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AN ANALYSIS OF THE ATMOSPHERIC DRAG OF THE EXPLORER IX SATELLITE FROM PRECISELY REDUCED PHOTOGRAPHIC OBSERVATIONS

by

Luigi G. Jacchia and Jack Slowey

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AN ANALYSIS OF THE ATMOSPHERIC DRAG OF THE EXPLORER IX SATELLITE FROM PRECISELY REDUCED PHOTOGRAPHIC OBSERVATIONS[1]

by

Luigi G. Jacchia[2] and Jack Slowey[3]

21723

Summary.--The atmospheric drag of the Explorer IX satellite was derived over an interval of 283 days by using, for the first time, precisely reduced photographs taken with the Baker-Nunn cameras; the positions are about 40 times more accurate than those used in previous drag work. The 12-hour oscillations in the mean anomaly caused by the ellipticity of the earth's equator are very noticeable and had to be eliminated as a prerequisite to the analysis. Forty-six atmospheric perturbations related to geomagnetic disturbances can be recognized during the time covered by the observations--on the average one every six days. The increase ΔT in the atmospheric temperature that accompanies a geomagnetic disturbance is linearly correlated with the three-hourly geomagnetic index a_p; the maximum of the atmospheric perturbation occurs systematically five hours later than the a_p maximum.

In addition, this paper reports on the extension to September 1962 of the analysis of the field-reduced observations for this satellite, which were presented in S.A.O. Special Report No. 84. According to this analysis, the semiannual temperature variation in 1961-1962 was clearly present, with a semiamplitude of 35°.

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[1]This work was supported by grant NsG 87-60 from the National Aeronautics and Space Administration.

[2]Physicist, Smithsonian Astrophysical Observatory.

[3]Astronomer, Smithsonian Astrophysical Observatory.

A preliminary analysis of the atmospheric drag of the Explorer IX satellite (1961 δ1) in the time interval from February 17 to October 2, 1961, was published in Smithsonian Astrophysical Observatory Special Report No. 84 (Jacchia and Slowey, 1962a). The observational material consisted mainly of approximate positions determined in situ (field-reduced) from photographs taken with the S.A.O. Baker-Nunn cameras. The present report extends the analysis of this material to September 12, 1962. In addition, we present the first results of an analysis of precisely reduced Baker-Nunn photographic observations of this satellite in the time interval from February 24 to December 4, 1961. Most of these observations prior to June 30, 1961, are published in S.A.O. Special Report No. 104. We have used a few additional observations that had been rejected for publication because the clock correction was deemed insufficiently well known; as it turned out, the majority of these rejected observations could be rescued by analyzing the clock rates before and after the date of the observation.

The methods used to derive atmospheric drag and to determine atmospheric densities from both the field-reduced and the precisely reduced observations have been fully described in other papers (Jacchia and Slowey 1962a, 1962b) and will not be repeated here. As we have done in the past, we computed densities at perigee and then reduced them to a standard height close to the perigee height. The logarithms of both densities appear in the tables of results. The density at standard height is used primarily to facilitate the computation of temperatures. The standard heights used and the intervals to which they apply are given in table 1. Using Nicolet's (1961) model atmosphere, we again computed temperatures from the densities. An area/mass ratio of 15.84 cm^2/gm and a drag coefficient of 2.2 were used to compute densities. We evaluated the effects of solar-radiation pressure, using a value of 2.00 $cal/cm^2/min.$ for the solar constant.

The least-squares fitting of orbital elements not previously published is given in table 2 for the field-reduced observations and in table 3 for the precisely reduced observations. The results from the field-reduced observations and those from the precisely reduced observations are given in tables 4 and 5. For convenience, table 4 includes the results published in S.A.O. Special Report No. 84. The quantities tabulated in both tables are the time, in Modified Julian Days (MJD = JD-2400000.5), in column one; the observed rate of change of period (acceleration), the acceleration attributed to solar-radiation pressure, and the acceleration resulting from air drag, in columns two, three, and four; the common logarithms of the density at perigee and at the standard height, in columns five and six; the asymptotic temperature computed from Nicolet's model, in column seven; the height of perigee above the geoid, in column eight; the right ascension of perigee minus the right ascension of the sun, in column nine; and the angular distance between perigee and the subsolar point and the angular distance between perigee and a point 30 degrees in longitude east of the subsolar point that is reasonably close to the center of the diurnal bulge in the atmosphere (Jacchia and Slowey, 1962b), in columns ten and eleven.

Results from field-reduced observations

The temperatures of table 4 are plotted in figure 1, together with the daily geomagnetic index A_p, the 10.7-cm solar flux and the angular distance from the diurnal bulge. The motion of the perigee with respect to the sun is very slow for this satellite, on the average only $0\overset{\circ}{.}16$ per day. During all the time covered by the observations the perigee was in sunlight, and from May to September 1962 it remained in the vicinity of the diurnal bulge. This circumstance makes it relatively easy to discern the semiannual variations (Paetzold and Zschörner, 1960), which are shown in figure 2. The points in the diagram represent means, taken over 28-day intervals, of the temperatures reduced to a standard 10.7-cm solar flux of 100×10^{-22} watts/m^2/cycle/sec bandwidth. The reduction was made with the formula

$$T_{100} = T - 2\overset{\circ}{.}2(F_{10.7}-100) \ .$$

The value $2\overset{\circ}{.}2$ of the coefficient $dT/dF_{10.7}$ is the one that best fits the observed amplitudes of the "27-day" oscillations for the present material. Its being a little lower than the value $2\overset{\circ}{.}5$ derived earlier (Jacchia and Slowey, 1962b) would indicate that the coefficient is not larger in daytime, as had been previously surmised (Paetzold, 1962; Harris and Priester, 1962; Jacchia, 1962). The semiamplitude of the semiannual variation, as derived from figure 2, is approximately 35° for the time covered by the observations, or less than 1/3 of the value it appeared to have in 1958 (Jacchia and Slowey, 1962b). There is no clear evidence for unequal minima (annual effect) as found by Paetzold.

Computation of precision orbits

Computation of orbital elements from the precisely reduced observations was greatly complicated by the fluctuations resulting from the several significant perturbations acting on the orbit. We computed orbital elements at two-day intervals, using observations within a four-day interval centered on the epoch and varying only the constant and linear terms in all of the elements except the mean anomaly. In order to determine the higher-order derivatives beforehand--and to separate the results into physically meaningful terms--we first determined the major perturbations. We computed the theoretical luni-solar and solar-radiation pressure perturbations by using computer programs developed for this purpose by Kozai (1959, 1961). The perturbations resulting from the longitude-dependent terms in the earth's potential, the "ellipticity of the equator," were evaluated in terms of the simplified theory developed by Izsak (1961). The ellipticity of the equator causes long-periodic perturbations, each with a period of about 12 hours, in all of the elements except the eccentricity and the semimajor axis. The combined effect of these can be seen in figure 3. Residuals in mean anomaly, taken with the ellipticity perturbations entirely neglected, are plotted at the top of

the figure; residuals from the same reference orbit, but with the ellipticity perturbations included, are plotted at the bottom of the figure. It is obvious that, in any event, the oscillations in mean anomaly that would otherwise have been present made it necessary to eliminate these perturbations prior to the analysis of air drag. This was done upon making an independent solution for the constants in Izsak's theory. We then computed the important perturbations caused by the odd harmonics in the earth's potential and determined preliminary orbits.

The preliminary orbits were used to obtain an empirical determination of the important perturbations caused by the odd harmonics. The residuals in the elements left after subtracting all of the major perturbations were then fitted by least squares. These residuals are owing in part to the air drag perturbations caused by the rotation of the atmosphere. Final orbits were then computed and the residuals again fitted by least squares.

Least-squares fitting of the elements was made over periods of 26 days with a six-day overlap between sections. The fitted elements are those in table 3. The various sine terms represent one or another of the major perturbations. The solar-radiation pressure perturbation is always taken up in the polynomial part, which is why it was necessary to go to so high a degree in the polynomial. A portion of the results is plotted for one element, the inclination, in figure 4. The perturbations caused by solar-radiation pressure, the third harmonic in the geopotential, and the luni-solar attractions are plotted individually at the top of the figure; the sum of these, with an arbitrary zero point, is plotted at the bottom, directly over the computed values. The curve through the computed points represents the least-squares fit to this element. Considering that the air drag and the higher-order terms in the geopotential have been entirely neglected in drawing the curve representing the perturbations, the agreement between the two curves is quite good. As the figure shows, the accuracy of an individual determination of the inclination was about .0002 degree, less than one second of arc.

Atmospheric perturbations related to magnetic storms

The temperatures of table 5 are plotted in figures 5 and 6. These diagrams show at first glance that every geomagnetic perturbation, even the smaller ones, has its counterpart in an atmospheric perturbation. Forty-six atmospheric perturbations related to geomagnetic disturbances can be recognized in the 283-day interval covered by the observations--on the average one every six days. A list of these perturbations is given in table 6. In this table Δa_p is the amplitude of the three-hourly geomagnetic index a_p, obtained from a curve, smoothed to match the smoothing that comes from the finite resolution of the drag data which result in the temperature increase ΔT of the following column. The three columns that follow give the time lag ΔT between the geomagnetic and the atmospheric perturbation: Δt_1 at time t_1 corresponding to the point

halfway up in the ordinates, and Δt_M at maximum and Δt_2 at time t_2 corresponding to the point halfway down in the ordinates. The last column gives the time difference $t_2 - t_1$.

As can be seen, Δt_M is systematically positive, and its average value is $0^{d}.22$, or about five hours. The time lag can be noticed at a glance in figure 7, which depicts two atmospheric perturbations compared with geomagnetic disturbances. The fact that $\Delta t_1 < \Delta t_M < \Delta t_2$, taken at face value, would indicate that the atmospheric perturbation lasts longer than the geomagnetic disturbance. It is more probable that it is actually an effect of the finite resolution of the drag data: as the resolution increases, the maxima become sharper and narrower, until--for time resolutions much higher than the characteristic time of the perturbation--the correct picture is reached. For an illustration of this effect, see figure 8, in which data from field-reduced observations are compared with accurately reduced observations. If we accept this explanation, the observed amplitudes ΔT must be multiplied by a factor $f = 1 + (\Delta t_2 - \Delta t_1)/(t_2 - t_1) = 1.2$ to obtain the true amplitudes.

As can be seen from figure 9, the relation between ΔT and Δa_p is, for all practical purposes, linear. From the diagram we obtain $\Delta T = 1^{\circ}.0\ \Delta a_p$; if, however, we accept the reality of the factor f, we should have $\Delta T = 1^{\circ}.2\ \Delta a_p$.

It would be of the highest interest to study the dependence of the amplitude and time lag of the atmospheric perturbation on geomagnetic latitude. Unfortunately, the low orbital inclination ($38^{\circ}.8$) of the Explorer IX satellite prevents such an investigation.

Acknowledgement

The assistance of Mrs. Helene Cornelius and Mrs. Mary M. Thorndike is gratefully acknowledged.

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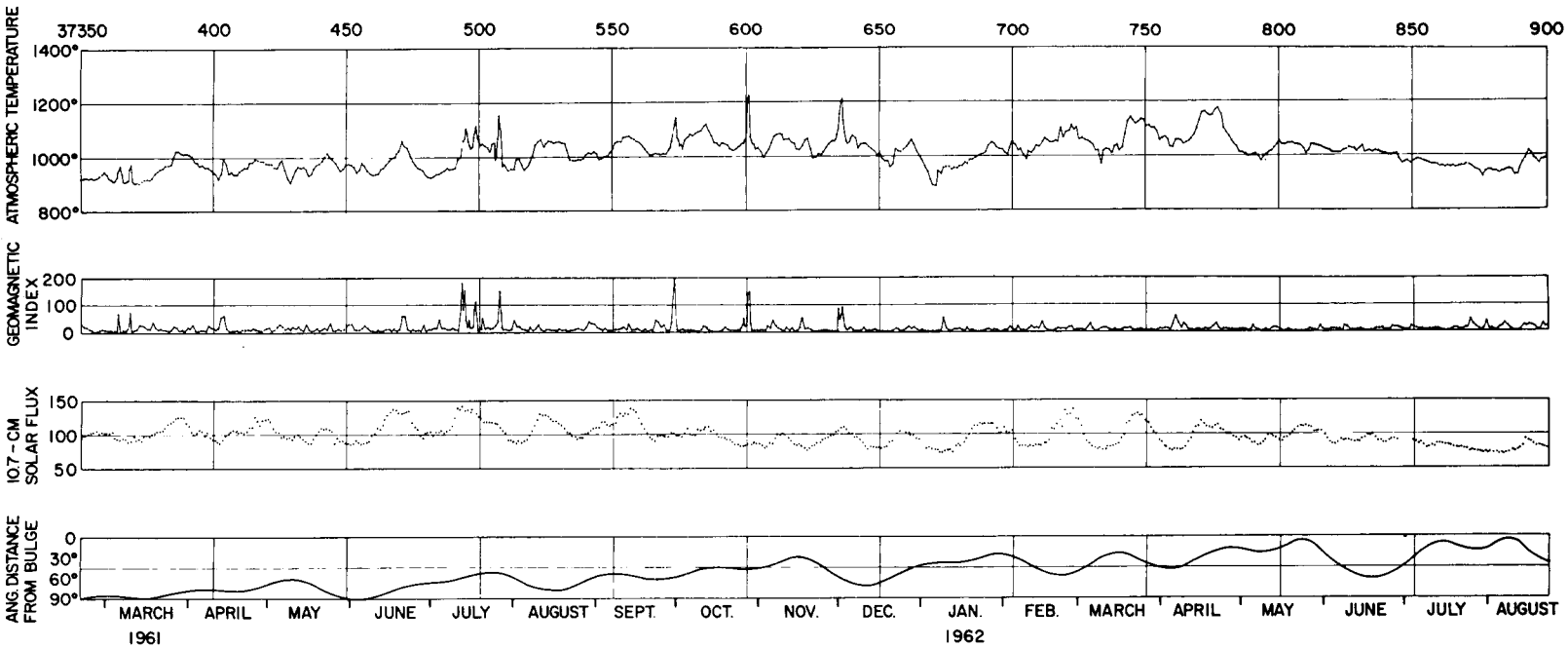

Figure 1.--Atmospheric temperature ($^{\circ}K$) from field-reduced observations of Satellite 1961 δ1 compared with the daily geomagnetic index A_p, the 10.7-cm. solar flux, and the angular distance of perigee from the diurnal bulge (assuming a lag angle of 30°).

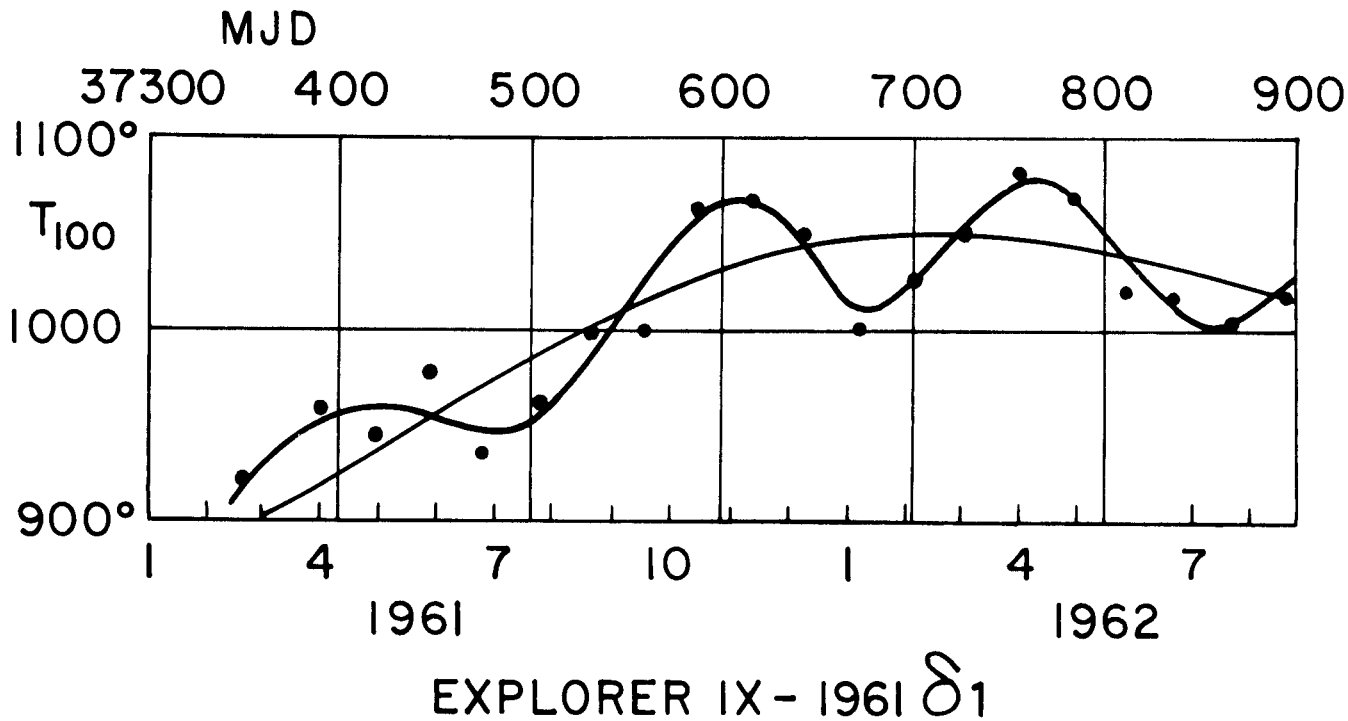

Figure 2.--The semiannual variations in the temperature of the atmosphere from field-reduced observations of Satellite 1961 δ1. The plotted points are 28-day means of the "corrected" temperature

$$T_{100} = T - 2\overset{\circ}{.}2(F_{10.7}-100),$$

where $F_{10.7}$ is the 10.7-cm solar flux in watts/m^2/cycle/sec bandwidth.

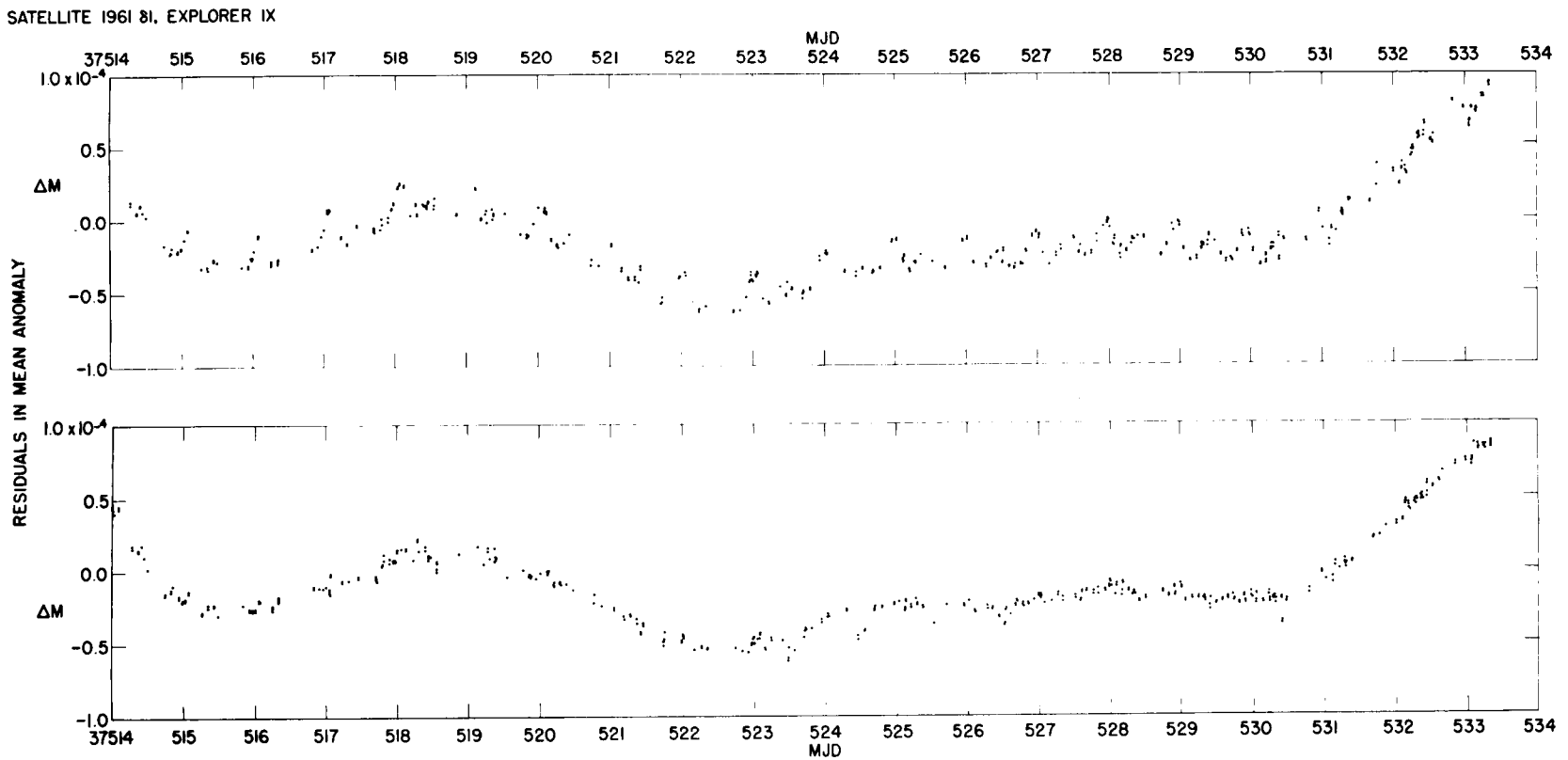

Figure 3.--The 12-hour oscillations in mean anomaly caused by the ellipticity of the earth's equator. Precisely reduced observations of Satellite 1961 δ1 are plotted in the upper diagram with the ellipticity perturbations eliminated from the reference orbit. The perturbations have been included in the lower diagram.

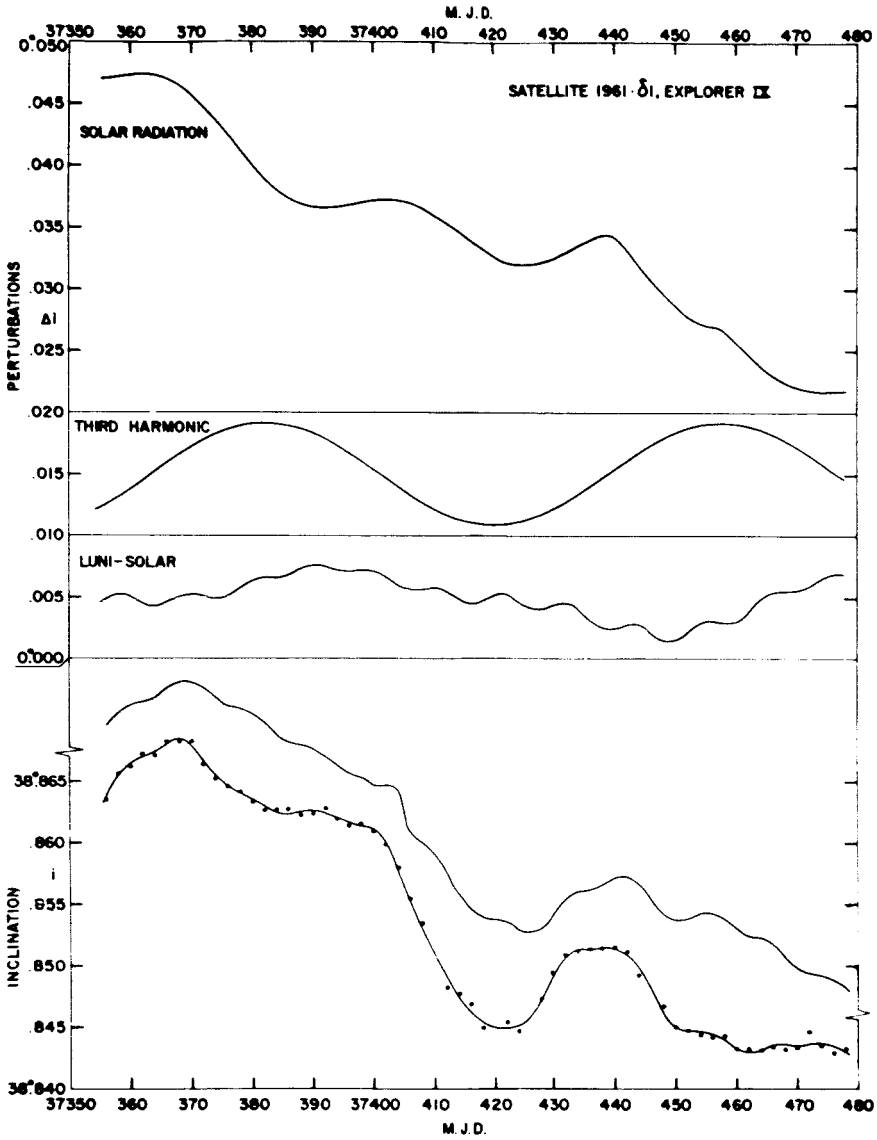

Figure 4.--The orbital inclination of Satellite 1961 δ1 determined from precisely reduced observations. The least-squares fit to the computed points is shown in the lower diagram, with the sum of the three perturbations shown plotted above it.

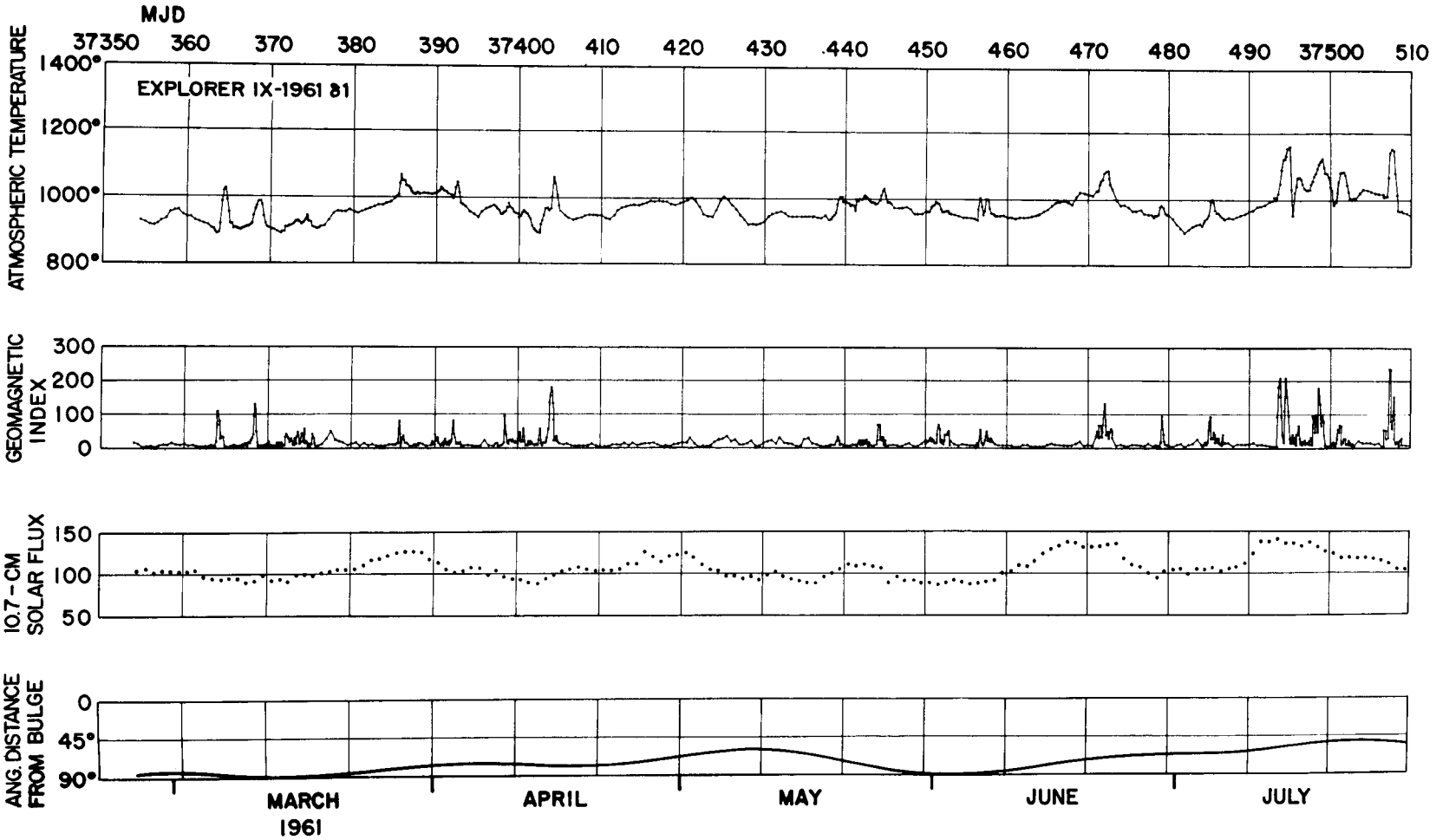

Figure 5.--Atmospheric temperature ($^{\circ}$K) from precisely reduced observations of Satellite 1961 δ1, compared with the geomagnetic index, the 10.7-cm. flux and the angular distance of perigee from the diurnal bulge (assuming a lag angle of 30°).

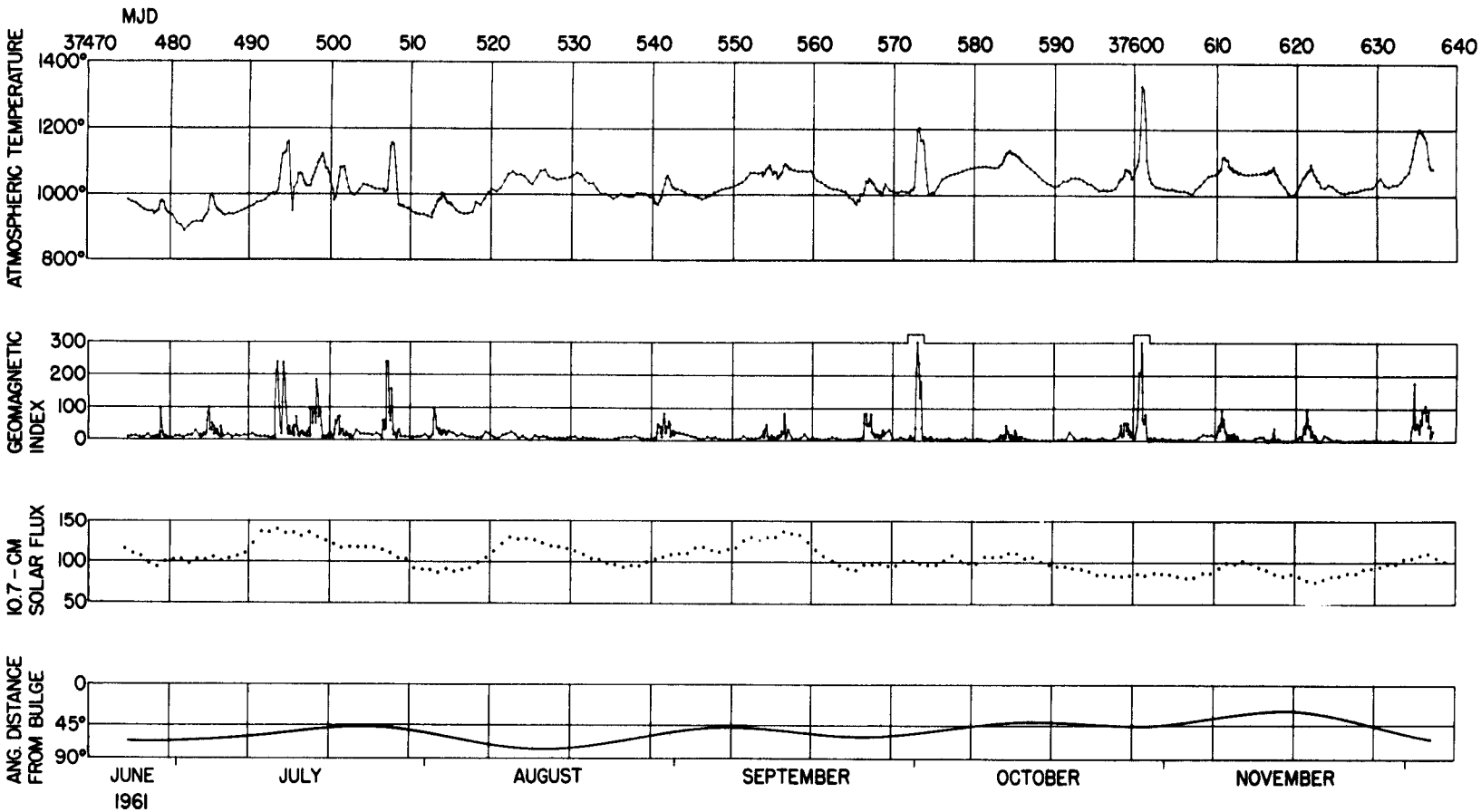

Figure 6.--Continuation of figure 5.

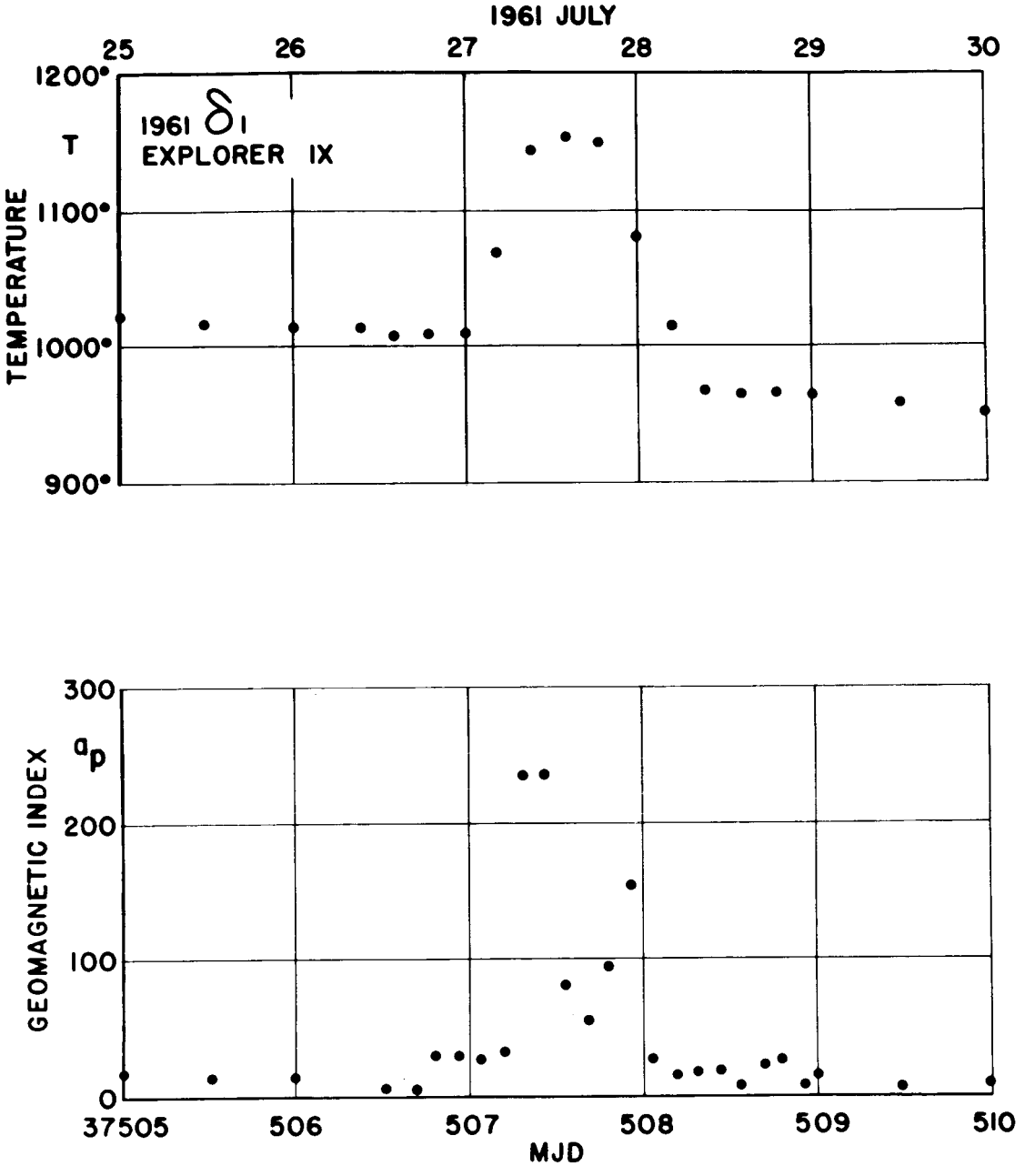

Figure 7.--Two atmospheric perturbations compared with the corresponding geomagnetic disturbances.

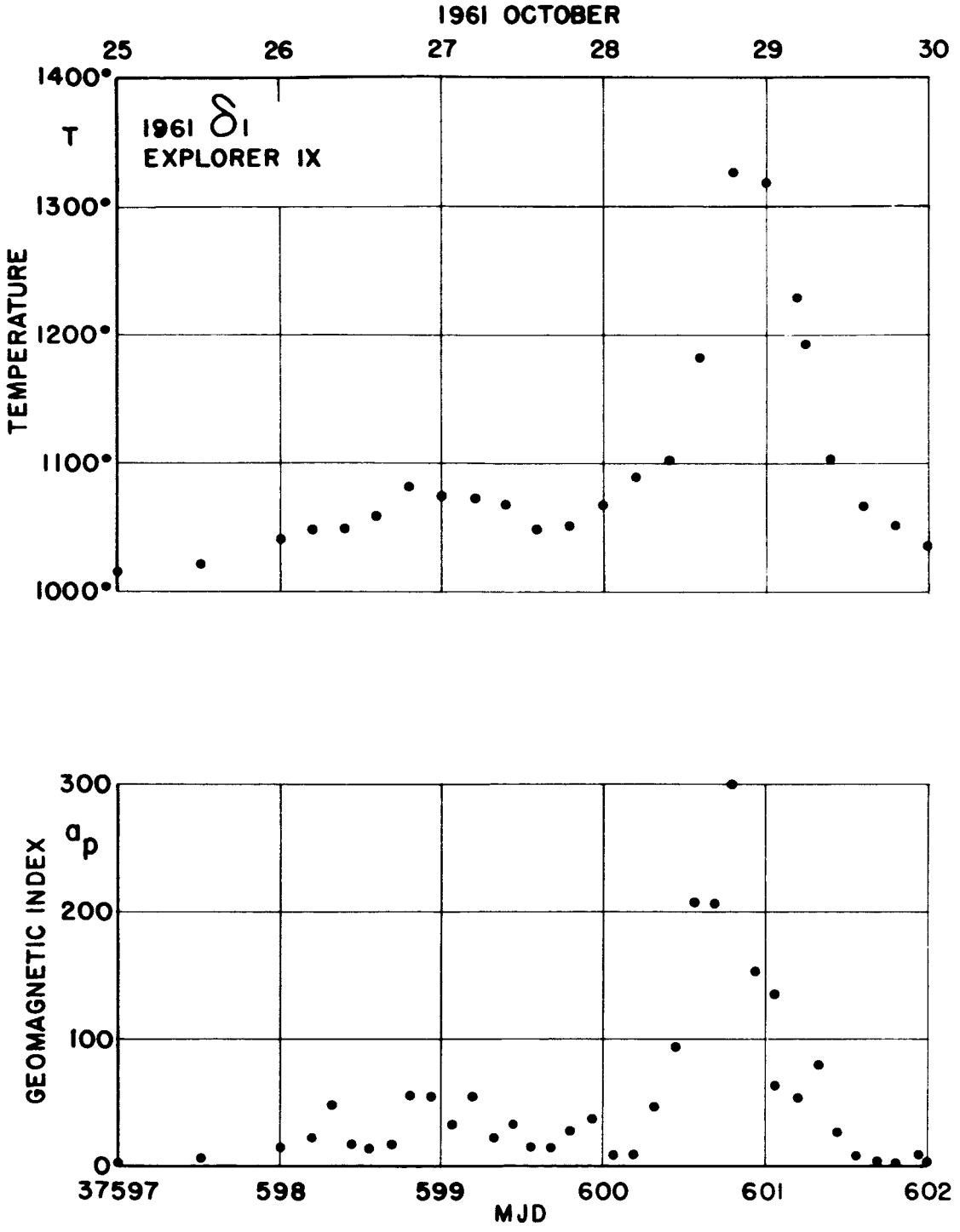

Figure 7.---(cont'd).

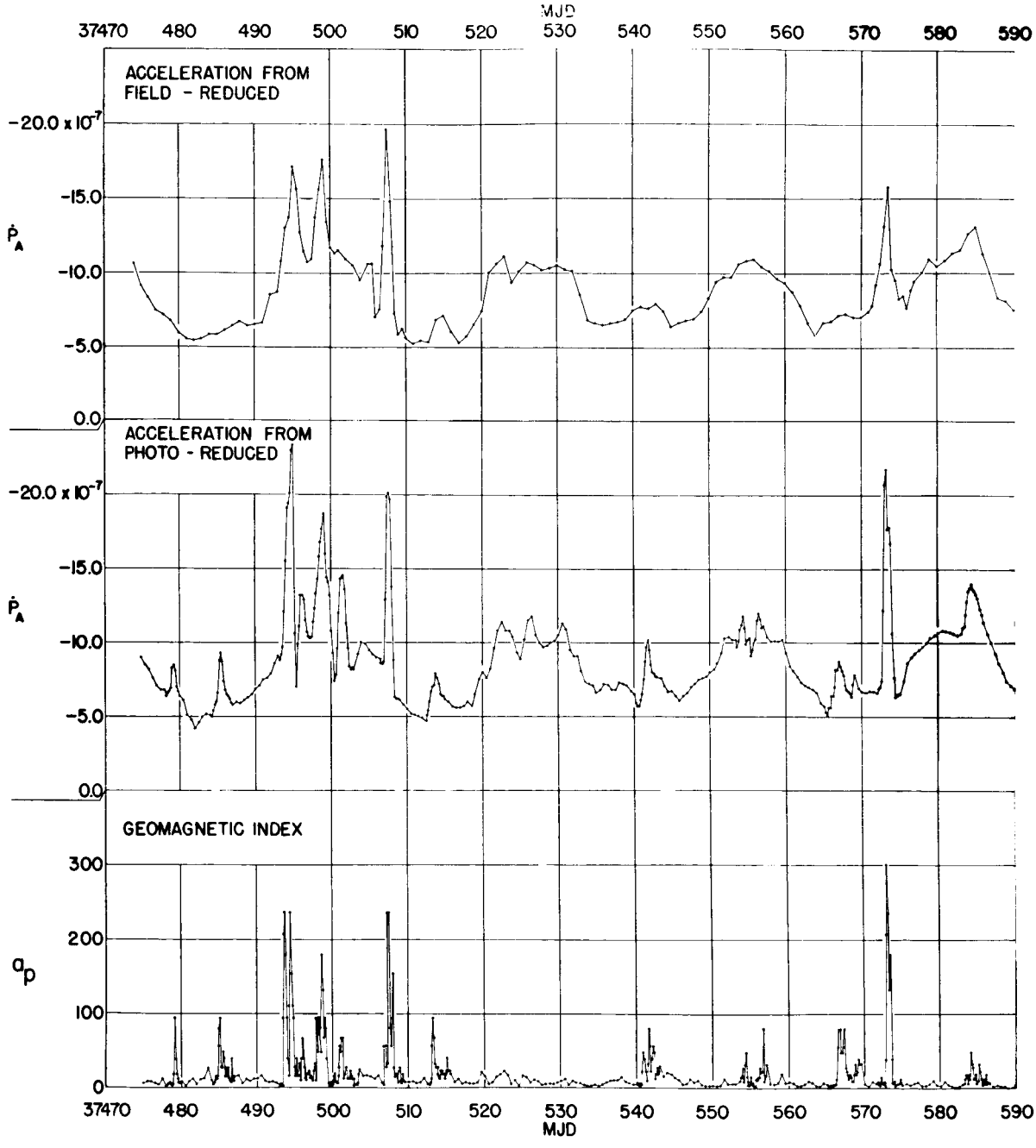

Figure 8.--A comparison of results from field-reduced and precisely reduced observations of Satellite 1961 δ1. The rate of change of period owing to atmospheric drag is plotted in each case, together with the three-hourly geomagnetic index, a_p.

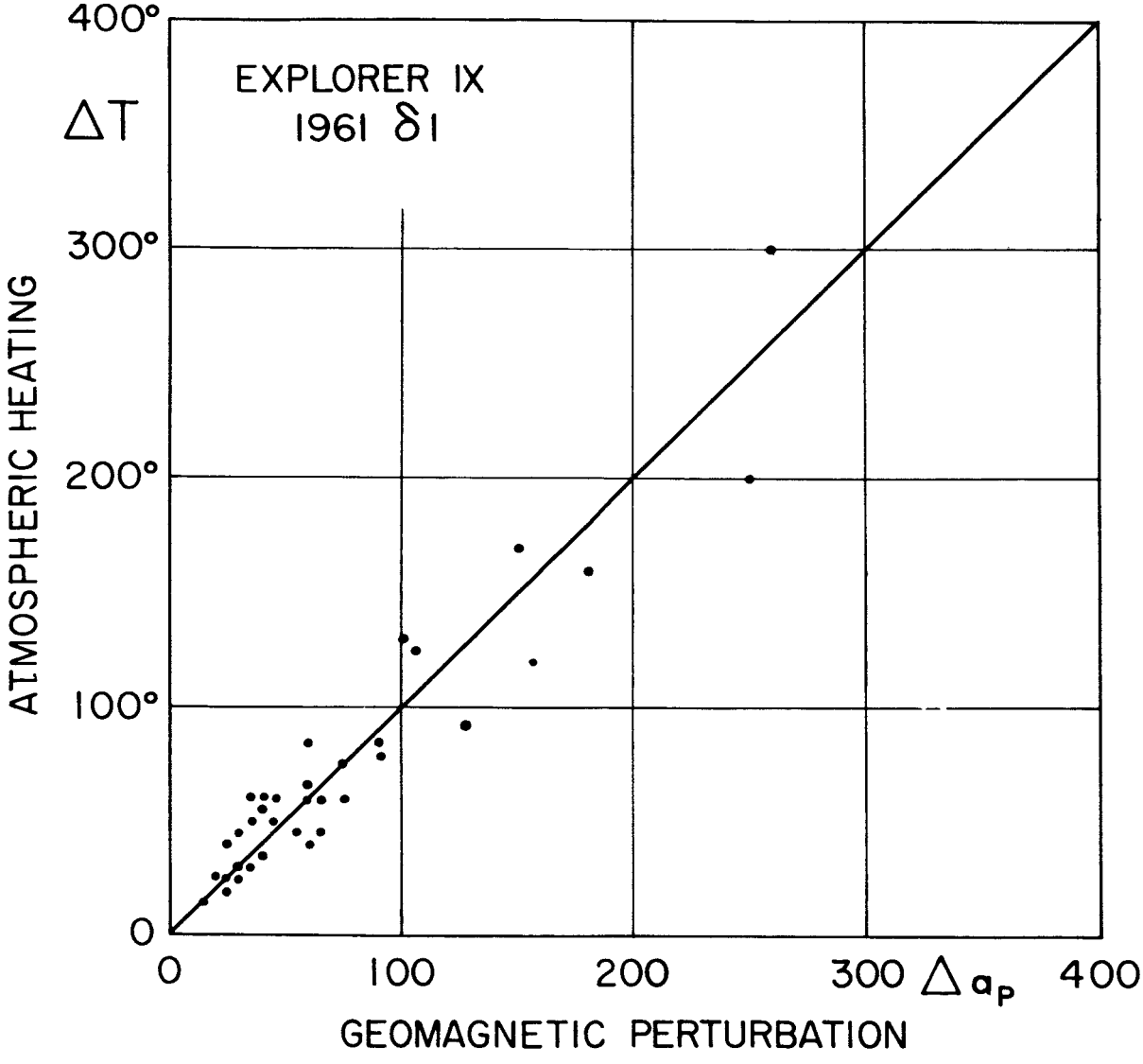

Figure 9.--Atmospheric heating ($^{\circ}$K) as a function of the amplitude of the corresponding geomagnetic disturbance, Δa_p. The plotted points represent the data of table 6.

Table 1

Standard Heights

Field-reduced observations

Time interval		Standard height (km)
MJD	37349 - 37393	660
	37394 - 37430	680
	37431 - 37462	700
	37463 - 37504	720
	37505 - 37562	740
	37563 - 37629	750
	37630 - 37780	760
	37781 - 37830	750
	37831 - 37880	740
	37881 - 37919	720

Precisely reduced observations

Time interval		Standard height (km)
MJD	37354.5 - 37396.5	660
	37397.0 - 37437.0	680
	37437.5 - 37476.0	700
	37476.5 - 37517.5	720
	37518.0 - 37557.0	740
	37557.0 - 37597.5	750
	37598.0 - 37637.0	760

Table 2

Least-Squares Fitting of Orbital Elements Determined from Field-Reduced Observations

Satellite 1961 $\delta 1$ (Explorer IX)

Section 1: MJD 37554 to 37635 (September 12 to December 2, 1961)

$$T_o = 37554.0$$

$$\omega = 8^\circ.998 + 4^\circ.77717t + {}^\circ.801(10)^{-4}t^2 + {}^\circ.286 \sin(97.67 + 4.785t)$$

$$\Omega = 137^\circ.5784 - 3^\circ.624329t - {}^\circ.00033473t^2 + {}^\circ.108032(10)^{-4}t^3 - {}^\circ.139014(10)^{-6}t^4 + {}^\circ.61979(10)^{-9}t^5$$

$$i = 38^\circ.8387 - {}^\circ.000791t + {}^\circ.833(10)^{-5}t^2 + {}^\circ.0092 \sin(222.21 + 4.785t)$$

$$e = .107733 - .4777(10)^{-4}t + .2410(10)^{-6}t^2 + .000643 \sin(9.77 + 4.785t)$$

$$M = .04491 + 12.174296t + .29184(10)^{-4}t^2 + .41425(10)^{-6}t^3 - .62718(10)^{-8}t^4 + .35182(10)^{-10}t^5$$

Section 2: MJD 37625 to 37685 (November 22, 1961 to January 21, 1962)

$$T_o = 37625.0$$

$$\omega = 348^\circ.349 + 4^\circ.80291t - {}^\circ.0002502t^2 + {}^\circ.495 \sin(86.88 + 4.785t)$$

$$\Omega = 240^\circ.0207 - 3^\circ.627750t - {}^\circ.00016769t^2 - {}^\circ.13658(10)^{-5}t^3 + {}^\circ.119921(10)^{-6}t^4 - {}^\circ.109010(10)^{-8}t^5$$

$$i = 38^\circ.8098 + {}^\circ.001502t - {}^\circ.2491(10)^{-4}t^2 + {}^\circ.0184 \sin(142.54 + 4.785t)$$

$$e = .105431 - .1656(10)^{-4}t + .1884(10)^{-6}t^2 + .001507 \sin(353.69 + 4.785t)$$

$$M = .61966 + 12.179948t + .80816(10)^{-4}t^2 + .51302(10)^{-6}t^3 - .315811(10)^{-7}t^4 + .261333(10)^{-9}t^5$$

Section 3: MJD 37675 to 37735 (January 11 to March 12, 1962)

$$T_o = 37675.0$$

$$\omega = 227^\circ.961 + 4^\circ.77206t + {}^\circ.0003249t^2 + {}^\circ.431 \sin(312.35 + 4.785t)$$

$$\Omega = 58^\circ.4494 - 3^\circ.625949t - {}^\circ.00044574t^2 + {}^\circ.214917(10)^{-4}t^3 - {}^\circ.459467(10)^{-6}t^4 + {}^\circ.329642(10)^{-8}t^5$$

$$i = 38^\circ.8214 + {}^\circ.000452t - {}^\circ.1049(10)^{-4}t^2 + {}^\circ.0062 \sin(95.63 + 4.785t)$$

$$e = .104488 + .3456(10)^{-4}t - .7430(10)^{-6}t^2 + .000870 \sin(195.81 + 4.785t)$$

$$M = .76753 + 12.184247t + .17586(10)^{-4}t^2 + .8623(10)^{-7}t^3 + .128975(10)^{-7}t^4 - .131576(10)^{-9}t^5$$

Section 4: MJD 37725 to 37785 (March 2 to May 1, 1962)

$$T_o = 37725.0$$

$$\omega = 107^\circ.456 + 4^\circ.77915t + {}^\circ.0003301t^2 + {}^\circ.204 \sin(237.09 + 4.8005t)$$

$$\Omega = 236^\circ.8828 - 3^\circ.636793t + {}^\circ.00027559t^2 - {}^\circ.111040(10)^{-4}t^3 + {}^\circ.17222(10)^{-6}t^4 - {}^\circ.10123(10)^{-8}t^5$$

$$i = 38^\circ.8241 - {}^\circ.000302t + {}^\circ.470(10)^{-5}t^2 + {}^\circ.0098 \sin(270.00 + 4.8005t)$$

$$e = .105271 - .6180(10)^{-4}t + .9778(10)^{-6}t^2 + .87(10)^{-4} \sin(202.14 + 4.8005t)$$

$$M = .07497 + 12.188834t + .42584(10)^{-4}t^2 + .60663(10)^{-6}t^3 - .38818(10)^{-8}t^4 - .53(10)^{-13}t^5$$

Section 5: MJD 37775 to 37835 (April 21 to June 20, 1962)

$$T_o = 37775.0$$

$$\omega = 347^\circ.118 + 4^\circ.81331t - .0002713t^2 + {}^\circ.305 \sin(93.85 + 4.8005t)$$

$$\Omega = 55^\circ.1040 - 3^\circ.638312t - {}^\circ.407(10)^{-5}t^2 - {}^\circ.56026(10)^{-5}t^3 + {}^\circ.13451(10)^{-6}t^4 - {}^\circ.10180(10)^{-8}t^5$$

$$i = 38^\circ.8182 + {}^\circ.000646t - {}^\circ.1119(10)^{-4}t^2 + {}^\circ.0123 \sin(143.62 + 4.8005t)$$

$$e = .104784 - .202(10)^{-5}t + .6590(10)^{-6}t^2 + .000633 \sin(347.37 + 4.8005t)$$

$$M = .67349 + 12.195821t + .93593(10)^{-4}t^2 - .149106(10)^{-5}t^3 + .333094(10)^{-7}t^4 - .223581(10)^{-9}t^5$$

Section 6: MJD 37825 to 37885 (June 10 to August 9, 1962)

$$T_o = 37825.0$$

$$\omega = 227^\circ.272 + 4^\circ.78131t + {}^\circ.0003144t^2 + {}^\circ.311 \sin(298.60 + 4.8005t)$$

$$\Omega = 232^\circ.9967 - 3^\circ.643098t - {}^\circ.00052821t^2 + {}^\circ.201731(10)^{-4}t^3 - {}^\circ.34381(10)^{-6}t^4 + {}^\circ.20506(10)^{-8}t^5$$

$$i = 38^\circ.8364 - {}^\circ.001066t + {}^\circ.1878(10)^{-4}t^2 + {}^\circ.0093 \sin(316.56 + 4.8005t)$$

$$e = .105472 + .00010794t - .11733(10)^{-5}t^2 + .000571 \sin(143.24 + 4.8005t)$$

$$M = .65038 + 12.203697t + .99463(10)^{-4}t^2 - .24182(10)^{-5}t^3 + .450250(10)^{-7}t^4 - .271501(10)^{-9}t^5$$

Section 7: MJD 37875 to 37919 (July 30 to September 12, 1962)

$$T_o = 37875.0$$

$$\omega = 107^\circ.272 + 4^\circ.79566t + {}^\circ.0002154t^2 + {}^\circ.206 \sin(228.35 + 4.8005t)$$

$$\Omega = 50^\circ.5351 - 3^\circ.652568t - {}^\circ.6320(10)^{-4}t^2 + {}^\circ.15125(10)^{-5}t^3 - {}^\circ.10800(10)^{-6}t^4 + {}^\circ.14491(10)^{-8}t^5$$

$$i = 38^\circ.8272 + {}^\circ.001327t - {}^\circ.2476(10)^{-4}t^2 + {}^\circ.0077 \sin(181.18 + 4.8005t)$$

$$e = .107808 + .5045(10)^{-4}t - .964(10)^{-7}t^2 + .000511 \sin(135.60 + 4.8005t)$$

$$M = .97814 + 12.209616t + .52228(10)^{-4}t^2 + .88431(10)^{-6}t^3 + .14894(10)^{-8}t^4 - .117578(10)^{-9}t^5$$

Table 3

Least-Squares Fitting of Orbital Elements Determined from Precisely Reduced Observations

Satellite 1961 δ1 (Photo-reduced observations)

Section 1: MJD 37354 to 37380 (February 24 to March 22, 1961)

$$T_o = 37354.0$$

$$\omega = 135^\circ.1966 + 4^\circ.766207t + {}^\circ.0011315t^2 - {}^\circ.000118344t^3 + {}^\circ.43197 \times 10^{-5}t^4 - {}^\circ.59613 \times 10^{-7}t^5$$
$$+ {}^\circ.2636 \sin(224.98 + 4.77t) + {}^\circ.0090 \sin(269.96 + 9.54t) + {}^\circ.0029 \sin(310.33 + 24.0t)$$

$$\Omega = 143^\circ.8977 - 3^\circ.637659t - {}^\circ.00033054t^2 + {}^\circ.551162 \times 10^{-4}t^3 - {}^\circ.261850 \times 10^{-5}t^4$$
$$+ {}^\circ.403412 \times 10^{-7}t^5 + {}^\circ.00694 \sin(224.98 + 4.77t) + {}^\circ.00050 \sin(214.83 + 34.06t)$$
$$+ {}^\circ.00212 \sin(313.2 + 729.2379t)$$

$$i = 38^\circ.86447 - {}^\circ.0001106t + {}^\circ.9266 \times 10^{-4}t^2 - {}^\circ.80982 \times 10^{-5}t^3 + {}^\circ.21654 \times 10^{-6}t^4$$
$$- {}^\circ.16904 \times 10^{-8}t^5 + {}^\circ.00418 \sin(314.98 + 4.77t) + {}^\circ.00036 \sin(294.49 + 34.06t)$$
$$+ {}^\circ.00170 \sin(43.2 + 729.2379t)$$

$$e = .1209121 - .000103362t + .26987 \times 10^{-5}t^2 - .208909 \times 10^{-6}t^3 + .80484 \times 10^{-8}t^4$$
$$- .119001 \times 10^{-9}t^5 + .0005262 \sin(134.98 + 4.77t) + .255 \times 10^{-4} \sin(179.96 + 9.54t)$$
$$+ .73 \times 10^{-5} \sin(58.37 + 24.0t)$$

$$M = .59090 + 12.160284t + .11759 \times 10^{-4}t^2 + .212722 \times 10^{-5}t^3 - .89665 \times 10^{-7}t^4$$
$$+ .118123 \times 10^{-8}t^5 + .45 \times 10^{-5} \sin(313.2 + 729.2379t)$$

Section 2: MJD 37374 to 37400 (March 16 to April 11, 1961)

$$T_o = 37374.0$$

$$\omega = 230^\circ.5312 + 4^\circ.754267t + {}^\circ.001008578t^2 - {}^\circ.0001045441t^3 + {}^\circ.4971981 \times 10^{-5}t^4$$
$$- {}^\circ.7625789 \times 10^{-7}t^5 + {}^\circ.2636 \sin(320.38 + 4.77t) + {}^\circ.0090 \sin(100.76 + 9.54t)$$
$$+ {}^\circ.0037 \sin(97.48 + 24.0t)$$

$$\Omega = 71^\circ.16175 - 3^\circ.635338t - {}^\circ.00013818t^2 + {}^\circ.141311 \times 10^{-4}t^3 - {}^\circ.4587 \times 10^{-6}t^4$$
$$+ {}^\circ.55694 \times 10^{-8}t^5 + {}^\circ.00694 \sin(320.38 + 4.77t) + {}^\circ.00039 \sin(170.40 + 34.06t)$$
$$+ {}^\circ.00212 \sin(138.0 + 729.2379t)$$

$$i = 38^\circ.86357 - {}^\circ.0004551t - {}^\circ.966 \times 10^{-5}t^2 + {}^\circ.23827 \times 10^{-5}t^3 - {}^\circ.9669 \times 10^{-7}t^4$$
$$+ {}^\circ.13283 \times 10^{-8}t^5 + {}^\circ.00418 \sin(50.38 + 4.77t) + {}^\circ.00023 \sin(255.23 + 34.06t)$$
$$+ {}^\circ.00170 \sin(228.0 + 729.2379t)$$

$$e = .1191650 - .88200 \times 10^{-4}t + .10623 \times 10^{-5}t^2 - .249949 \times 10^{-6}t^3 + .133439 \times 10^{-7}t^4$$
$$- .210470 \times 10^{-9}t^5 + .0005262 \sin(230.38 + 4.77t) + .255 \times 10^{-4} \sin(10.76 + 9.54t)$$
$$+ .77 \times 10^{-5} \sin(169.42 + 24.0t)$$

$$M = .80768 + 12.161488t - .15903 \times 10^{-4}t^2 + .289629 \times 10^{-5}t^3 + .13792 \times 10^{-7}t^4$$
$$- .170695 \times 10^{-8}t^5 + .45 \times 10^{-5} \sin(138.0 + 729.2379t)$$

Section 3: MJD 37394 to 37420 (April 5 to May 1, 1961)

$$T_o = 37394.0$$

$$\omega = 325^\circ.7357 + 4^\circ.763287t + {}^\circ.001903773t^2 - {}^\circ.0002036114t^3 + {}^\circ.861301 \times 10^{-5}t^4$$
$$- {}^\circ.1266827 \times 10^{-6}t^5 + {}^\circ.2636 \sin(55.78 + 4.77t) + {}^\circ.0090 \sin(291.56 + 9.54t)$$
$$+ {}^\circ.0032 \sin(189.18 + 24.0t)$$

$$\Omega = 358^\circ.4570 - 3^\circ.634068t + {}^\circ.9416 \times 10^{-4}t^2 - {}^\circ.10032 \times 10^{-4}t^3 + {}^\circ.65420 \times 10^{-6}t^4$$
$$- {}^\circ.138528 \times 10^{-7}t^5 + {}^\circ.00694 \sin(55.78 + 4.77t) + {}^\circ.00050 \sin(144.04 + 34.06t)$$
$$+ {}^\circ.00212 \sin(322.7 + 729.2379t)$$

$$i = 38^\circ.85843 - {}^\circ.0004914t + {}^\circ.00022869t^2 - {}^\circ.301274 \times 10^{-4}t^3 + {}^\circ.138714 \times 10^{-5}t^4$$
$$- {}^\circ.214012 \times 10^{-7}t^5 + {}^\circ.00418 \sin(145.78 + 4.77t) + {}^\circ.00031 \sin(237.99 + 34.06t)$$
$$+ {}^\circ.00170 \sin(52.7 + 729.2379t)$$

$$e = .1172943 - .90322 \times 10^{-4}t + .17404 \times 10^{-5}t^2 - .121074 \times 10^{-6}t^3 + .50153 \times 10^{-8}t^4$$
$$- .86994 \times 10^{-10}t^5 + .0005262 \sin(325.78 + 4.77t) + .255 \times 10^{-4} \sin(201.56 + 9.54t)$$
$$+ .73 \times 10^{-5} \sin(277.19 \times 24.0t)$$

$$M = .05102 + 12.163450t + .18051 \times 10^{-4}t^2 + .126857 \times 10^{-5}t^3 - .66850 \times 10^{-7}t^4$$
$$+ .126477 \times 10^{-8}t^5 + .45 \times 10^{-5} \sin(322.7 + 729.2379t)$$

Section 4: MJD 37414 to 37440 (April 25 to May 21, 1961)

$$T_o = 37414.0$$

$$\omega = 61^\circ.10490 + 4^\circ.776469t - {}^\circ.0023894t^2 + {}^\circ.000248334t^3 - {}^\circ.93386 \times 10^{-5}t^4 + {}^\circ.120774 \times 10^{-6}t^5$$
$$+ {}^\circ.2636 \sin(151.18 + 4.77t) + {}^\circ.0090 \sin(122.36 + 9.54t) + {}^\circ.0035 \sin(320.19 + 24.0t)$$

$$\Omega = 285^\circ.7947 - 3^\circ.633765t + {}^\circ.9145407 \times 10^{-4}t^2 - {}^\circ.4667237 \times 10^{-5}t^3 + {}^\circ.3613138 \times 10^{-6}t^4$$
$$- {}^\circ.803777 \times 10^{-8}t^5 + {}^\circ.00694 \sin(151.18 + 4.77t) + {}^\circ.00053 \sin(78.49 + 34.06t)$$
$$+ {}^\circ.00212 \sin(147.5 + 729.2379t)$$

$$i = 38^\circ.85301 + {}^\circ.3910577 \times 10^{-4}t - {}^\circ.0001853171t^2 + {}^\circ.2402383 \times 10^{-4}t^3 - {}^\circ.1064077 \times 10^{-5}t^4$$
$$+ {}^\circ.1556108 \times 10^{-7}t^5 + {}^\circ.00418 \sin(241.18 + 4.77t) + {}^\circ.00047 \sin(183.96 + 34.06t)$$
$$+ {}^\circ.00170 \sin(237.5 + 729.2379t)$$

$$e = .1157366 - .6544083 \times 10^{-4}t - .5125521 \times 10^{-5}t^2 + .5614901 \times 10^{-6}t^3 - .2186490 \times 10^{-7}t^4$$
$$+ .309767 \times 10^{-9}t^5 + .0005262 \sin(61.18 + 4.77t) + .255 \times 10^{-4} \sin(32.36 + 9.54t)$$
$$+ .60 \times 10^{-5} \sin(51.61 + 24.0t)$$

$$M = .33069 + 12.164555t + .51827 \times 10^{-4}t^2 - .95671 \times 10^{-6}t^3 - .11031 \times 10^{-7}t^4$$
$$+ .69764 \times 10^{-9}t^5 + .45 \times 10^{-5} \sin(147.5 + 729.2379t)$$

Section 5: MJD 37434 to 37460 (May 15 to June 10, 1961)

$$T_o = 37434.0$$

$$\omega = 156^\circ.5558 + 4^\circ.770480t + {}^\circ.0022718t^2 - {}^\circ.00024620t^3 + {}^\circ.86989 \times 10^{-5}t^4 - {}^\circ.108987 \times 10^{-6}t^5$$
$$+ {}^\circ.2636 \sin(246.58 + 4.77t) + {}^\circ.0090 \sin(313.16 + 9.54t) + {}^\circ.0032 \sin(90.00 + 24.0t)$$

$$\Omega = 213^\circ.1503 - 3^\circ.629788t - {}^\circ.00018437t^2 + {}^\circ.50467 \times 10^{-5}t^3 - {}^\circ.17133 \times 10^{-6}t^4$$
$$+ {}^\circ.37500 \times 10^{-8}t^5 + {}^\circ.00694 \sin(246.58 + 4.77t) + {}^\circ.00055 \sin(31.11 + 34.06t)$$
$$+ {}^\circ.00212 \sin(332.2 + 729.2379t)$$

$$i = 38^\circ.85060 + {}^\circ.0003084t - {}^\circ.8389 \times 10^{-4}t^2 - {}^\circ.1564 \times 10^{-6}t^3 + {}^\circ.23012 \times 10^{-6}t^4$$
$$- {}^\circ.53006 \times 10^{-8}t^5 + {}^\circ.00418 \sin(336.58 + 4.77t) + {}^\circ.00048 \sin(117.90 + 34.06t)$$
$$+ {}^\circ.00170 \sin(62.2 + 729.2379t)$$

$$e = .1143589 - .40580 \times 10^{-4}t - .8138 \times 10^{-6}t^2 + .206326 \times 10^{-6}t^3 - .125362 \times 10^{-7}t^4$$
$$+ .203202 \times 10^{-9}t^5 + .0005262 \sin(156.58 + 4.77t) + .255 \times 10^{-4} \sin(223.16 + 9.54t)$$
$$+ .60 \times 10^{-5} \sin(178.25 + 24.0t)$$
$$M = .63529 + 12.165800t - .26749 \times 10^{-4}t^2 + .822956 \times 10^{-5}t^3 - .290890 \times 10^{-6}t^4$$
$$+ .358509 \times 10^{-8}t^5 + .45 \times 10^{-5} \sin(332.2 + 729.2379t)$$

Section 6: MJD 37454 to 37480 (June 4 to June 30, 1961)

$$T_o = 37454.0$$
$$\omega = 251^\circ.9442 + 4^\circ.766120t - {}^\circ.0042848t^2 + {}^\circ.000498752t^3 - {}^\circ.222690 \times 10^{-4}t^4 + {}^\circ.355566 \times 10^{-6}t^5$$
$$+ {}^\circ.2636 \sin(341.98 + 4.77t) + {}^\circ.0090 \sin(143.96 + 9.54t) + {}^\circ.0029 \sin(225.34 + 24.0t)$$
$$\Omega = 140^\circ.5054 - 3^\circ.633767t + {}^\circ.00022482t^2 - {}^\circ.238682 \times 10^{-4}t^3 + {}^\circ.141198 \times 10^{-5}t^4$$
$$- {}^\circ.271995 \times 10^{-7}t^5 + {}^\circ.00694 \sin(341.98 + 4.77t) + {}^\circ.00051 \sin(341.73 + 34.06t)$$
$$+ {}^\circ.00212 \sin(157.0 + 729.2379t)$$
$$i = 38^\circ.84189 + {}^\circ.0004860t - {}^\circ.00022850t^2 + {}^\circ.254850 \times 10^{-4}t^3 - {}^\circ.110995 \times 10^{-5}t^4$$
$$+ {}^\circ.170391 \times 10^{-7}t^5 + {}^\circ.00418 \sin(71.98 \times 4.77t) + {}^\circ.00038 \sin(57.42 + 34.06t)$$
$$+ {}^\circ.00170 \sin(247.0 + 729.2379t)$$
$$e = .1135187 - .72658 \times 10^{-4}t + .1256 \times 10^{-6}t^2 - .108608 \times 10^{-6}t^3 + .56326 \times 10^{-8}t^4$$
$$- .76287 \times 10^{-10}t^5 + .0005262 \sin(251.98 + 4.77t) + .255 \times 10^{-4} \sin(53.96 + 9.54t)$$
$$+ .61 \times 10^{-5} \sin(316.81 + 24.0t)$$
$$M = .97134 + 12.168035t + .000135335t^2 - .1290213 \times 10^{-4}t^3 + .556861 \times 10^{-6}t^4$$
$$- .832099 \times 10^{-8}t^5 + .45 \times 10^{-5} \sin(157.0 + 729.2379t)$$

Section 7: MJD 37474 to 37500 (June 24 to July 20, 1961)

$$T_o = 37474.0$$
$$\omega = 347^\circ.1131 + 4^\circ.769534t + {}^\circ.000402312t^2 - {}^\circ.16287 \times 10^{-4}t^3 - {}^\circ.2829 \times 10^{-6}t^4 + {}^\circ.17486 \times 10^{-7}t^5$$
$$+ {}^\circ.2636 \sin(78.54 + 4.7785t) + {}^\circ.0090 \sin(347.68 + 9.5570t) + {}^\circ.0036 \sin(313.98 + 24.00t)$$
$$\Omega = 67^\circ.86804 - 3^\circ.6296232t - {}^\circ.000345585t^2 + {}^\circ.5674117 \times 10^{-4}t^3 - {}^\circ.2854664 \times 10^{-5}t^4$$
$$+ {}^\circ.467970 \times 10^{-7}t^5 + {}^\circ.00694 \sin(67.97 + 4.7785t) + {}^\circ.00038 \sin(297.28 + 34.06t)$$
$$+ {}^\circ.00212 \sin(346.5 + 729.2248t)$$

$$i = 38^\circ.84039 + {}^\circ.00063102t - {}^\circ.0001780757t^2 + {}^\circ.172474 \times 10^{-4}t^3 - {}^\circ.70619 \times 10^{-6}t^4$$
$$+ {}^\circ.102415 \times 10^{-7}t^5 + {}^\circ.00418 \sin(164.49 + 4.7785t) + {}^\circ.00022 \sin(20.59 + 34.06t)$$
$$+ {}^\circ.00170 \sin(76.5 + 729.2248t)$$

$$e = .1118965 - .701186 \times 10^{-4}t - 1418152 \times 10^{-5}t^2 + .2564548 \times 10^{-6}t^3 - .126441 \times 10^{-7}t^4$$
$$+ .200508 \times 10^{-9}t^5 + .0005262 \sin(347.65 + 4.7785t) + .255 \times 10^{-4} \sin(266.29 + 9.5570t)$$
$$+ .75 \times 10^{-5} \sin(73.24 + 24.00t)$$

$$M = .34552 + 12.169123t + .21412 \times 10^{-4}t^2 - .241605 \times 10^{-5}t^3 + .806458 \times 10^{-7}t^4$$
$$- .414974 \times 10^{-9}t^5 + .45 \times 10^{-5} \sin(346.5 + 729.2248t)$$

Section 8: MJD 37494 to 37520 (July 14 to August 9, 1961)

$$T_o = 37494.0$$

$$\omega = 82^\circ.5488 + 4^\circ.769396t + {}^\circ.0007168t^2 - {}^\circ.35197 \times 10^{-4}t^3 + {}^\circ.11210 \times 10^{-5}t^4$$
$$- {}^\circ.17254 \times 10^{-7}t^5 + {}^\circ.2636 \sin(174.11 + 4.7785t) + {}^\circ.0090 \sin(178.82 + 9.5570t)$$
$$+ {}^\circ.0029 \sin(106.63 + 24.00t)$$

$$\Omega = 355^\circ.28432 - 3^\circ.6295306t + {}^\circ.00014826t^2 - {}^\circ.18355 \times 10^{-5}t^3 - {}^\circ.12055 \times 10^{-6}t^4$$
$$+ {}^\circ.24774 \times 10^{-8}t^5 + {}^\circ.00694 \sin(163.54 + 4.7785t) + {}^\circ.00044 \sin(265.26 + 34.06t)$$
$$+ {}^\circ.00212 \sin(171.0 + 729.2248t)$$

$$i = 38^\circ.83980 - {}^\circ.0006651t + {}^\circ.00012919t^2 - {}^\circ.114879 \times 10^{-4}t^3 + {}^\circ.46977 \times 10^{-6}t^4$$
$$- {}^\circ.72686 \times 10^{-8}t^5 + {}^\circ.00418 \sin(260.06 + 4.7785t) + {}^\circ.00033 \sin(4.81 + 34.06t)$$
$$+ {}^\circ.00170 \sin(261.0 + 729.2248t)$$

$$e = .1105921 - .62208 \times 10^{-4}t - .1634 \times 10^{-6}t^2 + .106381 \times 10^{-6}t^3 - .38067 \times 10^{-8}t^4$$
$$+ .43069 \times 10^{-10}t^5 + .0005262 \sin(83.22 + 4.7785t) + .255 \times 10^{-4} \sin(97.43 + 9.5570t)$$
$$+ .78 \times 10^{-5} \sin(183.70 + 24.00t)$$

$$M = .72873 + 12.169347t + .4524 \times 10^{-4}t^2 + .13636 \times 10^{-5}t^3 - .101282 \times 10^{-6}t^4$$
$$+ .175901 \times 10^{-8}t^5 + .45 \times 10^{-5} \sin(171.0 + 729.2248t)$$

Section 9: MJD 37514 to 37540 (August 3 to August 29, 1961)

$$T_o = 37514.0$$

$$\omega = 178^\circ.0659 + 4^\circ.781451t - {}^\circ.0013941t^2 + {}^\circ.000136822t^3 - {}^\circ.69071 \times 10^{-5}t^4 + {}^\circ.120555 \times 10^{-6}t^5$$
$$+ {}^\circ.2636 \sin(269.68 + 4.7785t) + {}^\circ.0090 \sin(9.96 + 9.5570t) + {}^\circ.0055 \sin(227.30 + 24.00t)$$

$$\Omega = 282^\circ.72666 - 3^\circ.6274365t - {}^\circ.4430 \times 10^{-4}t^2 - {}^\circ.105834 \times 10^{-4}t^3 + {}^\circ.64560 \times 10^{-6}t^4$$
$$- {}^\circ.103217 \times 10^{-7}t^5 + {}^\circ.00694 \sin(259.11 + 4.7785t) + {}^\circ.00054 \sin(206.77 + 34.06t)$$
$$+ {}^\circ.00212 \sin(355.5 + 729.2248t)$$

$$i = 38^\circ.83846 - {}^\circ.204 \times 10^{-4}t - {}^\circ.00010223t^2 + {}^\circ.87516 \times 10^{-5}t^3 - {}^\circ.30303 \times 10^{-6}t^4$$
$$+ {}^\circ.37806 \times 10^{-8}t^5 + {}^\circ.00418 \sin(355.63 + 4.7785t) + {}^\circ.00048 \sin(282.52 + 34.06t)$$
$$+ {}^\circ.00170 \sin(85.5 + 729.2248t)$$

$$e = .1096514 - .22306 \times 10^{-4}t + .5852 \times 10^{-6}t^2 - .133042 \times 10^{-6}t^3 + .34217 \times 10^{-8}t^4$$
$$- .18415 \times 10^{-10}t^5 + .0005262 \sin(178.79 + 4.7785t) + .255 \times 10^{-4} \sin(288.57 + 9.557t)$$
$$+ .12 \times 10^{-5} \sin(192.30 + 24.00t)$$

$$M = .13405 + 12.171051t - .13627 \times 10^{-4}t^2 + .538270 \times 10^{-5}t^3 - .119903 \times 10^{-6}t^4$$
$$+ .217968 \times 10^{-9}t^5 + .45 \times 10^{-5} \sin(355.5 + 729.2248t)$$

Section 10: MJD 37534 to 37560 (August 23 to September 18, 1961)

$$T_o = 37534.0$$

$$\omega = 273^\circ.5076 + 4^\circ.767634t + {}^\circ.0001351t^2 + {}^\circ.2990 \times 10^{-4}t^3 - {}^\circ.10134 \times 10^{-5}t^4 + {}^\circ.6722 \times 10^{-8}t^5$$
$$+ {}^\circ.2636 \sin(5.25 + 4.7785t) + {}^\circ.0090 \sin(201.10 + 9.5570t) + {}^\circ.0027 \sin(327.72 + 24.00t)$$

$$\Omega = 210^\circ.14589 - 3^\circ.6296580t + {}^\circ.6703 \times 10^{-4}t^2 - {}^\circ.12885 \times 10^{-5}t^3 + {}^\circ.16791 \times 10^{-6}t^4$$
$$- {}^\circ.48965 \times 10^{-8}t^5 + {}^\circ.00694 \sin(354.68 + 4.7785t) + {}^\circ.00051 \sin(157.18 + 34.06t)$$
$$+ {}^\circ.00212 \sin(180.0 + 729.2248t)$$

$$i = 38^\circ.83094 - {}^\circ.0002336t - {}^\circ.4676 \times 10^{-4}t^2 + {}^\circ.65612 \times 10^{-5}t^3 - {}^\circ.27793 \times 10^{-6}t^4$$
$$+ {}^\circ.38773 \times 10^{-8}t^5 + {}^\circ.00418 \sin(91.20 + 4.7785t) + {}^\circ.00048 \sin(234.88 + 34.06t)$$
$$+ {}^\circ.00170 \sin(270.0 + 729.2248t)$$

$$e = .1088651 - .67081 \times 10^{-4}t + .2965 \times 10^{-6}t^2 - .22854 \times 10^{-7}t^3 + .24784 \times 10^{-8}t^4$$
$$- .46630 \times 10^{-10}t^5 + .0005262 \sin(274.36 + 4.7785t) + .255 \times 10^{-4} \sin(119.71 + 9.5570t)$$
$$+ .44 \times 10^{-5} \sin(59.53 + 24.00t)$$
$$M = .57427 + 12.173275t + .2858 \times 10^{-4}t^2 - .22920 \times 10^{-5}t^3 + .95228 \times 10^{-7}t^4$$
$$- .88405 \times 10^{-9}t^5 + .45 \times 10^{-5} \sin(180.0 + 729.2248t)$$

Section 11: MJD 37554 to 37580 (September 12 to October 8, 1961)

$$T_o = 37554.0$$
$$\omega = 9^\circ.0097 + 4^\circ.786253t - {}^\circ.0014720t^2 + {}^\circ.000151197t^3 - {}^\circ.71169 \times 10^{-5}t^4 + {}^\circ.116009 \times 10^{-6}t^5$$
$$+ {}^\circ.2636 \sin(100.82 + 4.7785t) + {}^\circ.0090 \sin(32.24 + 9.5570t) + {}^\circ.0049 \sin(100.17 + 24.00t)$$
$$\Omega = 137^\circ.57900 - 3^\circ.6249026t - {}^\circ.00072752t^2 + {}^\circ.746747 \times 10^{-4}t^3 - {}^\circ.326224 \times 10^{-5}t^4$$
$$+ {}^\circ.505689 \times 10^{-7}t^5 + {}^\circ.00694 \sin(90.25 + 4.7785t) + {}^\circ.00050 \sin(97.29 + 34.06t)$$
$$+ {}^\circ.00212 \sin(4.5 + 729.2248t)$$
$$i = 38^\circ.82846 - {}^\circ.0010805t + {}^\circ.00032822t^2 - {}^\circ.328532 \times 10^{-4}t^3 + {}^\circ.130790 \times 10^{-5}t^4$$
$$- {}^\circ.181976 \times 10^{-7}t^5 + {}^\circ.00418 \sin(186.77 + 4.7785t) + {}^\circ.00037 \sin(177.02 + 34.06t)$$
$$+ {}^\circ.00170 \sin(94.5 + 729.2248t)$$
$$e = .1077071 - .37637 \times 10^{-4}t + .1963 \times 10^{-6}t^2 + .79299 \times 10^{-7}t^3 - .68430 \times 10^{-8}t^4$$
$$+ .133273 \times 10^{-9}t^5 + .0005262 \sin(9.93 + 4.7785t) + .255 \times 10^{-4} \sin(310.83 + 9.5570t)$$
$$+ .65 \times 10^{-5} \sin(184.16 + 24.00t)$$
$$M = .04529 + 12.173938t + .90931 \times 10^{-4}t^2 - .375896 \times 10^{-5}t^3 + .119311 \times 10^{-6}t^4$$
$$- .139012 \times 10^{-8}t^5 + .45 \times 10^{-5} \sin(4.5 + 729.2248t)$$

Section 12: MJD 37574 to 37600 (October 2 to October 28, 1961)

$$T_o = 37574.0$$
$$\omega = 104^\circ.5817 + 4^\circ.774025t + {}^\circ.0004485t^2 - {}^\circ.1622 \times 10^{-5}t^3 - {}^\circ.6944 \times 10^{-6}t^4 + {}^\circ.22071 \times 10^{-7}t^5$$
$$+ {}^\circ.2636 \sin(196.39 + 4.7785t) + {}^\circ.0090 \sin(223.38 + 9.5570t) + {}^\circ.0016 \sin(212.44 + 24.00t)$$

$$\Omega = 65^\circ.02595 - 3^\circ.6280208t + {}^\circ.00015986t^2 - {}^\circ.118148 \times 10^{-4}t^3 + {}^\circ.33624 \times 10^{-6}t^4$$
$$- {}^\circ.33037 \times 10^{-8}t^5 + {}^\circ.00694 \sin(185.82 + 4.7785t) + {}^\circ.00046 \sin(69.56 + 34.06t)$$
$$+ {}^\circ.00212 \sin(189.0 + 729.2248t)$$

$$i = 38^\circ.82671 + .781 \times 10^{-4}t - {}^\circ.8542 \times 10^{-4}t^2 + {}^\circ.132433 \times 10^{-4}t^3 - {}^\circ.74496 \times 10^{-6}t^4$$
$$+ {}^\circ.138123 \times 10^{-7}t^5 + {}^\circ.00418 \sin(282.34 + 4.7785t) + {}^\circ.00028 \sin(147.11 + 34.06t)$$
$$+ {}^\circ.00170 \sin(279.0 + 729.2248t)$$

$$e = .106994 - .41121 \times 10^{-4}t - .19198 \times 10^{-5}t^2 + .169566 \times 10^{-6}t^3 - .49665 \times 10^{-8}t^4$$
$$+ .53767 \times 10^{-10}t^5 + .0005262 \sin(105.50 + 4.7785t) + .255 \times 10^{-4} \sin(141.99 + 9.5570t)$$
$$+ .63 \times 10^{-5} \sin(309.63 + 24.00t)$$

$$M = .54495 + 12.175908t - .701 \times 10^{-5}t^2 + .54515 \times 10^{-5}t^3 - .226456 \times 10^{-6}t^4$$
$$+ .313871 \times 10^{-8}t^5 + .45 \times 10^{-5} \sin(189.0 + 729.2248t)$$

Section 13: MJD 37594 to 37620 (October 22 to November 17, 1961)

$$T_o = 37594.0$$

$$\omega = 200^\circ.1915 + 4^\circ.784691t + {}^\circ.0009499t^2 - {}^\circ.000108383t^3 + {}^\circ.40610 \times 10^{-5}t^4$$
$$- {}^\circ.44210 \times 10^{-7}t^5 + {}^\circ.2636 \sin(291.96 + 4.7785t) + {}^\circ.0090 \sin(54.52 + 9.5570t)$$
$$+ {}^\circ.0040 \sin(318.40 + 24.00t)$$

$$\Omega = 352^\circ.47752 - 3^\circ.627026t - {}^\circ.00020087t^2 + {}^\circ.246222 \times 10^{-4}t^3 - {}^\circ.116652 \times 10^{-5}t^4$$
$$+ {}^\circ.180917 \times 10^{-7}t^5 + {}^\circ.00694 \sin(281.39 + 4.7785t) + {}^\circ.00061 \sin(30.90 + 34.06t)$$
$$+ {}^\circ.00212 \sin(13.5 + 729.2248t)$$

$$i = 38^\circ.82510 + {}^\circ.67 \times 10^{-5}t + {}^\circ.00010772t^2 - {}^\circ.177089 \times 10^{-4}t^3 + {}^\circ.90842 \times 10^{-6}t^4$$
$$- {}^\circ.152122 \times 10^{-7}t^5 + {}^\circ.00418 \sin(17.91 + 4.7785t) + {}^\circ.00034 \sin(132.86 + 34.06t)$$
$$+ {}^\circ.00170 \sin(103.5 + 729.2248t)$$

$$e = .1061395 - .31193 \times 10^{-4}t + .6639 \times 10^{-6}t^2 + .190411 \times 10^{-7}t^3 - .34437 \times 10^{-8}t^4$$
$$+ .84794 \times 10^{-10}t^5 + .0005262 \sin(201.07 + 4.7785t) + .255 \times 10^{-4} \sin(333.13 + 9.5570t)$$
$$+ .55 \times 10^{-5} \sin(74.25 + 24.00t)$$

$$M = .07776 + 12.177260t + .70950 \times 10^{-4}t^2 - .157765 \times 10^{-5}t^3 + .280873 \times 10^{-7}t^4$$
$$+ .14922 \times 10^{-10}t^5 + .45 \times 10^{-5} \sin(13.5 + 729.2248t)$$

Section 14: MJD 37614 to 37640 (November 11 to December 7, 1961)

$$T_o = 37614.0$$

$$\omega = 295^\circ.9054 + 4^\circ.783027t + {}^\circ.00319853t^2 - {}^\circ.000354787t^3 + {}^\circ.151288 \times 10^{-4}t^4 - {}^\circ.228398 \times 10^{-6}t^5$$
$$+ {}^\circ.2636 \sin(27.53 + 4.7785t) + {}^\circ.0090 \sin(245.66 + 9.5570t) + {}^\circ.0059 \sin(92.83 + 24.00t)$$

$$\Omega = 279^\circ.92392 - 3^\circ.6267616t - {}^\circ.00054088t^2 + .527879 \times 10^{-4}t^3 - {}^\circ.210551 \times 10^{-5}t^4$$
$$+ {}^\circ.279834 \times 10^{-7}t^5 + {}^\circ.00694 \sin(16.96 + 4.7785t) + {}^\circ.00049 \sin(321.96 + 34.06t)$$
$$+ {}^\circ.00212 \sin(198.0 + 729.2248t)$$

$$i = 38^\circ.82325 - {}^\circ.0001258t - {}^\circ.3167 \times 10^{-4}t^2 + {}^\circ.87963 \times 10^{-5}t^3 - {}^\circ.49630 \times 10^{-6}t^4$$
$$+ {}^\circ.80865 \times 10^{-8}t^5 + {}^\circ.00418 \sin(113.48 + 4.7785t) + {}^\circ.00046 \sin(78.56 + 34.06t)$$
$$+ {}^\circ.00170 \sin(288.0 + 729.2248t)$$

$$e = .1056541 - .27441 \times 10^{-4}t + .21795 \times 10^{-5}t^2 - .131514 \times 10^{-6}t^3 + .73786 \times 10^{-8}t^4$$
$$- .146603 \times 10^{-9}t^5 + .0005262 \sin(296.64 + 4.7785t) + .255 \times 10^{-4} \sin(164.27 + 9.5570t)$$
$$+ .80 \times 10^{-5} \sin(171.35 + 24.00t)$$

$$M = .64325 + 12.179132t + .4934 \times 10^{-4}t^2 - .4661 \times 10^{-6}t^3 + .22861 \times 10^{-7}t^4$$
$$+ .8793 \times 10^{-10}t^5 + .45 \times 10^{-5} \sin(198.0 + 729.2248t)$$

Table 4.--Acceleration, Drag, Atmospheric Temperature, and Geometric Parameters from Field-reduced Observations

MJD	$-10^7\dot{P}$	$10^7\dot{P}_R$	$-10^7\dot{P}_A$	$\log \rho_\pi$	$\log \rho_s$	T_π (°K)	z (km)	$\alpha_\pi-\alpha_\odot$ (deg.)	ψ'_0 (deg.)	ψ'_{30} (deg.)
37349.0	3.0	11.0	14.0	-16.53	-16.62	920	641.0	306.5	69.1	91.5
50.0	2.8	11.0	13.8	.54	.62	919	641.7	307.4	67.4	90.2
51.0	3.1	10.9	14.0	.53	.61	922	642.2	308.1	65.8	89.1
52.0	3.4	10.8	14.2	.52	.60	925	642.8	308.6	64.2	88.0
53.0	3.1	10.7	13.8	.53	.61	923	643.2	308.9	62.6	87.1
54.0	3.3	10.6	13.9	.53	.60	925	643.6	309.0	61.2	86.3
55.0	2.8	10.5	13.3	.54	.61	921	644.1	309.0	59.9	85.7
56.0	3.1	10.3	13.4	.54	.60	924	644.5	308.7	58.7	85.2
57.0	3.8	10.1	13.9	.52	.58	929	644.9	308.3	57.8	84.9
58.0	5.1	9.9	15.0	.48	.54	940	645.4	307.8	57.0	84.8
59.0	6.4	9.6	16.0	.45	.51	949	646.0	307.2	56.4	84.8
37360.0	4.9	9.4	14.3	-16.50	-16.56	937	646.6	306.5	56.1	85.0
60.5	3.5	9.3	12.8	.55	.60	924	647.0	306.1	56.0	85.1
61.0	3.2	9.2	12.4	.56	.61	921	647.3	305.7	56.0	85.3
61.5	3.1	9.0	12.1	.57	.62	919	647.7	305.3	56.0	85.4
62.0	2.9	8.9	11.8	.58	.63	916	648.1	304.9	56.1	85.7
62.5	2.4	8.8	11.2	.60	.65	911	648.6	304.5	56.2	85.9
63.0	3.0	8.7	11.7	.58	.63	917	649.0	304.0	56.4	86.1
63.5	3.9	8.6	12.5	.55	.60	925	649.5	303.6	56.6	86.4
64.0	6.4	8.5	14.9	.48	.52	947	650.1	303.2	56.8	86.7
64.5	7.3	8.4	15.7	.45	.49	954	650.6	302.8	57.1	86.9
65.0	9.0	8.3	17.3	.41	.45	968	651.2	302.4	57.4	87.2
65.5	5.5	8.3	13.8	.51	.55	939	651.8	301.9	57.8	87.5
66.0	2.6	8.2	10.8	.62	.65	911	652.4	301.5	58.1	87.8
66.5	2.4	8.1	10.5	.63	.66	908	653.0	301.2	58.5	88.1
67.0	2.5	8.0	10.5	.63	.66	909	653.7	300.8	58.9	88.4
67.5	2.8	7.9	10.7	.62	.65	912	654.4	300.4	59.3	88.6
68.0	3.1	7.8	10.9	.62	.64	914	655.1	300.1	59.7	88.9
68.5	7.8	7.8	15.6	.46	.48	959	655.8	299.8	60.2	89.1
69.0	9.7	7.8	17.5	.41	.43	974	656.5	299.5	60.6	89.4
69.5	2.8	7.8	10.6	.63	.64	913	657.3	299.3	61.0	89.6
70.0	2.3	7.8	10.1	.65	.66	908	658.0	299.1	61.4	89.7
70.5	1.8	7.8	9.6	.68	.68	903	658.8	298.9	61.8	89.9
37371.0	1.9	7.8	9.7	-16.67	-16.68	904	659.6	298.8	62.2	90.0
72.0	1.6	7.9	9.5	.69	.68	903	661.2	298.6	62.9	90.2
73.0	2.3	8.0	10.3	.65	.64	913	662.8	298.6	63.5	90.2
74.0	2.5	8.1	10.6	.64	.63	918	664.3	298.8	64.0	90.1
75.0	2.3	8.2	10.5	.65	.63	917	665.8	299.2	64.4	89.9
76.0	2.0	8.4	10.4	.66	.63	917	667.3	299.8	64.6	89.5
77.0	2.5	8.5	11.0	.64	.60	924	668.7	300.6	64.7	89.0
78.0	3.8	8.7	12.5	.59	.54	940	670.0	301.7	64.6	88.4
79.0	4.5	8.9	13.4	.56	.51	950	671.2	302.9	64.4	87.7
80.0	5.0	9.0	14.0	.54	.49	956	672.3	304.3	64.0	86.9
81.0	5.1	9.2	14.3	.53	.48	960	673.2	305.8	63.4	86.0
82.0	6.0	9.4	15.4	.50	.44	970	674.0	307.4	62.7	85.0
83.0	5.7	9.5	15.2	.51	.44	969	674.7	309.0	61.8	84.0
84.0	6.0	9.6	15.6	.50	.43	973	675.3	310.5	60.9	83.0
85.0	8.9	9.7	18.6	.42	.35	999	675.7	312.0	59.8	82.0
86.0	12.3	9.7	22.0	.34	.28	1024	676.0	313.3	58.7	81.1
87.0	12.1	9.7	21.8	.35	.28	1024	676.2	314.5	57.5	80.2
88.0	11.0	9.7	20.7	.37	.30	1017	676.3	315.4	56.3	79.3
89.0	10.6	9.6	20.2	.38	.31	1014	676.3	316.2	55.0	78.5
90.0	10.6	9.5	20.1	.37	.31	1014	676.2	316.7	53.9	77.9
91.0	10.3	9.4	19.7	.38	.31	1012	676.1	317.1	52.7	77.3
92.0	9.3	9.3	18.6	.40	.34	1004	675.9	317.2	51.7	76.9
93.0	7.2	9.2	16.4	.45	.39	987	675.8	317.1	50.7	76.6
94.0	5.2	9.0	14.2	.51	.53	980	675.6	316.9	49.9	76.4
95.0	4.2	8.8	13.0	.55	.57	968	675.4	316.6	49.2	76.4

Table 4.--Continued

MJD	$-10^7\dot{P}$	$10^7\dot{P}_R$	$-10^7\dot{P}_A$	$\log \rho_\pi$	$\log \rho_s$	T_π (°K)	z (km)	$\alpha_\pi-\alpha_\odot$ (deg.)	ψ_0' (deg.)	ψ_{30}' (deg.)
37396.0	4.4	8.7	13.1	-16.54	-16.56	970	675.2	316.0	48.7	76.4
97.0	3.9	8.5	12.4	.57	.59	963	675.0	315.4	48.3	76.6
98.0	4.0	8.3	12.3	.57	.59	962	674.8	314.8	48.1	76.8
99.0	3.3	8.2	11.5	.60	.62	954	674.8	314.0	48.0	77.1
37400.0	3.1	8.0	11.1	.61	.63	950	674.8	313.2	48.1	77.5
01.0	2.4	7.9	10.3	.64	.66	941	674.9	312.3	48.3	77.9
02.0	0.7	7.7	8.4	.73	.75	917	675.2	311.5	48.6	78.2
03.0	2.8	7.6	10.4	.64	.66	943	675.5	310.7	49.0	78.6
04.0	7.9	7.5	15.4	.47	.48	995	676.0	309.9	49.4	78.9
05.0	6.0	7.5	13.5	.53	.54	977	676.6	309.2	49.9	79.2
06.0	2.5	7.5	10.0	.66	.67	939	677.2	308.5	50.4	79.3
07.0	3.1	7.5	10.6	.63	.64	947	678.0	307.9	50.8	79.4
08.0	2.1	7.5	9.6	.68	.68	935	678.9	307.5	51.2	79.3
09.0	2.1	7.5	9.6	.68	.68	936	679.8	307.2	51.5	79.1
10.0	3.1	7.5	10.6	.64	.64	948	680.8	307.0	51.6	78.8
11.0	3.6	7.6	11.2	.62	.61	956	681.9	307.1	51.7	78.3
12.0	4.1	7.6	11.7	.60	.59	962	683.0	307.3	51.6	77.7
13.0	3.8	7.7	11.5	.61	.59	961	684.0	307.7	51.4	76.9
14.0	5.6	7.7	13.3	.55	.53	981	685.1	308.3	51.0	76.0
15.0	5.6	7.8	13.4	.54	.52	983	686.1	309.2	50.5	75.0
16.0	6.6	7.8	14.4	.51	.49	994	687.1	310.2	49.8	73.8
17.0	5.9	7.9	13.8	.53	.50	990	688.0	311.4	48.9	72.6
18.0	5.5	7.9	13.4	.54	.51	987	688.9	312.8	47.9	71.3
19.0	5.4	7.9	13.3	.55	.51	987	689.6	314.2	46.8	69.9
20.0	4.4	7.8	12.2	.58	.54	977	690.3	315.7	45.6	68.6
21.0	4.2	7.8	12.0	.59	.54	976	690.9	317.2	44.2	67.2
22.0	4.2	7.7	11.9	.59	.54	976	691.4	318.6	42.8	65.9
23.0	3.0	7.6	10.6	.64	.59	962	691.8	320.0	41.4	64.7
24.0	2.9	7.4	10.3	.64	.60	960	692.1	321.2	39.9	63.6
25.0	4.8	7.2	12.0	.57	.53	982	692.4	322.2	38.5	62.7
26.0	5.7	7.0	12.7	.55	.50	991	692.5	323.0	37.2	61.9
27.0	2.8	6.7	9.5	.67	.62	953	692.6	323.7	36.0	61.3
28.0	0.9	6.4	7.3	.78	.73	922	692.7	324.1	35.1	61.0
29.0	0.1	6.1	6.2	.85	.80	904	692.7	324.3	34.4	60.9
30.0	1.8	5.8	7.6	.75	.71	929	692.6	324.3	33.9	61.0
31.0	2.9	5.5	8.4	.71	.74	953	692.5	324.2	33.8	61.4
32.0	4.1	5.2	9.3	.66	.69	967	692.4	323.8	34.2	62.1
33.0	4.1	4.8	8.9	.68	.71	962	692.4	323.3	34.8	63.0
34.0	4.5	4.4	8.9	.68	.71	962	692.5	322.7	35.9	64.2
35.0	4.3	4.1	8.4	.70	.73	956	692.7	322.0	37.2	65.6
36.0	3.2	3.7	6.9	.78	.81	932	692.9	321.2	38.9	67.1
37.0	4.1	3.2	7.3	.76	.79	939	693.2	320.4	40.8	68.8
38.0	5.9	2.7	8.6	.69	.71	960	693.7	319.5	42.9	70.7
39.0	7.4	2.0	9.4	.65	.67	972	694.2	318.6	45.2	72.6
40.0	8.4	1.3	9.7	.64	.66	977	694.9	317.7	47.6	74.6
41.0	9.6	0.8	10.4	.61	.63	987	695.7	316.8	50.0	76.6
42.0	11.1	0.4	11.5	.57	.58	1001	696.6	315.9	52.4	78.5
43.0	12.6	0.1	12.7	.53	.54	1016	697.6	315.1	54.8	80.4
44.0	11.7	-0.2	11.5	.57	.58	1002	698.6	314.4	57.2	82.3
45.0	11.0	-0.3	10.7	.61	.61	993	699.8	313.8	59.5	84.0
46.0	10.2	-0.4	9.8	.65	.64	981	701.0	313.3	61.7	85.6
47.0	9.1	-0.4	8.7	.70	.69	966	702.2	313.0	63.7	87.1
48.0	8.1	-0.4	7.7	.76	.75	950	703.5	312.8	65.6	88.4
49.0	8.6	-0.3	8.3	.73	.71	960	704.8	312.8	67.2	89.4
50.0	9.5	-0.3	9.2	.69	.67	974	706.0	313.0	68.7	90.3
51.0	9.7	-0.3	9.4	.69	.66	977	707.2	313.4	70.0	90.9
52.0	9.3	-0.2	9.1	.71	.67	972	708.4	314.0	70.9	91.3
53.0	8.7	-0.1	8.6	.74	.70	964	709.5	314.9	71.7	91.4
54.0	7.3	0.1	7.4	.81	.77	945	710.5	315.9	72.2	91.3
55.0	7.4	0.5	7.9	.79	.74	953	711.4	317.1	72.4	91.0

Table 4.--Continued

MJD	$-10^7\dot{P}$	$10^7\dot{P}_R$	$-10^7\dot{P}_A$	$\log \rho_\pi$	$\log \rho_s$	T_π (°K)	z (km)	$\alpha_\pi-\alpha_\odot$ (deg.)	ψ_0' (deg.)	ψ_{30}' (deg.)
37456.0	8.4	1.3	9.7	-16.70	-16.65	979	712.1	318.4	72.3	90.5
57.0	7.0	2.1	9.1	.73	.68	970	712.8	319.9	72.0	89.8
58.0	4.6	3.2	7.8	.80	.75	950	713.3	321.3	71.5	89.0
59.0	2.8	4.4	7.2	.84	.78	939	713.8	322.8	70.7	87.9
60.0	1.4	5.6	7.0	.86	.80	935	714.0	324.2	69.7	86.8
61.0	0.4	6.7	7.1	.85	.79	937	714.2	325.5	68.5	85.5
62.0	-0.3	7.5	7.2	.85	.79	938	714.3	326.6	67.1	84.2
63.0	-0.3	8.0	7.7	.82	.84	956	714.3	327.5	65.6	82.8
64.0	-0.3	8.3	8.0	.80	.82	961	714.2	328.3	63.9	81.4
65.0	0.3	8.5	8.8	.76	.78	974	714.0	328.8	62.1	80.0
66.0	1.3	8.6	9.9	.70	.73	990	713.7	329.1	60.3	78.6
67.0	1.6	8.7	10.3	.68	.71	996	713.4	329.2	58.4	77.3
68.0	1.8	8.7	10.5	.67	.70	999	713.1	329.1	56.4	76.0
69.0	3.0	8.7	11.7	.62	.65	1016	712.9	328.8	54.5	74.8
70.0	3.8	8.6	12.4	.59	.62	1025	712.6	328.4	52.6	73.7
71.0	7.0	8.4	15.4	.49	.52	1058	712.4	327.8	50.8	72.7
72.0	5.1	8.3	13.4	.55	.58	1038	712.2	327.2	49.1	71.8
73.0	4.9	8.2	13.1	.56	.59	1036	712.1	326.4	47.5	71.0
74.0	2.6	8.0	10.6	.65	.68	1006	712.1	325.5	46.0	70.3
75.0	1.2	7.9	9.1	.71	.74	986	712.2	324.6	44.6	69.7
76.0	0.6	7.7	8.3	.75	.78	974	712.4	323.7	43.5	69.2
77.0	-0.1	7.5	7.4	.80	.82	960	712.7	322.7	42.5	68.8
78.0	-0.2	7.3	7.1	.81	.84	956	713.1	321.8	41.6	68.4
79.0	-0.5	7.2	6.7	.84	.86	949	713.6	320.8	41.0	68.1
80.0	-1.1	7.0	5.9	.89	.91	934	714.2	320.0	40.4	67.8
81.0	-1.4	6.9	5.5	.92	.94	926	714.9	319.2	40.0	67.6
82.0	-1.4	6.8	5.4	.93	.95	924	715.7	318.5	39.8	67.3
83.0	-1.2	6.7	5.5	.92	.93	928	716.6	317.8	39.6	67.0
84.0	-0.8	6.6	5.8	.90	.91	935	717.5	317.4	39.4	66.6
85.0	-0.7	6.5	5.8	.90	.90	936	718.4	317.0	39.3	66.2
86.0	-0.3	6.4	6.1	.88	.88	944	719.4	316.9	39.2	65.8
87.0	0.1	6.3	6.4	.86	.85	951	720.3	316.9	39.1	65.2
88.0	0.4	6.3	6.7	.84	.83	958	721.3	317.2	38.9	64.6
89.0	0.2	6.2	6.4	.86	.85	953	722.2	317.6	38.7	63.9
90.0	0.3	6.2	6.5	.85	.84	956	723.1	318.2	38.4	63.1
91.0	0.5	6.1	6.6	.84	.83	959	723.9	319.1	37.9	62.2
92.0	2.4	6.1	8.5	.73	.72	994	724.6	320.2	37.4	61.3
37493.0	2.6	6.1	8.7	-16.72	-16.70	998	725.3	321.4	36.7	60.3
93.5	4.7	6.1	10.8	.63	.61	1030	725.6	322.0	36.4	59.8
94.0	7.0	6.0	13.0	.55	.52	1058	725.8	322.7	36.0	59.2
94.5	7.7	6.0	13.7	.52	.50	1067	726.1	323.4	35.6	58.7
95.0	11.1	6.0	17.1	.43	.40	1104	726.3	324.2	35.1	58.2
95.5	9.7	5.9	15.6	.47	.44	1089	726.5	324.9	34.6	57.7
96.0	6.8	5.9	12.7	.55	.53	1057	726.7	325.6	34.1	57.1
96.5	5.5	5.9	11.4	.60	.57	1041	726.8	326.3	33.6	56.6
97.0	4.9	5.8	10.7	.63	.60	1032	726.9	327.0	33.1	56.1
97.5	5.1	5.8	10.9	.62	.59	1035	727.0	327.8	32.5	55.6
98.0	8.0	5.7	13.7	.52	.49	1071	727.1	328.4	32.0	55.1
98.5	9.9	5.7	15.6	.46	.43	1092	727.2	329.1	31.4	54.7
99.0	12.0	5.6	17.6	.41	.38	1113	727.2	329.7	30.8	54.2
99.5	7.9	5.5	13.4	.52	.50	1069	727.2	330.2	30.2	53.8
37500.0	6.3	5.4	11.7	.58	.55	1048	727.2	330.8	29.6	53.5
00.5	5.9	5.4	11.3	.59	.57	1043	727.2	331.2	29.1	53.1
37501.0	6.2	5.3	11.5	-16.59	-16.56	1046	727.2	331.7	28.5	52.8
02.0	5.8	5.1	10.9	.61	.58	1039	727.2	332.4	27.5	52.4
03.0	5.6	4.9	10.5	.62	.59	1035	727.1	332.9	26.6	52.1
04.0	4.8	4.7	9.5	.66	.63	1021	727.0	333.2	25.9	52.0

Table 4.--Continued

MJD	$-10^7\dot{P}$	$10^7\dot{P}_R$	$-10^7\dot{P}_A$	$\log \rho_\pi$	$\log \rho_s$	T_π (°K)	z (km)	$\alpha_\pi-\alpha_\odot$ (deg.)	ψ'_0 (deg.)	ψ'_{30} (deg.)
37505.0	6.1	4.5	10.6	-16.61	-16.66	1050	727.7	333.3	25.4	52.2
05.5	6.2	4.4	10.6	.61	.66	1050	727.7	333.2	25.3	52.4
06.0	2.8	4.2	7.0	.79	.83	990	727.6	333.2	25.3	52.6
06.5	3.4	4.1	7.5	.76	.80	1000	727.6	333.1	25.3	52.9
07.0	7.8	4.0	11.8	.56	.61	1068	727.5	332.9	25.4	53.2
07.5	15.7	3.9	19.6	.34	.38	1153	727.5	332.8	25.6	53.6
08.0	11.1	3.7	14.8	.46	.51	1105	727.5	332.5	26.0	54.1
08.5	3.6	3.6	7.2	.77	.82	995	727.4	332.3	26.4	54.6
09.0	2.3	3.5	5.8	.86	.91	966	727.4	332.0	26.8	55.2
09.5	2.9	3.3	6.2	.83	.88	975	727.4	331.7	27.4	55.8
37510.0	2.4	3.2	5.6	-16.88	-16.93	962	727.4	331.4	28.0	56.4
11.0	2.2	3.0	5.2	.91	.96	952	727.5	330.6	29.5	57.8
12.0	2.7	2.7	5.4	.89	.94	957	727.7	329.8	31.3	59.4
13.0	2.8	2.5	5.3	.90	.95	955	727.9	329.0	33.2	61.1
14.0	4.6	2.2	6.8	.79	.84	989	728.3	328.1	35.3	62.8
15.0	5.1	2.0	7.1	.77	.82	996	728.8	327.3	37.4	64.6
16.0	4.3	1.7	6.0	.85	.89	973	729.4	326.4	39.6	66.4
17.0	3.8	1.4	5.2	.91	.95	954	730.1	325.6	41.9	68.2
18.0	4.5	1.2	5.7	.88	.91	966	731.0	324.8	44.1	69.9
19.0	5.7	0.8	6.5	.82	.85	984	731.9	324.1	46.2	71.5
20.0	6.9	0.5	7.4	.77	.79	1003	732.9	323.5	48.3	73.1
21.0	9.7	0.3	10.0	.64	.66	1047	734.0	323.0	50.3	74.4
22.0	10.5	0.1	10.6	.62	.64	1056	735.2	322.7	52.1	75.6
23.0	11.2	-0.1	11.1	.60	.62	1064	736.4	322.5	53.7	76.7
24.0	9.5	-0.2	9.3	.68	.69	1037	737.6	322.5	55.2	77.5
25.0	10.3	-0.2	10.1	.65	.66	1049	738.8	322.7	56.4	78.1
26.0	11.0	-0.3	10.7	.63	.63	1058	740.0	323.1	57.4	78.5
27.0	10.7	-0.2	10.5	.64	.64	1055	741.1	323.7	58.2	78.6
28.0	10.3	-0.1	10.2	.66	.65	1051	742.2	324.6	58.7	78.5
29.0	10.2	0.1	10.3	.66	.65	1052	743.2	325.6	59.0	78.1
30.0	10.0	0.5	10.5	.66	.64	1055	744.1	326.8	59.0	77.6
31.0	9.2	1.0	10.2	.67	.65	1051	744.9	328.2	58.7	76.8
32.0	8.3	1.8	10.1	.68	.66	1049	745.6	329.7	58.2	75.7
33.0	5.8	2.7	8.5	.76	.73	1023	746.2	331.3	57.4	74.6
34.0	3.2	3.6	6.8	.85	.83	992	746.6	332.9	56.3	73.2
35.0	2.2	4.4	6.6	.87	.84	988	746.9	334.5	55.1	71.7
36.0	1.4	5.1	6.5	.87	.85	986	747.1	335.9	53.6	70.1
37.0	1.1	5.5	6.6	.87	.84	989	747.1	337.3	51.8	68.4
38.0	0.9	5.8	6.7	.86	.83	991	747.1	338.4	49.9	66.7
39.0	0.9	6.0	6.9	.84	.82	996	747.0	339.4	47.9	64.9
40.0	1.4	6.1	7.5	.80	.78	1009	746.7	340.2	45.7	63.2
41.0	1.6	6.1	7.7	.79	.76	1013	746.4	340.7	43.4	61.5
42.0	1.5	6.1	7.6	.79	.77	1012	746.0	341.0	41.0	59.8
43.0	1.9	6.0	7.9	.77	.75	1018	745.6	341.2	38.6	58.4
44.0	1.5	5.9	7.4	.79	.77	1010	745.1	341.1	36.2	57.0
45.0	0.7	5.7	6.4	.85	.83	990	744.7	340.9	33.8	55.8
46.0	1.1	5.5	6.6	.83	.82	995	744.2	340.6	31.6	54.8
47.0	1.5	5.3	6.8	.82	.80	1000	743.8	340.1	29.5	54.1
48.0	1.9	5.0	6.9	.81	.80	1003	743.4	339.5	27.6	53.6
49.0	2.6	4.8	7.4	.77	.76	1013	743.1	338.8	26.1	53.2
50.0	3.8	4.5	8.3	.72	.71	1031	742.8	338.1	25.0	53.2
51.0	5.1	4.3	9.4	.67	.66	1050	742.7	337.3	24.2	53.3
52.0	5.7	4.0	9.7	.65	.64	1055	742.6	336.5	24.0	53.7
53.0	6.0	3.7	9.7	.65	.64	1056	742.6	335.7	24.3	54.2
54.0	7.1	3.5	10.6	.61	.60	1070	742.7	335.0	25.0	54.8
55.0	7.5	3.3	10.8	.60	.59	1073	742.9	334.2	26.1	55.6
56.0	7.8	3.1	10.9	.60	.59	1075	743.2	333.5	27.4	56.5
57.0	7.5	2.9	10.4	.62	.60	1068	743.5	332.9	29.0	57.4
58.0	7.4	2.7	10.1	.63	.62	1064	743.9	332.4	30.7	58.3

Table 4.--Continued

M.D.	$-10^7\dot{P}$	$10^7\dot{P}_R$	$-10^7\dot{P}_A$	log ρ_π	log ρ_s	T_π (°K)	z (km)	$\alpha_\pi-\alpha_\odot$ (deg.)	ψ'_0 (deg.)	ψ'_{30} (deg.)
37559.0	7.1	2.5	9.6	-16.66	-16.64	1056	744.4	332.0	32.5	59.2
60.0	6.9	2.4	9.3	.67	.65	1051	745.0	331.8	34.3	60.0
61.0	6.3	2.4	8.7	.70	.68	1041	745.5	331.7	36.0	60.8
62.0	5.5	2.3	7.8	.75	.73	1025	746.1	331.8	37.6	61.5
63.0	4.6	2.4	7.0	.80	.81	1014	746.9	332.1	39.2	62.0
64.0	4.2	2.3	6.5	.83	.84	1004	747.6	332.6	40.6	62.4
65.0	4.2	2.4	6.6	.83	.84	1006	748.3	333.3	41.8	62.7
66.0	4.3	2.4	6.7	.83	.83	1008	749.0	334.2	42.8	62.8
67.0	4.2	2.5	6.7	.83	.83	1008	749.6	335.3	43.6	62.7
68.0	4.0	2.6	6.6	.84	.84	1006	750.2	336.6	44.2	62.5
69.0	4.1	2.8	6.8	.83	.82	1010	750.7	338.0	44.6	62.1
70.0	3.8	2.9	6.7	.83	.83	1008	751.1	339.5	44.7	61.6
37571.0	4.2	3.2	7.4	-16.79	-16.79	1023	751.4	341.1	44.6	60.9
71.5	4.5	3.3	7.8	.77	.76	1030	751.5	341.8	44.5	60.4
72.0	5.6	3.5	9.2	.70	.69	1055	751.6	342.6	44.3	60.0
72.5	7.0	3.6	10.6	.64	.63	1078	751.7	343.4	44.0	59.5
73.0	9.5	3.7	13.1	.55	.54	1112	751.8	344.1	43.7	59.0
73.5	11.9	3.8	15.7	.47	.46	1143	751.8	344.8	43.3	58.5
74.0	6.3	3.9	10.2	.65	.65	1072	751.9	345.5	42.9	58.0
74.5	5.5	4.0	9.5	.68	.68	1061	751.9	346.2	42.5	57.4
75.0	4.2	4.1	8.2	.75	.74	1038	751.9	346.8	41.9	56.8
75.5	4.2	4.2	8.4	.74	.73	1042	751.9	347.3	41.4	56.2
76.0	3.4	4.2	7.6	.78	.77	1027	751.8	347.9	40.7	55.6
76.5	4.5	4.3	8.8	.72	.71	1050	751.8	348.3	40.1	55.0
37577.0	5.0	4.4	9.4	-16.69	-16.68	1060	751.7	348.7	39.4	54.4
78.0	5.5	4.5	10.0	.66	.65	1070	751.6	349.4	37.8	53.1
79.0	6.3	4.6	10.9	.62	.61	1084	751.5	349.9	36.1	51.9
80.0	5.8	4.6	10.4	.64	.63	1078	751.3	350.1	34.3	50.7
81.0	6.3	4.5	10.8	.62	.61	1084	751.2	350.2	32.4	49.6
82.0	6.8	4.5	11.3	.59	.59	1093	751.0	350.1	30.5	48.6
83.0	7.1	4.4	11.5	.58	.58	1096	751.0	349.8	28.4	47.7
84.0	8.4	4.2	12.6	.54	.54	1112	751.0	349.4	26.4	46.9
85.0	8.9	4.1	13.1	.52	.52	1120	751.1	348.8	24.5	46.3
86.0	7.4	3.9	11.3	.58	.58	1097	751.2	348.2	22.6	45.9
87.0	6.2	3.8	10.0	.64	.63	1078	751.5	347.5	20.9	45.6
88.0	4.7	3.6	8.3	.71	.71	1050	751.9	346.7	19.4	45.5
89.0	4.7	3.4	8.1	.72	.71	1047	752.3	345.9	18.2	45.5
90.0	4.3	3.2	7.5	.76	.74	1037	752.9	345.0	17.4	45.6
91.0	5.0	3.0	8.0	.73	.71	1048	753.7	344.2	16.9	45.9
92.0	5.0	2.8	7.8	.74	.72	1045	754.5	343.4	16.9	46.2
93.0	4.8	2.6	7.4	.76	.74	1039	755.4	342.6	17.2	46.6
94.0	4.3	2.5	6.8	.80	.77	1027	756.4	341.9	17.8	47.1
95.0	4.0	2.4	6.4	.82	.80	1020	757.5	341.3	18.6	47.5
96.0	4.3	2.2	6.6	.81	.78	1025	758.6	340.8	19.6	47.9
97.0	4.8	2.2	6.9	.79	.76	1033	759.8	340.4	20.7	48.2
37597.5	5.0	2.1	7.1	-16.78	-16.74	1038	760.4	340.3	21.3	48.4
98.0	5.2	2.1	7.3	.77	.73	1043	761.0	340.2	21.8	48.5
98.5	5.2	2.0	7.3	.77	.73	1043	761.6	340.1	22.4	48.6
99.0	5.5	2.0	7.5	.76	.71	1048	762.2	340.1	22.9	48.6
99.5	6.0	2.0	8.0	.73	.68	1058	762.8	340.1	23.4	48.6
37600.0	7.9	2.0	9.9	.64	.59	1093	763.4	340.2	23.9	48.6
00.5	17.4	1.9	19.3	.35	.30	1212	763.9	340.4	24.3	48.6
01.0	18.1	1.9	20.0	.34	.28	1219	764.5	340.5	24.7	48.5
01.5	6.8	1.9	8.7	.70	.64	1074	765.0	340.8	25.1	48.4
02.0	6.0	1.9	7.9	.74	.68	1059	765.6	341.1	25.4	48.3
02.5	5.4	1.9	7.3	.77	.72	1047	766.0	341.4	25.7	48.1
03.0	5.2	1.9	7.1	.79	.73	1044	766.5	341.8	25.9	47.8

Table 4.--Continued

MJD	$-10^7\dot{P}$	$10^7\dot{P}_R$	$-10^7\dot{P}_A$	$\log \rho_\pi$	$\log \rho_s$	T_π (°K)	z (km)	$\alpha_\pi-\alpha_\odot$ (deg.)	ψ'_0 (deg.)	ψ'_{30} (deg.)
37603.5	4.4	1.9	6.3	-16.84	-16.78	1C26	767.C	342.3	26.1	47.6
376C4.C	4.6	1.9	6.5	-16.83	-16.76	1C31	767.4	342.8	26.3	47.2
05.C	3.9	2.0	5.9	.87	.80	1C18	768.1	343.9	26.4	46.5
06.C	3.0	2.0	5.C	.94	.87	S94	768.7	345.2	26.3	45.6
07.C	3.5	2.0	5.5	.90	.83	1C09	769.2	346.7	26.0	44.5
08.C	4.2	2.0	6.2	.85	.78	1026	769.5	348.2	25.4	43.3
C9.C	5.2	2.0	7.2	.78	.71	1C49	769.6	349.7	24.7	42.0
10.C	6.5	2.0	8.5	.71	.64	1C75	769.6	351.3	23.6	40.6
11.C	6.9	2.0	8.9	.69	.62	1C83	769.4	352.7	22.4	39.1
12.C	7.C	2.0	9.C	.68	.61	1C85	769.1	354.0	20.9	37.6
13.C	6.9	1.9	8.8	.69	.62	1C81	768.7	355.2	19.2	36.1
14.C	6.0	1.8	7.8	.74	.67	1C62	768.1	356.1	17.3	34.7
15.C	6.1	1.7	7.8	.74	.67	1C62	767.4	356.9	15.3	33.4
16.C	6.4	1.5	7.9	.73	.67	1C64	766.6	357.4	13.0	32.2
17.C	6.0	1.4	7.3	.76	.70	1C52	765.8	357.7	10.6	31.3
18.C	5.9	1.2	7.1	.77	.72	1047	764.9	357.8	8.1	30.7
19.C	5.2	0.9	6.1	.83	.78	1C24	763.9	357.7	5.5	30.5
20.C	5.4	0.7	6.1	.83	.78	1C24	763.0	357.4	3.3	30.7
21.C	6.4	0.4	6.8	.78	.74	1C39	762.1	357.0	3.0	31.2
22.C	7.8	0.2	7.9	.72	.67	1C62	761.2	356.4	5.0	32.2
23.C	8.2	-0.1	8.1	.70	.67	1C65	76C.4	355.7	7.9	33.6
24.C	6.7	-0.4	6.3	.81	.78	1C26	759.6	354.9	11.1	35.3
25.C	5.6	-0.7	5.0	.91	.88	993	759.C	354.0	14.3	37.2
26.C	6.0	-1.0	5.1	.90	.87	995	758.4	353.1	17.6	39.4
27.C	6.8	-1.2	5.6	.86	.83	1C08	757.9	352.2	20.9	41.8
28.C	7.1	-1.5	5.6	.86	.83	1C07	757.6	351.2	24.3	44.2
29.C	7.6	-1.6	6.0	.83	.81	1016	757.3	350.3	27.6	46.8
3C.C	8.3	-1.8	6.5	.80	.81	1C31	757.0	349.4	30.9	49.3
31.C	9.1	-1.9	7.2	.76	.77	1C46	756.7	348.5	34.1	51.9
32.C	9.6	-2.C	7.7	.73	.74	1C55	756.6	347.7	37.2	54.4
33.C	9.6	-1.8	7.7	.73	.74	1C55	756.5	347.0	40.3	56.9
37633.5	9.8	-1.8	8.0	-16.71	-16.73	1C60	756.6	346.7	41.7	58.0
34.C	10.5	-1.6	9.C	.66	.68	1C78	756.6	346.4	43.2	59.2
34.5	11.3	-1.3	10.0	.62	.63	1C95	756.7	346.2	44.6	60.3
35.C	15.2	-0.9	14.3	.47	.48	1156	756.8	346.0	46.0	61.4
35.5	18.9	-0.5	18.4	.36	.37	12C2	756.9	345.8	47.3	62.4
36.C	19.7	-0.4	19.2	.34	.35	1209	757.C	345.7	48.6	63.4
36.5	13.1	-C.4	12.7	.52	.53	1134	757.1	345.6	49.9	64.4
37.C	10.0	-0.4	9.6	.64	.66	1C87	757.2	345.5	51.1	65.3
37.5	8.3	-0.4	7.9	.73	.74	1C56	757.4	345.5	52.2	66.1
38.C	7.9	-C.4	7.5	.75	.76	1047	757.6	345.6	53.3	66.9
38.5	8.1	-C.4	7.7	.74	.75	1C51	757.7	345.7	54.4	67.7
37639.C	8.8	-0.4	8.5	-16.70	-16.71	1C66	757.9	345.8	55.4	68.3
4C.C	9.4	-C.4	9.0	.68	.69	1C74	758.2	346.3	57.2	69.5
41.C	9.0	-0.3	8.6	.71	.71	1C66	758.6	346.9	58.7	70.5
42.C	7.C	-C.3	6.8	.81	.82	1C30	758.9	347.8	6C.0	71.1
43.C	7.8	-0.2	7.6	.77	.77	1C46	759.2	348.8	61.0	71.5
44.C	7.7	-0.1	7.6	.77	.77	1C45	759.4	350.0	61.7	71.7
45.C	7.8	-C.1	7.7	.77	.77	1C46	759.6	351.3	62.2	71.5
46.C	7.2	C.0	7.2	.80	.80	1C35	759.7	352.6	62.3	71.1
47.C	6.8	0.0	6.9	.82	.82	1C27	759.8	354.0	62.2	70.5
48.C	6.4	C.1	6.5	.85	.85	1C18	759.8	355.3	61.7	69.6
49.C	5.7	0.2	5.9	.89	.89	1C03	759.8	356.5	61.0	68.6
50.C	5.8	0.2	6.1	.88	.88	1CC7	759.7	357.6	60.0	67.3
51.C	5.1	0.3	5.4	.93	.93	990	759.5	358.5	58.7	65.8
52.C	4.8	0.3	5.1	.96	.96	981	759.4	359.2	57.2	64.2
53.C	4.5	0.5	5.1	.96	.96	981	759.2	359.7	55.4	62.5

Table 4.--Continued

MJD	$-10^7\dot{P}$	$10^7\dot{P}_R$	$-10^7\dot{P}_A$	log ρ_π	log ρ_s	T_π (°K)	z (km)	$\alpha_\pi-\alpha_\odot$ (deg.)	ψ'_0 (deg.)	ψ'_{30} (deg.)
37654.0	3.5	0.9	4.4	-17.02	-17.02	961	759.0	0.0	53.4	60.7
55.0	3.2	1.5	4.7	-16.99	-16.99	970	758.9	0.1	51.3	58.8
56.0	3.5	3.5	6.8	.83	.83	1024	758.7	0.0	49.0	56.9
57.0	4.0	4.0	6.5	.84	.85	1018	758.6	359.8	46.5	55.0
58.0	4.2	4.2	6.4	.85	.85	1017	758.6	359.3	43.9	53.1
59.0	4.3	4.3	6.7	.82	.83	1025	758.6	358.7	41.2	51.2
60.0	4.3	4.3	7.1	.80	.80	1035	758.7	358.0	38.4	49.4
61.0	4.3	4.3	7.7	.76	.76	1048	758.9	357.2	35.5	47.8
62.0	4.2	4.2	8.3	.72	.72	1061	759.2	356.4	32.7	46.2
63.0	4.0	4.0	7.4	.77	.77	1045	759.6	355.4	29.8	44.8
64.0	3.8	3.8	6.0	.86	.86	1015	760.2	354.4	27.0	43.6
65.0	3.6	3.6	5.3	.91	.91	999	760.8	353.4	24.2	42.5
66.0	3.4	3.4	4.8	.95	.94	986	761.5	352.4	21.5	41.6
67.0	3.2	3.2	4.0	-17.03	-17.02	962	762.4	351.5	19.0	40.9
68.0	2.9	2.9	3.4	.10	.09	941	763.4	350.5	16.8	40.4
69.0	2.7	2.7	2.8	.18	.16	916	764.4	349.6	14.8	40.0
70.0	2.4	2.4	2.4	.25	.23	896	765.5	348.9	13.3	39.7
71.0	2.2	2.2	2.3	.27	.24	891	766.6	348.2	12.2	39.5
72.0	2.0	2.0	3.4	.10	.07	947	767.8	347.6	11.7	39.4
73.0	1.8	1.8	3.1	.14	.10	935	769.0	347.2	11.8	39.4
74.0	1.6	1.6	3.6	.07	.03	957	770.2	347.0	12.3	39.4
75.0	1.5	1.5	3.6	.07	.03	958	771.3	347.0	13.1	39.3
76.0	1.3	1.3	3.6	.07	.03	960	772.4	347.1	14.1	39.2
77.0	1.2	1.2	3.3	.11	.06	948	773.4	347.5	15.1	39.1
78.0	1.0	1.0	3.5	.09	.03	957	774.2	348.1	16.1	38.8
79.0	2.4	1.0	3.4	.10	.05	954	774.7	348.9	17.0	38.5
80.0	2.7	1.0	3.6	.08	.02	962	775.4	349.9	17.8	38.0
81.0	2.6	1.0	3.6	.08	.02	963	776.0	351.1	18.4	37.5
82.0	2.9	0.9	3.9	.04	-16.98	975	776.4	352.4	18.8	36.8
83.0	2.8	0.9	3.8	.05	.99	971	776.7	353.8	19.0	36.0
84.0	3.4	0.9	4.2	.01	.95	986	776.9	355.3	19.0	35.1
85.0	3.4	0.8	4.2	.01	.95	986	776.9	356.8	18.8	34.1
86.0	3.6	0.8	4.5	-16.98	.92	996	776.8	358.2	18.3	33.0
87.0	3.7	0.8	4.6	.97	.91	999	776.5	359.5	17.6	31.8
88.0	4.0	0.7	4.8	.95	.89	1005	776.1	0.7	16.7	30.7
89.0	4.2	0.7	4.9	.94	.88	1008	775.5	1.6	15.6	29.5
90.0	4.6	0.6	5.2	.91	.85	1016	774.9	2.4	14.2	28.4
91.0	5.4	0.5	6.0	.85	.79	1037	774.1	2.9	12.7	27.4
92.0	6.2	0.4	6.6	.80	.75	1051	773.3	3.3	11.0	26.6
93.0	6.0	0.3	6.3	.82	.77	1043	772.4	3.4	9.1	26.0
94.0	5.8	0.2	6.0	.84	.80	1036	771.4	3.4	7.1	25.6
95.0	5.6	0.0	5.6	.87	.83	1025	770.5	3.1	5.1	25.6
96.0	5.7	-0.1	5.6	.87	.83	1024	769.5	2.7	3.1	25.9
97.0	5.4	-0.3	5.1	.90	.87	1010	768.6	2.2	2.2	26.6
98.0	5.5	-0.5	5.0	.91	.88	1006	767.7	1.6	3.6	27.6
99.0	6.6	-0.7	5.9	.84	.81	1030	766.8	0.8	6.0	28.9
37700.0	7.9	-0.9	7.0	.76	.74	1055	766.1	0.0	8.6	30.5
01.0	7.5	-1.1	6.4	.80	.78	1041	765.4	359.2	11.3	32.3
02.0	6.9	-1.3	5.6	.86	.84	1020	764.8	358.3	14.0	34.2
03.0	7.3	-1.5	5.8	.85	.83	1025	764.3	357.4	16.8	36.3
04.0	6.7	-1.7	5.0	.91	.90	1002	764.0	356.5	19.6	38.4
05.0	6.4	-1.9	4.5	.96	.94	987	763.7	355.7	22.4	40.5
06.0	7.5	-2.0	5.5	.87	.86	1015	763.5	354.9	25.1	42.6
07.0	7.5	-2.2	5.3	.89	.88	1009	763.4	354.1	27.8	44.7
08.0	8.0	-2.2	5.8	.85	.84	1022	763.4	353.5	30.3	46.7
09.0	8.7	-2.2	6.5	.80	.79	1039	763.5	353.0	32.8	48.6
10.0	8.5	-2.1	6.3	.82	.80	1033	763.7	352.6	35.2	50.3
11.0	9.1	-2.0	7.1	.77	.75	1051	763.9	352.4	37.4	51.9
12.0	9.6	-1.9	7.8	.73	.71	1065	764.1	352.3	39.4	53.3
13.0	9.1	-1.6	7.5	.75	.73	1059	764.4	352.5	41.3	54.4

Table 4.--Continued

MJD	$-10^7\dot{P}$	$10^7\dot{P}_R$	$-10^7\dot{P}_A$	$\log \rho_\pi$	$\log \rho_s$	T_π (°K)	z (km)	$\alpha_\pi-\alpha_\odot$ (deg.)	ψ'_0 (deg.)	ψ'_{30} (deg.)
37714.0	8.5	-1.3	7.2	-16.77	-16.75	1052	764.6	352.8	42.9	55.4
15.0	8.0	-0.9	7.1	.78	.76	1050	764.9	353.3	44.4	56.1
16.0	8.0	-0.6	7.4	.76	.74	1056	765.1	354.1	45.6	56.6
17.0	7.6	-0.3	7.3	.77	.75	1053	765.3	355.1	46.5	56.8
18.0	10.2	-0.1	10.1	.63	.61	1104	765.4	356.2	47.2	56.8
19.0	8.1	0.0	8.1	.73	.71	1068	765.5	357.5	47.7	56.5
20.0	9.2	0.0	9.2	.67	.65	1088	765.6	359.0	47.9	55.9
21.0	9.3	0.0	9.3	.67	.65	1089	765.5	0.5	47.8	55.1
22.0	10.6	0.1	10.7	.61	.59	1112	765.4	2.0	47.4	54.0
23.0	9.8	0.1	9.8	.65	.63	1097	765.3	3.5	46.7	52.7
24.0	10.2	0.0	10.2	.63	.61	1103	765.1	5.0	45.8	51.2
25.0	7.7	0.1	7.8	.75	.73	1060	764.8	6.2	44.6	49.5
26.0	7.7	0.4	8.1	.73	.71	1066	764.5	7.4	43.2	47.6
27.0	7.0	0.7	7.7	.75	.73	1058	764.2	8.3	41.5	45.6
28.0	6.7	0.9	7.6	.75	.74	1056	763.9	9.1	39.5	43.4
29.0	6.2	1.0	7.2	.78	.76	1048	763.6	9.6	37.4	41.2
30.0	5.8	1.1	6.9	.79	.78	1042	763.3	9.9	35.0	38.9
31.0	4.6	1.2	5.8	.86	.85	1017	763.7	10.1	32.5	36.5
32.0	4.7	1.1	5.9	.85	.84	1020	763.4	10.0	29.8	34.2
33.0	3.1	1.0	4.1	-17.01	-17.00	969	763.1	9.8	26.9	32.0
34.0	4.9	0.9	5.8	-16.86	-16.85	1019	762.8	9.4	24.0	30.0
35.0	5.3	0.7	6.0	.84	.83	1024	762.5	9.0	20.9	28.1
36.0	5.4	0.5	5.9	.84	.84	1023	762.3	8.4	17.7	26.6
37.0	5.0	0.3	5.3	.89	.88	1007	762.2	7.7	14.5	25.4
38.0	6.3	0.0	6.3	.81	.80	1033	762.1	6.9	11.4	24.7
39.0	6.9	-0.2	6.6	.79	.78	1041	762.2	6.2	8.3	24.5
40.0	6.3	-0.5	5.7	.85	.84	1020	762.3	5.4	5.8	24.7
41.0	6.9	-0.8	6.1	.82	.81	1030	762.5	4.6	4.7	25.5
42.0	9.4	-1.1	8.3	.69	.68	1078	762.9	3.8	5.9	26.6
43.0	12.4	-1.4	11.0	.57	.55	1125	763.3	3.0	8.5	28.0
44.0	13.5	-1.7	11.8	.54	.52	1138	763.8	2.3	11.5	29.7
45.0	13.0	-2.0	11.1	.56	.55	1128	764.4	1.7	14.7	31.6
46.0	12.7	-2.2	10.5	.59	.57	1119	765.0	1.2	17.8	33.5
47.0	13.3	-2.4	10.9	.57	.55	1126	765.7	0.8	21.0	35.4
48.0	13.9	-2.6	11.3	.56	.53	1133	766.4	0.6	24.0	37.4
49.0	13.7	-2.7	11.0	.57	.55	1129	767.1	0.5	26.9	39.2
50.0	12.5	-2.8	9.7	.63	.60	1108	767.8	0.6	29.7	41.0
51.0	12.5	-2.8	9.7	.63	.60	1108	768.5	1.0	32.3	42.6
52.0	12.1	-2.8	9.3	.65	.62	1102	769.2	1.5	34.8	44.1
53.0	11.9	-2.7	9.2	.66	.62	1100	769.7	2.2	37.0	45.3
54.0	11.1	-2.6	8.5	.69	.65	1087	770.2	3.2	39.1	46.4
55.0	9.3	-2.4	7.0	.78	.74	1056	770.6	4.3	40.9	47.2
56.0	9.4	-2.1	7.3	.76	.72	1063	770.9	5.6	42.5	47.8
57.0	9.3	-1.7	7.6	.74	.70	1069	771.1	7.1	43.8	48.2
58.0	8.6	-1.4	7.2	.77	.73	1060	771.1	8.7	44.9	48.3
59.0	7.2	-1.1	6.2	.84	.79	1037	771.0	10.3	45.7	48.2
60.0	6.9	-0.7	6.2	.84	.80	1036	770.8	11.9	46.2	47.9
61.0	7.6	-0.5	7.1	.78	.74	1056	770.4	13.5	46.4	47.3
62.0	7.7	-0.4	7.2	.77	.73	1058	769.9	14.9	46.4	46.4
63.0	7.4	-0.4	7.0	.78	.75	1053	769.3	16.2	46.1	45.4
64.0	7.0	-0.4	6.6	.81	.78	1043	768.6	17.3	45.5	44.1
65.0	7.2	-0.4	6.9	.79	.76	1049	767.8	18.2	44.7	42.7
66.0	7.6	-0.3	7.3	.76	.74	1057	766.9	18.9	43.6	41.1
67.0	7.7	-0.2	7.5	.75	.73	1060	766.0	19.4	42.3	39.3
68.0	8.5	-0.1	8.4	.70	.68	1077	765.0	19.6	40.8	37.5
69.0	9.6	0.0	9.6	.64	.62	1098	764.0	19.7	39.1	35.5
70.0	11.6	0.0	11.6	.56	.54	1129	763.0	19.6	37.2	33.4
71.0	13.7	0.1	13.7	.48	.47	1158	762.1	19.3	35.1	31.4
72.0	13.9	0.1	13.9	.47	.47	1160	761.1	18.8	32.9	29.3
73.0	13.2	0.0	13.2	.49	.49	1150	760.3	18.3	30.6	27.2

Table 4.--Continued

MJD	$-10^7\dot{P}$	$10^7\dot{P}_R$	$-10^7\dot{P}_A$	$\log \rho_\pi$	$\log \rho_s$	T_π (°K)	z (km)	$\alpha_\pi-\alpha_\odot$ (deg.)	ψ'_0 (deg.)	ψ'_{30} (deg.)
37774.0	13.0	-0.1	12.9	-16.50	-16.50	1146	759.5	17.7	28.2	25.3
75.0	13.3	-0.2	13.1	.49	.50	1148	758.8	16.9	25.7	23.4
76.0	14.9	-0.3	14.6	.44	.45	1167	758.2	16.1	23.3	21.8
77.0	15.9	-0.5	15.4	.42	.43	1177	757.7	15.3	20.8	20.3
78.0	13.9	-0.7	13.2	.48	.49	1149	757.3	14.5	18.4	19.2
79.0	10.7	-0.9	9.8	.61	.62	1098	757.0	13.7	16.1	18.4
80.0	10.1	-1.1	9.0	.65	.66	1084	756.8	12.9	14.1	17.9
81.0	9.9	-1.3	8.6	.67	.65	1072	756.5	12.1	12.4	17.8
82.0	9.2	-1.5	7.7	.72	.69	1055	756.5	11.4	11.1	18.1
83.0	8.9	-1.7	7.1	.75	.73	1043	756.5	10.8	10.6	18.6
84.0	8.6	-1.9	6.7	.78	.75	1034	756.6	10.3	10.7	19.3
85.0	7.9	-2.1	5.8	.84	.82	1013	756.7	10.0	11.4	20.1
86.0	8.1	-2.3	5.7	.85	.82	1010	756.9	9.7	12.6	21.0
87.0	8.0	-2.6	5.5	.87	.84	1005	757.1	9.7	14.1	21.8
88.0	8.0	-2.7	5.2	.89	.86	997	757.4	9.8	15.7	22.6
89.0	8.1	-2.9	5.2	.89	.86	998	757.6	10.2	17.3	23.3
90.0	8.4	-3.0	5.4	.88	.85	1003	757.9	10.7	18.9	23.9
91.0	8.5	-3.1	5.4	.88	.85	1003	758.1	11.4	20.5	24.3
92.0	8.3	-3.1	5.2	.89	.86	998	758.2	12.4	21.9	24.5
93.0	7.8	-3.2	4.6	.95	.92	980	758.3	13.5	23.1	24.6
94.0	8.3	-3.2	5.1	.90	.87	995	758.3	14.8	24.2	24.4
95.0	8.6	-3.2	5.4	.88	.85	1003	758.2	16.2	25.2	24.0
96.0	9.1	-3.3	5.8	.85	.82	1013	758.0	17.7	25.9	23.4
97.0	9.2	-3.3	6.0	.83	.80	1017	757.7	19.2	26.5	22.6
98.0	9.8	-3.3	6.5	.80	.77	1029	757.4	20.7	26.9	21.5
99.0	10.3	-3.3	7.0	.76	.74	1039	756.9	22.1	27.1	20.3
37800.0	11.0	-3.3	7.7	.72	.70	1053	756.4	23.4	27.2	18.8
01.0	10.5	-3.4	7.2	.75	.73	1043	755.8	24.4	27.1	17.1
02.0	10.6	-3.4	7.2	.75	.73	1042	755.1	25.3	26.8	15.2
03.0	10.8	-3.4	7.4	.74	.72	1046	754.4	26.0	26.5	13.2
04.0	10.9	-3.5	7.4	.73	.72	1045	753.6	26.5	26.1	11.0
05.0	10.9	-3.6	7.3	.74	.73	1042	752.9	26.8	25.7	8.7
06.0	10.9	-3.7	7.2	.74	.74	1040	752.1	26.8	25.3	6.4
07.0	11.1	-3.8	7.2	.74	.74	1039	751.3	26.7	24.9	4.3
08.0	11.2	-4.0	7.2	.74	.74	1039	750.6	26.4	24.6	3.4
09.0	10.7	-4.2	6.6	.78	.78	1025	749.9	25.9	24.6	4.7
10.0	10.2	-4.3	5.8	.84	.84	1006	749.3	25.4	24.7	7.1
11.0	11.0	-4.5	6.4	.79	.80	1019	748.8	24.7	25.1	10.0
12.0	12.1	-4.7	7.4	.73	.73	1040	748.3	23.9	25.8	13.1
13.0	12.3	-5.0	7.4	.73	.74	1040	748.0	23.0	26.8	16.3
14.0	12.5	-5.2	7.2	.74	.75	1035	747.8	22.1	28.0	19.5
15.0	12.6	-5.4	7.2	.74	.75	1035	747.6	21.2	29.6	22.8
16.0	12.7	-5.6	7.1	.75	.76	1032	747.6	20.3	31.4	26.1
17.0	12.6	-5.9	6.8	.77	.78	1026	747.7	19.4	33.4	29.3
18.0	12.7	-6.1	6.6	.78	.79	1021	747.8	18.5	35.5	32.5
19.0	12.7	-6.2	6.5	.79	.80	1018	748.1	17.7	37.8	35.7
20.0	12.8	-6.4	6.4	.80	.81	1016	748.4	17.0	40.2	38.8
21.0	12.7	-6.5	6.1	.82	.83	1009	748.8	16.3	42.7	41.8
22.0	12.6	-6.6	6.1	.83	.83	1009	749.3	15.8	45.1	44.6
23.0	12.8	-6.6	6.2	.82	.82	1011	749.7	15.4	47.6	47.3
24.0	13.0	-6.5	6.5	.80	.80	1018	750.2	15.2	50.0	49.9
25.0	13.0	-6.4	6.6	.80	.79	1020	750.6	15.2	52.3	52.2
26.0	13.1	-6.1	7.0	.77	.77	1029	751.0	15.3	54.6	54.4
27.0	12.6	-5.8	6.9	.78	.78	1027	751.3	15.7	56.7	56.4
28.0	11.9	-5.1	6.8	.79	.78	1024	751.6	16.3	58.7	58.1
29.0	10.5	-4.1	6.4	.82	.81	1015	751.7	17.1	60.5	59.5
30.0	9.1	-2.2	6.9	.78	.78	1026	751.7	18.1	62.0	60.7
31.0	7.9	-0.2	7.7	.74	.69	1037	751.3	19.2	63.4	61.6
32.0	6.8	-0.3	6.5	.81	.77	1012	751.2	20.6	64.5	62.2
33.0	6.8	-0.2	6.6	.80	.76	1013	751.0	22.0	65.4	62.5

Table 4.--Continued

MJD	$-10^7\dot{P}$	$10^7\dot{P}_R$	$-10^7\dot{P}_A$	log ρ_π	log ρ_s	T_π (°K)	z (km)	$\alpha_\pi-\alpha_\odot$ (deg.)	ψ'_0 (deg.)	ψ'_{30} (deg.)
37834.0	6.8	-0.1	6.7	-16.80	-16.76	1015	750.7	23.5	66.0	62.5
35.0	6.6	-0.1	6.6	.81	.77	1012	750.3	24.9	66.3	62.3
36.0	6.9	0.0	6.9	.79	.75	1018	749.7	26.4	66.4	61.7
37.0	6.6	0.1	6.7	.80	.76	1013	749.1	27.7	66.1	60.8
38.0	6.4	0.1	6.5	.81	.78	1007	748.4	28.8	65.6	59.7
39.0	6.2	0.2	6.4	.82	.79	1004	747.6	29.8	64.8	58.3
40.0	6.2	0.3	6.4	.82	.79	1003	746.7	30.6	63.7	56.6
41.0	6.0	0.3	6.3	.82	.80	1000	745.8	31.2	62.3	54.7
42.0	6.0	0.4	6.4	.82	.80	1002	744.8	31.5	60.7	52.6
43.0	6.1	0.4	6.5	.81	.79	1003	743.8	31.7	58.9	50.4
44.0	6.2	0.4	6.6	.80	.79	1005	742.8	31.6	56.9	47.9
45.0	5.4	0.4	5.8	.85	.85	986	741.8	31.4	54.6	45.3
46.0	4.7	0.5	5.2	.90	.90	971	740.8	31.0	52.2	42.6
47.0	4.9	0.5	5.4	.88	.88	975	739.9	30.4	49.6	39.7
48.0	5.1	0.5	5.5	.87	.87	978	739.0	29.8	47.0	36.8
49.0	5.3	-0.1	5.2	.89	.90	970	738.2	29.0	44.2	33.8
50.0	5.9	-0.3	5.5	.87	.87	977	737.4	28.2	41.4	30.8
51.0	6.1	-0.5	5.7	.85	.86	982	736.8	27.3	38.5	27.8
52.0	6.4	-0.6	5.9	.83	.84	987	736.2	26.4	35.6	24.9
53.0	6.5	-0.8	5.7	.84	.86	982	735.8	25.5	32.8	21.9
54.0	6.6	-1.0	5.5	.86	.88	977	735.5	24.6	30.0	19.1
55.0	6.8	-1.3	5.4	.87	.88	975	735.2	23.7	27.4	16.4
56.0	6.8	-1.6	5.2	.88	.90	969	735.1	22.8	25.0	14.0
57.0	6.9	-1.9	5.1	.89	.91	967	735.1	22.0	22.9	11.9
58.0	7.3	-2.2	5.1	.89	.91	967	735.1	21.4	21.1	10.2
59.0	7.5	-2.6	5.0	.90	.92	964	735.2	20.8	19.8	9.2
60.0	7.7	-2.9	4.8	.92	.93	959	735.3	20.4	18.9	9.0
61.0	8.0	-3.2	4.8	.92	.93	959	735.5	20.1	18.7	9.4
62.0	8.2	-3.4	4.7	.93	.94	956	735.7	20.0	18.9	10.4
63.0	8.5	-3.7	4.8	.92	.93	959	735.9	20.1	19.6	11.7
64.0	8.7	-3.9	4.7	.93	.94	956	736.1	20.3	20.7	13.0
65.0	8.9	-4.2	4.8	.92	.93	959	736.2	20.8	22.0	14.4
66.0	9.0	-4.4	4.6	.94	.95	953	736.3	21.6	23.4	15.6
67.0	9.4	-4.6	4.8	.92	.93	959	736.3	22.5	25.0	16.7
68.0	9.6	-4.7	4.9	.91	.93	961	736.2	23.6	26.5	17.7
69.0	9.8	-4.8	4.9	.91	.93	961	736.1	24.9	28.0	18.4
70.0	10.0	-5.0	5.1	.89	.91	966	735.8	26.3	29.4	19.0
71.0	10.1	-5.0	5.0	.90	.92	963	735.5	27.7	30.7	19.3
72.0	10.0	-5.1	4.9	.91	.93	960	735.1	29.2	31.8	19.4
73.0	9.7	-5.2	4.5	.95	.97	948	734.5	30.7	32.8	19.3
74.0	9.5	-5.2	4.4	.96	.98	944	733.9	32.1	33.7	18.9
75.0	9.4	-5.2	4.3	.97	.99	941	733.2	33.4	34.4	18.4
76.0	8.9	-5.2	3.7	-17.03	-17.06	920	732.5	34.5	34.9	17.6
77.0	9.5	-5.2	4.3	-16.97	.00	939	731.7	35.4	35.3	16.6
78.0	9.7	-5.2	4.5	.95	-16.98	945	730.8	36.1	35.5	15.4
79.0	9.7	-5.2	4.5	.95	.98	944	730.0	36.6	35.5	14.0
80.0	9.6	-5.2	4.4	.95	.99	940	729.1	36.9	35.5	12.5
81.0	9.9	-5.2	4.7	.92	.89	940	728.6	37.0	35.3	10.9
82.0	9.8	-5.3	4.5	.94	.91	934	727.8	36.9	35.1	9.2
83.0	10.1	-5.3	4.8	.91	.89	941	727.0	36.6	34.8	7.5
84.0	10.3	-5.4	4.9	.90	.88	943	726.3	36.2	34.6	6.2
85.0	10.5	-5.5	5.1	.89	.87	948	725.6	35.7	34.3	5.5
86.0	10.7	-5.6	5.2	.88	.86	950	725.0	35.0	34.1	5.9
87.0	10.8	-5.7	5.1	.89	.87	947	724.5	34.3	34.0	7.3
88.0	10.2	-5.9	4.4	.95	.93	927	724.0	33.5	34.0	9.3
89.0	10.4	-6.0	4.4	.95	.94	927	723.7	32.7	34.2	11.6
90.0	11.4	-6.2	5.2	.88	.87	948	723.5	31.9	34.5	14.1
91.0	12.7	-6.3	6.4	.79	.78	975	723.4	31.0	35.0	16.7
92.0	13.7	-6.5	7.2	.74	.73	990	723.4	30.2	35.7	19.4
93.0	15.2	-6.7	8.6	.66	.65	1015	723.4	29.4	36.6	22.1

Table 4.--Continued

MJD	$-10^7\dot{P}$	$10^7\dot{P}_R$	$-10^7\dot{P}_A$	$\log \rho_\pi$	$\log \rho_s$	T_π (°K)	z (km)	$\alpha_\pi-\alpha_\odot$ (deg.)	ψ'_0 (deg.)	ψ'_{30} (deg.)
37894.0	15.2	-6.9	8.3	-16.68	-16.67	1010	723.6	28.7	37.7	24.7
95.0	14.2	-7.0	7.2	.74	.73	990	723.9	28.1	39.0	27.3
96.0	14.1	-7.2	6.9	.76	.75	984	724.2	27.6	40.3	29.9
97.0	13.5	-7.3	6.2	.81	.79	969	724.5	27.1	41.8	32.3
98.0	14.3	-7.4	6.9	.77	.75	984	724.9	26.9	43.4	34.7
99.0	14.5	-7.5	7.0	.76	.74	986	725.3	26.8	45.1	36.9
37900.0	14.7	-7.6	7.1	.76	.73	988	725.6	26.9	46.7	38.9
01.0	14.6	-7.6	6.9	.77	.75	984	726.0	27.2	48.4	40.7
02.0	14.0	-7.7	6.3	.81	.79	972	726.2	27.7	50.0	42.4
03.0	13.4	-7.6	5.8	.85	.82	961	726.4	28.4	51.5	43.9
04.0	12.7	-7.5	5.2	.89	.87	946	726.5	29.4	53.0	45.1
05.0	12.9	-7.3	5.6	.86	.84	956	726.5	30.5	54.3	46.1
06.0	14.0	-7.2	6.8	.78	.75	982	726.4	31.9	55.5	46.8
07.0	14.7	-6.9	7.7	.72	.70	999	726.1	33.3	56.5	47.3
08.0	14.7	-6.6	8.1	.70	.68	1005	725.7	34.9	57.3	47.5
09.0	14.7	-6.2	8.5	.68	.66	1012	725.2	36.6	58.0	47.4
10.0	14.5	-5.8	8.7	.67	.65	1014	724.5	38.2	58.4	47.1
11.0	14.3	-5.4	8.9	.66	.64	1017	723.7	39.7	58.7	46.4
12.0	14.2	-4.9	9.3	.64	.63	1022	722.7	41.2	58.7	45.6
13.0	14.0	-4.5	9.6	.62	.62	1026	721.7	42.5	58.5	44.4
14.0	13.8	-4.0	9.8	.61	.61	1028	720.5	43.6	58.1	43.0
15.0	13.5	-3.7	9.8	.61	.62	1027	719.2	44.5	57.4	41.4
16.0	13.3	-3.5	9.8	.61	.62	1026	717.8	45.2	56.6	39.5
17.0	13.2	-3.5	9.7	.61	.63	1023	716.4	45.6	55.6	37.4
18.0	13.2	-3.6	9.6	.62	.64	1020	715.0	45.9	54.5	35.2
19.0	13.2	-3.7	9.5	.62	.64	1017	713.6	46.0	53.2	32.7

Table 5.--Acceleration, Drag, Atmospheric Temperature, and Geometric Parameters from Precisely Reduced Observations

MJD	$-10^7\dot{P}$	$10^7\dot{P}_R$	$-10^7\dot{P}_A$	$\log \rho_\pi$	$\log \rho_s$	T_π (°K)	z (km)	$\alpha_\pi-\alpha_\odot$ (deg.)	ψ'_0 (deg.)	ψ'_{30} (deg.)
37354.5	3.4	10.9	14.3	-16.51	-16.58	930	644.2	309.0	60.5	86.0
55.0	2.7	10.9	13.6	.53	.60	924	644.4	308.9	59.9	85.7
55.5	1.9	10.7	12.7	.56	.63	917	644.6	308.8	59.3	85.5
56.0	1.6	10.6	12.3	.57	.64	914	644.8	308.7	58.7	85.2
56.5	2.5	10.5	13.1	.55	.61	922	645.0	308.5	58.2	85.1
57.0	3.5	10.4	13.9	.52	.58	930	645.2	308.3	57.8	85.0
57.5	4.2	10.3	14.5	.50	.56	935	645.4	308.1	57.4	84.9
58.0	5.6	11.3	16.8	.43	.49	954	645.7	307.8	57.0	84.8
58.5	6.5	11.2	17.6	.41	.47	961	646.0	307.5	56.7	84.8
59.0	6.6	11.0	17.7	.41	.47	962	646.2	307.2	56.5	84.8
59.5	5.6	9.9	15.5	.46	.52	946	646.5	306.8	56.3	84.9
60.0	5.0	9.7	14.8	.48	.54	941	646.9	306.5	56.1	85.0
60.5	4.6	9.6	14.3	.50	.55	938	647.2	306.1	56.0	85.1
61.0	4.0	9.5	13.5	.52	.58	931	647.6	305.7	56.0	85.3
61.5	3.5	9.4	12.9	.54	.59	926	648.0	305.3	56.0	85.4
62.0	2.9	9.3	12.2	.56	.61	921	648.4	304.9	56.1	85.7
62.5	2.5	9.2	11.7	.58	.63	916	648.8	304.5	56.2	85.9
63.0	1.7	9.0	10.7	.62	.67	907	649.3	304.0	56.4	86.1
37363.2	1.5	9.0	10.5	-16.63	-16.67	905	649.5	303.9	56.4	86.2
63.4	0.7	9.0	9.6	.67	.71	895	649.7	303.7	56.5	86.3
63.6	0.3	8.9	9.2	.69	.73	891	649.9	303.5	56.6	86.4
63.8	0.5	8.8	9.3	.68	.72	892	650.1	303.4	56.7	86.5
64.0	3.0	8.8	11.8	.58	.62	919	650.3	303.2	56.8	86.7
64.2	10.9	8.8	19.7	.36	.40	984	650.6	303.0	56.9	86.8
64.4	16.2	8.7	24.8	.26	.30	1018	650.7	302.9	57.0	86.9
64.6	17.0	8.7	25.6	.24	.28	1023	651.0	302.7	57.2	87.0
64.8	11.5	8.6	20.2	.34	.38	989	651.2	302.5	57.3	87.1
65.0	7.1	8.6	15.7	.45	.49	955	651.4	302.4	57.4	87.2
65.2	3.2	8.5	11.7	.58	.62	920	651.7	302.2	57.5	87.3
65.4	3.0	8.5	11.5	.59	.62	918	651.9	302.0	57.7	87.5
65.6	2.0	8.5	10.4	.63	.67	907	652.2	301.9	57.8	87.6
65.8	1.9	8.4	10.4	.63	.67	907	652.4	301.7	58.0	87.7
66.0	1.9	8.4	10.3	.64	.67	906	652.6	301.6	58.1	87.8
66.2	1.7	8.4	10.0	.65	.68	903	652.9	301.4	58.3	87.9
66.4	1.5	8.3	9.8	.66	.69	901	653.1	301.2	58.4	88.0
66.6	1.8	8.3	10.1	.65	.68	905	653.4	301.1	58.6	88.1
66.8	1.9	8.3	10.2	.64	.67	906	653.7	300.9	58.7	88.3
67.0	2.2	8.3	10.4	.63	.66	908	653.9	300.8	58.9	88.4
67.2	2.5	8.2	10.7	.62	.65	912	654.2	300.7	59.1	88.5
67.4	2.6	8.2	10.8	.62	.64	913	654.5	300.5	59.2	88.6
67.6	2.9	8.2	11.0	.61	.63	915	654.8	300.4	59.4	88.7
67.8	3.2	8.1	11.3	.60	.62	919	655.0	300.3	59.6	88.8
68.0	5.7	8.1	13.8	.51	.53	943	655.3	300.1	59.7	88.9
68.2	8.2	8.1	16.2	.44	.46	963	655.6	300.0	59.9	89.0
68.4	9.1	8.1	17.2	.42	.44	972	655.9	299.9	60.1	89.1
68.6	10.9	8.0	19.0	.38	.39	985	656.2	299.8	60.2	89.2
68.8	11.2	8.0	19.2	.37	.39	987	656.5	299.7	60.4	89.3
69.0	9.5	8.0	17.5	.41	.43	975	656.8	299.6	60.6	89.3
69.2	5.5	8.0	13.5	.53	.54	942	657.1	299.5	60.7	89.4
69.4	3.3	8.0	11.2	.61	.62	919	657.4	299.4	60.9	89.5
69.6	2.2	8.0	10.2	.65	.66	909	657.7	299.3	61.1	89.6
69.8	2.0	8.0	9.9	.66	.67	906	658.0	299.2	61.2	89.7
70.0	1.9	8.0	9.9	.66	.67	906	658.3	299.1	61.4	89.7
70.2	1.7	8.0	9.6	.68	.68	903	658.6	299.0	61.6	89.8
70.4	1.5	7.9	9.4	.69	.69	901	658.9	298.9	61.7	89.8
70.6	1.2	7.9	9.2	.70	.70	898	659.3	298.9	61.9	89.9
70.8	0.9	7.9	8.8	.72	.72	894	659.5	298.8	62.0	90.0
71.0	0.8	8.0	8.8	.72	.72	894	659.9	298.8	62.2	90.0
71.2	0.6	8.0	8.5	.73	.73	890	660.2	298.7	62.3	90.0

Table 5.--Continued

MJD	$-10^7\dot{P}$	$10^7\dot{P}_R$	$-10^7\dot{P}_A$	$\log \rho_\pi$	$\log \rho_s$	T_π (°K)	z (km)	$\alpha_\pi-\alpha_\odot$ (deg.)	ψ'_0 (deg.)	ψ'_{30} (deg.)
37371.4	0.9	8.0	8.8	-16.72	-16.72	894	660.5	298.7	62.5	90.1
71.6	0.8	8.0	8.8	.72	.71	895	660.8	298.7	62.6	90.1
71.8	1.9	8.0	10.0	.66	.66	909	661.1	298.6	62.8	90.1
72.0	2.1	8.0	10.1	.66	.65	910	661.5	298.6	62.9	90.2
72.2	2.4	8.1	10.4	.65	.64	914	661.8	298.6	63.0	90.2
72.4	2.5	8.1	10.5	.64	.63	915	662.1	298.6	63.2	90.2
72.6	2.4	8.1	10.5	.64	.63	915	662.4	298.6	63.3	90.2
72.8	2.7	8.1	10.8	.63	.62	919	662.7	298.6	63.4	90.2
73.0	3.4	8.1	11.5	.61	.59	926	663.1	298.6	63.5	90.2
73.2	3.5	8.2	11.6	.60	.59	928	663.4	298.6	63.6	90.2
73.4	3.3	8.2	11.4	.61	.60	926	663.7	298.7	63.7	90.2
73.6	2.6	8.2	10.8	.64	.62	920	664.0	298.7	63.8	90.2
73.8	2.7	8.2	10.9	.63	.61	921	664.3	298.8	63.9	90.1
74.0	2.8	8.3	11.1	.62	.60	923	664.6	298.8	64.0	90.1
74.2	3.3	8.3	11.6	.61	.58	929	664.9	298.9	64.1	90.1
74.4	4.8	8.3	13.1	.55	.53	944	665.2	299.0	64.2	90.0
74.6	3.1	8.4	11.4	.62	.59	927	665.6	299.0	64.3	90.0
74.8	2.9	8.4	11.3	.62	.59	926	665.8	299.1	64.3	89.9
75.0	1.5	8.4	9.9	.68	.65	911	666.2	299.2	64.4	89.9
75.2	1.1	8.5	9.6	.69	.66	908	666.5	299.3	64.5	89.8
75.4	1.0	8.5	9.5	.70	.67	907	666.8	299.4	64.5	89.8
75.6	0.8	8.6	9.3	.71	.68	904	667.1	299.6	64.6	89.7
75.8	0.8	8.6	9.4	.70	.67	906	667.3	299.7	64.6	89.6
76.0	1.1	8.6	9.7	.69	.66	909	667.7	299.8	64.6	89.5
37376.5	1.6	8.8	10.3	-16.67	-16.63	917	668.4	300.2	64.7	89.3
77.0	2.7	8.9	11.6	.62	.58	931	669.1	300.7	64.7	89.0
77.5	4.3	9.0	13.3	.56	.51	948	669.8	301.2	64.7	88.7
78.0	5.1	9.1	14.2	.53	.49	957	670.4	301.7	64.6	88.4
78.5	4.8	9.2	14.0	.54	.49	956	671.0	302.3	64.5	88.1
79.0	4.5	9.3	13.8	.55	.49	954	671.6	302.9	64.4	87.7
79.5	4.9	9.4	14.3	.53	.48	959	672.2	303.6	64.2	87.3
80.0	4.5	9.5	14.0	.54	.49	957	672.7	304.3	63.9	86.9
80.5	3.7	9.6	13.3	.56	.51	951	673.2	305.1	63.7	86.4
81.0	4.1	9.6	13.7	.55	.49	955	673.6	305.8	63.4	86.0
81.5	4.5	9.7	14.2	.54	.48	960	674.0	306.6	63.0	85.5
82.0	5.0	9.8	14.8	.52	.46	965	674.4	307.4	62.7	85.0
82.5	5.4	9.8	15.3	.50	.44	970	674.8	308.2	62.3	84.5
83.0	5.8	9.9	15.7	.49	.43	974	675.1	309.0	61.8	84.0
83.5	6.0	9.9	15.9	.49	.42	976	675.4	309.8	61.4	83.5
84.0	6.6	9.9	16.5	.47	.40	982	675.7	310.5	60.9	83.0
84.5	6.9	10.0	16.9	.46	.39	985	675.9	311.3	60.3	82.5
37385.0	7.9	10.0	17.9	-16.44	-16.37	994	676.1	312.0	59.8	82.0
85.2	9.0	10.0	19.0	.41	.34	1002	676.1	312.3	59.6	81.8
85.4	9.3	10.0	19.3	.40	.33	1005	676.2	312.5	59.4	81.6
85.6	14.4	10.0	24.4	.30	.23	1041	676.2	312.8	59.1	81.5
85.8	18.6	10.0	28.6	.23	.16	1067	676.3	313.1	58.9	81.3
86.0	15.6	10.0	25.6	.28	.21	1049	676.4	313.3	58.7	81.1
86.2	15.7	10.0	25.7	.28	.21	1049	676.4	313.6	58.4	80.9
86.4	13.4	10.0	23.4	.32	.25	1035	676.5	313.8	58.2	80.7
86.6	12.6	10.0	22.6	.33	.26	1030	676.5	314.0	58.0	80.5
86.8	11.8	10.0	21.9	.35	.28	1025	676.6	314.3	57.7	80.3
87.0	10.7	10.0	20.7	.37	.30	1017	676.6	314.5	57.5	80.2
87.2	9.9	10.0	19.9	.39	.32	1011	676.6	314.7	57.2	80.0
87.4	9.8	10.0	19.8	.39	.32	1010	676.6	314.9	57.0	79.8
87.6	10.0	10.0	20.0	.38	.31	1012	676.6	315.1	56.8	79.6
87.8	10.1	9.9	20.0	.38	.31	1012	676.7	315.3	56.5	79.5

Table 5.--Continued

MJD	$-10^7\dot{P}$	$10^7\dot{P}_R$	$-10^7\dot{P}_A$	$\log \rho_\pi$	$\log \rho_s$	T_π (°K)	z (km)	$\alpha_\pi-\alpha_\odot$ (deg.)	ψ'_0 (deg.)	ψ'_{30} (deg.)
37388.0	9.9	9.9	19.9	-16.38	-16.31	1011	676.7	315.4	56.3	79.3
88.5	10.0	9.9	19.9	.38	.31	1012	676.7	315.8	55.7	78.9
89.0	9.8	9.9	19.7	.39	.32	1011	676.7	316.2	55.1	78.5
89.5	9.7	9.8	19.5	.39	.32	1010	676.6	316.5	54.5	78.2
37389.8	9.7	9.8	19.5	-16.39	-16.32	1010	676.6	316.6	54.1	78.0
90.0	10.0	9.8	19.8	.38	.31	1012	676.6	316.7	53.9	77.9
90.2	10.5	9.8	20.2	.37	.30	1015	676.6	316.8	53.6	77.8
90.4	11.1	9.7	20.8	.36	.29	1020	676.6	316.9	53.4	77.6
90.6	12.4	9.7	22.1	.33	.26	1029	676.5	317.0	53.2	77.5
90.8	11.6	9.7	21.3	.35	.28	1024	676.5	317.0	53.0	77.4
91.0	10.9	9.7	20.5	.36	.29	1018	676.4	317.1	52.7	77.3
91.2	10.6	9.6	20.3	.37	.30	1017	676.4	317.1	52.5	77.2
91.4	10.0	9.6	19.6	.38	.31	1012	676.4	317.1	52.3	77.1
91.6	9.7	9.6	19.3	.39	.32	1010	676.3	317.2	52.1	77.1
91.8	8.9	9.6	18.5	.41	.34	1004	676.3	317.2	51.9	77.0
92.0	8.0	9.6	17.5	.43	.36	996	676.2	317.2	51.7	76.9
92.2	9.0	9.5	18.5	.40	.34	1004	676.2	317.2	51.5	76.8
92.4	12.3	9.5	21.8	.33	.27	1028	676.2	317.2	51.3	76.8
92.6	14.6	9.5	24.1	.29	.22	1044	676.1	317.2	51.1	76.7
92.8	10.4	9.4	19.9	.37	.30	1015	676.1	317.2	50.9	76.7
93.0	6.4	9.4	15.8	.47	.40	982	676.0	317.1	50.7	76.6
93.2	6.0	9.4	15.4	.48	.41	978	676.0	317.1	50.6	76.6
37393.5	5.1	9.3	14.4	-16.51	-16.44	970	675.9	317.0	50.3	76.5
94.0	3.8	9.2	13.0	.55	.49	956	675.7	316.9	49.9	76.4
94.5	3.1	9.1	12.2	.58	.51	949	675.6	316.7	49.6	76.4
95.0	2.2	9.0	11.3	.61	.55	939	675.5	316.5	49.2	76.4
95.5	3.6	9.0	12.6	.56	.50	953	675.3	316.3	48.9	76.4
96.0	5.1	8.9	13.9	.52	.46	966	675.2	316.0	48.7	76.4
96.5	5.4	8.8	14.2	.51	.45	969	675.1	315.7	48.5	76.5
37397.0	4.7	8.7	13.4	-16.53	-16.55	973	675.1	315.4	48.3	76.6
97.2	4.4	8.7	13.1	.54	.56	970	675.1	315.3	48.3	76.6
97.4	3.9	8.7	12.6	.56	.58	965	675.0	315.2	48.2	76.7
97.6	3.2	8.6	11.9	.58	.60	958	675.0	315.0	48.2	76.7
97.8	2.6	8.6	11.2	.61	.63	950	675.0	314.9	48.1	76.8
98.0	2.6	8.5	11.1	.61	.63	949	675.0	314.7	48.1	76.8
98.2	2.9	8.5	11.5	.60	.62	954	675.0	314.6	48.1	76.9
98.4	3.3	8.5	11.8	.59	.61	957	675.0	314.4	48.1	76.9
98.6	4.3	8.5	12.8	.55	.57	968	675.0	314.3	48.0	77.0
98.8	5.7	8.4	14.1	.51	.53	981	675.0	314.1	48.0	77.1
99.0	4.6	8.4	13.0	.54	.56	970	674.9	314.0	48.0	77.1
99.2	4.1	8.4	12.5	.56	.58	965	675.0	313.8	48.0	77.2
99.4	3.1	8.3	11.5	.60	.62	954	675.0	313.7	48.0	77.3
99.6	2.9	8.3	11.2	.61	.63	951	675.0	313.5	48.1	77.3
99.8	2.8	8.3	11.0	.61	.63	949	675.0	313.3	48.1	77.4
37400.0	2.1	8.2	10.3	.64	.66	941	675.0	313.2	48.1	77.5
00.2	2.4	8.2	10.6	.63	.65	944	675.1	313.0	48.1	77.6
00.4	3.2	8.2	11.4	.60	.62	954	675.1	312.8	48.2	77.6
00.6	3.7	8.1	11.9	.58	.60	959	675.1	312.7	48.2	77.7
00.8	3.4	8.1	11.5	.59	.61	955	675.2	312.5	48.3	77.8
01.0	3.0	8.1	11.1	.61	.63	950	675.2	312.3	48.3	77.9
01.2	2.3	8.1	10.4	.64	.66	942	675.3	312.2	48.4	77.9
01.4	1.8	8.0	9.9	.66	.68	936	675.3	312.0	48.4	78.0
01.6	0.3	8.0	8.3	.74	.75	915	675.4	311.8	48.5	78.1
01.8	-0.4	8.0	7.6	.77	.79	905	675.4	311.7	48.5	78.2
02.0	-0.6	8.0	7.4	.79	.80	902	675.5	311.5	48.6	78.2
02.2	-1.0	7.9	7.0	.81	.83	896	675.6	311.3	48.7	78.3
02.4	-1.0	7.9	6.9	.82	.83	894	675.6	311.2	48.8	78.4

Table 5.--Continued

MJD	$-10^7\dot{P}$	$10^7\dot{P}_R$	$-10^7\dot{P}_A$	$\log \rho_\pi$	$\log \rho_s$	T_π (°K)	z (km)	$\alpha_\pi-\alpha_\odot$ (deg.)	ψ'_0 (deg.)	ψ'_{30} (deg.)
37402.6	0.7	7.9	8.6	-16.72	-16.74	920	675.7	311.0	48.8	78.5
02.8	1.5	7.8	9.4	.68	.70	931	675.8	310.8	48.9	78.5
03.0	2.7	7.8	10.5	.63	.65	944	675.9	310.7	49.0	78.6
03.2	4.5	7.8	12.3	.57	.58	964	676.0	310.5	49.1	78.7
03.4	4.7	7.8	12.5	.56	.57	967	676.1	310.4	49.2	78.7
03.6	4.3	7.8	12.1	.57	.59	962	676.2	310.2	49.3	78.8
03.8	4.3	7.8	12.1	.57	.59	963	676.3	310.1	49.4	78.9
04.0	8.3	7.8	16.1	.45	.46	1001	676.4	309.9	49.4	78.9
04.2	16.1	7.8	23.8	.28	.29	1061	676.6	309.7	49.5	79.0
04.4	13.5	7.7	21.3	.33	.34	1043	676.6	309.6	49.6	79.0
04.6	9.0	7.7	16.7	.43	.45	1007	676.8	309.5	49.7	79.1
04.8	5.6	7.7	13.3	.53	.55	975	676.9	309.3	49.8	79.1
05.0	4.0	7.7	11.8	.58	.60	960	677.0	309.2	49.9	79.2
37405.5	2.9	7.7	10.6	-16.63	-16.64	946	677.4	308.8	50.1	79.2
06.0	2.3	7.7	10.0	.66	.67	939	677.8	308.5	50.4	79.3
06.5	1.9	7.7	9.5	.68	.69	933	678.2	308.2	50.6	79.4
07.0	2.1	7.7	9.8	.67	.67	937	678.6	308.0	50.8	79.4
07.5	2.2	7.6	9.8	.67	.67	938	679.0	307.7	51.0	79.4
08.0	2.5	7.7	10.2	.65	.66	943	679.5	307.5	51.2	79.3
08.5	2.8	7.7	10.5	.64	.64	947	679.9	307.3	51.3	79.2
09.0	2.7	7.7	10.5	.64	.64	947	680.4	307.2	51.5	79.1
09.5	2.8	7.7	10.5	.64	.64	947	680.8	307.1	51.6	79.0
10.0	2.6	7.7	10.3	.65	.65	945	681.3	307.0	51.6	78.8
10.5	1.9	7.7	9.7	.68	.67	938	681.8	307.0	51.7	78.6
11.0	1.6	7.8	9.4	.69	.68	935	682.3	307.1	51.7	78.3
11.5	2.5	7.8	10.3	.66	.64	946	682.8	307.2	51.7	78.0
12.0	3.7	7.9	11.6	.60	.59	962	683.3	307.3	51.6	77.7
12.5	4.2	7.9	12.2	.58	.57	969	683.8	307.5	51.5	77.3
13.0	4.7	8.0	12.6	.57	.55	973	684.3	307.7	51.4	76.9
13.5	4.9	8.0	12.9	.56	.54	977	684.7	308.0	51.2	76.5
14.0	4.9	8.1	13.0	.56	.54	978	685.2	308.3	51.0	76.0
14.5	4.9	8.1	12.9	.56	.54	978	685.7	308.7	50.8	75.5
15.0	5.1	8.1	13.2	.55	.53	981	686.2	309.2	50.5	75.0
15.5	5.3	8.2	13.5	.54	.51	985	686.6	309.7	50.2	74.4
16.0	5.7	8.2	13.9	.53	.50	990	687.1	310.2	49.8	73.8
16.5	5.7	8.2	13.9	.53	.50	990	687.5	310.8	49.4	73.2
17.0	5.6	8.2	13.9	.53	.50	991	687.9	311.4	49.0	72.6
17.5	5.3	8.3	13.6	.54	.50	988	688.4	312.0	48.5	71.9
18.0	5.3	8.3	13.5	.54	.51	988	688.8	312.7	48.0	71.3
18.5	4.7	8.3	12.9	.56	.52	982	689.2	313.4	47.4	70.6
19.0	4.3	8.2	12.5	.57	.53	979	689.5	314.2	46.8	70.0
19.5	4.6	8.2	12.8	.56	.52	983	689.9	314.9	46.2	69.3
20.0	5.0	8.2	13.2	.55	.51	988	690.3	315.7	45.6	68.6
20.5	5.6	8.1	13.7	.53	.49	993	690.6	316.4	44.9	67.9
21.0	6.0	8.1	14.1	.52	.47	998	690.9	317.2	44.2	67.3
21.5	5.3	8.1	13.4	.54	.49	992	691.1	317.9	43.5	66.6
22.0	3.6	8.0	11.6	.60	.55	973	691.4	318.6	42.8	66.0
22.5	1.8	8.0	9.8	.67	.62	952	691.6	319.3	42.1	65.4
23.0	1.2	7.9	9.1	.70	.65	943	691.8	319.9	41.4	64.8
23.5	1.2	7.8	9.0	.70	.66	942	691.9	320.6	40.7	64.2
24.0	2.8	7.7	10.5	.64	.59	963	692.1	321.1	39.9	63.7
24.5	5.7	7.6	13.3	.53	.48	995	692.2	321.7	39.2	63.2
25.0	6.5	7.5	14.0	.51	.46	1003	692.3	322.2	38.5	62.7
25.5	5.8	7.4	13.2	.53	.48	995	692.4	322.6	37.9	62.3
26.0	4.4	7.3	11.7	.58	.53	979	692.4	323.0	37.2	61.9
26.5	3.4	7.2	10.6	.62	.57	967	692.4	323.3	36.6	61.6
27.0	2.1	7.0	9.1	.69	.64	948	692.5	323.6	36.1	61.3
27.5	1.2	6.9	8.1	.74	.69	934	692.5	323.9	35.5	61.1
28.0	0.5	6.8	7.2	.79	.74	920	692.5	324.1	35.1	61.0

Table 5.--Continued

MJD	$-10^7\dot{P}$	$10^7\dot{P}_R$	$-10^7\dot{P}_A$	$\log \rho_\pi$	$\log \rho_s$	T_π (°K)	z (km)	$\alpha_\pi-\alpha_\odot$ (deg.)	ψ'_0 (deg.)	ψ'_{30} (deg.)
37428.5	0.6	6.6	7.2	-16.78	-16.73	921	692.5	324.2	34.7	60.9
29.0	0.7	6.4	7.1	.79	.74	920	692.5	324.3	34.4	60.9
29.5	1.0	6.3	7.3	.77	.72	923	692.5	324.3	34.1	60.9
30.0	1.6	6.1	7.8	.74	.69	932	692.5	324.3	34.0	61.0
30.5	2.5	5.9	8.5	.70	.66	943	692.5	324.2	33.9	61.2
31.0	3.4	5.8	9.2	.67	.62	953	692.5	324.1	33.9	61.5
31.5	4.0	5.6	9.5	.65	.60	958	692.5	324.0	34.0	61.8
32.0	4.3	5.4	9.7	.64	.59	961	692.6	323.8	34.2	62.1
32.5	4.1	5.2	9.4	.66	.61	957	692.6	323.6	34.5	62.6
33.0	3.8	5.0	8.8	.68	.63	949	692.7	323.3	34.9	63.1
33.5	3.7	4.9	8.5	.70	.65	945	692.8	323.0	35.3	63.6
34.0	3.8	4.7	8.4	.70	.65	944	692.9	322.7	35.9	64.2
34.5	3.9	4.5	8.4	.70	.65	945	693.0	322.4	36.5	64.9
35.0	4.0	4.3	8.3	.70	.65	944	693.1	322.0	37.3	65.6
35.5	4.3	4.1	8.4	.70	.65	945	693.3	321.6	38.1	66.3
36.0	4.5	3.9	8.5	.69	.64	947	693.5	321.2	38.9	67.1
36.5	4.5	3.7	8.2	.71	.65	943	693.6	320.8	39.8	68.0
37.0	4.6	3.5	8.1	.71	.66	942	693.9	320.4	40.8	68.8
37.5	4.5	3.3	7.8	.73	.75	948	694.0	320.0	41.9	69.7
37438.0	4.0	3.0	7.1	-16.77	-16.79	937	694.3	319.5	42.9	70.7
38.2	4.4	2.9	7.3	.76	.78	940	694.4	319.3	43.4	71.0
38.4	4.8	2.8	7.7	.74	.76	947	694.5	319.1	43.8	71.4
38.6	5.3	2.7	8.0	.72	.74	952	694.6	319.0	44.3	71.8
38.8	5.7	2.6	8.4	.70	.72	958	694.8	318.8	44.7	72.2
39.0	7.5	2.6	10.1	.62	.64	983	694.9	318.6	45.2	72.6
39.2	8.9	2.4	11.4	.57	.59	1000	695.0	318.4	45.7	73.0
39.4	9.5	2.3	11.8	.55	.57	1005	695.1	318.2	46.1	73.4
39.6	9.6	2.2	11.8	.55	.57	1005	695.3	318.1	46.6	73.8
39.8	8.6	2.1	10.7	.59	.61	991	695.4	317.9	47.1	74.1
40.0	9.0	2.0	11.0	.58	.60	995	695.5	317.7	47.5	74.5
40.2	8.8	1.8	10.6	.60	.62	990	695.7	317.5	48.0	74.9
40.4	8.7	1.5	10.2	.62	.63	985	695.8	317.3	48.5	75.3
40.6	8.7	1.2	9.9	.63	.64	981	696.0	317.2	49.0	75.7
40.8	9.1	0.8	10.0	.62	.64	982	696.1	317.0	49.5	76.1
41.0	9.5	0.4	9.9	.63	.64	981	696.3	316.8	50.0	76.5
41.2	9.8	-1.0	8.7	.69	.70	964	696.5	316.6	50.5	76.9
41.4	11.1	-0.3	10.8	.59	.61	993	696.6	316.5	50.9	77.3
41.6	11.2	-0.4	10.8	.59	.61	993	696.8	316.3	51.4	77.7
41.8	11.6	-0.4	11.2	.58	.59	998	696.9	316.1	51.9	78.1
42.0	11.7	-0.4	11.3	.57	.59	1000	697.1	316.0	52.4	78.5
42.2	12.0	-0.4	11.6	.56	.57	1003	697.3	315.8	52.9	78.9
42.4	12.7	-0.4	12.3	.54	.55	1012	697.4	315.6	53.4	79.3
42.6	12.4	-0.4	12.0	.55	.56	1008	697.6	315.5	53.9	79.7
42.8	11.8	-0.4	11.4	.57	.58	1001	697.8	315.3	54.3	80.0
43.0	11.4	-0.4	11.0	.59	.60	996	698.0	315.2	54.8	80.4
43.2	10.9	-0.4	10.5	.61	.62	990	698.2	315.0	55.3	80.8
43.4	10.9	-0.4	10.5	.61	.62	990	698.4	314.9	55.8	81.2
43.6	10.8	-0.4	10.4	.61	.62	989	698.6	314.8	56.3	81.5
43.8	10.5	-0.4	10.0	.63	.64	984	698.8	314.6	56.7	81.9
44.0	10.6	-0.4	10.2	.62	.63	986	699.0	314.5	57.2	82.3
44.2	11.3	-0.4	10.9	.60	.60	996	699.2	314.4	57.7	82.6
44.4	12.5	-0.4	12.1	.55	.55	1010	699.4	314.2	58.1	83.0
44.6	13.8	-0.4	13.4	.51	.51	1025	699.6	314.1	58.6	83.3
44.8	14.0	-0.4	13.6	.50	.50	1028	699.8	314.0	59.0	83.7
45.0	12.4	-0.4	12.0	.56	.56	1009	700.0	313.9	59.5	84.0
45.2	11.1	-0.4	10.6	.61	.61	992	700.3	313.8	59.9	84.3
45.4	10.8	-0.4	10.4	.62	.62	989	700.5	313.7	60.4	84.6
45.6	10.6	-0.4	10.2	.63	.63	987	700.7	313.6	60.8	85.0

Table 5.--Continued

MJD	$-10^7\dot{P}$	$10^7\dot{P}_R$	$-10^7\dot{P}_A$	$\log \rho_\pi$	$\log \rho_s$	T_π (°K)	z (km)	$\alpha_\pi-\alpha_\odot$ (deg.)	ψ'_0 (deg.)	ψ'_{30} (deg.)
37446.0	9.6	-0.4	9.2	-16.67	-16.67	973	701.2	313.4	61.7	85.6
46.5	9.6	-0.4	9.2	.68	.67	973	701.7	313.2	62.7	86.3
47.0	9.5	-0.4	9.2	.68	.67	973	702.3	313.1	63.7	87.0
47.5	9.7	-0.4	9.3	.68	.66	975	702.9	313.0	64.6	87.7
48.0	9.3	-0.3	8.9	.70	.68	969	703.5	312.9	65.5	88.3
48.5	8.4	-0.3	8.1	.74	.72	957	704.1	312.9	66.4	88.8
49.0	8.4	-0.3	8.1	.74	.72	957	704.8	312.9	67.2	89.4
49.5	8.4	-0.3	8.1	.75	.72	957	705.4	313.0	68.0	89.8
50.0	8.8	-0.3	8.5	.73	.70	963	706.0	313.1	68.7	90.2
37450.2	8.7	-0.3	8.4	-16.73	-16.71	962	706.2	313.2	68.9	90.3
50.4	8.7	-0.3	8.5	.73	.70	963	706.4	313.2	69.2	90.5
50.6	9.5	-0.3	9.2	.70	.67	974	706.7	313.3	69.4	90.6
50.8	9.9	-0.2	9.7	.67	.65	981	706.9	313.4	69.7	90.7
51.0	10.1	-0.2	9.9	.67	.64	983	707.1	313.5	69.9	90.8
51.2	10.7	-0.2	10.5	.64	.61	991	707.4	313.6	70.1	90.9
51.4	10.6	-0.2	10.4	.65	.62	990	707.6	313.7	70.3	91.0
51.6	10.2	-0.2	10.0	.67	.63	985	707.8	313.9	70.5	91.1
51.8	9.1	-0.2	8.9	.72	.68	969	708.0	314.0	70.7	91.2
52.0	8.7	-0.2	8.5	.74	.70	963	708.3	314.1	70.9	91.2
52.2	8.8	-0.2	8.6	.73	.70	965	708.5	314.3	71.1	91.3
52.4	8.9	-0.2	8.7	.73	.69	966	708.7	314.4	71.2	91.3
52.6	8.8	-0.1	8.7	.73	.69	966	708.9	314.6	71.4	91.3
52.8	8.4	-0.1	8.3	.75	.71	960	709.1	314.8	71.5	91.4
37453.0	8.3	-0.1	8.2	-16.76	-16.72	958	709.4	315.0	71.6	91.4
53.5	8.1	-0.1	8.0	.77	.73	955	709.9	315.4	71.9	91.4
54.0	7.8	-0.1	7.7	.79	.75	950	710.4	316.0	72.1	91.3
54.5	7.6	-0.1	7.5	.81	.76	946	710.9	316.6	72.3	91.2
55.0	7.4	0.0	7.4	.81	.77	944	711.3	317.2	72.3	91.0
55.5	7.3	0.0	7.3	.82	.77	943	711.7	317.8	72.4	90.8
56.0	7.3	0.0	7.3	.82	.77	942	712.1	318.5	72.3	90.5
37456.2	7.1	0.1	7.2	-16.83	-16.78	940	712.2	318.8	72.3	90.4
56.4	8.9	0.3	9.2	.73	.67	972	712.4	319.1	72.2	90.2
56.6	11.0	0.7	11.7	.62	.57	1005	712.6	319.3	72.2	90.1
56.8	8.6	1.2	9.8	.70	.65	980	712.7	319.6	72.1	90.0
57.0	6.3	1.7	8.0	.79	.74	953	712.8	319.9	72.0	89.8
57.2	6.5	2.2	8.7	.75	.70	964	712.9	320.2	71.9	89.6
57.4	8.7	2.7	11.4	.64	.58	1001	713.1	320.5	71.8	89.5
57.6	8.1	3.1	11.2	.65	.59	998	713.2	320.8	71.7	89.3
57.8	5.8	3.5	9.3	.73	.67	973	713.3	321.1	71.6	89.1
58.0	4.4	3.9	8.3	.78	.72	958	713.4	321.4	71.5	88.9
58.2	3.8	4.3	8.1	.79	.73	955	713.5	321.7	71.3	88.7
58.4	3.3	4.6	7.9	.80	.74	951	713.6	322.0	71.2	88.5
58.6	2.9	5.0	7.9	.80	.74	951	713.7	322.2	71.0	88.3
37459.0	2.2	5.6	7.8	-16.81	-16.75	950	713.9	322.8	70.7	87.9
59.5	1.5	6.2	7.8	.81	.75	949	714.1	323.5	70.2	87.4
60.0	0.9	6.7	7.6	.82	.76	946	714.3	324.2	69.7	86.8
60.5	0.4	7.1	7.5	.83	.77	944	714.4	324.8	69.1	86.2
61.0	-0.1	7.5	7.4	.83	.77	942	714.6	325.5	68.5	85.5
61.5	-0.3	7.7	7.5	.83	.77	944	714.7	326.0	67.8	84.9
62.0	-0.4	8.0	7.6	.82	.76	946	714.7	326.6	67.1	84.2
62.5	-0.5	8.2	7.7	.82	.76	947	714.8	327.1	66.4	83.5
63.0	-0.6	8.4	7.8	.81	.75	949	714.8	327.5	65.6	82.8
63.5	-0.5	8.5	8.0	.80	.74	952	714.8	327.9	64.8	82.1
64.0	-0.5	8.7	8.1	.79	.73	954	714.8	328.2	63.9	81.4
64.5	0.0	8.8	8.8	.76	.70	965	714.7	328.5	63.0	80.7
65.0	0.4	8.9	9.3	.73	.67	972	714.7	328.8	62.1	80.0

Table 5.--Continued

MJD	$-10^7\dot{P}$	$10^7\dot{P}_R$	$-10^7\dot{P}_A$	log ρ_π	log ρ_s	T_π (°K)	z (km)	$\alpha_\pi-\alpha_\odot$ (deg.)	ψ'_0 (deg.)	ψ'_{30} (deg.)
37465.5	1.0	9.0	10.0	-16.70	-16.64	982	714.6	328.9	61.2	79.3
66.0	1.7	9.0	10.7	.67	.61	992	714.5	329.1	60.3	78.6
66.5	1.8	9.0	10.8	.66	.61	993	714.4	329.1	59.3	78.0
67.0	2.0	9.0	11.1	.65	.59	997	714.3	329.2	58.4	77.3
67.5	1.6	9.1	10.6	.67	.61	991	714.2	329.1	57.4	76.6
68.0	1.1	9.0	10.2	.68	.63	986	714.0	329.1	56.5	76.0
68.5	3.0	9.0	12.0	.61	.56	1009	713.9	329.0	55.5	75.4
69.0	4.1	9.0	13.1	.57	.52	1022	713.8	328.8	54.5	74.8
69.5	3.7	9.0	12.7	.58	.53	1018	713.6	328.6	53.6	74.2
70.0	3.4	8.9	12.3	.60	.54	1014	713.5	328.4	52.7	73.7
70.5	3.1	8.9	12.0	.61	.55	1011	713.4	328.1	51.7	73.2
37471.0	4.1	8.8	13.0	-16.57	-16.52	1023	713.2	327.8	50.8	72.7
71.2	4.6	8.8	13.4	.55	.50	1027	713.2	327.7	50.5	72.5
71.4	6.3	8.8	15.1	.50	.45	1045	713.2	327.6	50.1	72.3
71.6	7.0	8.8	15.8	.48	.43	1053	713.1	327.4	49.8	72.1
71.8	7.6	8.7	16.3	.47	.42	1058	713.1	327.3	49.4	72.0
72.0	10.1	8.7	18.8	.40	.35	1081	713.0	327.1	49.1	71.8
72.2	10.5	8.7	19.1	.40	.35	1084	713.0	327.0	48.8	71.6
72.4	10.6	8.7	19.3	.39	.34	1086	713.0	326.8	48.4	71.5
72.6	8.3	8.6	16.9	.45	.40	1064	712.9	326.7	48.1	71.3
72.8	6.2	8.6	14.8	.51	.45	1044	712.9	326.5	47.8	71.1
73.0	5.0	8.6	13.6	.54	.49	1031	712.9	326.4	47.5	71.0
37473.5	2.3	8.5	10.7	-16.64	-16.59	997	712.8	326.0	46.7	70.6
74.0	1.3	8.4	9.7	.69	.64	984	712.8	325.5	46.0	70.3
74.5	1.5	8.3	9.7	.68	.63	984	712.8	325.1	45.3	70.0
75.0	1.0	8.3	9.2	.71	.66	978	712.8	324.6	44.7	69.7
75.5	0.3	8.1	8.4	.74	.69	966	712.9	324.1	44.0	69.4
76.0	0.4	8.0	8.4	.74	.69	966	712.9	323.7	43.5	69.2
76.5	0.0	7.9	7.9	.77	.80	969	713.0	323.2	42.9	69.0
77.0	-0.5	7.8	7.3	.80	.83	959	713.1	322.7	42.4	68.8
77.5	-0.6	7.7	7.1	.81	.84	955	713.3	322.3	42.0	68.6
78.0	-0.6	7.6	7.0	.82	.84	954	713.5	321.8	41.6	68.4
37478.2	-0.9	7.6	6.7	-16.84	-16.86	949	713.6	321.6	41.5	68.3
78.4	-0.7	7.5	6.9	.82	.85	953	713.6	321.4	41.3	68.3
78.6	-0.6	7.5	6.9	.82	.85	953	713.7	321.2	41.2	68.2
78.8	-0.4	7.5	7.1	.81	.84	957	713.8	321.1	41.0	68.2
79.0	1.1	7.4	8.5	.73	.76	981	713.9	320.9	40.9	68.1
79.2	1.3	7.4	8.7	.72	.75	984	714.0	320.7	40.8	68.0
79.4	0.9	7.4	8.3	.74	.77	978	714.1	320.5	40.7	68.0
79.6	-0.1	7.3	7.2	.80	.83	959	714.2	320.3	40.6	67.9
79.8	-0.4	7.3	6.9	.82	.84	954	714.3	320.2	40.5	67.9
37480.0	-0.6	7.3	6.7	-16.84	-16.86	950	714.5	320.0	40.4	67.8
80.5	-0.9	7.2	6.3	.86	.88	943	714.8	319.6	40.2	67.7
81.0	-1.8	7.1	5.4	.93	.95	924	715.1	319.2	40.0	67.5
81.5	-2.0	7.1	5.0	.96	.98	914	715.4	318.8	39.8	67.4
82.0	-2.6	7.0	4.4	-17.02	-17.03	899	715.8	318.5	39.7	67.2
82.5	-2.1	6.9	4.8	-16.98	-16.99	910	716.2	318.2	39.6	67.1
83.0	-1.6	6.9	5.2	.94	.96	921	716.5	317.9	39.5	66.9
83.5	-1.4	6.8	5.4	.93	.94	926	716.9	317.6	39.4	66.8
84.0	-1.4	6.8	5.4	.93	.94	926	717.3	317.4	39.4	66.6
37484.2	-1.5	6.7	5.2	-16.94	-16.95	922	717.5	317.3	39.4	66.5
84.4	-1.1	6.7	5.6	.91	.92	931	717.7	317.3	39.3	66.4
84.6	-0.7	6.7	6.0	.88	.89	940	717.8	317.2	39.3	66.3
84.8	-0.5	6.7	6.2	.87	.88	945	718.0	317.1	39.3	66.3
85.0	0.1	6.7	6.8	.83	.84	957	718.2	317.1	39.3	66.2

Table 5.--Continued

MJD	$-10^7\dot{P}$	$10^7\dot{P}_R$	$-10^7\dot{P}_A$	$\log \rho_\pi$	$\log \rho_s$	T_π (°K)	z (km)	$\alpha_\pi-\alpha_\odot$ (deg.)	ψ'_0 (deg.)	ψ'_{30} (deg.)
37485.2	2.3	6.6	9.0	-16.71	-16.71	995	718.4	317.0	39.3	66.1
85.4	2.9	6.6	9.5	.68	.69	1002	718.5	317.0	39.2	66.0
85.6	2.3	6.6	8.9	.71	.72	993	718.7	317.0	39.2	65.9
85.8	1.0	6.6	7.6	.78	.78	972	718.9	317.0	39.2	65.8
86.0	0.4	6.6	7.0	.82	.82	961	719.0	316.9	39.2	65.7
86.2	0.2	6.6	6.8	.83	.83	958	719.2	316.9	39.2	65.6
86.4	0.1	6.6	6.6	.84	.84	954	719.4	316.9	39.1	65.5
86.6	-0.2	6.6	6.4	.86	.86	950	719.6	316.9	39.1	65.4
86.8	-0.4	6.5	6.1	.88	.88	944	719.8	316.9	39.1	65.3
37487.0	-0.5	6.5	6.0	-16.88	-16.88	942	719.9	317.0	39.1	65.2
87.5	-0.3	6.5	6.2	.87	.87	947	720.4	317.1	39.0	64.9
88.0	-0.4	6.5	6.1	.88	.87	945	720.8	317.2	38.9	64.5
88.5	-0.1	6.5	6.3	.86	.86	950	721.3	317.4	38.8	64.2
89.0	0.1	6.4	6.5	.85	.84	955	721.7	317.6	38.6	63.8
89.5	0.3	6.4	6.7	.84	.83	959	722.1	317.9	38.5	63.4
90.0	0.7	6.4	7.1	.81	.80	967	722.6	318.3	38.3	63.0
90.5	0.9	6.4	7.3	.80	.79	971	723.0	318.7	38.1	62.6
91.0	1.3	6.4	7.7	.78	.76	979	723.4	319.2	37.9	62.2
91.5	1.5	6.3	7.8	.77	.76	981	723.8	319.7	37.6	61.7
92.0	1.8	6.3	8.1	.75	.74	987	724.2	320.2	37.4	61.2
92.5	2.5	6.3	8.7	.72	.70	997	724.6	320.8	37.1	60.8
93.0	3.0	6.3	9.3	.69	.67	1007	725.0	321.4	36.7	60.3
37493.2	2.8	6.3	9.0	-16.71	-16.69	1003	725.1	321.7	36.6	60.1
93.4	3.1	6.3	9.4	.69	.67	1009	725.3	321.9	36.4	59.8
93.6	3.7	6.3	9.9	.67	.64	1017	725.4	322.2	36.3	59.6
93.8	6.0	6.2	12.3	.57	.55	1049	725.5	322.5	36.1	59.4
94.0	9.5	6.2	15.7	.46	.44	1088	725.7	322.7	36.0	59.2
94.2	13.0	6.2	19.3	.37	.35	1124	725.8	323.0	35.8	59.0
94.4	13.4	6.2	19.6	.37	.35	1127	725.9	323.3	35.6	58.8
94.6	14.1	6.2	20.3	.35	.33	1133	726.0	323.6	35.5	58.6
94.8	17.0	6.2	23.2	.29	.27	1157	726.1	323.9	35.3	58.4
95.0	17.4	6.2	23.6	.29	.26	1161	726.3	324.2	35.1	58.2
95.2	4.6	6.2	10.8	.63	.60	1032	726.4	324.4	34.9	58.0
95.4	0.0	6.2	6.1	.87	.85	953	726.5	324.7	34.7	57.8
95.6	3.9	6.2	10.1	.65	.63	1022	726.6	325.0	34.5	57.6
95.8	5.2	6.1	11.3	.60	.58	1039	726.7	325.3	34.3	57.3
96.0	7.2	6.1	13.4	.53	.50	1066	726.8	325.6	34.1	57.1
96.2	7.3	6.1	13.4	.53	.50	1066	726.9	325.9	33.9	56.9
96.4	7.0	6.1	13.1	.54	.51	1062	726.9	326.2	33.7	56.7
96.6	5.6	6.1	11.7	.59	.56	1045	727.0	326.5	33.5	56.5
96.8	4.8	6.1	10.9	.62	.59	1035	727.1	326.8	33.3	56.3
97.0	4.6	6.0	10.6	.63	.60	1031	727.2	327.0	33.1	56.1
97.2	4.5	6.0	10.5	.63	.61	1030	727.3	327.3	32.9	55.9
97.4	4.6	6.0	10.5	.63	.61	1030	727.3	327.6	32.7	55.7
97.6	5.7	6.0	11.6	.59	.56	1045	727.4	327.9	32.4	55.5
97.8	6.6	5.9	12.5	.56	.53	1057	727.4	328.1	32.2	55.3
98.0	7.6	5.9	13.5	.52	.49	1069	727.5	328.4	32.0	55.2
98.2	8.6	5.9	14.5	.49	.46	1081	727.5	328.7	31.8	55.0
98.4	10.1	5.9	16.0	.45	.42	1097	727.6	328.9	31.5	54.8
98.6	11.1	5.8	17.0	.42	.39	1108	727.6	329.2	31.3	54.6
98.8	12.1	5.8	17.9	.40	.37	1117	727.6	329.4	31.1	54.4
99.0	13.1	5.8	18.9	.37	.35	1126	727.7	329.6	30.8	54.3
99.2	10.4	5.8	16.2	.44	.41	1100	727.7	329.9	30.6	54.1
99.4	8.9	5.8	14.6	.49	.46	1083	727.7	330.1	30.4	53.9
99.6	8.5	5.7	14.2	.50	.47	1079	727.8	330.3	30.1	53.8
99.8	7.6	5.7	13.3	.53	.50	1069	727.8	330.5	29.9	53.6
37500.0	5.3	5.7	10.9	.61	.58	1038	727.8	330.7	29.7	53.5
00.2	3.9	5.6	9.5	.67	.64	1018	727.8	330.9	29.4	53.4

Table 5.--Continued

MJD	$-10^7\dot{P}$	$10^7\dot{P}_R$	$-10^7\dot{P}_A$	$\log \rho_\pi$	$\log \rho_s$	T_π (°K)	z (km)	$\alpha_\pi-\alpha_\odot$ (deg.)	ψ_0' (deg.)	ψ_{30}' (deg.)
37500.4	2.0	5.6	7.6	-16.77	-16.74	987	727.8	331.1	29.2	53.2
00.6	2.4	5.6	8.0	.74	.71	994	727.8	331.3	29.0	53.1
00.8	4.3	5.5	9.8	.66	.63	1023	727.8	331.5	28.8	53.0
01.0	6.7	5.5	12.2	.56	.53	1056	727.8	331.6	28.6	52.9
01.2	9.1	5.5	14.5	.48	.45	1084	727.8	331.8	28.3	52.8
01.4	9.2	5.4	14.6	.48	.45	1085	727.8	331.9	28.1	52.7
01.6	9.3	5.4	14.7	.48	.45	1087	727.8	332.1	27.9	52.6
01.8	8.4	5.3	13.7	.51	.48	1075	727.8	332.2	27.7	52.5
02.0	6.1	5.3	11.4	.59	.56	1047	727.8	332.3	27.5	52.4
02.2	4.5	5.3	9.8	.65	.62	1024	727.8	332.5	27.3	52.3
02.4	3.3	5.2	8.5	.71	.68	1004	727.8	332.6	27.1	52.3
02.6	3.2	5.2	8.4	.72	.69	1003	727.8	332.7	27.0	52.2
02.8	3.3	5.2	8.5	.71	.68	1004	727.7	332.8	26.8	52.2
03.0	3.3	5.1	8.4	.72	.69	1003	727.7	332.8	26.6	52.1
37503.5	4.4	5.0	9.4	-16.67	-16.64	1019	727.7	333.0	26.2	52.1
04.0	5.3	4.9	10.2	.63	.60	1032	727.6	333.1	25.9	52.1
04.5	5.3	4.7	10.0	.64	.61	1029	727.6	333.2	25.6	52.1
05.0	5.1	4.6	9.7	.65	.62	1025	727.5	333.2	25.4	52.2
05.5	4.9	4.5	9.4	.66	.63	1021	727.5	333.2	25.3	52.4
06.0	4.8	4.4	9.1	.67	.65	1017	727.4	333.2	25.3	52.6
06.5	4.8	4.2	9.0	.68	.65	1015	727.4	333.1	25.3	52.9
37506.6	4.5	4.2	8.7	-16.69	-16.66	1011	727.4	333.0	25.3	53.0
06.8	4.6	4.2	8.8	.69	.66	1012	727.4	333.0	25.4	53.1
07.0	4.7	4.1	8.8	.69	.66	1012	727.4	332.9	25.4	53.3
07.2	9.0	4.0	13.1	.51	.49	1073	727.4	332.9	25.5	53.4
07.4	16.0	4.0	20.0	.33	.30	1145	727.4	332.8	25.6	53.6
07.6	17.3	4.0	21.3	.30	.27	1156	727.4	332.7	25.7	53.7
07.8	16.9	3.9	20.8	.31	.28	1152	727.4	332.6	25.8	53.9
08.0	10.1	3.9	13.9	.49	.46	1083	727.4	332.5	26.0	54.1
08.2	5.1	3.8	8.9	.68	.65	1015	727.4	332.4	26.1	54.3
08.4	2.7	3.7	6.4	.82	.79	969	727.4	332.3	26.3	54.5
08.6	2.6	3.7	6.3	.83	.80	967	727.4	332.2	26.5	54.7
08.8	2.7	3.6	6.3	.83	.80	967	727.4	332.1	26.6	55.0
09.0	2.6	3.6	6.2	.83	.81	965	727.4	332.0	26.9	55.2
37509.5	2.5	3.4	6.0	-16.85	-16.82	961	727.4	331.7	27.4	55.8
10.0	2.3	3.3	5.6	.88	.85	953	727.5	331.4	28.1	56.4
10.5	2.2	3.2	5.3	.90	.87	946	727.6	331.0	28.8	57.1
11.0	2.2	3.0	5.2	.91	.88	944	727.7	330.6	29.5	57.9
11.5	2.2	2.9	5.1	.92	.89	941	727.8	330.2	30.4	58.6
12.0	2.2	2.8	4.9	.93	.90	936	727.9	329.8	31.3	59.4
12.5	2.2	2.7	4.8	.94	.91	934	728.1	329.4	32.2	60.2
37512.6	2.5	2.6	5.2	-16.91	-16.88	944	728.1	329.3	32.4	60.4
12.8	2.9	2.6	5.5	.88	.85	952	728.2	329.2	32.8	60.8
13.0	3.6	2.6	6.1	.84	.81	965	728.3	329.0	33.2	61.1
13.2	4.2	2.5	6.7	.80	.77	978	728.4	328.8	33.6	61.4
13.4	4.6	2.5	7.1	.77	.74	986	728.4	328.7	34.0	61.8
13.6	4.8	2.4	7.2	.77	.73	988	728.5	328.5	34.4	62.1
13.8	5.6	2.4	8.0	.72	.69	1002	728.6	328.3	34.8	62.5
14.0	5.3	2.3	7.6	.74	.71	995	728.7	328.1	35.3	62.8
14.2	5.0	2.3	7.3	.76	.73	990	728.8	328.0	35.7	63.2
14.4	4.4	2.2	6.6	.81	.77	976	728.9	327.8	36.1	63.6
14.6	4.2	2.2	6.4	.82	.78	972	729.0	327.6	36.6	63.9
14.8	4.3	2.2	6.4	.82	.78	972	729.1	327.4	37.0	64.3
15.0	4.1	2.1	6.3	.83	.79	970	729.2	327.3	37.4	64.6

Table 5.--Continued

MJD	$-10^7\dot{P}$	$10^7\dot{P}_R$	$-10^7\dot{P}_A$	$\log \rho_\pi$	$\log \rho_s$	T_π (°K)	z (km)	$\alpha_\pi-\alpha_\odot$ (deg.)	ψ'_0 (deg.)	ψ'_{30} (deg.)
37515.5	4.1	2.0	6.1	-16.84	-16.84	955	729.5	326.8	38.5	65.5
16.0	3.9	1.9	5.8	.86	.86	948	729.9	326.4	39.7	66.4
16.5	3.8	1.8	5.7	.87	.87	946	730.2	326.0	40.8	67.3
17.0	3.9	1.7	5.6	.88	.88	943	730.6	325.6	41.9	68.2
17.5	4.2	1.6	5.7	.87	.87	945	731.0	325.2	43.0	69.1
18.0	4.6	1.5	6.1	.85	.88	976	731.4	324.8	44.1	69.9
18.5	4.4	1.4	5.8	.87	.90	969	731.8	324.5	45.2	70.7
19.0	5.4	1.1	6.6	.81	.84	987	732.3	324.1	46.2	71.5
19.5	6.8	0.8	7.6	.75	.78	1007	732.7	323.8	47.3	72.3
20.0	7.7	0.3	8.0	.73	.76	1014	733.2	323.5	48.3	73.0
20.5	7.8	-0.2	7.6	.76	.78	1007	733.8	323.3	49.3	73.8
21.0	8.6	-0.3	8.2	.73	.75	1018	734.3	323.1	50.2	74.4
21.5	9.9	-0.4	9.6	.66	.68	1041	734.8	322.9	51.2	75.0
22.0	11.2	-0.3	10.8	.61	.63	1060	735.4	322.7	52.1	75.6
22.5	11.7	-0.3	11.4	.59	.60	1068	735.9	322.6	52.9	76.2
23.0	11.1	-0.3	10.8	.61	.63	1060	736.5	322.6	53.7	76.6
23.5	11.0	-0.3	10.8	.62	.63	1060	737.1	322.5	54.4	77.1
24.0	10.6	-0.2	10.4	.64	.64	1054	737.6	322.6	55.1	77.5
24.5	9.5	-0.2	9.3	.69	.69	1037	738.2	322.6	55.8	77.8
25.0	9.1	-0.2	8.9	.71	.71	1030	738.8	322.8	56.4	78.1
25.5	10.3	-0.2	10.2	.65	.65	1051	739.4	322.9	56.9	78.3
26.0	11.6	-0.1	11.5	.60	.60	1069	739.9	323.2	57.4	78.4
26.5	11.9	-0.1	11.8	.59	.59	1073	740.5	323.5	57.8	78.5
27.0	10.6	-0.1	10.5	.64	.64	1055	741.0	323.8	58.2	78.6
27.5	10.0	-0.1	9.9	.67	.67	1046	741.6	324.2	58.5	78.5
28.0	9.7	0.0	9.7	.68	.68	1043	742.1	324.6	58.7	78.4
28.5	9.9	0.1	9.8	.68	.67	1045	742.6	325.1	58.9	78.3
29.0	10.0	0.0	10.0	.67	.66	1048	743.1	325.7	59.0	78.1
29.5	10.1	0.0	10.1	.67	.66	1049	743.5	326.2	59.0	77.8
30.0	10.5	0.0	10.5	.66	.64	1055	744.0	326.9	59.0	77.5
30.5	11.3	0.0	11.3	.63	.61	1066	744.4	327.6	58.9	77.1
31.0	10.8	0.1	10.9	.64	.63	1061	744.7	328.3	58.7	76.7
31.5	8.9	0.6	9.5	.70	.69	1040	745.1	329.0	58.5	76.2
32.0	7.6	1.6	9.1	.72	.70	1033	745.4	329.8	58.2	75.7
32.5	6.7	2.5	9.1	.73	.70	1033	745.7	330.6	57.8	75.1
33.0	5.0	3.2	8.2	.77	.75	1018	746.0	331.3	57.4	74.5
33.5	3.7	3.7	7.4	.82	.79	1003	746.2	332.1	56.9	73.9
34.0	3.1	4.2	7.3	.82	.80	1002	746.4	332.9	56.3	73.2
34.5	2.7	4.6	7.3	.82	.80	1002	746.6	333.7	55.7	72.4
35.0	1.8	5.0	6.7	.86	.84	990	746.8	334.5	55.0	71.7
35.5	1.7	5.3	6.9	.85	.82	994	746.9	335.2	54.3	70.9
36.0	1.9	5.5	7.4	.82	.79	1004	746.9	336.0	53.5	70.1
36.5	1.6	5.7	7.3	.82	.80	1002	747.0	336.6	52.7	69.2
37.0	1.1	5.9	7.0	.84	.81	997	747.0	337.3	51.8	68.4
37.5	1.0	6.0	7.0	.84	.81	997	747.0	337.9	50.9	67.5
38.0	1.4	6.1	7.5	.81	.78	1007	747.0	338.4	49.9	66.7
38.5	1.2	6.2	7.4	.81	.79	1005	747.0	338.9	48.9	65.8
39.0	1.0	6.3	7.3	.82	.79	1004	746.9	339.4	47.9	64.9
39.5	0.5	6.4	6.9	.84	.81	996	746.8	339.8	46.8	64.0
40.0	0.3	6.4	6.7	.85	.83	993	746.6	340.2	45.7	63.2
37540.2	-0.3	6.4	6.1	-16.89	-16.87	980	746.6	340.3	45.2	62.8
40.4	-0.5	6.4	5.9	.91	.88	975	746.5	340.4	44.8	62.5
40.6	-0.5	6.4	5.9	.90	.88	975	746.5	340.5	44.3	62.1
40.8	-0.1	6.4	6.3	.88	.85	985	746.4	340.6	43.8	61.8
41.0	0.4	6.4	6.7	.85	.82	993	746.3	340.7	43.4	61.5
41.2	1.4	6.4	7.7	.79	.76	1013	746.3	340.8	42.9	61.1
41.4	2.6	6.4	8.9	.72	.70	1035	746.2	340.9	42.4	60.8
41.6	3.6	6.4	9.9	.68	.65	1051	746.1	340.9	42.0	60.5
41.8	4.1	6.3	10.4	.65	.63	1058	746.0	341.0	41.5	60.2

Table 5.--Continued

MJD	$-10^7\dot{P}$	$10^7\dot{P}_R$	$-10^7\dot{P}_A$	$\log \rho_\pi$	$\log \rho_s$	T_π (°K)	z (km)	$\alpha_\pi-\alpha_\odot$ (deg.)	ψ'_0 (deg.)	ψ'_{30} (deg.)
37542.0	3.4	6.3	9.7	-16.68	-16.66	1048	746.0	341.0	41.0	59.9
42.2	2.4	6.3	8.7	.73	.71	1032	745.9	341.1	40.5	59.6
42.4	2.0	6.3	8.2	.75	.73	1023	745.8	341.1	40.0	59.2
42.6	1.8	6.3	8.1	.76	.74	1022	745.7	341.1	39.5	58.9
42.8	1.7	6.2	7.9	.77	.75	1018	745.6	341.2	39.1	58.7
37543.0	1.6	6.2	7.8	-16.77	-16.75	1016	745.5	341.2	38.6	58.4
43.5	1.6	6.2	7.8	.77	.75	1017	745.3	341.2	37.4	57.7
44.0	1.2	6.1	7.3	.80	.78	1008	745.1	341.1	36.2	57.0
44.5	0.8	6.0	6.8	.83	.81	998	744.8	341.0	35.0	56.4
45.0	0.9	5.9	6.9	.82	.80	1001	744.6	340.9	33.8	55.8
45.5	0.8	5.8	6.6	.84	.82	995	744.4	340.8	32.7	55.3
46.0	0.6	5.7	6.3	.85	.84	988	744.1	340.6	31.6	54.9
46.5	1.0	5.6	6.6	.83	.82	995	743.9	340.3	30.5	54.5
47.0	1.3	5.5	6.8	.82	.80	1000	743.7	340.1	29.5	54.1
47.5	1.9	5.3	7.2	.79	.78	1008	743.5	339.8	28.5	53.8
48.0	2.1	5.2	7.3	.78	.77	1011	743.3	339.5	27.6	53.6
48.5	2.6	5.1	7.7	.76	.75	1019	743.1	339.2	26.8	53.4
49.0	2.8	4.9	7.8	.75	.74	1021	743.0	338.8	26.1	53.3
49.5	3.0	4.8	7.8	.75	.74	1021	742.8	338.5	25.5	53.2
50.0	3.5	4.7	8.2	.73	.72	1029	742.7	338.1	24.9	53.2
50.5	3.8	4.5	8.3	.72	.71	1031	742.6	337.7	24.5	53.2
51.0	4.3	4.4	8.7	.70	.69	1038	742.6	337.3	24.2	53.3
51.5	5.2	4.2	9.4	.66	.66	1050	742.5	336.9	24.1	53.5
52.0	6.4	4.1	10.4	.62	.61	1066	742.5	336.5	24.0	53.7
52.5	6.6	3.9	10.5	.62	.61	1068	742.5	336.1	24.1	53.9
53.0	6.5	3.8	10.3	.62	.61	1065	742.5	335.7	24.3	54.2
53.5	6.6	3.7	10.3	.62	.61	1065	742.5	335.3	24.6	54.5
37553.6	6.1	3.7	9.8	-16.64	-16.63	1057	742.6	335.3	24.7	54.5
53.8	6.6	3.6	10.2	.63	.62	1064	742.6	335.1	24.8	54.7
54.0	7.4	3.6	11.0	.59	.58	1076	742.6	335.0	25.0	54.8
54.2	7.7	3.5	11.3	.58	.57	1080	742.6	334.8	25.2	55.0
54.4	8.4	3.5	11.9	.56	.55	1088	742.7	334.7	25.4	55.1
54.6	7.7	3.5	11.1	.59	.58	1077	742.7	334.5	25.6	55.3
54.8	6.6	3.4	10.1	.63	.62	1063	742.8	334.4	25.8	55.4
55.0	7.0	3.4	10.3	.62	.61	1066	742.8	334.2	26.1	55.6
55.2	7.1	3.3	10.4	.62	.61	1067	742.9	334.1	26.3	55.8
55.4	5.9	3.3	9.2	.67	.66	1048	742.9	333.9	26.6	55.9
55.6	6.4	3.2	9.6	.65	.64	1055	743.0	333.8	26.8	56.1
55.8	6.9	3.2	10.1	.63	.62	1063	743.0	333.7	27.1	56.3
56.0	7.2	3.1	10.3	.62	.61	1066	743.1	333.5	27.4	56.5
56.2	8.5	3.1	11.6	.57	.56	1085	743.2	333.4	27.7	56.6
56.4	9.0	3.1	12.1	.55	.54	1092	743.2	333.3	28.0	56.8
56.6	8.6	3.0	11.7	.57	.55	1087	743.3	333.2	28.3	57.0
56.8	8.1	3.0	11.1	.59	.58	1078	743.4	333.0	28.7	57.2
37557.0	8.2	3.0	11.2	-16.59	-16.57	1080	743.5	332.9	29.0	57.4
57.5	7.6	2.9	10.4	.62	.64	1073	743.6	332.7	29.8	57.8
58.0	7.4	2.8	10.2	.63	.65	1070	743.9	332.4	30.7	58.3
58.5	7.5	2.7	10.2	.63	.65	1070	744.1	332.2	31.6	58.7
59.0	7.5	2.7	10.2	.63	.65	1071	744.4	332.0	32.5	59.2
59.5	7.7	2.6	10.2	.63	.65	1071	744.6	331.9	33.4	59.6
60.0	6.8	2.6	9.4	.67	.69	1058	744.9	331.8	34.3	60.0
60.5	6.0	2.5	8.4	.72	.73	1041	745.2	331.7	35.1	60.4
61.0	5.7	2.4	8.1	.73	.75	1035	745.5	331.7	36.0	60.8
61.5	5.4	2.4	7.8	.75	.77	1030	745.8	331.7	36.8	61.1
62.0	5.0	2.4	7.4	.77	.79	1022	746.1	331.8	37.6	61.5
62.5	4.8	2.4	7.2	.79	.80	1018	746.4	331.9	38.4	61.8
63.0	4.7	2.4	7.0	.80	.81	1014	746.8	332.1	39.2	62.0

Table 5.--Continued

MJD	$-10^7\dot{P}$	$10^7\dot{P}_R$	$-10^7\dot{P}_A$	$\log \rho_\pi$	$\log \rho_s$	T_π (°K)	z (km)	$\alpha_\pi-\alpha_\odot$ (deg.)	ψ'_0 (deg.)	ψ'_{30} (deg.)
37563.5	4.6	2.4	6.9	-16.81	-16.82	1012	747.1	332.3	39.9	62.2
64.0	4.3	2.3	6.6	.83	.84	1006	747.4	332.6	40.5	62.4
64.5	3.6	2.4	5.9	.88	.89	990	747.7	332.9	41.2	62.6
65.0	3.4	2.4	5.8	.89	.89	987	748.0	333.3	41.8	62.7
37565.2	3.0	2.4	5.4	-16.92	-16.93	977	748.2	333.5	42.0	62.7
65.4	2.8	2.4	5.2	.94	.94	972	748.3	333.6	42.2	62.7
65.6	3.3	2.4	5.7	.90	.90	985	748.4	333.8	42.4	62.8
65.8	3.3	2.4	5.7	.90	.90	985	748.5	334.0	42.6	62.8
66.0	4.1	2.4	6.5	.84	.84	1003	748.6	334.2	42.8	62.8
66.2	4.1	2.4	6.5	.84	.84	1003	748.8	334.4	43.0	62.8
66.4	4.6	2.4	7.0	.81	.81	1014	748.9	334.6	43.1	62.8
66.6	5.8	2.5	8.2	.74	.74	1037	749.0	334.9	43.3	62.8
66.8	5.8	2.5	8.2	.74	.74	1037	749.1	335.1	43.5	62.8
67.0	6.3	2.5	8.8	.71	.71	1048	749.2	335.3	43.6	62.7
67.2	5.9	2.5	8.5	.73	.73	1043	749.3	335.6	43.7	62.7
67.4	5.6	2.5	8.1	.75	.75	1035	749.5	335.8	43.9	62.7
67.6	5.3	2.6	7.8	.76	.77	1030	749.6	336.1	44.0	62.6
67.8	4.6	2.6	7.2	.80	.80	1018	749.7	336.3	44.1	62.6
68.0	4.3	2.6	6.9	.82	.82	1012	749.8	336.6	44.2	62.5
68.2	4.1	2.6	6.8	.82	.83	1010	749.9	336.9	44.3	62.4
68.4	4.0	2.7	6.7	.83	.83	1008	750.0	337.1	44.4	62.4
68.6	3.7	2.7	6.4	.85	.85	1001	750.1	337.4	44.4	62.3
68.8	4.5	2.7	7.3	.80	.79	1020	750.2	337.7	44.5	62.2
69.0	5.1	2.8	7.8	.77	.77	1030	750.3	338.0	44.6	62.1
37569.5	4.2	2.8	7.0	-16.81	-16.81	1014	750.5	338.8	44.7	61.8
70.0	3.8	3.0	6.8	.83	.83	1010	750.7	339.5	44.7	61.5
70.5	3.6	3.1	6.7	.83	.83	1008	750.9	340.3	44.7	61.2
71.0	3.6	3.2	6.8	.83	.83	1010	751.1	341.1	44.6	60.8
71.5	3.5	3.3	6.8	.83	.82	1010	751.2	341.9	44.5	60.4
37572.0	3.3	3.4	6.7	-16.84	-16.83	1008	751.3	342.6	44.3	60.0
72.2	3.5	3.5	7.0	.82	.81	1014	751.4	342.9	44.2	59.8
72.4	3.6	3.5	7.1	.81	.81	1016	751.4	343.3	44.1	59.6
72.6	3.9	3.6	7.5	.79	.78	1024	751.5	343.5	44.0	59.4
72.8	8.7	3.6	12.3	.57	.57	1101	751.5	343.8	43.8	59.2
73.0	17.2	3.7	20.9	.34	.34	1195	751.6	344.1	43.7	59.0
73.2	18.1	3.7	21.8	.32	.32	1203	751.6	344.4	43.6	58.8
73.4	14.1	3.8	17.8	.41	.41	1165	751.6	344.7	43.4	58.6
73.6	14.1	3.8	17.9	.41	.40	1166	751.7	345.0	43.3	58.4
73.8	13.0	3.9	16.8	.44	.43	1155	751.7	345.3	43.1	58.2
74.0	6.8	3.9	10.7	.63	.63	1079	751.7	345.5	42.9	58.0
74.2	3.8	4.0	7.7	.78	.77	1029	751.7	345.8	42.7	57.8
74.4	2.5	4.0	6.5	.85	.84	1004	751.7	346.1	42.6	57.5
74.6	2.5	4.0	6.5	.85	.84	1004	751.8	346.3	42.4	57.3
74.8	2.5	4.1	6.6	.84	.84	1006	751.8	346.5	42.1	57.1
37575.0	2.5	4.1	6.6	-16.84	-16.84	1007	751.8	346.8	41.9	56.8
75.5	3.3	4.2	7.5	.79	.78	1025	751.8	347.3	41.4	56.2
76.0	4.4	4.3	8.7	.72	.71	1048	751.8	347.8	40.7	55.6
76.5	4.8	4.4	9.2	.70	.69	1056	751.8	348.3	40.1	55.0
77.0	5.0	4.4	9.5	.68	.67	1062	751.8	348.7	39.4	54.4
77.5	5.2	4.5	9.6	.68	.67	1064	751.8	349.1	38.6	53.8
78.0	5.4	4.5	9.9	.66	.66	1069	751.7	349.4	37.8	53.1
78.5	5.6	4.5	10.1	.65	.65	1072	751.7	349.6	37.0	52.5
79.0	5.9	4.5	10.4	.64	.63	1077	751.6	349.8	36.1	51.9
79.5	6.1	4.6	10.6	.63	.62	1081	751.6	350.0	35.3	51.3
80.0	6.3	4.6	10.9	.62	.61	1085	751.6	350.1	34.3	50.7
80.5	6.4	4.6	11.0	.61	.60	1087	751.5	350.2	33.4	50.2

Table 5.--Continued

MJD	$-10^7\dot{P}$	$10^7\dot{P}_R$	$-10^7\dot{P}_A$	$\log \rho_\pi$	$\log \rho_s$	T_π (°K)	z (km)	$\alpha_\pi-\alpha_\odot$ (deg.)	ψ_0' (deg.)	ψ_{30}' (deg.)
37581.0	6.4	4.5	11.0	-16.61	-16.60	1088	751.5	350.2	32.4	49.6
81.5	6.3	4.5	10.8	.62	.61	1085	751.5	350.1	31.5	49.1
82.0	6.2	4.5	10.7	.62	.61	1084	751.5	350.0	30.5	48.6
82.5	6.3	4.4	10.7	.62	.61	1085	751.5	349.9	29.5	48.1
83.0	6.4	4.4	10.8	.61	.61	1087	751.5	349.8	28.5	47.7
37583.2	6.8	4.3	11.1	-16.60	-16.59	1091	751.5	349.7	28.1	47.5
83.4	6.9	4.3	11.2	.59	.59	1093	751.5	349.6	27.7	47.4
83.6	7.7	4.3	12.0	.56	.56	1105	751.5	349.5	27.3	47.2
83.8	8.7	4.3	13.0	.53	.52	1118	751.6	349.4	26.9	47.1
84.0	9.3	4.3	13.6	.51	.50	1126	751.6	349.3	26.5	46.9
84.2	9.6	4.2	13.9	.50	.49	1130	751.6	349.3	26.1	46.8
84.4	9.9	4.2	14.1	.49	.49	1133	751.6	349.1	25.7	46.7
84.6	9.5	4.2	13.7	.50	.50	1128	751.6	349.0	25.3	46.6
84.8	9.5	4.2	13.6	.51	.50	1127	751.7	348.9	24.9	46.4
85.0	9.3	4.1	13.4	.51	.51	1125	751.7	348.8	24.5	46.3
85.2	9.0	4.1	13.1	.52	.52	1121	751.7	348.7	24.1	46.2
85.4	8.8	4.1	12.9	.53	.52	1119	751.8	348.6	23.7	46.1
85.6	8.4	4.0	12.4	.54	.54	1112	751.8	348.4	23.4	46.0
85.8	8.0	4.0	12.0	.56	.55	1107	751.9	348.3	23.0	46.0
86.0	7.6	4.0	11.6	.57	.57	1102	751.9	348.2	22.6	45.9
37586.5	6.8	3.9	10.7	-16.61	-16.60	1089	752.0	347.8	21.8	45.7
87.0	6.4	3.8	10.1	.63	.62	1080	752.2	347.4	20.9	45.6
87.5	5.7	3.7	9.4	.66	.65	1070	752.3	347.1	20.2	45.5
88.0	5.2	3.6	8.8	.69	.68	1060	752.5	346.7	19.5	45.5
88.5	4.7	3.5	8.2	.72	.71	1050	752.8	346.3	18.8	45.5
89.0	4.1	3.4	7.5	.76	.75	1037	753.0	345.9	18.2	45.5
89.5	3.9	3.3	7.2	.77	.76	1031	753.3	345.4	17.8	45.6
90.0	3.8	3.2	7.0	.79	.77	1027	753.5	345.0	17.4	45.6
90.5	4.0	3.1	7.1	.78	.76	1030	753.9	344.6	17.1	45.8
91.0	4.7	3.0	7.7	.74	.73	1043	754.2	344.2	16.9	45.9
91.5	4.8	2.9	7.7	.74	.73	1043	754.5	343.8	16.8	46.1
92.0	5.3	2.8	8.1	.72	.70	1052	754.9	343.4	16.8	46.2
92.5	5.3	2.7	8.1	.72	.70	1052	755.3	343.0	17.0	46.4
93.0	5.3	2.7	8.0	.73	.71	1051	755.8	342.6	17.2	46.6
93.5	5.0	2.6	7.5	.75	.73	1042	756.2	342.3	17.4	46.8
94.0	4.7	2.5	7.2	.77	.75	1036	756.7	341.9	17.8	47.1
94.5	4.6	2.4	7.0	.78	.76	1032	757.2	341.6	18.2	47.3
95.0	4.2	2.4	6.5	.82	.79	1022	757.7	341.3	18.6	47.5
95.5	3.9	2.3	6.2	.84	.81	1016	758.2	341.0	19.1	47.7
96.0	4.0	2.3	6.3	.83	.80	1019	758.7	340.8	19.6	47.9
96.5	4.0	2.2	6.2	.84	.80	1017	759.3	340.6	20.2	48.0
97.0	4.0	2.2	6.2	.84	.80	1017	759.8	340.4	20.7	48.2
97.5	4.2	2.1	6.3	.83	.79	1020	760.4	340.3	21.3	48.3
98.0	5.0	2.1	7.1	.78	.78	1042	760.9	340.2	21.8	48.4
37598.2	5.3	2.0	7.4	-16.76	-16.76	1049	761.2	340.2	22.0	48.5
98.4	5.4	2.0	7.4	.76	.76	1049	761.4	340.2	22.2	48.5
98.6	6.0	2.0	8.0	.73	.72	1061	761.6	340.1	22.4	48.5
98.8	6.9	2.0	8.9	.68	.68	1078	761.8	340.1	22.7	48.6
99.0	6.8	2.0	8.8	.69	.68	1077	762.0	340.1	22.9	48.6
99.2	6.7	2.0	8.7	.69	.69	1075	762.3	340.1	23.1	48.6
99.4	6.4	2.0	8.4	.71	.70	1070	762.5	340.2	23.3	48.6
99.6	5.5	2.0	7.5	.76	.75	1052	762.7	340.2	23.5	48.6
99.8	5.6	2.0	7.6	.75	.74	1055	762.9	340.2	23.7	48.6
37600.0	6.4	2.0	8.3	.72	.70	1069	763.1	340.3	23.8	48.6
00.2	7.6	1.9	9.6	.65	.64	1092	763.3	340.3	24.0	48.6
00.4	8.4	1.9	10.3	.62	.61	1104	763.6	340.4	24.2	48.6
00.6	14.4	1.9	16.3	.42	.41	1184	763.8	340.4	24.4	48.6

Table 5.--Continued

MJD	$-10^7\dot{P}$	$10^7\dot{P}_R$	$-10^7\dot{P}_A$	log ρ_π	log ρ_s	T_π (°K)	z (km)	$\alpha_\pi-\alpha_\odot$ (deg.)	ψ'_0 (deg.)	ψ'_{30} (deg.)
37600.8	31.2	1.9	33.1	-16.12	-16.10	1329	764.0	340.5	24.5	48.5
01.0	29.9	1.9	31.9	.13	.12	1321	764.2	340.6	24.7	48.5
01.2	18.8	1.9	20.7	.32	.30	1231	764.4	340.7	24.9	48.5
01.4	8.4	1.9	10.3	.62	.61	1105	764.6	340.8	25.0	48.4
01.6	6.3	1.9	8.2	.72	.71	1068	764.8	340.9	25.1	48.4
01.8	5.6	1.9	7.5	.76	.74	1054	765.0	341.0	25.3	48.3
02.0	4.9	1.9	6.8	.80	.79	1040	765.1	341.1	25.4	48.2
37602.5	4.3	1.9	6.2	-16.85	-16.82	1026	765.6	341.5	25.7	48.0
03.0	4.2	1.9	6.1	.85	.83	1024	766.0	341.9	25.9	47.8
03.5	4.1	1.9	6.0	.86	.84	1022	766.4	342.3	26.1	47.5
04.0	4.0	1.9	5.9	.87	.84	1020	766.8	342.8	26.3	47.2
04.5	3.9	1.9	5.8	.88	.85	1018	767.2	343.3	26.4	46.9
05.0	3.8	1.9	5.8	.88	.85	1018	767.5	343.9	26.4	46.5
05.5	3.8	1.9	5.7	.88	.86	1016	767.8	344.6	26.4	46.0
06.0	3.7	2.0	5.7	.88	.85	1016	768.0	345.2	26.3	45.6
06.5	3.5	2.0	5.5	.90	.87	1011	768.3	345.9	26.2	45.1
07.0	3.3	2.0	5.2	.92	.89	1003	768.5	346.7	26.0	44.5
07.5	3.8	2.0	5.8	.88	.85	1019	768.6	347.4	25.7	43.9
08.0	4.2	2.1	6.2	.85	.82	1029	768.8	348.2	25.4	43.3
08.5	4.8	2.1	6.9	.80	.77	1046	768.9	349.0	25.1	42.7
09.0	5.4	2.1	7.5	.76	.73	1059	768.9	349.7	24.7	42.0
09.5	5.6	2.1	7.7	.75	.72	1063	769.0	350.5	24.2	41.3
10.0	5.7	2.0	7.8	.75	.71	1065	769.0	351.3	23.6	40.6
37610.2	6.0	2.0	8.0	-16.74	-16.70	1069	769.0	351.5	23.4	40.3
10.4	6.2	2.0	8.2	.72	.69	1073	769.0	351.8	23.2	40.0
10.6	6.6	2.0	8.6	.70	.67	1081	768.9	352.1	22.9	39.7
10.8	8.4	2.0	10.4	.62	.59	1112	768.9	352.4	22.7	39.4
11.0	8.6	2.0	10.6	.61	.58	1116	768.9	352.7	22.4	39.1
11.2	8.3	2.0	10.3	.62	.59	1111	768.9	353.0	22.1	38.8
11.4	8.2	2.0	10.1	.63	.60	1108	768.8	353.2	21.8	38.5
11.6	7.2	2.0	9.2	.67	.64	1092	768.8	353.5	21.5	38.2
11.8	6.9	2.0	8.8	.69	.66	1085	768.7	353.8	21.2	37.9
12.0	6.8	2.0	8.7	.70	.66	1083	768.7	354.0	20.9	37.6
12.2	6.3	2.0	8.2	.72	.69	1074	768.6	354.2	20.6	37.3
12.4	6.3	1.9	8.3	.72	.68	1076	768.5	354.5	20.3	37.0
12.6	6.2	1.9	8.1	.73	.69	1072	768.5	354.7	19.9	36.7
12.8	6.1	1.9	8.0	.73	.70	1070	768.4	354.9	19.6	36.4
37613.0	6.1	1.9	8.0	-16.73	-16.70	1070	768.3	355.1	19.2	36.1
13.5	5.9	1.9	7.8	.74	.71	1066	768.1	355.6	18.3	35.4
14.0	6.0	1.8	7.8	.74	.71	1066	767.9	356.1	17.3	34.7
14.5	6.0	1.7	7.8	.74	.71	1066	767.6	356.5	16.3	34.0
15.0	6.1	1.7	7.8	.74	.71	1067	767.3	356.8	15.3	33.4
15.5	6.3	1.6	7.9	.73	.70	1069	767.0	357.1	14.2	32.8
37616.0	6.4	1.5	8.0	-16.72	-16.70	1071	766.7	357.4	13.0	32.2
16.2	6.3	1.5	7.8	.73	.71	1067	766.5	357.4	12.5	32.0
16.4	6.6	1.5	8.1	.72	.69	1072	766.4	357.5	12.1	31.8
16.6	6.9	1.4	8.3	.71	.68	1076	766.2	357.6	11.6	31.7
16.8	6.8	1.4	8.2	.71	.69	1074	766.1	357.6	11.1	31.5
17.0	7.0	1.4	8.3	.71	.68	1076	765.9	357.7	10.6	31.3
17.2	7.6	1.3	8.9	.67	.65	1087	765.8	357.7	10.1	31.2
17.4	6.7	1.3	8.0	.72	.70	1070	765.6	357.7	9.6	31.1
17.6	6.5	1.2	7.8	.73	.71	1066	765.4	357.7	9.1	31.0
17.8	6.0	1.2	7.2	.76	.75	1054	765.3	357.8	8.6	30.8
18.0	5.6	1.1	6.8	.79	.77	1045	765.1	357.8	8.1	30.8

Table 5.--Continued

MJD	$-10^7\dot{P}$	$10^7\dot{P}_R$	$-10^7\dot{P}_A$	log ρ_π	log ρ_s	T_π (°K)	z (km)	$\alpha_\pi-\alpha_\odot$ (deg.)	ψ'_0 (deg.)	ψ'_{30} (deg.)
37618.5	5.1	1.0	6.2	-16.83	-16.81	1031	764.7	357.7	6.8	30.6
19.0	4.5	0.9	5.4	.89	.87	1010	764.2	357.7	5.6	30.5
19.5	4.3	0.8	5.1	.91	.90	1002	763.8	357.5	4.4	30.5
20.0	4.8	0.7	5.5	.88	.86	1013	763.3	357.4	3.3	30.7
20.5	5.9	0.6	6.4	.81	.80	1035	762.9	357.2	2.8	30.9
37620.8	6.7	0.5	7.2	-16.76	-16.75	1053	762.6	357.1	2.8	31.1
21.0	7.1	0.4	7.5	.74	.73	1059	762.4	356.9	3.0	31.3
21.2	7.6	0.4	8.0	.71	.70	1069	762.3	356.8	3.2	31.4
21.4	7.9	0.3	8.2	.70	.69	1073	762.1	356.7	3.6	31.6
21.6	8.1	0.3	8.4	.69	.68	1077	761.9	356.6	4.0	31.8
21.8	9.1	0.2	9.3	.65	.64	1093	761.7	356.5	4.5	32.0
22.0	8.5	0.2	8.6	.68	.67	1080	761.5	356.4	5.0	32.2
22.2	7.8	0.1	7.9	.72	.71	1066	761.4	356.3	5.6	32.5
22.4	7.5	0.0	7.5	.74	.73	1058	761.2	356.1	6.2	32.7
22.6	7.0	0.0	7.0	.77	.76	1048	761.0	356.0	6.7	33.0
22.8	6.9	-0.1	6.8	.78	.78	1043	760.9	355.8	7.3	33.3
37623.0	6.3	-0.1	6.2	-16.82	-16.82	1029	760.7	355.7	7.9	33.6
23.5	6.4	-0.3	6.1	.83	.82	1026	760.3	355.3	9.5	34.4
24.0	6.9	-0.4	6.5	.80	.80	1035	759.9	354.9	11.1	35.3
24.5	6.8	-0.5	6.3	.81	.81	1030	759.6	354.5	12.7	36.2
25.0	6.5	-0.7	5.8	.85	.85	1018	759.2	354.1	14.3	37.2
25.5	6.4	-0.8	5.5	.87	.87	1010	758.9	353.6	15.9	38.3
26.0	6.4	-1.0	5.5	.87	.87	1009	758.6	353.1	17.6	39.4
26.5	6.7	-1.1	5.6	.86	.87	1012	758.3	352.7	19.3	40.6
27.0	6.9	-1.2	5.7	.85	.86	1014	758.1	352.2	20.9	41.7
27.5	7.1	-1.4	5.7	.85	.86	1014	757.8	351.7	22.6	43.0
28.0	7.3	-1.5	5.8	.85	.86	1016	757.6	351.2	24.3	44.2
28.5	7.6	-1.6	6.0	.83	.84	1021	757.4	350.8	25.9	45.5
29.0	7.8	-1.7	6.2	.82	.83	1025	757.3	350.3	27.6	46.8
29.5	8.0	-1.7	6.3	.81	.82	1027	757.2	349.8	29.2	48.1
30.0	8.5	-1.8	6.7	.79	.80	1036	757.0	349.4	30.9	49.3
30.5	9.4	-1.9	7.5	.74	.75	1053	757.0	348.9	32.5	50.6
31.0	8.5	-1.9	6.6	.79	.81	1033	756.9	348.5	34.1	51.9
31.5	8.3	-1.9	6.4	.81	.82	1028	756.8	348.1	35.7	53.2
32.0	8.5	-1.9	6.7	.79	.80	1034	756.8	347.7	37.2	54.4
32.5	8.5	-1.8	6.7	.79	.80	1034	756.8	347.3	38.8	55.7
33.0	9.0	-1.8	7.2	.76	.77	1045	756.8	347.0	40.3	56.9
33.5	9.6	-1.7	8.0	.72	.73	1060	756.8	346.7	41.7	58.1
37634.0	10.2	-1.5	8.7	-16.68	-16.69	1073	756.8	346.4	43.2	59.2
34.2	11.2	-1.4	9.7	.63	.64	1091	756.8	346.3	43.8	59.7
34.4	12.7	-1.4	11.3	.57	.58	1116	756.8	346.2	44.3	60.1
34.6	14.3	-1.3	13.1	.50	.52	1141	756.9	346.1	44.9	60.5
34.8	16.1	-1.2	15.0	.45	.46	1165	756.9	346.0	45.4	61.0
35.0	17.6	-1.1	16.6	.40	.41	1183	756.9	346.0	46.0	61.4
35.2	18.6	-1.0	17.6	.38	.39	1194	756.9	345.9	46.5	61.8
35.4	19.1	-0.9	18.2	.36	.37	1200	756.9	345.8	47.1	62.2
35.6	18.4	-0.8	17.6	.38	.39	1193	757.0	345.8	47.6	62.6
35.8	17.7	-0.7	17.0	.39	.40	1187	757.0	345.7	48.1	63.0
36.0	17.0	-0.6	16.4	.41	.42	1180	757.0	345.6	48.6	63.4
36.2	15.6	-0.6	15.1	.45	.46	1165	757.1	345.6	49.1	63.8
36.4	11.9	-0.5	11.4	.57	.58	1115	757.1	345.6	49.6	64.2
36.6	10.3	-0.5	9.9	.63	.64	1092	757.1	345.5	50.1	64.6
36.8	10.0	-0.4	9.5	.65	.66	1085	757.2	345.5	50.6	64.9
37.0	9.8	-0.4	9.4	.65	.66	1083	757.2	345.5	51.1	65.3

Table 6

1961 δ1 - Geomagnetic and Atmospheric Perturbations

(M.J.D. 37354 - 37637)

n	MJD	Δa_p	ΔT	Δt_1	Δt_M	Δt_2	$t_2 - t_1$	
1	37364	105	125°	+0.^{d}1	+0.^{d}4	+0.^{d}4	0.^{d}8	
2	368	90	85	-	+0.3	-	1.0	
3	373	30	30	-	+0.1	-	-	
4	377	30	*	-	-	-	-	
5	385	45	60	-	+0.1	-	1.0	
6	390	25	20	-	+0.4	-	0.5	
7	392	40	60	-	+0.4	-	0.5	
8	398	35	30	-	+0.3	-	0.6	
9	400	20	25	-	+0.1	-	1.0	
10	402	30	*	-	-	-	-	
11	404	155	120	+0.2	+0.2	+0.3	0.6	
12	425	35	60	-	-	-	-	
13	439	25	40	-	+0.2	-	1.0	
14	442	15	15	-	-	-	-	
15	444	65	45	+0.3	+0.4	+0.4	0.8	
16	451	40	*	-	-	-	-	
17	456	40	55	-	0.0	-	0.4	
18	457	35	50	-	0.0	-	0.5	
19	472	75	75	-	+0.2	-	1.5	
20	479	60	40	-0.1	0.0	+0.1	0.5	
21	485	65	60	+0.2	+0.3	+0.3	0.8	
{22	493							
{23	494	180:	160	-	+0.4	-	1.2	irregular
24	496	40	35	-	+0.2	-	0.4	
25	498	90	80	+0.2	+0.4	+0.4	1.5	
26	501	60	85	+0.2	+0.2	+0.4	1.0	
27	505	20	*	-	-	-	-	
28	507	150	170	0.0	+0.2	+0.2	0.8	
29	513	75	60	-	(+0.5)	-	(1.5)	
30	519	15	*	-	-	-	-	
31	522	20	*	-	-	-	-	
32	541	45	50	-	+0.2	-	(1.5)	
33	554	25	25	-	+0.1	-	0.7	irregular
34	556	35	35	-	-	-	0.6	
35	566	60	60	-	+0.2	-	1.4	
36	569	25	20	-	-	-	-	
37	573	250	200	-0.1	+0.2	+0.4	1.1	
38	584	30	45	-	+0.3	-	(1.2)	
39	592	30	25	-	-	-	-	
40	599	30	30	-	+0.1	-	0.7	
41	600	260	300	+0.1	+0.2	+0.2	0.7	
42	610	55	45	+0.2	+0.2	+0.2	1.0	
43	617	30	*	-	-	-	0.4	
44	621	60	65	-	+0.3	-	1.7	
45	623	15	15	-	-	-	-	
46	633	100:	130	-	-	-	-	irregular
		Means :		+0.12	+0.22	+0.30	0.87	