the first and last observation was then applied to these observations, respectively, to produce fictitious first and last observations, which were exactly fitted by the final computation. The velocity vector was also derived at the time of the first observation, and the ecliptic elements were derived from the position and velocity vectors by the usual formulae. The automatic computations required certain precautionary tests in the computer programs, for example only five iterations were permitted, and the orbits had to be rejected and the computations terminated if the geocentric distances were negative or the semi-major axis was less than 1.1 A.U. If the given observations are dynamically inconsistent for any reason, this method of solution will tend to give $\rho = 0$, *i. e.* only the Earth (as represented by the solar coordinates) can satisfy the dynamical conditions.

6. MAGNITUDES

The magnitudes of the objects found were measured with the Sartorius iris-photometer of the Leiden Observatory by I. van Houten-Groeneveld, H. J. Krijnen, C. J. van Houten and D. Latshaw (in the order of decreasing share in the measurements). The plates were directly compared with S.A. 68, without recourse to secondary standard sequences on the plates themselves.

The magnitudes derived were corrected for differential extinction (average correction $0^m.04$) and trailing effects (corrections for a trail of 100 micron are shown in figure 3). They were calibrated on the International Photographic System with Baum's P_0 values in S.A. 68 (see Gehrels 1967, 1970). A transformation to B of the UBV system has been carried out for 1735 numbered asteroids in the 1970 reference.

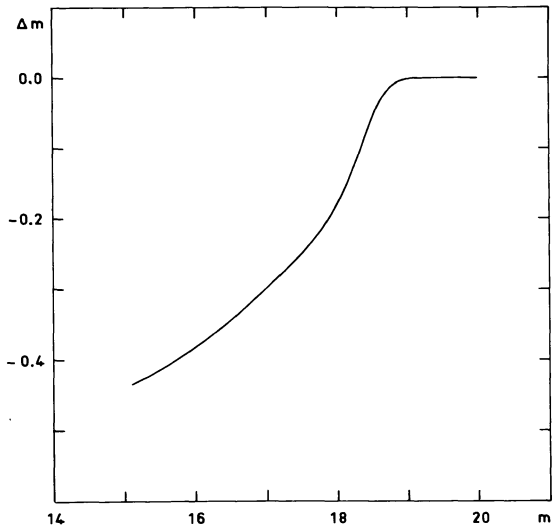

Figure 3. Trail correction, as a function of magnitude, for a trail of 100 micron.

7. ACCURACY OF POSITIONS

On the basis of residuals from 491 well-determined orbits, the mean error of the derived positions was found to be 0″.6 (corresponding to 0.009 mm on the plates). This is only an internal error; the real accuracy will be somewhat worse. The rounding-off error can be set at 0.0045 mm, so that this did not influence the accuracy noticeably. The measuring error turned out to be slightly magnitude-dependent, in the sense that the faintest objects have the largest measuring errors; the mean error at $m = 19.5$ equals 0″.7. In deriving these

© European Southern Observatory • Provided by the NASA Astrophysics Data System

1970A&AS....2..339V

results the objects which had positions in field overlaps were not used, because they showed residuals which were larger than average, and accordingly it could be assumed that the positions measured near the edges of the plates were of less-than-average precision. This precision was determined by taking the difference of the residuals of those positions which were measured on different plates taken on the same day; these automatically are positions near the plate edges, because of the small overlaps of the fields in this program. This difference can be ascribed to a combination of measuring errors and errors due to inaccuracies in the reference system used, because the time difference between the two exposures is so small that errors in the orbital elements will not influence the *difference*, although they will influence the individual residuals. From this comparison a mean error of $1''.3$ was found for the positions within 3 cm of the edges of the plates.

8. ACCURACY OF THE MAGNITUDES

The accuracy of the magnitudes was derived from the deviations from the average value of the individual magnitude determinations. The observations in September and October were treated separately, The resulting mean error is $0^m.19$, but it depends slightly on magnitude. When corrections were applied by taking into account brightness variations caused by varying distances to Earth and Sun, and by phase changes, the accuracy did not improve. This is probably caused by small errors in the characteristic curves used for reducing the plates. The best results were obtained in the magnitude range 18-19 (about one magnitude above the plate limit), where a mean error of $0^m.16$ was found. The mean error of the average of six September (or October) magnitudes is accordingly $0^m.08$, which is sufficiently precise for our purposes. Part of this error must have been caused by variations of the brightness of the asteroid itself, due to its rotation. If we assume that the average amplitude of an asteroidal light-curve is $0^m.2$, the average deviation of the magnitude due to the rotation of the object will be $0^m.05$, for one measurement, and accordingly this hardly influences the accuracy of the present set of magnitudes.

The mean error of the magnitudes of objects near the edges of the plates was determined from the field overlaps in essentially the same manner as for the positional accuracy in these regions. The resulting accuracy is $0^m.26$, which means that there is again a loss of accuracy near the plate edges.

9. DERIVATION OF ABSOLUTE MAGNITUDES

Absolute magnitudes g are defined by $g = m - 5 \log r\rho - F(\alpha)$. Here r and ρ are the distances of the object to Sun and Earth, respectively, expressed in astronomical units, $F(\alpha)$ is the phase function, and α the phase angle in degrees. The quantities r, ρ and α were computed from the derived orbital elements; for the phase function the approximate value $0.03\ \alpha$ was used and the quantity $5 \log r\rho + 0.03\ \alpha$ was calculated for each observation. All these computations were performed by P. Herget, with the NORC computer.

It was decided to make an independent determination of the phase function from the present photometric data instead of simply using the function determined before (Gehrels 1967), thus insuring against the possibility that the phase functions of bright and faint asteroids are different. The phase function may be divided into a linear part and an opposition effect. Since the present photometry is not accurate enough to determine the opposition effect accurately, it was assumed that its form is, apart from a scale factor, the same as found before (table I of Gehrels 1967). If we denote the previously found opposition effect by $T(\alpha)$, we can write the phase function of the present material as

$$F(\alpha) = a\ T(\alpha) + b\ \alpha + c,$$

© European Southern Observatory • Provided by the NASA Astrophysics Data System

1970A&AS....2..339V

a and b being constants to be determined from our photometry. The constant c was chosen such that, for $\alpha = 4°$, $F(\alpha) = 0$, in accordance with the previous definition of the phase function. The constants a and b were found by a least-squares solution, using September and October magnitudes of the same object, corrected for variations in distance to Earth and Sun. Photometric inaccuracies, including rotational light-variation, are treated as random errors. We used 587 first-class orbits (see section 10) of objects which were brighter than $19^m.0$ in September, in order to avoid photometry near the plate limit for the October magnitudes. The resulting phase function is

$$F(\alpha) = \underset{\pm 0.12}{1.03\ T(\alpha)} + \underset{\pm 0.002}{0.039\ |\alpha|} - 0.05. \quad \text{(m.e.)}$$

The opposition effect is thus equal to that found for the bright asteroids, within the errors of measurement, but the linear part is considerably steeper ($b = 0.023$ for the bright asteroids). This may be explained by a less compact surface structure, as follows from Hapke's (1963) reflection law. The absolute magnitudes in tables 7-10 were reduced with a preliminary form for the phase function, and are, on the average, $0^m.03$ fainter than if they had been reduced with the above phase function.

Fifteen asteroids with reliable orbital elements and not too bright for accurate photometry also had absolute magnitudes determined in the MDS (MDS table A). Table 2 compares the absolute magnitudes derived from the present material (PLS) with the average of these McDonald values. The differences PLS minus MDS are given in the last column of the table. Included is asteroid 1630, which is listed in table A of the MDS as 1952 DA. The average difference without regard to sign is $0^m.14$. The systematic difference $+ 0^m.03 \pm 0^m.05$ (m.e.) is not significant.

Table 2. Comparison of absolute magnitudes derived from the Palomar-Leiden and McDonald surveys

Asteroid	g		Δg
	PLS	MDS	
212	9.10	9.18	− 0.08
296	13.83	13.74	+ 0.09
355	11.41	11.54	− 0.13
449	10.85	11.05	− 0.20
673	11.33	11.31	+ 0.02
720	10.62	10.86	− 0.24
841	13.98	13.81	+ 0.17
1029	12.19	11.96	+ 0.23
1045	14.17	14.15	+ 0.02
1114	11.01	10.81	+ 0.20
1363	12.80	12.64	+ 0.16
1368	12.18	12.03	+ 0.15
1572	11.06	11.13	− 0.07
1590	13.18	12.92	+ 0.26
1630	12.50	12.60	− 0.10

The accuracy of the combined apparent magnitudes in the present investigation is given as $0^m.08$ in section 8, but this is not necessarily the accuracy of our absolute magnitudes, since errors in trail corrections and in the adopted phase function may give additional contributions. If we adopt a value of $0^m.12$ for the

© European Southern Observatory • Provided by the NASA Astrophysics Data System

1970A&AS....2..339V

mean error of our absolute magnitudes, this quantity for the McDonald absolute magnitudes is $0^m.13$. Kuiper *et al.* (1958) give for a single entry in their table A the value of $0^m.14$ (p.e.) which corresponds to a mean error of $0^m.21$. The 15 MDS values in table 2 refer to 31 entries, so that the mean error of one of these values would be expected to be equal to $0^m.15$. This is sufficiently close to the mean error of $0^m.13$ found above to say that the MDS values have the expected accuracy.

A comparison of our absolute magnitudes of numbered asteroids with the values derived by Gehrels (1968) yield much larger differences; the average difference without regard to sign is $0^m.33$. This may indicate that the values in MDS table A are more reliable than those of Gehrels (1968), but on account of the smallness of the comparison material (19 objects) this possibility should be checked by an independent investigation involving a much larger material.

Summarizing we can say that, if a systematic difference exists between the MDS absolute magnitudes and those of the present survey, it is likely to be small, and since the accuracy of our magnitudes, derived from first-class orbits, seems to be satisfactory, there is no objection against a combination of the two surveys.

10. THE MAIN TABLES

The results of the orbit computations are collected in tables 7 and 8. The objects are listed in the order of their running number, which in the case of the numbers below 2000 is the same as the asteroid number, while all other objects were numbered according to the fields in which they were found. The numbers with 2, 4 or 6 as the first digit refer to objects having at least three positions on the September plates, while the numbers beginning with 5, 7 or 9 refer to objects having at least three positions on the October plates and less than three on the September ones. The mean opposition magnitudes are given in the column m_0 and the absolute magnitudes in the column g. The orbital elements are denoted by the usual symbols, except for the mean daily motion which is indicated by n. All elements have been reduced to the same epoch: JDE 2437200.5. The number of positions from which the orbit was determined is given under N, the column headed σ^2 contains the mean-square value of the residuals of the measured positions, compared with those predicted from the computed orbit, and, finally, the column headed Q gives the quality class to which the orbit has to be assigned. The meaning of the figures in column Q is the following:

1: At least two positions in each observing month (September and October 1960).
2: Observations during both months, but one of the months contains only one observation.
3: Observations during one month only, but time interval between first and last observation larger than seven days (usually nine days).
4: Observations during one month only, but time interval between first and last observation smaller than seven days (usually four days).

No values for g and m_0 are given for objects which were too bright for photometry with the iris photometer, and for a few objects with a very long trail.

The total number of objects in each quality class is:

Q	N
1	981
2	141
3	144
4	534
total	1800

© European Southern Observatory • Provided by the NASA Astrophysics Data System

1970A&AS....2..339V

The rejected orbits ($Q = 0$) are listed in table 8. It contains the 287 objects for which at least three positions were measured, but for which no orbit could be obtained or for which the computed orbit violated the selection rules given in section 11. Of the fourth-class objects 35 were not used in the statistics, because they have apparent magnitudes fainter than the 20.0 limit set for the statistical discussion.

11. ACCURACY OF ORBIT COMPUTATION

The accuracy of a computed orbit turned out to be very much dependent on the time difference between first and last observation, and to a smaller extent on the number of observations or the size of the residuals. To determine the accuracy the material has, therefore, been divided into four groups, corresponding to the quality classes given in table 7.

The accuracy of the first-class orbits was determined by comparing orbital elements of the objects already known in this class with the elements published in the "Minor Planet Ephemerides" (Institute for Theoretical Astronomy, Leningrad, 1969). In total 19 objects were available for this comparison, viz. 212, 296, 319, 355, 356, 641, 673, 720, 841, 1029, 1114, 1363, 1502, 1519, 1572, 1590, 1630, 1652, and 1694. The average differences between the two sets of elements, ephemeris minus survey, are:

$\overline{\lvert\Delta a\rvert} = 0.003$ A.U.	$\overline{\Delta a} = +0.0006 \pm 0.0009$ (m.e.)
$\overline{\lvert\Delta e\rvert} = 0.0026$	$\overline{\Delta e} = +0.0008 \pm 0.0008$ (m.e.)
$\overline{\lvert\Delta i\rvert} = 0\overset{\circ}{.}018$	$\overline{\Delta i} = +0\overset{\circ}{.}011 \pm 0\overset{\circ}{.}006$ (m.e.)
$\overline{\lvert\Delta\Omega\rvert} = 0\overset{\circ}{.}26$	$\overline{\Delta\Omega} = +0\overset{\circ}{.}26 \pm 0\overset{\circ}{.}05$ (m.e.)
$\overline{\lvert\Delta\omega\rvert} = 2\overset{\circ}{.}6$	$\overline{\Delta\omega} = -1\overset{\circ}{.}2 \pm 0\overset{\circ}{.}8$ (m.e.).

Only the difference in the nodes is clearly significant, it amounts to five times its mean error.

No accuracy is given here for second-class orbits, because no comparison material was available. When they were used in the statistics their accuracy was taken equal to that of the first-class orbits.

For the determination of the accuracy of the third- and fourth-class orbits no use could be made of the orbital elements of already known objects, their number in the two groups being too small. But in comparing the list of elements of first-class orbits with those of fourth-class orbits it was seen that there were relatively many more fourth-class orbits with large eccentricities (12 per cent with $e > 0.3$) or small semi-major axes (6 per cent with $a < 2.0$ A.U.) than occur in the sample of first-class ones. Clearly there is some systematic error in the elements of the fourth-class orbits, caused by the shortness of the September arc and the limited accuracy. To allow for this the following procedure was adopted: those third- and fourth-class orbits that were almost certainly impossible were rejected; for the remaining material the systematic errors were determined and used to correct the statistics. Inspection of the first-class orbits showed that only 1 per cent of them had orbital eccentricities exceeding 0.3, and, apart from the members of the Hungaria group (to be discussed in section 19), none were found with $a < 2.0$ A.U.

The fraction of numbered asteroids having eccentricities larger than 0.3 is 3.5 per cent of the total, but most of them are associated with high-inclination objects for which our survey is very incomplete. A rough estimate shows that under the conditions of the present survey, the fraction of numbered asteroids with $e > 0.3$ would be 1 per cent as well. The probability of finding such objects in September only is 0.2 times the probability of finding them both in September and October, if only the declination cut-off is taken into account (see section 17). Accordingly, 10 per cent of the large eccentricities found for fourth-class objects are real.

Only 6 (or 0.3 per cent) of the numbered asteroids have semi-major axes smaller than 2.0 A.U., if the

© European Southern Observatory • Provided by the NASA Astrophysics Data System

1970A&AS....2..339V

Hungaria group is omitted. Such objects should normally be fast-moving asteroids, but practically all of the fourth-class objects with $a < 2.0$ A.U. show motions characteristic of the majority of the asteroids. The conclusion seems to be justified that their orbits, with very few exceptions, are spurious.

Accordingly, all orbits with $e > 0.3$ were rejected from the sample of third- and fourth-class orbits (thereby automatically excluding the 1.2 per cent for which the orbital elements are correct). Moreover, from the same material all orbits with $a < 2.0$ A.U. were rejected, excepting the fast-moving objects.

The accuracy of the remaining material of third- and fourth-class orbits was determined in the following way: from all first-class orbits two extra sets of orbital elements were computed, based on the September and October positions separately, and these were compared with the orbital elements based on the complete arc. The same selection rules as were applied to the third- and fourth-class objects were also applied to these two sets of elements. Accordingly, the accuracies derived in this way should equal those of the third- and fourth-class orbits in table 7. The average differences between the elements of first- and third-class orbits are (in the sense 1st minus 3rd class):

$\overline{\lvert\Delta a\rvert} = 0.032$ A.U.	$\overline{\Delta a} = -0.013 \pm 0.0017$ (m.e.)
$\overline{\lvert\Delta e\rvert} = 0.031$	$\overline{\Delta e} = -0.013 \pm 0.0016$ (m.e.)
$\overline{\lvert\Delta i\rvert} = 0\overset{\circ}{.}17$	$\overline{\Delta i} = -0\overset{\circ}{.}004 \pm 0\overset{\circ}{.}009$ (m.e.)
$\overline{\lvert\Delta\Omega\rvert} = 0\overset{\circ}{.}7$	$\overline{\Delta\Omega} = +0\overset{\circ}{.}04 \pm 0\overset{\circ}{.}04$ (m.e.)
$\overline{\lvert\Delta\omega\rvert} = 19\overset{\circ}{.}2$	$\overline{\Delta\omega} = +1\overset{\circ}{.}1 \pm 1\overset{\circ}{.}0$ (m.e.).

for first- and fourth-class orbits (1st minus 4th) they are:

$\overline{\lvert\Delta a\rvert} = 0.071$ A.U.	$\overline{\Delta a} = +0.038 \pm 0.0033$ (m.e.)
$\overline{\lvert\Delta e\rvert} = 0.035$	$\overline{\Delta e} = -0.018 \pm 0.0016$ (m.e.)
$\overline{\lvert\Delta i\rvert} = 0\overset{\circ}{.}76$	$\overline{\Delta i} = +0\overset{\circ}{.}31 \pm 0\overset{\circ}{.}035$ (m.e.)
$\overline{\lvert\Delta\Omega\rvert} = 2\overset{\circ}{.}1$	$\overline{\Delta\Omega} = -0\overset{\circ}{.}55 \pm 0\overset{\circ}{.}10$ (m.e.)
$\overline{\lvert\Delta\omega\rvert} = 27\overset{\circ}{.}9$.	

For the determination of these values 534 third- and 724 fourth-class orbits were used. For the latter no value of $\overline{\Delta\omega}$ is given because of the occurrence of differences near 180°, for which the sign is almost indeterminate.

It is seen that for the third-class orbits the only elements that show a significant systematic error are the semi-major axis and the eccentricity. In the case of the fourth-class orbits all four listed elements show systematic errors.

The accuracies given above are clearly dependent on the selection of the materal. In order to illustrate this dependence we made a different selection: all fourth-class objects with $e > 0.250$ and/or $a < 2.1$ A.U. (together 110 additional objects) were rejected. The following average differences were obtained:

$\overline{\lvert\Delta a\rvert} = 0.054$ A.U.	$\overline{\Delta a} = +0.020 \pm 0.0027$ (m.e.)
$\overline{\lvert\Delta e\rvert} = 0.032$	$\overline{\Delta e} = -0.012 \pm 0.0017$ (m.e.)
$\overline{\lvert\Delta i\rvert} = 0\overset{\circ}{.}68$	$\overline{\Delta i} = +0\overset{\circ}{.}25 \pm 0\overset{\circ}{.}034$ (m.e.)
$\overline{\lvert\Delta\Omega\rvert} = 1\overset{\circ}{.}8$	$\overline{\Delta\Omega} = -0\overset{\circ}{.}25 \pm 0\overset{\circ}{.}09$ (m.e.)
$\overline{\lvert\Delta\omega\rvert} = 27\overset{\circ}{.}2$.	

The second selection leads to a somewhat better accuracy, and mostly to a decrease in the systematic effects. However, the price paid for this improvement is that many orbits that were undoubtedly correct were

© European Southern Observatory • Provided by the NASA Astrophysics Data System

1970A&AS....2..339V

eliminated (about half of the rejected 110 orbits had small residuals with regard to the elements of the first-class orbits). This was regarded as undesirable, and accordingly in all discussions in which fourth-class orbits were used, the first selection was taken, with corrections for the systematic differences.

It may be thought that an effective rejection of poor fourth-class elements can be obtained by using the mean residuals for the positions used in deriving the orbit, large residuals would result in poor elements and small residuals in good elements. This criterion was checked in two fields and proved to be disappointing. Therefore the mean residuals were not taken into account in determining the quality groups, but if σ^2 was greater than 10″ the orbital elements were not calculated.

In order to derive the accuracy of the absolute magnitudes the errors in the quantity $-5 \log r\rho$, needed to transform the apparent magnitudes into absolute ones, should be determined. These errors will be denoted by Δg, although this is not the complete error in absolute magnitude (errors in the phase function and photometric errors are disregarded).

The average differences in g for first- minus third-class orbits are

$$\overline{|\Delta g|} = 0.07 \text{ and } \overline{\Delta g} = -0.006 \pm 0.003 \text{ (m.e.)},$$

for first- minus fourth-class orbits they are

$$\overline{|\Delta g|} = 0.38 \text{ and } \overline{\Delta g} = +0.16 \pm 0.018 \text{ (m.e.)},$$

while the second selection for the fourth-class orbits gives

$$\overline{|\Delta g|} = 0.33 \text{ and } \overline{\Delta g} = +0.12 \pm 0.017 \text{ (m.e.)}.$$

It follows that for the third-class orbits the errors in the absolute magnitudes due to the uncertainty of the orbital elements are small compared to the photometric errors, while the reverse is true for the fourth-class orbits. Here the combined error due to the two effects amounts to $0^m.52$ (m.e.). These values should therefore be used with caution; however, inspection of the statistics, to be discussed below, did not show indications that these objects introduced an incorrect result.

12. DEGREE OF COMPLETENESS

For a statistical study of the magnitudes it is necessary to know the degree of completeness of the material down to a fixed magnitude limit, adopted as 20.0 for the September fields. At this limit it was usually impossible to secure three positions for each object, on account of their small discovery probability. Although an attempt was made to recover the missed positions by reblinking small sections of the plate around the region where the object was expected to be found, this was not always successful. Failure to find the object might be due to search at an incorrect place, discovery of a variable object at maximum brightness, or a spurious object. This third possibility was investigated on a set of three plates of which two formed a normal pair to be compared in the blink microscope, and the third was taken immediately after the second for determination of trail corrections. If an object found only once during blinking also showed up on the third plate, it was certainly not spurious. It turned out that the large majority of objects that were found only once are real asteroids, only about 10 per cent being spurious.

The probability k of finding an object during the blinking of one plate pair was determined from the expressions

© European Southern Observatory • Provided by the NASA Astrophysics Data System

1970A&AS....2..339V

$$N_2/N_3 = 3\,(1-k)/k \quad \text{and} \quad N_1/N_2 = (1-k)/k,$$

where N_3 is the number of objects found on all three 103a-O plate pairs taken in September, N_2 is the number found on two pairs, and N_1 the number found on only one. Positions found after the special search mentioned in section 3 were excluded.

The expressions used can easily be derived by writing $[k + (1-k)]^3$ in polynomial form; the successive terms are proportional to N_3, N_2, N_1, and N_0. It is this last quantity, the number of objects not found at all, which interests us. It follows that

$$N_0 = N\,(1-k)^3,$$

where N equals $N_3 + N_2 + N_1 + N_0$.

The two determinations of k generally showed good agreement. For the magnitude interval 19.5-20.0 the discovery probability for the first field investigated was considerably lower than for the other five ones; this was probably caused by lack of efficiency in blinking this field. Accordingly it had to be excluded from most of the statistical discussions. The average value of k for the other fields, in the magnitude interval 19.5-20.0, is 0.70. This means that, on the average, three objects per field were missed completely, and a corresponding correction was made to the faintest magnitude interval. All other intervals were complete, N_0 being practically equal to zero.

13. STATISTICS OF APPARENT MAGNITUDES AND MEAN OPPOSITION MAGNITUDES

Table 3 gives the result of the counts of objects found in the different fields (the first field excluded, for reasons given above), per half-magnitude interval after correction for incompleteness. These counts are only based on the September fields, since the October fields are off opposition and therefore the objects found in them are generally fainter. The $\log N(m)$ plot in figure 4 is seen to be approximately linear.

Table 3. Numbers of objects found, after correction for incompleteness

m	Field 81	Field 82	Field 91	Field 92	Field 102	Total number	Total log
14.0 - 14.5	0	0	1	2	1	4	0.602
14.5 - 15.0	3	2	2	1	0	8	0.903
15.0 - 15.5	0	0	0	0	0	0	
15.5 - 16.0	1	1	2	2	3	9	0.954
16.0 - 16.5	3	4	4	3	9	23	1.362
16.5 - 17.0	6	16	2	4	7	35	1.544
17.0 - 17.5	13	12	24	20	14	83	1.919
17.5 - 18.0	23	26	9	26	26	110	2.041
18.0 - 18.5	40	39	37	37	48	201	2.303
18.5 - 19.0	60	65	53	64	50	292	2.465
19.0 - 19.5	69	78	80	98	82	407	2.610
19.5 - 20.0	117	119	109	152	145	642	2.808
14.0 - 20.0	335	362	323	409	385	1814	3.259

© European Southern Observatory • Provided by the NASA Astrophysics Data System

1970A&AS....2..339V

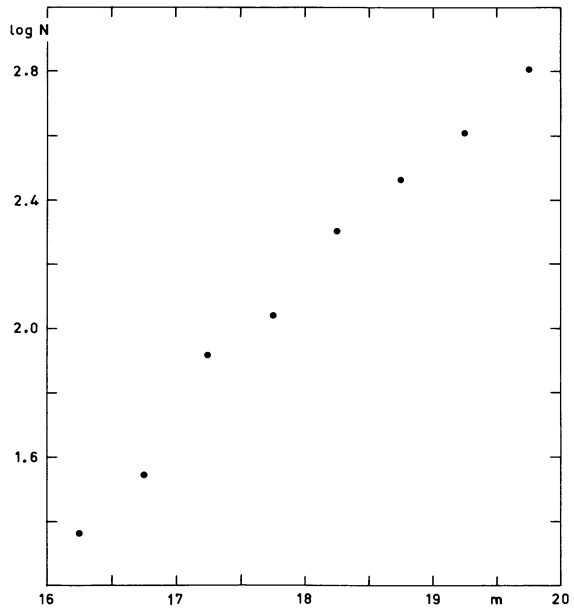

Figure 4. The logarithm of the number of asteroids per half-magnitude interval as a function of apparent magnitude, for the material in the Palomar-Leiden Survey.

To combine these results with those of the MDS we first reduced our counts to the field of one MDS strip. This was done in three steps:

1) The counts were reduced to one north-south strip of our survey. In this survey each vertical strip consists of two fields; the counts refer to five fields, and accordingly to 2.5 strips. Therefore, reduction to one strip means multiplication of $N(m)$ by a factor of 0.4, or addition to $\log N(m)$ of -0.40.

2) This strip was reduced to the width of a strip in the MDS. The width of a strip in the MDS is 6°.5 and in the present investigation 6°.4. $\log N(m)$ has therefore to be increased by 0.01.

3) The strip was reduced to the length of a strip in the MDS. The length of a strip in our survey, 6°.4, is equal to the height of the plate field used, since overlaps within a strip were negligible. Since the strips extend in declination rather than in latitude, their extension from the ecliptic is only $6°.4 \cos \epsilon = 5°.9$, ϵ being the obliquity of the ecliptic. In four well-investigated fields of the MDS the fraction of objects nearer than 5°.9 to the ecliptic was found to be 0.525. The factor needed to reduce the counts to the length of the McDonald strip is therefore 1.90, assuming that the distribution of the asteroids at right angles to the ecliptic is the same in the two surveys. This means an addition of + 0.28 to $\log N(m)$.

The total correction to $\log N(m)$ is then -0.11.

We shall follow the MDS in transforming this relation into a frequency function of the mean opposition magnitude m_0 for the whole asteroid ring. The differences $m - m_0$ have been determined empirically for the two surveys separately. Assuming that within each survey these differences do not depend on magnitude, the average value can be applied as a constant correction to the magnitudes. The values found for $\overline{m - m_0}$ were -0.10 for the MDS (only objects brighter than magnitude 14.0 being used to avoid unidentified objects, for which no value of m_0 is available) and -0.58 for the present material. This difference is caused by the fact that the fields in the MDS are larger than in the present investigation, and accordingly the asteroids are, on the average, further from opposition in the MDS. The difference between the two values is close enough to 0.50, that we can, within observational accuracy, adopt this value. Since our counts were made in intervals of half a magnitude the correction thus involves only a shift of one unit in Δm of the present survey with respect to the

© European Southern Observatory • Provided by the NASA Astrophysics Data System

1970A&AS....2..339V

MDS. To transfer both surveys to mean opposition magnitudes, we therefore added + 0.10 to the apparent magnitudes of the MDS, and + 0.60 to ours.

Before combining them, both surveys were extended to the whole asteroid ring. The reduction was done in the same way as in the MDS, except for the following changes: a) the reduction to magnitude-intervals was not made; $\log N(m)$ refers to the number of objects in half-magnitude intervals, b) the MDS correction for overlap between strips, amounting to − 0.046, was dropped because in the MDS for the extension of the counts to the whole asteroid ring the full width of the strip was used, disregarding the reduction of the effective width of the strip by this correction.

The one remaining correction is the reduction from one MDS strip to the whole asteroid ring, for which the MDS gives a value of 1.90, to be added to $\log N(m_0)$. Therefore the values of $\log N(m)$ as listed in table 3 have to be corrected by adding $-0.11 + 1.90 = 1.79$; at the same time the values listed in table 13 of the MDS have to be corrected by adding − 0.29, when the corrections mentioned above are taken into account. The combined values from the two surveys are given in table 4 and depicted in figure 5. For objects brighter than $m_0 = 16.6$ the results are from the MDS and for fainter objects the present material has been used.

Table 4. Values of $\log N$ combined from the MD and PL surveys and extended to the whole asteroid ring

m_0	$\log N$	m_0	$\log N$	m_0	$\log N$
9.35	0.13	13.35	1.88	17.35	3.33
9.85	0.49	13.85	2.04	17.85	3.71
10.35	0.82	14.35	2.08	18.35	3.83
10.85	0.91	14.85	2.32	18.85	4.09
11.35	1.11	15.35	2.47	19.35	4.25
11.85	1.39	15.85	2.55	19.85	4.40
12.35	1.54	16.35	2.79	20.35	4.60
12.85	1.71	16.85	3.15		

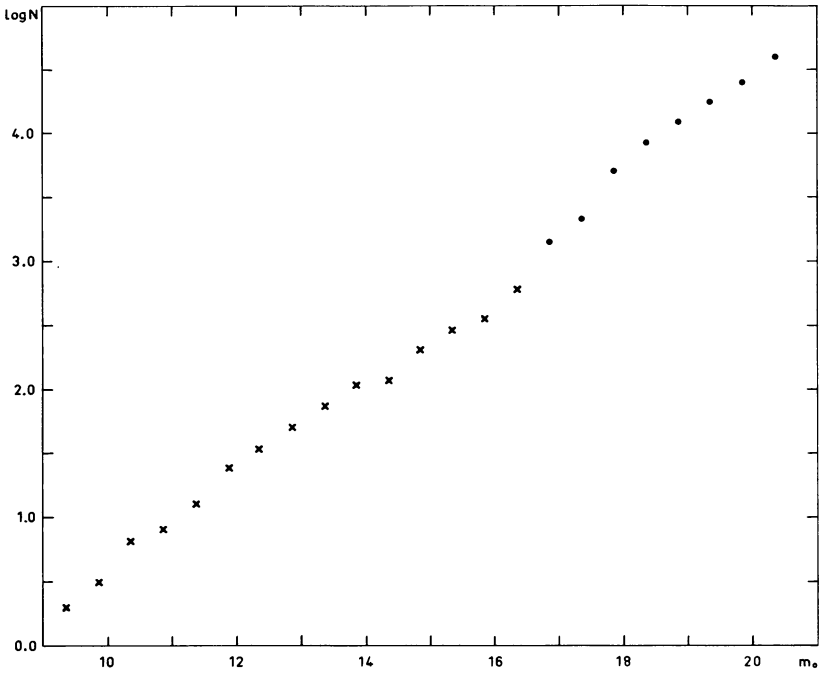

Figure 5. The logarithm of the number of asteroids in the whole asteroid ring as a function of mean opposition magnitude, for the McDonald survey (crosses) and the Palomar-Leiden survey combined.

© European Southern Observatory • Provided by the NASA Astrophysics Data System

1970A&AS....2..339V

It is seen that, except for the interval $13 < m_0 < 17.5$, the relation can be represented by a straight line of the form

$$\log N(m_0) = -3.30 + 0.390\, m_0. \quad (1)$$

$N(m_0)$ refers to the number of asteroids counted between $m_0 - 1/4$ and $m_0 + 1/4$ in the whole asteroid ring.

In the interval $13 < m_0 < 17.5$ all points lie below the line representing eq. (1), by as much as a factor of 0.5 at $m_0 = 16.0$. This is caused by the discontinuities in the MDS $\log N(g)$ relation discussed in the next section.

In this connection it seems appropriate to comment on Kiang's (1962) rediscussion of the zero-point of the MDS $\log N(m_0)$ relation; it contains two errors, presumably caused by omissions in the text of the survey report. First, Kiang states that in the survey no correction was made for overlap between the individual fields within a strip. This is not true, for the correction was indeed made. Secondly, the values of $N(m)$ in Kiang's paper which were corrected for incompleteness are all considerably higher than the survey values, although Kiang used the incompleteness corrections actually determined in the survey. The most likely explanation is that Kiang supposed that all objects listed in table A of the MDS had been found when the plates were blinked for the first time. This is not correct, a number of them was found in reblinking (parts of) the plates. These objects are marked with a cross in the second column of table A. Comparison of this column with the original records showed that not all objects concerned were actually marked by crosses, so that it is not possible to make a rediscussion of the counts from the published material. Kiang's figure 3 shows that for the extension of the MDS by means of the Palomar Sky Survey charts he used counts at $m = 17.0$, 19.0 and 19.5. These appear to be well represented by the linear relation derived by him, and therefore we shall use his expression (12) for a comparison with the present results. The values of $\log N(m_0)$ computed from this expression were diminished by 0.31 to reduce them to counts in half-magnitude intervals (see Kuiper *et al.* 1958, p. 324). The comparison yields the following result:

m_0	$\log N$		$\Delta \log N$
	Kiang	PLS	
17.0	3.37	3.18	+ 0.19
19.0	4.12	4.14	− 0.02
19.5	4.30	4.31	− 0.01

There is thus a very satisfactory agreement between the two investigations for the faintest magnitude intervals, but for $m_0 = 17$ Kiang's value is considerably higher than ours.

14. STATISTICS OF ABSOLUTE MAGNITUDES

The statistical discussion of the absolute magnitudes g was made in the same way as in the MDS. The material was divided into three intervals of semi-major axis: $2.0 < a < 2.6$, $2.6 < a < 3.0$, and $3.0 < a < 3.5$, denoted by I, II and III in the following discussion.

Within these intervals the asteroids were counted in half-magnitude intervals of g. The counts were corrected for incompleteness of two different kinds: the first caused by the limit in apparent magnitude of the material and the second by the inclination cut-off. This last correction is independent of absolute magnitude

© European Southern Observatory • Provided by the NASA Astrophysics Data System

1970A&AS....2..339V

and was applied to all values within the distance interval. The correction factors were 1.94, 2.42 and 2.45, for groups I, II and III, respectively. The derivation of this correction is given in section 17.

The correction for the apparent magnitude cut-off was made as follows. For each distance interval the distribution function of $m - g$ was determined, between $m = 17.0$ and 19.5. Fourth-class orbits were given a special treatment, as explained below. The distribution functions were assumed to be independent of magnitude. They were used to extrapolate $N(g)$ for objects beyond $m = 20.0$, following the extrapolation of $\log N(m)$ beyond this limit, with an adopted slope of 0.4. The interval $19.5 < m < 20.0$ was treated separately because of the occurrence in it of objects that were found only once or twice, no orbital elements being then available. The numbers counted in this interval were divided by the fraction of objects having at least three positions within it. Afterwards, all counts in the various half-magnitude intervals of g were collected and added; the results are listed in table 5. Here all three declination strips are combined, so that the resulting strip width is 18° (3 × 6°.5 minus overlaps). The quantity $N(g)$ is not tabulated if more than 50 per cent of the contributing objects have $m > 20.0$.

Table 5. Corrected numbers of asteroids reduced to a declination strip 18° wide

g	N		
	$2.0 < a < 2.6$	$2.6 < a < 3.0$	$3.0 < a < 3.5$
10.75	0	0	0
11.25	1	1	9
11.75	0	0	4
12.25	0	1	12
12.75	0	12	21
13.25	6	33	21
13.75	6	23	24
14.25	21	46	72
14.75	42	109	206
15.25	94	165	213
15.75	172	314	253
16.25	254	283	328
16.75	455	517	
17.25	715		

The fourth-class objects need special consideration because of systematic errors in the absolute magnitudes and because of the objects without reliable orbital elements. These effects should be differentiated between the three distance groups. The systematic errors in g, as found from the September elements of first-class orbits, were + 0.09 in group I, + 0.24 in group II, and + 0.33 in group III; these numbers were added to the absolute magnitudes resulting from the orbital elements. The corrections for incompleteness caused by failure of the orbital-element computation were determined by using the "September elements" of the first-class orbits, as explained above. Here the fraction of missing orbits is 12, 16 and 24 per cent in groups I, II and III, respectively; for the whole material the average is 16 per cent. However, for the fourth-class orbits themselves the fraction of missing orbits is as much as 25 per cent; it was assumed that they are distributed over the three distance groups in the same way as in the "September elements" of the first-class orbits. This resulted in correction terms of 1.20, 1.26 and 1.38 for groups I, II and III, respectively; the counts of fourth-class objects were multiplied by these factors.

Combination of the results of table 5 with those of the MDS can be made in the same way as for the apparent magnitudes, except that no correction is needed for extension of the counts to the complete length of the MDS strip, this having already been accomplished in the correction for the inclination cutt-off.

© European Southern Observatory • Provided by the NASA Astrophysics Data System

1970A&AS....2..339V

Accordingly the total correction to $\log N(g)$ to extend the counts to the whole asteroid ring amounts to $-0.52 + 1.90 = +1.38$ ($-0.52 = \log 1/3$, because all six fields were used in this part of the statistics). The combined results of the MDS and the present investigation are shown in figure 6, for the three intervals of semi-major axes separately. The MDS values have been used when their correction for incompleteness was less than 50 per cent of the adopted value.

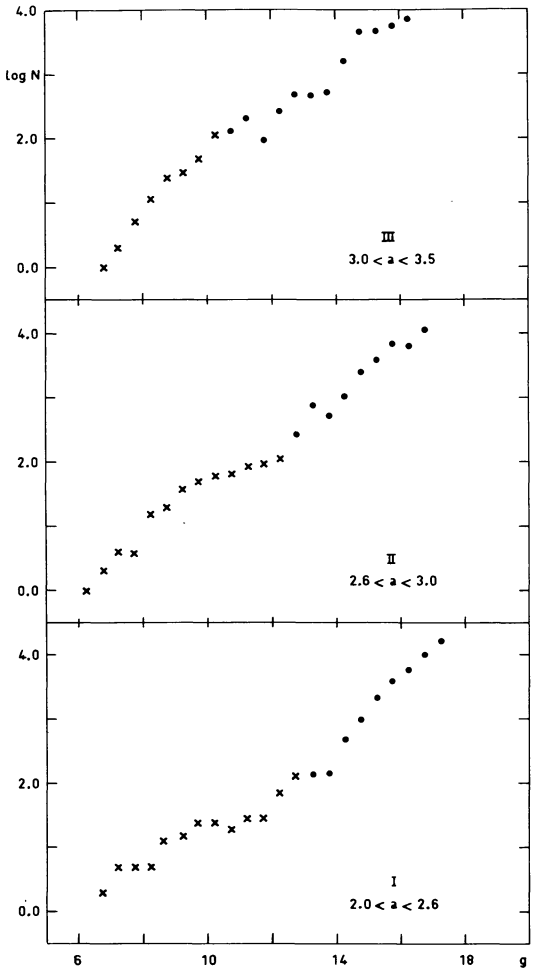

Figure 6. The logarithm of the number of asteroids per half-magnitude interval in the whole asteroid ring, as a function of absolute magnitude, for three intervals of semi-major axis. Values taken from the McDonald Survey are indicated by crosses.

From the MDS results it was concluded that there are discontinuities in $\log N(g)$ at different values of g for different distance intervals. The present material shows them (figure 6) at the same value of g ($g = 11$) in all three groups. This difference is mostly caused by the lack of agreement between the two surveys in the $3.0 < a < 3.5$ group, possibly due to incorrect incompleteness corrections in the MDS. Moreover, figure 6 shows that beyond the discontinuity the plots are approximately parallel for the distance groups II and III, but that the plot for group I is somewhat steeper.

© European Southern Observatory • Provided by the NASA Astrophysics Data System

1970A&AS....2..339V

15. STATISTICS OF SEMI-MAJOR AXES AND MEAN DAILY MOTIONS

It is well known that the distribution of the semi-major axes of the brighter asteroids shows gaps (the Kirkwood gaps) at those values where the orbital periods are commensurate with the orbital period of Jupiter. We next investigate how these gaps appear among the faint asteroids.

Counts were made in intervals of 40″ in n (the mean daily motion) derived from first-class orbits; the result is shown in figure 7. If we compare the latter with a similar diagram for the brighter minor planets (see, *e. g.* Richter 1960) then the following conclusions may be drawn:

a) In the present material deep gaps occur at the two main commensurabilities (1 : 3 and 2 : 5), comparable to those found for the brighter asteroids.

b) At the commensurability 1 : 2 no asteroids are found at all, and objects with $n < 600''$ are very rare (except for the Hilda and Trojan groups), contrary to the situation in Richter's material.

c) The distribution of the brighter asteroids shows a pronounced maximum near $n = 630''$. This maximum is much less pronounced for the fainter objects; in general the distribution is much flatter.

Figure 7, however, should be corrected for the effect of the inclination cutt-off, as mentioned above. If we do that, the number of objects with $2.0 < a < 2.6$ has to be decreased by a factor of 0.80 with respect to the remainder of the curve. The corrected values have been indicated in figure 7 by a dashed line. The curve has

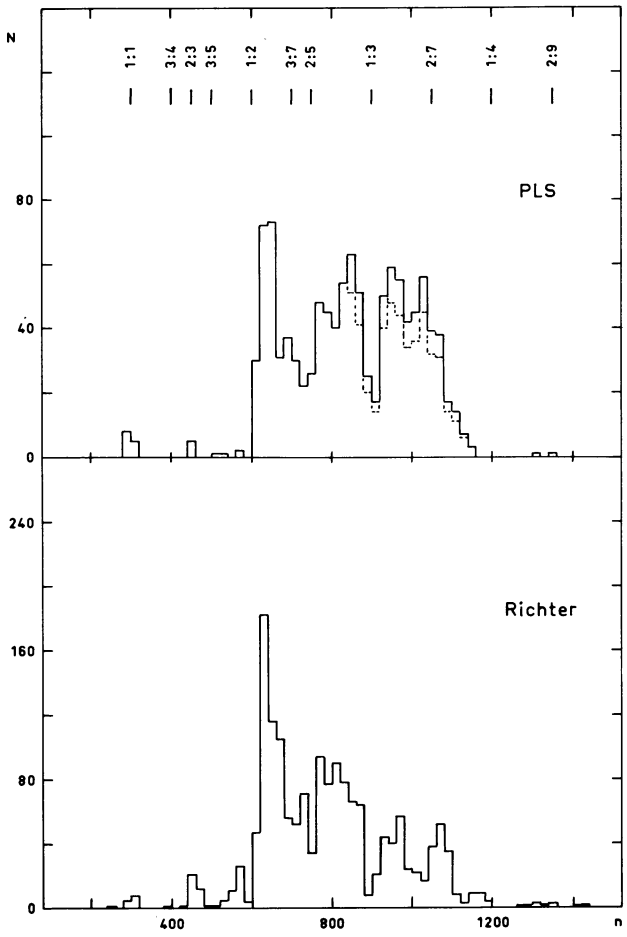

Figure 7. Frequency curves of mean daily motions; PLS (above) and Richter's (1960) (below).

© European Southern Observatory • Provided by the NASA Astrophysics Data System

1970A&AS....2..339V

become somewhat steeper, after this correction, but remains flatter than that of Richter.

The source of this difference is the discontinuity in the distribution function of the absolute magnitudes. Most of the nearby asteroids in Richter's material are to the right of the discontinuity and most of his asteroids with large semi-major axis are to the left of it, while in the present material practically the whole material is to the right of the discontinuity. This can be seen from figure 6. We found that, approximately, $\overline{m_0} = 15.0$ for Richter's material and 19.0 for ours. For distance group I $\overline{m_0 - g} = 2.35$ and for distance group III 4.32, so that in Richter's material $\bar{g} = 12.65$ in group I and 10.65 in group III, while in the present material $\bar{g} = 16.65$ in group I and 14.65 in group III. For these absolute magnitudes figure 6 shows the following values of log N: 2.0 for Richter's group I, 2.1 for Richter's group III, 4.0 for our group I and 3.5 for our group III. This means that compared with our material Richter's sample is four times as numerous in group III objects, relative to the group I objects ($\Delta \log N = 0.6$). This difference in the distribution of semi-major axes makes the comparison of the Kirkwood gaps difficult, but the general impression is that no clear-cut difference exists in the gaps for the bright and faint asteroids.

16. STATISTICS OF ECCENTRICITIES

The eccentricities were counted in intervals of 0.02, again for first-class orbits only. The resulting distribution is shown in figure 8. It has a maximum near 0.17, while the largest eccentricity is 0.385. The distribution of eccentricities of the brighter asteroids (see, *e.g.*, Watson 1956) is similar to the one found here.

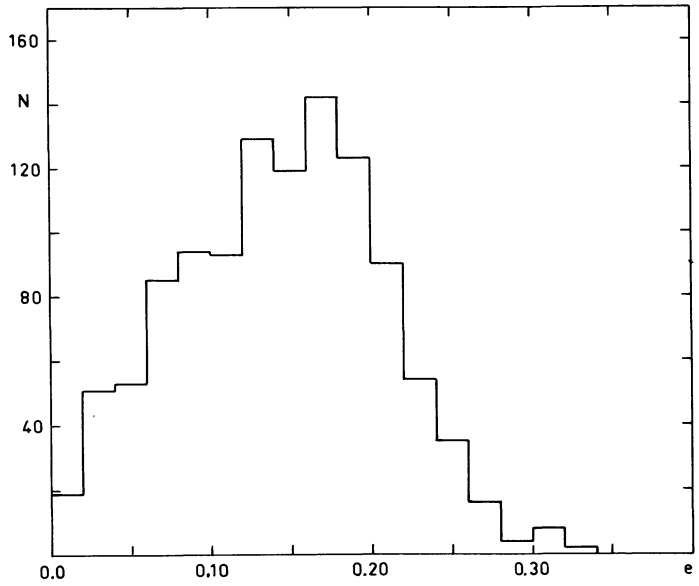

Figure 8. Frequency curve of eccentricities.

17. STATISTICS OF INCLINATIONS

The same material as in the two preceding sections was used to derive the distribution of inclinations. The counts were made in intervals of 1°; the resulting distribution is shown in figure 9. It has a maximum near 3° and the largest inclination is 26°.4. These values are considerably smaller than those found for the brighter asteroids (*cf.* Watson 1956), which is to be expected because the present investigation was limited to the

© European Southern Observatory • Provided by the NASA Astrophysics Data System

1970A&AS....2..339V

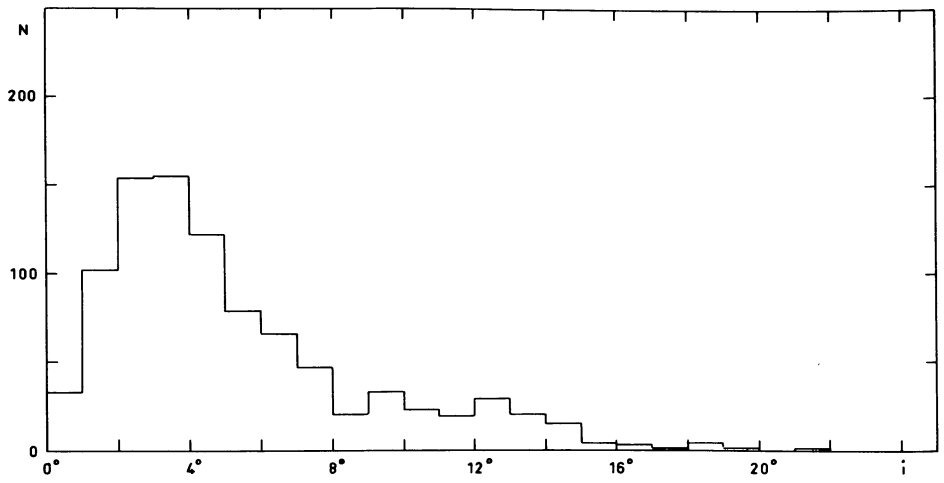

Figure 9. Frequency curve of inclinations, not corrected for incompleteness.

immediate neighbourhood of the ecliptic, so that our material is very incomplete as regards objects of large inclination. It is possible, however, to correct for this effect in the following way.

If we assume the orbit of the asteroid to be circular, the greatest height above the ecliptic plane that it can reach is $z_0 = a \sin i$. As seen from the Earth at the time of opposition this corresponds to a distance from the ecliptic

$$\text{arc tg } [a \sin i / (a \cos i - 1)].$$

If this angle is smaller than, or equal to, the upper latitude of the observed ecliptical strip, the material will be complete for these values of i. If this angle exceeds the critical value, the object will be outside this strip at large distances from the plane of the ecliptic. If the maximum value of i for which the material is complete (as far as the declination cut-off is concerned) is denoted by i_0, it follows that

$$5^\circ.9 = \text{arc tg } [a \sin i_0 / (a \cos i_0 - 1)],$$

$5^\circ.9$ being the height of the strip above the ecliptic. For $i > i_0$ the incompleteness factor can be derived as follows.

The motion of the asteroid in the z coordinate is given by

$$z = z_0 \sin \omega t, \tag{2}$$

where $\omega = 2\pi/T$. If we denote the maximum value of z within the inclination boundary of the survey by z_m and the time the asteroid needs to reach z_m starting from the ecliptic by t_m, then

$$2\pi t_m / T = \text{arc sin } (z_m / z_0).$$

From figure 10 it is seen that

$$z_m = (a \cos i - 1) \text{ tg } 5^\circ.9,$$

© European Southern Observatory • Provided by the NASA Astrophysics Data System

1970A&AS....2..339V

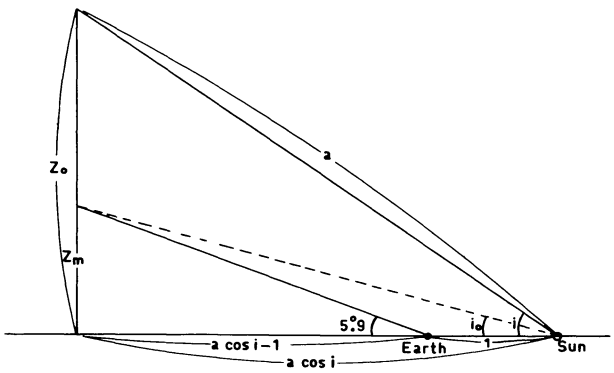

Figure 10. Definition of the quantities z_0, z_m and i_0, to be used in connection with the derivation of the correction formulae for the inclination cut-off.

so that after substitution we obtain

$$4\, t_m/T = (2/\pi) \text{ arc sin } [\, (a \cos i - 1) \text{ tg } 5^\circ.9 \,/\, (a \sin i)\,]. \tag{3}$$

But $4\, t_m/T$ is equal to the fraction of the time during which the asteroid is within 5°.9 from the ecliptic, and therefore to the fraction of objects within this limit.

Equation (3) would be correct if we were interested in observing the object only once. However, our statistics were based on first-class orbits, so that the object should be visible during the full time over which the observations extend (32 days). This will reduce the time in which the object is in the strip, so that the corrected expression is

$$4t_m/T = (2/\pi) \left\{ \text{arc sin } [\, (a \cos i - 1) \text{ tg } 5^\circ.9 \,/\, (a \sin i)\,] - 16\, n \right\}. \tag{4}$$

The correction factor for incompleteness is the reciprocal of this expression.

In practice eq. (4) was not applied exactly, by using the i_0 and n for each individual object. Instead, to speed up the computations, the material was divided in the three distance groups, and for each group mean values for a, n and i_0 were used, as given below

	$\bar{a}$	$\bar{n}$	$\bar{i}_0$
$2.0 < a < 2.6$	2.43	940″	3°.47
$2.6 < a < 3.0$	2.75	773	3.76
$3.0 < a < 3.5$	3.17	637	4.04

The values for $\bar{a}$ were taken from the MDS.

The corrected distribution of orbital inclinations is shown in figure 11. This distribution seems to have two maxima, one at about 5°, the other at 13°, but the individual counts in the three zones scatter too widely for this to be completely certain. A smoothed distribution would have about the form found for the brighter asteroids, which is also shown in figure 11. The secondary maximum, if real, is probably caused by the existence of the new Io family (see section 21), which in our material contributes 42 per cent of all asteroids with inclinations between 11° and 15°.

© European Southern Observatory • Provided by the NASA Astrophysics Data System

1970A&AS....2..339V

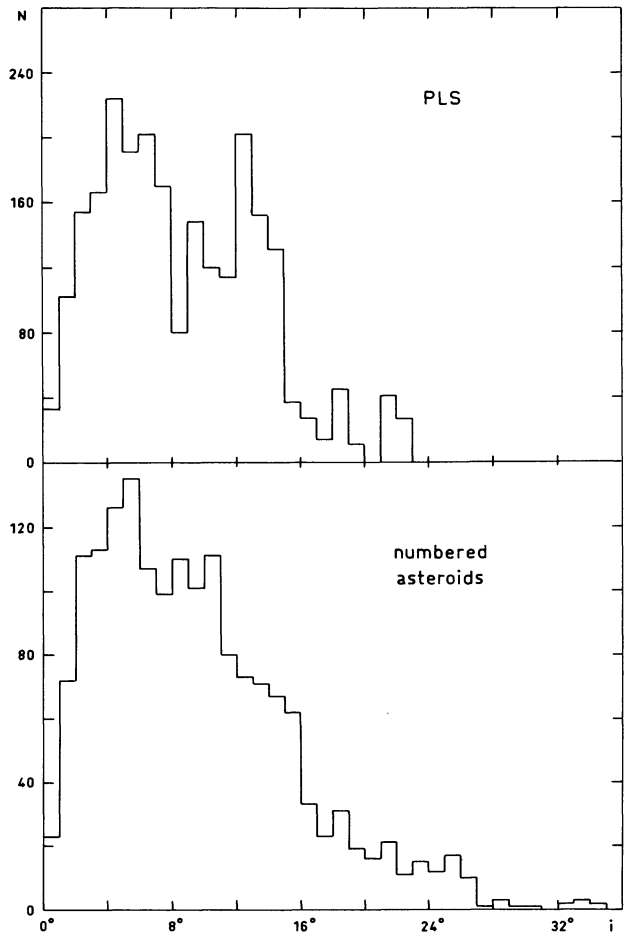

Figure 11. Frequency curve of inclinations for the Palomar-Leiden Survey (corrected for incompleteness) and for the numbered asteroids.

The selection effect in the distribution of inclinations causes a selection in the nodes: for all values of i larger than about 5° the nodes cluster around the two equinoxes, while for values of i between 4° and 5° there is a pronounced preference for them to be near one of the equinoxes.

For the influence of the selection effect in the distribution of inclinations on the occurrence of large eccentricities see section 11.

18. OBJECTS APPROACHING THE EARTH AT SHORT DISTANCE

The present material was not favourable for the determination of orbital elements of objects close to the Earth, because of their rapid motion in relation to the relatively small size of the observed field. The approach of only two objects within 0.5 A.U. of the Earth could be established from our observations. They are objects 2108 (closest approach 0.45 A.U.) and 6344 (closest approach 0.12 A.U.). Both turned out to have normal semi-major axes but large eccentricities (for 2108 $a = 2.32$ and $e = 0.385$, for 6344 $a = 2.58$ and $e = 0.635$). Only one object, at a geocentric distance of 0.53 A.U., had a semi-major axis smaller than 1.9 (6743, $a = 1.62$, $e = 0.493$). If the orbital elements are reliable, the perihelium of this object is within the Earth's orbit.

© European Southern Observatory • Provided by the NASA Astrophysics Data System

1970A&AS....2..339V

19. SPECIAL GROUPS OF ASTEROIDS

Members of the following groups, having atypical semi-major axes, were found.

a) The Hungaria group. This group occurs at the commensurability 2 : 9 and the orbits of its members are characterized by large inclinations ($\approx 22°$) and moderate eccentricities (≈ 0.09). The mean value of their semi-major axes is about 1.95 A.U. Nine new members of this group have been found, viz. the objects 2112, 2511, 4761, 4861, 6255, 7071, 7072, 7082, and 9091. In the present material the group is incomplete by a factor of 15 with respect to the low-inclination objects. Correction for this incompleteness would result in 135 Hungaria-type objects in a declination strip 18° wide. There are only 11 numbered Hungaria-group members.

b) The Hilda group. This is also a group occurring at a commensurability, in this case 2 : 3. The mean semi-major axis of its members is about 3.95 A.U. Ten new members were found, viz. the objects 2033, 2159, 2554, 2696, 2709, 4282, 4652, 4710, 6847 and 9550. Moreover, the known member 1439 Vogtia has been found again, at a distance of 7° from the ephemeris position.

c) The Trojan group. We found 15 Trojans for which reasonably reliable elements could be determined. They are numbered 2008, 2706, 4139, 4523, 4572, 4596, 4655, 6020, 6540, 6541, 6581, 6591, 6629, 6844, and 9507. Four more objects, for which no reliable orbital elements could be obtained, are also judged from their motions to be Trojans. They have the numbers 2804, 4322, 6375, and 6889.

20. DENSITY PERPENDICULAR TO THE PLANE OF THE ECLIPTIC

In principle it must be possible to compute the asteroidal density distribution perpendicular to the ecliptic plane from the orbital elements. It is not certain that this distribution is independent of distance from the Sun; if the distribution function of inclinations is the same everywhere in the asteroid ring the objects with larger semi-major axis will, on the average, be farther from the plane of the ecliptic than the objects closer to the Sun. In the following discussion we shall disregard this possibility, so that the density distribution found here will be an average over the asteroid ring. We assume all orbits to be circular. As before, $z_0 = a \sin i$.

Consider a layer of thickness dz at a distance z from the plane of the ecliptic and let the total number of objects in this layer be $N(z)\,dz$. Their orbits have different values of a and i, and thus of z_0. We now denote the number of objects in this layer with z_0 values between z_0 and $z_0 + dz_0$ by $N(z, z_0)\,dz_0$, so that

$$N(z) = \int_z^\infty N(z, z_0)\,dz_0. \tag{5}$$

Let $N(z_0)\,dz_0$ be the total number of objects with z_0 between z_0 and $z_0 + dz_0$. If $z < z_0$, the fraction of the total $N(z_0)$ which are in the layer at z will be equal to the fraction of the time each object remains in this layer. Therefore $N(z, z_0)\,dz = N(z_0)\,dt/T$.

It follows from (2) that $dz = z_0 \omega \cos \omega t\,dt$, so that

$$\begin{aligned} N(z, z_0)\,dz &= (1/2\pi z_0)\,N(z_0)\,dz / \cos \omega t \\ &= N(z_0)\,(2\pi z_0)^{-1}\,[\,1 - (z/z_0)^2\,]^{-\frac{1}{2}}\,dz. \end{aligned}$$

Accordingly, using eq. (5),

$$N(z) = (1/\pi) \int_z^\infty N(z_0)\,(z_0^2 - z^2)^{-\frac{1}{2}}\,dz_0,$$

if it is remembered that each object crosses the layer with thickness dz twice.

© European Southern Observatory • Provided by the NASA Astrophysics Data System

1970A&AS....2..339V

Following these precepts, z_0 and then $N(z_0)$ were computed for all objects with first-class orbits. Corrections for incompleteness, which are the same as those applied in the derivation of the distribution function of the inclinations were included, depending on the values of a and i. Next, counts were made of the total number of objects within intervals of z_0. In figure 12 $N(z_0)$ is plotted against z_0; the width of the interval dz_0 was taken as 0.02 A.U. The function has two maxima, at $z_0 = 0.25$ and 0.61, separated by a minimum at $z_0 = 0.39$. This is a result of the two maxima in the distribution function of i. In figure 13, $N(z)$ is shown, normalized to $\int_0^\infty N(z)\,dz = 1$. At $z = 0.28$ the density of asteroids has decreased to half its value in the plane of the ecliptic.

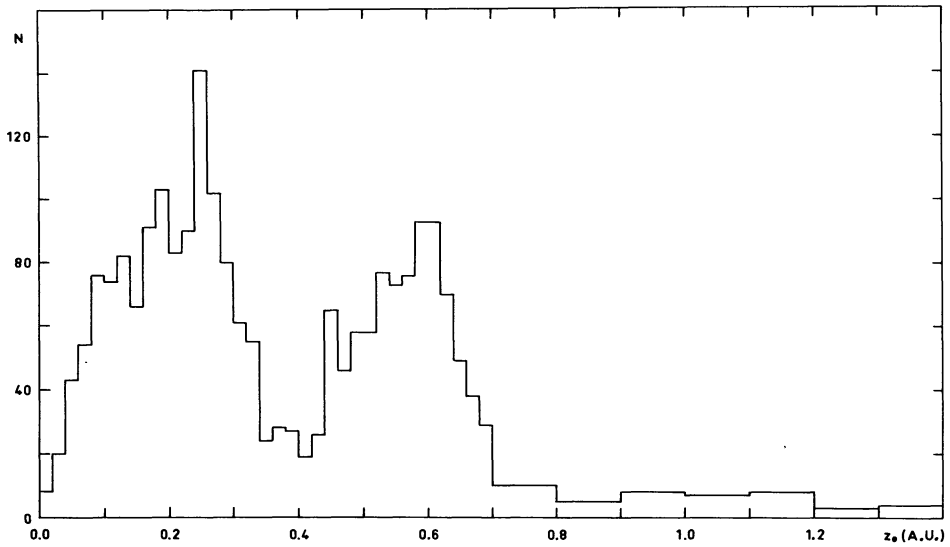

Figure 12. Frequency curve of z_0, the maximum distance from the ecliptic plane.

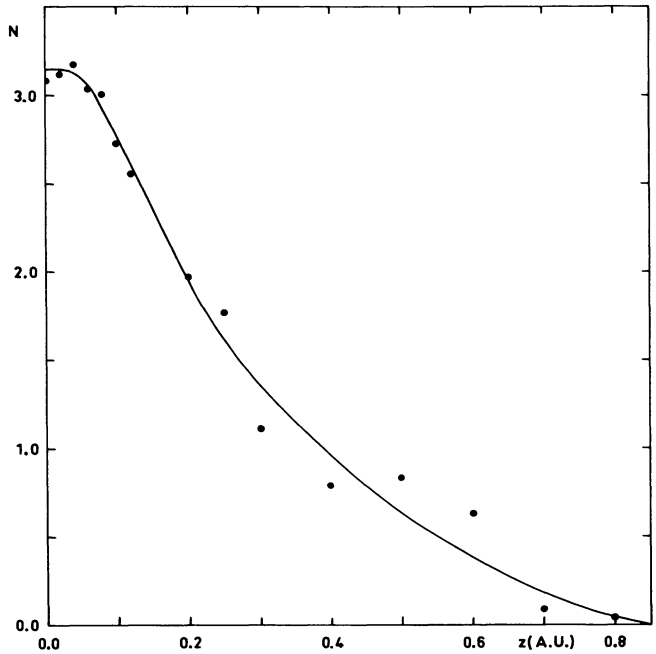

Figure 13. Normalized average density distribution above the ecliptic plane.

© European Southern Observatory • Provided by the NASA Astrophysics Data System

1970A&AS....2..339V

21. PROPER ELEMENTS AND FAMILIES

Proper elements of all objects with orbital semi-major axes between 1.89 and 4.04 A.U. were computed in Cincinnati. They are defined as follows:

$$\begin{aligned}
\nu \sin \beta &= e \sin (\Omega + \omega) - q_0 \\
\nu \cos \beta &= e \cos (\Omega + \omega) - p_0 \\
\mu \sin \gamma &= \operatorname{tg} i \sin \Omega - Q_0 \\
\mu \cos \gamma &= \operatorname{tg} i \cos \Omega - P_0,
\end{aligned}$$

in which the quantities p_0, q_0, P_0, and Q_0 are the so-called induced oscillations. The notation used here is related to that of Brouwer (1951) in the following way:

$A = \nu$	the proper eccentricity
$B = \mu \cos i$	the proper inclination
$\pi_1 = \beta$	the longitude of the proper perihelion
$\theta_1 = \gamma$	the longitude of the proper node.

The values β and γ are expressed as fractions of the circumference.
We refer to Brouwer and Clemence (1961) for the physical meaning of the proper elements. They were computed using the tables of Brouwer and van Woerkom (1950), interpolated by a four-point Lagrangian formula, except that in the neighbourhood of the singularities the functions were represented over each interval by a rational fraction of the form

$$f(a - a_0) = [\, N_0 + N_1(a - a_0) + N_2(a - a_0)^2 \,] / [\, a + D_1(a - a_0) \,],$$

where the coefficients were evaluated to fit four successive tabular values. Mr. J. Carr assisted in this portion of the work.

Brouwer's list of proper elements and the present one (table 9), to which only first-class objects have been admitted, have 14 objects in common. From these an estimate of the precision of our proper elements was derived. The average differences without regard to sign are:

$$\begin{aligned}
\overline{|A - \nu|} &= 0.0039 \\
\overline{|B - \mu \cos i|} &= 0.0004 \\
\overline{|(\pi_1 + \theta_1) - (\beta + \gamma)|} &= 0.006.
\end{aligned}$$

It follows that the present material is sufficiently accurate for the finding of families of asteroids, defined as density maxima in the a, μ, ν space.

The search for families was made as follows: the whole material was divided into intervals of 0.05 A.U. in semi-major axis, within these intervals μ was plotted against ν and the plots were searched for concentrations of points. These were considered to be families if: 1) they coincided with the positions of known families or groups, or 2) they were recognizable in the neighbouring intervals of a as well. It is true that in this way new families may be missed if they are contained within a very small interval of a, but on the other hand the criterion guards against the adoption of a chance concentration as a new family.

In this way the Hirayama families of Themis, Eos, Coronis, Maria and Flora could be recognized, but not the Phocaea family. The members of this latter family, however, have such large inclinations that our survey is

© European Southern Observatory • Provided by the NASA Astrophysics Data System

1970A&AS....2..339V

very incomplete for them. As a consequence nothing can be said about the occurrence of the Phocaea family amongst the fainter asteroids. Five new families were found, which were named after bright asteroids occurring within their boundaries. Both the previously recognized families and the new ones are listed in table 6, containing the designation, the number of members found in this survey, and both the average and extreme values of the quantities a, μ and ν. Generally, the families do not show a clear boundary, so that there is an element of arbitrariness in the limits listed in table 6. This must be kept in mind when they are compared with the corresponding values in Brouwer's paper. In the present investigation these limits are, in general, wider. If we omit the Flora families, for reasons to be discussed below, we obtain for the spread in the values for the family (in the sense Brouwer minus Palomar-Leiden)

$$\text{for } a\text{: } -0.055 \text{ A.U., for } \nu\text{: } -0.013, \text{ for } \mu\text{: } -0.010.$$

Table 6. Asteroid families found in the Palomar-Leiden survey

Family name	no.	n	$\bar{a}$	$\bar{\mu}$	$\bar{\nu}$	Range in a	Range in μ	Range in ν
Themis	1	63	3.149	0.0255	0.1595	3.072 - 3.232	0.0035 - 0.0476	0.1019 - 0.2123
Eos	2	23	3.019	0.1728	0.0693	2.963 - 3.103	0.1631 - 0.1843	0.0331 - 0.1061
Coronis	3	32	2.880	0.0364	0.0523	2.807 - 2.944	0.0272 - 0.0474	0.0299 - 0.0805
Maria	4	3	2.569	0.2652	0.0947	2.551 - 2.586	0.2636 - 0.2666	0.0820 - 0.1021
Flora	6	36	2.232	0.0708	0.1412	2.184 - 2.269	0.0569 - 0.0873	0.1091 - 0.1735
Nysa	32	77	2.385	0.0451	0.1700	2.300 - 2.448	0.0355 - 0.0602	0.1348 - 0.2012
Medea	34	32	3.163	0.0892	0.1268	3.086 - 3.235	0.0758 - 0.1047	0.0716 - 0.1591
Michela	31	26	2.380	0.0216	0.1706	2.302 - 2.447	0.0087 - 0.0324	0.1272 - 0.2187
Vesta	30	28	2.328	0.1159	0.0938	2.277 - 2.390	0.1008 - 0.1372	0.0735 - 0.1218
Io	33	37	2.637	0.2239	0.1622	2.553 - 2.738	0.1973 - 0.2551	0.1242 - 0.2108
Brouwer	12	7	3.087	0.2018	0.1155	3.068 - 3.106	0.1900 - 0.2303	0.0897 - 0.1479
Brouwer	16	10	2.781	0.1645	0.1435	2.736 - 2.813	0.1552 - 0.1700	0.1296 - 0.1766
Brouwer	25	7	2.432	0.0789	0.1646	2.405 - 2.477	0.0700 - 0.0839	0.1390 - 0.1800
Brouwer	27	8	2.401	0.1892	0.1965	2.365 - 2.440	0.1579 - 0.2278	0.1600 - 0.2334

Brouwer (1951) introduced loose groups of asteroids showing a concentration of the value of the angle $\beta + \gamma$ within a limited interval. The way in which they were defined by Brouwer may give the impression that this was the only criterion he used in selecting these groups, but the fact that Arnold (1969), without using this criterion, rediscovered most of these groups shows that Brouwer must have used *concentrations* in the a, μ, ν space as a second selection criterion (Brouwer used the term "nearly common values"). Seven of the 19 groups could be recognized in our survey; three are incorporated in the new families: no. 24 in the Nysa family and nos. 19 and 20 in the Io family. Moreover, the groups 12, 16, 25 and 27 could also be recognized (no. 25 uncertainly). None of these obeyed the criterion which Brouwer used for finding them. It is preferable, for that reason, not to use the word "group" anymore, but to regard these as small-sized families. It must be kept in mind that the present material was not searched for such small families, and more of them may be found if a statistical investigation like the one made by Arnold (1969) is made; none of Arnold's new families has been recognized, however.

The families found in the present survey are shown in μ, ν diagrams in figure 14.* Non-member asteroids within the intervals of a, μ and ν depicted in these diagrams are denoted by open circles. They are all at the edges of the figures and were added only to show how sharply the family is defined in the diagrams. It is seen that the limits, especially of the Flora family, are not well defined. The limits of this family as adopted here

*The Maria family has been omitted in figure 14 because of the small number of members found.

© European Southern Observatory • Provided by the NASA Astrophysics Data System

1970A&AS....2..339V

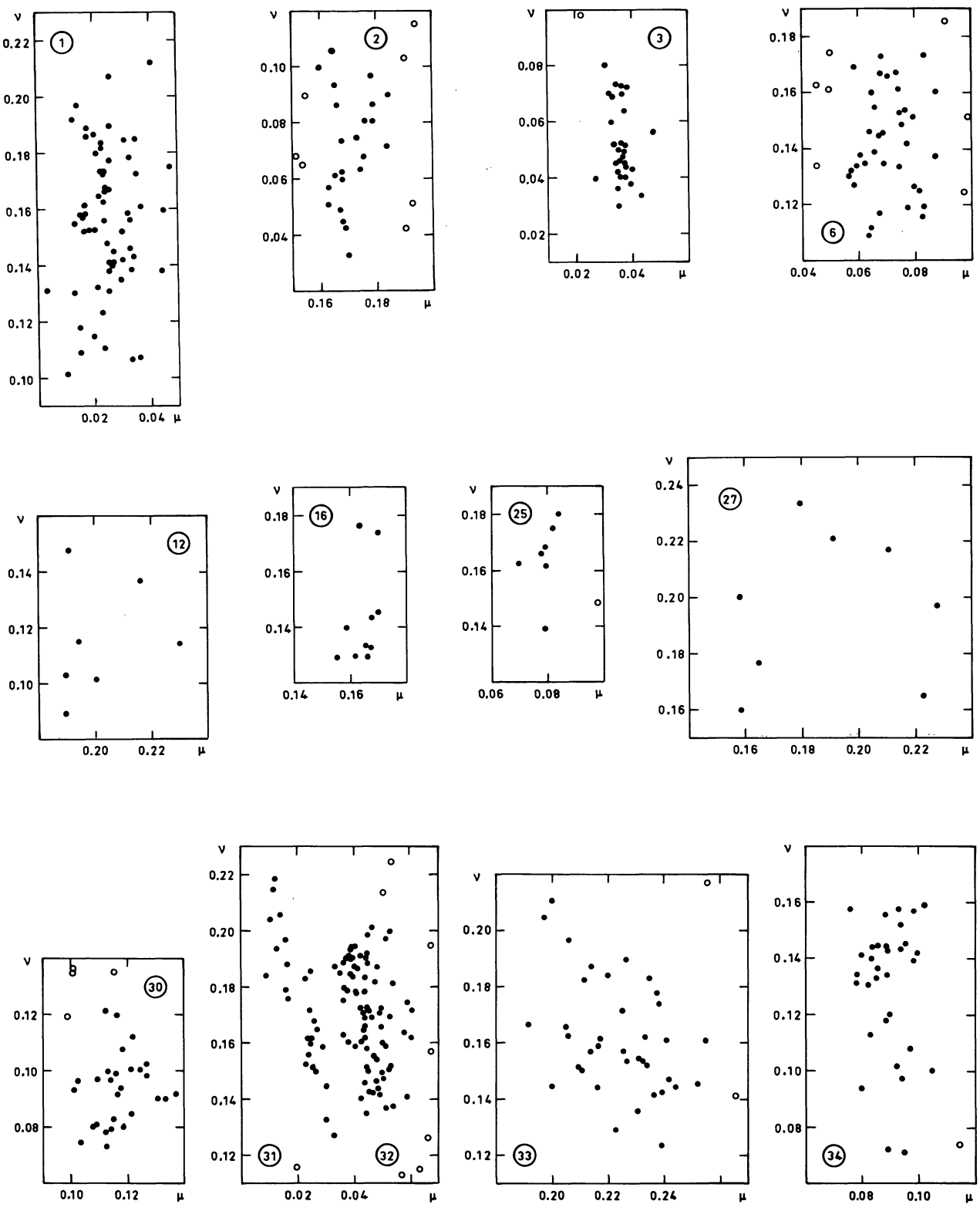

Figure 14. Diagrams of proper elements μ and ν for the families 1, 2, 3, 6, 12, 16, 25, 27, 30, 31, 32, 33 and 34.

© European Southern Observatory • Provided by the NASA Astrophysics Data System

1970A&AS...2..339V

only separate a concentration within a dense field of much larger dimensions. If we had adopted the limits given by Brouwer, this family would have lacked the typical segregation properties of families in the μ, ν diagrams. The fact that five new families could be found shows that there are families which have practically no members among the bright asteroids. On the other hand, the fact that many previously known families could be recovered from our material, among them most of the large ones, shows that the range of asteroid sizes in several families must be considerable. Most of the "Brouwer groups", however, seem to be limited to the bright asteroids, although it might be that more Brouwer families could be recognized in a larger material of faint asteroids than the present one.

It is remarkable that in those Brouwer groups that could be recognized in our material no concentration of the angle $\beta + \gamma$ was noticeable. The possibility that this might be a property only of the brighter members of a family was investigated for the seven brightest members of the families 1-5, but no concentration of $\beta + \gamma$ was noticed. The explanation of the concentrations of $\beta + \gamma$ found by Brouwer is not at all clear. It is true that in the present material there is a selection effect in the angle γ similar to that in Ω, which causes the values of γ for all objects with inclination larger than about 4° to cluster around the values 0.0 and 0.5, but this effect cannot influence the distribution of $\beta + \gamma$, if β is distributed at random.

Alfvén (1969) called attention to groups showing concentrations in the β, γ diagram within families; these groups were named "jet streams" by him. Their existence was demonstrated by means of the Flora families. It is difficult to make a parallel from the present material, on account of the selection effect in the proper element γ. The search could only be made for families whose members have small values of inclination ($i < 4°$). It was pointed out by Danielsson (private communication) that in the Nysa family the distribution of points in the β, γ plane indicated the presence of a jet stream. And indeed, the square defined by $0.84 < \beta < 1.28$, $0.47 < \gamma < 0.97$, covering 22 per cent of the diagram, contains 54 per cent of the points in this diagram.

The total number of asteroids found as members of families in our material amounts to 389, or 40 per cent of the first-class orbits. To these should be added the members of the Hungaria and Hilda groups (not groups in the sense as defined by Brouwer), and the Trojans, totalling 19 in the sample of first-class orbits. This brings the percentage given above to 42. This high proportion is caused mainly by the fact that for $a > 3.05$ practically all asteroids found belong to families and that the members of the Nysa family are so numerous.

A remarkable circumstance is the finding of twin families in our material. The most pronounced ones are the Nysa and Michela families, which occur in practically the same intervals of a and ν, while the intervals of μ are close together. Also the Themis and Medea families form such a pair, as well as the Eos family and Brouwer 12. Moreover, there is some indication that the Io family consists of two separate concentrations. Brouwer found this family as two different groups, nos. 19 and 20, but it turned out to be impossible to disentangle these in the present material. Other families seem to be single or are found in regions with many families. It is not clear what meaning, if any, should be ascribed to the twin families. If the phenomenon is not accidental then it might be that each family of such a twin is a remnant of one of two colliding objects. It seems premature, however, to draw such a conclusion.

22. TABLES OF PROPER ELEMENTS

The results of the computation of the proper elements are collected in the tables 9 and 10. Table 9 contains the results for the first-class orbits, which were exclusively used in the statistics, while table 10 contains all other results (orbits of class 2, 3 and 4 and rejected orbits). No proper elements were computed for rejected orbits with only three observations and for 10 objects of class 4 with three observations. The headings of the columns are largely self-explanatory. The column headed Ref. gives the family (if any) to which the object belongs. The numbers are the same as used by Brouwer (1951); for the new families the following numbers

© European Southern Observatory • Provided by the NASA Astrophysics Data System

1970A&AS....2..339V

were used (continuing Brouwer's sequence): 30 for Vesta, 31 for Michela, 32 for Nysa, 33 for Io, and 34 for Medea. The Flora family is denoted by 6.

After these tables were prepared it was found that Anders (1964) had given the numbers 30 and 31 to two families not listed by Brouwer, no. 30 being the Aethra family already found by Hirayama, and no. 31 being a new family introduced by Anders himself. The latter family could not be recognized in the present material, and since it was not listed by Brouwer either it is likely that it is not a real family, but only a chance concentration of objects in the a, μ, ν space. The Aethra family looks reliable, although it has only four members and no additional objects could be found (not surprising because of the large inclinations of the known members). It was decided not to renumber the newly found families and groups; if the families are designated by their usual names no confusion can result.

23. DISCUSSION

One of the aims of our program was to see whether the faint asteroids differ statistically from the bright ones. The comparison of the orbital elements shows that no clear-cut differences are apparent between the present sample and the numbered asteroids. Neither are the Kirkwood gaps different for bright and faint asteroids.

One of the results of the MDS has to be revised; there it was found that in the $\log N(g)$ statistics the number of asteroids increased monotonically with increasing g except for a discontinuity which depended on the distance to the Sun. This last conclusion was not confirmed in the present investigation; the plateau is at about $g = 11$ for all three distance groups. This shows that the cause of this plateau is independent of the distance to the Sun. The suggestion made in the MDS paper, that the discontinuity could be caused by the existence of two different classes of asteroids, original condensations and fragmentation products, does not disagree with the observations (see also Anders 1965).

No asteroids were found outside the Jupiter orbit, although the blinking was done carefully enough to find them. This means that, if such objects exist at all (note Hidalgo), they must be very rare.

The known Hirayama families (except Phocaea and some families not recognized by Brouwer) were found again in our material, together with five new families. On the other hand, the groups found by Brouwer on the basis of agreement of the value of the proper element $\pi_1 + \theta_1$ could not be confirmed. Four of such groups were recovered as families, viz. they only showed a concentration in the a, μ, ν space without having preferential values for $\beta + \gamma$. Three others are incorporated in new families in the same way. From this it follows that preferential values for $\beta + \gamma$ cannot be a fundamental property of the "group" and the question arises what meaning should be attached to it. At present it looks as if this property is irrelevant, and accordingly does not give any indication about the age of these groupings (*cf.* Brouwer 1951).

As regards a possible extension of this survey, it should be remarked that in principle the limit for obtaining reliable elements can be pushed down by one magnitude, if observations are made exactly in opposition and the complete dark-of-the-moon period is used for obtaining positions. The third-class objects in the present survey, based on a nine-day arc, were almost good enough for statistical purposes, suggesting that a small extension of the time interval probably would be sufficient. Moreover, the positional accuracy could be increased by measuring both plates of a blink pair, instead of one, as was done by us.

ACKNOWLEDGEMENTS

Thanks are due to many persons in this truly international undertaking which involved six astronomical institutes. We are indebted to Dr. G. P. Kuiper who initiated the program, to Dr. I. S. Bowen for his permission to use the 48-inch Palomar Schmidt camera, to Mr. C. Kearns for his assistance in taking the plates,

© European Southern Observatory • Provided by the NASA Astrophysics Data System

1970A&AS...2..339V

to Mr. M. L. Humason for making one observing night available (which was critical for the success of the program), to Dr. H. Kienle and Dr. H. Elsässer for their hospitality and the use of the Zeiss blink comparator of the Heidelberg Observatory, to Dr. A. Blaauw and Dr. L. Plaut for their hospitality and the use of the coordinate measuring frame at the Kapteyn Laboratory at Groningen, to Dr. Plaut again for making his determination of the photometric field effects of the Palomar Schmidt camera available prior to publication, and to Dr. W. A. Baum for permission to use his unpublished photometry of faint stars in S.A. 68. We are grateful to Dr. J. H. Oort, Mr. R. S. Le Poole, Dr. E. Roemer and Dr. B. Marsden for their comments on an earlier version of this paper. One of us (I. van Houten-Groeneveld) gratefully acknowledges financial aid by the Netherlands Organisation for the Advancement of Pure Research (Z. W. O.) and by the Leiden Kerkhoven-Bosscha Foundation.

REFERENCES

Alfvén, H. 1969, *Astrophys. Space Sci.*, **4**, 84.
Anders, E. 1964, *Space Sci. Rev.*, **3**, 583.
Anders, E. 1965, *Icarus*, **4**, 399.
Arnold, J. R. 1969, *Astr. J.*, **74**, 1235.
Brouwer, D. 1951, *Astr. J.*, **56**, 9.
Brouwer, D., Clemence, G. M. 1961, *Methods of Celestial Mechanics*, Academic Press, New York.
Brouwer, D., Woerkom, A. J. J. van 1950, *Astr. Pap. Washington*, **13**, Part 2.
Gehrels, T. 1967, *Astr. J.*, **72**, 1288.
Gehrels, T. 1968, *Trans. IAU*, **XIII B**, 120.
Gehrels, T. 1970, *Surfaces and Interiors of Planets and Satellites*, ed. A. Dollfus, Pergamon Press, London.
Hapke, B. 1963, *J. geophys. Res.*, **68**, 4571.
Herget, P. 1965, *Astr. J.*, **70**, 1.
Kiang, T. 1962, *Mon. Not. R. astr. Soc.*, **123**, 509.
Kuiper, G. P., Fujita,Y., Gehrels, T., Groeneveld, I., Kent, J., Biesbroeck, G. van, Houten, C. J. van 1958, *Astrophys. J. Suppl.*, **3**, 289.
Richter, N. 1960, *Forsch. Fortschr.*, **34**, 66.
Väisälä, Y. 1939, *Stern. Univ. Turku Informo*, no. 1.
Watson, F. G. 1956, *Between the Planets*, Harvard Univ. Press, Cambridge, Mass.

C. J. van Houten
I. van Houten-Groeneveld — Sterrewacht, Leiden 2401, The Netherlands

P. Herget — Cincinnati Observatory, Cincinnati, Ohio 45208, U. S. A.

T. Gehrels — Lunar and Planetary Laboratory, Tucson, Arizona 85721, U. S. A.

© European Southern Observatory • Provided by the NASA Astrophysics Data System

1970A&AS....2..339V

Table 7. Class 1-4 orbital elements

PL	m_0	g	M	ω (1950)	Ω (1950)	i (1950)	e	n	a (A. U.)	N	σ^2	Q
85			24°.48	119°.17	203°.36	12°.017	0.1948	817″.833	2.6600	4	0″.05	3
212			321.05	104.71	313.76	4.276	0.1081	646.153	3.1125	7	0.29	1
247			325.27	55.03	0.15	24.812	0.2453	783.856	2.7364	4	0.37	2
296	16.17	13.98	351.08	251.81	121.18	1.747	0.1596	1066.360	2.2287	7	0.15	1
319	16.06	11.54	335.12	214.22	188.71	10.869	0.2327	573.442	3.3703	12	0.67	1
355	14.40	11.44	281.77	103.86	352.28	4.283	0.1024	876.765	2.5395	9	0.65	1
356			317.23	76.87	355.40	8.273	0.2375	776.944	2.7526	9	0.15	1
406			294.21	127.29	323.86	5.089	0.1249	700.202	2.9502	4	2.43	4
449	13.94	10.88	257.04	39.54	85.54	3.086	0.1797	852.753	2.5869	4	0.03	3
641	15.78	13.62	317.59	17.20	40.77	1.719	0.1275	1072.982	2.2196	8	0.11	1
673	14.91	11.37	246.90	250.67	227.25	2.869	0.0112	751.644	2.8140	12	0.43	1
720	14.30	10.62	214.31	116.39	35.88	2.374	0.0187	723.858	2.8856	8	0.31	1
841	16.29	14.03	256.81	117.94	354.58	3.783	0.0725	1047.262	2.2558	8	0.17	1
1029	15.91	12.23	195.76	142.39	30.12	2.449	0.0290	722.840	2.8883	8	0.17	1
1045	16.73	14.20	307.36	164.00	269.71	0.259	0.1618	979.699	2.3583	10	0.81	1
1114	15.11	11.05	322.50	208.94	195.95	10.687	0.0761	651.404	3.0957	8	0.27	1
1363	16.54	12.83	43.25	103.94	215.37	1.093	0.0666	717.538	2.9025	9	0.53	1
1368	15.14	12.21	75.57	262.00	18.42	14.820	0.0527	883.554	2.5264	4	0.11	3
1439	16.76	11.51	164.42	152.31	36.21	4.188	0.1214	462.541	3.8895	4	0.59	3
1502	15.90	12.53	260.34	272.36	204.75	4.077	0.0878	786.319	2.7306	8	0.51	1
1519	16.47	12.32	4.63	335.56	16.62	12.468	0.2264	636.481	3.1439	9	0.93	1
1572	15.20	11.10	0.62	352.80	6.38	13.210	0.1963	644.598	3.1175	8	0.23	1
1590	15.41	13.22	68.20	51.47	226.46	4.347	0.1561	1065.641	2.2297	8	0.27	1
1630	16.46	12.52	220.43	93.57	55.14	4.542	0.1699	673.849	3.0266	8	0.57	1
1652	15.95	13.70	87.77	11.67	251.67	3.191	0.1491	1050.232	2.2515	8	0.21	1
1694	16.26	13.64	357.79	355.11	13.27	11.077	0.2564	958.189	2.3935	11	0.63	1
1743	16.18	13.38	181.62	354.16	189.48	6.314	0.1389	914.049	2.4699	9	0.39	1
1744	16.95	14.76	175.81	154.19	27.30	4.412	0.1212	1066.200	2.2290	8	0.47	1
1745	16.67	13.07	306.23	337.38	78.74	3.264	0.0527	740.036	2.8433	5	0.37	2
2005	16.53	13.05	29.39	15.32	316.19	1.690	0.1043	763.384	2.7851	8	0.61	1
2006	17.23	14.66	319.01	220.34	202.53	6.036	0.1003	970.524	2.3731	9	0.82	1
2007	17.15	14.36	337.97	161.78	238.57	2.354	0.1917	915.349	2.4676	8	0.07	1
2008	17.34	10.65	3.83	167.58	197.22	16.802	0.1101	300.302	5.1875	8	0.87	1
2009	16.87	14.20	337.22	173.95	219.48	5.307	0.0579	943.844	2.4177	7	0.09	1
2010	17.07	14.41	354.70	126.34	248.61	3.816	0.0901	947.985	2.4106	8	0.39	1
2011	17.06	13.30	82.35	84.78	197.23	7.408	0.0835	708.303	2.9276	10	1.13	1
2012	19.48	16.12	352.62	24.16	356.75	8.241	0.3026	787.319	2.7283	8	0.21	1
2013	18.49	16.39	30.49	345.37	333.81	4.065	0.2248	1089.223	2.1974	8	0.41	1
2014	18.47	16.10	25.18	337.62	356.91	7.724	0.1323	1020.217	2.2954	8	0.25	1
2015	17.00	13.83	264.07	119.03	1.02	7.759	0.1255	829.159	2.6358	8	0.47	1
2016	18.26	14.78	27.70	134.11	198.24	6.529	0.1468	762.487	2.7872	6	0.87	1
2017	18.31	16.10	33.84	54.46	262.43	2.253	0.2183	1062.150	2.2346	7	0.31	1
2018	17.50	15.14	74.22	293.44	349.74	5.880	0.1113	1022.779	2.2916	8	0.65	1
2019	17.61	15.22	248.81	270.11	220.81	3.207	0.1201	1014.989	2.3033	9	0.45	1
2020	18.83	15.82	338.59	59.48	343.09	5.120	0.2434	865.685	2.5611	8	0.27	1
2021	18.80	15.78	324.23	204.59	211.14	8.287	0.1498	862.593	2.5672	8	0.47	1
2022	18.16	14.72	80.01	292.21	352.30	5.086	0.0417	772.228	2.7638	8	0.37	1
2023	18.59	14.56	38.68	353.99	323.93	0.628	0.1558	656.296	3.0803	9	0.45	1
2024	17.32	15.03	186.28	189.70	354.69	4.701	0.0842	1040.409	2.2657	8	0.35	1
2025	17.58	13.36	119.75	232.93	359.02	9.530	0.1956	623.424	3.1877	7	0.77	1

© European Southern Observatory • Provided by the NASA Astrophysics Data System

1970A&AS....2..339V

Table 7 (*continued*)

PL	m_0	g	M	ω (1950)	Ω (1950)	i (1950)	e	n	a (A. U.)	N	σ^2	Q
			°	°	°	°		″			″	
2026	18.73	15.36	23.45	6.74	334.61	6.184	0.0863	785.329	2.7329	8	1.81	1
2027	19.43	16.72	345.18	108.34	281.50	1.503	0.2064	935.913	2.4313	8	0.35	1
2028	19.13	17.24	30.19	336.30	344.47	1.991	0.2090	1145.837	2.1245	8	0.23	1
2029	19.44	16.96	347.99	93.40	292.38	1.198	0.2156	992.088	2.3386	8	0.21	1
2030	19.28	17.31	23.96	107.20	223.58	4.295	0.2077	1125.738	2.1497	7	1.57	1
2032	19.43	16.36	348.14	41.71	343.53	4.185	0.1556	852.137	2.5882	8	0.57	1
2033	18.95	13.56	290.48	233.50	224.20	3.530	0.1675	444.361	3.9949	8	0.71	1
2034	18.18	15.86	173.87	281.41	271.71	3.665	0.1368	1032.037	2.2779	8	0.59	1
2035	20.21	17.58	16.83	49.69	291.54	1.932	0.1915	953.453	2.4014	9	0.33	1
2036	20.88	17.84	349.42	157.72	227.31	3.005	0.2650	857.829	2.5767	8	0.69	1
2037	18.56	14.30	97.17	252.99	2.16	18.384	0.1612	617.264	3.2089	8	0.19	1
2038	18.90	16.58	241.34	266.98	225.97	5.947	0.0586	1032.245	2.2776	8	0.49	1
2039	20.42	17.30	341.71	188.16	213.33	4.809	0.3023	841.164	2.6106	8	0.31	1
2040	19.96	17.86	13.60	342.15	0.69	4.823	0.2439	1090.774	2.1954	8	0.17	1
2041	19.16	15.92	78.43	284.99	0.41	14.787	0.0538	814.933	2.6663	7	0.45	1
2042	18.75	16.14	246.09	256.41	231.29	4.739	0.0435	958.493	2.3930	6	0.71	1
2043	19.25	16.46	53.21	293.48	354.27	5.854	0.2529	916.210	2.4660	8	0.25	1
2044	18.13	15.96	132.20	241.67	349.73	3.876	0.0642	1070.777	2.2226	8	0.19	1
2045	20.26	18.04	346.86	23.26	3.70	6.763	0.2130	1058.477	2.2398	8	2.65	1
2046	20.16	17.06	349.06	95.26	289.04	2.907	0.1621	844.907	2.6029	8	1.15	1
2047	19.41	17.29	41.16	314.05	4.43	6.655	0.0974	1084.413	2.2039	8	1.77	1
2048	18.59	15.50	94.69	289.90	320.99	3.868	0.2334	846.801	2.5990	8	0.71	1
2049	19.17	16.68	272.88	140.88	325.51	3.650	0.0840	989.559	2.3426	8	0.79	1
2050	19.72	17.11	356.92	134.87	237.22	1.276	0.2228	959.721	2.3909	8	0.15	1
2051	19.21	16.46	61.53	40.08	247.70	2.571	0.1846	926.130	2.4484	8	0.51	1
2052	19.35	17.08	5.04	157.69	202.93	5.913	0.1669	1045.435	2.2584	6	0.25	1
2053	18.21	14.95	138.08	358.93	223.56	3.159	0.1600	808.769	2.6799	7	0.15	1
2054	18.06	15.64	168.57	332.87	226.58	4.811	0.1563	1006.172	2.3168	7	0.85	1
2055	18.78	16.23	128.43	244.82	344.58	8.840	0.1377	974.739	2.3663	7	0.37	1
2056	18.54	14.79	177.88	344.92	205.74	12.276	0.1210	708.811	2.9262	8	0.63	1
2057	20.30	17.88	354.57	44.16	330.43	4.715	0.1630	1006.989	2.3155	8	0.85	1
2058	18.80	15.59	81.88	6.07	277.44	2.183	0.0351	820.942	2.6533	8	0.17	1
2059	18.90	16.12	140.76	225.70	357.28	5.485	0.0563	919.013	2.4610	8	0.55	1
2060	18.68	16.44	152.55	256.92	314.10	2.988	0.0984	1052.618	2.2481	7	0.53	1
2061	18.38	15.84	128.33	267.18	320.58	4.956	0.1773	975.924	2.3644	8	0.69	1
2062	19.25	16.66	32.04	325.06	3.93	10.228	0.1105	963.108	2.3853	8	0.51	1
2063	20.12	17.50	322.56	210.14	216.49	3.580	0.2364	956.300	2.3966	8	0.51	1
2064	18.82	14.62	234.10	204.81	299.10	3.549	0.1011	626.665	3.1767	9	0.37	1
2065	19.43	15.36	66.31	9.15	278.22	4.421	0.1404	650.268	3.0993	8	0.49	1
2066	19.88	16.88	8.64	350.39	4.32	11.308	0.1786	867.280	2.5579	8	0.51	1
2067	19.51	16.12	76.51	292.39	336.91	3.303	0.2197	782.863	2.7387	6	1.03	1
2068	19.57	16.16	11.26	38.18	318.26	4.165	0.0903	778.132	2.7498	8	0.95	1
2069	20.10	16.84	326.73	166.60	248.57	2.609	0.1731	809.652	2.6779	8	0.49	1
2070	19.17	15.72	95.76	277.00	351.79	5.005	0.0353	769.382	2.7706	8	0.51	1
2071	19.71	16.49	38.87	104.39	218.01	2.134	0.0997	817.219	2.6614	7	0.43	1
2072	19.47	17.06	276.80	115.51	352.97	6.652	0.1472	1010.289	2.3105	7	0.49	1
2073	19.57	16.54	285.70	250.15	213.86	2.837	0.1818	861.187	2.5700	7	0.35	1
2074	19.40	16.97	289.99	209.11	239.11	2.518	0.0918	1003.092	2.3215	8	0.39	1
2075	19.92	16.84	302.89	81.09	353.92	3.821	0.0978	849.615	2.5933	8	0.55	1
2076	18.47	16.15	351.99	167.25	213.01	6.631	0.2174	1033.412	2.2759	6	0.45	1

© European Southern Observatory • Provided by the NASA Astrophysics Data System

1970A&AS....2..339V

Table 7 (*continued*)

PL	m_0	g	M	ω (1950)	Ω (1950)	i (1950)	e	n	a (A. U.)	N	σ^2	Q
2077	17.34	15.10	96°.88	278°.72	340°.05	3°.391	0.1341	1052".616	2.2481	6	0".43	1
2078	17.90	14.90	310.16	79.55	354.65	7.039	0.1377	866.675	2.5591	6	0.43	1
2079	18.51	14.98	318.84	79.10	338.82	4.865	0.0701	753.832	2.8085	7	0.43	1
2080	19.64	17.50	354.34	80.24	294.24	2.247	0.1992	1080.639	2.2091	8	0.31	1
2081	20.11	17.10	18.47	71.12	264.88	3.208	0.2490	865.363	2.5617	8	0.23	1
2082	19.09	16.82	34.79	64.77	254.69	3.726	0.1608	1045.602	2.2581	7	0.75	1
2083	19.39	16.33	320.21	197.48	232.39	3.142	0.2338	853.393	2.5856	8	0.47	1
2084	19.02	17.10	35.26	347.93	334.83	1.057	0.1338	1138.116	2.1340	7	0.31	1
2085	19.23	15.52	261.06	193.24	279.35	0.999	0.0277	716.740	2.9046	7	0.17	1
2086	19.48	16.44	330.79	138.61	269.63	2.883	0.1740	859.198	2.5740	8	0.19	1
2087	19.53	15.74	16.84	141.26	207.93	11.412	0.0714	701.910	2.9454	7	0.61	1
2088	19.51	16.02	303.21	121.31	309.71	3.351	0.0465	761.642	2.7893	8	0.95	1
2089	19.38	16.76	300.88	218.08	227.43	2.347	0.1736	957.224	2.3951	8	0.23	1
2090	19.32	15.66	1.90	44.10	321.73	4.881	0.0870	727.600	2.8756	6	0.15	1
2091	18.95	16.52	348.85	132.42	248.40	3.515	0.1159	1003.489	2.3209	6	0.19	1
2092	18.29	15.08	30.93	5.67	324.07	5.191	0.1226	821.104	2.6530	7	1.85	1
2093	18.08	14.14	83.28	67.92	214.31	8.957	0.0531	672.984	3.0292	7	0.65	1
2094	20.27	17.94	2.12	16.58	348.48	1.551	0.1336	1030.231	2.2805	6	0.65	1
2095	19.70	16.53	295.75	116.70	330.06	2.528	0.1280	829.073	2.6359	8	0.59	1
2096	18.50	15.90	329.07	205.42	200.59	2.910	0.1180	960.842	2.3891	9	0.69	1
2097	18.93	14.97	36.11	134.61	194.95	7.631	0.0484	670.325	3.0372	10	1.83	1
2098	17.29	14.13	10.27	156.84	192.01	11.881	0.2613	832.059	2.6296	9	1.03	1
2099	17.78	15.48	202.70	331.64	198.99	5.749	0.1157	1037.782	2.2695	8	1.11	1
2100	18.92	15.30	94.44	72.08	193.15	16.794	0.0751	734.575	2.8574	9	1.05	1
2101	19.75	16.45	24.86	120.36	216.34	5.010	0.1016	800.799	2.6976	9	0.27	1
2102	19.21	16.82	48.09	324.10	335.76	3.919	0.1857	1014.915	2.3034	10	1.29	1
2103	18.07	14.86	148.91	353.34	218.30	3.019	0.1395	819.623	2.6562	9	0.53	1
2104	19.11	15.00	33.08	123.08	195.80	26.378	0.1993	642.596	3.1240	8	0.17	1
2105	19.60	17.43	22.21	353.27	341.71	6.971	0.1769	1070.893	2.2224	4	0.09	4
2106	19.69	16.68	43.27	93.24	220.99	6.373	0.1200	864.829	2.5628	6	0.39	1
2107	18.97	16.67	102.87	11.70	243.48	4.937	0.1479	1038.610	2.2683	6	1.38	1
2108	21.92	19.50	11.71	4.96	344.04	2.617	0.3846	1004.907	2.3187	6	0.57	1
2109	19.76	17.22	14.06	137.72	209.05	3.210	0.1656	977.049	2.3626	8	0.45	1
2110	19.91	16.78	35.29	21.49	299.76	1.919	0.1464	838.787	2.6155	6	0.35	1
2112	18.38	17.14	239.53	135.74	4.59	25.657	0.1294	1332.783	1.9208	4	0.13	4
2113	20.62	17.48	18.06	113.17	228.37	2.791	0.1762	836.862	2.6196	4	0.19	4
2114	19.60	16.90	25.52	134.98	203.97	4.808	0.0595	938.511	2.4268	7	0.31	1
2115	19.11	15.35	163.94	347.87	213.99	6.411	0.1488	708.640	2.9267	3	0.00	4
2116	20.03	16.67	345.83	162.10	225.67	6.729	0.1408	788.834	2.7248	7	3.11	1
2117	19.79	16.46	2.64	94.41	270.74	1.214	0.0759	794.857	2.7111	5	0.39	2
2119	19.95	17.42	14.34	137.06	211.47	6.320	0.1397	978.088	2.3609	7	1.33	1
2120	19.68	17.36	60.02	85.88	214.78	6.506	0.1298	1032.390	2.2774	6	0.72	1
2121	20.11	16.98	315.53	63.33	6.62	14.589	0.1849	837.220	2.6188	8	0.73	1
2122	20.39	18.16	28.70	335.35	347.42	4.901	0.2185	1056.347	2.2428	6	0.35	1
2123	19.88	15.61	39.39	336.60	344.05	7.800	0.1270	614.932	3.2170	4	0.25	4
2124	19.49	15.48	35.38	331.82	353.50	11.006	0.1261	660.432	3.0675	6	0.57	1
2125	19.33	16.64	16.14	9.41	342.43	6.172	0.1836	939.776	2.4246	5	0.54	2
2126	17.24	14.46	281.10	112.45	341.42	7.199	0.0462	917.439	2.4638	6	1.03	1
2127	20.48	16.50	18.89	26.78	315.67	2.563	0.1696	666.786	3.0479	5	0.07	2
2128	20.64	17.21	320.73	128.12	299.32	1.934	0.2178	773.041	2.7618	4	0.25	4

© European Southern Observatory • Provided by the NASA Astrophysics Data System

1970A&AS....2..339V

Table 7 (*continued*)

PL	m_0	g	M	ω (1950)	Ω (1950)	i (1950)	e	n	a (A. U.)	N	σ^2	Q
2129	19.28	16.46	255°.77	281°.51	201°.04	5°.545	0.0888	909″.739	2.4777	7	0″.35	1
2130	19.00	15.01	33.03	325.66	352.48	9.868	0.2312	664.826	3.0539	6	0.29	1
2131	20.39	17.90	349.23	57.37	324.68	1.798	0.1430	990.306	2.3414	6	0.27	1
2132	19.72	16.77	39.05	319.47	356.12	11.481	0.1707	878.092	2.5369	4	0.45	4
2133	18.62	15.33	298.91	100.61	357.98	16.133	0.2378	803.888	2.6907	4	1.13	4
2134	19.65	16.34	324.24	82.87	335.60	3.047	0.1727	799.967	2.6995	5	0.07	1
2135	20.59	18.55	11.56	17.22	333.73	2.432	0.1586	1105.166	2.1763	3	0.00	4
2136	21.17	17.98	341.73	34.99	6.25	12.307	0.2949	824.451	2.6458	6	0.17	1
2138	19.70	16.67	306.70	199.38	236.83	3.583	0.1327	861.061	2.5702	8	0.99	1
2139	20.71	17.50	350.45	20.31	2.64	12.139	0.1919	820.100	2.6551	5	0.75	1
2140	17.56	14.15	8.88	0.41	354.55	10.108	0.2226	777.750	2.7507	4	0.13	4
2142	17.85	14.35	314.63	242.02	193.36	7.379	0.2140	758.839	2.7962	9	1.85	1
2147	19.55	16.09	339.06	45.92	359.66	9.776	0.2619	767.002	2.7763	4	0.23	4
2148	19.20	15.14	77.58	272.22	5.28	4.685	0.1389	652.492	3.0923	6	0.35	1
2153	20.82	18.75	18.00	38.31	296.45	1.284	0.2605	1097.768	2.1860	7	0.27	1
2154	19.17	15.68	286.31	253.44	202.98	12.881	0.1053	761.055	2.7907	5	0.65	2
2155	18.98	14.88	28.26	28.05	302.37	0.890	0.1773	644.376	3.1182	5	0.15	2
2156	19.70	15.65	11.98	159.20	193.99	11.364	0.1667	653.394	3.0895	4	0.33	4
2157	18.64	14.39	311.39	238.44	193.56	21.032	0.1305	617.658	3.2075	4	0.25	4
2158	18.71	15.98	299.76	235.17	205.72	5.984	0.1007	930.514	2.4407	6	0.19	1
2159	16.88	11.58	315.58	89.05	343.70	5.610	0.1645	456.079	3.9262	4	0.51	4
2160	19.11	16.59	22.43	113.65	222.20	4.582	0.1945	980.986	2.3562	3	0.00	4
2161	20.19	17.39	353.41	28.70	350.78	6.413	0.2007	914.376	2.4693	3	0.00	4
2162	19.55	16.98	334.61	182.13	216.98	3.901	0.0695	969.964	2.3741	3	0.00	4
2164	18.16	15.50	20.54	48.49	290.89	2.195	0.1874	946.166	2.4137	5	0.17	1
2165	16.95	13.68	35.49	122.45	200.02	17.217	0.1600	808.638	2.6802	3	0.00	4
2168	20.07	17.70	336.58	43.70	357.36	5.378	0.1559	1020.395	2.2952	6	0.23	1
2169	19.44	16.92	226.31	152.03	356.76	6.723	0.0558	981.237	2.3558	6	0.83	1
2170	20.47	18.01	352.17	85.51	294.12	2.713	0.2064	996.136	2.3323	7	0.17	1
2171	20.20	16.99	315.40	191.06	233.51	4.230	0.1215	821.328	2.6525	4	0.03	4
2172	20.42	16.36	14.28	1.05	345.16	9.572	0.2078	653.089	3.0904	3	0.00	4
2175	19.50	16.38	83.57	283.47	352.49	4.497	0.0844	839.200	2.6147	6	1.13	1
2177	20.29	16.40	312.29	195.60	247.82	1.273	0.2548	682.626	3.0006	6	0.27	1
2179	19.56	16.21	255.24	127.41	359.68	15.798	0.1093	790.096	2.7219	4	0.27	4
2182	20.42	16.28	15.04	350.46	359.62	4.197	0.1501	638.023	3.1389	4	0.11	2
2184	18.79	15.75	169.21	350.70	206.07	11.881	0.1716	858.539	2.5753	4	0.47	2
2185	19.76	17.45	290.28	108.70	347.10	7.147	0.1616	1034.610	2.2741	5	0.29	2
2186	18.54	15.67	183.40	185.28	2.32	19.181	0.2628	899.103	2.4972	3	0.00	4
2187	19.01	15.69	223.51	212.94	309.50	5.257	0.1833	796.503	2.7073	5	0.86	4
2188	20.29	17.86	337.80	112.22	286.64	2.154	0.1699	1003.752	2.3205	8	0.73	1
2189	19.35	15.24	134.88	221.90	7.29	17.719	0.0819	643.608	3.1207	5	0.37	1
2191	19.81	15.92	274.25	102.83	358.31	11.052	0.0413	683.194	2.9989	6	0.65	1
2194	19.55	16.16	338.73	38.21	358.92	15.094	0.1289	782.227	2.7402	4	0.11	4
2196	18.59	16.28	287.02	172.99	283.69	1.343	0.1495	1035.399	2.2730	8	0.31	1
2197	17.56	14.75	66.44	88.61	193.85	4.205	0.1702	910.111	2.4770	9	0.43	1
2198	18.93	15.78	199.68	175.61	359.77	18.973	0.1710	834.252	2.6250	4	0.15	4
2200	19.36	16.43	30.32	49.27	269.28	2.835	0.2339	882.405	2.5286	7	0.13	1
2201	19.79	15.57	51.41	298.40	10.29	4.444	0.1069	623.026	3.1890	7	2.21	1
2202	18.69	15.92	123.74	247.04	342.10	7.040	0.1816	920.300	2.4587	7	5.31	2
2203	20.09	17.88	34.99	98.99	218.62	3.614	0.1686	1061.290	2.2358	5	0.47	4

© European Southern Observatory • Provided by the NASA Astrophysics Data System

1970A&AS....2..339V

Table 7 (*continued*)

PL	m_0	g	M	ω (1950)	Ω (1950)	i (1950)	e	n	a (A. U.)	N	σ^2	Q
			°	°	°	°		″			″	
2204	19.06	16.74	291.73	105.17	343.76	6.201	0.1216	1032.057	2.2779	5	0.09	2
2205	19.75	17.36	9.54	159.06	188.52	3.386	0.2985	1013.491	2.3056	4	1.25	4
2206	18.97	15.88	266.25	284.42	192.62	5.281	0.1218	846.544	2.5995	7	0.59	1
2207	18.38	15.82	220.07	176.24	334.32	6.125	0.0452	972.095	2.3706	6	2.37	2
2208	20.31	17.18	316.07	210.68	225.39	4.513	0.2566	837.104	2.6191	11	1.51	1
2209	19.83	17.25	12.85	4.15	345.54	7.646	0.1342	966.142	2.3803	4	0.03	2
2210	20.69	19.04	0.53	97.65	266.21	0.982	0.1748	1214.989	2.0431	4	0.23	4
2503	17.84	14.86	312.95	57.32	7.68	15.008	0.1078	870.748	2.5511	8	2.03	1
2504	19.54	15.62	337.41	28.52	7.56	9.488	0.0900	676.693	3.0181	8	0.77	1
2505	18.98	16.32	327.74	46.15	4.52	6.583	0.1619	946.714	2.4128	9	0.37	1
2506	19.35	16.12	29.83	314.02	7.43	11.964	0.2087	816.297	2.6634	11	0.59	1
2507	18.99	16.67	297.10	80.55	2.09	5.771	0.1213	1031.789	2.2783	10	1.11	1
2508	18.84	16.38	3.66	350.18	9.88	6.378	0.2494	996.646	2.3315	8	0.33	1
2509	17.41	14.48	9.81	340.91	12.13	4.863	0.1949	883.398	2.5267	8	0.53	1
2510	16.26	13.64	357.79	355.11	13.27	11.077	0.2564	958.189	2.3935	11	0.63	1
2511	18.56	17.22	309.27	54.70	12.94	20.777	0.1076	1303.817	1.9492	5	0.07	1
2512	19.11	15.98	59.20	317.78	348.86	1.447	0.0251	837.394	2.6184	10	1.17	1
2513	20.43	16.34	325.09	68.76	354.10	1.736	0.2320	645.506	3.1146	8	1.79	1
2514	20.57	17.35	26.45	320.00	8.90	11.893	0.1824	817.704	2.6603	7	0.45	1
2515	20.27	17.66	357.31	4.47	5.45	6.566	0.1348	960.326	2.3899	8	0.27	1
2516	20.08	16.66	359.48	1.70	6.50	9.471	0.1813	776.729	2.7531	8	0.45	1
2517	16.63	13.23	322.06	46.07	13.48	2.055	0.1779	779.485	2.7466	8	0.21	1
2519	17.03	12.88	28.84	129.76	189.83	13.797	0.2628	635.229	3.1481	8	0.71	1
2520	16.08	12.00	255.16	298.93	177.04	9.404	0.0245	648.990	3.1034	8	0.19	1
2521	16.34	13.32	308.80	341.41	87.90	2.228	0.1070	861.960	2.5685	8	0.35	1
2522	16.45	12.70	31.18	231.41	99.49	3.260	0.0967	709.036	2.9256	7	0.19	1
2523	17.82	13.64	328.51	277.74	133.86	2.978	0.1867	629.793	3.1662	8	0.49	1
2524	17.40	14.48	342.99	202.81	187.37	4.181	0.1676	885.667	2.5224	8	0.31	1
2525	17.32	13.11	16.29	292.48	52.50	2.548	0.1406	624.876	3.1827	8	0.29	1
2526	17.71	15.65	15.13	156.90	185.85	2.546	0.1917	1100.591	2.1823	8	0.27	1
2527	18.61	14.41	341.05	214.22	185.58	15.029	0.2685	626.565	3.1770	8	0.31	1
2528	16.80	13.13	66.73	244.30	51.40	2.676	0.0430	725.970	2.8800	8	0.19	1
2529	17.17	13.41	98.24	174.53	90.10	3.048	0.0513	707.422	2.9301	7	0.35	1
2530	18.00	15.66	320.24	35.21	22.61	4.694	0.1303	1026.110	2.2867	8	0.37	1
2531	18.40	15.39	0.17	184.18	182.90	6.790	0.2192	865.422	2.5616	6	0.33	1
2532	18.88	14.83	30.94	125.65	190.56	8.450	0.2580	653.734	3.0884	8	0.31	1
2533	18.24	16.20	31.08	198.19	119.62	1.650	0.2153	1105.187	2.1762	8	0.21	1
2534	18.28	14.06	0.76	307.97	59.43	0.595	0.1559	622.775	3.1899	7	0.21	1
2535	18.06	13.88	29.38	188.79	138.59	2.232	0.1662	629.803	3.1661	7	12.73	1
2536	17.83	15.49	28.63	305.00	21.35	7.373	0.1536	1028.437	2.2832	8	0.11	1
2537	18.97	16.39	14.29	316.88	26.69	5.225	0.2038	967.049	2.3788	8	0.11	1
2538	17.31	14.97	135.41	200.04	26.08	8.301	0.0648	1027.315	2.2849	8	0.21	1
2540	17.90	14.50	298.79	265.59	185.42	7.002	0.1917	779.360	2.7469	8	0.21	1
2541	18.90	16.23	11.11	320.40	29.31	1.034	0.2163	945.375	2.4151	6	0.45	1
2542	18.83	16.32	351.15	330.56	50.06	3.698	0.2317	983.640	2.3520	7	0.37	1
2543	19.80	16.36	29.25	299.89	12.50	5.874	0.3001	771.729	2.7650	9	0.23	1
2544	20.03	16.20	4.22	352.79	9.08	11.614	0.1141	693.924	2.9679	9	1.01	1
2545	18.82	15.38	1.40	352.57	11.33	9.550	0.1703	770.740	2.7673	11	0.33	1
2546	18.24	15.18	297.10	254.01	185.85	14.760	0.0959	853.256	2.5859	8	0.23	1
2547	19.32	15.10	21.62	257.92	75.97	2.520	0.1969	623.285	3.1882	8	0.31	1

© European Southern Observatory • Provided by the NASA Astrophysics Data System

1970A&AS....2..339V

Table 7 (*continued*)

PL	m_0	g	M	ω (1950)	Ω (1950)	i (1950)	e	n	a (A. U.)	N	σ^2	Q
			°	°	°	°		″			″	
2548	18.11	14.00	99.65	146.98	105.22	2.174	0.1416	643.136	3.1222	8	0.15	1
2549	18.51	14.94	279.76	284.69	167.38	2.112	0.0394	744.630	2.8316	8	0.29	1
2550	18.55	16.16	59.44	226.54	57.18	2.135	0.2039	1015.599	2.3024	7	0.21	1
2551	18.36	14.76	42.75	290.38	25.61	1.756	0.0991	738.943	2.8461	8	1.31	1
2552	17.78	15.04	188.70	54.00	125.45	2.482	0.0909	927.002	2.4469	8	0.37	1
2553	18.28	14.18	320.66	65.34	355.28	0.601	0.1580	643.806	3.1200	8	0.17	1
2554	19.20	13.84	332.76	0.92	50.54	3.538	0.2377	447.615	3.9755	8	0.11	1
2555	19.33	15.22	349.50	195.41	188.62	2.420	0.2109	643.293	3.1217	8	0.15	1
2556	18.72	14.54	334.75	22.54	23.11	10.695	0.2157	629.996	3.1655	8	0.27	1
2557	17.55	15.24	103.00	233.34	14.24	4.809	0.1687	1036.159	2.2718	8	0.13	1
2558	18.62	14.48	313.71	51.39	18.95	5.161	0.1581	637.766	3.1397	8	0.23	1
2559	17.94	15.60	205.88	91.94	74.32	2.742	0.0944	1026.175	2.2866	8	0.23	1
2560	18.90	15.22	40.89	140.26	183.79	1.086	0.0593	724.085	2.8849	7	0.37	1
2561	17.97	14.64	188.06	157.06	23.92	13.116	0.0650	794.887	2.7110	8	0.35	1
2562	17.48	15.08	188.45	139.20	43.85	1.489	0.1572	1011.878	2.3080	7	0.77	1
2563	17.92	13.70	88.89	112.89	150.11	1.716	0.1616	623.559	3.1872	7	0.37	1
2564	19.31	16.20	327.99	10.23	34.73	2.669	0.1012	841.824	2.6093	8	0.47	1
2565	19.09	16.38	41.61	299.70	23.31	4.838	0.0200	934.291	2.4341	8	0.61	1
2566	19.20	16.47	314.32	239.51	190.09	1.944	0.1825	930.262	2.4411	8	0.21	1
2567	19.39	15.82	342.90	7.23	19.65	2.247	0.0703	744.143	2.8329	8	0.55	1
2568	19.39	15.88	338.00	28.01	6.28	3.363	0.0996	757.537	2.7994	8	0.23	1
2569	19.66	17.12	349.86	6.81	14.04	9.626	0.2084	975.751	2.3647	9	0.29	1
2570	18.29	14.12	120.36	59.75	176.61	5.721	0.1286	632.399	3.1575	7	0.15	1
2571	19.07	15.80	359.89	182.08	185.35	7.232	0.1239	806.763	2.6843	8	0.29	1
2572	18.52	16.31	256.54	112.76	9.37	2.692	0.1022	1059.998	2.2377	8	0.39	1
2573	19.54	16.54	25.95	300.12	25.82	4.510	0.2186	866.330	2.5598	8	0.09	1
2574	18.83	14.66	263.01	101.51	12.76	22.275	0.0794	632.646	3.1566	8	0.41	1
2575	18.41	14.71	147.55	144.65	71.12	3.408	0.0873	720.178	2.8954	8	0.85	1
2576	19.26	16.76	63.71	250.79	27.09	5.071	0.2259	986.984	2.3467	8	0.21	1
2577	18.72	16.04	71.74	293.48	349.20	0.546	0.1245	941.628	2.4215	9	0.79	1
2578	17.79	14.52	270.70	299.32	183.49	3.903	0.2172	806.548	2.6848	8	0.63	1
2579	18.32	15.95	108.61	215.22	26.77	7.931	0.1684	1019.825	2.2960	8	0.23	1
2580	17.89	15.32	216.74	99.88	60.75	2.966	0.1526	969.492	2.3748	8	0.23	1
2581	19.98	16.30	13.31	257.06	95.63	3.169	0.0714	723.369	2.8869	7	0.53	1
2582	19.59	16.90	323.74	25.49	30.13	3.342	0.1486	940.944	2.4226	8	5.49	1
2583	19.25	15.50	61.95	241.98	56.73	2.958	0.0777	710.140	2.9226	7	0.55	1
2584	20.36	17.25	27.18	130.53	194.49	2.390	0.2082	843.051	2.6067	8	0.31	1
2585	20.18	16.74	329.16	40.97	10.61	9.697	0.1976	772.328	2.7635	10	1.01	1
2586	20.11	17.62	335.61	233.49	165.64	2.574	0.1630	990.349	2.3414	8	0.69	1
2587	19.80	16.40	1.84	174.77	189.69	3.924	0.1145	780.067	2.7452	8	0.13	1
2588	19.15	16.72	274.67	93.54	17.84	6.188	0.1733	1003.889	2.3203	11	0.23	1
2589	18.64	15.54	211.27	18.40	145.10	3.220	0.1492	845.571	2.6015	8	0.47	1
2590	19.07	16.35	73.16	263.21	10.93	4.687	0.1727	931.848	2.4384	8	0.97	1
2591	19.65	16.14	325.02	231.94	179.90	4.848	0.1280	758.026	2.7982	8	0.27	1
2592	18.65	15.88	112.16	69.73	176.46	5.291	0.0882	921.214	2.4571	7	0.67	1
2593	20.44	18.00	25.24	306.88	16.46	0.210	0.2560	1001.305	2.3243	8	0.19	1
2594	19.21	15.51	71.76	142.13	148.84	2.499	0.0445	719.846	2.8963	8	0.15	1
2595	20.09	17.11	19.80	311.35	25.28	3.129	0.1979	870.992	2.5507	8	0.69	1
2596	19.83	15.69	317.50	2.33	67.03	1.863	0.2044	637.548	3.1404	8	0.29	1
2597	20.42	18.00	16.19	314.99	22.54	7.413	0.2531	1007.979	2.3140	8	0.57	1

© European Southern Observatory • Provided by the NASA Astrophysics Data System

1970A&AS....2..339V

Table 7 (*continued*)

PL	m_0	g	M	ω (1950)	Ω (1950)	i (1950)	e	n	a (A. U.)	N	σ^2	Q
			°	°	°	°		″			″	
2598	19.09	15.60	205.69	130.15	31.04	4.689	0.0100	760.583	2.7919	7	0.33	1
2599	19.47	16.55	292.03	256.07	193.39	7.008	0.1296	886.256	2.5213	8	0.61	1
2600	19.87	17.17	12.76	157.23	190.46	1.248	0.1699	936.452	2.4304	8	0.33	1
2601	19.39	15.10	79.23	226.47	54.54	2.837	0.0700	611.572	3.2287	7	0.23	1
2602	19.95	15.90	313.95	11.26	62.22	2.866	0.1978	653.234	3.0900	8	1.13	1
2603	20.39	17.83	314.77	274.81	155.45	2.876	0.1883	971.999	2.3707	7	0.37	1
2604	18.37	15.90	114.99	225.82	7.94	3.069	0.1950	995.090	2.3339	10	0.85	1
2605	17.97	14.70	29.85	309.05	10.93	3.777	0.2192	808.484	2.6805	9	0.65	1
2606	19.07	16.51	21.52	130.25	203.73	2.001	0.1886	970.979	2.3724	7	0.33	1
2607	18.78	15.40	330.69	217.62	192.36	6.202	0.2024	785.028	2.7336	8	0.17	1
2608	18.88	14.86	7.55	338.51	17.97	10.556	0.1078	658.825	3.0724	8	0.17	1
2609	20.57	18.37	46.26	265.01	35.69	2.769	0.1876	1063.072	2.2333	4	0.07	4
2610	19.21	16.28	351.21	199.96	178.28	3.033	0.1862	883.661	2.5262	8	0.29	1
2611	18.26	14.09	63.51	113.70	179.95	5.416	0.0893	631.400	3.1608	9	0.53	1
2612	20.13	15.90	357.00	168.50	202.90	2.331	0.2230	620.949	3.1962	8	0.35	1
2613	19.63	15.50	321.77	223.53	192.73	4.498	0.1349	639.509	3.1340	8	0.47	1
2614	20.09	16.93	13.48	164.02	184.26	3.202	0.1464	831.338	2.6311	8	0.31	1
2615	19.75	16.33	43.69	272.28	35.77	5.302	0.1582	774.928	2.7573	7	0.55	1
2617	20.91	18.45	341.10	239.60	154.93	2.088	0.1989	997.920	2.3295	8	0.69	1
2618	18.91	15.92	94.77	71.78	181.83	3.028	0.1879	869.672	2.5532	8	0.95	1
2620	18.50	15.46	176.72	162.74	29.45	1.641	0.1144	857.059	2.5782	7	0.41	1
2621	19.94	17.61	34.89	302.63	18.54	7.632	0.1382	1028.598	2.2830	6	0.57	1
2622	19.19	15.00	251.05	342.01	152.46	1.559	0.1573	627.947	3.1724	8	0.31	1
2623	20.06	17.04	14.32	335.32	13.81	14.943	0.1150	861.556	2.5693	8	0.75	1
2624	20.06	17.48	32.42	196.44	122.91	2.095	0.1971	965.944	2.3806	8	0.43	1
2625	20.25	17.16	351.00	234.22	145.98	2.568	0.1916	847.976	2.5966	8	0.27	1
2626	18.75	14.84	132.20	75.04	153.96	1.912	0.0946	680.101	3.0080	7	0.25	1
2627	19.64	16.20	316.48	41.77	22.23	5.960	0.1350	772.309	2.7636	8	0.33	1
2629	19.82	15.90	345.19	10.48	13.74	1.872	0.0689	676.644	3.0183	8	0.53	1
2630	18.62	15.93	331.90	11.76	33.41	3.119	0.1877	938.829	2.4263	9	0.63	1
2631	18.28	14.09	319.78	23.42	36.85	1.584	0.1616	629.047	3.1687	9	0.47	1
2632	19.49	15.63	10.75	330.66	18.55	1.209	0.2039	688.055	2.9848	10	0.23	1
2633	19.15	16.75	324.79	242.65	169.06	3.214	0.1511	1011.275	2.3090	10	0.43	1
2634	20.86	16.92	358.37	180.78	187.67	8.461	0.2743	674.364	3.0251	10	1.05	1
2635	18.51	16.19	86.58	71.77	189.88	3.136	0.1559	1032.106	2.2778	11	0.67	1
2636	18.49	16.06	100.08	79.19	166.70	2.837	0.1867	1004.880	2.3187	9	0.61	1
2637	19.59	16.58	318.39	220.96	199.39	1.921	0.1435	866.041	2.5604	9	0.51	1
2638	20.04	17.04	6.00	165.89	189.63	1.969	0.2255	867.787	2.5569	8	0.17	1
2642	17.49	15.29	124.12	52.55	181.24	6.716	0.1282	1063.134	2.2332	7	0.43	1
2643	18.28	15.00	293.17	71.77	8.34	21.973	0.0612	804.574	2.6892	9	0.63	1
2645	17.30	15.28	135.02	123.21	104.77	2.197	0.0736	1111.616	2.1678	7	0.43	1
2646	19.32	16.14	336.75	21.84	18.69	5.321	0.1589	828.050	2.6381	7	0.37	1
2647	19.16	16.55	334.22	28.16	16.65	1.503	0.1782	959.265	2.3917	7	0.89	1
2648	19.48	16.80	319.06	22.90	40.60	1.844	0.1625	941.776	2.4212	7	0.73	1
2649	18.60	15.39	169.33	8.29	190.25	10.681	0.1172	820.834	2.6535	7	0.59	1
2650	20.22	17.88	346.19	221.57	165.97	1.759	0.1902	1027.359	2.2848	7	0.49	1
2651	20.12	17.21	5.57	0.66	355.91	4.887	0.2213	886.711	2.5204	10	0.27	1
2654	20.74	16.92	347.18	251.51	132.57	1.340	0.1683	696.779	2.9598	3	0.00	4
2655	20.59	16.29	348.14	11.48	11.69	13.588	0.1751	608.832	3.2384	6	0.17	1
2656	19.53	16.02	87.71	239.50	30.88	4.067	0.0701	756.457	2.8020	8	0.17	1

© European Southern Observatory • Provided by the NASA Astrophysics Data System

1970A&AS....2..339V

Table 7 (*continued*)

PL	m_0	g	M	ω (1950)	Ω (1950)	i (1950)	e	n	a (A. U.)	N	σ^2	Q
			°	°	°	°		″			″	
2657	18.54	15.80	140.64	186.45	33.08	3.699	0.0852	927.966	2.4452	10	0.57	1
2658	19.10	16.74	44.39	288.62	17.92	7.022	0.1517	1022.684	2.2918	9	0.31	1
2659	19.69	17.40	14.40	176.87	163.85	3.519	0.2292	1040.469	2.2656	5	0.49	2
2660	19.16	15.26	46.57	128.38	179.27	2.658	0.1338	681.036	3.0053	7	0.45	1
2665	20.64	17.83	19.46	160.74	170.84	3.952	0.2567	912.278	2.4731	6	0.61	1
2667	21.17	19.29	359.54	359.75	5.49	1.757	0.2058	1150.789	2.1184	3	0.00	4
2669	19.97	17.58	330.91	232.61	172.91	5.803	0.1671	1015.142	2.3031	5	0.15	2
2671	19.97	16.56	323.49	40.18	14.93	14.899	0.1614	776.864	2.7528	5	0.43	1
2672	20.62	16.67	346.10	13.70	12.42	22.525	0.1906	672.735	3.0299	3	0.00	4
2673	19.52	16.06	347.15	281.47	100.12	1.796	0.0844	767.477	2.7752	7	0.15	1
2674	20.21	17.05	39.71	240.58	68.84	1.462	0.1916	831.224	2.6314	4	0.17	4
2675	20.06	16.70	345.09	11.55	14.87	4.925	0.1441	787.362	2.7282	6	0.67	1
2676	20.70	18.05	7.44	50.86	304.44	0.470	0.1749	950.692	2.4060	4	0.51	4
2678	19.70	17.09	298.21	314.36	114.74	1.980	0.0118	960.263	2.3900	4	0.39	4
2679	19.47	17.20	11.07	188.17	159.83	3.745	0.1951	1045.240	2.2587	5	0.53	2
2680	20.49	17.23	341.54	9.33	22.83	2.432	0.1638	810.168	2.6768	8	0.37	1
2681	18.95	15.65	250.43	110.57	18.70	13.230	0.1295	801.427	2.6962	8	0.17	1
2682	20.35	16.03	22.64	182.88	153.39	1.771	0.1578	605.887	3.2489	5	0.59	2
2684	20.33	17.34	5.73	177.70	182.44	5.648	0.0832	869.723	2.5531	3	0.00	4
2685	20.66	16.49	19.55	153.01	190.49	0.254	0.1118	632.279	3.1579	4	0.07	4
2688	20.25	16.34	36.24	198.48	125.45	1.622	0.0970	678.502	3.0128	7	0.45	1
2689	18.81	15.40	155.10	183.99	21.39	6.905	0.1831	779.896	2.7456	3	0.00	4
2690	20.16	17.11	294.99	68.88	25.95	4.660	0.2031	854.900	2.5826	5	0.33	2
2692	19.90	15.70	282.73	292.46	168.19	5.972	0.1359	626.205	3.1782	6	0.19	1
2693	20.42	16.29	341.00	218.28	178.88	11.984	0.2242	639.490	3.1341	4	0.13	4
2694	20.62	17.96	348.68	6.41	16.43	4.242	0.1926	946.155	2.4137	8	0.59	1
2695	19.82	15.76	288.12	122.08	330.40	1.094	0.1045	652.343	3.0928	6	1.55	1
2696	20.51	15.20	317.56	301.34	129.08	2.889	0.2128	454.906	3.9329	5	0.11	1
2697	21.14	19.05	8.89	205.95	144.78	2.415	0.2144	1092.674	2.1928	3	0.00	4
2698	19.36	17.12	77.23	276.41	5.72	7.671	0.0705	1052.949	2.2476	7	1.47	1
2699	20.20	15.70	291.64	231.80	235.21	0.394	0.2561	575.672	3.3616	4	0.07	4
2700	19.72	16.82	29.22	156.64	176.91	3.017	0.0742	890.990	2.5124	7	0.45	1
2701	19.67	16.89	356.37	193.48	178.20	12.059	0.2733	919.312	2.4605	3	0.00	4
2702	19.05	14.82	173.52	155.49	38.64	1.126	0.1489	621.252	3.1951	6	0.37	1
2703	19.65	17.17	277.69	280.68	185.13	7.259	0.1396	991.734	2.3392	4	0.15	4
2704	19.09	15.06	165.55	11.11	187.95	27.777	0.2145	656.637	3.0793	4	0.17	4
2705	19.25	15.20	244.41	320.50	185.03	17.236	0.2310	654.291	3.0866	3	0.00	4
2706	20.62	14.04	288.05	356.64	98.81	1.214	0.1192	310.435	5.0740	4	0.07	4
2707	21.21	17.99	10.12	333.71	18.04	4.866	0.1896	818.369	2.6589	4	0.13	4
2708	19.30	16.62	176.44	178.97	11.97	4.294	0.0695	943.233	2.4187	7	0.47	1
2709	21.17	15.73	328.64	257.96	163.61	3.346	0.2718	437.682	4.0355	4	0.00	4
2710	19.44	15.40	255.59	105.00	22.58	9.081	0.1468	654.895	3.0847	8	0.27	1
2711	19.44	16.87	260.40	323.43	156.54	2.832	0.1181	968.827	2.3759	5	0.19	1
2712	19.52	16.32	119.58	131.01	112.21	2.969	0.0478	822.571	2.6498	7	0.61	1
2714	19.51	16.94	284.06	105.92	9.33	2.072	0.2724	969.886	2.3742	6	0.09	1
2715	20.84	17.84	27.49	147.29	178.30	2.767	0.2067	868.661	2.5552	3	0.00	4
2716	20.31	17.79	23.49	170.85	159.40	2.618	0.2090	981.945	2.3547	6	0.17	1
2717	18.64	16.81	161.84	49.88	150.54	3.692	0.1766	1164.776	2.1014	4	0.27	4
2719	20.68	16.64	26.74	220.14	104.66	1.938	0.2338	656.013	3.0812	4	1.19	4
2720	20.63	17.29	327.83	267.39	141.73	3.065	0.1355	793.373	2.7144	3	0.00	4

© European Southern Observatory • Provided by the NASA Astrophysics Data System

1970A&AS....2..339V

Table 7 (*continued*)

PL	m_0	g	M	ω (1950)	Ω (1950)	i (1950)	e	n	a (A. U.)	N	σ^2	Q
			°	°	°	°		″			″	
2721	20.50	16.88	4.15	301.56	60.77	2.886	0.0947	734.670	2.8572	4	0.15	4
2722	18.91	15.49	84.62	78.72	181.26	14.906	0.2110	774.937	2.7573	4	0.07	4
2724	20.63	18.18	353.38	207.36	168.95	5.962	0.2249	999.167	2.3276	4	0.07	4
2725	19.91	16.62	300.63	261.70	185.29	1.365	0.1740	803.661	2.6912	6	0.37	1
2726	18.83	15.87	319.94	248.54	176.95	12.702	0.2039	876.780	2.5394	4	2.55	4
2727	19.09	16.61	147.78	191.95	20.63	5.078	0.1599	991.786	2.3391	4	0.09	4
2728	20.44	16.47	45.11	296.64	14.20	7.991	0.1415	668.910	3.0415	3	0.00	4
2731	19.88	15.82	342.21	208.48	183.82	10.776	0.1362	651.872	3.0943	7	0.43	1
2732	20.67	17.05	34.53	284.38	32.07	3.370	0.2095	735.740	2.8544	4	0.11	4
2733	19.37	16.46	322.11	305.67	108.91	2.871	0.1206	887.131	2.5196	7	0.41	1
2734	21.77	17.73	14.35	232.75	107.38	1.988	0.2949	655.682	3.0823	3	0.00	4
2735	21.17	18.94	21.92	314.50	10.83	1.727	0.2949	1056.507	2.2426	4	0.19	4
2736	20.01	16.52	61.62	126.70	178.20	4.694	0.0252	763.210	2.7855	3	0.00	4
2737	20.24	17.52	7.59	300.10	56.84	3.542	0.1271	933.859	2.4349	4	0.23	4
2738	21.16	17.00	29.08	139.33	183.87	9.585	0.2292	635.093	3.1485	3	0.00	4
2739	18.83	16.77	168.84	94.38	102.62	2.139	0.1233	1101.123	2.1816	4	0.03	4
2740	20.03	16.80	326.78	243.77	165.08	5.421	0.1062	816.101	2.6638	5	0.09	2
2741	20.17	16.45	332.35	26.22	17.24	20.350	0.1331	715.914	2.9069	4	0.01	2
2742	20.59	17.43	317.63	306.13	123.84	2.541	0.2124	830.776	2.6323	4	0.03	4
2743	18.58	15.98	186.16	58.81	126.35	0.789	0.1672	962.587	2.3862	6	0.95	1
2745	20.18	17.84	37.18	128.75	187.70	4.902	0.1699	1027.017	2.2853	4	0.21	4
2747	19.89	17.11	308.30	32.73	33.67	4.963	0.0709	918.505	2.4619	4	0.65	4
2748	20.01	16.93	332.06	238.00	170.86	7.496	0.1967	850.182	2.5921	4	0.07	4
2749	20.25	17.85	349.25	238.59	144.08	3.297	0.1978	1011.651	2.3084	4	0.07	4
2750	20.38	18.26	24.77	174.81	157.82	3.871	0.1595	1084.633	2.2036	4	0.00	4
2751	19.77	15.48	338.55	274.17	125.55	2.548	0.1770	610.650	3.2320	6	0.13	1
2752	19.30	15.29	14.99	163.64	183.36	7.864	0.1877	661.182	3.0651	4	0.05	4
2754	19.98	16.95	332.18	223.06	182.57	12.083	0.1490	862.156	2.5681	3	0.00	4
2757	19.08	14.87	20.94	297.92	38.99	1.437	0.2144	625.697	3.1800	6	0.15	1
2759	20.27	17.29	333.04	230.27	177.58	1.185	0.1908	872.585	2.5476	4	0.41	4
2760	19.04	15.22	306.73	317.43	109.28	0.932	0.0350	696.747	2.9599	6	0.11	1
2761	19.68	17.05	8.60	177.24	174.66	5.527	0.2494	955.187	2.3985	4	0.27	4
2762	19.60	15.40	353.73	296.40	82.06	2.739	0.2163	626.187	3.1783	5	0.09	2
2763	19.73	15.94	254.71	25.79	97.75	2.126	0.0779	703.763	2.9402	3	0.00	4
2765	19.85	16.55	338.71	25.34	14.79	1.225	0.1871	801.668	2.6957	7	1.09	1
2766	20.27	17.72	48.59	251.38	43.91	2.483	0.2333	975.445	2.3652	3	0.00	4
2767	19.30	14.77	34.84	220.35	91.31	2.351	0.2634	570.283	3.3828	4	0.07	4
2768	18.71	15.64	139.76	95.45	126.38	2.794	0.1208	851.731	2.5890	4	0.05	4
2769	19.37	16.43	86.08	87.16	184.99	12.150	0.0995	882.080	2.5292	4	0.15	4
2770	19.96	17.94	20.47	314.66	20.40	4.974	0.2099	1110.483	2.1693	7	0.21	1
2771	17.90	13.66	306.18	29.16	39.49	4.748	0.0493	619.229	3.2021	5	0.07	2
2772	18.69	16.42	43.17	227.22	84.49	2.532	0.1410	1045.976	2.2576	7	0.61	1
2773	21.31	18.69	22.54	308.77	24.50	2.518	0.2100	956.372	2.3965	4	0.21	4
2774	19.90	16.98	317.37	19.74	47.14	3.031	0.1741	886.565	2.5207	4	0.05	4
2775	19.30	16.74	66.83	217.31	61.78	3.073	0.1975	970.781	2.3727	7	0.25	1
2776	18.11	14.58	37.09	168.15	157.93	4.206	0.0836	753.968	2.8082	4	0.01	4
2777	18.33	15.68	93.02	98.54	159.43	2.930	0.1667	949.393	2.4082	6	0.11	1
2778	18.20	15.58	118.94	81.18	167.26	1.620	0.0228	956.639	2.3961	6	0.45	1
2779	18.13	15.89	9.19	302.26	51.36	2.219	0.1805	1054.186	2.2459	6	0.15	1
2780	16.82	13.31	298.10	298.39	143.09	4.942	0.0977	757.601	2.7992	4	0.03	4

© European Southern Observatory • Provided by the NASA Astrophysics Data System

1970A&AS....2..339V

Table 7 (*continued*)

PL	m_0	g	M	ω (1950)	Ω (1950)	i (1950)	e	n	a (A. U.)	N	σ^2	Q
			°	°	°	°		″			″	
2781	19.25	16.81	11.55	318.82	28.53	7.105	0.2312	1001.183	2.3245	6	0.73	1
2782	21.54	18.78	334.18	322.69	90.49	2.534	0.2884	924.219	2.4518	3	0.00	4
2785	19.59	16.44	24.41	246.91	92.54	2.191	0.0968	834.036	2.6255	4	0.00	2
2786	19.40	16.35	283.13	85.81	16.64	13.007	0.1397	856.945	2.5785	5	0.41	1
2790	20.03	17.40	317.53	269.15	150.87	4.733	0.1090	954.443	2.3997	3	0.00	4
2791	19.59	16.68	5.89	337.38	21.12	12.492	0.1903	886.997	2.5199	6	0.45	1
2793	17.56	15.04	123.38	44.22	187.19	6.576	0.1896	982.466	2.3539	3	0.00	4
2796	20.14	16.94	346.19	248.40	141.59	3.336	0.2225	824.909	2.6448	3	0.00	4
2799	20.24	16.18	9.84	166.91	185.93	28.855	0.2148	652.353	3.0927	3	0.00	4
2800	19.38	16.26	119.43	223.72	17.59	14.854	0.0923	840.728	2.6115	5	0.29	2
2801	20.10	17.18	350.37	207.57	174.76	5.916	0.1818	886.496	2.5208	4	0.23	4
2802	20.66	17.48	325.61	44.91	16.39	13.322	0.2521	827.196	2.6399	6	0.19	1
2805	20.30	16.08	293.20	271.05	189.51	15.064	0.2121	624.333	3.1846	3	0.00	4
2806	20.74	17.94	16.68	332.55	10.76	7.631	0.1829	913.236	2.4714	6	0.43	1
2809	20.77	17.05	23.16	161.60	170.74	1.379	0.2196	715.707	2.9074	3	0.00	4
2810	19.28	16.69	269.04	284.16	186.15	4.113	0.0901	965.617	2.3812	3	0.00	4
2811	21.52	17.24	15.45	180.41	161.45	1.681	0.2563	612.509	3.2254	3	0.00	4
2812	21.29	19.63	12.02	327.38	19.89	4.605	0.2075	1209.629	2.0491	3	0.00	4
2814	19.89	15.79	71.95	276.15	3.82	6.134	0.1385	643.666	3.1205	5	0.19	2
2815	20.50	17.83	338.47	38.74	357.05	2.383	0.1583	944.504	2.4165	6	0.51	1
2818	19.19	16.59	151.99	165.26	44.21	4.550	0.1123	963.434	2.3864	3	0.00	4
2820	17.61	15.32	246.93	103.15	22.62	5.180	0.0758	1040.335	2.2658	8	0.39	1
2821	17.91	13.82	78.66	151.93	116.73	2.574	0.1674	645.751	3.1138	6	0.53	1
2823	20.81	18.67	12.27	162.97	184.26	4.710	0.1739	1077.829	2.2129	3	0.00	4
2825	19.56	15.38	208.58	321.14	204.28	0.932	0.1171	630.553	3.1636	6	0.41	1
2826	20.78	18.55	19.12	318.09	20.59	5.309	0.1537	1054.705	2.2451	4	0.17	4
2827	19.27	16.70	136.15	197.48	27.65	4.976	0.1004	970.212	2.3737	7	0.37	1
2828	18.87	16.15	21.47	152.98	178.59	10.927	0.2114	933.694	2.4352	5	0.83	4
2829	18.70	17.03	25.31	176.25	146.02	1.239	0.2408	1208.324	2.0506	4	9.33	4
2830	19.97	16.06	298.17	309.25	143.45	2.825	0.2235	679.362	3.0102	6	0.29	2
2831	21.02	16.67	31.84	260.32	56.86	2.267	0.2456	601.443	3.2649	4	0.07	4
2832	19.70	15.68	358.79	184.90	185.91	16.398	0.2283	658.551	3.0733	4	0.79	4
2835	17.79	15.43	250.27	114.01	16.38	7.734	0.1526	1021.452	2.2936	7	0.31	1
2836	20.72	17.35	347.92	239.32	145.68	2.674	0.2457	785.531	2.7325	4	0.09	4
4004	18.81	15.61	52.56	326.86	342.08	5.317	0.0226	821.937	2.6512	12	0.57	1
4005	19.59	15.72	47.23	311.75	348.92	7.008	0.1642	687.233	2.9872	10	0.53	1
4006	16.79	12.61	91.31	63.58	203.21	8.767	0.0529	630.435	3.1640	9	0.19	1
4007	15.97	12.82	253.17	138.05	334.93	3.161	0.0170	834.412	2.6247	8	0.13	1
4008	17.64	15.41	342.04	57.33	332.22	3.685	0.1634	1055.938	2.2434	8	0.39	1
4009	18.36	15.66	28.94	350.43	332.16	1.923	0.1919	937.165	2.4291	8	0.25	1
4010	16.40	12.93	75.12	75.80	193.16	7.505	0.1898	766.045	2.7786	10	0.33	1
4011	17.25	14.54	273.04	107.68	352.91	4.989	0.0648	934.229	2.4342	9	0.57	1
4013	19.04	15.52	14.02	134.41	205.96	7.312	0.2388	754.959	2.8057	8	0.07	1
4014	18.23	16.09	323.02	67.43	344.12	5.966	0.1403	1078.468	2.2120	8	0.31	1
4015	18.89	16.20	31.02	5.03	312.77	1.827	0.1919	939.955	2.4243	11	0.41	1
4016	17.62	14.11	359.39	24.92	340.02	4.876	0.0199	756.720	2.8014	9	0.43	1
4017	19.41	16.06	349.51	22.01	359.49	13.219	0.2552	790.668	2.7206	7	0.11	1
4018	18.60	15.58	320.62	71.43	354.14	5.070	0.2428	862.424	2.5675	8	0.15	1
4019	17.70	15.04	39.43	54.68	262.25	2.160	0.1031	948.131	2.4104	8	0.19	1
4020	17.76	15.22	333.10	183.00	212.33	2.250	0.0721	975.837	2.3645	8	0.53	1

© European Southern Observatory • Provided by the NASA Astrophysics Data System

1970A&AS....2..339V

Table 7 (*continued*)

PL	m_0	g	M	ω (1950)	Ω (1950)	i (1950)	e	n	a (A. U.)	N	σ^2	Q
			°	°	°	°		″			″	
4021	17.79	15.07	302.58	100.37	339.36	2.921	0.1605	932.151	2.4378	8	0.07	1
4022	18.60	16.38	358.64	22.97	343.55	4.503	0.1820	1059.071	2.2390	8	0.67	1
4023	16.72	14.24	237.47	149.78	350.13	2.728	0.1338	991.208	2.3400	8	0.73	1
4024	18.71	15.52	21.39	49.64	286.33	2.984	0.1372	823.821	2.6471	8	0.29	1
4025	18.07	15.92	296.53	237.33	196.72	7.519	0.0670	1078.099	2.2125	9	0.07	1
4026	17.71	14.56	102.69	248.37	359.62	13.344	0.1318	833.907	2.6257	8	0.29	1
4027	17.81	13.77	122.50	318.07	273.57	3.459	0.1356	655.543	3.0827	8	0.35	1
4028	18.56	15.50	312.62	222.22	207.51	7.181	0.1774	854.397	2.5836	8	0.33	1
4029	19.66	16.90	17.81	341.39	355.23	6.846	0.2099	924.047	2.4521	8	0.49	1
4030	18.21	14.82	3.27	69.48	292.63	2.744	0.0923	781.792	2.7412	9	0.29	1
4031	18.52	15.97	314.65	86.64	341.61	5.109	0.1823	973.054	2.3690	8	1.03	1
4032	18.32	15.96	287.88	124.99	326.31	4.954	0.1281	1021.385	2.2937	7	0.57	1
4033	19.45	16.84	333.13	86.50	317.18	1.604	0.2039	959.771	2.3908	8	0.29	1
4034	19.87	17.86	355.89	24.73	344.84	4.427	0.2085	1114.172	2.1645	8	0.19	1
4035	18.55	14.40	46.19	24.80	281.04	3.651	0.1460	635.212	3.1481	7	0.09	1
4036	18.76	15.17	26.04	105.75	228.64	1.134	0.0753	741.529	2.8395	11	0.55	1
4037	18.20	15.77	279.22	97.45	357.72	6.852	0.0868	1004.993	2.3186	8	0.17	1
4038	18.40	15.82	264.47	176.44	302.30	1.533	0.1675	965.841	2.3808	8	0.31	1
4039	19.83	17.34	27.55	112.01	208.50	1.644	0.2252	989.138	2.3433	9	0.65	1
4040	19.28	15.86	35.37	95.97	215.83	6.864	0.2194	775.276	2.7565	8	0.15	1
4041	19.27	16.73	343.24	96.02	292.27	1.867	0.1704	975.741	2.3647	8	0.19	1
4042	18.98	15.56	319.69	228.02	196.17	4.868	0.2094	776.133	2.7545	9	0.15	1
4043	18.64	14.82	41.42	117.78	199.05	9.537	0.0926	695.851	2.9625	9	0.65	1
4044	18.74	14.90	333.96	37.02	359.51	9.334	0.0733	692.909	2.9708	9	0.51	1
4045	19.33	16.30	349.05	36.17	342.48	5.159	0.1386	861.342	2.5697	8	0.15	1
4046	20.40	17.90	342.77	41.23	350.57	5.028	0.2327	986.618	2.3473	8	0.29	1
4047	18.97	15.49	46.67	337.38	339.72	2.054	0.0133	763.604	2.7845	9	0.83	1
4048	19.17	15.32	10.38	134.59	218.50	2.420	0.0752	690.549	2.9776	8	0.51	1
4049	19.11	14.78	327.89	209.46	194.47	7.849	0.0967	604.734	3.2530	9	0.33	1
4050	18.72	14.86	289.92	239.79	203.51	9.568	0.0669	687.692	2.9859	8	1.05	1
4051	19.91	16.73	9.51	90.74	259.25	1.741	0.2107	826.474	2.6415	9	0.51	1
4052	19.18	15.43	342.40	174.93	212.91	7.992	0.1010	710.077	2.9228	9	0.31	1
4053	18.66	15.84	81.27	58.03	214.52	6.359	0.1065	908.164	2.4806	8	0.37	1
4054	19.42	16.06	46.73	85.39	219.89	4.318	0.1509	787.400	2.7281	8	0.37	1
4055	17.99	15.56	157.65	240.27	323.98	3.090	0.1236	1004.810	2.3189	9	0.57	1
4056	20.29	17.64	350.06	72.41	308.10	1.180	0.2184	949.934	2.4073	10	1.35	1
4057	19.10	15.48	289.34	101.73	340.26	5.514	0.0350	735.868	2.8541	8	1.79	1
4058	19.72	16.31	345.95	138.57	243.72	4.110	0.1233	778.082	2.7499	8	0.73	1
4059	20.15	17.08	12.65	100.32	245.08	1.440	0.1716	850.759	2.5910	8	0.23	1
4060	18.74	15.54	199.74	283.59	242.07	1.599	0.0336	821.915	2.6512	8	0.19	1
4061	19.20	15.06	61.71	46.40	239.77	4.821	0.1594	637.559	3.1404	8	0.45	1
4062	20.54	16.81	27.16	322.51	353.13	10.039	0.2913	713.922	2.9123	6	0.39	1
4063	19.65	16.93	305.98	108.60	328.29	4.191	0.1737	932.549	2.4371	8	0.89	1
4064	20.39	16.54	26.16	1.74	324.91	2.566	0.1947	691.097	2.9760	7	0.45	1
4065	19.42	17.07	34.58	14.02	301.76	2.799	0.1842	1025.010	2.2883	8	0.17	1
4066	19.48	17.29	330.61	46.50	359.05	4.325	0.1769	1066.224	2.2289	12	1.01	1
4067	19.66	15.49	42.21	338.13	329.67	1.654	0.1744	631.258	3.1613	7	0.13	1
4068	18.15	16.03	337.05	51.31	340.12	3.187	0.0717	1083.774	2.2048	8	0.53	1
4069	18.69	14.66	177.02	346.44	203.13	9.068	0.0488	656.898	3.0785	9	0.69	1
4070	18.91	15.91	248.66	189.88	300.35	3.017	0.1175	866.260	2.5599	9	1.11	1

© European Southern Observatory • Provided by the NASA Astrophysics Data System

1970A&AS....2..339V

Table 7 (*continued*)

PL	m_0	g	M	ω (1950)	Ω (1950)	i (1950)	e	n	a (A. U.)	N	σ^2	Q
			°	°	°	°		"			"	
4071	19.27	16.79	49.28	107.60	199.00	5.436	0.1016	992.586	2.3379	8	0.33	1
4072	18.49	16.00	88.11	17.92	235.58	2.590	0.2238	988.411	2.3444	10	1.21	1
4073	18.99	17.00	84.46	17.05	260.55	2.764	0.0208	1120.897	2.1558	7	0.09	1
4074	19.14	16.50	94.03	16.01	238.97	0.598	0.1437	952.471	2.4030	11	1.01	1
4075	19.28	16.58	299.79	109.44	326.89	0.721	0.0997	938.708	2.4265	7	0.33	1
4076	19.92	16.16	17.45	354.27	350.54	11.739	0.0648	708.605	2.9268	7	0.35	1
4077	18.74	16.10	199.33	211.73	318.15	1.374	0.1471	951.767	2.4042	10	0.53	1
4078	20.26	17.62	29.05	340.57	340.08	2.166	0.2014	952.888	2.4023	7	0.19	1
4079	19.39	17.42	280.89	105.07	347.48	2.754	0.0821	1125.687	2.1497	7	0.51	1
4080	18.94	14.90	138.84	10.29	209.59	3.872	0.1007	654.470	3.0861	7	0.41	1
4081	18.07	15.86	0.97	161.77	199.37	7.056	0.1449	1060.838	2.2365	11	0.31	1
4082	17.68	15.08	130.40	260.41	323.53	1.585	0.1661	962.908	2.3856	10	0.67	1
4083	18.33	15.91	164.98	214.80	341.01	4.128	0.0936	1006.061	2.3169	12	0.49	1
4084	19.39	16.33	52.50	67.31	220.93	2.164	0.2124	854.650	2.5831	13	0.61	1
4085	19.66	16.40	54.65	87.88	203.62	12.013	0.1899	809.606	2.6780	9	0.43	1
4086	20.24	17.00	354.76	127.88	245.15	2.110	0.2134	813.804	2.6688	8	0.27	1
4087	18.81	15.99	215.95	154.44	2.81	2.034	0.1185	908.692	2.4796	11	0.55	1
4088	19.52	16.48	288.75	147.78	312.66	2.683	0.1966	857.017	2.5783	7	0.41	1
4089	18.63	15.27	359.59	160.98	204.49	8.582	0.1784	788.476	2.7257	8	0.17	1
4090	19.37	15.18	315.30	82.56	335.97	4.695	0.0901	627.917	3.1725	8	0.43	1
4091	20.76	17.64	359.16	140.09	224.80	2.795	0.2550	840.092	2.6128	7	0.29	1
4092	20.00	15.93	109.97	275.03	337.25	5.964	0.0375	651.193	3.0964	3	0.00	4
4093	19.13	16.52	95.97	42.69	203.87	11.457	0.2057	960.261	2.3900	6	0.27	1
4094	20.48	17.31	16.99	93.54	245.18	3.004	0.1908	829.800	2.6344	4	0.19	4
4095	20.11	16.78	301.75	206.81	231.51	4.365	0.1406	794.675	2.7115	7	0.83	1
4096	19.35	15.38	324.00	207.62	201.46	14.489	0.1231	668.242	3.0435	7	0.49	1
4097	17.45	13.63	255.90	185.24	293.80	3.792	0.1020	695.979	2.9621	6	0.15	1
4098	19.48	15.95	281.44	248.09	208.55	8.328	0.1234	753.193	2.8101	7	0.63	1
4099	19.02	16.70	329.48	193.21	210.65	5.179	0.1545	1033.318	2.2760	8	0.29	1
4100	19.06	16.02	137.21	226.82	352.37	12.902	0.1296	858.658	2.5750	7	0.67	1
4101	18.80	16.16	228.37	212.70	297.93	2.293	0.1884	951.197	2.4052	7	0.25	1
4102	20.43	17.78	326.67	73.85	337.82	4.146	0.1804	949.152	2.4086	7	0.25	1
4103	19.92	17.22	305.72	124.13	313.03	2.341	0.1679	937.306	2.4289	7	0.69	1
4104	19.77	17.34	348.05	171.30	208.92	6.084	0.1221	1003.489	2.3209	7	0.23	1
4105	19.82	16.72	317.84	203.29	229.23	4.045	0.2517	844.561	2.6036	8	0.25	1
4106	19.13	15.24	236.50	297.00	197.37	12.128	0.0600	682.873	2.9999	7	0.39	1
4107	20.10	15.82	32.28	355.46	328.69	4.418	0.1256	612.930	3.2240	6	0.11	1
4110	19.00	16.81	38.68	119.07	196.31	3.012	0.1155	1065.327	2.2302	8	0.45	1
4111	19.93	16.53	315.99	70.50	355.84	4.876	0.1934	779.116	2.7474	7	1.39	2
4112	18.83	15.64	262.88	124.73	341.93	1.904	0.0471	824.592	2.6455	9	0.61	1
4113	18.34	15.64	251.61	283.68	203.92	1.877	0.1436	937.290	2.4289	10	0.59	1
4114	20.47	16.56	357.36	3.59	6.05	18.097	0.2301	679.414	3.0101	8	0.39	1
4115	19.65	16.50	335.59	170.23	223.70	1.052	0.1016	833.810	2.6259	11	0.47	1
4116	18.38	16.28	16.22	108.28	226.86	1.176	0.2432	1089.423	2.1972	11	0.31	1
4117	19.69	16.23	22.56	342.66	354.14	3.547	0.0998	766.717	2.7770	10	0.45	1
4119	18.45	16.38	22.71	137.83	191.17	4.442	0.2168	1098.500	2.1851	8	0.11	1
4120	17.62	13.49	288.83	266.58	188.58	18.195	0.1581	639.303	3.1347	11	0.53	1
4121	18.85	14.77	348.01	184.14	199.10	8.682	0.1670	647.308	3.1088	11	0.67	1
4122	17.60	13.87	313.56	201.71	216.72	1.281	0.0627	713.231	2.9141	11	0.41	1
4123	20.03	17.04	15.06	144.76	192.62	12.110	0.2789	869.771	2.5531	8	0.21	1

© European Southern Observatory • Provided by the NASA Astrophysics Data System

1970A&AS....2..339V

Table 7 (*continued*)

PL	m_0	g	M	ω (1950)	Ω (1950)	i (1950)	e	n	a (A.U.)	N	σ^2	Q
			°	°	°	°		″			″	
4124	19.05	15.56	336.99	202.75	195.34	9.157	0.1595	760.711	2.7916	8	0.29	1
4125	20.22	15.96	357.30	176.37	194.02	11.181	0.1742	616.030	3.2131	7	0.53	1
4126	19.94	16.95	11.61	146.44	201.18	1.089	0.1936	870.497	2.5516	12	0.97	1
4127	19.93	15.77	9.54	114.85	237.42	0.279	0.1670	633.139	3.1550	14	0.65	1
4128	19.02	15.18	215.32	324.13	190.54	10.304	0.0566	691.699	2.9743	7	0.63	1
4129	18.71	16.56	359.27	175.57	189.17	5.968	0.1955	1077.685	2.2131	14	0.69	1
4130	19.12	16.07	52.16	108.00	188.81	14.003	0.1618	856.342	2.5797	10	0.75	1
4139	18.98	12.34	77.81	287.51	2.72	17.614	0.0031	304.357	5.1414	8	0.15	1
4140	18.47	15.48	344.79	199.84	186.44	13.618	0.1720	869.598	2.5534	9	0.39	1
4141	18.26	15.30	296.74	229.74	216.00	4.384	0.1756	876.977	2.5391	9	0.41	1
4149	20.31	17.25	353.96	187.99	185.97	3.976	0.2084	854.440	2.5835	9	0.51	1
4150	19.32	16.02	338.32	206.02	188.50	11.935	0.1906	800.144	2.6991	13	0.97	1
4151	19.44	17.28	342.32	199.36	187.81	5.903	0.1407	1074.154	2.2179	9	0.53	1
4152	18.16	14.45	50.19	98.52	190.15	12.730	0.2280	716.797	2.9045	9	0.43	1
4153	17.60	15.14	265.53	120.01	350.48	7.778	0.1177	995.943	2.3326	8	0.33	1
4157	18.63	16.32	247.76	186.07	304.77	2.187	0.1593	1035.712	2.2725	9	0.21	1
4158	19.07	16.54	229.94	164.18	333.91	4.259	0.0573	979.097	2.3593	8	0.59	1
4159	18.90	16.58	185.32	192.94	346.60	7.498	0.1491	1031.394	2.2788	6	0.85	4
4160	17.10	13.73	260.56	126.94	354.73	18.786	0.1651	786.499	2.7302	3	0.00	4
4161	18.61	15.46	236.75	161.42	338.46	7.408	0.1447	833.455	2.6267	4	0.07	2
4163	19.37	15.46	72.99	59.84	229.10	3.853	0.0156	680.151	3.0079	10	0.19	1
4164	19.62	14.71	13.80	345.89	357.49	31.986	0.2323	512.216	3.6338	3	0.00	4
4166	19.70	15.72	8.98	150.09	204.70	9.234	0.0044	666.618	3.0485	6	0.63	1
4167	20.30	16.15	57.11	298.09	353.40	17.267	0.1528	636.553	3.1437	3	0.00	4
4168	19.42	16.06	182.57	271.49	269.62	2.006	0.0285	787.473	2.7280	9	0.49	1
4169	18.88	15.66	41.33	69.82	243.32	4.863	0.1152	818.972	2.6576	7	0.53	1
4170	20.40	17.64	25.25	94.15	236.19	4.874	0.1435	922.523	2.4548	5	0.45	2
4171	20.21	17.88	11.56	100.59	246.66	3.319	0.1602	1029.936	2.2810	6	0.23	1
4172	20.45	17.86	358.96	32.01	333.20	5.943	0.1473	965.420	2.3815	4	0.01	4
4173	19.68	15.62	102.06	254.52	355.88	23.576	0.1239	652.598	3.0920	4	0.17	4
4174	20.78	16.54	323.27	77.35	343.32	9.659	0.2234	619.281	3.2019	3	0.00	4
4175	18.80	16.59	252.82	281.71	200.30	4.352	0.1113	1060.354	2.2371	10	0.35	1
4176	20.77	17.98	34.06	46.80	265.28	3.684	0.2204	915.034	2.4682	4	0.19	4
4177	19.09	16.34	113.84	266.36	335.48	7.156	0.0902	925.459	2.4496	5	0.25	2
4178	20.37	16.58	36.38	339.68	341.50	8.878	0.0964	702.678	2.9432	4	0.27	4
4179	19.91	15.79	58.99	353.93	301.51	3.788	0.1331	640.087	3.1321	5	0.32	2
4180	18.74	16.33	185.25	206.45	332.51	2.202	0.0832	1008.877	2.3126	10	1.35	2
4181	18.48	15.41	131.51	219.38	354.20	9.246	0.2800	851.462	2.5895	5	0.07	4
4183	20.88	17.86	348.97	100.27	282.28	3.000	0.2530	863.379	2.5656	4	0.03	4
4184	18.99	16.55	4.16	34.73	324.19	5.329	0.1110	1002.693	2.3221	4	0.13	4
4185	20.05	16.08	36.29	24.40	290.83	4.795	0.1680	667.440	3.0460	4	0.00	4
4186	20.11	17.19	26.49	112.22	213.51	2.010	0.1729	884.584	2.5245	11	0.31	1
4187	21.07	18.62	16.24	125.69	210.45	3.708	0.2366	1000.164	2.3260	4	0.23	4
4188	20.11	16.98	76.52	270.93	354.40	14.517	0.1983	838.912	2.6153	4	0.47	4
4189	19.71	16.68	282.29	181.98	281.57	4.130	0.1822	859.588	2.5732	5	0.09	2
4190	19.54	16.99	19.95	111.29	225.18	5.722	0.1597	974.842	2.3661	6	1.15	1
4191	19.47	15.32	99.79	267.11	349.92	16.655	0.0859	636.470	3.1440	4	0.00	4
4192	19.10	14.89	47.51	313.65	349.96	14.410	0.1508	625.249	3.1815	4	0.00	4
4193	20.25	17.20	326.03	89.29	328.44	2.673	0.1798	855.284	2.5818	8	0.33	1
4194	21.25	17.78	21.35	128.45	197.97	5.768	0.2628	765.225	2.7806	5	0.11	4

© European Southern Observatory • Provided by the NASA Astrophysics Data System

1970A&AS....2..339V

Table 7 (*continued*)

PL	m_0	g	M	ω (1950)	Ω (1950)	i (1950)	e	n	a (A. U.)	N	σ^2	Q
4196	15.95	13.77	277°.41	203°.64	254°.03	4°.033	0.0916	1070".152	2.2235	7	0".43	1
4197	21.15	17.73	352.74	107.39	267.44	2.236	0.1957	776.311	2.7541	4	0.33	4
4198	21.16	19.13	11.61	353.00	349.50	5.536	0.2572	1107.868	2.1727	5	0.25	4
4199	20.63	18.07	311.30	73.79	349.52	5.816	0.1152	971.011	2.3724	4	0.03	4
4200	19.19	16.88	26.82	127.96	193.73	4.904	0.2139	1033.692	2.2755	8	0.39	1
4201	19.79	16.28	246.37	208.72	273.25	3.900	0.0304	757.253	2.8001	6	0.17	1
4202	18.62	15.36	351.30	35.87	338.94	8.925	0.0373	809.245	2.6788	4	0.00	4
4203	19.88	15.13	106.88	254.76	357.72	19.081	0.0577	536.350	3.5240	3	0.00	4
4204	19.67	15.80	12.00	144.75	206.81	9.947	0.0512	687.509	2.9864	7	0.45	1
4205	19.32	17.09	344.92	49.15	335.90	6.417	0.1571	1056.623	2.2424	4	0.05	4
4206	18.11	15.61	36.24	323.32	350.32	12.221	0.1805	986.602	2.3473	4	0.03	4
4208	21.55	19.28	19.19	131.23	199.91	3.130	0.2397	1045.266	2.2586	5	0.91	4
4209	20.08	15.98	27.45	10.12	318.71	4.626	0.1423	644.112	3.1191	5	0.19	2
4210	20.43	17.72	11.29	64.59	286.69	3.574	0.0868	934.840	2.4332	4	0.39	4
4211	20.79	18.66	14.32	140.02	200.04	2.335	0.2186	1081.102	2.2084	7	1.55	4
4212	19.21	15.23	342.43	28.09	359.23	23.344	0.1064	666.626	3.0484	4	0.11	4
4213	19.76	15.91	76.12	296.52	348.48	8.269	0.0707	689.126	2.9817	5	0.50	2
4214	19.15	15.01	234.80	265.79	232.08	4.615	0.0799	638.209	3.1383	7	0.11	1
4215	19.75	17.58	269.50	194.46	272.02	1.808	0.1022	1070.520	2.2230	4	0.15	4
4216	21.14	17.20	349.71	22.59	357.54	17.204	0.1750	674.411	3.0249	3	0.00	4
4217	20.56	17.50	18.99	50.58	290.61	0.738	0.0987	854.041	2.5843	6	0.55	2
4218	19.21	16.00	81.88	302.05	313.82	4.648	0.2467	821.468	2.6522	5	0.33	2
4220	20.68	17.39	353.63	67.46	306.66	3.964	0.1618	802.369	2.6941	4	0.17	4
4221	21.07	17.14	29.64	340.54	335.39	6.555	0.2593	674.774	3.0238	4	0.11	4
4222	20.35	16.66	55.72	326.17	334.64	5.660	0.0906	721.879	2.8908	4	0.27	4
4223	20.74	18.05	30.36	352.60	328.25	2.377	0.1813	940.905	2.4227	3	0.00	4
4224	20.66	16.41	27.08	89.76	228.29	5.920	0.2791	617.526	3.2080	4	0.07	4
4225	20.27	16.20	322.51	71.97	345.64	5.041	0.1788	650.307	3.0992	5	0.09	2
4227	20.37	18.24	26.11	20.09	306.85	2.045	0.1756	1083.054	2.2058	6	0.29	1
4228	19.83	17.63	295.20	115.63	318.74	4.803	0.0380	1062.609	2.2340	4	0.03	4
4229	20.51	16.38	11.36	55.15	295.80	3.601	0.1342	639.145	3.1352	5	0.29	2
4230	20.12	16.93	44.13	95.00	199.78	12.228	0.2598	824.660	2.6453	5	0.07	2
4231	20.32	18.10	313.86	63.60	353.04	5.862	0.0692	1057.107	2.2417	4	0.05	4
4233	20.19	16.45	322.88	130.90	286.60	1.475	0.1848	711.307	2.9194	4	0.11	4
4235	19.43	17.22	54.09	333.55	323.64	4.319	0.1359	1060.665	2.2367	5	0.09	2
4236	19.27	16.99	350.05	34.11	343.85	7.240	0.1310	1042.166	2.2631	4	0.03	4
4237	19.03	16.56	230.88	170.75	328.96	2.013	0.0666	992.953	2.3373	7	0.27	1
4238	19.99	16.75	307.70	241.60	201.79	12.797	0.2398	813.679	2.6691	5	0.97	2
4239	18.80	14.89	62.31	297.84	351.71	11.715	0.1344	678.993	3.0113	4	0.00	4
4240	19.61	15.75	135.03	228.69	358.35	9.754	0.0488	688.690	2.9830	6	0.21	1
4241	19.40	15.64	71.04	87.17	206.16	11.537	0.0180	707.137	2.9309	6	0.37	1
4242	21.73	18.62	335.15	223.06	193.52	6.725	0.3618	842.431	2.6080	5	0.03	2
4243	19.15	15.32	125.12	24.25	213.27	8.949	0.0441	694.237	2.9671	6	0.21	1
4244	20.59	17.94	45.74	81.11	217.18	4.448	0.2142	949.190	2.4086	4	0.51	4
4245	21.54	19.20	9.58	3.01	344.12	2.369	0.2524	1028.427	2.2832	4	0.11	4
4246	19.77	15.54	272.27	266.13	205.46	4.039	0.1280	620.636	3.1972	6	0.30	1
4247	18.51	15.82	164.56	298.17	259.60	1.261	0.1264	940.453	2.4235	7	0.13	1
4248	20.16	17.02	313.24	85.42	340.44	3.722	0.1448	835.259	2.6229	4	0.23	4
4249	21.28	17.13	15.54	142.01	198.74	10.736	0.2223	635.531	3.1471	4	0.19	4
4250	19.40	16.10	320.21	76.79	342.39	7.870	0.1538	801.355	2.6964	4	0.15	4

© European Southern Observatory • Provided by the NASA Astrophysics Data System

1970A&AS....2..339V

Table 7 (*continued*)

PL	m_0	g	M	ω (1950)	Ω (1950)	i (1950)	e	n	a (A. U.)	N	σ^2	Q
			°	°	°	°		″			″	
4251	19.62	17.08	288.27	222.72	228.79	5.187	0.1218	976.748	2.3631	6	0.05	1
4253	20.08	16.63	291.07	113.00	354.47	8.447	0.2808	769.512	2.7703	4	0.13	4
4254	20.40	18.53	352.72	165.07	208.02	2.180	0.0928	1151.589	2.1174	4	0.09	4
4255	18.95	15.99	322.16	56.38	357.03	13.570	0.1211	877.084	2.5388	4	0.03	4
4256	20.01	17.27	347.33	52.21	331.77	5.604	0.1751	929.526	2.4424	3	0.00	4
4257	19.77	17.16	357.32	31.27	337.99	6.146	0.1282	958.518	2.3929	4	0.19	4
4258	20.09	17.55	345.50	44.64	337.11	5.448	0.0423	975.621	2.3649	4	0.83	4
4259	20.16	16.16	1.41	136.26	228.16	3.924	0.1203	663.350	3.0585	6	0.15	1
4260	17.15	13.69	353.86	110.80	263.64	3.469	0.1318	767.307	2.7756	4	0.11	4
4261	20.16	17.22	359.07	158.89	214.60	2.112	0.1927	881.560	2.5302	5	2.29	4
4262	20.90	18.65	13.36	137.19	207.52	2.394	0.1828	1049.579	2.2524	4	0.99	4
4263	20.27	16.25	320.72	50.78	2.91	11.014	0.1066	658.548	3.0733	5	0.35	2
4264	21.27	18.84	357.98	20.88	346.25	1.139	0.1979	1003.289	2.3212	6	1.41	4
4265	21.24	18.16	359.36	10.11	355.44	1.315	0.1944	849.477	2.5936	7	0.39	4
4266	20.31	17.37	307.39	92.95	332.66	1.349	0.0782	879.985	2.5333	4	0.09	4
4269	19.43	15.57	301.92	226.53	205.48	8.347	0.0714	688.610	2.9832	6	0.13	1
4270	20.03	16.64	318.89	176.35	239.09	1.945	0.1008	781.024	2.7430	5	0.07	2
4271	20.17	16.82	348.61	186.35	194.86	5.979	0.1614	790.678	2.7206	6	0.13	1
4272	20.50	17.43	322.12	190.62	235.59	4.242	0.2461	850.959	2.5905	6	0.29	1
4273	21.44	19.00	35.24	37.76	264.82	0.475	0.2939	1001.330	2.3242	3	0.00	4
4274	19.49	17.11	181.51	263.71	281.34	2.141	0.0629	1016.566	2.3009	4	0.11	4
4275	20.80	17.88	352.33	185.60	191.97	12.610	0.2367	885.336	2.5230	7	0.57	1
4276	18.83	16.67	96.35	253.89	355.81	5.508	0.1819	1075.230	2.2165	6	0.15	1
4277	21.76	18.68	355.68	170.81	202.47	4.937	0.3187	849.005	2.5945	6	0.65	1
4278	20.19	15.99	32.40	91.89	230.68	3.848	0.1632	626.426	3.1775	9	0.39	1
4279	21.08	18.83	9.38	138.83	212.59	4.014	0.1775	1050.664	2.2509	4	0.27	4
4281	21.26	17.50	344.64	24.61	3.17	3.047	0.1758	708.086	2.9282	7	0.47	4
4282	20.61	15.26	336.44	49.76	353.13	8.309	0.1991	449.545	3.9642	9	0.17	1
4284	19.76	17.37	26.43	113.67	217.60	5.615	0.1382	1014.688	2.3038	8	0.73	1
4285	19.89	16.01	4.44	13.56	348.68	8.639	0.0873	684.371	2.9955	4	0.41	4
4286	21.72	17.94	0.17	121.81	243.71	1.365	0.2297	704.412	2.9384	4	0.17	4
4289	19.93	17.48	324.31	62.33	353.38	4.447	0.1045	999.428	2.3272	6	0.60	1
4290	20.48	17.87	358.05	23.93	344.47	4.577	0.0872	960.244	2.3901	3	0.00	4
4291	20.10	17.06	30.62	126.17	201.35	8.859	0.1215	859.117	2.5741	6	0.27	1
4302	19.31	15.20	173.27	318.17	231.96	4.071	0.0933	642.064	3.1257	6	0.23	2
4303	21.25	19.07	19.70	128.58	203.71	7.539	0.2150	1068.390	2.2259	4	2.29	4
4304	20.21	17.47	26.50	76.81	248.19	2.561	0.1936	928.712	2.4439	7	1.35	1
4305	20.74	16.64	358.82	16.81	349.65	8.040	0.1531	644.310	3.1184	4	0.33	4
4306	20.80	17.61	305.19	169.67	267.69	1.421	0.1727	825.057	2.6445	4	0.11	4
4307	20.96	17.80	334.39	52.86	351.13	11.750	0.2065	832.823	2.6280	3	0.00	4
4308	22.13	19.37	352.54	179.90	196.51	4.477	0.2569	924.001	2.4522	4	0.13	4
4309	20.44	18.01	299.12	163.15	271.41	3.549	0.0774	1004.558	2.3192	3	0.00	4
4310	20.53	16.54	353.99	10.97	1.95	8.894	0.1372	665.242	3.0527	10	1.23	1
4311	19.94	17.39	45.28	3.99	303.88	3.302	0.1369	975.386	2.3653	5	0.29	2
4312	19.37	16.47	48.64	316.31	348.82	9.061	0.1333	890.673	2.5130	4	0.79	4
4313	19.61	16.72	109.56	44.89	198.94	12.027	0.1281	891.778	2.5109	4	0.07	4
4314	19.42	16.06	355.17	22.56	352.07	6.910	0.3129	787.387	2.7282	5	0.23	2
4315	19.34	15.70	122.12	29.16	210.36	1.520	0.0520	731.105	2.8665	5	0.05	2
4316	21.05	18.67	341.85	191.46	201.07	4.058	0.2059	1017.892	2.2989	4	0.09	4
4318	21.07	17.85	0.89	137.74	226.49	4.076	0.2093	818.437	2.6587	4	0.33	4

© European Southern Observatory • Provided by the NASA Astrophysics Data System

1970A&AS....2..339V

Table 7 (*continued*)

PL	m_0	g	M	ω (1950)	Ω (1950)	i (1950)	e	n	a (A. U.)	N	σ^2	Q
			°	°	°	°		"			"	
4319	19.47	17.53	55.71	43.03	253.61	3.197	0.1296	1134.231	2.1389	5	0.95	2
4320	20.79	16.96	332.78	43.68	1.50	11.721	0.1845	693.656	2.9687	4	0.59	2
4321	20.24	17.66	52.91	86.48	200.46	7.954	0.2723	967.377	2.3783	6	1.19	2
4323	21.40	19.05	343.03	84.88	304.76	3.818	0.1992	1025.191	2.2880	3	0.00	4
4324	19.55	16.27	125.32	247.20	343.28	10.622	0.1163	806.450	2.6850	3	0.00	4
4325	20.54	16.58	352.20	16.94	357.60	16.126	0.0985	669.595	3.0394	4	0.07	2
4327	19.67	15.55	267.23	282.79	194.74	18.045	0.1754	640.189	3.1318	4	0.21	4
4330	21.15	18.87	12.05	36.94	310.39	2.157	0.1856	1042.393	2.2628	3	0.00	4
4331	21.98	20.01	1.01	27.66	333.54	1.748	0.2006	1125.979	2.1494	4	0.05	4
4332	21.28	18.96	12.21	104.33	241.61	1.640	0.2096	1033.308	2.2760	3	0.00	4
4333	20.85	18.14	1.58	7.03	356.58	9.541	0.1574	934.729	2.4334	3	0.00	4
4334	21.21	17.85	15.91	359.54	343.25	2.040	0.1416	789.356	2.7236	3	0.00	4
4337	22.60	20.20	10.23	156.55	187.19	6.931	0.2935	1010.602	2.3100	3	0.00	4
4506	16.96	12.83	120.70	125.79	106.87	2.466	0.1442	638.919	3.1359	7	0.25	1
4517	17.48	15.10	22.33	321.93	9.54	6.855	0.1762	1017.518	2.2995	8	0.29	1
4519	17.21	13.15	43.90	192.00	113.64	0.455	0.1683	651.634	3.0950	9	0.73	1
4521	18.19	14.48	23.10	3.82	333.21	1.248	0.0781	717.842	2.9016	8	0.37	1
4522	18.63	15.25	16.03	340.51	6.20	5.151	0.0686	784.941	2.7338	8	0.39	1
4523	18.93	12.28	25.60	128.62	208.40	0.943	0.0491	303.866	5.1469	9	0.47	1
4524	18.30	15.98	344.26	154.10	227.39	0.540	0.0846	1032.840	2.2767	9	0.31	1
4525	19.03	14.98	340.38	184.01	207.02	1.155	0.1768	652.873	3.0911	11	0.31	1
4526	17.68	14.98	241.70	137.08	357.99	2.365	0.1470	936.709	2.4299	8	0.41	1
4528	19.43	16.76	354.00	177.11	194.92	2.411	0.1994	944.989	2.4157	7	0.27	1
4529	19.43	15.23	33.87	320.82	358.33	4.718	0.1389	627.088	3.1753	9	0.25	1
4530	18.53	16.55	354.63	162.10	208.16	1.171	0.1716	1121.810	2.1547	8	0.19	1
4535	19.31	15.06	332.98	359.97	40.54	0.229	0.1460	617.503	3.2080	8	0.57	1
4536	19.30	15.32	32.62	142.03	184.83	2.350	0.0771	666.938	3.0475	8	0.63	1
4537	19.86	17.67	321.97	52.41	0.47	6.457	0.1426	1066.689	2.2283	7	0.41	1
4538	19.56	15.93	317.47	50.68	2.33	12.489	0.0784	732.385	2.8631	7	0.19	1
4539	20.42	17.38	339.07	30.97	4.14	7.222	0.1933	858.846	2.5747	7	0.79	1
4541	20.13	16.64	312.68	65.13	10.03	8.306	0.2311	761.830	2.7889	7	0.37	1
4542	20.15	16.01	27.39	2.45	318.10	0.349	0.2307	637.241	3.1414	8	0.61	1
4543	18.49	16.47	39.95	294.46	15.98	2.436	0.1596	1111.163	2.1684	9	0.25	1
4544	19.98	16.84	35.33	316.00	8.89	4.171	0.0689	835.629	2.6221	6	0.87	1
4545	19.02	15.23	81.69	79.94	199.33	1.370	0.0281	702.261	2.9444	8	0.19	1
4546	20.50	17.92	334.20	31.84	9.24	4.385	0.1999	966.340	2.3800	6	3.03	1
4547	20.45	17.38	357.05	359.94	6.70	14.358	0.1921	851.380	2.5897	7	0.67	1
4548	20.48	18.45	29.69	299.88	4.17	7.503	0.3397	1108.147	2.1724	7	0.21	1
4550	19.69	17.51	314.29	52.56	12.24	4.134	0.1535	1069.009	2.2251	7	0.27	1
4552	20.60	17.40	12.49	334.33	11.03	13.553	0.1868	822.498	2.6500	6	0.31	1
4555	19.18	16.55	9.73	181.08	167.62	2.449	0.2210	953.558	2.4012	8	0.37	1
4556	18.77	14.88	354.01	329.20	43.53	3.170	0.1303	682.467	3.0011	10	0.57	1
4557	19.37	17.14	22.95	150.97	174.45	3.021	0.2515	1056.037	2.2432	8	0.37	1
4559	19.91	15.62	12.00	175.02	174.14	0.511	0.1676	610.563	3.2323	7	0.35	1
4572	19.45	12.78	311.87	43.01	16.00	9.280	0.0567	301.998	5.1681	8	0.21	1
4573	19.41	15.22	265.28	87.92	20.47	9.499	0.0689	628.832	3.1694	6	0.05	1
4575	16.49	14.03	4.29	186.49	171.32	8.076	0.0984	995.777	2.3329	8	0.15	1
4576	16.27	12.14	57.38	128.40	168.70	8.437	0.0967	638.405	3.1376	7	0.21	1
4577	17.60	14.40	293.30	271.24	174.33	12.661	0.1397	823.409	2.6480	8	0.13	1
4578	18.04	15.92	11.06	183.08	162.28	3.956	0.2044	1085.510	2.2025	8	0.21	1

© European Southern Observatory • Provided by the NASA Astrophysics Data System

1970A&AS....2..339V

Table 7 (*continued*)

PL	m_0	g	M	ω (1950)	Ω (1950)	i (1950)	e	n	a (A. U.)	N	σ^2	Q
			°	°	°	°		″			″	
4579	18.44	16.06	34.08	194.60	117.38	1.345	0.2109	1016.155	2.3016	8	0.21	1
4580	18.64	15.48	19.53	150.69	184.09	11.586	0.1985	830.748	2.6324	8	0.19	1
4581	17.84	15.62	341.40	333.52	54.33	2.830	0.1250	1059.215	2.2388	7	0.21	1
4582	18.18	13.98	49.71	274.60	20.62	3.348	0.1763	626.700	3.1766	8	0.05	1
4583	17.12	13.45	225.12	336.31	167.28	1.005	0.0675	724.361	2.8842	8	0.13	1
4584	18.59	16.10	345.76	218.35	166.41	5.873	0.2113	990.016	2.3419	8	0.11	1
4585	17.86	13.72	72.85	171.56	102.85	3.076	0.1487	638.284	3.1380	7	0.11	1
4586	18.49	14.18	336.56	325.98	65.46	1.394	0.1087	608.075	3.2411	9	0.15	1
4587	18.76	16.02	33.53	122.58	193.01	2.478	0.1756	927.627	2.4458	11	0.35	1
4588	18.89	16.49	22.16	142.95	187.81	5.660	0.1751	1011.062	2.3093	11	0.19	1
4589	19.21	16.48	30.70	299.25	11.09	10.373	0.2597	930.696	2.4404	11	0.63	1
4590	18.63	14.57	20.26	244.94	89.81	1.931	0.1600	652.259	3.0930	8	0.51	1
4591	18.51	15.53	310.46	57.99	15.34	7.621	0.2012	872.235	2.5482	8	0.15	1
4592	18.79	15.37	31.18	160.02	159.93	5.284	0.1706	776.059	2.7547	8	0.31	1
4593	18.48	14.89	349.84	210.18	166.49	2.223	0.0764	740.257	2.8428	7	0.15	1
4594	17.18	13.85	136.51	41.93	173.46	14.578	0.1989	794.131	2.7127	7	0.41	1
4595	19.33	16.74	359.29	188.61	176.21	2.622	0.1878	963.225	2.3851	8	0.25	1
4596	18.99	12.22	349.16	331.15	43.88	3.948	0.0685	292.357	5.2811	8	0.23	1
4597	19.10	16.72	320.02	252.66	167.38	3.729	0.1997	1016.631	2.3008	8	0.17	1
4598	18.17	15.23	84.53	249.92	11.56	1.772	0.1500	882.014	2.5294	8	0.41	1
4599	18.83	15.46	325.58	31.85	12.55	5.585	0.0982	786.698	2.7298	8	0.17	1
4600	18.29	14.07	260.69	343.91	136.34	1.888	0.1629	623.908	3.1860	8	0.13	1
4601	18.90	15.02	304.21	10.40	73.89	2.984	0.2304	685.239	2.9930	8	0.07	1
4602	19.19	15.15	333.71	253.07	149.40	0.915	0.1816	655.959	3.0814	7	0.45	1
4603	18.77	14.51	306.79	355.80	81.78	3.040	0.1890	615.836	3.2138	7	0.21	1
4604	18.81	16.49	25.88	304.24	27.56	2.329	0.1140	1031.541	2.2786	8	0.21	1
4606	18.46	16.10	87.47	213.55	51.54	2.060	0.0802	1021.619	2.2933	10	0.41	1
4607	18.29	14.98	155.19	183.53	18.85	5.429	0.1184	799.285	2.7010	8	0.37	1
4608	19.27	15.28	4.28	340.57	16.29	9.499	0.0977	664.161	3.0560	8	0.27	1
4609	19.17	15.82	19.14	312.72	25.48	4.514	0.1171	789.752	2.7227	8	0.19	1
4610	18.48	15.54	232.37	314.97	184.65	4.768	0.0998	881.238	2.5309	8	0.11	1
4611	18.56	15.92	234.92	130.11	9.04	12.750	0.1314	953.008	2.4021	9	0.83	1
4612	19.12	16.64	304.54	14.63	62.90	0.319	0.1784	992.486	2.3380	8	0.41	1
4613	19.75	16.76	42.22	268.74	28.17	3.493	0.2455	870.129	2.5524	7	0.19	1
4614	18.78	15.24	273.07	76.47	16.00	6.017	0.0134	750.731	2.8163	8	0.25	1
4615	19.40	15.14	350.84	270.41	105.73	2.544	0.1483	615.887	3.2136	8	0.07	1
4616	19.80	16.46	341.60	252.46	138.50	3.163	0.1901	792.859	2.7156	6	0.33	1
4617	20.29	17.87	337.85	29.49	5.43	6.076	0.1965	1006.849	2.3157	10	0.29	1
4618	19.97	17.46	324.42	243.74	170.75	2.043	0.2050	985.118	2.3497	12	0.25	1
4619	19.27	17.12	278.34	91.19	4.64	1.842	0.0986	1075.855	2.2156	8	0.37	1
4620	19.43	17.32	56.26	269.92	20.43	4.361	0.1499	1086.324	2.2014	8	0.53	1
4621	20.48	17.92	6.00	198.30	154.98	1.687	0.1976	971.947	2.3708	7	0.49	1
4622	19.63	16.56	36.24	132.73	178.84	13.565	0.1842	850.768	2.5909	8	6.29	1
4623	18.64	16.42	178.70	171.04	13.81	3.945	0.0907	1057.464	2.2412	8	0.39	1
4624	19.35	15.19	306.46	288.04	147.30	4.071	0.1716	633.873	3.1526	8	0.21	1
4625	18.63	16.28	134.38	189.48	33.59	2.230	0.0912	1025.607	2.2874	7	0.43	1
4626	18.98	15.34	287.42	55.41	28.41	1.993	0.0562	730.479	2.8681	7	0.31	1
4627	17.17	14.76	352.75	335.46	38.84	1.990	0.1902	1010.022	2.3109	5	85.01	4
4628	19.75	15.57	332.09	22.18	18.85	6.088	0.1304	630.223	3.1647	8	0.65	1
4629	19.22	17.03	7.10	184.58	171.68	5.859	0.0559	1066.549	2.2285	7	0.23	1

© European Southern Observatory • Provided by the NASA Astrophysics Data System

1970A&AS....2..339V

Table 7 (*continued*)

PL	m_0	g	M	ω (1950)	Ω (1950)	i (1950)	e	n	a (A. U.)	N	σ^2	Q
			°	°	°	°		″			″	
4630	18.44	15.76	329.38	33.11	10.50	6.076	0.1632	941.417	2.4218	11	0.31	1
4631	18.17	15.72	169.29	177.93	13.59	7.202	0.0469	998.428	2.3287	11	0.51	1
4632	19.95	18.21	13.21	148.32	196.65	2.155	0.1215	1188.917	2.0728	6	0.51	4
4633	17.44	14.03	305.42	54.35	17.49	5.349	0.1502	777.752	2.7507	12	0.51	1
4634	18.43	16.20	27.63	305.30	15.66	4.794	0.1979	1056.541	2.2425	8	0.21	1
4635	20.23	17.25	30.59	207.92	109.94	1.984	0.1886	872.333	2.5481	8	0.33	1
4636	19.18	15.02	218.83	137.54	13.11	14.004	0.0761	634.244	3.1513	8	0.15	1
4637	18.95	16.74	348.50	215.98	162.37	5.343	0.1566	1059.905	2.2378	7	0.21	1
4638	19.73	16.56	23.24	199.57	137.13	1.665	0.0834	829.400	2.6352	8	0.99	1
4640	19.80	15.54	31.80	155.32	169.56	8.061	0.1043	616.339	3.2121	8	0.15	1
4641	18.89	15.57	120.48	98.58	140.63	4.288	0.0432	797.014	2.7062	7	0.07	1
4642	19.84	17.32	32.28	268.00	42.82	1.133	0.2452	981.213	2.3559	8	0.47	1
4643	18.78	14.69	110.93	51.04	182.27	19.454	0.2035	645.778	3.1137	7	0.39	1
4644	19.40	16.00	281.76	255.87	186.96	4.926	0.0132	779.912	2.7456	9	4.69	1
4645	16.53	12.62	288.88	263.44	178.90	10.229	0.0822	680.024	3.0083	9	0.47	1
4646	17.84	13.80	261.91	289.02	186.24	10.775	0.1325	656.095	3.0810	10	0.35	1
4647	18.60	16.55	78.00	75.78	194.20	1.508	0.1218	1104.693	2.1769	12	0.53	1
4648	19.19	16.52	59.36	97.50	186.18	0.945	0.1731	943.991	2.4174	11	0.39	1
4649	18.48	14.57	283.97	258.09	183.81	10.798	0.0326	679.326	3.0103	9	0.31	1
4650	18.15	15.53	138.79	204.70	9.67	2.137	0.1341	955.908	2.3973	11	0.25	1
4651	18.94	14.70	134.05	14.40	204.45	0.370	0.1323	619.617	3.2007	8	0.13	1
4652	18.69	13.34	252.17	134.26	349.63	6.745	0.1197	449.273	3.9658	9	0.35	1
4653	19.29	14.99	102.29	251.94	1.18	21.429	0.0712	610.032	3.2342	10	1.01	1
4654	19.87	16.91	46.16	340.75	310.44	1.327	0.2474	877.462	2.5381	10	0.43	1
4655	18.57	11.83	263.89	95.89	5.79	17.112	0.0313	295.175	5.2474	9	0.25	1
4656	19.11	16.95	293.41	70.26	14.05	4.657	0.1436	1075.016	2.2168	11	0.59	1
4657	18.29	14.36	331.23	276.16	119.74	0.936	0.0879	676.259	3.0194	9	0.33	1
4658	19.07	15.60	23.77	294.63	32.94	3.773	0.1777	765.568	2.7798	9	0.19	1
4659	19.78	15.76	333.52	213.85	183.14	9.383	0.1373	658.870	3.0723	10	0.19	1
4660	19.85	17.09	28.35	312.28	9.04	5.744	0.1784	922.338	2.4551	10	1.11	1
4661	19.46	15.78	293.07	18.75	54.21	2.713	0.0404	723.948	2.8853	9	0.35	1
4663	19.99	17.46	20.62	186.62	142.52	2.743	0.2236	980.298	2.3573	6	0.23	1
4664	18.60	15.06	6.04	342.77	11.79	9.459	0.1701	751.895	2.8134	7	0.19	1
4665	18.02	15.31	356.40	327.63	40.13	4.332	0.1301	935.474	2.4321	7	0.33	1
4667	18.72	15.36	23.71	300.53	27.63	7.008	0.2079	788.231	2.7262	9	0.79	1
4668	18.74	16.09	316.77	28.33	28.03	7.491	0.1023	950.857	2.4058	6	0.03	1
4681	19.27	15.37	162.74	201.57	357.16	10.291	0.0479	682.020	3.0024	7	0.53	2
4689	22.00	19.85	0.81	167.70	192.73	2.331	0.2011	1075.577	2.2160	6	0.39	4
4690	21.06	17.65	17.94	322.84	9.96	8.419	0.2244	777.165	2.7520	5	0.65	4
4692	19.15	16.54	97.55	77.80	170.56	2.825	0.1473	959.838	2.3907	8	0.83	1
4693	19.34	16.96	69.12	295.00	339.36	2.384	0.1680	1017.008	2.3003	9	0.57	1
4694	20.04	17.28	356.55	7.83	359.34	11.393	0.1515	922.909	2.4541	6	0.97	4
4695	18.96	16.50	178.32	180.33	3.54	6.296	0.0410	995.503	2.3333	8	2.49	1
4696	20.18	18.63	9.52	174.61	175.39	1.500	0.0996	1242.567	2.0127	6	0.69	4
4697	21.32	18.70	338.95	22.33	11.85	5.364	0.2156	956.173	2.3968	4	0.11	4
4698	20.52	17.27	325.00	45.04	7.21	11.596	0.1933	811.982	2.6728	7	0.27	1
4700	20.47	17.83	17.57	7.97	328.40	1.190	0.1883	952.405	2.4032	8	1.65	4
4701	19.96	17.52	79.55	244.38	32.97	3.200	0.0415	1001.120	2.3245	4	0.19	4
4703	20.97	17.03	28.83	306.86	10.81	2.894	0.2207	672.819	3.0297	7	0.61	4
4704	20.72	17.88	2.60	25.93	332.91	2.260	0.1771	904.570	2.4871	6	1.39	4

© European Southern Observatory • Provided by the NASA Astrophysics Data System

1970A&AS....2..339V

Table 7 (*continued*)

PL	m_0	g	M	ω (1950)	Ω (1950)	i (1950)	e	n	a (A. U.)	N	σ^2	Q
			°	°	°	°		″			″	
4706	19.62	17.39	176.47	174.89	10.22	6.624	0.0976	1055.699	2.2437	4	0.03	4
4707	20.59	17.74	294.83	292.83	156.26	2.604	0.1940	901.927	2.4920	4	0.11	4
4708	20.06	17.34	58.80	281.17	12.04	4.285	0.0983	932.875	2.4366	4	0.03	4
4710	20.84	15.41	317.97	51.17	16.52	6.773	0.2426	438.702	4.0292	4	0.15	4
4711	20.29	16.90	33.36	146.41	167.74	3.637	0.1895	781.466	2.7419	6	0.25	1
4712	20.43	18.01	319.45	218.51	188.45	1.122	0.0486	1006.656	2.3160	6	2.17	4
4713	21.28	17.33	3.65	139.61	216.47	0.791	0.2662	671.941	3.0323	7	0.31	4
4714	20.49	17.22	31.26	312.70	0.71	15.024	0.2360	806.529	2.6848	7	0.69	2
4715	19.41	16.78	98.78	100.27	148.30	2.895	0.1358	954.588	2.3995	4	0.13	4
4716	19.30	15.88	87.09	247.09	19.90	6.834	0.0689	776.309	2.7541	9	0.37	1
4717	21.82	18.47	9.10	343.42	3.18	3.504	0.2547	791.731	2.7182	5	0.15	4
4718	21.16	18.22	24.25	319.49	7.46	2.915	0.1897	880.522	2.5322	5	0.25	4
4719	21.36	18.92	343.78	224.86	162.17	1.071	0.2077	1002.766	2.3220	5	1.11	4
4720	20.92	18.23	358.06	354.08	10.07	13.104	0.1062	941.112	2.4223	3	0.00	4
4721	20.36	16.94	14.60	335.52	11.73	2.079	0.0366	775.638	2.7557	4	0.05	4
4722	18.52	15.91	174.05	336.05	212.09	1.408	0.1253	960.929	2.3889	6	0.67	2
4723	21.24	18.70	355.09	184.73	185.01	5.768	0.1875	976.131	2.3641	5	1.55	4
4724	21.05	18.62	3.85	351.09	4.75	4.620	0.2277	1004.571	2.3192	5	0.23	4
4725	21.69	18.96	351.47	19.90	357.65	3.667	0.2655	931.838	2.4384	4	1.05	4
4726	20.05	17.49	14.91	131.44	207.36	1.463	0.2223	970.640	2.3730	6	0.61	2
4727	22.21	18.62	8.34	150.14	197.40	2.950	0.2787	741.285	2.8401	4	2.05	4
4728	21.61	17.54	357.68	178.51	188.43	4.711	0.2303	650.134	3.0998	4	1.01	4
4729	20.20	17.96	40.39	153.72	153.67	2.406	0.1652	1052.285	2.2486	4	0.33	4
4730	19.96	16.74	38.87	290.45	26.43	4.726	0.0842	817.642	2.6604	5	0.33	2
4731	21.92	18.96	11.22	320.79	21.41	3.165	0.2636	878.122	2.5368	3	0.00	4
4732	20.34	17.66	43.91	295.31	5.89	8.407	0.1882	942.351	2.4202	4	0.03	4
4733	20.49	18.09	28.59	155.72	167.31	4.981	0.1603	1011.297	2.3089	4	0.15	4
4734	19.37	17.01	21.83	299.40	38.62	2.709	0.0533	1021.091	2.2941	8	0.63	1
4735	19.48	17.58	329.81	342.54	51.04	2.651	0.0225	1144.993	2.1255	8	0.45	1
4736	21.19	17.30	10.69	330.58	15.61	6.195	0.2025	683.506	2.9980	4	0.07	4
4737	20.98	17.55	323.92	44.75	6.85	12.427	0.1583	773.414	2.7609	4	0.41	4
4738	20.89	18.44	19.92	324.11	8.13	1.091	0.2046	998.049	2.3293	4	0.07	4
4739	20.50	18.56	3.60	359.46	358.19	4.125	0.1585	1134.095	2.1391	4	0.47	4
4741	20.39	18.11	3.85	7.45	350.44	1.779	0.1334	1042.343	2.2628	4	0.05	4
4742	19.96	17.40	324.82	34.67	15.50	3.005	0.1579	972.830	2.3694	7	0.37	1
4745	20.38	17.81	35.96	308.32	5.33	2.874	0.1674	970.084	2.3739	4	0.17	4
4747	20.30	18.06	328.69	32.45	8.93	6.050	0.1086	1052.764	2.2479	4	0.07	4
4748	20.43	17.62	28.26	161.06	161.11	3.422	0.1811	912.243	2.4732	4	0.29	4
4749	20.07	16.99	294.83	22.35	67.20	1.347	0.1891	848.376	2.5958	4	0.17	4
4751	20.63	18.07	6.63	356.15	356.59	2.414	0.2031	971.398	2.3717	6	0.11	1
4752	21.66	18.73	15.49	355.32	342.70	1.562	0.2304	882.543	2.5284	4	1.19	4
4753	19.40	17.17	58.06	163.96	134.30	2.661	0.0616	1055.313	2.2443	4	0.19	4
4754	21.29	18.19	356.87	241.98	125.15	1.790	0.1714	844.468	2.6038	4	0.05	4
4755	20.16	17.03	332.15	220.87	180.44	12.344	0.1596	837.461	2.6183	4	1.17	4
4756	19.14	16.58	103.78	60.62	176.30	6.020	0.2250	970.773	2.3727	4	0.07	2
4757	20.79	16.57	18.76	160.30	176.88	4.627	0.1680	623.762	3.1865	3	0.00	4
4758	20.03	15.98	313.51	55.00	9.71	4.957	0.1529	652.828	3.0912	5	0.27	2
4761	19.64	18.11	300.22	71.89	4.60	21.369	0.1289	1249.285	2.0055	4	1.97	4
4762	20.37	16.31	8.22	184.00	169.25	9.433	0.0993	651.372	3.0958	4	0.21	4
4763	20.98	16.83	65.80	99.50	175.23	13.735	0.2038	635.935	3.1457	4	0.27	4

© European Southern Observatory • Provided by the NASA Astrophysics Data System

1970A&AS....2..339V

Table 7 (*continued*)

PL	m_0	g	M	ω (1950)	Ω (1950)	i (1950)	e	n	a (A. U.)	N	σ^2	Q
			°	°	°	°		″			″	
4764	19.05	15.38	168.20	43.05	151.84	2.234	0.0332	725.148	2.8821	7	0.69	1
4765	20.11	16.94	41.58	284.10	21.35	1.344	0.1833	829.144	2.6358	6	0.65	1
4766	19.86	15.82	290.08	244.51	194.37	4.748	0.0383	655.740	3.0821	6	0.79	1
4767	20.71	18.68	330.18	196.69	202.40	1.548	0.0899	1108.181	2.1723	4	0.65	4
4768	19.77	15.56	80.79	81.48	181.84	10.032	0.1764	624.455	3.1842	4	0.03	4
4769	20.81	17.61	323.18	231.50	182.26	11.161	0.1633	824.292	2.6461	3	0.00	4
4770	20.08	15.89	56.22	268.40	20.10	8.154	0.1748	629.144	3.1683	4	0.39	4
4771	20.83	17.40	353.33	215.01	156.89	2.913	0.1172	772.968	2.7620	4	0.45	4
4772	20.23	16.64	355.67	5.22	4.87	2.174	0.1712	741.530	2.8395	5	0.65	2
4773	21.63	18.78	5.81	114.88	239.74	0.655	0.2033	902.556	2.4908	4	0.07	4
4774	21.43	17.74	11.64	149.62	199.57	1.531	0.1264	721.180	2.8927	4	0.35	4
4775	20.55	16.99	273.59	100.52	2.71	5.402	0.1068	746.359	2.8273	4	0.29	4
4776	20.17	16.06	288.51	330.17	123.72	2.236	0.1636	643.194	3.1220	6	0.31	1
4777	20.88	17.35	19.80	179.89	153.48	4.514	0.1967	753.198	2.8101	4	0.17	4
4778	18.72	16.72	91.91	87.25	171.45	4.458	0.1138	1117.192	2.1606	6	0.67	1
4779	21.54	18.75	7.11	347.16	5.17	1.548	0.2070	915.394	2.4675	4	0.03	4
4780	18.98	14.80	244.67	307.76	185.23	5.237	0.1330	629.648	3.1666	7	0.75	1
4781	20.34	16.94	8.15	350.27	2.08	5.018	0.1703	780.659	2.7438	6	0.21	1
4784	20.62	16.43	345.84	14.36	7.88	2.591	0.1115	629.033	3.1687	4	0.23	4
4785	20.21	15.95	280.08	305.64	171.75	1.871	0.2877	616.419	3.2118	4	0.05	4
4786	20.63	17.61	353.78	225.48	145.84	1.993	0.1154	862.710	2.5670	4	0.15	4
4788	20.76	17.79	29.97	95.82	178.40	10.768	0.5448	873.165	2.5464	5	2.59	2
4789	20.82	18.73	42.52	268.70	25.05	1.073	0.2716	1091.168	2.1948	4	0.19	4
4790	21.63	19.29	351.60	27.81	348.43	0.957	0.2017	1026.868	2.2855	3	0.00	4
4791	21.13	18.59	18.51	328.23	7.41	1.203	0.1980	976.280	2.3638	4	0.25	4
4792	19.32	15.56	109.48	232.49	14.44	2.589	0.0789	707.685	2.9293	5	0.41	2
4793	19.94	17.43	84.85	177.12	90.71	1.684	0.0943	985.234	2.3495	3	0.00	4
4795	20.86	17.43	309.00	276.04	170.04	9.022	0.2893	773.989	2.7596	3	0.00	4
4796	20.31	17.98	354.06	193.60	179.11	2.047	0.2267	1028.696	2.2828	5	0.53	2
4797	20.16	16.73	47.04	121.88	184.02	8.507	0.1242	774.046	2.7594	5	1.01	2
4798	20.12	17.72	51.88	281.57	12.69	2.980	0.1732	1010.715	2.3098	4	0.01	2
4800	20.26	17.60	35.49	154.33	155.49	2.477	0.2162	946.116	2.4138	5	0.07	2
4801	19.78	15.57	70.60	177.79	98.70	2.162	0.1514	624.538	3.1839	6	0.29	1
4803	20.52	18.15	358.87	342.04	22.98	1.366	0.1970	1020.594	2.2949	4	0.51	4
4804	19.87	16.02	75.99	97.58	182.02	8.834	0.0826	689.903	2.9795	6	0.73	1
4806	19.00	15.90	233.37	343.85	162.65	2.968	0.1897	843.690	2.6054	4	0.43	4
4809	20.43	17.94	327.41	5.59	42.03	3.208	0.1615	988.064	2.3450	5	0.31	2
4810	19.75	15.69	281.44	96.80	5.55	12.111	0.1288	651.801	3.0945	7	0.87	1
4812	20.35	16.32	329.10	352.36	59.58	0.860	0.2179	656.743	3.0789	6	0.83	1
4813	20.54	17.72	52.22	120.55	160.14	6.255	0.2800	909.063	2.4789	3	0.00	4
4814	19.98	16.20	312.04	280.91	134.46	3.070	0.0352	704.107	2.9393	4	0.00	4
4815	20.34	17.36	316.72	28.17	30.55	3.481	0.1295	871.702	2.5493	5	0.27	2
4816	21.40	19.20	6.81	209.32	142.53	1.213	0.2302	1063.509	2.2327	4	0.15	4
4817	19.58	16.88	308.90	242.59	182.07	7.373	0.0946	938.662	2.4266	5	0.23	2
4818	19.07	15.07	111.18	234.64	2.89	5.981	0.1762	662.666	3.0606	6	0.49	1
4819	21.10	16.35	25.92	157.54	166.10	7.010	0.2259	535.218	3.5289	3	0.00	4
4820	19.22	15.24	246.40	98.83	22.13	9.497	0.0306	665.387	3.0522	7	0.09	1
4821	19.94	16.64	310.99	274.87	144.27	3.807	0.0658	800.489	2.6983	4	0.00	4
4822	19.38	15.66	47.58	178.73	135.74	2.741	0.0288	715.872	2.9070	7	0.23	1
4823	19.87	15.92	129.29	74.97	153.76	1.426	0.0895	671.797	3.0328	3	0.00	4

© European Southern Observatory • Provided by the NASA Astrophysics Data System

1970A&AS....2..339V

Table 7 (*continued*)

PL	m_0	g	M	ω (1950)	Ω (1950)	i (1950)	e	n	a (A. U.)	N	σ^2	Q
			°	°	°	°		″			″	
4824	19.78	16.32	87.45	92.04	178.26	2.789	0.0654	769.137	2.7712	3	0.00	4
4825	19.71	16.34	185.12	350.03	190.49	1.407	0.0210	786.736	2.7297	6	0.51	1
4827	21.21	17.93	11.94	106.72	235.50	0.251	0.2815	804.562	2.6892	4	0.67	4
4829	20.04	16.72	56.97	283.85	6.78	8.378	0.1643	797.558	2.7049	5	0.17	2
4830	20.78	18.08	24.19	310.88	19.02	2.099	0.1732	937.018	2.4294	3	0.00	4
4831	19.05	15.94	260.06	108.80	12.06	13.540	0.1522	842.727	2.6074	6	0.41	1
4832	21.13	18.98	14.81	171.45	166.19	4.952	0.2498	1075.099	2.2166	4	0.17	4
4835	20.30	16.48	294.48	274.29	164.84	3.808	0.0790	697.031	2.9591	3	0.00	4
4836	20.07	17.83	38.83	138.04	183.01	1.309	0.0619	1052.922	2.2477	4	0.35	4
4838	19.37	17.08	275.13	89.68	22.09	1.535	0.1944	1040.657	2.2653	5	0.17	2
4839	19.53	17.03	50.94	126.71	165.55	2.176	0.2041	987.330	2.3461	7	0.11	1
4841	19.47	15.42	85.53	266.42	7.04	6.424	0.0610	653.383	3.0895	6	0.77	1
4843	20.18	17.10	282.66	61.96	33.36	3.304	0.1159	850.198	2.5921	4	0.19	4
4844	18.95	16.76	195.14	21.31	152.34	3.605	0.1617	1065.869	2.2294	3	0.00	4
4845	19.22	15.14	313.51	249.29	171.87	11.013	0.1073	648.308	3.1056	6	0.35	1
4846	19.48	15.50	38.55	274.78	46.23	2.534	0.0727	665.517	3.0518	7	0.09	1
4847	21.51	18.06	0.50	350.01	13.24	8.318	0.2375	769.901	2.7693	4	0.03	4
4848	18.91	16.43	143.28	35.63	175.67	3.520	0.1911	991.600	2.3394	4	0.37	4
4850	19.93	16.86	321.69	231.08	185.90	13.147	0.1624	852.291	2.5878	5	0.17	2
4851	19.37	15.46	86.89	251.99	13.70	8.837	0.1131	678.653	3.0123	5	0.15	2
4852	19.62	15.45	229.12	327.42	174.43	14.705	0.0666	632.338	3.1577	4	0.00	4
4853	19.76	17.54	48.78	134.19	168.85	3.878	0.1314	1057.154	2.2417	6	0.69	1
4854	20.80	17.79	343.98	239.47	146.36	3.729	0.1480	865.198	2.5620	4	0.31	4
4856	20.14	16.02	24.00	300.25	25.93	6.137	0.2319	641.270	3.1283	4	0.21	4
4857	20.33	17.76	64.28	237.63	37.57	3.278	0.2212	968.383	2.3766	4	0.13	4
4858	19.69	15.66	289.15	267.57	182.17	11.040	0.1145	656.445	3.0799	6	0.55	1
4859	19.28	17.10	69.02	156.28	128.94	1.005	0.0958	1067.704	2.2269	5	0.59	2
4861	19.70	18.22	289.77	269.87	180.64	22.366	0.1414	1261.285	1.9927	4	0.29	4
4862	20.03	16.99	294.08	293.07	159.71	4.260	0.1928	858.167	2.5760	4	0.07	4
4863	19.95	16.76	332.26	222.20	179.31	4.513	0.1350	825.888	2.6427	6	0.19	1
4864	19.16	16.58	195.68	354.20	177.70	7.139	0.0697	966.332	2.3800	5	8.15	2
4865	19.20	17.31	55.02	271.59	37.20	2.023	0.0098	1147.485	2.1224	8	0.39	1
4869	20.88	17.28	319.72	62.82	12.05	3.701	0.2959	741.225	2.8403	3	0.00	4
4870	19.61	16.88	55.62	118.50	180.39	4.801	0.1083	929.248	2.4429	6	0.53	1
4871	19.90	16.87	286.26	35.88	55.58	2.715	0.1108	860.903	2.5706	3	0.00	4
4874	19.12	15.94	335.17	340.54	54.38	3.398	0.0965	826.896	2.6406	6	0.05	1
4875	18.89	16.36	267.60	63.19	52.67	3.256	0.1647	979.484	2.3587	7	0.41	1
4877	19.78	17.02	49.67	290.95	16.35	8.812	0.0872	923.796	2.4525	4	1.35	2
4878	20.15	16.85	307.72	266.10	163.85	6.230	0.1239	802.640	2.6935	3	0.00	4
4880	20.30	17.66	35.55	285.18	10.40	10.972	0.3208	951.827	2.4041	7	0.15	1
4881	21.01	18.15	15.36	194.27	146.31	3.182	0.2066	899.430	2.4966	4	0.17	4
4882	18.89	15.80	149.48	192.21	20.47	10.075	0.0550	846.642	2.5993	7	0.27	1
4883	21.42	18.81	333.13	185.06	216.78	1.802	0.1904	960.380	2.3898	5	0.27	4
4884	20.73	16.95	2.61	168.49	190.66	5.786	0.1601	703.670	2.9405	7	0.43	4
4885	19.69	17.12	49.44	288.54	2.40	4.483	0.2148	968.117	2.3771	8	0.63	2
4886	20.47	17.65	323.24	232.80	176.71	7.192	0.1240	908.725	2.4796	3	0.00	4
4889	21.41	17.47	324.45	241.45	184.01	15.503	0.2830	674.045	3.0260	3	0.00	4
4890	21.57	18.93	348.44	20.02	2.81	2.441	0.2341	952.228	2.4035	4	0.17	4
4891	20.07	16.62	54.37	128.40	174.76	3.804	0.0737	771.450	2.7656	3	0.00	4
4892	19.74	15.85	53.52	138.83	169.40	10.651	0.0286	682.442	3.0011	4	0.57	4

© European Southern Observatory • Provided by the NASA Astrophysics Data System

1970A&AS....2..339V

Table 7 (*continued*)

PL	m_0	g	M	ω (1950)	Ω (1950)	i (1950)	e	n	a (A. U.)	N	σ^2	Q
4893	19.34	15.68	279°.06	63°.84	25°.38	2°.278	0.0266	726".581	2.8783	6	0".15	2
4894	20.14	16.39	23.26	329.33	11.39	12.812	0.0353	710.296	2.9222	4	0.15	4
4895	18.20	14.79	327.15	246.28	159.35	7.103	0.1128	779.813	2.7458	3	0.00	4
4896	19.15	15.04	13.52	231.91	114.40	2.614	0.1625	642.962	3.1228	4	0.47	2
4898	20.87	16.99	28.38	305.98	18.09	7.170	0.1460	684.958	2.9938	3	0.00	4
4899	20.97	17.73	12.95	169.32	175.91	3.321	0.1864	814.551	2.6672	4	0.63	4
4900	19.58	15.30	132.14	170.88	54.44	3.363	0.0708	613.231	3.2229	5	0.73	1
4901	22.00	18.79	344.92	236.92	151.05	2.047	0.2607	821.355	2.6524	4	0.05	4
4902	20.60	18.46	351.43	344.34	27.22	2.193	0.0467	1077.826	2.2129	3	0.00	4
4903	20.95	17.59	11.30	318.73	28.26	2.968	0.1526	788.600	2.7254	4	0.09	4
4905	21.17	19.14	353.17	25.84	345.85	1.067	0.1260	1110.059	2.1699	4	0.17	4
4906	20.60	17.37	322.25	219.84	186.97	2.276	0.0614	816.712	2.6625	3	0.00	4
4907	20.21	15.72	95.93	257.67	5.53	29.788	0.0546	578.340	3.3513	3	0.00	4
4908	19.89	16.30	186.54	17.27	161.82	5.846	0.0806	741.066	2.8407	4	0.09	4
4909	21.28	19.45	353.65	327.33	43.37	1.372	0.1828	1162.157	2.1045	5	1.91	4
4910	21.05	19.25	32.98	304.89	7.16	2.816	0.2199	1171.896	2.0928	3	0.00	4
4911	21.13	18.22	20.81	143.18	186.46	3.212	0.2439	889.775	2.5146	3	0.00	4
4917	19.23	16.33	156.20	183.40	19.45	2.183	0.0644	890.689	2.5129	8	2.05	1
4918	19.38	16.17	100.18	71.10	175.56	15.423	0.1410	819.535	2.6563	4	0.43	4
5004	18.23	14.27	25.00	118.22	209.72	10.937	0.2226	670.474	3.0368	5	0.41	2
5008	20.62	17.71	314.04	85.00	355.02	5.463	0.2491	886.778	2.5203	4	0.25	3
5011	19.12	15.77	4.97	122.50	243.05	5.172	0.0229	790.947	2.7200	4	0.05	2
5015	19.47	16.40	338.96	24.93	14.35	13.986	0.1753	851.591	2.5893	4	0.05	2
5016	18.31	16.10	134.09	208.69	14.11	6.138	0.2002	1060.035	2.2376	3	0.00	4
5017	19.50	15.06	315.29	222.30	210.51	14.311	0.1792	585.463	3.3240	3	0.00	4
5020	19.70	16.93	325.37	191.97	229.52	5.800	0.2236	920.554	2.4583	3	0.00	4
5021	18.52	16.01	48.93	89.38	210.85	9.732	0.1728	983.044	2.3530	6	1.25	3
5023	19.60	17.08	59.19	74.85	220.18	6.575	0.1222	980.837	2.3565	6	4.37	1
5027	20.14	17.54	2.45	150.93	211.69	11.700	0.2052	961.929	2.3873	4	0.31	3
5031	20.27	17.86	4.29	143.47	217.62	3.603	0.1711	1009.510	2.3117	4	0.23	2
5034	20.12	17.04	323.90	214.66	211.21	10.454	0.2660	848.519	2.5955	3	0.00	3
5550	17.45	14.38	180.86	165.38	19.92	12.133	0.1203	852.075	2.5883	5	0.31	3
5552	20.60	17.49	350.47	355.76	23.54	7.913	0.1973	842.939	2.6070	4	0.31	3
5553	18.91	16.38	262.10	80.60	29.00	8.405	0.0523	979.619	2.3584	4	0.31	3
5554	18.94	15.80	62.01	278.36	19.47	13.660	0.0602	836.767	2.6198	4	0.61	3
5555	18.11	14.19	297.41	58.28	23.15	10.638	0.1176	676.813	3.0178	4	0.01	3
5557	19.78	15.31	272.36	128.65	346.02	1.008	0.1707	580.378	3.3434	4	0.53	3
5560	18.96	14.66	68.93	181.53	88.11	2.982	0.2426	609.718	3.2353	3	0.00	3
5564	18.71	16.13	340.98	341.51	52.79	3.453	0.2012	966.155	2.3803	4	0.03	3
5565	18.07	16.00	345.04	351.65	35.29	6.342	0.1779	1098.463	2.1851	4	0.09	3
5566	19.44	16.77	326.18	356.48	59.29	3.536	0.2001	943.641	2.4180	3	0.00	3
5567	18.44	16.04	92.57	216.45	37.98	7.495	0.1830	1011.924	2.3080	4	0.03	3
5568	17.68	14.50	8.53	325.10	30.75	7.999	0.1221	827.343	2.6396	4	0.00	3
5570	19.22	14.99	297.94	44.40	36.86	8.616	0.1056	621.472	3.1944	3	0.00	4
5571	19.94	16.27	334.51	356.78	44.11	6.618	0.1383	726.129	2.8795	3	0.00	4
5578	19.63	16.38	77.54	74.30	191.02	8.273	0.2143	811.689	2.6734	5	0.07	1
5581	20.89	17.74	358.97	327.62	40.06	4.832	0.2306	834.596	2.6243	4	0.13	2
5582	20.83	18.17	332.90	354.63	54.71	3.995	0.2352	948.358	2.4100	3	0.00	4
5586	20.51	16.34	355.41	344.82	29.84	12.281	0.2148	631.477	3.1605	3	0.00	4
6020	19.70	12.96	72.82	90.45	189.02	1.360	0.0938	295.873	5.2392	6	0.05	1

© European Southern Observatory • Provided by the NASA Astrophysics Data System

1970A&AS....2..339V

Table 7 (*continued*)

PL	m_0	g	M	ω (1950)	Ω (1950)	i (1950)	e	n	a (A. U.)	N	σ^2	Q
			°	°	°	°		″			″	
6030	18.49	13.56	316.86	223.27	183.72	3.236	0.0212	508.610	3.6510	8	0.47	1
6032	18.03	15.28	12.09	27.28	316.35	2.354	0.1586	925.099	2.4502	8	0.21	1
6033	18.97	16.66	350.90	24.10	351.02	1.706	0.2407	1036.095	2.2719	8	0.19	1
6034	18.48	15.42	13.27	141.08	198.41	7.546	0.2232	854.566	2.5832	8	0.37	1
6035	18.39	15.21	43.87	299.62	359.48	11.191	0.1880	826.762	2.6408	7	2.35	1
6036	17.12	13.94	0.54	28.77	332.51	3.579	0.0092	826.493	2.6414	8	0.33	1
6037	19.06	16.14	356.61	2.91	3.50	10.256	0.2246	884.535	2.5246	8	0.45	1
6038	18.03	15.02	324.01	56.77	358.50	6.994	0.2112	864.819	2.5628	8	0.31	1
6039	17.72	14.21	291.30	264.35	186.49	9.199	0.1758	756.452	2.8021	9	0.43	1
6040	18.26	16.21	1.45	56.06	303.47	1.204	0.2057	1104.479	2.1772	8	0.25	1
6044	18.28	14.57	92.76	307.85	317.65	1.294	0.0167	716.445	2.9054	8	0.29	1
6045	17.87	14.42	299.40	238.89	205.16	7.229	0.2002	770.106	2.7688	8	0.11	1
6046	18.95	15.71	356.99	8.26	357.26	12.068	0.2021	813.639	2.6692	8	0.25	1
6047	17.52	15.12	224.98	302.44	200.17	5.141	0.0796	1012.929	2.3064	7	0.55	1
6048	17.76	15.00	302.60	87.98	340.83	4.693	0.0931	922.371	2.4550	8	0.11	1
6052	19.24	16.25	328.83	69.06	348.54	4.636	0.3136	869.248	2.5541	8	0.13	1
6053	18.71	15.60	47.45	81.02	211.79	3.313	0.1990	843.538	2.6057	8	0.23	1
6054	19.40	15.30	340.97	182.75	205.33	3.814	0.1925	643.926	3.1197	8	0.25	1
6055	19.64	17.12	331.73	76.16	327.15	1.873	0.2136	982.255	2.3542	8	0.19	1
6056	19.05	16.24	333.80	196.25	198.57	8.562	0.1362	911.544	2.4744	8	0.23	1
6057	19.69	16.76	335.60	66.76	333.78	4.087	0.2396	883.689	2.5262	8	0.07	1
6058	19.25	16.32	43.75	315.60	344.23	6.741	0.1883	883.920	2.5257	8	0.43	1
6059	18.26	14.78	302.71	200.90	222.44	3.619	0.0495	762.772	2.7866	8	0.37	1
6060	19.12	16.19	340.86	43.86	343.00	3.798	0.1480	883.076	2.5273	8	0.25	1
6061	19.51	16.89	31.37	318.30	354.09	2.267	0.2202	955.821	2.3974	8	0.29	1
6062	18.53	15.88	303.20	105.26	328.43	2.062	0.1497	949.910	2.4074	8	0.23	1
6063	18.88	16.88	32.29	4.76	314.18	2.390	0.1439	1116.265	2.1618	8	0.41	1
6064	18.33	14.85	276.22	273.15	193.75	10.665	0.1880	763.836	2.7840	8	0.25	1
6065	18.40	15.38	58.04	287.12	348.60	4.136	0.2483	861.994	2.5684	8	0.27	1
6066	17.56	13.38	199.06	293.00	234.37	4.079	0.1194	629.819	3.1661	8	0.63	1
6067	19.43	15.13	2.65	152.83	203.64	4.628	0.1093	609.842	3.2348	8	0.17	1
6068	19.09	15.25	320.68	214.81	192.81	4.993	0.1076	691.842	2.9739	8	0.33	1
6069	19.05	15.60	81.78	287.66	332.17	1.641	0.1587	768.559	2.7725	8	0.53	1
6070	19.23	15.74	309.74	91.16	328.63	2.258	0.0978	760.451	2.7922	7	0.13	1
6071	17.96	14.49	182.31	341.76	196.81	8.891	0.0925	765.846	2.7791	8	0.19	1
6072	19.13	15.77	8.07	51.61	299.40	1.241	0.0811	788.593	2.7254	8	0.59	1
6073	19.15	15.77	80.64	291.51	343.04	3.876	0.0478	783.188	2.7379	8	0.51	1
6074	19.60	17.56	28.80	339.93	342.03	0.667	0.1477	1106.488	2.1745	8	0.21	1
6075	19.70	17.38	326.47	216.78	192.85	6.681	0.1936	1031.950	2.2780	8	0.83	1
6076	19.74	16.45	12.76	338.60	2.78	2.887	0.2053	802.367	2.6941	9	0.63	1
6077	19.24	15.18	316.44	68.26	343.27	3.226	0.0731	650.924	3.0973	8	0.13	1
6078	20.03	16.78	349.35	189.33	190.77	14.201	0.2578	810.760	2.6755	8	0.43	1
6079	18.27	14.05	285.84	96.80	359.84	21.188	0.1757	622.513	3.1908	8	0.19	1
6080	20.11	17.38	14.72	332.30	6.73	2.304	0.1943	930.209	2.4412	9	0.41	1
6081	17.45	14.95	109.75	7.71	228.57	1.999	0.1644	985.614	2.3489	8	0.47	1
6082	18.58	15.74	298.88	212.89	220.21	3.475	0.0879	903.671	2.4888	9	0.59	1
6085	19.03	16.48	27.93	119.79	197.83	1.766	0.2228	974.873	2.3661	11	0.55	1
6090	16.82	14.18	163.49	206.23	345.51	4.585	0.1445	951.230	2.4051	7	0.45	1
6091	17.68	14.50	321.41	82.03	317.68	1.613	0.0262	826.038	2.6424	7	0.53	1
6092	17.67	14.56	118.70	27.82	196.42	10.869	0.1881	841.698	2.6095	7	0.37	1

© European Southern Observatory • Provided by the NASA Astrophysics Data System

1970A&AS....2..339V

Table 7 (*continued*)

PL	m_0	g	M	ω (1950)	Ω (1950)	i (1950)	e	n	a (A. U.)	N	σ^2	Q
			°	°	°	°		″			″	
6095	19.37	15.15	49.47	90.51	207.40	4.546	0.1510	623.232	3.1883	7	0.71	1
6096	20.22	16.92	9.07	347.87	0.66	11.790	0.1880	801.335	2.6964	8	0.27	1
6097	19.27	16.72	32.57	36.65	276.14	1.269	0.2098	973.444	2.3684	8	0.23	1
6098	20.10	17.82	21.72	111.31	218.80	0.995	0.1749	1043.800	2.2607	7	0.41	1
6099	19.25	16.31	3.30	4.63	352.71	5.707	0.1567	881.240	2.5309	9	0.35	1
6100	19.55	17.21	353.79	177.49	191.56	7.063	0.1269	1028.149	2.2836	9	0.81	1
6101	20.21	16.76	2.05	142.53	215.32	3.925	0.1638	769.248	2.7709	7	0.53	1
6102	20.18	17.60	328.84	205.23	201.69	1.789	0.2048	966.873	2.3791	7	0.23	1
6103	19.91	15.82	318.88	61.13	0.57	5.133	0.2119	647.103	3.1094	8	0.65	1
6104	19.90	15.69	321.32	204.62	199.82	3.606	0.0659	625.119	3.1819	8	0.29	1
6105	19.45	15.87	9.70	149.22	198.96	11.945	0.1078	743.838	2.8336	7	0.27	1
6106	19.49	16.36	344.36	55.44	324.25	2.515	0.0795	839.007	2.6151	7	0.21	1
6107	19.40	16.40	80.25	78.15	196.60	13.635	0.0508	868.056	2.5564	7	0.19	1
6108	19.00	15.88	302.81	217.91	219.84	3.189	0.1811	839.681	2.6137	8	0.15	1
6109	18.97	16.05	90.06	279.55	339.85	3.300	0.1030	886.106	2.5216	8	0.49	1
6110	19.74	17.40	333.55	47.67	349.35	5.086	0.1617	1026.204	2.2865	7	0.19	1
6111	19.69	15.62	29.01	330.65	352.68	9.750	0.1199	650.057	3.1000	8	0.29	1
6112	20.50	17.49	16.25	48.18	284.86	1.202	0.2461	864.997	2.5624	3	0.00	4
6113	19.30	16.30	56.97	316.47	331.23	1.175	0.1410	868.209	2.5561	7	0.35	1
6114	18.53	15.24	139.80	223.16	348.39	12.902	0.1464	803.735	2.6911	8	0.37	1
6115	19.11	16.81	272.03	119.51	337.97	5.248	0.0756	1036.846	2.2708	8	0.35	1
6116	17.34	15.30	76.64	10.29	254.56	0.891	0.1565	1107.359	2.1734	7	0.13	1
6117	19.17	16.52	335.05	17.99	18.30	1.852	0.1678	949.635	2.4078	10	0.35	1
6118	19.85	15.67	0.85	176.34	184.18	22.903	0.1324	630.337	3.1643	7	0.09	1
6119	20.69	17.60	9.00	157.98	186.49	13.383	0.2758	846.796	2.5990	7	0.29	1
6120	20.13	17.14	4.60	164.69	189.26	5.226	0.2382	870.197	2.5522	8	0.41	1
6121	19.64	15.42	313.91	155.62	267.88	0.137	0.1815	622.815	3.1898	8	0.49	1
6122	19.75	16.70	340.10	214.96	180.88	12.253	0.2634	855.037	2.5823	9	0.41	1
6123	20.45	17.78	353.24	191.10	181.19	12.711	0.2309	943.657	2.4180	7	0.65	1
6124	19.75	17.14	29.75	130.78	181.36	4.528	0.2484	959.398	2.3915	6	0.17	1
6126	19.81	17.40	352.21	9.66	3.17	6.074	0.1959	1010.623	2.3100	8	0.39	1
6127	19.59	16.68	358.04	4.33	357.95	10.022	0.1797	888.522	2.5170	6	0.45	1
6128	20.20	17.20	18.97	109.65	224.57	0.847	0.1577	867.676	2.5572	6	0.21	1
6130	18.39	15.66	245.41	292.09	193.00	4.183	0.1111	930.092	2.4414	7	0.39	1
6131	19.26	16.21	61.47	62.68	206.22	3.597	0.2617	855.456	2.5815	8	0.79	1
6132	20.74	18.16	8.43	74.41	271.94	1.180	0.2370	967.966	2.3773	7	0.19	1
6133	19.40	17.16	351.25	127.56	247.33	2.554	0.2172	1054.081	2.2460	4	0.01	4
6159	20.77	18.92	347.77	65.89	312.54	2.593	0.1962	1157.609	2.1100	3	0.00	4
6179	20.40	17.36	37.40	356.89	313.18	2.029	0.1489	858.366	2.5756	3	0.00	4
6180	19.87	16.50	24.25	113.70	210.99	2.406	0.1777	785.890	2.7316	7	0.33	1
6181	18.37	16.14	156.11	323.69	231.13	3.338	0.2520	1056.849	2.2421	3	0.00	4
6184	19.90	17.57	345.00	174.07	204.66	5.872	0.1086	1030.597	2.2800	5	0.17	1
6186	19.57	17.28	44.86	96.06	200.74	5.658	0.1915	1040.297	2.2658	7	0.17	1
6187	19.59	16.95	71.05	65.32	197.45	7.790	0.2267	951.140	2.4053	4	0.45	4
6188	18.71	16.52	217.59	283.24	226.07	2.197	0.1128	1065.225	2.2303	6	0.09	1
6189	19.94	17.68	11.76	76.97	266.53	1.676	0.1618	1047.664	2.2552	6	0.35	1
6190	19.08	16.80	71.69	43.58	230.43	4.061	0.1303	1041.592	2.2639	7	0.45	1
6191	20.53	16.40	24.24	101.06	224.60	4.527	0.1775	638.318	3.1379	7	4.49	1
6192	18.56	14.83	141.48	19.99	183.92	14.126	0.2452	713.991	2.9121	3	0.00	4
6193	19.96	16.77	25.06	136.62	191.52	12.330	0.1206	824.141	2.6464	5	0.21	2

© European Southern Observatory • Provided by the NASA Astrophysics Data System

1970A&AS....2..339V

Table 7 (*continued*)

PL	m_0	g	M	ω (1950)	Ω (1950)	i (1950)	e	n	a (A. U.)	N	σ^2	Q
			°	°	°	°		″			″	
6194	20.80	18.70	31.22	358.73	318.46	3.621	0.1697	1090.350	2.1959	4	0.91	4
6195	20.70	17.57	359.56	7.38	353.59	12.350	0.2041	838.744	2.6156	4	0.11	4
6196	19.47	15.64	74.76	88.16	193.09	9.318	0.0349	693.772	2.9684	6	0.57	1
6197	21.00	19.18	339.93	71.79	320.67	0.673	0.2360	1164.159	2.1021	4	0.21	4
6199	19.70	17.49	343.13	172.91	211.01	2.855	0.1666	1061.307	2.2358	6	0.33	1
6200	19.96	16.89	31.73	76.58	240.30	2.128	0.1616	852.324	2.5878	5	0.51	2
6201	21.22	19.27	358.62	116.91	245.53	2.240	0.1865	1129.390	2.1450	4	0.05	4
6202	20.25	16.18	350.33	139.15	235.84	4.420	0.1807	650.122	3.0998	6	0.11	1
6203	19.57	17.12	84.45	345.94	267.96	3.601	0.2006	998.270	2.3290	3	0.00	4
6204	20.81	17.97	351.33	175.07	198.00	8.229	0.1821	904.487	2.4873	4	0.03	4
6205	20.83	18.61	336.40	197.05	196.63	2.177	0.1790	1058.946	2.2391	4	0.09	4
6207	19.33	16.30	106.17	3.66	242.86	2.584	0.0737	860.353	2.5717	7	0.05	1
6208	20.10	17.30	52.23	307.20	349.92	15.238	0.1233	912.900	2.4720	4	0.21	4
6209	20.46	18.32	13.77	96.54	248.87	2.943	0.0585	1079.631	2.2104	3	0.00	4
6210	20.49	17.98	341.13	148.43	239.38	1.900	0.1815	983.619	2.3520	5	0.07	2
6211	21.29	18.00	338.17	178.32	216.35	4.350	0.2164	802.445	2.6939	4	0.19	4
6212	20.52	17.21	44.69	304.63	351.19	12.485	0.2125	798.637	2.7025	4	0.01	4
6213	19.52	16.91	271.19	242.63	226.50	2.834	0.1738	958.864	2.3924	4	0.25	4
6214	18.95	16.42	286.68	225.61	221.89	4.323	0.1156	980.428	2.3571	7	0.43	1
6215	20.41	17.92	312.54	74.32	345.06	9.006	0.1139	988.124	2.3449	3	0.00	4
6217	18.87	14.80	146.88	9.39	196.66	16.162	0.1491	650.157	3.0997	7	0.17	1
6218	20.08	15.83	324.77	62.56	345.91	13.130	0.1473	617.327	3.2086	4	0.00	4
6219	20.73	19.06	4.87	75.63	277.05	1.082	0.2108	1206.737	2.0524	4	0.15	4
6220	20.19	17.15	311.66	98.84	324.74	2.025	0.1524	857.671	2.5770	4	0.25	4
6222	20.45	17.59	32.83	88.59	225.93	1.730	0.1740	898.363	2.4986	4	0.09	4
6223	20.11	18.33	342.96	80.51	299.55	1.580	0.0668	1177.738	2.0859	3	0.00	4
6224	19.73	16.29	65.50	79.70	211.09	4.495	0.0424	771.219	2.7662	4	0.09	4
6225	21.62	19.12	355.83	111.14	256.32	1.571	0.2344	986.784	2.3470	4	0.00	4
6226	21.43	18.34	336.10	54.46	349.22	9.943	0.2800	845.831	2.6010	4	2.67	4
6227	21.10	17.77	13.48	31.49	304.76	3.026	0.2826	795.177	2.7103	4	0.13	4
6228	20.66	18.74	350.50	180.27	193.64	5.795	0.1688	1137.413	2.1349	4	0.23	4
6229	20.93	18.72	358.25	29.01	334.53	4.732	0.1497	1061.848	2.2351	3	0.00	4
6230	19.52	17.11	45.60	16.27	280.65	2.997	0.1953	1010.326	2.3104	4	0.07	4
6231	20.94	16.97	354.57	42.02	327.67	6.031	0.1830	668.001	3.0442	4	0.15	4
6232	19.40	15.40	284.57	228.77	228.46	4.824	0.1762	662.848	3.0600	6	0.93	1
6233	20.51	18.91	342.75	46.84	338.80	4.946	0.1725	1228.508	2.0280	4	1.21	4
6235	20.63	17.67	306.46	185.00	238.36	2.928	0.0876	875.735	2.5414	4	0.21	4
6237	19.86	16.43	269.36	241.50	213.36	4.854	0.0308	773.407	2.7609	4	0.05	4
6238	19.75	17.37	221.46	302.30	200.78	6.831	0.0526	1017.100	2.3001	3	0.00	4
6241	20.93	16.75	352.41	174.51	197.66	12.222	0.1766	630.445	3.1640	4	0.09	4
6242	18.42	15.66	211.25	294.30	220.51	5.530	0.0803	923.487	2.4531	7	0.11	1
6243	19.02	16.50	187.68	214.70	319.92	2.834	0.0756	982.793	2.3534	5	0.13	2
6245	18.88	15.78	142.11	19.65	193.36	13.064	0.0939	844.086	2.6046	4	0.35	4
6246	19.34	15.04	348.49	70.64	306.59	3.718	0.1443	608.964	3.2380	4	0.11	4
6247	19.66	17.30	298.00	89.19	347.42	3.788	0.1268	1023.279	2.2909	5	0.67	2
6248	21.40	19.02	2.58	8.45	348.11	1.840	0.1923	1015.833	2.3020	4	0.00	4
6250	19.87	17.80	345.51	170.67	206.99	3.800	0.0659	1097.038	2.1870	5	0.07	2
6251	21.39	18.81	13.05	0.30	338.82	1.744	0.2353	967.959	2.3773	4	0.21	4
6252	20.30	17.22	39.91	327.95	339.90	3.200	0.1550	848.569	2.5954	4	0.15	4
6253	19.60	16.22	114.81	33.63	192.91	8.221	0.2166	783.831	2.7364	4	0.03	4

© European Southern Observatory • Provided by the NASA Astrophysics Data System

1970A&AS....2..339V

Table 7 (*continued*)

PL	m_0	g	M	ω (1950)	Ω (1950)	i (1950)	e	n	a (A. U.)	N	σ^2	Q
			°	°	°	°		″			″	
6254	20.25	16.84	18.31	57.89	284.76	3.499	0.0299	779.598	2.7463	3	0.00	4
6255	18.92	17.72	24.68	146.29	186.29	22.411	0.0688	1345.806	1.9084	4	0.03	2
6256	21.25	19.41	359.67	8.21	352.93	3.382	0.1921	1159.217	2.1081	4	0.07	4
6257	20.72	17.31	305.01	113.02	331.41	3.449	0.2537	777.748	2.7507	4	0.01	4
6258	20.22	16.12	39.91	89.65	219.98	4.132	0.1440	644.871	3.1166	5	0.11	2
6259	21.31	18.37	20.29	86.59	242.27	3.025	0.2326	881.176	2.5310	4	0.15	4
6260	18.26	13.98	355.23	17.57	350.37	10.959	0.1058	613.786	3.2210	4	0.03	4
6261	21.60	19.02	11.46	12.85	330.87	0.888	0.1899	967.491	2.3781	4	0.05	4
6262	20.65	17.82	11.81	146.86	198.53	6.465	0.1333	906.684	2.4833	4	0.19	4
6264	20.82	18.31	18.47	336.60	355.40	1.572	0.2127	983.270	2.3526	4	0.09	4
6266	20.22	17.44	6.27	19.62	331.78	1.494	0.2001	917.481	2.4638	4	0.11	4
6267	20.39	17.18	320.11	58.93	350.54	3.124	0.1034	819.865	2.6556	4	0.00	4
6268	21.60	19.43	352.08	182.53	190.89	0.653	0.2270	1069.923	2.2238	4	0.09	4
6269	20.93	16.68	14.72	141.94	199.15	3.990	0.1570	617.788	3.2070	4	0.00	4
6272	21.61	17.53	359.32	43.65	319.41	3.189	0.2322	648.968	3.1035	3	0.00	4
6273	22.21	18.82	352.32	47.66	327.56	3.510	0.2673	781.069	2.7429	4	0.87	4
6274	18.90	15.91	105.81	33.02	205.76	4.074	0.1678	870.203	2.5522	5	0.45	2
6275	21.00	18.29	349.22	63.32	315.78	0.556	0.2443	935.315	2.4323	4	0.05	4
6276	20.51	16.44	327.06	205.29	205.50	0.995	0.2109	649.602	3.1015	6	0.43	1
6277	21.03	16.91	345.75	154.45	226.85	4.076	0.1404	640.567	3.1306	4	0.15	4
6278	19.35	16.00	280.13	178.94	276.42	2.437	0.1147	791.459	2.7188	6	0.05	1
6279	19.70	17.29	312.56	65.43	352.68	7.439	0.0968	1009.792	2.3112	5	0.21	2
6280	20.82	16.50	338.93	46.18	345.10	5.013	0.1639	605.711	3.2495	5	0.45	2
6281	21.30	19.47	330.23	40.67	3.35	0.230	0.1894	1161.345	2.1055	4	0.07	4
6282	18.95	15.16	135.67	234.01	349.61	11.855	0.0473	701.874	2.9455	4	0.09	4
6285	19.52	17.36	45.74	312.15	346.33	4.128	0.1827	1074.789	2.2171	6	0.41	1
6286	19.50	15.21	167.97	231.52	321.24	2.740	0.0753	611.883	3.2276	5	0.23	2
6287	19.16	14.86	259.47	132.61	354.90	18.322	0.2286	609.314	3.2367	4	0.39	4
6288	20.32	16.74	310.51	157.39	266.72	2.799	0.1248	743.588	2.8343	4	0.15	4
6289	19.74	17.14	282.41	109.56	339.67	5.985	0.0789	963.313	2.3850	3	0.00	4
6290	20.44	18.82	41.49	96.63	215.17	2.251	0.1006	1221.639	2.0356	4	1.33	4
6291	21.02	18.40	40.35	12.65	287.49	1.017	0.2288	955.762	2.3975	4	0.00	4
6292	21.16	19.17	345.22	24.83	357.02	4.333	0.1604	1118.391	2.1591	4	0.05	4
6294	19.61	16.86	251.26	292.14	198.32	3.603	0.2002	925.238	2.4500	3	0.00	4
6295	19.68	15.62	147.32	211.37	355.67	17.162	0.1666	651.542	3.0953	3	0.00	4
6296	21.92	17.85	348.01	65.90	317.57	4.056	0.2654	650.990	3.0971	3	0.00	4
6299	19.15	15.66	261.88	282.53	195.56	13.359	0.1599	762.080	2.7882	5	0.81	2
6300	18.91	16.41	222.69	174.92	342.12	2.322	0.2907	986.286	2.3478	4	0.07	4
6303	19.28	15.62	291.40	249.66	182.41	2.252	0.0168	726.657	2.8781	11	0.57	4
6305	19.16	15.45	49.52	301.32	356.95	13.816	0.1505	717.893	2.9015	4	0.05	4
6306	19.83	16.64	334.74	139.11	252.42	2.860	0.0654	824.466	2.6457	4	1.67	4
6307	20.89	17.36	334.85	52.08	352.66	7.807	0.2582	753.927	2.8083	4	0.19	4
6308	19.24	16.24	107.86	31.02	219.65	2.347	0.0354	866.486	2.5595	6	0.17	1
6309	19.46	16.44	54.75	98.31	192.67	6.985	0.1567	863.772	2.5649	7	0.13	1
6312	19.86	17.44	3.96	8.56	346.99	4.832	0.2209	1006.774	2.3158	6	0.07	1
6313	20.43	17.01	333.36	85.03	310.46	2.220	0.1076	776.631	2.7533	4	0.19	4
6316	18.40	15.14	138.47	209.99	357.69	6.247	0.2729	809.817	2.6776	4	0.00	4
6318	20.75	17.62	318.11	72.31	347.84	8.138	0.1708	837.442	2.6183	4	0.41	4
6319	18.74	16.79	348.56	113.82	262.91	2.324	0.1070	1129.747	2.1446	6	0.17	1
6320	19.34	15.44	50.41	117.14	187.63	8.557	0.0763	681.556	3.0037	8	0.59	1

© European Southern Observatory • Provided by the NASA Astrophysics Data System

1970A&AS....2..339V

Table 7 (*continued*)

PL	m_0	g	M	ω (1950)	Ω (1950)	i (1950)	e	n	a (A. U.)	N	σ^2	Q
			°	°	°	°		″			″	
6322	20.04	17.20	298.12	89.96	356.34	5.625	0.1985	903.141	2.4898	4	0.01	4
6323	20.05	16.66	12.15	359.25	353.01	4.867	0.1245	783.097	2.7382	7	0.88	1
6324	21.57	19.37	9.40	72.69	274.04	1.791	0.2313	1063.459	2.2328	4	0.17	4
6325	21.27	18.23	11.06	25.74	319.14	1.254	0.2084	858.884	2.5746	4	0.67	4
6327	21.17	18.20	359.55	100.36	262.09	0.398	0.2522	875.032	2.5428	4	0.21	4
6328	18.94	15.86	171.63	179.87	9.29	3.033	0.0890	849.995	2.5925	9	0.55	1
6329	20.46	16.18	352.15	164.11	209.35	5.220	0.1382	613.170	3.2231	4	0.45	4
6330	21.14	18.19	339.15	46.44	344.60	7.471	0.1435	879.662	2.5339	4	0.35	4
6331	22.00	19.54	1.93	3.28	355.10	8.086	0.2816	996.721	2.3314	3	0.00	4
6333	20.52	17.40	309.23	204.15	232.44	3.248	0.2169	840.233	2.6125	4	0.57	4
6334	20.52	18.14	35.29	50.71	260.36	0.772	0.1942	1017.879	2.2990	4	0.29	4
6335	18.98	14.92	115.19	53.69	180.38	0.887	0.1394	651.670	3.0949	8	0.45	1
6337	21.72	19.45	358.45	165.32	198.84	0.699	0.2132	1043.942	2.2605	4	0.11	4
6340	20.26	16.89	316.96	76.32	335.39	4.845	0.0614	787.019	2.7290	3	0.00	4
6344	25.96	22.92	348.70	232.60	184.27	4.616	0.6350	858.194	2.5760	4	0.13	4
6345	20.59	17.22	305.74	232.26	195.98	9.922	0.1160	787.181	2.7286	4	0.41	4
6346	18.76	15.28	203.57	167.18	355.04	13.131	0.0775	762.695	2.7867	5	0.05	1
6349	20.41	16.94	293.43	204.19	236.38	3.021	0.1003	766.673	2.7771	3	0.00	4
6350	20.64	17.89	313.69	202.24	223.85	3.339	0.1787	925.973	2.4487	4	0.41	4
6353	21.13	17.44	330.30	32.45	7.71	1.577	0.1342	723.195	2.8873	3	0.00	4
6354	20.63	17.92	356.10	190.70	176.36	2.520	0.1902	936.213	2.4308	7	0.57	1
6355	21.45	19.39	340.31	121.26	271.59	0.988	0.2179	1100.912	2.1819	3	0.00	4
6357	20.31	16.96	35.72	125.74	190.88	9.219	0.1217	790.321	2.7214	4	0.15	2
6358	21.39	18.36	345.72	169.29	215.05	3.289	0.2275	861.077	2.5702	3	0.00	4
6359	21.59	17.50	3.27	0.61	356.18	6.919	0.2201	647.314	3.1088	3	0.00	4
6360	19.56	17.30	225.57	242.29	257.14	3.038	0.0437	1048.300	2.2543	3	0.00	4
6362	20.42	18.35	31.02	106.98	213.39	5.160	0.1418	1099.144	2.1842	4	0.41	4
6363	21.52	19.15	15.79	345.99	349.73	1.815	0.2149	1019.864	2.2960	4	0.01	4
6364	20.33	17.10	32.37	122.27	197.20	9.236	0.1492	815.492	2.6651	4	0.27	4
6366	20.95	17.57	52.30	302.39	349.84	6.026	0.1556	785.848	2.7317	3	0.00	4
6367	20.39	17.04	282.37	93.56	352.59	13.171	0.0627	791.525	2.7187	3	0.00	4
6368	20.87	18.53	338.57	61.82	327.56	3.461	0.1307	1028.036	2.2838	4	0.95	4
6369	20.21	16.33	133.17	267.00	317.21	3.726	0.0623	685.723	2.9916	3	0.00	4
6372	19.60	16.32	81.53	46.17	217.65	3.291	0.1470	805.173	2.6878	4	0.07	4
6373	21.54	18.77	347.51	42.52	339.22	4.190	0.2126	920.281	2.4588	4	0.07	4
6374	22.36	19.84	359.99	102.32	258.92	0.026	0.2587	982.096	2.3545	3	0.00	4
6377	21.31	19.28	4.99	103.26	251.10	2.581	0.1757	1107.551	2.1731	4	3.71	4
6380	20.68	17.41	286.39	120.04	333.10	4.067	0.1537	808.127	2.6813	3	0.00	4
6381	19.14	16.13	298.96	244.00	182.13	10.159	0.0541	865.364	2.5617	8	2.13	1
6382	18.36	15.95	353.74	31.15	337.86	5.597	0.1731	1010.039	2.3108	3	0.00	4
6384	21.68	18.67	359.65	174.15	186.14	1.646	0.1561	865.550	2.5613	4	0.31	4
6511	20.51	17.84	357.55	333.08	30.97	0.429	0.2297	945.942	2.4141	8	0.07	1
6512	17.58	14.83	330.61	29.47	7.15	5.952	0.1100	925.464	2.4496	8	0.45	1
6513	18.33	15.27	92.69	245.49	2.27	12.661	0.1610	853.464	2.5855	8	0.47	1
6514	19.03	15.76	3.12	352.07	4.15	14.124	0.1377	807.582	2.6825	8	0.41	1
6515	19.25	16.08	6.50	345.30	0.44	15.451	0.3186	829.153	2.6358	5	0.45	1
6516	19.36	17.18	351.28	1.40	12.87	6.462	0.2429	1069.318	2.2246	8	0.19	1
6519	18.32	14.35	261.92	90.34	30.07	3.429	0.1885	668.333	3.0432	11	0.19	1
6520	18.96	16.62	323.58	239.27	169.08	4.875	0.1340	1027.516	2.2846	8	0.29	1
6521	17.30	15.05	334.38	241.16	152.99	3.591	0.1317	1050.178	2.2516	8	0.13	1

© European Southern Observatory • Provided by the NASA Astrophysics Data System

1970A&AS....2..339V

Table 7 (*continued*)

PL	m_0	g	M	ω (1950)	Ω (1950)	i (1950)	e	n	a (A. U.)	N	σ^2	Q
			°	°	°	°		″			″	
6522	19.35	15.10	307.44	316.82	112.77	3.068	0.1534	618.420	3.2049	7	0.21	1
6523	17.63	14.50	14.90	325.15	13.69	13.342	0.1784	837.217	2.6188	8	0.31	1
6525	18.85	14.57	22.24	180.11	149.38	1.442	0.1800	612.740	3.2246	8	0.23	1
6526	19.75	15.54	4.59	176.13	179.68	17.906	0.1229	625.144	3.1818	7	0.11	1
6527	19.68	17.00	322.98	280.46	133.02	1.844	0.1855	943.478	2.4183	8	0.17	1
6528	18.90	15.15	77.69	135.94	140.41	2.765	0.0633	709.783	2.9236	8	0.23	1
6529	19.47	15.39	28.28	196.85	126.35	2.223	0.1471	647.720	3.1075	8	0.13	1
6530	17.68	14.85	332.46	227.10	171.48	5.606	0.1564	906.341	2.4839	8	0.11	1
6531	18.13	16.03	329.53	19.64	16.15	4.710	0.0689	1090.861	2.1952	9	0.15	1
6532	20.48	17.46	5.38	338.47	12.91	6.083	0.2529	862.772	2.5668	10	0.23	1
6533	18.61	14.38	70.38	152.25	121.47	1.872	0.1498	621.230	3.1952	8	0.05	1
6534	16.75	13.04	329.40	318.09	76.30	3.166	0.0944	717.025	2.9039	8	0.29	1
6536	18.07	13.97	345.93	238.55	141.37	0.707	0.1459	644.189	3.1188	10	0.09	1
6537	19.70	16.32	334.39	6.15	27.39	3.180	0.1260	783.222	2.7378	7	0.21	1
6538	18.51	14.48	302.35	322.36	118.32	1.831	0.2055	657.087	3.0779	9	0.83	1
6539	18.63	15.40	63.02	120.80	170.18	7.713	0.0638	815.048	2.6661	9	0.31	1
6540	19.45	12.69	273.34	68.91	24.00	9.097	0.0588	293.928	5.2623	8	0.45	1
6541	19.47	12.72	310.36	264.37	152.87	8.092	0.0867	294.592	5.2544	8	0.33	1
6542	17.24	13.62	335.84	348.33	38.90	2.543	0.0781	734.676	2.8572	8	0.29	1
6543	18.32	14.14	26.82	239.42	82.84	2.109	0.1818	630.521	3.1637	8	0.11	1
6545	16.80	12.92	58.97	273.78	16.64	10.296	0.0869	684.410	2.9954	8	0.61	1
6546	16.78	13.16	267.77	7.57	88.10	3.266	0.0369	736.044	2.8536	8	0.35	1
6547	18.30	15.60	0.87	318.89	38.46	3.087	0.2092	938.649	2.4266	8	0.29	1
6548	17.69	14.50	314.85	261.77	170.82	4.169	0.2735	824.178	2.6464	8	0.39	1
6549	16.46	12.52	220.43	93.57	55.14	4.542	0.1699	673.849	3.0266	8	0.57	1
6550	17.36	12.60	348.50	4.08	9.69	10.917	0.1199	534.645	3.5315	8	0.31	1
6551	17.14	12.93	40.69	258.37	52.33	1.544	0.1024	624.707	3.1833	8	0.45	1
6552	16.92	14.61	287.49	279.87	165.78	7.018	0.1120	1035.337	2.2730	8	0.73	1
6553	17.02	14.54	283.73	74.71	18.97	3.191	0.1431	992.482	2.3380	9	0.41	1
6554	17.29	13.82	258.91	102.72	359.63	4.077	0.0230	765.848	2.7791	8	0.17	1
6555	17.54	13.96	244.75	349.60	124.25	2.998	0.0089	742.398	2.8373	8	0.17	1
6556	18.73	15.22	10.40	170.09	173.26	9.806	0.1791	756.426	2.8021	8	0.47	1
6558	17.36	14.26	273.28	95.71	3.03	14.875	0.1177	845.470	2.6017	7	0.33	1
6559	16.93	12.91	243.04	62.57	64.85	1.881	0.1310	658.846	3.0724	8	0.61	1
6560	17.13	14.86	201.70	51.08	109.18	2.988	0.0880	1046.050	2.2575	8	0.41	1
6561	16.98	14.78	263.47	81.84	28.36	6.232	0.1387	1064.004	2.2320	8	0.75	1
6562	17.43	13.27	255.60	56.68	64.67	2.345	0.1725	634.721	3.1498	8	0.55	1
6563	17.44	14.14	202.95	153.34	7.22	6.963	0.0701	800.958	2.6973	7	0.29	1
6564	18.10	13.92	30.88	192.56	125.19	2.540	0.1621	630.014	3.1654	9	0.51	1
6565	18.12	14.46	322.34	304.72	98.83	3.062	0.0763	727.554	2.8758	7	4.45	1
6566	18.73	15.74	16.52	169.27	159.40	4.308	0.2866	869.011	2.5545	7	0.17	1
6567	17.79	14.63	115.47	39.84	190.02	2.133	0.1414	830.553	2.6328	8	0.33	1
6568	17.97	15.64	291.37	81.67	359.61	4.236	0.1225	1029.623	2.2814	8	0.39	1
6569	18.38	14.14	56.83	151.38	133.11	2.705	0.1573	620.120	3.1990	7	0.23	1
6570	18.80	16.22	316.71	242.02	180.28	2.406	0.2085	966.165	2.3803	8	0.77	1
6571	18.19	14.34	293.81	335.53	118.06	3.113	0.2531	691.126	2.9760	8	0.49	1
6572	19.39	16.98	336.65	28.88	11.10	7.522	0.2737	1010.099	2.3108	8	0.53	1
6573	17.67	14.58	207.31	28.55	126.50	3.652	0.0771	846.067	2.6005	8	0.35	1
6574	18.56	16.02	351.21	0.07	10.66	6.944	0.1148	976.780	2.3630	8	0.27	1
6575	18.03	13.74	265.97	84.29	22.85	5.243	0.1232	610.385	3.2329	8	0.83	1

© European Southern Observatory • Provided by the NASA Astrophysics Data System

1970A&AS....2..339V

Table 7 (*continued*)

PL	m_0	g	M	ω (1950)	Ω (1950)	i (1950)	e	n	a (A. U.)	N	σ^2	Q
			°	°	°	°		″			″	
6576	17.95	15.56	266.60	76.40	26.92	4.054	0.0883	1014.879	2.3035	8	0.41	1
6577	18.75	15.25	43.51	177.52	125.74	1.856	0.1479	759.202	2.7953	9	0.47	1
6578	17.53	14.88	217.87	51.08	99.60	2.991	0.1433	949.235	2.4085	8	0.77	1
6579	17.84	15.27	288.63	15.36	66.30	3.155	0.0927	968.794	2.3760	8	0.87	1
6580	17.82	15.64	128.63	154.06	68.82	3.931	0.0987	1069.006	2.2251	8	0.87	1
6581	18.81	12.00	314.56	55.94	350.62	4.922	0.0299	289.073	5.3210	7	0.39	1
6582	17.99	13.80	261.16	103.43	11.47	0.749	0.1593	628.635	3.1700	8	0.53	1
6583	18.34	16.00	284.22	273.79	172.89	4.122	0.1021	1027.506	2.2846	8	0.57	1
6584	18.20	14.92	164.48	163.85	29.87	3.399	0.0301	804.376	2.6896	8	0.65	1
6585	19.45	15.36	4.83	205.48	147.93	2.402	0.1202	645.473	3.1147	8	0.19	1
6586	19.38	16.24	23.41	153.34	172.06	11.771	0.1879	835.723	2.6219	8	0.21	1
6587	19.77	15.66	4.64	292.40	60.17	2.186	0.1838	643.107	3.1223	8	0.41	1
6588	19.17	14.88	313.40	329.47	88.54	0.664	0.1230	610.914	3.2311	8	0.27	1
6589	18.98	15.30	312.83	60.49	8.37	9.904	0.2145	722.365	2.8895	8	0.45	1
6590	19.11	15.28	334.18	23.94	7.30	9.530	0.0739	694.780	2.9655	8	0.09	1
6591	19.02	12.22	283.56	58.99	18.56	7.360	0.0417	290.298	5.3061	8	0.69	1
6592	19.91	15.66	337.17	283.23	106.71	1.134	0.1667	618.936	3.2031	7	0.33	1
6593	18.83	16.66	67.53	114.60	155.44	3.154	0.1833	1071.919	2.2210	8	0.51	1
6594	18.93	16.22	345.40	198.38	177.35	6.334	0.0729	934.458	2.4338	8	0.41	1
6595	19.01	16.38	71.79	101.57	168.25	1.306	0.1522	953.569	2.4012	8	0.43	1
6596	19.84	16.78	1.84	347.52	8.87	3.641	0.1535	852.813	2.5868	8	0.19	1
6598	20.40	17.00	17.72	313.55	16.10	7.792	0.2384	779.628	2.7462	7	0.45	1
6599	18.37	15.32	248.03	9.91	109.88	1.674	0.0796	854.920	2.5825	8	0.59	1
6600	18.21	16.12	158.78	134.34	64.08	1.960	0.0623	1093.373	2.1919	8	0.61	1
6601	19.17	16.90	38.45	146.25	163.52	6.955	0.1392	1045.074	2.2589	8	0.33	1
6602	19.69	17.60	349.89	1.98	11.33	6.563	0.1367	1093.117	2.1922	7	0.59	1
6603	20.30	16.78	337.04	244.52	153.37	2.549	0.2449	755.774	2.8037	8	0.25	1
6604	19.51	16.52	319.66	279.81	137.81	2.922	0.1961	868.675	2.5552	8	0.33	1
6605	19.72	16.62	326.12	258.44	150.68	3.662	0.1922	844.558	2.6036	7	0.17	1
6606	18.58	16.13	226.84	107.99	28.67	6.666	0.0431	999.118	2.3277	8	1.39	1
6607	18.07	15.38	147.19	71.45	134.28	3.851	0.1408	939.635	2.4249	8	0.75	1
6608	20.31	17.18	329.30	42.89	13.18	6.072	0.3143	838.948	2.6152	8	0.53	1
6609	19.67	16.37	340.49	16.19	11.73	13.690	0.1833	801.358	2.6964	6	0.31	1
6610	19.44	15.12	324.16	40.06	359.93	10.442	0.0801	605.487	3.2503	8	0.47	1
6611	18.17	15.24	316.91	239.32	183.32	2.702	0.2196	883.094	2.5273	6	0.35	1
6612	18.78	15.68	30.08	146.85	171.98	3.978	0.1380	843.705	2.6054	6	0.29	1
6613	19.93	17.28	7.98	295.81	49.61	1.924	0.2201	948.767	2.4093	7	0.21	1
6614	19.18	16.00	45.20	188.45	117.29	2.773	0.0770	827.334	2.6396	8	0.33	1
6615	17.92	15.72	157.81	178.00	18.81	4.705	0.0925	1063.602	2.2326	8	0.61	1
6616	19.45	15.93	327.93	225.96	171.84	1.914	0.1026	754.492	2.8069	7	0.83	1
6617	18.86	16.07	263.05	89.10	18.34	6.494	0.1087	915.546	2.4672	8	0.45	1
6618	19.64	17.06	348.83	300.39	75.18	2.332	0.2012	965.949	2.3806	8	0.27	1
6619	19.16	17.02	16.11	168.58	165.87	3.423	0.2064	1079.842	2.2102	7	0.61	1
6620	19.13	15.75	285.75	81.57	11.01	13.443	0.1758	783.265	2.7377	8	0.77	1
6621	19.06	15.74	72.15	99.80	169.49	12.479	0.1530	796.626	2.7070	7	0.71	1
6622	18.10	15.68	206.79	358.02	159.58	3.029	0.1108	1006.018	2.3170	8	0.75	1
6623	19.35	16.72	297.77	59.35	10.32	6.154	0.0770	953.938	2.4006	6	0.43	1
6624	18.93	16.51	331.66	333.98	58.59	3.077	0.0921	1006.118	2.3168	8	0.25	1
6625	18.99	16.30	62.04	149.11	135.63	2.629	0.1143	940.816	2.4229	8	0.47	1
6626	18.68	16.30	135.82	217.97	1.48	2.582	0.0616	1016.065	2.3017	8	0.51	1

© European Southern Observatory • Provided by the NASA Astrophysics Data System

1970A&AS....2..339V

Table 7 (*continued*)

PL	m_0	g	M	ω (1950)	Ω (1950)	i (1950)	e	n	a (A. U.)	N	σ^2	Q
			°	°	°	°		″			″	
6627	18.38	14.36	326.49	226.88	172.87	3.241	0.0935	659.770	3.0695	8	0.55	1
6628	19.52	16.82	9.55	187.93	158.05	1.273	0.1892	938.069	2.4276	8	0.23	1
6629	18.85	12.28	250.89	306.80	162.11	4.213	0.0067	311.120	5.0666	8	0.29	1
6630	18.71	16.40	131.46	208.46	15.11	6.142	0.0646	1035.410	2.2729	8	0.73	1
6631	19.31	16.97	328.99	251.27	150.84	5.126	0.1603	1027.947	2.2839	6	0.25	1
6632	19.19	15.49	268.90	338.13	117.04	3.088	0.0381	719.617	2.8969	7	0.97	1
6633	20.33	16.61	334.96	238.10	157.08	3.342	0.1806	715.065	2.9092	7	0.11	1
6634	19.24	15.18	267.70	24.60	80.66	3.665	0.1287	651.235	3.0963	8	0.51	1
6635	19.79	17.06	34.45	172.21	134.70	3.088	0.2127	929.707	2.4421	7	0.15	1
6636	19.13	15.46	186.55	55.99	116.19	3.768	0.0198	726.087	2.8796	8	0.41	1
6637	18.59	16.24	255.44	318.87	157.23	4.761	0.1175	1024.397	2.2892	8	0.49	1
6638	20.01	16.75	36.05	264.21	40.51	3.801	0.2086	810.264	2.6766	5	0.11	2
6639	19.50	15.40	289.23	310.00	138.75	2.768	0.1752	645.357	3.1150	8	0.63	1
6640	19.07	14.98	311.39	59.41	5.10	4.688	0.1541	646.539	3.1113	8	0.19	1
6641	18.89	15.81	355.10	0.74	7.40	12.762	0.1868	849.012	2.5945	8	0.31	1
6642	18.56	16.29	8.50	299.41	49.29	2.906	0.1371	1045.983	2.2576	8	0.47	1
6643	18.41	16.25	324.82	18.12	31.07	4.802	0.1684	1073.130	2.2194	8	0.29	1
6644	19.32	16.39	48.70	137.03	154.49	5.301	0.2079	883.214	2.5271	7	0.21	1
6645	19.47	16.76	1.72	339.05	18.67	9.291	0.2369	934.136	2.4344	7	0.35	1
6646	19.41	16.03	330.71	5.83	32.26	5.361	0.1198	783.307	2.7376	7	0.11	1
6647	18.51	15.86	13.38	304.99	34.45	3.028	0.2269	949.713	2.4077	7	0.09	1
6651	20.44	18.03	29.47	291.27	28.30	2.084	0.1608	1010.536	2.3101	4	1.69	4
6652	19.29	15.18	101.04	120.07	123.05	1.982	0.1617	641.861	3.1264	8	0.13	1
6653	19.31	16.06	312.20	285.17	131.51	3.599	0.0879	811.890	2.6730	8	0.29	1
6667	19.53	15.70	11.92	340.01	3.44	9.760	0.0955	694.103	2.9674	7	0.73	1
6668	19.73	15.89	109.84	231.88	10.33	10.307	0.0482	692.264	2.9727	3	0.00	4
6669	19.28	17.07	27.81	321.03	358.38	6.406	0.1778	1060.112	2.2375	7	0.63	1
6670	18.89	15.76	240.17	119.31	10.44	3.958	0.1292	837.163	2.6189	6	0.53	1
6671	19.67	16.34	298.49	305.27	121.81	3.176	0.0770	795.348	2.7099	4	0.00	4
6672	20.33	16.89	24.74	159.53	160.93	7.909	0.2042	772.028	2.7642	3	0.00	4
6673	18.45	14.12	1.23	186.72	169.91	21.913	0.0281	604.506	3.2539	5	0.13	2
6674	20.40	16.81	34.68	150.10	148.96	4.841	0.2770	741.444	2.8397	4	0.05	4
6675	20.32	17.37	311.54	64.39	10.66	5.332	0.2672	877.881	2.5373	8	1.33	1
6676	18.81	14.92	258.30	127.44	345.65	1.139	0.1193	682.308	3.0015	6	0.43	1
6677	19.56	17.31	351.52	349.31	19.54	4.353	0.1122	1051.772	2.2493	8	0.97	1
6678	19.89	17.10	334.14	28.79	4.24	4.028	0.1431	917.116	2.4644	8	0.45	1
6679	18.88	16.18	128.02	213.85	356.36	7.434	0.2854	937.146	2.4292	3	0.00	4
6680	18.90	16.42	287.07	255.81	183.55	6.235	0.0665	991.230	2.3400	7	0.81	1
6681	19.37	16.89	150.27	200.46	3.06	7.927	0.0921	992.924	2.3373	3	0.00	4
6682	21.09	19.29	347.24	197.15	182.35	1.043	0.2213	1169.624	2.0955	4	1.95	4
6683	19.46	15.20	214.89	359.79	149.41	5.463	0.1124	615.957	3.2134	6	0.21	1
6684	20.46	18.21	58.45	271.60	11.40	3.514	0.1613	1050.999	2.2504	4	0.25	4
6685	21.68	18.22	340.90	240.34	150.35	1.315	0.2471	766.912	2.7765	4	0.37	4
6686	20.16	17.84	26.37	310.97	11.54	4.923	0.1592	1032.784	2.2768	4	0.05	4
6687	21.08	19.26	23.99	167.75	153.99	3.819	0.2107	1166.297	2.0995	3	0.00	4
6688	20.23	16.08	13.49	336.92	2.37	5.208	0.1770	636.035	3.1454	7	0.25	1
6691	18.43	15.82	214.21	134.54	15.16	6.133	0.0954	958.756	2.3925	5	0.03	2
6692	20.29	18.06	337.96	344.90	41.03	3.284	0.1135	1055.908	2.2434	5	2.13	2
6693	20.71	18.06	333.22	22.60	16.07	6.278	0.2037	950.852	2.4058	5	0.39	1
6694	20.79	18.95	323.63	239.86	169.78	2.140	0.1725	1160.965	2.1060	4	0.21	4

© European Southern Observatory • Provided by the NASA Astrophysics Data System

1970A&AS....2..339V

Table 7 (*continued*)

PL	m_0	g	M	ω (1950)	Ω (1950)	i (1950)	e	n	a (A. U.)	N	σ^2	Q
6695	20.45	16.24	339°.77	14°.99	12°.06	4°.380	0.1668	624".949	3.1825	6	0".29	1
6696	20.99	18.82	348.18	236.18	141.56	2.603	0.2260	1070.100	2.2235	4	0.25	4
6697	20.26	16.89	299.62	23.99	48.94	3.846	0.1365	786.609	2.7300	4	0.33	4
6698	20.02	17.52	19.83	316.03	16.89	5.995	0.1275	987.049	2.3466	4	0.29	4
6700	19.84	16.50	309.50	44.75	13.92	3.221	0.0973	793.095	2.7151	7	0.43	1
6701	19.81	16.04	83.99	77.79	179.38	21.607	0.1571	706.396	2.9329	4	0.15	4
6702	20.25	18.17	8.39	340.48	6.71	6.216	0.1701	1095.047	2.1896	4	0.33	4
6703	19.69	16.47	275.46	277.84	167.89	3.973	0.0194	819.174	2.6571	4	0.05	4
6704	19.35	16.76	53.96	152.01	131.71	1.258	0.2014	964.746	2.3826	7	0.29	1
6705	19.33	16.84	277.52	76.76	22.58	7.252	0.1633	988.243	2.3447	5	0.19	2
6706	20.12	17.14	313.62	46.55	24.50	5.627	0.2560	871.563	2.5496	8	0.39	1
6707	19.75	15.84	149.81	63.67	143.68	3.049	0.0268	680.119	3.0080	4	0.07	4
6708	20.70	18.48	340.99	342.02	42.37	1.392	0.1377	1058.320	2.2400	4	0.95	4
6709	20.66	18.21	351.51	326.92	45.66	3.038	0.2322	998.905	2.3280	4	0.21	4
6711	19.75	16.01	49.26	308.56	1.10	2.113	0.0071	711.698	2.9183	4	0.00	4
6712	19.72	16.68	352.58	189.28	180.84	12.948	0.1676	858.838	2.5747	7	1.29	1
6713	21.02	17.67	69.66	276.33	4.96	4.842	0.0773	790.674	2.7206	4	0.23	4
6714	20.93	16.93	337.00	26.72	4.68	14.633	0.1705	663.821	3.0570	3	0.00	4
6715	20.55	18.27	333.28	17.02	17.25	7.139	0.1437	1041.529	2.2640	4	1.39	4
6716	19.68	16.12	296.36	50.49	13.54	12.343	0.0231	746.380	2.8272	4	1.11	4
6717	19.80	17.09	93.17	172.77	76.01	2.485	0.1505	935.346	2.4323	3	0.00	4
6720	20.05	16.25	352.18	2.51	7.23	0.860	0.1206	700.406	2.9496	6	0.43	1
6721	20.91	17.90	47.98	280.32	20.70	2.638	0.1116	866.490	2.5595	3	0.00	4
6722	19.58	17.24	332.32	15.44	16.70	6.796	0.0932	1027.683	2.2843	7	0.45	1
6724	21.88	17.84	13.01	333.42	1.84	9.034	0.2924	655.728	3.0821	4	0.03	4
6725	19.77	15.56	278.02	299.64	161.95	2.172	0.1748	625.120	3.1819	5	0.07	2
6726	20.08	16.31	50.38	182.77	119.26	3.061	0.0679	706.605	2.9323	4	0.00	4
6727	19.66	17.24	341.37	219.10	169.72	12.449	0.2248	1006.770	2.3158	4	0.11	4
6728	20.60	18.20	347.46	251.49	127.19	2.556	0.2129	1013.157	2.3061	5	0.09	2
6729	20.26	16.31	9.95	341.74	5.96	13.389	0.0711	672.377	3.0310	4	0.35	4
6731	20.94	17.95	336.01	325.66	71.98	2.528	0.2349	869.055	2.5545	4	0.03	4
6732	20.38	17.92	332.98	338.61	57.89	3.219	0.1677	996.473	2.3318	6	0.03	1
6733	20.95	19.11	3.15	189.35	165.37	5.100	0.1914	1160.775	2.1062	4	2.15	4
6734	20.33	18.02	322.19	286.99	121.82	1.270	0.1399	1036.163	2.2718	4	0.57	4
6735	19.71	15.59	328.90	28.91	12.32	5.106	0.1506	640.211	3.1317	7	1.31	1
6736	19.77	16.84	308.77	23.88	37.11	5.134	0.1125	883.992	2.5256	7	0.29	1
6737	20.31	16.82	41.01	294.49	12.39	3.730	0.1397	761.638	2.7893	4	0.15	4
6739	19.99	17.64	21.04	161.29	171.50	6.370	0.1252	1024.384	2.2892	6	1.13	1
6740	21.02	16.73	352.66	341.86	27.69	4.646	0.1649	610.954	3.2309	4	0.01	4
6741	19.64	16.38	171.88	116.66	70.26	3.052	0.0133	809.556	2.6781	4	0.45	4
6742	19.75	17.48	302.70	343.92	88.92	2.398	0.1532	1046.528	2.2568	7	0.41	1
6743	18.32	18.31	302.78	104.68	10.92	7.290	0.4931	1721.276	1.6197	4	0.09	4
6744	20.48	17.48	325.34	239.07	173.26	6.560	0.2156	867.224	2.5581	6	1.19	1
6745	19.49	15.39	274.41	325.21	139.01	2.010	0.1647	644.457	3.1179	7	0.53	1
6746	20.63	18.10	355.70	198.53	167.18	6.478	0.1572	980.190	2.3575	4	0.39	4
6747	20.71	17.84	40.45	288.05	8.79	14.533	0.2363	897.686	2.4998	3	0.00	4
6748	20.09	17.93	31.28	299.65	26.49	5.233	0.0305	1074.111	2.2180	4	0.25	4
6749	21.31	19.14	12.78	175.75	164.69	4.033	0.1984	1071.940	2.2210	4	0.27	4
6752	20.51	16.24	310.22	0.62	75.31	2.874	0.2533	614.601	3.2181	4	1.07	4
6753	20.21	16.88	325.65	341.93	57.43	2.800	0.0778	794.703	2.7114	4	0.03	4

© European Southern Observatory • Provided by the NASA Astrophysics Data System

1970A&AS....2..339V

Table 7 (*continued*)

PL	m_0	g	M	ω (1950)	Ω (1950)	i (1950)	e	n	a (A. U.)	N	σ^2	Q
			°	°	°	°		″			″	
6755	20.03	16.20	324.34	30.09	15.71	0.938	0.1262	694.721	2.9657	7	0.19	1
6756	21.67	19.02	8.19	174.52	171.37	2.454	0.2573	950.774	2.4059	4	0.01	4
6757	21.16	18.96	9.77	168.55	174.52	8.595	0.2521	1062.564	2.2340	4	0.23	4
6758	20.37	18.17	338.25	235.44	159.18	4.793	0.2305	1062.727	2.2338	4	0.53	4
6759	19.26	16.83	97.39	161.71	85.68	2.615	0.1345	1004.869	2.3188	4	0.05	4
6760	21.29	18.64	1.27	199.42	158.53	2.923	0.2255	949.154	2.4086	4	0.09	4
6761	18.73	14.70	245.32	307.49	174.83	9.582	0.0719	657.982	3.0751	7	0.75	1
6762	20.38	18.02	37.59	273.53	37.05	3.602	0.1434	1023.218	2.2910	4	1.63	4
6763	20.07	17.72	347.36	199.80	179.48	6.939	0.1890	1025.342	2.2878	6	0.27	1
6764	20.37	16.10	319.76	266.37	156.26	2.045	0.2353	614.465	3.2186	4	0.45	4
6765	20.98	18.28	351.03	357.49	15.18	3.686	0.1518	939.096	2.4258	3	0.00	4
6766	17.62	13.48	76.08	106.32	171.11	13.486	0.0593	638.006	3.1389	5	0.25	2
6768	21.08	18.78	359.26	307.71	53.13	2.708	0.2263	1038.160	2.2689	4	0.05	4
6769	19.38	15.24	343.46	327.74	56.15	2.442	0.1784	637.858	3.1394	6	0.21	1
6770	21.17	19.45	342.71	232.38	153.04	1.486	0.1806	1193.258	2.0678	4	0.05	4
6773	19.83	17.13	302.01	346.08	90.62	3.243	0.1766	937.364	2.4288	7	0.31	1
6774	19.72	16.72	50.99	279.54	13.38	13.478	0.1554	866.930	2.5586	6	0.13	1
6775	19.94	17.42	308.17	331.40	102.17	1.521	0.2047	980.931	2.3563	6	0.21	1
6776	20.08	16.83	254.64	53.97	59.47	1.482	0.0690	812.429	2.6718	3	0.00	4
6778	19.61	16.36	358.93	199.97	161.61	9.356	0.2262	811.346	2.6742	4	0.01	4
6779	18.95	15.80	87.41	132.18	134.83	4.131	0.0492	832.537	2.6286	7	0.19	1
6780	19.43	15.28	184.30	8.76	168.16	14.273	0.1105	635.865	3.1460	3	0.00	4
6781	21.27	17.12	327.11	25.64	27.95	5.086	0.2511	634.930	3.1491	4	0.61	4
6782	19.19	16.98	89.13	123.64	132.73	2.838	0.1307	1061.187	2.2360	5	0.89	2
6783	20.19	16.77	345.39	356.34	24.29	5.454	0.1647	775.465	2.7561	7	0.19	1
6784	19.62	15.74	357.48	351.02	12.07	10.384	0.0545	684.037	2.9965	4	0.03	4
6785	20.38	17.45	40.91	274.74	25.44	3.379	0.2115	882.905	2.5277	4	0.17	4
6786	19.35	15.46	165.06	168.57	22.44	2.871	0.2046	684.511	2.9951	3	0.00	4
6787	17.98	15.97	127.91	101.03	124.75	0.855	0.0857	1112.996	2.1660	7	0.31	1
6788	20.86	17.12	349.19	308.83	67.93	2.793	0.2065	711.550	2.9187	4	0.05	4
6789	19.83	16.00	331.68	289.30	109.82	3.337	0.1655	694.393	2.9666	5	0.09	2
6790	19.53	16.83	42.92	202.87	96.16	3.380	0.1911	937.788	2.4281	7	0.59	1
6791	19.02	15.80	135.28	196.13	17.70	12.978	0.1454	819.172	2.6571	6	0.53	1
6792	18.60	14.86	44.56	208.20	102.80	3.313	0.0528	711.755	2.9182	6	0.07	1
6793	18.88	16.58	76.42	223.36	44.64	3.836	0.1367	1038.440	2.2685	6	0.13	1
6794	19.01	16.60	215.10	20.93	130.01	3.435	0.0967	1008.932	2.3125	5	0.55	1
6795	21.74	19.75	359.54	187.56	173.67	4.982	0.1981	1118.940	2.1584	3	0.00	4
6796	19.84	17.63	81.50	255.99	16.33	4.572	0.0610	1059.866	2.2378	3	0.00	4
6797	18.82	16.22	105.19	190.49	49.94	2.000	0.1455	962.240	2.3868	6	0.73	1
6798	20.69	18.04	356.60	352.46	13.23	6.996	0.2052	948.911	2.4091	6	1.15	1
6799	20.57	17.86	329.65	283.42	120.80	2.055	0.1876	935.066	2.4328	4	0.11	4
6800	18.40	14.79	196.43	38.57	129.39	3.451	0.1439	737.214	2.8506	4	0.21	4
6801	19.67	16.96	19.20	199.17	131.39	3.276	0.2081	935.956	2.4312	4	0.15	4
6802	21.15	18.90	10.74	321.99	22.94	2.332	0.1832	1050.092	2.2517	4	0.41	4
6803	20.25	16.78	53.92	266.44	15.15	10.184	0.2298	764.619	2.7821	4	0.03	4
6804	19.55	16.86	274.74	14.80	84.81	3.320	0.1240	940.495	2.4234	4	0.05	4
6805	20.87	17.81	12.39	276.84	60.73	3.015	0.2755	852.684	2.5870	5	0.13	2
6806	19.81	16.03	55.81	231.11	69.57	3.068	0.0403	704.641	2.9378	5	0.09	2
6807	20.56	17.38	341.52	227.79	164.40	6.417	0.2573	827.632	2.6390	3	0.00	4
6808	19.32	15.29	105.78	212.35	21.58	6.428	0.2085	657.644	3.0761	4	0.07	4

© European Southern Observatory • Provided by the NASA Astrophysics Data System

1970A&AS....2..339V

Table 7 (*continued*)

PL	m_0	g	M	ω (1950)	Ω (1950)	i (1950)	e	n	a (A. U.)	N	σ^2	Q
			°	°	°	°		″			″	
6809	19.51	17.34	76.00	191.11	78.69	1.021	0.1334	1070.341	2.2232	5	0.25	2
6810	20.41	17.64	29.86	181.69	134.26	4.257	0.1997	920.712	2.4580	4	0.25	4
6811	20.07	16.20	337.23	318.33	70.35	2.744	0.1057	687.473	2.9865	4	0.05	4
6812	19.89	17.09	351.90	202.88	167.38	8.594	0.0736	912.641	2.4725	4	0.45	4
6813	20.41	16.95	37.09	262.90	51.74	4.118	0.1114	767.915	2.7741	4	0.59	4
6814	18.91	15.07	141.02	192.43	16.02	3.509	0.2059	693.243	2.9699	4	0.03	4
6816	16.70	12.77	313.72	252.00	166.59	10.398	0.1231	675.525	3.0216	5	0.03	2
6818	18.69	15.56	40.30	232.22	70.34	3.520	0.1953	838.392	2.6164	8	0.39	1
6819	20.11	16.50	44.32	285.93	15.52	14.039	0.1557	737.619	2.8495	4	0.03	4
6820	20.41	17.12	19.77	178.66	159.65	4.707	0.0736	802.667	2.6934	4	0.03	4
6822	21.26	18.23	12.15	194.96	146.22	5.454	0.2168	860.785	2.5708	4	0.17	4
6823	21.17	18.82	359.87	224.86	136.38	1.522	0.2038	1025.130	2.2881	4	0.00	4
6826	19.51	15.74	4.51	309.77	44.84	5.658	0.1222	706.246	2.9333	5	0.15	2
6827	18.35	15.45	198.62	95.53	74.75	3.814	0.2862	891.547	2.5113	3	0.00	4
6828	18.82	16.00	177.15	54.88	128.25	4.636	0.1499	910.209	2.4769	3	0.00	4
6829	18.25	14.14	219.86	128.87	24.92	11.651	0.2199	642.285	3.1250	4	0.11	2
6832	19.93	17.35	73.13	231.63	44.33	1.432	0.0847	965.893	2.3807	4	0.03	4
6834	21.19	16.79	334.48	3.43	34.14	1.840	0.2109	593.085	3.2955	4	0.15	4
6835	19.59	15.86	114.12	171.91	52.49	3.222	0.2089	713.926	2.9123	4	0.03	4
6836	21.08	18.58	346.72	359.30	20.31	4.015	0.2069	987.776	2.3454	4	1.21	4
6837	20.46	16.83	340.98	295.46	85.72	3.224	0.0823	733.423	2.8604	4	0.49	4
6839	20.56	17.73	42.06	196.05	106.44	3.057	0.1621	906.273	2.4840	4	0.51	4
6840	20.58	17.70	2.01	253.39	103.12	2.589	0.1409	895.535	2.5038	4	0.01	4
6841	20.05	17.52	283.00	85.96	7.11	4.720	0.1368	979.513	2.3586	4	0.33	4
6842	20.57	16.99	330.38	14.49	23.12	1.629	0.1167	743.710	2.8340	4	0.21	4
6843	19.73	16.79	170.50	86.04	102.21	2.081	0.0722	881.195	2.5309	4	0.15	4
6844	20.49	13.78	324.98	24.63	17.61	8.207	0.1029	298.546	5.2079	6	0.39	1
6845	21.31	17.20	4.92	282.75	69.03	3.756	0.2012	643.198	3.1220	4	0.03	4
6846	19.60	15.50	262.70	321.15	148.33	5.623	0.1094	644.406	3.1181	5	0.03	2
6847	21.45	16.09	347.12	227.98	156.82	8.760	0.3003	448.309	3.9714	4	0.29	4
6848	20.92	18.58	349.39	359.87	15.87	6.997	0.1765	1027.847	2.2841	4	0.25	4
6849	21.04	17.53	34.61	289.99	20.70	6.034	0.1913	757.546	2.7994	4	0.01	4
6850	20.72	17.06	31.27	213.20	112.31	3.121	0.0592	728.022	2.8745	4	0.53	4
6852	21.34	17.71	334.44	276.41	128.70	3.041	0.2978	733.806	2.8594	3	0.00	4
6854	19.94	17.86	47.52	280.56	23.02	6.276	0.0766	1094.421	2.1905	3	0.00	4
6855	20.90	17.97	314.94	283.94	143.23	3.152	0.2372	882.836	2.5278	4	0.47	4
6857	21.29	19.67	333.46	34.37	3.08	0.594	0.1758	1220.541	2.0369	3	0.00	4
6858	19.01	15.14	132.03	36.56	173.22	23.028	0.2566	687.301	2.9870	4	0.21	4
6859	21.01	17.19	345.67	259.82	118.25	3.372	0.1355	697.697	2.9572	3	0.00	4
6860	20.97	16.85	7.84	207.27	141.99	5.240	0.1202	641.253	3.1283	3	0.00	4
6861	20.03	16.76	13.31	229.84	114.06	3.576	0.0799	807.638	2.6824	4	0.07	4
6862	21.15	18.63	29.44	143.99	172.63	4.711	0.2060	982.096	2.3545	3	0.00	4
6863	20.79	18.67	316.41	2.69	59.57	2.133	0.2146	1083.773	2.2048	3	0.00	4
6864	20.53	18.08	343.90	232.78	145.72	3.193	0.1009	999.457	2.3271	4	0.13	4
6865	21.08	18.53	336.18	26.54	6.46	12.237	0.1715	974.933	2.3660	3	0.00	4
6867	20.81	18.87	348.52	218.79	157.28	6.493	0.1580	1133.968	2.1392	4	0.09	4
6868	20.51	18.03	55.80	115.91	159.99	8.232	0.2450	992.976	2.3372	3	0.00	4
6870	19.69	17.29	104.52	114.69	125.97	2.143	0.1204	1012.633	2.3069	3	0.00	4
6871	19.70	17.37	117.58	105.08	126.49	2.050	0.0989	1030.769	2.2798	4	0.39	4
6873	19.53	17.25	203.06	97.90	61.70	3.587	0.0927	1042.967	2.2619	3	0.00	4

© European Southern Observatory • Provided by the NASA Astrophysics Data System

1970A&AS....2..339V

Table 7 (*continued*)

PL	m_0	g	M	ω (1950)	Ω (1950)	i (1950)	e	n	a (A. U.)	N	σ^2	Q
6876	21.74	18.09	335°.16	277°.22	128°.29	1°.873	0.2967	729″.282	2.8712	4	1″.57	4
6879	22.06	18.25	355.15	347.90	20.64	5.528	0.2696	699.652	2.9517	3	0.00	4
6880	20.19	17.56	191.59	120.59	49.16	2.378	0.0562	954.338	2.3999	3	0.00	4
6881	21.52	19.01	9.61	187.41	157.77	4.695	0.2059	984.055	2.3513	3	0.00	4
6882	21.66	18.64	340.81	24.67	8.68	3.913	0.2526	864.771	2.5629	3	0.00	4
6883	21.27	18.97	327.69	250.57	159.32	4.340	0.2195	1037.902	2.2693	3	0.00	4
6886	21.57	18.15	352.53	199.59	171.75	6.391	0.2236	777.101	2.7522	3	0.00	4
6887	21.78	19.75	345.91	326.73	55.35	0.944	0.2172	1107.018	2.1738	4	2.11	4
6888	21.29	18.30	25.04	275.51	46.67	4.879	0.2101	870.746	2.5511	3	0.00	4
6890	21.67	20.10	351.95	195.18	177.11	8.491	0.1827	1235.892	2.0200	3	0.00	4
7061	19.37	16.66	337.89	178.11	213.06	5.543	0.1263	935.409	2.4322	6	0.11	2
7063	18.12	15.65	33.17	70.49	243.32	4.294	0.2048	994.795	2.3344	4	0.01	3
7066	17.86	13.92	37.56	107.88	205.57	11.696	0.1541	672.962	3.0293	5	0.21	2
7068	18.46	15.20	359.55	153.67	209.89	8.223	0.2481	809.327	2.6786	4	0.17	3
7069	18.20	15.28	314.47	215.29	207.30	11.497	0.1377	886.053	2.5217	4	3.03	4
7071	17.94	16.71	23.89	134.50	199.36	21.189	0.1039	1334.392	1.9193	4	1.27	3
7072	17.51	16.18	241.31	294.85	196.52	20.992	0.0818	1305.084	1.9479	4	1.01	3
7075	18.24	14.36	17.21	133.30	204.16	9.388	0.1785	685.564	2.9920	6	0.27	2
7081	19.95	17.81	284.99	105.75	348.57	4.980	0.1134	1079.833	2.2102	4	0.63	2
7082	18.01	16.66	334.90	198.46	194.96	22.112	0.0967	1300.747	1.9522	4	0.05	3
7561	19.86	16.57	39.02	290.89	13.45	12.221	0.2028	803.588	2.6914	7	0.29	1
7562	19.62	15.91	334.18	13.55	20.87	12.491	0.1407	717.553	2.9024	3	0.00	3
7566	18.46	15.85	249.48	94.75	27.25	6.612	0.0942	960.630	2.3894	4	0.07	3
7569	19.06	16.55	303.42	32.69	38.85	4.150	0.1269	985.204	2.3495	4	0.05	3
7571	17.39	14.61	203.77	127.90	34.63	6.701	0.1126	918.897	2.4612	4	0.01	3
7572	19.22	16.90	61.79	149.29	136.98	3.620	0.1230	1033.000	2.2765	5	0.07	1
7574	20.50	16.46	347.03	348.58	34.61	7.055	0.2610	654.481	3.0860	5	0.11	2
7575	19.80	17.58	4.03	318.72	35.61	6.556	0.1947	1058.971	2.2391	4	0.13	3
7579	19.83	16.57	347.84	354.18	24.90	6.407	0.1666	810.553	2.6759	4	0.05	3
7581	18.19	15.96	14.80	308.45	35.05	5.513	0.1058	1056.889	2.2420	4	0.05	3
7582	19.95	16.98	3.35	334.71	21.56	14.552	0.1846	873.556	2.5457	4	0.09	3
7584	18.80	16.38	82.68	231.97	38.31	5.794	0.0809	1006.193	2.3167	4	0.01	3
7585	19.26	16.84	43.32	198.85	96.51	2.525	0.2368	1007.509	2.3147	4	0.01	3
7587	19.24	16.18	311.66	11.84	50.39	3.700	0.1219	853.619	2.5852	4	0.07	3
7588	17.53	13.78	111.27	143.41	90.22	3.070	0.1804	710.001	2.9230	4	0.09	3
7589	16.83	13.52	192.68	134.99	35.88	7.939	0.0632	798.710	2.7023	4	0.07	3
7590	20.81	17.61	335.40	10.83	35.00	6.990	0.2874	822.361	2.6503	3	0.00	3
7592	20.48	17.35	13.46	294.03	44.77	5.837	0.2377	839.855	2.6133	3	0.00	4
7593	19.22	15.40	255.81	85.73	29.02	10.529	0.0793	695.574	2.9633	4	0.13	3
7594	18.88	16.81	32.90	247.90	70.04	3.415	0.1488	1097.317	2.1866	3	0.00	4
7595	19.97	17.49	23.24	181.99	144.68	3.286	0.2011	990.804	2.3407	4	0.35	3
7596	19.55	17.35	3.43	332.22	23.75	6.162	0.2285	1063.381	2.2329	4	0.15	3
7600	19.22	16.10	327.69	28.63	19.21	12.912	0.1681	840.689	2.6116	4	0.23	3
7602	20.63	16.59	346.43	357.53	29.16	6.816	0.2689	654.502	3.0860	4	0.03	3
7603	17.91	14.67	24.70	304.34	22.12	13.735	0.1883	814.132	2.6681	4	0.19	3
7604	17.72	14.99	255.30	32.32	83.71	4.001	0.0768	929.447	2.4426	4	0.07	3
7605	19.21	15.08	344.11	213.90	170.96	11.647	0.1611	638.347	3.1378	5	0.19	2
7606	20.03	17.63	16.90	248.73	83.41	3.032	0.2581	1011.066	2.3093	4	0.27	3
7607	19.35	16.86	304.78	339.69	99.50	3.416	0.1964	988.066	2.3450	4	0.11	3
7608	19.60	16.47	294.82	47.23	49.02	5.149	0.2404	838.829	2.6155	4	0.21	3

© European Southern Observatory • Provided by the NASA Astrophysics Data System

1970A&AS....2..339V

Table 7 (*continued*)

PL	m_0	g	M	ω (1950)	Ω (1950)	i (1950)	e	n	a (A. U.)	N	σ^2	Q
			°	°	°	°		″			″	
7609	18.92	16.52	74.47	228.01	45.77	6.449	0.1298	1011.813	2.3081	4	0.23	3
7610	18.01	15.69	171.04	75.28	115.52	4.275	0.1340	1032.944	2.2766	4	0.09	3
7611	19.37	16.30	321.67	278.03	140.40	3.933	0.1945	852.110	2.5882	4	0.01	3
7613	18.79	14.82	124.93	78.85	152.49	7.816	0.0827	668.334	3.0432	4	0.01	3
7618	17.59	13.46	255.00	335.34	137.59	6.110	0.0406	638.537	3.1372	4	0.15	3
7619	20.50	17.78	344.43	277.88	110.66	3.350	0.2506	931.810	2.4384	4	0.05	3
7622	17.55	15.38	358.88	321.28	42.73	6.829	0.1789	1070.351	2.2232	3	0.00	4
7623	20.28	17.66	331.02	277.99	128.99	3.107	0.2075	955.788	2.3975	4	0.05	2
7627	20.42	17.09	356.11	281.92	87.18	3.779	0.1783	796.663	2.7070	3	0.00	4
7628	18.36	15.76	311.08	55.03	15.37	10.724	0.1984	961.407	2.3881	6	0.29	3
7631	16.94	13.24	349.99	260.90	112.77	2.979	0.0824	718.516	2.8998	4	0.00	3
7632	19.46	15.88	81.21	143.14	114.94	3.137	0.2005	744.923	2.8309	3	0.00	4
7633	18.64	15.06	30.31	220.61	108.58	3.298	0.0513	742.405	2.8373	4	0.03	3
7634	18.89	16.28	260.96	327.49	144.95	5.096	0.0925	959.346	2.3915	3	0.00	4
7635	20.22	18.04	322.58	19.58	35.45	5.225	0.1751	1068.706	2.2255	3	0.00	4
7636	18.90	16.69	67.59	224.90	55.88	4.218	0.1338	1062.308	2.2344	4	0.05	3
7637	18.11	15.58	113.55	176.36	53.53	6.328	0.2165	979.247	2.3590	3	0.00	4
7638	18.13	15.36	62.90	127.55	163.52	8.577	0.0888	920.599	2.4582	3	0.00	3
7639	19.26	15.77	265.05	31.52	91.69	4.333	0.2255	763.419	2.7850	3	0.00	4
7642	20.27	17.33	349.98	0.83	16.06	18.959	0.2207	881.939	2.5295	3	0.00	3
7643	19.10	16.55	311.10	289.18	146.43	3.916	0.2381	973.130	2.3689	4	0.49	3
7646	20.43	16.83	320.25	296.60	122.79	3.606	0.2027	740.478	2.8422	3	0.00	4
7647	20.17	16.55	333.56	271.09	125.47	3.517	0.1172	735.858	2.8541	3	0.00	4
7649	20.28	18.04	18.16	193.91	132.98	3.023	0.2917	1054.400	2.2456	5	0.29	1
9050	19.59	16.76	317.01	88.33	333.60	3.336	0.2115	906.475	2.4837	4	0.25	3
9054	18.31	15.33	69.99	295.68	335.19	3.730	0.1562	872.226	2.5483	4	0.07	3
9055	19.07	17.03	29.52	318.41	355.32	6.197	0.2118	1106.608	2.1744	4	0.27	3
9056	18.94	16.83	29.67	326.84	352.65	5.772	0.1448	1086.545	2.2011	4	0.35	3
9057	18.20	15.74	127.09	270.22	312.82	3.290	0.1126	996.399	2.3319	5	0.19	2
9058	18.01	14.02	24.45	56.42	268.25	3.203	0.1653	664.294	3.0556	4	0.11	3
9060	18.28	15.91	107.59	319.90	273.89	1.500	0.1761	1018.875	2.2975	4	0.21	3
9062	18.36	15.29	342.89	144.20	240.41	2.476	0.1989	851.725	2.5890	4	0.07	3
9063	18.77	16.50	259.03	264.74	205.26	4.507	0.0884	1044.673	2.2595	5	0.09	2
9064	19.62	17.30	354.84	148.27	218.44	5.068	0.2034	1032.197	2.2777	3	0.00	3
9066	19.52	17.30	39.30	304.68	358.39	4.791	0.1872	1057.184	2.2416	6	0.13	1
9070	18.20	14.71	352.84	161.32	209.27	7.685	0.2273	762.335	2.7876	4	0.27	3
9071	18.50	15.94	267.34	233.69	234.10	5.056	0.1296	971.532	2.3715	3	0.00	4
9072	19.12	15.63	110.16	27.74	212.80	6.084	0.0856	762.322	2.7877	3	0.00	3
9073	18.16	14.09	31.38	331.68	345.86	5.162	0.1430	650.675	3.0981	4	0.11	3
9074	20.20	16.59	317.81	177.37	245.94	0.742	0.2320	737.699	2.8493	4	0.31	3
9075	17.99	13.96	13.26	112.99	230.77	5.305	0.0954	656.855	3.0786	3	0.00	4
9076	17.38	14.32	337.91	195.89	196.13	13.526	0.1949	854.535	2.5833	4	0.03	3
9079	20.15	17.58	1.29	61.45	296.28	2.109	0.1867	969.870	2.3742	5	0.05	2
9084	20.67	17.55	359.67	145.65	214.50	4.124	0.2958	839.999	2.6130	4	0.41	3
9085	19.56	17.40	22.96	322.55	3.85	4.009	0.1958	1074.492	2.2175	5	0.19	1
9087	17.49	15.06	108.43	17.07	220.89	6.745	0.1331	1003.766	2.3205	3	0.00	4
9088	18.70	16.41	355.72	142.05	223.95	4.164	0.2155	1041.201	2.2645	4	0.11	3
9089	19.74	16.72	349.29	65.39	312.88	3.444	0.2582	863.207	2.5660	4	0.07	3
9090	19.98	16.55	11.71	117.37	223.62	3.019	0.2039	772.670	2.7627	3	0.00	3
9091	18.45	17.13	306.69	226.74	195.77	21.701	0.0918	1307.681	1.9453	4	0.47	3

© European Southern Observatory • Provided by the NASA Astrophysics Data System

1970A&AS....2..339V

Table 7 (*continued*)

PL	m_0	g	M	ω (1950)	Ω (1950)	i (1950)	e	n	a (A. U.)	N	σ^2	Q
			°	°	°	°		″			″	
9093	19.67	16.96	15.29	353.25	342.87	2.141	0.2013	935.225	2.4325	6	0.11	1
9094	19.10	16.50	358.32	164.88	196.49	9.382	0.2548	960.979	2.3888	4	0.07	3
9097	18.65	15.60	173.20	185.97	359.35	7.113	0.1336	855.949	2.5805	4	0.03	2
9099	19.38	15.23	49.23	111.53	185.36	12.786	0.1225	635.987	3.1456	3	0.00	3
9101	18.55	14.42	23.87	131.37	188.53	16.248	0.2213	638.576	3.1371	4	0.47	3
9103	16.39	14.15	354.60	174.64	191.71	3.139	0.1868	1052.657	2.2480	3	0.00	4
9104	19.75	15.70	27.52	139.70	183.30	13.003	0.1377	654.290	3.0866	5	1.07	1
9502	18.93	15.94	29.02	284.05	27.96	6.586	0.2055	871.492	2.5497	3	0.00	3
9503	17.57	15.06	129.03	126.84	92.11	2.369	0.1011	985.137	2.3496	3	0.00	3
9505	18.23	15.92	351.51	196.97	171.60	1.863	0.1258	1035.160	2.2733	4	0.19	3
9506	19.02	15.97	74.05	245.53	15.81	7.050	0.1822	856.516	2.5793	4	0.27	3
9507	18.45	11.86	50.70	257.65	34.01	5.028	0.1139	309.918	5.0797	4	0.25	3
9508	18.98	14.28	279.56	4.97	93.88	2.338	0.2025	543.539	3.4928	4	0.43	3
9509	19.56	16.00	8.21	154.74	187.97	10.605	0.2421	749.220	2.8201	3	0.00	4
9510	17.49	15.11	315.99	42.63	5.82	4.252	0.0783	1017.004	2.3003	4	0.47	3
9512	18.07	16.05	145.04	76.55	128.84	1.786	0.1173	1111.016	2.1686	4	0.41	3
9513	20.34	15.56	329.97	292.62	114.84	2.814	0.2772	530.750	3.5487	4	0.67	3
9515	18.73	15.80	346.25	319.71	52.03	3.650	0.0626	882.494	2.5285	4	0.23	3
9516	18.96	16.78	68.52	103.51	171.14	2.476	0.1275	1068.844	2.2253	3	0.00	4
9517	17.60	13.89	63.64	87.73	180.72	15.077	0.2181	717.266	2.9032	4	0.73	3
9518	18.42	15.72	69.73	255.96	12.71	2.434	0.1671	936.501	2.4303	4	0.15	3
9519	19.20	15.78	31.93	289.42	30.40	4.656	0.0686	775.805	2.7553	4	0.03	3
9520	19.15	16.40	258.10	57.52	55.23	3.338	0.1306	925.653	2.4492	4	1.99	3
9521	17.66	15.57	308.36	289.08	125.43	2.015	0.0590	1093.312	2.1920	4	0.17	3
9522	17.78	14.27	68.80	260.09	2.69	7.503	0.2257	757.727	2.7989	4	0.29	3
9523	18.25	15.90	156.54	187.74	8.85	6.357	0.1205	1024.568	2.2889	6	0.81	1
9524	20.25	16.88	333.91	283.74	111.31	1.844	0.1930	786.502	2.7302	4	0.15	3
9525	18.69	16.40	331.59	336.19	57.02	3.492	0.1270	1040.962	2.2648	4	0.29	3
9526	18.27	14.99	124.32	207.98	16.46	12.124	0.0811	804.905	2.6884	4	0.43	3
9527	17.22	13.93	173.60	2.76	180.62	3.547	0.0429	803.666	2.6912	4	0.21	3
9530	17.66	15.14	267.34	291.61	176.66	9.646	0.1578	982.874	2.3532	4	0.75	3
9531	18.63	15.98	42.57	270.74	30.43	6.551	0.1456	948.794	2.4092	4	1.03	3
9532	19.45	16.28	351.18	332.60	37.38	3.116	0.1858	828.372	2.6374	4	1.33	3
9534	18.08	15.38	117.93	57.49	171.99	3.168	0.1119	938.470	2.4269	5	0.95	2
9535	19.29	15.96	357.97	191.66	167.82	6.327	0.0643	794.435	2.7120	4	0.45	3
9536	19.76	17.70	4.06	200.27	153.18	2.614	0.0454	1099.903	2.1832	4	0.03	2
9537	19.30	16.40	291.58	255.38	174.15	5.382	0.0307	891.065	2.5122	3	0.00	3
9538	18.34	16.05	50.07	148.20	157.56	1.552	0.0257	1040.905	2.2649	5	0.79	2
9540	18.40	15.38	12.02	326.75	15.69	2.319	0.1240	861.760	2.5689	5	0.57	2
9542	19.35	15.56	353.00	301.63	62.55	3.020	0.0307	701.476	2.9466	5	1.01	2
9543	18.90	14.69	112.37	227.70	12.84	14.423	0.0314	624.240	3.1849	4	0.51	3
9544	18.72	15.94	2.08	191.55	163.82	4.802	0.0538	918.656	2.4617	5	0.51	2
9546	17.19	13.10	119.05	125.46	100.75	2.837	0.1233	645.525	3.1145	5	0.83	2
9547	18.69	15.72	357.97	171.69	189.55	7.567	0.2266	874.396	2.5440	3	0.00	4
9549	17.82	14.91	285.86	70.34	15.82	17.142	0.1291	888.273	2.5175	4	0.55	3
9553	19.59	17.11	18.03	272.38	59.45	3.460	0.1757	992.037	2.3387	3	0.00	3
9554	19.47	14.80	325.35	272.49	127.45	5.046	0.1146	548.537	3.4716	4	0.31	3
9555	19.78	15.79	315.35	25.00	32.42	6.215	0.1624	664.889	3.0537	3	0.00	3
9560	18.69	16.61	88.76	150.37	103.18	3.954	0.1443	1094.920	2.1898	3	0.00	3
9561	18.40	14.87	350.26	239.98	131.17	4.909	0.1451	754.018	2.8081	3	0.00	4

© European Southern Observatory • Provided by the NASA Astrophysics Data System

1970A&AS....2..339V

Table 7 (*continued*)

PL	m_0	g	M	ω (1950)	Ω (1950)	i (1950)	e	n	a (A. U.)	N	σ^2	Q
			°	°	°	°		″			″	
9562	20.04	15.82	12.26	255.33	84.84	4.565	0.1673	623.207	3.1884	3	0.00	3
9564	20.32	17.82	340.38	328.84	60.55	3.583	0.2203	986.778	2.3470	4	0.09	3
9565	18.20	15.92	24.95	185.06	140.09	4.511	0.1462	1042.921	2.2620	4	0.17	3
9566	19.09	16.52	321.70	327.08	83.78	3.515	0.1644	968.140	2.3770	4	0.03	3
9567	18.87	14.69	77.18	242.55	30.71	9.418	0.0640	631.061	3.1619	4	0.05	3
9569	18.71	15.98	117.61	192.90	40.01	6.075	0.0872	930.611	2.4405	3	0.00	3
9570	19.26	16.08	47.48	212.83	93.74	3.794	0.0551	827.924	2.6384	4	0.39	3
9572	18.91	16.32	342.48	309.03	74.47	4.037	0.1663	963.130	2.3853	4	0.25	3
9573	19.83	16.69	334.55	356.89	53.43	5.521	0.2327	838.378	2.6164	3	0.00	4
9574	18.86	14.96	339.47	24.51	20.45	13.652	0.2715	682.618	3.0006	3	0.00	4
9575	18.78	16.89	0.05	280.54	78.40	2.899	0.1864	1147.337	2.1226	4	0.27	3
9578	18.26	14.28	272.65	89.48	3.37	5.965	0.0716	665.501	3.0519	4	0.29	3
9579	19.24	17.06	31.23	281.78	28.13	5.704	0.2033	1068.756	2.2254	4	0.45	3
9580	20.02	17.21	44.45	163.44	126.67	1.051	0.2279	911.659	2.4742	4	0.69	3
9581	19.62	16.28	340.88	220.70	157.72	7.704	0.0761	791.697	2.7183	3	0.00	3
9582	19.01	14.91	66.45	87.09	173.46	16.379	0.2557	644.492	3.1178	4	0.29	3
9583	19.31	16.61	5.00	178.05	171.52	4.786	0.1919	937.575	2.4284	4	0.29	3
9585	18.68	15.56	25.55	231.53	94.69	3.650	0.0988	839.705	2.6136	4	0.51	3
9586	19.34	15.03	236.72	359.20	132.66	5.954	0.1299	608.098	3.2410	3	0.00	3
9587	19.24	15.88	354.57	304.58	59.61	5.210	0.0418	788.911	2.7247	4	0.25	3
9588	18.96	16.38	355.86	301.47	62.32	1.644	0.2123	966.970	2.3790	4	0.23	3
9589	19.56	16.40	4.00	179.86	171.18	4.130	0.2175	831.613	2.6306	4	0.09	3
9590	20.19	16.82	337.15	342.04	50.93	4.325	0.1958	785.547	2.7324	6	0.23	1
9591	20.15	16.94	328.45	237.69	165.61	3.866	0.1934	819.537	2.6563	3	0.00	3
9592	18.57	16.50	42.62	121.21	178.85	3.481	0.1639	1098.207	2.1854	4	0.07	3
9594	19.55	15.07	338.30	328.50	51.21	2.127	0.0204	579.618	3.3463	5	0.63	2
9597	18.24	15.60	12.49	214.48	123.32	2.934	0.2285	952.780	2.4025	5	0.13	2
9600	19.74	16.97	321.23	309.76	104.21	3.456	0.2031	919.850	2.4595	4	0.17	3
9606	20.10	16.02	353.19	311.08	61.05	2.721	0.1834	648.772	3.1041	6	0.07	1
9607	18.52	14.54	205.60	154.91	4.36	9.523	0.0760	666.211	3.0497	5	0.11	2
9608	19.23	15.39	94.15	73.69	187.18	6.106	0.0348	693.025	2.9705	4	0.65	3
9609	18.99	16.93	40.07	121.16	187.59	3.373	0.1854	1099.657	2.1835	6	0.33	1
9610	19.28	15.13	335.08	315.13	84.74	3.200	0.1879	635.260	3.1480	4	0.09	3
9611	19.12	15.94	42.62	302.35	0.34	14.612	0.1632	827.953	2.6383	4	0.15	3
9613	20.13	16.65	335.91	204.94	194.00	13.907	0.1417	762.513	2.7872	4	0.05	2
9614	20.23	16.85	60.55	57.24	238.30	5.566	0.1210	785.156	2.7333	3	0.00	3

© European Southern Observatory • Provided by the NASA Astrophysics Data System

1970A&AS....2..339V

Table 8. Rejected orbital elements

PL	m_0	g	M	ω (1950)	Ω (1950)	i (1950)	e	n	a (A. U.)	N	σ^2
			°	°	°	°		″			″
577	17.21	12.07	18.56	354.48	320.34	3.960	0.4880	478.165	3.8044	4	1.21
2137	20.26	16.58	306.96	272.32	205.63	11.847	0.4670	727.061	2.8871	3	0.00
2141	21.32	18.23	24.87	106.48	212.57	2.149	0.3225	847.998	2.5966	4	0.01
2143	21.76	18.54	12.53	345.31	351.60	6.907	0.3893	818.425	2.6588	3	0.00
2144	20.42	17.35	346.41	69.73	325.67	3.580	0.3251	851.900	2.5886	4	2.77
2145	19.03	17.69	19.73	111.07	218.25	3.515	0.2874	1301.810	1.9512	4	6.27
2146	20.37	16.94	9.69	140.59	199.67	8.519	0.4282	774.390	2.7586	4	0.03
2149	19.27	17.49	18.47	19.82	289.90	0.781	0.4768	1176.092	2.0879	3	0.00
2150	21.25	17.74	20.04	118.64	210.28	5.649	0.3246	758.221	2.7977	4	0.05
2174	20.11	17.15	53.46	315.50	323.77	4.944	0.3202	875.726	2.5415	3	0.00
2176	18.08	18.06	22.42	3.67	323.20	1.216	0.2338	1716.993	1.6224	3	0.00
2181	20.52	16.31	310.64	91.74	2.73	10.749	0.3310	624.397	3.1844	3	0.00
2183	18.65	15.08	282.10	319.94	193.60	15.724	0.6040	746.175	2.8277	3	0.00
2190	24.41	18.88	12.42	79.25	234.89	1.304	0.5886	426.252	4.1073	3	0.00
2192	19.83	14.52	306.86	300.90	194.74	19.948	0.5935	455.440	3.9299	3	0.00
2653	23.28	19.25	17.60	333.01	346.11	1.918	0.4329	656.806	3.0787	5	1.87
2661	21.83	20.32	21.85	308.57	13.45	1.574	0.3042	1252.475	2.0021	4	0.00
2664	19.73	15.44	277.20	120.12	6.31	12.558	0.3184	611.570	3.2287	3	0.00
2666	20.81	17.45	342.96	230.94	169.48	5.319	0.3433	789.309	2.7237	3	0.00
2670	21.04	17.02	325.86	247.64	188.57	17.898	0.3693	658.415	3.0737	3	0.00
2677	19.73	16.43	281.51	102.34	23.95	6.752	0.3632	802.179	2.6945	3	0.00
2683	18.49	17.82	24.25	150.88	174.88	4.982	0.2163	1506.391	1.7703	4	2.43
2687	21.61	18.66	0.70	178.76	185.02	5.720	0.3077	879.045	2.5351	4	0.57
2691	21.36	17.22	47.21	228.67	34.88	2.667	0.4853	636.991	3.1423	4	15.47
2730	21.56	18.93	27.94	249.24	64.15	0.532	0.3170	954.908	2.3990	3	0.00
2755	21.99	22.79	30.31	193.34	116.14	0.462	0.2767	1990.171	1.4703	3	0.00
2756	18.57	14.34	268.82	137.11	17.61	23.304	0.5474	621.263	3.1951	3	0.00
2758	22.53	20.10	19.29	306.65	14.22	1.275	0.3866	1004.295	2.3196	3	0.00
2764	18.27	16.10	177.51	10.36	181.28	7.705	0.3079	1070.033	2.2236	3	0.00
2784	24.14	16.84	11.04	178.96	125.81	2.487	0.6757	248.067	5.8924	4	1.39
2808	19.22	15.29	298.93	315.94	184.89	3.709	0.5912	676.163	3.0197	3	0.00
2817			8.97	78.13	198.06	2.959	0.7418	2037.132	1.4476	3	0.00
2819	16.77	17.29	30.44	155.88	158.19	0.236	0.2295	1895.570	1.5188	4	1.97
2824	19.05	13.51	296.69	159.46	8.24	10.961	0.8817	425.082	4.1148	3	0.00
2834	21.33	16.95	326.40	93.75	358.21	6.304	0.4857	595.612	3.2862	3	0.00
4195	21.29	20.05	348.49	156.00	223.06	1.207	0.1828	1331.564	1.9220	4	1.51
4207	19.19	15.22	220.59	169.00	353.32	7.671	0.3185	668.471	3.0428	3	0.00
4219	18.46	14.68	254.16	328.68	191.60	27.220	0.6027	703.441	2.9411	3	0.00
4232	21.45	19.76	31.32	358.57	307.39	0.973	0.3043	1201.024	2.0589	4	0.53
4252	20.77	20.00	33.93	4.29	311.00	2.047	0.1838	1477.136	1.7935	4	3.87
4267	21.72	22.32	18.81	349.43	346.46	1.093	0.1592	1924.509	1.5035	3	0.00
4268	22.01	19.05	22.05	356.65	322.16	3.121	0.3483	877.740	2.5376	4	2.35
4283	21.72	18.75	17.95	122.39	206.99	5.796	0.3194	874.330	2.5442	4	2.53
4288	18.06	15.93	204.67	346.40	189.43	10.583	0.4300	1081.390	2.2080	4	0.13
4322	23.64	15.38	3.59	29.72	321.27	3.374	0.5407	182.999	7.2172	4	0.89
4326	21.81	21.32	27.68	19.36	295.95	1.432	0.2618	1565.267	1.7256	3	0.00
4328	18.14	15.77	212.60	313.62	221.36	2.078	0.5392	1020.424	2.2951	3	0.00
4699	21.12	19.81	18.97	145.49	189.06	1.826	0.1732	1310.143	1.9429	6	0.27
4702	21.58	18.82	24.53	243.37	72.51	0.890	0.3013	923.091	2.4538	4	0.05
4709	22.38	19.22	1.86	186.95	170.69	5.989	0.3106	832.736	2.6282	5	0.17

© European Southern Observatory • Provided by the NASA Astrophysics Data System

1970A&AS....2..339V

Table 8 (*continued*)

PL	m_0	g	M	ω (1950)	Ω (1950)	i (1950)	e	n	a (A. U.)	N	σ^2
			°	°	°	°		″			″
4740	22.27	18.49	15.62	6.74	326.34	0.781	0.3039	704.322	2.9387	4	0.93
4746	13.31	15.89	44.63	297.62	5.26	0.476	0.1426	2553.916	1.2450	4	48.83
4750	18.65	14.91	278.22	311.16	186.50	1.511	0.4802	711.628	2.9185	4	0.01
4782	19.70	17.24	161.83	4.15	189.34	8.124	0.4167	996.363	2.3319	4	0.21
4783	16.94	14.46	189.62	351.55	191.28	4.348	0.6507	992.597	2.3378	4	0.00
4787	19.70	16.42	282.28	105.93	12.03	11.252	0.3197	806.293	2.6854	3	0.00
4794	19.19	15.08	263.06	121.35	13.59	13.989	0.3335	642.010	3.1259	4	0.05
4802	20.24	13.48	303.06	96.25	6.23	69.276	0.3640	293.745	5.2645	3	0.00
4811	21.01	21.13	27.90	293.47	27.77	0.620	0.1892	1764.045	1.5934	4	11.41
4826	21.51	18.50	18.95	109.36	217.57	0.523	0.3138	864.547	2.5633	5	1.13
4828	21.73	22.55	29.95	310.60	6.66	0.609	0.1980	1997.506	1.4667	3	0.00
4842	17.34	15.10	182.67	5.79	179.51	3.108	0.5354	1053.556	2.2468	3	0.00
4849	20.86	21.29	25.85	330.78	355.39	0.188	0.1653	1865.606	1.5350	4	3.75
4855	19.84	17.11	56.36	257.85	15.29	15.070	0.3026	930.618	2.4405	4	0.09
5012	18.52	14.15	81.10	35.72	209.80	16.253	0.4072	596.601	3.2825	3	0.00
5019	20.71	17.20	31.11	286.68	10.36	3.791	0.4224	757.967	2.7983	3	0.00
5029	22.56	19.14	337.53	138.54	282.48	1.408	0.4153	776.729	2.7531	3	0.00
5033	22.49	16.43	14.72	267.82	13.24	9.035	0.7225	363.065	4.5710	3	0.00
5585	25.08	17.98	349.17	53.33	25.30	0.811	0.7060	263.820	5.6554	3	0.00
6129	20.93	19.83	348.22	177.96	200.06	0.378	0.1737	1373.346	1.8828	4	0.11
6198	17.99	16.55	348.94	23.66	355.03	6.424	0.2454	1273.008	1.9805	4	0.00
6206	21.50	18.25	327.90	76.49	347.69	4.874	0.3551	811.395	2.6741	4	0.03
6244	20.42	19.54	15.34	338.04	356.02	5.378	0.2522	1443.191	1.8216	4	0.15
6249	20.36	21.48	342.35	190.51	191.33	0.845	0.1028	2095.079	1.4208	4	3.39
6271	22.41	18.38	357.71	67.88	297.70	0.579	0.3076	656.634	3.0793	3	0.00
6284			357.24	173.71	189.80	0.366	0.0820	2378.799	1.3054	4	5.27
6293			37.71	18.63	297.96	0.165	0.0775	2712.950	1.1959	4	4.95
6301	21.50	21.91	338.75	38.13	349.73	0.481	0.1230	1858.964	1.5387	4	0.31
6302	21.47	20.77	345.29	29.84	351.49	0.391	0.1613	1499.145	1.7760	4	0.00
6304			32.91	317.45	2.70	0.414	0.1041	2365.303	1.3104	4	0.33
6311	20.64	19.48	6.86	22.00	331.22	3.406	0.1214	1354.641	1.9001	4	4.05
6314	20.97	19.99	338.59	37.22	354.72	0.995	0.1803	1410.609	1.8495	4	0.11
6315	21.65	20.57	359.72	4.16	357.21	1.081	0.1941	1381.350	1.8755	4	0.13
6317			1.35	83.52	275.20	0.171	0.0643	2659.526	1.2119	4	1.97
6321			30.01	150.43	174.04	0.115	0.0924	2437.676	1.2843	4	5.87
6336	21.18	19.69	339.59	188.83	201.17	0.465	0.1617	1258.314	1.9959	3	0.00
6338	21.13	20.00	9.09	160.08	189.29	2.033	0.1408	1364.498	1.8909	4	0.53
6341	20.17	21.34	12.81	151.40	192.96	0.811	0.1196	2112.558	1.4129	4	0.33
6342	20.70	16.54	46.06	286.93	356.01	16.109	0.3271	633.249	3.1546	4	1.91
6348	18.32	14.55	225.62	163.28	2.26	19.273	0.5534	705.876	2.9344	3	0.00
6351	21.50	20.45	358.67	144.35	218.87	1.155	0.1828	1389.626	1.8681	4	1.87
6352			37.61	90.52	223.34	0.076	0.1126	2517.150	1.2571	4	4.71
6361	21.83	17.06	331.52	195.73	227.24	4.383	0.3740	532.267	3.5420	3	0.00
6365	21.63	20.44	353.13	27.45	343.18	4.088	0.1916	1347.178	1.9071	4	0.81
6371	20.84	19.64	8.76	2.22	347.67	2.096	0.1164	1345.401	1.9088	4	0.07
6375	26.14	19.87	7.43	8.33	298.96	0.920	0.7107	341.068	4.7655	3	0.00
6388	23.42	14.92	16.21	68.95	180.17	28.542	0.7901	169.448	7.5970	3	0.00
6690	20.80	16.96	39.17	162.71	125.21	1.705	0.3186	693.335	2.9696	4	0.03
6699	21.85	15.97	22.86	87.31	175.91	10.950	0.6604	383.293	4.4087	4	0.00
6730	22.37	22.22	326.13	234.19	187.20	0.172	0.3092	1674.991	1.6494	3	0.00

© European Southern Observatory • Provided by the NASA Astrophysics Data System

1970A&AS....2..339V

Table 8 (*continued*)

PL	m_0	g	M	ω (1950)	Ω (1950)	i (1950)	e	n	a (A. U.)	N	σ^2
			°	°	°	°		″			″
6750	18.08	15.64	147.73	182.08	11.16	6.500	0.4806	1000.655	2.3253	3	0.00
6751	20.24	12.86	55.46	57.98	181.36	13.835	0.5717	242.138	5.9881	3	0.00
6777	21.09	16.89	330.74	253.65	161.35	9.127	0.3162	627.054	3.1754	4	0.57
6815	21.90	19.00	334.06	32.91	20.28	5.077	0.3439	890.125	2.5140	4	0.13
6817	19.56	16.70	53.84	182.53	89.10	3.419	0.3115	900.165	2.4953	4	1.99
6824	21.21	18.38	356.72	202.77	164.49	5.628	0.3168	906.759	2.4831	4	0.39
6856	21.44	20.04	351.03	212.97	160.26	4.597	0.2144	1285.457	1.9677	3	0.00
6889	20.36	13.34	67.43	162.48	69.46	3.019	0.5175	270.232	5.5656	3	0.00
7583	20.80	17.48	323.75	329.69	100.37	2.769	0.3305	797.006	2.7062	3	0.00
7586	20.24	17.03	34.91	108.85	168.03	7.520	0.4685	820.428	2.6544	3	0.00
7591	20.01	15.69	48.42	219.58	60.58	3.983	0.3097	605.430	3.2505	4	0.05
7614	19.94	17.13	40.61	151.91	131.04	3.636	0.3752	912.203	2.4733	3	0.00
7617	22.03	15.45	21.88	209.23	68.81	4.080	0.6179	310.027	5.0785	3	0.00
7620	20.18	17.63	34.53	268.85	32.33	5.535	0.3045	973.971	2.3675	4	0.27
7648	20.98	16.27	330.90	36.61	29.52	7.669	0.3786	542.592	3.4969	3	0.00
9061	20.10	16.80	41.16	318.26	321.82	3.687	0.3615	801.422	2.6962	4	0.07
9086	20.18	17.99	353.40	158.31	214.39	4.815	0.3102	1066.365	2.2287	4	0.05
9511	21.67	13.98	15.66	84.78	164.87	1.133	0.7841	219.088	6.4011	4	0.05
9514	22.23	15.97	338.53	19.11	50.15	2.387	0.5558	342.478	4.7524	3	0.00
9528	16.46	14.49	84.52	73.96	165.26	3.832	0.3087	1125.939	2.1494	4	0.31
9529	22.10	16.17	340.98	278.51	144.53	2.099	0.5490	377.519	4.4536	3	0.00
9541	20.35	15.43	31.04	87.70	168.19	2.876	0.6143	510.492	3.6420	4	0.59
9548	20.70	16.12	30.61	110.74	164.81	5.012	0.4954	562.218	3.4150	4	0.13
9552	20.75	16.59	346.88	219.12	166.12	6.041	0.3406	634.711	3.1498	4	0.69
9563	20.85	17.41	342.45	303.65	87.75	3.457	0.3033	772.482	2.7632	3	0.00
9568	19.94	16.62	347.27	353.36	33.85	7.873	0.3784	797.779	2.7044	3	0.00
9593	19.18	15.23	261.36	342.07	143.84	6.639	0.3095	671.357	3.0341	3	0.00
9596	20.57	15.02	322.11	265.72	175.57	10.001	0.4333	423.448	4.1254	3	0.00
9599	20.26	15.23	307.95	268.09	181.77	9.811	0.3589	494.307	3.7211	3	0.00

© European Southern Observatory • Provided by the NASA Astrophysics Data System

1970A&AS....2..339V

Table 9. Proper elements of asteroids with class 1 orbits

PL	g	a (A. U.)	ν	μ	β	γ	$\beta+\gamma$	Ref.
2511	17.22	1.9492	0.0686	0.7094	0.059	0.274	0.333	
4865	17.31	2.1224	0.0721	0.0261	0.403	0.154	0.558	
2028	17.24	2.1245	0.1289	0.0223	0.886	0.931	0.817	
4735	17.58	2.1255	0.0749	0.0392	0.353	0.182	0.536	
2084	17.10	2.1340	0.0592	0.0102	0.888	0.822	0.711	
6319	16.79	2.1446	0.0821	0.0458	0.159	0.692	0.851	
2030	17.31	2.1497	0.1404	0.0852	0.923	0.611	0.534	
4079	17.42	2.1497	0.1329	0.0385	0.325	0.942	0.268	
4530	16.55	2.1547	0.1307	0.0314	0.083	0.569	0.652	
4073	17.00	2.1558	0.0543	0.0545	0.459	0.695	0.155	
4778	16.72	2.1606	0.1099	0.0873	0.627	0.486	0.113	
6063	16.88	2.1618	0.0825	0.0393	0.864	0.831	0.696	
4034	17.86	2.1645	0.1659	0.0696	0.065	0.941	0.007	
6787	15.97	2.1660	0.1169	0.0196	0.541	0.437	0.978	
2645	15.28	2.1678	0.1049	0.0375	0.536	0.335	0.872	
4543	16.47	2.1684	0.1040	0.0321	0.831	0.033	0.864	
2770	17.94	2.1693	0.1495	0.0765	0.936	0.053	0.990	
4548	18.45	2.1724	0.2872	0.1222	0.829	0.005	0.835	
6116	15.30	2.1734	0.1427	0.0243	0.673	0.658	0.331	
6074	17.56	2.1745	0.0895	0.0093	0.878	0.785	0.663	
2533	16.20	2.1762	0.1585	0.0302	0.869	0.389	0.258	
4647	16.55	2.1769	0.1065	0.0365	0.669	0.554	0.223	
6040	16.21	2.1772	0.1567	0.0234	0.027	0.768	0.795	
2526	15.65	2.1823	0.1359	0.0538	0.965	0.531	0.496	
9609	16.93	2.1835	0.1348	0.0683	0.831	0.532	0.364	6
4119	16.38	2.1851	0.1602	0.0872	0.911	0.539	0.450	6
2153	18.75	2.1860	0.2041	0.0265	0.931	0.759	0.691	
6600	16.12	2.1919	0.1084	0.0249	0.491	0.204	0.696	
6602	17.60	2.1922	0.1013	0.1060	0.094	0.023	0.118	
6531	16.03	2.1952	0.0653	0.0730	0.232	0.034	0.267	
2040	17.86	2.1954	0.1904	0.0768	0.959	0.987	0.947	
4116	16.28	2.1972	0.1891	0.0310	0.932	0.626	0.559	
2013	16.39	2.1974	0.1729	0.0681	0.874	0.904	0.778	6
4620	17.32	2.2014	0.1172	0.0667	0.755	0.046	0.801	6
4578	15.92	2.2025	0.1527	0.0745	0.970	0.471	0.441	6
2047	17.29	2.2039	0.0487	0.1090	0.837	0.001	0.839	
4068	16.03	2.2048	0.0618	0.0523	0.214	0.914	0.129	
4227	18.24	2.2058	0.1237	0.0390	0.899	0.809	0.708	
2080	17.50	2.2091	0.1627	0.0447	0.072	0.782	0.855	
6619	17.02	2.2102	0.1547	0.0653	0.928	0.484	0.412	6
4014	16.09	2.2120	0.1377	0.1005	0.202	0.940	0.142	
4025	15.92	2.2125	0.0905	0.1411	0.300	0.553	0.853	
4129	16.56	2.2131	0.1531	0.1128	0.039	0.535	0.575	
4619	17.12	2.2156	0.1318	0.0259	0.320	0.963	0.284	
4276	16.67	2.2165	0.1853	0.0908	0.649	0.972	0.622	
4656	16.95	2.2168	0.1669	0.0731	0.280	0.024	0.305	6
6285	17.36	2.2171	0.1456	0.0684	0.795	0.938	0.734	6
9085	17.40	2.2175	0.1462	0.0633	0.897	0.990	0.888	6
4151	17.28	2.2179	0.1161	0.1114	0.130	0.532	0.663	
6643	16.25	2.2194	0.1613	0.0740	0.184	0.077	0.262	6

© European Southern Observatory • Provided by the NASA Astrophysics Data System

1970A&AS....2..339V

Table 9 (*continued*)

PL	g	a (A. U.)	ν	μ	β	γ	$\beta+\gamma$	Ref.
641	13.62	2.2196	0.1305	0.0195	0.223	0.094	0.317	
6749	19.14	2.2210	0.1485	0.0751	0.949	0.479	0.428	6
6593	16.66	2.2210	0.1692	0.0583	0.706	0.461	0.167	6
2044	15.96	2.2226	0.0908	0.0637	0.553	0.946	0.500	
4196	13.77	2.2235	0.1249	0.0809	0.326	0.698	0.024	6
6516	17.18	2.2246	0.2061	0.1053	0.063	0.024	0.087	
4550	17.51	2.2251	0.1599	0.0646	0.230	0.015	0.245	6
6580	15.64	2.2251	0.1268	0.0580	0.561	0.198	0.759	6
4859	17.10	2.2269	0.0756	0.0178	0.707	0.459	0.166	
4537	17.67	2.2283	0.1392	0.1073	0.202	0.987	0.190	
4629	17.03	2.2285	0.0189	0.1078	0.154	0.491	0.645	
296	13.98	2.2287	0.1235	0.0276	0.073	0.395	0.469	
4066	17.29	2.2289	0.1655	0.0702	0.170	0.976	0.147	6
1744	14.76	2.2290	0.1670	0.0676	0.484	0.063	0.547	6
1590	13.22	2.2297	0.1375	0.0869	0.722	0.632	0.355	6
4110	16.81	2.2302	0.0724	0.0615	0.836	0.564	0.400	
6188	16.52	2.2303	0.1613	0.0493	0.421	0.634	0.055	
6323	16.66	2.2308	0.1600	0.0379	0.010	0.919	0.929	
6561	14.78	2.2320	0.1754	0.0995	0.338	0.070	0.408	
6615	15.72	2.2326	0.1335	0.0739	0.509	0.037	0.546	6
2642	15.29	2.2332	0.1473	0.1242	0.597	0.515	0.113	
2017	16.10	2.2346	0.1740	0.0498	0.864	0.714	0.578	
6199	17.49	2.2358	0.1379	0.0600	0.107	0.599	0.706	6
4081	15.86	2.2365	0.1027	0.1326	0.033	0.562	0.595	
4175	16.59	2.2371	0.1528	0.0852	0.368	0.569	0.937	
6669	17.07	2.2375	0.1332	0.1072	0.869	0.980	0.850	
2572	16.31	2.2377	0.1438	0.0406	0.370	0.991	0.362	
4637	16.74	2.2378	0.1243	0.0967	0.091	0.469	0.560	
4581	15.62	2.2388	0.1012	0.0381	0.136	0.146	0.282	
4022	16.38	2.2390	0.1420	0.0768	0.043	0.931	0.975	6
2045	18.04	2.2398	0.1852	0.1126	0.105	0.996	0.102	
4623	16.42	2.2412	0.1348	0.0616	0.488	0.017	0.505	6
9066	17.30	2.2416	0.1509	0.0791	0.813	0.975	0.788	6
4853	17.54	2.2417	0.0966	0.0722	0.796	0.492	0.289	
4634	16.20	2.2425	0.1534	0.0762	0.876	0.026	0.903	6
2122	18.16	2.2428	0.1735	0.0831	0.885	0.944	0.829	6
4557	17.14	2.2432	0.2057	0.0583	0.895	0.513	0.409	
4008	15.41	2.2434	0.1388	0.0651	0.124	0.894	0.019	6
7649	18.04	2.2456	0.2459	0.0503	0.901	0.404	0.306	
2779	15.89	2.2459	0.1357	0.0275	0.996	0.130	0.127	
2698	17.12	2.2476	0.0594	0.1286	0.669	0.003	0.673	
2060	16.44	2.2481	0.1322	0.0568	0.541	0.841	0.382	6
2077	15.10	2.2481	0.1342	0.0588	0.663	0.913	0.576	6
6677	17.31	2.2493	0.0755	0.0681	0.074	0.035	0.110	
1652	13.70	2.2515	0.1449	0.0673	0.681	0.695	0.376	6
6521	15.05	2.2516	0.1118	0.0638	0.149	0.454	0.604	6
6189	17.68	2.2552	0.1160	0.0403	0.958	0.722	0.681	
841	14.03	2.2558	0.1091	0.0630	0.362	0.956	0.319	6
6742	17.48	2.2568	0.1623	0.0315	0.247	0.271	0.519	
6560	14.86	2.2575	0.1337	0.0445	0.444	0.333	0.777	

© European Southern Observatory • Provided by the NASA Astrophysics Data System

1970A&AS....2..339V

Table 9 (*continued*)

PL	g	a (A. U.)	ν	μ	β	γ	$\beta+\gamma$	Ref.
6642	16.29	2.2576	0.0923	0.0395	0.981	0.124	0.105	
2772	16.42	2.2576	0.1029	0.0333	0.832	0.253	0.086	
2082	16.82	2.2581	0.1190	0.0768	0.866	0.703	0.569	6
2052	17.08	2.2584	0.1254	0.1126	0.022	0.574	0.597	
6601	16.90	2.2589	0.1023	0.1242	0.824	0.469	0.294	
6098	17.82	2.2607	0.1304	0.0285	0.907	0.637	0.545	
6190	16.80	2.2639	0.1194	0.0826	0.705	0.646	0.351	6
2024	15.03	2.2657	0.1265	0.0793	0.489	0.962	0.451	6
2820	15.32	2.2658	0.1156	0.0824	0.384	0.046	0.431	6
6186	17.28	2.2658	0.1620	0.1077	0.793	0.570	0.364	
2107	16.67	2.2683	0.1510	0.0984	0.661	0.677	0.338	
6793	16.58	2.2685	0.1305	0.0560	0.691	0.110	0.802	6
2099	15.48	2.2695	0.1598	0.1091	0.466	0.566	0.032	
6115	16.81	2.2708	0.1035	0.0926	0.333	0.917	0.251	
2557	15.24	2.2718	0.1770	0.0775	0.647	0.019	0.666	
6033	16.66	2.2719	0.2055	0.0295	0.061	0.909	0.970	
4157	16.32	2.2725	0.1988	0.0460	0.381	0.811	0.192	
6630	16.40	2.2729	0.0936	0.1007	0.552	0.026	0.578	30
2196	16.28	2.2730	0.1733	0.0341	0.305	0.754	0.060	
6552	14.61	2.2730	0.1304	0.1252	0.291	0.475	0.767	
4200	16.88	2.2755	0.1731	0.0933	0.880	0.555	0.435	
2076	16.15	2.2759	0.1853	0.1264	0.080	0.600	0.680	
4099	16.70	2.2760	0.1398	0.1006	0.166	0.597	0.764	
7572	16.90	2.2765	0.1042	0.0597	0.739	0.411	0.150	
4524	15.98	2.2767	0.0583	0.0213	0.140	0.665	0.806	
2120	17.36	2.2774	0.1007	0.1244	0.789	0.605	0.394	30
2038	16.58	2.2776	0.0993	0.1156	0.403	0.634	0.037	30
2635	16.19	2.2778	0.1543	0.0620	0.681	0.554	0.236	
2034	15.86	2.2779	0.1756	0.0756	0.515	0.744	0.260	
6075	17.38	2.2780	0.1819	0.1244	0.173	0.548	0.722	
2507	16.67	2.2783	0.1367	0.0969	0.280	0.987	0.267	
4604	16.49	2.2786	0.0712	0.0325	0.905	0.035	0.940	
6184	17.57	2.2800	0.0784	0.1119	0.106	0.581	0.687	30
2094	17.94	2.2805	0.0952	0.0280	0.043	0.895	0.938	
4171	17.88	2.2810	0.1169	0.0704	0.970	0.686	0.657	
6568	15.64	2.2814	0.1367	0.0708	0.276	0.972	0.249	
2621	17.61	2.2830	0.0988	0.1266	0.867	0.039	0.906	30
2536	15.49	2.2832	0.1124	0.1215	0.890	0.046	0.936	30
6100	17.21	2.2836	0.0905	0.1308	0.060	0.545	0.605	30
6631	16.97	2.2839	0.1437	0.0884	0.159	0.441	0.600	
6722	17.24	2.2843	0.0734	0.1122	0.164	0.032	0.196	30
6520	16.62	2.2846	0.1232	0.0880	0.186	0.492	0.678	
6583	16.00	2.2846	0.1206	0.0757	0.297	0.506	0.803	
2650	17.88	2.2848	0.1628	0.0342	0.106	0.520	0.627	
2538	14.97	2.2849	0.0924	0.1372	0.558	0.062	0.621	30
6110	17.40	2.2865	0.1413	0.0880	0.143	0.947	0.090	
2559	15.60	2.2866	0.1375	0.0353	0.458	0.209	0.668	
2530	15.66	2.2867	0.1267	0.0743	0.214	0.042	0.256	
4625	16.28	2.2874	0.1184	0.0299	0.568	0.052	0.620	
6763	17.72	2.2878	0.1568	0.1262	0.080	0.513	0.593	

© European Southern Observatory • Provided by the NASA Astrophysics Data System

1970A&AS....2..339V

Table 9 (*continued*)

PL	g	a (A. U.)	ν	μ	β	γ	$\beta+\gamma$	Ref.
4065	17.07	2.2883	0.1470	0.0577	0.856	0.811	0.667	
9523	15.90	2.2889	0.1579	0.1061	0.521	0.007	0.529	
6637	16.24	2.2892	0.1504	0.0833	0.355	0.461	0.816	
6739	17.64	2.2892	0.0831	0.1145	0.910	0.493	0.404	30
2018	15.14	2.2916	0.0968	0.1020	0.724	0.951	0.676	30
2658	16.74	2.2918	0.1198	0.1161	0.817	0.035	0.853	30
4606	16.10	2.2933	0.0824	0.0244	0.652	0.113	0.765	
2835	15.43	2.2936	0.1900	0.1290	0.381	0.032	0.413	
4032	15.96	2.2937	0.1473	0.0910	0.297	0.884	0.182	
4734	17.01	2.2941	0.0114	0.0373	0.888	0.076	0.965	
2168	17.70	2.2952	0.1383	0.0916	0.156	0.971	0.127	
2014	16.10	2.2954	0.0905	0.1330	0.918	0.976	0.894	30
2579	15.95	2.2960	0.1814	0.1306	0.635	0.063	0.698	
4517	15.10	2.2995	0.1351	0.1150	0.910	0.010	0.921	
4693	16.96	2.3003	0.1578	0.0444	0.721	0.895	0.617	32
4597	16.72	2.3008	0.1944	0.0673	0.200	0.495	0.696	
4579	16.06	2.3016	0.1763	0.0167	0.846	0.416	0.263	31
6626	16.30	2.3017	0.0920	0.0429	0.547	0.957	0.505	
2550	16.16	2.3024	0.1863	0.0250	0.756	0.135	0.892	31
2019	15.22	2.3033	0.1571	0.0673	0.386	0.630	0.016	
2102	16.82	2.3034	0.1580	0.0715	0.803	0.903	0.707	
6576	15.56	2.3035	0.1151	0.0626	0.338	0.050	0.388	
4284	17.37	2.3038	0.0976	0.1091	0.905	0.615	0.521	30
6047	15.12	2.3064	0.1196	0.0982	0.416	0.573	0.989	
2562	15.08	2.3080	0.1971	0.0161	0.497	0.053	0.551	31
2633	16.75	2.3090	0.1408	0.0586	0.187	0.505	0.693	32
4588	16.49	2.3093	0.1349	0.1050	0.907	0.540	0.447	
6126	17.40	2.3100	0.1607	0.1030	0.055	0.989	0.044	
2072	17.06	2.3105	0.1742	0.1154	0.332	0.962	0.295	
6572	16.98	2.3108	0.2527	0.1267	0.132	0.015	0.148	
6794	16.60	2.3125	0.1374	0.0535	0.430	0.393	0.824	32
2597	18.00	2.3140	0.2121	0.1225	0.933	0.048	0.982	
2057	17.88	2.3155	0.1290	0.0869	0.066	0.894	0.960	
4617	17.87	2.3157	0.1732	0.1026	0.126	0.995	0.122	
6312	17.44	2.3158	0.1806	0.0852	0.994	0.938	0.933	
2054	15.64	2.3168	0.1915	0.0960	0.534	0.640	0.174	
6624	16.51	2.3168	0.0714	0.0411	0.161	0.147	0.308	
4083	15.91	2.3169	0.1306	0.0744	0.517	0.918	0.436	
6622	15.68	2.3170	0.1518	0.0531	0.443	0.483	0.926	32
4037	15.77	2.3186	0.1083	0.1181	0.322	0.975	0.298	30
2108	19.50	2.3187	0.3437	0.0480	0.970	0.910	0.881	
2636	16.06	2.3187	0.1972	0.0515	0.650	0.505	0.155	32
4055	15.56	2.3189	0.1575	0.0603	0.540	0.866	0.407	
2588	16.72	2.3203	0.2005	0.1019	0.335	0.031	0.367	
2188	17.86	2.3205	0.1496	0.0497	0.143	0.774	0.917	32
4104	17.34	2.3209	0.0918	0.1161	0.097	0.593	0.691	30
2091	16.52	2.3209	0.0862	0.0748	0.102	0.693	0.796	
2074	16.97	2.3215	0.1088	0.0570	0.304	0.675	0.980	
2593	18.00	2.3243	0.2186	0.0121	0.887	0.755	0.642	31
2781	16.81	2.3245	0.1904	0.1160	0.966	0.065	0.031	

© European Southern Observatory • Provided by the NASA Astrophysics Data System

1970A&AS....2..339V

Table 9 (*continued*)

PL	g	a (A. U.)	ν	μ	β	γ	$\beta+\gamma$	Ref.
4289	17.48	2.3272	0.0987	0.0774	0.218	0.953	0.171	
6606	16.13	2.3277	0.0811	0.1083	0.418	0.064	0.482	30
4631	15.72	2.3287	0.0852	0.1209	0.498	0.021	0.520	30
2617	18.45	2.3295	0.1750	0.0361	0.123	0.490	0.614	32
2508	16.38	2.3315	0.2106	0.1073	0.007	0.008	0.016	
6732	17.92	2.3318	0.1457	0.0435	0.135	0.143	0.279	32
2170	18.01	2.3323	0.1744	0.0590	0.075	0.794	0.870	32
4153	15.14	2.3326	0.1446	0.1366	0.343	0.957	0.301	
4575	14.03	2.3329	0.0596	0.1434	0.016	0.491	0.507	
4695	16.50	2.3333	0.0803	0.1074	0.485	0.990	0.475	30
2604	15.90	2.3339	0.2134	0.0505	0.621	0.980	0.602	
4237	16.56	2.3373	0.1041	0.0418	0.415	0.863	0.278	
4071	16.79	2.3379	0.0751	0.1029	0.796	0.571	0.367	30
6553	14.54	2.3380	0.1599	0.0501	0.298	0.014	0.313	32
4612	16.64	2.3380	0.1839	0.0086	0.250	0.744	0.995	31
2029	16.96	2.3386	0.1866	0.0333	0.093	0.774	0.868	
6680	16.42	2.3400	0.0795	0.1136	0.304	0.528	0.832	30
4023	14.24	2.3400	0.1706	0.0492	0.405	0.926	0.332	32
2586	17.62	2.3414	0.1426	0.0463	0.144	0.508	0.653	32
2131	17.90	2.3414	0.1131	0.0392	0.094	0.849	0.943	
4584	16.10	2.3419	0.1818	0.1032	0.090	0.483	0.574	
2049	16.68	2.3426	0.1096	0.0705	0.346	0.874	0.221	
4039	17.34	2.3433	0.1901	0.0391	0.875	0.623	0.499	32
4072	16.00	2.3444	0.2293	0.0584	0.676	0.669	0.346	
4839	17.03	2.3461	0.1837	0.0396	0.783	0.517	0.301	32
2576	16.76	2.3467	0.2146	0.0808	0.744	0.053	0.797	
4046	17.90	2.3473	0.2067	0.0887	0.110	0.948	0.058	
6081	14.95	2.3489	0.1820	0.0476	0.623	0.659	0.282	32
4618	17.46	2.3497	0.1935	0.0386	0.181	0.534	0.715	32
2542	16.32	2.3520	0.2000	0.0527	0.074	0.117	0.192	32
6055	17.12	2.3542	0.1945	0.0404	0.147	0.856	0.003	32
2716	17.79	2.3547	0.1717	0.0453	0.906	0.492	0.399	32
2169	16.92	2.3558	0.0939	0.1171	0.434	0.971	0.405	30
4642	17.32	2.3559	0.2148	0.0120	0.846	0.991	0.837	31
6775	17.42	2.3563	0.2060	0.0143	0.234	0.344	0.579	31
5023	17.08	2.3565	0.1029	0.1265	0.770	0.623	0.394	30
6214	16.42	2.3571	0.1285	0.0872	0.291	0.632	0.924	
4663	17.46	2.3573	0.1867	0.0431	0.903	0.443	0.347	32
1045	14.20	2.3583	0.1641	0.0188	0.243	0.729	0.972	
4875	16.36	2.3587	0.1916	0.0446	0.347	0.122	0.469	32
7637	15.58	2.3590	0.2371	0.0982	0.615	0.138	0.753	
4158	16.54	2.3593	0.0934	0.0797	0.416	0.899	0.316	
2119	17.42	2.3609	0.1006	0.1206	0.969	0.601	0.571	30
2109	17.22	2.3626	0.1265	0.0660	0.962	0.608	0.570	
6574	16.02	2.3630	0.0804	0.1176	0.060	0.011	0.071	30
4251	17.08	2.3631	0.1366	0.1033	0.298	0.647	0.946	
2061	15.84	2.3644	0.1996	0.0948	0.605	0.869	0.475	
4020	15.22	2.3645	0.0542	0.0500	0.187	0.624	0.812	
2569	17.12	2.3647	0.1771	0.1644	0.077	0.026	0.103	27
4041	16.73	2.3647	0.1431	0.0456	0.106	0.785	0.892	32

© European Southern Observatory • Provided by the NASA Astrophysics Data System

1970A&AS....2..339V

Table 9 (*continued*)

PL	g	a (A. U.)	ν	μ	β	γ	$\beta+\gamma$	Ref.
6085	16.48	2.3661	0.1902	0.0395	0.865	0.602	0.468	32
4190	16.99	2.3661	0.1218	0.1123	0.924	0.637	0.562	30
2055	16.23	2.3663	0.1599	0.1578	0.602	0.942	0.545	27
6097	16.72	2.3684	0.1794	0.0364	0.849	0.750	0.599	32
4031	15.97	2.3690	0.1799	0.0930	0.223	0.924	0.147	
4742	17.40	2.3694	0.1440	0.0484	0.177	0.998	0.176	32
2603	17.83	2.3707	0.1870	0.0482	0.228	0.478	0.706	32
4621	17.92	2.3708	0.1590	0.0289	0.984	0.511	0.496	31
4751	18.07	2.3717	0.1646	0.0434	0.982	0.935	0.918	32
2606	16.51	2.3724	0.1514	0.0445	0.917	0.611	0.528	32
2775	16.74	2.3727	0.1872	0.0402	0.744	0.151	0.896	32
2006	14.66	2.3731	0.0976	0.1139	0.237	0.580	0.817	30
2827	16.70	2.3737	0.1257	0.0793	0.583	0.052	0.636	
2714	16.94	2.3742	0.2973	0.0347	0.336	0.959	0.296	
2580	15.32	2.3748	0.1909	0.0384	0.450	0.146	0.597	32
2711	16.87	2.3759	0.1466	0.0477	0.364	0.483	0.847	32
6579	15.27	2.3760	0.1025	0.0411	0.288	0.168	0.456	
6132	18.16	2.3773	0.1985	0.0352	0.961	0.744	0.705	32
2537	16.39	2.3788	0.1656	0.0839	0.951	0.050	0.002	
6102	17.60	2.3791	0.1876	0.0406	0.158	0.611	0.770	32
4546	17.92	2.3800	0.1792	0.0737	0.141	0.994	0.136	
6570	16.22	2.3803	0.2012	0.0464	0.202	0.552	0.754	32
6618	17.06	2.3806	0.1679	0.0260	0.059	0.197	0.257	31
2624	17.48	2.3806	0.1647	0.0270	0.868	0.399	0.268	31
4038	15.82	2.3808	0.1945	0.0393	0.353	0.800	0.154	32
6704	16.76	2.3826	0.1884	0.0166	0.758	0.484	0.243	31
4595	16.74	2.3851	0.1514	0.0490	0.024	0.538	0.563	32
2062	16.66	2.3853	0.0757	0.1781	0.886	0.997	0.884	
4082	15.08	2.3856	0.1906	0.0373	0.595	0.841	0.437	32
2743	15.98	2.3862	0.2041	0.0107	0.505	0.557	0.063	31
6797	16.22	2.3868	0.1617	0.0237	0.631	0.083	0.714	31
2096	15.90	2.3891	0.1024	0.0593	0.178	0.593	0.771	
2515	17.66	2.3899	0.1002	0.1128	0.049	0.994	0.043	30
4093	16.52	2.3900	0.2171	0.2107	0.657	0.576	0.233	27
4692	16.54	2.3907	0.1588	0.0509	0.652	0.521	0.173	32
4033	16.84	2.3908	0.1845	0.0388	0.148	0.830	0.978	32
2050	17.11	2.3909	0.1884	0.0364	0.046	0.688	0.734	32
6124	17.14	2.3915	0.2192	0.0826	0.850	0.532	0.383	
2647	16.55	2.3917	0.1598	0.0245	0.155	0.950	0.106	31
2042	16.14	2.3930	0.0762	0.0960	0.408	0.655	0.064	
1694	13.64	2.3935	0.2209	0.1911	0.032	0.025	0.057	27
2089	16.76	2.3951	0.1817	0.0539	0.270	0.658	0.929	32
2778	15.58	2.3961	0.0478	0.0305	0.548	0.546	0.095	
2063	17.50	2.3966	0.2310	0.0737	0.210	0.625	0.836	
4650	15.53	2.3973	0.1630	0.0362	0.569	0.960	0.530	32
6061	16.89	2.3974	0.1914	0.0423	0.848	0.925	0.773	32
6623	16.72	2.4006	0.0797	0.1045	0.270	0.006	0.277	
6595	16.38	2.4012	0.1502	0.0261	0.709	0.566	0.275	31
4555	16.55	2.4012	0.1833	0.0438	0.968	0.521	0.490	32
2035	17.58	2.4014	0.1543	0.0478	0.942	0.786	0.728	32

© European Southern Observatory • Provided by the NASA Astrophysics Data System

1970A&AS....2..339V

Table 9 (*continued*)

PL	g	a (A. U.)	ν	μ	β	γ	$\beta+\gamma$	Ref.
4611	15.92	2.4021	0.1649	0.2228	0.405	0.014	0.419	27
4078	17.62	2.4023	0.1695	0.0441	0.873	0.890	0.763	32
4074	16.50	2.4030	0.1516	0.0251	0.668	0.705	0.373	31
4880	17.66	2.4041	0.3003	0.1901	0.804	0.016	0.821	
4077	16.10	2.4042	0.1847	0.0352	0.471	0.826	0.298	32
6090	14.18	2.4051	0.1799	0.0839	0.520	0.930	0.451	25
4101	16.16	2.4052	0.2243	0.0535	0.427	0.802	0.229	
4668	16.09	2.4058	0.0939	0.1236	0.216	0.061	0.277	
6693	18.06	2.4058	0.1812	0.1052	0.132	0.022	0.155	
4056	17.64	2.4073	0.1870	0.0334	0.073	0.804	0.877	32
6062	15.88	2.4074	0.1503	0.0449	0.244	0.862	0.107	32
6647	15.86	2.4077	0.1902	0.0445	0.937	0.053	0.990	32
6117	16.52	2.4078	0.1445	0.0296	0.130	0.972	0.102	31
2777	15.68	2.4082	0.1721	0.0494	0.681	0.491	0.173	32
6578	14.88	2.4085	0.1791	0.0375	0.429	0.293	0.723	32
4102	17.78	2.4086	0.1660	0.0783	0.175	0.908	0.083	25
6798	18.04	2.4091	0.1694	0.1186	0.025	0.017	0.042	
6613	17.28	2.4093	0.1828	0.0227	0.956	0.074	0.031	31
4019	15.04	2.4104	0.0746	0.0531	0.836	0.730	0.566	
2010	14.41	2.4106	0.0583	0.0816	0.085	0.698	0.783	
2505	16.32	2.4128	0.1471	0.1138	0.176	0.991	0.167	
2164	15.50	2.4137	0.1509	0.0527	0.935	0.787	0.722	32
2694	17.96	2.4137	0.1624	0.0699	0.083	0.012	0.095	25
6511	17.84	2.4141	0.1937	0.0126	0.018	0.814	0.833	31
2541	16.23	2.4151	0.1791	0.0158	0.971	0.930	0.902	31
4528	16.76	2.4157	0.1653	0.0496	0.046	0.589	0.635	32
2815	17.83	2.4165	0.1348	0.0439	0.131	0.934	0.065	32
4648	16.52	2.4174	0.1620	0.0248	0.754	0.623	0.377	31
2009	14.20	2.4177	0.0398	0.1044	0.202	0.626	0.829	
6123	17.78	2.4180	0.1969	0.2277	0.045	0.514	0.559	27
6527	17.00	2.4183	0.1719	0.0246	0.179	0.447	0.626	31
2708	16.62	2.4187	0.1051	0.0721	0.510	0.000	0.510	
2648	16.80	2.4212	0.1557	0.0237	0.213	0.036	0.249	31
2577	16.04	2.4215	0.1158	0.0192	0.737	0.819	0.556	
4630	15.76	2.4218	0.1439	0.1034	0.154	0.005	0.159	
2582	16.90	2.4226	0.1371	0.0511	0.193	0.043	0.237	32
6625	16.30	2.4229	0.1048	0.0378	0.738	0.428	0.167	
6804	16.86	2.4234	0.1405	0.0423	0.316	0.234	0.551	32
4247	15.82	2.4235	0.1603	0.0376	0.532	0.727	0.260	32
4015	16.20	2.4243	0.1620	0.0441	0.862	0.826	0.689	32
2125	16.64	2.4246	0.1466	0.1127	0.978	0.929	0.907	
6607	15.38	2.4249	0.1724	0.0581	0.551	0.405	0.957	32
2630	15.93	2.4263	0.1689	0.0465	0.153	0.049	0.203	32
4075	16.58	2.4265	0.1036	0.0244	0.269	0.812	0.082	
6547	15.60	2.4266	0.1725	0.0447	0.996	0.065	0.061	32
2114	16.90	2.4268	0.0245	0.0926	0.891	0.590	0.481	
6628	16.82	2.4276	0.1524	0.0230	0.957	0.552	0.510	31
6790	16.83	2.4281	0.1707	0.0436	0.803	0.277	0.081	32
6773	17.13	2.4288	0.1777	0.0409	0.246	0.256	0.503	32
4103	17.22	2.4289	0.1695	0.0529	0.249	0.834	0.083	32

© European Southern Observatory • Provided by the NASA Astrophysics Data System

1970A&AS....2..339V

Table 9 (*continued*)

PL	g	a (A. U.)	ν	μ	β	γ	$\beta+\gamma$	Ref.
4113	15.64	2.4289	0.1724	0.0425	0.377	0.619	0.997	32
4009	15.66	2.4291	0.1604	0.0424	0.878	0.867	0.745	32
4526	14.98	2.4299	0.1782	0.0436	0.394	0.935	0.330	32
2600	17.17	2.4304	0.1331	0.0300	0.963	0.614	0.577	31
6354	17.92	2.4308	0.1551	0.0469	0.030	0.544	0.574	32
2027	16.72	2.4313	0.1792	0.0417	0.103	0.765	0.869	
4665	15.31	2.4321	0.0954	0.0656	0.039	0.083	0.123	
9093	16.96	2.4325	0.1660	0.0438	0.924	0.894	0.819	32
6594	16.22	2.4338	0.0424	0.1125	0.102	0.515	0.617	
2565	16.38	2.4341	0.0213	0.0786	0.548	0.035	0.584	
4011	14.54	2.4342	0.0845	0.0895	0.346	0.951	0.298	
6645	16.76	2.4344	0.2004	0.1581	0.997	0.037	0.034	27
4063	16.93	2.4371	0.1748	0.0819	0.247	0.884	0.131	25
4021	15.07	2.4378	0.1636	0.0577	0.257	0.900	0.157	32
2590	16.35	2.4384	0.1684	0.0794	0.727	0.999	0.726	25
4589	16.48	2.4404	0.2334	0.1796	0.845	0.017	0.862	27
2158	15.98	2.4407	0.1069	0.1135	0.280	0.591	0.871	
2566	16.47	2.4411	0.1786	0.0408	0.225	0.590	0.815	32
6080	17.38	2.4412	0.1587	0.0405	0.933	0.955	0.889	32
6130	15.66	2.4414	0.1389	0.0792	0.378	0.567	0.945	25
6635	17.06	2.4421	0.1884	0.0448	0.830	0.417	0.247	32
4870	16.88	2.4429	0.0909	0.0865	0.778	0.530	0.309	
4304	17.47	2.4439	0.1618	0.0602	0.886	0.702	0.589	32
2657	15.80	2.4452	0.1130	0.0565	0.571	0.055	0.626	
4587	16.02	2.4458	0.1476	0.0502	0.853	0.585	0.439	32
2552	15.04	2.4469	0.1272	0.0323	0.492	0.398	0.891	31
2051	16.46	2.4484	0.1717	0.0604	0.768	0.702	0.470	32
6512	14.83	2.4496	0.0880	0.1026	0.148	0.995	0.143	
6032	15.28	2.4502	0.1227	0.0530	0.947	0.841	0.789	
4029	16.90	2.4521	0.1751	0.1216	0.926	0.965	0.891	
6242	15.66	2.4531	0.1155	0.1086	0.444	0.629	0.074	
6048	15.00	2.4550	0.0919	0.0880	0.253	0.918	0.172	
4660	17.09	2.4551	0.1483	0.0985	0.872	0.999	0.871	
2592	15.88	2.4571	0.1041	0.0938	0.629	0.517	0.147	
2059	16.12	2.4610	0.0840	0.0974	0.565	0.965	0.530	
2126	14.46	2.4638	0.0641	0.1318	0.353	0.929	0.283	
6678	17.10	2.4644	0.1181	0.0704	0.123	0.974	0.098	
2043	16.46	2.4660	0.2396	0.1047	0.777	0.959	0.736	
6617	16.07	2.4672	0.1282	0.1091	0.339	0.028	0.367	
2007	14.36	2.4676	0.1698	0.0560	0.137	0.685	0.822	
1743	13.38	2.4699	0.1743	0.1151	0.503	0.548	0.052	
2806	17.94	2.4714	0.1476	0.1312	0.947	0.010	0.957	
2665	17.83	2.4731	0.2236	0.0690	0.911	0.512	0.424	
6056	16.24	2.4744	0.1123	0.1571	0.131	0.567	0.698	
2197	14.75	2.4770	0.1617	0.0796	0.751	0.570	0.321	25
2129	16.46	2.4777	0.1150	0.1046	0.378	0.581	0.960	
4087	15.99	2.4796	0.1532	0.0380	0.446	0.935	0.382	
4053	15.84	2.4806	0.1065	0.1220	0.703	0.613	0.316	
6530	14.85	2.4839	0.1339	0.0975	0.137	0.503	0.641	
6082	15.74	2.4888	0.0889	0.0729	0.267	0.639	0.906	

© European Southern Observatory • Provided by the NASA Astrophysics Data System

1970A&AS....2..339V

Table 9 (*continued*)

PL	g	a (A. U.)	ν	μ	β	γ	$\beta+\gamma$	Ref.
2700	16.82	2.5124	0.0431	0.0546	0.881	0.541	0.423	
4917	16.33	2.5129	0.0964	0.0360	0.535	0.980	0.515	
6127	16.68	2.5170	0.1454	0.1780	0.012	0.978	0.991	
2733	16.46	2.5196	0.1080	0.0343	0.197	0.328	0.525	
2791	16.68	2.5199	0.1556	0.2158	0.998	0.046	0.045	
2651	17.21	2.5204	0.1866	0.0883	0.991	0.957	0.949	
2599	16.55	2.5213	0.1375	0.1280	0.289	0.558	0.847	
6109	16.05	2.5216	0.1112	0.0655	0.670	0.904	0.574	
2524	14.48	2.5224	0.1411	0.0772	0.107	0.555	0.663	
4275	17.88	2.5230	0.2054	0.2279	0.059	0.545	0.604	
4186	17.19	2.5245	0.1432	0.0469	0.886	0.642	0.529	
6037	16.14	2.5246	0.1909	0.1806	0.024	0.994	0.018	
6736	16.84	2.5256	0.1041	0.0806	0.219	0.075	0.294	
6058	16.32	2.5257	0.1703	0.1240	0.806	0.934	0.741	
6057	16.76	2.5262	0.2173	0.0805	0.131	0.896	0.027	
2610	16.28	2.5262	0.1553	0.0552	0.065	0.545	0.611	
2509	14.48	2.5267	0.1603	0.0831	0.980	0.001	0.981	
6644	16.39	2.5271	0.1942	0.0867	0.784	0.457	0.242	
6611	15.24	2.5273	0.2096	0.0511	0.198	0.563	0.762	
6060	16.19	2.5273	0.1205	0.0733	0.099	0.916	0.016	
2200	16.43	2.5286	0.2067	0.0668	0.869	0.748	0.618	
4598	15.23	2.5294	0.1554	0.0323	0.690	0.944	0.634	
6099	16.31	2.5309	0.1223	0.1036	0.995	0.953	0.948	
4610	15.54	2.5309	0.1298	0.0865	0.411	0.544	0.956	
6675	17.37	2.5373	0.2641	0.0918	0.229	0.999	0.228	
4654	16.91	2.5381	0.2337	0.0381	0.788	0.814	0.602	
4141	15.30	2.5391	0.1800	0.0879	0.268	0.625	0.894	
355	11.44	2.5395	0.1146	0.0792	0.314	0.943	0.257	
4635	17.25	2.5481	0.1624	0.0189	0.863	0.354	0.217	
4591	15.53	2.5482	0.1978	0.1304	0.230	0.021	0.252	
6706	17.14	2.5496	0.2507	0.0928	0.218	0.040	0.258	
2595	17.11	2.5507	0.1658	0.0500	0.925	0.018	0.943	
2503	14.86	2.5511	0.1021	0.2665	0.231	0.010	0.242	4
4126	16.95	2.5516	0.1599	0.0300	0.961	0.651	0.613	
6120	17.14	2.5522	0.2043	0.0956	0.983	0.554	0.538	
4613	16.76	2.5524	0.2288	0.0552	0.804	0.032	0.837	
4123	17.04	2.5531	0.2466	0.2188	0.931	0.547	0.478	
2618	15.92	2.5532	0.1967	0.0560	0.677	0.555	0.233	
4140	15.48	2.5534	0.1447	0.2446	0.093	0.529	0.622	33
6052	16.25	2.5541	0.3002	0.0865	0.176	0.936	0.112	
6566	15.74	2.5545	0.2564	0.0708	0.904	0.480	0.384	
6604	16.52	2.5552	0.1837	0.0410	0.186	0.433	0.620	
6113	16.30	2.5561	0.1310	0.0330	0.761	0.843	0.604	
6107	16.40	2.5564	0.0554	0.2479	0.661	0.557	0.218	
2638	17.04	2.5569	0.1919	0.0409	0.988	0.596	0.585	
6128	17.20	2.5572	0.1264	0.0298	0.914	0.694	0.608	
2066	16.88	2.5579	0.1450	0.1997	0.985	0.997	0.983	33
6744	17.48	2.5581	0.2002	0.1139	0.168	0.505	0.674	
6774	16.72	2.5586	0.1421	0.2365	0.780	0.025	0.806	33
2078	14.90	2.5591	0.1362	0.1266	0.245	0.963	0.208	

© European Southern Observatory • Provided by the NASA Astrophysics Data System

1970A&AS....2..339V

Table 9 (*continued*)

PL	g	a (A. U.)	ν	μ	β	γ	$\beta+\gamma$	Ref.
6308	16.24	2.5595	0.0540	0.0538	0.592	0.651	0.244	
2573	16.54	2.5598	0.1895	0.0732	0.892	0.036	0.928	
4070	15.91	2.5599	0.1438	0.0686	0.387	0.814	0.201	
2637	16.58	2.5604	0.1338	0.0425	0.204	0.618	0.823	
2020	15.82	2.5611	0.2228	0.0965	0.136	0.925	0.061	
2531	15.39	2.5616	0.1868	0.1209	0.026	0.531	0.557	
6381	16.13	2.5617	0.0544	0.1803	0.283	0.521	0.805	
2081	17.10	2.5617	0.2173	0.0736	0.925	0.739	0.665	
2106	16.68	2.5628	0.0965	0.1238	0.837	0.631	0.469	
6038	15.02	2.5628	0.1976	0.1247	0.177	0.973	0.150	
6309	16.44	2.5649	0.1444	0.1272	0.775	0.557	0.332	
6532	17.46	2.5668	0.2196	0.1044	0.975	0.009	0.984	
2021	15.78	2.5672	0.1375	0.1552	0.189	0.602	0.791	
4018	15.58	2.5675	0.2347	0.0926	0.203	0.953	0.156	
6065	15.38	2.5684	0.2433	0.0781	0.744	0.932	0.677	
2521	13.32	2.5685	0.1041	0.0211	0.242	0.236	0.478	
2623	17.04	2.5693	0.0819	0.2636	0.965	0.027	0.993	4
4045	16.30	2.5697	0.1096	0.0975	0.072	0.923	0.996	
2073	16.54	2.5700	0.1959	0.0610	0.314	0.633	0.947	
2138	16.67	2.5702	0.1327	0.0779	0.251	0.678	0.930	
6207	16.30	2.5717	0.0890	0.0614	0.626	0.696	0.323	
2086	16.44	2.5740	0.1575	0.0682	0.161	0.750	0.911	
4291	17.06	2.5741	0.0929	0.1628	0.885	0.575	0.461	
4539	17.38	2.5747	0.1704	0.1271	0.118	0.989	0.107	
6712	16.68	2.5747	0.1365	0.2304	0.039	0.514	0.554	33
4100	16.02	2.5750	0.1542	0.2325	0.584	0.966	0.551	33
2036	17.84	2.5767	0.2380	0.0665	0.081	0.661	0.742	
2620	15.46	2.5782	0.1456	0.0257	0.522	0.976	0.498	
4088	16.48	2.5783	0.2089	0.0614	0.302	0.837	0.140	
2786	16.35	2.5785	0.1538	0.2269	0.316	0.034	0.350	33
4130	16.07	2.5797	0.1460	0.2522	0.794	0.535	0.330	33
6131	16.21	2.5815	0.2601	0.0722	0.727	0.609	0.336	
4193	17.20	2.5818	0.1689	0.0584	0.188	0.871	0.059	
6122	16.70	2.5823	0.2409	0.2176	0.114	0.515	0.629	
6599	15.32	2.5825	0.1026	0.0134	0.373	0.374	0.747	
2690	17.11	2.5826	0.2125	0.0759	0.287	0.037	0.324	
4084	16.33	2.5831	0.2004	0.0510	0.777	0.657	0.435	
6034	15.42	2.5832	0.1918	0.1387	0.937	0.570	0.508	
4149	17.25	2.5835	0.1788	0.0730	0.049	0.556	0.605	
4028	15.50	2.5836	0.1732	0.1348	0.222	0.595	0.818	
6513	15.27	2.5855	0.1718	0.2251	0.659	0.993	0.652	33
2083	16.33	2.5856	0.2291	0.0697	0.215	0.671	0.887	
2546	15.18	2.5859	0.0999	0.2653	0.273	0.527	0.800	4
6596	16.78	2.5868	0.1216	0.0639	0.993	0.979	0.972	
2032	16.36	2.5882	0.1301	0.0806	0.091	0.920	0.011	
4547	17.38	2.5897	0.1616	0.2550	0.026	0.007	0.034	33
4272	17.43	2.5905	0.2397	0.0893	0.204	0.673	0.877	
4622	16.56	2.5909	0.1612	0.2410	0.845	0.508	0.354	33
4059	17.08	2.5910	0.1401	0.0420	0.955	0.711	0.667	
6328	15.86	2.5925	0.1194	0.0537	0.512	0.971	0.484	

© European Southern Observatory • Provided by the NASA Astrophysics Data System

1970A&AS....2..339V

Table 9 (*continued*)

PL	g	a (A. U.)	ν	μ	β	γ	$\beta+\gamma$	Ref.
2075	16.84	2.5933	0.0995	0.0715	0.259	0.942	0.202	
6641	15.81	2.5945	0.1572	0.2255	0.032	0.007	0.039	33
4277	18.68	2.5945	0.2900	0.0942	0.043	0.591	0.634	
2625	17.16	2.5966	0.1653	0.0372	0.071	0.469	0.540	
2048	15.50	2.5990	0.2401	0.0806	0.676	0.864	0.541	
6119	17.60	2.5990	0.2451	0.2400	0.955	0.530	0.485	
4882	15.80	2.5993	0.0803	0.1728	0.548	0.041	0.589	
2206	15.88	2.5995	0.1426	0.0974	0.352	0.564	0.916	
6573	14.58	2.6005	0.1070	0.0499	0.441	0.384	0.826	
2589	15.54	2.6015	0.1796	0.0476	0.456	0.452	0.909	
6558	14.26	2.6017	0.1312	0.2659	0.309	0.997	0.306	
2046	17.06	2.6029	0.1386	0.0683	0.087	0.790	0.878	
4105	16.72	2.6036	0.2504	0.0849	0.220	0.660	0.880	
6605	16.62	2.6036	0.1794	0.0566	0.159	0.462	0.622	
6612	15.68	2.6054	0.1128	0.0687	0.865	0.519	0.384	
6053	15.60	2.6057	0.1834	0.0687	0.792	0.625	0.417	
2584	17.25	2.6067	0.1811	0.0489	0.893	0.599	0.492	
4831	15.94	2.6074	0.1740	0.2383	0.355	0.021	0.376	33
2564	16.20	2.6093	0.0899	0.0399	0.169	0.033	0.203	
6092	14.56	2.6095	0.2048	0.1972	0.603	0.559	0.163	33
2039	17.30	2.6106	0.2875	0.0948	0.128	0.618	0.747	
4091	17.64	2.6128	0.2290	0.0626	0.020	0.659	0.679	
6108	15.88	2.6137	0.1857	0.0684	0.239	0.644	0.884	
2175	16.38	2.6147	0.0773	0.0837	0.713	0.944	0.658	
6106	16.36	2.6151	0.0604	0.0570	0.100	0.860	0.960	
6608	17.18	2.6152	0.3083	0.1045	0.169	0.009	0.178	
2110	16.78	2.6155	0.1209	0.0504	0.880	0.806	0.686	
6818	15.56	2.6164	0.1745	0.0450	0.825	0.171	0.996	
2512	15.98	2.6184	0.0134	0.0345	0.629	0.882	0.511	
2121	16.98	2.6188	0.1884	0.2596	0.216	0.007	0.223	
6523	14.50	2.6188	0.1522	0.2342	0.942	0.025	0.968	33
6670	15.76	2.6189	0.1532	0.0690	0.372	0.986	0.359	
2208	17.18	2.6191	0.2625	0.0924	0.226	0.649	0.876	
6586	16.24	2.6219	0.1630	0.2058	0.902	0.491	0.394	33
4544	16.84	2.6221	0.0441	0.0732	0.896	0.984	0.880	
4007	12.82	2.6247	0.0400	0.0658	0.357	0.890	0.247	
4026	14.56	2.6257	0.1241	0.2388	0.660	0.986	0.647	33
4115	16.50	2.6259	0.1006	0.0334	0.131	0.689	0.821	
6779	15.80	2.6286	0.0289	0.0598	0.680	0.407	0.087	
2098	14.13	2.6296	0.2514	0.2141	0.984	0.546	0.531	
2614	16.93	2.6311	0.1454	0.0593	0.003	0.562	0.566	
4580	15.48	2.6324	0.1968	0.2062	0.965	0.525	0.491	33
6567	14.63	2.6328	0.0954	0.0436	0.610	0.596	0.207	
4638	16.56	2.6352	0.2007	0.0204	0.073	0.489	0.563	
2015	13.83	2.6358	0.3128	0.1380	0.193	0.981	0.174	
6515	16.08	2.6358	0.4950	0.2778	0.034	0.990	0.025	
4765	16.94	2.6358	0.2878	0.0248	0.022	0.934	0.957	
2095	16.53	2.6359	0.4172	0.0563	0.159	0.872	0.032	
2646	16.14	2.6381	0.0836	0.0898	0.574	0.020	0.594	
6614	16.00	2.6396	0.1441	0.0324	0.675	0.363	0.039	

© European Southern Observatory • Provided by the NASA Astrophysics Data System

1970A&AS....2..339V

Table 9 (*continued*)

PL	g	a (A. U.)	ν	μ	β	γ	$\beta+\gamma$	Ref.
2802	17.48	2.6399	0.1623	0.2331	0.232	0.033	0.265	33
4874	15.94	2.6406	0.0136	0.0463	0.434	0.110	0.545	
6035	15.21	2.6408	0.2107	0.1998	0.752	0.983	0.736	33
6036	13.94	2.6414	0.0826	0.0737	0.581	0.888	0.470	
4051	16.73	2.6415	0.1480	0.0486	0.912	0.734	0.647	
6091	14.50	2.6424	0.0560	0.0433	0.549	0.833	0.382	
4863	16.76	2.6427	0.0647	0.0799	0.174	0.535	0.709	
4112	15.64	2.6455	0.0771	0.0435	0.451	0.884	0.335	
2136	17.98	2.6458	0.2374	0.2179	0.130	0.003	0.133	
6548	14.50	2.6464	0.2422	0.0713	0.234	0.515	0.749	
4024	15.52	2.6471	0.1016	0.0703	0.869	0.785	0.654	
4577	14.40	2.6480	0.1297	0.2225	0.304	0.497	0.802	33
2712	16.32	2.6498	0.0933	0.0347	0.605	0.339	0.945	
4552	17.40	2.6500	0.1431	0.2392	0.928	0.018	0.947	33
4004	15.61	2.6512	0.0477	0.1012	0.613	0.922	0.535	
4060	15.54	2.6512	0.0831	0.0449	0.509	0.706	0.216	
2092	15.08	2.6530	0.0934	0.1036	0.854	0.877	0.732	
2058	15.59	2.6533	0.0611	0.0567	0.635	0.766	0.402	
2649	15.39	2.6535	0.1668	0.1918	0.547	0.543	0.091	33
2139	17.50	2.6551	0.1445	0.2160	0.073	0.993	0.066	33
2103	14.86	2.6562	0.1851	0.0653	0.574	0.644	0.218	
6791	15.80	2.6571	0.1899	0.2265	0.579	0.036	0.615	33
4169	15.66	2.6576	0.0993	0.1017	0.803	0.690	0.494	
2514	17.35	2.6603	0.1517	0.2096	0.881	0.010	0.892	33
2071	16.49	2.6614	0.0773	0.0503	0.824	0.655	0.479	
2506	16.12	2.6634	0.1824	0.2114	0.863	0.006	0.870	33
2740	16.80	2.6638	0.0771	0.0907	0.194	0.490	0.684	
6539	15.40	2.6661	0.0696	0.1324	0.703	0.494	0.198	
2041	15.92	2.6663	0.0655	0.2656	0.678	0.989	0.667	
4086	17.00	2.6688	0.1707	0.0541	0.039	0.707	0.746	
6046	15.71	2.6692	0.1594	0.2166	0.012	0.978	0.991	33
4698	17.27	2.6728	0.1657	0.2048	0.173	0.005	0.178	33
6653	16.06	2.6730	0.0679	0.0494	0.234	0.403	0.637	
5578	16.38	2.6734	0.2272	0.1490	0.708	0.550	0.258	
6078	16.78	2.6755	0.2173	0.2561	0.062	0.541	0.603	
2680	17.23	2.6768	0.1273	0.0404	0.110	0.990	0.101	
2069	16.84	2.6779	0.1484	0.0632	0.186	0.710	0.896	
4085	16.40	2.6780	0.1843	0.2199	0.774	0.578	0.353	33
2053	14.95	2.6799	0.1949	0.0688	0.598	0.654	0.253	
2605	14.70	2.6805	0.1937	0.0663	0.864	0.984	0.848	
6514	15.76	2.6825	0.0980	0.2521	0.977	0.999	0.976	
2571	15.80	2.6843	0.0834	0.1288	0.021	0.538	0.559	
2578	14.52	2.6848	0.2377	0.0707	0.365	0.552	0.918	
2643	15.00	2.6892	0.0629	0.4024	0.327	0.015	0.342	
6584	14.92	2.6896	0.0700	0.0538	0.526	0.031	0.558	
6114	15.24	2.6911	0.1834	0.2348	0.572	0.955	0.528	33
2725	16.62	2.6912	0.1720	0.0308	0.278	0.620	0.898	
7561	16.57	2.6914	0.1875	0.2142	0.815	0.023	0.838	33
6076	16.45	2.6941	0.1701	0.0542	0.932	0.950	0.883	
2765	16.55	2.6957	0.1558	0.0258	0.134	0.912	0.046	

© European Southern Observatory • Provided by the NASA Astrophysics Data System

1970A&AS....2..339V

Table 9 (*continued*)

PL	g	a (A. U.)	ν	μ	β	γ	$\beta+\gamma$	Ref.
2681	15.65	2.6962	0.1547	0.2309	0.393	0.039	0.432	33
6609	16.37	2.6964	0.1474	0.2417	0.093	0.020	0.113	33
6096	16.92	2.6964	0.1508	0.2106	0.955	0.987	0.942	33
6563	14.14	2.6973	0.1071	0.1225	0.471	0.995	0.466	
2101	16.45	2.6976	0.0700	0.0991	0.890	0.626	0.517	
4150	16.02	2.6991	0.1571	0.2137	0.114	0.537	0.652	33
2134	16.34	2.6995	0.1520	0.0645	0.195	0.890	0.085	
4607	14.98	2.7010	0.1564	0.0920	0.550	0.020	0.571	
4641	15.57	2.7062	0.0734	0.0633	0.594	0.425	0.020	
6621	15.74	2.7070	0.1621	0.2172	0.709	0.484	0.194	33
2561	14.64	2.7110	0.1037	0.2272	0.507	0.053	0.561	
4095	16.78	2.7115	0.1343	0.0913	0.262	0.665	0.927	
4594	13.85	2.7127	0.2333	0.2572	0.585	0.493	0.078	
6700	16.50	2.7151	0.0803	0.0563	0.225	0.984	0.209	
4616	16.46	2.7156	0.1561	0.0436	0.102	0.434	0.537	
6278	16.00	2.7188	0.1209	0.0617	0.316	0.765	0.082	
4271	16.82	2.7206	0.1248	0.1099	0.072	0.568	0.641	
4017	16.06	2.7206	0.2185	0.2372	0.067	0.985	0.053	
4609	15.82	2.7227	0.0849	0.0742	0.906	0.031	0.938	
2116	16.67	2.7248	0.1064	0.1315	0.098	0.644	0.743	
6072	15.77	2.7254	0.0450	0.0399	0.941	0.798	0.740	
4089	15.27	2.7257	0.1401	0.1585	0.015	0.586	0.601	16
4667	15.36	2.7262	0.1789	0.1166	0.890	0.052	0.943	
4168	16.06	2.7280	0.0667	0.0542	0.509	0.753	0.263	
4054	16.06	2.7281	0.1360	0.0881	0.808	0.639	0.448	
2675	16.70	2.7282	0.1093	0.0848	0.093	0.005	0.098	
2012	16.12	2.7283	0.2659	0.1486	0.064	0.970	0.034	
4825	16.34	2.7297	0.0591	0.0328	0.510	0.628	0.138	
4599	15.46	2.7298	0.0726	0.0969	0.176	0.003	0.180	
1502	12.53	2.7306	0.1079	0.0800	0.378	0.605	0.983	
6180	16.50	2.7316	0.1509	0.0535	0.875	0.638	0.514	
9590	16.82	2.7324	0.1630	0.0630	0.108	0.107	0.216	
2026	15.36	2.7329	0.0538	0.1191	0.901	0.907	0.808	
2607	15.40	2.7336	0.1773	0.1129	0.162	0.561	0.724	
4522	15.25	2.7338	0.0347	0.0916	0.906	0.983	0.889	
6646	16.03	2.7376	0.0902	0.0865	0.142	0.057	0.200	
6620	15.75	2.7377	0.1780	0.2376	0.291	0.017	0.309	33
6537	16.32	2.7378	0.0943	0.0512	0.123	0.019	0.143	
6073	15.77	2.7379	0.0615	0.0769	0.656	0.915	0.572	
6323	16.66	2.7382	0.0879	0.0910	0.962	0.947	0.910	
2067	16.12	2.7387	0.2269	0.0688	0.721	0.895	0.617	
4030	14.82	2.7412	0.0545	0.0666	0.999	0.798	0.798	
4711	16.90	2.7419	0.1683	0.0608	0.844	0.515	0.359	
4781	16.94	2.7438	0.1336	0.0907	0.968	0.971	0.940	
2587	16.40	2.7452	0.0766	0.0729	0.011	0.569	0.580	
4644	16.00	2.7456	0.0373	0.0891	0.458	0.554	0.012	
6598	17.00	2.7462	0.2088	0.1343	0.898	0.022	0.921	
2517	13.23	2.7466	0.1587	0.0380	0.196	0.953	0.149	
2540	14.50	2.7469	0.1925	0.1246	0.284	0.539	0.824	
2068	16.16	2.7498	0.0533	0.0879	0.972	0.859	0.832	

© European Southern Observatory • Provided by the NASA Astrophysics Data System

1970A&AS....2..339V

Table 9 (*continued*)

PL	g	a (A. U.)	ν	μ	β	γ	$\beta+\gamma$	Ref.
4058	16.31	2.7499	0.0879	0.0890	0.081	0.694	0.776	
4633	14.03	2.7507	0.1395	0.0913	0.239	0.015	0.254	
356		2.7526	0.2254	0.1497	0.225	0.966	0.192	
2671	16.56	2.7528	0.1400	0.2633	0.186	0.029	0.215	
2516	16.66	2.7531	0.1436	0.1673	0.024	0.999	0.024	16
4716	15.88	2.7541	0.0832	0.1162	0.667	0.029	0.697	
4042	15.56	2.7545	0.1927	0.0910	0.205	0.578	0.783	
4592	15.37	2.7547	0.1466	0.0861	0.859	0.477	0.336	
6783	16.77	2.7561	0.1287	0.0908	0.069	0.035	0.104	
4040	15.86	2.7565	0.1993	0.1314	0.841	0.619	0.461	
2615	16.33	2.7573	0.1415	0.0844	0.819	0.067	0.887	
2585	16.74	2.7635	0.1738	0.1700	0.168	0.011	0.179	16
2627	16.20	2.7636	0.1198	0.1003	0.220	0.032	0.252	
2022	14.72	2.7638	0.0515	0.0951	0.662	0.946	0.608	
2543	16.36	2.7650	0.2791	0.1021	0.850	0.004	0.855	
2545	15.38	2.7673	0.1328	0.1671	0.009	0.012	0.022	16
6045	14.42	2.7688	0.1963	0.1348	0.263	0.591	0.855	
2070	15.72	2.7706	0.0544	0.0939	0.626	0.944	0.571	
6101	16.76	2.7709	0.1267	0.0803	0.987	0.631	0.619	
6069	15.60	2.7725	0.1726	0.0425	0.688	0.859	0.547	
6813	16.95	2.7741	0.0924	0.0592	0.823	0.107	0.930	
2673	16.06	2.7752	0.0496	0.0119	0.093	0.301	0.395	
4117	16.23	2.7770	0.0693	0.0684	0.893	0.938	0.832	
4010	12.93	2.7786	0.1976	0.1359	0.717	0.559	0.276	
6554	13.82	2.7791	0.0462	0.0756	0.432	0.957	0.390	
6071	14.49	2.7791	0.1297	0.1615	0.501	0.565	0.067	16
4658	15.60	2.7798	0.1499	0.0593	0.885	0.044	0.929	
6064	14.85	2.7840	0.1988	0.1922	0.326	0.554	0.880	
4047	15.49	2.7845	0.0301	0.0477	0.568	0.882	0.451	
2005	13.05	2.7851	0.0762	0.0461	0.876	0.833	0.710	
6059	14.78	2.7866	0.0433	0.0767	0.305	0.650	0.956	
6346	15.28	2.7867	0.1128	0.2375	0.471	0.973	0.444	
2016	14.78	2.7872	0.1174	0.1204	0.895	0.576	0.471	
4541	16.64	2.7889	0.2209	0.1456	0.234	0.006	0.240	
2088	16.02	2.7893	0.0460	0.0755	0.329	0.836	0.166	
4124	15.56	2.7916	0.1296	0.1658	0.130	0.561	0.691	16
2598	15.60	2.7919	0.0466	0.0755	0.501	0.048	0.549	
6070	15.74	2.7922	0.0819	0.0535	0.226	0.865	0.091	
6577	15.25	2.7953	0.1347	0.0183	0.803	0.440	0.243	
2142	14.35	2.7962	0.2042	0.1337	0.236	0.560	0.797	
2591	16.14	2.7982	0.1057	0.0852	0.185	0.536	0.721	
2568	15.88	2.7994	0.0693	0.0616	0.136	0.965	0.102	
4201	16.28	2.8001	0.0576	0.0879	0.437	0.760	0.197	
4016	14.11	2.8014	0.0172	0.0954	0.517	0.914	0.432	
2656	16.02	2.8020	0.0823	0.0650	0.676	0.041	0.718	
6039	14.21	2.8021	0.1767	0.1635	0.286	0.537	0.823	16
6556	15.22	2.8021	0.1453	0.1698	0.938	0.499	0.437	16
6603	16.78	2.8037	0.2144	0.0379	0.120	0.498	0.618	
4013	15.52	2.8057	0.2057	0.1365	0.933	0.593	0.526	
6616	15.93	2.8069	0.0738	0.0346	0.148	0.571	0.719	3

© European Southern Observatory • Provided by the NASA Astrophysics Data System

1970A&AS....2..339V

Table 9 (*continued*)

PL	g	a (A. U.)	ν	μ	β	γ	$\beta+\gamma$	Ref.
2079	14.98	2.8085	0.0557	0.0956	0.249	0.911	0.160	
4098	15.95	2.8101	0.1295	0.1552	0.314	0.598	0.912	16
4664	15.06	2.8134	0.1338	0.1655	0.976	0.013	0.990	16
673	11.37	2.8140	0.0427	0.0650	0.476	0.667	0.144	
4614	15.24	2.8163	0.0388	0.1036	0.459	0.014	0.473	
2549	14.94	2.8316	0.0523	0.0360	0.380	0.553	0.933	3
2567	15.82	2.8329	0.0381	0.0394	0.131	0.973	0.104	3
6105	15.87	2.8336	0.0733	0.2170	0.942	0.566	0.509	
6555	13.96	2.8373	0.0407	0.0361	0.482	0.387	0.870	3
4036	15.17	2.8395	0.0478	0.0364	0.862	0.700	0.563	3
4593	14.89	2.8428	0.0405	0.0373	0.073	0.546	0.620	3
2551	13.76	2.8461	0.0805	0.0303	0.820	0.964	0.785	3
6546	13.16	2.8536	0.0521	0.0373	0.391	0.233	0.624	3
4057	15.48	2.8541	0.0443	0.1067	0.377	0.918	0.295	
6542	13.62	2.8572	0.0455	0.0374	0.122	0.033	0.156	3
2100	15.30	2.8574	0.0898	0.3050	0.670	0.546	0.217	
4538	15.93	2.8631	0.0595	0.2236	0.222	0.992	0.214	
4626	15.34	2.8681	0.0603	0.0328	0.335	0.983	0.318	3
2090	15.66	2.8756	0.0500	0.1005	0.015	0.870	0.886	
6565	14.46	2.8758	0.0519	0.0333	0.191	0.279	0.471	3
6303	15.62	2.8781	0.0338	0.0430	0.442	0.584	0.026	3
6636	15.46	2.8796	0.0565	0.0474	0.503	0.346	0.850	3
2528	13.13	2.8800	0.0465	0.0353	0.686	0.077	0.763	3
4764	15.38	2.8821	0.0701	0.0323	0.528	0.508	0.037	3
4583	13.45	2.8842	0.0980	0.0220	0.440	0.631	0.071	
2560	15.22	2.8849	0.0405	0.0271	0.794	0.644	0.438	3
4661	15.78	2.8853	0.0426	0.0350	0.349	0.087	0.437	3
1029	12.23	2.8883	0.0655	0.0391	0.500	0.005	0.506	
6589	15.30	2.8895	0.2001	0.1750	0.217	0.004	0.222	
720	10.62	2.8856	0.0536	0.0360	0.486	0.018	0.504	
2581	16.30	2.8869	0.0365	0.0351	0.941	0.264	0.206	3
2575	14.71	2.8954	0.1210	0.0420	0.575	0.164	0.740	
2594	15.51	2.8963	0.0503	0.0352	0.682	0.489	0.171	3
6632	15.49	2.8969	0.0525	0.0357	0.388	0.357	0.746	3
4521	14.48	2.9016	0.0493	0.0370	0.875	0.849	0.725	3
1363	12.83	2.9025	0.0496	0.0339	0.794	0.685	0.480	
6534	13.04	2.9039	0.0640	0.0368	0.139	0.181	0.320	3
4152	14.45	2.9045	0.2232	0.2281	0.775	0.542	0.318	
2085	15.52	2.9046	0.0520	0.0377	0.432	0.771	0.204	3
6044	14.57	2.9054	0.0434	0.0401	0.579	0.828	0.408	3
4822	15.66	2.9070	0.0298	0.0346	0.656	0.437	0.093	3
6633	16.61	2.9092	0.1492	0.0516	0.116	0.492	0.608	
4062	16.81	2.9123	0.2696	0.1827	0.859	0.963	0.823	
4122	13.87	2.9141	0.0493	0.0370	0.262	0.680	0.943	3
6792	14.86	2.9182	0.0442	0.0377	0.742	0.295	0.037	3
2583	15.50	2.9226	0.0725	0.0382	0.751	0.102	0.853	3
4052	15.43	2.9228	0.0677	0.1506	0.108	0.610	0.719	
6528	15.15	2.9236	0.0736	0.0364	0.683	0.453	0.137	3
2522	12.70	2.9256	0.0702	0.0365	0.869	0.281	0.150	3
2056	14.79	2.9262	0.1580	0.2251	0.527	0.585	0.112	

© European Southern Observatory • Provided by the NASA Astrophysics Data System

1970A&AS....2..339V

Table 9 (*continued*)

PL	g	a (A. U.)	ν	μ	β	γ	$\beta+\gamma$	Ref.
4076	16.16	2.9268	0.0335	0.2143	0.889	0.959	0.848	
2011	13.30	2.9276	0.0883	0.1353	0.714	0.571	0.286	
2529	13.41	2.9301	0.0694	0.0330	0.647	0.239	0.887	3
4241	15.64	2.9309	0.0363	0.2118	0.598	0.587	0.185	
6826	15.74	2.9333	0.0863	0.0878	0.970	0.095	0.065	
4545	15.23	2.9444	0.0456	0.0347	0.625	0.651	0.276	3
2087	15.74	2.9454	0.0378	0.2101	0.921	0.592	0.513	
6720	16.25	2.9496	0.0836	0.0252	0.030	0.869	0.899	
2760	15.22	2.9599	0.0358	0.0058	0.360	0.665	0.026	
4097	13.63	2.9621	0.1208	0.0861	0.376	0.804	0.181	
4043	14.82	2.9625	0.0746	0.1735	0.817	0.571	0.389	2
6590	15.28	2.9655	0.0428	0.1689	0.144	0.000	0.145	2
6755	16.20	2.9657	0.0999	0.0242	0.164	0.885	0.049	
4243	15.32	2.9671	0.0736	0.1676	0.596	0.609	0.206	2
6667	15.70	2.9674	0.0633	0.1744	0.916	0.990	0.906	2
2544	16.20	2.9679	0.0772	0.2057	0.998	0.009	0.007	
6196	15.64	2.9684	0.0491	0.1676	0.645	0.555	0.201	2
4044	14.90	2.9708	0.0447	0.1682	0.167	0.979	0.147	2
6068	15.25	2.9739	0.0829	0.0918	0.179	0.571	0.750	
4128	15.18	2.9743	0.0901	0.1843	0.465	0.547	0.012	2
6571	14.34	2.9760	0.2535	0.0359	0.283	0.361	0.644	
4064	16.54	2.9760	0.1683	0.0605	0.884	0.861	0.746	
4048	15.32	2.9776	0.0402	0.0559	0.944	0.657	0.602	
4804	16.02	2.9795	0.0893	0.1550	0.708	0.526	0.235	
4240	15.75	2.9830	0.0810	0.1761	0.583	0.976	0.560	2
4269	15.57	2.9832	0.0649	0.1545	0.286	0.590	0.877	
2632	15.63	2.9848	0.1690	0.0263	0.959	0.912	0.871	
4050	14.86	2.9859	0.0681	0.1756	0.320	0.583	0.903	2
4204	15.80	2.9864	0.0185	0.1834	0.884	0.591	0.475	
4005	15.72	2.9872	0.1534	0.1307	0.799	0.945	0.744	
4601	15.02	2.9930	0.2248	0.0340	0.259	0.167	0.426	
6545	12.92	2.9954	0.0865	0.1793	0.737	0.028	0.766	2
2191	15.92	2.9989	0.0573	0.1995	0.393	0.978	0.372	
4106	15.24	2.9999	0.0875	0.2195	0.428	0.563	0.991	
2177	16.40	3.0006	0.2484	0.0415	0.254	0.727	0.982	
4556	14.88	3.0011	0.0933	0.0461	0.041	0.062	0.103	
6676	14.92	3.0015	0.1342	0.0335	0.357	0.862	0.219	
6320	15.44	3.0037	0.0679	0.1521	0.765	0.542	0.308	
2660	15.26	3.0053	0.1195	0.0482	0.811	0.568	0.379	
4163	15.46	3.0079	0.0374	0.0827	0.588	0.666	0.254	
2626	14.84	3.0080	0.1250	0.0280	0.604	0.533	0.138	
4645	12.62	3.0083	0.0808	0.1787	0.302	0.515	0.817	2
4114	16.56	3.0101	0.1929	0.3278	0.027	0.006	0.034	
4649	14.57	3.0103	0.0423	0.1906	0.388	0.527	0.916	
2688	16.34	3.0128	0.0747	0.0140	0.843	0.472	0.315	
2504	15.62	3.0181	0.0598	0.1682	0.148	0.001	0.149	2
2629	15.90	3.0183	0.0348	0.0366	0.116	0.942	0.059	
4657	14.36	3.0194	0.0578	0.0085	0.148	0.637	0.786	
2634	16.92	3.0251	0.2370	0.1504	0.023	0.543	0.567	
1630	12.52	3.0266	0.2003	0.0654	0.431	0.119	0.550	

© European Southern Observatory • Provided by the NASA Astrophysics Data System

1970A&AS....2..339V

Table 9 (*continued*)

PL	g	a (A. U.)	ν	μ	β	γ	$\beta+\gamma$	Ref.
2093	14.14	3.0292	0.0625	0.1681	0.682	0.612	0.295	2
2097	14.97	3.0372	0.0300	0.1383	0.775	0.565	0.340	
6519	14.35	3.0432	0.2058	0.0552	0.361	0.026	0.388	
4096	15.38	3.0435	0.0981	0.2643	0.176	0.571	0.748	
4536	15.32	3.0475	0.0548	0.0452	0.833	0.589	0.423	
4166	15.72	3.0485	0.0330	0.1700	0.527	0.587	0.114	2
4846	15.50	3.0518	0.0545	0.0351	0.808	0.051	0.859	
4820	15.24	3.0522	0.0568	0.1631	0.439	0.041	0.481	2
4310	16.54	3.0527	0.1000	0.1597	0.041	0.984	0.025	2
2130	15.01	3.0539	0.2091	0.1804	0.861	0.961	0.823	
4608	15.28	3.0560	0.0614	0.1653	0.972	0.025	0.997	2
4259	16.16	3.0585	0.0829	0.0838	0.007	0.664	0.671	
6232	15.40	3.0600	0.1796	0.0994	0.303	0.659	0.963	
4818	15.07	3.0606	0.2025	0.1084	0.637	0.977	0.614	
2124	15.48	3.0675	0.1019	0.2005	0.863	0.965	0.829	12
6627	14.36	3.0695	0.0647	0.0552	0.159	0.540	0.699	
4659	15.76	3.0723	0.1060	0.1650	0.130	0.528	0.659	2
6559	12.91	3.0724	0.1528	0.0188	0.388	0.078	0.466	1
2608	14.86	3.0724	0.0715	0.1836	0.973	0.032	0.005	2
6761	14.70	3.0751	0.0937	0.1655	0.399	0.505	0.904	2
6538	14.48	3.0779	0.1974	0.0144	0.253	0.415	0.668	1
4069	14.66	3.0785	0.0863	0.1665	0.525	0.583	0.108	2
4812	16.32	3.0789	0.1925	0.0129	0.165	0.895	0.061	1
4858	15.66	3.0799	0.1151	0.1943	0.301	0.523	0.824	12
2023	14.56	3.0803	0.1350	0.0296	0.848	0.813	0.662	1
4646	13.80	3.0810	0.1479	0.1910	0.359	0.534	0.894	12
4602	15.15	3.0814	0.1520	0.0168	0.140	0.636	0.776	1
4766	15.82	3.0821	0.0438	0.0881	0.368	0.577	0.946	
4027	13.77	3.0827	0.1650	0.0814	0.618	0.762	0.381	
2710	15.40	3.0847	0.1683	0.1556	0.385	0.041	0.427	
4080	14.90	3.0861	0.1341	0.0780	0.587	0.622	0.209	34
9104	15.70	3.0866	0.1144	0.2303	0.859	0.523	0.383	12
2532	14.83	3.0884	0.2368	0.1511	0.858	0.551	0.409	
4841	15.42	3.0895	0.0743	0.1147	0.675	0.990	0.665	
2602	15.90	3.0900	0.1851	0.0350	0.233	0.116	0.350	1
4525	14.98	3.0911	0.1429	0.0336	0.102	0.675	0.777	1
2148	15.14	3.0923	0.1445	0.0854	0.729	0.975	0.704	34
2695	15.76	3.0928	0.1073	0.0359	0.313	0.840	0.153	1
4590	14.57	3.0930	0.1304	0.0131	0.904	0.215	0.119	1
2731	15.82	3.0943	0.1030	0.1901	0.113	0.528	0.641	12
4810	15.69	3.0945	0.1366	0.2163	0.328	0.999	0.328	12
6335	14.92	3.0949	0.1679	0.0245	0.624	0.663	0.287	1
4519	13.15	3.0950	0.1548	0.0136	0.814	0.744	0.559	1
1114	11.05	3.0957	0.0510	0.1929	0.196	0.561	0.758	
6634	15.18	3.0963	0.1383	0.0443	0.335	0.202	0.537	1
6077	15.18	3.0973	0.0524	0.0678	0.224	0.907	0.132	
2065	15.36	3.0993	0.1396	0.0984	0.755	0.772	0.527	34
6217	14.80	3.0997	0.1853	0.2939	0.562	0.557	0.120	
6202	16.18	3.0998	0.1435	0.0941	0.046	0.678	0.725	34
6111	15.62	3.1000	0.0971	0.1784	0.853	0.961	0.815	2

© European Southern Observatory • Provided by the NASA Astrophysics Data System

1970A&AS....2..339V

Table 9 (*continued*)

PL	g	a (A. U.)	ν	μ	β	γ	$\beta+\gamma$	Ref.
6276	16.44	3.1015	0.1849	0.0311	0.162	0.682	0.845	1
2520	12.00	3.1034	0.0507	0.1631	0.447	0.512	0.959	2
9606	16.02	3.1041	0.1459	0.0330	0.036	0.107	0.143	1
4845	15.14	3.1056	0.0897	0.1900	0.224	0.494	0.718	12
6529	15.39	3.1075	0.1236	0.0227	0.863	0.424	0.287	1
4121	14.77	3.1088	0.1309	0.1582	0.076	0.573	0.650	
6103	15.82	3.1094	0.1917	0.0947	0.196	0.966	0.162	
6640	14.98	3.1113	0.1366	0.0855	0.215	0.974	0.190	34
212		3.1125	0.0886	0.0926	0.215	0.850	0.065	
4643	14.69	3.1137	0.2317	0.3518	0.629	0.515	0.145	
2821	13.82	3.1138	0.1778	0.0259	0.712	0.367	0.080	1
2513	16.34	3.1146	0.2123	0.0407	0.197	0.899	0.097	1
6585	15.36	3.1147	0.0844	0.0327	0.963	0.493	0.456	
6639	15.40	3.1150	0.1728	0.0353	0.281	0.449	0.730	1
1572	11.10	3.1175	0.1593	0.2361	0.991	0.003	0.995	
6745	15.39	3.1179	0.1725	0.0237	0.324	0.486	0.810	1
6536	13.97	3.1188	0.1092	0.0149	0.066	0.674	0.740	1
6054	15.30	3.1197	0.1575	0.0758	0.090	0.613	0.703	34
2553	14.18	3.1200	0.1381	0.0255	0.202	0.836	0.039	1
2189	15.24	3.1207	0.1132	0.3203	0.601	0.009	0.611	
2555	15.22	3.1217	0.1748	0.0475	0.075	0.597	0.673	1
4776	16.06	3.1220	0.1649	0.0221	0.297	0.412	0.710	1
2548	14.00	3.1222	0.1619	0.0172	0.667	0.318	0.985	1
6587	15.66	3.1223	0.1479	0.0249	0.968	0.080	0.049	1
2104	15.00	3.1240	0.1773	0.4993	0.859	0.550	0.410	
6652	15.18	3.1264	0.1861	0.0179	0.648	0.426	0.075	1
6735	15.59	3.1317	0.1205	0.0901	0.141	0.996	0.138	34
2613	15.50	3.1340	0.1129	0.0832	0.195	0.576	0.772	34
4120	13.49	3.1347	0.1603	0.3297	0.302	0.534	0.836	
4506	12.83	3.1359	0.1734	0.0224	0.622	0.320	0.943	1
4576	12.14	3.1376	0.0921	0.1428	0.761	0.491	0.252	
6191	16.40	3.1379	0.1522	0.0934	0.877	0.652	0.530	34
4585	13.72	3.1380	0.1561	0.0326	0.723	0.294	0.018	1
4214	15.01	3.1383	0.1078	0.0967	0.426	0.669	0.096	34
6769	15.24	3.1394	0.1423	0.0302	0.077	0.079	0.156	1
2558	14.48	3.1397	0.1440	0.0886	0.232	0.014	0.247	34
4061	15.06	3.1404	0.1591	0.1019	0.757	0.686	0.443	34
2596	15.69	3.1404	0.1888	0.0179	0.220	0.083	0.303	1
4542	16.01	3.1414	0.2075	0.0261	0.868	0.795	0.664	1
1519	12.32	3.1439	0.1904	0.2188	0.969	0.030	0.000	
6688	16.08	3.1454	0.1453	0.0955	0.922	0.971	0.893	34
2519	12.88	3.1481	0.2398	0.2472	0.868	0.540	0.409	
4035	14.40	3.1481	0.1331	0.0850	0.808	0.778	0.587	34
6562	13.27	3.1498	0.1902	0.0259	0.366	0.105	0.472	1
4636	15.02	3.1513	0.1084	0.2483	0.453	0.022	0.475	
4624	15.19	3.1526	0.1603	0.0596	0.244	0.452	0.696	
4127	15.77	3.1550	0.1312	0.0251	0.965	0.751	0.717	1
2574	14.66	3.1566	0.0966	0.4083	0.379	0.027	0.406	
2570	14.12	3.1575	0.1567	0.0983	0.628	0.524	0.152	34
2611	14.09	3.1608	0.0877	0.0942	0.747	0.535	0.282	34

© European Southern Observatory • Provided by the NASA Astrophysics Data System

1970A&AS....2..339V

Table 9 (*continued*)

PL	g	a (A. U.)	ν	μ	β	γ	$\beta+\gamma$	Ref.
4067	15.49	3.1613	0.1596	0.0452	0.821	0.855	0.677	1
2825	15.38	3.1636	0.1526	0.0302	0.475	0.685	0.160	1
6543	14.14	3.1637	0.1582	0.0171	0.867	0.178	0.045	1
4006	12.61	3.1640	0.0713	0.1611	0.654	0.584	0.238	
6118	15.67	3.1643	0.0951	0.4216	0.992	0.519	0.511	
4628	15.57	3.1647	0.1003	0.1047	0.146	0.020	0.166	34
6564	13.92	3.1654	0.1414	0.0272	0.849	0.406	0.255	1
2556	14.54	3.1655	0.1866	0.1844	0.146	0.046	0.192	
6066	13.38	3.1661	0.1553	0.0879	0.479	0.677	0.156	34
2535	13.88	3.1661	0.1401	0.0267	0.880	0.471	0.352	1
2523	13.64	3.1662	0.1609	0.0369	0.168	0.426	0.595	
4780	14.80	3.1666	0.1574	0.0931	0.401	0.551	0.952	34
2631	14.09	3.1687	0.1411	0.0254	0.201	0.971	0.172	1
4573	15.22	3.1694	0.0839	0.1640	0.374	0.036	0.411	
6582	13.80	3.1700	0.1736	0.0242	0.352	0.862	0.215	1
2622	15.00	3.1724	0.1820	0.0228	0.400	0.560	0.961	1
4090	15.18	3.1725	0.0715	0.0951	0.228	0.902	0.131	34
4529	15.23	3.1753	0.1180	0.0886	0.847	0.957	0.804	34
4582	13.98	3.1766	0.1696	0.0576	0.785	0.998	0.784	
2064	14.62	3.1767	0.1307	0.0822	0.432	0.815	0.248	34
2527	14.41	3.1770	0.2366	0.2684	0.123	0.528	0.651	
4278	15.99	3.1775	0.1398	0.0832	0.864	0.670	0.535	34
2692	15.70	3.1782	0.1421	0.0994	0.322	0.499	0.822	34
2757	14.87	3.1800	0.1833	0.0230	0.918	0.962	0.881	1
6526	15.54	3.1818	0.0863	0.3207	0.972	0.509	0.481	
6104	15.69	3.1819	0.0413	0.0705	0.212	0.602	0.815	
6695	16.24	3.1825	0.1312	0.0780	0.089	0.989	0.078	34
2525	13.11	3.1827	0.1071	0.0332	0.935	0.070	0.005	1
6551	12.93	3.1833	0.0886	0.0194	0.803	0.001	0.805	
4801	15.57	3.1839	0.1578	0.0164	0.729	0.276	0.006	1
4600	14.07	3.1860	0.1802	0.0209	0.365	0.487	0.853	1
2563	13.70	3.1872	0.1760	0.0238	0.697	0.541	0.239	1
2025	13.36	3.1877	0.2250	0.1724	0.625	0.977	0.603	
2547	15.10	3.1882	0.1673	0.0255	0.906	0.160	0.066	1
6095	15.15	3.1883	0.1433	0.0889	0.787	0.612	0.399	34
2201	15.57	3.1890	0.0941	0.0797	0.800	0.985	0.785	34
6121	15.42	3.1898	0.1623	0.0237	0.206	0.769	0.976	1
2534	14.06	3.1899	0.1179	0.0147	0.019	0.844	0.863	1
6079	14.05	3.1908	0.1782	0.3912	0.302	0.990	0.293	
2702	14.82	3.1951	0.1869	0.0203	0.536	0.928	0.464	1
6533	14.38	3.1952	0.1580	0.0156	0.721	0.429	0.151	1
2612	15.90	3.1962	0.1849	0.0506	0.032	0.630	0.663	
4246	15.54	3.1972	0.1411	0.0796	0.352	0.611	0.964	34
6569	14.14	3.1990	0.1584	0.0322	0.751	0.432	0.183	1
4651	14.70	3.2007	0.1665	0.0240	0.589	0.730	0.320	1
2771	13.66	3.2021	0.0444	0.0741	0.322	0.070	0.393	
6592	15.66	3.2031	0.1318	0.0035	0.099	0.609	0.708	1
6522	15.10	3.2049	0.1386	0.0333	0.231	0.339	0.571	1
4535	15.06	3.2080	0.1151	0.0195	0.140	0.799	0.939	1
2037	14.30	3.2089	0.1802	0.3352	0.677	0.995	0.673	

© European Southern Observatory • Provided by the NASA Astrophysics Data System

1970A&AS....2..339V

Table 9 (*continued*)

PL	g	a (A. U.)	ν	μ	β	γ	$\beta+\gamma$	Ref.
4640	15.54	3.2121	0.0815	0.1363	0.849	0.494	0.344	
4125	15.96	3.2131	0.1360	0.2010	0.029	0.555	0.585	
6683	15.20	3.2134	0.1437	0.0839	0.441	0.446	0.888	34
4615	15.14	3.2136	0.1105	0.0233	0.051	0.313	0.364	1
4603	14.51	3.2138	0.1784	0.0331	0.247	0.198	0.445	1
4900	15.30	3.2229	0.1042	0.0457	0.591	0.098	0.690	
4107	15.82	3.2240	0.1023	0.0923	0.857	0.884	0.742	34
6525	14.57	3.2246	0.1526	0.0204	0.889	0.567	0.457	1
2601	15.10	3.2287	0.0788	0.0371	0.700	0.086	0.786	
6588	14.88	3.2311	0.1019	0.0102	0.206	0.802	0.009	1
2751	15.48	3.2320	0.1453	0.0273	0.131	0.407	0.539	1
4559	15.62	3.2323	0.1324	0.0211	0.953	0.705	0.659	1
6575	13.74	3.2329	0.1339	0.0887	0.343	0.025	0.369	34
4653	14.99	3.2342	0.0946	0.3956	0.644	0.994	0.638	
6067	15.13	3.2348	0.0725	0.0891	0.971	0.602	0.574	34
2655	16.29	3.2384	0.1382	0.2413	0.074	0.018	0.093	
4586	14.18	3.2411	0.0746	0.0131	0.118	0.010	0.128	
6610	15.12	3.2503	0.0509	0.1886	0.173	0.981	0.155	
4049	14.78	3.2530	0.0686	0.1418	0.173	0.564	0.737	
319	11.54	3.3703	0.2009	0.1932	0.135	0.542	0.678	
6550	12.60	3.5315	0.0799	0.1938	0.042	0.008	0.050	
6030	13.56	3.6510	0.0265	0.0587	0.455	0.571	0.026	
2696	15.20	3.9329	0.1936	0.0328	0.225	0.413	0.638	
4282	15.26	3.9642	0.1637	0.1539	0.140	0.958	0.098	
4652	13.34	3.9658	0.1411	0.1277	0.389	0.944	0.334	
2554	13.84	3.9755	0.2062	0.0500	0.163	0.085	0.249	
2033	13.56	3.9949	0.1694	0.0767	0.312	0.661	0.973	

© European Southern Observatory • Provided by the NASA Astrophysics Data System

1970A&AS....2..339V

Table 10. Proper elements of asteroids with class 2-4 or rejected orbits

PL	g	a (A. U.)	ν	μ	β	γ	$\beta+\gamma$	Q
6338	20.00	1.8909	0.1548	0.1236	0.927	0.796	0.723	0
6365	20.44	1.9071	0.1929	0.2437	0,989	0.872	0.862	0
6255	17.72	1.9084	0.1039	0.3664	0.858	0.593	0.452	2
6371	19.64	1.9088	0.1380	0.2203	0.916	0.861	0.777	0
7071	16.71	1.9193	0.1423	0.4103	0.876	0.663	0.540	3
2112	17.14	1.9208	0.0950	0.6736	0.452	0.952	0.404	4
4195	20.05	1.9220	0.1821	0.3081	0.003	0.836	0.839	0
4699	19.81	1.9429	0.2266	9.9999	0.890	9.999	0.890	0
9091	17.13	1.9453	0.0637	9.9999	0.025	9.999	0.025	3
7072	16.18	1.9479	0.0341	9.9999	0.557	9.999	0.557	3
2145	17.69	1.9512	0.3515	0.6073	0.890	0.371	0.262	0
7082	16.66	1.9522	0.1086	0.7928	0.964	0.434	0.398	3
6198	16.55	1.9805	0.2944	0.0883	0.975	0.198	0.174	0
4861	18.22	1.9927	0.0929	0.4778	0.952	0.479	0.432	4
4761	18.11	2.0055	0.2431	0.3500	0.897	0.035	0.932	4
4696	18.63	2.0127	0.5720	0.0810	0.861	0.413	0.275	4
6890	20.10	2.0200	9.9999	0.1923	9.999	0.465	0.465	4
6233	18.91	2.0280	9.9999	0.0462	9.999	0.988	0.988	4
6290	18.82	2.0356	0.5698	0.0634	0.352	0.497	0.849	4
2210	19.04	2.0431	0.3216	0.0299	0.285	0.483	0.769	4
2829	17.03	2.0506	0.0626	0.0529	0.221	0.407	0.628	4
6219	19.06	2.0524	0.1724	0.0235	0.212	0.516	0.728	4
4232	19.76	2.0589	0.0985	0.0136	0.812	0.493	0.305	0
6770	19.45	2.0678	0.2039	0.0505	0.213	0.424	0.638	4
4632	18.21	2.0728	0.0766	0.0568	0.228	0.502	0.730	4
6223	18.33	2.0859	0.1088	0.0179	0.289	0.707	0.996	4
6682	19.29	2.0955	0.1927	0.0351	0.134	0.482	0.616	4
2717	16.81	2.1014	0.2419	0.0802	0.498	0.427	0.925	4
6197	19.18	2.1021	0.2267	0.0078	0.158	0.586	0.744	4
4909	19.45	2.1045	0.1421	0.0195	0.117	0.234	0.351	4
6281	19.47	2.1055	0.2021	0.0117	0.200	0.458	0.658	4
6694	18.95	2.1060	0.1954	0.0529	0.218	0.471	0.690	4
6733	19.11	2.1062	0.1246	0.1047	0.055	0.461	0.516	4
6256	19.41	2.1081	0.1350	0.0438	0.076	0.982	0.058	4
6159	18.92	2.1100	0.1654	0.0350	0.127	0.824	0.952	4
4254	18.53	2.1174	0.0764	0.0504	0.201	0.554	0.756	4
2667	19.29	2.1184	0.1546	0.0171	0.074	0.035	0.109	4
9575	16.89	2.1226	0.1292	0.0499	0.056	0.260	0.317	3
6228	18.74	2.1349	0.1322	0.1136	0.107	0.535	0.643	4
4319	17.53	2.1389	0.0752	0.0619	0.746	0.676	0.423	2
4739	18.56	2.1391	0.1044	0.0604	0.052	0.988	0.041	4
6867	18.87	2.1392	0.1249	0.1240	0.117	0.445	0.562	4
6201	19.27	2.1450	0.1364	0.0470	0.054	0.650	0.705	4
4331	20.01	2.1494	0.1494	0.0234	0.044	0.873	0.917	4
9528	14.49	2.1494	0.3138	0.0769	0.629	0.470	0.100	0
6795	19.75	2.1584	0.1482	0.0969	0.041	0.490	0.531	4
6292	19.17	2.1591	0.1324	0.0660	0.124	0.980	0.104	4
9512	16.05	2.1686	0.1599	0.0348	0.519	0.406	0.926	3
4905	19.14	2.1699	0.0902	0.0129	0.106	0.867	0.973	4
4767	18.68	2.1723	0.0881	0.0375	0.217	0.568	0.785	4

© European Southern Observatory • Provided by the NASA Astrophysics Data System

1970A&AS....2..339V

Table 10 (*continued*)

PL	g	a (A. U.)	ν	μ	β	γ	$\beta+\gamma$	Q
4198	19.13	2.1727	0.1991	0.0891	0.961	0.958	0.919	4
6377	19.28	2.1731	0.1235	0.0535	0.015	0.676	0.692	4
6887	19.75	2.1738	0.1861	0.0081	0.101	0.244	0.346	4
9055	17.03	2.1744	0.1560	0.1002	0.853	0.977	0.831	3
2135	18.55	2.1763	0.1053	0.0380	0.005	0.889	0.894	4
2739	16.77	2.1816	0.1687	0.0347	0.508	0.330	0.838	4
9536	17.70	2.1832	0.0225	0.0513	0.287	0.454	0.741	2
6362	18.35	2.1842	0.0868	0.1008	0.869	0.593	0.462	4
5565	16.00	2.1851	0.1526	0.1006	0.124	0.097	0.221	3
9592	16.50	2.1854	0.1197	0.0693	0.793	0.511	0.305	3
7594	16.81	2.1866	0.0952	0.0510	0.860	0.212	0.072	4
6250	17.80	2.1870	0.0480	0.0767	0.206	0.579	0.785	2
6702	18.17	2.1896	0.1171	0.1002	0.983	0.009	0.993	4
9560	16.61	2.1898	0.1444	0.0651	0.642	0.309	0.952	3
6854	17.86	2.1905	0.0389	0.0999	0.721	0.059	0.780	4
9521	15.57	2.1920	0.0748	0.0357	0.281	0.395	0.677	3
4789	18.73	2.1948	0.2320	0.0091	0.792	0.014	0.807	4
6194	18.70	2.1959	0.1184	0.0630	0.860	0.858	0.718	4
9056	16.83	2.2011	0.0940	0.0949	0.865	0.965	0.830	3
2750	18.26	2.2036	0.1066	0.0722	0.921	0.460	0.382	4
6863	18.67	2.2048	0.2191	0.0269	0.211	0.179	0.391	4
4288	15.93	2.2080	0.4789	0.1953	0.482	0.531	0.013	0
4211	18.66	2.2084	0.1668	0.0504	0.949	0.571	0.520	4
7081	17.81	2.2102	0.1459	0.0824	0.311	0.950	0.262	2
6209	18.32	2.2104	0.0121	0.0616	0.100	0.681	0.782	4
2823	18.67	2.2129	0.1242	0.0902	0.978	0.525	0.503	4
4902	18.46	2.2129	0.0309	0.0287	0.253	0.052	0.305	4
4689	19.85	2.2160	0.1565	0.0496	0.023	0.557	0.580	4
4832	18.98	2.2166	0.1991	0.0916	0.939	0.478	0.418	4
6748	17.93	2.2180	0.0210	0.0819	0.471	0.064	0.535	4
2105	17.43	2.2224	0.1271	0.1194	0.929	0.935	0.864	4
4215	17.58	2.2230	0.1396	0.0407	0.339	0.729	0.068	4
7622	15.38	2.2232	0.1368	0.1090	0.038	0.115	0.153	4
6809	17.34	2.2232	0.1224	0.0090	0.688	0.302	0.990	2
6696	18.82	2.2235	0.1916	0.0462	0.076	0.431	0.508	4
6268	19.43	2.2238	0.1898	0.0207	0.062	0.589	0.652	4
9516	16.78	2.2253	0.1129	0.0491	0.699	0.507	0.207	4
9579	17.06	2.2254	0.1607	0.0902	0.838	0.069	0.908	3
7635	18.04	2.2255	0.1722	0.0811	0.198	0.091	0.289	4
4303	19.07	2.2259	0.1658	0.1418	0.919	0.572	0.491	4
9086	17.99	2.2287	0.2721	0.0946	0.052	0.602	0.654	0
4844	16.76	2.2294	0.2090	0.0650	0.471	0.450	0.922	4
4816	19.20	2.2327	0.1837	0.0230	0.987	0.476	0.464	4
6324	19.37	2.2328	0.1837	0.0408	0.970	0.735	0.705	4
7596	17.35	2.2329	0.1833	0.0988	0.002	0.055	0.058	3
2609	18.37	2.2333	0.1516	0.0382	0.804	0.081	0.886	4
6758	18.17	2.2338	0.2084	0.0867	0.127	0.462	0.589	4
4228	17.63	2.2340	0.0650	0.0865	0.338	0.864	0.203	4
6757	18.96	2.2340	0.2041	0.1564	0.956	0.495	0.451	4
7636	16.69	2.2344	0.1146	0.0625	0.722	0.154	0.876	3

© European Southern Observatory • Provided by the NASA Astrophysics Data System

1970A&AS....2..339V

Table 10 (*continued*)

PL	g	a (A. U.)	ν	μ	β	γ	$\beta+\gamma$	Q
6229	18.72	2.2351	0.1085	0.0823	0.041	0.907	0.948	4
2203	17.88	2.2358	0.1245	0.0738	0.861	0.615	0.476	4
6782	16.98	2.2360	0.1322	0.0477	0.653	0.405	0.058	2
4235	17.22	2.2367	0.1042	0.0773	0.777	0.875	0.653	2
5016	16.10	2.2376	0.2246	0.0998	0.587	0.026	0.614	4
6796	17.63	2.2378	0.0599	0.0721	0.627	0.028	0.655	4
7575	17.58	2.2391	0.1496	0.1046	0.998	0.091	0.090	3
6205	18.61	2.2391	0.1572	0.0469	0.133	0.572	0.706	4
6708	18.48	2.2400	0.1104	0.0139	0.118	0.078	0.196	4
4231	18.10	2.2417	0.0756	0.0988	0.262	0.963	0.226	4
7581	15.96	2.2420	0.0588	0.0863	0.966	0.088	0.054	3
6181	16.14	2.2421	0.2914	0.0696	0.525	0.646	0.172	4
4205	17.09	2.2424	0.1294	0.1120	0.112	0.916	0.029	4
2735	18.94	2.2426	0.2491	0.0244	0.896	0.971	0.868	4
6692	18.06	2.2434	0.0888	0.0467	0.136	0.100	0.236	2
4706	17.39	2.2437	0.1413	0.1092	0.490	0.015	0.505	4
4753	17.17	2.2443	0.0397	0.0445	0.690	0.412	0.102	4
2826	18.55	2.2451	0.1067	0.0845	0.941	0.043	0.984	4
6133	17.16	2.2460	0.1815	0.0560	0.065	0.683	0.749	4
4836	17.83	2.2477	0.0224	0.0304	0.783	0.561	0.344	4
4747	18.06	2.2479	0.0965	0.0995	0.185	0.009	0.195	4
9103	14.15	2.2480	0.1471	0.0628	0.041	0.555	0.596	4
4729	17.96	2.2486	0.1277	0.0438	0.823	0.469	0.292	4
6684	18.21	2.2504	0.1407	0.0549	0.742	0.005	0.747	4
4279	18.83	2.2509	0.1326	0.0804	0.988	0.602	0.590	4
6802	18.90	2.2517	0.1373	0.0327	0.963	0.026	0.990	4
4262	18.65	2.2524	0.1369	0.0517	0.962	0.597	0.560	4
6360	17.30	2.2543	0.0884	0.0645	0.415	0.707	0.123	4
4208	19.28	2.2586	0.1948	0.0636	0.914	0.576	0.490	4
2679	17.20	2.2587	0.1502	0.0675	0.973	0.471	0.445	2
9063	16.50	2.2595	0.1227	0.0882	0.351	0.583	0.935	2
6337	19.45	2.2605	0.1728	0.0221	0.028	0.616	0.644	4
6873	17.25	2.2619	0.1379	0.0508	0.443	0.168	0.612	4
9565	15.92	2.2620	0.1031	0.0765	0.885	0.413	0.298	3
4330	18.87	2.2628	0.1409	0.0441	0.971	0.822	0.794	4
4741	18.11	2.2628	0.0914	0.0303	0.018	0.911	0.929	4
4236	16.99	2.2631	0.0993	0.1259	0.094	0.940	0.034	4
6715	18.27	2.2640	0.1227	0.1177	0.143	0.035	0.178	4
9088	16.41	2.2645	0.1761	0.0840	0.034	0.630	0.665	3
9525	16.40	2.2648	0.1061	0.0492	0.147	0.152	0.299	3
9538	16.05	2.2649	0.0279	0.0298	0.532	0.503	0.036	2
4838	17.08	2.2653	0.2267	0.0200	0.334	0.992	0.326	2
2659	17.40	2.2656	0.1844	0.0641	0.946	0.484	0.431	2
6768	18.78	2.2689	0.1851	0.0356	0.015	0.134	0.149	4
6883	18.97	2.2693	0.2079	0.0772	0.170	0.467	0.638	4
6734	18.02	2.2718	0.1299	0.0179	0.186	0.431	0.617	4
9505	15.92	2.2733	0.0890	0.0372	0.060	0.528	0.589	3
2185	17.45	2.2741	0.1844	0.1241	0.301	0.948	0.249	2
4332	18.96	2.2760	0.1658	0.0408	0.964	0.677	0.641	4
7610	15.69	2.2766	0.1736	0.0668	0.510	0.342	0.852	3

© European Southern Observatory • Provided by the NASA Astrophysics Data System

1970A&AS....2..339V

Table 10 (*continued*)

PL	g	a (A. U.)	ν	μ	β	γ	$\beta+\gamma$	Q
6686	17.84	2.2768	0.1185	0.0801	0.876	0.011	0.888	4
9064	17.30	2.2777	0.1649	0.0995	0.036	0.616	0.653	3
2204	16.74	2.2779	0.1411	0.1083	0.294	0.936	0.231	2
4159	16.58	2.2788	0.1912	0.1306	0.487	0.947	0.435	4
6871	17.37	2.2798	0.1211	0.0308	0.588	0.406	0.994	4
4796	17.98	2.2828	0.1907	0.0415	0.053	0.543	0.597	2
4245	19.20	2.2832	0.2092	0.0424	0.967	0.908	0.875	4
6368	18.53	2.2838	0.1063	0.0644	0.130	0.879	0.009	4
6848	18.58	2.2841	0.1425	0.1159	0.070	0.030	0.100	4
2745	17.84	2.2853	0.1322	0.0921	0.856	0.540	0.397	4
4790	19.29	2.2855	0.1677	0.0195	0.068	0.857	0.925	4
4323	19.05	2.2880	0.1730	0.0749	0.111	0.824	0.936	4
6823	18.82	2.2881	0.1637	0.0241	0.017	0.457	0.474	4
6247	17.30	2.2909	0.1367	0.0661	0.263	0.934	0.197	2
6762	18.02	2.2910	0.1094	0.0529	0.829	0.081	0.910	4
4803	18.15	2.2949	0.1584	0.0183	0.030	0.974	0.004	4
6363	19.15	2.2960	0.1728	0.0326	0.927	0.907	0.835	4
9060	15.91	2.2975	0.1943	0.0385	0.616	0.741	0.358	3
4316	18.67	2.2989	0.1812	0.0795	0.118	0.578	0.697	4
6334	18.14	2.2990	0.1599	0.0263	0.841	0.713	0.554	4
6238	17.37	2.3001	0.0934	0.1281	0.422	0.570	0.992	4
9510	15.11	2.3003	0.0717	0.0704	0.224	0.989	0.213	3
4274	17.11	2.3009	0.1032	0.0492	0.489	0.761	0.251	4
6248	19.02	2.3020	0.1516	0.0336	0.000	0.904	0.904	4
2669	17.58	2.3031	0.1520	0.1045	0.165	0.499	0.665	2
2205	17.36	2.3056	0.2567	0.0656	0.967	0.552	0.520	4
6728	18.20	2.3061	0.1802	0.0382	0.073	0.397	0.470	2
6870	17.29	2.3069	0.1361	0.0310	0.620	0.403	0.023	4
5567	16.04	2.3080	0.1873	0.1212	0.671	0.095	0.766	3
7609	16.52	2.3081	0.1221	0.1016	0.708	0.117	0.825	3
2749	17.85	2.3084	0.1673	0.0544	0.087	0.436	0.524	4
4733	18.09	2.3089	0.1222	0.0887	0.877	0.488	0.366	4
7606	17.63	2.3093	0.2175	0.0399	0.916	0.239	0.156	3
4798	17.72	2.3098	0.1497	0.0473	0.783	0.995	0.779	2
6651	18.03	2.3101	0.1241	0.0289	0.865	0.024	0.890	4
6230	17.11	2.3104	0.1697	0.0645	0.796	0.765	0.561	4
6382	15.95	2.3108	0.1366	0.1004	0.045	0.917	0.963	4
4627	14.76	2.3109	0.1557	0.0252	0.061	0.058	0.119	4
6279	17.29	2.3112	0.0943	0.1294	0.231	0.963	0.194	2
5031	17.86	2.3117	0.1319	0.0739	0.017	0.621	0.639	2
4712	18.01	2.3160	0.0471	0.0276	0.272	0.596	0.869	4
4180	16.33	2.3126	0.1238	0.0433	0.483	0.875	0.358	2
7585	16.84	2.3147	0.2120	0.0320	0.796	0.292	0.089	3
6727	17.24	2.3158	0.1975	0.2221	0.103	0.481	0.584	4
7584	16.38	2.3167	0.0802	0.0912	0.668	0.092	0.760	3
6759	16.83	2.3188	0.1455	0.0325	0.642	0.249	0.891	4
4724	18.62	2.3192	0.1875	0.0775	0.995	0.986	0.982	4
4309	18.01	2.3192	0.0875	0.0750	0.284	0.746	0.031	4
9087	15.06	2.3205	0.1502	0.1295	0.618	0.623	0.242	4
4264	18.84	2.3212	0.1608	0.0240	0.035	0.866	0.902	4

© European Southern Observatory • Provided by the NASA Astrophysics Data System

1970A&AS....2..339V

Table 10 (*continued*)

PL	g	a (A. U.)	ν	μ	β	γ	$\beta+\gamma$	Q
4719	18.92	2.3220	0.1795	0.0222	0.099	0.554	0.653	4
4184	16.55	2.3221	0.0720	0.0991	0.019	0.880	0.899	4
4273	19.00	2.3242	0.2652	0.0218	0.824	0.721	0.545	4
4701	17.52	2.3245	0.0458	0.0470	0.616	0.059	0.676	4
4187	18.62	2.3260	0.1965	0.0748	0.928	0.605	0.534	4
6864	18.08	2.3271	0.0706	0.0524	0.102	0.443	0.546	4
2724	18.18	2.3276	0.1912	0.1057	0.062	0.489	0.552	4
6709	18.21	2.3280	0.1970	0.0420	0.050	0.099	0.149	4
6203	17.12	2.3290	0.2057	0.0764	0.673	0.739	0.412	4
4738	18.44	2.3293	0.1654	0.0191	0.914	0.905	0.819	4
9057	15.74	2.3319	0.1386	0.0663	0.580	0.841	0.421	2
4782	17.24	2.3319	0.4528	0.1484	0.530	0.539	0.070	0
7063	15.65	2.3344	0.1719	0.0885	0.851	0.682	0.534	3
6868	18.03	2.3372	0.2344	0.1433	0.740	0.459	0.200	4
6681	16.89	2.3373	0.1263	0.1363	0.534	0.992	0.527	4
4783	14.46	2.3378	0.6892	0.0824	0.505	0.556	0.061	0
9553	17.11	2.3387	0.1372	0.0475	0.910	0.150	0.060	3
2727	16.61	2.3391	0.1897	0.0822	0.566	0.034	0.600	4
2703	17.17	2.3392	0.1632	0.1320	0.328	0.530	0.858	4
4848	16.43	2.3394	0.2211	0.0647	0.566	0.522	0.088	4
7595	17.49	2.3407	0.1640	0.0533	0.894	0.440	0.334	3
6705	16.84	2.3447	0.1825	0.1200	0.308	0.047	0.355	2
6215	17.92	2.3449	0.1091	0.1600	0.221	0.944	0.166	4
7607	16.86	2.3450	0.2022	0.0467	0.251	0.293	0.544	3
4809	17.94	2.3450	0.1465	0.0456	0.170	0.087	0.257	2
6836	18.58	2.3454	0.1750	0.0640	0.074	0.026	0.100	4
6698	17.52	2.3466	0.0894	0.0992	0.908	0.026	0.934	4
6225	19.12	2.3470	0.1978	0.0415	0.032	0.714	0.746	4
9564	17.82	2.3470	0.1930	0.0494	0.104	0.153	0.257	3
4206	15.61	2.3473	0.1488	0.2168	0.848	0.962	0.810	4
6300	16.41	2.3478	0.3299	0.0445	0.439	0.899	0.338	4
4793	17.43	2.3495	0.0950	0.0157	0.676	0.279	0.956	4
7569	16.55	2.3495	0.1295	0.0625	0.247	0.084	0.332	3
9503	15.06	2.3496	0.1292	0.0277	0.569	0.273	0.842	3
6881	19.01	2.3513	0.1664	0.0804	0.957	0.465	0.423	4
6210	17.98	2.3520	0.1538	0.0467	0.104	0.681	0.785	2
6264	18.31	2.3526	0.1748	0.0296	0.913	0.907	0.820	4
5021	16.01	2.3530	0.1485	0.1811	0.803	0.595	0.398	3
9530	15.14	2.3532	0.1814	0.1722	0.330	0.503	0.834	3
6243	16.50	2.3534	0.1148	0.0579	0.477	0.854	0.332	2
2793	15.04	2.3539	0.2097	0.1202	0.615	0.538	0.153	4
6862	18.63	2.3545	0.1732	0.0842	0.861	0.506	0.367	4
2160	16.59	2.3562	0.1561	0.0918	0.925	0.632	0.557	4
6746	18.10	2.3575	0.1207	0.1136	0.032	0.484	0.516	4
5553	16.38	2.3584	0.0804	0.1392	0.372	0.067	0.439	3
6841	17.52	2.3586	0.1523	0.0796	0.298	0.992	0.290	4
4791	18.59	2.3638	0.1600	0.0218	0.924	0.911	0.835	4
4723	18.70	2.3641	0.1521	0.1054	0.042	0.535	0.577	4
4258	17.55	2.3649	0.0240	0.0998	0.241	0.913	0.155	4
2766	17.72	2.3652	0.2118	0.0329	0.797	0.079	0.876	4

© European Southern Observatory • Provided by the NASA Astrophysics Data System

1970A&AS....2..339V

Table 10 (*continued*)

PL	g	a (A. U.)	ν	μ	β	γ	$\beta+\gamma$	Q
4311	17.39	2.3653	0.1098	0.0690	0.818	0.821	0.640	2
6865	18.53	2.3660	0.1468	0.2135	0.121	0.007	0.129	4
7620	17.63	2.3675	0.2793	0.0880	0.820	0.069	0.890	0
7643	16.55	2.3689	0.2397	0.0636	0.235	0.440	0.676	3
2207	15.82	2.3706	0.0830	0.1125	0.440	0.908	0.349	2
9071	15.94	2.3715	0.1525	0.1017	0.334	0.660	0.995	4
4199	18.07	2.3724	0.1118	0.1034	0.230	0.948	0.178	4
4756	16.58	2.3727	0.2417	0.1076	0.634	0.511	0.145	2
4726	17.49	2.3730	0.1843	0.0361	0.935	0.629	0.565	2
4745	17.81	2.3739	0.1373	0.0489	0.845	0.967	0.813	4
2162	16.98	2.3741	0.0542	0.0793	0.201	0.623	0.825	4
9079	17.58	2.3742	0.1488	0.0496	0.000	0.796	0.796	2
4857	17.76	2.3766	0.2133	0.0478	0.736	0.069	0.806	4
9566	16.52	2.3770	0.1506	0.0466	0.177	0.234	0.411	3
4885	17.12	2.3771	0.1967	0.0771	0.781	0.976	0.758	2
6251	18.81	2.3773	0.1974	0.0367	0.937	0.877	0.814	4
6261	19.02	2.3781	0.1516	0.0250	0.951	0.826	0.777	4
4321	17.66	2.3783	0.2562	0.1473	0.776	0.570	0.346	2
9588	16.38	2.3790	0.1755	0.0156	0.019	0.120	0.140	3
4864	16.58	2.3800	0.1081	0.1274	0.474	0.512	0.986	2
5564	16.13	2.3803	0.1766	0.0480	0.120	0.122	0.242	3
2209	17.25	2.3803	0.0958	0.1368	0.972	0.942	0.915	2
6832	17.35	2.3807	0.0818	0.0161	0.692	0.027	0.719	4
2810	16.69	2.3812	0.1150	0.0768	0.352	0.547	0.899	4
4172	17.86	2.3815	0.1111	0.1099	0.030	0.905	0.935	4
6289	17.14	2.3850	0.0937	0.1092	0.313	0.922	0.235	4
9572	16.32	2.3853	0.1367	0.0558	0.090	0.200	0.291	3
2818	16.59	2.3864	0.1435	0.0685	0.554	0.101	0.655	4
5027	17.54	2.3873	0.1684	0.2168	0.015	0.596	0.612	3
7628	15.76	2.3881	0.1964	0.1842	0.226	0.030	0.256	3
9094	16.50	2.3888	0.2177	0.1717	0.009	0.558	0.568	3
4722	15.91	2.3889	0.1618	0.0359	0.510	0.641	0.152	2
7566	15.85	2.3894	0.1233	0.1082	0.375	0.057	0.432	3
4883	18.81	2.3898	0.1701	0.0432	0.144	0.642	0.787	4
2678	17.09	2.3900	0.0378	0.0231	0.419	0.374	0.793	4
4290	17.87	2.3901	0.0528	0.0836	0.061	0.928	0.990	4
7634	16.28	2.3915	0.1177	0.0830	0.355	0.428	0.783	4
6213	16.91	2.3924	0.1956	0.0622	0.330	0.652	0.982	4
6691	15.82	2.3925	0.1318	0.1028	0.431	0.020	0.451	2
4257	17.16	2.3929	0.0935	0.1126	0.047	0.918	0.966	4
2773	18.69	2.3965	0.1740	0.0384	0.916	0.013	0.929	4
4697	18.70	2.3968	0.1906	0.0903	0.117	0.007	0.124	4
7623	17.66	2.3975	0.1899	0.0449	0.157	0.396	0.554	2
6291	18.40	2.3975	0.2062	0.0322	0.811	0.768	0.579	4
2761	17.05	2.3985	0.2117	0.0981	0.978	0.509	0.488	4
4715	16.78	2.3995	0.1478	0.0461	0.650	0.460	0.110	4
2790	17.40	2.3997	0.1027	0.0781	0.223	0.447	0.670	4
6880	17.56	2.3999	0.0940	0.0302	0.471	0.090	0.561	4
9597	15.60	2.4025	0.1918	0.0405	0.931	0.380	0.312	2
4700	17.83	2.4032	0.1520	0.0307	0.925	0.838	0.763	4

© European Southern Observatory • Provided by the NASA Astrophysics Data System

1970A&AS....2..339V

Table 10 (*continued*)

PL	g	a (A. U.)	ν	μ	β	γ	$\beta+\gamma$	Q
4890	18.93	2.4035	0.2036	0.0430	0.079	0.950	0.030	4
6187	16.95	2.4053	0.2279	0.1435	0.703	0.564	0.267	4
6756	19.02	2.4059	0.2198	0.0447	0.958	0.531	0.490	4
2676	18.05	2.4060	0.1375	0.0222	0.991	0.772	0.763	4
4244	17.94	2.4086	0.1932	0.0889	0.804	0.623	0.427	4
6760	18.64	2.4086	0.1884	0.0491	0.998	0.489	0.487	4
9531	15.98	2.4092	0.1242	0.1065	0.800	0.065	0.865	3
5582	18.17	2.4100	0.2185	0.0569	0.160	0.130	0.291	4
4800	17.60	2.4138	0.1893	0.0408	0.840	0.490	0.330	2
5566	16.77	2.4180	0.1877	0.0482	0.183	0.142	0.326	3
4732	17.66	2.4202	0.1664	0.1457	0.809	0.999	0.809	4
4720	18.23	2.4223	0.0706	0.2293	0.031	0.017	0.048	4
4223	18.05	2.4227	0.1503	0.0506	0.871	0.867	0.739	4
6765	18.28	2.4258	0.1183	0.0609	0.053	0.003	0.056	4
4817	16.88	2.4266	0.0915	0.1321	0.243	0.524	0.767	2
9534	15.38	2.4269	0.1348	0.0565	0.599	0.522	0.122	2
9583	16.61	2.4284	0.1550	0.0840	0.970	0.506	0.476	3
6679	16.18	2.4292	0.3148	0.1312	0.572	0.970	0.542	4
4830	18.08	2.4294	0.1393	0.0337	0.901	0.981	0.883	4
9518	15.72	2.4303	0.1662	0.0408	0.711	0.974	0.685	3
6801	16.96	2.4312	0.1740	0.0475	0.906	0.403	0.309	4
7061	16.66	2.4322	0.1010	0.1073	0.124	0.610	0.734	2
6717	17.09	2.4323	0.1624	0.0279	0.655	0.195	0.851	4
6275	18.29	2.4323	0.2125	0.0233	0.066	0.790	0.856	4
6799	17.86	2.4328	0.1681	0.0245	0.150	0.395	0.546	4
4210	17.72	2.4332	0.0499	0.0775	0.976	0.784	0.761	4
4333	18.14	2.4334	0.1218	0.1686	0.020	0.975	0.995	4
2737	17.52	2.4349	0.0906	0.0486	0.997	0.132	0.130	4
2828	16.15	2.4352	0.1772	0.1944	0.909	0.509	0.419	4
4708	17.34	2.4366	0.0848	0.0722	0.754	0.999	0.754	4
4725	18.96	2.4384	0.2331	0.0656	0.059	0.954	0.014	4
7619	17.78	2.4384	0.2225	0.0444	0.095	0.331	0.426	3
4855	17.11	2.4405	0.2973	0.2645	0.739	0.033	0.772	0
9569	15.98	2.4405	0.1096	0.0960	0.599	0.091	0.691	3
4256	17.27	2.4424	0.1455	0.1058	0.088	0.899	0.987	4
7604	14.99	2.4426	0.1021	0.0539	0.370	0.230	0.600	3
6350	17.89	2.4487	0.1725	0.0710	0.216	0.646	0.862	4
9520	16.40	2.4492	0.1526	0.0453	0.346	0.123	0.469	3
4177	16.34	2.4496	0.1082	0.1323	0.620	0.913	0.534	2
6294	16.86	2.4500	0.2288	0.0705	0.379	0.585	0.964	4
2782	18.78	2.4518	0.2729	0.0281	0.166	0.257	0.423	4
4308	19.37	2.4522	0.2243	0.0851	0.056	0.574	0.630	4
4877	17.02	2.4525	0.0664	0.1504	0.790	0.029	0.820	2
4702	18.82	2.4538	0.2727	0.0040	0.864	0.944	0.809	0
4694	17.28	2.4541	0.1169	0.2015	0.032	0.985	0.018	4
4170	17.64	2.4548	0.1106	0.0995	0.898	0.669	0.567	2
6810	17.64	2.4580	0.1718	0.0644	0.857	0.402	0.260	4
7638	15.36	2.4582	0.0780	0.1478	0.741	0.471	0.213	3
5020	16.93	2.4583	0.2136	0.1149	0.196	0.651	0.847	4
2202	15.92	2.4587	0.2036	0.1287	0.612	0.930	0.543	2

© European Southern Observatory • Provided by the NASA Astrophysics Data System

1970A&AS....2..339V

Table 10 (*continued*)

PL	g	a (A. U.)	ν	μ	β	γ	$\beta+\gamma$	Q
6373	18.77	2.4588	0.1820	0.0798	0.076	0.911	0.987	4
9600	16.97	2.4595	0.1887	0.0450	0.177	0.306	0.483	3
7571	14.61	2.4612	0.1484	0.1083	0.457	0.077	0.535	3
9544	15.94	2.4617	0.0178	0.0817	0.005	0.486	0.491	2
2747	17.11	2.4619	0.0702	0.0782	0.266	0.066	0.333	4
6266	17.44	2.4638	0.1640	0.0363	0.975	0.855	0.830	4
4779	18.75	2.4675	0.1710	0.0297	0.978	0.922	0.900	4
4176	17.98	2.4682	0.1944	0.0808	0.847	0.738	0.586	4
2161	17.39	2.4693	0.1695	0.1155	0.069	0.951	0.021	4
6208	17.30	2.4720	0.1071	0.2751	0.780	0.962	0.743	4
6812	17.09	2.4725	0.0409	0.1490	0.071	0.482	0.553	4
4748	17.62	2.4732	0.1513	0.0572	0.875	0.492	0.367	4
9580	17.21	2.4742	0.2138	0.0116	0.782	0.525	0.307	3
6828	16.00	2.4769	0.1852	0.0692	0.503	0.380	0.884	4
4813	17.72	2.4789	0.2712	0.1056	0.759	0.468	0.228	4
4886	17.65	2.4796	0.1086	0.1268	0.181	0.511	0.693	4
6824	18.38	2.4831	0.2824	0.0959	0.025	0.483	0.509	0
6262	17.82	2.4833	0.0981	0.1201	0.951	0.572	0.524	4
9050	16.76	2.4837	0.2015	0.0670	0.198	0.890	0.088	3
6839	17.73	2.4840	0.1421	0.0378	0.809	0.317	0.126	4
4704	17.88	2.4871	0.1418	0.0490	0.000	0.875	0.875	4
6204	17.97	2.4873	0.1492	0.1510	0.049	0.566	0.616	4
6322	17.20	2.4898	0.2036	0.1005	0.267	0.963	0.230	4
4773	18.78	2.4908	0.1678	0.0273	0.985	0.713	0.699	4
4707	17.74	2.4920	0.2008	0.0420	0.275	0.494	0.769	4
6817	16.70	2.4953	0.3084	0.0429	0.736	0.247	0.984	0
4881	18.15	2.4966	0.1723	0.0486	0.938	0.453	0.392	4
2186	15.67	2.4972	0.2972	0.3472	0.516	0.998	0.515	4
6222	17.59	2.4986	0.1481	0.0440	0.849	0.669	0.519	4
6747	17.84	2.4998	0.2188	0.2569	0.803	0.014	0.817	4
6840	17.70	2.5038	0.1058	0.0290	0.993	0.308	0.302	4
4313	16.72	2.5109	0.1438	0.2193	0.640	0.564	0.204	4
6827	15.45	2.5113	0.3212	0.0503	0.474	0.193	0.667	4
9537	16.40	2.5122	0.0405	0.0941	0.350	0.512	0.863	3
4312	16.47	2.5130	0.1132	0.1635	0.810	0.952	0.763	4
6815	19.00	2.5140	0.3275	0.0843	0.162	0.025	0.188	0
4911	18.22	2.5146	0.2125	0.0606	0.905	0.563	0.468	4
9549	14.91	2.5175	0.1352	0.3041	0.280	0.035	0.316	3
5008	17.71	2.5203	0.2493	0.0985	0.244	0.958	0.202	3
2774	16.98	2.5207	0.1674	0.0419	0.217	0.086	0.303	4
2801	17.18	2.5208	0.1522	0.1035	0.079	0.511	0.591	4
7069	15.52	2.5217	0.1293	0.2119	0.214	0.587	0.801	4
1368	12.21	2.5264	0.0541	0.2596	0.674	0.041	0.715	3
6785	17.45	2.5277	0.1930	0.0539	0.810	0.023	0.834	4
6855	17.97	2.5278	0.2297	0.0468	0.209	0.445	0.655	4
4752	18.73	2.5284	0.1974	0.0363	0.931	0.877	0.808	4
9515	15.80	2.5285	0.0315	0.0512	0.087	0.111	0.198	3
2769	16.43	2.5292	0.1005	0.2174	0.700	0.526	0.227	4
7642	17.33	2.5295	0.1894	0.3391	0.058	0.036	0.095	3
4261	17.22	2.5302	0.1605	0.0488	0.049	0.643	0.692	4

© European Southern Observatory • Provided by the NASA Astrophysics Data System

1970A&AS....2..339V

Table 10 (*continued*)

PL	g	a (A. U.)	ν	μ	β	γ	$\beta+\gamma$	Q
6843	16.79	2.5309	0.1060	0.0197	0.510	0.313	0.823	4
6259	18.37	2.5310	0.2018	0.0686	0.902	0.691	0.593	4
4718	18.22	2.5322	0.1597	0.0516	0.892	0.966	0.859	4
4266	17.37	2.5333	0.0749	0.0351	0.254	0.851	0.106	4
6330	18.19	2.5339	0.1179	0.1368	0.114	0.937	0.052	4
2687	18.66	2.5351	0.2739	0.1030	0.013	0.540	0.554	0
4731	18.96	2.5368	0.2301	0.0516	0.945	0.008	0.954	4
2132	16.77	2.5369	0.1454	0.2051	0.853	0.975	0.829	4
4268	19.05	2.5376	0.3208	0.0667	0.875	0.862	0.737	0
4255	15.99	2.5388	0.1078	0.2430	0.192	0.980	0.172	4
2726	15.87	2.5394	0.1958	0.2250	0.208	0.503	0.712	4
6235	17.67	2.5414	0.0821	0.0666	0.239	0.684	0.924	4
2174	17.15	2.5415	0.3129	0.0979	0.758	0.876	0.635	0
6327	18.20	2.5428	0.2185	0.0243	0.010	0.744	0.755	4
9547	15.72	2.5440	0.1928	0.1366	0.007	0.546	0.553	4
4283	18.75	2.5442	0.2887	0.1104	0.907	0.597	0.504	0
7582	16.98	2.5457	0.1506	0.2538	0.991	0.049	0.040	3
4788	17.79	2.5464	0.5398	0.1903	0.751	0.510	0.262	2
2759	17.29	2.5476	0.1730	0.0263	0.158	0.608	0.767	4
9054	15.33	2.5483	0.1557	0.0744	0.717	0.896	0.614	3
4815	17.36	2.5493	0.1191	0.0542	0.204	0.039	0.244	2
9502	15.94	2.5497	0.1816	0.1085	0.846	0.054	0.901	3
6888	18.30	2.5511	0.1821	0.0737	0.879	0.103	0.982	4
6274	15.91	2.5522	0.1847	0.0802	0.636	0.603	0.240	2
2684	17.34	2.5531	0.0498	0.1009	0.012	0.534	0.547	4
6731	17.95	2.5545	0.2118	0.0280	0.122	0.167	0.289	4
2715	17.84	2.5552	0.1777	0.0506	0.890	0.551	0.441	4
6721	17.90	2.5595	0.0950	0.0434	0.790	0.994	0.785	4
6384	18.67	2.5613	0.1229	0.0350	0.005	0.600	0.606	4
4854	17.79	2.5620	0.1210	0.0569	0.095	0.447	0.543	4
6112	17.49	2.5624	0.2151	0.0384	0.916	0.773	0.690	4
6882	18.64	2.5629	0.2279	0.0683	0.107	0.982	0.090	4
4826	18.50	2.5633	0.2843	0.0243	0.899	0.704	0.604	0
4183	17.86	2.5656	0.2244	0.0699	0.074	0.776	0.850	4
9089	16.72	2.5660	0.2284	0.0744	0.060	0.843	0.904	3
4786	17.61	2.5670	0.0843	0.0284	0.050	0.490	0.540	4
2754	16.95	2.5681	0.1314	0.2152	0.158	0.520	0.679	4
9540	15.38	2.5689	0.0916	0.0399	0.940	0.972	0.913	2
6358	18.36	2.5702	0.1999	0.0689	0.081	0.631	0.713	4
4871	16.87	2.5706	0.1201	0.0345	0.298	0.105	0.403	4
6822	18.23	2.5708	0.1846	0.0864	0.941	0.433	0.374	4
4189	16.68	2.5732	0.1962	0.0898	0.312	0.776	0.089	2
6325	18.23	2.5746	0.1759	0.0364	0.953	0.827	0.781	4
2184	15.75	2.5753	0.2021	0.2184	0.536	0.584	0.120	2
6179	17.36	2.5756	0.1268	0.0502	0.833	0.831	0.665	4
6344	22.92	2.5760	0.6213	0.0835	0.165	0.546	0.711	4
4862	16.99	2.5760	0.2010	0.0698	0.283	0.481	0.765	4
6220	17.15	2.5770	0.1449	0.0482	0.210	0.854	0.064	4
9506	15.97	2.5793	0.1859	0.1205	0.697	0.020	0.718	3
9097	15.60	2.5805	0.1655	0.1267	0.507	0.975	0.483	2

© European Southern Observatory • Provided by the NASA Astrophysics Data System

1970A&AS....2..339V

Table 10 (*continued*)

PL	g	a (A. U.)	ν	μ	β	γ	$\beta+\gamma$	Q
9076	14.32	2.5833	0.1713	0.2456	0.108	0.556	0.664	3
4217	17.50	2.5843	0.0673	0.0304	0.933	0.776	0.709	2
7587	16.18	2.5852	0.1150	0.0525	0.215	0.103	0.318	3
449	10.88	2.5869	0.2030	0.0360	0.365	0.229	0.594	3
6805	17.81	2.5870	0.2446	0.0383	0.932	0.129	0.062	2
6200	16.89	2.5878	0.1367	0.0533	0.858	0.695	0.554	2
4850	16.86	2.5878	0.1517	0.2355	0.188	0.528	0.717	2
7611	16.30	2.5882	0.1842	0.0584	0.187	0.427	0.614	3
5550	14.38	2.5883	0.1516	0.2100	0.506	0.042	0.549	3
2144	17.35	2.5886	0.3028	0.0746	0.109	0.873	0.983	0
2768	15.64	2.5890	0.1433	0.0354	0.588	0.397	0.986	4
9062	15.29	2.5890	0.1730	0.0593	0.084	0.693	0.777	3
5015	16.40	2.5893	0.1556	0.2457	0.133	0.028	0.161	2
4181	15.41	2.5895	0.3044	0.1661	0.582	0.966	0.548	4
4843	17.10	2.5921	0.1273	0.0507	0.303	0.043	0.347	4
2748	16.93	2.5921	0.1817	0.1293	0.159	0.496	0.655	4
4265	18.16	2.5936	0.1641	0.0307	0.023	0.888	0.911	4
6252	17.22	2.5954	0.1338	0.0649	0.829	0.902	0.732	4
5034	17.04	2.5955	0.2598	0.1940	0.201	0.599	0.801	3
4749	16.99	2.5958	0.1964	0.0103	0.273	0.056	0.330	4
2141	18.23	2.5966	0.2964	0.0492	0.877	0.641	0.519	0
6226	18.34	2.6010	0.2634	0.1802	0.136	0.954	0.090	4
4754	18.19	2.6038	0.1432	0.0188	0.030	0.435	0.466	4
6245	15.78	2.6046	0.1171	0.2362	0.562	0.549	0.111	4
4806	15.90	2.6054	0.2178	0.0488	0.414	0.508	0.923	4
5552	17.49	2.6070	0.1730	0.1334	0.068	0.045	0.113	3
4242	18.62	2.6080	0.3528	0.1227	0.169	0.560	0.730	2
2800	16.26	2.6115	0.1026	0.2610	0.626	0.038	0.664	2
7600	16.10	2.6116	0.1575	0.2246	0.158	0.040	0.199	3
6333	17.40	2.6125	0.2202	0.0717	0.233	0.671	0.905	4
9084	17.55	2.6130	0.2690	0.0832	0.005	0.625	0.630	3
7592	17.35	2.6133	0.2097	0.0909	0.939	0.100	0.040	4
9585	15.56	2.6136	0.0724	0.0455	0.888	0.265	0.154	3
4188	16.98	2.6153	0.1933	0.2621	0.715	0.973	0.688	4
7608	16.47	2.6155	0.2534	0.0778	0.283	0.110	0.393	3
6195	17.57	2.6156	0.1786	0.2225	0.011	0.969	0.980	4
9573	16.69	2.6164	0.2251	0.0832	0.157	0.126	0.284	4
4755	17.03	2.6183	0.1500	0.2189	0.140	0.514	0.654	4
6318	17.62	2.6183	0.1696	0.1486	0.191	0.947	0.139	4
2113	17.48	2.6196	0.1504	0.0632	0.951	0.666	0.618	4
5554	15.80	2.6198	0.0424	0.2383	0.767	0.042	0.810	3
4248	17.02	2.6229	0.1508	0.0739	0.208	0.908	0.117	4
5581	17.74	2.6243	0.2147	0.0747	0.034	0.080	0.114	2
2198	15.78	2.6250	0.1905	0.3452	0.475	0.990	0.465	4
2785	16.44	2.6255	0.0756	0.0198	0.963	0.256	0.220	2
4161	15.46	2.6267	0.1680	0.1385	0.384	0.920	0.304	2
4307	17.80	2.6280	0.2143	0.2124	0.139	0.961	0.101	4
4709	19.22	2.6282	0.2995	0.1026	0.004	0.502	0.507	0
9589	16.40	2.6306	0.2133	0.0708	0.997	0.516	0.513	3
2674	17.05	2.6314	0.1689	0.0114	0.883	0.077	0.960	4

© European Southern Observatory • Provided by the NASA Astrophysics Data System

1970A&AS....2..339V

Table 10 (*continued*)

PL	g	a (A. U.)	ν	μ	β	γ	$\beta+\gamma$	Q
2742	17.43	2.6323	0.2562	0.0301	0.196	0.395	0.591	4
4094	17.31	2.6344	0.2314	0.0694	0.006	0.700	0.707	4
9532	16.28	2.6374	0.3122	0.0465	0.652	0.050	0.703	3
9611	15.94	2.6383	0.2729	0.2621	0.699	0.989	0.689	3
9570	16.08	2.6384	0.2109	0.0477	0.638	0.261	0.900	3
6807	17.38	2.6390	0.1010	0.1080	0.086	0.482	0.569	4
5568	14.50	2.6396	0.0760	0.1328	0.773	0.065	0.839	3
4306	17.61	2.6445	0.1460	0.0433	0.277	0.749	0.027	4
2796	16.94	2.6448	0.1571	0.0480	0.093	0.440	0.534	4
4230	16.93	2.6453	0.2627	0.2228	0.779	0.567	0.347	2
6306	16.64	2.6457	0.0133	0.0677	0.293	0.716	0.009	4
4769	17.61	2.6461	0.1176	0.1979	0.197	0.521	0.718	4
6193	16.77	2.6464	0.0948	0.2221	0.828	0.545	0.373	2
7590	17.61	2.6503	0.2428	0.1138	0.144	0.075	0.219	3
4218	16.00	2.6522	0.2747	0.0962	0.684	0.851	0.536	2
4901	18.79	2.6524	0.2117	0.0302	0.086	0.507	0.593	4
2171	16.99	2.6525	0.0974	0.0891	0.244	0.669	0.914	4
6267	17.18	2.6556	0.0711	0.0614	0.203	0.925	0.129	4
9591	16.94	2.6563	0.1546	0.0644	0.145	0.504	0.650	3
4918	16.17	2.6563	0.1731	0.2740	0.649	0.498	0.147	4
6703	16.47	2.6571	0.0456	0.0669	0.466	0.509	0.975	4
4318	17.85	2.6587	0.1635	0.0851	0.006	0.654	0.660	4
2707	17.99	2.6589	0.1470	0.0823	0.960	0.014	0.975	4
85		2.6600	0.1681	0.2200	0.863	0.577	0.441	3
4730	16.74	2.6604	0.0683	0.0772	0.789	0.037	0.827	2
4906	17.37	2.6625	0.0368	0.0450	0.258	0.587	0.845	4
6364	17.10	2.6651	0.1256	0.1680	0.844	0.565	0.409	4
4899	17.73	2.6672	0.1479	0.0586	0.940	0.540	0.480	4
7603	14.67	2.6681	0.1592	0.2390	0.877	0.049	0.927	3
4238	16.75	2.6691	0.2322	0.2337	0.260	0.572	0.832	2
6776	16.83	2.6718	0.0899	0.0147	0.390	0.038	0.428	4
6206	18.25	2.6741	0.3336	0.0922	0.194	0.934	0.129	0
6778	16.36	2.6742	0.1846	0.1586	0.000	0.466	0.466	4
7579	16.57	2.6759	0.1261	0.1068	0.063	0.042	0.106	3
6638	16.75	2.6766	0.1933	0.0571	0.815	0.070	0.885	2
6316	15.14	2.6776	0.3120	0.1129	0.569	0.967	0.536	4
6741	16.38	2.6781	0.0546	0.0367	0.520	0.162	0.682	4
7068	15.20	2.6786	0.2071	0.1538	0.007	0.600	0.608	3
4202	15.36	2.6788	0.0063	0.1658	0.382	0.925	0.307	4
2165	13.68	2.6802	0.1340	0.3157	0.861	0.564	0.426	4
6380	17.41	2.6813	0.1562	0.0823	0.300	0.893	0.194	4
6861	16.76	2.6824	0.0454	0.0452	0.897	0.340	0.238	4
4714	17.22	2.6848	0.2144	0.2700	0.846	0.990	0.837	2
4324	16.27	2.6850	0.1482	0.1949	0.610	0.939	0.549	4
6372	16.32	2.6878	0.1608	0.0698	0.693	0.640	0.334	4
9526	14.99	2.6884	0.1154	0.2114	0.589	0.031	0.621	3
4827	17.93	2.6892	0.2455	0.0225	0.939	0.741	0.681	4
2133	15.33	2.6907	0.2426	0.2918	0.300	0.984	0.284	4
9527	13.93	2.6912	0.0827	0.0638	0.513	0.549	0.063	3
6820	17.12	2.6934	0.0428	0.0765	0.868	0.479	0.347	4

© European Southern Observatory • Provided by the NASA Astrophysics Data System

1970A&AS....2..339V

Table 10 (*continued*)

PL	g	a (A. U.)	ν	μ	β	γ	$\beta+\gamma$	Q
4878	16.85	2.6935	0.1120	0.1042	0.245	0.482	0.728	4
6211	18.00	2.6939	0.1824	0.0877	0.112	0.630	0.743	4
4220	17.39	2.6941	0.1226	0.0859	0.046	0.832	0.878	4
9061	16.80	2.6962	0.3609	0.0784	0.760	0.865	0.625	0
4250	16.10	2.6964	0.1338	0.1462	0.202	0.931	0.134	4
4821	16.64	2.6983	0.0525	0.0563	0.266	0.442	0.709	4
7589	13.52	2.7023	0.1016	0.1303	0.490	0.079	0.570	3
6212	17.21	2.7025	0.2026	0.2264	0.792	0.962	0.755	4
9568	16.62	2.7044	0.3423	0.1298	0.082	0.073	0.155	0
4829	16.72	2.7049	0.1589	0.1476	0.769	0.998	0.767	2
7627	17.09	2.7070	0.1394	0.0471	0.027	0.234	0.262	4
2187	15.69	2.7073	0.2196	0.1081	0.462	0.843	0.305	4
6671	16.34	2.7099	0.0676	0.0395	0.270	0.374	0.644	4
6227	17.77	2.7103	0.2495	0.0700	0.921	0.824	0.746	4
2117	16.46	2.7111	0.0372	0.0403	0.012	0.756	0.769	2
6753	16.88	2.7114	0.0503	0.0354	0.179	0.107	0.286	4
9535	15.96	2.7120	0.0261	0.1070	0.973	0.493	0.466	3
2720	17.29	2.7144	0.1107	0.0430	0.175	0.447	0.622	4
4717	18.47	2.7182	0.2186	0.0645	0.953	0.960	0.914	4
9581	16.28	2.7183	0.0395	0.1278	0.086	0.459	0.545	3
6367	17.04	2.7187	0.0680	0.2386	0.333	0.966	0.300	4
5011	15.77	2.7200	0.0155	0.1074	0.515	0.689	0.205	2
6713	17.67	2.7206	0.0828	0.0866	0.705	0.978	0.683	4
6357	16.96	2.7214	0.1007	0.1656	0.833	0.548	0.381	2
2179	16.21	2.7219	0.1335	0.2851	0.392	0.988	0.380	4
4334	17.85	2.7236	0.1072	0.0461	0.930	0.889	0.820	4
9587	15.88	2.7247	0.0036	0.0761	0.974	0.142	0.117	3
4903	17.59	2.7254	0.1169	0.0474	0.947	0.017	0.965	4
4314	16.06	2.7282	0.2752	0.1267	0.044	0.954	0.998	2
6345	17.22	2.7286	0.1042	0.1797	0.242	0.561	0.803	4
6340	16.89	2.7290	0.0446	0.0956	0.249	0.903	0.153	4
6697	16.89	2.7300	0.1269	0.0554	0.247	0.096	0.343	4
9524	16.88	2.7302	0.1610	0.0148	0.116	0.370	0.486	3
4160	13.73	2.7302	0.1852	0.3439	0.367	0.976	0.344	4
6366	17.57	2.7317	0.1491	0.1120	0.772	0.945	0.717	4
2836	17.35	2.7325	0.2102	0.0377	0.079	0.470	0.549	4
9614	16.85	2.7333	0.1137	0.1136	0.770	0.677	0.447	3
247		2.7364	0.2227	0.4641	0.174	0.993	0.167	2
6253	16.22	2.7364	0.2465	0.1485	0.613	0.556	0.169	4
2194	16.16	2.7402	0.0986	0.2723	0.135	0.985	0.121	4
6273	18.82	2.7429	0.2300	0.0746	0.046	0.876	0.923	4
4270	16.64	2.7430	0.0818	0.0510	0.211	0.699	0.911	2
2689	15.40	2.7456	0.2191	0.1170	0.561	0.034	0.595	4
4895	14.79	2.7458	0.0875	0.1176	0.171	0.466	0.638	4
6254	16.84	2.7463	0.0154	0.0803	0.649	0.784	0.434	4
4111	16.53	2.7474	0.1782	0.0903	0.214	0.954	0.168	2
6257	17.31	2.7507	0.2493	0.0727	0.258	0.884	0.143	4
2140	14.15	2.7507	0.1856	0.1827	0.980	0.968	0.948	4
4690	17.65	2.7520	0.1937	0.1475	0.907	0.006	0.914	4
6886	18.15	2.7522	0.1861	0.1093	0.034	0.504	0.539	4

© European Southern Observatory • Provided by the NASA Astrophysics Data System

1970A&AS....2..339V

Table 10 (*continued*)

PL	g	a (A. U.)	ν	μ	β	γ	$\beta+\gamma$	Q
6313	17.01	2.7533	0.0774	0.0557	0.137	0.829	0.967	4
4197	17.73	2.7541	0.1586	0.0584	0.047	0.749	0.797	4
9519	15.78	2.7553	0.0501	0.0751	0.798	0.046	0.845	3
4721	16.94	2.7557	0.0117	0.0390	0.726	0.950	0.676	4
2722	15.49	2.7573	0.2239	0.2657	0.696	0.515	0.211	4
2146	16.94	2.7586	0.3944	0.1559	0.938	0.573	0.512	0
4797	16.73	2.7594	0.1100	0.1505	0.802	0.531	0.334	2
4795	17.43	2.7596	0.2857	0.1549	0.259	0.491	0.751	4
4737	17.55	2.7609	0.1350	0.2205	0.175	0.004	0.180	4
6237	16.43	2.7609	0.0484	0.0957	0.405	0.621	0.026	4
2128	17.21	2.7618	0.2029	0.0521	0.213	0.806	0.020	4
4771	17.40	2.7620	0.0799	0.0451	0.041	0.498	0.539	4
9090	16.55	2.7627	0.1704	0.0667	0.932	0.657	0.590	3
6672	16.89	2.7642	0.1796	0.1322	0.866	0.468	0.335	4
4891	16.62	2.7656	0.0653	0.0659	0.757	0.532	0.289	4
6224	16.29	2.7662	0.0486	0.0889	0.674	0.617	0.292	4
4847	18.06	2.7693	0.2000	0.1446	0.007	0.015	0.023	4
4253	16.63	2.7703	0.2910	0.1532	0.318	0.964	0.283	4
4824	16.32	2.7712	0.0782	0.0503	0.671	0.558	0.229	4
4260	13.69	2.7756	0.0950	0.0799	0.050	0.740	0.790	4
2147	16.09	2.7763	0.2346	0.1752	0.143	0.981	0.124	4
6685	18.22	2.7765	0.2138	0.0199	0.097	0.567	0.664	4
6349	16.94	2.7771	0.0976	0.0691	0.284	0.684	0.969	4
4194	17.78	2.7806	0.2350	0.1071	0.890	0.578	0.469	4
6803	16.78	2.7821	0.2288	0.1772	0.756	0.024	0.780	4
7639	15.77	2.7850	0.2452	0.0561	0.363	0.251	0.615	4
2736	16.52	2.7855	0.0332	0.0821	0.630	0.533	0.163	4
9613	16.65	2.7872	0.1124	0.2514	0.137	0.551	0.688	2
9070	14.71	2.7876	0.1902	0.1441	0.032	0.601	0.633	3
9072	15.63	2.7877	0.1113	0.1170	0.623	0.614	0.238	3
6299	15.66	2.7882	0.1777	0.2418	0.359	0.555	0.915	2
6737	16.82	2.7893	0.1244	0.0656	0.811	0.986	0.797	4
2154	15.68	2.7907	0.1122	0.2354	0.321	0.576	0.898	2
2150	17.74	2.7977	0.2955	0.1087	0.901	0.610	0.512	0
9522	14.27	2.7989	0.2367	0.1340	0.705	0.984	0.689	3
2780	13.31	2.7992	0.0957	0.0746	0.287	0.428	0.716	4
6849	17.53	2.7994	0.1726	0.1022	0.834	0.027	0.862	4
9561	14.87	2.8081	0.1081	0.0708	0.036	0.390	0.426	4
2776	14.58	2.8082	0.0598	0.0667	0.841	0.481	0.322	4
6307	17.36	2.8083	0.2305	0.1427	0.140	0.958	0.098	4
4777	17.35	2.8101	0.1664	0.0705	0.907	0.464	0.371	4
9509	16.00	2.8201	0.2084	0.1891	0.940	0.538	0.479	4
6716	16.12	2.8272	0.0317	0.2169	0.409	0.023	0.432	4
4775	16.99	2.8273	0.1175	0.0976	0.337	0.974	0.312	4
7632	15.88	2.8309	0.2147	0.0366	0.690	0.348	0.038	4
6842	16.99	2.8340	0.0874	0.0294	0.140	0.952	0.092	4
6288	16.74	2.8343	0.1099	0.0686	0.224	0.748	0.972	4
7633	15.06	2.8373	0.0309	0.0384	0.787	0.320	0.107	3
4772	16.64	2.8395	0.1343	0.0431	0.031	0.936	0.968	2
6674	16.81	2.8397	0.2646	0.0745	0.810	0.448	0.258	4

© European Southern Observatory • Provided by the NASA Astrophysics Data System

1970A&AS....2..339V

Table 10 (*continued*)

PL	g	a (A. U.)	ν	μ	β	γ	$\beta+\gamma$	Q
4727	18.62	2.8401	0.2438	0.0589	0.957	0.602	0.559	4
4869	17.28	2.8403	0.2847	0.0655	0.227	0.984	0.211	4
4908	16.30	2.8407	0.1175	0.0960	0.503	0.479	0.983	4
7646	16.83	2.8422	0.1831	0.0461	0.190	0.372	0.563	4
1745	13.07	2.8433	0.0406	0.0383	0.279	0.194	0.473	2
9074	16.59	2.8493	0.2142	0.0319	0.199	0.733	0.932	3
6819	16.50	2.8495	0.1438	0.2474	0.799	0.030	0.830	4
6800	14.79	2.8506	0.1795	0.0450	0.476	0.399	0.875	4
7647	16.55	2.8541	0.0873	0.0451	0.136	0.383	0.519	4
2732	17.05	2.8544	0.1876	0.0531	0.855	0.034	0.889	4
2721	16.88	2.8572	0.0577	0.0359	0.999	0.116	0.116	4
6852	17.71	2.8594	0.2700	0.0378	0.139	0.403	0.543	4
6837	16.83	2.8604	0.0476	0.0367	0.091	0.222	0.314	4
4315	15.70	2.8665	0.0798	0.0393	0.604	0.661	0.266	2
6876	18.09	2.8712	0.2690	0.0190	0.140	0.452	0.592	4
6850	17.06	2.8745	0.0395	0.0356	0.799	0.337	0.136	4
4893	15.68	2.8783	0.0428	0.0382	0.411	0.987	0.399	2
5571	16.27	2.8795	0.1098	0.1048	0.144	0.098	0.242	4
6353	17.44	2.8873	0.1054	0.0337	0.142	0.919	0.061	4
4222	16.66	2.8908	0.0825	0.1110	0.768	0.904	0.673	4
4774	17.74	2.8927	0.0917	0.0371	0.950	0.643	0.594	4
7631	13.24	2.8998	0.0459	0.0330	0.053	0.341	0.395	3
6305	15.45	2.9015	0.1410	0.2500	0.789	0.978	0.768	4
7562	15.91	2.9024	0.1094	0.2173	0.120	0.043	0.164	3
9517	13.89	2.9032	0.2263	0.2681	0.719	0.514	0.233	3
2741	16.45	2.9069	0.1058	0.3675	0.154	0.039	0.193	2
2809	17.05	2.9074	0.1902	0.0270	0.905	0.603	0.509	4
6192	14.83	2.9121	0.2808	0.2516	0.560	0.523	0.084	4
6835	15.86	2.9123	0.2393	0.0439	0.608	0.093	0.702	4
6711	16.01	2.9183	0.0337	0.0437	0.546	0.926	0.473	4
4750	14.91	2.9185	0.5052	0.0333	0.391	0.622	0.013	0
6788	17.12	2.9187	0.1701	0.0323	0.052	0.140	0.192	4
4233	16.45	2.9194	0.1639	0.0459	0.187	0.783	0.971	4
4894	16.39	2.9222	0.0164	0.2265	0.716	0.017	0.733	4
7588	13.78	2.9230	0.2075	0.0334	0.628	0.240	0.868	3
2115	15.35	2.9267	0.1848	0.1231	0.552	0.617	0.170	4
4281	17.50	2.9282	0.1418	0.0581	0.092	0.951	0.043	4
4792	15.56	2.9293	0.1026	0.0469	0.635	0.969	0.604	2
6726	16.31	2.9323	0.0620	0.0355	0.748	0.367	0.115	4
6701	16.04	2.9329	0.1731	0.3940	0.682	0.506	0.188	4
6806	16.03	2.9378	0.0424	0.0365	0.687	0.152	0.840	2
4286	17.94	2.9384	0.1927	0.0425	0.014	0.719	0.733	4
4740	18.49	2.9387	0.2739	0.0310	0.913	0.822	0.735	0
4814	16.20	2.9393	0.0297	0.0395	0.345	0.425	0.770	4
2763	15.94	2.9402	0.1002	0.0166	0.396	0.275	0.672	4
4884	16.95	2.9405	0.1235	0.1048	0.991	0.560	0.551	4
4178	16.58	2.9432	0.0754	0.1659	0.834	0.930	0.765	4
6282	15.16	2.9455	0.0802	0.2167	0.576	0.956	0.533	4
9542	15.56	2.9466	0.0065	0.0375	0.556	0.124	0.681	2
406		2.9502	0.1266	0.1040	0.300	0.876	0.176	4

© European Southern Observatory • Provided by the NASA Astrophysics Data System

1970A&AS....2..339V

Table 10 (*continued*)

PL	g	a (A. U.)	ν	μ	β	γ	$\beta+\gamma$	Q
6879	18.25	2.9517	0.2325	0.0939	0.024	0.023	0.047	4
6859	17.19	2.9572	0.0993	0.0405	0.061	0.358	0.419	4
4835	16.48	2.9591	0.0762	0.0619	0.296	0.507	0.804	4
2654	16.92	2.9598	0.1332	0.0138	0.079	0.537	0.616	4
7593	15.40	2.9633	0.0972	0.1790	0.378	0.063	0.441	3
6789	16.00	2.9666	0.1354	0.0385	0.131	0.324	0.456	2
4320	16.96	2.9687	0.1568	0.2103	0.148	0.988	0.137	2
6690	16.96	2.9696	0.3138	0.0152	0.781	0.459	0.240	0
6814	15.07	2.9699	0.2409	0.0614	0.570	0.990	0.561	4
9608	15.39	2.9705	0.0577	0.1090	0.618	0.550	0.168	3
6668	15.89	2.9727	0.0759	0.1817	0.607	0.010	0.617	4
4213	15.91	2.9817	0.0754	0.1531	0.710	0.947	0.658	2
6811	16.20	2.9865	0.0723	0.0308	0.109	0.147	0.256	4
6858	15.14	2.9870	0.2914	0.4206	0.575	0.488	0.063	4
6369	16.33	2.9916	0.0948	0.0820	0.585	0.855	0.440	4
7075	14.36	2.9920	0.1475	0.1726	0.917	0.585	0.502	2
4898	16.99	2.9938	0.1217	0.1234	0.866	0.023	0.890	4
6786	15.46	2.9951	0.2418	0.0488	0.529	0.995	0.524	4
4285	16.01	2.9955	0.0503	0.1596	0.995	0.948	0.944	4
6784	15.74	2.9965	0.0177	0.1825	0.982	0.015	0.998	4
4736	17.30	2.9980	0.1684	0.1074	0.948	0.012	0.961	4
9574	14.96	3.0006	0.2430	0.2389	0.139	0.043	0.183	4
4892	15.85	3.0011	0.0334	0.1828	0.652	0.487	0.140	4
4681	15.37	3.0024	0.0847	0.1862	0.538	0.974	0.513	2
6707	15.84	3.0080	0.0631	0.0418	0.544	0.457	0.001	4
2830	16.06	3.0102	0.2234	0.0381	0.284	0.463	0.747	2
4239	14.89	3.0113	0.1319	0.2138	0.759	0.962	0.721	4
4851	15.46	3.0123	0.1263	0.1544	0.691	0.016	0.708	2
5555	14.19	3.0178	0.1130	0.1831	0.277	0.046	0.324	3
6816	12.77	3.0216	0.1037	0.1772	0.207	0.480	0.688	2
4221	17.14	3.0238	0.2380	0.1271	0.857	0.909	0.767	4
4216	17.20	3.0249	0.1387	0.3137	0.065	0.982	0.047	4
4889	17.47	3.0260	0.2650	0.2770	0.200	0.523	0.723	4
7066	13.92	3.0293	0.1358	0.2145	0.834	0.585	0.420	2
4703	17.03	3.0297	0.1988	0.0534	0.859	0.966	0.825	4
2672	16.67	3.0299	0.1556	0.4133	0.084	0.026	0.111	4
6729	16.31	3.0310	0.0382	0.2393	0.911	0.002	0.914	4
4713	17.33	3.0323	0.2298	0.0301	0.983	0.704	0.688	4
4823	15.92	3.0328	0.1203	0.0219	0.602	0.572	0.175	4
9593	15.23	3.0341	0.3287	0.1032	0.365	0.423	0.788	0
5004	14.27	3.0368	0.1954	0.2021	0.891	0.597	0.489	2
4325	16.58	3.0394	0.0616	0.2933	0.051	0.982	0.033	2
2728	16.47	3.0415	0.1252	0.1393	0.823	0.015	0.838	4
7613	14.82	3.0432	0.1128	0.1265	0.606	0.445	0.051	3
6231	16.97	3.0442	0.1456	0.1200	0.028	0.888	0.916	4
4185	16.08	3.0460	0.1483	0.1043	0.843	0.800	0.643	4
2127	16.50	3.0479	0.1368	0.0625	0.932	0.843	0.776	2
4212	15.23	3.0484	0.0721	0.4349	0.103	0.990	0.093	4
9607	14.54	3.0497	0.1103	0.1701	0.468	0.992	0.461	2
9578	14.28	3.0519	0.0777	0.1079	0.337	0.978	0.315	3

© European Southern Observatory • Provided by the NASA Astrophysics Data System

1970A&AS....2..339V

Table 10 (*continued*)

PL	g	a (A. U.)	ν	μ	β	γ	$\beta+\gamma$	Q
9555	15.79	3.0537	0.1410	0.1017	0.191	0.060	0.252	3
9058	14.02	3.0556	0.1404	0.0767	0.872	0.751	0.624	3
6714	16.93	3.0570	0.1369	0.2628	0.104	0.000	0.104	4
2752	15.29	3.0651	0.1534	0.1382	0.949	0.533	0.483	4
2832	15.68	3.0733	0.1908	0.2945	0.031	0.527	0.559	4
4263	16.25	3.0733	0.0847	0.1973	0.200	0.991	0.191	2
6808	15.29	3.0761	0.2362	0.1094	0.631	0.030	0.661	4
9075	13.96	3.0786	0.0632	0.1083	0.915	0.663	0.578	4
2653	19.25	3.0787	0.4093	0.0455	0.875	0.890	0.766	0
2704	15.06	3.0793	0.2515	0.5273	0.548	0.528	0.076	4
2719	16.64	3.0812	0.2082	0.0132	0.882	0.322	0.205	4
6724	17.84	3.0821	0.2617	0.1624	0.918	0.984	0.903	4
2734	17.73	3.0823	0.2624	0.0144	0.934	0.338	0.272	4
7602	16.59	3.0860	0.2336	0.1134	0.082	0.053	0.135	3
7574	16.46	3.0860	0.2250	0.1156	0.071	0.070	0.141	2
2705	15.20	3.0866	0.2598	0.3100	0.419	0.524	0.944	4
2156	15.65	3.0895	0.1308	0.2044	0.969	0.555	0.524	4
2172	16.36	3.0904	0.1736	0.1777	0.948	0.941	0.890	4
4758	15.98	3.0912	0.1358	0.0884	0.216	0.988	0.205	2
4173	15.62	3.0920	0.1453	0.4411	0.658	0.981	0.640	4
2799	16.18	3.0927	0.1789	0.5508	0.971	0.522	0.493	4
6295	15.62	3.0953	0.2026	0.3138	0.565	0.977	0.543	4
4762	16.31	3.0958	0.0638	0.1608	0.956	0.490	0.446	4
4092	15.93	3.0964	0.0637	0.1165	0.612	0.911	0.523	4
6296	17.85	3.0971	0.2294	0.0880	0.072	0.857	0.929	4
9073	14.09	3.0981	0.1228	0.1000	0.843	0.929	0.773	3
4225	16.20	3.0992	0.1568	0.0980	0.189	0.928	0.117	2
4728	17.54	3.0998	0.1927	0.0853	0.018	0.563	0.581	4
6272	17.53	3.1035	0.1948	0.0728	0.005	0.856	0.861	4
6359	17.50	3.1088	0.1834	0.1272	0.984	0.963	0.947	4
9546	13.10	3.1145	0.1548	0.0284	0.604	0.286	0.891	2
6258	16.12	3.1166	0.1286	0.0854	0.819	0.644	0.464	2
9582	14.91	3.1178	0.2698	0.2894	0.702	0.493	0.195	3
6846	15.50	3.1181	0.1222	0.0866	0.353	0.442	0.795	2
2155	14.88	3.1182	0.1495	0.0358	0.892	0.800	0.693	2
4305	16.64	3.1184	0.1155	0.1491	0.016	0.949	0.965	4
4209	15.98	3.1191	0.1159	0.0978	0.880	0.862	0.742	2
2814	15.79	3.1205	0.1427	0.1109	0.735	0.980	0.715	2
6845	17.20	3.1220	0.1655	0.0481	0.966	0.158	0.124	4
4896	15.04	3.1228	0.1284	0.0261	0.944	0.355	0.299	2
6829	14.14	3.1250	0.2518	0.2009	0.440	0.053	0.494	2
4302	15.20	3.1257	0.1310	0.0872	0.526	0.672	0.199	2
4794	15.08	3.1259	0.3571	0.2478	0.388	0.024	0.412	0
4856	16.02	3.1283	0.2056	0.1028	0.886	0.040	0.927	4
6860	16.85	3.1283	0.0856	0.0779	0.946	0.424	0.371	4
6277	16.91	3.1306	0.1039	0.0862	0.071	0.660	0.732	4
4327	15.55	3.1318	0.1909	0.3290	0.356	0.551	0.907	4
4179	15.79	3.1321	0.1275	0.0860	0.774	0.821	0.596	2
2693	16.29	3.1341	0.1918	0.2100	0.118	0.512	0.630	4
4229	16.38	3.1352	0.0989	0.0833	0.956	0.809	0.765	2

© European Southern Observatory • Provided by the NASA Astrophysics Data System

1970A&AS....2..339V

Table 10 (*continued*)

PL	g	a (A. U.)	ν	μ	β	γ	$\beta+\gamma$	Q
9101	14.42	3.1371	0.1985	0.2925	0.865	0.535	0.400	3
7618	13.46	3.1372	0.0619	0.0918	0.414	0.405	0.820	3
7605	15.08	3.1378	0.1253	0.2010	0.082	0.490	0.573	2
2182	16.28	3.1389	0.1149	0.0792	0.955	0.956	0.911	2
6766	13.48	3.1389	0.0711	0.2346	0.681	0.489	0.170	2
2691	17.22	3.1423	0.4966	0.0414	0.720	0.021	0.742	0
4167	16.15	3.1437	0.1491	0.3167	0.769	0.971	0.741	4
4191	15.32	3.1440	0.1059	0.3063	0.660	0.961	0.621	4
9099	15.23	3.1456	0.1165	0.2270	0.774	0.529	0.304	3
4763	16.83	3.1457	0.2099	0.2407	0.734	0.500	0.234	4
6780	15.28	3.1460	0.1477	0.2480	0.499	0.479	0.979	4
4249	17.13	3.1471	0.1898	0.1947	0.931	0.569	0.500	4
9610	15.13	3.1480	0.1568	0.0355	0.130	0.213	0.344	3
2738	17.00	3.1485	0.2045	0.1687	0.876	0.530	0.407	4
6781	17.12	3.1491	0.2258	0.0840	0.167	0.039	0.207	4
9552	16.59	3.1498	0.3044	0.0999	0.075	0.493	0.568	0
6342	16.54	3.1546	0.3266	0.2938	0.767	0.977	0.745	0
4852	15.45	3.1577	0.0965	0.2583	0.440	0.497	0.937	4
2685	16.49	3.1579	0.0793	0.0219	0.921	0.739	0.660	4
5586	16.34	3.1605	0.1772	0.2106	0.044	0.067	0.112	4
9567	14.69	3.1619	0.0775	0.1588	0.678	0.065	0.743	3
6241	16.75	3.1640	0.1388	0.2212	0.036	0.564	0.600	4
4770	15.89	3.1683	0.1726	0.1403	0.766	0.032	0.798	4
4784	16.43	3.1687	0.0751	0.0500	0.080	0.951	0.032	4
6777	16.89	3.1754	0.2911	0.1523	0.167	0.468	0.635	0
2762	15.40	3.1783	0.1789	0.0279	0.056	0.194	0.251	2
4192	14.89	3.1815	0.1394	0.2643	0.803	0.959	0.763	4
6725	15.56	3.1819	0.1805	0.0344	0.315	0.543	0.859	2
4768	15.56	3.1842	0.1903	0.1759	0.700	0.524	0.225	4
2805	16.08	3.1846	0.2164	0.2705	0.307	0.538	0.846	4
9543	14.69	3.1849	0.0626	0.2562	0.589	0.022	0.611	3
4757	16.57	3.1865	0.1372	0.0796	0.913	0.533	0.446	4
9562	15.82	3.1884	0.1353	0.0592	0.923	0.222	0.145	3
5570	14.99	3.1944	0.1007	0.1424	0.284	0.081	0.365	4
4174	16.54	3.2019	0.2019	0.1801	0.192	0.936	0.128	4
6269	16.68	3.2070	0.1247	0.0768	0.924	0.597	0.521	4
2157	14.39	3.2075	0.1180	0.3871	0.246	0.546	0.792	4
4224	16.41	3.2080	0.2570	0.1186	0.865	0.656	0.521	4
6218	15.83	3.2086	0.1202	0.2421	0.166	0.947	0.114	4
4785	15.95	3.2118	0.3018	0.0336	0.345	0.581	0.926	4
2123	15.61	3.2170	0.1057	0.1470	0.847	0.934	0.781	4
6752	16.24	3.2181	0.2407	0.0315	0.234	0.166	0.401	4
6764	16.10	3.2186	0.2146	0.0304	0.196	0.536	0.732	4
6260	13.98	3.2210	0.0676	0.2012	0.019	0.957	0.976	4
6329	16.18	3.2231	0.1001	0.1011	0.041	0.613	0.654	4
2811	17.24	3.2254	0.2231	0.0275	0.937	0.571	0.508	4
6286	15.21	3.2276	0.1135	0.0651	0.532	0.856	0.388	2
6740	16.73	3.2309	0.1267	0.0768	0.026	0.034	0.061	4
5560	14.66	3.2353	0.2520	0.0311	0.725	0.225	0.950	3
6287	14.86	3.2367	0.2489	0.3367	0.375	0.975	0.351	4

© European Southern Observatory • Provided by the NASA Astrophysics Data System

1970A&AS....2..339V

Table 10 (*continued*)

PL	g	a (A. U.)	ν	μ	β	γ	$\beta+\gamma$	Q
6246	15.04	3.2380	0.1065	0.0844	0.055	0.832	0.887	4
9586	15.03	3.2410	0.1538	0.0874	0.400	0.390	0.790	3
2682	16.03	3.2489	0.1275	0.0256	0.907	0.546	0.454	2
6280	16.50	3.2495	0.1291	0.0981	0.104	0.926	0.030	2
7591	15.69	3.2505	0.3117	0.0542	0.758	0.129	0.888	0
6673	14.12	3.2539	0.0126	0.3960	0.609	0.480	0.090	2
2831	16.67	3.2649	0.2243	0.0274	0.859	0.071	0.930	4
6834	16.79	3.2955	0.1777	0.0299	0.120	0.982	0.102	4
5017	15.06	3.3240	0.1652	0.2640	0.235	0.596	0.832	4
5557	15.31	3.3434	0.1843	0.0327	0.351	0.856	0.207	3
9594	15.07	3.3463	0.0190	0.0275	0.499	0.043	0.543	2
4907	15.72	3.3513	0.0757	0.5739	0.649	0.009	0.658	4
2699	15.70	3.3616	0.2636	0.0271	0.320	0.746	0.066	4
2767	14.77	3.3828	0.2454	0.0196	0.844	0.231	0.075	4
9548	16.12	3.4150	0.5003	0.0813	0.752	0.497	0.250	0
9554	14.80	3.4716	0.0823	0.0698	0.148	0.378	0.526	3
9508	14.28	3.4928	0.2050	0.0190	0.305	0.244	0.550	3
4203	15.13	3.5240	0.0845	0.3508	0.633	0.983	0.617	4
4819	16.35	3.5289	0.2010	0.1161	0.875	0.489	0.364	4
9513	15.56	3.5487	0.2460	0.0285	0.147	0.352	0.500	3
4164	14.71	3.6338	0.1973	0.6294	0.938	0.987	0.925	4
9541	15.43	3.6420	0.6330	0.0470	0.701	0.539	0.241	0
577	12.07	3.8044	0.4667	0.0873	0.862	0.863	0.725	0
1439	11.51	3.8895	0.1637	0.0662	0.526	0.051	0.578	3
2159	11.58	3.9262	0.1482	0.1099	0.242	0.925	0.167	4
6847	16.09	3.9714	0.2586	0.1431	0.074	0.456	0.531	4
4710	15.41	4.0292	0.2207	0.1182	0.213	0.015	0.229	4
2709	15.73	4.0355	0.2456	0.0526	0.192	0.517	0.709	4

© European Southern Observatory • Provided by the NASA Astrophysics Data System