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 The MINOR PLANET CIRCULARS/MINOR PLANETS AND COMETS are published, on behalf
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EDITORIAL NOTICE.

Further to the Editorial Notice on MPC 5799, it should be noted that the 8192-byte block size refers only to users who require an ANSI-type labeled tape; in other cases an 8000-byte (i.e. 100 observations) block size is being utilized. For BCD, ASCII read ASCII. The tape file is intended to be complete through the 1981 Feb. 1 MPCs, and it contains 186 108 observations of numbered minor planets, 43 076 of unnumbered minor planets, 229 184 in all. Although moderately extensive checking of the observations has been done, the tape file still contains many errors, particularly in the observations of low-numbered minor planets. The Minor Planet Center wishes to be informed of any errors that are found.

From time to time, the question arises as to whether inclusion of observations in the MPCs can be construed as publication in the 'refereed' astronomical literature. The Minor Planet Center stresses most emphatically that astrometric observations of comets and minor planets submitted for publication in the MPCs are indeed subjected to close, critical study, and that erroneous observations are returned to their authors for amendment. Particular care is taken to ensure that all observations presented are correctly identified. The resources of the Minor Planet Center are in fact such that observations published nowadays in the MPCs are more consistently checked than similar observations appearing anywhere else in the astronomical literature.

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IDENTIFICATION CHANGES.

Continuation to MPC 5801.

Object	Date	UT	R. A. (1950)	Decl.	Old desig.	Mag.	Obs.
A892 FB	* 1892 03	25.87028	11 31 43.96	+05 47 51.3	332		024
A892 FC	* 1892 03	25.87028	11 32 09.80	+05 44 54.2	332		024
A892 HA	* 1892 04	19.93972	11 17 54.20	+06 45 05.4	332		024
A909 TG	* 1909 10	13.84424	22 27 38.77	+00 38 49.8	687		024
1929 PO	* 1929 08	06.93180	21 16 28.23	-12 23 43.5	1929 PJ		024
1929 VY	* 1929 11	05.79007	23 18 35.69	+00 17 44.9	1929 RE		024
1951 UZ	* 1951 10	27.95186	03 14 54.46	+19 09 12.6	1537		012
1965 NA	* 1965 07	02.28890	18 26 38	-36 45.5	1964 JD	17.0	808
1966 MC	* 1966 06	22.93313	17 42 33.25	-20 09 44.0	1537		020
1966 MC	1966 06	22.95529	17 42 31.83	-20 09 14.2	1537		020
1967 VA	* 1967 11	08.00520	03 41 28.56	+19 33 38.5	1537		012
1967 VA	1967 11	08.03359	03 41 27.15	+19 33 38.2	1537		012
1967 XB	* 1967 12	04.85741	03 20 33.03	+17 16 59.4	1537		020
1967 XB	1967 12	04.88303	03 20 32.25	+17 16 46.1	1537		020
1972 NY	* 1972 07	13.86831	18 13 09.78	-11 41 20.7	1972 LB1	16.5	095

1972 NY	1972 07 16.89506	18 11 06.10	-11 52 52.4	1972 LBI	16.5	095
1973 YG4 *	1973 12 26.00970	08 53 00.30	+12 21 02.0	1537		095
1978 RU4 *	1978 09 03.90664	22 35 13.34	-10 51 07.6	1978 PR2	17.0	095
1981 AK1 *	1981 01 08.88066	07 29 56.02	+18 09 16.9	1980 YM	16.5	046
1981 AK1	1981 01 08.89484	07 29 55.19	+18 09 18.8	1980 YM		046

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IDENTIFICATIONS.

The following list of identifications with numbered minor planets continues that on MPC 5802.

	Note		Note		Note
1930 YQ = (841)	1	1930 YR = (1244)	1	1978 BE = (2344)	2

Note 1: identification by E. Bowell. 2: identification by P. Herget.

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OBSERVATIONS OF COMETS.

It has for some time been apparent that the form in which observations of comets have been presented in the MPCs is unsatisfactory. For that reason, a change is being instituted, and starting with the current batch of MPCs, these observations will be published chronologically by comet, with the name of each comet clearly indicated.

Observations are published here for the following observatory codes:

012 Uccle. Observer H. Debehogne.
 017 Hoher List. Observers M. Geffert and M. Grossmann.
 024 Heidelberg. Observer U. Gorze. Communicated by G. Klare.
 026 Berne-Zimmerwald. Observer P. Wild.
 046 Klet. Observers A. Mrkos and M. Mahrova.
 057 Belgrade. Observer V. Protitch-Benishek.
 372 Geisei. Observer T. Seki. In part from Orient. Astron. Assoc. Comet Bull. No. 211 and Yamamoto Circ. No. 1954.
 375 Uzurano. Observer H. Einaga. Measured by M. Takeishi. From Japan Astron. Circ. No. 283. Long. and Parallax 134.86, -350, -243 (see MPC 4766).
 381 Tokyo-Kiso. Observer H. Kosai.
 413 Siding Spring. Observers S. J. Bus, M. Hartley and K. S. Russell.
 491 Yebes. Observers M. de Pascual, J. Garcia and C. Cabanas.
 552 S. Vittore. Observer L. Pansecchi.
 657 Victoria. Observers J. B. Tatum and D. D. Balam. Measured by Tatum.
 662 Lick Observatory. Observer E. Roemer.
 675 Palomar. Observer J. Gibson.
 688 Lowell Observatory. Observers E. Bowell and B. A. Skiff. Measured by Bowell.
 691 Steward Observatory, Kitt Peak. Observer E. Roemer, assisted by C. Coleman, M. Daniel, D. Daniels, R. C. Elliott, A. H. Ferguson, D. Ferguson, M. Gonzales, C. Heller, A. K. Herring, J. Q. Latta, R. A. McCallister, G. McCorkle, G. Reskin and L. M. Vaughn. Measured by Elliott, A. H. Ferguson, D. J. Granrath, C. C. McCarthy, Roemer, B. Schreuer, R. Shuart, W. Smith and C. D. Vesely.
 693 Lunar and Planetary Laboratory, Catalina station. See code 691 above.
 754 Yerkes Observatory. Observer E. Roemer. Measured by B. G. Marsden.
 801 Agassiz Station. Observers R. E. McCrosky, C.-Y. Shao, G. Schwartz and J. Bulger, assisted by C. M. Bardwell, D. W. E. Green and B. G. Marsden.
 809 European Southern Observatory. Observers H.-E. Schuster and G. Pizarro. Measured by R. M. West.

Object	Date	UT	R. A. (1950)	Decl.	Mag.	N Obs.
Comet Abell (1954 V)						
/1954 V	1956 03	20.45109	11 19 03.62	+35 48 17.0		662
/1954 V	1956 03	20.51559	11 18 59.90	+35 48 17.9		662
/1954 V	1956 04	30.20241	10 47 20.38	+34 28 42.9		662
/1954 V	1956 04	30.26474	10 47 18.32	+34 28 29.9		662
Periodic Comet Schwassmann-Wachmann 2						
/1955 I	1956 05	16.41460	15 38 38.64	-14 23 51.0		662
/1955 I	1956 05	16.45929	15 38 36.51	-14 23 43.8		662
/1955 I	1956 05	29.21972	15 28 49.31	-13 56 24.0		662
/1955 I	1956 05	29.26549	15 28 47.42	-13 56 19.1		662
Comet Baade (1955 VI)						
/1955 VI	1956 02	02.29495	04 46 43.63	+28 18 34.4		662
/1955 VI	1956 02	02.30189	04 46 43.43	+28 18 28.1		662
Periodic Comet Whipple						
/1955 VIII	1956 01	04.14883	00 27 15.61	-01 10 43.4		662
/1955 VIII	1956 01	04.15714	00 27 16.19	-01 10 40.1		662
Comet Haro-Chavira (1956 I)						
/1956 I	1956 02	04.12052	00 04 11.59	+78 52 07.2		662
/1956 I	1956 02	04.13992	00 04 11.55	+78 52 00.0		662
/1956 I	1956 03	18.14685	00 37 11.43	+77 54 36.7		662
/1956 I	1956 03	18.15517	00 37 12.10	+77 54 38.0		662
/1956 I	1956 05	19.21111	04 11 20.54	+86 02 24.1		662
Comet Mrkos (1956 III)						
/1956 III	1956 04	28.18047	04 22 38.85	+40 14 36.3		662
Periodic Comet Olbers						
/1956 IV	1956 02	04.17246	02 53 39.59	-02 34 01.5		662
/1956 IV	1956 02	04.19186	02 53 39.76	-02 33 36.2		662
/1956 IV	1956 03	12.15037	03 17 06.74	+11 09 01.0		662
/1956 IV	1956 03	12.16977	03 17 07.98	+11 09 27.7		662
/1956 IV	1956 04	20.17436	04 20 18.58	+26 19 43.6		662
/1956 IV	1956 04	20.18545	04 20 20.00	+26 19 59.0		662
/1956 IV	1956 05	19.18927	05 41 42.02	+37 19 02.8		662
/1956 IV	1956 05	19.19552	05 41 43.28	+37 19 10.9		662
Periodic Comet Crommelin						
/1956 VI	1956 10	03.36372	09 28 59.95	+32 45 07.7		754
/1956 VI	1956 10	03.39425	09 29 09.04	+32 42 03.0		754
/1956 VI	1956 10	05.42315	09 38 48.94	+29 14 58.7		754
/1956 VI	1956 10	05.43632	09 38 52.30	+29 13 43.2		754
/1956 VI	1956 10	08.39644	09 51 53.90	+24 14 07.5		754
/1956 VI	1956 10	08.42279	09 52 00.41	+24 11 28.7		754
/1956 VI	1956 10	13.42198	10 11 50.94	+16 03 44.1		754
/1956 VI	1956 10	13.44070	10 11 55.08	+16 01 57.4		754
/1956 VI	1956 10	17.41633	10 26 24.67	+09 59 37.4		754
/1956 VI	1956 10	17.44185	10 26 30.18	+09 57 21.7		754
Comet Wirtanen (1957 VI)						
/1957 VI	1956 03	20.36786	11 46 07.53	-30 34 58.1		662
/1957 VI	1956 03	20.37688	11 46 07.34	-30 34 56.1		662
/1957 VI	1956 04	02.28416	11 41 19.75	-29 41 09.1		662
/1957 VI	1956 04	02.30494	11 41 19.28	-29 41 03.2		662

/1957 VI	1956 04	20.26204	11 35	53.72	-28 02	25.2	662
/1957 VI	1956 04	20.27624	11 35	53.53	-28 02	20.4	662
/1957 VI	1956 04	30.30776	11 33	58.22	-27 00	19.7	662
/1957 VI	1956 04	30.31887	11 33	58.16	-27 00	14.9	662
/1957 VI	1956 05	28.20190	11 34	13.89	-24 09	53.1	662
/1957 VI	1956 05	28.25597	11 34	14.29	-24 09	34.1	662

Periodic Comet Wirtanen

/1967 XIV	1968 03	24.14900	06 01	53.82	+32 38	17.3	693
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Periodic Comet Johnson

/1970 IV	1969 05	17.36039	15 49	53.34	-01 13	24.6	693
/1970 IV	1969 05	17.40692	15 49	51.09	-01 13	20.2	693
/1970 IV	1969 05	25.34854	15 43	25.76	-01 05	16.9	693
/1970 IV	1969 05	25.39646	15 43	23.21	-01 05	15.5	1 693
/1970 IV	1970 07	05.41112	01 42	57.00	-02 26	56.7	693
/1970 IV	1970 07	05.44237	01 42	59.71	-02 26	52.9	693
/1970 IV	1970 10	03.40405	02 32	32.12	-08 01	38.2	691
/1970 IV	1970 10	03.42836	02 32	31.24	-08 01	47.3	691
/1977 I	1976 05	05.34609	17 33	52.32	-08 15	06.5	691
/1977 I	1976 05	05.38956	17 33	51.58	-08 15	01.8	691
/1977 I	1976 05	29.35348	17 21	55.19	-08 07	31.8	691

Periodic Comet Pons-Winnecke

/1970 VIII	1970 03	07.44756	13 49	06.10	+32 37	56.7	691
/1970 VIII	1970 03	13.34126	13 49	44.65	+34 22	20.0	691
/1970 VIII	1970 03	13.37396	13 49	44.56	+34 22	54.6	691
/1970 VIII	1970 05	08.36927	13 05	05.69	+40 30	01.2	691
/1970 VIII	1970 05	08.38177	13 05	05.01	+40 29	50.7	691
/1970 VIII	1970 06	07.22294	12 59	37.10	+28 14	43.0	693
/1970 VIII	1970 06	07.23509	12 59	37.45	+28 14	16.5	693
/1970 VIII	1970 07	06.25904	13 33	21.25	+06 35	50.2	693
/1970 VIII	1970 11	01.08613	20 32	38.60	-42 16	49.0	693
/1970 VIII	1970 11	01.11669	20 32	44.60	-42 16	27.2	693
/1976 XIV	1976 03	25.21281	09 24	56.22	+41 12	18.6	691
/1976 XIV	1976 03	25.25622	09 24	54.37	+41 12	16.1	691

Periodic Comet Kopff

/1970 XI	1970 02	07.47512	13 37	48	-04 22	.8	693
/1970 XI	1970 02	07.52164	13 37	50	-04 22	.9	693
/1970 XI	1970 03	08.38402	13 44	16.70	-03 29	32.3	693
/1970 XI	1970 03	08.42777	13 44	16.34	-03 29	21.9	693
/1970 XI	1970 04	07.33118	13 29	31.90	-00 33	21.5	693
/1970 XI	1970 04	07.35479	13 29	30.70	-00 33	12.2	693
/1970 XI	1970 05	08.24757	13 03	18.71	+02 17	25.4	691
/1970 XI	1970 05	08.25833	13 03	18.29	+02 17	27.1	691
/1970 XI	1970 07	05.21946	13 16	05.82	-01 54	53.2	693
/1970 XI	1970 07	05.22744	13 16	06.37	-01 54	58.5	693
/1970 XI	1970 07	27.15005	13 47	35.79	-06 14	28.0	691
/1970 XI	1970 07	27.15399	13 47	36.19	-06 14	31.2	691

Periodic Comet Kojima

/1970 XII	1971 04	01.33102	14 35	49.13	-22 18	23.6	691
/1970 XII	1971 04	01.33906	14 35	48.76	-22 18	22.7	691
/1970 XII	1971 04	21.39074	14 17	55.60	-20 59	53.5	691
/1970 XII	1971 04	21.41406	14 17	54.20	-20 59	46.0	691
/1970 XII	1971 04	30.33333	14 09	24.13	-20 08	51.1	693
/1970 XII	1971 04	30.35764	14 09	22.78	-20 08	42.7	693
/1970 XII	1971 05	27.28819	13 51	40.98	-17 39	59.4	693

/1970 XII	1971 05	27.31250	13 51	40.45	-17 39	52.5	693
/1970 XII	1971 06	19.18403	13 50	34.90	-16 35	02.6	693
/1970 XII	1971 06	19.23611	13 50	35.50	-16 34	58.8	693
/1970 XII	1971 06	27.17361	13 53	01.99	-16 29	05.4	691
/1970 XII	1971 06	27.19734	13 53	02.52	-16 29	05.5	691

Comet Abe (1970 XV)

/1970 XV	1970 10	05.16359	16 11	39.54	+24 32	01.9	691
/1970 XV	1970 10	05.17224	16 11	39.06	+24 31	33.0	691
/1970 XV	1971 02	28.46632	14 16	27.65	-22 19	19.0	693
/1970 XV	1971 02	28.47465	14 16	25.95	-22 19	23.8	693
/1970 XV	1971 03	28.35868	12 28	35.23	-23 11	10.5	693
/1970 XV	1971 03	28.37257	12 28	32.01	-23 11	05.1	693

Periodic Comet Ashbrook-Jackson

/1971 III	1970 07	06.29862	18 32	46.16	-42 23	16.6	693
/1971 III	1970 07	06.32571	18 32	44.47	-42 23	16.6	693
/1971 III	1971 06	20.44724	02 29	59.50	+18 37	08.6	693
/1971 III	1971 07	24.46389	03 24	38.28	+24 46	25.2	691
/1971 III	1971 07	24.47101	03 24	38.88	+24 46	29.1	691
/1971 III	1971 08	23.45417	04 04	04.40	+29 17	15.6	693
/1971 III	1971 08	23.47847	04 04	05.99	+29 17	27.9	693
/1971 III	1971 09	19.40764	04 26	23.27	+32 49	13.3	693
/1971 III	1971 09	19.43368	04 26	24.03	+32 49	24.8	693
/1971 III	1971 10	19.48264	04 28	11.62	+36 07	09.2	693
/1971 III	1971 10	19.50625	04 28	11.00	+36 07	16.9	693
/1971 III	1971 12	21.17390	03 35	20.06	+36 21	10.6	691
/1971 III	1971 12	21.19878	03 35	19.18	+36 21	04.5	691
/1971 III	1972 01	21.16458	03 31	16.05	+34 24	47.0	693
/1971 III	1972 01	21.20833	03 31	16.80	+34 24	39.0	693
/1971 III	1972 02	10.21048	03 41	38.81	+33 40	54.4	1 691
/1971 III	1972 02	17.11806	03 47	04.13	+33 32	23.8	693
/1971 III	1972 02	17.16458	03 47	06.41	+33 32	21.1	693

Periodic Comet Arend-Rigaux

/1971 IV	1970 07	27.37975	00 24	51.42	-14 21	20.5	691
/1971 IV	1970 07	27.42431	00 24	52.35	-14 21	39.8	691
/1971 IV	1970 09	26.32708	00 06	08.96	-26 05	22.7	691
/1971 IV	1970 09	26.35029	00 06	07.66	-26 05	37.3	691

Comet Toba (1971 V)

/1971 V	1971 04	29.45903	22 11	37.56	+03 19	32.9	693
/1971 V	1971 04	29.46562	22 11	37.79	+03 19	18.0	693
/1971 V	1971 05	26.45382	22 23	58.02	-26 00	09.6	693
/1971 V	1971 05	26.45868	22 23	58.09	-26 00	39.8	693

Periodic Comet Wolf-Harrington

/1971 VI	1970 11	25.14057	20 51	41.20	+00 39	12.5	691
/1971 VI	1970 11	25.18466	20 51	43.73	+00 39	12.3	691
/1971 VI	1971 09	18.47778	08 07	21.15	+15 45	28.0	693
/1971 VI	1971 09	18.49653	08 07	24.04	+15 45	08.3	693
/1971 VI	1971 10	22.45000	09 25	12.61	+04 37	56.7	693
/1971 VI	1971 10	22.45903	09 25	13.63	+04 37	44.7	693
/1971 VI	1971 12	21.40614	10 47	46.85	-15 22	55.8	691
/1971 VI	1971 12	21.42049	10 47	47.36	-15 23	10.6	691
/1971 VI	1972 01	20.37708	10 51	50.22	-22 19	06.4	693
/1971 VI	1972 01	20.40278	10 51	49.60	-22 19	21.4	693
/1971 VI	1972 02	18.34236	10 30	34.44	-24 06	48.5	693
/1971 VI	1972 02	18.36667	10 30	33.00	-24 06	45.2	693

/1971 VI	1972 03	10.22222	10 12	02.46	-21 55	51.1	691
/1971 VI	1972 03	10.24502	10 12	01.38	-21 55	38.2	691
/1971 VI	1972 04	18.13889	10 03	20.89	-15 14	29.0	691
/1971 VI	1972 04	18.16163	10 03	21.23	-15 14	16.8	691

Periodic Comet Vaisala 1

/1971 VII	1971 01	21.24647	06 04	11.73	+14 00	40.5	691
/1971 VII	1971 03	03.18166	05 54	42.00	+17 32	23.7	691
/1971 VII	1971 03	03.22633	05 54	42.82	+17 32	39.1	691
/1971 VII	1971 04	20.14635	06 40	42.68	+20 57	33.4	691
/1971 VII	1971 04	20.16991	06 40	44.77	+20 57	37.4	691

Periodic Comet Shajn-Schaldach

/1971 IX	1971 10	19.36250	02 05	46.85	+04 59	59.6	693
/1971 IX	1971 10	19.38542	02 05	46.04	+04 59	50.6	693
/1971 IX	1971 12	20.13171	01 54	05.72	+03 32	43.3	691
/1971 IX	1971 12	20.15457	01 54	06.35	+03 32	49.1	691
/1971 IX	1972 01	20.10764	02 19	36.83	+06 46	51.3	693
/1971 IX	1972 01	20.15347	02 19	39.77	+06 47	11.7	693

Periodic Comet Tsuchinshan 2

/1971 X	1971 09	19.48194	08 15	36.93	+20 57	38.8	693
/1971 X	1971 09	22.45700	08 23	04.22	+20 25	56.2	691
/1971 X	1971 09	22.48875	08 23	09.02	+20 25	35.3	691
/1971 X	1971 10	15.48250	09 19	10.97	+15 36	12.0	691
/1971 X	1971 10	15.50501	09 19	14.13	+15 35	52.9	691
/1971 X	1971 11	22.50972	10 42	36.46	+05 37	34.7	693
/1971 X	1971 11	22.53056	10 42	38.94	+05 37	14.0	693
/1971 X	1971 12	16.42569	11 26	13.75	-00 59	29.4	693
/1971 X	1971 12	16.45000	11 26	16.11	-00 59	53.5	693
/1971 X	1972 03	10.28414	12 06	57.84	-14 10	29.7	691
/1971 X	1972 03	10.30949	12 06	56.69	-14 10	27.5	691
/1971 X	1972 04	17.30249	11 44	16.10	-11 15	49.8	691
/1971 X	1972 04	17.32633	11 44	15.75	-11 15	42.3	691
/1971 X	1972 05	18.17853	11 50	08.73	-09 35	44.8	691

Periodic Comet Holmes

/1972 I	1971 06	20.38542	19 42	35.10	-43 29	29.3	693
/1972 I	1971 06	27.31892	19 36	22.53	-43 33	08.5	691
/1972 I	1971 06	27.37135	19 36	19.32	-43 33	07.5	691
/1972 I	1971 09	21.12292	18 54	54.96	-31 49	17.0	691
/1972 I	1971 09	21.16754	18 54	56.90	-31 48	47.1	691
/1972 I	1971 09	22.12222	18 55	41.50	-31 38	08.0	691
/1972 I	1971 10	15.10417	19 19	56.57	-27 25	32.3	691
/1972 I	1971 10	16.10256	19 21	14.11	-27 14	38.3	691
/1972 I	1972 09	13.37500	05 38	49.41	+43 17	36.5	691
/1972 I	1972 09	13.42153	05 38	52.81	+43 17	53.9	691
/1972 I	1972 10	03.39855	05 58	11.73	+45 13	33.4	691
/1972 I	1972 10	03.44606	05 58	13.63	+45 13	50.8	691
/1972 I	1972 12	13.39068	05 24	20.22	+48 41	01.5	691
/1972 I	1972 12	13.44867	05 24	15.70	+48 40	48.6	691
/1972 I	1973 01	30.19971	04 50	49.24	+43 02	59.0	691
/1972 I	1973 01	30.24994	04 50	49.24	+43 02	36.3	691

Periodic Comet Grigg_Skjellerup

/1972 II	1972 02	12.52460	16 42	59.49	-33 12	26.2	691
/1972 II	1972 02	12.53553	16 43	03.50	-33 12	11.8	691
/1972 II	1972 05	13.40833	21 42	59.48	+12 40	57.5	693
/1972 II	1972 05	13.44792	21 43	02.38	+12 41	46.1	693

/1972 II	1972 05	18.45058	21 48	45.85	+14 23	02.5	691
/1972 II	1972 07	13.36626	21 47	34.75	+24 41	06.8	691
/1972 II	1972 07	13.40972	21 47	31.88	+24 41	06.9	691
/1972 II	1972 08	14.26806	21 09	27.52	+20 35	39.3	691
/1972 II	1972 08	14.33160	21 09	23.14	+20 34	45.0	691

Periodic Comet Neujmin 3

/1972 IV	1972 04	17.47969	20 59	37.26	-14 12	17.6	691
/1972 IV	1972 07	14.34847	23 10	07.64	-04 29	23.0	691
/1972 IV	1972 07	14.38589	23 10	08.75	-04 29	21.2	691
/1972 IV	1972 08	14.38681	23 12	33.12	-05 45	11.3	691
/1972 IV	1972 08	14.41111	23 12	32.57	-05 45	19.0	691
/1972 IV	1972 09	12.22326	22 58	29.60	-08 33	52.2	691
/1972 IV	1972 09	12.24653	22 58	28.85	-08 34	00.0	691

Periodic Comet Tempel 1

/1972 V	1972 01	11.48368	12 29	39.10	+11 33	35.3	691
/1972 V	1972 01	11.52662	12 29	41.81	+11 33	33.8	691
/1972 V	1972 01	20.47500	12 38	33.70	+11 35	01.2	693
/1972 V	1972 02	10.37737	12 53	53.58	+12 31	1.1	691
/1972 V	1972 02	10.38628	12 53	53.58	+12 31	1.1	691
/1972 V	1972 03	11.33953	12 54	32.28	+15 44	56.4	691
/1972 V	1972 03	11.34375	12 54	32.15	+15 44	58.1	691
/1972 V	1972 04	17.35174	12 24	33	+17 38	5	691
/1972 V	1972 04	17.36146	12 24	32	+17 38	5	691
/1972 V	1972 05	14.24132	12 13	55	+13 04	0	693
/1972 V	1972 05	14.24826	12 13	55	+13 03	9	693
/1972 V	1972 05	16.22668	12 13	53.13	+12 32	14.8	691
/1972 V	1972 05	16.23067	12 13	53.17	+12 32	10.6	691

Periodic Comet Giacobini-Zinner

/1972 VI	1972 08	09.48160	04 58	18.63	+23 51	28.2	693
/1972 VI	1972 09	04.47431	06 35	29.13	+07 43	14.5	693
/1972 VI	1972 09	04.47986	06 35	30.13	+07 43	02.6	693
/1972 VI	1973 02	06.24236	07 13	20.23	-24 34	53.2	693

Periodic Comet Tempel 2

/1972 X	1972 02	10.53316	14 18	20.48	+01 22	15.0	691
/1972 X	1972 02	11.43738	14 18	51.05	+01 25	13.7	691
/1972 X	1972 02	12.46354	14 19	24.74	+01 28	46.1	691
/1972 X	1972 03	11.39821	14 26	22.64	+04 08	05.6	691
/1972 X	1972 03	11.42118	14 26	22.49	+04 08	16.8	691
/1972 X	1972 04	18.27124	14 04	53.92	+09 43	33.9	691
/1972 X	1972 05	16.25017	13 37	12	+11 50	5	691
/1972 X	1972 05	16.25851	13 37	11	+11 50	5	691
/1972 X	1972 07	14.17014	13 37	33	+04 17	9	691
/1972 X	1972 07	14.20650	13 37	36	+04 17	5	691
/1972 X	1972 10	03.10547	16 11	40.03	-17 26	10.0	691
/1972 X	1973 09	22.44086	06 14	28.36	+14 10	37.7	691
/1972 X	1973 09	22.48472	06 14	29.82	+14 10	33.7	691
/1972 X	1973 12	30.24254	05 31	25.57	+14 03	39.7	691
/1972 X	1973 12	30.28351	05 31	23.33	+14 03	45.2	691

Periodic Comet Kearns-Kwee

/1972 XI	1971 07	26.36487	23 00	03.36	-02 12	45.8	691
/1972 XI	1971 07	26.40868	23 00	02.49	-02 12	45.2	691
/1972 XI	1971 09	14.26898	22 30	21.66	-03 39	49.5	691
/1972 XI	1971 09	14.31754	22 30	19.57	-03 39	58.1	691
/1972 XI	1971 10	15.15851	22 13	52.69	-04 54	59.8	691

/1972 XI	1971 10	15.20272	22 13	51.88	-04 55	03.8	691
/1972 XI	1971 12	21.08611	22 33	30.10	-03 14	03.2	691
/1972 XI	1971 12	21.13050	22 33	32.28	-03 13	50.6	691
/1972 XI	1972 09	04.42222	05 24	52.18	+32 08	47.4	693
/1972 XI	1972 09	04.45139	05 24	55.44	+32 08	53.1	693
/1972 XI	1972 11	04.48958	06 51	38.97	+33 46	56.6	693
/1972 XI	1972 11	04.49931	06 51	39.40	+33 46	56.6	693
/1972 XI	1972 12	04.27569	06 56	56.94	+33 48	55.5	693
/1972 XI	1972 12	04.29792	06 56	56.42	+33 48	54.7	693
/1972 XI	1973 01	01.40694	06 38	12.33	+32 38	09.3	693
/1972 XI	1973 01	01.41875	06 38	11.73	+32 38	05.9	693
/1972 XI	1973 04	04.17913	07 07	54.77	+23 32	00.6	693
/1972 XI	1973 04	04.20413	07 07	56.77	+23 31	52.0	693

Comet Huchra (1973 III)

/1973 III	1973 07	01.18785	13 47	53.35	+05 41	30.7	691
/1973 III	1973 07	01.21238	13 47	53.60	+05 40	55.9	691

Periodic Comet Tuttle-Giacobini-Kresak

/1973 VI	1973 01	08.37043	07 20	22.15	+00 05	56.7	691
/1973 VI	1973 01	08.41609	07 20	18.75	+00 06	01.7	691
/1973 VI	1973 01	29.28750	06 53	28.68	+02 10	21.6	691
/1973 VI	1973 01	29.33206	06 53	24.97	+02 10	48.8	2 691
/1973 VI	1973 04	26.20237	07 56	25.10	+22 40	28.8	691
/1973 VI	1973 04	27.19115	07 59	21.20	+22 49	49.6	691
/1973 VI	1973 04	27.20017	07 59	22.81	+22 49	54.8	691
/1973 VI	1973 06	07.16829	10 35	29.42	+23 28	35.9	691
/1973 VI	1973 06	07.17917	10 35	32.27	+23 28	29.4	691
/1973 VI	1973 07	02.17801	12 25	44.00	+16 43	06.5	691
/1973 VI	1973 07	02.20295	12 25	50.34	+16 42	33.6	691
/1973 VI	1973 09	23.12280	17 04	04.66	-11 08	07	691
/1973 VI	1973 09	23.16088	17 04	04.76	-11 09	01	691

Comet Kohoutek (1973 VII)

/1973 VII	1973 04	26.13542	06 32	51.30	+54 18	17.7	691
/1973 VII	1973 04	26.14248	06 32	50.36	+54 18	18.4	691
/1973 VII	1973 09	21.18299	22 52	27.86	+52 33	57.8	691
/1973 VII	1973 09	21.19306	22 52	25.03	+52 33	18.2	691

Periodic Comet Wild 1

/1973 VIII	1973 01	08.30561	06 37	29.20	+53 40	30.2	691
/1973 VIII	1973 02	04.31667	06 11	15.72	+51 08	16.8	693
/1973 VIII	1973 02	04.36042	06 11	14.48	+51 07	53.6	693
/1973 VIII	1973 03	26.12153	06 40	50.72	+41 34	33.0	691
/1973 VIII	1973 03	26.14456	06 40	52.64	+41 34	15.7	691
/1973 VIII	1973 04	27.14236	07 36	38.11	+34 31	17.9	691
/1973 VIII	1973 04	27.16597	07 36	40.83	+34 30	57.8	691
/1973 VIII	1973 06	05.16667	08 57	13.52	+24 20	30.0	691
/1973 VIII	1973 06	05.18912	08 57	16.34	+24 20	06.7	691

Comet Kohoutek (1973 XII)

/1973 XII	1973 04	04.23260	08 08	08.26	+06 25	52.3	693
/1973 XII	1973 04	04.25066	08 08	07.89	+06 25	56.5	693
/1973 XII	1973 04	28.13542	08 05	22.71	+07 43	02.3	691
/1973 XII	1973 04	28.14381	08 05	22.74	+07 43	03.5	691
/1973 XII	1973 09	29.50347	10 26	26.44	-00 24	2.2	693
/1973 XII	1973 09	29.51424	10 26	26.45	-00 24	2.3	693
/1973 XII	1973 09	30.50938	10 28	08.00	-00 34	57.0	693
/1973 XII	1973 09	30.51354	10 28	08.45	-00 34	59.8	693

/1973 XII	1973	10	21.52008	11	08	35.83	-05	01	58.5	691
/1973 XII	1973	10	21.52263	11	08	36.17	-05	02	00.7	691
/1973 XII	1973	10	28.52257	11	25	02.72	-06	53	27.8	693
/1973 XII	1973	10	28.52604	11	25	03.20	-06	53	30.5	693
/1973 XII	1973	11	20.53825	12	40	28.01	-14	57	15.2	691
/1973 XII	1973	11	20.54068	12	40	28.62	-14	57	18.9	691
/1973 XII	1973	11	21.53877	12	44	56.78	-15	23	06.9	691
/1973 XII	1973	11	21.54248	12	44	57.80	-15	23	12.7	691
/1973 XII	1974	04	26.13618	04	49	17.82	+20	27	15.8	691
/1973 XII	1974	04	26.14942	04	49	19.06	+20	27	18.3	691

Periodic Comet Brooks 2

/1974 I	1973	07	01.39306	21	00	50.08	-09	22	57.8	691
/1974 I	1973	07	01.43600	21	00	49.52	-09	22	57.0	691
/1974 I	1973	09	03.19375	20	24	12.09	-13	33	45.0	693
/1974 I	1973	09	03.21736	20	24	11.58	-13	33	52.7	693
/1974 I	1973	09	22.15746	20	24	08.26	-15	02	00.5	691
/1974 I	1973	09	22.18154	20	24	08.64	-15	02	05.7	691
/1974 I	1973	10	27.10637	20	55	39.92	-15	34	38.5	693
/1974 I	1973	10	27.15046	20	55	43.56	-15	34	33.2	693
/1974 I	1973	11	25.07986	21	45	09.09	-13	26	15.5	693

Comet Bradfield (1974 III)

/1974 III	1974	06	17.23490	14	39	59.58	+70	08	46.8	691
/1974 III	1974	06	17.24462	14	40	00.02	+70	08	27.9	691
/1974 III	1974	09	11.13194	16	10	00.25	+34	54	59.1	691

Periodic Comet Reinmuth 2

/1974 VI	1973	05	25.23166	15	19	59.78	-27	23	03.4	691
/1974 VI	1973	05	25.27662	15	19	57.34	-27	22	53.0	691
/1974 VI	1974	09	11.46059	03	35	05.45	+28	49	11.2	691
/1974 VI	1974	09	11.48316	03	35	06.20	+28	49	17.6	691
/1974 VI	1974	10	21.36111	03	32	21.44	+30	09	49.9	691
/1974 VI	1974	10	21.37564	03	32	20.84	+30	09	48.7	691
/1974 VI	1974	11	16.23333	03	09	28.87	+28	28	59.0	693
/1974 VI	1974	11	16.25694	03	09	27.54	+28	28	51.2	693
/1974 VI	1974	12	17.20417	02	50	52.38	+25	19	27.9	693
/1974 VI	1974	12	17.24792	02	50	51.75	+25	19	13.8	693
/1974 VI	1975	01	07.08819	02	52	40.35	+23	55	57.8	691
/1974 VI	1975	01	07.16528	02	52	41.86	+23	55	45.4	691
/1974 VI	1975	02	05.16944	03	11	44.58	+23	26	59.0	691
/1974 VI	1975	02	05.21788	03	11	47.17	+23	27	00.1	691

Periodic Comet Forbes

/1974 IX	1974	01	19.51383	16	06	04.01	-21	49	02.8	691
/1974 IX	1974	01	19.54508	16	06	08.60	-21	49	18.7	691
/1974 IX	1974	02	25.49228	17	49	15.12	-25	39	12.0	691
/1974 IX	1974	02	25.51817	17	49	19.75	-25	39	17.2	691
/1974 IX	1974	03	22.48084	19	07	04.61	-25	55	52.7	691
/1974 IX	1974	03	22.49676	19	07	07.60	-25	55	50.8	691
/1974 IX	1974	04	20.45347	20	38	59.27	-23	25	27.0	693
/1974 IX	1974	04	20.47361	20	39	03.00	-23	25	17.5	693
/1974 IX	1974	09	11.31823	23	30	54.62	-09	28	48.6	691
/1974 IX	1974	09	11.32738	23	30	54.08	-09	28	49.2	691

Periodic Comet Finlay

/1974 X	1974	09	12.48304	07	14	56.77	+23	50	02.9	691
/1974 X	1974	11	10.49068	08	44	07.69	+22	07	21.7	691

/1974 X	1974	12	19.25712	08	33	14.58	+24	21	15.5	691
/1974 X	1975	01	07.29907	08	09	32.49	+25	59	24.4	691
Comet van den Bergh (1974 XII)										
/1974 XII	1975	10	07.30584	03	42	11.62	+10	27	42.5	691
/1974 XII	1975	10	07.35162	03	42	10.90	+10	27	24.4	691
/1974 XII	1975	12	30.24306	03	12	45.50	+02	41	24.2	691
/1974 XII	1975	12	30.26725	03	12	45.20	+02	41	21.8	691
Comet Schuster (1975 II)										
/1975 II	1976	04	25.14932	10	05	03.02	-39	57	45.8	693
Comet Bradfield (1975 V)										
/1975 V	1976	02	25.43785	12	09	25.22	+21	48	52.8	691
Periodic Comet Arend										
/1975 VI	1975	10	06.49560	08	59	50.65	+35	24	45.8	691
/1975 VI	1975	10	07.48877	09	01	44.90	+35	20	39.2	691
/1975 VI	1975	12	04.48466	10	12	27.16	+33	25	13.8	691
/1975 VI	1976	01	26.46197	09	47	30.51	+35	48	45.8	691
/1975 VI	1976	01	26.49193	09	47	28.31	+35	48	47.0	691
Periodic Comet Smirnova-Chernykh										
/1975 VII	1976	01	26.52865	14	01	02.87	-05	36	50.4	691
/1975 VII	1976	01	26.53935	14	01	03.15	-05	36	51.2	691
/1975 VII	1976	03	05.47986	14	08	17.83	-05	31	29.9	693
/1975 VII	1976	03	05.51736	14	08	17.43	-05	31	26.1	693
/1975 VII	1976	03	30.44097	13	59	12.55	-04	29	38.8	693
/1975 VII	1976	03	30.46667	13	59	11.76	-04	29	34.4	693
/1975 VII	1976	04	25.29723	13	43	22.67	-03	18	11.0	693
/1975 VII	1976	04	25.33057	13	43	21.38	-03	18	06.7	693
/1975 VII	1976	05	25.18958	13	28	45.22	-02	49	28.4	693
/1975 VII	1976	05	25.21215	13	28	44.80	-02	49	29.3	693
/1975 VII	1976	06	26.22656	13	27	27.95	-03	56	12.4	691
/1975 VII	1976	06	26.23559	13	27	28.05	-03	56	14.5	691
/1975 VII	1976	07	31.15417	13	43	24.30	-06	39	01.6	691
/1975 VII	1976	07	31.16296	13	43	24.65	-06	39	04.2	691
Comet Lovas (1975 VIII)										
/1975 VIII	1974	04	20.30764	12	25	10.21	-00	14	42.1	693
/1975 VIII	1974	04	20.31667	12	25	09.84	-00	14	42.4	693
/1975 VIII	1974	06	20.17014	12	03	05.93	-02	55	27.0	693
/1975 VIII	1974	06	20.19444	12	03	05.93	-02	55	33.5	693
/1975 VIII	1976	08	01.37532	00	57	01.60	-22	12	01.0	691
/1975 VIII	1976	08	01.39895	00	57	01.04	-22	12	01.8	691
/1975 VIII	1976	10	26.21250	23	56	25.40	-20	09	41.7	693
/1975 VIII	1976	10	26.26736	23	56	23.49	-20	09	24.4	693
/1975 VIII	1976	11	25.08958	23	46	08.24	-17	03	51.0	693
/1975 VIII	1976	11	25.13472	23	46	07.87	-17	03	32.5	693
/1975 VIII	1976	12	25.08333	23	47	54.49	-13	24	06.8	693
/1975 VIII	1976	12	25.12778	23	47	55.07	-13	23	47.3	693
Comet Mori-Sato-Fujikawa (1975 XII)										
/1975 XII	1975	11	03.51181	08	38	21.22	-19	51	01.4	693
/1975 XII	1975	11	03.51701	08	38	21.32	-19	51	21.1	693
Comet Bradfield (1976 IV)										
/1976 IV	1976	03	05.10451	03	05	37.10	-19	57	03.7	693
/1976 IV	1976	03	05.11007	03	05	39.01	-19	56	35.2	693

Periodic Comet Churyumov-Gerasimenko

/1976 VII	1975	10	06.15521	20	10	29.54	-29	16	15.4	691
/1976 VII	1975	10	06.17789	20	10	29.81	-29	16	09.6	691
/1976 VII	1975	11	01.08333	20	27	12.89	-26	56	17.7	691
/1976 VII	1975	11	01.11348	20	27	14.69	-26	56	06.4	691
/1976 VII	1975	12	07.08333	21	18	51.78	-21	44	38.5	693

Periodic Comet Harrington-Abell

/1976 VIII	1975	11	01.32882	02	29	59.23	+31	28	50.2	691
/1976 VIII	1975	11	01.37245	02	29	56.28	+31	28	50.8	691
/1976 VIII	1976	01	26.23806	02	24	25.96	+27	44	23.9	691
/1976 VIII	1976	01	26.28223	02	24	29.66	+27	44	26.0	691
/1976 VIII	1976	02	25.17697	03	19	12.28	+28	46	46.2	691

Periodic Comet Klemola

/1976 X	1976	11	27.07101	23	54	27.99	-06	21	40.1	691
/1976 X	1976	12	24.08194	00	31.34		-03	26.8		693
/1976 X	1976	12	24.12708	00	31.41		-03	26.5		693

Periodic Comet d'Arrest

/1976 XI	1976	06	26.31209	18	54	10.94	+21	50	08.0	691
/1976 XI	1976	06	26.32402	18	54	11.66	+21	50	11.7	691
/1976 XI	1976	07	31.33176	20	24	13.36	+08	19	03.2	691
/1976 XI	1976	07	31.33655	20	24	14.68	+08	18	42.1	691

Comet Harlan (1976 XIII)

/1976 XIII	1976	06	05.24493	13	02.52		+38	05.5		3 691
/1976 XIII	1976	06	05.25552	13	02.52		+38	05.3		3 691
/1976 XIII	1976	08	01.15417	13	29	44.42	+15	48	08.3	691
/1976 XIII	1976	08	01.16338	13	29	45.04	+15	47	53.0	691
/1976 XIII	1976	09	19.10764	14	46	16.68	-07	34	32.3	691

Periodic Comet Gehrels 3

/1977 VII	1976	11	24.35208	06	39	38.90	+22	28	51.0	693
/1977 VII	1976	11	24.38819	06	39	38.05	+22	28	51.3	693
/1977 VII	1976	12	24.41181	06	20	56.09	+22	33	09.7	693
/1977 VII	1976	12	24.44375	06	20	54.60	+22	33	10.0	693

Comet Bowell (1980b)

/1980b	1980	12	10.78902	12	19	49.78	-00	37	33.1	4 381
/1980b	1981	02	15.36773	12	35	46.42	-01	52	57.7	675
/1980b	1981	02	16.49064	12	35	37.48	-01	51	31.9	675
/1980b	1981	03	09.27222	12	30	29.19	-01	10	47.7	688

Periodic Comet Stephan-Oterma

/1980g	1980	11	16.97153	05	26	20.43	+12	37	23.6	552
/1980g	1980	12	01.93819	05	31	13.55	+20	00	47.5	552
/1980g	1980	12	06.87292	05	31	41.22	+22	44	04.8	552
/1980g	1980	12	09.97986	05	31	46.65	+24	28	10.8	8 T 026
/1980g	1980	12	11.97506	05	31	47.24	+25	34	56.4	491
/1980g	1980	12	12.97199	05	31	46.84	+26	08	10.2	491
/1980g	1980	12	28.87083	05	32	17.12	+34	14	11.4	10.5T 026
/1980g	1980	12	29.86042	05	32	26.12	+34	40	21.4	10.5T 026
/1980g	1980	12	29.87153	05	32	26.25	+34	40	39.6	552
/1980g	1981	01	02.86111	05	33	17.60	+36	19	59.4	552
/1980g	1981	01	07.88022	05	35	03.08	+38	10	19.4	491
/1980g	1981	01	08.07309	05	35	07.27	+38	14	12.3	491
/1980g	1981	01	08.80841	05	35	28.38	+38	28	53.1	491
/1980g	1981	01	09.01981	05	35	33.43	+38	33	04.5	491

/1980g	1981 01	22.77241	05 45	42.57	+42 03	52.7		024
/1980g	1981 01	23.83264	05 46	46.86	+42 15	34.4		017
/1980g	1981 01	23.85347	05 46	48.17	+42 15	48.1		017
/1980g	1981 01	26.78102	05 50	00.35	+42 44	57.1	9.6T	046
/1980g	1981 01	26.78964	05 50	00.84	+42 45	01.5		046
/1980g	1981 01	27.17449	05 50	27.5	+42 48	34		657
/1980g	1981 01	27.76015	05 51	08.65	+42 53	41.2		046
/1980g	1981 01	27.76877	05 51	09.41	+42 53	47.7		046
/1980g	1981 01	30.77683	05 54	51.80	+43 17	49.3		046
/1980g	1981 01	30.78597	05 54	52.59	+43 17	54.0		046
/1980g	1981 01	30.86597	05 54	58.42	+43 18	28.7	12 T	026
/1980g	1981 02	22.90208	06 32	03.83	+44 20	53.7		017
/1980g	1981 02	23.92083	06 33	58.18	+44 19	40.4		017

Periodic Comet Borrelly

/1980i	1980 07	09.32570	23 43	57.12	-43 31	47.2		809
/1980i	1981 01	30.41701	01 02	02.21	-05 08	48.2	10 T	375
/1980i	1981 01	30.43438	01 02	04.59	-05 08	11.6		375
/1980i	1981 03	08.15208	02 36	48.1	+17 58	39		657
/1980i	1981 03	09.14653	02 39	40.70	+18 32	24.9		657

Periodic Comet Kohoutek

/1980j	1980 08	06.27292	23 29	04.10	+04 32	37.0		809
/1980j	1980 08	07.31528	23 28	44.67	+04 33	55.0		809
/1980j	1980 08	10.25584	23 27	41.69	+04 36	44.8		809

Comet Meier (1980q)

/1980q	1981 01	11.84896	17 51	55.47	+22 03	35.7	10 T	372
/1980q	1981 02	04.81111	17 43	46.63	+21 04	45.6	10 T	372

Periodic Comet Lovas

/1980s	1981 01	01.29722	09 03	17.91	+33 44	55.4	5	688
/1980s	1981 01	01.33125	09 03	15.92	+33 44	56.9		688
/1980s	1981 02	06.28779	08 23	37.74	+31 53	31.3		801
/1980s	1981 02	10.55972	08 19	55.76	+31 26	06.8	18 T	372
/1980s	1981 02	10.57986	08 19	54.91	+31 26	00.1		372
/1980s	1981 02	28.09421	08 10	54.33	+29 17	37.4		801

Comet Bradfield (1980t)

/1980t	1981 01	11.71285	20 39	47.91	+00 21	01.9		552
/1980t	1981 01	11.72604	20 39	52.66	+00 21	39.3		552
/1980t	1981 01	11.73403	20 39	54.36	+00 21	49.0		552
/1980t	1981 01	11.74375	20 39	58.05	+00 22	16.2		552
/1980t	1981 01	23.73646	21 22	55.70	+04 57	29.4		017
/1980t	1981 01	23.73924	21 22	56.08	+04 57	32.1		017
/1980t	1981 01	23.74340	21 22	56.66	+04 57	34.1		017
/1980t	1981 01	23.75417	21 22	58.04	+04 57	44.1		026

Comet Panther (1980u)

/1980u	1980 12	28.72986	18 48	24.52	+39 36	55.2	9.5T	026
/1980u	1980 12	31.74792	18 49	57.37	+40 24	53.0	6	026
/1980u	1981 01	23.77500	19 04	20.58	+49 25	27.3		026
/1980u	1981 01	24.72339	19 05	01.37	+49 55	31.1	9.0T	046
/1980u	1981 01	24.72646	19 05	01.42	+49 55	36.5		046
/1980u	1981 01	26.74091	19 06	29.33	+51 01	41.4		046
/1980u	1981 01	26.74415	19 06	29.42	+51 01	46.9		046
/1980u	1981 01	28.77222	19 07	59.99	+52 11	39.3	10 T	026
/1980u	1981 01	30.79792	19 09	33.03	+53 24	55.3		372
/1980u	1981 01	30.80417	19 09	33.50	+53 25	09.3		372

/1980u	1981 02 01.20853	19 10 38.54	+54 18 02.0	8.7T	012
/1980u	1981 02 01.21234	19 10 38.68	+54 18 11.2		012
/1980u	1981 02 01.21545	19 10 38.80	+54 18 17.9		012
/1980u	1981 02 01.21857	19 10 38.96	+54 18 24.4		012
/1980u	1981 02 02.17464	19 11 23.66	+54 55 31.0		012
/1980u	1981 02 02.18018	19 11 23.84	+54 55 42.9		012
/1980u	1981 02 02.18572	19 11 24.13	+54 55 54.4		012
/1980u	1981 02 02.19126	19 11 24.37	+54 56 06.7		012
/1980u	1981 02 02.19680	19 11 24.61	+54 56 18.1		012
/1980u	1981 02 02.20234	19 11 24.94	+54 56 31.4		012
/1980u	1981 02 02.20788	19 11 25.12	+54 56 43.3		012
/1980u	1981 02 02.21342	19 11 25.41	+54 56 57.0		012
/1980u	1981 02 02.21896	19 11 25.59	+54 57 08.8		012
/1980u	1981 02 02.22450	19 11 25.84	+54 57 20.6		012
/1980u	1981 02 02.23004	19 11 26.10	+54 57 32.5		012
/1980u	1981 02 02.23559	19 11 26.29	+54 57 45.2		012
/1980u	1981 02 22.88056	19 30 20.44	+71 46 08.7		017
/1980u	1981 02 23.80139	19 31 24.57	+72 40 22.9		017
/1980u	1981 02 24.83403	19 32 39.79	+73 42 09.5		017
/1980u	1981 02 25.95005	19 34 08.20	+74 49 49.5	8.9T	057
/1980u	1981 02 26.82361	19 35 18.06	+75 43 25.6		017
/1980u	1981 02 27.86250	19 36 49.34	+76 47 55.8		017
/1980u	1981 02 28.96463	19 38 37.20	+77 57 32.9		057
/1980u	1981 03 01.27674	19 39 07.2	+78 17 13.5		657
/1980u	1981 03 01.81597	19 40 03.88	+78 51 38.1		017
/1980u	1981 03 05.31389	19 48 25.0	+82 39 10.9		657
/1980u	1981 03 08.16684	20 02 47.7	+85 49 10.8		657
/1980u	1981 03 09.15735	20 13 42.5	+86 55 37.5		657
/1980u	1981 03 15.10000	07 10 27.9	+86 12 09.4	8 T	017
/1980u	1981 03 17.18993	07 24 11.4	+83 48 51.9		657

Periodic Comet Bus

/1981b	1981 02 09.64757	11 59 16.76	-01 11 45.8	19.8T	413
/1981b	1981 02 13.64028	11 58 57.89	-01 05 50.9	20.0T	413
/1981b	1981 03 02.60104	11 53 27.48	-00 09 12.9	17.5T	413
/1981b	1981 03 03.58906	11 52 57.36	-00 04 30.5		413
/1981b	1981 03 04.17280	11 52 39.27	-00 01 47.6		7 801
/1981b	1981 03 04.22568	11 52 37.30	-00 01 32.0		7 801
/1981b	1981 03 05.70174	11 51 49.43	+00 05 54.0	18 T	372
/1981b	1981 03 05.71979	11 51 48.70	+00 05 59.7		372
/1981b	1981 03 07.62836	11 50 44.45	+00 15 57.6	16.5T	413
/1981b	1981 03 09.60486	11 49 35.12	+00 26 27.7	18 T 8	372
/1981b	1981 03 11.67118	11 48 19.47	+00 37 56.4	18 T 8	372
/1981b	1981 03 16.71113	11 45 08.14	+01 07 08.5	16 T	413

Note 1: difficult to measure. 2: ends of star trails weak. 3: correction to IAUC 3011. 4: correction to MPC 5664. 5: measurement uncertain. 6: time of observation may be Jan. 31.74757. 7: near edge of plate. 8: tail 15" long in p.a. 310 .

* * * * *

OBSERVATIONS MADE AT THE ZIMMERWALD STATION OF THE BERNE ASTRONOMICAL INSTITUTE BY P. WILD.

Object	Date	UT	R. A. (1950)	Decl.	Mag.	N Obs.
636	1981 01	30.89931	07 22 51.88	+33 03 30.1	15	026
671	1981 01	30.89931	07 17 52.16	+33 05 30.4	15.5	026
751	1980 12	09.97986	05 30 28.40	+24 27 33.9		026
1798	1981 01	30.89931	07 16 31.55	+33 09 38.9	16.5	026

1803	1980	12	29.89931	06	43	10.98	+52	14	38.5	17.2	1	026
1803	1980	12	30.94132	06	41	21.76	+52	12	54.2		1	026
1866	1981	01	23.81146	10	19	53.33	+78	41	33.2			026
1866	1981	01	24.86250	10	14	04.14	+78	53	17.4	17		026
1893	1980	12	09.90451	02	30	28.93	+11	31	40.3	16.8	1	026
1893	1980	12	24.75417	02	25	57.94	+12	10	17.0		2	026
1906	1981	01	30.89931	07	23	20.84	+31	03	01.1	17.2		026
2001	1981	02	02.03021	10	29	42.90	+41	54	33.6		3	026
2001	1981	02	02.14375	10	29	30.29	+41	54	34.5	15.5		026
2043	1980	12	09.92326	03	25	36.51	+23	23	24.5	16.2		026
2043	1980	12	24.73889	03	18	04.91	+22	37	47.0			026
2320	1981	01	30.91597	08	02	28.60	+21	20	25.5			026
2320	1981	02	02.07101	08	00	47.01	+21	31	05.8	16		026
2353	1980	12	09.92326	03	22	46.59	+23	03	39.5			026
2353	1980	12	24.73889	03	14	20.24	+22	34	06.5	17.5		026

Note 1: weak images. 2: image apparently involved with defect. 3: time of observation may be Feb. 2.03056.

OBSERVATIONS MADE AT KLET BY A. MRKOS, Z. VAVROVA, L. BROZEK, M. CERNY
AND M. MAHROVA.

Object	Date	UT	R. A. (1950)			Decl.	Mag.	Obs.	
66	1981	02	02.85957	09	01	56.41	+21 13	07.3	046
66	1981	02	02.87375	09	01	55.52	+21 13	10.0	046
200	1981	02	02.89562	09	11	38.17	+18 15	06.1	046
200	1981	02	02.91003	09	11	37.32	+18 15	08.1	046
263	1981	01	30.84292	07	48	40.19	+19 07	55.7	046
263	1981	01	30.85715	07	48	39.48	+19 07	58.2	046
263	1981	01	31.94109	07	47	45.22	+19 10	31.5	046
263	1981	01	31.95532	07	47	44.50	+19 10	32.8	046
263	1981	02	01.91042	07	46	57.60	+19 12	46.6	046
263	1981	02	01.92465	07	46	56.86	+19 12	48.4	046
306	1981	01	27.86420	07	08	34.75	+17 16	36.9	046
306	1981	01	27.87850	07	08	33.99	+17 16	40.4	046
711	1981	02	12.06198	09	16	33.84	+22 15	37.3	046
711	1981	02	12.07616	09	16	32.80	+22 15	39.1	046
1352	1981	01	27.86420	07	09	07.16	+17 00	16.2	046
1352	1981	01	27.87850	07	09	06.41	+17 00	18.1	046
1352	1981	01	29.81495	07	07	38.92	+17 05	25.7	046
1352	1981	01	29.82931	07	07	38.29	+17 05	28.1	046
1352	1981	01	30.80524	07	06	55.79	+17 08	02.0	046
1352	1981	01	30.81942	07	06	55.23	+17 08	03.8	046
1352	1981	01	31.85583	07	06	11.36	+17 10	47.8	046
1352	1981	01	31.87009	07	06	10.73	+17 10	50.4	046
2297	1981	01	30.00917	07	48	44.69	+20 16	56.6	046
2297	1981	01	30.02410	07	48	43.93	+20 16	59.0	046
2297	1981	02	01.91043	07	46	26.23	+20 24	07.3	046
2297	1981	02	01.92410	07	46	25.41	+20 24	10.9	046
2320	1981	01	26.85422	08	05	45.52	+20 59	38.4	046
2320	1981	01	27.82832	08	04	57.74	+21 04	42.0	046
2320	1981	01	27.84267	08	04	57.06	+21 04	46.2	046
2320	1981	01	29.85541	08	03	19.32	+21 15	04.6	046
2320	1981	01	29.86958	08	03	18.63	+21 15	08.9	046
2320	1981	01	30.87764	08	02	30.46	+21 20	13.7	046
2320	1981	01	30.89153	08	02	29.63	+21 20	18.9	046
2320	1981	01	31.99149	08	01	37.59	+21 25	45.6	046
2320	1981	02	01.0090	08	01	36.85	+21 25	49.5	046
2325	1981	01	29.77971	07	24	08.24	+20 52	36.5	046
2325	1981	01	29.79395	07	24	07.38	+20 52	39.6	046
1975 VD3	1981	02	02.85957	09	01	21.86	+22 39	33.5	046

1975	VD3	1981	02	02.87375	09	01	21.12	+22	39	36.3	046
1975	VD3	1981	02	09.92157	08	54	22.63	+23	03	38.1	046
1975	VD3	1981	02	09.94275	08	54	21.59	+23	03	43.9	046
1976	GQ1	1981	02	02.89562	09	17	38.97	+18	26	01.4	046
1976	GQ1	1981	02	02.91003	09	17	38.30	+18	26	05.3	046
1978	RP	1981	02	02.89562	09	11	40.13	+17	23	56.4	16.8 046
1978	RP	1981	02	02.91003	09	11	39.30	+17	23	59.3	046
1978	RP	1981	02	09.95728	09	05	47.78	+17	54	51.5	046
1978	RP	1981	02	09.97163	09	05	47.07	+17	54	55.0	046
1978	RP	1981	02	11.98285	09	04	07.71	+18	03	20.8	046
1978	RP	1981	02	11.99734	09	04	07.00	+18	03	26.6	046
1979	UD	1981	01	29.92682	08	09	18.27	+30	13	32.0	046
1979	UD	1981	01	29.94123	08	09	17.54	+30	13	34.6	046
1979	UD	1981	01	30.91462	08	08	28.17	+30	16	48.7	046
1979	UD	1981	01	30.93019	08	08	27.35	+30	16	52.4	046
1979	UD	1981	01	31.90185	08	07	38.50	+30	20	00.3	046
1979	UD	1981	01	31.91609	08	07	37.58	+30	20	02.8	046
1980	XA	1980	12	01.88638	03	52	41.49	+30	11	22.7	046
1980	XA	1980	12	01.90067	03	52	40.66	+30	11	18.9	046
1980	XA	1980	12	08.77745	03	46	50.89	+29	35	01.6	046
1980	XA	1980	12	08.79163	03	46	50.24	+29	34	56.5	046
1980	XE	1981	01	29.89024	07	52	10.26	+19	04	00.9	16.6 046
1980	XE	1981	01	29.90442	07	52	08.89	+19	03	53.7	046
1980	XE	1981	01	30.00917	07	51	58.99	+19	02	50.9	046
1980	XE	1981	01	30.02410	07	51	57.40	+19	02	40.1	046
1980	XE	1981	01	30.84292	07	50	43.19	+18	54	28.0	046
1980	XE	1981	01	30.85715	07	50	41.86	+18	54	19.0	046
1980	XE	1981	01	31.94109	07	49	04.08	+18	43	26.7	046
1980	XE	1981	01	31.95532	07	49	02.92	+18	43	19.0	046
1980	XE	1981	02	01.91042	07	47	38.83	+18	33	42.3	046
1980	XE	1981	02	01.92465	07	47	37.76	+18	33	35.5	046
1980	XE	1981	02	09.88350	07	37	11.61	+17	14	37.4	046
1980	XE	1981	02	09.89773	07	37	10.62	+17	14	30.1	046
1980	XE	1981	02	11.93600	07	34	55.17	+16	54	47.8	046
1980	XE	1981	02	11.94323	07	34	54.53	+16	54	40.9	046
1980	YC	1981	01	29.92682	08	05	44.07	+31	45	21.3	17.6 046
1980	YC	1981	01	29.94123	08	05	43.31	+31	45	22.6	046
1980	YC	1981	01	30.91462	08	04	41.57	+31	48	18.1	046
1980	YC	1981	01	30.93019	08	04	40.56	+31	48	22.9	046
1980	YC	1981	01	31.90185	08	03	40.29	+31	51	07.6	046
1980	YC	1981	01	31.91609	08	03	39.06	+31	51	07.4	046
1980	YQ	1981	01	27.90101	07	58	52.21	+17	24	34.5	046
1980	YQ	1981	01	27.91519	07	58	51.42	+17	24	34.4	046
1980	YQ	1981	01	29.89024	07	56	53.59	+17	25	02.9	046
1980	YQ	1981	01	29.90442	07	56	52.71	+17	25	03.7	046
1980	YQ	1981	01	30.84292	07	55	57.92	+17	25	15.6	046
1980	YQ	1981	01	30.85715	07	55	57.08	+17	25	16.7	046
1981	AQ	1981	02	02.89562	09	20	23.14	+20	35	44.3	16.8 046
1981	AQ	1981	02	02.91003	09	20	22.26	+20	35	54.3	046
1981	AQ	1981	02	09.99356	09	13	51.69	+21	57	08.2	046
1981	AQ	1981	02	10.00780	09	13	50.87	+21	57	16.3	046
1981	AQ	1981	02	12.06198	09	11	59.40	+22	19	28.8	046
1981	AQ	1981	02	12.07616	09	11	58.58	+22	19	38.2	046
1981	AT	1981	01	26.81163	07	25	04.29	+22	59	09.1	16.6 046
1981	AT	1981	01	26.82616	07	25	03.33	+22	59	08.0	046
1981	AT	1981	01	27.78978	07	24	07.49	+22	57	19.2	046
1981	AT	1981	01	27.80419	07	24	06.67	+22	57	17.6	046
1981	AT	1981	01	29.77971	07	22	16.81	+22	53	21.8	046
1981	AT	1981	01	29.79395	07	22	16.00	+22	53	20.3	046

1981 AT	1981 01	31.81193	07 20	30.60	+22 49	06.7		046
1981 AT	1981 01	31.82617	07 20	29.89	+22 49	04.1		046
1981 AT	1981 02	09.80410	07 14	21.06	+22 27	41.9		046
1981 AT	1981 02	09.82076	07 14	20.58	+22 27	39.1		046
1981 AK1	1981 01	27.86420	07 10	04.15	+18 59	58.3	16.8	046
1981 AK1	1981 01	27.87850	07 10	03.42	+19 00	00.9		046
1981 AK1	1981 01	29.81495	07 08	24.90	+19 05	04.6		046
1981 AK1	1981 01	29.82931	07 08	24.12	+19 05	05.6		046
1981 AK1	1981 01	30.80524	07 07	37.14	+19 07	35.2		046
1981 AK1	1981 01	30.81942	07 07	36.43	+19 07	36.8		046
1981 AK1	1981 02	09.84611	07 01	26.86	+19 31	40.0		046
1981 AK1	1981 02	09.86041	07 01	26.29	+19 31	41.9		046
1981 BD *	1981 01	27.82832	08 04	37.28	+20 09	40.8	17.5	046
1981 BD	1981 01	27.84267	08 04	36.36	+20 09	39.8		046
1981 BD	1981 01	29.85541	08 02	14.94	+20 06	43.5		046
1981 BD	1981 01	29.86958	08 02	13.73	+20 06	42.5		046
1981 BD	1981 01	31.99149	07 59	47.49	+20 03	23.6		046
1981 BD	1981 02	01.00590	07 59	46.84	+20 03	22.0		046
1981 BE *	1981 01	27.86420	07 11	20.10	+18 28	22.1		046
1981 BE	1981 01	27.87850	07 11	19.53	+18 28	23.6		046
1981 BF *	1981 01	29.92682	08 07	02.02	+32 09	19.5	17.0	046
1981 BF	1981 01	29.94123	08 07	01.23	+32 09	22.5		046
1981 BF	1981 01	30.91462	08 06	07.72	+32 12	57.8		046
1981 BF	1981 01	30.93019	08 06	06.81	+32 12	59.9		046
1981 BF	1981 01	31.90185	08 05	13.97	+32 16	26.3		046
1981 BF	1981 01	31.91609	08 05	13.28	+32 16	31.3		046
1981 CD *	1981 02	02.85957	08 56	30.34	+21 29	39.4	17.0	046
1981 CD	1981 02	02.87375	08 56	29.47	+21 29	43.3		046
1981 CD	1981 02	09.92157	08 48	54.61	+22 08	53.3		046
1981 CD	1981 02	09.94275	08 48	53.48	+22 08	57.3		046
1981 CE *	1981 02	02.85957	09 01	09.12	+21 39	50.5	17.4	046
1981 CE	1981 02	02.87375	09 01	08.17	+21 39	55.2		046
1981 CF *	1981 02	02.85957	09 02	19.98	+24 59	54.7	17.2	046
1981 CF	1981 02	02.87375	09 02	19.32	+24 59	58.7		046
1981 CG *	1981 02	02.85957	09 02	32.88	+23 27	52.2	17.0	046
1981 CG	1981 02	02.87375	09 02	32.10	+23 27	51.5		046
1981 CG	1981 02	09.92157	08 54	53.09	+23 33	16.9		046
1981 CG	1981 02	09.94275	08 54	52.65	+23 33	17.9		046
1981 CH *	1981 02	02.89562	09 14	55.82	+17 06	55.4	16.4	046
1981 CH	1981 02	02.91083	09 14	54.12	+17 06	42.2		046
1981 CH	1981 02	09.95728	09 02	59.73	+15 23	17.1		046
1981 CH	1981 02	09.97163	09 02	58.36	+15 23	05.3		046
1981 CH	1981 02	11.98285	08 59	41.23	+14 53	11.3		046
1981 CH	1981 02	11.99734	08 59	39.70	+14 52	58.3		046
1981 CJ *	1981 02	02.89562	09 20	57.08	+19 15	12.3	17.2	046
1981 CJ	1981 02	02.91003	09 20	56.16	+19 15	18.0		046
1981 CJ	1981 02	09.99356	09 13	39.61	+19 58	08.9		046
1981 CJ	1981 02	10.00780	09 13	38.70	+19 58	15.0		046
1981 CK *	1981 02	09.95728	09 02	40.06	+17 06	57.9	17.0	046
1981 CK	1981 02	09.97163	09 02	39.18	+17 07	00.0		046
1981 CK	1981 02	11.98285	09 00	58.22	+17 13	48.8		046
1981 CK	1981 02	11.99734	09 00	57.46	+17 13	49.2		046
1981 CL *	1981 02	09.95728	09 03	48.89	+17 36	12.6	17.0	046
1981 CL	1981 02	09.97163	09 03	48.52	+17 36	16.7		046
1981 CM *	1981 02	09.95728	09 05	35.92	+17 00	25.6	17.4	046
1981 CM	1981 02	09.97163	09 05	35.34	+17 00	35.8		046
1981 CM	1981 02	11.98285	09 04	00.02	+17 12	51.4		046
1981 CM	1981 02	11.99734	09 03	59.26	+17 12	58.2		046

1981 CU	1981 02 12.06198	09 16 05.86	+22 16 59.7	17.2	046
1981 CU	1981 02 12.07616	09 16 05.00	+22 16 55.5		046

OBSERVATIONS MADE AT TURKU. MEASURED BY J. LEHTINEN. COMMUNICATED BY L. OTERMA.

Object	Date	UT	R. A. (1950)	Decl.	Obs.
1942 XW	1942 12 03.87331	03 10 57.15	+12 20 50.5		062
1942 XW	1942 12 07.88472	03 07 51.49	+12 31 58.2		062

OBSERVATIONS MADE AT TRAUNSTEIN BY R. BENDEL. REDUCTION BY R. HEMPEL. COMMUNICATED BY F. FREVERT.

Object	Date	UT	R. A. (1950)	Decl.	O - C	Obs.
686	1980 09 03.87187	23 58 36.21	+29 54 30.2	0.1+ 2+	065	
686	1980 09 03.88681	23 58 35.78	+29 54 29.6	0.1+ 2+	065	
686	1980 09 03.89514	23 58 35.48	+29 54 28.6	0.1+ 2+	065	
686	1980 09 03.91042	23 58 35.04	+29 54 27.6	0.1+ 2+	065	
686	1980 09 07.89028	23 56 25.10	+29 45 39.2	0.0 0	065	
686	1980 09 07.90139	23 56 24.73	+29 45 37.3	0.0 0	065	
686	1980 09 07.91736	23 56 24.15	+29 45 34.6	0.0 0	065	
686	1980 09 19.84583	23 48 40.97	+28 32 03.0	0.0 1+	065	
686	1980 09 19.85764	23 48 40.38	+28 31 56.8	0.0 1+	065	
686	1980 09 19.87014	23 48 39.89	+28 31 50.2	0.0 1+	065	
686	1980 09 19.87431	23 48 39.71	+28 31 47.9	0.0 1+	065	
1685	1980 07 24.93056	22 34 01.54	+27 20 14.0	0.2+ 1+	065	
1685	1980 07 24.93750	22 34 03.05	+27 21 08.0	0.2+ 1+	065	
1685	1980 07 24.95139	22 34 06.14	+27 22 58.2	0.2+ 1+	065	
1685	1980 07 24.95833	22 34 07.51	+27 23 51.9	0.2+ 1+	065	

OBSERVATIONS MADE AT ABASTUMANI BY A. SH. KHATISASHVILI. COMMUNICATED BY G. R. KASTEL'.

Object	Date	UT	R. A. (1950)	Decl.	Obs.
2201	1979 12 21.62553	01 49 04.50	+11 23 36.4		119
2201	1979 12 21.63386	01 49 01.40	+11 23 25.0		119
2201	1979 12 21.64359	01 48 57.74	+11 23 11.1		119
2201	1979 12 21.65331	01 48 54.11	+11 22 57.2		119
2201	1979 12 22.71782	01 42 22.69	+10 56 42.2		119
2201	1979 12 22.72407	01 42 18.98	+10 56 27.8		119

OBSERVATIONS MADE AT GEISEI BY T. SEKI. IN PART FROM NIHONDAIRA OBS. CIRC. NOS. 1176-1177 AND JAPAN ASTRON. CIRC. NO. 288.

Object	Date	UT	R. A. (1950)	Decl.	Mag.	Obs.
1669	1980 12 30.57778	06 00 38.39	+24 45 05.4			372
1669	1980 12 30.58889	06 00 37.76	+24 45 07.3			372
1955 WB	1981 02 09.70521	11 18 21.60	-07 55 41.4		17	372
1955 WB	1981 02 09.72674	11 18 20.99	-07 55 38.9			372
1968 SB	1981 01 26.51424	05 42 38.30	+24 56 58.9		17.5	372
1968 SB	1981 01 26.54976	05 42 37.57	+24 57 00.3			372
1973 SZ2	1981 01 30.62465	10 53 22.99	+08 06 36.3		16.5	372
1973 SZ2	1981 01 30.64063	10 53 22.45	+08 06 41.7			372
1978 NC3	1981 01 28.54340	09 11 37.19	+02 55 58.7		18	372
1978 NC3	1981 01 28.55694	09 11 36.60	+02 56 02.4			372
1981 CA	1981 03 05.57812	11 35 01.79	+21 04 49.7		16.5	372
1981 CA	1981 03 05.59444	11 35 01.00	+21 04 58.2			372
1981 CA	1981 03 09.55243	11 32 03.18	+21 27 11.6		16	372
1981 CA	1981 03 09.56389	11 32 02.70	+21 27 16.7			372
1981 CB	1981 03 05.63819	11 02 34.41	+08 16 23.8		15.5	372
1981 CB	1981 03 05.65278	11 02 33.76	+08 16 34.7			372
1981 CB	1981 03 09.57569	10 59 38.57	+08 55 34.3		15.5	372
1981 CB	1981 03 09.58646	10 59 38.16	+08 55 41.8			372

OBSERVATIONS MADE AT HAUTE PROVENCE BY F. DOSSIN AND G. SAUSE. MEASURED BY H. DEBEHOGNE. REDUCTION BY DEBEHOGNE AND L. HOUZIAUX.										
Object	Date	UT	R. A. (1950)		Decl.	O - C		Mag.	Obs.	
78	1980	11	10.94375	01 40	12.65	+24 11	35.5	0.3- 1+	12.1	511
78	1980	11	10.95903	01 40	11.81	+24 11	31.4	0.3- 1+		511
78	1980	11	10.97431	01 40	10.91	+24 11	26.4	0.3- 1+		511
83	1980	11	10.77222	23 56	15.71	-02 01	43.1	0.2- 3-	14.9	511
83	1980	11	10.78750	23 56	15.49	-02 01	41.6	0.2- 3-		511
83	1980	11	10.80278	23 56	15.28	-02 01	41.4	0.2- 3-		511
456	1980	10	13.86875	23 41	20.60	+13 19	13.1	0.2- 0	14.9	511
456	1980	10	13.88472	23 41	20.04	+13 19	03.9	0.2- 0		511
456	1980	10	13.90069	23 41	19.46	+13 18	54.7	0.2- 0		511
477	1980	10	14.02118	00 53	16.81	+07 08	12.2	0.3- 2-	13.1	511
477	1980	10	14.03542	00 53	15.89	+07 08	09.9	0.3- 2-		511
477	1980	10	14.04965	00 53	14.94	+07 08	07.1	0.3- 2-		511
693	1980	11	10.94375	01 41	31.36	+26 59	37.5	0.2- 0	14.4	511
693	1980	11	10.95903	01 41	30.62	+26 59	33.0	0.2- 0		511
693	1980	11	10.97431	01 41	29.85	+26 59	29.9	0.2- 0		511
869	1980	11	10.88611	01 29	09.84	-00 34	16.2	0.2- 2-	17.9	511
869	1980	11	10.90139	01 29	09.30	-00 34	18.3	0.2- 2-		511
869	1980	11	10.91667	01 29	08.75	-00 34	20.4	0.2- 2-		511
1209	1980	11	10.88611	01 40	32.15	+01 37	59.5	0.2- 2-	16.8	511
1209	1980	11	10.90139	01 40	31.56	+01 37	58.1	0.2- 2-		511
1209	1980	11	10.91667	01 40	31.02	+01 37	55.5	0.2- 2-		511
1311	1980	10	14.02118	00 50	38.11	+09 13	12.8	0.1- 0	16.5	511
1311	1980	10	14.03542	00 50	37.29	+09 13	06.6	0.1- 0		511
1311	1980	10	14.04965	00 50	36.43	+09 12	59.7	0.1- 0		511
1322	1980	11	07.97639	02 31	40.53	+33 28	06.7	0.0 0	17.3	511
1322	1980	11	07.99167	02 31	39.60	+33 27	54.9	0.0 0		511
1322	1980	11	08.01424	02 31	38.15	+33 27	37.4	0.0 0		511
1332	1980	10	14.02118	00 58	43.52	+06 33	12.9	0.0 0	14.5	511
1332	1980	10	14.03542	00 58	42.75	+06 33	09.8	0.0 0		511
1332	1980	10	14.04965	00 58	41.98	+06 33	06.4	0.0 0		511
1514	1980	11	10.88611	01 38	45.17	+01 43	07.3	0.4- 3-	15.9	511
1514	1980	11	10.90139	01 38	44.62	+01 43	05.1	0.4- 3-		511
1514	1980	11	10.91667	01 38	44.07	+01 43	03.9	0.4- 3-		511
1575	1980	09	09.88264	21 06	47.44	+16 01	41.2	0.0 2+	17.8	511
1575	1980	09	09.89792	21 06	46.98	+16 01	27.9	0.0 2+		511
1575	1980	09	09.91458	21 06	46.58	+16 01	15.4	0.0 2+		511
1628	1980	08	17.99479	21 09	49.49	+02 41	09.4	0.0 0+	15.9	511
1628	1980	08	18.01563	21 09	48.59	+02 40	59.8	0.0 0+		511
1628	1980	08	18.03646	21 09	47.73	+02 40	49.7	0.0 0+		511
1639	1980	11	10.94375	01 31	26.76	+24 48	44.3	0.4- 0	14.6	511
1639	1980	11	10.95903	01 31	26.03	+24 48	40.0	0.4- 0		511
1639	1980	11	10.97431	01 31	25.29	+24 48	34.6	0.4- 0		511
1939	1980	10	14.02118	00 54	54.47	+05 18	40.5	0.1- 0	16.7	511
1939	1980	10	14.03542	00 54	53.81	+05 18	36.5	0.1- 0		511
1939	1980	10	14.04965	00 54	53.14	+05 18	32.7	0.1- 0		511
1943	1980	10	13.86875	23 32	17.69	+14 43	03.7	0.6- 2-	17.3	511
1943	1980	10	13.88472	23 32	16.85	+14 42	47.2	0.6- 2-		511
1943	1980	10	13.90069	23 32	15.99	+14 42	31.0	0.6- 2-		511
1980	HD *	1980	04 22.05486	13 51	03.24	-02 11	19.4		16.7	511
1980	TT2 *	1980	10 13.86875	23 26	40.42	+15 01	58.9		17.9	511
1980	TT2	1980	10 13.88472	23 26	39.75	+15 01	52.5			511
1980	TT2	1980	10 13.90069	23 26	39.11	+15 01	45.5			511
1980	TU2 *	1980	10 13.86875	23 32	42.71	+12 29	43.4		17.9	511
1980	TU2	1980	10 13.88472	23 32	42.24	+12 29	32.8			511
1980	TU2	1980	10 13.90069	23 32	41.76	+12 29	21.9			511
1980	TV2 *	1980	10 14.02118	00 49	07.71	+08 26	42.3		16.9	511

1980	TV2	1980	10	14.03542	00	49	06.77	+08	26	43.8		511
1980	TV2	1980	10	14.04965	00	49	05.81	+08	26	44.4		511
1980	TW2	* 1980	10	14.02118	00	50	47.58	+08	04	13.2	18.0	511
1980	TW2	1980	10	14.03542	00	50	46.98	+08	04	01.2		511
1980	TW2	1980	10	14.04965	00	50	46.30	+08	03	47.7		511
1980	TX2	* 1980	10	14.02118	00	51	09.35	+05	37	06.3	17.7	511
1980	TX2	1980	10	14.03542	00	51	08.75	+05	37	00.5		511
1980	TX2	1980	10	14.04965	00	51	08.14	+05	36	54.9		511
1980	TY2	* 1980	10	14.02118	00	51	51.40	+05	50	38.0	16.3	511
1980	TY2	1980	10	14.03542	00	51	50.58	+05	50	31.9		511
1980	TY2	1980	10	14.04965	00	51	49.74	+05	50	25.4		511
1980	TZ2	* 1980	10	14.02118	00	52	02.32	+06	52	29.9	17.6	511
1980	TZ2	1980	10	14.03542	00	52	01.61	+06	52	22.6		511
1980	TZ2	1980	10	14.04965	00	52	00.90	+06	52	14.9		511
1980	TA3	* 1980	10	14.02118	00	53	15.79	+07	45	26.2	18.8	511
1980	TA3	1980	10	14.03542	00	53	15.04	+07	45	16.0		511
1980	TA3	1980	10	14.04965	00	53	14.30	+07	45	05.6		511
1980	TB3	* 1980	10	14.02118	00	54	18.80	+05	24	46.4	17.9	511
1980	TB3	1980	10	14.03542	00	54	18.07	+05	24	41.8		511
1980	TB3	1980	10	14.04965	00	54	17.35	+05	24	36.9		511
1980	TC3	* 1980	10	14.02118	00	54	23.89	+09	01	15.9	18.1	511
1980	TC3	1980	10	14.03542	00	54	23.78	+09	01	16.9		511
1980	TC3	1980	10	14.04965	00	54	23.71	+09	01	16.4		511
1980	TD3	* 1980	10	14.02118	00	54	40.53	+09	10	51.9	17.8	511
1980	TD3	1980	10	14.03542	00	54	39.71	+09	10	49.4		511
1980	TD3	1980	10	14.04965	00	54	38.90	+09	10	47.2		511
1980	TE3	* 1980	10	14.02118	00	54	50.97	+08	47	42.8	17.9	511
1980	TE3	1980	10	14.03542	00	54	50.07	+08	47	35.1		511
1980	TE3	1980	10	14.04965	00	54	49.17	+08	47	26.6		511
1980	TF3	* 1980	10	14.02118	00	56	32.94	+06	51	31.1	16.6	511
1980	TF3	1980	10	14.03542	00	56	32.14	+06	51	26.7		511
1980	TF3	1980	10	14.04965	00	56	31.36	+06	51	22.4		511
1980	TG3	* 1980	10	14.02118	00	58	04.96	+08	14	17.2	17.7	511
1980	TG3	1980	10	14.03542	00	58	04.27	+08	14	11.8		511
1980	TG3	1980	10	14.04965	00	58	03.47	+08	14	05.9		511
1980	TH3	* 1980	10	14.02118	00	59	00.29	+07	44	38.0	17.4	511
1980	TH3	1980	10	14.03542	00	58	59.48	+07	44	33.6		511
1980	TH3	1980	10	14.04965	00	58	58.66	+07	44	29.2		511
1980	TJ3	* 1980	10	14.02118	00	59	51.34	+05	58	50.4	17.7	511
1980	TJ3	1980	10	14.03542	00	59	50.72	+05	58	43.5		511
1980	TJ3	1980	10	14.04965	00	59	50.03	+05	58	37.4		511
1980	TK3	* 1980	10	14.02118	01	01	46.45	+06	39	29.1	17.8	511
1980	TK3	1980	10	14.03542	01	01	45.62	+06	39	28.5		511
1980	TK3	1980	10	14.04965	01	01	44.75	+06	39	27.8		511
1980	TL3	* 1980	10	14.02118	01	01	52.53	+09	09	46.6	17.9	511
1980	TL3	1980	10	14.03542	01	01	51.47	+09	09	46.0		511
1980	TL3	1980	10	14.04965	01	01	50.41	+09	09	45.4		511
1980	TM3	* 1980	10	14.02118	01	02	18.94	+06	06	13.4	18.0	511
1980	TM3	1980	10	14.03542	01	02	18.08	+06	06	05.2		511
1980	TM3	1980	10	14.04965	01	02	17.25	+06	05	57.4		511
1980	VZ	* 1980	11	10.77222	23	56	16.35	-01	53	47.8	18.2	511
1980	VZ	1980	11	10.78750	23	56	16.64	-01	53	52.5		511
1980	VZ	1980	11	10.80278	23	56	16.99	-01	53	56.1		511
1980	VA1	* 1980	11	10.88611	01	33	41.79	+01	31	34.6	17.5	511
1980	VA1	1980	11	10.90139	01	33	41.14	+01	31	34.7		511
1980	VA1	1980	11	10.91667	01	33	40.46	+01	31	34.8		511
1980	VB1	* 1980	11	10.88611	01	35	17.67	-00	32	19.6	17.4	511
1980	VB1	1980	11	10.90139	01	35	16.85	-00	32	21.6		511
1980	VB1	1980	11	10.91667	01	35	16.04	-00	32	23.6		511

1980	VC1	*	1980	11	10.88611	01	37	42.21	+01	14	58.0	17.2	511
1980	VC1		1980	11	10.90139	01	37	41.52	+01	14	59.8		511
1980	VC1		1980	11	10.91667	01	37	40.94	+01	15	01.9		511
1980	VD1	*	1980	11	13.91944	00	07	28.82	-08	44	01.1	17.9	511
1980	VD1		1980	11	13.93472	00	07	29.12	-08	43	52.3		511
1980	VD1		1980	11	13.95000	00	07	29.40	-08	43	44.6		511

OBSERVATIONS MADE AT THE OSSERVATORIO S. VITTORE BY G. SASSI, G. SETTE AND
C. VACCHI. SCANNED BY C. VACCHI. MEASURED BY E. PANCALDI, E. COLUMBINI
AND V. GORETTI. REDUCED BY V. GORETTI AND E. COLUMBINI.

Object	Date	UT	R. A. (1950)			Decl.			Obs.	
29	1974	09	15.88194	00	40	02.30	+05	47	08.6	552
29	1974	09	15.90278	00	40	01.26	+05	47	06.3	552
29	1974	09	16.86806	00	39	13.62	+05	45	12.6	552
29	1974	09	16.88889	00	39	12.66	+05	45	10.7	552
29	1974	09	24.84878	00	32	09.55	+05	26	05.5	552
29	1974	09	24.87031	00	32	08.33	+05	26	02.7	552
29	1974	09	24.88970	00	32	07.24	+05	25	59.6	552
29	1974	09	24.92587	00	32	05.17	+05	25	53.4	552
177	1974	12	06.87500	04	42	42.90	+24	45	33.6	552
177	1974	12	06.89167	04	42	42.16	+24	45	32.1	552
222	1978	07	08.96736	21	48	07.71	-15	52	30.3	552
222	1978	07	08.97917	21	48	07.50	-15	52	30.4	552
358	1978	07	07.91597	20	52	20.68	-13	32	55.3	552
358	1978	07	07.92500	20	52	20.35	-13	32	57.2	552
358	1978	07	08.92222	20	51	43.62	-13	35	23.2	552
358	1978	07	08.94097	20	51	42.94	-13	35	27.3	552
362	1976	03	30.93299	13	19	58.25	-05	56	08.1	552
362	1976	03	30.96493	13	19	56.32	-05	56	01.4	552
362	1976	04	03.92743	13	16	14.64	-05	45	32.1	552
362	1976	04	03.94757	13	16	13.39	-05	45	28.3	552
362	1976	04	03.96076	13	16	12.57	-05	45	26.2	552
362	1976	04	03.97951	13	16	11.52	-05	45	23.4	552
362	1976	04	30.93750	12	52	07.18	-04	44	58.8	552
362	1976	04	30.95903	12	52	06.11	-04	44	57.5	552
362	1976	05	01.91146	12	51	25.52	-04	43	46.6	552
362	1976	05	01.92951	12	51	24.73	-04	43	45.6	552
596	1974	12	09.93056	04	43	58.15	+23	31	10.9	552
596	1974	12	09.94514	04	43	57.34	+23	31	15.6	552
627	1978	07	07.91597	20	53	16.08	-13	55	58.9	552
627	1978	07	07.92500	20	53	15.72	-13	56	01.3	552
627	1978	07	08.92222	20	52	41.85	-13	59	57.3	552
627	1978	07	08.94097	20	52	41.31	-14	00	01.1	552
627	1978	08	10.87708	20	28	09.34	-16	47	05.8	552
627	1978	08	10.89306	20	28	08.59	-16	47	10.8	552
720	1978	05	02.91806	14	25	54.22	-14	44	41.4	552
720	1978	05	02.95694	14	25	52.13	-14	44	33.5	552
785	1976	04	30.89444	12	20	19.19	+17	15	45.2	552
785	1976	04	30.91875	12	20	18.63	+17	15	31.0	552
785	1976	05	01.86771	12	19	58.26	+17	06	35.4	552
785	1976	05	01.89271	12	19	57.73	+17	06	21.1	552
850	1979	05	31.92639	17	00	29.65	-03	37	05.4	552
850	1979	05	31.93889	17	00	29.09	-03	37	05.9	552
850	1979	06	23.86875	16	41	51.53	-05	08	49.6	552
850	1979	06	23.88333	16	41	50.80	-05	08	56.2	552
868	1975	04	02.93125	14	48	46.32	-07	41	02.8	552
868	1975	04	02.96111	14	48	45.19	-07	40	50.8	552
868	1975	04	07.93472	14	45	43.43	-07	19	54.3	552
868	1975	04	07.97083	14	45	41.85	-07	19	44.8	552

868	1975	04	11.93819	14	42	59.01	-07	02	29.9	552
868	1975	04	17.97569	14	38	26.44	-06	36	04.8	552
868	1975	05	30.90069	14	06	10.50	-04	33	29.2	552
868	1975	05	30.92569	14	06	09.72	-04	33	28.5	552
944	1978	03	29.92986	12	51	37.60	+11	50	37.3	552
944	1978	03	29.95000	12	51	36.44	+11	50	37.1	552
1027	1974	12	06.91319	04	50	26.89	+23	47	35.3	552
1027	1974	12	06.93264	04	50	26.07	+23	47	35.1	552
1027	1974	12	09.88472	04	47	45.61	+23	43	46.2	552
1027	1974	12	09.90069	04	47	44.64	+23	43	45.5	552
1027	1974	12	16.86875	04	41	34.35	+23	34	01.1	552
1027	1974	12	16.88333	04	41	33.42	+23	34	00.2	552
1027	1974	12	18.86736	04	39	51.46	+23	30	10.7	552
1027	1974	12	18.88194	04	39	51.45	+23	30	09.8	552
1064	1979	08	22.91528	23	36	56.66	+13	38	13.2	552
1064	1979	08	22.93403	23	36	55.88	+13	38	14.3	552
1064	1979	08	29.92778	23	31	44.93	+13	44	10.6	552
1064	1979	08	29.93681	23	31	44.52	+13	44	04.9	552
1252	1978	07	08.86875	19	14	44.97	+09	27	34.6	552
1252	1978	07	08.88611	19	14	44.00	+09	27	20.7	552
1544	1976	04	30.97708	12	54	53.52	-02	32	01.5	552
1544	1976	05	01.00069	12	54	52.51	-02	31	59.7	552
1650	1979	11	12.88264	02	34	16.44	+13	17	24.9	552
1650	1979	11	12.93403	02	34	13.43	+13	17	08.6	552
1766	1980	09	03.90764	22	32	52.87	-04	33	40.1	552
1766	1980	09	03.92292	22	32	52.11	-04	33	47.6	552
1766	1980	09	04.90903	22	32	07.06	-04	40	34.9	552
1766	1980	09	04.92500	22	32	06.21	-04	40	41.9	552
1766	1980	09	04.94097	22	32	05.48	-04	40	48.1	552
1801	1975	01	06.90208	05	55	13.56	+28	21	59.5	552
1801	1975	01	06.91736	05	55	12.77	+28	22	00.5	552
1801	1975	01	07.89514	05	54	20.65	+28	24	47.0	552
1801	1975	01	07.90972	05	54	19.73	+28	24	47.2	552
1850	1974	12	16.93333	05	54	27.87	+25	32	02.8	552
1850	1974	12	16.94792	05	54	26.66	+25	32	04.9	552
1850	1974	12	17.90000	05	53	17.66	+25	33	23.2	552
1850	1974	12	17.91458	05	53	16.67	+25	33	24.7	552
1904	1976	03	28.89687	12	41	31.89	+16	05	21.6	552
1904	1976	03	28.92604	12	41	30.44	+16	05	31.1	552
1904	1976	03	30.89896	12	39	53.19	+16	16	14.9	552
1904	1976	03	30.91771	12	39	52.29	+16	16	20.2	552
1904	1976	03	31.89201	12	39	04.25	+16	21	23.7	552
1904	1976	03	31.91215	12	39	03.01	+16	21	27.8	552
1904	1976	04	03.89132	12	36	36.73	+16	35	37.4	552
1904	1976	04	03.91354	12	36	35.55	+16	35	41.2	552
1904	1976	04	30.89444	12	18	28.62	+17	14	38.1	552
1904	1976	04	30.91875	12	18	28.05	+17	14	35.5	552
1904	1976	05	01.86771	12	18	02.80	+17	13	02.6	552
1904	1976	05	01.89271	12	18	02.20	+17	12	59.3	552
2060	1979	11	12.88264	02	35	21.24	+13	34	21.4	552
2060	1979	11	12.93403	02	35	21.27	+13	34	21.0	552
2111	1979	06	01.89167	16	19	09.23	-06	21	19.8	552
2111	1979	06	01.90972	16	19	10.11	-06	21	22.8	552
2111	1979	06	02.96042	16	18	20.16	-06	19	13.6	552
2111	1979	06	02.98125	16	18	19.43	-06	19	12.4	552
2111	1979	06	20.91875	16	05	38.28	-06	03	36.8	552
2111	1979	06	20.93194	16	05	37.87	-06	03	39.1	552
2111	1979	06	23.92639	16	03	52.62	-06	04	50.1	552
2111	1979	06	23.94306	16	03	52.10	-06	04	50.1	552

2111	1979	06	29.91319	16	00	48.48	-06	10	33.0	552
2111	1979	06	29.92847	16	00	48.11	-06	10	35.5	552
2173	1979	06	24.00347	19	57	26.43	-01	02	57.6	552
2173	1979	06	24.02153	19	57	25.92	-01	02	56.6	552
2235	1980	11	14.96597	05	05	50.42	+03	27	26.8	552
2235	1980	11	14.98403	05	05	49.81	+03	27	16.5	552
2235	1980	11	15.00208	05	05	49.03	+03	27	07.5	552
2235	1980	11	15.01895	05	05	48.47	+03	26	57.8	552
1974 YS *	1974	12	16.93333	05	53	52.44	+25	05	49.2	552
1974 YS	1974	12	16.94792	05	53	51.31	+25	05	49.0	552
1974 YS	1974	12	17.90000	05	52	47.71	+25	05	48.7	552
1974 YS	1974	12	17.91458	05	52	46.37	+25	05	48.6	552
1976 GM2	1976	03	30.93299	13	20	49.44	-06	01	44.7	552
1976 GM2	1976	03	30.96493	13	20	47.96	-06	01	33.8	552
1976 GM2	1976	04	03.92743	13	17	59.71	-05	42	38.7	552
1976 GM2	1976	04	03.94757	13	17	58.76	-05	42	32.3	552
1976 GM2	1976	04	03.96076	13	17	58.16	-05	42	31.5	552
1976 GM2	1976	04	03.97951	13	17	57.35	-05	42	23.5	552

OBSERVATIONS MADE AT THE LICK OBSERVATORY BY E. ROEMER.

Object	Date	UT	R. A. (1950)		Decl.			Obs.
1221	1956	03	02.31169	11 47	01.66	-09 59	16.0	662
1221	1956	03	02.32174	11 47	04.47	-09 58	49.5	662
1221	1956	03	18.25362	13 33	21.98	+08 38	25.2	662
1221	1956	03	18.26056	13 33	25.31	+08 39	02.4	662
1221	1956	04	02.33646	15 33	49.33	+27 05	44.0	662
1221	1956	04	02.34132	15 33	51.25	+27 05	58.1	662

OBSERVATIONS MADE AT PALOMAR. MEASURED BY J. GIBSON.

Object	Date	UT	R. A. (1950)		Decl.		N	Obs.
1969 RK2 *	1969	09	10.34479	23 55	44.82	-01 55	51.5	5 675
1969 RK2	1969	09	11.32465	23 55	01.87	-02 01	35.0	1 675
1976 QV	1980	11	28.47571	03 30	14.84	+23 54	10.0	1 675
1976 QV	1980	11	28.50210	03 30	13.23	+23 54	01.6	1 675
1977 CA	1981	02	15.46946	12 41	56.10	-25 04	59.5	2 675
1977 CA	1981	02	15.51043	12 41	54.28	-25 05	50.9	2 675
1978 CH	1978	02	08.34722	08 47	23.88	+17 18	12.7	3 675
1978 CK	1978	02	08.34722	08 56	07.26	+14 35	04.7	3 675
1980 YS	1981	01	03.28681	06 07	24.98	+30 44	06.8	6 675

Note 1: 1.2-m Schmidt, observer C. Kowal. 2: 1.2-m Schmidt, observer J.

Gibson. 3: 0.46-m Schmidt, observers E. Helin and D. Zelinsky. 4:

discoverer: J. Gibson. 5 = 1 + 4. 6: 0.46-m Schmidt, observer E.

Helin; image partly on a star.

OBSERVATIONS MADE WITH THE 1.2-M SCHMIDT AT PALOMAR BY E. HELIN.

Object	Date	UT	R. A. (1950)		Decl.		Mag.	Obs.
1980 YS	1981	02	24.11806	07 20	36.79	+29 39	21.8	17 675
1980 YS	1981	02	24.14236	07 20	40.07	+29 39	10.6	675

OBSERVATIONS MADE AT THE LOWELL OBSERVATORY'S ANDERSON MESA STATION BY E. BOWELL, B. A. SKIFF AND N. G. THOMAS. MEASURED BY BOWELL.

Object	Date	UT	R. A. (1950)		Decl.		Mag.	N	Obs.
1	1981	03	09.11806	07 03	16.06	+32 17	20.8		688
1	1981	03	09.14097	07 03	16.43	+32 17	19.1		688
4	1981	02	06.27361	10 46	30.72	+16 52	09.1		688
4	1981	02	06.29375	10 46	29.68	+16 52	19.3		688
66	1981	03	09.18681	08 36	08.85	+21 59	57.0		688
66	1981	03	09.22778	08 36	07.93	+21 59	54.5		688
109	1981	02	05.12639	05 36	22.42	+35 37	53.3		688

109	1981	02	05.16597	05	36	23.35	+35	37	38.4	688
120	1981	01	28.21667	05	52	16.43	+31	40	15.4	688
120	1981	01	28.23542	05	52	15.86	+31	40	12.8	688
120	1981	02	05.12639	05	49	09.82	+31	17	58.6	688
120	1981	02	05.16597	05	49	09.11	+31	17	52.3	688
120	1981	02	06.17847	05	48	52.39	+31	14	55.7	688
120	1981	02	06.22292	05	48	51.61	+31	14	48.4	688
174	1981	01	28.21667	05	48	30.24	+35	37	28.4	688
174	1981	01	28.23542	05	48	29.61	+35	37	23.4	688
174	1981	02	05.12639	05	44	58.28	+34	59	41.0	688
174	1981	02	05.16597	05	44	57.40	+34	59	29.6	688
200	1981	02	08.20278	09	06	18.96	+18	23	43.5	688
200	1981	02	08.24444	09	06	16.40	+18	23	47.3	688
200	1981	03	09.18681	08	44	06.45	+18	35	04.0	688
200	1981	03	09.22778	08	44	05.31	+18	35	00.8	688
214	1981	02	08.20278	09	05	36.28	+19	16	50.7	688
214	1981	02	08.24444	09	05	33.72	+19	16	57.7	688
214	1981	03	09.18681	08	43	23.81	+19	56	18.6	688
214	1981	03	09.22778	08	43	22.68	+19	56	18.0	688
215	1981	03	09.27222	12	33	06.64	-02	28	57.1	688
263	1981	01	30.11875	07	49	17.00	+19	06	11.4	688
263	1981	01	30.16042	07	49	14.80	+19	06	17.6	688
263	1981	02	28.14931	07	32	33.58	+19	57	34.2	688
263	1981	02	28.19028	07	32	32.98	+19	57	36.1	688
272	1981	03	09.27222	12	32	16.20	+00	58	39.3	688
321	1981	01	30.14097	07	15	17.85	+26	06	54.2	688
321	1981	01	30.18056	07	15	15.93	+26	06	56.7	688
331	1981	03	09.27222	12	26	17.87	+00	33	29.7	688
360	1981	02	05.20764	08	48	00.67	+17	35	36.5	688
360	1981	02	05.24792	08	47	58.58	+17	35	55.5	688
360	1981	02	08.18056	08	45	36.08	+17	57	51.2	688
360	1981	02	08.22431	08	45	33.97	+17	58	10.5	688
366	1981	03	09.11806	06	59	53.66	+32	14	55.6	688
366	1981	03	09.14097	06	59	53.67	+32	14	50.0	688
398	1981	02	05.10625	05	23	39.35	+22	20	18.2	688
398	1981	02	05.14653	05	23	40.14	+22	20	07.4	688
420	1981	02	28.14931	07	20	55.27	+14	42	56.1	688
420	1981	02	28.19028	07	20	54.78	+14	42	59.6	688
464	1981	02	08.20278	09	18	09.33	+24	17	47.0	688
464	1981	02	08.24444	09	18	07.06	+24	18	02.0	688
476	1981	02	28.14931	07	17	31.67	+17	35	30.9	688
476	1981	02	28.19028	07	17	31.02	+17	35	28.6	688
497	1981	02	06.27361	10	30	59.95	+13	44	52.1	688
497	1981	02	06.29375	10	30	59.00	+13	44	57.6	688
498	1981	02	05.10625	05	37	19.85	+24	02	30.0	688
498	1981	02	05.14653	05	37	19.38	+24	02	35.3	688
507	1981	02	28.14931	07	19	22.63	+20	24	34.1	688
507	1981	02	28.19028	07	19	22.08	+20	24	29.9	688
581	1981	02	05.10625	05	38	34.01	+21	32	16.4	688
581	1981	02	05.14653	05	38	33.31	+21	32	29.8	688
626	1981	03	12.23472	07	29	59.04	+40	50	45.5	688
626	1981	03	12.25556	07	29	59.28	+40	50	28.1	688
627	1981	02	05.20764	08	51	04.31	+15	56	21.7	688
627	1981	02	05.24792	08	51	02.21	+15	56	35.3	688
627	1981	02	08.18056	08	48	35.85	+16	11	52.8	688
627	1981	02	08.22431	08	48	33.65	+16	12	06.0	688
656	1981	01	30.14097	07	00	49.58	+21	59	30.1	688
661	1981	03	09.16458	07	50	50.59	+26	19	58.9	688
661	1981	03	09.20694	07	50	50.16	+26	19	49.5	688

671	1981	03	09.11806	07	05	44.70	+31	11	44.2	688
671	1981	03	09.14097	07	05	45.02	+31	11	38.4	688
711	1981	02	08.20278	09	21	02.53	+22	03	06.4	688
711	1981	02	08.24444	09	20	59.69	+22	03	15.7	688
711	1981	03	09.18681	08	52	18.91	+22	47	52.8	688
711	1981	03	09.22778	08	52	17.18	+22	47	51.8	688
734	1981	02	28.17083	07	32	37.88	+28	26	56.5	688
734	1981	02	28.21042	07	32	37.29	+28	26	51.6	688
750	1981	02	05.10625	05	27	34.30	+26	38	42.9	688
750	1981	02	05.14653	05	27	34.38	+26	38	43.9	688
750	1981	02	06.17847	05	27	41.08	+26	39	08.2	688
750	1981	02	06.22292	05	27	41.33	+26	39	10.6	688
810	1981	01	30.11875	07	42	54.76	+19	00	38.9	688
810	1981	01	30.16042	07	42	52.22	+19	00	47.6	688
819	1981	02	08.18056	08	45	18.71	+20	59	34.1	688
819	1981	02	08.22431	08	45	15.62	+20	59	40.0	688
834	1981	01	30.11875	07	39	42.65	+16	34	52.0	688
834	1981	01	30.16042	07	39	40.68	+16	34	58.3	688
835	1981	02	05.10625	05	27	49.02	+25	49	03.2	688
835	1981	02	05.14653	05	27	48.81	+25	48	59.0	688
884	1981	01	30.14097	07	02	35.19	+25	00	37.3	688
884	1981	01	30.18056	07	02	34.07	+25	00	37.2	688
902	1981	02	08.20278	09	03	32.45	+23	30	24.6	688
902	1981	02	08.24444	09	03	29.52	+23	30	30.4	688
902	1981	03	09.18681	08	39	32.01	+23	29	52.3	688
902	1981	03	09.22778	08	39	30.88	+23	29	45.4	688
928	1981	02	28.14931	07	18	54.63	+20	08	24.1	688
928	1981	02	28.19028	07	18	54.33	+20	08	40.3	688
972	1981	01	30.14097	07	17	34.82	+19	36	47.0	688
972	1981	01	30.18056	07	17	32.99	+19	36	46.1	688
1015	1981	03	09.16458	07	53	13.66	+22	48	08.0	688
1015	1981	03	09.20694	07	53	13.24	+22	48	12.3	688
1027	1981	01	30.14097	07	00	04.79	+24	34	08.4	688
1027	1981	01	30.18056	07	00	02.97	+24	34	09.9	688
1044	1981	03	09.16458	07	53	16.21	+26	21	24.8	688
1044	1981	03	09.20694	07	53	15.54	+26	21	21.7	688
1089	1981	02	28.17083	07	25	46.76	+27	11	41.2	688
1089	1981	02	28.21042	07	25	46.85	+27	11	38.0	688
1196	1981	02	05.10625	05	27	28.64	+22	56	19.1	688
1196	1981	02	05.14653	05	27	28.28	+22	56	34.2	688
1219	1981	01	28.21667	05	26	09.43	+29	49	12.9	688
1219	1981	01	28.23542	05	26	09.46	+29	49	14.9	688
1219	1981	02	06.17847	05	27	38.16	+29	36	48.8	688
1219	1981	02	06.22292	05	27	38.98	+29	36	45.3	688
1254	1981	02	05.20764	08	50	15.02	+13	09	35.0	688
1254	1981	02	05.24792	08	50	12.93	+13	09	39.7	688
1254	1981	02	08.18056	08	47	43.76	+13	14	42.3	688
1254	1981	02	08.22431	08	47	41.58	+13	14	46.5	688
1270	1981	02	05.10625	05	21	33.60	+23	49	42.8	688
1270	1981	02	05.14653	05	21	33.77	+23	49	46.3	688
1302	1981	01	30.14097	07	04	02.54	+24	13	14.2	688
1302	1981	01	30.18056	07	04	00.87	+24	13	17.8	688
1393	1981	02	06.27361	10	36	04.91	+19	14	30.2	688
1393	1981	02	06.29375	10	36	03.96	+19	14	38.9	688
1539	1981	02	08.18056	09	02	44.07	+16	29	55.8	688
1539	1981	02	08.22431	09	02	41.84	+16	30	06.7	688
1539	1981	03	09.18681	08	44	06.11	+17	58	48.2	688
1548	1981	03	09.16458	07	52	29.25	+27	09	06.4	688
1548	1981	03	09.20694	07	52	28.97	+27	09	14.5	688

17.0

1634	1981 02 28.17083	07 38 03.55	+28 21 13.4	688
1634	1981 02 28.21042	07 38 02.38	+28 21 16.0	688
1650	1981 02 05.20764	08 48 10.27	+13 40 01.1	688
1650	1981 02 05.24792	08 48 07.73	+13 40 12.6	688
1650	1981 02 08.18056	08 45 11.18	+13 53 40.2	688
1650	1981 02 08.22431	08 45 08.51	+13 53 51.9	688
1669	1981 02 05.10625	05 38 01.58	+24 33 13.0	688
1669	1981 02 05.14653	05 38 00.95	+24 33 13.9	688
1675	1981 03 09.11806	07 29 28.55	+31 57 36.8	3 688
1675	1981 03 09.14097	07 29 29.17	+31 57 28.7	3 688
1682	1981 02 28.17083	07 39 49.53	+23 08 52.8	688
1682	1981 02 28.21042	07 39 48.61	+23 08 50.4	688
1682	1981 03 09.16458	07 37 46.31	+22 58 21.0	688
1682	1981 03 09.20694	07 37 46.34	+22 58 20.3	688
1789	1981 01 30.11875	07 39 34.46	+22 25 47.4	688
1789	1981 01 30.16042	07 39 32.02	+22 25 57.3	688
1789	1981 02 28.17083	07 19 46.84	+23 17 40.8	688
1789	1981 02 28.21042	07 19 46.32	+23 17 43.0	688
1800	1981 02 08.24444	09 11 42.13	+18 17 56.3	688
1800	1981 03 09.18681	08 48 09.22	+20 40 11.4	688
1800	1981 03 09.22778	08 48 07.91	+20 40 17.5	688
1822	1981 01 30.11875	07 48 17.48	+19 29 22.1	688
1822	1981 01 30.16042	07 48 14.69	+19 29 29.0	3 688
1822	1981 02 28.14931	07 26 21.80	+20 30 39.5	688
1822	1981 02 28.19028	07 26 20.99	+20 30 41.7	688
1859	1981 03 09.16458	07 42 00.96	+27 10 50.5	17.2 688
1859	1981 03 09.20694	07 42 00.51	+27 10 43.3	688
1915	1981 02 23.20451	08 51 24.75	-23 38 21.3	16.2 688
1915	1981 02 23.22188	08 51 35.08	-23 35 37.6	688
1930	1981 03 09.16458	07 42 18.71	+24 53 33.2	688
1930	1981 03 09.20694	07 42 18.20	+24 53 27.5	688
1964	1981 02 05.20764	08 47 11.66	+13 55 05.7	688
1964	1981 02 05.24792	08 47 09.23	+13 55 16.8	688
1964	1981 02 08.18056	08 44 15.31	+14 07 05.0	1 688
1964	1981 02 08.22431	08 44 12.74	+14 07 15.8	688
2004	1981 02 08.18056	09 00 44.90	+20 41 09.8	688
2004	1981 02 08.22431	09 00 41.90	+20 41 18.7	688
2004	1981 03 09.18681	08 37 39.30	+21 15 51.0	688
2004	1981 03 09.22778	08 37 38.38	+21 15 48.1	688
2027	1981 01 28.21667	05 42 17.53	+34 17 27.6	688
2027	1981 01 28.23542	05 42 17.03	+34 17 28.1	688
2027	1981 02 05.12639	05 40 06.52	+34 10 19.9	688
2027	1981 02 05.16597	05 40 06.08	+34 10 17.5	688
2027	1981 02 06.17847	05 39 57.91	+34 09 12.1	688
2027	1981 02 06.22292	05 39 57.48	+34 09 08.7	688
2046	1981 02 28.17083	07 36 22.65	+24 17 30.5	688
2046	1981 02 28.21042	07 36 21.87	+24 17 30.6	688
2055	1981 02 06.27361	10 35 27.95	+21 25 45.8	688
2055	1981 02 06.29375	10 35 26.31	+21 25 40.6	688
2086	1981 03 09.18681	08 53 04.46	+19 32 54.5	688
2086	1981 03 09.22778	08 53 03.51	+19 33 02.0	688
2203	1981 02 08.18056	08 57 04.76	+19 41 50.6	688
2203	1981 02 08.22431	08 57 02.48	+19 41 59.6	688
2247	1981 03 09.18681	08 36 29.97	+25 11 59.4	688
2247	1981 03 09.22778	08 36 28.84	+25 11 48.8	688
2297	1981 01 30.11875	07 48 39.56	+20 17 12.5	688
2297	1981 01 30.16042	07 48 37.40	+20 17 18.4	688
2320	1981 01 30.11875	08 03 06.91	+21 16 25.2	688
2320	1981 01 30.16042	08 03 04.84	+21 16 39.0	1 688

2320		1981	03	09.16458	07	44	03.01	+23	33	53.0		688	
2320		1981	03	09.20694	07	44	02.67	+23	33	58.2		688	
2325		1981	01	30.14097	07	23	52.30	+20	53	24.8	17.2	2 688	
2325		1981	01	30.18056	07	23	50.47	+20	53	29.2		688	
2357		1981	02	28.14931	07	22	44.74	+19	21	38.3	17.0	688	
2357		1981	02	28.19028	07	22	44.20	+19	21	41.5		688	
1935	TC	1981	02	08.20278	09	29	45.98	+24	13	54.9	16.0	688	
1935	TC	1981	02	08.24444	09	29	43.15	+24	14	13.4		688	
1968	SB	1981	02	05.10625	05	39	59.92	+24	57	20.8	17.5	688	
1968	SB	1981	02	05.14653	05	39	59.49	+24	57	21.7		688	
1976	GQ1	1981	02	08.24444	09	13	08.64	+18	45	57.0		688	
1978	RP	1981	02	08.20278	09	07	15.39	+17	47	18.0	16.5	688	
1978	RP	1981	02	08.24444	09	07	13.24	+17	47	29.0		688	
1978	RP	1981	03	09.18681	08	47	33.16	+19	23	47.7	17.0	688	
1978	RP	1981	03	09.22778	08	47	32.13	+19	23	51.7		688	
1980	XE	1981	01	30.11875	07	51	49.39	+19	01	44.0	16.5	1 688	
1980	XE	1981	01	30.16042	07	51	45.66	+19	01	19.3		688	
1980	XE	1981	02	28.14931	07	23	46.81	+14	30	34.1	16.8	688	
1980	XE	1981	02	28.19028	07	23	45.99	+14	30	13.4		688	
1980	YH	1981	02	08.18056	08	48	25.64	+19	43	50.3	16.2	688	
1980	YH	1981	02	08.22431	08	48	23.60	+19	44	14.1		688	
1980	YH	1981	03	09.18681	08	32	20.32	+23	14	53.6	16.8	688	
1980	YH	1981	03	09.22778	08	32	19.60	+23	15	03.7		688	
1980	YK	1981	01	01.29722	08	49	10.78	+34	59	43.8	17.2	1 688	
1980	YK	1981	01	01.33125	08	49	08.91	+34	59	46.0		688	
1980	YQ	1981	01	30.11875	07	56	40.35	+17	25	06.7	15.5	688	
1980	YQ	1981	01	30.16042	07	56	37.87	+17	25	07.6		688	
1981	AA	1981	01	28.26910	07	42	28.89	+30	35	15.9	15.5	3 688	
1981	AA	1981	02	26.12986	07	28	41.88	+36	45	01.0	16.5	688	
1981	AA	1981	02	26.16875	07	28	42.15	+36	45	16.8		688	
1981	AA	1981	03	12.25556	07	34	42.56	+37	48	04.1	17.2	3 688	
1981	AD	1981	01	30.14097	07	23	58.98	+25	03	18.0	16.0	688	
1981	AD	1981	01	30.18056	07	23	56.94	+25	03	38.7		688	
1981	AD	1981	02	28.17083	07	12	58.13	+28	18	02.4	16.5	688	
1981	AD	1981	02	28.21042	07	12	58.34	+28	18	12.5		688	
1981	AE	1981	02	08.20278	09	08	18.62	+21	44	50.5	16.2	688	
1981	AE	1981	02	08.24444	09	08	16.32	+21	44	58.2		688	
1981	AE	1981	03	09.18681	08	49	14.08	+22	23	25.2	16.8	688	
1981	AE	1981	03	09.22778	08	49	13.20	+22	23	23.9		688	
1981	AK	1981	01	30.11875	07	46	57.53	+24	06	18.2	16.8	688	
1981	AK	1981	01	30.16042	07	46	55.56	+24	06	26.0		688	
1981	AO	1981	03	09.16458	07	45	41.28	+27	50	38.3	16.5	688	
1981	AO	1981	03	09.20694	07	45	40.87	+27	50	43.5		688	
1981	AQ	1981	01	10.27014	09	36	46.49	+16	05	29.5	16.8	688	
1981	AQ	1981	01	10.30694	09	36	45.65	+16	05	50.4		688	
1981	AQ	1981	02	08.20278	09	15	30.75	+21	37	15.0	16.2	688	
1981	AQ	1981	02	08.24444	09	15	28.35	+21	37	43.9		688	
1981	AQ	1981	03	09.18681	08	56	07.58	+25	29	12.3	17.0	688	
1981	AQ	1981	03	09.22778	08	56	06.85	+25	29	21.9		688	
1981	AT	1981	01	30.14097	07	21	57.51	+22	52	39.8	16.5	688	
1981	AT	1981	01	30.18056	07	21	55.27	+22	52	33.9		688	
1981	AX	1981	01	09.18472	07	36	41.79	+12	51	19.5	16.8	688	
1981	AX	1981	01	09.22222	07	36	39.42	+12	51	27.5		688	
1981	AY	1981	01	09.22222	07	42	47.38	+16	20	20.8	17.0	688	
1981	AC1	1981	01	01.38264	09	23	35.02	+15	31	23.9	17.2	688	
1981	AC1	1981	01	01.42431	09	23	33.58	+15	31	30.1		688	
1981	AC1	*	1981	01	10.27014	09	18	02.65	+15	51	22.6	17.2	4 688
1981	AC1		1981	01	10.30694	09	18	00.78	+15	51	30.8		688
1981	AC1		1981	02	05.20764	08	51	40.60	+17	26	35.3	17.5	688

1981 AC1	1981 02 05.24792	08 51 37.83	+17 26 46.2		688
1981 AC1	1981 02 08.18056	08 48 28.54	+17 37 21.8	17.2	688
1981 AC1	1981 02 08.22431	08 48 25.68	+17 37 31.5		1 688
1981 AD1	1981 01 01.38264	09 23 31.57	+16 34 58.8	17.0	688
1981 AD1	1981 01 01.42431	09 23 30.44	+16 35 02.0		688
1981 AD1 *	1981 01 10.27014	09 18 32.76	+16 57 16.2	17.2	4 688
1981 AD1	1981 01 10.30694	09 18 31.33	+16 57 21.4		688
1981 AD1	1981 02 05.20764	08 57 24.75	+18 22 02.5	17.0	688
1981 AD1	1981 02 05.24792	08 57 22.55	+18 22 11.9		688
1981 AD1	1981 02 08.18056	08 54 48.06	+18 31 27.5	17.0	688
1981 AD1	1981 02 08.22431	08 54 45.88	+18 31 37.3		688
1981 AE1	1981 01 03.35625	09 21 34.09	+14 26 25.1	17.2	2 688
1981 AE1	1981 01 03.41528	09 21 32.97	+14 26 38.4		688
1981 AE1 *	1981 01 10.27014	09 18 59.77	+14 57 52.6	17.2	4 688
1981 AE1	1981 01 10.30694	09 18 58.85	+14 58 03.5		688
1981 AF1	1981 01 01.38264	09 36 15.61	+20 12 01.1	16.8	688
1981 AF1	1981 01 01.42431	09 36 14.80	+20 12 07.8		688
1981 AF1 *	1981 01 10.27014	09 32 11.69	+20 40 42.3	16.5	4 688
1981 AF1	1981 01 10.30694	09 32 10.28	+20 40 50.3		688
1981 AG1 *	1981 01 03.35625	09 07 11.49	+15 07 52.7	17.2	4 688
1981 AG1	1981 01 03.41528	09 07 09.73	+15 08 09.1		688
1981 AH1	1980 12 16.39236	09 13 59.64	+09 48 04.1	17.5	688
1981 AH1	1980 12 16.44379	09 13 59.20	+09 48 03.7		688
1981 AH1 *	1981 01 03.35625	09 08 39.77	+10 24 52.4	17.5	4 688
1981 AH1	1981 01 03.41528	09 08 37.88	+10 25 04.6		688
1981 AH1	1981 02 05.20764	08 45 35.93	+13 07 04.1	17.0	688
1981 AH1	1981 02 05.24792	08 45 33.92	+13 07 21.0		688
1981 AH1	1981 02 08.18056	08 43 15.99	+13 24 46.2	17.0	688
1981 AH1	1981 02 08.22431	08 43 13.98	+13 25 01.8		688
1981 AJ1 *	1981 01 09.18472	07 29 21.75	+18 09 47.9	16.8	6 688
1981 AJ1	1981 01 09.22222	07 29 19.30	+18 09 49.7		688
1981 AK1	1981 01 09.18472	07 29 36.05	+18 10 03.2	16.0	1 688
1981 AK1	1981 01 09.22222	07 29 33.47	+18 10 08.3		688
1981 CN	1981 01 03.35625	09 12 13.78	+15 05 01.6	16.8	688
1981 CN	1981 01 03.41528	09 12 11.76	+15 05 02.9		1 688
1981 CN	1981 02 05.20764	08 41 48.36	+16 25 35.6	17.0	688
1981 CN *	1981 02 08.18056	08 38 37.62	+16 34 38.0	16.8	4 688
1981 CN	1981 02 08.22431	08 38 34.71	+16 34 46.1		688
1981 CO *	1981 02 08.18056	08 39 24.25	+21 00 49.1	17.0	4 688
1981 CO	1981 02 08.22431	08 39 21.32	+21 00 48.3		688
1981 CP	1981 02 05.24792	08 42 32.06	+16 47 52.2	17.5	688
1981 CP *	1981 02 08.18056	08 40 14.24	+17 09 31.4	17.5	4 688
1981 CP	1981 02 08.22431	08 40 12.04	+17 09 52.5		3 688
1981 CQ	1981 01 01.38264	09 25 34.56	+18 15 18.1	17.0	688
1981 CQ	1981 01 01.42431	09 25 33.35	+18 15 29.8		688
1981 CQ *	1981 02 08.18056	08 45 03.04	+20 26 23.3	17.0	4 688
1981 CQ	1981 02 08.22431	08 44 59.87	+20 26 30.2		688
1981 CS	1981 01 01.38264	09 31 26.31	+14 23 48.0	17.0	688
1981 CS	1981 01 01.42431	09 31 25.43	+14 23 56.2		688
1981 CS	1981 01 10.27014	09 27 19.02	+14 58 59.1	16.8	688
1981 CS	1981 01 10.30694	09 27 17.66	+14 59 08.9		688
1981 CS	1981 02 05.20764	09 03 19.54	+17 37 01.6	17.0	688
1981 CS	1981 02 05.24792	09 03 17.13	+17 37 18.3		1 688
1981 CS *	1981 02 08.18056	09 00 07.90	+17 56 01.0	16.8	4 688
1981 CS	1981 02 08.22431	09 00 04.98	+17 56 18.2		688
1981 CT *	1981 02 08.20278	09 17 38.55	+18 24 03.1	17.2	4 688
1981 CT	1981 02 08.24444	09 17 36.49	+18 24 15.8		688
1981 CU *	1981 02 08.20278	09 21 03.40	+22 28 41.5	17.2	4 688
1981 CU	1981 02 08.24444	09 21 00.36	+22 28 36.0		1 688

1981 CV *	1981 02 08.20278	09 23 05.17	+17 15 31.8	17.0	5	688
1981 CV	1981 02 08.24444	09 23 02.48	+17 15 51.2			688
1981 CW *	1981 02 06.17847	05 29 09.79	+29 17 09.0	16.0	5	688
1981 CW	1981 02 06.22292	05 29 17.18	+29 17 55.6			688
1981 CW	1981 03 09.11806	07 21 01.25	+32 56 52.7	16.8		688
1981 CW	1981 03 09.14097	07 21 06.45	+32 56 49.1			688
1981 CX *	1981 02 06.27361	10 36 31.62	+15 47 55.8	17.2	4	688
1981 CX	1981 02 06.29375	10 36 30.58	+15 48 05.1		1	688
1981 CY *	1981 02 06.27361	10 39 09.39	+21 26 41.8	17.0	4	688
1981 CY	1981 02 06.29375	10 39 08.42	+21 26 52.9			688
1981 CZ *	1981 02 05.12639	05 47 01.79	+33 54 55.1	17.2	4	688
1981 CZ	1981 02 05.16597	05 47 01.36	+33 54 44.2			688
1981 CA1 *	1981 02 05.20764	08 48 18.71	+15 52 53.4	17.5	4	688
1981 CA1	1981 02 05.24792	08 48 16.83	+15 53 03.5		3	688
1981 CA1	1981 02 08.18056	08 45 53.05	+16 04 06.1	17.2	1	688
1981 CA1	1981 02 08.22431	08 45 51.06	+16 04 14.8		1	688

Note 1: right ascension uncertain. 2: declination uncertain. 3 = 1 + 2.

4: discoverer Thomas. 5 = 1 + 4. 6: discoverer Bowell.

OBSERVATIONS MADE AT THE LOWELL OBSERVATORY UNDER THE DIRECTION OF C. O.
LAMPLAND AND H. L. GICLAS. MEASURED BY E. BOWELL.

Object	Date	UT	R. A. (1950)	Decl.	N	Obs.
54	1959 02 02.27896	08 55 48.68	+17 52 35.1			690
108	1930 12 24.18750	04 47 35.65	+28 44 49.4			690
108	1930 12 25.19896	04 46 46.19	+28 42 44.8			690
175	1930 12 24.18750	04 42 23.77	+25 53 12.9			690
175	1930 12 25.19896	04 41 37.89	+25 51 41.7			690
214	1949 08 18.28181	22 06 11.59	-13 11 47.0			690
214	1949 08 20.28191	22 04 22.11	-13 19 02.5			690
271	1949 08 18.28181	21 51 58.22	-14 07 04.3			690
271	1949 08 20.28191	21 49 58.45	-14 13 09.5	3		690
274	1948 09 07.27984	23 11 20.69	-10 41 32.2			690
274	1948 09 08.27984	23 10 35.35	-10 46 26.6	2		690
274	1948 09 09.27984	23 09 50.47	-10 51 19.0			690
621	1949 08 18.28181	22 03 09.04	-15 13 48.4			690
621	1949 08 20.28191	22 01 36.11	-15 23 24.5			690
658	1949 08 18.28181	22 02 14.07	-13 05 51.0			690
658	1949 08 20.28191	22 00 33.78	-13 13 48.5			690
731	1930 12 24.18750	04 40 50.22	+30 22 58.0			690
731	1930 12 25.19896	04 39 57.61	+30 22 41.6			690
841	1930 12 24.18750	04 53 31.23	+29 33 55.6			690
841	1930 12 25.19896	04 52 27.49	+29 31 09.1			690
938	1948 09 07.27984	23 08 15.05	-08 53 18.2			690
938	1948 09 08.27984	23 07 31.63	-08 58 34.2			690
938	1948 09 09.27984	23 06 48.39	-09 03 49.0	1		690
973	1948 09 07.27984	22 54 37.62	-09 45 16.6			690
973	1948 09 08.27984	22 53 46.03	-09 46 14.6			690
973	1948 09 09.27984	22 52 54.51	-09 47 08.2			690
1145	1949 08 18.28181	22 03 09.17	-16 10 56.3			690
1145	1949 08 20.28191	22 01 04.39	-16 15 15.2	3		690
1244	1930 12 24.18750	04 53 36.47	+26 30 32.0			690
1244	1930 12 25.19896	04 52 33.85	+26 24 11.4			690
1263	1959 03 06.32639	10 49 00.86	+10 45 35.9			690
1263	1959 03 07.30556	10 48 15.81	+11 03 16.4			690
1283	1948 09 07.27984	23 20 46.83	-06 36 13.9			690
1283	1948 09 08.27984	23 20 07.35	-06 44 05.9			690
1283	1948 09 09.27984	23 19 27.72	-06 51 57.1			690
1633	1948 09 07.27984	23 16 47.92	-07 47 24.1	2		690
1633	1948 09 08.27984	23 16 05.39	-07 52 07.1			690

1633	1948	09	09.27984	23	15	23.46	-07	56	54.5	690
2009	1959	03	06.32639	10	52	40.65	+11	00	19.9	690
2009	1959	03	07.30556	10	51	55.74	+11	05	18.8	690
2357	1959	03	06.32639	10	58	23.42	+05	39	01.5	690
2357	1959	03	07.30556	10	57	54.60	+05	42	19.1	690
1930 YL	1930	12	24.18750	04	39	01.88	+31	37	06.1	690
1930 YL	1930	12	25.19896	04	38	00.51	+31	35	05.5	690
1930 YM	1930	12	24.18750	04	41	16.96	+28	12	42.2	690
1930 YM	1930	12	25.19896	04	40	19.47	+28	07	29.3	690
1930 YN	1930	12	24.18750	04	46	56.41	+29	59	36.4	690
1930 YN	1930	12	25.19896	04	45	59.20	+29	53	04.3	690
1948 RD	1948	09	07.27984	22	55	33.51	-10	33	00.4	2 690
1948 RD	1948	09	08.27984	22	54	32.95	-10	32	37.8	690
1948 RD	1948	09	09.27984	22	53	32.62	-10	32	08.2	2 690
1948 RF	1948	09	08.27984	22	56	24.48	-08	47	19.0	1 690
1948 RF	1948	09	09.27984	22	55	28.67	-08	49	33.4	1 690
1948 RG	1948	09	08.27984	23	00	20.79	-06	46	42.1	690
1948 RG	1948	09	09.27984	22	59	36.26	-06	51	51.1	1 690
1948 RH	1948	09	07.27984	23	07	56.29	-05	44	56.5	690
1948 RH	1948	09	08.27984	23	07	11.71	-05	59	05.4	2 690
1948 RH	1948	09	09.27984	23	06	27.43	-06	13	13.3	3 690
1948 RK	1948	09	07.27984	23	10	10.02	-05	20	19.6	1 690
1948 RK	1948	09	08.27984	23	09	06.53	-05	19	51.2	1 690
1948 RK	1948	09	09.27984	23	08	03.63	-05	19	23.6	1 690
1948 RL	1948	09	07.27984	23	10	36.67	-07	57	45.0	690
1948 RL	1948	09	08.27984	23	09	56.94	-08	11	57.0	690
1948 RL	1948	09	09.27984	23	09	17.71	-08	25	58.6	2 690
1948 RM	1948	09	07.27984	23	11	12.54	-07	45	02.6	690
1948 RM	1948	09	08.27984	23	10	24.33	-07	48	00.4	690
1948 RM	1948	09	09.27984	23	09	36.61	-07	50	56.8	690
1948 RN	1948	09	07.27984	23	14	00.86	-04	08	15.9	2 690
1948 RN	1948	09	08.27984	23	13	15.94	-04	22	05.6	690
1948 RN	1948	09	09.27984	23	12	30.71	-04	35	56.7	2 690
1949 QN	1949	08	18.28181	21	55	33.37	-13	53	07.3	690
1949 QN	1949	08	20.28191	21	53	53.15	-14	01	00.9	690
1949 QP	1949	08	18.28181	22	01	08.62	-15	21	57.3	690
1949 QP	1949	08	20.28191	21	59	23.05	-15	27	13.8	690
1959 ET	1959	03	06.32639	10	52	56.06	+10	54	50.6	690
1959 ET	1959	03	07.30556	10	52	10.00	+11	02	45.3	690
1978 RP	1959	02	01.28681	09	00	00.20	+18	02	57.1	4 690
1978 RP	1959	02	02.27896	08	59	10.42	+18	07	10.6	4 690

Note 1: right ascension uncertain. 2: declination uncertain. 3 = 1 + 2.

4: images found by E. Bowell from an ephemeris by B. G. Marsden.

OBSERVATIONS MADE AT THE GOETHE LINK OBSERVATORY. MEASURED AND REDUCED AT INDIANA UNIVERSITY.

Object	Date	UT	R. A. (1950)	Decl.	N Obs.	
2305	1952	09	16.13475	23 02 57.08	-14 19 48.6	760
2305	1952	09	16.17294	23 02 55.05	-14 19 53.6	760
2305	1952	09	16.22294	23 02 52.51	-14 20 02.6	760
2305	1952	09	16.26427	23 02 50.25	-14 20 07.8	760
2346	1958	10	14.29723	02 38 01.99	+21 31 56.4	760
2346	1958	10	14.36112	02 37 59.25	+21 31 33.8	760
1949 UT	1949	10	28.20638	01 53 18.26	-01 06 23.5	760
1949 UT	1949	10	28.27999	01 53 14.98	-01 07 09.8	760
1949 XA	1949	12	14.24508	04 36 40.25	+24 37 22.9	760
1949 XA	1949	12	14.26661	04 36 38.93	+24 37 19.8	760
1951 CF	1951	02	10.10433	09 41 07.08	+13 37 03.4	760
1951 CF	1951	02	10.21879	09 41 04.09	+13 37 22.4	760

1951 CL	1951 02 10.17433	09 28 22.28	+12 28 43.7	760
1951 CL	1951 02 10.21879	09 28 19.66	+12 29 08.6	760
1951 CN	1951 02 10.10433	09 24 19.21	+09 57 49.8	760
1951 CN	1951 02 10.21879	09 24 16.88	+09 57 52.2	760
1951 XB	1951 12 03.16354	02 59 19.33	+15 57 50.5	760
1951 XB	1951 12 03.20850	02 59 17.51	+15 57 43.3	760
1951 XC	1951 12 03.16354	02 58 44.22	+14 29 29.0	760
1951 XC	1951 12 03.20850	02 58 41.73	+14 29 42.9	760
1951 XD	1951 12 03.16354	02 42 31.81	+11 17 26.4	1 760
1951 XD	1951 12 03.20850	02 42 30.49	+11 17 24.2	1 760
1952 BG	1952 01 30.30829	09 09 09.87	+24 22 00.2	760
1952 BG	1952 01 30.34442	09 09 08.06	+24 22 19.6	760
1952 BL	1952 01 30.30829	08 45 41.66	+19 49 03.5	760
1952 BL	1952 01 30.34442	08 45 39.75	+19 49 15.8	760
1952 HQ	1952 04 17.20833	11 13 57.48	-03 44 39.7	1 760
1952 HQ	1952 04 17.24999	11 13 56.36	-03 44 31.9	1 760
1952 HR	1952 04 17.20833	10 59 12.33	-05 26 56.7	760
1952 HR	1952 04 17.24999	10 59 11.16	-05 26 53.0	760
1952 HJ1	1952 04 29.18713	13 25 07.78	+01 23 25.7	760
1952 HJ1	1952 04 29.24549	13 25 05.29	+01 23 35.8	760
1952 HL1	1952 04 29.18713	13 20 11.82	-00 12 59.3	760
1952 HL1	1952 04 29.24549	13 20 09.44	-00 12 41.4	760
1952 JG	1952 05 01.29998	16 30 12.29	-21 03 59.8	760
1952 JG	1952 05 01.36456	16 30 09.78	-21 04 00.8	760
1952 JL	1952 05 01.29998	16 33 24.65	-19 48 42.7	760
1952 JL	1952 05 01.36456	16 33 22.29	-19 48 42.8	760
1952 MK	1952 06 21.24149	19 16 25.15	-26 27 20.7	760
1952 MK	1952 06 21.28664	19 16 22.37	-26 27 46.4	760
1952 OM	1952 07 24.29688	21 57 47.28	-12 22 25.5	760
1952 OO	1952 07 25.30176	22 20 15.72	-09 21 02.4	760
1952 OO	1952 07 25.35070	22 20 14.65	-09 21 14.8	760
1952 OU	1952 07 28.28648	22 14 03.04	-08 49 21.4	760
1952 QY	1952 08 25.30210	23 59 26.38	-09 06 38.7	760
1952 QY	1952 08 25.32988	23 59 25.93	-09 06 49.9	760
1952 RD	1952 09 13.13376	21 26 07.89	-14 11 30.5	760
1952 SE	1952 09 16.22294	23 15 09.18	-10 37 56.2	760
1952 SF	1952 09 16.22294	23 20 00.39	-14 44 22.6	760
1952 SN	1952 09 24.20838	23 08 03.41	-06 28 21.4	760
1952 SN	1952 09 24.26809	23 08 01.52	-06 28 38.9	760
1952 SQ	1952 09 24.20838	23 20 41.79	-03 08 36.1	760
1952 SQ	1952 09 24.26809	23 20 39.48	-03 09 21.7	760
1952 SR	1952 09 24.20838	23 18 08.29	-01 57 21.0	1 760
1952 SR	1952 09 24.26809	23 18 05.43	-01 57 55.7	1 760
1952 SA1	1952 09 29.31738	01 40 03.41	+10 14 20.7	760
1952 SA1	1952 09 29.36601	01 40 01.14	+10 14 09.5	760
1952 TD	1952 10 12.14481	01 10 23.35	-04 50 57.7	760
1952 TD	1952 10 12.18995	01 10 20.83	-04 51 20.5	760
1952 UA	1952 10 21.14523	00 51 45.70	-16 55 08.4	760
1952 UA	1952 10 21.18340	00 51 43.92	-16 55 15.6	760
1952 UB	1952 10 21.22712	02 49 52.15	-03 38 17.4	760
1952 UB	1952 10 21.27401	02 49 49.60	-03 38 38.0	760
1952 UD	1952 10 21.22712	02 40 41.61	-03 59 34.0	760
1952 UD	1952 10 21.27401	02 40 39.78	-03 59 54.1	760
1952 UP	1952 10 23.23059	02 10 44.92	+03 20 21.8	760
1952 US	1952 10 23.18892	02 00 55.57	+04 04 10.6	760
1952 US	1952 10 23.23059	02 00 52.96	+04 04 12.5	760
1952 VF	1952 11 14.13015	01 31 44.29	+03 53 54.6	760
1952 VF	1952 11 14.17321	01 31 42.94	+03 53 47.0	760
1952 WA	1952 11 16.09323	02 02 49.97	+09 21 13.7	760

1952 WA	1952 11 16.13421	02 02 48.53	+09 21 03.8	760
1952 WB	1952 11 16.09323	02 04 00.81	+06 13 52.7	760
1952 WB	1952 11 16.13421	02 03 59.20	+06 13 51.0	760
1952 WD	1952 11 16.09323	01 47 43.85	+07 17 26.5	760
1952 WD	1952 11 16.13421	01 47 41.73	+07 17 31.4	760
1952 YB	1952 12 16.22956	04 10 59.71	+10 59 27.9	760
1952 YB	1952 12 16.27951	04 10 57.19	+10 59 39.1	760
1952 YG	1952 12 18.13193	23 36 37.29	+03 27 14.8	760
1952 YG	1952 12 18.17707	23 36 39.79	+03 27 49.6	760
1953 DB	1953 02 19.23472	08 27 33.27	+20 23 12.4	760
1953 DB	1953 02 19.28334	08 27 31.01	+20 23 12.4	760
1961 US	1961 10 18.25762	01 32 43.51	+11 13 04.8	760
1961 US	1961 10 18.29998	01 32 41.45	+11 12 51.9	760
1963 FG	1963 03 28.26973	11 46 20.99	+01 09 50.2	760
1963 FG	1963 03 28.31660	11 46 18.55	+01 10 06.7	760
1963 VE	1963 11 11.16080	03 15 32.63	+12 20 36.7	760
1963 VE	1963 11 11.20594	03 15 30.03	+12 20 35.1	760
1964 VA	1964 11 01.04395	01 07 56.94	+25 05 39.1	760
1964 VA	1964 11 01.08700	01 07 54.25	+25 05 32.8	760

Note 1: the approximate discovery observations (MPC 718, 821 and 857) were somewhat in error.

OBSERVATIONS MADE AT THE AGASSIZ STATION BY R. E. MC CROSKY, C.-Y. SHAO, G. SCHWARTZ AND J. BULGER (WITH ASSISTANCE FROM C. M. BARDWELL, D. W. E. GREEN AND B. G. MARSDEN).

Object	Date	UT	R. A. (1950)	Decl.	Mag.	Obs.
203	1981 02 10.32256	11 18 41.08	+05 13 53.6	15	801	
2086	1981 03 11.12774	08 52 25.45	+19 40 18.0		801	
2356	1981 01 06.39194	08 27 46.32	-01 28 55.9		801	
A921 SA	1981 02 10.07595	08 07 17.73	+33 56 10.7		801	
A921 SA	1981 02 13.29100	08 04 41.43	+33 53 00.1		801	
1929 PC	1980 09 11.03486	17 31 48.00	-15 53 16.9		801	
1931 TV	1980 11 09.06582	23 10 06.03	-03 22 44.7		801	
1952 UT	1981 03 04.29050	10 05 13.95	+23 13 36.1		801	
1968 SB	1981 02 01.15315	05 40 47.86	+24 57 13.9		801	
1968 SB	1981 02 04.17573	05 40 08.70	+24 57 21.0		801	
1969 VW	1981 02 10.32256	11 16 41.65	+05 17 06.7		801	
1969 VW	1981 02 28.28242	11 01 21.76	+07 23 31.5		801	
1969 VW	1981 03 11.23501	10 50 47.77	+08 45 33.6		801	
1969 VW	1981 03 12.26662	10 49 49.58	+08 52 54.5		801	
1973 SJ4	1980 02 22.27075	10 32 50.60	+02 24 48.4		801	
1977 RA	1980 09 05.02924	18 43 17.19	-12 11 36.7		801	
1978 GD	1981 01 02.97863	00 44 22.08	+01 24 04.3		801	
1979 MM5	1981 01 31.25770	08 19 33.56	+17 26 29.6		801	
1979 MM5	1981 02 01.25598	08 18 31.94	+17 29 44.4		801	
1979 MM5	1981 02 04.26524	08 15 31.12	+17 39 18.3		801	
1979 OC	1981 01 11.19110	07 37 41.87	+13 55 05.5		801	
1979 QE	1981 01 09.17150	05 09 26.74	+26 01 25.0		801	
1980 PA	1980 12 05.39801	07 58 30.47	+20 32 06.9		801	
1981 BC	1981 02 28.25249	09 19 57.42	+17 23 26.3		801	
1981 BG *	1981 01 31.25770	08 18 20.81	+17 22 55.0	19	801	
1981 BG	1981 02 01.25598	08 17 20.34	+17 25 49.4	19.5	801	
1981 DA *	1981 02 28.25249	09 21 26.38	+17 12 26.0	17.5	801	
1981 DB *	1981 02 28.28242	11 01 50.38	+07 16 36.2	18	801	
1981 DC *	1981 02 28.28242	11 02 37.10	+07 16 24.1	18	801	
1981 EA *	1981 03 04.29050	10 04 07.41	+23 10 43.0	18	801	
1981 EB *	1981 03 04.29050	10 05 43.00	+23 19 31.9	17.5	801	
1981 EC *	1981 03 11.23501	10 52 32.86	+08 29 42.0	18	801	
1981 EC	1981 03 12.26662	10 51 38.08	+08 32 35.4		801	

OBSERVATIONS MADE AT THE EUROPEAN SOUTHERN OBSERVATORY BY H.-E. SCHUSTER, G. PIZARRO AND O. PIZARRO. SCANNED AND MEASURED BY R. M. WEST.

Object	Date	UT	R. A. (1950)			Decl.	Mag.	N	Obs.
389	1980	08	10.25584	23	41	01.29	+09 17	20.1	809
874	1980	08	06.27292	23	20	36.55	+03 50	14.0	809
874	1980	08	07.31528	23	20	13.09	+03 47	01.8	809
937	1980	08	06.27292	23	27	07.90	+04 38	42.3	809
937	1980	08	07.31528	23	27	01.63	+04 41	13.3	809
937	1980	08	09.33090	23	26	43.12	+04 45	08.0	809
937	1980	08	10.25584	23	26	32.03	+04 46	32.1	809
949	1980	08	09.33090	23	40	15.27	+04 23	11.2	809
949	1980	08	10.25584	23	39	47.89	+04 23	31.4	809
1287	1980	08	09.33090	23	40	41.90	+06 44	51.6	809
1287	1980	08	10.25584	23	40	24.08	+06 42	52.8	809
2307	1980	08	09.33090	23	26	25.72	+07 59	23.7	809
2307	1980	08	10.25584	23	26	01.47	+07 59	04.8	809
1980 PA	1980	08	06.27292	23	27	31.71	+04 48	35.8	17.0 809
1980 PA	1980	08	07.31528	23	30	18.88	+05 20	07.7	809
1980 PA	1980	08	09.33090	23	35	55.23	+06 23	31.0	809
1980 PA	1980	08	10.25584	23	38	36.96	+06 53	45.2	809
1980 PA	1980	08	14.28958	23	51	09.37	+09 14	24.8	809
1980 PD1 *	1980	08	06.27292	23	17	25.90	+05 27	26.2	18.5 809
1980 PD1	1980	08	07.31528	23	17	17.82	+05 31	49.0	809
1980 PE1 *	1980	08	06.27292	23	18	01.98	+04 40	56.6	17.0 809
1980 PE1	1980	08	07.31528	23	17	29.48	+04 42	19.4	809
1980 PF1 *	1980	08	06.27292	23	19	43.39	+05 50	52.9	18.0 809
1980 PF1	1980	08	07.31528	23	19	34.79	+05 49	45.0	809
1980 PG1 *	1980	08	06.27292	23	20	15.25	+02 37	16.9	18.5 809
1980 PG1	1980	08	07.31528	23	19	43.58	+02 35	33.4	809
1980 PH1 *	1980	08	06.27292	23	21	23.44	+04 20	23.6	18.0 809
1980 PJ1 *	1980	08	06.27292	23	23	33.00	+03 41	36.2	17.5 809
1980 PJ1	1980	08	07.31528	23	23	21.99	+03 46	15.1	809
1980 PJ1	1980	08	09.33090	23	22	54.64	+03 54	35.5	809
1980 PK1 *	1980	08	06.27292	23	23	44.55	+05 42	55.0	18.0 809
1980 PK1	1980	08	07.31528	23	23	03.40	+05 49	40.3	809
1980 PL1 *	1980	08	06.27292	23	23	54.96	+01 54	11.2	18.5 809
1980 PL1	1980	08	07.31528	23	23	41.20	+01 59	19.5	809
1980 PM1 *	1980	08	06.27292	23	24	56.97	+04 50	28.0	17.5 809
1980 PM1	1980	08	07.31528	23	24	48.04	+04 43	08.7	809
1980 PN1 *	1980	08	06.27292	23	25	56.33	+04 10	52.3	18.5 809
1980 PN1	1980	08	07.31528	23	25	33.04	+04 12	51.2	809
1980 PO1 *	1980	08	06.27292	23	26	54.28	+05 56	09.5	18.5 809
1980 PO1	1980	08	07.31528	23	26	26.16	+05 56	33.7	809
1980 PO1	1980	08	09.33090	23	25	28.35	+05 56	53.5	809
1980 PP1 *	1980	08	06.27292	23	27	36.84	+04 45	04.4	18.0 809
1980 PP1	1980	08	07.31528	23	27	15.61	+04 49	22.5	809
1980 PP1	1980	08	09.33090	23	26	29.66	+04 57	09.5	809
1980 PP1	1980	08	10.25584	23	26	06.54	+05 00	31.8	18.0 809
1980 PQ1 *	1980	08	06.27292	23	29	11.50	+02 28	20.0	18.5 809
1980 PQ1	1980	08	07.31528	23	28	52.96	+02 29	19.3	809
1980 PR1 *	1980	08	06.27292	23	29	33.80	+02 43	08.6	18.0 809
1980 PR1	1980	08	07.31528	23	29	05.46	+02 40	37.0	809
1980 PS1 *	1980	08	06.27292	23	29	46.71	+03 18	20.5	17.5 809
1980 PS1	1980	08	07.31528	23	29	25.98	+03 27	36.2	809
1980 PS1	1980	08	09.33090	23	28	40.05	+03 44	59.1	809
1980 PT1 *	1980	08	06.27292	23	29	55.47	+04 58	56.1	19.0 809
1980 PT1	1980	08	07.31528	23	29	29.24	+05 00	20.8	809
1980 PT1	1980	08	09.33090	23	28	34.91	+05 02	36.6	809
1980 PT1	1980	08	10.25584	23	28	08.45	+05 03	27.8	18.5 809

1980 PU1 *	1980 08 06.27292	23 30 25.63	+05 56 04.2	18.0	809
1980 PU1	1980 08 07.31528	23 30 26.11	+05 52 10.9		809
1980 PU1	1980 08 10.25584	23 30 18.92	+05 39 21.8	18.5	809
1980 PV1 *	1980 08 06.27292	23 32 10.84	+05 34 10.7	18.0	809
1980 PV1	1980 08 07.31528	23 31 42.44	+05 34 41.8		809
1980 PV1	1980 08 09.33090	23 30 43.56	+05 35 08.0		809
1980 PV1	1980 08 10.25584	23 30 15.03	+05 35 07.1	18.0	809
1980 PW1 *	1980 08 06.27292	23 32 56.96	+03 02 17.7	18.5	809
1980 PW1	1980 08 07.31528	23 32 42.44	+02 58 22.9		809
1980 PX1 *	1980 08 06.27292	23 33 13.17	+02 43 35.7	18.5	809
1980 PX1	1980 08 07.31528	23 32 55.68	+02 45 16.0		809
1980 PY1 *	1980 08 06.27292	23 34 27.67	+02 19 47.8	18.5	809
1980 PY1	1980 08 07.31528	23 34 03.95	+02 21 29.0		1 809
1980 PZ1 *	1980 08 06.27292	23 34 58.53	+04 33 34.6	19.5	809
1980 PZ1	1980 08 07.31528	23 34 33.44	+04 33 47.2		809
1980 PZ1	1980 08 10.25584	23 33 14.95	+04 33 26.6	19.0	809
1980 PA2 *	1980 08 06.27292	23 35 30.71	+06 16 10.7	19.0	809
1980 PA2	1980 08 07.31528	23 35 00.66	+06 19 01.3		809
1980 PA2	1980 08 09.33090	23 33 58.27	+06 24 02.5		809
1980 PA2	1980 08 10.25584	23 33 27.90	+06 26 03.7	18.5	809
1980 PB2 *	1980 08 06.27292	23 35 57.70	+04 44 36.8	18.0	809
1980 PB2	1980 08 07.31528	23 35 42.14	+04 41 40.2		809
1980 PB2	1980 08 09.33090	23 35 08.42	+04 35 26.3		809
1980 PB2	1980 08 10.25584	23 34 51.49	+04 32 20.1	17.5	809
1980 PC2 *	1980 08 06.27292	23 36 00.97	+03 00 49.1	19.0	809
1980 PC2	1980 08 07.31528	23 35 36.81	+02 59 35.1		809
1980 PD2 *	1980 08 06.27292	23 36 01.87	+03 38 41.2	17.5	809
1980 PD2	1980 08 07.31528	23 35 48.55	+03 35 23.0		809
1980 PD2	1980 08 09.33090	23 35 19.03	+03 28 21.6		809
1980 PE2 *	1980 08 07.31528	23 25 23.59	+05 59 39.5	18.5	809
1980 PF2 *	1980 08 10.25584	23 27 32.59	+08 57 08.4	17.0	809
1980 PG2 *	1980 08 10.25584	23 30 09.04	+08 38 21.7	18.0	809
1980 PH2 *	1980 08 10.25584	23 41 49.70	+06 09 19.4	19.0	809
1980 PH2	1980 08 14.28958	23 39 52.74	+06 16 41.8	18.5	809
1980 PJ2 *	1980 08 10.25584	23 45 19.80	+05 37 51.9	18.0	809
1980 PK2 *	1980 08 10.25584	23 46 46.35	+04 41 09.2	17.0	809

Note 1: diffuse image.

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ORBITAL ELEMENTS OF ONE-OPPOSITION MINOR PLANETS.

The orbit computers and authors of double designations are B = C. M. Bardwell, E = E. Bowell, M = B. G. Marsden, U = T. Urata, W = J. G. Williams. For further information see MPC 5833.

Planet	B(1,0)	Epoch	M	Peri.	Node	Incl.	e	a	Arc	O	N	C
1976 GM2	13.5	760412	326.64	113.57	132.65	1.66	0.1727	3.1952	33 0			M
1978 CH	12.5	780221	317.16	43.74	136.22	5.97	0.0342	3.4052	32 4 1			W
1978 CK	13.0	780221	33.92	147.66	309.57	19.55	0.0885	3.1685	6 3			W
1980 PJ1	15.5	800809	310.65	130.74	277.90	4.50	0.2402	2.1273	3 3			M
1980 PO1	14.0	800809	252.96	192.68	285.53	7.70	0.2923	2.7903	3 3			M
1980 PP1	15.0	800809	308.50	114.60	303.71	8.51	0.2573	2.6525	4 4			M
1980 PS1	15.5	800809	5.85	7.26	317.82	11.35	0.2939	2.8063	3 3			M
1980 PT1	15.0	800809	58.60	333.06	302.30	8.47	0.0842	3.0579	4 4			M
1980 PU1	15.5	800809	334.34	196.69	181.15	12.07	0.2255	2.6336	4 3 2			M
1980 PV1	14.0	800809	75.39	317.63	286.02	6.68	0.2023	2.8227	4 4 2			M
1980 PZ1	15.5	800809	249.93	196.13	278.85	5.28	0.2336	2.5193	4 3 2			M
1980 PA2	15.0	800809	220.07	180.72	311.69	11.20	0.1468	2.4305	4 4			M

1980 PB2	14.0	800809	2.30	150.93	189.30	10.69	0.0584	3.1019	4 4	M
1980 PD2	14.0	800809	3.66	152.57	184.49	9.99	0.1075	3.0414	3 3 2	M
1980 XE	15.0	801227	251.68	281.79	300.31	19.00	0.0267	1.9357	86 0 1	M
1980 YC	15.0	810205	46.97	7.01	59.27	7.12	0.1209	2.4218	33 8	M
1980 YH	12.5	810116	33.70	314.90	128.80	17.88	0.1394	3.1671	83 7	E
1980 YM	14.5	810116	45.97	158.92	251.63	3.38	0.1640	2.5715	28 6 1	M
1981 AA	13.9	810205	38.76	307.03	110.26	23.96	0.2949	2.3280	68 6	E
1981 AD	13.0	810116	35.53	312.13	111.55	16.38	0.1800	2.6654	58 8	E
1981 AQ	14.4	810205	16.89	352.34	121.18	10.41	0.1369	2.3472	58 0	M
1981 BC	16.0	810205	37.48	108.63	332.55	10.13	0.2313	2.4181	28 5	M
1981 BD	15.0	810205	286.89	266.43	301.91	9.41	0.0914	2.3412	4 6	B
1981 BF	13.0	810205	303.79	117.12	72.33	10.32	0.1012	3.0777	2 6 2	B
1981 CA	11.5	810225	147.22	272.20	96.43	13.06	0.1689	3.0990	28 8	U
1981 CB	12.5	810225	321.28	47.98	158.46	12.66	0.0736	2.7963	28 8	U
1981 CH	15.5	810205	354.95	186.98	315.88	23.00	0.1811	2.2638	9 6	B
1981 CN	14.7	810116	319.51	249.25	283.25	1.96	0.0839	2.2385	36 5	E

Note 1: double designations 1978 CH = 1978 EV (W), 1980 XE = 1980 YD (M),
1980 YM = 1981 AJ1 = 1981 BE (M). 2: e assumed.

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ORBITAL ELEMENTS BY C. M. BARDWELL, SMITHSONIAN ASTROPHYSICAL OBSERVATORY.

The identifications are by C. M. Bardwell unless otherwise stated.

(2358)* 1929 RE = 1945 TB = 1950 ST = 1964 JD = 1966 UN = 1968 BB
= 1971 TO1 = 1973 AB = 1974 EE = 1976 SP

Discovered 1929 Sept. 2 by K. Reinmuth at Heidelberg. The key identification 1929 RE = 1950 ST is by A. Patry (MPC 1900). The identifications 1929 RE = 1964 JD = 1971 TO1 are by O. Kippes.

Epoch 1981 July 15.0 ET = JDE 2444800.5

M 276.75369	(1950.0)	P	Q
n 0.18772435	Peri. 49.26667	+0.82751912	-0.55964378
a 3.0208023	Node 344.59270	+0.45065070	+0.70974271
e 0.1019049	Incl. 9.71740	+0.33485230	+0.42785993
P 5.25	B(1,0) 12.0		

Residuals in seconds of arc (or two decimals in units of degrees)

290902	024(0.05+ 0.01+)	501006	711	3.6+	2.4-	Y	680124	095	0.2-	3.2-
290907	024 0.4- 0.1-	640506	822	0.1+	0.8+		711012	095	0.2-	1.0+
290911	024(13.5- 1.9-)	640506	822	1.1+	0.2+		711015	095	5.5-	1.4-
290927	024 1.7- 0.0	640513	822	0.2-	0.4+		730101	095	3.3-	3.9+
290928	024 (0.5+ 33.5+)	640514	822	0.2-	0.0		740313	095	2.8-	5.8-
291007	024 1.9- 0.8+	640515	822	0.9+	0.4-		740320	095	3.7+	6.4+
451001	062 (2.3+ 22.5+)X	640515	822	0.2-	0.5-		760917	095	0.2-	0.7+
500917	711 2.8+ 0.1+ Y	661018	095	4.0+	3.0+					

(2359)* 1931 TV = 1979 HB

Discovered 1931 Oct. 5 by K. Reinmuth at Heidelberg. The identification is by E. Bowell (MPC 4780).

Epoch 1981 July 15.0 ET = JDE 2444800.5

M 138.31654	(1950.0)	P	Q
n 0.26089184	Peri. 75.88610	+0.19941514	+0.97936543
a 2.4256551	Node 205.68721	-0.92569730	+0.17729072
e 0.1137952	Incl. 4.34202	-0.32143133	+0.09701217
P 3.78	B(1,0) 13.5		

Residuals in seconds of arc

311005	024	0.7+	1.6+	790423	809	0.6+	0.3-	790430	809	1.0-	0.5+
311007	024	1.9-	0.1-	790425	809	0.8-	0.4+	790430	809	1.4-	0.9+
311103	024	1.0+	0.7-	790425	809	0.7-	0.4+	800907	046	1.2-	0.3-
790421	809	0.5-	0.1+	790425	809	0.6+	0.2-	800907	046	0.3+	0.8+
790421	809	0.3-	0.9+	790426	809	0.3-	0.3-	800908	046	0.5-	0.9-
790421	809	0.7+	0.1+	790426	809	0.1-	0.0	800908	046	0.2+	1.1+
790422	809	0.7-	0.0	790426	809	0.6-	0.9+	801010	688	1.5+	0.5-
790422	809	0.4-	0.5-	790429	809	0.3+	1.4-	801010	688	0.8+	1.4-
790422	809	0.3-	0.7-	790429	809	0.4-	0.4-	801109	801	2.1-	0.0
790423	809	0.0	0.3+	790429	809	1.5-	0.4+				
790423	809	0.2-	0.0	790430	809	0.8-	0.6+				

(2360)* 1975 VD3 = 1949 XD = 1962 XC

Discovered 1975 Nov. 2 by T. Smirnova at the Crimean Astrophysical Observatory. The key identification 1975 VD3 = 1949 XD is by E. Bowell (MPC 5418).

Epoch 1981 July 15.0 ET = JDE 2444800.5

M	107.07214	(1950.0)	P	Q
n	0.22544512	Peri. 1.18069	+0.77365999	-0.63253751
a	2.6736763	Node 38.13765	+0.58080072	+0.68485189
e	0.1943735	Incl. 3.40651	+0.25322072	+0.36176537
P	4.37	B(1,0) 13.5		

Residuals in seconds of arc

491214	760	2.0-	1.0-	621202	760	0.6-	0.1-	810101	688	4.9-	0.2+
491214	760	2.6-	1.0-	751102	095	1.6-	1.6-	810110	688	0.1-	0.7+
491225	760	4.0+	1.2-	751107	095	1.9+	1.1-	810202	046	0.4-	0.6+
491225	760	1.0+	1.7+	751201	095	0.2+	1.2-	810202	046	1.5+	0.1+
621201	760	1.0-	0.7-	751203	095	1.1+	0.2+	810209	046	0.4+	1.6-
621201	760	0.5+	0.0	801215	801	0.5-	0.4-	810209	046	3.3+	0.4+
621202	760	0.5+	5.3+	810101	688	0.6-	1.9-				

(2361)* 1976 GQ1 = 1976 JE = 1968 UB1 = 1970 EK1

Discovered 1976 Apr. 1 by N. S. Chernykh at the Crimean Astrophysical Observatory.

Epoch 1981 July 15.0 ET = JDE 2444800.5

M	30.40119	(1950.0)	P	Q
n	0.17686889	Peri. 90.18316	-0.68047432	-0.73251879
a	3.1431740	Node 42.71895	+0.66047198	-0.62450616
e	0.1363495	Incl. 1.62678	+0.31738220	-0.27093960
P	5.57	B(1,0) 13.0		

Residuals in seconds of arc

681022	095	2.7+	0.3-	760401	095	3.3-	1.4-	810110	688	0.1-	0.8-
681023	095	3.5-	0.4-	760404	095	1.1-	1.1-	810110	688	0.3+	0.6+
681026	095	1.0+	0.4-	760501	095	1.6+	0.3-	810202	046	2.0-	0.8+
700302	805	0.1+	0.5+	760502	095	2.0+	0.4+	810202	046	1.0-	1.4+
700302	805	0.5+	0.3+	810101	688	1.3+	2.0-	810208	688	0.8+	0.6-
700302	805	0.4+	1.7+	810101	688	0.4+	0.9-				

(2362)* 1976 SH2 = 1969 LJ = 1969 NA = 1973 YA1

Discovered 1976 Sept. 24 by N. S. Chernykh at the Crimean Astrophysical Observatory. The identification 1976 SH2 = 1973 YA1 was found independently by E. Bowell (MPC 5321). The identification 1976 SH2 = 1969 NA is by T. Urata (NOC 1067).

Epoch 1981 July 15.0 ET = JDE 2444800.5

M	174.07026		(1950.0)		P		Q
n	0.30286195	Peri.	349.95991	+0.99966546		+0.02366499	
a	2.1960366	Node	8.70440	-0.01622506		+0.88804012	
e	0.1928937	Incl.	3.95477	-0.02014252		+0.45915652	
P	3.25	B(1,0)	15.0				

Residuals in seconds of arc

690608	808	0.1+	0.4-	731221	095	5.8-	0.1-	761025	095	0.5-	0.7+
690609	808	0.5-	0.4-	760924	095	0.3+	0.9+	761027	095	4.0-	0.4+
690617	808	0.4-	0.2-	760925	095	1.9+	2.0+	810131	801	0.1-	0.4+
690701	808	0.7+	1.0+	760928	095	3.9+	0.0	810201	801	0.9+	0.2+
731220	095	5.9+	0.3-	760929	095	2.7-	3.8-	810204	801	0.6-	0.1-

(2363)* 1977 TJ3

Discovered 1977 Oct. 4 at the Purple Mountain Observatory.

Epoch 1981 July 15.0 ET = JDE 2444800.5

M	231.51045		(1950.0)		P		Q
n	0.08492634	Peri.	51.85402	-0.18372583		+0.94325036	
a	5.1259510	Node	211.20812	-0.98247063		-0.16717315	
e	0.0350884	Incl.	32.26798	+0.03156371		+0.28693534	
P	11.61	B(1,0)	10.0				

Residuals in seconds of arc

771004	330	0.2+	0.7-	791026	801	0.3+	2.4-	801113	801	0.2+	0.2+
771010	330	1.0+	1.8+	791113	330	0.9+	0.3+	801206	474	0.9-	0.0
771016	330	0.6+	0.4-	791118	330	4.5-	0.4-	801206	474	0.9-	0.8+
771101	330	0.6+	0.1-	791212	801	0.8+	1.0+	810101	688	3.1+	1.5-
771108	330	2.2-	0.2-	800117	801	0.3+	1.3+	810103	474	0.0	1.0+
791022	801	0.5-	0.2+	800122	801	0.2-	0.7-	810103	474	0.5-	1.1+
791023	801	2.2+	0.7-	801109	801	0.7-	0.2+				

(2364)* 1978 GD = 1971 BH

Discovered 1978 Apr. 14 by H. Debehogne at the European Southern Observatory.

Epoch 1981 July 15.0 ET = JDE 2444800.5

M	202.96475		(1950.0)		P		Q
n	0.17329561	Peri.	171.84626	-0.82110879		+0.55662954	
a	3.1862341	Node	42.78889	-0.53357775		-0.67002977	
e	0.1261853	Incl.	10.71254	-0.20267004		-0.49114525	
P	5.69	B(1,0)	12.0				

Residuals in seconds of arc

710121	095	1.6+	1.7+	780421	809	4.3+	2.0+	780427	809	0.6-	0.4+
710127	095	1.7-	1.4-	780421	809	0.3-	0.4+	780510	688	0.1-	1.5-
780404	809	1.3+	2.1-	780422	809	0.6-	0.5+	780702	801	1.3+	1.8+
780404	809	0.2-	1.4-	780422	809	0.5+	0.6+	800912	801	0.5-	2.8+
780404	809	1.0+	0.6-	780424	809	0.2-	0.3-	801106	688	0.1-	0.5-
780414	809	1.8-	0.2-	780424	809	0.2-	0.5-	801106	688	0.6+	0.2-
780414	809	2.1-	0.2-	780425	809	0.1-	0.4+	801109	688	0.1+	1.8-
780414	809	1.3-	0.1-	780425	809	0.4-	0.4+	801109	688	0.5+	0.8-
780419	809	0.1+	0.6-	780425	809	0.5-	0.4+	801111	688	1.3+	0.8-
780419	809	1.1+	1.0-	780425	809	0.2-	0.4+	801111	688	1.7+	1.5-
780419	809	0.1+	1.0-	780426	809	0.2-	0.5+	810102	801	2.2-	0.4-
780420	809	0.2-	0.8-	780426	809	0.2-	0.4+				
780420	809	0.4-	1.1-	780427	809	1.2-	0.5+				

(2365)* 1980 YQ = 1981 AL = 1955 SJ1 = 1955 UY = 1959 TU = 1959 UE
= 1969 EA = 1973 ED = 1979 TB

Discovered 1980 Dec. 30 by Z. Vavrova at the Klet Observatory. The double designation 1959 TU = 1959 UE is by O. Kippes (MPC 2324). The double designation 1980 YQ = 1981 AL is by B. G. Marsden (MPC 5835).

Epoch 1981 July 15.0 ET = JDE 2444800.5

M	32.94025		(1950.0)		P		Q
n	0.24284680	Peri.	209.73675		-0.67212577		-0.73488512
a	2.5443750	Node	282.65626		+0.69629763		-0.58574857
e	0.1172115	Incl.	5.32223		+0.25182642		-0.34182227
P	4.06	B(1,0)	13.5				

Residuals in seconds of arc (or two decimals in units of degrees)

550918	760	(35.0+ 95.2+)X	791015	688	2.6+	3.5-	810127	046	1.7+	0.4+
551020	760	(0.03- 0.01+)X	791022	688	0.3+	3.6-	810129	046	0.4+	0.3+
591008	024	1.5- 0.2+	801230	046	0.2-	1.2+	810129	046	0.1+	0.9+
591028	760	0.1- 1.5+	801231	046	0.3-	0.3+	810130	688	0.6-	0.1+
591028	760	0.2+ 1.7+	810103	688	0.5+	0.7-	810130	688	0.2-	0.1+
690309	095	2.2- 0.9-	810103	688	0.9+	1.3-	810130	046	0.7-	0.2-
690311	095	1.1- 2.9-	810108	046	1.0-	0.1+	810130	046	0.5-	0.7+
730309	808	0.5+ 0.1-	810108	046	0.2-	0.0				
730309	808	0.7+ 0.5-	810127	046	0.4+	0.7+				

(2366)* 1981 AC1 = 1934 CC1 = 1949 PJ = 1971 DR = 1973 YM1 = 1976 SM8
 = 1978 ET2 = 1979 OK7

Discovered 1981 Jan. 10 by N. G. Thomas at the Anderson Mesa Station
 of the Lowell Observatory.

Epoch 1981 July 15.0 ET = JDE 2444800.5

M	108.09542		(1950.0)		P		Q
n	0.29373743	Peri.	110.08353		+0.52732652		-0.84953267
a	2.2412821	Node	308.08259		+0.77228458		+0.48652484
e	0.1269829	Incl.	1.08216		+0.35426439		+0.20393093
P	3.36	B(1,0)	15.0				

Residuals in seconds of arc

340209	024	2.4+ 1.0+	731221	095	1.7-	4.2-	810101	688	0.8-	1.3+
340214	024	2.0- 0.6-	760928	095	3.4+	2.9+	810110	688	0.8+	0.6-
490802	024	1.9+ 1.2-	760928	095	2.2-	0.0	810110	688	0.6-	1.0+
490821	024	1.5- 1.6-	780305	095	0.6-	0.5-	810205	688	0.7+	1.6-
490822	024	1.1+ 0.7-	790724	675	0.1+	0.9-	810205	688	0.3+	0.1+
710218	095	0.0 1.1+	790725	675	1.5-	0.3-	810208	688	0.1-	0.6-
731220	095	0.9- 2.4+	810101	688	1.5+	0.9-	810208	688	0.2+	0.4-

(2367)* 1981 AK1 = 1945 AB = 1952 HO = 1952 JM = 1960 VF = 1976 SE7
 = 1978 CG

Discovered 1981 Jan. 8 by A. Mrkos at the Klet Observatory. The identification A924 EJ = 1945 AB (MPC 2806) and the double designation 1952 HO = 1952 HD1 (MPC 1331) are invalid.

Epoch 1981 July 15.0 ET = JDE 2444800.5

M	41.44942		(1950.0)		P		Q
n	0.30063564	Peri.	297.38048		-0.61362986		-0.78957141
a	2.2068648	Node	190.47822		+0.73546884		-0.56880934
e	0.0996094	Incl.	1.87446		+0.28730468		-0.23028878
P	3.28	B(1,0)	14.5				

Residuals in seconds of arc (or two decimals in units of degrees)

450115	062	0.6+ 0.7+	780209	414	1.7-	0.2+	810127	046	0.6-	0.4+
520416	078	(0.00+ 0.13+)Y	780209	414	0.0	0.9+	810127	046	0.2+	0.7+
520424	711	(6.5+ 2.7+)Y	780212	414	0.3+	0.0	810129	046	0.0	0.8+
520514	760	1.6- 0.6-	780212	414	0.4-	1.3+	810129	046	0.6-	0.6-
520514	760	2.3+ 0.4-	810108	046	1.0-	0.5-	810130	046	1.0+	1.8-
601112	760	2.4- 0.2-	810108	046	1.1+	0.8-	810130	046	0.9+	2.4-
601112	760	0.2+ 1.6+	810109	688	0.9+	1.0-	810209	046	0.6+	2.1+
760925	095	0.7+ 0.4-	810109	688	1.0+	1.9-	810209	046	1.8-	2.1+

1979 MM5

Epoch 1981 July 15.0 ET = JDE 2444800.5 (J-P)

M	130.55434		(1950.0)		P		Q
n	0.25970138	Peri.	125.46701	+0.95630462			-0.29123686
a	2.4330671	Node	251.47716	+0.25866801			+0.88381514
e	0.1899672	Incl.	1.55557	+0.13628033			+0.36613097
P	3.80	B(1,0)	16.0				

Residuals in seconds of arc

790623	413	1.1+	0.5+	790724	675	0.8-	1.2+	790823	675	0.5-	0.1+
790624	413	0.1-	0.2-	790724	413	1.0-	0.6-	810131	801	0.8+	0.5+
790625	413	0.7-	0.4-	790725	675	0.4-	1.6+	810201	801	0.7-	0.2+
790629	413	0.3-	0.3-	790727	675	2.5+	1.1-	810204	801	0.1+	0.1-

1981 AE = 1970 AW = 1974 VZ = 1976 GU4 = 1979 US1

Epoch 1981 July 15.0 ET = JDE 2444800.5 (J-P)

M	29.78899		(1950.0)		P		Q
n	0.18238729	Peri.	102.58943	-0.68861062			-0.72456772
a	3.0794550	Node	30.99206	+0.64184704			-0.62738928
e	0.1840524	Incl.	3.18220	+0.33741339			-0.28527934
P	5.40	B(1,0)	13.0				

Residuals in seconds of arc

700105	095	0.4-	2.2-	810101	688	0.3-	0.1-	810208	688	0.2-	0.3+
741112	095	(11.0-	3.6+)	810101	688	0.2-	0.8+	810309	688	0.3+	0.4-
760402	095	1.4+	2.9+	810110	688	0.0	0.3-	810309	688	0.3+	0.3-
791019	010	0.4-	1.6+	810110	688	0.1+	0.5+				
791023	010	1.2-	1.8+	810208	688	0.5+	0.6+				

1981 AT = 1930 YM = 1942 EE = 1956 AD = 1974 DB2

Epoch 1981 July 15.0 ET = JDE 2444800.5 (J-P)

M	38.26786		(1950.0)		P		Q
n	0.27693706	Peri.	185.72941	-0.63657678			-0.76819418
a	2.3310389	Node	303.82841	+0.71075945			-0.55007155
e	0.1524751	Incl.	4.70740	+0.29931756			-0.32756524
P	3.56	B(1,0)	15.0				

Residuals in seconds of arc (or two decimals in units of degrees)

301224	690	0.7+	0.6-	810114	688	2.5+	4.3-	810129	046	0.4+	1.8-
301225	690	0.1+	0.4-	810126	046	0.4+	0.5-	810131	046	1.5+	2.0-
420306	062	(78.3+	82.0-)X	810126	046	0.7-	0.1-	810131	046	2.1+	2.8-
560113	760	(0.08+	0.00+)X	810127	046	1.1-	0.0	810209	046	0.0	0.3+
740218	095	0.8+	0.4-	810127	046	0.6-	0.0	810209	046	1.1+	0.0
810114	688	0.2+	2.4-	810129	046	0.6+	1.9-				

1981 AD1 = 1939 UF = 1969 UG2 = 1978 PM

Epoch 1981 July 15.0 ET = JDE 2444800.5 (J-P)

M	164.69759		(1950.0)		P		Q
n	0.19789615	Peri.	12.63812	+0.99651447			+0.08305468
a	2.9163883	Node	342.59200	-0.07862318			+0.90384725
e	0.0584832	Incl.	1.49395	-0.02788034			+0.41971663
P	4.98	B(1,0)	13.0				

Residuals in seconds of arc (or two decimals in units of degrees)

391018	062	(72.9+	99.1+)X	780804	474	1.2-	1.9-	810205	688	0.0	0.9-
391020	062	(0.03+	0.02+)X	810101	688	0.7-	0.8+	810205	688	0.1-	0.6+
691018	095	1.5-	0.3-	810101	688	0.6+	1.3-	810208	688	1.0-	0.0
691105	095	1.6+	0.9+	810110	688	0.3-	0.6+	810208	688	1.3+	1.5+
780804	474	1.2+	1.1-	810110	688	0.4+	0.6-				

1981 AH1 = 1960 DE = 1972 NY = 1978 PO2 = 1978 RU4 = 1978 SE4

Epoch 1981 July 15.0 ET = JDE 2444800.5 (J-P)

M	273.93123		(1950.0)		P		Q
n	0.18515052	Peri.	101.31668		-0.29815201		+0.95082983
a	3.0487393	Node	150.90758		-0.92913274		-0.26898043
e	0.0477022	Incl.	9.92846		-0.21867262		-0.15353226
P	5.32	B(1,0)	13.0				

Residuals in seconds of arc

600227	760	(40.1+ 44.5-)X	780928	095	0.8+	1.0+	810205	688	0.1+	0.7-
720713	095	0.1+ 0.8+	801216	688	0.8+	1.3+	810205	688	0.5-	1.8+
720716	095	0.0 0.1-	801216	688	0.1-	1.8-	810208	688	0.8-	0.9+
780808	095	1.8- 0.3-	810103	688	0.9+	0.9-	810208	688	0.3+	0.7+
780903	095	0.9+ 0.4+	810103	688	0.5-	0.3-				

1981 CS = 1976 SN1

Epoch 1981 July 15.0 ET = JDE 2444800.5 (J-P)

M	69.28477		(1950.0)		P		Q
n	0.30996649	Peri.	347.14312		-0.39438572		-0.91810144
a	2.1623555	Node	126.07125		+0.84732735		-0.37989527
e	0.0363731	Incl.	2.79155		+0.35566312		-0.11300142
P	3.18	B(1,0)	15.0				

Residuals in seconds of arc

760924	095	0.7- 3.7+	810110	688	2.6-	0.4+	810208	688	0.7+	2.0-
760928	095	2.4+ 1.9-	810110	688	1.5-	0.6-	810208	688	0.4+	1.6-
810101	688	1.5- 1.3-	810205	688	2.0-	2.3-				
810101	688	1.6- 0.9-	810205	688	2.3+	1.5-				

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ORBITAL ELEMENTS BY B. G. MARSDEN, SMITHSONIAN ASTROPHYSICAL OBSERVATORY.

The identifications are by B. G. Marsden unless otherwise stated.

Comet Bowell (1980b)

Epoch 1982 Mar. 12.0 ET = JDE 2445040.5

T 1982 Mar. 12.33199 ET

q	3.3644181		(1950.0)		P		Q
z	-0.0169801	Peri.	134.86361		-0.35910652		+0.93291938
	+/-0.0000383	Node	114.07428		-0.86422739		-0.32166358
e	1.0571282	Incl.	1.66522		-0.35235425		-0.16184552

From 30 observations 1980 Feb. 11-1981 Mar. 9, mean residual 1".2.

Periodic Comet Bus (1981b)

T 1981 June 9.89468 ET

q	2.1838653		(1950.0)		P		Q
n	0.15153306	Peri.	24.09000		-0.90148443		+0.43280981
a	3.4844250	Node	181.55760		-0.40399732		-0.84247451
e	0.3732494	Incl.	2.56728		-0.15528032		-0.32079957

P 6.50

From 12 observations 1981 Feb. 9-Mar. 16.

(2368)* 1977 RA

Discovered 1977 Sept. 4 by P. Wild at Zimmerwald.

Epoch 1981 July 15.0 ET = JDE 2444800.5

M	100.16012		(1950.0)		P		Q
n	0.32291535	Peri.	41.91719		+0.85608664		+0.50936716
a	2.1041511	Node	287.26177		-0.49518402		+0.75988063
e	0.4133630	Incl.	5.25876		-0.14801502		+0.40388924
P	3.05	B(1,0)	16.8				

Residuals in seconds of arc

770904	026	1.2-	1.7+	770916	885	1.8-	0.6-	771009	046	2.3+	0.4-
770906	026	0.7+	1.4+	770916	885	1.0+	0.4+	771010	494	0.3-	1.8+
770907	026	0.3-	0.2+	770916	885	0.8-	0.3+	771012	026	0.8-	0.5+
770909	026	0.4+	0.3+	770916	879	2.4+	1.1-	771013	026	0.5-	0.8+
770911	801	0.9-	1.2+	770916	879	2.4+	0.5+	771016	801	0.6-	0.6+
770911	026	0.6-	0.3-	770917	885	0.3+	0.7+	771016	046	1.1+	1.5-
770912	885	1.5+	0.3+	770917	885	0.8+	0.3+	771016	046	0.3+	1.2-
770912	885	0.6+	0.2-	770917	885	0.2+	0.8+	771017	046	0.8-	0.0
770912	323	0.9-	0.7+	770917	396	0.5-	0.1+	771017	046	0.3-	0.1-
770912	026	0.6+	1.2+	770917	396	0.6+	0.7+	771017	026	0.5+	1.3-
770913	675	0.0	0.0	770917	396	1.8-	1.0-	771018	046	0.7-	0.4-
770913	372	0.5+	0.1-	770919	688	0.6+	1.6-	771018	046	0.2-	0.6-
770913	372	2.3-	0.3-	770919	323	0.9-	0.9+	771019	046	0.0	1.0-
770913	046	0.8-	0.6-	770923	026	0.5-	0.2+	771019	046	0.0	1.2-
770913	046	0.8-	1.2-	770923	026	0.3+	0.4+	771020	046	0.3-	1.2-
770914	885	2.0-	1.1-	771006	046	1.3+	0.1+	771020	046	1.8-	1.8-
770914	885	0.1+	1.7-	771006	046	2.7-	2.1+	771105	026	0.0	0.4+
770914	046	0.7-	0.7-	771007	046	0.0	0.0	771208	801	0.9+	1.0+
770914	046	1.2-	0.3-	771007	046	0.5+	0.6+	800611	688	0.5+	1.6-
770915	675	0.1-	0.5+	771008	046	4.4+	0.4-	800719	801	0.3-	0.7-
770915	026	0.5+	0.4-	771008	046	4.0+	0.8-	800816	801	1.8+	0.5-
770915	026	0.5-	0.9-	771009	879	2.3-	0.6+	800905	801	1.2-	0.4+
770915	026	0.5+	0.4+	771009	879	0.5-	0.7+	801013	801	0.7-	0.7+
770916	688	0.7+	1.9-	771009	046	1.9+	0.5-				

1976 SR10 = 1980 XG

The identification is by J. G. Williams.

Epoch 1981 July 15.0 ET = JDE 2444800.5 (J-P)

M	76.91443		(1950.0)	P	Q
n	0.28463680	Peri.	303.58118	+0.11374679	-0.95948478
a	2.2888090	Node	137.42854	+0.99000840	+0.08769995
e	0.1899246	Incl.	22.39840	+0.08333687	+0.26776420
P	3.46	B(1,0)	14.5		

Residuals in seconds of arc

760925	808	0.5+	1.1+	761023	808	1.4-	2.0-	801216	688	0.6-	2.1-
760928	808	0.6+	0.2+	801204	688	0.4-	2.4+	810103	688	0.4+	1.0-
761018	808	0.2+	0.3-	801204	688	1.0-	0.1+	810103	688	0.8+	0.1-
761019	808	1.5-	0.6+	801212	688	0.3+	1.3+				
761023	808	1.3+	0.2-	801216	688	0.0	0.0				

1977 CA

Epoch 1981 July 15.0 ET = JDE 2444800.5 (J-P)

M	67.78834		(1950.0)	P	Q
n	0.26555168	Peri.	164.47960	-0.78326436	-0.58419819
a	2.3971997	Node	335.64717	+0.50123871	-0.39110258
e	0.1722687	Incl.	31.04000	+0.36777261	-0.71116189
P	3.71	B(1,0)	13.0		

Residuals in seconds of arc

770213	675	0.9-	0.3-	770220	801	(3.3+	9.2-)	770322	095	1.2-	0.9+
770213	675	(4.7+	2.1+)	770309	095	0.4+	1.3-	770323	095	1.0-	2.1-
770214	675	1.1-	0.2+	770309	095	1.3+	1.4+	770323	095	0.0	1.5-
770214	675	1.9-	0.4-	770313	095	1.0+	0.9+	770327	675	0.2+	1.7-
770214	675	3.3+	3.4+	770313	095	0.2-	1.4+	770327	675	0.7+	0.7+
770216	675	0.7-	0.9-	770317	801	0.1-	0.4-	770415	801	0.3+	0.5+
770216	801	1.9+	1.2-	770317	095	0.5+	3.2+	770419	675	0.2+	0.6-
770217	801	2.1-	2.3-	770317	095	(0.1-	4.3+)	810215	675	0.1-	0.9-
770218	801	0.1+	0.5+	770322	095	0.5-	0.1-	810215	675	0.1-	0.6+

1977 UQ = 1977 TJ4 = 1948 RM = 1948 RF1 = 1956 LF

The key identification 1977 UQ = 1948 RM is by E. Bowell. The double designations 1977 UQ = 1977 TJ4 and 1948 RM = 1948 RF1 (MPC 702) are by O. Kippen. The identification 1977 UQ = 1972 GH (NOC 1067) is invalid.

Epoch 1981 July 15.0 ET = JDE 2444800.5 (J-P)

M	358.49767	(1950.0)	P	Q	
n	0.23956246	Peri.	317.12632	+0.87006572	+0.49285140
a	2.5675825	Node	13.35420	-0.44087798	+0.78632107
e	0.2652466	Incl.	2.26259	-0.22048186	+0.37255425
P	4.11	B(1,0)	14.5		

Residuals in seconds of arc (or two decimals in units of degrees)

480905	094(0.04+ 0.02-)X	771007	095	0.2-	1.5-	771105	026	1.0+	1.4+		
480907	690	0.5+	0.2-	771013	095	0.6-	1.3+	771109	026	1.0-	0.2-
480908	690	2.2-	0.5+	771017	095	1.5-	0.8-	771109	026	2.4-	1.3+
480909	690	1.7+	0.3-	771018	026	0.1-	2.3-	771110	026	0.4+	1.5+
480911	094(17.2- 21.7+)X	771019	026	2.2+	0.7-	771110	026	0.4-	1.6+		
560611	839	0.1-	0.6+	771020	026	0.5+	1.5-	771110	026	1.3-	0.8+
770919	095	0.5+	0.8+	771103	026	0.4+	0.7-				
770922	095	0.4+	0.2+	771103	026	1.9+	0.9-				

1980 PA

Epoch 1981 July 15.0 ET = JDE 2444800.5

M	102.20053	(1950.0)	P	Q	
n	0.36864232	Peri.	124.79921	+0.89285219	-0.44880536
a	1.9263384	Node	261.89353	+0.39989486	+0.82815919
e	0.4586198	Incl.	2.15722	+0.20712091	+0.33574707
P	2.67	B(1,0)	19.5		

From 22 observations 1980 Aug. 6-1981 Jan. 6, mean residual 1".5.

1980 YS

Epoch 1981 Feb. 5.0 ET = JDE 2444640.5

M	9.54138	(1950.0)	P	Q	
n	0.40298493	Peri.	49.00677	-0.30317627	-0.95232908
a	1.8152795	Node	58.67237	+0.86188326	-0.28923743
e	0.3211742	Incl.	2.27866	+0.40649894	-0.09701053
P	2.45	B(1,0)	17.5		

From 5 observations 1980 Dec. 30-1981 Feb. 24.

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ORBITAL ELEMENTS BY T. URATA, SHIMIZU, JAPAN.

The following orbital elements are from NOC 1176-1180. The identifications are by T. Urata.

1979 MX2 = 1975 VP6 = 1975 XS3

Epoch 1981 July 15.0 ET = JDE 2444800.5 (J-P)

M	88.83839	(1950.0)	P	Q	
n	0.18760100	Peri.	73.87232	+0.98455126	+0.07731906
a	3.0221323	Node	281.49084	-0.13771180	+0.89605930
e	0.1169664	Incl.	9.22511	+0.10814009	+0.43714928
P	5.25	B(1,0)	13.5		

Residuals in seconds of arc

751106	095	0.5-	0.7-	790625	413	0.5-	0.4-	790725	675	1.3+	0.5+
751202	095	0.4+	0.7+	790629	413	0.9-	0.5+	790727	675	0.1+	0.1-
790623	413	0.4+	0.3-	790724	675	0.8+	0.2+	790823	675	1.8-	0.1-
790624	413	0.4-	0.2-	790724	413	0.7+	0.1+				

1979 MZ3 = 1975 TN5 = 1975 VP7

Epoch 1981 July 15.0 ET = JDE 2444800.5 (J-P)

M	162.22407		(1950.0)		P		Q
n	0.18895804	Peri.	65.97303	+0.00576816		+0.99995123	
a	3.0076456	Node	204.36154	-0.92433979		+0.00227299	
e	0.0453593	Incl.	1.11359	-0.38152676		+0.00961101	
P	5.22	B(1,0)	13.5				

Residuals in seconds of arc

751014	095	0.4+	0.5+	790625	413	0.7-	0.5+	790725	675	0.2+	0.2-
751106	095	0.4-	0.3-	790629	413	0.6-	0.5+	790727	675	0.7+	1.3-
790623	413	0.7+	0.1-	790724	675	1.8+	0.8+	790823	675	0.1-	0.1+
790624	413	0.7-	0.0	790724	413	1.2-	0.4-				

1979 MR4 = 1956 GK = 1978 ER2 = 1978 GF1

Epoch 1981 July 15.0 ET = JDE 2444800.5 (J-P)

M	37.60495		(1950.0)		P		Q
n	0.26766331	Peri.	251.96744	-0.15625778		-0.98706724	
a	2.3845752	Node	207.10004	+0.93330409		-0.13568799	
e	0.0969127	Incl.	4.50760	+0.32330631		-0.08536415	
P	3.68	B(1,0)	14.0				

Residuals in seconds of arc

560406	839	1.7-	0.7+	790624	413	0.9+	1.2+	790726	675	1.6-	1.0+
560512	839	0.7+	4.5-	790625	413	1.1+	1.0+	790727	675	0.4-	0.4-
780305	095	1.3+	0.8+	790629	413	0.1-	1.6+	790728	413	0.9+	1.5-
780407	095	0.2-	2.3+	790724	413	1.7-	1.2-	790823	675	1.4-	0.8-
790623	413	1.9+	1.1+	790726	675	0.4+	0.4-				

1980 VW = 1975 VR6

Epoch 1981 July 15.0 ET = JDE 2444800.5 (J-P)

M	310.29649		(1950.0)		P		Q
n	0.18798723	Peri.	102.61229	-0.87993662		-0.45212577	
a	3.0179916	Node	50.70211	+0.32862715		-0.80105714	
e	0.0383468	Incl.	10.86909	+0.34309728		-0.39228784	
P	5.24	B(1,0)	13.0				

Residuals in seconds of arc

751106	095	0.0	0.4-	801111	046	0.5+	0.3+	801212	046	2.5+	0.1+
751107	095	0.0	0.4+	801208	046	0.8+	0.8+	801212	046	2.5-	0.7-
801111	046	0.5-	0.4-	801208	046	0.7-	0.1-				

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EPHEMERIDES.

1977 CA

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	Mag.
1981 03 17		12 03.02	-33 44.7	1.203	2.093	144.4	16.1	15.4
1981 03 27		11 44.71	-35 13.8					
1981 04 06		11 27.34	-35 51.4	1.233	2.124	143.8	16.2	15.5
1981 04 16		11 13.11	-35 47.1					
1981 04 26		11 03.32	-35 16.8	1.348	2.158	132.3	20.2	15.8
1981 05 06		10 58.30	-34 35.5					
1981 05 16		10 57.79	-33 55.2	1.523	2.193	118.5	23.9	16.2
1981 05 26		11 01.19	-33 23.5					
1981 06 05		11 07.89	-33 04.0	1.732	2.231	105.6	26.0	16.5
1981 06 15		11 17.32	-32 58.7					
1981 06 25		11 29.00	-33 07.2	1.957	2.269	94.1	26.5	16.8

Elements MPC 5898

1975 XY1					Elements MPC 5834			
Date	ET	R. A. (1950)	Decl.	Delta	r	Variation		Mag.
1981 04 06		18 45.15	-18 36.3	2.509	2.780	-0.72	-5.6	18.2
1981 04 16		18 49.84	-17 22.2					
1981 04 26		18 52.13	-16 04.3	2.262	2.806	-0.80	-6.0	18.0
1981 05 06		18 51.82	-14 43.6					
1981 05 16		18 48.83	-13 21.5	2.051	2.828	-0.90	-6.3	17.7
1981 05 26		18 43.24	-12 00.0					
1981 06 05		18 35.33	-10 41.7	1.911	2.848	-1.00	-6.5	17.4
1981 06 15		18 25.70	-09 29.7					
1981 06 25		18 15.21	-08 27.3	1.870	2.864	-1.04	-6.3	17.2
1981 07 05		18 04.81	-07 37.1					
1981 07 15		17 55.47	-07 00.7	1.942	2.878	-1.00	-6.0	17.5
1981 07 25		17 47.95	-06 38.3					
1981 08 04		17 42.71	-06 28.5	2.109	2.889	-0.90	-5.5	17.8
1981 08 14		17 39.98	-06 29.2					
1981 08 24		17 39.75	-06 37.4	2.343	2.897	-0.79	-5.0	18.1
1981 09 03		17 41.87	-06 50.7					
1981 09 13		17 46.15	-07 06.4	2.610	2.901	-0.69	-4.5	18.4

(2309) 1971 QX1					Elements MPC 5645			
Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	Mag.
1981 04 06		18 53.24	-11 41.9	3.082	3.279	92.3	17.8	17.9
1981 04 16		18 58.45	-11 08.4					
1981 04 26		19 01.87	-10 36.2	2.800	3.273	109.3	16.9	17.7
1981 05 06		19 03.32	-10 06.9					
1981 05 16		19 02.71	-09 42.3	2.549	3.266	127.6	14.2	17.4
1981 05 26		19 00.03	-09 24.2					
1981 06 05		18 55.38	-09 14.4	2.358	3.257	147.1	9.7	17.1
1981 06 15		18 49.08	-09 14.0					
1981 06 25		18 41.64	-09 23.7	2.258	3.248	164.4	4.8	16.9
1981 07 05		18 33.67	-09 43.3					
1981 07 15		18 25.96	-10 11.8	2.265	3.238	159.9	6.2	16.9
1981 07 25		18 19.20	-10 47.3					
1981 08 04		18 13.96	-11 28.0	2.376	3.227	140.8	11.5	17.2
1981 08 14		18 10.67	-12 11.6					
1981 08 24		18 09.50	-12 56.2	2.570	3.215	121.5	15.6	17.4
1981 09 03		18 10.51	-13 40.0					
1981 09 13		18 13.62	-14 21.6	2.815	3.202	103.5	17.8	17.7

(2322) 1954 UQ2					Elements MPC 5677			
Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	Mag.
1981 04 06		18 45.64	-20 36.1	2.043	2.352	95.0	25.1	18.0
1981 04 16		18 55.24	-20 11.1					
1981 04 26		19 02.56	-19 46.2	1.794	2.344	110.5	23.7	17.7
1981 05 06		19 07.26	-19 23.4					
1981 05 16		19 09.04	-19 04.6	1.571	2.336	128.2	19.9	17.3
1981 05 26		19 07.70	-18 51.1					
1981 06 05		19 03.19	-18 43.8	1.400	2.327	148.6	13.1	16.9
1981 06 15		18 55.82	-18 42.7					
1981 06 25		18 46.34	-18 46.9	1.309	2.319	170.9	4.0	16.4
1981 07 05		18 35.87	-18 55.0					
1981 07 15		18 25.79	-19 05.7	1.316	2.309	163.6	7.1	16.6
1981 07 25		18 17.41	-19 18.1					
1981 08 04		18 11.66	-19 31.8	1.418	2.300	141.5	15.9	16.9
1981 08 14		18 09.11	-19 46.2					
1981 08 24		18 09.84	-20 00.8	1.589	2.290	121.9	22.0	17.3
1981 09 03		18 13.72	-20 14.4					
1981 09 13		18 20.47	-20 25.8	1.801	2.281	105.1	25.2	17.6

(2348) 1939 AA		Elements MPC 5838							
Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	Mag.	
1981 04 06		19 06.07	-17 38.5	2.506	2.697	89.9	21.8	18.2	
1981 04 16		19 13.45	-17 06.7						
1981 04 26		19 18.71	-16 36.4	2.260	2.719	106.2	20.8	17.9	
1981 05 06		19 21.61	-16 09.3						
1981 05 16		19 21.95	-15 47.0	2.035	2.738	124.6	17.7	17.6	
1981 05 26		19 19.62	-15 30.9						
1981 06 05		19 14.66	-15 22.0	1.861	2.755	145.1	12.2	17.3	
1981 06 15		19 07.38	-15 20.7						
1981 06 25		18 58.36	-15 26.5	1.771	2.770	166.6	4.9	17.0	
1981 07 05		18 48.45	-15 38.5						
1981 07 15		18 38.69	-15 55.3	1.786	2.782	165.5	5.2	17.1	
1981 07 25		18 30.07	-16 15.6						
1981 08 04		18 23.38	-16 37.9	1.906	2.791	144.0	12.3	17.4	
1981 08 14		18 19.14	-17 01.2						
1981 08 24		18 17.54	-17 24.5	2.108	2.798	123.7	17.5	17.8	
1981 09 03		18 18.57	-17 46.7						
1981 09 13		18 22.08	-18 06.8	2.361	2.803	105.5	20.2	18.1	
1980 FB		Elements MPC 5347							
Date	ET	R. A. (1950)	Decl.	Delta	r	Variation		Mag.	
1981 04 26		19 12.36	-24 01.7	2.290	2.782	-1.12	-1.7	18.0	
1981 05 06		19 16.57	-24 02.4						
1981 05 16		19 18.26	-24 07.5	2.071	2.796	-1.26	-2.1	17.7	
1981 05 26		19 17.35	-24 17.2						
1981 06 05		19 13.88	-24 30.9	1.907	2.813	-1.40	-2.1	17.4	
1981 06 15		19 08.14	-24 46.8						
1981 06 25		19 00.70	-25 02.7	1.827	2.831	-1.50	-1.7	17.1	
1981 07 05		18 52.38	-25 16.2						
1981 07 15		18 44.17	-25 25.8	1.850	2.852	-1.49	-1.1	17.2	
1981 07 25		18 37.02	-25 30.7						
1981 08 04		18 31.68	-25 31.3	1.976	2.874	-1.37	-0.6	17.5	
1981 08 14		18 28.66	-25 28.6						
1981 08 24		18 28.15	-25 23.3	2.185	2.897	-1.22	-0.4	17.9	
1981 09 03		18 30.14	-25 16.0						
1981 09 13		18 34.48	-25 06.8	2.449	2.922	-1.07	-0.5	18.2	
1981 09 23		18 40.91	-24 55.3						
1981 10 03		18 49.19	-24 41.1	2.741	2.949	-0.94	-0.9	18.5	
1978 GC		Elements MPC 5130							
Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	Mag.	
1981 04 26		18 45.69	+15 29.4	1.026	1.628	106.4	36.4	16.5	
1981 05 06		18 57.50	+19 38.9						
1981 05 16		19 06.22	+23 38.8	0.926	1.608	112.1	35.7	16.2	
1981 05 26		19 11.55	+27 17.0						
1981 06 05		19 13.20	+30 20.4	0.852	1.594	117.0	34.6	16.0	
1981 06 15		19 11.28	+32 34.4						
1981 06 25		19 06.35	+33 46.0	0.800	1.588	121.4	33.1	15.8	
1981 07 05		18 59.47	+33 43.8						
1981 07 15		18 52.31	+32 21.4	0.771	1.590	125.0	31.6	15.7	
1981 07 25		18 46.58	+29 40.8						
1981 08 04		18 43.66	+25 51.7	0.774	1.600	126.3	30.7	15.7	
1981 08 14		18 44.47	+21 11.7						
1981 08 24		18 49.22	+16 03.4	0.823	1.617	123.4	31.5	15.8	
1981 09 03		18 57.74	+10 49.4						
1981 09 13		19 09.66	+05 49.7	0.926	1.641	116.2	33.4	16.2	
1981 09 23		19 24.42	+01 19.1						
1981 10 03		19 41.51	-02 33.9	1.081	1.670	106.6	35.0	16.6	

7071 P-L						Elements MPC				5603
Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	Mag.		
1981 04 26		19 08.85	+03 07.8	1.328	1.857	104.5	31.6	19.4		
1981 05 06		19 18.15	+06 27.9							
1981 05 16		19 24.64	+09 53.8	1.157	1.832	115.2	30.0	19.0		
1981 05 26		19 28.01	+13 17.7							
1981 06 05		19 27.95	+16 29.2	1.024	1.809	125.1	27.3	18.7		
1981 06 15		19 24.40	+19 15.0							
1981 06 25		19 17.75	+21 20.8	0.936	1.787	132.5	24.8	18.4		
1981 07 05		19 08.81	+22 33.1							
1981 07 15		18 59.05	+22 42.9	0.898	1.768	134.8	24.1	18.3		
1981 07 25		18 50.13	+21 49.6							
1981 08 04		18 43.60	+19 59.8	0.912	1.752	130.7	26.0	18.3		
1981 08 14		18 40.58	+17 26.7							
1981 08 24		18 41.53	+14 26.2	0.973	1.738	122.4	29.4	18.5		
1981 09 03		18 46.47	+11 13.1							
1981 09 13		18 55.18	+08 00.5	1.074	1.729	112.4	32.6	18.8		
1981 09 23		19 07.18	+04 58.2							
1981 10 03		19 22.04	+02 13.0	1.208	1.723	102.1	34.6	19.1		

(1020) Arcadia						Elements MPC				5273
Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	Mag.		
1981 04 26		19 27.23	-17 04.4	2.296	2.726	104.3	21.0	16.7		
1981 05 06		19 31.85	-16 37.5							
1981 05 16		19 34.09	-16 15.5	2.061	2.733	121.8	18.3	16.4		
1981 05 26		19 33.81	-15 59.8							
1981 06 05		19 30.97	-15 51.7	1.872	2.740	141.5	13.3	16.1		
1981 06 15		19 25.73	-15 51.6							
1981 06 25		19 18.55	-15 59.3	1.760	2.747	162.8	6.3	15.7		
1981 07 05		19 10.11	-16 13.7							
1981 07 15		19 01.35	-16 33.1	1.748	2.755	170.6	3.5	15.6		
1981 07 25		18 53.26	-16 55.6							
1981 08 04		18 46.70	-17 19.4	1.840	2.763	149.6	10.7	16.0		
1981 08 14		18 42.33	-17 43.2							
1981 08 24		18 40.46	-18 05.7	2.020	2.771	129.2	16.4	16.3		
1981 09 03		18 41.17	-18 26.0							
1981 09 13		18 44.40	-18 43.1	2.258	2.779	110.8	19.8	16.6		
1981 09 23		18 49.90	-18 56.2							
1981 10 03		18 57.45	-19 04.4	2.528	2.788	94.3	21.0	16.9		

1980 CK						Elements MPC				5357
Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	Mag.		
1981 04 26		19 39.93	-12 11.2	2.627	2.978	100.4	19.4	17.9		
1981 05 06		19 43.00	-11 23.8							
1981 05 16		19 43.84	-10 41.0	2.427	3.037	118.2	17.1	17.7		
1981 05 26		19 42.40	-10 04.8							
1981 06 05		19 38.73	-09 36.7	2.270	3.096	137.6	12.8	17.5		
1981 06 15		19 33.07	-09 18.0							
1981 06 25		19 25.85	-09 09.6	2.190	3.153	157.4	7.1	17.3		
1981 07 05		19 17.68	-09 11.4							
1981 07 15		19 09.32	-09 22.7	2.213	3.209	166.3	4.3	17.3		
1981 07 25		19 01.53	-09 41.9							
1981 08 04		18 54.97	-10 07.0	2.344	3.264	150.2	8.9	17.6		
1981 08 14		18 50.15	-10 35.7							
1981 08 24		18 47.33	-11 05.9	2.570	3.316	130.5	13.4	18.0		
1981 09 03		18 46.60	-11 35.8							
1981 09 13		18 47.94	-12 03.7	2.861	3.367	111.8	16.1	18.3		
1981 09 23		18 51.18	-12 28.4							
1981 10 03		18 56.14	-12 49.0	3.188	3.416	94.6	17.0	18.6		

1934 CD		Elements MPC 4933							
Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	Mag.	
1981 04 26		19 49.45	-24 12.8	2.688	3.036	100.4	19.0	18.5	
1981 05 06		19 53.46	-23 39.8						
1981 05 16		19 55.20	-23 09.2	2.409	3.022	118.3	17.1	18.2	
1981 05 26		19 54.51	-22 41.3						
1981 06 05		19 51.30	-22 16.1	2.173	3.007	138.2	13.0	17.9	
1981 06 15		19 45.64	-21 52.8						
1981 06 25		19 37.86	-21 30.3	2.014	2.990	160.3	6.6	17.5	
1981 07 05		19 28.53	-21 07.7						
1981 07 15		19 18.52	-20 43.9	1.957	2.972	176.0	1.4	17.1	
1981 07 25		19 08.79	-20 18.8						
1981 08 04		19 00.26	-19 52.9	2.013	2.953	152.9	9.0	17.6	
1981 08 14		18 53.70	-19 27.0						
1981 08 24		18 49.53	-19 01.9	2.165	2.932	131.3	15.0	17.9	
1981 09 03		18 47.94	-18 37.9						
1981 09 13		18 48.92	-18 14.8	2.381	2.910	111.9	18.7	18.1	
1981 09 23		18 52.29	-17 51.9						
1981 10 03		18 57.82	-17 28.2	2.630	2.887	94.6	20.2	18.4	

(2268) 1942 VW		Elements MPC 5416							
Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	Mag.	
1981 04 26		19 43.05	-21 44.9	2.814	3.171	101.4	18.1	18.2	
1981 05 06		19 47.26	-21 42.6						
1981 05 16		19 49.41	-21 46.0	2.533	3.155	119.3	16.2	17.9	
1981 05 26		19 49.34	-21 55.9						
1981 06 05		19 46.97	-22 12.3	2.299	3.137	139.2	12.2	17.6	
1981 06 15		19 42.36	-22 34.3						
1981 06 25		19 35.79	-23 00.2	2.141	3.119	160.9	6.1	17.2	
1981 07 05		19 27.76	-23 27.6						
1981 07 15		19 19.01	-23 53.6	2.086	3.100	175.7	1.4	16.9	
1981 07 25		19 10.43	-24 16.1						
1981 08 04		19 02.87	-24 33.7	2.141	3.081	153.1	8.6	17.3	
1981 08 14		18 57.07	-24 46.0						
1981 08 24		18 53.48	-24 53.3	2.292	3.060	131.8	14.3	17.6	
1981 09 03		18 52.34	-24 56.2						
1981 09 13		18 53.69	-24 55.1	2.509	3.039	112.5	17.8	17.8	
1981 09 23		18 57.39	-24 50.4						
1981 10 03		19 03.24	-24 41.8	2.759	3.017	95.1	19.3	18.0	

1974 KB		Elements MPC 5840							
Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	Mag.	
1981 04 26		19 33.25	-25 48.8	1.511	2.011	104.3	29.0	17.6	
1981 05 06		19 43.35	-25 32.5						
1981 05 16		19 50.36	-25 20.7	1.323	2.024	119.7	25.7	17.2	
1981 05 26		19 53.91	-25 15.1						
1981 06 05		19 53.67	-25 16.2	1.169	2.040	138.1	19.4	16.8	
1981 06 15		19 49.59	-25 22.8						
1981 06 25		19 42.06	-25 31.6	1.074	2.058	159.6	9.9	16.4	
1981 07 05		19 31.99	-25 38.3						
1981 07 15		19 20.90	-25 38.6	1.064	2.078	174.9	2.5	16.1	
1981 07 25		19 10.54	-25 30.6						
1981 08 04		19 02.39	-25 14.7	1.145	2.100	152.9	12.7	16.7	
1981 08 14		18 57.50	-24 53.0						
1981 08 24		18 56.21	-24 27.7	1.306	2.123	132.4	20.6	17.2	
1981 09 03		18 58.46	-24 00.1						
1981 09 13		19 03.93	-23 30.3	1.520	2.148	114.9	25.1	17.6	
1981 09 23		19 12.16	-22 57.8						
1981 10 03		19 22.69	-22 21.7	1.767	2.173	99.8	27.0	18.0	

(2265) 1950 DB

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	Elements MPC	Mag.
1981 04 26		19 55.40	-08 29.9	2.884	3.151	95.9	18.5	5413	19.2
1981 05 06		19 59.09	-08 12.6						
1981 05 16		20 00.83	-08 02.6	2.619	3.160	113.4	17.1		19.0
1981 05 26		20 00.48	-08 02.1						
1981 06 05		19 57.96	-08 12.8	2.390	3.167	132.7	13.6		18.7
1981 06 15		19 53.33	-08 36.3						
1981 06 25		19 46.81	-09 13.1	2.229	3.171	153.4	8.3		18.4
1981 07 05		19 38.84	-10 02.5						
1981 07 15		19 30.07	-11 02.3	2.168	3.173	169.3	3.4		18.2
1981 07 25		19 21.29	-12 09.2						
1981 08 04		19 13.27	-13 19.6	2.222	3.172	155.3	7.7		18.4
1981 08 14		19 06.74	-14 29.8						
1981 08 24		19 02.17	-15 36.8	2.379	3.169	134.3	13.2		18.7
1981 09 03		18 59.84	-16 38.6						
1981 09 13		18 59.84	-17 33.9	2.610	3.163	114.5	16.8		19.0
1981 09 23		19 02.09	-18 22.0						
1981 10 03		19 06.44	-19 02.5	2.882	3.155	96.4	18.4		19.2

1980 GD

Date	ET	R. A. (1950)	Decl.	Delta	r	Variation	Elements MPC	Mag.	
1981 04 26		20 01.92	-24 58.5	2.613	2.924	-0.88	+0.4	5347	18.5
1981 05 06		20 08.03	-25 28.1						
1981 05 16		20 12.05	-26 07.9	2.334	2.910	-1.01	+0.1		18.2
1981 05 26		20 13.75	-26 58.8						
1981 06 05		20 12.87	-28 00.7	2.095	2.894	-1.16	-0.1		17.8
1981 06 15		20 09.30	-29 11.8						
1981 06 25		20 03.12	-30 28.4	1.925	2.876	-1.32	+0.3		17.5
1981 07 05		19 54.68	-31 45.0						
1981 07 15		19 44.71	-32 55.0	1.853	2.856	-1.40	+1.1		17.2
1981 07 25		19 34.24	-33 52.7						
1981 08 04		19 24.44	-34 34.5	1.890	2.835	-1.36	+2.1		17.5
1981 08 14		19 16.41	-34 59.8						
1981 08 24		19 10.90	-35 10.2	2.023	2.812	-1.24	+2.6		17.7
1981 09 03		19 08.33	-35 08.5						
1981 09 13		19 08.82	-34 57.4	2.222	2.788	-1.09	+2.5		18.0
1981 09 23		19 12.20	-34 39.0						
1981 10 03		19 18.22	-34 14.8	2.455	2.762	-0.97	+1.9		18.2

1980 EC

Date	ET	R. A. (1950)	Decl.	Delta	r	Variation	Elements MPC	Mag.	
1981 04 26		20 00.56	-06 13.7	2.213	2.496	-1.04	+0.7	5313	17.8
1981 05 06		20 07.87	-05 22.1						
1981 05 16		20 13.00	-04 36.8	1.994	2.518	-1.16	+0.7		17.5
1981 05 26		20 15.76	-04 01.1						
1981 06 05		20 15.99	-03 38.3	1.800	2.541	-1.32	+0.7		17.2
1981 06 15		20 13.65	-03 31.7						
1981 06 25		20 08.89	-03 44.0	1.659	2.564	-1.47	+0.6		16.9
1981 07 05		20 02.12	-04 16.5						
1981 07 15		19 54.04	-05 08.6	1.598	2.587	-1.55	+0.3		16.7
1981 07 25		19 45.58	-06 17.0						
1981 08 04		19 37.74	-07 36.5	1.638	2.610	-1.51	+0.3		16.8
1981 08 14		19 31.43	-09 01.1						
1981 08 24		19 27.30	-10 25.0	1.776	2.634	-1.37	+0.4		17.2
1981 09 03		19 25.70	-11 43.7						
1981 09 13		19 26.73	-12 54.0	1.992	2.657	-1.21	+0.5		17.6
1981 09 23		19 30.26	-13 54.2						
1981 10 03		19 36.08	-14 43.1	2.256	2.680	-1.05	+0.4		17.9

1978 PC						Elements MPC 4576			
Date	ET	R. A. (1950)	Decl.	Delta	r	Variation		Mag.	
1981 04 26		20 19.49	-35 35.0	2.533	2.824	-0.93	+0.5	19.3	
1981 05 06		20 27.15	-36 50.7						
1981 05 16		20 32.58	-38 20.2	2.283	2.828	-1.08	-0.1	19.0	
1981 05 26		20 35.39	-40 03.4						
1981 06 05		20 35.15	-41 58.8	2.073	2.829	-1.29	-0.5	18.7	
1981 06 15		20 31.50	-44 01.5						
1981 06 25		20 24.28	-46 04.0	1.931	2.826	-1.52	-0.1	18.5	
1981 07 05		20 13.67	-47 56.4						
1981 07 15		20 00.45	-49 27.8	1.883	2.819	-1.67	+1.3	18.3	
1981 07 25		19 46.01	-50 30.1						
1981 08 04		19 32.09	-50 59.9	1.934	2.809	-1.63	+3.0	18.5	
1981 08 14		19 20.41	-50 59.2						
1981 08 24		19 12.11	-50 34.1	2.072	2.796	-1.44	+3.9	18.7	
1981 09 03		19 07.74	-49 51.3						
1981 09 13		19 07.33	-48 57.2	2.267	2.779	-1.22	+3.7	19.0	
1981 09 23		19 10.53	-47 56.3						
1981 10 03		19 16.90	-46 51.2	2.492	2.758	-1.06	+2.9	19.2	

1980 HB						Elements MPC 5409			
Date	ET	R. A. (1950)	Decl.	Delta	r	Variation		Mag.	
1981 04 26		20 11.59	+07 35.0	2.576	2.738	-0.82	+0.1	17.7	
1981 05 06		20 17.90	+09 16.0						
1981 05 16		20 22.27	+10 54.3	2.347	2.739	-0.92	+0.4	17.5	
1981 05 26		20 24.53	+12 26.7						
1981 06 05		20 24.50	+13 49.0	2.136	2.739	-1.05	+0.5	17.3	
1981 06 15		20 22.12	+14 56.0						
1981 06 25		20 17.47	+15 42.2	1.966	2.736	-1.17	+0.2	17.0	
1981 07 05		20 10.82	+16 02.1						
1981 07 15		20 02.74	+15 51.4	1.860	2.732	-1.25	-0.4	16.8	
1981 07 25		19 54.02	+15 08.3						
1981 08 04		19 45.55	+13 54.4	1.837	2.726	-1.24	-1.0	16.8	
1981 08 14		19 38.27	+12 14.8						
1981 08 24		19 32.89	+10 17.2	1.904	2.719	-1.15	-1.2	16.9	
1981 09 03		19 29.85	+08 09.9						
1981 09 13		19 29.39	+06 01.3	2.049	2.709	-1.02	-0.8	17.1	
1981 09 23		19 31.47	+03 57.6						
1981 10 03		19 35.95	+02 03.6	2.251	2.698	-0.91	-0.3	17.4	

(2300) 1953 TG2						Elements MPC 5641			
Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	Mag.	
1981 04 26		20 11.80	-22 26.3	2.631	2.898	95.0	20.2	18.9	
1981 05 06		20 18.75	-22 14.4						
1981 05 16		20 23.72	-22 08.7	2.353	2.883	111.6	19.0	18.6	
1981 05 26		20 26.50	-22 10.4						
1981 06 05		20 26.88	-22 20.4	2.106	2.867	130.1	15.7	18.3	
1981 06 15		20 24.75	-22 38.3						
1981 06 25		20 20.18	-23 02.9	1.920	2.851	150.8	10.0	17.9	
1981 07 05		20 13.43	-23 31.7						
1981 07 15		20 05.10	-24 01.2	1.824	2.835	172.7	2.6	17.5	
1981 07 25		19 56.05	-24 27.5						
1981 08 04		19 47.27	-24 47.7	1.833	2.819	162.8	6.1	17.7	
1981 08 14		19 39.77	-25 00.0						
1981 08 24		19 34.32	-25 04.1	1.945	2.802	140.9	13.2	18.0	
1981 09 03		19 31.37	-25 00.8						
1981 09 13		19 31.14	-24 50.8	2.133	2.786	120.9	18.1	18.3	
1981 09 23		19 33.55	-24 34.9						
1981 10 03		19 38.42	-24 13.5	2.367	2.770	103.1	20.6	18.6	

1951 RL		Elements MPC 5414							Mag.
Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	Mag.	
1981 04 26		20 12.40	-33 26.8	2.169	2.502	97.1	23.5	17.7	
1981 05 06		20 22.63	-33 24.0						
1981 05 16		20 30.56	-33 26.4	1.899	2.466	112.2	22.3	17.4	
1981 05 26		20 35.86	-33 34.9						
1981 06 05		20 38.13	-33 49.4	1.660	2.431	129.0	18.9	17.0	
1981 06 15		20 37.06	-34 07.9						
1981 06 25		20 32.55	-34 26.7	1.475	2.397	147.7	13.1	16.5	
1981 07 05		20 24.77	-34 40.0						
1981 07 15		20 14.47	-34 40.7	1.370	2.364	164.4	6.7	16.2	
1981 07 25		20 02.90	-34 23.2						
1981 08 04		19 51.63	-33 45.0	1.360	2.334	158.5	9.2	16.2	
1981 08 14		19 42.23	-32 47.6						
1981 08 24		19 35.77	-31 35.8	1.444	2.306	139.2	16.6	16.5	
1981 09 03		19 32.81	-30 15.0						
1981 09 13		19 33.44	-28 49.6	1.598	2.280	120.5	22.3	16.8	
1981 09 23		19 37.38	-27 22.4						
1981 10 03		19 44.25	-25 54.1	1.795	2.258	104.1	25.5	17.1	

(2186) Keldysh		Elements MPC 5035							Mag.
Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	Mag.	
1981 04 26		20 19.44	-19 44.9	2.634	2.863	92.7	20.6	18.4	
1981 05 06		20 26.47	-19 15.9						
1981 05 16		20 31.57	-18 52.2	2.352	2.848	109.1	19.6	18.1	
1981 05 26		20 34.53	-18 34.9						
1981 06 05		20 35.12	-18 25.4	2.098	2.831	127.4	16.6	17.7	
1981 06 15		20 33.22	-18 24.3						
1981 06 25		20 28.86	-18 31.3	1.900	2.813	147.9	11.1	17.4	
1981 07 05		20 22.26	-18 45.2						
1981 07 15		20 13.94	-19 03.6	1.787	2.795	170.5	3.4	17.0	
1981 07 25		20 04.72	-19 23.8						
1981 08 04		19 55.57	-19 42.7	1.780	2.775	165.9	5.1	17.0	
1981 08 14		19 47.53	-19 58.0						
1981 08 24		19 41.39	-20 08.6	1.877	2.755	143.4	12.6	17.4	
1981 09 03		19 37.71	-20 13.8						
1981 09 13		19 36.73	-20 13.6	2.054	2.735	122.9	18.0	17.7	
1981 09 23		19 38.43	-20 07.8						
1981 10 03		19 42.66	-19 56.5	2.280	2.714	104.8	20.9	17.9	

1939 BF		Elements MPC 4828							Mag.
Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	Mag.	
1981 04 26		20 28.89	-19 57.6	3.632	3.779	90.6	15.4	18.0	
1981 05 06		20 33.33	-19 43.9						
1981 05 16		20 36.17	-19 35.8	3.321	3.762	108.2	14.8	17.8	
1981 05 26		20 37.29	-19 34.0						
1981 06 05		20 36.57	-19 38.8	3.040	3.743	127.3	12.4	17.6	
1981 06 15		20 33.97	-19 50.3						
1981 06 25		20 29.57	-20 07.6	2.821	3.723	148.1	8.3	17.3	
1981 07 05		20 23.57	-20 29.4						
1981 07 15		20 16.37	-20 53.5	2.695	3.701	170.3	2.6	16.9	
1981 07 25		20 08.52	-21 17.7						
1981 08 04		20 00.65	-21 39.8	2.683	3.677	166.7	3.6	17.0	
1981 08 14		19 53.44	-21 57.9						
1981 08 24		19 47.49	-22 11.1	2.782	3.652	144.4	9.3	17.2	
1981 09 03		19 43.21	-22 19.0						
1981 09 13		19 40.88	-22 21.6	2.971	3.625	123.5	13.4	17.5	
1981 09 23		19 40.60	-22 19.3						
1981 10 03		19 42.33	-22 12.1	3.217	3.597	104.3	15.6	17.7	

1975 BU						Elements MPC				5218
Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	Mag.		
1981 04 26		20 20.43	-10 01.7	2.510	2.708	90.2	21.8	17.0		
1981 05 06		20 27.83	-09 45.8							
1981 05 16		20 33.30	-09 38.7	2.271	2.731	106.2	20.8	16.7		
1981 05 26		20 36.65	-09 42.8							
1981 06 05		20 37.70	-10 00.7	2.053	2.754	124.2	17.7	16.5		
1981 06 15		20 36.34	-10 34.1							
1981 06 25		20 32.62	-11 23.9	1.886	2.778	144.6	12.2	16.2		
1981 07 05		20 26.78	-12 29.2							
1981 07 15		20 19.31	-13 47.0	1.802	2.801	166.9	4.7	15.9		
1981 07 25		20 10.99	-15 12.7							
1981 08 04		20 02.70	-16 40.2	1.824	2.824	167.7	4.4	15.9		
1981 08 14		19 55.40	-18 04.1							
1981 08 24		19 49.84	-19 19.9	1.956	2.847	145.5	11.6	16.3		
1981 09 03		19 46.52	-20 25.0							
1981 09 13		19 45.70	-21 18.3	2.173	2.869	124.8	16.7	16.7		
1981 09 23		19 47.38	-21 59.8							
1981 10 03		19 51.41	-22 29.8	2.445	2.890	106.3	19.4	17.0		

1939 FY						Elements MPC				5844
Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	Mag.		
1981 05 16		20 43.52	-28 57.8	1.931	2.450	108.7	23.0	17.4		
1981 05 26		20 48.51	-29 13.7							
1981 06 05		20 50.56	-29 39.6	1.710	2.449	126.0	19.6	17.1		
1981 06 15		20 49.38	-30 14.6							
1981 06 25		20 44.84	-30 55.6	1.539	2.445	145.5	13.6	16.7		
1981 07 05		20 37.08	-31 37.4							
1981 07 15		20 26.71	-32 12.6	1.446	2.441	164.4	6.4	16.4		
1981 07 25		20 14.89	-32 34.5							
1981 08 04		20 03.05	-32 38.2	1.453	2.435	160.9	7.8	16.4		
1981 08 14		19 52.72	-32 22.9							
1981 08 24		19 45.05	-31 51.1	1.557	2.427	141.0	15.2	16.7		
1981 09 03		19 40.66	-31 07.0							
1981 09 13		19 39.76	-30 14.5	1.735	2.418	121.5	20.8	17.1		
1981 09 23		19 42.15	-29 16.5							
1981 10 03		19 47.46	-28 14.5	1.957	2.407	104.3	23.8	17.4		
1981 10 13		19 55.32	-27 09.0							
1981 10 23		20 05.27	-25 59.9	2.198	2.396	88.9	24.5	17.7		

1978 WB						Elements MPC				4637
Date	ET	R. A. (1950)	Decl.	Delta	r	Variation	Mag.			
1981 05 16		20 39.49	-20 32.4	2.031	2.529	-1.21	-4.1	20.1		
1981 05 26		20 44.75	-20 25.7							
1981 06 05		20 47.54	-20 28.9	1.769	2.494	-1.42	-5.0	19.7		
1981 06 15		20 47.59	-20 43.3							
1981 06 25		20 44.74	-21 08.8	1.556	2.458	-1.66	-5.7	19.2		
1981 07 05		20 38.99	-21 43.7							
1981 07 15		20 30.76	-22 24.3	1.420	2.421	-1.86	-5.6	18.8		
1981 07 25		20 20.87	-23 05.4							
1981 08 04		20 10.47	-23 41.3	1.382	2.383	-1.90	-4.6	18.7		
1981 08 14		20 00.95	-24 08.0							
1981 08 24		19 53.53	-24 23.3	1.443	2.345	-1.75	-3.5	19.0		
1981 09 03		19 49.03	-24 27.1							
1981 09 13		19 47.87	-24 20.6	1.581	2.307	-1.53	-2.8	19.3		
1981 09 23		19 50.05	-24 04.7							
1981 10 03		19 55.35	-23 40.3	1.766	2.269	-1.33	-2.8	19.6		
1981 10 13		20 03.43	-23 07.6							
1981 10 23		20 13.88	-22 26.4	1.970	2.232	-1.18	-3.1	19.8		

(2358) 1929 RE				Elements MPC				5892
Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	Mag.
1981 05 16		20 47.16	-27 49.9	2.614	3.076	107.7	18.3	16.9
1981 05 26		20 50.60	-27 54.6					
1981 06 05		20 51.74	-28 06.6	2.352	3.056	125.6	15.7	16.6
1981 06 15		20 50.42	-28 24.9					
1981 06 25		20 46.61	-28 47.7	2.145	3.036	145.2	11.0	16.3
1981 07 05		20 40.46	-29 11.7					
1981 07 15		20 32.42	-29 32.8	2.023	3.016	164.9	5.1	16.0
1981 07 25		20 23.21	-29 46.6					
1981 08 04		20 13.77	-29 50.0	2.006	2.996	164.6	5.2	16.0
1981 08 14		20 05.11	-29 41.4					
1981 08 24		19 58.10	-29 21.2	2.094	2.975	144.5	11.4	16.2
1981 09 03		19 53.35	-28 51.1					
1981 09 13		19 51.19	-28 13.2	2.267	2.955	124.5	16.3	16.5
1981 09 23		19 51.65	-27 29.5					
1981 10 03		19 54.61	-26 41.3	2.495	2.935	106.2	19.1	16.8
1981 10 13		19 59.84	-25 49.2					
1981 10 23		20 07.05	-24 53.5	2.748	2.915	89.6	20.0	17.0

(2179) 1965 MA				Elements MPC				5031
Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	Mag.
1981 05 16		20 51.11	-30 18.7	2.784	3.232	107.3	17.4	18.2
1981 05 26		20 54.40	-30 41.9					
1981 06 05		20 55.43	-31 13.1	2.526	3.219	125.2	14.9	17.9
1981 06 15		20 54.06	-31 51.2					
1981 06 25		20 50.26	-32 33.4	2.325	3.205	144.3	10.7	17.6
1981 07 05		20 44.14	-33 16.0					
1981 07 15		20 36.14	-33 53.9	2.209	3.191	161.8	5.7	17.3
1981 07 25		20 26.95	-34 22.2					
1981 08 04		20 17.45	-34 37.2	2.199	3.175	161.0	6.0	17.3
1981 08 14		20 08.64	-34 37.0					
1981 08 24		20 01.39	-34 22.1	2.293	3.159	142.9	11.1	17.6
1981 09 03		19 56.30	-33 54.6					
1981 09 13		19 53.74	-33 17.0	2.473	3.142	123.5	15.5	17.8
1981 09 23		19 53.74	-32 32.1					
1981 10 03		19 56.22	-31 41.7	2.707	3.124	105.3	18.0	18.1
1981 10 13		20 00.95	-30 47.1					
1981 10 23		20 07.65	-29 48.9	2.966	3.106	88.7	18.7	18.3

1978 SY2				Elements MPC				5846
Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	Mag.
1981 05 16		20 58.26	-21 35.5	1.984	2.431	103.7	23.8	18.0
1981 05 26		21 04.35	-21 10.3					
1981 06 05		21 07.90	-20 53.6	1.733	2.412	120.5	21.3	17.6
1981 06 15		21 08.60	-20 46.5					
1981 06 25		21 06.23	-20 49.0	1.522	2.391	139.9	15.9	17.2
1981 07 05		21 00.71	-20 59.9					
1981 07 15		20 52.34	-21 16.2	1.380	2.367	162.0	7.6	16.7
1981 07 25		20 41.85	-21 33.2					
1981 08 04		20 30.40	-21 46.3	1.333	2.343	172.9	3.1	16.4
1981 08 14		20 19.46	-21 51.6					
1981 08 24		20 10.37	-21 47.3	1.387	2.317	149.7	12.7	16.8
1981 09 03		20 04.11	-21 33.6					
1981 09 13		20 01.21	-21 11.7	1.525	2.290	128.4	20.1	17.2
1981 09 23		20 01.72	-20 42.7					
1981 10 03		20 05.44	-20 07.1	1.715	2.262	110.0	24.6	17.5
1981 10 13		20 12.03	-19 25.1					
1981 10 23		20 21.07	-18 36.4	1.929	2.233	94.1	26.4	17.8

1980 EG						Elements MPC		5408
Date	ET	R. A. (1950)	Decl.	Delta	r	Variation	Mag.	
1981 05 16		21 00.04	-22 41.3	2.501	2.910	-0.89 -0.6	18.6	
1981 05 26		21 04.64	-23 15.6					
1981 06 05		21 07.05	-24 02.8	2.249	2.910	-1.01 -1.0	18.3	
1981 06 15		21 07.04	-25 03.4					
1981 06 25		21 04.50	-26 15.8	2.046	2.908	-1.16 -1.3	18.0	
1981 07 05		20 59.43	-27 36.7					
1981 07 15		20 52.11	-29 00.7	1.923	2.904	-1.28 -1.0	17.7	
1981 07 25		20 43.16	-30 20.9					
1981 08 04		20 33.42	-31 30.5	1.905	2.898	-1.33 -0.2	17.6	
1981 08 14		20 24.01	-32 24.3					
1981 08 24		20 15.95	-33 00.1	1.995	2.890	-1.26 +0.6	17.9	
1981 09 03		20 10.03	-33 18.1					
1981 09 13		20 06.78	-33 20.4	2.173	2.881	-1.13 +1.0	18.2	
1981 09 23		20 06.33	-33 09.8					
1981 10 03		20 08.63	-32 48.5	2.405	2.870	-0.99 +0.9	18.4	
1981 10 13		20 13.45	-32 18.5					
1981 10 23		20 20.49	-31 41.1	2.663	2.858	-0.88 +0.5	18.7	

1975 EE3						Elements MPC		4644
Date	ET	R. A. (1950)	Decl.	Delta	r	Elong. Phase	Mag.	
1981 05 16		20 57.64	+09 56.9	1.846	2.167	94.1 27.7	17.7	
1981 05 26		21 04.65	+11 47.7					
1981 06 05		21 09.32	+13 30.2	1.637	2.163	107.0 26.7	17.5	
1981 06 15		21 11.35	+14 59.3					
1981 06 25		21 10.50	+16 08.6	1.447	2.157	121.3 23.8	17.1	
1981 07 05		21 06.64	+16 50.3					
1981 07 15		20 59.93	+16 55.8	1.295	2.147	136.2 19.1	16.8	
1981 07 25		20 50.93	+16 18.0					
1981 08 04		20 40.62	+14 53.0	1.207	2.133	147.5 14.8	16.5	
1981 08 14		20 30.37	+12 43.4					
1981 08 24		20 21.57	+09 59.2	1.203	2.117	145.7 15.6	16.5	
1981 09 03		20 15.33	+06 54.9					
1981 09 13		20 12.39	+03 46.5	1.286	2.097	132.0 20.9	16.7	
1981 09 23		20 12.93	+00 47.1					
1981 10 03		20 16.88	-01 54.2	1.436	2.074	115.5 25.8	17.1	
1981 10 13		20 23.93	-04 12.4					
1981 10 23		20 33.68	-06 05.6	1.628	2.049	99.9 28.6	17.4	

(2294) 1977 PL1						Elements MPC		5597
Date	ET	R. A. (1950)	Decl.	Delta	r	Elong. Phase	Mag.	
1981 05 16		21 00.45	-17 28.3	1.919	2.349	102.1 24.9	16.4	
1981 05 26		21 08.03	-16 31.9					
1981 06 05		21 13.24	-15 41.4	1.678	2.331	117.9 22.6	16.1	
1981 06 15		21 15.78	-14 58.7					
1981 06 25		21 15.46	-14 25.2	1.474	2.316	136.0 17.7	15.7	
1981 07 05		21 12.19	-14 01.9					
1981 07 15		21 06.15	-13 48.8	1.332	2.302	157.0 9.9	15.3	
1981 07 25		20 57.96	-13 44.5					
1981 08 04		20 48.55	-13 46.6	1.278	2.291	176.1 1.7	14.8	
1981 08 14		20 39.23	-13 51.8					
1981 08 24		20 31.25	-13 57.0	1.322	2.283	155.9 10.4	15.2	
1981 09 03		20 25.63	-13 59.6					
1981 09 13		20 22.98	-13 57.7	1.453	2.277	134.8 18.3	15.6	
1981 09 23		20 23.47	-13 49.9					
1981 10 03		20 26.99	-13 35.2	1.645	2.274	116.4 23.2	16.0	
1981 10 13		20 33.27	-13 12.8					
1981 10 23		20 41.92	-12 42.0	1.872	2.273	100.4 25.5	16.3	

(2219) 1975 LU				Elements MPC				5415
Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	Mag.
1981 05 16		21 05.70	-22 35.2	2.661	3.041	102.3	19.0	17.0
1981 05 26		21 11.08	-22 45.1					
1981 06 05		21 14.49	-23 05.2	2.386	3.018	119.6	17.0	16.7
1981 06 15		21 15.72	-23 36.0					
1981 06 25		21 14.66	-24 16.9	2.157	2.996	138.6	13.0	16.3
1981 07 05		21 11.28	-25 06.1					
1981 07 15		21 05.78	-25 59.8	2.003	2.973	158.8	7.1	16.0
1981 07 25		20 58.61	-26 53.2					
1981 08 04		20 50.46	-27 41.0	1.948	2.952	169.7	3.5	15.8
1981 08 14		20 42.27	-28 18.4					
1981 08 24		20 34.97	-28 42.5	2.000	2.931	151.9	9.3	16.1
1981 09 03		20 29.37	-28 52.3					
1981 09 13		20 26.04	-28 48.6	2.144	2.910	131.5	15.0	16.3
1981 09 23		20 25.23	-28 32.9					
1981 10 03		20 26.99	-28 06.9	2.353	2.891	112.7	18.6	16.6
1981 10 13		20 31.17	-27 32.1					
1981 10 23		20 37.52	-26 49.6	2.597	2.873	95.8	20.2	16.8

(2289) 6567 P-L				Elements MPC				5447
Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	Mag.
1981 05 16		21 25.47	-12 40.2	2.139	2.442	94.9	24.4	18.7
1981 05 26		21 33.20	-11 55.9					
1981 06 05		21 38.76	-11 21.3	1.924	2.470	110.6	22.6	18.5
1981 06 15		21 41.91	-10 58.5					
1981 06 25		21 42.49	-10 49.5	1.735	2.499	128.6	18.5	18.2
1981 07 05		21 40.38	-10 55.3					
1981 07 15		21 35.71	-11 15.8	1.601	2.529	149.3	11.8	17.9
1981 07 25		21 28.88	-11 49.1					
1981 08 04		21 20.57	-12 31.6	1.550	2.558	172.0	3.2	17.6
1981 08 14		21 11.77	-13 18.3					
1981 08 24		21 03.56	-14 03.7	1.603	2.588	163.7	6.3	17.8
1981 09 03		20 56.88	-14 43.4					
1981 09 13		20 52.44	-15 14.3	1.755	2.619	141.6	13.8	18.2
1981 09 23		20 50.57	-15 34.6					
1981 10 03		20 51.34	-15 43.9	1.983	2.648	121.6	18.8	18.6
1981 10 13		20 54.61	-15 42.3					
1981 10 23		21 00.10	-15 30.2	2.258	2.678	103.9	21.1	19.0

(2251) Tikhov				Elements MPC				5349
Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	Mag.
1981 05 16		21 21.29	-06 59.4	2.294	2.572	94.1	23.1	17.2
1981 05 26		21 29.19	-05 57.2					
1981 06 05		21 35.29	-05 01.7	2.022	2.542	109.1	22.2	16.9
1981 06 15		21 39.36	-04 15.8					
1981 06 25		21 41.19	-03 42.1	1.776	2.512	126.0	19.1	16.5
1981 07 05		21 40.60	-03 23.7					
1981 07 15		21 37.57	-03 23.2	1.581	2.483	145.1	13.5	16.1
1981 07 25		21 32.31	-03 41.9					
1981 08 04		21 25.30	-04 19.6	1.462	2.456	164.8	6.2	15.7
1981 08 14		21 17.38	-05 13.4					
1981 08 24		21 09.60	-06 17.9	1.441	2.430	164.4	6.4	15.7
1981 09 03		21 02.99	-07 26.6					
1981 09 13		20 58.47	-08 32.8	1.518	2.406	144.1	14.2	15.9
1981 09 23		20 56.57	-09 31.0					
1981 10 03		20 57.53	-10 17.5	1.672	2.384	124.3	20.3	16.3
1981 10 13		21 01.32	-10 50.3					
1981 10 23		21 07.70	-11 08.4	1.875	2.364	106.9	23.7	16.6

1978 SP		Elements MPC 5602							
Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	Mag.	
1981 05 16		20 57.10	-18 25.7	1.321	1.837	103.1	32.4	18.2	
1981 05 26		21 11.30	-17 27.6						
1981 06 05		21 23.32	-16 35.3	1.116	1.806	115.8	30.4	17.7	
1981 06 15		21 32.74	-15 52.2						
1981 06 25		21 39.15	-15 21.6	0.941	1.781	130.9	25.6	17.2	
1981 07 05		21 42.09	-15 06.4						
1981 07 15		21 41.31	-15 08.1	0.809	1.761	149.4	17.1	16.7	
1981 07 25		21 36.96	-15 25.2						
1981 08 04		21 29.71	-15 53.4	0.739	1.749	171.4	5.0	16.1	
1981 08 14		21 21.01	-16 24.9						
1981 08 24		21 12.71	-16 51.4	0.746	1.743	165.2	8.5	16.3	
1981 09 03		21 06.58	-17 06.6						
1981 09 13		21 03.90	-17 06.8	0.829	1.745	143.7	19.9	16.8	
1981 09 23		21 05.12	-16 51.1						
1981 10 03		21 10.17	-16 20.0	0.969	1.754	125.8	27.6	17.3	
1981 10 13		21 18.63	-15 34.2						
1981 10 23		21 29.90	-14 34.6	1.149	1.770	111.1	31.6	17.8	

1976 UB		Elements MPC 4539							
Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	Mag.	
1981 05 16		21 33.92	-14 24.5	2.935	3.162	93.5	18.6	19.3	
1981 05 26		21 39.87	-13 54.8						
1981 06 05		21 44.18	-13 32.9	2.629	3.126	110.1	17.8	19.0	
1981 06 15		21 46.66	-13 20.0						
1981 06 25		21 47.15	-13 17.4	2.354	3.090	128.4	14.9	18.7	
1981 07 05		21 45.55	-13 25.4						
1981 07 15		21 41.88	-13 44.0	2.138	3.053	148.8	9.9	18.3	
1981 07 25		21 36.35	-14 11.6						
1981 08 04		21 29.37	-14 45.7	2.011	3.017	171.1	3.0	17.9	
1981 08 14		21 21.61	-15 22.5						
1981 08 24		21 13.89	-15 58.0	1.991	2.981	165.7	4.8	17.9	
1981 09 03		21 07.02	-16 28.6						
1981 09 13		21 01.75	-16 51.5	2.077	2.946	143.3	11.8	18.2	
1981 09 23		20 58.57	-17 05.2						
1981 10 03		20 57.73	-17 08.9	2.246	2.911	122.7	16.8	18.5	
1981 10 13		20 59.31	-17 02.6						
1981 10 23		21 03.17	-16 46.5	2.465	2.877	104.3	19.6	18.7	

1980 EB		Elements MPC 5440							
Date	ET	R. A. (1950)	Decl.	Delta	r	Variation	Phase	Mag.	
1981 05 16		21 34.10	-16 42.2	2.106	2.401	-1.05	-5.6	19.1	
1981 05 26		21 42.56	-16 05.7						
1981 06 05		21 48.84	-15 39.1	1.883	2.421	-1.18	-6.6	18.8	
1981 06 15		21 52.68	-15 24.5						
1981 06 25		21 53.85	-15 23.0	1.684	2.441	-1.35	-7.7	18.5	
1981 07 05		21 52.18	-15 35.2						
1981 07 15		21 47.67	-16 00.1	1.537	2.460	-1.54	-8.5	18.2	
1981 07 25		21 40.67	-16 34.8						
1981 08 04		21 31.80	-17 14.6	1.472	2.479	-1.67	-8.5	17.8	
1981 08 14		21 22.10	-17 53.6						
1981 08 24		21 12.77	-18 26.4	1.509	2.498	-1.65	-7.6	18.0	
1981 09 03		21 04.91	-18 49.3						
1981 09 13		20 59.38	-19 00.2	1.645	2.516	-1.48	-6.4	18.4	
1981 09 23		20 56.61	-18 59.2						
1981 10 03		20 56.70	-18 46.8	1.857	2.534	-1.27	-5.5	18.8	
1981 10 13		20 59.53	-18 23.8						
1981 10 23		21 04.78	-17 51.3	2.115	2.551	-1.08	-4.9	19.2	

1977 PY1						Elements MPC		5598
Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	Mag.
1981 05 16		21 21.45	-07 59.2	1.841	2.166	94.4	27.7	17.1
1981 05 26		21 31.94	-06 37.0					
1981 06 05		21 40.38	-05 21.6	1.626	2.167	108.1	26.4	16.8
1981 06 15		21 46.50	-04 16.4					
1981 06 25		21 50.04	-03 24.6	1.433	2.171	123.9	22.9	16.5
1981 07 05		21 50.78	-02 49.9					
1981 07 15		21 48.66	-02 35.6	1.284	2.179	142.4	16.6	16.1
1981 07 25		21 43.90	-02 43.7					
1981 08 04		21 37.05	-03 14.1	1.202	2.191	162.3	8.1	15.8
1981 08 14		21 29.10	-04 03.7					
1981 08 24		21 21.26	-05 06.0	1.210	2.206	166.5	6.1	15.8
1981 09 03		21 14.70	-06 13.4					
1981 09 13		21 10.43	-07 17.8	1.311	2.224	147.1	14.2	16.2
1981 09 23		21 08.95	-08 13.3					
1981 10 03		21 10.44	-08 55.8	1.489	2.245	127.7	20.6	16.6
1981 10 13		21 14.77	-09 23.4					
1981 10 23		21 21.63	-09 35.5	1.719	2.269	110.6	24.2	17.0

1977 QR2						Elements MPC		4927
Date	ET	R. A. (1950)	Decl.	Delta	r	Variation		Mag.
1981 06 05		21 48.93	-11 19.6	2.018	2.527	-1.17	-5.9	18.6
1981 06 15		21 53.57	-10 46.9					
1981 06 25		21 55.91	-10 25.7	1.772	2.502	-1.35	-7.0	18.2
1981 07 05		21 55.72	-10 18.1					
1981 07 15		21 52.93	-10 25.0	1.575	2.478	-1.56	-8.0	17.8
1981 07 25		21 47.67	-10 46.0					
1981 08 04		21 40.35	-11 19.1	1.454	2.454	-1.72	-8.4	17.3
1981 08 14		21 31.81	-12 00.1					
1981 08 24		21 23.10	-12 43.7	1.432	2.431	-1.74	-8.0	17.3
1981 09 03		21 15.35	-13 24.2					
1981 09 13		21 09.60	-13 57.1	1.510	2.410	-1.60	-7.1	17.6
1981 09 23		21 06.46	-14 19.4					
1981 10 03		21 06.23	-14 29.6	1.666	2.390	-1.41	-6.1	18.0
1981 10 13		21 08.92	-14 27.1					
1981 10 23		21 14.28	-14 12.2	1.873	2.371	-1.22	-5.5	18.3
1981 11 02		21 22.04	-13 45.0					
1981 11 12		21 31.84	-13 06.1	2.102	2.354	-1.08	-5.2	18.5

1964 XA						Elements MPC		5130
Date	ET	R. A. (1950)	Decl.	Delta	r	Variation		Mag.
1981 06 05		22 24.82	-38 07.7	2.571	3.046	-0.74	-6.2	19.4
1981 06 15		22 28.07	-39 09.3					
1981 06 25		22 28.63	-40 22.4	2.350	3.041	-0.85	-7.0	19.1
1981 07 05		22 26.17	-41 43.6					
1981 07 15		22 20.51	-43 06.7	2.186	3.033	-1.00	-7.3	18.9
1981 07 25		22 11.72	-44 23.7					
1981 08 04		22 00.26	-45 25.3	2.106	3.020	-1.13	-6.6	18.7
1981 08 14		21 47.11	-46 02.8					
1981 08 24		21 33.62	-46 11.0	2.124	3.004	-1.17	-5.4	18.8
1981 09 03		21 21.24	-45 48.8					
1981 09 13		21 11.18	-44 59.2	2.235	2.984	-1.08	-4.2	19.0
1981 09 23		21 04.16	-43 47.9					
1981 10 03		21 00.44	-42 21.0	2.417	2.960	-0.93	-3.6	19.2
1981 10 13		20 59.91	-40 43.7					
1981 10 23		21 02.25	-38 59.9	2.640	2.932	-0.79	-3.6	19.4
1981 11 02		21 07.07	-37 12.0					
1981 11 12		21 13.97	-35 21.5	2.878	2.901	-0.67	-3.8	19.6

1974 RV1		Elements MPC 5440							
Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	Mag.	
1981 06 05		22 00.27	-12 38.5	1.445	1.982	106.1	29.5	16.5	
1981 06 15		22 08.20	-11 36.4						
1981 06 25		22 13.25	-10 46.7	1.274	2.003	121.5	25.6	16.1	
1981 07 05		22 15.08	-10 12.2						
1981 07 15		22 13.53	-09 54.4	1.140	2.028	140.2	18.7	15.8	
1981 07 25		22 08.69	-09 53.5						
1981 08 04		22 01.04	-10 07.7	1.067	2.057	162.2	8.7	15.4	
1981 08 14		21 51.65	-10 32.4						
1981 08 24		21 41.90	-11 01.5	1.081	2.088	173.2	3.3	15.3	
1981 09 03		21 33.27	-11 28.6						
1981 09 13		21 26.98	-11 48.5	1.188	2.122	150.5	13.5	15.8	
1981 09 23		21 23.72	-11 58.1						
1981 10 03		21 23.68	-11 55.9	1.372	2.158	130.2	20.7	16.3	
1981 10 13		21 26.75	-11 41.6						
1981 10 23		21 32.54	-11 15.4	1.610	2.195	112.7	24.7	16.8	
1981 11 02		21 40.66	-10 37.8						
1981 11 12		21 50.70	-09 49.5	1.878	2.233	97.4	26.1	17.2	

1977 PZ1		Elements MPC 5441							
Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	Mag.	
1981 06 05		21 58.03	-13 52.6	1.396	1.951	107.0	29.8	16.9	
1981 06 15		22 06.93	-12 31.9						
1981 06 25		22 12.98	-11 20.6	1.222	1.959	121.8	26.2	16.5	
1981 07 05		22 15.84	-10 21.2						
1981 07 15		22 15.29	-09 35.9	1.085	1.973	139.7	19.5	16.1	
1981 07 25		22 11.40	-09 05.6						
1981 08 04		22 04.59	-08 50.1	1.008	1.994	160.8	9.6	15.7	
1981 08 14		21 55.88	-08 46.7						
1981 08 24		21 46.65	-08 51.2	1.013	2.021	173.8	3.1	15.5	
1981 09 03		21 38.39	-08 58.5						
1981 09 13		21 32.40	-09 03.6	1.109	2.054	152.3	13.1	16.1	
1981 09 23		21 29.40	-09 02.7						
1981 10 03		21 29.64	-08 53.5	1.282	2.091	132.4	20.7	16.6	
1981 10 13		21 33.01	-08 34.4						
1981 10 23		21 39.13	-08 05.1	1.510	2.133	115.2	25.0	17.1	
1981 11 02		21 47.59	-07 25.4						
1981 11 12		21 57.98	-06 35.5	1.773	2.178	100.2	26.6	17.5	

(2323) 1976 SF2		Elements MPC 5677							
Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	Mag.	
1981 06 05		22 21.83	-14 30.1	3.161	3.512	101.8	16.4	17.6	
1981 06 15		22 24.73	-14 20.2						
1981 06 25		22 25.90	-14 19.8	2.872	3.491	119.9	14.6	17.3	
1981 07 05		22 25.20	-14 29.2						
1981 07 15		22 22.60	-14 48.1	2.631	3.470	139.7	10.9	17.1	
1981 07 25		22 18.17	-15 15.0						
1981 08 04		22 12.12	-15 47.6	2.470	3.447	161.3	5.4	16.7	
1981 08 14		22 04.90	-16 22.7						
1981 08 24		21 57.09	-16 56.4	2.416	3.423	173.7	1.9	16.5	
1981 09 03		21 49.38	-17 25.1						
1981 09 13		21 42.51	-17 46.0	2.476	3.397	152.1	8.0	16.8	
1981 09 23		21 37.04	-17 57.2						
1981 10 03		21 33.40	-17 58.2	2.634	3.371	130.5	13.0	17.0	
1981 10 13		21 31.82	-17 48.8						
1981 10 23		21 32.32	-17 29.9	2.860	3.344	110.7	16.2	17.3	
1981 11 02		21 34.84	-17 01.9						
1981 11 12		21 39.20	-16 25.7	3.120	3.316	92.6	17.3	17.5	

1979 DE			R. A. (1950)		Decl.	Delta	r	Elements MPC		5008
Date	ET							Variation		Mag.
1981 06 05			22 30.77	-11 34.3		3.063	3.370	-0.63	-0.2	17.5
1981 06 15			22 34.74	-11 54.9						
1981 06 25			22 37.04	-12 29.1		2.784	3.365	-0.71	-0.4	17.2
1981 07 05			22 37.51	-13 17.6						
1981 07 15			22 36.06	-14 20.4		2.547	3.358	-0.79	-0.5	16.9
1981 07 25			22 32.71	-15 35.8						
1981 08 04			22 27.59	-17 00.6		2.389	3.350	-0.86	-0.5	16.7
1981 08 14			22 21.08	-18 29.9						
1981 08 24			22 13.71	-19 57.7		2.337	3.340	-0.90	-0.2	16.4
1981 09 03			22 06.17	-21 18.0						
1981 09 13			21 59.21	-22 25.8		2.401	3.328	-0.88	+0.2	16.7
1981 09 23			21 53.50	-23 18.0						
1981 10 03			21 49.54	-23 53.5		2.567	3.315	-0.81	+0.5	16.9
1981 10 13			21 47.62	-24 12.7						
1981 10 23			21 47.85	-24 16.9		2.802	3.299	-0.73	+0.5	17.2
1981 11 02			21 50.16	-24 07.9						
1981 11 12			21 54.42	-23 47.3		3.071	3.283	-0.66	+0.4	17.4

(2303) 1979 FK			R. A. (1950)		Decl.	Delta	r	Elements MPC		5642
Date	ET							Elong.	Phase	Mag.
1981 06 05			22 45.36	+08 03.3		3.202	3.324	87.9	17.8	19.0
1981 06 15			22 49.99	+08 52.6						
1981 06 25			22 53.08	+09 32.7		2.935	3.330	104.0	17.2	18.8
1981 07 05			22 54.47	+10 01.5						
1981 07 15			22 54.08	+10 16.4		2.687	3.335	121.7	15.0	18.6
1981 07 25			22 51.88	+10 15.2						
1981 08 04			22 47.96	+09 56.0		2.491	3.339	140.8	11.1	18.4
1981 08 14			22 42.57	+09 17.9						
1981 08 24			22 36.17	+08 21.5		2.377	3.341	159.2	6.2	18.1
1981 09 03			22 29.31	+07 09.4						
1981 09 13			22 22.67	+05 46.1		2.370	3.342	162.2	5.3	18.1
1981 09 23			22 16.90	+04 17.6						
1981 10 03			22 12.52	+02 49.8		2.475	3.342	144.7	10.0	18.3
1981 10 13			22 09.90	+01 28.3						
1981 10 23			22 09.22	+00 17.0		2.674	3.341	124.6	14.2	18.6
1981 11 02			22 10.49	-00 41.5						
1981 11 12			22 13.65	-01 26.1		2.934	3.338	105.5	16.6	18.8

(2196) 1965 BC			R. A. (1950)		Decl.	Delta	r	Elements MPC		5132
Date	ET							Elong.	Phase	Mag.
1981 06 05			22 50.47	+02 59.4		3.502	3.624	88.7	16.3	16.9
1981 06 15			22 54.68	+03 44.6						
1981 06 25			22 57.47	+04 21.6		3.225	3.629	105.4	15.7	16.7
1981 07 05			22 58.69	+04 48.8						
1981 07 15			22 58.27	+05 04.6		2.972	3.634	123.5	13.5	16.5
1981 07 25			22 56.21	+05 07.6						
1981 08 04			22 52.58	+04 56.8		2.774	3.638	143.2	9.6	16.2
1981 08 14			22 47.62	+04 32.1						
1981 08 24			22 41.70	+03 54.4		2.663	3.641	162.8	4.7	16.0
1981 09 03			22 35.33	+03 06.1						
1981 09 13			22 29.08	+02 10.6		2.662	3.644	165.4	4.0	16.0
1981 09 23			22 23.51	+01 12.3						
1981 10 03			22 19.13	+00 15.5		2.773	3.646	146.1	8.8	16.2
1981 10 13			22 16.27	-00 36.1						
1981 10 23			22 15.14	-01 19.4		2.977	3.648	125.6	12.8	16.5
1981 11 02			22 15.79	-01 52.8						
1981 11 12			22 18.18	-02 15.1		3.245	3.649	106.3	15.1	16.7

1980 EF						Elements MPC 5347			
Date	ET	R. A. (1950)	Decl.	Delta	r	Variation		Mag.	
1981 06 05		23 02.36	-14 46.4	2.151	2.422	-0.83	-8.4	19.8	
1981 06 15		23 09.78	-14 07.9						
1981 06 25		23 15.05	-13 41.5	1.934	2.453	-0.92	-9.6	19.5	
1981 07 05		23 17.86	-13 28.3						
1981 07 15		23 17.95	-13 28.8	1.739	2.482	-1.06	-10.9	19.2	
1981 07 25		23 15.15	-13 42.3						
1981 08 04		23 09.45	-14 06.7	1.595	2.509	-1.23	-11.9	18.9	
1981 08 14		23 01.17	-14 37.7						
1981 08 24		22 51.00	-15 09.5	1.534	2.534	-1.34	-12.0	18.6	
1981 09 03		22 39.97	-15 36.0						
1981 09 13		22 29.35	-15 51.8	1.579	2.557	-1.33	-11.0	18.8	
1981 09 23		22 20.25	-15 53.7						
1981 10 03		22 13.51	-15 40.9	1.728	2.577	-1.19	-9.5	19.2	
1981 10 13		22 09.56	-15 14.2						
1981 10 23		22 08.47	-14 35.3	1.953	2.595	-1.02	-8.2	19.6	
1981 11 02		22 10.08	-13 45.8						
1981 11 12		22 14.09	-12 47.1	2.222	2.611	-0.86	-7.3	19.9	

1964 TA1						Elements MPC 5224			
Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	Mag.	
1981 06 25		23 06.05	-07 43.1	1.945	2.462	108.3	23.1	17.4	
1981 07 05		23 10.95	-07 11.9						
1981 07 15		23 13.54	-06 54.3	1.713	2.446	125.3	19.8	17.1	
1981 07 25		23 13.60	-06 51.3						
1981 08 04		23 11.01	-07 03.3	1.529	2.432	145.1	13.8	16.7	
1981 08 14		23 05.90	-07 28.9						
1981 08 24		22 58.73	-08 04.7	1.422	2.419	167.4	5.2	16.3	
1981 09 03		22 50.29	-08 45.5						
1981 09 13		22 41.71	-09 24.7	1.413	2.408	168.7	4.7	16.2	
1981 09 23		22 34.10	-09 56.3						
1981 10 03		22 28.44	-10 15.8	1.505	2.399	145.8	13.6	16.6	
1981 10 13		22 25.36	-10 20.5						
1981 10 23		22 25.09	-10 10.0	1.675	2.392	125.2	19.9	17.0	
1981 11 02		22 27.59	-09 44.6						
1981 11 12		22 32.65	-09 05.3	1.896	2.386	107.4	23.3	17.3	
1981 11 22		22 39.95	-08 13.5						
1981 12 02		22 49.15	-07 10.4	2.141	2.383	91.7	24.4	17.6	

(2274) Ehrsson						Elements MPC 5442			
Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	Mag.	
1981 06 25		23 18.71	-05 25.2	2.441	2.869	104.5	20.1	19.2	
1981 07 05		23 21.01	-05 08.3						
1981 07 15		23 21.15	-05 04.8	2.211	2.892	122.9	17.2	18.9	
1981 07 25		23 19.00	-05 15.1						
1981 08 04		23 14.55	-05 39.3	2.030	2.911	143.7	11.9	18.6	
1981 08 14		23 08.00	-06 15.6						
1981 08 24		22 59.82	-07 00.8	1.934	2.927	166.8	4.5	18.3	
1981 09 03		22 50.71	-07 50.4						
1981 09 13		22 41.56	-08 38.9	1.947	2.941	169.0	3.8	18.3	
1981 09 23		22 33.28	-09 21.2						
1981 10 03		22 26.59	-09 53.5	2.071	2.951	145.5	11.1	18.7	
1981 10 13		22 22.04	-10 13.5						
1981 10 23		22 19.84	-10 20.4	2.285	2.958	124.0	16.2	19.0	
1981 11 02		22 20.00	-10 14.4						
1981 11 12		22 22.39	-09 56.2	2.552	2.962	104.7	18.9	19.3	
1981 11 22		22 26.78	-09 26.9						
1981 12 02		22 32.91	-08 47.5	2.841	2.963	87.3	19.4	19.6	

1977 QL2						Elements MPC		5679
Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	Mag.
1981 06 25		23 11.01	+00 08.1	1.817	2.287	104.1	25.5	17.8
1981 07 05		23 17.38	+01 00.5					
1981 07 15		23 21.47	+01 37.7	1.604	2.289	120.1	22.6	17.4
1981 07 25		23 23.03	+01 57.0					
1981 08 04		23 21.89	+01 56.0	1.430	2.292	138.8	17.0	17.1
1981 08 14		23 18.11	+01 33.3					
1981 08 24		23 12.06	+00 50.0	1.321	2.298	160.2	8.6	16.7
1981 09 03		23 04.47	-00 10.3					
1981 09 13		22 56.41	-01 20.7	1.304	2.306	173.0	3.0	16.5
1981 09 23		22 49.07	-02 32.6					
1981 10 03		22 43.46	-03 37.5	1.387	2.316	151.4	11.9	16.9
1981 10 13		22 40.32	-04 28.9					
1981 10 23		22 39.95	-05 03.2	1.555	2.327	130.5	19.0	17.3
1981 11 02		22 42.35	-05 19.1					
1981 11 12		22 47.34	-05 16.8	1.781	2.341	112.1	23.1	17.7
1981 11 22		22 54.57	-04 57.8					
1981 12 02		23 03.73	-04 23.5	2.038	2.356	96.1	24.6	18.1

(2277) 1950 DS						Elements MPC		5443
Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	Mag.
1981 06 25		23 44.84	-12 11.4	2.522	2.895	101.1	20.2	18.5
1981 07 05		23 49.94	-12 33.1					
1981 07 15		23 53.09	-13 10.2	2.281	2.903	118.3	18.0	18.2
1981 07 25		23 54.11	-14 02.5					
1981 08 04		23 52.83	-15 08.8	2.083	2.910	137.2	13.7	17.9
1981 08 14		23 49.24	-16 25.6					
1981 08 24		23 43.54	-17 47.5	1.960	2.915	156.4	8.0	17.7
1981 09 03		23 36.16	-19 07.5					
1981 09 13		23 27.84	-20 17.8	1.939	2.918	163.7	5.5	17.6
1981 09 23		23 19.46	-21 11.8					
1981 10 03		23 11.93	-21 45.4	2.026	2.920	147.6	10.6	17.8
1981 10 13		23 06.03	-21 56.9					
1981 10 23		23 02.23	-21 47.6	2.204	2.920	127.7	15.6	18.1
1981 11 02		23 00.76	-21 19.7					
1981 11 12		23 01.65	-20 36.2	2.443	2.918	108.9	18.7	18.4
1981 11 22		23 04.71	-19 39.8					
1981 12 02		23 09.75	-18 32.9	2.712	2.915	91.8	19.8	18.6

1978 VT9						Elements MPC		5318
Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	Mag.
1981 06 25		23 16.29	-10 43.0	1.244	1.823	107.1	32.2	20.0
1981 07 05		23 28.76	-09 56.5					
1981 07 15		23 38.88	-09 25.2	1.061	1.803	120.4	29.1	19.6
1981 07 25		23 46.22	-09 11.2					
1981 08 04		23 50.28	-09 16.3	0.911	1.789	136.5	23.0	19.1
1981 08 14		23 50.72	-09 39.5					
1981 08 24		23 47.53	-10 16.8	0.811	1.782	155.9	13.4	18.6
1981 09 03		23 41.17	-11 00.8					
1981 09 13		23 32.88	-11 40.4	0.781	1.783	172.0	4.5	18.3
1981 09 23		23 24.34	-12 04.9					
1981 10 03		23 17.30	-12 07.0	0.833	1.792	155.2	13.5	18.7
1981 10 13		23 13.11	-11 43.8					
1981 10 23		23 12.39	-10 56.8	0.958	1.807	135.5	22.7	19.2
1981 11 02		23 15.19	-09 49.2					
1981 11 12		23 21.23	-08 24.7	1.136	1.829	118.6	28.3	19.7
1981 11 22		23 30.00	-06 46.9					
1981 12 02		23 41.05	-04 58.6	1.349	1.858	104.4	30.9	20.2

(2301) 1965 WJ

						Elements MPC 5642			
Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	Mag.	
1981 06 25		23 48.35	-15 14.0	2.873	3.232	101.4	18.0	17.8	
1981 07 05		23 53.34	-15 30.4						
1981 07 15		23 56.65	-15 59.8	2.578	3.187	118.3	16.3	17.4	
1981 07 25		23 58.07	-16 42.0						
1981 08 04		23 57.42	-17 35.8	2.328	3.142	136.4	12.9	17.1	
1981 08 14		23 54.65	-18 38.4						
1981 08 24		23 49.86	-19 45.1	2.153	3.096	154.5	8.1	16.8	
1981 09 03		23 43.33	-20 50.0						
1981 09 13		23 35.67	-21 46.3	2.077	3.050	162.0	5.8	16.6	
1981 09 23		23 27.65	-22 27.6						
1981 10 03		23 20.11	-22 49.7	2.108	3.003	147.9	10.2	16.7	
1981 10 13		23 13.88	-22 50.6						
1981 10 23		23 09.54	-22 30.7	2.231	2.956	128.6	15.2	16.9	
1981 11 02		23 07.43	-21 52.1						
1981 11 12		23 07.67	-20 57.3	2.419	2.910	110.0	18.6	17.2	
1981 11 22		23 10.19	-19 49.1						
1981 12 02		23 14.80	-18 29.9	2.638	2.863	92.9	20.1	17.4	

1977 UQ

						Elements MPC 5899			
Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	Mag.	
1981 06 25		23 30.77	-05 51.3	1.402	1.894	101.9	31.7	17.3	
1981 07 05		23 43.11	-04 33.3						
1981 07 15		23 53.25	-03 27.7	1.219	1.887	114.9	29.3	17.0	
1981 07 25		00 00.82	-02 36.9						
1981 08 04		00 05.39	-02 03.2	1.064	1.889	130.6	24.1	16.6	
1981 08 14		00 06.65	-01 48.0						
1981 08 24		00 04.54	-01 51.0	0.955	1.899	149.9	15.5	16.1	
1981 09 03		23 59.37	-02 09.7						
1981 09 13		23 52.06	-02 38.3	0.916	1.918	172.4	4.0	15.7	
1981 09 23		23 43.97	-03 09.1						
1981 10 03		23 36.61	-03 33.6	0.963	1.944	163.9	8.2	16.0	
1981 10 13		23 31.35	-03 45.0						
1981 10 23		23 28.96	-03 39.7	1.095	1.978	142.4	17.9	16.6	
1981 11 02		23 29.73	-03 16.8						
1981 11 12		23 33.54	-02 37.0	1.292	2.018	123.8	24.0	17.1	
1981 11 22		23 40.04	-01 42.3						
1981 12 02		23 48.83	-00 34.8	1.535	2.063	107.9	27.0	17.6	

(603) Timandra

						Elements MPC 5219			
Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	Mag.	
1981 06 25		00 07.43	+00 32.2	2.732	2.931	91.0	20.3	18.6	
1981 07 05		00 12.84	+01 25.0						
1981 07 15		00 16.54	+02 08.8	2.448	2.917	107.3	19.4	18.3	
1981 07 25		00 18.33	+02 42.3						
1981 08 04		00 17.96	+03 04.3	2.188	2.900	125.7	16.5	18.0	
1981 08 14		00 15.30	+03 13.7						
1981 08 24		00 10.37	+03 10.1	1.983	2.881	146.6	11.1	17.6	
1981 09 03		00 03.35	+02 53.9						
1981 09 13		23 54.79	+02 27.0	1.865	2.860	169.5	3.7	17.2	
1981 09 23		23 45.45	+01 53.2						
1981 10 03		23 36.26	+01 17.1	1.858	2.838	165.4	5.1	17.3	
1981 10 13		23 28.17	+00 44.0						
1981 10 23		23 21.92	+00 18.6	1.960	2.813	142.1	12.5	17.6	
1981 11 02		23 17.99	+00 03.9						
1981 11 12		23 16.58	+00 02.1	2.146	2.786	120.9	17.8	17.9	
1981 11 22		23 17.65	+00 13.6						
1981 12 02		23 21.02	+00 38.1	2.379	2.758	102.0	20.5	18.2	

1975 NY		Elements MPC 5356							
Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	Mag.	
1981 06 25		23 58.53	-02 16.9	2.477	2.745	94.2	21.7	17.7	
1981 07 05		00 05.15	-01 39.6						
1981 07 15		00 09.94	-01 14.3	2.245	2.766	110.2	20.2	17.4	
1981 07 25		00 12.72	-01 02.1						
1981 08 04		00 13.29	-01 03.8	2.042	2.788	128.4	16.6	17.2	
1981 08 14		00 11.59	-01 19.5						
1981 08 24		00 07.71	-01 48.0	1.895	2.812	149.2	10.6	16.9	
1981 09 03		00 01.95	-02 26.9						
1981 09 13		23 54.89	-03 11.8	1.837	2.837	171.8	2.9	16.5	
1981 09 23		23 47.31	-03 57.5						
1981 10 03		23 40.06	-04 38.4	1.887	2.863	164.2	5.5	16.8	
1981 10 13		23 33.98	-05 09.8						
1981 10 23		23 29.65	-05 28.6	2.042	2.889	141.8	12.3	17.1	
1981 11 02		23 27.42	-05 33.2						
1981 11 12		23 27.41	-05 23.6	2.278	2.917	121.3	16.9	17.5	
1981 11 22		23 29.54	-05 00.7						
1981 12 02		23 33.65	-04 25.5	2.564	2.945	102.9	19.0	17.8	

1979 DK		Elements MPC 4771							
Date	ET	R. A. (1950)	Decl.	Delta	r	Variation	Mag.		
1981 06 25		00 04.55	+08 27.0	2.895	3.043	-0.65	-4.4	18.2	
1981 07 05		00 09.92	+09 33.1						
1981 07 15		00 13.67	+10 30.8	2.625	3.043	-0.73	-4.8	17.9	
1981 07 25		00 15.61	+11 18.5						
1981 08 04		00 15.53	+11 54.3	2.376	3.042	-0.82	-5.3	17.7	
1981 08 14		00 13.35	+12 16.0						
1981 08 24		00 09.11	+12 22.1	2.178	3.039	-0.91	-6.0	17.4	
1981 09 03		00 03.03	+12 11.1						
1981 09 13		23 55.59	+11 43.5	2.062	3.036	-0.97	-6.6	17.1	
1981 09 23		23 47.48	+11 01.5						
1981 10 03		23 39.51	+10 09.2	2.053	3.031	-0.96	-6.9	17.0	
1981 10 13		23 32.53	+09 12.5						
1981 10 23		23 27.17	+08 17.4	2.154	3.025	-0.88	-6.6	17.3	
1981 11 02		23 23.86	+07 29.0						
1981 11 12		23 22.81	+06 51.4	2.345	3.018	-0.79	-5.9	17.6	
1981 11 22		23 24.01	+06 26.7						
1981 12 02		23 27.31	+06 15.8	2.593	3.010	-0.70	-5.2	17.9	

1978 VV6		Elements MPC 5318							
Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	Mag.	
1981 06 25		23 37.41	-06 41.9	1.293	1.788	100.7	34.0	19.6	
1981 07 05		23 51.06	-05 30.6						
1981 07 15		00 02.46	-04 33.5	1.124	1.788	113.2	31.5	19.2	
1981 07 25		00 11.20	-03 53.0						
1981 08 04		00 16.78	-03 31.3	0.980	1.796	128.5	26.2	18.8	
1981 08 14		00 18.80	-03 29.6						
1981 08 24		00 17.10	-03 46.8	0.875	1.811	147.5	17.4	18.4	
1981 09 03		00 11.86	-04 19.3						
1981 09 13		00 03.97	-04 59.7	0.835	1.833	169.5	5.7	18.0	
1981 09 23		23 54.87	-05 38.3						
1981 10 03		23 46.26	-06 05.4	0.878	1.862	164.6	8.2	18.2	
1981 10 13		23 39.74	-06 14.2						
1981 10 23		23 36.24	-06 02.0	1.004	1.895	143.0	18.4	18.8	
1981 11 02		23 36.12	-05 29.2						
1981 11 12		23 39.30	-04 37.9	1.194	1.933	124.3	25.0	19.4	
1981 11 22		23 45.37	-03 31.2						
1981 12 02		23 53.91	-02 11.7	1.427	1.975	108.4	28.3	19.9	

1976 QG1		Elements MPC 5836							
Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	Mag.	
1981 07 15		00 16.05	+01 43.1	2.436	2.910	107.6	19.4	17.7	
1981 07 25		00 19.03	+01 56.3						
1981 08 04		00 19.99	+01 55.7	2.194	2.905	125.7	16.5	17.4	
1981 08 14		00 18.80	+01 40.6						
1981 08 24		00 15.47	+01 11.1	2.005	2.901	146.3	11.2	17.1	
1981 09 03		00 10.22	+00 28.9						
1981 09 13		00 03.49	-00 22.9	1.902	2.896	169.0	3.8	16.7	
1981 09 23		23 55.97	-01 19.3						
1981 10 03		23 48.50	-02 14.5	1.907	2.891	167.2	4.4	16.8	
1981 10 13		23 41.91	-03 02.8						
1981 10 23		23 36.89	-03 39.6	2.021	2.887	144.2	11.6	17.1	
1981 11 02		23 33.89	-04 02.1						
1981 11 12		23 33.15	-04 09.2	2.220	2.882	123.1	16.7	17.4	
1981 11 22		23 34.64	-04 01.1						
1981 12 02		23 38.24	-03 38.9	2.471	2.878	104.3	19.4	17.7	
1981 12 12		23 43.76	-03 03.9						
1981 12 22		23 50.94	-02 17.7	2.745	2.873	87.4	20.0	17.9	

1974 SJ		Elements MPC 5840							
Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	Mag.	
1981 07 15		00 18.38	+03 11.2	1.760	2.268	106.5	25.4	18.1	
1981 07 25		00 24.92	+03 29.4						
1981 08 04		00 29.18	+03 28.8	1.527	2.248	123.0	22.2	17.7	
1981 08 14		00 30.86	+03 07.2						
1981 08 24		00 29.74	+02 23.2	1.338	2.227	142.5	16.0	17.2	
1981 09 03		00 25.81	+01 17.2						
1981 09 13		00 19.44	-00 06.8	1.219	2.207	165.1	6.7	16.8	
1981 09 23		00 11.43	-01 41.1						
1981 10 03		00 02.94	-03 15.3	1.196	2.188	169.6	4.7	16.7	
1981 10 13		23 55.32	-04 38.0						
1981 10 23		23 49.66	-05 40.7	1.271	2.169	146.1	14.8	17.0	
1981 11 02		23 46.74	-06 18.7						
1981 11 12		23 46.86	-06 30.9	1.424	2.152	125.2	22.1	17.4	
1981 11 22		23 49.97	-06 19.0						
1981 12 02		23 55.82	-05 45.7	1.624	2.137	107.4	26.1	17.8	
1981 12 12		00 04.10	-04 54.3						
1981 12 22		00 14.43	-03 47.7	1.844	2.123	92.2	27.6	18.1	

1980 GA		Elements MPC 5409							
Date	ET	R. A. (1950)	Decl.	Delta	r	Variation		Mag.	
1981 07 15		00 55.72	-26 15.8	2.284	2.769	-0.65	-9.7	18.5	
1981 07 25		00 58.73	-27 11.5						
1981 08 04		00 59.05	-28 19.1	2.106	2.793	-0.74	-10.8	18.3	
1981 08 14		00 56.45	-29 33.8						
1981 08 24		00 50.85	-30 48.8	1.980	2.813	-0.86	-11.4	18.0	
1981 09 03		00 42.41	-31 55.5						
1981 09 13		00 31.70	-32 44.1	1.933	2.831	-0.97	-11.0	17.9	
1981 09 23		00 19.70	-33 06.5						
1981 10 03		00 07.59	-32 57.8	1.984	2.846	-0.99	-9.8	18.0	
1981 10 13		23 56.61	-32 17.4						
1981 10 23		23 47.70	-31 08.9	2.127	2.858	-0.91	-8.4	18.3	
1981 11 02		23 41.40	-29 37.7						
1981 11 12		23 37.91	-27 49.8	2.343	2.867	-0.79	-7.4	18.6	
1981 11 22		23 37.10	-25 50.7						
1981 12 02		23 38.74	-23 44.3	2.601	2.873	-0.66	-6.8	18.8	
1981 12 12		23 42.49	-21 33.7						
1981 12 22		23 48.04	-19 20.9	2.875	2.876	-0.56	-6.4	19.0	