

Limb Profiles of the Moon from Grazing Occultation Observations Collected at RGO

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Abstract

From lunar grazing occultation observations it is shown that the present lunar limb profile data have sometimes large errors, and therefore it is apparent that they need to be modified. For that purpose observations of grazing occultations collected at the Royal Greenwich Observatory until 1980 were analyzed and lunar limb profile data were obtained. As a result the number of the lunar limb profile data obtained from grazing occultations was almost doubled. These profile data are being used for the predictions of lunar grazing occultations in order to locate observers at better positions, so that they can also get good grazing occultation data to improve the lunar limb profiles. These profile data will be used in the future analyses of solar eclipse observations and of the possible errors of the Hipparcos proper motion system.

Key words: Lunar grazing occultations, Lunar limb profiles.

1. Introduction

For the lunar limb irregularity corrections in the lunar occultation analyses, Watts' (1963) charts are still being used. In 1994 lunar topographic features were observed by the Clementine lunar mapping mission (Smith et al. 1997), but the Clementine laser altimeter data were too sparse (they only covered narrow meridional strips separated by almost 3° of selenographic longitude) to replace Watts' data, and the altimeter data for the polar regions were not obtained. Margot et al. (1999) obtained lunar polar topography from radar interferometry, and Cook et al. (2000) derived them from Clementine stereoimages, but derived lunar limb profiles from them did not agree well.

There is a Japanese SELENE mission which will start in 2003. The Moon-orbiting SELENE satellite will observe Moon's surface, and it is expected that the observations will help to derive the lunar limb profiles. But for the present, lunar occultation observations are the only ways to get precise lunar limb profile data. Those data will be used to detect the variation of the solar diameter from analyzing solar eclipse timing observations (Fiala et al. 1994). They are also useful for detecting errors of the Hipparcos proper motion system (Dunham 1997, Sôma 2000).

Lunar grazing occultation observations are of an advantage to getting lunar limb profile data in the lunar polar regions, and they can be used for predictions of future grazing occultations with near librations. The International Lunar Occultation Centre (ILOC) in Tokyo has been collecting lunar total and grazing occultation observations made in the world since 1980. Sôma (1999) analyzed those grazing occultation observations collected at the ILOC using the planetary and lunar ephemerides DE405 (Standish 1998) and the Hipparcos Catalogue of stars (ESA 1997), and published the lunar limb profile data obtained from the analysis. They have been be-

ing used for the predictions of grazing occultations provided by IOTA (International Occultation Timing Association) each year, but they are not enough for the predictions so that many predicted grazing events still have inaccurate profile data for the observations as will be explained in Sect. 2 below.

Until 1980 the lunar total and grazing occultation observations were collected at the Royal Greenwich Observatory (RGO), and the total occultation data were provided in the machine-readable form, but the grazing data were only publicized on the microfiche (Appleby et al. 1984) and those in the machine-readable form were lost. However Dietmar Bütner and other IOTA/European Section members digitized the data recently, and they kindly provided the data to the authors. We checked the data and some errors in the digitized data were corrected with the help of David Herald in Australia. In Sect. 3 these grazing occultation observations are analyzed with the same lunar and planetary ephemerides and the same star catalog as was used by Sôma (1999) and the lunar limb profile data obtained from the analysis are given in the same format of table 1 by Sôma (1999).

Our goal is to give lunar limb data for any libration and any position angle. The grazing occultation observations made hitherto are not enough to provide them. But the data in the present paper are intended to be used for the lunar limb profile predictions for future grazing occultations in order to locate observers at better positions, so that they can also get good grazing occultation data to improve the lunar limb profiles.

The data presented in this paper have been provided in the machine-readable form to IOTA computers, who are responsible for grazing occultation predictions for observers in their countries or regions, and are used for the predictions for 2002. One of the authors (MS), as the Vice President for Grazing Occultation Services of IOTA from 1998, is receiving grazing occultation observations made by the IOTA members. The authors will reduce them, update the limb profile data, and provide them annually to the IOTA computers. The data can also be provided in the machine-readable form to anyone upon request.

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2. Recent Examples of Successful Grazing Occultations

The lunar limb profiles obtained by Sôma (1999) have been used for the predictions of lunar grazing occultations distributed annually from IOTA, but there are still many grazing events which have no observed lunar limb profiles in the predictions. The grazing occultations of the 5.1-magnitude star 97 Tauri (ZC 730) observed on 2000 July 27 in Florida, U.S.A. and on 2000 August 23 in Japan were two of such events, and Watts' (1963) lunar profile charts had large errors for those events, but through international collaboration those events were successfully observed, as explained below.

Just a few days before the 2000 July event David W. Dunham, the president of IOTA, remembered that he and an IOTA member Robert H. Stewart observed the grazing occultation of the same star on 1995 July 23 in Virginia, U.S.A., and from their observations he suspected that while Watts' charts gave rather low lunar limb profile for that region, the actual profile was not so low. So he reported their observations to Sôma and Dunham's suspicion was confirmed from Sôma's analysis of their observation as given in figure 1. The fact was also consistent with the grazing occultation of ZC 478 observed on 1977 August 7 in Maryland, U.S.A. (figure 2), whose observations were archived at the ILOC in Tokyo, although the latitude librations b of the Moon of them differed by about 1° . The Watts angle (the position angle used in Watts' charts; it was Watts' intention that this angle was identical with that

measured from the north pole of the Moon, but actually they differed by about $0^\circ.24$) of those profiles were larger than the central graze Watts angle of the 2000 July event by about 10° , but Sôma found that a few other grazing occultations that were within a few degrees of Watts angle and librations of the 2000 July event showed the actual lunar limb profile being close to the lunar mean limb, which was about $0''.5$ to $1''.0$ higher than Watts' profile, as shown in figures 3–6 (it is noted that, as shown in the figures, the longitude librations l and the latitude librations b of the Moon for these events vary in the regions $-1.1 \leq l \leq +3.2$ and $+3.60 \leq b \leq +6.11$, but all of the observed lunar limb profiles are close to the lunar mean limb). Based on this information the 2000 July grazing occultation of 97 Tauri was successfully observed, and 9 observers in three expeditions got a total of 65 contacts. A month later, on 2000 August 23, another grazing occultation of the same star occurred over almost the length of Japan (figure 7). In order to help positioning Japanese observers of the event, the timings and locations of the observations in Florida were all determined and they were sent to Sôma by a few days before the date of the Japanese event. Based on the reduced lunar profile as given in figure 8, the Japanese event was successfully observed, and 31 observers in five expeditions were able to time a total of 198 contacts. As a result the lunar limb profile was accurately determined as shown in figure 9.

It is regretted that the Japanese expeditions failed to observe the top of the highest mountain located at Watts angle

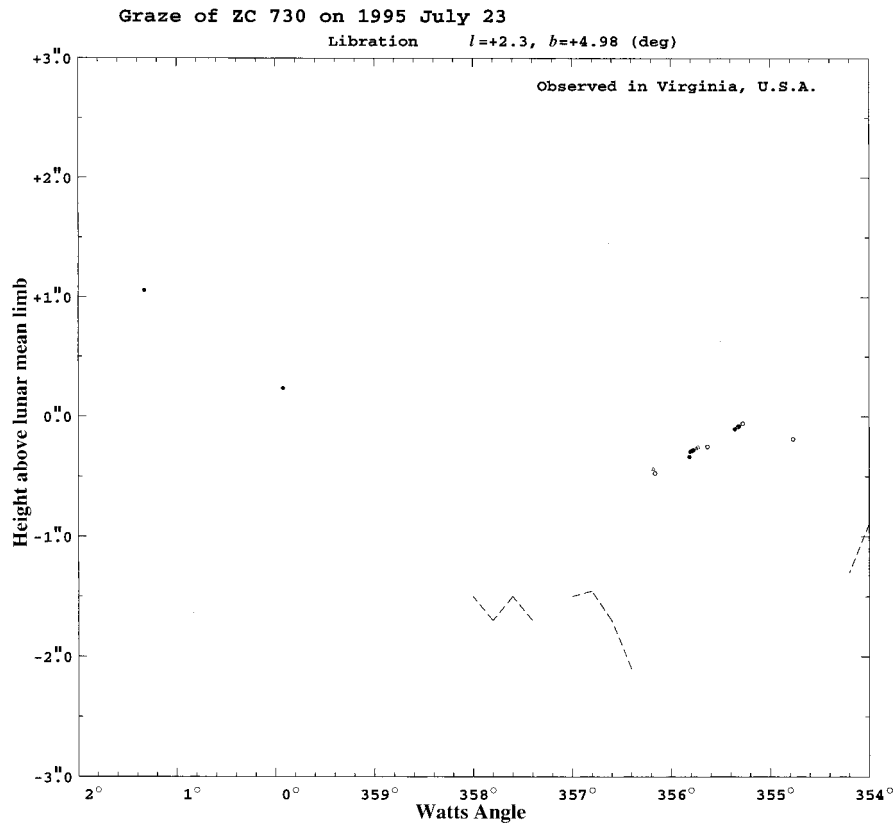


Fig. 1. Limb profile from the 97 Tauri (ZC 730) graze observed on 1995 July 23 in Virginia, U.S.A. The plot uses the mean limb as the horizontal axis. The abscissa is WA (see the text). Since a 1° arc of the Moon's limb at average distance subtends $16''$, the vertical scale on the plot is exaggerated by a factor of about 19 over the horizontal scale. The filled circles are from disappearances, the open circles from reappearances, the filled triangles from blinks, and the open triangles from flashes. The curved line represents the profile data from Watts' (1963) charts, the solid part being the one given as accurate and the broken part being the extrapolated inaccurate one.

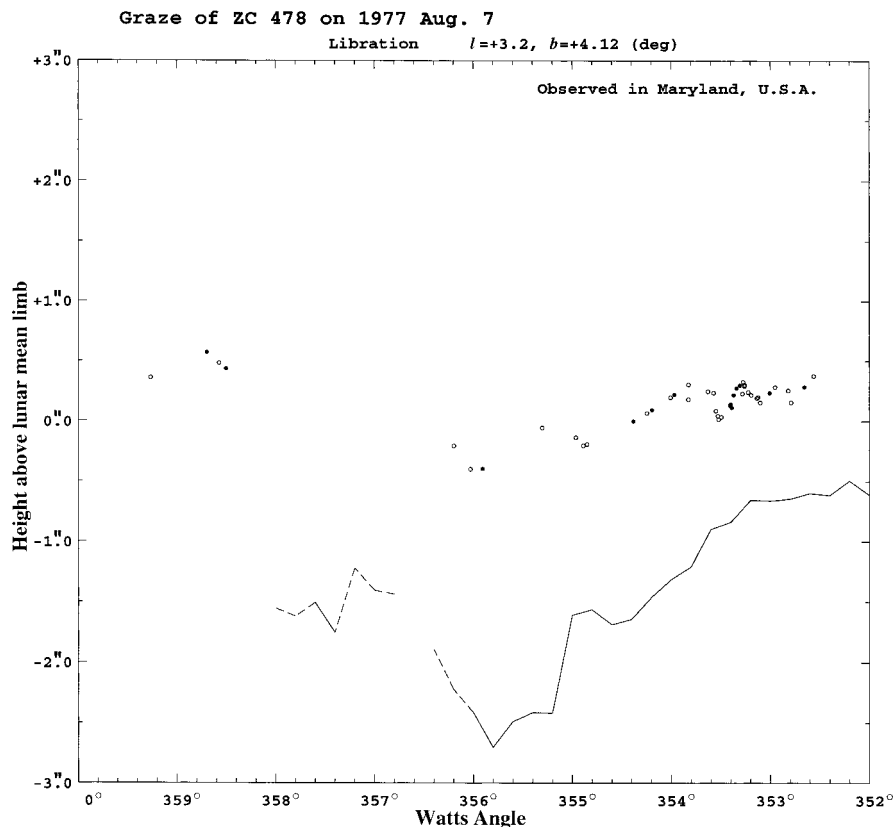


Fig. 2. Limb profile from the ZC 478 graze observed on 1977 Aug. 7 in Maryland, U.S.A. For the explanation, see figure 1.

346°. But about nine hours earlier of the Japanese event a grazing occultation of a 6.9-magnitude star X 5788 (SAO 93963) was observed in North Carolina, U.S.A., and fortunately the top of the mountain at Watts angle 346° was obtained from the observation as shown in figure 10. It is also noted that the two profiles obtained from the two events are slightly different due to the slightly different librations of the Moon.

These grazing occultation observations were summarized in *Sky and Telescope* by Dunham (2001) as the most successful grazing events in the year 2000.

3. Lunar Limb Profile Data

The lunar limb profile data obtained from the grazing occultation observations collected at the ILOC were published by Sôma (1999) and they are used for the predictions of lunar grazing occultations distributed annually from IOTA, but as discussed in the previous section, there are still many grazing events which have no observed lunar limb profiles in the predictions.

Before 1980 lunar grazing occultation observations were collected at RGO. The data were digitized recently by Bütner and other IOTA/European Section members. In total there were about 17,000 timings for 842 grazing occultations in the RGO data, whose number is comparable to the total number of grazing occultations collected at the ILOC and analyzed by Sôma (1999). Those RGO data were analyzed using the same procedure and the same values of the parameters as used by Sôma (1999), which are summarized as follows:

Lunar and planetary ephemeris: DE405/LE405 (Standish 1998)

Star catalog: Hipparcos Catalogue (ESA 1997)

Correction to the Moon's ecliptic longitude and latitude at mean distance (384, 400 km): $\Delta\lambda = +0''.50$ and $\Delta\beta = -0''.24$
Radius of the Moon: $R_0 = 1738.107$ km

Correction for the ellipticity of Watts' datum: $\Delta\rho = +0''.128 \sin 2(WA)$

Relation of Watts angle (WA) with axis angle (AA): $WA = AA + 0^\circ.24$

Here WA is the argument of position angle in Watts' charts, and AA is the position angle measured from the lunar north pole. For the basis of each adopted value, see Sôma (1985).

It should be noted that nowadays precise geodetic coordinates of the observation stations can be obtained from GPS measurements, but during the intervals of the observations of which the current analysis was made those coordinates were usually measured from geographical survey maps whose accuracy is considered to be typically about 1 arcsec. This accuracy corresponds to within 0''.02 arcsec for the obtained lunar limb profile accuracy, which is enough for the purposes of the present paper.

The obtained lunar limb data are given in table 1 for every 0.2 deg of Watts angle. In order to preserve only reliable data, observations with only a small number of limb points or with many inconsistent data are rejected. In table 1 the observations which have the mean number of observed limb points for every 0.2 deg of WA of more than 1.5 are given, and the rejected data are stored in another file to be used for future analyses.

The data in table 1 are given in the format which is compatible with the input data for IOTA's ACLPPP (Automatic Computer Lunar Profile Printing Program) profile predictions. The byte-by-byte description is given below.

1st line for every grazing occultation:

- 1-4 Watts Angle range in $0^{\circ}.1$
 5-8
 9-10 Limit: 1 means northern limit, -1 means southern limit
 11-14 Usable latitude libration range in $0^{\circ}.01$
 15-18
 19-22 Usable longitude libration range in $0^{\circ}.01$
 23-26
 27-33 Catalog identifier and number in the catalog of the star; Catalog identifier X means XZ (Schmidt & Van Flandern 1977) and ZC means Robertson's (1940) zodiacal catalog
 35-42 Observation date MM/DD/YY (Year is subtracted by 1900)
 43-45 Number of the profile data given
 46-50 Libration in longitude in degrees
 51-55 Libration in latitude in degrees
 57-59* Basis of the analysis (99B is the basis in the present paper)
 61-65* Number of observed profile points used to derive the data
 66-70* Standard error in the star's declination
 71-74* Star's magnitude

The values in the columns indicated by * were not given in the original ACLPPP input data.

2nd and the following lines for every grazing occultation:

The profile data and the accuracy code are given successively for every WA at an interval of $0^{\circ}.2$ in each of the 5 columns. In one line the data for up to 16 Watts Angles can be given. In each of the 5 columns the first 4 byte gives the limb profile height in $0''.01$, and the last byte gives the code for the accuracy of the limb profile height (3 means good and 4 means extrapolated).

The data are arranged so that the data for brighter stars come later and therefore information farther down in the table can be regarded as more reliable. Hence the data farther down can override the earlier data for the same librations and WA.

The data in table 1 can be used for the predictions of lunar grazing occultations together with the profile data provided by Sôma (1999). The positions on the lunar surface where the profile data were obtained are shown in figures 11 and 12. The figures use P and D coordinates where D is the distance from the meridians of longitude $l = \pm 90^{\circ}$ measured positively toward the Earth and P is measured along those meridians from the north pole counterclockwise as seen from the Earth. Formulae to obtain P and D from the librations l and b and the position angle Π are given by Watts (1963). As shown in figures 11 and 12 the number of the lunar limb profile data obtained from grazing occultations are almost doubled by the current analysis.

4. Conclusions

The grazing occultations collected at RGO were analyzed. The resulted lunar profile data can be used together with

the data provided by Sôma (1999) for the predictions of lunar grazing occultations in order to locate observers at better positions, so that they can also get good grazing occultation data to improve the lunar limb profiles. These data will be used in the future analyses of solar eclipse observations and the possible errors of the Hipparcos proper motion system.

Mr. Dietmar Büttner in Germany and other IOTA/European Section members provided us the digitized grazing occultation data. David Herald in Australia corrected some of the errors in the digitized data. The authors would like to express their hearty gratitude to all of them. Thanks are also due to many amateur astronomers who made the observations analyzed in this paper.

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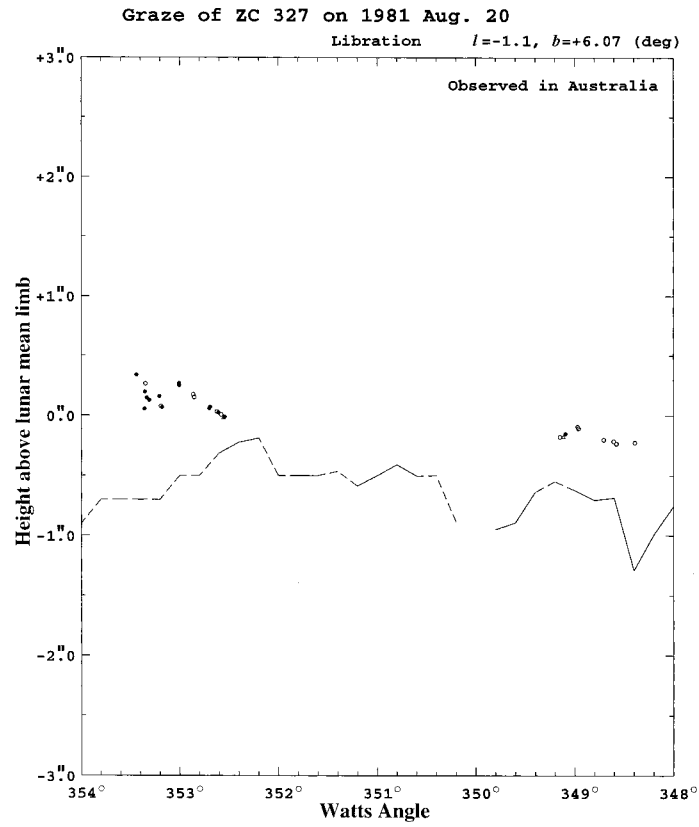


Fig. 3. Limb profile from the ξ^1 Ceti (ZC 327) graze observed on 1981 Aug. 20 in Australia. For the explanation, see figure 1.

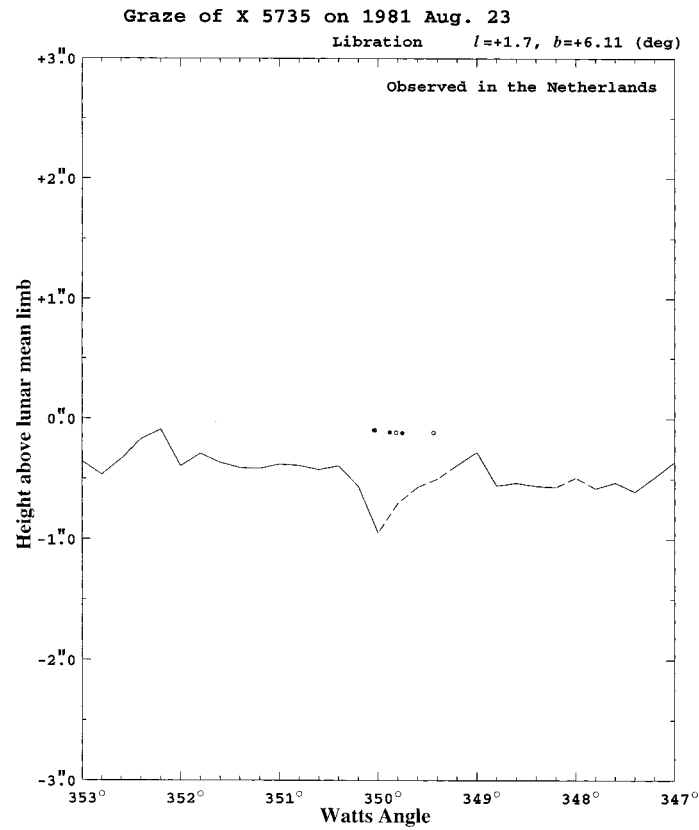


Fig. 4. Limb profile from the X 5735 graze observed on 1981 Aug. 23 in the Netherlands. For the explanation, see figure 1.

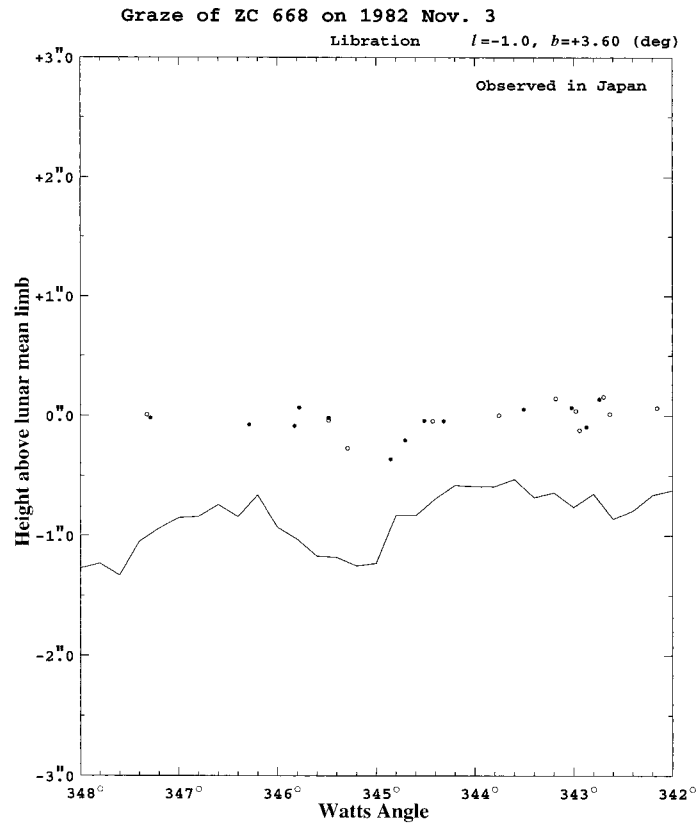


Fig. 5. Limb profile from the ϵ Tauri (ZC 668) graze observed on 1982 Nov. 3 in Japan. For the explanation, see figure 1.

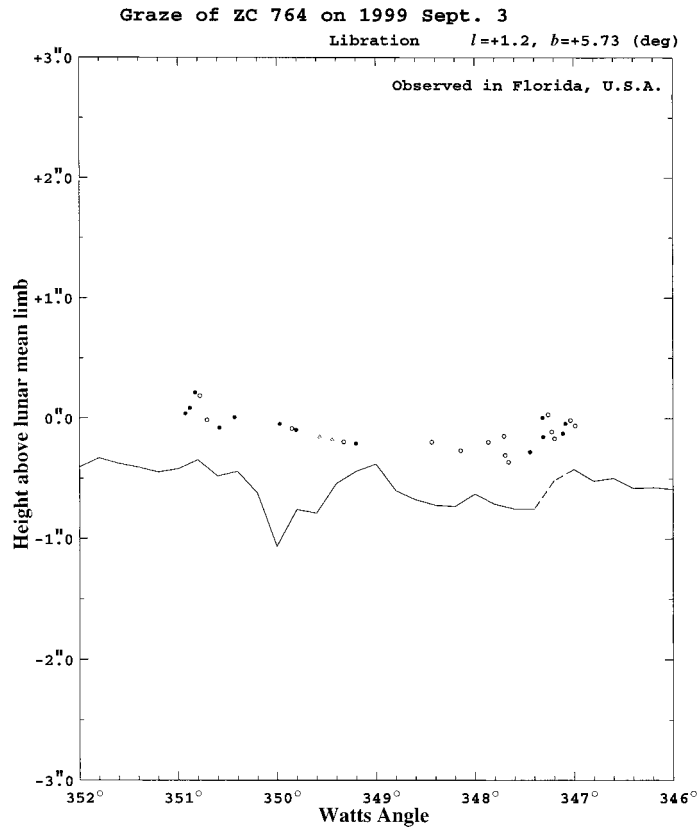


Fig. 6. Limb profile from the 104 Tauri (ZC 764) graze observed on 1999 Sept. 3 in Florida, U.S.A. For the explanation, see figure 1.

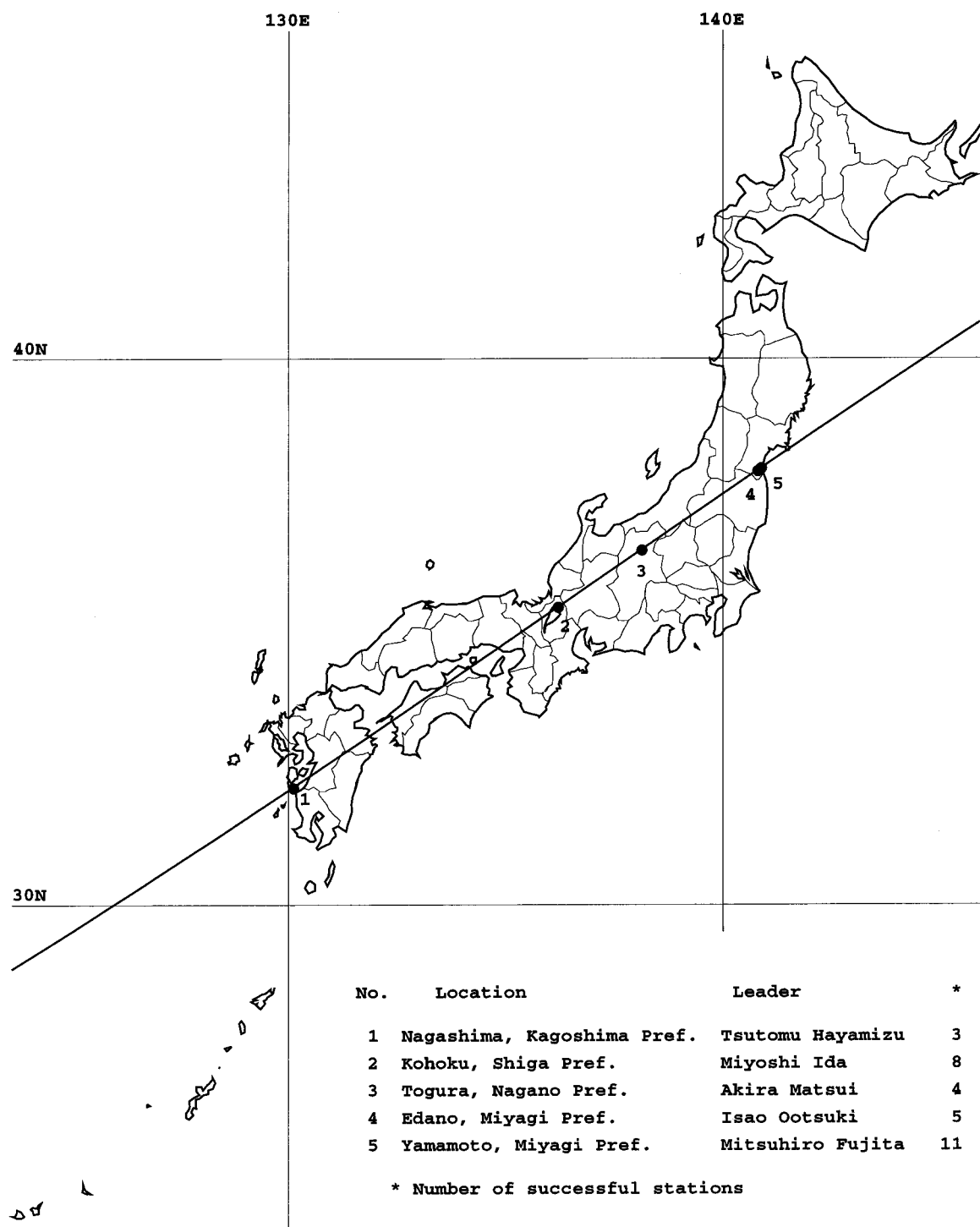


Fig. 7. Northern limit of the 97 Tauri (ZC 730) graze on 2000 Aug. 23. The dots represent the places where the observations were made.

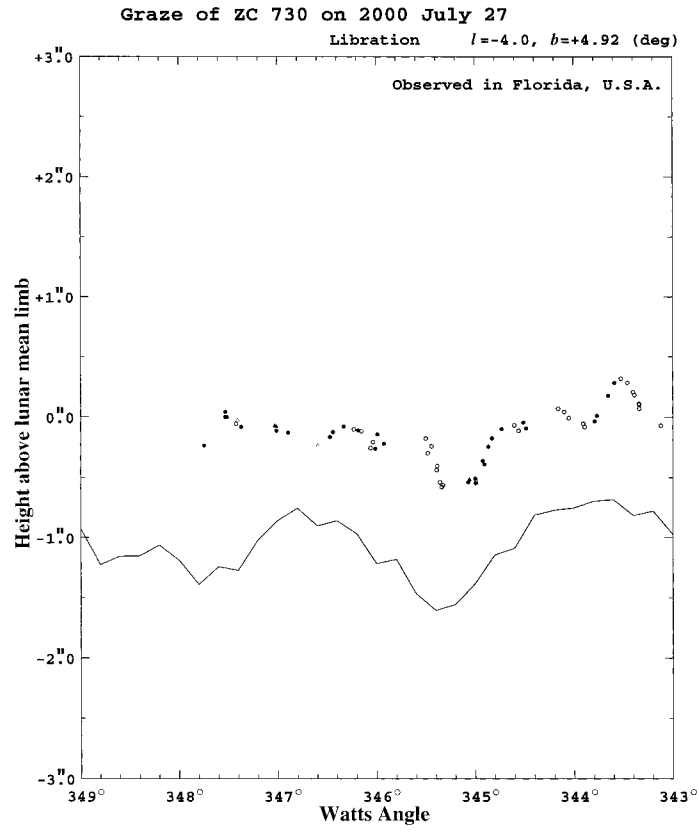


Fig. 8. Limb profile from the 97 Tauri (ZC 730) graze observed on 2000 July 27 in Florida, U.S.A. For the explanation, see figure 1.

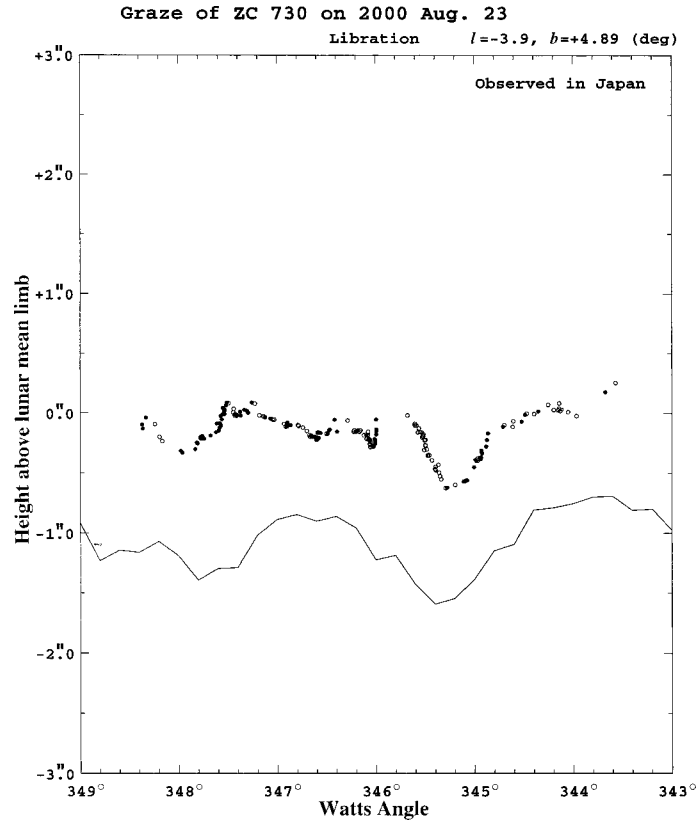


Fig. 9. Limb profile from the 97 Tauri (ZC 730) graze observed on 2000 Aug. 23 in Japan. For the explanation, see figure 1.

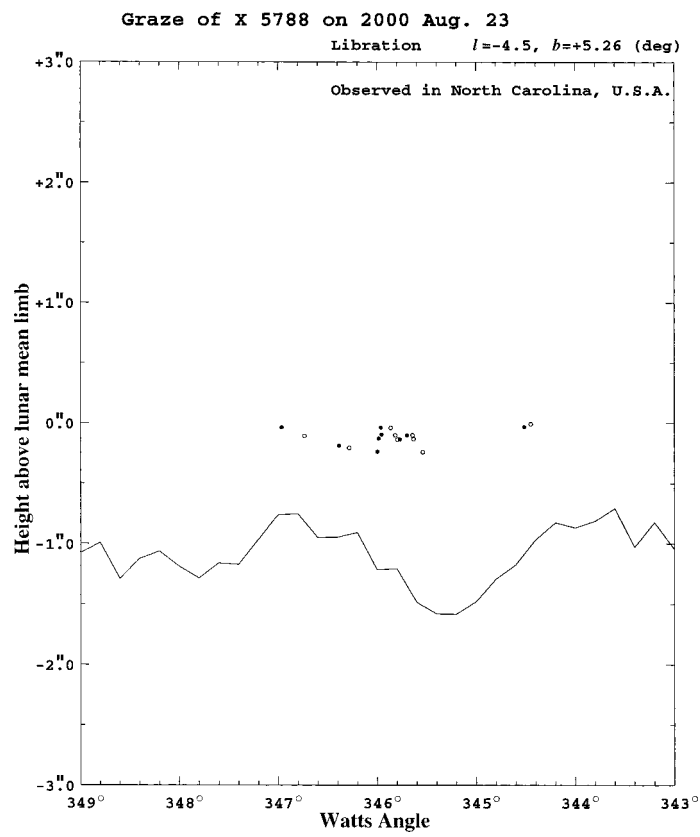


Fig. 10. Limb profile from the X 5788 (SAO 93963) graze observed on 2000 Aug. 23 in North Carolina, U.S.A. For the explanation, see figure 1.

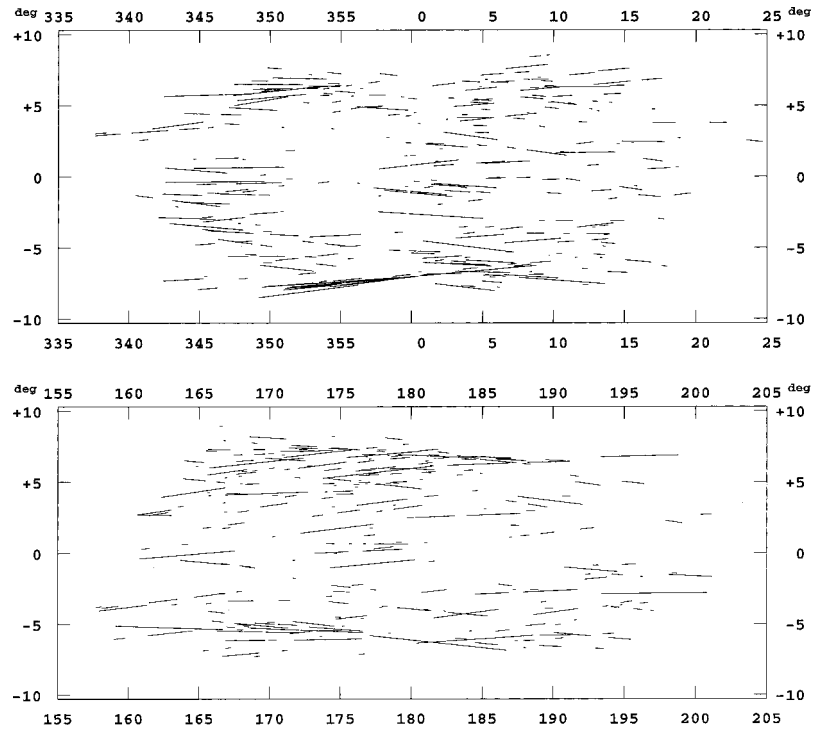


Fig. 11. Location on the moon in the P - D frame that has the limb profile data given by Sôma (1999).

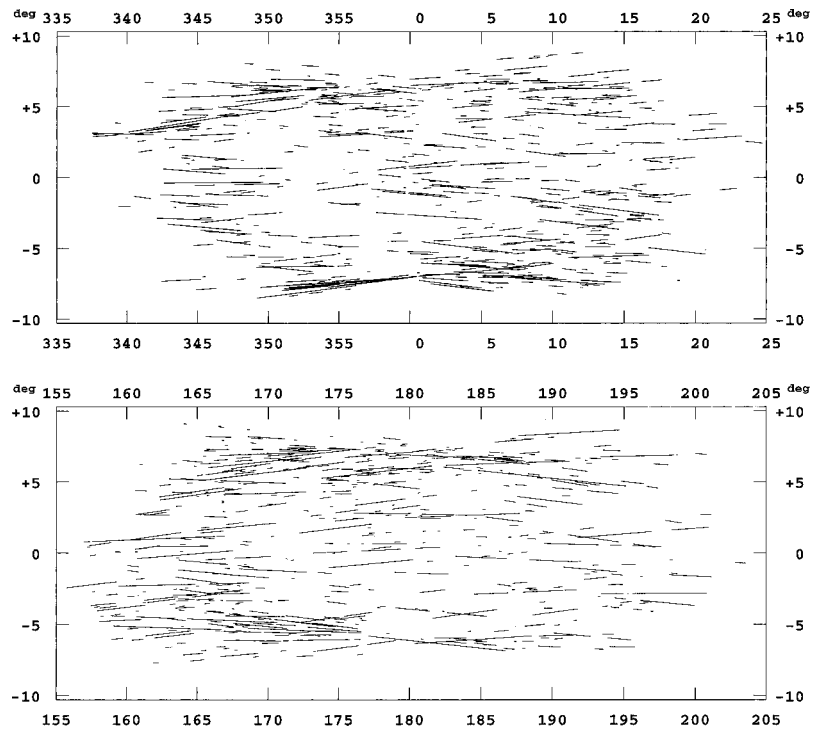


Fig. 12. Location on the moon in the P - D frame that has the limb profile data given by Sôma (1999) and in the present paper.

Table 1. Lunar Limb Profile Data.

35803584	1-388-288	90	690X	6966	09/01/72	3	3.9	-3.38	99B	6	0.02	9.4			
383	503	343													
16301636-1	-631-531-340	260X	29210	12/18/74	4	-0.4	-5.81	99B	6	0.02	9.4				
-993-1143	-993-1133														
16981708-1	-631-531-340	260X	29210	12/18/74	6	-0.4	-5.81	99B	3	0.02	9.4				
-1354-1314	-1284-1243-1194-1153														
35583564	1-104	-4	360	900X	10477	09/30/72	4	6.6	-0.54	99B	6	0.03	9.3		
23	-163	-244	-333												
18421842-1	450	550	140	740X	13920	10/20/73	1	4.4	5.00	99B	1	0.01	8.7		
2224															
18621866-1	450	550	140	740X	13920	10/20/73	3	4.4	5.00	99B	4	0.01	8.7		
-223	-213	-63													
18741874-1	450	550	140	740X	13920	10/20/73	1	4.4	5.00	99B	1	0.01	8.7		
704															
138	152	1	8	108-610	-10X	6976	04/26/74	8	-3.1	0.58	99B	4	0.01	8.7	
174	194	224	254	274	304	333	303								
160	180	1	8	108-610	-10X	6976	04/26/74	11	-3.1	0.58	99B	12	0.01	8.7	
163	153	174	183	203	233	154	73	24	-44	-94					
90	106	1	87	187-900-300ZC	495	03/07/76	9	-6.0	1.37	99B	6	0.02	8.7		
253	184	53	154	193	84	-44	-363	-393							
156	164	1	87	187-900-300ZC	495	03/07/76	5	-6.0	1.37	99B	4	0.02	8.7		
43	74	103	133	153											
18621864-1	16	116	420	900X	14048	10/13/71	2	7.2	0.66	99B	3	0.01	8.6		
-804	-553														
19181920-1	16	116	420	900X	14048	10/13/71	2	7.2	0.66	99B	3	0.01	8.6		
1473	1633														
72	80	1-603-503	110	710X	5287	03/20/72	5	4.1	-5.53	99B	6	0.03	8.6		
-373	-344	-313	-343	-223											
114	126	1-603-503	110	710X	5287	03/20/72	7	4.1	-5.53	99B	12	0.03	8.6		
-283	-173	-144	03	-103	03	-103									
158	170	1-388-288	330	900X	10357	04/30/71	7	6.3	-3.38	99B	13	0.02	8.4		
83	163	133	173	113	183	213									
178	182	1-388-288	330	900X	10357	04/30/71	3	6.3	-3.38	99B	3	0.02	8.4		
393	454	333													
104	106	1	457	557-900-440X	9495	05/04/76	2	-7.4	5.07	99B	5	0.01	8.4		
-623	-653														
166	166	1	457	557-900-440X	9495	05/04/76	1	-7.4	5.07	99B	2	0.01	8.4		
143															
60	64	1	48	148-830-230X	4099	03/06/76	3	-5.3	0.98	99B	8	0.02	8.3		
273	103	-43													
104	104	1	48	148-830-230X	4099	03/06/76	1	-5.3	0.98	99B	3	0.02	8.3		
-173															
54	58	1	-65	35	-80	520ZC	216	01/26/77	3	2.2	-0.15	99B	2	0.03	8.3
303	304	293													
88	96	1	-65	35	-80	520ZC	216	01/26/77	5	2.2	-0.15	99B	6	0.03	8.3
-283	-404	-213	154	-23											
35283548	1-494-394-850-250X	29942	03/30/73	11	-5.5	-4.44	99B	24	0.02	8.2					
53	204	283	243	63	303	213	223	154	-13	-63					
35603562	1-494-394-850-250X	29942	03/30/73	2	-5.5	-4.44	99B	6	0.02	8.2					
-313	-293														
80	88	1-350-250-860-260X	5514	03/01/74	5	-5.6	-3.00	99B	7	0.01	8.2				
254	304	264	113	-43											
132	136	1-350-250-860-260X	5514	03/01/74	3	-5.6	-3.00	99B	6	0.01	8.2				
153	373	363													
16381650-1	-474-374	-80	520X	27868	10/23/74	7	2.2	-4.24	99B	7	0.02	8.2			
-403	503	454	273	-493	-543	-813									
16601664-1	-474-374	-80	520X	27868	10/23/74	3	2.2	-4.24	99B	2	0.02	8.2			
-883	-304	154													
16801684-1	-474-374	-80	520X	27868	10/23/74	3	2.2	-4.24	99B	3	0.02	8.2			
893	343	243													
19201922-1	622	722-150	450X	19119	12/12/71	2	1.5	6.72	99B	2	0.01	8.1			
1613	1533														
19301930-1	622	722-150	450X	19119	12/12/71	1	1.5	6.72	99B	2	0.01	8.1			
853															
19681978-1	622	722-150	450X	19119	12/12/71	6	1.5	6.72	99B	9	0.01	8.1			
213	183	223	374	513	603										

Table 1.

16101612-1-322-222-660 -60X 28070 10/06/73 2-3.6 -2.72 99B	4	0.02	8.1	
-123 -503				
16341642-1-322-222-660 -60X 28070 10/06/73 5-3.6 -2.72 99B	5	0.02	8.1	
153 553 693 503 -104				
16481660-1-317-217-670 -70ZC 2948 10/06/73 7-3.7 -2.67 99B	5	0.02	8.1	
-943-1223-1254-1153-1123 -914 -713				
92 112 1 -35 65-840-240X 3800 02/08/76 11-5.4 0.15 99B	19	0.01	8.1	
193 84 -24 -133 -213 -253 -323 -363 -403 -403 -483				
122 130 1 -35 65-840-240X 3800 02/08/76 5-5.4 0.15 99B	8	0.01	8.1	
-303 -233 -203 -103 73				
138 140 1 408 508 140 740X 14163 04/12/73 2 4.4 4.58 99B	2	0.01	8.0	
-63 43				
16941706-1-685-585-490 110X 30367 11/22/74 7-1.9 -6.35 99B	14	0.01	8.0	
-1233-1303-1193 -943-1104 -883-1203				
16721674-1-585-485 430 900X 30350 11/28/76 2 7.3 -5.35 99B	4	0.01	8.0	
663 1203				
17721776-1-585-485 430 900X 30350 11/28/76 3 7.3 -5.35 99B	3	0.01	8.0	
-1083-1434-1483				
19821984-1 -50 50 -60 540X 14498 02/10/71 2 2.4 0.00 99B	7	0.02	7.9	
53 553				
20282036-1 -50 50 -60 540X 14498 02/10/71 5 2.4 0.00 99B	8	0.02	7.9	
-103 -103 -254 -123 -354				
72 78 1-661-561 -50 550X 4002 03/19/72 4 2.5 -6.11 99B	6	0.02	7.9	
83 -173 -333 -283				
88 134 1-661-561 -50 550X 4002 03/19/72 24 2.5 -6.11 99B	33	0.02	7.9	
-273 -323 -383 -243 -194 -143 -153 -163 -163 -143 -204 -253 -363 -224 -93 -83				
-103 -143 -104 -64 -23 -83 54 173				
35043510 1-273-173-900-440ZC 3221 05/07/72 4-7.4 -2.23 99B	7	0.01	7.9	
-283 -373 -403 -393				
35323542 1-273-173-900-440ZC 3221 05/07/72 6-7.4 -2.23 99B	9	0.01	7.9	
-273 -223 -144 -63 153 23				
18701878-1 462 562 120 720X 14012 10/20/73 5 4.2 5.12 99B	5	0.01	7.9	
1153 1323 903 704 553				
18881888-1 462 562 120 720X 14012 10/20/73 1 4.2 5.12 99B	5	0.01	7.9	
03				
18961910-1 462 562 120 720X 14012 10/20/73 8 4.2 5.12 99B	6	0.01	7.9	
-303 -203 64 323 384 303 274 313				
19201942-1 462 562 120 720X 14012 10/20/73 12 4.2 5.12 99B	10	0.01	7.9	
583 483 314 103 254 324 343 653 834 1004 1183 1253				
16381646-1-128 -28 240 840X 23003 09/23/74 5 5.4 -0.78 99B	40	0.01	7.9	
-353 383 -363 -103 183				
16801686-1-128 -28 240 840X 23003 09/23/74 4 5.4 -0.78 99B	19	0.01	7.9	
483 153 -183 54				
19341946-1 675 775-270 330X 19541 01/09/72 7 0.3 7.25 99B	7	0.01	7.8	
1303 1373 1413 1384 1353 1204 1053				
19982006-1 675 775-270 330X 19541 01/09/72 5 0.3 7.25 99B	7	0.01	7.8	
613 504 423 414 433				
17241726-1-679-579-900-440ZC 77 01/29/74 2-7.4 -6.29 99B	3	0.01	7.8	
-1503-1223				
24 68 1 703 803-900-430X 12270 04/26/77 23-7.3 7.53 99B	106	0.01	7.8	
804 1023 753 883 363 383 363 293 223 343 363 43	03	13	73	263
193 223 263 323 333 333 143				
16541670-1 110 210 10 610X 946 01/07/68 9 3.1 1.60 99B	19	0.02	7.7	
1133 1133 1023 554 603 753 1313 733 453				
110 162 1-497-397 140 740ZC 717 04/17/72 27 4.4 -4.47 99B	55	0.02	7.7	
23 -143 -454 -263 -33 -43 34 204 163 223 203 343	453	374	283	554
553 263 23 183 -53 64 73 143 -83 -203 -193				
16261632-1-692-592-550 50ZC 3340 11/23/74 4-2.5 -6.42 99B	7	0.07	7.7	
-1063-1123-1283-1424				
16621668-1-692-592-550 50ZC 3340 11/23/74 4-2.5 -6.42 99B	6	0.07	7.7	
-1743-1483-1403-1203				
16821682-1-692-592-550 50ZC 3340 11/23/74 1-2.5 -6.42 99B	2	0.07	7.7	
-1493				
35543556 1 553 653-790-190X 7560 10/14/76 2-4.9 6.03 99B	2	0.02	7.7	
-83 73				

Table 1.

34283442	1-434-334-340	260ZC	3525	06/16/71	8-0.4	-3.84	99B	23	0.03	7.6
463	333	183	-143	-213	-273	-83	33			
34923498	1-434-334-340	260ZC	3525	06/16/71	4-0.4	-3.84	99B	18	0.03	7.6
-143	-23	-73	-163							
4	72	1-674-574	-10	590ZC	483	02/21/72	35	2.9	-6.24	99B
43	54	53	43	-23	-313	-503	-463	-513	-593	-533
-703	-633	-283	-363	-333	-573	-384	-83	-354	-213	-183
-234	-283	-404	-484	-453						
-323	-264	-213								
82	94	1-674-574	-10	590ZC	483	02/21/72	7	2.9	-6.24	99B
-453	-433	-473	-424	-373	-313	-263				
124	130	1	605	705	360	900ZC	1705	06/08/73	4	6.6
-383	-133	-133	-183							
144	170	1	605	705	360	900ZC	1705	06/08/73	14	6.6
-253	-323	-374	-433	-373	-303	-393	-143	-113	63	-243
-313	-93	-23								
16681674-1	-524-424-850-250ZC	3103	12/01/73	4-5.5	-4.74	99B	4	0.01	7.6	
93	263	554	403							
142	154	1	34	134-690	-90X	7598	03/30/74	7-3.9	0.84	99B
273	373	243	343	413	313	253				
172	184	1	34	134-690	-90X	7598	03/30/74	7-3.9	0.84	99B
63	93	-103	-154	-204	-153	-53				
92	108	1	37	137-900-540X	5915	02/20/75	9-8.4	0.87	99B	14
33	114	193	163	124	04	-183	-393	-453		
122	148	1	37	137-900-540X	5915	02/20/75	14-8.4	0.87	99B	18
-623	-493	-393	-323	-303	-403	-103	-204	-253	-14	154
80	88	1	697	797-490	110X	15665	05/19/75	5-1.9	7.47	99B
-23	-153	-224	-303	-203						
70	80	1	545	645-850-250X	9384	04/24/77	6-5.5	5.95	99B	12
204	353	213	53	-143	-264					
122	134	1	545	645-850-250X	9384	04/24/77	7-5.5	5.95	99B	11
-323	-333	-453	-434	-413	-293	-123				
16641666-1	134	234	390	900X	22249	08/25/74	2	6.9	1.84	99B
903	663									
16761676-1	134	234	390	900X	22249	08/25/74	1	6.9	1.84	99B
-244										
17221726-1	134	234	390	900X	22249	08/25/74	3	6.9	1.84	99B
-623	-433	-353								
17381738-1	134	234	390	900X	22249	08/25/74	1	6.9	1.84	99B
743										
18461854-1	56	156	-90	510X	31403	05/20/79	5	2.1	1.06	99B
293	23	-33	-133	-193						
18661866-1	56	156	-90	510X	31403	05/20/79	1	2.1	1.06	99B
-303										
18821888-1	56	156	-90	510X	31403	05/20/79	4	2.1	1.06	99B
513	603	583	563							
34123422	1-454-354	400	900X	3219	07/08/69	6	7.0	-4.04	99B	27
673	703	513	263	313	203					
34343438	1-454-354	400	900X	3219	07/08/69	3	7.0	-4.04	99B	14
-543	-863	-703								
34663480	1-454-354	400	900X	3219	07/08/69	8	7.0	-4.04	99B	16
-354	-453	-313	-323	-303	-313	-193	-153			
176	176	1-511-411	380	900X	8938	04/02/71	1	6.8	-4.61	99B
353										
168	174	1	33	133	270	870X	12950	06/14/72	4	5.7
33	163	263	273							
182	200	1	33	133	270	870X	12950	06/14/72	10	5.7
03	-163	-284	-413	-423	-423	-403	-383	-424	-453	
18221828-1	662	762	-40	560X	16742	11/09/74	4	2.6	7.12	99B
1424	1444	1464	1484							
18521862-1	662	762	-40	560X	16742	11/09/74	6	2.6	7.12	99B
513	443	284	53	73	583					
18801884-1	662	762	-40	560X	16742	11/09/74	3	2.6	7.12	99B
1483	1394	1303								
17721776-1	73	173-490	110X	19634	11/19/76	3-1.9	1.23	99B	4	0.01
-773	-1063	-903								
17841788-1	73	173-490	110X	19634	11/19/76	3-1.9	1.23	99B	2	0.01
-533	-234	73								

18101812-1	73	173-490	110X	19634	11/19/76	2-1.9	1.23	99B	2	0.01	7.4	
-103 -643												
18201822-1	73	173-490	110X	19634	11/19/76	2-1.9	1.23	99B	3	0.01	7.4	
-73 823												
18381846-1	73	173-490	110X	19634	11/19/76	5-1.9	1.23	99B	7	0.01	7.4	
2253 1883 1854 1824 1603												
16521708-1	220	320-800-200ZC	2703	09/17/72	29-5.0	2.70	99B		47	0.01	7.4	
783 793 1074 1253 1403 754 693 803 853 863 523 -53									53	-203	03	-153
03 -283 -393 -474 -544 -623 -363 -284 -313 -453 -303 -523 -323												
18041822-1	-44	56-510	90X	20193	12/17/76	10-2.1	0.06	99B	9	0.01	7.4	
114 24 -64 -153 -284 -293 -813 -863 -873 -413												
18481850-1	-44	56-510	90X	20193	12/17/76	2-2.1	0.06	99B	2	0.01	7.4	
443 03												
18141814-1	-677-577	300	900ZC	3154	03/16/77	1 6.0	-6.27	99B	1	0.01	7.4	
-854												
18621862-1	-677-577	300	900ZC	3154	03/16/77	1 6.0	-6.27	99B	1	0.01	7.4	
-1554												
18721880-1	-677-577	300	900ZC	3154	03/16/77	5 6.0	-6.27	99B	9	0.01	7.4	
-1483-1293-1503-1294-1463												
64 72 1 428 528 -10 590X 4038 04/10/78 5 2.9 4.78 99B									6	0.01	7.4	
143 193 273 244 223												
124 132 1 428 528 -10 590X 4038 04/10/78 5 2.9 4.78 99B									5	0.01	7.4	
-503 -444 -383 -363 -383												
34883494	1-556-456-900-300X	10805	09/10/66	4-6.0	-5.06	99B			9	0.02	7.3	
-173 -133 -113 -23												
130 152 1-350-250-210 390ZC 1253 06/08/70 12 0.9 -3.00 99B									15	0.02	7.3	
513 743 743 714 684 653 653 544 423 413 474 523												
35083526	1-649-549 150 750X 4273 07/17/71 10 4.5 -5.99 99B								16	0.02	7.3	
-193 -273 -353 -193 -193 -343 -343 -344 -354 -353												
35423554	1-649-549 150 750X 4273 07/17/71 7 4.5 -5.99 99B								12	0.02	7.3	
43 94 143 253 413 593 443												
15721574-1	-16 84-340 260X 24698 10/31/73 2-0.4 0.34 99B								7	0.01	7.3	
1343 1523												
15841584-1	-16 84-340 260X 24698 10/31/73 1-0.4 0.34 99B								1	0.01	7.3	
2114												
16081608-1	-16 84-340 260X 24698 10/31/73 1-0.4 0.34 99B								1	0.01	7.3	
764												
16221658-1	-16 84-340 260X 24698 10/31/73 19-0.4 0.34 99B								24	0.01	7.3	
-673 -653 -613 -703 -943-1063 -923 -484 03 143 -304 -104									43	333	223	373
663 1103 903												
35763576	1-507-407 150 750ZC 2922 03/08/75 1 4.5 -4.57 9											

Table 1.

16381640-1	-47	53-360	240X	30242	01/01/71	2-0.6	0.03	99B	2	0.01	7.2
303	363										
18261832-1	613	713-900-420ZC	2540	02/20/71	4-7.2	6.63	99B	3	0.01	7.2	
984	1164	1334	1503								
18401846-1	613	713-900-420ZC	2540	02/20/71	4-7.2	6.63	99B	5	0.01	7.2	
1643	1693	1514	1333								
78	86	1	435	535	220	820ZC	1577	06/17/72	5	5.2	4.85
153	103	63	104	-53					5	0.01	7.2
98	98	1	435	535	220	820ZC	1577	06/17/72	1	5.2	4.85
-64									1	0.01	7.2
16121616-1	-658	-558-900-400X	30908	12/03/73	3-7.0	-6.08	99B	4	0.01	7.2	
-1363	-1293	-1423									
134	140	1	28	128-610	-10X	6981	04/26/74	4-3.1	0.78	99B	6
123	164	213	383						0.01	7.2	
150	152	1	28	128-610	-10X	6981	04/26/74	2-3.1	0.78	99B	3
343	163								0.01	7.2	
160	160	1	28	128-610	-10X	6981	04/26/74	1-3.1	0.78	99B	1
134									0.01	7.2	
15741574-1	-403-303	-20	580ZC	2854	09/25/74	1	2.8	-3.53	99B	1	0.01
1004									7.2		
16501650-1	-403-303	-20	580ZC	2854	09/25/74	1	2.8	-3.53	99B	1	0.01
-764									7.2		
16661674-1	-403-303	-20	580ZC	2854	09/25/74	5	2.8	-3.53	99B	6	0.01
953	1284	1614	1953	2203					7.2		
17941794-1	240	340	390	900X	20996	01/07/75	1	6.9	2.90	99B	2
1063									0.02	7.2	
18041810-1	240	340	390	900X	20996	01/07/75	4	6.9	2.90	99B	3
314	164	-44	44						0.02	7.2	
18501876-1	240	340	390	900X	20996	01/07/75	14	6.9	2.90	99B	8
104	-154	-104	-153	-254	-363	-174	24	203	983	1304	1363
17441744-1	495	595-720-120X	8094	07/24/76	1-4.2	5.45	99B	1	0.01	7.2	1324
163									7.2		1283
17561762-1	495	595-720-120X	8094	07/24/76	4-4.2	5.45	99B	3	0.01	7.2	
-433	-453	-504	-543								
17821784-1	495	595-720-120X	8094	07/24/76	2-4.2	5.45	99B	1	0.01	7.2	
-184	-554										
17901792-1	495	595-720-120X	8094	07/24/76	2-4.2	5.45	99B	2	0.01	7.2	
243	383										
18021806-1	495	595-720-120X	8094	07/24/76	3-4.2	5.45	99B	2	0.01	7.2	
1163	1504	1613									
16641674-1	-628-528	240	840ZC	2573	09/29/76	6	5.4	-5.78	99B	4	0.02
-54	94	224	363	793	1223				7.2		
16801686-1	-628-528	240	840ZC	2573	09/29/76	4	5.4	-5.78	99B	3	0.02
743	534	323	-233						7.2		
35443548	1	698	798	540	900ZC	659	09/12/79	3	8.4	7.48	99B
353	393	473							4	0.01	7.2
35563556	1	698	798	540	900ZC	659	09/12/79	1	8.4	7.48	99B
164									1	0.01	7.2
16541670-1	172	272-690	-90ZC	2988	11/05/70	9-3.9	2.22	99B	13	0.02	7.1
754	1003	1373	1403	733	723	803	1503	504			
16641666-1	578	678	230	830X	20283	09/02/73	2	5.3	6.28	99B	4
553	943								0.02	7.1	
17261728-1	578	678	230	830X	20283	09/02/73	2	5.3	6.28	99B	4
-513	-643								0.02	7.1	
94	94	1	12	112-900-490X	5624	03/19/75	1-7.9	0.62	99B	1	0.02
94									7.1		
118	118	1	12	112-900-490X	5624	03/19/75	1-7.9	0.62	99B	1	0.02
-634									7.1		
172	172	1	12	112-900-490X	5624	03/19/75	1-7.9	0.62	99B	1	0.02
44									7.1		
186	186	1	12	112-900-490X	5624	03/19/75	1-7.9	0.62	99B	1	0.02
-354									7.1		
50	72	1	18	118-180	420ZC	284	02/23/77	12	1.2	0.68	99B
33	64	103	114	123	64	03	243	-263	-303	-44	-63
92	104	1	18	118-180	420ZC	284	02/23/77	7	1.2	0.68	99B
-273	-274	-273	-294	-253	-173	-283			12	0.01	7.1

Table 1.

60	62	1	249	349-820-220ZC	1474	07/09/78	2-5.2	2.99	99B	3	0.01	7.1
383	323											
16301638-1	598	698-880-280X	21419	09/24/71	5-5.8	6.48	99B	12	0.05	7.1		
1403	1283	973	993	833								
16741734-1	598	698-880-280X	21419	09/24/71	31-5.8	6.48	99B	28	0.05	7.1		
733	33	-253	-293	353	323	264	203	193	-14	-214	-423	-663 -643 -843-1074
-1303	-964	-613	-203	-114	-14	83	303	383	524	673	683	333 94 -153
17421750-1	598	698-880-280X	21419	09/24/71	5-5.8	6.48	99B	5	0.05	7.1		
-323	-394	-463	-343	-273								
60	74	1	497	597	90	690ZC	1006	05/01/79	8	3.9	5.47	99B
103	103	123	173	-73	-163	34	193					
34903544	1	586	686-120	480ZC	1190	09/26/78	28	1.8	6.36	99B	36	0.01 7.1
-173	-154	-133	33	-23	-163	-123	-143	-203	-113	-183	-213	-253 -233 -193 -183
23	-223	03	153	-53	-124	-183	-274	-353	-334	-314	-283	
17121724-1	699	799-550	50ZC	2496	10/16/69	7-2.5	7.49	99B	19	0.01	7.0	
1053	1453	1393	1374	1253	1543	1443						
16601696-1	597	697-880-280ZC	2220	09/24/71	19-5.8	6.47	99B	24	0.03	7.0		
1083	1243	1513	1613	1494	1373	1164	943	173	-44	-253	43	304 443 413 373
553	554	03	-854									
17081724-1	597	697-880-280ZC	2220	09/24/71	9-5.8	6.47	99B	10	0.03	7.0		
-333	-63	-104	-143	54	243	443	483	613				
17181722-1	664	764-870-270ZC	2256	09/25/71	3-5.7	7.14	99B	6	0.01	7.0		
953	1073	1143										
86	94	1-518-418	220	820ZC	750	03/21/72	5	5.2	-4.68	99B	9	0.02 7.0
-724	-604	-533	-633	-533								
156	160	1-518-418	220	820ZC	750	03/21/72	3	5.2	-4.68	99B	9	0.02 7.0
-243	-53	-503										
35443554	1-388-288	160	760ZC	912	09/02/72	6	4.6	-3.38	99B	4	0.01	7.0
53	164	263	153	84	13							
35663574	1-388-288	160	760ZC	912	09/02/72	5	4.6	-3.38	99B	3	0.01	7.0
-64	-64	04	-63	-43								
35843588	1-388-288	160	760ZC	912	09/02/72	3	4.6	-3.38	99B	3	0.01	7.0
404	-54	-254										
132	134	1	-79	21-140	460ZC	1017	03/13/73	2	1.6	-0.29	99B	2 0.02 7.0
73	173											
182	184	1	-79	21-140	460ZC	1017	03/13/73	2	1.6	-0.29	99B	2 0.02 7.0
124	03											
35243526	1-531-431-520	80ZC	29	07/01/75	2-2.2	-4.81	99B	4	0.01	7.0		
-153	-113											
35803582	1-531-431-520	80ZC	29	07/01/75	2-2.2	-4.81	99B	3	0.01	7.0		
-53	-143											
16421664-1	534-434	370	900ZC	2816	10/12/75	12	6.7	-4.84	99B	18	0.01	7.0
-43	763	573	-443	-523	-763-1213-1184-1153-1263-1033	-703						
17021708-1	534-434	370	900ZC	2816	10/12/75	4	6.7	-4.84	99B	5	0.01	7.0
-663	-1063	-1094	-1123									
16341648-1	727-627	270	870ZC	2975	11/09/75	8	5.7	-6.77	99B	9	0.01	7.0
-1224	-1204	-1053	-723	463	403	-43	-904					
16641682-1	727-627	270	870ZC	2975	11/09/75	10	5.7	-6.77	99B	14	0.01	7.0
-1083	-604	163	263	404	583	1023	943	283	-463			
16701712-1	523-423-320	280ZC	2391	09/19/77	22-0.2	-4.73	99B	41	0.01	7.0		
893	1503	1654	1304	603	04	-213	-543	-453	-603	-323	-343	-204 -403-1003-1483
-1543	-1603	-1623	-1643	-1663	-1663							
33983400	1-240-140-520	80ZC	460	09/23/67	2-2.2	-1.90	99B	5	0.02	6.9		
254	553											
34263450	1-240-140-520	80ZC	460	09/23/67	13-2.2	-1.90	99B	40	0.02	6.9		
04	-553	-103	-533	-373	-283	33	03	-263	163	383	503	243
16361638-1	352-252-160	440ZC	3460	01/30/71	2	1.4	-3.02	99B	7	0.02	6.9	
-754	-303											
16501652-1	352-252-160	440ZC	3460	01/30/71	2	1.4	-3.02	99B	10	0.02	6.9	
-1153	-1003											
16921698-1	352-252-160	440ZC	3460	01/30/71	4	1.4	-3.02	99B	6	0.02	6.9	
23	-34	-73	-303									
200	216	1-207-107	160	760ZC	1305	05/29/71	9	4.6	-1.57	99B	15	0.01 6.9
-193	-863	-484	-103	-313	-393	-393	-623	-383				
16821710-1	668	768-900-340ZC	2320	08/29/71	15-6.4	7.18	99B	47	0.01	6.9		
553	643	923	854	804	853	943	923	-213	-813	-1044	-1093	-933 -673 263

Table 1.

17321746-1	668	768-900-340ZC	2320	08/29/71	8-6.4	7.18	99B	25	0.01	6.9
403	03	-54 443 613 443	-73 -553							
15841592-1-177	-77-850-250ZC	3149	12/22/71	5-5.5	-1.27	99B	10	0.01	6.9	
2073	2053	1973	1903 1623							
16101612-1-177	-77-850-250ZC	3149	12/22/71	2-5.5	-1.27	99B	6	0.01	6.9	
203	-153									
16321634-1-177	-77-850-250ZC	3149	12/22/71	2-5.5	-1.27	99B	6	0.01	6.9	
-723	-203									
16401642-1-177	-77-850-250ZC	3149	12/22/71	2-5.5	-1.27	99B	4	0.01	6.9	
-93	-453									
16621674-1-177	-77-850-250ZC	3149	12/22/71	7-5.5	-1.27	99B	14	0.01	6.9	
953	1144	1334	1523 1943 2303 2103							
106	108	1	476 576-570 30X	5788	04/21/77	2-2.7	5.26	99B	2	0.01 6.9
-503	-493									
130	138	1	476 576-570 30X	5788	04/21/77	5-2.7	5.26	99B	11	0.01 6.9
-273	-164	-53	43 143							
17421742-1	203	303-890-290ZC	1754	07/21/77	1-5.9	2.53	99B	2	0.01	6.9
-204										
17501766-1	203	303-890-290ZC	1754	07/21/77	9-5.9	2.53	99B	11	0.01	6.9
63	-623-1054	-523 -253	03 -633 -643	-83						
17781778-1	203	303-890-290ZC	1754	07/21/77	1-5.9	2.53	99B	2	0.01	6.9
-353										
17861790-1	203	303-890-290ZC	1754	07/21/77	3-5.9	2.53	99B	4	0.01	6.9
-513	103	493								
18021804-1	203	303-890-290ZC	1754	07/21/77	2-5.9	2.53	99B	2	0.01	6.9
1303	1704									
17601760-1-237-137	70	670ZC	3238	12/05/78	1	3.7	-1.87	99B	2	0.01 6.9
533										
17681768-1-237-137	70	670ZC	3238	12/05/78	1	3.7	-1.87	99B	2	0.01 6.9
263										
35823598	1-131	-31-880-280ZC	442	03/16/67	9-5.8	-0.81	99B	18	0.02	6.8
-133	-303	-353 -353 -344 -323	33 73	-173						
35823598	1-655-555-850-250ZC	1436	09/30/67	9-5.5	-6.05	99B	38	0.02	6.8	
193	123	103 143 233	03 -73 53	103						
0	2	1-655-555-850-250ZC	1436	09/30/67	2-5.5	-6.05	99B	10	0.02	6.8
53	-53									
132	148	1-470-370 200 800ZC	780	03/21/72	9	5.0	-4.20	99B	11	0.01 6.8
484	623	573 454 473 603	423 244	183						
35163526	1-147	-47-900-430ZC	3134	04/09/72	6-7.3	-0.97	99B	7	0.01	6.8
94	54	14 -33 -113 -203								
35543558	1-147	-47-900-430ZC	3134	04/09/72	3-7.3	-0.97	99B	7	0.01	6.8
-303	-433	-173								
112	112	1-547-447-350 250ZC	553	04/06/73	1-0.5	-4.97	99B	2	0.01	6.8
-203										
160	168	1-547-447-350 250ZC	553	04/06/73	5-0.5	-4.97	99B	7	0.01	6.8
203	313	294 284 264								
35403546	1-537-437-600	0ZC	553	06/27/73	4-3.0	-4.87	99B	10	0.01	6.8
293	273	304 103								
16381648-1-663-563-900-410ZC	3326	12/03/73	6-7.1	-6.13	99B	23	0.02	6.8		
-1133	03	-753 -733 -864-1003								
132	132	1	571 671-220 380ZC	1429	04/03/74	1	0.8	6.21	99B	1 0.01 6.8
244										
142	160	1	571 671-220 380ZC	1429	04/03/74	10	0.8	6.21	99B	20 0.01 6.8
-23	-113	-114 -253 -253 -363	-233 -243 -243 -243							
18401844-1	574	674 330 900ZC	1788	01/04/75	3	6.3	6.24	99B	2	0.01 6.8
1604	1003	363								
18561858-1	574	674 330 900ZC	1788	01/04/75	2	6.3	6.24	99B	2	0.01 6.8
24	404									
18761884-1	574	674 330 900ZC	1788	01/04/75	5	6.3	6.24	99B	3	0.01 6.8
1024	924	824 723 513								
114	130	1	26 126-900-490ZC	642	03/19/75	9-7.9	0.76	99B	10	0.01 6.8
-573	-604	-773 -624 -614 -623	-293 -263 -283							
156	166	1	26 126-900-490ZC	642	03/19/75	6-7.9	0.76	99B	11	0.01 6.8
213	23	123 124 123 113								
76	102	1	298 398-900-430ZC	935	03/21/75	14-7.3	3.48	99B	11	0.01 6.8
223	204	184 113 73	14 -54 -103 -113 -104 -173 -173	-64 -183						

Table 1.

110	120	1	298	398-900-430ZC	935	03/21/75	6-7.3	3.48	99B	7	0.01	6.8	
-333	-553	-534	-523	-563	-293								
138	138	1	298	398-900-430ZC	935	03/21/75	1-7.3	3.48	99B	2	0.01	6.8	
-323													
146	146	1	298	398-900-430ZC	935	03/21/75	1-7.3	3.48	99B	1	0.01	6.8	
-43													
35663598	1-621-521-900-300ZC	51	06/14/74	17-6.0	-5.71	99B	24	0.01	6.8				
73	223	224	164	63	-73	-303	-13	-33	-33	-13	03	54	23 34 113
153													
0	0	1-621-521-900-300ZC	51	06/14/74	1-6.0	-5.71	99B	1	0.01	6.8			
23													
64	72	1-328-228-520	80ZC	145	02/05/76	5-2.2	-2.78	99B	12	0.01	6.8		
353	364	303	483	323									
17381770-1-645-545	370	900ZC	3051	10/03/76	17	6.7	-5.95	99B	13	0.01	6.8		
-1793-1624-1453-1274-1093	-733	-554	-484-1003-1623-1164	-703	-303	-154	44	-323					
-943													
16721672-1-643-543	290	890ZC	3051	12/24/76	1	5.9	-5.93	99B	1	0.01	6.8		
914													
16781684-1-643-543	290	890ZC	3051	12/24/76	4	5.9	-5.93	99B	4	0.01	6.8		
1493	1263	993	843										
16941704-1-643-543	290	890ZC	3051	12/24/76	6	5.9	-5.93	99B	8	0.01	6.8		
-353-323	-233	-413	-803-1204										
17101754-1-643-543	290	890ZC	3051	12/24/76	23	5.9	-5.93	99B	19	0.01	6.8		
-1593-1534-1483-1603-1654-1703-2053-2084-2103-2114-2124-1994-1854-1713-1403													
-1133-1073	-964	-854	-733	-463	-993								
34683476	1-542-442-900-320ZC	1089	09/10/66	5-6.2	-4.92	99B	25	0.02	6.7				
-363	-403	-193	-153	303									
34843508	1-542-442-900-320ZC	1089	09/10/66	13-6.2	-4.92	99B	73	0.02	6.7				
103	43	-33	-133	-73	33	23	-193	-283	-113	03	-73	-223	
16441648-1	452	552-370	230ZC	20	12/20/66	3-0.7	5.02	99B	6	0.01	6.7		
1333	1403	1283											
16041612-1	251	351	90	690ZC	3240	11/16/69	5	3.9	3.01	99B	7	0.01	6.7
653	744	843	1043	1033									
16301644-1	251	351	90	690ZC	3240	11/16/69	8	3.9	3.01	99B	9	0.01	6.7
863	573	603	673	723	1054	1003	733						
35103532	1-626-526	480	900X	8040	09/22/70	12	7.8	-5.76	99B	10	0.01	6.7	
-143	-183	-284	-383	-303	-354	-403	-423	-424	-414	-413	-393		
35443548	1-626-526	480	900X	8040	09/22/70	3	7.8	-5.76	99B	6	0.01	6.7	
33	103	233											
16561670-1	-48	52-600	0ZC	3091	08/06/71	8-3.0	0.02	99B	17	0.01	6.7		
503	424	343	173	403	503	1013	1193						
16761702-1	-48	52-600	0ZC	3091	08/06/71	14-3.0	0.02	99B	24	0.01	6.7		
1123	663	433	243	233	-363	-503	-544	-583	-753	-963-1243-1424-1613			
15741576-1	-57	43-900-460ZC	3091	10/28/71	2-7.6	-0.07	99B	3	0.01	6.7			
1463	1923												
16101612-1	-57	43-900-460ZC	3091	10/28/71	2-7.6	-0.07	99B	3	0.01	6.7			
593	-53												
140	142	1-227-127	340	900ZC	1080	03/23/72	2	6.4	-1.77	99B	5	0.01	6.7
553	483												
152	174	1-227-127	340	900ZC	1080	03/23/72	12	6.4	-1.77	99B	21	0.01	6.7
353	423	504	583	653	614	583	623	554	484	413	423		
82	92	1	255	355	360	900ZC	1386	05/19/72	6	6.6	3.05	99B	11 0.01 6.7
1103	923	773	614	453	273								
104	116	1	255	355	360	900ZC	1386	05/19/72	7	6.6	3.05	99B	10 0.01 6.7
-263	-323	-384	-433	-443	-453	-463							
128	140	1	255	355	360	900ZC	1386	05/19/72	7	6.6	3.05	99B	10 0.01 6.7
-263	-184	-103	-53	113	283	413							
35303546	1-424-324-590	10ZC	524	08/21/73	9-2.9	-3.74	99B	9	0.02	6.7			
-183	73	94	114	133	244	353	354	03					
19581966-1	613	713	400	900ZC	1528	12/15/73	5	7.0	6.63	99B	16	0.01	6.7
773	553	803	1143	1033									
100	114	1	626	726-740-140ZC	1320	04/20/75	8-4.4	6.76	99B	13	0.01	6.7	
-493	-303	-483	-304	-434	-433	-424	-413						
124	152	1	626	726-740-140ZC	1320	04/20/75	15-4.4	6.76	99B	27	0.01	6.7	
-304	-603	-533	-413	-153	-103	33	-123	64	73	03	253	233	244 253

35183532	1	485	585	440	900ZC	360	08/13/79	8	7.4	5.35	99B	29	0.01	6.7	
13	-43	64	-43	43	-183	-23	-143								
35343562	1	682	782	100	700ZC	944	09/24/78	15	4.0	-7.32	99B	16	0.01	6.7	
-204	-214	-224	-234	-204	-184	-153	-103	23	123	213	233	194	153	123	
192	234	1-150	-50	140	740ZC	1340	05/29/71	22	4.4	-1.00	99B	55	0.01	6.6	
243	53	13	-93	-333	-343	-313	-374	-433	-543	-544	-553	-433	-553	-703	
-463	-443	-503	-493	-583	-633									-553	
34303434	1	652	552	360	240ZC	756	09/14/68	3	-0.6	-6.02	99B	8	0.01	6.6	
493	433	223													
18761894	-1	642	742	-900	-300ZC	2453	01/23/71	10	-6.0	6.92	99B	13	0.01	6.6	
933	863	1183	1443	1953	1903	1604	1504	1443	1443						
19041908	-1	642	742	-900	-300ZC	2453	01/23/71	3	-6.0	6.92	99B	3	0.01	6.6	
1113	1194	1263													
19161916	-1	642	742	-900	-300ZC	2453	01/23/71	1	-6.0	6.92	99B	1	0.01	6.6	
1234															
142	142	1	-17	83	180	780ZC	1385	05/02/71	1	4.8	0.33	99B	2	0.01	6.6
183															
154	156	1	-17	83	180	780ZC	1385	05/02/71	2	4.8	0.33	99B	3	0.01	6.6
-53	153														
164	186	1	-17	83	180	780ZC	1385	05/02/71	12	4.8	0.33	99B	15	0.01	6.6
103	94	83	164	253	304	304	303	253	-13	-93	-383				
114	116	1-503	-403	190	790ZC	844	05/26/71	2	4.9	-4.53	99B	6	0.02	6.6	
-383	-383														
138	142	1-503	-403	190	790ZC	844	05/26/71	3	4.9	-4.53	99B	4	0.02	6.6	
353	514	673													
66	74	1	593	693	300	900ZC	1489	07/04/73	5	6.0	6.43	99B	8	0.01	6.6
-113	-313	-313	-304	-293											
17021704	-1	578	678	220	820ZC	2066	09/02/73	2	5.2	6.28	99B	5	0.01	6.6	
1533	1273														
17121718	-1	578	678	220	820ZC	2066	09/02/73	4	5.2	6.28	99B	6	0.01	6.6	
1703	603	233	353												
18181832	-1	547	647	220	820ZC	1489	10/21/73	8	5.2	5.97	99B	29	0.01	6.6	
1823	1943	2133	2193	1993	2423	2383	2554								
18421946	-1	547	647	220	820ZC	1489	10/21/73	53	5.2	5.97	99B	143	0.01	6.6	
1783	663	133	03	-353	-473	-564	-453	23	303	303	523	813	1273	1534	
973	1083	673	703	673	503	383	03	253	254	313	433	403	103	233	
193	443	773	1143	1353	1374	1453	653	703</							

3544	3566	1	195	295-720-120ZC	984	08/14/74	12-4.2	2.45	99B		18	0.01	6.5		
173	214	243	204	153	223	303	254 -143 -333	-493	-403						
15981606-1-500-400-690	-90ZC	3507	10/31/71	5-3.9	-4.50	99B				4	0.01	6.5			
703	643	504	364	234											
16361638-1-500-400-690	-90ZC	3507	10/31/71	2-3.9	-4.50	99B				2	0.01	6.5			
-103	03														
30	34	1	195	295-720-120ZC	984	08/14/74	3-4.2	2.45	99B		2	0.01	6.5		
93	-14	-123													
112	120	1	361	461-900-490ZC	769	03/09/76	5-7.9	4.11	99B		6	0.01	6.5		
-433	-503	-444	-384	-323											
148	152	1	361	461-900-490ZC	769	03/09/76	3-7.9	4.11	99B		3	0.01	6.5		
43	-24	-83													
3544	3572	1-357-257	10	610ZC	842	08/05/72	15	3.1	-3.07	99B	28	0.01	6.5		
-54	123	203	53	-303	-73	-74	-64	-53	-133	153	104	13	-113	-103	
3584	3598	1-357-257	10	610ZC	842	08/05/72	8	3.1	-3.07	99B		8	0.01	6.5	
153	-103	-204	-204	-163	153	374	573								
0	4	1-357-257	10	610ZC	842	08/05/72	3	3.1	-3.07	99B		6	0.01	6.5	
663	443	53													
17461762-1-597-497	420	900ZC	3199	11/27/76	9	7.2	-5.47	99B			21	0.01	6.5		
-863	-703	-133	-63	-23-1004	-993	-753	03								
16701708-1-591-491-170	430ZC	2497	10/17/77	20	1.3	-5.41	99B				21	0.01	6.5		
683	1313	1343	1094	503	-43	-374	-713	-704	-693	-503	-444	-373	-293	-463-1554	
-1583-1514-1444-1373															
34	42	1	671	771-480	120ZC	1091	04/14/78	5-1.8	7.21	99B		4	0.01	6.5	
253	323	213	-84	-83											
84	94	1	671	771-480	120ZC	1091	04/14/78	6-1.8	7.21	99B		4	0.01	6.5	
-223	-294	-353	-424	-493	-653										
19481950-1-243-143	-50	550ZC	1973	12/08/66	2	2.5	-1.93	99B				8	0.02	6.4	
273	283														
18901894-1	203	303	470	900ZC	1323	10/29/72	3	7.7	2.53	99B		5	0.01	6.4	
723	473	853													
19081944-1	203	303	470	900ZC	1323	10/29/72	19	7.7	2.53	99B		49	0.01	6.4	
1413	1533	1763	1633	1544	1453	1373	1013	703	504	773	953	923	1013	1203	1253
1023	693	254													
19541970-1	203	303	470	900ZC	1323	10/29/72	9	7.7	2.53	99B		13	0.01	6.4	
-503	-903	-453	-53	-283	364	323	43	153							
18501854-1	647	747	60	660ZC	1582	12/06/74	3	3.6	6.97	99B		4	0.01	6.4	
583	393	243													

Table 1.

142 146 1-586-486 360 900ZC 840 03/05/71 3 6.6 -5.36 99B 5 0.01 6.3	
403 554 483	
16041606-1-328-228-810-210ZC 3367 10/30/71 2-5.1 -2.78 99B 2 0.01 6.3	
1593 1433	
16321646-1-328-228-810-210ZC 3367 10/30/71 8-5.1 -2.78 99B 8 0.01 6.3	
-1083 -353 473 633 243 -413 -784-1153	
16581658-1-328-228-810-210ZC 3367 10/30/71 1-5.1 -2.78 99B 1 0.01 6.3	
-814	
16741678-1-328-228-810-210ZC 3367 10/30/71 3-5.1 -2.78 99B 3 0.01 6.3	
1833 1304 783	
16341640-1-655-555-580 20ZC 3455 09/30/74 4-2.8 -6.05 99B 4 0.01 6.3	
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35583576 1-596-496-360 240ZC 3455 06/30/75 10-0.6 -5.46 99B 14 0.01 6.3	
23 114 203 143 -33 -54 13 33 173 463	
16361638-1-256-156 190 790ZC 2457 07/19/75 2 4.9 -2.06 99B 3 0.01 6.3	
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493 453	
17961798-1 188 288 -70 530ZC 2017 11/30/75 2 2.3 2.38 99B 3 0.02 6.3	
983 1583	
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18141818-1 188 288 -70 530ZC 2017 11/30/75 3 2.3 2.38 99B 2 0.02 6.3	
-43 444 923	
18441846-1 188 288 -70 530ZC 2017 11/30/75 2 2.3 2.38 99B 2 0.02 6.3	
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72 80 1 678 778-380 220ZC 1003 04/14/78 5-0.8 7.28 99B 9 0.03 6.3	
23 -163 23 1044 13	
35503564 1 129 229 150 750ZC 4 07/14/79 8 4.5 1.79 99B 13 0.01 6.3	
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1223 1923 2103 1864 1604 1093 493	
94 150 1 151 251-900-470ZC 1787 05/27/69 29-7.7 2.01 99B 50 0.01 6.2	
293 233 184 133 133 -213 -323 -133 -513 -613 -644 -664 -683 -533 -443 -424	
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-343 -453 -133	
180 186 1 164 264-900-400ZC 755 04/16/75 4-7.0 2.14 99B 8 0.01 6.2	
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-23 -63 -173 -233 -234 -223 -243 -283	
35723572 1 660 760-900-300ZC 1234 11/13/76 1-6.0 7.10 99B 1 0.01 6.2	
-14	
17981798-1 -31 69-430 170ZC 3360 11/27/79 1-1.3 0.19 99B 2 0.01 6.2	
243	
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1423	
16701676-1 393 493-340 260ZC 620 02/20/64 4-0.4 4.43 99B 7 0.03 6.1	
243 104 -44 -173	
33903394 1-305-205-640 -40ZC 566 07/31/67 3-3.4 -2.55 99B 13 0.02 6.1	
193 283 383	

34343450	1-305-205-640	-40ZC	566	07/31/67	9-3.4	-2.55	99B	41	0.02	6.1					
-323	-273	-113	03	183	303	654	443	253							
34083486	1-641-541	480	900ZC	370	08/22/70	40	7.8	-5.91	99B	77	0.01	6.1			
683	1033	904	953	573	543	673	634	583	524	453	343	293	253	93	163
113	103	-243	-43	-273	-33	233	273	304	333	133	263	323	153	263	173
83	-63	24	93	174	253	193	263								
15901600	1-575-475-230	370ZC	2995	11/20/74	6	0.7	-5.25	99B	11	0.01	6.1				
703	1183	1553	1304	1304	1403										
16081636	1-575-475-230	370ZC	2995	11/20/74	15	0.7	-5.25	99B	31	0.01	6.1				
653	03-1004-1253-1503-1253-1663-1463-1223-1453-1273-1144-1084	-963-1023													
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-733	-1054-1303-1903-1983-1533-1753-1563-1233	-953	93	183	-104	603									
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1083	503	-223													
90	104	1	430	530-510	90ZC	610	04/21/77	8-2.1	4.80	99B	14	0.01	6.1		
-383	-143	-123	-163	-323	-253	-334	-383								
124	142	1	430	530-510	90ZC	610	04/21/77	10-2.1	4.80	99B	16	0.01	6.1		
-343	-353	-334	-303	-293	-393	83	-13	-113	-113						
198	218	1-305-205	210	810ZC	1221	05/28/71	11	5.1	-2.55	99B	26	0.01	6.0		
-13	-33	-233	-113	63	23	-123	63	-233	-284	-313					
56	60	1	694	794	140	740ZC	1587	05/29/74	3	4.4	7.44	99B	6	0.01	6.0
-133	53	263													
130	134	1	694	794	140	740ZC	1587	05/29/74	3	4.4	7.44	99B	5	0.01	6.0
33	103	-13													
120	130	1	41	141-900-510ZC	651	03/19/75	6-8.1	0.91	99B	8	0.01	6.0			
-663	-633	-543	-453	-323	-353										
162	172	1	41	141-900-510ZC	651	03/19/75	6-8.1	0.91	99B	8	0.01	6.0			
103	64	33	-93	-73	13										
130	130	1	45	145-900-380ZC	651	04/15/75	1-6.8	0.95	99B	2	0.01	6.0			
-213															
164	166	1	45	145-900-380ZC	651	04/15/75	2-6.8	0.95	99B	2	0.01	6.0			
103	103														
18841898	1-532-632-900-380ZC	1072	10/26/75	8-6.8	5.82	99B	21	0.01	6.0						
1943	2123	1444	1503	1583	1263	1463	954								
19361948	1-532-632-900-380ZC	1072	10/26/75	7-6.8	5.82	99B	13	0.01	6.0						
843	763														

15781608-1-421-321-730-130ZC	3066	10/07/73	16-4.3	-3.71	99B	34	0.01	5.9	
833 663 754 843 923 523 453 993 1233 1163 1113 1093 1063 1053 703	-33								
16781710-1-704-604-290 310ZC	3045	11/20/74	17	0.1	-6.54	99B	20	0.01	5.9
-973-1493-1703-1563-1773-1623-1484-1334-1183-1133-1533-1274-1013-1063-1114-1233	-1283								
48 78 1 681 781-340 260ZC	1605	05/19/75	16-0.4	7.31	99B	20	0.01	5.9	
113 113 174 233 153 133 124 114 103 -163 04 173	-83 -33 103	53							
58 64 1 680 780-260 340ZC	1605	06/16/75	4	0.4	7.30	99B	9	0.01	5.9
-23 94 193 253									
16 60 1 688 788-900-460ZC	1318	04/26/77	23-7.6	7.38	99B	80	0.01	5.9	
603 483 603 803 783 813 763 743 453 373 303 303	273 313 403	213							
93 44 03 183 233 253 253									
17581760-1 671 771 270 870ZC	444	02/21/80	2	5.7	7.21	99B	5	0.01	5.9
803 893									
17701776-1 671 771 270 870ZC	444	02/21/80	4	5.7	7.21	99B	9	0.01	5.9
-13 -444 03 404									
17861790-1 671 771 270 870ZC	444	02/21/80	3	5.7	7.21	99B	4	0.01	5.9
263 -244 203									
16521670-1 673 773 80 680ZC	3141	11/19/66	10	3.8	7.23	99B	17	0.01	5.8
1263 1233 1083 904 733 574 423 703 873 813									
16841692-1 673 773 80 680ZC	3141	11/19/66	5	3.8	7.23	99B	17	0.01	5.8
503 -163 33 423 553									
17141716-1 673 773 80 680ZC	3141	11/19/66	2	3.8	7.23	99B	6	0.01	5.8
1773 1153									
16321634-1 661 761 420 900ZC	3141	11/09/67	2	7.2	7.11	99B	4	0.01	5.8
533 673									
16561660-1 661 761 420 900ZC	3141	11/09/67	3	7.2	7.11	99B	10	0.01	5.8
323 183 423									
16761678-1 661 761 420 900ZC	3141	11/09/67	2	7.2	7.11	99B	5	0.01	5.8
1143 1243									
138 156 1-590-490 20 620ZC	1088	04/13/70	10	3.2	-5.40	99B	14	0.01	5.8
603 713 583 474 353 333 324 303 323 333									
35263526 1-672-572-520 80ZC	3272	01/16/75	1-2.2	-6.22	99B	1	0.01	5.8	
264									
35383546 1-672-572-520 80ZC	3272	01/16/75	5-2.2	-6.22	99B	5	0.01	5.8	
133 163 193 324 293									
35023518 1-672-572-170 430ZC	3272	06/01/75	9	1.3	-6.22	99B	32	0.01	5.8
-204 123 -133 -203 53 -23 -273 -223 -253									
19281932-1 455 555-810-210ZC	764	10/13/76	3-5.1	5.05	99B	5	0.01	5.8	
1683 1343 973									
35443554 1 555 655 230 830ZC	764	08/26/78	6	5.3	6.05	99B	5	0.01	5.8
-23 33 104 104 53 103									
35783594 1 -22 78-900-320ZC	531	04/23/66	9-6.2	0.28	99B	27	0.02	5.7	
-83 -163 -133 -183 -123 -274 -413 -343 -513									
8 28 1 -22 78-900-320ZC	531	04/23/66	11-6.2	0.28	99B	38	0.02	5.7	
-413 -383 -353 -273 -113 -93 143 -43									

35363548	1-546-446-690	-90ZC	399	08/20/73	7-3.9	-4.96	99B	16	0.01	5.7			
383	203	383	633	593	253	203							
15761580-1	217	317-900-460ZC	2771	10/25/71	3-7.6	2.67	99B	5	0.01	5.6			
1503	2023	2183											
16081626-1	217	317-900-460ZC	2771	10/25/71	10-7.6	2.67	99B	14	0.01	5.6			
904	693	-363 -493 -523 -353 -533 -344 -343 -493											
18001804-1	646	746 130 730ZC	1713	07/16/72	3 4.3	6.96	99B	5	0.01	5.6			
633	673	523											
74	92 1	710 810 410 900ZC	1713	07/06/73	10 7.1	7.60	99B	17	0.01	5.6			
-423	-354	-463 -563 -573 -633 -523 -554 -573 -623											
18541870-1	658	758 400 900ZC	1713	11/19/73	9 7.0	7.08	99B	10	0.01	5.6			
103	404	653 804 954 1263 1423 1753 1554											
18981916-1	658	758 400 900ZC	1713	11/19/73	10 7.0	7.08	99B	20	0.01	5.6			
653	444	533 714 884 1053 1113 1504 1504 1203											
48	66 1	449 549-810-210ZC	1611	05/09/76	10-5.1	4.99	99B	22	0.01	5.6			
-283	94	263 113 -63 103 284 183 154 83											
18701880-1	-360-260-850-250ZC	2114	01/04/78	6-5.5	-3.10	99B		5	0.01	5.6			
-1033	-773	-404 -313 -473 -713											
44	56 1	587 687 0 600ZC	650	02/15/78	7 3.0	6.37	99B	18	0.01	5.6			
-83	13	-63 -104 -84 43 43											
19281932-1	-32	68 480 900ZC	2217	02/12/66	3 7.8	0.18	99B	5	0.02	5.5			
1553	1723	1713											
33943402 1	162	262-210 390ZC	167	08/24/67	5 0.9	2.12	99B	15	0.02	5.5			
323	323	173 133 333											
34423452 1	162	262-210 390ZC	167	08/24/67	6 0.9	2.12	99B	13	0.02	5.5			
-63	-94	-123 -73 -23 -123											
15761592-1	285	385-900-440ZC	2809	10/26/71	9-7.4	3.35	99B	28	0.02	5.5			
1253	1523	1753 2013 1923 1703 2104 1764 1774											
16061642-1	285	385-900-440ZC	2809	10/26/71	19-7.4	3.35	99B	82	0.02	5.5			
1083	623	-33 -553 -53 33 113 113 403 223 123 -123 -203 03 -113 -403											
-24	183	203											
18601864-1	586	686 550 900ZC	1944	01/15/74	3 8.5	6.36	99B	5	0.01	5.5			
643	983	1203											
18801884-1	586	686 550 900ZC	1944	01/15/74	3 8.5	6.36	99B	3	0.01	5.5			
504	53	103											
18901916-1	586	686 550 900ZC	1944	01/15/74	14 8.5	6.36	99B	14	0.01	5.5			
204	303	153 -93 163 284 243 404 743 743 904 1084 943 653											
72	104 1	4 104-900-530ZC	633	02/19/75	17-8.3	0.5							

18	18	1	565	665-810-210ZC	1623	05/09/76	1-5.1	6.15	99B	1	0.01	5.4							
564																			
40	82	1	565	665-810-210ZC	1623	05/09/76	22-5.1	6.15	99B	20	0.01	5.4							
-73	-64	-213	-184	-23	-34	-53	-53	-14	-13	-94	-173	-133	04	24	93				
243	114	-24	-203	-153	93														
35023534	1	653	753	490	900ZC	814	09/13/79	17	7.9	7.03	99B	26	0.01	5.4					
33	323	234	93	-123	-23	153	73	04	-24	43	-134	-263	-253	-204	-154				
-104																			
34463478	1-382-282-110	490ZC	486	06/22/68	17	1.9	-3.32	99B	37	0.02	5.3								
03	503	493	333	193	93	-43	-83	-63	-213	-223	-233	-93	-163	-63	-23				
-113																			
34863488	1-382-282-110	490ZC	486	06/22/68	2	1.9	-3.32	99B	3	0.02	5.3								
-133	-13																		
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423	373	243	-23	-23	-113	-433	-614	-794	-973	-913-1023-1143-1223-1063-1153									
-1113	-823	-503																	
18841918-1	-84	16	-30	570ZC	1466	10/24/70	18	2.7	-0.34	99B	54	0.01	5.3						
-183	-113	-233	-143	53	163	443	904	1204	1093	983	1163	1103	1403	1773	1973				
1803	1983																		
35583598	1-296-196-900-400ZC	487	08/11/74	21-7.0	-2.46	99B	22	0.02	5.3										
-83	93	33	-23	-83	233	354	384	433	504	403	-133	-113	-124	-193	-153				
44	233	374	513	353															
34403456	1-569-469	370	900ZC	440	08/05/69	9	6.7	-5.19	99B	17	0.02	5.2							
-263	-463	-153	-43	-353	403	203	553	403											
34183456	1-573-473	310	900ZC	440	09/29/69	20	6.1	-5.23	99B	63	0.02	5.2							
653	803	553	663	493	363	433	293	453	03	203	-23	313	323	03	33				
483	263	543	303																
122	142	1	295	395-250	350ZC	1635	06/01/71	11	0.5	3.45	99B	14	0.01	5.2					
-323	-343	-323	-353	-193	-273	-243	-43	04	44	74									
152	168	1	295	395-250	350ZC	1635	06/01/71	9	0.5	3.45	99B	10	0.01	5.2					
183	63	54	33	83	83	63	03	23											
110	110	1	202	302															

Table 1.

98 98 1 689 789-900-400ZC 1359 04/09/76 1-7.0 7.39 99B	6 0.01 5.2
-463	
18341836-1 633 733-900-380ZC 1359 11/14/76 2-6.8 6.83 99B	2 0.01 5.2
1193 1223	
18681880-1 633 733-900-380ZC 1359 11/14/76 7-6.8 6.83 99B	14 0.01 5.2
463 173 243 553 764 663 853	
18881892-1 633 733-900-380ZC 1359 11/14/76 3-6.8 6.83 99B	4 0.01 5.2
1383 1373 1363	
94 108 1-798-698-900-390ZC 1134 04/06/68 8-6.9 -7.48 99B	18 0.01 5.1
13 -23 -53 -74 -83 83 -73 -43	
34243436 1-546-446-200 400ZC 561 10/10/68 7 1.0 -4.96 99B	13 0.01 5.1
433 753 453 653 433 603 404	
34423462 1-546-446-200 400ZC 561 10/10/68 11 1.0 -4.96 99B	18 0.01 5.1
173 223 413 383 533 03 234 373 143 173 163	
46 46 1-717-617-240 360ZC 288 03/18/72 1 0.6 -6.67 99B	3 0.01 5.1
-203	
54 70 1-717-617-240 360ZC 288 03/18/72 9 0.6 -6.67 99B	11 0.01 5.1
-304 -294 -284 -273 -243 -204 -163 -94 -23	
35543558 1 586 686-310 290ZC 1410 10/11/74 3-0.1 6.36 99B	6 0.01 5.1
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48 48 1 460 560-900-470ZC 913 03/10/76 1-7.7 5.10 99B	5 0.01 5.1
-373	
82 86 1 460 560-900-470ZC 913 03/10/76 3-7.7 5.10 99B	6 0.01 5.1
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34803486 1-779-679-620 -20ZC 1137 09/17/68 4-3.2 -7.29 99B	7 0.03 5.0
-153 -73 -33 93	
35203532 1-779-679-620 -20ZC 1137 09/17/68 7-3.2 -7.29 99B	11 0.03 5.0
-143 -13 104 223 193 13 -123	
40 50 1-749-649-150 450ZC 638 03/23/69 6 1.5 -6.99 99B	31 0.02 5.0
-243 -333 -523 -523 -293 -193	
74 86 1-749-649-150 450ZC 638 03/23/69 7 1.5 -6.99 99B	30 0.02 5.0
-243 -123 -203 -333 -423 -373 -403	
19181970-1 -64 36-770-170ZC 1600 12/02/69 27-4.7 -0.14 99B	31 0.01 5.0
1933 1744 1543 1004 823 904 973 1204 1173 1014 853 404	-53 -474 -903 -523
-13 443 424 403 383 03 -443 -463 -133 503 453	
19842010-1 -64 36-770-170ZC 1600 12/02/69 14-4.7 -0.14 99B	22 0.01 5.0
513 604 433 143 264 393 583 703 193 104 33 -284	03 73
16341648-1-626-526-900-370ZC 3320 12/02/73 8-6.7 -5.76 99B	15 0.01 5.0
-733 -754 -553 -443 -523 -864-1193-1243	
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2763 2423 2543 2163 1703	
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-363 63 -303 354 354 -443 -483 -513 -493 -443 -524 -433 -403 -293 53 303	
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1203 943	
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-823 -943 -673 -523 -803-1293-1163-1133-1094-1044-1003 -963-1023	
18301858-1-467-367 250 850ZC 2666 01/28/76 15 5.5 -4.17 99B	29 0.02 5.0
-1293-1584-1883-2043-2233-2283-2333-2284-2184-2053-1713-1733-1754-1513-1423	
35303536 1 661 761 290 890ZC 667 09/22/78 4 5.9 7.11 99B	3 0.01 5.0
-223 -103 -114 -123	
35443544 1 661 761 290 890ZC 667 09/22/78 1 5.9 7.11 99B	1 0.01 5.0
-114	
35823582 1 661 761 290 890ZC 667 09/22/78 1 5.9 7.11 99B	1 0.01 5.0
564	

35903592	1	661	761	290	890ZC	667	09/22/78	2	5.9	7.11	99B	3	0.01	5.0
783	663													
34523480	1-583-483-850-250ZC	3453	05/09/72	15-5.5	-5.33	99B	23	0.01	4.9					
463	523	83	84	-263	-303	-203	-643	-693	-383	-293	-224	-153	113	204
34863510	1-583-483-850-250ZC	3453	05/09/72	13-5.5	-5.33	99B	16	0.01	4.9					
163	64	-43	84	63	133	-153	-354	-203	23	-153	-183	-243		
34103416	1-609-509-670	-70ZC	3501	07/30/72	4-3.7	-5.59	99B	8	0.01	4.9				
-233	153	53	254											
34363446	1-609-509-670	-70ZC	3501	07/30/72	6-3.7	-5.59	99B	11	0.01	4.9				
343	313	383	364	333	343									
17261756	1-671-571-900-500ZC	3501	12/14/72	16-8.0	-6.21	99B	28	0.01	4.9					
-1183	-1234	-1283	-1283	-1273	-1384	-1554	-1763	-1853	-2043	-1913	-1403	-1743	-1853	-1873
-1503														
17621782	1-671-571-900-500ZC	3501	12/14/72	11-8.0	-6.21	99B	23	0.01	4.9					
-1703	-2123	-1853	-2063	-2023	-1843	-1903	-1824	-1743	-1383	-1483				
35723586	1-633-533-750-150ZC	3501	04/19/74	8-4.5	-5.83	99B	7	0.01	4.9					
573	513	384	254	123	94	163	123							
98	98	1	99	199-900-380ZC	628	02/09/76	1-6.8	1.49	99B	1	0.01	4.9		
244														
118	124	1	99	199-900-380ZC	628	02/09/76	4-6.8	1.49	99B	5	0.01	4.9		
-723	-593	-534	-483											
154	164	1	99	199-900-380ZC	628	02/09/76	6-6.8	1.49	99B	4	0.01	4.9		
163	43	13	24	24	34									
38	40	1-427-327-900-410ZC	2814	09/19/80	2-7.1	-3.77	99B	3	0.01	4.9				
-213	-303													
72	86	1-427-327-900-410ZC	2814	09/19/80	8-7.1	-3.77	99B	10	0.01	4.9				
-184	-483	-103	104	304	283	143	253							
118	152	1-354-254	270	870ZC	900	03/21/72	18	5.7	-3.04	99B	63	0.01	4.8	
103	133	243	303	283	333	363	433	603	803	243	553	353	303	283
213	183	83												
16701674	1-241-141	-60	540ZC	2303	08/04/76	3	2.4	-1.91	99B	6	0.16	4.8		
1183	1473	1743												
16801700	1-241-141	-60	540ZC	2303	08/04/76	11	2.4	-1.91	99B	25	0.16	4.8		
1083	843	604	683	403	-83	104	-124	-223	-323	-803				
17201728	1-241-141	-60	540ZC	2303	08/04/76	5	2.4	-1.91	99B	10	0.16	4.8		
-663	-303	-363	-123	-453										
35043510	1	691	791	540	900ZC	677	09/12/79	4</						

34303462	1-619-519	320	900ZC	539	08/06/69	17	6.2	-5.69	99B	48	0.02	4.3			
303	603	103	303	-53	203	-353	-203	-303	-353	64	253	404	363	304	304
363															
33743418	1-262-162-540	60ZC	465	09/23/67	23	-2.4	-2.12	99B		74	0.03	4.3			
503	1203	1404	1004	863	653	323	204	93	163	193	293	363	523	573	753
633	553	513	753	483	653	763									
15701670-1	92	192-500	100ZC	3126	12/04/70	51	-2.0	1.42	99B	185	0.01	4.3			
1253	1603	1803	1773	1604	1803	1843	2303	2103	1864	1703	1863	1804	2033	1963	1813
1704	1604	1253	503	-43	213	163	453	403	83	-103	-223	-214	-213	-653	-653
-903	-603	-153	183	-283	-153	193	463	253	483	853	703	1303	953	853	803
1413	1623	1004													
18501856-1	-156	-56-900-310ZC	709	09/09/74	4	-6.1	-1.06	99B		4	0.01	4.3			
-523	-1054	-953	-973												
18681872-1	-156	-56-900-310ZC	709	09/09/74	3	-6.1	-1.06	99B		6	0.01	4.3			
-683	-543	603													
18781882-1	-156	-56-900-310ZC	709	09/09/74	3	-6.1	-1.06	99B		5	0.01	4.3			
973	743	303													
120	130	1	-84	16-900-460ZC	709	01/23/75	6	-7.6	-0.34	99B	7	0.01	4.3		
93	243	423	203	393	443										
16541662-1	-96	4	200	800ZC	2310	07/18/75	5	5.0	-0.46	99B	10	0.01	4.3		
993	1204	853	503	633											
16821688-1	-96	4	200	800ZC	2310	07/18/75	4	5.0	-0.46	99B	8	0.01	4.3		
-103	-323	-254	-383												
74	94	1	450	550-600	0ZC	658	03/25/77	11	-3.0	5.00	99B	42	0.01	4.3	
33	-53	-103	-153	-263	-173	-343	-203	-293	-273	-233					
102	106	1	450	550-600	0ZC	658	03/25/77	3	-3.0	5.00	99B	7	0.01	4.3	
-313	-363	-453													
146	166	1	450	550-600	0ZC	658	03/25/77	11	-3.0	5.00	99B	32	0.01	4.3	
-263	-223	-323	-393	-354	-313	-383	-283	-193	-183	-123					
60	64	1	583	683	330	900ZC	832	04/19/80	3	6.3	6.33	99B	6	0.01	4.3
133	243	33													
16061608-1	432	532	130	730ZC	3419	10/15/67	2	4.3	4.82	99B	6	0.02	4.2		
133	73														
15981606-1	-446	-346-900-480ZC	3269	11/15/72	5	-7.8	-3.96	99B		5	0.01	4.2			
-263	-284	-204	-343	-873											
16141642-1	-446	-346-900-480ZC	3269	11/15/72	15	-7.8	-3.96								

Table 1.

18821882-1	15	115-160	440ZC	976	10/17/73	1	1.4	0.65	99B	3	0.01	2.9			
443															
18941932-1	15	115-160	440ZC	976	10/17/73	20	1.4	0.65	99B	28	0.01	2.9			
653	933	1143	1454	1393	1003	1263	1373	1633	1863	1993	2103	1874	1654	1433	1073
804	993	1124	1263												
19401948-1	15	115-160	440ZC	976	10/17/73	5	1.4	0.65	99B	5	0.01	2.9			
1203	863	284	-293	-303											
19561976-1	15	115-160	440ZC	976	10/17/73	11	1.4	0.65	99B	12	0.01	2.9			
-223	-474	-733	-604	-483	-243	493	753	323	294	263					
18821952-1	691	791-780-180ZC	2383	03/28/70	36-4.8	7.41	99B	85	0.01	2.8					
1553	1903	1304	1553	1153	1403	1304	1223	1323	1233	1113	1183	1194	1203	1283	1253
1113	853	813	993	1103	1043	1133	1083	693	513	464	423	513	863	854	843
683	723	613	423												
16601664-1	691	791-900-500ZC	2383	08/12/70	3-8.0	7.41	99B	3	0.01	2.8					
1183	1203	1323													
16781686-1	691	791-900-500ZC	2383	08/12/70	5-8.0	7.41	99B	6	0.01	2.8					
573	243	04	03	604											
17001702-1	691	791-900-500ZC	2383	08/12/70	2-8.0	7.41	99B	3	0.01	2.8					
523	04														
35363568	1-552-452-250	350ZC	552	07/07/72	17	0.5	-5.02	99B	68	0.01	2.8				
23	143	223	23	243	303	404	173	-33	-353	-263	-234	-373	-214	-144	23
-154															
35763580	1-552-452-250	350ZC	552	07/07/72	3	0.5	-5.02	99B	10	0.01	2.8				
233	523	553													
2	16	1	-48	52	90	690ZC	2118	01/24/76	8	3.9	0.02	99B	9	0.01	2.8
-83	03	-173	-293	-423	-354	-284	-204								
46	46	1	-48	52	90	690ZC	2118	01/24/76	1	3.9	0.02	99B	1	0.01	2.8
-64															
60	66	1	-48	52	90	690ZC	2118	01/24/76	4	3.9	0.02	99B	6	0.01	2.8
263	173	493	623												
16701674-1	-241-141	-60	540ZC	2302	08/04/76	3	2.4	-1.91	99B	4	0.02	2.6			
704	1554	1713													
16801686-1	-241-141	-60	540ZC	2302	08/04/76	4	2.4	-1.91	99B	10	0.02	2.6			
1033	844	653	523												
17001720-1	-241-141	-60	540ZC	2302	08/04/76	11	2.4	-1.91	99B	6	0.02	2.6			
-1193	-1264	-1293	-1524	-1694	-1894	-1884	-1864	-1853	-1544	-1243					
17															

Table 1.