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TWX 710-320-6842 ASTROGRAM CAM ** Brian G. Marsden, Director
Telephone 617-495-7244/7440/7444 ** Conrad M. Bardwell, Associate Director

EDITORIAL NOTICE.

The next MPCs will be published on or about Apr. 2. No MPCs will be issued in March.

* * * * *

ERRATA.

MPC	Line	
12627	-5	For S. Hayakawa read S. Hayakawa and T. Kojima.
12640	23	Add and S. Swierkowska
12667	25	For S. Hayakawa, T. Kojima read T. Kojima
12707	17	Add The identification 1933 OB = 1954 UW (MPC 2327) is invalid.
12707	31	Add The identification 1981 VP2 = 1953 VJ1 was suggested by L. D. Schmadel.

* * * * *

DELETED OBSERVATIONS.

The following observations are to be deleted.

Object	Date	UT	R. A. (1950)	Decl.	Reference	Obs.
1963 YA	* 1963 12	16.09	04 46.3	+29 09	MPC 2311	760
1970 AC1	* 1970 01	06.84200	04 19 21.13	+51 36 33.2	MPC 3192	026

* * * * *

IDENTIFICATION CHANGE.

Continuation to MPC 12625.

Object	Date	UT	R. A. (1950)	Decl.	Old desig.	Mag.	Obs.
1925 DG	* 1925 02	22.93610	08 10.9	+22 41	1925 BF	14	105

* * * * *

OBSERVATIONS OF COMETS.

Observations are published here for the following observatory codes:

006 Fabra Observatory, Barcelona. 0.38-m f/11 Mailhat astrograph.
Observer J. M. Codina. Measured by N. Torras.
046 Klet. Observers A. Mrkos and Z. Vavrova.

056 Skalnate Pleso. Observers P. Rychtarcik and J. Borosova.
323 Perth. Observers P. Jekabsons and G. Lowe. Measured by M. P. Candy.
372 Geisei. Observer T. Seki.
400 Kitami. Observers K. Endate and T. Fujii. Measured by K. Watanabe and M. Yanai.
413 Siding Spring. Uppsala Southern Schmidt. Observer R. H. McNaught.
415 Kambah, near Canberra. Observer D. Herald.
474 Mt. John. Observer A. C. Gilmore. Measured by P. M. Kilmartin.
501 Herstmonceux. University of Aston 0.61-m Hewitt Satellite Tracking Camera. Observers P. Strugnell and M. White.
503 Cambridge. Observer J. D. Shanklin.
552 San Vittore. 0.45-m reflector. Observers G. Sassi and C. Vacchi. Measured by C. Vacchi, V. Goretti and E. Colombini.
657 Victoria. Observers D. D. Balam and J. Tatum.
675 Palomar. 0.46-m Schmidt. Observers C. Shoemaker and E. Shoemaker.
688 Lowell Observatory, Anderson Mesa Station. 1.8-m reflector + CCD. Observers S. J. Bus, S. McDonald and D. Norman.
691 University of Arizona, Kitt Peak. 0.91-m SPACEWATCH telescope, CCD in scanning mode. Observer J. V. Scotti.
801 Oak Ridge Observatory. Observers R. E. McCrosky and C.-Y. Shao.
892 YGCO Hoshikawa and Nagano Stations. Observers S. Hayakawa and T. Kojima.
894 Kiyasato. Observers S. Miyasaka and Y. Yaita.

Object	Date	UT	R. A. (1950)	Decl.	Mag.	N	Obs.
		Periodic Comet Ashbrook-Jackson					
/1986 II	1987	12 21.36473	09 20 10.01	+29 00 38.8	21.7N	1	691
/1986 II	1987	12 21.39008	09 20 09.47	+29 00 43.3	20.2T	1	691
		Periodic Comet Halley					
/1986 III	1987	12 22.50709	10 29 11.65	-10 22 39.0	21.3N	2	691
/1986 III	1987	12 22.51043	10 29 11.65	-10 22 38.1			691
/1986 III	1987	12 22.53316	10 29 11.14	-10 22 39.2	17.1T		691
/1986 III	1987	12 22.53772	10 29 11.08	-10 22 40.2			691
		Periodic Comet Schwassmann-Wachmann 2					
/1986h	1987	12 25.79236	12 49 53.31	-02 35 28.6	14 T		892
/1986h	1987	12 25.85243	12 49 58.23	-02 35 52.9			892
		Periodic Comet Kohoutek					
/1986k	1987	11 21.74652	08 37 23.10	+17 22 14.5	15.5T		892
/1986k	1987	12 17.72152	08 55 17.92	+13 35 02.4	14 T		892
/1986k	1987	12 17.75972	08 55 18.17	+13 34 45.7			892
/1986k	1987	12 18.33715	08 55 23.99	+13 30 32.9			801
/1986k	1987	12 19.07840	08 55 30.12	+13 25 13.8			503
/1986k	1987	12 20.75572	08 55 38.95	+13 13 31.4	14 T		892
/1986k	1987	12 20.79513	08 55 38.90	+13 13 15.8			892
/1986k	1987	12 24.36576	08 55 35.37	+12 49 49.2			801
/1986k	1987	12 24.43132	08 55 35.13	+12 49 24.2			657
/1986k	1987	12 26.62650	08 55 17.97	+12 36 04.8	14 T		892
/1986k	1987	12 26.66898	08 55 17.37	+12 35 50.0			892
		Comet Wilson (1986l)					
/1986l	1987	11 29.69760	09 24 44.28	+04 42 24.5			894
/1986l	1987	11 29.73010	09 24 42.20	+04 42 36.3			894
/1986l	1987	12 19.05965	08 58 56.83	+07 21 43.4			503
/1986l	1987	12 20.74045	08 56 15.10	+07 38 06.3	11 T		892
/1986l	1987	12 20.77986	08 56 11.20	+07 38 30.0			892

/1986l	1987	12	22.39885	08	53	31.70	+07	54	34.5	801
/1986l	1987	12	24.34809	08	50	15.49	+08	14	19.1	801
/1986l	1987	12	26.62013	08	46	21.06	+08	37	48.8	12 T 892
/1986l	1987	12	26.66302	08	46	16.55	+08	38	15.0	892

Periodic Comet Howell

/1987h	1987	06	23.45553	00	27	54.48	-03	49	01.4	688
/1987h	1987	06	23.45919	00	27	54.85	-03	48	59.6	688
/1987h	1987	07	22.47117	01	08	02.06	-01	07	18.1	688

Periodic Comet Reinmuth 2

/1987l	1987	11	22.38177	21	32	56.58	-07	45	55.9	15 T 892
/1987l	1987	11	22.42725	21	33	01.77	-07	45	30.4	892

Periodic Comet Brooks 2

/1987m	1987	12	19.05338	01	03	43.53	+00	32	27.0	801

Periodic Comet Harrington

/1987n	1987	11	22.39126	22	09	32.46	-21	45	08.7	14.5T 892
/1987n	1987	11	22.43755	22	09	39.64	-21	44	26.9	892

Periodic Comet Borrelly

/1987p	1987	11	19.71215	02	54	54.75	-26	31	21.9	894
/1987p	1987	11	21.64551	02	51	44.84	-24	57	00.1	894
/1987p	1987	11	21.65038	02	51	44.33	-24	56	44.9	894
/1987p	1987	11	25.60603	02	45	29.68	-21	23	38.1	400
/1987p	1987	11	25.61354	02	45	28.94	-21	23	10.2	400
/1987p	1987	11	29.59708	02	39	40.79	-17	23	14.8	894
/1987p	1987	11	29.62210	02	39	38.60	-17	21	39.5	894
/1987p	1987	12	05.47641	02	32	21.72	-10	51	33.1	400
/1987p	1987	12	05.48266	02	32	21.30	-10	51	07.0	400
/1987p	1987	12	08.74955	02	29	02.99	-06	59	54.5	046
/1987p	1987	12	08.75140	02	29	02.87	-06	59	47.0	046
/1987p	1987	12	08.88594	02	28	55.01	-06	50	09.4	503
/1987p	1987	12	10.03715	02	27	53.30	-05	27	12.8	503
/1987p	1987	12	10.77293	02	27	17.72	-04	33	57.4	046
/1987p	1987	12	10.77640	02	27	17.45	-04	33	41.3	046
/1987p	1987	12	11.76251	02	26	31.57	-03	22	05.7	046
/1987p	1987	12	11.76598	02	26	31.39	-03	21	50.6	046
/1987p	1987	12	12.76736	02	25	48.19	-02	09	01.8	046
/1987p	1987	12	12.77014	02	25	48.10	-02	08	46.9	046
/1987p	1987	12	13.21285	02	25	30.17	-01	36	36.6	657
/1987p	1987	12	13.22187	02	25	29.50	-01	35	54.8	657
/1987p	1987	12	14.79306	02	24	32.06	+00	18	21.7	046
/1987p	1987	12	14.79410	02	24	32.06	+00	18	26.6	046
/1987p	1987	12	15.79068	02	24	00.22	+01	30	46.3	046
/1987p	1987	12	15.79248	02	24	00.12	+01	30	53.6	046
/1987p	1987	12	16.49756	02	23	39.42	+02	21	57.1	892
/1987p	1987	12	16.51006	02	23	39.17	+02	22	51.8	892
/1987p	1987	12	17.51909	02	23	13.34	+03	35	32.4	892
/1987p	1987	12	17.54878	02	23	12.42	+03	37	40.7	892
/1987p	1987	12	18.96729	02	22	43.12	+05	19	03.2	503
/1987p	1987	12	20.06049	02	22	26.08	+06	36	34.5	801
/1987p	1987	12	22.79678	02	22	03.00	+09	46	49.1	503
/1987p	1987	12	22.86793	02	22	02.30	+09	51	42.1	046
/1987p	1987	12	22.86966	02	22	02.31	+09	51	49.8	046
/1987p	1987	12	23.76914	02	22	01.74	+10	53	04.5	046
/1987p	1987	12	23.77082	02	22	01.71	+10	53	12.1	046
/1987p	1987	12	24.72082	02	22	04.17	+11	57	06.6	046

/1987p	1987	12	24.72291	02	22	04.13	+11	57	15.2		046
/1987p	1987	12	25.52060	02	22	07.98	+12	50	20.0		892
/1987p	1987	12	25.52685	02	22	08.03	+12	50	45.5		892
/1987p	1987	12	25.53038	02	22	08.01	+12	51	00.2		892
/1987p	1987	12	25.72186	02	22	10.29	+13	03	35.7		046
/1987p	1987	12	25.72360	02	22	10.29	+13	03	43.0		046
/1987p	1987	12	26.52864	02	22	17.27	+13	56	31.9		892
/1987p	1987	12	26.53888	02	22	17.43	+13	57	11.7		892
/1987p	1987	12	26.54201	02	22	17.38	+13	57	24.8		892
/1987p	1987	12	30.76983	02	23	39.30	+18	23	30.4		046
/1987p	1987	12	30.77087	02	23	39.62	+18	23	33.7		046
/1987p	1987	12	31.79787	02	24	09.48	+19	25	17.4		503
/1987p	1988	01	03.73256	02	25	56.76	+22	15	11.9		503
/1987p	1988	01	04.92057	02	26	48.32	+23	21	12.3		503
/1987p	1988	01	07.94050	02	29	23.64	+26	01	49.7		503
/1987p	1988	01	11.77774	02	33	28.19	+29	11	23.9		503

Periodic Comet Reinmuth 1

/1987r	1987	12	18.24363	04	11	55.02	+10	46	11.9		801
/1987r	1987	11	28.72153	04	29	06.52	+10	28	05.4		400
/1987r	1987	11	28.74306	04	29	05.41	+10	28	02.0		400
/1987r	1987	12	21.27001	04	09	34.38	+10	54	15.5	18.7N	691
/1987r	1987	12	21.30400	04	09	32.80	+10	54	21.7	16 T	691

Comet Bradfield (1987s)

/1987s	1987	10	07.12552	16	06	14.36	-09	37	18.4		657
/1987s	1987	10	09.12292	16	12	00.90	-09	00	34.8		657
/1987s	1987	11	06.71771	17	50	03.04	+02	18	54.6		046
/1987s	1987	11	06.71829	17	50	03.17	+02	18	55.6		046
/1987s	1987	11	22.38160	19	01	53.14	+10	33	14.9		400
/1987s	1987	11	22.39549	19	01	57.63	+10	33	43.4		400
/1987s	1987	11	25.44688	19	18	23.13	+12	16	04.5		400
/1987s	1987	11	25.45799	19	18	26.99	+12	16	27.8		400
/1987s	1987	11	25.72162	19	19	54.98	+12	25	21.8		046
/1987s	1987	11	25.72226	19	19	55.22	+12	25	22.8		046
/1987s	1987	12	05.36021	20	18	24.11	+17	43	08.2		400
/1987s	1987	12	05.36843	20	18	27.48	+17	43	23.3		400
/1987s	1987	12	08.69081	20	40	48.00	+19	24	38.3		046
/1987s	1987	12	08.69150	20	40	48.25	+19	24	40.0		046
/1987s	1987	12	10.70499	20	54	48.31	+20	22	13.8		046
/1987s	1987	12	10.70521	20	54	48.70	+20	22	19.9		552
/1987s	1987	12	10.70916	20	54	50.09	+20	22	20.7		046
/1987s	1987	12	11.69596	21	01	48.56	+20	49	21.0		046
/1987s	1987	12	11.69735	21	01	49.12	+20	49	23.7		046
/1987s	1987	12	11.72604	21	02	01.45	+20	50	11.1		552
/1987s	1987	12	11.79965	21	02	32.68	+20	52	09.3		006
/1987s	1987	12	11.81076	21	02	37.44	+20	52	27.2		006
/1987s	1987	12	12.69942	21	08	58.08	+21	15	52.2		046
/1987s	1987	12	12.70498	21	09	00.44	+21	15	59.8		046
/1987s	1987	12	14.69196	21	23	20.82	+22	05	31.0		046
/1987s	1987	12	14.69259	21	23	21.13	+22	05	32.4		046
/1987s	1987	12	14.80486	21	24	09.95	+22	08	13.6		006
/1987s	1987	12	14.81875	21	24	15.98	+22	08	33.0		006
/1987s	1987	12	15.75671	21	31	06.24	+22	30	19.4		046
/1987s	1987	12	15.75741	21	31	06.47	+22	30	21.2		046
/1987s	1987	12	15.77049	21	31	11.98	+22	30	40.4		006
/1987s	1987	12	15.78125	21	31	16.63	+22	30	55.0		006
/1987s	1987	12	20.35214	22	04	51.82	+24	02	23.8		892
/1987s	1987	12	20.35312	22	04	52.27	+24	02	25.6		892

/1987s	1987	12	20.39172	22	05	09.11	+24	03	04.3			892
/1987s	1987	12	22.78116	22	22	40.04	+24	40	35.9			503
/1987s	1987	12	22.80346	22	22	49.69	+24	40	53.6			046
/1987s	1987	12	22.80433	22	22	50.08	+24	40	54.0			046
/1987s	1987	12	23.69420	22	29	18.93	+24	53	05.3			046
/1987s	1987	12	23.69490	22	29	19.17	+24	53	05.8			046
/1987s	1987	12	23.71979	22	29	29.97	+24	53	26.4			552
/1987s	1987	12	24.70635	22	36	38.32	+25	05	45.2			046
/1987s	1987	12	24.70705	22	36	38.61	+25	05	45.8			046
/1987s	1987	12	25.51776	22	42	27.82	+25	14	59.7			892
/1987s	1987	12	25.53211	22	42	33.88	+25	15	08.0			892
/1987s	1987	12	25.53428	22	42	34.87	+25	15	08.1			892
/1987s	1987	12	25.69594	22	43	44.78	+25	16	56.4			046
/1987s	1987	12	25.69663	22	43	45.01	+25	16	57.1			046
/1987s	1987	12	26.50607	22	49	30.82	+25	25	15.2			892
/1987s	1987	12	26.50954	22	49	32.28	+25	25	16.2			892
/1987s	1987	12	26.51232	22	49	33.46	+25	25	18.3			892
/1987s	1987	12	30.75808	23	19	00.83	+25	56	52.5			046
/1987s	1987	12	30.75854	23	19	01.02	+25	56	51.9			046
/1987s	1987	12	31.78832	23	25	55.16	+26	01	44.1			503
/1987s	1988	01	02.85808	23	39	27.67	+26	08	33.1			503
/1987s	1988	01	03.72231	23	44	59.29	+26	10	21.5			503
/1987s	1988	01	04.89782	23	52	21.48	+26	11	46.1			503
/1987s	1988	01	07.82530	00	10	03.05	+26	11	20.0			501
/1987s	1988	01	07.93106	00	10	40.26	+26	11	12.6			503
/1987s	1988	01	11.77034	00	32	19.91	+26	03	00.6			503
/1987s	1988	01	14.77638	00	48	07.18	+25	52	39.0			501
/1987s	1988	01	14.79484	00	48	12.69	+25	52	36.8			501

Periodic Comet Helin

/1987w	1987	09	22.24581	01	20	37.56	+02	29	28.2			688
/1987w	1987	09	22.25436	01	20	37.38	+02	29	25.9			688
/1987w	1987	09	22.27919	01	20	36.83	+02	29	18.9			688
/1987w	1987	10	26.28079	01	05	06.25	+00	07	16.4			688
/1987w	1987	10	26.29237	01	05	05.94	+00	07	14.5			688
/1987w	1987	12	21.18375	01	10	05.35	+01	34	45.7	21.4N		691
/1987w	1987	12	22.24655	01	10	46.17	+01	40	33.4	18.8T		691
/1987w	1987	12	22.25839	01	10	46.55	+01	40	36.2			691
/1987w	1988	01	15.15096	01	30	28.56	+04	13	23.1			688
/1987w	1988	01	15.16339	01	30	29.25	+04	13	28.7			688

Periodic Comet West-Kohoutek-Ikemura

/1987x	1987	12	21.53117	13	17	53.62	+25	43	01.3	21.0N	3	691
/1987x	1987	12	21.55073	13	17	55.55	+25	43	05.3	18.4T		691

Periodic Comet Shoemaker-Holt

/1987z	1987	11	23.22222	00	52	59.26	+06	23	23.1			675
/1987z	1987	11	23.25000	00	52	59.04	+06	23	18.8			675
/1987z	1987	12	19.02370	00	55	53.40	+06	07	48.8		4	801
/1987z	1987	12	23.12855	00	57	32.88	+06	13	19.4			691
/1987z	1987	12	23.15406	00	57	33.52	+06	13	21.7			691
/1987z	1987	12	24.00722	00	57	56.45	+06	14	46.2			801

Periodic Comet Mueller

/1987a1	1987	12	21.22123	00	58	46.13	+12	52	09.2	21.2N		691
/1987a1	1987	12	21.23519	00	58	46.41	+12	52	10.6	17.8T		691
/1987a1	1987	12	21.23900	00	58	46.53	+12	52	11.6			691
/1987a1	1987	12	23.16297	00	59	46.61	+12	58	55.3	21.1N	5	691

Comet McNaught (1987b1)

/1987b1	1987	12	31.86006	17	56	30.9	+01	35	13		8 T	892
/1987b1	1987	12	31.86342	17	56	31.2	+01	35	28			892
/1987b1	1987	12	31.86423	17	56	31.4	+01	35	28			892
/1987b1	1988	01	16.85382	18	37	15.74	+16	41	22.4		7.5T	372

Comet Ichimura (1987d1)

/1987d1	1987	11	24.62604	03	43	53.8	-24	36	47			894
/1987d1	1987	11	24.73438	03	43	04.9	-24	54	45			894
/1987d1	1987	12	22.47843	19	40	59.27	-51	56	39.0		6	415

Comet Furuyama (1987f1)

/1987f1	1987	12	10.05313	03	52	28.58	+09	48	08.6			503
/1987f1	1987	12	12.30451	03	41	53.41	+07	35	04.2			657
/1987f1	1987	12	14.87135	03	30	16.13	+05	06	08.5			046
/1987f1	1987	12	14.87436	03	30	15.32	+05	05	57.6			046
/1987f1	1987	12	15.56389	03	27	13.24	+04	26	41.2			400
/1987f1	1987	12	15.57431	03	27	10.40	+04	26	06.6			400
/1987f1	1987	12	15.80046	03	26	11.55	+04	13	18.9			046
/1987f1	1987	12	15.80347	03	26	10.86	+04	13	09.6			046
/1987f1	1987	12	16.52256	03	23	04.47	+03	32	49.8			892
/1987f1	1987	12	16.52986	03	23	02.64	+03	32	26.1			892
/1987f1	1987	12	17.52291	03	18	50.29	+02	37	30.8			892
/1987f1	1987	12	17.52638	03	18	49.45	+02	37	19.2			892
/1987f1	1987	12	17.55243	03	18	42.84	+02	35	53.9			892
/1987f1	1987	12	18.98292	03	12	49.82	+01	18	41.9			503
/1987f1	1987	12	22.12274	03	00	38.14	-01	22	14.3			801
/1987f1	1987	12	22.87846	02	57	51.28	-01	59	02.2			046
/1987f1	1987	12	22.88159	02	57	50.67	-01	59	10.2			046
/1987f1	1987	12	23.78135	02	54	36.94	-02	42	00.0			046
/1987f1	1987	12	23.78436	02	54	36.38	-02	42	07.4			046
/1987f1	1987	12	24.77638	02	51	08.55	-03	28	02.2			046
/1987f1	1987	12	24.77916	02	51	07.59	-03	28	15.2			046
/1987f1	1987	12	25.53611	02	48	33.41	-04	02	16.3			892
/1987f1	1987	12	25.53923	02	48	32.64	-04	02	23.2			892
/1987f1	1987	12	25.73436	02	47	53.91	-04	11	05.5			046
/1987f1	1987	12	25.73749	02	47	53.31	-04	11	11.9			046
/1987f1	1987	12	26.55289	02	45	11.98	-04	46	47.9			892
/1987f1	1987	12	26.56006	02	45	10.48	-04	47	06.3			892
/1987f1	1987	12	26.56736	02	45	08.96	-04	47	26.1			892
/1987f1	1987	12	26.57141	02	45	08.23	-04	47	35.6		13 T	892

Comet Jensen-Shoemaker (1987g1)

/1987g1	1987	12	14.76510	00	19	57.76	-05	43	53.2			046
/1987g1	1987	12	14.77917	00	19	57.93	-05	44	02.3			046
/1987g1	1987	12	19.00452	00	21	15.46	-06	31	19.8		7	801
/1987g1	1987	12	21.15344	00	22	02.09	-06	53	30.8		16.7T 8	691
/1987g1	1987	12	21.15844	00	22	02.20	-06	53	33.9		19.3N	691

Comet Liller (1988a)

/1988a	1988	01	12.50000	23	50	53.51	-27	19	31.0		10 T	413
/1988a	1988	01	12.50069	23	50	53.60	-27	19	29.2			413
/1988a	1988	01	12.50139	23	50	53.53	-27	19	28.6			413
/1988a	1988	01	13.49861	23	51	03.07	-26	39	09.4			413
/1988a	1988	01	13.50874	23	51	03.20	-26	38	45.0			413
/1988a	1988	01	13.53264	23	51	03.47	-26	37	45.5			323
/1988a	1988	01	14.39971	23	51	12.14	-26	02	43.3			894
/1988a	1988	01	14.41880	23	51	13.49	-26	01	56.3			894
/1988a	1988	01	14.45591	23	51	13.57	-26	00	20.9		13 N	474

/1988a	1988	01	14.46355	23	51	13.62	-26	00	03.0		474
/1988a	1988	01	14.49010	23	51	13.99	-25	58	59.3		415
/1988a	1988	01	14.49272	23	51	14.21	-25	58	56.2		415
/1988a	1988	01	14.53056	23	51	14.43	-25	57	21.9		323
/1988a	1988	01	15.50470	23	51	26.59	-25	17	48.1		413
/1988a	1988	01	15.50729	23	51	26.60	-25	17	42.5		413
/1988a	1988	01	15.53542	23	51	27.06	-25	16	32.7		323
/1988a	1988	01	15.55694	23	51	27.29	-25	15	42.2		323
/1988a	1988	01	16.41017	23	51	39.24	-24	41	03.8		894
/1988a	1988	01	16.52986	23	51	40.69	-24	36	07.0		323
/1988a	1988	01	16.71250	23	51	43.49	-24	28	44.9		056
/1988a	1988	01	18.38125	23	52	10.19	-23	20	42.2	10 T	892
/1988a	1988	01	18.38888	23	52	10.35	-23	20	19.5		892
/1988a	1988	01	18.42569	23	52	10.91	-23	18	49.2	10 T	372
/1988a	1988	01	18.43003	23	52	10.93	-23	18	36.9		372
/1988a	1988	01	19.53194	23	52	30.41	-22	33	28.0		323
/1988a	1988	01	21.45793	23	53	08.44	-21	14	26.7		415
/1988a	1988	01	21.47006	23	53	08.82	-21	13	56.3		415
/1988a	1988	01	22.45353	23	53	29.65	-20	33	28.8		415

Note 1: image diffuse and elongated, measurement uncertain. 2: coma diameter 75". 3: 2′.25 tail in p.a. 323 . 4: inkdot measured. 5: 29" tail in p.a. 237 . 6: position poor; comet very diffuse. 7: weak image. 8: 39" tail in p.a. 339 .

* * * * *

OBSERVATIONS OF MINOR PLANETS.

The observations are listed separately for each observatory code. Alphabetic note codes shown with some of the observations are defined according to the scheme below. Numerical codes are defined in the headings for the individual observatories.

A earlier approximate position inferior
a sense of motion ambiguous
B black or dark plate
b bad seeing
C correction to earlier position
c crowded star field
D declination uncertain
d diffuse image
E at or near edge of plate
F faint image
G poor guiding
g no guiding
I involved with star
i inkdot measured
M measurement difficult
N near edge of plate, measurement uncertain
O image out of focus
o plate measured in one direction only
P position uncertain
p poor image
R right ascension uncertain
r outside reference star set
S poor sky
s streaked image
T time uncertain

t trailed image
U uncertain image
u unconfirmed image
V very faint image
W weak image
w weak solution

Object		Date	UT	R. A. (1950)	Decl.	Mag.	N	Obs.
010 Caussols								
J.-L. Heudier, CERGA Caussols, F-06460 Saint Vallier de Thiey, France								
Observers R. Chemin, J.-L. Heudier, C. Labeyrie, T. Laverge, C. Pollas, V. Shkodrov								
0.9-m Schmidt telescope								
Observations in association with INAS								
1966 PK		1987 11	20.81944	23 46 34.49	-04 02 29.3			010
1966 PK		1987 11	20.85556	23 46 35.16	-04 02 20.7			010
1981 EO34		1987 11	20.81944	00 01 44.93	-06 51 27.3			010
1981 EO34		1987 11	20.85556	00 01 46.17	-06 51 20.5			010
1987 QM		1987 11	17.76667	22 34 16.46	+05 49 17.9			010
1987 QM		1987 11	17.78750	22 34 17.32	+05 49 26.5			010
1987 QM		1987 11	17.79792	22 34 17.81	+05 49 31.8			010
1987 VH	*	1987 11	11.84306	00 00 36.99	-06 57 58.2			010
1987 VH		1987 11	11.87431	00 00 36.80	-06 57 41.7			010
1987 VH		1987 11	20.81944	00 00 56.03	-05 34 15.8			010
1987 VH		1987 11	20.85556	00 00 56.32	-05 33 54.7			010
1987 VJ	*	1987 11	14.95625	02 44 29.06	+34 18 09.1			010
1987 VJ		1987 11	14.97708	02 44 27.56	+34 18 00.6			010
1987 VJ		1987 11	14.98750	02 44 26.74	+34 17 57.4			010
1987 VK	*	1987 11	14.95625	02 46 47.01	+32 44 25.5			010
1987 VK		1987 11	14.97708	02 46 45.84	+32 44 14.6			010
1987 VK		1987 11	14.98750	02 46 45.28	+32 44 09.1			010
1987 VL	*	1987 11	14.95625	02 53 29.09	+32 50 16.5			010
1987 VL		1987 11	14.97708	02 53 27.93	+32 50 07.8			010
1987 VL		1987 11	14.98750	02 53 27.30	+32 50 03.8			010
1987 VM	*	1987 11	14.95625	02 54 56.53	+35 26 27.3			010
1987 VM		1987 11	14.97708	02 54 55.51	+35 26 18.7			010
1987 VM		1987 11	14.98750	02 54 54.94	+35 26 14.0			010
1987 VN	*	1987 11	14.95625	03 01 46.80	+34 10 19.4			010
1987 VN		1987 11	14.97708	03 01 45.45	+34 10 15.0			010
1987 VN		1987 11	14.98750	03 01 44.76	+34 10 13.3			010
1987 VO	*	1987 11	15.81597	01 17 55.22	-16 15 52.7			010
1987 VO		1987 11	15.84606	01 17 54.61	-16 15 39.7			010
1987 VP	*	1987 11	15.81597	01 18 38.04	-14 40 48.6			010
1987 VP		1987 11	15.83681	01 18 37.62	-14 40 46.9			010
1987 VP		1987 11	15.84606	01 18 37.25	-14 40 45.4			010
1987 WU2	*	1987 11	17.76667	22 37 08.60	+03 40 52.4			010
1987 WU2		1987 11	17.78750	22 37 09.67	+03 40 57.7			010
1987 WU2		1987 11	17.79792	22 37 10.35	+03 41 00.7			010
1987 WV2	*	1987 11	17.77708	22 53 50.80	+03 22 01.6		W	010
1987 WW2	*	1987 11	17.82431	23 32 56.81	-03 40 09.2			010
1987 WW2		1987 11	17.85556	23 32 57.51	-03 39 59.8			010
1987 WX2	*	1987 11	17.82431	23 33 58.25	-06 36 54.1			010
1987 WX2		1987 11	17.85556	23 33 58.43	-06 36 38.7			010
1987 WY2	*	1987 11	17.82431	23 34 03.90	-04 15 37.8			010
1987 WY2		1987 11	17.85556	23 34 05.04	-04 15 33.5			010
1987 WZ2	*	1987 11	17.82431	23 37 20.85	-02 48 00.3			010
1987 WZ2		1987 11	17.84514	23 37 21.16	-02 47 53.2			010
1987 WZ2		1987 11	17.85556	23 37 21.35	-02 47 49.6			010

1987	WA3	*	1987	11	17.82431	23	37	45.86	-05	04	03.0		010
1987	WA3		1987	11	17.85556	23	37	46.62	-05	04	09.0		010
1987	WB3	*	1987	11	17.82431	23	39	13.09	-03	26	31.5		010
1987	WB3		1987	11	17.85556	23	39	14.07	-03	26	23.3		010
1987	WC3	*	1987	11	17.82431	23	40	38.06	-03	04	22.1		010
1987	WC3		1987	11	17.84514	23	40	38.75	-03	04	14.1		010
1987	WD3	*	1987	11	17.82431	23	43	02.59	-04	51	41.8		010
1987	WD3		1987	11	17.85556	23	43	03.23	-04	51	42.5		010
1987	WE3	*	1987	11	17.82431	23	44	59.43	-06	00	42.2		010
1987	WE3		1987	11	17.85556	23	45	00.19	-06	00	18.5		010
1987	WF3	*	1987	11	17.82431	23	45	26.97	-04	14	40.8		010
1987	WF3		1987	11	17.85556	23	45	27.36	-04	14	33.4		010
1987	WG3	*	1987	11	17.82431	23	45	34.19	-03	49	58.6		010
1987	WG3		1987	11	17.85556	23	45	34.94	-03	49	46.5		010
1987	WH3	*	1987	11	17.82431	23	47	35.13	-06	02	24.2		010
1987	WH3		1987	11	17.85556	23	47	35.72	-06	02	20.1		010
1987	WJ3	*	1987	11	17.82431	23	49	28.62	-06	28	49.4		010
1987	WJ3		1987	11	17.84514	23	49	29.08	-06	28	42.8		010
1987	WJ3		1987	11	17.85556	23	49	29.36	-06	28	37.6		010
1987	WJ3		1987	11	20.81944	23	50	55.55	-06	09	00.5		010
1987	WJ3		1987	11	20.85556	23	50	56.59	-06	08	46.1		010
1987	WK3	*	1987	11	20.81944	23	58	03.71	-07	22	39.6		010
1987	WK3		1987	11	20.85556	23	58	03.79	-07	22	22.2		010
1987	WL3	*	1987	11	20.81944	00	02	08.47	-03	31	21.1		010
1987	WL3		1987	11	20.85556	00	02	10.12	-03	31	25.0		010
482			1987	11	11.84306	23	56	44.39	-04	58	25.2	14	010
482			1987	11	11.87431	23	56	44.14	-04	58	30.0		010
482			1987	11	18.99294	23	56	47.47	-05	14	30.3	M	010
482			1987	11	20.83229	23	56	58.66	-05	17	11.5		010
516			1987	11	14.95625	02	51	15.68	+35	14	05.1	16	010
516			1987	11	14.97708	02	51	14.46	+35	13	59.1		010
516			1987	11	14.98750	02	51	13.78	+35	13	56.0		010
690			1987	11	17.76667	22	30	11.87	+04	30	56.2	12	010
690			1987	11	17.78750	22	30	12.91	+04	30	54.4		010
690			1987	11	17.79792	22	30	13.22	+04	30	53.7		010
692			1987	11	15.81597	01	14	56.64	-17	10	32.8	14	010
692			1987	11	15.83681	01	14	56.08	-17	10	27.3		010
692			1987	11	15.84606	01	14	55.69	-17	10	24.1		010
795			1987	11	11.84306	23	41	57.99	-05	48	29.2	15	010
795			1987	11	11.87431	23	41	57.48	-05	48	21.8		010
795			1987	11	17.82431	23	40	53.68	-05	19	47.0		010
795			1987	11	17.85556	23	40	53.43	-05	19	37.9		010
933			1987	11	11.85347	23	57	30.19	-06	56	09.2	16	010
933			1987	11	18.99294	23	56	47.10	-06	52	32.2	M	010
961			1987	11	17.82431	23	37	53.62	-06	16	08.4		010
961			1987	11	17.84514	23	37	53.74	-06	16	02.7		010
961			1987	11	17.85556	23	37	53.87	-06	15	57.3		010
1044			1987	11	11.84306	00	00	02.48	-04	35	08.5	14	010
1044			1987	11	11.87431	00	00	02.15	-04	35	03.4		010
1044			1987	11	18.99294	00	00	03.40	-04	14	46.3	M	010
1044			1987	11	20.81944	00	00	16.61	-04	08	19.0		010
1044			1987	11	20.85903	00	00	16.72	-04	08	11.8		010
1185			1987	11	11.84306	23	57	51.99	-08	03	41.4	15	010
1185			1987	11	11.87431	23	57	51.92	-08	03	32.1		010
1185			1987	11	20.81944	23	58	44.34	-07	11	36.8		010
1185			1987	11	20.85556	23	58	44.88	-07	11	22.0		010
1304			1987	11	15.81597	01	08	50.87	-16	48	50.0	14	010
1304			1987	11	15.83681	01	08	50.45	-16	48	46.5		010

1304		1987 11 15.84606	01	08	50.12	-16	48	44.4			010
1336		1987 11 17.82431	23	40	41.45	-06	33	28.6			010
1336		1987 11 17.85556	23	40	41.73	-06	33	22.6			010
1371		1987 11 17.82431	23	36	04.60	-04	01	24.9			010
1371		1987 11 17.85556	23	36	04.80	-04	01	29.5			010
1842		1987 11 17.82431	23	37	42.57	-07	50	03.1			010
1842		1987 11 17.85556	23	37	43.38	-07	49	57.3			010
2678		1987 11 17.83472	23	39	50.39	-05	24	46.0			010
2678		1987 11 17.85556	23	39	50.60	-05	24	39.5			010
2707		1987 11 11.85347	23	48	01.82	-04	53	42.0	16		010
2707		1987 11 17.83472	23	48	00.41	-04	45	24.7			010
2707		1987 11 18.99294	23	48	05.62	-04	43	10.6		M	010
2707		1987 11 20.81944	23	48	18.06	-04	39	16.0			010
3452		1987 11 17.82431	23	31	45.08	-05	29	31.2		N	010
3452		1987 11 17.84514	23	31	45.55	-05	29	26.8		N	010
3452		1987 11 17.85556	23	31	45.89	-05	29	22.2		N	010
3726		1987 11 17.82431	23	49	39.32	-05	27	33.0			010
3726		1987 11 17.85556	23	49	39.44	-05	27	27.6			010

012 Uccle
E. W. Elst, Royal Observatory, B-1180 Brussels, Belgium

1987 YE	*	1987 12 23.90139	06	10	29.91	+23	44	19.8	16		012
1987 YE		1987 12 23.94097	06	10	38.08	+23	43	50.0			012

033 Tautenburg
S. Marx, Karl Schwarzschild Observatorium, DDR-6901 Tautenburg,
Democratic Republic of Germany
Observers F. Borngen, R. Ziener, K.-H. Mau, C. Hogner
Measurer F. Borngen
1.3-m Schmidt telescope
SAOC

1928 UF		1987 12 22.90556	06	02	17.95	+23	43	08.3	17.4		033
1928 UF		1987 12 25.01111	06	00	22.93	+23	45	19.0			033
1928 UF		1987 12 25.03889	06	00	21.42	+23	45	20.6			033
1972 VT1	*	1972 11 03.96111	03	54	42.57	+36	49	54.2	17.2R		033
1972 VT1		1972 11 04.00764	03	54	40.31	+36	49	46.4			033
1972 VU1	*	1972 11 03.96111	03	55	39.17	+37	35	51.9	18.1R		033
1972 VU1		1972 11 03.99167	03	55	37.86	+37	35	49.6			033
1972 VV1	*	1972 11 03.96111	03	56	14.99	+35	52	21.8	17.6R		033
1972 VV1		1972 11 04.00764	03	56	13.22	+35	52	15.0			033
1972 VW1	*	1972 11 03.96111	03	58	12.68	+36	17	58.2	16.7R		033
1972 VW1		1972 11 04.00764	03	58	10.42	+36	18	07.4			033
1972 VX1	*	1972 11 03.96111	04	00	01.10	+35	36	54.2	18.3R		033
1972 VX1		1972 11 03.99167	03	59	59.72	+35	36	51.3			033
1972 VY1	*	1972 11 03.96111	04	00	20.53	+34	44	07.1	17.9R		033
1972 VY1		1972 11 03.99167	04	00	19.25	+34	44	05.5			033
1972 VZ1	*	1972 11 03.96111	04	00	43.85	+35	42	19.7	16.7R		033
1972 VZ1		1972 11 04.00764	04	00	42.06	+35	42	09.2			033
1972 VA2	*	1972 11 03.96111	04	01	37.35	+37	40	22.3	17.4R		033
1972 VA2		1972 11 04.00764	04	01	35.35	+37	40	31.4			033
1972 VB2	*	1972 11 03.96111	04	04	55.96	+36	16	26.2	16.9R		033
1972 VB2		1972 11 04.00764	04	04	53.93	+36	16	38.3			033
1972 VC2	*	1972 11 03.96111	04	06	24.56	+35	19	10.2	17.0R		033
1972 VC2		1972 11 04.00764	04	06	22.61	+35	19	10.9			033
1972 VD2	*	1972 11 03.96111	04	07	01.94	+35	16	52.7	17.5R		033
1972 VD2		1972 11 03.99167	04	07	00.70	+35	16	49.9			033
1972 VE2	*	1972 11 03.96111	04	08	26.40	+36	32	10.9	18.3R		033
1972 VE2		1972 11 03.99167	04	08	24.43	+36	32	10.2			033

1975	CH	*	1975	02	08.75625	03	50	13.40	+36	42	32.2	17.1R	033
1975	CH		1975	02	08.79444	03	50	15.79	+36	42	26.2		033
1975	CJ	*	1975	02	08.75625	03	52	06.00	+36	59	39.0	17.7R	033
1975	CJ		1975	02	08.79444	03	52	08.54	+36	59	08.1	W	033
1975	CK	*	1975	02	08.75625	03	52	38.22	+35	07	04.0	16.5R	033
1975	CK		1975	02	08.79444	03	52	40.76	+35	06	55.3		033
1975	CL	*	1975	02	08.75625	03	55	09.46	+36	58	25.3	16.8R	033
1975	CL		1975	02	08.79444	03	55	11.04	+36	58	14.1		033
1979	FU2		1987	11	23.98542	03	49	48.60	+24	50	39.2	18.2V	033
1979	FU2		1987	11	23.99931	03	49	47.88	+24	50	38.9		033
1981	VP2		1987	12	22.90556	06	04	47.85	+23	02	19.4		033
1981	VP2		1987	12	25.01111	06	02	44.49	+23	05	00.3		033
1981	VP2		1987	12	25.03889	06	02	42.79	+23	05	02.9		033
1985	CR2		1987	12	22.90556	06	05	00.23	+23	37	00.1	17.3	033
1985	CR2		1987	12	25.01111	06	02	31.99	+23	36	29.2		033
1985	CR2		1987	12	25.03889	06	02	29.88	+23	36	28.9		033
1987	WT1		1987	12	22.90556	06	06	08.68	+23	02	58.0	18.2	033
1987	WT1		1987	12	25.01111	06	04	14.60	+23	06	11.8		033
1987	WT1		1987	12	25.03889	06	04	13.11	+23	06	15.9		033
1987	WV1		1987	12	22.90556	06	03	28.81	+22	04	23.8	18.1	033
1987	WV1		1987	12	25.01111	06	01	04.28	+22	05	44.1		033
1987	WV1		1987	12	25.03889	06	01	02.33	+22	05	45.1		033
1987	WN2	*	1987	11	26.11493	06	17	35.37	+31	51	48.0	17.3	033
1987	WN2		1987	11	26.14062	06	17	34.25	+31	51	51.2		033
1987	WO2	*	1987	11	26.11493	06	21	27.01	+31	00	47.1	18.2	033
1987	WO2		1987	11	26.14062	06	21	26.18	+31	00	45.2		033
1987	WP2	*	1987	11	26.11493	06	22	03.04	+31	44	48.6	16.2 I	033
1987	WP2		1987	11	26.14062	06	22	02.21	+31	44	55.9		033
1987	WQ2	*	1987	11	26.11493	06	24	23.66	+32	37	48.2	18.7	033
1987	WQ2		1987	11	26.14062	06	24	22.59	+32	37	53.0		033
1987	WR2	*	1987	11	26.11493	06	27	20.74	+31	43	31.9	17.6	033
1987	WR2		1987	11	26.14062	06	27	19.74	+31	43	31.3		033
1987	WS2	*	1987	11	26.11493	06	27	23.68	+30	09	35.0	18.5	033
1987	WS2		1987	11	26.14062	06	27	22.68	+30	09	38.3		033
1987	WT2	*	1987	11	26.11493	06	27	26.96	+29	32	08.7	19.1	033
1987	WT2		1987	11	26.14062	06	27	25.96	+29	32	14.2		033
1987	WO3	*	1987	11	23.98542	03	40	04.56	+23	27	06.2	15.4V	033
1987	WO3		1987	11	23.99931	03	40	03.80	+23	27	06.7		033
1987	WP3	*	1987	11	23.98542	03	40	27.09	+22	21	30.0	17.8V	033
1987	WP3		1987	11	23.99931	03	40	26.26	+22	21	31.8		033
1987	WQ3	*	1987	11	23.98542	03	46	50.24	+23	51	21.9	16.4V	033
1987	WQ3		1987	11	23.99931	03	46	49.33	+23	51	22.8		033
1987	XH	*	1987	12	15.93056	03	39	34.42	+24	36	40.4	18.0V	033
1987	XH		1987	12	15.95208	03	39	33.21	+24	36	37.4		033
1987	XJ	*	1987	12	15.93056	03	43	25.92	+24	21	01.0	17.2V	033
1987	XJ		1987	12	15.95208	03	43	25.08	+24	20	55.3		033
1987	XK	*	1987	12	15.93056	03	44	54.20	+24	07	03.3	18.7V	033
1987	XK		1987	12	15.95208	03	44	53.01	+24	07	03.3		033
1987	XL	*	1987	12	15.93056	03	45	52.02	+25	01	49.4	18.3V	033
1987	XL		1987	12	15.95208	03	45	50.96	+25	01	52.4		033
1987	XM	*	1987	12	15.93056	03	49	50.01	+23	33	32.2	16.6V	033
1987	XM		1987	12	15.95208	03	49	48.97	+23	33	22.1		033
1987	YZ	*	1987	12	22.90556	05	53	42.07	+21	38	04.6	17.1	033
1987	YA1	*	1987	12	22.90556	05	53	43.60	+23	37	14.4	19.2	033
1987	YB1	*	1987	12	22.90556	05	57	06.14	+22	40	02.4	17.6	033
1987	YC1	*	1987	12	22.90556	05	58	58.31	+23	03	00.6	19.1	033
1987	YC1		1987	12	25.01111	05	56	58.64	+23	03	10.3	V	033
1987	YC1		1987	12	25.03889	05	56	57.06	+23	03	10.1		033

1987	YD1	*	1987	12	22.90556	06	00	43.68	+22 57 57.0	18.9	033
1987	YD1		1987	12	25.01111	05	58	49.95	+22 58 56.3		033
1987	YD1		1987	12	25.03889	05	58	48.36	+22 58 57.7		033
1987	YE1	*	1987	12	22.90556	06	00	57.63	+24 16 21.2	18.0	033
1987	YE1		1987	12	25.01111	05	58	36.38	+24 13 31.9		033
1987	YE1		1987	12	25.03889	05	58	34.44	+24 13 29.7		033
1987	YF1	*	1987	12	22.90556	06	01	07.16	+22 59 22.4	19.3	033
1987	YG1	*	1987	12	22.90556	06	03	57.15	+22 22 56.0	18.3	033
1987	YG1		1987	12	25.01111	06	02	01.80	+22 24 32.9		033
1987	YG1		1987	12	25.03889	06	02	00.24	+22 24 33.4		033
1987	YH1	*	1987	12	25.01111	06	05	33.72	+22 26 20.1	19.4	033
1987	YH1		1987	12	25.03889	06	05	32.00	+22 26 19.0		033
1987	YJ1	*	1987	12	25.01111	06	07	01.46	+22 50 25.7	17.4	033
1987	YJ1		1987	12	25.03889	06	06	59.06	+22 50 01.5		033
1987	YK1	*	1987	12	25.01111	06	08	46.40	+21 45 15.1	18.1	033
1987	YK1		1987	12	25.03889	06	08	44.30	+21 45 18.5		033
157			1987	11	26.11493	06	23	23.46	+30 18 47.0	15.1	033
157			1987	11	26.14062	06	23	22.64	+30 19 01.8		033
910			1987	12	15.93056	03	43	44.54	+23 24 33.1	15.5V	033
910			1987	12	15.95208	03	43	43.50	+23 24 31.8		033
955			1972	11	03.96111	04	04	12.76	+34 51 55.5	15.7R	033
955			1972	11	04.00764	04	04	10.57	+34 51 55.9		033
1183			1987	12	15.93056	03	48	11.39	+23 33 39.4	15.9V	033
1183			1987	12	15.95208	03	48	10.17	+23 33 35.6		033
2525			1987	12	22.90556	06	00	07.50	+23 41 54.5	15.7	033
2525			1987	12	25.01111	05	58	08.65	+23 43 44.3		033
2525			1987	12	25.03889	05	58	07.08	+23 43 45.3		033
3313			1987	12	25.01111	06	08	17.29	+23 27 17.9	17.6	033
3313			1987	12	25.03889	06	08	15.53	+23 27 13.2		033
3526			1987	11	26.11493	06	21	57.79	+31 29 10.6	18.0	033
3526			1987	11	26.14062	06	21	56.73	+31 29 15.8		033
3584			1987	11	23.98542	03	39	47.03	+22 39 50.6	16.6V	033
3584			1987	11	23.99931	03	39	46.46	+22 39 47.4		033
3588			1987	11	26.11493	06	27	22.38	+32 17 29.1	16.7	033
3588			1987	11	26.14062	06	27	21.58	+32 17 30.7		033

046 Klet
A. Mrkos, Dept. of Astronomy and Astrophysics, Charles University,
Svedska 8, C-15000 Prague 5, Czechoslovakia
Observers A. Mrkos, Z. Vavrova
0.6-m Maksutov reflector

1979	TA		1987	12	14.89236	05	04	53.46	+25 39 59.0	16.9	046
1979	TA		1987	12	14.90405	05	04	52.57	+25 40 01.1		046
1979	TA		1987	12	15.82350	05	03	50.54	+25 37 28.2		046
1979	TA		1987	12	15.83819	05	03	49.46	+25 37 28.9		046
1983	QA		1987	12	14.84074	04	46	32.76	+36 41 37.0		046
1983	QA		1987	12	14.85567	04	46	31.69	+36 41 32.6		046
1983	TE1		1987	11	23.84225	02	33	22.25	+11 19 04.7		046
1986	RG1		1987	12	15.88032	05	48	13.19	+20 21 00.3	16.5	046
1986	RG1		1987	12	15.89456	05	48	12.24	+20 20 59.9		046
1986	RG1		1987	12	22.97586	05	41	25.70	+20 18 12.7		046
1986	RG1		1987	12	22.99003	05	41	24.90	+20 18 11.9		046
1987	XN	*	1987	12	14.77164	00	53	21.08	+06 43 47.2		046
1987	XN		1987	12	14.78414	00	53	20.78	+06 43 44.9		046
1987	XO	*	1987	12	14.89236	04	59	48.32	+26 31 53.5	16.5	046
1987	XO		1987	12	14.90405	04	59	47.48	+26 31 58.7		046
1987	XO		1987	12	15.82350	04	58	44.72	+26 37 11.4		046
1987	XO		1987	12	15.83819	04	58	43.60	+26 37 16.3		046
1987	XO		1987	12	22.90265	04	50	59.96	+27 14 47.6		046

1987	XO		1987	12	22.91677	04	50	58.97	+27	14	51.6		046
1987	XP	*	1987	12	14.89236	05	04	15.82	+25	51	44.6	17.1	046
1987	XP		1987	12	14.90405	05	04	14.96	+25	51	50.2		046
1987	XQ	*	1987	12	14.89236	05	04	33.91	+25	03	53.9		046
1987	XQ		1987	12	14.90405	05	04	33.42	+25	03	53.2		046
1987	XQ		1987	12	15.82350	05	03	43.70	+24	59	03.6		046
1987	XQ		1987	12	15.83819	05	03	43.03	+24	58	55.1		046
1987	XR	*	1987	12	14.89236	05	09	52.27	+23	46	37.2	16.8	046
1987	XR		1987	12	14.90405	05	09	51.58	+23	46	34.3		046
1987	XR		1987	12	15.82350	05	08	48.27	+23	43	48.6		046
1987	XR		1987	12	15.83819	05	08	47.52	+23	43	49.7		046
1987	XS	*	1987	12	14.89236	05	11	46.73	+24	20	43.4	16.6	046
1987	XS		1987	12	14.90405	05	11	45.96	+24	20	41.5		046
1987	XS		1987	12	15.82350	05	10	44.61	+24	19	49.4	17.0	046
1987	XS		1987	12	15.83819	05	10	43.86	+24	19	48.8		046
1987	XS		1987	12	15.95012	05	10	35.68	+24	19	41.9		046
1987	XS		1987	12	15.96499	05	10	34.90	+24	19	39.4		046
1987	XT	*	1987	12	15.82350	05	04	45.30	+26	11	20.3	16.7	046
1987	XT		1987	12	15.83819	05	04	44.37	+26	11	22.1		046
1987	XU	*	1987	12	15.88032	05	50	31.10	+21	30	11.3		046
1987	XU		1987	12	15.89456	05	50	30.15	+21	30	03.3		046
1987	XV	*	1987	12	15.91487	06	39	51.08	+17	46	41.9	16.7	046
1987	XV		1987	12	15.92905	06	39	50.28	+17	46	43.1		046
1987	XW	*	1987	12	15.95012	05	14	57.55	+25	02	36.4	16.9	046
1987	XW		1987	12	15.96499	05	14	57.29	+25	02	46.9		046
1987	XX	*	1987	12	15.95012	05	18	54.81	+22	52	46.7	16.8	046
1987	XX		1987	12	15.96499	05	18	54.29	+22	52	54.0		046
1987	XX		1987	12	23.80080	05	09	10.15	+23	19	20.8	17.1	046
1987	XX		1987	12	23.81498	05	09	09.18	+23	19	23.9		046
1987	XY	*	1987	12	15.95012	05	19	06.98	+25	21	43.6	16.7	046
1987	XY		1987	12	15.96499	05	19	06.04	+25	21	43.1		046
1987	XZ	*	1987	12	15.95012	05	19	56.18	+25	48	30.1	16.6	046
1987	XZ		1987	12	15.96499	05	19	55.31	+25	48	32.4		046
1987	XZ		1987	12	23.80080	05	12	39.38	+26	06	04.2		046
1987	XZ		1987	12	23.81498	05	12	38.66	+26	06	06.8		046
1987	XA1	*	1987	12	15.95012	05	20	58.07	+24	16	59.8	16.7	046
1987	XA1		1987	12	15.96499	05	20	57.40	+24	16	58.2		046
1987	XB1	*	1987	12	15.95012	05	22	23.08	+23	27	57.7	16.8	046
1987	XB1		1987	12	15.96499	05	22	22.10	+23	27	57.3		046
1987	YM	*	1987	12	22.90265	05	02	24.61	+24	20	45.8	17.0	046
1987	YM		1987	12	22.91677	05	02	23.63	+24	20	53.7		046
1987	YN	*	1987	12	22.90265	05	03	08.52	+27	23	36.5	17.0	046
1987	YN		1987	12	22.91677	05	03	07.58	+27	23	36.5		046
1987	YO	*	1987	12	22.93911	05	12	02.34	+26	28	49.6	17.0	046
1987	YO		1987	12	22.95323	05	12	01.41	+26	28	55.0		046
1987	YP	*	1987	12	22.97586	05	41	51.94	+22	30	38.2	16.8	046
1987	YP		1987	12	22.99003	05	41	51.12	+22	30	39.9		046
1987	YQ	*	1987	12	22.97586	05	47	07.06	+18	47	26.7		046
1987	YQ		1987	12	22.99003	05	47	06.18	+18	47	26.5		046
1987	YR	*	1987	12	23.80080	05	03	43.72	+25	38	26.9	17.1	046
1987	YR		1987	12	23.81498	05	03	42.73	+25	38	28.9		046
1987	YS	*	1987	12	23.83587	05	28	20.21	+25	01	43.0	16.8	046
1987	YS		1987	12	23.84999	05	28	19.30	+25	01	49.2		046
1987	YT	*	1987	12	23.83587	05	29	11.61	+23	56	52.1	16.7	046
1987	YT		1987	12	23.84999	05	29	10.72	+23	56	50.3		046
1987	YU	*	1987	12	23.83587	05	30	03.36	+24	04	30.7	16.7	046
1987	YU		1987	12	23.84999	05	30	02.51	+24	04	31.5		046
1987	YV	*	1987	12	23.83587	05	31	45.20	+22	46	36.2	16.9	046
1987	YV		1987	12	23.84999	05	31	44.27	+22	46	42.4		046

1987	YW	*	1987	12	23.83587	05 33 36.39	+23 22 38.7		16.8	046
1987	YW		1987	12	23.84999	05 33 35.35	+23 22 42.8			046
2402	T-3		1987	12	14.89236	05 11 09.88	+26 28 37.6		16.9	046
2402	T-3		1987	12	14.90405	05 11 08.94	+26 28 39.6			046
2402	T-3		1987	12	15.82350	05 09 59.95	+26 26 32.1			046
2402	T-3		1987	12	15.83819	05 09 59.22	+26 26 33.6			046
228			1987	12	23.83587	05 24 26.86	+26 25 59.9			046
228			1987	12	23.84999	05 24 25.81	+26 25 58.1			046
1494			1987	12	15.88032	05 52 13.72	+18 58 41.6			046
1494			1987	12	15.89456	05 52 12.78	+18 58 40.5			046
1878			1987	12	15.88032	05 51 26.31	+20 45 30.6			046
1878			1987	12	15.89456	05 51 25.48	+20 45 30.5			046
1878			1987	12	22.97586	05 44 38.31	+20 42 40.1			046
1878			1987	12	22.99003	05 44 37.50	+20 42 39.2			046
2515			1987	12	15.95012	05 19 45.30	+26 01 29.1			046
2515			1987	12	15.96499	05 19 44.24	+26 01 32.8			046
2515			1987	12	22.93911	05 13 19.05	+26 04 25.0			046
2515			1987	12	22.95323	05 13 18.34	+26 04 25.7			046
2515			1987	12	23.80080	05 12 33.94	+26 04 37.1			046
2515			1987	12	23.81498	05 12 33.25	+26 04 37.4			046
2519			1987	12	23.83587	05 19 52.70	+23 08 38.2			046
2519			1987	12	23.84999	05 19 51.87	+23 08 37.3			046
2533			1987	12	15.88032	05 48 32.47	+21 09 39.9			046
2533			1987	12	15.89456	05 48 31.65	+21 09 38.6			046
2533			1987	12	22.97586	05 42 04.02	+21 05 34.6			046
2533			1987	12	22.99003	05 42 03.19	+21 05 34.2			046
2739			1987	12	15.95012	05 20 22.71	+23 19 16.1		16.8	046
2739			1987	12	15.96499	05 20 21.98	+23 19 17.8			046

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H. G. Fogh Olsen, Copenhagen University Observatory, Brorfelde,
DK-4340 Tollose, Denmark
Observers K. Augustesen, P. Jensen
Measurer P. Jensen
0.45-m Schmidt

6048	P-L		1987	10	02.96780	00 51 49.15	+10 20 25.9		17.0	054

071 Bulgarian National Observatory
E. W. Elst, Royal Observatory, B-1180 Brussels, Belgium
Observers E. W. Elst, V. Shkodrov, V. Ivanova

1940	RG		1987	08	30.02771	22 59 15.81	+06 33 30.4			071
1940	RG		1987	08	30.89750	22 58 39.40	+06 29 39.3			071
1987	OT1	*	1987	07	30.83333	18 54 22.96	+00 22 58.0			071
1987	OT1		1987	07	30.86887	18 54 21.73	+00 22 42.7			071
1987	OU1	*	1987	07	30.85174	18 21 01.25	+03 01 56.0			071
1987	OU1		1987	07	30.88680	18 20 59.59	+03 01 17.4			071
1987	QD9	*	1987	08	30.73622	23 03 15.93	+03 37 30.7			071
1987	QE9	*	1987	08	31.00965	22 22 39.19	+12 15 46.2			071
1987	QF9	*	1987	08	31.88604	20 43 37.98	-28 26 21.6			071
1987	QF9		1987	08	31.93014	20 43 35.18	-28 26 23.0			071
1987	SJ6		1987	09	19.94149	00 32 49.70	-00 04 09.5		17.5	071
1987	SJ6		1987	09	19.98449	00 32 47.52	-00 04 16.7			071
1987	SH11	*	1987	09	22.03457	01 31 05.00	+03 39 01.2			071
1987	SH11		1987	09	22.04927	01 31 04.14	+03 39 01.4			071
36			1987	09	22.89185	22 13 53.36	-21 06 44.7			071
92			1987	08	02.96528	21 03 54.50	-24 28 00.2			071
92			1987	08	03.01493	21 03 52.06	-24 28 20.0			071
92			1987	08	03.92292	21 03 10.40	-24 33 50.1			071
92			1987	08	03.95810	21 03 08.25	-24 34 04.0			071

92		1987 08 05.00557	21	02	20.26	-24	40	17.2		071
92		1987 08 31.88604	20	43	33.69	-26	40	39.5		071
92		1987 08 31.93014	20	43	32.16	-26	40	46.3		071
92		1987 08 31.95358	20	43	31.30	-26	40	51.0		071
92		1987 09 01.90417	20	43	02.35	-26	43	21.4		071
92		1987 09 01.95486	20	43	00.63	-26	43	26.6		071
161		1987 09 02.02025	00	50	50.69	-01	03	52.2		071
161		1987 09 02.07014	00	50	49.42	-01	03	49.6		071
272		1987 08 02.96528	21	18	27.91	-22	53	44.0		071
272		1987 08 03.01493	21	18	25.45	-22	53	54.1		071
272		1987 08 03.92292	21	17	37.42	-22	57	32.6		071
272		1987 08 03.95810	21	17	35.61	-22	57	39.5		071
272		1987 08 05.00557	21	16	40.89	-23	01	40.8		071
566		1987 08 02.96528	21	12	14.14	-22	06	37.0		071
566		1987 08 03.01493	21	12	11.91	-22	06	49.3		071
566		1987 08 03.92292	21	11	31.71	-22	10	38.5		071
566		1987 08 03.95810	21	11	29.93	-22	10	47.1		071
566		1987 08 05.00557	21	10	43.93	-22	15	04.0		071
566		1987 08 31.95358	20	51	54.15	-23	39	10.0		071
566		1987 09 01.90417	20	51	22.64	-23	40	53.1		071
566		1987 09 01.95486	20	51	20.96	-23	40	58.5		071
682		1987 07 30.91157	20	39	43.85	+00	40	18.8		071
682		1987 08 02.94253	20	37	25.46	+00	21	16.6		071
682		1987 08 02.99462	20	37	22.92	+00	20	53.2		071
682		1987 08 03.03235	20	37	21.06	+00	20	38.2		071
682		1987 08 03.90382	20	36	41.89	+00	14	44.5		071
682		1987 08 03.94005	20	36	40.16	+00	14	28.6		071
1122		1987 09 22.03457	01	37	52.82	+02	18	45.5		071
1122		1987 09 22.04927	01	37	52.40	+02	18	43.7		071
1736		1988 01 18.77905	01	40	50.96	+04	58	06.6		071
1736		1988 01 18.81435	01	40	54.51	+04	58	29.8		071

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E. W. Elst, Royal Observatory, B-1180 Brussels, Belgium
Observers M. J. Bester, Sanders, Denoyelle
Measurer E. W. Elst
ADH telescope

1969 LK	*	1969 06 12.81657	16	39	31.60	-39	59	58.9	17.5	074
1969 LK		1969 06 12.83741	16	39	29.97	-40	00	05.6		074
1969 LK		1969 06 12.85824	16	39	28.02	-40	00	13.9		074
1969 LK		1969 06 12.86506	16	39	27.03	-40	00	17.5		074
1969 LK		1969 06 12.88589	16	39	26.11	-40	00	20.5		074
1969 LK		1969 06 12.90672	16	39	25.11	-40	00	26.0		074
1969 OF1	*	1969 07 20.81324	18	09	13.56	-17	56	21.0	17.5	074
1969 OF1		1969 07 20.83407	18	09	12.88	-17	56	21.6		074
1969 OF1		1969 07 20.85491	18	09	12.08	-17	56	22.8		074
1969 OF1		1969 07 20.86172	18	09	12.02	-17	56	22.6		074
1969 OF1		1969 07 20.88256	18	09	11.37	-17	56	24.4		074
1969 OF1		1969 07 20.90339	18	09	10.63	-17	56	24.9		074
1969 OG1	*	1969 07 20.81324	18	17	28.61	-19	14	49.2	17	074
1969 OG1		1969 07 20.83407	18	17	27.64	-19	14	49.4		074
1969 OG1		1969 07 20.85491	18	17	26.57	-19	14	48.9		074
1969 OG1		1969 07 20.86172	18	17	25.98	-19	14	50.8		074
1969 OG1		1969 07 20.88256	18	17	25.19	-19	14	50.3		074
1969 OG1		1969 07 20.90339	18	17	24.31	-19	14	50.3		074
1969 OH1	*	1969 07 20.81324	18	18	21.88	-18	41	41.6	18	074
1969 OH1		1969 07 20.83407	18	18	21.26	-18	41	39.9		074
1969 OH1		1969 07 20.85491	18	18	20.70	-18	41	37.4		074
1969 OH1		1969 07 20.86172	18	18	20.02	-18	41	35.8		074

```
1969 OH1   1969 07 20.88256  18 18 19.45  -18 41 35.3                    074
1969 OH1   1969 07 20.90339  18 18 18.95  -18 41 32.4                    074
1969 OJ1 * 1969 07 20.81324  18 18 22.88  -17 20 12.1           17       074
1969 OJ1   1969 07 20.83407  18 18 22.25  -17 20 12.7                    074
1969 OJ1   1969 07 20.85491  18 18 21.56  -17 20 14.2                    074
1969 OJ1   1969 07 20.86172  18 18 20.93  -17 20 16.3                    074
1969 OJ1   1969 07 20.88256  18 18 20.16  -17 20 17.8                    074
1969 OJ1   1969 07 20.90339  18 18 19.45  -17 20 19.5                    074
1969 OK1 * 1969 07 20.81324  18 19 25.33  -18 20 58.3           17       074
1969 OK1   1969 07 20.83407  18 19 24.45  -18 20 58.5                    074
1969 OK1   1969 07 20.85491  18 19 23.43  -18 20 56.2                    074
1969 OK1   1969 07 20.86172  18 19 23.11  -18 20 56.1                    074
1969 OK1   1969 07 20.88256  18 19 22.17  -18 20 55.5                    074
1969 OK1   1969 07 20.90339  18 19 21.19  -18 20 54.6                    074
1980 TL15  1969 07 20.81324  18 15 38.21  -17 58 24.6           17       074
1980 TL15  1969 07 20.83407  18 15 37.29  -17 58 28.8                    074
1980 TL15  1969 07 20.85491  18 15 36.18  -17 58 32.6                    074
1980 TL15  1969 07 20.86172  18 15 35.68  -17 58 34.0                    074
1980 TL15  1969 07 20.88256  18 15 34.54  -17 58 37.4                    074
1980 TL15  1969 07 20.90339  18 15 33.67  -17 58 40.5                    074
 685       1969 07 20.81324  18 18 17.66  -17 13 48.0           16       074
 685       1969 07 20.83407  18 18 16.87  -17 13 48.4                    074
 685       1969 07 20.85491  18 18 16.00  -17 13 47.6                    074
 685       1969 07 20.86172  18 18 15.60  -17 13 47.5                    074
 685       1969 07 20.88256  18 18 14.85  -17 13 47.0                    074
 685       1969 07 20.90339  18 18 14.02  -17 13 46.0                    074
1002       1969 06 12.81657  16 43 01.44  -39 37 13.3           16       074
1002       1969 06 12.83741  16 43 00.08  -39 37 08.6                    074
1002       1969 06 12.85824  16 42 58.59  -39 37 03.9                    074
1002       1969 06 12.86506  16 42 58.28  -39 37 03.9                    074
1002       1969 06 12.88589  16 42 56.86  -39 37 01.6                    074
1002       1969 06 12.90672  16 42 55.49  -39 36 58.3                    074
1404       1969 07 04.80707  16 48 04.15  -43 07 16.3           17       074
1404       1969 07 04.82791  16 48 03.48  -43 07 12.8                    074
1404       1969 07 04.84874  16 48 02.94  -43 07 08.9                    074
1404       1969 07 07.75248  16 46 35.24  -42 58 06.8                    074
1404       1969 07 07.77331  16 46 34.54  -42 58 04.7                    074
1404       1969 07 07.79414  16 46 33.98  -42 58 00.4                    074

293 Burlington remote site
T. Handley, 13 Linden Avenue, Burlington, NJ 08016, U.S.A.
0.20-m f/4.0 astrograph
SAOC
1982 XV1   1987 10 23.30278  02 10 40.27  +01 16 51.8                    293
1982 XV1   1987 10 23.31944  02 10 39.22  +01 16 48.6                    293
1984 AP    1987 10 23.25243  02 06 38.94  +34 34 40.6                    293
1984 AP    1987 10 23.26910  02 06 37.83  +34 34 38.7                    293
2378       1987 10 23.30278  02 09 44.50  +01 07 17.1                    293
2378       1987 10 23.31944  02 09 43.78  +01 07 06.9                    293
3730       1987 10 23.19861  01 45 20.80  +23 35 56.1                    293
3730       1987 10 23.21458  01 45 19.93  +23 35 51.6                    293

372 Geisei
T. Seki, Kamimachi 2-9-35, Kochi, Japan
0.60-m reflector
1983 BE    1988 01 11.57743  08 13 05.69  +20 34 53.2           18       372
1983 BE    1988 01 11.58924  08 13 05.18  +20 34 57.4                    372
1987 WY    1987 12 14.47118  04 33 00.17  +13 03 49.0           17       372
1987 WY    1987 12 14.48924  04 32 59.21  +13 03 40.3                    372
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1987	WY		1987	12	21.61840	04	27	22.27	+12	18	46.7	16.5	372
1987	WY		1987	12	21.63020	04	27	21.72	+12	18	41.3		372
1987	WY		1987	12	25.61215	04	24	46.42	+11	58	12.9	16.5	372
1987	WY		1987	12	25.62396	04	24	46.06	+11	58	09.3		372
1987	XC		1987	12	19.58958	03	02	50.80	+21	50	49.7	18	372
1987	XC		1987	12	19.60000	03	02	50.42	+21	50	52.9		372
1987	XC		1987	12	25.58403	03	00	17.23	+22	15	17.7	18	372
1987	XC		1987	12	25.59792	03	00	16.77	+22	15	21.1		372
1987	XC		1988	01	13.53924	03	00	26.61	+23	38	28.9	20	372
1987	XC		1988	01	13.55486	03	00	26.61	+23	38	30.1		372
1987	YJ	*	1987	12	19.70521	07	52	35.28	+25	51	52.8	17	372
1987	YJ		1987	12	19.71632	07	52	34.97	+25	51	54.0		372
1987	YJ		1987	12	21.64444	07	51	07.62	+25	52	56.2	17	372
1987	YJ		1987	12	21.66042	07	51	06.96	+25	52	57.7		372
1987	YJ		1987	12	23.66667	07	49	27.22	+25	54	01.0	17	372
1987	YJ		1987	12	23.68125	07	49	26.43	+25	54	03.6		372
1987	YJ		1987	12	25.66944	07	47	40.02	+25	55	02.0	17	372
1987	YJ		1987	12	25.68333	07	47	39.12	+25	55	02.1		372
1987	YJ		1987	12	27.73681	07	45	41.55	+25	55	54.6	17	372
1987	YJ		1987	12	27.75243	07	45	40.54	+25	55	54.7		372
1987	YJ		1988	01	10.51910	07	30	08.28	+25	55	47.7	17	372
1987	YJ		1988	01	10.53125	07	30	07.78	+25	55	47.7		372
1987	YJ		1988	01	16.69792	07	22	36.87	+25	50	20.7	18	372
1987	YJ		1988	01	16.70833	07	22	36.32	+25	50	21.7		372
1987	YK	*	1987	12	19.70521	07	52	48.45	+25	45	50.3	17.5	372
1987	YK		1987	12	19.71632	07	52	48.05	+25	45	57.1		372
1987	YK		1987	12	21.64444	07	51	13.97	+25	54	33.7	18	372
1987	YK		1987	12	21.66042	07	51	13.40	+25	54	38.1		372
1987	YK		1987	12	23.66667	07	49	28.82	+26	03	45.5	18	372
1987	YK		1987	12	23.68125	07	49	28.60	+26	03	48.1		372
1987	YK		1987	12	25.66944	07	47	39.80	+26	12	46.5	18	372
1987	YK		1987	12	25.68333	07	47	39.12	+26	12	50.0		372
1987	YK		1987	12	27.73681	07	45	42.36	+26	21	59.8	18	372
1987	YK		1987	12	27.75243	07	45	41.36	+26	22	04.3		372
1987	YK		1988	01	13.57153	07	27	44.90	+27	28	36.5	17.5	372
1987	YK		1988	01	13.58646	07	27	43.72	+27	28	40.7		372
1988	AB	*	1988	01	11.60035	08	40	29.5	+10	45	35	16.5	372
1988	AB		1988	01	11.61076	08	40	29.0	+10	45	38		372

385 Nihondaira Observatory, Oohira Station
M. Kizawa, 1458-10, Minami Numagami, Shizuoka 420, Japan
Observers W. Kakkei, M. Kizawa, T. Urata
0.13-m hyperboloid astrocamera

1987	YF	*	1987	12	22.56458	07	56	53.25	+25	19	10.7	15.5	385
1987	YF		1987	12	22.62431	07	56	49.64	+25	19	06.4		385
1987	YF		1987	12	24.54375	07	54	55.12	+25	16	09.4		385
1987	YF		1987	12	24.60764	07	54	51.03	+25	16	05.6		385
1987	YF		1987	12	25.56597	07	53	52.05	+25	14	37.0		385
1987	YF		1987	12	25.65139	07	53	46.32	+25	14	22.9		385
1987	YF		1987	12	27.56458	07	51	44.39	+25	11	15.7		385
1987	YF		1987	12	27.60069	07	51	42.26	+25	11	08.1		385
1987	YF		1987	12	28.63681	07	50	34.22	+25	09	27.8		385
1987	YF		1987	12	28.67396	07	50	31.60	+25	09	24.1		385
1987	YF		1987	12	28.70278	07	50	29.70	+25	09	23.4		385
1987	YF		1988	01	09.48785	07	36	41.33	+24	45	50.6	16	385
1987	YF		1988	01	09.53819	07	36	37.60	+24	45	42.0		385
1987	YG	*	1987	12	22.56458	07	59	24.2	+25	06	38	16.0	385
1987	YG		1987	12	22.62431	07	59	20.7	+25	06	41		385

386 Yatsugatake-Kobuchizawa
O. Muramatsu, 119-1, 2-8 Sakurazutsumi, Musashino-city,
Tokyo 150, Japan
Observers M. Inoue, O. Muramatsu
0.31-m reflector

1987 YC		1987 12 26.70043	07 27 03.78	+23 36 53.3		16.0		386
1987 YC		1987 12 26.72387	07 27 02.18	+23 36 53.1				386
1987 YC		1987 12 27.65909	07 26 13.04	+23 36 20.3				386
1987 YC		1987 12 27.68270	07 26 11.70	+23 36 19.3				386
1988 BA	*	1988 01 16.65104	09 25 05.37	+24 45 54.6		17.0		386
1988 BA		1988 01 16.66285	09 25 04.13	+24 46 01.3				386

391 Sendai Observatory, Ayashi Station
M. Koishikawa, Sendai Municipal Observatory, 1-1 Sakuragaoka-koen,
Sendai 980, Japan
0.20-m reflector

1987 YA		1987 12 20.61771	04 44 06.57	+19 01 51.3			C	391
1987 YA		1987 12 22.51389	04 42 47.51	+18 57 31.1				391
1987 YA		1987 12 23.57292	04 42 06.06	+18 55 18.7		16.5		391
1987 YA		1987 12 23.57639	04 42 05.83	+18 55 20.2				391
1987 YA		1987 12 27.57292	04 39 51.29	+18 48 20.5		16.5		391
1987 YA		1987 12 27.57986	04 39 51.09	+18 48 20.1				391

399 Kushiro
H. Kaneda, 12-7-2, 1 Chome, Ishiyama 1 Jo, Minami-Ku,
Sapporo 005, Japan
Observers S. Ueda, M. Matsuyama
Measurers H. Kaneda, K. Watanabe
0.16-m reflector

1987 UB1		1987 12 12.36547	01 46 09.38	+17 24 14.9		15.5		399
1987 UB1		1987 12 12.38218	01 46 09.71	+17 24 17.1				399
1987 VC		1987 12 12.50502	02 27 46.52	+22 45 43.4		16.5		399
1987 VC		1987 12 12.52575	02 27 46.05	+22 45 40.4				399
1987 VC		1987 12 12.54653	02 27 45.57	+22 45 38.5				399
1987 WE1		1987 12 12.36547	01 43 49.83	+16 46 06.4		16		399
1987 WE1		1987 12 12.38218	01 43 49.93	+16 46 09.7				399
1988 AC	*	1988 01 10.51678	07 29 53.35	+10 35 24.7		15.5		399
1988 AC		1988 01 10.53229	07 29 52.35	+10 35 24.4				399
1988 AC		1988 01 10.54965	07 29 51.38	+10 35 25.3				399
1988 AC		1988 01 10.56227	07 29 50.66	+10 35 25.4				399
1988 AC		1988 01 11.52431	07 28 57.40	+10 35 48.0				399
1988 AC		1988 01 11.54144	07 28 56.46	+10 35 48.4		15.5		399
1988 AC		1988 01 11.55632	07 28 55.52	+10 35 49.4				399
1988 AC		1988 01 15.52384	07 25 14.77	+10 38 36.6		15.5		399
1988 AC		1988 01 15.53958	07 25 13.79	+10 38 37.7				399
1988 AC		1988 01 15.55880	07 25 12.6	+10 38 41				399
1988 AC		1988 01 17.50000	07 23 25.44	+10 40 42.5		15.5		399
1988 AC		1988 01 17.51597	07 23 24.55	+10 40 44.2				399
1988 AC		1988 01 17.53316	07 23 23.71	+10 40 44.4				399
1988 AD	*	1988 01 10.51678	07 40 13.86	+09 27 06.9		16		399
1988 AD		1988 01 10.53229	07 40 13.00	+09 27 11.1				399
1988 AD		1988 01 10.54965	07 40 12.22	+09 27 17.9				399
1988 AD		1988 01 11.52431	07 39 22.99	+09 32 08.3		16.5		399
1988 AD		1988 01 11.54144	07 39 22.16	+09 32 15.2				399
1988 AD		1988 01 11.55632	07 39 21.22	+09 32 20.9				399
1988 AD		1988 01 15.52384	07 35 59.83	+09 53 03.1		16		399
1988 AD		1988 01 15.53958	07 35 59.08	+09 53 05.9				399
1988 AD		1988 01 15.55880	07 35 58.12	+09 53 13.1				399
1988 AD		1988 01 17.50000	07 34 20.08	+10 03 50.0		16		399

1988	AD		1988	01	17.51597	07	34	19.14	+10	03	54.7		399
1988	AD		1988	01	17.53316	07	34	18.37	+10	04	01.5		399
1988	BG	*	1988	01	18.58229	07	52	47.73	+19	25	53.2	15.5	399
1988	BG		1988	01	18.59479	07	52	46.90	+19	25	52.6		399
1988	BG		1988	01	18.61059	07	52	45.80	+19	25	49.2		399
1988	BH	*	1988	01	18.58229	07	52	59.04	+19	33	04.6	16	399
1988	BH		1988	01	18.59479	07	52	58.29	+19	33	04.3		399
1988	BH		1988	01	18.61059	07	52	57.25	+19	33	04.0		399
374			1988	01	10.51678	07	40	13.24	+08	14	26.3	12.5	399
374			1988	01	10.53229	07	40	12.37	+08	14	26.4		399
374			1988	01	10.54965	07	40	11.44	+08	14	28.9		399
374			1988	01	11.52431	07	39	18.70	+08	15	23.7		399
374			1988	01	11.55632	07	39	16.95	+08	15	24.9		399
3244			1987	12	12.36547	01	44	17.45	+17	31	18.4	16	399
3244			1987	12	12.38218	01	44	17.76	+17	31	16.2		399
3719			1987	12	12.36547	01	47	37.42	+15	28	27.9	16.5	399
3719			1987	12	12.38218	01	47	37.64	+15	28	28.7		399

400 Kitami
H. Kaneda, 12-7-2, 1 Chome, Ishiyama 1 Jo, Minami-Ku,
Sapporo 005, Japan
Observers K. Endate, T. Fujii, K. Watanabe, M. Yanai
Measurers H. Kaneda, K. Watanabe
0.2-m reflector

1987	WR		1987	12	10.52153	04	22	42.19	+21	26	34.3	15	400
1987	WR		1987	12	10.53472	04	22	41.45	+21	26	31.6		400
1987	WR		1987	12	10.54375	04	22	40.86	+21	26	29.0		400
1987	WR		1987	12	14.54965	04	18	29.74	+21	11	36.7	15.5	400
1987	WR		1987	12	14.56493	04	18	28.85	+21	11	32.7		400
1987	WR		1987	12	14.57608	04	18	28.21	+21	11	30.5		400
1987	WR		1987	12	18.57361	04	14	36.37	+20	57	08.1	16	400
1987	WR		1987	12	18.58958	04	14	35.46	+20	57	05.3		400
1987	WR		1987	12	18.60417	04	14	34.57	+20	57	02.6		400
1987	WR		1987	12	23.48625	04	10	24.61	+20	40	41.6	16	400
1987	WR		1987	12	23.49944	04	10	23.90	+20	40	39.0		400
1987	WR		1987	12	23.52375	04	10	23.26	+20	40	38.2		400
1987	WS		1987	12	10.46389	02	14	43.98	+22	54	49.8	16.5	400
1987	WS		1987	12	10.48750	02	14	43.35	+22	54	46.5		400
1987	WS		1987	12	11.46875	02	14	18.20	+22	53	14.6	16	400
1987	WS		1987	12	11.48819	02	14	17.70	+22	53	14.3		400
1987	WS		1987	12	11.50833	02	14	17.17	+22	53	11.8		400
1987	XD		1987	12	21.60017	04	50	19.56	+12	52	49.6	16	400
1987	XD		1987	12	21.61944	04	50	18.52	+12	52	52.9		400
1987	XD		1987	12	21.63299	04	50	17.78	+12	52	54.6		400
1987	XF	*	1987	12	15.48750	04	02	08.69	+23	25	24.3	15.5	400
1987	XF		1987	12	15.51528	04	02	07.30	+23	25	14.5		400
1987	XF		1987	12	15.54306	04	02	06.17	+23	25	05.4		400
1987	XG	*	1987	12	15.48750	04	03	57.10	+24	06	18.8	16.5	400
1987	XG		1987	12	15.51528	04	03	55.97	+24	06	16.3		400
1988	AF	*	1988	01	11.56042	08	40	56.82	+16	07	39.2	16	400
1988	AF		1988	01	11.57795	08	40	55.66	+16	07	35.0		400
1988	AF		1988	01	11.59097	08	40	54.83	+16	07	31.6		400
440			1987	12	15.48750	04	03	01.99	+22	41	09.8	14.5	400
440			1987	12	15.51528	04	03	00.31	+22	41	03.8		400
440			1987	12	15.54306	04	02	58.72	+22	40	58.3		400
632			1987	12	15.48750	04	03	00.01	+23	48	20.1	16	400
632			1987	12	15.51528	04	02	58.68	+23	48	17.5		400
632			1987	12	15.54306	04	02	56.96	+23	48	12.1		400
2145			1987	12	23.60431	04	59	31.86	+24	08	04.9	15.5	400

2145	1987 12 23.61958	04 59 30.94	+24 08 00.7			400
2145	1987 12 23.63000	04 59 30.42	+24 07 57.8			400
2947	1987 12 15.48750	04 02 08.49	+23 48 46.5		15.5	400
2947	1987 12 15.51528	04 02 06.95	+23 48 37.6			400
2947	1987 12 15.54306	04 02 05.64	+23 48 27.9			400

474 Mount John
A. C. Gilmore, P.O. Box 57, Lake Tekapo, New Zealand
Observer A. C. Gilmore
Measurer P. M. Kilmartin
0.6-m f/14 Cassegrain reflector
AGK3, SAOC, CPZ, field plates from Carter Observatory

1986 TO	1987 10 25.54593	03 19 03.60	-55 44 33.8			474
1986 TO	1987 10 25.55947	03 19 01.31	-55 45 14.5			474
1986 TO	1987 10 31.42405	02 59 14.56	-60 23 12.5			474
1986 TO	1987 10 31.43366	02 59 12.24	-60 23 38.9			474
1986 TO	1987 11 18.51237	00 53 12.98	-70 26 56.0			474
1986 TO	1987 11 18.52522	00 53 04.74	-70 27 08.8			474

552 San Vittore
E. Colombini, Via S. Vittore 44, I-40136 Bologna, Italy
Observers C. Vacchi, G. Sassi
Measurers C. Vacchi, V. Goretti, E. Colombini
AGK3, SAOC

1986 OA	1987 12 11.84514	03 14 01.53	+25 22 26.1		17.0	552
1986 OA	1987 12 11.87431	03 14 00.15	+25 22 11.5			552
1986 OA	1987 12 23.92083	03 07 38.47	+23 43 20.1		17.3	552
1986 OA	1987 12 23.95417	03 07 37.57	+23 43 01.4			552

567 Osservatorio Chaonis
J. M. Baur, Via Zara 20, I-33083 Chions, Italy
Observers C. R. Baur, G. Carniel
Measurer J. M. Baur
0.6-m f/3 Wright reflector
AGK3, SAOC

1987 WA	1988 01 08.76389	03 04 17.39	+18 14 26.9		18.8V	567
1987 WA	1988 01 08.77778	03 04 17.47	+18 14 29.4			567
1987 WA	1988 01 09.78055	03 04 29.74	+18 17 14.5			567
1987 WA	1988 01 09.79583	03 04 29.91	+18 17 17.7			567
1987 WB	1988 01 08.79653	03 07 01.73	+14 55 38.9		18.2V	567
1987 WB	1988 01 08.81042	03 07 01.67	+14 55 37.4			567
1987 WB	1988 01 09.81736	03 07 03.95	+14 54 13.8			567
1987 WB	1988 01 09.85903	03 07 03.94	+14 54 10.7			567
1988 AA *	1988 01 09.91736	07 29 48.68	+17 27 20.2		17 V	567
1988 AA	1988 01 09.93125	07 29 47.92	+17 27 23.4			567

568 Mauna Kea Observatory
D. J. Tholen, Institute for Astronomy, 2680 Woodlawn Drive,
Honolulu, HI 96822, U.S.A.
Observer D. J. Tholen
2.24-m telescope encoders
AGK3, SAOC

588	1987 12 30.43846	06 18 58.23	+32 09 01.7		14.8V	568
1143	1987 12 30.48906	06 21 47.54	+20 06 19.1		14.9V	568
2212	1987 12 30.62606	13 57 31.58	+16 35 13.7		15.4V	568
2212	1987 12 30.64609	13 57 44.23	+16 33 54.1		15.3V	568
2212	1988 01 13.65844	16 31 24.38	-02 52 27.1			568
2260	1987 12 30.46003	05 53 58.67	+25 13 18.1		16.1V	568

2329		1988 01 13.23088	23 44 11.25	-18 21 46.9				17.3V	568
3063		1987 12 30.40693	06 05 59.56	+27 20 01.5				15.3V	568

657 Victoria, Climenhaga Observatory
J. B. Tatum, Dept. of Physics, University of Victoria, P.O. Box 1700, Victoria, BC, V8W 2Y2, Canada
Observers J. B. Tatum, D. D. Balam

1953	UD		1987 10 19.19097	22 55 31.69	+03 45 55.1						657
1953	UD		1987 10 19.28125	22 55 31.74	+03 44 57.5						657
1972	RF		1987 10 21.20174	23 08 37.99	-12 58 20.4						657
1985	JV1		1987 10 22.32194	03 54 31.88	+16 10 50.3						657
1985	JV1		1987 10 22.37264	03 54 29.89	+16 10 54.5						657
1987	UU2	*	1987 10 20.30875	01 08 50.23	+07 38 53.7				16.0		657
1987	UU2		1987 10 20.33444	01 08 48.94	+07 38 36.9						657
1987	UU2		1987 10 21.26326	01 08 00.26	+07 32 40.9						657
1987	UU2		1987 10 21.29521	01 07 58.50	+07 32 29.5						657
1987	UV2	*	1987 10 21.28271	01 07 10.69	+11 50 35.2				15.8		657
1987	UV2		1987 10 21.31535	01 07 08.53	+11 50 25.6						657
615			1987 10 20.33444	01 11 08.45	+08 13 13.5						657
615			1987 10 21.26326	01 10 19.77	+08 09 08.3						657
615			1987 10 21.29521	01 10 18.05	+08 09 01.1						657
921			1987 10 19.19097	22 59 14.45	+04 36 42.8						657
1288			1987 10 19.19097	22 59 45.20	+04 10 00.8						657
3236			1987 10 21.26326	01 09 14.69	+07 56 03.4						657
3236			1987 10 21.29521	01 09 12.75	+07 55 52.0						657

675 Palomar
J. Gibson, ITT/Federal Electric Corporation and Jet Propulsion Laboratory, MS 238-332, Pasadena, CA 91109, U.S.A. (1)
E. Helin, MS 183-501, Jet Propulsion Laboratory, Pasadena, CA 91109, U.S.A. (2)
C. Shoemaker, P.O. Box 984, Flagstaff, AZ 86002, U.S.A. (3)
C. J. van Houten, Sterrewacht Leiden, Postbus 9513, NL-2300 RA Leiden, The Netherlands (4)
E. Bowell, Lowell Observatory, 1400 West Mars Hill Road, Flagstaff, AZ 86001, U.S.A. (6)
Observers T. Gehrels (4, L), J. Gibson (1, C), E. Helin (2, S), R. Helin (2, S), C. Kowal (6, L), D. Schneeberger (2, S), C. Shoemaker (3, S), E. Shoemaker (3, S)
Measurers J. Alu (2), S. J. Bus (6), J. Gibson (1), C. Shoemaker (3), C. J. van Houten (4), I. van Houten-Groeneveld (4), T. Rodriquez (3)
1.5-m reflector + CCD (C), 1.2-m (L) and 0.46-m (S) Schmidt telescopes

1973	SM		1987 11 23.48993	06 02 36.60	+21 17 56.6				18	3	675
1973	SM		1987 11 24.52813	06 02 08.85	+21 17 37.4					3	675
1979	MR3		1985 02 20.27049	09 11 16.34	+20 19 14.3				19.2	6	675
1979	MR3		1985 02 23.32882	09 08 26.87	+20 38 01.4					6	675
1980	TN4		1987 11 16.33090	02 22 21.10	+14 25 43.6				17.0	2	675
1980	TN4		1987 11 20.31736	02 18 30.87	+14 13 27.2					2	675
1981	EB1		1979 12 20.36250	06 27 37.34	+20 57 35.9					6	675
1981	EB1		1979 12 20.41458	06 27 34.78	+20 57 39.0					6	675
1981	EC11		1979 12 20.36250	06 26 48.56	+24 46 33.9					6	675
1981	EC11		1979 12 20.41458	06 26 45.13	+24 46 31.2					6	675
1981	ET20		1985 02 20.27049	09 09 36.87	+25 52 03.5				19.8	6	675
1981	ET20		1985 02 23.32882	09 06 38.62	+25 47 56.0					6	675
1981	EC21		1985 02 20.27049	08 51 15.36	+24 33 55.2				19.5	6	675
1981	EC21		1985 02 23.32882	08 48 56.09	+24 33 10.0					6	675
1981	EB37		1985 02 20.29653	08 55 01.99	+25 56 36.3				19.8	6	675
1981	EB37		1985 02 23.32882	08 52 24.93	+25 55 45.0					6	675
1981	ES42		1985 02 20.27049	08 58 05.45	+20 03 38.0				19.2	6	675

1981	ES42		1985	02	23.32882	08	55	47.88	+20	09	19.0		6 675
1982	BG1		1977	10	11.26632	00	46	01.79	+15	26	00.0		C 675
1983	AJ		1987	11	22.21614	22	41	13.46	+20	13	30.8	17.2	3 675
1983	AJ		1987	11	23.12344	22	42	26.18	+20	10	06.7		3 675
1983	AF2		1987	11	22.21614	22	20	27.01	+24	20	36.8	17	3 675
1983	AF2		1987	11	23.12344	22	21	37.18	+24	19	12.2		3 675
1983	EA		1987	11	26.50607	08	01	23.89	+67	22	04.5	17.7	3 675
1983	EA		1987	11	26.53262	08	01	25.84	+67	22	35.3		3 675
1983	OD		1985	02	20.27049	08	55	20.13	+19	47	31.1	18.8	6 675
1983	OD		1985	02	23.32882	08	52	47.09	+20	09	03.0		6 675
1983	TL		1985	02	20.27049	09	11	01.95	+22	11	29.9	18.0	6 675
1983	TL		1985	02	23.32882	09	08	37.80	+22	16	34.3		6 675
1984	WK		1987	11	22.51094	07	29	01.15	+26	23	47.5	17.5	3 675
1984	WK		1987	11	26.54184	07	27	23.88	+25	52	36.4		3 675
1985	CG		1985	02	20.27049	08	49	30.80	+22	03	10.2	16.8	6 675
1985	CG		1985	02	23.32882	08	47	23.08	+22	12	59.9		6 675
1985	DM4	*	1985	02	20.27049	08	57	55.72	+23	19	35.5	17.5	6 675
1985	DM4		1985	02	23.32882	08	55	16.33	+23	26	07.3		6 675
1985	DN4	*	1985	02	20.27049	09	00	11.72	+21	06	22.4	18.0	6 675
1985	DN4		1985	02	23.32882	08	57	54.28	+21	18	56.0		6 675
1985	DO4	*	1985	02	20.27049	09	00	17.86	+19	49	12.8	17.8	6 675
1985	DO4		1985	02	23.32882	08	58	04.41	+19	58	57.4		6 675
1985	DP4	*	1985	02	20.27049	09	03	02.63	+24	44	59.3	17.0	6 675
1985	DP4		1985	02	23.32882	09	00	28.52	+24	39	32.6		6 675
1985	DQ4	*	1985	02	20.27049	09	04	15.12	+25	02	36.1	18.0	6 675
1985	DQ4		1985	02	23.32882	09	00	07.70	+24	16	23.2		6 675
1985	DR4	*	1985	02	20.27049	09	06	05.04	+20	42	06.5	17.8	6 675
1985	DR4		1985	02	23.32882	09	03	42.33	+20	51	49.6		6 675
1985	DS4	*	1985	02	20.27049	09	10	52.96	+20	16	55.7	17.5	6 675
1985	DS4		1985	02	23.32882	09	08	00.94	+20	31	36.0		6 675
1985	FA		1987	11	22.47378	05	29	30.29	+30	16	53.6	16	3 675
1985	FA		1987	11	22.51840	05	29	27.37	+30	17	50.0		3 675
1985	PA		1988	01	08.49178	15	21	56.13	+12	20	24.0		1 675
1985	PA		1988	01	08.49479	15	21	56.75	+12	20	29.3		1 675
1985	PA		1988	01	09.51412	15	25	36.82	+12	47	50.3		1 675
1985	PA		1988	01	09.51902	15	25	37.89	+12	47	58.3		1 675
1985	TE3		1987	11	22.50451	06	27	32.91	-00	31	27.8	16.5	3 675
1985	TE3		1987	11	22.54201	06	27	32.05	-00	31	36.1		3 675
1985	TF3		1987	11	22.54965	07	46	39.80	+27	11	16.7	18	3 675
1985	TF3		1987	11	26.51458	07	45	55.27	+27	15	43.6		3 675
1985	TG3		1987	11	22.52569	05	51	37.14	+33	34	46.7	18.3	3 675
1985	TG3		1987	11	23.48264	05	51	07.72	+33	34	49.2		3 675
1987	SD		1987	09	19.29167	23	23	12.22	+02	06	03.0	16.5	2 675
1987	SD		1987	09	19.34028	23	23	10.67	+02	05	17.0		2 675
1987	SD		1987	09	20.28125	23	22	41.22	+01	50	15.4		2 675
1987	SD		1987	09	20.32292	23	22	39.86	+01	49	35.7		2 675
1987	SL		1987	11	22.33350	00	17	45.25	+30	58	24.7	17	3 675
1987	SJ3		1987	11	23.20313	23	39	41.40	+07	29	00.6	17.5	3 675
1987	SJ3		1987	11	23.23125	23	39	41.60	+07	29	23.0		3 675
1987	SF7		1987	11	22.21614	22	37	43.43	+24	03	31.8	17	3 675
1987	SF7		1987	11	23.12344	22	39	28.74	+23	56	21.3		3 675
1987	SH7		1987	11	22.21614	22	38	26.30	+21	45	26.4	18	3 675
1987	SH7		1987	11	23.12344	22	39	40.46	+21	40	34.7		3 675
1987	SG11	*	1987	09	19.29167	23	23	25.76	+07	47	37.6	17.0	2 675
1987	SG11		1987	09	19.34028	23	23	22.67	+07	47	52.8		2 675
1987	SG11		1987	09	20.28125	23	22	25.53	+07	52	34.7		2 675
1987	SG11		1987	09	20.32292	23	22	22.86	+07	52	47.5		2 675
1987	SJ11	*	1987	09	19.29167	23	23	33.45	+03	24	07.9	16.5	2 675
1987	SJ11		1987	09	19.34028	23	23	31.52	+03	23	40.7		2 675

1987	SJ11		1987	09	20.28125	23	22	55.16	+03	15	07.2		2 675
1987	SJ11		1987	09	20.32292	23	22	53.50	+03	14	43.3		2 675
1987	UW		1987	11	19.41625	02	12	56.22	-03	40	39.7		1 675
1987	UW		1987	11	19.42111	02	12	56.05	-03	40	44.2		1 675
1987	UW		1987	11	19.42944	02	12	55.76	-03	40	51.6		1 675
1987	UT1		1987	11	23.20313	23	38	48.12	+08	54	32.1	19	3 675
1987	UT1		1987	11	23.23125	23	38	50.28	+08	54	37.3		3 675
1987	UZ1		1987	11	23.27500	02	06	06.99	+08	00	28.3	17	3 675
1987	UZ1		1987	11	24.28871	02	05	40.95	+07	31	16.3		3 675
1987	UZ1		1987	11	26.34427	02	04	55.38	+06	34	05.7		3 675
1987	WF1		1987	11	23.39166	04	00	43.03	+13	51	41.1		3 675
1987	WM3	*	1987	11	22.25486	23	11	10.21	-06	43	07.9	18	3 675
1987	WM3		1987	11	23.13229	23	12	10.46	-06	37	31.4		3 675
1987	WN3	*	1987	11	24.16996	00	25	36.20	-07	38	42.3	18.5	3 675
1987	WN3		1987	11	24.20329	00	25	37.38	-07	38	24.8		3 675
1987	WR3	*	1987	11	28.37344	04	35	23.61	+01	27	41.7	17.5	3 675
1987	WR3		1987	11	28.40711	04	35	22.58	+01	27	38.6		3 675
4028	P-L	*	1960	09	24.37573	00	25	28.10	+07	53	07.4	17.8	4 675
4028	P-L		1960	09	25.42780	00	24	39.13	+07	44	20.2		4 675
4028	P-L		1960	09	26.30558	00	23	58.39	+07	36	53.7		4 675
4028	P-L		1960	09	28.36808	00	22	21.03	+07	19	05.2		4 675
4028	P-L		1960	10	17.27085	00	08	18.06	+04	27	52.1		4 675
4028	P-L		1960	10	22.22293	00	05	25.82	+03	45	51.3		4 675
4028	P-L		1960	10	24.35836	00	04	21.43	+03	28	45.8		4 675
4028	P-L		1960	10	26.32573	00	03	28.32	+03	13	37.3		4 675
4068	P-L	*	1960	09	24.37573	00	30	38.79	+06	11	07.9	17.7	4 675
4068	P-L		1960	09	25.42780	00	29	35.93	+06	06	58.0		4 675
4068	P-L		1960	09	26.30558	00	28	43.49	+06	03	25.5		4 675
4068	P-L		1960	09	28.36808	00	26	38.42	+05	54	49.3		4 675
4068	P-L		1960	10	17.27085	00	08	43.86	+04	32	13.7		4 675
4068	P-L		1960	10	22.22293	00	05	06.51	+04	13	54.6		4 675
4068	P-L		1960	10	24.35836	00	03	45.36	+04	06	58.8		4 675
4068	P-L		1960	10	26.32573	00	02	38.30	+04	01	07.5		4 675
4192	P-L	*	1960	09	24.37573	00	18	26.77	+08	28	49.9	18.5	4 675
4192	P-L		1960	09	25.39444	00	17	31.51	+08	28	01.8		4 675
4192	P-L		1960	09	25.42780	00	17	29.61	+08	27	59.8		4 675
4192	P-L		1960	09	26.30558	00	16	42.14	+08	27	14.7		4 675
4192	P-L		1960	09	26.32569	00	16	41.02	+08	27	13.8		4 675
4192	P-L		1960	09	28.36808	00	14	50.13	+08	25	15.5		4 675
4192	P-L		1960	09	28.38750	00	14	49.04	+08	25	15.0		4 675
6829	P-L	*	1960	09	26.28543	00	12	45.14	-05	40	30.0	19.0	4 675
6829	P-L		1960	09	27.34237	00	11	55.76	-05	43	32.0		4 675
6829	P-L		1960	09	28.33822	00	11	09.42	-05	46	20.6		4 675
6829	P-L		1960	10	17.28198	23	57	20.06	-06	25	59.2		4 675
1128	T-3		1977	10	07.24652	01	04	24.22	+18	08	30.8		4 675
1128	T-3		1977	10	11.26632	01	00	43.51	+18	03	38.7		4 675
1128	T-3		1977	10	11.33351	01	00	39.60	+18	03	34.0		4 675
1128	T-3		1977	10	12.26510	00	59	48.62	+18	02	07.3		4 675
1128	T-3		1977	10	12.33125	00	59	44.94	+18	02	01.1		4 675
1128	T-3		1977	10	16.25156	00	56	11.95	+17	55	02.0		4 675
1128	T-3		1977	10	16.31684	00	56	08.37	+17	54	54.8		4 675
1128	T-3	*	1977	10	17.25365	00	55	18.42	+17	53	00.7	18.5	4 675
1128	T-3		1977	10	17.32083	00	55	14.71	+17	52	53.5		4 675
1128	T-3		1977	10	22.42812	00	50	49.72	+17	41	17.8		4 675
1128	T-3		1977	10	22.48003	00	50	47.13	+17	41	09.9		4 675
3019	T-3	*	1977	10	16.27309	01	26	38.47	+06	06	02.3	16.9	4 675
3019	T-3		1977	10	16.33872	01	26	35.31	+06	05	29.6		4 675
3019	T-3		1977	10	17.27552	01	25	52.04	+05	57	40.8		4 675
3019	T-3		1977	10	17.34236	01	25	48.78	+05	57	06.9		4 675

3019	T-3		1977	10	21.39792	01	22	43.85	+05	23	47.3		4 675
3019	T-3		1977	10	21.45799	01	22	41.14	+05	23	18.6		4 675
3019	T-3		1977	10	22.39844	01	21	59.10	+05	15	46.2		4 675
3019	T-3		1977	10	22.45920	01	21	56.34	+05	15	16.2		4 675
3279	T-3		1977	10	07.27031	01	21	01.89	+06	39	01.8		4 675
3279	T-3		1977	10	11.28819	01	17	46.14	+06	29	18.5		4 675
3279	T-3		1977	10	11.35642	01	17	42.66	+06	29	08.6		4 675
3279	T-3		1977	10	12.28681	01	16	57.05	+06	26	50.5		4 675
3279	T-3		1977	10	12.35347	01	16	53.67	+06	26	39.9		4 675
3279	T-3	*	1977	10	16.27309	01	13	39.94	+06	17	07.8	18.6	4 675
3279	T-3		1977	10	16.33872	01	13	36.61	+06	16	56.2		4 675
3279	T-3		1977	10	17.27552	01	12	50.37	+06	14	40.8		4 675
3279	T-3		1977	10	17.34236	01	12	46.86	+06	14	31.4		4 675
3279	T-3		1977	10	21.39792	01	09	27.93	+06	04	50.8		4 675
3279	T-3		1977	10	21.45799	01	09	25.00	+06	04	42.7		4 675
3279	T-3		1977	10	22.39844	01	08	39.65	+06	02	32.7		4 675
3279	T-3		1977	10	22.45920	01	08	36.68	+06	02	24.6		4 675
3502	T-3		1977	10	07.27031	01	12	54.12	+06	10	12.6		4 675
3502	T-3		1977	10	11.28819	01	08	44.76	+05	48	11.2		4 675
3502	T-3		1977	10	11.35642	01	08	40.35	+05	47	49.0		4 675
3502	T-3		1977	10	12.28681	01	07	42.52	+05	42	40.6		4 675
3502	T-3		1977	10	12.35347	01	07	38.11	+05	42	19.0		4 675
3502	T-3	*	1977	10	16.27309	01	03	34.79	+05	20	58.0	19.3	4 675
3502	T-3		1977	10	16.33872	01	03	30.62	+05	20	36.7		4 675
3502	T-3		1977	10	17.27552	01	02	33.31	+05	15	36.0		4 675
3502	T-3		1977	10	17.34236	01	02	29.13	+05	15	15.0		4 675
3502	T-3		1977	10	21.39792	00	58	26.24	+04	54	17.5		4 675
3502	T-3		1977	10	21.45799	00	58	22.65	+04	53	59.1		4 675
4134	T-3		1977	10	07.28125	01	26	10.27	+03	21	36.1		4 675
4134	T-3		1977	10	11.30000	01	22	49.16	+03	05	51.2		4 675
4134	T-3		1977	10	11.36771	01	22	45.52	+03	05	34.8		4 675
4134	T-3		1977	10	12.29826	01	21	58.04	+03	02	00.9		4 675
4134	T-3		1977	10	12.36441	01	21	54.45	+03	01	44.4		4 675
4134	T-3	*	1977	10	16.28368	01	18	32.55	+02	47	12.5	18.6	4 675
4134	T-3		1977	10	16.34931	01	18	29.10	+02	46	56.4		4 675
4134	T-3		1977	10	17.28628	01	17	40.74	+02	43	39.9		4 675
4134	T-3		1977	10	17.35313	01	17	37.20	+02	43	25.1		4 675
4134	T-3		1977	10	21.38698	01	14	11.61	+02	30	02.6		4 675
4134	T-3		1977	10	21.44705	01	14	08.47	+02	29	53.0		4 675
4134	T-3		1977	10	22.38542	01	13	21.62	+02	27	00.9		4 675
4134	T-3		1977	10	22.44878	01	13	18.41	+02	26	48.3		4 675
143			1985	02	20.27049	08	55	23.04	+22	17	59.8		6 675
143			1985	02	23.32882	08	52	38.90	+22	14	13.2		6 675
340			1985	02	20.27049	08	54	39.34	+24	34	51.0		6 675
340			1985	02	23.32882	08	52	16.24	+24	37	46.4		6 675
367			1985	02	20.27049	08	50	03.11	+22	34	10.2		6 675
367			1985	02	23.32882	08	47	38.48	+22	43	25.9		6 675
981			1985	02	20.27049	08	55	45.61	+20	15	52.7		6 675
981			1985	02	23.32882	08	53	37.01	+20	23	20.0		6 675
1141			1985	02	20.27049	09	05	49.75	+20	54	03.3		6 675
1141			1985	02	23.32882	09	03	04.13	+21	07	50.6		6 675
1180			1985	02	20.27049	09	01	59.03	+23	51	15.3		6 675
1180			1985	02	23.32882	09	00	11.70	+23	58	26.9		6 675
1191			1985	02	23.32882	09	09	41.97	+19	46	11.6		6 675
2138			1985	02	20.27049	08	49	10.84	+22	32	50.8		6 675
2138			1985	02	23.32882	08	46	50.31	+22	44	26.4		6 675
2172			1985	02	20.27049	08	48	07.30	+21	59	36.9		6 675
2212			1987	12	14.45833	11	41	22.69	+26	44	35.3		1 675
2212			1987	12	14.51250	11	41	42.83	+26	43	40.5		1 675

2212		1987	12	15.50000	11	48	01.21	+26	26	05.1	1 675
2623		1985	02	20.27049	09	04	41.91	+20	02	02.0	6 675
2623		1985	02	23.32882	09	01	43.42	+20	08	04.7	6 675
2705		1985	02	20.27049	08	53	27.43	+23	18	31.3	6 675
2705		1985	02	23.32882	08	50	30.55	+23	22	46.4	6 675
2873		1985	02	20.27049	08	59	22.06	+23	19	48.7	6 675
2873		1985	02	23.32882	08	56	26.09	+23	34	27.3	6 675
3254		1985	02	20.27049	08	49	07.99	+23	38	48.2	6 675
3254		1985	02	23.32882	08	47	21.82	+23	43	36.0	6 675
3484		1985	02	20.27049	08	57	53.74	+25	35	36.7	6 675
3484		1985	02	23.32882	08	55	21.20	+25	53	35.1	6 675
3564		1987	11	22.52569	05	33	39.35	+38	56	59.7	18 3 675
3564		1987	11	23.48264	05	33	06.37	+38	58	46.7	3 675
3564		1987	11	26.48177	05	31	19.96	+39	03	57.7	3 675
3709		1987	11	22.50451	06	30	57.66	+00	01	01.8	17.3 3 675
3709		1987	11	22.54201	06	30	56.88	+00	00	56.2	3 675

688 Lowell Observatory, Anderson Mesa Station
E. Bowell, Lowell Observatory, 1400 West Mars Hill Road,
Flagstaff, AZ 86001, U.S.A.
Observers S. J. Bus, S. McDonald, D. Norman, B. A. Skiff
Measurers S. J. Bus, S. McDonald, D. Norman
1.8-m reflector + CCD (1) and 0.33-m photographic telescope
PDS scanning microdensitometer
AGK3 and Perth 70 secondary nets, global solutions
See also MPC 9533

1928	UF	1987	12	23.17569	06	02	03.72	+23	43	26.5	17.2 P 688
1928	UF	1987	12	23.19861	06	02	01.95	+23	43	29.8	P 688
1959	LM	1987	07	24.33997	19	55	48.60	-19	53	34.8	1 688
1959	LM	1987	07	24.34427	19	55	48.09	-19	53	35.1	1 688
1967	UR	1987	11	24.28112	04	15	17.97	+19	33	18.9	16.8 688
1973	SM	1987	12	23.17569	05	46	32.33	+21	08	59.4	17.2 688
1973	SM	1987	12	23.19861	05	46	31.49	+21	08	55.9	688
1980	RS2	1987	11	24.21424	04	20	00.22	+22	39	04.0	16.2 688
1980	RS2	1987	11	24.28112	04	19	55.74	+22	38	43.5	688
1981	EB1	1987	07	24.17846	13	52	01.74	-08	37	52.7	1 688
1981	EB1	1987	07	24.18411	13	52	01.99	-08	37	54.6	1 688
1981	EB1	1987	07	24.19065	13	52	02.30	-08	37	56.7	1 688
1981	EH9	1988	01	13.33443	09	33	52.71	+09	38	55.8	1 688
1981	EH9	1988	01	13.34429	09	33	52.40	+09	38	55.0	1 688
1981	EH9	1988	01	13.35868	09	33	51.95	+09	38	53.8	1 688
1981	EH9	1988	01	14.35271	09	33	22.69	+09	37	37.0	1 688
1981	EH9	1988	01	14.36512	09	33	22.27	+09	37	36.2	1 688
1981	EC11	1987	10	26.30617	01	38	31.33	+17	27	35.2	1 688
1981	EC11	1987	10	26.31566	01	38	30.81	+17	27	31.9	1 688
1981	EC11	1987	10	27.16971	01	37	45.80	+17	22	37.7	1 688
1981	EC11	1987	10	27.17884	01	37	45.30	+17	22	34.7	1 688
1981	EC11	1988	01	13.21646	01	31	19.65	+14	00	52.0	1 688
1981	EC11	1988	01	13.22550	01	31	20.06	+14	00	52.8	1 688
1981	ED35	1987	12	21.10836	02	10	26.29	+15	30	59.7	1 688
1981	ED35	1987	12	21.11685	02	10	26.40	+15	31	00.2	1 688
1981	QJ	1987	11	24.19206	03	58	09.75	+21	26	26.4	16.5 688
1981	QJ	1987	11	24.25894	03	58	05.99	+21	26	16.3	688
1981	UE10	1987	11	24.19206	03	58	14.80	+17	22	45.9	16.8 688
1981	UE10	1987	11	24.25894	03	58	11.18	+17	22	37.3	688
1982	XB	1988	01	14.37509	12	29	21.61	+15	52	31.6	1 688
1982	XB	1988	01	14.38274	12	29	22.03	+15	52	31.9	1 688
1985	TQ	1988	01	13.40782	06	52	09.97	+26	29	30.0	1 688
1985	TQ	1988	01	13.41727	06	52	09.62	+26	29	30.5	1 688

1985	YP		1988	01	14.20081	00	38	08.27	+17	47	14.6	1	688
1985	YP		1988	01	14.20297	00	38	08.67	+17	47	15.1	1	688
1986	PA		1987	07	23.22762	17	47	00.19	-00	20	38.1	1	688
1986	PA		1987	07	23.23190	17	46	59.62	-00	20	42.4	1	688
1986	RG1		1987	12	23.17569	05	41	14.80	+20	18	10.5	17.0	688
1986	RG1		1987	12	23.19861	05	41	13.30	+20	18	08.1		688
1986	RQ2		1987	12	22.29284	05	17	43.04	+00	56	52.5	17.2	688
1986	RQ2		1987	12	22.31468	05	17	42.06	+00	56	56.5		688
1986	WA		1988	01	13.39009	08	10	36.82	-26	22	32.4	1	688
1986	WA		1988	01	13.39662	08	10	36.05	-26	22	35.0	1	688
1987	KF		1987	06	24.19189	14	39	51.62	+00	28	35.2	1	688
1987	KF		1987	06	24.20811	14	39	52.21	+00	28	10.9	1	688
1987	PA		1987	08	28.20749	21	49	44.16	+13	32	34.9	1	688
1987	PA		1987	08	28.21585	21	49	43.69	+13	32	43.5	1	688
1987	PA		1987	10	26.17072	22	07	21.59	+15	07	26.8	1	688
1987	PA		1987	10	26.18051	22	07	22.23	+15	07	25.7	1	688
1987	QB		1987	10	26.25904	00	07	24.48	-06	19	54.4	1	688
1987	QB		1987	10	26.26937	00	07	24.89	-06	19	50.1	1	688
1987	QB		1987	11	19.10517	00	29	10.55	-03	02	49.5	1	688
1987	QB		1987	11	19.11255	00	29	10.99	-03	02	45.6	1	688
1987	QX		1988	01	12.20402	01	54	10.94	+33	22	12.9	1	688
1987	QX		1988	01	12.20970	01	54	11.62	+33	22	13.8	1	688
1987	QX		1988	01	12.21843	01	54	12.66	+33	22	15.1	1	688
1987	SB		1987	11	19.07630	23	52	08.43	-05	08	29.0	1	688
1987	SB		1987	11	19.09495	23	52	08.75	-05	08	23.7	1	688
1987	SB		1987	12	21.15220	00	12	16.67	-01	45	35.7	1	688
1987	SB		1987	12	21.15815	00	12	17.04	-01	45	32.9	1	688
1987	SB		1988	01	14.09216	00	35	45.37	+01	19	46.6	1	688
1987	SB		1988	01	14.10728	00	35	46.33	+01	19	53.9	1	688
1987	SB		1988	01	15.12562	00	36	52.06	+01	28	05.1	1	688
1987	SB		1988	01	15.13165	00	36	52.45	+01	28	07.8	1	688
1987	SL		1988	01	12.16450	01	13	22.30	+30	33	10.0	1	688
1987	SL		1988	01	12.17323	01	13	23.06	+30	33	10.8	1	688
1987	SY		1987	11	17.08584	23	19	46.12	+05	22	22.0	1	688
1987	SY		1987	11	17.09247	23	19	46.43	+05	22	21.9	1	688
1987	SY		1988	01	15.10586	00	31	00.98	+09	24	58.5	1	688
1987	SY		1988	01	15.11378	00	31	01.66	+09	25	01.3	1	688
1987	SS1		1988	01	12.13900	00	44	49.19	+03	09	25.3	1	688
1987	SS1		1988	01	12.14733	00	44	49.77	+03	09	27.1	1	688
1987	UA		1988	01	12.24444	03	06	29.74	-11	13	55.9	1	688
1987	WJ1		1987	12	21.14110	02	07	56.89	+16	22	25.3	1	688
1987	WJ1		1987	12	21.16865	02	07	56.84	+16	22	27.3	1	688
1987	WJ1		1987	12	22.06655	02	07	57.25	+16	23	34.8	1	688
1987	WJ1		1987	12	22.08711	02	07	57.25	+16	23	36.5	1	688
1987	WJ1		1988	01	12.23275	02	13	58.82	+17	14	10.9	1	688
1987	WJ1		1988	01	12.23275	02	13	58.82	+17	14	10.9	1	688
1987	WS3	*	1987	11	24.21424	04	12	43.17	+21	16	37.1	15.2	688
1987	WS3		1987	11	24.28112	04	12	39.18	+21	15	43.4		688
1987	WS3		1988	01	15.17932	03	54	08.60	+13	03	31.9	16.2	688
1987	WS3		1988	01	15.23368	03	54	09.89	+13	03	20.5		688
1987	WT3	*	1987	11	24.21424	04	20	36.15	+20	08	09.6	17.0	688
1987	WT3		1987	11	24.28112	04	20	31.79	+20	08	20.0		688
1987	WU3	*	1987	11	24.21424	04	27	36.85	+24	47	59.0	17.0	688
1987	WU3		1987	11	24.28112	04	27	31.68	+24	48	03.9		688
1987	WV3	*	1987	11	24.21424	04	30	32.13	+23	34	31.3	16.8	688
1987	WV3		1987	11	24.28112	04	30	27.55	+23	34	17.8		688
1987	WW3	*	1987	11	24.21424	04	31	37.53	+19	39	52.2	17.0	688
1987	WW3		1987	11	24.28112	04	31	33.59	+19	39	33.7		688
1987	WX3	*	1987	11	24.19206	03	38	25.40	+17	32	10.6	17.2	688

1987	WX3		1987	11	24.25894	03	38	22.40	+17	31	54.9		688
1987	WY3	*	1987	11	24.19206	03	41	22.53	+18	51	14.2	16.8	688
1987	WY3		1987	11	24.25894	03	41	19.04	+18	51	01.9		688
1987	WZ3	*	1987	11	24.19206	03	53	40.15	+15	42	24.2	16.8 R	688
1987	WZ3		1987	11	24.25894	03	53	34.86	+15	41	52.9	R	688
1987	WA4	*	1987	11	24.19206	03	54	30.11	+19	03	41.4	17.2	688
1987	WA4		1987	11	24.25894	03	54	25.85	+19	03	46.0		688
1987	WB4	*	1987	11	24.19206	03	57	38.10	+20	23	40.9	17.2	688
1987	WB4		1987	11	24.25894	03	57	34.23	+20	23	39.9		688
1987	WC4	*	1987	11	24.19206	04	00	27.80	+22	10	57.0	16.8	688
1987	WC4		1987	11	24.25894	04	00	23.99	+22	10	34.8		688
1987	XF		1987	11	24.21424	04	20	32.62	+25	14	42.2	16.5	688
1987	XF		1987	11	24.28112	04	20	28.93	+25	14	22.5		688
1987	YQ		1987	12	23.17569	05	46	55.37	+18	47	36.6	16.2	688
1987	YQ		1987	12	23.19861	05	46	53.98	+18	47	37.6		688
1987	YQ		1988	01	15.20800	05	27	41.56	+19	13	54.0	16.5	688
1987	YQ		1988	01	15.25949	05	27	39.49	+19	13	58.8		688
1987	YX	*	1987	12	23.17569	05	42	40.74	+24	39	52.6	16.5	688
1987	YX		1987	12	23.19861	05	42	39.43	+24	39	55.0		688
1987	YX		1988	01	15.20800	05	23	33.59	+25	25	08.9	16.8	688
1987	YX		1988	01	15.25949	05	23	31.71	+25	25	14.2		688
1987	YY	*	1987	12	23.17569	05	47	43.93	+18	25	46.2	16.8	688
1987	YY		1987	12	23.19861	05	47	42.48	+18	25	39.8		688
1988	AH	*	1988	01	15.17932	03	59	37.09	+12	54	06.6	16.8	688
1988	AH		1988	01	15.23368	03	59	37.00	+12	54	26.2		688
1988	AJ	*	1988	01	15.20800	05	26	15.16	+25	23	49.8	16.2	688
1988	AJ		1988	01	15.25949	05	26	13.46	+25	22	39.5		688
1988	AK	*	1988	01	15.20800	05	27	17.47	+24	22	41.8	16.5	688
1988	AK		1988	01	15.25949	05	27	15.79	+24	22	47.8		688
20			1987	11	24.21424	04	38	13.00	+21	15	26.8		688
20			1987	11	24.28112	04	38	08.89	+21	15	19.4		688
88			1987	12	23.17569	05	36	18.32	+24	39	23.1		688
88			1987	12	23.19861	05	36	16.91	+24	39	20.9		688
106			1987	11	24.19206	03	51	18.29	+19	56	05.3		688
106			1987	11	24.25894	03	51	14.52	+19	56	03.8		688
210			1987	11	24.21424	04	30	29.51	+26	52	52.0		688
210			1987	11	24.28112	04	30	25.28	+26	52	55.1		688
239			1988	01	15.17932	03	39	31.28	+11	04	55.7		688
239			1988	01	15.23368	03	39	32.15	+11	05	07.4		688
296			1987	12	23.17569	05	50	10.66	+21	40	06.2	15.8	688
296			1987	12	23.19861	05	50	08.90	+21	40	03.9		688
296			1988	01	15.20800	05	28	13.75	+21	58	34.1		688
296			1988	01	15.25949	05	28	11.72	+21	58	38.2	D	688
336			1987	11	24.19206	03	43	20.56	+18	58	52.0		688
336			1987	11	24.25894	03	43	16.20	+18	58	28.5		688
393			1987	12	22.29284	05	08	56.24	+07	09	12.2		688
393			1987	12	22.31468	05	08	55.07	+07	09	09.0		688
395			1987	11	24.21424	04	25	17.22	+22	49	26.9		688
395			1987	11	24.28112	04	25	13.32	+22	49	15.3		688
437			1987	11	24.21424	04	36	34.79	+25	36	50.5		688
437			1987	11	24.28112	04	36	29.98	+25	36	29.0		688
440			1987	11	24.21424	04	26	17.46	+23	58	53.0		688
440			1987	11	24.28112	04	26	12.91	+23	58	41.2		688
503			1987	11	24.19206	03	41	13.48	+18	06	12.4		688
503			1987	11	24.25894	03	41	09.33	+18	06	09.9		688
589			1987	12	22.29284	05	04	16.88	+07	05	26.6		688
589			1987	12	22.31468	05	04	15.73	+07	05	27.2		688
590			1988	01	15.17932	03	52	15.80	+12	29	55.0		688
590			1988	01	15.23368	03	52	15.53	+12	30	12.4		688

632	1987	11	24.21424	04	23	25.26	+24	38	23.2		16.5	688
632	1987	11	24.28112	04	23	21.17	+24	38	15.5			688
635	1987	12	22.29284	05	26	31.47	+06	54	52.8			688
635	1987	12	22.31468	05	26	30.42	+06	54	52.5			688
640	1988	01	15.17932	03	58	37.11	+14	43	16.0		15.8	688
640	1988	01	15.23368	03	58	36.45	+14	43	10.4			688
654	1988	01	15.20800	05	43	04.36	+21	37	33.7			688
654	1988	01	15.25949	05	43	01.59	+21	36	43.0			688
718	1987	11	24.21424	04	36	05.86	+26	56	49.0			688
718	1987	11	24.28112	04	36	02.22	+26	56	49.2			688
732	1987	12	22.29284	05	15	13.02	+05	23	53.1			688
732	1987	12	22.31468	05	15	11.74	+05	23	52.5			688
805	1987	12	22.29284	05	12	57.97	+01	39	33.8			688
805	1987	12	22.31468	05	12	57.04	+01	39	36.0			688
937	1987	11	24.19206	03	41	09.19	+20	07	31.7			688
937	1987	11	24.25894	03	41	04.43	+20	07	08.5			688
1022	1987	12	22.29284	05	15	17.44	+07	37	15.1			688
1022	1987	12	22.31468	05	15	16.19	+07	37	19.4			688
1032	1987	11	24.19206	03	43	19.72	+15	34	40.2			688
1032	1987	11	24.25894	03	43	16.24	+15	34	37.1			688
1041	1987	11	24.21424	04	25	36.65	+23	56	30.9			688
1041	1987	11	24.28112	04	25	32.42	+23	56	44.9			688
1261	1987	12	23.17569	06	03	17.28	+24	53	55.1		16.2	688
1261	1987	12	23.19861	06	03	15.87	+24	53	55.1			688
1261	1988	01	15.20800	05	43	21.33	+25	02	52.2			688
1261	1988	01	15.25949	05	43	18.92	+25	02	52.1			688
1326	1987	12	23.17569	05	51	58.55	+17	20	30.8			688
1326	1987	12	23.19861	05	51	57.09	+17	20	41.5			688
1326	1988	01	15.20800	05	30	40.67	+20	24	25.4			688
1326	1988	01	15.25949	05	30	38.55	+20	24	47.9			688
1494	1987	12	23.17569	05	43	40.18	+18	53	34.1		15.2	688
1494	1987	12	23.19861	05	43	38.64	+18	53	33.7			688
1494	1988	01	15.20800	05	22	46.41	+18	55	01.7		16.0	688
1494	1988	01	15.25949	05	22	44.39	+18	55	04.7			688
1566	1987	08	28.14873	16	01	26.91	-28	12	01.9		1	688
1570	1987	12	23.17569	06	00	18.97	+20	52	36.1		16.8	688
1570	1987	12	23.19861	06	00	17.71	+20	52	37.0			688
1580	1988	01	13.23771	02	39	00.36	+08	20	23.6		1	688
1580	1988	01	13.24632	02	39	00.19	+08	20	27.6		1	688
1615	1987	12	23.17569	05	52	39.94	+21	02	16.5			688
1615	1987	12	23.19861	05	52	38.64	+21	02	17.7			688
1658	1987	12	23.17569	05	49	22.97	+21	49	40.3			688
1658	1987	12	23.19861	05	49	21.39	+21	49	41.8			688
1658	1988	01	15.25949	05	27	56.69	+22	36	13.1			688
1674	1987	11	24.21424	04	37	14.92	+20	05	35.3			688
1674	1987	11	24.28112	04	37	11.49	+20	05	34.9			688
1810	1988	01	15.20800	05	48	26.85	+20	07	51.3			688
1810	1988	01	15.25949	05	48	24.23	+20	07	44.9			688
1878	1987	12	23.17569	05	44	27.25	+20	42	38.6			688
1878	1987	12	23.19861	05	44	25.75	+20	42	37.5			688
1878	1988	01	15.20800	05	25	34.78	+20	37	35.5			688
1878	1988	01	15.25949	05	25	32.94	+20	37	34.8			688
1956	1987	12	23.17569	05	43	48.54	+21	23	34.3			688
1956	1988	01	15.20800	05	26	14.90	+21	22	51.3			688
2086	1988	01	15.17932	03	38	56.67	+11	19	55.3			688
2086	1988	01	15.23368	03	38	57.46	+11	20	16.5			688
2184	1987	11	24.21424	04	19	02.39	+23	01	52.4			688
2184	1987	11	24.28112	04	18	58.87	+23	01	38.1			688
2232	1987	11	24.19206	03	52	10.85	+17	59	23.2			688

2232		1987	11	24.25894	03	52	06.99	+17	59	07.4	688
2260		1987	12	23.17569	05	58	32.77	+24	59	08.1	16.8 688
2260		1987	12	23.19861	05	58	32.05	+24	59	12.4	688
2260		1988	01	15.20800	05	44	59.18	+25	40	09.3	688
2260		1988	01	15.25949	05	44	57.59	+25	40	14.3	688
2415		1987	11	24.21424	04	18	28.46	+19	47	40.8	688
2415		1987	11	24.28112	04	18	24.17	+19	47	37.3	688
2505		1987	11	24.21424	04	15	03.42	+21	32	11.9	16.8 688
2505		1987	11	24.28112	04	15	00.06	+21	32	04.9	688
2525		1987	12	23.17569	05	59	52.39	+23	42	11.0	688
2525		1987	12	23.19861	05	59	51.05	+23	42	12.1	688
2525		1988	01	15.20800	05	40	49.62	+23	56	25.4	688
2528		1987	11	24.21424	04	32	28.30	+21	09	09.0	688
2528		1987	11	24.28112	04	32	24.50	+21	09	02.7	688
2533		1987	12	23.17569	05	41	53.42	+21	05	31.5	15.5 688
2533		1987	12	23.19861	05	41	52.15	+21	05	29.8	688
2533		1988	01	15.20800	05	24	47.86	+20	57	21.1	688
2533		1988	01	15.25949	05	24	46.07	+20	57	21.6	688
2585		1988	01	15.17932	03	59	26.51	+12	52	35.7	688
2585		1988	01	15.23368	03	59	27.41	+12	52	56.4	688
2593		1987	11	24.21424	04	15	19.21	+21	16	04.2	17.5 R 688
2593		1987	11	24.28112	04	15	14.47	+21	15	55.1	688
2635		1987	11	24.21424	04	15	57.73	+25	14	26.4	688
2635		1987	11	24.28112	04	15	52.78	+25	14	08.2	688
2648		1988	01	15.20800	05	25	58.99	+23	32	20.8	688
2648		1988	01	15.25949	05	25	57.29	+23	32	08.3	688
2797		1987	11	24.19206	03	54	02.22	+15	18	09.1	688
2797		1987	11	24.25894	03	53	59.42	+15	18	11.8	688
2923		1987	11	24.28112	04	16	36.79	+26	00	56.1	16.8 688
2947		1987	11	24.21424	04	24	08.81	+25	27	28.7	688
3122		1988	01	13.43152	12	12	44.23	-04	47	43.1	1 688
3122		1988	01	13.43870	12	12	44.21	-04	47	46.3	1 688
3179		1987	11	24.19206	03	45	57.82	+17	26	43.9	688
3179		1987	11	24.25894	03	45	54.33	+17	26	31.4	688
3224		1987	11	24.19206	04	03	38.66	+19	10	19.9	688
3224		1987	11	24.25894	04	03	35.03	+19	10	06.0	688
3501		1987	11	24.21424	04	14	09.90	+21	28	54.6	688
3501		1987	11	24.28112	04	14	06.14	+21	28	40.1	688
3515		1987	11	24.21424	04	13	18.94	+23	19	42.3	688
3584		1987	11	24.19206	03	39	36.52	+22	39	11.3	688
3584		1987	11	24.25894	03	39	32.78	+22	38	57.0	688
3688		1987	06	24.24604	15	06	30.56	-20	26	32.5	1 688
3688		1987	06	24.25720	15	06	30.49	-20	26	32.1	1 688
3688		1987	06	24.27727	15	06	30.36	-20	26	31.3	1 688
3688		1987	07	23.19794	15	14	39.82	-20	44	59.3	1 688
3688		1987	07	23.20596	15	14	40.04	-20	45	00.0	1 688
3688		1987	07	23.21337	15	14	40.38	-20	44	59.9	1 688

690 Lowell Observatory
E. Bowell, Lowell Observatory, 1400 West Mars Hill Road,
Flagstaff, AZ 86001, U.S.A.
Observers C. W. Tombaugh, R. Burnham, C. D. Slaughter
Measurer B. A. Skiff
0.33-m photographic telescope
PDS scanning microdensitometer
AGK3 and Perth 70 secondary nets, global solutions

1929	WA1	1929	11	28.21181	04	51	14.76	+14	15	45.3	690
1929	WA1	1929	11	28.27083	04	51	11.31	+14	15	47.6	690
1929	WA1	1929	12	04.19792	04	46	07.39	+14	15	40.4	690

1930	MF	1930	06	23.41319	19	33	42.02	-15	58	42.0	690
1930	MF	1930	06	26.40278	19	31	47.16	-15	43	32.1	R 690
1930	MF	1930	06	27.39931	19	31	05.90	-15	38	40.1	690
1931	BF	1931	01	15.37153	09	17	31.63	+05	13	31.9	690
1931	BF	1931	01	16.33958	09	16	51.15	+05	12	59.1	690
1931	BF	1931	01	17.32986	09	16	08.48	+05	12	35.6	690
1958	RP	1958	09	10.34586	22	32	56.67	-02	58	13.8	690
1958	RP	1958	09	11.35066	22	32	30.83	-03	07	05.7	690
1959	EC1	1959	03	06.22917	08	44	54.96	+23	58	38.2	690
1959	EC1	1959	03	08.22153	08	44	05.43	+24	03	26.9	690
1959	EC1	1959	03	10.21528	08	43	21.48	+24	07	42.1	690
1959	EC1	1959	03	11.16667	08	43	02.63	+24	09	34.4	690
1959	EC1	1959	03	12.14931	08	42	44.60	+24	11	19.3	690
1959	EC1	1959	03	13.14583	08	42	27.65	+24	12	57.7	690
58		1929	11	28.21181	04	57	35.82	+14	49	09.8	690
58		1929	11	28.27083	04	57	32.63	+14	49	02.9	690
58		1929	12	04.19792	04	51	58.19	+14	38	00.3	690
523		1958	09	10.34586	22	40	00.07	-01	30	40.7	690
523		1958	09	11.35066	22	39	13.13	-01	35	29.4	690
566		1959	03	06.22917	08	44	48.81	+23	40	47.2	690
566		1959	03	08.22153	08	43	56.74	+23	42	51.2	690
566		1959	03	10.21528	08	43	09.23	+23	44	29.9	690
566		1959	03	11.16667	08	42	48.51	+23	45	10.3	690
566		1959	03	12.14931	08	42	28.19	+23	45	41.0	690
566		1959	03	13.14583	08	42	08.60	+23	46	10.0	690

691 Kitt Peak, Steward Observatory
T. Gehrels, Space Sciences Building, University of Arizona,
Tucson, AZ 85721, U.S.A.
Observers J. V. Scotti, W. Wisniewski
2.3-m reflector encoders (1) and 0.91-m SPACEWATCH telescope
SAOC 1984
See also MPC 9198, MPC 10373 and Astron. J. 91, 1242, 1986

1985	PA	1988	01	15.51282	15	47	05.24	+15	29	55.8	691
1985	PA	1988	01	15.52274	15	47	07.36	+15	30	12.5	18.2V 691
1985	PA	1988	01	15.52962	15	47	08.81	+15	30	23.3	691
1985	VS	1987	12	21.34481	07	39	45.73	-12	53	14.2	691
1985	VS	1987	12	21.35244	07	39	45.52	-12	53	15.6	691
1985	VS	1987	12	21.35676	07	39	45.41	-12	53	16.3	691
1986	WA	1987	12	21.45205	08	42	27.98	-21	42	01.2	691
1986	WA	1987	12	21.45904	08	42	27.59	-21	42	08.1	691
1986	WA	1987	12	21.47185	08	42	26.88	-21	42	19.8	19.2V 691
1986	WA	1987	12	22.41926	08	41	34.09	-21	56	39.9	691
1986	WA	1987	12	22.44552	08	41	32.55	-21	57	04.5	19.4V 691
1987	SB	1987	12	23.08395	00	13	58.72	-01	31	20.6	20.0V 691
1987	SB	1987	12	23.11878	00	14	00.55	-01	31	04.5	691
1987	SB	1987	12	23.12230	00	14	00.70	-01	31	03.1	691
1987	SL	1987	12	22.19965	00	44	55.41	+30	08	57.3	18.9V 691
1987	SL	1987	12	22.20160	00	44	55.57	+30	08	57.7	691
1987	SL	1987	12	22.21910	00	44	56.80	+30	08	57.2	691
1987	SY	1987	12	21.09517	23	57	00.83	+06	53	12.7	691
1987	SY	1987	12	21.09981	23	57	01.22	+06	53	14.1	691
1987	SY	1987	12	21.13527	23	57	03.98	+06	53	25.9	691
1987	SY	1987	12	21.13970	23	57	04.16	+06	53	25.5	691
1987	SY	1987	12	21.14456	23	57	04.55	+06	53	28.1	20.6V 691
1987	SY	1987	12	22.09647	23	58	17.70	+06	58	17.6	20.5V 691
1987	SY	1987	12	22.10112	23	58	18.07	+06	58	18.9	691
1987	SY	1987	12	22.12833	23	58	20.20	+06	58	27.6	691
1987	UA	1987	12	22.14535	02	27	58.95	-16	41	28.2	18.7V 691

1987	UA	1987	12	22.15329	02	27	59.78	-16	41	21.7		691
1987	UA	1987	12	22.16078	02	28	00.46	-16	41	15.7		691
1987	WC	1987	12	21.31924	03	15	52.62	+52	09	18.3		691
1987	WC	1987	12	21.33079	03	15	52.08	+52	09	20.2		691
1987	WC	1987	12	21.33688	03	15	51.81	+52	09	21.0	19.3V	691
1009		1988	01	17.43819	07	30	42.0	-10	55	34	1	691
3737		1987	12	23.18796	06	42	54.98	+33	08	50.1	15.4V	691
3737		1987	12	23.19418	06	42	54.31	+33	08	44.8		691
3737		1987	12	23.20044	06	42	53.65	+33	08	39.6		691

760 Goethe Link
E. Bowell, Lowell Observatory, 1400 West Mars Hill Road, Flagstaff, AZ 86001, U.S.A.
Observers M. Dyck, J. E. Michlovic, C. J. Murphy, S. F. Strother, Y. Terzian, A. Young, H. S. Yun
Measurer E. Bowell
0.25-m refractor
PDS scanning microdensitometer
AGK3 and Perth 70 secondary nets, global solutions

1963	WD	1963	11	24.27637	05	17	02.37	+15	52	07.5	15.8	760
1963	WD	1963	11	24.32012	05	17	00.43	+15	52	09.9		760
1963	XA	1963	12	15.32153	07	44	06.05	+24	04	06.7		760
23		1963	12	15.13957	06	36	45.89	+30	48	20.6	10.0	760
23		1963	12	15.20902	06	36	42.28	+30	49	00.3		760
75		1963	12	15.13957	06	39	23.26	+30	46	52.7	13.8	760
75		1963	12	15.20902	06	39	18.83	+30	47	01.3		760
150		1963	12	17.05694	04	12	40.35	+18	48	42.9	13.7	760
150		1963	12	17.12153	04	12	37.38	+18	48	33.5		760
186		1963	11	27.37151	05	42	41.49	+42	25	55.5	13.8	760
186		1963	11	27.39512	05	42	39.75	+42	26	03.1		760
201		1963	11	24.27637	05	07	05.17	+13	47	54.7	12.7	760
201		1963	11	24.32012	05	07	02.70	+13	47	49.5		760
208		1963	12	17.05694	04	09	34.98	+23	28	49.2	14.9 C	760
208		1963	12	17.12153	04	09	31.87	+23	28	39.8	C	760
231		1963	11	24.37116	05	04	47.23	+29	57	02.6	15.3	760
231		1963	11	24.42359	05	04	44.29	+29	57	01.4		760
231		1963	12	16.08958	04	44	08.81	+29	32	05.9	14.0	760
231		1963	12	16.13264	04	44	06.14	+29	32	01.9		760
526		1963	12	15.27708	07	41	07.51	+19	35	00.1	14.6	760
526		1963	12	15.32153	07	41	05.96	+19	35	03.7		760
544		1963	12	15.02916	04	28	35.16	+30	36	15.7	14.8 C	760
544		1963	12	15.07291	04	28	32.47	+30	36	04.5		760
544		1963	12	16.08958	04	27	31.73	+30	31	20.0	15.0 C	760
544		1963	12	16.13264	04	27	29.11	+30	31	07.7	C	760
586		1963	12	15.27708	07	45	27.01	+19	18	17.8	13.4	760
586		1963	12	15.32153	07	45	25.34	+19	18	19.3		760
588		1963	12	15.02916	04	29	24.29	+33	41	56.1	15.6	760
588		1963	12	15.07291	04	29	22.63	+33	41	48.2		760
588		1963	12	16.08958	04	28	43.51	+33	39	08.0	16.0	760
588		1963	12	16.13264	04	28	41.82	+33	39	00.5		760
624		1963	11	27.37151	05	52	19.12	+45	10	28.0	14.6 C	760
624		1963	11	27.39512	05	52	18.18	+45	10	30.3	C	760
643		1963	12	17.05694	04	07	18.55	+22	10	14.4	15.0	760
643		1963	12	17.12153	04	07	15.78	+22	09	53.1		760
828		1963	12	15.27708	07	31	22.19	+23	21	19.2	15.2	760
828		1963	12	15.32153	07	31	20.23	+23	20	23.1		760
842		1963	12	15.38194	07	01	15.69	+43	26	07.3	16.2	760
842		1963	12	15.43542	07	01	12.49	+43	26	19.7		760
911		1963	12	15.38194	07	08	11.91	+45	59	37.5	15.0 C	760

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 911       1963 12 15.43542  07 08 09.70  +45 59 42.4                C 760
 975       1963 12 15.13957  06 14 37.10  +26 28 41.6          14.9    760
 975       1963 12 15.20902  06 14 32.90  +26 28 47.5                  760
1097       1963 12 17.05694  04 10 19.48  +19 00 11.8          16.1    760
1097       1963 12 17.12153  04 10 16.07  +19 00 04.4                  760
1234       1963 12 15.13957  06 32 36.22  +30 16 43.8          16.5    760
1234       1963 12 15.20902  06 32 32.76  +30 16 39.6                  760
1251       1963 11 24.27637  04 58 22.07  +13 22 03.3          14.9    760
1251       1963 11 24.32012  04 58 19.62  +13 21 59.6                  760
1269       1963 11 24.27637  04 54 30.93  +19 17 17.4          15.3  C 760
1269       1963 11 24.32012  04 54 29.25  +19 17 15.2                C 760
1598       1963 12 15.13957  06 22 54.82  +29 08 20.5          17.0  C 760
1598       1963 12 15.20902  06 22 50.20  +29 08 14.2                C 760
1631       1963 11 24.37116  05 02 28.85  +33 30 21.2          16.2  C 760
1631       1963 11 24.42359  05 02 24.73  +33 30 26.1                C 760
1631       1963 12 15.02916  04 34 43.76  +33 26 08.4          15.7  C 760
1631       1963 12 15.07291  04 34 40.41  +33 26 04.1                C 760
1631       1963 12 16.08958  04 33 24.97  +33 23 48.4          15.7  C 760
1631       1963 12 16.13264  04 33 21.70  +33 23 42.5                C 760
1654       1963 11 24.37116  04 57 16.33  +33 59 27.0          16.1  C 760
1654       1963 11 24.42359  04 57 13.24  +33 59 32.8                C 760
1654       1963 12 15.02916  04 35 52.61  +34 11 51.1          15.7  C 760
1654       1963 12 15.07291  04 35 49.98  +34 11 49.1                C 760
1654       1963 12 16.08958  04 34 49.25  +34 10 58.1          15.9  C 760
1654       1963 12 16.13264  04 34 46.43  +34 10 55.7                C 760
1667       1963 12 17.05694  04 07 02.17  +19 42 51.8          16.0  C 760
1667       1963 12 17.12153  04 06 58.31  +19 42 49.7                C 760
1669       1963 12 17.05694  04 21 28.40  +22 35 38.4          16.0  C 760
1669       1963 12 17.12153  04 21 25.22  +22 35 30.2                C 760
1741       1963 12 17.05694  04 04 06.91  +21 57 53.3          16.0  C 760
1741       1963 12 17.12153  04 04 03.95  +21 57 49.5                C 760
2563       1963 12 17.05694  04 23 12.08  +19 36 11.4          16.2  C 760
2563       1963 12 17.12153  04 23 08.99  +19 36 10.5                C 760
3139       1963 12 17.05694  04 08 21.24  +22 16 28.4          16.3  C 760
3139       1963 12 17.12153  04 08 18.53  +22 15 59.3                C 760

801 Oak Ridge
R. E. McCrosky, Harvard-Smithsonian Center for Astrophysics,
   60 Garden Street, Cambridge, MA 02138, U.S.A.
Observers R. E. McCrosky, C.-Y. Shao
1.5-m reflector
AC
1928 UF    1987 11 17.36415  06 27 13.62  +22 59 17.8                  801
1928 UF    1987 11 19.33100  06 26 32.85  +23 01 28.9                  801
1928 UF    1987 12 18.31802  06 06 27.87  +23 38 03.6                  801
1931 TC4   1987 12 24.08185  01 38 10.90  +14 05 25.4                  801
1940 WA    1987 12 18.94721  22 02 26.59  +01 50 16.3                  801
1949 SF    1987 10 24.27353  01 27 44.95  +19 24 05.5                  801
1949 SF    1987 11 20.11934  01 07 00.17  +18 22 18.4                  801
1967 UR    1987 11 19.28402  04 21 00.78  +19 36 51.2                  801
1973 SM    1987 12 18.29429  05 49 24.01  +21 10 19.9                  801
1975 VY5   1987 10 19.36688  04 00 49.29  +29 19 57.7                  801
1975 VG9   1987 11 20.03554  23 07 11.94  +08 32 34.2                  801
1976 QN1   1985 03 24.21470  10 44 42.55  +08 12 36.9          18      801
1976 QN1   1986 08 06.14496  20 05 25.25  -18 37 33.0                  801
1978 RN5   1987 11 21.12123  00 40 25.91  +19 30 32.8                  801
1978 RN5   1987 12 24.02977  01 03 45.42  +21 20 46.8                  801
1979 FU2   1987 11 19.26099  03 54 18.17  +24 48 15.7                  801
1980 RS2   1987 09 24.38506  04 30 50.90  +24 53 20.4                  801
```

1980	TN4		1987	10	24.33195	02	46	59.20	+15	40	47.1		801
1980	TA6		1987	10	22.30053	03	13	16.58	+21	55	36.7		801
1980	TA6		1987	12	24.12567	02	18	28.04	+20	01	12.9		801
1981	DK3		1987	10	19.97554	21	54	01.99	-00	32	03.1		801
1981	QJ		1987	11	21.27217	04	00	46.14	+21	32	44.6		801
1982	FH3		1987	08	25.35148	00	13	23.11	+02	51	34.3		801
1982	FH3		1987	11	23.00195	23	31	42.88	-03	41	54.9		801
1982	VR4		1987	10	24.11017	23	29	00.71	-05	02	47.9		801
1982	VR4		1987	11	20.06242	23	31	51.01	-04	50	25.6		801
1982	XB		1987	12	18.42292	11	02	20.69	+17	59	09.5		801
1983	AF2		1987	12	21.97748	23	10	54.66	+24	43	23.2	W	801
1983	QA		1987	11	19.30888	05	19	23.76	+38	04	32.8		801
1983	WP		1987	12	24.05508	02	11	52.22	+03	21	11.5		801
1984	AP		1987	12	24.10432	01	37	28.96	+26	40	58.9		801
1984	AQ		1987	12	22.33070	07	01	42.15	+18	18	03.8		801
1985	FA		1987	12	22.22557	04	43	00.77	+40	02	55.0		801
1985	JV1		1987	12	20.08033	02	59	30.15	+18	19	21.0		801
1985	TE3		1987	12	23.27520	06	12	51.79	-01	50	18.7		801
1985	VK2		1987	11	19.44212	09	23	09.93	+37	53	41.6		801
1985	VK2		1987	12	22.44087	09	24	23.46	+40	39	53.3		801
1985	VK2		1987	12	24.38551	09	23	51.77	+40	50	47.6		801
1986	QL1		1987	12	22.37722	08	50	42.97	+26	51	22.4		801
1986	RL		1987	12	22.19337	05	15	18.29	+21	51	07.7	17	801
1986	RL		1987	12	22.24547	05	15	15.44	+21	50	57.0		801
1986	RL		1987	12	24.18405	05	13	34.94	+21	44	41.9		801
1986	RG1		1987	11	21.35554	06	08	11.83	+20	34	01.7		801
1986	RG1		1987	12	18.27024	05	45	55.62	+20	20	03.6		801
1987	SS1		1987	12	18.97422	00	15	16.78	+02	24	31.9		801
1987	WH		1987	12	19.09863	03	00	13.35	+29	15	47.0		801
1987	WA1		1987	12	19.07414	02	02	03.66	+16	12	17.1		801
1987	YL	*	1987	12	22.19337	05	15	46.90	+21	46	51.4	17.5	801
1987	YL		1987	12	22.24547	05	15	44.06	+21	46	48.2		801
1987	YL		1987	12	24.18405	05	14	06.13	+21	45	08.6		801
2402	T-3		1987	12	24.21917	04	59	52.54	+26	04	24.1		801
654			1987	12	22.17529	06	11	12.35	+28	26	14.6		801
654			1987	12	22.20857	06	11	09.54	+28	25	43.3		801
654			1987	12	24.29603	06	08	20.83	+27	52	20.6		801
2212			1987	12	18.43749	12	08	10.74	+25	23	11.6		801
3272			1987	12	22.19337	05	17	17.87	+21	53	11.6	16	801
3272			1987	12	22.24547	05	17	14.16	+21	53	16.7		801
3272			1987	12	24.18405	05	15	05.10	+21	56	29.8		801

809 European Southern Observatory
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0.4-m GPO astrograph

1983	RT3		1987	08	24.20208	21	43	29.20	-15	02	16.5	17.5	809
1983	RT3		1987	08	24.21458	21	43	28.41	-15	02	14.6		809
1987	MK		1987	08	24.20208	21	42	21.67	-15	39	38.5	17	809
1987	MK		1987	08	24.21458	21	42	20.87	-15	39	36.8		809
1987	QG1		1987	08	25.29514	22	05	13.85	-05	17	46.2	17	809
1987	QG1		1987	08	25.30556	22	05	13.19	-05	17	43.5		809
1987	QG1		1987	08	25.31597	22	05	12.37	-05	17	42.0		809
1987	QV1		1987	08	29.07986	21	34	48.06	-11	12	18.2	16.8	809
1987	QV1		1987	08	29.09028	21	34	47.47	-11	12	17.1		809
1987	QV1		1987	08	29.10208	21	34	46.82	-11	12	15.6		809
1987	QD2		1987	08	24.20208	21	40	23.51	-15	29	47.6	17	809
1987	QD2		1987	08	24.21458	21	40	23.10	-15	29	52.9		809
1987	QG2		1987	08	24.20208	21	41	54.44	-14	00	42.2	17.5	809
1987	QG2		1987	08	24.21458	21	41	53.81	-14	00	42.8		809

1987	QH2		1987	08	24.20208	21	42	48.19	-15	21	03.1	17	809
1987	QH2		1987	08	24.21458	21	42	47.31	-15	21	01.9		809
1987	QE3		1987	08	28.18403	22	03	01.49	-07	11	06.1		809
1987	QE3		1987	08	28.19722	22	03	00.92	-07	11	11.3		809
1987	QE3		1987	08	28.20764	22	03	00.33	-07	11	15.3		809
1987	QE3		1987	08	29.24028	22	02	10.73	-07	18	19.2		809
1987	QE3		1987	08	29.25139	22	02	10.19	-07	18	24.7		809
1987	QE3		1987	08	29.26181	22	02	09.63	-07	18	29.3		809
1987	QF3		1987	08	31.32431	22	49	34.13	-11	43	07.5	17.3	809
1987	QF3		1987	08	31.33576	22	49	33.62	-11	43	11.7		809
1987	QF3		1987	08	31.34514	22	49	33.11	-11	43	17.5		809
1987	QH3		1987	08	31.32431	22	50	41.37	-11	18	21.7	17.5	809
1987	QH3		1987	08	31.33576	22	50	40.57	-11	18	23.5		809
1987	QH3		1987	08	31.34514	22	50	40.00	-11	18	24.3		809
1987	QO5		1987	08	24.20208	21	39	54.46	-15	02	01.9	17.5	809
1987	QO5		1987	08	24.21458	21	39	53.70	-15	02	03.3		809
1987	QZ5		1987	08	28.21736	22	03	48.10	-09	03	03.9	17	809
1987	QZ5		1987	08	28.22778	22	03	47.51	-09	03	04.2		809
1987	QZ5		1987	08	28.23819	22	03	46.94	-09	03	04.0		809
1987	QC6		1987	08	28.21736	22	03	32.54	-10	30	56.3	17.8	809
1987	QC6		1987	08	28.22778	22	03	32.19	-10	31	06.1		809
1987	QC6		1987	08	28.23819	22	03	31.87	-10	31	16.1		809
1987	QY6		1987	08	25.29514	21	59	12.87	-04	34	01.0	17	809
1987	QY6		1987	08	25.30556	21	59	12.23	-04	33	59.8		809
1987	QY6		1987	08	25.31597	21	59	11.51	-04	33	58.0		809
1987	QZ6		1987	08	25.29514	22	01	18.93	-05	33	42.7	17	809
1987	QZ6		1987	08	25.30556	22	01	18.29	-05	33	45.6		809
1987	QZ6		1987	08	25.31597	22	01	17.58	-05	33	47.1		809
1987	QA7		1987	08	25.29514	22	01	25.70	-03	55	54.3	17.7	809
1987	QA7		1987	08	25.30556	22	01	25.13	-03	55	57.6		809
1987	QA7		1987	08	25.31597	22	01	24.61	-03	56	01.0		809
1987	QY7		1987	08	27.05556	21	55	59.90	-32	54	03.6	17.5	809
1987	QY7		1987	08	27.06597	21	55	59.41	-32	54	06.3		809
1987	QY7		1987	08	27.07847	21	55	58.69	-32	54	09.0		809
1987	QZ8	*	1987	08	21.36875	23	57	31.15	-10	54	26.8	17.2	809
1987	QZ8		1987	08	21.37917	23	57	30.80	-10	54	28.4		809
1987	QZ8		1987	08	21.38958	23	57	30.49	-10	54	28.4		809
1987	QA9	*	1987	08	21.36875	23	57	31.23	-10	09	02.8	17.5	809
1987	QA9		1987	08	21.37917	23	57	30.86	-10	09	08.4		809
1987	QA9		1987	08	21.38958	23	57	30.48	-10	09	09.6		809
1987	QB9	*	1987	08	28.21736	22	00	13.73	-09	46	41.3	17.5	809
1987	QB9		1987	08	28.22778	22	00	13.12	-09	46	43.0		809
1987	QB9		1987	08	28.23819	22	00	12.45	-09	46	44.4		809
1987	QC9	*	1987	08	29.07986	21	32	21.29	-10	13	17.7	17.2	809
1987	QC9		1987	08	29.09028	21	32	20.76	-10	13	19.8		809
1987	QC9		1987	08	29.10208	21	32	20.22	-10	13	22.9		809
3538	P-L		1987	08	25.29514	22	02	56.24	-05	09	15.5	16.5	809
3538	P-L		1987	08	25.30556	22	02	55.63	-05	09	15.7		809
3538	P-L		1987	08	25.31597	22	02	54.96	-05	09	15.8		809
82			1987	08	31.32431	22	47	48.24	-10	52	27.4	15	809
82			1987	08	31.33576	22	47	47.69	-10	52	29.6		809
82			1987	08	31.34514	22	47	47.21	-10	52	32.6		809
385			1987	08	31.32431	22	49	36.36	-09	43	54.1	15	809
385			1987	08	31.33576	22	49	35.75	-09	43	55.2		809
385			1987	08	31.34514	22	49	35.16	-09	43	56.7		809
884			1987	08	29.07986	21	31	36.37	-09	50	36.8	16	809
884			1987	08	29.09028	21	31	36.01	-09	50	38.0		809
884			1987	08	29.10208	21	31	35.64	-09	50	39.2		809
1173			1987	08	25.29514	22	06	20.28	-04	33	54.4	16	809

1173		1987	08	25.30556	22	06	19.85	-04	33	55.0		809
1173		1987	08	25.31597	22	06	19.53	-04	33	56.5		809
1623		1987	08	31.32431	22	50	36.42	-10	08	42.9	16	809
1623		1987	08	31.33576	22	50	35.90	-10	08	45.5		809
1623		1987	08	31.34514	22	50	35.53	-10	08	48.8		809
3381		1987	08	25.29514	22	01	08.27	-04	01	25.2	16.7	809
3381		1987	08	25.30556	22	01	07.69	-04	01	26.9		809
3381		1987	08	25.31597	22	01	07.06	-04	01	29.9		809
3706		1987	08	24.20208	21	40	27.10	-14	59	25.9	17.5	809
3706		1987	08	24.21458	21	40	26.16	-14	59	30.8		809

877 Okutama
N. Kawasato, 3-51, Hana-Koganei, Kodaira, Tokyo 187, Japan
Observer T. Hioki
Measurer N. Kawasato
0.30-m f/3.8 hyperboloid astrocamera

1986 QL1		1988	01	16.69602	08	32	44.99	+28	23	22.8		877
1986 QL1		1988	01	16.75036	08	32	41.16	+28	23	32.3		877
1988 AG	*	1988	01	11.60104	07	44	51.43	+32	33	34.7	16	877
1988 AG		1988	01	11.63750	07	44	48.73	+32	33	32.7		877
1988 BF	*	1988	01	16.69602	08	31	11.45	+27	45	19.2	16	877
1988 BF		1988	01	16.75036	08	31	08.56	+27	45	38.2		877

892 YGCO Hoshikawa and Nagano Stations
T. Kobayashi, 1717-2, Shimo-Koizumi, Oizumi-Cho, Ora-Gun,
Gunma-ken, 370-05 Japan
Observer T. Kojima
0.25-m f/3.4 Wright-Schmidt camera

1987 YB		1987	12	25.55624	03	14	18.39	+15	03	57.2	17	892
1987 YB		1987	12	25.58333	03	14	18.20	+15	04	08.1		892
1987 YB		1987	12	26.58437	03	14	13.41	+15	10	17.3	17	892
1987 YB		1987	12	26.63501	03	14	13.19	+15	10	37.2		892
1987 YC		1987	12	25.71851	07	27	54.63	+23	37	29.0	17	892
1987 YC		1987	12	25.75902	07	27	52.50	+23	37	26.3		892
1987 YC		1987	12	26.59444	07	27	09.26	+23	36	55.8	16.5	892
1987 YC		1987	12	26.64484	07	27	06.53	+23	36	55.1		892
1987 YC		1987	12	31.81828	07	22	25.66	+23	33	39.4	16.5	892
1987 YC		1987	12	31.84045	07	22	24.39	+23	33	38.5		892
1987 YC		1988	01	10.59936	07	13	05.11	+23	25	41.2	16	892
1987 YC		1988	01	10.62152	07	13	03.68	+23	25	39.9		892
1987 YC		1988	01	16.73015	07	07	13.76	+23	19	04.5	16	892
1987 YC		1988	01	16.76898	07	07	11.59	+23	19	02.0		892
1987 YD		1987	12	25.71041	07	24	24.77	+32	44	34.9	16	892
1987 YD		1987	12	25.75057	07	24	22.43	+32	44	58.0		892
1987 YD		1987	12	26.60312	07	23	34.39	+32	52	49.3	16	892
1987 YD		1987	12	26.65358	07	23	31.36	+32	53	15.8		892
1987 YD		1987	12	31.82569	07	18	13.65	+33	38	48.6	16	892
1987 YD		1987	12	31.84780	07	18	12.17	+33	39	00.0		892
1987 YD		1988	01	10.60671	07	07	11.33	+34	50	59.0	15.5	892
1987 YD		1988	01	10.62881	07	07	09.55	+34	51	07.6		892
1987 YH	*	1987	12	25.72708	07	21	48.28	+11	20	32.3	17	892
1987 YH		1987	12	25.76736	07	21	46.37	+11	20	40.5		892
1987 YH		1987	12	30.82991	07	17	37.68	+11	39	11.3	17	892
1988 AE	*	1988	01	10.54722	06	49	17.10	+14	03	29.0	16	892
1988 AE		1988	01	16.69785	06	43	01.50	+13	48	05.1	15.5	892
1988 AE		1988	01	16.73761	06	42	59.11	+13	47	59.1		892
1988 BB	*	1988	01	16.70578	06	37	02.21	+26	29	24.6	17	892
1988 BB		1988	01	16.74490	06	36	59.78	+26	29	18.2		892
1988 BC	*	1988	01	16.72106	06	44	38.37	+32	30	47.4	16	892

1988 BC		1988 01 16.76018	06 44 36.00	+32 31 03.5						892
1988 BD	*	1988 01 16.72106	06 46 33.53	+32 59 18.8				16		892
1988 BD		1988 01 16.76018	06 46 31.19	+32 59 18.5						892
1988 BE	*	1988 01 16.77916	09 07 52.82	+17 12 22.1				15.5		892
1988 BE		1988 01 16.81805	09 07 50.26	+17 12 18.0						892

894 Kiyosato
S. Miyasaka, 3-8-501, 4 Chome, Nagayama, Tama, Tokyo 206, Japan
Observers S. Miyasaka, Y. Sakakibara
Measurer S. Miyasaka
0.25-m f/4.8 reflector

1987 YC		1988 01 14.51323	07 09 19.71	+23 21 35.3						894
1987 YC		1988 01 14.53544	07 09 18.49	+23 21 34.9						894
1987 YC		1988 01 16.78028	07 07 10.83	+23 19 01.0						894
1987 YC		1988 01 16.79992	07 07 09.67	+23 19 02.6						894
1987 YD		1988 01 14.44898	07 02 50.54	+35 12 49.3						894
1987 YD		1988 01 14.47526	07 02 48.67	+35 12 58.3						894
1987 YD		1988 01 16.76858	07 00 16.92	+35 24 02.6						894
1987 YD		1988 01 16.78980	07 00 15.60	+35 24 11.5						894

* * * * *

ORBITAL ELEMENTS OF ONE-OPPOSITION MINOR PLANETS.

The columns headed Arc and O give the time span in days covered by the observations and the number of observations utilized in the computation (0 = 10 or more). In the note column N, D means that there are double (or other multiple) designations, E means that the value of the eccentricity was assumed, F means both; the designations are listed at the end.

The orbit computers (column C) are B = C. M. Bardwell, G = D. W. E. Green, M = B. G. Marsden, N = S. Nakano.

Planet	H	Epoch	M	Peri.	Node	Incl.	e	a	Arc	O	N	C
1985 CG	14.0	850204	17.59	14.03	95.49	3.18	0.1527	2.3618	11	6		B
1987 QM	13.5	870922	6.32	4.70	333.87	17.00	0.2598	2.7014	84	5		G
1987 QV1	14.5	870813	4.37	358.22	317.29	7.25	0.2098	2.4212	8	9		G
1987 QG2	13.0	870813	206.57	159.20	326.16	11.84	0.2043	2.3515	4	8	E	G
1987 QE3	12.5	870813	276.34	265.42	173.29	7.81	0.2347	2.8321	7	0	E	M
1987 QO5	13.5	870813	208.56	148.85	330.62	6.51	0.1092	2.2430	5	8		G
1987 QY6	14.5	870813	358.54	19.38	309.13	9.64	0.2193	2.5401	4	9		G
1987 QZ6	14.5	870813	33.59	352.29	289.38	4.52	0.1472	2.2017	4	9		G
1987 SD	14.5	870902	18.58	125.23	186.52	11.77	0.2917	2.4971	2	6	E	B
1987 SJ3	14.0	871012	19.63	331.91	14.49	24.59	0.0978	1.9865	57	0		B
1987 SF7	14.0	871012	346.15	115.81	274.39	19.66	0.2898	2.3059	58	5		M
1987 SH7	14.5	871012	18.50	54.28	289.14	18.67	0.0789	1.9398	58	5		B
1987 UW	14.0	871101	24.21	158.37	205.65	32.44	0.1686	2.6381	32	0		B
1987 UB1	12.0	871121	20.27	354.13	17.15	6.01	0.2413	2.4340	48	0		N
1987 UT1	16.0	871012	14.13	41.78	297.54	6.04	0.3167	2.3006	60	7		B
1987 UZ1	14.5	871101	328.03	213.68	223.63	25.67	0.1068	1.8823	38	7		B
1987 VC	11.5	871121	68.95	307.61	18.25	8.97	0.1369	2.8022	27	0		N
1987 WA	14.0	871211	43.04	304.09	62.48	5.92	0.1292	2.6698	52	0		M
1987 WB	12.0	871211	227.64	322.43	232.55	9.69	0.0400	3.0061	52	0		M
1987 WR	12.5	871211	328.36	214.37	250.08	2.28	0.0140	2.2653	28	0		N
1987 WY	12.5	871211	38.70	141.26	231.16	12.40	0.2464	2.6188	34	0		N
1987 WF1	14.5	871121	28.50	147.21	231.28	16.68	0.1859	1.9675	4	3	E	M
1987 WJ1	14.0	871211	13.13	359.58	32.69	7.11	0.1448	3.1480	56	0		M
1987 WT1	13.0	871211	296.29	71.36	94.00	4.99	0.1184	3.2098	29	5		B
1987 WV1	15.5	871211	30.24	264.73	138.60	0.91	0.1737	2.2459	29	5		B

1987 XD	11.0	871211	325.07	358.72	114.60	10.70	0.0420	3.0173	7 9	N
1987 XO	13.5	871211	351.66	21.89	68.32	10.44	0.1872	2.5121	8 6 E	G
1987 YA	14.5	871231	23.34	185.43	220.58	2.21	0.2599	2.2471	9 0	N
1987 YD	13.0	871231	358.26	42.26	62.97	8.76	0.1713	2.3398	27 0	N
1987 YJ	15.0	871231	332.78	184.22	314.29	5.06	0.0925	2.2436	28 0	N
1987 YK	13.5	871231	81.60	297.46	65.63	4.88	0.1987	2.5677	25 9	N
1987 YQ	14.0	871231	46.44	252.91	142.05	3.49	0.0969	2.6891	23 6	M

* * * * *

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

(2212) Hephaistos Obs. 55 M 61.13276 Peri. 208.09020
H 14.0 G 0.25 Opp. 4 n 0.30943243 Node 28.01457
rms res. 1".1 (M-P) 1978-1988 e 0.8350056 Incl. 11.87839

The above orbital elements are for Epoch 1988 Aug. 27.0 ET, equinox 1950.0. The following identifications are by C. M. Bardwell unless otherwise stated.

(3745)* 1949 SF = 1960 MC = 1983 RQ2

Discovered 1949 Sept. 23 by K. Reinmuth at Heidelberg. The key identification 1949 SF = 1983 RQ2 is by E. Bowell (MPC 8284).

Epoch 1988 Aug. 27.0 ET = JDE 2447400.5

M 120.46873		(1950.0)	P	Q	
n 0.26044066	Peri.	329.01219	+0.81976752	+0.57259195	
a 2.4284557	Node	356.00485	-0.48798853	+0.68839018	
e 0.2505708	Incl.	9.03342	-0.29974724	+0.44526107	
P 3.78	H	14.3	G	0.25	

Residuals in seconds of arc

490923	024	2.3-	0.3-	830902	688	1.4-	0.3+	830910	688	1.3-	2.7-
491015	024	2.8+	2.4+	830904	688	0.1-	0.1-	830912	688	1.5+	2.0-
491022	024	0.2+	1.5-	830904	688	0.3-	0.4+	830912	688	1.7+	1.9-
600624	839	0.6+	0.0	830906	688	0.6+	0.3-	871024	801	0.4+	1.3+
600624	839	0.8-	0.1+	830906	688	2.0+	0.4+	871120	801	1.3-	0.0
830902	688	0.7-	0.3+	830910	688	0.4+	0.1+				

(3746)* 1964 TC1 = 1935 SD2 = 1976 YM5 = 1981 RS4

Discovered 1964 Oct. 8 at the Purple Mountain Observatory. The key identification 1964 TC1 = 1981 RS4 is by B. G. Marsden (MPC 10036).

Epoch 1988 Aug. 27.0 ET = JDE 2447400.5

M 97.02779		(1950.0)	P	Q	
n 0.17367736	Peri.	306.43808	+0.87096093	+0.49129776	
a 3.1815633	Node	24.13856	-0.44486146	+0.79479029	
e 0.2468658	Incl.	1.02564	-0.20862729	+0.35627925	
P 5.67	H	12.5	G	0.25	

Residuals in seconds of arc

350928	078	2.9-	4.5+	761218	095	0.0	0.7+	871020	688	1.6-	2.3-
351001	078	1.2+	0.5-	810908	095	0.7+	0.0	871020	688	2.0+	0.6-
641008	330	2.2-	2.0-	810928	095	1.7+	1.1-	871024	801	1.1-	2.6+
641030	330	0.5-	0.4+	811005	095	3.6-	0.6-	871124	688	0.5+	0.7+
641109	330	3.3+	0.1+	811022	095	2.6+	0.4-	871124	688	0.3+	1.0-

(3747)* 1975 VY5 = 1930 XR = 1981 SF8 = 1981 VE

Discovered 1975 Nov. 5 by L. I. Chernykh at the Crimean Astrophysical Observatory.

Epoch 1988 Aug. 27.0 ET = JDE 2447400.5

M	343.30238		(1950.0)		P		Q				
n	0.17279642	Peri.	98.75033		-0.67758232		-0.68949608				
a	3.1923675	Node	38.32085		+0.39917066		-0.63701004				
e	0.1131729	Incl.	24.37301		+0.61769328		-0.34469314				
P	5.70	H	11.4		G	0.25					

Residuals in seconds of arc

301113	690	0.2-	0.9+	751124	033	0.0	2.5+	811102	688	0.1+	2.2-
301114	690	2.1+	1.8+	751125	033	0.4-	2.5+	811102	688	2.7+	1.5-
301126	690	1.0-	0.8-	810924	033	1.0-	1.8+	811105	688	1.5+	1.5-
301213	690	1.1-	1.4-	810924	033	1.0-	1.8+	811105	688	1.0-	0.9-
301214	690	0.0	0.4-	811023	095	2.5+	2.3-	871019	801	0.1+	1.3+
751105	095	0.4+	0.2+	811025	330	(8.6-	0.7-)	871119	688	0.7-	0.8+
751106	095	2.7-	2.4-	811029	330	0.8+	0.1+	871119	688	1.5-	0.7+

(3748)* 1981 JQ = 1979 VT2 = 1985 GN1

Discovered 1981 May 3 by E. Bowell at the Anderson Mesa Station of the Lowell Observatory. The key identification 1981 JQ = 1979 VT2 is by S. J. Bus (MPC 10544).

Epoch 1988 Aug. 27.0 ET = JDE 2447400.5

M	359.19270		(1950.0)		P		Q				
n	0.24472836	Peri.	110.22677		-0.80138669		-0.59540748				
a	2.5313169	Node	33.30511		+0.50251411		-0.72202594				
e	0.1556479	Incl.	5.97708		+0.32443634		-0.35237547				
P	4.03	H	12.8		G	0.25					

Residuals in seconds of arc

770518	675	1.1-	0.2+	810506	675	0.4-	0.7+	871122	688	0.7-	0.4-
791114	095	0.5-	0.0	810511	675	2.8-	0.7+	871129	372	(4.6+	0.2-)
791122	675	0.8+	0.8+	810604	688	0.4-	1.4-	871129	372	1.7+	3.0-
791124	675	0.9+	0.5-	810604	688	0.5+	1.9-	871214	372	(3.4-	1.2-)
791125	675	0.0	0.7-	850415	688	0.4+	1.9+	871214	372	1.2+	0.3-
810503	688	0.9-	2.6-	850415	688	1.8+	1.3+	871216	372	1.4-	0.8+
810503	688	0.5+	2.3-	871119	801	1.1-	0.4-				
810505	675	0.9+	0.7-	871122	688	0.3+	0.2+				

(3749)* 1982 BG1 = 1954 XM = 1962 ED = 1974 YO

Discovered 1982 Jan. 24 by E. Bowell at the Anderson Mesa Station of the Lowell Observatory.

Epoch 1988 Aug. 27.0 ET = JDE 2447400.5

M	11.63897		(1950.0)		P		Q				
n	0.29469104	Peri.	173.18644		-0.31700001		-0.94462527				
a	2.2364443	Node	295.26659		+0.86563343		-0.25162563				
e	0.1093533	Incl.	5.38173		+0.38754324		-0.21063627				
P	3.34	H	13.7		G	0.25					

Residuals in seconds of arc

541206	760	0.8+	0.8+	820124	688	1.8+	1.7-	841120	688	0.1-	1.7-
620302	760	0.1-	1.1+	820124	688	1.3+	1.4-	841120	688	1.2-	3.4-
741219	330	0.8-	0.1-	820130	688	1.8+	1.1+	841121	675	0.2-	0.5+
771007	675	1.2+	0.1+	820130	688	0.9-	1.0+	841127	688	(6.3-	3.9-)
771011	675	0.6-	1.2+	820218	704	1.5-	2.7+	841127	688	1.1+	0.1+
771011	675	0.3-	0.2+	820220	704	0.2+	0.6-	841127	010	1.8+	0.5+
771012	675	0.0	0.5+	820221	704	2.1-	2.0-	841128	010	1.1-	0.6+
771012	675	0.2-	1.6+	820222	704	0.8-	1.8-	841224	801	1.3-	1.9+
771016	675	0.1-	1.4-	820223	704	2.3+	1.0+	841225	552	1.1-	0.0
771016	675	0.2-	1.2-	841119	675	1.6+	0.8+	841225	552	0.5+	1.1-
820120	095	1.2+	2.0+	841120	801	0.2-	1.3+				

(3750)* 1982 TD1 = 1974 DD

Discovered 1982 Oct. 14 by L. G. Karachkina at the Crimean Astrophysical Observatory.

Epoch 1988 Aug. 27.0 ET = JDE 2447400.5

M	224.26218	(1950.0)		P	Q
n	0.18738528	Peri.	202.01596	-0.86865575	+0.49481209
a	3.0244453	Node	7.77770	-0.42328749	-0.71562950
e	0.0420200	Incl.	10.41211	-0.25741967	-0.49298622
P	5.26	H	12.9	G	0.25

Residuals in seconds of arc

740219 029	0.2+	0.9-	821024 095	0.5+	0.5+	870929 054	0.3-	1.2+
740220 029	0.2+	0.3+	821109 095	0.8+	1.4+	870930 054	0.4+	1.2+
740223 029	0.1+	0.0	821111 095	3.6-	2.1+	870930 054	0.2+	0.8+
821014 095	0.4-	0.4-	821112 095	0.9+	0.5-	871002 054	0.6+	0.7+
821020 095	0.2+	0.5-	850324 688	0.2+	0.5+	871025 054	0.2+	0.5-
821021 095	0.2+	0.9-	850324 688	0.5+	0.8+	871025 054	0.2+	1.4-
821022 095	1.2-	2.0-	850417 801	0.3-	0.8+			

(3751)* 1983 NK = 1954 GN = 1977 LM1 = 1977 NA

Discovered 1983 July 10 by E. Bowell at the Anderson Mesa Station of the Lowell Observatory. The key identification 1983 NK = 1977 LM1 is by Bowell (MPC 11053). The identification 1983 NK = 1977 NA was suggested by W. Landgraf (MPC 11053).

Epoch 1988 Aug. 27.0 ET = JDE 2447400.5

M	348.82412	(1950.0)		P	Q
n	0.17707885	Peri.	12.46300	+0.23382555	+0.94467290
a	3.1406889	Node	271.40083	-0.91059870	+0.12984532
e	0.1091583	Incl.	13.30352	-0.34078677	+0.30121968
P	5.57	H	11.7	G	0.25

Residuals in seconds of arc

540408 839	0.2-	0.7-	830710 688	0.5+	0.6-	870224 474	0.9-	1.1-
770613 675	0.7+	1.8+	830713 688	2.8+	1.5-	870224 474	1.5-	1.4-
770614 675	1.0-	1.2+	830713 688	2.3-	0.7-	870227 801	0.9+	0.6-
770709 095	1.0-	0.7+	830813 688	0.6+	0.5-			
830710 688	0.5+	0.8-	830813 688	0.7+	0.7-			

(3752)* 1985 PA

Discovered 1985 Aug. 15 by E. Helin, M. A. Barucci and J.-L. Heudier at Caussols.

Epoch 1988 Aug. 27.0 ET = JDE 2447400.5

M	187.50420	(1950.0)		P	Q
n	0.58642196	Peri.	312.20872	-0.33954091	-0.82869885
a	1.4136088	Node	147.34492	+0.89926268	-0.14732455
e	0.3025238	Incl.	55.54804	-0.27575096	+0.53995713
P	1.68	H	15.6	G	0.25

Residuals in seconds of arc

850815 010	(3.5+	1.0+)	850818 675	(7.3-	2.8+)	850827 691	0.3+	0.1+
850815 010	1.0-	1.4-	850819 675	(7.8-	2.7-)	850827 691	0.0	0.1+
850815 010	(3.2+	0.9-)	850819 010	0.9+	0.2-	850827 691	0.4+	0.3+
850816 010	(6.3-	9.0-)	850819 010	0.9-	1.4-	850908 675	0.1+	0.4+
850817 675	1.4-	2.5+	850820 675	0.4+	2.3+	850908 675	0.1+	0.3+
850817 675	1.8+	0.2-	850821 675	0.2-	2.0-	850915 474	0.6-	0.2-
850818 010	(6.6+	1.7-)	850824 010	(3.3-	0.8-)	850916 474	0.2+	0.9-
850818 010	(9.3+	3.2+)	850824 010	1.4+	0.5+	850916 474	(3.2-	6.4-)
850818 010	(8.8+	1.9+)	850824 691	1.0+	0.2-	851018 474	1.3-	0.0
850818 675	(6.9-	1.9-)	850824 691	0.6+	0.7-	851018 474	0.4-	0.9-
850818 675	(6.1-	1.4-)	850825 568	1.0-	0.3+	851108 474	1.7-	1.6+
850818 801	0.2+	0.5-	850826 568	0.6-	0.1+	851108 474	0.5-	1.6+

860304 675 1.1- 0.7- 860626 675 0.5- 0.2+ 860816 675 0.2- 0.1-
860304 675 1.2- 0.7- 860626 675 0.6- 0.1+ 880108 675 0.0 0.2+
860308 801 (0.7- 4.0+) 860726 675 0.8+ 0.3- 880108 675 0.4+ 0.3-
860315 691 0.4+ 1.1+ 860726 675 0.1+ 0.2- 880109 675 0.2- 0.4+
860315 691 0.1- 0.7+ 860728 675 1.0+ 0.8- 880109 675 0.1+ 0.5+
860315 691 0.8+ 1.3+ 860728 675 0.8+ 0.5- 880115 691 0.2- 0.1+
860316 691 0.6+ 0.9- 860815 675 1.0- 0.6- 880115 691 0.1- 0.5+
860316 691 0.8+ 0.5- 860815 675 1.1- 0.5- 880115 691 0.3- 0.0
860316 691 0.3+ 0.9- 860816 675 0.1+ 0.3-

(3753)* 1986 TO = 1983 UH
Discovered 1986 Oct. 10 by D. Waldron at Siding Spring.
Epoch 1988 Aug. 27.0 ET = JDE 2447400.5

M 214.17474		(1950.0)	P	Q
n 0.98905294	Peri.	43.58168	-0.94961192	-0.15022551
a 0.9976764	Node	125.75553	+0.09865383	-0.97630395
e 0.5147701	Incl.	19.81419	+0.29749726	-0.15576549
P 1.00	H	15.0	G 0.25	

Residuals in seconds of arc
831030 809 0.2- 2.1- 861025 413 0.4- 0.6- 861031 323 (4.1+ 0.6-)
831030 809 0.1+ 0.4- 861025 413 0.7+ 0.4- 861104 413 0.6- 0.8-
831104 809 1.8- 0.6- 861025 413 2.2- 0.6+ 861104 413 0.5- 1.3-
831104 809 1.3+ 2.1+ 861025 413 0.2- 0.5+ 870616 675 0.1- 0.0
861010 413 0.4+ 0.7- 861025 413 0.7- 0.6+ 870616 675 0.3- 0.0
861010 413 0.2+ 0.8+ 861025 413 0.3- 1.2+ 870617 675 0.0 0.5+
861011 413 0.4- 2.6- 861025 413 0.7+ 0.6- 870617 675 0.3+ 0.5+
861011 413 0.4- 1.9+ 861025 413 (0.2+ 3.6-) 870817 691 0.1- 0.6+
861021 413 0.6+ 0.6+ 861027 323 1.4+ 1.6- 870817 691 0.1- 0.3+
861021 413 0.6+ 0.3- 861028 413 0.3- 0.7- 870817 691 0.1- 0.5+
861023 413 0.3+ 0.1- 861028 413 0.8+ 1.8- 871025 474 0.0 0.1-
861023 413 0.9- 1.8- 861029 474 0.3+ 0.3- 871025 474 0.8+ 0.6-
861023 413 0.8- 0.1- 861029 474 0.6+ 0.6+ 871031 474 0.8+ 2.0+
861023 413 0.1- 0.2+ 861030 474 1.5+ 2.1+ 871031 474 1.6+ 2.1+
861023 413 0.8- 1.8- 861030 474 0.8+ 1.1+ 871118 474 1.4- 1.3+
861023 413 0.2+ 0.3- 861031 474 0.6- 0.2+ 871118 474 2.1- 1.0+
861025 413 2.5+ 1.3+ 861031 474 0.5- 0.3-

1953 TS2 = 1982 BK10 = 1984 XD = 1987 WJ3
Epoch 1988 Aug. 27.0 ET = JDE 2447400.5 (J-P)

M 125.39973		(1950.0)	P	Q
n 0.28923520	Peri.	241.07471	+0.78441677	+0.61694222
a 2.2644852	Node	80.75935	-0.54413592	+0.73390303
e 0.1577851	Incl.	3.70712	-0.29766833	+0.28419825
P 3.41	H	13.5	G 0.25	

Residuals in seconds of arc
531014 760 3.2- 1.5- 531105 760 2.2+ 2.8+ 871117 010 2.6- 1.0-
531014 760 2.6- 1.5- 820119 095 0.4+ 1.9+ 871117 010 2.2- 0.2+
531031 760 1.5+ 0.3+ 841201 046 2.0- 1.7- 871120 010 3.0+ 2.3+
531031 760 0.6+ 0.9- 841201 046 2.1+ 0.5- 871120 010 2.6+ 1.9+
531105 760 2.8+ 0.4- 871117 010 1.9- 0.4+

1976 UH16 = 1976 ST5 = 1987 SJ11
Epoch 1988 Aug. 27.0 ET = JDE 2447400.5 (J-P)

M 28.03847		(1950.0)	P	Q
n 0.17411425	Peri.	203.09662	+0.80991006	-0.58439671
a 3.1762453	Node	193.03303	+0.56690149	+0.80188991
e 0.1562523	Incl.	12.87793	+0.15056025	+0.12431029
P 5.66	H	12.0	G 0.25	

Residuals in seconds of arc

760924 095	1.1-	0.9-	761024 381	0.4+	0.4-	870919 675	0.0	0.5-
761022 381	0.6-	0.5-	761118 381	1.7+	0.9-	870920 675	0.5-	0.4+
761022 381	0.2+	0.5-	761118 381	0.4+	0.6+	870920 675	0.1-	0.7-
761024 381	0.0	0.2-	870919 675	0.6-	0.2+			

1979 MR3

The 1985 observations were identified by S. J. Bus.

Epoch 1988 Aug. 27.0 ET = JDE 2447400.5 (J-P)

M 211.01645		(1950.0)		P	Q
n 0.27974819	Peri.	173.98889	+0.43695399		+0.89232827
a 2.3153966	Node	121.87024	-0.83067582		+0.44860669
e 0.1388565	Incl.	7.66220	-0.34503463		+0.05002301
P 3.52	H	15.0	G	0.25	

Residuals in seconds of arc

790623 413	0.8+	0.8-	790724 675	0.1-	0.7-	790823 675	0.5-	1.3+
790624 413	0.6+	0.8-	790724 413	0.8-	2.7-	850220 675	0.9-	1.5+
790625 413	0.9+	0.2-	790725 675	0.0	1.0-	850223 675	0.4+	0.7+
790629 413	0.3+	0.7-	790727 675	0.5+	1.9-			

1979 VS2 = 1987 WA1

Epoch 1988 Aug. 27.0 ET = JDE 2447400.5 (J-P)

M 157.60674		(1950.0)		P	Q
n 0.36566897	Peri.	288.45219	+0.89472520		+0.33031170
a 1.9367706	Node	53.37879	-0.10693062		+0.81191909
e 0.1062501	Incl.	21.99562	-0.43362733		+0.48133311
P 2.70	H	14.0	G	0.25	

Residuals in seconds of arc

791114 095	0.6+	0.7-	791125 675	0.8-	1.9-	871219 801	0.5-	1.1+
791122 675	0.6-	1.4-	871120 675	0.9+	0.1+			
791124 675	0.1-	2.2-	871120 675	0.8+	0.4+			

1981 ET20

The 1985 observations were identified by S. J. Bus.

Epoch 1988 Aug. 27.0 ET = JDE 2447400.5 (J-P)

M 260.51263		(1950.0)		P	Q
n 0.23128995	Peri.	191.21566	-0.99128756		+0.13132572
a 2.6284461	Node	356.28542	-0.10548322		-0.83755286
e 0.1438958	Incl.	8.99164	-0.07888130		-0.53033835
P 4.26	H	15.0	G	0.25	

Residuals in seconds of arc

810202 413	0.3-	1.4-	810307 413	0.7+	0.1+	810411 413	1.3-	0.3+
810213 413	0.6-	1.1-	810311 413	1.2-	1.0+	810411 413	1.0+	0.1-
810302 413	1.5-	0.6+	810316 413	1.4-	0.4+	810430 413	0.3+	1.3-
810302 413	1.9+	0.0	810316 413	0.3+	0.1+	810502 413	0.0	0.1+
810303 413	0.2+	0.7+	810329 413	0.9+	0.2+	850220 675	0.0	0.5-
810303 413	2.9+	0.1-	810408 413	0.7-	0.5+	850223 675	0.1+	0.4+
810307 413	1.3-	0.3+	810408 413	0.1-	1.0-			

1981 EB37

The 1985 observations were identified by S. J. Bus.

Epoch 1988 Aug. 27.0 ET = JDE 2447400.5 (J-P)

M 120.95702		(1950.0)		P	Q
n 0.22339465	Peri.	305.57491	+0.54976381		+0.83530139
a 2.6900173	Node	357.75348	-0.71268340		+0.46554409
e 0.0302317	Incl.	8.21167	-0.43570876		+0.29247273
P 4.41	H	14.5	G	0.25	

Residuals in seconds of arc

810202	413	0.2+	0.8+	810407	413	1.1-	0.4+	810502	413	1.8+	0.9+
810213	413	0.1+	0.5-	810407	413	0.4+	0.8-	810502	413	1.7+	0.5-
810311	413	0.5-	0.1-	810408	413	(5.6-	0.3+)	810503	413	0.6+	0.9-
810311	413	0.5-	1.6-	810411	413	1.3-	0.4+	850220	675	0.7-	0.8-
810316	413	1.3-	0.4-	810411	413	1.5+	1.0-	850223	675	1.8+	0.7-
810329	413	2.0+	0.7-	810430	413	0.1-	0.1-				

1983 OD

The 1985 observations were identified by S. J. Bus.

Epoch 1988 Aug. 27.0 ET = JDE 2447400.5 (J-P)

M	124.76964		(1950.0)	P	Q
n	0.27129449	Peri.	214.92233	+0.95938602	+0.21790812
a	2.3632497	Node	131.44367	-0.17189488	+0.95512387
e	0.2324498	Incl.	13.82701	-0.22367526	+0.20063508
P	3.63	H	14.0	G 0.25	

Residuals in seconds of arc

830717	688	0.0	0.8-	830907	809	0.2+	0.4-	830910	809	0.6+	1.2+
830717	688	0.8-	1.2+	830907	809	0.5+	0.2+	830911	809	1.0-	0.4-
830902	809	0.3+	0.0	830907	809	0.4+	0.2+	830912	809	0.6-	0.2-
830902	809	0.3+	0.5-	830908	809	0.5-	1.4+	830912	809	0.1-	0.1-
830902	809	0.2-	0.2-	830908	809	0.5-	0.8+	830913	809	3.2-	1.0-
830904	809	0.4+	0.4-	830908	809	0.4-	0.2-	830913	809	1.0-	0.1-
830904	809	0.1+	0.9-	830909	809	0.6-	1.0+	830913	809	0.0	0.1+
830904	809	0.2+	0.3-	830909	809	0.0	0.5+	830915	809	0.2+	0.7-
830906	809	1.0+	0.9-	830909	809	0.0	1.6+	830915	809	0.6+	1.0-
830906	809	1.4+	0.3-	830910	809	0.0	0.1+	850220	675	0.9-	0.9+
830906	809	1.6+	1.1-	830910	809	0.3+	0.6+	850223	675	0.9+	0.2-

1983 TL = 1973 YO2

The 1985 observations were identified by S. J. Bus.

Epoch 1988 Aug. 27.0 ET = JDE 2447400.5 (J-P)

M	317.63360		(1950.0)	P	Q
n	0.18581532	Peri.	27.08208	+0.77414228	-0.63275716
a	3.0414632	Node	12.22199	+0.56431107	+0.67700161
e	0.1790096	Incl.	4.86321	+0.28680436	+0.37588189
P	5.30	H	13.0	G 0.25	

Residuals in seconds of arc

731220	095	0.1+	0.8+	831007	046	1.7+	0.8-	831014	046	2.3-	1.0-
830910	688	1.7+	0.7-	831009	046	1.8-	1.7-	831015	046	0.8+	0.5-
830910	688	0.8+	0.0	831009	046	2.3-	1.2+	831015	046	1.7-	1.4+
831005	046	1.5+	1.2+	831012	688	2.0+	0.1+	831104	688	0.9-	0.4+
831005	046	0.9-	0.3+	831012	688	2.1+	1.1+	831104	688	0.7+	0.2-
831006	046	1.4-	0.1-	831013	046	0.4-	0.7+	850220	675	0.9-	0.7-
831006	046	1.9-	0.5-	831013	046	0.1-	0.5-	850223	675	0.5+	0.3-
831007	046	2.3+	1.4+	831014	046	0.5+	2.1-				

1985 TG3

Epoch 1988 Aug. 27.0 ET = JDE 2447400.5 (J-P)

M	66.57592		(1950.0)	P	Q
n	0.08164976	Peri.	86.04563	+0.81254772	-0.56043504
a	5.2621954	Node	307.96178	+0.42069458	+0.75413410
e	0.0516147	Incl.	11.72703	+0.40346284	+0.34233657
P	12.07	H	10.0	G 0.25	

Residuals in seconds of arc

850916	675	1.2+	0.8+	851013	675	1.8-	0.7+	871122	675	0.8+	0.8+
850916	675	1.1-	0.7-	851013	675	0.2-	0.7+	871123	675	0.7-	0.1-
851011	675	(2.5-	1.2-)	851015	688	(2.2+	1.8-)				
851011	675	1.4+	0.1+	851015	688	0.6+	0.8-				

1987 SL
Epoch 1988 Aug. 27.0 ET = JDE 2447400.5

M 77.33412		(1950.0)	P	Q
n 0.19252090	Peri.	319.89981	+0.68101056	+0.73104722
a 2.9704173	Node	352.65967	-0.55762931	+0.48022738
e 0.6117099	Incl.	19.36414	-0.47463056	+0.48471808
P 5.12	H 15.5	G 0.25		

From 26 observations 1987 Sept. 19-1988 Jan. 12, mean residual 1".1.

1987 SS1
Epoch 1988 Aug. 27.0 ET = JDE 2447400.5

M 51.17225		(1950.0)	P	Q
n 0.16341205	Peri.	159.63131	+0.97762692	-0.14922329
a 3.3134468	Node	210.16755	+0.12757066	+0.98099796
e 0.2805544	Incl.	17.15794	+0.16724629	+0.12399762
P 6.03	H 13.0	G 0.25		

From 10 observations 1987 Sept. 21-1988 Jan. 12, mean residual 1".2.

1987 UA
Epoch 1988 Aug. 27.0 ET = JDE 2447400.5

M 140.63975		(1950.0)	P	Q
n 0.43307344	Peri.	173.62219	+0.97954586	-0.18222778
a 1.7301949	Node	197.59049	+0.16986972	+0.97621303
e 0.2966392	Incl.	16.40263	+0.10786191	+0.11747828
P 2.28	H 18.0	G 0.25		

From 13 observations 1987 Sept. 24-1988 Jan. 12, mean residual 1".0.

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

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

Comet McNaught (1987b1)
Epoch 1987 Dec. 31.0 ET = JDE 2447160.5
T 1987 Dec. 11.94554 ET

q 0.8412654		(1950.0)	P	Q
z +0.0015385	Peri.	17.42769	-0.19176937	-0.06809927
+/-0.0000908	Node	260.64387	-0.97638205	-0.08791158
e 0.9987057	Incl.	97.12641	-0.09951183	+0.99379779

From 38 observations 1987 Oct. 10-1988 Jan. 16, mean residual 1".2.

Comet Liller (1988a)
T 1988 Mar. 31.18675 ET

q 0.8484183		(1950.0)	P	Q
	Peri.	56.93086	+0.34742525	-0.80019868
	Node	30.66663	+0.12437630	-0.47739767
e 1.0	Incl.	73.42707	+0.92942252	+0.36300625

From 22 observations 1988 Jan. 12-22.

(3754)* 1931 FM = A909 HE = 1925 BF = 1929 WA1 = 1955 MR = 1957 WH1
= 1959 EC1 = 1963 WD = 1977 KR = 1978 NM2 = 1982 DQ4
= 1985 UD4 = 1987 BK

Discovered 1931 Mar. 16 by C. W. Tombaugh at the Lowell Observatory. The identifications 1931 FM = 1925 BF = 1959 EC1 were suggested by W. Landgraf. The identification 1977 KR = 1987 BK is by A. Lowe.

Epoch 1988 Aug. 27.0 ET = JDE 2447400.5

M	55.88328		(1950.0)	P	Q
n	0.17530305	Peri.	61.22841	-0.97984224	-0.14437177
a	3.1618631	Node	110.18597	+0.08867270	-0.93367192
e	0.1053121	Incl.	8.45982	+0.17901490	-0.32774004
P	5.62	H	10.1	G 0.25	

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

090420	024	2.1-	3.1+	571127	760	3.7-	0.5+	770523	095	0.3+	0.6+
090420	024	1.7+	2.6+	571127	760	3.0-	2.0+	780707	095	2.0-	2.0-
250118	105	(67.5-	4.7+)X	590306	690	2.0-	0.1+	820220	033	1.4+	0.5+
250120	105	(0.03-	0.00+)X	590308	690	2.0-	0.2-	820220	033	1.4+	0.5+
291128	690	5.2+	0.8-	590310	690	1.8-	1.6-	851021	095	1.0+	2.5-
291128	690	0.6-	2.0+	590311	690	1.3-	0.4-	851108	095	(22.1+	3.1+)
291204	690	0.4-	0.3-	590312	690	0.7+	2.5-	851111	095	1.9+	1.6-
310309	690	0.9-	1.3-	590313	690	1.3+	4.7-	870121	046	0.1-	0.2+
310316	690	1.7-	0.5+	631124	760	0.3-	0.9+	870121	046	1.4+	0.1-
310318	690	4.4+	2.1-	631124	760	1.0+	3.2+	870129	012	1.7-	1.8+
550623	076	0.3+	4.5-	770519	095	0.1-	1.9+	870129	012	1.2+	0.4-

(3755)* 1950 SJ = 1950 TG1 = 1977 VJ1

Discovered 1950 Sept. 19 by S. Arend at Uccle. The double designation 1950 SJ = 1950 TG1 is by S. Kanda, and the identification 1950 SJ = 1977 VJ1 is by E. Bowell and W. Landgraf, who found it independently (MPC 8142).

Epoch 1988 Aug. 27.0 ET = JDE 2447400.5

M	108.46636		(1950.0)	P	Q
n	0.29284957	Peri.	120.66437	+0.96532781	+0.24247224
a	2.2458099	Node	225.50137	-0.26066200	+0.91530483
e	0.2191476	Incl.	7.79116	+0.01405484	+0.32159646
P	3.37	H	14.0	G 0.25	

Residuals in seconds of arc

500919	012	1.7+	0.6-	771101	330	(13.1+	13.1+)	871016	688	0.9-	0.8-
500922	012	1.3-	2.1-	771108	330	0.5+	0.2+	871016	688	3.9+	1.5+
501005	012	2.8+	4.3+	841125	801	0.1-	0.2-	871026	688	0.9-	0.3-
501013	012	1.4-	2.1-	841221	801	0.1-	0.6-	871026	688	0.9-	1.0-
501013	024	4.6-	2.0-	871016	688	1.9-	4.1-				
501014	012	1.9+	4.7+	871016	688	1.1+	2.2+				

(3756)* 1979 MV6 = 1980 XU

Discovered 1979 June 25 by E. Helin and S. J. Bus at Siding Spring. The identification is by C. Atallah (MPC 8675).

Epoch 1988 Aug. 27.0 ET = JDE 2447400.5

M	129.04730		(1950.0)	P	Q
n	0.26203785	Peri.	99.23197	+0.81547901	+0.57710905
a	2.4185777	Node	225.53587	-0.55228424	+0.75312411
e	0.0608666	Incl.	3.53747	-0.17313608	+0.31583101
P	3.76	H	13.6	G 0.25	

Residuals in seconds of arc

790623	413	0.9+	0.5+	830902	809	0.1-	0.2+	830909	809	1.4+	0.2-
790624	413	1.0+	0.3+	830902	809	0.1+	0.3+	830913	809	0.6+	0.1+
790625	413	0.7+	0.9+	830903	809	3.4-	1.8-	830913	809	0.9+	0.1+
790629	413	0.5+	0.3+	830903	809	1.6-	0.6+	830913	809	0.7+	0.0
790726	675	0.4+	0.1-	830903	809	2.0-	1.1-	830913	809	0.2+	0.0
790727	675	0.1+	0.7+	830906	809	1.0-	0.2-	830914	809	0.7+	1.0+
790728	413	1.1-	1.2-	830906	809	0.9-	0.1-	830914	809	0.2+	0.4+
790823	675	0.9-	0.6+	830906	809	0.8-	0.1-	860610	801	0.1-	1.1+
801214	675	0.2-	0.9+	830907	809	0.4-	1.0-	870929	054	0.8+	0.7+
830901	809	0.3-	0.1-	830907	809	0.4-	0.5-	870930	054	0.2+	0.3+
830901	809	0.1-	0.1-	830907	809	2.2+	0.6-	870930	054	0.2+	0.8+
830901	809	0.1-	0.0	830909	809	1.3+	0.2-	871002	054	0.2-	0.6+
830902	809	0.3-	0.3+	830909	809	1.3+	0.2-				

(3757)* 1982 XB

Discovered 1982 Dec. 14 by E. Helin at Palomar.

Epoch 1988 Aug. 27.0 ET = JDE 2447400.5

M	99.95712	(1950.0)	P	Q	
n	0.39620042	Peri. 16.74541	-0.02165245	-0.99764198	
a	1.8359440	Node 74.53165	+0.90930123	-0.04672961	
e	0.4464883	Incl. 3.87475	+0.41557483	+0.05026747	
P	2.49	H 19.2	G 0.25		

Residuals in seconds of arc

821214	675	2.2-	1.2-	821220	675	1.8+	3.4+	830113	675	0.1-	0.5+	
821215	675	0.1+	1.3+	821220	688	(1.0-	4.0-)	830116	688	1.0-	1.3-	
821215	675	0.9-	2.0+	821222	801	1.8-	1.7-	830118	801	(4.8+	6.4-)	
821215	675	0.1+	1.4+	821222	489	(1.2+	0.7-)	830221	675	0.3-	0.6+	
821216	675	1.2-	1.0-	821222	489	(0.6+	1.8-)	830314	801	1.0-	0.5+	
821216	675	1.8+	0.2-	821224	372	2.5+	2.8-	Y	871119	675(10.4-	0.8+)	
821217	675	(0.5-	3.9+)	830105	675	(1.4+	4.7+)	871119	675(10.5-	0.8-)		
821217	688	2.1-	0.8-	830106	688	0.9+	0.0	871120	675	1.1-	2.3+	Y
821217	688	(3.1-	4.3-)	830106	688	0.2-	0.9+	871120	675	(3.8-	0.9+)	Y
821217	675	(0.2+	5.4+)	830106	675	1.9+	3.4+	871122	801	0.6-	0.0	
821217	489	(4.8+	6.5+)	830106	675	1.1+	3.6+	871123	801	0.4+	0.8-	
821217	489	(1.2-	3.5-)	830107	046	1.2+	0.9-	871124	691	0.7+	1.4-	
821217	489(17.7-	21.4-)	Y	830107	046	2.3-	1.8-	871124	691	1.3+	1.2-	
821217	489	(5.8-	5.3-)	Y	830109	489	1.8+	0.9-	871124	691	1.3-	2.1-
821218	489	(2.1+	0.2+)	830109	489	1.4-	1.0+	871128	801	1.4-	0.5+	
821218	489	(0.1-	2.6-)	830110	675	2.2-	1.5-	871128	801	2.1+	0.3+	
821219	675	0.2-	1.1+	830112	688	0.6+	0.3-	871218	801	1.4+	1.2+	
821219	381	(4.4+	0.1+)	830112	675	(3.8+	5.9-)	880114	688	0.6-	0.5-	
821220	688	0.5+	1.7-	830113	046	0.4-	0.9-	880114	688	0.7-	0.5-	
821220	688	0.9+	1.2-	830113	046	0.5-	0.2+					

(3758)* 1983 WP

Discovered 1983 Nov. 28 by E. Bowell at the Anderson Mesa Station of the Lowell Observatory.

Epoch 1988 Aug. 27.0 ET = JDE 2447400.5

M	342.43996	(1950.0)	P	Q	
n	0.23121961	Peri. 57.46557	-0.71718525	-0.65397260	
a	2.6289739	Node 80.46577	+0.52893349	-0.73576525	
e	0.1129321	Incl. 14.13053	+0.45373414	-0.17598106	
P	4.26	H 12.7	G 0.25		

Residuals in seconds of arc

770613 675	0.5-	0.9-	831209 688	1.9+	1.4-	850417 801	0.2+	0.9-
770614 675	0.0	1.1-	831209 688	0.7-	0.8-	850420 552	2.0-	0.2+
831128 688	0.7+	0.0	831229 688	2.6-	2.5+	850420 552	1.4-	0.1+
831128 688	0.2+	0.6+	831229 688	0.6-	1.6-	850424 054	0.5-	0.7+
831201 688	1.4+	0.6-	840102 688	3.3+	1.0+	850425 688	3.2+	0.9-
831201 688	0.7-	1.1-	840104 688	1.2+	1.4-	850523 801	0.2-	0.4-
831205 688	0.2-	0.6-	840104 688	0.5+	0.3+	871020 688	1.0-	0.5-
831205 688	2.8-	0.2-	840304 801	1.3-	1.6+	871020 688	1.9+	1.3+
831206 688	0.5-	0.8+	840404 801	0.4+	0.1+	871224 801	1.6-	0.0
831206 688	0.9+	1.9-	850322 801	0.2+	0.3+			

(3759)* 1984 AP

Discovered 1984 Jan. 8 by E. Bowell at the Anderson Mesa station of the Lowell Observatory.

Epoch 1988 Aug. 27.0 ET = JDE 2447400.5

M 18.27575		(1950.0)		P	Q
n 0.21978395	Peri.	164.31213	-0.12580640		-0.96989860
a 2.7193935	Node	292.54304	+0.88413671		-0.01429187
e 0.1162731	Incl.	13.04650	+0.44997225		-0.24308940
P 4.48	H	12.0	G	0.25	

Residuals in seconds of arc

840105 688	0.1-	0.3-	840204 688	1.1+	3.7-	860801 688	3.0+	0.1-
840105 688	1.1+	0.1+	840204 688	0.3+	3.6-	860801 688	0.3-	0.6-
840108 688	0.1-	0.2+	840403 801	0.1+	1.5+	860805 801	0.4+	1.6-
840108 688	1.0-	0.6+	850219 474	0.5+	4.0-	871023 293	1.3+	2.0-
840108 675	2.7-	4.1+	850219 474	1.4+	0.5-	871023 293	0.0	0.2-
840108 675	0.9-	3.0+	850321 474	1.5-	0.7+	871224 801	0.7-	0.1-
840126 688	0.4+	1.0-	850321 474	0.9-	0.5+			
840126 688	2.0+	2.6-	860731 688	2.0-	0.0			

(3760)* 1984 AQ = 1940 GL = 1948 EN = 1952 DB2 = 1987 WL2

Discovered 1984 Jan. 8 by E. Bowell at the Anderson Mesa Station of the Lowell Observatory. The identification 1984 AQ = 1987 WL2 is by E. Bowell.

Epoch 1988 Aug. 27.0 ET = JDE 2447400.5

M 341.35467		(1950.0)		P	Q
n 0.24422600	Peri.	84.98307	-0.93288419		+0.31883897
a 2.5347869	Node	113.52807	-0.35755930		-0.87578932
e 0.1790874	Incl.	10.52874	+0.04334086		-0.36240140
P 4.04	H	12.6	G	0.25	

Residuals in seconds of arc

400409 062	0.1+	0.0	840105 688	1.1+	0.1-	840204 688	1.5+	2.7-
400410 062	0.5+	0.5-	840105 688	3.2+	1.4-	840328 801(54.1-		2.7-)
480305 012	4.0+	2.0-	840108 688	0.1-	1.2+	861125 688	0.4-	1.0+
480310 012	4.3-	4.8+	840108 688	2.3-	1.5+	861125 688	0.4-	1.0+
520220 711 (1.4-		21.6+)Y	840108 675	2.3-	3.2+	871126 033	1.6-	0.1-
831209 688	1.2+	0.5-	840108 675	1.1+	1.6+	871126 033	1.2-	0.1+
831209 688	2.9+	1.9-	840204 688	0.1-	2.8-	871222 801	2.2-	1.2+

1981 EB1

The 1979 and 1987 observations were identified by S. J. Bus.

Epoch 1988 Aug. 27.0 ET = JDE 2447400.5 (J-P)

M 76.53240		(1950.0)		P	Q
n 0.17578177	Peri.	88.50327	-0.73980896		+0.67204233
a 3.1561262	Node	133.72017	-0.63367012		-0.67983704
e 0.0815222	Incl.	2.55969	-0.22615232		-0.29356550
P 5.61	H	13.0	G	0.25	

Residuals in seconds of arc

791220	675	1.1-	1.0+	810306	809	0.6-	0.2+	810317	809	1.4-	0.5-
791220	675	1.1+	1.4+	810306	809	0.5-	0.2+	810317	809	1.2-	0.2-
810202	413	1.9-	3.3-	810307	809	0.8+	0.7+	810502	413	2.3-	1.6-
810213	413	0.3-	0.6+	810307	809	1.0+	0.3+	810503	413	1.3-	0.2-
810305	809	0.2+	0.1+	810307	809	1.2+	0.1+	870724	688	0.6+	1.3+
810305	809	0.3+	0.1+	810308	809	1.5+	0.3+	870724	688	0.4+	1.2+
810305	809	0.1+	0.0	810308	809	1.7+	0.4+	870724	688	0.4+	1.2+
810306	809	0.7-	0.1+	810308	809	2.0+	0.3+				

1981 EC11

The 1979 and 1987 observations were identified by S. J. Bus.

Epoch 1988 Aug. 27.0 ET = JDE 2447400.5 (J-P)

M	158.86694		(1950.0)	P	Q
n	0.22591660	Peri.	1.29662	+0.29315106	+0.95320871
a	2.6699604	Node	285.75393	-0.87781993	+0.23774458
e	0.1167223	Incl.	4.40149	-0.37880685	+0.18673690
P	4.36	H	15.5	G 0.25	

Residuals in seconds of arc

791220	675	1.2+	0.1-	810307	413	1.3+	0.4-	871026	688	0.1+	0.0
791220	675	1.4-	1.1-	810315	413	0.8-	0.6+	871026	688	0.2+	0.1-
810212	413	1.2+	0.4+	810315	413	0.2+	1.2+	871027	688	0.1-	0.2-
810214	413	0.9+	1.0+	810412	413	0.3-	1.2-	871027	688	0.2-	0.1-
810301	413	1.5-	1.5+	810412	413	0.7-	0.0	880113	688	0.1-	0.6+
810301	413	(10.3-	6.1+)	810503	413	0.3-	3.1-	880113	688	0.0	0.2+

1986 RO2 = 1931 BF = 1971 ST2 = 1987 XF

The key identification 1986 RO2 = 1987 XF is by E. Bowell.

Epoch 1988 Aug. 27.0 ET = JDE 2447400.5 (J-P)

M	6.59273		(1950.0)	P	Q
n	0.18787182	Peri.	213.66683	-0.41103815	-0.89835107
a	3.0192273	Node	261.03010	+0.86714065	-0.33284602
e	0.0487149	Incl.	9.02584	+0.28127340	-0.28666859
P	5.25	H	11.5	G 0.25	

Residuals in seconds of arc

310115	690	1.8-	0.8+	860905	688	1.5-	1.4-	871124	688	0.4-	1.3+
310116	690	1.2+	1.2-	860911	688	1.1+	0.0	871124	688	0.1-	0.0
310117	690	0.1-	1.3-	860911	688	0.7+	0.3+	871215	400	0.2+	0.5+
710927	095	0.1+	1.1+	861004	688	0.1+	0.4-	871215	400	1.0-	0.6-
860905	688	0.3-	0.2-	861004	688	0.8+	0.5-	871215	400	1.3+	0.9-

1987 SB

Epoch 1988 Aug. 27.0 ET = JDE 2447400.5

M	134.60010		(1950.0)	P	Q
n	0.30119531	Peri.	168.04525	-0.34086124	+0.93864529
a	2.2041302	Node	82.00779	-0.86680729	-0.29216286
e	0.6607987	Incl.	3.04027	-0.36394881	-0.18326450
P	3.27	H	15.5	G 0.25	

From 22 observations 1987 Sept. 20-1988 Jan. 15, mean residual 1".0.

1987 SY

Epoch 1988 Aug. 27.0 ET = JDE 2447400.5

M	239.28762		(1950.0)	P	Q
n	0.56927215	Peri.	291.28943	-0.45237836	+0.88892316
a	1.4418589	Node	311.60660	-0.77840658	-0.43290649
e	0.5867464	Incl.	5.51793	-0.43524362	-0.14969166
P	1.73	H	17.5	G 0.25	

From 29 observations 1987 Sept. 25-1988 Jan. 15, mean residual 0".8.

ORBITAL ELEMENTS BY D. W. E. GREEN, SMITHSONIAN ASTROPHYSICAL OBSERVATORY.

Periodic Comet Helin (1987w)
Epoch 1987 July 24.0 ET = JDE 2447000.5
T 1987 Aug. 12.10911 ET

		(1950.0)	P	Q
q	2.5711788			
n	0.06817395	Peri.	216.20118	+0.99873226	+0.01090572
a	5.9345856	Node	143.08085	+0.00627695	+0.94164749
e	0.5667467	Incl.	4.69259	-0.04994463	+0.33642395
P	14.46				

From 21 observations 1987 Aug. 24-1988 Jan. 15, mean residual 1".2.

Periodic Comet Mueller (1987a1)
Epoch 1987 Nov. 21.0 ET = JDE 2447120.5
T 1987 Dec. 5.08379 ET

		(1950.0)	P	Q
q	2.7461021			
n	0.11659719	Peri.	30.54105	+0.82472364	-0.56543850
a	4.1496424	Node	3.93999	+0.48303661	+0.69463805
e	0.3382316	Incl.	8.78913	+0.29411997	+0.44469909
P	8.45				

From 20 observations 1987 Oct. 18-Dec. 23, mean residual 0".8.

Periodic Comet Shoemaker-Holt (1987z)
Epoch 1988 June 8.0 ET = JDE 2447320.5
T 1988 May 21.29011 ET

		(1950.0)	P	Q
q	3.0537501			
n	0.10318518	Peri.	210.38618	+0.43589960	-0.89899577
a	4.5018514	Node	213.82334	+0.84026368	+0.42339622
e	0.3216680	Incl.	4.36903	+0.32241043	+0.11199212
P	9.55				

From 33 observations 1987 Sept. 24-Dec. 24, mean residual 1".0.

1980 RJ = 1987 WH
The identification is by E. Bowell.
Epoch 1988 Aug. 27.0 ET = JDE 2447400.5 (J-P)

		(1950.0)	P	Q
M	93.69647			
n	0.29754313	Peri.	49.17654	+0.72883059	-0.68458980
a	2.2221343	Node	353.99166	+0.58877434	+0.63554022
e	0.1447275	Incl.	6.55477	+0.34950071	+0.35696700
P	3.31	H	13.5	G	0.25

Residuals in seconds of arc

800902	688	0.6-	0.8+	801002	688	1.1+	0.6-	871119	688	0.1-	0.2+
800904	688	0.1-	0.0	871119	688	0.5+	0.2-	871219	801	0.6+	0.2-

1987 QB
Epoch 1988 Aug. 27.0 ET = JDE 2447400.5

		(1950.0)	P	Q
M	82.10566			
n	0.21007143	Peri.	156.01077	+0.62982298	+0.77625467
a	2.8025803	Node	153.00145	-0.72202231	+0.59810462
e	0.5936890	Incl.	3.46245	-0.28636830	+0.19924745
P	4.69	H	18.5	G	0.25

From 11 observations 1987 Aug. 28-Nov. 19, mean residual 0".8.

1987 QX
Epoch 1988 Aug. 27.0 ET = JDE 2447400.5

M 72.05225		(1950.0)	P	Q
n 0.21271249	Peri.	12.60967	+0.99077811	-0.13370786
a 2.7793339	Node	354.91866	+0.09247999	+0.78561808
e 0.4657909	Incl.	14.33586	+0.09902618	+0.60409142
P 4.63	H 15.5		G 0.25	

From 9 observations 1987 Aug. 24-1988 Jan. 12, mean residual 0".7.

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ORBITAL ELEMENTS BY S. NAKANO, SMITHSONIAN ASTROPHYSICAL OBSERVATORY.

The identifications are by S. Nakano unless otherwise stated.

(3761)* 1936 OH = 1941 KC = 1953 TF = 1957 EK = 1970 WJ = 1980 JG = 1981 TE3 = 1981 WF7

Discovered 1936 July 25 by G. N. Neujmin at Simeis. The identifications 1936 OH = 1953 TF = 1957 EK and 1936 OH = 1980 JG were suggested by O. Kippes and by F. N. Bowman, respectively (MPC 11422).

Epoch 1988 Aug. 27.0 ET = JDE 2447400.5

M 143.56106		(1950.0)	P	Q
n 0.17811352	Peri.	84.93511	+0.35270378	+0.92722985
a 3.1285141	Node	206.81455	-0.93032191	+0.33302758
e 0.2787096	Incl.	16.20294	-0.10050470	+0.17128173
P 5.53	H 11.2		G 0.25	

Residuals in seconds of arc

360725	094	0.4+	2.0+	701126	095	1.8+	3.8-	811006	095	2.4+	1.6-
360727	094	2.5+	3.2-	800511	046	0.5-	0.6+	811021	095	(2.5+	4.5+)
360813	094	3.0-	0.2-	800511	046	0.8-	0.8+	811027	095	2.1+	1.2+
360821	094	1.7+	0.5+	800512	046	0.4-	0.1+	811125	095	2.1-	0.5+
410520	078(58.7-	65.4-)X		800512	046	0.2-	0.5+	871019	801	0.9-	1.2+
531004	062	2.7-	0.8+	800513	046	0.4+	0.4-	871122	688	0.8+	0.4-
531004	062	1.8-	0.5-	800513	046	0.2-	1.6-	871122	688	0.5-	2.1-
570305	760	1.4-	1.7-	800517	095	0.7+	2.7-				
570305	760	1.7+	0.5-	800518	095	(4.2+	2.2+)				

(3762)* 1976 QN1 = 1983 TM = 1985 DV1

Discovered 1976 Aug. 26 by N. S. Chernykh at the Crimean Astrophysical Observatory. The identification 1976 QN1 = 1983 TM is by C. M. Bardwell (MPC 8284).

Epoch 1988 Aug. 27.0 ET = JDE 2447400.5

M 176.87834		(1950.0)	P	Q
n 0.28748320	Peri.	187.94421	+0.98846220	+0.15129210
a 2.2736716	Node	163.34865	-0.13752514	+0.91661037
e 0.0788908	Incl.	1.45832	-0.06347690	+0.37004881
P 3.43	H 13.5		G 0.25	

Residuals in seconds of arc

760826	095	0.0	1.4-	831009	046	0.3-	0.0	831104	688	0.8+	1.5-
760924	095	0.5-	0.0	831009	046	1.5+	1.0+	850216	809	1.0-	0.0
760928	095	0.7+	0.8+	831012	688	0.6-	0.1-	850216	809	0.6-	0.1-
830910	688	1.0-	1.9-	831012	688	0.4-	0.6+	850216	809	0.4-	0.1-
830910	688	0.4-	2.5-	831013	046	1.6-	1.5+	850217	809	0.0	0.6-
831005	046	1.1+	0.0	831013	046	1.0-	1.1+	850217	809	0.2+	0.6-
831005	046	0.5+	2.0-	831014	046	1.4-	0.5+	850217	809	0.2+	0.8-
831006	046	0.1-	1.1-	831014	046	0.0	2.4+	850218	809	0.3-	0.5-
831006	046	0.4-	0.3+	831015	046	0.2+	1.8+	850218	809	0.5-	0.3-
831007	046	0.3+	2.1-	831015	046	1.4+	0.5+	850218	809	0.1+	0.7-
831007	046	0.1+	0.3+	831104	688	1.9+	1.4-	850219	809	1.2+	1.0-

850219	809	1.4+	0.7-	850222	809	0.5-	0.2+	850224 809	0.1+	0.1+
850219	809	1.5+	0.4-	850222	809	0.6-	0.3+	850226 809	0.2+	0.5+
850220	809	1.7-	0.8-	850222	809	0.7-	0.6+	850226 809	0.4+	0.6+
850220	809	1.6-	0.5-	850223	809	0.3+	0.6+	850226 809	0.1+	0.4+
850220	809	1.7-	1.0-	850223	809	0.2+	0.9+	850324 801	1.5+	0.1+
850221	809	0.1-	0.2-	850223	809	0.6+	0.2+	860806 801	0.4+	1.6-
850221	809	0.0	0.1-	850224	809	0.2-	0.2+			
850221	809	0.2-	0.1-	850224	809	0.3+	0.3+			

(3763)* 1980 TA6 = 1928 HE = 1931 AG = 1955 DD = 1955 HB = 1970 SA1 = 1973 SC5

Discovered 1980 Oct. 14 at the Purple Mountain Observatory.

Epoch 1988 Aug. 27.0 ET = JDE 2447400.5

M 307.02319		(1950.0)	P	Q
n 0.29160504	Peri.	169.42345	-0.97700447	+0.20791452
a 2.2521952	Node	22.74374	-0.20345660	-0.84277504
e 0.1041238	Incl.	7.02200	-0.06377835	-0.49648946
P 3.38	H	12.6	G 0.25	

Residuals in seconds of arc

280425	024	2.4-	1.8-	550223	760	3.0+	1.7+	801014 330	1.8+	1.0+
280507	024	1.1+	0.3+	550416	760	0.1-	0.1-	801028 330	1.9-	0.1+
310110	690	1.8-	1.0-	550416	760	0.4-	2.5+	801031 330	1.1-	1.2+
310111	690	2.3-	0.5+	700930	095	0.1-	2.1-	871022 801	1.7-	0.3+
310112	690	4.3+	1.0-	730927	095	0.3-	1.4+	871224 801	1.4+	0.3+
550223	760	(1.6+	6.2+)	801013	095	0.4+	0.0			

(3764)* 1980 TL15 = 1980 XC = 1958 DE = 1958 DA1 = 1975 EJ3

Discovered 1980 Oct. 10 at Perth. The double designation 1958 DE = 1958 DA1 was found by O. Kippes (NAZ 13, 3).

Epoch 1988 Aug. 27.0 ET = JDE 2447400.5

M 49.14402		(1950.0)	P	Q
n 0.29212854	Peri.	325.02262	-0.35464531	-0.93377102
a 2.2495038	Node	145.67738	+0.87603112	-0.34976215
e 0.0899670	Incl.	4.87746	+0.32679685	-0.07575038
P 3.37	H	13.3	G 0.25	

Residuals in seconds of arc

580222	024	3.6-	0.3+	690720	074	2.4-	0.3-	801016 323	3.1+	1.1+
580224	760	0.6+	0.2+	690720	074	0.5+	0.3+	801210 381	0.8-	2.9+
580224	760	2.2+	0.1+	750314	095	0.2+	1.4+	801210 381	1.8-	1.3-
690720	074	0.9-	0.1+	750316	095	3.9+	3.4-	850220 675	2.1-	0.6+
690720	074	1.3+	0.3-	801010	323	0.4+	1.4-	850222 675	1.0-	0.2+
690720	074	0.8+	0.4-	801010	323	0.9-	0.9-	860711 323	0.5+	1.8+
690720	074	1.4-	0.6-	801016	323	0.6+	0.3-			

(3765)* 1982 SU1 = 1982 SY4 = 1970 EF3 = 1975 EE5 = 1977 SH2 = 1980 GY

Discovered 1982 Sept. 16 by K. Tomita at Caussols.

Epoch 1988 Aug. 27.0 ET = JDE 2447400.5

M 36.67984		(1950.0)	P	Q
n 0.20565965	Peri.	179.92475	+0.35454636	-0.93489103
a 2.8425186	Node	249.30959	+0.85782954	+0.33228417
e 0.0394863	Incl.	1.01687	+0.37205558	+0.12476373
P 4.79	H	12.8	G 0.25	

Residuals in seconds of arc

700310	805	1.6+	0.0	800415	805	0.9+	0.2+	871022 801	2.3+	0.9-
700310	805	0.0	1.1+	800416	805	1.0+	0.5+	871124 688	1.5+	0.5+
700310	805	0.6-	0.4+	820915	010	2.4-	0.1-	871124 688	(5.9+	0.1+)
750315	095	1.5-	1.9-	820916	010	(3.1-	9.9+)	871125 801	1.7-	0.1-
770919	095	2.0+	0.3+	820918	010	0.7-	1.7-			
800414	805	1.0-	1.6+	820926	095	1.6-	3.5+			

(3766)* 1983 BF = A915 FC = 1961 GA = 1966 CC = 1976 YG7 = 1981 TB3 = 1981 VA3

Discovered 1983 Jan. 16 by E. Bowell at the Anderson Mesa Station of the Lowell Observatory. The double designation 1981 TB3 = 1981 VA3 is by C. M. Bardwell (MPC 9952). The identification 1983 BF = 1966 CC was independently suggested by W. Landgraf (MPC 11346).

Epoch 1988 Aug. 27.0 ET = JDE 2447400.5

M	345.30471	(1950.0)		P	Q
n	0.17022591	Peri.	347.67245	-0.44256393	-0.89651392
a	3.2244250	Node	128.59164	+0.82485789	-0.41573709
e	0.1246158	Incl.	1.46617	+0.35177640	-0.15305377
P	5.79	H	11.8	G 0.25	

Residuals in seconds of arc

150320	024	0.7-	2.2-		811027	095	0.0	1.3-		830116	688	0.4+	0.8-
610414	760	1.9-	1.8-		811102	688	(1.6-	5.7-)		830121	688	2.4+	2.4-
610414	760	0.1-	1.8-		811102	688	4.0+	4.2-		830210	675	0.0	0.1+
660214	020	(14.9- | 6.5-)X		830110	675	(5.9- | 0.1+)		830211	675	0.9+	0.3+
660217	020	(22.4-	5.1-)X		830111	675	1.7-	1.3+		830215	675	0.9+	0.4-
761220	095	1.7-	1.1-		830111	675	1.3-	0.2-		871024	801	0.8-	0.1-
811006	095	1.0-	1.6-		830112	675	1.4+	3.7+		871117	801	0.3-	0.2+
811026	095	0.8+	1.6+		830116	688	1.0-	0.5-					

(3767)* 1986 LC = 1935 CS = 1952 DX2 = 1952 FV = 1975 VD8 = 1977 FN3 = 1978 NC2 = 1984 UM3

Discovered 1986 June 3 by E. Helin at Palomar.

Epoch 1988 Aug. 27.0 ET = JDE 2447400.5

M	226.64139	(1950.0)		P	Q
n	0.23432863	Peri.	74.72687	-0.93242427	+0.30136438
a	2.6056684	Node	122.43486	-0.34795511	-0.89768220
e	0.1393463	Incl.	13.66636	+0.09753060	-0.32147501
P	4.21	H	11.8	G 0.25	

Residuals in seconds of arc

350210	012	(13.6-	3.6-)X		780706	095	0.1-	4.7-		860608	675	0.4-	0.1-
520224	711	1.3+	1.7-	Y	841030	033	0.5-	1.7-		860609	675	0.9+	0.5-
520322	711	2.9-	2.0+	Y	841030	033	0.9-	1.3-		870825	801	0.5-	0.1+
520322	711	1.0+	1.2-	Y	860603	675	1.0+	1.5+		871117	675	0.7+	0.0
751106	095	0.5+	0.9-		860603	675	0.7-	2.6+		871119	675	(5.7-	0.7-)
751111	095	0.4-	2.6+		860604	675	1.2+	0.7-					
770317	095	1.6+	1.4-		860604	675	1.6-	0.1-					

1931 TS1 = 1981 UX15 = 1986 WW10 = 1987 BH

The double designation 1986 WW10 = 1987 BH is by H. Oishi (MPC 12560).

Epoch 1988 Aug. 27.0 ET = JDE 2447400.5 (J-P)

M	170.48742	(1950.0)		P	Q
n	0.19858671	Peri.	359.69808	+0.98285775	-0.18424362
a	2.9096235	Node	10.92587	+0.16921778	+0.88707724
e	0.0852273	Incl.	2.02656	+0.07318457	+0.42325910
P	4.96	H	12.0	G 0.25	

Residuals in seconds of arc

311009	024	3.5+	1.4-		311103	024	3.7+	1.7-		861201	381	0.5+	0.6+
311017	024	2.6+	1.1+		811024	095	0.2-	0.4+		861201	381	0.3-	1.0-
311020	024	5.0-	0.7+		861130	381	0.3+	1.3+		870130	887	0.3-	1.4-
311102	024	4.6-	0.8+		861130	381	0.6-	0.1+		870130	887	0.7+	0.2-

1933 OD = 1955 SZ = 1986 EO5
Epoch 1988 Aug. 27.0 ET = JDE 2447400.5 (J-P)

M 58.57883		(1950.0)	P	Q
n 0.18094679	Peri.	131.78359	+0.69289829	+0.72102623
a 3.0957769	Node	182.08710	-0.68752431	+0.65917156
e 0.1861013	Incl.	5.71316	-0.21726087	+0.21357442
P 5.45	H	12.0	G 0.25	

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

330724	024	1.0+	0.4-	330828	024	(25.8-	11.7-)	
330727	024	1.2-	0.4+	550918	760	(0.06+	0.02+)X	
330825	024	0.8+	1.1-	860306	809	0.1-	0.2-	
330827	024	0.6-	1.1+	860306	809	0.1-	0.0	
860307	809	0.6-	0.4-					
860307	809	0.8+	0.7+					

1981 ES33 = 1978 NR6
Epoch 1988 Aug. 27.0 ET = JDE 2447400.5 (J-P)

M 149.44613		(1950.0)	P	Q
n 0.24176598	Peri.	13.62983	+0.89010170	+0.44973791
a 2.5519576	Node	319.38097	-0.42804965	+0.76928472
e 0.1649849	Incl.	6.51401	-0.15650068	+0.45380263
P 4.08	H	15.0	G 0.25	

Residuals in seconds of arc

780710	675	(1.0+	8.6-)Y	810301	413	1.5+	1.0-	
780711	675	3.6+	1.6+ Y	810307	413	0.6-	0.4+	
780713	675	3.5-	1.6- Y	810311	413	1.1-	0.6+	
810209	413	1.5+	0.6-	810315	413	1.9-	0.2-	
810429	413	0.4+	0.1-					
810502	413	0.4+	0.8+					

1981 EX41 = 1978 SC3 = 1984 UL1
Epoch 1988 Aug. 27.0 ET = JDE 2447400.5 (J-P)

M 233.36360		(1950.0)	P	Q
n 0.17419998	Peri.	205.66043	+0.69447080	-0.71947848
a 3.1752031	Node	200.35754	+0.66392392	+0.64495655
e 0.1717332	Incl.	1.28676	+0.27733616	+0.25764659
P 5.66	H	13.0	G 0.25	

Residuals in seconds of arc

780926	095	0.7+	1.7-	810311	413	0.9-	0.3-	
810212	413	0.8-	0.1-	810311	413	0.9+	0.3+	
810212	413	0.5-	1.5+	810315	413	2.1+	2.1-	
810213	413	0.1+	0.4+	810315	413	1.4+	1.0-	
810302	413	2.2-	0.3-	810406	413	1.2+	1.1-	
810306	413	0.8-	0.0	810410	413	2.1-	1.6+	
810306	413	(4.9+	1.3-)	810501	413	0.4+	0.1-	
810503	413	0.1+	1.0-					
841028	046	1.7-	0.0					
841028	046	0.1+	1.8+					
841029	046	2.4+	0.6+					
841029	046	0.8-	0.2+					
841030	046	0.8+	2.2-					
841030	046	0.7-	0.8-					

1988 AC = 1979 DS = 1984 JQ1
The identifications were found independently by T. Kobayashi.
Epoch 1988 Aug. 27.0 ET = JDE 2447400.5 (J-P)

M 27.72469		(1950.0)	P	Q
n 0.21175223	Peri.	279.36561	-0.76758508	-0.63598951
a 2.7877356	Node	221.19923	+0.62519384	-0.71557550
e 0.1689878	Incl.	6.93792	+0.14122961	-0.28891009
P 4.65	H	12.0	G 0.25	

Residuals in seconds of arc

790228	330	0.1+	0.2+	880110	399	0.0	0.3-	
840502	095	0.9-	0.3-	880111	399	0.6+	0.2+	
840505	095	0.9+	0.2+	880111	399	1.3+	0.1+	
880110	399	1.3+	0.0	880111	399	0.0	0.6+	
880110	399	0.4-	0.6-	880115	399	0.3+	0.1+	
880110	399	0.0	0.1-	880115	399	0.8-	0.3+	
880115	399	2.1-	2.5+ Y					
880117	399	0.9-	1.0-					
880117	399	0.7-	0.5-					
880117	399	1.4+	1.5-					

4028 P-L = 1981 WH9
Epoch 1988 Aug. 27.0 ET = JDE 2447400.5 (J-P)

M	210.52053		(1950.0)		P		Q				
n	0.23719866	Peri.	224.03428		+0.32763769		-0.94310663				
a	2.5846124	Node	206.98955		+0.89763269		+0.32941292				
e	0.1774289	Incl.	7.16426		+0.29480348		+0.04513337				
P	4.16	H	14.0	G	0.25						

Residuals in seconds of arc

600924	675	0.0	0.0	601017	675	0.3-	0.3-	811116	323	0.6+	0.9-
600925	675	0.5-	0.1+	601022	675	0.6-	0.7-	811117	323	1.0-	1.5+
600926	675	0.0	0.4-	601024	675	0.4+	0.8+	811123	323	0.4+	0.6-
600928	675	0.7+	0.1+	601026	675	0.4+	0.4+				

4068 P-L = 1986 QM2
Epoch 1988 Aug. 27.0 ET = JDE 2447400.5 (J-P)

M	166.67799		(1950.0)		P		Q				
n	0.30088629	Peri.	51.03530		+0.85777084		-0.51367641				
a	2.2056435	Node	339.85141		+0.45275017		+0.77260284				
e	0.0716075	Incl.	3.18271		+0.24340600		+0.37312383				
P	3.28	H	14.5	G	0.25						

Residuals in seconds of arc

600924	675	0.3+	0.7-	601024	675	0.5+	1.6+	860830	809	1.2-	0.7-
600925	675	0.8+	0.6-	601026	675	0.6-	0.1+	860830	809	1.2-	0.6-
600926	675	0.1+	0.1+	860828	809	0.4-	0.7+	860904	809	1.3+	0.0
600928	675	0.2+	0.2+	860828	809	0.1-	0.7+	860904	809	1.3+	0.0
601017	675	0.6-	0.7-	860828	809	0.1+	0.8+	860904	809	1.4+	0.1+
601022	675	0.8-	0.2-	860830	809	1.3-	0.6-				

* * * * *

ORBITAL ELEMENTS BY T. KOBAYASHI, GUNMA, JAPAN.

The identifications are by T. Kobayashi unless otherwise stated.

Comet Wilson (1986l)
Epoch 1987 May 5.0 ET = JDE 2446920.5
T 1987 Apr. 20.78077 ET

q	1.1996493		(1950.0)		P		Q
z	-0.0002548	Peri.	238.29605		-0.47926079		-0.71646666
	+/-0.0000032	Node	110.95814		-0.50095266		+0.69757039
e	1.0003057	Incl.	147.12211		-0.72066326		-0.00843024

From 381 observations 1986 Aug. 5-1987 Dec. 26, mean residual 1".0. Non-gravitational parameters A1 = +1.90, A2 = +0.0505.

(3768)* 1937 RB = 1969 MC = 1975 RW = 1978 EJ5 = 1981 UB20 = 1983 CZ3 = 1988 AD

Discovered 1937 Sept. 5 by C. Jackson at Johannesburg.
Epoch 1988 Aug. 27.0 ET = JDE 2447400.5

M	120.52669		(1950.0)		P		Q				
n	0.18215921	Peri.	220.16538		+0.97970603		-0.15364215				
a	3.0820189	Node	147.97060		+0.17712589		+0.96422872				
e	0.2225717	Incl.	14.04687		-0.09382173		+0.21600248				
P	5.41	H	11.3	G	0.25						

Residuals in seconds of arc

370905	078(56.9-	38.2-)X	370930	012	3.4-	1.4+	880111	399	0.0	0.9-
370905	078(31.0-	9.3-)X	690623	095	1.0+	0.6-	880111	399	0.9+	0.7+
370907	012	0.2-	5.1-	750903	095	0.7+	3.2-	880111	399	1.6-	1.9+
370911	078(32.1+	11.2-)X	750906	095	1.7-	1.6+	880115	399	0.3-	1.1+
370911	012	0.3-	2.0+	780306	095	2.1-	2.0+	880115	399	0.7+	1.2-
370914	012	0.0	3.7+	811027	095	3.5+	3.9-	880115	399	1.2+	0.3-
370915	012	0.2+	1.8+	830214	381	5.5+	0.4-	880117	399	1.5+	0.7+
370926	012	2.1+	1.9+	880110	399	2.9-	0.1-	880117	399	0.3-	0.1+
370927	078(16.0-	18.3+)X	880110	399	3.7-	0.5-	880117	399	1.4+	1.1+
370928	012	0.8+	1.4+	880110	399	2.0-	1.1+				

(3769)* 1967 UV = 1953 TV2 = 1953 UW = 1958 DM = 1960 VE = 1975 AV = 1975 CC = 1979 HQ = 1984 YO1

Discovered 1967 Oct. 30 by L. Kohoutek and A. Kriete at Bergedorf. The double designation 1975 AV = 1975 CC is by S. Nakano.

Epoch 1988 Aug. 27.0 ET = JDE 2447400.5

M	21.55852	(1950.0)	P	Q	
n	0.28927745	Peri.	35.29059	-0.02386899	-0.99744015
a	2.2642602	Node	56.16783	+0.89751419	-0.05107803
e	0.1141481	Incl.	4.65438	+0.44033912	+0.05004180
P	3.41	H	13.7	G	0.25

Residuals in seconds of arc

531014	760	2.3-	0.3-	750110	026	1.3-	0.2-	870923	071	1.8-	0.7-
531014	760	1.8-	0.1+	750111	026	0.7-	0.9-	870923	071	2.2-	0.3+
531031	760	0.8+	2.2+	750204	026	0.2-	0.5+	870923	071	(1.4+	3.0-)
531031	760	0.8-	0.5-	750207	026	0.6-	0.1-	870924	071	0.9+	1.3-
580223	760	1.1+	1.2+	790419	807	0.6-	0.7+	870925	071	0.7+	1.6-
580223	760	1.0+	0.7+	790426	807	0.7+	0.2+	871113	071	(2.7+	1.5+)
601112	760	2.3+	0.7+	790426	807	0.8+	0.1-	871113	071	1.3+	0.6+
601112	760(61.6+	2.6-)	841217	095	0.9+	0.5-	871113	071	1.1+	0.2-
671013	029	1.3-	0.0	841223	095	0.7-	0.1-	871115	071	0.6+	0.1-
671014	029	1.3+	0.3+	841227	095	0.6-	0.9-	871115	071	0.3+	1.1+
671014	029	0.4+	0.2+	870919	688	0.3+	0.0	871115	071	1.1+	1.0+
671030	029	0.7-	0.6-	870919	688	(3.8+	0.4-)	871116	071	0.0	0.8+
671031	029	0.6+	0.4+	870921	071	(2.7+	3.7+)	871116	071	0.3+	0.5+
671031	029	0.1+	0.3+	870921	071	(1.5+	5.6+)				
671031	029	0.5+	0.3+	870922	071	(4.9-	8.8+)				

(3770)* 1974 QT1 = 1948 RK = 1984 WL2

Discovered 1974 Aug. 24 by L. I. Chernykh at the Crimean Astrophysical Observatory.

Epoch 1988 Aug. 27.0 ET = JDE 2447400.5

M	93.48454	(1950.0)	P	Q	
n	0.30339219	Peri.	20.40811	+0.99500607	-0.09561051
a	2.1934772	Node	344.99251	+0.06909209	+0.86698368
e	0.1804093	Incl.	6.35510	+0.07203612	+0.48907865
P	3.25	H	14.4	G	0.25

Residuals in seconds of arc

480907	690	(7.4+	0.4-)	740827	095	(4.1-	0.9+)	870826	801	0.5+	0.9+
480908	690	0.9-	0.2+	740911	095	0.8-	0.7+	871019	801	1.1-	0.4-
480909	690	1.1+	0.1-	841120	675	0.4-	0.4-	871023	801	0.9+	0.2+
740824	095	0.3+	1.6-	841121	675	0.4+	0.2+				

(3771)* 1974 SB3 = 1954 QF = 1984 SG5

Discovered 1974 Sept. 20 by L. V. Zhuravleva at the Crimean Astrophysical Observatory.

Epoch 1988 Aug. 27.0 ET = JDE 2447400.5

M 57.08167	(1950.0)	P	Q	
n 0.29696683	Peri. 136.66775	+0.89953030	-0.43055325	
a 2.2250038	Node 248.97049	+0.37604090	+0.84928733	
e 0.1686571	Incl. 4.54435	+0.22234769	+0.30550766	
P 3.32	H 14.3	G 0.25		

Residuals in seconds of arc

540831	024	0.2+	0.2-	840927	675	0.1-	0.2-	870728	801	0.7+	0.7-
740920	095	1.4-	1.1+	840927	675	1.4+	1.6+	870825	801	0.6-	0.3+
740922	095	0.7+	0.2-	841025	675	0.6-	1.0-				
741010	095	(8.1+	10.2+)	841026	675	0.1-	1.0-				

(3772)* 1982 UR7 = 1943 GN = 1950 TR2 = 1958 DR = 1969 FJ = 1972 XK2

Discovered 1982 Oct. 21 by L. G. Karachkina at the Crimean Astrophysical Observatory.

Epoch 1988 Aug. 27.0 ET = JDE 2447400.5

M 146.63109	(1950.0)	P	Q	
n 0.18767856	Peri. 201.00218	+0.52466490	+0.83037050	
a 3.0212937	Node 101.08132	-0.75122011	+0.55528910	
e 0.0661975	Incl. 11.02356	-0.40049356	+0.04624774	
P 5.25	H 11.3	G 0.25		

Residuals in seconds of arc

430406	062	1.3-	0.5+	580223	760	0.3-	1.1+	821111	095	4.0-	0.7-
430406	062	2.2-	0.2-	690324	095	5.6+	2.9-	871020	688	0.7+	0.5-
430408	062	2.5-	4.3+	721202	095	1.3+	0.9-	871020	688	0.7+	0.5-
501011	760	3.1+	1.1-	821021	095	2.1-	3.5+	871119	688	0.4+	1.2-
501011	760	2.5+	1.1+	821022	095	1.2-	0.3+	871119	688	0.1-	0.0
580223	760	1.1+	3.2-	821025	095	2.5-	0.7+				

(3773)* 1984 YY = 1938 DA2 = 1971 TS = 1974 QO = 1981 YC2

Discovered 1984 Dec. 23 at the Oak Ridge Observatory.

Epoch 1988 Aug. 27.0 ET = JDE 2447400.5

M 127.83890	(1950.0)	P	Q	
n 0.30932289	Peri. 286.13724	+0.98210438	+0.18720161	
a 2.1653496	Node 63.07712	-0.16272443	+0.89863713	
e 0.1840885	Incl. 1.32729	-0.09482482	+0.39674534	
P 3.19	H 13.4	G 0.25		

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

380228	053	(0.08-	0.26-)X	841223	801	3.2+	0.5+	871020	688	1.3+	1.3+
380306	053	(38.2-	10.3-)X	841223	095	0.9+	1.3-	871020	688	1.1-	1.5+
711010	095	0.2-	1.0-	841227	095	0.6-	1.5-	871111	376	2.1+	0.8-
740818	095	0.6+	2.0+	870922	657	2.5-	1.5-	871111	376	0.2-	0.6-
740823	095	0.4+	2.8-	870929	657	2.6-	0.5+	871119	688	1.3+	2.0+
811222	330	3.6-	0.6+	871001	657	2.6-	0.4+	871119	688	1.1+	1.1+
841217	095	0.9+	1.1-	871001	657	0.1-	0.8-	871124	688	0.3+	1.0+
841222	552	0.9+	1.7+	871016	657	0.2-	1.4-	871124	688	2.0+	0.8+
841222	552	0.2-	0.1-	871019	657	2.1-	1.1-				

(3774)* 1987 YC = 1931 BG = 1933 OA = 1974 FW1 = 1974 HO3 = 1976 YL6 = 1986 TH1

Discovered 1987 Dec. 20 by T. Kojima at Chiyoda. The double designation 1974 FW1 = 1974 HO3 is by H. Oishi (JAM 974).

Epoch 1988 Aug. 27.0 ET = JDE 2447400.5

M 303.84041	(1950.0)	P	Q	
n 0.18935510	Peri. 281.50462	-0.82410941	+0.54663549	
a 3.0034336	Node 291.79500	-0.43706709	-0.78036385	
e 0.0564251	Incl. 9.19898	-0.36029994	-0.30368058	
P 5.21	H 11.6	G 0.25		

Residuals in seconds of arc

310116	690	(6.9+	3.3+)	861004	688	1.8-	0.6+	871227	386	0.1+	0.1+
310117	690	0.7-	2.0+	861004	688	1.5-	0.9+	871231	892	1.1-	0.6-
330724	024	1.6+	0.4-	871220	892	0.1+	0.8-	871231	892	1.4-	0.4-
330727	024	0.8+	0.6-	871220	892	2.1+	0.2-	880110	892	1.0+	0.7+
740321	805	0.7+	1.6+	871225	892	0.7-	1.0+	880110	892	0.6-	0.7+
740322	805	0.0	1.3+	871225	892	0.4-	0.1-	880114	894	0.0	1.8-
740421	805	0.2+	0.6+	871226	892	0.5-	1.8-	880114	894	1.1+	0.8-
740422	805	0.2+	1.0-	871226	892	0.7-	0.9-	880116	892	0.7+	0.6-
740424	805	0.0	1.2+	871226	386	2.7+	0.7-	880116	892	1.3+	0.0
740425	805	1.6-	2.0-	871226	386	1.9-	0.1-	880116	894	0.3-	0.2-
761220	095	0.4+	0.4+	871227	386	0.7+	0.2+	880116	894	0.9-	3.0+

1982 OR = 1940 RD = 1957 SD = 1971 BC4 = 1980 BT2 = 1987 YF
Epoch 1988 Aug. 27.0 ET = JDE 2447400.5

M	119.72294		(1950.0)	P	Q
n	0.23404646	Peri.	75.58251	+0.94803894	-0.26346330
a	2.6077623	Node	299.42041	+0.14934451	+0.86350196
e	0.2554143	Incl.	11.81529	+0.28092416	+0.43005982
P	4.21	H	12.9	G 0.25	

Residuals in seconds of arc

400906	024	1.3+	0.9-	820814	046	0.1-	1.0-	871227	385	2.8-	2.5-
570924	760	2.9-	2.7+	820814	046	0.0	0.3-	871227	385	(1.0+	6.7-)
710118	095	2.2+	3.0+	871222	385	(0.4-	6.4-)	871228	385	0.3-	2.0-
800124	095	0.9-	0.2+	871222	385	(0.7-	5.6-)	871228	385	1.4-	2.0-
820730	046	0.1-	2.0-	871224	385	0.0	2.7-	871228	385	0.5-	0.3+
820730	046	0.1-	2.0-	871224	385	1.1-	1.0-	880109	385	0.2-	2.0-
820812	046	2.1+	0.6-	871225	385	1.8+	2.4+	880109	385	(0.2-	4.1-)
820812	046	1.7+	0.0	871225	385	(1.2-	4.0-)				

1984 CP = 1961 CO = 1961 EF = 1980 BB6

The identification 1984 CP = 1980 BB6 was also found by C. M. Bardwell, W. Landgraf and L. D. Schmadel.

Epoch 1988 Aug. 27.0 ET = JDE 2447400.5

M	23.35452		(1950.0)	P	Q
n	0.25906180	Peri.	79.40540	-0.90482858	+0.41225719
a	2.4370651	Node	124.86117	-0.42342800	-0.84504996
e	0.1043575	Incl.	7.45331	-0.04465386	-0.34049166
P	3.80	H	14.0	G 0.25	

Residuals in seconds of arc

610214	033	(0.01-	0.06+)	840227	809	0.9-	0.1+	840308	809	0.7-	0.0
610215	033	0.4-	0.9+	840227	809	0.6-	0.0	840308	809	0.4-	0.4+
610215	033	0.5+	0.9+	840227	809	0.1-	0.2-	840309	809	0.3+	0.2+
610309	033	0.1+	1.9+	840303	809	0.2-	0.5-	840309	809	0.5+	0.9+
800123	095	0.1-	1.5-	840303	809	0.4-	0.4-	840309	809	0.2+	0.6+
840205	688	1.9+	0.2-	840303	809	0.3-	0.2-				
840205	688	0.6+	2.0-	840308	809	0.4-	0.7-				

1987 WS = 1987 UP1 = 1976 SY5 = 1976 UM1

The double designation 1987 WS = 1987 UP1 is by H. Kaneda and S. Nakano. The identification and double designation 1987 WS = 1976 SY5 = 1976 UM1 were found independently by S. Nakano. The double designation 1976 SY5 = 1976 UB9 (MPC 9064) is invalid.

Epoch 1988 Aug. 27.0 ET = JDE 2447400.5

M	132.20082		(1950.0)	P	Q
n	0.18266016	Peri.	297.92818	+0.72542338	+0.68479794
a	3.0763812	Node	19.12506	-0.53326482	+0.62288756
e	0.0834214	Incl.	12.22452	-0.43518909	+0.37823653
P	5.40	H	11.5	G 0.25	

Residuals in seconds of arc

760924	095	0.8+	1.4+		871128	399	0.2+	0.9-	Y	871210	400	0.3+	1.0-
761026	095	0.5-	1.7-		871128	399	0.5+	0.2+	Y	871211	400	1.0+	0.7-
871028	399	0.4-	1.0-		871129	400	2.2-	2.9+		871211	400	1.1+	0.8+
871028	399	1.0-	0.8-		871129	400	(0.1+	5.0+)		871211	400	1.1+	0.1+
871028	399	0.6-	0.9+		871210	400	0.0	0.0					

1987 WW = 1949 GN = 1976 JV3

Epoch 1988 Aug. 27.0 ET = JDE 2447400.5

M	142.53308		(1950.0)	P	Q
n	0.29429975	Peri.	321.51873	+0.94576614	+0.32401593
a	2.2384262	Node	19.61348	-0.27825416	+0.84495341
e	0.1424911	Incl.	3.96997	-0.16763364	+0.42552015
P	3.35	H	14.0	G 0.25	

Residuals in seconds of arc

490404	760	0.3-	0.2+		871027	372	3.1-	0.1-		871123	372	0.2+	0.2-
490404	760	0.6+	0.4+		871118	372	0.8-	1.1+		871129	372	1.3-	2.1-
760503	809	0.2-	0.5-		871118	372	0.3-	1.6+		871129	372	2.1+	0.3-
871027	372	1.2+	0.4+		871123	372	1.9+	0.4-					

1987 XC = 1982 JG1

Epoch 1988 Aug. 27.0 ET = JDE 2447400.5

M	115.86746		(1950.0)	P	Q
n	0.24129700	Peri.	285.06001	+0.90702185	+0.35106452
a	2.5552580	Node	54.92285	-0.18389411	+0.82699623
e	0.2668895	Incl.	16.50634	-0.37880645	+0.43912519
P	4.08	H	14.0	G 0.25	

Residuals in seconds of arc

820515	675	0.5+	0.2-		871214	372	0.5-	1.1-	Y	871225	372	1.6-	0.5+
820516	675	0.1-	0.2-		871216	372	2.1+	0.0		880113	372	2.0+	1.3+
820516	675	0.2+	0.4+		871219	372	0.4-	0.2-		880113	372	1.7-	1.7-
820517	675	0.7-	0.2-		871219	372	0.7-	0.6+					
871214	372	(6.8-	0.1-)Y		871225	372	0.8+	0.5+					

1987 YB = 1951 WG2 = 1977 TH3 = 1977 TG6 = 1985 BD2

Epoch 1988 Aug. 27.0 ET = JDE 2447400.5

M	95.62301		(1950.0)	P	Q
n	0.30092607	Peri.	315.25774	+0.75984505	-0.64027859
a	2.2054447	Node	84.89398	+0.62360678	+0.66891324
e	0.1727895	Incl.	6.49110	+0.18371197	+0.37762203
P	3.28	H	13.8	G 0.25	

Residuals in seconds of arc

511129	711	0.3+	0.9-	Y	871217	892	0.1+	0.3-		871225	892	0.4+	0.6+
771004	330	0.8+	3.0+		871217	892	0.2-	0.5-		871226	892	0.3+	0.4+
771008	095	1.2-	2.3-		871220	892	0.8-	0.5-		871226	892	1.3+	1.9+
850119	688	1.0+	0.4+		871220	892	0.7-	1.0-					
850119	688	1.0-	0.7+		871225	892	0.2-	0.5-					

3019 T-3 = 1986 RT

Epoch 1988 Aug. 27.0 ET = JDE 2447400.5

M	161.63664		(1950.0)	P	Q
n	0.21078759	Peri.	129.86497	+0.77135404	+0.63578405
a	2.7962287	Node	190.75826	-0.62016522	+0.74101033
e	0.1589194	Incl.	8.66894	-0.14285673	+0.21606094
P	4.68	H	13.0	G 0.25	

Residuals in seconds of arc

771016	675	0.6+	1.0-	771021	675	0.2+	0.0	860905	071	0.6-	0.8-
771016	675	0.7+	0.7-	771021	675	1.2+	0.5+	860905	071	1.7-	2.0-
771017	675	0.9-	1.2+	771022	675	0.4-	0.1+	860907	071	0.5-	0.8+
771017	675	1.5-	0.7+	771022	675	0.0	0.7-	860907	071	2.8+	2.1+

3502 T-3 = 1979 GH

The identification is by K. Hurukawa.

Epoch 1988 Aug. 27.0 ET = JDE 2447400.5

M	12.95695		(1950.0)	P	Q
n	0.30881251	Peri.	109.22391	-0.90390832	-0.42723636
a	2.1677347	Node	45.48992	+0.38084169	-0.82568644
e	0.0403164	Incl.	1.64453	+0.19470324	-0.36838975
P	3.19	H	16.6	G 0.25	

Residuals in seconds of arc

771007	675	0.1-	1.4-	771016	675	0.8-	0.2-	771021	675	0.3+	0.0
771011	675	0.4-	1.0+	771016	675	0.3-	0.3-	790401	809	1.3+	0.7-
771011	675	0.1-	1.4+	771017	675	0.4-	0.8-	790402	809	1.3-	0.8+
771012	675	1.1+	0.1+	771017	675	0.7+	0.5-				
771012	675	0.1-	0.5+	771021	675	0.1+	0.2+				

4134 T-3 = 1986 TC4

The identification is by K. Hurukawa.

Epoch 1988 Aug. 27.0 ET = JDE 2447400.5

M	129.30339		(1950.0)	P	Q
n	0.21852028	Peri.	337.63981	+0.66379819	-0.74544070
a	2.7298674	Node	70.71295	+0.69553573	+0.58541331
e	0.1921415	Incl.	3.69002	+0.27495820	+0.31876233
P	4.51	H	14.3	G 0.25	

Residuals in seconds of arc

771007	675	0.1+	1.0+	771016	675	0.5+	1.2-	771022	675	0.6+	1.5-
771011	675	0.7+	1.4+	771017	675	2.0-	1.2+	861005	046	0.3-	1.1-
771011	675	0.4+	0.7+	771017	675	1.0-	0.5+	861005	046	2.3-	1.9-
771012	675	0.7-	1.4+	771021	675	1.2+	1.2-	861009	046	3.1+	2.9-
771012	675	1.3-	0.1+	771021	675	1.0+	0.4+	861009	046	0.9+	2.6+
771016	675	1.0-	0.8+	771022	675	0.1-	0.4-				

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ORBITAL ELEMENTS BY H. OISHI, NIIZA, JAPAN.

1128 T-3 = 4192 P-L

The identification is by K. Hurukawa.

Epoch 1988 Aug. 27.0 ET = JDE 2447400.5 (J-P)

M	22.82320		(1950.0)	P	Q
n	0.17554794	Peri.	331.91400	+0.77624527	+0.62875443
a	3.1589282	Node	348.76944	-0.52514074	+0.60455725
e	0.1306343	Incl.	13.64586	-0.34881297	+0.48905868
P	5.61	H	13.7	G 0.25	

Residuals in seconds of arc

600924	675	0.3-	0.5+	600928	675	0.5+	0.3+	771016	675	1.3-	0.4+
600925	675	0.2+	0.2+	771007	675	0.1+	2.3-	771016	675	0.9-	0.9+
600925	675	0.4-	0.1-	771011	675	1.3+	0.3+	771017	675	0.0	0.4+
600926	675	0.3-	0.2-	771011	675	0.3-	1.5+	771017	675	0.3-	1.5+
600926	675	0.2-	0.1-	771012	675	0.1-	0.1-	771022	675	0.0	1.3-
600928	675	0.6+	0.5-	771012	675	0.6+	0.1-	771022	675	0.8+	1.3-

3279 T-3 = 6829 P-L = 1974 FO1

The key identification 3279 T-3 = 6829 P-L is by K. Hurukawa. The identification 3279 T-3 = 1974 FO1 is by H. Oishi.

Epoch 1988 Aug. 27.0 ET = JDE 2447400.5 (J-P)

M 236.39524	(1950.0)	P	Q
n 0.17739879	Peri. 124.17740	-0.85260461	-0.51569926
a 3.1369178	Node 25.09635	+0.38952955	-0.73485149
e 0.2124186	Incl. 11.47488	+0.34832759	-0.44050830
P 5.56	H 12.8	G 0.25	

Residuals in seconds of arc

600926	675	0.2+	0.1-	771011	675	0.9-	0.8+	771017	675	0.3+	0.8+
600927	675	0.3-	0.2+	771011	675	1.5-	0.9+	771017	675	1.6-	1.1+
600928	675	0.5+	0.2+	771012	675	0.5+	0.5-	771021	675	1.2-	1.3-
601017	675	0.0	0.9-	771012	675	0.3+	1.3-	771021	675	0.6-	0.9-
740321	095	0.2-	0.3-	771016	675	0.6+	1.9+	771022	675	1.6+	0.8-
771007	675	0.1-	0.2+	771016	675	0.6+	0.2-	771022	675	1.8+	0.4-

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NEW NAMES OF MINOR PLANETS.

(2652) Yabuuti = 1953 GM

Discovered 1953 Apr. 7 by K. Reinmuth at Heidelberg.

Named in honor of Kiyosi Yabuuti, a member of the Japan Academy, former professor of the Astronomical Institute and former director of the Research Institute for Humanistic Studies, Kyoto University. A pioneer in the study of sinology, he has published various books on Chinese ancient astronomy and technology. The minor planet is named on the occasion of the international conference on the history of science in China (Kyoto, 1987), which was held in his honor. Name proposed by K. Hurukawa, who was a student of Yabuuti and who found the identifications involving this planet.

(2846) Ylppo = 1942 CJ

Discovered 1942 Feb. 12 by L. Oterma at Turku.

Named in honor of the distinguished Finnish physician and scientist Arvo Ylppo on the occasion of his hundredth birthday, 1987 October 27. He has been a pioneer in saving premature babies and in the development of pediatrics and mother-and-child welfare in Finland.

(3387) Greenberg = 1981 WE

Discovered 1981 Nov. 20 by E. Bowell at the Anderson Mesa Station of Lowell Observatory.

Named in honor of Richard J. Greenberg, planetary scientist at the University of Arizona. Greenberg has carried out careful and innovative studies of the evolution of dynamical resonances in outer-planet satellite and ring systems. He has also contributed important new insights into collisional processes between minor planets and into the formation of resulting dust bands. Citation prepared by W. B. Hubbard following a suggestion by L. A. Lebofsky.

(3402) Wisdom = 1981 PB

Discovered 1981 Aug. 5 by E. Bowell at the Anderson Mesa Station of Lowell Observatory.

Named in honor of Jack Wisdom, a dynamicist at the Massachusetts Institute of Technology. Wisdom is well known for his discovery of a dynamical mechanism for the removal of minor-planet type objects from the 3:1 and other Kirkwood gaps via chaotic behavior, which can also deliver meteorites to the earth. He and his colleagues have also explored the long-term stability of the solar system, the tidal evolution of planetary

satellite systems and the chaotic rotation states of irregularly shaped natural satellites. Citation prepared by W. C. Tittemore and L. M. French at the request of the discoverer.

(3452) Hawke = 1980 OA

Discovered 1980 July 17 by E. Bowell at the Anderson Mesa Station of Lowell Observatory.

Named in honor of B. R. Hawke, planetary geologist at the University of Hawaii, Honolulu. Hawke's research has concentrated on the geologic evolution of the moon as revealed by sample studies, spacecraft photography and infrared spectroscopy. He has also undertaken spectroscopic evaluation of minor planet mineralogy. Name suggested and citation prepared by J. F. Bell.

(3464) Owensby = 1983 BA

Discovered 1983 Jan. 16 by E. Bowell at the Anderson Mesa Station of Lowell Observatory.

Named in honor of Pamela D. Owensby, planetary astronomer at the University of Hawaii, Honolulu. Her hard work and dedication to accurate data analysis have made possible the success of several large observational programs at Mauna Kea Observatory, including the 24-color visual and 52-color infrared spectral surveys of minor planets. Name suggested and citation prepared by J. F. Bell.

(3478) Fanale = 1979 XG

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

Named in honor of Fraser P. Fanale, planetary scientist at the University of Hawaii, Honolulu. Fanale has specialized in the study of volatile compounds in the planets and carried out some of the earliest work in relating C-type minor planets to the carbonaceous chondrites. Name suggested and citation prepared by J. F. Bell.

(3480) Abante = 1981 GB

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

Named in honor of Robert Hamilton Brown, planetary astronomer at the Jet Propulsion Laboratory. A pioneer in the study of the compositions of the satellites of Uranus, Brown has also contributed greatly to the development of the radiometric method of diameter determination for minor planets and satellites. He has been involved in several calibrations of the radiometric method using occultation diameters, and he has investigated the geometric assumptions by developing a generalized ellipsoidal radiometric model. "Abante" derives from the name of Brown's Italian grandfather; in English, it loosely corresponds to "Bob", a nickname for Robert. Citation prepared by D. L. Matson and L. A. Lebofsky following a suggestion by the discoverer.

(3488) Brahic = 1980 PM

Discovered 1980 Aug. 8 by E. Bowell at the Anderson Mesa Station of Lowell Observatory.

Named in honor of Andre Brahic, astronomer at the Observatoire de Paris, Meudon, and at the Universite de Paris. His studies of the dynamics of planetary rings have provided insight into how collisional interactions among particles can control the large-scale behavior of a swarm. He was leader of the team that discovered the apparent "ring arcs" of Neptune and has performed several other ring occultation experiments. Brahic is also a member of the imaging team for the Voyager spacecraft. Through popular articles, public talks and books, he has helped convey the excitement of

planetary science to the public in both his native France and abroad. Citation prepared by R. J. Greenberg at the request of the discoverer.

(3506) French = 1984 CO1

Discovered 1984 Feb. 6 by E. Bowell at the Anderson Mesa Station of Lowell Observatory.

Named in honor of Linda M. French, planetary scientist at the Department of Earth, Atmospheric and Planetary Sciences of the Massachusetts Institute of Technology. An active teacher, French has encouraged undergraduate research in planetary astronomy by using a hands-on approach to observing and data analysis and by arranging for students to observe at major facilities. Involved in research on the shapes, spin states and surface compositions of small solar-system bodies, she has emphasized the properties of Trojan asteroids in an effort to understand their origins. Citation prepared by F. Vilas.

(3507) Vilas = 1982 UX

Discovered 1982 Oct. 21 by E. Bowell at the Anderson Mesa Station of Lowell Observatory.

Named in honor of Faith Vilas, planetary scientist at the Johnson Manned Space Center in Houston. Vilas has used high-resolution visual and near-infrared spectral measurements to search for compositional trends among outer-belt minor planets and to investigate the mineralogy of Mercury. She designed and built the coronagraph/spectrograph that was used to image the planetary disk around Beta Pictoris and is currently evaluating the hazard presented by earth-orbiting debris for future manned missions, including NASA’s Space Station. Citation prepared by M. V. Sykes, with assistance from N. Lebofsky and E. Roemer.

(3510) Veeder = 1982 TP

Discovered 1982 Oct. 13 by E. Bowell at the Anderson Mesa Station of Lowell Observatory.

Named in honor of Glenn J. Veeder, planetary astronomer at the Jet Propulsion Laboratory. Veeder was chiefly responsible for the initiation of minor planet observations through the J, H and K bandpasses. This work resulted in the identification of new minor planet types and led to a new classification scheme. Veeder is also noted for his work on minor planet radiometry for the determination of diameters and albedos, particularly among the earth-crossers, and he is codiscoverer of the existence of low-albedo cometary nuclei. In addition, he was in charge of the scientific analysis of the characteristics of the IRAS Asteroid and Comet Survey. Citation prepared by D. L. Matson and L. A. Lebofsky following a suggestion by the discoverer.

(3526) Jeffbell = 1984 CN

Discovered 1984 Feb. 5 by E. Bowell at the Anderson Mesa Station of Lowell Observatory.

Named in honor of Jeffrey F. Bell, planetary astronomer at the University of Hawaii, Honolulu. Bell has contributed greatly to our understanding of the composition of minor planets and to their relationship with meteorites. He was responsible for the 0.3 to 2.5 micrometer 52-color minor planet survey, which has led to the spectral characterization of more than 100 minor planets. Recently, he has proposed that the CV and CO chondrite meteorites may be derived from Eos family members. Citation prepared by L. A. Lebofsky following a suggestion by the discoverer.

(3527) McCord = 1985 GE1

Discovered 1985 Apr. 15 by E. Bowell at the Anderson Mesa Station of Lowell Observatory.

Named in honor of Thomas B. McCord, planetary scientist at the University of Hawaii, Honolulu. McCord developed reflection spectroscopy as a means of probing the mineralogical composition of planetary surfaces and played a major role in early applications of this technique to minor planets and the moon. Citation prepared by J. F. Bell at the request of the discoverer.

(3531) Cruikshank = 1981 FB

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

Named in honor of Dale P. Cruikshank, planetary scientist at the University of Hawaii, Honolulu. Cruikshank is well known for his observational work on solar system small bodies, including Trojan asteroids, belt asteroids of selected spectral classes, earth-approaching asteroids, comets and Pluto. He is especially known for studies of outer-planet satellites, including Triton, Iapetus and Io, through both telescopic and Voyager spacecraft observations. He has been active in developing instrumentation and facilities at Mauna Kea Observatory and has promoted historical studies of planetary science. Through several extended working visits to the Soviet Union and other projects, Cruikshank has also been a leader in furthering international scientific relations. Citation prepared by W. K. Hartmann and D. J. Tholen at the request of the discoverer.

(3545) Gaffey = 1981 WK2

Discovered 1981 Nov. 20 by E. Bowell at the Anderson Mesa Station of Lowell Observatory.

Named in honor of Michael J. Gaffey, planetary scientist at the Rensselaer Polytechnic Institute. His pioneering and comprehensive study of the spectra of meteorites has become the principal resource in interpreting minor planet spectra. More recently, he has demonstrated that careful spectrophotometry can resolve geological units on minor planet surfaces. Citation prepared by J. F. Bell at the request of the discoverer.

(3546) Atanasoff = 1983 SC

Discovered 1983 Sept. 28 by E. Helin, V. Shkodrov, V. Ivanova and A. Georgieva at the Bulgarian National Astronomical Observatory, Rozhen.

Named in honor of the mathematician John Atanasoff (1903-), a pioneer in the development of computers who between 1936 and 1942 created an operating model with regenerative memory that utilized a magnetic drum and some relay logical schemes. At the same time he lectured on mathematics and physics at Iowa State University. Atanasoff, whose father was a Bulgarian, has been a member of the Bulgarian Academy of Sciences since 1983.

(3549) Hapke = 1981 YH

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

Named in honor of Bruce W. Hapke, planetary scientist at the University of Pittsburgh. A pioneer investigator of the physical and chemical nature of the surfaces of minor planets, he was one of the first to recognize the division of minor planets into two principal color classes (later known as C and S types) on the basis of UBV photometry. More recently, he has developed a comprehensive theoretical treatment of the scattering of sunlight in planetary regoliths. Citation prepared by J. F. Bell at the request of the discoverer.

(3559) Violamayer = 1980 PH

Discovered 1980 Aug. 8 by E. Bowell at the Anderson Mesa Station of Lowell Observatory.

Named for a village in Bavaria and in honor of Martin Mayer, who there directs the "Bruder-Klaus-Heim", a Catholic educational center. Known for his enthusiastic and didactic style of teaching astronomy, Mayer has erected a well-equipped observatory to show the beauty of the universe to his guests and to the public. International Astronomical Youth Camps and conventions of the German Planetary Observers, a group of amateur astronomers, have been held in Violau. Name suggested and citation prepared by C. M. Schambeck and G. Marxer.

(3574) Rudaux = 1982 TQ

Discovered 1982 Oct. 13 by E. Bowell at the Anderson Mesa Station of Lowell Observatory.

Named for Lucien Rudaux (1874-1947), French astronomical painter, writer and amateur astronomer. Rudaux is considered the grandfather of astronomical art. He maintained his own observatory at Donville and used his observations of mountain profiles on the lunar limb to argue that lunar mountains are rounded. His lunar paintings and articles, from about 1910 onward, correctly described lunar topography, whereas the popular misconception was of spiky crags. His paintings also showed various aspects of other planets, satellites, the zodiacal light and comets, using the best available data. His writings include many illustrated articles about astronomy and space travel and the book "Sur les Autres Mondes" (1937). Name suggested and citation prepared by W. K. Hartmann.

(3581) Alvarez = 1985 HC

Discovered 1985 Apr. 23 by C. S. Shoemaker and E. M. Shoemaker at Palomar.

Named in honor of Luis W. Alvarez, physicist and Nobel laureate, and his son Walter Alvarez, geologist, both on the faculty of the University of California at Berkeley. The Alvarezes headed a team that discovered a global geochemical anomaly of noble metals at the Cretaceous-Tertiary boundary. They propounded the theory that a mass extinction of living species at the end of the Cretaceous period was triggered by impact of an asteroid or a comet about 10 km in diameter. Their work has stimulated intensive international research on the possible relationships between large body impacts and the evolution of life.

(3590) Holst = 1984 CQ

Discovered 1984 Feb. 5 by E. Bowell at the Anderson Mesa Station of Lowell Observatory.

Named for English composer Gustav Holst (1874-1934). One of Holst's best-known and most popular compositions is the symphonic suite "The Planets", written between 1914 and 1916. The titles of the seven movements are taken from the names of the seven major planets (excluding the earth) known at the time the piece was written. Although the ideas for the scores are based on the astrological character of each planet, the work is nevertheless enjoyed by astronomers throughout the world. Name suggested and citation provided by D. J. Tholen.

(3595) Gallagher = 1985 TF1

Discovered 1985 Oct. 15 by E. Bowell at the Anderson Mesa Station of Lowell Observatory.

Named in honor of John S. Gallagher III, Director of Lowell Observatory. Gallagher's particular devotion to astronomy has been manifest in his service to the community, energetic and productive research, and teaching. He is a council member of the American Astronomical Society, is an editor of the Astrophysical Journal and has served on numerous committees and boards. His research has included work on luminous stars, novae, a broad variety of extragalactic problems, and cosmology. With a colleague, he discovered the

ultraviolet output of novae and developed a method to evaluate star-formation rates at different stages in the evolution of galaxies. Citation prepared by D. A. Hunter at the request of the discoverer.

(3612) Peale = 1982 TW

Discovered 1982 Oct. 13 by E. Bowell at the Anderson Mesa Station of Lowell Observatory.

Named in honor of Stanton J. Peale, planetary astronomer at the University of California at Santa Barbara. Peale has made important contributions to the theory of tidal interactions between orbiting bodies and resulting capture into spin-orbit and orbit-orbit resonances, and to chaotic orbital and rotational motion. He is perhaps best known for predicting, almost literally on the eve of the Voyager 1 encounter with Jupiter, that its satellite Io would show extensive evidence of volcanism as a result of tidal heating by Jupiter. Citation prepared by A. W. Harris at the request of the discoverer.

(3615) Safronov = 1983 WZ

Discovered 1983 Nov. 29 by E. Bowell at the Anderson Mesa Station of Lowell Observatory.

Named in honor of Victor S. Safronov of the O. Yu. Shmidt Institute of Earth Physics in Moscow. Starting with Shmidt’s pioneering work from 1944 to 1960, Safronov developed a comprehensive theory of the origin of planetary bodies from the protoplanetary swarm. This work has well stood the tests of time and scrutiny by other scientists and is the basis of most modern research on the origin of terrestrial and minor planets. Citation prepared by A. W. Harris at the request of the discoverer.

(3640) Gostin = 1985 TR3

Discovered 1985 Oct. 11 by C. S. Shoemaker and E. M. Shoemaker at Palomar.

Named in honor of Victor A. Gostin, geologist on the faculty of the University of Adelaide, South Australia. A specialist in sedimentology and stratigraphy, Gostin discovered in the Flinders Ranges of South Australia a deposit of shocked debris ejected from the Lake Acraman impact structure about 300 km to the west. His careful studies of this ancient deposit have provided the first detailed picture of the distant ejecta from a known large terrestrial impact crater.

(3642) Frieden = 1953 XL1

Discovered 1953 Dec. 4 by H. Gessner at Sonneberg.

This planet is given the German form of the goddess Pax in the hope for peace around the world.

(3647) Dermott = 1986 AD1

Discovered 1986 Jan. 11 by E. Bowell at the Anderson Mesa Station of Lowell Observatory.

Named in honor of Stanley F. Dermott, planetary scientist at Cornell University, Ithaca, New York. Dermott’s unusually broad range of contributions includes work on planetary origin, resonance effects on planetary satellites, rings, zodiacal dust bands, tidal interactions, and minor planets, for the last of which he is known for his study of the statistics of spin rates. Citation prepared by A. W. Harris at the request of the discoverer.

(3671) Dionysius = 1984 KD

Discovered 1984 May 27 by C. S. Shoemaker and E. M. Shoemaker at Palomar.

Originating in Thrace, where he was revered as a god of wine, the cult of Dionysius spread gradually through Greece. Dionysius became, in turn, the god of vegetation and warm moisture, the god of pleasure, the god of civilization, and ultimately a kind of supreme god and a symbol of rebirth or everlasting life. In some instances he appeared as a sun deity.

(3674) Erbisbuhl = 1963 RH

Discovered 1963 Sept. 13 by C. Hoffmeister at Sonneberg.

Named for the mountain on which the Sonneberg Observatory is situated. The discoverer, who founded the observatory, lived and worked there for many decades.

(3689) Yeates = 1981 JJ2

Discovered 1981 May 5 by C. S. Shoemaker on films taken by S. J. Bus at Palomar.

Named in honor of Anthony N. Yeates, geologist with the Bureau of Mineral Resources of the Commonwealth of Australia. In the course of regional geologic mapping at the southern edge of the Great Sandy desert of Western Australia, Yeates led a team of geologists that discovered the Veevers meteorite crater. This site, discovered in 1975, is the fifteenth and latest recognized locality where meteorites have been found associated with an impact crater.

(3696) Herald = 1980 OF

Discovered 1980 July 17 by E. Bowell at the Anderson Mesa Station of the Lowell Observatory.

Named in honor of the Australian amateur astronomer David Herald for his astrometric observations of comets and his work on occultations by minor planets. The number of his cometary positions is the second highest in the world for an amateur astronomer in modern times, and his prompt and reliable attention to new comets discovered in the southern hemisphere has been invaluable. Name suggested by B. G. Marsden, who wrote the citation.

(3697) Guyhurst = 1984 EV

Discovered 1984 Mar. 6 by E. Bowell at the Anderson Mesa Station of the Lowell Observatory.

Named in honor of Guy M. Hurst, editor of the British amateur astronomical journal "The Astronomer" since 1975. An enthusiastic visual observer of comets and variable stars himself, he is in contact with an enormous network of other observers all over western Europe, and his frequent assistance in thereby securing verifications of reports for the IAU Central Telegram Bureau is greatly appreciated. Name suggested by R. H. McNaught and B. G. Marsden, the citation being prepared by the latter.

(3698) Manning = 1984 UA2

Discovered 1984 Oct. 29 by E. Bowell at the Anderson Mesa Station of the Lowell Observatory.

Named in honor of Brian Manning, British amateur cometary astrometrist, whose numerous contributions to the IAU Circulars and Minor Planet Circulars, as well as to the astrometric campaigns of International Halley Watch, have been consistently timely and of the highest accuracy. Name suggested by D. K. Yeomans and B. G. Marsden, the citation being prepared by the latter.

(3699) Milbourn = 1984 UC2

Discovered 1984 Oct. 29 by E. Bowell at the Anderson Mesa Station of the Lowell Observatory.

Named in honor of Stanley William Milbourn, editor of the circulars of the British Astronomical Association during 1969-1986, director of the comet section during 1968-1977 and currently assistant director of the computing

section. Long interested in astronomical computations, particularly those involving returning periodic comets, he has produced a steady stream of accurate predictions over the years, as he has adapted procedures from mechanical calculating machine to pocket calculator to personal computer. Name suggested by B. G. Marsden, who wrote the citation.

(3700) Geowilliams = 1984 UL2

Discovered 1984 Oct. 23 by C. S. Shoemaker and E. M. Shoemaker at Palomar.

Named in honor of George E. Williams, exploration geologist with Broken Hill Proprietary Co., Ltd. at Adelaide, South Australia. Williams discovered the Lake Acraman impact structure of South Australia, the largest such feature found so far on the Australian continent. He also discovered rhythmically layered sedimentary deposits of Precambrian age that exhibit periods closely matching those of the modern solar cycle.

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EPHEMERIDES.

Comet Liller (1988a) Elements MPC 12787

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	m1
1988	01 20	23 52.66	-22 14.4	1.873	1.506	53.2	31.5	9.6
1988	01 25	23 54.49	-18 48.4					
1988	01 30	23 56.74	-15 20.3	1.866	1.376	45.9	30.9	9.2
1988	02 04	23 59.36	-11 49.9					
1988	02 09	00 02.29	-08 16.8	1.853	1.250	39.0	29.7	8.8
1988	02 14	00 05.49	-04 40.4					
1988	02 19	00 08.92	-01 00.1	1.829	1.131	32.7	28.1	8.3
1988	02 24	00 12.57	+02 44.6					
1988	02 29	00 16.41	+06 34.6	1.793	1.024	27.6	26.7	7.9
1988	03 05	00 20.45	+10 30.5					
1988	03 10	00 24.70	+14 33.3	1.739	0.935	24.8	26.4	7.4
1988	03 15	00 29.23	+18 43.9					
1988	03 20	00 34.11	+23 03.0	1.666	0.874	25.1	29.0	7.0
1988	03 25	00 39.51	+27 31.8					
1988	03 30	00 45.63	+32 11.1	1.575	0.849	28.8	34.5	6.8
1988	04 04	00 52.81	+37 02.2					
1988	04 09	01 01.59	+42 06.1	1.471	0.864	34.8	41.4	6.7
1988	04 14	01 12.74	+47 23.8					
1988	04 19	01 27.56	+52 54.9	1.368	0.917	42.1	47.2	6.8
1988	04 24	01 48.29	+58 36.1					
1988	04 29	02 19.10	+64 18.4	1.284	1.000	50.0	50.5	7.0
1988	05 04	03 07.97	+69 39.0					
1988	05 09	04 27.7	+73 46.3	1.237	1.104	57.8	50.7	7.4
1988	05 14	06 20.7	+75 10.8					
1988	05 19	08 09.1	+73 02.3	1.245	1.221	64.5	48.4	7.8

Periodic Comet Shoemaker-Holt (1987z) Elements MPC 12792

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	m1
1988	01 20	01 16.29	+07 40.1	3.111	3.128	81.9	18.1	15.4
1988	01 30	01 25.73	+08 27.9					
1988	02 09	01 36.34	+09 22.0	3.359	3.106	66.8	17.0	15.6
1988	02 19	01 47.96	+10 20.6					
1988	02 29	02 00.48	+11 22.5	3.583	3.088	52.9	14.8	15.7
1988	03 10	02 13.78	+12 26.0					
1988	03 20	02 27.76	+13 29.9	3.770	3.073	39.9	12.0	15.8
1988	03 30	02 42.35	+14 33.0					
1988	04 09	02 57.45	+15 34.0	3.915	3.063	27.7	8.7	15.8

Comet McNaught (1987b1) Elements MPC 12787

Date ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	m1
1988 01 20	18 46.45	+19 50.6	1.564	1.103	44.4	38.7	7.9
1988 01 25	19 02.09	+24 56.3					
1988 01 30	19 19.18	+30 04.3	1.540	1.221	52.4	39.7	8.3
1988 02 04	19 37.95	+35 09.6					
1988 02 09	19 58.64	+40 06.0	1.560	1.347	58.8	38.8	8.8
1988 02 14	20 21.50	+44 47.0					
1988 02 19	20 46.74	+49 06.4	1.627	1.476	63.3	36.7	9.2
1988 02 24	21 14.50	+52 58.8					
1988 02 29	21 44.76	+56 19.7	1.741	1.608	65.6	34.1	9.8
1988 03 05	22 17.29	+59 06.7					
1988 03 10	22 51.58	+61 18.9	1.892	1.741	65.9	31.4	10.3
1988 03 15	23 26.86	+62 57.5					
1988 03 20	00 02.17	+64 05.2	2.073	1.873	64.5	28.7	10.8
1988 03 25	00 36.55	+64 46.0					
1988 03 30	01 09.21	+65 04.7	2.271	2.004	61.9	26.1	11.3
1988 04 04	01 39.65	+65 06.1					
1988 04 09	02 07.63	+64 54.5	2.480	2.134	58.4	23.6	11.8
1988 04 14	02 33.14	+64 33.7					
1988 04 19	02 56.33	+64 06.9	2.693	2.263	54.5	21.2	12.2
1988 04 24	03 17.40	+63 36.3					
1988 04 29	03 36.58	+63 03.6	2.903	2.390	50.4	18.9	12.6
1988 05 04	03 54.10	+62 30.0					
1988 05 09	04 10.19	+61 56.4	3.105	2.516	46.3	16.9	13.0
1988 05 14	04 25.02	+61 23.5					
1988 05 19	04 38.78	+60 51.6	3.297	2.640	42.4	15.0	13.3
1988 05 24	04 51.58	+60 21.2					
1988 05 29	05 03.53	+59 52.3	3.475	2.763	39.0	13.4	13.6
1988 06 03	05 14.74	+59 25.0					
1988 06 08	05 25.29	+58 59.5	3.637	2.884	36.4	12.1	13.9
1988 06 13	05 35.24	+58 35.8					
1988 06 18	05 44.65	+58 14.0	3.781	3.004	34.8	11.1	14.2
1988 06 23	05 53.54	+57 54.1					
1988 06 28	06 01.97	+57 36.0	3.905	3.122	34.6	10.6	14.4

Periodic Comet d'Arrest (1987k) Elements MPC 11501

Date ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	m2
1988 02 29	13 34.76	+10 58.7	2.586	3.384	137.5	11.4	21.6
1988 03 10	13 31.21	+12 34.6					
1988 03 20	13 25.64	+14 15.8	2.339	3.264	154.0	7.7	21.1
1988 03 30	13 18.34	+15 55.1					
1988 04 09	13 09.86	+17 24.8	2.202	3.140	155.2	7.7	20.9
1988 04 19	13 00.92	+18 37.7					
1988 04 29	12 52.37	+19 28.0	2.175	3.012	139.4	12.6	21.0
1988 05 09	12 45.01	+19 53.3					
1988 05 19	12 39.45	+19 53.8	2.234	2.881	120.4	17.6	21.1
1988 05 29	12 36.10	+19 31.3					
1988 06 08	12 35.11	+18 48.9	2.340	2.745	102.5	21.2	21.2
1988 06 18	12 36.50	+17 49.7					
1988 06 28	12 40.15	+16 36.6	2.460	2.606	86.6	22.9	21.2
1988 07 08	12 45.91	+15 12.0					
1988 07 18	12 53.62	+13 37.7	2.567	2.463	72.7	23.2	21.2
1988 07 28	13 03.11	+11 55.2					
1988 08 07	13 14.25	+10 05.8	2.645	2.318	60.4	22.4	21.1
1988 08 17	13 26.95	+08 10.3					
1988 08 27	13 41.14	+06 09.7	2.685	2.170	49.6	20.8	20.9
1988 09 06	13 56.79	+04 04.9					
1988 09 16	14 13.91	+01 56.6	2.685	2.022	40.1	18.7	20.7

1988 09 26	14 32.51	-00 13.9					
1988 10 06	14 52.66	-02 25.7	2.650	1.875	31.8	16.3	20.5

Periodic Comet Finlay — Elements MPC 11519

Date ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	m2
1988 02 29	20 25.41	-21 34.6	2.372	1.670	35.7	20.2	20.9
1988 03 10	20 56.94	-19 43.3					
1988 03 20	21 29.83	-17 23.5	2.121	1.500	39.9	25.2	20.5
1988 03 30	22 04.03	-14 33.8					
1988 04 09	22 39.50	-11 14.3	1.913	1.342	41.7	29.8	20.2
1988 04 19	23 16.17	-07 27.4					
1988 04 29	23 53.92	-03 18.9	1.771	1.210	41.1	33.2	19.9
1988 05 09	00 32.61	+01 03.0					
1988 05 19	01 12.06	+05 26.9	1.709	1.122	39.1	34.6	19.7
1988 05 29	01 52.00	+09 40.5					
1988 06 08	02 32.12	+13 32.0	1.721	1.095	36.9	33.8	19.6
1988 06 18	03 12.02	+16 52.1					
1988 06 28	03 51.20	+19 35.0	1.785	1.135	36.1	31.9	19.7
1988 07 08	04 29.17	+21 38.9					
1988 07 18	05 05.46	+23 05.1	1.871	1.233	37.6	30.2	20.0
1988 07 28	05 39.66	+23 57.5					
1988 08 07	06 11.53	+24 21.4	1.953	1.371	41.6	29.4	20.3
1988 08 17	06 40.90	+24 22.5					
1988 08 27	07 07.70	+24 06.6	2.011	1.532	48.0	29.4	20.6
1988 09 06	07 31.95	+23 38.9					
1988 09 16	07 53.66	+23 04.1	2.031	1.704	56.9	29.6	20.8
1988 09 26	08 12.85	+22 26.4					
1988 10 06	08 29.54	+21 49.6	2.008	1.880	68.1	29.6	21.0
1988 10 16	08 43.67	+21 17.0					
1988 10 26	08 55.13	+20 51.7	1.945	2.055	81.9	28.6	21.1
1988 11 05	09 03.78	+20 36.4					
1988 11 15	09 09.41	+20 33.7	1.854	2.229	98.6	26.0	21.1
1988 11 25	09 11.79	+20 45.0					
1988 12 05	09 10.77	+21 10.9	1.764	2.398	118.6	21.1	21.0
1988 12 15	09 06.25	+21 50.1					
1988 12 25	08 58.47	+22 39.1	1.716	2.563	141.9	13.7	20.9
1989 01 04	08 48.02	+23 32.2					
1989 01 14	08 35.86	+24 22.8	1.755	2.723	166.9	4.7	20.8
1989 01 24	08 23.33	+25 04.8					
1989 02 03	08 11.71	+25 34.7	1.914	2.877	164.9	5.1	21.1
1989 02 13	08 02.06	+25 51.6					
1989 02 23	07 55.03	+25 56.8	2.188	3.027	141.7	11.7	21.7

Comet Levy (1987y) — Elements MPC 12575

Date ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	m1
1988 02 29	20 38.32	+06 53.5	3.747	2.983	34.5	10.8	15.6
1988 03 10	20 47.67	+07 33.4					
1988 03 20	20 55.74	+08 16.2	3.849	3.235	45.9	12.8	16.0
1988 03 30	21 02.47	+09 00.6					
1988 04 09	21 07.81	+09 45.1	3.876	3.480	59.7	14.4	16.4
1988 04 19	21 11.69	+10 28.4					
1988 04 29	21 14.02	+11 08.8	3.843	3.717	75.3	15.2	16.6
1988 05 09	21 14.75	+11 44.5					
1988 05 19	21 13.80	+12 13.6	3.776	3.948	92.3	14.8	16.8
1988 05 29	21 11.17	+12 34.1					
1988 06 08	21 06.90	+12 43.7	3.708	4.174	110.6	13.2	17.1
1988 06 18	21 01.11	+12 40.5					
1988 06 28	20 54.04	+12 23.1	3.681	4.395	129.2	10.3	17.3
1988 07 08	20 46.02	+11 50.6					

1988 07 18	20 37.48	+11 03.5	3.736	4.610	145.6	7.2	17.5
1988 07 28	20 28.88	+10 03.3					
1988 08 07	20 20.70	+08 52.8	3.902	4.822	152.1	5.6	17.8

1986 LA a,e,i = 1.54, 0.32, 11 Elements MPC 11619

Date	ET	R. A. (1950)	Decl.	Delta	r	Variation		V
1988 03 20	17 11.46	-26 43.2	0.915	1.464	-3.29	-7.4	20.6
1988 03 25	17 26.38	-26 17.3					
1988 03 30	17 41.66	-25 40.1	0.805	1.418	-3.66	-11.0	20.3
1988 04 04	17 57.31	-24 50.3					
1988 04 09	18 13.35	-23 46.4	0.703	1.371	-4.13	-15.3	19.9
1988 04 14	18 29.78	-22 26.6					
1988 04 19	18 46.61	-20 49.4	0.612	1.326	-4.72	-20.1	19.6
1988 04 24	19 03.86	-18 52.9					
1988 04 29	19 21.55	-16 35.4	0.531	1.280	-5.44	-24.5	19.3
1988 05 04	19 39.72	-13 55.5					
1988 05 09	19 58.37	-10 52.2	0.464	1.237	-6.26	-27.1	19.0
1988 05 14	20 17.51	-07 25.4					
1988 05 19	20 37.13	-03 36.4	0.412	1.196	-7.05	-25.4	18.7
1988 05 24	20 57.25	+00 31.8					
1988 05 29	21 17.89	+04 54.8	0.377	1.158	-7.60	-17.1	18.6
1988 06 03	21 39.04	+09 26.3					
1988 06 08	22 00.68	+13 59.2	0.358	1.125	-7.74	-2.0	18.6
1988 06 13	22 22.76	+18 25.6					
1988 06 18	22 45.20	+22 38.2	0.353	1.097	-7.52	+16.6	18.6
1988 06 23	23 07.94	+26 31.1					
1988 06 28	23 30.90	+30 00.5	0.360	1.076	-7.20	+33.9	18.7
1988 07 03	23 53.98	+33 04.4					
1988 07 08	00 17.04	+35 42.0	0.373	1.062	-7.01	+46.8	18.8
1988 07 13	00 39.90	+37 53.9					
1988 07 18	01 02.40	+39 41.1	0.390	1.056	-7.03	+54.6	18.9
1988 07 23	01 24.38	+41 05.2					
1988 07 28	01 45.70	+42 08.3	0.407	1.059	-7.20	+58.2	19.0
1988 08 02	02 06.23	+42 52.5					
1988 08 07	02 25.80	+43 19.9	0.421	1.070	-7.40	+58.9	19.0
1988 08 12	02 44.26	+43 32.1					
1988 08 17	03 01.47	+43 30.7	0.431	1.088	-7.59	+57.6	19.0
1988 08 22	03 17.32	+43 17.0					
1988 08 27	03 31.74	+42 52.3	0.436	1.114	-7.73	+55.1	19.0

1981 QB a,e,i = 2.24, 0.52, 37 Elements MPC 6895

Date	ET	R. A. (1950)	Decl.	Delta	r	Variation		V
1988 03 20	21 42.12	-00 53.2	2.506	1.765	-1.23	+5.4	20.1
1988 03 30	22 07.15	-00 12.9					
1988 04 09	22 33.38	+00 29.4	2.268	1.626	-1.48	+5.7	19.8
1988 04 19	23 01.09	+01 11.8					
1988 04 29	23 30.55	+01 51.7	2.026	1.487	-1.80	+6.0	19.5
1988 05 09	00 02.11	+02 26.4					
1988 05 19	00 36.11	+02 53.0	1.798	1.355	-2.18	+6.1	19.2
1988 05 29	01 12.83	+03 08.2					
1988 06 08	01 52.40	+03 09.2	1.611	1.236	-2.54	+5.6	18.9
1988 06 18	02 34.68	+02 54.0					
1988 06 28	03 19.13	+02 22.2	1.494	1.142	-2.72	+3.5	18.6
1988 07 08	04 04.86	+01 36.1					
1988 07 18	04 50.68	+00 39.6	1.468	1.088	-2.57	-0.4	18.5
1988 07 28	05 35.37	-00 22.2					
1988 08 07	06 17.97	-01 24.5	1.522	1.084	-2.21	-5.1	18.5
1988 08 17	06 57.86	-02 24.4					
1988 08 27	07 34.77	-03 20.5	1.620	1.130	-1.85	-8.8	18.7

1988 09 06	08 08.73	-04 12.1					
1988 09 16	08 39.87	-04 59.4	1.718	1.217	-1.59	-10.9	18.9

Periodic Comet Schwassmann-Wachmann 1 — Elements MPC 11510

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	m2
1988 03 20		21 48.22	-12 06.6	6.636	5.837	33.9	5.5	(19.3)
1988 03 30		21 55.04	-11 23.2					
1988 04 09		22 01.38	-10 41.2	6.423	5.832	50.2	7.6	(19.2)
1988 04 19		22 07.15	-10 01.0					
1988 04 29		22 12.26	-09 23.5	6.152	5.828	66.7	9.1	(19.1)
1988 05 09		22 16.64	-08 49.0					
1988 05 19		22 20.21	-08 18.4	5.845	5.824	83.9	9.9	(19.0)
1988 05 29		22 22.87	-07 52.1					
1988 06 08		22 24.58	-07 30.7	5.529	5.821	101.7	9.8	(18.9)
1988 06 18		22 25.26	-07 14.8					
1988 06 28		22 24.90	-07 04.5	5.234	5.817	120.6	8.7	(18.7)
1988 07 08		22 23.50	-07 00.1					
1988 07 18		22 21.12	-07 01.5	4.994	5.813	140.4	6.4	(18.6)
1988 07 28		22 17.87	-07 08.3					
1988 08 07		22 13.92	-07 19.5	4.841	5.810	161.1	3.2	(18.6)
1988 08 17		22 09.49	-07 34.3					
1988 08 27		22 04.88	-07 51.2	4.799	5.807	175.3	0.8	(18.5)
1988 09 06		22 00.38	-08 08.7					
1988 09 16		21 56.28	-08 25.3	4.876	5.804	155.2	4.2	(18.6)
1988 09 26		21 52.85	-08 39.6					
1988 10 06		21 50.28	-08 50.5	5.060	5.801	134.2	7.1	(18.7)
1988 10 16		21 48.74	-08 57.1					
1988 10 26		21 48.29	-08 58.8	5.323	5.798	113.9	9.0	(18.8)
1988 11 05		21 48.97	-08 55.1					
1988 11 15		21 50.74	-08 46.0	5.632	5.795	94.5	9.8	(18.9)
1988 11 25		21 53.54	-08 31.5					
1988 12 05		21 57.28	-08 11.6	5.950	5.792	76.1	9.5	(19.0)
1988 12 15		22 01.87	-07 46.7					
1988 12 25		22 07.18	-07 16.9	6.244	5.790	58.4	8.3	(19.1)
1989 01 04		22 13.12	-06 42.7					
1989 01 14		22 19.58	-06 04.5	6.489	5.788	41.4	6.5	(19.2)
1988 10 16		21 48.74	-08 57.1					
1988 10 26		21 48.29	-08 58.8	5.323	5.798	113.9	9.0	18.8
1988 11 05		21 48.97	-08 55.1					
1988 11 15		21 50.74	-08 46.0	5.632	5.795	94.5	9.8	18.9
1988 11 25		21 53.54	-08 31.5					
1988 12 05		21 57.28	-08 11.6	5.950	5.792	76.1	9.5	19.0
1988 12 15		22 01.87	-07 46.7					
1988 12 25		22 07.18	-07 16.9	6.244	5.790	58.4	8.3	19.1
1989 01 04		22 13.12	-06 42.7					
1989 01 14		22 19.58	-06 04.5	6.489	5.788	41.4	6.5	19.2

Periodic Comet Wild 3 (1987e) — Elements MPC 12200

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	m2
1988 03 20		21 59.37	-23 22.6	3.384	2.651	36.6	12.9	19.4
1988 03 30		22 16.85	-22 24.3					
1988 04 09		22 33.44	-21 28.3	3.282	2.715	47.9	15.9	19.4
1988 04 19		22 49.11	-20 36.3					
1988 04 29		23 03.80	-19 49.9	3.146	2.781	59.9	18.3	19.4
1988 05 09		23 17.44	-19 10.7					
1988 05 19		23 29.96	-18 40.2	2.981	2.848	72.7	19.8	19.4
1988 05 29		23 41.23	-18 19.9					
1988 06 08		23 51.13	-18 11.1	2.799	2.918	86.5	20.3	19.4
1988 06 18		23 59.51	-18 14.9					

1988 06 28	00 06.16	-18 32.1	2.613	2.988	101.6	19.5	19.3
1988 07 08	00 10.92	-19 02.9					
1988 07 18	00 13.59	-19 46.7	2.444	3.059	118.3	17.0	19.3
1988 07 28	00 14.03	-20 41.7					
1988 08 07	00 12.19	-21 44.5	2.321	3.131	136.0	13.0	19.3
1988 08 17	00 08.14	-22 50.5					
1988 08 27	00 02.20	-23 53.4	2.272	3.202	152.4	8.4	19.3
1988 09 06	23 54.86	-24 47.0					
1988 09 16	23 46.84	-25 25.5	2.323	3.273	157.2	6.8	19.5
1988 09 26	23 38.93	-25 45.1					
1988 10 06	23 31.90	-25 44.4	2.479	3.344	144.5	10.0	19.7
1988 10 16	23 26.31	-25 24.2					
1988 10 26	23 22.58	-24 46.7	2.726	3.414	126.6	13.5	20.0
1988 11 05	23 20.81	-23 55.1					
1988 11 15	23 21.02	-22 52.2	3.038	3.483	108.6	15.6	20.3

Periodic Comet Encke — Elements MPC 10520

Date ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	m2
1988 04 09	22 30.32	-11 34.2	3.837	3.191	43.9	12.6	20.3
1988 04 19	22 38.45	-10 42.6					
1988 04 29	22 45.54	-09 56.6	3.701	3.303	59.3	15.2	20.4
1988 05 09	22 51.49	-09 17.1					
1988 05 19	22 56.17	-08 45.1	3.510	3.405	75.8	16.7	20.4
1988 05 29	22 59.41	-08 21.8					
1988 06 08	23 01.06	-08 08.1	3.286	3.500	93.6	16.8	20.3
1988 06 18	23 00.95	-08 04.9					
1988 06 28	22 58.92	-08 13.1	3.062	3.586	113.2	15.1	20.2
1988 07 08	22 54.89	-08 32.9					
1988 07 18	22 48.83	-09 03.9	2.876	3.665	134.9	11.3	20.0
1988 07 28	22 40.91	-09 44.6					
1988 08 07	22 31.43	-10 32.5	2.774	3.736	158.5	5.7	19.7
1988 08 17	22 20.91	-11 24.1					
1988 08 27	22 10.04	-12 15.4	2.791	3.800	176.6	0.9	19.7
1988 09 06	21 59.53	-13 02.5					
1988 09 16	21 50.06	-13 42.3	2.939	3.857	152.2	7.0	20.0
1988 09 26	21 42.17	-14 13.0					
1988 10 06	21 36.16	-14 33.8	3.199	3.908	129.2	11.4	20.3
1988 10 16	21 32.19	-14 44.9					
1988 10 26	21 30.23	-14 46.7	3.532	3.952	107.9	13.8	20.6
1988 11 05	21 30.14	-14 40.3					
1988 11 15	21 31.75	-14 26.2	3.895	3.990	88.3	14.3	20.9

Comet Ichimura (1987d1) — Elements MPC 12710

Date ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	m1
1988 04 09	23 08.06	+23 18.7	2.790	2.027	33.2	15.7	16.3
1988 04 19	23 20.25	+25 32.4					
1988 04 29	23 30.70	+27 39.3	2.985	2.341	42.3	16.8	17.1
1988 05 09	23 39.47	+29 40.4					
1988 05 19	23 46.50	+31 36.3	3.106	2.637	53.7	18.0	17.7
1988 05 29	23 51.70	+33 27.0					
1988 06 08	23 54.94	+35 11.9	3.163	2.918	66.9	18.7	18.2
1988 06 18	23 56.06	+36 49.7					
1988 06 28	23 54.89	+38 18.4	3.174	3.187	81.5	18.4	18.5
1988 07 08	23 51.33	+39 35.3					
1988 07 18	23 45.32	+40 37.0	3.167	3.446	97.3	17.0	18.9
1988 07 28	23 36.99	+41 19.4					
1988 08 07	23 26.68	+41 38.6	3.175	3.696	113.4	14.6	19.2
1988 08 17	23 14.94	+41 31.4					
1988 08 27	23 02.56	+40 56.5	3.237	3.939	127.9	11.7	19.5

4068 P-L a,e,i = 2.21, 0.07, 3 Elements MPC 12797

Date ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1988 01 20	10 26.41	+11 44.6	1.370	2.245	144.5	14.7	17.7
1988 01 30	10 19.20	+12 14.4					
1988 02 09	10 09.55	+12 53.9	1.284	2.261	169.1	4.8	17.2
1988 02 19	09 58.62	+13 36.3					
1988 02 29	09 47.92	+14 14.0	1.303	2.275	165.3	6.4	17.3
1988 03 10	09 38.89	+14 41.3					
1988 03 20	09 32.53	+14 55.1	1.424	2.289	141.6	15.7	17.8
1988 03 30	09 29.36	+14 54.4					
1988 04 09	09 29.43	+14 40.0	1.619	2.302	121.2	21.9	18.3
1988 04 19	09 32.47	+14 13.1					
1988 04 29	09 38.13	+13 34.6	1.855	2.314	104.0	25.0	18.7
1988 05 09	09 45.95	+12 45.8					
1988 05 19	09 55.55	+11 47.7	2.107	2.325	89.2	25.8	19.0
1988 05 29	10 06.61	+10 40.8					
1988 06 08	10 18.82	+09 26.2	2.358	2.335	76.2	25.0	19.2
1988 06 18	10 31.97	+08 04.4					
1988 06 28	10 45.87	+06 36.2	2.595	2.343	64.4	23.0	19.4

1931 TS1 a,e,i = 2.91, 0.09, 2 Elements MPC 12795

Date ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1988 01 20	10 34.11	+11 11.3	2.231	3.071	142.6	11.2	16.8
1988 01 30	10 28.63	+11 43.7					
1988 02 09	10 21.49	+12 23.5	2.116	3.083	166.1	4.4	16.4
1988 02 19	10 13.32	+13 06.2					
1988 02 29	10 04.98	+13 46.9	2.115	3.094	169.2	3.5	16.4
1988 03 10	09 57.34	+14 21.1					
1988 03 20	09 51.14	+14 45.8	2.230	3.104	145.8	10.4	16.8
1988 03 30	09 46.90	+14 59.3					
1988 04 09	09 44.85	+15 01.3	2.434	3.114	124.6	15.4	17.1
1988 04 19	09 45.02	+14 52.2					
1988 04 29	09 47.30	+14 32.7	2.695	3.123	105.8	18.1	17.4
1988 05 09	09 51.47	+14 03.9					
1988 05 19	09 57.29	+13 26.6	2.979	3.130	89.1	18.9	17.7
1988 05 29	10 04.53	+12 41.6					
1988 06 08	10 12.94	+11 49.6	3.261	3.137	74.0	18.1	17.9
1988 06 18	10 22.34	+10 51.3					
1988 06 28	10 32.55	+09 47.4	3.522	3.143	60.2	16.3	18.0

4134 T-3 a,e,i = 2.73, 0.19, 4 Elements MPC 12804

Date ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1988 01 20	11 20.76	+09 40.7	2.000	2.750	131.2	15.6	18.8
1988 01 30	11 17.50	+10 18.4					
1988 02 09	11 11.88	+11 07.5	1.870	2.790	153.8	9.0	18.4
1988 02 19	11 04.37	+12 03.3					
1988 02 29	10 55.75	+12 59.2	1.841	2.828	174.2	2.0	18.1
1988 03 10	10 47.00	+13 48.7					
1988 03 20	10 39.07	+14 26.8	1.926	2.865	156.2	8.1	18.5
1988 03 30	10 32.79	+14 50.2					
1988 04 09	10 28.63	+14 58.1	2.112	2.902	134.3	14.3	18.9
1988 04 19	10 26.81	+14 51.3					
1988 04 29	10 27.30	+14 31.0	2.369	2.936	114.8	18.1	19.3
1988 05 09	10 29.92	+13 59.1					
1988 05 19	10 34.41	+13 17.1	2.662	2.970	97.6	19.7	19.7
1988 05 29	10 40.52	+12 26.4					
1988 06 08	10 47.98	+11 28.3	2.967	3.002	82.2	19.6	19.9
1988 06 18	10 56.56	+10 23.9					
1988 06 28	11 06.08	+09 14.1	3.261	3.032	68.1	18.1	20.1

1984 CP a,e,i = 2.44, 0.10, 7 Elements MPC 12800

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1988	01 20	12 36.45	+02 45.1	1.682	2.235	111.2	24.2	18.7
1988	01 30	12 42.72	+03 01.8					
1988	02 09	12 46.39	+03 39.3	1.461	2.220	129.2	20.1	18.2
1988	02 19	12 47.14	+04 37.6					
1988	02 29	12 44.85	+05 53.8	1.296	2.208	149.6	13.1	17.8
1988	03 10	12 39.79	+07 21.6					
1988	03 20	12 32.56	+08 51.7	1.215	2.198	167.7	5.6	17.3
1988	03 30	12 24.28	+10 12.2					
1988	04 09	12 16.26	+11 13.0	1.233	2.191	157.2	10.2	17.5
1988	04 19	12 09.71	+11 47.8					
1988	04 29	12 05.53	+11 54.2	1.340	2.186	136.8	18.4	18.0
1988	05 09	12 04.15	+11 34.1					
1988	05 19	12 05.62	+10 50.9	1.509	2.183	118.7	24.0	18.4
1988	05 29	12 09.79	+09 48.4					
1988	06 08	12 16.33	+08 30.8	1.714	2.183	103.3	26.9	18.7
1988	06 18	12 24.91	+07 01.0					
1988	06 28	12 35.23	+05 21.9	1.935	2.186	90.0	27.7	19.0

1986 TJ2 a,e,i = 2.27, 0.14, 6 Elements MPC 11432

Date	ET	R. A. (1950)	Decl.	Delta	r	Variation		V
1988	01 20	13 49.29	-04 36.4	2.075	2.321	-1.05	+5.4	17.9
1988	01 30	13 58.43	-04 50.9					
1988	02 09	14 05.42	-04 49.8	1.852	2.350	-1.19	+6.2	17.7
1988	02 19	14 09.92	-04 32.5					
1988	02 29	14 11.60	-03 58.9	1.652	2.378	-1.35	+7.2	17.3
1988	03 10	14 10.30	-03 10.3					
1988	03 20	14 06.00	-02 09.5	1.505	2.405	-1.50	+8.4	17.0
1988	03 30	13 59.06	-01 01.7					
1988	04 09	13 50.25	+00 06.0	1.443	2.431	-1.55	+9.0	16.6
1988	04 19	13 40.61	+01 05.9					
1988	04 29	13 31.35	+01 50.7	1.487	2.455	-1.47	+8.6	16.8
1988	05 09	13 23.54	+02 15.9					
1988	05 19	13 17.91	+02 20.1	1.627	2.477	-1.30	+7.5	17.3
1988	05 29	13 14.85	+02 04.0					
1988	06 08	13 14.40	+01 30.4	1.838	2.497	-1.14	+6.4	17.7
1988	06 18	13 16.43	+00 41.9					
1988	06 28	13 20.69	-00 18.4	2.089	2.515	-1.01	+5.5	18.1

(3754) 1931 FM a,e,i = 3.16, 0.11, 8 Elements MPC 12788

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1988	02 09	14 31.58	-04 41.0	2.488	2.856	101.7	19.8	15.2
1988	02 19	14 36.95	-04 32.9					
1988	02 29	14 40.19	-04 13.3	2.245	2.865	119.5	17.5	14.9
1988	03 10	14 41.14	-03 43.5					
1988	03 20	14 39.71	-03 05.1	2.049	2.876	139.1	13.1	14.6
1988	03 30	14 36.01	-02 21.3					
1988	04 09	14 30.37	-01 36.1	1.931	2.888	159.0	7.1	14.3
1988	04 19	14 23.35	-00 54.3					
1988	04 29	14 15.76	-00 21.0	1.914	2.902	165.9	4.8	14.2
1988	05 09	14 08.43	-00 00.2					
1988	05 19	14 02.13	+00 05.7	2.004	2.916	148.6	10.4	14.5
1988	05 29	13 57.45	-00 04.3					
1988	06 08	13 54.74	-00 29.3	2.183	2.931	129.1	15.6	14.9
1988	06 18	13 54.13	-01 07.7					
1988	06 28	13 55.60	-01 57.4	2.422	2.948	111.3	18.7	15.2
1988	07 08	13 59.00	-02 56.1					
1988	07 18	14 04.17	-04 01.9	2.694	2.965	95.2	20.0	15.5

1975 XP3 a,e,i = 2.35, 0.13, 3 Elements MPC 7606

Date ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1988 03 01	15 54.98	-22 15.5	2.278	2.619	98.8	22.0	18.8
1988 03 11	16 00.68	-22 45.6					
1988 03 21	16 03.87	-23 09.4	2.030	2.631	116.6	19.8	18.5
1988 03 31	16 04.25	-23 26.2					
1988 04 10	16 01.68	-23 35.3	1.821	2.641	136.7	15.1	18.1
1988 04 20	15 56.17	-23 35.5					
1988 04 30	15 48.12	-23 25.8	1.682	2.648	159.1	7.8	17.7
1988 05 10	15 38.28	-23 06.2					
1988 05 20	15 27.70	-22 38.2	1.644	2.653	175.0	1.9	17.4
1988 05 30	15 17.61	-22 05.4					
1988 06 09	15 09.07	-21 32.4	1.713	2.656	152.7	10.1	17.9
1988 06 19	15 02.83	-21 03.9					
1988 06 29	14 59.32	-20 43.4	1.874	2.657	131.3	16.7	18.3
1988 07 09	14 58.60	-20 32.9					
1988 07 19	15 00.55	-20 32.8	2.095	2.656	112.5	20.7	18.6
1988 07 29	15 04.96	-20 42.5					
1988 08 08	15 11.55	-21 00.5	2.347	2.652	96.0	22.3	18.9

1981 JD2 a,e,i = 2.28, 0.16, 4 Elements MPC 7613

Date ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1988 03 01	15 55.47	-19 36.4	2.104	2.465	99.2	23.4	18.0
1988 03 11	16 02.84	-20 08.1					
1988 03 21	16 07.88	-20 34.1	1.825	2.435	116.2	21.5	17.7
1988 03 31	16 10.19	-20 54.6					
1988 04 10	16 09.46	-21 09.2	1.584	2.403	135.4	17.0	17.2
1988 04 20	16 05.49	-21 17.5					
1988 04 30	15 58.44	-21 18.6	1.407	2.369	157.4	9.4	16.7
1988 05 10	15 48.89	-21 12.2					
1988 05 20	15 37.86	-20 58.7	1.323	2.335	177.8	0.9	16.1
1988 05 30	15 26.77	-20 40.9					
1988 06 09	15 17.01	-20 23.0	1.341	2.299	154.3	11.0	16.5
1988 06 19	15 09.70	-20 09.5					
1988 06 29	15 05.52	-20 04.3	1.447	2.262	132.6	19.3	16.9
1988 07 09	15 04.70	-20 09.6					
1988 07 19	15 07.16	-20 25.7	1.609	2.225	114.0	24.7	17.3
1988 07 29	15 12.68	-20 51.9					
1988 08 08	15 20.93	-21 26.1	1.798	2.188	98.3	27.3	17.6

1979 SJ11 a,e,i = 3.12, 0.14, 4 Elements MPC 10627

Date ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1988 03 20	16 57.07	-24 42.4	3.137	3.503	103.3	16.1	18.5
1988 03 30	16 59.54	-24 45.8					
1988 04 09	16 59.91	-24 45.7	2.874	3.515	122.4	13.9	18.2
1988 04 19	16 58.12	-24 41.8					
1988 04 29	16 54.21	-24 33.5	2.666	3.525	143.3	9.8	17.9
1988 05 09	16 48.44	-24 20.6					
1988 05 19	16 41.22	-24 02.7	2.545	3.533	165.5	4.1	17.6
1988 05 29	16 33.18	-23 40.6					
1988 06 08	16 25.03	-23 15.3	2.534	3.541	171.2	2.5	17.5
1988 06 18	16 17.48	-22 48.9					
1988 06 28	16 11.17	-22 23.8	2.637	3.547	149.0	8.5	17.9
1988 07 08	16 06.54	-22 02.0					
1988 07 18	16 03.84	-21 45.2	2.833	3.552	128.1	13.0	18.2
1988 07 28	16 03.17	-21 34.2					
1988 08 07	16 04.47	-21 29.2	3.092	3.556	109.1	15.6	18.5
1988 08 17	16 07.64	-21 29.8					
1988 08 27	16 12.53	-21 35.2	3.381	3.558	91.7	16.5	18.7

1974 SF a,e,i = 2.36, 0.24, 5 Elements MPC 12447

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1988	03 20	16 52.20	-18 15.2	2.199	2.640	105.1	21.4	19.7
1988	03 30	16 57.34	-17 57.4					
1988	04 09	17 00.04	-17 33.3	1.911	2.596	123.0	18.9	19.3
1988	04 19	16 59.99	-17 03.4					
1988	04 29	16 57.05	-16 28.7	1.671	2.549	143.1	13.7	18.8
1988	05 09	16 51.28	-15 50.4					
1988	05 19	16 43.07	-15 10.3	1.510	2.501	164.7	6.1	18.3
1988	05 29	16 33.20	-14 31.3					
1988	06 08	16 22.78	-13 56.7	1.450	2.449	167.0	5.4	18.1
1988	06 18	16 13.03	-13 30.2					
1988	06 28	16 05.08	-13 14.8	1.491	2.397	145.2	14.0	18.5
1988	07 08	15 59.70	-13 12.1					
1988	07 18	15 57.31	-13 22.3	1.610	2.342	124.7	20.9	18.8
1988	07 28	15 58.02	-13 44.1					
1988	08 07	16 01.71	-14 15.5	1.775	2.287	107.0	25.1	19.1
1988	08 17	16 08.16	-14 54.2					
1988	08 27	16 17.14	-15 37.6	1.958	2.231	91.8	26.9	19.3

1978 RK1 a,e,i = 3.13, 0.17, 3 Elements MPC 11050

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1988	03 20	16 55.49	-20 52.1	2.942	3.328	104.1	16.9	18.7
1988	03 30	16 58.73	-20 56.0					
1988	04 09	16 59.90	-20 57.1	2.647	3.299	122.8	14.8	18.4
1988	04 19	16 58.86	-20 55.5					
1988	04 29	16 55.59	-20 51.3	2.405	3.269	143.4	10.6	18.1
1988	05 09	16 50.27	-20 44.6					
1988	05 19	16 43.26	-20 35.5	2.249	3.239	165.5	4.5	17.7
1988	05 29	16 35.15	-20 24.5					
1988	06 08	16 26.74	-20 12.7	2.201	3.208	171.2	2.8	17.5
1988	06 18	16 18.80	-20 01.6					
1988	06 28	16 12.11	-19 53.0	2.263	3.176	148.7	9.6	17.8
1988	07 08	16 07.20	-19 48.7					
1988	07 18	16 04.42	-19 49.9	2.415	3.144	127.9	14.8	18.1
1988	07 28	16 03.93	-19 57.0					
1988	08 07	16 05.68	-20 09.8	2.627	3.111	109.1	17.9	18.4
1988	08 17	16 09.58	-20 27.8					
1988	08 27	16 15.47	-20 49.9	2.868	3.078	92.3	19.1	18.6

(3643) 1978 UN2 a,e,i = 2.40, 0.15, 14 Elements MPC 11998

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1988	03 20	17 05.56	-22 59.7	2.385	2.763	101.6	20.7	18.1
1988	03 30	17 09.83	-23 40.7					
1988	04 09	17 11.56	-24 22.5	2.125	2.763	119.8	18.3	17.8
1988	04 19	17 10.47	-25 05.2					
1988	04 29	17 06.41	-25 48.1	1.910	2.761	140.3	13.5	17.4
1988	05 09	16 59.47	-26 29.1					
1988	05 19	16 50.03	-27 05.8	1.775	2.757	162.7	6.3	17.0
1988	05 29	16 38.91	-27 35.4					
1988	06 08	16 27.24	-27 56.4	1.744	2.751	170.4	3.5	16.8
1988	06 18	16 16.24	-28 09.1					
1988	06 28	16 07.03	-28 16.0	1.824	2.742	148.4	11.2	17.2
1988	07 08	16 00.37	-28 20.2					
1988	07 18	15 56.64	-28 25.1	1.991	2.731	127.5	17.2	17.6
1988	07 28	15 55.93	-28 32.9					
1988	08 07	15 58.09	-28 44.9	2.213	2.718	108.9	20.7	17.9
1988	08 17	16 02.89	-29 01.1					
1988	08 27	16 10.07	-29 21.1	2.461	2.702	92.6	21.9	18.1

1958 GQ a,e,i = 2.63, 0.28, 13 Elements MPC 9416

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1988	03 20	16 30.05	-31 53.1	1.360	1.918	108.0	29.6	15.7
1988	03 30	16 42.03	-34 10.2					
1988	04 09	16 51.26	-36 29.6	1.174	1.903	121.9	26.5	15.3
1988	04 19	16 57.03	-38 50.0					
1988	04 29	16 58.68	-41 06.7	1.032	1.897	137.1	21.2	14.9
1988	05 09	16 55.89	-43 12.2					
1988	05 19	16 48.83	-44 55.4	0.951	1.901	151.2	14.9	14.5
1988	05 29	16 38.71	-46 05.3					
1988	06 08	16 27.63	-46 35.2	0.943	1.913	155.2	12.9	14.4
1988	06 18	16 18.00	-46 26.4					
1988	06 28	16 11.85	-45 47.7	1.012	1.933	144.8	17.6	14.8
1988	07 08	16 10.18	-44 50.7					
1988	07 18	16 13.12	-43 45.8	1.144	1.962	130.4	23.2	15.2
1988	07 28	16 20.30	-42 40.0					
1988	08 07	16 31.04	-41 36.7	1.326	1.998	116.6	27.0	15.7
1988	08 17	16 44.69	-40 36.6					
1988	08 27	17 00.66	-39 39.1	1.544	2.040	104.1	28.7	16.1

1964 TG2 a,e,i = 2.60, 0.16, 3 Elements MPC 10391

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1988	03 20	17 01.97	-25 39.2	2.633	3.004	102.1	18.9	18.8
1988	03 30	17 05.93	-25 54.1					
1988	04 09	17 07.52	-26 06.1	2.361	2.997	120.6	16.7	18.5
1988	04 19	17 06.53	-26 14.7					
1988	04 29	17 02.90	-26 19.2	2.138	2.988	141.0	12.2	18.2
1988	05 09	16 56.79	-26 18.3					
1988	05 19	16 48.60	-26 10.8	1.994	2.978	163.3	5.6	17.8
1988	05 29	16 39.08	-25 56.2					
1988	06 08	16 29.18	-25 35.2	1.957	2.965	171.8	2.8	17.6
1988	06 18	16 19.90	-25 10.0					
1988	06 28	16 12.16	-24 43.6	2.029	2.950	149.5	10.1	18.0
1988	07 08	16 06.57	-24 19.4					
1988	07 18	16 03.47	-24 00.0	2.192	2.933	128.4	15.7	18.3
1988	07 28	16 02.98	-23 47.1					
1988	08 07	16 04.98	-23 40.9	2.413	2.915	109.6	19.1	18.6
1988	08 17	16 09.31	-23 41.2					
1988	08 27	16 15.75	-23 46.9	2.663	2.895	92.9	20.4	18.8

(3751) 1983 NK a,e,i = 3.14, 0.11, 13 Elements MPC 12783

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1988	03 20	16 54.88	-31 37.9	2.503	2.893	102.9	19.6	16.9
1988	03 30	17 00.36	-31 46.4					
1988	04 09	17 03.39	-31 48.7	2.237	2.878	120.6	17.4	16.5
1988	04 19	17 03.73	-31 43.5					
1988	04 29	17 01.32	-31 29.4	2.017	2.864	140.2	13.0	16.2
1988	05 09	16 56.35	-31 04.6					
1988	05 19	16 49.24	-30 27.5	1.874	2.851	161.3	6.5	15.8
1988	05 29	16 40.81	-29 38.2					
1988	06 08	16 32.05	-28 38.5	1.832	2.839	170.9	3.2	15.6
1988	06 18	16 23.97	-27 32.3					
1988	06 28	16 17.51	-26 24.7	1.898	2.828	150.7	10.1	15.9
1988	07 08	16 13.25	-25 20.6					
1988	07 18	16 11.50	-24 23.9	2.054	2.819	130.3	16.0	16.3
1988	07 28	16 12.32	-23 36.7					
1988	08 07	16 15.58	-22 59.3	2.271	2.812	111.9	19.5	16.6
1988	08 17	16 21.10	-22 31.1					
1988	08 27	16 28.62	-22 10.6	2.522	2.806	95.5	21.0	16.9

1981 EJ17 a,e,i = 2.20, 0.11, 6 Elements MPC 10617

Date ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1988 03 20	17 01.39	-17 32.9	1.875	2.313	103.0	24.8	19.2
1988 03 30	17 07.76	-17 02.7					
1988 04 09	17 11.27	-16 25.5	1.662	2.334	120.4	21.7	18.9
1988 04 19	17 11.64	-15 42.5					
1988 04 29	17 08.75	-14 55.6	1.491	2.354	140.2	15.9	18.5
1988 05 09	17 02.79	-14 07.0					
1988 05 19	16 54.27	-13 19.7	1.391	2.372	161.5	7.8	18.1
1988 05 29	16 44.15	-12 37.4					
1988 06 08	16 33.66	-12 03.7	1.388	2.389	167.2	5.4	18.0
1988 06 18	16 24.06	-11 41.7					
1988 06 28	16 16.43	-11 33.5	1.486	2.403	147.0	13.3	18.4
1988 07 08	16 11.43	-11 38.8					
1988 07 18	16 09.34	-11 56.6	1.663	2.416	127.0	19.6	18.9
1988 07 28	16 10.16	-12 24.7					
1988 08 07	16 13.69	-13 00.5	1.891	2.426	109.5	23.2	19.3
1988 08 17	16 19.66	-13 41.4					
1988 08 27	16 27.81	-14 25.0	2.144	2.434	94.1	24.5	19.6

1981 SE2 a,e,i = 2.43, 0.21, 3 Elements MPC 12325

Date ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1988 03 20	16 59.06	-19 40.1	2.232	2.646	103.4	21.5	19.2
1988 03 30	17 04.71	-19 42.7					
1988 04 09	17 07.98	-19 41.8	1.945	2.607	121.0	19.2	18.8
1988 04 19	17 08.53	-19 38.0					
1988 04 29	17 06.18	-19 32.0	1.704	2.565	140.9	14.3	18.3
1988 05 09	17 00.94	-19 24.1					
1988 05 19	16 53.09	-19 14.6	1.537	2.522	163.2	6.7	17.8
1988 05 29	16 43.37	-19 04.0					
1988 06 08	16 32.84	-18 53.6	1.468	2.478	171.9	3.3	17.5
1988 06 18	16 22.74	-18 45.4					
1988 06 28	16 14.27	-18 41.7	1.504	2.432	149.0	12.4	17.9
1988 07 08	16 08.29	-18 44.6					
1988 07 18	16 05.31	-18 55.4	1.622	2.385	127.9	19.6	18.2
1988 07 28	16 05.48	-19 14.3					
1988 08 07	16 08.71	-19 40.3	1.792	2.338	109.7	24.1	18.5
1988 08 17	16 14.79	-20 12.1					
1988 08 27	16 23.47	-20 47.8	1.985	2.291	94.1	26.1	18.7

1981 RF a,e,i = 2.43, 0.19, 3 Elements MPC 8908

Date ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1988 03 20	16 58.38	-19 01.1	2.192	2.613	103.6	21.7	18.7
1988 03 30	17 04.17	-19 00.1					
1988 04 09	17 07.55	-18 55.4	1.911	2.576	121.2	19.4	18.3
1988 04 19	17 08.22	-18 47.6					
1988 04 29	17 05.96	-18 37.4	1.675	2.538	141.0	14.5	17.9
1988 05 09	17 00.81	-18 25.6					
1988 05 19	16 53.07	-18 12.7	1.513	2.499	163.1	6.8	17.3
1988 05 29	16 43.48	-17 59.7					
1988 06 08	16 33.11	-17 48.3	1.450	2.458	171.4	3.5	17.1
1988 06 18	16 23.18	-17 40.3					
1988 06 28	16 14.91	-17 38.3	1.489	2.417	148.8	12.6	17.4
1988 07 08	16 09.14	-17 43.8					
1988 07 18	16 06.34	-17 57.8	1.610	2.375	127.9	19.7	17.8
1988 07 28	16 06.68	-18 20.1					
1988 08 07	16 10.05	-18 49.6	1.783	2.332	109.9	24.1	18.1
1988 08 17	16 16.24	-19 24.6					
1988 08 27	16 25.00	-20 03.1	1.980	2.290	94.4	26.1	18.3

1982 SL a,e,i = 2.20, 0.20, 3 Elements MPC 7470

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1988	03 20	16 59.39	-21 54.9	2.051	2.475	103.1	23.1	19.0
1988	03 30	17 05.80	-21 52.7					
1988	04 09	17 09.65	-21 45.2	1.776	2.442	120.5	20.7	18.6
1988	04 19	17 10.57	-21 32.7					
1988	04 29	17 08.32	-21 15.2	1.543	2.406	140.4	15.5	18.1
1988	05 09	17 02.88	-20 52.7					
1988	05 19	16 54.55	-20 25.2	1.382	2.368	162.9	7.2	17.5
1988	05 29	16 44.13	-19 53.7					
1988	06 08	16 32.85	-19 20.1	1.317	2.327	172.2	3.4	17.2
1988	06 18	16 22.11	-18 48.0					
1988	06 28	16 13.23	-18 21.5	1.354	2.284	148.6	13.4	17.6
1988	07 08	16 07.15	-18 03.9					
1988	07 18	16 04.34	-17 57.1	1.471	2.240	127.5	21.1	18.0
1988	07 28	16 04.92	-18 01.3					
1988	08 07	16 08.72	-18 15.3	1.637	2.194	109.5	25.8	18.3
1988	08 17	16 15.47	-18 37.2					
1988	08 27	16 24.90	-19 04.3	1.823	2.147	94.2	28.0	18.6

1978 VS5 a,e,i = 2.44, 0.16, 2 Elements MPC 12579

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1988	03 20	16 42.24	-22 31.2	1.545	2.068	107.0	27.4	17.1
1988	03 30	16 51.98	-22 39.7					
1988	04 09	16 58.88	-22 40.5	1.335	2.058	122.9	24.1	16.7
1988	04 19	17 02.49	-22 34.4					
1988	04 29	17 02.54	-22 21.7	1.165	2.052	141.6	17.7	16.2
1988	05 09	16 59.07	-22 02.9					
1988	05 19	16 52.48	-21 38.3	1.061	2.051	163.3	8.1	15.7
1988	05 29	16 43.83	-21 09.4					
1988	06 08	16 34.57	-20 38.8	1.042	2.054	173.1	3.4	15.4
1988	06 18	16 26.24	-20 10.6					
1988	06 28	16 20.20	-19 48.9	1.114	2.061	150.6	14.0	16.0
1988	07 08	16 17.23	-19 36.7					
1988	07 18	16 17.63	-19 34.9	1.260	2.073	130.9	21.8	16.5
1988	07 28	16 21.36	-19 42.8					
1988	08 07	16 28.10	-19 58.3	1.455	2.088	114.3	26.3	17.0
1988	08 17	16 37.52	-20 19.0					
1988	08 27	16 49.25	-20 42.1	1.681	2.108	100.1	28.2	17.3

(3590) Holst a,e,i = 2.25, 0.08, 7 Elements MPC 11832

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1988	03 20	17 02.28	-14 37.8	1.853	2.293	103.0	25.0	17.4
1988	03 30	17 08.92	-14 20.3					
1988	04 09	17 12.77	-13 58.4	1.640	2.310	120.0	22.1	17.0
1988	04 19	17 13.53	-13 34.1					
1988	04 29	17 11.03	-13 09.5	1.467	2.327	139.5	16.3	16.6
1988	05 09	17 05.43	-12 47.2					
1988	05 19	16 57.16	-12 29.5	1.364	2.343	160.5	8.3	16.2
1988	05 29	16 47.14	-12 19.2					
1988	06 08	16 36.61	-12 18.1	1.356	2.357	167.8	5.2	16.1
1988	06 18	16 26.85	-12 27.6					
1988	06 28	16 19.01	-12 48.1	1.446	2.371	148.1	13.1	16.5
1988	07 08	16 13.80	-13 18.8					
1988	07 18	16 11.54	-13 58.2	1.618	2.384	128.1	19.6	17.0
1988	07 28	16 12.29	-14 44.5					
1988	08 07	16 15.84	-15 35.3	1.842	2.395	110.6	23.4	17.4
1988	08 17	16 21.94	-16 28.8					
1988	08 27	16 30.29	-17 22.8	2.093	2.405	95.2	24.7	17.7

1981 ET26 a,e,i = 2.23, 0.18, 4 Elements MPC 10541

Date ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1988 03 20	16 36.65	-26 12.1	1.382	1.934	107.7	29.4	17.3
1988 03 30	16 48.24	-27 07.8					
1988 04 09	16 57.14	-27 59.7	1.168	1.904	122.6	26.3	16.8
1988 04 19	17 02.73	-28 48.1					
1988 04 29	17 04.50	-29 32.1	0.993	1.880	140.0	20.1	16.2
1988 05 09	17 02.21	-30 09.4					
1988 05 19	16 56.02	-30 35.6	0.876	1.860	160.0	10.7	15.7
1988 05 29	16 46.92	-30 46.4					
1988 06 08	16 36.63	-30 39.3	0.837	1.845	170.2	5.4	15.3
1988 06 18	16 27.18	-30 16.5					
1988 06 28	16 20.46	-29 44.2	0.879	1.837	151.3	15.4	15.8
1988 07 08	16 17.58	-29 10.0					
1988 07 18	16 18.94	-28 39.6	0.989	1.835	132.4	24.2	16.3
1988 07 28	16 24.42	-28 16.0					
1988 08 07	16 33.56	-27 59.1	1.146	1.839	116.6	29.6	16.8
1988 08 17	16 45.84	-27 47.2					
1988 08 27	17 00.76	-27 37.7	1.332	1.849	103.4	32.1	17.2

1986 WB1 a,e,i = 2.24, 0.12, 4 Elements MPC 12001

Date ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1988 03 20	17 03.48	-24 05.1	1.810	2.239	102.0	25.8	18.1
1988 03 30	17 10.92	-24 05.3					
1988 04 09	17 15.38	-23 59.6	1.604	2.266	119.0	22.7	17.8
1988 04 19	17 16.51	-23 48.2					
1988 04 29	17 14.13	-23 31.2	1.436	2.293	138.9	16.8	17.4
1988 05 09	17 08.38	-23 08.1					
1988 05 19	16 59.75	-22 38.7	1.336	2.318	161.6	7.9	16.9
1988 05 29	16 49.29	-22 03.7					
1988 06 08	16 38.34	-21 25.5	1.331	2.343	174.1	2.5	16.7
1988 06 18	16 28.31	-20 47.9					
1988 06 28	16 20.38	-20 15.1	1.427	2.366	150.7	12.1	17.3
1988 07 08	16 15.27	-19 50.5					
1988 07 18	16 13.26	-19 35.7	1.606	2.388	129.9	19.1	17.8
1988 07 28	16 14.31	-19 30.9					
1988 08 07	16 18.18	-19 34.7	1.839	2.409	111.9	23.0	18.2
1988 08 17	16 24.56	-19 45.4					
1988 08 27	16 33.14	-20 00.8	2.100	2.427	96.2	24.4	18.5

1985 RF a,e,i = 2.26, 0.19, 3 Elements MPC 10303

Date ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1988 03 20	16 48.07	-20 18.0	1.634	2.134	105.9	26.7	17.3
1988 03 30	16 57.76	-20 13.9					
1988 04 09	17 04.95	-20 02.1	1.381	2.089	121.7	24.1	16.8
1988 04 19	17 09.18	-19 43.3					
1988 04 29	17 10.05	-19 18.5	1.169	2.046	140.0	18.4	16.2
1988 05 09	17 07.42	-18 49.0					
1988 05 19	17 01.41	-18 16.0	1.020	2.004	161.1	9.4	15.6
1988 05 29	16 52.79	-17 42.0					
1988 06 08	16 42.86	-17 10.1	0.954	1.965	172.6	3.8	15.2
1988 06 18	16 33.24	-16 44.6					
1988 06 28	16 25.58	-16 29.4	0.976	1.929	150.9	14.8	15.6
1988 07 08	16 21.04	-16 27.1					
1988 07 18	16 20.20	-16 38.3	1.070	1.897	130.8	23.9	16.0
1988 07 28	16 23.21	-17 01.5					
1988 08 07	16 29.86	-17 33.7	1.209	1.870	114.3	29.6	16.4
1988 08 17	16 39.79	-18 11.8					
1988 08 27	16 52.63	-18 52.0	1.373	1.849	100.6	32.5	16.7

1973 QG2 a,e,i = 3.05, 0.20, 3 Elements MPC 10829

Date ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1988 03 20	17 10.93	-23 45.6	3.061	3.384	100.3	16.8	18.4
1988 03 30	17 14.77	-23 57.2					
1988 04 09	17 16.60	-24 07.0	2.756	3.355	118.7	15.2	18.1
1988 04 19	17 16.22	-24 15.0					
1988 04 29	17 13.56	-24 21.0	2.498	3.324	138.9	11.5	17.7
1988 05 09	17 08.73	-24 24.3					
1988 05 19	17 01.97	-24 24.1	2.319	3.292	160.8	5.8	17.3
1988 05 29	16 53.84	-24 20.0					
1988 06 08	16 45.06	-24 12.1	2.245	3.258	175.6	1.4	17.0
1988 06 18	16 36.45	-24 01.3					
1988 06 28	16 28.83	-23 49.3	2.284	3.224	153.2	8.2	17.3
1988 07 08	16 22.85	-23 38.2					
1988 07 18	16 18.95	-23 29.9	2.419	3.188	131.9	13.7	17.6
1988 07 28	16 17.37	-23 26.0					
1988 08 07	16 18.11	-23 26.9	2.621	3.152	112.6	17.3	17.9
1988 08 17	16 21.11	-23 32.7					
1988 08 27	16 26.21	-23 42.7	2.856	3.115	95.2	18.8	18.1

1986 WE a,e,i = 2.44, 0.19, 6 Elements MPC 11512

Date ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1988 03 20	17 12.62	-17 30.9	1.985	2.376	100.4	24.4	17.4
1988 03 30	17 19.00	-17 32.9					
1988 04 09	17 22.60	-17 32.7	1.785	2.418	117.6	21.5	17.1
1988 04 19	17 23.16	-17 31.6					
1988 04 29	17 20.57	-17 30.9	1.621	2.460	137.5	16.1	16.8
1988 05 09	17 14.95	-17 31.3					
1988 05 19	17 06.75	-17 33.3	1.527	2.501	159.8	8.0	16.4
1988 05 29	16 56.82	-17 37.2					
1988 06 08	16 46.31	-17 43.4	1.529	2.541	173.6	2.6	16.2
1988 06 18	16 36.42	-17 52.7					
1988 06 28	16 28.24	-18 06.0	1.637	2.579	152.0	10.7	16.7
1988 07 08	16 22.46	-18 24.0					
1988 07 18	16 19.43	-18 46.9	1.833	2.616	131.1	17.0	17.2
1988 07 28	16 19.21	-19 14.6					
1988 08 07	16 21.65	-19 46.0	2.089	2.651	112.8	20.7	17.6
1988 08 17	16 26.49	-20 20.1					
1988 08 27	16 33.47	-20 55.6	2.376	2.685	96.4	22.0	18.0

1987 CJ a,e,i = 3.01, 0.05, 10 Elements MPC 12670

Date ET	R. A. (1950)	Decl.	Delta	r	Variation		V
1988 03 20	17 10.05	-11 05.3	2.662	3.020	-0.84	+1.6	17.4
1988 03 30	17 14.50	-10 30.7					
1988 04 09	17 16.81	-09 52.4	2.416	3.030	-0.92	+1.8	17.1
1988 04 19	17 16.85	-09 12.2					
1988 04 29	17 14.58	-08 32.5	2.216	3.039	-1.02	+2.1	16.8
1988 05 09	17 10.17	-07 55.8					
1988 05 19	17 03.94	-07 24.9	2.093	3.048	-1.10	+2.3	16.5
1988 05 29	16 56.47	-07 02.7					
1988 06 08	16 48.50	-06 51.3	2.070	3.057	-1.11	+2.4	16.4
1988 06 18	16 40.82	-06 52.0					
1988 06 28	16 34.18	-07 05.1	2.152	3.066	-1.06	+2.3	16.7
1988 07 08	16 29.15	-07 29.5					
1988 07 18	16 26.09	-08 03.6	2.324	3.074	-0.98	+2.2	17.0
1988 07 28	16 25.17	-08 45.5					
1988 08 07	16 26.40	-09 32.8	2.560	3.082	-0.88	+2.0	17.3
1988 08 17	16 29.67	-10 23.7					
1988 08 27	16 34.84	-11 16.1	2.829	3.090	-0.80	+1.8	17.6

(3585) 1987 BE a,e,i = 3.07, 0.19, 3 Elements MPC 11741

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1988	03 20	17 08.97	-19 32.2	2.314	2.689	101.1	21.3	17.2
1988	03 30	17 14.81	-19 25.1					
1988	04 09	17 18.19	-19 14.4	2.097	2.722	118.6	18.8	16.9
1988	04 19	17 18.93	-19 00.9					
1988	04 29	17 16.98	-18 45.5	1.922	2.757	138.4	14.0	16.6
1988	05 09	17 12.50	-18 29.2					
1988	05 19	17 05.90	-18 12.5	1.820	2.793	160.1	7.1	16.3
1988	05 29	16 57.89	-17 56.7					
1988	06 08	16 49.37	-17 42.9	1.818	2.830	174.0	2.2	16.1
1988	06 18	16 41.29	-17 32.7					
1988	06 28	16 34.52	-17 27.6	1.922	2.867	153.3	9.2	16.5
1988	07 08	16 29.66	-17 28.5					
1988	07 18	16 27.07	-17 35.7	2.118	2.905	132.7	14.9	17.0
1988	07 28	16 26.85	-17 49.0					
1988	08 07	16 28.93	-18 07.5	2.379	2.943	114.2	18.3	17.4
1988	08 17	16 33.15	-18 29.9					
1988	08 27	16 39.31	-18 54.9	2.675	2.981	97.5	19.6	17.7

1977 EG7 a,e,i = 2.28, 0.15, 6 Elements MPC 12581

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1988	03 20	17 03.64	-17 12.4	1.931	2.357	102.5	24.4	18.8
1988	03 30	17 11.55	-16 47.1					
1988	04 09	17 17.03	-16 14.6	1.667	2.324	119.0	22.2	18.4
1988	04 19	17 19.69	-15 36.1					
1988	04 29	17 19.28	-14 53.1	1.442	2.289	137.7	17.2	17.9
1988	05 09	17 15.70	-14 07.9					
1988	05 19	17 09.14	-13 23.0	1.284	2.255	158.2	9.6	17.4
1988	05 29	17 00.27	-12 42.2					
1988	06 08	16 50.17	-12 09.3	1.215	2.220	168.9	5.0	17.0
1988	06 18	16 40.17	-11 48.0					
1988	06 28	16 31.66	-11 40.9	1.242	2.184	150.4	13.3	17.3
1988	07 08	16 25.67	-11 48.9					
1988	07 18	16 22.79	-12 11.1	1.348	2.150	130.2	21.1	17.7
1988	07 28	16 23.27	-12 45.3					
1988	08 07	16 27.00	-13 28.5	1.506	2.116	112.8	26.2	18.1
1988	08 17	16 33.75	-14 17.7					
1988	08 27	16 43.24	-15 09.7	1.690	2.084	97.9	28.7	18.3

1981 EX41 a,e,i = 3.18, 0.17, 1 Elements MPC 12796

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1988	03 20	17 16.46	-22 05.6	3.389	3.681	99.1	15.5	19.2
1988	03 30	17 19.65	-22 04.8					
1988	04 09	17 20.94	-22 01.8	3.093	3.670	117.9	14.0	19.0
1988	04 19	17 20.23	-21 56.8					
1988	04 29	17 17.49	-21 49.9	2.844	3.657	138.2	10.6	18.7
1988	05 09	17 12.85	-21 40.9					
1988	05 19	17 06.58	-21 29.8	2.676	3.643	160.1	5.4	18.3
1988	05 29	16 59.15	-21 16.8					
1988	06 08	16 51.17	-21 02.5	2.614	3.628	176.7	0.9	18.0
1988	06 18	16 43.32	-20 48.0					
1988	06 28	16 36.28	-20 34.6	2.667	3.611	154.4	7.0	18.4
1988	07 08	16 30.59	-20 23.8					
1988	07 18	16 26.63	-20 16.8	2.821	3.593	133.1	11.9	18.7
1988	07 28	16 24.61	-20 14.4					
1988	08 07	16 24.59	-20 16.8	3.045	3.573	113.5	15.1	18.9
1988	08 17	16 26.53	-20 23.8					
1988	08 27	16 30.31	-20 34.6	3.307	3.552	95.7	16.4	19.1

1982 DU a,e,i = 2.98, 0.22, 18 Elements MPC 11842

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1988	03 20	17 26.87	-42 36.6	2.922	3.171	95.2	18.2	18.7
1988	03 30	17 32.43	-43 41.0					
1988	04 09	17 35.38	-44 45.0	2.700	3.210	111.8	16.8	18.5
1988	04 19	17 35.40	-45 46.9					
1988	04 29	17 32.30	-46 43.6	2.515	3.246	129.2	13.9	18.3
1988	05 09	17 26.13	-47 30.8					
1988	05 19	17 17.22	-48 03.5	2.396	3.282	145.7	10.0	18.0
1988	05 29	17 06.34	-48 17.0					
1988	06 08	16 54.61	-48 08.8	2.370	3.316	154.6	7.5	18.0
1988	06 18	16 43.25	-47 39.2					
1988	06 28	16 33.46	-46 51.9	2.447	3.348	147.4	9.4	18.1
1988	07 08	16 26.02	-45 52.4					
1988	07 18	16 21.37	-44 46.9	2.617	3.379	131.6	13.0	18.4
1988	07 28	16 19.60	-43 40.7					
1988	08 07	16 20.57	-42 37.8	2.858	3.408	114.6	15.7	18.7
1988	08 17	16 24.03	-41 40.3					
1988	08 27	16 29.68	-40 49.3	3.142	3.435	98.3	16.9	19.0

(3592) 1980 CT a,e,i = 2.35, 0.19, 10 Elements MPC 11833

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1988	03 20	17 26.51	-30 25.5	2.456	2.750	96.3	21.1	19.1
1988	03 30	17 32.56	-31 12.1					
1988	04 09	17 36.10	-31 59.8	2.205	2.764	113.7	19.4	18.8
1988	04 19	17 36.78	-32 48.0					
1988	04 29	17 34.34	-33 35.4	1.989	2.775	132.9	15.4	18.5
1988	05 09	17 28.75	-34 19.0					
1988	05 19	17 20.21	-34 54.9	1.841	2.783	153.5	9.4	18.1
1988	05 29	17 09.39	-35 18.5					
1988	06 08	16 57.38	-35 26.9	1.790	2.789	167.3	4.6	17.8
1988	06 18	16 45.46	-35 19.5					
1988	06 28	16 34.95	-34 58.8	1.846	2.791	153.2	9.5	18.1
1988	07 08	16 26.82	-34 29.8					
1988	07 18	16 21.63	-33 57.7	1.997	2.791	133.0	15.4	18.5
1988	07 28	16 19.58	-33 26.9					
1988	08 07	16 20.54	-33 00.3	2.214	2.788	114.2	19.4	18.8
1988	08 17	16 24.29	-32 39.1					
1988	08 27	16 30.54	-32 23.5	2.465	2.782	97.4	21.1	19.1

(3662) 1980 RU2 a,e,i = 2.65, 0.17, 13 Elements MPC 12129

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1988	03 20	17 11.21	-37 17.8	2.222	2.570	98.8	22.5	16.7
1988	03 30	17 20.25	-38 34.1					
1988	04 09	17 26.91	-39 51.6	1.950	2.533	114.3	21.1	16.4
1988	04 19	17 30.67	-41 09.8					
1988	04 29	17 31.07	-42 26.4	1.717	2.496	131.0	17.7	16.0
1988	05 09	17 27.81	-43 37.2					
1988	05 19	17 20.85	-44 36.0	1.545	2.460	147.7	12.7	15.6
1988	05 29	17 10.74	-45 15.0					
1988	06 08	16 58.69	-45 28.0	1.457	2.425	157.3	9.3	15.3
1988	06 18	16 46.39	-45 12.0					
1988	06 28	16 35.68	-44 29.9	1.461	2.391	149.1	12.6	15.4
1988	07 08	16 27.99	-43 28.9					
1988	07 18	16 24.10	-42 18.0	1.549	2.359	132.6	18.5	15.6
1988	07 28	16 24.23	-41 04.9					
1988	08 07	16 28.16	-39 55.1	1.697	2.329	116.1	23.0	15.9
1988	08 17	16 35.50	-38 50.9					
1988	08 27	16 45.81	-37 53.0	1.882	2.300	101.1	25.5	16.2

(3613) 1982 VJ11 a,e,i = 2.37, 0.08, 7 Elements MPC 11850

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1988	03 20	17 18.62	-20 33.7	1.964	2.334	98.8	24.9	17.0
1988	03 30	17 26.61	-20 57.3					
1988	04 09	17 31.99	-21 20.4	1.741	2.351	115.3	22.7	16.7
1988	04 19	17 34.40	-21 44.3					
1988	04 29	17 33.56	-22 09.8	1.551	2.368	134.5	17.7	16.3
1988	05 09	17 29.42	-22 36.8					
1988	05 19	17 22.19	-23 04.0	1.423	2.385	156.4	9.8	15.9
1988	05 29	17 12.55	-23 29.5					
1988	06 08	17 01.64	-23 51.5	1.387	2.401	178.9	0.5	15.4
1988	06 18	16 50.79	-24 09.1					
1988	06 28	16 41.39	-24 23.3	1.453	2.418	156.1	9.8	16.0
1988	07 08	16 34.45	-24 36.0					
1988	07 18	16 30.51	-24 49.4	1.610	2.434	134.6	17.3	16.5
1988	07 28	16 29.79	-25 04.9					
1988	08 07	16 32.14	-25 23.2	1.828	2.449	116.0	21.9	16.9
1988	08 17	16 37.32	-25 43.9					
1988	08 27	16 45.01	-26 06.1	2.082	2.463	99.8	23.8	17.2

(3642) Frieden a,e,i = 2.79, 0.08, 13 Elements MPC 11998

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1988	03 20	17 21.71	-08 29.8	2.446	2.775	98.6	20.8	15.9
1988	03 30	17 27.29	-07 57.5					
1988	04 09	17 30.63	-07 22.7	2.212	2.792	115.3	18.9	15.6
1988	04 19	17 31.52	-06 47.5					
1988	04 29	17 29.90	-06 14.9	2.017	2.809	133.6	15.0	15.3
1988	05 09	17 25.84	-05 47.9					
1988	05 19	17 19.61	-05 29.7	1.890	2.825	152.3	9.6	15.0
1988	05 29	17 11.78	-05 23.4					
1988	06 08	17 03.14	-05 30.6	1.856	2.842	162.7	6.1	14.8
1988	06 18	16 54.56	-05 52.2					
1988	06 28	16 46.94	-06 27.4	1.927	2.858	150.8	10.0	15.1
1988	07 08	16 40.97	-07 14.2					
1988	07 18	16 37.10	-08 10.0	2.090	2.873	132.2	15.2	15.4
1988	07 28	16 35.56	-09 12.1					
1988	08 07	16 36.37	-10 17.9	2.319	2.888	114.3	18.7	15.8
1988	08 17	16 39.42	-11 25.2					
1988	08 27	16 44.55	-12 32.0	2.588	2.903	97.8	20.2	16.1

(3594) Scotti a,e,i = 2.53, 0.03, 15 Elements MPC 11834

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1988	03 20	17 21.45	-39 31.7	2.225	2.539	96.5	22.9	17.7
1988	03 30	17 30.56	-40 45.0					
1988	04 09	17 37.00	-41 58.4	1.993	2.545	112.0	21.4	17.4
1988	04 19	17 40.25	-43 11.1					
1988	04 29	17 39.89	-44 20.4	1.795	2.551	128.9	17.9	17.1
1988	05 09	17 35.71	-45 21.8					
1988	05 19	17 27.79	-46 08.6	1.656	2.557	145.7	12.9	16.8
1988	05 29	17 16.86	-46 33.7					
1988	06 08	17 04.24	-46 31.7	1.600	2.562	156.3	9.2	16.6
1988	06 18	16 51.63	-46 01.3					
1988	06 28	16 40.76	-45 06.5	1.640	2.568	149.5	11.6	16.7
1988	07 08	16 32.86	-43 55.1					
1988	07 18	16 28.54	-42 35.9	1.767	2.573	133.4	16.7	17.1
1988	07 28	16 27.93	-41 16.3					
1988	08 07	16 30.74	-40 01.3	1.960	2.578	116.6	20.6	17.4
1988	08 17	16 36.60	-38 53.3					
1988	08 27	16 45.08	-37 52.9	2.193	2.582	100.9	22.6	17.7

1981 EH26 a,e,i = 3.08, 0.28, 2 Elements MPC 8288

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1988	03 20	17 29.76	-20 51.4	3.261	3.510	96.1	16.4	19.1
1988	03 30	17 34.12	-20 49.0					
1988	04 09	17 36.65	-20 45.0	2.934	3.468	114.3	15.3	18.8
1988	04 19	17 37.15	-20 39.7					
1988	04 29	17 35.51	-20 33.6	2.646	3.424	134.0	12.2	18.4
1988	05 09	17 31.74	-20 26.9					
1988	05 19	17 25.99	-20 19.4	2.432	3.379	155.5	7.1	18.0
1988	05 29	17 18.65	-20 11.4					
1988	06 08	17 10.29	-20 03.0	2.318	3.331	176.8	1.0	17.6
1988	06 18	17 01.65	-19 54.9					
1988	06 28	16 53.52	-19 48.0	2.317	3.283	158.2	6.6	17.8
1988	07 08	16 46.61	-19 43.6					
1988	07 18	16 41.49	-19 42.8	2.420	3.233	136.4	12.5	18.1
1988	07 28	16 38.49	-19 46.4					
1988	08 07	16 37.76	-19 54.6	2.596	3.181	116.5	16.6	18.4
1988	08 17	16 39.30	-20 07.2					
1988	08 27	16 43.01	-20 23.4	2.814	3.128	98.6	18.6	18.6

(3715) 1980 DS a,e,i = 2.32, 0.10, 6 Elements MPC 12566

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1988	03 20	17 26.36	-16 22.6	2.160	2.489	97.1	23.4	18.3
1988	03 30	17 34.22	-16 04.0					
1988	04 09	17 39.79	-15 41.5	1.898	2.474	113.5	21.8	18.0
1988	04 19	17 42.75	-15 16.6					
1988	04 29	17 42.83	-14 51.1	1.668	2.459	132.0	17.7	17.6
1988	05 09	17 39.92	-14 26.7					
1988	05 19	17 34.11	-14 05.6	1.498	2.441	152.6	11.0	17.1
1988	05 29	17 25.86	-13 49.8					
1988	06 08	17 16.01	-13 40.9	1.417	2.423	170.4	4.0	16.7
1988	06 18	17 05.71	-13 40.5					
1988	06 28	16 56.22	-13 49.6	1.436	2.404	156.7	9.6	16.9
1988	07 08	16 48.63	-14 08.2					
1988	07 18	16 43.68	-14 35.8	1.547	2.384	135.8	17.3	17.3
1988	07 28	16 41.74	-15 11.1					
1988	08 07	16 42.86	-15 52.2	1.722	2.363	117.0	22.5	17.7
1988	08 17	16 46.90	-16 37.1					
1988	08 27	16 53.62	-17 23.6	1.933	2.341	100.7	25.1	18.0

1981 EC25 a,e,i = 2.17, 0.17, 4 Elements MPC 10541

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1988	03 20	17 14.70	-26 18.1	1.812	2.203	99.2	26.5	18.6
1988	03 30	17 25.59	-26 52.3					
1988	04 09	17 34.22	-27 25.1	1.546	2.163	114.5	24.9	18.1
1988	04 19	17 40.09	-27 57.5					
1988	04 29	17 42.70	-28 30.1	1.312	2.122	132.0	20.7	17.6
1988	05 09	17 41.67	-29 02.1					
1988	05 19	17 36.78	-29 31.3	1.131	2.080	152.1	13.1	17.0
1988	05 29	17 28.33	-29 53.7					
1988	06 08	17 17.27	-30 04.8	1.029	2.039	172.0	3.9	16.4
1988	06 18	17 05.16	-30 01.9					
1988	06 28	16 54.01	-29 45.9	1.019	1.999	158.5	10.8	16.6
1988	07 08	16 45.51	-29 21.4					
1988	07 18	16 40.80	-28 54.6	1.090	1.961	137.2	20.6	17.0
1988	07 28	16 40.37	-28 30.5					
1988	08 07	16 44.12	-28 11.5	1.217	1.925	118.9	27.5	17.4
1988	08 17	16 51.72	-27 57.8					
1988	08 27	17 02.73	-27 48.1	1.375	1.892	103.9	31.2	17.8

1948 WF a,e,i = 2.25, 0.27, 9 Elements MPC 9685

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1988	03 20	17 22.01	-13 53.6	2.030	2.387	98.3	24.4	17.9
1988	03 30	17 30.84	-13 39.2					
1988	04 09	17 37.60	-13 21.2	1.734	2.328	114.0	23.1	17.5
1988	04 19	17 41.89	-13 01.5					
1988	04 29	17 43.32	-12 42.6	1.470	2.267	131.6	19.4	17.0
1988	05 09	17 41.61	-12 27.3					
1988	05 19	17 36.63	-12 18.6	1.262	2.205	151.5	12.7	16.4
1988	05 29	17 28.60	-12 19.5					
1988	06 08	17 18.26	-12 32.5	1.135	2.141	169.1	5.1	15.8
1988	06 18	17 06.78	-12 58.8					
1988	06 28	16 55.76	-13 38.6	1.104	2.076	156.6	11.2	15.9
1988	07 08	16 46.68	-14 30.6					
1988	07 18	16 40.67	-15 32.8	1.158	2.012	135.3	20.8	16.2
1988	07 28	16 38.41	-16 42.7					
1988	08 07	16 40.05	-17 57.5	1.269	1.949	116.7	27.7	16.6
1988	08 17	16 45.48	-19 14.7					
1988	08 27	16 54.47	-20 31.3	1.410	1.888	101.3	31.7	16.8

1985 RK a,e,i = 2.37, 0.14, 7 Elements MPC 10293

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1988	03 20	17 32.78	-30 47.1	2.365	2.644	94.9	22.0	18.9
1988	03 30	17 40.94	-31 19.8					
1988	04 09	17 46.78	-31 52.3	2.091	2.627	111.4	20.8	18.6
1988	04 19	17 49.90	-32 24.7					
1988	04 29	17 49.97	-32 56.3	1.847	2.609	129.8	17.2	18.2
1988	05 09	17 46.79	-33 25.2					
1988	05 19	17 40.37	-33 48.1	1.662	2.589	150.1	11.2	17.8
1988	05 29	17 31.14	-34 00.8					
1988	06 08	17 20.01	-33 59.6	1.565	2.567	168.2	4.6	17.4
1988	06 18	17 08.24	-33 43.0					
1988	06 28	16 57.32	-33 12.3	1.572	2.544	158.2	8.6	17.5
1988	07 08	16 48.49	-32 32.2					
1988	07 18	16 42.58	-31 48.3	1.674	2.519	137.5	15.8	17.9
1988	07 28	16 40.00	-31 05.6					
1988	08 07	16 40.73	-30 27.4	1.846	2.492	118.3	21.0	18.2
1988	08 17	16 44.57	-29 55.3					
1988	08 27	16 51.22	-29 29.2	2.056	2.465	101.5	23.7	18.5

1978 PJ2 a,e,i = 3.14, 0.15, 5 Elements MPC 11632

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1988	03 20	17 36.94	-18 40.0	3.374	3.593	94.5	16.0	18.8
1988	03 30	17 41.17	-18 25.5					
1988	04 09	17 43.58	-18 08.9	3.081	3.588	112.6	14.9	18.5
1988	04 19	17 44.05	-17 51.0					
1988	04 29	17 42.49	-17 32.4	2.825	3.581	132.3	12.0	18.3
1988	05 09	17 38.97	-17 13.8					
1988	05 19	17 33.65	-16 55.9	2.639	3.572	153.3	7.3	17.9
1988	05 29	17 26.91	-16 39.3					
1988	06 08	17 19.29	-16 24.8	2.554	3.563	172.6	2.1	17.6
1988	06 18	17 11.42	-16 13.2					
1988	06 28	17 04.00	-16 05.6	2.583	3.552	159.4	5.8	17.8
1988	07 08	16 57.63	-16 02.5					
1988	07 18	16 52.78	-16 04.4	2.716	3.540	138.3	11.0	18.1
1988	07 28	16 49.76	-16 11.4					
1988	08 07	16 48.72	-16 23.0	2.929	3.527	118.5	14.6	18.4
1988	08 17	16 49.65	-16 38.8					
1988	08 27	16 52.48	-16 57.6	3.187	3.512	100.3	16.4	18.6

1981 EV46 a,e,i = 2.18, 0.20, 1 Elements MPC 10544

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1988	03 20	17 09.46	-24 28.5	1.685	2.108	100.6	27.7	19.8
1988	03 30	17 21.35	-24 48.5					
1988	04 09	17 31.06	-25 04.3	1.423	2.062	115.4	26.0	19.4
1988	04 19	17 38.08	-25 17.0					
1988	04 29	17 41.90	-25 27.6	1.194	2.016	132.4	21.6	18.8
1988	05 09	17 42.13	-25 36.0					
1988	05 19	17 38.52	-25 41.6	1.017	1.971	152.5	13.7	18.2
1988	05 29	17 31.32	-25 42.3					
1988	06 08	17 21.43	-25 36.1	0.914	1.928	175.0	2.7	17.5
1988	06 18	17 10.36	-25 22.0					
1988	06 28	17 00.10	-25 02.0	0.899	1.887	160.3	10.4	17.7
1988	07 08	16 52.41	-24 40.3					
1988	07 18	16 48.46	-24 21.5	0.962	1.851	138.7	21.3	18.2
1988	07 28	16 48.80	-24 08.8					
1988	08 07	16 53.34	-24 02.9	1.079	1.819	120.6	28.7	18.6
1988	08 17	17 01.78	-24 02.6					
1988	08 27	17 13.67	-24 05.4	1.227	1.792	106.0	32.8	18.9

1981 ER17 a,e,i = 3.12, 0.16, 5 Elements MPC 10617

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1988	03 20	17 38.26	-19 59.4	3.310	3.525	94.2	16.4	19.1
1988	03 30	17 42.89	-19 46.4					
1988	04 09	17 45.69	-19 31.3	3.006	3.509	112.2	15.3	18.9
1988	04 19	17 46.52	-19 14.6					
1988	04 29	17 45.26	-18 57.0	2.739	3.491	131.7	12.4	18.6
1988	05 09	17 41.96	-18 38.9					
1988	05 19	17 36.75	-18 20.7	2.541	3.472	152.8	7.7	18.2
1988	05 29	17 30.01	-18 03.0					
1988	06 08	17 22.27	-17 46.4	2.441	3.451	173.3	2.0	17.8
1988	06 18	17 14.19	-17 31.9					
1988	06 28	17 06.51	-17 20.3	2.455	3.430	160.4	5.7	18.0
1988	07 08	16 59.89	-17 12.7					
1988	07 18	16 54.84	-17 09.8	2.574	3.407	139.0	11.3	18.3
1988	07 28	16 51.71	-17 11.9					
1988	08 07	16 50.64	-17 19.0	2.772	3.383	119.1	15.2	18.6
1988	08 17	16 51.65	-17 30.3					
1988	08 27	16 54.67	-17 45.1	3.016	3.358	101.0	17.2	18.8

1984 DS a,e,i = 2.22, 0.19, 4 Elements MPC 10763

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1988	03 20	17 04.85	-17 59.2	1.533	1.997	102.2	29.2	18.1
1988	03 30	17 17.54	-17 45.7					
1988	04 09	17 28.03	-17 24.1	1.295	1.957	116.3	27.3	17.6
1988	04 19	17 35.82	-16 56.2					
1988	04 29	17 40.45	-16 24.5	1.089	1.920	132.7	22.7	17.1
1988	05 09	17 41.60	-15 51.6					
1988	05 19	17 39.06	-15 20.8	0.934	1.887	151.7	14.7	16.5
1988	05 29	17 33.17	-14 55.7					
1988	06 08	17 24.81	-14 39.5	0.849	1.858	170.4	5.2	15.9
1988	06 18	17 15.40	-14 35.1					
1988	06 28	17 06.75	-14 44.5	0.847	1.834	159.4	11.2	16.1
1988	07 08	17 00.47	-15 07.7					
1988	07 18	16 57.60	-15 43.2	0.920	1.816	139.3	21.4	16.5
1988	07 28	16 58.67	-16 28.3					
1988	08 07	17 03.65	-17 19.2	1.047	1.805	122.2	28.4	17.0
1988	08 17	17 12.25	-18 12.3					
1988	08 27	17 24.08	-19 03.6	1.209	1.800	108.0	32.3	17.4

1976 GJ1 a,e,i = 3.12, 0.10, 1 Elements MPC 12199

Date ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1988 03 20	17 38.42	-22 09.1	2.828	3.064	94.1	18.9	17.5
1988 03 30	17 44.51	-22 07.9					
1988 04 09	17 48.52	-22 05.1	2.574	3.085	111.5	17.6	17.3
1988 04 19	17 50.25	-22 01.3					
1988 04 29	17 49.60	-21 57.1	2.352	3.105	130.8	14.2	17.0
1988 05 09	17 46.57	-21 52.5					
1988 05 19	17 41.36	-21 47.5	2.196	3.125	152.0	8.7	16.7
1988 05 29	17 34.37	-21 41.7					
1988 06 08	17 26.28	-21 35.1	2.134	3.146	174.5	1.8	16.3
1988 06 18	17 17.86	-21 28.0					
1988 06 28	17 09.97	-21 21.1	2.182	3.165	162.3	5.6	16.6
1988 07 08	17 03.37	-21 15.6					
1988 07 18	16 58.57	-21 12.6	2.334	3.185	140.6	11.7	17.0
1988 07 28	16 55.92	-21 12.9					
1988 08 07	16 55.51	-21 16.8	2.564	3.204	120.8	15.8	17.3
1988 08 17	16 57.30	-21 24.0					
1988 08 27	17 01.15	-21 34.0	2.843	3.223	102.9	17.8	17.6

1980 GF a,e,i = 2.41, 0.08, 2 Elements MPC 11852

Date ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1988 03 20	17 30.50	-21 06.7	1.952	2.282	95.9	25.7	17.8
1988 03 30	17 40.35	-21 04.7					
1988 04 09	17 47.72	-20 59.3	1.728	2.296	111.7	23.9	17.5
1988 04 19	17 52.26	-20 52.1					
1988 04 29	17 53.67	-20 44.3	1.532	2.310	129.8	19.6	17.1
1988 05 09	17 51.80	-20 37.0					
1988 05 19	17 46.72	-20 30.4	1.390	2.325	150.7	12.3	16.7
1988 05 29	17 38.90	-20 24.6					
1988 06 08	17 29.28	-20 19.4	1.330	2.341	173.4	2.8	16.2
1988 06 18	17 19.06	-20 15.1					
1988 06 28	17 09.63	-20 12.6	1.370	2.358	162.0	7.7	16.5
1988 07 08	17 02.15	-20 13.4					
1988 07 18	16 57.36	-20 18.5	1.503	2.375	140.2	15.9	17.0
1988 07 28	16 55.65	-20 28.5					
1988 08 07	16 56.99	-20 43.0	1.705	2.392	121.1	21.3	17.5
1988 08 17	17 01.20	-21 01.0					
1988 08 27	17 08.00	-21 21.0	1.948	2.409	104.5	24.0	17.8

1985 TE1 a,e,i = 2.46, 0.11, 1 Elements MPC 10391

Date ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1988 03 20	17 42.72	-22 42.7	2.454	2.697	93.1	21.6	18.5
1988 03 30	17 50.68	-22 41.9					
1988 04 09	17 56.52	-22 39.2	2.177	2.685	109.6	20.6	18.2
1988 04 19	17 59.92	-22 35.5					
1988 04 29	18 00.62	-22 31.5	1.928	2.671	128.2	17.2	17.9
1988 05 09	17 58.48	-22 27.5					
1988 05 19	17 53.49	-22 23.3	1.735	2.655	149.2	11.3	17.4
1988 05 29	17 45.99	-22 18.4					
1988 06 08	17 36.64	-22 11.9	1.629	2.639	172.2	3.0	16.9
1988 06 18	17 26.41	-22 03.9					
1988 06 28	17 16.51	-21 54.9	1.628	2.620	163.9	6.2	17.1
1988 07 08	17 08.03	-21 46.5					
1988 07 18	17 01.80	-21 40.5	1.728	2.601	141.4	14.1	17.5
1988 07 28	16 58.35	-21 38.4					
1988 08 07	16 57.81	-21 40.8	1.903	2.580	121.4	19.6	17.8
1988 08 17	17 00.14	-21 47.5					
1988 08 27	17 05.13	-21 57.7	2.121	2.559	103.9	22.5	18.1

1981 EX6 a,e,i = 3.21, 0.16, 17 Elements MPC 8676

Date ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1988 03 20	17 46.00	-41 18.0	3.083	3.269	91.7	17.7	18.8
1988 03 30	17 53.86	-42 12.0					
1988 04 09	17 59.64	-43 07.6	2.790	3.239	107.8	17.1	18.6
1988 04 19	18 02.97	-44 04.3					
1988 04 29	18 03.54	-45 00.4	2.527	3.209	124.7	15.0	18.3
1988 05 09	18 01.16	-45 53.2					
1988 05 19	17 55.77	-46 38.3	2.322	3.178	141.6	11.4	18.0
1988 05 29	17 47.66	-47 10.7					
1988 06 08	17 37.54	-47 25.3	2.201	3.147	154.4	8.0	17.7
1988 06 18	17 26.44	-47 18.8					
1988 06 28	17 15.67	-46 50.7	2.179	3.117	152.5	8.6	17.7
1988 07 08	17 06.43	-46 03.9					
1988 07 18	16 59.61	-45 03.5	2.254	3.086	138.1	12.7	17.9
1988 07 28	16 55.75	-43 55.7					
1988 08 07	16 54.97	-42 45.7	2.407	3.055	121.0	16.5	18.1
1988 08 17	16 57.15	-41 37.3					
1988 08 27	17 02.07	-40 33.0	2.612	3.025	104.4	18.9	18.3

1980 FO3 a,e,i = 3.39, 0.17, 10 Elements MPC 12000

Date ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1988 03 20	17 48.89	-33 45.4	3.480	3.643	91.4	15.9	17.3
1988 03 30	17 54.68	-34 17.8					
1988 04 09	17 58.63	-34 51.4	3.167	3.615	108.7	15.2	17.0
1988 04 19	18 00.50	-35 25.8					
1988 04 29	18 00.10	-36 00.0	2.887	3.588	127.3	12.9	16.7
1988 05 09	17 57.37	-36 32.6					
1988 05 19	17 52.36	-37 00.9	2.670	3.559	146.7	9.0	16.4
1988 05 29	17 45.36	-37 22.2					
1988 06 08	17 36.91	-37 33.6	2.544	3.530	163.5	4.7	16.1
1988 06 18	17 27.75	-37 33.4					
1988 06 28	17 18.78	-37 21.3	2.528	3.500	159.9	5.7	16.1
1988 07 08	17 10.84	-36 59.0					
1988 07 18	17 04.61	-36 29.3	2.616	3.469	141.4	10.5	16.4
1988 07 28	17 00.57	-35 55.7					
1988 08 07	16 58.92	-35 21.1	2.789	3.438	122.2	14.5	16.6
1988 08 17	16 59.67	-34 48.0					
1988 08 27	17 02.75	-34 17.7	3.014	3.407	104.3	16.7	16.8

(3657) 1978 ST6 a,e,i = 2.31, 0.13, 6 Elements MPC 12125

Date ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1988 03 20	17 31.59	-23 07.8	2.008	2.327	95.6	25.2	17.1
1988 03 30	17 42.14	-22 52.4					
1988 04 09	17 50.51	-22 30.9	1.739	2.297	111.0	24.0	16.7
1988 04 19	17 56.29	-22 03.9					
1988 04 29	17 59.11	-21 32.5	1.499	2.267	128.5	20.3	16.2
1988 05 09	17 58.71	-20 57.4					
1988 05 19	17 54.98	-20 19.2	1.310	2.238	148.7	13.6	15.7
1988 05 29	17 48.18	-19 38.7					
1988 06 08	17 39.04	-18 57.2	1.200	2.208	170.8	4.2	15.1
1988 06 18	17 28.70	-18 16.8					
1988 06 28	17 18.66	-17 40.6	1.186	2.179	163.3	7.7	15.2
1988 07 08	17 10.30	-17 11.8					
1988 07 18	17 04.67	-16 52.7	1.263	2.151	141.3	17.2	15.7
1988 07 28	17 02.36	-16 44.3					
1988 08 07	17 03.48	-16 45.6	1.406	2.125	122.0	23.9	16.1
1988 08 17	17 07.92	-16 54.8					
1988 08 27	17 15.38	-17 09.1	1.587	2.101	105.8	27.6	16.4

1987 BB2 a,e,i = 2.30, 0.18, 2 Elements MPC 12207

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1988	03 20	17 51.04	-22 58.1	2.412	2.627	91.1	22.3	19.5
1988	03 30	17 58.80	-22 52.4					
1988	04 09	18 04.27	-22 45.0	2.165	2.649	107.8	21.1	19.2
1988	04 19	18 07.15	-22 36.7					
1988	04 29	18 07.20	-22 28.3	1.941	2.668	126.7	17.6	18.9
1988	05 09	18 04.31	-22 19.8					
1988	05 19	17 58.52	-22 11.0	1.772	2.685	148.0	11.5	18.5
1988	05 29	17 50.24	-22 01.4					
1988	06 08	17 40.20	-21 50.2	1.690	2.698	171.4	3.2	18.1
1988	06 18	17 29.40	-21 37.6					
1988	06 28	17 19.04	-21 24.3	1.716	2.709	164.4	5.8	18.2
1988	07 08	17 10.18	-21 12.1					
1988	07 18	17 03.57	-21 02.9	1.845	2.717	141.8	13.4	18.7
1988	07 28	16 59.67	-20 57.8					
1988	08 07	16 58.57	-20 57.6	2.051	2.722	121.5	18.5	19.1
1988	08 17	17 00.20	-21 01.9					
1988	08 27	17 04.34	-21 09.8	2.303	2.724	103.6	21.1	19.4

4530 P-L a,e,i = 2.15, 0.17, 1 Elements MPC 10030

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1988	03 20	17 37.50	-22 37.9	2.061	2.355	94.3	24.9	19.8
1988	03 30	17 47.67	-22 36.1					
1988	04 09	17 55.70	-22 31.0	1.784	2.323	109.8	23.9	19.5
1988	04 19	18 01.19	-22 23.7					
1988	04 29	18 03.75	-22 15.3	1.532	2.289	127.5	20.4	19.0
1988	05 09	18 03.06	-22 06.7					
1988	05 19	17 58.93	-21 57.9	1.330	2.252	147.9	13.8	18.5
1988	05 29	17 51.52	-21 48.7					
1988	06 08	17 41.51	-21 38.2	1.206	2.214	171.0	4.1	17.9
1988	06 18	17 30.01	-21 26.3					
1988	06 28	17 18.60	-21 13.8	1.179	2.175	164.3	7.3	17.9
1988	07 08	17 08.83	-21 02.7					
1988	07 18	17 01.88	-20 55.6	1.244	2.135	141.3	17.3	18.3
1988	07 28	16 58.46	-20 54.3					
1988	08 07	16 58.76	-20 59.3	1.377	2.094	121.5	24.4	18.7
1988	08 17	17 02.65	-21 09.9					
1988	08 27	17 09.85	-21 24.5	1.546	2.053	104.9	28.4	19.0

1985 SE1 a,e,i = 2.26, 0.23, 5 Elements MPC 10390

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1988	03 20	17 32.19	-18 17.7	1.993	2.315	95.7	25.4	18.3
1988	03 30	17 42.85	-17 58.7					
1988	04 09	17 51.55	-17 34.2	1.706	2.263	110.7	24.4	17.9
1988	04 19	17 57.88	-17 05.4					
1988	04 29	18 01.45	-16 34.2	1.446	2.211	127.7	21.1	17.4
1988	05 09	18 01.95	-16 02.3					
1988	05 19	17 59.12	-15 32.1	1.237	2.157	147.1	14.8	16.9
1988	05 29	17 53.07	-15 05.8					
1988	06 08	17 44.32	-14 45.7	1.101	2.104	167.4	6.1	16.2
1988	06 18	17 33.90	-14 34.2					
1988	06 28	17 23.30	-14 33.0	1.057	2.051	162.8	8.4	16.2
1988	07 08	17 14.10	-14 43.2					
1988	07 18	17 07.58	-15 04.8	1.101	1.999	141.5	18.5	16.5
1988	07 28	17 04.59	-15 36.6					
1988	08 07	17 05.41	-16 16.3	1.207	1.949	122.4	26.1	16.9
1988	08 17	17 10.02	-17 01.3					
1988	08 27	17 18.15	-17 48.3	1.350	1.902	106.5	30.6	17.2

1986 WG a,e,i = 2.41, 0.26, 22 Elements MPC 11729

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1988	03 20	18 00.98	-21 18.4	2.292	2.480	88.8	23.7	18.3
1988	03 30	18 08.75	-20 08.0					
1988	04 09	18 13.98	-18 50.3	2.078	2.536	105.5	22.4	18.1
1988	04 19	18 16.44	-17 26.3					
1988	04 29	18 15.95	-15 57.1	1.886	2.589	124.2	18.8	17.8
1988	05 09	18 12.49	-14 24.6					
1988	05 19	18 06.21	-12 51.1	1.749	2.641	144.7	12.8	17.5
1988	05 29	17 57.59	-11 20.2					
1988	06 08	17 47.43	-09 56.1	1.701	2.689	163.3	6.2	17.2
1988	06 18	17 36.72	-08 43.4					
1988	06 28	17 26.56	-07 45.6	1.762	2.735	158.9	7.7	17.4
1988	07 08	17 17.88	-07 04.4					
1988	07 18	17 11.34	-06 39.8	1.926	2.778	139.5	13.8	17.8
1988	07 28	17 07.28	-06 30.1					
1988	08 07	17 05.78	-06 32.5	2.166	2.818	120.4	18.1	18.3
1988	08 17	17 06.72	-06 43.9					
1988	08 27	17 09.92	-07 01.5	2.451	2.855	103.1	20.2	18.6

1984 UW a,e,i = 2.88, 0.31, 5 Elements MPC 9418

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1988	03 20	17 52.05	-27 26.7	3.012	3.186	90.8	18.2	19.4
1988	03 30	17 59.01	-27 33.4					
1988	04 09	18 04.13	-27 39.3	2.676	3.132	107.9	17.7	19.1
1988	04 19	18 07.13	-27 44.9					
1988	04 29	18 07.76	-27 50.2	2.368	3.076	126.5	15.3	18.8
1988	05 09	18 05.87	-27 54.5					
1988	05 19	18 01.40	-27 56.8	2.117	3.017	147.1	10.5	18.3
1988	05 29	17 54.54	-27 55.3					
1988	06 08	17 45.79	-27 48.2	1.954	2.957	169.1	3.7	17.8
1988	06 18	17 35.91	-27 34.4					
1988	06 28	17 25.94	-27 13.9	1.899	2.896	165.9	4.9	17.8
1988	07 08	17 16.91	-26 48.3					
1988	07 18	17 09.71	-26 20.4	1.950	2.833	143.5	12.3	18.1
1988	07 28	17 04.97	-25 53.1					
1988	08 07	17 02.99	-25 28.6	2.083	2.768	122.9	17.9	18.3
1988	08 17	17 03.84	-25 08.4					
1988	08 27	17 07.41	-24 52.7	2.264	2.703	104.7	21.2	18.5

(3549) Hapke a,e,i = 2.76, 0.17, 8 Elements MPC 11615

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1988	04 09	18 13.02	-27 57.5	2.484	2.921	105.9	19.3	18.2
1988	04 19	18 16.01	-27 55.4					
1988	04 29	18 16.35	-27 52.6	2.261	2.952	124.6	16.3	17.9
1988	05 09	18 14.00	-27 48.6					
1988	05 19	18 09.00	-27 42.1	2.092	2.981	145.5	11.1	17.6
1988	05 29	18 01.72	-27 31.6					
1988	06 08	17 52.79	-27 15.9	2.009	3.009	167.9	4.1	17.2
1988	06 18	17 43.05	-26 54.3					
1988	06 28	17 33.54	-26 27.8	2.035	3.036	167.7	4.1	17.3
1988	07 08	17 25.17	-25 58.2					
1988	07 18	17 18.66	-25 28.2	2.168	3.061	145.5	10.8	17.7
1988	07 28	17 14.46	-25 00.1					
1988	08 07	17 12.72	-24 35.6	2.388	3.084	125.1	15.6	18.1
1988	08 17	17 13.42	-24 15.4					
1988	08 27	17 16.41	-23 59.4	2.662	3.106	106.6	18.2	18.4
1988	09 06	17 21.45	-23 47.0					
1988	09 16	17 28.32	-23 37.1	2.961	3.126	89.9	18.8	18.7

1981 QP a,e,i = 2.43, 0.13, 9 Elements MPC 10308

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1988	04 09	18 00.47	-20 52.8	1.823	2.344	108.7	23.9	17.1
1988	04 19	18 06.74	-21 18.4					
1988	04 29	18 10.27	-21 49.0	1.575	2.315	126.0	20.6	16.7
1988	05 09	18 10.75	-22 26.1					
1988	05 19	18 07.92	-23 10.0	1.377	2.286	145.9	14.4	16.2
1988	05 29	18 01.87	-23 59.8					
1988	06 08	17 53.08	-24 52.4	1.255	2.259	168.4	5.2	15.6
1988	06 18	17 42.53	-25 43.8					
1988	06 28	17 31.66	-26 30.4	1.230	2.232	167.3	5.8	15.6
1988	07 08	17 22.01	-27 10.2					
1988	07 18	17 14.87	-27 43.5	1.299	2.208	144.7	15.4	16.0
1988	07 28	17 11.11	-28 12.0					
1988	08 07	17 11.02	-28 37.2	1.441	2.185	124.9	22.4	16.4
1988	08 17	17 14.57	-29 00.2					
1988	08 27	17 21.50	-29 21.2	1.627	2.165	108.1	26.3	16.8
1988	09 06	17 31.43	-29 39.3					
1988	09 16	17 43.99	-29 53.4	1.834	2.147	93.7	27.9	17.1

1981 RD5 a,e,i = 2.44, 0.13, 6 Elements MPC 12313

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1988	04 09	18 06.26	-16 27.9	2.115	2.594	107.2	21.6	17.6
1988	04 19	18 10.88	-15 59.2					
1988	04 29	18 12.94	-15 30.1	1.857	2.569	124.8	18.8	17.2
1988	05 09	18 12.26	-15 02.3					
1988	05 19	18 08.73	-14 37.5	1.649	2.543	144.6	13.3	16.8
1988	05 29	18 02.54	-14 17.6					
1988	06 08	17 54.21	-14 04.1	1.521	2.516	165.1	6.0	16.3
1988	06 18	17 44.56	-13 58.3					
1988	06 28	17 34.73	-14 01.0	1.492	2.487	164.7	6.2	16.3
1988	07 08	17 25.89	-14 12.4					
1988	07 18	17 19.01	-14 32.1	1.563	2.459	144.0	14.1	16.6
1988	07 28	17 14.79	-14 59.1					
1988	08 07	17 13.50	-15 31.7	1.710	2.430	124.2	20.2	17.0
1988	08 17	17 15.21	-16 08.3					
1988	08 27	17 19.76	-16 46.8	1.905	2.400	106.8	23.8	17.3
1988	09 06	17 26.91	-17 25.2					
1988	09 16	17 36.39	-18 01.6	2.120	2.371	91.5	25.1	17.5

1984 FM a,e,i = 2.36, 0.23, 24 Elements MPC 11623

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1988	04 09	18 24.65	-42 25.8	1.671	2.136	103.2	27.2	17.8
1988	04 19	18 33.76	-45 02.3					
1988	04 29	18 39.22	-47 46.7	1.527	2.189	118.0	24.0	17.6
1988	05 09	18 40.23	-50 35.0					
1988	05 19	18 35.95	-53 19.5	1.429	2.242	132.6	19.4	17.4
1988	05 29	18 25.96	-55 47.4					
1988	06 08	18 10.73	-57 44.2	1.402	2.295	143.0	15.4	17.3
1988	06 18	17 52.04	-58 57.2					
1988	06 28	17 32.97	-59 21.3	1.456	2.347	142.7	15.2	17.4
1988	07 08	17 16.71	-59 01.3					
1988	07 18	17 05.38	-58 08.9	1.589	2.398	132.8	18.1	17.7
1988	07 28	16 59.80	-56 57.4					
1988	08 07	16 59.63	-55 37.5	1.785	2.448	119.5	21.1	18.1
1988	08 17	17 04.13	-54 16.2					
1988	08 27	17 12.49	-52 57.2	2.023	2.496	105.9	22.9	18.5
1988	09 06	17 23.87	-51 41.5					
1988	09 16	17 37.64	-50 28.9	2.286	2.543	92.8	23.3	18.8

1983 AN a,e,i = 2.41, 0.12, 7 Elements MPC 11843

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1988	04 09	18 18.36	-21 09.7	2.255	2.687	104.5	21.2	17.3
1988	04 19	18 22.67	-21 19.1					
1988	04 29	18 24.39	-21 31.7	2.008	2.689	122.7	18.4	17.0
1988	05 09	18 23.33	-21 48.4					
1988	05 19	18 19.38	-22 09.3	1.809	2.689	143.2	13.0	16.6
1988	05 29	18 12.71	-22 33.4					
1988	06 08	18 03.80	-22 58.9	1.690	2.686	166.0	5.2	16.2
1988	06 18	17 53.47	-23 23.9					
1988	06 28	17 42.85	-23 46.4	1.675	2.682	170.1	3.7	16.1
1988	07 08	17 33.10	-24 05.9					
1988	07 18	17 25.22	-24 22.7	1.766	2.676	147.0	11.9	16.5
1988	07 28	17 19.91	-24 38.0					
1988	08 07	17 17.50	-24 52.9	1.941	2.668	126.2	17.9	16.9
1988	08 17	17 18.01	-25 08.1					
1988	08 27	17 21.32	-25 23.7	2.169	2.659	107.8	21.2	17.2
1988	09 06	17 27.16	-25 39.2					
1988	09 16	17 35.28	-25 53.7	2.420	2.647	91.6	22.3	17.5

(3659) 1969 TE2 a,e,i = 2.53, 0.12, 3 Elements MPC 12128

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1988	04 09	18 18.91	-19 42.9	2.403	2.823	104.3	20.1	18.5
1988	04 19	18 22.73	-19 24.8					
1988	04 29	18 24.07	-19 07.2	2.156	2.828	122.6	17.5	18.2
1988	05 09	18 22.82	-18 51.2					
1988	05 19	18 18.93	-18 37.4	1.958	2.831	142.9	12.4	17.9
1988	05 29	18 12.62	-18 26.1					
1988	06 08	18 04.37	-18 17.5	1.840	2.833	165.0	5.3	17.5
1988	06 18	17 54.93	-18 11.7					
1988	06 28	17 45.30	-18 08.7	1.828	2.833	169.2	3.9	17.4
1988	07 08	17 36.46	-18 08.8					
1988	07 18	17 29.26	-18 12.6	1.922	2.831	147.3	11.2	17.8
1988	07 28	17 24.32	-18 20.2					
1988	08 07	17 21.92	-18 31.5	2.102	2.827	126.6	16.7	18.2
1988	08 17	17 22.11	-18 45.9					
1988	08 27	17 24.83	-19 02.6	2.338	2.822	108.2	19.9	18.5
1988	09 06	17 29.83	-19 20.4					
1988	09 16	17 36.91	-19 38.0	2.598	2.814	91.7	20.9	18.7

1975 XJ a,e,i = 2.31, 0.05, 8 Elements MPC 11991

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1988	04 09	18 19.67	-13 56.4	1.915	2.364	103.8	24.3	17.9
1988	04 19	18 25.71	-13 26.4					
1988	04 29	18 29.03	-12 57.9	1.695	2.372	120.6	21.4	17.5
1988	05 09	18 29.43	-12 33.7					
1988	05 19	18 26.76	-12 16.2	1.517	2.381	139.8	15.9	17.1
1988	05 29	18 21.15	-12 08.0					
1988	06 08	18 13.08	-12 10.6	1.408	2.388	160.2	8.3	16.7
1988	06 18	18 03.37	-12 24.9					
1988	06 28	17 53.21	-12 50.6	1.394	2.395	167.0	5.5	16.6
1988	07 08	17 43.85	-13 25.8					
1988	07 18	17 36.35	-14 08.6	1.479	2.401	147.9	13.0	17.0
1988	07 28	17 31.48	-14 56.6					
1988	08 07	17 29.59	-15 47.2	1.645	2.407	128.1	19.4	17.4
1988	08 17	17 30.71	-16 38.5					
1988	08 27	17 34.71	-17 28.6	1.865	2.411	110.4	23.1	17.8
1988	09 06	17 41.29	-18 15.7					
1988	09 16	17 50.18	-18 58.4	2.112	2.415	94.8	24.5	18.1

1981 QE1 a,e,i = 2.43, 0.20, 2 Elements MPC 11740

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1988	04 09	18 24.70	-23 34.9	2.391	2.795	103.2	20.4	19.0
1988	04 19	18 29.43	-23 29.0					
1988	04 29	18 31.72	-23 24.0	2.110	2.768	121.1	18.2	18.7
1988	05 09	18 31.34	-23 20.5					
1988	05 19	18 28.13	-23 18.4	1.876	2.739	141.2	13.4	18.2
1988	05 29	18 22.18	-23 17.1					
1988	06 08	18 13.84	-23 15.5	1.718	2.708	163.7	6.0	17.8
1988	06 18	18 03.83	-23 12.2					
1988	06 28	17 53.19	-23 06.4	1.663	2.674	172.4	2.9	17.5
1988	07 08	17 43.08	-22 58.6					
1988	07 18	17 34.59	-22 49.8	1.714	2.638	149.1	11.4	17.9
1988	07 28	17 28.53	-22 41.8					
1988	08 07	17 25.34	-22 36.1	1.852	2.600	127.8	17.9	18.2
1988	08 17	17 25.14	-22 33.4					
1988	08 27	17 27.85	-22 33.5	2.045	2.561	109.2	21.9	18.5
1988	09 06	17 33.25	-22 35.6					
1988	09 16	17 41.08	-22 38.4	2.261	2.520	92.8	23.5	18.8

1967 UT a,e,i = 2.39, 0.05, 3 Elements MPC 9031

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1988	04 09	18 16.70	-21 26.4	1.869	2.337	104.9	24.5	17.8
1988	04 19	18 23.92	-21 27.1					
1988	04 29	18 28.44	-21 29.9	1.633	2.326	121.7	21.6	17.4
1988	05 09	18 29.97	-21 36.3					
1988	05 19	18 28.27	-21 47.3	1.440	2.316	141.1	15.9	17.0
1988	05 29	18 23.37	-22 02.6					
1988	06 08	18 15.67	-22 21.0	1.316	2.306	163.2	7.3	16.5
1988	06 18	18 05.99	-22 40.6					
1988	06 28	17 55.60	-22 59.2	1.285	2.297	173.0	3.1	16.2
1988	07 08	17 45.93	-23 15.8					
1988	07 18	17 38.24	-23 30.5	1.352	2.289	150.0	12.8	16.7
1988	07 28	17 33.45	-23 44.1					
1988	08 07	17 31.95	-23 57.6	1.499	2.282	129.4	20.1	17.2
1988	08 17	17 33.79	-24 11.2					
1988	08 27	17 38.80	-24 24.6	1.699	2.276	111.8	24.3	17.5
1988	09 06	17 46.62	-24 36.7					
1988	09 16	17 56.93	-24 46.2	1.926	2.271	96.5	26.1	17.8

1985 RU2 a,e,i = 2.24, 0.16, 3 Elements MPC 11420

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1988	04 09	18 24.14	-26 00.2	2.011	2.446	103.4	23.5	18.7
1988	04 19	18 31.08	-26 11.3					
1988	04 29	18 35.38	-26 24.8	1.747	2.418	120.4	21.1	18.3
1988	05 09	18 36.71	-26 41.4					
1988	05 19	18 34.74	-27 01.0	1.523	2.387	139.8	15.9	17.9
1988	05 29	18 29.41	-27 21.9					
1988	06 08	18 21.00	-27 41.4	1.370	2.355	161.7	7.8	17.3
1988	06 18	18 10.25	-27 55.7					
1988	06 28	17 58.45	-28 01.9	1.311	2.322	172.2	3.4	17.0
1988	07 08	17 47.14	-27 59.1					
1988	07 18	17 37.76	-27 49.0	1.351	2.287	149.7	13.0	17.4
1988	07 28	17 31.42	-27 34.7					
1988	08 07	17 28.61	-27 19.5	1.473	2.251	128.7	20.6	17.8
1988	08 17	17 29.46	-27 05.6					
1988	08 27	17 33.78	-26 53.7	1.646	2.215	110.7	25.3	18.1
1988	09 06	17 41.22	-26 43.1					
1988	09 16	17 51.41	-26 32.5	1.842	2.178	95.3	27.4	18.4

1985 RP a,e,i = 2.29, 0.23, 8 Elements MPC 10293

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1988	04 09	18 27.10	-13 49.3	2.216	2.614	102.0	22.0	19.2
1988	04 19	18 32.64	-13 09.0					
1988	04 29	18 35.82	-12 28.2	1.934	2.577	118.9	20.0	18.9
1988	05 09	18 36.41	-11 49.0					
1988	05 19	18 34.18	-11 13.7	1.695	2.536	137.7	15.6	18.4
1988	05 29	18 29.14	-10 45.1					
1988	06 08	18 21.56	-10 25.6	1.525	2.493	157.5	9.0	17.9
1988	06 18	18 12.01	-10 17.5					
1988	06 28	18 01.51	-10 22.3	1.449	2.447	165.8	5.8	17.7
1988	07 08	17 51.25	-10 39.9					
1988	07 18	17 42.38	-11 09.4	1.475	2.400	148.3	12.9	17.9
1988	07 28	17 35.88	-11 48.8					
1988	08 07	17 32.32	-12 35.3	1.584	2.350	128.2	19.8	18.2
1988	08 17	17 31.92	-13 26.3					
1988	08 27	17 34.67	-14 19.0	1.746	2.299	110.1	24.4	18.5
1988	09 06	17 40.35	-15 11.1					
1988	09 16	17 48.73	-16 00.4	1.933	2.246	94.4	26.5	18.7

4575 P-L a,e,i = 2.33, 0.10, 8 Elements MPC 11350

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1988	04 09	18 22.25	-13 32.3	1.936	2.374	103.1	24.3	17.3
1988	04 19	18 29.26	-12 44.1					
1988	04 29	18 33.77	-11 54.7	1.689	2.352	119.3	21.9	16.9
1988	05 09	18 35.51	-11 06.5					
1988	05 19	18 34.26	-10 22.8	1.482	2.330	137.4	17.1	16.5
1988	05 29	18 30.04	-09 46.8					
1988	06 08	18 23.14	-09 22.1	1.341	2.308	156.6	10.1	16.0
1988	06 18	18 14.24	-09 11.4					
1988	06 28	18 04.42	-09 16.7	1.288	2.286	165.0	6.6	15.8
1988	07 08	17 54.98	-09 37.7					
1988	07 18	17 47.10	-10 12.7	1.331	2.264	149.0	13.4	16.1
1988	07 28	17 41.75	-10 58.8					
1988	08 07	17 39.45	-11 52.2	1.454	2.242	129.7	20.4	16.5
1988	08 17	17 40.35	-12 49.5					
1988	08 27	17 44.39	-13 47.3	1.631	2.222	112.4	24.9	16.8
1988	09 06	17 51.29	-14 42.8					
1988	09 16	18 00.78	-15 33.8	1.835	2.202	97.3	26.9	17.1

1971 OH a,e,i = 2.65, 0.28, 12 Elements MPC 12323

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1988	04 09	18 28.13	-09 31.7	2.388	2.766	101.3	20.8	18.0
1988	04 19	18 33.66	-08 44.9					
1988	04 29	18 37.07	-07 57.8	2.088	2.708	117.8	19.2	17.6
1988	05 09	18 38.14	-07 12.7					
1988	05 19	18 36.69	-06 32.7	1.830	2.649	135.6	15.5	17.2
1988	05 29	18 32.67	-06 01.3					
1988	06 08	18 26.30	-05 42.1	1.640	2.589	153.6	10.0	16.7
1988	06 18	18 18.04	-05 38.3					
1988	06 28	18 08.71	-05 52.1	1.541	2.528	162.1	7.1	16.4
1988	07 08	17 59.36	-06 23.7					
1988	07 18	17 51.04	-07 11.6	1.542	2.466	148.5	12.4	16.5
1988	07 28	17 44.74	-08 12.4					
1988	08 07	17 41.06	-09 22.2	1.627	2.404	129.6	19.0	16.8
1988	08 17	17 40.35	-10 37.1					
1988	08 27	17 42.69	-11 53.2	1.771	2.342	111.8	23.6	17.1
1988	09 06	17 47.95	-13 07.6					
1988	09 16	17 55.94	-14 17.9	1.943	2.281	96.1	26.0	17.3

1981 EG36 a,e,i = 3.16, 0.05, 5 Elements MPC 10622

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1988	04 09	18 32.79	-17 18.1	2.854	3.199	100.9	17.9	18.6
1988	04 19	18 36.98	-16 56.2					
1988	04 29	18 39.14	-16 35.5	2.582	3.190	118.7	16.1	18.3
1988	05 09	18 39.14	-16 17.1					
1988	05 19	18 36.93	-16 02.1	2.354	3.182	138.3	12.2	18.0
1988	05 29	18 32.63	-15 51.4					
1988	06 08	18 26.54	-15 45.4	2.204	3.173	159.1	6.6	17.7
1988	06 18	18 19.15	-15 44.5					
1988	06 28	18 11.18	-15 48.5	2.155	3.164	171.7	2.7	17.4
1988	07 08	18 03.40	-15 57.2					
1988	07 18	17 56.57	-16 10.1	2.214	3.155	153.2	8.4	17.7
1988	07 28	17 51.32	-16 26.6					
1988	08 07	17 48.06	-16 45.9	2.370	3.146	132.6	13.7	18.1
1988	08 17	17 47.01	-17 07.3					
1988	08 27	17 48.21	-17 29.7	2.592	3.137	113.6	17.2	18.3
1988	09 06	17 51.56	-17 52.1					
1988	09 16	17 56.92	-18 13.5	2.852	3.128	96.4	18.6	18.6

1985 PB a,e,i = 2.23, 0.18, 5 Elements MPC 10166

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1988	04 09	18 32.13	-17 27.3	2.103	2.497	101.1	23.2	18.6
1988	04 19	18 38.71	-17 02.1					
1988	04 29	18 42.87	-16 37.6	1.832	2.469	117.8	21.1	18.2
1988	05 09	18 44.33	-16 15.6					
1988	05 19	18 42.82	-15 58.1	1.600	2.438	136.9	16.5	17.7
1988	05 29	18 38.27	-15 46.7					
1988	06 08	18 30.92	-15 42.4	1.434	2.405	158.1	9.1	17.2
1988	06 18	18 21.32	-15 45.8					
1988	06 28	18 10.51	-15 56.6	1.360	2.370	171.8	3.5	16.8
1988	07 08	17 59.80	-16 14.1					
1988	07 18	17 50.46	-16 37.4	1.387	2.333	151.9	11.8	17.2
1988	07 28	17 43.58	-17 05.4					
1988	08 07	17 39.79	-17 36.9	1.501	2.295	130.7	19.6	17.6
1988	08 17	17 39.33	-18 10.8					
1988	08 27	17 42.17	-18 45.3	1.669	2.255	112.3	24.5	17.9
1988	09 06	17 48.07	-19 18.8					
1988	09 16	17 56.73	-19 49.5	1.864	2.214	96.4	26.8	18.1

1987 FF1 a,e,i = 2.59, 0.14, 14 Elements MPC 12002

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1988	04 09	18 39.62	-18 29.2	2.603	2.937	99.4	19.7	18.3
1988	04 19	18 44.06	-18 40.1					
1988	04 29	18 46.25	-18 55.9	2.342	2.943	117.3	17.7	18.0
1988	05 09	18 46.00	-19 17.9					
1988	05 19	18 43.20	-19 46.7	2.122	2.948	137.4	13.4	17.7
1988	05 29	18 37.90	-20 22.0					
1988	06 08	18 30.39	-21 02.7	1.977	2.950	159.7	6.9	17.3
1988	06 18	18 21.22	-21 46.4					
1988	06 28	18 11.26	-22 30.5	1.936	2.951	176.5	1.2	16.9
1988	07 08	18 01.47	-23 12.8					
1988	07 18	17 52.82	-23 51.7	2.007	2.950	153.3	8.9	17.4
1988	07 28	17 46.10	-24 27.0					
1988	08 07	17 41.80	-24 58.7	2.174	2.947	131.7	14.9	17.8
1988	08 17	17 40.13	-25 27.6					
1988	08 27	17 41.11	-25 54.1	2.406	2.942	112.3	18.5	18.1
1988	09 06	17 44.58	-26 18.2					
1988	09 16	17 50.33	-26 39.9	2.671	2.935	95.0	19.9	18.3

1985 TP3 a,e,i = 2.28, 0.21, 4 Elements MPC 11740

Date ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1988 04 09	18 30.46	-25 49.4	1.979	2.396	102.0	24.1	18.9
1988 04 19	18 38.69	-25 40.5					
1988 04 29	18 44.44	-25 31.5	1.699	2.350	118.3	22.2	18.4
1988 05 09	18 47.34	-25 23.0					
1988 05 19	18 47.04	-25 15.6	1.457	2.303	137.0	17.4	17.9
1988 05 29	18 43.34	-25 08.6					
1988 06 08	18 36.35	-25 00.4	1.278	2.254	158.6	9.5	17.3
1988 06 18	18 26.62	-24 49.1					
1988 06 28	18 15.27	-24 32.6	1.189	2.205	177.2	1.3	16.7
1988 07 08	18 03.84	-24 10.6					
1988 07 18	17 53.90	-23 45.0	1.197	2.155	153.5	12.1	17.2
1988 07 28	17 46.77	-23 18.8					
1988 08 07	17 43.19	-22 54.7	1.287	2.105	132.0	21.0	17.6
1988 08 17	17 43.41	-22 34.4					
1988 08 27	17 47.35	-22 17.9	1.431	2.057	113.7	26.7	17.9
1988 09 06	17 54.66	-22 03.9					
1988 09 16	18 04.97	-21 50.6	1.600	2.009	98.3	29.7	18.2

1974 OE a,e,i = 2.31, 0.12, 7 Elements MPC 10612

Date ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1988 04 09	18 20.66	-30 37.5	1.625	2.108	104.2	27.4	17.8
1988 04 19	18 31.74	-31 23.2					
1988 04 29	18 40.10	-32 13.0	1.403	2.090	119.4	24.8	17.3
1988 05 09	18 45.26	-33 07.9					
1988 05 19	18 46.71	-34 07.4	1.218	2.074	136.7	19.5	16.9
1988 05 29	18 44.17	-35 08.1					
1988 06 08	18 37.74	-36 04.3	1.094	2.061	155.6	11.7	16.4
1988 06 18	18 28.08	-36 47.9					
1988 06 28	18 16.68	-37 11.4	1.050	2.051	166.0	6.9	16.1
1988 07 08	18 05.50	-37 11.5					
1988 07 18	17 56.42	-36 50.0	1.094	2.044	151.1	13.9	16.4
1988 07 28	17 50.84	-36 13.0					
1988 08 07	17 49.38	-35 27.2	1.214	2.040	132.4	21.5	16.9
1988 08 17	17 52.03	-34 37.7					
1988 08 27	17 58.48	-33 47.6	1.386	2.040	115.8	26.5	17.3
1988 09 06	18 08.17	-32 57.3					
1988 09 16	18 20.59	-32 06.3	1.590	2.043	101.5	28.8	17.7

1972 RU3 a,e,i = 2.20, 0.14, 5 Elements MPC 8785

Date ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1988 04 09	18 24.15	-26 05.5	1.723	2.184	103.4	26.5	18.4
1988 04 19	18 34.06	-26 29.1					
1988 04 29	18 41.44	-26 56.6	1.473	2.151	119.0	24.2	18.0
1988 05 09	18 45.85	-27 29.7					
1988 05 19	18 46.83	-28 09.1	1.260	2.117	137.1	19.0	17.5
1988 05 29	18 44.07	-28 53.9					
1988 06 08	18 37.63	-29 40.5	1.108	2.083	157.7	10.6	16.9
1988 06 18	18 28.03	-30 23.6					
1988 06 28	18 16.55	-30 56.7	1.040	2.051	172.1	3.9	16.5
1988 07 08	18 04.97	-31 15.6					
1988 07 18	17 55.13	-31 20.0	1.062	2.020	152.8	13.3	16.8
1988 07 28	17 48.57	-31 12.9					
1988 08 07	17 46.04	-30 58.6	1.162	1.992	132.4	22.1	17.3
1988 08 17	17 47.75	-30 40.8					
1988 08 27	17 53.49	-30 21.0	1.312	1.965	115.0	27.8	17.6
1988 09 06	18 02.77	-29 59.5					
1988 09 16	18 15.12	-29 35.0	1.489	1.942	100.4	30.6	18.0

3524 P-L a,e,i = 2.57, 0.04, 14 Elements MPC 9299

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1988	04 09	18 36.56	-40 00.7	2.068	2.464	101.0	23.5	17.5
1988	04 19	18 45.74	-40 55.2					
1988	04 29	18 51.99	-41 52.7	1.846	2.467	116.5	21.4	17.2
1988	05 09	18 54.88	-42 52.5					
1988	05 19	18 54.00	-43 51.8	1.663	2.470	133.4	17.3	16.9
1988	05 29	18 49.19	-44 45.1					
1988	06 08	18 40.72	-45 25.3	1.543	2.474	149.9	11.9	16.5
1988	06 18	18 29.42	-45 44.6					
1988	06 28	18 16.80	-45 37.2	1.509	2.479	157.6	9.0	16.4
1988	07 08	18 04.66	-45 02.2					
1988	07 18	17 54.63	-44 03.6	1.569	2.485	147.2	12.8	16.6
1988	07 28	17 47.86	-42 49.0					
1988	08 07	17 44.80	-41 26.3	1.712	2.491	130.3	18.1	17.0
1988	08 17	17 45.42	-40 01.9					
1988	08 27	17 49.43	-38 39.7	1.916	2.498	113.5	21.8	17.3
1988	09 06	17 56.34	-37 21.4					
1988	09 16	18 05.72	-36 07.2	2.156	2.505	98.2	23.4	17.6

1987 FA a,e,i = 2.23, 0.16, 1 Elements MPC 11745

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1988	04 09	18 51.47	-22 18.8	2.218	2.541	96.9	23.0	18.2
1988	04 19	18 58.95	-22 04.7					
1988	04 29	19 04.09	-21 52.4	1.948	2.525	113.5	21.5	17.9
1988	05 09	19 06.59	-21 43.5					
1988	05 19	19 06.16	-21 38.9	1.710	2.506	132.4	17.4	17.5
1988	05 29	19 02.65	-21 38.9					
1988	06 08	18 56.16	-21 43.1	1.533	2.484	153.8	10.4	17.0
1988	06 18	18 47.09	-21 49.9					
1988	06 28	18 36.33	-21 57.4	1.445	2.460	177.3	1.1	16.4
1988	07 08	18 25.10	-22 03.8					
1988	07 18	18 14.72	-22 08.4	1.461	2.434	158.3	8.9	16.8
1988	07 28	18 06.42	-22 11.4					
1988	08 07	18 00.97	-22 13.9	1.571	2.406	136.0	17.0	17.2
1988	08 17	17 58.76	-22 16.6					
1988	08 27	17 59.84	-22 19.6	1.746	2.376	116.6	22.4	17.5
1988	09 06	18 04.00	-22 22.6					
1988	09 16	18 10.95	-22 24.5	1.954	2.344	99.7	25.0	17.8

(3639) Weidenschilling a,e,i = 2.40, 0.10, 2 Elements MPC 11994

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1988	04 09	18 50.70	-21 24.6	2.268	2.589	97.0	22.6	18.5
1988	04 19	18 58.12	-21 04.3					
1988	04 29	19 03.24	-20 45.2	2.001	2.575	113.6	21.0	18.2
1988	05 09	19 05.79	-20 28.8					
1988	05 19	19 05.53	-20 16.3	1.768	2.561	132.3	17.0	17.8
1988	05 29	19 02.35	-20 08.1					
1988	06 08	18 56.37	-20 04.4	1.596	2.545	153.5	10.2	17.3
1988	06 18	18 48.01	-20 04.3					
1988	06 28	18 38.12	-20 06.7	1.513	2.528	175.8	1.7	16.8
1988	07 08	18 27.81	-20 10.3					
1988	07 18	18 18.29	-20 14.6	1.534	2.509	159.0	8.3	17.1
1988	07 28	18 10.68	-20 19.5					
1988	08 07	18 05.69	-20 25.1	1.650	2.490	137.1	16.1	17.5
1988	08 17	18 03.70	-20 31.7					
1988	08 27	18 04.79	-20 38.8	1.833	2.470	117.7	21.2	17.9
1988	09 06	18 08.76	-20 45.8					
1988	09 16	18 15.37	-20 51.4	2.053	2.449	100.8	23.8	18.2

1984 HX a,e,i = 2.30, 0.10, 6 Elements MPC 10161

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1988	04 09	18 56.42	-27 37.7	2.218	2.532	96.3	23.2	18.7
1988	04 19	19 04.53	-27 32.1					
1988	04 29	19 10.20	-27 28.6	1.959	2.525	112.7	21.6	18.4
1988	05 09	19 13.12	-27 27.8					
1988	05 19	19 12.99	-27 30.1	1.730	2.516	131.3	17.6	18.0
1988	05 29	19 09.63	-27 34.6					
1988	06 08	19 03.16	-27 39.1	1.560	2.505	152.5	10.8	17.6
1988	06 18	18 53.99	-27 40.5					
1988	06 28	18 43.04	-27 35.8	1.479	2.492	174.2	2.3	17.1
1988	07 08	18 31.59	-27 23.1					
1988	07 18	18 21.01	-27 02.5	1.501	2.478	159.3	8.3	17.4
1988	07 28	18 12.53	-26 36.2					
1988	08 07	18 06.94	-26 07.1	1.619	2.463	137.3	16.2	17.8
1988	08 17	18 04.58	-25 38.1					
1988	08 27	18 05.49	-25 10.4	1.805	2.446	117.8	21.4	18.1
1988	09 06	18 09.42	-24 44.4					
1988	09 16	18 16.06	-24 19.5	2.028	2.427	100.8	24.0	18.4

(3673) 1985 QS a,e,i = 2.35, 0.18, 7 Elements MPC 12139

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1988	04 09	18 59.78	-30 10.3	2.434	2.723	95.8	21.5	18.0
1988	04 19	19 07.34	-30 31.9					
1988	04 29	19 12.60	-30 58.6	2.155	2.705	112.4	20.1	17.7
1988	05 09	19 15.25	-31 30.8					
1988	05 19	19 14.95	-32 08.5	1.910	2.684	131.0	16.5	17.3
1988	05 29	19 11.50	-32 49.9					
1988	06 08	19 04.92	-33 31.3	1.726	2.660	151.2	10.6	16.9
1988	06 18	18 55.55	-34 07.8					
1988	06 28	18 44.24	-34 33.8	1.631	2.634	168.1	4.6	16.5
1988	07 08	18 32.21	-34 45.2					
1988	07 18	18 20.87	-34 40.8	1.642	2.606	156.5	8.9	16.7
1988	07 28	18 11.54	-34 22.6					
1988	08 07	18 05.10	-33 54.5	1.748	2.575	135.9	15.9	17.0
1988	08 17	18 02.00	-33 20.8					
1988	08 27	18 02.30	-32 45.0	1.923	2.542	116.7	20.8	17.3
1988	09 06	18 05.78	-32 09.0					
1988	09 16	18 12.13	-31 33.2	2.134	2.508	99.7	23.3	17.6

1980 FY4 a,e,i = 2.33, 0.17, 5 Elements MPC 10295

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1988	04 09	18 43.17	-17 13.0	1.921	2.293	98.4	25.6	19.0
1988	04 19	18 52.99	-16 30.8					
1988	04 29	19 00.62	-15 46.7	1.654	2.253	113.5	24.2	18.6
1988	05 09	19 05.74	-15 03.1					
1988	05 19	19 08.01	-14 22.5	1.418	2.213	130.6	20.3	18.1
1988	05 29	19 07.17	-13 47.6					
1988	06 08	19 03.21	-13 21.0	1.235	2.174	150.0	13.5	17.5
1988	06 18	18 56.35	-13 05.2					
1988	06 28	18 47.36	-13 01.7	1.130	2.136	168.6	5.4	17.0
1988	07 08	18 37.44	-13 10.7					
1988	07 18	18 28.00	-13 31.4	1.117	2.099	159.5	9.8	17.1
1988	07 28	18 20.49	-14 01.6					
1988	08 07	18 15.90	-14 38.3	1.190	2.065	138.9	18.8	17.5
1988	08 17	18 14.79	-15 18.5					
1988	08 27	18 17.32	-15 59.2	1.324	2.033	120.5	25.4	17.9
1988	09 06	18 23.28	-16 37.5					
1988	09 16	18 32.38	-17 10.8	1.494	2.004	104.9	29.0	18.2

1982 VD5 a,e,i = 2.28, 0.15, 3 Elements MPC 10943

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1988	04 09	19 02.69	-20 36.4	2.353	2.623	94.2	22.4	19.4
1988	04 19	19 09.99	-20 10.4					
1988	04 29	19 15.04	-19 45.9	2.087	2.619	110.7	21.1	19.1
1988	05 09	19 17.58	-19 24.4					
1988	05 19	19 17.37	-19 07.0	1.850	2.612	129.4	17.4	18.7
1988	05 29	19 14.27	-18 54.8					
1988	06 08	19 08.36	-18 47.7	1.670	2.602	150.5	11.1	18.3
1988	06 18	18 59.99	-18 45.5					
1988	06 28	18 49.91	-18 47.1	1.578	2.590	172.8	2.8	17.8
1988	07 08	18 39.18	-18 51.3					
1988	07 18	18 28.98	-18 57.1	1.591	2.575	161.3	7.3	18.0
1988	07 28	18 20.44	-19 04.1					
1988	08 07	18 14.36	-19 12.0	1.704	2.558	139.1	15.1	18.4
1988	08 17	18 11.17	-19 21.0					
1988	08 27	18 11.01	-19 30.3	1.888	2.538	119.1	20.3	18.8
1988	09 06	18 13.74	-19 39.4					
1988	09 16	18 19.13	-19 47.2	2.113	2.517	101.7	23.0	19.1

1984 EM a,e,i = 2.26, 0.13, 3 Elements MPC 10041

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1988	04 09	18 38.09	-19 56.0	1.533	1.969	99.9	30.1	17.0
1988	04 19	18 50.56	-19 26.7					
1988	04 29	19 00.40	-18 56.7	1.333	1.970	114.0	27.8	16.7
1988	05 09	19 07.24	-18 29.1					
1988	05 19	19 10.68	-18 06.7	1.160	1.975	130.7	22.8	16.3
1988	05 29	19 10.48	-17 52.2					
1988	06 08	19 06.67	-17 47.1	1.036	1.984	150.6	14.5	15.8
1988	06 18	18 59.67	-17 51.8					
1988	06 28	18 50.49	-18 05.1	0.985	1.997	172.3	3.9	15.3
1988	07 08	18 40.64	-18 24.7					
1988	07 18	18 31.71	-18 48.1	1.022	2.013	161.9	9.0	15.6
1988	07 28	18 25.15	-19 13.1					
1988	08 07	18 21.81	-19 38.0	1.142	2.032	140.8	18.4	16.2
1988	08 17	18 22.02	-20 01.7					
1988	08 27	18 25.73	-20 22.5	1.325	2.053	122.6	24.5	16.7
1988	09 06	18 32.58	-20 39.1					
1988	09 16	18 42.16	-20 50.0	1.547	2.078	107.0	27.6	17.1

1975 AN a,e,i = 2.37, 0.32, 22 Elements MPC 10527

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1988	04 09	19 08.01	-29 15.2	2.400	2.663	93.9	22.0	19.0
1988	04 19	19 15.70	-28 35.1					
1988	04 29	19 21.11	-27 52.1	2.076	2.603	110.3	21.3	18.6
1988	05 09	19 23.91	-27 06.3					
1988	05 19	19 23.72	-26 17.0	1.779	2.539	128.9	18.1	18.1
1988	05 29	19 20.27	-25 23.2					
1988	06 08	19 13.50	-24 23.0	1.540	2.473	150.1	11.8	17.5
1988	06 18	19 03.65	-23 14.9					
1988	06 28	18 51.46	-21 57.9	1.390	2.403	174.0	2.5	16.9
1988	07 08	18 38.17	-20 33.4					
1988	07 18	18 25.27	-19 05.0	1.349	2.332	160.5	8.4	17.0
1988	07 28	18 14.25	-17 38.2					
1988	08 07	18 06.16	-16 18.0	1.409	2.258	136.8	17.9	17.3
1988	08 17	18 01.58	-15 07.8					
1988	08 27	18 00.66	-14 08.1	1.538	2.184	116.4	24.5	17.6
1988	09 06	18 03.20	-13 17.8					
1988	09 16	18 08.92	-12 34.6	1.699	2.108	99.2	28.1	17.9

(3610) 1981 EA1 a,e,i = 2.15, 0.05, 2 Elements MPC 11849

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1988	04 09	18 53.43	-21 15.4	1.809	2.163	96.4	27.4	18.4
1988	04 19	19 03.72	-21 00.9					
1988	04 29	19 11.47	-20 48.9	1.590	2.174	111.7	25.5	18.1
1988	05 09	19 16.32	-20 41.6					
1988	05 19	19 17.93	-20 41.1	1.396	2.184	129.5	20.9	17.7
1988	05 29	19 16.05	-20 48.6					
1988	06 08	19 10.72	-21 03.9	1.253	2.194	150.4	13.2	17.3
1988	06 18	19 02.32	-21 25.3					
1988	06 28	18 51.79	-21 49.9	1.190	2.203	173.9	2.8	16.8
1988	07 08	18 40.52	-22 14.0					
1988	07 18	18 30.05	-22 35.5	1.223	2.212	161.9	8.2	17.1
1988	07 28	18 21.78	-22 53.2					
1988	08 07	18 16.61	-23 07.4	1.348	2.220	139.6	17.2	17.6
1988	08 17	18 14.91	-23 18.9					
1988	08 27	18 16.70	-23 27.7	1.538	2.227	120.4	23.0	18.0
1988	09 06	18 21.67	-23 33.6					
1988	09 16	18 29.47	-23 36.0	1.767	2.233	103.9	25.9	18.4

(3544) 1977 RD4 a,e,i = 2.40, 0.22, 9 Elements MPC 11513

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1988	04 09	18 27.90	-11 53.0	1.539	1.999	101.6	29.4	16.0
1988	04 19	18 40.36	-11 02.2					
1988	04 29	18 50.60	-10 09.8	1.314	1.964	114.9	27.7	15.5
1988	05 09	18 58.29	-09 19.8					
1988	05 19	19 03.04	-08 36.9	1.121	1.935	130.2	23.6	15.1
1988	05 29	19 04.55	-08 06.5					
1988	06 08	19 02.79	-07 54.4	0.975	1.911	147.6	16.5	14.5
1988	06 18	18 57.98	-08 05.3					
1988	06 28	18 50.93	-08 42.2	0.895	1.894	164.2	8.4	14.1
1988	07 08	18 42.90	-09 43.8					
1988	07 18	18 35.41	-11 05.3	0.896	1.883	159.9	10.7	14.1
1988	07 28	18 29.99	-12 38.9					
1988	08 07	18 27.66	-14 16.4	0.976	1.880	141.7	19.5	14.6
1988	08 17	18 28.93	-15 51.0					
1988	08 27	18 33.90	-17 17.1	1.118	1.884	124.5	26.2	15.1
1988	09 06	18 42.28	-18 31.2					
1988	09 16	18 53.67	-19 31.2	1.302	1.895	109.8	29.9	15.5

1978 SP6 a,e,i = 3.18, 0.17, 2 Elements MPC 12131

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1988	04 09	19 08.33	-23 40.7	3.465	3.661	93.2	15.9	18.8
1988	04 19	19 12.89	-23 38.0					
1988	04 29	19 15.67	-23 38.3	3.161	3.647	111.1	14.9	18.5
1988	05 09	19 16.55	-23 42.2					
1988	05 19	19 15.40	-23 49.8	2.892	3.631	130.5	12.2	18.2
1988	05 29	19 12.22	-24 00.8					
1988	06 08	19 07.15	-24 14.1	2.690	3.615	151.6	7.7	17.9
1988	06 18	19 00.47	-24 28.5					
1988	06 28	18 52.68	-24 42.1	2.584	3.597	173.8	1.8	17.5
1988	07 08	18 44.42	-24 53.6					
1988	07 18	18 36.41	-25 02.0	2.593	3.577	163.1	4.7	17.7
1988	07 28	18 29.36	-25 07.0					
1988	08 07	18 23.82	-25 08.9	2.709	3.557	141.2	10.3	18.0
1988	08 17	18 20.18	-25 08.4					
1988	08 27	18 18.66	-25 06.2	2.909	3.535	120.8	14.2	18.3
1988	09 06	18 19.26	-25 02.8					
1988	09 16	18 21.93	-24 58.2	3.160	3.512	102.2	16.3	18.5

(3627) 1973 DS a,e,i = 2.35, 0.15, 10 Elements MPC 11861

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1988	04 09	18 53.55	-20 29.0	1.704	2.069	96.3	28.8	17.3
1988	04 19	19 05.08	-20 47.7					
1988	04 29	19 14.07	-21 13.2	1.507	2.093	111.1	26.7	17.0
1988	05 09	19 20.17	-21 48.5					
1988	05 19	19 22.98	-22 35.7	1.336	2.120	128.6	21.9	16.6
1988	05 29	19 22.23	-23 35.8					
1988	06 08	19 17.89	-24 47.0	1.214	2.149	149.2	14.0	16.2
1988	06 18	19 10.29	-26 04.8					
1988	06 28	19 00.34	-27 21.9	1.170	2.180	171.3	4.1	15.8
1988	07 08	18 49.42	-28 31.0					
1988	07 18	18 39.15	-29 26.8	1.222	2.212	162.4	8.0	16.1
1988	07 28	18 31.01	-30 07.2					
1988	08 07	18 25.98	-30 33.7	1.365	2.245	140.9	16.6	16.6
1988	08 17	18 24.45	-30 48.9					
1988	08 27	18 26.46	-30 55.1	1.576	2.279	122.0	22.1	17.1
1988	09 06	18 31.66	-30 54.2					
1988	09 16	18 39.67	-30 46.9	1.829	2.313	105.6	24.7	17.5

1976 GU3 a,e,i = 3.19, 0.14, 2 Elements MPC 10613

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1988	04 09	19 05.81	-23 42.0	2.622	2.868	93.8	20.4	17.3
1988	04 19	19 13.16	-23 38.0					
1988	04 29	19 18.39	-23 37.3	2.379	2.889	110.5	19.1	17.0
1988	05 09	19 21.29	-23 41.0					
1988	05 19	19 21.71	-23 49.7	2.167	2.912	129.1	15.7	16.8
1988	05 29	19 19.60	-24 03.2					
1988	06 08	19 15.09	-24 20.4	2.014	2.936	149.8	10.0	16.4
1988	06 18	19 08.52	-24 39.4					
1988	06 28	19 00.54	-24 57.9	1.951	2.961	172.0	2.8	16.1
1988	07 08	18 51.99	-25 13.6					
1988	07 18	18 43.81	-25 25.0	1.994	2.987	164.7	5.2	16.3
1988	07 28	18 36.87	-25 31.8					
1988	08 07	18 31.84	-25 34.3	2.141	3.013	142.9	11.7	16.7
1988	08 17	18 29.09	-25 33.4					
1988	08 27	18 28.80	-25 30.0	2.368	3.039	123.1	16.2	17.1
1988	09 06	18 30.89	-25 24.4					
1988	09 16	18 35.20	-25 16.8	2.646	3.066	105.1	18.5	17.4

(3593) 1981 EB20 a,e,i = 2.15, 0.09, 1 Elements MPC 11833

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1988	04 09	19 06.78	-22 52.1	2.011	2.301	93.5	25.8	17.9
1988	04 19	19 16.43	-22 33.1					
1988	04 29	19 23.65	-22 16.3	1.780	2.314	109.1	24.3	17.6
1988	05 09	19 28.12	-22 03.7					
1988	05 19	19 29.50	-21 56.8	1.571	2.325	127.0	20.3	17.2
1988	05 29	19 27.57	-21 56.3					
1988	06 08	19 22.32	-22 01.8	1.412	2.335	147.9	13.4	16.8
1988	06 18	19 14.05	-22 11.7					
1988	06 28	19 03.57	-22 23.4	1.332	2.342	171.3	3.8	16.3
1988	07 08	18 52.09	-22 33.8					
1988	07 18	18 41.04	-22 41.2	1.353	2.348	164.4	6.7	16.5
1988	07 28	18 31.81	-22 45.1					
1988	08 07	18 25.35	-22 46.2	1.471	2.352	141.7	15.5	16.9
1988	08 17	18 22.14	-22 45.5					
1988	08 27	18 22.29	-22 43.5	1.660	2.353	121.7	21.4	17.4
1988	09 06	18 25.58	-22 40.3					
1988	09 16	18 31.71	-22 35.1	1.891	2.353	104.5	24.4	17.7

1985 PE1 a,e,i = 2.16, 0.24, 3 Elements MPC 10545

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1988	04 09	18 24.69	-27 07.8	1.406	1.905	103.3	30.8	18.3
1988	04 19	18 39.92	-27 05.5					
1988	04 29	18 53.06	-26 59.9	1.169	1.852	116.5	29.1	17.8
1988	05 09	19 03.67	-26 52.7					
1988	05 19	19 11.16	-26 45.9	0.963	1.802	131.7	24.8	17.2
1988	05 29	19 15.03	-26 40.3					
1988	06 08	19 14.93	-26 35.8	0.804	1.758	149.9	16.8	16.5
1988	06 18	19 10.80	-26 30.3					
1988	06 28	19 03.33	-26 20.2	0.708	1.719	171.0	5.3	15.8
1988	07 08	18 54.02	-26 01.9					
1988	07 18	18 44.88	-25 34.2	0.686	1.688	164.9	9.0	15.9
1988	07 28	18 38.10	-24 58.5					
1988	08 07	18 35.15	-24 18.7	0.736	1.666	143.8	21.1	16.4
1988	08 17	18 36.68	-23 37.8					
1988	08 27	18 42.72	-22 56.9	0.840	1.654	126.4	29.4	16.8
1988	09 06	18 52.76	-22 15.1					
1988	09 16	19 06.19	-21 30.3	0.980	1.651	112.6	34.2	17.3

1980 VX1 a,e,i = 2.79, 0.21, 7 Elements MPC 11747

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1988	04 09	19 23.46	-29 49.3	3.195	3.359	90.7	17.3	19.3
1988	04 19	19 29.46	-29 59.4					
1988	04 29	19 33.55	-30 14.1	2.904	3.353	107.9	16.6	19.0
1988	05 09	19 35.50	-30 33.7					
1988	05 19	19 35.13	-30 57.9	2.641	3.345	126.6	14.0	18.7
1988	05 29	19 32.33	-31 25.6					
1988	06 08	19 27.16	-31 54.5	2.438	3.335	146.9	9.6	18.4
1988	06 18	19 19.83	-32 21.6					
1988	06 28	19 10.88	-32 43.3	2.326	3.323	166.4	4.1	18.1
1988	07 08	19 01.07	-32 56.5					
1988	07 18	18 51.28	-32 59.5	2.324	3.309	162.7	5.2	18.1
1988	07 28	18 42.47	-32 52.1					
1988	08 07	18 35.38	-32 36.0	2.430	3.292	142.4	10.8	18.4
1988	08 17	18 30.53	-32 13.3					
1988	08 27	18 28.17	-31 46.7	2.621	3.274	122.2	15.1	18.7
1988	09 06	18 28.32	-31 17.8					
1988	09 16	18 30.86	-30 47.9	2.864	3.253	103.7	17.5	19.0

(3674) Erbisbuhl a,e,i = 2.36, 0.38, 21 Elements MPC 12140

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1988	04 09	19 23.23	-34 36.2	2.472	2.689	91.4	21.9	17.0
1988	04 19	19 32.29	-34 21.4					
1988	04 29	19 39.18	-34 07.7	2.139	2.619	107.1	21.6	16.7
1988	05 09	19 43.52	-33 55.3					
1988	05 19	19 44.89	-33 43.9	1.829	2.544	124.7	19.1	16.2
1988	05 29	19 42.86	-33 31.7					
1988	06 08	19 37.16	-33 15.6	1.568	2.466	144.6	13.8	15.6
1988	06 18	19 27.77	-32 50.7					
1988	06 28	19 15.21	-32 11.1	1.386	2.385	166.0	5.9	15.0
1988	07 08	19 00.62	-31 12.1					
1988	07 18	18 45.66	-29 52.8	1.308	2.300	163.5	7.2	14.9
1988	07 28	18 32.18	-28 16.9					
1988	08 07	18 21.65	-26 32.0	1.334	2.213	140.6	16.9	15.1
1988	08 17	18 14.94	-24 46.2					
1988	08 27	18 12.36	-23 05.1	1.436	2.124	119.4	24.5	15.4
1988	09 06	18 13.71	-21 31.4					
1988	09 16	18 18.66	-20 05.2	1.577	2.033	101.6	29.0	15.7

1981 EX19 a,e,i = 2.15, 0.21, 1 Elements MPC 10040

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1988	04 09	18 37.83	-22 02.7	1.539	1.978	100.1	29.9	18.1
1988	04 19	18 51.89	-21 39.0					
1988	04 29	19 03.95	-21 12.7	1.292	1.929	113.5	28.6	17.6
1988	05 09	19 13.60	-20 46.2					
1988	05 19	19 20.37	-20 22.2	1.074	1.882	128.9	24.7	17.0
1988	05 29	19 23.79	-20 03.4					
1988	06 08	19 23.58	-19 51.9	0.900	1.838	147.2	17.4	16.4
1988	06 18	19 19.61	-19 49.0					
1988	06 28	19 12.40	-19 54.0	0.790	1.798	168.7	6.4	15.7
1988	07 08	19 03.14	-20 04.8					
1988	07 18	18 53.55	-20 18.8	0.758	1.764	167.2	7.3	15.6
1988	07 28	18 45.67	-20 33.4					
1988	08 07	18 41.06	-20 47.0	0.803	1.736	145.4	19.4	16.1
1988	08 17	18 40.62	-20 58.5					
1988	08 27	18 44.60	-21 06.6	0.906	1.715	127.0	28.1	16.6
1988	09 06	18 52.70	-21 09.4					
1988	09 16	19 04.44	-21 04.8	1.046	1.703	112.2	33.1	17.0

(3686) 1987 EB a,e,i = 2.74, 0.15, 6 Elements MPC 12308

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1988	04 29	19 26.32	-16 42.0	1.977	2.475	107.6	22.8	16.6
1988	05 09	19 31.01	-16 27.3					
1988	05 19	19 33.02	-16 19.9	1.777	2.501	125.2	19.3	16.3
1988	05 29	19 32.20	-16 21.8					
1988	06 08	19 28.62	-16 33.6	1.627	2.528	145.3	13.2	15.9
1988	06 18	19 22.52	-16 55.1					
1988	06 28	19 14.55	-17 24.8	1.555	2.557	167.2	5.0	15.6
1988	07 08	19 05.61	-18 00.0					
1988	07 18	18 56.80	-18 37.6	1.584	2.586	167.7	4.8	15.6
1988	07 28	18 49.19	-19 15.0					
1988	08 07	18 43.61	-19 50.1	1.714	2.616	146.0	12.5	16.1
1988	08 17	18 40.56	-20 21.7					
1988	08 27	18 40.26	-20 49.0	1.924	2.647	126.0	18.0	16.6
1988	09 06	18 42.64	-21 11.5					
1988	09 16	18 47.49	-21 28.9	2.187	2.678	108.2	20.9	16.9
1988	09 26	18 54.56	-21 40.5					
1988	10 06	19 03.53	-21 45.9	2.477	2.708	92.3	21.6	17.3

1985 TC a,e,i = 2.27, 0.19, 3 Elements MPC 10402

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1988	04 29	19 22.13	-19 14.2	1.774	2.308	109.0	24.4	18.1
1988	05 09	19 28.31	-18 42.0					
1988	05 19	19 31.80	-18 13.2	1.518	2.265	125.8	21.2	17.6
1988	05 29	19 32.27	-17 49.8					
1988	06 08	19 29.55	-17 33.4	1.310	2.221	145.3	15.1	17.1
1988	06 18	19 23.65	-17 24.8					
1988	06 28	19 15.04	-17 24.0	1.174	2.177	167.1	6.0	16.4
1988	07 08	19 04.70	-17 29.7					
1988	07 18	18 53.98	-17 40.5	1.131	2.133	166.8	6.2	16.3
1988	07 28	18 44.46	-17 54.4					
1988	08 07	18 37.45	-18 10.1	1.179	2.089	144.5	16.4	16.7
1988	08 17	18 33.81	-18 26.6					
1988	08 27	18 33.90	-18 42.5	1.298	2.047	124.5	24.0	17.1
1988	09 06	18 37.67	-18 56.3					
1988	09 16	18 44.86	-19 06.4	1.457	2.007	107.8	28.5	17.4
1988	09 26	18 55.08	-19 10.8					
1988	10 06	19 07.91	-19 07.8	1.635	1.969	93.6	30.4	17.7

1942 RJ a,e,i = 2.22, 0.23, 6 Elements MPC 11628

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1988	04 29	19 13.20	-25 57.6	1.450	2.050	111.9	27.1	17.4
1988	05 09	19 22.00	-25 29.2					
1988	05 19	19 27.86	-25 00.2	1.210	1.997	127.8	23.6	16.9
1988	05 29	19 30.34	-24 31.6					
1988	06 08	19 29.12	-24 03.3	1.015	1.945	146.6	16.7	16.3
1988	06 18	19 24.08	-23 34.4					
1988	06 28	19 15.73	-23 03.2	0.888	1.895	168.6	6.1	15.5
1988	07 08	19 05.23	-22 27.7					
1988	07 18	18 54.31	-21 47.8	0.843	1.849	167.5	6.8	15.4
1988	07 28	18 44.98	-21 05.3					
1988	08 07	18 38.83	-20 23.2	0.881	1.807	144.8	18.9	15.9
1988	08 17	18 36.78	-19 44.1					
1988	08 27	18 39.11	-19 08.5	0.980	1.772	125.7	27.6	16.3
1988	09 06	18 45.56	-18 35.5					
1988	09 16	18 55.70	-18 02.7	1.116	1.743	110.4	32.7	16.7
1988	09 26	19 09.00	-17 27.1					
1988	10 06	19 24.87	-16 46.1	1.272	1.723	97.9	35.1	17.0

1982 UP a,e,i = 2.18, 0.14, 2 Elements MPC 10040

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1988	04 29	19 23.36	-19 48.9	1.701	2.238	108.8	25.2	18.4
1988	05 09	19 29.83	-19 20.2					
1988	05 19	19 33.50	-18 55.8	1.459	2.207	125.6	21.9	18.0
1988	05 29	19 34.02	-18 37.5					
1988	06 08	19 31.22	-18 26.8	1.263	2.175	145.1	15.5	17.4
1988	06 18	19 25.12	-18 24.2					
1988	06 28	19 16.24	-18 29.0	1.139	2.143	167.3	6.0	16.8
1988	07 08	19 05.61	-18 39.3					
1988	07 18	18 54.65	-18 53.0	1.107	2.110	167.3	6.1	16.8
1988	07 28	18 45.02	-19 08.0					
1988	08 07	18 38.00	-19 23.1	1.166	2.078	144.6	16.4	17.2
1988	08 17	18 34.44	-19 37.6					
1988	08 27	18 34.66	-19 50.5	1.295	2.047	124.7	23.9	17.6
1988	09 06	18 38.55	-20 00.8					
1988	09 16	18 45.81	-20 07.1	1.466	2.016	107.9	28.3	18.0
1988	09 26	18 56.04	-20 07.6					
1988	10 06	19 08.80	-20 00.8	1.655	1.988	93.7	30.1	18.2

1982 TQ2 a,e,i = 2.18, 0.15, 5 Elements MPC 10292

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1988	04 29	19 19.10	-28 06.6	1.504	2.086	110.8	26.8	18.0
1988	05 09	19 27.54	-28 03.9					
1988	05 19	19 32.92	-28 04.7	1.277	2.052	127.0	23.2	17.6
1988	05 29	19 34.78	-28 09.7					
1988	06 08	19 32.83	-28 17.7	1.096	2.018	145.9	16.4	17.0
1988	06 18	19 27.01	-28 26.1					
1988	06 28	19 17.90	-28 29.7	0.983	1.987	167.3	6.5	16.4
1988	07 08	19 06.74	-28 23.7					
1988	07 18	18 55.30	-28 04.9	0.956	1.958	166.2	7.1	16.3
1988	07 28	18 45.56	-27 33.9					
1988	08 07	18 39.01	-26 54.3	1.015	1.932	144.4	17.8	16.8
1988	08 17	18 36.47	-26 10.3					
1988	08 27	18 38.15	-25 25.0	1.139	1.909	125.2	25.6	17.2
1988	09 06	18 43.75	-24 39.3					
1988	09 16	18 52.81	-23 52.8	1.302	1.889	109.2	30.2	17.6
1988	09 26	19 04.81	-23 04.0					
1988	10 06	19 19.20	-22 10.9	1.487	1.875	95.9	32.0	17.9

1981 EM8 a,e,i = 3.11, 0.16, 4 Elements MPC 12714

Date ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1988 04 29	19 28.43	-20 33.6	2.418	2.888	107.7	19.4	19.1
1988 05 09	19 32.53	-20 10.0					
1988 05 19	19 34.34	-19 50.0	2.149	2.859	125.6	16.7	18.7
1988 05 29	19 33.71	-19 34.4					
1988 06 08	19 30.65	-19 23.7	1.934	2.830	145.5	11.7	18.3
1988 06 18	19 25.31	-19 17.7					
1988 06 28	19 18.15	-19 15.6	1.801	2.802	167.2	4.6	17.9
1988 07 08	19 09.89	-19 16.2					
1988 07 18	19 01.43	-19 18.5	1.771	2.775	168.9	4.0	17.8
1988 07 28	18 53.78	-19 21.5					
1988 08 07	18 47.77	-19 24.4	1.843	2.750	146.9	11.6	18.1
1988 08 17	18 44.02	-19 27.0					
1988 08 27	18 42.85	-19 29.0	2.000	2.726	126.6	17.3	18.5
1988 09 06	18 44.33	-19 29.7					
1988 09 16	18 48.37	-19 28.5	2.210	2.704	108.6	20.6	18.8
1988 09 26	18 54.75	-19 24.4					
1988 10 06	19 03.21	-19 16.4	2.447	2.684	92.5	21.8	19.0

1983 AG2 a,e,i = 2.32, 0.33, 22 Elements MPC 8061

Date ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1988 04 29	20 03.67	-42 10.4	2.667	3.060	103.3	18.7	18.4
1988 05 09	20 07.25	-42 47.0					
1988 05 19	20 07.89	-43 29.8	2.403	3.041	120.2	16.7	18.1
1988 05 29	20 05.25	-44 16.6					
1988 06 08	19 59.14	-45 02.7	2.186	3.018	137.9	13.0	17.8
1988 06 18	19 49.56	-45 41.9					
1988 06 28	19 37.03	-46 06.5	2.049	2.991	153.1	8.9	17.5
1988 07 08	19 22.58	-46 09.3					
1988 07 18	19 07.67	-45 46.4	2.012	2.959	154.0	8.7	17.4
1988 07 28	18 53.92	-44 58.1					
1988 08 07	18 42.64	-43 49.1	2.080	2.924	139.2	13.1	17.6
1988 08 17	18 34.64	-42 26.1					
1988 08 27	18 30.21	-40 56.0	2.233	2.885	120.9	17.5	17.9
1988 09 06	18 29.24	-39 24.2					
1988 09 16	18 31.42	-37 53.9	2.438	2.841	103.1	20.2	18.1
1988 09 26	18 36.35	-36 26.7					
1988 10 06	18 43.62	-35 02.7	2.666	2.793	86.8	20.9	18.3

1984 SG1 a,e,i = 2.78, 0.08, 3 Elements MPC 11425

Date ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1988 04 29	19 40.60	-22 22.3	2.408	2.843	105.2	20.0	18.1
1988 05 09	19 44.99	-22 06.2					
1988 05 19	19 47.04	-21 54.7	2.146	2.827	123.0	17.5	17.7
1988 05 29	19 46.54	-21 48.5					
1988 06 08	19 43.48	-21 47.5	1.933	2.811	143.0	12.6	17.3
1988 06 18	19 37.95	-21 50.9					
1988 06 28	19 30.37	-21 57.1	1.800	2.795	165.1	5.4	16.9
1988 07 08	19 21.47	-22 04.0					
1988 07 18	19 12.16	-22 09.5	1.768	2.778	171.6	3.1	16.7
1988 07 28	19 03.52	-22 12.5					
1988 08 07	18 56.46	-22 12.3	1.843	2.761	148.9	10.9	17.1
1988 08 17	18 51.66	-22 09.4					
1988 08 27	18 49.51	-22 04.1	2.004	2.744	128.0	16.9	17.5
1988 09 06	18 50.09	-21 56.6					
1988 09 16	18 53.29	-21 46.9	2.222	2.728	109.5	20.3	17.8
1988 09 26	18 58.91	-21 34.4					
1988 10 06	19 06.67	-21 18.5	2.467	2.711	93.1	21.6	18.1

1983 RO3 a,e,i = 3.15, 0.19, 2 Elements MPC 10038

Date ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1988 04 29	19 43.71	-22 24.7	3.111	3.502	104.5	16.2	18.5
1988 05 09	19 46.43	-22 23.4					
1988 05 19	19 47.17	-22 27.3	2.818	3.475	123.1	14.1	18.2
1988 05 29	19 45.84	-22 36.5					
1988 06 08	19 42.44	-22 50.6	2.579	3.447	143.4	10.1	17.8
1988 06 18	19 37.10	-23 08.5					
1988 06 28	19 30.14	-23 28.5	2.425	3.418	165.3	4.3	17.4
1988 07 08	19 22.12	-23 48.5					
1988 07 18	19 13.71	-24 06.3	2.379	3.387	171.5	2.5	17.3
1988 07 28	19 05.73	-24 20.5					
1988 08 07	18 58.88	-24 30.3	2.445	3.356	149.2	8.9	17.6
1988 08 17	18 53.75	-24 35.9					
1988 08 27	18 50.72	-24 37.6	2.604	3.323	128.1	13.8	17.9
1988 09 06	18 49.95	-24 36.0					
1988 09 16	18 51.45	-24 31.4	2.824	3.290	108.9	16.8	18.1
1988 09 26	18 55.11	-24 23.9					
1988 10 06	19 00.74	-24 13.4	3.074	3.256	91.4	17.9	18.3

1980 FG12 a,e,i = 2.42, 0.26, 23 Elements MPC 10952

Date ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1988 04 29	19 10.56	+07 02.8	1.362	1.901	105.8	30.6	16.7
1988 05 09	19 20.70	+10 30.8					
1988 05 19	19 28.31	+14 01.1	1.196	1.863	114.9	29.5	16.4
1988 05 29	19 33.11	+17 24.4					
1988 06 08	19 34.91	+20 30.1	1.069	1.832	123.0	27.7	16.0
1988 06 18	19 33.66	+23 05.6					
1988 06 28	19 29.72	+24 57.3	0.985	1.809	129.3	25.8	15.8
1988 07 08	19 23.86	+25 54.5					
1988 07 18	19 17.27	+25 49.2	0.945	1.796	132.5	24.7	15.7
1988 07 28	19 11.43	+24 40.7					
1988 08 07	19 07.66	+22 35.7	0.952	1.791	131.2	25.2	15.7
1988 08 17	19 06.91	+19 45.9					
1988 08 27	19 09.70	+16 27.5	1.009	1.796	125.6	27.2	15.9
1988 09 06	19 16.03	+12 56.5					
1988 09 16	19 25.68	+09 27.1	1.117	1.811	117.0	29.6	16.2
1988 09 26	19 38.24	+06 11.0					
1988 10 06	19 53.21	+03 16.0	1.272	1.834	107.1	31.4	16.5

1982 UQ5 a,e,i = 2.25, 0.07, 2 Elements MPC 12007

Date ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1988 04 29	19 47.49	-23 40.4	1.919	2.371	103.9	24.3	17.9
1988 05 09	19 53.80	-23 30.6					
1988 05 19	19 57.33	-23 27.5	1.696	2.380	120.9	21.4	17.5
1988 05 29	19 57.78	-23 32.0					
1988 06 08	19 55.01	-23 44.1	1.515	2.388	140.6	15.6	17.1
1988 06 18	19 49.04	-24 02.1					
1988 06 28	19 40.33	-24 22.9	1.404	2.394	163.0	7.1	16.7
1988 07 08	19 29.75	-24 42.4					
1988 07 18	19 18.56	-24 56.8	1.388	2.399	172.2	3.3	16.5
1988 07 28	19 08.20	-25 03.9					
1988 08 07	18 59.90	-25 03.5	1.475	2.403	149.3	12.4	17.0
1988 08 17	18 54.48	-24 56.9					
1988 08 27	18 52.33	-24 45.6	1.643	2.405	128.4	19.2	17.4
1988 09 06	18 53.41	-24 30.7					
1988 09 16	18 57.52	-24 12.8	1.865	2.406	110.3	23.1	17.8
1988 09 26	19 04.31	-23 51.4					
1988 10 06	19 13.38	-23 26.2	2.114	2.406	94.4	24.5	18.1