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

ERRATA.

MPC	Line	
3034	-29	For JUM read JUN
3542	20	For 1935 SM1 = 1955 FU = 1959 EB read 1935 SM1 = 1959 EB
3542	22 to 24	The statement should read: The 1955 Mar. 21 observation erroneously attributed to 1955 FU belongs to (1833).
3548	-23	For 1967 JUNE 10 read 1967 MAY 30 AND JUNE 10
3628	-11	For L. C. ZHURAVLEVA read L. V. ZHURAVLEVA
3683	-27	For SEP 20.28 read SEP 20.29
3758	-34	For C. U. CESCO read C. U. CESCO AND A. G. SAMUEL.
3935	- 3	For C. U. CESCO read C. U. CESCO AND A. G. SAMUEL.
3988	- 2	The erratum is incorrect. The name (1760) Sandra, as originally given on MPC 3934, is correct.
4027	-29	For R. SATHERS AND C. VESLEY read R. SATHER AND C. VESELY
4338	10	For 1938 YA read 1939 YA
4345	-38	For G 16.0 read G 14.0
4345	- 9	For 1978 AD read 1978 AE
4406	- 3	For 1942 SEPT. 11 read 1942 SEPT. 8
4406	- 1	Add: The identification 1942 RQ = 1974 OK was independently found by E. Bowell.
4409	-18	Add: The identifications 1965 UV = 1951 AG = 1975 BD1 were independently found by H. Oishi.
4418	-18	For 1907-1973 read 1907-1975
4419	-16	For 492-500 read 429-500
4424	16	For V. LAIHO read V. LAIHO, J. SUOMINEN
4474	11 to 13	The statement should read: The identifications 1935 CK = 1970 PK, 1935 CK = 1974 UK and 1970 PK = 1974 UK were found by H. Oishi, P. Wild and B. G. Marsden, respectively.
4492	-29	For J. JOHNSON, STUART read J. JOHNSTON, B. STUART
4501	- 6	For 770820 read 780820
4547	- 2	For PRECIPITATION read PRECIPITATION PATENT
4578	23	For B(1,0) 13.9 read B(1,0) 12.9
4660	-18	For B(1,0) 18.5 read B(1,0) 20.4
4677	-19	For MPC 4499 read MPC 4501
4737	- 6	For (531) Zerlina read (790) Pretoria
4738	13	For (790) Pretoria read (796) Sarita
4738	19	For (796) Sarita read (531) Zerlina
4765	- 4	Add: The identification 1958 WA = (867) was originally published on MPC 3008.
5014	12, 14	For Kukkamaki read Kukkamaki
5275	- 6	For 340810 078 read 340810 024
5277	- 2	Add: The identification (1229) = 1976 KB1 was independently suggested by E. Bowell.

5281 16, 18 For Honkaselo read Honkasalo
5281 15, 35 For Torun Ursa read Turun Ursa
5333 - 3 For 3543 read MPC 3543

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CORRECTED OBSERVATIONS.

The following observations correct those previously published.

Object	Date	UT	R. A. (1950)	Decl.	Reference	Mag.	N	Obs.
/1965 I	1965	01 06.68004	06 44 28.80	+27 07 16.3	MPC 4947		1	324
/1965 I	1965	01 07.72778	06 44 25.99	+27 29 13.4	MPC 4947		1	324
/1965 I	1965	01 11.86250	06 44 25.28	+28 55 16.9	MPC 4947		1	324
/1965 I	1965	03 04.52569	07 38 52.78	+37 43 52.3	MPC 4947		1	324
/1965 I	1965	04 06.72049	08 54 04.41	+33 41 56.7	MPC 4947		1	324
/1965 I	1965	04 23.58438	09 32 24.49	+30 00 30.4	MPC 4947		1	324
/1965 II	1965	03 09.62604	08 04 07.27	+12 39 06.3	MPC 4947		1	324
/1965 II	1965	04 24.58750	09 02 29.33	+08 46 54.6	MPC 4947		1	324
/1978m	1978	11 29.46181	00 35 47.1	-38 32 21	MPC 4597	13.5T		372
7	1976	07 19.61076	20 19 31.33	-13 04 56.6	MPC 4240			420
225	1958	10 16.16	23 47.4	+05 36	MPC 1881	13.0		760
269	1941	03 21.95360	11 51 47.20	+04 22 19.8	MPC 3222		2	020
358	1949	08 01.29410	22 37 06.68	-06 24 37.2	MPC 4359	14.7	3	760
358	1949	08 01.32331	22 37 05.81	-06 24 43.7	MPC 4359		3	760
628	1978	04 30.88895	12 58 42.30	+12 45 25.5	MPC 4527			519
628	1978	04 30.89208	12 58 42.19	+12 45 25.7	MPC 4527			519
628	1978	04 30.89451	12 58 42.09	+12 45 25.6	MPC 4527			519
628	1978	04 30.90909	12 58 41.51	+12 45 25.5	MPC 4527			519
628	1978	05 03.86875	12 56 49.67	+12 44 58.4	MPC 4527			519
628	1978	05 03.87152	12 56 49.51	+12 44 59.0	MPC 4527			519
628	1978	05 03.87673	12 56 49.30	+12 44 58.5	MPC 4527			519
628	1978	05 03.89479	12 56 48.66	+12 44 57.5	MPC 4527			519
628	1978	05 04.90388	12 56 12.88	+12 44 18.5	MPC 4527			519
628	1978	05 04.90944	12 56 12.69	+12 44 17.7	MPC 4527			519
628	1978	05 04.92541	12 56 12.12	+12 44 16.8	MPC 4527			519
628	1978	05 04.92819	12 56 12.05	+12 44 18.0	MPC 4527			519
737	1978	06 18.9236	19 36 09.39	+01 15 26.8	MPC 4686			550
737	1978	06 18.9792	19 36 08.05	+01 15 39.7	MPC 4686			550
740	1936	07 23.91751	20 18 51.02	-21 02 48.0	MPC 3230		4	020
740	1936	07 23.95421	20 18 49.86	-21 03 02.4	MPC 3230		4	020
740	1936	07 30.04416	20 13 56.62	-21 34 31.6	MPC 3230		4	020
740	1936	07 30.07819	20 13 54.93	-21 34 43.0	MPC 3230		4	020
755	1949	08 21.23750	22 21 47.80	-08 05 59.0	MPC 354	14.8	3	760
755	1949	08 21.27083	22 21 46.25	-08 06 09.5	MPC 354		3	760
960	1958	10 16.15629	23 43 55.77	+03 50 57.9	MPC 2639			760
960	1958	10 16.19998	23 43 54.49	+03 50 41.8	MPC 2639			760
975	1941	03 21.95360	11 52 49.58	+03 36 15.1	MPC 3209		2	020
1069	1978	04 30.96013	15 01 05.93	+03 48 36.2	MPC 4527			519
1069	1978	04 30.96916	15 01 05.42	+03 48 37.8	MPC 4527			519
1069	1978	04 30.98270	15 01 04.88	+03 48 41.6	MPC 4527			519
1069	1978	04 30.98687	15 01 04.77	+03 48 41.6	MPC 4527			519
1069	1978	05 03.91840	14 58 55.60	+04 01 20.6	MPC 4527			519
1069	1978	05 03.92222	14 58 55.40	+04 01 22.4	MPC 4527			519
1069	1978	05 03.93819	14 58 54.69	+04 01 25.4	MPC 4527			519
1069	1978	05 03.97118	14 58 53.25	+04 01 33.9	MPC 4527			519
1069	1978	05 04.94833	14 58 09.92	+04 05 27.8	MPC 4527			519
1069	1978	05 04.95284	14 58 09.73	+04 05 28.2	MPC 4527			519
1069	1978	05 04.96916	14 58 08.98	+04 05 31.5	MPC 4527			519

1069		1978 05 04.97263	14 58 08.80	+04 05 33.0	MPC 4527			519
1111		1955 10 12.55	23 10 06	-09 42.3	MPC 1395	13		388
1463		1958 10 16.15629	23 43 49.64	+05 41 51.0	MPC 2239			760
1463		1958 10 16.19998	23 43 48.18	+05 41 40.9	MPC 2239			760
1488		1958 10 16.15629	23 43 21.81	+00 57 57.5	MPC 2239			760
1488		1958 10 16.19998	23 43 20.18	+00 57 51.0	MPC 2239			760
1628		1923 09 18.01547	00 10 00.08	+02 04 33.2	MPC 4276			045
1937	WG	1937 12 03.99095	04 08 54.64	+11 41 19.8	MPC 3232			020
1937	WG	1937 12 04.02246	04 08 52.97	+11 41 06.1	MPC 3232			020
1953	FJ1	1953 03 21.27884	12 34 17.34	+01 57 15.1	MPC 4731		5	760
1953	FJ1	1953 03 21.32329	12 34 14.09	+01 57 26.9	MPC 4731		5	760
1956	UD	1956 10 28.16457	01 38 21.10	+19 19 38.4	MPC 4189		6	760
1956	UD	1956 10 28.20762	01 38 18.74	+19 19 33.9	MPC 4189		6	760
1958	RQ	1958 09 11.35069	22 46 30	+01 06 18	MPC 3268			690
1958	UA	1958 10 16.15629	23 55 11.48	+01 26 53.2	MPC 2462		7	760
1958	UA	1958 10 16.19998	23 55 10.20	+01 26 43.2	MPC 2462		7	760
1958	UB	* 1958 10 16.16	23 48.2	+06 13	MPC 1882	16.7		760
1958	UC	* 1958 10 16.16	23 47.7	+06 07	MPC 1882	16.3		760
1958	UD	1958 10 16.19998	23 52 05.38	+03 10 05.0	MPC 3092			760
1958	UE	* 1958 10 16.16	23 38.8	+04 13	MPC 1882	12.3	8	760
1958	UF	* 1958 10 16.16	23 43.6	+08 01	MPC 1882	16.6		760
1961	RB	* 1961 09 13.24139	00 21.0	+03 26	MPC 2140	15		012
1961	TA	* 1961 10 07.97506	23 14 51.62	+05 38 50.8	MPC 2122			012
1966	HE	* 1966 04 23.00632	15 34 20.82	-09 10 59.1	MPC 2659		9	095
1967	GP	* 1967 04 02.21300	13 12 18.91	-06 15 08.6	MPC 2908			808
1968	HK1	1968 04 27.98487	14 59 56.92	-04 32 22.1	MPC 2946	16.0	A	095
1971	TZ2	* 1971 10 14.96917	03 16 29.70	+31 03 20.0	MPC 3515	17.0	B	095
1973	FK2	1973 03 31.96174	11 37 13.40	+05 21 00.5	MPC 4164		C	049
1973	SD	1973 09 20.29256	00 14 36.63	+15 31 48.2	MPC 3655			675
1974	HL1	* 1974 04 24.13485	12 04 48.39	-04 06 18.2	MPC 3868	16		805
1974	XT	* 1974 12 14.22441	06 37 53.70	-06 54 53.2	MPC 4916	17.2		808
1975	EL2	* 1975 03 08.86610	10 25 19.62	+10 20 51.8	MPC 4201	17.0	D	095
1975	TB	* 1975 10 03.17560	00 57 50.10	-33 53 48.7	MPC 4046		E	809
1976	AA	1976 01 21.50000	05 13 57.97	+45 51 05.3	MPC 4046	14.5	F	885
1976	AA	1976 01 21.50139	05 13 57.17	+45 51 14.9	MPC 4046		F	885
1976	AA	1976 01 23.41200	04 57 50.72	+48 50 23.3	MPC 4046	15	F	885
1976	AA	1976 01 23.41866	04 57 47.27	+48 50 59.2	MPC 4046		F	885
1976	UY	* 1976 10 31.34124	08 31 25.78	+09 52 08.3	MPC 4146	19.3		809
1976	UA1	* 1976 10 31.34124	08 31 13.43	+08 07 38.9	MPC 4146	19.3		809
1977	HE	* 1977 04 22.11594	11 09 46.38	-00 07 38.7	MPC 4333	19		801
1977	LA	1977 07 09.37998	16 01 30.85	-31 01 48.3	MPC 4302	15.8	G	485
1977	RC	* 1977 09 05.20811	00 08 21.79	-39 52 53.4	MPC 4308	16.5		809
1977	RC	1977 09 06.13542	00 08 17.03	-40 22 07.0	MPC 4308			809
1977	RC	1977 09 07.28470	00 08 08.22	-40 58 01.8	MPC 4308			809
1977	RL	* 1977 09 05.20811	00 12 25.71	-39 04 14.0	MPC 4308	17.5		809
1977	RN	* 1977 09 05.20811	00 24 15.06	-38 31 54.8	MPC 4308	17.5		809
1977	TL3	1978 11 30.60061	03 31 34.37	+13 21 13.0	MPC 4984		H	330
1977	VD	* 1977 11 12.27609	03 01 22.17	+19 53 25.2	MPC 4334	16.5		801

Note 1: observations made at Peking Observatory, Shaho Station, new observatory code 324, Long. and Parallax 116.33, -327, -273 (see MPC 4766). 2: these observations were erroneously interchanged. 3: the erratum on MPC 4359 should refer to lines 27 and 35, not to lines 18 and 22: on MPC 354 the Aug. 1 observations are correct, but the Aug. 21 observations were erroneously attributed to (358). 4: these observations were erroneously designated 1936 OD. 5: observations erroneously designated 1953 FJ. 6: observations erroneously designated (1642). 7: 1958 UA = (2096); the erratum on MPC 2527 is incorrect. 8: 1958 UE = (137). 9: 1966 HE = (1842). A: observation erroneously designated 1968 KH1. B:

1971 TZ2 = (1971); this observation was erroneously designated 1971 TX2. C: observation erroneously designated 1975 FK2. D: observation erroneously designated 1976 EL2. E: 1975 TB = (2100). F: 1976 AA = (2062). G: 1977 LA = (2130). H: 1977 TL3 = (2223).

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DELETED OBSERVATIONS.

The following observations are to be deleted.

Object		Date	UT	R. A. (1950)	Decl.	Reference	Obs.
85		1977 12	05.03679	06 29 54.88	+30 10 45.6	MPC 4685	542
85		1977 12	07.93611	06 27 15.72	+30 19 34.1	MPC 4685	542
85		1978 01	31.80385	05 35 33.61	+30 26 33.0	MPC 4685	542
85		1978 01	31.82907	05 35 33.47	+30 26 22.4	MPC 4685	542
1642		1940 02	16.03994	12 05 32.52	-02 36 42.0	MPC 3229	020
1642		1940 02	16.08357	12 05 31.38	-02 36 34.3	MPC 3229	020
1933 JB	*	1933 05	15.95463	13 00 13.60	-05 34 34.4	MPC 5189	012
1949 DG		1949 03	01.98	09 16.5	+18 06	MPC 291	062
1976 KX1	*	1976 05	30.88811	14 47 35.70	-07 39 30.5	MPC 4441	095
1976 UY	*	1976 10	24.31880	08 24 48.37	+10 57 38.0	MPC 4146	809
1976 UY		1976 10	24.33577	08 24 52.71	+10 58 01.8	MPC 4146	809
1976 UA1	*	1976 10	24.33577	08 20 28.94	+08 52 13.3	MPC 4146	809
1976 UA1		1976 10	25.31607	08 21 55.46	+08 47 05.3	MPC 4146	809
1979 XF	*	1979 12	14.32708	08 57 07.20	+17 06 11.2	MPC 5172	688
1980 ED		1980 03	16.21042	10 08 52.54	+14 37 32.5	MPC 5263	688

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IDENTIFICATION CHANGES.

Continuation to MPC 5333.

Object		Date	UT	R. A. (1950)	Decl.	Old desig.	Mag.	Obs.
1928 JC	*	1928 05	13.88819	10 26 06.11	+12 21 08.7	1928 DB1	16.5	024
1937 VQ	*	1937 11	10.05	04 02.5	+19 04	1937 VD	13.7	094
1940 GB1	*	1940 04	07.84830	11 11 24.05	-01 12 47.3	1642		020
1940 GB1		1940 04	11.88578	11 08 56.12	-00 53 41.7	1642		020
1948 UJ	*	1948 10	27.93	01 22.6	+07 40	975		062
1950 EY	*	1950 03	07.85	08 11.2	+23 04	975		062
1951 AV1	*	1951 01	13.0100	08 24.4	+00 09	1275		119
1951 AV1		1951 01	13.9713	08 23.5	+00 11	1275		119
1952 FM1	*	1952 03	23.1	13 50.8	-07 31	1275		020
1955 BX	*	1955 01	26.1	10 18.1	+14 33	975		020
1955 FY1	*	1955 03	17.51111	09 35 08.86	+17 48 15.6	975		388
1955 TC1	*	1955 10	12.55000	23 10 28.74	-09 53 14.9	1111	13.5	388
1960 QD	*	1960 08	23.87824	20 25 48.15	-16 49 16.9	1260		020
1961 UT	*	1961 10	18.39745	04 15 52.40	+03 42 34.8	1580		689
1962 BG	*	1962 01	31.04860	12 13 39.86	+04 17 04.7	1962 BF		043
1964 XM	*	1964 12	03.50903	00 47 04.37	+07 53 49.2	1964 WD1		330
1965 GE	*	1965 04	12.13472	12 42.4	-02 33	975		808
1965 JJ	*	1965 05	02.89412	12 27 30.71	-00 48 26.0	1275		095
1966 UA1	*	1966 10	19.91874	00 48 40.17	+03 47 33.5	1651		020
1966 UA1		1966 10	19.93951	00 48 38.56	+03 47 20.9	1651		020
1967 KD	*	1967 05	30.91633	14 32 01.01	-15 38 20.0	1462		020
1967 KD		1967 05	30.93019	14 32 00.43	-15 38 16.4	1462		020
1967 KD		1967 06	10.87235	14 27 54.71	-15 18 46.1	1462		020

1967 KD		1967 06 10.89451	14 27 54.28	-15 18 47.5	1462					020
1969 PX	*	1969 08 14.02491	22 14 19.58	-10 28 34.0	1489					020
1969 PX		1969 08 14.04222	22 14 18.95	-10 28 44.2	1489					020
1969 PX		1969 08 19.97800	22 09 53.94	-10 59 24.6	1489					020
1969 PX		1969 08 19.99947	22 09 53.59	-10 59 28.3	1489					020
1970 SO1	*	1970 09 28.95998	23 00 23.18	+01 28 43.0	937					012
1970 SO1		1970 09 29.00291	23 00 21.98	+01 28 17.2	937					012
1973 SU6	*	1973 09 17.84027	22 53 31.90	-20 18 58.2	1619					073
1973 SU6		1973 09 17.85343	22 53 31.39	-20 18 57.3	1619					073
1975 RB2	*	1975 09 04.89855	23 07 39.50	+18 05 11.0	1306					095
1975 VN9	*	1975 11 06.87965	02 22 52.58	+13 54 36.8	1975	TP4	17.0			095

* * * * *

IDENTIFICATIONS.

The following list of identifications with numbered minor planets continues that on MPC 5333.

	Note		Note		Note
1933 WO =	(1428) 1	1937 JL =	(1990) 1	1938 FP =	(1424) 2
1949 DG =	(2248) 3	1958 XS =	(1512) 1	1958 XX =	(543) 1
1960 DB =	(2142) 1	1962 BF =	(210) 1	1964 WD1 =	(1610) 1
1966 QF =	(761) 1	1968 HJ1 =	(1937) 1		

Note 1: identification by E. Bowell. 2: identification by C. M. Bardwell. 3: identification by T. Urata and S. Nakano (NOC 1112).

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OBSERVATIONS MADE AT CAUSSOLS BY CHEMIN. MEASURED BY C. POLLAS AND M. T. DEMOULIN. REDUCED BY M. ROUSSEAU AT BORDEAUX.

Object	Date	UT	R. A. (1950)	Decl.	Obs.
1979 VA	1979 11	17.87907	01 50 04.83	+24 49 16.7	010
1979 VA	1979 11	17.94574	01 50 30.39	+24 48 38.5	010
1979 VA	1979 11	17.98009	01 50 43.66	+24 48 21.8	010

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

Object	Date	UT	R. A. (1950)	Decl.	Obs.
/1980d	1980 05	11.88333	13 07 44.74	+11 12 51.7	026
/1980d	1980 05	12.01944	13 07 40.22	+11 12 02.0	026
/1980d	1980 05	20.02778	13 04 14.37	+10 14 46.4	026

OBSERVATIONS MADE AT SONNEBERG BY H. GESSNER. COMMUNICATED BY W. WENZEL.

Object	Date	UT	R. A. (1950)	Decl.	Mag.	Obs.
154	1979 03	22.8137	05 31 53.63	+43 17 31.7	14.0	031
154	1979 03	22.8555	05 31 56.45	+43 17 23.8		031
186	1975 02	10.8269	05 45 25.57	+41 27 42.0	13.5	031
186	1975 02	10.8971	05 45 25.17	+41 27 18.6		031

OBSERVATIONS MADE AT TAUTENBURG BY F. BORNGEN AND K. KIRSCH.

Object	Date	UT	R. A. (1950)	Decl.	Mag.	Obs.
1980 GS	1980 04	12.96944	13 07 33.54	+28 11 04.6		033
1980 GS *	1980 04	12.99236	13 07 32.57	+28 11 18.7	14	033
1980 GS	1980 04	13.97153	13 06 53.59	+28 21 17.4		033
1980 GS	1980 04	14.04792	13 06 50.60	+28 22 02.1		033
1980 GS	1980 04	14.06840	13 06 49.67	+28 22 14.1		033
1980 GT *	1980 04	12.99236	12 57 29.37	+28 52 17.6	17	033

1980 GT 1980 04 13.97153 12 56 40.96 +28 51 21.5 033
1980 GT 1980 04 14.04792 12 56 37.55 +28 51 16.1 033

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

Object		Date	UT	R. A. (1950)	Decl.	Mag.	N Obs.
/1980d		1980 06	09.93280	13 02 57.82	+06 50 42.7	16.0T	046
/1980d		1980 06	09.94704	13 02 58.07	+06 50 35.4		046
/1980d		1980 06	11.89396	13 03 25.00	+06 28 26.0		046
/1980d		1980 06	11.90819	13 03 25.22	+06 28 17.2		046
/1980d		1980 06	12.89455	13 03 41.31	+06 16 56.4		046
/1980d		1980 06	12.90890	13 03 41.37	+06 16 51.1		046
/1980d		1980 06	14.90080	13 04 18.06	+05 53 29.8		046
/1980d		1980 06	14.91503	13 04 18.12	+05 53 19.9		046
300		1980 05	10.89764	13 23 23.43	-08 32 13.0		046
300		1980 05	10.91182	13 23 22.91	-08 32 09.8		046
300		1980 05	15.86709	13 20 51.11	-08 18 10.8		046
300		1980 05	15.88122	13 20 50.61	-08 18 08.8		046
300		1980 05	16.93498	13 20 21.44	-08 15 28.3		046
300		1980 05	16.94921	13 20 21.04	-08 15 26.4		046
1020		1980 04	12.86057	11 36 44.84	+02 55 25.2		046
1020		1980 04	12.87475	11 36 44.36	+02 55 30.8		046
1167		1980 06	12.01913	19 23 55.69	-15 11 58.8	15.8	046
1167		1980 06	12.03366	19 23 55.22	-15 11 58.1		046
1167		1980 06	13.01339	19 23 23.83	-15 10 58.6		046
1167		1980 06	13.02768	19 23 23.38	-15 10 59.0		046
1167		1980 06	14.00466	19 22 51.14	-15 10 02.4		046
1167		1980 06	14.01878	19 22 50.76	-15 10 01.9		046
1167		1980 06	14.97562	19 22 18.23	-15 09 12.8		046
1167		1980 06	14.98975	19 22 17.65	-15 09 12.5		046
2109		1980 05	11.97225	15 34 52.10	-07 15 59.6		046
2109		1980 05	11.98822	15 34 51.11	-07 15 53.7		046
2109		1980 05	12.96602	15 33 59.58	-07 11 24.6		046
2109		1980 05	12.98025	15 33 58.93	-07 11 20.6		046
2109		1980 05	13.94740	15 33 07.91	-07 06 58.2		046
2109		1980 05	13.96152	15 33 07.15	-07 06 55.1		046
2230		1980 02	14.95449	10 12 33.24	+10 45 29.2		046
2230		1980 02	14.96888	10 12 32.63	+10 45 35.0		046
2240		1980 04	12.86057	11 32 07.21	+04 07 44.6		046
2240		1980 04	12.87475	11 32 06.78	+04 07 48.4		046
2251		1980 05	10.93473	14 34 05.58	-09 18 26.6	16.8	046
2251		1980 05	10.94897	14 34 04.88	-09 18 22.4		046
2260		1980 05	10.97299	14 27 59.93	+02 53 45.0	16.6	046
2260		1980 05	10.98716	14 27 59.49	+02 53 47.0		046
2260		1980 05	11.93521	14 27 31.45	+02 54 10.3		046
2260		1980 05	11.94944	14 27 31.07	+02 54 10.5		046
1933	QA	1980 05	10.89764	13 22 53.11	-08 42 30.7	16.0	046
1933	QA	1980 05	10.91182	13 22 52.49	-08 42 25.3		046
1933	QA	1980 05	11.86079	13 22 18.99	-08 37 29.8		046
1933	QA	1980 05	11.87497	13 22 18.46	-08 37 24.5		046
1933	QA	1980 05	15.86709	13 20 13.80	-08 18 16.5		046
1933	QA	1980 05	15.88122	13 20 13.35	-08 18 14.0		046
1933	QA	1980 05	16.93498	13 19 45.10	-08 13 39.8		046
1933	QA	1980 05	16.94921	13 19 44.50	-08 13 38.0		046
1978	SQ	1980 02	23.07691	12 08 37.40	+09 47 16.4		046
1978	SQ	1980 02	23.09120	12 08 36.70	+09 47 21.9		046
1980	CT *	1980 02	15.02150	12 08 08.17	+09 48 39.5	17.2	046
1980	CT	1980 02	15.03580	12 08 07.65	+09 48 38.7		046
1980	CT	1980 02	21.04185	12 03 37.70	+10 05 31.7		046
1980	CT	1980 02	21.05632	12 03 36.95	+10 05 34.2		046

1980	CT		1980	02	22.06373	12	02	45.50	+10	08	32.7		046
1980	CT		1980	02	22.07883	12	02	44.6	+10	08	36		046
1980	CT		1980	02	23.07691	12	01	52.13	+10	11	35.1		046
1980	CT		1980	02	23.09120	12	01	51.42	+10	11	39.4		046
1980	CU	*	1980	02	15.02150	12	15	05.23	+10	03	27.0	16.6	046
1980	CU		1980	02	15.03580	12	15	04.98	+10	03	34.3		046
1980	CU		1980	02	19.98862	12	12	55.79	+10	41	55.0		046
1980	CU		1980	02	20.00286	12	12	55.33	+10	42	02.3		046
1980	CU		1980	02	21.04185	12	12	23.12	+10	50	21.6		046
1980	CU		1980	02	21.05632	12	12	22.68	+10	50	27.4		046
1980	CU		1980	02	22.06373	12	11	49.8	+10	58	47	1	046
1980	CU		1980	02	22.07883	12	11	49.3	+10	58	54	1	046
1980	CU		1980	02	23.07691	12	11	15.1	+11	07	11	1	046
1980	CU		1980	02	23.09120	12	11	14.7	+11	07	17	1	046
1980	DG		1980	02	21.96101	09	39	01.54	-01	48	15.2	2	046
1980	DG		1980	02	21.96963	09	39	00.83	-01	48	12.5	2	046
1980	DL		1980	02	14.86624	08	48	57.36	+19	52	29.7		046
1980	DL		1980	02	14.88076	08	48	56.66	+19	52	29.8		046
1980	DO		1980	02	14.86624	08	51	01.23	+19	33	36.1		046
1980	DO		1980	02	14.88076	08	51	00.30	+19	33	41.7		046
1980	DU		1980	02	15.90245	10	13	50.27	+10	16	49.5		046
1980	DU		1980	02	15.91681	10	13	49.55	+10	16	54.4		046
1980	DW		1980	02	14.95449	10	17	59.68	+13	01	30.2		046
1980	DW		1980	02	14.96888	10	17	58.90	+13	01	33.4		046
1980	DY		1980	02	15.90245	10	21	05.90	+12	33	46.7		046
1980	DY		1980	02	15.91681	10	21	05.39	+12	33	53.4		046
1980	DB1		1980	02	15.02150	12	09	48.51	+08	55	27.2		046
1980	DB1		1980	02	15.03580	12	09	48.10	+08	55	29.3		046
1980	GF		1980	04	12.86057	11	37	09.96	+04	44	04.1		046
1980	GF		1980	04	12.87475	11	37	09.52	+04	44	07.6		046
1980	GG		1980	04	12.89836	13	21	54.95	+04	30	41.4		046
1980	GG		1980	04	12.91259	13	21	54.08	+04	30	43.7		046
1980	GH		1980	04	12.89836	13	25	20.92	+06	22	34.0		046
1980	GH		1980	04	12.91259	13	25	19.88	+06	22	38.9		046
1980	GK		1980	04	12.93447	12	54	28.29	-04	37	04.9		046
1980	GK		1980	04	12.94870	12	54	27.49	-04	37	00.1		046
1980	GM		1980	04	12.93447	12	57	23.55	-04	00	20.1		046
1980	GM		1980	04	12.94870	12	57	23.19	-04	00	13.2		046
1980	GN		1980	04	12.93447	12	59	06.33	-05	52	18.6		046
1980	GN		1980	04	12.94870	12	59	05.59	-05	52	13.0		046
1980	GP		1980	04	12.93447	13	02	07.14	-07	08	55.5		046
1980	GP		1980	04	12.94870	13	02	06.37	-07	08	51.3		046
1980	HB		1980	05	06.84991	12	43	44.14	+07	52	00.3		046
1980	HB		1980	05	06.86414	12	43	43.86	+07	52	07.3		046
1980	HB		1980	05	10.86043	12	42	39.65	+08	23	59.0		046
1980	HB		1980	05	10.87466	12	42	39.31	+08	24	06.8		046
1980	HB		1980	05	12.85942	12	42	16.14	+08	37	58.6		046
1980	HB		1980	05	12.87360	12	42	15.95	+08	38	03.7		046
1980	JA	*	1980	05	10.89764	13	14	07.92	-09	14	19.5	17.0	046
1980	JA		1980	05	10.91182	13	14	07.37	-09	14	14.0		046
1980	JA		1980	05	11.86079	13	13	36.81	-09	11	05.6		046
1980	JA		1980	05	11.87497	13	13	36.37	-09	11	00.5		046
1980	JA		1980	05	12.89536	13	13	04.64	-09	07	45.5		046
1980	JA		1980	05	12.90959	13	13	04.16	-09	07	41.9		046
1980	JA		1980	05	13.87454	13	12	35.37	-09	04	40.0		046
1980	JA		1980	05	13.88869	13	12	34.75	-09	04	37.5		046
1980	JA		1980	05	14.86882	13	12	06.82	-09	01	38.8		046
1980	JA		1980	05	14.88294	13	12	06.33	-09	01	36.8		046
1980	JB	*	1980	05	10.97299	14	24	48.28	+04	01	26.1	17.5	046

1980	JB		1980	05	10.98716	14	24	47.54	+04	01	25.8		046
1980	JC	*	1980	05	11.86079	13	11	43.6	-10	37	45	17.2	1 046
1980	JC		1980	05	11.87497	13	11	42.9	-10	37	38		1 046
1980	JC		1980	05	13.87454	13	10	21.80	-10	29	53.3		046
1980	JC		1980	05	13.88869	13	10	21.10	-10	29	47.2		046
1980	JC		1980	05	14.86882	13	09	43.85	-10	26	15.9		046
1980	JC		1980	05	14.88294	13	09	43.38	-10	26	12.9		046
1980	JD	*	1980	05	11.89968	14	05	55.51	-07	37	25.9	17.4	046
1980	JD		1980	05	11.91391	14	05	54.63	-07	37	19.4		046
1980	JD		1980	05	12.93095	14	05	05.10	-07	33	00.0		046
1980	JD		1980	05	12.94513	14	05	04.50	-07	32	56.6		046
1980	JD		1980	05	13.91152	14	04	19.06	-07	28	58.3		046
1980	JD		1980	05	13.92587	14	04	18.14	-07	28	53.7		046
1980	JD		1980	05	14.90510	14	03	32.96	-07	25	01.3		046
1980	JD		1980	05	14.91940	14	03	32.33	-07	24	57.1		046
1980	JE	*	1980	05	11.89968	14	09	12.88	-06	01	59.9	16.8	046
1980	JE		1980	05	11.91391	14	09	12.11	-06	02	04.5		046
1980	JE		1980	05	12.94513	14	08	11.98	-06	08	31.9		046
1980	JE		1980	05	13.91152	14	07	17.07	-06	14	41.2		046
1980	JE		1980	05	13.92587	14	07	16.28	-06	14	46.1		046
1980	JE		1980	05	14.90510	14	06	21.63	-06	21	09.4		046
1980	JE		1980	05	14.91940	14	06	20.92	-06	21	15.1		046
1980	JF	*	1980	05	11.97225	15	32	44.33	-06	27	04.4	17.0	046
1980	JF		1980	05	11.98822	15	32	43.43	-06	26	58.9		046
1980	JF		1980	05	12.96602	15	31	51.67	-06	22	16.5		046
1980	JF		1980	05	12.98025	15	31	50.86	-06	22	11.8		046
1980	JF		1980	05	13.94740	15	30	59.42	-06	17	38.2		046
1980	JF		1980	05	13.96152	15	30	58.88	-06	17	36.5		046
1980	JG	*	1980	05	11.97225	15	37	28.73	-07	10	56.8	15.6	046
1980	JG		1980	05	11.98822	15	37	27.99	-07	10	46.9		046
1980	JG		1980	05	12.96602	15	36	45.34	-07	00	56.2		046
1980	JG		1980	05	12.98025	15	36	44.71	-07	00	47.2		046
1980	JG		1980	05	13.94740	15	36	02.25	-06	51	07.6		046
1980	JG		1980	05	13.96152	15	36	01.57	-06	51	00.4		046
1980	JH	*	1980	05	11.97225	15	37	48.70	-06	44	54.8	16.8	046
1980	JH		1980	05	11.98822	15	37	48.00	-06	44	47.1		046
1980	JH		1980	05	12.96602	15	36	58.94	-06	36	17.7		046
1980	JH		1980	05	12.98025	15	36	58.16	-06	36	09.9		046
1980	JH		1980	05	13.94740	15	36	09.56	-06	27	52.4		046
1980	JH		1980	05	13.96152	15	36	08.56	-06	27	44.2		046
1980	JJ	*	1980	05	11.97225	15	41	04.9	-07	36	09	16.5	1 046
1980	JJ		1980	05	11.98822	15	41	04.0	-07	36	04		1 046
1980	JJ		1980	05	12.96602	15	40	10.06	-07	29	35.6		046
1980	JJ		1980	05	12.98025	15	40	09.29	-07	29	28.8		046
1980	JJ		1980	05	13.94740	15	39	15.76	-07	23	13.0		046
1980	JJ		1980	05	13.96152	15	39	14.96	-07	23	07.3		046
1980	JK	*	1980	05	12.93095	14	05	22.61	-07	34	56.6	17.8	046
1980	JK		1980	05	12.94513	14	05	22.10	-07	34	55.6		046
1980	JL	*	1980	05	12.93095	14	07	46.36	-04	18	03.1	17.4	046
1980	JL		1980	05	12.94513	14	07	45.61	-04	18	03.8		046
1980	JL		1980	05	13.91152	14	06	50.75	-04	18	55.3		046
1980	JL		1980	05	13.92587	14	06	49.88	-04	18	56.9		046
1980	JM		1980	05	11.89968	14	10	24.45	-05	54	19.3		046
1980	JM		1980	05	11.91391	14	10	23.88	-05	54	18.3		046
1980	JM	*	1980	05	12.93095	14	09	30.75	-05	55	21.1		046
1980	JM		1980	05	12.94513	14	09	30.39	-05	55	21.2		046
1980	JM		1980	05	13.91152	14	08	41.09	-05	56	27.3		046
1980	JM		1980	05	13.92587	14	08	40.41	-05	56	28.9		046
1980	JM		1980	05	14.90510	14	07	52.04	-05	57	47.7	17.0	046

1980 JM		1980 05 14.91940	14 07 51.22	-05 57 45.1							046
1980 JN	*	1980 05 14.90510	13 57 16.3	-08 15 28				17.0		1	046
1980 JN		1980 05 14.91940	13 57 15.8	-08 15 22						1	046
1980 JN		1980 05 16.97369	13 56 02.91	-08 03 19.2							046
1980 JN		1980 05 16.98828	13 56 02.23	-08 03 13.4							046
1980 JO	*	1980 05 10.93473	14 34 46.47	-08 23 06.4				17.5			046
1980 JO		1980 05 10.94897	14 34 46.12	-08 23 01.1							046
1980 JP	*	1980 05 11.86079	13 17 41.32	-10 55 03.4				15.5			046
1980 JP		1980 05 11.87497	13 17 40.82	-10 55 03.1							046
1980 JP		1980 05 12.89536	13 17 02.09	-10 55 29.0							046
1980 JP		1980 05 12.90959	13 17 01.50	-10 55 28.5							046
1980 JP		1980 05 13.87454	13 16 26.04	-10 55 56.0							046
1980 JP		1980 05 13.88869	13 16 25.51	-10 55 55.2							046
1980 JP		1980 05 14.86882	13 15 50.63	-10 56 27.5							046
1980 JP		1980 05 14.88294	13 15 50.09	-10 56 28.1							046
1980 JP		1980 05 15.86709	13 15 16.40	-10 57 03.4							046
1980 JP		1980 05 15.88122	13 15 15.90	-10 57 03.8							046
1980 LG	*	1980 06 10.00416	18 02 36.51	-06 24 22.4				18			046
1980 LG		1980 06 10.01839	18 02 35.78	-06 24 17.1							046

Note 1: near edge of plate. 2: correction to MPC 5253.

OBSERVATIONS MADE AT TURKU BY L. OTERMA AND H. A. ALIKOSKI. MEASURED BY M.-O. SNARE.

Object	Date	UT	R. A. (1950)	Decl.	N	Obs.
820	1941 11	14.96279	04 14 46.59	+13 49 56.2		062
820	1941 11	16.99336	04 13 08.33	+13 46 17.0		062
820	1941 11	17.03097	04 13 06.50	+13 46 13.8		062
1037	1941 11	14.96279	04 16 35.63	+13 55 12.4		062
1037	1941 11	16.99336	04 14 35.81	+13 41 16.5	1	062
1037	1941 11	17.03097	04 14 33.53	+13 41 01.0	1	062
2248	1949 02	25.84595	09 20 27.30	+18 03 04.4		062
2248	1949 02	25.88229	09 20 25.68	+18 03 07.7		062
1944 SA	1944 09	15.92086	00 02 32.19	+11 30 45.7		062
1944 SA	1944 09	20.86528	23 58 10.77	+11 12 25.1		062
1944 SA	1944 09	20.93368	23 58 07.22	+11 12 08.6		062
1944 SD	1944 09	15.92086	00 07 12.98	+10 09 10.3		062
1944 SD	1944 09	20.86528	00 02 39.16	+09 58 22.7		062
1944 SD	1944 09	20.93368	00 02 35.23	+09 58 11.5		062
1948 QA	1948 08	30.88476	22 33 07.82	+01 36 54.8	2	062
1948 QA	1948 08	30.92226	22 33 05.58	+01 36 44.4		062
1948 QB	1948 08	30.88476	22 34 09.60	+00 00 46.1	2	062
1948 QB	1948 08	30.92226	22 34 07.61	+00 00 41.1		062
1949 DH	1949 02	25.84595	09 21 09.59	+17 58 46.0		062
1949 DH	1949 02	25.88229	09 21 07.87	+17 58 50.1		062

Note 1: very faint image. 2: broken plate.

OBSERVATIONS MADE AT PERTH BY J. JOHNSTON AND P. JEKABSONS.

Object	Date	UT	R. A. (1950)	Decl.	Obs.
/1980e	1980 06	16.70208	19 06 33.34	-31 40 37.5	323
/1980e	1980 06	17.68889	19 04 23.48	-31 16 28.1	323
/1980e	1980 06	18.64722	19 02 17.71	-30 52 47.8	323
/1980e	1980 06	24.90278	18 48 39.19	-28 12 35.3	323

OBSERVATIONS MADE AT GEISEI BY T. SEKI. FROM ORIENT. ASTRON. ASSOC. COMET BULL. NO. 198.

Object	Date	UT	R. A. (1950)	Decl.	Mag.		Obs.
/1980d	1980 05	09.67361	13 08 56.94	+11 26 06.8	16	T	372
/1980d	1980 05	09.68333	13 08 56.69	+11 26 01.8			372
/1980d	1980 05	18.51042	13 04 46.36	+10 26 43.7	16	T	372

OBSERVATIONS MADE AT THE TOKYO OBSERVATORY'S KISO STATION BY H. KOSAI.

Object	Date	UT	R. A. (1950)	Decl.	Mag.		Obs.
/1980a	1980 06	06.57234	12 40 12.81	-06 51 23.3	18	T	381
/1980b	1980 06	06.51056	10 22 01.30	+11 25 51.3	15	T	381
/1980d	1980 06	06.54179	13 02 24.55	+07 28 16.6	16	T	381

OBSERVATIONS MADE AT CHORZOW BY M. SZCZEPANSKI AND I. WLODARCZYK. FROM ACTA ASTRON. 30, 63, 1980.

Object	Date	UT	R. A. (1950)	Decl.	Obs.
/1977 XIV	1977 10	05.80961	16 38 56.30	+17 06 24.7	553
/1977 XIV	1977 10	06.77431	16 42 02.64	+16 35 33.2	553
/1977 XIV	1977 10	07.76424	16 45 16.85	+16 03 18.0	553
/1977 XIV	1977 10	07.77951	16 45 19.80	+16 02 44.9	553
/1977 XIV	1977 10	08.76736	16 48 37.02	+15 29 53.6	553
/1977 XIV	1977 10	08.80134	16 48 43.80	+15 28 40.2	553
/1977 XIV	1977 10	09.76744	16 52 00.41	+14 55 48.7	553
/1977 XIV	1977 10	09.78075	16 52 02.95	+14 55 23.8	553
/1977 XIV	1977 10	16.74450	17 17 16.31	+10 37 08.6	553
/1977 XIV	1977 10	17.74104	17 21 07.06	+09 57 01.1	553
/1977 XIV	1977 10	17.75840	17 21 11.43	+09 56 17.8	553
/1977 XIV	1977 10	18.74110	17 25 02.57	+09 15 54.9	553
/1977 XIV	1977 10	19.73748	17 29 00.87	+08 34 09.6	553
/1977 XIV	1977 10	19.75067	17 29 03.77	+08 33 35.8	553
/1977 XIV	1977 10	19.76178	17 29 06.59	+08 33 10.7	553

OBSERVATIONS MADE AT STERNWARTE REINTAL, NEAR MUNICH, BY F. SEILER (WITH ASSISTANCE FROM F. FREVERT).

Object	Date	UT	R. A. (1950)	Decl.	N	Obs.
2035	1980 02	23.8146	09 11 18.57	+60 14 00.5	1	556
2035	1980 02	23.81875	09 11 18.22	+60 14 01.6	1	556
2035	1980 02	23.8722	09 11 12.52	+60 14 05.7	1	556
2035	1980 03	04.8104	08 56 54.33	+59 58 25.8	1	556
2035	1980 03	04.8368	08 56 52.56	+59 58 18.1	1	556
2035	1980 03	05.8202	08 55 45.63	+59 54 00.5	1	556
2035	1980 03	05.8583	08 55 43.08	+59 53 51.0	1	556

Note 1: observatory code 556, Long. and Parallax 11.26, -288, -313 (see MPC 4766).

OBSERVATIONS MADE AT THE LOWELL OBSERVATORY (CODE 690) AND BY H. L. GICLAS AT THE ANDERSON MESA STATION (CODE 688). MEASURED IN PART BY M. L. KANTZ.

Object	Date	UT	R. A. (1950)	Decl.	Mag.	Obs.
10	1979 10	22.18819	23 12 08.6	+00 18 19		688
204	1979 10	15.15694	22 52 28.7	-00 53 57		688
204	1979 10	22.18819	22 51 14.4	-01 34 01		688
248	1979 10	15.15694	23 00 09.8	-00 08 31		688
248	1979 10	22.18819	22 58 07.9	-00 39 16		688
371	1979 10	15.15694	22 39 27.0	+02 33 17		688
371	1979 10	22.18819	22 37 59.8	+02 07 10		688
382	1979 10	15.15694	23 08 00.1	+02 03 02		688
382	1979 10	22.18819	23 05 09.5	+01 41 45		688
1002	1979 10	15.15694	22 59 20.6	-01 24 36		688
1002	1979 10	22.18819	22 57 00.1	-01 14 45		688
1064	1979 10	15.15694	22 57 11.6	+10 04 26		688
1064	1979 10	22.18819	22 55 43.8	+09 21 33		688
1206	1979 10	22.18819	22 32 37.9	+00 33 14		688
1214	1979 10	15.15694	22 33 16.1	+06 20 49		688
1214	1979 10	22.18819	22 32 33.1	+05 51 15		688
1265	1979 10	15.15694	22 38 06.6	+00 28 56		688

1265		1979	10	22.18819	22	36	12.4	+00	15	58		688
1324		1979	05	22.26597	13	06	19.63	-16	05	00.8		688
1942		1979	10	15.15694	22	36	15.5	+05	29	15		688
1942		1979	10	22.18819	22	32	30.3	+06	34	50		688
2112		1979	10	15.15694	22	44	10.9	-02	14	21		688
2112		1979	10	22.18819	22	43	44.2	-02	39	49		688
2235		1979	10	15.15694	23	01	48.9	+06	37	17		688
2235		1979	10	22.18819	22	59	31.3	+05	40	19		688
1931	TJ3	1931	10	11.28681	00	21	43.26	-09	15	13.3		690
1931	TJ3	1931	10	12.22431	00	21	02.77	-09	17	08.3		690
1931	TJ3	1931	10	13.29861	00	20	17.01	-09	19	08.3		690
1931	XS	1931	12	05.32153	04	11	54.24	+12	02	11.6		690
1931	XS	1931	12	06.24479	04	10	59.20	+11	58	43.7		690
1931	XS	1931	12	07.26042	04	09	59.45	+11	54	55.2		690
1975	TN	1979	10	15.15694	23	03	34.9	+04	26	57		688
1975	TN	1979	10	22.18819	23	02	25.8	+03	06	41		688
1979	TB *	1979	10	15.15694	23	04	31.2	+02	25	26	15.5	688
1979	TB	1979	10	22.18819	23	01	30.2	+01	54	10		688

OBSERVATIONS MADE AT THE LOWELL OBSERVATORY'S ANDERSON MESA STATION BY E. BOWELL.

Object	Date	UT	R. A. (1950)			Decl.			Mag.	N	Obs.
106	1980	06 11.31528	18	48	17.12	-26	29	59.6			688
145	1980	06 11.27847	18	05	34.61	-26	51	23.4			688
158	1980	06 11.31528	18	50	58.79	-23	02	08.8			688
182	1980	06 11.26181	13	31	58.47	-07	01	27.4			688
205	1980	06 14.40035	20	28	21.01	-03	45	37.0			688
205	1980	06 17.30556	20	27	27.39	-03	35	06.2			688
205	1980	06 17.34306	20	27	26.58	-03	34	58.7			688
205	1980	06 18.33750	20	27	05.48	-03	31	39.1			688
271	1980	06 11.41771	20	28	30.37	-22	37	31.7			688
271	1980	06 14.37882	20	27	38.12	-22	41	12.0			688
271	1980	06 14.42188	20	27	37.25	-22	41	16.1			688
271	1980	06 17.32500	20	26	34.06	-22	45	20.5		1	688
271	1980	06 17.36111	20	26	33.14	-22	45	24.2			688
271	1980	06 18.31944	20	26	09.68	-22	46	50.6			688
271	1980	06 18.35556	20	26	08.71	-22	46	54.5			688
291	1980	06 11.41771	20	16	16.10	-17	20	25.5			688
325	1980	06 18.35556	20	23	22.85	-28	54	23.6			688
333	1980	06 11.41771	20	38	04.69	-23	15	56.9			688
333	1980	06 14.37882	20	37	30.99	-23	20	22.7			688
333	1980	06 14.42188	20	37	30.53	-23	20	27.4			688
333	1980	06 17.32500	20	36	44.85	-23	25	18.8			688
333	1980	06 17.36111	20	36	44.15	-23	25	22.7			688
333	1980	06 18.31944	20	36	26.40	-23	27	06.9			688
333	1980	06 18.35556	20	36	25.64	-23	27	11.2			688
383	1980	06 11.37535	20	31	27.78	-20	07	31.5			688
383	1980	06 11.41771	20	31	27.08	-20	07	36.4			688
383	1980	06 14.37882	20	30	38.12	-20	13	03.1			688
383	1980	06 14.42188	20	30	37.28	-20	13	08.2			688
383	1980	06 17.32500	20	29	38.66	-20	19	05.6			688
383	1980	06 17.36111	20	29	37.82	-20	19	09.7			688
460	1980	06 11.35313	20	27	20.88	-12	16	56.5			688
715	1980	06 11.26181	13	45	41.31	-10	22	01.8			688
743	1980	06 11.35313	20	29	12.24	-12	55	10.5			688
761	1980	06 11.27847	17	52	35.36	-26	26	22.7			688
846	1980	06 11.26181	13	29	32.89	-09	37	21.2		3	688
876	1980	06 11.35313	20	30	04.08	-08	48	02.0			688
876	1980	06 14.40035	20	29	34.92	-08	50	16.9			688

876		1980	06	17.30556	20	28	53.72	-08	52	54.5				688
876		1980	06	17.34306	20	28	53.04	-08	52	56.7				688
876		1980	06	18.33750	20	28	36.34	-08	54	09.0				688
921		1980	06	11.26181	13	45	57.47	-03	38	08.7				688
965		1980	06	11.26181	13	41	52.36	-10	17	29.6				688
1041		1980	06	11.27847	17	50	35.20	-32	07	39.8				688
1112		1980	06	11.31528	18	54	44.30	-29	03	21.4				688
1123		1980	06	11.26181	13	39	23.34	-04	44	00.3				688
1133		1980	06	11.26181	13	51	55.57	-10	06	15.8				688
1162		1980	06	11.41771	20	21	05.83	-21	54	27.4				688
1162		1980	06	14.37882	20	20	12.48	-21	59	13.5				688
1162		1980	06	14.42188	20	20	11.56	-21	59	18.3				688
1162		1980	06	17.32500	20	19	10.02	-22	04	20.5				688
1162		1980	06	17.36111	20	19	09.15	-22	04	27.0				688
1162		1980	06	18.31944	20	18	46.87	-22	06	09.5				688
1162		1980	06	18.35556	20	18	45.94	-22	06	14.8				688
1284		1980	06	11.41771	20	27	41.24	-22	44	40.1				688
1284		1980	06	14.37882	20	26	31.52	-22	42	27.9				688
1284		1980	06	14.42188	20	26	30.39	-22	42	26.8				688
1284		1980	06	17.32500	20	25	08.65	-22	40	36.5				688
1284		1980	06	17.36111	20	25	07.51	-22	40	35.6				688
1284		1980	06	18.31944	20	24	37.59	-22	40	01.5				688
1284		1980	06	18.35556	20	24	36.35	-22	40	01.7			3	688
1309		1980	06	11.26181	13	37	33.31	-06	54	16.3				688
1327		1980	06	11.27847	17	57	46.99	-28	01	09.8				688
1354		1980	06	11.27847	17	57	57.96	-31	48	42.0				688
1398		1980	06	11.27847	18	00	12.74	-32	08	23.8				688
1523		1980	06	11.27847	17	47	26.10	-31	37	56.5				688
1616		1980	06	11.26181	13	48	08.87	-10	20	26.4				688
1679		1980	06	11.24549	14	06	26.39	+06	26	00.6				688
1758		1980	06	11.41771	20	36	31.48	-18	16	13.8				688
1758		1980	06	17.32500	20	35	08.09	-18	39	41.3				688
1758		1980	06	17.36111	20	35	07.25	-18	39	51.5				688
1838		1980	06	11.26181	13	38	56.71	-08	34	16.7				688
1845		1980	06	11.24549	14	12	09.49	+01	40	30.6				688
1900		1980	06	11.41771	20	16	59.70	-18	57	46.2				688
1963		1980	06	11.41771	20	22	11.26	-21	13	34.8				688
1963		1980	06	14.37882	20	20	54.83	-21	38	25.2				688
1963		1980	06	14.42188	20	20	53.71	-21	38	47.2				688
1963		1980	06	17.32500	20	19	25.56	-22	04	12.8				688
1963		1980	06	17.36111	20	19	24.31	-22	04	32.5				688
1963		1980	06	18.31944	20	18	52.49	-22	13	09.1			2	688
1963		1980	06	18.35556	20	18	51.18	-22	13	29.1				688
1969		1980	06	11.35313	20	35	35.09	-14	11	16.1				688
2072		1980	06	11.31528	18	47	37.65	-29	46	54.9				688
2136		1980	06	11.35313	20	25	29.03	-10	19	12.0				688
2136		1980	06	17.30556	20	23	42.99	-10	26	17.0				688
2136		1980	06	17.34306	20	23	42.05	-10	26	20.6				688
2136		1980	06	18.33750	20	23	19.92	-10	27	59.3				688
2175		1980	06	11.35313	20	14	51.55	-14	05	47.1				688
2260		1980	06	11.24549	14	15	34.41	+02	27	29.0				688
1977	RA	1980	06	11.27847	17	58	56.30	-30	05	13.1				688
1977	RF	1980	06	11.31528	18	43	55.74	-26	31	58.0				688
1980	EG	1980	06	11.24549	14	05	46.74	+03	25	12.0		17.5	3	688
1980	GA	1980	06	11.26181	13	31	08.79	-10	46	29.5		17.0		688
1980	GC	1980	06	11.24549	14	23	54.88	+07	01	47.0		17.5		688
1980	LA *	1980	06	14.35660	20	14	25.61	-06	30	09.1		15.5	2	688
1980	LA	1980	06	14.40035	20	14	24.96	-06	29	01.1		15.0	2	688
1980	LA	1980	06	17.30556	20	13	40.26	-05	15	04.5		15.5	2	688

1980	LA		1980	06	17.34306	20	13	39.45	-05	14	11.7	2	688
1980	LA		1980	06	18.30069	20	13	20.36	-04	49	29.8	15.5 2	688
1980	LA		1980	06	18.33750	20	13	19.44	-04	48	33.8	2	688
1980	LB		1980	06	11.37535	20	33	24.66	-20	14	16.0	2	688
1980	LB		1980	06	11.41771	20	33	24.18	-20	14	56.2	2	688
1980	LB	*	1980	06	14.37882	20	32	50.04	-21	00	01.8	2	688
1980	LB		1980	06	14.42188	20	32	49.33	-21	00	44.2	16.0 2	688
1980	LB		1980	06	17.32500	20	32	01.49	-21	47	24.7	16.0 2	688
1980	LB		1980	06	17.36111	20	32	00.67	-21	47	58.4	2	688
1980	LB		1980	06	18.31944	20	31	41.71	-22	03	56.9	2	688
1980	LB		1980	06	18.35556	20	31	40.84	-22	04	33.6	16.0 3	688
1980	LC	*	1980	06	11.35313	20	30	26.68	-08	14	29.4	17.0	688
1980	LC		1980	06	14.40035	20	29	39.00	-08	06	42.1		688
1980	LC		1980	06	17.30556	20	28	38.37	-08	00	41.6	17.0	688
1980	LC		1980	06	17.34306	20	28	37.39	-08	00	36.7		688
1980	LC		1980	06	18.33750	20	28	13.10	-07	58	53.2	17.0	688
1980	LD	*	1980	06	11.41771	20	26	45.08	-20	59	56.4	16.5	688
1980	LD		1980	06	14.37882	20	25	51.38	-21	12	28.4		688
1980	LD		1980	06	14.42188	20	25	50.45	-21	12	40.8	16.0	688
1980	LD		1980	06	17.32500	20	24	46.50	-21	25	39.4	16.5	688
1980	LD		1980	06	18.35556	20	24	21.11	-21	30	24.3	17.0	688
1980	LE	*	1980	06	14.37882	20	26	09.95	-23	20	47.8	1	688
1980	LE		1980	06	14.42188	20	26	09.38	-23	20	44.5	17.0	688
1980	LE		1980	06	17.32500	20	25	31.22	-23	17	27.5	17.0	688
1980	LE		1980	06	17.36111	20	25	30.55	-23	17	24.5		688
1980	LE		1980	06	18.31944	20	25	13.66	-23	16	30.0		688
1980	LE		1980	06	18.35556	20	25	12.99	-23	16	26.5	17.0	688
1980	LF	*	1980	06	14.37882	20	34	19.76	-24	43	20.8		688
1980	LF		1980	06	14.42188	20	34	18.91	-24	43	17.6	16.5	688
1980	LF		1980	06	17.32500	20	33	17.32	-24	38	52.8	17.0	688
1980	LF		1980	06	17.36111	20	33	16.31	-24	38	49.9		688
1980	LF		1980	06	18.31944	20	32	52.87	-24	37	25.5		688
1980	LF		1980	06	18.35556	20	32	51.70	-24	37	24.5	16.5	688
1980	MA	*	1980	06	18.31944	20	43	30.27	-28	33	07.9	16.0 3	688
1980	MA		1980	06	18.35556	20	43	29.68	-28	33	28.0		688

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

OBSERVATIONS MADE AT THE LINCOLN LABORATORY ETS, NEW MEXICO, BY L. G. TAFF AND J. M. SORVARI (WITH ASSISTANCE FROM D. BEATTY).

Object	Date	UT	R. A. (1950)	Decl.	N Obs.
99	1980 01	13.16580	05 24 40.59	+38 31 30.5	1 704
182	1980 05	20.27913	13 39 21.87	-07 22 24.9	1 704
182	1980 05	20.32425	13 39 20.38	-07 22 17.0	1 704
232	1979 11	19.25534	02 41 42.32	+06 37 50.8	1 704
255	1979 11	19.26429	01 45 41.51	+17 28 57.2	1 704
293	1979 11	19.26635	01 51 10.19	+00 55 48.7	1 704
486	1979 11	19.26922	02 44 29.76	+02 26 57.9	1 704
526	1979 11	19.27361	03 29 35.87	+15 40 06.3	1 704
565	1979 11	19.28174	01 43 31.98	+12 57 36.4	1 704
575	1979 11	19.28722	04 07 05.96	+44 22 55.1	1 704
615	1979 11	19.29166	04 36 04.71	+25 22 05.5	1 704
617	1980 01	13.17446	06 59 35.44	+46 06 42.5	1 704
621	1980 05	17.21666	13 02 42.05	-04 31 38.0	1 704
621	1980 05	17.28406	13 02 40.60	-04 31 41.4	1 704
621	1980 05	19.27247	13 02 00.32	-04 29 27.3	1 704
621	1980 05	19.32087	13 01 59.14	-04 29 25.9	1 704
621	1980 05	20.30398	13 01 40.6	-04 28 29	1 704
632	1980 01	13.18014	08 05 54.30	+23 16 38.4	1 704
662	1980 01	13.18272	05 47 38.40	+19 42 20.1	1 704

680		1980	01	13.18810	07	37	32.80	+43	52	16.5	1 704
681		1980	05	19.23042	13	35	12.32	+01	02	57.4	1 704
681		1980	05	19.30471	13	35	10.42	+01	03	11.9	1 704
681		1980	05	20.27353	13	34	45.94	+01	06	18.0	1 704
681		1980	05	20.32270	13	34	45.59	+01	06	22.4	1 704
708		1979	11	19.29406	02	39	07.97	+19	56	35.1	1 704
728		1980	05	17.22781	13	03	26.89	-00	57	13.4	1 704
728		1980	05	17.27399	13	03	26.08	-00	57	24.7	1 704
728		1980	05	19.27854	13	02	51.05	-01	00	59.8	1 704
728		1980	05	19.32603	13	02	50.57	-01	01	12.0	1 704
732		1979	11	19.29613	03	04	38.15	+02	03	54.0	1 704
794		1980	05	19.23632	13	37	48.48	-03	02	25.9	1 704
794		1980	05	19.30806	13	37	46.04	-03	02	31.2	1 704
846		1980	05	19.23909	13	36	57.59	-10	22	21.4	1 704
846		1980	05	19.30661	13	36	55.27	-10	22	12.5	1 704
929		1980	01	13.21282	07	47	58.76	+15	08	51.3	1 704
1058		1980	05	19.20818	13	24	46.24	-09	15	42.5	1 704
1058		1980	05	19.29682	13	24	42.94	-09	15	09.4	1 704
1058		1980	05	20.26219	13	24	12.05	-09	10	01.0	1 704
1058		1980	05	20.31690	13	24	09.73	-09	09	35.7	1 704
1072		1980	05	17.24095	13	11	28.33	-05	56	12.2	1 704
1072		1980	05	17.27955	13	11	27.55	-05	56	11.7	1 704
1132		1980	01	13.20154	08	36	29.63	+28	59	08.8	1 704
1181		1980	05	17.23737	13	08	38.09	-13	37	59.9	1 704
1181		1980	05	17.27787	13	08	37.13	-13	37	50.0	1 704
1181		1980	05	19.28360	13	07	45.35	-13	27	54.0	1 704
1218		1980	05	19.22850	13	29	07.30	-06	52	02.0	1 704
1218		1980	05	19.30316	13	29	03.43	-06	52	56.3	1 704
1218		1980	05	20.27118	13	28	36.5	-06	52	35	1 704
1228		1980	05	17.22385	13	03	50.48	-12	03	06.6	1 704
1228		1980	05	17.27251	13	03	49.78	-12	02	57.5	1 704
1228		1980	05	19.27638	13	03	08.59	-11	56	07.7	1 704
1228		1980	05	19.32414	13	03	07.27	-11	55	59.8	1 704
1320		1980	05	17.23131	13	02	19.58	+15	53	32.6	1 704
1320		1980	05	17.27594	13	02	18.28	+15	53	12.2	1 704
1320		1980	05	19.28103	13	01	21.94	+15	36	57.9	1 704
1320		1980	05	19.32753	13	01	20.19	+15	36	33.6	1 704
1348		1980	05	19.22263	13	31	10.85	-01	17	03.1	1 704
1348		1980	05	19.29828	13	31	09.02	-01	17	07.2	1 704
1348		1980	05	20.26403	13	30	41.32	-01	17	29.6	1 704
1348		1980	05	20.31876	13	30	39.08	-01	17	39.1	1 704
1416		1980	05	19.22084	13	27	27.99	-19	32	04.1	1 704
1416		1980	05	19.29479	13	27	24.97	-19	32	00.5	1 704
1416		1980	05	20.25995	13	26	53.92	-19	28	45.6	1 704
1454		1980	05	19.24214	13	35	52.82	-16	47	47.9	1 704
1454		1980	05	19.31073	13	35	49.9	-16	47	09	1 704
1506		1980	05	17.24688	13	15	21.12	-14	47	39.1	1 704
1506		1980	05	17.28258	13	15	20.10	-14	47	12.1	1 704
1506		1980	05	19.28969	13	14	42.73	-14	24	02.3	1 704
1506		1980	05	19.33345	13	14	40.98	-14	23	43.3	1 704
1522		1980	05	17.21367	12	57	54.67	-01	43	14.2	1 704
1522		1980	05	17.26692	12	57	53.42	-01	43	18.1	1 704
1522		1980	05	19.25764	12	57	11.95	-01	45	51.8	1 704
1522		1980	05	19.31895	12	57	11.20	-01	45	55.1	1 704
1534		1980	05	17.24413	13	12	10.64	+00	37	42.5	1 704
1534		1980	05	17.28104	13	12	09.56	+00	37	26.4	1 704
1534		1980	05	19.28794	13	11	18.19	+00	32	29.0	1 704
1583		1980	05	17.20468	13	03	42.16	-16	06	55.5	1 704
1583		1980	05	17.26023	13	03	41.67	-16	06	45.2	1 704

1844	1980 05 17.21078	12 59 39.17	+10 35 19.0			1	704
1844	1980 05 17.28572	12 59 38.11	+10 35 02.0			1	704
1844	1980 05 19.25326	12 59 02.86	+10 27 53.6			1	704
1844	1980 05 19.31464	12 59 01.68	+10 27 38.5			1	704
1857	1980 05 19.22551	13 28 20.10	-11 35 01.9			1	704
1857	1980 05 19.34125	13 28 16.7	-11 34 18			1	704
1857	1980 05 20.26656	13 27 46.01	-11 29 32.3			1	704
1908	1980 05 17.19733	13 00 03.26	-08 28 13.6			1	704
1908	1980 05 17.26487	13 00 01.84	-08 28 14.2			1	704
1908	1980 05 19.25514	12 59 18.67	-08 25 59.7			1	704
1908	1980 05 19.31634	12 59 17.81	-08 25 41.1			1	704
1908	1980 05 20.29984	12 58 58.0	-08 24 48			1	704
1953	1980 01 13.25382	06 09 02.57	+24 58 22.3			1	704
1962	1980 01 13.25170	06 52 48.91	+25 18 59.3			1	704
1984	1980 01 13.27173	05 10 32.23	+16 27 10.4			1	704
1986	1980 01 13.23801	05 06 46.73	+20 11 40.0			1	704
2084	1980 05 17.20774	12 53 54.1	+00 45 00			1	704
2084	1980 05 17.26300	12 53 52.9	+00 45 06			1	704
2084	1980 05 19.25110	12 53 16.31	+00 46 48.5			1	704
2084	1980 05 19.31330	12 53 14.63	+00 46 48.8			1	704
2236	1980 05 17.22036	13 43 51.60	-21 51 17.7			1	704
2236	1980 05 17.27113	13 43 47.77	-21 51 24.5			1	704
2236	1980 05 19.27431	13 41 57.08	-21 47 03.9			1	704
2236	1980 05 19.32234	13 41 54.15	-21 47 04.5			1	704

Note 1: observatory code 704, Long. and Parallax 253.34, -355, -236 (see MPC 4766).

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

Object	Date	UT	R. A. (1950)	Decl.	N	Obs.
1370	1952 10 24.10530	00 37 06.08	+13 28 34.1			760
1370	1952 10 24.14590	00 37 04.07	+13 28 19.9			760
2235	1959 04 16.34255	14 00 32.21	-10 30 46.6			760
2235	1959 04 16.38630	14 00 30.38	-10 30 21.3			760
2235	1962 09 30.30618	01 38 35.19	+12 42 28.0			760
2235	1962 09 30.35201	01 38 33.57	+12 42 07.4			760
1950 TL2	1950 10 05.14512	23 54 22.53	-12 32 31.7		1	760
1950 TL2	1950 10 05.17219	23 54 21.48	-12 32 37.5		1	760
1950 TM2	1950 10 05.14512	23 58 24.91	-15 51 59.3			760
1950 TM2	1950 10 05.17219	23 58 23.35	-15 51 53.1			760
1950 TN2	1950 10 05.14512	23 49 08.27	-17 36 15.3			760
1950 TN2	1950 10 05.17219	23 49 07.32	-17 36 19.5			760
1950 UK	1950 10 20.27821	02 41 34.44	-02 33 54.5			760
1950 UK	1950 10 20.30392	02 41 32.95	-02 34 08.2			760
1950 UL	1950 10 20.27821	02 49 19.29	-06 48 33.9			760
1950 UL	1950 10 20.30392	02 49 19.17	-06 49 39.1			760
1951 AN	1951 01 09.06120	00 48 53.54	+13 09 25.0			760
1951 AN	1951 01 09.10982	00 48 55.73	+13 09 25.5			760
1951 AO	1951 01 09.06120	00 52 48.68	+14 25 03.9			760
1951 AO	1951 01 09.10982	00 52 50.59	+14 25 03.1			760
1955 BC	1955 01 16.21043	05 49 43.51	+29 38 29.1			760
1955 BC	1955 01 16.25557	05 49 41.58	+29 38 39.0			760
1955 QY	1955 08 24.32149	23 48 18.85	+16 44 56.6			760
1955 QY	1955 08 24.35413	23 48 17.79	+16 44 54.9			760
1962 WM2	1962 11 30.27285	06 03 33.89	+12 37 05.3		2	760
1962 WM2	1962 11 30.32770	06 03 31.79	+12 36 45.9		2	760

Note 1: the approximate position is given incorrectly on MPC 551. 2: the approximate position is given incorrectly on MPC 2232.

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.
/1980a	1980 05	17.18929	12 42 48.76	-06 09 22.2	18.5N		801
/1980b	1980 05	10.17735	10 17 30.89	+11 54 07.5	17 N	1	801
/1980d	1980 06	06.11563	13 02 21.81	+07 32 45.9			801
/1980e	1980 06	19.22911	19 01 00.86	-30 38 21.0	15 T	2	801
/1980e	1980 06	20.22727	18 58 49.84	-30 13 12.8		3	801
/1980f	1980 06	18.27914	22 10 58.46	-05 17 20.4	19 N		801
/1980f	1980 06	19.28881	22 11 46.56	-05 12 03.3	19 N		801
2255	1980 05	15.23648	12 34 21.95	+03 52 18.6		4	801
1942 VW	1980 04	20.25632	14 35 02.92	-11 13 02.3			801
1942 VW	1980 05	10.22934	14 19 14.97	-10 05 29.1			801
1950 DB	1980 05	21.16067	14 08 24.81	+18 08 31.6			801
1953 GE	1980 05	15.25916	14 46 26.51	-15 25 07.0			801
1953 TG2	1980 05	16.19693	13 42 47.52	-10 57 47.5			801
1953 TG2	1980 05	17.22444	13 42 09.88	-10 54 52.5			801
1968 DL	1980 05	23.20663	17 11 09.13	-17 50 21.3			801
1971 SL2	1980 05	16.22961	16 04 19.71	-16 08 31.1			801
1972 FA	1980 05	10.31472	16 55 18.18	+18 21 14.1			801
1975 FX	1980 02	14.04825	09 24 07.45	+32 36 37.5			801
1975 FX	1980 05	10.14947	09 21 58.29	+27 06 03.3			801
1976 EA	1980 05	10.20674	14 14 46.64	-17 29 24.4			801
1977 QK3	1980 05	16.25407	17 14 41.59	-18 36 44.1			801
1977 QK3	1980 05	17.28328	17 14 00.31	-18 38 12.6			801
1979 FK	1980 05	16.28031	18 12 30.56	+00 36 15.1			801
1979 MF9 *	1979 06	17.19650	16 23 48.38	-14 35 27.2	16		801
1980 CK	1980 05	15.11872	10 12 07.44	+04 10 19.2			801

Note 1: image diffuse, weak condensation. 2: trailed, diffuse image. 3: image poor and diffuse. 4: very weak image.

OBSERVATIONS MADE AT THE UNIVERSITY OF CHILE'S CERRO EL ROBLE STATION BY C. TORRES, E. COSTA AND L. E. GONZALEZ.

Object	Date	UT	R. A. (1950)	Decl.	Mag.	N	Obs.
/1978 III	1978 01	09.16538	02 32 43.38	-08 37 33.0			805
/1978 III	1978 01	10.14617	02 34 08.92	-08 07 42.7		1	805
/1978 XXI	1979 07	22.22043	23 43 37.61	-17 41 05.1		2	805
/1978 XXI	1979 09	30.23457	22 37 24.94	-18 18 15.3			805
/1980e	1980 06	13.24769	19 14 04.27	-33 02 43.9	15 T	3	805
/1980e	1980 06	14.25116	19 11 53.95	-32 39 18.3	15 T	3	805
/1980e	1980 06	17.25532	19 05 20.59	-31 27 09.0	15 T	3	805
/1980e	1980 06	19.22719	19 01 01.21	-30 38 18.5	16 T	3	805
845	1980 04	15.31658	17 43 20.12	-30 25 19.6	18.5		805
845	1980 04	16.29297	17 43 30.12	-30 30 28.8			805

Note 1: 5" nucleus in an eccentric 10" coma, no tail. 2: 15" coma with central condensation and a 50' tail in p.a. 210 . 3: object diffuse, with condensation, tail < 1 .

OBSERVATIONS MADE AT WITH THE 0.4-M ASTROGRAPH AT THE EUROPEAN SOUTHERN OBSERVATORY BY H. DEBEHOGNE, L. E. MACHADO, J. F. CALDEIRA, G. G. VIEIRA, E. RANGEL NETTO, R. R. DE FREITAS MOURAO AND O. TAVARES (ASSISTED BY G. ROMAN AND H. VEGA). FROM ASTRON. ASTROPHYS. 40, 251 AND 253, 1980.

Object	Date	UT	R. A. (1950)	Decl.	O - C	Obs.
/1978 XXI	1979 04	21.38196	23 24 36.89	-22 52 28.5		809
/1978 XXI	1979 04	21.38854	23 24 37.39	-22 52 24.6		809
/1978 XXI	1979 04	22.39481	23 25 38.70	-22 43 10.4		809
/1978 XXI	1979 04	22.39966	23 25 38.96	-22 43 07.6		809
/1978 XXI	1979 04	23.40005	23 26 38.93	-22 34 03.5		809

/1978 XXI	1979	04	23.40421	23	26	39.05	-22	34	01.3	809
/1978 XXI	1979	04	24.38589	23	27	36.98	-22	25	17.7	809
/1978 XXI	1979	04	24.39212	23	27	37.38	-22	25	14.1	809
/1978 XXI	1979	04	26.41298	23	29	33.51	-22	07	38.5	809
/1978 XXI	1979	04	26.41817	23	29	33.76	-22	07	35.6	809
/1978 XXI	1979	04	30.39167	23	33	10.52	-21	34	32.9	809
/1978 XXI	1979	04	30.39652	23	33	10.66	-21	34	31.2	809
110	1979	04	21.24726	15	49	51.95	-18	53	39.2 0.3+ 1-	809
110	1979	04	21.25626	15	49	51.60	-18	53	39.0 0.3+ 1-	809
110	1979	04	21.26527	15	49	51.24	-18	53	38.7 0.3+ 0	809
110	1979	04	22.20922	15	49	15.51	-18	53	24.6 0.3+ 0	809
110	1979	04	22.21579	15	49	15.23	-18	53	24.4 0.3+ 0	809
110	1979	04	22.23068	15	49	14.66	-18	53	24.3 0.3+ 0	809
110	1979	04	22.23900	15	49	14.31	-18	53	24.2 0.3+ 0	809
110	1979	04	23.12892	15	48	39.50	-18	53	07.8 0.3+ 0	809
110	1979	04	25.24084	15	47	12.43	-18	52	18.4 0.2+ 0	809
110	1979	04	25.24985	15	47	12.05	-18	52	18.4 0.2+ 0	809
110	1979	04	25.25885	15	47	11.64	-18	52	18.2 0.2+ 0	809
110	1979	04	26.21352	15	46	30.60	-18	51	51.7 0.1+ 0	809
110	1979	04	26.22322	15	46	30.16	-18	51	51.6 0.1+ 0	809
110	1979	04	26.23291	15	46	29.72	-18	51	51.0 0.1+ 0	809
110	1979	04	29.36462	15	44	07.26	-18	50	03.2 0.2+ 0	809
110	1979	04	29.37363	15	44	06.83	-18	50	02.7 0.2+ 0	809
110	1979	04	29.38263	15	44	06.39	-18	50	02.5 0.2+ 0	809
344	1979	04	21.24726	15	54	26.55	-18	40	04.2 0.5+ 1+	809
344	1979	04	21.25626	15	54	26.22	-18	40	10.2 0.5+ 1+	809
344	1979	04	21.26527	15	54	25.96	-18	40	16.7 0.5+ 1+	809
344	1979	04	22.20922	15	53	51.26	-18	50	57.9 0.5+ 1+	809
344	1979	04	22.21579	15	53	50.98	-18	51	02.5 0.5+ 1+	809
344	1979	04	22.23068	15	53	50.33	-18	51	12.8 0.5+ 1+	809
344	1979	04	22.23900	15	53	50.00	-18	51	18.6 0.5+ 1+	809
344	1979	04	23.12892	15	53	15.58	-19	01	27.6 0.5+ 1+	809
344	1979	04	25.24084	15	51	45.19	-19	25	57.3 0.3+ 1+	809
344	1979	04	25.24985	15	51	44.73	-19	26	03.4 0.3+ 1+	809
344	1979	04	25.25885	15	51	44.28	-19	26	10.1 0.3+ 1+	809
344	1979	04	26.21352	15	51	00.22	-19	37	22.6 0.1+ 1+	809
344	1979	04	26.22322	15	50	59.74	-19	37	29.6 0.1+ 1+	809
344	1979	04	26.23291	15	50	59.25	-19	37	36.8 0.1+ 1+	809
368	1979	04	21.24726	15	49	37.58	-19	32	13.4 0.2+ 1-	809
368	1979	04	21.25626	15	49	37.30	-19	32	11.4 0.2+ 1-	809
368	1979	04	21.26527	15	49	37.00	-19	32	09.2 0.2+ 1-	809
368	1979	04	22.20922	15	49	07.81	-19	28	14.4 0.2+ 1-	809
368	1979	04	22.21579	15	49	07.59	-19	28	13.0 0.2+ 1-	809
368	1979	04	22.23068	15	49	07.11	-19	28	09.0 0.2+ 1-	809
368	1979	04	22.23900	15	49	06.82	-19	28	07.6 0.2+ 1-	809
368	1979	04	23.12892	15	48	38.29	-19	24	22.7 0.2+ 1-	809
368	1979	04	25.24084	15	47	26.50	-19	15	12.5 0.1+ 1-	809
368	1979	04	25.24985	15	47	26.13	-19	15	09.7 0.1+ 1-	809
368	1979	04	25.25885	15	47	25.89	-19	15	07.9 0.1+ 1-	809
368	1979	04	26.21352	15	46	51.85	-19	10	50.7 0.1+ 1-	809
368	1979	04	26.22322	15	46	51.51	-19	10	48.6 0.1+ 1-	809
368	1979	04	26.23291	15	46	51.09	-19	10	45.3 0.1+ 1-	809
368	1979	04	29.36462	15	44	52.31	-18	56	16.1 0.1+ 1-	809
368	1979	04	29.37363	15	44	51.95	-18	56	13.7 0.1+ 1-	809
368	1979	04	29.38263	15	44	51.54	-18	56	10.7 0.1+ 1-	809
650	1979	04	21.24726	15	50	54.05	-19	09	37.7 0.3+ 1-	809
650	1979	04	21.25626	15	50	53.56	-19	09	36.3 0.3+ 1-	809
650	1979	04	21.26527	15	50	53.26	-19	09	35.1 0.3+ 1-	809
650	1979	04	26.21352	15	47	21.48	-18	53	59.7 0.1+ 1-	809

650	1979 04 26.22322	15 47 21.03	-18 53 58.3	0.1+	1-				809
650	1979 04 26.23291	15 47 20.44	-18 53 56.6	0.1+	1-				809
941	1979 04 21.25626	15 48 56.40	-19 46 18.3	0.2+	1-				809
941	1979 04 21.26527	15 48 55.99	-19 46 18.4	0.2+	1-				809
941	1979 04 22.20922	15 48 18.79	-19 45 43.2	0.3+	1-				809
941	1979 04 22.21579	15 48 18.55	-19 45 43.5	0.3+	1-				809
941	1979 04 22.23068	15 48 18.00	-19 45 42.8	0.3+	1-				809
941	1979 04 22.23900	15 48 17.54	-19 45 43.0	0.3+	1-				809
941	1979 04 23.12892	15 47 41.45	-19 45 07.6	0.2+	1-				809
941	1979 04 25.24084	15 46 12.39	-19 43 35.1	0.1+	1-				809
941	1979 04 25.24985	15 46 11.95	-19 43 34.7	0.1+	1-				809
941	1979 04 25.25885	15 46 11.62	-19 43 34.8	0.1+	1-				809
941	1979 04 26.21352	15 45 29.94	-19 42 48.2	0.1+	0				809
941	1979 04 26.22322	15 45 29.47	-19 42 47.2	0.1+	0				809
941	1979 04 26.23291	15 45 29.01	-19 42 46.9	0.1+	0				809
941	1979 04 29.36462	15 43 05.91	-19 39 52.1	0.1+	0				809
941	1979 04 29.37363	15 43 05.51	-19 39 51.7	0.1+	0				809
941	1979 04 29.38263	15 43 05.00	-19 39 51.0	0.1+	0				809

OBSERVATION MADE AT THE EUROPEAN SOUTHERN OBSERVATORY BY H.-E. SCHUSTER.
MEASURED BY R. M. WEST.

Object	Date	UT	R. A. (1950)	Decl.	Obs.
/1980a	1980 03 12.26854	13 37 05.08	-08 36 11.6		809

OBSERVATIONS MADE AT OXFORD BY W. G. WADDINGTON.

Object	Date	UT	R. A. (1950)	Decl.	Obs.
385	1980 02 15.9201	07 16 35.59	+36 34 22.3		996
385	1980 02 15.9219	07 16 35.51	+36 34 19.8		996
385	1980 02 16.8470	07 16 05.11	+36 28 17.0		996
385	1980 02 16.8481	07 16 05.08	+36 28 16.0		996
385	1980 02 16.8521	07 16 05.09	+36 28 14.0		996
385	1980 02 17.8307	07 15 34.57	+36 21 44.9		996
385	1980 02 17.8323	07 15 34.58	+36 21 42.6		996
385	1980 02 22.8828	07 13 30.67	+35 46 56.5		996
385	1980 02 22.8845	07 13 30.64	+35 46 55.7		996
385	1980 02 22.8869	07 13 30.57	+35 46 54.2		996
385	1980 02 22.8876	07 13 30.55	+35 46 54.4		996
385	1980 03 04.8161	07 12 03.97	+34 25 58.1		996
385	1980 03 04.8185	07 12 03.85	+34 25 56.4		996
385	1980 03 04.8196	07 12 03.75	+34 25 55.5		996

* * * * *

ORBITAL ELEMENTS OF ONE-OPPOSITION MINOR PLANETS.

The orbit computers 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
1928 DB1	12.5	280315	301.63	110.77	133.74	2.91	0.2211	2.9772	23	4	1	B
1935 TC	14.0	351005	322.78	337.51	86.50	5.97	0.1515	2.2485	23	5		B
1936 PB	14.5	360820	11.91	0.87	302.84	6.77	0.3098	2.6365	11	4		B
1936 UB	13.0	361108	41.07	279.50	59.70	19.11	0.2356	3.1442	27	9		B
1937 QB	13.0	370904	55.18	206.63	33.93	0.86	0.3731	2.7917	10	3		B
1943 EC1	12.5	430317	298.03	260.33	6.11	19.81	0.2284	2.9103	38	5		B
1980 CT	15.0	800411	79.14	60.51	19.88	9.86	0.1743	2.3274	8	8		M
1980 CU	13.0	800411	283.26	182.08	104.07	7.91	0.2520	2.3761	8	0		M
1980 DB1	13.0	800411	114.06	12.04	45.70	7.76	0.0630	2.9996	8	0		M
1980 EG	13.6	800411	83.42	19.68	93.16	14.76	0.1280	2.5798	89	9		E

1980 GA	13.4	800501	16.23	140.25	48.59	25.39	0.2086	2.3796	58	0		E
1980 GC	10.8	800411	36.27	5.20	170.55	21.99	0.0683	5.1582	89	9		E
1980 GP	15.5	800411	330.97	246.40	357.35	0.72	0.2194	2.7784	4	0		M
1980 HB	13.0	800501	81.19	281.59	186.01	25.36	0.1171	2.4522	26	8		M
1980 JA	13.0	800521	300.67	308.80	330.53	1.00	0.0707	2.9339	4	0	1	F
1980 JC	14.8	800521	266.23	333.87	350.84	2.37	0.1280	2.1483	3	6	1	F
1980 JD	14.5	800521	85.87	295.99	167.60	3.73	0.2902	2.3718	3	8		F
1980 JE	14.8	800521	351.55	182.09	55.18	14.17	0.2107	2.6160	3	7		F
1980 JF	14.0	800521	58.75	7.76	164.11	7.92	0.0369	2.5276	2	6		F
1980 JG	13.0	800521	333.49	75.09	204.30	14.31	0.2448	2.9681	2	6		F
1980 JH	14.0	800521	299.97	114.02	198.56	12.93	0.1560	2.6030	2	6		F
1980 JJ	14.0	800521	67.38	333.35	184.30	8.69	0.0994	2.3641	2	6		F
1980 JM	15.0	800521	32.54	113.37	70.39	7.59	0.1058	2.3847	3	8		M
1980 JP	11.5	800521	46.53	133.41	24.94	14.59	0.0968	3.1431	4	0		M
1980 LA	13.6	800610	331.96	68.68	265.86	22.22	0.3146	2.3962	4	6		E
1980 LB	12.1	800610	316.65	260.52	108.89	42.08	0.3413	3.2352	7	8		E
1980 LC	13.6	800610	70.71	3.83	198.31	6.72	0.1351	2.3451	7	5		E
1980 LD	11.9	800610	50.50	109.71	103.24	9.98	0.2540	3.4356	7	5		E
1980 LE	15.0	800610	14.65	306.84	311.75	4.65	0.2205	2.4718	4	6	1	M

Note 1: e assumed.

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ORBITAL ELEMENTS BY P. HERGET, UNIVERSITY OF CINCINNATI.

(937) Bethgea
Epoch 1981 July 15.0 ET = JDE 2444800.5

M 112.06618		(1950.0)	P	Q
n 0.29573479	Peri.	71.76262	+0.70687417	+0.70498968
a 2.23117908	Node	243.36167	-0.67085902	+0.64237442
e 0.21797957	Incl.	3.69508	-0.22422549	+0.30057387

From 52 observations at 17 oppositions 1916-1977, mean residual 4".1.

(975) Perseverantia
Epoch 1981 July 15.0 ET = JDE 2444800.5

M 245.94453		(1950.0)	P	Q
n 0.20661547	Peri.	51.57189	-0.00240457	-0.99960826
a 2.83374528	Node	38.59386	+0.90293856	-0.01415400
e 0.03606769	Incl.	2.56202	+0.42976291	+0.02414485

From 63 observations at 23 oppositions 1922-1977, mean residual 4".0.

(1260) Walhalla
Epoch 1981 July 15.0 ET = JDE 2444800.5

M 328.24263		(1950.0)	P	Q
n 0.23326754	Peri.	22.60742	+0.83688734	+0.53516656
a 2.61356417	Node	304.53122	-0.52110886	+0.71467947
e 0.03698002	Incl.	8.02170	-0.16752648	+0.45036651

From 25 observations at 9 oppositions 1933-1973, mean residual 2".7.

(1275) Cimbria
Epoch 1981 July 15.0 ET = JDE 2444800.5

M 59.76814		(1950.0)	P	Q
n 0.22475351	Peri.	196.09280	+0.91148755	-0.41005831
a 2.67915837	Node	188.33570	+0.39765691	+0.89854459
e 0.16877154	Incl.	12.86936	+0.10516378	+0.15642819

From 28 observations at 15 oppositions 1932-1972, mean residual 2".9.

(1306) Scythia
Epoch 1981 July 15.0 ET = JDE 2444800.5

M	332.78038	(1950.0)	P	Q
n	0.17733923	Peri. 134.03679	+0.64027695	-0.72366232
a	3.13761389	Node 274.31081	+0.60992572	+0.68281295
e	0.11083116	Incl. 14.97109	+0.46694328	+0.10039576

From 25 observations at 15 oppositions 1942-1977, mean residual 3".4.

(1370) Hella
The 1952 observations were identified by H. J. Wood on the basis of a prediction by P. Herget.
Epoch 1980 Dec. 27.0 ET = JDE 2444600.5

M	179.45167	(1950.0)	P	Q
n	0.29202971	Peri. 3.02094	+0.62553353	+0.77722267
a	2.25001121	Node 305.71148	-0.71752806	+0.53883712
e	0.17113420	Incl. 4.80852	-0.30636785	+0.32492993
P	3.38	B(1,0) 15.0		

Residuals in seconds of arc

350831	024	1.2+	1.8+	351101	024	0.6-	0.9-	761220	095	0.0	0.8-
350901	024	1.1+	1.4+	351101	024	2.1-	1.2-	791213	809	1.3+	0.4+
350909	024	2.0+	1.9-	521024	760	2.1+	1.6-	791215	809	3.2-	0.3+
350920	024	2.9-	2.1-	521024	760	1.5+	0.7-	791216	809	0.2-	1.1+
350924	024	1.4-	3.5+	550627	760	0.2+	0.8-	791221	809	0.6-	0.4+

(1480) Aunus
Epoch 1981 July 15.0 ET = JDE 2444800.5

M	123.49309	(1950.0)	P	Q
n	0.30161356	Peri. 64.20379	-0.60631723	-0.79160234
a	2.20209204	Node 63.32909	+0.69580892	-0.57425038
e	0.10923314	Incl. 4.86578	+0.38500566	-0.20881147

From 21 observations at 9 oppositions 1940-1977, mean residual 4".0.

(1489) Attila
Epoch 1981 July 15.0 ET = JDE 2444800.5

M	192.91640	(1950.0)	P	Q
n	0.17237698	Peri. 8.13905	-0.95729904	-0.28855520
a	3.19754403	Node 155.06736	+0.26280481	-0.89414912
e	0.14709507	Incl. 2.41082	+0.12046649	-0.34239338

From 31 observations at 10 oppositions 1939-1976, mean residual 4".1.

(1619) Ueta
Epoch 1981 July 15.0 ET = JDE 2444800.5

M	89.01047	(1950.0)	P	Q
n	0.29382246	Peri. 327.29974	+0.87634291	-0.47227247
a	2.24084964	Node 61.16378	+0.46190805	+0.76812892
e	0.17585993	Incl. 6.21083	+0.13661638	+0.43236173

From 66 observations at 15 oppositions 1926-1978, mean residual 3".4.

(1626) Sadeya
Epoch 1981 July 15.0 ET = JDE 2444800.5

M	30.16956	(1950.0)	P	Q
n	0.27120855	Peri. 148.43048	+0.33144530	-0.84416526
a	2.36374409	Node 279.18106	+0.75204617	+0.50605471
e	0.27430810	Incl. 25.26526	+0.56971094	-0.17690005

From 53 observations at 7 oppositions 1927-1977, mean residual 3".9.

(1638) Ruanda
Epoch 1981 July 15.0 ET = JDE 2444800.5

M 14.12206		(1950.0)	P	Q
n 0.21617766	Peri.	85.52304	+0.27400111	+0.96172780
a 2.74955345	Node	200.37972	-0.88429481	+0.25122848
e 0.18724810	Incl.	0.28608	-0.37808208	+0.10937954

From 47 observations at 11 oppositions 1935-1977, mean residual 1".9.

(1642) Hill
Epoch 1981 July 15.0 ET = JDE 2444800.5

M 60.00826		(1950.0)	P	Q
n 0.21578892	Peri.	149.75475	-0.63036495	-0.77340256
a 2.75285460	Node	339.08686	+0.66928867	-0.49771879
e 0.06730955	Incl.	10.81798	+0.39330990	-0.39258689

From 42 observations at 12 oppositions 1908-1974, mean residual 6".1.

(1650) Heckmann
Epoch 1981 July 15.0 ET = JDE 2444800.5

M 293.59259		(1950.0)	P	Q
n 0.25913197	Peri.	57.47293	-0.22668596	+0.97383811
a 2.43662506	Node	199.44388	-0.90881317	-0.21736382
e 0.16246569	Incl.	2.73769	-0.35024575	-0.06627441

From 68 observations at 14 oppositions 1906-1979, mean residual 2".8.

(1651) 1936 HD
Epoch 1981 July 15.0 ET = JDE 2444800.5

M 65.80629		(1950.0)	P	Q
n 0.30627893	Peri.	338.40599	-0.96804026	-0.25055586
a 2.17967274	Node	187.11029	+0.24109156	-0.91767776
e 0.06635128	Incl.	5.07312	+0.06908617	-0.30836550

From 35 observations at 9 oppositions 1936-1972, mean residual 4".1.

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ORBITAL ELEMENTS BY W. LANDGRAF, WIESBADEN.

Periodic Comet Wilk (1937 II)
Epoch 1937 Feb. 16.0 ET = JDE 2428580.5
T 1937 Feb. 21.54318 ET

q 0.6190026		(1950.0)	P	Q
z +0.0296936	Peri.	31.48341	+0.06142470	-0.92688505
+/-0.0002817	Node	57.55772	+0.80007433	-0.17608011
e 0.9816196	Incl.	26.02490	+0.59674790	+0.33148137

P 195.4
From 71 observations 1937 Feb. 28-May 8, mean residual 2".4.

Comet Bradfield (1979l)
Epoch 1980 Jan. 2.0 ET = JDE 2444240.5
T 1979 Dec. 21.60028 ET

q 0.5451825		(1950.0)	P	Q
z +0.0226615	Peri.	257.57597	-0.76720512	-0.39082062
+/-0.0002963	Node	102.50989	-0.15592976	+0.88278110
e 0.9876454	Incl.	148.60401	-0.62215931	+0.26068522

P 293.1
From 89 observations 1979 Dec. 26-1980 Mar. 10, mean residual 2".9.

(2035) Stearns
Epoch 1979 Nov. 23.0 ET = JDE 2444200.5

M 198.82138	(1950.0)	P	Q	
n 0.38112348	Peri. 200.18477	+0.07884335	+0.88804807	
a 1.88404918	Node 76.56049	-0.83868748	+0.30469437	
e 0.13129383	Incl. 27.75503	-0.53887571	-0.34428472	
P 2.59	B(1,0) 13.1			

Residuals in seconds of arc

730921	808	0.4-	0.7-	750108	801	0.9-	0.1-	761220	095	1.4+	3.5-
730926	808	0.2-	0.7-	750209	801	0.4-	1.3+	780802	474	0.1-	0.4+
731001	808	0.3+	1.8+	750211	801	2.1-	0.2-	780802	474	0.4+	0.2-
731025	485	1.1+	2.1-	750305	801	2.4+	0.0	800223	556	0.3+	0.4+
731025	485	1.1+	1.8-	750305	801	2.3+	0.4+	800223	556	1.0+	1.2+
731029	076	(3.7-)	0.8+	761022	801	0.2+	0.1-	800223	556	0.0	0.6+
731029	076	0.4-	3.4-	761029	801	0.0	1.2-	800304	556	0.7-	0.7-
731121	485	0.1-	3.1-	761117	801	0.4+	0.4+	800304	556	0.5+	2.0-
731121	485	1.9-	0.2-	761216	095	(9.4-)	2.9+	800305	556	1.0-	0.8-
750108	801	1.1-	1.0-	761218	095	2.1-	1.3+	800305	556	0.3-	0.0

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ORBITAL ELEMENTS BY G. SITARSKI, SPACE RESEARCH CENTER, WARSAW.

(2060) Chiron
Epoch 1977 Sept. 14.0 ET = JDE 2443400.5

M 229.07579	(1950.0)	P	Q	
n 0.019446262	Peri. 339.10135	-0.98946043	+0.13272019	
a 13.6955232	Node 208.71466	-0.10974997	-0.94823569	
e 0.37859871	Incl. 6.92272	-0.09446164	-0.28850374	
P 50.68	B(1,0) 6.0			

Residuals in seconds of arc

950424	802	0.4+	2.3+	761024	381	0.6+	1.6-	771110	675	1.8-	0.6+
410123	074	1.7+	0.1-	761117	801	0.1+	0.4+	771112	801	0.4+	0.6-
430308	074	0.9-	0.2+	761216	801	(8.2-	12.1+)	771112	711	0.1+	0.3-
450416	062	0.2-	1.4-	771011	675	0.3-	0.4+	771113	675	1.7-	1.2+
480804	074	0.1+	(5.6+)	771012	675	0.6-	0.1+	771114	711	0.5+	0.2-
520823	675	0.3-	1.3+	771018	675	0.7+	0.2+	771114	675	2.0-	1.9+
690910	675	1.2+	0.1+	771019	675	0.2+	0.5+	771115	801	0.2+	0.2+
690911	675	1.5+	0.2-	771103	675	0.1-	1.3+	771118	675	0.5+	1.4-
761022	381	0.6+	1.1-	771104	675	0.2-	1.2+	780109	809	0.3+	0.6-
761022	381	0.3+	1.6-	771109	675	2.3-	1.7+	780110	809	1.0+	1.0-

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

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

Comet Torres (1980e)
T 1980 Apr. 18.86606 ET

q 2.5805217	(1950.0)	P	Q	
	Peri. 334.62044	+0.01547971	+0.32533823	
	Node 278.82575	-0.67345072	-0.69554435	
e 1.0	Incl. 73.09731	-0.73907002	+0.64060369	

From 10 observations 1980 June 13-24.

Periodic Comet Wild 3 (1980d)
T 1980 Oct. 5.11231 ET

q	2.2882530	(1950.0)	P	Q
n	0.14306393	Peri. 179.29876	-0.31959785	+0.91297520
a	3.6206173	Node 72.03714	-0.87061362	-0.17727310
e	0.3679937	Incl. 15.46426	-0.37401755	-0.36749221
P	6.89			

From 25 observations 1980 Apr. 11-June 14.

Comet Bowell (1980b)
Epoch 1982 Mar. 12.0 ET = JDE 2445040.5
T 1982 Mar. 12.27995 ET

q	3.3630673	(1950.0)	P	Q
z	-0.0171037	Peri. 134.77501	-0.35880999	+0.93303236
	+/-0.0004483	Node 114.18099	-0.86436193	-0.32138761
e	1.0575211	Incl. 1.66905	-0.35232632	-0.16174244

From 21 observations 1980 Feb. 11-June 16, mean residual 0".9.

(1037) Davidweilla

The 1941 observations were identified by L. Oterma on the basis of a prediction by B. G. Marsden.
Epoch 1980 Dec. 27.0 ET = JDE 2444600.5

M	232.08318	(1950.0)	P	Q
n	0.29112517	Peri. 169.21295	+0.98587296	-0.16365026
a	2.2546694	Node 200.31081	+0.14499423	+0.94049141
e	0.1914511	Incl. 5.90001	+0.08385217	+0.29781619
P	3.39	B(1,0) 14.0		

Residuals in seconds of arc

241029 008	0.7-	1.0-	411116 062	0.6+	0.6-	751203 095	1.6-	3.2+
241101 008	0.3+	0.2+	411117 062	1.1+	0.7-	800417 801	0.5-	0.3+
241102 008	1.3-	0.7+	511005 012	1.2+	4.0+	800418 801	2.3+	0.7+
241114 008	0.7-	2.8-	511006 012	3.5-	2.3-			
411114 062	0.6-	3.4-	581206 024	0.2-	1.1-			

(2265)* 1950 DB = 1971 BZ1

Discovered 1950 Feb. 17 by S. Arend at Uccle. The identification is by D. W. Green (MPC 4782).
Epoch 1980 Dec. 27.0 ET = JDE 2444600.5

M	132.35255	(1950.0)	P	Q
n	0.23329358	Peri. 338.79074	-0.38706285	-0.88796097
a	2.6133697	Node 133.00699	+0.88727565	-0.43198582
e	0.2140763	Incl. 19.85840	+0.25084710	+0.15784034
P	4.22	B(1,0) 14.0		

Residuals in seconds of arc

500217 012	(8.7+	3.5+)	500620 672	1.1-	0.5+	510805 672	0.5-	1.3-
500218 012	0.4+	2.8+	510501 672	0.2+	1.1-	510805 672	0.5-	1.5-
500221 012	0.9+	2.0+	510502 672	0.2+	1.4-	510805 672	0.5-	1.4-
500307 012	1.5+	0.5-	510503 672	2.3-	3.2+	510805 672	0.9-	0.9-
500319 012	0.2+	0.8+	510503 672	3.4+	1.9-	710131 095	(1.1+	11.0-)
500520 672	0.8-	1.1+	510708 672	0.1-	0.6-	800312 801	0.5+	1.6+
500520 672	0.8-	0.9+	510708 672	0.0	0.3-	800417 801	0.4+	0.9-
500521 672	0.3-	0.2+	510709 672	0.3-	0.7-	800521 801	0.2-	0.2-
500521 672	0.7-	0.4+	510710 672	0.7-	0.9-			
500620 672	1.0-	0.3+	510710 672	0.2-	0.7-			

(2266)* 1974 VK = 1937 VM = 1937 VQ = 1943 UH = 1955 QY = 1962 WM2 = 1973 QH

Discovered 1974 Nov. 12 by L. Chernykh at the Crimean Astrophysical Observatory. The key identification 1974 VK = 1973 QH is by E. Bowell (MPC 5317). The double designation 1937 VM = 1937 XB (MPC 1330) is invalid.

Epoch 1980 Dec. 27.0 ET = JDE 2444600.5

		(1950.0)	P	Q
M	338.98671			
n	0.15982754	Peri.	205.45349	+0.25366786	-0.95080352
a	3.3628046	Node	230.38095	+0.92222580	+0.29318982
e	0.2069629	Incl.	13.34796	+0.29180846	-0.10006195
P	6.17	B(1,0)	12.0		

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

371103	020	3.5+	5.6-	550824	760	0.2-	1.5+	741112 095	0.2+	2.4+
371103	020	5.1+	5.0+	550824	760	2.1-	2.1+	741117 095	1.6-	1.9+
371110	094	(0.03-	0.01+)X	621130	760	1.6-	0.4-	741119 095	0.4-	1.6+
371112	020	(0.02-	0.03+)	621130	760	0.9+	1.6+	741210 095	2.3+	4.0+
371203	020	(1.02-	0.32-)	730827	095	0.9+	0.7-			
431030	024	3.1+	0.5+	730831	095	0.8-	1.6-			

(2267)* 1977 RF = 1973 FJ1

Discovered 1977 Sept. 9 at the Harvard College Observatory, Agassiz Station. The identification is by E. Bowell.

Epoch 1980 Dec. 27.0 ET = JDE 2444600.5

		(1950.0)	P	Q
M	60.59834			
n	0.29843538	Peri.	299.38108	-0.03907952	+0.99907619
a	2.2176985	Node	328.36404	-0.90451503	-0.04297213
e	0.1379653	Incl.	1.95309	-0.42464732	-0.00041089
P	3.30	B(1,0)	14.5		

Residuals in seconds of arc

730327	095	4.2+	2.0+	770915	801	2.7+	1.4+	771211 801	1.1+	0.7-
730401	095	4.1-	1.8-	770918	095	1.8-	0.0	781125 801	0.9+	0.1-
770908	801	0.2-	0.6+	771007	801	0.9+	0.7-	790120 801	0.8-	0.0
770909	801	2.2-	0.8+	771016	801	0.7-	1.4-	800611 688	0.0	0.3+
770911	801	0.2+	1.3-	771111	801	1.2+	1.0+			
770912	801	0.7+	1.2-	771207	801	2.2-	2.4+			

1951 RL = 1977 QP2

The identification was found independently by O. Kippes, C. M. Bardwell and B. G. Marsden.

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

		(1950.0)	P	Q
M	271.61594			
n	0.22776781	Peri.	18.42492	+0.98956474	+0.10783933
a	2.6554738	Node	334.79023	-0.14329020	+0.80624218
e	0.1720832	Incl.	12.96533	+0.01515043	+0.58167364
P	4.33	B(1,0)	13.5		

Residuals in seconds of arc

510904	024	1.3+	0.7-	511004	024	1.3+	0.2-	770909 095	1.5-	2.3+
510905	024	3.2-	0.4-	770821	095	0.3-	0.0			
510906	024	2.5+	1.4-	770823	095	0.0	0.5+			

1972 TL2 = 1935 BF = 1980 LF

The key identification 1972 TL2 = 1980 LF is by E. Bowell.

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

		(1950.0)	P	Q
M	339.49257			
n	0.22910502	Peri.	68.66068	+0.94441793	-0.28352531
a	2.6451310	Node	307.42714	+0.16504787	+0.84666669
e	0.1948345	Incl.	12.09512	+0.28431317	+0.45029869
P	4.30	B(1,0)	13.0		

Residuals in seconds of arc

350129	012(77.7-	27.1+)X	721006	095	0.4+	0.6-	721028 095	1.4- 0.7-
350208	012	1.2+ 1.5+	721006	095	1.2-	0.4-	800614 688	1.1- 0.5+
721002	095	1.6- 1.0+	721007	095	3.4+	2.5-	800614 688	0.7- 0.2-
721002	095	0.7- 1.2+	721008	095	0.1+	0.7-	800617 688	0.8- 0.9+
721003	095	3.5- 0.4+	721008	095(11.2-		1.5-)	800617 688	1.9- 0.9+
721004	095	0.7+ 0.2+	721013	095	0.9-	1.5-	800618 688	2.3+ 0.8+
721005	095	1.8- 0.3-	721014	095	1.3+	1.3-	800618 688	0.1- 1.1-
721005	095(47.3-	3.0-)	721028	095	0.1+	2.9-		

1977 RA
Epoch 1980 Dec. 27.0 ET = JDE 2444600.5

M	35.56543		(1950.0)	P	Q
n	0.32285668	Peri.	41.92863	+0.85621127	+0.50915883
a	2.1044060	Node	287.26430	-0.49499600	+0.76000194
e	0.4133757	Incl.	5.25842	-0.14792302	+0.40392366
P	3.05	B(1,0)	16.8		

Residuals in seconds of arc

770904	026	0.8- 1.6+	770916	688	0.7+	1.9-	771009 879	0.7- 0.9+
770906	026	1.0+ 1.3+	770916	885	1.8-	0.6-	771009 046	1.7+ 0.3-
770907	026	0.1- 0.1+	770916	885	1.1+	0.4+	771009 046	2.1+ 0.2-
770909	026	0.7+ 0.2+	770916	885	0.8-	0.3+	771010 494	0.5- 2.0+
770911	801	0.7- 1.2+	770916	879	2.5+	1.1-	771012 026	1.0- 0.7+
770911	026	0.5- 0.4-	770916	879	2.5+	0.5+	771013 026	0.7- 1.0+
770912	885	1.7+ 0.3+	770917	885	0.4+	0.7+	771016 801	0.8- 0.8+
770912	885	0.7+ 0.3-	770917	885	0.8+	0.3+	771016 046	1.0+ 1.3-
770912	323	0.7- 0.7+	770917	885	0.2+	0.8+	771016 046	0.1+ 1.0-
770912	026	0.7+ 1.2+	770917	396	0.5-	0.1+	771017 046	0.9- 0.2+
770913	675	0.2+ 0.0	770917	396	0.6+	0.7+	771017 046	0.5- 0.1+
770913	372	0.6+ 0.1-	770917	396	1.8-	1.0-	771017 026	0.3+ 1.1-
770913	372	2.2- 0.4-	770919	688	0.6+	1.6-	771018 046	0.9- 0.1-
770913	046	0.7- 0.7-	770919	323	0.9-	0.9+	771018 046	0.3- 0.4-
770913	046	0.7- 1.2-	770923	026	0.6-	0.3+	771019 046	0.2- 0.7-
770914	885	1.9- 1.1-	770923	026	0.2+	0.5+	771019 046	0.1- 1.0-
770914	885	0.2+ 1.7-	771006	046	1.1+	0.3+	771020 046	0.5- 1.0-
770914	046	0.7- 0.7-	771006	046	2.9-	2.2+	771020 046	2.0- 1.6-
770914	046	1.1- 0.3-	771007	046	0.2-	0.2+	771105 026	0.0 0.6+
770915	675	0.0 0.4+	771007	046	0.3+	0.8+	771208 801	1.4+ 1.1+
770915	026	0.6+ 0.4-	771008	046	4.2+	0.2-	800611 688	0.0 0.2-
770915	026	0.5- 0.9-	771008	046	3.8+	0.6-		
770915	026	0.5+ 0.4+	771009	879	2.6-	0.8+		

* * * * *

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

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

(2219) 1975 LU = 1931 TJ3 = 1936 OK = 1948 TM
Epoch 1980 Dec. 27.0 ET = JDE 2444600.5

M	268.39406		(1950.0)	P	Q
n	0.17637333	Peri.	301.38908	+0.96406402	-0.23398225
a	3.1490588	Node	72.39875	+0.26555954	+0.86237955
e	0.1207859	Incl.	7.58569	-0.00766070	+0.44894745
P	5.59	B(1,0)	12.0		

Residuals in seconds of arc

311011	690	0.2+	1.6-	651120	760	1.8-	2.7-	750615	808	0.1-	0.8+
311012	690	0.6-	2.3-	651120	760	2.9-	0.4-	750617	808	0.1+	0.6-
311013	690	1.7+	1.8-	711029	095	2.0+	1.6-	750617	808	0.1-	0.2+
360716	078	(5.9-	9.5+)X	740419	026	4.2-	1.2-	750701	808	0.2+	0.9+
481009	062	2.5+	0.5-	740420	026	0.8+	3.1-	750701	808	0.9-	0.7-
481009	062	1.1+	1.1+	740422	026	0.5-	2.4-	750707	808	1.6+	0.8+
520503	839	0.5+	3.2-	750613	808	0.9+	0.3+	750707	808	0.8-	0.6+
520503	839	1.9-	1.1-	750613	808	0.3+	0.6+	750712	808	0.4+	0.6+
651101	760	0.6-	0.1-	750615	808	0.2+	0.3-	750712	808	0.4-	0.0
651101	760	2.3+	0.4-								

(2268)* 1942 VW = 1977 SW1

Discovered 1942 Nov. 6 by L. Oterma at Turku.

Epoch 1980 Dec. 27.0 ET = JDE 2444600.5

			(1950.0)	P	Q
M	208.27470				
n	0.19571463	Peri.	324.03319	+0.59418726	-0.80225437
a	2.9380139	Node	89.44235	+0.75074810	+0.52743282
e	0.1160215	Incl.	3.30803	+0.28864992	+0.27964718
P	5.04	B(1,0)	13.0		

Residuals in seconds of arc

421106	062	0.3-	0.1-	421211	062	1.2+	0.6+	771007	095	2.0-	0.4+
421113	062	2.2-	0.8-	421211	062	1.0-	0.9+	800420	801	1.8-	0.4-
421203	062	1.2+	0.6-	770919	095	1.4-	0.4-	800510	801	1.6+	0.1+
421204	062	1.3+	0.8-	770922	095	3.3+	0.4-				

(2269)* 1976 JA2 = 1951 WO1 = 1962 XA = 1978 VE

Discovered 1976 May 2 by N. Chernykh at the Crimean Astrophysical Observatory. The identification 1976 JA2 = 1962 XA is by E. Bowell. The identification 1976 JA2 = 1978 VE is by T. Urata (NOC 1067).

Epoch 1980 Dec. 27.0 ET = JDE 2444600.5

			(1950.0)	P	Q
M	46.25664				
n	0.17795020	Peri.	44.18764	-0.33120249	-0.91168903
a	3.1304281	Node	66.54901	+0.77539390	-0.40982561
e	0.0819108	Incl.	15.37028	+0.53765156	+0.02942911
P	5.54	B(1,0)	12.0		

Residuals in seconds of arc

511129	711	1.1+	2.0-	760406	808	0.8-	0.4-	760502	095	2.2-	0.5-
621201	760	0.6+	0.4-	760422	808	0.3+	0.1-	760525	095	1.7-	0.5-
621201	760	1.5-	0.7-	760422	808	0.1-	0.2+	760530	095	0.1-	0.6+
621202	760	0.5+	0.1+	760426	808	0.4-	0.2-	781105	809	1.3+	1.5-
621202	760	0.4+	0.2+	760426	808	0.1-	0.0				
760406	808	0.5+	0.9-	760501	808	2.2+	1.4-				

(2270)* 1980 ED = 1952 DM1 = 1958 FD = 1970 LF = 1971 TF2 = 1976 QH = 1977 UD1

Discovered 1980 Mar. 14 by E. Bowell at the Anderson Mesa Station of the Lowell Observatory.

Epoch 1980 Dec. 27.0 ET = JDE 2444600.5

			(1950.0)	P	Q
M	329.80008				
n	0.17596416	Peri.	176.70625	-0.29749353	+0.95403547
a	3.1539387	Node	75.98429	-0.87675078	-0.25797198
e	0.1314584	Incl.	2.14109	-0.37789637	-0.15253453
P	5.60	B(1,0)	12.2		

Residuals in seconds of arc

520219	711	3.8+	0.2-	Y	711020	095	2.9+	0.9-	800314	688	0.2+	2.5-
580323	024	3.0-	2.5+		711020	095	0.8+	2.0-	800316	688	1.7-	1.7-
700610	095	0.3+	2.1-		760826	095	1.9+	0.3-	800321	688	1.6+	0.3+
711013	095	0.7+	0.0		771017	095	0.5-	0.8-	800414	688	0.7-	1.3-
711014	095	0.4-	1.2-		800211	688	0.2+	0.7-	800414	688	2.8-	0.5-
711015	095	3.6-	0.0		800314	688	0.7+	1.0-				

1928 TK = 1935 QB1 = 1964 XC = 1971 SJ1 = 1975 XL5

The key identification 1928 TK = 1964 XC is by E. Bowell. The identifications 1928 TK = 1935 PC (MPC 2807) and 1928 TK = 1939 TB (JC 115) are invalid.

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

			(1950.0)	P	Q
M	217.86070				
n	0.27461506	Peri.	147.24396	+0.98896914	+0.14787483
a	2.3441605	Node	204.25658	-0.13997887	+0.91417148
e	0.2538762	Incl.	1.19233	-0.04843511	+0.37739042
P	3.59	B(1,0)	14.5		

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

281007	094	0.6+	0.8-		350820	078	(0.05+ | 0.00+)X	710916	095	0.9+	0.4+
281021	094	2.1+	0.4-		350824	078	(0.03+ | 0.00+)X	751204	095	0.4+	2.6-
281107	094	2.6-	0.0		641205	095	0.3-	2.9+				
281108	094	3.1-	1.5+		641210	095	1.8-	2.0+				

1939 PM = 1971 SC3

The identification 1939 PM = 1962 WD2 (MPC 2505) is invalid.

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

			(1950.0)	P	Q
M	58.81292				
n	0.21830799	Peri.	102.08175	+0.92948612	+0.36367339
a	2.7316423	Node	236.62159	-0.36057521	+0.86064484
e	0.0636468	Incl.	4.23190	-0.07772434	+0.35641566
P	4.51	B(1,0)	13.0		

Residuals in seconds of arc

390815	024	2.1-	1.2+		390908	024	1.7+	1.1+	710927	095	0.2+	1.7-
390818	024	0.8+	1.8-		390909	024	0.7-	0.5-	711012	095	0.1+	0.1-

1941 SS = 1968 QQ = 1975 XV

The key identification 1941 SS = 1968 QQ is by E. Bowell.

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

			(1950.0)	P	Q
M	249.29381				
n	0.29151954	Peri.	75.57952	+0.79461191	+0.60233336
a	2.2526400	Node	247.32712	-0.58392235	+0.72392822
e	0.2018285	Incl.	4.72880	-0.16621253	+0.33633682
P	3.38	B(1,0)	14.5		

Residuals in seconds of arc

410921	062	1.7-	0.6-		410927	062	2.1+	2.2+	680831	095	1.4-	0.7-
410925	062	1.8-	1.3+		411015	062	1.2-	0.3-	751201	095	0.2-	0.9+
410926	062	0.9-	0.3+		680827	095	2.1+	2.0+				

1962 HD = 1962 JQ = 1949 QK = 1959 NM = 1966 PR

The key identifications 1962 HD = 1949 QK = 1966 PR are by E. Bowell. The double designation 1962 HD = 1962 JQ is by O. Kippes (MPC 2324).

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

			(1950.0)	P	Q
M	150.78869				
n	0.28842082	Peri.	111.35802	-0.61337024	+0.78741210
a	2.2687458	Node	120.66042	-0.74843543	-0.55470290
e	0.0745650	Incl.	4.08727	-0.25223273	-0.26886217
P	3.42	B(1,0)	14.5		

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

490821 024	0.4-	2.8-	620503 760	0.1-	1.2+	660808 074	2.9+	0.8-
490822 024	0.5+	2.3+	620507 760	0.5+	0.8-	660808 074	2.0-	1.2-
590710 760(0.04-	0.00+)X		620507 760	0.4-	1.3-	660809 074	1.1+	0.2-
620427 760	1.0+	0.1-	660807 074	0.4+	0.6+	660809 074	0.8-	0.3+
620427 760	1.7+	0.0	660807 074	0.2+	0.4+	660810 074	2.0-	0.6+
620503 760	3.2-	0.9+						

1975 VD3 = 1949 XD = 1962 XC

The key identification 1975 VD3 = 1949 XD is by E. Bowell.

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

M	62.11736	(1950.0)	P	Q	
n	0.22560519	Peri.	1.01916	+0.77537949	-0.63042840
a	2.6724168	Node	38.14315	+0.57893606	+0.68643258
e	0.1945745	Incl.	3.40631	+0.25222942	+0.36245047
P	4.37	B(1,0)	13.5		

Residuals in seconds of arc

491214 760	2.0-	0.8-	621201 760	1.1-	0.4-	751102 095	0.7-	0.1-
491214 760	2.7-	0.8-	621201 760	0.4+	0.3+	751107 095	2.5+	0.1+
491225 760	3.7+	1.0-	621202 760	0.3+	5.5+	751201 095	1.3-	1.6-
491225 760	0.7+	1.9+	621202 760	0.8-	0.1+	751203 095	0.7-	0.4-

1976 UH1 = 1955 TV = 1970 HF

The key identification 1976 UH1 = 1970 HF was found independently by T. Urata (NOC 1067) and by B. G. Marsden.

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

M	332.50460	(1950.0)	P	Q	
n	0.23591884	Peri.	25.35704	+0.46898410	-0.87032520
a	2.5939514	Node	37.20055	+0.76202189	+0.31270313
e	0.1697144	Incl.	14.39347	+0.44651600	+0.38046129
P	4.18	B(1,0)	12.5		

Residuals in seconds of arc

551011 388	0.0	1.6-	761024 026	0.0	0.3+	761213 026	2.4+	1.3+
700429 095	1.7-	2.4-	761126 026	1.6-	2.3-	761214 026	0.7-	0.2+
761022 026	0.4+	0.5+	761126 026	0.5-	1.3-			

1978 VG3 = 1962 XB

The identification is by E. Bowell.

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

M	126.89014	(1950.0)	P	Q	
n	0.18684331	Peri.	26.90102	+0.04081377	-0.97073419
a	3.0302971	Node	61.60115	+0.86141139	-0.08582872
e	0.1551838	Incl.	15.60713	+0.50626538	+0.22429572
P	5.28	B(1,0)	12.0		

Residuals in seconds of arc

621201 760	0.6-	0.0	621202 760	0.6+	0.7+	781107 675	1.5+	1.1+
621201 760	0.8-	0.3-	781105 675	0.3+	1.0+	781108 675	0.2-	1.9+
621202 760	0.0	0.8+	781106 675	0.9+	0.8+	781129 675	0.4+	1.1+

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EPHEMERIDES.

Periodic Comet Wild 3 (1980d) Elements MPC 5413

Date ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	m1
1980 06 10	13 02.98	+06 50.1	1.847	2.423	112.4	22.8	15.7
1980 06 20	13 06.29	+04 52.2					
1980 06 30	13 11.90	+02 45.9	2.027	2.383	97.5	25.0	15.8
1980 07 10	13 19.57	+00 33.6					

1980 07 20	13 29.07	-01 42.7	2.221	2.349	84.3	25.5	15.9
1980 07 30	13 40.21	-04 01.1					
1980 08 09	13 52.80	-06 20.2	2.418	2.322	72.4	24.6	16.1
1980 08 19	14 06.73	-08 38.5					
1980 08 29	14 21.86	-10 54.7	2.607	2.303	61.4	22.7	16.2
1980 09 08	14 38.12	-13 07.5					
1980 09 18	14 55.43	-15 15.7	2.784	2.291	51.1	20.0	16.3
1980 09 28	15 13.73	-17 17.9					
1980 10 08	15 32.96	-19 12.8	2.944	2.288	41.1	16.7	16.4
1980 10 18	15 53.07	-20 59.2					
1980 10 28	16 13.97	-22 35.9	3.083	2.294	31.4	13.0	16.5

Comet Torres (1980e) Elements MPC 5412

Date ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	m1
1980 06 30	18 37.89	-25 57.2	1.677	2.693	177.1	1.1	15.4
1980 07 10	18 18.55	-21 30.3					
1980 07 20	18 02.55	-17 18.6	1.817	2.761	153.0	9.6	15.7
1980 07 30	17 50.44	-13 36.3					
1980 08 09	17 42.16	-10 29.1	2.101	2.842	128.2	16.3	16.1
1980 08 19	17 37.38	-07 55.7					
1980 08 29	17 35.61	-05 51.5	2.471	2.935	107.4	19.2	16.6
1980 09 08	17 36.35	-04 10.3					
1980 09 18	17 39.20	-02 46.4	2.874	3.039	89.7	19.3	17.1
1980 09 28	17 43.77	-01 34.6					
1980 10 08	17 49.73	-00 30.8	3.274	3.151	74.2	17.8	17.6
1980 10 18	17 56.85	+00 28.7					
1980 10 28	18 04.88	+01 26.7	3.646	3.272	60.4	15.3	18.0
1980 11 07	18 13.64	+02 25.3					
1980 11 17	18 22.97	+03 26.7	3.972	3.398	48.5	12.6	18.3
1980 11 27	18 32.71	+04 32.2					
1980 12 07	18 42.74	+05 43.0	4.242	3.530	38.9	10.1	18.6
1980 12 17	18 52.94	+07 00.3					
1980 12 27	19 03.17	+08 24.7	4.448	3.667	33.3	8.5	18.9

Comet Bowell (1980b) Elements MPC 5413

Date ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	m1
1980 10 28	11 51.47	+02 15.3	6.454	5.694	37.2	6.1	15.1
1980 11 07	11 58.58	+01 31.2					
1980 11 17	12 05.37	+00 49.4	6.087	5.556	53.5	8.2	14.9
1980 11 27	12 11.80	+00 10.3					
1980 12 07	12 17.72	-00 25.0	5.669	5.418	70.4	9.9	14.6
1980 12 17	12 23.05	-00 56.2					
1980 12 27	12 27.65	-01 22.1	5.223	5.282	88.1	10.7	14.3
1981 01 06	12 31.41	-01 42.4					
1981 01 16	12 34.18	-01 56.0	4.777	5.147	106.7	10.5	14.0
1981 01 26	12 35.89	-02 02.5					
1981 02 05	12 36.44	-02 01.6	4.366	5.016	126.5	9.1	13.7
1981 02 15	12 35.81	-01 53.2					
1981 02 25	12 34.05	-01 37.7	4.023	4.886	147.4	6.3	13.4
1981 03 07	12 31.24	-01 16.1					
1981 03 17	12 27.62	-00 49.9	3.778	4.759	169.0	2.3	13.2
1981 03 27	12 23.48	-00 21.2					
1981 04 06	12 19.17	+00 07.6	3.650	4.635	168.5	2.5	13.0
1981 04 16	12 15.09	+00 33.9					
1981 04 26	12 11.61	+00 55.4	3.636	4.513	147.0	7.0	12.8
1981 05 06	12 09.03	+01 10.1					
1981 05 16	12 07.61	+01 16.5	3.716	4.395	126.6	10.6	12.8
1981 05 26	12 07.49	+01 14.1					

1981 06 05	12 08.74	+01 02.4	3.860	4.280	107.8	13.0	12.7
1981 06 15	12 11.37	+00 41.7					
1981 06 25	12 15.33	+00 12.3	4.035	4.170	90.5	14.1	12.7
1981 07 05	12 20.56	-00 25.2					
1981 07 15	12 26.97	-01 10.0	4.213	4.064	74.7	14.0	12.7
1981 07 25	12 34.45	-02 01.3					
1981 08 04	12 42.94	-02 58.5	4.372	3.963	59.9	12.8	12.7
1981 08 14	12 52.33	-04 00.7					
1981 08 24	13 02.55	-05 07.0	4.500	3.868	46.1	10.9	12.6
1981 09 03	13 13.53	-06 16.7					
1981 09 13	13 25.22	-07 29.0	4.584	3.779	32.8	8.3	12.6

1980 LB Elements MPC 5409

Date ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	Mag.
1980 06 30	20 25.70	-25 37.0	1.666	2.621	154.6	9.6	15.5
1980 07 10	20 17.51	-29 00.7					
1980 07 20	20 06.93	-32 30.8	1.552	2.555	168.0	4.7	15.2
1980 07 30	19 54.95	-35 51.9					
1980 08 09	19 42.89	-38 50.2	1.562	2.490	149.6	11.9	15.3
1980 08 19	19 32.32	-41 17.6					
1980 08 29	19 24.62	-43 12.5	1.676	2.429	127.8	19.2	15.6
1980 09 08	19 20.65	-44 38.3					
1980 09 18	19 20.85	-45 39.8	1.850	2.371	108.7	23.7	15.9
1980 09 28	19 25.22	-46 21.9					
1980 10 08	19 33.48	-46 47.9	2.045	2.317	92.7	25.5	16.1

1972 TL2 Elements MPC 5414

Date ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	Mag.
1980 06 30	20 25.88	-24 21.1	1.533	2.489	154.5	10.1	16.1
1980 07 10	20 17.11	-24 05.8					
1980 07 20	20 06.61	-23 46.0	1.433	2.448	176.1	1.6	15.6
1980 07 30	19 55.65	-23 19.3					
1980 08 09	19 45.55	-22 45.2	1.437	2.407	158.0	9.1	15.9
1980 08 19	19 37.52	-22 04.9					
1980 08 29	19 32.39	-21 20.4	1.534	2.368	136.0	17.2	16.2
1980 09 08	19 30.51	-20 33.4					
1980 09 18	19 31.92	-19 44.8	1.698	2.330	116.7	22.7	16.5
1980 09 28	19 36.38	-18 54.6					
1980 10 08	19 43.55	-18 02.1	1.897	2.294	100.1	25.4	16.8

1976 UH1 Elements MPC 5418

Date ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	Mag.
1980 06 30	00 17.93	-14 40.7	2.138	2.514	99.5	23.5	16.7
1980 07 10	00 25.68	-14 26.4					
1980 07 20	00 31.46	-14 24.8	1.876	2.477	114.6	21.9	16.3
1980 07 30	00 34.93	-14 36.1					
1980 08 09	00 35.76	-14 59.3	1.647	2.441	131.6	18.1	15.9
1980 08 19	00 33.67	-15 32.0					
1980 08 29	00 28.61	-16 09.2	1.476	2.405	150.1	12.1	15.5
1980 09 08	00 20.82	-16 43.9					
1980 09 18	00 10.99	-17 07.9	1.391	2.370	163.2	7.0	15.2
1980 09 28	00 00.29	-17 13.2					
1980 10 08	23 50.03	-16 54.9	1.405	2.337	152.5	11.4	15.3
1980 10 18	23 41.48	-16 11.6					
1980 10 28	23 35.56	-15 05.3	1.510	2.305	133.0	18.4	15.6
1980 11 07	23 32.67	-13 39.9					
1980 11 17	23 32.89	-11 59.4	1.682	2.275	114.4	23.3	16.0
1980 11 27	23 36.02	-10 07.4					
1980 12 07	23 41.72	-08 06.6	1.890	2.248	97.9	25.7	16.2

1962 HD Elements MPC 5417

Date ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	Mag.
1980 07 20	00 39.91	+00 19.0	1.803	2.323	107.7	24.6	18.2
1980 07 30	00 44.71	+00 21.9					
1980 08 09	00 46.97	+00 07.0	1.603	2.338	125.2	20.8	17.8
1980 08 19	00 46.42	-00 26.2					
1980 08 29	00 43.00	-01 16.7	1.449	2.353	145.6	14.0	17.5
1980 09 08	00 36.91	-02 21.0					
1980 09 18	00 28.74	-03 33.0	1.375	2.367	168.0	5.1	17.1
1980 09 28	00 19.47	-04 44.3					
1980 10 08	00 10.29	-05 46.2	1.402	2.380	164.3	6.5	17.2
1980 10 18	00 02.40	-06 31.4					
1980 10 28	23 56.70	-06 56.0	1.531	2.391	141.8	14.9	17.7
1980 11 07	23 53.66	-06 59.0					
1980 11 17	23 53.44	-06 41.6	1.735	2.402	121.3	20.6	18.1
1980 11 27	23 55.91	-06 06.3					
1980 12 07	00 00.79	-05 15.7	1.984	2.411	103.4	23.4	18.4
1980 12 17	00 07.79	-04 12.4					
1980 12 27	00 16.57	-02 58.7	2.251	2.419	87.7	24.0	18.7

(2266) 1974 VK Elements MPC 5414

Date ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	Mag.
1980 08 09	01 51.16	+21 25.0	2.551	2.942	102.5	19.7	16.8
1980 08 19	01 55.87	+21 52.0					
1980 08 29	01 58.63	+22 05.8	2.273	2.908	119.6	17.6	16.5
1980 09 08	01 59.24	+22 04.4					
1980 09 18	01 57.59	+21 45.5	2.040	2.875	139.0	13.3	16.1
1980 09 28	01 53.81	+21 07.8					
1980 10 08	01 48.26	+20 11.0	1.883	2.843	160.3	6.8	15.8
1980 10 18	01 41.58	+18 57.4					
1980 10 28	01 34.64	+17 31.9	1.829	2.814	170.7	3.3	15.5
1980 11 07	01 28.34	+16 01.6					
1980 11 17	01 23.49	+14 34.4	1.886	2.786	149.9	10.2	15.8
1980 11 27	01 20.68	+13 17.4					
1980 12 07	01 20.19	+12 15.4	2.039	2.761	128.4	16.2	16.1
1980 12 17	01 22.10	+11 30.8					
1980 12 27	01 26.30	+11 04.1	2.255	2.739	109.1	19.8	16.4
1981 01 06	01 32.59	+10 53.9					
1981 01 16	01 40.75	+10 58.3	2.501	2.719	92.0	21.2	16.7

1939 PM Elements MPC 5417

Date ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	Mag.
1980 08 09	01 59.09	+16 01.6	2.159	2.581	102.8	22.5	17.2
1980 08 19	02 04.24	+16 32.1					
1980 08 29	02 07.10	+16 49.4	1.932	2.589	119.9	19.8	17.0
1980 09 08	02 07.45	+16 52.1					
1980 09 18	02 05.15	+16 38.9	1.747	2.597	139.8	14.5	16.6
1980 09 28	02 00.37	+16 09.2					
1980 10 08	01 53.53	+15 24.2	1.637	2.606	162.3	6.7	16.3
1980 10 18	01 45.43	+14 26.9					
1980 10 28	01 37.10	+13 23.2	1.628	2.616	172.4	2.9	16.1
1980 11 07	01 29.60	+12 20.1					
1980 11 17	01 23.81	+11 24.4	1.729	2.627	149.2	11.1	16.5
1980 11 27	01 20.34	+10 41.6					
1980 12 07	01 19.41	+10 14.4	1.920	2.638	127.5	17.2	16.9
1980 12 17	01 21.03	+10 03.9					
1980 12 27	01 25.02	+10 09.1	2.169	2.650	108.5	20.6	17.3
1981 01 06	01 31.14	+10 28.3					
1981 01 16	01 39.12	+10 59.5	2.447	2.662	91.6	21.7	17.6

1975 VD3 Elements MPC 5418

Date ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	Mag.
1980 11 17	09 20.14	+19 34.8	2.094	2.437	98.0	23.7	17.6
1980 11 27	09 26.96	+19 21.5					
1980 12 07	09 31.17	+19 20.4	1.886	2.477	115.6	21.0	17.3
1980 12 17	09 32.49	+19 33.0					
1980 12 27	09 30.77	+19 59.0	1.715	2.518	136.1	15.7	17.0
1981 01 06	09 26.02	+20 36.5					
1981 01 16	09 18.61	+21 21.2	1.616	2.560	159.2	7.8	16.8
1981 01 26	09 09.32	+22 06.9					
1981 02 05	08 59.27	+22 47.2	1.621	2.602	172.7	2.8	16.6
1981 02 15	08 49.74	+23 17.0					
1981 02 25	08 41.89	+23 33.8	1.737	2.643	150.4	10.7	17.1
1981 03 07	08 36.48	+23 37.1					
1981 03 17	08 33.89	+23 28.4	1.945	2.684	128.9	16.8	17.5
1981 03 27	08 34.12	+23 09.3					
1981 04 06	08 36.96	+22 41.4	2.214	2.725	110.1	20.2	17.9
1981 04 16	08 42.10	+22 05.9					
1981 04 26	08 49.15	+21 23.6	2.512	2.764	93.6	21.3	18.2

(2203) 1935 SQ1 Elements MPC 5178

Date ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	Mag.
1980 11 17	09 23.73	+17 04.8	2.906	3.173	96.4	18.0	17.7
1980 11 27	09 27.80	+16 52.4					
1980 12 07	09 29.82	+16 49.7	2.661	3.207	115.2	16.1	17.5
1980 12 17	09 29.62	+16 57.6					
1980 12 27	09 27.15	+17 15.9	2.457	3.240	136.3	12.1	17.3
1981 01 06	09 22.51	+17 43.4					
1981 01 16	09 15.99	+18 17.5	2.333	3.272	159.4	6.1	17.0
1981 01 26	09 08.17	+18 54.8					
1981 02 05	08 59.76	+19 31.0	2.320	3.304	175.5	1.4	16.7
1981 02 15	08 51.64	+20 02.7					
1981 02 25	08 44.58	+20 27.0	2.427	3.335	152.1	8.0	17.2
1981 03 07	08 39.20	+20 42.8					
1981 03 17	08 35.87	+20 49.7	2.636	3.364	130.1	13.1	17.5
1981 03 27	08 34.72	+20 48.1					
1981 04 06	08 35.70	+20 38.7	2.912	3.393	110.3	16.1	17.8
1981 04 16	08 38.67	+20 22.2					
1981 04 26	08 43.38	+19 59.2	3.222	3.420	92.7	17.1	18.1

(2247) 6512 P-L Elements MPC 5321

Date ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	Mag.
1980 11 17	09 23.30	+22 27.0	2.004	2.357	98.1	24.5	18.7
1980 11 27	09 30.91	+22 13.4					
1980 12 07	09 35.86	+22 11.9	1.786	2.380	115.4	22.0	18.4
1980 12 17	09 37.78	+22 23.7					
1980 12 27	09 36.45	+22 48.4	1.603	2.404	135.4	16.7	18.1
1981 01 06	09 31.78	+23 23.6					
1981 01 16	09 24.05	+24 04.3	1.488	2.428	157.9	8.8	17.8
1981 01 26	09 14.07	+24 43.5					
1981 02 05	09 03.03	+25 14.1	1.474	2.452	170.6	3.8	17.6
1981 02 15	08 52.41	+25 30.7					
1981 02 25	08 43.58	+25 31.4	1.569	2.476	149.9	11.6	18.0
1981 03 07	08 37.43	+25 16.9					
1981 03 17	08 34.43	+24 49.8	1.755	2.499	128.6	18.1	18.4
1981 03 27	08 34.58	+24 12.5					
1981 04 06	08 37.59	+23 27.2	1.998	2.522	110.0	21.9	18.8
1981 04 16	08 43.12	+22 35.0					
1981 04 26	08 50.72	+21 36.9	2.269	2.544	93.9	23.2	19.1