

=====

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

=====

EDITORIAL NOTICE.

The Minor Planet Center is pleased to announce that it will shortly be able to supply to interested users copies of the magnetic tape of astrometric observations of minor planets. The cost of the complete tape, with observations of both numbered and unnumbered minor planets, will be \$250.00. A tape with observations of only the numbered or only the unnumbered planets will cost \$150.00. The tape will normally be supplied in 9-track, BCD, ASCII, 1600 bpi, 80-byte record size, 8192-byte block size, and significant departures from this could increase the cost. The tape file is intended to be complete for the unnumbered minor planets. Observations of the numbered objects generally extend back only to 1939, as in the Cincinnati version of the tape; many earlier observations are included, however, notably those of subsequently numbered minor planets that were published under their provisional designations during 1925-1938. Arrangements for distributing updated versions of the tape will be announced at a later date. Enquiries concerning the availability of the tape should be made to the Minor Planet Center at the address given above.

* * * * *

ERRATA.

MPC	Line	
3643	-15	For 1960 Sept. 24 read 1960 Sept. 26
3768	-16	For 1971 Oct. 16 read 1971 Oct. 26
3827	3	For 1971 Oct. 16 read 1971 Oct. 26
3899	2	For 1973 Mar. 10 read 1973 Mar. 13
3930	6	For 1938 Nov. 18 read 1938 Nov. 16
3933	7	For 1941 Mar. 20 read 1941 Mar. 18
4071	18 to 19	The discovery of (1990) should be attributed to K. Reinmuth at Heidelberg.
4236	19	For 1940 Sept. 2 read 1940 Sept. 6
4236	23	For 1940 Dec. 30 read 1940 Dec. 28
4237	3	For 1973 Mar. 10 read 1973 Mar. 13
5250	13	Delete the entry 1975 BJ1 = (1138)
5281	11	For 1940 Sept. 11 read 1940 Sept. 8
5281	22	For 1941 Sept. 29 read 1941 Sept. 26
5357	-23	For 1929 Nov. 30 read 1929 Dec. 1
5413	16	For June 16 read June 6
5439	- 5	Include a note 2 and add to MPC 5440, line 9, the double designation 1974 SY4 = 1974 TD1 (B)
5449	-17	For 1940 Aug. 27 read 1940 Aug. 26
5483	27	For those Sept. read those on Sept.
5680	24	For B(1,0) 5.0 read B(1,0) 15.0
5680	- 1	For B(1,0) 6.3 read B(1,0) 16.3

CORRECTED OBSERVATIONS.

The following observations correct those previously published.

Object	Date	UT	R. A. (1950)	Decl.	Reference	Mag.	N	Obs.
3	1975 01 09.72741		23 55 38.54	-07 35 56.8	MPC 4849			020
3	1975 01 09.72822		23 55 38.62	-07 35 56.4	MPC 4849			020
3	1975 01 09.72902		23 55 38.72	-07 35 56.4	MPC 4849			020
3	1975 01 09.73214		23 55 39.04	-07 35 55.0	MPC 4849			020
3	1975 01 09.73906		23 55 39.73	-07 35 51.2	MPC 4849			020
25	1973 12 28.84943		04 04 24.17	+00 21 46.4	MPC 4857			020
25	1973 12 28.85117		04 04 24.15	+00 21 46.9	MPC 4857			020
79	1974 11 08.98477		03 26 27.69	+15 03 30.1	MPC 4862			020
94	1974 12 03.79716		02 13 26.66	+22 16 01.5	MPC 4864			020
94	1974 12 03.79958		02 13 26.58	+22 16 01.6	MPC 4864			020
94	1974 12 05.78824		02 12 29.24	+22 10 54.7	MPC 4864			020
94	1974 12 05.79049		02 12 29.19	+22 10 54.6	MPC 4864			020
149	1973 02 06.05739		09 19 52.20	+14 54 51.0	MPC 4866		1	020
149	1973 02 06.07159		09 19 51.22	+14 54 55.2	MPC 4866		1	020
169	1974 12 03.79716		02 18 34.79	+21 59 52.2	MPC 4866			020
169	1974 12 03.79958		02 18 34.69	+21 59 52.3	MPC 4866			020
169	1974 12 05.78824		02 17 33.56	+21 52 47.0	MPC 4866			020
169	1974 12 05.79049		02 17 33.44	+21 52 47.4	MPC 4866			020
192	1973 05 09.06036		14 58 17.64	-27 02 59.4	MPC 4867			020
192	1973 05 09.06278		14 58 17.29	-27 03 01.5	MPC 4867			020
201	1973 01 26.02665		06 01 27.92	+16 43 40.5	MPC 4868			020
201	1973 01 26.02873		06 01 27.79	+16 43 41.7	MPC 4868			020
389	1975 07 02.91774		17 58 14.26	-25 24 55.3	MPC 4872			020
429	1973 12 26.88917		05 20 21.41	+11 41 30.7	MPC 4873		2	020
429	1973 12 28.90068		05 18 37.28	+11 37 17.0	MPC 4873		2	020
429	1973 12 28.90363		05 18 37.21	+11 37 17.0	MPC 4873		2	020
500	1973 09 03.98824		23 00 30.98	+09 28 59.2	MPC 4875			020
547	1973 09 03.98824		22 49 52.01	+08 40 14.8	MPC 4877			020
548	1924 06 30.27067		19 32 45.82	-21 30 05.5	MPC 2410			754
548	1924 06 30.28509		19 32 44.80	-21 30 10.0	MPC 2410			754
560	1973 01 05.99799		06 00 09.50	+21 13 07.7	MPC 4877			020
685	1923 12 14.35634		05 51 08.19	+20 26 11.9	MPC 2410			754
685	1923 12 14.37066		05 51 07.21	+20 26 13.5	MPC 2410			754
1367	1952 07 21.19628		18 09 22.55	-12 43 01.9	MPC 1560			760
A924 GD *	1924 04 11.28858		11 25 06.45	-16 19 46.6	MPC 4349		3	754
A924 GD	1924 04 11.30320		11 25 05.88	-16 19 48.3	MPC 4349		3	754
1930 UP	1930 10 18.23958		00 50 19.54	+12 45 42.0	MPC 2928		4	690
1951 CC1 *	1951 02 08.3983		12 07.3	-20 13	MPC 637	16.6		760
1951 CD1 *	1951 02 08.3983		11 52.7	-17 49	MPC 637	15.6		760
1951 CE1 *	1951 02 08.3983		11 46.6	-17 36	MPC 637	16.2		760
1960 VF	1960 11 12.17663		03 00 10.04	+14 51 38.3	MPC 3029		5	760
1960 VF	1960 11 12.22351		03 00 07.08	+14 51 24.8	MPC 3029		5	760
1961 RB *	1961 09 13.24139		00 21.0	+03 26	MPC 2140	15	6	760
1962 EB	1962 03 02.13509		09 03 25.60	+13 20 21.5	MPC 3029		5	760
1962 EB	1962 03 02.18093		09 03 23.94	+13 20 35.4	MPC 3029		5	760
1972 RO3 *	1972 09 05.85057		21 55 22.85	+00 51 33.4	MPC 3631	16.5		095
1980 RF1 *	1980 09 08.04323		02 01 12.09	+11 57 49.4	MPC 5543		7	046
1980 RF1	1980 09 08.05793		02 01 11.95	+11 57 44.7	MPC 5543		7	046

Note 1: observations erroneously designated (145). 2: observations erroneously designated (423). 3: observations erroneously designated (989) on MPC 2410. 4: observation erroneously designated 1930 UQ. 5: observations erroneously designated (1650); the identifications (1650) = 1960 VF = 1962 EB (MPC 2325) are invalid. 6: the observatory code was given incorrectly on MPC 5393. 7: 1980 RF1 = (2304).

DELETED OBSERVATIONS.

The following observations are to be deleted.

Object	Date	UT	R. A. (1950)	Decl.	Reference	Obs.
1	1974 12	14.78253	22 56 05.10	-17 55 08.7	MPC 4847	020
1	1974 12	30.75910	23 11 40.69	-15 30 47.1	MPC 4847	020
2	1974 07	18.00459	19 44 45.96	+19 25 40.9	MPC 4848	020
2	1974 07	18.00563	19 44 45.90	+19 25 38.7	MPC 4848	020
2	1974 07	18.00667	19 44 45.86	+19 25 38.3	MPC 4848	020
4	1973 01	23.80565	03 57 33.27	+16 44 02.7	MPC 4850	020
4	1975 09	17.94117	23 59 02.12	-12 46 50.8	MPC 4850	020
192	1973 07	25.84911	14 26 19.16	-22 53 56.9	MPC 4867	020
192	1973 07	25.85153	14 26 19.32	-22 53 57.4	MPC 4867	020
582	1975 10	29.77185	19 18 56.40	-07 53 21.6	MPC 4877	020
582	1975 10	29.77237	19 18 56.21	-07 53 23.6	MPC 4877	020
1167	1966 03	28.87793	11 41 49.17	-03 47 07.4	MPC 2658	095
1487	1940 03	09.8	10 13.6	+13 55	MPC 43	020
1761	1978 11	29.34653	04 05 08.25	+19 57 50.5	MPC 5068	675
1761	1978 11	30.34809	04 04 13.32	+19 56 16.6	MPC 5068	675
1935 PF *	1935 08	09.22158	21 13 20.20	-02 31 40.4	MPC 4635	094
1958 GP *	1958 04	13.09	09 53.2	+32 05	MPC 1780	760
1959 EV *	1959 03	06.32639	11 00 52	+04 28.5	MPC 3272	690
1959 EV	1959 03	07.30556	10 58 38	+04 15.9	MPC 3273	690
1960 BD	1960 01	31.05893	08 33 59.08	+16 03 11.9	MPC 5635	760
1960 BD *	1960 01	31.06	08 33.8	+16 03	MPC 2062	760
1976 SC10*	1976 09	24.82376	22 13 51.97	-11 33 59.8	MPC 5605	095
1981 AB *	1981 01	01.28056	07 32 57.12	+19 29 52.6	MPC 5775	688

* * * * *

IDENTIFICATION CHANGES.

Continuation to MPC 5723.

Object	Date	UT	R. A. (1950)	Decl.	Old desig.	Mag.	Obs.
A924 OC *	1924 07	31.90903	16 07 14.92	-03 18 25.8	1030		024
A924 OD *	1924 07	31.90903	16 07 17.45	-03 23 43.8	1030		024
1940 CL *	1940 02	02.9820	07 41 32.18	+29 20 44.0	1935 EA		062
1946 SN *	1946 09	30.91912	00 03 27.15	+09 40 08.7	1280		012
1946 SN	1946 10	01.91691	00 02 45.20	+09 33 03.5	1280		012
1951 WP2 *	1951 11	29.21494	02 31 08.54	+11 05 44.4	1951 UJ	16.2	760
1951 WP2	1951 11	29.25728	02 31 07.26	+11 05 43.5	1951 UJ		760
1952 QJ1 *	1952 08	28.96806	22 10 12.45	-07 41 01.4	1950 DO	14.4	024
1952 QJ1	1952 09	15.89514	21 56 16.88	-08 49 57.1	1950 DO	14.6	024
1955 BY *	1955 01	25.95307	08 32 13.62	+17 01 00.5	1280	14.5	020
1955 MJ1 *	1955 06	22.16903	15 58 05.21	-18 41 16.1	1537	17.0	760
1955 MJ1	1955 06	22.22046	15 58 03.18	-18 41 16.5	1537		760
1956 LF *	1956 06	11.29268	19 11 02.68	-26 35 46.3	1951 RJ	15.0	839
1958 HL *	1958 04	17.09	09 53.1	+32 05	1958 GP	16.3	760
1969 JR *	1969 05	05.87552	13 29 04.09	-13 46 25.2	1950 DO	16.0	095
1969 JR	1969 05	12.89536	13 27 33.68	-13 23 39.4	1950 DO		020
1969 JR	1969 05	12.91752	13 27 33.10	-13 23 35.4	1950 DO		020
1969 XG *	1969 12	09.05305	06 11 47.42	+34 54 06.7	1515		020
1969 XG	1969 12	09.06413	06 11 42.15	+34 54 11.7	1515		020
1972 JP1 *	1972 05	09.83704	13 29 09.59	-07 35 29.3	1972 GB	16.5	095
1972 JP1	1972 05	11.84113	13 28 21.86	-07 30 35.9	1972 GB	16.5	095
1972 JP1	1972 05	16.84310	13 26 31.81	-07 19 17.4	1972 GB	16.5	095
1973 CF *	1973 02	03.91065	09 07 56.17	+18 09 34.9	1973 AO4	16.0	095

1973 CG *	1973 02 03.91065	09 10 19.57	+17 51 32.5	1973 AS4	16.5	095
1976 EP *	1976 03 04.11874	12 08 26.87	+12 31 24.6	1974 VQ2	17.5	026
1976 JH3 *	1976 05 02.92441	14 14 55.12	-10 01 21.6	1976 GW3	18.0	095
1978 RR4 *	1978 09 07.95475	00 16 23.73	+03 14 45.7	1978 RQ	17.0	095
1981 AV *	1981 01 01.31458	07 32 54.72	+19 30 12.4	1981 AB		688
1981 AV	1981 01 09.18472	07 24 55.63	+20 32 56.4	1981 AB	16.8	688

* * * * *

IDENTIFICATIONS.

The following list of identifications with numbered minor planets continues that on MPC 5659.

	Note		Note
1955 MJ1 = (2132)	1	1980 VY = (2319)	2
Note 1: identification by B. G. Marsden. 2: identification by F. N. Bowman.			

* * * * *

OBSERVATIONS MADE AT THE FABRA OBSERVATORY, BARCELONA, BY J. M. CODINA (ASSISTED BY N. TORRAS).

Object	Date	UT	R. A. (1950)	Decl.	Obs.
/1977 XI	1980 11 20.22219		14 23 39.29	-02 40 38.7	006
/1977 XI	1980 11 20.22929		14 23 40.60	-02 41 09.5	006
/1980h	1980 11 20.16130		10 29 10.41	+15 52 02.6	006
/1980h	1980 11 20.20226		10 29 15.03	+15 46 56.1	006

OBSERVATIONS MADE AT NICE BY B. MILET.

Object	Date	UT	R. A. (1950)	Decl.	N Obs.
/1980q	1981 01 06.18550		17 52 35.31	+22 37 27.4	1 020
/1980q	1981 01 08.20255		17 52 23.25	+22 24 24.7	1 020
/1980t	1981 01 05.71802		19 52 41.38	-06 32 27.3	2 020
/1980t	1981 01 05.72737		19 52 47.19	-06 31 30.0	2 020
/1980t	1981 01 07.72538		20 12 04.59	-03 32 00.1	020
/1980t	1981 01 07.73576		20 12 10.04	-03 31 11.0	020
/1980t	1981 01 07.74684		20 12 15.70	-03 30 21.1	020
/1980u	1981 01 08.22194		18 54 10.61	+42 44 30.3	3 020

Note 1: comet uncondensed. 2: comet condensed, 1 tail. 3: comet condensed, 15' tail.

OBSERVATION MADE AT HEIDELBERG BY U. GORZE AND C. KIEFER. COMMUNICATED BY G. KLARE.

Object	Date	UT	R. A. (1950)	Decl.	Obs.
/1980g	1980 12 01.87309		05 31 13.07	+19 58 41.1	024

OBSERVATIONS MADE AT TAUTENBURG BY F. BORNGEN, K. KIRSCH AND P. LOCHNO. COMMUNICATED BY S. MARX.

Object	Date	UT	R. A. (1950)	Decl.	Mag.	Obs.
136	1972 10 09.91944		01 22 22.35	+04 29 57.3		033
136	1972 10 09.93819		01 22 21.42	+04 29 44.8		033
136	1972 10 09.95278		01 22 20.59	+04 29 35.0		033
136	1972 10 09.96562		01 22 19.93	+04 29 26.4	11.7V	033
136	1972 10 10.00382		01 22 17.86	+04 29 00.6		033
136	1972 10 10.05069		01 22 15.39	+04 28 29.1		033
1155	1972 10 09.91944		01 19 27.68	+04 32 28.4		033
1155	1972 10 09.93819		01 19 26.61	+04 32 23.8		033
1155	1972 10 09.95278		01 19 25.65	+04 32 20.8		033
1155	1972 10 09.96562		01 19 24.91	+04 32 18.0	14.9V	033
1155	1972 10 10.00382		01 19 22.66	+04 32 09.0		033

1155		1972	10	10.05069	01	19	19.82	+04	31	58.4		033
1972	TX8 *	1972	10	09.91944	01	15	19.80	+04	33	11.4		033
1972	TX8	1972	10	09.93819	01	15	19.15	+04	33	07.0		033
1972	TX8	1972	10	09.95278	01	15	18.25	+04	33	02.6		033
1972	TX8	1972	10	09.96562	01	15	17.67	+04	32	58.5	19.7V	033
1972	TY8 *	1972	10	09.91944	01	16	12.25	+03	25	55.1		033
1972	TY8	1972	10	09.93819	01	16	11.36	+03	25	50.1		033
1972	TY8	1972	10	09.95278	01	16	10.60	+03	25	46.8		033
1972	TY8	1972	10	09.96562	01	16	09.90	+03	25	43.4	17.5V	033
1972	TZ8 *	1972	10	09.91944	01	16	31.96	+03	49	13.1		033
1972	TZ8	1972	10	09.93819	01	16	31.00	+03	49	11.3		033
1972	TZ8	1972	10	09.95278	01	16	30.09	+03	49	10.5		033
1972	TZ8	1972	10	09.96562	01	16	29.39	+03	49	09.9	17.9V	033
1972	TA9 *	1972	10	09.91944	01	16	39.78	+03	47	10.0		033
1972	TA9	1972	10	09.93819	01	16	39.10	+03	47	40.7		033
1972	TA9	1972	10	09.95278	01	16	38.47	+03	48	07.3		033
1972	TA9	1972	10	09.96562	01	16	37.97	+03	48	30.0	18.1V	033
1972	TB9 *	1972	10	09.91944	01	16	49.61	+04	31	57.3		033
1972	TB9	1972	10	09.93819	01	16	48.36	+04	31	53.3		033
1972	TB9	1972	10	09.95278	01	16	47.33	+04	31	50.4		033
1972	TB9	1972	10	09.96562	01	16	46.50	+04	31	47.9	18.5V	033
1972	TC9 *	1972	10	09.91944	01	17	22.32	+02	45	11.6		033
1972	TC9	1972	10	09.93819	01	17	21.46	+02	45	06.4		033
1972	TC9	1972	10	09.95278	01	17	20.67	+02	45	02.3		033
1972	TC9	1972	10	09.96562	01	17	20.06	+02	44	58.5	17.7V	033
1972	TD9 *	1972	10	09.91944	01	17	28.96	+03	58	26.2		033
1972	TD9	1972	10	09.93819	01	17	28.09	+03	58	20.6		033
1972	TD9	1972	10	09.95278	01	17	27.34	+03	58	17.4		033
1972	TD9	1972	10	09.96562	01	17	26.73	+03	58	13.9	16.9V	033
1972	TE9 *	1972	10	09.91944	01	17	33.00	+03	21	26.8		033
1972	TE9	1972	10	09.93819	01	17	31.96	+03	21	19.2		033
1972	TE9	1972	10	09.95278	01	17	31.09	+03	21	14.2		033
1972	TE9	1972	10	09.96562	01	17	30.47	+03	21	09.9	18.5V	033
1972	TF9 *	1972	10	09.91944	01	17	40.54	+02	16	27.2		033
1972	TF9	1972	10	09.93819	01	17	39.70	+02	16	13.9		033
1972	TF9	1972	10	09.95278	01	17	38.93	+02	16	03.0		033
1972	TF9	1972	10	09.96562	01	17	38.33	+02	15	53.3	17.5V	033
1972	TG9 *	1972	10	09.91944	01	17	50.29	+03	32	26.0		033
1972	TG9	1972	10	09.93819	01	17	49.20	+03	32	21.3		033
1972	TG9	1972	10	09.95278	01	17	48.07	+03	32	17.9		033
1972	TG9	1972	10	09.96562	01	17	47.15	+03	32	14.5	18.5V	033
1972	TH9 *	1972	10	09.91944	01	18	00.18	+04	02	23.8		033
1972	TH9	1972	10	09.93819	01	17	59.36	+04	02	17.8		033
1972	TH9	1972	10	09.95278	01	17	58.61	+04	02	14.3		033
1972	TH9	1972	10	09.96562	01	17	58.03	+04	02	10.4	14.9V	033
1972	TH9	1972	10	10.00382	01	17	56.21	+04	01	59.3		033
1972	TH9	1972	10	10.05069	01	17	54.11	+04	01	46.7		033
1972	TJ9 *	1972	10	09.91944	01	18	05.58	+02	24	08.1		033
1972	TJ9	1972	10	09.93819	01	18	04.44	+02	23	57.0	19.1V	033
1972	TJ9	1972	10	09.95278	01	18	03.66	+02	23	50.8		033
1972	TK9 *	1972	10	09.91944	01	18	20.73	+04	35	10.0		033
1972	TK9	1972	10	09.93819	01	18	19.74	+04	35	04.2		033
1972	TK9	1972	10	09.95278	01	18	18.81	+04	35	01.5		033
1972	TK9	1972	10	09.96562	01	18	18.15	+04	34	57.9	18.5V	033
1972	TL9 *	1972	10	09.91944	01	18	27.65	+04	22	18.0		033
1972	TL9	1972	10	09.93819	01	18	26.56	+04	22	16.8		033
1972	TL9	1972	10	09.95278	01	18	25.54	+04	22	15.9		033
1972	TL9	1972	10	09.96562	01	18	24.81	+04	22	15.3	17.5V	033
1972	TM9 *	1972	10	09.91944	01	18	39.29	+02	08	07.5		033

1972	TM9	1972	10	09.93819	01	18	38.37	+02	08	03.0		033
1972	TM9	1972	10	09.95278	01	18	37.58	+02	08	00.1		033
1972	TM9	1972	10	09.96562	01	18	36.95	+02	07	57.5	15.5V	033
1972	TM9	1972	10	10.00382	01	18	35.00	+02	07	49.9		033
1972	TM9	1972	10	10.05069	01	18	32.59	+02	07	40.2		033
1972	TN9	* 1972	10	09.91944	01	18	53.60	+01	57	19.2		033
1972	TN9	1972	10	09.93819	01	18	52.52	+01	57	18.3		033
1972	TN9	1972	10	09.95278	01	18	51.58	+01	57	18.2		033
1972	TN9	1972	10	09.96562	01	18	50.85	+01	57	17.3	18.3V	033
1972	TO9	* 1972	10	09.91944	01	18	54.07	+03	45	31.7		033
1972	TO9	1972	10	09.93819	01	18	53.13	+03	45	24.3		033
1972	TO9	1972	10	09.95278	01	18	52.36	+03	45	20.2		033
1972	TO9	1972	10	09.96562	01	18	51.71	+03	45	15.6	16.9V	033
1972	TP9	* 1972	10	09.91944	01	19	08.80	+02	51	17.9		033
1972	TP9	1972	10	09.93819	01	19	07.86	+02	51	04.8		033
1972	TP9	1972	10	09.95278	01	19	07.07	+02	50	56.0		033
1972	TP9	1972	10	09.96562	01	19	06.43	+02	50	47.6	18.1V	033
1972	TQ9	* 1972	10	09.91944	01	19	25.51	+04	16	32.1		033
1972	TQ9	1972	10	09.93819	01	19	24.57	+04	16	30.5		033
1972	TQ9	1972	10	09.95278	01	19	23.46	+04	16	28.7		033
1972	TQ9	1972	10	09.96562	01	19	22.66	+04	16	27.2	17.9V	033
1972	TR9	* 1972	10	09.91944	01	19	33.15	+03	17	44.1		033
1972	TR9	1972	10	09.93819	01	19	31.99	+03	17	41.1		033
1972	TR9	1972	10	09.95278	01	19	30.99	+03	17	39.4		033
1972	TR9	1972	10	09.96562	01	19	30.18	+03	17	38.0	14.9V	033
1972	TR9	1972	10	10.00382	01	19	27.67	+03	17	32.4		033
1972	TR9	1972	10	10.05069	01	19	24.61	+03	17	26.8		033
1972	TS9	* 1972	10	09.91944	01	19	37.99	+04	28	03.5		033
1972	TS9	1972	10	09.93819	01	19	36.92	+04	27	34.8		033
1972	TS9	1972	10	09.95278	01	19	36.02	+04	27	13.8		033
1972	TS9	1972	10	09.96562	01	19	35.25	+04	26	54.2	18.5V	033
1972	TT9	* 1972	10	09.91944	01	19	47.76	+03	32	44.6		033
1972	TT9	1972	10	09.93819	01	19	46.68	+03	32	35.2	18.9V	033
1972	TT9	1972	10	09.95278	01	19	45.85	+03	32	28.1		033
1972	TU9	* 1972	10	09.91944	01	20	10.80	+02	48	49.8		033
1972	TU9	1972	10	09.93819	01	20	10.04	+02	48	41.8		033
1972	TU9	1972	10	09.95278	01	20	09.28	+02	48	34.9		033
1972	TU9	1972	10	09.96562	01	20	08.71	+02	48	29.0	18.3V	033
1972	TV9	* 1972	10	09.91944	01	20	31.16	+04	05	02.6		033
1972	TV9	1972	10	09.93819	01	20	30.36	+04	04	55.0		033
1972	TV9	1972	10	09.95278	01	20	29.60	+04	04	48.7		033
1972	TV9	1972	10	09.96562	01	20	29.01	+04	04	43.2	15.9V	033
1972	TV9	1972	10	10.00382	01	20	27.15	+04	04	26.1		033
1972	TV9	1972	10	10.05069	01	20	25.08	+04	04	07.9		033
1972	TW9	* 1972	10	09.91944	01	21	51.57	+02	06	28.9		033
1972	TW9	1972	10	09.93819	01	21	50.56	+02	06	24.2	15.7V	033
1972	TW9	1972	10	09.95278	01	21	49.73	+02	06	21.4		033
1972	TX9	* 1972	10	09.91944	01	22	11.77	+04	28	24.8		033
1972	TX9	1972	10	09.93819	01	22	10.72	+04	28	20.3		033
1972	TX9	1972	10	09.95278	01	22	09.79	+04	28	16.3		033
1972	TX9	1972	10	09.96562	01	22	09.13	+04	28	14.8	16.1V	033
1972	TY9	* 1972	10	09.91944	01	22	16.20	+05	04	24.6		033
1972	TY9	1972	10	09.93819	01	22	15.41	+05	04	19.8		033
1972	TY9	1972	10	09.95278	01	22	14.65	+05	04	16.7		033
1972	TY9	1972	10	09.96562	01	22	14.07	+05	04	12.9	16.7V	033
1972	TZ9	* 1972	10	09.91944	01	22	17.23	+03	38	47.6		033
1972	TZ9	1972	10	09.93819	01	22	16.40	+03	38	39.6		033
1972	TZ9	1972	10	09.95278	01	22	15.66	+03	38	33.1		033
1972	TZ9	1972	10	09.96562	01	22	15.09	+03	38	27.6	15.9V	033

1972	TZ9	1972	10	10.00382	01	22	13.34	+03	38	12.7		033
1972	TZ9	1972	10	10.05069	01	22	11.19	+03	37	52.4		033
1972	TA10*	1972	10	09.91944	01	22	34.07	+04	43	56.0		033
1972	TA10	1972	10	09.93819	01	22	33.02	+04	43	46.8		033
1972	TA10	1972	10	09.95278	01	22	32.07	+04	43	39.5		033
1972	TA10	1972	10	09.96562	01	22	31.32	+04	43	33.7	17.5V	033
1972	TB10*	1972	10	09.91944	01	22	47.16	+04	46	43.3		033
1972	TB10	1972	10	09.93819	01	22	45.98	+04	46	38.6		033
1972	TB10	1972	10	09.95278	01	22	44.96	+04	46	35.2		033
1972	TB10	1972	10	09.96562	01	22	44.17	+04	46	32.3	17.7V	033
1972	TC10*	1972	10	09.91944	01	22	55.95	+04	42	43.5		033
1972	TC10	1972	10	09.93819	01	22	55.14	+04	42	38.0		033
1972	TC10	1972	10	09.95278	01	22	54.35	+04	42	33.6		033
1972	TC10	1972	10	09.96562	01	22	53.71	+04	42	29.6	18.3V	033
1972	TD10*	1972	10	09.91944	01	23	22.20	+03	37	40.2		033
1972	TD10	1972	10	09.93819	01	23	21.10	+03	37	35.3		033
1972	TD10	1972	10	09.95278	01	23	20.17	+03	37	31.5		033
1972	TD10	1972	10	09.96562	01	23	19.46	+03	37	28.6	17.5V	033
1972	TE10*	1972	10	09.91944	01	23	22.91	+04	07	53.2		033
1972	TE10	1972	10	09.93819	01	23	21.96	+04	07	46.0		033
1972	TE10	1972	10	09.95278	01	23	21.00	+04	07	39.7		033
1972	TE10	1972	10	09.96562	01	23	20.27	+04	07	34.9	18.5V	033
1972	TF10*	1972	10	09.91944	01	23	23.84	+03	01	47.5		033
1972	TF10	1972	10	09.93819	01	23	22.73	+03	01	42.7		033
1972	TF10	1972	10	09.95278	01	23	21.71	+03	01	38.0		033
1972	TF10	1972	10	09.96562	01	23	20.96	+03	01	35.3	19.1V	033
1972	TG10*	1972	10	09.91944	01	23	37.19	+03	36	08.2		033
1972	TG10	1972	10	09.93819	01	23	36.48	+03	36	02.8	18.7V	033
1972	TG10	1972	10	09.95278	01	23	35.75	+03	35	57.6		033
1972	TH10*	1972	10	09.91944	01	23	38.64	+04	53	15.4		033
1972	TH10	1972	10	09.93819	01	23	37.59	+04	53	14.8		033
1972	TH10	1972	10	09.95278	01	23	36.70	+04	53	14.7		033
1972	TH10	1972	10	09.96562	01	23	35.91	+04	53	14.8	17.5V	033
1972	TJ10*	1972	10	09.91944	01	23	40.66	+02	34	29.5		033
1972	TJ10	1972	10	09.93819	01	23	39.70	+02	34	22.6	19.5V	033
1972	TJ10	1972	10	09.95278	01	23	38.96	+02	34	18.6		033
1972	TK10*	1972	10	09.91944	01	23	45.77	+03	15	50.4		033
1972	TK10	1972	10	09.93819	01	23	44.58	+03	15	47.8	18.9V	033
1972	TK10	1972	10	09.95278	01	23	43.55	+03	15	46.3		033
1972	TL10*	1972	10	09.91944	01	24	07.29	+02	40	45.9		033
1972	TL10	1972	10	09.93819	01	24	06.29	+02	40	38.9		033
1972	TL10	1972	10	09.95278	01	24	05.42	+02	40	33.1		033
1972	TL10	1972	10	09.96562	01	24	04.70	+02	40	28.8	18.1V	033
1972	TM10*	1972	10	09.91944	01	24	09.32	+02	10	22.2		033
1972	TM10	1972	10	09.93819	01	24	08.54	+02	10	17.6	19.3V	033
1972	TM10	1972	10	09.95278	01	24	07.80	+02	10	14.6		033
1972	TN10*	1972	10	09.91944	01	24	34.75	+03	56	22.2		033
1972	TN10	1972	10	09.93819	01	24	33.78	+03	56	18.6		033
1972	TN10	1972	10	09.95278	01	24	32.91	+03	56	15.3		033
1972	TN10	1972	10	09.96562	01	24	32.23	+03	56	13.0	17.5V	033
1972	TO10*	1972	10	09.91944	01	24	44.64	+03	37	30.8		033
1972	TO10	1972	10	09.93819	01	24	43.61	+03	37	24.2		033
1972	TO10	1972	10	09.95278	01	24	42.68	+03	37	20.3		033
1972	TO10	1972	10	09.96562	01	24	41.91	+03	37	16.2	18.9V	033
1972	TP10*	1972	10	09.91944	01	24	51.39	+04	42	31.5		033
1972	TP10	1972	10	09.93819	01	24	50.21	+04	42	32.5		033
1972	TP10	1972	10	09.95278	01	24	49.08	+04	42	33.2		033
1972	TP10	1972	10	09.96562	01	24	48.22	+04	42	33.7	17.9V	033
1972	TQ10*	1972	10	09.91944	01	25	03.45	+02	23	44.4		033

1972	TQ10	1972	10	09.93819	01	25	02.44	+02	23	45.9		033
1972	TQ10	1972	10	09.95278	01	25	01.48	+02	23	47.3		033
1972	TQ10	1972	10	09.96562	01	25	00.72	+02	23	48.6	17.9V	033
1972	TR10*	1972	10	09.91944	01	25	04.62	+02	34	31.1		033
1972	TR10	1972	10	09.93819	01	25	03.38	+02	34	30.1	18.5V	033
1972	TS10*	1972	10	09.91944	01	25	27.04	+02	20	11.4		033
1972	TS10	1972	10	09.93819	01	25	26.18	+02	20	04.2	18.9V	033
1972	TS10	1972	10	09.95278	01	25	25.31	+02	19	57.1		033
1972	TT10*	1972	10	09.91944	01	25	45.39	+03	25	58.6		033
1972	TT10	1972	10	09.93819	01	25	44.44	+03	25	51.9		033
1972	TT10	1972	10	09.95278	01	25	43.65	+03	25	47.2		033
1972	TT10	1972	10	09.96562	01	25	42.97	+03	25	42.6	17.7V	033
1972	TU10*	1972	10	09.91944	01	25	50.46	+02	37	50.0		033
1972	TU10	1972	10	09.93819	01	25	49.67	+02	37	39.4		033
1972	TU10	1972	10	09.95278	01	25	49.01	+02	37	30.5		033
1972	TU10	1972	10	09.96562	01	25	48.48	+02	37	23.6	17.7V	033
1972	TV10*	1972	10	09.91944	01	27	16.17	+04	18	47.3		033
1972	TV10	1972	10	09.93819	01	27	14.96	+04	18	47.7		033
1972	TV10	1972	10	09.95278	01	27	13.94	+04	18	47.7		033
1972	TV10	1972	10	09.96562	01	27	13.08	+04	18	48.3	17.5V	033
1972	TW10*	1972	10	09.91944	01	28	04.63	+03	46	17.6		033
1972	TW10	1972	10	09.93819	01	28	03.78	+03	46	12.3		033
1972	TW10	1972	10	09.95278	01	28	03.02	+03	46	07.5		033
1972	TW10	1972	10	09.96562	01	28	02.35	+03	46	04.2	17.7V	033
1972	TX10*	1972	10	09.93819	01	21	50.97	+03	41	08.2	18.7V	033

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

Object	Date	UT	R. A. (1950)			Decl.	Mag.	Obs.	
/1980u	1980	12	29.72431	18	48	54.31	+39 52 14.2	10.2T	046
/1980u	1980	12	29.72917	18	48	54.50	+39 52 19.0		046
/1980u	1980	12	31.70164	18	49	55.80	+40 24 09.9		046
/1980u	1981	01	08.70737	18	54	27.25	+42 54 37.9		046
/1980u	1981	01	08.71061	18	54	27.47	+42 54 42.8		046
/1980u	1981	01	09.73126	18	55	04.39	+43 16 30.5		046
/1980u	1981	01	09.73439	18	55	04.60	+43 16 35.6		046
371	1980	12	30.80007	05	09	42.96	+26 20 31.7		046
371	1980	12	30.81425	05	09	42.22	+26 20 28.5		046
371	1981	01	06.01167	05	04	42.64	+25 57 49.9		046
371	1981	01	06.02764	05	04	41.79	+25 57 45.7		046
654	1981	01	06.01167	05	00	04.97	+27 10 34.1		046
654	1981	01	06.02764	05	00	04.14	+27 10 14.9		046
751	1981	01	06.01167	05	01	08.19	+27 14 55.6		046
751	1981	01	06.02764	05	01	07.28	+27 15 00.8		046
772	1980	12	29.77917	03	09	02.77	+16 59 51.9		046
772	1980	12	29.79340	03	09	02.40	+16 59 56.0		046
772	1980	12	30.76344	03	08	35.12	+17 04 26.2		046
772	1980	12	30.77819	03	08	34.70	+17 04 29.5		046
972	1980	12	30.91280	07	45	07.70	+19 44 03.4		046
972	1980	12	30.92704	07	45	06.87	+19 44 03.3		046
972	1981	01	08.88066	07	36	41.98	+19 41 57.7		046
972	1981	01	08.89484	07	36	41.19	+19 41 56.9		046
1822	1980	12	30.99238	08	21	36.51	+17 56 14.9		046
1822	1980	12	31.00784	08	21	35.64	+17 56 16.0		046
1970	1980	12	29.81701	03	32	33.45	+28 28 04.8		046
1970	1980	12	29.83125	03	32	32.77	+28 27 59.1		046
1970	1980	12	30.72380	03	32	13.43	+28 23 23.8		046
1970	1980	12	30.73838	03	32	13.12	+28 23 21.7		046
2288	1980	12	29.93699	08	55	39.90	+32 31 11.5		046
2288	1980	12	29.95146	08	55	39.49	+32 31 19.6		046

2320		1980	12	30.99238	08	26	47.73	+18	35	37.3	15.8	046
2320		1980	12	31.00784	08	26	47.19	+18	35	41.8		046
2320		1981	01	08.95637	08	20	23.51	+19	22	32.3		046
2320		1981	01	08.97095	08	20	22.81	+19	22	36.2		046
2333		1980	12	29.81701	03	31	49.98	+29	18	18.7		046
2333		1980	12	29.83125	03	31	49.52	+29	18	19.5		046
2333		1980	12	30.72380	03	31	23.89	+29	17	58.2		046
2333		1980	12	30.73838	03	31	23.50	+29	17	58.7		046
2333		1981	01	09.75400	03	28	30.14	+29	15	49.8		046
2333		1981	01	09.76830	03	28	30.00	+29	15	49.7		046
1979	OC	1981	01	08.91729	07	40	15.23	+13	55	12.3	17.8	046
1979	OC	1981	01	08.93193	07	40	14.15	+13	55	13.6		046
1979	QE	1980	12	29.85794	05	17	14.09	+26	55	57.4		046
1979	QE	1980	12	29.87223	05	17	13.28	+26	55	53.3		046
1979	QE	1980	12	30.80007	05	16	26.35	+26	51	00.3		046
1979	QE	1980	12	30.81425	05	16	25.56	+26	50	54.6		046
1980	SS	* 1980	09	16.93146	00	26	18.51	-02	57	38.1	17.0	046
1980	SS	1980	09	16.94558	00	26	17.47	-02	57	41.0		046
1980	TB1	* 1980	10	01.89397	01	03	01.40	+02	14	54.2	17.5	046
1980	TB1	1980	10	01.90728	01	03	01.03	+02	14	50.3		046
1980	TB1	1980	10	05.90469	00	59	53.50	+02	06	06.3		046
1980	TB1	1980	10	05.91887	00	59	52.86	+02	06	00.4		046
1980	TC1	1980	10	01.84796	00	15	26.02	-05	08	59.4		046
1980	TC1	1980	10	01.86567	00	15	25.01	-05	09	04.0		046
1980	TC1	* 1980	10	02.98951	00	14	34.43	-05	17	38.5	17.0	046
1980	TC1	1980	10	03.00132	00	14	33.74	-05	17	48.4		046
1980	XM	1980	12	30.72380	03	32	27.57	+29	56	09.5		046
1980	XM	1980	12	30.73838	03	32	27.29	+29	56	07.0		046
1980	XP	1980	12	29.77917	03	06	25.45	+16	53	12.3		046
1980	XP	1980	12	29.79340	03	06	25.57	+16	53	10.8		046
1980	XP	1980	12	30.76344	03	06	29.72	+16	50	54.6		046
1980	XP	1980	12	30.77819	03	06	29.88	+16	50	51.3		046
1980	XQ	1980	12	12.89108	05	31	58.38	+28	28	38.0		046
1980	YK	* 1980	12	29.93699	08	51	15.03	+34	51	32.4	16.5	046
1980	YK	1980	12	29.95146	08	51	14.35	+34	51	39.6		046
1980	YL	* 1980	12	30.80007	05	10	53.34	+25	57	26.7	16.2	046
1980	YL	1980	12	30.81425	05	10	52.52	+25	57	29.8		046
1980	YL	1981	01	06.01167	05	05	33.03	+26	16	15.8		046
1980	YL	1981	01	08.78839	05	03	37.71	+26	23	58.6		046
1980	YL	1981	01	08.80269	05	03	37.20	+26	24	03.4		046
1980	YM	* 1980	12	30.91280	07	38	48.85	+18	03	25.0		046
1980	YM	1980	12	30.92704	07	38	48.22	+18	03	26.1		046
1980	YM	1981	01	08.88066	07	29	56.02	+18	09	16.9	16.5	046
1980	YM	1981	01	08.89484	07	29	55.19	+18	09	18.8		046
1980	YN	* 1980	12	30.91280	07	41	07.85	+21	01	53.3	17.0	046
1980	YN	1980	12	30.92704	07	41	07.53	+21	02	04.2		046
1980	YO	* 1980	12	30.91280	07	42	39.90	+20	04	55.8	16.6	046
1980	YO	1980	12	30.92704	07	42	39.01	+20	05	01.7		046
1980	YO	1981	01	08.88066	07	34	53.27	+20	25	13.8		046
1980	YO	1981	01	08.89484	07	34	52.65	+20	25	23.4		046
1980	YP	* 1980	12	30.91280	07	49	52.49	+20	59	20.1	17.5	046
1980	YP	1980	12	30.92704	07	49	52.03	+20	59	22.5		046
1980	YQ	* 1980	12	30.99238	08	25	47.95	+17	26	40.0	15.4	046
1980	YQ	1980	12	31.00784	08	25	47.23	+17	26	38.4		046
1980	YQ	1981	01	08.95637	08	18	11.18	+17	22	26.4		046
1980	YQ	1981	01	08.97095	08	18	10.38	+17	22	26.1		046
1980	YR	* 1980	12	30.99238	08	26	27.25	+18	32	26.6	17.0	046
1980	YR	1980	12	31.00784	08	26	27.50	+18	32	27.1		046
1981	AW	* 1981	01	08.91729	07	34	36.66	+15	36	59.0	18.0	046

1981 AW	1981 01 08.93193	07 34 35.53	+15 37 08.6					046
1981 AX *	1981 01 08.91729	07 36 57.37	+12 49 36.2			16.8		046
1981 AX	1981 01 08.93193	07 36 56.40	+12 49 48.6					046
1981 AY *	1981 01 08.91729	07 43 03.3	+16 20.7					046
1981 AY	1981 01 08.93193	07 43 02.7	+16 20.7			17.0		046

OBSERVATIONS MADE AT THE KONKOLY OBSERVATORY, BUDAPEST, BY M. LOVAS.

Object	Date	UT	R. A. (1950)	Decl.	Mag.	Obs.
/1980s	1980 12 05.06213	09 11 47.93	+33 40 34.0		17 T	053
/1980s	1980 12 05.98192	09 12 04.80	+33 40 27.0			053
/1980s	1980 12 09.00623	09 12 43.01	+33 40 02.8			053

OBSERVATIONS MADE AT THE CRIMEAN ASTROPHYSICAL OBSERVATORY BY N. S. CHERNYKH,
L. I. CHERNYKH, L. G. KARACHKINA, T. M. SMIRNOVA AND L. V. ZHURAVLEVA
(41ST REPORT).

Object	Date	UT	R. A. (1950)	Decl.	O - C	Mag.	N	Obs.
1240	1978 08 08.97237	22 41 04.10	-06 31 03.6	0.1+	0		1	095
1978 PV1 *	1978 08 08.97237	22 41 32.47	-09 22 14.3			17.2	1	095
1978 PW1 *	1978 08 08.97237	22 41 44.72	-09 33 49.0			17.0	1	095
1978 PX1 *	1978 08 08.97237	22 41 48.16	-05 41 14.8			17.0	1	095
1978 PY1 *	1978 08 08.97237	22 42 02.60	-06 49 32.8			17.0	1	095
1978 PZ1 *	1978 08 08.97237	22 42 41.82	-08 32 19.6			17.2	1	095
1978 PA2 *	1978 08 08.97237	22 42 50.78	-06 03 22.6			17.0	1	095
1978 PB2 *	1978 08 08.97237	22 43 36.97	-07 29 50.6			17.2	1	095
1978 PC2 *	1978 08 08.97237	22 43 44.69	-05 24 21.4			17.0	1	095
1978 PD2 *	1978 08 08.97237	22 44 03.22	-03 57 07.1			17.5	1	095
1978 PE2 *	1978 08 08.97237	22 44 43.60	-02 16 50.2			17.0	1	095
1978 PF2 *	1978 08 08.97237	22 46 23.50	-07 34 30.6			16.8	6	095
1978 PG2 *	1978 08 08.97237	22 46 25.66	-05 59 12.2			17.5		095
1978 PH2 *	1978 08 08.97237	22 46 49.19	-06 39 24.6			17.0		095
1978 PJ2 *	1978 08 08.97237	22 47 36.72	-03 02 20.7			17.5		095
1978 PK2 *	1978 08 08.97237	22 47 54.10	-05 01 54.6			17.5		095
1978 PL2 *	1978 08 08.97237	22 48 31.03	-04 49 34.9			17.5		095
1978 PM2 *	1978 08 08.97237	22 48 55.66	-10 27 02.3			16.8	1	095
1978 PN2 *	1978 08 08.97237	22 49 03.72	-10 24 25.7			17.5	1	095
1802	1978 08 08.97237	22 49 17.78	-08 13 52.2	0.0	0			095
1978 PO2 *	1978 08 08.97237	22 52 03.32	-07 47 40.2			16.8		095
1978 PP2 *	1978 08 08.97237	22 52 05.16	-08 10 19.3			16.5		095
1978 PQ2 *	1978 08 08.97237	22 54 06.06	-04 19 18.2			16.5		095
1978 PR2 *	1978 08 08.97237	22 55 00.44	-09 41 01.7			17.0		095
1978 PS2 *	1978 08 08.97237	22 55 05.88	-03 39 21.2			17.5		095
1978 PT2 *	1978 08 08.97237	22 55 18.03	-05 41 19.8			17.0		095
1978 PU2 *	1978 08 08.97237	22 55 27.97	-08 09 16.4			16.2		095
1978 PV2 *	1978 08 08.97237	22 56 53.19	-04 47 54.6			16.2	4	095
1978 PW2 *	1978 08 08.97237	22 57 17.10	-04 19 17.6			17.0		095
1978 PX2 *	1978 08 08.97237	22 57 42.56	-07 49 25.0			17.5		095
1978 PY2 *	1978 08 08.97237	22 58 50.41	-04 04 55.6			17.2		095
1978 PZ2 *	1978 08 08.97237	22 59 13.78	-05 39 58.0			17.5		095
1978 PA3 *	1978 08 08.97237	22 59 41.28	-04 42 36.3			17.5		095
1978 QC	1978 08 08.97237	23 00 06.25	-04 46 25.6			17.5		095
1978 PB3 *	1978 08 08.97237	23 01 40.60	-05 54 04.4			17.5		095
1742	1978 08 08.97237	23 02 44.38	-06 14 58.8	0.0	0			095
1978 PC3 *	1978 08 08.97237	23 02 53.91	-05 08 19.9			17.0		095
1978 PD3 *	1978 08 08.97237	23 02 57.75	-05 05 31.9			17.2		095
1953	1978 08 08.97237	23 04 19.84	-09 51 54.4	0.1+	0			095
1978 PE3 *	1978 08 08.97237	23 04 32.62	-03 05 55.2			17.5		095
1978 PF3 *	1978 08 08.97237	23 04 34.88	-05 47 47.4			15.5		095
1358	1978 08 08.97237	23 05 46.56	-09 10 12.0	0.1+	1+			095
1978 PG3 *	1978 08 08.97237	23 06 14.04	-03 30 11.4			17.5		095

1978	PH3	*	1978	08	08.97237	23	07	06.44	-05	08	47.3			17.2	095
824			1978	08	08.97237	23	07	23.10	-08	30	59.8	0.1-	1-		095
1978	PJ3	*	1978	08	08.97237	23	09	01.97	-05	59	58.7			17.5	095
1824			1978	08	08.97237	23	09	25.60	-07	22	52.6	0.1-	0		095
1978	PK3	*	1978	08	08.97237	23	09	40.67	-02	41	55.0			17.2	2 095
1978	PL3	*	1978	08	08.97237	23	10	26.60	-09	32	53.5			17.5	095
1808			1978	08	08.97237	23	10	31.25	-07	27	07.4	0.1+	0		095
2108			1978	08	08.97237	23	10	38.41	-02	53	19.8				095
1978	PM3	*	1978	08	08.97237	23	11	25.69	-06	54	42.9			16.5	095
1978	PN3	*	1978	08	08.97237	23	11	31.94	-04	54	54.6			17.2	095
1962			1978	08	08.97237	23	13	06.06	-06	49	53.4	0.1+	0		095
1978	PO3	*	1978	08	08.97237	23	13	06.19	-06	28	40.6			17.0	095
1978	PP3	*	1978	08	08.97237	23	14	13.60	-07	46	22.2			17.2	095
1978	PQ3	*	1978	08	08.97237	23	14	45.91	-03	11	43.7			17.2	1 095
273			1978	08	08.97237	23	14	47.53	-01	26	59.2	0.2-	0		1 095
1376			1978	08	08.97237	23	16	04.12	-02	53	43.4	0.0	1+		1 095
605			1978	08	08.97237	23	16	35.10	-09	19	45.6	0.0	3-		1 095
1978	PR3	*	1978	08	08.97237	23	17	08.66	-02	30	24.9			17.5	3 095
1978	PS3	*	1978	08	08.97237	23	18	02.50	-03	33	57.4			16.8	1 095
1978	PT3	*	1978	08	08.97237	23	19	20.44	-04	24	59.8			17.0	1 095
970			1978	08	09.93490	22	04	21.22	-09	46	46.0	0.0	0		095
1978	PU3	*	1978	08	09.93490	22	07	21.56	-04	50	29.2			17.0	095
1978	PV3	*	1978	08	09.93490	22	09	37.62	-04	36	43.4			16.8	095
420			1978	08	09.93490	22	11	12.22	-01	16	53.6	0.1-	1-		1 095
1978	PW3	*	1978	08	09.93490	22	11	33.06	-05	55	35.4			17.0	095
656			1978	08	09.93490	22	14	32.12	-10	27	21.6	0.1-	0		1 095
1978	PX3	*	1978	08	09.93490	22	16	27.10	-07	24	25.8			17.0	095
1475			1978	08	09.93490	22	18	33.34	-03	29	28.4	0.0	1+		095
1978	PY3	*	1978	08	09.93490	22	19	29.32	-09	43	45.6			16.8	095
808			1978	08	09.93490	22	19	51.62	-06	18	00.8	0.1+	0		095
1978	PZ3	*	1978	08	09.93490	22	20	13.06	-07	35	20.8			16.2	095
1014			1978	08	09.93490	22	22	24.69	-06	46	17.4	0.1+	1+		095
1978	PA4	*	1978	08	09.93490	22	24	59.56	-08	31	31.7			16.8	095
304			1978	08	09.93490	22	25	33.10	-01	58	18.5	0.7+	2+		1 095
1978	PB4	*	1978	08	09.93490	22	26	59.97	-05	21	16.2			17.5	095
709			1978	08	09.93490	22	27	33.25	-07	38	59.6	0.0	1-		095
1471			1978	08	09.93490	22	28	28.82	-06	14	19.3	0.1+	0		095
1978	PC4	*	1978	08	09.93490	22	30	01.62	-09	45	42.4			17.0	095
2012			1978	08	09.93490	22	32	08.38	-04	19	45.0			16.2	1 095
1704			1978	08	09.93490	22	32	23.06	-07	32	33.0	0.0	1-		1 095
1978	PD4	*	1978	08	09.93490	22	32	55.88	-06	46	25.4			17.0	3 095
658			1978	08	09.93490	22	36	20.75	-09	42	37.0	0.0	0		1 095
1277			1978	08	09.98905	22	36	59.22	+04	44	11.2	0.0	0		1 095
1176			1978	08	09.98905	22	41	07.78	+01	21	17.8	0.2+	1+		1 095
583			1978	08	09.98905	22	50	21.32	+04	17	33.8	0.0	0		095
1978	PE4	*	1978	08	09.98905	22	53	33.38	+02	07	06.2			16.5	095
1978	PF4	*	1978	08	09.98905	22	55	49.60	+05	09	25.0			16.0	095
1978	PG4	*	1978	08	09.98905	22	56	30.31	-00	11	16.6			17.0	3 095
1978	PH4	*	1978	08	09.98905	22	56	35.53	+00	46	01.2			17.0	095
1978	PJ4	*	1978	08	09.98905	22	56	36.44	+04	20	54.8			15.5	095
1254			1978	08	09.98905	22	57	22.01	+01	26	22.6	0.0	1-		095
1978	PK4	*	1978	08	09.98905	22	59	29.13	+04	52	28.8			17.0	095
1401			1978	08	09.98905	23	04	21.41	+07	10	11.8	0.1+	1+		095
1978	PL4	*	1978	08	09.98905	23	04	50.34	+04	21	26.5			16.5	095
1775			1978	08	09.98905	23	05	28.50	+08	42	09.4	0.0	0		1 095
1978	PM4	*	1978	08	09.98905	23	06	29.28	+01	38	14.8			17.0	095
1978	PN4	*	1978	08	09.98905	23	06	36.22	+00	09	05.4			16.0	1 095
390			1978	08	09.98905	23	07	57.41	+05	07	02.8	0.0	0		095
342			1978	08	09.98905	23	09	10.25	+05	59	29.4	0.4-	3-		095

1979 UJ	1978 08 09.98905	23 12 33.53	+05 49 59.8						16.0	1 095
1978 PO4 *	1978 08 09.98905	23 12 58.10	+02 49 11.2						16.5	1 095
607	1978 08 09.98905	23 16 17.12	+08 16 35.4	0.1-	0					1 095
402	1978 08 27.85690	20 35 38.66	-20 38 48.6	0.2-	2-					095
120	1978 08 27.85690	20 37 55.28	-23 06 53.8	0.3-	2-					1 095
1719	1978 08 27.85690	20 48 04.10	-19 32 02.2	0.1+	1+					095
1118	1978 08 27.85690	20 50 00.50	-18 12 13.7	0.1-	0					095
1978 QL *	1978 08 27.91939	22 50 23.00	+18 32 24.4						16.5	095
1040	1978 08 27.91939	22 55 29.28	+17 20 58.9	0.2+	2+					095
1177	1978 08 27.91939	23 01 23.97	+16 30 06.8	0.1+	2+					095
970	1978 08 31.86912	21 43 09.53	-10 32 57.8	0.0	0					1 095
1978 PV3	1978 08 31.86912	21 50 31.53	-05 24 01.6						17.5	095
1978 PU3	1978 08 31.86912	21 50 40.78	-08 08 17.4						17.2	095
1978 QM *	1978 08 31.86912	21 50 42.75	-10 14 56.2						16.5	095
1978 PW3	1978 08 31.86912	21 55 08.06	-09 01 22.0						17.5	095
1978 PX3	1978 08 31.86912	21 56 58.22	-06 53 44.6						17.0	095
656	1978 08 31.86912	21 58 52.19	-11 55 25.6	0.0	0					095
1475	1978 08 31.86912	21 59 56.28	-05 43 41.1	0.0	1+					095
1978 QN *	1978 08 31.86912	22 01 57.47	-13 26 31.1						16.8	1 095
808	1978 08 31.86912	22 02 47.38	-08 19 34.6	0.0	0					095
1978 PZ3	1978 08 31.86912	22 03 21.16	-09 39 14.2						16.5	095
1978 QO *	1978 08 31.86912	22 04 12.91	-13 13 20.4						16.5	1 095
1978 PB4	1978 08 31.86912	22 04 41.47	-06 28 47.9						17.0	095
1978 QP *	1978 08 31.86912	22 04 45.66	-05 11 21.2						17.0	1 095
1014	1978 08 31.86912	22 05 17.38	-08 18 14.2	0.1+	1+					095
1978 PA4	1978 08 31.86912	22 06 02.63	-10 45 09.8						16.8	095
709	1978 08 31.86912	22 06 07.63	-06 58 50.8	0.1-	2-					095
1471	1978 08 31.86912	22 07 20.56	-06 36 03.2	0.0	0					095
1978 QQ *	1978 08 31.86912	22 08 03.66	-12 34 47.2						17.0	095
1978 QR *	1978 08 31.86912	22 10 13.44	-11 39 02.3						16.8	095
1704	1978 08 31.86912	22 11 25.31	-09 28 15.2	0.0	1-				17.2	095
1978 QS *	1978 08 31.86912	22 11 50.78	-09 45 16.0						17.0	095
1978 QT *	1978 08 31.86912	22 11 57.47	-07 58 55.4						17.2	095
1027	1978 08 31.86912	22 11 57.69	-12 42 40.7	0.1+	1-					1 095
1978 QU *	1978 08 31.86912	22 12 39.78	-10 54 47.5						17.0	095
1978 PC4	1978 08 31.86912	22 12 50.94	-11 12 03.9						16.5	095
1978 QV *	1978 08 31.86912	22 13 34.91	-10 56 47.1						16.5	095
2012	1978 08 31.86912	22 13 53.06	-05 24 56.6						16.5	095
304	1978 08 31.86912	22 14 37.53	-08 36 44.0	0.7+	2+					095
1978 QW *	1978 08 31.86912	22 14 48.66	-11 29 03.8						17.2	095
1978 QX *	1978 08 31.86912	22 14 51.16	-10 18 12.6						17.0	095
1978 QY *	1978 08 31.86912	22 16 36.47	-10 55 15.8						17.5	095
1978 QZ *	1978 08 31.86912	22 16 38.53	-08 00 18.2						17.0	095
1978 QA1 *	1978 08 31.86912	22 17 01.31	-09 45 02.1						17.2	095
1978 QB1 *	1978 08 31.86912	22 17 51.78	-10 04 46.5						17.2	1 095
658	1978 08 31.86912	22 19 16.16	-11 11 15.2	0.1+	0					1 095
1978 QC1 *	1978 08 31.86912	22 19 32.47	-09 09 04.1						17.0	1 095
662	1978 08 31.86912	22 20 54.10	-13 25 39.3	0.1-	1-					1 095
1240	1978 08 31.86912	22 21 09.22	-06 15 02.4	0.1+	0					1 095
1978 QD1 *	1978 08 31.86912	22 21 27.69	-07 20 58.0						17.5	1 095
1978 QE1 *	1978 08 31.86912	22 21 32.72	-07 24 53.4						17.2	1 095
526	1978 08 31.93098	23 10 24.16	-06 46 38.4	0.1-	1-					1 095
1978 QF1 *	1978 08 31.93098	23 11 46.28	-00 35 19.3						17.5	1 095
1978 QG1 *	1978 08 31.93098	23 14 35.22	-04 00 26.6						17.5	1 095
1978 QH1 *	1978 08 31.93098	23 15 14.03	-01 49 34.8						17.0	1 095
1978 QJ1 *	1978 08 31.93098	23 16 12.13	-05 34 53.6						17.0	095
1978 QK1 *	1978 08 31.93098	23 16 26.38	-04 16 00.3						16.0	095
1978 QL1 *	1978 08 31.93098	23 17 29.10	-03 06 58.0						17.5	095
1938	1978 08 31.93098	23 18 16.25	-03 40 27.6	0.0	1+					095

1978	QM1	*	1978	08	31.93098	23	18	31.34	-02	57	47.1			17.5		095
1978	QN1	*	1978	08	31.93098	23	20	26.25	+01	12	04.6			17.0	3	095
1978	QO1	*	1978	08	31.93098	23	20	29.22	-03	54	13.4			17.0		095
1678			1978	08	31.93098	23	20	55.78	-05	50	57.6	0.1+	1+			095
1978	QP1	*	1978	08	31.93098	23	21	42.72	-07	08	03.6			16.5	1	095
1978	QQ1	*	1978	08	31.93098	23	23	05.72	-07	51	47.8			16.8	1	095
1978	QR1	*	1978	08	31.93098	23	23	32.10	-00	56	35.2			16.8		095
1692			1978	08	31.93098	23	24	02.63	-01	25	33.4	0.0	0			095
1978	QS1	*	1978	08	31.93098	23	24	12.75	-07	18	18.0			16.0	1	095
1978	QT1	*	1978	08	31.93098	23	25	00.53	-02	06	32.4			16.5		095
802			1978	08	31.93098	23	25	19.84	-07	41	16.1	0.1+	0	16.5	1	095
1978	QU1	*	1978	08	31.93098	23	25	23.50	-04	48	31.0			16.5		095
1978	QV1	*	1978	08	31.93098	23	25	27.19	-00	02	54.2			17.5		095
1978	QW1	*	1978	08	31.93098	23	25	48.44	-02	04	57.2			16.8		095
1978	QX1	*	1978	08	31.93098	23	25	59.63	-01	59	09.9			16.2		095
1978	QY1	*	1978	08	31.93098	23	26	40.75	-03	09	36.1			17.0		095
1978	QZ1	*	1978	08	31.93098	23	27	03.90	-01	05	21.6			17.5		095
1978	QA2	*	1978	08	31.93098	23	27	28.66	+00	03	27.8			17.0		095
1978	QB2	*	1978	08	31.93098	23	27	30.19	-05	56	45.4			16.0		095
1978	QC2	*	1978	08	31.93098	23	27	37.50	-07	02	20.4			17.0		095
1045			1978	08	31.93098	23	28	01.34	-02	57	52.4	0.1+	1+			095
1978	QD2	*	1978	08	31.93098	23	28	27.41	-04	34	55.3			17.2		095
1978	QE2	*	1978	08	31.93098	23	28	33.06	-06	12	24.2			16.8		095
1978	QF2	*	1978	08	31.93098	23	29	11.06	-04	38	00.8			17.0		095
1978	QG2	*	1978	08	31.93098	23	29	58.63	-00	04	21.5			17.0		095
1978	QH2	*	1978	08	31.93098	23	29	59.31	-06	51	36.5			16.2		095
107			1978	08	31.93098	23	30	38.78	-01	42	42.5	0.1-	0			095
215			1978	08	31.93098	23	30	47.94	-04	59	09.8	0.0	0			095
1978	QJ2	*	1978	08	31.93098	23	30	59.03	-04	23	25.6			16.2		095
1978	QK2	*	1978	08	31.93098	23	31	14.28	+01	07	31.6			17.0	1	095
1978	QL2	*	1978	08	31.93098	23	31	39.16	-03	54	56.4			16.8		095
1978	QM2	*	1978	08	31.93098	23	32	01.72	+01	13	34.4			17.0	1	095
142			1978	08	31.93098	23	32	11.56	+00	18	06.4	0.0	0			095
1978	QN2	*	1978	08	31.93098	23	32	21.54	-02	27	19.4			16.8		095
1978	QO2	*	1978	08	31.93098	23	32	33.16	-04	39	01.1			16.8		095
1978	QP2	*	1978	08	31.93098	23	32	50.88	-00	20	17.6			16.8		095
1533			1978	08	31.93098	23	32	53.31	-06	01	25.0	0.1+	1+			095
1978	QQ2	*	1978	08	31.93098	23	33	58.72	-01	36	48.6			16.8		095
1978	QR2	*	1978	08	31.93098	23	34	36.22	-03	44	49.3			17.0		095
892			1978	08	31.93098	23	35	29.78	+00	56	26.4	0.0	0			1 095
82			1978	08	31.93098	23	35	41.72	-05	20	20.8	0.2+	1+			095
1978	QS2	*	1978	08	31.93098	23	37	02.25	+00	05	31.0			17.5		095
1978	QT2	*	1978	08	31.93098	23	37	49.00	-05	57	24.4			17.5	2	095
1978	QU2	*	1978	08	31.93098	23	38	04.84	-05	59	58.0			17.2		095
1978	QV2	*	1978	08	31.93098	23	38	06.56	-04	47	48.3			16.8		095
765			1978	08	31.93098	23	38	13.10	+01	47	15.8	0.0	0			1 095
2322			1978	08	31.93098	23	39	35.56	-00	04	08.4			16.2		095
1978	QW2	*	1978	08	31.93098	23	39	41.06	-03	13	45.8			16.2		095
2092			1978	08	31.93098	23	39	51.19	-07	19	57.0			16.8	1	095
1978	QX2	*	1978	08	31.93098	23	39	54.19	-03	18	54.4			17.0		095
1978	QY2	*	1978	08	31.93098	23	40	26.63	-02	57	18.6			17.2		095
1978	QZ2	*	1978	08	31.93098	23	43	43.53	-01	56	32.5			17.0		095
1978	QA3	*	1978	08	31.93098	23	45	18.66	-03	37	37.4			17.0		095
48			1978	08	31.93098	23	48	40.41	+00	56	26.1	0.0	0			1 095
1978	QB3	*	1978	08	31.93098	23	50	53.19	-01	42	44.4			16.2	1	095
1978	RL1		1978	09	01.00629	00	15	33.25	+00	22	28.7			17.5		095
2296			1978	09	01.00629	00	17	09.94	+00	33	19.9			17.5		095
1978	RJ2		1978	09	01.00629	00	20	06.96	+03	28	07.2			17.0		095
1978	RS4	*	1978	09	01.00629	00	23	09.48	+03	09	24.6			17.0		095

1978	RR1	1978	09	01.00629	00	27	19.57	+00	08	59.8			17.5	095
1978	RS1	1978	09	01.00629	00	29	18.65	-00	52	36.8			17.5	095
1978	RU1	1978	09	01.00629	00	33	14.71	+03	44	08.9			17.5	095
1978	RM2	1978	09	01.00629	00	35	28.03	+05	27	56.4			17.8	095
1978	RV1	1978	09	01.00629	00	36	30.65	+02	28	23.2			17.5	095
1978	RW1	1978	09	01.00629	00	40	23.80	+02	59	52.2			17.5	095
1978	RX1	1978	09	01.00629	00	40	31.98	-00	51	29.3			17.5	095
1978	RT4 *	1978	09	01.01416	00	24	01.55	+03	18	51.2			17.5	095
1802		1978	09	03.90664	22	30	29.12	-10	31	11.2	0.1-	1-		1 095
1978	PP2	1978	09	03.90664	22	32	36.25	-09	56	30.4			16.8	1 095
1978	RW2 *	1978	09	03.90664	22	33	00.32	-05	58	59.4			17.5	1 095
1978	RX2 *	1978	09	03.90664	22	34	08.10	-05	54	51.4			17.5	1 095
1978	PR2	1978	09	03.90664	22	35	13.34	-10	51	07.6			17.0	095
1978	PT2	1978	09	03.90664	22	36	42.50	-07	26	51.5			16.8	095
1978	PQ2	1978	09	03.90664	22	37	35.34	-06	21	00.0			16.5	095
1978	RY2 *	1978	09	03.90664	22	38	05.53	-03	02	36.8			16.2	1 095
1978	PU2	1978	09	03.90664	22	40	12.26	-12	21	50.9			16.5	3 095
1978	PY2	1978	09	03.90664	22	40	15.97	-06	15	03.8			17.0	095
1978	RZ2 *	1978	09	03.90664	22	40	21.40	-05	25	03.2			17.5	095
1978	RA3 *	1978	09	03.90664	22	41	05.16	-05	05	33.8			17.5	095
1978	RB3 *	1978	09	03.90664	22	41	48.06	-07	55	07.8			17.5	095
1978	RC3 *	1978	09	03.90664	22	42	59.56	-04	11	45.7			17.2	095
1978	QC	1978	09	03.90664	22	43	13.88	-06	40	09.1			17.0	095
1978	RD3 *	1978	09	03.90664	22	43	50.38	-04	01	26.1			17.5	095
1978	PB3	1978	09	03.90664	22	43	56.03	-07	15	58.1			17.0	095
1978	RE3 *	1978	09	03.90664	22	44	02.53	-05	59	21.7			17.2	095
1742		1978	09	03.90664	22	45	25.00	-08	29	51.5	0.1-	1-		095
1358		1978	09	03.90664	22	45	48.19	-10	51	38.4	0.0	1-		095
1978	PF3	1978	09	03.90664	22	46	08.13	-06	29	43.1			15.5	095
1978	RF3 *	1978	09	03.90664	22	46	42.00	-06	12	37.8			17.0	4 095
2108		1978	09	03.90664	22	46	49.13	-02	54	17.8				1 095
1953		1978	09	03.90664	22	47	11.22	-11	50	44.2	0.0	1-		1 095
1978	RG3 *	1978	09	03.90664	22	48	45.19	-11	07	04.8			17.2	095
1978	RH3 *	1978	09	03.90664	22	49	45.47	-07	16	18.3			17.5	095
1978	PH3	1978	09	03.90664	22	49	58.72	-06	52	53.3			17.5	095
824		1978	09	03.90664	22	50	21.25	-11	57	08.4	0.2-	1-		1 095
1978	RJ3 *	1978	09	03.90664	22	50	55.50	-04	17	49.0			17.5	095
1978	RK3 *	1978	09	03.90664	22	51	10.03	-03	51	15.6			17.5	1 095
1824		1978	09	03.90664	22	51	10.19	-09	07	25.8	0.1-	0		095
1978	RL3 *	1978	09	03.90664	22	51	36.88	-07	39	19.8			17.2	095
1808		1978	09	03.90664	22	51	50.53	-09	11	37.0	0.0	1-		095
1978	RM3 *	1978	09	03.90664	22	51	58.69	-07	41	03.3			17.0	095
605		1978	09	03.90664	22	52	18.81	-08	16	06.6	0.2-	3-		095
1978	RN3 *	1978	09	03.90664	22	52	54.25	-07	46	35.4			17.5	095
1978	RO3 *	1978	09	03.90664	22	53	16.91	-05	37	31.4			17.5	095
1978	PO3	1978	09	03.90664	22	53	29.53	-08	24	26.9			17.0	095
1978	RP3 *	1978	09	03.90664	22	54	11.84	-05	48	18.4			17.2	095
1978	RQ3 *	1978	09	03.90664	22	54	49.53	-04	17	16.9			17.5	095
1978	RR3 *	1978	09	03.90664	22	55	31.40	-12	00	42.6			17.2	1 095
1978	RS3 *	1978	09	03.90664	22	56	25.78	-03	24	54.0			17.2	3 095
1978	RT3 *	1978	09	03.90664	22	56	33.44	-05	16	31.0			17.0	095
1962		1978	09	03.90664	22	57	14.00	-08	19	34.2	0.0	0		095
1978	PS3	1978	09	03.90664	22	57	16.41	-03	24	53.2			16.5	1 095
1978	PM3	1978	09	03.90664	22	57	47.75	-11	02	16.6			16.5	095
1978	PP3	1978	09	03.90664	22	57	57.72	-09	50	24.5			17.0	095
1978	RU3 *	1978	09	03.90664	22	58	43.97	-05	08	34.0			17.2	095
273		1978	09	03.90664	22	59	42.31	-08	46	30.2	0.3-	2-		095
1978	PQ3	1978	09	03.90664	22	59	49.69	-05	46	48.2			16.8	095
1978	RV3 *	1978	09	03.90664	23	01	21.84	-05	36	36.2			17.2	095

1978	RW3	*	1978	09	03.90664	23	01	59.28	-05	42	31.1			17.2	095
1376			1978	09	03.90664	23	02	51.94	-05	59	08.8	0.2-	0		095
1978	RX3	*	1978	09	03.90664	23	02	54.00	-10	57	53.6			17.0	095
19			1978	09	03.90664	23	03	33.47	-03	40	32.8	0.3+	0		1 095
1978	RY3	*	1978	09	03.90664	23	03	35.41	-07	40	12.4			16.8	095
1978	RZ3	*	1978	09	03.90664	23	06	04.72	-07	39	03.6			17.5	1 095
1978	RA4	*	1978	09	03.90664	23	07	09.31	-06	47	50.9			17.2	3 095
526			1978	09	03.90664	23	08	18.78	-07	01	13.4	0.2-	1-		1 095
1978	RB4	*	1978	09	03.90664	23	09	05.75	-06	30	47.4			17.5	1 095
1978	RC4	*	1978	09	03.90664	23	10	41.41	-07	28	58.4			17.0	1 095
970			1978	09	05.85157	21	38	34.78	-10	43	25.4	0.1-	0		1 095
1978	QM		1978	09	05.85157	21	45	26.41	-09	53	17.8			16.5	095
1978	PV3		1978	09	05.85157	21	46	49.44	-05	40	04.5			17.0	095
1978	PU3		1978	09	05.85157	21	47	18.41	-08	55	09.3			17.2	095
1978	RD4	*	1978	09	05.85157	21	48	45.16	-07	29	00.8			17.5	095
1978	PW3		1978	09	05.85157	21	51	45.28	-09	44	08.6			17.5	095
1978	PX3		1978	09	05.85157	21	52	53.00	-06	51	07.1			17.2	095
656			1978	09	05.85157	21	55	26.31	-12	14	20.3	0.1-	0		095
1475			1978	09	05.85157	21	55	43.25	-06	19	58.4	0.1-	1+		095
808			1978	09	05.85157	21	58	56.69	-08	48	45.8	0.0	0		095
1978	PZ3		1978	09	05.85157	21	59	35.88	-10	08	09.0			16.2	095
1978	PB4		1978	09	05.85157	21	59	46.41	-06	46	53.6			17.0	095
1978	QO		1978	09	05.85157	21	59	58.25	-13	16	02.2			16.8	1 095
1978	QP		1978	09	05.85157	22	00	28.22	-05	35	12.0			17.2	095
709			1978	09	05.85157	22	01	20.03	-06	51	40.4	0.2-	2-		095
1014			1978	09	05.85157	22	01	24.81	-08	40	17.6	0.1+	2+		095
1978	PA4		1978	09	05.85157	22	01	41.94	-11	15	46.4			16.5	095
1471			1978	09	05.85157	22	02	29.97	-06	37	05.5	0.0	1+		095
1978	QQ		1978	09	05.85157	22	03	15.19	-12	50	17.4			17.2	1 095
1978	RE4	*	1978	09	05.85157	22	04	44.44	-06	45	02.1			17.0	095
1704			1978	09	05.85157	22	06	40.50	-09	54	56.8	0.0	0	17.2	095
1978	QR		1978	09	05.85157	22	06	43.06	-11	57	36.2			17.0	095
1978	QS		1978	09	05.85157	22	07	03.60	-09	36	47.0			17.5	095
1978	QT		1978	09	05.85157	22	08	04.38	-08	24	59.0			17.2	095
1027			1978	09	05.85157	22	08	24.60	-13	00	58.4	0.0	0		1 095
1978	PC4		1978	09	05.85157	22	08	56.25	-11	30	57.8			16.8	095
1978	QV		1978	09	05.85157	22	09	04.10	-10	55	21.6			17.0	095
1978	QU		1978	09	05.85157	22	09	06.84	-11	15	39.0			17.5	095
1978	QW		1978	09	05.85157	22	09	42.28	-11	20	10.4			17.5	095
2012			1978	09	05.85157	22	09	45.38	-05	45	08.0			16.5	095
1978	QX		1978	09	05.85157	22	10	09.03	-10	42	21.0			17.0	095
1978	QY		1978	09	05.85157	22	11	57.94	-11	12	19.8			17.0	1 095
304			1978	09	05.85157	22	12	04.60	-10	11	24.0	0.7+	1+		1 095
1978	QZ		1978	09	05.85157	22	12	23.54	-08	15	16.6			17.5	1 095
1978	QA1		1978	09	05.85157	22	13	07.50	-10	00	49.8			17.5	1 095
658			1978	09	05.85157	22	15	15.03	-11	31	01.0	0.1+	0		1 095
526			1978	09	05.91163	23	06	53.53	-07	11	02.6	0.1-	1-		1 095
1978	QF1		1978	09	05.91163	23	08	11.03	-01	17	10.2			17.2	1 095
1978	RF4	*	1978	09	05.91163	23	09	37.69	+00	57	43.1			16.8	1 095
1978	RG4	*	1978	09	05.91163	23	10	33.41	-04	48	55.4			17.5	095
1978	QH1		1978	09	05.91163	23	10	57.56	-02	24	01.9			17.0	095
1978	RH4	*	1978	09	05.91163	23	11	54.88	-01	08	40.0			17.0	095
1978	QK1		1978	09	05.91163	23	12	47.56	-05	26	33.9			16.0	095
1938			1978	09	05.91163	23	13	35.78	-04	19	07.9	0.0	0		095
1978	QL1		1978	09	05.91163	23	13	37.13	-03	30	08.4			17.2	095
1978	RJ4	*	1978	09	05.91163	23	14	20.56	-06	55	12.2			17.0	1 095
1978	QN1		1978	09	05.91163	23	16	00.66	+00	48	32.2			17.0	095
1978	QO1		1978	09	05.91163	23	16	23.75	-04	30	04.5			17.0	095
1978	RK4	*	1978	09	05.91163	23	16	39.22	-06	06	53.6			17.5	095

1678		1978 09 05.91163	23 17 03.91	-06 03 20.6	0.1+	1+			095
1978 QP1		1978 09 05.91163	23 18 10.50	-07 35 03.3			16.5	1	095
1978 QR1		1978 09 05.91163	23 18 35.50	-01 18 18.2			16.8		095
1692		1978 09 05.91163	23 20 18.28	-01 53 50.3	0.1+	0			095
1978 QU1		1978 09 05.91163	23 20 54.47	-05 00 08.0			16.5		095
1978 QT1		1978 09 05.91163	23 21 15.66	-02 29 41.2			16.5		095
1978 QW1		1978 09 05.91163	23 21 16.66	-02 20 39.6			17.0		095
1978 QV1		1978 09 05.91163	23 21 47.53	-00 36 47.5			17.5		095
1978 QX1		1978 09 05.91163	23 22 43.25	-02 40 06.5			16.5		095
1978 QY1		1978 09 05.91163	23 22 51.22	-03 48 02.7			17.5		095
1978 QZ1		1978 09 05.91163	23 22 56.75	-01 05 03.8			17.0		095
1045		1978 09 05.91163	23 23 42.25	-03 25 03.6	0.2+	1+			095
1978 QB2		1978 09 05.91163	23 24 16.50	-06 38 56.4			16.0	1	095
1978 QC2		1978 09 05.91163	23 24 17.63	-07 52 09.4			16.8	1	095
1978 QA2		1978 09 05.91163	23 24 21.44	-00 34 11.8			16.8		095
1978 QE2		1978 09 05.91163	23 24 40.06	-06 27 03.2			16.8		095
1978 RL4 *		1978 09 05.91163	23 25 36.13	-05 22 17.4			17.2		095
1978 RM4 *		1978 09 05.91163	23 25 37.12	+00 32 42.0			17.2		095
1978 QG2		1978 09 05.91163	23 25 41.47	-00 44 33.2			16.8		095
215		1978 09 05.91163	23 26 53.38	-05 22 07.7	0.1+	0			095
1978 QH2		1978 09 05.91163	23 27 04.84	-08 03 35.0			16.5	1	095
1978 QJ2		1978 09 05.91163	23 27 21.47	-04 45 24.7			16.5		095
1978 QM2		1978 09 05.91163	23 27 24.41	+01 17 24.3			16.8	1	095
107		1978 09 05.91163	23 27 42.03	-02 12 11.8	0.0	0			095
142		1978 09 05.91163	23 27 46.28	-00 06 25.6	0.1+	1+			095
1978 QK2		1978 09 05.91163	23 28 15.06	+00 26 58.0			16.8		095
1978 QL2		1978 09 05.91163	23 28 20.25	-04 21 15.6			16.8		095
1978 QN2		1978 09 05.91163	23 28 36.72	-02 48 40.9			16.8		095
1978 QO2		1978 09 05.91163	23 29 05.84	-05 01 57.0			16.8		095
1978 QP2		1978 09 05.91163	23 29 07.03	-00 37 05.0			17.0		095
1533		1978 09 05.91163	23 29 36.44	-06 38 41.7	0.1+	0			095
1978 QQ2		1978 09 05.91163	23 29 53.66	-02 12 40.2			16.8		095
82		1978 09 05.91163	23 31 51.22	-05 43 18.3	0.2+	1+			095
892		1978 09 05.91163	23 32 33.13	+00 12 15.9	0.1+	1+			095
1978 QS2		1978 09 05.91163	23 32 41.03	-00 24 53.1			17.0		095
1978 RN4 *		1978 09 05.91163	23 33 21.16	-06 57 33.2			17.5	1	095
765		1978 09 05.91163	23 34 17.06	+01 48 55.4	0.0	1+		1	095
1978 QV2		1978 09 05.91163	23 34 26.60	-05 00 55.4			17.0		095
1978 QU2		1978 09 05.91163	23 34 49.06	-06 27 02.8			17.2		095
2322		1978 09 05.91163	23 35 33.06	-00 35 32.0			16.2		095
1978 QW2		1978 09 05.91163	23 35 43.66	-03 29 26.2			16.2		095
2092		1978 09 05.91163	23 36 07.62	-07 45 19.8			17.0	1	095
1978 QX2		1978 09 05.91163	23 36 17.75	-03 32 54.6			17.0		095
1978 RO4 *		1978 09 05.91163	23 37 27.50	-00 08 22.1			17.5		095
1978 QA3		1978 09 05.91163	23 42 20.72	-04 16 54.2			17.2	1	095
1978 RA2		1978 09 05.97240	00 20 10.74	+00 28 19.6			17.5		095
1978 RU		1978 09 05.97240	00 25 52.50	+00 31 04.0			17.5		095
424		1978 09 07.89156	22 27 34.53	-21 07 43.7	0.0	1-		1	095
1978 RP4 *		1978 09 07.89156	22 38 05.78	-24 47 56.2			16.5		095
1801		1978 09 07.89156	22 51 42.88	-24 30 01.4	0.1+	0			095
961		1978 09 07.89156	22 56 11.66	-21 20 09.2	0.0	1-			095
1978 RQ4 *		1978 09 07.89156	23 00 03.19	-28 46 38.9			16.5	1	095
963		1978 09 07.89156	23 02 25.94	-21 54 47.4	0.0	1-			095
247		1978 09 07.89156	23 03 27.72	-21 53 18.8	0.1-	2-			095
1978 RM		1978 09 07.95475	00 16 07.97	+01 10 04.0			17.5		095
1978 RQ1		1978 09 07.95475	00 20 08.17	+02 23 16.1			17.5		095
1978 RW1		1978 09 07.95475	00 36 08.73	+02 19 28.2			17.5		095
1978 SX1 *		1978 09 26.82964	22 10 15.44	-02 26 15.8			17.5	3	095
1978 SY1 *		1978 09 26.82964	22 14 02.19	-02 41 27.1			16.8	1	095

1978	SZ1	*	1978	09	26.82964	22	17	33.13	+00	18	29.4			16.2	095
1978	SA2	*	1978	09	26.82964	22	17	42.81	-05	07	57.2			17.5	095
1978	SB2	*	1978	09	26.82964	22	17	45.16	-01	55	30.2			16.2	095
583			1978	09	26.82964	22	19	18.47	+01	19	49.1	0.1-	0		1 095
1978	PG4		1978	09	26.82964	22	20	43.47	+00	40	09.8			16.5	1 095
1978	SC2	*	1978	09	26.82964	22	22	10.53	-02	21	39.0			16.5	095
1978	SD2	*	1978	09	26.82964	22	22	44.53	-05	22	41.7			16.0	095
1360			1978	09	26.82964	22	23	04.69	+01	31	49.9	0.2-	0		1 095
1978	SE2	*	1978	09	26.82964	22	24	02.28	-02	26	27.0			15.0	095
1254			1978	09	26.82964	22	24	24.06	-00	59	51.4	0.2-	0		095
1978	SF2	*	1978	09	26.82964	22	25	16.10	-02	02	38.3			16.5	095
2108			1978	09	26.82964	22	25	19.19	-03	23	42.2				095
1978	SG2	*	1978	09	26.82964	22	26	52.72	+00	43	52.2			17.0	1 095
605			1978	09	26.82964	22	29	54.53	-07	12	04.6	0.2-	3-		1 095
1978	PF3		1978	09	26.82964	22	30	54.97	-07	13	09.0			15.5	1 095
342			1978	09	26.82964	22	33	15.41	+01	55	45.1	0.6-	2-		1 095
1775			1978	09	26.82964	22	34	44.38	+01	05	50.2	0.2-	1-		1 095
1978	PS3		1978	09	26.82964	22	35	00.81	-03	48	42.3			16.0	095
1978	SH2	*	1978	09	26.82964	22	37	04.88	-00	14	16.8			16.5	4 095
1978	SJ2	*	1978	09	26.82964	22	37	23.44	-02	42	28.3			16.0	095
1978	SK2	*	1978	09	26.82964	22	38	23.44	-00	38	51.2			16.0	095
1978	SL2	*	1978	09	26.82964	22	39	41.72	-05	52	29.0			16.5	2 095
1978	PO4		1978	09	26.82964	22	40	38.81	-04	22	57.7			16.2	095
1978	SM2	*	1978	09	26.82964	22	41	32.66	+00	41	21.2			17.5	3 095
1978	SN2	*	1978	09	26.82964	22	43	38.12	-03	43	05.2			17.5	3 095
1979	UJ		1978	09	26.82964	22	44	41.91	+00	19	49.0			16.5	1 095
19			1978	09	26.82964	22	45	08.63	-05	55	35.1	0.2+	1+		1 095
1281			1978	09	26.82964	22	45	16.56	+00	41	28.2	0.1-	0		1 095
1978	SO2	*	1978	09	26.89144	23	12	56.44	+03	41	56.4			17.5	1 095
930			1978	09	26.89144	23	14	51.16	+03	44	13.3	0.3+	4+		1 095
107			1978	09	26.89144	23	14	51.44	-04	21	09.6	0.1-	1-		1 095
1978	QK2		1978	09	26.89144	23	15	17.34	-02	40	48.5			17.5	1 095
765			1978	09	26.89144	23	15	19.97	+01	27	21.0	0.3-	1-		1 095
2322			1978	09	26.89144	23	17	13.22	-03	03	11.9			16.0	1 095
1978	QW2		1978	09	26.89144	23	17	50.28	-04	39	20.6			16.0	1 095
892			1978	09	26.89144	23	19	26.60	-03	05	51.6	0.1-	1-		095
1978	SP2	*	1978	09	26.89144	23	21	05.97	+02	28	55.1			17.2	095
1978	SQ2	*	1978	09	26.89144	23	21	29.10	+01	03	54.0			16.2	095
1978	SR2	*	1978	09	26.89144	23	24	02.90	-01	54	46.8			16.8	095
929			1978	09	26.89144	23	24	31.38	+02	16	27.6	0.2-	1-		095
1978	SS2	*	1978	09	26.89144	23	24	59.25	+01	50	35.3			16.8	095
1978	ST2	*	1978	09	26.89144	23	25	13.28	+01	25	06.6			17.2	095
1978	SU2	*	1978	09	26.89144	23	26	30.60	-00	42	29.7			17.2	095
1978	SV2	*	1978	09	26.89144	23	26	40.34	+01	14	15.0			16.2	095
1978	SW2	*	1978	09	26.89144	23	27	59.78	-04	26	52.8			16.2	1 095
1978	QB3		1978	09	26.89144	23	28	21.16	-02	16	56.4			16.2	095
1978	SX2	*	1978	09	26.89144	23	29	53.03	-00	09	35.1			16.8	2 095
1978	SY2	*	1978	09	26.89144	23	30	03.32	+04	05	39.1			16.0	1 095
48			1978	09	26.89144	23	31	18.19	-01	44	36.9	0.2-	2-		095
1377			1978	09	26.89144	23	31	51.16	+04	46	43.8	0.1-	0-		1 095
1037			1978	09	26.89144	23	32	26.72	+02	07	59.6			16.0	095
1859			1978	09	26.89144	23	32	28.94	-00	11	27.4	0.1-	0		095
1978	SZ2	*	1978	09	26.89144	23	33	43.56	-00	37	12.3			17.0	095
224			1978	09	26.89144	23	33	57.10	-02	04	12.2	0.2-	1-		095
1978	SA3	*	1978	09	26.89144	23	34	32.50	-00	49	14.3			16.5	095
1978	SB3	*	1978	09	26.89144	23	35	48.50	+02	01	47.6			16.0	095
1978	SC3	*	1978	09	26.89144	23	36	15.56	-01	43	01.0			17.5	095
1978	SD3	*	1978	09	26.89144	23	36	54.50	-00	02	26.9			17.0	095
1978	SE3	*	1978	09	26.89144	23	39	11.54	+00	48	09.4			17.0	095

436		1978	09	26.89144	23	39	22.63	+01	34	54.3	0.1-	1-			095
1978	SF3 *	1978	09	26.89144	23	39	31.66	-04	22	55.4			17.2	1	095
1978	SG3 *	1978	09	26.89144	23	39	37.81	-02	04	52.0			17.5	2	095
2139		1978	09	26.89144	23	39	46.50	+02	19	20.5			15.5		095
1978	SH3 *	1978	09	26.89144	23	41	11.28	+03	04	16.0			16.8		095
1978	SJ3 *	1978	09	26.89144	23	42	24.84	-02	47	20.2			16.0		095
29		1978	09	26.89144	23	43	20.06	-01	16	56.0	0.1-	1-			095
1984		1978	09	26.89144	23	44	31.69	-00	40	02.8					095
1978	SK3 *	1978	09	26.89144	23	44	54.88	-01	49	06.2			17.5		095
1274		1978	09	26.89144	23	46	27.25	+02	59	39.6	0.0	0			095
1978	RF	1978	09	26.89144	23	50	12.82	+01	37	29.2			16.5	1	095
1978	RG1	1978	09	26.89144	23	51	00.10	-02	48	47.4			17.0	1	095
2297		1978	09	26.89144	23	51	41.69	-02	27	34.6			17.0	1	095
1978	PO4	1978	09	27.81944	22	40	03.53	-04	32	41.1			17.0	1	095
1962		1978	09	27.81944	22	40	39.50	-09	40	54.6	0.0	0		3	095
1978	PQ3	1978	09	27.81944	22	42	50.47	-08	37	11.4			17.0	1	095
19		1978	09	27.81944	22	44	30.75	-06	00	39.6	0.1+	0		1	095
1978	SL3 *	1978	09	27.81944	22	45	20.34	-09	06	42.2			17.0		095
1978	RY3	1978	09	27.81944	22	47	10.67	-10	51	03.7			17.0	3	095
1376		1978	09	27.81944	22	48	13.19	-09	01	40.2	0.1-	1+			095
1978	SM3 *	1978	09	27.81944	22	48	59.72	-07	44	58.8			16.5		095
1978	SN3 *	1978	09	27.81944	22	51	08.66	-04	21	48.0			17.5	2	095
1978	SO3 *	1978	09	27.81944	22	51	24.44	-10	44	33.8			16.8	1	095
526		1978	09	27.81944	22	51	57.22	-08	50	29.8	0.0	0			095
1978	QH1	1978	09	27.81944	22	52	22.88	-05	01	26.8			16.8		095
1978	QF1	1978	09	27.81944	22	52	53.91	-04	39	15.3			17.2		095
1938		1978	09	27.81944	22	54	22.34	-06	58	43.4	0.1-	1-			095
1978	SP3 *	1978	09	27.81944	22	54	47.97	-09	34	13.8			16.5		095
1978	SQ3 *	1978	09	27.81944	22	55	08.69	-04	07	58.4			16.2	4	095
1978	SR3 *	1978	09	27.81944	22	56	33.00	-07	30	45.1			17.2		095
1978	QR1	1978	09	27.81944	22	57	38.06	-03	00	56.0			16.8	1	095
802		1978	09	27.81944	22	57	54.63	-09	18	08.1	0.1-	0	16.5		095
1978	QK1	1978	09	27.81944	22	58	00.66	-10	09	41.3			16.0	2	095
1978	SS3 *	1978	09	27.81944	22	59	19.63	-03	30	40.9			17.0	2	095
1978	ST3 *	1978	09	27.81944	22	59	28.19	-11	42	34.4			16.5	1	095
1678		1978	09	27.81944	23	00	09.16	-06	53	12.8	0.0	1+			095
1978	QU1	1978	09	27.81944	23	01	09.41	-05	47	54.9			16.5		095
1978	SU3 *	1978	09	27.81944	23	02	39.41	-02	51	46.3			16.8	1	095
1978	QP1	1978	09	27.81944	23	03	03.03	-09	19	53.5			16.5		095
1045		1978	09	27.81944	23	03	49.60	-05	30	39.8	0.0	0			095
1978	SV3 *	1978	09	27.81944	23	03	51.75	-11	06	13.0			16.0	1	095
1692		1978	09	27.81944	23	04	08.31	-04	02	46.2	0.1-	1-			095
1978	QT1	1978	09	27.81944	23	04	37.22	-04	16	11.6			16.5		095
1978	SW3 *	1978	09	27.81944	23	04	42.78	-09	36	48.3			17.0		095
1978	SX3 *	1978	09	27.81944	23	06	15.22	-06	30	15.2			17.0		095
1978	QG2	1978	09	27.81944	23	07	19.97	-03	46	44.0			17.0		095
1978	QE2	1978	09	27.81944	23	07	33.19	-07	18	52.9			16.8		095
142		1978	09	27.81944	23	08	16.10	-02	04	56.9	0.1-	0		1	095
1978	QX1	1978	09	27.81944	23	08	18.34	-05	41	16.4			16.5		095
1978	QC2	1978	09	27.81944	23	09	04.72	-11	08	43.4			16.5	3	095
215		1978	09	27.81944	23	09	23.00	-06	58	35.4	0.1-	0			095
1978	QB2	1978	09	27.81944	23	09	47.66	-09	35	28.6			16.0		095
1978	QA2	1978	09	27.81944	23	10	21.53	-03	36	17.5			17.0		095
1978	QQ2	1978	09	27.81944	23	10	33.56	-05	03	14.5			16.8		095
1978	QJ2	1978	09	27.81944	23	11	22.66	-06	18	10.0			16.5		095
1978	QN2	1978	09	27.81944	23	11	35.34	-04	26	45.9			16.8		095
1978	QL2	1978	09	27.81944	23	13	04.82	-06	17	36.9			16.8		095
1978	QO2	1978	09	27.81944	23	13	07.62	-06	41	39.2			17.0		095
82		1978	09	27.81944	23	14	10.06	-07	21	38.0	0.1+	0			095

107		1978 09	27.81944	23 14	19.56	-04 26	38.6	0.1-	0		095
1533		1978 09	27.81944	23 14	42.00	-09 15	31.8	0.0	0		095
1978	QK2	1978 09	27.81944	23 14	50.53	-02 48	31.4			17.0	3 095
2322		1978 09	27.81944	23 16	28.56	-03 09	28.4			16.5	1 095
1978	QV2	1978 09	27.81944	23 16	42.13	-05 56	17.6			17.0	1 095
1978	SY3 *	1978 09	27.81944	23 17	01.06	-05 57	51.4			16.2	5 095
425		1978 09	27.81944	23 17	03.97	-10 38	56.0	0.1-	0		1 095
1978	QW2	1978 09	27.81944	23 17	08.10	-04 41	51.2			16.2	1 095
892		1978 09	27.81944	23 18	53.66	-03 14	31.8	0.0	1-		1 095
2092		1978 09	27.81944	23 18	59.50	-09 26	12.5			17.0	3 095
1978	QU2	1978 09	27.81944	23 19	25.19	-08 20	15.8			17.2	095
1978	QX2	1978 09	27.81944	23 19	50.94	-04 35	47.7			17.0	2 095
36		1978 09	27.81944	23 20	52.41	-05 49	28.6	0.0	0		1 095
1978	SZ3 *	1978 09	28.81927	22 11	30.88	-10 26	28.6			17.0	3 095
1978	SA4 *	1978 09	28.81927	22 13	40.22	-09 36	41.8			17.5	1 095
1978	SB4 *	1978 09	28.81927	22 13	58.10	-13 32	26.1			17.2	095
1802		1978 09	28.81927	22 14	08.75	-12 21	31.6			17.0	095
1978	PP2	1978 09	28.81927	22 15	29.47	-11 20	44.2			17.0	095
1978	SC4 *	1978 09	28.81927	22 19	29.13	-13 51	30.3			17.2	095
1978	SD4 *	1978 09	28.81927	22 19	40.38	-12 48	34.2			17.2	095
1978	PT2	1978 09	28.81927	22 20	08.60	-09 04	50.0			17.0	095
1978	SE4 *	1978 09	28.81927	22 20	23.10	-13 22	30.2			17.0	095
1978	SF4 *	1978 09	28.81927	22 21	14.32	-09 49	59.8			17.2	2 095
1978	PQ2	1978 09	28.81927	22 23	06.38	-08 26	29.0			16.5	095
1978	PB3	1978 09	28.81927	22 26	16.69	-08 41	23.6			17.5	095
1978	PU2	1978 09	28.81927	22 26	25.03	-15 42	29.7			16.8	3 095
1358		1978 09	28.81927	22 27	53.94	-11 53	14.5	0.0	1+		095
605		1978 09	28.81927	22 28	21.97	-07 05	16.6	0.2-	2-		1 095
1742		1978 09	28.81927	22 28	48.13	-10 31	51.5	0.0	1-		095
1953		1978 09	28.81927	22 30	08.50	-13 20	39.8	0.1-	0		095
1978	PF3	1978 09	28.81927	22 30	09.88	-07 14	33.8			15.5	1 095
272		1978 09	28.81927	22 30	34.38	-14 59	18.0	0.0	0		1 095
1808		1978 09	28.81927	22 32	16.56	-10 44	05.0	0.0	1-		095
1824		1978 09	28.81927	22 33	02.03	-10 37	36.2	0.1-	1-		095
1978	PH3	1978 09	28.81927	22 33	51.60	-08 31	12.3			17.2	095
824		1978 09	28.81927	22 34	10.03	-14 36	04.2	0.2-	1-		095
1978	SG4 *	1978 09	28.81927	22 34	26.76	-14 24	57.2			17.0	2 095
1978	PO3	1978 09	28.81927	22 34	28.38	-10 02	17.2			17.0	095
1978	RP3	1978 09	28.81927	22 35	34.90	-08 06	51.8			17.2	095
1978	SH4 *	1978 09	28.81927	22 36	32.31	-15 36	40.8			16.8	1 095
1962		1978 09	28.81927	22 40	07.22	-09 43	09.9	0.0	0		095
1978	PP3	1978 09	28.81927	22 40	32.47	-11 40	33.8			17.0	095
1978	SJ4 *	1978 09	28.81927	22 40	42.31	-10 08	24.5			17.5	2 095
1978	SK4 *	1978 09	28.81927	22 42	13.75	-10 53	20.0			17.2	095
1978	PQ3	1978 09	28.81927	22 42	20.66	-08 42	47.1			16.5	095
1978	PM3	1978 09	28.81927	22 42	56.47	-14 35	34.2			16.8	095
1978	SL4 *	1978 09	28.81927	22 43	47.53	-15 17	27.3			16.5	1 095
19		1978 09	28.81927	22 43	53.88	-06 05	38.0	0.2+	0		1 095
273		1978 09	28.81927	22 43	57.38	-15 14	08.8	0.2-	1-		1 095
1978	RY3	1978 09	28.81927	22 46	36.97	-10 57	41.8			17.2	1 095
1376		1978 09	28.81927	22 47	51.91	-09 06	58.3	0.2-	0		1 095
1978	RO	1978 09	28.87310	00 02	03.22	+00 44	00.4			17.0	095
1176		1978 10	02.78667	22 01	27.72	-01 54	46.8				1 095
1277		1978 10	02.78667	22 04	11.03	+00 14	36.9				1 095
1978	SY1	1978 10	02.78667	22 10	34.19	-03 07	53.6			16.5	095
1978	SZ1	1978 10	02.78667	22 14	36.44	-00 18	04.8			16.2	095
1978	SB2	1978 10	02.78667	22 15	54.54	-02 13	15.0			16.5	095
583		1978 10	02.78667	22 16	28.28	+00 52	29.8	0.1-	1-		095
1360		1978 10	02.78667	22 18	29.44	+01 39	50.4				1 095

1978	PG4	1978	10	02.78667	22	19	05.66	+00	33	11.3			16.5	095
1978	TW *	1978	10	02.78667	22	19	13.69	+02	03	36.1			16.0	1 095
1978	SC2	1978	10	02.78667	22	20	03.22	-02	28	37.4			16.8	095
1978	TX *	1978	10	02.78667	22	20	07.19	-05	21	49.7			17.0	095
1978	TY *	1978	10	02.78667	22	20	30.31	-04	56	48.6			16.5	095
2108		1978	10	02.78667	22	21	23.69	-03	28	37.6				095
1254		1978	10	02.78667	22	21	25.50	-01	21	22.9	0.3-	0		095
1978	SE2	1978	10	02.78667	22	23	10.28	-02	16	28.0			15.5	095
1978	SF2	1978	10	02.78667	22	23	10.94	-02	41	04.7			16.5	095
605		1978	10	02.78667	22	25	34.25	-06	51	06.2	0.3-	3-		1 095
1978	PF3	1978	10	02.78667	22	29	01.28	-07	15	56.2			15.5	1 095
342		1978	10	02.78667	22	29	46.06	+01	14	19.4	0.7-	4-		1 095
1978	PS3	1978	10	02.78667	22	30	47.44	-03	51	28.0			16.0	095
1775		1978	10	02.78667	22	32	27.38	+00	02	18.4	0.3-	2-		095
1978	SJ2	1978	10	02.78667	22	33	37.94	-02	55	27.2			16.2	095
1978	SK2	1978	10	02.78667	22	34	43.94	-00	55	09.9			16.0	095
1978	PO4	1978	10	02.78667	22	37	24.10	-05	19	49.0			16.2	3 095
1978	TZ *	1978	10	02.78667	22	41	20.60	-05	08	41.4			17.0	1 095
19		1978	10	02.78667	22	41	42.78	-06	24	01.1	0.2+	1+		1 095
1978	SO2	1978	10	02.84638	23	08	19.34	+03	32	28.0			17.0	1 095
1940		1978	10	02.84638	23	08	43.84	+04	51	12.8	0.2-	1-		1 095
930		1978	10	02.84638	23	08	52.38	+03	52	37.2	0.1+	4+		1 095
765		1978	10	02.84638	23	10	33.66	+01	18	06.4	0.4-	2-		1 095
2322		1978	10	02.84638	23	12	43.38	-03	41	44.4			16.0	1 095
1978	TA1 *	1978	10	02.84638	23	15	38.88	+05	28	39.8			17.5	1 095
1978	SQ2	1978	10	02.84638	23	15	41.28	+01	01	53.1			16.5	095
892		1978	10	02.84638	23	16	03.88	-04	00	12.4	0.1-	1-		1 095
1978	SP2	1978	10	02.84638	23	17	19.10	+01	19	31.4			17.2	095
1978	SR2	1978	10	02.84638	23	19	12.75	-02	23	24.5			17.0	095
1978	TB1 *	1978	10	02.84638	23	19	43.19	+05	27	25.8			17.0	3 095
929		1978	10	02.84638	23	19	43.60	+01	31	28.4	0.3-	2-		095
1136		1978	10	02.84638	23	19	55.06	+05	08	52.6	0.1-	2-		1 095
1978	SS2	1978	10	02.84638	23	21	21.22	+01	07	23.0			17.0	095
1978	SV2	1978	10	02.84638	23	21	27.75	+00	30	18.8			16.5	095
1978	SU2	1978	10	02.84638	23	21	52.97	-00	52	05.6			17.5	095
1978	QB3	1978	10	02.84638	23	23	36.03	-02	23	22.6			16.2	095
1978	SY2	1978	10	02.84638	23	24	13.47	+03	43	20.8			16.0	095
1978	SX2	1978	10	02.84638	23	24	36.22	-00	07	44.1			16.8	095
1377		1978	10	02.84638	23	26	55.11	+03	56	14.0	0.2-	1-		2 095
48		1978	10	02.84638	23	27	28.34	-02	21	37.0	0.2-	2-		095
1249		1978	10	02.84638	23	27	33.88	+05	32	09.8	0.2-	1-		1 095
1859		1978	10	02.84638	23	28	14.41	-00	29	15.4	0.2-	0		095
1037		1978	10	02.84638	23	28	50.69	+01	04	57.4			16.0	095
224		1978	10	02.84638	23	28	59.31	-02	22	10.0	0.3-	2-		095
1978	SZ2	1978	10	02.84638	23	30	01.40	-01	02	51.5			17.0	095
1978	TC1 *	1978	10	02.84638	23	30	30.28	+04	44	29.0			16.5	1 095
1978	SA3	1978	10	02.84638	23	30	48.22	-01	07	16.6			16.5	095
1978	SB3	1978	10	02.84638	23	31	01.75	+01	46	41.2			16.5	095
1978	SD3	1978	10	02.84638	23	31	38.28	-00	14	35.4			17.0	095
1978	TD1 *	1978	10	02.84638	23	32	23.06	+05	17	17.4			17.5	1 095
1978	TE1 *	1978	10	02.84638	23	32	46.10	+04	24	01.4			17.5	1 095
436		1978	10	02.84638	23	34	08.13	+01	34	01.6	0.3-	2-		095
1978	SE3	1978	10	02.84638	23	34	36.19	+00	06	20.8			17.0	095
1978	TF1 *	1978	10	02.84638	23	34	39.28	+04	16	24.2			16.8	095
2139		1978	10	02.84638	23	35	19.47	+01	43	47.2			15.5	095
1978	TG1 *	1978	10	02.84638	23	35	20.47	+05	10	09.3			17.5	1 095
1978	TH1 *	1978	10	02.84638	23	36	36.60	+02	46	11.4			17.5	095
1978	SH3	1978	10	02.84638	23	36	56.00	+02	12	13.6			16.5	095
29		1978	10	02.84638	23	37	57.34	-01	34	01.9	0.1-	1-		095

1978	SJ3	1978	10	02.84638	23	38	30.56	-03	56	59.2			16.5	1	095
1978	TJ1 *	1978	10	02.84638	23	39	34.00	+03	31	53.4			17.5		095
1978	TK1 *	1978	10	02.84638	23	40	15.90	-03	00	59.3			17.0	2	095
1978	TL1 *	1978	10	02.84638	23	40	19.91	+03	53	21.3			17.5		095
1984		1978	10	02.84638	23	40	28.50	-01	17	24.1					095
1274		1978	10	02.84638	23	40	39.66	+02	29	30.8	0.2-	0			095
1978	TM1 *	1978	10	02.84638	23	42	07.00	-01	46	22.6			17.5		095
1978	RF	1978	10	02.84638	23	45	11.06	+01	17	51.1			16.5	1	095
1978	TN1 *	1978	10	02.84638	23	45	36.82	-03	43	38.2			17.5	3	095
2297		1978	10	02.84638	23	47	34.10	-02	55	32.3			17.0	1	095
1978	TO1 *	1978	10	02.84638	23	47	52.54	-01	43	36.6			17.0	1	095
1415		1978	10	02.84638	23	48	02.91	+02	14	13.4	0.2-	0		1	095
1978	TP1 *	1978	10	03.83287	23	03	42.44	-16	19	15.4			17.0		095
858		1978	10	03.83287	23	05	14.50	-19	36	26.1	0.2-	2-			095
1602		1978	10	03.83287	23	07	39.88	-12	49	24.8	0.3-	2-		1	095
2243		1978	10	03.83287	23	08	44.06	-11	55	19.0			15.8	1	095
1978	TQ1 *	1978	10	03.83287	23	10	55.38	-14	02	02.0			16.5	4	095
1978	TR1 *	1978	10	03.83287	23	18	32.12	-21	09	07.4			16.5	1	095
2008		1978	10	03.83287	23	20	30.13	-17	08	02.3			16.0		095
2149		1978	10	03.83287	23	23	35.94	-16	36	51.9			16.0		095
722		1978	10	03.83287	23	25	25.88	-12	29	12.0	0.4-	3-		1	095
1978	TS1 *	1978	10	03.83287	23	32	24.40	-21	42	02.0			16.0	1	095
307		1978	10	03.83287	23	37	53.60	-12	25	42.4	0.3-	4-		1	095
1978	RN	1978	10	04.82705	23	59	25.69	-02	27	07.3			17.5		095
1978	RM2	1978	10	04.82705	00	12	09.12	+01	58	31.0			17.8		095
765		1978	10	05.80742	23	08	29.56	+01	13	57.8	0.4-	1-		1	095
107		1978	10	05.80742	23	10	05.03	-05	11	21.3	0.2-	1-		1	095
2322		1978	10	05.80742	23	10	45.40	-03	59	14.4			16.2	1	095
36		1978	10	05.80742	23	11	47.44	-04	54	44.2	0.2-	1-		1	095
1978	QW2	1978	10	05.80742	23	11	52.41	-04	58	52.4			16.2	1	095
892		1978	10	05.80742	23	14	31.50	-04	26	08.3	0.2-	1-			095
929		1978	10	05.80742	23	17	36.31	+01	10	05.8	0.3-	1-			095
1978	SV2	1978	10	05.80742	23	19	05.34	+00	09	18.2			16.8		095
1978	SW2	1978	10	05.80742	23	19	19.75	-04	39	51.0			16.0		095
1978	QB3	1978	10	05.80742	23	21	31.56	-02	25	20.2			16.0		095
1978	SY2	1978	10	05.80742	23	21	34.03	+03	32	14.3			16.0	1	095
1978	SX2	1978	10	05.80742	23	22	08.03	-00	06	27.5			16.5		095
48		1978	10	05.80742	23	25	42.03	-02	39	09.6	0.3-	1-			095
1859		1978	10	05.80742	23	26	15.91	-00	37	34.8	0.1-	1-			095
224		1978	10	05.80742	23	26	42.44	-02	30	09.6	0.4-	2-			095
1037		1978	10	05.80742	23	27	19.56	+00	34	48.7			16.0		095
1978	SB3	1978	10	05.80742	23	28	54.13	+01	39	36.8			16.2		095
1978	SA3	1978	10	05.80742	23	29	04.10	-01	15	40.8			16.2		095
1978	SD3	1978	10	05.80742	23	29	20.81	-00	19	37.3			16.8		095
436		1978	10	05.80742	23	31	39.91	+01	33	45.4	0.2-	1-			095
1978	SE3	1978	10	05.80742	23	32	31.97	-00	13	24.4			16.8		095
2139		1978	10	05.80742	23	33	21.06	+01	26	56.0			15.5		095
1978	SH3	1978	10	05.80742	23	35	03.38	+01	47	03.7			16.8		095
29		1978	10	05.80742	23	35	26.90	-01	41	42.2	0.2-	1-			095
1978	SJ3	1978	10	05.80742	23	36	47.38	-04	29	06.0			16.2		095
1274		1978	10	05.80742	23	37	57.56	+02	14	51.4	0.1-	1-			095
1984		1978	10	05.80742	23	38	35.66	-01	35	07.0					095
1978	RF	1978	10	05.80742	23	42	50.44	+01	08	27.9			16.5	1	095
1415		1978	10	05.80742	23	45	17.97	+01	59	04.9	0.1-	0		1	095
765		1978	10	08.85938	23	06	36.72	+01	10	14.8	0.1-	1-		1	095
107		1978	10	08.85938	23	08	39.16	-05	27	03.0	0.1-	1-		1	095
36		1978	10	08.85938	23	08	43.50	-04	32	04.0	0.1-	0		1	095
2322		1978	10	08.85938	23	08	57.19	-04	15	52.4			16.2	1	095
1978	QW2	1978	10	08.85938	23	10	18.12	-05	02	53.0			16.2	1	095

1978 SQ2	1978 10 08.85938	23 10 35.47	+01 01 00.7						16.5	1	095
892	1978 10 08.85938	23 13 03.28	-04 51 53.4	0.0	0					1	095
1978 SP2	1978 10 08.85938	23 14 07.69	+00 13 08.0						16.5		095
1978 TT1 *	1978 10 08.85938	23 14 30.22	+01 19 45.6						17.2		095
1978 SR2	1978 10 08.85938	23 14 55.34	-02 49 13.2						17.0		095
1978 TU1 *	1978 10 08.85938	23 14 55.97	+01 30 29.7						17.0		095
929	1978 10 08.85938	23 15 37.84	+00 49 02.4	0.1-	0						095
1978 SW2	1978 10 08.85938	23 16 43.91	-04 42 14.2						16.0		095
1978 SV2	1978 10 08.85938	23 16 49.47	-00 11 31.0						17.0		095
1978 SU2	1978 10 08.85938	23 17 37.47	-01 00 19.8						17.0		095
1136	1978 10 08.85938	23 18 04.69	+03 57 58.7	0.1-	2-					1	095
1978 SS2	1978 10 08.85938	23 18 09.34	+00 26 06.0						17.0		095
1978 SY2	1978 10 08.85938	23 19 02.34	+03 21 09.0						16.0	1	095
1978 QB3	1978 10 08.85938	23 19 37.72	-02 26 19.4						16.0		095
1978 SX2	1978 10 08.85938	23 19 43.38	-00 04 51.5						16.2		095
1377	1978 10 08.85938	23 22 33.19	+03 06 51.3	0.0	0					1	095
48	1978 10 08.85938	23 23 59.44	-02 56 29.5	0.2-	0						095
1859	1978 10 08.85938	23 24 20.41	-00 45 41.6	0.1-	0						095
224	1978 10 08.85938	23 24 30.81	-02 37 35.2	0.2-	1-						095
1978 TV1 *	1978 10 08.85938	23 24 35.38	-01 58 40.4						17.5		095
1037	1978 10 08.85938	23 25 59.25	+00 05 05.0						16.0		095
1978 SZ2	1978 10 08.85938	23 26 35.72	-01 27 06.9						17.0		095
1978 SB3	1978 10 08.85938	23 26 55.62	+01 32 55.6						16.0		095
1978 SD3	1978 10 08.85938	23 27 15.12	-00 23 48.6						17.0		095
1978 SA3	1978 10 08.85938	23 27 23.19	-01 23 48.6						16.2		095
1978 TF1	1978 10 08.85938	23 29 07.38	+04 00 34.6						16.8	1	095
436	1978 10 08.85938	23 29 14.44	+01 33 43.3	0.1-	1-						095
1978 SE3	1978 10 08.85938	23 30 34.88	-00 32 42.8						17.0	2	095
2139	1978 10 08.85938	23 31 31.25	+01 10 27.2						15.8		095
1978 TH1	1978 10 08.85938	23 32 07.53	+02 17 03.2						17.2		095
29	1978 10 08.85938	23 33 00.60	-01 48 50.8	0.0	0						095
1978 SH3	1978 10 08.85938	23 33 20.13	+01 22 05.6						17.0		095
1978 TW1 *	1978 10 08.85938	23 34 42.62	+01 06 45.0						17.5		095
1978 SJ3	1978 10 08.85938	23 35 12.60	-05 00 07.8						16.5	1	095
1274	1978 10 08.85938	23 35 20.16	+02 00 19.4	0.0	1-						095
1978 TK1	1978 10 08.85938	23 35 53.78	-03 43 14.5						17.2		095
1984	1978 10 08.85938	23 36 46.31	-01 52 32.1								095
1978 TM1	1978 10 08.85938	23 37 28.25	-02 29 08.6						17.5		095
1978 RF	1978 10 08.85938	23 40 35.16	+00 59 25.7						16.5		095
1978 TN1	1978 10 08.85938	23 41 09.44	-04 22 50.3						16.8	1	095
1415	1978 10 08.85938	23 42 36.75	+01 43 59.2	0.0	0					1	095
1978 TX1 *	1978 10 08.85938	23 42 48.47	-00 00 34.0						17.5	1	095
1978 TO1	1978 10 08.85938	23 43 34.63	-02 13 41.5						17.5	1	095
1978 TY1 *	1978 10 08.85938	23 43 34.66	-05 32 11.4						17.5	3	095
2297	1978 10 08.85938	23 43 41.40	-03 21 19.2						16.8	1	095
30	1978 10 08.85938	23 45 39.31	+02 04 50.6	0.0	0					1	095
1978 RQ1	1978 10 09.91619	23 56 10.97	-02 36 09.8						17.5		095

Note 1: near edge of plate. 2: measurement uncertain. 3 = 1 + 2. 4 = fast-moving object. 6 = 2 + 4.

OBSERVATIONS MADE AT GEISEI BY T. SEKI. IN PART FROM ORIENT. ASTRON. ASSOC. COMET BULL. NO. 210.

Object	Date	UT	R. A. (1950)	Decl.	Mag.	Obs.
/1980t	1981 01 06.38653		19 59 38.9	-05 26 24	4 T	372
/1980t	1981 01 12.39514		20 43 29.8	+00 49 18	5.5T	372
/1980u	1980 12 28.42500		18 48 15.08	+39 32 20.8		372
/1980u	1980 12 30.85625		18 49 29.65	+40 10 19.1	9.5T	372
/1980u	1980 12 30.87153		18 49 30.13	+40 10 30.4		372

/1980u	1981 01 11.86354	18 56 23.89	+44 04 09.4	9.5T	372
/1980u	1981 01 11.87222	18 56 24.10	+44 04 22.0		372
/1980u	1981 01 13.87222	18 57 39.87	+44 51 36.9	9.5T	372
/1980u	1981 01 13.87535	18 57 39.95	+44 51 42.3		372
1149	1981 01 02.76076	09 28 39.22	+02 01 07.1	14	372
1149	1981 01 02.77188	09 28 38.99	+02 01 06.0		372
1149	1981 01 03.71910	09 28 11.28	+01 58 25.2		372
1149	1981 01 03.73403	09 28 10.78	+01 58 23.7		372
1359	1981 01 08.43229	01 58 16.60	+08 39 34.6	16	372
1359	1981 01 08.45313	01 58 17.11	+08 39 43.8		372
2325	1980 12 30.67431	07 49 36.33	+19 36 12.9	16.5	372
2325	1980 12 30.68750	07 49 35.79	+19 36 14.8		372
1980 VA	1980 12 30.48229	02 47 41.89	+10 10 35.8	18	372
1980 VA	1980 12 30.49687	02 47 42.55	+10 10 40.7		372
1980 VB	1980 12 29.46059	01 53 01.20	+06 48 11.1	17	372
1980 VB	1980 12 29.47257	01 53 01.42	+06 48 16.1		372
1980 VB	1981 01 08.43229	01 58 10.33	+08 36 42.0	17	372
1980 VB	1981 01 08.45313	01 58 11.05	+08 36 55.5		372
1981 CA *	1981 02 09.74306	11 49 54.34	+18 26 13.4	16	372
1981 CA	1981 02 09.75764	11 49 54.01	+18 26 19.7		372
1981 CA	1981 02 11.72812	11 48 58.02	+18 39 58.2		372
1981 CA	1981 02 11.74062	11 48 57.74	+18 40 05.4		372
1981 CB *	1981 02 09.66736	11 17 57.1	+04 31 11	15.8	372
1981 CB	1981 02 09.68681	11 17 56.4	+04 31 26		372
1981 CB	1981 02 11.69444	11 16 58.62	+04 47 43.0		372
1981 CB	1981 02 11.71146	11 16 58.18	+04 47 53.6		372

OBSERVATION MADE AT HAMAMATSU BY M. WAKUTA.

Object	Date	UT	R. A. (1950)	Decl.	N	Obs.
/1980u	1981 01 03.8531		18 51 39.44	+41 19 15.9	1	379

Note 1: observatory code 379, Long. and Parallax 137.77, -351, -241 (see MPC 4766).

OBSERVATIONS MADE AT YATSUGATAKE OBSERVATORY BY A. TERUNAMA. MEASURED BY T. URATA. FROM NIHONDAIRA OBS. CIRC. NO. 1175.

Object	Date	UT	R. A. (1950)	Decl.	Mag.	Obs.
/1979k	1980 12 29.46398		06 14 37.62	+19 58 21.3		386
/1979k	1980 12 29.47998		06 14 36.82	+19 58 24.8		386
/1979k	1980 12 29.49144		06 14 36.23	+19 58 26.3		386
/1979k	1980 12 31.49722		06 12 58.44	+20 03 18.1		386
/1979k	1980 12 31.50856		06 12 57.84	+20 03 19.2		386
/1979k	1981 01 03.73854		06 10 22.47	+20 11 22.4		386
/1979k	1981 01 05.67778		06 08 52.56	+20 16 26.2		386
/1979k	1981 01 08.51777		06 06 46.67	+20 23 57.2		386
/1979k	1981 01 08.52951		06 06 46.12	+20 23 59.7		386
/1979k	1981 01 09.54057		06 06 02.98	+20 26 41.2		386
/1979k	1981 01 09.55174		06 06 02.44	+20 26 41.2		386
/1980b	1981 01 08.75903		12 32 16.98	-01 47 00.4	14 T	386
/1980b	1981 01 09.73194		12 32 34.30	-01 48 26.8	14 T	386
/1980b	1981 01 17.85278		12 34 35.51	-01 57 57.3	14 T	386
/1980g	1981 01 04.43275		05 33 45.86	+36 56 15.3		386
/1980g	1981 01 05.66615		05 34 09.49	+37 23 38.9		386
/1980g	1981 01 09.52824		05 35 48.79	+38 42 59.1	10 T	386
/1980i	1980 12 30.40949		23 55 24.43	-24 49 54.2	9 T	386
/1980i	1980 12 30.41719		23 55 25.32	-24 49 38.3		386
/1980i	1981 01 03.41574		00 03 22.4	-22 25 19	9 T	386
/1980i	1981 01 04.42031		00 05 24.35	-21 48 36.9	8.5T	386
/1980q	1981 01 08.81887		17 52 18.91	+22 20 38.3		386

/1980g	1981 01 17.83310	17 50 49.85	+21 36 32.8	386
/1980u	1980 12 30.85845	18 49 30.03	+40 10 17.7	386
/1980u	1980 12 30.86076	18 49 29.98	+40 10 20.3	386
/1980u	1981 01 03.85680	18 51 39.38	+41 19 17.0	386
/1980u	1981 01 08.83356	18 54 32.54	+42 57 20.1	386
/1980u	1981 01 17.81441	19 00 14.58	+46 32 23.0	386
/1980u	1981 01 17.81719	19 00 14.68	+46 32 27.8	386

OBSERVATIONS MADE AT THE JCPM HAMATONBETSU STATION BY T. TAKEISHI. FROM
HAMATONBETSU STA. REP. NO. 3.

Object	Date	UT	R. A. (1950)	Decl.	Mag.	Obs.
/1980g	1980 10 03.61319	04 38 13.34	+01 37 05.9	13 T	394	
/1980g	1980 10 03.64340	04 38 16.17	+01 37 18.5		394	
/1980g	1980 10 11.56389	04 49 47.61	+02 39 59.2	12 T	394	
/1980g	1980 10 11.57014	04 49 48.08	+02 40 00.2		394	
236	1979 08 23.63785	21 33 27.00	-05 22 29.1		394	
236	1979 08 23.65104	21 33 26.51	-05 22 32.6		394	
433	1979 08 20.57014	21 25 11.99	-05 30 02.5		394	
433	1979 08 20.58333	21 25 10.53	-05 30 00.2		394	
433	1979 08 23.60521	21 19 39.47	-05 28 45.6		394	
433	1979 08 23.62378	21 19 37.35	-05 28 44.3		394	
773	1980 10 01.50735	00 21 21.42	+24 06 06.7		394	
773	1980 10 01.53229	00 21 20.16	+24 06 08.2		394	
1332	1980 10 11.49306	01 00 44.37	+06 42 59.8		394	
1332	1980 10 11.51458	01 00 43.27	+06 42 55.0		394	
1579	1980 11 10.49063	02 44 09.67	+07 48 33.9		394	
1579	1980 11 10.51007	02 44 08.66	+07 48 23.2		394	
1590	1980 10 03.55972	00 20 27.75	+07 32 22.6		394	
1590	1980 10 03.56771	00 20 27.48	+07 32 20.1		394	
1689	1980 10 03.66458	01 59 38.59	-00 57 37.7		394	
1689	1980 10 03.68194	01 59 38.01	-00 57 43.2		394	
1700	1980 10 01.47465	00 20 57.56	+04 17 07.0		394	
1700	1980 10 01.49688	00 20 56.31	+04 17 06.9		394	
1700	1980 10 03.52708	00 19 04.88	+04 14 57.2		394	
1700	1980 10 03.54896	00 19 03.74	+04 14 53.4		394	
2052	1980 09 30.48923	00 01 55.60	+08 01 11.4		394	
2052	1980 09 30.50417	00 01 55.00	+08 01 03.5		394	

OBSERVATIONS MADE AT KAMBAH BY D. HERALD.

Object	Date	UT	R. A. (1950)	Decl.	Mag.	N	Obs.
/1980g	1980 12 03.55059	05 31 25.62	+20 53 58.7				415
/1980g	1980 12 09.56632	05 31 46.31	+24 14 37.7				415
/1980g	1980 12 09.57399	05 31 46.30	+24 14 51.4				415
/1980g	1980 12 11.53944	05 31 47.32	+25 20 35.4				415
/1980h	1980 12 09.58646	11 01 35.86	-31 22 49.2	7.5T			415
/1980h	1980 12 11.55035	11 05 20.09	-35 52 53.3				415
/1980h	1980 12 19.70997	11 22 48.49	-51 46 24.4				415
/1980h	1980 12 19.71118	11 22 48.63	-51 46 29.4				415
/1980h	1980 12 20.70979	11 25 13.59	-53 24 05.3	8.1T			415
/1980h	1980 12 30.48438	11 53 27.48	-66 12 47.2	8.1T			415
/1980h	1980 12 31.51267	11 57 01.42	-67 16 44.3				415
/1980h	1981 01 01.56545	12 00 49.51	-68 19 24.9	8.3T			415
/1980h	1981 01 02.58090	12 04 37.86	-69 17 21.3				415
/1980h	1981 01 13.55674	12 57 47.35	-77 26 01.5			1	415
/1980h	1981 01 14.53028	13 03 53.21	-77 58 56.5				415
/1980h	1981 01 16.49903	13 17 03.65	-79 01 13.3				415
/1980h	1981 01 17.51337	13 24 20.17	-79 31 05.5				415

Note 1: poor distribution of reference stars.

OBSERVATIONS MADE WITH THE 0.61-M REFLECTOR AT MOUNT JOHN UNIVERSITY OBSERVATORY BY A. C. GILMORE AND P. M. KILMARTIN.

Object	Date	UT	R. A. (1950)			Decl.	Mag.	N	Obs.
/1979k	1980 12	05.55068	06 31	34.37	+19 15	09.9		1 474	
/1979k	1980 12	05.57344	06 31	33.71	+19 15	11.4	15.2N	2 474	
/1980h	1980 12	05.59512	10 54	24.57	-21 36	22.4	12.2N	3 474	
/1980h	1980 12	05.59871	10 54	24.77	-21 36	54.8		474	
/1980h	1980 12	05.60565	10 54	25.57	-21 37	58.0		4 474	
/1980h	1981 01	08.61638	12 30	44.64	-74 14	22.6		4 474	
/1980h	1981 01	08.62222	12 30	46.32	-74 14	37.2		5 474	
/1980i	1980 12	05.47352	23 11	19.86	-38 25	42.2	15.0N	1 474	
/1980i	1980 12	05.48490	23 11	20.79	-38 25	22.7		1 474	
/1980l	1980 12	05.42032	22 02	47.43	-59 58	46.4		6 474	
/1980l	1980 12	05.44291	22 02	43.78	-59 58	30.2		6 474	
/1980l	1980 12	06.48553	22 00	48.80	-59 46	23.4		1 474	
/1980l	1980 12	06.50780	22 00	46.09	-59 46	09.7		474	
/1980t	1980 12	20.64133	16 31	56	-35	13.8		7 474	
/1980t	1980 12	23.62957	16 51	13	-33	19.9		8 474	
/1980t	1980 12	23.63970	16 51	19	-33	19.6		8 474	
1915	1981 01	09.54531	06 25	00.93	-42 34	19.9	18	474	
1915	1981 01	09.56927	06 25	00.95	-42 34	34.7		1 474	
2150	1980 12	29.58749	08 38	20.21	-27 32	58.6		1 474	
2150	1980 12	29.60971	08 38	19.42	-27 33	13.2	17.3	474	
2311	1980 12	09.43108	22 16	01.65	-11 52	19.9		9 474	
2311	1980 12	09.44780	22 16	02.64	-11 52	19.4		9 474	
2340	1980 12	29.46909	05 38	19.98	-11 06	45.3		1 474	
2340	1980 12	29.49304	05 38	09.56	-11 07	32.4	18.9	474	
2340	1980 12	31.43889	05 24	08.80	-12 06	31.3		1 474	
2340	1980 12	31.46424	05 23	57.23	-12 07	16.8		1 474	
1977 GA	1981 01	08.57124	11 46	53.05	-34 16	09.4		474	
1977 GA	1981 01	08.59375	11 46	53.27	-34 16	22.3	18	474	
1977 TJ3	1980 12	06.60142	07 44	12.87	-16 02	43.7	16.3	1 474	
1977 TJ3	1980 12	06.61977	07 44	12.52	-16 02	48.0		474	
1977 TJ3	1981 01	03.55671	07 31	58.07	-17 23	51.8		474	
1977 TJ3	1981 01	03.57801	07 31	57.34	-17 23	52.8	17	474	
1980 LB	1980 12	06.42841	21 21	25.30	-44 28	26.4		1 474	
1980 LB	1980 12	06.45127	21 21	28.46	-44 28	18.7	17.6	1 474	
1980 WF	1980 12	28.44861	06 12	26.64	-11 44	30.2		1 474	
1980 WF	1980 12	28.47431	06 12	34.38	-11 45	37.7	16.1	1 474	
1980 WF	1981 01	03.50394	06 42	44.12	-15 19	50.7		1 474	
1980 WF	1981 01	03.52998	06 42	50.77	-15 20	37.3		1 474	

Note 1: slightly trailed image. 2: broad fan-tail 20" long in p.a. 280 .

3: comet image damaged during development. 4: large, diffuse image.

5 = 1 + 4. 6: plate very dark, image trailed. 7: 0.12-m astrograph; narrow tail 20' long in p.a. 240 ; dark plate; large, diffuse image.

8: 0.12-m astrograph; narrow tail 8' long in p.a. 250 ; large, diffuse image; interference from twilight. 9: badly trailed images.

OBSERVATIONS MADE AT HEMINGFORD ABBOTS (CODE 489) BY A. YOUNG, AT WIMBORNE MINSTER (CODE 490) BY M. SWAN AND AT STAKENBRIDGE (CODE 494) BY B. MANNING. MEASURED BY MANNING. COMMUNICATED BY G. M. HURST.

Object	Date	UT	R. A. (1950)			Decl.	N	Obs.
/1979l	1980 02	10.8035	03 28	43.87	+12 10	29.9		3 489
/1979l	1980 02	10.8125	03 28	44.49	+12 10	48.2		3 489
/1979l	1980 02	10.8219	03 28	45.03	+12 11	26.1		3 489
/1979l	1980 02	10.8750	03 28	47.75	+12 14	41.9		1 490
/1980u	1980 12	27.25382	18 47	41.18	+39 15	04.3		1 489
/1980u	1980 12	27.81215	18 47	56.84	+39 23	12.5		1 490

/1980u 1980 12 31.8097 18 49 59.47 +40 25 59.0 494
 /1980u 1981 01 04.2493 18 51 52.54 +41 26 30.6 1 489
 Note 1: observatory code 489, Long. and Parallax 359.87, -261, -336; observa-
 tory code 490, Long. and Parallax 358.00, -270, -329 (see MPC 4766).
 2: two-star reduction. 3 = 1 + 2.

OBSERVATIONS MADE AT THE CENTRO ASTRONOMICO DE YEBES BY M. DE PASCUAL, J.
 GARCIA AND C. CABANAS.

Object	Date	UT	R. A. (1950)	Decl.	Obs.
/1980g	1980 12 02.03734		05 31 14.12	+20 04 03.9	491
/1980g	1980 12 02.13257		05 31 14.47	+20 07 11.3	491
/1980g	1980 12 03.01557		05 31 21.68	+20 36 04.1	491
/1980h	1980 12 02.10625		10 48 27.76	-12 39 42.3	491

OBSERVATIONS MADE AT GOTTINGEN BY W. LANDGRAF.

Object	Date	UT	R. A. (1950)	Decl.	Mag.	Obs.
1019	1980 06 06.04240		18 37 24.74	+23 46 25.0	15	528
1019	1980 06 06.05590		18 37 23.86	+23 46 24.4		528
1685	1980 07 25.02689		22 34 22.17	+27 32 51.4		528
1685	1980 07 25.03383		22 34 23.60	+27 33 44.0		528
1685	1980 07 25.05050		22 34 27.17	+27 35 56.2		528
1685	1980 07 25.05228		22 34 27.57	+27 36 11.0		528

OBSERVATIONS MADE AT THE OSSERVATORIO S. VITTORE.

Object	Date	UT	R. A. (1950)	Decl.	Mag.	Obs.
1980 XA	1981 01 07.84514		03 32 11.76	+26 53 07.1	17.1	552
1980 XA	1981 01 08.75069		03 32 06.40	+26 48 59.9	17.1	552
1980 XA	1981 01 08.77083		03 32 06.14	+26 48 53.8		552
1980 XA	1981 01 09.84306		03 32 01.21	+26 44 04.5	17.1	552
1980 XA	1981 01 09.87569		03 32 00.96	+26 43 58.1		552
1980 XA	1981 01 23.78125		03 33 37.75	+25 51 34.0	17.2	552
1980 XA	1981 01 26.78472		03 34 35.87	+25 42 45.3	17.2	552
1980 XA	1981 01 26.81528		03 34 36.55	+25 42 40.0		552
1980 XA	1981 01 30.78611		03 36 13.04	+25 32 22.8	17.3	552
1980 XA	1981 01 30.81667		03 36 13.76	+25 32 18.7		552
1980 XA	1981 01 31.75139		03 36 39.64	+25 30 07.4	17.3	552
1980 XA	1981 01 31.76875		03 36 40.09	+25 30 03.7		552
1980 XA	1981 01 31.78542		03 36 40.58	+25 30 01.7		552
1980 XA	1981 01 31.80347		03 36 40.99	+25 29 59.2		552
1980 XA	1981 02 06.76042		03 39 52.62	+25 17 51.4	17.3	552
1980 XA	1981 02 06.78681		03 39 53.67	+25 17 48.2		552

OBSERVATIONS MADE AT THE UNIVERSITY OF VICTORIA BY D. D. BALAM AND J. B.
 TATUM.

Object	Date	UT	R. A. (1950)	Decl.	Obs.
/1980g	1981 01 15.25625		05 39 15.8	+40 22 53.4	657
/1980g	1981 01 31.29756		05 55 31.74	+43 21 32.9	657
/1980u	1981 01 18.10833		19 00 25.52	+46 40 14.6	657
/1980u	1981 01 31.53073		19 10 06.84	+53 52 16.9	657
/1980u	1981 02 10.54792		19 18 18.90	+60 55 11.7	657

OBSERVATIONS MADE WITH THE 1.2-M SCHMIDT TELESCOPE AT PALOMAR.

Object	Date	UT	R. A. (1950)	Decl.	Mag.	N	Obs.
/1975 VII	1981 01 27.12502		01 03 55.98	+01 34 44.4	19.5T	1	675
/1980s	1981 01 26.20835		08 35 21.64	+32 52 14.2	17 T	1	675
/1980s	1981 02 01.35070		08 28 32.19	+32 22 09.4		2	675
1979 MP1	1978 03 15.30313		11 17 41.63	+04 48 03.3	19.5	7	675
1979 MP1	1978 03 15.35521		11 17 38.86	+04 48 22.4		7	675
1979 MP1	1978 03 16.33958		11 16 45.89	+04 54 33.9		7	675

1979 MP1	1978 03 16.39167	11 16 42.99	+04 54 54.0		7 675
1979 MR5	1978 03 15.30313	11 15 52.97	+01 22 21.3	19.5	7 675
1979 MR5	1978 03 16.33958	11 14 54.05	+01 28 38.9		7 675
1979 MR5	1978 03 16.39167	11 14 51.11	+01 28 57.5		7 675
1979 ME8	1978 03 15.30313	11 17 22.56	+01 37 55.6	17.5	7 675
1979 ME8	1978 03 16.33958	11 16 28.15	+01 46 41.8		7 675
1979 ME8	1978 03 16.39167	11 16 25.42	+01 47 07.6		7 675
1980 RB1	1980 10 31.12847	22 29 28.23	+12 21 35.7		3 675
1980 RB1	1980 11 02.10069	22 29 50.91	+12 29 45.4		3 675
1980 RB1	1980 11 29.11458	22 48 31.08	+14 40 40.0		3 675
1980 RB1	1980 11 29.13542	22 48 32.25	+14 40 47.7		3 675
1980 RB1	1980 12 01.11806	22 50 40.94	+14 52 25.8		3 675
1980 RB1	1980 12 01.13889	22 50 42.07	+14 52 33.1		3 675
1981 BA *	1981 01 26.20835	08 34 08.02	+32 52 42.0	18	1 675

Note 1: observer J. Gibson. 2: observer E. Helin. 3: observer C. Kowal.
4: scanned and measured by S. J. Bus. 7 = 3 + 4.

OBSERVATION MADE AT THE NORTHERN ARIZONA UNIVERSITY BY B. A. SKIFF. MEASURED BY E. BOWELL.

Object	Date	UT	R. A. (1950)	Decl.	N	Obs.
/1980u	1981 02 19.50399		19 26 42.33	+68 33 42.7	1	687

Note 1: observatory code 687, Long. and Parallax 248.35, -349, -244 (see MPC 4766).

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

Object	Date	UT	R. A. (1950)	Decl.	Mag.	N	Obs.
61	1981 01 01.29722		08 54 55.24	+32 35 15.3			688
61	1981 01 01.33125		08 54 53.55	+32 35 20.0			688
66	1981 01 10.27014		09 23 38.86	+19 45 55.8			688
66	1981 01 10.30694		09 23 37.20	+19 46 04.0			688
97	1981 01 03.33750		08 25 50.02	+04 24 01.9			688
97	1981 01 03.39861		08 25 47.35	+04 24 20.7			688
144	1980 12 30.22639		06 21 09.59	+26 05 00.0			688
144	1980 12 30.26042		06 21 07.27	+26 05 04.6			688
200	1981 01 10.27014		09 32 41.77	+17 33 37.5			688
200	1981 01 10.30694		09 32 40.23	+17 33 41.3			688
214	1981 01 10.27014		09 31 12.19	+17 49 16.8			688
214	1981 01 10.30694		09 31 10.77	+17 49 23.2			688
222	1980 12 30.22639		06 19 02.32	+24 10 06.4			688
222	1980 12 30.26042		06 19 00.48	+24 10 09.1			688
234	1981 01 14.30556		09 42 51.62	+09 44 44.7			688
234	1981 01 14.36458		09 42 49.18	+09 45 08.6			688
360	1981 01 03.35625		09 11 58.57	+13 37 34.6			688
360	1981 01 03.41528		09 11 56.78	+13 37 55.0			688
444	1981 01 03.33750		08 41 15.67	+03 54 59.2			688
444	1981 01 03.39861		08 41 13.08	+03 55 02.2			688
466	1980 12 30.22639		06 21 11.83	+30 43 04.3			688
466	1980 12 30.26042		06 21 09.81	+30 42 57.3			688
627	1981 01 03.35625		09 15 12.96	+13 22 20.4			688
627	1981 01 03.41528		09 15 11.11	+13 22 32.0			688
627	1981 01 10.27014		09 11 18.09	+13 48 23.7			688
627	1981 01 10.30694		09 11 16.73	+13 48 32.5			688
673	1981 01 14.28264		07 31 56.86	+17 40 19.6			688
673	1981 01 14.34375		07 31 53.44	+17 40 24.2			688
767	1980 12 30.22639		06 22 22.11	+24 19 22.3		1	688
767	1980 12 30.26042		06 22 20.30	+24 19 24.9			688
815	1981 01 01.29722		09 00 41.60	+36 51 21.1			688
815	1981 01 01.33125		09 00 40.40	+36 51 40.8			688

819	1981	01	10.27014	09	17	00.82	+19	34	36.6		688
819	1981	01	10.30694	09	16	58.84	+19	34	42.7		688
966	1981	01	01.29722	08	48	55.59	+33	19	32.0		688
966	1981	01	01.33125	08	48	54.22	+33	19	47.9		688
972	1981	01	14.28264	07	31	31.15	+19	40	53.7		688
972	1981	01	14.34375	07	31	27.63	+19	40	52.6	3	688
993	1981	01	09.12708	06	34	18.12	+20	29	35.3		688
993	1981	01	09.16528	06	34	15.98	+20	29	38.8		688
993	1981	01	09.20278	06	34	13.87	+20	29	42.9		688
1140	1981	01	01.29722	08	58	53.13	+33	00	33.8		688
1140	1981	01	01.33125	08	58	51.86	+33	00	50.6		688
1173	1981	01	03.35625	09	26	17.59	+10	42	02.5		688
1173	1981	01	03.41528	09	26	16.42	+10	42	04.8		688
1214	1980	12	30.22639	06	25	57.56	+25	41	09.3	1	688
1214	1980	12	30.26042	06	25	55.52	+25	41	03.6		688
1246	1981	01	03.35625	09	20	14.76	+08	07	26.1	16.8	688
1246	1981	01	03.41528	09	20	12.28	+08	07	20.8		688
1254	1981	01	03.35625	09	15	01.81	+12	38	15.8		688
1254	1981	01	03.41528	09	14	59.94	+12	38	14.8		688
1302	1981	01	14.28264	07	16	41.21	+23	40	19.9	2	688
1302	1981	01	14.34375	07	16	38.11	+23	40	27.2		688
1382	1980	12	30.22639	06	21	14.02	+25	54	25.3		688
1382	1980	12	30.26042	06	21	11.34	+25	54	25.8		688
1473	1981	01	03.33750	08	29	00.09	-01	09	53.0		688
1473	1981	01	03.39861	08	28	56.86	-01	09	55.2		688
1482	1980	12	30.22639	06	14	05.34	+25	12	38.9		688
1482	1980	12	30.26042	06	14	03.26	+25	12	41.5		688
1539	1981	01	03.35625	09	28	20.27	+14	19	48.4		688
1539	1981	01	03.41528	09	28	18.57	+14	19	57.3		688
1539	1981	01	10.27014	09	24	38.34	+14	39	39.7		688
1539	1981	01	10.30694	09	24	36.94	+14	39	46.4		688
1600	1980	12	31.15556	06	03	16.65	+50	34	09.6		688
1600	1980	12	31.16458	06	03	15.41	+50	34	18.6		688
1644	1981	01	03.35625	09	04	06.91	+10	27	23.0	16.0	688
1644	1981	01	03.41528	09	04	04.76	+10	27	12.1		688
1650	1981	01	03.35625	09	16	22.93	+11	46	10.9		688
1650	1981	01	03.41528	09	16	20.89	+11	46	16.6		688
1669	1980	12	30.22639	06	00	57.40	+24	45	03.4		688
1672	1981	01	10.27014	09	34	17.46	+13	11	05.4		688
1672	1981	01	10.30694	09	34	16.18	+13	11	11.4		688
1691	1981	01	14.30556	09	42	24.06	+12	46	56.8		688
1691	1981	01	14.36458	09	42	21.98	+12	47	06.2		688
1793	1981	01	03.35625	09	04	02.94	+14	08	20.8		688
1793	1981	01	03.41528	09	04	00.88	+14	08	25.4		688
1867	1981	01	09.12708	06	40	32.60	+24	24	09.2		688
1867	1981	01	09.20278	06	40	29.70	+24	24	00.3		688
1964	1981	01	03.35625	09	17	06.45	+12	11	55.1		688
2004	1981	01	10.27014	09	30	26.81	+18	45	37.8		688
2004	1981	01	10.30694	09	30	25.21	+18	45	46.1		688
2086	1981	01	14.30556	09	35	31.37	+13	20	20.4		688
2086	1981	01	14.36458	09	35	28.93	+13	20	42.3		688
2203	1981	01	10.27014	09	19	54.10	+17	57	24.2		688
2203	1981	01	10.30694	09	19	52.65	+17	57	32.2		688
2249	1981	01	14.36458	09	39	16.76	+12	41	09.2		688
2288	1981	01	01.29722	08	54	28.68	+32	54	17.9		688
2288	1981	01	01.33125	08	54	27.51	+32	54	38.6		688
1936 TK	1980	12	30.22639	06	16	14.78	+29	09	04.4	15.8	688
1936 TK	1980	12	30.26042	06	16	12.52	+29	08	53.8		688
1968 SB	1980	12	30.22639	06	01	25.63	+24	49	34.1	17.0	688

1968 SB	1980	12	30.26042	06	01	23.86	+24	49	37.8		688
1974 QE1	1980	12	31.10764	03	45	38.41	+42	05	30.3	16.5	688
1974 QE1	1980	12	31.14097	03	45	37.52	+42	05	16.6		688
1975 VD3	1981	01	10.27014	09	23	05.38	+20	55	19.7	17.2	688
1976 GQ1	1981	01	10.27014	09	34	15.78	+16	59	53.2	17.0	688
1976 GQ1	1981	01	10.30694	09	34	14.67	+17	00	01.4		688
1977 RB	1981	01	01.40347	10	22	45.44	+43	43	25.2	17.5	2 688
1977 RB	1981	01	01.44514	10	22	43.71	+43	43	35.6		688
1977 TJ3	1981	01	01.34861	07	33	07.78	-17	21	33.1		688
1978 RP	1981	01	01.38264	09	32	16.99	+15	19	44.8	17.2	688
1978 RP	1981	01	01.42431	09	32	16.19	+15	19	50.5		688
1978 RP	1981	01	10.27014	09	28	26.87	+15	46	12.6	17.0	688
1978 RP	1981	01	10.30694	09	28	25.75	+15	46	19.9		688
1979 OC	1981	01	09.18472	07	39	56.85	+13	55	12.0	17.2	3 688
1979 OC	1981	01	09.22222	07	39	54.85	+13	55	12.3		688
1979 UJ	1981	01	03.33750	08	29	40.28	-01	31	01.5	16.8	688
1979 UJ	1981	01	03.39861	08	29	37.93	-01	30	59.9		688
1980 XA	1980	12	31.09028	03	33	53.34	+27	31	13.5	17.0	688
1980 XA	1980	12	31.12431	03	33	52.71	+27	31	03.4		688
1980 XA	1981	01	09.10696	03	32	04.44	+26	47	20.5	17.2	3 688
1980 XA	1981	01	09.14514	03	32	04.08	+26	47	11.1		688
1980 XB	1980	12	30.20278	04	59	43.67	+45	49	33.4	16.0	688
1980 XB	1980	12	30.21319	04	59	42.22	+45	49	53.6		3 688
1980 XG	1981	01	03.33750	08	25	10.77	+01	26	45.9	16.5	688
1980 XG	1981	01	03.39861	08	25	08.08	+01	27	41.5		688
1980 YH *	1980	12	16.39236	09	17	02.06	+12	26	48.8	16.8	4 688
1980 YH	1980	12	16.44379	09	17	01.95	+12	27	01.7		2 688
1980 YH	1981	01	03.35625	09	13	10.97	+14	17	31.2	16.5	688
1980 YJ *	1980	12	31.10764	03	55	36.40	+44	56	59.6	17.0	4 688
1980 YJ	1980	12	31.14097	03	55	35.52	+44	56	43.1		688
1980 YS *	1980	12	30.22639	06	06	22.41	+30	14	50.6	15.5	6 688
1980 YS	1980	12	30.26042	06	06	22.43	+30	15	03.5		688
1981 AC	1981	01	14.34375	07	42	13.56	+18	21	27.3		3 688
1981 AD	1981	01	14.28264	07	38	47.01	+22	19	07.4	15.2	688
1981 AD	1981	01	14.34375	07	38	43.45	+22	19	44.4		688
1981 AE	1981	01	10.27014	09	30	16.54	+19	58	28.7	16.5	688
1981 AE	1981	01	10.30694	09	30	15.38	+19	58	37.3		688
1981 AJ *	1981	01	03.28681	08	08	59.72	+23	14	13.2	17.0	7 688
1981 AJ	1981	01	03.32014	08	08	58.11	+23	14	18.7		688
1981 AK *	1981	01	03.28681	08	09	20.26	+22	33	00.1	16.5	4 688
1981 AK	1981	01	03.32014	08	09	18.75	+22	33	08.3		688
1981 AL *	1981	01	03.28681	08	23	13.31	+17	24	29.3	15.8	4 688
1981 AL	1981	01	03.32014	08	23	11.61	+17	24	27.7		1 688
1981 AM *	1981	01	03.28681	08	27	08.66	+23	21	18.0	17.2	4 688
1981 AM	1981	01	03.32014	08	27	07.01	+23	21	27.4		1 688
1981 AN *	1981	01	03.28681	08	28	49.29	+21	12	52.6	17.0	5 688
1981 AN	1981	01	03.32014	08	28	47.38	+21	12	56.2		688
1981 AO *	1981	01	03.28681	08	29	44.44	+21	50	06.2	16.0	4 688
1981 AO	1981	01	03.32014	08	29	43.10	+21	50	19.8		688
1981 AP *	1981	01	09.12708	06	40	08.69	+20	52	33.3	17.0	4 688
1981 AP	1981	01	09.16528	06	40	07.33	+20	52	36.8		688
1981 AP	1981	01	09.20278	06	40	06.09	+20	52	42.5		688
1981 AQ *	1981	01	10.28889	09	36	46.06	+16	05	40.6	16.5	4 688
1981 AQ	1981	01	10.32431	09	36	45.25	+16	06	00.9		688
1981 AQ	1981	01	14.30556	09	34	59.70	+16	46	56.2	16.5	688
1981 AQ	1981	01	14.36458	09	34	57.79	+16	47	34.0		688
1981 AR *	1981	01	10.28889	09	53	10.13	+08	34	38.6	17.0	5 688
1981 AR	1981	01	10.32431	09	53	09.36	+08	34	47.8		688
1981 AR	1981	01	14.36458	09	51	22.29	+08	50	43.6	17.0	688

1981 AS	*	1981 01 10.28889	09 58 54.98	+14 24 32.8	17.2	4	688
1981 AS		1981 01 10.32431	09 58 54.37	+14 24 37.4			688
1981 AS		1981 01 14.30556	09 57 23.96	+14 37 53.3	17.2	2	688
1981 AS		1981 01 14.36458	09 57 22.43	+14 38 07.2			688
1981 AT	*	1981 01 14.28264	07 38 37.94	+23 17 02.7	16.2	4	688
1981 AT		1981 01 14.34375	07 38 33.73	+23 16 57.1			688
1981 AU	*	1981 01 14.28264	07 43 11.07	+22 47 23.4	16.8	4	688
1981 AU		1981 01 14.34375	07 43 07.41	+22 47 33.5			688
1981 AV		1981 01 14.28264	07 19 42.01	+21 12 59.6	17.2		688

Note 1: right ascension uncertain. 2: declination uncertain. 3 = 1 + 2.
4: discoverer Bowell. 5 = 1 + 4. 6: discoverer Thomas. 7 = 3 + 4.

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

Object	Date	UT	R. A. (1950)	Decl.	N	Obs.
1261	1966 02	18.29871	09 56 25.95	+16 34 30.1		760
1261	1966 02	18.35253	09 56 23.30	+16 34 44.0		760
1951 CB1	1951 02	03.12988	05 34 12.51	+18 12 37.9		760
1951 CC1	1951 02	08.39830	12 07 16.20	-20 13 00.4		760
1951 CD1	1951 02	08.39830	11 52 43.75	-17 50 54.2		760
1951 CE1	1951 02	08.39830	11 46 46.41	-17 35 34.1		760
1951 XA	1951 12	03.07603	02 29 09.74	+25 00 13.9		760
1951 XA	1951 12	03.11563	02 29 08.26	+25 00 02.9		760
1953 TV2	1953 10	31.14721	00 52 55.69	+00 19 32.8		760
1953 TV2	1953 10	31.19235	00 52 53.43	+00 19 32.9		760
1954 LD	1954 06	07.23531	17 11 35.88	-21 21 11.4		760
1954 LD	1954 06	07.27073	17 11 33.55	-21 21 04.6		760
1954 RH	1954 10	20.09176	00 01 01.73	-02 58 24.4		760
1954 RH	1954 10	20.13690	00 01 01.14	-02 58 32.2		760
1955 RR	1955 09	13.33256	01 11 21.64	+05 21 22.2		760
1955 RR	1955 09	13.36728	01 11 20.57	+05 21 16.4		760
1955 TJ	1955 10	12.18649	23 59 54.73	+11 26 53.5		760
1955 TJ	1955 10	12.22606	23 59 53.18	+11 26 39.7		760
1955 XF	1955 12	13.05727	03 41 15.87	+20 41 18.5		760
1955 XF	1955 12	13.09688	03 41 14.22	+20 41 03.2		760
1957 JJ	1957 05	02.24270	14 16 41.23	-06 48 07.7		760
1957 JJ	1957 05	02.28717	14 16 39.16	-06 47 46.1		760
1957 LM	1957 06	22.93200	17 07 38.76	-19 57 27.5		081
1957 LM	1957 06	22.99400	17 07 35.65	-19 57 29.2		081
1958 GW	* 1958 04	13.08544	09 53 19.57	+32 31 28.9		760
1958 HL	1958 04	17.09365	09 52 40.75	+32 02 04.4		760
1958 HL	1958 04	17.17067	09 52 38.57	+32 02 32.3		760
1958 VA1	1958 11	11.26946	03 05 12.01	+19 19 36.8		760
1958 VA1	1958 11	11.31806	03 05 09.64	+19 19 20.7		760
1959 ND	1959 07	09.22116	18 51 25.47	-25 05 26.1		760
1959 ND	1959 07	09.26490	18 51 22.82	-25 05 37.5		760
1960 TA	1960 10	13.17712	23 08 42.54	-03 32 02.3	1	760
1961 UK	1961 10	18.25762	01 47 41.55	+07 18 51.6		760
1961 UK	1961 10	18.29998	01 47 38.88	+07 18 40.1		760
1962 QE	1962 08	29.30533	22 03 45.56	+01 47 55.3		760
1962 QE	1962 08	29.35062	22 03 43.32	+01 47 40.7		760
1962 SK	1962 09	30.30618	01 42 29.85	+17 28 44.9		760
1962 SK	1962 09	30.35201	01 42 27.78	+17 28 31.8		760
1963 TV	1963 10	18.27849	02 32 13.39	+00 37 48.3		760
1963 UN	1963 10	22.18267	01 45 36.75	+08 18 15.4		760
1963 UN	1963 10	22.22642	01 45 34.61	+08 17 51.1		760
1964 TG	1964 10	04.18143	01 40 27.86	+24 40 02.7		760
1964 TG	1964 10	04.22518	01 40 25.11	+24 40 13.7		760

Note 1: the identification (1418) = 1960 TA (MPC 2140) is invalid.

OBSERVATIONS MADE AT ALFRED UNIVERSITY OBSERVATORY BY W. WATSON.
MEASURED BY A. C. PORTER.

Object	Date	UT	R. A. (1950)			Decl.	N	Obs.
68	1978 09	02.16562	22 15	37.54	-25 09	12.2		784
68	1978 09	02.29340	22 15	30.72	-25 09	25.8		784
304	1978 09	02.15451	22 13	56.77	-09 01	21.8		784
304	1978 09	02.28472	22 13	52.39	-09 03	49.4		784
709	1978 09	02.13854	22 04	52.95	-06 57	00.6		784
709	1978 09	02.27257	22 04	44.75	-06 56	49.1		784
1277	1978 09	02.18056	22 19	27.16	+03 25	45.5		784
1277	1978 09	02.30625	22 19	20.89	+03 25	02.1		784
1277	1978 09	02.31458	22 19	20.60	+03 25	01.1		784
1554	1978 09	02.09722	21 41	15.51	+07 44	33.9		784
1554	1978 09	02.10382	21 41	15.02	+07 44	28.9		784
1554	1978 09	02.25972	21 41	08.77	+07 43	00.0		784
1685	1980 08	10.19444	01 30	17.39	+68 09	54.8	1	784
1685	1980 08	10.20000	01 30	26.50	+68 10	25.5	1	784
1685	1980 08	10.21389	01 30	49.93	+68 12	03.7	1	784
1685	1980 08	10.23264	01 31	20.58	+68 14	05.1	1	784
1695	1978 09	02.22292	00 16	25.67	+24 25	00.5		784
1695	1978 09	02.35278	00 16	24.06	+24 24	25.2		784

Note 1: observatory code 784, Long. and Parallax 282.28, -315, -286 (see MPC 4766).

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

Object	Date	UT	R. A. (1950)			Decl.	Mag.	Obs.
/1978 VIII	1978 11	29.34271	06 05	58.42	+09 00	02.6		801
/1979 I	1978 10	31.08021	22 32	53.22	-10 55	06.4		801
/1979k	1981 01	11.15648	06 04	56.35	+20 31	02.4		801
/1980e	1980 10	06.01244	17 48	19.52	-00 39	59.4		801
/1980g	1980 12	14.24447	05 31	45.75	+26 50	15.2		801
/1980g	1981 01	11.13000	05 36	38.88	+39 13	00.6		801
/1980s	1981 01	31.21641	08 29	44.55	+32 28	11.1	17.5T	801
1125	1977 06	09.17903	16 13	29.09	-19 09	32.5		801
1669	1981 01	06.24738	05 54	50.07	+24 44	33.4		801
1862	1980 12	15.05867	02 24	12.33	+28 53	26.0		801
1862	1981 01	11.07086	03 10	44.92	+28 27	45.4		801
1922	1980 09	16.33007	03 31	43.34	+21 17	09.4		801
2325	1980 12	05.43300	08 03	49.56	+18 51	12.7		801
2325	1980 12	07.40288	08 03	14.64	+18 53	02.4		801
2327	1980 12	15.09657	02 28	13.58	+08 29	32.3		801
2328	1980 09	05.11948	21 59	37.21	-04 31	11.6		801
2329	1980 12	15.20678	06 03	55.84	-15 13	23.0		801
2333	1980 12	07.27618	03 50	43.87	+29 20	45.1		801
2336	1980 09	16.26265	01 15	01.76	+03 48	21.7		801
1936 TK	1980 12	15.14895	06 31	55.86	+30 12	03.6		801
1936 TK	1981 01	09.19584	06 06	36.73	+28 17	59.4		801
1940 GN	1980 12	07.31716	05 04	47.38	+22 10	57.2		801
1964 VD	1980 09	12.23715	00 14	16.34	+04 42	55.4		801
1965 LA	1980 12	14.42832	08 27	00.70	+30 36	38.0		801
1968 SB	1981 01	06.24738	05 55	20.10	+24 53	14.9		801
1970 OG	1980 12	15.12199	03 56	48.44	-04 28	11.2		801
1973 SO2	1980 12	11.21942	05 33	29.86	+27 46	41.2		801
1974 QE1	1981 01	11.00905	03 43	04.51	+40 53	29.0		801
1974 QE1	1981 01	12.00183	03 43	02.61	+40 47	04.6		801
1975 UD	1981 01	03.10444	03 11	58.59	+22 22	41.5		801
1975 UD	1981 01	11.03925	03 11	51.30	+22 18	42.4		801

1975 VD3	1980	12	15.36155	09	32	25.85	+19	30	15.1	801
1976 SH2	1981	01	31.35477	09	52	00.54	+18	13	06.2	801
1976 SH2	1981	02	01.32317	09	50	57.80	+18	17	54.6	801
1976 SH2	1981	02	04.35807	09	47	36.12	+18	32	48.9	801
1976 YQ7	1980	09	11.31194	00	55	12.79	+10	58	11.3	801
1978 DA	1978	06	29.22144	19	10	11.91	+20	29	11.5	801
1978 DA	1978	07	31.13788	18	47	53.40	+05	25	45.7	801
1978 GD	1980	09	12.26171	01	24	16.00	+00	43	59.4	801
1978 UV1	1980	03	12.16112	08	15	44.00	+32	30	11.1	801
1979 UJ	1980	12	14.38772	08	38	15.69	-01	05	05.5	801
1979 UJ	1980	12	15.33350	08	38	01.49	-01	07	42.8	801
1980 PA	1981	01	03.29824	07	13	30.79	+19	33	48.3	801
1980 PA	1981	01	06.28514	07	09	06.37	+19	33	10.9	801
1980 ST *	1980	09	16.26265	01	15	03.81	+03	51	43.2	801
1980 WF	1981	01	09.22273	07	07	52.04	-17	21	39.2	801
1980 WF	1981	02	04.22161	08	20	47.62	-15	27	23.6	801
1980 WF	1981	02	10.20089	08	31	06.25	-13	42	56.7	801
1981 AZ *	1981	01	11.22462	08	02	57.17	+20	10	38.8	801
1981 AA1 *	1981	01	11.22462	08	03	41.58	+19	58	20.2	801
1981 AB1 *	1981	01	11.22462	08	04	10.32	+20	25	15.0	801
1981 BB *	1981	01	31.35477	09	51	22.57	+18	24	34.3	801
1981 BB	1981	02	01.32317	09	50	34.64	+18	31	49.1	801
1981 BC *	1981	01	31.35477	09	51	37.60	+18	21	17.5	801
1981 BC	1981	02	01.32317	09	50	29.92	+18	20	11.9	801
1981 BC	1981	02	04.35807	09	46	52.58	+18	16	35.0	801
1981 BC	1981	02	10.26265	09	39	39.95	+18	07	57.9	801
1981 CC *	1981	02	06.16133	07	34	48.81	+21	52	38.8	801
4578 P-L	1981	01	11.10399	05	28	21.66	+17	03	46.4	801

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

Object	Date	UT	R. A. (1950)	Decl.	Mag.	N	Obs.
/1980i	1980	07	09.31181	23 43.96	-43	32.6	809
/1980i	1980	07	21.34514	23 51 17.71	-46	31 02.2	809
/1980i	1980	07	21.36875	23 51 18.31	-46	31 25.1	809
/1980i	1980	12	02.05278	23 06 13.40	-40	05 15.5	809
/1980i	1980	12	02.08056	23 06 15.92	-40	04 26.0	809
/1980r	1980	11	12.06181	23 05 00.26	-46	27 52.8	809
/1980r	1980	11	12.09167	23 05 00.69	-46	27 19.1	809
/1980r	1980	12	02.05278	23 17 42.52	-40	12 21.5	809
/1980r	1980	12	02.08056	23 17 44.14	-40	11 44.9	809
131	1980	10	05.15486	23 49 27.21	-09	00 27.5	809
196	1980	10	05.15486	23 54 56.97	-11	34 58.0	809
196	1980	10	05.18333	23 54 55.69	-11	35 02.5	809
250	1980	10	05.18333	23 46 49.27	-10	23 48.9	809
752	1980	10	05.15486	23 52 02.37	-11	21 13.6	809
752	1980	10	05.18333	23 52 00.86	-11	21 19.9	809
1368	1980	10	05.15486	23 52 55.50	-08	26 20.4	809
1850	1980	10	05.15486	23 51 10.37	-08	01 15.3	809
1938 CG	1980	10	05.15486	00 00 48.65	-07	06 04.0	809
1979 KL	1980	10	05.15486	23 57 25.87	-09	51 36.4	809
1979 KL	1980	10	05.18333	23 57 24.62	-09	51 48.6	809
1979 KN	1980	10	05.15486	23 52 45.63	-11	56 40.2	809
1979 KN	1980	10	05.18333	23 52 44.51	-11	56 49.4	809
1980 TD1 *	1980	10	05.15486	23 49 02.62	-10	53 36.9	809
1980 TD1	1980	10	05.18333	23 49 01.36	-10	53 41.8	809
1980 TE1 *	1980	10	05.15486	23 49 39.79	-09	10 10.1	809
1980 TE1	1980	10	05.18333	23 49 38.49	-09	10 23.6	809
1980 TF1 *	1980	10	05.15486	23 50 28.61	-10	21 34.1	809

1980	TF1		1980	10	05.18333	23	50	27.37	-10	21	46.1	18.0	809
1980	TG1	*	1980	10	05.15486	23	50	45.28	-11	57	23.7	17.0	809
1980	TG1		1980	10	05.18333	23	50	44.19	-11	57	31.5	16.5	809
1980	TH1	*	1980	10	05.15486	23	51	05.61	-06	57	03.1	17.5	809
1980	TJ1	*	1980	10	05.15486	23	51	39.94	-10	19	07.7	17.5	809
1980	TJ1		1980	10	05.18333	23	51	38.59	-10	19	14.1	17.0	809
1980	TK1	*	1980	10	05.15486	23	52	08.96	-07	15	13.1	18.5	809
1980	TL1	*	1980	10	05.15486	23	52	33.63	-07	32	43.5	17.5	809
1980	TM1	*	1980	10	05.15486	23	55	40.52	-11	26	14.3	18.5	809
1980	TM1		1980	10	05.18333	23	55	38.92	-11	26	10.8		809
1980	TN1	*	1980	10	05.15486	23	56	24.02	-09	16	12.7	17.5	809
1980	TN1		1980	10	05.18333	23	56	22.76	-09	16	22.8		809
1980	TO1	*	1980	10	05.15486	23	57	13.05	-09	05	41.0	18.0	809
1980	TO1		1980	10	05.18333	23	57	11.81	-09	05	54.5		1 809
1980	TP1	*	1980	10	05.15486	23	57	16.09	-07	03	48.3	18.5	809
1980	TQ1	*	1980	10	05.15486	23	58	40.66	-07	15	08.8	18.5	809
1980	TR1	*	1980	10	05.15486	23	59	01.01	-11	57	38.3	18.0	809
1980	TR1		1980	10	05.18333	23	58	59.32	-11	57	40.2		809
1980	TS1	*	1980	10	05.15486	23	59	55.06	-08	33	36.5	17.5	809
1980	TT1	*	1980	10	05.15486	00	01	22.51	-11	23	39.6	19.0	809
1980	TT1		1980	10	05.18333	00	01	21.06	-11	23	53.1		809
1980	TU1	*	1980	10	05.15486	00	01	31.44	-10	36	56.2	17.5	809
1980	TU1		1980	10	05.18333	00	01	29.89	-10	37	01.8		809
1980	TV1	*	1980	10	05.15486	00	02	38.95	-10	03	58.9	18.0	809
1980	TV1		1980	10	05.18333	00	02	37.33	-10	04	05.0		809
1980	TW1	*	1980	10	05.15486	00	03	16.12	-06	52	01.8	17.5	1 809
1980	TX1	*	1980	10	05.15486	00	03	28.72	-11	49	12.2	19.0	809
1980	TX1		1980	10	05.18333	00	03	27.40	-11	49	25.0		809
1980	TY1	*	1980	10	05.15486	00	07	35.81	-09	07	49.1	18.0	809
1980	TZ1	*	1980	10	05.15486	00	08	30.95	-09	12	32.4	18.5	809
1980	TA2	*	1980	10	05.15486	00	08	35.25	-09	18	03.6	17.0	809
1980	TB2	*	1980	10	05.15486	00	08	38.26	-10	29	35.3	18.5	809
1980	TC2	*	1980	10	05.15486	00	09	01.19	-10	05	17.4	18.0	1 809
1980	TD2	*	1980	10	05.18333	23	43	13.93	-12	50	08.7	19.0	809
1980	TE2	*	1980	10	05.18333	23	43	32.96	-12	40	37.7	16.5	809
1980	TF2	*	1980	10	05.18333	23	43	41.03	-10	27	21.1	18.5	809
1980	TG2	*	1980	10	05.18333	23	43	52.78	-12	26	00.5	19.0	809
1980	TH2	*	1980	10	05.18333	23	44	23.14	-09	18	46.1	19.0	809
1980	TJ2	*	1980	10	05.18333	23	46	46.15	-10	38	50.6	17.5	809
1980	TK2	*	1980	10	05.18333	23	47	32.85	-13	07	07.5	18.5	809
1980	TL2	*	1980	10	05.18333	23	48	48.84	-13	27	08.7	17.5	809
1980	TM2	*	1980	10	05.18333	23	51	01.00	-14	25	06.0	18.0	809
1980	TN2	*	1980	10	05.18333	23	51	04.53	-12	42	42.1	18.0	809
1980	TO2	*	1980	10	05.18333	23	51	28.31	-14	09	55.7	18.5	809
1980	TP2	*	1980	10	05.18333	23	54	37.29	-12	40	05.6	18.0	809
1980	TQ2	*	1980	10	05.18333	23	55	30.23	-12	42	19.5	18.5	809
1980	TR2	*	1980	10	05.18333	23	56	03.24	-12	17	17.5	19.0	809
1980	TS2	*	1980	10	05.18333	00	01	35.70	-13	00	22.3	18.0	809

Note 1: near edge of plate.

OBSERVATIONS MADE AT THE EUROPEAN SOUTHERN OBSERVATORY UNDER THE DIRECTION OF H. DEBEHOGNE.

Object	Date	UT	R. A. (1950)	Decl.	O - C	Mag.	Obs.
12	1979	12	17.23814	05 31 07.43	+16 58 17.8	0.1- 1-	809
12	1979	12	17.24641	05 31 06.91	+16 58 16.3	0.1- 1-	809
12	1979	12	17.25472	05 31 06.21	+16 58 14.8	0.1- 1-	809
12	1979	12	20.28600	05 27 44.44	+16 49 07.0	0.1- 0	809
12	1979	12	20.29431	05 27 43.88	+16 49 05.4	0.1- 0	809

12	1979	12	20.30262	05	27	43.34	+16	49	03.7	0.1-	0	809
12	1979	12	21.27774	05	26	39.22	+16	46	14.7	0.1-	0	809
12	1979	12	21.28605	05	26	38.68	+16	46	13.0	0.1-	0	809
12	1979	12	21.29436	05	26	38.10	+16	46	11.5	0.1-	0	809
12	1979	12	25.26405	05	22	23.36	+16	35	16.3	0.1+	1+	809
12	1979	12	25.27172	05	22	22.87	+16	35	14.9	0.1+	1+	809
12	1979	12	25.28760	05	22	21.84	+16	35	12.2	0.1+	1+	809
12	1979	12	26.26339	05	21	21.01	+16	32	41.6	0.2+	2+	809
67	1979	12	17.23814	05	29	17.09	+15	00	20.2	0.1-	1-	809
67	1979	12	17.24641	05	29	16.55	+15	00	19.2	0.1-	1-	809
67	1979	12	17.25472	05	29	15.99	+15	00	18.5	0.1-	1-	809
67	1979	12	20.28600	05	26	04.13	+14	56	01.6	0.1-	1-	809
67	1979	12	20.29431	05	26	03.60	+14	56	01.0	0.1-	1-	809
67	1979	12	20.30262	05	26	03.06	+14	56	00.2	0.1-	1-	809
67	1979	12	21.27774	05	25	02.14	+14	54	46.6	0.1-	1-	809
67	1979	12	21.28605	05	25	01.63	+14	54	45.9	0.1-	1-	809
67	1979	12	21.29436	05	25	01.08	+14	54	44.9	0.1-	1-	809
67	1979	12	25.26405	05	20	58.95	+14	50	26.6	0.1+	1+	809
67	1979	12	25.27172	05	20	58.50	+14	50	26.2	0.1+	1+	809
67	1979	12	25.28760	05	20	57.52	+14	50	25.4	0.1+	1+	809
67	1979	12	26.26339	05	19	59.76	+14	49	33.7	0.1+	1+	809
90	1979	12	18.30463	07	12	15.92	+23	56	19.8	0.1+	0	809
90	1979	12	18.31299	07	12	15.51	+23	56	20.9	0.1+	0	809
90	1979	12	18.32125	07	12	15.15	+23	56	21.8	0.1+	0	809
105	1980	01	11.10335	08	40	30.51	-12	21	35.3	0.1+	2-	809
105	1980	01	11.11305	08	40	29.96	-12	21	33.5	0.1+	2-	809
105	1980	01	11.12274	08	40	29.36	-12	21	31.5	0.1+	1-	809
542	1979	12	25.29798	05	13	47.25	+05	37	24.0	0.2-	1-	809
542	1979	12	25.30560	05	13	46.89	+05	37	25.2	0.2-	1-	809
542	1979	12	25.31322	05	13	46.52	+05	37	26.4	0.2-	1-	809
542	1979	12	26.30079	05	12	58.51	+05	40	07.9	0.3-	2-	809
886	1979	12	25.23635	05	29	00.59	+34	16	00.9	0.1-	1+	809
886	1979	12	25.24396	05	29	00.10	+34	16	01.9	0.1-	1+	809
886	1979	12	25.25158	05	28	59.57	+34	16	03.1	0.1-	1+	809
886	1979	12	26.21214	05	27	58.58	+34	18	32.2	0.1-	1+	809
886	1979	12	26.22599	05	27	57.77	+34	18	33.9	0.1-	1+	809
886	1979	12	26.23984	05	27	56.96	+34	18	35.8	0.1-	1+	809
984	1979	12	25.23635	05	30	35.66	+34	04	35.8	0.1-	1+	809
984	1979	12	25.24396	05	30	35.16	+34	04	33.9	0.1-	1+	809
984	1979	12	25.25158	05	30	34.67	+34	04	31.9	0.1-	1+	809
984	1979	12	26.21214	05	29	33.73	+34	00	21.9	0.2-	1+	809
984	1979	12	26.22599	05	29	32.90	+34	00	19.0	0.2-	1+	809
984	1979	12	26.23984	05	29	32.12	+34	00	16.3	0.2-	1+	809
1146	1979	12	25.29798	05	16	54.11	+05	47	53.9	0.1-	1-	809
1146	1979	12	25.30560	05	16	53.72	+05	47	53.2	0.1-	1-	809
1146	1979	12	25.31322	05	16	53.39	+05	47	52.7	0.1-	1-	809
1146	1979	12	26.30079	05	16	08.68	+05	46	38.6	0.1-	1-	809
1658	1979	12	18.30463	07	15	35.36	+23	27	57.0	0.4+	0	809
1658	1979	12	18.31299	07	15	34.93	+23	27	58.5	0.4+	0	809
1658	1979	12	18.32125	07	15	34.52	+23	28	00.1	0.4+	0	809
1733	1980	01	11.14214	05	43	57.38	+16	05	20.9	0.1-	0	809
1733	1980	01	11.15045	05	43	56.99	+16	05	22.2	0.0	0	809
1733	1980	01	11.15876	05	43	56.59	+16	05	23.4	0.0	0	809
1775	1979	12	25.29798	05	16	12.76	+06	07	14.3	0.2-	1-	809
1775	1979	12	25.30560	05	16	12.28	+06	07	13.7	0.2-	1-	809
1775	1979	12	25.31322	05	16	11.83	+06	07	13.4	0.2-	1-	809
1775	1979	12	26.30079	05	15	20.24	+06	06	46.6	0.2-	2-	809
1962	1979	12	18.30463	07	16	09.77	+24	41	33.5	0.2+	0	809

1962		1979	12	18.31299	07	16	09.32	+24	41	34.4	0.2+	0		809
1962		1979	12	18.32125	07	16	08.92	+24	41	35.3	0.2+	0		809
1984		1979	12	17.23814	05	31	02.04	+16	31	14.2	0.0	0		809
1984		1979	12	17.24641	05	31	01.58	+16	31	13.6	0.0	0		809
1984		1979	12	17.25472	05	31	01.14	+16	31	13.2	0.0	0		809
1984		1979	12	20.28600	05	28	21.56	+16	29	00.9	0.0	0		809
1984		1979	12	20.29431	05	28	21.12	+16	29	00.5	0.0	0		809
1984		1979	12	20.30262	05	28	20.68	+16	29	00.3	0.0	0		809
1984		1979	12	21.27774	05	27	29.73	+16	28	22.8	0.1+	0		809
1984		1979	12	21.28605	05	27	29.32	+16	28	22.2	0.1+	0		809
1984		1979	12	21.29436	05	27	28.86	+16	28	22.2	0.1+	0		809
1984		1979	12	25.26405	05	24	05.19	+16	26	17.2	0.2+	1+		809
1984		1979	12	25.27172	05	24	04.80	+16	26	16.9	0.2+	1+		809
1984		1979	12	25.28760	05	24	04.04	+16	26	16.4	0.2+	1+		809
1984		1979	12	26.26339	05	23	15.03	+16	25	52.4	0.3+	1+		809
1979	YR	*	1979	12	25.23635	05	31	13.84	+33	41	12.6		16.8	809
1979	YR		1979	12	25.24396	05	31	13.32	+33	41	13.2			809
1979	YR		1979	12	25.25158	05	31	12.76	+33	41	13.8			809
1979	YR		1979	12	26.21214	05	30	04.32	+33	41	49.2			809
1979	YR		1979	12	26.22599	05	30	03.38	+33	41	50.1			809
1979	YR		1979	12	26.23984	05	30	02.55	+33	41	50.5			809
1979	YS	*	1979	12	18.30463	07	16	28.76	+25	14	00.1			809
1979	YS		1979	12	18.31299	07	16	28.38	+25	14	00.4			809
1979	YS		1979	12	18.32125	07	16	27.93	+25	14	01.7			809

OBSERVATIONS MADE AT TOKAI BY T. FURUTA. FROM JAPAN STUDY ASSOC. MINOR PLANET CIRC. SER. II NOS. 769, 774 AND 780.

Object	Date	UT	R. A. (1950)	Decl.	Mag.	Obs.
308	1980	12	06.58889	05 03 32.34	+16 22 08.1	879
308	1980	12	06.61806	05 03 30.66	+16 22 05.2	879
2043	1980	11	29.53889	03 33 33.05	+23 59 18.2	879
2043	1980	11	29.55069	03 33 32.35	+23 59 16.6	879
2228	1980	03	19.50799	10 11 49.54	+12 09 50.5	879
2228	1980	03	19.52025	10 11 49.13	+12 09 54.2	879
2333	1980	12	06.53113	03 51 34.09	+29 20 17.1	879
2333	1980	12	06.54236	03 51 33.20	+29 20 18.3	879
1969 TO1	1980	12	06.58889	05 03 10.48	+16 44 32.1	879
1969 TO1	1980	12	06.61806	05 03 08.36	+16 44 27.4	879
1970 OG	1980	12	06.50035	04 03 34.89	-05 05 28.3	879
1970 OG	1980	12	06.51285	04 03 34.24	-05 05 27.0	879
1974 QE1	1980	11	29.56979	04 13 26.26	+44 40 15.7	879
1974 QE1	1980	11	29.57917	04 13 25.70	+44 40 14.0	879
1975 UD	1980	11	29.53889	03 31 32.84	+23 27 44.0	879
1975 UD	1980	11	29.55069	03 31 32.35	+23 27 42.8	879
1980 XA	1980	12	06.53113	03 48 41.49	+29 47 12.0	16 879
1980 XA	1980	12	06.54236	03 48 40.72	+29 47 10.9	879

OBSERVATION MADE AT WOOLSTON BY H. B. RIDLEY. MEASURED BY R. L. WATERFIELD.

Object	Date	UT	R. A. (1950)	Decl.	Mag.	N Obs.
/1980u	1981	01	11.77386	18 56 19.64	+44 02 05.2	9.5T 1 993

Note 1: short, diffuse tail in p.a. 0 .

* * * * *

ORBITAL ELEMENTS OF ONE-OPPOSITION MINOR PLANETS.

The orbit computers and authors of double designations are B = C. M. Bardwell, c = N. S. Chernykh, E = E. Bowell, G = D. W. E. Green, M = B. G.

Marsden. The columns headed Arc and O give the time span in days covered by the observations and the number of observations utilized (0 means 10 or more).

Planet	B(1,0)	Epoch	M	Peri.	Node	Incl.	e	a	Arc	O	N	C
1975 XY1	13.5	751214	334.36	223.10	250.43	23.52	0.2142	2.3910	55	5	1	B
1975 XP3	15.0	751124	4.49	56.82	5.58	2.92	0.1326	2.3544	27	4	1	B
1978 PT2	13.5	780909	8.21	55.07	275.67	0.86	0.0658	2.9084	51	3		G
1978 PU2	14.0	780909	358.13	195.73	147.16	10.48	0.1697	2.8227	51	3		G
1978 PB3	16.0	780909	339.65	53.73	320.65	1.00	0.2200	2.3264	51	3		G
1978 PH3	13.5	780909	35.81	31.22	259.14	0.33	0.1948	3.1879	51	3		G
1978 PM3	14.0	780909	354.54	202.93	147.91	9.92	0.1806	2.7947	51	3		G
1978 PO3	14.5	780909	34.28	272.59	25.89	0.94	0.1336	2.4437	51	3		G
1978 PS3	14.0	780909	318.22	76.12	330.31	7.48	0.2174	2.4436	55	4		B
1978 PU3	15.5	780909	7.84	152.11	172.75	6.67	0.1351	2.3240	27	3		M
1978 PV3	15.5	780909	23.31	22.62	279.13	4.08	0.2010	2.2510	27	3		M
1978 PW3	15.5	780909	19.24	140.19	168.90	6.36	0.1506	2.4552	27	3		G
1978 PX3	16.5	780909	358.72	31.23	308.85	5.18	0.2169	2.2038	27	3		G
1978 PA4	13.5	780909	257.98	289.59	162.58	3.16	0.1449	2.4453	27	3		G
1978 PB4	14.0	780909	138.07	248.16	303.50	5.70	0.0892	2.2225	27	3		G
1978 PC4	14.0	780909	5.70	350.25	338.27	0.99	0.1485	2.7717	27	3		G
1978 PG4	15.5	780909	2.75	36.44	302.60	6.13	0.2217	2.2333	54	3		B
1978 QC	14.5	780909	331.28	193.65	192.96	1.43	0.2266	2.9132	26	3		B
1978 QF1	16.0	780909	334.16	198.86	186.87	4.91	0.2128	2.2980	27	3		M
1978 QP1	13.5	780909	25.26	189.83	120.93	2.52	0.1720	3.1422	27	3		M
1978 QU1	14.5	780909	344.61	16.51	350.31	5.47	0.1223	2.5261	27	3		M
1978 QA2	16.0	780909	3.99	153.33	188.15	3.51	0.2184	2.2555	27	3		M
1978 QB2	13.0	780909	349.06	203.08	157.77	10.32	0.0940	3.0085	27	3		M
1978 QC2	15.5	780909	349.61	216.43	145.37	4.68	0.1795	2.1390	27	3		M
1978 QE2	15.5	780909	3.75	327.56	13.31	2.36	0.2274	2.3753	27	3		M
1978 QG2	15.5	780909	48.73	93.03	189.25	3.61	0.1743	2.2155	27	3		M
1978 QJ2	13.0	780909	50.34	255.47	27.02	1.17	0.1570	3.1501	27	3		M
1978 QK2	16.0	780909	14.21	135.12	188.98	4.10	0.2523	2.3149	27	4		M
1978 QL2	13.5	780909	339.15	225.07	153.34	2.14	0.1762	3.1463	27	3		M
1978 QN2	13.0	780909	263.36	115.93	335.04	1.49	0.0459	2.8731	27	3		M
1978 QO2	13.5	780909	329.66	315.25	75.85	0.98	0.1735	3.1215	27	3		M
1978 QQ2	15.0	780909	291.48	255.71	176.74	3.35	0.1353	2.2645	27	3		M
1978 QU2	14.0	780909	342.89	255.07	118.84	2.78	0.1826	3.1348	27	3		G
1978 QV2	15.5	780909	349.91	356.00	8.79	2.58	0.2303	2.4043	27	3		M
1978 QW2	14.5	780909	3.25	347.20	357.01	2.46	0.1784	2.4244	38	6		B
1978 QX2	12.0	780909	159.35	191.86	354.21	9.29	0.1501	3.1508	27	3	2	M
1978 QB3	14.5	780909	352.75	10.29	351.34	4.69	0.2023	2.4381	38	5		B
1978 RF	15.0	780909	332.59	65.73	335.43	2.82	0.2711	2.5534	38	9		B
1978 RM	14.0	780909	24.07	295.09	28.81	0.65	0.1633	3.1794	39	6	1	M
1978 RN	15.0	780909	326.55	228.52	173.79	7.12	0.1629	2.7060	39	7		M
1978 RO	14.5	780909	337.34	197.28	185.64	4.97	0.0746	2.4284	39	8		M
1978 RU	15.0	780909	45.89	273.21	11.98	4.23	0.2516	2.5688	39	7		M
1978 RG1	14.0	780909	4.60	200.36	145.76	1.78	0.2547	3.2033	23	4		B
1978 RL1	14.0	780909	8.96	194.96	148.55	1.79	0.1667	3.2097	39	6		M
1978 RO1	15.0	780909	101.32	39.04	205.00	0.67	0.0996	2.1592	39	7	1	M
1978 RQ1	16.0	780909	26.79	143.38	176.15	5.70	0.1496	2.2932	34	6		M
1978 RR1	16.0	780909	32.67	160.39	149.02	3.38	0.1742	2.2699	39	6		M
1978 RS1	16.0	780909	46.75	138.98	152.20	5.64	0.1797	2.2383	28	5		M
1978 RU1	14.0	780909	83.46	92.11	181.31	1.88	0.0283	2.8441	39	7		M
1978 RV1	16.5	780909	31.38	181.97	127.75	0.96	0.2039	2.2723	39	8		M
1978 RW1	14.0	780909	222.43	340.53	165.05	3.57	0.1208	2.2398	39	6		M
1978 RX1	16.5	780909	354.89	225.95	137.65	4.05	0.2026	2.2482	12	4		M
1978 RA2	16.5	780909	337.31	30.81	1.15	5.04	0.2492	2.3252	34	5		M
1978 RJ2	16.0	780909	334.72	66.74	327.19	1.47	0.2137	2.3825	39	7	1	M

1978	RM2	15.0	780909	356.45	173.46	190.69	4.93	0.0021	2.7445	39	5	M
1978	RY3	13.0	780909	101.68	57.16	159.32	15.81	0.2527	2.8761	25	3	M
1978	SP2	14.0	780909	70.24	79.03	190.79	14.63	0.1019	2.5361	12	3	B
1978	SQ2	14.0	780909	333.36	38.43	343.55	11.86	0.0675	2.4303	12	3	B
1978	SR2	14.0	780909	215.15	179.73	319.88	1.90	0.0522	2.4665	12	3	B
1978	SS2	13.0	780909	64.74	60.93	197.18	9.66	0.2587	3.2031	12	3	B
1978	SU2	13.0	780909	303.44	83.97	346.87	11.71	0.2017	3.3503	12	3	B
1978	SV2	14.0	780909	193.49	297.46	224.54	3.58	0.1231	2.1875	12	4	B
1978	SX2	12.0	780909	30.73	329.99	351.39	21.88	0.0212	3.1768	12	4	B
1978	SZ2	12.0	780909	94.33	341.81	242.11	1.68	0.3462	3.4883	12	3	M
1978	SA3	12.0	780909	358.87	15.28	339.74	4.22	0.1574	3.8424	12	4	2 M
1978	SB3	14.5	780909	352.26	34.50	329.78	4.28	0.2065	2.4808	12	4	B
1978	SD3	16.0	780909	27.01	326.78	345.36	4.30	0.1909	2.1543	12	4	B
1978	SE3	14.5	780909	27.67	109.21	210.26	2.97	0.1031	2.4235	12	4	B
1978	SH3	15.5	780909	347.24	157.52	213.29	3.95	0.1705	2.2225	12	4	B
1978	SJ3	14.5	780909	18.29	151.43	176.46	9.47	0.1433	2.3095	12	4	M
1980	VA	16.0	801227	15.60	233.50	168.64	3.20	0.2644	2.2561	52	0	M
1980	XB	15.0	801207	347.70	39.14	70.87	25.32	0.3997	2.5929	17	7	M
1980	XG	14.4	801207	14.19	303.83	137.41	22.42	0.1885	2.2858	30	7	E
1980	XM	12.5	801227	114.91	283.16	22.65	10.53	0.0923	2.9918	29	6	M
1980	YL	13.5	801227	1.79	9.64	75.48	6.61	0.1225	2.2313	8	5	M
1980	YQ	13.5	801227	358.58	192.08	282.06	5.07	0.1294	2.5402	9	6	1 M
1981	AV	13.5	801227	87.15	240.89	112.11	18.92	0.2360	2.7029	13	3	E
1981	BC	16.0	810205	34.88	110.41	333.31	9.19	0.2404	2.3705	10	4	B

Note 1: double designations 1975 XY1 = 1975 VJ6 (B), 1975 XP3 = 1975 VM6

(B), 1978 RM = 1978 RH2 (c), 1978 RO1 = 1978 RQ (M), 1978 RJ2 = 1978 RN1 = 1978 RR4 (c), 1980 YQ = 1981 AL (M). 2: e assumed.

* * * * *

ORBITAL ELEMENTS BY S. NAKANO, SUMOTO, AND T. URATA, SHIMIZU, JAPAN.

The following orbital elements are from NOC 1171-1174. The identifications are by T. Urata unless otherwise stated.

(2345)* 1974 OS = 1951 EC2 = 1969 QJ = 1972 EG = 1972 GP = 1972 GT
= 1975 XH2

Discovered 1974 July 25 by T. Smirnova at the Crimean Astrophysical Observatory.

Epoch 1981 July 15.0 ET = JDE 2444800.5

M	2.62749	(1950.0)	P	Q
n	0.18799187	Peri. 133.80199	+0.20496743	-0.96988008
a	3.0179359	Node 303.92627	+0.84624793	+0.24316822
e	0.0726346	Incl. 9.12633	+0.49178530	-0.01420697
P	5.24	B(1,0) 11.9		

Residuals in seconds of arc

510306	711	3.2-	0.9+	Y	790727	675	1.1-	2.3-	801012	394	1.8-	1.6-
690821	095	6.9+	1.6+		800930	372	3.0-	0.1-	801013	801	0.3-	0.1+
720314	095	3.5+	4.6-		801001	372	0.5-	3.8+	801106	688	1.0+	1.9-
720409	095	3.8-	4.9-		801002	372	0.9+	0.6+	801106	688	1.0+	1.1-
720412	095	0.7+	2.5-		801002	372	0.2-	0.8+	801108	879	1.7-	0.3+
740725	095	2.8+	0.4-		801004	893	(5.4-	1.1-)	801108	879	0.5+	0.3+
740727	095	1.3+	1.3-		801004	893	1.3+	2.4+	801129	688	1.1+	1.3-
740822	095	1.2+	1.4+		801007	893	1.7+	1.3+	801129	688	1.1+	1.0-
751202	095	6.6-	3.7-		801007	893	1.5-	2.3+	801204	688	1.7+	2.6-
790724	675	3.5-	1.5-		801011	394	2.1+	1.2-	801204	688	0.5+	2.2-
790724	413	2.3-	3.3-		801011	394	2.6+	0.0				
790725	675	2.6-	1.0-		801012	394	0.9+	2.1-				

1973 SZ2 = 1950 TH4 = 1969 AR = 1975 BT = 1978 PC1

The identifications 1973 SZ2 = 1976 GH3 and 1973 SZ2 = 1976 GK7 (NOC 1053) are invalid.

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

M	93.55403		(1950.0)		P		Q
n	0.17169615	Peri.	298.13437	+0.41366243		-0.91015230	
a	3.2059978	Node	127.41283	+0.84488667		+0.37455808	
e	0.1881103	Incl.	1.62317	+0.33919007		+0.17700009	
P	5.74	B(1,0)	12.5				

Residuals in seconds of arc

501009	711	(7.9- 40.7+)Y	730922	095	0.9+	2.9+	731026	095	0.5-	0.5+
501010	711	(2.9- 0.9-)Y	730926	095	0.5+	0.7+	750117	095	0.3+	1.0+
690115	095	0.3- 2.6-	731002	095	1.2-	3.0-	780808	095	0.5+	2.0-

1976 QG1 = 1959 EO = 1974 EG

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

M	262.52020		(1950.0)		P		Q
n	0.19959602	Peri.	280.47618	+0.08636576		-0.99621354	
a	2.8998064	Node	164.55868	+0.92804395		+0.07680591	
e	0.0232564	Incl.	2.14741	+0.36231943		+0.04073608	
P	4.94	B(1,0)	13.0				

Residuals in seconds of arc

590306	690	11.7- 0.0 Y	760826	095	2.8-	2.4+	760928	095	2.6-	3.2-
590309	690	12.3+ 1.5+ Y	760924	095	0.8+	1.7+	760928	095	3.3+	2.4+
740313	095	0.7+ 1.8+	760928	095	(16.1-	20.2-)				

1980 VN = 1974 VL2 = 1974 XC

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

M	77.90203		(1950.0)		P		Q
n	0.15708468	Peri.	305.71260	+0.93735940		+0.29556264	
a	3.4018438	Node	38.08107	-0.13265521		+0.79226839	
e	0.1607809	Incl.	17.39513	-0.32211791		+0.53381037	
P	6.27	B(1,0)	12.3				

Residuals in seconds of arc

741115	095	1.8+ 0.0	801113	688	0.3-	0.0	801204	688	0.1+	0.4-
741214	095	2.2- 0.2+	801114	688	0.1-	0.4-	801204	688	2.2+	0.0
801109	688	0.6- 0.2+	801114	688	0.5-	0.4+	801210	688	1.7+	1.1-
801109	688	0.2+ 0.6+	801129	688	0.2+	0.7+	801210	688	0.1-	0.0
801113	688	1.4- 0.3-	801129	688	0.9-	0.0				

* * * * *

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. 19.87409 ET

q	2.5839288		(1950.0)		P		Q
		Peri.	334.97750	+0.01779167		+0.32450494	
		Node	278.82279	-0.67768523		-0.69153745	
e	1.0	Incl.	73.14486	-0.73513684		+0.64534679	

From 23 observations 1980 June 13-Oct. 6.

Periodic Comet Lovas (1980s)

T 1980 Sept. 3.45087 ET

q	1.6757349	(1950.0)	P	Q	
n	0.10880362	Peri.	72.57996	+0.56833130	-0.82025569
a	4.3455074	Node	342.32219	+0.65066875	+0.49614156
e	0.6143753	Incl.	12.29310	+0.50361664	+0.28464741
P	9.06				

From 9 observations 1980 Dec. 5-1981 Feb. 1.

Comet Meier (1980q)

T 1980 Dec. 9.52089 ET

q	1.5220767	(1950.0)	P	Q	
		Peri.	87.91336	+0.11320422	-0.90433646
		Node	24.78891	-0.53548625	-0.40442525
e	1.0	Incl.	101.02783	+0.83692250	-0.13643970

From 36 observations 1980 Nov. 6-1981 Jan. 17.

Comet Bradfield (1980t)

Epoch 1980 Dec. 27.0 ET = JDE 2444600.5

T 1980 Dec. 29.54169 ET

q	0.2598203	(1950.0)	P	Q	
z	+0.0011282	Peri.	358.28658	-0.43720717	+0.66887242
	+/-0.0000555	Node	114.64609	+0.83277674	+0.04865799
e	0.9997069	Incl.	138.58755	+0.33960681	+0.74178305

From 14 observations 1980 July 18-1981 Jan. 12, mean residual 1".0.

Comet Panther (1980u)

T 1981 Jan. 27.35402 ET

q	1.6576358	(1950.0)	P	Q	
		Peri.	105.61703	-0.17690895	-0.86121059
		Node	331.28756	-0.16224505	+0.50299614
e	1.0	Incl.	82.64930	+0.97076246	-0.07287800

From 42 observations 1980 Dec. 27-1981 Feb. 19.

Comet Russell (1980l)

T 1981 Mar. 6.34282 ET

q	2.1107036	(1950.0)	P	Q	
		Peri.	297.27145	+0.15678187	-0.77233586
		Node	232.07359	-0.36902689	-0.62393785
e	1.0	Incl.	128.70488	-0.91609966	+0.11915907

From 10 observations 1980 Sept. 6-Dec. 6.

Periodic Comet Gale

Epoch 1981 Oct. 3.0 ET = JDE 2444880.5

T 1981 Oct. 27.92912 ET

q	1.1981458	(1950.0)	P	Q	
n	0.08871381	Peri.	210.62148	+0.08102369	+0.98137437
a	4.9789974	Node	64.52280	-0.87086095	+0.15470635
e	0.7593600	Incl.	11.12470	-0.48480549	-0.11388721

P 11.11

From 46 observations 1927-1938; residuals up to 20".

(1793) Zoya

Epoch 1981 July 15.0 ET = JDE 2444800.5

M 359.21797

		(1950.0)	P	Q	
n	0.29709202	Peri.	322.59041	-0.98946334	+0.14355732
a	2.2243787	Node	225.67470	-0.12566594	-0.91603925
e	0.0975089	Incl.	1.50620	-0.07190523	-0.37451753
P	3.32	B(1,0)	13.7		

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

320627	078	(8.4+ 4.3-)Y	531111	760	3.3-	0.4-	731030	095	0.1+	4.2+
331021	012	1.7- 0.8-	531205	760	0.9-	1.5+	731123	049	0.5+	0.0
331023	012	0.1- 2.2-	531205	760	1.5+	2.6+	731123	049	0.2-	0.3-
461003	062	(79.2- 35.8-)X	531208	024	1.6+	0.7-	731126	049	0.9-	0.5+
461006	062	(0.04- 0.00-)X	680228	095	0.6-	4.7+	731126	049	1.3-	0.4+
490820	690	(42.9- 10.1-)Y	680303	095	(3.2- 15.4+)		750606	076	(1.6- 3.8-)	
490824	690	(5.7+ 13.7-)Y	680330	095	0.1+	2.8+	760924	095	0.2-	0.0
490826	690	(2.2- 5.7+)Y	690913	095	(0.7- 3.5-)		761024	381	0.5+	1.5+
510108	711	(8.9- 2.4-)Y	710127	095	0.9-	3.6-	761024	381	0.6-	0.5+
510108	711	4.9+ 0.3- Y	710220	095	1.6-	0.9-	761026	095	1.8+	0.3-
510109	012	2.7- 0.2-	720713	095	0.3+	0.3-	761118	381	1.2-	1.1-
510112	012	4.6+ 2.7+	720716	095	0.7+	0.5-	761118	381	0.5-	0.4-
531109	024	(2.9- 3.4-)	720719	095	2.5+	0.4+	810103	688	0.5-	2.2-
531111	760	1.9- 0.1-	720815	095	1.4-	2.1+	810103	688	1.0+	2.5-

(2346)* 1934 CB = 1929 WV = 1929 XO = 1932 NE = 1951 YA2 = 1958 TU
 = 1969 UM = 1978 EH4 = 1980 XP

Discovered 1934 Feb. 5 by K. Reinmuth at Heidelberg.

Epoch 1981 July 15.0 ET = JDE 2444800.5

M	114.56998		(1950.0)		P		Q		
n	0.27004953	Peri.	105.25507		+0.97944503		+0.17896549		
a	2.3705026	Node	244.50911		-0.20057064		+0.91307433		
e	0.1569802	Incl.	5.91701		+0.02142067		+0.36642408		
P	3.65	B(1,0)	13.5						

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

291127	690	(13.4+ 27.1+)Y	511228	711	3.0-	0.7- Y	801212	046	0.5+	0.0
291203	690	(46.7+ 18.7-)Y	581014	760	(0.05- 0.00+)X		801229	046	1.3-	0.4-
320708	094	1.2+ 0.7-	691016	095	0.4+	2.5+	801229	046	0.1+	0.2+
320713	094	0.7- 1.2-	780306	095	0.6-	0.6+	801230	046	0.6-	1.6+
340205	024	4.5+ 0.5+	801208	046	0.3+	0.7-	801230	046	1.0+	0.2+
340210	024	1.0+ 0.2-	801208	046	0.4+	1.6-				
340214	024	3.4- 1.8-	801212	046	0.5+	1.0-				

(2347)* 1936 TK = 1976 EG = 1979 PC

Discovered 1936 Oct. 7 by H. L. Giclas at the Lowell Observatory.

Epoch 1981 July 15.0 ET = JDE 2444800.5

M	76.22533		(1950.0)		P		Q		
n	0.18099546	Peri.	104.01264		+0.79283225		-0.57214808		
a	3.0952158	Node	291.29372		+0.43494780		+0.77247504		
e	0.2084565	Incl.	13.02016		+0.42689277		+0.27555194		
P	5.45	B(1,0)	12.5						

Residuals in seconds of arc

361007	690	2.0+ 0.9+	790829	046	1.0-	0.9+	790916	046	1.0-	0.2-
361009	690	0.6+ 0.5-	790829	046	0.2-	0.8+	790919	046	1.9+	0.4+
361011	690	1.3- 3.3-	790830	046	0.4-	1.5+	790919	046	2.1+	0.1+
760307	808	0.9+ 0.1+	790830	046	0.3-	1.4+	801215	801	0.4-	2.3+
760307	808	0.3- 0.4+	790912	046	2.0-	0.5+	801230	688	1.8+	0.4-
790814	046	(0.6+ 17.8+)Y	790912	046	1.0-	0.5-	801230	688	0.6+	1.3-
790814	046	(2.8- 17.7+)Y	790913	046	0.1-	0.5-	810109	801	1.3-	2.6+
790825	046	0.6+ 0.8+	790913	046	0.1-	0.6-				
790825	046	0.8- 0.2-	790916	046	0.1+	0.1-				

(2348)* 1939 AA = 1958 GR = 1965 DA = 1975 XA5 = 1978 QH1

Discovered 1939 Jan. 10 by M. B. Protitch at Belgrade. The identifi-
 cations 1939 AA = 1937 PE (MPC 2807) and (1606) = 1958 GR (MPC 1898) are in-
 valid.

Epoch 1981 July 15.0 ET = JDE 2444800.5

M 157.28746	(1950.0)		P	Q
n 0.26546098	Peri. 294.10504	-0.50551391		-0.86277256
a 2.3977409	Node 186.28241	+0.81818180		-0.47606196
e 0.1698776	Incl. 4.66461	+0.27392373		-0.17026016
P 3.71	B(1,0) 13.5			

Residuals in seconds of arc

390110	057(10.0- 0.4+)Y	390206	012	4.0+	4.4-	580413	330	0.8+	2.4+
390114	057(12.4- 16.5-)Y	390208	012	1.6+	1.6+	580415	330	1.8+	3.3+
390115	057(4.5+ 13.2+)Y	390208	057	(6.6- 20.8+)Y		650223	330	1.2-	1.7+
390117	057(11.9+ 6.2+)Y	390209	057	(8.3+ 4.4+)Y		751203	095	0.2+	6.4+
390119	057(7.5+ 17.3-)Y	390213	012	5.0+	6.7-	780831	095	0.1+	0.2-
390126	012 1.7+ 2.8+	390215	057	(13.8- 20.4+)Y		780905	095	0.3+	0.1+
390127	057(2.9+ 3.9+)Y	390217	057	(6.7- 27.9+)Y		780927	095	1.1-	1.5+
390206	057(35.9+ 39.9+)Y	390219	057	(16.5- 23.9+)Y					

(2349)* 1970 OG = 1969 LC = 1979 NA

Discovered 1970 July 30 by T. Smirnova at the Crimean Astrophysical Observatory.

Epoch 1981 July 15.0 ET = JDE 2444800.5

M 107.87085	(1950.0)		P	Q
n 0.21394636	Peri. 216.73318	+0.96367338		+0.15189114
a 2.7686376	Node 132.95876	-0.10997766		+0.97524191
e 0.1185826	Incl. 17.46863	-0.24338967		+0.16072427
P 4.61	B(1,0) 12.5			

Residuals in seconds of arc

690606	095 1.2- 1.3-	790702	805	1.2-	1.0-	801109	688	1.5+	2.6-
700730	095 0.4+ 0.8+	790702	805	1.7-	1.9-	801109	688	1.1+	2.6-
700731	095 (4.6+ 7.9-)	790702	805	2.1+	1.0-	801206	879	0.9-	1.7+
700807	095 1.5+ 1.2+	790715	805	0.1+	2.6-	801206	879	0.8-	0.6+
700808	095 (2.8+ 6.7+)	790715	805	1.1-	2.1-	801210	688	1.0+	0.9-
700809	095 2.0- 2.1+	790715	805	1.0+	0.6-	801210	688	0.9+	2.4-
700811	095 0.5+ 3.2+	790716	805	0.5-	0.6-	801215	801	1.0-	0.1-

1934 RR = 1967 RT = 1978 PQ3

The identification 1974 SJ = 1967 RT (MPC 5518) is invalid.

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

M 258.30397	(1950.0)		P	Q
n 0.26843452	Peri. 206.42266	+0.97078297		-0.23963999
a 2.3800058	Node 167.42404	+0.22898294		+0.90972827
e 0.1829465	Incl. 3.25768	+0.07174421		+0.33906804
P 3.67	B(1,0) 15.0			

Residuals in seconds of arc

340907	024 0.3+ 0.9+	341008	024	3.1-	0.5+	780927	095	2.8-	2.2+
340908	024 0.1+ 1.4-	670911	095	5.7+	5.7-	780928	095	4.8-	0.7+
340917	024 0.5+ 1.8-	780808	095	2.0+	1.7+				
341003	012 1.4+ 0.5+	780903	095	0.6-	1.0+				

1972 KJ = 1978 QX1

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

M 231.02478	(1950.0)		P	Q
n 0.18935564	Peri. 135.40391	+0.60704668		+0.79425514
a 3.0034340	Node 171.85480	-0.77012679		+0.59592682
e 0.0996963	Incl. 10.39151	-0.19595672		+0.11844825
P 5.21	B(1,0) 13.0			

Residuals in seconds of arc

720517	095 0.8+ 0.8-	720610	095	0.1-	0.4-	780905	095	0.3-	0.1-
720606	095 0.9- 1.9+	780831	095	0.2+	0.2+	780927	095	0.6+	0.1+

1974 KB = 1978 QR1

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

M	44.12395	(1950.0)	P	Q	
n	0.29316446	Peri.	276.31926	-0.55921760	+0.82802679
a	2.2442059	Node	319.59162	-0.73366762	-0.51709957
e	0.1129366	Incl.	3.58976	-0.38601489	-0.21674793
P	3.36	B(1,0)	14.5		

Residuals in seconds of arc

740518	808	0.4-	0.2+	740527	808	0.6-	0.7-	740617	808	1.8-	1.0-
740518	808	0.6-	0.1-	740611	808	0.3-	0.6-	740617	808	1.3-	1.0-
740522	808	0.1+	0.5-	740611	808	0.2+	0.6-	780831	095	1.9+	0.3-
740522	808	0.7+	0.9-	740612	808	0.1-	0.8-	780905	095	1.1+	0.6+
740526	808	0.7-	0.9-	740612	808	0.3-	0.2-	780927	095	3.3-	0.1+
740526	808	1.4-	1.0-	740613	808	0.8-	1.7-				
740527	808	0.1-	0.1-	740613	808	1.3-	0.8-				

1974 SJ = 1952 HS2 = 1976 GJ

The identification 1974 SJ = 1976 GJ is by T. Urata (MPC 5518). The identification 1974 SJ = 1967 RT is invalid (see above orbit for 1934 RR).

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

M	282.75428	(1950.0)	P	Q	
n	0.28328170	Peri.	260.06525	+0.37751269	-0.92569905
a	2.2961023	Node	167.67406	+0.88722187	+0.35422877
e	0.0921101	Incl.	6.39553	+0.26518204	+0.13267723
P	3.48	B(1,0)	14.5		

Residuals in seconds of arc

520426	711	0.3+	0.5+	Y	740921	095	0.4-	5.6-	741019	808	1.0+	1.2+
740919	095	2.4-	0.6-		741010	808	0.2+	0.5+	760401	095	1.0+	0.4-
740921	808	0.3-	0.9+		741010	808	0.9+	0.6+	760404	095	0.1-	0.7-
740921	808	1.7+	3.2+		741019	808	1.5+	1.4+				

1978 DA

Epoch 1981 July 15.0 ET = JDE 2444800.5

M	301.95692	(1950.0)	P	Q	
n	0.25266122	Peri.	32.42931	-0.92176354	+0.38483498
a	2.4780515	Node	169.86277	-0.38761210	-0.91120254
e	0.5872779	Incl.	15.64900	-0.01043273	-0.14701006
P	3.90	B(1,0)	18.8		

From 41 observations 1978 Feb. 17-July 31, mean residual 1".5.

1978 RP

The 1981 observations were identified by E. Bowell.

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

M	324.03551	(1950.0)	P	Q	
n	0.17962955	Peri.	95.93717	-0.83864353	+0.54326717
a	3.1108929	Node	116.97525	-0.51550809	-0.76842098
e	0.1203081	Incl.	2.52195	-0.17586481	-0.33821586
P	5.49	B(1,0)	12.5		

Residuals in seconds of arc

780901	095	0.4-	1.2-	780928	095	3.8+	0.3+	810101	688	2.4-	1.0-
780905	095	0.7+	0.2-	781004	095	2.3+	1.9+	810110	688	3.8-	0.2-
780907	095	0.6+	0.9+	781009	095	0.7-	0.9+	810110	688	2.6-	0.6-
780912	095	1.7+	1.4+	810101	688	3.8-	0.4-				

1979 OC

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

M	201.28614		(1950.0)		P		Q
n	0.28429122	Peri.	64.12696	+0.75138282		+0.64783514	
a	2.2906634	Node	255.22576	-0.64228051		+0.67443014	
e	0.0853122	Incl.	7.45353	-0.15132615		+0.35419432	
P	3.47	B(1,0)	14.5				

Residuals in seconds of arc

790723	688	1.0+	0.0	790830	046	0.1-	0.3-	791116	801	0.3+	1.3+
790724	688	0.5+	1.6-	790917	046	0.4-	0.6+	791210	801	0.9+	2.1+
790726	688	1.2+	1.6-	790917	046	1.5+	0.0	810108	046	2.0+	2.0-
790730	688	0.3+	1.7-	790921	801	4.6-	1.1-	810108	046	1.0+	0.6-
790827	688	0.7+	0.3+	790924	801	0.4-	0.9-	810109	688	6.3-	0.7-
790830	046	0.5+	0.1+	791022	801	0.8-	0.9+	810109	688	2.1+	0.3-

1980 WF

Epoch 1981 July 15.0 ET = JDE 2444800.5

M	59.38572		(1950.0)		P		Q
n	0.29581686	Peri.	212.79919	-0.06656200		-0.99297287	
a	2.2307664	Node	241.18785	+0.93778749		-0.02876590	
e	0.5140687	Incl.	6.41179	+0.34076989		-0.11479289	
P	3.33	B(1,0)	19.5				

From 15 observations 1980 Nov. 29-1981 Feb. 10, mean residual 1".8.

* * * * *

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

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

(1474) Beira

Epoch 1981 July 15.0 ET = JDE 2444800.5

M	23.22209		(1950.0)		P		Q
n	0.21814294	Peri.	83.20371	+0.61895525		-0.73926892	
a	2.7330145	Node	323.83502	+0.41527706		+0.59471355	
e	0.4905591	Incl.	26.71476	+0.66666285		+0.31590703	
P	4.52	B(1,0)	13.8				

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

350820	078	4.0-	2.1-	410220	024	1.3-	0.3+	500218	760	0.8-	0.2-
350824	078	(57.3-	16.3-)X	410222	094	(13.1+	1.7-)X	590211	024	0.9-	3.1-
350905	078	5.7+	1.5-	410226	024	(83.9+	55.5+)X	590227	012	(11.4+	0.3+)
350917	078	1.6+	1.6-	440816	078	(0.03+	0.01-)X	680205	095	0.5+	1.9+
350926	078	1.8-	2.0+	500122	012	(16.9+	0.5-)				
351002	078	0.4+	1.2+	500218	760	0.1-	1.2-				

(2350)* 1938 CG = 1975 EY1

Discovered 1938 Feb. 6 by A. Bohrmann at Heidelberg.

Epoch 1981 July 15.0 ET = JDE 2444800.5

M	31.90999		(1950.0)		P		Q
n	0.29363008	Peri.	287.08800	+0.37518641		-0.92525511	
a	2.2418283	Node	140.72935	+0.88052694		+0.33685999	
e	0.1263869	Incl.	5.07732	+0.28966784		+0.17443717	
P	3.36	B(1,0)	14.5				

Residuals in seconds of arc

380206	024	0.1+	3.0+	750116	330	0.2-	0.0	750312	095	1.8+	0.1-
380219	024	1.0-	0.0	750122	330	0.9+	1.2-	801005	809	1.0-	0.5-
380223	024	0.7+	0.6+	750212	330	(1.9+	11.0-)	801109	801	0.4-	0.9-
380304	024	1.6+	0.2-	750308	095	1.8-	0.7-				

(2351)* 1964 VD = 1976 SO2

Discovered 1964 Nov. 3 at the Goethe Link Observatory, Indiana University.

Epoch 1981 July 15.0 ET = JDE 2444800.5

M	50.95536		(1950.0)		P		Q
n	0.24515291	Peri.	59.73652		+0.83950205		-0.54255630
a	2.5283936	Node	333.08828		+0.47343479		+0.75701652
e	0.1893790	Incl.	3.73424		+0.26663797		+0.36408603
P	4.02	B(1,0)	14.5				

Residuals in seconds of arc

641009	330	0.1+	0.8-	641109	330	4.4+	0.0	800912	801	0.1-	0.9-
641030	330	0.2-	0.4-	760924	095	0.5-	0.6+	801013	801	1.3+	1.4-
641103	760	0.6-	0.5+	760929	095	0.8+	1.6+	801031	801	1.3-	0.2+
641103	760	3.3-	0.0	761026	095	1.1-	0.5+				

(2352)* 1969 RY = 1975 VW

Discovered 1969 Sept. 10 by L. Chernykh at the Crimean Astrophysical Observatory.

Epoch 1981 July 15.0 ET = JDE 2444800.5

M	67.43849		(1950.0)		P		Q
n	0.18039751	Peri.	114.93173		+0.95123551		+0.23328080
a	3.1020517	Node	232.22781		-0.27911972		+0.92946608
e	0.1217866	Incl.	14.79263		+0.13131332		+0.28578464
P	5.46	B(1,0)	12.2				

Residuals in seconds of arc

690910	095	2.9+	0.6+	751201	095	3.6+	3.3-	801010	688	1.1+	2.5-
691010	095	1.6+	0.7-	751202	095	0.6+	1.7+	801031	801	1.0-	1.8+
691013	095	4.5-	0.6-	790616	801	0.7-	0.6-	801108	879	1.1-	1.4+
751101	095	(1.6-	10.8+)	790703	801	0.3+	2.4+	801108	879	0.4-	0.9+
751107	095	3.8-	3.5+	801010	688	1.2+	1.8-				

(2353)* 1975 UD = 1966 VG = 1970 SG1

Discovered 1975 Oct. 27 by P. Wild at Zimmerwald. The key identification 1975 UD = 1970 SG1 is by B. G. Marsden (MPC 4504).

Epoch 1981 July 15.0 ET = JDE 2444800.5

M	131.98271		(1950.0)		P		Q
n	0.21004228	Peri.	298.06309		+0.79522975		+0.60529713
a	2.8028395	Node	24.73632		-0.52274467		+0.71373000
e	0.1146577	Incl.	4.79807		-0.30716062		+0.35242710
P	4.69	B(1,0)	13.0				

Residuals in seconds of arc

661112	095	0.6-	5.8+	751105	026	0.6-	1.2+	801109	688	1.6+	1.6-
700930	095	0.0	1.8-	751121	026	0.3-	0.5+	801129	879	1.4-	0.4-
751027	026	0.8+	0.5+	751123	026	0.0	0.5+	801129	879	1.2+	0.1-
751028	026	4.1-	1.7+	801106	801	1.0+	0.6-	810103	801	0.6-	1.5+
751029	026	0.1+	0.2+	801109	688	1.9+	2.1-	810111	801	1.1-	0.7+

(2354)* 1978 PZ3 = 1929 VN = 1931 DE = 1969 PM = 1972 GP1 = 1977 JV

Discovered 1978 Aug. 9 by L. Chernykh and N. Chernykh at the Crimean Astrophysical Observatory.

Epoch 1981 July 15.0 ET = JDE 2444800.5

M	202.32854		(1950.0)		P		Q
n	0.21809467	Peri.	189.19415		+0.99623499		-0.08659203
a	2.7334178	Node	175.76662		+0.08271754		+0.93490309
e	0.1032302	Incl.	3.26482		+0.02595502		+0.34417732
P	4.52	B(1,0)	13.0				

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

291106	690(0.04+ 0.01+)X	720409	805	1.5-	1.1-	770523	095	1.1-	0.2-
310225	024 0.6+ 0.6+	720409	805	0.3-	1.8-	780809	095	0.7+	1.0+
690811	095 1.8- 0.9-	720410	805	0.6-	0.2-	780831	095	0.4-	0.5-
690821	095(98.4+ 81.5+)	720410	805	0.0	2.1-	780905	095	0.4+	0.3-
690823	095 0.9+ 0.6+	770515	095	1.2+	0.5+				
690908	095 1.0+ 2.6-	770518	095	0.9+	2.5+				

(2355)* 1978 UV1 = 1973 YE1 = 1976 JB3

Discovered 1978 Oct. 30 at the Purple Mountain Observatory.

Epoch 1981 July 15.0 ET = JDE 2444800.5

M 248.05275		(1950.0)		P		Q	
n 0.18726645	Peri.	278.20161		+0.87058507		+0.47158324	
a 3.0257246	Node	53.77521		-0.35435496		+0.79882196	
e 0.1095938	Incl.	10.01741		-0.34134178		+0.37348724	
P 5.26	B(1,0)	12.5					

Residuals in seconds of arc

731220	095	1.1-	2.4+	781103	330	0.5-	1.3-	800213	801	0.1-	1.2-
731221	095	0.1-	0.9+	781107	330	2.1+	1.8+	800312	801	0.0	1.1-
760503	095	0.3+	0.3+	781127	330	0.8-	0.3+	800313	801	0.2-	0.4+
781030	330	2.1+	0.6-	781130	330	1.8-	2.6-				

(2356)* 1979 UJ = 1970 GG1 = 1972 QD = 1972 RO3 = 1976 GM5

Discovered 1979 Oct. 17 by E. Bowell at the Anderson Mesa Station of the Lowell Observatory. The 1978 observations were identified at the Crimean Astrophysical Observatory.

Epoch 1981 July 15.0 ET = JDE 2444800.5

M 302.80128		(1950.0)		P		Q	
n 0.16949065	Peri.	26.56825		-0.81813317		+0.57355390	
a 3.2337434	Node	188.78445		-0.56379235		-0.81416958	
e 0.0387714	Incl.	15.63501		-0.11312073		-0.09035378	
P 5.82	B(1,0)	11.9					

Residuals in seconds of arc

700411	805	0.3-	0.7-	791017	688	1.4+	0.2+	801214	801	0.9+	2.7+
700411	805	0.5-	0.8+	791028	688	0.5+	0.7-	801215	801	1.3+	2.9+
700411	805	0.3-	1.2+	791122	688	1.3-	1.5+	801216	688	0.2-	0.8-
720816	095	2.0+	0.1+	791208	688	0.8-	0.4+	801216	688	1.9-	2.3-
720905	095	0.7+	1.3-	800122	688	0.3+	1.0-	810103	688	0.5-	0.5-
760402	095	0.6+	0.5-	801204	688	0.5+	2.1-	810103	688	1.6-	0.4-
780809	095	1.6-	0.6-	801204	688	1.1+	1.6-				
780926	095	1.3-	1.0+	801212	688	0.7+	0.2+				

(2357)* 1981 AC = 1959 EU = 1965 UQ1 = 1972 JP1 = 1976 SC1 = 1977 RM7

Discovered 1981 Jan. 1 by E. Bowell at the Anderson Mesa Station of the Lowell Observatory.

Epoch 1981 July 15.0 ET = JDE 2444800.5

M 244.04655		(1950.0)		P		Q	
n 0.08381643	Peri.	70.06623		-0.36126632		+0.93246213	
a 5.1711039	Node	178.75442		-0.87198895		-0.33745110	
e 0.0427324	Incl.	2.67568		-0.33033604		-0.12900053	
P 11.76	B(1,0)	10.0					

Residuals in seconds of arc

590306	690 (8.3+ 2.1-)Y	760925	095	2.7+	0.8+	770921	095	1.0+	1.6+
590307	690 (5.8+ 5.0+)Y	760928	095	0.6+	4.2-	810101	688	0.1+	0.8-
651019	330 0.3- 0.3-	760928	095	0.5-	1.1-	810101	688	0.8+	1.7-
720509	095 0.3+ 0.1+	760928	095	0.6-	0.9-	810109	688	0.5+	0.5+
720511	095 0.4- 1.4-	760929	095	0.7-	1.3+	810109	688	0.8-	0.7-
720516	095 0.0 0.4-	770911	095	1.9+	0.2-	810114	688	1.7-	0.1-
760924	095 1.3- 0.1+	770918	095	1.8-	1.0+				

A919 SA = 1963 RE

The identification is by O. Kippes.

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

M	82.77118		(1950.0)		P		Q
n	0.29119482	Peri.	22.00434	+0.98193434		-0.18872565	
a	2.2543144	Node	348.84783	+0.16132809		+0.87281294	
e	0.2358120	Incl.	4.06055	+0.09888476		+0.45008910	
P	3.38	B(1,0)	14.5				

Residuals in seconds of arc

190922	024	0.2+	1.0-	630914	760	0.3-	2.0+	630924	760	0.5+	3.1-
190925	024	1.0-	0.3+	630914	760	1.6+	0.0	630924	760	0.5-	1.9-
190930	045	3.0-	3.3-	630917	760	1.5-	2.8+	631010	760	2.4-	0.6+
191001	045	1.9-	2.3-	630917	760	1.1-	3.8-	631010	760	1.1-	1.4+

1934 FF = 1930 FF = 1949 UT = 1978 PO4

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

M	162.39597		(1950.0)		P		Q
n	0.23518705	Peri.	265.29405	+0.10591503		-0.99435874	
a	2.5993293	Node	178.58744	+0.97926491		+0.10330509	
e	0.1541883	Incl.	13.41366	+0.17269113		+0.02405732	
P	4.19	B(1,0)	13.5				

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

300330	024	0.3-	0.5+	340316	024	0.5-	1.3+	780926	095	0.3-	0.4+	
340310	754	0.8-	1.0-	340319	754	0.9+	2.5-	780927	095	1.7-	0.8+	
340314	754	0.8-	0.3-	491028	760	(0.04+	0.01-)	X	781002	095	2.2+	0.6-
340316	754	0.1+	0.6+	780809	095	0.8-	3.1-					

1939 FY = 1970 GN = 1975 WC = 1978 SW2

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

M	199.97054		(1950.0)		P		Q
n	0.28853430	Peri.	100.31990	-0.17353403		-0.98482751	
a	2.2681509	Node	359.66991	+0.83659807		-0.14696353	
e	0.0802790	Incl.	8.40698	+0.51960524		-0.09228483	
P	3.42	B(1,0)	13.5				

Residuals in seconds of arc

390216	062	0.3+	0.2-	700407	805	0.2-	1.5+	781005	095	1.2-	3.2+
390314	062	2.8+	0.9+	700407	805	0.1+	1.3+	781008	095	0.3+	3.5+
390322	062	1.9+	0.8+	751127	095	0.9-	7.3-				
700407	805	0.5-	0.7+	780926	095	0.5+	2.0+				

1978 PP2 = 1933 FM1 = 1949 QN = 1962 GD = 1974 WH

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

M	69.62294		(1950.0)		P		Q
n	0.20460156	Peri.	127.70440	-0.55424409		-0.83235215	
a	2.8523159	Node	355.95296	+0.75519252		-0.50193345	
e	0.0250051	Incl.	1.49366	+0.34999678		-0.23505892	
P	4.82	B(1,0)	13.0				

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

330325	024	0.2+	1.7+	490820	690	(0.05+	0.03+)	Y	780808	095	1.1-	0.4-
330414	024	1.8+	0.6-	620404	760	(0.07-	0.03+)	X	780903	095	0.3-	1.8+
330420	024	0.6+	5.0+	741117	095	2.5+	1.3+		780928	095	0.5-	3.1+
490818	690	(0.06+	0.04+)	Y	741118	095	3.3-	1.9+				

1978 PQ2 = 1952 SA1 = 1974 VV

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

M	229.84756		(1950.0)		P		Q
n	0.22511350	Peri.	153.68974	+0.97811884			+0.20787443
a	2.6763067	Node	194.32006	-0.19640092			+0.90916881
e	0.2181607	Incl.	1.96263	-0.06863097			+0.36083277
P	4.38	B(1,0)	14.5				

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

520929	760	(0.05+ 0.01-)X	741117	095	0.1+	2.6-	780928	095	0.4+	0.1+
741112	095	1.8- 2.3-	780808	095	0.3+	0.1-				
741115	095	1.7+ 4.7+	780903	095	0.7-	0.1+				

1978 PF3 = 1948 RZ = 1948 RL1 = 1948 TB = 1951 EK = 1974 SX4 = 1974 WL1

The 1948 double designations are by O. Kippes (MPC 600; NAZ 12, 22).

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

M	257.72745		(1950.0)		P		Q
n	0.22854592	Peri.	338.27671	+0.60438588			+0.79624273
a	2.6494431	Node	328.88952	-0.72308072			+0.53414116
e	0.2787666	Incl.	2.96691	-0.33447268			+0.28406113
P	4.31	B(1,0)	13.5				

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

480914	094	(0.05- 0.04-)X	510313	024	0.4+	0.7+	780926	095	1.1+	0.9-
480929	020	(0.06+ 0.01-)X	740926	095	0.4+	1.2+	780928	095	0.6+	1.0+
481002	020	(0.04+ 0.01+)X	741118	330	0.7-	0.6-	781002	095	0.6+	1.1-
481008	062	(0.06- 0.05-)X	780808	095	0.9-	0.1-				
481009	020	(0.02+ 0.03-)X	780903	095	1.1-	1.2+				

1978 PP3 = 1951 UJ = 1958 BF = 1973 UA1 = 1975 BF1 = 1976 JH3

The identification 1975 BF1 = 1971 TD2 (NOC 1053) is invalid.

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

M	120.45296		(1950.0)		P		Q
n	0.17861823	Peri.	316.82129	+0.40366700			-0.91398158
a	3.1226242	Node	109.33268	+0.85078624			+0.35846922
e	0.1645493	Incl.	2.49741	+0.33647543			+0.19009864
P	5.52	B(1,0)	13.0				

Residuals in seconds of arc

511029	760	1.7+ 4.1+	731026	095	1.7+	6.1-	780903	095	0.0	0.7-
511029	760	4.7- 0.5+	750118	095	1.9-	2.4-	780928	095	1.1+	0.2-
580119	760	0.1+ 0.8+	760502	095	0.3-	0.5-				
580119	760	1.2+ 0.6-	780808	095	0.3+	0.2+				

1978 QK1 = 1977 DG5

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

M	293.38192		(1950.0)		P		Q
n	0.23006422	Peri.	101.45449	-0.05775452			+0.99503085
a	2.6377737	Node	164.52418	-0.99270728			-0.04862857
e	0.2412357	Incl.	17.69534	-0.10581431			-0.08688421
P	4.28	B(1,0)	14.0				

Residuals in seconds of arc

770218	381	0.2- 0.0	770219	381	0.6+	0.8-	780905	095	0.3-	0.4-
770219	381	0.3- 0.8+	780831	095	0.3+	0.3+	780927	095	0.0	0.0

1978 QT1 = 1973 QJ

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

M	132.28901		(1950.0)		P		Q
n	0.20157896	Peri.	168.50459	+0.32151716			-0.94674336
a	2.8807580	Node	262.73886	+0.86732548			+0.30183215
e	0.0518723	Incl.	1.00666	+0.37996476			+0.11213543
P	4.89	B(1,0)	13.0				

Residuals in seconds of arc

730827	095	0.4-	0.5-	730905	095	1.5-	0.3-	780905	095	0.1+	0.0
730831	095	0.8+	2.1-	780831	095	0.3+	0.1-	780927	095	1.0-	1.2-

1978 SY2 = 1953 DB = 1968 QO = 1973 AS4 = 1973 CF = 1973 EG

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

M	246.80387		(1950.0)		P		Q
n	0.29616584	Peri.	105.27527	+0.37692768		-0.92406913	
a	2.2290181	Node	322.38396	+0.80489983		+0.36065859	
e	0.1261935	Incl.	5.96382	+0.45832496		+0.12657655	
P	3.33	B(1,0)	14.0				

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

530219	760(0.02+ 0.03+)X	730307	029	0.2-	0.8-	781002	095	1.4-	1.5+		
680827	095	3.1+	5.7-	730307	029	1.8-	1.2-	781005	095	0.4-	0.5-
730103	095	2.3+	1.3+	730309	029	1.2-	1.6-	781008	095	0.2+	0.4-
730203	095	0.3-	0.7-	780926	095	0.0	2.0+				

1979 KL = 1952 SE = 1959 ET

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

M	11.93674		(1950.0)		P		Q
n	0.21198689	Peri.	275.52417	+0.43033898		-0.89822650	
a	2.7856779	Node	148.49867	+0.88103985		+0.39640488	
e	0.1445475	Incl.	9.85467	+0.19641065		+0.18987449	
P	4.65	B(1,0)	13.5				

Residuals in seconds of arc

520916	760(35.6+ 11.9+)X	790520	809	0.1+	0.0	790618	809	0.3+	0.3-		
590306	690	0.7-	5.3- Y	790524	809	0.4-	0.0	790721	809	0.2+	0.6+
590307	690	0.8+	5.4+ Y	790616	809	0.5-	0.3-	801005	809	0.0	0.2+
790519	809	0.2+	0.1+	790617	809	0.1+	0.0	801005	809	0.0	0.0

1979 KN

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

M	31.46139		(1950.0)		P		Q
n	0.18674990	Peri.	246.04512	+0.89727803		-0.42573131	
a	3.0313075	Node	138.88327	+0.44123056		+0.85619755	
e	0.0711085	Incl.	10.23202	+0.01441301		+0.29270908	
P	5.28	B(1,0)	14.0				

Residuals in seconds of arc

790519	809	0.1+	0.1+	790616	809	0.4+	0.2+	790721	809	0.9+	0.3+
790520	809	0.1-	0.4+	790617	809	3.1-	0.6+	801005	809	0.1-	0.1+
790524	809	0.1+	0.2+	790618	809	1.4+	0.0	801005	809	0.4+	0.3+

1979 MP1

The 1978 observations were identified by S. J. Bus.

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

M	161.69558		(1950.0)		P		Q
n	0.25904945	Peri.	164.04200	+0.86172624		+0.50731981	
a	2.4371474	Node	165.46559	-0.46864173		+0.80143507	
e	0.1212548	Incl.	1.68556	-0.19442943		+0.31674662	
P	3.80	B(1,0)	16.5				

Residuals in seconds of arc

780315	675	2.0-	1.2+	790623	413	0.6+	0.4+	790724	413	1.4+	0.4-
780315	675	0.0	0.5+	790624	413	1.0-	0.2+	790725	675	0.3-	1.0-
780316	675	1.0+	1.2-	790625	413	1.2-	0.8+	790727	675	3.7+	0.3+
780316	675	0.9+	0.8-	790724	675	2.2-	0.1+	790823	675	1.3-	0.0

1979 MR5

The 1978 observations were identified by S. J. Bus.

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

M	164.55226		(1950.0)		P		Q
n	0.27820186	Peri.	79.73474	+0.97244531		+0.23065090	
a	2.3239685	Node	266.92381	-0.22497145		+0.89027418	
e	0.1370214	Incl.	1.94640	-0.06113881		+0.39269839	
P	3.54	B(1,0)	17.0				

Residuals in seconds of arc

780315	675	1.7-	0.1+	790624	413	1.2-	0.1-	790724	413	0.3-	1.6-
780316	675	0.0	0.0	790625	413	0.7+	0.2+	790725	675	0.8+	0.3+
780316	675	1.5+	0.4-	790629	413	0.3+	0.5-	790727	675	2.8+	1.3-
790623	413	0.2-	0.5+	790724	675	1.1-	0.7+	790823	675	1.4-	0.7-

1979 ME8

The 1978 observations were identified by S. J. Bus.

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

M	33.77620		(1950.0)		P		Q
n	0.28639388	Peri.	281.16513	-0.40720072		-0.91321117	
a	2.2794379	Node	192.89614	+0.86236013		-0.37891434	
e	0.1362842	Incl.	3.92107	+0.30086968		-0.14989755	
P	3.44	B(1,0)	16.5				

Residuals in seconds of arc

780315	675	1.4-	0.9+	790625	413	2.3+	0.0	790727	675	0.2-	0.8+
780316	675	0.2-	0.2-	790629	413	1.3-	0.7+	790728	413	0.7+	0.1+
780316	675	1.7+	0.8-	790724	413	1.2-	1.2-	790823	675	0.7-	0.5-
790624	413	1.9-	0.7-	790726	675	2.1+	0.9+				

1980 RB1 = 1959 EH

Epoch 1981 July 15.0 ET = JDE 2444800.5

M	193.97154		(1950.0)		P		Q
n	0.42937020	Peri.	280.43955	-0.09063141		+0.98906610	
a	1.7401290	Node	342.99348	-0.68458748		-0.14671515	
e	0.2292301	Incl.	23.43812	-0.72327445		+0.01493057	
P	2.30	B(1,0)	16.0				

Residuals in seconds of arc

590306	690	1.2-	3.0-	800914	675	1.1+	0.8+	801129	675	1.3+	0.2-
590307	690	0.6-	2.2+	800916	675	1.8+	0.5-	801129	675	0.2-	0.3+
590310	690	2.8+	3.6+	801014	675	1.9-	0.7+	801201	675	2.4+	1.0+
800913	675	2.9-	2.5+	801014	675	1.6+	0.9-	801201	675	0.5-	0.9+
800913	675	3.5+	0.5+	801031	675	0.5-	0.3-				
800914	675	2.8-	1.4+	801102	675	2.4-	0.5-				

1980 SO = 1964 TG = 1964 VA

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

M	92.36927		(1950.0)		P		Q
n	0.24422637	Peri.	340.65616	+0.89994695		+0.43491266	
a	2.5347893	Node	353.31535	-0.35702429		+0.69459614	
e	0.1635493	Incl.	15.32483	-0.25025816		+0.57305076	
P	4.04	B(1,0)	12.5				

Residuals in seconds of arc

641004	760	1.5-	0.3-	800908	095	1.0+	2.5-	801003	046	0.2-	1.0+
641004	760	1.9+	0.8-	800929	046	0.5+	1.5-	801003	046	0.1+	1.4+
641101	760(38.1+ 36.1-)X			800929	046	0.2-	1.4-	801207	046	0.4+	1.0+
800906	095	1.7-	3.1+	801001	046	1.3-	0.4+	801207	046	1.1-	0.3-
800907	095	1.4+	0.4-	801001	046	0.0	0.2-				

1980 VP = 1951 EC1 = 1975 VH5

The identifications were independently found by T. Urata.

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

M 133.86786	(1950.0)	P	Q
n 0.18865195	Peri. 211.56133	+0.58990255	+0.78171590
a 3.0108980	Node 95.36417	-0.69203118	+0.61854447
e 0.0936388	Incl. 11.72500	-0.41606228	+0.07951727
P 5.22	B(1,0) 12.5		

Residuals in seconds of arc

510309 760	0.9+	0.3+	801109 688	0.2+	0.5-	801204 688	0.9-	0.7-
510309 760	0.9-	0.8-	801129 688	0.5+	0.6-	801230 688	0.1-	0.7+
751102 095	0.9-	1.6+	801129 688	1.0+	0.3-	801230 688	0.3+	0.7+
801109 688	0.8+	0.9-	801204 688	0.8-	0.0			

* * * * *

NEW NAMES OF MINOR PLANETS.

(1955) McMath = 1963 SR

Discovered 1963 Sept. 22 at the Goethe Link Observatory, Indiana University.

Named in memory of Robert R. McMath (1891-1962), astronomer, engineer and businessman. Co-donor of the McMath-Hulbert Observatory to the University of Michigan in 1931, he served as its director during 1931-1961. He was an adviser to the National Science Foundation in its early years and chaired the panel that advised NSF on the need for a national observatory and conducted the site survey leading to the selection of Kitt Peak. He played a leading role in the incorporation of AURA, served as its first president (1957-1958) and then as chairman of the AURA board. Name proposed by F. K. Edmondson.

(1994) Shane = 1961 TE

Discovered 1961 Oct. 4 at the Goethe Link Observatory, Indiana University.

Named in honor of C. D. Shane, the second president of AURA (1958-1962). He played a major role in the planning and construction of the first telescopes and buildings on Kitt Peak and also the Tucson headquarters building. Even more important was his initiative in arranging for AURA to take on the responsibility for the construction of a major observatory in the southern hemisphere; this led to the establishment of the Cerro Tololo Interamerican Observatory. His long and distinguished career at the University of California spanned a period of more than 50 years; he was director of the Lick Observatory during 1945-1958 and was responsible for modernizing and expanding its facilities. Name proposed by F. K. Edmondson.

(2131) Mayall = 1975 RA

Discovered 1975 Sept. 3 by A. R. Klemola at the Lick Observatory.

Named in honor of Nicholas U. Mayall, director of the Kitt Peak National Observatory during 1960-1971. It was under his direction that the planning and construction of a major portion of the astronomical facilities at the Kitt Peak and Cerro Tololo observatories were accomplished. He was on the Lick Observatory staff from 1945 to 1960. His major research contribution spans the domains of nebular spectroscopy, radial velocities of globular clusters and planetary nebulae, and the redshifts and internal motions of galaxies.

(2161) Grissom = 1963 UD

Discovered 1963 Oct. 17 at the Goethe Link Observatory, Indiana University.

Named in memory of Virgil I. "Gus" Grissom (1926-1967), one of the seven Mercury astronauts. On 1961 July 21, as pilot of the Mercury-Redstone 4 suborbital mission, he became the second American in space. In 1965 he commanded a three-orbit mission, the first manned Gemini flight. As command pilot of Apollo 1, he lost his life in the tragic fire in that spacecraft. Name proposed by D. Owings and F. K. Edmondson. Citation prepared by Muriel M. Thorne, NASA.

(2186) Keldysh = 1973 SQ4

Discovered 1973 Sept. 27 by L. I. Chernykh at the Crimean Astrophysical Observatory.

Named in memory of Academician Mstislav Vsevolodovich Keldysh (1911-1978), famous Soviet scientist and mathematician who made a valuable contribution to space science and engineering. He was president of the U.S.S.R. Academy of Sciences from 1961 to 1975.

(2188) Orlenok = 1976 UL4

Discovered 1976 Oct. 28 by L. V. Zhuravleva at the Crimean Astrophysical Observatory.

Named on the occasion of the 20th anniversary of the all-Union pioneer camp in the Tuapse region. An orlenok, or an eaglet, is the symbol of the young revolutionary.

(2192) Pyatigoriya = 1972 HP

Discovered 1972 Apr. 18 by T. M. Smirnova at the Crimean Astrophysical Observatory.

Named on the occasion of the 200th anniversary of the town Pyatigorsk, in the Caucasus.

(2205) Glinka = 1973 SU4

Discovered 1973 Sept. 27 by L. I. Chernykh at the Crimean Astrophysical Observatory.

Named for Mikhail Ivanovich Glinka (1804-1857), celebrated composer and the acknowledged founder of Russian classical music.

(2206) Gabrova = 1976 GR3

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

Discovered on All Fools' Day, this minor planet is named for the Bulgarian town known for its humor and high-spirited merriment.

(2207) Antenor = 1977 QH1

Discovered 1977 Aug. 19 by N. S. Chernykh at the Crimean Astrophysical Observatory.

This Trojan planet is named for the Trojan hero and sage who called for peace with the Greeks. He advised the citizens of Troy to put an end to the war by returning the kidnapped Helen to her husband Menelaus.

(2208) Pushkin = 1977 QL3

Discovered 1977 Aug. 22 by N. S. Chernykh at the Crimean Astrophysical Observatory.

Named for the great Russian poet Aleksandr Sergeevich Pushkin (1799-1837).

(2212) Hephaistos = 1978 SB

Discovered 1978 Sept. 27 by L. I. Chernykh at the Crimean Astrophysical Observatory.

This Apollo-type object is named for the god of fire and blacksmiths.

(2216) Kerch = 1971 LF

Discovered 1971 June 12 by T. M. Smirnova at the Crimean Astrophysical Observatory.

Named for the hero city in the Crimea.

(2217) Eltigen = 1971 SK2

Discovered 1971 Sept. 26 by T. M. Smirnova at the Crimean Astrophysical Observatory.

Named for the site of the heroic landing of Soviet troops in the Crimea in November 1943.

(2222) Lermontov = 1977 ST1

Discovered 1977 Sept. 19 by N. S. Chernykh at the Crimean Astrophysical Observatory.

Named for the great Russian poet Mikhail Yur'evich Lermontov (1814-1841).

(2228) Soyuz-Apollo

Discovered 1977 July 19 by N. S. Chernykh at the Crimean Astrophysical Observatory.

Named in honor of the joint Soviet-American space flight in 1975.

(2232) Altaj = 1969 RD2

Discovered 1969 Sept. 15 by B. A. Burnasheva at the Crimean Astrophysical Observatory.

Named by the discoverer for the place of residence of her mother, Elena Andreevna Vasil'eva.

(2233) Kuznetsov = 1972 XE1

Discovered 1972 Dec. 3 by L. V. Zhuravleva at the Crimean Astrophysical Observatory.

Named in memory of Nikolaj Ivanovich Kuznetsov (1911-1944), hero of the Soviet Union, renowned participant in the partisan movement during the Second World War.

(2238) Steshenko = 1972 RQ1

Discovered 1972 Sept. 11 by N. S. Chernykh at the Crimean Astrophysical Observatory.

Named in honor of Nikolaj Vladimirovich Steshenko, deputy director of the Crimean Astrophysical Observatory, whose comprehensive support has contributed to the success of the program for the discovery and observation of minor planets. Well-known for his work in solar physics, he is in charge of the program of solar observations from space, and he is the author of the design for the Soviet 25-m-diameter mosaic optical telescope.

(2245) Hekatostos = 1968 BC

Discovered 1968 Jan. 24 by L. I. Chernykh at the Crimean Astrophysical Observatory.

The Greek ordinal number acknowledges this as the 100th minor planet to be numbered as a result of the joint observational program of the Institute for Theoretical Astronomy in Leningrad and the Crimean Astrophysical Observatory at Nauchnij.

(2324) Janice = 1978 VS4

Discovered 1978 Nov. 7 by E. F. Helin and S. J. Bus at Palomar.

Named in honor of Janice Cline, who for many years has encouraged astrometric studies of minor planets at Caltech. Her kindness and support are greatly appreciated.

(2330) Ontake = 1977 DS3

Discovered 1977 Feb. 18 by H. Kosai and H. Hurukawa at the Tokyo Observatory's Kiso Station.

Named for the conical volcano near the Kiso station. In October 1979, for the first time in its recorded history, the volcano, which is 3063 m high, exhibited small eruptions.

(2343) Siding Spring = 1979 MD4

Discovered 1979 June 25 by E. F. Helin and S. J. Bus at Siding Spring.

Named for the New South Wales community in which the Australian National Observatory, Anglo-Australian Observatory and U.K. Schmidt telescope are located. This is the first minor planet discovered with the U.K. Schmidt telescope to be numbered.

* * * * *

EPHEMERIDES.

Comet Panther (1980u)

				Elements MPC 5837				
Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	ml
1981 02 25		19 32.88	+73 52.1	1.423	1.701	87.7	35.6	9.1
1981 03 07		19 55.21	+84 31.1					
1981 03 17		07 23.27	+84 02.1	1.405	1.779	94.1	33.9	9.2
1981 03 27		07 44.78	+72 46.8					
1981 04 06		07 56.31	+62 24.7	1.581	1.889	91.2	32.0	9.8
1981 04 16		08 06.53	+53 21.8					
1981 04 26		08 16.34	+45 41.4	1.915	2.025	81.3	29.4	10.5
1981 05 06		08 26.02	+39 14.7					
1981 05 16		08 35.62	+33 48.4	2.330	2.178	68.8	25.6	11.2
1981 05 26		08 45.16	+29 09.6					
1981 06 05		08 54.63	+25 07.5	2.764	2.345	55.6	20.9	11.9
1981 06 15		09 04.01	+21 33.5					
1981 06 25		09 13.27	+18 20.7	3.178	2.521	42.3	15.7	12.5
1981 07 05		09 22.39	+15 24.2					
1981 07 15		09 31.33	+12 40.0	3.545	2.703	29.1	10.5	13.1

Comet Bradfield (1980t)

				Elements MPC 5837				
Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	ml
1981 04 06		22 35.13	+12 09.4	2.831	2.100	35.7	16.1	14.5
1981 04 16		22 38.24	+13 03.0					
1981 04 26		22 39.80	+13 54.9	2.900	2.405	51.4	19.1	15.1
1981 05 06		22 39.65	+14 43.9					
1981 05 16		22 37.58	+15 28.0	2.881	2.694	69.2	20.5	15.6
1981 05 26		22 33.39	+16 04.8					
1981 06 05		22 26.91	+16 31.4	2.811	2.969	88.8	20.0	16.0
1981 06 15		22 18.03	+16 44.2					
1981 06 25		22 06.81	+16 39.5	2.738	3.233	110.2	17.2	16.3
1981 07 05		21 53.50	+16 13.9					
1981 07 15		21 38.62	+15 25.1	2.724	3.488	132.1	12.5	16.6
1981 07 25		21 22.94	+14 13.4					
1981 08 04		21 07.34	+12 41.7	2.823	3.734	149.7	7.9	17.0
1981 08 14		20 52.73	+10 55.6					
1981 08 24		20 39.80	+09 02.3	3.067	3.973	149.8	7.4	17.4
1981 09 03		20 29.00	+07 08.4					
1981 09 13		20 20.55	+05 19.6	3.447	4.206	133.7	10.0	17.9
1981 09 23		20 14.41	+03 39.8					
1981 10 03		20 10.44	+02 11.1	3.928	4.433	114.2	11.9	18.4
1981 10 13		20 08.42	+00 54.4					
1981 10 23		20 08.09	-00 10.3	4.462	4.654	94.9	12.3	18.9

1981 11 02	20 09.19	-01 03.4						
1981 11 12	20 11.49	-01 45.5	5.008	4.870	76.4	11.4	19.4	
1981 11 22	20 14.75	-02 17.7						
1981 12 02	20 18.80	-02 40.8	5.526	5.082	58.6	9.5	19.8	
1981 12 12	20 23.43	-02 55.5						
1981 12 22	20 28.49	-03 02.8	5.985	5.290	41.6	7.1	20.1	
1982 01 01	20 33.84	-03 03.5						
1982 01 11	20 39.34	-02 58.3	6.362	5.494	25.9	4.5	20.4	

Periodic Comet Russell 2 (1980o)

Elements MPC 5639

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	m2
1981 06 05		02 36.76	+12 52.6	4.131	3.327	33.0	9.6	20.3
1981 06 15		02 48.32	+13 59.6					
1981 06 25		02 59.29	+15 01.1	4.030	3.407	46.2	12.4	20.4
1981 07 05		03 09.58	+15 57.4					
1981 07 15		03 19.05	+16 48.4	3.877	3.486	60.2	14.7	20.4
1981 07 25		03 27.57	+17 34.3					
1981 08 04		03 34.97	+18 15.3	3.683	3.563	75.3	16.0	20.3
1981 08 14		03 41.07	+18 51.4					
1981 08 24		03 45.69	+19 23.0	3.466	3.640	91.8	16.1	20.3
1981 09 03		03 48.65	+19 49.9					
1981 09 13		03 49.77	+20 12.1	3.248	3.715	110.0	14.7	20.3
1981 09 23		03 48.93	+20 29.5					
1981 10 03		03 46.09	+20 41.6	3.063	3.788	130.3	11.6	20.2
1981 10 13		03 41.35	+20 48.3					
1981 10 23		03 34.95	+20 49.1	2.949	3.860	152.6	6.8	20.2
1981 11 02		03 27.32	+20 44.4					
1981 11 12		03 19.08	+20 35.0	2.942	3.930	175.7	1.1	20.3
1981 11 22		03 10.87	+20 22.5					
1981 12 02		03 03.36	+20 09.0	3.060	3.999	159.6	4.9	20.4
1981 12 12		02 57.09	+19 57.1					
1981 12 22		02 52.42	+19 48.8	3.292	4.065	136.8	9.5	20.7

Periodic Comet Encke

Elements MPC 5129

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	m2
1981 06 05		22 42.20	-13 21.8	2.265	2.589	96.8	22.9	20.0
1981 06 15		22 40.59	-13 34.0					
1981 06 25		22 36.19	-14 01.5	2.126	2.747	117.4	19.2	19.9
1981 07 05		22 28.90	-14 43.3					
1981 07 15		22 18.84	-15 36.8	2.032	2.893	140.8	12.8	19.7
1981 07 25		22 06.46	-16 37.2					
1981 08 04		21 52.51	-17 38.5	2.032	3.027	166.1	4.6	19.6
1981 08 14		21 38.05	-18 34.6					
1981 08 24		21 24.25	-19 20.4	2.160	3.151	166.5	4.3	19.8
1981 09 03		21 12.07	-19 53.5					
1981 09 13		21 02.25	-20 13.4	2.411	3.266	142.4	10.8	20.3
1981 09 23		20 55.08	-20 21.4					
1981 10 03		20 50.62	-20 19.2	2.756	3.372	120.2	14.9	20.8
1981 10 13		20 48.70	-20 08.5					
1981 10 23		20 49.04	-19 50.8	3.152	3.470	100.2	16.4	21.2

Periodic Comet Kearns-Kwee

Elements MPC 5129

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	m2
1981 06 05		02 25.57	+21 25.2	3.409	2.622	33.4	12.3	18.3
1981 06 15		02 43.83	+23 01.2					
1981 06 25		03 02.51	+24 32.7	3.190	2.547	43.2	15.9	18.1
1981 07 05		03 21.56	+25 58.9					
1981 07 15		03 40.93	+27 18.8	2.950	2.477	53.1	19.2	17.8
1981 07 25		04 00.54	+28 31.8					

1981 08 04	04 20.28	+29 37.2	2.697	2.414	63.1	22.0	17.5
1981 08 14	04 39.99	+30 34.5					
1981 08 24	04 59.50	+31 23.5	2.436	2.358	73.5	24.3	17.2
1981 09 03	05 18.58	+32 04.4					
1981 09 13	05 36.96	+32 37.4	2.175	2.310	84.7	25.7	16.8
1981 09 23	05 54.32	+33 03.3					
1981 10 03	06 10.29	+33 23.2	1.922	2.272	97.0	25.9	16.5
1981 10 13	06 24.46	+33 38.2					
1981 10 23	06 36.39	+33 49.6	1.687	2.245	111.0	24.4	16.1
1981 11 02	06 45.59	+33 58.4					
1981 11 12	06 51.61	+34 04.9	1.484	2.229	127.4	20.7	15.8
1981 11 22	06 54.13	+34 08.3					
1981 12 02	06 52.99	+34 06.4	1.334	2.224	146.4	14.2	15.6
1981 12 12	06 48.56	+33 55.4					
1981 12 22	06 41.67	+33 31.7	1.263	2.230	166.1	6.1	15.5
1982 01 01	06 33.68	+32 53.3					
1982 01 11	06 26.21	+32 01.2	1.289	2.248	163.2	7.2	15.6
1982 01 21	06 20.65	+30 59.5					
1982 01 31	06 17.93	+29 53.4	1.411	2.277	143.1	15.1	15.8
1982 02 10	06 18.44	+28 47.5					
1982 02 20	06 22.10	+27 44.3	1.612	2.317	124.2	20.7	16.2
1982 03 02	06 28.62	+26 44.6					
1982 03 12	06 37.57	+25 47.8	1.864	2.365	107.8	23.6	16.6
1982 03 22	06 48.49	+24 52.7					
1982 04 01	07 01.00	+23 57.7	2.148	2.422	93.4	24.3	17.0
1982 04 11	07 14.72	+23 01.4					
1982 04 21	07 29.33	+22 02.7	2.447	2.487	80.5	23.5	17.4
1982 05 01	07 44.59	+21 00.6					
1982 05 11	08 00.27	+19 54.5	2.747	2.557	68.6	21.6	17.8
1982 05 21	08 16.21	+18 44.2					
1982 05 31	08 32.28	+17 29.4	3.040	2.633	57.3	18.9	18.1
1982 06 10	08 48.35	+16 10.3					
1982 06 20	09 04.35	+14 47.1	3.314	2.714	46.3	15.7	18.4
1982 06 30	09 20.21	+13 20.1					
1982 07 10	09 35.88	+11 49.7	3.562	2.797	35.5	12.2	18.7

Periodic Comet Oterma

Elements AJ 75, 83, 1970

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	m2
1981 06 25		22 38.19	-08 42.2	5.524	6.026	115.1	8.8	21.5
1981 07 05		22 37.83	-08 42.8					
1981 07 15		22 36.48	-08 49.1	5.242	5.999	134.6	6.9	21.4
1981 07 25		22 34.22	-09 00.7					
1981 08 04		22 31.15	-09 16.8	5.037	5.972	155.1	4.1	21.3
1981 08 14		22 27.46	-09 36.4					
1981 08 24		22 23.39	-09 58.1	4.937	5.946	176.3	0.6	21.2
1981 09 03		22 19.18	-10 20.3					
1981 09 13		22 15.14	-10 41.3	4.955	5.921	162.2	3.0	21.2
1981 09 23		22 11.54	-10 59.7					
1981 10 03		22 08.63	-11 14.2	5.085	5.896	140.9	6.1	21.2
1981 10 13		22 06.60	-11 23.9					
1981 10 23		22 05.57	-11 28.0	5.306	5.871	120.3	8.4	21.3
1981 11 02		22 05.63	-11 26.4					
1981 11 12		22 06.78	-11 18.8	5.583	5.847	100.6	9.6	21.4

Periodic Comet Smirnova-Chernykh (1975 VII)

Elements MPC 4830

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	m2
1981 06 25		03 14.39	+14 31.0	5.165	4.474	42.9	8.9	20.1
1981 07 05		03 23.10	+15 05.4					
1981 07 15		03 31.30	+15 35.8	4.913	4.454	57.7	11.1	19.9

1981 07 25	03	38.87	+16	02.2					
1981 08 04	03	45.67	+16	24.3	4.618	4.433	73.2	12.7	19.8
1981 08 14	03	51.55	+16	42.3					
1981 08 24	03	56.37	+16	56.2	4.298	4.411	89.8	13.2	19.6
1981 09 03	03	59.95	+17	05.9					
1981 09 13	04	02.14	+17	11.5	3.977	4.390	107.7	12.6	19.4
1981 09 23	04	02.82	+17	13.2					
1981 10 03	04	01.90	+17	11.1	3.688	4.368	127.3	10.5	19.2
1981 10 13	03	59.37	+17	05.3					
1981 10 23	03	55.34	+16	56.4	3.464	4.345	148.6	6.8	19.1
1981 11 02	03	50.02	+16	44.8					
1981 11 12	03	43.80	+16	31.5	3.342	4.322	171.0	2.0	19.0
1981 11 22	03	37.14	+16	17.9					
1981 12 02	03	30.57	+16	05.4	3.340	4.299	164.7	3.5	19.0
1981 12 12	03	24.65	+15	55.9					
1981 12 22	03	19.81	+15	50.7	3.456	4.275	142.0	8.1	19.0
1982 01 01	03	16.38	+15	50.9					
1982 01 11	03	14.57	+15	57.3	3.666	4.251	120.5	11.5	19.1
1982 01 21	03	14.42	+16	09.9					
1982 01 31	03	15.94	+16	28.4	3.932	4.227	100.6	13.2	19.2
1982 02 10	03	19.03	+16	52.2					
1982 02 20	03	23.57	+17	20.3	4.217	4.202	82.4	13.5	19.4
1982 03 02	03	29.42	+17	51.9					
1982 03 12	03	36.44	+18	26.0	4.490	4.178	65.6	12.5	19.5
1982 03 22	03	44.49	+19	01.7					
1982 04 01	03	53.44	+19	38.0	4.726	4.153	49.9	10.6	19.6
1982 04 11	04	03.16	+20	14.1					
1982 04 21	04	13.56	+20	49.3	4.909	4.128	35.1	8.1	19.6

Periodic Comet Reinmuth 2 (1980n)

Elements MPC 4773

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	m2	
1981 06 25	03	25.11	+24	02.1	2.983	2.274	38.2	16.1	19.6
1981 07 05	03	44.70	+25	11.8					
1981 07 15	04	03.60	+26	11.3	2.907	2.354	48.2	18.8	19.7
1981 07 25	04	21.67	+27	01.1					
1981 08 04	04	38.74	+27	41.9	2.797	2.440	59.2	20.9	19.8
1981 08 14	04	54.60	+28	14.8					
1981 08 24	05	09.06	+28	40.7	2.658	2.528	71.6	22.3	19.8
1981 09 03	05	21.89	+29	01.0					
1981 09 13	05	32.81	+29	16.9	2.495	2.619	85.7	22.5	19.8
1981 09 23	05	41.57	+29	29.5					
1981 10 03	05	47.86	+29	39.8	2.323	2.711	101.8	21.2	19.6
1981 10 13	05	51.42	+29	48.1					
1981 10 23	05	52.04	+29	54.5	2.164	2.804	120.6	17.8	19.4
1981 11 02	05	49.61	+29	58.0					
1981 11 12	05	44.28	+29	56.9	2.052	2.897	142.0	12.1	19.2
1981 11 22	05	36.48	+29	49.2					
1981 12 02	05	26.98	+29	33.3	2.026	2.990	165.1	4.9	19.1
1981 12 12	05	16.84	+29	09.1					
1981 12 22	05	07.16	+28	38.2	2.114	3.082	167.4	4.0	19.2
1982 01 01	04	58.92	+28	03.4					
1982 01 11	04	52.83	+27	28.6	2.318	3.172	144.8	10.3	19.6
1982 01 21	04	49.20	+26	56.5					
1982 01 31	04	48.09	+26	29.2	2.613	3.262	123.5	14.6	20.1
1982 02 10	04	49.39	+26	07.4					
1982 02 20	04	52.82	+25	51.0	2.966	3.350	104.3	16.6	20.5
1982 03 02	04	58.13	+25	39.1					
1982 03 12	05	05.04	+25	30.6	3.343	3.437	87.0	16.8	20.8
1982 03 22	05	13.27	+25	24.4					

1982 04 01	05 22.61	+25 19.3	3.717	3.522	71.1	15.6	21.1
1982 04 11	05 32.83	+25 14.3					
1982 04 21	05 43.76	+25 08.3	4.066	3.605	56.2	13.4	21.2
1982 05 01	05 55.25	+25 00.7					
1982 05 11	06 07.14	+24 50.8	4.372	3.686	42.1	10.6	21.4

Periodic Comet Gale

Date	ET	R. A. (1950)	Decl.	Delta	r	Variation	Elements MPC	5837
								m2
1981 06 25		11 04.91	+15 07.9	2.114	1.987	-0.65	+5.2	21.1
1981 07 05		11 17.90	+12 52.8					
1981 07 15		11 32.77	+10 24.4	2.131	1.809	-0.72	+6.8	20.5
1981 07 25		11 49.45	+07 42.6					
1981 08 04		12 07.95	+04 46.9	2.112	1.637	-0.84	+8.8	19.8
1981 08 14		12 28.30	+01 37.4					
1981 08 24		12 50.62	-01 45.4	2.063	1.478	-1.02	+11.0	19.1
1981 09 03		13 15.11	-05 20.4					
1981 09 13		13 42.00	-09 04.9	1.998	1.343	-1.28	+13.3	18.4
1981 09 23		14 11.57	-12 54.7					
1981 10 03		14 44.15	-16 43.5	1.934	1.245	-1.64	+14.7	17.9
1981 10 13		15 19.98	-20 22.0					
1981 10 23		15 59.15	-23 38.6	1.895	1.200	-2.09	+13.8	17.6
1981 11 02		16 41.45	-26 20.5					
1981 11 12		17 26.17	-28 15.5	1.907	1.216	-2.49	+9.4	17.7
1981 11 22		18 12.14	-29 14.9					
1981 12 02		18 57.89	-29 16.4	1.984	1.289	-2.58	+2.7	18.1
1981 12 12		19 41.96	-28 24.1					
1981 12 22		20 23.31	-26 47.4	2.129	1.408	-2.31	-3.4	18.9
1982 01 01		21 01.39	-24 37.7					
1982 01 11		21 36.11	-22 06.6	2.329	1.556	-1.87	-6.7	19.7

1978 RP

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	Elements MPC	5840
									Mag.
1981 02 25		08 54.29	+18 52.0	2.042	2.968	154.8	8.2	16.6	
1981 03 07		08 48.52	+19 19.3						
1981 03 17		08 44.93	+19 36.2	2.180	2.945	132.5	14.4	16.9	
1981 03 27		08 43.78	+19 42.6						
1981 04 06		08 45.07	+19 38.9	2.387	2.923	112.7	18.4	17.1	
1981 04 16		08 48.69	+19 25.5						
1981 04 26		08 54.39	+19 03.2	2.628	2.902	95.5	20.2	17.4	
1981 05 06		09 01.88	+18 32.3						
1981 05 16		09 10.92	+17 53.5	2.876	2.881	80.2	20.2	17.6	
1981 05 26		09 21.24	+17 07.0						
1981 06 05		09 32.62	+16 13.2	3.112	2.862	66.4	19.0	17.7	

1978 QK1

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	Elements MPC	5845
									Mag.
1981 02 25		09 02.32	+06 25.5	1.931	2.873	157.9	7.4	17.9	
1981 03 07		08 55.53	+08 00.8						
1981 03 17		08 50.82	+09 30.4	2.026	2.828	136.0	14.1	18.1	
1981 03 27		08 48.56	+10 49.6						
1981 04 06		08 48.86	+11 55.8	2.200	2.782	115.5	18.9	18.4	
1981 04 16		08 51.66	+12 47.9						
1981 04 26		08 56.77	+13 25.6	2.413	2.734	97.5	21.4	18.6	
1981 05 06		09 03.91	+13 49.4						
1981 05 16		09 12.84	+13 59.9	2.636	2.684	81.8	21.9	18.8	
1981 05 26		09 23.27	+13 58.0						
1981 06 05		09 35.00	+13 44.4	2.845	2.634	67.8	20.9	18.9	

1972 KJ						Elements MPC		5839
Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	Mag.
1981 02 25		09 38.81	+07 39.4	2.308	3.280	167.1	3.9	17.4
1981 03 07		09 32.12	+08 43.0					
1981 03 17		09 26.82	+09 41.9	2.410	3.273	144.8	10.1	17.7
1981 03 27		09 23.35	+10 32.6					
1981 04 06		09 21.93	+11 13.0	2.603	3.265	123.6	14.8	18.0
1981 04 16		09 22.60	+11 42.1					
1981 04 26		09 25.26	+11 59.8	2.852	3.255	104.6	17.4	18.2
1981 05 06		09 29.74	+12 06.3					
1981 05 16		09 35.84	+12 02.3	3.124	3.245	87.7	18.1	18.4
1981 05 26		09 43.31	+11 48.5					
1981 06 05		09 51.96	+11 25.7	3.392	3.234	72.4	17.4	18.6

1978 PF3						Elements MPC		5845
Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	Mag.
1981 02 25		10 24.18	+09 30.9	2.255	3.245	178.4	0.5	17.5
1981 03 07		10 15.39	+10 14.3					
1981 03 17		10 07.37	+10 52.8	2.290	3.215	154.1	7.8	18.0
1981 03 27		10 00.82	+11 23.2					
1981 04 06		09 56.21	+11 43.2	2.430	3.182	131.4	13.6	18.3
1981 04 16		09 53.81	+11 52.1					
1981 04 26		09 53.62	+11 49.8	2.639	3.147	111.2	17.3	18.5
1981 05 06		09 55.55	+11 36.7					
1981 05 16		09 59.42	+11 13.6	2.880	3.109	93.4	18.9	18.7
1981 05 26		10 04.98	+10 41.1					
1981 06 05		10 12.02	+10 00.1	3.123	3.069	77.5	18.8	18.8

1973 SZ2						Elements MPC		5836
Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	Mag.
1981 02 25		10 36.02	+10 04.9	2.113	3.103	178.5	0.5	16.3
1981 03 07		10 28.44	+10 52.9					
1981 03 17		10 21.66	+11 34.2	2.199	3.139	157.1	7.1	16.8
1981 03 27		10 16.32	+12 05.6					
1981 04 06		10 12.84	+12 25.3	2.388	3.176	135.0	12.9	17.2
1981 04 16		10 11.43	+12 32.7					
1981 04 26		10 12.07	+12 28.2	2.651	3.212	115.2	16.5	17.5
1981 05 06		10 14.64	+12 12.7					
1981 05 16		10 18.94	+11 47.2	2.954	3.248	97.7	18.0	17.8
1981 05 26		10 24.73	+11 12.9					
1981 06 05		10 31.80	+10 30.6	3.269	3.283	81.9	17.8	18.1
1981 06 15		10 39.94	+09 41.4					
1981 06 25		10 48.95	+08 46.2	3.574	3.318	67.4	16.4	18.2

1978 PP2						Elements MPC		5844
Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	Mag.
1981 02 25		11 32.31	+03 23.9	1.836	2.799	163.6	5.7	16.7
1981 03 07		11 24.46	+04 09.0					
1981 03 17		11 16.24	+04 55.8	1.814	2.803	172.1	2.8	16.5
1981 03 27		11 08.61	+05 38.3					
1981 04 06		11 02.38	+06 11.7	1.903	2.807	148.7	10.7	16.9
1981 04 16		10 58.15	+06 32.8					
1981 04 26		10 56.21	+06 40.1	2.082	2.811	127.5	16.5	17.2
1981 05 06		10 56.58	+06 33.6					
1981 05 16		10 59.18	+06 13.9	2.319	2.815	109.0	19.9	17.5
1981 05 26		11 03.76	+05 42.1					
1981 06 05		11 10.08	+04 59.6	2.582	2.820	92.8	21.1	17.8
1981 06 15		11 17.90	+04 07.6					
1981 06 25		11 26.97	+03 07.3	2.850	2.824	78.3	20.6	18.0

(2354) 1978 PZ3

						Elements MPC		5842
Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	Mag.
1981 02 25		12 31.29	-03 09.6	2.131	3.013	147.4	10.2	17.3
1981 03 07		12 25.38	-02 21.5					
1981 03 17		12 18.10	-01 24.2	2.028	3.015	171.2	2.9	16.9
1981 03 27		12 10.20	-00 22.9					
1981 04 06		12 02.48	+00 36.5	2.039	3.016	164.6	5.0	17.0
1981 04 16		11 55.76	+01 28.4					
1981 04 26		11 50.65	+02 08.7	2.159	3.015	141.7	11.9	17.3
1981 05 06		11 47.51	+02 34.8					
1981 05 16		11 46.50	+02 46.1	2.362	3.013	121.2	16.7	17.6
1981 05 26		11 47.59	+02 42.8					
1981 06 05		11 50.63	+02 26.2	2.613	3.009	103.1	19.2	17.9
1981 06 15		11 55.44	+01 57.6					
1981 06 25		12 01.79	+01 18.5	2.881	3.004	87.0	19.7	18.1
1981 07 05		12 09.49	+00 30.4					
1981 07 15		12 18.35	-00 25.4	3.145	2.998	72.4	18.9	18.3
1981 07 25		12 28.22	-01 27.4					
1981 08 04		12 38.96	-02 34.6	3.386	2.991	58.9	16.9	18.4

1978 PQ2

						Elements MPC		5845
Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	Mag.
1981 02 25		12 35.68	-04 33.7	2.373	3.240	145.9	9.9	19.2
1981 03 07		12 29.71	-03 52.2					
1981 03 17		12 22.38	-03 01.1	2.245	3.229	169.5	3.2	18.8
1981 03 27		12 14.35	-02 04.5					
1981 04 06		12 06.37	-01 07.7	2.235	3.216	166.2	4.2	18.8
1981 04 16		11 59.20	-00 15.8					
1981 04 26		11 53.47	+00 26.8	2.338	3.200	143.1	10.9	19.1
1981 05 06		11 49.55	+00 57.3					
1981 05 16		11 47.67	+01 14.4	2.527	3.182	122.1	15.6	19.4
1981 05 26		11 47.83	+01 17.8					
1981 06 05		11 49.92	+01 08.3	2.768	3.161	103.4	18.2	19.6
1981 06 15		11 53.80	+00 46.8					
1981 06 25		11 59.25	+00 14.7	3.026	3.138	86.8	18.9	19.8
1981 07 05		12 06.10	-00 26.7					
1981 07 15		12 14.16	-01 16.2	3.278	3.113	71.8	18.1	20.0
1981 07 25		12 23.28	-02 12.6					
1981 08 04		12 33.33	-03 14.7	3.504	3.086	57.8	16.2	20.0

1978 PP3

						Elements MPC		5845
Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	Mag.
1981 02 25		12 39.48	-00 45.4	2.381	3.252	146.4	9.7	17.7
1981 03 07		12 34.00	-00 02.3					
1981 03 17		12 27.26	+00 46.7	2.298	3.281	169.4	3.2	17.4
1981 03 27		12 19.92	+01 36.8					
1981 04 06		12 12.69	+02 23.3	2.330	3.310	165.9	4.2	17.5
1981 04 16		12 06.26	+03 01.8					
1981 04 26		12 01.17	+03 29.2	2.474	3.338	143.5	10.3	17.8
1981 05 06		11 57.78	+03 44.1					
1981 05 16		11 56.26	+03 45.9	2.705	3.364	123.0	14.6	18.1
1981 05 26		11 56.58	+03 35.3					
1981 06 05		11 58.67	+03 13.4	2.989	3.390	104.6	16.8	18.4
1981 06 15		12 02.36	+02 41.3					
1981 06 25		12 07.46	+02 00.6	3.296	3.415	88.0	17.3	18.7
1981 07 05		12 13.80	+01 12.4					
1981 07 15		12 21.21	+00 18.0	3.599	3.438	72.8	16.4	18.8
1981 07 25		12 29.54	-00 41.5					
1981 08 04		12 38.66	-01 45.1	3.881	3.461	58.5	14.5	19.0

1978 QT1		Elements MPC 5845							
Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	Mag.	
1981 02 25		12 44.45	-06 18.3	2.071	2.924	143.2	11.7	17.2	
1981 03 07		12 39.19	-05 47.8						
1981 03 17		12 32.32	-05 05.6	1.958	2.934	166.4	4.6	16.9	
1981 03 27		12 24.56	-04 16.0						
1981 04 06		12 16.75	-03 24.2	1.954	2.943	169.4	3.6	16.8	
1981 04 16		12 09.75	-02 36.0						
1981 04 26		12 04.23	-01 56.3	2.061	2.953	146.5	10.9	17.2	
1981 05 06		12 00.64	-01 28.4						
1981 05 16		11 59.20	-01 14.0	2.255	2.961	125.7	16.1	17.5	
1981 05 26		11 59.89	-01 13.6						
1981 06 05		12 02.61	-01 26.3	2.505	2.970	107.4	19.0	17.8	
1981 06 15		12 07.16	-01 51.3						
1981 06 25		12 13.31	-02 26.9	2.779	2.978	91.1	20.0	18.0	
1981 07 05		12 20.86	-03 11.8						
1981 07 15		12 29.63	-04 04.7	3.056	2.985	76.4	19.3	18.2	
1981 07 25		12 39.44	-05 04.1						
1981 08 04		12 50.15	-06 08.9	3.316	2.992	62.8	17.6	18.4	

1934 RR		Elements MPC 5839							
Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	Mag.	
1981 02 25		16 10.99	-18 07.1	2.523	2.738	91.7	21.2	19.7	
1981 03 07		16 18.70	-18 12.1						
1981 03 17		16 24.42	-18 09.8	2.231	2.716	108.5	20.3	19.4	
1981 03 27		16 27.85	-18 00.4						
1981 04 06		16 28.70	-17 44.4	1.965	2.692	127.3	17.2	19.0	
1981 04 16		16 26.78	-17 21.9						
1981 04 26		16 22.11	-16 53.8	1.756	2.666	148.4	11.4	18.6	
1981 05 06		16 14.94	-16 21.1						
1981 05 16		16 05.88	-15 45.7	1.635	2.638	170.7	3.6	18.2	
1981 05 26		15 55.89	-15 10.7						
1981 06 05		15 46.05	-14 39.5	1.619	2.607	163.0	6.5	18.3	
1981 06 15		15 37.47	-14 15.8						
1981 06 25		15 30.97	-14 02.4	1.705	2.574	140.7	14.5	18.5	
1981 07 05		15 27.06	-14 00.7						
1981 07 15		15 25.94	-14 10.9	1.866	2.539	120.6	20.1	18.8	
1981 07 25		15 27.58	-14 31.8						
1981 08 04		15 31.80	-15 01.9	2.068	2.503	103.2	23.2	19.1	

1934 FF		Elements MPC 5844							
Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	Mag.	
1981 02 25		16 19.77	-10 51.7	2.696	2.886	90.9	20.1	18.4	
1981 03 07		16 26.69	-10 14.0						
1981 03 17		16 31.61	-09 26.8	2.443	2.906	107.8	19.0	18.2	
1981 03 27		16 34.32	-08 31.1						
1981 04 06		16 34.64	-07 28.6	2.219	2.924	126.2	16.0	17.9	
1981 04 16		16 32.51	-06 21.7						
1981 04 26		16 28.05	-05 13.7	2.055	2.940	145.5	11.2	17.7	
1981 05 06		16 21.58	-04 08.8						
1981 05 16		16 13.68	-03 11.7	1.981	2.954	160.9	6.4	17.5	
1981 05 26		16 05.12	-02 26.7						
1981 06 05		15 56.74	-01 57.2	2.012	2.967	155.8	8.1	17.6	
1981 06 15		15 49.36	-01 44.9						
1981 06 25		15 43.60	-01 49.5	2.144	2.977	137.9	13.2	17.8	
1981 07 05		15 39.83	-02 09.5						
1981 07 15		15 38.25	-02 42.4	2.351	2.986	119.5	17.2	18.1	
1981 07 25		15 38.85	-03 25.3						
1981 08 04		15 41.52	-04 15.6	2.603	2.992	102.5	19.3	18.4	