The MINOR PLANET CIRCULARS/MINOR PLANETS AND COMETS are published, on behalf of Commission 20 of the International Astronomical Union, usually in batches on the 1st of each month, by:

Minor Planet Center
Smithsonian Astrophysical Observatory
Cambridge, MA 02138, U.S.A.

TWX 710-320-6842 ASTROGRAM CAM ** Brian G. Marsden, Director
Telephone 617-864-5758 ** Conrad M. Bardwell, Assistant Director

IDENTIFICATION CHANGES.

Continuation to MPC 5249.

Object		Date	UT	R. A. (1950)	Decl.	Old desig.	Mag.	Obs.
A917 VB	*	1917 11	07.84071	23 39 15.47	-01 11 25.6	A917 SD		045
1926 XG	*	1926 12	05.87986	01 49 48.96	+03 27 33.4	1926 TF	14	024
1927 CV	*	1927 02	04.04755	02 13 47.75	+07 46 04.0	1926 TF	12	754
1928 XF	*	1928 12	11.10213	00 56 11.39	+07 13 56.5	1928 SL	15.5	754
1930 BL	*	1930 01	17.79757	06 13 00.92	+22 53 31.0	1928 SL	16	024
1930 XV	*	1930 12	13.19235	03 21.5	+24 58	1930 VD	14.5	690
1930 XV		1930 12	14.20068	03 20.6	+24 53	1930 VD	13.5	690
1931 VM1	*	1931 11	01.91994	01 21 53.03	+07 27 45.7	1931 TK		012
1934 RF1	*	1934 09	12.91382	22 44 02.41	-08 03 53.2	1934 RB		012
1935 UZ	*	1935 10	19.94893	01 35 39.58	-01 56 47.8	1935 SD		012
1935 UZ		1935 10	21.91957	01 34 09.35	-02 09 48.9	1935 SD		012
1935 UZ		1935 10	23.89368	01 32 39.32	-02 21 48.6	1935 SD		012
1937 TV	*	1937 10	07.86638	22 11 26.62	-04 55 46.5	1937 QC	16.5	029
1937 TV		1937 10	07.90312	22 11 25.93	-04 56 06.9	1937 QC	16.5	029
1938 YM	*	1938 12	17.85535	02 38 01.19	+22 47 20.0	1324	15.0	024
1941 KG	*	1941 05	16.92764	14 07 38.86	-04 59 25.1	1941 HR		024
1953 DK	*	1953 02	17.07893	11 39 11.87	-02 54 48.6	1324		012
1953 PA1	*	1953 08	03.96007	21 58 23.48	-19 52 40.2	1105	13.8	078
1953 RM1	*	1953 09	03.0	21 36.0	-23 02	1105		020
1966 FV	*	1966 03	23.07776	12 06.0	-09 39	1324		808
1967 EB1	*	1967 03	12.08558	12 18 57.23	+12 37 37.0	1105		020
1967 EB1		1967 03	12.09733	12 18 55.63	+12 37 48.0	1105		020
1967 EB1		1967 03	13.91130	12 18 00.25	+12 51 00.5	1105		020
1967 EB1		1967 03	16.05632	12 16 32.15	+13 06 51.8	1105		020
1967 EB1		1967 03	16.07016	12 16 31.35	+13 07 00.0	1105		020
1969 LJ	*	1969 06	08.12745	16 16 13.41	-27 47 00.5	970		808
1969 LJ		1969 06	09.14896	16 15 00.18	-27 44 47.3	970		808
1969 LJ		1969 06	17.05821	16 06 07.13	-27 24 46.5	970		808
1976 SZ9	*	1976 09	25.89852	00 00 23.06	-01 12 59.0	1976 SH	16.8	095
1976 SZ9		1976 09	28.88331	23 58 04.00	-01 22 47.2	1976 SH	16.5	095
1976 SZ9		1976 09	29.92667	23 57 15.7	-01 26 11	1976 SH		049
1976 SZ9		1976 09	30.90385	23 56 31.1	-01 29 12	1976 SH		049
1976 SZ9		1976 09	30.95372	23 56 28.7	-01 29 23	1976 SH		049
1977 TH8	*	1977 10	07.95644	01 57 04.50	+11 29 09.6	1977 SQ1	17.0	095
1977 TH8		1977 10	17.92538	01 48 13.40	+10 41 28.1	1977 SQ1	17.0	095

* * * * *

IDENTIFICATIONS.

The following list of identifications with numbered minor planets continues that on MPC 5250.

		Note			Note			Note
1926 TF	= (1731)	1	1929 EA	= (1268)	2	1941 KG	= (1731)	2
1942 KC	= (1601)	3	1945 WD	= (417)	4	1963 WE	= (1720)	4
1972 JE	= (834)	3	1975 AJ	= (1617)	4	1975 JM	= (637)	4
1975 TF	= (1564)	4	1977 FG	= (2094)	4	1978 AA	= (551)	4
1979 NE	= (1305)	4						

Note 1: identification by C. M. Bardwell; the identification 1926 TF = 1940 HD (JC 68) is invalid. 2: identification by C. M. Bardwell. 3: identification by B. G. Marsden. 4: identification by E. Bowell.

* * * * *

OBSERVATION MADE AT HEIDELBERG BY U. GORZE, P. KAISER AND H. MANDEL. COMMUNICATED BY G. KLARE.

Object	Date	UT	R. A. (1950)	Decl.	Obs.
/1979l	1980 02	20.85208	03 37 16.8	+19 03 53	024

OBSERVATIONS MADE AT THE KARL SCHWARZSCHILD OBSERVATORY, TAUTENBURG, BY R. ZIENER AND A. DILL.

Object	Date	UT	R. A. (1950)	Decl.	Mag.	Obs.
1980 DG1 *	1980 02	20.93021	11 07 38.52	+29 23 17.8	17	033
1980 DG1	1980 02	20.96632	11 07 36.10	+29 23 22.8		033
1980 DH1 *	1980 02	20.93021	11 14 45.07	+29 40 37.5	18.5	033
1980 DH1	1980 02	20.96632	11 14 42.90	+29 40 53.8		033
1980 DJ1 *	1980 02	20.93021	11 15 58.09	+27 58 42.3	18	033
1980 DJ1	1980 02	20.96632	11 15 56.08	+27 58 54.9		033

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

Object	Date	UT	R. A. (1950)	Decl.	Mag.	N	Obs.
/1974 II	1980 02	21.98977	08 41 48.79	+18 24 16.9	16	T	046
/1974 II	1980 02	22.00412	08 41 48.36	+18 24 20.1			046
/1974 II	1980 03	16.83096	08 34 04.54	+18 35 43.7	17.6	T	046
/1974 II	1980 03	16.84554	08 34 04.36	+18 35 41.6			046
/1974 II	1980 03	17.82031	08 33 52.37	+18 35 46.1	18.0	T	046
/1974 II	1980 03	17.83461	08 33 52.12	+18 35 45.7			046
1020	1980 03	17.91510	11 54 51.22	+00 16 08.5	16.5		046
1020	1980 03	17.92934	11 54 50.56	+00 16 15.1			046
1082	1980 03	16.91314	11 56 51.68	+01 43 58.0			046
1082	1980 03	16.92778	11 56 51.07	+01 44 02.7			046
1762	1980 03	16.91314	11 46 24.71	+02 27 31.3			046
1762	1980 03	16.92778	11 46 24.00	+02 27 36.7			046
1762	1980 03	17.91510	11 45 37.90	+02 33 12.9			046
1762	1980 03	17.92934	11 45 37.22	+02 33 17.8			046
1774	1980 03	16.91314	11 56 39.59	+00 31 22.8			046
1774	1980 03	16.92778	11 56 38.90	+00 31 26.9			046
1774	1980 03	17.91510	11 55 52.56	+00 37 05.9			046
1774	1980 03	17.92934	11 55 51.94	+00 37 12.3			046
2169	1980 03	16.91314	11 50 30.38	+03 31 22.2	16.8		046
2169	1980 03	16.92778	11 50 29.75	+03 31 26.5			046
2169	1980 03	17.91510	11 49 40.81	+03 36 34.6			046
2169	1980 03	17.92934	11 49 40.06	+03 36 38.4			046
2230	1980 02	22.02779	10 06 42.97	+11 24 00.6			046
2230	1980 02	22.04220	10 06 42.21	+11 24 05.6			046
2230	1980 02	23.03964	10 05 52.91	+11 29 28.1			046
2230	1980 02	23.05399	10 05 52.10	+11 29 32.9			046
1978 SQ	1980 02	22.06373	12 09 21.21	+09 41 27.1			046
1978 SQ	1980 02	22.07883	12 09 20.64	+09 41 28.3			046
1978 YA	1980 03	16.91314	11 50 05.30	+02 18 18.4	16.6		046
1978 YA	1980 03	16.92778	11 50 04.66	+02 18 22.2			046

1978	YA	1980	03	17.91510	11	49	19.54	+02	23	06.8		046
1978	YA	1980	03	17.92934	11	49	18.88	+02	23	10.9		046
1980	AA	1980	02	23.01198	09	40	57.23	-02	24	41.2	15	046
1980	AA	1980	02	23.02060	09	40	57.72	-02	24	46.0		046
1980	CR	1980	02	22.02779	10	08	05.17	+13	26	36.6		046
1980	CR	1980	02	22.04220	10	08	04.40	+13	26	44.7		046
1980	CR	1980	02	23.03964	10	07	13.02	+13	35	27.6		046
1980	CR	1980	02	23.05399	10	07	12.25	+13	35	34.7		046
1980	DF	1980	02	23.01198	09	35	51.59	-00	45	18.6		046
1980	DF	1980	02	23.02060	09	35	51.18	-00	45	18.6		046
1980	DG	1980	02	23.01198	09	38	02.69	-01	45	08.1		046
1980	DG	1980	02	23.02060	09	38	01.95	-01	45	05.2		046
1980	DH	1980	02	23.01198	09	41	40.92	-01	26	13.4		046
1980	DH	1980	02	23.02060	09	41	40.57	-01	26	10.2		046
1980	DJ	1980	02	14.86624	08	46	36.59	+20	37	28.2		046
1980	DJ	1980	02	14.88076	08	46	35.76	+20	37	30.1		046
1980	DJ	1980	02	15.80483	08	45	47.69	+20	40	50.6		046
1980	DJ	1980	02	15.81910	08	45	47.31	+20	40	52.3		046
1980	DJ	1980	02	21.98977	08	40	47.12	+21	00	41.5		046
1980	DJ	1980	02	22.00412	08	40	46.42	+21	00	45.0		046
1980	DK	1980	02	14.86624	08	50	04.39	+19	45	41.1		046
1980	DK	1980	02	14.88076	08	50	03.56	+19	45	40.2		046
1980	DK	1980	02	15.80483	08	49	03.49	+19	45	33.3		046
1980	DK	1980	02	15.81910	08	49	02.60	+19	45	32.9		046
1980	DK	1980	02	21.98977	08	42	48.71	+19	42	28.6		046
1980	DK	1980	02	22.00412	08	42	47.86	+19	42	27.5		046
1980	DL	1980	02	15.80483	08	48	13.35	+19	51	42.2		046
1980	DL	1980	02	15.81910	08	48	12.69	+19	51	41.5		046
1980	DL	1980	02	21.98977	08	43	56.36	+19	44	09.6		046
1980	DL	1980	02	22.00412	08	43	56.00	+19	44	07.9		046
1980	DM	1980	02	21.98977	08	43	57.07	+19	32	38.2		046
1980	DM	1980	02	22.00412	08	43	56.41	+19	32	40.4		046
1980	DN	1980	02	14.86624	08	49	50.10	+18	55	05.5		046
1980	DN	1980	02	14.88076	08	49	49.56	+18	55	09.9		046
1980	DN	1980	02	15.80483	08	49	07.95	+19	00	13.9		046
1980	DN	1980	02	15.81910	08	49	07.43	+19	00	17.4		046
1980	DN	1980	02	21.98977	08	44	45.85	+19	32	17.6		046
1980	DN	1980	02	22.00412	08	44	45.32	+19	32	22.7		046
1980	DO	1980	02	15.80483	08	50	13.83	+19	38	49.7		046
1980	DO	1980	02	15.81910	08	50	13.13	+19	38	55.4		046
1980	DO	1980	02	21.98977	08	45	22.76	+20	10	51.6		046
1980	DO	1980	02	22.00412	08	45	22.21	+20	10	56.2		046
1980	DP	1980	02	21.98977	08	46	13.84	+17	21	28.5		046
1980	DP	1980	02	22.00412	08	46	12.92	+17	21	37.8		046
1980	DQ	1980	02	21.98977	08	46	44.67	+20	17	41.2		046
1980	DQ	1980	02	22.00412	08	46	43.87	+20	17	38.2		046
1980	DS	1980	02	23.03964	10	02	42.88	+12	58	45.0		046
1980	DS	1980	02	23.05399	10	02	41.98	+12	58	52.2		046
1980	DT	1980	02	14.95449	10	11	24.70	+12	16	54.1		046
1980	DT	1980	02	14.96888	10	11	24.14	+12	16	58.3		046
1980	DT	1980	02	15.90245	10	10	42.41	+12	21	16.8		046
1980	DT	1980	02	15.91681	10	10	41.42	+12	21	23.0		046
1980	DT	1980	02	22.02779	10	06	04.21	+12	49	25.6		046
1980	DT	1980	02	22.04220	10	06	03.65	+12	49	29.5		046
1980	DT	1980	02	23.03964	10	05	18.34	+12	54	01.1		046
1980	DT	1980	02	23.05399	10	05	17.67	+12	54	03.4		046
1980	DU	1980	02	14.95449	10	14	33.99	+10	10	10.0		046
1980	DU	1980	02	14.96888	10	14	33.10	+10	10	17.3		046
1980	DU	1980	02	22.02779	10	09	06.33	+10	59	35.6		046

1980	DU		1980	02	22.04220	10	09	05.82	+10	59	41.5		046
1980	DU		1980	02	23.03964	10	08	19.43	+11	06	39.1		046
1980	DU		1980	02	23.05399	10	08	18.74	+11	06	44.3		046
1980	DV		1980	02	14.95449	10	16	48.01	+09	56	05.4		046
1980	DV		1980	02	14.96888	10	16	47.35	+09	56	13.1		046
1980	DV		1980	02	15.90245	10	16	06.22	+10	04	17.2		046
1980	DV		1980	02	15.91681	10	16	05.38	+10	04	30.0		046
1980	DV		1980	02	22.02779	10	11	27.92	+10	58	20.6		046
1980	DV		1980	02	22.04220	10	11	27.28	+10	58	30.0		046
1980	DV		1980	02	23.03964	10	10	41.57	+11	07	21.2		046
1980	DV		1980	02	23.05399	10	10	40.73	+11	07	30.0		046
1980	DW		1980	02	15.90245	10	17	13.92	+13	04	35.0		046
1980	DW		1980	02	15.91681	10	17	13.16	+13	04	39.3		046
1980	DW		1980	02	22.02779	10	12	13.80	+13	24	13.1		046
1980	DW		1980	02	22.04220	10	12	13.39	+13	24	15.9		046
1980	DW		1980	02	23.03964	10	11	24.02	+13	27	24.7		046
1980	DW		1980	02	23.05399	10	11	23.17	+13	27	28.8		046
1980	DX		1980	02	19.96565	10	16	58.76	+09	36	04.0	1	046
1980	DX		1980	02	22.02779	10	15	15.17	+09	52	49.5		046
1980	DX		1980	02	22.04220	10	15	14.25	+09	52	57.0		046
1980	DX		1980	02	23.03964	10	14	24.34	+10	01	03.0		046
1980	DX		1980	02	23.05399	10	14	23.39	+10	01	09.4		046
1980	DY		1980	02	14.95449	10	21	49.38	+12	29	10.0		046
1980	DY		1980	02	14.96888	10	21	48.77	+12	29	13.6		046
1980	DY		1980	02	23.03964	10	15	33.19	+13	08	44.3		046
1980	DY		1980	02	23.05399	10	15	32.63	+13	08	48.9		046
1980	DZ		1980	02	22.06373	12	02	23.34	+10	40	56.1		046
1980	DZ		1980	02	22.07883	12	02	22.70	+10	40	59.4		046
1980	DZ		1980	02	23.07691	12	01	43.21	+10	44	44.6		046
1980	DZ		1980	02	23.09120	12	01	42.73	+10	44	47.1		046
1980	DA1		1980	02	22.06373	12	03	16.74	+10	39	47.9		046
1980	DA1		1980	02	22.07883	12	03	16.23	+10	39	51.0		046
1980	DA1		1980	02	23.07691	12	02	44.64	+10	43	08.7		046
1980	DA1		1980	02	23.09120	12	02	44.23	+10	43	11.3		046
1980	DB1		1980	02	22.06373	12	06	05.05	+09	24	37.7		046
1980	DB1		1980	02	22.07883	12	06	04.48	+09	24	41.1		046
1980	DB1		1980	02	23.07691	12	05	28.51	+09	29	00.4		046
1980	DB1		1980	02	23.09120	12	05	27.97	+09	29	04.4		046
1980	DC1		1980	02	22.02779	10	16	21.92	+09	48	33.7		046
1980	DC1		1980	02	22.04220	10	16	21.37	+09	48	38.3		046
1980	DC1		1980	02	23.03964	10	15	36.23	+09	54	44.8		046
1980	DC1		1980	02	23.05399	10	15	35.48	+09	54	51.0		046
1980	DD1		1980	02	22.06373	11	59	43.64	+11	06	51.6		046
1980	DD1		1980	02	22.07883	11	59	43.00	+11	06	53.7		046
1980	DD1		1980	02	23.07691	11	59	02.90	+11	10	36.6		046
1980	DD1		1980	02	23.09120	11	59	02.37	+11	10	41.0		046
1980	DE1		1980	02	22.06373	12	00	32.98	+10	52	10.0		046
1980	DE1		1980	02	22.07883	12	00	32.50	+10	52	12.3		046
1980	DE1		1980	02	23.07691	11	59	55.14	+10	55	41.3		046
1980	DE1		1980	02	23.09120	11	59	54.67	+10	55	43.5		046
1980	FA	*	1980	03	16.91314	11	47	22.35	+01	51	40.1	17.4	046
1980	FA		1980	03	16.92778	11	47	21.31	+01	51	46.8		046
1980	FA		1980	03	17.91510	11	46	35.07	+01	57	24.1		046
1980	FA		1980	03	17.92934	11	46	34.17	+01	57	29.3		046
1980	FB	*	1980	03	16.91314	11	47	25.72	+02	49	35.4	17.0	046
1980	FB		1980	03	16.92778	11	47	25.00	+02	49	40.7		046
1980	FB		1980	03	17.91510	11	46	40.39	+02	54	01.4		046
1980	FB		1980	03	17.92934	11	46	39.80	+02	54	06.2		046
1980	FC	*	1980	03	16.91314	11	50	46.04	+02	32	35.8	17.2	046

1980	FC		1980	03	16.92778	11	50	45.30	+02	32	38.0		046
1980	FC		1980	03	17.91510	11	49	52.88	+02	36	10.8		046
1980	FC		1980	03	17.92934	11	49	52.22	+02	36	14.8		046
1980	FD	*	1980	03	16.91314	11	52	59.35	+00	08	28.4	17.0	046
1980	FD		1980	03	16.92778	11	52	58.67	+00	08	37.5		046
1980	FD		1980	03	17.91510	11	52	15.35	+00	19	20.9		046
1980	FD		1980	03	17.92934	11	52	14.67	+00	19	33.3		046
1980	FE	*	1980	03	16.91314	11	54	34.69	+04	01	30.2	17.6	046
1980	FE		1980	03	16.92778	11	54	33.85	+04	01	34.2		046
1980	FF	*	1980	03	16.91314	11	55	30.69	+01	07	38.7	17.5	046
1980	FF		1980	03	16.92778	11	55	29.77	+01	07	44.3		046
1980	FF		1980	03	17.91510	11	54	46.25	+01	12	32.0		046
1980	FF		1980	03	17.92934	11	54	45.55	+01	12	37.3		046

Note 1: correction to MPC 5254.

OBSERVATIONS MADE AT KVISTABERG UNDER THE DIRECTION OF C.-I. LAGERKVIST. COMMUNICATED BY V. ZAPPALA. THE OBSERVATIONS OF UNNUMBERED OBJECTS GENERALLY REPLACE THOSE ON MPC 4158-4159 AND 4492.

Object	Date	UT	R. A. (1950)	Decl.	Obs.
52	1978 03 11.81129		11 12 52.65	+12 33 25.9	049
75	1978 03 11.85146		10 02 22.15	+15 09 37.6	049
75	1978 03 11.86184		10 02 21.62	+15 09 39.7	049
75	1978 03 12.03844		10 02 13.45	+15 10 09.0	049
75	1978 03 12.04398		10 02 13.20	+15 10 09.6	049
286	1978 03 11.85146		10 07 34.32	+14 35 52.6	049
286	1978 03 11.86184		10 07 33.91	+14 35 57.2	049
286	1978 03 12.03844		10 07 27.45	+14 37 15.4	049
286	1978 03 12.04398		10 07 27.23	+14 37 17.8	049
761	1976 09 20.93878		00 03 03.22	-01 14 04.3	049
761	1976 09 20.95817		00 03 02.38	-01 14 09.4	049
761	1976 09 20.99418		00 03 00.47	-01 14 19.0	049
761	1976 09 29.92667		23 55 48.15	-01 53 28.2	049
761	1976 09 29.97861		23 55 45.63	-01 53 41.4	049
761	1976 09 30.90386		23 55 02.18	-01 57 31.2	049
761	1976 09 30.95372		23 54 59.83	-01 57 44.1	049
876	1978 03 11.85146		09 59 57.05	+13 12 53.7	049
876	1978 03 11.86184		09 59 56.66	+13 12 57.1	049
876	1978 03 12.03844		09 59 49.97	+13 13 58.0	049
876	1978 03 12.04398		09 59 49.76	+13 14 00.4	049
935	1978 03 11.85146		10 03 57.11	+12 56 57.1	049
935	1978 03 11.86184		10 03 56.48	+12 56 58.4	049
935	1978 03 12.03844		10 03 46.96	+12 57 24.0	049
935	1978 03 12.04398		10 03 46.69	+12 57 24.3	049
1870	1976 09 29.92667		23 53 10.03	-01 20 08.1	049
1870	1976 09 29.97861		23 53 08.57	-01 20 19.7	049
1870	1976 09 30.90386		23 52 43.47	-01 23 45.1	049
1870	1976 09 30.95372		23 52 42.03	-01 23 56.3	049
2015	1978 04 02.92361		09 41 19.93	+14 40 18.1	049
2015	1978 04 02.94023		09 41 18.68	+14 40 14.7	049
2159	1978 03 11.85146		10 02 11.74	+13 26 34.9	049
2159	1978 03 11.86184		10 02 11.23	+13 26 36.8	049
2159	1978 03 12.03844		10 02 02.60	+13 27 01.3	049
2159	1978 03 12.04398		10 02 02.34	+13 27 01.6	049
1975	RB	1975 11 04.75807	23 32 02.59	+12 25 21.2	049
1975	RB	1975 11 04.81278	23 32 05.05	+12 25 23.9	049
1975	RB	1975 12 05.68416	00 10 49.29	+13 46 56.4	049
1975	RB	1975 12 06.71691	00 12 30.95	+13 51 41.4	049
1975	RB	1975 12 06.72869	00 12 31.73	+13 51 43.4	049
1976	SF	1976 09 20.93878	00 00 59.60	-01 15 21.0	049

1976	SF	1976	09	20.95817	00	00	58.76	-01 15 26.8	049
1976	SF	1976	09	20.99418	00	00	57.10	-01 15 37.8	049
1976	SF	1976	09	29.92667	23	54	29.64	-02 01 34.2	049
1976	SF	1976	09	29.97861	23	54	27.30	-02 01 49.7	049
1976	SF	1976	09	30.90386	23	53	48.24	-02 06 24.2	049
1976	SF	1976	09	30.95372	23	53	46.08	-02 06 38.3	049
1976	SG	1976	09	20.93878	00	02	39.29	-00 41 15.5	049
1976	SG	1976	09	20.95817	00	02	38.44	-00 41 20.3	049
1976	SG	1976	09	20.99418	00	02	36.76	-00 41 28.7	049
1976	SG	1976	09	29.92667	23	55	53.03	-01 18 10.4	049
1976	SG	1976	09	29.97861	23	55	50.55	-01 18 22.5	049
1976	SG	1976	09	30.90386	23	55	09.79	-01 22 00.8	049
1976	SG	1976	09	30.95372	23	55	07.56	-01 22 12.8	049
1976	SH	1976	09	20.93878	00	03	56.23	-01 16 05.5	049
1976	SH	1976	09	20.95817	00	03	55.06	-01 16 08.4	049
1976	SH	1976	09	20.99418	00	03	52.67	-01 16 14.5	049
1976	SJ	1976	09	20.93878	00	00	52.54	-00 32 59.4	049
1976	SJ	1976	09	20.95817	00	00	51.60	-00 33 08.7	049
1976	SJ	1976	09	20.99418	00	00	49.89	-00 33 23.4	049
1976	SJ	1976	09	29.92667	23	54	08.15	-01 37 23.5	049
1976	SJ	1976	09	29.97861	23	54	05.73	-01 37 44.9	049
1976	SJ	1976	09	30.90386	23	53	26.00	-01 44 04.9	049
1976	SJ	1976	09	30.95372	23	53	22.35	-01 44 16.5	049
1976	SK	1976	09	20.93878	23	54	05.07	-00 52 31.2	049
1976	SK	1976	09	20.95817	23	54	04.00	-00 52 36.5	049
1976	SK	1976	09	20.99418	23	54	02.08	-00 52 44.7	049
1976	SK	1976	09	29.92667	23	46	25.80	-01 29 33.4	049
1976	SK	1976	09	29.97861	23	46	23.16	-01 29 45.5	049
1976	SK	1976	09	30.90386	23	45	38.04	-01 33 19.1	049
1976	SK	1976	09	30.95372	23	45	35.52	-01 33 31.1	049
1976	SL	1976	09	20.93878	00	01	30.37	+01 28 36.9	049
1976	SL	1976	09	20.95817	00	01	29.41	+01 28 31.6	049
1976	SL	1976	09	20.99418	00	01	27.70	+01 28 19.1	049
1976	SL	1976	09	29.92667	23	54	29.20	+00 38 59.4	049
1976	SL	1976	09	29.97861	23	54	26.83	+00 38 29.1	049
1976	SL	1976	09	30.90386	23	53	44.49	+00 33 41.2	049
1976	SL	1976	09	30.95372	23	53	40.83	+00 33 05.8	049
1976	SN	1976	09	29.92667	00	00	44.34	-00 40 09.1	049
1976	SN	1976	09	29.97861	00	00	41.64	-00 40 18.7	049
1976	SN	1976	09	30.90386	23	59	55.97	-00 43 18.6	049
1976	SN	1976	09	30.95372	23	59	53.44	-00 43 28.6	049
1976	SO	1976	09	29.92667	23	57	39.69	+00 57 15.6	049
1976	SO	1976	09	29.97861	23	57	36.96	+00 56 48.2	049
1976	SO	1976	09	30.90386	23	56	49.53	+00 48 29.6	049
1976	SO	1976	09	30.95372	23	56	46.89	+00 48 02.6	049
1976	SZ9	1976	09	29.92667	23	57	15.83	-01 26 08.5	049
1976	SZ9	1976	09	29.97861	23	57	13.29	-01 26 18.2	049
1976	SZ9	1976	09	30.90386	23	56	31.10	-01 29 11.7	049
1976	SZ9	1976	09	30.95372	23	56	28.74	-01 29 21.1	049
1978	EC	1978	03	11.85146	10	09	11.65	+14 52 33.5	049
1978	EC	1978	03	11.86184	10	09	11.15	+14 52 34.7	049
1978	EC	1978	03	12.03844	10	09	02.22	+14 52 54.2	049
1978	EC	1978	03	12.04398	10	09	01.74	+14 52 55.6	049
1978	ED	1978	03	11.85146	10	11	00.14	+14 34 46.3	049
1978	ED	1978	03	11.86184	10	10	59.62	+14 34 55.1	049
1978	ED	1978	03	12.03844	10	10	52.68	+14 37 07.8	049
1978	ED	1978	03	12.04398	10	10	52.38	+14 37 11.9	049
1978	EE	1978	03	11.85146	10	12	27.74	+14 11 24.0	049
1978	EE	1978	03	11.86184	10	12	27.23	+14 11 26.2	049

1978 EE	1978 03 12.03844	10 12 18.54	+14 12 13.3		049
1978 EE	1978 03 12.04398	10 12 18.22	+14 12 15.5		049
1978 EF	1978 03 11.85146	10 13 02.55	+15 01 43.8		049
1978 EF	1978 03 11.86184	10 13 02.06	+15 01 47.3		049
1978 EF	1978 03 12.03844	10 12 54.25	+15 02 50.2		049
1978 EF	1978 03 12.04398	10 12 54.01	+15 02 52.3		049

OBSERVATIONS MADE AT BUDAPEST BY G. KULIN.

Object	Date UT	R. A. (1950)	Decl.		Obs.
1936 TG	1936 10 13.04861	02 18 28.63	+17 30 27.5		053
1936 TG	1936 10 14.94236	02 16 49.20	+17 25 52.8		053
1936 TG	1936 10 17.95694	02 13 53.01	+17 17 22.2		053
1936 TG	1936 10 27.07014	02 04 25.27	+16 44 07.4		053

OBSERVATION MADE AT TURKU. MEASURED BY M.-A. SNARE.

Object	Date UT	R. A. (1950)	Decl.		Obs.
1938 UT1	1938 10 21.83303	00 42 40.11	+03 14 16.5		062

OBSERVATIONS MADE AT TRAUNSTEIN BY R. BENDEL.

Object	Date UT	R. A. (1950)	Decl.	O - C		N	Obs.
54	1979 09 18.89792	02 07 09.73	+30 04 30.7	0.1+	1+	1	065
54	1979 09 18.90000	02 07 09.60	+30 04 30.9	0.1+	1+	1	065
54	1979 09 18.92639	02 07 08.78	+30 04 36.8	0.1+	1+	1	065
54	1979 09 18.92847	02 07 08.74	+30 04 37.4	0.1+	1+	1	065
397	1979 09 17.88681	21 04 23.56	+06 03 26.6	0.1-	0	1	065
397	1979 09 17.89583	21 04 23.47	+06 03 21.2	0.1-	0	1	065
397	1979 09 17.90417	21 04 23.39	+06 03 16.1	0.1-	0	1	065
397	1979 09 17.90694	21 04 23.35	+06 03 14.3	0.1-	0	1	065
397	1979 09 18.84167	21 04 16.06	+05 53 58.8	0.1-	0	1	065
397	1979 09 18.84931	21 04 16.10	+05 53 57.4	0.1-	0	1	065
397	1979 09 18.85139	21 04 16.02	+05 53 54.3	0.1-	0	1	065
397	1979 09 18.85347	21 04 16.01	+05 53 52.6	0.1-	0	1	065
1069	1978 04 18.91042	15 09 18.81	+02 43 32.9	0.6+	2-	1	065
1069	1978 04 18.93819	15 09 17.75	+02 43 45.8	0.6+	2-	1	065
1069	1978 04 26.91701	15 03 59.88	+03 28 52.2	0.7+	2-	1	065
1069	1978 04 26.94132	15 03 58.79	+03 28 59.6	0.7+	2-	1	065
1069	1978 06 02.94653	14 39 24.12	+04 36 32.4	0.5+	1-	1	065
1069	1978 06 02.96181	14 39 23.64	+04 36 30.2	0.5+	1-	1	065
1069	1978 06 02.97569	14 39 23.23	+04 36 28.2	0.5+	1-	1	065
1069	1978 06 02.98958	14 39 22.89	+04 36 28.9	0.5+	1-	1	065
1136	1978 09 24.90347	23 23 32.60	+06 45 00.6	0.1-	1-	1	065
1136	1978 09 24.94097	23 23 31.36	+06 44 34.6	0.1-	1-	1	065
1136	1978 09 24.96736	23 23 30.48	+06 44 15.1	0.1-	1-	1	065
1136	1978 09 25.85069	23 23 03.49	+06 33 38.3	0.1-	1-	1	065
1136	1978 09 25.87847	23 23 02.60	+06 33 18.3	0.1-	1-	1	065
1136	1978 10 08.86111	23 18 04.83	+03 57 57.0	0.1-	2-	1	065
1136	1978 10 08.88472	23 18 04.44	+03 57 40.1	0.1-	2-	1	065
1136	1978 10 09.86875	23 17 51.87	+03 46 29.3	0.2-	2-	1	065
1136	1978 10 09.89653	23 17 51.47	+03 46 11.6	0.2-	2-	1	065

Note 1: observatory code 065, Long. and Parallax 12.63, -287, -315 (see MPC 4766).

OBSERVATIONS MADE AT GEISEI (CODE 372) BY T. SEKI AND AT TOKAI (CODE 879) BY T. FURUTA. IN PART FROM ORIENT. ASTRON. ASSOC. COMET BULL. NOS. 195-196 AND JAPAN ASTRON. CIRC. NO. 236.

Object	Date UT	R. A. (1950)	Decl.	Mag.		Obs.
/1974 II	1980 02 09.54965	08 47 28.08	+18 11 59.2	14	T	879
/1974 II	1980 02 09.56319	08 47 27.51	+18 11 57.8			879
/1974 II	1980 02 16.47917	08 44 13.48	+18 19 19.0	14	T	879

/1974 II	1980	02	16.51007	08	44	12.98	+18	19	18.6		879
/1979l	1980	02	03.44954	03	18	20.3	-00	48	49	6 T	372
/1979l	1980	02	16.44861	03	33	48.50	+16	44	40.3		879
/1979l	1980	02	16.45191	03	33	48.81	+16	44	47.3		879
/1979l	1980	03	10.47708	03	51	16.11	+24	20	45.9	15 T	372
/1980b	1980	03	19.61319	10	26	40.18	+11	04	44.7	16.5T	372
/1980b	1980	03	19.63611	10	26	39.58	+11	04	45.8		372
/1980b	1980	03	23.63299	10	25	17.38	+11	12	38.0	16.5T	372
/1980b	1980	03	23.66042	10	25	16.57	+11	12	43.6		372
/1980b	1980	04	16.63611	10	19	04.00	+11	47	18.0	16.0T	372

OBSERVATIONS MADE AT THE TOKYO OBSERVATORY, KISO STATION, BY H. KOSAI AND G. SASAKI.

Object		Date	UT	R. A. (1950)			Decl.			Mag.	Obs.
/1980a		1980	04 18.60293	13	07	34.65	-07	10	24.1	17 T	381
/1980a		1980	04 18.63207	13	07	32.76	-07	10	18.1		381
/1980b		1980	04 17.58002	10	18	54.55	+11	48	08.5	15 T	381
/1980b		1980	04 17.61126	10	18	54.26	+11	48	09.3		381
/1980b		1980	04 18.57513	10	18	45.16	+11	48	56.8	15 T	381
1980 HA	*	1980	04 17.56959	10	30	44.78	+08	17	46.3	16.0	381
1980 HA		1980	04 17.59044	10	30	43.81	+08	17	09.1		381
1980 HA		1980	04 17.60084	10	30	43.56	+08	16	47.8		381
1980 HA		1980	04 17.62168	10	30	42.62	+08	16	07.7		381
1980 HA		1980	04 18.56821	10	30	06.64	+07	45	47.2	16.0	381
1980 HA		1980	04 18.58205	10	30	05.97	+07	45	22.1		381

OBSERVATIONS MADE AT THE TOKYO OBSERVATORY, DODAIRA STATION, BY K. TOMITA.

Object	Date	UT	R. A. (1950)			Decl.			Mag.	Obs.
1978 VT	1980	02 09.74288	11	30	36.89	+05	15	13.5	17	387
1978 VT	1980	02 09.75556	11	30	36.54	+05	15	13.9		387

OBSERVATIONS MADE AT STAKENBRIDGE BY B. MANNING. COMMUNICATED BY G. M. HURST.

Object	Date	UT	R. A. (1950)			Decl.			Obs.
/1979l	1980	02 15.84479	03	33	18.96	+16	21	36.6	494
/1979l	1980	02 16.81111	03	34	06.60	+16	57	58.7	494

OBSERVATIONS MADE AT FALKENSEE BY M. GRESSMANN.

Object	Date	UT	R. A. (1950)			Decl.			N	Obs.
200	1979	10 22.83301	23	29	28.20	+04	50	38.3		542
200	1979	10 22.83773	23	29	28.16	+04	50	36.6		542
200	1979	10 22.84145	23	29	27.99	+04	50	38.0	1	542
200	1979	10 23.86808	23	29	00.88	+04	47	59.4		542
200	1979	10 23.87221	23	29	00.75	+04	47	59.9		542
200	1979	10 23.87609	23	29	00.68	+04	47	57.8		542
322	1979	10 23.96439	01	28	44.57	+20	30	26.2		542
322	1979	10 23.96880	01	28	44.38	+20	30	24.8		542
322	1979	10 23.97300	01	28	44.16	+20	30	21.5		542
523	1979	10 23.98119	02	26	10.85	+19	37	33.8		542
523	1979	10 23.98590	02	26	10.70	+19	37	31.7		542
523	1979	10 23.99043	02	26	10.34	+19	37	30.1		542
543	1979	10 22.90986	00	27	00.33	+17	20	05.2	1	542
543	1979	10 22.91409	00	27	00.46	+17	20	11.5	1	542
543	1979	10 22.91847	00	27	00.04	+17	20	09.8		542
804	1979	10 22.89106	23	47	41.85	+09	37	56.2		542
804	1979	10 22.89441	23	47	41.86	+09	37	55.1		542
804	1979	10 22.89735	23	47	41.72	+09	37	55.8		542
804	1979	10 23.90106	23	47	02.89	+09	37	24.5		542
804	1979	10 23.90447	23	47	02.78	+09	37	24.0		542

804	1979	10	23.90796	23	47	02.59	+09	37	23.9		542
1246	1979	10	22.85872	23	45	56.64	+33	21	02.5	2	542
1246	1979	10	22.86389	23	45	56.44	+33	20	58.1		542
1246	1979	10	22.87035	23	45	56.51	+33	20	53.6		542
1246	1979	10	23.88441	23	45	38.84	+33	10	17.6		542
1246	1979	10	23.88892	23	45	38.81	+33	10	15.0		542
1246	1979	10	23.89396	23	45	38.66	+33	10	10.5	2	542

Note 1: near edge of plate. 2: measurement uncertain.

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

Object	Date	UT	R. A. (1950)			Decl.			Mag.	Obs.
1979 SA	1979	11 12.81250	22	58	13.75	+03	17	09.4		552
1979 SA	1979	11 12.84444	22	58	14.09	+03	16	59.1		552
1979 SA	1979	11 21.84792	23	00	18.47	+02	35	40.0		552
1979 SA	1979	11 21.89028	23	00	19.05	+02	35	31.7		552
1979 SA	1979	12 16.71806	23	13	09.34	+01	41	23.6		552
1979 SA	1979	12 16.74167	23	13	10.57	+01	41	21.7	17.5	552

OBSERVATIONS MADE AT THE BURGSOLMS OBSERVATORY BY F. FREVERT.

Object	Date	UT	R. A. (1950)			Decl.			N	Obs.
2	1979	08 29.86944	20	58	03.08	+09	07	17.5	1	554
2	1979	08 29.87153	20	58	03.00	+09	07	17.1	1	554
2	1979	08 29.87431	20	58	02.90	+09	07	15.1	1	554
2	1979	09 06.82778	20	53	16.16	+07	31	24.7	1	554
2	1979	09 06.83125	20	53	16.01	+07	31	21.4	1	554
2	1979	09 06.83472	20	53	15.87	+07	31	18.9	1	554
2	1979	09 06.84097	20	53	15.65	+07	31	13.9	1	554
2	1979	10 19.77431	20	47	45.80	-00	39	51.1	1	554
2	1979	10 19.78021	20	47	45.90	-00	39	54.6	1	554
2	1979	10 19.78750	20	47	46.00	-00	39	58.3	1	554
2	1979	10 22.74514	20	48	44.71	-01	06	40.9	1	554
2	1979	10 22.75000	20	48	44.76	-01	06	43.2	1	554
2	1979	10 22.75417	20	48	44.91	-01	06	45.6	1	554
2	1979	10 25.78333	20	49	55.06	-01	32	47.6	1	554
13	1980	02 19.92708	10	06	03.62	+40	48	01.6	1	554
13	1980	02 19.93403	10	06	03.19	+40	48	02.6	1	554
13	1980	02 19.94097	10	06	02.60	+40	48	02.5	1	554
13	1980	02 19.94792	10	06	02.15	+40	48	03.2	1	554
54	1979	10 22.82917	01	37	58.91	+29	55	04.3	1	554
54	1979	10 22.83472	01	37	58.56	+29	55	03.8	1	554
54	1979	10 22.83889	01	37	58.27	+29	55	02.2	1	554
54	1979	10 22.84792	01	37	57.76	+29	54	59.8	1	554
54	1979	10 25.85069	01	34	55.52	+29	40	49.7	1	554
54	1979	10 25.85833	01	34	55.05	+29	40	47.2	1	554
54	1979	10 25.86736	01	34	54.45	+29	40	44.8	1	554
115	1978	12 06.91597	04	15	28.67	+40	55	52.8	1	554
115	1978	12 06.93056	04	15	27.70	+40	55	45.5	1	554
397	1979	08 29.87917	21	12	29.66	+08	53	39.3	1	554
397	1979	08 29.88333	21	12	29.51	+08	53	37.4	1	554
397	1979	08 29.88889	21	12	29.25	+08	53	34.6	1	554
397	1979	08 29.89097	21	12	29.16	+08	53	34.2	1	554
397	1979	09 06.85833	21	07	55.09	+07	48	20.5	1	554
397	1979	09 06.86250	21	07	55.08	+07	48	18.0	1	554
397	1979	10 19.79861	21	16	46.02	+01	22	17.5	1	554
397	1979	10 19.80278	21	16	46.28	+01	22	16.2	1	554
397	1979	10 19.81597	21	16	46.97	+01	22	12.7	1	554
397	1979	10 22.77917	21	19	33.30	+01	03	24.9	1	554

397	1979 10 22.79201	21 19 34.13	+01 03 18.8			1	554
397	1979 10 22.80556	21 19 34.88	+01 03 14.6			1	554
397	1979 10 22.81424	21 19 35.32	+01 03 10.9			1	554
397	1979 10 25.80799	21 22 38.28	+00 45 55.9			1	554
397	1979 10 25.81840	21 22 38.97	+00 45 51.7			1	554
397	1979 10 25.82986	21 22 39.66	+00 45 48.2			1	554
579	1980 02 19.85694	07 49 57.77	+31 08 24.0			1	554
579	1980 02 19.87431	07 49 57.26	+31 08 26.1			1	554
579	1980 02 19.88958	07 49 56.58	+31 08 26.2			1	554
579	1980 02 19.89861	07 49 56.32	+31 08 26.9			1	554

Note 1: observatory code 554, Long. and Parallax 8.40, -272, -328 (see MPC 4766).

OBSERVATIONS MADE AT PALOMAR (CODE 675), AT FORD OBSERVATORY (CODE 674), AT COONABARABRAN (CODE 413) AND AT ASIAGO (CODE 043). MEASURED BY S. J. BUS.

Object	Date	UT	R. A. (1950)	Decl.		N	Obs.
/1979l	1980 02 12.12986	03 30 01.99	+13 28 54.2				675
1977 RD	1977 08 18.56979	22 27 07.27	-32 25 39.1				413
1977 RD	1977 08 18.62188	22 27 01.03	-32 24 59.2				413
1978 VV6	1977 04 24.31007	13 50 03.73	-09 50 45.2			1	675
1978 VV6	1977 04 24.36215	13 50 00.34	-09 50 31.5			1	675
1978 VV6	1977 04 25.31250	13 48 59.47	-09 46 13.5			1	675
1978 VV6	1977 04 25.36458	13 48 55.93	-09 45 59.7			1	675
1978 VT9	1977 04 24.36684	14 14 55.86	-11 06 58.3			1	675
1978 VT9	1977 04 25.36979	14 13 51.43	-11 02 54.9			1	675
1978 VT9	1977 04 25.42188	14 13 47.79	-11 02 43.8			1	675
1979 VA	1979 11 21.29028	02 10 15.88	+24 15 34.7			2	674
1979 VA	1979 12 11.85069	03 14 35.19	+21 38 48.1				043
1979 VA	1979 12 18.87361	03 27 13.01	+21 13 06.0				043
1979 WM	1976 08 30.24931	22 29 00.83	+11 29 35.5			3	675
1979 WM	1977 09 14.47500	00 24 33.13	+23 42 32.9			3	675
1979 WM	1978 11 02.28472	02 17 51.79	+29 16 03.8			7	675
1979 WM	1980 02 12.13889	04 10 29.71	+24 47 54.2				675
1980 AA	1980 02 05.86181	09 07 22.28	+03 41 43.7				043

Note 1: 1.2-m Schmidt telescope, observer C. Kowal. 2: 0.46-m reflector, observer R. Royer; observatory code 674, Long. and Parallax 242.39, -352, -240 (see MPC 4766). 3: 0.46-m Schmidt telescope, observer E. Helin. 4: identified by J. G. Williams. 7 = 3 + 4.

OBSERVATIONS MADE AT PALOMAR. IMAGES IDENTIFIED BY J. DENGEL, G. LEUPRECHT AND R. WEINBERGER ON SKY SURVEY PRINTS.

Object		Date	UT	R. A. (1950)	Decl.	Mag.	N	Obs.
1953 VT3		1953 11 13.29305	03 13 31.3	-21 19 34			1	675
1953 VT3		1953 11 13.32430	03 13 28.2	-21 19 03			1	675
1953 VT3	*	1953 11 13.33194	03 13 27.4	-21 18 48		16		675
1955 WH	*	1955 11 18.33264	04 22 32.7	-16 25 37		16		675
1955 WH		1955 11 18.34097	04 22 32.5	-16 25 46			1	675
1955 WH		1955 11 18.37569	04 22 31.1	-16 26 17			1	675

Note 1: beginning and end of trail.

OBSERVATIONS MADE AT THE LOWELL OBSERVATORY'S ANDERSON MESA STATION (CODE 688) AND AT THE U.S. NAVAL OBSERVATORY'S FLAGSTAFF STATION (CODE 689) BY E. BOWELL.

Object	Date	UT	R. A. (1950)	Decl.	Mag.	N	Obs.
/1980b	1980 04 01.21104	10 22 37.41	+11 27 50.4			5	689
/1980b	1980 04 14.17569	10 19 30.74	+11 44 57.1		16.5T		688
17	1980 03 21.20625	10 21 21.20	+16 04 33.7				688
17	1980 04 14.17569	10 12 14.41	+16 58 13.4				688
199	1980 04 14.21771	13 54 48.17	+11 06 07.9				688

254		1980	03	21.20625	10	13	10.63	+16	54	57.8		3	688
254		1980	04	14.17569	10	03	37.94	+16	21	38.4			688
401		1980	03	21.20625	10	23	33.13	+17	15	23.6			688
401		1980	04	14.17569	10	14	09.26	+17	16	07.6			688
491		1980	04	15.25694	14	30	58.87	+02	09	47.2			688
491		1980	04	16.24306	14	30	21.16	+02	17	24.9			688
491		1980	04	19.27083	14	28	23.09	+02	40	20.2			688
598		1980	04	16.24306	14	41	31.20	-00	32	09.9			688
598		1980	04	19.27083	14	39	09.10	-00	21	07.2			688
932		1980	03	21.20625	10	27	07.22	+17	04	39.4			688
932		1980	04	14.17569	10	16	23.71	+16	04	05.0			688
973		1980	03	21.20625	10	24	29.84	+12	48	09.7			688
973		1980	04	14.17569	10	13	19.10	+11	59	50.7			688
1100		1980	03	21.20625	10	15	32.65	+09	52	38.6			688
1100		1980	04	14.17569	10	06	46.24	+10	41	37.8			688
1128		1980	03	21.20625	10	15	02.34	+12	25	09.0			688
1128		1980	04	14.17569	10	06	36.03	+13	00	47.7			688
1245		1980	03	21.20625	10	13	25.58	+11	39	06.1			688
1245		1980	04	14.17569	10	05	25.68	+12	36	31.0			688
1247		1980	03	21.20625	10	15	23.08	+10	42	19.7			688
1247		1980	04	14.17569	10	06	29.62	+11	40	47.4			688
1379		1980	04	14.17569	10	15	43.28	+11	43	04.0			688
1679		1980	04	14.23194	14	36	34.99	+01	21	15.1			688
1679		1980	04	15.25694	14	35	58.14	+01	31	33.0			688
1679		1980	04	16.24306	14	35	22.10	+01	41	23.5			688
1679		1980	04	19.27083	14	33	27.53	+02	11	10.4			688
1778		1980	03	21.20625	10	24	50.52	+13	05	04.6			688
1778		1980	04	14.17569	10	16	06.99	+13	46	49.9			688
1845		1980	04	16.24306	14	46	12.23	-00	13	04.5			688
1845		1980	04	19.27083	14	44	05.13	+00	04	08.4		1	688
1967		1980	03	21.20625	10	22	54.87	+16	44	26.8			688
1967		1980	04	14.17569	10	13	46.76	+16	32	33.7			688
2144		1980	04	14.17569	10	10	27.06	+13	07	57.6			688
2217		1980	04	14.17569	10	01	44.27	+13	42	32.4	17.0		688
2228		1980	03	21.20625	10	10	55.83	+12	15	25.3			688
2228		1980	04	14.17569	10	04	30.26	+12	56	17.4		2	688
1975	WM1	1980	04	14.23194	14	41	26.61	+02	16	39.0	17.0		688
1975	WM1	1980	04	15.25694	14	40	57.56	+02	18	50.0	17.0		688
1975	WM1	1980	04	16.24306	14	40	29.15	+02	20	53.6	17.0		688
1975	WM1	1980	04	19.27083	14	39	00.85	+02	26	55.0	17.0		688
1980	CD	1980	03	21.20625	10	08	39.85	+14	45	05.9			688
1980	CD	1980	04	14.17569	10	02	15.98	+14	22	17.6	16.5		688
1980	CF	1980	03	21.20625	10	26	47.71	+11	51	53.6			688
1980	CF	1980	04	14.17569	10	19	06.47	+12	57	25.4			688
1980	CO	1980	03	14.27500	10	10	59.69	+15	20	23.1	17.7	3	688
1980	EC	1980	03	21.20625	10	24	44.83	+12	27	24.8			688
1980	EC	1980	04	14.17569	10	18	37.03	+15	11	14.4	17.0		688
1980	EE	1980	03	21.18889	10	10	36.11	+15	36	14.9	17.5		688
1980	EE	1980	03	21.20625	10	10	35.52	+15	36	18.3			688
1980	EG	1980	04	14.23194	14	49	03.27	+05	22	37.1	17.0		688
1980	EG	1980	04	16.24306	14	47	19.22	+05	29	32.6	17.5	1	688
1980	EG	1980	04	19.27083	14	44	36.68	+05	38	40.8	17.0		688
1980	GA *	1980	04	14.23194	14	34	13.25	+04	38	55.4	15.0		688
1980	GA	1980	04	15.25694	14	32	43.04	+04	27	01.0			688
1980	GA	1980	04	16.24306	14	31	15.32	+04	15	19.2			688
1980	GA	1980	04	19.27083	14	26	38.80	+03	37	36.3		1	688
1980	GB *	1980	04	14.23194	14	40	24.30	+00	24	52.3	17.0	3	688
1980	GB	1980	04	16.24306	14	38	42.66	+00	33	55.2	17.0		688
1980	GB	1980	04	19.27083	14	36	01.31	+00	46	26.1	17.5		688

1980 GC	*	1980 04 14.23194	14 48 01.43	+04 28 40.8			16.5		688
1980 GC		1980 04 15.25694	14 47 35.00	+04 34 04.7			17.5	3	688
1980 GC		1980 04 16.24306	14 47 08.94	+04 39 13.9			17.5	4	688
1980 GC		1980 04 19.27083	14 45 47.72	+04 54 36.5			17.5		688
1980 GD	*	1980 04 15.25694	14 28 54.56	+04 04 15.2			17.5		688
1980 GD		1980 04 16.24306	14 28 00.42	+04 07 05.9			17.5		688
1980 GD		1980 04 19.27083	14 25 12.51	+04 15 09.9			17.5		688

Note 1: right ascension uncertain. 2: declination uncertain. 3 = 1 + 2. 4: diffuse image, position uncertain. 5: plate taken by H. Guetter; object diffuse, without condensation, plate dark in moonlight.

OBSERVATIONS MADE AT THE LOWELL OBSERVATORY'S ANDERSON MESA STATION BY H. L. GICLAS. MEASURED BY M. L. KANTZ.

Object	Date	UT	R. A. (1950)	Decl.	Obs.
1324	1979 04 28.21354		13 22 19.94	-18 28 16.4	688
1324	1979 05 22.24583		13 06 20.10	-16 05 06.8	688

OBSERVATIONS MADE AT THE GOETHE LINK OBSERVATORY (CODE 760) AND THE LEIDEN SOUTHERN STATION (CODE 081). MEASURED AT INDIANA UNIVERSITY.

Object	Date	UT	R. A. (1950)	Decl.	Obs.
1229	1951 02 10.17433		09 24 12.25	+14 05 41.7	760
1229	1951 02 10.21879		09 24 10.14	+14 05 50.4	760
1370	1955 06 27.25834		19 18 32.50	-26 37 57.6	760
1949 YX	1949 12 28.31390		09 14 53.42	+21 28 33.0	760
1949 YX	1949 12 28.39862		09 14 50.79	+21 28 46.3	760
1950 RL	1950 09 14.10002		20 10 42.37	-15 57 50.5	760
1950 RL	1950 09 14.14515		20 10 41.60	-15 57 47.3	760
1950 RM	1950 09 14.14515		20 23 40.92	-17 28 40.6	760
1950 TR2	1950 10 11.26313		01 55 01.49	-05 28 57.2	760
1950 TR2	1950 10 11.29021		01 55 00.17	-05 29 02.3	760
1950 UD	1950 10 18.12370		22 38 48.30	+01 22 28.1	760
1950 UD	1950 10 18.17993		22 38 48.71	+01 22 17.5	760
1950 UE	1950 10 18.12370		22 33 18.47	-01 06 54.1	760
1950 UE	1950 10 18.17993		22 33 17.18	-01 07 14.2	760
1950 UH	1950 10 20.27821		02 41 13.11	-00 19 56.4	760
1950 UH	1950 10 20.30392		02 41 11.28	-00 19 52.9	760
1950 UJ	1950 10 20.27821		02 39 47.33	-00 19 11.0	760
1950 UJ	1950 10 20.30392		02 39 47.29	-00 19 09.5	760
1956 TL	1956 10 09.17435		01 14 31.49	-03 27 04.1	760
1956 TL	1956 10 09.21671		01 14 29.66	-03 27 22.5	760
1957 LE	1957 06 05.97500		17 31 28.07	-22 41 18.2	081
1957 LE	1957 06 06.03000		17 31 31.22	-22 41 24.3	081
1961 TC	1961 10 04.15001		23 14 52.09	+05 47 52.3	760
1961 TC	1961 10 04.19376		23 14 50.91	+05 47 07.7	760
1961 UO	1961 10 18.25762		01 46 02.52	+13 10 46.1	760
1961 UO	1961 10 18.29998		01 46 00.39	+13 10 44.4	760

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

Object	Date	UT	R. A. (1950)	Decl.	Mag.	N	Obs.
/1974 II	1978 12 28.28579		07 16 36.34	+27 29 06.8			801
/1978 XVII	1978 12 07.42458		11 43 50.57	+16 53 36.6			801
/1978 XXII	1979 03 28.03113		04 13 28.62	+15 13 38.1		1	801
/1979f	1980 02 11.09941		04 26 28.66	+41 22 01.1			801
/1979i	1980 02 06.15764		06 52 18.20	+20 39 33.2			801
/1979i	1980 02 09.14392		06 47 45.43	+19 04 13.7			801
/1979i	1980 03 07.05439		06 32 24.36	+09 33 34.6		2	801
/1980b	1980 04 18.09169		10 18 49.84	+11 48 26.2			801

/1980b		1980	04	20.05988	10	18	32.11	+11	50	06.5		801
129		1980	03	16.09316	08	59	40.23	+19	57	41.5		801
184		1980	03	16.09316	08	56	59.93	+17	27	38.0		801
279		1980	03	16.09316	08	58	02.49	+19	52	31.7		801
706		1980	04	19.09145	09	44	23.18	+08	13	50.9		801
706		1980	04	20.10668	09	44	22.91	+08	12	36.4		801
1020		1980	03	13.36331	11	58	22.62	-00	14	09.2		801
1020		1980	03	13.39929	11	58	20.69	-00	13	55.1		801
1123		1978	11	26.15714	04	43	27.71	+19	28	33.4		801
1128		1978	12	02.12416	04	20	47.90	+21	43	53.4		801
1221		1980	02	13.34641	13	39	43.35	-19	40	05.3		801
1772		1978	12	02.09016	01	14	07.76	+00	58	39.5		801
1801		1978	12	01.97891	22	42	57.41	-20	17	15.6		801
2055		1980	02	14.01705	02	03	28.81	+34	55	27.4		801
2075		1978	12	01.33878	08	22	01.05	+07	51	58.1		801
2077		1979	05	02.24832	11	29	40.17	+41	12	54.5		801
2228		1980	02	16.19948	10	34	59.76	+09	40	01.7		801
2228		1980	03	10.32082	10	17	30.33	+11	34	16.7		801
1936	TG	1980	02	09.04385	06	58	57.58	+25	54	41.8		801
1936	TG	1980	03	11.03963	07	04	37.51	+24	35	44.0		801
1938	TB	1980	01	25.33826	11	18	14.15	+06	34	36.7		801
1938	TB	1980	02	13.26990	11	09	03.92	+07	47	11.2		801
1941	SA1	1979	12	19.38244	09	53	27.62	+22	20	22.9		801
1952	UW1	1979	06	22.21587	16	31	29.09	-16	00	10.8		801
1971	OG	1980	03	11.06951	06	13	10.59	+22	05	23.3		801
1975	BU	1980	02	13.29367	12	43	36.52	+13	24	34.7		801
1975	BU	1980	03	12.30219	12	34	49.18	+19	11	14.2		801
1975	WM1	1980	03	12.36400	14	52	24.72	+00	55	20.6		801
1977	GA	1978	11	26.15714	04	43	32.50	+19	28	54.9		801
1977	HC	1980	02	13.98326	04	28	56.97	+16	00	17.8		801
1978	UV1	1980	02	13.10382	08	31	47.42	+32	41	49.1		801
1978	UV1	1980	03	13.11789	08	15	30.06	+32	28	07.7		801
1978	VT	1980	03	10.34711	11	06	30.84	+07	09	45.6		801
1978	XE *	1978	12	02.12416	04	19	16.95	+21	37	33.4	18	801
1978	XF *	1978	12	07.31416	06	02	43.33	+12	49	05.1	18	801
1978	YA	1980	04	17.17935	11	30	09.28	+04	18	46.3		801
1979	BA	1979	03	01.29475	10	19	56.94	+35	15	31.3		801
1979	BA	1979	03	27.32042	09	53	54.28	+46	39	33.4		801
1979	BA	1979	05	02.11977	10	09	19.60	+48	30	19.3	19	2 801
1979	VA	1980	02	11.02976	04	48	02.52	+21	34	54.1		801
1979	YB	1979	12	28.29838	05	47	53.52	+16	53	35.4		3 801
1980	AA	1980	02	13.13446	09	24	57.56	+00	04	36.3		801
1980	CK	1980	03	20.11155	09	38	04.11	+00	20	33.7	16	801
1980	CO	1980	04	17.06219	10	01	17.97	+15	55	51.8		2 801
1980	CO	1980	04	18.11562	10	01	25.30	+15	54	12.0		801
1980	DA	1980	04	19.09145	09	44	21.41	+08	15	11.5		801
1980	DA	1980	04	20.10668	09	44	44.42	+08	14	55.1		801
1980	GA	1980	04	16.20921	14	31	17.91	+04	15	43.9		801
1980	GA	1980	04	17.20624	14	29	48.12	+04	03	37.9		801
1980	GA	1980	04	17.21392	14	29	47.31	+04	03	31.5		801
6512	P-L	1979	08	27.10997	22	35	34.79	-15	06	15.1		801

Note 1: comet image weak and diffuse. 2: poor solution and/or weak image. 3: image on star trail.

OBSERVATIONS MADE AT THE UNIVERSITY OF CHILE'S CERRO EL ROBLE STATION BY J. MAZA AND C. TORRES. MEASURED BY M. WISCHNJEWSKY.

Object	Date	UT	R. A. (1950)	Decl.	N	Obs.
/1979l	1980 01	10.32639	16 08 22.18	-45 40 22.2	1	805
/1979l	1980 01	12.34271	16 10 30.32	-48 11 02.7	2	805

/1979l	1980 01 12.34688	16 10 30.71	-48 11 24.3		2	805
/1979l	1980 01 13.34514	16 12 12.70	-49 40 34.2			805
/1979l	1980 01 29.11628	02 58 08.28	-27 19 16.7		3	805

Note 1: 50" bright coma, no condensation, no tail. 2: 50" coma, 10" central condensation, 30’ faint narrow tail in p.a. 260 . 3: nebulous image 60" in diameter, no condensation, no tail.

OBSERVATIONS MADE WITH THE 1-M SCHMIDT TELESCOPE AT THE EUROPEAN SOUTHERN OBSERVATORY BY H.-E. SCHUSTER. MEASURED BY R. M. WEST.

Object	Date	UT	R. A. (1950)	Decl.	N	Obs.
/1979l	1980 01 11.31458		16 09 13.8	-46 49 56	1	809
/1979l	1980 01 15.31890		16 17 30.6	-53 15 29	1	809
/1979l	1980 01 20.34611		17 10 07.7	-69 09 23	1	809

Note 1: rather uncertain because of rapid motion and comet’s large, bright halo.

OBSERVATIONS MADE WITH THE 0.4-M ASTROGRAPH AT THE EUROPEAN SOUTHERN OBSERVATORY BY H. DEBEHOGNE AND E. RANGEL NETTO (ASSISTED BY G. ROMAN, G. VIEIRA, F. CALDEIRA AND L. E. MACHADO).

Object	Date	UT	R. A. (1950)	Decl.	Mag.	Obs.
24	1979 12	17.20832	05 49 55.20	+24 19 25.5		809
24	1979 12	17.21663	05 49 54.69	+24 19 25.4		809
24	1979 12	17.22494	05 49 54.25	+24 19 25.3		809
24	1979 12	19.24303	05 48 01.91	+24 19 18.4		809
24	1979 12	19.24995	05 48 01.53	+24 19 18.3		809
24	1979 12	19.25688	05 48 01.12	+24 19 18.1		809
24	1979 12	20.17104	05 47 10.22	+24 19 12.6		809
24	1979 12	20.17935	05 47 09.73	+24 19 12.5		809
24	1979 12	20.18766	05 47 09.26	+24 19 12.4		809
24	1979 12	21.22545	05 46 11.18	+24 19 04.0		809
24	1979 12	21.23341	05 46 10.73	+24 19 04.0		809
24	1979 12	21.24172	05 46 10.26	+24 19 03.7		809
24	1979 12	22.15034	05 45 19.65	+24 18 54.8		809
24	1979 12	22.15865	05 45 19.17	+24 18 54.6		809
24	1979 12	22.16627	05 45 18.73	+24 18 54.5		809
24	1979 12	23.21064	05 44 20.41	+24 18 42.7		809
24	1979 12	23.21757	05 44 20.01	+24 18 42.7		809
24	1979 12	23.22449	05 44 19.59	+24 18 42.6		809
24	1979 12	24.20444	05 43 25.15	+24 18 29.2		809
24	1979 12	24.21208	05 43 24.71	+24 18 29.0		809
24	1979 12	24.21898	05 43 24.34	+24 18 28.7		809
24	1979 12	25.15393	05 42 32.68	+24 18 14.8		809
24	1979 12	25.16227	05 42 32.21	+24 18 14.2		809
24	1979 12	25.17055	05 42 31.74	+24 18 14.2		809
24	1979 12	26.14496	05 41 38.13	+24 17 58.0		809
24	1979 12	26.15331	05 41 37.66	+24 17 58.0		809
24	1979 12	28.13950	05 39 49.40	+24 17 20.2		809
24	1979 12	28.14920	05 39 48.88	+24 17 20.0		809
24	1979 12	29.16585	05 38 54.19	+24 16 58.7		809
24	1979 12	29.18594	05 38 53.08	+24 16 57.7		809
24	1979 12	30.17369	05 38 00.58	+24 16 35.4		809
24	1979 12	30.19014	05 37 59.68	+24 16 35.4		809
27	1979 12	15.31905	05 31 46.10	+22 39 08.3		809
27	1979 12	15.32736	05 31 45.55	+22 39 08.6		809
27	1979 12	15.33567	05 31 44.97	+22 39 09.0		809
27	1979 12	16.25192	05 30 46.27	+22 39 40.6		809
27	1979 12	16.25884	05 30 45.78	+22 39 40.0		809
27	1979 12	16.26577	05 30 45.33	+22 39 40.5		809
27	1979 12	17.09128	05 29 52.73	+22 40 07.1		809

27	1979	12	17.09682	05	29	52.35	+22	40	07.3	809
27	1979	12	17.10513	05	29	51.77	+22	40	06.9	809
27	1979	12	17.17092	05	29	47.33	+22	40	10.3	809
27	1979	12	17.17785	05	29	46.91	+22	40	10.3	809
27	1979	12	17.18477	05	29	46.41	+22	40	10.5	809
27	1979	12	19.22710	05	27	35.02	+22	41	13.2	809
27	1979	12	19.23403	05	27	34.55	+22	41	13.6	809
27	1979	12	22.12126	05	24	32.20	+22	42	35.4	809
27	1979	12	22.12957	05	24	31.66	+22	42	36.1	809
27	1979	12	22.13788	05	24	31.11	+22	42	36.3	809
27	1979	12	23.19480	05	23	25.31	+22	43	05.6	809
27	1979	12	23.20302	05	23	24.76	+22	43	05.9	809
142	1979	12	17.20832	05	49	27.67	+24	54	42.7	809
142	1979	12	17.21663	05	49	27.11	+24	54	42.0	809
142	1979	12	17.22494	05	49	26.55	+24	54	41.5	809
142	1979	12	19.24303	05	47	09.31	+24	52	38.4	809
142	1979	12	19.24995	05	47	08.83	+24	52	37.8	809
142	1979	12	19.25688	05	47	08.34	+24	52	37.3	809
142	1979	12	20.17104	05	46	06.18	+24	51	37.8	809
142	1979	12	20.17935	05	46	05.63	+24	51	37.2	809
142	1979	12	20.18766	05	46	05.01	+24	51	36.8	809
142	1979	12	21.22545	05	44	54.11	+24	50	25.8	809
142	1979	12	21.23341	05	44	53.58	+24	50	25.3	809
142	1979	12	21.24172	05	44	53.01	+24	50	24.6	809
142	1979	12	22.15034	05	43	51.32	+24	49	19.8	809
142	1979	12	22.15865	05	43	50.75	+24	49	19.1	809
142	1979	12	22.16627	05	43	50.21	+24	49	18.6	809
142	1979	12	23.21064	05	42	39.14	+24	48	01.8	809
142	1979	12	23.21757	05	42	38.66	+24	48	01.5	809
142	1979	12	23.22449	05	42	38.17	+24	48	00.8	809
142	1979	12	24.20444	05	41	31.78	+24	46	45.2	809
142	1979	12	24.21208	05	41	31.24	+24	46	44.7	809
142	1979	12	24.21898	05	41	30.77	+24	46	44.0	809
142	1979	12	25.15393	05	40	27.87	+24	45	30.2	809
142	1979	12	25.16227	05	40	27.28	+24	45	29.5	809
142	1979	12	25.17055	05	40	26.71	+24	45	28.8	809
142	1979	12	26.14496	05	39	21.43	+24	44	09.1	809
142	1979	12	26.15331	05	39	20.89	+24	44	08.3	809
142	1979	12	28.13950	05	37	09.30	+24	41	18.5	809
142	1979	12	28.14920	05	37	08.60	+24	41	17.8	809
142	1979	12	29.16585	05	36	02.23	+24	39	47.5	809
142	1979	12	29.18594	05	36	00.86	+24	39	45.8	809
142	1979	12	30.17369	05	34	57.05	+24	38	16.5	809
142	1979	12	30.19014	05	34	56.01	+24	38	14.8	809
639	1979	04	21.12675	12	20	37.81	-15	20	28.7	809
639	1979	04	21.13575	12	20	37.47	-15	20	25.9	809
639	1979	04	21.14476	12	20	37.11	-15	20	23.0	809
639	1979	04	22.09425	12	20	01.22	-15	14	54.2	809
639	1979	04	22.10117	12	20	00.84	-15	14	50.8	809
639	1979	04	22.11225	12	20	00.50	-15	14	47.7	809
639	1979	04	25.12968	12	18	11.23	-14	57	22.3	809
639	1979	04	25.13868	12	18	10.93	-14	57	19.7	809
639	1979	04	25.14769	12	18	10.60	-14	57	16.6	809
639	1979	04	26.09995	12	17	37.99	-14	51	47.0	809
639	1979	04	26.10964	12	17	37.63	-14	51	44.0	809
639	1979	04	26.11957	12	17	37.31	-14	51	40.6	809
639	1979	04	29.26281	12	15	55.52	-14	33	44.7	809
639	1979	04	29.27182	12	15	55.24	-14	33	41.8	809
639	1979	04	29.28082	12	15	54.98	-14	33	38.5	809

639	1979	04	30.19238	12	15	27.52	-14	28	30.2	809
639	1979	04	30.20156	12	15	27.25	-14	28	28.0	809
639	1979	04	30.21056	12	15	26.97	-14	28	24.5	809
755	1979	12	15.26260	05	24	52.07	+18	42	57.1	809
755	1979	12	15.27022	05	24	51.65	+18	42	56.3	809
755	1979	12	15.27784	05	24	51.28	+18	42	56.0	809
755	1979	12	16.14665	05	24	07.21	+18	42	15.1	809
755	1979	12	16.15357	05	24	06.86	+18	42	14.9	809
755	1979	12	16.16050	05	24	06.50	+18	42	14.7	809
755	1979	12	17.14530	05	23	16.47	+18	41	28.1	809
755	1979	12	17.15241	05	23	16.09	+18	41	28.0	809
755	1979	12	17.15915	05	23	15.72	+18	41	27.2	809
755	1979	12	19.20286	05	21	32.00	+18	39	57.1	809
755	1979	12	19.20979	05	21	31.60	+18	39	56.7	809
755	1979	12	19.21671	05	21	31.27	+18	39	56.3	809
755	1979	12	20.14264	05	20	44.62	+18	39	15.6	809
755	1979	12	20.15095	05	20	44.16	+18	39	15.4	809
755	1979	12	20.15926	05	20	43.80	+18	39	15.1	809
755	1979	12	21.16554	05	19	53.15	+18	38	33.4	809
755	1979	12	21.17385	05	19	52.75	+18	38	33.3	809
755	1979	12	22.08739	05	19	07.14	+18	37	56.2	809
755	1979	12	22.09575	05	19	06.75	+18	37	56.4	809
755	1979	12	22.10394	05	19	06.37	+18	37	55.8	809
755	1979	12	23.16978	05	18	13.35	+18	37	14.4	809
755	1979	12	23.17809	05	18	12.92	+18	37	13.9	809
755	1979	12	23.18640	05	18	12.49	+18	37	13.6	809
755	1979	12	24.15250	05	17	24.90	+18	36	37.7	809
755	1979	12	24.16020	05	17	24.45	+18	36	37.8	809
755	1979	12	24.16774	05	17	24.13	+18	36	37.4	809
755	1979	12	25.10684	05	16	38.37	+18	36	03.5	809
755	1979	12	25.11515	05	16	37.94	+18	36	03.1	809
755	1979	12	26.09648	05	15	50.46	+18	35	29.3	809
755	1979	12	26.10514	05	15	50.02	+18	35	28.7	809
997	1979	04	21.12675	12	18	37.97	-15	38	33.7	809
997	1979	04	21.14476	12	18	37.20	-15	38	24.9	809
997	1979	04	22.09425	12	17	58.85	-15	30	08.4	809
997	1979	04	22.10117	12	17	58.48	-15	30	03.7	809
997	1979	04	22.11225	12	17	58.10	-15	29	58.9	809
997	1979	04	25.12968	12	16	02.66	-15	03	38.4	809
997	1979	04	25.13868	12	16	02.35	-15	03	34.3	809
997	1979	04	25.14769	12	16	02.02	-15	03	29.3	809
997	1979	04	26.09995	12	15	27.89	-14	55	12.5	809
997	1979	04	26.10964	12	15	27.57	-14	55	07.2	809
997	1979	04	26.11957	12	15	27.21	-14	55	02.2	809
997	1979	04	29.26281	12	13	42.60	-14	27	53.5	809
997	1979	04	29.27182	12	13	42.29	-14	27	48.5	809
997	1979	04	29.28082	12	13	42.02	-14	27	44.2	809
997	1979	04	30.19238	12	13	14.39	-14	19	57.9	809
997	1979	04	30.20156	12	13	14.15	-14	19	55.3	809
997	1979	04	30.21056	12	13	13.83	-14	19	49.5	809
1056	1979	12	15.26260	05	29	16.74	+19	55	49.1	809
1056	1979	12	15.27022	05	29	16.15	+19	55	48.9	809
1056	1979	12	15.27784	05	29	15.63	+19	55	49.3	809
1056	1979	12	16.14665	05	28	12.99	+19	57	03.4	809
1056	1979	12	16.15357	05	28	12.51	+19	57	04.4	809
1056	1979	12	16.16050	05	28	11.95	+19	57	04.7	809
1056	1979	12	17.14530	05	27	00.87	+19	58	27.4	809
1056	1979	12	17.15241	05	27	00.30	+19	58	28.3	809
1056	1979	12	17.15915	05	26	59.76	+19	58	28.6	809

1056	1979	12	19.20286	05	24	32.83	+20	01	21.0	809
1056	1979	12	19.20979	05	24	32.31	+20	01	21.7	809
1056	1979	12	19.21671	05	24	31.82	+20	01	22.0	809
1056	1979	12	20.14264	05	23	26.11	+20	02	41.0	809
1056	1979	12	20.15095	05	23	25.46	+20	02	41.7	809
1056	1979	12	20.15926	05	23	24.83	+20	02	42.6	809
1056	1979	12	21.16554	05	22	13.73	+20	04	08.0	809
1056	1979	12	21.17385	05	22	13.11	+20	04	08.6	809
1056	1979	12	22.08739	05	21	09.34	+20	05	26.5	809
1056	1979	12	22.09575	05	21	08.78	+20	05	27.4	809
1056	1979	12	22.10394	05	21	08.18	+20	05	28.0	809
1056	1979	12	23.16978	05	19	54.23	+20	06	59.3	809
1056	1979	12	23.17809	05	19	53.66	+20	07	00.4	809
1056	1979	12	23.18640	05	19	53.06	+20	07	00.8	809
1056	1979	12	24.15250	05	18	47.11	+20	08	24.7	809
1056	1979	12	24.16020	05	18	46.49	+20	08	25.4	809
1056	1979	12	24.16774	05	18	46.03	+20	08	26.2	809
1056	1979	12	25.10684	05	17	42.78	+20	09	47.6	809
1056	1979	12	25.11515	05	17	42.20	+20	09	48.2	809
1056	1979	12	26.09648	05	16	36.95	+20	11	13.6	809
1056	1979	12	26.10514	05	16	36.38	+20	11	14.6	809
1056	1979	12	28.09103	05	14	27.64	+20	14	09.9	809
1056	1979	12	28.10356	05	14	26.75	+20	14	11.1	809
1056	1979	12	29.10907	05	13	23.36	+20	15	41.3	809
1277	1979	12	15.26260	05	25	17.86	+20	37	02.2	809
1277	1979	12	15.27022	05	25	17.53	+20	36	59.8	809
1277	1979	12	15.27784	05	25	17.08	+20	36	57.9	809
1277	1979	12	16.14665	05	24	26.22	+20	34	56.3	809
1277	1979	12	16.15357	05	24	25.77	+20	34	54.7	809
1277	1979	12	16.16050	05	24	25.40	+20	34	53.5	809
1277	1979	12	17.14530	05	23	27.55	+20	32	35.4	809
1277	1979	12	17.15241	05	23	27.14	+20	32	34.2	809
1277	1979	12	17.15915	05	23	26.70	+20	32	33.1	809
1277	1979	12	19.20286	05	21	27.53	+20	27	47.2	809
1277	1979	12	19.20979	05	21	27.06	+20	27	45.9	809
1277	1979	12	19.21671	05	21	26.63	+20	27	45.0	809
1277	1979	12	20.14264	05	20	33.22	+20	25	35.8	809
1277	1979	12	20.15095	05	20	32.72	+20	25	35.2	809
1277	1979	12	20.15926	05	20	32.25	+20	25	33.5	809
1277	1979	12	21.16554	05	19	34.45	+20	23	14.5	809
1277	1979	12	21.17385	05	19	33.96	+20	23	12.8	809
1277	1979	12	22.08739	05	18	41.99	+20	21	06.8	809
1277	1979	12	22.09575	05	18	41.46	+20	21	05.3	809
1277	1979	12	22.10394	05	18	40.96	+20	21	03.6	809
1277	1979	12	23.16978	05	17	40.54	+20	18	40.0	809
1277	1979	12	23.17809	05	17	40.17	+20	18	38.6	809
1277	1979	12	23.18640	05	17	39.83	+20	18	36.4	809
1277	1979	12	24.15250	05	16	45.87	+20	16	25.6	809
1277	1979	12	24.16020	05	16	45.41	+20	16	23.8	809
1277	1979	12	24.16774	05	16	44.99	+20	16	23.2	809
1277	1979	12	25.10684	05	15	53.20	+20	14	16.2	809
1277	1979	12	25.11515	05	15	52.70	+20	14	14.8	809
1277	1979	12	26.09648	05	14	59.20	+20	12	03.8	809
1277	1979	12	26.10514	05	14	58.65	+20	12	01.8	809
1277	1979	12	28.09103	05	13	12.49	+20	07	40.8	809
1277	1979	12	28.10356	05	13	11.87	+20	07	39.7	809
1277	1979	12	29.10907	05	12	19.30	+20	05	29.7	809
1321	1979	04	21.12675	12	22	08.16	-15	41	40.7	809
1321	1979	04	21.13575	12	22	07.72	-15	41	38.1	809

1321	1979	04	21.14476	12	22	07.29	-15	41	35.5	809
1321	1979	04	22.09425	12	21	25.83	-15	37	11.4	809
1321	1979	04	22.10117	12	21	25.39	-15	37	08.5	809
1321	1979	04	22.11225	12	21	25.01	-15	37	06.2	809
1321	1979	04	23.09705	12	20	42.87	-15	32	30.8	809
1321	1979	04	23.10467	12	20	42.53	-15	32	28.6	809
1321	1979	04	23.11298	12	20	42.16	-15	32	26.1	809
1321	1979	04	25.12968	12	19	18.46	-15	22	57.5	809
1321	1979	04	25.13868	12	19	18.10	-15	22	55.4	809
1321	1979	04	25.14769	12	19	17.78	-15	22	53.0	809
1321	1979	04	26.09995	12	18	39.84	-15	18	25.2	809
1321	1979	04	26.10964	12	18	39.42	-15	18	22.5	809
1321	1979	04	26.11957	12	18	39.04	-15	18	20.3	809
1321	1979	04	29.26281	12	16	40.68	-15	03	40.5	809
1321	1979	04	29.27182	12	16	40.30	-15	03	38.0	809
1321	1979	04	29.28082	12	16	40.01	-15	03	35.6	809
1321	1979	04	30.19238	12	16	07.91	-14	59	22.5	809
1321	1979	04	30.20156	12	16	07.60	-14	59	20.9	809
1321	1979	04	30.21056	12	16	07.25	-14	59	18.3	809
1535	1979	12	15.31905	05	38	42.09	+23	38	32.4	809
1535	1979	12	15.32736	05	38	41.66	+23	38	34.6	809
1535	1979	12	15.33567	05	38	41.23	+23	38	34.6	809
1535	1979	12	16.25192	05	37	53.10	+23	37	08.3	809
1535	1979	12	16.25884	05	37	52.80	+23	37	08.1	809
1535	1979	12	16.26577	05	37	52.37	+23	37	06.1	809
1535	1979	12	17.09128	05	37	09.46	+23	35	46.6	809
1535	1979	12	17.09682	05	37	08.94	+23	35	46.2	809
1535	1979	12	17.10513	05	37	08.39	+23	35	44.2	809
1535	1979	12	17.17092	05	37	04.94	+23	35	38.8	809
1535	1979	12	17.17785	05	37	04.72	+23	35	38.5	809
1535	1979	12	17.18477	05	37	04.29	+23	35	39.1	809
1535	1979	12	19.22710	05	35	17.14	+23	32	16.9	809
1535	1979	12	19.23403	05	35	16.67	+23	32	15.5	809
1535	1979	12	20.22921	05	34	24.70	+23	30	35.6	809
1535	1979	12	20.23787	05	34	24.33	+23	30	34.5	809
1535	1979	12	20.24583	05	34	23.88	+23	30	34.2	809
1535	1979	12	21.18216	05	33	35.24	+23	29	00.4	809
1535	1979	12	21.19048	05	33	34.78	+23	28	59.2	809
1535	1979	12	22.12126	05	32	46.61	+23	27	23.9	809
1535	1979	12	22.12957	05	32	46.17	+23	27	22.5	809
1535	1979	12	22.13788	05	32	45.79	+23	27	23.1	809
1720	1979	12	15.31905	05	37	26.07	+22	20	12.2	809
1720	1979	12	15.32736	05	37	25.64	+22	20	11.9	809
1720	1979	12	15.33567	05	37	24.89	+22	20	12.3	809
1720	1979	12	16.25192	05	36	21.38	+22	19	58.5	809
1720	1979	12	16.25884	05	36	20.86	+22	19	59.0	809
1720	1979	12	16.26577	05	36	20.38	+22	19	58.6	809
1720	1979	12	17.09128	05	35	23.32	+22	19	45.4	809
1720	1979	12	17.09682	05	35	22.82	+22	19	46.3	809
1720	1979	12	17.10513	05	35	22.31	+22	19	45.7	809
1720	1979	12	17.17092	05	35	17.59	+22	19	44.9	809
1720	1979	12	17.17785	05	35	17.10	+22	19	44.7	809
1720	1979	12	17.18477	05	35	16.63	+22	19	44.8	809
1720	1979	12	19.22710	05	32	54.22	+22	19	10.6	809
1720	1979	12	19.23403	05	32	53.67	+22	19	10.5	809
1720	1979	12	20.22921	05	31	44.80	+22	18	52.9	809
1720	1979	12	20.23787	05	31	44.15	+22	18	52.8	809
1720	1979	12	20.24583	05	31	43.55	+22	18	52.8	809
1720	1979	12	21.18216	05	30	39.32	+22	18	35.4	809

1720	1979	12	21.19048	05	30	38.74	+22	18	35.4	809
1720	1979	12	22.12126	05	29	35.34	+22	18	17.5	809
1720	1979	12	22.12957	05	29	34.78	+22	18	17.5	809
1720	1979	12	22.13788	05	29	34.18	+22	18	16.9	809
1720	1979	12	23.19480	05	28	22.44	+22	17	56.9	809
1720	1979	12	23.20302	05	28	21.87	+22	17	56.5	809
1720	1979	12	24.17951	05	27	16.70	+22	17	37.0	809
1720	1979	12	24.18713	05	27	16.18	+22	17	37.0	809
1720	1979	12	24.19475	05	27	15.62	+22	17	36.7	809
1720	1979	12	25.12485	05	26	14.50	+22	17	18.7	809
1720	1979	12	25.13350	05	26	13.87	+22	17	18.4	809
1720	1979	12	25.14147	05	26	13.34	+22	17	18.1	809
1720	1979	12	26.11795	05	25	10.01	+22	16	58.8	809
1720	1979	12	26.12627	05	25	09.51	+22	16	58.4	809
1720	1979	12	28.11526	05	23	03.76	+22	16	20.2	809
1720	1979	12	28.12773	05	23	02.96	+22	16	19.8	809
1720	1979	12	29.13192	05	22	01.41	+22	16	00.4	809
1720	1979	12	29.14439	05	22	00.64	+22	15	59.9	809
1940	1979	12	15.31905	05	33	19.81	+23	26	03.5	809
1940	1979	12	15.32736	05	33	19.28	+23	26	01.9	809
1940	1979	12	15.33567	05	33	18.88	+23	26	00.5	809
1940	1979	12	16.25192	05	32	27.82	+23	23	27.2	809
1940	1979	12	16.25884	05	32	27.39	+23	23	26.2	809
1940	1979	12	16.26577	05	32	27.04	+23	23	24.9	809
1940	1979	12	17.09128	05	31	41.22	+23	21	06.4	809
1940	1979	12	17.09682	05	31	41.02	+23	21	05.4	809
1940	1979	12	17.10513	05	31	40.40	+23	21	03.2	809
1940	1979	12	17.17092	05	31	36.69	+23	20	52.3	809
1940	1979	12	17.17785	05	31	36.27	+23	20	51.4	809
1940	1979	12	17.18477	05	31	35.72	+23	20	50.2	809
1940	1979	12	19.22710	05	29	42.22	+23	15	02.9	809
1940	1979	12	19.23403	05	29	41.73	+23	15	02.2	809
1940	1979	12	20.22921	05	28	46.66	+23	12	10.3	809
1940	1979	12	20.23787	05	28	46.16	+23	12	09.0	809
1940	1979	12	20.24583	05	28	45.70	+23	12	07.3	809
1940	1979	12	21.18217	05	27	54.27	+23	09	26.2	809
1940	1979	12	21.19048	05	27	53.79	+23	09	24.5	809
1940	1979	12	22.12125	05	27	03.01	+23	06	43.2	809
1940	1979	12	22.12957	05	27	02.50	+23	06	41.7	809
1940	1979	12	22.13788	05	27	02.08	+23	06	40.5	809
1940	1979	12	23.19480	05	26	04.59	+23	03	36.2	809
1940	1979	12	23.20302	05	26	04.11	+23	03	34.9	809
1940	1979	12	24.17951	05	25	11.66	+23	00	44.9	809
1940	1979	12	24.18713	05	25	11.27	+23	00	43.5	809
1940	1979	12	24.19475	05	25	10.81	+23	00	42.0	809
1940	1979	12	25.12485	05	24	21.35	+22	57	59.4	809
1940	1979	12	25.13350	05	24	20.87	+22	57	57.7	809
1940	1979	12	25.14147	05	24	20.48	+22	57	56.6	809
1940	1979	12	26.11795	05	23	29.08	+22	55	05.9	809
1940	1979	12	26.12627	05	23	28.63	+22	55	05.0	809
1940	1979	12	28.12773	05	21	45.30	+22	49	15.2	809
1940	1979	12	29.13192	05	20	54.56	+22	46	20.5	809
1940	1979	12	29.14439	05	20	53.93	+22	46	18.1	809
1986	1979	12	15.26260	05	28	48.64	+20	11	50.8	809
1986	1979	12	15.27022	05	28	48.26	+20	11	50.0	809
1986	1979	12	15.27784	05	28	47.89	+20	11	49.2	809
1986	1979	12	16.14665	05	28	00.00	+20	11	35.3	809
1986	1979	12	16.15357	05	27	59.64	+20	11	35.7	809
1986	1979	12	16.16050	05	27	59.19	+20	11	35.3	809

1986			1979	12	17.14530	05	27	04.82	+20	11	18.7	809
1986			1979	12	17.15241	05	27	04.48	+20	11	18.7	809
1986			1979	12	17.15915	05	27	03.98	+20	11	18.5	809
1986			1979	12	19.20286	05	25	11.75	+20	10	45.8	809
1986			1979	12	19.20979	05	25	11.29	+20	10	45.6	809
1986			1979	12	19.21671	05	25	10.93	+20	10	45.0	809
1986			1979	12	20.14264	05	24	20.68	+20	10	32.3	809
1986			1979	12	20.15095	05	24	20.25	+20	10	32.5	809
1986			1979	12	20.15926	05	24	19.78	+20	10	32.0	809
1986			1979	12	21.16554	05	23	25.39	+20	10	18.2	809
1986			1979	12	21.17385	05	23	24.88	+20	10	18.2	809
1986			1979	12	22.08739	05	22	36.15	+20	10	06.8	809
1986			1979	12	22.09575	05	22	35.72	+20	10	06.6	809
1986			1979	12	22.10394	05	22	35.24	+20	10	05.8	809
1986			1979	12	23.16978	05	21	38.76	+20	09	53.2	809
1986			1979	12	23.17809	05	21	38.32	+20	09	53.8	809
1986			1979	12	23.18640	05	21	37.84	+20	09	53.3	809
1986			1979	12	24.15250	05	20	47.28	+20	09	44.0	809
1986			1979	12	24.16020	05	20	46.92	+20	09	43.9	809
1986			1979	12	24.16774	05	20	46.51	+20	09	43.9	809
1986			1979	12	25.10684	05	19	58.09	+20	09	34.6	809
1986			1979	12	25.11515	05	19	57.62	+20	09	34.8	809
1986			1979	12	26.09648	05	19	07.65	+20	09	26.3	809
1986			1979	12	26.10514	05	19	07.25	+20	09	26.7	809
1986			1979	12	28.09103	05	17	28.45	+20	09	14.7	809
1986			1979	12	28.10356	05	17	27.80	+20	09	15.0	809
1979	XK	*	1979	12	15.31905	05	37	57.47	+22	50	23.6	17.0 809
1979	XK		1979	12	15.32736	05	37	57.08	+22	50	22.6	809
1979	XK		1979	12	15.33567	05	37	56.44	+22	50	23.2	809
1979	XK		1979	12	16.25192	05	36	56.46	+22	50	19.3	809
1979	XK		1979	12	16.25884	05	36	56.03	+22	50	19.2	809
1979	XK		1979	12	16.26577	05	36	55.49	+22	50	19.6	809
1979	XK		1979	12	17.09128	05	36	01.57	+22	50	13.6	809
1979	XK		1979	12	17.09682	05	36	01.11	+22	50	13.8	809
1979	XK		1979	12	17.10513	05	36	00.52	+22	50	14.3	809
1979	XK		1979	12	17.17092	05	35	56.00	+22	50	13.8	809
1979	XK		1979	12	17.17785	05	35	55.66	+22	50	13.1	809
1979	XK		1979	12	17.18477	05	35	54.86	+22	50	11.5	809
1979	XK		1979	12	19.22710	05	33	39.35	+22	49	58.0	809
1979	XK		1979	12	19.23403	05	33	38.69	+22	49	57.5	809
1979	XK		1979	12	20.22921	05	32	32.50	+22	49	47.9	809
1979	XK		1979	12	20.23787	05	32	31.88	+22	49	48.2	809
1979	XK		1979	12	20.24583	05	32	31.31	+22	49	48.0	809
1979	XK		1979	12	21.18216	05	31	29.20	+22	49	38.3	809
1979	XK		1979	12	21.19048	05	31	28.78	+22	49	37.6	809
1979	XK		1979	12	22.12126	05	30	27.24	+22	49	27.0	809
1979	XK		1979	12	22.12957	05	30	26.68	+22	49	27.0	809
1979	XK		1979	12	22.13788	05	30	26.11	+22	49	26.8	809
1979	XK		1979	12	23.19480	05	29	16.25	+22	49	12.9	809
1979	XK		1979	12	23.20302	05	29	15.66	+22	49	12.9	809
1979	XK		1979	12	24.17951	05	28	11.83	+22	48	59.4	809
1979	XK		1979	12	24.18713	05	28	11.25	+22	48	59.5	809
1979	XK		1979	12	24.19475	05	28	10.79	+22	48	59.1	809
1979	XK		1979	12	25.12485	05	27	10.67	+22	48	45.8	809
1979	XK		1979	12	25.13350	05	27	10.06	+22	48	46.1	809
1979	XK		1979	12	25.14147	05	27	09.52	+22	48	45.4	809
1979	XK		1979	12	26.11795	05	26	06.98	+22	48	31.2	809
1979	XK		1979	12	26.12626	05	26	06.44	+22	48	30.6	809
1979	XK		1979	12	28.11527	05	24	01.12	+22	47	58.7	809

1979	XK		1979	12	28.12773	05	24	00.35	+22	47	58.3		809
1979	XK		1979	12	29.13192	05	22	58.66	+22	47	42.0		809
1979	XK		1979	12	29.14439	05	22	57.92	+22	47	42.0		809
1979	XL	*	1979	12	15.26260	05	27	56.92	+19	33	32.4	17.0	809
1979	XL		1979	12	15.27022	05	27	56.48	+19	33	34.2		809
1979	XL		1979	12	15.27784	05	27	55.96	+19	33	36.4		809
1979	XL		1979	12	16.14665	05	27	03.42	+19	36	45.8		809
1979	XL		1979	12	16.15357	05	27	02.98	+19	36	47.3		809
1979	XL		1979	12	16.16050	05	27	02.58	+19	36	48.5		809
1979	XL		1979	12	17.14530	05	26	02.55	+19	40	22.8		809
1979	XL		1979	12	17.15241	05	26	02.12	+19	40	24.4		809
1979	XL		1979	12	17.15915	05	26	01.69	+19	40	25.8		809
1979	XL		1979	12	19.20286	05	23	57.46	+19	47	53.3		809
1979	XL		1979	12	19.20979	05	23	57.02	+19	47	54.8		809
1979	XL		1979	12	19.21671	05	23	56.61	+19	47	56.5		809
1979	XL		1979	12	20.14264	05	23	00.60	+19	51	20.8		809
1979	XL		1979	12	20.15095	05	23	00.17	+19	51	22.9		809
1979	XL		1979	12	20.15926	05	22	59.74	+19	51	24.2		809
1979	XL		1979	12	21.16554	05	21	58.80	+19	55	04.9		809
1979	XL		1979	12	21.17385	05	21	58.57	+19	55	08.8		809
1979	XL		1979	12	22.08739	05	21	04.18	+19	58	32.1		809
1979	XL		1979	12	22.09575	05	21	03.65	+19	58	33.9		809
1979	XL		1979	12	22.10394	05	21	03.18	+19	58	34.9		809
1979	XL		1979	12	23.16978	05	19	59.81	+20	02	33.5		809
1979	XL		1979	12	23.17809	05	19	59.34	+20	02	35.4		809
1979	XL		1979	12	23.18640	05	19	58.82	+20	02	36.6		809
1979	XL		1979	12	24.15250	05	19	02.30	+20	06	13.5		809
1979	XL		1979	12	24.16020	05	19	01.75	+20	06	15.1		809
1979	XL		1979	12	24.16774	05	19	01.24	+20	06	17.5		809
1979	XL		1979	12	25.10684	05	18	06.91	+20	09	47.9		809
1979	XL		1979	12	25.11515	05	18	06.35	+20	09	49.6		809
1979	XL		1979	12	26.09648	05	17	10.14	+20	13	30.5		809
1979	XL		1979	12	26.10514	05	17	09.50	+20	13	33.0		809
1979	XL		1979	12	28.09103	05	15	18.10	+20	21	02.0		809
1979	XL		1979	12	28.10356	05	15	17.43	+20	21	04.9		809
1979	YP	*	1979	12	16.25192	05	36	19.75	+22	17	04.7	17.0	809
1979	YP		1979	12	16.25884	05	36	19.19	+22	17	04.9		809
1979	YP		1979	12	16.26577	05	36	18.81	+22	17	04.8		809
1979	YP		1979	12	17.09128	05	35	25.08	+22	16	21.6		809
1979	YP		1979	12	17.09682	05	35	24.63	+22	16	21.4		809
1979	YP		1979	12	17.10513	05	35	24.02	+22	16	21.3		809
1979	YP		1979	12	17.17092	05	35	19.55	+22	16	18.0		809
1979	YP		1979	12	17.17785	05	35	19.10	+22	16	17.3		809
1979	YP		1979	12	17.18477	05	35	18.59	+22	16	17.6		809
1979	YP		1979	12	19.22710	05	33	04.93	+22	14	29.2		809
1979	YP		1979	12	19.23403	05	33	04.31	+22	14	28.4		809
1979	YP		1979	12	20.22921	05	32	00.01	+22	13	35.3		809
1979	YP		1979	12	20.23787	05	31	59.42	+22	13	34.9		809
1979	YP		1979	12	20.24583	05	31	58.86	+22	13	34.7		809
1979	YP		1979	12	21.18216	05	30	58.99	+22	12	44.6		809
1979	YP		1979	12	21.19048	05	30	58.42	+22	12	44.0		809
1979	YP		1979	12	22.12126	05	29	59.62	+22	11	54.7		809
1979	YP		1979	12	22.12957	05	29	59.00	+22	11	54.4		809
1979	YP		1979	12	22.13788	05	29	58.59	+22	11	53.2		809
1979	YP		1979	12	23.19480	05	28	52.22	+22	10	56.9		809
1979	YP		1979	12	23.20302	05	28	51.68	+22	10	56.9		809
1979	YP		1979	12	24.17951	05	27	51.62	+22	10	04.8		809
1979	YP		1979	12	24.18713	05	27	51.06	+22	10	04.6		809
1979	YP		1979	12	24.19475	05	27	50.57	+22	10	04.3		809

1979 YP		1979 12 25.12485	05	26	54.50	+22	09	16.2			809
1979 YP		1979 12 25.13350	05	26	53.90	+22	09	15.6			809
1979 YP		1979 12 25.14147	05	26	53.41	+22	09	14.4			809
1979 YP		1979 12 26.11795	05	25	55.52	+22	08	24.6			809
1979 YP		1979 12 26.12627	05	25	54.99	+22	08	24.6			809
1979 YP		1979 12 28.11526	05	24	00.60	+22	06	42.5			809
1979 YP		1979 12 28.12773	05	23	59.93	+22	06	42.7			809
1979 YP		1979 12 29.13192	05	23	04.30	+22	05	53.3			809
1979 YP		1979 12 29.14439	05	23	03.66	+22	05	53.2			809
1979 YQ	*	1979 12 17.20832	05	47	49.02	+23	58	34.0		16.0	809
1979 YQ		1979 12 17.21663	05	47	48.41	+23	58	36.3			809
1979 YQ		1979 12 17.22494	05	47	47.93	+23	58	39.6			809
1979 YQ		1979 12 19.24303	05	45	34.39	+24	10	38.2			809
1979 YQ		1979 12 19.24995	05	45	33.89	+24	10	40.7			809
1979 YQ		1979 12 19.25688	05	45	33.39	+24	10	43.0			809
1979 YQ		1979 12 20.17104	05	44	33.34	+24	16	04.0			809
1979 YQ		1979 12 20.17935	05	44	32.74	+24	16	07.0			809
1979 YQ		1979 12 20.18766	05	44	32.18	+24	16	09.8			809
1979 YQ		1979 12 21.22545	05	43	23.70	+24	22	09.9			809
1979 YQ		1979 12 21.23341	05	43	23.20	+24	22	11.9			809
1979 YQ		1979 12 21.24172	05	43	22.61	+24	22	15.1			809
1979 YQ		1979 12 22.15034	05	42	23.44	+24	27	26.5			809
1979 YQ		1979 12 22.15865	05	42	22.91	+24	27	29.2			809
1979 YQ		1979 12 22.16627	05	42	22.37	+24	27	32.0			809
1979 YQ		1979 12 23.21064	05	41	14.31	+24	33	25.6			809
1979 YQ		1979 12 23.21757	05	41	13.83	+24	33	27.7			809
1979 YQ		1979 12 23.22449	05	41	13.37	+24	33	29.7			809
1979 YQ		1979 12 24.20444	05	40	10.27	+24	38	56.4			809
1979 YQ		1979 12 24.21208	05	40	09.78	+24	38	59.1			809
1979 YQ		1979 12 24.21898	05	40	09.32	+24	39	01.2			809
1979 YQ		1979 12 25.15393	05	39	09.85	+24	44	10.0			809
1979 YQ		1979 12 25.16227	05	39	09.33	+24	44	12.3			809
1979 YQ		1979 12 25.17055	05	39	08.78	+24	44	15.0			809
1979 YQ		1979 12 26.14496	05	38	07.42	+24	49	31.9			809
1979 YQ		1979 12 26.15331	05	38	06.87	+24	49	34.5			809
1979 YQ		1979 12 28.13950	05	36	04.48	+25	00	05.2			809
1979 YQ		1979 12 28.14920	05	36	03.83	+25	00	08.7			809
1979 YQ		1979 12 29.16585	05	35	02.77	+25	05	24.0			809
1979 YQ		1979 12 29.18594	05	35	01.53	+25	05	30.2			809
1979 YQ		1979 12 30.17369	05	34	03.59	+25	10	31.2			809
1979 YQ		1979 12 30.19014	05	34	02.25	+25	10	36.5			809

OBSERVATIONS MADE AT OXFORD UNIVERSITY OBSERVATORY BY G. WADDINGTON.

Object	Date	UT	R. A. (1950)			Decl.			Obs.
/1979l	1980 02	10.8007	03	28	43.89	+12	10	08.8	996
/1979l	1980 02	10.8736	03	28	48.25	+12	14	40.9	996
3	1980 02	10.8559	07	02	46.10	+06	21	33.2	996
3	1980 02	10.8589	07	02	46.04	+06	21	35.9	996
3	1980 02	10.8604	07	02	46.02	+06	21	36.4	996
3	1980 02	11.8948	07	02	29.25	+06	32	11.9	996
3	1980 02	11.8962	07	02	29.21	+06	32	13.0	996
3	1980 02	15.9104	07	01	41.89	+07	14	05.5	996
3	1980 02	15.9128	07	01	41.85	+07	14	07.6	996
3	1980 02	16.8396	07	01	35.44	+07	23	41.1	996
3	1980 02	16.8403	07	01	35.36	+07	23	41.0	996
3	1980 02	22.8738	07	01	35.91	+08	21	55.3	996
3	1980 02	22.8745	07	01	35.92	+08	21	55.8	996
3	1980 03	04.8068	07	04	24.17	+10	01	24.6	996
3	1980 03	04.8090	07	04	24.21	+10	01	25.1	996

3	1980 03 04.8120	07 04 24.27	+10 01 27.5	996
9	1980 02 17.8477	08 58 19.42	+26 40 25.2	996
9	1980 02 22.8941	08 53 58.05	+26 52 25.5	996
9	1980 03 04.8380	08 46 59.48	+26 59 48.3	996
9	1980 03 04.8411	08 46 59.32	+26 59 47.8	996
29	1980 02 22.9019	08 50 43.91	+23 55 24.8	996
29	1980 02 22.9030	08 50 43.92	+23 55 23.4	996
150	1980 01 20.9177	07 40 28.56	+18 13 15.5	996
150	1980 01 20.9201	07 40 28.45	+18 13 15.1	996
150	1980 01 20.9250	07 40 28.19	+18 13 15.5	996
150	1980 01 20.9267	07 40 28.10	+18 13 16.4	996
150	1980 01 20.9278	07 40 27.97	+18 13 15.9	996
150	1980 01 20.9285	07 40 28.00	+18 13 16.4	996
385	1980 01 20.8583	07 40 52.55	+38 28 53.8	996
385	1980 01 20.8590	07 40 52.47	+38 28 53.7	996
385	1980 01 20.8618	07 40 52.30	+38 28 53.6	996
385	1980 01 20.8649	07 40 52.04	+38 28 53.2	996
385	1980 01 20.8667	07 40 51.91	+38 28 53.2	996
385	1980 01 20.8681	07 40 51.88	+38 28 53.2	996

* * * * *

OBSERVATIONS USED IN ORBIT IMPROVEMENTS.

The following observations have been used in orbit improvements and are now included in the cumulative observation index on magnetic tape. This is a continuation from MPC 4712-4714.

Object	Date UT	R. A. (1950)	Decl.	Obs.
603	1906 02 17.04022	10 05 21.18	+16 20 07.3	803
603	1906 02 18.04462	10 04 17.13	+16 20 18.0	803
603	1906 02 24.12292	09 57 52.62	+16 19 33.6	803
603	1906 03 18.02951	09 40 14.41	+15 40 16.3	803
612	1906 10 12.00829	23 33 41.63	+09 55 25.3	045
612	1906 10 12.94050	23 33 23.94	+09 41 44.3	045
612	1906 10 17.85630	23 32 10.35	+08 30 57.0	045
612	1906 10 23.75942	23 31 24.94	+07 11 11.8	045
612	1906 11 11.81899	23 34 36.44	+03 46 43.2	045
646	1907 09 19.06656	23 55 20.37	+13 04 08.6	045
646	1907 09 30.84484	23 44 36.36	+12 31 56.6	045
646	1907 10 05.85690	23 40 34.55	+12 10 49.8	045
646	1907 10 08.97292	23 38 21.03	+11 56 24.7	045
646	1907 10 12.91309	23 35 56.99	+11 37 33.7	045
646	1907 10 23.72846	23 32 00.42	+10 47 15.6	045
646	1907 10 29.76411	23 31 36.65	+10 23 28.1	045
646	1907 11 04.92382	23 32 32.73	+10 04 11.1	045
646	1914 08 21.93057	22 26 32.83	-01 41 23.5	045
646	1914 08 23.96609	22 24 39.08	-01 37 53.2	045
646	1914 08 24.92034	22 23 45.19	-01 36 29.0	045
646	1914 08 29.88721	22 19 02.09	-01 31 22.6	045
646	1932 11 30.86	02 18.3	+26 06	012
646	1937 01 11.95597	07 21 53.30	+24 45 24.3	029
646	1937 01 12.00514	07 21 49.52	+24 45 24.7	029
646	1937 01 13.21185	07 20 22.28	+24 44 56.1	754
1009	1923 11 09.82167	01 21 57.27	+17 46 03.7	029
1009	1923 11 09.84103	01 21 57.87	+17 45 26.7	029
1009	1923 11 09.87690	01 21 58.96	+17 44 21.8	029
1009	1923 11 10.81976	01 22 42.38	+17 13 38.6	024
1009	1923 11 10.94057	01 22 47.14	+17 09 42.9	024

1009		1923	11	11.17853	01	22	58.28	+17	02	07.2	754
1009		1923	11	12.16669	01	23	45.73	+16	30	09.7	754
1009		1923	11	12.93557	01	24	23.56	+16	05	25.7	024
1009		1923	11	17.02554	01	28	06.20	+13	56	49.0	045
1009		1923	11	18.07096	01	29	08.71	+13	24	56.3	024
1009		1923	11	22.32399	01	33	45.90	+11	20	51.7	754
1009		1923	11	25.04654	01	37	02.27	+10	06	09.9	754
1009		1923	11	29.26542	01	42	31.05	+08	19	57.1	754
1009		1923	12	01.84443	01	46	08.39	+07	20	51.2	024
1009		1923	12	02.84716	01	47	35.75	+06	59	09.7	027
1009		1923	12	03.83837	01	49	03.39	+06	38	41.8	045
1009		1923	12	04.86070	01	50	35.27	+06	17	51.2	027
1009		1923	12	04.91505	01	50	40.18	+06	16	43.0	008
1009		1923	12	04.91538	01	50	40.10	+06	16	41.1	045
1009		1923	12	07.22350	01	54	26.02	+05	32	50.7	754
1009		1923	12	11.16731	02	00	38.13	+04	26	22.8	754
1009		1923	12	14.06953	02	05	34.74	+03	44	58.7	754
1009		1924	01	02.06127	02	41	27.06	+01	18	07.6	754
1009		1924	01	06.07205	02	49	37.25	+01	10	11.2	754
1009		1924	01	08.03377	02	53	40.97	+01	08	39.3	754
1009		1924	01	27.12461	03	34	41.89	+01	52	01.2	754
1009		1924	01	27.14127	03	34	44.26	+01	52	05.2	754
1009		1924	02	25.12211	04	40	02.75	+04	32	00.8	754
1009		1924	02	25.14572	04	40	06.24	+04	32	08.2	754
1009		1924	02	26.06962	04	42	12.79	+04	37	31.0	754
1009		1924	02	26.09392	04	42	16.37	+04	37	39.8	754
1037		1924	10	29.98617	03	08	49.03	+12	58	27.1	008
1037		1924	11	01.04994	03	07	01.32	+12	39	48.3	008
1037		1924	11	02.93918	03	05	20.71	+12	22	48.3	008
1037		1924	11	07.01684	03	01	39.74	+11	46	42.9	008
1037		1924	11	14.88174	02	54	38.26	+10	42	12.5	008
1105		1931	05	15.826	14	36.0		+00	56		094
1105		1932	08	05.939	21	01.2		-21	36		094
1105		1937	07	14.86910	19	17.1		-19	46		078
1229		1936	06	22.89319	19	31.3		-20	26		078
1324		1934	06	04.92713	17	43	18.03	-30	26	43.7	078
1324		1934	06	15.94626	17	32	14.44	-29	52	06.9	078
1324		1934	07	03.89123	17	15	49.05	-28	21	51.3	078
1324		1934	07	09.85788	17	12	16.84	-27	47	47.1	078
1324		1934	07	16.90525	17	09	53.02	-27	08	35.5	078
2062		1976	01	14.14931	06	12	01.20	+30	58	13.2	673
2062		1976	01	14.27084	06	11	05.84	+31	15	06.1	673
2083		1975	09	02.16840	19	18	41.91	+04	28	36.0	675
2139		1924	09	05.99979	23	50	33.75	+03	35	15.4	094
2139		1924	09	06.99347	23	49	47.54	+03	31	36.7	094
2139		1924	09	23.82021	23	35	58.71	+01	57	18.2	094
2139		1924	09	24.24741	23	35	40.34	+01	54	51.5	754
2139		1924	10	01.15140	23	30	27.51	+01	10	19.7	754
2139		1924	10	06.21620	23	27	20.10	+00	46	29.2	754
2139		1928	10	13.87986	01	24.8		+12	28		022
2139		1928	10	14.90693	01	23.9		+12	22		022
2149		1937	07	14.91377	21	13.9		-28	22		078
2149		1937	07	29.86762	21	01.4		-30	01		078
2149		1937	08	10.86117	20	49.9		-30	57		078
2156		1917	09	23.86786	00	57	47.85	+03	49	29.6	094
2156		1917	10	11.76928	00	40	31.74	+03	48	05.6	094
2156		1917	10	15.82668	00	36	42.46	+03	48	56.4	094
2156		1937	08	10.90705	22	35.5		-18	14		078
2156		1937	08	27.94253	22	19.4		-19	36		078

2159		1933 10 23.93	01 07.2	+10 14			012
2166		1936 08 13.99028	22 26 51.57	-06 29 39.3			094
2166		1936 08 16.99028	22 24 49.09	-06 55 27.9			094
2166		1936 08 22.95347	22 20 29.28	-07 49 34.9			094
2166		1936 09 19.86056	22 04 00.05	-11 40 11.4			094
2193		1926 05 18.84870	16 23 11.0	-29 52.8			078
2193		1926 05 19.92145	16 22 12.5	-29 54.8			078
2193		1926 05 20.99213	16 21 12.0	-29 57.2			078
2193		1926 06 02.79171	16 08 57.1	-30 13.1			078
2193		1926 06 03.82499	16 07 59.0	-30 14.3			078
2193		1926 06 08.79957	16 03 23.6	-30 14.8			078
2195		1934 08 07.89990	20 51.2	-22 13			078
2196		1906 11 15.18333	04 18 13	+15 01.2			803
2196		1906 11 20.16283	04 14 37	+14 39.7			803
2196		1906 11 24.07013	04 11 42	+14 21.5			803
2196		1906 11 26.24654	04 10 03.39	+14 12 57.2			786
2203		1935 09 28.90677	00 45 17.07	+02 52 29.6			078
2203		1935 10 01.96749	00 42 58.17	+02 39 30.7			078
2203		1935 10 15.81915	00 32 38.19	+01 43 41.8			078
2203		1935 10 18.89684	00 30 32.13	+01 32 58.4			078
2203		1935 10 27.83002	00 25 16.24	+01 07 43.7			078
2203		1935 10 30.75413	00 23 53.00	+01 01 45.4			078
2222		1933 10 20.07949	03 12 01.32	+14 27 35.4			012
2222		1933 11 17.03293	02 50 08.82	+13 09 26.4			012
A915	TA	1915 10 14.98851	00 14 49.56	+02 50 08.2			045
A915	TA	1915 10 15.92469	00 14 15.95	+02 42 26.8			029
1929	PC	1929 08 06.94569	21 16 27.61	-12 23 43.7			078
1929	PC	1929 08 06.96785	21 16 26.75	-12 23 54.1			078
1929	PC	1929 08 09.45907	21 14 32.47	-12 45 22.9			662
1929	PC	1929 08 27.28686	21 01 42.06	-15 18 25.6			662
1933	QA	1933 08 18.98214	22 16 38.76	-06 10 00.9			012
1933	QA	1933 08 19.96909	22 15.7	-06 16			094
1933	QA	1933 08 20.98014	22 14 51.00	-06 21 35.0			012
1933	QA	1933 08 21.97568	22 13 56.83	-06 27 22.0			012
1933	QA	1933 08 25.88581	22 10 25.63	-06 50 49.0			012
1933	QA	1933 08 26.90974	22 09 29.83	-06 57 09.4			012
1933	QA	1933 08 28.91467	22 07 43.40	-07 09 20.6			012
1933	QA	1933 09 15.84301	21 54 32.27	-08 47 23.2			012
1933	QA	1933 09 17.85590	21 53 29.78	-09 00 25.0			012
1934	TE	1934 10 04.97465	01 16.8	+11 08			094
1934	TE	1934 10 07.94089	01 13.3	+11 08			094
1936	SF	1936 09 17.86410	23 34.1	-10 04			078
1936	SF	1936 09 17.91050	23 34.1	-10 05			078
1936	SF	1936 09 26.03132	23 28.5	-11 29			078
1936	SF	1936 10 04.81976	23 23.4	-12 47			078
1936	SF	1936 10 10.86709	23 20.1	-13 32			078
1936	SF	1936 10 16.86040	23 17.8	-14 07			078

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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, F = E. Fogelin, M = B. G. Marsden. For further information see MPC 4499.

Planet	B(1,0)	Epoch	M	Peri.	Node	Incl.	e	a	Arc	O	N	C
A917 SD	15.0	171019	30.76	312.38	11.20	4.91	0.2078	2.3210	27	7		B
A919 SD	14.0	190919	29.69	351.42	317.72	4.75	0.2289	2.3597	12	4		B

1928	SL	11.5	281005	352.01	136.37	256.04	1.31	0.2516	3.9792	23	3	1	B
1928	TK	14.5	281021	20.86	144.92	205.25	1.18	0.2576	2.3563	32	4	1	B
1928	UF	14.0	281130	1.12	320.68	87.23	2.77	0.2163	3.2394	46	8	2	B
1930	HB	13.5	300504	329.16	208.53	54.00	10.78	0.2072	2.5060	38	4		B
1930	VD	14.0	301210	10.17	133.42	272.80	6.74	0.3099	2.7920	25	4	2	B
1931	TK	14.0	311026	346.24	16.30	30.75	16.14	0.1908	2.7033	8	6		B
1932	CB1	13.5	320223	350.36	23.76	149.69	10.56	0.1462	2.7608	42	4		B
1932	EO	12.0	320314	95.83	61.93	357.49	9.68	0.0667	3.0685	13	3		B
1932	HD	13.0	320423	7.92	309.56	251.68	0.31	0.1868	2.9484	11	3		B
1932	PB	15.0	320801	356.29	173.19	143.93	3.87	0.2783	2.2856	8	6		B
1933	FM	14.0	330329	78.29	92.87	351.99	7.49	0.1292	2.3693	6	3		B
1933	FO	13.5	330329	351.63	1.08	189.99	6.22	0.1768	2.9705	6	3		B
1934	AK		340103	15.17	39.57	35.64	15.72	0.1528	2.5869	5	3		B
1934	RB		340831	24.80	141.80	163.76	5.57	0.1578	2.1842	12	3		B
1934	RE1		340831	337.72	292.59	75.53	8.29	0.2973	3.0322	3	3		B
1934	SE		340920	246.46	255.57	243.52	16.43	0.2110	3.1894	4	3		B
1935	UZ		351025	341.82	286.09	131.90	4.52	0.2564	2.1031	4	3		B
1936	UG	14.5	361108	347.60	324.89	104.49	6.12	0.3178	2.6100	21	7	1	B
1937	QC	14.5	370815	288.63	104.51	306.46	5.17	0.0463	2.2651	10	6		B
1945	TE		450922	17.25	52.83	305.66	3.56	0.1281	2.2756	8	4		B
1976	SF	13.5	760919	331.89	245.70	147.29	1.55	0.1031	3.1532	10	9		M
1976	SG		760919	341.40	10.28	23.47	1.17	0.3016	2.9863	10	7		M
1976	SJ	15.0	760919	348.62	203.39	172.30	2.53	0.2080	2.4479	10	8		M
1976	SK		760919	335.03	37.01	2.62	1.11	0.2621	2.2401	10	7		M
1976	SL		760919	312.97	194.92	216.22	1.29	0.0546	2.8466	10	5	3	M
1976	SZ9	15.5	760919	339.65	23.61	18.35	1.87	0.3569	2.8057	5	6		M
1977	RD	15.0	770825	22.95	300.42	343.13	32.96	0.2845	2.7669	18	6		M
1979	XK	15.5	791213	324.40	34.27	103.38	0.78	0.2272	2.4070	14	0		F
1979	XL	14.5	791213	344.18	6.15	95.04	10.09	0.1060	2.7874	13	0		F
1979	YP	15.5	791213	27.68	193.53	207.44	0.63	0.2056	2.3402	13	0		F
1979	YQ	14.5	791213	28.29	314.16	84.02	9.31	0.2459	2.6146	13	0		F
1980	CF	12.5	800302	340.33	36.26	146.14	4.63	0.0886	3.1257	63	0		M
1980	CK	13.0	800302	350.64	317.09	215.44	9.30	0.2990	3.0513	36	6		M
1980	CR	13.0	800302	292.69	99.05	143.70	9.66	0.2010	2.6891	8	0		M
1980	DA	14.0	800322	79.03	158.59	270.71	3.83	0.1025	2.3895	62	6		M
1980	DF	14.0	800302	304.55	302.84	293.41	15.47	0.2626	2.9754	4	7	3	M
1980	DG	14.0	800302	253.64	358.04	274.46	11.88	0.1397	2.6441	3	7		M
1980	DH	12.5	800302	154.80	145.42	199.76	13.72	0.2575	3.0098	3	7	3	M
1980	DJ	13.0	800302	120.68	266.02	93.95	2.69	0.1877	2.6373	7	0		M
1980	DK	14.5	800302	225.03	312.47	324.22	7.95	0.0153	2.2792	7	0		M
1980	DL	15.5	800302	4.66	163.51	332.08	3.82	0.2795	2.6287	6	8		M
1980	DM	13.0	800302	346.02	50.53	105.31	1.80	0.1146	3.2168	2	6	3	M
1980	DN	13.0	800302	97.87	264.67	129.76	9.17	0.0470	3.0350	7	0		M
1980	DO	14.0	800302	78.83	283.79	124.98	6.19	0.1034	2.6141	6	8		M
1980	DP	15.0	800302	331.46	49.59	141.53	7.31	0.2770	2.9525	2	6		M
1980	DQ	12.0	800302	151.87	21.92	319.18	24.38	0.0756	3.0378	2	6		M
1980	DS	15.5	800302	51.49	309.32	143.64	4.19	0.0896	2.2612	3	6		M
1980	DU	15.0	800302	21.14	328.99	153.62	5.15	0.1868	2.9494	8	0	3	M
1980	DV	14.0	800302	300.63	85.76	151.88	13.17	0.2255	3.0414	8	0		M
1980	DW	13.0	800302	273.60	271.27	346.16	5.60	0.1656	3.1894	7	0	3	M
1980	DX	17.0	800302	0.86	355.15	159.89	2.85	0.1941	2.1584	3	8		M
1980	DY	13.5	800302	107.30	276.52	113.30	2.46	0.1550	3.1072	8	6	3	M
1980	DZ	12.0	800302	65.72	48.59	33.44	9.78	0.1945	3.1719	3	8	3	M
1980	DA1	11.5	800302	13.28	116.02	37.56	9.93	0.1232	3.9238	3	8	3	M
1980	DB1	12.0	800302	201.82	292.56	42.67	8.51	0.1577	2.9585	3	8	3	M
1980	DC1	14.0	800302	18.26	327.65	159.93	3.99	0.1905	3.1306	2	6	3	M
1980	DD1	14.0	800302	27.47	84.68	38.94	7.40	0.2400	2.8386	2	6	3	M
1980	DE1	13.5	800302	357.37	137.55	34.67	8.31	0.1521	2.9034	2	6	3	M

1980 EC	13.5	800322	322.50	52.33	158.30	14.04	0.1106	2.6437	32 8	E
1980 EE	15.0	800322	313.09	97.99	129.41	4.62	0.1877	2.6148	7 6 3	M
1980 EG	13.8	800322	78.64	19.71	93.16	14.75	0.1281	2.5796	36 5	E
1980 GA	14.0	800411	18.57	127.01	50.32	22.09	0.2050	2.2154	5 7	M
1980 GB	15.4	800411	8.89	94.90	103.28	8.15	0.1130	2.2506	5 3	E
1980 GC	10.8	800411	42.00	357.74	170.52	21.97	0.0814	5.1709	5 4 4	E
1980 GD	13.5	800411	142.51	336.09	77.88	16.19	0.2159	2.5614	4 3 4	M

Note 1: the identifications 1928 SL = 1955 EL (MPC 2807), 1928 TK = 1935 PC (MPC 2807), 1928 TK = 1939 TB (JC 115) and 1936 UG = 1955 MO (MPC 1531) do not seem to be valid. 2: double designations 1928 UF = 1928 WC (AN 238, 158), 1930 XO = 1930 XQ (AN 251, 129), 1930 VD = 1930 XO (E, B); 1928 UF was originally numbered (1125) - see MPC 4307. 3: e assumed. 4: e and a assumed.

* * * * *

ORBITAL ELEMENTS BY P. HERGET, CINCINNATI UNIVERSITY.

(1009) Sirene
Epoch 1923 Dec. 7.0 ET = JDE 2423760.5

M	1.62643		(1950.0)	P	Q
n	0.23133018	Peri.	183.39170	+0.59850812	-0.77367815
a	2.62813606	Node	229.96677	+0.74121699	+0.63323814
e	0.45388285	Incl.	15.75281	+0.30394965	-0.02077387
P	4.26	B(1,0)	16.9		

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

231031	024	1.4-	0.3-	231122	754	(5.9+ 16.9+)	240102	754	0.4+	0.7-
231105	024	2.8+	1.6+	231125	754	1.2- 1.1+	240106	754	2.1-	1.0-
231109	029	1.2-	1.5-	231129	754	0.4+ 1.2+	240107	024	(7.2-)	0.8+
231109	029	3.4-	0.9-	231201	024	0.4+ 1.4-	240108	754	0.0	1.4+
231109	029	(8.0-	4.1+)	231202	027	3.2+ 1.7-	240126	024	0.2-	0.4+
231110	024	1.5+	1.0-	231203	045	2.1+(16.3+)	240127	754	5.0-	0.6-
231110	024	1.4-	1.9-	231204	027	1.5- (5.5+)	240127	754	1.8-	1.0-
231111	754	2.5-	3.1+	231204	008	1.1+ 0.1+	240225	754	1.5-	0.5-
231112	754	1.0+	0.8+	231204	045	1.1+ 1.2+	240225	754	2.9+	1.3-
231112	024	0.3+	0.8+	231207	754	(0.05+) 0.2+	240226	754	0.4-	0.4+
231117	045	0.6+	1.6-	231211	754	0.6-(19.2-)	240226	754	4.0+	0.9+
231118	024	0.8+	0.6-	231214	754	1.6+ 1.6+				

(1324) Knysna
Epoch 1980 Dec. 27.0 ET = JDE 2444600.5

M	139.33421		(1950.0)	P	Q
n	0.30519344	Peri.	329.48795	+0.06315632	+0.99587001
a	2.18483800	Node	304.05811	-0.89896663	+0.02838338
e	0.16351856	Incl.	4.51548	-0.43344003	+0.08623976
P	3.23	B(1,0)	13.7		

Residuals in seconds of arc

340604	078	1.5-	0.2-	340709	078	1.7- 4.7+	700927	095	1.0-	1.9-
340608	690	1.2-	1.9-	340716	078	2.4- 2.7-	760630	076	0.8+	2.1+
340609	690	1.2-	1.4-	370414	078	(44.3- 6.1+)	790428	688	1.5-	0.6-
340611	690	(5.3-	1.0+)	690312	095	1.0+ 0.6-	790428	688	0.6+	0.5-
340612	690	2.4+	1.8+	700830	095	1.2+ 0.8+	790522	688	1.2-	0.0
340615	078	0.2+	0.1-	700905	095	0.2+ 0.8-				
340703	078	0.3-	1.3+	700910	095	0.4+ 0.3-				

ORBITAL ELEMENTS BY L. D. SCHMADEL, ASTRONOMISCHES RECHEN-INSTITUT.

(1105) Fragaria
Epoch 1980 Dec. 27.0 ET = JDE 2444600.5

M 70.40613		(1950.0)	P	Q
n 0.18871099	Peri.	221.78586	+0.92100921	+0.35071655
a 3.0102640	Node	116.93904	-0.28752484	+0.90567450
e 0.1050248	Incl.	10.96232	-0.26281459	+0.23822596
P 5.22	B(1,0)	11.3		

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

281209	024	2.0-	2.7-		470519	020	(0.12+	0.03-)X	690922	020	(0.11- 0.04+)
290101	024	0.4-	0.3-		480901	078	(29.1-	2.1-)X	690922	020	(0.11- 0.04+)
290112	024	1.2+	3.0-		480924	078	(55.1-	70.9-)X	691003	020	(39.5- 60.2+)
290131	024	0.1-	2.0-		520520	711	(6.3+	8.2-)Y	691003	020	(46.4- 69.6+)
290204	024	3.4+	1.3+		580719	760	1.2-	2.4+	691006	020	(0.06- 0.01+)
300127	024	0.7+	2.4-		580719	760	0.4-	0.7+	691006	020	(0.06- 0.01+)
310515	094	(13.1+	2.0-)X		580810	760	1.2+	2.8-	691008	095	1.0- 1.9-
320805	094	(16.1-	67.9-)X		580810	760	0.2+	1.2-	740820	076	0.7- 1.1+
370714	078	(21.1-	13.9+)X		620408	760	2.9-	3.4-	751103	095	1.0- 0.3-
410319	024	1.6+	0.0		620408	760	2.9+	0.4-	751112	095	2.5+ 1.5-
410403	062	(3.9-	72.2-)X		660116	095	1.7-	4.1+	751203	095	0.0 2.6+
410416	062	(8.4-	67.7-)X		670409	095	1.6-	2.5+	790715	688	3.2+ 0.2-
410419	062	(34.0-	67.6+)X		680522	095	2.5-	4.2-			
420613	078	(31.4-	79.2-)X		680526	095	0.6-	2.7+			

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

(2235)* A924 GA = 1933 WM = 1939 VE = 1950 TT = 1959 GS = 1962 SM = 1976 EN = 1976 FC = 1979 SA

Discovered 1924 Apr. 5 by K. Reinmuth at Heidelberg. The identifications are by B. G. Marsden.
Epoch 1980 Dec. 27.0 ET = JDE 2444600.5

M 332.52613		(1950.0)	P	Q
n 0.16997390	Peri.	273.77495	-0.46019312	-0.87723577
a 3.2276112	Node	205.09167	+0.88715925	-0.44843677
e 0.1922254	Incl.	18.80160	+0.03421610	-0.17135305
P 5.80	B(1,0)	11.5		

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

240406	024	1.3+	0.8+		790916	046	0.5+	0.6+	791015	046	0.7+ 0.8+
240510	024	(8.1-	10.1+)		790916	552	1.3+	4.4+	791015	046	0.1+ 1.7-
240530	024	0.9-	0.8-		790916	552	1.4+	3.3+	791018	552	0.3+ 0.1+
331121	024	0.5+	0.0		790917	046	0.5-	1.6-	791018	552	0.2- 0.4-
331121	024	0.3-	0.6+		790917	046	0.4-	1.0-	791018	552	1.4+ 1.1-
391107	012	(10.0-	30.6+)X		790917	552	1.0-	0.2+	791018	552	0.2+ 0.4-
501011	024	0.6+	1.4+		790917	552	1.3+	0.4-	791019	046	2.3- 1.8-
590416	760	(0.03-	0.00+)X		790918	552	1.8+	0.5+	791019	046	0.5- 0.6-
620930	760	(0.05+	0.01+)X		790918	552	2.2+	0.8+	791020	046	0.3- 3.0-
760307	808	1.1+	0.1+		790919	046	3.2-	1.5-	791020	046	0.8- 3.5-
760307	808	0.2+	0.5-		790919	046	2.3-	2.3-	791021	552	0.1- 3.1-
760331	095	1.9-	3.2-		790926	046	0.6+	0.6+	791112	552	1.0+ 0.1+
790829	046	0.0	0.7+		790926	046	2.0+	0.0	791112	552	2.3+ 0.2-
790829	046	0.1+	0.2+		790926	552	1.0-	2.1+	791121	552	2.0+ 0.5+
790912	046	0.2-	0.5-		790926	552	0.8+	0.6+	791121	552	0.8- 2.2+
790912	046	0.0	1.1-		790927	552	0.2-	1.1+	791216	552	4.7- 0.2+
790916	046	1.4-	0.0		790927	552	0.1+	0.9+	791216	552	0.9- 1.0-

(2236)* 1933 FX = 1934 TE = 1959 SB = 1962 JT = 1969 EZ = 1976 GY = 1977 RV

Discovered 1933 Mar. 23 by K. Reinmuth at Heidelberg. The identifications 1933 FX = 1934 TE (MPC 2327) and 1933 FX = 1959 SB are by O. Kippes. The identification 1933 FX = 1976 GY is by E. Bowell. The identifications 1977 RV = 1976 GY and 1933 FX = 1962 JT = 1969 EZ are by B. G. Marsden.

Epoch 1980 Dec. 27.0 ET = JDE 2444600.5

M	0.65120		(1950.0)	P	Q
n	0.27444635	Peri.	300.47938	+0.61987697	+0.78432164
a	2.3451164	Node	7.96342	-0.64616395	+0.52778940
e	0.2182240	Incl.	10.11591	-0.44522432	+0.32600293
P	3.59	B(1,0)	13.5		

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

330323	024	1.8+	0.6-		620504	839	0.8+	0.4+		770906	095	0.9+	0.5+
330327	024	1.4-	1.9+		620504	839	0.1-	0.6-		770908	095	0.4-	1.3+
330413	024	1.8+	1.6-		620508	839	0.2-	0.8+		770910	095	0.1-	0.5+
330522	024	(0.07+ | 0.04-)		620508	839	1.5-	0.6+		770918	095	0.3-	0.7+
341004	094	(41.6- | 41.8+)X		690312	095	1.6+	3.6-		770922	095	2.0+	1.6+
341007	094	(26.4- | 11.7-)X		760401	095	1.1+	2.8+		771007	095	2.0-	0.1+
590928	024	0.9-	2.0-		760402	095	2.8-	1.4+		771008	095	0.0	1.5-

(2237)* 1938 TB = 1949 SO1 = 1972 TB2 = 1977 RU3

Discovered 1938 Oct. 2 by G. Neujmin at Simeis. The key identification 1938 TB = 1972 TB2 is by J. Lehtinen. The identifications 1938 TB = 1949 SO1 = 1977 RU3 are by B. G. Marsden. The identification 1938 TB = 1977 RU3 was found independently by E. Bowell.

Epoch 1980 Dec. 27.0 ET = JDE 2444600.5

M	170.26390		(1950.0)	P	Q
n	0.17510728	Peri.	267.78511	+0.89869720	-0.43701695
a	3.1642193	Node	118.12670	+0.41715290	+0.82583324
e	0.2026178	Incl.	2.39618	+0.13537650	+0.35639254
P	5.63	B(1,0)	12.5		

Residuals in seconds of arc

380922	062	2.4+	0.6-		490925	760	0.1+	0.3-		770912	095	0.5+	1.0+
381015	062	0.2-	0.5-		490925	760	0.4-	3.0-		770918	095	0.3-	0.9+
381015	062	0.2+	0.9+		721008	095	0.2+	1.9-		800125	801	0.4-	0.7+
381021	062	0.9-	1.4+		721202	095	0.6-	0.0		800213	801	0.8+	0.9+
381021	062	0.6+	1.4+		721206	095	0.9+	1.1+					
381115	062	2.3-	0.0		770907	095	0.8-	1.7+					

(2238)* 1972 RQ1 = 1976 HA1 = 1977 RV3 = 1978 VP5

Discovered 1972 Sept. 11 by N. S. Chernykh at the Crimean Astrophysical Observatory. The identification 1978 VP5 = 1976 HA1 is by E. Bowell. The identifications 1972 RQ1 = 1977 RV3 = 1978 VP5 are by B. G. Marsden.

Epoch 1980 Dec. 27.0 ET = JDE 2444600.5

M	222.85733		(1950.0)	P	Q
n	0.18265507	Peri.	292.10781	+0.82748605	+0.56133996
a	3.0764384	Node	33.74753	-0.50624970	+0.75576063
e	0.1670786	Incl.	1.32207	-0.24285403	+0.33722888
P	5.40	B(1,0)	13.0		

Residuals in seconds of arc

720911	095	0.5-	0.4-		760430	808	1.1-	1.1-		781106	675	0.2-	0.5+
721005	095	0.8+	5.6-		760430	808	0.1+	1.2-		781107	675	0.7+	0.9+
721013	095	2.9+	1.0-		770907	095	1.0-	1.5+		781108	675	0.1-	0.2-
760427	808	0.6-	1.0-		770912	095	0.1-	2.1+		781129	675	0.6-	0.3-
760427	808	0.5-	2.1-		781105	675	0.0	0.2-		781130	675	0.2+	0.4-

(2239)* 1978 RC = 1938 UT1 = 1961 UO = 1976 JX

Discovered 1978 Sept. 13 by P. Wild at Zimmerwald. The identification 1978 RC = 1976 JX is by T. Urata (NOC 1067). The identifications 1978 RC = 1938 UT1 = 1961 UO are by B. G. Marsden.

Epoch 1980 Dec. 27.0 ET = JDE 2444600.5

		(1950.0)	P	Q
M	140.25215			
n	0.17175840	Peri.	348.81966	+0.98619491	-0.15211163
a	3.2052167	Node	20.28420	+0.16272181	+0.81703226
e	0.0912762	Incl.	10.87969	+0.03067924	+0.55616574
P	5.74	B(1,0)	13.0		

Residuals in seconds of arc

381021 062	2.1-	1.3+	781012 026	0.7-	0.6-	781202 801	1.1+	0.6-
611018 760	0.8-	1.2+	781027 026	1.4-	1.8-	791124 801	1.0+	0.2-
611018 760	1.7+	2.2+	781027 026	0.3-	0.3+	791218 801	0.1+	0.2-
760502 095	1.3+	0.4+	781028 026	1.6+	0.4-	800114 801	0.8-	0.1+
780913 026	0.1-	0.5-	781107 026	0.3+	0.9+	800118 026	0.3-	0.2-
780924 026	1.4+	0.6-	781119 026	0.8-	0.5-	800119 026	0.6-	0.8+
781001 026	0.1-	0.6-	781124 026	0.4-	0.5-	800219 801	0.9-	1.0-
781012 026	0.3+	0.9+	781126 801	0.7+	0.1+			

(2240)* 1978 YA = 1966 RH = 1972 TV1

Discovered 1978 Dec. 30 at the Harvard College Observatory, Agassiz Station. The identifications are by B. G. Marsden. The identification 1978 YA = 1974 EM (NOC 1067) is invalid.

Epoch 1980 Dec. 27.0 ET = JDE 2444600.5

		(1950.0)	P	Q
M	119.27935			
n	0.17654400	Peri.	29.47740	+0.00124382	-0.99991654
a	3.1470290	Node	60.45401	+0.91451796	-0.00406466
e	0.1563583	Incl.	0.84693	+0.40454338	+0.01226303
P	5.58	B(1,0)	13.0		

Residuals in seconds of arc

660915 095	0.2-	0.6+	790104 801	0.7+	1.1+	800316 046	0.5-	0.2-
721006 095	0.8-	0.9-	790104 801	0.2+	0.1-	800316 046	0.2+	0.7-
721007 095	0.9-	2.9-	790105 801	0.7-	0.7+	800317 046	0.1-	1.4-
721013 095	3.4+	0.9-	790123 801	0.8-	0.4+	800317 046	0.0	1.4-
781230 801	0.5+	0.3+	790123 801	0.5-	0.1+	800417 801	1.2-	0.6+

(2241)* 1979 WM = 1950 NC = 1968 WF

Discovered 1979 Nov. 22 by C. Kowal at Palomar. The 1978 observation was identified by J. G. Williams, the 1977 and 1976 observations by S. J. Bus. The identifications 1979 WM = 1950 NC = 1968 WF are by B. G. Marsden.

Epoch 1980 Dec. 27.0 ET = JDE 2444600.5

		(1950.0)	P	Q
M	270.39527			
n	0.08187511	Peri.	290.07246	-0.91573150	+0.28342777
a	5.2525251	Node	267.24447	-0.16824854	-0.91415849
e	0.0662338	Incl.	16.56592	-0.36486745	-0.28979812
P	12.04	B(1,0)	9.5		

Residuals in seconds of arc

500706 078	(9.1-	9.6-)Y	781102 675	0.8-	0.9-	791212 675	0.7-	0.4-
681130 095	0.2-	0.6-	791122 675	0.1-	0.8+	800209 801	0.6-	0.3-
760830 675	0.1+	1.0-	791124 675	0.7+	0.2+	800212 675	0.5-	0.2+
770914 675	0.7+	1.5+	791125 675	1.3+	0.4+	800310 801	0.0	0.1+

1965 WJ = 1974 MD = 1976 UA4

The key identification 1965 WJ = 1974 MD is by E. Bowell. The identification 1965 WJ = 1976 UA4 is by B. G. Marsden.

Epoch 1980 Dec. 27.0 ET = JDE 2444600.5 (J-P)

M	245.08793		(1950.0)	P	Q
n	0.17647130	Peri.	3.40332	+0.12212635	-0.97174736
a	3.1478995	Node	79.65365	+0.90565149	+0.02585341
e	0.2349376	Incl.	11.84760	+0.40605484	+0.23460324
P	5.59	B(1,0)	12.5		

Residuals in seconds of arc

651120	760	0.8+	0.6-	651224	330	0.9+	1.9-	740622	808	0.4+	1.1-
651120	760	0.5+	3.4-	651230	330	1.4-	0.2+	740622	808	0.0	0.6-
651213	330	0.3+	0.8+	740617	808	0.3+	0.4-	761027	095	0.8-	1.8+
651218	330	0.1+	1.3+	740617	808	1.3-	0.2-				

1965 WR = 1973 QG

The identification is by E. Bowell.

Epoch 1980 Dec. 27.0 ET = JDE 2444600.5 (J-P)

M	203.42300		(1950.0)	P	Q
n	0.22795939	Peri.	136.82121	+0.86096581	-0.46673898
a	2.6539857	Node	252.03377	+0.38929745	+0.86049496
e	0.1748452	Incl.	12.27389	+0.32739176	+0.20421347
P	4.32	B(1,0)	13.5		

Residuals in seconds of arc

651121	330	0.4-	0.3-	651128	330	0.3+	2.0+	651224	330	2.4+	3.6+
651125	330	1.0+	0.4+	651213	330	0.2+	0.8+	730827	095	2.4-	2.3-
651125	330	2.0-	0.8+	651218	330	2.1-	2.7-	730831	095	1.9+	2.1+

1974 VK = 1973 QH

The identification is by E. Bowell.

Epoch 1980 Dec. 27.0 ET = JDE 2444600.5 (J-P)

M	338.89042		(1950.0)	P	Q
n	0.15977017	Peri.	205.40358	+0.25447014	-0.95058827
a	3.3636164	Node	230.38249	+0.92197643	+0.29396972
e	0.2070285	Incl.	13.34800	+0.29189793	-0.09981854
P	6.17	B(1,0)	12.0		

Residuals in seconds of arc

730827	095	1.0+	0.5+	741112	095	1.1+	0.6+	741119	095	0.2-	0.6-
730831	095	1.0-	0.5-	741117	095	1.2-	0.2-	741210	095	0.4+	0.3+

1975 EV1 = 1971 FO = 1977 TH8

The key identification 1975 EV1 = 1977 TH8 is by E. Bowell. The identification 1975 EV1 = 1971 FO is by B. G. Marsden. The identification 1969 TR1 = 1971 FO (NOC 1067) is invalid.

Epoch 1980 Dec. 27.0 ET = JDE 2444600.5 (J-P)

M	237.26057		(1950.0)	P	Q
n	0.25665571	Peri.	40.80682	-0.28892229	-0.95733158
a	2.4522776	Node	65.98748	+0.87649682	-0.26717734
e	0.1618692	Incl.	0.39750	+0.38506782	-0.11014771
P	3.84	B(1,0)	14.0		

Residuals in seconds of arc

710319	095	0.5+	1.0+	750315	095	1.1+	3.7-	771017	095	0.6+	0.9+
750306	095	1.8-	1.5+	750317	095	0.8-	2.1+				
750308	095	0.6+	1.5-	771007	095	0.5-	1.8-				

1977 RX7 = 1937 WG = 1957 WF = 1967 RW = 1976 JL2

The identifications are by B. G. Marsden. The double designation 1937 WG = 1937 YJ (MPC 1241) is invalid. The times of the second and third observations of 1937 WG given on MPC 3232 have been increased by +1 day.

Epoch 1980 Dec. 27.0 ET = JDE 2444600.5 (J-P)

M	307.22220		(1950.0)		P		Q
n	0.29361433	Peri.	230.12383		+0.56769214		-0.82319841
a	2.2419130	Node	185.30697		+0.78020558		+0.54123129
e	0.1352596	Incl.	5.19065		+0.26268781		+0.17150239
P	3.36	B(1,0)	14.0				

Residuals in seconds of arc

371129	020	(53.6+	6.0+)	571117	760	0.1-	1.6+	770919	095	1.4+	0.6+
371203	020	(51.1+	17.8+)	670911	095	3.0-	2.1-	771008	095	2.1-	0.5+
371204	020	(54.6+	11.1+)	760502	095	0.4+	2.3+				
571117	760	1.2+	0.8+	770912	095	1.9+	0.1+				

1978 VQ5 = 1977 RB3

The identification is by E. Bowell.

Epoch 1980 Dec. 27.0 ET = JDE 2444600.5 (J-P)

M	10.39024		(1950.0)		P		Q
n	0.18588032	Peri.	132.36695		-0.90911228		+0.41286468
a	3.0407542	Node	72.08616		-0.39720748		-0.81924039
e	0.0551896	Incl.	3.33151		-0.12546348		-0.39797982
P	5.30	B(1,0)	12.5				

Residuals in seconds of arc

770910	095	0.7+	0.8-	781106	675	0.9+	0.3+	781129	675	0.1-	1.1+
770922	095	0.6-	0.7+	781107	675	0.7+	1.3+	781130	675	0.2+	0.5+
781105	675	0.6-	0.1-	781108	675	0.0	0.0				

1978 VV6

The 1977 observations were identified by S. J. Bus.

Epoch 1980 Dec. 27.0 ET = JDE 2444600.5 (J-P)

M	304.77781		(1950.0)		P		Q
n	0.29265223	Peri.	274.92690		+0.78808378		+0.61450772
a	2.2468238	Node	47.16249		-0.54342481		+0.72208257
e	0.2047329	Incl.	2.82293		-0.28915987		+0.31776880
P	3.37	B(1,0)	17.0				

Residuals in seconds of arc

770424	675	1.1-	1.0+	781105	675	0.7+	0.4-	781129	675	0.3-	0.1+
770424	675	0.1+	0.5+	781106	675	0.3-	0.0	781130	675	0.1+	0.1-
770425	675	1.0+	0.6-	781107	675	0.1-	0.3+				
770425	675	0.1-	1.0-	781108	675	0.1-	0.1+				

1978 VT9

The 1977 observations were identified by S. J. Bus.

Epoch 1980 Dec. 27.0 ET = JDE 2444600.5 (J-P)

M	286.90252		(1950.0)		P		Q
n	0.29532875	Peri.	288.70527		+0.95818241		+0.28081707
a	2.2332282	Node	55.02117		-0.23065207		+0.87172892
e	0.2022147	Incl.	3.85096		-0.16936971		+0.40153513
P	3.34	B(1,0)	17.5				

Residuals in seconds of arc

770424	675	0.3-	0.5+	781105	675	0.5-	0.2+	781108	675	0.3+	0.4-
770425	675	1.5+	0.7+	781106	675	0.0	0.7+	781129	675	1.9+	0.5+
770425	675	1.2-	1.0-	781107	675	0.6-	0.0	781130	675	1.1-	0.8-

1979 VA
Epoch 1980 Dec. 27.0 ET = JDE 2444600.5

M	103.32069	(1950.0)	P	Q
n	0.23037049	Peri. 89.60453	+0.99859074	-0.02155138
a	2.6354300	Node 271.62990	+0.00042995	+0.91709058
e	0.6273521	Incl. 2.78096	+0.05306938	+0.39809597
P	4.28	B(1,0) 17.3		

From 49 observations 1979 Nov. 15-1980 Feb. 11, mean residual 1".4.

1980 CO = 1953 VO2

The identification is by C. M. Bardwell.
Epoch 1980 Dec. 27.0 ET = JDE 2444600.5 (J-P)

M	103.18145	(1950.0)	P	Q
n	0.19673671	Peri. 2.49609	-0.26418359	-0.96299849
a	2.9278353	Node 102.82613	+0.88389269	-0.26385513
e	0.0652939	Incl. 3.13361	+0.38592840	-0.05490337
P	5.01	B(1,0) 13.5		

Residuals in seconds of arc

531109	024	0.7-	1.4-	800216	801	1.1+	1.0-	800417	801	(6.1+	8.8+)
531208	024	0.6+	1.3-	800218	801	1.6+	1.5-	800418	801	1.0+	1.0-
800213	801	0.8-	2.0-	800312	801	0.8-	1.1+				
800214	801	3.6-	1.4-	800314	688	2.3+	0.8-				

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

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

(2242)* 1936 TG = 1972 RE2 = 1972 TT8 = 1975 RZ

Discovered 1936 Oct. 13 by G. Kulin at Budapest. The double designation 1972 RE2 = 1972 TT8 is by T. Urata (MPC 4637).
Epoch 1980 Dec. 27.0 ET = JDE 2444600.5

M	129.47593	(1950.0)	P	Q
n	0.30037208	Peri. 95.25829	+0.19273421	-0.98117159
a	2.2081556	Node 343.61324	+0.88179583	+0.17876647
e	0.1181137	Incl. 2.53614	+0.43045283	+0.07310859
P	3.28	B(1,0) 14.5		

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

361013	053	5.0-	1.2-	721003	095	4.4+	0.3+	750906	095	(0.08+	0.00+)
361014	053	(45.3+	0.7-)	721005	095	1.9-	0.8+	800209	801	1.1-	0.8+
361017	053	6.1+	1.7-	721013	095	0.3-	4.9+	800311	801	0.1-	0.2+
361027	053	1.4+	0.5-	721028	095	6.5-	0.8+				
720911	095	1.7+	1.0-	750903	095	0.2+	1.5-				

(2243)* 1941 SA1 = 1951 QH = 1951 RQ1 = 1951 SF

Discovered 1941 Sept. 25 by Y. Vaisala at Turku. The double designations 1951 QH = 1951 RQ1 = 1951 SF are by O. Kippes (MPC 1968, MPC 2324).
Epoch 1980 Dec. 27.0 ET = JDE 2444600.5

M	259.66358	(1950.0)	P	Q
n	0.29227101	Peri. 302.85254	+0.81761411	+0.57399891
a	2.2487727	Node 22.22021	-0.48033094	+0.72317109
e	0.1958182	Incl. 6.84668	-0.31747339	+0.38412085
P	3.37	B(1,0) 14.0		

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

410920	062	0.7-	0.1+		510902	711	0.3+	0.1- Y	791219	801	1.3-	1.4-
410920	062	0.2-	0.3-		510903	711	(20.9+ | 11.2+)Y	791228	801	0.3-	0.3+
410925	062	0.1-	1.5+		510907	094	(0.03- | 0.01-)X	800120	801	0.1-	0.4-
410927	062	0.4+	0.1+		510930	760	2.5+	0.8-	800216	801	1.5+	1.1+
510827	078	(15.9+ | 7.3-)Y		510930	760	2.0-	0.8-				

(2244)* 1952 UW1 = 1938 UE1 = 1949 AA = 1976 YR3

Discovered 1952 Oct. 22 by M. Protitch at Belgrade. The key identification 1952 UW1 = 1976 YR3 is by E. Bowell (MPC 4643).

Epoch 1980 Dec. 27.0 ET = JDE 2444600.5

M	341.24585		(1950.0)	P	Q
n	0.20916135	Peri.	295.88331	+0.73161687	-0.66912076
a	2.8107039	Node	106.41652	+0.66395489	+0.65599924
e	0.1826711	Incl.	7.81541	+0.15459833	+0.34920251
P	4.71	B(1,0)	13.4		

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

381022	062	0.3+	0.8+		521022	057	0.9-	2.2-	761216	095	0.7-	0.2+
490105	020	(0.08+ | 0.02-)X		521022	057	0.4+	0.7-	761220	095	1.9-	0.1-
490121	020	(0.05+ | 0.01-)X		521025	057	0.1+	1.8+	770113	095	0.3+	0.1-
490125	020	(0.02+ | 0.03-)X		521025	057	0.2-	0.2+	770120	095	2.2+	3.0+
490127	020	(7.8-	39.0-)X		521026	057	(0.03-	0.01-)	790622	801	0.1-	0.4+
490203	020	(0.03+ | 0.06-)X		521028	057	0.4+	1.0+				

(2245)* 1968 BC = 1958 XC = 1971 XC

Discovered 1968 Jan. 24 by L. Chernykh at the Crimean Astrophysical Observatory. The key identification 1968 BC = 1971 XC is by E. Bowell (MPC 4644).

Epoch 1980 Dec. 27.0 ET = JDE 2444600.5

M	72.08569		(1950.0)	P	Q
n	0.23015468	Peri.	315.32199	+0.74777395	-0.63166994
a	2.6370772	Node	84.97570	+0.65200024	+0.64042160
e	0.1327217	Incl.	11.84740	+0.12541854	+0.43686754
P	4.28	B(1,0)	12.5		

Residuals in seconds of arc

581204	024	1.0+	2.5-		711214	095	1.7-	0.6+	800113	801	0.8-	1.6-
680124	095	1.6+	2.2-		720105	095	0.1+	7.2+	800208	801	0.2+	1.9-
680203	095	1.6-	2.9-		791020	879	0.3+	0.6-				
680220	095	0.5-	0.6-		791020	879	0.9+	0.4+				

(2246)* 1979 XH = 1973 FR = 1973 FH2 = 1976 SL6 = 1977 SM3

Discovered 1979 Dec. 14 by E. Bowell at the Anderson Mesa Station of the Lowell Observatory.

Epoch 1980 Dec. 27.0 ET = JDE 2444600.5

M	350.18120		(1950.0)	P	Q
n	0.12531138	Peri.	31.55071	-0.99107753	+0.12471509
a	3.9549625	Node	155.48207	-0.13310762	-0.94437593
e	0.0978527	Incl.	6.50687	+0.00690534	-0.30430287
P	7.87	B(1,0)	11.8		

Residuals in seconds of arc

730326	095	0.1-	0.6-		770923	095	0.0	0.6+	800211	688	0.2-	1.9+
730331	049	0.2+	0.4+		791214	688	0.3-	1.5-	800305	688	1.2-	0.1-
730331	049	0.1-	0.0		791216	688	1.4+	0.7-				
760925	095	0.1+	0.6-		800122	688	0.2+	0.1+				

(2247)* 6512 P-L = 1977 AR1

Discovered 1960 Sept. 24 by C. J. van Houten and I. van Houten-Groeneveld on Palomar Schmidt plates taken by T. Gehrels. The identification was made independently by E. Bowell (MPC 4645).

Epoch 1980 Dec. 27.0 ET = JDE 2444600.5

M	74.26709	(1950.0)		P	Q
n	0.25721392	Peri.	28.69664	+0.81301244	-0.58211146
a	2.4487234	Node	6.94281	+0.51241341	+0.70511679
e	0.1087899	Incl.	5.95022	+0.27648374	+0.40491550
P	3.83	B(1,0)	14.8		

Residuals in second of arc

600924	675	0.5-	1.0-	601024	675	0.1-	0.3+	790916	801	0.9-	1.0+
600926	675	0.2+	0.2-	601026	801	0.6+	0.1-	790918	801	0.1-	0.1+
600927	675	1.7+	0.5+	770113	095	0.3-	1.3-	790919	801	1.5+	1.4+
600928	675	1.2+	0.4+	770120	095	0.6+	0.5-	790921	801	(6.6-	1.1+)
601017	675	0.8-	0.2+	790823	801	(6.2+	3.9-)	790927	801	0.6+	0.6+
601022	675	0.6-	0.8+	790827	801	0.0	0.5-				

1966 PD = 1966 RB = 1973 YR1

The key identification 1966 PD = 1973 YR1 is by E. Bowell.

Epoch 1980 Dec. 27.0 ET = JDE 2444600.5 (J-P)

M	89.70591	(1950.0)		P	Q
n	0.29643721	Peri.	90.21030	+0.99091302	-0.09095908
a	2.2276576	Node	275.00953	+0.04349362	+0.91377903
e	0.2326248	Incl.	5.70836	+0.12727804	+0.39589686
P	3.32	B(1,0)	14.0		

Residuals in seconds of arc

660813	095	0.4+	0.1+	660914	095	1.7+	1.4-	731220	095	0.4+	4.0+
660913	095	2.1-	0.2-	660916	095	1.9-	0.5-	731221	095	0.4-	1.9-

1976 SH2 = 1969 LJ = 1969 NA = 1973 YA1

The identification 1976 SH2 = 1973 YA1 was found independently by E. Bowell. The identification 1976 SH2 = 1969 NA is by T. Urata (NOC 1067).

Epoch 1980 Dec. 27.0 ET = JDE 2444600.5 (J-P)

M	113.57187	(1950.0)		P	Q
n	0.30303977	Peri.	349.88051	+0.99962991	+0.02512301
a	2.1951818	Node	8.70023	-0.01752167	+0.88801074
e	0.1932534	Incl.	3.95532	-0.02080926	+0.45913588
P	3.25	B(1,0)	15.0		

Residuals in seconds of arc

690608	808	0.0	0.3-	731220	095	5.9+	0.3-	760928	095	3.8+	0.1-
690609	808	0.5-	0.4-	731221	095	5.8-	0.0	760929	095	2.7-	3.9-
690617	808	0.3-	0.2-	760924	095	0.1+	0.7+	761025	095	0.2-	0.9+
690701	808	0.8+	0.9+	760925	095	1.7+	1.9+	761027	095	3.6-	0.6+

1976 YX1 = 1955 BV

The identification is by E. Bowell.

Epoch 1980 Dec. 27.0 ET = JDE 2444600.5 (J-P)

M	291.43395	(1950.0)		P	Q
n	0.17753922	Peri.	30.79856	+0.74879036	-0.66280365
a	3.1352635	Node	10.71625	+0.60578263	+0.68309207
e	0.1899019	Incl.	0.64075	+0.26896172	+0.30671900
P	5.55	B(1,0)	13.0		

Residuals in seconds of arc

550121	330	0.8-	1.6+	761216	095	0.1-	1.4+	761220	095	0.0	1.8+
550125	330	0.5+	0.2+	761218	095	0.1-	0.6+	770113	095	0.3-	1.1-

1977 RC7 = 1975 ER5 = 1980 DT
The key identification 1977 RC7 = 1980 DT is by E. Bowell.

Epoch 1980 Dec. 27.0 ET = JDE 2444600.5 (J-P)				
M 264.46087		(1950.0)	P	Q
n 0.17684212	Peri.	178.06975	+0.59147159	+0.80582670
a 3.1434973	Node	128.19053	-0.74023598	+0.55660501
e 0.1232822	Incl.	2.06839	-0.31970619	+0.20207473
P 5.57	B(1,0)	13.0		

Residuals in seconds of arc

750315 095	0.2-	0.8+	800214 046	0.4-	1.5+	800221 046	0.4-	0.0
770911 095	1.0+	0.8+	800215 046	1.0+	1.7+	800222 046	2.5-	1.6+
770918 095	1.9+	1.3+	800219 046	0.7+	0.2-	800222 046	0.9-	1.6+
770921 095	1.9+	1.0+	800219 046	2.4-	3.8+	800223 046	1.0-	1.8+
771009 095	1.6+	2.2+	800221 046	0.9+	0.1-	800223 046	1.1-	0.2+
800214 046	1.8-	1.3+						

1979 UJ = 1970 GG1 = 1972 QD = 1976 GM5

Epoch 1980 Dec. 27.0 ET = JDE 2444600.5 (J-P)				
M 268.32139		(1950.0)	P	Q
n 0.16959995	Peri.	27.12516	-0.81250358	+0.58150095
a 3.2323604	Node	188.78606	-0.57169976	-0.80863537
e 0.0385699	Incl.	15.63462	-0.11400575	-0.08924954
P 5.81	B(1,0)	11.9		

Residuals in seconds of arc

700411 805	1.1+	1.0-	760402 095	0.9-	0.0	791208 688	0.8-	0.5-
700411 805	0.9+	0.5+	791017 688	1.3+	0.7-	800122 688	0.6+	1.7-
700411 805	1.1+	1.0+	791028 688	0.4+	1.6-			
720816 095	0.3-	0.1+	791122 688	1.3-	0.6+			

2580 P-L = 1973 FA2
The identification is by E. Bowell.

Epoch 1980 Dec. 27.0 ET = JDE 2444600.5 (J-P)				
M 47.07312		(1950.0)	P	Q
n 0.26900240	Peri.	100.21492	-0.94341914	-0.32852811
a 2.3766550	Node	60.61815	+0.28037673	-0.86282494
e 0.1499642	Incl.	2.96360	+0.17705709	-0.38419057
P 3.66	B(1,0)	15.3		

Residuals in seconds of arc

600924 675	0.1+	0.2-	601017 675	0.8+	0.2+	730330 095	2.3+	2.3-
600926 675	0.6-	0.5-	601022 675	0.6+	0.4+	730331 095	1.7+	1.7-
600928 675	0.2+	0.3+	601025 675	0.9+	1.2+			
600929 675	0.4-	0.6-	601026 675	1.6+	0.1-			

2605 P-L = 1973 QW1
The identification is by E. Bowell.

Epoch 1980 Dec. 27.0 ET = JDE 2444600.5 (J-P)				
M 250.05433		(1950.0)	P	Q
n 0.22416258	Peri.	310.65377	+0.77731288	+0.62900179
a 2.6838701	Node	10.38856	-0.55543642	+0.69503330
e 0.2199026	Incl.	3.78149	-0.29542352	+0.34826062
P 4.40	B(1,0)	14.7		

Residuals in seconds of arc

600924 675	0.2-	0.5+	601017 675	0.3+	0.4+	601026 675	0.1-	1.2-
600926 675	0.6-	0.1+	601022 675	0.6-	0.3-	730831 095	0.6+	1.2-
600928 675	1.7+	0.1+	601025 675	0.8+	0.2+	730905 095	0.7-	0.6+
600928 675	0.9-	0.3+	601026 675	0.3-	0.2+			

4578 P-L = 1973 QK
The identification is by E. Bowell.
Epoch 1980 Dec. 27.0 ET = JDE 2444600.5 (J-P)

M	81.04587		(1950.0)	P	Q
n	0.30147542	Peri.	183.12816	+0.96721968	+0.25305694
a	2.2027691	Node	162.17002	-0.23144790	+0.91278370
e	0.2055170	Incl.	3.96499	-0.10448901	+0.32060582
P	3.27	B(1,0)	15.9		

Residuals in seconds of arc

600924	675	0.1-	0.1-	601017	675	0.4-	0.3+	730827	095	0.5-	2.7-
600926	675	0.3+	0.3+	601022	675	0.9-	1.3-	730831	095	1.0-	2.3+
600927	675	0.4-	0.4+	601025	675	0.6-	0.2-	730905	095	1.1+	0.8-
600928	675	0.2+	0.2+	601026	675	0.5-	0.5-				

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EPHEMERIDES.

Periodic Comet Harrington Elements Acta Astron. 23, 169, 1973

Date	ET	R. A. (1950)	Decl.	Delta	r	Variation		m2
1980	06 30	17 37.69	-16 01.8	1.317	2.314	-1.87	+4.1	21.1
1980	07 10	17 28.14	-16 41.5					
1980	07 20	17 20.37	-17 29.2	1.296	2.195	-1.76	+5.0	20.7
1980	07 30	17 15.44	-18 23.5					
1980	08 09	17 13.97	-19 22.7	1.347	2.080	-1.58	+5.5	20.4
1980	08 19	17 16.30	-20 25.0					
1980	08 29	17 22.44	-21 28.2	1.438	1.970	-1.47	+5.7	20.2
1980	09 08	17 32.24	-22 29.8					
1980	09 18	17 45.50	-23 26.8	1.543	1.868	-1.45	+5.3	20.0
1980	09 28	18 01.93	-24 16.2					
1980	10 08	18 21.24	-24 54.6	1.648	1.778	-1.51	+4.4	19.8
1980	10 18	18 43.15	-25 18.8					
1980	10 28	19 07.30	-25 25.6	1.747	1.703	-1.60	+2.8	19.7
1980	11 07	19 33.32	-25 12.1					
1980	11 17	20 00.83	-24 36.3	1.841	1.647	-1.69	+0.5	19.6
1980	11 27	20 29.39	-23 36.9					
1980	12 07	20 58.61	-22 13.8	1.937	1.614	-1.74	-2.1	19.6
1980	12 17	21 28.12	-20 27.8					
1980	12 27	21 57.58	-18 21.3	2.041	1.605	-1.71	-4.7	19.6
1981	01 06	22 26.76	-15 57.1					
1981	01 16	22 55.49	-13 19.0	2.160	1.621	-1.64	-6.6	19.8
1981	01 26	23 23.64	-10 31.2					
1981	02 05	23 51.18	-07 37.6	2.297	1.662	-1.53	-7.7	20.1
1981	02 15	00 18.11	-04 42.4					
1981	02 25	00 44.44	-01 49.2	2.452	1.724	-1.42	-7.9	20.5

Periodic Comet Encke Elements MPC 5129

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	m2
1980	06 30	01 48.75	+17 54.7	2.629	2.410	66.5	22.7	21.2
1980	07 10	02 01.34	+19 36.0					
1980	07 20	02 14.11	+21 22.0	2.188	2.223	78.6	26.6	20.7
1980	07 30	02 27.14	+23 14.2					
1980	08 09	02 40.53	+25 15.5	1.736	2.019	90.6	30.1	20.1
1980	08 19	02 54.45	+27 30.0	1.511	1.910	96.4	31.8	19.8
1980	08 24	03 01.71	+28 44.1					
1980	08 29	03 09.28	+30 04.3	1.289	1.795	102.0	33.4	19.3
1980	09 03	03 17.25	+31 32.1					
1980	09 08	03 25.78	+33 09.6	1.074	1.674	107.1	35.1	18.8

1980 09 13	03 35.10	+34 59.3						
1980 09 18	03 45.58	+37 05.0	0.867	1.547	111.3	37.3	18.3	
1980 09 23	03 57.86	+39 31.6						
1980 09 28	04 12.99	+42 25.9	0.671	1.412	113.6	40.5	17.6	
1980 10 03	04 32.93	+45 56.6						
1980 10 08	05 01.55	+50 12.2	0.493	1.269	112.0	46.9	16.9	
1980 10 13	05 47.17	+55 10.4						
1980 10 18	07 06.88	+59 50.8	0.348	1.116	101.1	61.1	16.3	
1980 10 23	09 14.62	+60 14.2						
1980 10 28	11 21.96	+51 21.8	0.278	0.954	73.7	90.0	16.3	
1980 11 02	12 40.86	+36 25.2						
1980 11 07	13 25.54	+21 55.9	0.336	0.780	43.0	119.9	17.2	
1980 11 12	13 53.32	+10 29.3						
1980 11 17	14 12.98	+01 50.3	0.493	0.598	27.7	129.7	17.7	
1980 11 22	14 29.28	-04 54.2						
1980 11 27	14 45.69	-10 28.9	0.727	0.424	22.8	115.5	17.4	
1980 12 02	15 05.55	-15 22.4						
1980 12 07	15 31.61	-19 41.6	1.032	0.340	19.2	72.6	16.4	
1980 12 12	16 03.20	-23 11.1						
1980 12 17	16 36.45	-25 38.9	1.321	0.437	14.0	33.1	16.3	
1980 12 22	17 08.31	-27 11.3						
1980 12 27	17 37.62	-28 01.9	1.549	0.613	11.0	17.8	16.9	
1981 01 01	18 04.22	-28 22.5						
1981 01 06	18 28.27	-28 22.1	1.743	0.795	10.3	12.7	17.6	
1981 01 11	18 50.03	-28 06.8						
1981 01 16	19 09.77	-27 41.2	1.914	0.968	11.2	11.3	18.2	
1981 01 21	19 27.77	-27 08.4						
1981 01 26	19 44.25	-26 30.6	2.065	1.129	13.3	11.6	18.7	
1981 01 31	19 59.41	-25 49.5						
1981 02 05	20 13.41	-25 06.3	2.196	1.281	16.5	12.6	19.1	
1981 02 10	20 26.39	-24 21.8						
1981 02 15	20 38.46	-23 36.8	2.306	1.423	20.5	14.1	19.5	
1981 02 25	21 00.25	-22 06.9	2.396	1.557	25.2	15.7	19.8	
1981 03 07	21 19.38	-20 39.5						
1981 03 17	21 36.24	-19 16.6	2.511	1.805	36.1	18.9	20.3	
1981 03 27	21 51.09	-17 59.4						
1981 04 06	22 04.09	-16 49.3	2.544	2.028	48.7	21.8	20.7	

Periodic Comet Tuttle — Elements MPC 5126

Date	ET	R. A. (1950)	Decl.	Delta	r	Variation		m2
1980 07 20	02 33.46	+65 03.0	2.435	2.249	-2.91	+4.1	20.5	
1980 07 30	03 13.96	+67 08.9						
1980 08 09	04 00.72	+68 45.9	2.137	2.044	-3.86	+10.9	19.8	
1980 08 19	04 53.12	+69 42.4						
1980 08 29	05 48.75	+69 47.7	1.832	1.836	-3.90	+22.0	19.0	
1980 09 08	06 43.69	+68 54.9						
1980 09 18	07 33.97	+67 01.6	1.519	1.629	-2.23	+35.4	18.0	
1980 09 28	08 17.35	+64 07.1						
1980 10 08	08 53.46	+60 07.1	1.196	1.428	-0.47	+51.1	16.9	
1980 10 18	09 22.94	+54 46.6	1.031	1.334	-0.09	+63.8	16.3	
1980 10 23	09 35.56	+51 26.4						
1980 10 28	09 46.98	+47 30.9	0.868	1.245	+0.07	+79.7	15.6	
1980 11 02	09 57.38	+42 50.5						
1980 11 07	10 06.92	+37 12.8	0.714	1.167	-0.03	+102.0	14.9	
1980 11 12	10 15.75	+30 22.2						
1980 11 17	10 24.08	+22 01.7	0.582	1.101	-0.39	+129.4	14.2	
1980 11 22	10 32.11	+11 59.5						

1980 11 27	10 40.09	+00 20.3	0.500	1.051	-1.04	+143.1	13.7
1980 12 02	10 48.26	-12 22.2					
1980 12 07	10 56.86	-25 07.2	0.496	1.022	-2.05	+104.3	13.6
1980 12 12	11 06.17	-36 52.4					
1980 12 17	11 16.56	-47 00.5	0.570	1.016	-3.46	+38.8	13.8
1980 12 27	11 42.26	-62 14.2	0.690	1.033	-6.04	+0.2	14.3
1981 01 06	12 18.55	-72 14.9					
1981 01 16	13 13.49	-78 46.2	0.958	1.129	-16.10	-25.4	15.4
1981 01 26	14 40.18	-82 44.8					
1981 02 05	16 41.00	-84 36.0	1.185	1.285	+55.12	-21.4	16.5
1981 02 15	18 36.24	-84 58.3					
1981 02 25	19 54.35	-84 55.0	1.342	1.473	+30.60	+0.1	17.3
1981 03 07	20 41.93	-85 08.6					
1981 03 17	21 07.09	-85 56.3	1.434	1.676	+30.07	+8.2	18.0
1981 03 27	21 00.11	-87 22.3					
1981 04 06	17 29.74	-88 56.6	1.485	1.883	+71.20	+20.6	18.6
1981 04 16	12 37.76	-86 57.7					
1981 04 26	12 11.78	-83 22.7	1.534	2.091	-16.04	+8.5	19.1
1981 05 06	12 14.48	-79 09.4					
1981 05 16	12 23.96	-74 31.6	1.626	2.295	-6.86	+3.5	19.7
1981 05 26	12 35.74	-69 43.8					
1981 06 05	12 48.46	-64 59.8	1.796	2.495	-3.78	+1.5	20.2

Comet Bradfield (1979l) Elements MPC 5176

Date ET	R. A. (1950) Decl.	Delta	r	Elong.	Phase	m2
1980 07 20	05 34.34 +35 59.6	4.195	3.406	34.5	9.7	19.9
1980 07 30	05 38.99 +36 46.8					
1980 08 09	05 42.47 +37 37.1	4.187	3.639	51.2	12.5	20.2
1980 08 19	05 44.54 +38 30.8					
1980 08 29	05 44.96 +39 28.1	4.105	3.865	69.3	14.1	20.4
1980 09 08	05 43.43 +40 28.8					
1980 09 18	05 39.64 +41 31.8	3.981	4.086	88.9	14.2	20.6
1980 09 28	05 33.31 +42 35.3					
1980 10 08	05 24.22 +43 36.1	3.858	4.302	109.9	12.6	20.8

Periodic Comet de Vico-Swift Elements MPC 5129

Date ET	R. A. (1950) Decl.	Delta	r	Variation		m2
1980 08 09	02 16.42 +15 13.3	1.798	2.201	-1.46	-10.3	21.2
1980 08 19	02 25.98 +16 36.7					
1980 08 29	02 33.26 +17 50.9	1.611	2.219	-1.68	-10.8	21.0
1980 09 08	02 37.90 +18 54.9					
1980 09 18	02 39.55 +19 47.2	1.456	2.247	-1.93	-11.6	20.8
1980 09 28	02 38.12 +20 26.4					
1980 10 08	02 33.76 +20 50.9	1.358	2.285	-2.14	-12.8	20.8
1980 10 18	02 27.09 +20 59.9					
1980 10 28	02 19.14 +20 54.6	1.343	2.330	-2.18	-13.8	20.8
1980 11 07	02 11.18 +20 38.5					
1980 11 17	02 04.45 +20 17.3	1.429	2.384	-2.01	-13.5	21.0
1980 11 27	01 59.89 +19 57.2					
1980 12 07	01 57.99 +19 43.2	1.611	2.443	-1.74	-12.1	21.4

Periodic Comet Kohoutek (1975 III) Elements HBAA 1980, 100

Date ET	R. A. (1950) Decl.	Delta	r	Variation		m2
1980 08 09	23 27.34 +04 29.9	1.852	2.718	-1.20	-8.3	20.2
1980 08 19	23 22.50 +04 30.3					
1980 08 29	23 15.55 +04 13.7	1.622	2.601	-1.34	-9.7	19.7
1980 09 08	23 06.96 +03 40.5					
1980 09 18	22 57.59 +02 53.4	1.491	2.482	-1.38	-10.3	19.3

1980 09 28	22 48.56	+01 58.2						
1980 10 08	22 40.97	+01 01.8	1.464	2.364	-1.29	-9.9	19.1
1980 10 18	22 35.78	+00 11.4						
1980 10 28	22 33.59	-00 27.0	1.521	2.245	-1.15	-8.9	18.9
1980 11 07	22 34.64	-00 49.8						
1980 11 17	22 38.92	-00 54.7	1.626	2.129	-1.05	-7.8	18.8
1980 11 27	22 46.24	-00 41.0						
1980 12 07	22 56.30	-00 09.1	1.747	2.016	-1.01	-7.2	18.8
1980 12 17	23 08.86	+00 40.4						
1980 12 27	23 23.62	+01 46.1	1.864	1.909	-1.03	-6.9	18.7
1981 01 06	23 40.36	+03 06.6						
1981 01 16	23 58.91	+04 40.2	1.965	1.810	-1.09	-6.8	18.5
1981 01 26	00 19.13	+06 24.7						
1981 02 05	00 40.92	+08 17.9	2.048	1.724	-1.20	-6.8	18.4
1981 02 15	01 04.24	+10 16.9						
1981 02 25	01 29.01	+12 18.7	2.118	1.653	-1.33	-6.5	18.3
1981 03 07	01 55.21	+14 19.7						
1981 03 17	02 22.80	+16 16.1	2.181	1.602	-1.48	-5.6	18.2
1981 03 27	02 51.68	+18 03.9						
1981 04 06	03 21.74	+19 39.1	2.247	1.575	-1.61	-4.1	18.2
1981 04 16	03 52.81	+20 58.0						
1981 04 26	04 24.62	+21 57.2	2.322	1.573	-1.69	-1.9	18.3

Periodic Comet West-Kohoutek-Ikemura (1975 IV) Elements HBAA 1980, 99

Date	ET	R. A. (1950)	Decl.	Delta	r	Variation		m2
1980 08 29	00 06.08	-49 18.1	1.774	2.591	-1.93	-4.7	20.4
1980 09 08	23 56.21	-51 15.1						
1980 09 18	23 43.78	-52 35.1	1.696	2.460	-2.10	-2.2	20.1
1980 09 28	23 30.43	-53 08.8						
1980 10 08	23 18.10	-52 53.0	1.683	2.327	-1.98	+0.1	19.8
1980 10 18	23 08.63	-51 49.8						
1980 10 28	23 03.12	-50 06.0	1.713	2.192	-1.69	+0.6	19.6
1980 11 07	23 01.90	-47 48.7						
1980 11 17	23 04.82	-45 04.3	1.762	2.058	-1.43	-0.7	19.4
1980 11 27	23 11.38	-41 57.8						
1980 12 07	23 21.00	-38 32.5	1.812	1.927	-1.25	-3.2	19.1
1980 12 17	23 33.19	-34 50.2						
1980 12 27	23 47.46	-30 52.6	1.855	1.800	-1.15	-6.5	18.9
1981 01 06	00 03.46	-26 40.6						
1981 01 16	00 20.96	-22 15.3	1.890	1.681	-1.09	-10.2	18.6
1981 01 26	00 39.75	-17 38.3						
1981 02 05	00 59.72	-12 51.2	1.921	1.576	-1.08	-13.8	18.4
1981 02 15	01 20.84	-07 56.6						
1981 02 25	01 43.09	-02 57.5	1.955	1.491	-1.11	-17.0	18.2
1981 03 07	02 06.55	+02 02.4						
1981 03 17	02 31.29	+06 58.6	1.999	1.431	-1.18	-19.1	18.1
1981 03 27	02 57.43	+11 46.2						
1981 04 06	03 25.10	+16 20.0	2.058	1.403	-1.31	-19.8	18.0
1981 04 16	03 54.42	+20 34.6						
1981 04 26	04 25.44	+24 24.3	2.135	1.409	-1.49	-18.6	18.1
1981 05 06	04 58.16	+27 44.2						
1981 05 16	05 32.41	+30 29.7	2.231	1.449	-1.69	-15.5	18.4

Periodic Comet Reinmuth 1 (1979j) Elements MPC 4659

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	m2
1980 08 29	08 10.98	+18 16.4	2.800	2.050	34.5	16.2	19.3
1980 09 08	08 34.97	+17 18.6						
1980 09 18	08 58.75	+16 10.9	2.639	2.013	42.3	19.6	19.2
1980 09 28	09 22.20	+14 55.0						

1980 10 08	09 45.25	+13 32.4	2.471	1.990	50.4	22.8	19.1
1980 10 18	10 07.79	+12 05.6					
1980 10 28	10 29.74	+10 36.6	2.299	1.982	59.1	25.5	19.1
1980 11 07	10 51.02	+09 08.1					
1980 11 17	11 11.49	+07 42.6	2.123	1.988	68.6	27.6	19.0
1980 11 27	11 31.04	+06 22.9					
1980 12 07	11 49.51	+05 11.6	1.946	2.008	79.1	28.8	18.8
1980 12 17	12 06.68	+04 11.6					
1980 12 27	12 22.34	+03 25.3	1.769	2.042	91.2	28.8	18.7
1981 01 06	12 36.19	+02 55.2					
1981 01 16	12 47.90	+02 43.6	1.602	2.089	105.3	27.0	18.4
1981 01 26	12 57.14	+02 51.6					
1981 02 05	13 03.57	+03 19.9	1.456	2.147	121.9	23.0	18.2
1981 02 15	13 06.91	+04 07.4					
1981 02 25	13 07.12	+05 10.7	1.355	2.214	141.0	16.3	17.9
1981 03 07	13 04.37	+06 23.8					
1981 03 17	12 59.23	+07 38.3	1.327	2.290	160.5	8.3	17.7
1981 03 27	12 52.65	+08 44.6					
1981 04 06	12 45.72	+09 34.7	1.393	2.371	164.0	6.7	17.8
1981 04 16	12 39.53	+10 02.9					
1981 04 26	12 34.95	+10 07.7	1.556	2.458	146.5	13.1	18.3
1981 05 06	12 32.42	+09 50.5					
1981 05 16	12 32.15	+09 14.1	1.798	2.549	128.1	18.2	18.9
1981 05 26	12 34.05	+08 22.3					
1981 06 05	12 37.91	+07 18.5	2.096	2.643	111.6	20.9	19.3
1981 06 15	12 43.49	+06 05.6					
1981 06 25	12 50.52	+04 46.2	2.427	2.739	96.7	21.6	19.8
1981 07 05	12 58.78	+03 22.3					
1981 07 15	13 08.05	+01 55.4	2.774	2.836	83.0	20.8	20.1
1981 07 25	13 18.17	+00 27.0					
1981 08 04	13 29.00	-01 01.7	3.120	2.933	70.1	19.0	20.4
1981 08 14	13 40.42	-02 30.0					
1981 08 24	13 52.34	-03 56.8	3.452	3.031	57.5	16.3	20.6

Periodic Comet Gunn Elements IAUC 3057

Date ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	m2
1980 09 18	09 04.01	+24 23.4	4.990	4.323	44.0	9.3	19.8
1980 09 28	09 13.49	+23 59.5					
1980 10 08	09 22.38	+23 38.7	4.711	4.285	59.2	11.5	19.7
1980 10 18	09 30.54	+23 22.0					
1980 10 28	09 37.85	+23 10.6	4.388	4.246	75.3	13.1	19.5
1980 11 07	09 44.16	+23 05.7					
1980 11 17	09 49.29	+23 08.2	4.042	4.206	92.7	13.6	19.3
1980 11 27	09 53.09	+23 19.3					
1980 12 07	09 55.37	+23 39.5	3.701	4.163	111.4	12.7	19.0
1980 12 17	09 55.97	+24 09.1					
1980 12 27	09 54.78	+24 47.3	3.400	4.120	131.6	10.3	18.8
1981 01 06	09 51.77	+25 32.7					
1981 01 16	09 47.00	+26 22.4	3.176	4.074	152.6	6.4	18.6
1981 01 26	09 40.77	+27 12.7					
1981 02 05	09 33.47	+27 59.5	3.060	4.028	167.2	3.1	18.5
1981 02 15	09 25.73	+28 38.8					
1981 02 25	09 18.20	+29 07.4	3.066	3.979	153.9	6.3	18.4
1981 03 07	09 11.54	+29 23.7					
1981 03 17	09 06.29	+29 27.5	3.182	3.930	133.2	10.6	18.5
1981 03 27	09 02.80	+29 19.8					
1981 04 06	09 01.23	+29 01.8	3.374	3.879	113.2	13.7	18.5
1981 04 16	09 01.64	+28 35.1					
1981 04 26	09 03.90	+28 01.2	3.607	3.827	94.9	15.2	18.6

1981 05 06	09 07.87	+27 21.1					
1981 05 16	09 13.37	+26 35.7	3.846	3.773	78.3	15.2	18.7
1981 05 26	09 20.19	+25 45.5					
1981 06 05	09 28.14	+24 51.0	4.067	3.719	63.1	14.1	18.7
1981 06 15	09 37.06	+23 52.6					
1981 06 25	09 46.78	+22 50.4	4.250	3.663	48.9	12.1	18.8
1981 07 05	09 57.18	+21 44.8					
1981 07 15	10 08.14	+20 35.9	4.383	3.606	35.6	9.5	18.8

Periodic Comet Schwassmann-Wachmann 1 Elements MPC 4830

Date ET	R. A. (1950) Decl.	Delta	r	Elong.	Phase	m2
1980 10 28	10 23.38 +07 40.8	6.716	6.271	59.5	7.8	(19.1)
1980 11 07	10 27.69 +07 06.5					
1980 11 17	10 31.25 +06 35.8	6.416	6.275	77.4	8.8	(19.0)
1980 11 27	10 33.98 +06 09.2					
1980 12 07	10 35.79 +05 47.4	6.094	6.278	96.2	9.0	(18.9)
1980 12 17	10 36.60 +05 31.0					
1980 12 27	10 36.40 +05 20.4	5.785	6.282	116.2	8.1	(18.8)
1981 01 06	10 35.16 +05 15.8					
1981 01 16	10 32.93 +05 17.3	5.526	6.285	137.3	6.1	(18.7)
1981 01 26	10 29.84 +05 24.4					
1981 02 05	10 26.03 +05 36.5	5.357	6.289	159.1	3.2	(18.6)
1981 02 15	10 21.74 +05 52.4					
1981 02 25	10 17.24 +06 10.7	5.304	6.292	175.4	0.7	(18.6)
1981 03 07	10 12.81 +06 29.9					
1981 03 17	10 08.75 +06 48.5	5.376	6.295	155.5	3.8	(18.6)
1981 03 27	10 05.29 +07 05.0					
1981 04 06	10 02.62 +07 18.4	5.558	6.298	134.3	6.5	(18.7)
1981 04 16	10 00.88 +07 27.6					
1981 04 26	10 00.13 +07 32.2	5.821	6.300	114.2	8.4	(18.8)
1981 05 06	10 00.40 +07 31.8					
1981 05 16	10 01.64 +07 26.2	6.130	6.303	95.2	9.2	(18.9)
1981 05 26	10 03.82 +07 15.6					
1981 06 05	10 06.84 +07 00.1	6.448	6.306	77.4	9.0	(19.0)
1981 06 15	10 10.62 +06 39.8					
1981 06 25	10 15.07 +06 15.2	6.745	6.308	60.6	8.1	(19.1)

(1862) Apollo Elements MPC 4832

Date ET	R. A. (1950) Decl.	Delta	r	Elong.	Phase	Mag.
1980 11 01	16 21.31 -22 47.1	0.150	0.864	29.1	146.1	15.9
1980 11 02	16 28.60 -22 15.0					
1980 11 03	16 36.85 -21 35.9	0.130	0.883	30.4	145.3	15.6
1980 11 04	16 46.28 -20 48.1					
1980 11 05	16 57.14 -19 49.1	0.110	0.901	33.0	143.2	15.3
1980 11 06	17 09.76 -18 35.8					
1980 11 07	17 24.54 -17 03.8	0.092	0.920	37.6	138.9	14.8
1980 11 08	17 41.96 -15 07.5					
1980 11 09	18 02.58 -12 39.9	0.075	0.939	45.3	131.4	14.3
1980 11 10	18 26.99 -09 33.2					
1980 11 11	18 55.64 -05 41.1	0.063	0.958	57.8	119.0	13.6
1980 11 12	19 28.68 -01 02.8					
1980 11 13	20 05.58 +04 10.3	0.056	0.977	75.7	101.1	13.0
1980 11 14	20 44.96 +09 32.8					
1980 11 15	21 24.70 +14 32.1	0.057	0.996	95.7	81.1	12.6
1980 11 16	22 02.57 +18 43.3					
1980 11 17	22 36.93 +21 57.5	0.066	1.015	112.4	64.2	12.6
1980 11 18	23 06.98 +24 19.3					
1980 11 19	23 32.69 +25 59.5	0.080	1.035	123.9	52.5	12.8
1980 11 20	23 54.45 +27 09.0					

1980 11 21	00 12.83	+27 56.9	0.096	1.054	131.3	44.8	13.1
1980 11 22	00 28.39	+28 29.6					
1980 11 23	00 41.65	+28 51.9	0.115	1.073	135.9	39.8	13.4
1980 11 24	00 53.04	+29 07.0					
1980 11 25	01 02.89	+29 16.9	0.135	1.092	138.9	36.5	13.7
1980 11 26	01 11.48	+29 23.2					
1980 11 27	01 19.05	+29 26.9	0.155	1.111	140.7	34.3	14.0
1980 11 28	01 25.76	+29 28.7					
1980 11 29	01 31.76	+29 29.2	0.176	1.130	141.7	32.8	14.2
1980 11 30	01 37.16	+29 28.7					
1980 12 01	01 42.05	+29 27.6	0.198	1.149	142.2	31.8	14.5
1980 12 02	01 46.52	+29 25.9					
1980 12 03	01 50.62	+29 23.8	0.220	1.167	142.3	31.1	14.8
1980 12 04	01 54.41	+29 21.5					
1980 12 05	01 57.93	+29 19.1	0.242	1.186	142.1	30.7	15.0
1980 12 06	02 01.22	+29 16.5					
1980 12 07	02 04.30	+29 13.9	0.265	1.204	141.6	30.5	15.2
1980 12 12	02 17.45	+29 00.9					
1980 12 17	02 28.19	+28 49.7	0.385	1.294	137.5	30.9	16.2
1980 12 22	02 37.60	+28 40.8					
1980 12 27	02 46.26	+28 34.4	0.515	1.380	131.7	32.1	17.0
1981 01 01	02 54.53	+28 30.2					
1981 01 06	03 02.60	+28 28.1	0.654	1.462	125.4	33.2	17.7
1981 01 11	03 10.63	+28 27.9					
1981 01 16	03 18.69	+28 29.4	0.801	1.540	118.9	34.0	18.2
1981 01 21	03 26.81	+28 32.3					
1981 01 26	03 35.01	+28 36.2	0.956	1.613	112.5	34.3	18.7
1981 01 31	03 43.32	+28 40.9					
1981 02 05	03 51.74	+28 46.2	1.117	1.683	106.1	34.3	19.2
1981 02 10	04 00.29	+28 51.7					
1981 02 15	04 08.96	+28 57.4	1.283	1.748	99.8	33.8	19.5
1981 02 20	04 17.74	+29 02.9					
1981 02 25	04 26.61	+29 08.0	1.451	1.809	93.7	33.1	19.9
1981 03 02	04 35.59	+29 12.5					
1981 03 07	04 44.65	+29 16.4	1.621	1.865	87.6	32.1	20.1
1981 03 12	04 53.80	+29 19.4					
1981 03 17	05 03.03	+29 21.4	1.790	1.918	81.7	30.9	20.4

(2236) 1933 FX Elements MPC 5315

Date ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	Mag.
1980 03 02	14 38.76	-18 55.5	1.751	2.382	117.9	21.6	17.1
1980 03 12	14 40.04	-19 56.7					
1980 03 22	14 38.18	-20 50.0	1.502	2.333	137.2	16.9	16.6
1980 04 01	14 33.02	-21 33.1					
1980 04 11	14 24.71	-22 03.2	1.321	2.284	158.6	9.2	16.1
1980 04 21	14 13.93	-22 17.8					
1980 05 01	14 01.93	-22 16.8	1.235	2.234	169.8	4.6	15.8
1980 05 11	13 50.27	-22 03.4					
1980 05 21	13 40.45	-21 43.5	1.249	2.184	149.8	13.5	16.0
1980 05 31	13 33.64	-21 24.8					
1980 06 10	13 30.35	-21 13.6	1.343	2.134	129.1	21.7	16.3
1980 06 20	13 30.73	-21 14.0					
1980 06 30	13 34.60	-21 28.0	1.487	2.086	111.5	27.0	16.6
1980 07 10	13 41.61	-21 55.3					
1980 07 20	13 51.45	-22 34.7	1.652	2.039	96.8	29.7	16.8
1980 07 30	14 03.81	-23 24.1					
1980 08 09	14 18.40	-24 20.9	1.821	1.995	84.4	30.4	17.0

1976 YX1 Elements MPC 5321

Date ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	Mag.
1980 04 11	19 09.05	-23 10.5	3.232	3.466	95.0	16.7	18.6
1980 04 21	19 13.92	-23 04.4					
1980 05 01	19 16.96	-23 01.2	2.921	3.438	112.7	15.7	18.4
1980 05 11	19 18.00	-23 01.6					
1980 05 21	19 16.91	-23 05.9	2.647	3.408	132.0	12.7	18.1
1980 05 31	19 13.68	-23 13.8					
1980 06 10	19 08.43	-23 24.4	2.440	3.378	153.2	7.8	17.8
1980 06 20	19 01.49	-23 36.5					
1980 06 30	18 53.39	-23 48.2	2.331	3.346	175.6	1.3	17.3
1980 07 10	18 44.86	-23 58.2					
1980 07 20	18 36.68	-24 05.3	2.334	3.313	161.3	5.6	17.5
1980 07 30	18 29.64	-24 09.5					
1980 08 09	18 24.31	-24 11.1	2.442	3.279	139.4	11.6	17.8
1980 08 19	18 21.10	-24 10.6					
1980 08 29	18 20.20	-24 08.7	2.630	3.244	119.2	15.8	18.0
1980 09 08	18 21.60	-24 05.6					
1980 09 18	18 25.22	-24 01.2	2.863	3.209	100.9	17.9	18.2

1965 WJ Elements MPC 5317

Date ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	Mag.
1980 04 11	19 29.17	-25 12.8	3.715	3.860	90.7	15.0	18.6
1980 04 21	19 33.69	-25 26.5					
1980 05 01	19 36.55	-25 45.4	3.407	3.849	108.6	14.4	18.4
1980 05 11	19 37.60	-26 09.8					
1980 05 21	19 36.70	-26 39.7	3.130	3.837	127.9	12.0	18.2
1980 05 31	19 33.83	-27 14.4					
1980 06 10	19 29.05	-27 52.3	2.918	3.822	148.7	7.9	17.9
1980 06 20	19 22.58	-28 31.3					
1980 06 30	19 14.85	-29 08.5	2.802	3.806	169.2	2.9	17.6
1980 07 10	19 06.43	-29 41.3					
1980 07 20	18 58.02	-30 07.8	2.801	3.788	163.9	4.3	17.7
1980 07 30	18 50.34	-30 26.9					
1980 08 09	18 43.98	-30 38.8	2.911	3.768	142.7	9.4	17.9
1980 08 19	18 39.41	-30 44.3					
1980 08 29	18 36.90	-30 44.7	3.108	3.746	122.3	13.2	18.1
1980 09 08	18 36.51	-30 41.2					
1980 09 18	18 38.23	-30 34.8	3.360	3.723	103.4	15.2	18.3

1950 FC Elements MPC 5275

Date ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	Mag.
1980 05 01	20 06.94	-28 40.4	2.059	2.480	102.4	23.4	17.6
1980 05 11	20 12.67	-28 27.2					
1980 05 21	20 15.48	-28 19.8	1.861	2.520	119.6	20.4	17.3
1980 05 31	20 15.19	-28 17.8					
1980 06 10	20 11.71	-28 20.1	1.704	2.560	139.3	15.0	17.0
1980 06 20	20 05.17	-28 23.7					
1980 06 30	19 56.14	-28 24.9	1.618	2.600	160.9	7.3	16.8
1980 07 10	19 45.50	-28 19.7					
1980 07 20	19 34.45	-28 05.7	1.631	2.640	171.2	3.4	16.7
1980 07 30	19 24.28	-27 42.3					
1980 08 09	19 16.04	-27 11.0	1.749	2.678	150.4	10.8	17.1
1980 08 19	19 10.40	-26 34.3					
1980 08 29	19 07.67	-25 54.8	1.957	2.716	129.7	16.6	17.5
1980 09 08	19 07.81	-25 14.0					
1980 09 18	19 10.61	-24 32.7	2.224	2.752	111.2	19.9	17.9
1980 09 28	19 15.76	-23 51.0					
1980 10 08	19 22.93	-23 08.2	2.524	2.787	94.6	20.9	18.2

1975 EV1 Elements MPC 5317

Date ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	Mag.
1980 05 01	20 26.45	-19 28.4	2.559	2.848	96.1	20.6	18.8
1980 05 11	20 32.08	-19 10.3					
1980 05 21	20 35.59	-18 59.4	2.294	2.849	113.3	19.1	18.5
1980 05 31	20 36.77	-18 57.0					
1980 06 10	20 35.46	-19 03.8	2.062	2.848	132.5	15.2	18.2
1980 06 20	20 31.58	-19 19.7					
1980 06 30	20 25.30	-19 43.5	1.895	2.844	154.0	9.0	17.9
1980 07 10	20 17.02	-20 12.6					
1980 07 20	20 07.45	-20 43.6	1.822	2.838	177.4	0.9	17.3
1980 07 30	19 57.57	-21 12.8					
1980 08 09	19 48.38	-21 37.5	1.859	2.829	158.9	7.4	17.8
1980 08 19	19 40.83	-21 55.9					
1980 08 29	19 35.59	-22 07.4	1.997	2.818	136.7	14.2	18.1
1980 09 08	19 32.97	-22 12.3					
1980 09 18	19 33.08	-22 11.0	2.207	2.805	116.7	18.7	18.4
1980 09 28	19 35.80	-22 03.8					
1980 10 08	19 40.89	-21 50.8	2.455	2.790	98.9	20.7	18.7

1977 RX7 Elements MPC 5318

Date ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	Mag.
1980 05 01	20 23.02	-13 17.4	2.122	2.434	95.5	24.3	18.1
1980 05 11	20 31.06	-12 27.1					
1980 05 21	20 37.01	-11 42.0	1.856	2.411	110.9	23.1	17.8
1980 05 31	20 40.60	-11 04.5					
1980 06 10	20 41.55	-10 37.3	1.617	2.386	128.5	19.5	17.4
1980 06 20	20 39.65	-10 23.1					
1980 06 30	20 34.90	-10 23.8	1.431	2.359	148.6	13.0	16.9
1980 07 10	20 27.57	-10 40.2					
1980 07 20	20 18.29	-11 11.4	1.326	2.331	169.1	4.7	16.5
1980 07 30	20 08.17	-11 54.2					
1980 08 09	19 58.45	-12 44.1	1.319	2.302	161.3	8.1	16.6
1980 08 19	19 50.40	-13 35.9					
1980 08 29	19 45.01	-14 25.1	1.406	2.272	139.7	16.7	16.9
1980 09 08	19 42.76	-15 08.3					
1980 09 18	19 43.83	-15 43.3	1.562	2.241	120.1	22.8	17.2
1980 09 28	19 48.10	-16 08.6					
1980 10 08	19 55.23	-16 23.3	1.757	2.210	103.1	26.1	17.5

1932 BH Elements MPC 5275

Date ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	Mag.
1980 05 01	20 38.88	-19 10.7	3.634	3.826	93.2	15.2	19.1
1980 05 11	20 42.80	-19 01.6					
1980 05 21	20 45.12	-18 58.8	3.322	3.805	111.1	14.4	18.8
1980 05 31	20 45.71	-19 03.0					
1980 06 10	20 44.49	-19 14.5	3.044	3.783	130.4	11.8	18.6
1980 06 20	20 41.44	-19 33.0					
1980 06 30	20 36.66	-19 57.6	2.834	3.758	151.5	7.4	18.3
1980 07 10	20 30.41	-20 26.5					
1980 07 20	20 23.11	-20 57.3	2.721	3.733	173.7	1.7	17.9
1980 07 30	20 15.34	-21 27.4					
1980 08 09	20 07.73	-21 54.6	2.723	3.705	163.2	4.5	18.1
1980 08 19	20 00.93	-22 16.9					
1980 08 29	19 55.50	-22 33.3	2.835	3.676	141.1	9.9	18.3
1980 09 08	19 51.82	-22 43.6					
1980 09 18	19 50.10	-22 47.9	3.033	3.645	120.4	13.8	18.5
1980 09 28	19 50.42	-22 46.4					
1980 10 08	19 52.71	-22 39.4	3.281	3.613	101.4	15.7	18.7

1957 HJ Elements MPC 4643

Date ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	Mag.
1980 06 10	23 17.30	+04 02.3	2.927	3.049	87.1	19.4	17.3
1980 06 20	23 23.18	+05 08.0					
1980 06 30	23 27.49	+06 05.4	2.670	3.060	102.8	18.9	17.1
1980 07 10	23 30.05	+06 52.9					
1980 07 20	23 30.69	+07 28.4	2.431	3.071	120.3	16.6	16.8
1980 07 30	23 29.33	+07 50.0					
1980 08 09	23 26.00	+07 56.0	2.239	3.082	139.6	12.3	16.6
1980 08 19	23 20.88	+07 45.4					
1980 08 29	23 14.40	+07 18.4	2.126	3.093	159.7	6.5	16.3
1980 09 08	23 07.12	+06 37.2					
1980 09 18	22 59.81	+05 45.4	2.116	3.103	167.1	4.1	16.2
1980 09 28	22 53.22	+04 48.4					
1980 10 08	22 47.99	+03 51.7	2.216	3.113	148.8	9.6	16.5
1980 10 18	22 44.59	+03 00.4					
1980 10 28	22 43.26	+02 18.4	2.409	3.123	128.2	14.5	16.8
1980 11 07	22 44.03	+01 48.0					
1980 11 17	22 46.84	+01 30.3	2.666	3.132	109.1	17.4	17.1

(2244) 1952 UW1 Elements MPC 5320

Date ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	Mag.
1980 06 10	23 08.86	-10 57.6	2.351	2.639	94.8	22.5	17.9
1980 06 20	23 17.54	-10 42.1					
1980 06 30	23 24.65	-10 39.9	2.070	2.602	110.1	21.5	17.6
1980 07 10	23 29.91	-10 52.9					
1980 07 20	23 33.06	-11 22.4	1.819	2.565	127.3	18.4	17.2
1980 07 30	23 33.85	-12 08.7					
1980 08 09	23 32.17	-13 10.3	1.621	2.530	146.6	12.8	16.8
1980 08 19	23 28.05	-14 23.4					
1980 08 29	23 21.89	-15 41.3	1.505	2.495	165.7	5.7	16.4
1980 09 08	23 14.37	-16 55.8					
1980 09 18	23 06.48	-17 58.0	1.488	2.463	162.0	7.2	16.4
1980 09 28	22 59.37	-18 41.0					
1980 10 08	22 53.97	-19 01.1	1.569	2.433	141.6	14.8	16.6
1980 10 18	22 50.99	-18 57.7					
1980 10 28	22 50.73	-18 32.3	1.725	2.405	122.0	20.5	17.0
1980 11 07	22 53.21	-17 47.8					
1980 11 17	22 58.25	-16 46.8	1.927	2.379	104.7	23.7	17.3

(2226) 1936 QC1 Elements MPC 5273

Date ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	Mag.
1980 06 30	23 49.51	-04 11.2	2.273	2.676	102.0	21.8	17.9
1980 07 10	23 55.06	-03 42.4					
1980 07 20	23 58.62	-03 26.5	2.025	2.665	118.7	19.5	17.6
1980 07 30	23 59.97	-03 24.4					
1980 08 09	23 58.96	-03 36.6	1.817	2.656	137.7	14.9	17.3
1980 08 19	23 55.57	-04 02.4					
1980 08 29	23 50.04	-04 39.2	1.680	2.649	159.3	7.8	16.9
1980 09 08	23 42.88	-05 23.1					
1980 09 18	23 34.88	-06 08.3	1.639	2.642	175.7	1.7	16.5
1980 09 28	23 27.05	-06 48.6					
1980 10 08	23 20.30	-07 18.7	1.705	2.637	153.4	9.8	17.0
1980 10 18	23 15.41	-07 34.9					
1980 10 28	23 12.85	-07 35.5	1.864	2.633	131.9	16.3	17.3
1980 11 07	23 12.77	-07 20.6					
1980 11 17	23 15.15	-06 50.8	2.087	2.631	112.6	20.3	17.7
1980 11 27	23 19.78	-06 07.7					
1980 12 07	23 26.39	-05 12.8	2.344	2.630	95.6	21.9	18.0