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TWX 710-320-6842 ASTROGRAM CAM ** Brian G. Marsden, Director
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ERRATA.

MPC	Line	
11507	9	For n 0.1186112 read e 0.1186112
11614	9	For Periodic Comet Niijima-Urata read Periodic Comet Urata-Niijima
11646	10	For m1 read m2

* * * * *

CORRECTED OBSERVATIONS.

The following observations correct those previously published.

Object		Date	UT	R. A. (1950)	Decl.	Reference	N	Obs.
1986 WX5		1986 12	02.97986	04 02 16.29	+34 57 50.6	MPC11573	1	010
1986 WX5		1986 12	03.00069	04 02 14.75	+34 57 47.0	MPC11573	1	010
1986 WX5		1986 12	03.01111	04 02 14.17	+34 57 45.6	MPC11573	1	010
1986 WC6		1986 12	02.97986	04 13 03.36	+35 56 16.7	MPC11574	1	010
1986 WC6		1986 12	03.00069	04 13 01.84	+35 56 05.1	MPC11574	1	010
1986 WC6		1986 12	03.01111	04 13 01.35	+35 55 59.3	MPC11574	1	010
1986 WD6		1986 12	02.97986	04 14 12.35	+34 17 39.3	MPC11574	1	010
1986 WD6		1986 12	03.00069	04 14 11.33	+34 17 22.5	MPC11574	1	010
1986 WD6		1986 12	03.00638	04 14 10.86	+34 17 18.7	MPC11574	1	010
1986 WD6		1986 12	03.01458	04 14 10.43	+34 17 12.2	MPC11574	1	010
1986 XW2	*	1986 12	02.97986	04 08 03.33	+33 07 00.8	MPC11577	1	010
1986 XW2		1986 12	03.00069	04 08 02.09	+33 06 50.3	MPC11577	1	010
1986 XW2		1986 12	03.01111	04 08 01.57	+33 06 46.4	MPC11577	1	010
1986 XX2	*	1986 12	02.97986	04 09 30.16	+36 12 55.7	MPC11577	1	010
1986 XX2		1986 12	03.00069	04 09 28.38	+36 12 49.2	MPC11577	1	010
1986 XX2		1986 12	03.00638	04 09 28.11	+36 12 47.4	MPC11577	1	010
1986 XX2		1986 12	03.01458	04 09 27.40	+36 12 45.3	MPC11577	1	010
1986 XY2	*	1986 12	02.97986	04 10 02.62	+37 01 02.4	MPC11577	1	010
1986 XY2		1986 12	03.00069	04 10 00.38	+37 01 10.3	MPC11577	1	010
1986 XY2		1986 12	03.01111	04 09 59.68	+37 01 14.2	MPC11577	1	010
1986 XZ2	*	1986 12	02.97986	04 13 07.63	+32 58 50.1	MPC11577	1	010
1986 XZ2		1986 12	03.00069	04 13 06.33	+32 58 49.7	MPC11577	1	010
1986 XZ2		1986 12	03.01111	04 13 05.55	+32 58 48.5	MPC11577	1	010
1986 XA3	*	1986 12	02.97986	04 15 11.05	+34 49 41.5	MPC11577	1	010
1986 XA3		1986 12	03.00069	04 15 09.46	+34 49 36.6	MPC11577	1	010
1986 XA3		1986 12	03.01111	04 15 08.97	+34 49 32.7	MPC11577	1	010
1986 XB3	*	1986 12	02.97986	04 16 47.62	+36 00 18.4	MPC11577	1	010
1986 XB3		1986 12	03.00069	04 16 46.05	+36 00 10.3	MPC11577	1	010
1986 XB3		1986 12	03.01111	04 16 45.50	+36 00 07.8	MPC11577	1	010

Note 1: date originally erroneously given as 1 day later.

DELETED OBSERVATIONS.

The following observations are to be deleted.

Object	Date	UT	R. A. (1950)	Decl.	Reference	N Obs.
1981 KP1 *	1981 05	28.03924	15 17 31.72	-28 34 23.4	MPC 6463	809
1983 RD	1986 08	31.15799	19 19 14.51	+00 40 36.7	MPC11218	1 293
1986 XV2 *	1986 12	03.88681	03 12 09.47	+00 44 51.3	MPC11577	010
1986 XV2	1986 12	03.95556	03 12 04.82	+00 43 49.3	MPC11577	010

Note 1: 1983 RD = (3551).

* * * * *

IDENTIFICATION CHANGES.

Continuation to MPC 11561.

Object	Date	UT	R. A. (1950)	Decl.	Old desig.	Mag.	Obs.
1931 TQ4 *	1931 10	12.97812	00 52 41.83	+01 37 45.3	1931 TM1		024
1931 TQ4	1931 10	16.87896	00 49 45.10	+01 22 20.9	1931 TM1		024
1973 SX6 *	1973 09	28.99285	02 08 44.24	+19 14 40.8	1973 SR4	17.0	095
1973 UF6 *	1973 10	29.91644	01 53 53.03	+17 15 50.1	1973 UD3	17.0	095
1977 DH11*	1977 02	22.29589	10 44 21.11	+13 23 18.0	1977 DG	17.5	801
1977 DJ11*	1977 02	22.29589	10 44 47.92	+13 12 59.3	1977 DH	17.5	801
1979 RP1 *	1979 09	14.89562	22 57 16.07	-13 44 42.2	1979 QH8	16.0	095

* * * * *

IDENTIFICATIONS.

The following list of identifications with numbered minor planets continues that on MPC 11562.

	Note		Note		Note
1981 VW = (2535)	1	1981 YW1 = (2535)	1	1982 BN1 = (2395)	2
1986 TJ6 = (3565)	3	1986 XX2 = (2794)	4		

Note 1: identification by T. Furuta (JAM 2058). 2: by S. Nakano. 3: by F. N. Bowman. 4: by J.-L. Heudier.

* * * * *

OBSERVATIONS OF COMETS.

Observations are published here for the following observatory codes:

046 Klet. Observers A. Mrkos and Z. Vavrova.
323 Perth Observatory, Bickley. 0.3-m astrograph. Observers M. P. Candy, P. Jekabsons and A. McGrath.
330 Purple Mountain Observatory. Observers Q. Wang and J.-x. Yang.
372 Geisei. 0.6-m reflector. Observer T. Seki. From Orient. Astron. Assoc. Comet Bull. and Yamamoto Circ.
398 Nagatoro. 0.13-m f/6.4 refractor. Observer N. Kawasato.
399 Kushiro. 0.16-m reflector. Observer S. Ueda. Measured by H. Kaneda and K. Watanabe.
474 Mt. John University Observatory. 0.6-m reflector. Observer A. C. Gilmore. Measured by P. M. Kilmartin.
675 Palomar. 1.5-m reflector + CCD. Observer J. Gibson.
688 Lowell Observatory, Anderson Mesa Station. 1.8-m Perkins reflector + CCD. Observer S. J. Bus. Measured by E. Bowell and S. J. Bus.

691 University of Arizona, Kitt Peak. 0.91-m SPACEWATCH telescope, CCD in scanning mode. Observers T. Gehrels and J. Scotti. Measurered by J. Scotti and R. McCarty.
707 Chamberlin Observatory field station. Observer J. Briggs. Measured by J. Briggs and E. Everhart.
801 Oak Ridge Observatory. Observers R. E. McCrosky, G. Schwartz and C.-Y. Shao.
806 Cerro Calan. Observer C. Torres.
890 JCPM Tone Station. Observer T. Furuyama. From Orient. Astron. Assoc. Comet Bull.
892 YGCO Hoshikawa and Nagano Stations. 0.25-m f/3.4 Wright-Schmidt. Observers T. Kojima and H. Mori.
984 Eastfield. Observer H. B. Ridley. Measured by H. B. Ridley, D. Buczynski and M. J. Hendrie.

Object	Date	UT	R. A. (1950)	Decl.	Mag.	N	Obs.
		Periodic Comet Halley					
/1982i	1986	05 13.92187	10 30 26.91	-10 44 14.3			984
/1982i	1986	05 28.91840	10 23 57.11	-07 00 04.9			984
/1982i	1986	06 12.19028	10 25 42.62	-05 30 44.5			707
/1982i	1986	11 27.78264	11 40 07.42	-14 41 43.6			323
/1982i	1987	01 04.59549	11 27 06.42	-16 22 18.6			474
/1982i	1987	01 25.43522	11 09 55.60	-16 11 34.3			691
/1982i	1987	01 25.45332	11 09 54.56	-16 11 32.1			691
/1982i	1987	01 25.45626	11 09 54.35	-16 11 31.3			691
/1982i	1987	01 26.68383	11 08 42.02	-16 08 53.9	16 T		330
/1982i	1987	01 27.67688	11 07 42.59	-16 06 38.3	16 T		330
/1982i	1987	01 29.36030	11 06 00.53	-16 02 31.7			801
/1982i	1987	01 31.98403	11 03 17.97	-15 55 13.8			046
/1982i	1987	01 31.99306	11 03 17.08	-15 55 07.5			046
/1982i	1987	02 01.99583	11 02 13.91	-15 52 05.2			046
/1982i	1987	02 02.00556	11 02 13.38	-15 52 01.6			046
/1982i	1987	02 02.65602	11 01 32.20	-15 49 54.7	16 T		330
/1982i	1987	02 05.55145	10 58 25.19	-15 39 49.3			474
/1982i	1987	02 05.57656	10 58 23.61	-15 39 43.5			474
/1982i	1987	02 27.25387	10 34 05.30	-13 47 59.9			801
/1982i	1987	03 31.19517	10 03 27.40	-09 58 01.9		1	707
		Comet Shoemaker (1985 XII)					
/1985 XII	1986	10 29.64395	05 27 27.99	-17 59 29.9	16.3N		474
/1985 XII	1986	10 29.66252	05 27 26.77	-17 59 31.8			474
/1985 XII	1986	10 31.61068	05 25 23.58	-18 02 53.3	17.4N		474
/1985 XII	1986	10 31.62717	05 25 22.55	-18 02 55.0			474
/1985 XII	1986	11 06.80278	05 18 32.65	-18 10 22.0			323
/1985 XII	1986	11 24.72465	04 56 51.26	-17 59 01.5			323
/1985 XII	1986	11 26.75486	04 54 18.70	-17 54 20.4			323
/1985 XII	1986	12 23.67569	04 22 38.85	-15 49 09.8			323
/1985 XII	1986	12 26.54583	04 19 42.93	-15 29 48.6		2	474
/1985 XII	1986	12 28.15360	04 18 07.51	-15 18 38.4			801
/1985 XII	1987	01 28.02600	03 55 49.43	-11 09 38.2			801
/1985 XII	1987	02 24.02377	03 48 51.36	-07 22 27.4			801
/1985 XII	1987	02 28.00334	03 48 39.61	-06 50 38.1			801
		Comet Hartley (1985 XIV)					
/1985 XIV	1986	07 12.37448	10 31 48.56	-72 50 43.7			474
/1985 XIV	1986	07 12.41771	10 31 58.44	-72 50 22.3			474

Periodic Comet Ashbrook-Jackson

/1985a	1987	03	02.23096	04	34	37.86	+35	18	54.8	691
/1985a	1987	03	02.24828	04	34	38.73	+35	18	53.2	691
/1985a	1987	03	02.25277	04	34	38.93	+35	18	52.0	19.1T 691

Periodic Comet Shajn-Schaldach

/1985i	1987	01	29.26086	05	06	17.44	+15	01	33.5	691
/1985i	1987	01	29.28244	05	06	17.45	+15	01	37.2	691

Periodic Comet Machholz

/1986e	1986	05	29.00556	21	53	20.64	+45	35	17.2	984

Periodic Comet Schwassmann-Wachmann 2

/1986h	1987	01	01.47049	01	37	11.0	+05	24	19	398
/1986h	1987	01	30.44155	01	57	18.3	+08	06	38	892
/1986h	1987	04	01.11910	03	23	47.16	+16	04	26.3	707

Comet Wilson (1986l)

/1986l	1986	08	14.97222	22	04	40.48	+24	05	48.2	984
/1986l	1986	09	03.91458	21	22	58.83	+19	47	32.9	984
/1986l	1986	09	09.93096	21	10	09.93	+17	57	53.4	984
/1986l	1986	10	27.19167	20	00	17.31	+01	19	55.0	707
/1986l	1986	11	04.49132	19	55	12.01	-01	07	35.2	323
/1986l	1986	11	06.49132	19	54	15.48	-01	40	58.5	323
/1986l	1986	11	07.49132	19	53	49.65	-01	57	22.5	323
/1986l	1986	11	13.49792	19	51	45.48	-03	31	27.0	323
/1986l	1986	11	28.76667	19	50	01.74	-07	00	02.7	984
/1986l	1986	12	02.50903	19	50	16.10	-07	45	13.9	323
/1986l	1986	12	03.50972	19	50	22.27	-07	56	58.4	323
/1986l	1987	03	03.38958	20	35	20.30	-23	22	55.6	806
/1986l	1987	03	05.36285	20	36	47.49	-23	55	48.4	806
/1986l	1987	03	05.38542	20	36	48.54	-23	56	12.8	806

Periodic Comet Grigg-Skjellerup

/1986m	1987	03	02.10244	05	30	44.01	-06	43	02.5	691
/1986m	1987	03	02.10698	05	30	44.09	-06	43	00.1	691
/1986m	1987	03	02.11150	05	30	44.11	-06	42	56.8	691
/1986m	1987	03	02.12355	05	30	44.27	-06	42	48.6	19.1N 691
/1986m	1987	03	02.13177	05	30	44.35	-06	42	43.6	691
/1986m	1987	03	02.13774	05	30	44.41	-06	42	39.7	691
/1986m	1987	03	03.09978	05	31	00.18	-06	32	16.2	18.6N 691
/1986m	1987	03	03.10897	05	31	00.32	-06	32	09.4	691
/1986m	1987	03	03.17977	05	31	01.38	-06	31	24.3	691

Comet Sorrells (1986n)

/1986n	1986	11	05.75556	05	21	47.87	+27	38	54.9	323
/1986n	1986	11	06.72708	05	17	36.79	+27	48	18.6	323
/1986n	1986	11	10.71181	04	58	45.13	+28	23	09.3	323
/1986n	1986	11	11.65625	04	53	52.43	+28	30	10.4	323
/1986n	1986	12	03.64028	02	32	06.51	+26	31	08.9	323
/1986n	1986	12	23.53611	00	52	23.59	+18	53	02.6	323
/1986n	1986	12	30.85848	00	30	44.09	+16	31	29.6	494
/1986n	1987	01	19.76319	23	57	12.77	+12	24	52.4	046
/1986n	1987	01	19.76777	23	57	12.52	+12	24	50.3	046
/1986n	1987	01	20.72714	23	56	13.05	+12	17	07.6	046
/1986n	1987	01	20.72951	23	56	12.93	+12	17	06.4	046
/1986n	1987	01	21.72199	23	55	14.10	+12	09	28.6	046
/1986n	1987	01	21.72431	23	55	13.93	+12	09	27.4	046
/1986n	1987	01	28.00092	23	49	56.00	+11	28	16.1	801

/1986n	1987	01	28.98896	23	49	13.79	+11	22	48.1				801
/1986n	1987	01	29.81910	23	48	39.81	+11	18	23.6				984
/1986n	1987	01	29.98626	23	48	32.83	+11	17	33.1				801
/1986n	1987	01	30.41209	23	48	16.0	+11	15	20				892
/1986n	1987	01	30.43281	23	48	15.0	+11	15	14				892
/1986n	1987	01	30.81354	23	48	00.49	+11	13	21.7				984
/1986n	1987	02	02.74149	23	46	14.29	+10	59	55.2				046
/1986n	1987	02	02.74410	23	46	14.17	+10	59	55.5				046
/1986n	1987	02	15.41470	23	40	46.01	+10	21	54.3				399
/1986n	1987	02	15.41834	23	40	45.91	+10	21	52.2				399

Periodic Comet Urata-Niijima

/1986o	1986	11	06.66736	01	47	14.99	+24	16	09.0				323
/1986o	1986	11	11.70801	01	38	08.45	+27	53	04.0	16	T	3	892
/1986o	1986	11	11.72465	01	38	06.65	+27	53	43.0			3	892
/1986o	1987	01	25.21964	02	33	16.14	+52	31	33.0				691
/1986o	1987	01	25.23366	02	33	18.61	+52	31	38.1				691
/1986o	1987	01	25.23942	02	33	19.68	+52	31	40.0				691
/1986o	1987	01	27.13919	02	39	07.56	+52	43	43.2			4	801
/1986o	1987	01	29.15786	02	45	25.80	+52	55	23.9				801
/1986o	1987	03	02.15359	04	36	49.36	+53	23	33.6			5	691
/1986o	1987	03	02.16715	04	36	52.34	+53	23	30.2	18.5	T	5	691
/1986o	1987	03	02.17301	04	36	53.55	+53	23	30.1			5	691

Periodic Comet Lovas 2

/1986p	1986	12	02.60428	01	49	23.1	+13	50	10				892
/1986p	1986	12	03.59167	01	50	06.35	+13	51	50.8				323
/1986p	1986	12	04.51562	01	50	47.18	+13	53	04.9	14	T	3	892
/1986p	1986	12	04.55104	01	50	48.75	+13	53	11.6			3	892
/1986p	1987	01	30.10205	02	59	23.72	+17	54	54.9	19.5	T	6	691
/1986p	1987	01	30.10660	02	59	24.10	+17	54	56.0			6	691
/1986p	1987	01	30.11523	02	59	24.84	+17	54	58.6			6	691
/1986p	1987	03	01.15881	03	47	53.38	+20	29	25.6			7	691
/1986p	1987	03	01.19225	03	47	56.72	+20	29	36.5			7	691
/1986p	1987	03	03.12525	03	51	11.90	+20	38	27.0	20	T	7	691
/1986p	1987	03	03.16323	03	51	15.70	+20	38	38.6			7	691

Periodic Comet du Toit-Hartley

/1986q	1987	01	03.30704	06	47	42.19	+25	31	10.9				691
/1986q	1987	01	03.31806	06	47	41.18	+25	31	11.3	18.9	N		691
/1986q	1987	01	03.33416	06	47	39.79	+25	31	12.1				691
/1986q	1987	01	03.35053	06	47	38.36	+25	31	12.2				691
/1986q	1987	01	03.36205	06	47	37.35	+25	31	12.3				691
/1986q	1987	01	25.29582	06	16	11.89	+25	17	13.8				691
/1986q	1987	01	25.30191	06	16	11.40	+25	17	13.1				691
/1986q	1987	01	25.31369	06	16	10.49	+25	17	12.1				691

Comet Levy (1987a)

/1987a	1987	01	08.84444	17	15	37.5	+09	25	23				890
/1987a	1987	01	08.85000	17	15	37.3	+09	25	14				890
/1987a	1987	01	08.85902	17	15	36.66	+09	25	01.1	13	T	3	892
/1987a	1987	01	08.86910	17	15	36.04	+09	24	55.9				372
/1987a	1987	01	10.84444	17	13	45.8	+08	48	28				890
/1987a	1987	01	10.84864	17	13	45.81	+08	48	22.0	11	T	3	892
/1987a	1987	01	10.85035	17	13	45.6	+08	48	25				890
/1987a	1987	01	10.86424	17	13	44.75	+08	48	06.1				372
/1987a	1987	01	10.86458	17	13	44.40	+08	48	04.3			3	892
/1987a	1987	02	02.49699	16	48	09.11	+01	16	24.6				688
/1987a	1987	02	04.82500	16	44	34.43	+00	24	35.7				372

/1987a	1987	02	04.83229	16	44	33.98	+00	24	24.6			372
/1987a	1987	02	07.81111	16	39	33.1	-00	44	08			892
/1987a	1987	02	07.83403	16	39	30.7	-00	44	46			892
/1987a	1987	02	24.42234	15	59	01.81	-08	03	04.3		8	801
/1987a	1987	03	08.44816	15	09	55.68	-14	18	44.9			688
/1987a	1987	03	08.45398	15	09	53.94	-14	18	55.8			688
/1987a	1987	03	08.46418	15	09	50.89	-14	19	15.3			688

Periodic Comet Wiseman-Skiff

/1987b	1987	01	20.50277	07	43	14.67	-00	36	10.6	15.5T	3	892
/1987b	1987	01	20.53211	07	43	13.17	-00	36	43.8		3	892
/1987b	1987	01	22.59878	07	41	33.40	-01	07	57.7	15.5T	3	892
/1987b	1987	01	25.68472	07	39	14.72	-01	49	22.5	16 T		372
/1987b	1987	01	27.20247	07	38	12.50	-02	07	36.6			801
/1987b	1987	01	28.66424	07	37	15.93	-02	23	42.7	16.5T		372
/1987b	1987	01	30.56719	07	36	08.7	-02	42	51			892
/1987b	1987	01	30.58270	07	36	08.4	-02	43	00			892
/1987b	1987	01	31.62361	07	35	34.3	-02	52	33			892
/1987b	1987	02	01.32726	07	35	12.88	-02	58	36.1	15 T	9	691
/1987b	1987	03	08.25686	07	39	33.19	-04	07	28.2			688
/1987b	1987	03	08.26660	07	39	33.60	-04	07	27.2			688

Comet Nishikawa-Takamizawa-Tago (1987c)

/1987c	1987	01	27.43611	23	52	40.48	+04	02	32.7	9.5T		372
/1987c	1987	01	30.40185	23	49	01.3	+03	09	02			892
/1987c	1987	01	30.77014	23	48	35.91	+03	02	38.9			984
/1987c	1987	01	30.78958	23	48	34.63	+03	02	22.5			984
/1987c	1987	02	07.39514	23	40	40.2	+01	02	54			892
/1987c	1987	02	08.41111	23	39	43.6	+00	48	22			892
/1987c	1987	02	15.40036	23	33	43.22	-00	45	12.4			399
/1987c	1987	02	19.10979	23	30	45.78	-01	31	38.2			675
/1987c	1987	02	19.11222	23	30	45.60	-01	31	40.4			675
/1987c	1987	02	19.11375	23	30	45.67	-01	31	40.9			675

Comet Terasako (1987d)

/1987d	1987	02	05.41476	00	33	27.60	-23	07	45.3			474
/1987d	1987	02	05.41985	00	33	29.13	-23	07	32.3			474
/1987d	1987	02	06.53750	00	39	22.01	-22	25	09.1			323
/1987d	1987	02	07.39120	00	43	43.4	-21	53	08			892
/1987d	1987	02	08.39253	00	48	43.0	-21	15	29			892
/1987d	1987	02	08.39444	00	48	43.7	-21	15	20			892
/1987d	1987	02	15.38536	01	19	54.62	-17	03	53.6			399
/1987d	1987	02	24.99651	01	54	41.94	-11	57	44.5		8	801
/1987d	1987	02	25.98761	01	57	52.73	-11	28	57.8		8	801
/1987d	1987	02	26.99665	02	01	02.84	-11	00	18.4		8	801

Periodic Comet Wild 3

/1987e	1987	02	28.42220	14	35	18.13	+03	03	43.9			691
/1987e	1987	02	28.46294	14	35	18.87	+03	03	47.1			691
/1987e	1987	02	28.47403	14	35	19.06	+03	03	48.0	19.5T		691
/1987e	1987	03	02.39887	14	35	54.78	+03	06	41.3			691
/1987e	1987	03	02.44344	14	35	55.47	+03	06	45.8			691

Periodic Comet Bus

/1987f	1987	02	28.32744	07	05	05.77	+19	38	06.0			691
/1987f	1987	02	28.33098	07	05	05.70	+19	38	06.0			691
/1987f	1987	02	28.33951	07	05	05.60	+19	38	07.0			691
/1987f	1987	02	28.34994	07	05	05.51	+19	38	08.0			691

/1987f	1987 03 02.31117	07 04 47.79	+19 40 56.5			691
/1987f	1987 03 02.32111	07 04 47.67	+19 40 56.8			691
	Periodic Comet Howell					
/1987h	1987 03 06.67623	19 47 49.85	-22 04 10.4	18	N	474
/1987h	1987 03 06.70424	19 47 54.91	-22 03 59.9			474
/1987h	1987 03 07.67624	19 50 56.46	-21 58 50.8	18	N	474
/1987h	1987 03 07.69822	19 51 00.59	-21 58 41.7			474
	Periodic Comet Klemola					
/1987i	1987 02 16.56132	18 41 23.95	-14 15 17.8	19	N	675
/1987i	1987 02 16.56514	18 41 24.38	-14 15 16.8			675
/1987i	1987 03 17.53368	19 42 41.30	-11 39 02.3	18	N	675
/1987i	1987 03 17.53826	19 42 41.88	-11 39 00.5			675
/1987i	1987 03 17.54347	19 42 42.54	-11 38 58.5			675

Note 1: very diffuse; coma diameter 9". 2: faint, unconfirmed image. 3: correction to earlier position. 4: very weak. 5: coma diameter 14". 6: very diffuse and uncertain. 7: image weak, diffuse and difficult to measure. 8: weak; inkdot measured. 9: tail > 90" long in p.a. 330 .

* * * * *

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 A. Barthelemy, J. Ciffreo, J.-L. Heudier, T. Laverge, C. Pollas							
0.9-m Schmidt telescope							
Observations in association with INAS							
1986 XO5 *	1986 12 02.88542		03 12 19.65	-03 36 22.0			010
1986 XO5	1986 12 02.94792		03 12 17.13	-03 36 29.8			010
230	1986 12 02.13611		09 19 34.16	+04 56 06.1		r	010
230	1986 12 02.16737		09 19 34.86	+04 55 49.9		r	010
335	1986 11 28.02326		05 00 55.18	+15 08 24.1			010
1464	1986 11 28.02326		04 55 54.31	+18 02 43.6			010
012 Uccle							
J. Dommanget, Observatoire Royal de Belgique, Avenue Circulaire 3, B-1180 Brussels, Belgium							
Observer T. Pauwels							
Double astrograph							
1987 BK *	1987 01 29.94792		07 32 48.8	+23 15 45	14.5V		012
1987 BK	1987 01 29.96875		07 32 48.0	+23 15 48			012
026 Zimmerwald							
P. Wild, Astronomisches Institut der Universitat, Sidlerstrasse 5, CH-3012 Berne, Switzerland							
Observer P. Wild							
Measurers U. Hugentobler, P. Wild							
0.4-m Schmidt telescope							
1969 TR1	1986 10 06.83993		00 11 03.00	+02 37 09.3			026
1969 TR1	1986 10 06.94965		00 10 57.87	+02 36 53.2			026
1978 SA3	1986 09 03.03750		00 24 59.73	+04 50 22.4			026
1978 SA3	1986 09 07.96944		00 22 29.91	+04 41 19.1			026
1978 SA3	1986 09 11.96458		00 20 15.19	+04 32 24.8			026
1984 WB	1986 08 07.10521		21 12 07.45	+25 42 13.2			026
1985 RS1	1985 09 21.95833		00 17 53.43	-00 41 08.6			026
1986 TB	1986 10 23.76424		23 42 23.74	+05 56 22.9			026
1986 TB	1986 11 03.85069		23 38 10.52	+07 13 16.6			026
1986 TB	1986 11 07.97986		23 37 54.69	+07 42 41.4			026
1986 TG	1986 09 10.90556		00 20 23.84	+04 55 12.7			026
1986 TG	1986 10 23.76424		23 42 23.21	+06 07 18.8			026
1986 TG	1986 11 03.85069		23 41 16.36	+06 28 45.6			026
1986 TG	1986 11 07.97986		23 42 03.22	+06 40 06.1			026
1986 TW1	1986 10 27.90347		00 33 23.96	-05 04 56.1		S	026
1986 TW1	1986 10 30.97934		00 31 34.90	-04 57 19.1		S	026
1986 TW1	1986 10 31.03385		00 31 32.84	-04 57 11.4		S	026
1986 TW1	1986 11 07.99670		00 28 15.23	-04 27 58.7			026
1986 TX1	1986 10 02.07049		01 03 57.46	-06 40 45.1		C	026
1986 TX1	1986 10 04.06042		01 01 57.43	-06 40 35.8		C	026
1986 TX1	1986 10 06.93375		00 59 01.69	-06 39 21.7		C	026
1986 TX1	1986 10 08.94514		00 56 57.79	-06 37 42.1			026
1986 TT5	1986 10 08.94514		00 47 50.59	-08 43 35.6			026
1986 TT5	1986 10 27.90347		00 33 11.69	-08 52 05.6		S	026
1986 TT5	1986 10 30.97934		00 31 17.26	-08 47 35.1		S	026
1986 TT5	1986 11 07.99670		00 27 12.13	-08 27 50.1			026
4	1986 10 27.90347		00 31 56.12	-08 52 13.4			026
4	1986 10 30.97934		00 30 00.60	-08 53 48.7			026

4	1986	11	07.99670	00	26	06.20	-08	47	47.2			026
60	1986	09	03.03750	00	25	34.66	+04	25	17.7			026
64	1986	09	03.03750	00	27	51.65	+04	36	17.7			026
107	1985	10	14.00625	01	21	01.80	+01	51	38.0		13	026
429	1979	03	24.83410	10	53	47.48	-04	29	03.0		15	026
429	1979	03	24.87986	10	53	45.59	-04	28	40.1			026
429	1979	03	24.89514	10	53	44.86	-04	28	33.0			026
429	1979	04	19.92035	10	42	16.40	-01	23	16.1			026
429	1979	04	19.93527	10	42	16.28	-01	23	11.1			026
429	1979	04	24.84444	10	41	47.85	-00	56	39.4		15.5	026
429	1979	04	24.89201	10	41	47.68	-00	56	25.4			026
429	1985	07	12.03194	23	17	29.72	+08	24	39.2		15	026
429	1985	07	14.06597	23	18	08.74	+08	35	40.0		14.5	026
429	1985	09	10.94931	22	56	55.34	+07	23	39.0		13.2	026
509	1979	09	15.85146	18	48	22.33	-04	20	53.0		14.5	026
509	1985	09	21.98403	23	06	48.64	+12	06	40.0		13	026
704	1985	12	19.74323	01	01	44.67	+26	49	13.6		12	026
704	1985	12	19.78411	01	01	46.10	+26	48	57.6			026
705	1985	12	19.74323	00	45	31.04	+26	19	49.3		14.5	026
705	1985	12	19.78411	00	45	31.54	+26	19	49.1			026
715	1986	10	04.06042	01	04	17.32	-07	16	45.8		14	026
715	1986	10	08.94514	00	59	29.83	-07	19	51.0			026
738	1985	10	14.00625	01	19	48.88	+03	17	44.0		15	026
740	1985	09	17.02604	01	02	24.70	-08	50	37.6		14.5	026
740	1985	09	19.00833	01	01	10.87	-09	03	09.4		14.8	026
740	1985	09	22.08958	00	59	10.98	-09	22	19.5			026
773	1985	09	17.04722	01	47	20.33	+32	55	17.8		14	026
773	1985	09	19.02986	01	46	07.23	+33	05	00.9		14.2	026
773	1985	12	19.74323	00	53	12.43	+27	54	11.7			026
773	1985	12	19.78411	00	53	13.32	+27	54	01.9			026
790	1978	11	08.05486	01	49	11.00	+28	38	41.4			026
798	1979	03	24.83410	10	46	34.04	-02	23	05.1		15.2	026
798	1979	03	24.87986	10	46	32.24	-02	22	45.6			026
798	1979	04	19.92035	10	36	54.81	+00	18	52.5			026
798	1979	04	19.93527	10	36	54.69	+00	18	57.0			026
872	1986	10	04.03958	00	11	41.28	+03	04	29.7			T 026
872	1986	10	06.83993	00	09	36.44	+02	43	56.9			026
872	1986	10	06.94965	00	09	31.73	+02	43	06.0			026
880	1985	09	13.04965	02	00	19.35	+35	55	31.2			026
880	1985	09	17.04722	02	00	32.69	+36	11	08.0			026
880	1985	09	19.02986	02	00	27.14	+36	16	56.8			026
880	1985	11	07.87257	01	33	11.10	+30	47	53.2			026
881	1985	09	13.04965	01	59	12.46	+34	36	51.4			026
881	1985	09	17.04722	01	57	51.72	+34	51	54.0			026
881	1985	09	19.02986	01	57	00.06	+34	57	39.2			026
907	1983	10	12.94375	00	24	13.31	-16	51	40.8			026
911	1985	09	13.04965	02	09	57.80	+35	36	24.4			026
911	1985	09	17.04722	02	08	36.24	+35	50	51.9		16	026
911	1985	09	19.02986	02	07	50.62	+35	57	26.6			026
1056	1982	10	21.13681	02	29	43.30	+04	24	13.9			S 026
1056	1982	10	21.94479	02	28	53.40	+04	20	41.9			026
1251	1985	09	22.01042	01	23	00.74	+00	08	25.2			026
1251	1985	09	25.04861	01	21	10.37	-00	13	41.4			026
1263	1983	08	16.02795	23	34	02.46	-05	31	02.4			026
1263	1983	08	19.04413	23	32	43.81	-06	13	48.6			026
1437	1985	09	17.04722	02	02	08.12	+37	33	29.6			026
1574	1985	09	21.98403	22	55	47.84	+13	37	21.1			026
1627	1985	07	12.03194	23	07	41.91	+07	28	05.9		13	026
1627	1985	07	14.05903	23	17	32.82	+06	48	33.3			026

1627		1985	07	14.06597	23	17	34.68	+06	48	24.9	12.5	026
1627		1985	07	14.07292	23	17	36.57	+06	48	16.2		026
1627		1985	08	21.07222	01	13	16.70	-10	02	15.4		026
1690		1979	08	28.97708	22	48	47.65	+12	23	48.3		026
1733		1985	09	16.98125	00	17	46.10	-01	05	39.0		026
1733		1985	09	19.04861	00	15	56.39	-01	23	15.6		026
1733		1985	09	22.04444	00	13	13.50	-01	49	01.1		026
1809		1985	09	12.01736	00	42	10.46	-00	58	05.8		026
1809		1985	09	12.98420	00	41	33.68	-01	02	57.5		026
1809		1985	09	16.93819	00	38	53.53	-01	23	20.8		026
1809		1985	09	16.98125	00	38	51.61	-01	23	33.7		026
1809		1985	09	18.92708	00	37	28.33	-01	33	47.3		026
1809		1985	09	19.04861	00	37	22.98	-01	34	26.1		026
1820		1985	09	22.01042	01	10	38.12	-00	06	51.4		026
1820		1985	09	25.04861	01	08	16.12	-00	34	37.1		026
1990		1986	10	02.03229	00	13	07.67	+02	12	42.0		026
2138		1979	11	24.09097	05	32	07.51	+18	54	14.7		026
2138		1979	11	29.12500	05	27	47.38	+18	55	58.2		026
2138		1980	01	13.87778	04	48	23.17	+19	34	29.0		026
2138		1980	01	18.83958	04	46	15.14	+19	42	27.2		026
2347		1985	09	13.04965	01	55	43.40	+32	06	41.4		026
2347		1985	09	19.02986	01	54	11.70	+32	35	54.4		026
2389		1985	12	10.90833	02	53	10.03	+29	14	15.9		026
2389		1985	12	15.99377	02	50	19.90	+28	45	00.4		026
2488		1986	10	02.07049	00	55	09.18	-07	57	28.3		026
2488		1986	10	04.06042	00	53	17.94	-07	58	28.8		026
2488		1986	10	06.93375	00	50	36.03	-07	58	17.8		026
2488		1986	10	08.94514	00	48	42.97	-07	56	55.2		026
2506		1986	09	03.03750	00	35	41.64	+02	57	24.7		026
2625		1983	08	09.07708	23	30	40.61	-07	02	27.8		026
2625		1983	09	08.01111	23	10	56.49	-11	07	38.6		026
2731		1983	08	05.01667	23	29	07.68	-05	36	52.2		026
2731		1983	08	09.07708	23	27	59.72	-06	06	50.8		026
2731		1983	08	16.02795	23	25	17.32	-07	03	29.8		026
2731		1983	08	19.04413	23	23	50.48	-07	29	45.5		026
2731		1983	09	08.01111	23	11	31.38	-10	33	54.7		026
2860		1985	09	21.98403	23	01	26.68	+12	38	01.5		026
2950		1983	10	04.94236	00	27	34.20	-15	31	47.6		026
2950		1983	10	12.94375	00	21	40.27	-16	06	46.4		026
3015		1986	10	02.07049	00	56	55.19	-08	02	44.6		026
3015		1986	10	04.06042	00	55	08.86	-08	02	44.0		026
3015		1986	10	06.93375	00	52	34.38	-08	01	56.1		026
3015		1986	10	08.94514	00	50	46.83	-08	00	44.4		026
3329		1985	09	21.95833	00	19	53.14	-00	40	13.0		026
3330		1985	09	16.93819	00	31	07.96	+00	59	41.4		026
3330		1985	09	21.95833	00	26	47.14	+00	54	45.5		026
3543		1986	09	03.03750	00	36	39.20	+03	26	49.2		026
3543		1986	09	07.96944	00	33	54.05	+03	07	17.0		026

033 Tautenburg
S. Marx, Karl Schwarzschild Observatorium, DDR-6901 Tautenburg,
Democratic Republic of Germany
Observers F. Borngen, K. Kirsch, F. Ludwig, K.-H. Mau, H. Meusinger
Reductions F. Borngen
1.3-m Schmidt telescope
SAOC

1981	RG1	1983	04	16.86701	10	58	16.78	+08	12	56.5		033
1981	RG1	1983	04	16.92535	10	58	14.99	+08	12	57.4		033
1982	FP3	1987	01	27.92257	09	10	26.72	+19	31	09.0	18.8	033

1982	FP3		1987	01	28.00949	09	10	22.41	+19	31	29.8	033
1983	HC2	*	1983	04	16.86701	10	58	06.77	+09	40	21.0	19.3 033
1983	HC2		1983	04	16.92535	10	58	05.91	+09	40	24.0	033
1987	BM	*	1987	01	26.92604	08	57	45.27	+19	52	58.2	033
1987	BM		1987	01	27.92257	08	56	51.59	+19	56	28.9	18.4 033
1987	BM		1987	01	28.00949	08	56	46.74	+19	56	47.1	033
1987	BN	*	1987	01	26.92604	08	58	28.30	+19	12	08.2	033
1987	BN		1987	01	27.92257	08	57	41.10	+19	15	32.6	19.1 033
1987	BN		1987	01	28.00949	08	57	36.87	+19	15	49.5	033
1987	BO	*	1987	01	26.92604	08	59	20.82	+19	44	06.9	033
1987	BO		1987	01	27.92257	08	58	40.49	+19	47	27.6	19.5 033
1987	BO		1987	01	28.00949	08	58	34.86	+19	47	54.4	033
1987	BP	*	1987	01	26.92604	08	59	22.21	+19	45	10.8	033
1987	BP		1987	01	27.92257	08	58	30.96	+19	48	06.8	19.4 033
1987	BP		1987	01	28.00949	08	58	26.49	+19	48	27.5	033
1987	BQ	*	1987	01	26.92604	08	59	54.14	+20	19	13.0	033
1987	BQ		1987	01	27.92257	08	59	04.61	+20	22	57.0	18.0 033
1987	BQ		1987	01	28.00949	08	59	00.21	+20	23	16.8	033
1987	BR	*	1987	01	26.92604	09	01	08.08	+17	59	10.2	033
1987	BR		1987	01	27.92257	09	00	06.33	+18	01	51.6	18.9 033
1987	BR		1987	01	28.00949	09	00	00.76	+18	02	05.2	033
1987	BS	*	1987	01	26.92604	09	05	32.96	+18	20	57.8	033
1987	BS		1987	01	27.92257	09	04	37.53	+18	21	43.4	17.9 033
1987	BS		1987	01	28.00949	09	04	32.60	+18	21	47.1	033
1987	BT	*	1987	01	26.92604	09	06	07.15	+18	46	43.4	033
1987	BT		1987	01	27.92257	09	05	14.23	+18	52	54.3	19.3 033
1987	BT		1987	01	28.00949	09	05	09.53	+18	53	26.1	033
1987	BU	*	1987	01	26.92604	09	07	00.65	+18	33	14.9	033
1987	BU		1987	01	27.92257	09	06	07.32	+18	41	22.2	19.2 033
1987	BU		1987	01	28.00949	09	06	02.47	+18	42	04.5	033
1987	BV	*	1987	01	26.92604	09	08	41.32	+20	02	45.4	033
1987	BV		1987	01	27.92257	09	07	52.63	+20	06	46.3	19.6 033
1987	BV		1987	01	28.00949	09	07	48.30	+20	07	07.6	033
1987	BW	*	1987	01	27.92257	08	58	40.64	+19	01	35.4	19.7 033
1987	BW		1987	01	28.00949	08	58	34.79	+19	01	55.5	033
1987	BX	*	1987	01	27.92257	08	59	30.28	+19	27	27.6	19.4 033
1987	BX		1987	01	28.00949	08	59	24.52	+19	28	00.0	033
1987	BY	*	1987	01	27.92257	09	00	24.83	+19	35	51.4	19.5 033
1987	BY		1987	01	28.00949	09	00	20.01	+19	36	35.3	033
1987	BZ	*	1987	01	27.92257	09	02	54.92	+17	45	17.5	19.4 033
1987	BZ		1987	01	28.00949	09	02	48.92	+17	45	43.8	033
1987	BA1	*	1987	01	27.92257	09	04	34.49	+17	23	57.9	18.7 033
1987	BA1		1987	01	28.00949	09	04	29.19	+17	24	45.9	033
1987	BB1	*	1987	01	27.92257	09	04	36.52	+19	11	42.7	19.2 033
1987	BB1		1987	01	28.00949	09	04	30.65	+19	12	02.0	033
1987	BC1	*	1987	01	27.92257	09	05	05.25	+18	52	11.1	20.4 033
1987	BC1		1987	01	28.00949	09	05	01.13	+18	52	51.7	033
1987	BD1	*	1987	01	27.92257	09	05	21.77	+17	56	35.7	19.3 033
1987	BD1		1987	01	28.00949	09	05	15.29	+17	56	26.2	033
1987	BE1	*	1987	01	27.92257	09	06	24.01	+17	49	54.2	19.6 033
1987	BE1		1987	01	28.00949	09	06	19.36	+17	50	19.9	033
1987	BF1	*	1987	01	27.92257	09	07	17.23	+19	36	35.6	19.0 033
1987	BF1		1987	01	28.00949	09	07	11.88	+19	37	08.0	033
1987	BG1	*	1987	01	27.92257	09	08	10.19	+19	01	01.8	19.2 033
1987	BG1		1987	01	28.00949	09	08	04.40	+19	01	30.1	033
1987	BH1	*	1987	01	27.92257	09	08	57.05	+19	32	32.0	19.5 033
1987	BH1		1987	01	28.00949	09	08	50.89	+19	32	17.5	033
1987	BJ1	*	1987	01	27.92257	09	09	08.69	+18	20	36.5	18.8 033
1987	BJ1		1987	01	28.00949	09	09	02.99	+18	20	55.1	033

1987	BK1	*	1987	01	27.92257	09	09	57.77	+18	58	22.4	18.1	033
1987	BK1		1987	01	28.00949	09	09	51.67	+18	58	10.9		033
1987	BL1	*	1987	01	27.92257	09	10	01.39	+18	27	09.2	19.2	033
1987	BL1		1987	01	28.00949	09	09	55.34	+18	27	24.7		033
1987	CB	*	1987	02	02.01215	10	35	51.30	+12	32	51.0	19.9	033
1987	CB		1987	02	02.02847	10	35	50.85	+12	32	57.2		033
1987	CC	*	1987	02	02.01215	10	38	10.15	+12	58	24.2	19.3	033
1987	CC		1987	02	02.02847	10	38	09.52	+12	58	28.6		033
1987	CD	*	1987	02	02.01215	10	39	20.38	+11	55	48.6	19.1	033
1987	CD		1987	02	02.02847	10	39	19.75	+11	55	53.1		033
1987	CE	*	1987	02	02.01215	10	39	32.02	+12	12	22.5	19.6	033
1987	CE		1987	02	02.02847	10	39	31.30	+12	12	26.6		033
1987	CF	*	1987	02	02.01215	10	44	04.89	+13	01	54.6	18.9	033
1987	CF		1987	02	02.02847	10	44	04.32	+13	02	01.8		033
178			1987	02	02.01215	10	36	47.76	+12	00	15.6	13.8	033
178			1987	02	02.02847	10	36	47.09	+12	00	20.0		033
492			1987	01	26.92604	09	06	59.91	+18	52	54.2		033
492			1987	01	27.92257	09	06	12.09	+18	56	26.8	15.8	033
492			1987	01	28.00949	09	06	07.81	+18	56	44.7		033
1125			1987	02	02.01215	10	45	23.26	+11	54	21.1	17.1	033
1125			1987	02	02.02847	10	45	22.73	+11	54	26.1		033
1455			1987	02	02.01215	10	40	36.23	+12	54	51.5	17.2	033
1455			1987	02	02.02847	10	40	35.65	+12	55	00.2		033
1912			1987	01	26.92604	09	09	40.98	+20	25	59.9		033
1912			1987	01	27.92257	09	08	48.81	+20	30	31.2	16.8	033
1912			1987	01	28.00949	09	08	44.12	+20	30	55.5		033
2858			1987	01	27.92257	09	02	08.03	+17	23	42.0	18.7	033
2858			1987	01	28.00949	09	02	02.54	+17	24	17.5		033
3382			1987	02	02.01215	10	39	30.13	+13	29	49.9	19.2	033
3382			1987	02	02.02847	10	39	29.22	+13	29	54.2		033
3460			1987	02	02.01215	10	37	06.04	+11	52	05.2	19.5	033
3460			1987	02	02.02847	10	37	05.45	+11	52	08.7		033

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1977	DO4		1987	01	31.90347	09	15	08.09	+20	08	40.1		046
1977	DO4		1987	01	31.91806	09	15	07.00	+20	08	43.4		046
1977	DO4		1987	02	01.90764	09	14	01.70	+20	12	23.6		046
1977	DO4		1987	02	01.92222	09	14	00.76	+20	12	27.7		046
1977	DO4		1987	02	02.84769	09	12	59.44	+20	15	50.9		046
1977	DO4		1987	02	02.86186	09	12	58.66	+20	15	54.0		046
1978	QJ2		1987	02	24.81481	09	34	04.12	+15	57	08.0		046
1978	QJ2		1987	02	24.82899	09	34	03.39	+15	57	11.1		046
1978	QJ2		1987	02	25.81389	09	33	19.36	+16	00	31.4		046
1978	QJ2		1987	02	25.82801	09	33	18.71	+16	00	34.0		046
1980	DS		1987	02	24.81481	09	31	52.90	+14	55	27.7		046
1980	DS		1987	02	24.82899	09	31	51.85	+14	55	35.2		046
1980	DS		1987	02	25.81389	09	30	59.42	+15	02	28.9		046
1980	DS		1987	02	25.82801	09	30	58.72	+15	02	33.2		046
1981	YY1		1987	02	24.84792	09	56	15.03	+16	00	40.7		046
1981	YY1		1987	02	24.86209	09	56	14.39	+16	00	43.6		046
1981	YY1		1987	02	25.84878	09	55	26.63	+16	07	56.8		046
1981	YY1		1987	02	25.86291	09	55	25.90	+16	08	04.0		046
1982	FP3		1987	01	31.90347	09	07	10.04	+19	47	06.4		046
1982	FP3		1987	01	31.91806	09	07	09.11	+19	47	09.6		046
1982	FP3		1987	02	01.90764	09	06	19.41	+19	51	05.8		046

1982	FP3		1987	02	01.92222	09	06	18.90	+19	51	08.5		046
1982	WK		1987	01	21.89167	07	40	04.89	+12	36	15.5		046
1982	WK		1987	01	21.90579	07	40	03.91	+12	36	17.6		046
1984	QN		1987	02	24.84792	09	56	06.81	+14	05	26.8		046
1984	QN		1987	02	24.86209	09	56	06.04	+14	05	29.2		046
1984	QN		1987	02	25.84878	09	55	13.01	+14	08	19.2		046
1984	QN		1987	02	25.86291	09	55	12.46	+14	08	20.1		046
1987	BK		1987	01	21.92477	07	39	28.36	+22	40	17.5	16.0	046
1987	BK		1987	01	21.93889	07	39	27.72	+22	40	21.1		046
1987	BK1		1987	01	31.90347	09	05	22.08	+18	49	50.6	17.0	046
1987	BK1		1987	01	31.91806	09	05	20.87	+18	49	49.1		046
1987	BK1		1987	02	01.90764	09	04	11.81	+18	47	37.0		046
1987	BK1		1987	02	01.92222	09	04	10.66	+18	47	35.5		046
1987	BG2	*	1987	01	21.82199	06	56	20.74	+25	14	33.6	16.5	046
1987	BG2		1987	01	21.83611	06	56	19.77	+25	14	35.3		046
1987	BH2	*	1987	01	21.92477	07	44	56.27	+21	26	17.2	15.8	046
1987	BH2		1987	01	21.93889	07	44	54.91	+21	26	30.1		046
1987	BJ2	*	1987	01	30.96597	08	31	00.86	+16	57	33.9	17.2	046
1987	BJ2		1987	01	30.98056	08	30	59.73	+16	57	48.6		046
1987	BJ2		1987	02	01.86875	08	29	24.34	+17	08	58.8		046
1987	BJ2		1987	02	01.88333	08	29	23.18	+17	09	01.2		046
1987	BK2	*	1987	01	30.96597	08	35	44.21	+14	12	17.8	17.0	046
1987	BK2		1987	01	30.98056	08	35	43.52	+14	12	16.0		046
1987	BK2		1987	02	01.86875	08	33	42.48	+14	16	44.1		046
1987	BK2		1987	02	01.88333	08	33	41.43	+14	16	43.2		046
1987	BL2	*	1987	01	30.96597	08	40	20.56	+16	08	14.4		046
1987	BL2		1987	01	30.98056	08	40	19.74	+16	08	17.9		046
1987	BL2		1987	01	31.86250	08	39	32.41	+16	11	25.7		046
1987	BL2		1987	01	31.87778	08	39	31.80	+16	11	30.7		046
1987	BL2		1987	02	01.86875	08	38	39.00	+16	15	00.6		046
1987	BL2		1987	02	01.88333	08	38	38.10	+16	15	03.2		046
1987	BM2	*	1987	01	31.90347	09	08	00.97	+19	53	44.1	17.0	046
1987	BM2		1987	01	31.91806	09	07	59.98	+19	53	49.2		046
1987	BM2		1987	02	01.90764	09	06	54.44	+19	59	55.1		046
1987	BM2		1987	02	02.84769	09	05	51.81	+20	05	40.2		046
1987	BM2		1987	02	02.86186	09	05	50.89	+20	05	45.9		046
1987	BN2	*	1987	01	31.90347	09	08	48.14	+18	41	50.2	16.9	046
1987	BN2		1987	01	31.91806	09	08	47.08	+18	41	53.8		046
1987	BN2		1987	02	01.90764	09	07	46.37	+18	45	36.6		046
1987	BN2		1987	02	01.92222	09	07	45.63	+18	45	37.4		046
1987	BN2		1987	02	02.84769	09	06	49.00	+18	49	02.7		046
1987	BN2		1987	02	02.86186	09	06	48.02	+18	49	05.6		046
1987	BO2	*	1987	01	31.90347	09	10	34.86	+18	44	15.7	16.9	046
1987	BO2		1987	01	31.91806	09	10	33.90	+18	44	16.8		046
1987	BO2		1987	02	01.90764	09	09	27.31	+18	45	58.3		046
1987	BO2		1987	02	01.92222	09	09	26.32	+18	45	59.7		046
1987	BO2		1987	02	02.84769	09	08	24.12	+18	47	29.0		046
1987	BO2		1987	02	02.86186	09	08	23.06	+18	47	31.2		046
1987	BP2	*	1987	01	31.90347	09	14	08.54	+16	59	35.1	16.9	046
1987	BP2		1987	01	31.91806	09	14	07.61	+16	59	39.9		046
1987	BP2		1987	02	01.90764	09	13	09.46	+17	06	34.5		046
1987	BP2		1987	02	01.92222	09	13	08.75	+17	06	38.9		046
1987	BP2		1987	02	02.84769	09	12	14.36	+17	13	02.4		046
1987	BP2		1987	02	02.86186	09	12	13.51	+17	13	05.2		046
1987	BQ2		1987	01	31.94306	09	12	10.09	+23	28	40.9	16.3	046
1987	BQ2	*	1987	01	31.95764	09	12	09.20	+23	28	46.2	16.9	046
1987	BQ2		1987	02	01.97153	09	11	20.05	+23	33	30.3		046
1987	BQ2		1987	02	02.88200	09	10	36.18	+23	37	36.3		046
1987	BQ2		1987	02	02.89612	09	10	35.34	+23	37	42.3		046

1987	BQ2		1987	02	03.86458	09	09	48.25	+23	42	11.6	046
1987	BQ2		1987	02	03.87564	09	09	47.58	+23	42	15.2	046
1987	BR2	*	1987	01	21.82199	06	43	36.03	+25	12	22.5	16.3 046
1987	BR2		1987	01	21.83611	06	43	35.37	+25	12	23.0	046
1987	CL	*	1987	02	01.90764	09	16	00.56	+18	50	17.4	16.8 046
1987	CL		1987	02	01.92222	09	15	59.87	+18	50	22.3	046
1987	CL		1987	02	02.84769	09	15	13.28	+18	54	47.5	046
1987	CL		1987	02	02.86186	09	15	12.55	+18	54	51.6	046
1987	CM		1987	01	31.94306	09	13	36.91	+22	57	56.8	16.9 046
1987	CM	*	1987	02	01.94375	09	12	45.43	+23	01	06.2	16.9 046
1987	CM		1987	02	01.97153	09	12	44.06	+23	01	12.6	046
1987	CM		1987	02	02.88200	09	11	56.97	+23	03	59.9	046
1987	CM		1987	02	02.89612	09	11	56.12	+23	04	04.5	046
1987	CM		1987	02	03.86458	09	11	06.07	+23	07	03.6	046
1987	CM		1987	02	03.87564	09	11	05.41	+23	07	05.8	046
1987	CN		1987	01	31.94306	09	14	43.89	+23	50	43.0	16.8 046
1987	CN	*	1987	02	01.94375	09	13	33.15	+23	49	49.3	16.8 046
1987	CN		1987	02	01.97153	09	13	31.23	+23	49	47.8	046
1987	CN		1987	02	03.86458	09	11	17.30	+23	47	51.0	046
1987	CN		1987	02	03.87564	09	11	16.52	+23	47	50.5	046
1987	CO		1987	01	31.94306	09	17	39.25	+21	19	25.5	16.8 046
1987	CO	*	1987	02	01.94375	09	16	50.51	+21	23	58.5	16.8 046
1987	CO		1987	02	01.97153	09	16	49.09	+21	24	07.2	046
1987	CO		1987	02	02.88200	09	16	04.51	+21	28	12.5	046
1987	CO		1987	02	02.89612	09	16	03.78	+21	28	17.4	046
1987	CO		1987	02	03.86458	09	15	16.31	+21	32	41.1	V 046
1987	CO		1987	02	03.87564	09	15	15.20	+21	32	41.4	V 046
1987	DS	*	1987	02	24.81481	09	32	09.55	+16	49	47.3	16.4 046
1987	DS		1987	02	24.82899	09	32	08.98	+16	49	50.4	046
1987	DS		1987	02	25.81389	09	31	25.80	+16	53	54.7	046
1987	DS		1987	02	25.82801	09	31	25.16	+16	53	57.0	046
1987	DS		1987	03	03.81655	09	27	20.46	+17	16	26.6	046
1987	DS		1987	03	03.83073	09	27	19.75	+17	16	30.2	046
1987	DT	*	1987	02	24.84792	09	52	13.72	+13	09	15.9	16.8 046
1987	DT		1987	02	24.86209	09	52	13.44	+13	09	20.9	046
1987	DT		1987	02	25.84878	09	51	14.72	+13	16	05.5	046
1987	DT		1987	02	25.86281	09	51	14.03	+13	16	12.1	046
1987	DU	*	1987	02	24.88264	10	10	13.21	+12	12	05.2	17.0 046
1987	DU		1987	02	24.89676	10	10	12.40	+12	12	20.0	046
1987	DV	*	1987	02	24.88264	10	16	58.20	+13	13	30.0	17.0 046
1987	DV		1987	02	24.89676	10	16	57.52	+13	13	26.5	046
1987	DW	*	1987	02	24.88264	10	21	19.07	+11	35	10.5	16.9 046
1987	DW		1987	02	24.89676	10	21	18.30	+11	35	16.4	046
1987	DX	*	1987	02	25.88247	10	18	58.63	+15	51	11.7	16.9 046
1987	DX		1987	02	25.89676	10	18	57.62	+15	51	18.8	046
1987	DY	*	1987	02	25.88247	10	19	55.24	+15	02	19.8	17.0 046
1987	DY		1987	02	25.89676	10	19	54.54	+15	02	25.0	046
1987	DZ	*	1987	02	25.88247	10	23	53.20	+14	02	12.3	16.8 046
1987	DZ		1987	02	25.89676	10	23	52.40	+14	02	18.6	046
1987	DA1	*	1987	02	25.88247	10	24	34.07	+16	32	45.9	16.9 046
1987	DA1		1987	02	25.89676	10	24	33.24	+16	32	53.3	046
1987	DB1	*	1987	02	25.88247	10	24	34.34	+15	21	59.7	16.8 046
1987	DB1		1987	02	25.89676	10	24	33.45	+15	22	02.2	046
120			1987	01	31.94306	09	06	58.24	+21	42	43.8	046
120			1987	01	31.95764	09	06	57.44	+21	42	46.0	046
120			1987	02	01.94375	09	06	04.44	+21	44	55.7	046
120			1987	02	01.97153	09	06	02.85	+21	44	53.5	046
120			1987	02	02.88200	09	05	13.95	+21	46	46.4	046
120			1987	02	02.89612	09	05	13.19	+21	46	48.4	046

120	1987	02	03.86458	09	04	20.82	+21	48	44.5	046
120	1987	02	03.87564	09	04	20.38	+21	48	45.2	046
135	1987	01	30.91250	08	18	17.87	+21	53	32.9	046
135	1987	01	30.92708	08	18	16.88	+21	53	34.7	046
178	1987	02	24.88264	10	16	40.51	+14	00	22.6	046
178	1987	02	24.89676	10	16	39.67	+14	00	27.1	046
178	1987	02	25.88247	10	15	42.45	+14	05	33.7	046
178	1987	02	25.89676	10	15	41.63	+14	05	38.6	046
222	1987	01	30.91250	08	14	53.62	+21	58	17.4	046
222	1987	01	30.92708	08	14	52.86	+21	58	19.5	046
289	1987	01	21.89167	07	42	02.87	+12	09	47.4	046
289	1987	01	21.90579	07	42	02.00	+12	09	50.3	046
427	1987	01	30.96597	08	39	48.88	+16	56	19.4	046
427	1987	01	30.98056	08	39	48.11	+16	56	21.0	046
427	1987	01	31.86250	08	39	01.96	+16	58	14.6	046
427	1987	01	31.87778	08	39	01.09	+16	58	16.5	046
427	1987	02	01.86875	08	38	09.38	+17	00	23.2	046
427	1987	02	01.88333	08	38	08.48	+17	00	25.0	046
492	1987	01	31.90347	09	02	59.04	+19	10	27.3	046
492	1987	01	31.91806	09	02	58.16	+19	10	29.4	046
492	1987	02	01.90764	09	02	09.81	+19	13	54.6	046
492	1987	02	01.92222	09	02	09.08	+19	13	58.6	046
492	1987	02	02.84769	09	01	23.87	+19	17	09.2	046
492	1987	02	02.86186	09	01	23.23	+19	17	12.6	046
522	1987	01	21.92477	07	46	17.34	+21	08	03.9	046
522	1987	01	21.93889	07	46	16.67	+21	08	06.1	046
811	1987	02	24.88264	10	16	05.63	+12	36	23.0	046
811	1987	02	24.89676	10	16	05.00	+12	36	27.1	046
817	1987	01	31.90347	09	08	18.25	+19	04	26.6	046
817	1987	01	31.91806	09	08	17.30	+19	04	34.5	046
817	1987	02	01.90764	09	07	21.76	+19	13	48.6	046
817	1987	02	01.92222	09	07	20.87	+19	13	56.0	046
817	1987	02	02.84769	09	06	28.96	+19	22	30.3	046
817	1987	02	02.86186	09	06	28.10	+19	22	37.7	046
820	1987	01	21.92477	07	45	25.71	+20	56	17.4	046
820	1987	01	21.93889	07	45	25.05	+20	56	20.2	046
917	1987	02	24.88264	10	08	33.14	+13	09	59.5	046
917	1987	02	24.89676	10	08	32.22	+13	10	04.1	046
946	1987	01	30.91250	08	11	25.91	+21	52	57.5	046
946	1987	01	30.92708	08	11	25.09	+21	53	00.0	046
1003	1987	02	24.84792	10	00	20.73	+12	47	42.6	046
1003	1987	02	24.86209	10	00	20.13	+12	47	45.1	046
1003	1987	02	25.84878	09	59	34.73	+12	52	30.3	046
1003	1987	02	25.86291	09	59	33.98	+12	52	30.7	046
1007	1987	01	19.82008	06	49	54.38	+24	16	42.9	16.3 046
1007	1987	01	19.83420	06	49	53.67	+24	16	44.0	046
1007	1987	01	21.82199	06	48	08.58	+24	16	30.1	046
1007	1987	01	21.83611	06	48	07.82	+24	16	30.5	046
1027	1987	02	24.84792	10	00	39.16	+13	57	19.3	046
1027	1987	02	24.86209	10	00	38.48	+13	57	23.2	046
1027	1987	02	25.84878	09	59	51.65	+14	01	14.8	046
1027	1987	02	25.86291	09	59	50.98	+14	01	15.6	046
1105	1987	01	21.92477	07	40	37.27	+21	05	12.9	046
1105	1987	01	21.93889	07	40	36.56	+21	05	16.8	046
1117	1987	02	24.84792	09	51	20.08	+13	18	27.1	046
1117	1987	02	24.86209	09	51	19.22	+13	18	31.4	046
1117	1987	02	25.84878	09	50	20.04	+13	25	19.7	046
1117	1987	02	25.86291	09	50	19.17	+13	25	24.8	046
1125	1987	02	25.88247	10	28	23.54	+14	01	33.6	046

1125	1987	02	25.89676	10	28	22.91	+14	01	38.2	046
1334	1987	01	30.96597	08	35	43.81	+17	03	54.6	046
1334	1987	01	30.98056	08	35	42.97	+17	04	00.3	046
1334	1987	01	31.86250	08	34	58.43	+17	09	33.8	046
1334	1987	01	31.87778	08	34	57.53	+17	09	39.2	046
1334	1987	02	01.86875	08	34	07.20	+17	15	54.7	046
1334	1987	02	01.88333	08	34	06.43	+17	16	00.5	046
1381	1987	02	24.84792	09	53	21.23	+15	51	30.9	046
1381	1987	02	24.86209	09	53	20.47	+15	51	33.8	046
1381	1987	02	25.84878	09	52	22.74	+15	54	42.5	046
1381	1987	02	25.86291	09	52	21.81	+15	54	45.6	046
1417	1987	01	19.82008	06	55	53.19	+25	13	48.7	046
1417	1987	01	19.83420	06	55	52.49	+25	13	50.3	046
1417	1987	01	21.82189	06	54	11.35	+25	19	32.1	046
1417	1987	01	21.83611	06	54	10.63	+25	19	35.4	046
1425	1987	01	20.83090	06	34	20.40	+02	46	30.8	046
1425	1987	01	20.84502	06	34	19.78	+02	46	36.0	046
1455	1987	02	25.88247	10	20	55.40	+16	57	03.3	046
1455	1987	02	25.89676	10	20	54.63	+16	57	11.4	046
1488	1987	02	25.88247	10	26	37.91	+15	56	37.5	046
1488	1987	02	25.89676	10	26	37.12	+15	56	38.3	046
1555	1987	02	03.83461	08	46	45.90	+19	11	08.0	046
1684	1987	01	31.90347	09	14	28.51	+18	38	42.4	046
1684	1987	01	31.91806	09	14	27.74	+18	38	46.3	046
1684	1987	02	01.90764	09	13	39.25	+18	43	16.3	046
1684	1987	02	01.92222	09	13	38.60	+18	43	19.4	046
1684	1987	02	02.84769	09	12	53.19	+18	47	30.9	046
1684	1987	02	02.86186	09	12	52.46	+18	47	33.6	046
1725	1987	02	24.84792	09	55	48.22	+15	03	03.4	046
1725	1987	02	24.86209	09	55	47.57	+15	03	06.3	046
1725	1987	02	25.84878	09	55	00.25	+15	07	51.9	046
1725	1987	02	25.86291	09	54	59.62	+15	07	55.3	046
1790	1987	02	25.88247	10	24	07.25	+14	57	36.7	046
1790	1987	02	25.89676	10	24	06.32	+14	57	38.8	046
1912	1987	01	31.90347	09	05	17.64	+20	48	13.0	046
1912	1987	01	31.91806	09	05	16.58	+20	48	14.7	046
1912	1987	02	01.90764	09	04	23.58	+20	52	35.1	046
1912	1987	02	01.92222	09	04	22.89	+20	52	37.1	046
1912	1987	02	02.84769	09	03	33.22	+20	56	37.1	046
1912	1987	02	02.86186	09	03	32.32	+20	56	42.7	046
2043	1987	01	19.82008	06	52	32.16	+25	27	16.7	046
2043	1987	01	19.83420	06	52	31.57	+25	27	17.0	046
2043	1987	01	21.82199	06	50	54.34	+25	27	10.9	046
2043	1987	01	21.83611	06	50	53.64	+25	27	11.6	046
2073	1987	01	20.79589	06	27	41.25	+25	00	37.4	046
2073	1987	01	20.81013	06	27	40.56	+25	00	38.7	046
2091	1987	01	31.94306	09	11	34.98	+21	58	30.2	046
2091	1987	01	31.95764	09	11	34.26	+21	58	36.6	046
2091	1987	02	01.94375	09	10	45.16	+22	05	44.6	046
2091	1987	02	01.97153	09	10	43.73	+22	05	57.1	046
2091	1987	02	02.88200	09	09	58.31	+22	12	28.9	046
2091	1987	02	02.89612	09	09	57.57	+22	12	35.2	046
2091	1987	02	03.86458	09	09	09.15	+22	19	29.1	046
2091	1987	02	03.87564	09	09	08.48	+22	19	34.9	046
2297	1987	02	24.84792	09	51	55.86	+13	19	13.8	046
2297	1987	02	24.86209	09	51	55.22	+13	19	17.1	046
2297	1987	02	25.84878	09	51	09.40	+13	23	45.9	046
2297	1987	02	25.86291	09	51	08.72	+13	23	47.6	046
2342	1987	01	21.92477	07	41	22.58	+20	54	56.4	046

2342	1987 01 21.93889	07 41 21.80	+20 54 59.5			046
2646	1987 02 25.88247	10 21 46.50	+15 11 18.9			046
2646	1987 02 25.89676	10 21 45.62	+15 11 20.4			046
2809	1986 12 09.00966	04 27 42.08	+25 55 07.7			046
2809	1986 12 09.02425	04 27 41.21	+25 55 07.3			046
2870	1987 02 25.88247	10 25 11.46	+16 17 50.6			046
2870	1987 02 25.89676	10 25 10.63	+16 17 55.0			046
3029	1986 12 09.00966	04 29 06.69	+26 51 17.7			046
3029	1986 12 09.02425	04 29 05.60	+26 51 13.7			046
3031	1987 01 19.82008	06 53 44.67	+26 28 25.8			046
3031	1987 01 19.83420	06 53 43.79	+26 28 23.9			046
3031	1987 01 21.82199	06 51 31.45	+26 25 54.4			046
3031	1987 01 21.83611	06 51 30.64	+26 25 54.1			046
3188	1987 01 31.90347	09 10 17.79	+19 31 25.4			046
3188	1987 01 31.91806	09 10 16.65	+19 31 26.6			046
3188	1987 02 01.90764	09 09 08.95	+19 34 32.1			046
3188	1987 02 01.92222	09 09 08.19	+19 34 34.0			046
3219	1987 01 31.86250	08 42 52.27	+14 33 39.9			046
3219	1987 01 31.87778	08 42 51.40	+14 33 40.6			046
3219	1987 02 01.86875	08 41 57.86	+14 35 10.6			046
3219	1987 02 01.88333	08 41 56.90	+14 35 11.8			046
3334	1987 01 19.82008	06 50 43.55	+24 40 31.0			046
3334	1987 01 19.83420	06 50 42.85	+24 40 33.7			046
3334	1987 01 21.82199	06 49 00.68	+24 43 54.2			046
3334	1987 01 21.83611	06 48 59.89	+24 43 57.3			046
3356	1987 01 31.90347	09 09 18.60	+19 29 08.9			046
3356	1987 01 31.91806	09 09 17.44	+19 29 13.6			046
3356	1987 02 01.90764	09 08 12.34	+19 35 53.8			046
3356	1987 02 01.92222	09 08 11.37	+19 35 57.9			046
3356	1987 02 02.84769	09 07 10.29	+19 42 09.5			046
3356	1987 02 02.86186	09 07 09.26	+19 42 17.3			046
3364	1987 02 24.88264	10 15 18.99	+12 13 22.2			046
3364	1987 02 24.89676	10 15 18.37	+12 13 27.8			046
3382	1987 02 25.88247	10 15 02.19	+15 11 48.6			046
3382	1987 02 25.89676	10 15 01.22	+15 11 51.5			046
3550	1987 01 19.78611	05 12 28.11	+28 07 25.6			046
3550	1987 01 19.80023	05 12 27.64	+28 07 29.1			046
3550	1987 01 20.74676	05 12 02.22	+28 11 19.0			046
3550	1987 01 20.77407	05 12 01.37	+28 11 26.4			046

047 Poznan
H. Hurnik, Astronomical Observatory, Adam Mickiewicz University,
Sloneczna 36, PL-60286 Poznan, Poland
Observers M. Gromadzinski, D. Matz, M. Mielnik, B. Morkowska, S. Swierkowska
0.20-m f/15 refractor
Yale, AKG2, AGK3, SAOC

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1	1967 02 11.86469	05 27 16.03	+28 24 39.6			047
1	1967 02 13.86829	05 27 33.22	+28 27 47.2			047
1	1967 02 13.87025	05 27 33.33	+28 27 47.8			047
1	1967 02 16.90358	05 28 13.91	+28 32 24.5			047
1	1967 02 16.90705	05 28 13.92	+28 32 24.7			047
1	1967 02 22.90527	05 30 23.26	+28 41 09.8			047
1	1967 02 22.90840	05 30 23.40	+28 41 09.9			047
1	1967 02 25.84690	05 31 49.40	+28 45 16.9			047
1	1967 02 25.85003	05 31 49.53	+28 45 17.6			047
1	1967 03 01.89757	05 34 11.24	+28 50 43.2			047
1	1967 03 01.90070	05 34 11.29	+28 50 43.2			047
1	1967 03 06.92497	05 37 42.96	+28 57 03.7			047

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1		1967	03	07.84511	05	38	25.85	+28 58 12.0	047
1		1967	03	07.84788	05	38	26.00	+28 58 12.2	047
1		1984	10	13.03664	03	33	46.40	+09 22 07.1	047
1		1984	10	13.04220	03	33	46.31	+09 22 06.9	047
1		1984	10	18.04347	03	30	51.14	+09 14 00.8	047
1		1984	11	05.05223	03	16	20.15	+08 46 30.8	047
1		1984	11	12.96637	03	08	52.06	+08 38 48.4	047
1		1984	11	13.95314	03	07	55.75	+08 38 09.0	047
1		1984	11	15.92292	03	06	03.54	+08 37 05.2	047
1		1984	12	04.93186	02	49	50.25	+08 46 26.5	047
3		1967	02	09.92304	08	08	00.50	+05 36 02.9	047
3		1967	02	09.92651	08	08	00.42	+05 36 05.6	047
3		1967	02	11.87128	08	06	43.40	+05 56 18.5	047
3		1967	02	11.87441	08	06	43.27	+05 56 20.7	047
3		1967	02	13.88067	08	05	29.30	+06 17 14.3	047
3		1967	02	13.88414	08	05	29.20	+06 17 16.4	047
3		1967	02	16.91747	08	03	48.76	+06 48 45.1	047
3		1967	02	16.92094	08	03	48.71	+06 48 46.1	047
3		1967	02	22.91465	08	01	14.30	+07 49 46.1	047
3		1967	02	22.91743	08	01	14.23	+07 49 48.0	047
3		1967	02	22.92298	08	01	14.17	+07 49 52.2	047
3		1967	02	25.85836	08	00	21.05	+08 18 46.6	047
3		1967	02	25.86357	08	00	20.92	+08 18 50.9	047
3		1967	02	25.86669	08	00	20.89	+08 18 52.7	047
3		1967	03	01.90903	07	59	32.32	+08 57 20.5	047
3		1967	03	01.91424	07	59	32.28	+08 57 23.3	047
3		1967	03	01.91736	07	59	32.24	+08 57 24.5	047
3		1967	03	06.93609	07	59	12.38	+09 42 34.0	047
3		1967	03	06.94164	07	59	12.37	+09 42 36.6	047
3		1967	03	06.94476	07	59	12.38	+09 42 38.9	047
3		1967	03	07.85483	07	59	13.68	+09 50 30.4	047
3		1967	03	07.86316	07	59	13.71	+09 50 34.1	047
3		1985	04	19.94091	12	06	54.54	+05 57 13.2	047
3		1985	04	26.86700	12	03	33.20	+06 31 14.3	047
3		1985	05	14.85341	11	59	19.99	+07 18 09.5	047
3		1985	05	17.86694	11	59	16.57	+07 20 26.7	047
4		1985	04	19.99439	14	01	50.49	+01 01 33.6	047
4		1985	04	26.89860	13	55	19.95	+01 27 21.4	047
4		1985	05	14.88709	13	40	38.20	+01 46 57.7	047
4		1985	05	17.90097	13	38	48.46	+01 42 50.5	047
4		1985	05	20.91590	13	37	13.03	+01 36 34.3	047
6		1984	10	13.08873	06	35	47.95	+05 49 47.7	047
6		1984	11	05.06473	06	49	01.10	+04 04 35.8	047
6		1984	12	04.93464	06	40	01.21	+03 25 11.5	047
7		1967	02	13.89699	10	29	18.62	+00 06 59.1	047
7		1967	02	13.90636	10	29	18.04	+00 07 01.0	047
7		1967	02	13.91192	10	29	17.76	+00 07 02.5	047
7		1967	02	16.94247	10	26	17.94	+00 20 26.2	047
7		1967	02	16.94802	10	26	17.56	+00 20 28.0	047
7		1967	03	01.92778	10	13	20.83	+01 29 26.7	047
7		1967	03	01.93542	10	13	20.37	+01 29 28.8	047
7		1967	03	07.87288	10	07	51.05	+02 04 24.2	047
7		1967	03	07.87951	10	07	50.69	+02 04 26.7	047
7		1967	03	07.88469	10	07	50.40	+02 04 28.1	047
7		1984	10	13.07067	05	40	19.45	+26 44 25.2	047
7		1984	10	13.07414	05	40	19.68	+26 44 25.2	047
7		1984	10	17.04697	05	43	58.38	+26 37 20.0	047
7		1984	11	05.05744	05	52	34.92	+25 46 09.3	047

7		1984	11	12.97123	05	51	31.41	+25	17	01.7	047
7		1984	11	13.96043	05	51	11.86	+25	13	03.6	047
7		1984	12	04.94089	05	35	51.86	+23	32	44.6	047
8		1984	10	13.03664	01	34	49.89	-03	36	52.8	047
8		1984	10	13.04220	01	34	49.56	-03	36	55.0	047
8		1984	10	16.99350	01	31	14.31	-03	57	34.6	047
8		1984	10	18.02061	01	30	17.58	-04	02	23.9	047
8		1984	11	12.94102	01	11	36.56	-04	23	12.4	047
8		1984	11	13.90577	01	11	15.25	-04	20	00.5	047
8		1984	11	13.91355	01	11	15.05	-04	19	59.2	047
20		1985	04	19.95480	12	59	21.16	-06	26	41.2	047
20		1985	04	26.87672	12	53	55.31	-05	50	21.0	047
20		1985	05	14.85550	12	44	47.27	-04	46	58.8	047
23		1984	11	12.95977	02	53	05.35	+10	17	18.2	047
23		1984	11	15.91667	02	49	56.36	+10	18	02.5	047
37		1984	10	13.05262	01	33	38.50	+11	22	19.8	047
37		1984	10	18.02750	01	29	06.08	+11	05	19.3	047
37		1984	11	05.03314	01	13	38.61	+10	02	10.6	047
40		1984	12	03.92045	06	55	28.03	+22	19	03.7	047
40		1984	12	04.96589	06	54	42.57	+22	22	11.8	047
41		1985	05	14.87112	13	00	54.89	+09	35	45.3	047
41		1985	06	04.88149	13	07	13.38	+09	48	08.5	047
44		1985	04	26.89200	13	46	58.12	-04	24	03.7	047
44		1985	05	20.88396	13	30	27.40	-03	15	34.6	047
97		1984	10	17.01780	03	09	00.62	-01	02	28.3	047
97		1984	10	18.03653	03	08	34.49	-01	13	50.9	047
97		1984	11	05.04355	02	57	25.24	-04	10	23.3	047
97		1984	11	12.95039	02	51	33.38	-05	02	48.3	047
97		1984	11	13.93855	02	50	50.18	-05	07	53.6	047
97		1984	11	15.90868	02	49	25.45	-05	17	01.0	047
144		1984	11	12.93060	02	38	46.56	+10	36	23.3	047
144		1984	11	13.92293	02	37	54.25	+10	35	54.6	047
144		1984	11	13.92953	02	37	53.82	+10	35	54.2	047
144		1984	11	15.90000	02	36	12.38	+10	35	14.4	047

054 Brorfelde
H. G. Fogh Olsen, Copenhagen University Observatory, Brorfelde,
DK-4340 Tollose, Denmark
Observers K. Augustesen, P. Jensen
Measurer P. Jensen
0.45-m Schmidt
Observations in part in association with INAS

1977	KK1		1987	02	02.95068	08	19	04.04	+18	56	56.6		054
1980	CT		1987	01	27.03042	10	02	18.90	+29	56	23.8		054
1980	CT		1987	02	18.87440	09	35	37.48	+30	39	57.3	16.7	054
1980	CT		1987	02	19.95901	09	34	22.92	+30	38	24.8		054
1980	CT		1987	02	19.97637	09	34	21.56	+30	38	24.3		054
1985	RF		1987	01	27.00229	08	43	30.45	+14	13	40.6	17.1	054
1987	AK	*	1987	01	02.81759	03	00	16.92	+39	01	23.0	17.3	054
1987	BG		1987	02	02.95068	08	16	25.16	+18	36	28.0		054
1987	BM1	*	1987	01	27.03042	10	07	12.98	+28	29	38.0	16.8	054
1987	BM1		1987	02	18.87440	09	49	13.79	+31	45	15.1		054
1987	BM1		1987	02	19.95901	09	48	18.39	+31	52	10.5		054
1987	BM1		1987	02	19.97637	09	48	17.46	+31	52	17.8		054
1987	BM1		1987	02	22.95296	09	45	47.75	+32	09	43.0		054
1987	BM1		1987	02	22.97032	09	45	46.70	+32	09	52.0	16.6	054
1987	BN1	*	1987	01	29.96896	08	35	32.74	+10	17	23.2	16.7	054
1987	BN1		1987	02	02.97337	08	32	02.13	+10	53	59.5		054
1987	CJ		1987	02	23.01456	11	06	18.57	+07	18	47.2	17.0	054

1987	CJ		1987	02	24.98238	11	04	57.89	+07	34	42.6		054
1987	CJ		1987	03	02.94663	11	00	44.75	+08	23	25.3	17.0	054
1987	DB	*	1987	02	22.95296	09	42	46.02	+32	00	25.8	16.8	054
1987	DB		1987	02	22.97032	09	42	44.14	+32	00	28.8		054
1987	DC	*	1987	02	22.95296	09	47	31.33	+33	27	02.5	16.9	054
1987	DC		1987	02	22.97032	09	47	30.08	+33	26	59.2		054
1987	DD	*	1987	02	25.00380	11	44	39.58	+50	35	13.9	17.0	054
1987	DD		1987	02	25.01595	11	44	38.69	+50	35	22.6		054
1987	DD		1987	02	27.02208	11	42	34.51	+50	53	02.6		054
1987	DD		1987	02	27.03412	11	42	33.64	+50	53	09.1		054
1987	DD		1987	03	01.90982	11	39	28.03	+51	15	22.7	16.9	054
1987	DD		1987	03	01.92718	11	39	26.73	+51	15	31.9		054
1987	DH	*	1987	02	18.83343	08	02	22.37	+17	48	25.8	17.1	054
1987	DJ	*	1987	02	19.98852	10	32	09.97	+24	35	04.4	17.0	054
1987	DJ		1987	02	20.00067	10	32	09.37	+24	35	09.8		054
1987	DJ		1987	02	22.98956	10	29	42.92	+24	51	23.8		054
1987	DJ		1987	02	24.95755	10	28	06.01	+25	01	26.4		054
1987	DJ		1987	02	26.97509	10	26	26.24	+25	11	12.9	17.2	054
1987	DK	*	1987	02	22.91051	08	10	37.60	+29	23	11.6	16.7	054
1987	DK		1987	02	23.92659	08	09	55.61	+29	26	34.2		054
1987	DK		1987	03	01.87093	08	06	26.38	+29	42	41.7	17.0	054
1987	DC1	*	1987	02	18.85843	08	18	19.27	+12	30	27.2	17.3V	054
1987	DC1		1987	02	19.92729	08	17	24.47	+12	36	30.8		054
1987	DD1	*	1987	02	23.01456	11	05	46.40	+06	20	48.1	16.9	054
1987	DD1		1987	02	24.98238	11	04	22.28	+06	43	06.4		054
1987	DD1		1987	03	02.94663	10	59	52.92	+07	52	31.5	17.1	054
1987	DE1	*	1987	02	23.01456	11	06	32.28	+06	23	52.8	17.2	054
1987	DE1		1987	02	24.98238	11	04	52.08	+06	36	59.7		054
1987	DE1		1987	03	02.94663	10	59	36.75	+07	17	42.5	17.2	054
1987	DF1	*	1987	02	23.01456	11	12	15.42	+06	48	31.6	17.2	054
1987	DF1		1987	02	24.98238	11	10	50.46	+07	09	20.4		054
75			1987	02	24.98238	11	16	22.10	+06	40	42.1		054
192			1987	02	23.01456	11	00	37.59	+06	54	44.4		054
192			1987	02	24.98238	10	58	40.87	+07	02	38.5		054
192			1987	03	02.94663	10	52	41.06	+07	26	51.9		054
359			1987	02	22.91051	08	11	16.09	+28	05	49.1		054
359			1987	02	23.92659	08	10	36.72	+28	04	55.8		054
453			1987	02	22.91051	08	08	36.75	+28	15	03.3		054
453			1987	02	23.92659	08	07	51.83	+28	13	10.7		054
1097			1987	02	23.01456	11	05	05.36	+06	58	51.8		054
1097			1987	02	24.98238	11	03	28.72	+07	09	45.5		054
1097			1987	03	02.94663	10	58	26.25	+07	43	21.0		054
1345			1987	01	06.96954	08	51	56.81	+13	51	16.4	16.6	054
1428			1987	02	19.98852	10	26	22.01	+25	16	36.5		054
1428			1987	02	20.00067	10	26	21.28	+25	16	43.9		054
1428			1987	02	22.98956	10	23	51.06	+25	41	04.8		054
1428			1987	02	24.95755	10	22	11.86	+25	56	21.8		054
1428			1987	02	26.97509	10	20	30.19	+26	11	22.0		054
1542			1987	01	27.00229	08	40	03.16	+14	19	32.3		054
1592			1987	02	19.98852	10	30	23.61	+24	19	36.8		054
1592			1987	02	20.00067	10	30	22.97	+24	19	41.3		054
1592			1987	02	22.98956	10	27	44.21	+24	42	33.9		054
1592			1987	02	24.95755	10	25	58.24	+24	57	01.9		054
1592			1987	02	26.97509	10	24	08.99	+25	11	17.8		054
1839			1987	02	19.98852	10	31	34.12	+25	37	58.6		054
1839			1987	02	20.00067	10	31	33.26	+25	38	03.6		054
1839			1987	02	22.98956	10	28	43.27	+25	50	49.8		054
1839			1987	02	24.95755	10	26	51.22	+25	58	25.1		054
1839			1987	02	26.97509	10	24	56.57	+26	05	29.1		054

1924		1987	02	23.01456	10	57	23.00	+07	50	41.6	054
2203		1987	02	23.01456	11	06	14.69	+08	03	43.0	054
2203		1987	02	24.98238	11	04	49.19	+08	12	36.2	054
2203		1987	03	02.94663	11	00	23.95	+08	39	40.0	054
2249		1987	02	23.01456	11	02	50.50	+07	33	22.5	054
2249		1987	02	24.98238	11	01	28.24	+07	44	18.8	054
2249		1987	03	02.94663	10	57	10.62	+08	17	57.3	054
2279		1987	02	02.95068	08	16	27.12	+18	34	33.0	054
2501		1987	02	23.01456	11	14	11.72	+08	10	24.5	054
2501		1987	02	24.98238	11	12	26.32	+08	19	07.0	054
2501		1987	03	02.94663	11	06	45.21	+08	46	14.4	054
2722		1987	02	23.01456	11	03	20.67	+07	17	15.6	054
2722		1987	02	24.98238	11	01	56.24	+07	27	07.3	054
2722		1987	03	02.94663	10	57	30.63	+07	57	37.9	054
2731		1987	02	23.01456	11	13	36.29	+08	58	59.2	054
2731		1987	02	24.98238	11	12	19.38	+09	13	22.6	054
2731		1987	03	02.94663	11	08	15.42	+09	59	31.4	054
2792		1987	01	27.03042	09	57	35.23	+29	01	22.6	054
2792		1987	02	18.87440	09	30	33.03	+29	46	37.7	054
2792		1987	02	19.95901	09	29	17.91	+29	45	22.9	054
2792		1987	02	19.97637	09	29	16.69	+29	45	22.4	054
2898		1987	02	24.95755	10	20	55.61	+24	26	28.0	054
2898		1987	02	26.97509	10	19	07.70	+24	44	07.8	054
2924		1987	02	23.01456	11	15	35.78	+08	44	00.6	054
2924		1987	02	24.98238	11	14	08.52	+08	55	08.1	054
2924		1987	03	02.94663	11	09	32.22	+09	29	05.3	054
2960		1987	02	23.01456	11	15	52.92	+09	21	14.8	054
2960		1987	02	24.98238	11	14	10.50	+09	38	41.3	054
2960		1987	03	02.94663	11	08	43.02	+10	31	27.1	054
3103		1987	02	22.95296	09	46	19.71	+32	44	11.6	054
3103		1987	02	22.97032	09	46	17.99	+32	44	35.0	054
3219		1987	01	27.00229	08	47	13.90	+14	26	24.5	054
3309		1987	02	26.99766	11	33	25.65	+42	18	31.4	17.0 054
3309		1987	02	27.00982	11	33	23.87	+42	18	31.7	054
3369		1987	01	29.96896	08	30	40.81	+10	55	20.4	054
3369		1987	02	02.97337	08	27	11.75	+11	01	45.5	054
3369		1987	02	18.85843	08	15	04.61	+11	31	40.8	054
3369		1987	02	19.92729	08	14	24.06	+11	33	45.9	054
3377		1987	02	02.95068	08	14	15.89	+17	51	22.2	054

071 Bulgarian National Observatory
E. W. Elst, Royal Observatory, B-1180 Brussels, Belgium
Observers E. W. Elst, V. G. Ivanova, B. I. Bilkina
Measurers E. W. Elst, G. Peeters
Reductions E. W. Elst, C. Leterme

1982	YP1		1986	09	06.86222	21	41	58.19	-17	24	32.6	17 071
1982	YP1		1986	09	06.87995	21	41	57.18	-17	24	35.6	071
1986	PY		1986	09	06.86222	21	53	16.22	-16	41	22.8	17 071
1986	PY		1986	09	06.87995	21	53	15.73	-16	41	31.4	071
1986	PT4	*	1986	08	09.92662	21	54	31.14	-09	53	46.8	17 071
1986	PT4		1986	08	09.94521	21	54	30.23	-09	53	52.2	071
1986	PU4	*	1986	08	09.92662	21	58	04.83	-09	33	07.3	071
1986	PU4		1986	08	09.94521	21	58	03.63	-09	33	09.9	071
1986	RS		1986	09	07.88697	21	35	55.37	-04	13	11.2	17 071
1986	RS		1986	09	07.94689	21	35	52.82	-04	13	18.5	071
1986	RJ4	*	1986	09	06.86222	21	40	15.29	-13	43	58.6	17 071
1986	RJ4		1986	09	06.87995	21	40	13.61	-13	43	48.9	071
1986	RK4	*	1986	09	06.86222	21	44	23.76	-15	52	53.6	17 071
1986	RK4		1986	09	06.87995	21	44	22.92	-15	53	00.6	071

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1986 RL4 * 1986 09 06.86222  21 45 45.82  -14 39 22.1            17      071
1986 RL4   1986 09 06.87995  21 45 44.93  -14 39 32.9                    071
1986 RM4 * 1986 09 06.92625  01 45 30.87  +22 02 01.1            17      071
1986 RM4   1986 09 06.96360  01 45 30.50  +22 02 22.0                    071
1986 RN4 * 1986 09 07.01885  01 55 27.33  +28 22 42.2            17      071
1986 RN4   1986 09 07.05279  01 55 26.94  +28 22 52.5                    071
1986 RO4 * 1986 09 07.88697  21 37 48.81  -02 45 48.1            17      071
1986 RO4   1986 09 07.94689  21 37 46.63  -02 46 21.4                    071
 160       1986 09 06.86222  21 39 01.50  -18 00 47.8                    071
 160       1986 09 06.87995  21 39 00.52  -18 00 50.7                    071
 220       1986 09 07.01885  01 57 04.42  +25 25 14.2                    071
 220       1986 09 07.05279  01 57 04.79  +25 25 21.9                    071
 268       1986 09 06.86222  21 44 42.58  -15 16 24.4                    071
 268       1986 09 06.87995  21 44 41.87  -15 16 29.6                    071
 338       1986 09 07.88697  21 46 58.41  -06 29 24.0                    071
 338       1986 09 07.94689  21 46 55.77  -06 29 36.2                    071
 574       1986 09 06.86222  21 45 58.30  -14 04 20.6                    071
 574       1986 09 06.87995  21 45 57.30  -14 04 23.8                    071
 676       1986 09 06.86222  21 43 01.07  -13 59 10.1                    071
 676       1986 09 06.87995  21 43 00.28  -13 59 16.8                    071
1157       1986 09 06.86222  21 51 13.12  -14 12 56.1                    071
1157       1986 09 06.87995  21 51 12.27  -14 12 56.1                    071
2412       1986 09 07.88697  21 45 57.74  -06 58 24.8                    071
2412       1986 09 07.94689  21 45 54.97  -06 58 32.0                    071
2525       1986 09 06.86222  21 53 18.58  -17 05 46.9                    071
2525       1986 09 06.87995  21 53 17.87  -17 05 52.2                    071
2758       1986 09 06.86222  21 43 54.74  -13 53 21.7                    071
2758       1986 09 06.87995  21 43 53.71  -13 53 23.2                    071
3499       1986 09 06.86222  21 51 19.43  -13 17 36.4            17      071
3499       1986 09 06.87995  21 51 18.85  -13 17 36.7                    071
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293 Burlington remote site
T. Handley, 13 Linden Avenue, Burlington, NJ 08016, U.S.A.
0.20-m f/4.0 astrograph
SAOC

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1980 VM1   1987 01 04.36944  07 49 21.29  +26 51 23.2                293
 947       1986 05 04.25417  14 08 24.17  -10 56 13.3                293
 947       1986 05 04.26875  14 08 23.60  -10 56 10.6                293
3551       1986 08 31.14965  19 19 14.72  +00 40 46.5              C 293
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376 Uenohara
N. Kawasato, 3-51, Hana-Koganei, Kodaira, Tokyo 187, Japan
Observer N. Kawasato
0.2-m f/4 hyperboloid astrocamera

```
1953 XL1   1987 02 05.69618  09 54 12.34  +16 59 52.0                376
1953 XL1   1987 02 05.74618  09 54 09.91  +17 00 24.4                376
1976 SJ4   1987 03 05.60313  11 27 35.95  -02 30 18.4                376
1976 SJ4   1987 03 05.67188  11 27 32.71  -02 29 43.1                376
1987 BJ    1987 02 05.68264  09 39 27.57  +11 34 53.5                376
1987 BJ    1987 02 05.72361  09 39 24.80  +11 35 09.8                376
2879       1987 03 02.48611  07 59 47.85  +16 24 17.7                376
2879       1987 03 02.54097  07 59 46.72  +16 24 36.1                376
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391 Sendai Observatory, Ayashi Station
M. Koishikawa, Sendai Municipal Observatory, 1-1 Sakuragaoka-koen,
Sendai 980, Japan
0.20-m reflector
Copied from Nihondaira Obs. Circ.

1987 ED	*	1987 03 06.57778	10	42	11.20	+12	01	02.2	16.5	d	391
1987 EE	*	1987 03 06.60000	10	38	12.97	+25	16	11.0	16.5		391
1987 EF	*	1987 03 06.60000	10	43	43.37	+24	52	14.7	16.5		391

398 Nagatoro
N. Kawasato, 3-51, Hana-Koganei, Kodaira, Tokyo 187, Japan
Observer N. Kawasato
0.26-m f/7.0 reflector
Copied from Nihondaira Obs. Circ.

1940 YE		1987 01 08.71076	09	23	34.74	+22	56	23.5			398
1940 YE		1987 01 08.80035	09	23	30.62	+22	56	13.4			398

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

1981 WO1		1987 01 04.56238	09	32	29.94	-22	10	01.5			474
1981 WO1		1987 01 04.57535	09	32	29.74	-22	10	16.6			474
1981 WO1		1987 02 05.45747	09	06	52.62	-28	43	32.1			474
1981 WO1		1987 02 05.47992	09	06	50.94	-28	43	34.9			474
1985 HC		1986 10 31.64798	06	13	55.89	-01	15	10.3			474
1985 HC		1986 10 31.66377	06	13	55.62	-01	15	23.3			474
1036		1987 02 05.50990	09	34	26.48	-19	54	20.2			474
1036		1987 02 05.52519	09	34	25.66	-19	54	17.2			474
1064		1987 03 06.67623	19	46	19.51	-22	07	05.5			474
1064		1987 03 06.70424	19	46	23.13	-22	06	51.1		t	474
1917		1987 01 03.57269	09	04	52.82	-26	08	07.3			474
1917		1987 01 03.59624	09	04	51.22	-26	08	05.2			474
1917		1987 02 06.57980	08	22	22.76	-19	02	08.3			474
1917		1987 02 06.60920	08	22	20.79	-19	01	31.4			474
2146		1987 01 04.43345	03	45	45.70	-24	31	45.1			474
2146		1987 01 04.45914	03	45	45.33	-24	31	33.1			474
3496		1986 12 26.41788	02	55	26.02	-33	59	49.2			474
3496		1986 12 26.44363	02	55	27.52	-33	58	50.3			474
3553		1986 12 31.48715	03	25	50.55	-28	05	51.1			474
3553		1986 12 31.51667	03	25	48.85	-28	06	32.2			474

482 St. Andrews
J. R. Stapleton, University Observatory, Buchanan Gardens,
St. Andrews, Fife KY16 9LZ, Scotland
Observer F. P. J. Smith
0.94-m Schmidt-Cassegrain

1986 XP5	*	1986 12 01.82899	03	09	11.84	+33	29	55.8	17		482
1986 XP5		1986 12 01.91002	03	09	09.14	+33	29	25.1			482
1986 XP5		1986 12 01.97478	03	09	06.97	+33	29	00.4			482
1986 XP5		1986 12 01.99728	03	09	06.34	+33	28	54.4			482
1986 XQ5	*	1986 12 06.05458	03	10	31.77	+32	27	28.4	17		482
1986 XQ5		1986 12 06.08367	03	10	29.97	+32	27	20.4			482
1321		1986 12 06.05458	03	13	36.60	+31	48	24.4			482
1321		1986 12 06.08367	03	13	35.13	+31	48	18.3			482
1321		1986 12 07.84682	03	12	13.70	+31	38	42.8			482
1321		1986 12 07.86179	03	12	13.08	+31	38	37.3			482
1321		1986 12 07.88002	03	12	12.22	+31	38	31.9			482
1321		1986 12 07.91245	03	12	10.73	+31	38	21.4			482
1321		1986 12 07.93918	03	12	09.49	+31	38	12.3			482
1321		1986 12 07.96567	03	12	08.27	+31	38	03.9			482
1321		1986 12 07.99268	03	12	06.99	+31	37	54.4			482

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

1987 AA	1987 01 21.89861	06 38 30.39	+23 23 20.0		17.0	552
1987 AA	1987 01 21.91389	06 38 29.83	+23 23 29.5			552
1987 AA	1987 01 24.86111	06 36 16.44	+24 00 58.0		17.1	552
1987 AA	1987 01 24.88542	06 36 15.28	+24 01 14.2			552
1987 AA	1987 01 30.89306	06 32 35.25	+25 13 04.9		17.2	552
1987 AA	1987 01 30.90903	06 32 34.75	+25 13 16.4			552
1987 BA	1987 01 24.91806	08 08 17.72	+17 30 38.9		16.5	552
1987 BA	1987 01 24.93611	08 08 16.84	+17 30 54.2			552
1987 BA	1987 01 25.87083	08 07 17.52	+17 48 14.7		16.6	552
1987 BA	1987 01 25.88889	08 07 16.17	+17 48 35.2			552
1987 BA	1987 01 30.85278	08 02 06.51	+19 18 57.6		16.8	552
1987 BA	1987 01 30.92847	08 02 01.43	+19 20 16.1			552
1987 BA	1987 01 31.88889	08 01 03.98	+19 37 24.6		16.9	552
1987 BA	1987 01 31.90764	08 01 02.78	+19 37 44.5			552
1987 BA	1987 02 01.89375	08 00 04.18	+19 55 11.5		17.0	552
1987 BA	1987 02 01.91111	08 00 03.20	+19 55 29.3			552
2601	1987 01 24.87361	06 33 14.24	+23 43 43.5		16.5	552
2601	1987 01 24.89722	06 33 13.26	+23 43 40.5			552

573 Eldagsen
W. Bonk, Nordstrasse 33, D-3257 Springe 3, Federal Republic of Germany
AGK3

70	1987 02 23.79583	09 58 12.77	+30 17 59.6	573
70	1987 02 23.79984	09 58 12.36	+30 18 00.0	573
70	1987 02 23.80361	09 58 12.28	+30 18 00.9	573
94	1987 01 30.75894	07 29 22.58	+32 39 42.3	573
94	1987 01 30.76389	07 29 22.26	+32 39 41.6	573
94	1987 01 30.77264	07 29 21.84	+32 39 41.1	573
94	1987 02 01.74755	07 27 44.80	+32 37 47.5	573
94	1987 02 01.75336	07 27 44.63	+32 37 45.8	573
94	1987 02 01.75964	07 27 44.25	+32 37 45.4	573
110	1987 02 23.81802	09 45 58.90	+22 53 43.9	573
110	1987 02 23.82215	09 45 58.71	+22 53 44.5	573
110	1987 02 23.82603	09 45 58.51	+22 53 44.9	573

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

1982 UM7	1987 03 20.27056	11 19 31.10	+02 10 38.8	657
1982 UM7	1987 03 20.30076	11 19 29.37	+02 10 55.1	657
5	1987 02 22.30243	08 36 30.47	+18 10 24.9	657
9	1986 11 29.31882	04 14 26.01	+20 44 08.7	657
22	1986 12 18.37778	04 21 05.91	+24 46 09.0	657
22	1987 02 02.17014	04 06 50.89	+26 45 43.6	657
22	1987 02 02.17014	04 06 50.89	+26 45 43.6	657
27	1986 10 12.27951	02 57 02.03	+14 12 29.5	657
101	1987 03 20.27056	11 21 38.40	+01 04 26.8	657
101	1987 03 20.30076	11 21 36.72	+01 04 32.9	657
125	1986 11 08.20521	02 19 00.84	+08 07 37.4	657
142	1986 10 12.36736	02 33 14.33	+18 33 07.4	657
145	1986 11 29.22993	03 16 49.43	+10 26 23.1	657
145	1986 11 29.22993	03 16 49.43	+10 26 23.1	657
211	1987 03 06.28854	10 24 34.63	+03 50 36.8	657

214		1986	04	30.29431	14	46	07.70	-21	08	04.3	657
221		1986	11	07.57500	11	22	27.72	+06	23	35.3	657
299		1987	03	20.27056	11	21	54.12	+01	28	35.2	657
299		1987	03	20.30076	11	21	52.46	+01	28	46.9	657
344		1987	03	06.36042	12	56	26.65	+18	45	43.2	657
420		1986	12	10.25694	06	14	04.55	+19	25	38.6	657
421		1987	03	20.27056	11	19	48.13	+01	14	07.7	657
421		1987	03	20.30076	11	19	46.56	+01	14	19.9	657
695		1987	02	22.16493	04	59	49.67	+21	59	03.8	657
770		1986	12	10.26458	06	12	01.89	+29	12	35.4	657
775		1987	01	08.16701	06	45	27.88	+26	47	43.9	657
785		1986	11	29.14379	01	35	26.57	-01	12	36.2	657
898		1986	11	01.23062	01	25	32.60	+18	08	52.8	657
943		1986	11	01.21326	00	55	35.99	-12	14	45.4	657
946		1986	12	06.45312	08	42	51.57	+19	31	08.0	657
1004		1986	11	08.20521	02	15	07.00	+09	23	32.3	657
1056		1986	12	06.45312	08	38	52.59	+19	10	54.4	657
1126		1986	11	29.19035	03	02	08.38	+27	29	15.3	657
1148		1986	04	30.43160	15	45	46.28	-03	30	06.4	657
1285		1987	01	08.16701	06	45	31.35	+28	01	21.0	657
1351		1987	01	07.39243	04	21	29.16	+34	29	29.0	657
1484		1986	12	10.26458	06	12	54.33	+30	17	14.0	657
1499		1986	11	01.23062	01	27	32.67	+19	23	02.7	657
1894		1986	11	29.31882	04	20	36.33	+21	45	55.4	657
2004		1986	11	29.20562	03	11	20.50	+21	54	49.2	657
2617		1986	11	29.22993	03	19	40.05	+11	53	09.5	657
2617		1986	11	29.22993	03	19	40.05	+11	53	09.5	657
2983		1986	10	12.20521	23	16	39.51	+01	50	10.3	657
3109		1986	04	30.31187	14	08	49.95	-16	28	06.0	657
3510		1986	11	01.23062	01	26	57.46	+18	25	23.4	657
3535		1986	10	12.36736	02	34	26.18	+17	43	46.9	657

662 Lick
A. R. Klemola, Lick Observatory, University of California,
Santa Cruz, CA 95064, U.S.A.
0.5-m double astrograph

1986 VF	*	1986	11	06.29626	03	04	50.60	-17	51	02.6	17	662
1986 VF		1986	11	06.38100	03	04	45.14	-17	50	56.1		662
1986 VF		1986	11	07.29422	03	03	51.67	-17	50	34.6		662
1986 VF		1986	11	07.37906	03	03	46.34	-17	50	30.8		662
1987 CA	*	1987	02	01.36310	10	22	23.09	-21	58	13.6	16.5 a	662
1987 CA		1987	02	01.44793	10	22	12.86	-21	57	19.4	a	662

672 Mount Wilson
J. Gibson, ITT/Federal Electric Corporation and Jet Propulsion Laboratory,
MS 138-307, Pasadena, CA 91109, U.S.A.
Observers S. Nicholson, H. Shapley
Measurer J. Gibson
AGK3

878		1916	09	07.36806	02	22	46.60	+12	58	32.6	672
878		1916	09	07.38090	02	22	46.85	+12	58	32.7	672
878		1916	09	07.48403	02	22	49.41	+12	58	34.0	672
878		1916	09	07.49965	02	22	49.72	+12	58	33.8	672
878		1916	09	07.51528	02	22	50.00	+12	58	33.6	672
878		1916	09	23.26007	02	25	17.47	+12	34	52.1	672
878		1916	09	23.41667	02	25	15.74	+12	34	22.7	672
878		1916	09	24.35660	02	25	06.42	+12	31	24.4	672
878		1916	09	24.36424	02	25	06.33	+12	31	23.0	672
878		1916	09	25.46840	02	24	52.30	+12	27	39.6	672

878	1916 10 19.18576	02 10 57.82	+10 25 56.9				672
878	1916 10 19.19410	02 10 57.54	+10 25 55.0				672

675 Palomar
J. Gibson, ITT/Federal Electric Corporation and Jet Propulsion Laboratory, MS 138-307, Pasadena, CA 91109, U.S.A. (1)
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C. Shoemaker, P.O. Box 984, Flagstaff, AZ 86002, U.S.A. (3)
Observers J. Gibson, E. Helin, C. Shoemaker, E. Shoemaker, S. J. Bus, B. A. Skiff, S. Singer-Brewster, D. Schneeberger, M. Rudnyk
Measurers R. Achterberg, J. Alu, T. Fric, J. Gibson, S. Gaiser, R. Gilbrech, D. Goldstein, J. Leech, F. Pepin, C. Shoemaker, C. Swift
1.5-m reflector, 1.2-m and 0.46-m Schmidt telescopes

1942 RJ		1985 11 07.26475	00 54 12.59	+18 16 40.7			3	675
1942 RJ		1985 11 07.29357	00 54 11.92	+18 16 25.2			3	675
1975 AN		1985 12 17.51875	07 28 32.45	+22 19 06.0		16.0	2	675
1975 AN		1985 12 18.48438	07 27 12.95	+22 04 45.0			2	675
1977 YA		1987 01 09.16667	02 27 44.97	+71 41 16.8			1	675
1977 YA		1987 01 09.18840	02 27 45.25	+71 41 06.4			1	675
1977 YA		1987 01 30.30850	02 59 31.17	+68 58 02.0			1	675
1977 YA		1987 01 30.31667	02 59 32.26	+68 57 57.7			1	675
1977 YA		1987 02 17.22806	03 55 53.48	+66 18 18.2			1	675
1977 YA		1987 02 17.23583	03 55 55.12	+66 18 13.5			1	675
1977 YA		1987 02 18.17625	03 59 19.50	+66 08 38.0			1	675
1977 YA		1987 02 18.25431	03 59 36.18	+66 07 47.8			1	675
1982 UD7		1986 11 04.29722	02 32 05.74	+11 10 54.3		17.0	2	675
1982 UD7		1986 11 04.33889	02 32 03.47	+11 10 33.8			2	675
1984 AB		1986 01 06.30834	06 35 29.02	+28 13 07.4		16.5	2	675
1984 AB		1986 01 06.32784	06 35 26.86	+28 13 27.3			2	675
1984 FN		1986 11 04.29722	02 42 36.10	+10 20 25.9		16.8	2	675
1984 FN		1986 11 04.33889	02 42 32.08	+10 20 45.0			2	675
1984 KD		1987 02 19.35917	11 11 38.01	+28 47 44.4			1	675
1984 KD		1987 02 19.37245	11 11 37.11	+28 47 54.1			1	675
1984 SH5		1987 02 23.41354	10 32 21.75	+06 12 50.1			3	675
1984 SH5		1987 02 27.33889	10 29 51.02	+06 24 56.8			3	675
1985 RZ4	*	1985 09 15.45295	02 12 53.23	+23 30 25.5		16	3	675
1985 RZ4		1985 09 15.47813	02 12 52.58	+23 30 38.6			3	675
1985 RZ4		1985 10 11.36727	01 52 40.99	+25 14 44.6		16.8	3	675
1985 RZ4		1985 10 13.36822	01 50 32.24	+25 16 56.6			3	675
1985 TX1		1985 09 16.44131	00 52 06.62	+18 21 00.1			3	675
1985 TX1		1985 09 16.50451	00 52 03.86	+18 20 49.3			3	675
1985 TX1		1985 10 11.26579	00 32 26.94	+16 09 58.2		17	3	675
1985 TX1		1985 10 13.26215	00 30 53.29	+15 55 50.3			3	675
1985 TN3		1985 11 08.12690	00 28 57.64	+20 49 07.2			3	675
1985 TN3		1985 11 08.22465	00 28 54.84	+20 48 50.6			3	675
1985 TP3		1985 11 07.21006	00 43 11.14	+13 30 49.1			3	675
1985 TP3		1985 11 08.14861	00 43 00.08	+13 25 22.0			3	675
1985 TR3		1985 09 17.40243	01 32 46.88	+17 39 13.1			3	675
1985 TR3		1985 09 17.42917	01 32 45.71	+17 39 13.4			3	675
1985 TR3		1985 11 08.14861	00 48 47.97	+13 25 01.3			3	675
1985 TR3		1985 11 08.22917	00 48 44.96	+13 24 32.1			3	675
1985 TT3	*	1985 10 11.33958	01 43 03.79	+24 37 16.6		17	3	675
1985 TT3		1985 10 13.33819	01 41 01.75	+24 42 20.8			3	675
1985 TU3	*	1985 10 11.33958	01 49 36.22	+22 50 38.9		16.5	3	675
1985 TU3		1985 10 13.33819	01 48 04.97	+22 35 16.7			3	675
1985 TV3	*	1985 10 11.33958	01 57 45.64	+25 03 50.0		16	3	675
1985 TV3		1985 10 13.33819	01 56 16.02	+25 07 35.5			3	675
1985 TW3		1985 09 15.44838	02 26 29.69	+10 29 47.3			3	675

1985	TW3		1985	09	15.47395	02	26	29.35	+10	29	48.3	3 675
1985	TW3	*	1985	10	11.33428	02	10	15.44	+10	07	26.3	16 3 675
1985	TW3		1985	10	13.33246	02	08	10.59	+10	02	55.7	3 675
1985	TW3		1985	11	07.28420	01	41	41.58	+09	08	46.1	3 675
1985	TW3		1985	11	07.31145	01	41	40.07	+09	08	43.7	3 675
1985	TX3		1985	09	17.45538	02	21	25.20	+16	57	50.8	3 675
1985	TX3		1985	09	17.48299	02	21	24.97	+16	57	49.4	3 675
1985	TX3	*	1985	10	11.33428	02	10	46.35	+15	43	23.4	17 3 675
1985	TX3		1985	10	13.33246	02	09	17.99	+15	33	07.7	3 675
1985	TX3		1985	11	07.28420	01	49	07.23	+13	00	45.6	3 675
1985	TX3		1985	11	07.31146	01	49	06.03	+13	00	32.7	3 675
1985	TY3	*	1985	10	11.26579	00	32	00.59	+20	22	58.9	16.5 3 675
1985	TY3		1985	10	13.26215	00	30	06.02	+20	16	32.5	3 675
1985	TZ3		1985	09	17.38559	00	58	17.38	+15	22	59.3	3 675
1985	TZ3		1985	09	17.41579	00	58	15.72	+15	22	52.1	3 675
1985	TZ3	*	1985	10	11.26579	00	34	29.34	+13	40	57.0	17.5 3 675
1985	TZ3		1985	10	13.26215	00	32	32.00	+13	28	45.4	3 675
1985	TA4	*	1985	10	11.32934	01	42	47.22	+22	30	10.2	17 3 675
1985	TA4		1985	10	13.32118	01	40	51.04	+22	21	26.7	3 675
1985	TA4		1985	11	07.26475	01	17	47.06	+19	40	00.1	3 675
1985	TA4		1985	11	07.29357	01	17	45.57	+19	39	48.3	3 675
1985	VY1	*	1985	11	07.27986	01	17	26.25	+24	31	25.8	17 3 675
1985	VY1		1985	11	07.30694	01	17	24.01	+24	31	22.0	3 675
1985	VZ1	*	1985	11	07.34444	04	06	01.06	+17	01	26.2	17.3 3 675
1985	VZ1		1985	11	07.37291	04	05	59.41	+17	01	21.0	3 675
1985	VA2	*	1985	11	07.34444	04	07	07.73	+16	38	55.6	17.5 3 675
1985	VA2		1985	11	07.37291	04	07	06.13	+16	38	55.5	3 675
1985	VB2	*	1985	11	07.34444	04	07	40.19	+17	52	15.4	17.5 3 675
1985	VB2		1985	11	07.37291	04	07	38.89	+17	52	03.4	3 675
1985	VC2	*	1985	11	07.34444	04	10	22.96	+17	38	41.7	17 3 675
1985	VC2		1985	11	07.37291	04	10	21.61	+17	38	28.0	3 675
1985	VD2	*	1985	11	07.34444	04	26	19.73	+19	19	22.5	17.2 3 675
1985	VD2		1985	11	07.37291	04	26	18.71	+19	19	12.4	3 675
1985	VE2	*	1985	11	08.36215	02	59	03.79	+47	47	34.4	17 3 675
1985	VE2		1985	11	08.39496	02	59	01.82	+47	46	57.0	3 675
1985	VE2		1985	11	16.34704	02	51	42.62	+44	58	14.9	3 675
1985	VE2		1985	11	16.38506	02	51	40.49	+44	57	19.5	3 675
1985	YP		1985	12	18.48438	07	21	15.06	+22	54	34.4	2 675
1986	AZ2		1985	12	15.39132	06	51	33.99	+24	08	15.3	16.5 2 675
1986	AZ2		1985	12	18.44618	06	48	24.72	+24	27	25.9	2 675
1986	AZ2	*	1986	01	06.32788	06	27	33.59	+26	15	41.5	16.5 2 675
1986	AZ2		1986	01	07.30382	06	26	31.07	+26	20	28.3	2 675
1986	AZ2		1986	01	08.37569	06	25	23.44	+26	25	38.9	2 675
1986	CB		1986	02	07.34097	10	17	36.34	+20	49	37.3	16.8 2 675
1986	CB		1986	02	07.39306	10	17	33.32	+20	50	50.0	2 675
1986	CB		1986	02	10.40764	10	14	41.70	+21	57	09.7	2 675
1986	DA		1986	07	24.17444	15	50	33.67	-23	47	52.3	1 675
1986	DA		1986	07	24.18333	15	50	34.63	-23	47	55.7	1 675
1986	DA		1986	07	24.18611	15	50	34.93	-23	47	56.8	1 675
1986	DA		1986	07	25.16222	15	52	23.75	-23	54	26.4	1 675
1986	DA		1986	07	25.16944	15	52	24.54	-23	54	29.4	1 675
1986	DA		1986	07	26.16840	15	54	15.73	-24	01	00.1	1 675
1986	DA		1986	07	26.17472	15	54	16.44	-24	01	02.4	1 675
1986	DA		1986	08	16.20236	16	33	22.49	-25	47	11.8	1 675
1986	DA		1986	08	16.20875	16	33	23.19	-25	47	13.3	1 675
1986	DA		1986	08	16.21347	16	33	23.69	-25	47	14.7	1 675
1986	TL7	*	1986	10	07.36458	02	48	31.01	+16	20	06.4	17.8 2 675
1986	TL7		1986	10	07.40625	02	48	30.05	+16	19	56.2	2 675
1986	TL7		1986	10	08.35464	02	48	08.32	+16	15	42.1	2 675

1986	TL7		1986	10	08.40972	02	48	07.30	+16	15	29.0		2 675
1986	TM7	*	1986	10	07.36458	02	45	47.40	+16	48	32.0	17.5	2 675
1986	TM7		1986	10	07.40625	02	45	45.76	+16	48	35.6		2 675
1986	TM7		1986	10	08.35764	02	45	06.43	+16	49	47.1		2 675
1986	TM7		1986	10	08.40972	02	45	04.36	+16	49	50.8		2 675
1986	UG		1986	11	04.29722	02	33	36.77	+09	46	55.6	17.0	2 675
1986	UG		1986	11	04.33889	02	33	34.27	+09	46	44.8		2 675
1986	UP		1986	10	07.36458	02	41	27.04	+12	23	42.6	17.0	2 675
1986	UP		1986	10	07.40625	02	41	24.21	+12	23	53.8		2 675
1986	UP		1986	10	08.35764	02	40	19.97	+12	27	56.6		2 675
1986	UP		1986	10	08.40972	02	40	16.43	+12	28	09.6		2 675
1986	VB7		1986	10	07.36458	02	37	07.63	+12	37	20.7	17.5	2 675
1986	VB7		1986	10	07.40625	02	37	05.48	+12	37	24.6		2 675
1986	VB7		1986	10	08.35764	02	36	17.81	+12	38	45.2		2 675
1986	VB7		1986	10	08.40972	02	36	15.06	+12	38	48.9		2 675
1986	VH7		1986	10	07.36458	02	44	42.41	+16	47	04.3	17.0	2 675
1986	VH7		1986	10	07.40625	02	44	41.27	+16	47	06.6		2 675
1986	VH7		1986	10	08.35764	02	44	16.94	+16	47	43.3		2 675
1986	VH7		1986	10	08.40972	02	44	15.36	+16	47	45.6		2 675
1986	VJ7		1986	10	07.36458	02	46	03.82	+16	43	06.0	17.5	2 675
1986	VJ7		1986	10	07.40625	02	46	02.59	+16	43	15.6		2 675
1986	VJ7		1986	10	08.35764	02	45	36.79	+16	46	43.3		2 675
1986	VJ7		1986	10	08.40972	02	45	35.15	+16	46	54.8		2 675
1986	VC8	*	1986	11	06.27014	02	11	24.32	+36	30	45.6	17.5	2 675
1986	VC8		1986	11	06.31181	02	11	21.75	+36	30	16.4		2 675
1986	VD8	*	1986	11	06.27014	02	19	40.13	+34	13	59.5	17.5	2 675
1986	VD8		1986	11	06.31181	02	19	37.62	+34	13	15.0		2 675
1986	VE8	*	1986	11	04.29722	02	38	40.99	+10	07	28.5	18.0	2 675
1986	VE8		1986	11	04.33889	02	38	39.31	+10	07	29.2		2 675
1986	VF8	*	1986	11	04.29722	02	39	39.90	+10	07	59.4	17.0	2 675
1986	VF8		1986	11	04.33889	02	39	37.27	+10	07	49.9		2 675
1986	VG8	*	1986	11	04.29722	02	41	02.04	+09	40	56.4	17.0	2 675
1986	VG8		1986	11	04.33889	02	40	59.56	+09	40	44.5		2 675
1986	VH8	*	1986	11	04.29722	02	42	57.76	+10	48	30.4	17.2	2 675
1986	VH8		1986	11	04.33889	02	42	55.29	+10	48	19.2		2 675
1986	VJ8	*	1986	11	04.29722	02	44	14.31	+09	37	59.8	17.0	2 675
1986	VJ8		1986	11	04.33889	02	44	12.00	+09	37	52.4		2 675
1986	VK8	*	1986	11	04.29722	02	43	33.84	+10	48	16.4	17.8	2 675
1986	VK8		1986	11	04.33889	02	43	31.59	+10	48	11.9		2 675
1986	VL8	*	1986	11	04.29722	02	43	34.82	+10	29	54.9	16.8	2 675
1986	VL8		1986	11	04.33889	02	43	32.65	+10	29	45.5		2 675
1986	VM8	*	1986	11	04.29722	02	44	56.62	+10	59	51.1	17.5	2 675
1986	VM8		1986	11	04.33889	02	44	55.36	+10	59	44.7		2 675
1986	VN8	*	1986	11	04.29722	02	45	05.27	+10	38	54.2	17.0	2 675
1986	VN8		1986	11	04.33889	02	45	02.74	+10	38	40.6		2 675
1986	VO8	*	1986	11	04.29722	02	45	54.34	+10	29	50.4	17.8	2 675
1986	VO8		1986	11	04.33889	02	45	51.88	+10	29	42.9		2 675
1986	VP8	*	1986	11	04.29722	02	34	31.11	+08	17	19.4	17.5	2 675
1986	VP8		1986	11	04.33889	02	34	29.15	+08	16	53.4		2 675
1986	VQ8	*	1986	11	04.29722	02	43	15.62	+07	39	14.1	16.5	2 675
1986	VQ8		1986	11	04.33889	02	43	13.20	+07	38	58.3		2 675
1986	VR8	*	1986	11	04.29722	02	47	18.58	+08	41	04.6	17.0	2 675
1986	VR8		1986	11	04.33889	02	47	16.20	+08	41	04.2		2 675
1986	VS8	*	1986	11	04.29722	02	49	30.81	+12	24	06.7	18.0	2 675
1986	VS8		1986	11	04.33889	02	49	28.52	+12	23	46.1		2 675
1986	VT8	*	1986	11	04.29722	02	49	33.12	+10	06	38.1	17.5	2 675
1986	VT8		1986	11	04.33889	02	49	31.29	+10	06	15.8		2 675
1986	WD		1985	10	12.40260	02	12	54.36	+18	44	20.4	17.5	3 675
1986	WD		1985	10	14.47482	02	11	55.23	+18	37	11.0		3 675

1986	WD		1985	11	08.24444	01	59	31.93	+16	58	28.3		3 675
1986	WD		1985	11	08.27240	01	59	30.99	+16	58	19.4		3 675
1986	WT7	*	1986	11	30.32222	05	14	15.18	+10	15	26.0	15	2 675
1986	WT7		1986	11	30.35556	05	14	13.41	+10	15	25.0		2 675
1986	WT7		1986	12	03.29514	05	11	37.97	+10	16	07.3		2 675
1986	WT7		1986	12	03.34722	05	11	35.05	+10	16	09.1		2 675
1986	WU7	*	1986	11	30.32222	05	12	32.17	+12	56	05.0	16.8	2 675
1986	WU7		1986	11	30.35556	05	12	29.81	+12	55	59.3		2 675
1986	WU7		1986	12	03.29514	05	09	30.13	+12	52	13.0		2 675
1986	WU7		1986	12	03.34722	05	09	26.74	+12	52	10.1		2 675
1986	WV7	*	1986	11	30.32222	05	14	18.43	+12	26	04.7	17.5	2 675
1986	WV7		1986	11	30.35556	05	14	16.43	+12	25	55.4		2 675
1986	WV7		1986	12	03.29514	05	11	50.04	+12	15	30.0		2 675
1986	WV7		1986	12	03.34722	05	11	47.23	+12	15	20.0		2 675
1986	WW7	*	1986	11	30.32222	05	08	17.13	+08	31	35.6	18.5	2 675
1986	WW7		1986	11	30.35556	05	08	15.36	+08	31	23.7		2 675
1986	WW7		1986	12	03.29514	05	05	21.68	+08	15	45.4		2 675
1986	WW7		1986	12	03.34722	05	05	18.55	+08	15	30.6		2 675
1986	WX7	*	1986	11	30.32222	05	09	27.35	+07	36	10.0	17.5	2 675
1986	WX7		1986	11	30.35556	05	09	25.81	+07	36	02.0		2 675
1986	WX7		1986	12	03.29514	05	06	59.00	+07	26	50.8		2 675
1986	WX7		1986	12	03.34722	05	06	56.44	+07	26	42.1		2 675
1986	XX4		1986	11	30.32222	05	08	47.48	+12	30	46.8	17.0	2 675
1986	XX4		1986	11	30.35556	05	08	45.65	+12	30	47.1		2 675
1986	XX4		1986	12	03.29514	05	05	54.98	+12	36	11.5		2 675
1986	XX4		1986	12	03.34722	05	05	51.88	+12	36	17.8		2 675
1986	XN5	*	1986	12	03.36111	06	16	57.57	+09	53	25.9	18.2	2 675
1986	XN5		1986	12	03.41319	06	16	52.93	+09	55	09.4		2 675
1986	YB1	*	1986	12	30.35764	07	33	19.56	+11	53	22.5	17.5	2 675
1986	YB1		1986	12	30.39236	07	33	17.77	+11	53	29.6		2 675
1986	YB1		1987	01	04.33681	07	29	08.65	+12	12	05.3		2 675
1986	YB1		1987	01	04.37847	07	29	06.39	+12	12	14.5		2 675
1986	YC1	*	1986	12	30.35764	07	34	50.52	+12	20	39.1	18.0	2 675
1986	YC1		1986	12	30.39236	07	34	48.83	+12	20	45.1		2 675
1986	YC1		1987	01	04.33681	07	30	48.48	+12	35	38.2		2 675
1986	YC1		1987	01	04.37847	07	30	46.37	+12	35	46.7		2 675
1986	YD1	*	1986	12	30.35764	07	42	46.21	+13	02	46.6	17.0	2 675
1986	YD1		1986	12	30.39236	07	42	44.15	+13	02	34.2		2 675
1986	YD1		1987	01	04.33681	07	37	53.13	+12	36	35.5		2 675
1986	YD1		1987	01	04.37847	07	37	50.55	+12	36	23.8		2 675
1986	YE1	*	1986	12	30.35764	07	44	00.29	+13	01	47.7	17.0	2 675
1986	YE1		1986	12	30.39236	07	43	58.36	+13	01	46.8		2 675
1986	YE1		1987	01	04.33681	07	39	30.18	+13	00	59.5		2 675
1986	YE1		1987	01	04.37847	07	39	27.70	+13	00	59.7		2 675
1986	YF1	*	1986	12	30.35764	07	46	54.97	+12	56	31.7	17.0	2 675
1986	YF1		1986	12	30.39236	07	46	52.73	+12	56	29.9		2 675
1986	YF1		1987	01	04.33681	07	41	28.90	+12	54	54.3		2 675
1986	YF1		1987	01	04.37847	07	41	26.08	+12	54	54.0		2 675
1986	YG1	*	1986	12	30.30208	06	38	30.93	+31	05	43.8	17.5	2 675
1986	YG1		1986	12	30.35069	06	38	26.27	+31	05	13.3		2 675
1986	YG1		1987	01	01.29583	06	35	21.70	+30	43	51.3		2 675
1986	YG1		1987	01	01.34444	06	35	16.98	+30	43	18.9		2 675
1986	YH1	*	1986	12	30.30208	06	18	33.05	+32	12	04.2	18.0	2 675
1986	YH1		1986	12	30.35069	06	18	28.68	+32	12	00.9		2 675
1986	YH1		1987	01	01.29583	06	16	00.48	+32	10	01.5		2 675
1986	YH1		1987	01	01.34444	06	15	56.71	+32	09	57.3		2 675
1986	YJ1	*	1986	12	30.30208	06	19	34.68	+32	17	40.7	17.0	2 675
1986	YJ1		1986	12	30.35069	06	19	31.38	+32	17	47.0		2 675
1986	YJ1		1987	01	01.29583	06	17	27.62	+32	21	39.3		2 675

1986	YJ1		1987	01	01.34444	06	17	24.89	+32	21	43.4	2 675
1986	YK1	*	1986	12	30.30208	06	21	10.71	+32	09	12.7	17.5 2 675
1986	YK1		1986	12	30.35069	06	21	06.87	+32	09	27.5	2 675
1986	YK1		1987	01	01.29583	06	18	44.48	+32	19	08.3	2 675
1986	YK1		1987	01	01.34444	06	18	40.76	+32	19	21.4	2 675
1986	YL1	*	1986	12	30.30208	06	31	22.53	+31	53	28.3	17.5 2 675
1986	YL1		1986	12	30.35069	06	31	18.67	+31	53	12.4	2 675
1986	YL1		1987	01	01.29583	06	28	53.69	+31	42	06.5	2 675
1986	YL1		1987	01	01.34444	06	28	49.90	+31	41	48.3	2 675
1986	YM1	*	1986	12	30.30208	06	31	42.35	+31	25	37.8	17.8 2 675
1986	YM1		1986	12	30.35069	06	31	39.46	+31	25	44.9	2 675
1986	YM1		1987	01	01.29583	06	29	49.87	+31	30	01.8	2 675
1986	YM1		1987	01	01.34444	06	29	47.12	+31	30	07.3	2 675
1987	AE	*	1987	01	03.27431	06	18	32.18	+48	01	27.4	18.2 2 675
1987	AE		1987	01	03.32292	06	18	24.05	+48	00	11.3	2 675
1987	AF	*	1987	01	03.39306	08	40	58.96	+43	11	44.6	18.8 2 675
1987	AF		1987	01	03.44167	08	40	55.06	+43	12	02.3	2 675
1987	AG	*	1987	01	03.39306	08	41	18.62	+42	51	00.4	17.5 2 675
1987	AG		1987	01	03.44167	08	41	16.23	+42	51	27.5	2 675
1987	AH	*	1987	01	03.39306	08	43	45.25	+45	22	28.2	17.5 2 675
1987	AH		1987	01	03.44167	08	43	39.75	+45	22	14.0	2 675
1987	AJ	*	1987	01	03.39306	08	48	40.02	+46	14	36.6	17.8 2 675
1987	AJ		1987	01	03.44167	08	48	37.74	+46	15	11.6	2 675
1987	AL	*	1987	01	03.36944	08	52	04.17	+42	20	45.6	17.0 2 675
1987	AL		1987	01	03.41806	08	52	01.73	+42	21	10.4	2 675
1987	AM	*	1987	01	03.36944	09	04	13.99	+45	16	49.9	17.0 2 675
1987	AM		1987	01	03.41806	09	04	11.50	+45	17	15.7	2 675
1987	DE	*	1987	02	23.33056	09	20	47.94	+11	42	10.2	15.5 3 675
1987	DE		1987	02	23.36128	09	20	46.60	+11	42	56.4	3 675
1987	DE		1987	02	27.25521	09	18	15.69	+13	17	47.0	3 675
1987	DE		1987	02	27.29080	09	18	14.28	+13	18	38.5	3 675
1987	DF	*	1987	02	23.38194	10	35	58.48	+06	09	42.6	15.5 3 675
1987	DF		1987	02	23.41354	10	35	56.83	+06	10	14.6	3 675
1987	DF		1987	02	27.33889	10	32	35.41	+07	20	56.0	3 675
1987	DF		1987	02	27.37118	10	32	33.64	+07	21	30.2	3 675
1987	DG	*	1987	02	23.38194	10	44	33.05	+05	42	14.8	17.5 3 675
1987	DG		1987	02	23.41354	10	44	31.29	+05	42	32.3	3 675
1987	DG		1987	02	27.33889	10	41	00.73	+06	13	10.8	3 675
1987	DG		1987	02	27.37118	10	40	58.98	+06	13	26.4	3 675
1987	DL	*	1987	02	23.39167	10	56	51.69	+09	45	43.0	17 3 675
1987	DL		1987	02	23.42274	10	56	50.24	+09	46	18.1	3 675
1987	DL		1987	02	27.34809	10	53	40.19	+10	56	32.1	3 675
1987	DL		1987	02	27.38611	10	53	38.05	+10	57	15.1	3 675
1987	DR	*	1987	02	27.16180	08	31	00.04	+56	32	27.7	17 3 675
1987	DR		1987	02	27.18177	08	30	59.09	+56	31	57.0	3 675
17			1987	03	03.15347	05	06	18.07	+20	02	19.3	14.0 2 675
17			1987	03	03.18090	05	06	19.09	+20	02	22.9	2 675
487			1987	03	03.15347	05	07	58.26	+20	01	35.4	14.0 2 675
487			1987	03	03.18090	05	07	59.65	+20	01	43.0	2 675
693			1985	10	13.36822	01	48	04.58	+25	03	58.9	3 675
740			1987	03	03.15347	05	07	32.25	+19	05	09.3	15.0 2 675
740			1987	03	03.18090	05	07	33.22	+19	05	17.5	2 675
772			1987	02	23.17674	07	28	32.89	+55	16	09.2	3 675
772			1987	02	23.29826	07	28	28.28	+55	15	44.0	3 675
772			1987	02	27.16181	07	26	32.58	+55	00	42.0	3 675
813			1986	01	06.32788	06	33	12.60	+31	44	17.9	16.5 2 675
917			1985	11	16.22986	01	25	49.38	+17	20	55.1	3 675
917			1985	11	16.26198	01	25	48.32	+17	20	49.3	3 675
2907			1986	11	30.32222	05	07	42.78	+07	39	05.4	16.5 2 675

2907		1986	11	30.35556	05	07	41.13	+07	38	59.4	2	675
2907		1986	12	03.29514	05	05	13.91	+07	32	09.6	2	675
2907		1986	12	03.34722	05	05	11.24	+07	32	02.3	2	675
3012		1985	10	11.26579	00	42	55.09	+15	38	32.2	16 3	675
3012		1985	10	13.26215	00	41	05.48	+15	36	46.2	3	675
3063		1985	10	12.34670	00	58	37.11	+22	31	48.8	17 3	675
3063		1985	10	14.33663	00	57	34.57	+22	25	33.8	3	675
3103		1987	02	23.31996	09	45	43.49	+32	52	38.0	3	675
3103		1987	02	23.35156	09	45	40.34	+32	53	20.3	3	675
3353		1986	11	06.27014	02	28	24.41	+32	05	18.5	16.5 2	675
3353		1986	11	06.31181	02	28	21.27	+32	04	27.5	2	675
3372		1985	10	11.33428	02	23	59.23	+15	24	42.4	16.5 3	675
3372		1985	10	13.33246	02	22	27.38	+15	21	11.4	3	675
3479		1986	11	30.32222	05	14	36.77	+07	51	23.7	17.5 2	675
3479		1986	11	30.35556	05	14	35.23	+07	51	17.6	2	675
3479		1986	12	03.29514	05	12	14.38	+07	41	47.6	2	675
3479		1986	12	03.34722	05	12	11.93	+07	41	38.8	2	675
3516		1986	08	04.34272	21	30	34.94	-13	09	04.6	16.5 2	675
3516		1986	08	06.33090	21	29	02.51	-13	18	02.0	2	675
3533		1986	11	04.29722	02	31	20.42	+10	52	07.1	16.5 2	675
3533		1986	11	04.33889	02	31	17.91	+10	51	46.3	2	675
3549		1985	11	07.21006	00	44	37.02	+16	40	27.6	3	675
3549		1985	11	07.25104	00	44	35.30	+16	40	14.3	3	675
3554		1987	02	08.43917	14	19	26.92	+08	26	20.3	1	675
3554		1987	02	23.39791	14	06	34.74	+03	14	59.6	3	675
3554		1987	02	23.42813	14	06	31.54	+03	14	15.3	3	675
3554		1987	03	01.48472	13	53	48.28	+00	31	04.1	2	675
3554		1987	03	03.40139	13	48	35.70	-00	26	43.0	2	675

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

1977	HH1	1987	02	02.38205	10	57	13.49	+06	56	39.8	688
1977	HH1	1987	02	02.39184	10	57	13.16	+06	56	41.8	688
1977	YA	1986	11	25.30275	04	16	55.96	+70	24	42.8	688
1977	YA	1986	11	25.30672	04	16	55.24	+70	24	46.8	688
1982	EJ	1987	02	02.18598	03	08	51.70	+18	30	57.7	688
1982	EJ	1987	02	02.19413	03	08	51.85	+18	30	57.7	688
1983	AD	1987	02	01.24248	05	22	42.43	+30	26	15.9	688
1983	AD	1987	02	01.25068	05	22	42.35	+30	26	16.6	688
1984	KD	1987	03	08.36139	10	48	59.65	+31	55	58.8	688
1984	KD	1987	03	08.37064	10	48	58.82	+31	56	03.4	688
1985	HC	1987	02	02.23889	05	07	22.71	-07	18	05.1	688
1985	HC	1987	02	02.24882	05	07	22.61	-07	18	01.9	688
1986	WD	1987	02	01.19887	04	20	26.52	+15	57	11.6	688
1986	WD	1987	02	01.22419	04	20	26.53	+15	57	11.4	688
1373		1987	02	01.32209	08	17	59.59	+07	35	05.6	688
1373		1987	02	01.33016	08	17	59.02	+07	35	03.2	688
1863		1986	11	25.25521	02	29	26.75	+39	39	38.0	688
1863		1986	11	25.26296	02	29	26.31	+39	39	35.1	688
1917		1987	02	01.34204	08	28	21.60	-20	47	12.0	688
1917		1987	02	01.34714	08	28	21.21	-20	47	06.1	688
1921		1987	02	02.36354	10	56	57.58	+16	26	29.1	688

1921	1987 02 02.37389	10 56 57.11	+16 26 30.8		688
1922	1987 02 02.16387	02 52 59.06	+08 52 21.1		688
1922	1987 02 02.17462	02 52 59.21	+08 52 21.2		688
1981	1987 02 02.43289	10 16 04.37	+70 14 06.6		688
1981	1987 02 02.43709	10 16 03.14	+70 14 08.9		688
1981	1987 02 02.44289	10 16 01.47	+70 14 11.9		688
2202	1987 02 02.25890	08 12 58.60	+07 26 38.6		688
2202	1987 02 02.26795	08 12 57.97	+07 26 45.7		688
2212	1986 11 27.18889	03 52 31.77	+29 38 47.3		688
2212	1986 11 27.19491	03 52 31.32	+29 38 46.5		688
2966	1986 11 25.22569	01 35 35.21	+09 23 57.2		688
2966	1986 11 25.23003	01 35 35.07	+09 23 56.7		688
3102	1987 03 08.40174	13 39 37.79	-05 49 30.6		688
3102	1987 03 08.41274	13 39 37.52	-05 49 26.2		688
3102	1987 03 08.42703	13 39 37.17	-05 49 20.5		688
3551	1987 02 01.20875	04 30 43.31	+06 03 08.7		688
3551	1987 02 01.21670	04 30 43.99	+06 03 15.9		688
3557	1987 02 02.20457	03 26 37.40	+12 58 05.7		688
3557	1987 02 02.21566	03 26 37.58	+12 58 07.0		688

690 Lowell Observatory
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Flagstaff, AZ 86001, U.S.A.
Observers O. G. Franz, A. M. Killian, R. L. Millis
Measurers D. Federico, L. H. Wasserman
0.46-m astrograph
AGK3 + SAOC, global solutions

30	1987 01 21.30556	08 52 14.11	+17 39 19.4		690
30	1987 01 21.30799	08 52 13.95	+17 39 19.7		690
30	1987 01 21.31042	08 52 13.80	+17 39 20.0		690
30	1987 01 22.29618	08 51 11.13	+17 42 28.9		690
30	1987 01 22.29792	08 51 11.02	+17 42 29.4		690
30	1987 01 22.29965	08 51 10.92	+17 42 29.5		690
30	1987 01 22.32014	08 51 09.56	+17 42 33.6		690
30	1987 01 22.32188	08 51 09.45	+17 42 33.8		690
30	1987 01 22.32361	08 51 09.32	+17 42 34.3		690
30	1987 01 25.26840	08 47 59.10	+17 52 02.6		690
30	1987 01 25.27188	08 47 58.88	+17 52 03.1		690
30	1987 01 25.27535	08 47 58.62	+17 52 03.8		690
41	1986 07 09.46319	23 39 04.07	+05 04 35.0		690
41	1986 07 12.45139	23 39 39.80	+05 03 43.7		690
52	1986 07 09.42708	23 37 29.50	-06 52 16.6		690
52	1986 07 11.43611	23 37 54.11	-06 55 07.8		690
52	1986 07 11.44375	23 37 54.19	-06 55 08.6		690
52	1986 07 11.45208	23 37 54.28	-06 55 09.2		690
52	1986 07 12.39028	23 38 04.39	-06 56 39.6		690
52	1986 07 12.39792	23 38 04.44	-06 56 40.3		690
52	1986 07 12.40625	23 38 04.53	-06 56 41.4		690
354	1987 01 09.44757	12 11 56.72	+06 35 05.0		690
354	1987 01 09.44896	12 11 56.78	+06 35 05.2		690
354	1987 01 09.45104	12 11 56.86	+06 35 05.8		690
354	1987 01 09.45382	12 11 56.99	+06 35 06.4		690
354	1987 01 12.45694	12 14 05.42	+06 49 58.7		690
354	1987 01 12.46181	12 14 05.60	+06 50 00.6		690
354	1987 01 12.46667	12 14 05.80	+06 50 01.8		690
354	1987 01 12.47118	12 14 05.99	+06 50 03.3		690
354	1987 01 12.47222	12 14 06.01	+06 50 03.8		690
354	1987 01 12.47396	12 14 06.09	+06 50 04.2		690
354	1987 01 12.47674	12 14 06.20	+06 50 05.0		690

471		1987	01	09.27882	06	02	29.96	+29 17 18.6	690
471		1987	01	09.28021	06	02	29.88	+29 17 19.2	690
471		1987	01	09.28021	06	02	29.88	+29 17 19.2	690
471		1987	01	22.25729	05	52	31.46	+30 18 43.1	690
471		1987	01	22.25833	05	52	31.41	+30 18 43.1	690
471		1987	01	22.25938	05	52	31.38	+30 18 43.5	690

691 Kitt Peak, Steward Observatory
T. Gehrels, Space Sciences Building, University of Arizona,
Tucson, AZ 85721, U.S.A.
Observers T. Gehrels, J. V. Scotti
Measurers J. V. Scotti, R. McCarty
0.91-m SPACEWATCH telescope, CCD in scanning mode
SAOC 1984
See also MPC 9198 and 10373

1984	KD	1987	02	28.38374	11	00	17.87	+30 35 52.9		691
1984	KD	1987	02	28.39743	11	00	16.71	+30 36 01.6		691
1984	KD	1987	02	28.40976	11	00	15.68	+30 36 09.9	19.9V	691
1984	KD	1987	03	02.33056	10	57	37.26	+30 57 03.2		691
1984	KD	1987	03	02.34740	10	57	35.78	+30 57 14.7		691
1984	KD	1987	03	02.35429	10	57	35.26	+30 57 18.7	19.7V	691
1986	RA	1987	01	25.12740	02	45	05.44	-06 21 29.3		691
1986	RA	1987	01	25.14987	02	45	07.48	-06 21 10.4		691
1986	RA	1987	01	25.15506	02	45	07.94	-06 21 06.4		691
1986	RA	1987	01	29.13632	02	51	12.66	-05 27 05.0		691
1986	RA	1987	01	29.15264	02	51	14.14	-05 26 51.7		691
1986	RA	1987	03	01.12279	03	39	31.75	+00 42 58.7		691
1986	RA	1987	03	01.13918	03	39	33.23	+00 43 08.6		691
1986	RA	1987	03	01.14939	03	39	34.24	+00 43 15.8		691
1986	WA	1987	01	25.16231	02	22	03.29	+04 59 45.6		691
1986	WA	1987	01	25.16696	02	22	03.69	+04 59 46.3		691
1986	WA	1987	01	25.17697	02	22	04.57	+04 59 48.2		691
1986	WA	1987	01	29.09214	02	27	56.77	+05 12 48.3		691
1986	WA	1987	01	29.09954	02	27	57.41	+05 12 49.7		691
1986	WA	1987	01	29.12333	02	27	59.48	+05 12 54.9		691
1986	WA	1987	02	28.13168	03	12	35.94	+07 15 49.1	19.9V	691
1986	WA	1987	02	28.13956	03	12	36.62	+07 15 51.1		691
2329		1987	03	02.37112	12	07	47.16	+02 44 11.9		691
2329		1987	03	02.37678	12	07	46.83	+02 44 16.2		691
2329		1987	03	02.39263	12	07	46.00	+02 44 28.3		691

760 Goethe Link
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1950	HU	1950	04	17.09339	11	53	49.26	-06 48 49.1	760
1950	HU	1950	04	17.16212	11	53	47.22	-06 48 04.6	760
1950	HL1	1950	04	16.14689	10	39	56.98	+24 29 05.1	760
1950	HL1	1950	04	16.24340	10	39	56.52	+24 28 59.2	760
1955	SS	1955	09	17.27286	23	51	29.15	+07 05 30.5	760
1955	SS	1955	09	17.31314	23	51	26.56	+07 05 19.1	760
1956	AB	1956	01	13.27606	06	21	30.12	+27 21 45.2	760
1956	AB	1956	01	13.31634	06	21	28.17	+27 21 53.3	760
1958	GO	1958	04	12.18471	12	00	00.19	+11 11 55.0	760
1958	GO	1958	04	12.21457	11	59	59.41	+11 12 13.1	760
1958	TO	1958	10	13.07118	22	54	52.26	+08 05 11.9	760
1958	TO	1958	10	13.10747	22	54	51.47	+08 04 59.3	760
1958	TW	1958	10	15.34164	03	33	57.11	+40 18 55.4	760
1958	TW	1958	10	15.38400	03	33	55.18	+40 19 18.8	760

1958	VJ	1958	11	11.26946	03	23	42.76	+13	51	29.3	760
1958	VJ	1958	11	11.31806	03	23	39.87	+13	51	13.9	760
1958	VO	1958	11	11.26946	03	16	28.66	+20	18	58.2	760
1958	VO	1958	11	11.31806	03	16	25.08	+20	19	07.2	760
1958	VF1	1958	11	11.13335	02	04	06.60	+24	37	39.0	760
1958	VF1	1958	11	11.17710	02	04	03.80	+24	37	35.6	760
1959	AD	1959	01	09.05001	05	57	45.97	+24	20	41.1	760
1959	AD	1959	01	09.09307	05	57	44.06	+24	20	42.0	760
1959	CF1	1959	02	07.15979	07	11	48.79	+26	21	33.1	A 760
1959	GM	1959	04	16.34255	14	15	03.65	-08	12	30.1	760
1959	GM	1959	04	16.38630	14	15	01.75	-08	11	58.3	760
1959	JD	1959	05	02.20628	13	43	27.04	-06	26	30.0	760
1959	JD	1959	05	02.25142	13	43	24.97	-06	26	07.5	760
1959	LL	1959	06	07.32915	19	29	56.77	-23	07	46.1	760
1959	LL	1959	06	07.35902	19	29	55.94	-23	07	49.2	760
1959	NE	1959	07	08.13710	17	29	37.97	-22	14	50.2	760
1959	OA	1959	07	30.21186	20	46	30.17	+07	31	54.4	760
1959	OA	1959	07	30.25486	20	46	28.04	+07	31	44.6	760
1959	UF	1959	10	28.24677	00	58	54.59	+13	12	21.8	760
1959	UF	1959	10	28.28945	00	58	52.46	+13	12	12.9	760
1960	DA	1960	02	22.28600	10	13	08.78	+10	57	18.9	760
1961	TV1	1961	10	15.24235	02	10	11.24	-05	59	26.0	760
1961	TV1	1961	10	15.28575	02	10	08.47	-05	59	24.5	760
1962	BE	1962	01	28.15903	09	05	35.23	+15	26	17.4	760
1962	BE	1962	01	28.20208	09	05	32.87	+15	26	09.1	760
1963	DK	1963	02	27.26208	10	35	03.57	+01	40	08.7	760
1963	DK	1963	02	27.30548	10	35	01.36	+01	40	29.9	760
1963	FA	1963	03	22.08409	10	29	47.76	+08	21	07.1	760
1963	TY	1963	10	14.20281	02	18	07.73	-00	25	11.3	760
1963	TY	1963	10	14.24795	02	18	04.89	-00	25	05.9	760
706		1957	02	20.07499	07	53	11.27	+27	55	54.8	760
706		1957	02	20.12777	07	53	08.95	+27	55	43.9	760
738		1964	11	10.15609	01	54	52.29	+06	26	20.2	A 760
738		1964	11	10.19880	01	54	50.51	+06	26	14.7	A 760
740		1952	08	20.12505	20	07	21.85	-23	06	22.1	760
740		1952	08	20.17365	20	07	19.97	-23	06	30.8	760
742		1953	11	09.44234	05	06	34.37	+23	43	22.9	A 760
743		1960	03	28.11454	12	07	06.27	-06	21	57.8	760
745		1960	04	19.23535	12	27	10.21	+15	21	52.5	760
745		1960	04	19.27911	12	27	08.77	+15	21	57.0	760
763		1963	06	24.30207	20	16	16.77	-19	57	55.5	760
763		1963	06	24.34513	20	16	15.31	-19	57	54.0	760
782		1950	07	10.23852	19	19	23.82	-26	40	14.8	A 760
782		1950	07	10.28436	19	19	20.62	-26	40	27.9	A 760
791		1949	11	30.32221	07	40	58.06	+11	26	19.5	760
791		1949	11	30.40346	07	40	56.31	+11	26	25.7	760
793		1963	03	22.28270	13	43	45.80	-02	42	14.8	760
793		1963	03	22.33270	13	43	43.60	-02	42	10.2	760

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1.5-m reflector
AC

A910	FA	1987	01	30.01310	04	28	05.58	+14	35	17.6	801
1929	PA	1986	12	05.21665	03	03	47.89	+21	41	38.5	801
1929	PA	1986	12	28.07403	02	54	22.61	+20	23	30.8	801
1929	PA	1987	01	29.09866	03	00	59.90	+19	56	45.9	801

1931	TW	1987	02	28.33690	13	19	09.75	-09	21	19.9	801
1932	WB	1986	12	01.24706	03	11	21.68	+22	50	04.4	801
1932	WB	1986	12	29.12500	02	57	03.49	+20	27	22.2	801
1932	WB	1987	01	29.11698	03	12	38.04	+20	00	40.1	801
1932	WB	1987	02	02.08633	03	16	39.03	+20	06	24.4	801
1942	DB	1987	02	26.05374	04	18	57.40	+32	18	19.6	801
1952	QX	1987	02	26.10923	05	12	39.55	+23	10	01.5	801
1973	DS	1987	01	04.35882	06	36	25.52	+27	22	30.3	801
1973	DS	1987	01	28.18351	06	11	34.38	+28	54	57.8	801
1977	DO4	1987	02	26.24293	08	49	31.63	+21	09	03.3	801
1977	KK1	1987	01	28.26268	08	23	47.39	+18	40	01.4	801
1977	KK1	1987	02	27.14165	08	02	56.40	+19	53	14.2	801
1977	KK1	1987	02	28.13458	08	02	29.80	+19	54	48.5	801
1978	PB3	1987	01	28.30271	09	05	12.50	+15	22	03.4	801
1978	PB3	1987	02	25.22770	08	43	36.76	+17	04	16.7	801
1978	QJ2	1987	02	27.21448	09	32	17.40	+16	05	16.2	w 801
1978	SD1	1986	12	28.38473	08	36	41.27	+28	01	32.7	801
1978	SD1	1987	01	27.24205	08	14	22.24	+30	12	56.2	801
1978	SD1	1987	02	24.11056	07	55	05.69	+31	07	50.8	801
1979	EE	1987	01	27.25794	08	25	10.71	+29	42	48.5	801
1979	EE	1987	02	25.17803	08	00	03.26	+25	32	23.1	801
1979	SP9	1987	01	29.31583	08	57	54.76	+20	28	07.1	801
1979	SP9	1987	02	24.13445	08	38	11.97	+21	41	58.6	801
1979	SA10	1987	01	29.19774	05	50	41.63	+15	03	14.5	801
1979	SA10	1987	02	28.05173	05	53	32.75	+16	19	43.9	801
1979	SG10	1986	11	30.31094	04	45	12.74	+22	55	05.2	801
1979	SG10	1987	02	26.07406	04	26	57.77	+21	51	39.9	801
1980	CT	1987	01	28.38054	10	00	55.05	+30	02	23.2	801
1980	CT	1987	02	24.19159	09	29	47.10	+30	29	11.4	801
1980	DS	1987	02	27.19855	09	29	47.12	+15	12	00.2	801
1980	DL5	1986	10	08.37186	02	58	02.07	+17	05	19.3	w 801
1980	OF	1986	12	01.13026	01	33	17.30	+25	09	23.0	801
1980	TK5	1987	01	30.08150	06	02	13.04	+12	11	06.8	801
1980	TK5	1987	02	27.07319	06	00	44.60	+13	07	53.1	801
1980	VM1	1987	01	30.24321	07	26	55.02	+28	15	56.0	801
1980	VM1	1987	02	24.09008	07	16	47.85	+28	24	17.7	801
1980	VM1	1987	02	28.06522	07	16	55.64	+28	19	57.9	801
1981	DQ2	1986	12	02.04412	00	51	43.06	+09	21	05.9	801
1981	EA1	1987	01	30.13542	06	18	08.25	+23	01	52.4	801
1981	EA1	1987	02	25.10655	06	16	27.34	+23	33	46.9	801
1981	EB20	1986	12	01.40797	07	48	50.18	+21	05	06.9	801
1981	EB20	1987	01	28.24730	07	00	44.69	+21	53	45.8	801
1981	QZ	1987	01	04.07934	02	48	06.03	+19	13	45.5	801
1981	QZ	1987	01	29.06313	03	01	05.33	+18	50	13.4	801
1981	VS	1987	02	24.06455	07	15	45.90	+09	00	21.0	801
1981	WG1	1987	01	30.06560	06	01	03.69	+14	58	14.0	801
1981	WG1	1987	02	25.08753	06	02	01.38	+17	16	34.9	801
1981	WO1	1986	11	28.40343	09	14	49.81	-07	20	22.1	801
1981	YY1	1987	01	27.36962	10	18	44.39	+12	12	46.2	801
1982	DR2	1987	02	27.11930	07	48	51.42	+07	41	07.6	801
1982	EJ	1987	01	28.05038	03	07	24.44	+18	31	03.8	801
1982	TH2	1986	12	28.36646	08	21	16.06	+26	44	03.1	801
1982	TH2	1987	01	27.22062	07	48	59.57	+28	01	06.0	801
1982	UJ2	1985	09	17.18394	23	06	03.73	-10	26	06.9	801
1982	UM7	1987	02	26.33236	11	39	01.11	-00	36	17.8	801
1982	VJ11	1987	01	28.20822	06	18	21.34	+30	39	11.4	801
1982	VJ11	1987	02	26.17556	06	14	55.59	+30	43	32.9	801
1982	WK	1986	12	05.40545	08	15	58.71	+13	13	51.1	801
1982	WK	1987	01	27.18433	07	34	49.02	+12	47	16.9	801

1982	WK		1987	02	28.09012	07	17	41.22	+14	08	11.0		801
1983	AE1		1986	12	29.08662	02	53	38.98	+32	26	44.3		801
1983	AE1		1987	01	29.04306	02	58	05.52	+29	30	15.9		801
1983	CN		1987	01	28.36094	09	39	24.75	+25	39	20.9		801
1983	CN		1987	02	24.17765	09	08	12.44	+25	02	38.1		801
1983	EV		1987	01	29.25564	06	55	00.60	+28	30	36.9		801
1983	EV		1987	01	30.17930	06	54	17.47	+28	30	10.4		801
1984	CQ		1987	01	27.09819	04	53	36.38	+16	54	26.5		801
1984	CQ		1987	02	25.04437	05	09	04.90	+19	37	27.0		801
1984	FC		1987	01	28.10861	04	03	58.69	+27	42	39.2		801
1984	LJ		1987	01	30.03287	04	32	23.64	+03	22	34.2		801
1984	LJ		1987	02	27.02158	04	42	31.17	+06	17	43.7	W	801
1984	LJ		1987	02	28.02749	04	43	12.09	+06	24	15.2		801
1984	SH5		1987	02	24.24164	10	31	50.32	+06	15	21.9		801
1985	PL		1987	01	29.28740	08	24	08.89	+24	43	38.6		801
1985	PL		1987	02	25.20087	07	59	35.78	+24	03	00.6		801
1985	RK4		1987	01	28.28405	08	49	57.69	+18	36	16.6		801
1985	RK4		1987	02	26.19815	08	25	21.97	+20	00	18.3		801
1985	TF1		1987	01	29.33315	09	04	34.24	+12	23	54.6		801
1985	TF1		1987	02	26.21559	08	40	54.40	+14	08	28.0		801
1985	TF3		1987	01	27.11510	04	10	45.37	+28	04	22.0		801
1985	TF3		1987	01	28.12850	04	10	44.96	+28	02	54.0		801
1985	VO		1987	02	26.00501	02	33	59.67	+36	49	13.7		801
1987	BL	*	1987	01	29.25564	06	55	33.27	+28	24	16.8	18	801
1987	BL		1987	01	30.17930	06	54	28.93	+28	30	11.2		801
1987	DG1	*	1987	02	25.20087	07	59	20.08	+24	02	32.6	18	801
1987	DH1	*	1987	02	25.27293	10	51	41.41	+21	39	09.2	17	801
1987	DJ1	*	1987	02	25.36196	11	38	17.29	+10	25	01.6	17	801
1987	DK1	*	1987	02	28.29506	10	34	11.63	+05	06	09.1	18	801
3524	P-L		1987	01	28.39771	10	31	47.51	+18	11	49.0	S	801
3524	P-L		1987	02	24.21979	10	04	01.56	+18	33	54.0		801
5550	P-L		1985	09	17.26068	23	42	54.64	-11	04	31.8	17.5	801
5550	P-L		1986	11	28.30963	05	55	10.46	+39	43	25.5		801
5550	P-L		1987	02	27.04376	05	07	21.07	+37	10	11.7		801
75			1987	02	26.30655	11	15	17.59	+06	46	24.1		801
487			1987	01	27.09819	04	53	09.54	+16	55	30.8		801
581			1987	01	30.19866	07	00	45.05	+27	45	04.4		801
3103			1987	02	27.33827	09	39	33.36	+34	14	01.9		801
3554			1987	01	29.41372	14	18	28.22	+11	13	54.0		801
3554			1987	02	24.40705	14	04	49.24	+02	49	36.4		801

809 European Southern Observatory
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0.4-m GPO astrograph

1982	WK		1987	01	24.10764	07	37	50.03	+12	40	47.2	15.5	809
1982	WK		1987	01	24.11806	07	37	49.44	+12	40	47.6	15.5	809
1987	BA		1987	01	22.21875	08	11	09.88	+16	40	49.4	17.2	809
1987	BA		1987	01	22.22917	08	11	09.21	+16	40	55.6	17.2	809
1987	BO1	*	1987	01	22.07014	06	43	13.21	+10	50	26.1	16	809
1987	BO1		1987	01	22.08056	06	43	12.52	+10	50	17.3	16	809
1987	BO1		1987	01	22.09097	06	43	11.86	+10	50	08.4	16	809
1987	BP1	*	1987	01	22.17014	08	03	42.31	+16	06	50.8	17	809
1987	BP1		1987	01	29.16181	07	58	54.09	+16	44	27.0	17	809
1987	BP1		1987	01	29.17222	07	58	53.36	+16	44	29.3	17	809
1987	BQ1	*	1987	01	22.21875	08	06	20.09	+16	01	17.0	16.8	809
1987	BQ1		1987	01	22.22917	08	06	19.47	+16	01	21.3	16.8	809
1987	BR1	*	1987	01	22.21875	08	09	34.85	+16	40	22.1	17	809
1987	BR1		1987	01	22.22917	08	09	34.06	+16	40	23.2	17	809

1987	BR1		1987	01	29.16181	08	01	53.95	+16	49	57.3	17	809
1987	BR1		1987	01	29.17222	08	01	53.22	+16	49	58.9	17	809
1987	BS1	*	1987	01	22.24792	08	21	18.06	+16	19	09.5	17	809
1987	BS1		1987	01	22.25764	08	21	17.31	+16	19	08.2	17	809
1987	BT1	*	1987	01	24.15903	07	38	08.59	+14	27	07.7	17	809
1987	BT1		1987	01	24.17153	07	38	07.75	+14	27	06.5	17	809
1987	BU1	*	1987	01	25.31250	09	00	24.64	+10	42	50.9	17.2	809
1987	BU1		1987	01	25.32639	09	00	23.81	+10	42	53.3	17.2	809
1987	BV1	*	1987	01	25.31250	09	00	31.23	+09	55	26.1	16	809
1987	BV1		1987	01	25.32639	09	00	30.66	+09	55	31.2	16	809
1987	BV1		1987	02	05.23403	08	52	12.38	+11	04	03.3	16	809
1987	BV1		1987	02	05.24514	08	52	11.92	+11	04	06.8	16	809
1987	BW1	*	1987	01	25.31250	09	04	40.99	+09	15	29.3	17.4	809
1987	BW1		1987	01	25.32639	09	04	40.17	+09	15	30.3	17.4	809
1987	BX1	*	1987	01	25.36389	09	02	17.99	+05	45	52.8	16	809
1987	BY1	*	1987	01	26.21667	08	25	57.11	+14	19	28.5	16.9	809
1987	BY1		1987	01	26.22708	08	25	56.59	+14	19	38.4	16.9	809
1987	BY1		1987	01	31.19514	08	21	53.88	+15	27	31.1	17.1	809
1987	BY1		1987	01	31.20556	08	21	53.45	+15	27	39.6	17.1	809
1987	BZ1	*	1987	01	26.23681	08	34	31.49	+13	10	15.0	17	809
1987	BZ1		1987	01	26.24931	08	34	30.87	+13	10	23.4	17	809
1987	BA2	*	1987	01	28.28264	09	21	16.74	-01	19	32.1	16.8	809
1987	BA2		1987	01	28.29306	09	21	16.07	-01	19	31.1	16.8	809
1987	BB2	*	1987	01	29.16181	07	55	09.57	+16	55	30.7	17	809
1987	BB2		1987	01	29.17222	07	55	09.05	+16	55	30.4	17	809
1987	BC2	*	1987	01	29.16181	07	56	08.55	+17	21	18.6	17	809
1987	BC2		1987	01	29.17222	07	56	07.80	+17	21	18.6	17	809
1987	BD2	*	1987	01	29.16181	07	57	56.69	+16	58	20.0	17	809
1987	BD2		1987	01	29.17222	07	57	56.24	+16	58	23.5	17	809
1987	BE2	*	1987	01	29.16181	07	59	18.34	+17	26	12.9	17	809
1987	BE2		1987	01	29.17222	07	59	17.74	+17	26	14.9	17	809
1987	BF2	*	1987	01	29.16181	08	00	07.05	+16	01	02.6	17	809
1987	BF2		1987	01	29.17222	08	00	06.61	+16	01	02.7	17	809
1987	CG	*	1987	02	02.35486	11	15	55.01	+05	53	38.2	17	809
1987	CH	*	1987	02	02.35486	11	16	15.38	+05	34	55.4	17	809
1987	CJ	*	1987	02	02.35486	11	17	13.83	+04	52	38.7	17	809
1987	CK	*	1987	02	05.23403	08	53	38.94	+09	49	15.6	17	809
1987	CK		1987	02	05.24514	08	53	38.19	+09	49	15.6	17	809
192			1987	02	02.35486	11	17	56.37	+05	46	33.8	12.2	809
289			1987	01	24.10764	07	40	06.68	+12	18	11.2	14.4	809
289			1987	01	24.11806	07	40	06.20	+12	18	13.1	14.4	809
320			1987	01	22.07014	06	42	12.23	+10	34	39.5	15.8	809
320			1987	01	22.08056	06	42	11.74	+10	34	39.9	15.8	809
320			1987	01	22.09097	06	42	11.25	+10	34	40.7	15.8	809
1097			1987	02	02.35486	11	18	50.54	+05	22	09.5	17.1	809
1408			1987	01	25.36389	09	03	21.56	+05	13	29.0	16.1	809
1668			1987	01	31.19514	08	19	30.84	+15	32	25.9	16.7	809
1668			1987	01	31.20556	08	19	30.27	+15	32	28.3	16.8	809
2203			1987	02	02.35486	11	18	47.91	+06	40	58.4	17.3	809
2249			1987	02	02.35486	11	14	26.17	+05	54	18.5	16.2	809
2356			1987	01	28.28264	09	17	06.18	-02	29	05.4	16.2	809
2356			1987	01	28.29306	09	17	05.68	-02	29	02.0	16.2	809
2478			1987	01	25.31250	09	02	56.66	+08	51	07.4	15.6	809
2478			1987	01	25.32639	09	02	55.83	+08	51	09.5	17.4	809
2722			1987	02	02.35486	11	15	04.82	+05	50	36.1	17	809
2929			1987	01	22.07014	06	42	42.75	+10	27	56.8	16.5	809
2929			1987	01	22.08056	06	42	42.28	+10	27	59.6	16.5	809
2929			1987	01	22.09097	06	42	41.86	+10	28	02.1	16.5	809

3355	1987 01 22.24792	08 19 19.81	+17 06 34.2		17		809
3355	1987 01 22.25764	08 19 18.98	+17 06 37.5		17		809

877 Okutama
N. Kawasato, 3-51, Hana-Koganei, Kodaira, Tokyo 187, Japan
Observer T. Hioki
Measurer N. Kawasato
0.26-m f/6.3 reflector
Copied from Nihondaira Obs. Circ.

1982 UJ2	1987 03 20.60281	11 49 31.84	+05 29 28.9				877
1982 UJ2	1987 03 20.65212	11 49 28.84	+05 29 36.8				877
3437	1987 02 26.68880	08 55 25.72	+24 18 20.5				877
3437	1987 02 26.73171	08 55 23.47	+24 18 22.2				877

881 Toyota
T. Urata, 1-8-303, 1 Chome, Dobayashi, Shimizu, Shizuoka 424, Japan
Observers K. Suzuki, T. Urata
0.31-m f/5.7 reflector
Copied from Nihondaira Obs. Circ.

1986 WP2	1986 12 07.57188	04 31 36.88	+17 18 08.3			F	881
1987 BJ	1987 02 07.74028	09 37 40.97	+11 53 09.1		15		881
1987 BJ	1987 02 07.76042	09 37 39.91	+11 53 20.2				881
1987 BJ	1987 02 27.52882	09 21 29.75	+14 47 25.1		15.5		881
1987 BJ	1987 02 27.56215	09 21 28.33	+14 47 41.9				881
1987 BJ	1987 02 27.59063	09 21 27.11	+14 47 54.6				881
1987 BJ	1987 03 20.54063	09 15 00.07	+16 47 24.2		16		881
1987 BJ	1987 03 20.59826	09 15 00.09	+16 47 35.6				881
1987 DA *	1987 02 20.57049	10 30 46.34	+07 16 06.7		17		881
1987 DA	1987 02 20.59132	10 30 45.02	+07 16 09.6				881
1987 EC *	1987 03 02.54965	11 21 23.73	+11 19 21.5		15.5		881
1987 EC	1987 03 02.57188	11 21 22.52	+11 19 26.0				881
1987 EC	1987 03 05.55521	11 18 32.70	+11 28 03.9		15.5		881
1987 EC	1987 03 05.57743	11 18 31.49	+11 28 09.2				881
3370	1987 03 20.55868	11 03 51.53	+12 05 08.7		16.5		881
3370	1987 03 20.57951	11 03 50.59	+12 05 16.5				881

883 Shizuoka
T. Urata, 1-8-303, 1 Chome, Dobayashi, Shimizu, Shizuoka 424, Japan
Observer M. Kizawa
Measurer T. Urata
0.31-m f/6.4 reflector
Copied from Nihondaira Obs. Circ.

1987 BJ	1987 02 04.61962	09 40 21.31	+11 25 34.9				883
1987 BJ	1987 02 04.64208	09 40 20.10	+11 25 46.2				883
84	1987 03 08.57077	09 33 14.17	+13 54 24.6				883
84	1987 03 08.58727	09 33 13.10	+13 54 25.6				883
602	1987 02 04.57972	08 54 43.07	+25 48 03.1				883
602	1987 02 04.60832	08 54 41.43	+25 48 02.4				883

887 Ojima
T. Urata, 1-8-303, 1 Chome, Dobayashi, Shimizu, Shizuoka 424, Japan
Observers T. Niijima, T. Urata
0.30-m f/5.8 reflector
Copied from Nihondaira Obs. Circ.

1931 TW	1987 02 07.78822	13 19 57.81	-08 47 17.0		16.5		887
1931 TW	1987 02 07.81329	13 19 58.08	-08 47 20.8				887
1931 TW	1987 02 07.83889	13 19 58.56	-08 47 27.4				887
1931 TW	1987 03 26.65637	13 00 11.63	-08 21 51.3		16.5		887
1931 TW	1987 03 26.67374	13 00 10.62	-08 21 47.4				887

1931	TW		1987	03	31.63773	12	55	08.70	-08	00	25.7	16.5	887
1931	TW		1987	03	31.65556	12	55	07.48	-08	00	20.0		887
1985	TC		1987	02	27.64306	11	54	38.0	-02	43	37	18 F	887
1985	TC		1987	02	27.65787	11	54	37.5	-02	43	27	F	887
1986	XO2		1987	02	25.55509	09	39	39.30	+08	59	37.2		887
1986	XO2		1987	02	25.58160	09	39	38.11	+09	00	19.4		887
1986	XO2		1987	03	02.57014	09	36	01.4	+11	00	10	u	887
1986	XO2		1987	03	05.60009	09	34	03.24	+12	11	49.4	14	887
1986	XO2		1987	03	05.63220	09	34	01.99	+12	12	33.3		887
1986	XO2		1987	03	18.50578	09	28	30.28	+16	51	57.7	15	887
1986	XO2		1987	03	18.52859	09	28	29.82	+16	52	26.4		887
1986	YA		1987	01	30.42196	03	32	12.67	+21	22	10.3	17	887
1986	YA		1987	01	30.44554	03	32	13.65	+21	22	05.4		887
1987	BC		1987	02	04.59509	08	29	37.68	+16	40	44.0	17	887
1987	BC		1987	02	04.63171	08	29	35.36	+16	40	54.3		887
1987	BC		1987	02	20.56123	08	17	36.33	+17	32	37.8	17	887
1987	BC		1987	02	20.58275	08	17	35.54	+17	32	40.4		887
1987	BE		1987	02	04.60874	08	32	04.83	+16	08	26.1	16	887
1987	BE		1987	02	04.64317	08	32	03.00	+16	08	34.3		887
1987	BE		1987	02	04.65457	08	32	02.33	+16	08	36.8		887
1987	BE		1987	02	07.74787	08	29	28.16	+16	21	37.9	16	887
1987	BE		1987	02	07.75894	08	29	27.85	+16	21	42.6		887
1987	BE		1987	02	20.56123	08	20	11.19	+17	12	14.4	16.5	887
1987	BE		1987	02	20.58275	08	20	10.34	+17	12	19.7		887
1987	BE		1987	02	27.57507	08	16	27.6	+17	35	39	17 F	887
1987	BE		1987	02	27.60840	08	16	26.9	+17	35	47	F	887
1987	BF		1987	02	04.60874	08	30	45.8	+16	18	33	17	887
1987	BF		1987	02	04.64317	08	30	43.0	+16	18	40		887
1987	BF		1987	02	04.65457	08	30	42.4	+16	18	37		887
1987	BF		1987	02	20.54977	08	14	45.2	+16	41	25	17.5 U	887
1987	BF		1987	02	20.57233	08	14	43.7	+16	41	28	U	887
1987	DN	*	1987	02	25.56396	09	40	22.4	+11	52	44	17	887
1987	DN		1987	02	25.59306	09	40	21.2	+11	52	49		887
1987	DN		1987	02	25.62002	09	40	19.6	+11	52	51		887
1987	DN		1987	03	01.55694	09	37	17.52	+12	02	20.3	17	887
1987	DN		1987	03	01.58090	09	37	16.21	+12	02	25.5		887
1987	DN		1987	03	02.54676	09	36	33.28	+12	04	39.2	17	887
1987	DN		1987	03	02.57014	09	36	32.19	+12	04	42.1		887
1987	DO	*	1987	02	25.57280	09	42	54.7	+14	20	07	17	887
1987	DO		1987	02	25.60208	09	42	52.9	+14	20	20		887
1987	DO		1987	02	25.62898	09	42	51.6	+14	20	32		887
1987	DO		1987	02	28.56512	09	40	33.6	+14	38	37	17 F	887
1987	DO		1987	02	28.61014	09	40	31.2	+14	38	50	F	887
1987	DO		1987	03	01.56840	09	39	48.45	+14	44	29.2	17	887
1987	DO		1987	03	01.59201	09	39	47.45	+14	44	37.9		887
1987	DO		1987	03	03.62303	09	38	20.4	+14	56	07	17	887
1987	DO		1987	03	03.64988	09	38	18.9	+14	56	20		887
1987	DO		1987	03	20.59670	09	30	57.0	+16	02	50	17.5 F	887
1987	DP	*	1987	02	25.67866	11	18	42.9	+01	42	53	17 F	887
1987	DP		1987	02	25.70549	11	18	41.65	+01	43	05.0	17	887
1987	DQ	*	1987	02	28.57466	09	38	50.99	+16	28	55.4	16	887
1987	DQ		1987	02	28.61984	09	38	48.53	+16	29	16.1		887
1987	DQ		1987	03	02.55926	09	37	09.98	+16	43	49.1	16.5	887
1987	DQ		1987	03	02.58530	09	37	08.63	+16	43	59.8		887
1987	DQ		1987	03	03.55463	09	36	21.15	+16	51	00.3	16	887
1987	DQ		1987	03	03.57576	09	36	20.08	+16	51	10.1		887
1987	DQ		1987	03	03.59618	09	36	18.95	+16	51	18.0		887
1987	DQ		1987	03	05.54479	09	34	47.28	+17	04	55.0	16	887
1987	DQ		1987	03	05.56655	09	34	46.16	+17	05	04.0		887

1987	DQ		1987	03	18.45700	09	27	13.76	+18	16	20.3	16	887
1987	DQ		1987	03	18.49519	09	27	12.84	+18	16	30.5		887
1987	DQ		1987	03	20.52350	09	26	29.77	+18	24	31.2	16.5	887
1987	DQ		1987	03	20.55718	09	26	29.02	+18	24	39.2		887
1987	EB	*	1987	03	03.55463	09	33	33.85	+16	53	19.1	16	887
1987	EB		1987	03	03.57576	09	33	33.07	+16	53	26.3		887
1987	EB		1987	03	03.59618	09	33	32.08	+16	53	33.4		887
1987	EB		1987	03	18.45700	09	24	55.47	+18	01	56.5	16.5	887
1987	EB		1987	03	18.49519	09	24	54.57	+18	02	04.0		887
1987	EB		1987	03	20.52350	09	24	09.26	+18	08	42.1	16.5	887
1987	EB		1987	03	20.55718	09	24	08.40	+18	08	48.7		887
1987	EB		1987	03	24.60174	09	22	58.8	+18	19	58	F	887
1987	EC		1987	03	20.55868	11	04	36.29	+11	59	29.3	16.5	887
1987	EC		1987	03	20.57951	11	04	35.37	+11	59	30.1		887
1987	FA	*	1987	03	20.61153	10	59	46.87	+05	09	36.0	16.5	887
1987	FA		1987	03	20.62083	10	59	46.18	+05	09	38.5		887
1987	FA		1987	03	20.62963	10	59	45.49	+05	09	41.8		887
1987	FA		1987	03	24.56007	10	56	23.64	+05	32	35.3	16.5	887
1987	FA		1987	03	24.58032	10	56	22.88	+05	32	44.0		887
1987	FA		1987	03	31.52373	10	51	14.43	+06	08	15.2	17	887
1987	FA		1987	03	31.57722	10	51	12.21	+06	08	29.6		887
1987	FB	*	1987	03	26.56537	13	00	20.50	-08	46	30.0	17	887
1987	FB		1987	03	26.67374	13	00	19.74	-08	46	29.2		887
1987	FB		1987	03	31.63773	12	55	53.66	-08	37	33.1	17	887
1987	FB		1987	03	31.65556	12	55	52.45	-08	37	31.0		887
1117			1987	03	20.53486	09	31	50.39	+15	32	22.8	16	887
1117			1987	03	20.59670	09	31	48.19	+15	32	37.6		887
1201			1987	03	26.65637	12	59	04.18	-08	23	43.0	16	887
1201			1987	03	26.67374	12	59	03.43	-08	23	35.2		887
1201			1987	03	31.63773	12	55	14.56	-07	48	23.9	15.5	887
1201			1987	03	31.65556	12	55	13.59	-07	48	15.2		887
1345			1987	02	04.60874	08	33	40.28	+16	24	29.4		887
1345			1987	02	04.64317	08	33	38.74	+16	24	40.6		887
1345			1987	02	04.65457	08	33	38.24	+16	24	45.1		887
3565			1987	01	30.50670	05	11	02.50	+23	19	14.3	17	887
3565			1987	01	30.57453	05	11	01.99	+23	19	23.2		887

888 Gekko
Y. Oshima, Gekko Observatory, Kan-nami, Shizuoka 419-01, Japan
Observer Y. Oshima
Measurer T. Urata
0.5-m f/4 reflector
Copied from Nihondaira Obs. Circ.

1986	WP2		1986	12	09.66736	04	29	28.27	+17	13	40.7	P	888
1987	BJ		1987	02	05.75139	09	39	23.65	+11	35	26.9	p	888
1987	BJ		1987	02	05.78076	09	39	22.02	+11	35	41.4	p	888
1987	DM	*	1987	02	28.5684	10	07	47.76	+16	14	36.0	16.5	888
1987	DM		1987	02	28.6066	10	07	46.33	+16	14	42.2		888
1987	DM		1987	03	02.6337	10	06	28.27	+16	20	25.8		888
1987	DM		1987	03	02.6580	10	06	27.27	+16	20	29.3		888
1987	DM		1987	03	03.60174	10	05	50.97	+16	23	00.7	17.5	888
1987	DM		1987	03	03.63715	10	05	50.19	+16	23	06.2		888
1987	DM		1987	03	04.66424	10	05	11.51	+16	25	45.6	17.5	888
1987	DM		1987	03	04.68785	10	05	10.61	+16	25	50.7		888
1987	EA	*	1987	03	02.69410	10	26	10.18	+15	10	08.4	16.5	888
1987	EA		1987	03	02.74757	10	26	06.64	+15	10	24.7		888
1987	EA		1987	03	03.62535	10	25	13.80	+15	13	59.1	16.5	888
1987	EA		1987	03	03.67882	10	25	10.33	+15	14	12.2		888

1987 EA 1987 03 04.67604 10 24 09.88 +15 18 09.3 16.5 888
1987 EA 1987 03 04.69896 10 24 08.50 +15 18 13.6 888

892 YGCO Hoshikawa and Nagano Stations
T. Urata, 1-8-303, 1 Chome, Dobayashi, Shimizu, Shizuoka 424, Japan
Observer T. Kojima
0.25-m f/3.4 Wright-Schmidt camera
Copied from Nihondaira Obs. Circ.
1986 XO2 1987 02 28.55347 09 37 26.17 +10 11 52.1 14 892
1986 XO2 1987 02 28.59167 09 37 24.32 +10 12 51.3 892

894 Kiyosato
T. Urata, 1-8-303, 1 Chome, Dobayashi, Shimizu, Shizuoka 424, Japan
Observer S. Miyasaka
0.16-m f/3.3 hyperboloid astro-camera
Copied from Nihondaira Obs. Circ.
1987 BJ 1987 02 20.54410 09 26 39.28 +13 49 01.2 894
1987 BJ 1987 02 20.59682 09 26 36.64 +13 49 25.5 894
1987 BJ 1987 02 21.61667 09 25 47.82 +13 58 21.2 894
1987 BJ 1987 02 21.65220 09 25 45.93 +13 58 38.3 894

* * * * *

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, b = F. N. Bowman, f = T. Furuta, G = D. W. E. Green, I = H. Oishi, M = B. G. Marsden, N = S. Nakano, U = T. Urata.

Planet	H	Epoch	M	Peri.	Node	Incl.	e	a	Arc	O	N	C
1978 NU3	14.6	780731	351.42	185.06	136.65	6.11	0.2213	2.3599	81	7	D	I
1978 PE	14.7	780929	352.83	213.54	132.91	5.24	0.2309	2.3015	51	4	D	I
1978 PB1	12.7	780929	58.57	119.50	138.84	17.06	0.0687	3.0762	51	4	D	I
1978 PL2	14.1	780909	328.87	116.74	279.04	1.86	0.2929	2.7009	32	6	D	f
1978 VP3	15.5	781108	310.02	37.17	83.86	4.15	0.0792	2.9713	25	5	D	I
1978 VM5	12.5	781108	3.35	4.84	54.14	11.58	0.1781	3.0699	3	4		I
1978 VJ6	14.1	781108	253.37	145.27	33.27	3.38	0.0664	2.6416	3	3		I
1978 VQ6	15.6	781108	326.65	75.70	27.96	2.23	0.0750	2.9256	25	4	D	I
1978 VC7	11.8	781108	267.65	136.23	71.26	15.48	0.2732	5.0711	25	6	D	f
1978 VK7	17.0	781108	37.73	145.22	224.01	0.96	0.1782	2.4340	25	5	D	f
1978 VV7	13.3	781108	71.10	260.27	60.99	15.16	0.2842	2.6781	3	4		I
1978 VA8	14.7	781108	249.04	139.24	44.50	1.64	0.0545	3.1552	24	4	D	I
1978 VP8	13.2	781108	230.93	84.59	124.76	2.21	0.1596	3.1970	25	6	D	I
1978 VC9	16.4	781108	320.64	204.16	268.58	1.40	0.1174	2.5857	25	5	D	I
1978 VD9	15.8	781108	42.08	339.13	33.94	1.28	0.0928	2.3483	25	6	D	I
1978 VZ9	14.7	781108	305.28	77.31	49.65	7.76	0.0737	2.5053	3	4		I
1978 VH10	15.5	781108	32.72	303.17	85.05	3.16	0.0757	2.9291	24	4	D	I
1978 VD11	15.4	781108	57.06	290.47	58.58	10.55	0.1762	2.4975	3	4		I
1978 VT11	14.1	781108	32.23	7.23	12.00	2.02	0.1607	2.3416	3	4		I
1981 RQ2	13.0	810913	29.62	90.56	230.62	10.14	0.1868	2.5927	46	5	D	M

1981	TW1	14.5	811003	34.42	89.55	238.32	5.78	0.2479	2.1977	27	4	D	M
1981	UU11	13.0	811023	343.82	218.40	198.42	8.44	0.1444	2.7944	28	5	D	M
1982	VA1	14.0	821127	59.63	272.74	61.20	6.08	0.2007	2.2336	29	6	D	M
1985	RZ4	12.0	850912	43.69	329.11	352.80	13.30	0.1650	2.6772	28	4		B
1985	TN3	13.0	851002	37.28	340.80	344.72	14.53	0.1772	2.6166	54	6		M
1985	TW3	13.5	851002	39.32	280.93	44.76	4.15	0.1896	2.1678	53	8	D	B
1985	TZ3	14.0	850912	63.30	340.88	305.81	5.36	0.1473	2.2551	26	4		M
1985	TA4	13.5	851022	50.85	39.21	291.34	6.28	0.0774	2.3666	27	4		B
1986	AZ2	12.0	851221	63.66	268.47	91.14	12.49	0.2844	2.7069	24	5		B
1986	PY	15.0	860818	351.26	195.29	145.63	8.18	0.2512	2.2197	31	9		B
1986	PM4	12.5	860818	358.23	38.72	291.08	8.64	0.1400	2.8513	30	7	D	B
1986	TX1	13.5	860927	352.25	335.15	43.87	12.27	0.1670	2.6529	7	6		G
1986	TN6	15.0	861017	11.23	94.51	262.41	3.65	0.1894	2.1125	21	3	D	N
1986	TT6	9.0	861017	290.76	244.53	241.10	35.29	0.0967	5.2410	31	0	D	N
1986	UP	13.0	861017	79.76	249.70	34.96	23.25	0.2448	2.4087	31	8		G
1986	UU	14.5	861017	28.32	108.00	235.90	5.99	0.2523	2.1883	36	6	D	b
1986	VB7	13.0	861017	182.68	173.05	36.82	14.35	0.0098	2.5131	28	6		G
1986	VH7	14.5	861017	356.55	19.26	18.24	2.40	0.2167	2.3370	32	6		G
1986	VJ7	15.0	861017	5.32	358.35	24.18	5.22	0.2662	2.4486	32	6		G
1986	WP2	14.0	861126	338.40	287.74	169.13	2.35	0.1527	2.3509	10	8		U
1986	XO2	11.5	870105	314.31	43.28	155.42	23.93	0.2250	2.3581	106	0		B
1986	XX4	13.0	861126	34.06	254.24	116.54	8.79	0.2996	2.9403	6	6		G
1987	BA	13.5	870125	44.25	301.60	125.17	24.18	0.1204	2.3265	11	0		M
1987	BB	14.5	870125	348.37	354.49	148.43	0.28	0.1933	2.1731	10	8		U
1987	BC	11.5	870214	119.73	183.91	179.27	1.98	0.0777	2.9150	23	7		U
1987	BF	13.5	870214	286.82	290.50	292.01	4.72	0.1466	2.2878	23	8		U
1987	BG	13.5	870125	339.51	217.23	303.97	12.12	0.2839	3.0032	7	3		B
1987	BK1	12.5	870125	238.43	307.96	315.51	24.55	0.1223	2.7573	5	6		B
1987	BM1	12.0	870125	358.42	46.30	93.27	14.59	0.1122	3.0113	27	6		B
1987	BL2		870125	358.59	280.98	208.23	1.32	0.1363	2.8779	2	6	E	B
1987	BN2	12.5	870125	177.61	327.32	346.13	2.55	0.1073	2.4726	2	6	E	B
1987	BO2	14.5	870125	357.41	164.57	328.84	4.24	0.1160	2.2461	2	6	E	B
1987	BP2	14.5	870125	357.39	9.42	124.79	3.11	0.1234	2.2636	2	6	E	B
1987	BQ2	11.5	870125	290.36	141.05	80.84	6.18	0.1804	3.3660	3	6	E	B
1987	CJ	12.0	870214	23.09	337.68	155.69	10.42	0.0550	3.0210	29	4		B
1987	CM	12.0	870125	17.64	90.18	19.59	4.76	0.1015	3.2284	3	7	E	B
1987	CN	12.0	870125	143.03	14.31	326.53	20.15	0.1103	2.6361	3	5	E	B
1987	CO	12.0	870125	28.43	18.18	79.43	4.35	0.1055	3.2466	3	6	E	B
1987	DD	12.5	870214	52.42	350.09	87.92	30.30	0.2168	2.7470	5	6		B
1987	DJ	12.0	870214	190.09	240.56	80.44	10.60	0.0714	3.0401	7	5		B
1987	DK	12.0	870214	125.00	240.59	104.80	14.03	0.2427	2.3034	7	3	E	B
1987	DM	10.5	870214	177.84	306.00	24.97	4.15	0.0493	3.9157	4	7	E	B
1987	DN	12.0	870214	318.95	243.13	313.04	5.16	0.1165	3.2041	5	7	E	B
1987	DO	14.0	870306	11.44	352.98	143.52	2.76	0.1700	2.3624	23	0		B
1987	DS	11.5	870214	38.94	336.67	115.45	2.78	0.1427	3.1222	7	6		B
1987	DD1	13.5	870214	305.79	67.78	158.97	13.06	0.1433	2.5870	8	3		B
1987	DE1	12.5	870214	221.07	156.46	155.51	4.16	0.2181	2.4505	8	3		B
1987	EA	12.0	870214	175.06	318.95	17.02	4.80	0.1432	2.3453	2	6	E	B

1978 NU3 = 1978 OH (O. Kippes)
1978 NU3 = 1978 OH = 1978 SJ (H. Oishi, JAM 2044)
1978 PE = 1978 SN (H. Oishi, JAM 2045)
1978 PB1 = 1978 SE (H. Oishi, JAM 2045)
1978 PL2 = 1978 RS10 (T. Furuta, JAM 2053)
1978 VP3 = 1978 WV10 (H. Oishi, JAM 2045)
1978 VQ6 = 1978 WC12 (H. Oishi, JAM 2046)
1978 VC7 = 1978 WA14 (T. Furuta, JAM 2053)
1978 VK7 = 1978 WV11 (T. Furuta, JAM 2053)
1978 VA8 = 1978 WP12 (H. Oishi, JAM 2046)

1978 VP8 = 1978 WU12 (H. Oishi, JAM 2046)
1978 VC9 = 1978 WM12 (H. Oishi, JAM 2047)
1978 VD9 = 1978 WE12 (H. Oishi, JAM 2047)
1978 VH10 = 1978 WC13 (H. Oishi, JAM 2049)
1981 RQ2 = 1981 SY = 1981 TE1 = 1981 UD13 (T. Furuta, JAM 2059)
1981 TW1 = 1981 UA1 = 1981 UG10 (T. Furuta, JAM 2059)
1981 UU11 = 1981 WF (T. Furuta, JAM 2060)
1982 VA1 = 1982 XH1 (T. Furuta, JAM 2060)
1985 TW3 = 1985 VQ1 (C. M. Bardwell)
1986 PM4 = 1986 RS (F. N. Bowman, E. W. Elst, B. G. Marsden)
1986 TN6 = 1986 UJ1 (S. Nakano)
1986 TT6 = 1986 VP5 (F. N. Bowman, S. Nakano)
1986 UU = 1986 XC1 (F. N. Bowman)

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ORBITAL ELEMENTS BY E. GOFFIN, AGFA-GEVAERT N.V., MORTSEL, BELGIUM.

(54) Alexandra
Epoch 1987 July 24.0 ET = JDE 2447000.5

M	336.89877		(1950.0)	P	Q
n	0.22077814	Peri.	344.23909	+0.46354171	+0.87344386
a	2.7112236	Node	313.10695	-0.78925549	+0.33053208
e	0.1962974	Incl.	11.78251	-0.40274665	+0.35755332
P	4.46	H	7.70	G 0.15	

From 118 observations at 29 oppositions 1909-1986, mean residual 0".8.

(152) Atala
Epoch 1987 July 24.0 ET = JDE 2447000.5

M	348.83676		(1950.0)	P	Q
n	0.17707207	Peri.	47.91646	+0.04946329	-0.98959214
a	3.1407691	Node	39.86159	+0.84273989	-0.03126254
e	0.0713635	Incl.	12.17137	+0.53604371	+0.14046368
P	5.57	H	8.58	G 0.25	

From 52 observations at 24 oppositions 1905-1986, mean residual 1".0.

(153) Hilda
Epoch 1987 July 24.0 ET = JDE 2447000.5

M	169.52062		(1950.0)	P	Q
n	0.12444232	Peri.	42.88849	+0.00704310	+0.99485936
a	3.9733545	Node	227.78498	-0.95038780	-0.02475827
e	0.1416585	Incl.	7.83953	-0.31098781	+0.09819308
P	7.92	H	7.46	G 0.03	

From 201 observations at 48 oppositions 1875-1985, mean residual 0".9.

(242) Kriemhild
Epoch 1987 July 24.0 ET = JDE 2447000.5

M	355.58542		(1950.0)	P	Q
n	0.20353924	Peri.	277.97504	-0.56202478	-0.82236091
a	2.8622262	Node	206.82566	+0.81492959	-0.53223057
e	0.1200374	Incl.	11.32305	+0.14148468	-0.20112971
P	4.84	H	9.61	G 0.15	

From 67 observations at 24 oppositions 1903-1985, mean residual 1".0.

(279) Thule
Epoch 1987 July 24.0 ET = JDE 2447000.5

M	291.52805		(1950.0)		P		Q
n	0.11172202	Peri.	73.52375		-0.83490506		-0.54900650
a	4.2694985	Node	73.16187		+0.48810486		-0.77134169
e	0.0113351	Incl.	2.33865		+0.25433675		-0.32190659
P	8.82	H	8.57	G	0.15		

From 188 observations at 46 oppositions 1888-1985, mean residual 0".9.

(282) Clorinde
Epoch 1987 July 24.0 ET = JDE 2447000.5

M	237.32088		(1950.0)		P		Q
n	0.27560882	Peri.	295.99509		+0.15812008		-0.98320621
a	2.3385176	Node	144.53141		+0.95275393		+0.12767956
e	0.0818130	Incl.	9.03518		+0.25934143		+0.13039739
P	3.58	H	10.98	G	0.25		

From 47 observations at 15 oppositions 1918-1986, mean residual 0".9.

(324) Bamberga
Epoch 1987 July 24.0 ET = JDE 2447000.5

M	9.89401		(1950.0)		P		Q
n	0.22451004	Peri.	43.40319		+0.97384698		-0.20263009
a	2.6810950	Node	327.86187		+0.11634115		+0.83327695
e	0.3415738	Incl.	11.13980		+0.19515841		+0.51438369
P	4.39	H	6.82	G	0.10		

From 211 observations at 30 oppositions 1905-1985, mean residual 0".7.

(330) Adalberta
Epoch 1987 July 24.0 ET = JDE 2447000.5

M	59.38742		(1950.0)		P		Q
n	0.25416504	Peri.	259.30040		+0.80486600		-0.58792800
a	2.4682672	Node	136.64696		+0.58004162		+0.75055238
e	0.2510148	Incl.	6.76080		+0.12546884		+0.30168162
P	3.88	H	12.7	G	0.25		

From 26 observations at 7 oppositions 1910-1986, mean residual 1".1.

(334) Chicago
Epoch 1987 July 24.0 ET = JDE 2447000.5

M	195.64511		(1950.0)		P		Q
n	0.12945126	Peri.	137.94517		-0.03164038		+0.99756602
a	3.8701863	Node	130.14453		-0.93728003		-0.00802183
e	0.0408863	Incl.	4.66246		-0.34713836		-0.06926537
P	7.61	H	7.48	G	0.15		

From 298 observations at 61 oppositions 1892-1985, mean residual 0".8.

(425) Cornelia
Epoch 1987 July 24.0 ET = JDE 2447000.5

M	95.61095		(1950.0)		P		Q
n	0.20111437	Peri.	120.96035		-0.99754050		+0.03295193
a	2.8851871	Node	60.99261		-0.05635599		-0.90185171
e	0.0603981	Incl.	4.05633		+0.04167686		-0.43078726
P	4.90	H	9.83	G	0.15		

From 67 observations at 17 oppositions 1900-1985, mean residual 1".0.

(441) Bathilde
Epoch 1987 July 24.0 ET = JDE 2447000.5

M	287.81481		(1950.0)		P	Q
n	0.20930782	Peri.	199.88068		-0.05367069	-0.98932252
a	2.8093924	Node	253.38379		+0.93418461	-0.00181306
e	0.0810236	Incl.	8.12918		+0.35273018	-0.14573147
P	4.71	H	8.40	G	0.25	

From 75 observations at 25 oppositions 1906-1986, mean residual 1".0.

(487) Venetia
Epoch 1987 July 24.0 ET = JDE 2447000.5

M	89.29410		(1950.0)		P	Q
n	0.22593661	Peri.	279.83746		+0.81052881	-0.56292242
a	2.6697974	Node	114.59261		+0.58245405	+0.74566559
e	0.0864212	Incl.	10.24632		+0.06156556	+0.35651253
P	4.36	H	8.21	G	0.08	

From 59 observations at 23 oppositions 1913-1985, mean residual 1".0.

(489) Comacina
Epoch 1987 July 24.0 ET = JDE 2447000.5

M	233.91828		(1950.0)		P	Q
n	0.17527352	Peri.	356.09790		-0.95634961	-0.28773814
a	3.1622182	Node	166.83386		+0.27379709	-0.94329217
e	0.0318392	Incl.	12.94150		+0.10213025	-0.16554950
P	5.62	H	8.36	G	0.15	

From 44 observations at 20 oppositions 1902-1986, mean residual 1".1.

(503) Evelyn
Epoch 1987 July 24.0 ET = JDE 2447000.5

M	296.89226		(1950.0)		P	Q
n	0.21884189	Peri.	40.22177		-0.32154798	-0.94337427
a	2.7271922	Node	68.67463		+0.84466971	-0.32469668
e	0.1735822	Incl.	5.02290		+0.42794857	-0.06794891
P	4.50	H	8.98	G	0.15	

From 82 observations at 27 oppositions 1903-1985, mean residual 1".0.

(515) Athalia
Epoch 1987 July 24.0 ET = JDE 2447000.5

M	26.78727		(1950.0)		P	Q
n	0.17864687	Peri.	292.79630		+0.58567043	-0.80998583
a	3.1222843	Node	121.31849		+0.75600023	+0.53243055
e	0.1738886	Incl.	2.02706		+0.29232481	+0.24584683
P	5.52	H	11.23	G	0.15	

From 78 observations at 20 oppositions 1903-1986, mean residual 0".9.

(683) Lanzia
Epoch 1987 July 24.0 ET = JDE 2447000.5

M	193.24749		(1950.0)		P	Q
n	0.17861534	Peri.	271.34209		-0.93715929	-0.15619959
a	3.1226517	Node	259.74050		+0.25989943	-0.90910496
e	0.0480281	Incl.	18.48483		-0.23277619	-0.38617336
P	5.52	H	8.55	G	0.15	

From 41 observations at 21 oppositions 1913-1986, mean residual 1".0.

(814) Tauris
Epoch 1987 July 24.0 ET = JDE 2447000.5

M	290.59953	(1950.0)	P	Q
n	0.17611804	Peri. 298.02957	+0.83349154	-0.40894457
a	3.1521012	Node 88.24058	+0.53840060	+0.75222782
e	0.3085482	Incl. 21.82262	-0.12416381	+0.51664073
P	5.60	H 8.79	G 0.15	

From 43 observations at 14 oppositions 1916-1986, mean residual 0".9.

(945) Barcelona
Epoch 1987 July 24.0 ET = JDE 2447000.5

M	196.85012	(1950.0)	P	Q
n	0.23008926	Peri. 161.20558	-0.52034934	-0.77269486
a	2.6375771	Node 317.86332	+0.69743542	-0.13886536
e	0.1617489	Incl. 32.81339	+0.49276810	-0.61940218
P	4.28	H 10.09	G 0.25	

From 27 observations at 14 oppositions 1923-1983, mean residual 1".1.

(1156) Kira
Epoch 1987 July 24.0 ET = JDE 2447000.5

M	326.93182	(1950.0)	P	Q
n	0.29453585	Peri. 353.04692	+0.10845205	-0.99380176
a	2.2372299	Node 90.72491	+0.91319782	+0.08988984
e	0.0464694	Incl. 1.39928	+0.39282044	+0.06540555
P	3.35	H 12.8	G 0.25	

From 52 observations at 9 oppositions 1928-1985, mean residual 0".9.

(1186) Turnera
Epoch 1987 July 24.0 ET = JDE 2447000.5

M	343.00167	(1950.0)	P	Q
n	0.18784438	Peri. 297.89699	+0.93326811	+0.33601481
a	3.0195154	Node 42.80865	-0.22700814	+0.82560269
e	0.1043459	Incl. 10.76300	-0.27834859	+0.45329268
P	5.25	H 9.52	G 0.25	

From 75 observations at 22 oppositions 1929-1986, mean residual 0".9.

(1189) Terentia
Epoch 1987 July 24.0 ET = JDE 2447000.5

M	104.98873	(1950.0)	P	Q
n	0.19641187	Peri. 94.26434	+0.97177655	-0.16305771
a	2.9310568	Node 275.18356	+0.08145824	+0.91014757
e	0.1132312	Incl. 9.85628	+0.22139306	+0.38084587
P	5.02	H 9.98	G 0.15	

From 59 observations at 19 oppositions 1945-1985, mean residual 0".7.

(1202) Marina
Epoch 1987 July 24.0 ET = JDE 2447000.5

M	57.34277	(1950.0)	P	Q
n	0.12463105	Peri. 310.77879	+0.99888516	-0.01436605
a	3.9693422	Node 50.09372	+0.03239846	+0.90143583
e	0.1807412	Incl. 3.36061	-0.03433322	+0.43267432
P	7.91	H 10.2	G 0.25	

From 41 observations at 11 oppositions 1925-1986, mean residual 1".1.

(1211) Bressole
Epoch 1987 July 24.0 ET = JDE 2447000.5

M	108.02308	(1950.0)	P	Q
n	0.19680885	Peri. 210.31790	+0.92952335	+0.32704496
a	2.9271140	Node 129.59140	-0.27804409	+0.92505819
e	0.1600442	Incl. 12.77321	-0.24223507	+0.19315520
P	5.01	H 10.94	G 0.15	

From 39 observations at 13 oppositions 1943-1985, mean residual 1".1.

(1271) Isergina
Epoch 1987 July 24.0 ET = JDE 2447000.5

M	13.37774	(1950.0)	P	Q
n	0.17782639	Peri. 265.58070	+0.83507579	-0.54233060
a	3.1318809	Node 127.23350	+0.53944656	+0.77431063
e	0.1362513	Incl. 6.65983	+0.10791587	+0.32606836
P	5.54	H 10.52	G 0.15	

From 53 observations at 12 oppositions 1931-1986, mean residual 0".9.

(1435) Garlena
Epoch 1987 July 24.0 ET = JDE 2447000.5

M	262.19179	(1950.0)	P	Q
n	0.22887808	Peri. 267.05307	-0.10980843	-0.99388782
a	2.6468739	Node 189.27429	+0.93761338	-0.09978342
e	0.2475128	Incl. 4.04296	+0.32988370	-0.04722573
P	4.31	H 12.76	G 0.15	

From 46 observations at 9 oppositions 1936-1985, mean residual 1".0.

(1451) Grano
Epoch 1987 July 24.0 ET = JDE 2447000.5

M	346.73678	(1950.0)	P	Q
n	0.30136921	Peri. 50.98166	-0.69613677	+0.71786511
a	2.2032822	Node 174.87845	-0.68311352	-0.65894787
e	0.1180430	Incl. 5.11247	-0.22079293	-0.22462721
P	3.27	H 12.7	G 0.25	

From 25 observations at 9 oppositions 1938-1985, mean residual 1".1.

(1460) Haltia
Epoch 1987 July 24.0 ET = JDE 2447000.5

M	91.10373	(1950.0)	P	Q
n	0.24321440	Peri. 357.84467	+0.31186788	-0.94347630
a	2.5418106	Node 73.96859	+0.87341797	+0.23819493
e	0.1902626	Incl. 6.70454	+0.37400465	+0.23046833
P	4.05	H 12.6	G 0.25	

From 29 observations at 6 oppositions 1937-1983, mean residual 1".1.

(1465) Autonoma
Epoch 1987 July 24.0 ET = JDE 2447000.5

M	99.72112	(1950.0)	P	Q
n	0.18684279	Peri. 48.17260	-0.81215703	+0.58220200
a	3.0302967	Node 167.27812	-0.57324905	-0.78417059
e	0.1736032	Incl. 9.92878	-0.10856558	-0.21474943
P	5.28	H 11.0	G 0.25	

From 21 observations at 7 oppositions 1938-1986, mean residual 1".0.

(1526) Mikkeli
Epoch 1987 July 24.0 ET = JDE 2447000.5

M	184.29500	(1950.0)	P	Q
n	0.27975727	Peri. 72.08329	+0.65720713	-0.75249138
a	2.3153419	Node 336.66122	+0.64406552	+0.59021761
e	0.1871540	Incl. 6.20830	+0.39148230	+0.29223259
P	3.52	H 13.6	G 0.25	

From 33 observations at 7 oppositions 1939-1983, mean residual 1".1.

(1679) Nevanlinna
Epoch 1987 July 24.0 ET = JDE 2447000.5

M	70.51568	(1950.0)	P	Q
n	0.17793668	Peri. 90.28218	-0.03553077	+0.99928218
a	3.1305866	Node 177.56231	-0.99487250	-0.03412192
e	0.1381951	Incl. 17.99731	-0.09469035	-0.01645689
P	5.54	H 10.4	G 0.25	

From 83 observations at 15 oppositions 1941-1985, mean residual 0".9.

(1952) Hesburgh
Epoch 1987 July 24.0 ET = JDE 2447000.5

M	7.86203	(1950.0)	P	Q
n	0.18001010	Peri. 332.42721	+0.62048984	-0.74632001
a	3.1065008	Node 78.19604	+0.75715234	+0.49015064
e	0.1472050	Incl. 14.24284	+0.20423683	+0.45028745
P	5.48	H 10.59	G 0.15	

From 47 observations at 10 oppositions 1951-1984, mean residual 0".9.

1969 UP1 = 1969 VO = 1984 HV1

The identification 1969 UP1 = 1984 HV1 was found independently by E. Goffin and W. Landgraf. The double designation 1969 UP1 = 1969 VO was found by C. M. Bardwell (MPC 4717). The identification 1969 UP1 = 1974 DE (NOC 1067) is invalid.

Epoch 1987 July 24.0 ET = JDE 2447000.5 (J-P)

M	104.13975	(1950.0)	P	Q
n	0.30420534	Peri. 61.78186	-0.19056431	-0.97977732
a	2.1895710	Node 39.35516	+0.86353201	-0.19686311
e	0.0325497	Incl. 5.52061	+0.46690225	-0.03579548
P	3.24	H 13.9	G 0.25	

Residuals in seconds of arc

691016	095	(2.5+	7.2-)	840429	809	0.3-	0.2+	840506	809	1.2-	0.2+
691111	095	1.7-	0.8+	840430	809	0.7-	0.0	840507	809	0.6+	0.1-
691113	095	1.6+	0.7-	840430	809	0.3+	0.2+	840507	809	1.3+	0.1-
840429	809	0.6+	0.2-	840506	809	0.4-	0.0	840507	809	0.1-	0.1-

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

The identifications are by L. D. Schmadel unless otherwise stated.

(2234) Schmadel
Epoch 1987 July 24.0 ET = JDE 2447000.5

M	91.34488	(1950.0)	P	Q
n	0.22196616	Peri. 271.92857	+0.12575791	+0.99110554
a	2.7015409	Node 5.85888	-0.65231853	+0.11566907
e	0.2000409	Incl. 25.24088	-0.74743929	+0.06580640
P	4.44	H 12.2	G 0.25	

From 38 observations at 7 oppositions 1972-1986, mean residual 0".7.

1981 RG1 = 1974 RQ1
Epoch 1987 July 24.0 ET = JDE 2447000.5

M	263.94124	(1950.0)	P	Q	
n	0.28751456	Peri.	353.64986	+0.99990921	-0.00367881
a	2.2735062	Node	6.60267	+0.00964740	+0.86707238
e	0.1895245	Incl.	6.47319	-0.00940750	+0.49816861
P	3.43	H	14.0	G 0.25	

Residuals in seconds of arc

740914 095	0.3-	1.6+	811102 026	1.8-	1.9-	811217 675	0.9-	1.0-
740914 095	1.4+	3.4-	811107 026	0.1-	1.2+	811217 675	0.5-	0.3-
810903 033	0.9-	0.3+	811116 026	2.2+	1.5+	830416 033	0.0	0.9-
810903 033	0.8-	0.4+	811116 026	0.9+	0.0	830416 033	1.1-	1.1-
811101 026	1.2+	0.1+	811121 026	0.1-	0.0			

1986 VB6 = 1969 TO6 = 1979 QG8 = 1979 RP1
Epoch 1987 July 24.0 ET = JDE 2447000.5

M	98.23844	(1950.0)	P	Q	
n	0.28994918	Peri.	237.29871	+0.99212778	-0.10552799
a	2.2607617	Node	128.66809	+0.12248153	+0.92987301
e	0.1878825	Incl.	4.95411	-0.02609107	+0.35242024
P	3.40	H	14.0	G 0.25	

Residuals in seconds of arc

691015 095	1.6+	4.6-	861106 688	0.4+	1.3+	861129 033	0.8-	0.2+
790826 095	0.5+	2.0+	861127 033	0.2-	0.3-	861204 688	0.1-	0.0
790914 095	0.9-	0.8-	861128 033	0.4-	0.4-	861204 688	0.3-	2.6+
861106 688	0.2-	1.0+						

1986 WG = 1984 KS
Epoch 1987 July 24.0 ET = JDE 2447000.5

M	17.99653	(1950.0)	P	Q	
n	0.26322033	Peri.	253.97812	-0.65240980	-0.68031480
a	2.4113288	Node	241.71740	+0.75462294	-0.62386850
e	0.2642787	Incl.	22.28655	-0.07004044	-0.38465552
P	3.74	H	13.5	G 0.25	

Residuals in seconds of arc

840522 071	1.3+	1.0-	861127 552	0.2-	0.3+	861204 046	0.3-	2.4-
840522 071	2.7-	1.7+	861128 046	0.3-	0.8+	861204 552	0.9-	0.3-
840522 071	2.1+	1.3-	861128 046	1.2+	1.3+	861204 552	0.8+	0.7-
840522 071	2.3-	1.5+	861129 552	1.4-	0.3+	861204 046	0.9-	2.4-
840522 071	1.8+	0.7-	861130 552	0.1-	0.6-	861205 046	0.4-	1.0-
861125 046	0.1-	2.3-	861130 552	2.2-	0.5-	861205 046	1.2+	0.2-
861125 046	1.0+	1.3-	861201 552	0.1-	2.2+	861205 552	2.5+	0.4-
861126 046	2.9-	2.4-	861201 552	0.8-	0.8+	861205 552	4.4+	1.6-
861126 046	0.2+	1.0+	861202 552	0.3-	1.8+	861207 046	0.2+	1.7-
861126 552	3.7+	3.5+	861202 552	0.5-	0.9+	861207 046	0.4+	0.4-
861126 552	0.4+	2.4+	861203 552	2.2-	0.9+	861222 552	0.4-	0.7+
861127 552	0.3-	0.0	861203 552	0.8-	0.2+	861222 552	0.7-	1.4+

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

(3571)* 1982 EJ = 1976 NL = 1985 TJ3

Discovered 1982 Mar. 15 by A. Mrkos at Klet. The identifications 1982 EJ = 1976 NL and 1982 EJ = 1985 TJ3 are by D. W. E. Green and by C. M. Bardwell, respectively (MPC 11516).

Epoch 1987 July 24.0 ET = JDE 2447000.5

M	163.00334	(1950.0)		P	Q
n	0.12652649	Peri.	25.45111	+0.06840994	+0.98953841
a	3.9296006	Node	248.68629	-0.93702072	+0.02001952
e	0.1177402	Incl.	7.83636	-0.34250877	+0.14287388
P	7.79	H	11.0	G 0.25	

Residuals in seconds of arc

760701	095	0.8+	2.9-	820326	046	1.7+	1.8-	861228	801	2.7-	2.4-
820315	046	0.9+	1.1+	820326	046	1.4-	1.8-	861229	801	0.3+	0.4-
820315	046	(0.2-	3.4+)	850916	675	0.2+	0.7-	870128	801	0.8+	0.7-
820324	046	1.4+	1.2-	850916	675	0.3+	0.0	870202	688	1.4+	0.5-
820324	046	(2.6-	3.6-)	851012	675	1.5-	1.2+	870202	688	1.4+	0.5-
820325	046	2.0-	2.1+	851013	675	0.8+	0.3-				
820326	046	1.5-	0.3-	851014	675	(4.6+	2.0-)				

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ORBITAL ELEMENTS BY S. NAKANO, SMITHSONIAN ASTROPHYSICAL OBSERVATORY.

The identifications are by S. Nakano unless otherwise stated.

(2395) Aho

Epoch 1987 July 24.0 ET = JDE 2447000.5

M	228.71916	(1950.0)		P	Q
n	0.18251456	Peri.	161.74270	-0.16159282	+0.98684369
a	3.0780171	Node	98.95769	-0.90603747	-0.14625889
e	0.0559996	Incl.	0.30300	-0.39113152	-0.06890476
P	5.40	H	12.4	G 0.25	

From 28 observations at 5 oppositions 1967-1982, mean residual 0".9.

(3572)* 1954 UJ2 = 1967 TB = 1969 AE1 = 1971 OT1 = 1981 WJ2 = 1985 TX3

Discovered 1954 Oct. 28 at the Goethe Link Observatory.

Epoch 1987 July 24.0 ET = JDE 2447000.5

M	137.38965	(1950.0)		P	Q
n	0.22190098	Peri.	164.83257	+0.79526586	-0.60443443
a	2.7020699	Node	232.45253	+0.54984961	+0.75176760
e	0.1332871	Incl.	3.40020	+0.25537741	+0.26363706
P	4.44	H	12.8	G 0.25	

Residuals in seconds of arc

541028	760	1.2+	0.8-	690115	095	2.5-	2.0+	850917	675	1.1-	1.0+
541028	760	3.6+	0.4+	710726	323	1.0+	2.4-	850917	675	0.6-	1.5+
541116	760	1.4-	0.1-	710726	323	(26.6+	1.7+)	851011	675	0.3-	0.3+
541116	760	2.5-	0.7-	811124	688	0.1+	4.0-	851013	675	0.8-	0.4+
541117	760	0.0	0.2-	811124	688	2.8+	1.0-	851107	675	1.7-	2.3+
541117	760	1.5-	1.3+	811220	688	1.1+	1.0-	851107	675	0.7-	0.5-
671003	095	2.9+	2.3-	811220	688	0.2+	0.9-				

(3573)* 1982 QO1 = 1929 WN = 1947 BL = 1976 YW1 = 1979 WH5

Discovered 1982 Aug. 16 by K. Olofsson and C.-I. Lagerkvist at the European Southern Observatory. The identifications 1982 QO1 = 1929 WN = 1947 BL were also suggested by W. Landgraf (MPC 11346).

Epoch 1987 July 24.0 ET = JDE 2447000.5

M	29.00016	(1950.0)		P	Q
n	0.29418186	Peri.	210.14565	-0.47659813	-0.87780100
a	2.2390242	Node	268.35581	+0.81586038	-0.42123204
e	0.0660840	Incl.	2.76172	+0.32745390	-0.22809861
P	3.35	H	12.6	G 0.25	

Residuals in seconds of arc

291127	690	1.0+	0.3+		820818	809	0.1-	0.2-		861206	883	1.7+	1.3+
291203	690	0.0	0.5-		820818	809	0.5-	0.3-		861206	399	0.4-	0.6-
470128	754	0.1-	0.3-		820820	809	0.3-	0.1+		861206	399	0.2+	0.8+
470128	754	0.3-	0.3+		820820	809	1.0-	0.6-		861206	399	0.3+	1.0-
761216	095	1.1-	2.7-		820820	809	0.3-	0.0		861207	881	2.0+	0.3-
761218	095	1.1-	0.9-		820822	809	1.4+	1.2+		861207	881	0.1+	0.4-
761220	095	0.7-	1.0-		820822	809	2.6+	2.0+		861208	883	0.5-	1.3+
791117	095	1.6-	2.3-		820822	809	0.3+	0.6+		861208	883	2.1-	0.6+
820816	809	0.1-	0.8-		861130	881	1.2+	0.5+		861208	881	0.2-	0.8+
820816	809	0.0	0.9-		861130	881	3.0+	1.1+		861208	881	0.7-	0.7+
820816	809	0.1+	0.3-		861201	881	0.6+	0.1+		861208	399	0.2-	0.2+
820818	809	1.4-	0.5-		861201	881	1.1-	0.5+		861208	399	0.7-	0.7+

(3574)* 1982 TQ = 1933 UH1 = 1978 SF2

Discovered 1982 Oct. 13 by E. Bowell at the Anderson Mesa station of the Lowell Observatory. The key identification 1982 TQ = 1978 SF2 is by T. Furuta and W. Landgraf (MPC 9032), who found it independently.

Epoch 1987 July 24.0 ET = JDE 2447000.5

			(1950.0)	P	Q
M	111.14011				
n	0.26201183	Peri.	143.91123	+0.98716121	-0.14910362
a	2.4187378	Node	224.77302	+0.12073322	+0.93132466
e	0.1836420	Incl.	4.66486	+0.10457647	+0.33226869
P	3.76	H	13.9	G 0.25	

Residuals in seconds of arc

331019	024	(29.2+	81.2-)		821013	688	1.4+	0.5-		821108	095	0.5+	1.1+
331020	024	0.6+	1.8-		821013	688	1.9+	0.1-		821115	688	0.7+	0.8-
770424	675	0.3-	1.1+		821014	095	0.3-	0.9+		821115	688	1.1+	1.1-
770425	675	1.2+	0.4+		821020	095	0.3-	0.1-		861128	010	1.0-	0.9+
780901	675	1.6-	1.2+		821022	095	1.7-	0.5+		861128	010	0.3-	0.2+
780902	675	0.5-	0.8+		821024	095	0.5+	1.0-		861128	010	0.0	1.1+
780926	095	0.6-	2.5+		821107	095	1.5-	0.1+		861201	801	0.1-	1.3+
781002	095	0.7+	0.9-		821108	095	0.5-	1.1-		861228	801	0.4+	0.9+

(3575)* 1984 DU2 = 1934 GN = 1948 LH = 1957 JH = 1957 JN = 1968 UH3 = 1975 LC = 1976 SE10

Discovered 1984 Feb. 26 by N. S. Chernykh at the Crimean Astrophysical Observatory. The double designation 1957 JH = 1957 JN was found by S. Kanda (MPC 1740).

Epoch 1987 July 24.0 ET = JDE 2447000.5

			(1950.0)	P	Q
M	217.63420				
n	0.21654548	Peri.	158.14779	-0.65289271	+0.74661824
a	2.7464391	Node	70.84779	-0.71339032	-0.54948539
e	0.1256841	Incl.	7.76557	-0.25456898	-0.37500269
P	4.55	H	11.9	G 0.25	

Residuals in seconds of arc

340406	024	1.6-	2.5-		681026	095	0.4-	4.5-		760919	808	0.7-	0.1-
480601	690	0.0	2.6-		750612	805	0.7-	0.4-		840226	095	3.1+	1.2-
480605	690	2.2+	2.5-		750612	805	1.1-	0.0		840329	095	2.2+	1.8+
570502	760	1.6-	0.3+		760916	808	1.9+	1.6+		840403	095	0.3+	4.1+
570502	760	1.0-	2.2+		760916	808	0.0	1.1+		840405	095	1.3+	4.2+
570504	760	0.4+	0.9-		760917	808	0.8-	1.1+		861201	801	0.1-	0.7+
570504	760	2.8-	0.0		760917	808	1.7-	2.3+		870104	801	3.1-	3.1+
681022	095	3.0+	1.2-		760919	808	0.3+	1.6+					

(3576)* 1984 DB3 = 1971 TM = 1973 FD = 1974 OS1 = 1975 XY6

Discovered 1984 Feb. 26 by N. S. Chernykh at the Crimean Astrophysical Observatory.

Epoch 1987 July 24.0 ET = JDE 2447000.5

M	56.16061	(1950.0)		P	Q
n	0.26589201	Peri.	46.62051	+0.39799468	-0.91538787
a	2.3951489	Node	20.16956	+0.78268493	+0.30439109
e	0.1318935	Incl.	10.11268	+0.47854418	+0.26345988
P	3.71	H	13.2	G 0.25	

Residuals in seconds of arc

711010 095	0.2+	1.7-	740726 808	1.4-	0.2-	840403 095	0.2+	2.3-
711011 095	0.9+	3.4+	751201 330	1.4-	0.5-	840405 095	0.4+	0.4-
730329 805	0.7-	0.4+	840226 095	0.7+	1.1-	861201 801	0.5-	0.7-
740726 808	0.3+	0.7-	840329 095	0.6+	2.9+	870104 801	0.5+	0.3-

1981 LJ = 1968 UJ = 1971 KF = 1982 RC = 1985 FU

Epoch 1987 July 24.0 ET = JDE 2447000.5 (J-P)

M	6.03979	(1950.0)		P	Q
n	0.20303690	Peri.	234.37509	+0.93553828	+0.34953566
a	2.8669509	Node	105.11812	-0.30460673	+0.87132990
e	0.0746381	Incl.	3.02356	-0.17883753	+0.34439660
P	4.85	H	12.0	G 0.25	

Residuals in seconds of arc

681022 095	2.8+	2.5-	810609 688	0.9+	0.8-	820915 688	0.5-	0.9-
681026 095	0.6+	5.5-	810609 688	0.5+	1.4-	850321 688	1.6-	1.4-
710524 095	0.4-	3.5+	810625 688	2.7-	2.1-	850321 688	0.1-	1.6-
810604 688	0.3+	1.6-	810625 688	1.8+	1.9-			
810604 688	1.3-	2.4-	820915 688	0.8-	1.6+			

1981 PQ = 1981 RZ2 = 1969 RN = 1975 RS1 = 1976 YY3

Epoch 1987 July 24.0 ET = JDE 2447000.5 (J-P)

M	4.92989	(1950.0)		P	Q
n	0.16215203	Peri.	145.69770	+0.63645511	+0.77089531
a	3.3305962	Node	163.78185	-0.72646197	+0.61018730
e	0.1244450	Incl.	5.21848	-0.25918698	+0.18273447
P	6.08	H	11.5	G 0.25	

Residuals in seconds of arc

690908 095	1.7+	3.6+	810807 046	4.4+	2.9+	810811 046	0.3+	2.0-
690913 095	1.2+	0.4-	810807 046	0.4+	0.6+	810811 046	0.3-	3.4-
750905 095	7.8-	0.2+	810808 046	1.3-	0.0	810902 095	0.6+	2.5-
761218 095	0.5+	1.1-	810808 046	0.4+	1.0+			

1981 WM4 = 1986 XC

Epoch 1987 July 24.0 ET = JDE 2447000.5 (J-P)

M	91.38354	(1950.0)		P	Q
n	0.20656201	Peri.	118.92753	+0.96519618	-0.19183118
a	2.8342399	Node	252.60416	+0.12273818	+0.93244563
e	0.2151873	Incl.	10.73552	+0.23093651	+0.30617959
P	4.77	H	12.0	G 0.25	

Residuals in seconds of arc

811124 095	0.8+	2.2+	861204 552	0.0	0.5+	861205 552	0.2+	0.4-
811127 330	0.1+	2.9-	861204 552	0.4+	0.1+	861222 552	0.2-	0.9-
811201 330	0.9-	0.5+	861205 552	0.1+	0.2+	861222 552	0.5-	0.5+

1983 AH1 = 1987 AA

Epoch 1987 July 24.0 ET = JDE 2447000.5 (J-P)

M	46.66416	(1950.0)		P	Q
n	0.24179745	Peri.	356.70049	-0.27150989	-0.92354243
a	2.5517362	Node	108.91801	+0.88940095	-0.34829639
e	0.2092383	Incl.	16.63658	+0.36776124	+0.16049609
P	4.08	H	14.0	G 0.25	

Residuals in seconds of arc

830110	675	0.4+	0.2+	830210	675	0.9-	0.6+	870121	552	0.7-	0.1-
830110	675	1.3+	0.0	830211	675	2.1-	0.4+	870121	552	2.2+	2.5-
830111	675	0.9+	1.5-	830215	675	0.7+	0.2+	870124	552	0.0	0.9+
830111	675	0.4+	0.8+	870106	552	2.0+	0.5-	870124	552	0.9-	1.1-
830112	675	2.0+	3.0-	870108	552	1.2-	2.0+	870130	552	0.4+	0.2+
830112	675	2.9-	1.6+	870108	552	2.5-	0.9+	870130	552	0.8+	0.8+

1986 TB3 = 1986 VE5 = 1979 QO7 = 1979 SL3

The double designation 1986 TB3 = 1986 VE5 is by F. N. Bowman (MPC 11613).

Epoch 1987 July 24.0 ET = JDE 2447000.5 (J-P)

M	142.82177		(1950.0)	P	Q
n	0.28790862	Peri.	123.81578	+0.41404939	+0.91013556
a	2.2714358	Node	170.60895	-0.86206901	+0.39726790
e	0.1825083	Incl.	5.17198	-0.29223301	+0.11760727
P	3.42	H	14.0	G 0.25	

Residuals in seconds of arc

790820	095	0.9+	1.0+	861004	046	1.6+	0.8-	861105	688	0.5+	1.4+
790924	095	1.0-	0.8-	861005	046	0.6-	0.9+	861105	688	0.8+	0.4+
861004	046	1.3-	1.7-	861005	046	0.8-	0.1-				

1986 TD7 = 1986 UK = 1973 UF1 = 1976 GC7 = 1976 JH

The double designation 1986 TD7 = 1986 UK was found independently by F. N. Bowman.

Epoch 1987 July 24.0 ET = JDE 2447000.5 (J-P)

M	111.55377		(1950.0)	P	Q
n	0.22730281	Peri.	291.06984	+0.78747257	+0.60663327
a	2.6590941	Node	31.87780	-0.46050348	+0.69663568
e	0.2057906	Incl.	11.91230	-0.40966266	+0.38300758
P	4.34	H	13.0	G 0.25	

Residuals in seconds of arc

731026	095	1.2-	2.1+	861007	675	(8.5-	1.7+)	861028	046	3.6-	1.9-
760404	095	0.1+	0.2-	861008	675	(12.6-	0.9+)	861109	046	1.9+	1.2+
760502	095	0.1-	0.3+	861008	675	(11.8-	1.7+)	861109	046	4.1+	0.6+
861007	675	(8.5-	1.4+)	861028	046	1.0-	1.7-				

1986 WO1 = 1986 XG = 1982 RQ1

Epoch 1987 July 24.0 ET = JDE 2447000.5 (J-P)

M	88.75705		(1950.0)	P	Q
n	0.26593660	Peri.	15.67593	+0.87320563	-0.48725836
a	2.3948860	Node	13.49696	+0.44260029	+0.78466684
e	0.2218283	Incl.	2.34529	+0.20400223	+0.38324567
P	3.71	H	14.5	G 0.25	

Residuals in seconds of arc

820915	046	2.6-	1.2+	820916	046	3.7+	0.1-	861129	046	2.4+	1.5+
820915	046	0.1-	2.1+	820917	046	1.9-	1.9-	861129	046	1.0+	0.2-
820915	046	1.8-	1.5+	820917	046	2.7+	1.6-	861204	046	0.3+	0.4+
820915	046	2.6-	0.4+	861125	046	0.3-	1.6-	861204	046	2.9-	0.0
820916	046	2.7+	1.6-	861125	046	0.9-	0.1-	861206	054	0.4+	0.1+

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

The orbital elements are by C. M. Bardwell unless otherwise stated.

(3577)* 1969 TK = 1969 TZ7 = 1969 UV2 = 1961 TX = 1970 XH = 1977 RP5 = 1985 RM2

Discovered 1969 Oct. 7 by L. I. Chernykh at the Crimean Astrophysical Observatory. The triple designation 1969 TK = 1969 TZ7 = 1969 UV2 is by B. G. Marsden (MPC 6045, 6751).

Epoch 1987 July 24.0 ET = JDE 2447000.5

M	19.01253	(1950.0)		P	Q
n	0.12520361	Peri.	180.42008	-0.18447487	-0.98073614
a	3.9572318	Node	280.21133	+0.90188148	-0.14294445
e	0.1887287	Incl.	3.74206	+0.39061339	-0.13312964
P	7.87	H	10.7	G	0.25

Residuals in seconds of arc

611010	760	0.3+	1.3+	701203	095	0.0	1.9+	850918	043	1.0-	0.4-
611010	760	0.1-	0.9+	770909	095	1.6+	0.8+	850918	043	1.1+	0.7-
691007	095	1.6-	4.5-	850911	043	0.9+	0.0	860111	801	0.1-	0.5+
691008	033	0.3+	0.7+	850912	043	0.5+	0.2-	861128	801	0.3-	0.7-
691008	033	0.2-	0.2+	850913	043	0.1+	1.0-	870104	801	0.2+	0.8-
691016	095	1.4-	3.7+	850913	043	0.1-	1.5-				

(3578)* 1977 CC = 1939 PL = 1950 LG = 1985 RY

Discovered 1977 Feb. 11 at the El Leoncito Station of the Felix Aguilar Observatory, University of Cuyo.

Epoch 1987 July 24.0 ET = JDE 2447000.5

M	131.00288	(1950.0)		P	Q
n	0.17224345	Peri.	48.99342	+0.84372726	+0.40509283
a	3.1991964	Node	284.35394	-0.53243464	+0.71483960
e	0.2178184	Incl.	21.31644	+0.06810045	+0.57000363
P	5.72	H	10.5	G	0.25

Residuals in seconds of arc

390807	094	(27.2-	46.4-)X	770217	808	0.2-	1.3-	851013	675	0.8-	0.6-
390809	094	3.8+	5.4-	770217	808	1.0-	1.2-	851015	675	0.9+	1.3-
390819	094	0.5+	0.6-	850916	675	0.1+	0.9+	851107	675	1.2-	1.5+
500607	078	(32.7+	7.9+)Y	850916	675	0.2-	0.2+	851116	675	0.0	0.3-
770211	808	1.9-	1.6-	850921	675	0.1-	0.5+	861206	657	0.0	3.1-
770214	808	0.5-	0.6-	851012	675	0.0	0.4-	870104	801	0.7-	1.4-
770214	808	0.7-	0.3-	851012	054	0.7+	0.4-				

(3579)* 1977 YA

Discovered 1977 Dec. 18 by M. Lovas at Piszkesteto.

Epoch 1987 July 24.0 ET = JDE 2447000.5

M	28.74768	(1950.0)		P	Q
n	0.21818519	Peri.	109.00124	-0.51335217	-0.84889058
a	2.7326617	Node	14.12223	+0.45353426	-0.39292184
e	0.3575148	Incl.	31.06831	+0.72854391	-0.35354945
P	4.52	H	15.1	G	0.25

Residuals in seconds of arc

771218	561	0.8-	0.1+	830416	474	2.4-	0.7-	861024	691	0.3+	0.3-
780102	561	(19.8-	14.2+)	830416	474	0.7+	0.6-	861024	691	0.9+	0.1-
780105	561	0.8+	0.1+	860902	691	0.4-	0.5+	861125	688	0.0	0.2+
780106	561	0.3+	0.2-	860902	691	0.9-	0.4+	861125	688	0.0	0.2+
780116	801	1.3-	2.2-	860902	691	0.0	0.8-	870109	675	0.2-	0.6-
780116	801	1.2-	0.1-	860903	691	0.4-	0.6+	870109	675	0.4+	1.3-
780201	801	1.4+	0.1+	860903	691	0.6-	0.2-	870130	675	0.9+	0.7+
780204	711	1.0+	0.2+	860925	691	1.9-	0.0	870130	675	0.0	0.6+
780205	801	1.5+	0.9-	860925	691	1.7-	0.6-	870217	675	0.0	0.4-
780318	801	1.6+	4.3+	860927	691	1.3+	0.3-	870217	675	0.0	0.1-
780406	801	2.0-	1.1+	860927	691	1.7+	0.1-	870218	675	0.4+	0.3+
780611	801	0.8+	1.1-	861024	691	0.4+	0.4-	870218	675	0.1+	0.4+

(3580)* 1983 CS2 = 1983 GH = 1949 DH = 1976 UP1 = 1978 ED1

Discovered 1983 Feb. 15 by N. G. Thomas at the Anderson Mesa Station of the Lowell Observatory. The double designation 1983 CS2 = 1983 GH is by E. Bowell (MPC 8062).

Epoch 1987 July 24.0 ET = JDE 2447000.5

M	321.66064	(1950.0)	P	Q	
n	0.20377256	Peri.	177.97082	-0.96855567	-0.24847212
a	2.8600410	Node	347.61978	+0.22741225	-0.86343117
e	0.2347515	Incl.	3.39834	+0.10091372	-0.43903100
P	4.84	H	12.6	G 0.25	

Residuals in seconds of arc

490225	062	0.5+	0.1+	830215	688	0.1+	0.6-	830506	688	1.5+	0.1-
490225	062	0.6+	1.8+	830215	688	0.3+	0.1-	861101	801	0.1+	0.1-
761026	095	0.3-	1.8-	830410	688	0.3+	1.3-	861228	801	1.3+	0.7+
780305	095	0.8-	1.6+	830410	688	1.5+	2.1-				
830210	330	3.3-	0.6-	830506	688	1.2-	0.5+				

(3581)* 1985 HC = 1962 JL = 1971 KE = 1981 TG4

Discovered 1985 Apr. 23 by C. Shoemaker at Palomar.

Epoch 1987 July 24.0 ET = JDE 2447000.5

M	123.64533	(1950.0)	P	Q	
n	0.21372842	Peri.	107.32780	+0.74394140	+0.60107289
a	2.7705195	Node	217.30996	-0.62777982	+0.77838571
e	0.4100411	Incl.	28.79933	+0.22900585	+0.18118240
P	4.61	H	12.0	G 0.25	

Residuals in seconds of arc

620505	760	0.7-	0.7+	850518	688	1.7+	1.0+	860927	691	0.1-	0.0
620505	760	0.4+	0.4-	850518	688	0.4+	0.1-	860927	691	0.4-	0.3+
710524	095	0.8-	1.7+	850521	801	0.2+	0.5-	860927	691	0.3-	0.0
811008	095	0.5+	2.6-	850618	801	1.8+	0.2-	861029	801	0.7+	1.6-
850423	675	0.9-	0.4+	850716	801	0.0	1.0+	861030	801	0.9+	0.8+
850424	675	1.0-	0.0	850723	691	1.0+	1.4-	861031	474	1.3-	0.6-
850425	675	1.2-	1.0+	850723	691	1.1+	1.4-	861031	474	1.0-	1.5-
850425	675	0.3-	2.9-	850723	691	0.9+	1.5-	870202	688	1.1-	1.5-
850508	675	0.3+	1.2-	850813	801	0.4+	1.9-	870202	688	1.1-	1.5-
850508	675	0.3+	1.2-	850814	801	0.9-	2.1-				

(3582)* 1986 TT5 = 1931 AB1 = 1950 VN = 1971 UK3 = 1981 UK10 = 1983 AF1 = 1984 HO

Discovered 1986 Oct. 2 by P. Wild at Zimmerwald.

Epoch 1987 July 24.0 ET = JDE 2447000.5

M	22.39324	(1950.0)	P	Q	
n	0.18956577	Peri.	347.55446	+0.67938519	-0.71559706
a	3.0012081	Node	59.38937	+0.68833959	+0.54486822
e	0.0767141	Incl.	10.87306	+0.25421323	+0.43708063
P	5.20	H	11.4	G 0.25	

Residuals in seconds of arc

310112	690	3.3-	0.7-	830112	688	0.3+	0.3+	861006	026	1.0-	1.0-
310113	690	2.0+	1.2-	830122	688	0.2+	0.0	861008	026	1.4+	0.6-
310115	690	0.3+	0.1+	830122	688	0.1+	0.4+	861027	026	1.6-	0.3+
501112	711	1.2+	2.0- Y	840419	046	0.8-	2.8-	861030	026	2.5+	1.1-
711029	095	1.0+	0.3+	840419	046	1.3-	2.4-	861107	026	0.6+	0.0
811024	330	(4.7+	5.8+)	861002	026	2.0-	0.9-				
830112	688	0.8-	1.3+	861004	026	1.3+	0.1+				

1951 JQ = 1951 LE = 1976 UP3 = 1985 TX1

The double designation 1951 JQ = 1951 LE is by O. Kippes (MPC 1968).

Epoch 1987 July 24.0 ET = JDE 2447000.5 (J-P)

M	205.82176	(1950.0)		P	Q
n	0.21047367	Peri.	29.69363	+0.35618714	+0.92412047
a	2.7990139	Node	261.46814	-0.88247375	+0.28401660
e	0.1333143	Incl.	8.04013	-0.30719831	+0.25560894
P	4.68	H	12.5	G 0.25	

Residuals in seconds of arc

510502	711	4.3-	3.9+	Y	761026	095	0.0	0.1+	851013	675	1.1-	0.3+
510503	711	0.3-	1.7-	Y	850916	675	1.0+	0.2+	851015	688	0.4+	1.7-
510602	760	3.1+	1.2-		850916	675	0.5+	1.3+	851015	688	1.0+	1.2-
510602	760	1.8+	1.2-		851011	675	1.6-	1.2+				

1982 FV2 = 1969 UC2 = 1987 CL

Epoch 1987 July 24.0 ET = JDE 2447000.5 (J-P)

M	50.80248	(1950.0)		P	Q
n	0.18443680	Peri.	11.07835	-0.26034786	-0.96442453
a	3.0565995	Node	94.02439	+0.88224614	-0.25692803
e	0.2055825	Incl.	2.63575	+0.39225086	-0.06223594
P	5.34	H	13.0	G 0.25	

Residuals in seconds of arc

691017	095	0.2-	0.1-		820331	675	1.4+	0.9-	870201	046	0.3-	1.1+
820323	675	0.0	0.9+		820331	675	0.1+	0.5+	870202	046	0.9+	0.6-
820324	675	1.8-	0.6-		870201	046	1.2-	0.5+	870202	046	1.0+	0.6-

1982 VE4 = 1987 BM2

Epoch 1987 July 24.0 ET = JDE 2447000.5 (J-P)

M	269.27649	(1950.0)		P	Q
n	0.30107024	Peri.	184.49505	+0.24807271	+0.96670284
a	2.2047450	Node	99.87774	-0.88675916	+0.25270632
e	0.1494246	Incl.	3.65558	-0.39002323	+0.04031284
P	3.27	H	13.5	G 0.25	

Residuals in seconds of arc

821114	381	0.2+	0.4+		821214	381	0.3-	0.6-	870202	046	0.7-	0.3-
821114	381	0.3-	0.5-		821214	381	0.0	0.4-	870202	046	0.1-	0.1+
821213	381	0.2-	0.3+		870131	046	0.4+	0.2+				
821213	381	0.7+	0.7+		870131	046	0.3+	0.1-				

1983 CN3 = 1987 DL

Epoch 1987 July 24.0 ET = JDE 2447000.5 (J-P)

M	87.22163	(1950.0)		P	Q
n	0.23810146	Peri.	281.70855	+0.20405779	-0.96421511
a	2.5780750	Node	154.52087	+0.97894801	+0.20016876
e	0.2843913	Incl.	23.17033	+0.00460645	+0.17384387
P	4.14	H	13.0	G 0.25	

Residuals in seconds of arc

830211	809	0.3-	0.2+		830213	809	0.5+	0.3-	870223	675	0.6+	0.6+
830211	809	0.3-	0.2+		830219	809	0.7-	0.1-	870227	675	1.6+	1.1-
830211	809	0.2-	0.3+		830219	809	0.0	0.1-	870227	675	1.2-	1.5+
830213	809	0.2+	0.0		830219	809	0.3+	0.1+				
830213	809	0.6+	0.2-		870223	675	1.0-	1.0-				

1984 UQ = 1942 GB = 1942 GX = 1946 GD = 1950 HU = 1959 OA = 1972 TJ2 = 1983 HF1

Epoch 1987 July 24.0 ET = JDE 2447000.5

M	336.51224	(1950.0)		P	Q
n	0.24155118	Peri.	67.60832	+0.07969643	+0.99010845
a	2.5534652	Node	207.73661	-0.98124682	+0.05752746
e	0.1262973	Incl.	14.36563	-0.17550830	+0.12796816
P	4.08	H	12.0	G 0.25	

Residuals in seconds of arc

420411	020	(3.3+	3.2-)	590730	760	0.4-	0.4+	840927	675	0.8+	1.4-
420411	020	(6.4+	3.6-)	590730	760	0.5+	0.3+	841023	688	0.2-	2.0-
420412	012	(39.9-	22.9-)X	721008	095	3.1+	1.2-	841023	688	0.7-	1.5-
460405	078	(39.0-	35.3-)X	830419	688	1.0+	3.1-	841029	688	2.6-	0.5-
500417	760	3.0-	0.5-	830419	688	0.2-	1.2-	841029	688	0.2+	0.9-
500417	760	1.4+	2.3-	840927	675	0.5+	0.2-				

1985 TR3 = 1955 SS = 1960 CB = 1970 CS = 1972 VJ1
Epoch 1987 July 24.0 ET = JDE 2447000.5 (J-P)

M	138.15060		(1950.0)	P	Q
n	0.29699706	Peri.	155.28513	+0.10172928	-0.99226926
a	2.2248573	Node	288.81175	+0.89973031	+0.12225616
e	0.0862018	Incl.	4.30667	+0.42442494	-0.02133413
P	3.32	H	13.0	G 0.25	

Residuals in seconds of arc

550917	760	1.5+	0.9-	700210	805	0.0	0.9-	851011	675	0.7+	0.2-
550917	760	0.3-	0.8-	700210	805	1.3-	0.7-	851013	675	0.8+	0.4+
600201	760	(20.7+	8.1-)	721109	095	0.5+	5.9+	851108	675	2.7+	2.5-
600201	760	(45.0+	6.9-)	850917	675	0.4-	0.5+	851108	675	1.5+	1.5-
700210	805	0.2-	0.9-	850917	675	3.8-	1.3+				

1986 TJ1 = 1986 WB5 = 1972 NO = 1978 YH = 1980 KB

The double designation 1986 TJ1 = 1986 WB5 is by F. N. Bowman.

Epoch 1987 July 24.0 ET = JDE 2447000.5 (J-P)

M	217.65761		(1950.0)	P	Q
n	0.22459513	Peri.	313.84411	-0.62831802	+0.76659329
a	2.6804232	Node	276.75666	-0.66996336	-0.61975269
e	0.0517523	Incl.	7.66654	-0.39543086	-0.16805161
P	4.39	H	12.0	G 0.25	

Residuals in seconds of arc

720713	095	0.9+	2.2-	800523	805	0.2-	0.7-	861105	688	0.5-	1.2+
781223	330	0.4-	2.1-	800523	805	0.4-	0.6-	861105	688	1.6-	0.7-
800518	805	0.1-	1.4-	861004	688	1.8+	2.2+	861126	010	1.7-	3.1-
800523	805	0.5-	0.1-	861004	688	4.0+	3.3+	861126	010	1.2-	5.7-

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

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

Periodic Comet Lovas 2 (1986p)
Epoch 1986 Sept. 7.0 ET = JDE 2446680.5
T 1986 Sept. 2.20471 ET

q	1.4580439		(1950.0)	P	Q
n	0.14569089	Peri.	71.57021	+0.99490725	+0.09738918
a	3.5769630	Node	282.83464	-0.09957513	+0.90969156
e	0.5923794	Incl.	1.52680	-0.01563164	+0.40370362
P	6.77				

From 27 observations 1986 Dec. 2-1987 Mar. 2, mean residual 0".9.

Periodic Comet Urata-Niijima (1986o)
Epoch 1986 Nov. 26.0 ET = JDE 2446760.5
T 1986 Nov. 22.94033 ET

q 1.4491946	(1950.0)		P	Q
n 0.14880852	Peri.	21.38508	+0.62313129	-0.75247456
a 3.5268273	Node	31.28363	+0.64467559	+0.33976007
e 0.5890940	Incl.	24.25079	+0.44283268	+0.56422082
P 6.62				

From 64 observations 1986 Oct. 29-1987 Mar. 2, mean residual 0".9.

Comet Levy (1987a)
T 1986 Dec. 17.52170 ET

q 0.9213257	(1950.0)		P	Q
	Peri.	95.22852	-0.05520753	-0.95819567
	Node	16.41506	-0.51754439	-0.21298502
e 1.0	Incl.	96.57152	+0.85387349	-0.19104565

From 29 observations 1987 Jan. 8-Mar. 8.

Comet Terasako (1987d)
Epoch 1987 Jan. 5.0 ET = JDE 2446800.5
T 1986 Dec. 24.86269 ET

q 0.3911114	(1950.0)		P	Q
z +0.0206968	Peri.	195.00536	+0.31265904	+0.69317284
+/-0.0031522	Node	97.03807	-0.79005929	+0.56932835
e 0.9919052	Incl.	40.87098	-0.52730508	-0.44201430

From 25 observations 1987 Jan. 27-Feb. 26, mean residual 1".7.

Comet Nishikawa-Takamizawa-Tago (1987c)
T 1987 Mar. 17.29244 ET

q 0.8721468	(1950.0)		P	Q
	Peri.	200.25901	+0.90697123	-0.42104760
	Node	175.31376	-0.36538632	-0.77347975
e 1.0	Incl.	172.22641	-0.20951380	-0.47375943

From 58 observations 1987 Jan. 20-Feb. 19.

Comet Wilson (1986l)
Epoch 1987 May 5.0 ET = JDE 2446920.5
T 1987 Apr. 20.78453 ET

q 1.1996047	(1950.0)		P	Q
z -0.0002690	Peri.	238.30109	-0.47933242	-0.71642054
+/-0.0000066	Node	110.95765	-0.50088990	+0.69761858
e 1.0003226	Incl.	147.12242	-0.72065924	-0.00836249

From 100 observations 1986 Aug. 5-1987 Mar. 5, mean residual 0".9.

A908 TC = 1952 HM3 = 1970 GD2 = 1980 TX = 1980 TO8 = 1984 NC
Epoch 1987 July 24.0 ET = JDE 2447000.5 (J-P)

M 199.90565	(1950.0)		P	Q
n 0.21859814	Peri.	112.67574	+0.89898369	+0.39391100
a 2.7292246	Node	224.76230	-0.42918443	+0.87946775
e 0.1987413	Incl.	15.77832	+0.08734440	+0.26715276
P 4.51	H 12.0	G 0.25		

Residuals in seconds of arc

081007 024 0.9+ 4.8+	520427 711(20.2- 13.5-)Y	801003 033 0.2-	1.6-
081020 024 (3.4+ 12.5+)	700412 805 0.1+ 0.7+	801003 033 1.9+	1.2-
081103 045 1.8- 0.8+	700412 805 0.2+ 0.2-	801013 095 0.5-	1.9-
520427 711(10.0- 1.7-)Y	700412 805 0.2- 0.5+	840702 095 0.3-	1.1+

1964 VT1 = 1980 EQ1 = 1982 SB5
Epoch 1987 July 24.0 ET = JDE 2447000.5 (J-P)

M	345.73556	(1950.0)		P	Q
n	0.21458666	Peri.	11.73097	+0.54771462	-0.83541322
a	2.7631329	Node	45.07927	+0.76226571	+0.47571911
e	0.0678714	Incl.	3.70486	+0.34490532	+0.27527456
P	4.59	H	13.0	G 0.25	

Residuals in seconds of arc

641109	330	2.6+	0.4-	641225	330	0.7+	0.8-	820926 095	0.1-	0.3+
641127	330	2.2-	0.8+	650101	330	0.8-	0.2+			
641223	330	0.1-	0.1+	800315	095	0.1+	0.2+			

1979 QE10 = 1953 QJ = 1964 PD = 1971 KY = 1985 CJ2
Epoch 1987 July 24.0 ET = JDE 2447000.5 (J-P)

M	90.93033	(1950.0)		P	Q
n	0.26741776	Peri.	104.88763	+0.47024403	+0.88245353
a	2.3860347	Node	193.18265	-0.82869953	+0.43680276
e	0.2134243	Incl.	3.04034	-0.30352536	+0.17458267
P	3.69	H	14.0	G 0.25	

Residuals in seconds of arc

530816	024	0.4+	1.1-	850215	809	1.4-	0.6+	850219 809	1.2-	0.4-
640812	760	(1.2+ 17.5-)X		850215	809	1.3-	0.6+	850219 809	0.7-	0.4-
710525	095	0.3-	0.7-	850216	809	0.4+	0.2-	850219 809	0.6-	0.6-
790827	095	2.8-	3.5-	850216	809	0.5+	0.5-	850221 809	0.7-	0.6-
790902	095	2.7+	1.3+	850216	809	0.3+	0.1-	850221 809	0.4-	0.6-
790924	095	2.8+	1.9+	850217	809	1.2+	0.0	850221 809	0.1+	0.3-
791014	095	2.6-	1.2-	850217	809	1.2+	0.0	850222 809	1.0+	0.9-
850214	809	0.8+	0.1-	850217	809	1.2+	0.1-	850222 809	1.1+	0.8-
850214	809	0.8+	0.1-	850218	809	1.2-	0.2+	850222 809	1.2+	0.7-
850214	809	0.7+	0.1-	850218	809	1.2-	0.6+			
850215	809	1.7-	0.7+	850218	809	1.0-	0.9+			

1979 SU11 = 1984 QW = 1985 YY1
Epoch 1987 July 24.0 ET = JDE 2447000.5 (J-P)

M	167.10390	(1950.0)		P	Q
n	0.17678450	Peri.	265.43934	+0.99369284	+0.10329059
a	3.1441804	Node	88.62760	-0.07749254	+0.91390570
e	0.1667398	Incl.	2.50265	-0.08105213	+0.39256519
P	5.58	H	12.5	G 0.25	

Residuals in seconds of arc

790924	095	1.6-	0.7-	791122	095	0.2-	2.5+	851217 010	2.2+	1.4-
791014	095	0.3+	0.5+	840824	801	0.9+	3.0-			
791116	095	0.3-	2.2+	851217	010	1.3-	3.6-			

1981 ET24 = 1986 WV2
The identification is by S. J. Bus.
Epoch 1987 July 24.0 ET = JDE 2447000.5 (J-P)

M	273.48778	(1950.0)		P	Q
n	0.28231274	Peri.	20.98778	-0.93529488	+0.35386891
a	2.3013531	Node	179.73460	-0.33885160	-0.89516677
e	0.0434906	Incl.	6.61310	-0.10199551	-0.27102260
P	3.49	H	14.5	G 0.25	

Residuals in seconds of arc

810212	413	0.0	0.2+	810315	413	2.4-	2.4+	810410	413	0.0	1.5-
810213	413	1.6+	0.0	810315	413	0.4+	0.1+	810426	413	2.7+	2.3-
810302	413	2.1-	0.9+	810405	413	1.4-	1.1+	810501	413	2.3+	0.1+
810302	413	0.7+	2.1-	810405	413	4.0+	3.0-	861127	033	0.2+	0.0
810306	413	1.5-	1.3+	810406	413	1.0-	0.9+	861128	033	1.0+	0.2-
810306	413	1.0+	0.1-	810406	413	0.1-	1.1-	861129	033	0.2-	0.6-
810311	413	0.9-	0.4+	810407	413	0.4-	0.5+				
810311	413	0.7-	0.6+	810410	413	0.7-	0.8+				

1981 QE1 = 1981 RJ4 = 1981 SW3 = 1928 RG = 1985 UV

The triple designation 1981 QE1 = 1981 RJ4 = 1981 SW3 is by T. Furuta (JAM 2059).

Epoch 1987 July 24.0 ET = JDE 2447000.5 (J-P)

M	161.07378		(1950.0)	P	Q
n	0.26051389	Peri.	137.62534	+0.75304680	-0.65743723
a	2.4280055	Node	263.49908	+0.59629508	+0.69887205
e	0.2009070	Incl.	1.52242	+0.27812354	+0.28169868
P	3.78	H	14.0	G 0.25	

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

280909	024(0.09+	0.03+)X	810925	095	0.2+	1.4-	851022	046	1.5-	0.2-
810828	046	1.4+	1.6-	851020	046	1.6+	0.6+	851025	046	0.4+	0.1+
810828	046	1.4-	0.0	851020	046	0.3-	1.1+	851025	046	0.1+	1.0-
810905	095	0.2-	2.8+	851022	046	0.2-	0.2-				

1985 TP3 = 1978 SB2

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

Epoch 1987 July 24.0 ET = JDE 2447000.5 (J-P)

M	193.08459		(1950.0)	P	Q
n	0.28690610	Peri.	85.37502	+0.98655013	-0.14732506
a	2.2767240	Node	283.08488	+0.10559187	+0.90507772
e	0.2134579	Incl.	4.16899	+0.12477660	+0.39891057
P	3.44	H	14.5	G 0.25	

Residuals in seconds of arc

780926	095	0.8-	1.4+	850917	675	0.3-	0.1+	851107	675	0.6+	1.5+
781002	095	0.3+	0.5-	850917	675	0.3+	0.3-	851108	675	0.8-	0.2-
850916	675	0.1+	1.1-	851011	675	0.0	1.1-				
850916	675	0.5+	0.1+	851013	675	0.0	0.2+				

1986 WD = 1973 SR4 = 1973 UF6

Epoch 1987 July 24.0 ET = JDE 2447000.5 (J-P)

M	20.28771		(1950.0)	P	Q
n	0.08201740	Peri.	197.05631	+0.34592596	-0.92306250
a	5.2464584	Node	233.02577	+0.88349991	+0.38080676
e	0.0584597	Incl.	12.15379	+0.31585303	-0.05423870
P	12.02	H	9.5	G 0.25	

Residuals in seconds of arc

730927	095	1.1+	2.6-	861122	881	1.3-	1.6-	870106	888	0.3-	0.9-
731029	095	0.5-	1.1-	861205	881	1.6+	0.1+	870106	888	1.0+	2.4-
851012	675	1.9+	1.7+	861205	881	1.2+	0.7+	870120	881	1.2+	0.1+
851014	675	0.3+	0.9+	861226	881	2.2-	0.6+	870120	881	2.5-	0.9+
851108	675	0.5-	1.9+	861226	881	1.5+	0.2+	870201	688	1.8+	1.1+
851108	675	2.1-	0.1+	870104	881	2.1-	1.5-	870201	688	1.9+	1.1+
861122	881	1.1-	2.2+	870104	881	0.7-	0.5+				

ORBITAL ELEMENTS BY T. KOBAYASHI, TOKYO.

The identifications are by T. Kobayashi unless otherwise stated.

(3583)* 1929 TQ = 1929 TW = 1971 UG3 = 1980 EN = 1982 SD

Discovered 1929 Oct. 5 by C. Tombaugh at the Lowell Observatory. The double designation 1929 TQ = 1929 TW is by O. Kippes (MPC 6840).

Epoch 1987 July 24.0 ET = JDE 2447000.5

M	47.69535		(1950.0)	P	Q
n	0.25975113	Peri.	30.19302	+0.45041465	-0.89242174
a	2.4327515	Node	33.05771	+0.80902030	+0.39533300
e	0.1770712	Incl.	2.80008	+0.37764109	+0.21747473
P	3.79	H	13.4	G 0.25	

Residuals in seconds of arc

290929	690	2.3-	2.1-		711029	095	0.6-	3.5-		820922	704	(1.3- 11.7-)
291001	690	0.0	1.9+		800315	095	0.3+	0.2-		820923	704	3.6+ 1.7+
291005	690	0.3+	2.9+		820922	688	0.4-	2.8-		820924	704	(10.6- 0.5+)
291010	690	3.1-	0.5-		820922	688	1.8-	1.0-		861204	688	0.7+ 0.6+
291011	690	(10.9-	1.9+)		820922	688	1.2+	1.3-		861204	688	0.7+ 1.4+
291012	690	3.2+	2.8+		820922	688	1.4-	0.9-		870103	801	0.9- 0.4-

(3584)* 1981 TW = 1954 RS = 1965 UY = 1978 EX1

Discovered 1981 Oct. 5 by N. G. Thomas at the Anderson Mesa Station of the Lowell Observatory.

Epoch 1987 July 24.0 ET = JDE 2447000.5

M	348.02076		(1950.0)	P	Q
n	0.18187568	Peri.	100.57335	+0.69507526	-0.71830007
a	3.0852211	Node	305.34944	+0.64422198	+0.64096921
e	0.1084994	Incl.	2.12582	+0.31913700	+0.27056141
P	5.42	H	12.1	G 0.25	

Residuals in seconds of arc

540904	839	1.1-	0.8-		811005	046	1.2+	0.2+		860831	809	0.6+ 0.7-
651016	330	2.6+	0.0		811006	046	0.6-	0.5-		860831	809	0.7+ 0.5-
780305	095	0.4-	0.6-		811021	095	1.2+	0.6+		860901	809	0.2+ 0.2+
810902	095	1.0+	2.7+		811022	095	1.8-	1.1+		860901	809	0.2+ 0.1+
810925	046	(4.2-	1.1-)		860826	809	1.2-	0.5+		860901	809	0.0 0.1+
810925	046	(0.4+	4.4-)		860826	809	0.8-	0.4+		860902	809	0.3+ 0.4-
810925	095	0.6-	3.0+		860826	809	0.8-	0.4+		860902	809	0.4+ 0.6-
810928	095	3.0-	1.6-		860828	809	0.1-	0.0		860902	809	0.4+ 0.6-
811005	688	0.2-	3.2-		860828	809	0.3+	0.3+		860903	809	0.3+ 0.3+
811005	688	1.3-	2.2-		860828	809	0.9+	0.1+		860903	809	0.3+ 0.1-
811005	095	1.5+	1.2+		860831	809	0.4-	0.8-		860903	809	0.2+ 0.1-

(3585)* 1987 BE = 1977 JY = 1980 WH1 = 1982 FO1

Discovered 1987 Jan. 28 by T. Niijima and T. Urata at Ojima.

Epoch 1987 July 24.0 ET = JDE 2447000.5

M	357.21804		(1950.0)	P	Q
n	0.18338254	Peri.	15.52835	-0.99940137	-0.03082872
a	3.0682970	Node	162.68213	+0.02335795	-0.93603412
e	0.1904048	Incl.	3.02331	+0.02552065	-0.35055630
P	5.37	H	12.3	G 0.25	

Residuals in seconds of arc

770515	095	0.1-	0.5+	820326	046	1.0+	0.7-	870204	887	0.4+	1.1+
770518	095	0.5+	0.8+	820327	046	1.1-	0.6-	870204	887	0.1-	0.6+
801130	095	0.5+	0.4-	820327	046	1.6-	0.7+	870204	887	1.1-	0.2+
801210	095	0.4-	0.1-	820328	046	1.9+	0.6-	870207	887	(5.1-	3.7-)
820323	675	0.4-	1.1-	820328	046	1.7+	2.0-	870207	887	1.6-	1.7-
820323	675	0.5-	0.1-	820331	675	0.2-	0.0	870220	887	0.9+	0.1+
820324	675	0.1+	0.2+	820331	675	1.0-	1.1+	870220	887	0.6+	0.8+
820325	046	2.3-	2.1+	870128	887	0.5-	1.2-	870227	887	1.5-	1.4- Y
820325	046	1.8+	0.4+	870128	887	0.4+	0.4+	870227	887	2.0+	0.6+ Y
820326	046	0.1-	1.6-	870128	887	1.0+	2.4+				

1925 VF = 1980 BC1 = 1982 SE = 1986 TP3
Epoch 1987 July 24.0 ET = JDE 2447000.5

M	29.59505		(1950.0)	P	Q
n	0.25740978	Peri.	38.83412	+0.24450359	-0.96890366
a	2.4474811	Node	37.05780	+0.87312030	+0.20295034
e	0.1522165	Incl.	3.61496	+0.42175695	+0.14155158
P	3.83	H	12.5	G 0.25	

Residuals in seconds of arc

251115	008	0.7-	0.1+	861004	046	3.9+	1.9+	861005	046	2.5-	1.8-
251120	008	0.9+	0.7-	861004	046	3.4+	1.2+	861009	046	3.6+	1.3+
251123	008	0.4-	0.9+	861004	046	1.7-	3.9-	861009	046	4.1+	0.6+
800123	095	0.4-	0.1-	861005	046	1.0-	3.9-	861010	046	0.1-	0.8-
800220	095	0.4-	2.3-	861005	046	3.7-	4.7+	861010	046	0.8-	0.3-
820922	688	0.1+	2.7-	861005	046	4.3-	5.0+				
820922	688	2.3+	1.7-	861005	046	2.3-	1.6-				

1931 TU1 = 1970 PD = 1979 FN3 = 1979 GA = 1980 RF4
The double designation 1979 FN3 = 1979 GA is by S. Nakano (MPC 11613). The identification 1931 TU1 = 1980 RF4 was independently suggested by F. N. Bowman.
Epoch 1987 July 24.0 ET = JDE 2447000.5

M	159.98174		(1950.0)	P	Q
n	0.20041884	Peri.	126.54493	+0.60797143	+0.79395664
a	2.8918584	Node	180.90467	-0.76140241	+0.58236275
e	0.2592705	Incl.	6.89877	-0.22502691	+0.17460381
P	4.92	H	12.5	G 0.25	

Residuals in seconds of arc

311009	024	4.8-	4.8-	700801	095	1.0-	1.8-	790402	809	0.2+	0.7-
311017	024	1.9+	2.7+	700807	095	1.7+	1.3-	800907	095	0.3-	1.5+
311020	024	0.3-	3.4-	790331	095	0.6-	1.0-	800909	095	0.8-	0.1-
311102	024	4.7+	2.1+	790401	809	0.0	0.4+	800911	095	0.1+	3.2+

1967 UR = A915 GA = 1935 ED = 1952 HJ = 1973 SE5 = 1975 BQ1 = 1980 TN11 = 1983 RD4
Epoch 1987 July 24.0 ET = JDE 2447000.5

M	172.06160		(1950.0)	P	Q
n	0.29357965	Peri.	145.09478	-0.76477580	+0.63845329
a	2.2420851	Node	74.81976	-0.60964633	-0.67361069
e	0.0939499	Incl.	5.14669	-0.20844504	-0.37232518
P	3.36	H	13.0	G 0.25	

Residuals in seconds of arc

150412	029	4.0+	5.4+ Y	671030	029	0.2+	0.1+	750117	330	(27.4+	1.4-)
350308	012	(12.1-	35.6+)X	671030	029	0.5+	0.5+	801008	095	0.1+	1.4+
520418	024	1.7-	1.1-	671031	029	0.1+	1.0+	830902	688	3.3+	4.8+
520424	711	0.1-	1.0+ Y	671031	029	0.3+	0.2+	830902	688	0.4+	2.2+
671014	029	0.1+	0.5+	671031	029	0.8-	0.2+				
671014	029	0.3-	0.3+	730927	095	6.3-	3.3-				

1969 TL1 = 1931 TQ4 = 1978 GP3
Epoch 1987 July 24.0 ET = JDE 2447000.5

M 182.26878	(1950.0)	P	Q	
n 0.18286586	Peri. 223.86317	+0.43994642	+0.89674634	
a 3.0740738	Node 72.29055	-0.80940085	+0.41906389	
e 0.1147843	Incl. 2.88142	-0.38899539	+0.14223735	
P 5.39	H 12.0	G 0.25		

Residuals in seconds of arc

311012 024	3.2+	1.5+	691013 095	0.3-	1.2-	691111 095	0.2-	1.1+
311016 024	3.9-	0.1-	691016 095	0.3-	1.4-	780411 095	0.4+	1.1+
691008 095	3.0+	0.4-	691104 095	2.1-	1.5+			

1985 RD3 = 1969 TQ2 = 1969 VG
The double designation 1969 TQ2 = 1969 VG is by H. Oishi (JAM 1814).
Epoch 1987 July 24.0 ET = JDE 2447000.5

M 170.99165	(1950.0)	P	Q	
n 0.30386760	Peri. 272.07679	+0.87567112	-0.48141999	
a 2.1911887	Node 116.70330	+0.45818861	+0.80351173	
e 0.1207614	Incl. 2.43019	+0.15252306	+0.35014810	
P 3.24	H 15.0	G 0.25		

Residuals in seconds of arc

691008 095	1.4+	2.5-	850910 809	0.7+	0.3+	850916 809	0.5+	0.4+
691104 095	(33.7-	38.9+)	850911 809	0.5-	1.3+	850916 809	0.7+	0.4+
691113 095	1.5-	2.6+	850911 809	0.3-	1.4+	850917 809	0.4+	0.2+
850906 809	0.5-	0.8+	850911 809	0.2-	1.1+	850917 809	0.3+	0.1-
850906 809	0.3-	0.9+	850914 809	0.8+	0.4-	850917 809	0.4+	0.2-
850906 809	0.0	1.1+	850914 809	0.8+	0.3-	850921 809	1.1+	1.6-
850908 809	1.4-	0.5-	850914 809	0.8+	0.1-	850921 809	1.0+	1.5-
850908 809	1.1-	0.4-	850915 809	0.3-	0.7+	850921 809	1.1+	1.7-
850908 809	0.9-	0.4-	850915 809	0.1-	0.5+	850922 809	1.5-	1.1-
850910 809	0.0	0.5+	850915 809	0.3+	0.5+	850922 809	1.3-	1.2-
850910 809	0.4+	0.4+	850916 809	0.0	0.5+	850922 809	1.3-	1.2-

1986 UT = 1974 SQ3 = 1976 YE = 1978 JF1 = 1984 JU = 1985 KG
Epoch 1987 July 24.0 ET = JDE 2447000.5

M 167.43918	(1950.0)	P	Q	
n 0.17343101	Peri. 10.89550	-0.07098250	+0.98537269	
a 3.1845755	Node 255.16973	-0.92675369	-0.12259143	
e 0.1180535	Incl. 9.22228	-0.36890255	+0.11837230	
P 5.68	H 11.5	G 0.25		

Residuals in seconds of arc

740922 095	1.8-	3.1+	840503 688	0.1-	1.8-	861028 046	1.5-	2.7-
741010 095	0.7-	3.5+	850519 691	0.0	1.5-	861103 046	2.7+	3.1-
761227 801	1.3+	2.0+	850519 691	0.2-	1.3-	861103 046	2.9+	3.4-
780506 095	0.9-	0.5-	850519 691	1.3+	0.5-	861107 046	1.0-	0.0
840503 688	0.2-	2.2-	861028 046	0.1+	1.7-	861107 046	1.2-	0.1+

1986 VU = 1959 XB = 1963 SJ = 1981 SU5 = 1982 YV
Epoch 1987 July 24.0 ET = JDE 2447000.5

M 86.07392	(1950.0)	P	Q	
n 0.21732798	Peri. 31.87395	+0.99516263	-0.09286142	
a 2.7398426	Node 333.39813	+0.06814267	+0.88757332	
e 0.1280112	Incl. 4.10618	+0.07076662	+0.45120988	
P 4.54	H 12.0	G 0.25		

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

591202 760	3.5+	1.7+	821222 511	0.5+	1.2+	861107 046	0.6-	0.4-
591202 760	3.5-	2.0-	821223 511	0.2-	0.4+	861107 046	0.5+	0.8-
630919 760	(0.06+	0.00+)X	861103 046	0.4-	0.7-	861109 046	0.3-	1.1+
810928 095	0.6-	1.3+	861104 046	0.9+	0.5-	861109 046	0.4+	0.0

1987 BJ = 1969 VX = 1979 YV3
Epoch 1987 July 24.0 ET = JDE 2447000.5

M	55.77403	(1950.0)		P	Q
n	0.29733302	Peri.	338.92699	-0.65765014	-0.75228884
a	2.2231766	Node	152.14826	+0.70265084	-0.63146150
e	0.1705298	Incl.	4.84625	+0.27162123	-0.18793049
P	3.31	H	12.5	G 0.25	

Residuals in seconds of arc

691111 095	2.0-	4.4-		870205 376	4.0+	3.2+		870221 894	2.6+	1.9-	
691113 095	0.8+	0.6+		870205 376	4.0-	2.0-		870221 894	1.3+	3.2-	
691115 095	2.1+	0.3+		870205 888	1.1+	0.4+		870227 881	0.6-	0.7+	
791218 095	0.8-	3.5+		870205 888	0.3+	0.4-		870227 881	0.5-	1.7+	
870131 881	1.3-	2.2-	Y	870207 881	0.7-	0.3+		870227 881	0.5-	1.0+	
870131 881	1.4-	0.1-	Y	870207 881	0.1-	0.7+		870320 881	0.6+	0.1+	
870204 883	0.6-	3.0+		870220 894	0.4-	0.6-		870320 881	0.4-	0.2+	
870204 883	0.6-	2.5+		870220 894	1.1+	4.1-					

1987 DQ = 1942 FC = 1970 GL2
Epoch 1987 July 24.0 ET = JDE 2447000.5

M	353.92687	(1950.0)		P	Q
n	0.28382860	Peri.	69.42507	-0.89097841	+0.44869829
a	2.2931473	Node	137.15498	-0.44526864	-0.83352260
e	0.1051645	Incl.	5.86427	-0.08884428	-0.32235061
P	3.47	H	13.0	G 0.25	

Residuals in seconds of arc

420317 062	0.4-	0.0		700413 805	0.4-	0.5-		870303 887	0.2+	0.3-	
420317 062	0.6+	1.1-		870228 887	0.9+	0.8-		870303 887	0.3+	0.4+	
420318 062	0.1-	1.6+		870228 887	0.9+	0.8-		870303 887	0.9-	0.4-	
700413 805	0.2+	0.2+		870302 887	0.5-	1.3+		870305 887	0.1+	0.2-	
700413 805	0.1+	0.0		870302 887	0.3-	0.5+		870305 887	0.8-	0.1-	

1987 EB = 1974 KF = 1978 EF = 1978 ET6 = 1979 OW14
Epoch 1987 July 24.0 ET = JDE 2447000.5

M	341.35678	(1950.0)		P	Q
n	0.21714991	Peri.	78.24556	-0.83892641	+0.53955561
a	2.7413403	Node	134.35846	-0.53005321	-0.78029311
e	0.1467357	Incl.	5.72239	-0.12347497	-0.31626318
P	4.54	H	12.0	G 0.25	

Residuals in seconds of arc

740524 095	0.1-	0.3-		780312 049	0.2-	0.4-		870318 887	0.0	0.1-	
780306 095	0.6-	0.3-		780312 049	0.1-	0.3-		870318 887	1.2+	0.6-	
780311 049	1.2+	3.1+		790721 095	0.1-	0.6+		870320 887	0.1+	0.1+	
780311 049	0.3+	0.5+		870303 887	1.3-	0.0		870320 887	1.4-	0.5+	
780311 049	0.2-	1.1-		870303 887	1.5+	0.0		870324 887	1.2-	0.4+	Y
780311 049	0.6-	1.3-		870303 887	0.9+	0.2+					

1987 EC = 1976 YF6 = 1978 JL = 1982 BX
Epoch 1987 July 24.0 ET = JDE 2447000.5

M	89.88848	(1950.0)		P	Q
n	0.21347408	Peri.	74.62763	+0.03971994	-0.99864259
a	2.7727196	Node	13.23383	+0.85095305	+0.01613247
e	0.1583886	Incl.	8.46377	+0.52373776	+0.04952490
P	4.62	H	12.0	G 0.25	

Residuals in seconds of arc

761220 095	0.6-	1.6+		870302 881	1.5-	0.9-		870320 881	1.2-	0.8+	
780505 095	0.5+	0.7+		870302 881	0.3-	0.5-		870320 881	1.7+	0.0	
820118 688	0.4-	0.8-		870305 881	0.1+	0.2-					
820118 688	0.1-	0.6-		870305 881	1.6+	1.3+					

1987 FA = 1972 TK8 = 1975 RD2 = 1980 AK = 1982 UV5
Epoch 1987 July 24.0 ET = JDE 2447000.5

M 135.93981		(1950.0)	P	Q
n 0.29554903	Peri.	192.73911	+0.58157668	-0.81342859
a 2.2321139	Node	221.70057	+0.74765612	+0.53937304
e 0.1576654	Incl.	0.87198	+0.32059147	+0.21773987
P 3.33	H 13.5	G 0.25		

Residuals in seconds of arc

721006	095	1.1-	2.6+	800115	330	2.0-	0.9-	870324	887	1.0+	0.3-
721013	095	1.4+	0.6+	821020	095	0.8+	0.9-	870324	887	(5.1+	1.6+)
750904	808	0.3-	0.5+	821108	095	0.3-	0.4-	870331	887	0.5+	0.8+
750904	808	0.5+	0.4+	870320	887	2.7+	0.3+	870331	887	0.3+	0.4+
750909	808	0.0	0.8-	870320	887	0.1+	0.5-				
750909	808	0.9-	1.8-	870320	887	2.8-	0.4-				

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ORBITAL ELEMENTS BY H. OISHI, TOKYO.

The following orbital elements are from JAM 2047, 2051-2052 and 2054-2056. The identifications are by H. Oishi unless otherwise stated.

(3586)* 1978 SW6 = 1969 EZ1 = 1974 SR = 1981 KL1 = 1982 UE8 = 1982 VR6

Discovered 1978 Sept. 26 by L. Zhuravleva at the Crimean Astrophysical Observatory. The double designation 1982 UE8 = 1982 VR6 was independently suggested by C. M. Bardwell (MPC 11142).

Epoch 1987 July 24.0 ET = JDE 2447000.5

M 193.50867		(1950.0)	P	Q
n 0.25569120	Peri.	260.62715	-0.05481557	+0.99831953
a 2.4584357	Node	6.32209	-0.83591453	-0.03558503
e 0.1192288	Incl.	9.82916	-0.54611552	-0.04573649
P 3.85	H 13.1	G 0.25		

Residuals in seconds of arc

690314	095	1.1-	2.0-	781004	675	0.4+	0.5+	821109	095	0.0	0.8-
740919	095	2.4-	2.8-	781008	095	0.5-	1.9+	821111	095	(5.4-	7.9+)
780926	095	2.3+	1.5+	781101	095	0.5-	1.6-	861031	801	1.4-	0.1-
781002	095	2.0+	1.7+	810528	809	0.7-	1.8-	861202	801	0.0	0.1+
781003	675	0.8+	0.3+	821021	095	1.0+	4.1-				

(3587)* 1981 RK5 = 1975 GE1 = 1983 AR2

Discovered 1981 Sept. 8 by L. Zhuravleva at the Crimean Astrophysical Observatory.

Epoch 1987 July 24.0 ET = JDE 2447000.5

M 60.76452		(1950.0)	P	Q
n 0.22174295	Peri.	26.14551	+0.52048232	-0.85070156
a 2.7033535	Node	32.63861	+0.75753409	+0.42031442
e 0.0370797	Incl.	7.83454	+0.39400541	+0.31566221
P 4.44	H 12.5	G 0.25		

Residuals in seconds of arc

750415	805	0.1+	0.4+	830110	675	0.1+	0.1-	830112	675	1.2+	0.2-
750420	805	0.0	0.0	830110	675	0.7+	0.3-	861201	801	1.2-	0.5+
810908	095	0.8+	0.1+	830111	675	0.7-	0.4+	861202	688	2.4+	0.8-
810928	095	1.3-	0.8+	830111	675	0.2-	1.3+	861202	688	0.3+	0.7-
811005	095	0.1+	0.0	830112	675	0.8-	0.4-	861228	801	1.5-	0.3+

(3588)* 1981 TH4 = 1941 SF = 1941 SZ1 = 1958 TJ1 = 1975 TQ1 = 1977 EF = 1983 ES

Discovered 1981 Oct. 8 by L. I. Chernykh at the Crimean Astrophysical Observatory. The key identifications 1981 TH4 = 1975 TQ1 = 1977 EF = 1983 ES are by T. Furuta (JAM 1948).

Epoch 1987 July 24.0 ET = JDE 2447000.5

M	346.81588	(1950.0)	P	Q	
n	0.17208624	Peri. 99.77532	+0.33883943	-0.93924649	
a	3.2011445	Node 330.23626	+0.81408410	+0.32189253	
e	0.2182251	Incl. 6.33863	+0.47165127	+0.11916889	
P	5.73	H 11.9	G 0.25		

Residuals in seconds of arc

410921	012	0.6+ 1.7-	770211	675	1.1- 0.6+	830310	688	1.6- 1.5-
410922	024	0.2+ 2.0-	770212	675	0.7- 0.3+	830310	688	0.7+ 2.0-
410923	012	(33.5+ 57.1-)	770214	675	1.8- 0.7+	830316	688	0.8+ 1.8-
410924	024	0.5+ 0.3-	770309	095	1.4+ 0.8-	830316	688	1.5- 1.5-
581007	690	1.8+ 1.2-	770313	095	0.9+ 1.1+	860908	801	0.7- 0.4+
581008	690	0.6+ 2.0-	811008	095	0.0 0.6+	861030	801	0.9- 0.1+
581010	690	1.5+ 0.9-	811022	095	1.2+ 2.5+			
751003	095	0.2- 0.6-	811024	095	1.8- 1.8+			

1962 OB = 1962 PQ = 1962 QL = 1978 GG = 1979 OF14 = 1979 QJ7 = 1980 WL

The key identification and double designation 1962 OB = 1979 OF14 = 1979 QJ7 are by T. Furuta (JAM 2054). The double designations 1962 OB = 1962 PQ and 1962 OB = 1962 QL are by O. Kippes (MPC 2324) and L. Boyer (MPC 5333), respectively.

Epoch 1987 July 24.0 ET = JDE 2447000.5 (J-P)

M	343.58280	(1950.0)	P	Q	
n	0.23225530	Peri. 325.61157	+0.21610740	+0.96463072	
a	2.6211577	Node 316.31613	-0.83945701	+0.10461880	
e	0.1549317	Incl. 12.62385	-0.49860758	+0.24195553	
P	4.24	H 12.4	G 0.25		

Residuals in seconds of arc

620731	760	2.4- 1.1+	620830	760	2.3+ 1.0-	790719	095	(2.5- 8.3-)
620731	760	0.5+ 1.7-	780407	809	0.6- 1.2-	790730	095	1.1- 2.7-
620809	760	2.1+ 1.9-	780407	809	0.8- 0.6-	790820	095	0.7+ 3.2+
620830	760	0.7- 0.7+	780407	809	0.2- 0.6-	801130	095	0.1+ 2.2-

1969 TQ1 = 1986 WD2

Epoch 1987 July 24.0 ET = JDE 2447000.5 (J-P)

M	62.40850	(1950.0)	P	Q	
n	0.17691590	Peri. 329.85604	+0.78637228	-0.61585305	
a	3.1426234	Node 68.23734	+0.57665548	+0.70369338	
e	0.1718565	Incl. 2.98799	+0.22155608	+0.35431717	
P	5.57	H 12.9	G 0.25		

Residuals in seconds of arc

691008	095	1.9+ 0.2-	861130	046	0.8+ 2.1+	861203	046	0.6+ 0.7+
691013	095	1.1+ 0.3+	861130	046	0.4+ 1.9+	861203	046	1.4- 1.6-
691016	095	0.3- 2.0-	861201	046	0.6- 2.5-			
691104	095	2.8- 2.3+	861201	046	0.2+ 1.1-			

1969 TC2 = 1977 DA11 = 1979 SV1

The identification 1969 TC2 = 1979 SV1 was independently suggested by L. D. Schmadel.

Epoch 1987 July 24.0 ET = JDE 2447000.5 (J-P)

M	165.90273		(1950.0)	P	Q
n	0.18773726	Peri.	316.35256	+0.98625227	+0.11129485
a	3.0206699	Node	37.77049	-0.02911733	+0.84465879
e	0.1210029	Incl.	11.50327	-0.16266110	+0.52360766
P	5.25	H	12.0	G 0.25	

Residuals in seconds of arc

691008 095	0.6+	0.8-	691104 095	0.8-	1.0-	770219 033	0.2+	0.2-
691013 095	0.3+	1.4+	691111 095	2.2-	0.8+	770219 033	0.2-	0.2+
691016 095	1.3+	0.6+	691113 095	0.8+	1.2-	790922 095	0.0	0.0

1978 VZ2 = 1978 WV8 = 1982 XO1

Epoch 1987 July 24.0 ET = JDE 2447000.5 (J-P)

M	17.90630		(1950.0)	P	Q
n	0.23962566	Peri.	22.58748	+0.00739735	-0.99961513
a	2.5671310	Node	66.99723	+0.91291575	-0.00416052
e	0.0841918	Incl.	1.66448	+0.40808102	+0.02742767
P	4.11	H	14.7	G 0.25	

Residuals in seconds of arc

781105 675	0.1-	0.0	781129 675	(4.8+	1.1+)	821214 381	0.3-	0.3-
781106 675	1.6+	0.5+	781130 675	0.3+	0.3+	821214 381	0.3-	0.2+
781107 675	1.6-	0.7-	821213 381	0.7-	0.5+			
781129 675	0.3-	0.3-	821213 381	1.2+	0.3-			

1980 VX1 = 1977 DG = 1977 DJ11

The double designation 1977 DG = 1977 GB (MPC 10817) is invalid.

Epoch 1987 July 24.0 ET = JDE 2447000.5 (J-P)

M	134.30982		(1950.0)	P	Q
n	0.21167253	Peri.	85.14044	+0.09786576	-0.99519818
a	2.7884354	Node	359.23708	+0.85518466	+0.08496710
e	0.2065265	Incl.	7.30615	+0.50900048	+0.04859184
P	4.66	H	13.3	G 0.25	

Residuals in seconds of arc

770217 801	1.2-	0.9-	801106 330	0.9+	0.3+	801210 095	0.4-	0.5+
770222 801	1.2+	0.8+	801110 330	0.5-	0.8-			

1981 JS1 = 1981 KD = 1977 CX

The identifications are by T. Furuta (JAM 2054).

Epoch 1987 July 24.0 ET = JDE 2447000.5 (J-P)

M	326.82205		(1950.0)	P	Q
n	0.28056383	Peri.	208.05791	-0.98650746	-0.15332977
a	2.3109070	Node	322.98188	+0.16229585	-0.86983207
e	0.1200543	Incl.	5.46933	+0.02151948	-0.46891593
P	3.51	H	13.8	G 0.25	

Residuals in seconds of arc

770213 675	0.5-	0.4+	810509 808	0.2+	0.2+	810529 805	2.2+	1.2-
770214 675	0.5+	0.4-	810528 809	2.4-	0.9+			
810509 808	0.0	0.0	810529 805	(9.2-	0.3+)			

1981 TQ1 = 1981 TE4 = 1981 WZ5 = 1977 TE1 = 1979 BF2

The identifications are by T. Furuta (JAM 2055). The double designation 1977 PF1 = 1977 TE1 (MPC 10752) is invalid.

Epoch 1987 July 24.0 ET = JDE 2447000.5 (J-P)

M	269.76283		(1950.0)	P	Q
n	0.27555890	Peri.	8.19388	+0.95045362	+0.30883135
a	2.3388046	Node	333.73219	-0.28955754	+0.83794153
e	0.0781252	Incl.	4.60244	-0.11311212	+0.44997465
P	3.58	H	13.4	G 0.25	

Residuals in seconds of arc

771003	095	0.4-	1.0+		811002	095	0.4-	0.7-		811124	095	0.6+	1.1+
790124	095	0.1+	0.6+		811008	095	0.2-	1.1-					

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NEW NAMES OF MINOR PLANETS.

(2391) Tomita = 1957 AA

Discovered 1957 Jan. 9 by K. Reinmuth at Heidelberg.

Named in honor of Koichiro Tomita, astronomer at the Tokyo Astronomical Observatory during 1947-1985, prominent observer of comets and minor planets, discoverer of comet 1964 VI and recoverer of almost all the comets that returned in 1967. Also a leading popularizer of astronomy in Japan, Tomita has been a source of inspiration for H. Oishi, who made the key identification for this minor planet and proposed the name.

(2615) Saito = 1951 RJ

Discovered 1951 Sept. 4 by K. Reinmuth at Heidelberg.

Named in honor of Keiji Saito, astrophysicist at the Tokyo Astronomical Observatory during 1961-1985 who has studied the physics of comets and meteors. While still a college student, he was an independent discoverer of the nova T CrB at its 1946 recurrence and has inspired many amateur astronomers in Japan. Name proposed by H. Oishi, who made the key identification involving this planet.

(3064) Zimmer = 1984 BB1

Discovered 1984 Jan. 28 by E. Bowell at the Anderson Mesa Station of the Lowell Observatory.

Named in memory of Louis Zimmer (1888-1970), world-famous Belgian maker of astronomical clocks. Many of his clocks were made for crowned heads and political leaders all over the world. Today he is best remembered for his "wonderclock", exhibited at the 1939 New York World Fair; his "Jubilee clock", donated to his native town of Lier in 1930; and his Astronomical Studio. All three masterpieces were housed in or near the "Zimmer Tower", which has subsequently become one of the main attractions of Lier. Name proposed by the discoverer, following a suggestion by E. Goffin, who prepared the citation.

(3066) McFadden = 1984 EO

Discovered 1984 Mar. 1 by E. Bowell at the Anderson Mesa Station of the Lowell Observatory.

Named in honor of Lucy-Ann A. McFadden, planetary scientist at the University of Maryland, for her studies of the nature of earth-approaching minor planets and for the comparison of their spectra with those of meteorites. Recently, she has been working on the relationship between cometary nuclei and earth approachers, and on ultraviolet spectrophotometry of comets. Name endorsed by M. F. A'Hearn.

(3161) Beadell = 1980 TB5

Discovered 1980 Oct. 9 by C. S. Shoemaker on films taken at Palomar by S. J. Bus.

Named in honor of Len Beadell, surveyor at Salisbury, South Australia. The last of the geographical explorers of the Australian outback, Beadell laid out more than 6000 km of graded track, including the well-known "Gun Barrel Highway", through the most remote regions of Australia.

(3169) Ostro = 1981 LA

Discovered 1981 June 4 by E. Bowell at the Anderson Mesa Station of the Lowell Observatory.

Named in honor of Steven J. Ostro, planetary scientist at the Jet Propulsion Laboratory of the California Institute of Technology. Ostro has specialized in radar studies of solar system objects, including the Galilean satellites. He is the leader in radar research on minor planets and has used his observations to deduce their surface roughness and radar reflectivity. He has also combined his radar data with optical rotational lightcurves to study the shapes and axial orientations of minor planets. Citation prepared by the discoverer and A. W. Harris.

(3247) Di Martino = 1981 YE

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

Named in honor of Mario Di Martino, astronomer at the Osservatorio di Torino, who in recent years has been a prolific observer of minor planet lightcurves. Di Martino has specialized in observations for the purpose of shape and pole determinations. Name proposed by the discoverer, following a suggestion by A. W. Harris, who also prepared the citation.

(3248) Farinella = 1982 FK

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

Named in honor of Paolo Farinella, planetary scientist at the University of Pisa, whose research has included studies of the origin of the solar system and the dynamics of planetary satellites and ring systems. Farinella's work on minor planets has concerned the collisional evolution of the belt and the formation of families, both from a theoretical and an experimental point of view. Named by the discoverer, following a suggestion by A. W. Harris. Citation prepared by A. Coradini and V. Zappala.

(3253) Gradie = 1982 HQ1

Discovered 1982 Apr. 28 by E. Bowell at the Anderson Mesa Station of the Lowell Observatory.

Named in honor of Jonathan C. Gradie, planetary scientist at the Hawaiian Institute of Geophysics, University of Hawaii. Gradie's research has centered on the physics of minor planets, satellites and comets, particularly on their light-scattering properties. His wide-ranging contributions to minor-planet science include a detailed physical study of the Eos and Koronis families and development of a number of aspects of minor-planet taxonomy.

(3255) Tholen = 1980 RA

Discovered 1980 Sept. 2 by E. Bowell at the Anderson Mesa Station of the Lowell Observatory.

Named in honor of David J. Tholen, planetary scientist at the Institute for Astronomy of the University of Hawaii. Tholen's work on the eight-color survey of minor planets led him to devise an improved taxonomy of minor planets. He has considered the physical properties of minor planets, satellites and comets in terms of composition and evolution, and he was among the first to observe events in the series of occultations and transits now occurring between Pluto and its satellite Charon.

(3308) Ferreri = 1981 EP

Discovered 1981 Mar. 1 by H. Debehogne and G. De Sanctis at the European Southern Observatory.

Named in honor of Walter Ferreri, who works in the photographic minor-planet program at the Osservatorio Astronomico di Torino and has discovered several minor planets at the European Southern Observatory.

(3368) Duncombe = 1985 QT

Discovered 1985 Aug. 22 by E. Bowell at the Anderson Mesa Station of the Lowell Observatory.

Named in honor of Raynor L. Duncombe, astronomer at the University of Texas, on the occasion of his seventieth birthday. A leader in positional and dynamical astronomy, he has pursued wide-ranging research that has included the study of the motions of major planets, minor planets and satellites; he was a pioneer in artificial-satellite orbit determination and in the use of digital computers in astronomy; and he has recently been involved with the astrometric uses of the Hubble Space Telescope as a member of the Astrometry Team. He served as director of the U.S. Nautical Almanac Office from 1963 to 1975, was the first chairman of the American Astronomical Society's Division on Dynamical Astronomy and for a number of years the executive editor of 'Celestial Mechanics'. Name proposed by the discoverer following a suggestion by P. K. Seidelmann, who provided the citation.

(3370) Kohsai = 1934 CU

Discovered 1934 Feb. 4 by K. Reinmuth at Heidelberg.

Named in honor of Hiroki Kosai, astronomer at the Tokyo Astronomical Observatory, outstanding observer of comets and minor planets, codiscoverer of comet 1976 XVI and popularizer of astronomy in Japan. Name proposed by H. Oishi and K. Hurukawa, who found the identifications for this planet.

(3375) Amy = 1981 JY1

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

Named in honor of Amy Shoemaker Prescott, aunt of E. M. Shoemaker.

(3430) Bradfield = 1980 TF4

Discovered 1980 Oct. 9 by C. S. Shoemaker on films taken at Palomar by S. J. Bus.

Named in honor of William A. Bradfield, rocket engineer of Dernancourt, South Australia. Discoverer of twelve comets, Bradfield has been chiefly responsible for the greatly increased rate of discovery of bright comets from the southern hemisphere during the 1970s and 1980s.

(3435) Boury = 1981 XC2

Discovered 1981 Dec. 2 by F. Dossin at Haute Provence.

Named in memory of Arsene Boury (1934-1982), fellow-student, colleague and friend of the discoverer. He was a theoretical astrophysicist known for his work on stellar evolution and stability, mainly concerning massive and population III stars. The discovery of this minor planet was announced around the date of his untimely death.

(3485) Barucci = 1983 NU

Discovered 1983 July 11 by E. Bowell at the Anderson Mesa Station of the Lowell Observatory.

Named in honor of M. Antonella Barucci, planetary scientist at the Istituto di Astrofisica Spaziale in Rome. A prolific contributor to the study of the physical properties of minor planets, Barucci has carried out both photometric and astrometric observations at the telescope and has studied minor planet body shapes and surface light-scattering properties in the laboratory. Citation prepared by the discoverer, with assistance from A. Coradini, A. W. Harris and V. Zappala.

(3486) Fulchignoni = 1984 CR

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

Named in honor of Marcello Fulchignoni, associate professor of physics at the University of Rome and director of the Istituto de Astrofisica Spaziale. Fulchignoni has played a crucial role in promoting planetary science in Italy, particularly in stimulating Italian participation in space exploration. His research has included studies of the geological and geochemical evolution of the moon and planetary surfaces. His interest in minor planets has centered on the problem of lightcurve inversion by means of laboratory simulation and numerical modeling. Citation prepared in part by A. Coradini and V. Zappala.

(3489) Lottie = 1983 AT2

Discovered 1983 Jan. 10 by K. Herkenhoff and G. Ojakangas at Palomar.

Named in honor of Lottie Soll-Herkenhoff, wife of one of the co-discoverers.

(3532) Tracie = 1983 AS2

Discovered 1983 Jan. 10 by G. Ojakangas and K. Herkenhoff at Palomar.

Named in honor of Tracie Lynn Ojakangas, wife of one of the co-discoverers.

(3540) Protesilaos = 1973 UF5

Discovered 1973 Oct. 27 by F. Borngen at Tautenburg.

Named for the first Greek warrior to jump to the shore in the landing at Asia Minor in the Trojan War. He died at the hand of Aneas.

(3553) Mera = 1985 JA

Discovered 1985 May 14 by C. S. Shoemaker and E. M. Shoemaker at Palomar.

Named for a daughter of Praetus. She was a follower of Artemis and was killed by the goddess for having given herself to Zeus. Before dying, she gave birth to Locri, ancestor of the Locrians.

(3554) Amun = 1986 EB

Discovered 1986 Mar. 4 by C. S. Shoemaker and E. M. Shoemaker at Palomar.

Named for the invisible or hidden god of Hermopolis, who later became the local god of Thebes and then the king of the gods of the Egyptian empire. Great temples at Karnak and Luxor were dedicated to Amun.

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EPHEMERIDES.

Comet Levy (1987a) Elements MPC 11738

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	m1
1987	03 26	13 27.88	-21 57.1	0.917	1.862	153.2	14.0	13.0
1987	04 05	12 30.18	-23 34.9					
1987	04 15	11 45.50	-23 32.9	1.178	2.115	151.5	13.1	14.1
1987	04 25	11 15.10	-22 49.4					
1987	05 05	10 56.02	-22 01.6	1.626	2.364	126.0	20.2	15.3
1987	05 15	10 44.95	-21 24.9					
1987	05 25	10 39.36	-21 03.2	2.150	2.609	105.4	22.0	16.3
1987	06 04	10 37.57	-20 56.7					
1987	06 14	10 38.43	-21 04.1	2.693	2.848	88.2	20.9	17.2
1987	06 24	10 41.18	-21 23.8					
1987	07 04	10 45.30	-21 54.4	3.220	3.083	73.2	18.4	17.9

1987 07 14	10 50.40	-22 34.8						
1987 07 24	10 56.21	-23 23.7	3.708	3.313	59.6	15.3	18.5	

Comet Nishikawa-Takamizawa-Tago (1987c) Elements MPC 11738

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	m1
1987 03 26	23 03.88	-08 26.8	1.748	0.887	20.6	23.3	8.7	
1987 03 31	22 59.58	-09 33.2						
1987 04 05	22 54.97	-10 44.8	1.592	0.937	33.4	36.0	8.7	
1987 04 10	22 49.87	-12 03.9						
1987 04 15	22 44.03	-13 33.5	1.391	1.016	46.9	46.1	8.8	
1987 04 20	22 37.07	-15 18.1						
1987 04 25	22 28.37	-17 23.8	1.158	1.116	61.6	52.5	8.8	
1987 04 30	22 17.00	-19 59.3						
1987 05 05	22 01.37	-23 16.3	0.913	1.229	79.4	53.7	8.7	
1987 05 10	21 38.84	-27 28.5						
1987 05 15	21 04.80	-32 44.6	0.690	1.351	103.6	46.6	8.5	
1987 05 20	20 11.88	-38 42.2						
1987 05 25	18 53.19	-43 32.9	0.561	1.478	138.0	27.3	8.4	
1987 05 30	17 18.15	-44 19.0						
1987 06 04	15 55.80	-40 40.0	0.618	1.607	159.0	13.1	9.0	
1987 06 09	14 59.71	-35 23.2						
1987 06 14	14 24.24	-30 32.0	0.835	1.737	139.3	22.4	10.0	
1987 06 19	14 01.63	-26 39.3						
1987 06 24	13 46.87	-23 41.4	1.127	1.867	121.1	27.8	11.0	
1987 06 29	13 37.07	-21 26.5						
1987 07 04	13 30.55	-19 44.0	1.446	1.996	107.0	29.1	11.8	
1987 07 09	13 26.29	-18 25.9						
1987 07 14	13 23.65	-17 26.2	1.775	2.125	95.3	28.4	12.5	
1987 07 19	13 22.20	-16 40.6						
1987 07 24	13 21.67	-16 06.1	2.104	2.253	84.9	26.7	13.1	
1987 07 29	13 21.84	-15 40.3						
1987 08 03	13 22.58	-15 21.6	2.425	2.379	75.3	24.4	13.7	
1987 08 08	13 23.76	-15 08.5						
1987 08 13	13 25.30	-15 00.1	2.734	2.504	66.2	21.7	14.2	
1987 08 18	13 27.15	-14 55.6						
1987 08 23	13 29.23	-14 54.3	3.029	2.627	57.5	18.9	14.6	
1987 08 28	13 31.52	-14 55.6						
1987 09 02	13 33.98	-14 59.2	3.304	2.749	48.9	16.1	15.0	
1987 09 07	13 36.57	-15 04.7						
1987 09 12	13 39.27	-15 11.8	3.559	2.869	40.5	13.2	15.3	
1987 09 17	13 42.06	-15 20.1						
1987 09 22	13 44.91	-15 29.6	3.790	2.989	32.2	10.3	15.6	

Comet Wilson (1986l) Elements MPC 11738

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	m1
1987 03 26	20 55.06	-32 21.7	1.462	1.266	58.3	42.1	6.3	
1987 03 31	21 01.25	-35 39.6						
1987 04 05	21 09.05	-39 50.9	1.164	1.225	68.4	49.4	5.7	
1987 04 10	21 19.79	-45 17.1						
1987 04 15	21 36.52	-52 27.5	0.881	1.203	79.1	54.9	5.0	
1987 04 20	22 08.36	-61 52.2						
1987 04 25	23 34.3	-72 58.7	0.671	1.201	89.2	56.8	4.4	
1987 04 30	04 01.4	-76 58.2						
1987 05 05	06 49.56	-64 47.7	0.637	1.220	92.9	55.6	4.4	
1987 05 10	07 39.93	-50 31.5						
1987 05 15	08 02.64	-38 51.1	0.805	1.258	86.9	53.4	5.0	
1987 05 20	08 16.03	-30 04.5						
1987 05 25	08 25.27	-23 34.1	1.078	1.313	77.7	48.9	5.8	
1987 05 30	08 32.36	-18 41.3						

1987 06 04	08 38.19	-14 57.3	1.382	1.382	68.5	43.1	6.6
1987 06 09	08 43.23	-12 02.5					
1987 06 14	08 47.74	-09 43.5	1.686	1.462	59.5	36.8	7.3
1987 06 19	08 51.90	-07 51.3					
1987 06 24	08 55.81	-06 19.5	1.976	1.551	50.9	30.6	7.9
1987 06 29	08 59.53	-05 03.8					
1987 07 04	09 03.10	-04 00.8	2.245	1.647	42.6	24.7	8.4
1987 07 09	09 06.55	-03 08.0					
1987 07 14	09 09.89	-02 23.7	2.487	1.749	34.6	19.3	8.9
1987 07 19	09 13.13	-01 46.3					
1987 07 24	09 16.29	-01 14.7	2.700	1.853	27.0	14.4	9.3

1986 TO a,e,i = 1.00, 0.51, 20 Elements MPC 11344

Date ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987 03 26	21 54.86	-09 08.5	1.592	0.992	36.7	37.0	17.3
1987 04 05	22 22.88	-08 10.5					
1987 04 15	22 49.11	-07 11.0	1.662	1.154	43.1	36.4	17.7
1987 04 25	23 13.87	-06 12.5					
1987 05 05	23 37.44	-05 17.6	1.656	1.284	50.8	37.5	18.0
1987 05 15	00 00.00	-04 28.8					
1987 05 25	00 21.75	-03 48.1	1.589	1.383	59.4	39.1	18.1
1987 06 04	00 42.80	-03 18.2					
1987 06 14	01 03.23	-03 01.4	1.470	1.454	68.8	40.7	18.1
1987 06 24	01 23.12	-03 00.5					
1987 07 04	01 42.47	-03 19.1	1.313	1.496	78.8	41.8	17.9
1987 07 14	02 01.26	-04 00.9					
1987 07 24	02 19.45	-05 10.6	1.130	1.511	89.3	42.2	17.6
1987 08 03	02 36.87	-06 54.0					
1987 08 13	02 53.35	-09 17.7	0.939	1.500	100.3	41.7	17.2
1987 08 23	03 08.61	-12 29.8					
1987 09 02	03 22.19	-16 39.1	0.755	1.462	111.1	40.1	16.6
1987 09 12	03 33.50	-21 53.2					
1987 09 22	03 41.61	-28 17.7	0.599	1.396	118.8	39.1	16.0
1987 10 02	03 45.04	-35 49.1					
1987 10 12	03 41.64	-44 09.8	0.489	1.301	117.9	42.7	15.5
1987 10 22	03 27.66	-52 46.7					
1987 11 01	02 56.86	-60 49.4	0.425	1.175	104.8	54.7	15.3
1987 11 11	01 59.74	-67 18.9					
1987 11 21	00 26.7	-71 03.0	0.384	1.018	83.4	74.6	15.4
1987 12 01	22 27.7	-70 39.0					
1987 12 11	20 36.02	-65 05.3	0.345	0.829	53.8	106.6	16.1
1987 12 21	19 13.22	-53 39.7					
1987 12 31	18 23.01	-37 57.4	0.379	0.625	15.0	155.9	21.7

Periodic Comet Harrington Elements MPC 10522

Date ET	R. A. (1950)	Decl.	Delta	r	Variation		m2
1987 06 14	20 00.04	-15 59.6	1.191	2.092	-2.76	-2.4	20.2
1987 06 24	20 00.02	-16 40.6					
1987 07 04	19 57.32	-17 43.2	0.986	1.981	-3.43	-2.8	19.4
1987 07 14	19 52.30	-19 06.5					
1987 07 24	19 45.79	-20 45.7	0.863	1.877	-3.98	-1.5	18.8
1987 08 03	19 39.15	-22 32.7					
1987 08 13	19 34.11	-24 17.1	0.825	1.784	-4.19	+1.6	18.4
1987 08 23	19 32.15	-25 50.5					
1987 09 02	19 34.44	-27 06.3	0.855	1.706	-4.04	+4.0	18.1
1987 09 12	19 41.46	-28 00.5					
1987 09 22	19 53.11	-28 30.8	0.930	1.646	-3.70	+3.8	18.1
1987 10 02	20 09.00	-28 34.9					
1987 10 12	20 28.40	-28 11.6	1.033	1.609	-3.30	+1.2	18.2

1987 10 22	20 50.53	-27 20.1						
1987 11 01	21 14.61	-26 00.5	1.157	1.596	-2.92	-2.5	18.4	
1987 11 11	21 39.89	-24 14.6						
1987 11 21	22 05.76	-22 05.2	1.303	1.609	-2.57	-6.0	18.7	
1987 12 01	22 31.76	-19 36.0						
1987 12 11	22 57.54	-16 51.6	1.476	1.647	-2.28	-8.5	19.1	
1987 12 21	23 22.90	-13 56.7						
1987 12 31	23 47.76	-10 55.7	1.677	1.707	-2.00	-9.6	19.6	
1988 01 10	00 12.05	-07 53.0						
1988 01 20	00 35.81	-04 52.2	1.905	1.785	-1.74	-9.4	20.2	

Periodic Comet Gehrels 1 (1973 I) Elements MPC 10521

Date ET	R. A. (1950)	Decl.	Delta	r	Variation		m2
1987 06 14	02 27.20	+16 34.0	3.696	3.020	-0.62	-5.2	20.1
1987 06 24	02 41.69	+18 04.4					
1987 07 04	02 55.91	+19 30.7	3.489	3.003	-0.66	-5.0	20.0
1987 07 14	03 09.77	+20 52.7					
1987 07 24	03 23.13	+22 10.3	3.257	2.992	-0.71	-4.8	19.8
1987 08 03	03 35.83	+23 23.7					
1987 08 13	03 47.67	+24 32.9	3.009	2.988	-0.77	-4.5	19.6
1987 08 23	03 58.44	+25 38.3					
1987 09 02	04 07.87	+26 40.2	2.756	2.991	-0.86	-4.3	19.5
1987 09 12	04 15.70	+27 38.8					
1987 09 22	04 21.64	+28 34.2	2.514	3.000	-0.97	-4.1	19.3
1987 10 02	04 25.40	+29 26.3					
1987 10 12	04 26.78	+30 14.2	2.305	3.016	-1.09	-4.2	19.1
1987 10 22	04 25.66	+30 56.5					
1987 11 01	04 22.14	+31 31.2	2.157	3.039	-1.19	-4.6	19.0
1987 11 11	04 16.60	+31 56.1					
1987 11 21	04 09.70	+32 09.7	2.100	3.068	-1.22	-5.3	19.0
1987 12 01	04 02.32	+32 11.6					
1987 12 11	03 55.47	+32 03.6	2.152	3.102	-1.17	-5.8	19.1
1987 12 21	03 49.98	+31 48.6					
1987 12 31	03 46.49	+31 30.5	2.311	3.143	-1.06	-5.8	19.3
1988 01 10	03 45.35	+31 13.0					
1988 01 20	03 46.62	+30 58.6	2.555	3.188	-0.95	-5.2	19.6
1988 01 30	03 50.23	+30 48.9					
1988 02 09	03 55.97	+30 44.1	2.853	3.238	-0.85	-4.4	19.9
1988 02 19	04 03.60	+30 43.8					
1988 02 29	04 12.87	+30 47.3	3.178	3.293	-0.77	-3.5	20.2
1988 03 10	04 23.54	+30 53.4					
1988 03 20	04 35.37	+31 00.7	3.507	3.352	-0.72	-2.6	20.5

Comet Shoemaker (1985 XII) Elements MPC 9426

Date ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	m2
1987 07 04	04 26.10	+03 04.6	7.485	6.733	39.7	5.5	20.2
1987 07 14	04 28.82	+03 17.9					
1987 07 24	04 30.99	+03 26.9	7.401	6.878	55.6	7.0	20.2
1987 08 03	04 32.51	+03 31.9					
1987 08 13	04 33.30	+03 33.2	7.252	7.023	73.0	7.9	20.3
1987 08 23	04 33.25	+03 31.2					
1987 09 02	04 32.29	+03 26.4	7.069	7.167	91.5	8.1	20.3
1987 09 12	04 30.37	+03 19.3					
1987 09 22	04 27.45	+03 10.7	6.888	7.310	111.2	7.4	20.3
1987 10 02	04 23.54	+03 01.3					
1987 10 12	04 18.71	+02 52.1	6.753	7.453	131.6	5.7	20.4
1987 10 22	04 13.05	+02 44.0					
1987 11 01	04 06.75	+02 37.9	6.708	7.595	151.4	3.6	20.4
1987 11 11	04 00.03	+02 34.8					

1987 11 21	03 53.13	+02 35.4	6.788	7.737	162.7	2.2	20.5
1987 12 01	03 46.33	+02 40.3					
1987 12 11	03 39.89	+02 49.8	7.003	7.878	150.8	3.5	20.7
1987 12 21	03 34.03	+03 03.7					
1987 12 31	03 28.93	+03 22.1	7.342	8.018	130.7	5.3	20.9
1988 01 10	03 24.72	+03 44.3					
1988 01 20	03 21.44	+04 09.9	7.771	8.158	109.8	6.5	21.1
1988 01 30	03 19.12	+04 38.3					
1988 02 09	03 17.73	+05 08.8	8.247	8.297	89.5	6.8	21.3

1969 UP1 a,e,i = 2.19, 0.03, 6 Elements MPC 11728

Date ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987 03 26	11 07.03	+13 31.6	1.210	2.164	157.2	10.3	16.6
1987 04 05	10 59.21	+13 36.3					
1987 04 15	10 54.37	+13 19.4	1.339	2.172	135.5	18.9	17.1
1987 04 25	10 52.77	+12 43.0					
1987 05 05	10 54.30	+11 49.9	1.530	2.179	116.8	24.4	17.5
1987 05 15	10 58.65	+10 42.9					
1987 05 25	11 05.39	+09 24.7	1.754	2.187	101.0	27.0	17.9
1987 06 04	11 14.14	+07 56.8					
1987 06 14	11 24.54	+06 21.2	1.991	2.194	87.4	27.5	18.2

1985 TR3 a,e,i = 2.22, 0.09, 4 Elements MPC 11737

Date ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987 03 26	13 20.68	-16 30.4	1.325	2.282	158.2	9.3	15.9
1987 04 05	13 11.02	-15 44.9					
1987 04 15	13 00.89	-14 44.4	1.303	2.300	171.3	3.8	15.7
1987 04 25	12 51.65	-13 37.4					
1987 05 05	12 44.44	-12 32.9	1.384	2.317	150.8	12.2	16.2
1987 05 15	12 39.96	-11 39.1					
1987 05 25	12 38.45	-11 00.6	1.548	2.333	130.1	19.4	16.7
1987 06 04	12 39.83	-10 39.6					
1987 06 14	12 43.86	-10 35.9	1.768	2.348	112.2	23.6	17.1
1987 06 24	12 50.19	-10 48.1					
1987 07 04	12 58.50	-11 14.3	2.015	2.362	96.8	25.3	17.4

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

Date ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987 03 26	14 46.18	-21 54.9	2.253	3.070	138.2	12.5	18.2
1987 04 05	14 40.10	-21 56.9					
1987 04 15	14 32.23	-21 47.0	2.140	3.103	160.3	6.3	17.8
1987 04 25	14 23.27	-21 25.8					
1987 05 05	14 14.08	-20 55.9	2.133	3.134	171.3	2.8	17.7
1987 05 15	14 05.58	-20 21.2					
1987 05 25	13 58.50	-19 46.4	2.240	3.163	150.9	9.0	18.1
1987 06 04	13 53.33	-19 15.7					
1987 06 14	13 50.35	-18 52.4	2.441	3.191	130.0	14.1	18.5
1987 06 24	13 49.58	-18 38.4					
1987 07 04	13 50.93	-18 34.6	2.706	3.216	111.2	17.1	18.8
1987 07 14	13 54.23	-18 40.7					
1987 07 24	13 59.26	-18 55.9	3.003	3.240	94.2	18.2	19.1

1981 TQ1 a,e,i = 2.34, 0.08, 5 Elements MPC 11747

Date ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987 03 26	14 54.13	-22 45.0	1.629	2.448	136.2	16.4	17.2
1987 04 05	14 49.29	-22 54.7					
1987 04 15	14 41.69	-22 48.5	1.476	2.435	157.9	8.9	16.7
1987 04 25	14 32.09	-22 26.1					
1987 05 05	14 21.62	-21 49.4	1.417	2.420	172.0	3.3	16.4

1987 05 15	14 11.66	-21 03.6						
1987 05 25	14 03.40	-20 15.7	1.462	2.404	152.1	11.4	16.7
1987 06 04	13 57.69	-19 32.7						
1987 06 14	13 54.98	-19 00.1	1.594	2.388	131.1	18.7	17.1
1987 06 24	13 55.30	-18 40.8						
1987 07 04	13 58.51	-18 35.7	1.782	2.371	112.9	23.3	17.5
1987 07 14	14 04.33	-18 44.3						
1987 07 24	14 12.45	-19 04.8	1.999	2.354	97.2	25.4	17.8

1984 UQ a,e,i = 2.55, 0.13, 14 Elements MPC 11736

Date ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987 03 26	14 57.36	-15 51.1	1.551	2.386	137.8	16.3	15.6
1987 04 05	14 54.91	-14 27.7					
1987 04 15	14 49.90	-12 46.7	1.394	2.361	159.8	8.4	15.1
1987 04 25	14 42.95	-10 53.7					
1987 05 05	14 35.03	-08 57.2	1.335	2.339	172.7	3.1	14.7
1987 05 15	14 27.35	-07 07.9					
1987 05 25	14 20.97	-05 34.9	1.379	2.317	151.0	12.2	15.2
1987 06 04	14 16.71	-04 24.7					
1987 06 14	14 15.05	-03 39.7	1.507	2.298	130.2	19.7	15.6
1987 06 24	14 16.09	-03 19.0					
1987 07 04	14 19.77	-03 20.1	1.690	2.280	112.4	24.3	15.9
1987 07 14	14 25.87	-03 39.4					
1987 07 24	14 34.13	-04 13.1	1.899	2.265	97.3	26.4	16.2

1981 RG1 a,e,i = 2.27, 0.19, 6 Elements MPC 11729

Date ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987 03 26	15 13.03	-22 34.0	1.815	2.593	132.2	16.6	18.1
1987 04 05	15 08.67	-22 52.8					
1987 04 15	15 01.41	-22 59.4	1.627	2.566	154.0	9.9	17.7
1987 04 25	14 51.79	-22 52.4					
1987 05 05	14 40.73	-22 32.0	1.532	2.537	173.3	2.7	17.2
1987 05 15	14 29.53	-22 01.1					
1987 05 25	14 19.45	-21 24.8	1.546	2.505	155.9	9.5	17.5
1987 06 04	14 11.54	-20 49.5					
1987 06 14	14 06.46	-20 20.9	1.654	2.471	134.1	17.2	17.9
1987 06 24	14 04.43	-20 02.8					
1987 07 04	14 05.44	-19 57.4	1.825	2.434	114.9	22.3	18.2
1987 07 14	14 09.27	-20 04.8					
1987 07 24	14 15.63	-20 24.0	2.027	2.396	98.4	24.8	18.4

1962 OB a,e,i = 2.62, 0.15, 13 Elements MPC 11746

Date ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987 03 26	15 59.45	-38 13.5	1.737	2.367	117.3	22.0	16.4
1987 04 05	16 01.96	-39 29.5					
1987 04 15	16 00.98	-40 34.1	1.528	2.339	134.1	17.9	16.0
1987 04 25	15 56.38	-41 22.0					
1987 05 05	15 48.48	-41 46.3	1.381	2.314	150.6	12.3	15.6
1987 05 15	15 38.30	-41 41.8					
1987 05 25	15 27.35	-41 06.3	1.319	2.291	158.3	9.4	15.3
1987 06 04	15 17.38	-40 03.4					
1987 06 14	15 09.92	-38 41.8	1.347	2.270	147.4	13.9	15.5
1987 06 24	15 05.84	-37 12.2					
1987 07 04	15 05.48	-35 44.4	1.455	2.252	130.6	20.1	15.9
1987 07 14	15 08.76	-34 25.2					
1987 07 24	15 15.29	-33 17.9	1.618	2.238	114.4	24.4	16.2
1987 08 03	15 24.70	-32 23.2					
1987 08 13	15 36.56	-31 39.9	1.816	2.227	99.9	26.6	16.5

1981 PQ a,e,i = 3.33, 0.12, 5 Elements MPC 11732

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	05 25	21 38.01	-10 05.0	2.578	2.918	99.3	20.0	16.8
1987	06 04	21 43.46	-09 35.4					
1987	06 14	21 47.05	-09 15.8	2.324	2.916	116.0	18.2	16.5
1987	06 24	21 48.61	-09 08.0					
1987	07 04	21 48.04	-09 13.3	2.109	2.916	134.8	14.3	16.2
1987	07 14	21 45.38	-09 32.0					
1987	07 24	21 40.82	-10 03.5	1.962	2.918	155.7	8.2	15.8
1987	08 03	21 34.77	-10 45.7					
1987	08 13	21 27.90	-11 34.6	1.910	2.922	176.5	1.2	15.4
1987	08 23	21 20.96	-12 26.0					
1987	09 02	21 14.77	-13 15.1	1.965	2.927	158.4	7.3	15.8
1987	09 12	21 10.05	-13 57.8					
1987	09 22	21 07.28	-14 31.5	2.119	2.934	137.0	13.5	16.2
1987	10 02	21 06.72	-14 54.7					
1987	10 12	21 08.41	-15 06.6	2.346	2.942	117.4	17.5	16.5
1987	10 22	21 12.26	-15 07.4					
1987	11 01	21 18.07	-14 57.3	2.616	2.952	99.8	19.4	16.8

1981 LJ a,e,i = 2.87, 0.07, 3 Elements MPC 11732

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	07 04	00 19.78	-00 59.5	2.332	2.653	96.8	22.4	16.9
1987	07 14	00 26.62	-00 31.1					
1987	07 24	00 31.61	-00 15.7	2.089	2.654	112.9	20.6	16.6
1987	08 03	00 34.49	-00 14.6					
1987	08 13	00 35.09	-00 28.5	1.877	2.657	131.2	16.7	16.3
1987	08 23	00 33.29	-00 57.0					
1987	09 02	00 29.17	-01 38.6	1.726	2.661	152.1	10.2	15.9
1987	09 12	00 23.11	-02 29.5					
1987	09 22	00 15.72	-03 24.4	1.665	2.665	173.6	2.4	15.5
1987	10 02	00 07.90	-04 16.8					
1987	10 12	00 00.62	-05 00.3	1.712	2.671	160.0	7.3	15.8
1987	10 22	23 54.72	-05 30.2					
1987	11 01	23 50.84	-05 43.5	1.858	2.679	137.9	14.4	16.2
1987	11 11	23 49.31	-05 39.7					
1987	11 21	23 50.17	-05 19.5	2.078	2.687	118.0	19.0	16.6
1987	12 01	23 53.33	-04 44.4					
1987	12 11	23 58.56	-03 56.4	2.341	2.696	100.2	21.1	16.9

1985 JY a,e,i = 3.26, 0.09, 3 Elements MPC 11426

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	07 24	01 19.82	+05 24.8	3.181	3.497	99.6	16.6	18.5
1987	08 03	01 22.77	+05 37.8					
1987	08 13	01 24.02	+05 40.9	2.919	3.506	117.6	14.8	18.3
1987	08 23	01 23.48	+05 33.6					
1987	09 02	01 21.09	+05 16.2	2.702	3.514	137.7	11.1	18.0
1987	09 12	01 16.96	+04 49.6					
1987	09 22	01 11.33	+04 15.5	2.563	3.522	159.6	5.7	17.7
1987	10 02	01 04.64	+03 36.7					
1987	10 12	00 57.48	+02 57.0	2.532	3.528	175.6	1.2	17.4
1987	10 22	00 50.48	+02 20.2					
1987	11 01	00 44.28	+01 50.1	2.619	3.534	153.3	7.3	17.8
1987	11 11	00 39.40	+01 29.5					
1987	11 21	00 36.17	+01 20.0	2.810	3.539	131.2	12.1	18.1
1987	12 01	00 34.77	+01 22.4					
1987	12 11	00 35.22	+01 36.4	3.072	3.544	110.8	15.1	18.4
1987	12 21	00 37.45	+02 01.3					
1987	12 31	00 41.31	+02 35.8	3.369	3.547	92.3	16.1	18.7

1982 YP1 a,e,i = 3.34, 0.12, 11 Elements MPC 11151

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	07 24	01 23.76	+14 49.3	3.404	3.639	95.2	16.1	17.7
1987	08 03	01 26.60	+15 38.2					
1987	08 13	01 27.82	+16 19.6	3.112	3.626	112.7	14.9	17.5
1987	08 23	01 27.26	+16 52.4					
1987	09 02	01 24.84	+17 15.3	2.858	3.611	132.0	12.0	17.2
1987	09 12	01 20.62	+17 27.0					
1987	09 22	01 14.78	+17 26.9	2.674	3.596	152.7	7.4	16.9
1987	10 02	01 07.73	+17 14.8					
1987	10 12	01 00.03	+16 52.2	2.593	3.580	170.0	2.8	16.6
1987	10 22	00 52.34	+16 21.7					
1987	11 01	00 45.37	+15 47.0	2.629	3.563	156.9	6.3	16.8
1987	11 11	00 39.69	+15 12.6					
1987	11 21	00 35.71	+14 42.4	2.772	3.546	135.5	11.3	17.1
1987	12 01	00 33.68	+14 19.7					
1987	12 11	00 33.64	+14 06.6	2.996	3.528	115.1	14.6	17.3
1987	12 21	00 35.52	+14 04.1					
1987	12 31	00 39.20	+14 12.5	3.262	3.509	96.3	16.2	17.6

1980 PF a,e,i = 2.26, 0.16, 8 Elements MPC 9469

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	07 24	01 09.04	+14 28.8	1.477	1.913	98.6	31.7	17.4
1987	08 03	01 18.72	+16 35.7					
1987	08 13	01 25.95	+18 32.5	1.303	1.929	112.2	29.1	17.1
1987	08 23	01 30.24	+20 16.6					
1987	09 02	01 31.10	+21 44.0	1.154	1.949	128.5	23.9	16.7
1987	09 12	01 28.29	+22 49.9					
1987	09 22	01 21.93	+23 28.8	1.051	1.973	147.4	15.9	16.3
1987	10 02	01 12.73	+23 36.1					
1987	10 12	01 02.12	+23 11.7	1.023	2.000	163.7	8.1	16.0
1987	10 22	00 51.82	+22 21.1					
1987	11 01	00 43.52	+21 15.2	1.084	2.031	155.8	11.6	16.3
1987	11 11	00 38.36	+20 07.1					
1987	11 21	00 36.78	+19 07.3	1.231	2.064	136.6	19.2	16.9
1987	12 01	00 38.76	+18 22.9					
1987	12 11	00 43.94	+17 56.7	1.441	2.099	118.6	24.3	17.4
1987	12 21	00 51.86	+17 48.7					
1987	12 31	01 02.10	+17 57.6	1.690	2.135	102.8	26.7	17.8

1982 TU a,e,i = 3.02, 0.08, 9 Elements MPC 11515

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	07 24	01 20.85	+16 36.5	2.754	3.020	95.1	19.6	17.4
1987	08 03	01 25.53	+17 41.7					
1987	08 13	01 28.39	+18 38.7	2.479	3.003	111.6	18.3	17.1
1987	08 23	01 29.22	+19 25.9					
1987	09 02	01 27.82	+20 01.2	2.237	2.987	130.0	15.0	16.8
1987	09 12	01 24.17	+20 22.4					
1987	09 22	01 18.44	+20 27.7	2.058	2.970	150.1	9.7	16.4
1987	10 02	01 11.07	+20 15.9					
1987	10 12	01 02.77	+19 48.0	1.973	2.954	167.1	4.3	16.1
1987	10 22	00 54.43	+19 07.1					
1987	11 01	00 46.97	+18 18.6	1.998	2.938	157.1	7.5	16.2
1987	11 11	00 41.18	+17 28.7					
1987	11 21	00 37.55	+16 43.4	2.127	2.923	136.4	13.5	16.6
1987	12 01	00 36.35	+16 07.5					
1987	12 11	00 37.58	+15 43.9	2.331	2.907	116.5	17.6	16.9
1987	12 21	00 41.09	+15 33.7					
1987	12 31	00 46.70	+15 37.1	2.579	2.892	98.5	19.6	17.1

1976 SZ5 a,e,i = 3.14, 0.16, 2 Elements MPC 9069

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	07 24	01 15.32	+07 00.4	2.288	2.661	100.0	22.1	17.6
1987	08 03	01 21.26	+07 27.6					
1987	08 13	01 25.18	+07 41.7	2.064	2.676	116.7	19.8	17.3
1987	08 23	01 26.86	+07 41.9					
1987	09 02	01 26.14	+07 27.7	1.878	2.694	135.8	15.1	17.0
1987	09 12	01 23.08	+06 59.7					
1987	09 22	01 17.93	+06 19.7	1.760	2.715	157.5	8.1	16.6
1987	10 02	01 11.22	+05 31.3					
1987	10 12	01 03.78	+04 39.9	1.739	2.737	177.7	0.8	16.2
1987	10 22	00 56.51	+03 51.2					
1987	11 01	00 50.31	+03 11.1	1.828	2.761	155.2	8.7	16.7
1987	11 11	00 45.85	+02 43.7					
1987	11 21	00 43.52	+02 31.2	2.014	2.786	133.4	14.9	17.2
1987	12 01	00 43.50	+02 34.4					
1987	12 11	00 45.72	+02 52.3	2.268	2.813	113.8	18.7	17.6
1987	12 21	00 50.00	+03 23.4					
1987	12 31	00 56.13	+04 05.9	2.561	2.842	96.3	20.1	17.9

1978 RN5 a,e,i = 2.72, 0.34, 11 Elements MPC 10025

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	07 24	01 00.15	+02 29.4	1.310	1.856	105.2	31.9	16.8
1987	08 03	01 11.12	+04 44.4					
1987	08 13	01 19.80	+06 57.5	1.116	1.827	118.2	29.3	16.4
1987	08 23	01 25.67	+09 07.8					
1987	09 02	01 28.18	+11 13.4	0.957	1.809	133.9	23.7	15.9
1987	09 12	01 26.96	+13 11.7					
1987	09 22	01 21.97	+14 58.1	0.851	1.803	152.8	14.7	15.4
1987	10 02	01 13.77	+16 27.3					
1987	10 12	01 03.76	+17 35.5	0.819	1.810	169.3	5.9	15.0
1987	10 22	00 53.80	+18 22.0					
1987	11 01	00 45.81	+18 51.5	0.873	1.828	156.8	12.4	15.4
1987	11 11	00 41.17	+19 12.0					
1987	11 21	00 40.46	+19 31.1	1.005	1.857	137.5	21.1	16.0
1987	12 01	00 43.69	+19 55.0					
1987	12 11	00 50.48	+20 26.9	1.194	1.897	120.8	26.5	16.5
1987	12 21	01 00.29	+21 07.5					
1987	12 31	01 12.64	+21 56.6	1.423	1.946	106.5	29.0	17.0

4017 P-L a,e,i = 2.72, 0.26, 13 Elements MPC 6639

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	07 24	01 14.68	+05 03.7	1.628	2.076	100.9	28.7	18.3
1987	08 03	01 23.69	+06 59.8					
1987	08 13	01 30.51	+08 52.5	1.404	2.049	115.0	26.6	17.9
1987	08 23	01 34.70	+10 41.0					
1987	09 02	01 35.77	+12 23.9	1.213	2.030	131.7	21.8	17.4
1987	09 12	01 33.41	+13 59.2					
1987	09 22	01 27.56	+15 23.5	1.078	2.018	151.4	13.8	16.9
1987	10 02	01 18.69	+16 32.9					
1987	10 12	01 07.95	+17 24.7	1.023	2.013	169.5	5.2	16.4
1987	10 22	00 56.95	+17 58.8					
1987	11 01	00 47.46	+18 19.2	1.063	2.016	157.2	11.0	16.8
1987	11 11	00 40.87	+18 32.8					
1987	11 21	00 37.90	+18 46.7	1.189	2.026	136.8	19.5	17.3
1987	12 01	00 38.73	+19 06.4					
1987	12 11	00 43.13	+19 35.3	1.377	2.043	118.9	25.0	17.8
1987	12 21	00 50.67	+20 14.4					
1987	12 31	01 00.91	+21 03.4	1.602	2.068	103.6	27.5	18.2

1977 RE2 a,e,i = 2.22, 0.15, 5 Elements MPC 10627

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	07 24	01 21.75	+03 14.5	1.600	2.038	99.9	29.4	17.2
1987	08 03	01 30.67	+03 33.5					
1987	08 13	01 37.04	+03 34.9	1.425	2.071	115.3	26.3	16.9
1987	08 23	01 40.47	+03 17.7					
1987	09 02	01 40.64	+02 42.0	1.279	2.107	133.7	20.2	16.5
1987	09 12	01 37.47	+01 50.0					
1987	09 22	01 31.16	+00 45.8	1.189	2.142	155.3	11.3	16.1
1987	10 02	01 22.45	-00 23.2					
1987	10 12	01 12.54	-01 27.5	1.186	2.178	171.4	3.9	15.9
1987	10 22	01 02.83	-02 18.3					
1987	11 01	00 54.67	-02 48.9	1.284	2.214	152.9	11.8	16.4
1987	11 11	00 49.00	-02 56.5					
1987	11 21	00 46.26	-02 41.7	1.469	2.250	131.6	19.2	17.0
1987	12 01	00 46.51	-02 06.7					
1987	12 11	00 49.54	-01 15.1	1.713	2.284	112.9	23.4	17.4
1987	12 21	00 55.01	-00 10.1					
1987	12 31	01 02.60	+01 05.2	1.989	2.317	96.6	24.9	17.8

(3448) 1977 QA5 a,e,i = 2.19, 0.12, 3 Elements MPC 10826

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	07 24	01 16.17	+04 07.0	1.534	1.994	100.9	30.0	16.8
1987	08 03	01 26.69	+05 05.0					
1987	08 13	01 35.07	+05 50.2	1.321	1.975	115.0	27.7	16.4
1987	08 23	01 40.86	+06 21.3					
1987	09 02	01 43.57	+06 36.8	1.136	1.960	132.0	22.5	15.9
1987	09 12	01 42.84	+06 36.7					
1987	09 22	01 38.58	+06 21.5	1.001	1.948	152.6	13.7	15.3
1987	10 02	01 31.16	+05 54.1					
1987	10 12	01 21.64	+05 20.5	0.942	1.939	175.6	2.3	14.7
1987	10 22	01 11.53	+04 48.2					
1987	11 01	01 02.58	+04 25.8	0.975	1.934	158.5	10.8	15.2
1987	11 11	00 56.21	+04 19.7					
1987	11 21	00 53.21	+04 32.9	1.093	1.932	136.4	20.7	15.7
1987	12 01	00 53.83	+05 06.0					
1987	12 11	00 57.89	+05 56.9	1.268	1.934	117.8	26.8	16.2
1987	12 21	01 05.01	+07 03.0					
1987	12 31	01 14.78	+08 21.4	1.478	1.940	102.2	29.7	16.6

1979 MM5 a,e,i = 2.43, 0.19, 2 Elements MPC 9160

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	07 24	01 10.22	+09 35.8	1.558	2.006	100.2	29.9	19.1
1987	08 03	01 21.29	+10 49.5					
1987	08 13	01 30.37	+11 50.0	1.349	1.988	113.9	27.8	18.7
1987	08 23	01 37.00	+12 35.2					
1987	09 02	01 40.72	+13 02.7	1.167	1.977	130.4	22.9	18.3
1987	09 12	01 41.23	+13 10.5					
1987	09 22	01 38.42	+12 57.1	1.034	1.970	150.3	14.6	17.8
1987	10 02	01 32.65	+12 23.2					
1987	10 12	01 24.89	+11 32.9	0.975	1.970	173.2	3.4	17.2
1987	10 22	01 16.52	+10 33.6					
1987	11 01	01 09.13	+09 35.7	1.007	1.975	162.0	8.9	17.5
1987	11 11	01 04.05	+08 48.9					
1987	11 21	01 02.01	+08 19.9	1.126	1.986	139.9	18.7	18.1
1987	12 01	01 03.30	+08 11.7					
1987	12 11	01 07.78	+08 24.1	1.309	2.003	121.0	24.9	18.6
1987	12 21	01 15.10	+08 54.9					
1987	12 31	01 24.90	+09 41.3	1.533	2.024	105.0	28.0	19.1

1985 FA2 a,e,i = 3.02, 0.10, 11 Elements MPC 11238

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	07 24	01 35.24	-03 16.0	2.413	2.762	99.1	21.3	16.5
1987	08 03	01 41.75	-03 31.0					
1987	08 13	01 46.34	-03 59.8	2.187	2.774	115.2	19.3	16.3
1987	08 23	01 48.77	-04 41.8					
1987	09 02	01 48.84	-05 35.4	1.998	2.788	133.2	15.3	16.0
1987	09 12	01 46.54	-06 37.2					
1987	09 22	01 42.00	-07 42.4	1.877	2.802	151.8	9.7	15.7
1987	10 02	01 35.62	-08 44.7					
1987	10 12	01 28.12	-09 36.9	1.850	2.818	162.5	6.1	15.5
1987	10 22	01 20.32	-10 13.1					
1987	11 01	01 13.15	-10 29.2	1.929	2.834	150.3	10.0	15.8
1987	11 11	01 07.38	-10 23.7					
1987	11 21	01 03.54	-09 57.8	2.102	2.851	131.2	15.1	16.1
1987	12 01	01 01.89	-09 13.6					
1987	12 11	01 02.48	-08 14.4	2.344	2.869	112.6	18.5	16.5
1987	12 21	01 05.20	-07 03.4					
1987	12 31	01 09.86	-05 43.2	2.623	2.888	95.5	19.8	16.8

(3386) 1980 FA a,e,i = 2.84, 0.09, 2 Elements MPC 10399

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	07 24	01 30.95	+08 54.4	2.294	2.601	95.7	22.9	17.6
1987	08 03	01 38.37	+09 28.4					
1987	08 13	01 43.95	+09 50.4	2.045	2.594	111.6	21.3	17.3
1987	08 23	01 47.38	+09 58.9					
1987	09 02	01 48.41	+09 53.2	1.825	2.590	129.8	17.4	17.0
1987	09 12	01 46.93	+09 32.8					
1987	09 22	01 42.98	+08 58.4	1.664	2.587	150.8	10.9	16.6
1987	10 02	01 36.91	+08 12.1					
1987	10 12	01 29.41	+07 18.4	1.591	2.585	173.9	2.3	16.1
1987	10 22	01 21.41	+06 23.1					
1987	11 01	01 13.96	+05 32.8	1.625	2.585	161.5	7.0	16.4
1987	11 11	01 08.01	+04 53.7					
1987	11 21	01 04.17	+04 29.7	1.760	2.587	138.9	14.6	16.8
1987	12 01	01 02.82	+04 22.6					
1987	12 11	01 04.01	+04 32.3	1.971	2.590	118.6	19.5	17.2
1987	12 21	01 07.59	+04 57.5					
1987	12 31	01 13.37	+05 36.3	2.224	2.595	100.8	21.8	17.5

1981 SX7 a,e,i = 3.40, 0.04, 5 Elements MPC 10027

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	07 24	01 39.12	+15 18.1	3.147	3.333	91.5	17.7	17.5
1987	08 03	01 44.22	+15 55.9					
1987	08 13	01 47.73	+16 24.9	2.866	3.326	108.3	16.8	17.3
1987	08 23	01 49.47	+16 43.8					
1987	09 02	01 49.27	+16 51.5	2.614	3.320	126.9	14.1	17.0
1987	09 12	01 47.11	+16 47.0					
1987	09 22	01 43.08	+16 29.6	2.422	3.314	147.7	9.3	16.7
1987	10 02	01 37.47	+15 59.6					
1987	10 12	01 30.79	+15 18.7	2.322	3.308	169.5	3.2	16.3
1987	10 22	01 23.70	+14 30.1					
1987	11 01	01 16.94	+13 38.1	2.335	3.303	164.5	4.6	16.4
1987	11 11	01 11.19	+12 47.8					
1987	11 21	01 06.99	+12 03.6	2.461	3.298	142.2	10.6	16.7
1987	12 01	01 04.67	+11 29.2					
1987	12 11	01 04.38	+11 06.7	2.674	3.293	121.1	14.8	17.0
1987	12 21	01 06.09	+10 56.8					
1987	12 31	01 09.71	+10 59.4	2.940	3.288	102.0	17.0	17.3

(3331) 1979 QS a,e,i = 2.42, 0.09, 4 Elements MPC 10291

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	07 24	01 33.77	+08 48.7	2.171	2.478	95.1	24.1	18.0
1987	08 03	01 41.82	+09 19.8					
1987	08 13	01 48.03	+09 37.9	1.911	2.459	110.7	22.7	17.7
1987	08 23	01 52.07	+09 41.6					
1987	09 02	01 53.60	+09 29.6	1.678	2.440	128.7	18.8	17.3
1987	09 12	01 52.42	+09 01.3					
1987	09 22	01 48.49	+08 16.9	1.500	2.420	149.7	12.1	16.8
1987	10 02	01 42.07	+07 18.9					
1987	10 12	01 33.86	+06 12.1	1.407	2.400	172.8	3.0	16.3
1987	10 22	01 24.86	+05 03.6					
1987	11 01	01 16.31	+04 01.8	1.419	2.380	161.3	7.7	16.5
1987	11 11	01 09.33	+03 14.0					
1987	11 21	01 04.72	+02 44.8	1.530	2.361	138.2	16.2	17.0
1987	12 01	01 02.92	+02 36.3					
1987	12 11	01 04.00	+02 47.9	1.713	2.341	117.9	21.8	17.3
1987	12 21	01 07.81	+03 17.6					
1987	12 31	01 14.10	+04 02.9	1.934	2.322	100.4	24.6	17.7

1949 SF a,e,i = 2.43, 0.25, 9 Elements MPC 8284

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	07 24	01 36.03	+09 17.5	1.486	1.864	94.4	32.9	17.4
1987	08 03	01 47.52	+11 17.4					
1987	08 13	01 56.66	+13 08.6	1.324	1.894	107.5	30.7	17.2
1987	08 23	02 02.96	+14 50.0					
1987	09 02	02 05.90	+16 20.0	1.181	1.931	123.5	25.8	16.8
1987	09 12	02 05.14	+17 36.4					
1987	09 22	02 00.51	+18 35.7	1.076	1.973	143.0	17.8	16.5
1987	10 02	01 52.36	+19 14.6					
1987	10 12	01 41.77	+19 31.3	1.040	2.020	164.5	7.6	16.1
1987	10 22	01 30.27	+19 27.2					
1987	11 01	01 19.70	+19 08.1	1.097	2.071	164.5	7.3	16.2
1987	11 11	01 11.56	+18 43.0					
1987	11 21	01 06.69	+18 20.4	1.247	2.124	143.5	16.1	16.9
1987	12 01	01 05.39	+18 06.9					
1987	12 11	01 07.47	+18 05.8	1.470	2.180	124.0	22.0	17.5
1987	12 21	01 12.54	+18 17.9					
1987	12 31	01 20.18	+18 42.7	1.740	2.236	107.1	24.9	18.0

1986 GV1 a,e,i = 2.39, 0.18, 10 Elements MPC 11054

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	07 24	01 56.70	+01 19.1	2.107	2.378	92.4	25.3	17.5
1987	08 03	02 04.52	+01 40.4					
1987	08 13	02 10.21	+01 49.1	1.905	2.417	107.9	23.5	17.3
1987	08 23	02 13.43	+01 45.1					
1987	09 02	02 13.88	+01 28.8	1.725	2.456	125.9	19.4	17.0
1987	09 12	02 11.42	+01 02.0					
1987	09 22	02 06.06	+00 27.3	1.594	2.494	146.6	12.8	16.7
1987	10 02	01 58.17	-00 10.6					
1987	10 12	01 48.50	-00 46.2	1.549	2.531	166.7	5.2	16.3
1987	10 22	01 38.10	-01 13.4					
1987	11 01	01 28.16	-01 27.1	1.611	2.565	159.8	7.7	16.6
1987	11 11	01 19.77	-01 24.4					
1987	11 21	01 13.64	-01 04.6	1.776	2.598	138.3	14.7	17.0
1987	12 01	01 10.16	-00 28.8					
1987	12 11	01 09.36	+00 21.0	2.019	2.630	118.1	19.3	17.5
1987	12 21	01 11.08	+01 22.3					
1987	12 31	01 15.08	+02 32.9	2.305	2.659	100.0	21.4	17.9

1981 EW21 a,e,i = 2.63, 0.12, 1 Elements MPC 11045

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	07 24	01 53.64	+12 15.1	2.729	2.901	89.3	20.5	18.9
1987	08 03	01 59.95	+12 48.9					
1987	08 13	02 04.51	+13 12.7	2.471	2.913	105.7	19.6	18.7
1987	08 23	02 07.08	+13 25.6					
1987	09 02	02 07.43	+13 26.5	2.235	2.923	124.2	16.6	18.4
1987	09 12	02 05.43	+13 14.8					
1987	09 22	02 01.11	+12 50.2	2.051	2.932	145.3	11.2	18.0
1987	10 02	01 54.73	+12 13.5					
1987	10 12	01 46.83	+11 27.2	1.954	2.939	168.7	3.8	17.6
1987	10 22	01 38.18	+10 35.1					
1987	11 01	01 29.71	+09 42.6	1.969	2.944	166.8	4.4	17.7
1987	11 11	01 22.30	+08 55.3					
1987	11 21	01 16.63	+08 17.7	2.097	2.948	143.2	11.6	18.1
1987	12 01	01 13.14	+07 53.1					
1987	12 11	01 11.99	+07 42.8	2.312	2.950	121.7	16.5	18.4
1987	12 21	01 13.13	+07 46.8					
1987	12 31	01 16.43	+08 04.1	2.578	2.950	102.5	19.0	18.8

1976 SZ3 a,e,i = 2.36, 0.17, 1 Elements MPC 10756

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	07 24	01 37.97	+09 38.5	2.053	2.351	93.9	25.5	18.4
1987	08 03	01 47.36	+10 31.3					
1987	08 13	01 55.05	+11 13.4	1.783	2.313	108.5	24.5	18.1
1987	08 23	02 00.69	+11 43.7					
1987	09 02	02 03.85	+12 00.6	1.536	2.276	125.5	21.2	17.6
1987	09 12	02 04.20	+12 02.8					
1987	09 22	02 01.51	+11 49.2	1.337	2.238	145.5	14.7	17.1
1987	10 02	01 55.84	+11 19.9					
1987	10 12	01 47.72	+10 37.4	1.214	2.202	168.8	5.1	16.5
1987	10 22	01 38.14	+09 46.3					
1987	11 01	01 28.50	+08 54.2	1.189	2.166	166.3	6.3	16.5
1987	11 11	01 20.26	+08 09.7					
1987	11 21	01 14.50	+07 39.5	1.261	2.132	142.5	16.4	16.9
1987	12 01	01 11.93	+07 28.2					
1987	12 11	01 12.72	+07 37.0	1.406	2.099	121.8	23.5	17.3
1987	12 21	01 16.72	+08 04.8					
1987	12 31	01 23.68	+08 49.6	1.593	2.070	104.4	27.4	17.7

1979 GE a,e,i = 3.14, 0.11, 1 Elements MPC 10630

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	07 24	01 56.01	+10 34.4	3.323	3.464	89.4	17.1	19.1
1987	08 03	02 00.86	+10 58.9					
1987	08 13	02 04.16	+11 14.8	3.044	3.469	106.4	16.3	18.9
1987	08 23	02 05.75	+11 21.4					
1987	09 02	02 05.47	+11 18.2	2.790	3.472	125.4	13.7	18.6
1987	09 12	02 03.27	+11 05.2					
1987	09 22	01 59.21	+10 42.7	2.594	3.475	146.4	9.2	18.3
1987	10 02	01 53.53	+10 11.8					
1987	10 12	01 46.68	+09 34.8	2.491	3.477	169.3	3.0	18.0
1987	10 22	01 39.22	+08 54.7					
1987	11 01	01 31.87	+08 15.5	2.503	3.477	166.7	3.8	18.0
1987	11 11	01 25.30	+07 41.1					
1987	11 21	01 20.05	+07 14.6	2.632	3.477	143.6	9.7	18.4
1987	12 01	01 16.51	+06 58.5					
1987	12 11	01 14.88	+06 54.0	2.851	3.475	122.0	13.9	18.7
1987	12 21	01 15.18	+07 00.9					
1987	12 31	01 17.35	+07 19.0	3.126	3.472	102.4	16.1	18.9

1983 NT a,e,i = 2.24, 0.10, 5 Elements MPC 10841

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	08 13	02 06.51	+17 43.1	2.012	2.456	103.6	23.6	17.4
1987	08 23	02 10.86	+18 36.5					
1987	09 02	02 12.66	+19 18.8	1.775	2.451	120.9	20.7	17.1
1987	09 12	02 11.62	+19 48.1					
1987	09 22	02 07.56	+20 02.0	1.580	2.443	140.9	15.0	16.7
1987	10 02	02 00.60	+19 58.0					
1987	10 12	01 51.32	+19 35.4	1.461	2.433	163.0	6.9	16.2
1987	10 22	01 40.72	+18 55.5					
1987	11 01	01 30.12	+18 03.3	1.444	2.422	167.2	5.2	16.1
1987	11 11	01 20.86	+17 06.5					
1987	11 21	01 13.97	+16 13.3	1.533	2.409	144.9	13.7	16.5
1987	12 01	01 10.07	+15 30.9					
1987	12 11	01 09.31	+15 03.4	1.705	2.395	123.6	20.0	16.9
1987	12 21	01 11.57	+14 52.5					
1987	12 31	01 16.60	+14 58.1	1.927	2.379	105.0	23.5	17.3
1988	01 10	01 24.03	+15 18.4					
1988	01 20	01 33.55	+15 51.5	2.166	2.362	88.9	24.6	17.6

1982 KG1 a,e,i = 2.36, 0.12, 4 Elements MPC 9466

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	08 13	02 02.25	+06 55.0	1.941	2.455	108.3	23.1	17.4
1987	08 23	02 07.02	+06 57.4					
1987	09 02	02 09.33	+06 45.8	1.698	2.430	125.8	19.7	16.9
1987	09 12	02 08.94	+06 20.0					
1987	09 22	02 05.67	+05 40.9	1.505	2.404	146.1	13.5	16.5
1987	10 02	01 59.66	+04 51.0					
1987	10 12	01 51.45	+03 55.3	1.392	2.378	168.0	5.0	16.0
1987	10 22	01 41.96	+03 00.2					
1987	11 01	01 32.43	+02 13.6	1.383	2.351	163.3	7.0	16.0
1987	11 11	01 24.11	+01 42.0					
1987	11 21	01 17.98	+01 29.5	1.474	2.323	140.5	15.7	16.4
1987	12 01	01 14.67	+01 37.6					
1987	12 11	01 14.36	+02 05.5	1.640	2.296	119.9	21.8	16.8
1987	12 21	01 16.97	+02 50.7					
1987	12 31	01 22.28	+03 50.8	1.848	2.269	102.2	25.1	17.1
1988	01 10	01 29.97	+05 02.7					
1988	01 20	01 39.75	+06 23.7	2.070	2.243	86.8	26.0	17.4

1986 EM1 a,e,i = 2.18, 0.12, 4 Elements MPC 10840

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	08 13	02 02.35	+09 58.4	1.401	1.957	107.3	29.6	16.8
1987	08 23	02 09.36	+10 51.1					
1987	09 02	02 13.31	+11 30.3	1.229	1.974	123.5	25.2	16.4
1987	09 12	02 13.79	+11 55.4					
1987	09 22	02 10.56	+12 05.4	1.096	1.994	143.4	17.5	16.0
1987	10 02	02 03.77	+12 00.3					
1987	10 12	01 54.22	+11 42.3	1.031	2.016	166.9	6.4	15.5
1987	10 22	01 43.25	+11 15.6					
1987	11 01	01 32.57	+10 47.2	1.059	2.040	167.8	5.9	15.6
1987	11 11	01 23.80	+10 24.7					
1987	11 21	01 17.99	+10 13.9	1.181	2.065	144.2	16.2	16.2
1987	12 01	01 15.66	+10 18.7					
1987	12 11	01 16.79	+10 39.5	1.377	2.091	123.8	23.0	16.8
1987	12 21	01 21.05	+11 15.4					
1987	12 31	01 28.09	+12 04.3	1.617	2.119	106.6	26.4	17.2
1988	01 10	01 37.45	+13 03.7					
1988	01 20	01 48.77	+14 11.0	1.878	2.146	91.7	27.3	17.6

1985 CT a,e,i = 2.32, 0.24, 23 Elements MPC 9678

Date	ET	R. A. (1950)	Decl.	Delta	r	Variation		V
1987	08 13	01 31.56	-07 27.1	1.196	1.912	-2.48	-4.8	15.9
1987	08 23	01 42.13	-10 20.1					
1987	09 02	01 50.19	-13 48.4	1.029	1.870	-3.06	-7.9	15.4
1987	09 12	01 55.27	-17 43.2					
1987	09 22	01 57.01	-21 48.7	0.930	1.835	-3.74	-10.0	15.0
1987	10 02	01 55.42	-25 42.1					
1987	10 12	01 51.10	-28 58.5	0.909	1.806	-4.17	-8.3	14.9
1987	10 22	01 45.20	-31 18.3					
1987	11 01	01 39.28	-32 30.6	0.957	1.785	-4.03	-3.8	15.2
1987	11 11	01 34.94	-32 35.7					
1987	11 21	01 33.21	-31 41.2	1.055	1.772	-3.46	-0.6	15.5
1987	12 01	01 34.68	-29 57.8					
1987	12 11	01 39.37	-27 37.2	1.184	1.767	-2.84	-0.2	15.8
1987	12 21	01 46.99	-24 49.3					
1987	12 31	01 57.23	-21 42.4	1.333	1.772	-2.35	-1.5	16.1
1988	01 10	02 09.65	-18 23.9					
1988	01 20	02 23.91	-14 59.3	1.498	1.786	-2.00	-3.2	16.4

6032 P-L a,e,i = 2.45, 0.16, 2 Elements MPC 8395

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	08 13	01 59.18	+14 41.9	1.553	2.080	106.4	27.9	17.6
1987	08 23	02 06.19	+15 37.6					
1987	09 02	02 10.38	+16 19.0	1.371	2.094	122.5	24.0	17.3
1987	09 12	02 11.41	+16 44.3					
1987	09 22	02 09.09	+16 51.9	1.229	2.113	142.0	17.0	16.9
1987	10 02	02 03.56	+16 40.4					
1987	10 12	01 55.53	+16 10.9	1.156	2.135	164.5	7.2	16.4
1987	10 22	01 46.14	+15 27.1					
1987	11 01	01 36.89	+14 35.8	1.176	2.159	169.4	4.9	16.4
1987	11 11	01 29.22	+13 46.1					
1987	11 21	01 24.11	+13 05.7	1.294	2.187	146.5	14.4	17.0
1987	12 01	01 22.10	+12 40.1					
1987	12 11	01 23.23	+12 31.6	1.490	2.217	126.0	21.1	17.5
1987	12 21	01 27.30	+12 40.0					
1987	12 31	01 33.97	+13 03.8	1.737	2.249	108.3	24.5	18.0
1988	01 10	01 42.86	+13 40.4					
1988	01 20	01 53.63	+14 27.1	2.010	2.282	92.9	25.5	18.3

1983 XM1 a,e,i = 2.73, 0.16, 7 Elements MPC 11520

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	08 13	02 01.85	+20 46.7	1.850	2.308	103.5	25.3	16.2
1987	08 23	02 07.79	+22 00.8					
1987	09 02	02 11.13	+23 02.9	1.652	2.323	119.7	22.2	15.9
1987	09 12	02 11.57	+23 50.5					
1987	09 22	02 08.94	+24 20.5	1.494	2.342	138.4	16.5	15.5
1987	10 02	02 03.41	+24 29.9					
1987	10 12	01 55.59	+24 16.7	1.405	2.363	158.8	8.8	15.1
1987	10 22	01 46.50	+23 41.9					
1987	11 01	01 37.45	+22 49.9	1.410	2.387	166.5	5.6	15.0
1987	11 11	01 29.75	+21 48.8					
1987	11 21	01 24.35	+20 47.6	1.518	2.413	147.9	12.6	15.5
1987	12 01	01 21.80	+19 54.1					
1987	12 11	01 22.23	+19 13.8	1.712	2.441	127.7	18.6	15.9
1987	12 21	01 25.47	+18 48.8					
1987	12 31	01 31.26	+18 39.5	1.962	2.471	109.5	22.0	16.4
1988	01 10	01 39.24	+18 44.7					
1988	01 20	01 49.09	+19 02.2	2.243	2.503	93.5	23.1	16.7

1981 EQ27 a,e,i = 2.56, 0.13, 3 Elements MPC 9765

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	08 13	02 16.58	+11 52.9	2.443	2.852	103.3	20.2	17.1
1987	08 23	02 20.45	+12 00.6					
1987	09 02	02 22.17	+11 56.3	2.182	2.840	121.3	17.7	16.8
1987	09 12	02 21.55	+11 39.7					
1987	09 22	02 18.48	+11 10.5	1.967	2.825	141.8	12.7	16.4
1987	10 02	02 13.07	+10 29.7					
1987	10 12	02 05.74	+09 39.6	1.834	2.809	164.7	5.4	15.9
1987	10 22	01 57.16	+08 44.3					
1987	11 01	01 48.28	+07 49.2	1.809	2.792	169.9	3.6	15.8
1987	11 11	01 40.09	+07 00.3					
1987	11 21	01 33.44	+06 22.7	1.897	2.773	146.2	11.4	16.2
1987	12 01	01 28.94	+05 59.8					
1987	12 11	01 26.91	+05 53.0	2.074	2.753	124.4	17.2	16.6
1987	12 21	01 27.37	+06 01.9					
1987	12 31	01 30.23	+06 25.5	2.306	2.731	105.0	20.4	16.9
1988	01 10	01 35.28	+07 01.6					
1988	01 20	01 42.26	+07 48.2	2.559	2.708	87.9	21.3	17.1

(3371) 1955 RZ a,e,i = 2.74, 0.01, 10 Elements MPC 11235

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	08 13	02 15.53	+25 17.6	2.395	2.742	98.9	21.4	16.9
1987	08 23	02 20.30	+26 21.4					
1987	09 02	02 22.79	+27 15.5	2.155	2.745	115.5	19.4	16.6
1987	09 12	02 22.76	+27 57.6					
1987	09 22	02 20.06	+28 24.9	1.952	2.747	134.1	15.2	16.3
1987	10 02	02 14.74	+28 34.0					
1987	10 12	02 07.26	+28 22.5	1.818	2.750	154.0	9.2	15.9
1987	10 22	01 58.36	+27 49.6					
1987	11 01	01 49.11	+26 57.6	1.782	2.753	165.1	5.3	15.7
1987	11 11	01 40.66	+25 52.2					
1987	11 21	01 33.96	+24 41.1	1.854	2.756	150.1	10.3	16.0
1987	12 01	01 29.67	+23 32.2					
1987	12 11	01 28.07	+22 32.3	2.022	2.758	129.8	15.9	16.4
1987	12 21	01 29.17	+21 45.2					
1987	12 31	01 32.80	+21 13.1	2.255	2.761	110.7	19.5	16.7
1988	01 10	01 38.70	+20 55.8					
1988	01 20	01 46.58	+20 52.3	2.522	2.763	93.6	20.8	17.0

1981 GC a,e,i = 2.63, 0.18, 1 Elements MPC 10831

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	08 13	02 23.62	+15 53.1	2.721	3.070	100.4	18.9	19.0
1987	08 23	02 26.77	+16 14.1					
1987	09 02	02 27.83	+16 25.1	2.464	3.077	118.5	16.7	18.7
1987	09 12	02 26.66	+16 25.3					
1987	09 22	02 23.18	+16 13.9	2.252	3.082	139.1	12.3	18.4
1987	10 02	02 17.53	+15 50.6					
1987	10 12	02 10.11	+15 16.3	2.119	3.084	162.0	5.7	18.0
1987	10 22	02 01.55	+14 33.2					
1987	11 01	01 52.67	+13 45.2	2.097	3.085	173.2	2.2	17.8
1987	11 11	01 44.40	+12 57.3					
1987	11 21	01 37.49	+12 14.4	2.191	3.083	149.4	9.4	18.2
1987	12 01	01 32.53	+11 40.8					
1987	12 11	01 29.79	+11 19.1	2.383	3.079	127.1	14.8	18.6
1987	12 21	01 29.36	+11 10.5					
1987	12 31	01 31.17	+11 14.9	2.638	3.073	107.0	17.8	18.9
1988	01 10	01 35.01	+11 31.2					
1988	01 20	01 40.68	+11 58.1	2.918	3.064	89.1	18.7	19.1

1979 HP a,e,i = 3.13, 0.12, 2 Elements MPC 8675

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	08 13	02 22.69	+11 26.8	3.064	3.422	102.0	16.8	17.9
1987	08 23	02 25.57	+11 32.7					
1987	09 02	02 26.63	+11 29.3	2.786	3.409	120.4	14.8	17.6
1987	09 12	02 25.76	+11 16.5					
1987	09 22	02 22.91	+10 54.3	2.557	3.395	140.8	10.8	17.3
1987	10 02	02 18.21	+10 23.7					
1987	10 12	02 11.97	+09 46.6	2.413	3.380	163.2	4.9	16.9
1987	10 22	02 04.72	+09 05.7					
1987	11 01	01 57.11	+08 24.8	2.379	3.365	172.0	2.4	16.7
1987	11 11	01 49.89	+07 48.0					
1987	11 21	01 43.73	+07 18.8	2.463	3.348	148.9	8.8	17.1
1987	12 01	01 39.15	+07 00.1					
1987	12 11	01 36.47	+06 53.3	2.644	3.331	126.9	13.7	17.4
1987	12 21	01 35.81	+06 58.8					
1987	12 31	01 37.17	+07 16.1	2.890	3.312	106.9	16.5	17.7
1988	01 10	01 40.43	+07 43.9					
1988	01 20	01 45.42	+08 20.9	3.163	3.293	88.9	17.4	17.9

1976 YO1 a,e,i = 2.41, 0.21, 3 Elements MPC 9753

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	08 13	01 58.61	+15 57.2	1.456	1.990	106.0	29.3	17.4
1987	08 23	02 08.36	+17 10.0					
1987	09 02	02 15.73	+18 10.2	1.246	1.963	120.6	26.3	17.0
1987	09 12	02 20.23	+18 55.9					
1987	09 22	02 21.43	+19 24.4	1.072	1.940	138.2	20.2	16.5
1987	10 02	02 19.10	+19 32.9					
1987	10 12	02 13.54	+19 19.9	0.958	1.924	159.2	10.6	15.9
1987	10 22	02 05.59	+18 45.8					
1987	11 01	01 56.76	+17 55.7	0.924	1.914	173.1	3.6	15.5
1987	11 11	01 48.80	+16 58.8					
1987	11 21	01 43.22	+16 05.6	0.982	1.910	151.7	14.2	16.1
1987	12 01	01 40.97	+15 25.4					
1987	12 11	01 42.39	+15 03.5	1.116	1.913	131.2	22.8	16.6
1987	12 21	01 47.31	+15 01.2					
1987	12 31	01 55.42	+15 17.3	1.301	1.923	113.9	27.9	17.1
1988	01 10	02 06.26	+15 48.9					
1988	01 20	02 19.38	+16 32.3	1.517	1.939	99.4	30.0	17.5

1984 AP a,e,i = 2.72, 0.12, 13 Elements MPC 9830

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	08 13	02 16.92	+29 30.4	2.295	2.621	97.1	22.6	16.8
1987	08 23	02 23.29	+30 56.1					
1987	09 02	02 27.44	+32 13.7	2.039	2.597	112.4	21.1	16.5
1987	09 12	02 29.03	+33 20.6					
1987	09 22	02 27.76	+34 13.2	1.816	2.573	129.5	17.5	16.2
1987	10 02	02 23.50	+34 46.7					
1987	10 12	02 16.55	+34 56.3	1.652	2.551	147.5	12.1	15.8
1987	10 22	02 07.60	+34 38.2					
1987	11 01	01 57.79	+33 51.7	1.576	2.529	159.5	7.9	15.5
1987	11 11	01 48.53	+32 41.1					
1987	11 21	01 41.05	+31 14.6	1.601	2.509	150.6	11.1	15.6
1987	12 01	01 36.29	+29 42.8					
1987	12 11	01 34.66	+28 15.9	1.720	2.490	132.1	17.1	16.0
1987	12 21	01 36.20	+27 00.7					
1987	12 31	01 40.71	+26 01.4	1.906	2.472	113.8	21.3	16.3
1988	01 10	01 47.88	+25 19.1					
1988	01 20	01 57.34	+24 52.9	2.130	2.457	97.3	23.4	16.6

1982 XV1 a,e,i = 3.02, 0.09, 11 Elements MPC 10387

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	08 13	02 29.39	+03 14.3	2.464	2.866	102.9	20.2	16.6
1987	08 23	02 33.46	+03 16.9					
1987	09 02	02 35.37	+03 10.0	2.237	2.882	120.3	17.6	16.4
1987	09 12	02 34.96	+02 54.8					
1987	09 22	02 32.16	+02 32.8	2.056	2.898	139.9	12.9	16.0
1987	10 02	02 27.06	+02 06.8					
1987	10 12	02 20.08	+01 40.5	1.954	2.914	160.6	6.5	15.7
1987	10 22	02 11.83	+01 18.0					
1987	11 01	02 03.17	+01 03.5	1.957	2.931	166.3	4.6	15.6
1987	11 11	01 55.03	+01 00.6					
1987	11 21	01 48.19	+01 11.0	2.072	2.948	146.7	10.6	16.0
1987	12 01	01 43.24	+01 35.3					
1987	12 11	01 40.51	+02 12.8	2.280	2.966	125.9	15.6	16.4
1987	12 21	01 40.07	+03 01.7					
1987	12 31	01 41.84	+04 00.4	2.548	2.983	106.7	18.4	16.7
1988	01 10	01 45.64	+05 06.9					
1988	01 20	01 51.24	+06 19.4	2.844	3.001	89.5	19.1	17.0

(3420) 1984 EB a,e,i = 3.12, 0.07, 14 Elements MPC 10612

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	08 13	02 28.28	+01 09.9	2.885	3.277	103.7	17.5	17.3
1987	08 23	02 32.04	+00 31.9					
1987	09 02	02 33.96	-00 17.6	2.628	3.268	121.3	15.3	17.0
1987	09 12	02 33.90	-01 17.1					
1987	09 22	02 31.82	-02 24.4	2.424	3.259	140.1	11.4	16.7
1987	10 02	02 27.80	-03 35.6					
1987	10 12	02 22.16	-04 45.8	2.305	3.249	157.5	6.8	16.4
1987	10 22	02 15.37	-05 49.3					
1987	11 01	02 08.10	-06 40.6	2.292	3.239	159.1	6.3	16.4
1987	11 11	02 01.12	-07 15.4					
1987	11 21	01 55.08	-07 31.3	2.389	3.228	142.3	10.8	16.6
1987	12 01	01 50.56	-07 27.9					
1987	12 11	01 47.90	-07 06.6	2.575	3.217	122.8	14.9	16.9
1987	12 21	01 47.23	-06 29.6					
1987	12 31	01 48.57	-05 39.7	2.817	3.205	104.3	17.3	17.2
1988	01 10	01 51.81	-04 39.6					
1988	01 20	01 56.78	-03 31.8	3.083	3.193	87.3	17.9	17.4

(3459) 1986 GB a,e,i = 2.25, 0.17, 5 Elements MPC 10837

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	08 13	02 32.34	+07 57.2	1.619	2.065	100.8	28.8	16.7
1987	08 23	02 40.43	+08 09.3					
1987	09 02	02 45.74	+08 07.0	1.446	2.103	116.7	25.4	16.4
1987	09 12	02 47.90	+07 50.7					
1987	09 22	02 46.62	+07 21.4	1.304	2.142	135.8	19.1	16.1
1987	10 02	02 41.90	+06 41.5					
1987	10 12	02 34.15	+05 55.5	1.224	2.181	157.8	9.9	15.7
1987	10 22	02 24.27	+05 09.4					
1987	11 01	02 13.59	+04 30.3	1.236	2.221	170.3	4.3	15.5
1987	11 11	02 03.63	+04 04.9					
1987	11 21	01 55.59	+03 57.0	1.350	2.260	149.8	12.7	16.1
1987	12 01	01 50.32	+04 08.1					
1987	12 11	01 48.11	+04 37.2	1.551	2.298	128.6	19.6	16.6
1987	12 21	01 48.90	+05 21.8					
1987	12 31	01 52.47	+06 19.0	1.807	2.335	110.1	23.3	17.1
1988	01 10	01 58.46	+07 25.8					
1988	01 20	02 06.52	+08 39.6	2.092	2.371	93.8	24.5	17.5

1977 RW6 a,e,i = 2.89, 0.09, 2 Elements MPC 9754

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	08 13	02 31.48	+14 39.7	2.307	2.661	99.0	22.1	17.9
1987	08 23	02 37.39	+15 13.6					
1987	09 02	02 41.14	+15 37.5	2.071	2.669	115.8	19.9	17.6
1987	09 12	02 42.48	+15 50.9					
1987	09 22	02 41.22	+15 53.2	1.871	2.678	135.1	15.3	17.2
1987	10 02	02 37.37	+15 44.0					
1987	10 12	02 31.22	+15 23.9	1.740	2.689	157.2	8.3	16.9
1987	10 22	02 23.36	+14 54.6					
1987	11 01	02 14.70	+14 19.6	1.708	2.700	178.5	0.5	16.4
1987	11 11	02 06.30	+13 43.6					
1987	11 21	01 59.15	+13 11.9	1.786	2.713	154.7	9.0	17.0
1987	12 01	01 54.00	+12 48.9					
1987	12 11	01 51.29	+12 37.7	1.963	2.726	132.4	15.5	17.4
1987	12 21	01 51.12	+12 39.4					
1987	12 31	01 53.45	+12 53.9	2.207	2.740	112.7	19.3	17.8
1988	01 10	01 58.05	+13 20.1					
1988	01 20	02 04.67	+13 56.2	2.486	2.755	95.2	20.8	18.1

1983 BF a,e,i = 3.23, 0.13, 1 Elements MPC 11346

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	08 13	02 35.54	+13 35.3	2.893	3.202	98.4	18.2	17.7
1987	08 23	02 40.12	+13 51.1					
1987	09 02	02 42.89	+13 58.0	2.605	3.178	115.9	16.6	17.4
1987	09 12	02 43.67	+13 55.5					
1987	09 22	02 42.32	+13 43.4	2.358	3.153	135.5	12.9	17.0
1987	10 02	02 38.84	+13 21.8					
1987	10 12	02 33.46	+12 51.9	2.184	3.129	157.4	7.0	16.6
1987	10 22	02 26.61	+12 15.6					
1987	11 01	02 18.95	+11 36.2	2.113	3.105	177.6	0.8	16.2
1987	11 11	02 11.31	+10 57.8					
1987	11 21	02 04.49	+10 24.6	2.158	3.081	154.9	7.8	16.6
1987	12 01	01 59.18	+10 00.5					
1987	12 11	01 55.85	+09 47.8	2.305	3.058	132.5	13.7	16.9
1987	12 21	01 54.71	+09 47.7					
1987	12 31	01 55.82	+10 00.2	2.523	3.035	112.2	17.5	17.2
1988	01 10	01 59.07	+10 24.2					
1988	01 20	02 04.28	+10 58.2	2.777	3.012	94.1	19.0	17.5

(3493) 1976 GR6 a,e,i = 2.20, 0.09, 6 Elements MPC 11052

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	08 13	02 45.48	+08 53.5	2.044	2.396	97.5	24.8	17.9
1987	08 23	02 52.93	+08 55.9					
1987	09 02	02 58.15	+08 45.5	1.806	2.396	113.6	22.7	17.5
1987	09 12	03 00.79	+08 22.3					
1987	09 22	03 00.55	+07 46.6	1.599	2.393	132.3	18.1	17.1
1987	10 02	02 57.24	+07 00.0					
1987	10 12	02 51.02	+06 05.8	1.453	2.389	153.6	10.7	16.7
1987	10 22	02 42.38	+05 08.9					
1987	11 01	02 32.27	+04 15.9	1.400	2.383	169.8	4.2	16.3
1987	11 11	02 21.98	+03 34.0					
1987	11 21	02 12.76	+03 08.5	1.453	2.376	152.8	11.0	16.7
1987	12 01	02 05.70	+03 03.0					
1987	12 11	02 01.41	+03 17.6	1.601	2.366	131.0	18.3	17.1
1987	12 21	02 00.13	+03 50.7					
1987	12 31	02 01.79	+04 39.5	1.809	2.356	111.6	22.8	17.5
1988	01 10	02 06.14	+05 41.0					
1988	01 20	02 12.90	+06 52.0	2.047	2.343	94.7	24.7	17.8

1984 YY a,e,i = 2.17, 0.18, 1 Elements MPC 10842

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	08 13	02 26.18	+12 49.0	1.282	1.777	100.8	34.1	16.0
1987	08 23	02 38.86	+13 48.3					
1987	09 02	02 48.89	+14 33.2	1.123	1.792	114.3	30.9	15.7
1987	09 12	02 55.73	+15 03.3					
1987	09 22	02 58.83	+15 17.9	0.986	1.813	131.2	24.6	15.3
1987	10 02	02 57.81	+15 16.7					
1987	10 12	02 52.76	+15 00.4	0.895	1.839	152.4	14.6	14.8
1987	10 22	02 44.37	+14 31.1					
1987	11 01	02 34.06	+13 54.0	0.878	1.870	176.7	1.7	14.3
1987	11 11	02 23.77	+13 16.8					
1987	11 21	02 15.26	+12 47.5	0.952	1.905	158.3	11.1	14.9
1987	12 01	02 09.84	+12 32.7					
1987	12 11	02 08.04	+12 35.3	1.109	1.944	136.3	20.5	15.6
1987	12 21	02 09.85	+12 55.2					
1987	12 31	02 14.96	+13 30.5	1.325	1.984	117.8	26.0	16.1
1988	01 10	02 22.91	+14 18.1					
1988	01 20	02 33.26	+15 14.5	1.576	2.027	102.2	28.3	16.6

1964 TC1 a,e,i = 3.19, 0.25, 1 Elements MPC 10036

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	08 13	02 45.93	+15 57.4	2.284	2.583	95.3	23.0	17.3
1987	08 23	02 52.99	+16 31.8					
1987	09 02	02 57.85	+16 56.3	2.077	2.622	111.5	21.0	17.1
1987	09 12	03 00.27	+17 10.3					
1987	09 22	03 00.06	+17 13.6	1.900	2.663	130.4	16.7	16.8
1987	10 02	02 57.17	+17 05.8					
1987	10 12	02 51.85	+16 47.3	1.784	2.706	152.1	9.9	16.5
1987	10 22	02 44.62	+16 19.6					
1987	11 01	02 36.31	+15 45.4	1.761	2.752	175.8	1.5	16.1
1987	11 11	02 27.96	+15 09.1					
1987	11 21	02 20.54	+14 35.3	1.849	2.798	160.1	6.9	16.5
1987	12 01	02 14.85	+14 08.7					
1987	12 11	02 11.38	+13 52.4	2.041	2.845	137.5	13.5	17.0
1987	12 21	02 10.31	+13 47.8					
1987	12 31	02 11.63	+13 55.1	2.309	2.894	117.2	17.6	17.4
1988	01 10	02 15.16	+14 13.5					
1988	01 20	02 20.66	+14 41.2	2.621	2.942	99.1	19.3	17.8

(3469) 1982 UL7 a,e,i = 3.03, 0.08, 9 Elements MPC 10937

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	08 13	02 49.37	+18 40.4	2.798	3.036	93.7	19.5	16.7
1987	08 23	02 55.03	+18 51.4					
1987	09 02	02 58.78	+18 52.2	2.545	3.052	110.8	18.0	16.5
1987	09 12	03 00.42	+18 42.0					
1987	09 22	02 59.80	+18 20.1	2.323	3.067	130.1	14.5	16.2
1987	10 02	02 56.90	+17 46.3					
1987	10 12	02 51.92	+17 01.1	2.166	3.083	152.0	8.7	15.8
1987	10 22	02 45.29	+16 06.1					
1987	11 01	02 37.66	+15 04.7	2.107	3.098	175.7	1.4	15.4
1987	11 11	02 29.89	+14 01.5					
1987	11 21	02 22.78	+13 01.6	2.165	3.112	160.1	6.2	15.8
1987	12 01	02 17.07	+12 10.0					
1987	12 11	02 13.24	+11 30.2	2.333	3.127	137.1	12.4	16.2
1987	12 21	02 11.53	+11 03.9					
1987	12 31	02 12.00	+10 51.6	2.579	3.140	116.2	16.3	16.5
1988	01 10	02 14.56	+10 52.2					
1988	01 20	02 19.02	+11 04.3	2.869	3.153	97.6	18.0	16.8

1980 TN4 a,e,i = 2.25, 0.08, 4 Elements MPC 10517

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	08 13	02 51.76	+14 44.5	2.135	2.431	94.3	24.6	17.9
1987	08 23	02 59.30	+15 23.0					
1987	09 02	03 04.67	+15 52.4	1.892	2.433	110.3	22.9	17.6
1987	09 12	03 07.51	+16 12.3					
1987	09 22	03 07.48	+16 22.2	1.674	2.433	128.9	18.7	17.2
1987	10 02	03 04.35	+16 21.3					
1987	10 12	02 58.17	+16 09.6	1.511	2.432	150.8	11.6	16.7
1987	10 22	02 49.39	+15 47.5					
1987	11 01	02 38.88	+15 17.4	1.438	2.429	175.4	1.9	16.2
1987	11 11	02 27.95	+14 43.6					
1987	11 21	02 17.94	+14 11.6	1.474	2.424	159.3	8.3	16.6
1987	12 01	02 10.01	+13 47.3					
1987	12 11	02 04.90	+13 34.9	1.612	2.418	135.9	16.5	17.0
1987	12 21	02 02.89	+13 36.4					
1987	12 31	02 03.97	+13 52.3	1.818	2.410	115.4	21.6	17.4
1988	01 10	02 07.87	+14 21.2					
1988	01 20	02 14.30	+15 01.4	2.061	2.401	97.8	24.0	17.8

1981 ED35 a,e,i = 2.44, 0.22, 2 Elements MPC 10824

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	08 13	02 30.32	+15 15.3	1.793	2.195	99.1	27.1	20.0
1987	08 23	02 40.47	+16 11.9					
1987	09 02	02 48.72	+16 59.1	1.535	2.149	113.6	25.5	19.6
1987	09 12	02 54.61	+17 36.2					
1987	09 22	02 57.68	+18 02.0	1.308	2.105	130.7	21.2	19.1
1987	10 02	02 57.51	+18 15.1					
1987	10 12	02 53.96	+18 14.5	1.133	2.064	151.1	13.5	18.5
1987	10 22	02 47.26	+17 59.5					
1987	11 01	02 38.28	+17 31.7	1.037	2.027	174.5	2.7	17.9
1987	11 11	02 28.49	+16 55.7					
1987	11 21	02 19.54	+16 18.3	1.036	1.994	160.3	9.6	18.1
1987	12 01	02 12.97	+15 47.8					
1987	12 11	02 09.77	+15 30.9	1.123	1.966	137.6	19.7	18.6
1987	12 21	02 10.31	+15 30.7					
1987	12 31	02 14.56	+15 48.0	1.272	1.944	118.5	26.4	19.0
1988	01 10	02 22.18	+16 20.9					
1988	01 20	02 32.77	+17 06.4	1.456	1.928	102.7	29.9	19.4

1929 PB a,e,i = 2.35, 0.24, 4 Elements MPC 9205

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	08 13	02 29.87	+12 12.8	1.348	1.824	100.1	33.2	17.7
1987	08 23	02 42.60	+12 38.6					
1987	09 02	02 52.64	+12 46.5	1.194	1.849	113.9	29.9	17.4
1987	09 12	02 59.51	+12 36.5					
1987	09 22	03 02.75	+12 08.9	1.064	1.882	131.0	23.7	17.0
1987	10 02	03 02.08	+11 24.9					
1987	10 12	02 57.67	+10 28.3	0.981	1.920	151.9	14.2	16.6
1987	10 22	02 50.21	+09 24.6					
1987	11 01	02 40.98	+08 22.3	0.975	1.964	172.5	3.8	16.2
1987	11 11	02 31.67	+07 30.7					
1987	11 21	02 23.82	+06 56.8	1.063	2.011	157.3	10.9	16.7
1987	12 01	02 18.60	+06 44.8					
1987	12 11	02 16.54	+06 54.8	1.237	2.062	136.0	19.4	17.4
1987	12 21	02 17.68	+07 24.1					
1987	12 31	02 21.82	+08 09.5	1.472	2.114	117.5	24.4	18.0
1988	01 10	02 28.58	+09 06.7					
1988	01 20	02 37.56	+10 12.3	1.745	2.168	101.6	26.4	18.4

(3494) 1980 XW a,e,i = 2.35, 0.13, 6 Elements MPC 11056

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	08 13	02 47.46	+20 17.4	1.912	2.220	93.6	27.1	17.1
1987	08 23	02 56.89	+20 53.9					
1987	09 02	03 03.96	+21 17.6	1.710	2.249	108.9	25.1	16.8
1987	09 12	03 08.30	+21 27.4					
1987	09 22	03 09.54	+21 22.2	1.528	2.278	127.0	20.6	16.5
1987	10 02	03 07.47	+21 00.3					
1987	10 12	03 02.22	+20 21.1	1.397	2.308	148.6	13.0	16.1
1987	10 22	02 54.30	+19 25.3					
1987	11 01	02 44.71	+18 16.3	1.349	2.338	172.8	3.0	15.7
1987	11 11	02 34.80	+17 00.7					
1987	11 21	02 25.92	+15 46.7	1.409	2.367	161.6	7.6	16.0
1987	12 01	02 19.18	+14 42.7					
1987	12 11	02 15.23	+13 54.4	1.569	2.396	138.4	15.8	16.5
1987	12 21	02 14.26	+13 24.1					
1987	12 31	02 16.19	+13 12.0	1.801	2.424	118.0	21.0	17.0
1988	01 10	02 20.75	+13 16.2					
1988	01 20	02 27.60	+13 34.1	2.075	2.451	100.4	23.3	17.4

1985 FD3 a,e,i = 2.61, 0.13, 29 Elements MPC 11505

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	08 13	03 09.64	+43 00.0	2.868	2.919	82.8	20.1	18.5
1987	08 23	03 17.37	+45 11.6					
1987	09 02	03 23.03	+47 22.8	2.637	2.930	96.6	20.0	18.3
1987	09 12	03 26.11	+49 32.1					
1987	09 22	03 26.00	+51 36.5	2.424	2.938	111.0	18.6	18.1
1987	10 02	03 22.13	+53 31.3					
1987	10 12	03 14.16	+55 09.8	2.253	2.945	125.3	16.1	17.9
1987	10 22	03 02.19	+56 23.8					
1987	11 01	02 47.08	+57 05.0	2.148	2.950	136.6	13.4	17.7
1987	11 11	02 30.59	+57 08.3					
1987	11 21	02 14.87	+56 34.0	2.129	2.953	139.7	12.5	17.6
1987	12 01	02 01.91	+55 28.5					
1987	12 11	01 52.95	+54 02.6	2.201	2.954	132.3	14.3	17.8
1987	12 21	01 48.38	+52 27.6					
1987	12 31	01 48.04	+50 53.4	2.349	2.954	119.0	16.9	18.0
1988	01 10	01 51.44	+49 27.1					
1988	01 20	01 58.04	+48 12.5	2.550	2.952	104.3	18.8	18.2

1981 TO3 a,e,i = 3.21, 0.17, 2 Elements MPC 10028

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	08 13	02 48.96	+14 23.7	2.395	2.681	95.1	22.1	17.2
1987	08 23	02 56.21	+14 52.1					
1987	09 02	03 01.45	+15 11.0	2.162	2.696	111.2	20.4	16.9
1987	09 12	03 04.42	+15 20.2					
1987	09 22	03 04.91	+15 19.4	1.958	2.713	129.8	16.5	16.6
1987	10 02	03 02.81	+15 08.9					
1987	10 12	02 58.28	+14 49.3	1.816	2.732	151.1	10.2	16.3
1987	10 22	02 51.75	+14 22.2					
1987	11 01	02 43.94	+13 50.4	1.764	2.754	174.3	2.0	15.8
1987	11 11	02 35.81	+13 18.1					
1987	11 21	02 28.35	+12 49.4	1.824	2.777	161.2	6.6	16.2
1987	12 01	02 22.42	+12 28.7					
1987	12 11	02 18.60	+12 18.7	1.987	2.803	138.6	13.4	16.6
1987	12 21	02 17.17	+12 20.7					
1987	12 31	02 18.16	+12 34.7	2.229	2.830	118.2	17.8	17.0
1988	01 10	02 21.45	+12 59.8					
1988	01 20	02 26.82	+13 34.1	2.515	2.858	100.2	19.8	17.4

1981 DS1 a,e,i = 2.56, 0.11, 9 Elements MPC 11148

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	08 13	02 41.01	+26 00.6	1.986	2.281	93.3	26.3	19.3
1987	08 23	02 51.00	+27 23.4					
1987	09 02	02 58.90	+28 37.7	1.763	2.281	107.6	24.9	19.0
1987	09 12	03 04.25	+29 42.0					
1987	09 22	03 06.63	+30 34.3	1.562	2.283	124.2	21.3	18.7
1987	10 02	03 05.68	+31 10.9					
1987	10 12	03 01.38	+31 28.1	1.407	2.287	143.4	15.1	18.3
1987	10 22	02 54.08	+31 21.6					
1987	11 01	02 44.74	+30 49.2	1.328	2.294	162.3	7.6	17.9
1987	11 11	02 34.77	+29 53.0					
1987	11 21	02 25.71	+28 39.6	1.348	2.303	160.6	8.2	18.0
1987	12 01	02 18.90	+27 19.0					
1987	12 11	02 15.13	+26 01.7	1.466	2.315	140.9	15.6	18.4
1987	12 21	02 14.68	+24 55.5					
1987	12 31	02 17.46	+24 04.8	1.660	2.328	121.4	21.1	18.8
1988	01 10	02 23.17	+23 30.8					
1988	01 20	02 31.42	+23 12.4	1.900	2.344	104.1	24.0	19.2

1983 WP a,e,i = 2.63, 0.11, 14 Elements MPC 9760

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	08 13	03 00.18	+02 48.1	2.447	2.739	95.6	21.6	17.6
1987	08 23	03 06.75	+02 50.0					
1987	09 02	03 11.39	+02 42.4	2.179	2.717	111.6	20.2	17.2
1987	09 12	03 13.79	+02 26.5					
1987	09 22	03 13.70	+02 03.5	1.941	2.694	129.6	16.7	16.9
1987	10 02	03 10.92	+01 35.9					
1987	10 12	03 05.52	+01 07.3	1.763	2.671	149.4	11.0	16.5
1987	10 22	02 57.80	+00 42.2					
1987	11 01	02 48.45	+00 25.8	1.676	2.647	164.8	5.7	16.1
1987	11 11	02 38.48	+00 22.7					
1987	11 21	02 28.97	+00 36.0	1.699	2.623	154.0	9.5	16.3
1987	12 01	02 20.98	+01 07.2					
1987	12 11	02 15.25	+01 55.3	1.822	2.599	133.3	16.0	16.6
1987	12 21	02 12.15	+02 58.1					
1987	12 31	02 11.82	+04 13.1	2.017	2.574	113.7	20.5	17.0
1988	01 10	02 14.14	+05 37.4					
1988	01 20	02 18.89	+07 08.4	2.249	2.550	96.2	22.6	17.2

1977 RG a,e,i = 2.79, 0.11, 9 Elements MPC 9765

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	08 13	03 00.58	+10 28.1	2.757	2.994	93.4	19.7	19.0
1987	08 23	03 06.44	+10 16.7					
1987	09 02	03 10.44	+09 54.5	2.505	3.009	110.4	18.3	18.7
1987	09 12	03 12.35	+09 21.6					
1987	09 22	03 12.00	+08 38.5	2.285	3.023	129.4	14.9	18.4
1987	10 02	03 09.35	+07 46.7					
1987	10 12	03 04.54	+06 48.8	2.128	3.036	150.3	9.4	18.1
1987	10 22	02 57.93	+05 48.2					
1987	11 01	02 50.13	+04 49.9	2.069	3.048	168.3	3.8	17.8
1987	11 11	02 41.95	+03 58.8					
1987	11 21	02 34.24	+03 19.4	2.125	3.059	156.9	7.3	18.0
1987	12 01	02 27.76	+02 54.8					
1987	12 11	02 23.08	+02 46.2	2.287	3.068	135.5	13.0	18.4
1987	12 21	02 20.48	+02 53.2					
1987	12 31	02 20.10	+03 14.4	2.526	3.076	115.2	16.8	18.7
1988	01 10	02 21.86	+03 47.6					
1988	01 20	02 25.59	+04 30.5	2.807	3.083	96.9	18.5	19.0

1986 PQ1 a,e,i = 3.16, 0.02, 3 Elements MPC 11148

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	08 13	02 59.06	+14 33.7	2.901	3.117	92.7	18.9	18.1
1987	08 23	03 04.89	+14 54.0					
1987	09 02	03 08.94	+15 06.4	2.629	3.114	109.5	17.8	17.9
1987	09 12	03 11.01	+15 10.6					
1987	09 22	03 10.91	+15 06.6	2.386	3.111	128.4	14.6	17.6
1987	10 02	03 08.55	+14 54.2					
1987	10 12	03 04.05	+14 34.3	2.206	3.109	149.8	9.3	17.2
1987	10 22	02 57.72	+14 08.0					
1987	11 01	02 50.14	+13 37.6	2.119	3.107	172.8	2.3	16.8
1987	11 11	02 42.10	+13 06.3					
1987	11 21	02 34.43	+12 37.7	2.148	3.105	162.5	5.5	17.0
1987	12 01	02 27.93	+12 15.5					
1987	12 11	02 23.19	+12 02.5	2.287	3.103	139.6	11.9	17.4
1987	12 21	02 20.57	+12 00.3					
1987	12 31	02 20.20	+12 09.3	2.509	3.101	118.6	16.2	17.7
1988	01 10	02 22.03	+12 28.9					
1988	01 20	02 25.91	+12 58.1	2.777	3.100	99.8	18.2	18.0

1983 TE1 a,e,i = 2.47, 0.15, 6 Elements MPC 11144

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	08 13	02 37.19	+17 24.0	1.727	2.104	96.8	28.6	16.4
1987	08 23	02 48.63	+17 55.9					
1987	09 02	02 57.96	+18 12.8	1.512	2.099	111.2	26.6	16.1
1987	09 12	03 04.73	+18 13.8					
1987	09 22	03 08.52	+17 57.6	1.323	2.099	128.3	22.1	15.7
1987	10 02	03 08.99	+17 23.5					
1987	10 12	03 06.11	+16 31.9	1.184	2.102	148.9	14.2	15.2
1987	10 22	03 00.24	+15 24.8					
1987	11 01	02 52.26	+14 07.6	1.122	2.110	172.3	3.6	14.7
1987	11 11	02 43.56	+12 48.5					
1987	11 21	02 35.57	+11 36.9	1.159	2.121	162.3	8.2	15.0
1987	12 01	02 29.61	+10 41.1					
1987	12 11	02 26.48	+10 06.0	1.289	2.136	139.6	17.4	15.5
1987	12 21	02 26.47	+09 52.8					
1987	12 31	02 29.56	+10 00.0	1.488	2.155	120.0	23.3	16.0
1988	01 10	02 35.46	+10 24.4					
1988	01 20	02 43.83	+11 02.3	1.728	2.176	103.3	26.1	16.4

1982 UR7 a,e,i = 3.02, 0.06, 11 Elements MPC 10939

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	08 13	03 04.88	+05 14.0	2.738	2.982	93.8	19.8	16.4
1987	08 23	03 10.88	+05 09.5					
1987	09 02	03 15.01	+04 55.7	2.492	2.995	110.3	18.4	16.2
1987	09 12	03 17.08	+04 33.4					
1987	09 22	03 16.89	+04 03.9	2.276	3.007	128.7	15.1	15.9
1987	10 02	03 14.38	+03 29.3					
1987	10 12	03 09.67	+02 52.4	2.122	3.020	148.7	9.9	15.6
1987	10 22	03 03.09	+02 17.2					
1987	11 01	02 55.23	+01 47.8	2.062	3.032	165.1	4.8	15.3
1987	11 11	02 46.90	+01 28.4					
1987	11 21	02 38.95	+01 22.0	2.114	3.044	156.2	7.5	15.5
1987	12 01	02 32.17	+01 30.4					
1987	12 11	02 27.15	+01 53.4	2.272	3.057	135.9	13.0	15.9
1987	12 21	02 24.22	+02 30.0					
1987	12 31	02 23.52	+03 18.2	2.508	3.069	116.0	16.7	16.2
1988	01 10	02 24.99	+04 15.8					
1988	01 20	02 28.47	+05 20.5	2.788	3.080	97.8	18.4	16.5

(3563) 1985 FE a,e,i = 2.80, 0.18, 7 Elements MPC 11628

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	08 13	03 11.07	+23 56.0	3.005	3.127	87.4	18.9	17.4
1987	08 23	03 17.07	+24 28.5					
1987	09 02	03 21.22	+24 54.0	2.750	3.151	104.0	18.1	17.2
1987	09 12	03 23.28	+25 11.5					
1987	09 22	03 23.05	+25 20.1	2.514	3.173	122.8	15.4	17.0
1987	10 02	03 20.42	+25 18.2					
1987	10 12	03 15.49	+25 04.8	2.331	3.193	143.9	10.6	16.6
1987	10 22	03 08.57	+24 38.9					
1987	11 01	03 00.24	+24 01.0	2.238	3.211	166.3	4.2	16.3
1987	11 11	02 51.34	+23 13.1					
1987	11 21	02 42.74	+22 19.1	2.260	3.227	166.1	4.2	16.3
1987	12 01	02 35.30	+21 24.0					
1987	12 11	02 29.66	+20 32.9	2.398	3.242	143.4	10.4	16.7
1987	12 21	02 26.17	+19 49.7					
1987	12 31	02 24.97	+19 17.3	2.627	3.255	121.9	14.9	17.1
1988	01 10	02 26.03	+18 56.4					
1988	01 20	02 29.16	+18 46.9	2.911	3.266	102.3	17.1	17.4

1979 MC a,e,i = 2.43, 0.27, 12 Elements MPC 8277

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	08 13	03 01.08	+05 55.4	1.685	2.034	94.6	29.8	17.8
1987	08 23	03 11.95	+05 19.7					
1987	09 02	03 20.23	+04 26.8	1.532	2.092	109.1	27.1	17.6
1987	09 12	03 25.56	+03 18.2					
1987	09 22	03 27.61	+01 56.1	1.401	2.151	126.1	22.1	17.3
1987	10 02	03 26.22	+00 25.0					
1987	10 12	03 21.52	-01 08.2	1.320	2.212	145.0	15.0	17.1
1987	10 22	03 14.03	-02 35.0					
1987	11 01	03 04.70	-03 45.7	1.319	2.274	159.1	8.9	16.9
1987	11 11	02 54.82	-04 32.2					
1987	11 21	02 45.71	-04 50.5	1.417	2.335	152.0	11.5	17.2
1987	12 01	02 38.45	-04 40.1					
1987	12 11	02 33.73	-04 04.6	1.606	2.396	133.8	17.2	17.7
1987	12 21	02 31.77	-03 09.1					
1987	12 31	02 32.55	-01 58.5	1.863	2.455	115.7	21.1	18.2
1988	01 10	02 35.84	-00 37.8					
1988	01 20	02 41.34	+00 49.1	2.159	2.513	99.3	22.7	18.6

1971 OU a,e,i = 2.45, 0.18, 3 Elements MPC 11056

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	08 13	03 09.82	+19 23.6	2.327	2.519	88.9	23.7	17.7
1987	08 23	03 17.95	+19 54.2					
1987	09 02	03 23.96	+20 15.3	2.107	2.557	104.7	22.4	17.5
1987	09 12	03 27.54	+20 26.5					
1987	09 22	03 28.39	+20 27.1	1.905	2.593	123.1	18.9	17.2
1987	10 02	03 26.32	+20 16.3					
1987	10 12	03 21.38	+19 53.5	1.751	2.628	144.5	12.8	16.9
1987	10 22	03 13.90	+19 18.9					
1987	11 01	03 04.62	+18 34.0	1.681	2.661	168.5	4.3	16.5
1987	11 11	02 54.60	+17 42.7					
1987	11 21	02 45.00	+16 50.2	1.722	2.692	166.3	5.0	16.6
1987	12 01	02 36.89	+16 02.3					
1987	12 11	02 31.03	+15 24.1	1.874	2.722	142.5	12.7	17.1
1987	12 21	02 27.79	+14 58.5					
1987	12 31	02 27.25	+14 47.0	2.110	2.749	121.0	17.8	17.5
1988	01 10	02 29.27	+14 48.8					
1988	01 20	02 33.59	+15 02.5	2.394	2.774	102.2	20.3	17.9

(3477) 1979 KH a,e,i = 2.35, 0.11, 7 Elements MPC 10947

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	08 13	03 03.66	+15 09.3	2.103	2.357	91.4	25.4	17.9
1987	08 23	03 12.84	+15 16.7					
1987	09 02	03 19.86	+15 11.3	1.885	2.382	106.9	23.9	17.6
1987	09 12	03 24.41	+14 52.7					
1987	09 22	03 26.14	+14 20.8	1.686	2.407	125.0	20.0	17.3
1987	10 02	03 24.83	+13 35.9					
1987	10 12	03 20.52	+12 39.5	1.537	2.430	146.1	13.2	16.9
1987	10 22	03 13.52	+11 34.2					
1987	11 01	03 04.59	+10 25.2	1.472	2.453	168.7	4.6	16.5
1987	11 11	02 54.85	+09 18.9					
1987	11 21	02 45.53	+08 22.0	1.515	2.475	162.4	6.9	16.7
1987	12 01	02 37.76	+07 40.4					
1987	12 11	02 32.35	+07 17.0	1.662	2.495	139.7	14.8	17.2
1987	12 21	02 29.67	+07 12.3					
1987	12 31	02 29.80	+07 25.0	1.885	2.514	119.1	20.0	17.7
1988	01 10	02 32.57	+07 52.4					
1988	01 20	02 37.72	+08 31.5	2.151	2.532	101.1	22.4	18.0

1981 EY12 a,e,i = 2.45, 0.19, 8 Elements MPC 9963

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	08 13	02 49.14	+17 55.6	2.061	2.359	94.0	25.4	19.5
1987	08 23	02 59.53	+18 16.6					
1987	09 02	03 08.16	+18 24.5	1.785	2.316	108.8	24.4	19.1
1987	09 12	03 14.66	+18 18.0					
1987	09 22	03 18.61	+17 55.8	1.534	2.274	126.0	20.9	18.6
1987	10 02	03 19.63	+17 16.5					
1987	10 12	03 17.55	+16 19.8	1.333	2.233	146.2	14.4	18.1
1987	10 22	03 12.45	+15 06.6					
1987	11 01	03 04.89	+13 40.6	1.210	2.193	169.2	4.8	17.5
1987	11 11	02 55.99	+12 09.1					
1987	11 21	02 47.09	+10 41.5	1.187	2.155	164.2	7.2	17.5
1987	12 01	02 39.64	+09 27.5					
1987	12 11	02 34.74	+08 34.5	1.263	2.119	140.8	17.1	17.9
1987	12 21	02 32.98	+08 05.4					
1987	12 31	02 34.56	+08 00.1	1.409	2.086	120.4	24.0	18.3
1988	01 10	02 39.33	+08 15.7					
1988	01 20	02 46.99	+08 48.3	1.594	2.057	103.3	27.7	18.7

6519 P-L a,e,i = 3.05, 0.18, 3 Elements MPC 9302

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	09 02	03 19.51	+18 36.1	2.485	2.930	106.1	19.3	18.4
1987	09 12	03 23.15	+18 59.7					
1987	09 22	03 24.56	+19 16.0	2.209	2.895	124.3	16.7	18.0
1987	10 02	03 23.54	+19 24.4					
1987	10 12	03 20.03	+19 24.4	1.986	2.861	144.9	11.6	17.6
1987	10 22	03 14.18	+19 15.8					
1987	11 01	03 06.47	+18 58.8	1.848	2.826	167.9	4.2	17.1
1987	11 11	02 57.71	+18 35.4					
1987	11 21	02 48.89	+18 08.5	1.820	2.793	167.5	4.4	17.1
1987	12 01	02 41.05	+17 42.6					
1987	12 11	02 35.07	+17 21.9	1.902	2.760	144.0	12.1	17.4
1987	12 21	02 31.49	+17 09.9					
1987	12 31	02 30.58	+17 08.8	2.071	2.728	122.5	17.7	17.8
1988	01 10	02 32.34	+17 19.0					
1988	01 20	02 36.61	+17 40.0	2.290	2.698	103.7	20.8	18.1
1988	01 30	02 43.20	+18 10.5					
1988	02 09	02 51.82	+18 48.7	2.529	2.669	87.2	21.7	18.3