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

CORRECTED OBSERVATIONS.

The following observations correct those previously published.

Object	Date	UT	R. A. (1950)	Decl.	Reference	Mag.	N Obs.
1957 LF	1957 06	05.97500	17 25 51.96	-21 52 37.1	MPC 7205		1 081
1957 LF	1957 06	06.03000	17 25 48.87	-21 52 36.1	MPC 7205		1 081
1974 CO	1974 02	18.85626	08 54 18.04	+17 47 57.2	MPC 4098	16.0	095
1979 YB	1982 11	20.73924	03 32 04.99	+44 34 36.9	MPC 7636	16.5	372
1982 VO	1982 11	20.94792	03 45 14.73	+22 28 41.8	MPC 7527		046

Note 1: observations originally interchanged.

* * * * *

DELETED OBSERVATIONS.

The following observations are to be deleted.

Object	Date	UT	R. A. (1950)	Decl.	Reference	Obs.
1946 UM *	1946 10	26.93	02 50.8	+05 38	MPC 225	062
1948 YE *	1948 12	28.85	04 35.6	+20 41	MPC 238	062
1948 YF *	1948 12	28.92	04 17.2	+12 14	MPC 238	062
1949 CC *	1949 02	01.89	07 52.5	+23 47	MPC 291	062
1949 SO *	1949 09	22.96	00 33.8	-07 52	MPC 351	062
1949 YB1 *	1949 12	23.85	03 45.7	+19 09	MPC 496	062
1954 QJ	1954 10	04.86	22 45.6	+14 08	MPC 1299	062

* * * * *

IDENTIFICATION CHANGES.

Continuation to MPC 7629.

Object	Date	UT	R. A. (1950)	Decl.	Old desig.	Mag.	Obs.
1936 PS *	1936 08	15.95826	20 03 18.39	-08 38 01.3	1936 OA	16	024
1976 UW20*	1976 10	26.82880	00 12 56.84	-01 46 51.7	1976 SX3	17.0	095
1981 SJ3 *	1981 09	25.90197	23 48 03.94	-00 56 46.8	1981 SK		046
1981 SJ3	1981 09	25.91615	23 48 03.35	-00 56 52.0	1981 SK		046

* * * * *

OBSERVATIONS OF COMETS.

Observations are published here for the following observatory codes:

046 Klet. Observer A. Mrkos.
056 Skainate Pleso. Observers T. Cisko, J. Klobusnik and J. Svoren.

Measured by Klobusnik, E. M. Pittich and Svoren.
066 Athens. Observer D. P. Elias.
372 Geisei. Observer T. Seki.
474 Mt. John Observatory. Observers A. C. Gilmore and P. M. Kiimartin.
657 Climenhaga Observatory, University of Victoria. 0.25-m f/2 Schmidt. Observer and measurer J. Tatum.
675 Palomar. 1.2-m Schmidt. Observer J. Gibson.
688 Lowell Observatory, Anderson Mesa Station. Observer B. A. Skiff. Measured by E. Bowell.
707 Chamberlin Observatory field station. 0.40-m f/5.5 reflector. Observer E. Everhart.
801 Oak Ridge Observatory. Observers R. E. McCrosky and G. Schwartz (assisted by C. M. Bardwell and B. G. Marsden).
993 Woolston Observatory. 0.15-m f/4.5 Cooke triplet. Observers M. Dykes, G. Keitch and P. Birtwhistle. Measured by Birtwhistle.

Object	Date UT	R. A. (1950)	Decl.	Mag.	N	Obs.
	Periodic Comet Schwassmann-Wachmann 1					
/1974 II	1977 12 08.19444	05 14 44.68	+32 04 45.7			801
	Periodic Comet Smirnova-Chernykh					
/1975 VII	1983 02 10.17645	06 51 42.29	+27 40 41.8			801
/1975 VII	1983 02 11.13726	06 51 18.71	+27 41 18.0			801
/1975 VII	1983 02 12.21042	06 50 52.72	+27 41 55.1			707
	Comet Kobayashi-Berger-Milon (1975 IX)					
/1975 IX	1975 07 12.96736	21 02 06.70	+12 33 52.9			056
/1975 IX	1975 07 17.98611	20 06 58.13	+31 43 16.1			056
/1975 IX	1975 08 11.83715	12 10 45.95	+46 24 55.2			056
	Comet Suzuki-Saigusa-Mori (1975 X)					
/1975 X	1975 10 25.11771	12 10 42.08	+33 56 46.9			056
	Comet Mori-Sato-Fujikawa (1975 XII)					
/1973 XII	1975 10 26.13611	08 34 42.92	-11 44 29.2			056
	Comet West (1976 VI)					
/1976 VI	1976 05 11.03715	19 47 58.96	+18 03 35.6			056
	Comet Meier (1979 IX)					
/1979 IX	1979 11 23.01181	12 03 28.02	+53 46 05.0			056
	Periodic Comet Stephan-Oterma					
/1980 X	1980 11 18.03403	05 26 52.70	+13 05 09.7			056
/1980 X	1980 12 02.99722	05 31 21.58	+20 35 29.1			056
/1980 X	1980 12 03.89861	05 31 27.70	+21 05 05.6			056
/1980 X	1980 12 12.91944	05 31 47.00	+26 06 23.3			056
/1980 X	1980 12 12.97014	05 31 46.76	+26 08 00.9			056
/1980 X	1980 12 29.87778	05 32 26.10	+34 40 45.8			056
/1980 X	1980 12 29.92500	05 32 26.26	+34 42 02.2			056
/1980 X	1980 12 31.05139	05 32 37.82	+35 10 59.2			056
/1980 X	1981 01 29.74444	05 53 33.44	+43 10 03.7			056
/1980 X	1981 02 03.01736	05 59 11.13	+43 38 57.1			056
	Comet Meier (1980 XII)					
/1980 XII	1980 12 31.18889	17 52 59.77	+23 23 02.4			056
/1980 XII	1980 12 31.20278	17 52 59.56	+23 22 47.1			056

Periodic Comet Tuttle

/1980	XIII	1980	11	02.09722	09	57	35.90	+42	43	57.8	056
/1980	XIII	1980	11	14.06319	10	19	15.42	+27	06	44.6	056

Comet Panther (1981 II)

/1981	II	1981	01	30.05625	19	08	58.89	+52	57	41.8	056

Periodic Comet Churyumov-Gerasimenko

/1982f		1982	11	16.92878	06	29	59.98	+29	29	10.2	993
/1982f		1983	01	12.84153	07	08	53.50	+40	02	46.3	046
/1982f		1983	01	16.96039	07	08	37.37	+39	53	14.2	993
/1982f		1983	01	20.29211	07	08	38.47	+39	41	05.0	801
/1982f		1983	02	01.75000	07	11	30.97	+38	28	56.2	046
/1982f		1983	02	01.75868	07	11	31.20	+38	28	53.5	046
/1982f		1983	02	04.24375	07	12	37.28	+38	10	54.0	657
/1982f		1983	02	04.82118	07	12	54.50	+38	06	31.6	046
/1982f		1983	02	04.82604	07	12	54.66	+38	06	29.5	046
/1982f		1983	02	05.21042	07	13	06.10	+38	03	40.8	657
/1982f		1983	02	06.22083	07	13	37.73	+37	55	52.3	657
/1982f		1983	02	07.11181	07	14	07.90	+37	48	59.7	707
/1982f		1983	02	16.14729	07	20	21.62	+36	34	31.0	801

Comet Austin (1982g)

/1982g		1982	08	28.79746	11	57	09.33	+44	47	10.0	1 066
/1982g		1982	08	29.77257	12	02	14.79	+44	42	33.9	1 066
/1982g		1982	08	30.77414	12	06	57.26	+44	35	29.9	1 066
/1982g		1982	08	31.79379	12	11	14.46	+44	26	29.5	1 066
/1982g		1982	09	01.76573	12	14	55.56	+44	16	34.5	1 066
/1982g		1982	09	04.77493	12	24	10.41	+43	39	18.5	066
/1982g		1982	09	05.77309	12	26	41.01	+43	25	26.9	066
/1982g		1982	09	06.76837	12	28	55.44	+43	11	09.0	066
/1982g		1982	09	07.76437	12	30	58.32	+42	56	24.6	066
/1982g		1982	09	08.76135	12	32	50.16	+42	41	20.6	066
/1982g		1982	09	10.77214	12	36	06.36	+42	10	17.9	066
/1982g		1982	09	13.76375	12	40	03.20	+41	23	25.5	066
/1982g		1982	09	15.76168	12	42	12.47	+40	52	15.1	066
/1982g		1982	09	17.75688	12	44	04.82	+40	21	28.0	066
/1982g		1982	09	19.75594	12	45	44.01	+39	51	11.8	066
/1982g		1982	09	24.73956	12	49	09.26	+38	39	13.5	066
/1982g		1982	09	28.74684	12	51	24.14	+37	45	20.6	066
/1982g		1983	01	18.41706	11	56	41.98	+42	07	11.3	2 801
/1982g		1983	02	07.22951	10	58	48.76	+44	31	40.8	3 707
/1982g		1983	02	13.06741	10	40	55.3	+44	36	42	4 993
/1982g		1983	02	20.23444	10	20	03.60	+44	17	57.5	801

Periodic Comet Tempel 1

/1982j		1983	01	21.40799	12	48	28.58	+10	27	42.6	801
/1982j		1983	03	10.30903	13	11	59.21	+13	34	25.8	5 707

Periodic Comet Kopff

/1982k		1983	01	24.49888	14	29	10.96	-09	40	09.3	707

Periodic Comet Bowell-Skiff

/1983c		1983	02	11.27639	09	25	46.52	+18	36	49.6	16.2T		688
/1983c		1983	02	11.30833	09	25	45.76	+18	36	48.9			688
/1983c		1983	02	15.26319	09	23	57.47	+18	31	21.8	16.5T		688
/1983c		1983	02	15.29375	09	23	56.71	+18	31	19.9			688
/1983c		1983	02	16.21252	09	23	32.36	+18	29	52.5	18	N	801
/1983c		1983	02	17.67778	09	22	54.33	+18	27	25.1	17	T	372

/1983c	1983	02	17.74774	09	22	52.19	+18	27	14.8			372
/1983c	1983	02	19.25139	09	22	15.63	+18	24	28.5	16.5T	6	688
/1983c	1983	02	19.26667	09	22	15.31	+18	24	27.0		6	688
/1983c	1983	02	19.29722	09	22	14.39	+18	24	22.5		6	688
/1983c	1983	02	19.31250	09	22	14.08	+18	24	20.4		6	688
/1983c	1983	02	20.34933	09	21	49.35	+18	22	17.3			675
/1983c	1983	02	20.48308	09	21	46.38	+18	22	09.8	17 T		474
/1983c	1983	02	20.51306	09	21	45.67	+18	22	05.0			474
/1983c	1983	02	21.42225	09	21	25.20	+18	20	02.7			675
/1983c	1983	03	03.17639	09	18	43.45	+17	53	12.3		7	707
/1983c	1983	03	09.15208	09	18	12.43	+17	31	06.4	16.8T		688
/1983c	1983	03	09.21528	09	18	12.13	+17	30	48.9			688

Note 1: correction to MPC 7170. 2: comet weak and diffuse; inkdot measured. 3: image 10" in diameter; round, faint. 4: image completely uncondensed size 110" x 100"; measurement refers to northern edge. 5: broad tail 18" long in p.a. 240. 6: correction to IAUC 3775. 7: poor conditions.

* * * * *

OBSERVATIONS MADE WITH THE 0.9-M SCHMIDT TELESCOPE AT CAUSSOLS BY G. HAHN, J.-L. HEUDIER AND C.-I. LAGERKVIST.

Object	Date	UT	R. A. (1950)	Decl.	N Obs.
16	1982 02	22.02766	10 54 10.91	+07 44 57.4	010
16	1982 02	27.97367	10 49 35.52	+08 17 55.2	010
196	1982 02	21.80231	04 38 01.80	+24 29 46.7	010
309	1982 02	22.02766	10 58 14.62	+08 23 25.1	010
309	1982 02	27.97367	10 53 01.59	+08 49 13.4	010
346	1982 02	21.80231	04 37 04.48	+22 09 41.6	010
449	1982 02	21.80231	04 31 59.92	+22 36 39.1	010
602	1982 02	25.93322	10 26 30.08	+08 21 33.6	010
602	1982 02	26.06519	10 26 23.11	+08 21 49.4	010
602	1982 02	27.94063	10 24 47.04	+08 25 30.7	010
602	1982 02	28.02396	10 24 42.68	+08 25 40.6	010
727	1982 02	24.91336	08 35 59.86	+20 30 58.1	010
839	1982 02	22.02766	10 58 42.40	+05 50 53.1	010
839	1982 02	27.97367	10 52 58.11	+06 03 23.1	010
864	1982 02	27.94063	10 29 40.08	+08 29 48.1	010
864	1982 02	28.02396	10 29 35.06	+08 30 27.5	010
924	1982 02	22.02766	10 58 46.11	+08 45 16.1	010
1029	1982 02	24.91336	08 36 39.61	+22 08 21.8	010
1426	1982 02	24.91336	08 38 28.89	+22 58 15.9	010
1445	1982 02	24.91336	08 26 09.05	+21 22 21.3	010
1494	1982 02	22.02766	10 45 58.03	+05 07 26.4	010
1531	1982 02	21.80231	04 24 29.11	+22 55 06.7	010
1542	1982 02	22.02766	10 43 17.52	+04 44 17.7	010
1736	1982 02	25.93322	10 28 39.23	+09 01 49.1	010
1736	1982 02	26.06519	10 28 31.37	+09 02 55.1	010
1736	1982 02	27.94063	10 26 39.79	+09 18 28.1	010
1736	1982 02	28.02396	10 26 34.76	+09 19 10.2	010
1912	1982 02	24.91336	08 26 08.43	+23 08 59.3	010
1965	1982 02	21.80231	04 37 04.48	+22 27 04.6	010
1977	1982 02	22.02766	10 45 19.58	+06 41 58.2	010
2036	1982 02	25.93322	10 36 49.98	+09 52 19.3	010
2036	1982 02	26.06519	10 36 40.92	+09 52 57.9	010
2036	1982 02	27.94063	10 34 39.31	+10 01 45.9	010
2036	1982 02	28.02396	10 34 33.85	+10 02 10.4	010
2098	1982 02	22.02766	10 50 26.70	+07 15 59.2	010
2098	1982 02	27.97367	10 44 33.07	+07 37 44.0	010

2248			1982	02	25.93322	10	36	37.28	+11	05	08.0	010
2248			1982	02	26.06519	10	36	30.76	+11	05	43.1	010
2248			1982	02	27.94063	10	35	00.50	+11	13	56.1	010
2248			1982	02	28.02396	10	34	56.46	+11	14	19.4	010
2250			1982	02	25.93322	10	21	05.83	+10	08	55.3	010
2250			1982	02	26.06519	10	21	00.13	+10	09	30.8	010
2290			1982	02	25.93322	10	32	36.75	+09	19	25.6	010
2290			1982	02	26.06519	10	32	29.80	+09	20	48.5	010
2290			1982	02	27.94063	10	30	54.49	+09	40	24.1	010
2290			1982	02	28.02396	10	30	50.23	+09	41	16.9	010
2351			1982	02	22.02766	10	46	30.79	+07	17	46.5	010
2589			1982	02	22.02766	10	55	31.33	+07	36	51.5	010
2589			1982	02	27.97367	10	50	53.28	+08	09	47.6	010
2751			1982	02	21.80231	04	23	36.30	+20	39	32.1	010
1982	BY7	*	1982	01	20.98507	07	31	06.18	+02	35	08.2	010
1982	BZ7	*	1982	01	23.97187	07	06	57.72	+06	18	04.1	010
1982	BA8	*	1982	01	23.97187	07	08	02.45	+06	47	31.5	010
1982	BB8	*	1982	01	23.97187	07	09	21.99	+03	13	28.6	010
1982	DY2		1982	02	22.02766	10	49	03.80	+06	46	04.4	010
1982	DW3		1982	02	25.93322	10	39	18.24	+11	56	29.6	010
1982	DW3		1982	02	26.06519	10	39	10.14	+11	57	35.9	010
1982	DR4	*	1982	02	21.80231	04	22	24.56	+22	07	52.2	010
1982	DS4	*	1982	02	21.80231	04	30	07.20	+21	39	45.6	010
1982	DT4	*	1982	02	21.80231	04	33	11.11	+20	18	39.1	1 010
1982	DU4	*	1982	02	21.80231	04	35	54.51	+20	17	21.1	010
1982	DV4	*	1982	02	22.02766	10	46	21.12	+05	09	07.6	010
1982	DW4	*	1982	02	22.02766	10	46	27.06	+08	34	06.3	010
1982	DX4	*	1982	02	22.02766	10	47	12.06	+06	06	41.1	010
1982	DY4	*	1982	02	22.02766	10	48	50.07	+06	49	29.7	010
1982	DZ4	*	1982	02	22.02766	10	48	50.92	+06	53	36.2	010
1982	DA5	*	1982	02	22.02766	10	49	59.81	+05	30	50.5	010
1982	DB5	*	1982	02	22.02766	10	53	17.54	+05	52	28.7	010
1982	DB5		1982	02	27.97367	10	47	43.14	+06	22	21.6	010
1982	DC5	*	1982	02	22.02766	10	56	31.81	+04	58	55.0	010
1982	DC5		1982	02	27.97367	10	51	37.92	+05	32	02.5	010
1982	DD5	*	1982	02	22.02766	10	56	48.67	+08	35	01.9	010
1982	DD5		1982	02	27.97367	10	50	22.14	+08	11	32.5	010
1982	DE5	*	1982	02	22.02766	10	57	46.60	+06	32	46.1	010
1982	DE5		1982	02	27.97367	10	52	45.55	+06	41	04.9	010
1982	DF5	*	1982	02	22.02766	10	58	40.69	+06	12	10.8	010
1982	DG5	*	1982	02	22.02766	11	02	06.49	+06	44	43.7	010
1982	DH5	*	1982	02	22.02766	11	02	51.18	+06	46	31.0	010
1982	DJ5	*	1982	02	22.02766	11	03	23.72	+08	43	47.8	010
1982	DJ5		1982	02	27.97367	10	58	36.87	+08	38	07.0	010
1982	DK5	*	1982	02	24.91336	08	25	03.35	+21	13	11.9	010
1982	DL5	*	1982	02	24.91336	08	29	49.03	+18	22	26.5	010
1982	DM5	*	1982	02	24.91336	08	32	49.59	+21	45	57.1	010
1982	DN5	*	1982	02	24.91336	08	34	31.04	+19	36	00.4	1 010
1982	DO5	*	1982	02	25.93322	10	22	21.04	+08	53	30.7	010
1982	DO5		1982	02	26.06519	10	22	14.90	+08	54	11.4	010
1982	DP5	*	1982	02	25.93322	10	27	33.87	+10	03	59.5	010
1982	DPS		1982	02	26.06519	10	27	27.54	+10	04	34.0	010
1982	DQ5	*	1982	02	25.93322	10	30	24.36	+08	45	32.2	010
1982	DQ5		1982	02	26.06519	10	30	14.96	+08	44	58.8	010
1982	DR5	*	1982	02	25.93322	10	31	33.45	+09	51	38.4	010
1982	DR5		1982	02	26.06519	10	31	27.19	+09	52	21.9	010
1982	DR5		1982	02	27.94063	10	29	59.66	+10	02	23.0	010
1982	DR5		1982	02	28.02396	10	29	55.70	+10	02	51.4	010
1982	DS5	*	1982	02	25.93322	10	32	18.63	+08	52	24.2	010

1982	DS5		1982	02	26.06519	10	32	12.62	+08 53 03.2	010
1982	DT5	*	1982	02	25.93322	10	33	00.53	+11 42 17.0	010
1982	DT5		1982	02	26.06519	10	32	54.21	+11 42 54.1	010
1982	DT5		1982	02	27.94063	10	31	24.67	+11 50 59.8	010
1982	DT5		1982	02	28.02396	10	31	20.59	+11 51 23.4	010
1982	DU5	*	1982	02	25.93322	10	33	32.55	+11 34 34.1	010
1982	DU5		1982	02	26.06519	10	33	26.46	+11 35 13.8	010
1982	DU5		1982	02	27.94063	10	32	00.75	+11 44 38.1	010
1982	DU5		1982	02	28.02396	10	31	56.80	+11 45 04.8	010
1982	DV5	*	1982	02	25.93322	10	37	04.57	+09 04 19.7	010
1982	DV5		1982	02	26.06519	10	36	56.89	+09 05 02.0	010
1982	DV5		1982	02	27.94063	10	35	11.46	+09 15 05.4	010
1982	DV5		1982	02	28.02396	10	35	06.21	+09 15 35.9	010
1982	DW5	*	1982	02	25.93322	10	39	20.94	+11 41 16.7	010
1982	DW5		1982	02	26.06519	10	39	14.23	+11 42 19.6	010
1982	DW5		1982	02	27.94063	10	37	40.89	+11 56 21.5	010
1982	DW5		1982	02	28.02396	10	37	36.79	+11 57 01.0	010
1982	DX5	*	1982	02	26.06519	10	39	12.58	+09 43 25.3	010
1982	DYS	*	1982	02	27.94063	10	22	49.16	+10 32 49.6	010
1982	DZ5	*	1982	02	27.94063	10	24	12.35	+10 40 10.0	010
1982	DA6	*	1982	02	27.94063	10	38	23.50	+11 57 38.4	010
1982	DB6	*	1982	02	27.94063	10	39	59.21	+11 57 54.0	010
1982	DC6	*	1982	02	27.97367	10	43	51.47	+08 13 54.3	010
1982	DD6	*	1982	02	27.97367	10	44	09.94	+07 41 08.3	010
1982	DE6	*	1982	02	27.97367	10	50	07.31	+05 36 52.0	010
1982	DF6	*	1982	02	27.97367	10	50	10.41	+03 55 28.7	010
1982	DG6	*	1982	02	27.97367	10	52	06.89	+05 09 31.4	010
1982	DH6	*	1982	02	27.97367	10	52	15.59	+09 01 35.3	010
1982	DJ6	*	1982	02	27.97367	10	53	30.82	+07 20 13.6	010
1982	DK6	*	1982	02	27.97367	10	54	45.26	+04 42 26.1	010
1982	DL6	*	1982	02	27.97367	10	56	07.30	+07 52 09.9	010
1982	DM6	*	1982	02	27.97367	10	58	52.70	+07 31 57.1	010
1982	DN6	*	1982	02	27.97367	10	59	37.76	+05 31 46.3	010
1982	DO6	*	1982	02	27.97367	11	02	09.39	+08 18 05.9	010
1982	DP6	*	1982	02	27.97367	11	02	51.83	+06 31 18.6	010
1982	FQ2		1982	02	22.02766	11	03	35.85	+07 21 48.5	010
1982	FQ2		1982	02	27.97367	10	59	03.20	+08 23 33.4	010

Note 1: very faint.

OBSERVATIONS MADE WITH THE 1.3-M SCHMIDT TELESCOPE AT TAUTENBURG BY F. BORNGEN, L. KOHOUTEK AND T. LEHMANN. REDUCTIONS BY BORNGEN AND K. KIRSCH. COMMUNICATED BY S. MARX.

Object	Date	UT	R. A. (1950)	Decl.	Mag.	N Obs.
375	1983 01	07.79792	02 17 18.07	+34 19 12.0		033
375	1983 01	07.85313	02 17 19.04	+34 18 57.4	13.3	033
460	1983 01	13.10660	11 28 14.86	-01 20 04.5	15.5	033
460	1983 01	13.16563	11 28 14.91	-01 20 07.5		033
970	1962 09	30.06059	04 08 38.58	+29 16 17.0	15.0	033
970	1962 09	30.09635	04 08 40.06	+29 16 27.4		033
970	1962 09	30.12361	04 08 41.27	+29 16 37.7		033
970	1962 10	03.09531	04 10 46.85	+29 32 47.4		033
2384	1962 09	27.12049	04 03 08.91	+31 56 30.1		033
2384	1962 09	30.06059	04 02 58.90	+32 14 17.3	17.5	033
2384	1962 09	30.09635	04 02 58.66	+32 14 30.7		033
2384	1962 09	30.12361	04 02 58.47	+32 14 40.3		033
1935 OK	* 1983 01	13.10660	11 29 43.80	-01 16 44.4	15.8	033
1935 OK	1983 01	13.16563	11 29 43.78	-01 17 08.0		033
1962 SQ	* 1962 09	30.06059	04 01 40.57	+29 10 09.4	17.0	033
1962 SQ	1962 09	30.09635	04 01 41.19	+29 10 21.0		033

1962	SQ		1962	09	30.12361	04	01	41.56	+29	10	30.5	033
1962	SR		1962	09	26.12083	04	10	10.58	+31	40	38.7	1 033
1962	SR		1962	09	27.12049	04	10	28.78	+31	43	31.3	033
1962	SR	*	1962	09	30.06059	04	11	10.96	+31	51	21.3	17.8 033
1962	SR		1962	09	30.09635	04	11	11.33	+31	51	26.4	033
1962	WH1		1962	09	26.12083	04	02	56.15	+31	11	25.8	1 033
1962	WH1		1962	09	27.12049	04	03	30.02	+31	19	20.4	033
1962	WH1		1962	09	30.06059	04	04	58.36	+31	42	17.0	17.2 033
1962	WH1		1962	09	30.09635	04	04	59.16	+31	42	31.7	033
1962	WH1		1962	09	30.12361	04	04	59.93	+31	42	45.8	033
1981	VL2		1983	01	13.10660	11	32	41.87	-00	24	18.0	16.7 033
1981	VL2		1983	01	13.16563	11	32	42.39	-00	24	21.7	033
1983	AK2		1983	01	07.79792	02	24	36.63	+33	12	26.2	033
1983	AK2	*	1983	01	07.85313	02	24	38.04	+33	12	17.6	18.3 033
1983	AL2	*	1983	01	13.10660	11	28	01.34	-00	41	18.0	17.2 033
1983	AM2	*	1983	01	13.10660	11	28	47.58	+00	32	36.5	16.9 033
1983	AM2		1983	01	13.16563	11	28	48.05	+00	32	36.0	033

Note 1: measurement uncertain.

OBSERVATIONS MADE AT KLET BY A. MRKOS AND Z. VAVROVA.

Object	Date	UT	R. A. (1950)	Decl.	Mag.	Obs.
71	1983	02 04.97292	09 14 00.78	+16 06 47.8		046
71	1983	02 04.98715	09 13 59.75	+16 06 44.8		046
71	1983	02 18.96711	08 57 05.19	+15 13 26.7		046
71	1983	02 18.98146	08 57 04.19	+15 13 22.7		046
317	1983	02 15.93749	08 57 35.79	+16 31 21.9		046
317	1983	02 15.95172	08 57 34.89	+16 31 26.2		046
317	1983	02 18.96711	08 54 42.51	+16 45 50.1		046
317	1983	02 18.98146	08 54 41.77	+16 45 54.3		046
600	1983	02 04.97292	09 21 00.26	+14 52 32.5		046
600	1983	02 04.98715	09 20 59.53	+14 52 38.4		046
600	1983	02 15.97580	09 11 24.53	+16 18 04.3		046
600	1983	02 15.99001	09 11 23.74	+16 18 10.7		046
1338	1983	02 15.93749	09 00 41.45	+18 03 19.1		046
1338	1983	02 15.95172	09 00 40.53	+18 03 18.7		046
1338	1983	02 15.97580	09 00 39.00	+18 03 20.8		046
1338	1983	02 15.99001	09 00 38.06	+18 03 21.6		046
1338	1983	02 18.96711	08 57 38.49	+18 06 02.9		046
1338	1983	02 18.98146	08 57 37.74	+18 06 02.1		046
1578	1983	02 04.93403	08 57 20.67	+18 16 17.8		046
1578	1983	02 04.94965	08 57 20.14	+18 16 19.7		046
1578	1983	02 15.93749	08 49 37.66	+18 47 47.7		046
1578	1983	02 15.95172	08 49 37.10	+18 47 50.4		046
1615	1983	02 04.97292	09 13 23.14	+15 18 53.9		046
1615	1983	02 04.98715	09 13 22.34	+15 18 57.7		046
1615	1983	02 15.97580	09 04 22.35	+16 04 17.2		046
1615	1983	02 15.99001	09 04 21.65	+16 04 21.4		046
1615	1983	02 18.96711	09 02 05.09	+16 15 43.5		046
1615	1983	02 18.98146	09 02 04.46	+16 15 47.4		046
1686	1983	02 04.97292	09 13 21.92	+16 46 16.5		046
1686	1983	02 04.98715	09 13 21.33	+16 46 18.3		046
1686	1983	02 15.97580	09 04 47.17	+17 22 43.9	17.0	046
1686	1983	02 15.99001	09 04 46.20	+17 22 49.4		046
1721	1983	02 18.96711	08 56 52.74	+17 15 17.5		046
1721	1983	02 18.98146	08 56 51.96	+17 15 15.5		046
1832	1983	02 01.79236	07 39 39.39	+23 14 31.9		046
1832	1983	02 01.80660	07 39 38.78	+23 14 31.8		046
2121	1983	02 04.97292	09 25 02.00	+14 10 44.4		046
2121	1983	02 04.98715	09 25 01.17	+14 10 48.2		046

2161		1983	02	04.93403	09	03	43.41	+18	17	35.6		046
2161		1983	02	04.94965	09	03	42.71	+18	17	40.3		046
2161		1983	02	15.93749	08	54	09.58	+19	20	24.0		046
2161		1983	02	15.95172	08	54	08.80	+19	20	27.7		046
2284		1983	02	16.01370	10	28	14.05	+10	34	29.3		046
2284		1983	02	16.02800	10	28	13.33	+10	34	37.2		046
2533		1983	02	18.96711	08	57	22.24	+15	02	55.9		046
2533		1983	02	18.98146	08	57	21.82	+15	02	57.5		046
2545		1983	02	04.97292	09	20	13.62	+16	49	37.1		046
2545		1983	02	04.98715	09	20	12.76	+16	49	37.7		046
2545		1983	02	15.97580	09	07	31.47	+17	01	26.3		046
2545		1983	02	15.99001	09	07	30.38	+17	01	27.3		046
2545		1983	02	18.96711	09	04	21.15	+17	03	09.3		046
2545		1983	02	18.98146	09	04	20.30	+17	03	10.8		046
2802		1983	02	04.89722	08	31	05.92	+18	46	48.4	16.2	046
2802		1983	02	04.91146	08	31	05.11	+18	46	53.3		046
1978	LB	1983	02	19.04095	11	23	39.65	+30	46	19.7		046
1978	LB	1983	02	19.05507	11	23	39.06	+30	46	26.5		046
1982	VO	1982	11	20.96215	03	45	13.84	+22	28	37.2		046
1982	WE	1982	11	20.94792	03	44	39.23	+21	12	09.4		046
1982	WE	1982	11	20.96215	03	44	38.30	+21	12	12.5		046
1983	AS	1983	01	07.85270	07	03	54.06	+41	54	01.1		046
1983	AV1	1983	01	13.00247	08	33	32.30	+14	46	22.4		046
1983	CO1 *	1983	02	04.89722	08	36	44.08	+18	48	31.7	16. 8	046
1983	CG1	1983	02	04.91146	08	36	43.29	+18	48	34.6		046
1983	CP1 *	1983	02	04.93403	09	03	07.51	+16	13	53.1	16.9	046
1983	CP1	1983	02	04.94965	09	03	06.85	+16	13	56.3		046
1983	CQ1 *	1983	02	04.93403	09	04	05.85	+17	31	37.0	17.2	046
1983	CQ1	1983	02	04.94965	09	04	05.07	+17	31	39.3		046
1983	CR1 *	1983	02	04.93403	09	04	30.77	+19	15	35.8	17.0	046
1983	CR1	1983	02	04.94965	09	04	30.26	+19	15	41.8		046
1983	CS1 *	1983	02	04.93403	09	06	46.04	+16	24	10.0	17.0	046
1983	CS1	1983	02	04.94965	09	06	45.26	+16	24	13.0		046
1983	CS1	1983	02	15.93749	08	59	00.62	+16	54	03.6		046
1983	CS1	1983	02	15.95172	08	58	59.59	+16	54	05.1		046
1983	CT1 *	1983	02	04.93403	09	07	07.03	+17	52	54.7	16.7	046
1983	CT1	1983	02	04.94965	09	07	05.97	+17	52	59.4		046
1983	CU1 *	1983	02	04.97292	09	10	56.50	+15	54	47.6	17.0	046
1983	CU1	1983	02	04.98715	09	10	55.55	+15	54	53.1		046
1983	CV1 *	1983	02	04.97292	09	12	27.67	+14	35	48.2	17.0	046
1983	CV1	1983	02	04.98715	09	12	26.68	+14	35	48.6		046
1983	CW1 *	1983	02	04.97292	09	13	18.13	+16	26	14.8	16.8	046
1983	CW1	1983	02	04.98715	09	13	17.31	+16	26	14.5		046
1983	CW1	1983	02	15.97580	09	02	02.36	+16	27	29.6	16.8	046
1983	CW1	1983	02	15.99001	09	02	01.57	+16	27	28.7		046
1983	CW1	1983	02	18.96711	08	59	10.32	+16	26	53.5		046
1983	CW1	1983	02	18.98146	08	59	09.56	+16	26	54.9		046
1983	CX1 *	1983	02	04.97292	09	18	17.50	+15	31	18.0	17.0	046
1983	CX1	1983	02	04.98715	09	18	16.69	+15	31	22.5		046
1983	CY1 *	1983	02	15.89264	08	17	59.14	+18	09	16.0		046
1983	CY1	1983	02	15.90693	08	17	58.56	+18	09	17.6		046
1983	CZ1 *	1983	02	15.89264	08	22	48.97	+19	49	17.9		046
1983	CZ1	1983	02	15.90693	08	22	48.23	+19	49	18.8		046
1983	CA2 *	1983	02	15.93749	08	48	50.78	+19	22	33.5		046
1983	CA2	1983	02	15.95172	08	48	50.06	+19	22	40.7		046
1983	CB2 *	1983	02	15.93749	08	52	16.52	+18	07	27.9	17.0	046
1983	CB2	1983	02	15.95172	08	52	15.76	+18	07	33.5		046
1983	CC2 *	1983	02	15.93749	08	59	42.70	+17	10	29.4	17.2	046

1983	CC2		1983	02	15.95172	08	59	41.78	+17	10	21.3		046
1983	CD2	*	1983	02	15.93749	09	00	59.69	+17	51	55.3	17.5	046
1983	CD2		1983	02	15.95172	09	00	58.93	+17	52	01.2		046
1983	CE2	*	1983	02	15.93749	09	01	18.42	+17	31	12.5	17.0	046
1983	CE2		1983	02	15.95172	09	01	17.74	+17	31	15.8		046
1983	CF2	*	1983	02	15.97580	09	03	38.97	+15	04	18.2	17.2	046
1983	CF2		1983	02	15.99001	09	03	38.00	+15	04	14.4		046
1983	CG2	*	1983	02	15.97580	09	06	46.50	+16	41	11.0	17.4	046
1983	CG2		1983	02	15.99001	09	06	45.72	+16	41	12.3		046
1983	DB	*	1983	02	16.01370	10	31	32.69	+09	40	03.7	16.4	046
1983	DB		1983	02	16.02800	10	31	31.99	+09	40	10.1		046
1983	DB		1983	02	19.00472	10	28	59.65	+10	06	00.9		046
1983	DB		1983	02	19.01931	10	28	58.81	+10	06	07.6		046
1983	DC	*	1983	02	16.01370	10	34	45.42	+09	34	52.8	16.8	046
1983	DC		1983	02	16.02800	10	34	44.58	+09	34	59.9		046
1983	DC		1983	02	19.00472	10	31	53.01	+09	45	53.2		046
1983	DC		1983	02	19.01931	10	31	51.97	+09	45	56.0		046
1983	DD	*	1983	02	18.96711	08	56	43.59	+16	01	23.0	16.0	046
1983	DD		1983	02	18.98146	08	56	43.04	+16	01	28.1		046

OBSERVATIONS MADE AT SKALNATE PLESO BY T. CISKO AND J. KLOBUSNIK. MEASURED AND REDUCED BY KLOBUSNIK, E. M. PITTICH AND J. SVOREN.

Object	Date	UT	R. A. (1950)	Decl.	Obs.
1	1981 01	28.90486	07 15 22.86	+31 49 38.8	056
3	1978 07	28.00486	19 56 55.00	-05 13 46.5	056
3	1980 02	22.76389	07 01 35.40	+08 20 53.4	056
3	1980 02	22.84861	07 01 35.71	+08 21 42.4	056
4	1981 01	30.01736	10 51 02.72	+15 52 10.4	056
7	1980 09	12.99826	23 47 24.84	+10 42 33.0	056
7	1980 09	16.83056	23 44 15.96	+10 26 31.2	056
11	1980 02	10.07500	11 34 51.15	+07 04 58.3	056
11	1980 03	10.87153	11 11 47.26	+10 29 32.6	056
11	1980 03	10.93542	11 11 43.67	+10 29 59.1	056
18	1979 01	19.87778	05 57 10.34	+10 24 32.3	056
18	1979 02	21.85069	05 56 02.49	+14 46 36.9	056
18	1979 02	21.92431	05 56 04.63	+14 47 07.9	056
18	1980 02	25.04236	14 04 26.51	-02 50 04.4	056
18	1980 03	23.08611	13 55 03.74	+00 19 35.4	056
25	1976 06	20.00278	18 56 19.00	+16 58 31.1	056
25	1980 08	18.02292	00 21 04.50	+29 53 00.6	056
25	1980 09	13.08611	00 12 20.78	+26 23 47.3	056
39	1980 01	20.01910	09 08 10.88	+09 18 35.6	056
39	1980 02	22.86146	08 41 04.14	+12 55 29.2	056
39	1980 02	22.95104	08 41 00.50	+12 56 04.0	056
40	1979 05	19.90556	13 30 44.02	-03 17 22.9	056
51	1980 09	16.98646	04 47 28.90	+12 46 53.6	056
51	1980 09	17.01285	04 47 30.01	+12 46 46.5	056
51	1980 09	17.04826	04 47 31.64	+12 46 39.1	056
51	1980 09	17.06076	04 47 32.33	+12 46 34.6	056
51	1980 09	17.08437	04 47 33.36	+12 46 29.7	056
51	1980 09	17.09618	04 47 33.70	+12 46 27.2	056
51	1980 09	17.10729	04 47 34.26	+12 46 25.2	056
51	1980 09	17.11910	04 47 34.82	+12 46 21.2	056
389	1980 09	05.92639	23 22 40.52	+08 49 00.8	056
389	1980 09	06.01250	23 22 36.05	+08 48 42.0	056
389	1980 09	12.85556	23 16 37.85	+08 21 36.1	056
389	1980 09	12.93611	23 16 33.52	+08 21 15.6	056
389	1980 09	16.82222	23 13 10.26	+08 03 06.9	056

389		1980	11	02.81875	22	50	23.98	+04	11	47.8	056
454		1974	09	12.97708	01	23	34.31	+05	11	02.5	056
454		1974	09	13.04722	01	23	31.70	+05	10	52.4	056
480		1975	08	14.02569	22	56	24.00	+26	11	44.0	056
480		1975	09	06.96250	22	38	08.44	+25	16	11.9	056
480		1975	09	07.03472	22	38	04.76	+25	15	44.5	056
480		1975	09	23.80903	22	25	30.15	+22	50	15.5	056
480		1979	08	31.88194	20	19	34.54	+13	10	20.3	056
480		1980	11	13.88889	04	44	51.02	+17	49	59.8	056
480		1980	11	13.95278	04	44	47.75	+17	49	16.5	056
480		1980	12	02.94549	04	26	54.15	+14	17	41.1	056
480		1980	12	02.98715	04	26	51.59	+14	17	13.8	056
532		1980	11	02.90556	02	35	54.55	-08	21	16.1	056
704		1975	12	28.99236	07	05	38.33	+21	46	24.9	056
704		1975	12	29.03507	07	05	35.70	+21	46	16.4	056
704		1976	02	01.97812	06	34	39.87	+19	42	41.5	056
704		1980	11	13.99583	04	52	52.34	+37	10	40.7	056
704		1980	12	03.01701	04	34	04.54	+35	21	59.9	056
704		1980	12	03.07535	04	34	00.85	+35	21	33.6	056
704		1980	12	30.93785	04	11	13.86	+31	20	22.8	056
990		1974	09	13.04722	00	57	11.88	+09	11	46.1	056

OBSERVATIONS MADE AT TURKU. MEASURED BY L. OTERMA.

Object	Date	UT	R. A. (1950)			Decl.			N	Obs.
1943 GW	1943	04 06.86347	12	13	14.33	+06	03	10.0		062
1943 GW	1943	04 06.90097	12	13	12.75	+06	03	22.9		062
1943 GW	1943	04 07.90973	12	12	27.48	+06	06	59.8	1	062
1946 DA	1946	02 19.80806	09	02	29.15	+17	19	32.7	2	062
1946 DA	1946	02 19.82832	09	02	27.35	+17	19	16.0	2	062
1946 DA	1946	02 23.86462	08	57	20.89	+16	22	38.9		062
1946 QC	1946	08 24.93824	22	56	36.20	+05	50	17.0		062
1946 QC	1946	08 24.96463	22	56	35.02	+05	50	13.5		062
1946 TB	1946	10 03.96054	00	40	56.13	+04	50	39.0		062
1946 TB	1946	10 03.97547	00	40	55.43	+04	50	33.9		062
1946 TB	1946	10 03.99260	00	40	54.49	+04	50	28.0		062
1946 TB	1946	10 04.00071	00	40	54.07	+04	50	23.3		062
1946 TB	1946	10 06.97845	00	38	26.66	+04	32	57.1		062
1946 TE	1946	10 03.96054	00	37	04.45	+04	37	02.0		062
1946 TE	1946	10 03.99260	00	37	02.62	+04	36	52.0		062
1946 TE	1946	10 06.97845	00	34	04.49	+04	23	38.0		062
1946 UA	1946	10 19.94146	01	00	51.33	+16	00	47.3		062
1946 UA	1946	10 19.97537	01	00	49.15	+16	00	53.4		062
1946 UC	1946	10 07.01213	01	59	23.74	+14	36	43.3		062
1946 UC	1946	10 07.03921	01	59	22.31	+14	36	43.7		062
1946 UC	1946	10 19.95778	01	48	26.14	+14	18	50.2		062
1946 UC	1946	10 19.99250	01	48	24.18	+14	18	45.0		062
1946 UC	1946	10 22.88708	01	45	50.07	+14	13	22.3		062
1946 UD	1946	10 19.95778	01	51	37.67	+17	03	12.4	3	062
1946 UD	1946	10 19.99250	01	51	35.49	+17	03	04.2	3	062
1946 UD	1946	10 22.88708	01	48	45.73	+16	53	47.4	3	062
1946 UE	1946	10 19.95778	01	54	40.56	+16	51	10.8	3	062
1946 UE	1946	10 19.99250	01	54	38.57	+16	51	00.9	3	062
1946 UE	1946	10 22.88708	01	51	53.51	+16	36	31.3		062
1946 UJ	1946	10 23.91941	01	53	40.98	+05	01	06.9	4	062
1946 UJ	1946	10 23.94661	01	53	39.17	+05	01	12.2	4	062
1946 UJ	1946	10 26.86400	01	50	39.24	+05	10	01.1		062
1946 WD	1946	11 16.93905	03	53	46.64	+24	29	58.8		062
1946 WD	1946	11 16.97076	03	53	44.80	+24	29	39.6		062

1946	WD	1946	11	23.99219	03	47	07.63	+23	18	27.0	062
1947	BF	1947	01	26.01068	10	03	48.65	+13	54	01.1	062
1947	BF	1947	01	26.03916	10	03	47.64	+13	53	54.5	062
1947	FD	1947	03	19.02079	13	32	58.72	+07	39	26.1	2 062
1947	FD	1947	03	19.05007	13	32	57.84	+07	39	20.4	2 062
1947	GF	1947	04	13.94956	13	10	03.33	+04	30	11.3	062
1947	GF	1947	04	13.97931	13	10	01.56	+04	30	15.5	062
1947	UD	1947	10	21.79238	23	42	48.01	+14	52	26.6	5 062
1947	UD	1947	10	21.82890	23	42	46.00	+14	52	44.6	5 062
1947	UE	1947	10	21.79238	23	43	11.10	+17	39	58.7	2 062
1947	UE	1947	10	21.82890	23	43	09.58	+1/	40	04.9	2 062
1947	UF	1947	10	21.84757	00	16	27.25	+24	42	49.8	062
1947	UF	1947	10	21.88368	00	16	25.90	+24	42	34.8	062
1947	UG	1947	10	21.86457	00	42	28.99	+22	47	45.8	2 062
1947	UG	1947	10	21.90138	00	42	27.20	+22	47	38.8	2 062
1947	UH	1947	10	21.94603	02	17	04.66	+20	34	56.9	4 062
1947	UH	1947	10	21.98110	02	17	03.41	+20	34	49.8	4 062
1948	TD	1948	10	08.91817	00	29	46.65	+07	21	39.6	2 062
1948	TD	1948	10	08.95880	00	29	44.80	+07	21	18.2	2 062
1948	UB	1948	10	28.81387	01	14	17.00	+15	08	37.4	062
1948	UB	1948	10	28.85275	01	14	15.61	+15	08	04.4	062
1948	UD	1948	10	28.81387	01	13	12.76	+14	30	42.7	062
1948	UD	1948	10	28.85275	01	13	10.86	+14	30	25.4	062
1948	YD	1948	12	28.81519	04	18	02.02	+24	24	30.2	6 062
1948	YD	1948	12	28.85257	04	18	00.88	+24	24	32.6	062
1948	YD	1948	12	28.90882	04	17	59.37	+24	24	37.4	5 062
1949	FE	1949	03	19.96209	12	32	20.24	+18	15	03.0	062
1949	FE	1949	03	19.99323	12	32	18.92	+18	15	27.2	062
1949	FE	1949	03	24.04887	12	29	35.35	+19	08	39.9	5 062
1949	FG	1949	03	28.02112	13	31	59.30	+11	11	34.8	062
1949	FG	1949	03	28.06163	13	31	57.72	+11	11	57.0	062
1949	UE1	1949	10	29.92190	01	13	53.72	+10	54	58.2	062
1949	UE1	1949	10	29.96125	01	13	51.63	+10	54	52.7	062
1949	UE1	1949	10	29.97578	01	13	50.97	+10	54	52.3	062
1950	EV	1950	03	14.91016	10	32	36.30	+26	09	05.2	062
1950	EV	1950	03	14.94083	10	32	34.89	+26	09	04.2	062
1950	EV	1950	03	21.89116	10	27	49.29	+25	56	59.8	062
1950	FK	1950	03	21.93139	11	36	47.22	+18	05	33.9	062
1950	FK	1950	03	21.96009	11	36	45.98	+18	05	45.0	062
1950	FK	1950	03	22.01553	11	36	43.39	+18	06	11.6	062
1950	RF	1950	09	12.92213	22	55	06.90	+01	30	56.3	062
1950	RF	1950	09	12.96438	22	55	04.67	+01	30	41.0	062
1953	FA	1953	03	18.88784	11	51	11.86	+05	48	19.2	062
1953	FA	1953	03	18.93321	11	51	09.04	+05	48	28.1	062
1953	FA	1953	03	18.95022	11	51	08.08	+05	48	31.5	062
1953	SB	1953	09	16.82810	23	00	39.11	+05	23	01.1	2 062
1953	SB	1953	09	16.85588	23	00	37.55	+05	23	01.1	2 062
1953	SB	1953	09	16.91816	23	00	34.00	+05	23	01.2	062
1953	TF	1953	10	04.92699	00	27	15.08	+11	48	31.4	062
1953	TF	1953	10	04.95963	00	27	13.75	+11	48	09.2	062
1953	TG	1953	10	13.87674	00	44	41.81	+19	45	34.1	062
1953	TG	1953	10	13.88137	00	44	41.57	+19	45	32.7	2 062
1953	TG	1953	10	13.89676	00	44	40.91	+19	45	27.4	062
1953	TG	1953	10	13.90116	00	44	40.69	+19	45	24.4	2 062
1954	QJ	1954	08	27.90536	23	16	47.85	+15	22	05.0	062
1954	QJ	1954	08	27.92029	23	16	47.07	+15	22	09.3	062
1954	QJ	1954	08	27.94402	23	16	45.87	+15	22	12.1	062
1956	VM	1956	11	06.92552	03	17	30.47	+28	41	58.1	062

1956 VM	1956 11 06.94253	03 17 29.38	+28 41 58.1				062
1957 GC	1957 04 01.87425	11 48 57.84	+24 39 40.6				062
1957 GC	1957 04 01.89103	11 48 57.12	+24 39 39.7				062
1957 GC	1957 04 01.89936	11 48 56.76	+24 39 39.2				062
1957 GC	1957 04 01.91603	11 48 55.81	+24 39 38.6				062

Note 1: faint and uncertain. 2: very close to edge of plate, transferred. 3: close to edge of plate, not transferred. 4: images somewhat deformed. 5: very faint. 6: involved with a star.

OBSERVATIONS MADE AT GEISEI BY T. SEKI. FROM NIHONDAIRA OBS. CIRC. NOS. 1407, 1409 AND 1416.

Object	Date	UT	R. A. (1950)	Decl.	Mag.	Obs.
1544	1983 02	17.75972	11 14 57.31	+10 48 18.6	15.5	372
1544	1983 02	17.76806	11 14 56.88	+10 48 21.6		372
2145	1983 02	13.56406	09 18 52.26	-04 32 04.7	16	372
2145	1983 02	13.57812	09 18 51.64	-04 32 03.6		372
2145	1983 02	15.66632	09 17 09.02	-04 28 22.1	16	372
2145	1983 02	17.69757	09 15 30.71	-04 24 06.0	16	372
2145	1983 02	17.70920	09 15 30.16	-04 24 04.1		372
2145	1983 02	21.59514	09 12 27.66	-04 14 26.3	16	372
2145	1983 02	21.62083	09 12 26.45	-04 14 20.1		372
2145	1983 02	21.72708	09 12 21.3	-04 14 03		372
2708	1983 02	13.63715	11 36 11.32	+05 58 46.6	17	372
2708	1983 02	13.65382	11 36 10.67	+05 58 51.4		372
1932 CB1	1983 01	18.82431	13 57 35.80	-04 45 42.4	16.5	372
1932 CB1	1983 01	18.83333	13 57 36.26	-04 45 41.9		372
1932 CB1	1983 02	15.75417	14 24 54.05	-04 18 05.7	16.5	372
1932 CB1	1983 02	15.76424	14 24 54.47	-04 18 02.5		372
1959 VF	1982 11	20.75764	07 01 01.00	+23 55 07.6	16	372
1959 VF	1982 11	20.85000	07 00 59.42	+23 55 10.8		372
1959 VF	1983 01	16.72847	06 18 25.23	+24 32 04.4	17	372
1959 VF	1983 01	16.73819	06 18 24.81	+24 32 06.1		372
1975 VS5	1983 01	20.76806	08 14 35.05	+11 08 27.3	17	372
1975 VS5	1983 01	20.77535	08 14 34.44	+11 08 29.6		372
1981 UL	1983 01	20.81851	12 12 31.74	-17 53 10.9	17	372
1981 UL	1983 01	20.82778	12 12 32.07	-17 53 14.6		372
1981 UL	1983 02	15.73264	12 12 22.26	-20 29 38.5	17	372
1981 UL	1983 02	15.74375	12 12 22.00	-20 29 38.7		372
1981 WA	1983 02	17.69757	09 13 04.15	-04 10 05.7	16.5	372
1981 WA	1983 02	17.70920	09 13 03.57	-04 10 00.2		372
1982 XA	1983 01	10.50399	03 18 49.22	+14 02 54.9	16.5	372
1982 XA	1983 01	10.53073	03 18 50.11	+14 02 57.2		372
1983 AB	1983 02	07.52986	09 18 30.00	+20 44 59.5	16.5	372
1983 AB	1983 02	07.54271	09 18 29.25	+20 45 05.0		372
1983 AB	1983 02	15.71372	09 10 37.13	+21 31 12.6	16.5	372
1983 AB	1983 02	15.72257	09 10 36.78	+21 31 17.3		372
1983 CA	1983 02	11.68038	09 51 31.42	+22 51 45.2	16.5	372
1983 CA	1983 02	11.69583	09 51 30.32	+22 51 51.1		372
1983 CA	1983 02	13.50000	09 49 26.63	+23 01 29.6	16.5	372
1983 CA	1983 02	13.51979	09 49 25.30	+23 01 36.5		372
1983 CA	1983 02	15.62934	09 46 58.98	+23 12 19.6	16.5	372
1983 CA	1983 02	15.63924	09 46 58.35	+23 12 24.3		372
1983 CA	1983 02	17.72194	09 44 33.82	+23 22 18.4	16.5	372
1983 CA	1983 02	17.73333	09 44 33.04	+23 22 22.8		372
1983 CB	1983 02	15.69028	11 16 45.06	+10 50 03.3	16.5	372
1983 CB	1983 02	15.70243	11 16 44.43	+10 50 03.8		372
1983 CB	1983 02	17.75972	11 15 02.26	+10 51 06.0	16.5	372
1983 CB	1983 02	17.76806	11 15 01.72	+10 51 05.5		372

OBSERVATIONS MADE WITH THE 1.0-M SCHMIDT TELESCOPE AT THETOKYO ASTRONOMICAL OBSERVATORY'S KISO STATION BY H. KOSAI AND K. HURUKAWA.

Object	Date	UT	R. A. (1950)	Decl.	Mag.	Obs.
525	1977 04	10.58832	11 24 16.27	+00 10 24.7	17.5	381
525	1977 04	10.60916	11 24 15.58	+00 10 34.2	17.5	381
832	1977 03	12.60500	11 45 38.61	-00 01 14.2	17.4	381
832	1977 03	12.63479	11 45 37.15	-00 01 04.9	17.4	381
832	1977 03	14.58208	11 44 05.14	+00 08 52.0	17.2	381
832	1977 03	14.61055	11 44 03.75	+00 09 00.5	17.2	381
832	1977 03	15.59802	11 43 16.87	+00 14 06.0	17.2	381
832	1977 03	15.62295	11 43 15.52	+00 14 13.9	17.2	381
832	1977 04	10.58832	11 24 44.48	+02 18 57.1	17.9	381
832	1977 04	10.60916	11 24 43.91	+02 19 01.8	17.9	381
1049	1977 03	12.60500	11 30 49.24	-00 54 27.0	17.8	381
1049	1977 03	12.63479	11 30 47.65	-00 54 22.4	17.8	381
1049	1977 03	14.58208	11 29 09.14	-00 50 25.5	17.5	381
1049	1977 03	14.61055	11 29 07.70	-00 50 21.9	17.5	381
1049	1977 03	15.59802	11 28 17.74	-00 48 18.8	17.5	381
1049	1977 03	15.62295	11 28 16.34	-00 48 16.0	17.5	381
1430	1977 03	12.60500	11 33 32.49	+00 30 32.1	17.5	381
1430	1977 03	12.63479	11 33 30.88	+00 30 40.9	17.5	381
1430	1977 03	14.58208	11 31 45.51	+00 40 06.8	17.8	381
1430	1977 03	14.61055	11 31 43.97	+00 40 14.2	17.8	381
1430	1977 03	15.59802	11 30 50.33	+00 45 04.0	17.8	381
1430	1977 03	15.62295	11 30 48.92	+00 45 11.3	17.8	381
1536	1977 03	12.60500	11 41 55.34	+00 58 50.7	17.8	381
1536	1977 03	12.63479	11 41 53.63	+00 59 01.9	17.8	381
1536	1977 03	14.58208	11 39 58.48	+01 12 28.2	18.0	381
1536	1977 03	14.61055	11 39 56.85	+01 12 39.0	18.0	381
1536	1977 03	15.59802	11 38 58.27	+01 19 29.2	18.0	381
1536	1977 03	15.62295	11 38 56.59	+01 19 40.4	18.0	381
1717	1977 03	12.60500	11 50 32.19	-02 18 22.2	17.0	381
1717	1977 03	12.63479	11 50 30.08	-02 18 17.7	17.0	381
1717	1977 03	14.58208	11 48 20.47	-02 12 34.7	17.0	381
1717	1977 03	14.61055	11 48 18.52	-02 12 29.4	17.0	381
1717	1977 03	15.59802	11 47 12.46	-02 09 29.4	17.0	381
1717	1977 03	15.62295	11 47 10.66	-02 09 24.5	17.0	381
1717	1977 04	10.58832	11 22 23.86	-00 51 32.9	17.3	381
1717	1977 04	10.60916	11 22 23.01	-00 51 30.5	17.3	381
2010	1977 03	12.60500	11 50 04.47	+01 58 45.1	18.0	381
2010	1977 03	12.63479	11 50 03.18	+01 58 52.4	18.0	381
2010	1977 03	14.58208	11 48 35.43	+02 07 23.0	18.0	381
2010	1977 03	14.61055	11 48 34.14	+02 07 29.2	18.0	381
2010	1977 03	15.59802	11 47 49.42	+02 11 48.1	18.0	381
2010	1977 03	15.62295	11 47 48.16	+02 11 55.8	18.0	381
2170	1977 03	12.60500	11 45 15.58	-01 51 13.3	18.6	381
2170	1977 03	12.63479	11 45 14.05	-01 51 03.2	18.6	381
2170	1977 03	14.58208	11 43 27.17	-01 39 32.8	18.8	381
2170	1977 03	14.61055	11 43 25.62	-01 39 22.2	18.8	381
2170	1977 03	15.59802	11 42 31.20	-01 33 27.1	18.8	381
2170	1977 03	15.62295	11 42 29.63	-01 33 17.6	18.8	381
2299	1977 03	12.60500	11 41 56.40	+01 57 36.1	18.8	381
2299	1977 03	12.63479	11 41 54.96	+01 57 46.6	18.8	381
2299	1977 03	14.58208	11 40 19.34	+02 10 24.4	18.7	381
2299	1977 03	14.61055	11 40 17.98	+02 10 35.3	18.7	381
2299	1977 03	15.59802	11 39 29.20	+02 17 01.0	18.7	381
2299	1977 03	15.62295	11 39 27.98	+02 17 09.7	18.7	381
2431	1977 03	12.60500	11 42 55.95	-00 15 04.4	18.1	381
2431	1977 03	12.63479	11 42 54.36	-00 14 55.3	18.1	381

2431			1977	03	14.58208	11	41	10.72	-00	05	28.0	18.0	381
2431			1977	03	14.61055	11	41	09.25	-00	05	19.9	18.0	381
2431			1977	03	15.59802	11	40	16.41	-00	00	28.3	18.0	381
2431			1977	03	15.62295	11	40	14.89	-00	00	21.3	18.0	381
2718			1977	03	12.60500	11	50	35.71	+02	47	12.4	18.0	381
2718			1977	03	12.63479	11	50	34.38	+02	47	20.0	18.0	381
2718			1977	03	14.58208	11	49	07.79	+02	56	25.0	18.1	381
2718			1977	03	14.61055	11	49	06.48	+02	56	32.0	18.1	381
2817			1977	03	12.60500	11	40	58.17	-01	43	35.6	18.5	381
2817			1977	03	12.63479	11	40	56.38	-01	43	24.6	18.5	381
2817			1977	03	14.58208	11	39	07.81	-01	31	41.7	18.6	381
2817			1977	03	14.61055	11	39	06.12	-01	31	31.0	18.6	381
2817			1977	03	15.59802	11	38	10.89	-01	25	30.8	18.6	381
2817			1977	03	15.62295	11	38	09.27	-01	25	20.6	18.6	381
2824			1977	03	12.60500	11	31	29.92	-00	40	40.8	18.0	381
2824			1977	03	12.63479	11	31	28.15	-00	40	30.6	18.0	381
2824			1977	03	14.58208	11	29	33.31	-00	29	58.4	18.4	381
2824			1977	03	14.61055	11	29	31.67	-00	29	49.4	18.4	381
2824			1977	03	15.59802	11	28	33.38	-00	24	26.2	18.4	381
2824			1977	03	15.62295	11	28	31.83	-00	24	16.5	18.4	381
1977	EX4	*	1977	03	12.60500	11	28	25.04	+00	46	59.8	17.5	381
1977	EX4		1977	03	12.63479	11	28	23.33	+00	47	11.5	18.5	381
1977	EY4	*	1977	03	12.60500	11	28	47.65	+02	40	02.2	18.8	381
1977	EY4		1977	03	12.63479	11	28	45.89	+02	40	12.5	18.8	381
1977	EZ4	*	1977	03	12.60500	11	29	06.19	-00	41	19.8	18.3	381
1977	EZ4		1977	03	12.63479	11	29	04.46	-00	41	12.5	18.3	381
1977	EA5	*	1977	03	12.60500	11	29	13.14	+00	42	35.1	18.2	381
1977	EA5		1977	03	12.63479	11	29	11.79	+00	42	43.7	18.2	381
1977	EB5	*	1977	03	12.60500	11	30	17.80	+00	58	13.4	17.2	381
1977	EB5		1977	03	12.63479	11	30	15.90	+00	58	18.1	17.2	381
1977	EB5		1977	03	14.58208	11	28	13.75	+01	03	43.9	18.5	381
1977	EB5		1977	03	14.61055	11	28	11.99	+01	03	48.4	18.5	381
1977	EC5	*	1977	03	12.60500	11	30	42.07	+02	09	25.7	18.6	381
1977	EC5		1977	03	12.63479	11	30	40.33	+02	09	41.1	18.6	381
1977	ED5	*	1977	03	12.60500	11	30	47.37	+00	23	12.6	18.2	381
1977	ED5		1977	03	12.63479	11	30	45.58	+00	23	23.9	18.2	381
1977	ED5		1977	03	14.58208	11	28	59.64	+00	35	04.3	18.6	381
1977	ED5		1977	03	14.61055	11	28	58.03	+00	35	13.2	18.6	381
1977	EE5	*	1977	03	12.60500	11	31	19.00	+02	08	11.9	18.7	381
1977	EE5		1977	03	12.63479	11	31	17.16	+02	08	15.2	18.7	381
1977	EP5	*	1977	03	12.60500	11	31	24.60	+02	14	20.7	18.7	381
1977	EF5		1977	03	12.63479	11	31	22.82	+02	14	29.6	18.7	381
1977	EG5	*	1977	03	12.60500	11	31	28.25	+00	03	03.3	18.5	381
1977	EG5		1977	03	12.63479	11	31	26.69	+00	03	18.3	18.5	381
1977	EG5		1977	03	14.58208	11	29	44.20	+00	19	29.9	18.1	381
1977	EG5		1977	03	14.61055	11	29	42.74	+00	19	42.3	18.1	381
1977	EG5		1977	03	15.59802	11	28	50.75	+00	27	57.7	18.1	381
1977	EG5		1977	03	15.62295	11	28	49.29	+00	28	10.5	18.1	381
1977	EH5	*	1977	03	12.60500	11	32	07.36	+00	05	12.5	18.7	381
1977	EH5		1977	03	12.63479	11	32	05.42	+00	05	24.3	18.7	381
1977	EJ5	*	1977	03	12.60500	11	32	11.65	-02	38	45.3	18.9	381
1977	EJ5		1977	03	12.63479	11	32	10.36	-02	38	37.5	18.9	381
1977	EJ5		1977	03	14.58208	11	30	45.83	-02	29	51.4	18.2	381
1977	EJ5		1977	03	14.61055	11	30	44.57	-02	29	44.8	18.2	381
1977	EJ5		1977	03	15.59802	11	30	01.68	-02	25	12.9	18.2	381
1977	EJ5		1977	03	15.62295	11	30	00.60	-02	25	06.8	18.2	381
1977	EK5	*	1977	03	12.60500	11	34	05.48	+00	07	28.4	18.3	381
1977	EK5		1977	03	12.63479	11	34	03.42	+00	07	29.9	18.3	381
1977	EK5		1977	03	14.58208	11	31	55.06	+00	09	35.4	18.3	381

1977	EK5		1977	03	14.61055	11	31	53.20	+00	09	36.1	18.3	381
1977	EK5		1977	03	15.59802	11	30	47.73	+00	10	43.0	18.3	381
1977	EK5		1977	03	15.62295	11	30	45.88	+00	10	44.8	18.3	381
1977	EL5	*	1977	03	12.60500	11	34	17.65	-00	05	15.8	17.9	381
1977	EL5		1977	03	14.58208	11	32	58.65	+00	14	02.2	18.6	381
1977	EL5		1977	03	14.61055	11	32	57.42	+00	14	17.4	18.6	381
1977	EL5		1977	03	15.59802	11	32	17.79	+00	23	59.3	18.6	381
1977	EL5		1977	03	15.62295	11	32	16.74	+00	24	14.5	18.6	381
1977	EM5	*	1977	03	12.60500	11	34	29.17	+01	22	50.9	18.5	381
1977	EM5		1977	03	12.63479	11	34	27.66	+01	23	07.2	18.5	381
1977	EM5		1977	03	14.58208	11	32	44.85	+01	41	16.7	18.5	381
1977	EM5		1977	03	14.61055	11	32	43.39	+01	41	30.8	18.5	381
1977	EM5		1977	03	15.59802	11	31	51.32	+01	50	44.4	18.5	381
1977	EM5		1977	03	15.62295	11	31	49.87	+01	50	58.2	18.5	381
1977	EN5	*	1977	03	12.60500	11	34	32.22	-00	07	57.3	18.8	381
1977	EN5		1977	03	12.63479	11	34	30.49	-00	07	43.0	18.8	381
1977	EN5		1977	03	14.58208	11	32	36.20	+00	09	05.5	18.7	381
1977	EN5		1977	03	14.61055	11	32	34.51	+00	09	18.2	18.7	381
1977	EN5		1977	03	15.59802	11	31	35.92	+00	17	58.3	18.7	381
1977	EN5		1977	03	15.62295	11	31	34.37	+00	18	11.2	18.7	381
1977	EO5	*	1977	03	12.60500	11	34	32.58	-01	21	14.5	18.8	381
1977	EO5		1977	03	12.63479	11	34	31.25	-01	21	02.7	18.8	381
1977	EP5	*	1977	03	12.60500	11	34	39.26	+00	36	23.8	18.8	381
1977	EP5		1977	03	12.63479	11	34	37.31	+00	36	25.1	18.5	381
1977	EP5		1977	03	14.58208	11	32	33.39	+00	37	50.6	18.8	381
1977	EP5		1977	03	15.59802	11	31	28.69	+00	38	37.5	18.8	381
1977	EP5		1977	03	15.62295	11	31	26.75	+00	38	36.9	18.8	381
1977	EQ5	*	1977	03	12.60500	11	34	41.48	+02	43	25.0	18.5	381
1977	EQ5		1977	03	12.63479	11	34	39.99	+02	43	36.4	18.5	381
1977	EQ5		1977	03	14.58208	11	32	53.32	+02	57	27.5	18.6	381
1977	EQ5		1977	03	14.61055	11	32	51.77	+02	57	39.0	18.6	381
1977	ER5	*	1977	03	12.60500	11	34	59.13	+01	23	56.1	18.7	381
1977	ER5		1977	03	12.63479	11	34	57.69	+01	24	04.9	18.7	381
1977	ER5		1977	03	14.58208	11	33	25.16	+01	33	59.3	18.7	381
1977	ER5		1977	03	14.61055	11	33	23.91	+01	34	06.9	18.7	381
1977	ER5		1977	03	15.59802	11	32	36.93	+01	39	10.1	18.7	381
1977	ER5		1977	03	15.62295	11	32	35.57	+01	39	17.6	18.7	381
1977	ES5	*	1977	03	12.60500	11	35	12.60	+00	08	40.5	18.3	381
1977	ES5		1977	03	12.63479	11	35	10.97	+00	09	00.6	18.3	381
1977	ES5		1977	03	14.58208	11	33	37.06	+00	30	30.9	18.3	381
1977	ES5		1977	03	14.61055	11	33	35.70	+00	30	48.0	18.3	381
1977	ES5		1977	03	15.59802	11	32	48.20	+00	41	41.6	18.3	381
1977	ES5		1977	03	15.62295	11	32	46.84	+00	41	59.4	18.3	381
1977	ET5	*	1977	03	12.60500	11	35	14.15	+02	21	58.1	18.8	381
1977	ET5		1977	03	12.63479	11	35	12.45	+02	22	12.1	18.8	381
1977	ET5		1977	03	14.58208	11	33	25.36	+02	39	07.6	18.8	381
1977	ET5		1977	03	14.61055	11	33	23.98	+02	39	20.4	18.8	381
1977	EU5	*	1977	03	12.60500	11	35	32.92	-01	33	09.4	18.6	381
1977	EU5		1977	03	12.63479	11	35	31.61	-01	32	56.7	18.6	381
1977	EU5		1977	03	14.58208	11	34	09.11	-01	18	40.1	18.8	381
1977	EU5		1977	03	14.61055	11	34	07.91	-01	18	28.2	18.8	381
1977	EU5		1977	03	15.59802	11	33	26.11	-01	11	10.6	18.8	381
1977	EU5		1977	03	15.62295	11	33	25.02	-01	10	59.1	18.8	381
1977	EV5	*	1977	03	12.60500	11	35	34.97	+02	08	55.7	18.3	381
1977	EV5		1977	03	12.63479	11	35	33.35	+02	08	56.8	18.3	381
1977	EV5		1977	03	14.58208	11	33	47.65	+02	10	22.7	18.4	381
1977	EV5		1977	03	14.61055	11	33	46.10	+02	10	23.6	18.4	381
1977	EV5		1977	03	15.59802	11	32	52.51	+02	11	06.9	18.4	381
1977	EV5		1977	03	15.62295	11	32	50.90	+02	11	07.6	18.4	381

1977	EW5	*	1977	03	12.60500	11	35	36.37	+00	19	29.4	18.2	381
1977	EW5		1977	03	12.63479	11	35	34.97	+00	19	34.9	18.2	381
1977	EW5		1977	03	14.58208	11	34	04.63	+00	26	42.0	18.1	381
1977	EW5		1977	03	14.61055	11	34	03.28	+00	26	47.4	18.1	381
1977	EW5		1977	03	15.59802	11	33	17.36	+00	30	25.2	18.1	381
1977	EW5		1977	03	15.62295	11	33	16.13	+00	30	31.2	18.1	381
1977	EX5	*	1977	03	12.60500	11	35	51.01	-01	47	07.7	18.6	381
1977	EX5		1977	03	12.63479	11	35	48.93	-01	47	05.0	18.6	381
1977	EY5	*	1977	03	12.60500	11	36	26.84	-00	48	40.5	18.7	381
1977	EY5		1977	03	12.63479	11	36	25.46	-00	48	21.4	18.7	381
1977	EY5		1977	03	14.58208	11	34	53.89	-00	26	56.4	18.8	381
1977	EY5		1977	03	14.61055	11	34	52.68	-00	26	39.3	18.8	381
1977	EY5		1977	03	15.59802	11	34	06.19	-00	15	46.3	18.8	381
1977	EY5		1977	03	15.62295	11	34	05.04	-00	15	28.1	18.8	381
1977	EZ5	*	1977	03	12.60500	11	36	29.40	+00	59	43.0	18.2	381
1977	EZ5		1977	03	12.63479	11	36	27.68	+00	59	49.8	18.2	381
1977	EZ5		1977	03	14.58208	11	34	37.80	+01	08	15.9	18.5	381
1977	EZ5		1977	03	14.61055	11	34	36.32	+01	08	21.2	18.5	381
1977	EZ5		1977	03	15.59802	11	33	40.33	+01	12	40.9	18.5	381
1977	EZ5		1977	03	15.62295	11	33	38.83	+01	12	47.3	18.5	381
1977	EA6	*	1977	03	12.60500	11	36	51.81	-02	57	32.3	18.6	381
1977	EA6		1977	03	12.63479	11	36	50.02	-02	57	23.6	18.6	381
1977	EA6		1977	03	14.58208	11	34	56.75	-02	47	55.1	18.6	381
1977	EA6		1977	03	14.61055	11	34	55.08	-02	47	46.6	18.6	381
1977	EA6		1977	03	15.59802	11	33	57.54	-02	42	52.7	18.6	381
1977	EA6		1977	03	15.62295	11	33	56.07	-02	42	46.0	18.6	381
1977	EB6	*	1977	03	12.60500	11	36	56.75	-00	51	57.6	18.7	381
1977	EB6		1977	03	12.63479	11	36	55.87	-00	51	47.0	18.7	381
1977	EC6	*	1977	03	12.60500	11	37	19.97	+02	24	15.7	18.6	381
1977	EC6		1977	03	12.63479	11	37	18.04	+02	24	18.2	18.6	381
1977	EC6		1977	03	14.58208	11	35	19.72	+02	27	03.6	18.6	381
1977	EC6		1977	03	14.61055	11	35	18.03	+02	27	05.3	18.6	381
1977	EC6		1977	03	15.59802	11	34	17.77	+02	28	28.3	18.6	381
1977	EC6		1977	03	15.62295	11	34	15.96	+02	28	31.9	18.6	381
1977	ED6	*	1977	03	12.60500	11	37	24.18	+00	29	34.2	18.2	381
1977	ED6		1977	03	12.63479	11	37	22.92	+00	29	45.5	18.2	381
1977	ED6		1977	03	14.58208	11	36	01.08	+00	42	36.1	18.5	381
1977	ED6		1977	03	14.61055	11	35	59.82	+00	42	46.8	18.5	381
1977	ED6		1977	03	15.59802	11	35	18.34	+00	49	20.2	18.5	381
1977	ED6		1977	03	15.62295	11	35	16.98	+00	49	29.7	18.5	381
1977	EE6	*	1977	03	12.60500	11	37	38.36	-00	32	01.7	18.8	381
1977	EE6		1977	03	12.63479	11	37	36.73	-00	31	51.5	18.8	381
1977	EE6		1977	03	14.61055	11	35	49.78	-00	21	03.8	18.8	381
1977	EE6		1977	03	15.59802	11	34	56.18	-00	15	35.5	18.8	381
1977	EE6		1977	03	15.62295	11	34	54.39	-00	15	26.2	18.8	381
1977	EF6	*	1977	03	12.60500	11	37	57.50	-02	06	26.2	18.7	381
1977	EF6		1977	03	12.63479	11	37	56.02	-02	06	12.7	18.7	381
1977	EF6		1977	03	14.58208	11	36	14.86	-01	50	43.3	18.7	381
1977	EF6		1977	03	14.61055	11	36	13.20	-01	50	29.3	18.7	381
1977	EF6		1977	03	15.59802	11	35	21.96	-01	42	33.3	18.7	381
1977	EF6		1977	03	15.62295	11	35	20.57	-01	42	20.6	18.7	381
1977	EG6	*	1977	03	12.60500	11	38	13.11	-01	08	39.9	18.8	381
1977	EG6		1977	03	12.63479	11	38	11.75	-01	08	25.6	18.8	381
1977	EG6		1977	03	14.58208	11	36	45.38	-00	52	19.0	18.7	381
1977	EG6		1977	03	14.61055	11	36	44.09	-00	52	05.7	18.7	381
1977	EH6	*	1977	03	12.60500	11	38	29.44	-02	50	22.9	18.6	381
1977	EH6		1977	03	12.63479	11	38	28.12	-02	50	12.6	18.6	381
1977	EH6		1977	03	14.58208	11	37	02.33	-02	38	41.5	18.7	381
1977	EH6		1977	03	14.61055	11	37	01.13	-02	38	32.8	18.7	381

1977	EH6		1977	03	15.59802	11	36	17.34	-02	32	36.1	18.7	381
1977	EH6		1977	03	15.62295	11	36	16.42	-02	32	28.5	18.7	381
1977	EJ6	*	1977	03	12.60500	11	38	41.79	+00	10	51.8	18.8	381
1977	EJ6		1977	03	12.63479	11	38	40.25	+00	11	06.8	18.0	381
1977	EJ6		1977	03	14.58208	11	36	54.77	+00	28	41.6	18.2	381
1977	EJ6		1977	03	15.59802	11	35	59.67	+00	37	54.0	18.2	381
1977	EJ6		1977	03	15.62295	11	35	58.13	+00	38	07.7	18.2	381
1977	EK6	*	1977	03	12.60500	11	38	54.14	+02	23	51.3	18.7	381
1977	EK6		1977	03	12.63479	11	38	52.55	+02	24	06.8	18.7	381
1977	EK6		1977	03	14.58208	11	37	07.85	+02	40	46.6	18.4	381
1977	EK6		1977	03	14.61055	11	37	06.47	+02	40	59.4	18.4	381
1977	EK6		1977	03	15.59802	11	36	13.00	+02	49	27.9	18.4	381
1977	EL6	*	1977	03	12.60500	11	39	17.88	-00	12	56.8	18.5	381
1977	EL6		1977	03	12.63479	11	39	16.12	-00	12	46.7	18.5	381
1977	EL6		1977	03	14.58208	11	37	22.62	-00	01	33.5	18.6	381
1977	EL6		1977	03	14.61055	11	37	20.90	-00	01	24.3	18.6	381
1977	EL6		1977	03	15.59802	11	36	23.25	+00	04	18.8	18.6	381
1977	EL6		1977	03	15.62295	11	36	21.89	+00	04	26.3	18.6	381
1977	EM6	*	1977	03	12.60500	11	39	25.33	-02	18	14.7	18.3	381
1977	EM6		1977	03	12.63479	11	39	23.54	-02	18	03.3	18.3	381
1977	EM6		1977	03	14.58208	11	37	27.59	-02	05	03.0	17.9	381
1977	EM6		1977	03	14.61055	11	37	25.85	-02	04	51.8	17.9	381
1977	EM6		1977	03	15.59802	11	36	26.64	-01	58	07.2	17.9	381
1977	EM6		1977	03	15.62295	11	36	25.00	-01	57	57.3	17.9	381
1977	EN6	*	1977	03	12.60500	11	39	25.90	-00	45	09.9	18.7	381
1977	EN6		1977	03	14.58208	11	37	46.85	-00	33	24.9	18.7	381
1977	EN6		1977	03	14.61055	11	37	45.38	-00	33	14.4	18.7	381
1977	EN6		1977	03	15.59802	11	36	55.44	-00	27	19.6	18.7	381
1977	EN6		1977	03	15.62295	11	36	54.16	-00	27	09.2	18.7	381
1977	EO6	*	1977	03	12.60500	11	39	30.82	-01	36	27.3	18.9	381
1977	EO6		1977	03	12.63479	11	39	29.16	-01	36	12.2	18.9	381
1977	EP6	*	1977	03	12.60500	11	39	32.09	+00	06	38.8	18.2	381
1977	EP6		1977	03	12.63479	11	39	31.04	+00	06	48.3	18.2	381
1977	EP6		1977	03	14.58208	11	38	20.72	+00	17	40.1	18.5	381
1977	EP6		1977	03	14.61055	11	38	19.71	+00	17	48.2	18.5	381
1977	EP6		1977	03	15.59802	11	37	43.94	+00	23	22.0	18.5	381
1977	EP6		1977	03	15.62295	11	37	42.92	+00	23	28.9	18.5	381
1977	EQ6	*	1977	03	12.60500	11	39	58.96	-02	04	40.2	18.7	381
1977	EQ6		1977	03	12.63479	11	39	57.53	-02	04	29.6	18.7	381
1977	EQ6		1977	03	14.58208	11	38	34.02	-01	53	57.3	18.7	381
1977	EQ6		1977	03	14.61055	11	38	32.71	-01	53	48.4	18.7	381
1977	EQ6		1977	03	15.59802	11	37	50.03	-01	48	23.0	18.7	381
1977	EQ6		1977	03	15.62295	11	37	48.98	-01	48	14.7	18.7	381
1977	ER6	*	1977	03	12.60500	11	39	59.45	-00	21	31.3	18.7	381
1977	ER6		1977	03	12.63479	11	39	57.70	-00	21	23.0	18.7	381
1977	ER6		1977	03	14.58208	11	38	02.05	-00	12	08.2	18.7	381
1977	ER6		1977	03	14.61055	11	38	00.25	-00	11	59.6	18.7	381
1977	ER6		1977	03	15.59802	11	37	00.89	-00	07	13.1	18.7	381
1977	ER6		1977	03	15.62295	11	36	59.24	-00	07	04.8	18.7	381
1977	ES6	*	1977	03	12.60500	11	40	11.92	+01	31	02.2	18.2	381
1977	ES6		1977	03	12.63479	11	40	10.25	+01	31	12.5	18.2	381
1977	ES6		1977	03	14.58208	11	38	18.94	+01	43	36.5	18.2	381
1977	ES6		1977	03	14.61055	11	38	17.31	+01	43	46.4	18.2	381
1977	ES6		1977	03	15.59802	11	37	20.81	+01	50	03.5	18.2	381
1977	ES6		1977	03	15.62295	11	37	19.29	+01	50	13.8	18.2	381
1977	ET6	*	1977	03	12.60500	11	40	28.14	-01	39	48.2	18.7	381
1977	ET6		1977	03	12.63479	11	40	26.63	-01	39	40.6	18.7	381
1977	ET6		1977	03	14.58208	11	38	54.71	-01	31	00.0	18.8	381
1977	ET6		1977	03	14.61055	11	38	53.23	-01	30	53.3	18.8	381

1977	ET6		1977	03	15.59802	11	38	06.57	-01	26	25.9	18.8	381
1977	ET6		1977	03	15.62295	11	38	05.25	-01	26	19.0	18.8	381
1977	EU6	*	1977	03	12.60500	11	40	28.18	+01	05	02.7	18.5	381
1977	EU6		1977	03	12.63479	11	40	26.37	+01	05	08.7	18.5	381
1977	EU6		1977	03	14.58208	11	38	37.46	+01	11	07.1	18.7	381
1977	EU6		1977	03	14.61055	11	38	35.76	+01	11	11.6	18.7	381
1977	EU6		1977	03	15.59802	11	37	40.45	+01	14	14.4	18.7	381
1977	EU6		1977	03	15.62295	11	37	38.87	+01	14	19.2	18.7	381
1977	EV6	*	1977	03	12.60500	11	40	34.54	-01	11	09.3	18.7	381
1977	EV6		1977	03	12.63479	11	40	32.89	-01	10	58.0	18.7	381
1977	EV6		1977	03	14.58208	11	38	48.73	-00	59	08.3	18.8	381
1977	EV6		1977	03	14.61055	11	38	47.10	-00	58	58.4	18.8	381
1977	EV6		1977	03	15.59802	11	37	54.18	-00	52	55.0	18.8	381
1977	EV6		1977	03	15.62295	11	37	52.76	-00	52	46.3	18.8	381
1977	EW6	*	1977	03	12.60500	11	40	35.03	+02	07	21.0	18.5	381
1977	EW6		1977	03	12.63479	11	40	33.75	+02	07	29.9	18.5	381
1977	EW6		1977	03	14.58208	11	39	02.16	+02	18	46.2	18.5	381
1977	EW6		1977	03	14.61055	11	39	00.83	+02	18	55.6	18.5	381
1977	EW6		1977	03	15.59802	11	38	14.09	+02	24	38.4	18.5	381
1977	EW6		1977	03	15.62295	11	38	12.93	+02	24	48.3	18.5	381
1977	EX6	*	1977	03	12.60500	11	40	47.36	+02	11	10.9	18.8	381
1977	EX6		1977	03	12.63479	11	40	45.74	+02	11	20.2	18.8	381
1977	EY6	*	1977	03	12.60500	11	42	08.71	+00	00	38.6	18.8	381
1977	EY6		1977	03	12.63479	11	42	06.95	+00	00	46.2	18.8	381
1977	EY6		1977	03	14.58208	11	40	18.47	+00	10	01.6	18.5	381
1977	EY6		1977	03	14.61055	11	40	16.93	+00	10	08.3	18.5	381
1977	EY6		1977	03	15.59802	11	39	21.65	+00	14	52.8	18.5	381
1977	EY6		1977	03	15.62295	11	39	20.11	+00	15	00.6	18.5	381
1977	EZ6	*	1977	03	12.60500	11	42	12.59	-00	54	34.7	18.7	381
1977	EZ6		1977	03	12.63479	11	42	10.88	-00	54	25.0	18.7	381
1977	EZ6		1977	03	14.58208	11	40	22.63	-00	44	12.2	18.7	381
1977	EZ6		1977	03	14.61055	11	40	20.98	-00	44	04.0	18.7	381
1977	EA7	*	1977	03	12.60500	11	42	22.61	+02	06	44.5	18.0	381
1977	EA7		1977	03	12.63479	11	42	21.35	+02	06	53.0	18.0	381
1977	EA7		1977	03	14.58208	11	40	54.66	+02	17	04.9	18.1	381
1977	EA7		1977	03	14.61055	11	40	53.46	+02	17	12.7	18.1	381
1977	EA7		1977	03	15.59802	11	40	09.11	+02	22	25.1	18.1	381
1977	EA7		1977	03	15.62295	11	40	07.96	+02	22	32.2	18.1	381
1977	EB7	*	1977	03	12.60500	11	42	29.79	-02	14	45.1	18.5	381
1977	EB7		1977	03	12.63479	11	42	28.53	-02	14	31.8	18.5	381
1977	EB7		1977	03	14.58208	11	41	06.57	-01	59	17.3	18.2	381
1977	EB7		1977	03	14.61055	11	41	05.32	-01	59	04.2	18.2	381
1977	EB7		1977	03	15.59802	11	40	23.57	-01	51	15.1	18.2	381
1977	EB7		1977	03	15.62295	11	40	22.47	-01	51	03.1	18.2	381
1977	EC7	*	1977	03	12.60500	11	42	32.94	-00	42	55.3	18.5	381
1977	EC7		1977	03	12.63479	11	42	31.10	-00	42	46.6	18.5	381
1977	EC7		1977	03	14.58208	11	40	33.11	-00	33	43.5	18.5	381
1977	EC7		1977	03	14.61055	11	40	31.24	-00	33	35.9	18.5	381
1977	EC7		1977	03	15.59802	11	39	31.30	-00	28	58.4	18.5	381
1977	EC7		1977	03	15.62295	11	39	29.55	-00	28	50.2	18.5	381
1977	ED7	*	1977	03	12.60500	11	42	43.02	+01	31	26.6	18.8	381
1977	ED7		1977	03	12.63479	11	42	41.86	+01	31	36.7	18.8	381
1977	ED7		1977	03	14.58208	11	41	17.21	+01	41	17.5	18.5	381
1977	ED7		1977	03	14.61055	11	41	15.94	+01	41	25.1	18.5	381
1977	ED7		1977	03	15.59802	11	40	32.89	+01	46	20.6	18.5	381
1977	ED7		1977	03	15.62295	11	40	31.73	+01	46	27.8	18.5	381
1977	EE7	*	1977	03	12.60500	11	42	44.80	+01	22	57.5	18.6	381
1977	EE7		1977	03	12.63479	11	42	43.33	+01	23	05.6	18.6	381
1977	EE7		1977	03	14.58208	11	41	09.85	+01	31	39.6	18.7	381

1977	EE7		1977	03	15.59802	11	40	20.68	+01	36	06.6	18.7	381
1977	EE7		1977	03	15.62295	11	40	19.44	+01	36	14.7	18.7	381
1977	EF7	*	1977	03	12.60500	11	42	51.80	+02	26	05.6	18.8	381
1977	EF7		1977	03	12.63479	11	42	50.45	+02	26	13.2	18.8	381
1977	EG7	*	1977	03	12.60500	11	42	59.75	+00	45	49.4	18.7	381
1977	EG7		1977	03	12.63479	11	42	58.14	+00	46	03.4	18.7	381
1977	EG7		1977	03	14.58208	11	41	11.07	+01	01	58.2	18.6	381
1977	EG7		1977	03	14.61055	11	41	09.50	+01	02	10.5	18.6	381
1977	EG7		1977	03	15.59802	11	40	14.94	+01	10	16.6	18.6	381
1977	EG7		1977	03	15.62295	11	40	13.46	+01	10	31.1	18.6	381
1977	EH7	*	1977	03	12.60500	11	43	05.88	-01	32	12.9	18.2	381
1977	EH7		1977	03	12.63479	11	43	03.89	-01	32	07.9	18.2	381
1977	EH7		1977	03	14.58208	11	40	54.42	-01	27	04.6	18.4	381
1977	EH7		1977	03	14.61055	11	40	52.52	-01	27	00.3	18.4	381
1977	EH7		1977	03	15.59802	11	39	46.80	-01	24	22.6	18.4	381
1977	EH7		1977	03	15.62295	11	39	44.99	-01	24	18.3	18.4	381
1977	EJ7	*	1977	03	12.60500	11	43	09.41	+02	20	32.5	18.8	381
1977	EJ7		1977	03	12.63479	11	43	07.86	+02	20	37.0	18.8	381
1977	EK7	*	1977	03	12.60500	11	43	45.23	+01	21	27.2	18.7	381
1977	EK7		1977	03	12.63479	11	43	43.91	+01	21	35.1	18.7	381
1977	EL7	*	1977	03	12.60500	11	44	17.09	-01	05	31.5	18.3	381
1977	EL7		1977	03	12.63479	11	44	16.01	-01	05	12.1	18.3	381
1977	EL7		1977	03	14.58208	11	43	07.08	-00	43	07.2	18.3	381
1977	EL7		1977	03	14.61055	11	43	06.02	-00	42	49.2	18.3	381
1977	EL7		1977	03	15.59802	11	42	30.73	-00	31	30.4	18.3	381
1977	EL7		1977	03	15.62295	11	42	29.69	-00	31	13.3	18.3	381
1977	EM7	*	1977	03	12.60500	11	44	54.53	-01	34	55.7	18.4	381
1977	EM7		1977	03	12.63479	11	44	52.93	-01	34	53.8	18.4	381
1977	EM7		1977	03	14.58208	11	43	11.58	-01	32	54.4	18.3	381
1977	EM7		1977	03	14.61055	11	43	10.15	-01	32	52.5	18.3	381
1977	EM7		1977	03	15.59802	11	42	18.24	-01	31	49.3	18.3	381
1977	EM7		1977	03	15.62295	11	42	16.99	-01	31	46.8	18.3	381
1977	EN7	*	1977	03	12.60500	11	44	55.39	+00	30	25.6	18.4	381
1977	EN7		1977	03	12.63479	11	44	54.14	+00	30	31.9	18.4	381
1977	EN7		1977	03	14.58208	11	43	30.76	+00	40	02.2	18.6	381
1977	EN7		1977	03	14.61055	11	43	29.62	+00	40	09.4	18.6	381
1977	EN7		1977	03	15.59802	11	42	47.01	+00	45	00.7	18.6	381
1977	EN7		1977	03	15.62295	11	42	45.75	+00	45	08.4	18.6	381
1977	E07	*	1977	03	12.60500	11	45	16.10	-00	30	54.9	18.8	381
1977	E07		1977	03	12.63479	11	45	14.75	-00	30	44.6	18.8	381
1977	EP7	*	1977	03	12.60500	11	45	17.14	-02	15	28.7	18.8	381
1977	EP7		1977	03	12.63479	11	45	15.69	-02	15	12.7	18.8	381
1977	EQ7	*	1977	03	12.60500	11	45	28.93	+02	18	10.4	18.7	381
1977	EQ7		1977	03	12.63479	11	45	27.07	+02	18	14.5	18.7	381
1977	EQ7		1977	03	14.58208	11	43	22.31	+02	24	45.3	18.5	381
1977	EQ7		1977	03	14.61055	11	43	20.54	+02	24	50.8	18.5	381
1977	EQ7		1977	03	15.59802	11	42	16.78	+02	28	08.0	18.5	381
1977	EQ7		1977	03	15.62295	11	42	15.06	+02	28	15.3	18.5	381
1977	ER7	*	1977	03	12.60500	11	45	34.07	-02	38	21.5	18.8	381
1977	ER7		1977	03	12.63479	11	45	32.39	-02	38	06.3	18.8	381
1977	ER7		1977	03	14.58208	11	43	53.16	-02	21	46.6	18.8	381
1977	ER7		1977	03	14.61055	11	43	51.65	-02	21	32.4	18.8	381
1977	ER7		1977	03	15.59802	11	43	00.82	-02	13	07.0	18.8	381
1977	ER7		1977	03	15.62295	11	42	59.46	-02	12	56.5	18.8	381
1977	ES7		1977	03	12.60500	11	45	35.14	+02	46	04.2	18.5	381
1977	ES7		1977	03	12.63479	11	45	33.53	+02	46	04.8	18.5	381
1977	ES7		1977	03	14.58208	11	43	49.76	+02	47	59.6	18.1	381
1977	ES7		1977	03	14.61055	11	43	48.24	+02	48	01.2	18.1	381
1977	ES7		1977	03	15.59802	11	42	55.41	+02	48	58.7	18.1	381

1977	ES7		1977	03	15.62295	11	42	53.92	+02	49	01.0	18.1	381
1977	ET7		1977	03	12.60500	11	45	45.27	-00	10	08.5	18.5	381
1977	ET7	*	1977	03	12.63479	11	45	43.75	-00	09	53.1	18.5	381
1977	ET7		1977	03	14.58208	11	44	04.28	+00	07	40.9	18.4	381
1977	ET7		1977	03	14.61055	11	44	02.81	+00	07	55.3	18.4	381
1977	ET7		1977	03	15.59802	11	43	12.16	+00	16	52.0	18.4	381
1977	ET7		1977	03	15.62295	11	43	10.68	+00	17	04.6	18.4	381
1977	EU7		1977	03	12.60500	11	46	11.44	+02	48	52.3	18.7	381
1977	EU7	*	1977	03	12.63479	11	46	09.95	+02	49	09.0	18.7	381
1977	EV7		1977	03	12.60500	11	46	23.15	+01	20	45.4	18.8	381
1977	EV7	*	1977	03	14.58208	11	44	38.64	+01	22	53.5	18.6	381
1977	EV7		1977	03	14.61055	11	44	37.18	+01	22	55.4	18.6	381
1977	EV7		1977	03	15.59802	11	43	44.92	+01	24	00.5	18.6	381
1977	EV7		1977	03	15.62295	11	43	43.49	+01	24	04.0	18.6	381
1977	EW7	*	1977	03	12.60500	11	47	08.80	+01	09	19.4	18.7	381
1977	EW7		1977	03	12.63479	11	47	07.48	+01	09	38.3	18.7	381
1977	EW7		1977	03	14.58208	11	45	39.86	+01	31	01.0	18.3	381
1977	EW7		1977	03	14.61055	11	45	38.59	+01	31	17.4	18.3	381
1977	EW7		1977	03	15.59802	11	44	53.62	+01	42	11.9	18.3	381
1977	EW7		1977	03	15.62295	11	44	52.29	+01	42	30.0	18.3	381
1977	EX7	*	1977	03	12.60500	11	47	48.42	+02	10	05.6	18.4	381
1977	EX7		1977	03	12.63479	11	47	46.68	+02	10	13.3	18.4	381
1977	EX7		1977	03	14.58208	11	45	58.88	+02	18	44.3	18.2	381
1977	EX7		1977	03	14.61055	11	45	57.32	+02	18	51.6	18.2	381
1977	EX7		1977	03	15.59802	11	45	02.01	+02	23	11.5	18.2	381
1977	EX7		1977	03	15.62295	11	45	00.55	+02	23	18.9	18.2	381
1977	EY7	*	1977	03	12.60500	11	48	11.41	-02	11	11.3	18.7	381
1977	EY7		1977	03	12.63479	11	48	09.62	-02	11	02.9	18.7	381
1977	EY7		1977	03	14.58208	11	46	24.63	-01	59	56.7	18.8	381
1977	EY7		1977	03	14.61055	11	46	23.05	-01	59	46.7	18.8	381
1977	EZ7	*	1977	03	12.60500	11	48	12.78	+01	13	58.2	18.6	381
1977	EZ7		1977	03	12.63479	11	48	11.09	+01	14	05.3	18.6	381
1977	EZ7		1977	03	14.58208	11	46	24.31	+01	21	42.7	18.5	381
1977	EZ7		1977	03	14.61055	11	46	22.73	+01	21	48.5	18.5	381
1977	EZ7		1977	03	15.59802	11	45	28.22	+01	25	42.6	18.5	381
1977	EZ7		1977	03	15.62295	11	45	26.71	+01	25	47.1	18.5	381
1977	EA8	*	1977	03	12.60500	11	48	20.85	+01	34	21.1	18.7	381
1977	EA8		1977	03	12.63479	11	48	18.73	+01	34	19.8	18.7	381
1977	EA8		1977	03	14.58208	11	46	09.01	+01	33	21.0	18.6	381
1977	EA8		1977	03	14.61055	11	46	07.10	+01	33	19.7	18.6	381
1977	EA8		1977	03	15.59802	11	45	00.89	+01	32	49.2	18.6	381
1977	EA8		1977	03	15.62295	11	44	58.89	+01	32	48.5	18.6	381
1977	EB8	*	1977	03	12.60500	11	48	52.67	-02	56	33.9	18.7	381
1977	EB8		1977	03	12.63479	11	48	50.89	-02	56	23.5	18.7	381
1977	EB8		1977	03	14.58208	11	47	13.04	-02	44	40.7	18.7	381
1977	EB8		1977	03	14.61055	11	47	11.64	-02	44	31.5	18.7	381
1977	EB8		1977	03	15.59802	11	46	21.74	-02	38	27.9	18.7	381
1977	EBB		1977	03	15.62295	11	46	20.32	-02	38	17.9	18.7	381
1977	EC8	*	1977	03	12.60500	11	48	52.84	-02	05	12.0	18.1	381
1977	EC8		1977	03	12.63479	11	48	51.12	-02	05	01.3	18.1	381
1977	EC8		1977	03	14.58208	11	47	06.60	-01	52	45.1	18.1	381
1977	EC8		1977	03	14.61055	11	47	05.03	-01	52	34.2	18.1	381
1977	EC8		1977	03	15.59802	11	46	11.23	-01	46	12.0	18.1	381
1977	EC8		1977	04	10.58832	11	24	54.90	+01	02	41.6	17.9	381
1977	EC8		1977	04	10.60916	11	24	53.91	+01	02	50.0	17.9	381
1977	ED8	*	1977	03	12.60500	11	49	04.61	-00	51	16.9	18.8	381
1977	ED8		1977	03	12.63479	11	49	03.10	-00	51	01.7	18.8	381
1977	ED8		1977	03	14.58208	11	47	24.87	-00	33	20.8	18.3	381
1977	ED8		1977	03	14.61055	11	47	23.39	-00	33	05.2	18.3	381

1977	ED8		1977	03	15.59802	11	46	32.85	-00	23	59.6	18.3	381
1977	ED8		1977	03	15.62295	11	46	31.53	-00	23	46.6	18.3	381
1977	EE8		1977	03	12.60500	11	49	07.81	-00	55	06.8	18.6	381
1977	EE8	*	1977	03	12.63479	11	49	06.54	-00	54	59.1	18.6	381
1977	EE8		1977	03	14.58208	11	47	43.29	-00	46	56.3	18.3	381
1977	EE8		1977	03	14.61055	11	47	42.15	-00	46	49.8	18.3	381
1977	EE8		1977	03	15.59802	11	46	59.58	-00	42	42.9	18.3	381
1977	EE8		1977	03	15.62295	11	46	58.47	-00	42	36.9	18.3	381
1977	EF8		1977	03	12.60500	11	49	40.52	+01	30	15.8	18.7	381
1977	EF8	*	1977	03	12.63479	11	49	39.02	+01	30	30.8	18.7	381
1977	EG8		1977	03	12.60500	11	50	00.78	+00	11	01.6	17.9	381
1977	EG8		1977	03	12.63479	11	49	59.31	+00	11	10.5	17.9	381
1977	EG8		1977	03	14.58208	11	48	31.96	+00	21	30.8	18.2	381
1977	EG8		1977	03	14.61055	11	48	30.69	+00	21	39.1	18.2	381
1977	EG8		1977	03	15.59802	11	47	45.95	+00	26	56.3	18.2	381
1977	EG8		1977	03	15.62295	11	47	44.77	+00	27	05.0	18.2	381
1977	EH8		1977	03	12.60500	11	50	28.08	+00	20	49.2	18.9	381
1977	EH8	*	1977	03	12.63479	11	50	26.20	+00	20	50.7	18.9	381
1977	EJ8	*	1977	03	12.60500	11	50	32.27	-01	44	46.8	18.7	381
1977	EJ8		1977	03	12.63479	11	50	30.49	-01	44	42.0	18.7	381
1977	EJ8		1977	03	14.58208	11	48	35.66	-01	38	34.8	18.8	381
1977	EJ8		1977	03	14.61055	11	48	33.92	-01	38	30.6	18.8	381
1977	EJ8		1977	03	15.59802	11	47	35.31	-01	35	19.0	18.8	381
1977	EJ8		1977	03	15.62295	11	47	33.64	-01	35	14.1	18.8	381
1977	EK8		1977	03	12.60500	11	51	20.34	-00	23	24.4	18.7	381
1977	EK8	*	1977	03	12.63479	11	51	18.61	-00	23	08.8	18.7	381
1977	EK8		1977	03	14.58208	11	49	28.72	-00	07	17.4	18.3	381
1977	EK8		1977	03	14.61055	11	49	26.94	-00	07	04.3	18.3	381
1977	EK8		1977	03	15.62295	11	48	29.18	+00	01	16.2	18.3	381
1977	EL8		1977	03	12.60500	11	51	23.36	+00	11	36.2	18.7	381
1977	EL8	*	1977	03	12.63479	11	51	21.86	+00	11	58.7	18.7	381
1977	EL8		1977	03	14.58208	11	49	58.60	+00	36	45.7	18.6	381
1977	EL8		1977	03	14.61055	11	49	57.23	+00	37	08.6	18.6	381
1977	EL8		1977	03	15.62295	11	49	13.53	+00	50	03.5	18.6	381
1977	EM8	*	1977	03	12.60500	11	51	50.91	+02	17	50.2	17.5	381
1977	EM8		1977	03	12.63479	11	51	49.29	+02	18	08.0	17.5	381
1977	EM8		1977	03	14.58208	11	50	10.37	+02	36	42.7	17.7	381
1977	EM8		1977	03	14.61055	11	50	08.81	+02	36	58.4	17.7	381
1977	EM8		1977	03	15.59802	11	49	18.14	+02	46	25.1	17.7	381
1977	EM8		1977	03	15.62295	11	49	16.70	+02	46	40.2	17.7	381
1977	EN8	*	1977	03	12.60500	11	51	54.23	-01	41	57.4	18.4	381
1977	EN8		1977	03	12.63479	11	51	52.41	-01	41	57.5	18.4	381
1977	EN8		1977	03	14.58208	11	49	47.26	-01	42	03.5	18.5	381
1977	EN8		1977	03	14.61055	11	49	45.37	-01	42	04.0	18.5	381
1977	EN8		1977	03	15.59802	11	48	41.04	-01	42	02.2	18.5	381
1977	EN8		1977	03	15.62295	11	48	39.41	-01	42	03.5	18.5	381
1977	EO8	*	1977	03	14.58208	11	31	37.79	+02	06	56.4	18.8	381
1977	EO8		1977	03	14.61055	11	31	36.36	+02	07	10.5	18.8	381
1977	EP8	*	1977	03	14.58208	11	33	51.22	+00	24	36.6	18.7	381
1977	EP8		1977	03	14.61055	11	33	49.62	+00	24	44.7	18.7	381
1977	EQ8	*	1977	03	14.61055	11	36	53.09	+00	27	14.4	18.2	381
1977	ER8	*	1977	03	14.58208	11	37	33.17	+02	35	19.0	18.5	381
1977	ER8		1977	03	14.61055	11	37	31.74	+02	35	29.5	18.5	381
1977	ER8		1977	03	15.59802	11	36	40.98	+02	41	39.4	18.5	381
1977	ER8		1977	03	15.62295	11	36	39.77	+02	41	49.4	18.5	381
1977	ES8		1977	03	14.61055	11	38	16.01	+01	29	15.2	18.6	381
1977	ET8	*	1977	03	14.58208	11	38	18.65	+01	27	25.4	18.6	381
1977	EU8	*	1977	03	14.58208	11	42	24.02	-00	34	46.3	18.6	381
1977	EU8	*	1977	03	14.61055	11	42	22.50	-00	34	42.4	18.6	381

1977 EV8		1977	03	14.58208	11	44	53.57	-02	51	24.2	18.9	381
1977 EV8	*	1977	03	14.61055	11	44	51.82	-02	51	18.1	18.9	381
1977 EV8		1977	03	15.59802	11	43	52.63	-02	47	44.9	18.9	381
1977 EV8		1977	03	15.62295	11	43	51.07	-02	47	39.3	18.9	381
1977 EW8	*	1977	03	14.58208	11	45	24.72	+01	29	04.6	18.6	381
1977 EW8		1977	03	14.61055	11	45	22.87	+01	29	19.1	18.6	381
1977 EX8	*	1977	03	14.58208	11	45	26.36	+01	38	43.6	18.7	381
1977 EX8		1977	03	14.61055	11	45	25.12	+01	38	58.5	18.7	381
1977 EX8		1977	03	15.59802	11	44	39.79	+01	47	30.7	18.7	381
1977 EX8		1977	03	15.62295	11	44	38.53	+01	47	45.3	18.7	381
1977 EY8	*	1977	03	14.58208	11	48	13.45	-00	45	32.7	18.6	381
1977 EY8		1977	03	14.61055	11	48	12.01	-00	45	24.5	18.6	381
1977 EZ8		1977	03	14.58208	11	48	56.74	-00	40	03.3	18.7	381
1977 EZ8	*	1977	03	14.61055	11	48	55.27	-00	39	50.7	18.7	381
1977 EZ8		1977	03	15.59802	11	48	03.57	-00	32	00.2	18.7	381
1977 EZ8		1977	03	15.62295	11	48	02.19	-00	31	47.3	18.7	381
1977 EA9	*	1977	03	14.58208	11	49	34.16	+00	10	05.7	18.8	381
1977 EA9		1977	03	14.61055	11	49	32.86	+00	10	17.3	18.8	381
1977 EB9	*	1977	03	14.58208	11	49	49.31	+00	45	16.0	18.4	381
1977 EB9		1977	03	14.61055	11	49	47.77	+00	45	25.6	18.4	381
1977 EB9		1977	03	15.59802	11	48	49.87	+00	51	40.2	18.4	381
1977 EB9		1977	03	15.62295	11	48	48.09	+00	51	50.5	18.4	381
1977 EC9	*	1977	03	14.58208	11	50	40.36	+01	59	48.7	18.3	381
1977 EC9		1977	03	14.61055	11	50	39.06	+01	59	57.0	18.3	381
1977 EC9		1977	03	15.59802	11	49	53.86	+02	05	31.6	18.3	381
1977 EC9		1977	03	15.62295	11	49	52.15	+02	05	49.9	18.3	381
1977 ED9	*	1977	03	15.62295	11	36	16.09	+02	52	30.4	18.4	381
1977 EE9	*	1977	03	15.62295	11	46	09.82	-01	40	48.8	18.1	381
1977 GW	*	1977	04	10.58832	11	10	49.99	-02	13	12.3	18.0	381
1977 GW		1977	04	10.60916	11	10	49.19	-02	13	02.5	18.0	381
1977 GX	*	1977	04	10.58832	11	15	41.19	-01	12	00.4	18.0	381
1977 GX		1977	04	10.60916	11	15	41.19	-01	12	02.1	18.0	381
1977 GY	*	1977	04	10.58832	11	18	48.32	-00	38	10.2	18.1	381
1977 GY		1977	04	10.60916	11	18	48.14	-00	38	10.5	18.1	381
1977 GZ	*	1977	04	10.58832	11	20	20.94	-02	02	42.1	17.7	381
1977 GZ		1977	04	10.60916	11	20	20.26	-02	02	35.6	17.7	381
1977 GA1	*	1977	04	10.58832	11	22	56.58	+00	54	18.4	18.2	381
1977 GA1		1977	04	10.60916	11	22	56.39	+00	54	19.8	18.2	381
1977 GB1	*	1977	04	10.58832	11	26	02.69	-02	36	00.6	17.9	381
1977 GB1		1977	04	10.60916	11	26	02.04	-02	35	51.3	17.9	381
1977 GC1	*	1977	04	10.58832	11	26	38.76	+01	36	38.1	18.0	381
1977 GC1		1977	04	10.60916	11	26	38.37	+01	36	49.9	18.0	381
1977 GD1	*	1977	04	10.58832	11	27	39.95	-01	16	20.9	18.0	381
1977 GD1		1977	04	10.60916	11	27	39.11	-01	16	14.5	18.0	381

OBSERVATIONS MADE AT MOUNT JOHN UNIVERSITY OBSERVATORY BY A. C. GILMORE AND P. M. KILMARTIN.

Object	Date	UT	R. A. (1950)	Decl.	Obs.
1620	1983 03	05.37914	10 18 07.94	-05 09 27.4	474
1620	1983 03	05.42749	10 17 46.48	-05 15 00.5	474

OBSERVATIONS MADE AT REINTAL BY F. SEILER. COMMUNICATED BY F. FREVERT.

Object	Date	UT	R. A. (1950)	Decl.	Obs.
1043	1983 01	09.80208	04 30 06.02	+09 52 14.7	556
1043	1983 01	09.80903	04 30 05.82	+09 52 16.4	556
1043	1983 01	09.81597	04 30 05.72	+09 52 15.4	556
1043	1983 01	09.82292	04 30 05.59	+09 52 16.2	556
1043	1983 01	09.83681	04 30 05.15	+09 52 19.4	556
1520	1983 01	06.75417	04 33 18.76	+19 01 27.2	556

1520	1983 01 06.76111	04 33 18.55	+19 01 26.4			556
1520	1983 01 06.76806	04 33 18.27	+19 01 21.8			556
1520	1983 01 06.77500	04 33 18.16	+19 01 21.2			556

OBSERVATIONS MADE AT SEEWALCHEN BY M. BRESSLER. COMMUNICATED BY F. FREVERT.

Object	Date UT	R. A. (1950)	Decl.			N Obs.
329	1982 05 25.88611	15 56 21.10	+03 47 38.3			1 563
329	1982 05 25.89375	15 56 20.62	+03 47 39.7			1 563
329	1982 05 26.84931	15 55 31.82	+03 52 14.8			1 563
329	1982 05 26.85694	15 55 31.50	+03 52 16.5			1 563
329	1982 05 26.86458	15 55 31.10	+03 52 18.8			1 563
329	1982 05 26.87986	15 55 30.23	+03 52 23.3			1 563
329	1982 05 26.88750	15 55 29.71	+03 52 25.0			1 563
329	1982 05 26.89167	15 55 29.62	+03 52 27.2			1 563
329	1982 06 17.88056	15 39 37.72	+04 26 11.3			1 563
329	1982 06 17.88819	15 39 37.46	+04 26 10.6			1 563
329	1982 06 17.90347	15 39 36.97	+04 26 09.3			1 563
329	1982 06 17.91111	15 39 36.72	+04 26 09.2			1 563
329	1982 06 17.91875	15 39 36.50	+04 26 09.3			1 563
942	1982 11 21.76528	01 45 12.28	+01 15 46.2			1 563
942	1982 11 21.78542	01 45 11.51	+01 15 50.7			1 563
942	1982 11 21.79583	01 45 11.11	+01 15 49.8			1 563
942	1982 11 21.80625	01 45 10.90	+01 15 53.9			1 563
1043	1983 01 06.79861	04 31 23.06	+09 45 27.5			1 563
1043	1983 01 06.80903	04 31 22.71	+09 45 27.7			1 563
1043	1983 01 06.84028	04 31 21.89	+09 45 30.8			1 563
1043	1983 01 11.83333	04 29 20.46	+09 57 17.5			1 563
1043	1983 01 11.84306	04 29 20.34	+09 57 20.3			1 563
1043	1983 01 11.85069	04 29 20.16	+09 57 21.6			1 563
1043	1983 01 11.88542	04 29 19.37	+09 57 26.3			1 563
1043	1983 01 11.89444	04 29 19.20	+09 57 27.2			1 563
1043	1983 01 11.90764	04 29 19.02	+09 57 29.8			1 563
1520	1983 01 11.74722	04 31 19.40	+18 39 24.8			1 563
1520	1983 01 11.75764	04 31 19.26	+18 39 20.2			1 563
1520	1983 01 11.76667	04 31 19.09	+18 39 19.1			1 563
1520	1983 01 11.79167	04 31 18.56	+18 39 12.5			1 563
1520	1983 01 11.80347	04 31 18.28	+18 39 09.6			1 563

Note 1: observatory code 563, Long. and Parallax 13.60, -286, -315 (see MPC 4766).

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

Object	Date UT	R. A. (1950)	Decl.	Mag.	N Obs.
1982 WD	1982 12 06.45071	04 32 12.52	+17 37 05.5		1 675
1982 WD	1982 12 06.45592	04 31 58.44	+17 32 22.3		1 675
1983 CC	1983 02 20.14794	09 17 53.63	+23 39 32.4		3 675
1983 CC	1983 02 21.44170	09 16 30.20	+24 05 16.6		1 675
6081 P-L *	1960 09 24.33613	00 10 06.96	+03 40 58.1	17.6	4 675
6081 P-L	1960 09 25.32502	00 09 11.52	+03 34 19.7		4 675
6081 P-L	1960 09 26.27573	00 08 18.32	+03 27 54.0		4 675
6081 P-L	1960 09 28.32780	00 06 23.84	+03 14 02.1		4 675
6081 P-L	1960 10 17.27085	23 50 58.89	+01 15 17.9		4 675
6081 P-L	1960 10 22.15559	23 48 04.32	+00 50 37.6		4 675
6081 P-L	1960 10 24.18787	23 47 01.59	+00 41 24.2		4 675
6081 P-L	1960 10 26.26113	23 46 04.05	+00 32 41.0		4 675
6091 P-L *	1960 09 24.33613	23 51 43.84	+01 01 02.4	17.5	4 675
6091 P-L	1960 09 25.32502	23 50 53.53	+00 56 02.7		4 675
6091 P-L	1960 09 26.27573	23 50 05.36	+00 51 12.9		4 675
6091 P-L	1960 10 17.21390	23 35 00.71	-00 42 20.2		4 675
6091 P-L	1960 10 22.15559	23 32 37.99	-00 57 58.9		4 675

6091	P-L		1960	10	24.18787	23	31	49.42	-01	03	26.8		4 675
6091	P-L		1960	10	26.26113	23	31	06.15	-01	08	22.8		4 67
6550	P-L	*	1960	09	24.35002	23	59	57.62	-03	08	27.4	16.5	4 675
6550	P-L		1960	09	26.28543	23	58	26.98	-03	11	31.3		4 675
6550	P-L		1960	09	27.34237	23	57	37.61	-03	13	08.7		4 675
6550	P-L		1960	09	28.33822	23	56	51.39	-03	14	37.5		4 675
6550	P-L		1960	10	17.22501	23	43	50.15	-03	30	24.1		4 675
6550	P-L		1960	10	22.16324	23	41	14.25	-03	29	24.1		4 675
6550	P-L		1960	10	24.23753	23	40	16.77	-03	28	14.4		4 675
6550	P-L		1960	10	26.27157	23	39	25.17	-03	26	38.0		4 675

Note 1: Observer J. Gibson. 2: image very weak. 3 = 1 + 2. 4: observer T .Gehrels; plates scanned and measured by C. J. van Houten and I. van Houten-Groeneveld.

OBSERVATIONS MADE WITH THE 0.46-M SCHMIDT TELESCOPE AT PALOMAR.

Object			Date	UT	R. A. (1950)			Decl.			Mag.	N	Obs.
1620			1983	02 11.37916	11	30	58.22	+15	15	52.7	14.5	1	675
1620			1983	02 11.40138	11	30	56.54	+15	15	23.3		1	675
1620			1983	02 15.27222	11	25	51.41	+13	34	01.2		1	675
1620			1983	02 15.30069	11	25	48.36	+13	33	12.6		1	675
2502			1983	02 11.18333	07	52	57.81	+48	29	19.7	16.5	1	675
2502			1983	02 11.20763	07	52	56.40	+48	29	08.4		1	675
1983	AG2		1983	02 17.27917	09	35	39.17	+20	39	50.8	15	2	675
1983	AG2		1983	02 18.23056	09	34	01.00	+20	24	19.3		2	675
1983	AG2		1983	02 18.30278	09	33	53.37	+20	23	09.1		2	675
1983	CD	*	1983	02 11.18333	07	50	37.00	+47	49	23.6	16	4	675
1983	CD		1983	02 11.20763	07	50	35.65	+47	49	27.6		1	675
1983	CE	*	1983	02 11.29444	09	52	18.74	+21	49	45.7	16	4	675
1983	CE		1983	02 11.35486	09	52	15.66	+21	50	26.4		1	675
1983	CH2	*	1983	02 11.18333	07	33	16.41	+49	34	52.7	16	4	675
1983	CH2		1983	02 11.20763	07	33	20.29	+49	35	12.2		1	675

Note 1: observers C. Shoemaker and E. Shoemaker (assisted by B. Behymer and D. Rudy). 2: observers E. Helin and S. Swanson; measured by Swanson. 3: discoverer C. Shoemaker. 4 = 1 + 3.

OBSERVATIONS MADE AT THE LOWELL OBSERVATORY'S ANDERSON MESA STATION BY B. A. SKIFF. MEASURED BY E. BOWELL.

Object	Date	UT	R. A. (1950)			Decl.			Mag.	N	Obs.
38	1983	02 15.20139	07	24	11.16	+20	23	15.3			688
38	1983	02 15.23229	07	24	10.26	+20	23	11.3			688
52	1983	02 11.23056	07	53	42.99	+20	08	17.5			688
52	1983	02 11.26111	07	53	41.76	+20	08	25.7			688
79	1983	02 15.21667	07	51	51.23	+13	17	43.2			688
79	1983	02 15.24792	07	51	50.02	+13	17	51.3			688
84	1983	02 15.11667	07	23	51.18	+28	08	26.6			688
84	1983	02 15.14722	07	23	49.92	+28	08	21.5			688
130	1983	01 09.38542	10	12	09.64	+08	05	15.5			688
130	1983	01 09.46319	10	12	07.83	+08	05	44.4			688
135	1983	02 11.12014	06	37	43.51	+25	40	18.8			688
135	1983	02 11.19653	06	37	41.32	+25	40	16.1			688
145	1983	02 15.09722	06	42	02.93	+35	40	29.3			688
145	1983	02 15.16667	06	42	02.13	+35	40	31.5			688
158	1983	02 15.23229	07	30	08.52	+21	13	41.8			688
169	1983	02 15.26319	09	02	29.37	+22	24	54.0			688
169	1983	02 15.29375	09	02	27.38	+22	24	57.9			688
169	1983	02 19.25139	08	58	25.70	+22	32	14.3			688
169	1983	02 19.29722	08	58	22.89	+22	32	19.5			688
170	1983	02 11.12014	06	56	56.69	+24	03	51.7			688
170	1983	02 11.19653	06	56	54.11	+24	03	24.2			688

172		1983	02	15.09722	06	37	40.92	+31 52 27.9	688
172		1983	02	15.16667	06	37	39.46	+31 52 05.8	688
178		1983	02	15.26319	09	03	42.37	+20 00 59.1	688
178		1983	02	15.29375	09	03	40.55	+20 01 06.3	688
178		1983	02	19.25139	08	59	56.14	+20 15 17.3	688
178		1983	02	19.29722	08	59	53.51	+20 15 26.6	688
192		1983	02	15.29375	09	16	09.67	+20 29 58.2	688
192		1983	02	19.25139	09	11	59.06	+20 36 55.7	688
192		1983	02	19.29722	09	11	56.16	+20 37 00.0	688
226		1983	02	15.20139	07	32	33.51	+16 41 18.6	688
226		1983	02	15.23229	07	32	32.39	+16 41 28.5	688
245		1983	02	11.21528	07	35	23.22	+28 07 12.7	688
245		1983	02	11.24583	07	35	22.03	+28 07 14.2	688
254		1983	02	11.21528	07	58	03.63	+28 10 57.8	688
254		1983	02	11.24583	07	58	01.71	+28 10 59.1	688
267		1983	02	11.27639	09	43	30.88	+22 31 14.5	688
267		1983	02	11.30833	09	43	29.10	+22 31 25.0	688
267		1983	02	15.27847	09	39	51.94	+22 51 25.5	688
267		1983	02	15.30903	09	39	50.22	+22 51 34.5	688
267		1983	02	19.26667	09	36	15.00	+23 09 47.9	688
267		1983	02	19.31250	09	36	12.46	+23 09 59.7	688
269		1983	01	09.38542	10	23	19.39	+07 55 11.7	688
269		1983	01	09.46319	10	23	18.05	+07 55 22.2	688
271		1983	02	15.26319	09	16	25.40	+17 23 42.0	688
271		1983	02	15.29375	09	16	23.83	+17 23 47.0	688
271		1983	02	19.25139	09	13	06.65	+17 34 06.2	688
271		1983	02	19.29722	09	13	04.34	+17 34 13.4	688
297		1983	02	15.09722	06	48	53.49	+29 11 09.8	688
297		1983	02	15.16667	06	48	51.76	+29 11 01.3	688
299		1983	01	09.38542	10	28	43.36	+07 06 12.8	688
299		1983	01	09.46319	10	28	42.29	+07 06 13.5	688
325		1983	02	15.26319	09	16	08.27	+21 50 07.4	688
325		1983	02	15.29375	09	16	06.60	+21 50 09.2	688
325		1983	02	19.25139	09	12	42.44	+21 53 23.4	688
325		1983	02	19.29722	09	12	40.09	+21 53 24.9	688
344		1983	02	19.40258	14	14	12.38	+03 56 55.3	688
379		1983	02	11.23056	07	41	20.61	+19 37 55.4	688
379		1983	02	11.26111	07	41	19.40	+19 37 59.0	688
379		1983	02	15.20139	07	38	58.90	+19 45 44.7	688
379		1983	02	15.23229	07	38	57.83	+19 45 48.0	688
383		1983	01	09.38542	10	28	03.05	+12 26 53.8	688
383		1983	01	09.46319	10	28	01.74	+12 27 06.4	688
383		1983	02	11.29236	10	09	16.20	+14 45 25.6	688
394		1983	02	11.21528	07	47	19.06	+28 20 37.4	688
394		1983	02	11.24583	07	47	17.69	+28 20 40.1	688
426		1983	02	15.11667	07	12	00.24	+28 30 41.8	688
426		1983	02	15.14722	07	11	59.10	+28 30 28.7	688
530		1983	02	15.20139	07	17	46.83	+20 03 47.2	688
530		1983	02	15.23229	07	17	45.91	+20 03 52.2	688
537		1983	02	11.29236	10	14	42.26	+17 30 35.0	688
537		1983	02	11.32431	10	14	40.83	+17 30 46.3	688
539		1983	02	11.12014	06	48	13.93	+19 36 30.8	688
589		1983	02	15.21667	07	59	51.70	+08 40 00.6	688
589		1983	02	15.24792	07	59	50.59	+08 40 10.8	688
599		1983	01	09.42083	10	06	44.76	+35 15 44.5	688
599		1983	01	09.48333	10	06	42.54	+35 16 11.4	688
613		1983	02	11.29236	10	03	05.43	+18 09 51.7	688
613		1983	02	11.32431	10	03	03.61	+18 09 57.0	688
638		1983	02	11.23056	07	49	13.38	+25 12 26.7	688

638		1983	02	11.26111	07	49	11.84	+25	12	33.4		688
639		1983	02	11.12014	07	03	05.57	+19	30	09.7		688
639		1983	02	11.19653	07	03	03.08	+19	30	07.7		688
645		1983	02	15.09722	06	30	24.78	+32	19	55.8		688
645		1983	02	15.16667	06	30	24.31	+32	19	40.0		688
710		1983	01	09.38542	10	32	33.97	+09	18	27.2		688
710		1983	01	09.46319	10	32	33.04	+09	18	34.3		688
731		1983	02	15.09722	06	24	09.85	+35	31	21.2		688
731		1983	02	15.16667	06	24	08.58	+35	31	13.2		688
745		1983	02	11.27639	09	40	46.22	+19	28	33.3	15.5	688
745		1983	02	11.30833	09	40	44.76	+19	28	48.3		688
745		1983	02	15.27847	09	37	45.82	+19	58	12.3	15.5	688
745		1983	02	15.30903	09	37	44.41	+19	58	25.6		688
745		1983	02	19.26667	09	34	47.84	+20	26	28.1		688
745		1983	02	19.31250	09	34	45.81	+20	26	46.6		688
748		1983	01	09.38542	10	14	06.95	+08	21	57.1		688
748		1983	01	09.46319	10	14	05.55	+08	22	00.7		688
757		1983	02	19.36042	11	24	07.34	+14	07	26.6		688
757		1983	02	19.39097	11	24	05.56	+14	07	34.3		688
759		1983	02	15.11667	07	27	11.79	+30	57	26.3		688
759		1983	02	15.14722	07	27	10.38	+30	57	15.9		688
761		1983	02	11.12014	06	51	46.77	+25	54	08.5	1	688
761		1983	02	11.19653	06	51	44.45	+25	54	08.8		688
762		1983	01	09.38542	10	09	36.56	+07	13	15.8		688
762		1983	01	09.46319	10	09	34.61	+07	13	01.7		688
792		1983	02	15.21667	07	57	21.55	+10	07	44.5		688
792		1983	02	15.24792	07	57	20.24	+10	07	46.3		688
802		1983	02	15.11667	07	09	43.30	+30	38	06.8		688
802		1983	02	15.14722	07	09	42.58	+30	38	00.4		688
806		1983	02	15.13194	07	13	44.11	+41	00	26.6	16.5	688
806		1983	02	15.18542	07	13	42.36	+41	00	18.1		688
866		1983	02	11.21528	07	46	11.84	+21	28	13.9		688
866		1983	02	11.24583	07	46	10.57	+27	28	17.9		688
868		1983	02	11.29236	09	53	00.18	+17	23	39.1		688
868		1983	02	11.32431	09	52	58.40	+17	23	51.7		688
868		1983	02	15.27847	09	49	26.02	+17	49	26.7		688
868		1983	02	15.30903	09	49	24.28	+17	49	38.5		688
868		1983	02	19.26667	09	45	52.83	+18	14	01.3		688
868		1983	02	19.31250	09	45	50.39	+18	14	17.9		688
917		1983	02	11.23056	08	04	42.91	+25	08	57.2		688
917		1983	02	11.26111	08	04	41.27	+25	08	58.4		688
927		1983	02	11.09722	06	46	50.88	+42	07	04.9		688
927		1983	02	11.15903	06	46	49.01	+42	06	45.6		688
949		1983	02	15.11667	07	27	37.87	+27	14	24.1		688
949		1983	02	15.14722	07	27	36.64	+27	14	19.0		688
963		1983	02	15.11667	07	08	42.56	+34	30	15.4		688
963		1983	02	15.14722	07	08	41.97	+34	30	12.8		688
1007		1983	01	09.38542	10	32	26.40	+08	15	32.7		688
1007		1983	01	09.46319	10	32	25.09	+08	15	35.7		688
1035		1983	02	19.36042	11	24	48.31	+12	49	19.6		688
1035		1983	02	19.39097	11	24	46.81	+12	49	24.5		688
1041		1983	02	11.09722	06	51	56.23	+38	41	53.9		688
1041		1983	02	11.15903	06	51	54.50	+38	41	48.5		688
1069		1983	02	19.36042	11	29	26.45	+10	56	27.2		688
1069		1983	02	19.39097	11	29	25.43	+10	56	44.1		688
1094		1983	01	09.38542	10	28	26.91	+05	09	37.6		688
1094		1983	01	09.46319	10	28	26.76	+05	10	03.2		688
1112		1983	02	11.23056	07	41	35.26	+21	33	08.2		688
1112		1983	02	11.26111	07	41	33.94	+21	33	06.6		688

1112	1983	02	15.20139	07	39	01.51	+21	29	07.1	688
1112	1983	02	15.23229	07	39	00.30	+21	29	05.7	688
1116	1983	02	11.09722	06	18	18.33	+45	44	29.6	688
1116	1983	02	11.15903	06	18	18.30	+45	43	48.6	688
1154	1983	02	11.12014	06	58	49.56	+25	43	36.6	688
1154	1983	02	11.19653	06	58	47.33	+25	43	40.3	688
1211	1983	02	15.26319	09	07	48.75	+19	01	18.6	688
1211	1983	02	15.29375	09	07	47.34	+19	01	30.3	688
1211	1983	02	19.25139	09	04	44.07	+19	24	57.8	688
1211	1983	02	19.29722	09	04	41.96	+19	25	12.8	688
1225	1983	02	15.26319	09	15	16.86	+20	44	14.3	688
1225	1983	02	15.29375	09	15	14.83	+20	44	19.6	688
1225	1983	02	19.25139	09	11	08.75	+20	54	21.9	688
1225	1983	02	19.29722	09	11	05.88	+20	54	27.8	688
1237	1983	02	15.09722	06	45	27.58	+34	39	53.3	688
1237	1983	02	15.16667	06	45	26.09	+34	39	46.9	688
1338	1983	02	19.25139	08	57	22.52	+18	06	17.9	688
1338	1983	02	19.29722	08	57	19.70	+18	06	20.0	688
1381	1983	02	11.27639	09	32	21.97	+18	43	26.7	688
1381	1983	02	15.26319	09	28	12.49	+18	56	04.9	688
1381	1983	02	15.29375	09	28	10.52	+18	56	10.4	688
1381	1983	02	19.26667	09	24	09.31	+19	07	15.7	688
1381	1983	02	19.31250	09	24	06.59	+19	07	23.1	688
1401	1983	02	15.20139	07	17	03.98	+17	26	05.6	688
1401	1983	02	15.23229	07	17	03.20	+17	26	05.1	688
1412	1983	02	15.09722	06	35	47.89	+29	30	22.0	688
1412	1983	02	15.16667	06	35	47.86	+29	30	17.9	688
1432	1983	02	15.20139	07	28	05.50	+21	46	09.8	688
1432	1983	02	15.23229	07	28	04.27	+21	46	16.5	688
1444	1983	02	11.23056	07	54	43.70	+20	30	40.6	688
1444	1983	02	11.26111	07	54	42.21	+20	30	38.8	688
1472	1983	02	11.27639	09	48	22.86	+21	09	07.0	688
1472	1983	02	11.29236	09	48	21.66	+21	09	12.5	688
1472	1983	02	11.30833	09	48	20.65	+21	09	17.6	688
1472	1983	02	11.32431	09	48	19.45	+21	09	22.5	688
1472	1983	02	15.27847	09	43	52.23	+21	29	25.0	688
1472	1983	02	15.30903	09	43	50.13	+21	29	34.4	688
1472	1983	02	19.26667	09	39	26.21	+21	47	29.3	688
1472	1983	02	19.31250	09	39	23.16	+21	47	42.1	688
1495	1983	02	11.09722	06	44	08.74	+40	08	15.8	17.2 688
1495	1983	02	11.15903	06	44	06.66	+40	08	01.8	688
1500	1983	02	11.21528	07	55	33.43	+33	26	30.7	688
1500	1983	02	11.24583	07	55	31.76	+33	26	25.2	688
1521	1983	01	09.42083	09	51	11.67	+35	02	37.6	688
1521	1983	01	09.48333	09	51	09.07	+35	02	57.6	688
1522	1983	02	15.09722	06	40	08.09	+30	11	52.8	688
1522	1983	02	15.16667	06	40	07.28	+30	11	48.8	688
1544	1983	02	19.36042	11	13	34.68	+10	57	50.9	688
1544	1983	02	19.39097	11	13	32.95	+10	58	02.4	688
1550	1983	02	11.21528	07	53	00.76	+32	54	51.1	16.5 688
1550	1983	02	11.24583	07	52	59.21	+32	54	52.3	688
1576	1983	02	15.20139	07	33	46.35	+20	44	36.9	688
1576	1983	02	15.23229	07	33	45.37	+20	44	40.8	688
1604	1983	01	09.38542	10	11	16.96	+08	44	49.0	688
1604	1983	01	09.46319	10	11	14.99	+08	44	46.4	688
1620	1983	02	19.36042	11	17	55.02	+11	14	13.5	688
1620	1983	02	19.39097	11	17	50.44	+11	13	03.2	688
1674	1983	02	15.27847	09	42	38.86	+16	56	20.3	688
1674	1983	02	15.30903	09	42	37.30	+16	56	28.5	688

1674		1983	02	19.26667	09	39	27.68	+17	14	01.7		688
1674		1983	02	19.31250	09	39	25.49	+17	14	13.9		688
1686		1983	02	15.26319	09	05	19.51	+17	20	35.2		688
1686		1983	02	15.29375	09	05	18.09	+17	20	41.0		688
1686		1983	02	19.25139	09	02	20.59	+17	32	48.8		688
1686		1983	02	19.29722	09	02	18.52	+17	32	56.8		688
1696		1983	02	11.27639	09	28	28.72	+25	28	37.2		688
1696		1983	02	11.30833	09	28	26.47	+25	28	42.8		688
1707		1983	02	15.11667	07	11	52.71	+28	34	51.6		688
1707		1983	02	15.14722	07	11	52.03	+28	34	46.2		688
1714		1983	01	09.38542	10	29	31.06	+05	14	17.9		688
1714		1983	01	09.46319	10	29	29.68	+05	14	04.4		688
1721		1983	02	19.25139	08	56	38.40	+17	15	00.8		688
1721		1983	02	19.29722	08	56	35.96	+17	14	58.2		688
1727		1983	02	15.40278	13	41	39.99	+16	58	26.0		688
1727		1983	02	15.43472	13	41	41.25	+16	59	07.6		688
1773		1983	02	19.36042	11	15	56.12	+14	37	45.3		688
1773		1983	02	19.39097	11	15	54.60	+14	37	58.4		688
1829		1983	02	15.20139	07	24	56.61	+19	28	04.3		688
1829		1983	02	15.23229	07	24	55.64	+19	28	00.3		688
1832		1983	02	15.20139	07	30	01.06	+22	40	41.4		688
1832		1983	02	15.23229	07	29	59.85	+22	40	36.9		688
1840		1983	02	19.25139	08	58	31.09	+20	52	13.5		688
1840		1983	02	19.29722	08	58	28.79	+20	52	22.5		688
1846		1983	02	15.09722	06	29	36.70	+28	25	53.9		688
1846		1983	02	15.16667	06	29	37.08	+28	25	44.2		688
1911		1983	02	15.20139	07	30	17.71	+21	13	35.0		688
1911		1983	02	15.23229	07	30	16.81	+21	13	36.2		688
1939		1983	01	09.38542	10	13	28.56	+12	17	40.0		688
1939		1983	01	09.46319	10	13	27.14	+12	17	48.0		688
1939		1983	02	11.29236	09	54	02.59	+14	08	34.1		688
1939		1983	02	11.32431	09	54	01.17	+14	08	42.9		688
1948		1983	02	11.29236	09	57	21.14	+21	57	00.5		688
1948		1983	02	11.32431	09	57	19.14	+21	57	07.8		688
1948		1983	02	15.2/847	09	53	14.61	+22	12	33.0		688
1948		1983	02	15.30903	09	53	12.60	+22	12	39.9		688
1967		1983	02	15.09722	06	24	36.39	+28	38	51.6		688
1967		1983	02	15.16667	06	24	36.65	+28	38	46.6		688
1971		1983	02	15.20139	07	32	53.93	+21	10	46.1		688
1971		1983	02	15.23229	07	32	52.92	+21	10	42.3		688
1987		1983	02	15.16667	06	31	31.78	+35	26	43.5	2	688
1996		1983	02	11.09722	06	25	44.20	+43	16	03.9		688
1996		1983	02	11.15903	06	25	42.64	+43	15	36.0		688
1998		1983	02	11.27639	09	25	58.60	+22	29	14.5	16.2	688
1998		1983	02	11.30833	09	25	56.44	+22	29	18.6		688
1998		1983	02	15.26319	09	21	31.11	+22	35	50.4	16.2	688
1998		1983	02	15.29375	09	21	29.01	+22	35	52.7		688
1998		1983	02	19.25139	09	17	10.80	+22	40	11.9	16.8	688
1998		1983	02	19.29722	09	17	07.67	+22	40	13.5		688
2011		1983	02	15.26319	09	13	11.08	+19	30	28.9	2	688
2011		1983	02	15.29375	09	13	09.06	+19	30	36.4		688
2011		1983	02	19.25139	09	09	05.74	+19	38	45.2		688
2011		1983	02	19.29722	09	09	02.53	+19	38	51.6	1	688
2034		1983	02	19.36042	11	25	55.53	+14	57	07.1		688
2034		1983	02	19.39097	11	25	53.62	+14	57	13.4		688
2065		1983	02	11.26111	07	58	45.91	+24	32	20.4	1	688
2073		1983	02	19.36042	11	09	15.91	+10	21	52.5		688
2073		1983	02	19.39097	11	09	14.57	+10	22	04.5		688
2082		1983	02	11.27639	09	29	38.55	+18	34	21.7		688

2082	1983	02	11.30833	09	29	36.96	+18	34	29.5	688
2082	1983	02	15.26319	09	26	08.33	+18	53	09.3	688
2082	1983	02	15.29375	09	26	06.65	+18	53	19.2	688
2082	1983	02	19.26667	09	22	40.44	+19	10	59.1	688
2082	1983	02	19.31250	09	22	37.88	+19	11	11.3	688
2084	1983	02	15.20139	07	28	07.26	+18	42	23.7	688
2084	1983	02	15.23229	07	28	06.33	+18	42	31.6	688
2090	1983	02	11.29236	09	53	24.84	+17	44	41.0	688
2090	1983	02	11.32431	09	53	23.07	+17	44	44.4	688
2090	1983	02	15.27847	09	49	56.64	+17	52	57.0	16.8 688
2090	1983	02	15.30903	09	49	55.01	+17	53	01.5	688
2090	1983	02	19.26667	09	46	28.34	+18	00	25.8	16.8 688
2090	1983	02	19.31250	09	46	25.99	+18	00	31.7	688
2140	1983	02	15.21667	08	01	39.59	+14	53	27.9	688
2140	1983	02	15.24792	08	01	38.09	+14	53	29.4	688
2176	1983	02	19.36042	11	30	06.79	+07	54	17.2	688
2184	1983	02	15.21667	07	46	33.90	+15	44	05.8	688
2184	1983	02	15.24792	07	46	32.77	+15	44	07.0	688
2188	1983	01	09.38542	10	25	05.46	+09	58	47.8	688
2188	1983	01	09.46319	10	25	04.18	+09	58	58.6	688
2190	1983	02	11.19653	06	53	16.61	+22	09	46.3	688
2197	1983	02	11.27639	09	21	41.55	+19	29	37.3	16.0 688
2197	1983	02	11.30833	09	21	39.96	+19	29	44.4	688
2197	1983	02	15.26319	09	18	24.06	+19	44	10.1	688
2197	1983	02	15.29375	09	18	22.50	+19	44	16.3	688
2197	1983	02	19.25139	09	15	13.53	+19	57	21.5	16.0 688
2197	1983	02	19.29722	09	15	11.28	+19	57	30.3	688
2301	1983	02	15.11667	07	05	54.85	+33	58	52.0	688
2301	1983	02	15.14722	07	05	54.31	+33	58	53.0	688
2404	1983	02	15.26319	09	20	42.90	+17	28	43.3	688
2404	1983	02	15.29375	09	20	41.50	+17	28	51.3	688
2404	1983	02	19.25139	09	17	34.44	+17	44	55.5	16.8 688
2404	1983	02	19.29722	09	17	32.10	+17	45	04.3	688
2407	1983	01	09.38542	10	34	13.70	+10	04	01.4	688
2407	1983	01	09.46319	10	34	12.03	+10	04	09.9	688
2485	1983	02	15.27847	09	33	07.09	+17	47	32.0	16.8 688
2485	1983	02	15.30903	09	33	05.67	+17	47	41.5	688
2485	1983	02	19.26667	09	29	56.10	+18	04	59.6	17.0 688
2485	1983	02	19.31250	09	29	53.88	+18	05	12.2	688
2507	1983	02	15.27847	09	39	11.49	+17	53	01.4	688
2507	1983	02	15.30903	09	39	09.94	+17	53	16.3	688
2507	1983	02	19.26667	09	35	49.91	+18	23	39.5	688
2507	1983	02	19.31250	09	35	47.58	+18	24	00.6	688
2515	1983	02	11.29236	10	02	06.09	+18	24	40.3	17.5 688
2515	1983	02	11.32431	10	02	04.29	+18	24	49.4	688
2523	1983	02	15.20139	07	30	32.61	+17	33	29.7	17.0 688
2523	1983	02	15.23229	07	30	31.49	+17	33	29.3	688
2534	1983	02	11.19653	06	57	52.58	+21	53	54.2	688
2541	1983	02	11.29236	09	56	36.28	+17	15	01.0	688
2541	1983	02	11.32431	09	56	34.58	+17	15	10.6	688
2541	1983	02	15.27847	09	53	13.24	+17	34	17.7	688
2541	1983	02	15.30903	09	53	11.49	+17	34	28.0	688
2545	1983	02	15.26319	09	08	18.63	+17	00	59.8	688
2545	1983	02	15.29375	09	08	16.49	+17	01	01.4	688
2545	1983	02	19.25139	09	04	04.38	+17	03	19.3	688
2545	1983	02	19.29722	09	04	01.51	+17	03	20.3	688
2548	1983	02	11.12014	07	00	25.81	+24	01	58.8	688
2548	1983	02	11.19653	07	00	22.54	+24	01	36.0	688
2562	1983	02	11.29236	10	10	23.57	+15	03	30.1	688

2562		1983	02	11.32431	10	10	21.86	+15	03	33.6		688
2587		1983	02	11.12014	07	01	18.53	+24	12	30.2		688
2587		1983	02	11.19653	07	01	16.22	+24	12	36.2	1	688
2760		1983	02	15.13194	07	27	42.48	+36	28	39.6		688
2760		1983	02	15.18542	07	27	40.70	+36	28	28.6		688
1936	XA	1983	02	15.21667	08	01	58.09	+08	45	49.7	16.5	688
1936	XA	1983	02	15.24792	08	01	56.88	+08	45	54.5		688
1972	KE	1983	02	15.20139	07	26	40.27	+23	15	29.8	17.2	688
1972	KE	1983	02	15.23229	07	26	38.99	+23	15	36.7		688
1978	TA	1983	01	09.42083	09	57	24.52	+33	11	16.3	16.8	1 688
1978	TA	1983	01	09.48333	09	57	20.06	+33	11	13.0		688
1983	AB	1983	02	15.26319	09	11	03.02	+21	28	53.9	16.5	688
1983	AB	1983	02	15.29375	09	11	01.09	+21	29	03.4		688
1983	AB	1983	02	19.25139	09	07	26.96	+21	48	01.2	16.8	688
1983	AB	1983	02	19.29722	09	07	24.45	+21	48	14.2		688
1983	AD	1983	02	15.09722	06	39	50.70	+34	01	27.1	16.8	688
1983	AD	1983	02	15.16667	06	39	49.78	+34	01	26.5		688
1983	AJ	1983	02	11.12014	06	50	48.30	+19	29	07.0	16.8	688
1983	AJ	1983	02	11.19653	06	50	45.87	+19	28	19.6		688
1983	AK	1983	02	15.11667	07	10	35.43	+28	25	05.1	17.0	688
1983	AK	1983	02	15.14722	07	10	34.68	+28	25	10.7		688
1983	AM	1983	02	15.20139	07	21	30.36	+22	36	34.4	17.0	688
1983	AM	1983	02	15.23229	07	21	29.25	+22	36	30.5		688
1983	AN	1983	02	15.11667	07	25	23.63	+29	13	23.3	16.8	688
1983	AN	1983	02	15.14722	07	25	22.75	+29	13	27.0		688
1983	AO	1983	02	11.21528	07	36	28.49	+26	52	32.2	16.5	688
1983	AO	1983	02	11.23056	07	36	27.81	+26	52	33.6	16.5	688
1983	AO	1983	02	11.24583	07	36	27.26	+26	52	39.1		688
1983	AO	1983	02	11.26111	07	36	26.51	+26	52	38.9		688
1983	AP	1983	02	15.13194	07	05	09.58	+40	32	55.9	17.5	688
1983	AP	1983	02	15.18542	07	05	07.92	+40	32	39.5		688
1983	AQ	1983	02	15.13194	07	07	51.58	+35	06	03.5	17.5	688
1983	AQ	1983	02	15.18542	07	07	49.94	+35	05	57.4		688
1983	AR	1983	02	15.13194	07	14	42.63	+37	51	21.7	17.0	688
1983	AR	1983	02	15.18542	07	14	40.88	+37	51	13.3		688
1983	AT	1983	02	11.15903	06	33	30.74	+40	37	07.8	16.8	688
1983	AV	1983	02	11.21528	07	34	24.16	+32	42	44.7	16.5	688
1983	AV	1983	02	11.24583	07	34	22.88	+32	42	54.7		688
1983	AZ	1983	02	11.23056	07	40	20.84	+20	31	24.3	16.8	688
1983	AZ	1983	02	11.26111	07	40	19.64	+20	31	30.5		688
1983	AZ	1983	02	15.20139	07	38	04.11	+20	43	43.8	17.0	688
1983	AZ	1983	02	15.23229	07	38	03.08	+20	43	49.6		688
1983	AA1	1983	02	15.24792	07	49	13.43	+15	01	04.3	16.5	688
1983	AC1	1983	02	11.23056	07	57	02.75	+22	03	09.7	16.5	688
1983	AC1	1983	02	11.26111	07	57	01.32	+22	04	00.7		688
1983	AG2	1983	02	15.27847	09	39	11.95	+21	12	19.1	15.0	688
1983	AG2	1983	02	15.30903	09	39	08.54	+21	11	49.4		688
1983	AG2	1983	02	19.26667	09	32	15.86	+20	07	20.7	15.2	1 688
1983	AG2	1983	02	19.31250	09	32	11.18	+20	06	36.1		688
1983	BH	1983	02	15.21667	07	52	25.02	+12	39	48.9	16.5	688
1983	BH	1983	02	15.24792	07	52	23.88	+12	39	47.2		688
1983	BJ	1983	02	15.21667	07	53	27.01	+13	00	53.9	17.0	688
1983	BJ	1983	02	15.24792	07	53	25.71	+13	00	54.4		688
1983	BM	1983	02	11.29236	09	58	16.64	+15	28	19.4	16.5	688
1983	BM	1983	02	11.32431	09	58	14.53	+15	28	20.7		688
1983	BN	1983	02	11.29236	10	02	31.60	+18	34	01.1	16.8	688
1983	BN	1983	02	11.32431	10	02	29.93	+18	34	15.4		688
1983	BP	1983	02	11.29236	10	04	37.39	+18	30	58.6	16.5	688
1983	BP	1983	02	11.32431	10	04	35.08	+18	31	04.5		688

1983	CA		1983	02	15.27847	09	47	23.50	+23	10	33.5	16.8	688
1983	CA		1983	02	15.30903	09	47	21.20	+23	10	41. 8		688
1983	CA		1983	02	19.26667	09	42	47.56	+23	29	12.6	16.8	688
1983	CA		1983	02	19.31250	09	42	44.20	+23	29	25.1		688
1983	CB		1983	02	19.36042	11	13	40.41	+10	51	52.8	16.8	688
1983	CB		1983	02	19.39097	11	13	38.77	+10	51	53.5		688
1983	CC	*	1983	02	11.27639	09	27	48.65	+20	29	58.2	16.5	7 688
1983	CC		1983	02	11.30833	09	27	45.85	+20	30	55.9		3 688
1983	CC		1983	02	15.26319	09	23	17.05	+21	57	37.7	16.5	2 688
1983	CC		1983	02	15.29375	09	23	15.31	+21	58	14.7		3 688
1983	CC		1983	02	19.25139	09	18	51.52	+23	21	18.9	16.8	2 688
1983	CC		1983	02	19.29722	09	18	48.24	+23	22	16.2		688
1983	CF	*	1983	02	11.27639	09	24	18.91	+23	09	12.3	16.5	4 688
1983	CF		1983	02	11.30833	09	24	16.73	+23	09	23.9		688
1983	CF		1983	02	15.26319	09	19	55.69	+23	30	41.6	16.5	688
1983	CF		1983	02	15.29375	09	19	53.59	+23	30	50.3		688
1983	CF		1983	02	19.25139	09	15	41.41	+23	49	37.0	16.8	688
1983	CF		1983	02	19.29722	09	15	38.38	+23	49	46.8		688
1983	CG	*	1983	02	11.27639	09	31	33.51	+24	26	11.6	16.5	4 688
1983	CG		1983	02	11.30833	09	31	31.71	+24	26	23.1		688
1983	CG		1983	02	15.26319	09	27	57.95	+24	47	59.8	16.8	688
1983	CG		1983	02	15.29375	09	27	56.29	+24	48	09.6		688
1983	CH	*	1983	02	11.27639	09	32	36.62	+22	36	34.6	16.5	4 688
1983	CH		1983	02	11.30833	09	32	34.64	+22	36	48.5		688
1983	CH		1983	02	15.26319	09	28	25.76	+23	05	33.6	16.8	688
1983	CH		1983	02	15.29375	09	28	23.94	+23	05	46.1		688
1983	CH		1983	02	19.26667	09	24	22.48	+23	31	24.6	16.8	688
1983	CH		1983	02	19.31250	09	24	19.59	+23	31	42.0		688
1983	CJ	*	1983	02	11.27639	09	32	51.55	+24	09	00.3	16.8	4 688
1983	CJ		1983	02	11.30833	09	32	49.40	+24	09	01.7		688
1983	CJ		1983	02	15.26319	09	28	21.30	+24	07	29.2	17.0	688
1983	CJ		1983	02	15.29375	09	28	19.20	+24	07	28.4		688
1983	CK	*	1983	02	11.27639	09	33	54.89	+18	38	57.2	17.0	4 688
1983	CK		1983	02	11.30833	09	33	52.99	+18	39	12.1		688
1983	CK		1983	02	15.26319	09	29	45.50	+19	06	54.4	17.2	2 688
1983	CK		1983	02	15.29375	09	29	43.49	+19	07	06.4		2 688
1983	CL	*	1983	02	11.27639	09	34	30.26	+19	47	19.3	16.5	4 688
1983	CL		1983	02	11.30833	09	34	28.30	+19	47	21.6		688
1983	CL		1983	02	15.26319	09	30	28.00	+19	50	10.4	16.8	688
1983	CL		1983	02	15.27847	09	30	27.03	+19	50	11.4	16.2	688
1983	CL		1983	02	15.29375	09	30	26.09	+19	50	12.1		688
1983	CL		1983	02	15.30903	09	30	25.07	+19	50	12.4		688
1983	CL		1983	02	19.26667	09	26	29.80	+19	51	27.4	16.5	688
1983	CL		1983	02	19.31250	09	26	27.14	+19	51	27.4		688
1983	CM	*	1983	02	11.27639	09	41	13.94	+23	36	55.5	17.2	4 688
1983	CM		1983	02	11.30833	09	41	11.43	+23	37	03.4		688
1983	CM		1983	02	15.27847	09	36	30.39	+23	51	29.0	17.0	688
1983	CM		1983	02	15.30903	09	36	28.02	+23	51	34.4		688
1983	CM		1983	02	19.26667	09	31	49.61	+24	03	07.5	16.8	688
1983	CM		1983	02	19.31250	09	31	46.26	+24	03	14.6		688
1983	CN	*	1983	02	11.27639	09	43	22.78	+22	38	48.5	16.5	4 688
1983	CN		1983	02	11.30833	09	43	20.52	+22	38	47.8		688
1983	CN		1983	02	15.27847	09	38	36.13	+22	35	16.9	16.8	688
1983	CN		1983	02	15.30903	09	38	33.89	+22	35	15.8		688
1983	CN		1983	02	19.26667	09	33	54.82	+22	29	31.2	16.8	1 688
1983	CN		1983	02	19.31250	09	33	51.84	+22	29	27.4		688
1983	CO	*	1983	02	11.27639	09	46	11.41	+17	33	09.2	16.8	4 688
1983	CO		1983	02	11.30833	09	46	09.54	+17	33	21.6		688
1983	CO		1983	02	15.27847	09	42	43.82	+18	06	25.1	17.0	688

1983	CO		1983	02	15.30903	09	42	42.34	+18	06	40.2		688
1983	CO		1983	02	19.26667	09	39	17.35	+18	38	19.4	17.0	688
1983	CO		1983	02	19.31250	09	39	15.07	+18	38	40.9		688
1983	CP	*	1983	02	11.27639	09	47	38.66	+25	25	50.4	17.0 4	688
1983	CP		1983	02	11.30833	09	47	36.62	+25	25	59.7	1	688
1983	CQ	*	1983	02	15.26319	09	05	57.02	+22	34	30.3	16.8 4	688
1983	CQ		1983	02	15.29375	09	05	55.13	+22	34	36.6		688
1983	CQ		1983	02	19.25139	09	02	07.66	+22	46	37.9	17.0	688
1983	CQ		1983	02	19.29722	09	02	05.34	+22	46	44.0		688
1983	CR	*	1983	02	15.26319	09	06	06.04	+20	05	03.8	17.0 4	688
1983	CR		1983	02	15.29375	09	06	04.37	+20	05	16.1		688
1983	CS	*	1983	02	15.26319	09	07	36.45	+19	54	36.0	16.8 4	688
1983	CS		1983	02	15.29375	09	07	35.03	+19	54	41.5		688
1983	CS		1983	02	19.25139	09	04	32.62	+20	07	46.2	17.0	688
1983	CS		1983	02	19.29722	09	04	30.49	+20	07	53.7		688
1983	CT	*	1983	02	15.26319	09	07	47.16	+22	07	32.7	16.8 4	688
1983	CT		1983	02	15.29375	09	07	45.63	+22	07	40.7		688
1983	CT		1983	02	19.25139	09	04	42.56	+22	25	06.1	17.0	688
1983	CT		1983	02	19.29722	09	04	40.28	+22	25	16.7		688
1983	CU		1983	02	15.26319	09	08	56.96	+20	16	32.8	16.5 4	688
1983	CU		1983	02	15.29375	09	08	55.22	+20	16	44.5		688
1983	CU		1983	02	19.25139	09	05	15.02	+20	43	22.5	16.5	688
1983	CU		1983	02	19.29722	09	05	12.39	+20	43	39.8		688
1983	CV	*	1983	02	15.26319	09	09	35.06	+23	19	32.2	17.0 4	688
1983	CV		1983	02	15.29375	09	09	33.37	+23	19	37.5	1	688
1983	CV		1983	02	19.25139	09	05	59.51	+23	30	53.8	17.2	688
1983	CV		1983	02	19.29722	09	05	56.81	+23	30	58.5		688
1983	CW	*	1983	02	15.26319	09	11	14.67	+21	30	06.7	16.8 4	688
1983	CW		1983	02	15.29375	09	11	12.96	+21	30	05.9		688
1983	CW		1983	02	19.25139	09	07	32.36	+21	29	10.7	17.0	688
1983	CW		1983	02	19.29722	09	07	29.62	+21	29	09.1		688
1983	CX	*	1983	02	15.26319	09	13	08.77	+22	05	46.4	17.0 4	688
1983	CX		1983	02	15.29375	09	13	06.97	+22	05	57.4		688
1983	CX		1983	02	19.25139	09	09	20.12	+22	27	28.7	17.2	688
1983	CX		1983	02	19.29722	09	09	17.27	+22	27	43.3		688
1983	CY	*	1983	02	15.26319	09	13	55.88	+21	43	38.7	16.8 4	688
1983	CY		1983	02	15.29375	09	13	54.17	+21	43	39.6		688
1983	CY		1983	02	19.25139	09	10	26.71	+21	44	20.1	17.0 1	688
1983	CY		1983	02	19.29722	09	10	24.32	+21	44	19.3		688
1983	CZ		1983	02	11.21528	07	38	58.67	+30	39	30.8	17.2 4	688
1983	CZ		1983	02	11.24583	07	38	57.24	+30	39	38.7		688
1983	CA1	*	1983	02	15.27847	09	39	55.51	+17	15	53.6	16.8 4	688
1983	CA1		1983	02	15.30903	09	39	53.58	+17	15	55.8		688
1983	CA1		1983	02	19.26667	09	35	59.90	+17	18	47.5	16.2	688
1983	CA1		1983	02	19.31250	09	35	57.16	+17	18	48.0		688
1983	CB1		1983	02	11.29236	09	52	18.92	+21	49	43.6	16.0	688
1983	CB1		1983	02	11.32431	09	52	17.27	+21	50	04.0		688
1983	CB1	*	1983	02	15.27847	09	48	55.02	+22	33	26.2	16.2 4	688
1983	CB1		1983	02	15.30903	09	48	53.43	+22	33	46.5		688
1983	CB1		1983	02	19.26667	09	45	29.54	+23	15	06.2	16.2	688
1983	CB1		1983	02	19.31250	09	45	27.18	+23	15	34.1		688
1983	CC1	*	1983	02	15.27847	09	51	39.90	+24	20	00.7	17.0 4	688
1983	CC1		1983	02	15.30903	09	51	38.32	+24	20	04.7		688
1983	CC1		1983	02	19.26667	09	48	30.38	+24	28	10.4	16.8	688
1983	CC1		1983	02	19.31250	09	48	27.88	+24	28	17.4		688
1983	CD1	*	1983	02	11.29236	09	48	21.04	+14	43	39.8	16.8 8	688
1983	CD1		1983	02	11.32431	09	48	19.69	+14	43	49.1		688
1983	CE1	*	1983	02	11.29236	09	53	00.00	+16	20	32.6	16.8 8	688
1983	CE1		1983	02	11.32431	09	52	58.47	+16	20	43.3		688

1983 CF1	*	1983	02	11.29236	09	54	38.64	+20	57	53.2	16.5 8 688
1983 CF1		1983	02	11.32431	09	54	37.22	+20	58	07.3	688
1983 CG1		1983	02	11.29236	09	56	03.60	+16	54	11.4	17.5 9 688
1983 CH1	*	1983	02	11.32431	09	56	01.26	+16	54	08.5	1 688
1983 CH1	*	1983	02	11.29236	09	56	43.57	+16	36	58.6	17.0 8 688
1983 CH1		1983	02	11.32431	09	56	41.18	+16	37	03.6	1 688
1983 CJ1		1983	02	11.29236	09	58	47.22	+19	03	53.3	16.8 4 688
1983 CJ1		1983	02	11.32431	09	58	44.96	+19	03	55.3	688
1983 CK1	*	1983	02	11.29236	10	01	28.44	+14	27	08.9	17.2 8 688
1983 CK1		1983	02	11.32431	10	01	26.86	+14	27	16.1	688
1983 CL1	*	1983	02	11.29236	10	05	02.33	+21	36	00.4	17.2 8 688
1983 CL1		1983	02	11.32431	10	05	00.20	+21	36	08.3	688
1983 CM1	*	1983	02	11.29236	10	09	30.19	+15	29	57.2	17.2 8 688
1983 CM1		1983	02	11.32431	10	09	28.58	+15	30	08.3	688
1983 CN1	*	1983	02	11.29236	10	12	53.17	+19	18	58.9	17.2 8 688
1983 CN1		1983	02	11.32431	10	12	49.47	+19	18	57.2	1 688
1983 CJ2	*	1983	02	15.20139	07	33	06.78	+16	45	57.8	17.2 4 688
1983 CJ2		1983	02	15.23229	07	33	05.80	+16	45	59.9	688
1983 DE	*	1983	02	19.36042	11	09	10.90	+11	14	43.9	17.0 4 688
1983 DE		1983	02	19.39097	11	09	09.40	+11	14	58.1	688
1983 DF		1983	02	19.36042	11	11	34.83	+13	51	46.2	17.0 4 688
1983 DF	*	1983	02	19.39097	11	11	33.77	+13	51	47.6	688
1983 DG	*	1983	02	19.36042	11	12	36.67	+09	05	48.7	16.8 5 688
1983 DG		1983	02	19.39097	11	12	35.08	+09	05	52.8	688
1983 DH	*	1983	02	19.36042	11	14	53.59	+10	07	03.9	16.5 4 688
1983 DH		1983	02	19.39097	11	14	52.10	+10	07	19.1	688
1983 DJ	*	1983	02	19.36042	11	23	45.58	+11	29	48.7	16.8 4 688
1983 DJ		1983	02	19.39097	11	23	43.95	+11	29	57.7	688
1983 DK	*	1983	02	19.36042	11	32	01.45	+15	29	06.3	17.0 4 688
1983 DK		1983	02	19.39097	11	31	59.73	+15	29	13.4	688
1983 DL	*	1983	02	19.36042	11	34	17.92	+09	04	47.3	17.0 5 688
1983 DL		1983	02	19.39097	11	34	16.52	+09	04	51.9	688

Note 1: right ascension uncertain. 2: declination uncertain. 3 = 1 + 2. 4: discoverer Bowell. 5 = 1 + 4. 7 = 3 + 4. 8: discoverer N. G. Thomas. 9 = 1 + 8.

OBSERVATIONS MADE AT THE LOWELL OBSERVATORY BY C. W. TOMBAUGH, R. BURNHAM AND C. D. SLAUGHTER. MEASURED BY E. BOWELL.

Object	Date	UT	R. A. (1950)	Decl.	N Obs.
191	1931 05	19.35764	16 17 45.76	-04 20 39.6	688
191	1931 05	20.35417	16 16 58.68	-04 17 18.0	688
191	1931 05	22.34028	16 15 24.13	-04 10 56.2	688
511	1931 05	19.35764	16 22 08.86	-05 33 09.5	688
511	1931 05	20.35417	16 21 23.72	-05 32 31.8	688
511	1931 05	22.34028	16 19 53.14	-05 31 31.0	688
1557	1930 12	20.26042	05 05 29.19	+38 10 55.0	688
1557	1930 12	24.18750	05 01 32.30	+38 01 24.0	688
1557	1930 12	25.19896	05 00 33.97	+37 58 37.2	688
1717	1930 12	20.26042	05 11 41.87	+35 17 04.0	688
1717	1930 12	24.18750	05 07 04.80	+35 01 26.3	688
1717	1930 12	25.19896	05 05 56.83	+34 56 55.4	688
1811	1931 05	19.35764	16 19 07.58	-08 56 48.9	688
1811	1931 05	20.35417	16 18 22.42	-08 53 20.3	688
1811	1931 05	22.34028	16 16 51.91	-08 46 34.8	688
2842	1930 12	20.26042	05 11 14.15	+37 13 46.0	1 690
2842	1930 12	24.18750	05 06 47.46	+36 51 00.3	3 690
2842	1930 12	25.19896	05 05 41.73	+36 44 42.6	3 690
1931 KN	1931 05	19.35764	16 24 26.93	-04 34 17.4	1 690

1931 KN	1931 05 20.35417	16 23 30.06	-04 37 03.3				690
1931 KN	1931 05 22.34028	16 21 36.39	-04 43 07.1				690
1958 TK1	1958 10 07.34444	00 50 54.98	+13 05 21.4				690
1958 TK1	1958 10 08.34747	00 49 55.68	+13 04 24.8				690
1958 TK1	1958 10 10.35594	00 47 57.07	+13 02 04.8				690

OBSERVATIONS MADE AT THE LINCOLN LABORATORY ETS, NEW MEXICO, UNDER THE DIRECTION OF L. G. TAFF.

Object	Date	UT	R. A. (1950)	Decl.			Obs.
1982 SD	1982 09 23.25659	23 29 03.76	-06 48 36.6				704
1982 TZ *	1982 10 15.14590	00 17 24.22	+11 49 59.2				704

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

Object	Date	UT	R. A. (1950)	Decl.		N	Obs.
2650	1954 07 10.29097	20 39 54.65	-33 33 45.3				760
2650	1954 07 10.34028	20 39 51.72	-33 33 44.5				760
1954 EN	1954 03 07.23957	09 32 53.48	+16 27 58.4				760
1954 EN	1954 03 07.28681	09 32 51.54	+16 28 00.9				760
1954 EO	1954 03 07.23957	09 25 03.34	+13 07 28.9				760
1954 EO	1954 03 07.28681	09 25 01.34	+13 07 29.8				760
1954 JE	1954 05 06.11575	12 10 28.09	+07 40 09.5			1	760
1954 JE	1954 05 06.15741	12 10 27.52	+07 39 53.8			1	760
1954 JF	1954 05 06.21402	14 22 48.43	+01 00 03.7				760
1954 JF	1954 05 06.25568	14 22 46.52	+01 00 17.4				760
1954 LE	1954 06 07.23531	17 03 51.18	-22 06 34.8				760
1954 LE	1954 06 07.27073	17 03 48.99	-22 06 21.8				760
1954 LF	1954 06 07.23531	16 58 58.71	-21 25 59.9				760
1954 LF	1954 06 07.27073	16 58 56.93	-21 25 53.3				760
1954 ND	1954 07 09.24307	19 36 13.15	-25 24 33.2				760
1954 NF	1954 07 09.32155	20 28 10.52	-09 45 53.4				760
1954 PA	1954 08 07.33369	22 50 34.67	-14 43 55.2				760
1954 PA	1954 08 07.37052	22 50 33.28	-14 43 55.9				760
1954 QB	1954 08 31.20516	21 45 36.89	-14 33 47.8				760
1954 RE	1954 09 05.28747	00 19 42.10	+06 22 49.6				760
1954 RE	1954 09 05.32706	00 19 40.82	+06 22 28.1				760
1954 RF	1954 09 05.28747	00 20 29.18	+01 03 01.4			2	760
1954 RF	1954 09 05.32706	00 20 28.05	+01 02 45.6			2	760
1954 RG	1954 09 05.32706	00 44 14.00	+03 08 37.4				760
1954 RH	1954 09 05.28747	00 30 53.95	+00 21 01.1				760
1954 RH	1954 09 05.32706	00 30 52.31	+00 20 50.7				760

Note 1: the approximate position on MPC 1106 is substantially in error. 2: the approximate position on MPC 1142 is substantially in error.

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

Object	Date	UT	R. A. (1950)	Decl.	Mag.	N	Obs.
2060	1983 01 14.03881	03 23 17.46	+15 13 46.4			1	801
2837	1983 01 21.24686	08 28 04.56	+23 05 32.5			2	801
1935 OK	1983 01 22.29860	11 28 51.47	-02 13 40.3				801
1938 DN	1983 01 22.23861	11 27 07.89	+16 15 01.1				801
1955 RY	1983 01 21.27417	10 06 31.91	+06 48 09.6				801
1961 TA	1983 01 20.26216	07 42 07.32	+25 55 35.3				801
1975 VS5	1983 01 21.22045	08 14 07.11	+11 11 27.0				801
1977 JP	1983 01 12.22225	07 34 28.39	+15 15 08.8				801
1977 QY2	1983 01 20.31184	08 37 41.84	+34 46 02.2				801
1983 LB	1983 01 21.36212	11 34 54.46	+26 34 45.4				801

1978	RW1		1983	01	20.20155	06	43	52.55	+17	28	38.8	801
1978	TA		1983	01	20.37050	09	42	47.88	+32	52	50.4	801
1979	YB		1983	01	20.09770	03	08	10.88	+21	15	26.2	801
1980	GD		1983	01	18.99462	03	25	32.98	+16	48	19.6	801
1980	LB		1983	01	22.33050	12	18	55.56	+41	08	52.7	801
1980	RX		1983	01	12.36089	10	16	32.06	+09	56	59.2	18.5 801
1980	RX		1983	01	19.28094	10	12	59.97	+09	59	00.3	19 1 801
1980	VN		1983	01	22.26863	11	34	18.88	+24	07	32.6	801
1981	KE		1983	01	18.96341	01	41	43.53	+12	37	33.4	801
1981	PL		1983	01	18.22328	07	06	08.10	+12	56	06.2	801
1981	QJ		1983	01	20.23277	07	50	07.94	+22	37	41.2	801
1981	QG2		1983	01	18.15670	05	38	48.51	+22	10	13.8	801
1981	RU		1983	01	14.30372	09	16	44.59	+11	20	21.8	801
1981	WY		1983	01	21.33361	11	11	25.10	+16	44	27.4	3 801
1982	RA		1983	01	08.00263	22	22	25.75	+54	26	03.2	801
1982	RA		1983	01	15.02755	22	58	56.27	+57	04	19.6	801
1982	UM		1983	01	20.00051	01	14	28.39	+07	17	16.2	4 801
1982	UB1		1983	01	15.06731	02	18	36.50	+11	12	33.7	801
1982	UB1		1983	01	20.06565	02	21	44.82	+11	36	10.2	5 801
1982	UN2		1983	01	18.03756	02	37	02.56	+14	10	49.0	6 801
1983	AJ2	*	1983	01	09.33847	09	27	36.44	+15	32	59.1	18.5 801
1983	BV	*	1983	01	20.34071	09	20	45.54	+16	16	04.4	18 801

Note 1: poor image. 2: trailed image. 3: weak solution. 4: dark plate.
5: weak image; inkdot measured. 6: at edge of field.

* * * * *

OBSERVATORY CODES.

The following listing of Observatory Codes is a revision of that on MPC 4766-4770, except that this time it is given in order of the code. The longitudes are measured (in degrees) eastward from Greenwich, and the parallax constants Dxy and Dz are in units of 0.0000001 AU.

Obs.	Long.	Parallax		
000	0.00	-266	-332	Greenwich
001	0.15	-268	-330	Crowborough (Roberts)
002	0.62	-265	-333	Rayleigh (Van Looy)
003	3.90	-309	-293	Montpellier
004	1.46	-309	-293	Toulouse
005	2.23	-281	-319	Meudon
006	2.13	-320	-281	Fabra Observatory, Barcelona
007	2.34	-281	-319	Paris
008	3.04	-342	-254	Algiers
009	7.45	-292	-310	Berne-Uecht
010	6.85	-309	-293	INAG-CERGA St. Vallier de Thiey
Oil	8.80	-290	-312	Wetzikon (Locher)
012	4.36	-270	-329	Uccle
013	4.48	-262	-335	Leiden
014	5.39	-311	-291	Marseilles
015	5.13	-263	-335	Utrecht
016	5.99	-290	-312	Besangon
017	6.85	-274	-326	Hoher List
018	6.76	-268	-331	Diisseldorf-Bilk
019	6.96	-291	-310	Neuchatel
020	7.30	-309	-293	Nice
021	8.38	-280	-320	Karlsruhe
022	7.78	-302	-300	Pino Torinese
023	8.26	-274	-325	Wiesbaden (Landgraf)

024	8.72	-278	-322	Heidelberg-Konigstuhl
025	9.20	-281	-319	Stuttgart
026	7.47	-292	-310	Berne-Zimmerwald
027	9.19	-300	-302	Milan
028	9.94	-276	-324	Wiirzburg
029	10.24	-254	-341	Hamburg-Bergedorf
030	11.26	-308	-293	Arcetri Observatory, Florence
031	11.19	-272	-327	Sonneberg
032	11.58	-269	-329	Jena
033	11.71	-269	-330	Karl Schwarzschild Observatory, Tautenburg
034	12.45	-318	-283	Monte Mario Observatory, Rome
035	12.58	-241	-351	Copenhagen
036	12.65	-319	-282	Castel Gandolfo
037	13.73	-314	-287	Collurania Observatory, Teramo
038	13.77	-299	-303	Trieste
039	13.19	-241	-351	Lund
040	13.73	-269	-330	Lohrmann Institute, Dresden
041	11.38	-290	-312	Innsbruck
042	13.06	-261	-336	Potsdam
043	11.53	-297	-305	Asiago Astrophysical Observatory, Padua
044	14.26	-323	-277	Capodimonte Observatory, Naples
045	16.34	-285	-316	Vienna (since 1879)
046	14.29	-281	-319	Klet Observatory, Ceske Budejovice
047	16.88	-261	-336	Poznan
048	15.83	-273	-326	Hradec Kralove
049	17.61	-217	-366	Uppsala-Kvistaberg
050	18.06	-218	-365	Stockholm (before 1931)
051	18.48	-354	+237	Cape
052	18.31	-218	-365	Stockholm-Saltsjobaden
053	18.96	-289	-313	Konkoly Observatory, Budapest (since 1934)
054	11.67	-241	-350	Brorfelde
055	19.96	-274	-325	Cracow
056	20.24	-279	-321	Skalnate Pleso
057	20.51	-303	-299	Belgrade
058	20.50	-247	-346	Kaliningrad
059	20.20	-279	-321	Lomnicky Stit
060	21.42	-263	-335	Warsaw-Ostrowik
061	22.30	-282	-318	Uzhgorod
062	22.23	-211	-369	Turku
063	22.44	-211	-369	Turku-Tuorla
064	22.75	-211	-369	Turku-Kevola
065	12.63	-287	-315	Traunstein (Bendel)
066	23.72	-337	-261	Athens
067	24.03	-276	-324	Lvov University Observatory
068	24.02	-276	-324	Lvov Polytechnic Institute
069	24.41	-234	-355	Baldone, near Riga
070	25.25	-247	-346	Vilnius (before 1939)
073	26.10	-305	-297	Bucharest
074	26.40	-373	+206	Boyden Observatory, Bloemfontein
075	26.72	-224	-362	Tartu
076	27.88	-384	+184	Johannesburg-Hartbeespoort
077	28.03	-383	+187	Yale-Columbia Station, Johannesburg
078	28.08	-383	+187	Johannesburg
079	28.23	-384	+184	Radcliffe Observatory, Pretoria
080	28.97	-322	-278	Istanbul
081	28.07	-383	+187	Leiden Station, Johannesburg
083	30.50	-273	-327	Golosseevo-Kiev
084	30.33	-215	-367	Pulkovo
085	30.50	-272	-327	Kiev

086	30.76	-294	-308	Odessa
087	31.34	-370	-211	Helwan
088	31.82	-370	-213	Kottomia
089	31.98	-291	-310	Nikolaev
094	34.00	-305	-297	Crimea-Simeis
095	34.02	-303	-299	Crimea-Nauchnij
097	34.76	-367	-216	Wise Observatory, Mitzpeh Ramon
101	36.23	-275	-325	Kharkov
102	36.83	-241	-351	Zvenigorod
105	37.57	-240	-351	Moscow
110	39.15	-232	-356	Rostov
115	41.44	-309	-293	Zelenchukskaya
119	42.82	-319	-283	Abastuman
123	44.29	-326	-275	Byurakan
125	44.90	-315	-286	Tbilisi
128	46.10	-267	-332	Saratov
129	46.00	-332	-266	Ordubad
135	49.12	-240	-351	Kasan
136	48.82	-240	-351	Engelhardt Observatory, Kasan
186	66.88	-331	-268	Kitab
190	68.60	-334	-264	Gissar
191	68.78	-334	-264	Dushanbe
192	69.29	-321	-280	Tashkent
210	76.96	-311	-290	Alma-Ata
218	78.45	-407	-127	Hyderabad
223	80.25	-415	-096	Madras
236	84.95	-236	-354	Tomsk
304	289.30	-373	+206	Las Campanas Observatory
323	116.14	-362	+225	Perth Observatory, Bickley
324	116.33	-327	-273	Peking Observatory, Shaho Station
330	118.82	-362	-225	Purple Mountain Observatory, Nanking
334	120.32	-345	-250	Tsingtao
337	121.19	-365	-219	Zo-Sd
363	130.78	-356	-234	Yamada (Otsubo)
370	133.53	-356	-234	Kochi (Seki)
371	133.60	-351	-241	Tokyo-Okayama
372	133.83	-356	-234	Geisei (Seki)
374	134.72	-349	-244	Minami-Oda Observatory (Sugano)
375	134.87	-350	-243	Uzurano (Einaga)
377	135.79	-350	-243	Kwasan Observatory, Kyoto
379	137.77	-351	-241	Hamamatsu (Wakuta)
380	137.03	-350	-242	Ishiki (Kojima)
381	137.63	-346	-248	Tokyo-Kiso
382	137.56	-345	-250	Tokyo-Norikura
383	137.89	-342	-254	Chirorin (Sei)
384	138.18	-350	-242	Shimada
385	138.47	-350	-243	Nihondaira Observatory (Urata)
386	138.32	-346	-249	Yatsugatake Observatory (Urata)
387	139.20	-345	-249	Tokyo-Dodaira
388	139.54	-347	-247	Tokyo-Mitaka
389	139.74	-347	-247	Tokyo (before 1938)
390	139.92	-343	-252	Utsunomiya (Kurosaki)
391	140.78	-335	-263	JCPM Ayashi Station
392	141.38	-312	-290	JCPM Sapporo Station
393	140.13	-345	-250	JCPM Sakura Station
394	142.32	-301	-301	JCPM Hamatonbetsu Station
395	142.36	-308	-294	Tokyo-Asahikawa
396	142.42	-308	-293	Asahikawa (Tsuchiya)
413	149.07	-365	+220	Siding Spring Observatory

414	149.00	-348	+245	Mount Stromlo
415	149.06	-348	+246	Kambah, near Canberra (Herald)
416	149.13	-348	+245	Barton, near Canberra (Herald)
419	150.83	-355	+235	Windsor (Tebbutt)
420	151.20	-354	+236	Sydney
474	170.46	-307	+295	Mount John Observatory, Lake Tekapo
483	173.80	-319	+282	Carter Observatory, Black Birch Station
484	174.75	-321	+280	Happy Valley, Wellington (Gilmore)
485	174.76	-321	+280	Carter Observatory, Wellington
486	175.47	-326	+274	Palmerston North (Munford)
487	355.45	-242	-350	Macnairston Observatory
488	358.37	-245	-348	Newcastle-upon-Tyne (D. S. Brown)
489	359.87	-261	-336	Hemingford Abbots (Young)
490	358.00	-270	-329	Wimborne Minster (Swan)
491	356.91	-324	-276	Centro Astronomico de Yebes
492	358.47	-258	-339	Mickleover (Baguley)
493	357.45	-340	-257	Estacion Astronomica de Calar Alto
494	357.84	-261	-336	Stakenbridge (Manning)
495	357.66	-255	-341	Altrincham (Scott)
496	358.69	-269	-330	Bishopstoke (Arbour)
497	359.30	-267	-331	Ascot-Loudwater (Armstrong)
498	359.26	-261	-336	Northampton (Hurst)
499	359.79	-267	-331	Cheam (Birtwhistle)
500	0.00	0	0	Geocentric
503	0.10	-262	-335	Cambridge
504	4.44	-292	-309	Le Creusot (Merlin)
505	4.56	-265	-333	Simon Stetin
506	9.96	-255	-340	Bendestorf (Ressel)
507	5.22	-263	-334	Nyenheim (Son)
508	5.29	-263	-334	Zeist (Son)
509	5.87	-312	-290	La Seyne sur Mer
510	8.03	-269	-329	Siegen
511	5.71	-308	-294	Haute Provence
512	4.49	-262	-335	Leiden (before 1860)
513	4.78	-298	-304	Lyons
514	8.43	-278	-322	Mundenheim (1907-1913)
515	7.48	-277	-323	Volkssternwarte Dhaun, near Kirn
516	9.97	-254	-341	Hamburg (before 1909)
517	6.15	-296	-306	Geneva
518	9.97	-254	-341	Marine Observatory, Hamburg
519	8.29	-267	-331	Meschede (Hempel)
520	7.10	-270	-329	Bonn
521	10.89	-275	-325	Bamberg
522	7.77	-283	-318	Strasbourg
523	8.65	-274	-326	Frankfurt
524	8.46	-278	-323	Mannheim
525	8.77	-270	-329	Marburg
526	10.15	-249	-345	Kiel
527	9.94	-254	-341	Altona
528	9.94	-266	-332	Gottingen
529	10.72	-214	-367	Christiania
530	10.69	-252	-343	Liibeck
531	12.48	-318	-283	Collegio Romano, Rome
532	11.61	-285	-316	Munich
533	11.87	-300	-302	Padua
534	12.39	-267	-331	Leipzig (since 1861)
535	13.36	-336	-262	Palermo
536	13.11	-261	-336	Berlin-Babelsberg
537	13.36	-260	-337	Urania Observatory, Berlin

538	13.85	-303	-299	Pola
539	14.13	-286	-316	Kremsmunster
540	14.27	-283	-318	Linz
541	14.40	-274	-325	Prague
542	13.04	-259	-337	Falkensee (Gressmann)
543	11.66	-241	-350	Leipzig (before 1861)
544	13.42	-260	-337	Wilhelm Foerster Observatory, Berlin
545	16.38	-285	-316	Vienna (before 1879)
546	16.35	-285	-316	Oppolzer Observatory, Vienna
547	17.04	-268	-330	Breslau
548	13.40	-260	-337	Berlin (1835-1913)
549	17.63	-215	-367	Uppsala
550	11.42	-253	-342	Schwerin
551	18.19	-287	-315	O'Gyalla
552	11.34	-305	-297	Osservatorio S. Vittore, Bologna
553	18.99	-273	-326	Chorzow
554	8.40	-272	-328	Burgsolms Observatory, Wetzlar
555	19.83	-274	-325	Cracow-Fort Skala
556	11.26	-288	-313	Reintal, near Munich (Seiler)
557	14.78	-275	-325	Ondrejov
558	21.03	-262	-335	Warsaw
559	14.98	-338	-259	Serra La Nave
560	10.93	-300	-302	Madonna di Dossobuono (Luciano)
561	20.02	-286	-315	Piszkesteto
562	15.92	-285	-316	Figl Observatory, Vienna
563	13.60	-286	-315	Seewalchen (Bressler)
566	203.74	-399	-150	Haleakala
568	204.53	-401	-144	Mauna Kea
569	24.96	-213	-368	Helsinki
570	25.29	-247	-346	Vilnius (since 1939)
578	27.99	-383	+187	Linden Observatory (Hers)
584	30.30	-214	-367	Leningrad
585	30.53	-272	-327	Kiev comet station
657	236.68	-283	-318	Victoria
660	237.74	-337	-260	Leuschner Observatory, Berkeley
662	238.36	-339	-257	Lick Observatory, Mount Hamilton
669	240.82	-352	-240	Ojai
671	242.00	-353	-239	Stony Ridge
672	241.94	-353	-238	Mount Wilson
673	242.32	-352	-239	Table Mountain Observatory, Wrightwood
674	242.39	-352	-240	Ford Observatory, Wrightwood
675	243.14	-357	-233	Palomar Mountain
686	249.21	-360	-227	U. of Minn. Infrared Obs., Mt. Lemmon
687	248.35	-349	-244	Northern Arizona University, Flagstaff
688	248.46	-349	-244	Lowell Observatory, Mesa Station
689	248.26	-349	-244	U.S. Naval Observatory, Flagstaff
690	248.34	-349	-245	Lowell Observatory, Flagstaff
691	248.40	-362	-224	Steward Observatory, Kitt Peak
692	249.05	-361	-226	Steward Observatory, Tucson
693	249.28	-360	-227	Catalina Station, Tucson
694	249.00	-361	-226	Tumamoc Hill, Tucson
695	248.40	-362	-224	Kitt Peak
696	249.12	-363	-223	Whipple Observatory (Mt. Hopkins)
702	252.81	-354	-237	Joint Obs. for cometary research, Socorro
704	253.34	-355	-236	Lincoln Laboratory ETS, New Mexico
707	254.56	-330	-270	Chamberlin field station (Everhart)
708	255.05	-329	-271	Chamberlin Observatory, Denver
711	255.98	-367	-216	McDonald Observatory, Fort Davis
724	260.80	-402	-141	National Observatory, Tacubaya

741	266.85	-305	-297	Goodsell Observatory, Northfield
754	271.44	-314	-287	Yerkes Observatory, Williams Bay
756	272.33	-317	-284	Dearborn Observatory, Evanston
760	273.60	-329	-270	Goethe Link Observatory, Brooklyn
765	275.58	-331	-268	Cincinnati
766	275.52	-314	-288	Michigan State University Obs., East Lansing
767	276.27	-316	-285	Ann Arbor
768	277.08	-313	-288	Dearborn (McEldery)
769	276.99	-327	-273	McMillin Observatory, Columbus
773	278.43	-320	-281	Warner and Swasey Observatory, Cleveland
774	278.93	-319	-282	Warner and Swasey Nassau Station, Chardon
777	280.60	-309	-293	Toronto
778	279.98	-325	-275	Allegheny Observatory, Pittsburgh
779	280.58	-308	-294	David Dunlap Observatory, Richmond Hill
784	282.28	-315	-286	Alfred University Observatory
786	282.94	-332	-266	U.S. Naval Obs., Washington (since 1893)
787	282.95	-332	-266	U.S. Naval Obs., Washington (before 1893)
788	284.37	-328	-271	Mount Cuba Observatory, Wilmington
789	284.59	-312	-290	Litchfield Observatory, Clinton
790	284.28	-300	-302	Dominion Observatory, Ottawa
791	284.52	-327	-273	Flower and Cook Observatory, Philadelphia
792	288.30	-321	-280	U. of Rhode Island, Quonochontaug
793	286.22	-314	-287	Dudley Observatory, Albany (before 1893)
794	278.90	-319	-282	Vassar College Observatory, Poughkeepsie
795	286.01	-324	-277	Rutherford
796	286.45	-322	-279	Stamford
797	287.07	-321	-280	Yale Observatory, New Haven
798	287.02	-320	-281	Yale Observatory, Bethany
799	288.86	-315	-286	Winchester (Metcalf)
800	288.45	-409	+119	Harvard Observatory, Arequipa
801	288.44	-315	-287	Oak Ridge Observatory
802	288.87	-315	-286	Harvard Observatory, Cambridge
803	288.92	-318	-283	Taunton (Metcalf)
804	289.31	-356	+235	Santiago-San Bernardo
805	288.97	-358	+231	Santiago-Cerro El Roble
806	289.45	-356	+233	Santiago-Cerro Calan
807	289.19	-369	+213	Cerro Tololo Observatory, La Serena
808	290.67	-363	+223	El Leoncito
809	289.2/	-372	+207	European Southern Observatory, La Silla
810	288.52	-314	-287	Wallace Observatory, Westford
811	289.90	-321	-280	Maria Mitchell Observatory, Nantucket
821	295.45	-364	+222	Cdrdoba-Bosque Alegre
822	295.80	-364	+221	Cdrdoba
839	302.07	-350	+243	La Plata
864	130.70	-359	-230	Kumamoto (Miyamoto)
869	133.42	-356	-234	Tosa (Ike)
873	133.77	-351	-241	Kurashiki Observatory (Honda)
878	136.91	-350	-243	Kagiya (Furuta)
879	137.35	-349	-243	Tokai (Furuta)
880	316.78	-393	+165	Rio de Janeiro
881	137.26	-349	-244	Toyota (Suzuki)
882	137.36	-349	-244	JCPM Oi Station
883	138.42	-350	-243	Tachibana Observatory (Yumoto)
884	138.08	-349	-244	Kawane (Iwahana)
885	138.46	-350	-243	JCPM Yakiimo Station
886	138.93	-349	-244	Mishima (Akiyama)
887	139.34	-345	-250	Ojima (Niijima)
891	140.86	-335	-263	JCPM Kimachi Station
893	140.87	-335	-263	Sendai Municipal Observatory

977	351.55	-250	-344	Markree
981	353.35	-249	-345	Armagh
982	353.66	-255	-341	Dunsink Observatory, Dublin
983	353.79	-343	-252	San Fernando
985	357.53	-259	-337	Telford (McAdam)
986	358.75	-266	-332	Ascot (Waterfield)
987	355.37	-250	-344	Archallagan Observatory (Soper)
988	355.71	-240	-351	Glasgow
989	357.69	-256	-340	Wilfred Hall Observatory, Preston
990	356.31	-325	-275	Madrid
991	356.93	-255	-341	Liverpool (since 1867)
992	357.00	-255	-341	Liverpool (before 1867)
993	357.50	-269	-330	Woolston Observatory (Waterfield)
994	359.39	-268	-331	Godalming (Ridley)
995	358.42	-247	-347	Durham
996	358.75	-264	-333	Oxford
997	359.15	-264	-334	Hartwell
998	359.76	-265	-333	London-Mill Hill
999	359.47	-303	-299	Bordeaux-Floirac

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ORBITAL ELEMENTS OF ONE-OPPOSITION MINOR PLANETS.

The orbit computers and authors of double designations are B = C. M. Bardwell, b = F. N. Bowman, E = E. Bowell, h = K. Hurukawa, I = H. Oishi, M = B. G. Marsden, s = L. D. Schmadel, U = T. Urata. See also MPC 5833.

Planet	B(1,0)	Epoch	M	Peri.	Node	Incl.	e	a	Arc	O	N	C
1962 SR	14.5	621003	203.54	283.99	280.21	9.21	0.0597	2.2248	4	4	1	M
1964 VN1	15.4	641211	14.94	340.67	67.26	7.05	0.2239	2.4213	53	6	2	h
1971 UL1	17.4	711105	2.74	348.36	48.14	5.92	0.2688	2.1955	15	5		h
1975 UE	15.0	751104	352.05	221.42	179.71	2.24	0.1012	2.4606	2	3	1	M
1976 SN	16.2	760919	6.90	334.49	13.42	1.78	0.2084	2.2552	5	5	2	I
1976 SN3	12.5	761009	318.05	283.70	150.92	3.35	0.2546	4.0400	32	3	2	I
1977 EG5	14.8	770318	193.99	157.56	185.80	7.82	0.1569	2.3792	3	6		h
1977 EJ5	14.3	770318	348.39	281.51	266.56	3.53	0.0706	3.3165	3	6		h
1977 EK5	17.0	770318	0.72	191.90	342.09	6.33	0.1295	2.1783	3	6	1	M
1977 EL5	15.0	770318	0.43	353.58	180.10	13.71	0.1117	3.0894	3	5	1	M
1977 EM5	14.6	770318	173.28	181.08	176.43	13.50	0.2947	2.3112	3	6		h
1977 EN5	15.7	770318	272.43	110.82	187.77	6.39	0.3384	2.3152	3	6		h
1977 EP5	16.8	770318	351.96	199.57	345.69	8.32	0.1310	2.4216	3	5		h
1977 ER5	15.4	770318	346.83	286.53	263.38	0.76	0.0882	2.9384	3	6		h
1977 ES5	16.5	770318	41.01	293.50	181.93	7.72	0.2010	2.3921	3	6		h
1977 EU5	15.6	770318	28.45	295.11	195.70	6.28	0.2211	3.1387	3	6		h
1977 EV5	14.3	770318	302.30	248.36	351.87	16.65	0.0841	3.2105	3	6		h
1977 EW5	13.3	770318	235.20	337.55	339.86	6.48	0.2305	3.0852	3	6		h
1977 EY5	14.5	770318	171.96	180.80	178.49	24.66	0.2406	2.5682	3	6		h
1977 EA6	15.0	770318	172.90	46.41	313.89	5.00	0.1977	2.3517	3	6		h
1977 EC6	17.7	770318	349.35	198.39	352.35	4.71	0.1882	2.2298	3	6		h
1977 ED6	16.8	770318	6.76	328.81	194.02	2.53	0.2758	2.7576	3	6		h
1977 EE6	17.3	770318	336.52	297.87	270.87	1.36	0.1749	2.3304	3	5		h
1977 EF6	16.5	770318	41.58	278.23	205.30	4.31	0.1215	2.3928	3	6		h
1977 EH6	15.3	770318	355.67	323.32	217.91	4.36	0.1213	3.0719	3	6		h
1977 EJ6	15.0	770318	176.41	175.63	181.69	8.78	0.1719	2.2793	3	5		h
1977 EL6	14.7	770318	163.45	49.79	314.21	2.34	0.3187	2.2704	3	6		h
1977 EM6	15.8	770318	279.43	32.20	240.42	2.50	0.1425	2.2020	3	6		h

1977	EN6	16.5	770318	354.16	313.16	229.98	1.84	0.1325	2.5869	3	5	1	M
1977	EP6	13.4	770318	302.27	67.90	184.39	7.96	0.1818	3.9498	3	6		h
1977	EQ6	15.0	770318	348.26	330.86	218.25	3.78	0.0667	3.2071	3	6	1	M
1977	ER6	15.9	770318	292.00	307.67	329.52	3.34	0.2927	2.5085	3	6		h
1977	ET6	15.3	770318	36.83	192.00	297.08	2.63	0.1258	3.0459	3	6		h
1977	EU6	17.3	770318	16.66	164.98	345.10	3.25	0.2018	2.4002	3	6		h
1977	EV6	14.9	770318	168.12	131.46	231.91	2.38	0.2098	2.4409	3	6		h
1977	EW6	14.1	770318	232.30	145.81	173.47	2.88	0.2231	2.8174	3	6		h
1977	EY6	15.5	770318	238.72	329.97	332.65	2.95	0.0621	2.4850	3	6		h
1977	EA7	13.9	770318	287.23	102.05	168.81	1.42	0.2014	3.1896	3	6		h
1977	EB7	14.6	770318	320.21	31.51	189.37	9.97	0.0660	3.0235	3	6		h
1977	EC7	15.6	770318	157.73	39.51	334.78	4.29	0.0948	2.2956	3	6		h
1977	ED7	14.4	770318	300.80	52.22	186.95	0.99	0.0475	3.2131	3	6		h
1977	EE7	14.3	770318	266.13	307.49	348.40	3.02	0.2491	3.0024	3	5		h
1977	EG7	15.1	770318	197.64	164.77	179.42	7.12	0.2472	2.2686	3	6		h
1977	EH7	15.5	770318	126.52	55.15	343.96	9.87	0.1249	2.2759	3	6		h
1977	EL7	16.4	770318	357.82	358.04	182.04	10.08	0.2676	2.8918	3	6		h
1977	EM7	15.0	770318	0.10	191.05	345.37	11.00	0.1488	3.2231	3	6	1	M
1977	EN7	14.6	770318	317.36	22.77	213.66	1.10	0.1939	3.3868	3	6		h
1977	EQ7	15.5	770318	255.74	299.60	356.96	7.86	0.1628	2.3148	3	6		M
1977	ER7	16.2	770318	288.46	62.26	195.82	6.31	0.0897	2.4046	3	6		h
1977	ES7	13.9	770318	270.53	280.64	356.72	18.06	0.1121	3.2167	3	6		h
1977	ET7	15.8	770318	75.61	269.22	182.40	6.67	0.0774	2.3997	3	6		h
1977	EV7	17.8	770318	18.48	146.27	352.94	4.00	0.3236	2.5521	3	5		h
1977	EW7	16.8	770318	341.50	27.01	174.94	7.33	0.1641	2.3656	3	6		h
1977	EX7	16.4	770318	333.36	207.91	4.32	2.31	0.1564	2.4213	3	6		h
1977	EA8	16.2	770318	324.52	224.57	355.16	13.49	0.1103	2.5293	3	6		h
1977	EB8	17.4	770318	26.52	245.96	245.92	1.94	0.2643	2.4485	3	6		h
1977	ED8	15.2	770318	265.16	114.20	182.26	9.87	0.2324	2.4801	3	6		h
1977	EE8	13.8	770318	283.39	319.50	315.02	2.07	0.1828	3.3956	3	6		h
1977	EG8	15.7	770318	8.30	316.27	206.86	0.88	0.2291	2.9289	3	6		h
1977	EJ8	16.0	770318	282.93	273.50	342.01	6.37	0.0114	2.4452	3	6		h
1977	EK8	16.0	770318	230.91	131.65	184.68	4.47	0.1308	2.2078	3	5	1	M
1977	EL8	16.7	770318	31.42	312.37	176.78	10.87	0.2129	2.5242	3	5		h
1977	EM8	16.3	770318	14.12	352.33	166.01	4.37	0.1208	2.1822	3	6		h
1977	EN8	15.4	770318	293.98	273.04	350.57	14.99	0.1784	2.6406	3	6		h
1981	EGl	15.0	810317	33.08	120.97	23.03	3.24	0.1206	2.6958	15	0	3	B
1981	QG	14.0	810913	15.48	342.89	349.75	1.19	0.1895	3.0622	36	0	2	B
1982	DW3	16.0	820220	41.35	331.77	126.60	3.21	0.1679	2.2439	5	7		M
1982	SD	14.5	820928	1.20	322.51	31.78	2.97	0.0087	2.3298	2	7	1	M
1982	WD	16.0	821127	338.15	217.70	247.17	29.54	0.2491	2.6633	11	8		M
1982	XA	14.0	830923	87.75	196.68	220.69	4.54	0.1395	2.2715	34	0		U
1983	AB	15.0	830126	344.32	64.07	89.47	3.39	0.1508	2.3839	37	0		M
1983	AD	13.9	830126	341.01	63.18	72.53	10.03	0.1211	2.5627	37	6		E
1983	AJ	15.0	830126	63.08	105.21	295.32	16.92	0.1092	1.9384	33	8		E
1983	AK	14.7	830126	326.50	65.77	94.98	7.02	0.1416	2.2948	37	6		E
1983	AN	13.5	830126	32.90	348.78	88.03	7.27	0.1192	2.4075	37	7		M
1983	AP	14.0	830126	310.09	154.73	19.73	11.99	0.1130	2.6015	34	8		M
1983	AQ	14.0	830126	79.69	305.98	60.04	9.85	0.2539	2.4580	34	0		M
1983	AR	13.5	830126	62.04	352.25	46.01	11.09	0.1347	2.7691	34	8		M
1983	AV	14.0	830126	333.43	64.04	94.89	13.11	0.2026	2.6616	30	6		E
1983	AAl	15.0	830126	348.39	326.11	172.72	4.61	0.1540	2.2476	34	7	2	M
1983	ACl	15.0	830126	357.75	357.61	128.82	28.47	0.2011	2.2737	30	6		E
1983	AG2	14.0	830126	26.59	109.56	330.70	21.86	0.3362	2.3158	37	0		M
1983	CB	12.5	830215	345.67	182.70	350.60	20.49	0.0001	3.2014	8	8	1	M
1983	CC	15.0	830215	202.02	167.64	133.77	24.84	0.0487	1.9341	10	8		M
1983	CH	14.8	830215	46.65	349.35	96.98	5.86	0.0911	2.1965	8	6		E
1983	CL	13.7	830215	348.88	174.26	341.09	8.54	0.1205	2.7892	8	8		E
1983	CM	14.8	830215	289.40	210.40	17.95	6.01	0.1430	2.2454	8	6		E

1983 CN 13.8 830215 5.96 153.77 341.19 14.35 0.0314 2.5280 8 6 E
1983 CO 14.9 830215 338.46 52.41 122.33 6.17 0.1815 2.5834 8 6 E
1983 CB1 13.4 830215 328.55 60.82 121.82 13.98 0.1088 2.6493 8 6 E
Note 1: e assumed. 2: double designations 1964 VN1 = 1964 VY2 (h, JAM 1344); 1976 SN = 1976 SR7 (I, JAM 1336); 1976 SN3 = 1976 UW20 (I, JAM 1336); 1981 EG1 = 1981 EU1 (s); 1981 QG = 1981 SJ3 (s); 1983 AA1 = 1983 AZ1 (b). 3 = 1 + 2.

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

(2234) Schmadel

The following elements replace those on MPC 7589. The residuals are as given earlier.

Epoch 1983 Sept. 23.0 ET = JDE 2445600.5

M 140.73310		(1950.0)	P	Q
n 0.22202907	Peri.	271.70788	+0.12241465	+0.99151447
a 2.7010304	Node	5.88907	-0.65275173	+0.11363637
e 0.1988031	Incl.	25.23693	-0.74761610	+0.06313341
P 4.44	B(1,0)	13.4		

(2846)* 1942 CJ = 1968 TK = 1971 BT1 = 1972 JN1 = 1974 UG = 1975 XK5 = 1979 OE13 = 1979 QB6 = 1979 QF8

Discovered 1942 Feb. 12 by L. Oterma at Turku. The identifications were found independently by K. Hurukawa (JAM 1371) and L. D. Schmadel. The identification and triple designation 1942 CJ = 1979 OE13 = 1979 QB6 = 1979 QF8 were found independently by T. Urata (NOC 1406). The identification 1969 TR1 = 1971 BT1 (NOC 1067) is invalid.

Epoch 1983 Sept. 23.0 ET = JDE 2445600.5

M 348.22640		(1950.0)	P	Q
n 0.16978983	Peri.	86.23267	-0.62094111	+0.77548075
a 3.2299436	Node	144.54821	-0.77437913	-0.58427271
e 0.0590184	Incl.	11.36405	-0.12152820	-0.23928018
P 5.80	B(1,0)	11.8		

Residuals in seconds of arc

420212	062	1.4-	4.3+	681015	095	0.1+	1.9+	741115	095	0.3-	1.4+
420218	062	0.4-	0.8+	710128	095	1.5-	1.7+	751203	095	0.9+	0.0
420218	062	0.3+	0.1+	720512	805	0.3+	1.2+	790731	095	3.4-	0.2+
420307	062	0.9+	0.5-	720512	805	0.9+	0.6+	790819	095	1.5-	0.5+
420313	062	0.8+	0.1+	720512	805	1.7+	0.3+	790826	095	1.1+	2.2+
420317	062	0.5+	0.4+	741024	095	1.1+	2.2+				

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ORBITAL ELEMENTS BY K. HURUKAWA, TOKYO ASTRONOMICAL OBSERVATORY.

The following orbital elements are from JAM 1344, 1372-1374 and 1382. The identifications are by K. Hurukawa unless otherwise stated.

1942 RN = 1932 HN = 1934 VP = 1940 GS = 1951 YB1 = 1957 JC = 1967 RC = 1979 OU14

Epoch 1983 Sept. 23.0 ET = JDE 2445600.5 (J-P)

M 181.41105		(1950.0)	P	Q
n 0.23394213	Peri.	291.80652	-0.17392491	-0.98409850
a 2.6085427	Node	168.03887	+0.95548949	-0.17750345
e 0.1428381	Incl.	10.01990	+0.23 830644	-0.00653180
P 4.21	B(1,0)	11.6		

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

320429	078	(8.1- | 6.4+)Y	420908	062	0.8+	1.1+		670903	095	0.6+	2.8-
341110	094	(2.7- | 12.8+)X	420915	062	0.3+	0.7+		670909	095	0.3+	1.8-
400403	094	(5.9- | 17.7-)X	421003	062	0.5-	0.2-		790721	095	0.0	1.3+
420907	062	0.7-	2.1+	511123	711	0.2+	4.1-	Y				
420908	062	0.8-	0.3+	570502	760	(0.04+ | 0.01+)X					

1955 RZ = 1955 TP = 1975 BK1

The double designation 1955 RZ = 1955 TP is by S. Kanda (MPC 1453). The identification 1955 RZ = 1975 B1l was found independently by E. Bowell,

Epoch 1983 Sept. 23.0 ET = JDE 2445600.5 (J-P)

			(1950.0)	P	Q
M	152.23104				
n	0.21743058	Peri.	342.49069	+0.10841242	+0.98207608
a	2.7389861	Node	293.50678	-0.89072056	+0.02708986
e	0.0106435	Incl.	9.67966	-0.44143361	+0.18652806
P	4.53	B(1,0)	13.5		

Residuals in seconds of arc

550914	760	3.3-	0.3-	550921	760	1.3+	0.0		750116	330	1.9-	1.7-
550914	760	3.1-	1.6+	551012	760	2.5+	0.3+		750117	330	4.5-	0.8-
550921	760	1.2+	0.2-	551012	760	1.3+	1.2-		750118	330	6.5+	2.8+

1981 EC16 = 1978 QP

The identification was found independently by L. D. Schmadel.

Epoch 1983 Sept. 23.0 ET = JDE 2445600.5 (J-P)

			(1950.0)	P	Q
M	192.14447				
n	0.27105347	Peri.	351.08345	-0.14086893	+0.98796843
a	2.3646504	Node	270.80012	-0.90430634	-0.15464665
e	0.2062009	Incl.	3.66006	-0.40297144	+0.00167230
P	3.64	B(1,0)	14.9		

Residuals in seconds of arc

780831	095	0.0	0.5-	810306	413	0.6+	0.2-		810408	413	0.6-	1.7+
780905	095	0.0	0.7+	810312	413	0.9-	0.4+		810408	413	1.0+	0.7+
810301	413	1.3-	0.4+	810312	413	0.8+	0.7-		810409	413	0.9-	0.7-
810301	413	1.6+	0.2+	810406	413	0.0	0.2-		810409	413	0.1+	0.6-
810306	413	1.1-	0.7+	810406	413	0.9+	1.3-					

1981 EB17 = 1977 EZ5

The identification was found independently by C. M. Bardwell.

Epoch 1983 Sept. 23.0 ET = JDE 2445600.5 (J-P)

			(1950.0)	P	Q
M	202.60879				
n	0.25087396	Peri.	234.19459	-0.84052719	+0.54135747
a	2.4898118	Node	338.55716	-0.47653263	-0.75730137
e	0.0513716	Incl.	3.31226	-0.25774154	-0.36527624
P	3.93	B(1,0)	15.7		

Residuals in seconds of arc

770312	381	1.1-	1.6+	810306	413	0.4-	0.6-		810408	413	0.4-	0.6-
770312	381	0.7-	0.7+	810306	413	3.4-	0.5+		810408	413	1.3+	0.9-
770314	381	0.5-	1.0+	810308	413	1.4+	2.1-		810409	413	0.2-	0.5+
770314	381	2.4+	1.2-	810312	413	0.0	0.3-		810409	413	1.3+	0.5+
770315	381	0.7+	0.1-	810406	413	1.6-	0.9+					
770315	381	0.1+	0.3-	810406	413	1.1+	0.4+					

1982 QQ = 1977 RN7 = 1977 SY2

Epoch 1983 Sept. 23.0 ET = JDE 2445600.5 (J-P)

			(1950.0)	P	Q
M	158.29579				
n	0.38244118	Peri.	138.18836	+0.82512050	+0.56160016
a	1.8797228	Node	188.34757	-0.56127626	+0.82727880
e	0.0530474	Incl.	25.06027	+0.06438258	+0.01466446
P	2.58	B(1,0)	14.8		

Residuals in seconds of arc

770911 095	2.3+	3.0+	820830 675	1.5-	4.8-	820918 675	0.5+	1.3-
770921 095	2.0-	2.3-	820914 675	0.1+	1.1+	820920 675	0.9-	0.6+
820820 675	1.5+	1.9+	820914 675	1.2+	0.9+	820920 675	3.3-	0.1-
820820 675	0.1-	1.1+	820918 675	2.7+	0.3+			

1983 BA = 1931 TD2 = 1970 EL2 = 1975 VO6 = 1975 XL3
Epoch 1983 Sept. 23.0 ET = JDE 2445600.5 (J-P)

M	337.79212		(1950.0)		P		Q
n	0.29407280	Peri.	250.90403		-0.81283098		+0.57843318
a	2.2395822	Node	324.34307		-0.48022959		-0.73220153
e	0.0439759	Incl.	6.76904		-0.32967460		-0.35957750
P	3.35	B(1,0)	14.2				

Residuals in seconds of arc

311010 024	1.6+	3.4-	700304 805	0.6+	0.1+	830116 688	1.7-	1.0-
311016 024	(10.1+	2.2+)	751106 095	1.5-	2.4+	830116 688	4.3-	1.6-
311019 024	(8.8-	4.3-)	751202 095	1.4+	4.6+	830121 688	1.7-	1.6-
700304 805	0.1+	0.3+	830109 688	0.6-	0.1-	830121 688	4.2+	0.6-
700304 805	0.0	0.5+	830109 688	2.0+	0.4-			

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ORBITAL ELEMENTS BY T. URATA, SHIMIZU, JAPAN.

The following orbital elements are from NOC 1405, 1408, 1414, 1415, and 1417-1421. The identifications are by T. Urata unless otherwise stated.

(2847)* 1959 CC1 = 1931 OE = 1940 EA = 1941 SE = 1941 SV = 1960 SF = 1969 KG = 1973 SR2 = 1975 BY = 1975 EN = 1979 QZ6

Discovered 1959 Feb. 1 at the Lowell Observatory. The double designation 1941 SE = 1941 SV was given on RI 2293. The identification 1959 CC1 = 1941 SV was found independently by E. Bowell.

Epoch 1983 Sept. 23.0 ET = JDE 2445600.5

M	145.81354		(1950.0)		P		Q
n	0.30846326	Peri.	11.65068		-0.20435284		+0.97811077
a	2.1693706	Node	246.56762		-0.90147732		-0.20366123
e	0.1154662	Incl.	2.45068		-0.38154757		-0.04267813
P	3.20	B(1,0)	13.8				

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

310724 024	(36.5+	34.3-)X	590131 690	0.9+	0.4+	690516 095	2.9-	0.1-
400302 078	(0.03-	0.01+)X	590201 690	0.5+	0.7+	730922 095	2.0-	0.6-
400308 029	(35.3-	53.0+)X	590201 690	1.2+	0.5-	730926 095	1.2-	0.2+
410920 012	(0.05-	0.01-)X	590202 690	0.4+	0.9+	750118 095	1.2+	1.8-
410921 062	0.6+	2.2-	590202 690	1.3+	0.3-	750306 095	1.1-	0.4-
410921 062	0.9+	1.3-	590207 690	2.2-	1.0-	790820 095	1.4+	0.5-
410925 062	0.1+	0.8-	600926 839	0.5-	1.2+	790826 095	1.3+	0.1+
410927 012	(0.06+	0.06+)X	600926 839	0.1+	1.9+			

(2848)* 1959 VF = 1970 RR = 1975 NA = 1975 NE1 = 1981 QM1

Discovered 1959 Nov. 8 at the Goethe Link Observatory.

Epoch 1983 Sept. 23.0 ET = JDE 2445600.5

M	90.73810		(1950.0)		P		Q
n	0.17298648	Peri.	55.02054		+0.83350661		-0.55247811
a	3.1900288	Node	338.51478		+0.50150736		+0.76099498
e	0.2033193	Incl.	0.92118		+0.23185577		+0.34008024
P	5.70	B(1,0)	12.5				

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

591108	760	1.4-	0.5+		810825	704	2.1+	1.6-		810903	704	0.6+	3.1+
591110	760	0.4+	2.0+		810825	704	0.7+	0.5-		821120	372	0.4+	0.9-
591110	760	2.0+	1.5+		810827	704	1.9+	0.3+		821120	372	0.2+	0.8-
591130	760	0.6+	0.3-		810829	704	0.9-	1.9-		821214	688	1.4-	2.0-
591130	760	0.0	2.0+		810829	704	0.5-	2.5-		821214	688	1.5-	0.0
700913	095	2.0-	3.3-		810829	704	0.3+	0.1+		821222	801	0.5-	0.4+
750706	485	0.7+	0.2+		810830	704	1.9+	0.9-		830112	801	0.7-	0.1+
750706	485	1.1-	0.6-		810831	704	0.1-	3.6+		830116	372	1.1+	1.2-
750711	095	1.8-	1.4+		810901	704	2.4-	0.0		830116	372	1.4+	0.6+
750713	095	(0.04+	0.02-)		810902	704	0.2-	1.0+					

(2849)* 1976 GN3 = 1968 KE = 1972 HA = 1980 GU

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

Epoch 1983 Sept. 23.0 ET = JDE 2445600.5

M	143.97835		(1950.0)	P	Q
n	0.23979914	Peri.	310.47118	+0.99137877	+0.10225402
a	2.5658877	Node	43.84158	-0.05158163	+0.87936031
e	0.0115173	Incl.	6.79282	-0.12044698	+0.46504791
P	4.11	B(1,0)	13.7		

Residuals in seconds of arc

680522	095	3.7+	0.7-		760503	095	1.2+	2.9-		821113	372	1.4-	2.8-
720418	095	8.1-	1.9+		800413	033	0.3+	0.8+		821113	372	0.7+	0.0
760401	095	1.3-	1.2+		810805	474	0.9+	0.3-		821116	801	1.0+	1.0-
760402	095	1.3+	2.4-		810805	474	1.0+	0.3+		830105	801	0.5+	0.3+
760404	095	2.0+	0.6+		810830	474	0.7-	1.2-					
760423	095	0.3-	1.9-		810830	474	1.2-	1.0-					

(2850)* 1978 TM7 = 1934 FC = 1938 GE = 1980 CU

Discovered 1978 Oct. 2 by L. V. Zhuravleva at the Crimean Astrophysical Observatory. The identifications 1978 TM7 = 1934 FC = 1938 GE are by S. Nakano.

Epoch 1983 Sept. 23.0 ET = JDE 2445600.5

M	52.23953		(1950.0)	P	Q
n	0.25713836	Peri.	341.09427	+0.05336121	-0.98985989
a	2.4492031	Node	105.67878	+0.93285491	+0.00237858
e	0.0496864	Incl.	7.85868	+0.35627 840	+0.14202727
P	3.83	B(1,0)	13.2		

Residuals in seconds of arc

340319	012	(6.0+	16.4+)X		800215	046	0.3+	0.0		800315	095	0.8+	0.5-
380405	062	1.0+	0.9+		800219	046	0.0	0.3+		820918	801	0.1+	0.5-
380405	062	1.5-	1.5+		800220	046	0.1-	0.8+		821016	372	1.0+	0.7-
380405	062	0.9-	1.8+		800221	046	0.6-	0.4+		821016	372	1.5+	0.4+
380406	062	3.0+	0.6-		800221	046	0.0	0.8-		821018	801	1.0+	1.0-
781002	095	0.6-	0.8+		800222	046	(1.9-	9.9+)Y		821116	801	0.1-	0.8+
781008	095	1.0-	0.5+		800222	046	(1.5-	9.6+)Y		821218	801	1.6-	1.2-
781101	095	1.2-	3.2+		800223	046	(5.4-	18.4+)Y					
800215	046	1.0-	0.9-		800223	046	(3.6-	17.5+)Y					

(2851)* 1978 UQ2 = 1935 UU = 1974 TE1 = 1974 WM

Discovered 1978 Oct. 30 at the Purple Mountain Observatory. The identification 1978 UQ2 = 1935 UU is by S. Nakano.

Epoch 1983 Sept. 23.0 ET = JDE 2445600.5

M	76.60732		(1950.0)	P	Q
n	0.25266432	Peri.	14.68134	+0.42447831	-0.89815009
a	2.4780312	Node	50.33862	+0.81494228	+0.32379765
e	0.1262931	Incl.	8.56485	+0.39457224	+0.29745840
P	3.90	B(1,0)	13.5		

Residuals in seconds of arc

351028	078	0.0	0.2-		781101	095	0.4-	0.8+		821119	552	0.3+	0.1+
741010	808	1.0-	0.4-		781103	330	0.3-	0.6+		821120	552	1.6+	0.8+
741010	808	0.8-	0.4-		781107	330	1.7+	0.5-		821120	552	0.4+	0.7+
741012	808	2.6-	1.2+		820926	372	0.1+	3.2-		821121	552	0.3+	0.8-
741012	808	1.1-	0.2-		820926	372	0.4+	0.6-		821121	552	0.3-	0.1-
741119	095	6.1+	1.6-		821018	801	2.9-	2.9+		821214	688	0.4-	0.5-
781009	095	1.5-	0.1+		821116	801	0.4-	1.7+		821214	688	0.4-	1.1-
781030	330	1.4+	0.3-		821119	552	0.2+	0.6+					

(2852)* 1981 QU2 = 1981 TN = 1957 LF = 1975 GB1 = 1975 HL

Discovered 1981 Aug. 23 by H. Debehogne at the European Southern Observatory.

Epoch 1983 Sept. 23.0 ET = JDE 2445600.5

			(1950.0)	P	Q
M	140.07525				
n	0.21218297	Peri.	255.63234	+0.99518213	-0.09397076
a	2.7839560	Node	109.75381	+0.09743755	+0.91628583
e	0.0874311	Incl.	1.70269	+0.01088334	+0.38934532
P	4.65	B(1,0)	13.4		

Residuals in seconds of arc

570605	081	0.0	0.3-		810831	809	0.0	0.6-		810906	809	0.4-	0.7+
570606	081	0.1-	0.6-		810831	809	0.2+	0.8-		810906	809	0.7-	0.3+
750415	805	0.5+	1.1+		810831	809	0.2-	0.4-		810906	809	1.4-	0.2+
750420	805	0.1-	0.2+		810901	809	1.9+	0.2-		810906	809	1.3-	0.3+
810823	809	0.6+	0.9+		810901	809	1.0+	0.0		810906	809	1.5-	0.2+
810823	809	1.1+	1.1+		810901	809	0.3+	0.4-		810907	809	0.9-	0.3+
810823	809	2.0+	0.9+		810902	809	1.1+	0.4-		810907	809	1.4-	0.7+
810824	809	0.2-	0.6+		800902	809	0.1-	0.9-		810907	809	1.7-	1.0+
810824	809	0.3+	0.8+		810902	809	0.8-	0.1-		810907	809	2.3-	0.3+
810824	809	0.7+	0.5+		810902	809	0.4+	0.0		810907	809	1.5-	0.3+
810825	809	0.4+	0.3-		810902	809	0.2+	0.2-		810907	809	1.2-	0.2+
810825	809	0.8+	0.5-		810902	809	1.0+	0.1+		810920	809	1.4-	1.0+
810825	809	0.6+	0.0		810903	809	0.1+	0.1-		810920	809	0.8-	0.3+
810826	809	0.2+	0.3+		810903	809	0.6+	0.1+		810920	809	0.3-	0.6+
810826	809	0.3+	0.4+		810903	809	1.0+	0.3+		810921	809	0.1+	0.9+
810826	809	0.3+	0.4+		810904	809	1.7+	0.3-		810921	809	0.2-	0.6+
810826	809	0.1-	0.2-		810904	809	1.1+	0.1-		810921	809	1.0+	1.0+
810826	809	0.2+	0.0		810904	809	0.0	0.1-		810921	809	0.8-	0.2+
810826	809	0.5+	0.1-		810905	809	0.7-	0.3+		810921	809	0.0	0.3+
810827	809	0.7-	1.2-		810905	809	0.6-	0.3+		810921	809	0.2-	0.1+
810827	809	0.0	0.9-		810905	809	0.7-	0.0		811004	688	0.6+	2.4-
810827	809	0.7-	0.5-		810905	809	0.2-	0.1-		811004	688	2.1+	1.9-
810828	809	0.2+	0.9-		810905	809	0.1+	0.0		821118	801	0.9+	0.8-
810828	809	0.4+	0.9-		810905	809	0.1-	0.2+		830114	801	0.8-	0.7+
810828	809	0.1-	1.4-		810906	809	0.2-	0.6+					

1981 EX16 = 1969 RG = 1969 RR1

The identifications were found independently by L. D. Schmadel.

Epoch 1983 Sept. 23.0 ET = JDE 2445600.5 (J-P)

			(1950.0)	P	Q
M	325.09855				
n	0.21174106	Peri.	45.50582	+0.77683472	-0.62872501
a	2.7878336	Node	353.17682	+0.46050760	+0.60524927
e	0.1617907	Incl.	17.18878	+0.42948873	+0.48823989
P	4.65	B(1,0)	13.5		

Residuals in seconds of arc

690908	095	1.1-	1.4+		810308	413	0.3-	0.1-		810408	413	0.3-
690913	095	1.3+	1.6-		810312	413	0.8+	0.7 +		810408	413	2.3+
810306	413	2.4-	0.0		810312	413	2.4 +	0.2 +		810409	413	0.9-
810308	413	2.1-	0.2+		810406	413	0.3 +	0.2 +		810409	413	0.1+

1983 CA = 1935 RH = 1948 QK = 1951 LU = 1958 TK = 1967 GM = 1971 UW1 = 1977 JK

Epoch 1983 Sept. 23.0 ET = JDE 2445600.5 (J-P)

M	296.36307	(1950.0)	P	Q
n	0.30138830	Peri. 246.33071	+0.26716771	+0.96156007
a	2.2031936	Node 39.33842	-0.84361539	+0.26519663
e	0.167 8185	Incl. 5.74301	-0.46576226	+0.07122485
P	3.27	B(1,0) 14.0		

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

350905	094	(0.03+	0.01+)X	770518	095	1.0-	1.1-		830215	372	0.9- 0.3+
480829	078	(7.3+	87.2-)X	830208	372	0.9-	0.2-	Y	830215	372	0.2+ 2.1+
510608	711	3.1-	5.2+ Y	830211	372	0.5-	0.7+		830217	372	0.2- 0.6-
510608	711	1.2+	1.1+ Y	830211	372	0.6-	1.6+		830217	372	0.2+ 0.7+
581012	024	1.7-	2.8+	830213	372	0.7-	1.4+		830219	688	(1.2+ 2.6-)
670413	095	5.4+	5.5-	830213	372	0.3+	1.9+		830219	688	(0.2- 2.2-)
711020	095	3.4+	0.7-	830215	688	(0.8+	1.1-)				
770515	095	1.4-	1.1-	830215	688	(0.8-	2.0-)				

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ORBITAL ELEMENTS BY S. NAKANO, TOKYO.

The following orbital elements are from JAM 1235, 1242, 1345 and 1346. The identifications are by K. Hurukawa unless otherwise stated.

(2853)* 1963 RG = 1974 SS4 = 1974 WG1 = 1976 GL5 = 1981 TG

Discovered 1963 Sept. 14 at the Goethe Link Observatory. The identification 1963 RG = 1976 GL5 was found independently by O. Kippes.

Epoch 1983 Sept. 23.0 ET = JDE 2445600.5

M	163.54635	(1950.0)	P	Q
n	0.27452514	Peri. 201.13093	+0.70545005	-0.70814455
a	2.3446677	Node 204.03437	+0.66019700	+0.67169648
e	0.1449815	Incl. 4.15665	+0.25783743	+0.21761234
P	3.59	B(1,0) 14.2		

Residuals in seconds of arc

630914	760	2.9-	1.6+	631010	760	1.1-	1.6-		811005	688	0.5- 1.3-
630914	760	5.1+	1.4-	740926	095	3.2-	0.4-		811005	046	0.4+ 0.0
630924	760	1.2+	3.3+	741119	095	2.7+	1.0+		811006	046	0.2+ 0.7-
630924	760	1.4-	0.3+	760402	095	0.4-	1.0-				
631010	760	1.9-	0.1-	811005	688	1.2+	1.5-				

(2854)* 1964 JE = 1931 DS = 1967 EN = 1971 ON = 1981 PS

Discovered 1964 May 6 by D. McLeish at Cordoba.

Epoch 1983 Sept. 23.0 ET = JDE 2445600.5

M	334.51603	(1950.0)	P	Q
n	0.30106499	Peri. 279.82418	-0.84471296	+0.52707094
a	2.2047662	Node 292.03745	-0.44322360	-0.78631326
e	0.1219613	Incl. 5.76061	-0.30002142	-0.32234716
P	3.27	B(1,0) 14.2		

Residuals in seconds of arc

310221	690	(1.9+	48.0-)X	640515	822	0.7+	0.1+		810807	046	1.5- 0.6+
310223	690	(46.6+	81.1-)X	640515	822	1.0+	0.1+		810809	046	1.4+ 1.9+
640506	822	0.6-	0.2+	670309	095	0.2+	1.0-		810809	046	1.2+ 1.4+
640506	822	1.2-	0.2-	670311	095	0.3-	1.3+		810811	046	0.4- 0.9-
640513	822	1.1-	0.2+	710726	095	0.0	0.1-		810811	046	0.3- 2.4-
640514	822	0.3+	0.0	810807	046	0.7-	0.4-				

1978 PU3 = 1977 EK6
Epoch 1983 Sept. 23.0 ET = JDE 2445600.5 (J-P)

M	157.36871	(1950.0)	P	Q
n	0.27682457	Peri. 151.67563	+0.81216782	+0.58322770
a	2.3316704	Node 172.59117	-0.55496155	+0.78028705
e	0.1337245	Incl. 6.73786	-0.18000311	+0.22582641
P	3.56	B(1,0) 15.4		

Residuals in seconds of arc

770312	381	1.2-	0.3+	770314	381	2.4+	1.1-	780831	095	0.2-	1.4+
770312	381	0.3-	0.6+	770315	381	0.2-	0.6-	780905	095	0.0	1.2-
770314	381	0.7-	0.7+	780809	095	0.1+	0.2-				

1979 YP = 1977 ES6
Epoch 1983 Sept. 23.0 ET = JDE 2445600.5 (J-P)

M	43.65443	(1950.0)	P	Q
n	0.27130962	Peri. 190.02154	+0.78904764	-0.61430972
a	2.3631617	Node 207.88233	+0.56438292	+0.72823157
e	0.2129983	Incl. 0.64122	+0.24264325	+0.30381301
P	3.63	B(1,0) 15.0		

Residuals in seconds of arc

770312	381	1.0-	1.1+	791217	809	0.5+	0.1+	791223	809	0.5+	0.2-
770312	381	0.3+	0.0	791217	809	0.1+	0.8+	791224	809	0.6+	0.7-
770314	381	0.3+	0.4+	791219	809	1.4+	0.3+	791224	809	0.3-	0.5-
770314	381	1.0+	0.6-	791219	809	0.6-	0.1-	791224	809	0.3-	0.4-
770315	381	0.1+	0.7-	791220	809	0.8+	0.2-	791225	809	0.1-	0.3+
770315	381	0.6-	0.0	791220	809	0.8+	0.1-	791225	809	0.8-	0.2+
791216	809	0.3-	0.6-	791220	809	0.5+	0.1+	791225	809	0.6-	0.6-
791216	809	1.5-	0.0	791221	809	0.1-	0.2-	791226	809	0.3+	0.3+
791216	809	0.1-	0.3+	791221	809	0.2-	0.4-	791226	809	0.1+	0.7+
791217	809	0.6+	0.4+	791222	809	0.1-	0.1+	791228	809	0.9-	0.7-
791217	809	0.4-	0.5+	791222	809	1.0-	0.2+	791228	809	0.1+	0.1+
791217	809	0.9-	0.7+	791222	809	0.9+	0.6-	791229	809	0.3-	0.0
791217	809	0.1+	0.5+	791223	809	0.5+	0.7-	791229	809	0.9+	0.5+

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

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

Periodic Comet Gunn
Epoch 1982 Nov. 7.0 ET = JDE 2445280.5
T 1982 Nov. 26.88498 ET

q	2.4591375	(1950.0)	P	Q
n	0.14446435	Peri. 196.98117	-0.09390275	+0.98148003
a	3.59/1808	Node 67.88559	-0.89116222	-0.00809242
e	0.3163709	Incl. 10.38313	-0.443 86053	-0.19139350
P	6.82			

From 88 observations 1954-1982, mean residual 1".4. Nongravitational parameters A1 = +2.38, A2 = +0.6128.

Periodic Comet Bowell-Skiff (1983c)
T 1983 Mar. 15.32756 ET

q	1.9439856	(1950.0)	P	Q
n	0.06292484	Peri. 169.07220	-0.90406434	-0.42708069
a	6.2601968	Node 345.61155	+0.38695532	-0.80159831
e	0.6894689	Incl. 3.78975	+0.18147521	-0.41838048
P	15.66			

From 16 observations 1983 Feb. 11-Mar. 9.

(1620) Geographos
Epoch 1983 Sept. 23.0 ET = JDE 2445600.5

M 90.91424		(1950.0)	P	Q
n 0.70984133	Peri.	276.53422	-0.27708083	+0.95653232
a 1.2445964	Node	336.74952	-0.76505896	-0.27689727
e 0.3354171	Incl.	13.32070	-0.58130112	-0.09150856
P 1.39	B(1,0)	16.7		

From observations 1951-1976. 1983 observations are represented within 2". See also IAUC 3774.

(2855)* 1931 TB2 = 1962 WH1 = 1971 BD = 1977 QV2

Discovered 1931 Oct. 10 by K. Reinmuth at Heidelberg. The identification 1931 TB2 = 1977 QV2 was also found independently by C. M. Bardwell, F. N. Bowman, O. Kippes and J. G. Williams.

Epoch 1983 Sept. 23.0 ET = JDE 2445600.5

M 137.12532		(1950.0)	P	Q
n 0.25609920	Peri.	97.81634	+0.22054577	-0.97408908
a 2.4558240	Node	339.23543	+0.82987621	+0.21438807
e 0.1665348	Incl.	8.12395	+0.51250857	+0.07202934
P 3.85	B(1,0)	14.0		

Residuals in seconds of arc

311010	024	5.2-	0.6+	620927	033	0.8-	0.2+	710120	095	0.8-	3.0-
311016	024	0.8+	2.5-	620930	033	0.1-	1.1+	770821	095	0.3-	1.5-
311019	024	5.5 +	2.2+	620930	033	1.3-	0.8-	770823	095	0.2-	0.6-
311104	024	2.9 +	1.1-	620930	033	0.2-	0.7+	770909	095	1.2+	0.8-
620926	033	1.3-	0.2+	621130	760	(43.6+	6.7-)X				

(2856)* 1933 GB = 1935 SV = 1941 WL = 1946 UC = 1959 CM = 1962 WK = 1970 GG = 1972 RR3 = 1975 EK = 1977 QX1

Discovered 1933 Apr. 14 by K. Reinmuth at Heidelberg.

Epoch 1983 Sept. 23.0 ET = JDE 2445600 .5

M 208.15596		(1950.0)	P	Q
n 0.18707509	Peri.	166.51680	-0.99719852	+0.05553890
a 3.02778/6	Node	16.90966	-0.07387319	-0.83638491
e 0.0059337	Incl.	9.91950	+0.01174189	-0.54532164
P 5.27	B(1,0)	12.5		

Residuals in seconds of arc

330414	024	3.5+	2.1+	461007	062	0.3-	1.4+	621124	760	0.9 +	0.4+
330420	024	0.5-	0.0	461019	062	0.2-	0.1-	700406	805	2.4-	0.5+
330425	024	0.4+	0.3-	461019	062	1.4-	1.5-	720906	095	2.7-	1.6+
350919	078(20.2+	41.2-)X		461022	062	0.5-	0.0	720909	095	2.7+	2.5+
411116	062	0.3+	1.2+	590212	024	2.6-	1.4+	750304	095	1.3+	0.2+
411116	062	1.3-	0.5+	590303	024	1.5-	0.1+	750314	095	2.6+	0.7-
461007	062	1.6+	0.5-	621124	760	1.1+	0.7+	770819	095	1.4-	1.3-

(2857)* 1942 DA = 1957 DG = 1976 KO1 = 1977 RN1 = 1980 LR = 1980 MC = 1983 DB

Discovered 1942 Feb. 17 by L. Oterma at Turku. The identifications 1942 DA = 1957 DG = 1976 KO1 = 1977 RN1 = 1980 LR = 1980 MC are by K. Hurukawa (JAM 1371). The identification 1942 DA = 1983 DB is by C. M. Bardwell.

Epoch 1983 Sept. 23.0 ET = JDE 2445600.5

M 83.37478		(1950.0)	P	Q
n 0.26499899	Peri.	331.55540	-0.51865639	-0.85348858
a 2.4005268	Node	149.60607	+0.80210349	-0.50618809
e 0.0940195	Incl.	5.73130	+0.29601609	-0.123 81784
P 3.72	B(1,0)	14.0		

Residuals in seconds of arc

420217	062	2.2-	1.4+	420306	062	0.1+	0.5-	800618	675	2.1-	0.3-
420217	062	0.2+	2.7+	420306	062	0.7-	0.8+	800619	675	2.2+	1.5-
420217	062	0.1-	1.8-	570228	388	1.4-	3.7+	800620	675	1.8+	2.4+
420219	062	1.7+	2.4+	570228	388	2.7+	1.6-	830216	046	0.4-	2.5-
420219	062	0.1+	0.9+	760530	095	1.8-	0.7-	830216	046	0.3+	3.4-
420221	062	0.1-	1.5-	770908	095	0.1+	1.5-	830219	046	0.7-	0.4-
420221	062	1.8+	0.4+	800610	675	0.5-	0.7+	830219	046	1.4-	1.4-

(2858)* 1975 XB = 1971 MJ = 1977 DW4

Discovered 1975 Dec. 1 by C. Torres and S. Barros at Cerro El Roble. The key identification 1975 XB = 1977 DW4 is by H. Oishi (JAM 735).

Epoch 1983 Sept. 23.0 ET = JDE 2445600.5

			(1950.0)	P	Q
M	188.77684				
n	0.28882428	Peri.	181.25243	+0.63486917	+0.76716639
a	2.2666280	Node	128.16653	-0.70781237	+0.62505935
e	0.1940941	Incl.	6.69309	-0.30974632	+0.14407129
P	3.41	B(1,0)	15.5		

Residuals in seconds of arc

710629	095	2.0-	3.7-	770218	381	2.6+	0.2+	770315	381	0.6-	0.9-
751201	805	1.3+	0.6-	770219	381	0.1-	0.2-	770315	381	2.1-	0.4-
751204	805	1.4+	1.6-	770219	381	2.4+	1.7-	821114	801	0.8+	0.8-
751205	805	0.1+	1.0-	770312	381	0.8-	0.8-	821218	801	0.2-	0.4-
770218	381	0.0	0.4-	770312	381	0.4-	1.6-				

(2859)* 1978 RW1 = 1973 AT1 = 1980 DU5

Discovered 1978 Sept. 5 by N. S. Chernykh at the Crimean Astrophysical Observatory. The key identification 1978 RW1 = 1980 DU5 was made at the Crimean Astrophysical Observatory.

Epoch 1983 Sept. 23.0 ET = JDE 2445600.5

			(1950.0)	P	Q
M	43.64619				
n	0.29427160	Peri.	340.55531	-0.82442498	-0.56574258
a	2.2385690	Node	164.95812	+0.52710776	-0.77785477
e	0.1176101	Incl.	3.55372	+0.20610885	-0.27363714
P	3.35	B(1,0)	14.0		

Residuals in seconds of arc

730101	095	1.1-	8.1-	780928	095	1.1+	0.3-	830108	801	0.1+	1.6+
780901	095	2.0+	0.6-	781009	095	0.9+	0.9-	830110	552	0.7+	1.7+
780905	095	1.1-	1.3+	800221	095	0.4-	0.3-	830110	552	1.3+	2.0+
780907	095	2.3-	3.7-	800316	095	0.0	0.9-	830120	801	0.9-	2.2+
780912	095	0.3+	2.1+	821114	801	1.0-	1.8+				

(2860)* 1978 TA

Discovered 1978 Oct. 8 by E. Helin at Palomar.

Epoch 1983 Sept. 23.0 ET = JDE 2445600.5

			(1950.0)	P	Q
M	126.67668				
n	0.27679627	Peri.	70.31064	+0.68164836	-0.71212388
a	2.3318247	Node	334.17772	+0.43820642	+0.58124235
e	0.2158109	Incl.	22.69139	+0.58594423	+0.39374726
P	3.56	B(1,0)	14.0		

Residuals in seconds of arc

780923	675	1.8-	1.1+	781010	675	0.7+	1.2-	810805	474	0.4+	0.2-
780924	675	1.2-	1.5+	781101	675	0.3-	1.1+	810830	474	0.6-	0.0
781008	675	0.2+	0.1+	781119	801	0.2-	0.2+	810830	474	0.5-	0.8-
781008	675	0.1+	1.1+	781127	801	1.7-	0.6+	830109	688	0.3+	2.1-
781009	675	1.9+	0.4-	781203	675	0.7-	0.6+	830109	688	0.6-	1.7-
781009	675	1.3-	0.6-	781204	675	0.9+	0.9+	830114	801	0.7-	0.8+
781010	675	0.4+	0.1-	790119	801	0.4-	0.5+	830120	801	0.3-	1.7+
781010	688	2.5+	4.9-	810805	474	0.9+	0.2+				

(2861)* 1981 VL2 = A921 GD = 1938 SQ = 1952 DA3 = 1958 XH = 1971 DW1 = 1977 RV5

Discovered 1981 Nov. 3 by F. Borngen and K. Kirsch at Tautenburg,

Epoch 1983 Sept. 23.0 ET = JDE 2445600.5

M	157.99923		(1950.0)	P	Q
n	0.25359047	Peri.	222.91470	+0.62468617	-0.78080705
a	2.4719941	Node	188.44446	+0.73417712	+0.59180001
e	0.0726340	Incl.	4.04957	+0.26599085	+0.20028257
P	3.89	B(1,0)	13.5		

Residuals in seconds of arc

210401	024(0.09+	0.06+)X	710220 095	0.3+	3.9-	811103 033	0.5-	0.2-
380921	062	0.1+	2.1-	770909 095	1.4+	0.2-	811117 330	0.2-	0.6+
380921	062	0.1-	0.8+	811023 330	1.1+	0.6+	830113 033	0.2+	1.2+
520226	711	0.7+	0.1+ Y	811028 330	0.5-	0.7+	830113 033	0.8-	1.8+
581206	024	0.5-	0.6+	811103 033	1.1-	0.3-			

1980 RK = 1958 TK1

The identification is by L. D. Schmadel.

Epoch 1983 Sept. 23.0 ET = JDE 2445600.5 (J-P)

M	296.45325		(1950.0)	P	Q
n	0.26718649	Peri.	356.41874	+0.93728503	+0.34718312
a	2.3874113	Node	343.16469	-0.31706684	+0.81227458
e	0.2629544	Incl.	6.14340	-0.14479433	+0.46869381
P	3.69	B(1,0)	15.5		

Residuals in seconds of arc

581007	690	0.5-	0.3+	800904 688	0.9-	0.1-	800911 688	1.6+	0.0
581008	690	3.3+	0.5+	800907 688	0.4+	1.3-	801002 688	1.9-	1.1+
581010	690	1.6-	0.2-	800909 095	1.5-	1.2-			
800902	688	1.2+	O.8-	800911 688	1.4-	0.1-			

1982 UM

Epoch 1983 Sept. 23.0 ET = JDE 2445600.5

M	62.99961		(1950.0)	P	Q
n	0.12587161	Peri.	307.75050	+0.98717762	+0.15029750
a	3.9432186	Node	43.67970	-0.11062595	+0.88699619
e	0.1768698	Incl.	4.46523	-0.11507496	+0.43663304
P	7.83	B(1,0)	12.0		

From 9 observations 1982 Oct. 17-1983 Jan. 20, mean residual 0".4.

6081 P-L = 1970 GE2 = 1977 EC5

The key identification 6081 P-L = 1977 EC5 is by K. Hurukawa.

Epoch 1983 Sept. 23.0 ET = JDE 2445600.5 (J-P)

M	246.67418		(1950.0)	P	Q
n	0.27369095	Peri.	9.03367	-0.54064765	+0.84084206
a	2.3494342	Node	228.24351	-0.77396796	-0.50935649
e	0.1667506	Incl.	2.01025	-0.32965697	-0.18314090
P	3.60	B(1,0)	15.0		

Residuals in seconds of arc

600924	675	0.7-	0.4-	601024 675	0.3-	0.5-	770312 381	0.8-	0.4+
600925	675	0.3+	0.4+	601026 675	0.6+	0.3+	770314 381	0.8-	0.1-
600926	675	0.1-	0.5-	700412 805	0.5-	0.2+	770314 381	0.1-	0.1-
600928	675	0.5-	0.3-	700412 805	0.2+	0.1-	770315 381	1.1-	0.5-
601017	675	0.3+	1.2+	700412 805	0.2+	0.1-	770410 381	3.1+	1.1-
601022	675	0.4+	0.2-	770312 381	0.0	0.8+	770410 381	0.1-	0.6+

6091 P-L = 1969 UG = 1976 JU6 = 1982 VO

The key identification 6091 P-L = 1982 VO is by O. Kippes.

Epoch 1983 Sept. 23.0 ET = JDE 2445600.5 (J-P)

M	88.77953	(1950.0)		P	Q
n	0.22945550	Peri.	81.67864	+0.77659356	-0.62971276
a	2.6424368	Node	317.34742	+0.56633104	+0.71105887
e	0.0279557	Incl.	1.61420	+0.27599201	+0.31282123
P	4.30	B(1,0)	14.5		

Residuals in seconds of arc

600924	675	0.0	0.2+	601026	675	0.6-	0.1-	821115	046	0.2+	2.7-
600925	675	1.0+	0.5+	691016	095	0.3+	0.5-	821116	046	3.3-	0.9-
600926	675	0.3+	1.2-	760503	809	0.4-	1.8-	821116	046	2.2-	1.1+
601017	675	0.4-	0.1+	821111	046	5.1+	2,3+	821120	046	2.9-	2.0+
601022	675	0.4-	0.6+	821111	046	5.2+	0.7-	821120	046	3.1-	0.2+
601024	675	0.1-	0.2-	821115	046	1.3+	2.8-				

6550 P-L = 1980 TH10 = 1983 CC1

The key identification 6550 P-L = 1983 CC1 is by E. Bowell.

Epoch 1983 Sept. 23.0 ET = JDE 2445600.5 (J-P)

M	151.05839	(1950.0)		P	Q
n	0.14783040	Peri.	4.74031	+0.97208894	-0.23279054
a	3.5423739	Node	8.88452	+0.20855194	+0.80042040
e	0.1069714	Incl.	10.89198	+0.10746714	+0.55239094
P	6.67	B(1,0)	12.5		

Residuals in seconds of arc

600924	675	0.5+	0.6-	601022	675	1.5-	0.1-	830215	688	0.5-	0.4+
600926	675	0.3+	0.2+	601024	675	0.5+	0.6-	830219	688	1.9+	1.6-
600927	675	0.6+	0.0	601026	675	0.3+	0.1-	830219	688	1.9-	0.2+
600928	675	0.9+	0.0	801015	095	1.3-	2.0+				
601017	675	0.1-	0.8-	830215	688	0.6+	0.5+				

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

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

(2862)* 1977 JP = 1931 DY = 1972 VF1 = 1978 SV2

Discovered 1977 May 15 by N. S. Chernykh at the Crimean Astrophysical Observatory.

Epoch 1983 Sept. 23.0 ET = JDE 2445600.5

M	51.85507	(1950.0)		P	Q
n	0.30183473	Peri.	277.53593	-0.79739004	-0.60190838
a	2.2010162	Node	225.46976	+0.57483838	-0.73576664
e	0.1143117	Incl.	3.48276	+0.18365716	-0.31040901
P	3.27	B(1,0)	14.0		

Residuals in seconds of arc

310223	690	2.8-	0.9+	780926	095	1.3-	0.3+	821222	801	0.6-	1.9+
310224	690	2.3+	0.8-	781002	095	0.5-	1.7-	830112	801	0.6-	3.7+
721109	095	2.8+	3.4-	781005	095	0.5+	0.1+	830112	552	0.2+	0.6-
770515	095	0.3+	0.3-	781008	095	0.2-	1.1+	830112	552	0.2-	1.1-
770518	095	1.0+	1.3-	821214	688	1.1-	0.1+	830121	688	0.7-	0.8-
770523	095	0.9-	0.7-	821214	688	1.1 +	0.8-	830121	688	0.5+	0.8-

(2863)* 1981 QG2 = 1975 NV = 1976 YG4

Discovered 1981 Aug. 30 by E. Bowell at the Anderson Mesa Station of the Lowell Observatory.

Epoch 1983 Sept. 23.0 ET = JDE 2445600.5

		(1950.0)	P	Q
M	131.54258			
n	0.17494615	Peri. 223.93908	+0.96245323	+0.26982296
a	3.1661619	Node 120.38534	-0.23858202	+0.89296602
e	0.1931094	Incl. 1.96996	-0.12946970	+0.36028772
P	5.63	B(1,0) 13.5		

Residuals in seconds of arc

750711	095	1.1-	3.4+	810830	688	0.5+	0.5+	811004	688	0.2-	3.5-
750713	095	0.0	2.1+	810830	688	0.9-	0.2+	811004	688	2.5+	0.8+
761218	095	0.9-	2.5+	810926	688	1.1-	1.5-	821118	801	0.1+	0.6+
761220	095	0.6-	2.8+	810926	688	1.1+	1.1-	830118	801	0.1+	0.7-

(2864)* 1983 AZ = 1965 CG = 1965 DE = 1970 JP = 1972 TO9 = 1974 CO

Discovered 1983 Jan. 12 by B. A. Skiff at the Anderson Mesa Station of the Lowell Observatory.

Epoch 1983 Sept. 23.0 ET = JDE 2445600.5

		(1950.0)	P	Q
M	33.43280			
n	0.21635817	Peri. 10.01279	-0.81841886	-0.57331668
a	2.7480239	Node 134.93241	+0.52332460	-0.77148730
e	0.1463519	Incl. 3.13458	+0.23732242	-0.2/589005
P	4.56	B(1,0) 14.0		

Residuals in seconds of arc

650202	330	0.1+	1.1+	721009	033	0.1-	0.5-	830121	688	0.6-	0.2-
650225	330	0.7+	0.6+	740214	095	0.8+	1.5+	830211	688	0.8+	0.5-
700508	095	1.1-	3.3-	740218	095	0.4-	2.5+	830211	688	1.1+	0.3-
721009	033	0.4+	0.2+	830112	688	0.0	0.9-	830215	688	1.1-	1.6-
721009	033	0.4+	1.0-	830112	688	0.3+	1.0-	830215	688	1.1-	1.3-
721009	033	0.1-	0.2-	830121	688	0.1-	0.5-				

1974 MJ = 1950 TA4 = 1977 EZ7

The key identification 1974 MJ = 1977 EZ7 is by K. Hurukawa (JAM 1235) The identification 1974 MJ = 1950 TA4 is by L. D. Schmadel.

Epoch 1983 Sept. 23.0 ET = JDE 2445600.5 (J-P)

		(1950.0)	P	Q
M	50.71538			
n	0.24121113	Peri. 350.00554	+0.96523105	+0.26115152
a	2.5558696	Node 354.81421	-0.23030691	+0.82907706
e	0.1992725	Incl. 7.21614	-0.12364364	+0.49439973
P	4.09	B(1,0) 15.0		

Residuals in seconds of arc

501012	711	3.2+	6.5- Y	740717	808	1.0-	0.0	740818	809	2.8+	7.1-
740617	808	0.5+	0.2+	740717	808	1.6-	0.0	770312	381	0.9-	1.0-
740617	808	0.1+	0.2-	740720	808	0.9+	0.6+	770312	381	1.2-	0.9-
740622	808	0.1-	0.6+	740808	808	1.5+	1.2+	770314	381	0.6-	1.3-
740622	808	0.4-	0.8+	740808	808	0.1+	2.3-	770314	381	0.2-	2.2-
740716	808	0.4-	0.1-	740816	808	1.1-	0.5+	770315	381	0.8-	1.7-
740716	808	0.3+	0.2+	740816	808	1.1-	0.3+	770315	381	2.2-	3.1-

1977 DX8 = 1962 TB = 1972 TG7 = 1982 UN2

Epoch 1983 Sept. 23.0 ET = JDE 2445600.5 (J-P)

		(1950.0)	P	Q
M	106.27395			
n	0.29729556	Peri. 291.22995	+0.89624835	-0.44216956
a	2.2233677	Node 95.02667	+0.41885147	+0.81773317
e	0.1617415	Incl. 2.01348	+0.14595318	+0.36850852
P	3.32	B(1,0) 14.5		

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

621001	760(0.14+	0.08+)X	770315	381	2.1-	6.4+	821111	046	1.3-	2.1-
721006	095	0.1-	2.7+	821020	046	0.8+	2.1+	821114	046	3.8-	2.8-
721013	095	0.4+	1.2+	821020	046	0.0	3.0+	821114	046	1.8-	3.3-
770219	381	0.0	0.2+	821021	046	3.2+	4.0+	821115	704	2.9-	0.9-
770219	381	0.7+	0.5-	821021	046	3.0+	4.0+	821116	046	0.4-	0.8-
770312	381	0.8-	0.9+	821022	046	1.9+	2.2+	821116	046	1.3-	1.0-
770312	381	0.3+	0.1-	821022	046	2.0+	2.5+	830118	801	1.4+	1.3+
770315	381	1.5+	0.2-	821111	046	0.1-	0.9+				

1978 TR3 = 1978 RL5 = 1976 GW = 1982 UU3

The key identification 1978 TR3 = 1976 GW was found independently by K. Hurukawa (JAM 1372) and L. D. Schmadel. The double designation 1978 TR3 = 1978 RL5 is by Schmadel (MPC 7589).

Epoch 1983 Sept. 23.0 ET = JDE 2445600.5 (J-P)

M	31.19129		(1950.0)	P	Q
n	0.24052611	Peri.	63.82692	+0.39575260	-0.91825994
a	2.5607200	Node	2.95866	+0.72267509	+0.30241456
e	0.1088394	Incl.	15.00453	+0.56667503	+0.25562497
P	4.10	B(1,0)	13.5		

Residuals in seconds of arc

760401	095	4.0+	0.2+	780906	095	0.2-	0.8-	781101	095	0.9-	1.1+
760402	095	6.2-	0.3+	781004	095	1.0-	0.4+	821019	033	0.7+	1.3-
760404	095	0.5+	1.1-	781008	095	1.5+	0.4+	821019	033	0.4+	1.2-

1980 RN1 = 1959 TL = 1975 TX3 = 1975 TO4 = 1975 TM6

The identifications and triple designation are by L. D. Schmadel.

Epoch 1983 Sept. 23.0 ET = JDE 2445600.5 (J-P)

M	191.71169		(1950.0)	P	Q
n	0.18626985	Peri.	179.11385	+0.99599024	-0.08622715
a	3.0365135	Node	185.99140	+0.08060627	+0.98054602
e	0.2716920	Incl.	13.20236	+0.03880803	+0.17633596
P	5.29	B(1,0)	14.0		

Residuals in seconds of arc

591006	024	0.3+	2.0-	751013	095	1.6-	4.2+	800917	688	1.2+	0.4-
751003	095	0.6+	2.0-	800907	688	0.9-	0.8+	801002	688	0.8-	1.0+
751011	033	1.0+	1.0-	800917	688	0.5 +	1.0-	801004	688	0.4-	0.8+

1980 SD = 1972 VJ = 1976 SM 5

The identifications are by L. D. Schmadel.

Epoch 1983 Sept. 23.0 ET = JDE 2445600.5 (J-P)

M	306.55298		(1950.0)	P	Q
n	0.23680879	Peri.	278.86739	+0.45960699	+0.88527559
a	2.5874484	Node	18.99586	-0.70458955	+0.41216297
e	0.1785986	Incl.	12.60856	-0.54066161	+0.21542704
P	4.16	B(1,0)	15.0		

Residuals in seconds of arc

721108	095	0.4-	1.2+	801001	046	1.7-	0.2-	801003	046	0.3+	1.5-
760924	095	1.5+	0.3-	801001	046	1.2+	1.0+	801003	046	0.7-	1.6-
800916	046	1.0-	1.6+	801002	046	0.3-	0.2+	801005	046	0.7-	0.7+
800916	046	0.8+	0.1+	801003	046	0.7+	0.2-	801005	046	0.9+	0.1-

1981 CY = 1978 GT4 = 1978 JT
The identification and double designation are by L. D. Schmadel.
Epoch 1983 Sept. 23.0 ET = JDE 2445600.5 (J-P)

M	302.98072	(1950.0)	P	Q
n	0.28801147	Peri. 37.98735	-0.38055945	-0.91773609
a	2.2708950	Node 74.63789	+0.81690366	-0.39126352
e	0.1063208	Incl. 6.77358	+0.43340848	-0.06836171
P	3.42	B(1,0) 14.5		

Residuals in seconds of arc

780412	095	0.1-	1.8+	810309	688	0.4+	0.1-	810330	688	0.1+	2.8-
780505	095	0.8+	0.3+	810309	688	0.5+	1.3-	810330	688	0.2-	2.7-
810206	688	0.3-	0.5+	810325	688	0.9+	1.5-				
810206	688	0.5+	1.2+	810325	688	0.5+	2.1-				

1981 QC1 = 1933 QE = 1955 SV = 1968 TN
The identifications are by L. D. Schmadel.
Epoch 1983 Sept. 23.0 ET = JDE 2445600.5 (J-P)

M	176.41326	(1950.0)	P	Q
n	0.22640378	Peri. 165.34870	+0.89709720	+0.43975952
a	2.6661289	Node 168.28150	-0.42358597	+0. 88353492
e	0.1960688	Incl. 12.15276	-0.12566438	+0.16117567
P	4.35	B(1,0) 14.0		

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

330820	012	1.0-	4.2-	810828	046	0.9+	0.0	810905	046	0.0	1.5-
330821	012	1.7-	0.9+	810830	704	0.6+	1.6-	810905	046	0.3+	0.9-
330823	012	0.9+	0.7-	810831	704	0.2+	0.7+	810926	688	0.3-	0.9-
330825	012	4.1+	4.1+	810901	704	0.5+	0.2+	810926	688	0.5-	0.8-
330826	012(0.03+	0.20+)		810902	704	0.5+	4.0+	811004	688	2.0-	1.5-
550918	760(0.03+	0.02-)X		810903	704	1.1+	0.7+	811004	688	1.4-	0.7-
681015	095	0.2-	0.7+	810904	046	0.1+	1.5+				
810828	046	0.4-	0.9-	810904	046	1.1-	0.8-				

1981 TM = 1936 OA = 1975 EN2
The key identification 1981 TM = 1975 EN2 is by L. D. Schmadel.
Epoch 1983 Sept. 23.0 ET = JDE 2445600.5 (J-P)

M	224.48798	(1950.0)	P	Q
n	0.24471430	Peri. 187.78089	+0.92337915	+0.35523919
a	2.5314189	Node 150.08699	-0.33460535	+0.93058213
e	0.1672806	Incl. 16.96621	-0.18817599	+0.08844216
P	4.03	B(1,0) 13.5		

Residuals in seconds of arc

360716	024	0.4-	2.0+	811005	688	1.1-	2.6+	811102	688	4.2+	1.4-
360723	024	1.6+	0.1+	811005	688	0.7-	2.3+	811124	688	0.2-	1.6+
750308	095	0.0	4.6+	811102	688	0.3+	1.8-	811124	688	0.3-	0.6+

1982 FQ2 = 1975 EL1
Epoch 1983 Sept. 23.0 ET = JDE 2445600.5 (J-P)

M	159.25173	(1950.0)	P	Q
n	0.28146780	Peri. 10.27055	-0.95612300	-0.28859259
a	2.3059564	Node 152.79141	+0.26034696	-0.91592119
e	0.1492778	Incl. 6.33221	+0.13434386	-0.27 893132
P	3.50	B(1,0) 16.0		

Residuals in seconds of arc

750306	095	0.8+	4.1-	820227	010	0.1+	1.0+	820326	033	0.0	0.2-
750315	095	1.5-	3.0+	820324	033	0.4-	0.4 +	820326	033	0.0	0.0
820222	010	0.2+	0.9+	820324	033	0.4-	0.5+				

1982 UB1 = 1933 UH = 1955 XM = 1971 UJ2 = 1973 AL1
Epoch 1983 Sept. 23.0 ET = JDE 2445600.5 (J-P)

M 97.55183		(1950.0)	P	Q
n 0.18121418	Peri.	246.34147	+0.95995482	+0.27443544
a 3.0927308	Node	97.69186	-0.23183701	+0.89103 820
e 0.1925246	Incl.	3.25795	-0.15728429	+0.36157447
P 5.44	B(1,0)	13.0		

Residuals in seconds of arc

331020 012	0.3+	0.1+	821021 688	0.8+	0.4-	821114 046	1.5-	0.5-
551212 760	1.5-	0.5+	821021 688	1.4+	0.3-	821114 046	2.5-	1.6-
551212 760	0.7+	0.9+	821021 046	0.7+	0.6-	821116 046	0.7+	0.5-
711021 095	1.5-	3.7+	821021 046	1.2+	0.2-	821116 046	0.9+	0.4+
730101 095	0.4-	1.8-	821022 046	0.4+	0.9-	830115 801	0.8+	0.8+
730102 095(25.6+	87.9-)		821022 046	0.6-	1.9-	830120 801	0.1-	6.1+
821020 046	0.3-	1.4-	821111 046	1.0-	0.2-			
821020 046	1.8+	0.4-	821111 046	0.7-	0.7-			

1983 AM = 1934 SA = 1978 EW
Epoch 1983 Sept. 23.0 ET = JDE 2445600.5 (J-P)

M 118.31403		(1950.0)	P	Q
n 0.18898678	Peri.	87.58498	+0.85576742	-0.49975467
a 3.0073407	Node	302.36906	+0.38889951	+0.79197369
e 0.1178798	Incl.	9.11618	+0.34120272	+0.3507 4626
P 5.22	B(1,0)	13.0		

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

340916 094(0.03+	0.03+)X	830109 688	0.3-	1.4-	830116 688	0.1-	1.7-	
341003 094(0.03+	0.01+)X	830109 688	2.0+	0.3-	830116 688	0.5+	0.9-	
780305 095	0.5-	0.8+	830112 046	1.3-	1.5+	830215 688	1.2+	0.1+
780306 095	0.8+	1.4-	830112 046	1.2-	0.7+	830215 688	0.4-	0.6-

1983 AO = 1949 PA = 1952 DR1 = 1962 CP = 1976 UW3 = 1978 EU3 = 1979 HR5
Epoch 1983 Sept. 23.0 ET = JDE 2445600.5 (J-P)

M 143.86255		(1950.0)	P	Q
n 0.18851540	Peri.	265.44364	+0.97363533	-0.123 84942
a 3.0123518	Node	101.58394	+0.18625781	+0.91644273
e 0.1130610	Incl.	11.27649	-0.13169004	+0.3 8051812
P 5.23	B(1,0)	12.0		

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

490815 078(75.9+	12.3+)X	830109 688	1.2+	0.2+	830211 688	1.7+	1.3+	
520220 711	1.2-	6.6- Y	830109 688	1.7+	0.9-	830211 688	0.7+	0.2-
620205 760(0.02-	0.06+)X	830116 688	0.7-	0.0	830211 688	1.5+	2.5+	
761027 095	0.1+	0.6-	830116 688	0.0	0.3+	830211 688	0.3-	0.6-
78U306 095	2.5-	0.5+	830121 688	2.2-	1.4+			
790428 095	1.4+	2.3+	830121 688	1.8-	2.2+			

1983 CF = 1938 UM = 1948 TN = 1951 NC = 1973 DC = 1974 HR2
Epoch 1983 Sept. 23.0 ET = JDE 2445600.5 (J-P)

M 200.41707		(1950.0)	P	Q
n 0.29645602	Peri.	270.33783	+0.98135989	+0.16769108
a 2.2275634	Node	80.01010	-0.11517173	+0.90422190
e 0.2005295	Incl.	5.46973	-0.15384485	+0.39276258
P 3.32	B(1,0)	13.5		

Residuals in seconds of arc

381022 031(27.5-	26.9+)X	730227 029	0.3+	0.0	830211 688	1.5+	0.2+	
481009 062	0.4-	0.3-	730309 029	1.2-	0.7+	830215 688	0.4-	0.8+
481009 062	0.7+	0.4-	740424 805	0.1+	0.7-	830215 688	1.1-	0.1+
510702 078(14.3-	18.4+)Y	740425 805	0.3-	0.3-	830219 688	0.3-	0.1+	
730227 029	0.9+	0.8+	830211 688	1.3+	0.5-	830219 688	1.5-	2.2-

1983 CW1 = 1959 VC = 1961 DC = 1963 SU = 1972 TG6 = 1974 CE
Epoch 1983 Sept. 23.0 ET = JDE 2445600.5 (J-P)

M	52.81780	(1950.0)	P	Q
n	0.22232413	Peri. 177.11694	-0.69203406	-0.71036869
a	2.6986455	Node 316.62614	+0.65847013	-0.54836249
e	0.0247149	Incl. 10.76870	+0.29581403	-0.44121977
P	4.43	B(1,0) 13.0		

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

591103	760(56.7+	17.3-)X	740214	095	2.3+	1.8+	830215	046	1.6-	1.1-
610219	024	2.5+	3.9+		740218	095	0.1-	3.9+	830215	046	0.7-	1.9-
630923	760(0.04-	0.00+)X	830204	046	1.4+	2.8-	830218	046	3.7-	1.6-	
721006	095	0.1-	0.1+		830204	046	2.7+	3.3-	830218	046	2.7-	0.1+

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NEW NAMES OF MINOR PLANETS.

(2155) Wodan = 6542 P-L

Discovered 1960 Sept. 24 by C. J. van Houten and I. van Houten-Groeneveld at Leiden on Palomar Schmidt plates taken by T. Gehrels.

Named for the chief god of Teutonic mythology, also honored in some languages by the fourth day of the week.

(2176) Donar = 2529 P-L

Discovered 1960 Sept. 24 by C. J. van Houten and I. van Houten-Groeneveld at Leiden on Palomar Schmidt plates taken by T. Gehrels.

Named for the god of thunderstorms in Teutonic mythology, also honored in some languages by the fifth day o f t h e week.

(2195) Tengstrom = 1941 SP1

Discovered 1941 Sept. 27 by L. Oterma at Turku.

Named in honor of Erik Tengstrom, emeritus professor at the University of Uppsala, on the occasion of his 70th birthday, 1983 Apr. 3. Initiator of the study of modern geodesy at Uppsala, he directed research in a wide number of subjects, including astronomy. One of his ancestors, Jacob Tengstrom, lived in Turku, was vice chancellor of the old Academia Aboensis (1803-1817) and the first archbishop of Finland (1817-1832).

(2201) Oljato = 1947 XC

Discovered 1947 Dec. 12 by H. L. Giclas at the Lowell Observatory.

Named for the place of Moonlight Water near Monument Valley, Utah, on the Navajo Indian Reservation. During the day the hot sun evaporates the small amount of spring water that seeps up through the sand. During the night, with less evaporation, the sand becomes moist enough to reflect the light of the moon. This Apollo object was rediscovered as 1979 XA on 1979 Dec. 13 by E. Helin at Palomar.

(2266) Tchaikovsky = 1974 VK

Discovered 1974 Nov. 12 by L. I. Chernykh at the Crimean Astrophysical Observatory.

Named in memory of the celebrated Russian composer Petr Il’ich Chajkovskij (1840-1893).

(2269) Efremiana = 1976 JA2

Discovered 1976 May 2 by N. S. Chernykh at the Crimean Astrophysical Observatory.

Named in memory of Ivan Antonovich Efremov (1907-1972), renowned paleontologist and the author of historical, science-fiction and adventure novels.

(2273) Yarilo = 1975 EV1
Discovered 1975 Mar. 6 by L. I. Chernykh at the Crimean Astrophysical Observatory.
Named for the ancient Slavic god of the sun, spring, fertility and love.

(2279) Barto = 1968 DL
Discovered 1968 Feb. 25 by L. I. Chernykh at the Crimean Astrophysical Observatory.
Named in memory of Agniya Lvovna Barto (1906-1982), a famous Soviet poetess, who dedicated all her works to children.

(2323) Zverev = 1976 SF2
Discovered 1976 Sept. 24 by N. S. Chernykh at the Crimean Astrophysical Observatory.
Named in honor of Mitrofan Stepanovich Zverev, specialist in fundamental astrometry, initiator of the international program to compile the Catalogue of Faint Stars (KSZ). This Pulkovo astrometrist organized expeditions in the 1960s for the observation of stars in the southern hemisphere. He is also popular as a fine pianist.

(2361) Gogol = 1976 GQ1
Discovered 1976 Apr. 1 by N. S. Chernykh at the Crimean Astrophysical Observatory.
Named for the celebrated writer Nikolaj Vasil'evich Gogol' (1809-1852).

(2369) Chekhov = 1976 GC8
Discovered 1976 Apr. 4by N. S. Chernykh at the Crimean Astrophysical Observatory.
Named for the celebrated writer Anton Pavlovich Chekhov (1860-1904).

(2372) Proskurin = 1977 RA8
Discovered 1977 Sept. 13 by N. S. Chernykh at the Crimean Astrophysical Observatory.
Named in memory of Vitalij Fedorovich Proskurin (1919-1964), celestial mechanician at the Institute for Theoretical Astronomy, known for his work on the motions of Ceres, Jupiter VI and VIII and artificial satellites.

(2376) Martynov = 1977 QG3
Discovered 1977 Aug. 22 by N. S. Chernykh at the Crimean Astrophysical Observatory.
Named in honor of Dmitrij Yakovlevich Martynov, outstanding astrophysicist, for many years the director of the Sternberg Astronomical Institute in Moscow, author of widely used texts on astrophysics.

(2377) Shcheglov = 1978 QT1
Discovered 1978 Aug. 31 by N. S. Chernykh at the Crimean Astrophysical Observatory.
Named in honor of Vladimir Petrovich Shcheglov, since 1941 the director of the Astronomical Institute of the Uzbek SSR in Tashkent, investigator in astrometry and the history of astronomy, renowned popularizer of astronomy.

(2388) Gase = 1977 EA2
Discovered 1977 Mar. 13 by N. S. Chernykh at the Crimean Astrophysical Observatory.
Named in memory of Vera Fedorovna Gaze (1899-1954), who worked at the Pulkovo and Simeis observatories on stellar spectroscopy and the study of diffuse nebulae. As a young assistant at the Astronomical Institute (predecessor of ITA) in Leningrad she determined the orbits of minor planets.

(2394) Nadeev = 1973 SZ2
Discovered 1973 Sept. 22 by N. S. Chernykh at the Crimean Astrophysical Observatory.
Named in memory of Lev Nikolaevich Nadeev (1902-1974), an astrometrist and geodesist who made extensive geodetic surveys in the northern USSR. He founded the Laboratory of Time and Frequency in Irkutsk, where the discoverer began his own career under Nadeev's guidance.

(2408) Astapovich = 1978 QK1
Discovered 1978 Aug. 31 by N. S. Chernykh at the Crimean Astrophysical Observatory.
Named in memory of Igor' Stanislavovich Astapovich (1908-1976), a professor at Kiev University known for his research in meteor astronomy.

(2416) Sharonov = 1979 OF13
Discovered 1979 July 31 by N. S. Chernykh at the Crimean Astrophysical Observatory.
Named in memory of Vsevolod Vasil'evich Sharonov (1901-1964), professor at Leningrad University and director of the Leningrad University Observatory, who contributed greatly to physical studies of the moon and planets.

(2424) Tautenburg = 1973 UTS
Discovered 1973 Oct. 27 by F. Borngen and K. Kirsch at Tautenburg.
Named for the village near which the Karl Schwarzschild Observatory is located, some 15 km to the northeast of the city of Jena.

(2439) Ulugbeii = 1977 QX2
Discovered 1977 Aug. 21 by N. S. Chernykh at the Crimean Astrophysical Observatory.
Named for the celebrated Uzbek astronomer and mathematician Ulugbek (Ulugh Beg) Mukhammed Taragaj (1394-1449).

(2446) Lunacharsky = 1971 TS2
Discovered 1971 Oct. 14 by L. I. Chernykh at the Crimean Astrophysical Observatory.
Named in memory of Anatolij Vasil'evich Lunacharskij (1875-1933), Soviet statesman, writer and literary and art critic.

(2450) Ioannisiani = 1978 RP
Discovered 1978 September 1 by N. S. Chernykh at the Crimean Astrophysical Observatory.
Named in honor of Bagrat Konstantinovich Ioannisiani, designer of astronomical instruments, including the largest Soviet telescopes.

(2497) Kulikovskij = 1977 PZ1
Discovered 1977 Aug. 14 by N. S. Chernykh at the Crimean Astrophysical Observatory.
Named in honor of Petr Grigor'evich Kulikovskij, stellar astronomer and distinguished authority on the history of astronomy. An assistant professor at Moscow University, Kulikovskij is widely known as the author of a reference book for amateur astronomers and also as a musician and composer.

(2498) Tsesevich = 1977 QM3
Discovered 1977 Aug. 23 by N. S. Chernykh at the Crimean Astrophysical Observatory.
Named in honor of Vladimir Platonovich Tsesevich, director of the Odessa University Observatory, renowned for his research on variable stars. He has also studied the brightness variations of Eros and is the author of a handbook for amateur astronomers.

(2553) Viljev = 1979 FS2
Discovered 1979 Mar. 29 by N. S. Chernykh at the Crimean Astrophysical Observatory.
Named in memory of Mikhail Anatol'evich Vil'ev (1893-1919), who, because of his exceptional abilities and tireless efforts, and in spite of his short life, made a prodigious number of investigations in the areas of celestial mechanics, theoretical astronomy and the history of astronomy.

(2561) Margolin = 1969 TK2
Discovered 1969 Oct. 8 by L. I. Chernykh at the Crimean Astrophysical Observatory.
Named in memory of Mikhail Vladimirovich Margolin (1906-1975), blind designer and inventor, a man of heroic fate.

(2563) Boyarchuk = 1977 FZ
Discovered 1977 Mar. 22 by N. S. Chernykh at the Crimean Astrophysical Observatory.
Named in honor of Aleksandr Alekseevich Boyarchuk, deputy director of the Crimean Astrophysical Observatory, well known for his research on stellar physics, president of IAU Commission 29 (Stellar Spectra) during 1973-76.

(2609) Kiril-Metodi = 1978 PB4
Discovered 1978 Aug. 9 by L. I. Chernykh and N. S. Chernykh at the Crimean Astrophysical Observatory.
Named for the brothers Kiril (827-869) and Metodi (815-885), also known as Cyril and Methodius, 'the apostles of the Slavs', great Slavic enlighteners, generally credited with the creation of the Slavic alphabet.

(2669) Shostakovich = 1976 YQ2
Discovered 1976 Dec. 16 by L. I. Chernykh at the Crimean Astrophysical Observatory.
Named in memory of Dmitrij Dmitrievich Shostakovich (1906-1975), outstanding twentieth-century Soviet composer.

(2692) Chkalov = 1976 YT3
Discovered 1976 Dec. 16 by L. I. Chernykh at the Crimean Astrophysical Observatory.
Named in memory of Valerij Pavlovich Chkalov (1904-1938), who participated in the historic flight from Moscow over the North Pole to the U.S.A. in 1937.

(2721) Vsekhsvyatskij = 1973 SP2
Discovered 1973 Sept. 22 by N. S. Chernykh at the Crimean Astrophysical Observatory.
Named in honor of Sergej Konstantinovich Vsekhsvyatskij, professor at Kiev University, a prominent researcher on comets, the sun and solar activity. This planet and the three following ones are named on the occasion of the fiftieth anniversary of the All-Union Astronomical Geodetical Organization. The initial letters of the four names spell out the Russian abbreviation for this body.

(2722) Abarakin = 1976 GM2
Discovered 1976 Apr. 1 by N. S. Chernykh at the Crimean Astrophysical Observatory.
Named in honor of Viktor Kuz'mich Abalakin, leader of the ephemeris group at the Institute for Theoretical Astronomy, editor of the 'Astronomicheskij Ezhegodnik', president of IAU Commission 4 (Ephemerides) during 1976-79, outstanding linguist and friend of astronomers around the world.

(2723) Gorshkov = 1978 QL2

Discovered 1978 Aug. 31 by N. S. Chernykh at the Crimean Astrophysical Observatory.

Named in memory of Petr Mikhailovich Gorshkov (1883-1975), professor at Leningrad University, prominent geodesist and astronomer, researcher in geodesy, gravimetry, celestial mechanics and the history of astronomy.

(2724) Onov = 1978 RZ5

Discovered 1978 Sept. 13 by N. S. Chernykh at the Crimean Astrophysical Observatory.

Named in memory of Sergej Vladimirovich Orlov (1880-1958), professor at Moscow University who contributed much to research on comets. This planet also honors Aleksandr Yakovlevich Orlov (1880-1954), founder and first director or the Golosseevo Astronomical Observatory, known for his research on the earth's polar motion and on tidal variations in gravity.

(2746) Hissao = 1979 SJ9

Discovered 1979 Sept. 22 by N. S. Chernykh at the Crimean Astrophysical Observatory.

Named for the Hissar (Gissar) Astronomical Observatory, part of the Institute of Astrophysics of the Tadjik SSR Academy of Sciences in Dushanbe, famous for its research activities on meteors, comets and minor planets.

(2755) Avicenna = 1973 SJ4

Discovered 1973 Sept. 26 by L. I. Chernykh at the Crimean Astrophysical Observatory.

Named for the medieval scientist, philosopher, physician and poet Ibn Sina, or Abu Ali al Hussein ibn Abdallah (980-1037), known in Europe under the name Avicenna.

(2780) Monnig = 1981 D02

Discovered 1981 Feb. 28 by S. J. Bus at Siding Spring in the course of the U.K.-Caltech Asteroid Survey.

Named in honor of Oscar Monnig, of Fort Worth, Texas, who has devoted a lifetime to the study and popularization of meteoritics. He has made outstanding contributions as the result of countless field investigations of meteorite falls. His tireless efforts have led to the accumulation of one of the world's largest private collections of meteorites. Name proposed by E. Helin.

(2835) Ryoma = 1982 WF

Discovered 1982 Nov. 20 by T. Seki at Geisei.

Named in memory of the Japanese revolutionary, Ryoma Sakamoto (1835-1867), born in the discoverer's hometown of Kochi, assassinated for his efforts, eventually successful, to democratize his country.

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EPHEMERIDES.

Periodic Comet Bowell-Skiff (1983c) Elements MPC 7773

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	Mag.
1983	03 27	09 23.10	+15 59.1	1.127	1.948	132.8	22.1	16.7
1983	04 06	09 30.09	+14 51.8					
1983	04 16	09 39.73	+13 34.4	1.292	1.971	117.7	26.8	17.0
1983	04 26	09 51.59	+12 07.8					
1983	05 06	10 05.15	+10 33.2	1.500	2.014	105.1	28.9	17.4
1983	05 16	10 20.01	+08 51.6					
1983	05 26	10 35.82	+07 04.1	1.740	2.076	94.2	29.1	17.9

1983 06 05	10 52.26	+05 12.1					
1983 06 15	11 09.15	+03 16.7	2.005	2.154	84.1	28.0	18.3
1983 06 25	11 26.33	+01 19.0					
1983 07 05	11 43.65	-00 39.5	2.290	2.245	74.6	25.9	18.8
1983 07 15	12 01.07	-02 38.0					
1983 07 25	12 18.53	-04 35.5	2.587	2.347	65.0	23.1	19.3
1983 08 04	12 35.99	-06 31.0					
1983 08 14	12 53.44	-08 23.8	2.887	2.457	55.4	19.8	19.7
1983 08 24	13 10.86	-10 13.1					
1983 09 03	13 28.25	-11 58.3	3.180	2.574	45.4	16.2	20.1

(1620) Geographos Elements MPC 7774

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	Mag.
1983 03 27	05 20.13	-47 26.2	0.111	0.988	81.6	92.0	14.0	
1983 04 01	04 13.27	-47 52.2						
1983 04 06	03 24.53	-46 28.2	0.153	0.938	61.9	109.8	15.0	
1983 04 11	02 49.47	-44 17.9						
1983 04 16	02 23.86	-41 46.3	0.203	0.895	52.8	116.8	15.7	
1983 04 21	02 04.87	-39 01.9						
1983 04 26	01 50.83	-36 07.2	0.259	0.861	49.4	117.4	16.1	
1983 05 01	01 40.76	-33 03.8						
1983 05 06	01 33.98	-29 53.6	0.318	0.837	49.4	113.8	16.4	
1983 05 16	01 28.29	-23 21.0						
1983 05 26	01 30.50	-16 44.7	0.442	0.832	53.7	100.9	16.8	
1983 06 05	01 38.34	-10 16.5						
1983 06 15	01 49.93	-04 05.7	0.554	0.881	60.0	87.0	17.1	
1983 06 25	02 03.79	+01 43.0						
1983 07 05	02 18.89	+07 08.6	0.633	0.968	67.3	75.6	17.4	
1983 07 15	02 34.34	+12 11.7						
1983 07 25	02 49.37	+16 54.7	0.670	1.074	76.1	66.6	17.5	
1983 08 04	03 03.34	+21 21.2						
1983 08 14	03 15.40	+25 34.7	0.667	1.183	87.0	58.8	17.5	
1983 08 24	03 24.57	+29 38.7						
1983 09 03	03 29.62	+33 35.7	0.633	1.287	100.7	50.4	17.4	
1983 09 13	03 28.86	+37 24.1						
1983 09 23	03 20.39	+40 55.4	0.588	1.381	118.0	39.9	17.2	
1983 10 03	03 02.64	+43 50.1						
1983 10 13	02 35.74	+45 35.9	0.563	1.463	137.3	27.5	16.9	
1983 10 23	02 03.67	+45 43.5						
1983 11 02	01 33.22	+44 10.4	0.595	1.531	148.2	20.0	17.0	
1983 11 12	01 10.17	+41 28.4						
1983 11 22	00 56.56	+38 24.2	0.700	1.585	139.2	24.1	17.5	
1983 12 02	00 51.48	+35 33.0						
1983 12 12	00 53.21	+33 12.4	0.864	1.625	122.9	30.6	18.1	
1983 12 22	01 00.07	+31 27.5						
1984 01 01	01 10.73	+30 15.9	1.061	1.650	107.6	34.6	18.7	
1984 01 11	01 24.31	+29 32.6						
1984 01 21	01 40.18	+29 12.2	1.270	1.662	94.1	36.2	19.2	
1984 01 31	01 57.87	+29 08.9						
1984 02 10	02 17.12	+29 17.9	1.474	1.658	82.1	36.1	19.5	

1981 TM Elements MPC 7780

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	Mag.
1983 03 27	09 54.83	+16 11.1	2.121	2.955	139.9	12.6	17.8	
1983 04 06	09 51.63	+17 01.6						
1983 04 16	09 50.79	+17 34.9	2.336	2.954	118.8	17.3	18.1	
1983 04 26	09 52.27	+17 51.9						

1983 05 06	09 55.88	+17 54.2	2.595	2.950	100.4	19.7	18.4
1983 05 16	10 01.38	+17 43.7					
1983 05 26	10 08.53	+17 21.7	2.868	2.944	84.2	20.0	18.6
1983 06 05	10 17.05	+16 49.8					
1983 06 15	10 26.74	+16 09.1	3.129	2.936	69.7	18.9	18.8

(2857) 1942 DA — Elements MPC 7774

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	Mag.
1983 03 27	10 03.51	+14 22.8	1.349	2.225	142.5	15.8	16.8
1983 04 06	10 01.84	+14 52.7					
1983 04 16	10 03.21	+15 01.8	1.535	2.240	122.5	22.2	17.2
1983 04 26	10 07.41	+14 51.7					
1983 05 06	10 14.07	+14 24.8	1.763	2.257	105.8	25.5	17.6
1983 05 16	10 22.81	+13 43.3					
1983 05 26	10 33.25	+12 49.0	2.011	2.274	91.4	26.4	17.9
1983 06 05	10 45.05	+11 43.7					
1983 06 15	10 57.95	+10 29.1	2.263	2.293	78.8	25.8	18.2

(2861) 1981 VL2 — Elements MPC 7776

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	Mag.
1983 03 27	10 52.23	+05 07.7	1.602	2.551	157.0	8.8	16.8
1983 04 06	10 46.54	+06 03.2					
1983 04 16	10 43.26	+06 43.3	1.757	2.564	134.7	16.1	17.1
1983 04 26	10 42.59	+07 06.3					
1983 05 06	10 44.44	+07 12.4	1.978	2.577	115.4	20.7	17.5
1983 05 16	10 48.58	+07 02.9					
1983 05 26	10 54.75	+06 39.2	2.235	2.589	98.7	22.8	17.8
1983 06 05	11 02.60	+06 03.0					
1983 06 15	11 11.90	+05 15.9	2.502	2.600	84.0	22.9	18.1
1983 06 25	11 22.39	+04 19.4					
1983 07 05	11 33.86	+03 14.9	2.763	2.610	70.7	21.6	18.3

(2853) 1963 RG — Elements MPC 7772

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	Mag.
1983 03 27	11 02.03	+02 28.2	1.560	2.521	160.1	7.7	17.3
1983 04 06	10 55.55	+03 31.6					
1983 04 16	10 51.48	+04 20.5	1.714	2.546	137.5	15.4	17.8
1983 04 26	10 50.07	+04 52.4					
1983 05 06	10 51.24	+05 07.0	1.940	2.569	117.7	20.3	18.2
1983 05 16	10 54.76	+05 05.4					
1983 05 26	11 00.36	+04 48.8	2.204	2.591	100.7	22.6	18.5
1983 06 05	11 07.70	+04 19.2					
1983 06 15	11 16.51	+03 38.1	2.482	2.610	85.7	22.8	18.8
1983 06 25	11 26.55	+02 47.2					
1983 07 05	11 37.60	+01 48.0	2.754	2.627	72.2	21.6	19.0

1980 RN1 — Elements MPC 7779

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	Mag.
1983 03 27	11 08.96	+00 53.5	2.863	3.825	162.1	4.6	19.3
1983 04 06	11 03.37	+01 55.7					
1983 04 16	10 59.08	+02 50.3	3.015	3.836	139.8	9.7	19.5
1983 04 26	10 56.36	+03 34.9					
1983 05 06	10 55.31	+04 08.1	3.254	3.845	119.0	13.3	19.8
1983 05 16	10 55.91	+04 29.6					
1983 05 26	10 58.08	+04 39.7	3.542	3.853	100.2	15.0	20.0
1983 06 05	11 01.68	+04 39.1					
1983 06 15	11 06.54	+04 28.9	3.846	3.858	83.1	15.2	20.2
1983 06 25	11 12.51	+04 09.9					
1983 07 05	11 19.44	+03 43.2	4.138	3.861	67.3	14.1	20.3

1980 SD Elements MPC 7779

Date ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	Mag.
1983 03 27	12 13.23	+04 45.4	1.721	2.714	173.0	2.6	18.3
1983 04 06	12 03.14	+05 01.9					
1983 04 16	11 54.06	+05 07.3	1.754	2.679	151.3	10.4	18.6
1983 04 26	11 46.87	+04 58.9					
1983 05 06	11 42.09	+04 36.1	1.882	2.642	129.6	17.1	18.9
1983 05 16	11 39.92	+03 59.4					
1983 05 26	11 40.35	+03 09.8	2.071	2.604	110.5	21.4	19.2
1983 06 05	11 43.18	+02 08.7					
1983 06 15	11 48.17	+00 57.7	2.287	2.566	94.0	23.3	19.4
1983 06 25	11 55.05	-00 22.2					
1983 07 05	12 03.56	-01 49.6	2.505	2.527	79.6	23.3	19.5

(2855) 1931 TB2 Elements MPC 7774

Date ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	Mag.
1983 03 27	12 16.98	-08 34.0	1.536	2.530	173.5	2.6	16.9
1983 04 06	12 07.07	-07 57.7					
1983 04 16	11 58.46	-07 20.4	1.612	2.564	156.6	8.9	17.3
1983 04 26	11 52.03	-06 48.3					
1983 05 06	11 48.18	-06 26.1	1.784	2.597	135.0	16.0	17.7
1983 05 16	11 47.00	-06 16.0					
1983 05 26	11 48.37	-06 19.3	2.023	2.629	115.9	20.3	18.1
1983 06 05	11 52.02	-06 35.6					
1983 06 15	11 57.66	-07 03.8	2.298	2.659	99.3	22.1	18.4
1983 06 25	12 04.99	-07 42.9					
1983 07 05	12 13.75	-08 31.3	2.585	2.687	84.6	22.1	18.7

(2846) 1942 CJ Elements MPC 7767

Date ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	Mag.
1983 03 27	12 24.19	+08 49.8	2.109	3.094	169.0	3.5	15.9
1983 04 06	12 17.49	+09 54.3					
1983 04 16	12 11.43	+10 44.5	2.168	3.086	151.3	9.0	16.1
1983 04 26	12 06.66	+11 17.1					
1983 05 06	12 03.62	+11 31.3	2.323	3.079	130.8	14.4	16.4
1983 05 16	12 02.50	+11 27.8					
1983 05 26	12 03.38	+11 08.2	2.543	3.072	112.1	17. 8	16.7
1983 06 05	12 06.15	+10 34.7					
1983 06 15	12 10.66	+09 49.3	2.796	3.066	95.5	19.3	16.9
1983 06 25	12 16.73	+08 54.2					
1983 07 05	12 24.15	+07 51.1	3.058	3.060	80.6	19.1	17.1
1983 07 15	12 32.77	+06 41.5					
1983 07 25	12 42.41	+05 26.9	3.308	3.055	66.9	17.8	17.2

1980 RK Elements MPC 7776

Date ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	Mag.
1983 03 27	13 56.30	-18 18.3	1.822	2.740	151.3	10.1	19.2
1983 04 06	13 47.75	-18 01.6					
1983 04 16	13 37.72	-17 30.6	1.698	2.696	172.1	2.9	18.8
1983 04 26	13 27.26	-16 48.6					
1983 05 06	13 17.51	-16 01.0	1.686	2.649	158.3	8.1	18.9
1983 05 16	13 09.46	-15 14.4					
1983 05 26	13 03.81	-14 34.9	1.774	2.600	136.1	15.7	19.2
1983 06 05	13 00.89	-14 07.0					
1983 06 15	13 00.76	-13 53.0	1.931	2.548	116.2	20.9	19.4
1983 06 25	13 03.29	-13 53.9					
1983 07 05	13 08.25	-14 08.8	2.122	2.494	99.1	23.7	19.7
1983 07 15	13 15.39	-14 36.8					
1983 07 25	13 24.47	-15 16.2	2.321	2.438	84.2	24.5	19.8

1942 RN Elements MPC 7767

Date ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	Mag.
1983 03 27	17 54.25	-12 27.5	2.622	2.910	96.6	19.9	16.5
1983 04 06	17 59.42	-11 48.6					
1983 04 16	18 02.40	-11 07.4	2.373	2.925	113.8	18.3	16.2
1983 04 26	18 03.04	-10 25.9					
1983 05 06	18 01.25	-09 46.2	2.161	2.939	132.6	14.6	16.0
1983 05 16	17 57.07	-09 10.4					
1983 05 26	17 50.77	-08 41.2	2.017	2.950	152.2	9.2	15.7
1983 06 05	17 42.85	-08 20.8					
1983 06 15	17 34.02	-08 11.1	1.968	2.960	164.9	5.1	15.5
1983 06 25	17 25.15	-08 13.1					
1983 07 05	17 17.11	-08 26.7	2.026	2.968	153.0	8.9	15.7
1983 07 15	17 10.58	-08 50.8					
1983 07 25	17 06.10	-09 23.8	2.180	2.974	133.7	14.3	16.0
1983 08 04	17 03.89	-10 03.3					
1983 08 14	17 04.01	-10 47.4	2.403	2.978	115.1	17.9	16.3
1983 08 24	17 06.40	-11 33.8					
1983 09 03	17 10.87	-12 20.7	2.665	2.981	98.2	19.6	16.6

1982 FQ2 Elements MPC 7780

Date ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	Mag.
1983 05 26	21 41.62	-09 42.5	2.166	2.536	99.3	23.2	20.2
1983 06 05	21 46.96	-09 16.8					
1983 06 15	21 50.04	-09 04.1	1.941	2.557	116.2	20.9	20.0
1983 06 25	21 50.65	-09 06.3					
1983 07 05	21 48.66	-09 25.0	1.750	2.577	135.7	16.0	19.6
1983 07 15	21 44.07	-10 00.5					
1983 07 25	21 37.18	-10 51.3	1.626	2.595	157.8	8.5	19.3
1983 08 04	21 28.58	-11 53.7					
1983 08 14	21 19.15	-13 02.0	1.598	2.610	176.8	1.3	18.9
1983 08 24	21 09.98	-14 09.6					
1983 09 03	21 02.11	-15 10.8	1.678	2.623	154.0	9.7	19.4
1983 09 13	20 56.34	-16 01.4					
1983 09 23	20 53.17	-16 39.1	1.853	2.633	132.1	16.4	19.8
1983 10 03	20 52.73	-17 03.4					
1983 10 13	20 54.95	-17 14.5	2.090	2.641	112.7	20.4	20.2
1983 10 23	20 59.61	-17 13.0					
1983 11 02	21 06.39	-17 00.0	2.360	2.647	95.5	21.9	20.5

1981 EX16 Elements MPC 7771

Date ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	Mag.
1983 07 05	23 49.75	-10 02.5	2.056	2.561	108.1	22.2	17.6
1983 07 15	23 53.22	-09 13.4					
1983 07 25	23 54.26	-08 32.8	1.802	2.531	125.5	19.1	17.2
1983 08 04	23 52.62	-08 00.4					
1983 08 14	23 48.15	-07 35.8	1.599	2.501	145.5	13.3	16.8
1983 08 24	23 40.98	-07 17.1					
1983 09 03	23 31.60	-07 01.4	1.477	2.473	168.2	4.8	16.4
1983 09 13	23 20.88	-06 45.5					
1983 09 23	23 10.04	-06 25.7	1.459	2.447	167.0	5.3	16.4
1983 10 03	23 00.32	-05 59.2					
1983 10 13	22 52.75	-05 24.1	1.546	2.424	143.8	14.1	16.7
1983 10 23	22 47.99	-04 39.7					
1983 11 02	22 46.25	-03 46.0	1.713	2.402	123.0	20.3	17.0
1983 11 12	22 47.48	-02 43.0					
1983 11 22	22 51.43	-01 31.2	1.930	2.384	104.9	23.6	17.4
1983 12 02	22 57.77	-00 11.1					
1983 12 12	23 06.17	+01 16.9	2.167	2.368	89.2	24.6	17.6