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

The next MPCs will be published on or about July 11. No MPCs will be issued in June.

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ERRATA.

MPC	Line	
10548	14	For Niepce read Niepce
10548	17	For Nicephore Niepce read Nicephore Niepce
11743	2	Add The identification 1969 TL1 = 1978 GP3 was found independently by L. D. Schmadel.
11751	5	For Istituto de Astrofisica read Istituto di Astrofisica

* * * * *

CORRECTED OBSERVATIONS.

The following observations correct those previously published.

Object	Date	UT	R. A. (1950)	Decl.	Reference	Mag.	N Obs.
813	1986 01	06.32797	06 33 12.60	+31 44 17.9	MPC11710	16.5	1 675
3554	1987 03	01.48507	13 53 48.28	+00 31 04.1	MPC11711		2 675
1984 AB	1986 01	06.32797	06 35 26.86	+28 13 27.3	MPC11706		3 675
1986 AZ2 *	1986 01	06.32797	06 27 33.59	+26 15 41.5	MPC11707	16.5	1 675
1987 FB *	1987 03	26.65637	13 00 20.50	-08 46 30.0	MPC11720	17	4 887

Note 1: time originally erroneously given as 1987 01 06.32788. 2: as 1987 03 01.48482. 3: as 1987 01 06.32784. 4: as 1987 03 26.56537.

* * * * *

IDENTIFICATION CHANGES.

Continuation to MPC 11682.

Object	Date	UT	R. A. (1950)	Decl.	Old desig.	Mag.	Obs.
1970 QS1 *	1970 08	28.84325	20 59 27.60	-20 39 40.4	1970 PB1	16.5	095
1979 YB10*	1979 12	18.86962	04 33 19.95	+10 14 46.3	1979 YD	16.8	095
1986 EC5 *	1986 03	12.14649	11 31 57.60	+05 33 40.5	1986 EE1	18.0	809

IDENTIFICATIONS.

The following list of identifications with numbered minor planets continues that on MPC 11682.

	Note		Note		Note
1981 UP10= (3302)	1	1985 RV3 = (3337)	2	1987 DE1 = (3302)	1

Note 1: identification by C. M. Bardwell. 2: by E. Goffin.

* * * * *

OBSERVATIONS OF COMETS.

Observations are published here for the following observatory codes:

046 Klet. Observer A. Mrkos.
102 Zvenigorod. 0.40-m f/5 Zeiss astrograph. Observers K. B. Lyukhanov, V. P. Osipenko, Yu. V. Rusin and V. A. Yurevich. Measured by N. N. Kubyshkina, V. I. Panferova and G. S. Shibalova. From Kiev Komet. Tsirk.
286 Yunnan Observatory. From Acta Astron. Sinica.
293 Burlington remote site. Observer T. Handley.
323 Perth Observatory, Bickley. 0.3-m astrograph. Observers M. P. Candy, P. Jekabsons, J. Johnston, M. Kempin and A. McGrath.
372 Geisei. 0.6-m reflector. Observer T. Seki. From Orient. Astron. Assoc. Comet Bull. and Yamamoto Circ.
381 Tokyo Observatory, Kiso Station. Observer H. Kosai.
415 Kambah, near Canberra. Observer D. Herald.
474 Mt. John University Observatory. 0.6-m reflector. Observer A. C. Gilmore. Measured by P. M. Kilmartin.
563 Seewalchen. 0.25-m f/6 reflector. Observer M. Bressler. Communicated by F. Frevert.
657 Victoria. Observers D. D. Balam and J. Tatum.
675 Palomar. For comet 1987o, 0.46-m Schmidt, observers C. and E. Shoemaker. Otherwise, 1.5-m reflector + CCD, observer J. Gibson.
688 Lowell Observatory, Anderson Mesa Station. 0.33-m photographic telescope and 1.8-m Perkins reflector + CCD. Observers B. A. Skiff and 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 R. McCarty.
695 Kitt Peak. 2.1-m reflector + CCD. Observers K. J. Meech and D. C. Jewitt.
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.
805 Cerro El Roble. Observer C. Torres.
872 Tokushima. Observer M. Iwamoto. Measured by T. Furuta. Long. and Parallax 134.24, -353, -238 (see MPC 11200). From Orient. Astron. Assoc. Comet Bull.
892 YGCO Hoshikawa and Nagano Stations. 0.25-m f/3.4 Wright-Schmidt. Observer T. Kojima.
984 Eastfield. Observer H. B. Ridley. Measured by D. Buczynski.

Object	Date	UT	R. A. (1950)	Decl.	Mag.		N Obs.
		Periodic Comet Schwassmann-Wachmann 1					
/1974 II	1987	04 24.75972	20 38 33.35	-21 03 32.3	15	T	892
/1974 II	1987	04 24.76597	20 38 33.55	-21 03 28.6			892

Periodic Comet Halley

/1982i	1984	11	17.80521	06	29	06.45	+12	01	47.8				286
/1982i	1984	11	17.83473	06	29	05.33	+12	01	46.8				286
/1982i	1984	11	17.86713	06	29	04.06	+12	01	43.9				286
/1982i	1986	04	26.93021	11	11	13.69	-22	28	17.4				984
/1982i	1987	01	05.71875	11	26	21.32	-16	23	11.0				323
/1982i	1987	01	07.75069	11	24	57.00	-16	24	22.2				323
/1982i	1987	01	28.79028	11	06	35.42	-16	03	58.1				323
/1982i	1987	01	30.74236	11	04	35.36	-15	58	43.7				323
/1982i	1987	02	02.77500	11	01	24.42	-15	49	31.2				323
/1982i	1987	02	05.63056	10	58	20.38	-15	39	33.2				323
/1982i	1987	02	06.63472	10	57	14.58	-15	35	47.1				323
/1982i	1987	02	23.48942	10	38	18.36	-14	11	27.5				474
/1982i	1987	02	23.51512	10	38	16.71	-14	11	17.4				474
/1982i	1987	02	23.63056	10	38	08.97	-14	10	35.5				323
/1982i	1987	02	24.91782	10	36	41.87	-14	02	47.1		13.6T		046
/1982i	1987	02	24.93194	10	36	41.26	-14	02	40.5				046
/1982i	1987	02	25.64583	10	35	53.16	-13	58	12.2				323
/1982i	1987	02	25.91875	10	35	34.61	-13	56	31.1		13.6T		046
/1982i	1987	02	25.93293	10	35	33.69	-13	56	26.1				046
/1982i	1987	03	21.86024	10	11	05.76	-11	07	07.6		13.0T		046
/1982i	1987	03	21.87431	10	11	05.23	-11	06	57.0				046
/1982i	1987	03	26.66250	10	07	00.24	-10	31	18.6		17 T		372
/1982i	1987	03	26.68056	10	06	59.39	-10	31	14.7				372
/1982i	1987	03	27.21007	10	06	32.81	-10	27	12.7			1	293
/1982i	1987	04	02.12771	10	02	02.64	-09	44	02.7				801
/1982i	1987	04	03.27292	10	01	13.83	-09	35	46.5			2	707
/1982i	1987	04	03.29514	10	01	12.93	-09	35	37.6			2	707
/1982i	1987	04	29.46330	09	48	23.09	-06	50	03.3		16 T	3	381

Periodic Comet Giacobini-Zinner

/1985 XIII	1985	07	17.85278	23	26	10.02	+56	51	45.8				102
/1985 XIII	1985	07	17.85938	23	26	12.60	+56	51	53.8				102
/1985 XIII	1985	07	17.86944	23	26	16.20	+56	52	08.6				102
/1985 XIII	1985	07	19.87292	23	38	33.14	+57	34	17.8				102
/1985 XIII	1985	07	19.93889	23	38	58.23	+57	35	39.0				102
/1985 XIII	1985	07	21.85174	23	51	27.75	+58	11	26.7				102
/1985 XIII	1985	07	30.92465	01	00	23.45	+59	45	03.9				102
/1985 XIII	1985	07	30.93344	01	00	28.01	+59	45	05.4				102
/1985 XIII	1985	08	02.87361	01	25	43.05	+59	39	55.3				102
/1985 XIII	1985	08	03.92292	01	34	56.76	+59	33	03.4				102
/1985 XIII	1985	08	04.94161	01	43	58.82	+59	23	38.9				102
/1985 XIII	1985	08	08.86181	02	19	03.15	+58	20	43.9				102
/1985 XIII	1985	08	09.86595	02	27	59.86	+57	57	32.2				102
/1985 XIII	1985	08	10.88472	02	37	00.46	+57	31	01.1				102
/1985 XIII	1985	08	10.88663	02	37	01.75	+57	30	54.5				102
/1985 XIII	1985	08	11.90451	02	45	56.92	+57	01	19.9				102
/1985 XIII	1985	08	12.84080	02	54	03.78	+56	31	19.3				102
/1985 XIII	1985	08	13.96285	03	03	39.10	+55	52	03.1				102
/1985 XIII	1985	08	15.93299	03	20	03.53	+54	33	50.6				102
/1985 XIII	1985	08	18.93229	03	43	48.55	+52	13	07.5				102
/1985 XIII	1985	08	19.87535	03	50	55.42	+51	23	34.1				102
/1985 XIII	1985	08	25.98786	04	32	53.18	+45	07	33.9				102
/1985 XIII	1985	08	26.90347	04	38	32.75	+44	03	49.5				102
/1985 XIII	1985	08	29.00191	04	50	54.98	+41	31	40.1				102
/1985 XIII	1985	09	01.91253	05	11	54.26	+36	28	43.3				102
/1985 XIII	1985	09	02.02471	05	12	27.71	+36	19	45.7				102
/1985 XIII	1985	09	11.91015	05	55	07.47	+22	35	02.0				102
/1985 XIII	1985	09	15.03831	06	06	07.48	+18	13	10.9				102

/1985 XIII	1985	09	15.05000	06	06	09.65	+18	12	12.7			102
/1985 XIII	1985	09	15.05463	06	06	10.82	+18	11	46.8			102
/1985 XIII	1985	09	15.06458	06	06	12.85	+18	10	57.1			102
/1985 XIII	1985	09	19.98638	06	21	33.23	+11	32	11.7			102
			Periodic Comet Schwassmann-Wachmann 2									
/1986h	1987	04	03.12014	03	27	24.63	+16	19	49.4		4	707
			Comet Wilson (1986l)									
/1986l	1986	09	29.81250	20	32	28.79	+10	54	07.7			563
/1986l	1986	09	29.82292	20	32	27.91	+10	53	55.0			563
/1986l	1987	02	23.85278	20	29	58.55	-21	31	38.4			323
/1986l	1987	02	23.86597	20	29	59.06	-21	31	48.6			323
/1986l	1987	02	24.87639	20	30	41.23	-21	45	35.7			323
/1986l	1987	02	26.87639	20	32	05.31	-22	13	48.8			323
/1986l	1987	02	27.87778	20	32	48.04	-22	28	29.0			323
/1986l	1987	03	04.88125	20	36	26.04	-23	47	38.3			323
/1986l	1987	03	06.86042	20	37	55.15	-24	22	01.6			323
/1986l	1987	03	10.86597	20	41	02.09	-25	38	06.8			323
/1986l	1987	03	26.86736	20	56	03.59	-32	52	56.2			323
/1986l	1987	03	31.82986	21	02	24.8	-36	17	05	9	T	372
/1986l	1987	04	03.68291	21	06	47.18	-38	38	27.8			415
/1986l	1987	04	03.71154	21	06	49.73	-38	40	02.2			415
/1986l	1987	04	10.72892	21	21	44.63	-46	12	34.2			415
/1986l	1987	04	10.72956	21	21	44.83	-46	12	37.0			415
/1986l	1987	04	20.58768	22	14	11.32	-63	07	34.6			415
/1986l	1987	04	20.58826	22	14	11.63	-63	07	40.3			415
/1986l	1987	04	20.58916	22	14	12.50	-63	07	48.2			415
/1986l	1987	04	21.54973	22	25	19.57	-65	14	32.1			415
/1986l	1987	04	21.57017	22	25	35.30	-65	17	15.0			415
/1986l	1987	04	21.59456	22	25	54.45	-65	20	32.2			415
/1986l	1987	04	22.53002	22	39	20.84	-67	26	58.8			415
/1986l	1987	04	25.42381	23	48	01.43	-73	51	24.1			415
/1986l	1987	04	26.42032	00	27	29.22	-75	43	07.6			415
/1986l	1987	04	26.49795	00	31	02.91	-75	50	50.6			415
/1986l	1987	04	27.88819	01	46	37.23	-77	32	24.0			323
/1986l	1987	04	27.90347	01	47	34.19	-77	33	02.7			323
/1986l	1987	04	27.90625	01	47	43.90	-77	33	09.6			323
/1986l	1987	04	28.69375	02	38	17.60	-77	49	04.6			323
/1986l	1987	04	28.74306	02	41	33.40	-77	48	50.4			323
/1986l	1987	04	28.77361	02	43	34.99	-77	48	45.1			323
/1986l	1987	04	28.80972	02	45	58.35	-77	48	29.9			323
/1986l	1987	04	28.84236	02	48	07.72	-77	48	14.4			323
/1986l	1987	04	28.87431	02	50	14.37	-77	47	55.5			323
/1986l	1987	04	29.42375	03	25	50.35	-77	32	33.1			415
/1986l	1987	04	29.45530	03	27	50.27	-77	31	05.8			415
/1986l	1987	05	03.46035	06	19	07.10	-69	15	55.3			415
/1986l	1987	05	03.48813	06	19	46.99	-69	11	12.3			415
			Periodic Comet Grigg-Skjellerup									
/1986m	1987	03	27.11169	05	50	15.57	-01	57	31.7			691
/1986m	1987	03	27.12318	05	50	16.43	-01	57	23.3	18.7T		691
/1986m	1987	03	27.12841	05	50	16.84	-01	57	19.7			691
			Comet Sorrells (1986n)									
/1986n	1986	11	25.80556	03	25	21.66	+28	27	58.2			563
/1986n	1986	11	25.82153	03	25	15.01	+28	27	49.7			563
/1986n	1986	11	25.83681	03	25	08.50	+28	27	40.2			563
/1986n	1986	11	27.96181	03	10	28.57	+28	04	04.6			984

/1986n	1986	12	04.71250	02	25	11.87	+26	09	25.1			563
/1986n	1986	12	04.71667	02	25	10.18	+26	09	19.3			563
/1986n	1986	12	04.72222	02	25	08.32	+26	09	14.2			563
/1986n	1986	12	04.73264	02	25	04.01	+26	09	00.9			563
/1986n	1987	05	01.43993	23	21	23.60	+11	41	44.0			707
/1986n	1987	05	01.44549	23	21	23.40	+11	41	45.0			707
/1986n	1987	05	05.47646	23	18	39.36	+11	50	08.9			657
/1986n	1987	05	06.46153	23	17	55.61	+11	52	05.1			657
/1986n	1987	05	07.45493	23	17	09.38	+11	54	04.7			657
			Periodic Comet Urata-Niijima									
/1986o	1986	11	30.34792	01	14	47.04	+38	32	18.9		5	707
/1986o	1987	03	27.14038	06	02	45.77	+50	36	59.3		6	691
/1986o	1987	03	27.15929	06	02	50.05	+50	36	49.8	19.5T	7	691
/1986o	1987	03	27.17057	06	02	51.87	+50	36	41.8		6	691
			Periodic Comet du Toit-Hartley									
/1986q	1987	03	27.18610	06	23	42.94	+22	46	42.9			691
/1986q	1987	03	27.20446	06	23	44.57	+22	46	39.6			691
/1986q	1987	03	27.22039	06	23	46.02	+22	46	35.8	18.7N		691
/1986q	1987	03	28.13303	06	25	12.09	+22	43	45.0	18.7N		691
/1986q	1987	03	28.16487	06	25	14.95	+22	43	38.6			691
/1986q	1987	03	28.19818	06	25	18.05	+22	43	31.7		7	691
			Comet Levy (1987a)									
/1987a	1987	02	03.82847	16	46	08.16	+00	47	01.4			323
/1987a	1987	02	09.85069	16	35	48.86	-01	32	30.1			323
/1987a	1987	02	10.84167	16	33	53.49	-01	56	28.2			323
/1987a	1987	02	11.85139	16	31	52.39	-02	21	20.9			323
/1987a	1987	02	24.66552	15	58	13.93	-08	10	05.6			474
/1987a	1987	02	24.69417	15	58	08.08	-08	10	56.7			474
/1987a	1987	02	24.78889	15	57	49.66	-08	13	47.5			323
/1987a	1987	02	26.76806	15	51	00.08	-09	13	24.4			323
/1987a	1987	03	06.60782	15	18	45.57	-13	19	50.5			474
/1987a	1987	03	06.63792	15	18	37.14	-13	20	45.9			474
/1987a	1987	03	27.35308	13	19	35.52	-22	18	07.7			691
/1987a	1987	03	27.36766	13	19	30.17	-22	18	21.2			691
/1987a	1987	03	27.38524	13	19	23.63	-22	18	36.5	18.1N		691
/1987a	1987	03	28.30201	13	13	50.07	-22	31	18.9			691
/1987a	1987	03	28.30934	13	13	47.32	-22	31	23.0			691
/1987a	1987	03	28.31392	13	13	45.71	-22	31	27.3			691
/1987a	1987	03	28.31709	13	13	44.52	-22	31	30.0	17.6T		691
/1987a	1987	04	03.35382	12	38	56.99	-23	27	18.5		8	707
			Periodic Comet Wiseman-Skiff									
/1987b	1987	01	27.70903	07	37	52.42	-02	13	06.3			323
/1987b	1987	02	02.69514	07	34	33.87	-03	09	29.7			323
/1987b	1987	02	03.71458	07	34	07.28	-03	17	04.6			323
/1987b	1987	02	04.70139	07	33	43.80	-03	23	56.8			323
/1987b	1987	02	05.57222	07	33	25.15	-03	29	37.6			323
/1987b	1987	03	27.25102	07	57	05.65	-03	30	30.2			691
/1987b	1987	03	27.26073	07	57	06.19	-03	30	28.9	17.6T		691
/1987b	1987	03	27.26642	07	57	06.63	-03	30	27.3			691
			Comet Nishikawa-Takamizawa-Tago (1987c)									
/1987c	1987	01	27.51806	23	52	33.68	+04	01	04.9			323
/1987c	1987	01	28.43191	23	51	24.58	+03	44	07.2			872
/1987c	1987	01	28.43654	23	51	24.12	+03	44	05.5			872
/1987c	1987	01	28.51806	23	51	17.96	+03	42	41.0			323

/1987c	1987	01	29.51736	23	50	04.26	+03	24	39.2			323
/1987c	1987	02	02.09885	23	45	59.29	+02	23	53.0			688
/1987c	1987	04	01.87396	22	57	50.30	-09	59	43.3			323
/1987c	1987	04	23.80417	22	30	34.96	-16	52	37.5	8	T	372
/1987c	1987	04	23.80885	22	30	34.34	-16	52	44.4			372
/1987c	1987	04	24.45729	22	29	21.35	-17	10	15.5		9	707
/1987c	1987	04	24.78472	22	28	43.04	-17	19	15.1			892
/1987c	1987	04	28.45556	22	20	46.96	-19	09	20.5		9	707
/1987c	1987	04	29.45556	22	18	18.65	-19	42	38.8			707
/1987c	1987	04	29.45903	22	18	18.05	-19	42	46.2			707
/1987c	1987	04	30.45625	22	15	40.51	-20	17	39.9			707
/1987c	1987	04	30.45972	22	15	39.79	-20	17	46.3			707
/1987c	1987	05	01.45694	22	12	51.52	-20	54	20.6			707
/1987c	1987	05	01.46046	22	12	50.92	-20	54	26.9			707
/1987c	1987	05	03.65813	22	05	57.72	-22	21	28.2			415
/1987c	1987	05	03.65961	22	05	57.30	-22	21	23.3			415

Comet Terasako (1987d)

/1987d	1987	01	27.53264	23	39	05.00	-28	41	54.9			323
/1987d	1987	01	28.53472	23	45	57.76	-28	05	35.5			323
/1987d	1987	01	29.53056	23	52	36.21	-27	28	55.5			323
/1987d	1987	01	30.53125	23	59	04.54	-26	51	35.5			323
/1987d	1987	02	02.53611	00	17	23.58	-24	57	35.9			323
/1987d	1987	02	03.54236	00	23	10.05	-24	19	10.4			323
/1987d	1987	02	04.53542	00	28	42.02	-23	41	16.3			323
/1987d	1987	02	05.53194	00	34	04.68	-23	03	18.4			323
/1987d	1987	02	06.53750	00	39	22.01	-22	25	09.1			323
/1987d	1987	02	18.51042	01	32	05.64	-15	18	52.4			323
/1987d	1987	02	19.51736	01	35	49.90	-14	46	08.4			323
/1987d	1987	02	20.51597	01	39	26.95	-14	14	11.3			323
/1987d	1987	02	24.50556	01	53	06.25	-12	12	09.5			323
/1987d	1987	02	25.50417	01	56	20.43	-11	43	00.7			323
/1987d	1987	03	05.50556	02	20	05.67	-08	07	51.l			323

Periodic Comet Tempel 2

/1987g	1987	03	27.31216	10	34	53.21	+20	22	28.1			691
/1987g	1987	03	27.32714	10	34	52.61	+20	22	31.2			691
/1987g	1987	03	27.34521	10	34	51.84	+20	22	34.3	19.8	T	691

Comet Torres (1987j)

/1987j	1987	03	28.25972	13	52	38.01	-49	08	22.3	15	T	805
/1987j	1987	03	29.24515	13	50	23.87	-48	54	29.5	16	T	805
/1987j	1987	04	01.34444	13	43	18.96	-48	07	33.1	16	T	805
/1987j	1987	04	01.34930	13	43	18.11	-48	07	27.9			805
/1987j	1987	04	01.35416	13	43	17.55	-48	07	22.0			805
/1987j	1987	04	01.77708	13	42	19.50	-48	00	36.8			323
/1987j	1987	04	23.61076	12	55	00.69	-40	12	47.5	16	T	372
/1987j	1987	05	07.16806	12	32	15.30	-34	04	37.1			707

Periodic Comet d’Arrest

/1987k	1987	03	31.39006	10	29	10.08	+18	38	46.8	23	N	695
/1987k	1987	03	31.39735	10	29	09.87	+18	38	48.4			695
/1987k	1987	04	02.39508	10	28	09.12	+18	44	54.9			695
/1987k	1987	04	02.40237	10	28	08.88	+18	44	56.3			695
/1987k	1987	04	02.40986	10	28	08.68	+18	44	58.1			695

Periodic Comet Reinmuth 2

/1987l	1987	04	11.48542	19	40	16.88	-24	56	19.0	19	N	675
/1987l	1987	04	11.48958	19	40	17.26	-24	56	17.9			675

/1987l	1987	04	11.49410	19	40	17.60	-24	56	16.8	675
/1987l	1987	04	13.46933	19	43	04.70	-24	48	09.3	675
/1987l	1987	04	13.47792	19	43	05.45	-24	48	07.3	675
/1987l	1987	04	13.48306	19	43	05.87	-24	48	05.5	675
			Periodic Comet Brooks 2							
/1987m	1987	04	11.50035	21	29	14.96	-10	37	08.0	675
/1987m	1987	04	11.50833	21	29	15.71	-10	37	03.6	675
/1987m	1987	04	13.50083	21	32	42.10	-10	20	01.6 21 T	675
/1987m	1987	04	13.50903	21	32	42.80	-10	19	58.3	675
			Periodic Comet Harrington							
/1987n	1987	05	01.44971	19	32	56.34	-15	58	20.7 20.0T A	691
/1987n	1987	05	01.46970	19	32	57.41	-15	58	17.3 A	691
/1987n	1987	05	03.43966	19	34	56.31	-15	54	44.5	691
/1987n	1987	05	03.46595	19	34	57.82	-15	54	40.9 20.0T B	691
/1987n	1987	05	03.47062	19	34	58.07	-15	54	41.3	691
/1987n	1987	05	03.47549	19	34	58.42	-15	54	41.3	691
			Comet Shoemaker (1987o)							
/1987o	1987	04	25.44583	16	48	15.93	+06	29	55.2 14 T	675
/1987o	1987	04	25.48246	16	48	13.90	+06	30	18.0	675
/1987o	1987	05	04.34719	16	39	36.57	+08	02	02.7 16.8T	688
/1987o	1987	05	04.35984	16	39	35.78	+08	02	08.0	688
/1987o	1987	05	05.35417	16	38	34.76	+08	12	06.1 16.5T	688
/1987o	1987	05	05.37172	16	38	33.52	+08	12	18.5	688
/1987o	1987	05	06.45417	16	37	26.26	+08	23	06.7 16.8T	688
/1987o	1987	05	08.41778	16	35	23.28	+08	42	27.0	657

Note 1: image out of focus. 2: image diffuse, coma diameter 13"-16". 3: no central condensation, coma diameter 1′. 4: image very diffuse. 5: bad focus; image diffuse. 6: image diffuse with slight condensation, involved with star. 7: image diffuse. 8: image very faint and diffuse, coma diameter 23". 9: low in twilight. A: poor seeing. B: coma 15".

* * * * *

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, H. Chemin, R. Chemin, J. Ciffreo, J.-L. Heudier, T. Laverge, C. Pollas								
0.9-m Schmidt telescope								
Observations in association with INAS								
1986 WY7	*	1986 11 25.78889		00 03 40.92	+06 24 02.2			010
1986 WY7		1986 11 25.80972		00 03 42.07	+06 24 02.1			010
1986 WZ7	*	1986 11 25.78889		00 06 11.18	+08 24 52.8			010
1986 WZ7		1986 11 25.80972		00 06 11.50	+08 25 01.5			010
1986 WZ7		1986 11 25.82014		00 06 11.66	+08 25 06.2			010
1986 WA8	*	1986 11 25.78889		00 06 36.69	+06 07 28.2			010
1986 WA8		1986 11 25.80972		00 06 37.15	+06 07 33.2			010
1986 WA8		1986 11 25.82014		00 06 37.41	+06 07 36.5			010
1986 WB8	*	1986 11 25.78889		00 08 30.68	+09 53 45.8			010
1986 WB8		1986 11 25.80972		00 08 31.01	+09 53 40.6			010
1986 WB8		1986 11 25.82014		00 08 31.25	+09 53 36.2			010
1987 DO1	*	1987 02 22.96042		09 55 44.24	-01 45 18.1		N	010
1987 DO1		1987 02 22.98125		09 55 42.79	-01 45 11.9			010
1987 DO1		1987 02 22.99167		09 55 42.23	-01 45 08.3			010
1987 DP1	*	1987 02 22.96042		10 06 18.22	-05 49 11.9			010
1987 DP1		1987 02 22.98125		10 06 16.96	-05 49 08.5			010
1987 DP1		1987 02 22.99167		10 06 16.35	-05 49 06.2			010
1987 DQ1	*	1987 02 22.96042		10 08 16.93	-02 26 32.7			010
1987 DQ1		1987 02 22.98125		10 08 15.73	-02 26 23.7			010
1987 DQ1		1987 02 22.99167		10 08 15.23	-02 26 19.7			010
1987 DR1	*	1987 02 23.86041		07 07 54.63	+51 27 12.1		M	010
1987 DR1		1987 02 23.88125		07 07 54.29	+51 26 53.4			010
1987 DR1		1987 02 23.89166		07 07 54.28	+51 26 40.8			010
1987 DS1	*	1987 02 23.92430		08 58 51.96	+15 51 02.1			010
1987 DS1		1987 02 23.94722		08 58 50.73	+15 51 01.9			010
1987 DS1		1987 02 23.95799		08 58 50.02	+15 51 01.9			010
1987 DT1	*	1987 02 23.92430		08 59 51.44	+12 02 11.2			010
1987 DT1		1987 02 23.94722		08 59 50.52	+12 02 22.2			010
1987 DT1		1987 02 23.95799		08 59 49.98	+12 02 29.1			010
1987 DU1	*	1987 02 23.92430		09 00 07.80	+12 14 11.7			010
1987 DU1		1987 02 23.94722		09 00 06.87	+12 14 20.5			010
1987 DU1		1987 02 23.95799		09 00 06.47	+12 14 22.3			010
1987 DV1	*	1987 02 23.92430		09 00 16.56	+15 15 27.4			010
1987 DV1		1987 02 23.94722		09 00 15.02	+15 15 24.4			010

1987	DV1		1987	02	23.95799	09	00	14.33	+15 15 22.4	010
1987	DW1	*	1987	02	23.92430	09	00	54.86	+15 42 18.7	010
1987	DW1		1987	02	23.94722	09	00	53.76	+15 42 22.4	010
1987	DW1		1987	02	23.95799	09	00	53.33	+15 42 25.0	010
1987	DX1	*	1987	02	23.92430	09	00	57.25	+13 58 33.1	010
1987	DX1		1987	02	23.94722	09	00	54.04	+13 58 37.8	010
1987	DX1		1987	02	23.95799	09	00	53.53	+13 58 38.9	010
1987	DY1	*	1987	02	23.92430	09	01	51.08	+13 56 45.2	010
1987	DY1		1987	02	23.94722	09	01	49.84	+13 56 48.6	010
1987	DY1		1987	02	23.95799	09	01	49.17	+13 56 51.1	010
1987	DZ1	*	1987	02	23.92430	09	02	05.67	+12 25 39.9	010
1987	DZ1		1987	02	23.94722	09	02	04.26	+12 25 44.4	010
1987	DZ1		1987	02	23.95799	09	02	03.68	+12 25 46.3	010
1987	DA2	*	1987	02	23.92430	09	02	54.50	+13 25 04.2	010
1987	DA2		1987	02	23.94722	09	02	53.43	+13 25 06.5	010
1987	DA2		1987	02	23.95799	09	02	52.93	+13 25 08.6	010
1987	DB2	*	1987	02	23.92430	09	03	02.80	+13 51 11.3	010
1987	DB2		1987	02	23.94722	09	03	01.36	+13 51 10.9	010
1987	DB2		1987	02	23.95799	09	03	00.80	+13 51 10.7	010
1987	DC2	*	1987	02	23.92430	09	03	18.40	+16 01 21.8	010
1987	DC2		1987	02	23.94722	09	03	17.01	+16 01 28.7	010
1987	DC2		1987	02	23.95799	09	03	16.56	+16 01 30.5	010
1987	DD2	*	1987	02	23.92430	09	04	00.60	+15 37 24.3	010
1987	DD2		1987	02	23.94722	09	03	59.10	+15 37 43.0	010
1987	DD2		1987	02	23.95799	09	03	58.46	+15 37 51.4	010
1987	DE2	*	1987	02	23.92430	09	04	27.63	+13 36 21.1	010
1987	DE2		1987	02	23.94722	09	04	26.63	+13 36 20.7	010
1987	DE2		1987	02	23.95799	09	04	26.10	+13 36 20.5	010
1987	DF2	*	1987	02	23.92430	09	04	30.29	+14 06 57.6	010
1987	DF2		1987	02	23.94722	09	04	29.22	+14 07 07.2	010
1987	DF2		1987	02	23.95799	09	04	28.87	+14 07 12.7	010
1987	DG2	*	1987	02	23.92430	09	04	52.49	+12 21 34.6	010
1987	DG2		1987	02	23.94722	09	04	51.49	+12 21 38.0	010
1987	DG2		1987	02	23.95799	09	04	50.89	+12 21 40.0	010
1987	DH2	*	1987	02	23.92430	09	04	53.04	+17 00 33.2	010
1987	DH2		1987	02	23.94722	09	04	51.91	+17 00 36.8	010
1987	DH2		1987	02	23.95799	09	04	51.36	+17 00 38.6	010
1987	DJ2	*	1987	02	23.92430	09	06	08.84	+12 20 52.2	010
1987	DJ2		1987	02	23.94722	09	06	07.72	+12 20 56.9	010
1987	DJ2		1987	02	23.95799	09	06	07.18	+12 20 59.6	010
1987	DK2	*	1987	02	23.92430	09	06	50.67	+13 42 09.6	010
1987	DK2		1987	02	23.94722	09	06	49.40	+13 42 14.1	010
1987	DK2		1987	02	23.95799	09	06	48.94	+13 42 16.7	010
1987	DL2	*	1987	02	23.92430	09	07	29.35	+16 43 22.1	010
1987	DL2		1987	02	23.94722	09	07	27.97	+16 43 27.9	010
1987	DL2		1987	02	23.95799	09	07	27.16	+16 43 31.0	010
1987	DM2	*	1987	02	23.92430	09	07	40.90	+14 43 04.2	010
1987	DM2		1987	02	23.94722	09	07	39.54	+14 43 06.2	010
1987	DM2		1987	02	23.95799	09	07	39.02	+14 43 06.6	010
1987	DN2	*	1987	02	23.92430	09	08	02.41	+14 13 10.2	010
1987	DN2		1987	02	23.94722	09	08	01.41	+14 13 22.3	010
1987	DN2		1987	02	23.95799	09	08	00.92	+14 13 27.8	010
1987	DO2	*	1987	02	23.92430	09	08	12.13	+16 14 29.8	010
1987	DO2		1987	02	23.94722	09	08	10.99	+16 14 38.2	010
1987	DO2		1987	02	23.95799	09	08	10.42	+16 14 42.2	010
1987	DP2	*	1987	02	23.92430	09	08	55.97	+12 12 04.8	010
1987	DP2		1987	02	23.94722	09	08	54.99	+12 12 08.8	010
1987	DP2		1987	02	23.95799	09	08	54.50	+12 12 12.8	010
1987	DQ2	*	1987	02	23.92430	09	09	35.18	+16 48 49.5	010

1987 DQ2 1987 02 23.94722 09 09 33.85 +16 48 52.0 010
1987 DQ2 1987 02 23.95799 09 09 33.31 +16 48 54.1 010
1987 DR2 * 1987 02 23.92430 09 09 48.06 +15 08 11.7 010
1987 DR2 1987 02 23.94722 09 09 46.67 +15 08 16.1 010
1987 DR2 1987 02 23.95799 09 09 46.19 +15 08 16.7 010
1987 DS2 * 1987 02 23.92430 09 10 19.77 +16 19 26.2 010
1987 DS2 1987 02 23.94722 09 10 18.77 +16 19 31.8 010
1987 DS2 1987 02 23.95799 09 10 18.33 +16 19 34.1 010
1987 DT2 * 1987 02 23.92430 09 11 00.37 +13 46 16.3 010
1987 DT2 1987 02 23.94722 09 10 59.64 +13 46 12.9 010
1987 DT2 1987 02 23.95799 09 10 59.39 +13 46 11.5 010
1987 DU2 * 1987 02 23.92430 09 11 41.34 +16 09 58.6 010
1987 DU2 1987 02 23.94722 09 11 39.71 +16 09 59.2 010
1987 DU2 1987 02 23.95799 09 11 39.12 +16 09 59.4 010
1987 DV2 * 1987 02 23.92430 09 12 00.65 +12 40 49.3 010
1987 DV2 1987 02 23.94722 09 11 59.27 +12 40 51.9 010
1987 DV2 1987 02 23.95799 09 11 58.66 +12 40 53.3 010
1987 DW2 * 1987 02 23.92430 09 12 06.45 +14 09 31.1 010
1987 DW2 1987 02 23.94722 09 12 05.15 +14 09 42.9 010
1987 DW2 1987 02 23.95799 09 12 04.72 +14 09 44.5 010
1987 DX2 * 1987 02 23.92430 09 12 12.60 +16 35 31.8 010
1987 DX2 1987 02 23.95799 09 12 11.03 +16 35 46.6 010
1987 DY2 * 1987 02 23.92430 09 12 14.75 +12 20 50.5 010
1987 DY2 1987 02 23.94722 09 12 13.38 +12 20 54.9 010
1987 DY2 1987 02 23.95799 09 12 12.69 +12 20 56.9 010
1987 DZ2 * 1987 02 23.92430 09 12 19.16 +15 54 47.9 010
1987 DZ2 1987 02 23.94722 09 12 17.76 +15 54 50.4 010
1987 DA3 * 1987 02 23.92430 09 12 31.69 +17 02 02.5 010
1987 DA3 1987 02 23.94722 09 12 30.54 +17 02 08.3 010
1987 DA3 1987 02 23.95799 09 12 30.11 +17 02 11.5 010
1987 DB3 * 1987 02 23.92430 09 12 41.43 +14 17 55.0 010
1987 DB3 1987 02 23.94722 09 12 40.17 +14 17 59.1 010
1987 DB3 1987 02 23.95799 09 12 39.71 +14 18 01.3 010
1987 DC3 * 1987 02 23.92430 09 13 04.12 +14 38 17.7 010
1987 DC3 1987 02 23.94722 09 13 03.11 +14 38 28.8 010
1987 DC3 1987 02 23.95799 09 13 02.64 +14 38 33.7 010
1987 DD3 * 1987 02 23.92430 09 13 55.36 +12 29 21.2 010
1987 DD3 1987 02 23.94722 09 13 54.42 +12 29 33.4 010
1987 DD3 1987 02 23.95799 09 13 53.95 +12 29 40.2 010
1987 DE3 * 1987 02 23.92430 09 14 25.75 +13 59 49.2 010
1987 DE3 1987 02 23.95799 09 14 23.74 +13 59 57.1 010
1987 DF3 * 1987 02 23.92430 09 15 25.71 +14 13 19.8 010
1987 DF3 1987 02 23.94722 09 15 24.07 +14 13 21.9 010
1987 DF3 1987 02 23.95799 09 15 23.49 +14 13 23.6 010
1987 DG3 * 1987 02 23.92430 09 15 27.23 +14 55 19.0 010
1987 DG3 1987 02 23.94722 09 15 26.17 +14 55 27.8 010
1987 DG3 1987 02 23.95799 09 15 25.66 +14 55 32.8 010
1987 DH3 * 1987 02 23.92430 09 15 38.84 +13 18 39.9 010
1987 DH3 1987 02 23.94722 09 15 37.05 +13 18 29.5 010
1987 DH3 1987 02 23.95799 09 15 36.17 +13 18 24.7 010
1987 DJ3 * 1987 02 23.92430 09 16 25.81 +15 10 52.0 010
1987 DJ3 1987 02 23.94722 09 16 24.75 +15 10 58.1 010
1987 DJ3 1987 02 23.95799 09 16 24.26 +15 11 00.4 010
1987 DK3 * 1987 02 23.92430 09 16 32.36 +13 06 18.5 010
1987 DK3 1987 02 23.95799 09 16 30.45 +13 06 21.7 010
1987 DL3 * 1987 02 23.92430 09 16 56.00 +15 16 14.7 010
1987 DL3 1987 02 23.94722 09 16 54.82 +15 16 19.8 010
1987 DL3 1987 02 23.95799 09 16 54.33 +15 16 23.1 010
1987 DM3 * 1987 02 23.92430 09 16 58.00 +12 25 03.8 010

1987	DM3		1987	02	23.94722	09	16	57.12	+12	25	09.8	010
1987	DM3		1987	02	23.95799	09	16	56.54	+12	25	13.6	010
1987	DN3	*	1987	02	23.92430	09	17	22.89	+13	33	03.5	010
1987	DN3		1987	02	23.94722	09	17	22.02	+13	33	12.3	010
1987	DN3		1987	02	23.95799	09	17	21.60	+13	33	17.8	010
1987	DO3	*	1987	02	23.92430	09	17	23.63	+16	16	24.2	010
1987	DO3		1987	02	23.94722	09	17	22.43	+16	16	33.3	010
1987	DO3		1987	02	23.95799	09	17	21.75	+16	16	38.5	010
1987	DP3	*	1987	02	23.92430	09	17	28.82	+14	42	54.8	010
1987	DP3		1987	02	23.95799	09	17	27.48	+14	43	02.7	010
1987	DQ3	*	1987	02	23.92430	09	17	29.96	+15	20	52.5	010
1987	DQ3		1987	02	23.94722	09	17	29.00	+15	20	58.9	010
1987	DQ3		1987	02	23.95799	09	17	28.52	+15	21	01.6	010
1987	DR3	*	1987	02	23.92430	09	17	31.50	+14	37	40.6	010
1987	DR3		1987	02	23.94722	09	17	30.46	+14	37	47.0	010
1987	DR3		1987	02	23.95799	09	17	29.90	+14	37	50.2	010
1987	DS3	*	1987	02	23.92430	09	18	25.51	+14	46	11.1	010
1987	DS3		1987	02	23.94722	09	18	24.44	+14	46	15.8	010
1987	DS3		1987	02	23.95799	09	18	23.88	+14	46	17.5	010
1987	DT3	*	1987	02	23.99653	09	57	27.68	+00	13	33.9	010
1987	DT3		1987	02	24.01736	09	57	26.67	+00	13	42.4	010
1987	DT3		1987	02	24.03056	09	57	26.24	+00	13	46.2	010
1987	DU3	*	1987	02	23.99653	09	58	38.55	+01	20	50.8	010
1987	DU3		1987	02	24.01736	09	58	37.09	+01	20	54.3	010
1987	DU3		1987	02	24.03056	09	58	36.50	+01	20	56.6	010
1987	DV3	*	1987	02	23.99653	09	59	25.00	+00	56	14.3	010
1987	DV3		1987	02	24.01736	09	59	23.87	+00	56	27.3	010
1987	DV3		1987	02	24.03056	09	59	23.47	+00	56	30.8	010
1987	DW3	*	1987	02	23.99653	09	59	51.67	+03	12	01.0	010
1987	DW3		1987	02	24.01736	09	59	50.49	+03	12	12.2	010
1987	DW3		1987	02	24.03056	09	59	49.95	+03	12	17.7	010
1987	DX3	*	1987	02	23.99653	10	01	17.30	+01	13	52.1	M 010
1987	DX3		1987	02	24.01736	10	01	15.06	+01	13	42.4	010
1987	DX3		1987	02	24.03056	10	01	14.07	+01	13	38.7	010
1987	DY3	*	1987	02	23.99653	10	03	30.20	+02	45	06.9	M 010
1987	DY3		1987	02	24.03056	10	03	28.52	+02	45	22.4	010
1987	DZ3	*	1987	02	23.99653	10	04	13.73	+01	14	28.2	010
1987	DZ3		1987	02	24.01736	10	04	12.44	+01	14	34.7	010
1987	DZ3		1987	02	24.03056	10	04	11.80	+01	14	38.5	010
1987	DA4	*	1987	02	23.99653	10	04	26.02	+00	09	52.1	M 010
1987	DA4		1987	02	24.03056	10	04	23.69	+00	09	56.1	010
1987	DB4	*	1987	02	23.99653	10	05	36.82	+02	12	53.3	M 010
1987	DB4		1987	02	24.03056	10	05	34.97	+02	12	57.7	010
1987	DC4	*	1987	02	23.99653	10	05	46.67	+04	24	01.4	M 010
1987	DC4		1987	02	24.01736	10	05	45.42	+04	24	14.9	010
1987	DC4		1987	02	24.03056	10	05	44.85	+04	24	17.9	010
1987	DD4	*	1987	02	23.99653	10	06	20.28	+04	59	41.0	010
1987	DD4		1987	02	24.01736	10	06	19.39	+04	59	48.4	010
1987	DD4		1987	02	24.03056	10	06	18.85	+04	59	53.2	010
1987	DE4	*	1987	02	23.99653	10	07	56.75	+03	58	34.8	010
1987	DE4		1987	02	24.01736	10	07	55.80	+03	58	45.5	010
1987	DE4		1987	02	24.03056	10	07	55.75	+03	58	50.8	010
1987	DF4	*	1987	02	23.99653	10	09	33.23	+01	42	34.5	010
1987	DF4		1987	02	24.03056	10	09	31.23	+01	42	44.2	010
1987	DG4	*	1987	02	23.99653	10	10	13.93	+00	32	09.8	010
1987	DG4		1987	02	24.01736	10	10	12.83	+00	32	17.8	010
1987	DG4		1987	02	24.03056	10	10	12.34	+00	32	20.6	010
1987	DH4	*	1987	02	23.99653	10	10	19.11	+01	14	05.7	M 010
1987	DH4		1987	02	24.03056	10	10	17.57	+01	14	25.5	010

1987	DJ4	*	1987	02	23.99653	10	10	21.43	+02	01	29.5		M 010
1987	DJ4		1987	02	24.03056	10	10	19.99	+02	01	35.7		010
1987	DK4	*	1987	02	23.99653	10	13	37.95	+00	12	53.3		010
1987	DK4		1987	02	24.01736	10	13	36.66	+00	13	00.0		010
1987	DK4		1987	02	24.03056	10	13	36.37	+00	13	03.3		010
1987	DL4	*	1987	02	23.99653	10	13	42.31	+01	50	21.4		010
1987	DL4		1987	02	24.01736	10	13	41.05	+01	50	31.3		010
1987	DL4		1987	02	24.03056	10	13	40.53	+01	50	35.4		010
1987	DM4	*	1987	02	23.99653	10	14	51.59	+03	31	06.8		M 010
1987	DM4		1987	02	24.03056	10	14	48.49	+03	30	47.2		010
1987	DN4	*	1987	02	23.99653	10	16	00.82	+04	38	51.6		N 010
1987	DN4		1987	02	24.01736	10	15	59.36	+04	38	59.7		010
1987	DN4		1987	02	24.03056	10	15	58.75	+04	39	02.9		010
1987	DO4	*	1987	02	23.99653	10	16	20.33	+02	04	24.4		N 010
1987	DO4		1987	02	24.01736	10	16	19.21	+02	04	34.0		010
1987	DO4		1987	02	24.03056	10	16	18.79	+02	04	37.6		010
1987	DP4	*	1987	02	23.99653	10	16	33.16	+02	54	22.2		N 010
1987	DP4		1987	02	24.03056	10	16	31.07	+02	54	22.5		010
1987	DQ4	*	1987	02	23.99653	10	16	41.09	+04	11	26.2		N 010
1987	DQ4		1987	02	24.03056	10	16	39.01	+04	11	39.4		010
1987	DR4	*	1987	02	28.89445	07	58	30.99	+12	33	04.6		010
1987	DR4		1987	02	28.91528	07	58	30.59	+12	33	09.1		010
1987	DR4		1987	02	28.92569	07	58	30.33	+12	33	13.9		010
1987	DS4	*	1987	02	28.89445	07	59	43.10	+12	06	37.5		010
1987	DS4		1987	02	28.91528	07	59	42.62	+12	06	39.1		010
1987	DS4		1987	02	28.92569	07	59	42.31	+12	06	42.2		010
1987	DT4	*	1987	02	28.89445	08	00	10.16	+13	21	44.3		010
1987	DT4		1987	02	28.91528	08	00	09.63	+13	21	44.7		010
1987	DT4		1987	02	28.92569	08	00	09.27	+13	21	45.8		010
1987	DU4	*	1987	02	28.89445	08	00	29.95	+11	36	44.1		010
1987	DU4		1987	02	28.91528	08	00	29.54	+11	36	46.9		010
1987	DU4		1987	02	28.92569	08	00	29.32	+11	36	58.4		010
1987	DV4	*	1987	02	28.89445	08	00	51.15	+11	49	26.8		010
1987	DV4		1987	02	28.91528	08	00	50.37	+11	49	32.7		010
1987	DV4		1987	02	28.92569	08	00	50.10	+11	49	35.3		010
1987	DW4	*	1987	02	28.89445	08	01	55.04	+10	20	18.1		010
1987	DW4		1987	02	28.91528	08	01	54.71	+10	20	28.8		010
1987	DW4		1987	02	28.92569	08	01	54.47	+10	20	37.1		010
1987	DX4	*	1987	02	28.89445	08	03	04.53	+14	01	56.6		010
1987	DX4		1987	02	28.91528	08	03	03.99	+14	02	00.9		010
1987	DX4		1987	02	28.92569	08	03	03.68	+14	02	04.2		010
410			1987	02	23.09722	12	58	10.60	+11	17	01.1		010
460			1987	02	28.89445	07	56	44.50	+14	23	34.7	16.0	010
460			1987	02	28.91528	07	56	44.02	+14	23	37.1		010
460			1987	02	28.92569	07	56	43.67	+14	23	40.0		010
508			1987	02	23.09722	12	50	39.66	+09	16	47.3		010
834			1987	02	23.92430	09	00	01.55	+13	09	00.3	15.4	010
834			1987	02	23.94722	09	00	00.71	+13	09	05.7		010
834			1987	02	23.95799	09	00	00.23	+13	09	08.5		010
972			1987	02	23.99653	10	07	10.41	+01	54	03.5	15.5	010
972			1987	02	24.01736	10	07	09.50	+01	54	07.6		010
972			1987	02	24.03056	10	07	08.97	+01	54	09.6		010
1094			1987	02	23.92430	09	13	26.27	+14	00	28.3	16.0	010
1094			1987	02	23.94722	09	13	25.37	+14	00	43.5		010
1094			1987	02	23.95799	09	13	24.91	+14	00	52.9		010
1138			1987	02	22.96042	09	58	24.73	-03	58	02.9	16.5	010
1138			1987	02	22.98125	09	58	23.59	-03	57	58.8		010
1138			1987	02	22.99167	09	58	23.04	-03	57	56.6		010
1377			1987	02	23.99653	09	58	27.30	+01	16	04.8		010

1377		1987	02	24.01736	09	58	26.10	+01	16	12.5		010
1377		1987	02	24.03056	09	58	25.47	+01	16	16.5		010
1588		1987	02	23.09722	12	48	45.57	+11	15	31.0		010
1651		1987	02	28.89445	07	58	39.00	+13	50	33.1	15.1	010
1651		1987	02	28.91528	07	58	38.61	+13	50	38.0		010
1651		1987	02	28.92569	07	58	38.30	+13	50	42.6		010
1820		1987	02	23.92430	09	09	37.30	+15	58	32.4		010
1820		1987	02	23.94722	09	09	36.00	+15	58	40.3		010
1820		1987	02	23.95799	09	09	35.38	+15	58	45.0		010
1992		1987	02	23.99653	10	05	30.52	+03	27	37.7		010
1992		1987	02	24.01736	10	05	29.21	+03	27	48.3		010
1992		1987	02	24.03056	10	05	28.81	+03	27	53.1		010
2211		1987	02	28.89445	08	03	58.82	+14	04	17.3	19	010
2211		1987	02	28.91528	08	03	58.22	+14	04	24.8		010
2211		1987	02	28.92569	08	03	57.85	+14	04	30.2		010
2266		1986	11	25.78889	00	05	34.68	+09	21	33.8	P	010
2266		1986	11	25.80972	00	05	34.95	+09	21	29.3	P	010
2266		1986	11	25.82014	00	05	35.08	+09	21	26.7	P	010
2572		1987	02	23.99653	10	01	49.85	+05	07	00.9		010
2572		1987	02	24.01736	10	01	48.51	+05	07	08.8		010
2572		1987	02	24.03056	10	01	47.89	+05	07	12.8		010
2734		1987	02	23.09722	13	01	00.35	+08	51	16.1		010
2740		1987	02	23.99653	10	13	13.15	+00	59	43.9		010
2740		1987	02	24.01736	10	13	12.29	+00	59	51.5		010
2740		1987	02	24.03056	10	13	11.80	+00	59	56.3		010
2975		1987	02	22.96042	09	58	48.03	-01	31	29.1	15.6 N	010
2975		1987	02	22.98125	09	58	46.62	-01	31	20.4	N	010
2975		1987	02	22.99167	09	58	45.90	-01	31	16.5	N	010
3076		1987	02	28.89445	07	51	05.59	+10	34	16.6	18.3	010
3076		1987	02	28.91528	07	51	05.15	+10	34	22.3		010
3076		1987	02	28.92569	07	51	04.92	+10	34	25.6		010
3114		1987	02	23.92430	09	17	17.30	+13	48	41.7	18.0 N	010
3114		1987	02	23.95799	09	17	15.50	+13	48	53.4		010
3184		1987	02	23.09722	12	47	11.94	+06	54	50.1		010
3403		1987	02	28.89445	08	08	37.84	+13	52	48.9		010
3403		1987	02	28.91528	08	08	37.12	+13	52	53.0		010
3403		1987	02	28.92569	08	08	36.69	+13	52	55.8		010
3544		1987	02	23.92430	09	11	33.22	+14	54	17.3		010
3544		1987	02	23.94722	09	11	32.03	+14	54	26.6		010
3544		1987	02	23.95799	09	11	31.46	+14	54	31.4		010
3549		1987	02	23.99653	09	58	07.62	+01	53	58.1		010
3549		1987	02	24.01736	09	58	06.42	+01	54	00.5		010
3549		1987	02	24.03056	09	58	05.89	+01	54	01.6		010

033 Tautenburg
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Democratic Republic of Germany
Observer F. Borngen (assisted by F. Ludwig)
Measurer F. Borngen
1.3-m Schmidt telescope
SAOC

1953	XL1	1987	03	21.81007	09	25	32.31	+22	46	47.3	16.6	033
1953	XL1	1987	03	21.85382	09	25	31.63	+22	46	57.6		033
1953	XL1	1987	03	22.83750	09	25	18.20	+22	50	38.1		033
1987	FK	1987	03	22.99826	13	31	45.28	-03	08	50.6	17.2	033
1987	FK	1987	03	23.02917	13	31	43.85	-03	08	48.2		033
1987	FE1 *	1987	03	21.81007	09	24	36.43	+22	07	06.2	19.2	033
1987	FE1	1987	03	21.85382	09	24	36.01	+22	07	12.9		033
1987	FE1	1987	03	22.83750	09	24	30.58	+22	09	12.5		033

1987	FL1	*	1987	03	22.90139	10	50	45.93	+02 30 31.4	18.4	033
1987	FL1		1987	03	22.93333	10	50	44.35	+02 30 40.0		033
1987	FM1	*	1987	03	22.90139	10	54	26.58	+02 45 22.3	17.9	033
1987	FM1		1987	03	22.93333	10	54	25.44	+02 45 36.9		033
1987	FN1	*	1987	03	22.90139	10	56	20.47	+02 02 15.5	17.1	033
1987	FN1		1987	03	22.93333	10	56	19.35	+02 02 35.0		033
1987	FO1	*	1987	03	22.90139	10	56	42.24	+01 55 09.9	16.7	033
1987	FO1		1987	03	22.93333	10	56	40.76	+01 55 14.5		033
1987	FP1	*	1987	03	22.99826	13	21	50.77	-06 03 42.7	18.1	033
1987	FP1		1987	03	23.02917	13	21	49.12	-06 03 41.1		033
1987	FQ1	*	1987	03	22.99826	13	23	13.17	-04 11 11.2	18.5	033
1987	FQ1		1987	03	23.02917	13	23	11.88	-04 11 07.8		033
1987	FR1	*	1987	03	22.99826	13	26	37.86	-03 29 33.1	17.8	033
1987	FR1		1987	03	23.02917	13	26	36.69	-03 29 24.4		033
1987	FS1	*	1987	03	22.99826	13	28	04.86	-03 07 21.3	17.5	033
1987	FS1		1987	03	23.02917	13	28	03.19	-03 07 13.2		033
1987	FT1	*	1987	03	22.99826	13	29	25.89	-04 19 14.8	19.1	033
1987	FT1		1987	03	23.02917	13	29	24.53	-04 19 01.0		033
1987	FU1	*	1987	03	22.99826	13	31	20.29	-04 55 43.0	18.3	033
1987	FU1		1987	03	23.02917	13	31	19.04	-04 55 33.4		033
1987	FV1	*	1987	03	26.84062	09	49	40.22	+19 31 42.6	17.9	033
1987	FV1		1987	03	26.87778	09	49	39.50	+19 31 41.9		033
110			1987	03	21.81007	09	27	56.70	+23 34 41.2	13.2	033
110			1987	03	21.85382	09	27	55.51	+23 34 40.3		033
110			1987	03	22.83750	09	27	31.19	+23 34 11.0		033
281			1987	03	22.99826	13	21	28.36	-05 38 11.7	16.2	033
281			1987	03	23.02917	13	21	26.60	-05 38 04.6		033
734			1987	03	26.84062	09	48	47.68	+17 01 58.6	15.8	033
734			1987	03	26.87778	09	48	46.78	+17 01 57.8		033
1017			1987	03	21.81007	09	34	13.23	+21 58 18.8	15.7	033
1017			1987	03	21.85382	09	34	12.29	+21 58 24.8		033
1017			1987	03	22.83750	09	33	53.29	+22 00 30.2		033
1447			1987	03	22.99826	13	22	30.83	-05 35 16.1	15.9	033
1447			1987	03	23.02917	13	22	29.33	-05 35 10.0		033
1748			1987	03	22.99826	13	27	21.94	-04 51 40.5	18.1	033
1748			1987	03	23.02917	13	27	20.98	-04 51 33.6		033
1967			1987	03	22.99826	13	23	25.95	-03 59 12.4	16.8	033
1967			1987	03	23.02917	13	23	24.31	-03 59 03.7		033
2009			1987	03	22.99826	13	25	42.46	-04 27 44.6	16.1	033
2009			1987	03	23.02917	13	25	41.20	-04 27 36.3		033
2227			1987	03	22.99826	13	20	19.54	-06 14 53.9	17.9	033
2227			1987	03	23.02917	13	20	17.97	-06 14 38.7		033
2320			1987	03	21.81007	09	29	23.57	+22 51 12.7	17.0	033
2320			1987	03	21.85382	09	29	22.51	+22 51 18.3		033
2320			1987	03	22.83750	09	29	01.25	+22 53 11.7		033
2417			1987	03	26.84062	09	54	16.45	+17 19 32.9	17.0	033
2417			1987	03	26.87778	09	54	15.82	+17 19 34.0		033
2729			1987	03	22.99826	13	24	52.01	-05 08 35.3	17.2	033
2729			1987	03	23.02917	13	24	50.76	-05 08 27.9		033
2874			1987	03	21.81007	09	28	22.67	+22 39 55.8	18.0	033
2874			1987	03	21.85382	09	28	21.70	+22 39 54.6		033
2874			1987	03	22.83750	09	28	01.93	+22 39 17.9		033

046 Klet
A. Mrkos, Dept. of Astronomy and Astrophysics, Charles University,
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Observers A. Mrkos, Z. Vavrova
0.6-m Maksutov reflector

1949	PL		1987	03	04.95874	10	38	32.16	+08	44	35.2	046
1949	PL		1987	03	04.97286	10	38	31.43	+08	44	41.9	046
1976	GU3		1987	03	21.92818	11	49	01.91	+04	05	02.7	16.7 046
1976	GU3		1987	03	21.94225	11	49	01.10	+04	05	07.8	046
1982	DU		1987	03	04.95874	10	43	40.91	+08	44	54.1	046
1982	DU		1987	03	04.97286	10	43	39.76	+08	44	52.2	046
1982	UJ2		1987	03	21.92818	11	48	11.47	+05	33	48.0	046
1982	UJ2		1987	03	21.94225	11	48	10.47	+05	33	51.5	046
1987	BE		1987	01	30.96597	08	36	01.99	+15	48	35.4	046
1987	BE		1987	01	30.98056	08	36	01.12	+15	48	39.2	046
1987	BE		1987	01	31.86250	08	35	15.94	+15	52	24.3	046
1987	BE		1987	01	31.87778	08	35	15.14	+15	52	27.8	046
1987	BE		1987	02	01.86875	08	34	24.26	+15	56	41.2	046
1987	BE		1987	02	01.88333	08	34	23.50	+15	56	46.1	046
1987	DY4	*	1987	02	24.91782	10	33	03.51	-12	19	00.5	046
1987	DY4		1987	02	24.93194	10	33	02.83	-12	18	59.3	046
1987	DY4		1987	02	25.91875	10	32	14.76	-12	17	27.0	046
1987	DY4		1987	02	25.93293	10	32	14.05	-12	17	27.5	046
1987	DY4		1987	03	21.86024	10	14	18.20	-10	51	53.6	046
1987	DY4		1987	03	21.87431	10	14	17.70	-10	51	49.1	046
1987	EZ		1987	03	21.92818	11	50	06.51	+01	49	09.6	16.4 046
1987	EZ		1987	03	21.94225	11	50	05.57	+01	49	11.9	046
1987	EB1	*	1987	03	04.91725	10	10	21.72	+16	16	39.8	17.0 046
1987	EB1		1987	03	04.93160	10	10	21.00	+16	16	39.6	046
1987	EC1	*	1987	03	04.95874	10	38	38.80	+16	37	22.5	16.9 046
1987	EC1		1987	03	04.97286	10	38	37.93	+16	37	30.0	046
1987	FL	*	1987	03	21.89549	10	34	13.17	+10	48	46.4	16.7 046
1987	FL		1987	03	21.90926	10	34	12.42	+10	48	47.7	046
1987	FM	*	1987	03	21.89549	10	35	12.00	+08	55	53.1	16.8 046
1987	FM		1987	03	21.90926	10	35	11.29	+08	55	56.0	046
1987	FN	*	1987	03	21.89549	10	45	43.84	+07	35	24.8	16.8 046
1987	FN		1987	03	21.90926	10	45	43.12	+07	35	25.6	046
1987	FO	*	1987	03	21.92818	11	50	41.27	+05	16	03.2	17.1 046
1987	FO		1987	03	21.94225	11	50	40.54	+05	16	09.1	046
1987	FP	*	1987	03	21.92818	11	51	25.12	+02	43	34.3	16.7 046
1987	FP		1987	03	21.94225	11	51	24.44	+02	43	40.4	046
1987	FQ	*	1987	03	21.92818	11	52	30.61	+04	07	36.9	16.9 046
1987	FQ		1987	03	21.94225	11	52	29.87	+04	07	42.2	046
1987	FR	*	1987	03	21.92818	11	53	46.24	+04	03	16.1	17.0 046
1987	FR		1987	03	21.94225	11	53	45.76	+04	03	19.4	046
1987	FS	*	1987	03	21.92818	11	54	06.77	+06	06	59.5	16.7 046
1987	FS		1987	03	21.94225	11	54	05.87	+06	07	03.5	046
1987	FT	*	1987	03	21.92818	11	55	58.59	+02	40	28.0	17.0 046
1987	FT		1987	03	21.94225	11	55	57.88	+02	40	34.4	046
1987	FU	*	1987	03	21.92818	11	56	45.19	+06	05	18.9	17.0 046
1987	FU		1987	03	21.94225	11	56	44.76	+06	05	19.1	046
1987	FV	*	1987	03	21.92818	11	57	27.76	+03	05	22.7	17.0 046
1987	FV		1987	03	21.94225	11	57	26.82	+03	05	29.2	046
1987	FW	*	1987	03	21.96111	12	00	06.22	-01	08	26.7	17.0 046
1987	FW		1987	03	21.97517	12	00	05.77	-01	08	21.9	046
1987	FX	*	1987	03	21.96111	12	04	34.00	+00	15	25.7	16.9 046
1987	FX		1987	03	21.97517	12	04	33.53	+00	15	28.8	046
1987	FY	*	1987	03	21.96111	12	06	40.95	+01	35	19.1	046
1987	FY		1987	03	21.97517	12	06	40.10	+01	35	23.3	046
1987	FZ	*	1987	03	21.96111	12	08	24.82	+01	16	30.8	16.8 046
1987	FZ		1987	03	21.97517	12	08	24.16	+01	16	29.9	046
1987	FA1	*	1987	03	21.96111	12	09	27.37	+00	35	29.9	17.0 046
1987	FA1		1987	03	21.97517	12	09	26.90	+00	35	34.8	046
1987	FB1	*	1987	03	21.96111	12	12	47.86	-01	25	58.1	16.9 046

1987	FB1		1987	03	21.97517	12	12	47.00	-01	25	57.1	046
1987	FC1	*	1987	03	21.96111	12	09	46.72	+02	20	47.3	046
1987	FC1		1987	03	21.97517	12	09	46.04	+02	20	53.3	046
16			1987	03	04.95874	10	44	52.64	+08	50	32.1	046
16			1987	03	04.97286	10	44	51.99	+08	50	37.1	046
16			1987	03	21.89549	10	32	41.02	+10	14	47.5	046
16			1987	03	21.90926	10	32	40.46	+10	14	51.0	046
192			1987	03	21.89549	10	34	49.38	+08	35	11.4	046
192			1987	03	21.90926	10	34	48.67	+08	35	13.9	046
201			1987	03	04.95874	10	41	54.62	+08	47	36.0	046
201			1987	03	04.97286	10	41	53.92	+08	47	41.7	046
822			1987	03	21.89549	10	34	52.79	+08	00	16.8	046
822			1987	03	21.90926	10	34	52.30	+08	00	20.7	046
1125			1987	03	04.91725	10	22	55.78	+14	35	31.2	046
1125			1987	03	04.93160	10	22	55.11	+14	35	34.6	046
1361			1987	03	21.89549	10	45	10.96	+08	22	34.3	046
1361			1987	03	21.90926	10	45	10.42	+08	22	42.8	046
1376			1987	03	21.89549	10	34	41.14	+09	12	50.8	046
1376			1987	03	21.90926	10	34	40.37	+09	12	56.0	046
1455			1987	03	04.91725	10	14	15.80	+18	03	30.4	046
1455			1987	03	04.93160	10	14	14.89	+18	03	39.4	046
1488			1987	03	04.91725	10	20	10.28	+16	03	14.8	046
1488			1987	03	04.93160	10	20	09.50	+16	03	16.3	046
1539			1987	03	04.95874	10	39	23.36	+09	15	05.0	046
1539			1987	03	04.97286	10	39	22.55	+09	15	11.1	046
1636			1987	03	21.96111	12	02	19.28	+01	28	56.1	046
1636			1987	03	21.97517	12	02	18.48	+01	29	03.0	046
1672			1987	03	04.95874	10	40	47.56	+07	46	28.2	046
1672			1987	03	04.97286	10	40	46.61	+07	46	32.4	046
1691			1987	03	21.89549	10	38	07.66	+08	21	43.4	046
1691			1987	03	21.90926	10	38	07.14	+08	21	46.4	046
1720			1987	03	21.96111	12	10	56.86	-00	01	07.7	046
1720			1987	03	21.97517	12	10	55.86	-00	01	01.0	046
1790			1987	03	04.91725	10	16	34.92	+15	11	34.9	046
1790			1987	03	04.93160	10	16	33.96	+15	11	37.3	046
1846			1987	03	21.96111	12	01	10.11	+01	52	25.7	046
1846			1987	03	21.97517	12	01	09.26	+01	52	30.2	046
1924			1987	03	04.95874	10	47	40.09	+08	29	22.5	046
1924			1987	03	04.97286	10	47	39.19	+08	29	26.6	046
1924			1987	03	21.89549	10	32	51.26	+09	21	16.3	046
1924			1987	03	21.90926	10	32	50.90	+09	21	18.2	046
1933			1987	03	21.96111	12	09	28.80	+02	23	14.9	16.7 046
1933			1987	03	21.97517	12	09	28.04	+02	23	19.4	046
2165			1987	03	21.96111	12	07	27.57	-00	22	11.0	046
2165			1987	03	21.97517	12	07	26.94	-00	22	07.5	046
2249			1987	03	21.89549	10	43	50.16	+09	58	11.5	046
2249			1987	03	21.90926	10	43	49.77	+09	58	15.7	046
2394			1987	03	21.92818	11	52	40.21	+02	45	52.7	046
2394			1987	03	21.94225	11	52	39.50	+02	45	58.3	046
2492			1987	03	21.96111	12	09	38.05	-00	36	19.6	046
2492			1987	03	21.97517	12	09	37.37	-00	36	14.9	046
2603			1987	03	21.92818	11	57	51.78	+03	25	47.6	046
2603			1987	03	21.94225	11	57	50.94	+03	25	51.9	046
2646			1987	03	04.91725	10	15	40.58	+15	25	20.0	046
2646			1987	03	04.93160	10	15	39.71	+15	25	22.5	046
2667			1987	03	21.92818	11	50	01.13	+04	01	38.7	046
2667			1987	03	21.94225	11	50	00.53	+04	01	42.5	046
2688			1987	03	21.92818	11	50	13.13	+06	31	30.0	046
2688			1987	03	21.94225	11	50	12.48	+06	31	35.4	046

2722		1987	03	21.89549	10	43	40.46	+09	28	57.7	046
2722		1987	03	21.90926	10	43	39.95	+09	29	01.7	046
2870		1987	03	04.91725	10	18	25.27	+16	55	55.6	046
2870		1987	03	04.93160	10	18	24.58	+16	55	59.3	046
3022		1987	03	21.96111	12	01	10.59	-00	09	57.6	046
3022		1987	03	21.97517	12	01	09.81	-00	09	37.4	046

071 Bulgarian National Observatory
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Measurers E. W. Elst
Reductions E. W. Elst, C. Leterme

1986	PC1		1986	09	08.82916	21	30	32.73	-14	22	52.8	17	071
1986	PC1		1986	09	08.85041	21	30	32.02	-14	22	57.3	17	071
1986	PC1		1986	09	08.86957	21	30	31.46	-14	23	00.9	17	071
1986	RK3		1986	09	06.82652	21	54	23.03	-05	33	51.5	17	071
1986	RK3		1986	09	06.84378	21	54	22.13	-05	34	04.2	17	071
1986	RL3		1986	09	06.82652	21	56	57.90	-05	28	30.8	17	071
1986	RL3		1986	09	06.84378	21	56	57.35	-05	28	35.2	17	071
1986	RM3		1986	09	06.82652	21	59	18.16	-05	24	09.6	17	071
1986	RM3		1986	09	06.84378	21	59	17.26	-05	24	09.2	17	071
1986	RN3		1986	09	06.82652	22	01	27.53	-05	24	59.5	17	071
1986	RN3		1986	09	06.84378	22	01	26.61	-05	24	59.7	17	071
1986	RJ4		1986	09	08.82916	21	37	26.59	-13	22	04.6	17	071
1986	RJ4		1986	09	08.85041	21	37	24.91	-13	21	50.9	17	071
1986	RJ4		1986	09	08.86957	21	37	23.17	-13	21	38.4	17	071
1986	RP4	*	1986	09	06.82652	21	54	33.26	-06	41	25.0	17	071
1986	RP4		1986	09	06.84378	21	54	32.68	-06	41	31.2	17	071
1986	RQ4	*	1986	09	06.82652	22	00	07.08	-06	24	25.6	18.5	071
1986	RQ4		1986	09	06.84378	22	00	06.33	-06	24	33.2	18.5	071
1986	RR4	*	1986	09	06.82652	22	01	54.87	-06	54	26.8	18.5	071
1986	RR4		1986	09	06.84378	22	01	54.23	-06	54	30.6	18.5	071
1986	RS4	*	1986	09	06.82652	22	03	35.54	-06	51	21.0	18	071
1986	RS4		1986	09	06.84378	22	03	34.98	-06	51	24.9	18	071
1986	RT4	*	1986	09	06.82652	22	04	53.92	-07	00	47.7	18	071
1986	RT4		1986	09	06.84378	22	04	53.27	-07	00	56.1	18	071
1986	RU4	*	1986	09	07.00156	01	37	20.23	+26	56	27.4	16.5	071
1986	RU4		1986	09	07.03587	01	37	19.45	+26	56	39.6	16.5	071
1986	RV4	*	1986	09	08.82916	21	34	52.30	-10	51	41.9	17	071
1986	RV4		1986	09	08.85041	21	34	51.43	-10	51	42.3	17	071
1986	RV4		1986	09	08.86957	21	34	50.87	-10	51	41.7	17	071
1986	RW4	*	1986	09	08.82916	21	34	58.90	-13	39	54.3	17	071
1986	RW4		1986	09	08.85041	21	34	58.16	-13	40	01.4	17	071
1986	RW4		1986	09	08.86957	21	34	57.27	-13	40	11.2	17	071
1986	RX4	*	1986	09	08.82916	21	37	15.38	-12	27	45.8	17	071
1986	RX4		1986	09	08.85041	21	37	14.47	-12	27	48.0	17	071
1986	RX4		1986	09	08.86957	21	37	13.42	-12	27	51.0	17	071
765			1986	09	08.82916	21	27	01.20	-14	03	14.2		071
765			1986	09	08.85041	21	26	59.80	-14	03	13.0		071
765			1986	09	08.86957	21	26	58.76	-14	03	15.5		071
778			1986	09	07.00156	01	38	49.04	+26	12	54.4		071
778			1986	09	07.03587	01	38	48.58	+26	13	11.5		071
1139			1986	09	07.00156	01	42	00.29	+25	17	39.6		071
1139			1986	09	07.03587	01	42	01.94	+25	17	38.7		071
1466			1986	09	08.82916	21	30	15.98	-13	12	46.6		071
1466			1986	09	08.85041	21	30	15.14	-13	12	58.2		071
1466			1986	09	08.86957	21	30	14.35	-13	13	09.5		071
1478			1986	09	08.82916	21	27	16.41	-12	28	07.0		071
1478			1986	09	08.85041	21	27	15.25	-12	28	07.1		071

1478		1986 09 08.86957	21 27 14.70	-12 28 09.1							071
1615		1986 09 08.82916	21 34 23.68	-14 17 14.2							071
1615		1986 09 08.85041	21 34 22.76	-14 17 20.1							071
1615		1986 09 08.86957	21 34 22.19	-14 17 25.0							071

092 Piwnice
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Observers M. Antal, M. Muciek
Measurer M. Antal
0.6-m Schmidt telescope
SAOC

1984	EN		1986 10 12.13750	03 21 00.96	+24 24 11.9				17.5	r	092
1986	TZ6		1986 10 12.13750	03 07 38.37	+26 17 56.1				17.5	N	092
1986	TA7		1986 10 12.13750	03 09 49.76	+26 43 16.5				17.5	N	092
1986	TN7	*	1986 10 09.05419	03 08 29.57	+26 30 49.9				17.2	r	092
1986	TN7		1986 10 09.11042	03 08 28.47	+26 30 44.6					r	092
1986	TN7		1986 10 11.06181	03 07 44.78	+26 27 21.1					r	092
1986	TN7		1986 10 11.09653	03 07 44.09	+26 27 17.8					r	092
1986	TO7	*	1986 10 09.05419	03 09 24.83	+26 23 30.6				18.6		092
1986	TO7		1986 10 09.11042	03 09 24.40	+26 23 30.3						092
1986	TP7	*	1986 10 09.05419	03 10 21.50	+25 42 00.8				18.2		092
1986	TP7		1986 10 09.11042	03 10 20.99	+25 41 58.4						092
1986	TQ7	*	1986 10 09.05419	03 10 33.14	+25 31 00.8				18.5		092
1986	TQ7		1986 10 09.11042	03 10 30.61	+25 30 49.7						092
1986	TR7	*	1986 10 09.05419	03 10 53.97	+26 50 08.5				17.4		092
1986	TR7		1986 10 09.11042	03 10 52.14	+26 50 07.3						092
1986	TS7	*	1986 10 09.05419	03 14 06.99	+25 40 06.5				18.2		092
1986	TS7		1986 10 09.11042	03 14 06.35	+25 39 57.4						092
1986	TT7	*	1986 10 09.05419	03 14 49.48	+26 45 19.0				18.4		092
1986	TT7		1986 10 09.11042	03 14 48.53	+26 45 32.3						092
1986	TU7	*	1986 10 09.05419	03 17 22.08	+26 59 41.8				18.0		092
1986	TU7		1986 10 09.11042	03 17 20.43	+26 59 49.5						092
1986	TV7	*	1986 10 09.05419	03 18 00.61	+23 48 10.5				17.5	r	092
1986	TV7		1986 10 09.11042	03 17 59.14	+23 48 20.6					r	092
1986	TW7	*	1986 10 09.05419	03 18 44.24	+27 42 45.5				17.5	r	092
1986	TW7		1986 10 09.11042	03 18 43.63	+27 42 39.7					r	092
1986	TX7	*	1986 10 09.05419	03 18 45.46	+26 16 26.9				18.6	M	092
1986	TX7		1986 10 09.11042	03 18 44.79	+26 16 20.7					M	092
1986	TY7	*	1986 10 09.05419	03 20 14.83	+24 58 50.0				18.2		092
1986	TY7		1986 10 09.11042	03 20 11.78	+24 58 58.5						092
1986	TZ7	*	1986 10 09.05419	03 21 03.49	+27 47 36.2				18.2	r	092
1986	TZ7		1986 10 09.11042	03 21 00.71	+27 47 44.5					r	092
1986	TA8	*	1986 10 09.05419	03 21 13.03	+24 57 25.4				18.7		092
1986	TA8		1986 10 09.11042	03 21 11.28	+24 57 30.8						092
1986	TB8	*	1986 10 09.05419	03 21 21.23	+27 11 59.1				18.4		092
1986	TB8		1986 10 09.11042	03 21 20.72	+27 12 06.2						092
1986	TC8	*	1986 10 09.05419	03 21 36.99	+25 36 18.8				18.0		092
1986	TC8		1986 10 09.11042	03 21 35.52	+25 36 09.1						092
1986	TD8	*	1986 10 09.05419	03 22 35.56	+26 00 06.1				18.3		092
1986	TD8		1986 10 09.11042	03 22 34.28	+26 00 04.0						092
1986	TE8	*	1986 10 09.05419	03 22 47.28	+25 25 40.8				18.2		092
1986	TE8		1986 10 09.11042	03 22 45.74	+25 25 56.8						092
1986	TF8	*	1986 10 09.05419	03 23 54.15	+26 32 36.8				17.7		092
1986	TF8		1986 10 09.11042	03 23 51.90	+26 32 43.6						092
1986	TG8	*	1986 10 09.05419	03 24 03.09	+26 24 37.3				18.5		092
1986	TG8		1986 10 09.11042	03 24 01.37	+26 24 38.1						092
1986	TH8	*	1986 10 09.05419	03 24 41.10	+24 42 11.5				17.9	r	092
1986	TH8		1986 10 09.11042	03 24 38.39	+24 42 23.4					r	092
1986	TJ8	*	1986 10 09.05419	03 25 19.26	+24 59 02.3				18.5	r	092

1986 TJ8 1986 10 09.11042 03 25 17.48 +24 59 09.8 r 092
1986 TK8 * 1986 10 09.05419 03 26 51.37 +25 34 35.2 18.3 r 092
1986 TK8 1986 10 09.11042 03 26 49.77 +25 34 41.9 r 092
1986 TL8 * 1986 10 09.05419 03 26 51.39 +25 17 27.6 18.5 r 092
1986 TL8 1986 10 09.11042 03 26 50.17 +25 17 53.8 r 092
1986 UY 1986 10 12.13750 03 14 15.65 +24 53 06.2 16.5 092
1986 UZ 1986 10 12.13750 03 16 46.79 +24 54 29.6 16.5 092
1986 VR5 1986 10 12.13750 03 25 28.70 +26 02 54.9 18.0 r 092
1226 1986 10 09.05419 03 20 48.63 +24 23 19.9 17.0 092
1226 1986 10 09.11042 03 20 46.76 +24 23 30.0 092
1226 1986 10 11.06181 03 19 40.39 +24 28 54.7 092
1226 1986 10 11.09653 03 19 39.18 +24 28 59.9 092
1226 1986 10 12.08333 03 19 03.08 +24 31 34.4 092
1226 1986 10 12.13750 03 19 01.04 +24 31 43.0 092
2154 1986 10 09.05419 03 24 31.58 +26 25 20.1 17.6 092
2154 1986 10 09.11042 03 24 30.03 +26 25 29.8 092
2154 1986 10 11.06181 03 23 35.01 +26 31 26.2 092
2154 1986 10 11.09653 03 23 33.97 +26 31 33.1 092
2154 1986 10 12.08333 03 23 03.44 +26 34 22.1 092
2154 1986 10 12.13750 03 23 01.69 +26 34 30.2 092
2730 1986 10 09.05419 03 18 05.25 +23 52 39.8 17.0 r 092
2730 1986 10 09.11042 03 18 03.26 +23 52 42.2 r 092
2730 1986 10 11.06181 03 16 52.68 +23 53 55.3 r 092
2730 1986 10 11.09653 03 16 51.37 +23 53 56.3 r 092
2730 1986 10 12.08333 03 16 13.59 +23 54 22.5 r 092
2730 1986 10 12.13750 03 16 11.38 +23 54 23.1 r 092
3564 1986 10 12.13750 03 23 55.96 +26 57 38.1 17.5 r 092

220 Kavalur
Long. and Parallax 78.83, -416, -092 (see MPC 11200)
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0.45-m f/3 Schmidt
SAOC
1987 BJ 1987 02 25.82778 09 22 38.8 +14 33 51 15.8 220
1987 BJ 1987 02 27.75486 09 21 20.8 +14 49 13 220
1987 BJ 1987 03 03.75000 09 18 58.9 +15 18 59 220
1987 BJ 1987 03 04.80903 09 18 25.5 +15 26 28 220
1987 DE 1987 02 25.82778 09 19 08.8 +12 43 23 15.2 220
1987 DE 1987 02 27.75486 09 17 57.5 +13 29 53 220
1987 DE 1987 03 02.72986 09 16 18.2 +14 39 44 220
1987 DE 1987 03 03.75000 09 15 47.3 +15 03 12 220
1987 DE 1987 03 04.80903 09 15 17.3 +15 27 07 220

293 Burlington remote site
T. Handley, 13 Linden Avenue, Burlington, NJ 08016, U.S.A.
0.20-m f/4.0 astrograph
SAOC
3417 1986 05 04.31042 14 24 50.32 -00 53 20.2 293
3417 1986 05 04.32500 14 24 49.53 -00 53 18.1 293

372 Geisei
T. Seki, Kamimachi 2-9-35, Kochi, Japan
0.60-m reflector
Copied in part from Nihondaira Obs. Circ.
1957 HK 1987 04 23.62639 13 18 31.75 -08 52 27.5 16.5 372
1957 HK 1987 04 23.64028 13 18 31.18 -08 52 15.1 372
1984 UQ 1987 04 23.67396 14 43 56.93 -11 09 08.9 15.5 372
1984 UQ 1987 04 23.68576 14 43 56.67 -11 09 01.8 372

1984 UQ		1987 04	24.66181	14	43	12.23	-10	57	39.0	16	372
1984 UQ		1987 04	24.67222	14	43	11.66	-10	57	33.4		372
1984 UQ		1987 04	27.67222	14	40	52.52	-10	22	32.4	16	372
1984 UQ		1987 04	27.68264	14	40	51.84	-10	22	24.3		372
1987 GB	*	1987 04	03.69861	13	30	01.00	-10	54	07.5	18	372
1987 GB		1987 04	03.71111	13	30	00.52	-10	54	02.9		372
1987 HB	*	1987 04	19.66388	14	45	49.44	-10	46	10.6	17	372
1987 HB		1987 04	19.67431	14	45	48.85	-10	46	01.1		372
1987 HD	*	1987 04	27.73299	19	35	09.11	-32	08	37.5	18	372
1987 HD		1987 04	27.74410	19	35	09.70	-32	08	34.7		372
1337		1987 03	24.72777	14	35	42.15	+03	40	40.8	18	372
1337		1987 03	24.74306	14	35	41.85	+03	40	50.3		372
1337		1987 03	26.75764	14	34	55.82	+03	58	52.7		372
1337		1987 03	26.77917	14	34	54.97	+03	59	03.6		372
2925		1987 04	23.62639	13	19	13.43	-09	08	24.4	17	372
2925		1987 04	23.64028	13	19	12.97	-09	08	17.4		372

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 GA	*	1987 04	03.56944	11	21	31.41	+20	32	43.4	16.5		391
1987 GA		1987 04	04.57847	11	20	45.46	+20	29	46.6	16.5		391
1987 GA		1987 04	05.55208	11	20	02.51	+20	26	39.4	17		391
1987 GA		1987 04	05.57465	11	20	01.44	+20	26	35.1			391
1987 GA		1987 04	05.57813	11	20	01.52	+20	26	33.7			391
1987 GA		1987 04	15.46354	11	14	11.60	+19	40	39.0	17		391
1987 GA		1987 04	15.46701	11	14	11.59	+19	40	38.8			391
1987 GA		1987 04	15.49722	11	14	10.58	+19	40	28.0			391
1987 GA		1987 04	16.45833	11	13	45.37	+19	34	41.0	17.0		391
1987 GA		1987 04	16.47743	11	13	45.31	+19	34	35.6			391
1987 GA		1987 04	16.53195	11	13	43.87	+19	34	18.9			391
1987 GA		1987 04	17.50000	11	13	20.49	+19	28	15.8	17		391
1987 GA		1987 04	17.50486	11	13	20.48	+19	28	15.8			391
1987 GA		1987 04	17.52257	11	13	20.16	+19	28	06.7			391
1987 GA		1987 04	17.52604	11	13	19.05	+19	28	04.5			391
1987 GA		1987 04	17.63021	11	13	17.09	+19	27	22.6			391
1987 GA		1987 04	18.50451	11	12	57.90	+19	21	46.3	17		391
1987 GA		1987 04	18.50833	11	12	58.15	+19	21	44.8			391
1987 GA		1987 04	18.52786	11	12	57.56	+19	21	34.7			391
1987 GA		1987 04	18.53125	11	12	57.46	+19	21	36.8			391
1987 GA		1987 04	20.56944	11	12	17.43	+19	07	42.8			391
1987 GA		1987 04	20.63021	11	12	16.38	+19	07	18.2			391
1987 GA		1987 04	24.48855	11	11	23.14	+18	38	39.6			391
1987 GA		1987 04	24.51216	11	11	22.79	+18	38	33.6			391
1987 GA		1987 04	27.47186	11	11	01.09	+18	14	36.4	17		391
1987 GA		1987 04	27.51771	11	11	00.59	+18	14	12.5			391
1987 GA		1987 04	29.46702	11	10	55.28	+17	57	36.3	17.5		391
1987 GA		1987 04	29.51424	11	10	55.24	+17	57	14.5			391
1987 GA		1987 04	30.47674	11	10	55.47	+17	48	42.2			391
1987 GA		1987 04	30.50174	11	10	55.42	+17	48	30.6			391
1987 GA		1987 05	04.46702	11	11	14.23	+17	11	48.1	17	p	391
1987 GA		1987 05	04.53855	11	11	14.04	+17	11	18.7			391

413 Siding Spring
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S-75120 Uppsala, Sweden
Observers C.-I. Lagerkvist, P. Magnusson, E. Onnela

Schmidt telescope, Uppsala Southern Station
AGK3, SAOC

1978	SL5		1986	03	09.56246	11	48	12.52	+00 31 16.8	413
1978	SL5		1986	03	09.59294	11	48	11.24	+00 31 24.8	413
1978	SL5		1986	03	10.56597	11	47	26.47	+00 35 51.2	413
1978	SL5		1986	03	10.59476	11	47	25.10	+00 35 59.2	413
1978	SL5		1986	04	02.48459	11	30	05.64	+02 20 24.2	413
1978	SL5		1986	04	02.50052	11	30	05.00	+02 20 28.6	413
1978	SL5		1986	04	09.43662	11	25	43.85	+02 46 59.2	413
1978	SL5		1986	04	09.45705	11	25	43.15	+02 47 03.1	413
1978	SL5		1986	04	09.52977	11	25	40.51	+02 47 18.0	413
1978	SL5		1986	04	09.55654	11	25	39.50	+02 47 24.8	413
1986	EJ1		1986	03	09.63103	12	57	34.38	-02 13 10.5	413
1986	EJ1		1986	03	09.67743	12	57	32.14	-02 13 16.9	413
1986	EJ1		1986	03	10.61861	12	56	46.60	-02 15 16.9	413
1986	EJ1		1986	03	10.65531	12	56	44.80	-02 15 22.4	413
1986	EE2		1986	03	10.56597	11	56	53.15	+01 27 31.2	413
1986	EE2		1986	03	10.59476	11	56	51.85	+01 27 49.2	413
1986	EZ4	*	1986	03	09.56246	11	49	41.35	+01 28 20.4	413
1986	EZ4		1986	03	09.59294	11	49	40.02	+01 28 29.3	413
1986	EZ4		1986	03	10.56597	11	48	46.78	+01 33 33.8	413
1986	EZ4		1986	03	10.59476	11	48	45.13	+01 33 42.0	413
1986	EA5	*	1986	03	09.56246	11	50	00.43	+01 09 15.7	413
1986	EA5		1986	03	09.59294	11	49	58.88	+01 09 11.9	413
1986	EB5	*	1986	03	12.65330	13	22	30.21	+01 18 55.7	413
1986	EB5		1986	03	12.67027	13	22	29.80	+01 18 59.7	413
1986	GD2	*	1986	04	02.48459	11	28	44.10	+00 55 09.2	413
1986	GD2		1986	04	02.50052	11	28	43.44	+00 55 13.8	413
1986	GE2	*	1986	04	02.48459	11	31	01.62	+03 05 32.4	413
1986	GE2		1986	04	02.50052	11	31	00.96	+03 05 36.6	413
1986	GF2	*	1986	04	11.48345	13	54	34.20	-21 28 21.8	413
1986	GF2		1986	04	11.50007	13	54	33.38	-21 28 20.8	413
1986	GG2	*	1986	04	14.42469	12	23	38.29	+00 12 51.9	413
1986	GG2		1986	04	14.44132	12	23	37.49	+00 12 51.4	413
1986	JW1	*	1986	05	11.53813	13	43	34.69	-16 46 38.4	413
1986	JW1		1986	05	11.55458	13	43	33.96	-16 46 32.3	413
1986	JW1		1986	05	11.59475	13	43	31.93	-16 46 17.2	413
1986	JW1		1986	05	11.61068	13	43	31.16	-16 46 09.7	413
37			1986	03	07.62956	11	54	53.37	+01 47 06.0	413
37			1986	03	07.64895	11	54	52.33	+01 47 11.5	413
37			1986	03	09.56246	11	53	11.56	+01 56 02.9	413
37			1986	03	09.59294	11	53	09.99	+01 56 09.8	413
37			1986	03	10.56597	11	52	18.00	+02 00 42.9	413
37			1986	03	10.59476	11	52	16.41	+02 00 50.6	413
37			1986	03	11.53346	11	51	26.12	+02 05 14.7	413
37			1986	03	11.55562	11	51	24.90	+02 05 21.0	413
37			1986	04	02.48459	11	32	26.14	+03 41 22.0	413
37			1986	04	02.50052	11	32	25.42	+03 41 25.7	413
37			1986	04	09.43662	11	27	36.18	+04 03 45.3	413
37			1986	04	09.45705	11	27	35.35	+04 03 48.2	413
37			1986	04	09.52977	11	27	32.58	+04 03 59.6	413
37			1986	04	09.55654	11	27	31.51	+04 04 04.1	413
474			1986	03	12.56016	12	58	06.70	-00 11 41.2	413
474			1986	03	12.58301	12	58	05.81	-00 11 30.4	413
763			1986	05	10.60764	15	12	58.75	-23 55 60.0	413
763			1986	05	10.62449	15	12	57.68	-23 55 55.0	413
763			1986	05	10.66882	15	12	54.85	-23 55 42.4	413
763			1986	05	10.68555	15	12	53.54	-23 55 37.2	413
1490			1986	04	10.49846	12	51	16.43	-19 46 38.3	413

1490	1986	04	10.51612	12	51	15.43	-19	46	29.6	413
1490	1986	04	11.45066	12	50	22.76	-19	39	10.8	413
1490	1986	04	11.46682	12	50	21.86	-19	39	03.1	413
1490	1986	04	14.49049	12	47	33.30	-19	14	34.2	413
1490	1986	04	14.50988	12	47	32.18	-19	14	23.3	413
1490	1986	04	14.55593	12	47	29.64	-19	14	01.0	413
1490	1986	04	14.57221	12	47	28.65	-19	13	53.0	413
1490	1986	05	11.44677	12	28	49.64	-15	18	46.0	413
1490	1986	05	11.46340	12	28	49.38	-15	18	36.2	413
1722	1986	03	09.56246	11	57	25.19	+01	26	17.4	413
1722	1986	03	09.59294	11	57	23.92	+01	26	28.9	413
1731	1986	03	09.63103	13	07	30.05	-02	05	56.9	413
1731	1986	03	09.67743	13	07	28.68	-02	05	43.6	413
1731	1986	03	10.61861	13	07	00.91	-02	01	05.4	413
1731	1986	03	10.65531	13	06	59.69	-02	00	53.2	413
1814	1986	03	09.63103	13	03	15.02	-04	33	53.5	413
1814	1986	03	09.67743	13	03	12.82	-04	33	45.3	413
1814	1986	03	10.61861	13	02	29.65	-04	30	59.9	413
1814	1986	03	10.65531	13	02	27.94	-04	30	54.3	413
2092	1986	04	14.42469	12	23	27.75	+01	54	46.1	413
2092	1986	04	14.44132	12	23	26.98	+01	54	48.7	413
2159	1986	03	07.62956	11	53	33.21	+00	26	52.4	413
2159	1986	03	07.64895	11	53	32.12	+00	26	56.9	413
2159	1986	03	09.56246	11	51	49.19	+00	34	53.7	413
2159	1986	03	09.59294	11	51	47.43	+00	35	01.2	413
2159	1986	03	10.56597	11	50	54.14	+00	39	09.7	413
2159	1986	03	10.59476	11	50	52.52	+00	39	16.6	413
2159	1986	03	11.53346	11	50	00.78	+00	43	17.6	413
2159	1986	03	11.55562	11	49	59.51	+00	43	22.9	413
2191	1986	04	11.48345	14	01	11.42	-20	35	55.8	413
2191	1986	04	11.50007	14	01	10.61	-20	35	50.2	413
2191	1986	04	14.52598	13	58	55.00	-20	20	27.0	413
2191	1986	04	14.54324	13	58	54.20	-20	20	21.9	413
2191	1986	04	14.58329	13	58	52.27	-20	20	10.1	413
2191	1986	05	11.53813	13	39	17.49	-17	35	27.7	413
2191	1986	05	11.55458	13	39	16.81	-17	35	21.9	413
2191	1986	05	11.59475	13	39	15.33	-17	35	06.8	413
2191	1986	05	11.61068	13	39	14.79	-17	35	02.6	413
2286	1986	03	09.63103	12	57	46.52	-04	12	19.7	413
2286	1986	03	09.67743	12	57	44.48	-04	12	07.7	413
2286	1986	03	10.61861	12	57	04.51	-04	07	48.0	413
2286	1986	03	10.65531	12	57	02.94	-04	07	39.3	413
2286	1986	04	14.42469	12	24	27.54	-00	51	04.8	413
2286	1986	04	14.44132	12	24	26.51	-00	51	00.6	413
2449	1986	03	09.63103	13	04	16.09	-04	05	10.8	413
2449	1986	03	09.67743	13	04	14.98	-04	04	03.9	413
2449	1986	03	10.61861	13	03	55.14	-03	42	04.3	413
2449	1986	03	10.65531	13	03	54.59	-03	41	21.0	413
2449	1986	03	21.63681	12	58	04.65	+01	02	51.5	413
2449	1986	03	21.65955	12	58	03.70	+01	03	29.2	413
2449	1986	04	09.56970	12	42	45.39	+10	00	00.4	413
2449	1986	04	09.58632	12	42	44.42	+10	00	28.7	413
2540	1986	03	07.62956	11	55	33.22	+00	03	34.1	413
2540	1986	03	07.64895	11	55	32.13	+00	03	42.3	413
2540	1986	03	09.56246	11	53	46.20	+00	16	37.5	413
2540	1986	03	09.59294	11	53	44.73	+00	16	46.8	413
2540	1986	03	10.56597	11	52	49.69	+00	23	29.9	413
2540	1986	03	10.59476	11	52	47.92	+00	23	42.0	413
2540	1986	03	11.53346	11	51	54.60	+00	30	11.5	413

2540		1986	03	11.55562	11	51	53.22	+00	30	20.9	413
2540		1986	04	09.43662	11	26	29.27	+03	37	16.0	413
2540		1986	04	09.45705	11	26	28.37	+03	37	21.1	413
2540		1986	04	09.52977	11	26	25.47	+03	37	42.1	413
2540		1986	04	09.55654	11	26	24.41	+03	37	50.0	413
2793		1986	03	09.56246	11	53	38.28	+01	46	08.3	413
2793		1986	03	09.59294	11	53	36.75	+01	46	06.4	413
2793		1986	03	10.56597	11	52	40.07	+01	45	29.6	413
2793		1986	03	10.59476	11	52	38.45	+01	45	28.7	413
2793		1986	04	09.43662	11	24	50.04	+01	21	11.1	413
2793		1986	04	09.45705	11	24	49.09	+01	21	09.8	413
2793		1986	04	09.52977	11	24	45.58	+01	21	03.6	413
2793		1986	04	09.55654	11	24	44.31	+01	21	01.9	413
2935		1986	04	09.49860	12	45	11.07	+14	11	33.0	413
2935		1986	04	09.51741	12	45	10.18	+14	11	41.0	413
2935		1986	04	09.60110	12	45	06.12	+14	12	14.9	413
2935		1986	04	09.62222	12	45	05.05	+14	12	24.2	413
3446		1986	04	14.45776	12	42	16.79	+00	17	11.8	413
3446		1986	04	14.47542	12	42	15.78	+00	17	13.3	413
3466		1986	04	14.45776	12	44	58.41	-01	04	29.5	413
3466		1986	04	14.47542	12	44	57.54	-01	04	23.8	413

474 Mount John
A. C. Gilmore, P.O. Box 57, Lake Tekapo, New Zealand
Observer A. C. Gilmore
Measurer P. M. Kilmartin
0.25-m astrograph (1) and 0.6-m f/14 Cassegrain reflector.
AGK3, SAOC, CPZ, field plates from Carter Observatory

1963	RH	1987	04	03.50392	13	22	55.19	-40	27	24.1	474
1963	RH	1987	04	03.53321	13	22	53.17	-40	27	20.5	474
1964	VE	1987	02	24.47530	09	31	20.33	-23	24	56.5	474
1964	VE	1987	02	24.50412	09	31	18.82	-23	24	35.7	474
1964	VE	1987	03	05.48149	09	24	18.24	-21	18	12.2	474
1976	QE1	1987	04	03.65503	14	04	19.30	-31	39	39.5	1 474
1976	QE1	1987	04	03.70203	14	04	17.00	-31	39	54.0	1 474
1981	DG3	1987	03	27.58704	13	55	27.17	-31	58	16.8	17 1 474
1981	DG3	1987	03	27.63241	13	55	25.27	-31	58	28.0	1 474
1981	DG3	1987	04	03.55994	13	50	13.99	-32	17	32.4	17 474
1981	DG3	1987	04	03.57788	13	50	13.05	-32	17	34.4	474
1981	WO1	1987	02	23.43537	08	47	44.21	-27	15	45.6	474
1981	WO1	1987	02	23.45753	08	47	42.98	-27	15	31.1	474
1983	NK	1987	02	24.54706	10	46	03.19	-11	34	36.4	474
1983	NK	1987	02	24.57229	10	46	01.95	-11	34	33.6	474
1986	AL	1987	02	24.60563	14	07	41.63	-33	00	09.4	t 474
1986	AL	1987	02	24.63086	14	07	41.81	-33	00	20.2	t 474
1986	PA	1986	09	09.44003	18	01	43.90	-18	05	36.1	474
1986	PA	1986	09	09.47279	18	01	39.66	-18	05	37.2	474
1987	GC1 *	1987	04	03.65503	14	05	19.35	-31	08	07.1	17 1 474
1987	GC1	1987	04	03.70203	14	05	17.55	-31	08	04.6	1 474
1987	JA *	1987	05	05.63935	15	41	34.20	-22	01	26.8	18 474
1987	JA	1987	05	05.66863	15	41	32.12	-22	01	22.7	474
1036		1987	02	24.42524	09	18	36.32	-18	14	54.3	474
1036		1987	02	24.44341	09	18	35.38	-18	14	45.6	474
1980		1987	03	05.42438	06	45	38.78	-14	46	47.8	474
1980		1987	03	05.44932	06	45	39.22	-14	46	29.7	474

491 Yebes
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E-28014 Madrid, Spain

Observers M. de Pascual, J. Martin-Pintado, J. Garcia, C. Cabanas, F. Sanchez

1985	KB1	*	1985	05	22.98903	13	43	21.64	-12	36 16.2	491
4			1985	05	20.98836	13	37	10.96	+01	36 25.9	491
4			1985	05	20.99528	13	37	10.74	+01	36 24.1	491
4			1985	05	21.00221	13	37	10.53	+01	36 23.1	491
4			1985	05	21.90114	13	36	45.32	+01	34 05.8	491
4			1985	05	21.90807	13	36	45.11	+01	34 04.8	491
4			1985	05	21.91500	13	36	44.93	+01	34 03.6	491
11			1985	05	21.12640	21	36	14.07	-13	16 25.7	491
11			1985	05	21.13038	21	36	14.34	-13	16 24.5	491
11			1985	05	21.14025	21	36	14.94	-13	16 22.3	491
11			1985	05	22.09391	21	37	17.58	-13	12 37.9	491
11			1985	05	22.10014	21	37	17.95	-13	12 37.2	491
11			1985	08	19.97813	21	38	18.89	-16	59 10.6	491
11			1985	08	19.98506	21	38	18.54	-16	59 13.4	491
11			1985	08	19.99198	21	38	18.15	-16	59 16.6	491
11			1985	08	20.96362	21	37	28.53	-17	05 53.4	491
11			1985	08	20.97055	21	37	28.19	-17	05 55.9	491
11			1985	08	20.97747	21	37	27.80	-17	05 58.7	491
11			1985	09	10.95605	21	22	50.81	-18	57 50.0	491
11			1985	09	10.96298	21	22	50.60	-18	57 51.3	491
11			1985	09	10.96990	21	22	50.36	-18	57 52.6	491
11			1985	09	11.90414	21	22	24.94	-19	01 10.1	491
11			1985	09	11.91314	21	22	24.75	-19	01 12.2	491
11			1985	09	11.92007	21	22	24.52	-19	01 13.6	491
11			1985	09	13.89833	21	21	35.33	-19	07 37.8	491
11			1985	09	13.90248	21	21	35.24	-19	07 38.5	491
11			1985	09	13.90313	21	21	35.12	-19	07 38.9	491
11			1985	10	14.90476	21	24	20.97	-19	14 39.9	491
11			1985	10	14.91168	21	24	21.19	-19	14 39.2	491
11			1985	10	14.91861	21	24	21.38	-19	14 37.7	491
11			1985	10	15.81338	21	24	51.62	-19	12 26.0	491
11			1985	10	15.81893	21	24	51.81	-19	12 26.0	491
11			1985	10	15.82447	21	24	51.99	-19	12 24.8	491
29			1985	07	11.95121	14	36	24.19	-22	51 41.5	491
39			1985	05	20.87640	10	46	43.63	+12	13 27.1	491
39			1985	05	20.88332	10	46	43.82	+12	13 25.7	491
39			1985	05	20.89059	10	46	44.03	+12	13 24.8	491
39			1985	05	21.88302	10	47	12.51	+12	11 18.6	491
39			1985	05	21.88995	10	47	12.71	+12	11 17.9	491
39			1985	05	21.89687	10	47	12.93	+12	11 16.4	491
135			1985	10	14.88052	23	42	54.31	+00	05 27.0	491
135			1985	10	15.89649	23	42	22.96	+00	03 06.3	491
148			1985	05	21.01005	18	04	45.47	+08	34 10.7	491
148			1985	05	21.01698	18	04	45.21	+08	34 11.8	491
148			1985	05	21.02390	18	04	44.97	+08	34 13.7	491
148			1985	05	22.03816	18	04	10.56	+08	37 51.5	491
148			1985	05	22.04509	18	04	10.31	+08	37 52.7	491
148			1985	05	22.05201	18	04	10.04	+08	37 55.1	491
148			1985	07	10.98128	17	25	11.65	+06	58 18.4	491
148			1985	07	10.98804	17	25	11.39	+06	58 15.3	491
148			1985	07	10.99496	17	25	11.08	+06	58 12.6	491
148			1985	07	11.95951	17	24	31.78	+06	50 48.8	491
148			1985	07	11.96644	17	24	31.54	+06	50 45.1	491
148			1985	07	11.97337	17	24	31.18	+06	50 42.0	491
148			1985	08	19.91794	17	13	48.67	+00	22 42.0	491
148			1985	08	19.92556	17	13	48.72	+00	22 36.1	491
148			1985	08	19.93317	17	13	48.73	+00	22 30.7	491

148	1985	08	20.90481	17	13	58.81	+00	11	53.1	491
148	1985	08	20.91174	17	13	58.86	+00	11	48.8	491
148	1985	08	20.91867	17	13	58.92	+00	11	44.6	491
148	1985	09	09.83309	17	21	47.17	-03	21	19.2	491
148	1985	09	09.84556	17	21	47.62	-03	21	27.0	491
148	1985	09	09.85768	17	21	48.07	-03	21	35.2	491
148	1985	09	10.84144	17	22	23.55	-03	31	40.4	491
148	1985	09	10.85252	17	22	23.98	-03	31	48.7	491
148	1985	09	10.86775	17	22	24.51	-03	31	58.3	491
379	1985	06	11.95207	14	43	21.47	-13	45	35.5	491
379	1985	06	14.92623	14	42	04.69	-13	40	24.5	491
389	1985	09	11.01008	04	44	29.51	+29	19	55.5	491
389	1985	09	11.01977	04	44	30.00	+29	19	56.4	491
389	1985	10	15.07963	04	59	35.05	+30	13	45.3	491
389	1985	10	15.08656	04	59	35.04	+30	13	45.4	491
389	1985	10	15.09348	04	59	34.99	+30	13	45.8	491
389	1985	10	16.06928	04	59	32.81	+30	14	20.0	491
389	1985	10	16.07620	04	59	32.81	+30	14	20.5	491
389	1985	10	16.08313	04	59	32.77	+30	14	20.3	491
395	1985	05	22.98903	13	40	15.59	-13	52	05.6	491
532	1985	09	11.04090	04	43	24.22	+06	50	29.4	491
532	1985	09	11.04713	04	43	24.40	+06	50	29.6	491
532	1985	09	11.05475	04	43	24.64	+06	50	27.9	491
657	1985	06	14.99202	17	51	23.33	-32	20	24.6	491
704	1985	07	11.08413	01	11	00.85	+26	34	33.2	491
704	1985	07	11.09106	01	11	01.25	+26	34	37.6	491
704	1985	07	11.09798	01	11	01.70	+26	34	43.1	491
704	1985	07	12.01162	01	11	58.33	+26	45	41.5	491
704	1985	07	12.01855	01	11	58.72	+26	45	47.4	491
704	1985	07	12.02547	01	11	59.12	+26	45	51.7	491
704	1985	09	09.87083	01	40	37.71	+36	15	51.6	491
704	1985	09	09.87637	01	40	37.64	+36	15	54.3	491
704	1985	09	09.88191	01	40	37.60	+36	15	56.3	491
704	1985	09	10.88887	01	40	21.98	+36	21	09.2	491
704	1985	09	10.89580	01	40	21.84	+36	21	11.2	491
704	1985	09	10.90273	01	40	21.69	+36	21	13.8	491
704	1985	10	14.93177	01	18	09.80	+36	31	13.8	491
704	1985	10	14.93869	01	18	09.42	+36	31	11.6	491
704	1985	10	14.94562	01	18	09.03	+36	31	10.1	491
704	1985	10	15.91796	01	17	18.45	+36	26	11.2	491
704	1985	10	15.92489	01	17	18.09	+36	26	08.4	491
704	1985	10	15.93181	01	17	17.72	+36	26	06.9	491
781	1985	05	20.93803	13	15	07.69	+17	02	17.0	491
781	1985	05	21.95990	13	14	48.77	+17	00	04.6	491
781	1985	05	22.87753	13	14	32.86	+16	57	54.8	491
816	1985	06	12.08296	18	27	31.36	-10	50	00.2	491
816	1985	06	15.06751	18	25	12.98	-10	57	02.9	491
910	1985	05	20.97024	14	54	26.28	-17	05	40.8	491
910	1985	05	21.98968	14	53	32.58	-17	06	12.5	491
910	1985	05	23.01742	14	52	39.18	-17	06	47.7	491
914	1985	10	15.05124	03	40	21.97	+39	48	01.2	491
914	1985	10	15.06370	03	40	21.38	+39	47	57.9	491
914	1985	10	16.02392	03	39	38.53	+39	42	51.3	491
914	1985	10	16.03656	03	39	37.90	+39	42	47.4	491
1036	1985	10	15.10560	05	04	49.62	+15	24	48.3	491
1036	1985	10	15.11253	05	04	49.52	+15	24	30.7	491
1036	1985	10	15.11945	05	04	49.48	+15	24	13.5	491
1036	1985	10	16.04746	05	04	44.80	+14	45	37.0	491
1036	1985	10	16.05439	05	04	44.73	+14	45	20.0	491

1036		1985	10	16.06131	05	04	44.64	+14	45	03.1	491
1036		1985	11	13.96966	04	41	17.93	-03	21	04.1	491
1036		1985	11	13.97382	04	41	17.65	-03	21	10.7	491
1036		1985	11	13.97797	04	41	17.23	-03	21	17.5	491
1036		1985	11	14.98909	04	40	00.99	-03	50	02.0	491
1036		1985	11	14.99809	04	40	00.32	-03	50	16.9	491
1036		1985	11	15.01020	04	39	59.33	-03	50	36.9	491
1339		1985	08	20.99744	20	28	36.14	-14	14	21.1	491
1627		1985	06	12.12555	20	38	15.77	+09	41	09.5	491
1627		1985	06	12.13247	20	38	17.57	+09	41	13.4	491
1627		1985	06	15.01384	20	51	28.21	+10	03	21.2	491
1627		1985	06	15.02077	20	51	30.12	+10	03	24.5	491
1627		1985	06	15.02769	20	51	31.99	+10	03	27.0	491
1627		1985	07	11.10612	23	03	06.87	+07	45	05.4	491
1627		1985	07	11.11305	23	03	08.81	+07	44	57.6	491
1627		1985	07	11.11997	23	03	10.79	+07	44	51.4	491
1627		1985	07	11.99224	23	07	30.94	+07	28	52.0	491
1627		1985	07	11.99916	23	07	32.92	+07	28	43.8	491
1627		1985	07	12.00609	23	07	34.96	+07	28	36.6	491
1627		1985	08	20.04208	01	12	04.56	-09	35	11.5	491
1627		1985	08	20.04901	01	12	05.05	-09	35	23.5	491
1627		1985	08	20.05593	01	12	05.43	-09	35	34.0	491
1627		1985	08	21.07258	01	13	17.05	-10	02	14.1	491
1627		1985	08	21.07950	01	13	17.43	-10	02	24.6	491
1627		1985	08	21.08643	01	13	17.80	-10	02	36.1	491
1627		1985	09	10.98272	01	18	53.94	-17	31	16.3	491
1627		1985	09	10.98964	01	18	53.71	-17	31	22.4	491
1627		1985	09	10.99657	01	18	53.49	-17	31	30.1	491
1759		1985	08	20.99744	20	32	27.28	-15	25	07.6	491
1836		1985	08	20.07221	21	35	48.29	-03	55	18.8	491
1836		1985	08	21.05838	21	34	58.25	-03	57	49.2	491
1836		1985	09	10.93389	21	20	34.57	-05	02	07.8	491
1836		1985	09	11.88406	21	20	12.62	-05	05	09.9	491
1866		1985	06	11.91225	14	36	33.74	-18	07	59.8	491
1866		1985	06	12.91678	14	33	20.61	-18	30	38.8	491
1866		1985	06	14.89506	14	27	07.00	-19	14	58.5	491
1943		1985	06	15.09695	21	32	01.04	+05	12	52.7	491
1943		1985	08	20.94065	20	20	04.18	+09	49	13.0	491
2669		1985	10	15.02007	02	43	40.88	+29	45	24.7	491
2669		1985	10	15.99518	02	43	02.12	+29	44	27.6	d 491
2860		1985	08	20.11618	23	46	44.03	+06	30	31.3	491
2860		1985	08	21.10444	23	45	47.33	+06	43	54.0	491
2906		1985	05	21.08658	16	50	53.44	-09	39	30.6	491
2906		1985	05	22.01877	16	50	04.29	-09	42	47.4	491
3224		1985	05	20.97024	14	56	05.68	-16	13	26.8	491
3224		1985	05	21.98968	14	55	21.24	-16	07	50.8	491
3224		1985	05	23.01742	14	54	37.26	-16	02	14.7	491
3382		1985	09	11.13093	00	10	42.98	+00	27	13.3	491
3382		1985	10	14.88052	23	39	52.83	+00	29	28.5	d 491
3382		1985	10	15.89649	23	39	17.16	+00	31	14.6	d 491

511 Haute Provence
E. W. Elst, Royal Observatory, B-1180 Brussels, Belgium

1986	UL1	1986	12	03.87049	03	24	44.17	+06	39	14.2	511
1986	UL1	1986	12	03.89549	03	24	42.85	+06	39	19.1	511
1986	UL1	1986	12	03.90313	03	24	42.37	+06	39	14.3	511
1986	UL1	1986	12	03.92951	03	24	41.33	+06	39	23.0	511
1986	UL1	1986	12	03.95208	03	24	39.91	+06	39	21.1	511
1986	UR4 *	1986	10	31.01944	02	57	20.55	+15	12	21.0	17 511

1986	UR4	1986	11	03.91632	02	54	03.54	+14 42 23.8	17	511
1986	UR4	1986	11	03.93299	02	54	02.77	+14 42 18.2		511
1986	VG1	1986	11	07.04826	04	08	11.93	+11 19 30.8		511
1986	VG1	1986	11	07.06215	04	08	11.42	+11 19 31.2		511
1986	VG1	1986	11	08.01146	04	07	38.12	+11 20 17.9	17	511
1986	VG1	1986	11	08.94722	04	07	04.77	+11 21 04.1	17	511
1986	VG1	1986	11	08.96632	04	07	04.20	+11 21 04.3		511
1986	VG1	1986	11	08.98715	04	07	03.24	+11 21 07.1		511
1986	XP	1986	12	03.87049	03	31	35.38	+07 25 26.5		511
1986	XP	1986	12	03.89549	03	31	34.15	+07 25 32.9		511
1986	XP	1986	12	03.90313	03	31	33.89	+07 25 41.6		511
1986	XP	1986	12	03.92951	03	31	32.70	+07 25 51.4		511
1986	XP	1986	12	03.95208	03	31	31.42	+07 25 58.8		511
242		1986	12	03.87049	03	40	10.37	+09 21 18.6		511
242		1986	12	03.89549	03	40	09.30	+09 21 15.7		511
242		1986	12	03.90313	03	40	08.83	+09 21 06.7		511
242		1986	12	03.92951	03	40	07.60	+09 21 02.2		511
242		1986	12	03.95208	03	40	06.41	+09 20 54.0		511
414		1986	12	03.87049	03	37	19.37	+08 23 45.3		511
414		1986	12	03.89549	03	37	18.46	+08 23 46.7		511
414		1986	12	03.90313	03	37	17.99	+08 23 41.6		511
414		1986	12	03.92951	03	37	16.70	+08 23 43.1		511
414		1986	12	03.95208	03	37	15.84	+08 23 45.0		511
756		1986	12	03.87049	03	31	26.85	+04 43 01.9		511
756		1986	12	03.89549	03	31	25.91	+04 43 00.1		511
756		1986	12	03.90313	03	31	25.50	+04 42 54.6		511
756		1986	12	03.92951	03	31	24.46	+04 42 47.0		511
756		1986	12	03.95208	03	31	23.65	+04 42 41.5		511
1059		1986	12	03.87049	03	33	03.24	+09 21 41.0		511
1059		1986	12	03.89549	03	33	01.93	+09 21 41.0		511
1059		1986	12	03.90313	03	33	01.34	+09 21 32.1		511
1059		1986	12	03.92951	03	33	00.01	+09 21 29.5		511
1059		1986	12	03.95208	03	32	58.92	+09 21 24.6		511
1583		1986	10	31.01944	02	54	38.20	+14 29 19.3		511
1583		1986	11	03.91632	02	52	34.12	+14 06 03.0		511
1583		1986	11	03.93299	02	52	33.56	+14 05 58.3		511

556 Reintal
F. Frevert, Dilichstrasse 1, D-6330 Wetzlar, Federal Republic of Germany
Observer F. Seiler
0.30-m f/6 reflector
AGK3, SAOC

141		1986	10	01.78333	22	33	19.16	+04 22 50.3		556
141		1986	10	01.80208	22	33	18.50	+04 22 49.4		556
141		1986	10	01.81944	22	33	17.77	+04 22 47.7		556
698		1986	11	30.81944	05	14	31.84	+33 31 27.6		556
698		1986	12	04.79167	05	10	17.03	+33 44 34.9		556
698		1986	12	04.80556	05	10	16.05	+33 44 36.8		556
698		1986	12	05.81597	05	09	09.69	+33 47 32.7		556
698		1986	12	05.83681	05	09	08.29	+33 47 38.2		556
3080		1986	11	30.84722	05	26	24.33	+34 26 06.5		556
3080		1986	12	04.83333	05	21	31.62	+34 46 39.2		556
3080		1986	12	04.84722	05	21	30.37	+34 46 42.4		556
3080		1986	12	04.86111	05	21	29.33	+34 46 45.8		556
3080		1986	12	05.86111	05	20	14.26	+34 51 32.2		556

563 Seewalchen
F. Frevert, Dilichstrasse 1, D-6330 Wetzlar, Federal Republic of Germany
Observer M. Bressler

0.25-m f/6 reflector
AGK3, SAOC

422	1986 11 28.88403	04 12 06.30	+29 17 41.6			563
422	1986 11 28.89861	04 12 05.05	+29 17 40.0			563
422	1986 11 28.91181	04 12 04.11	+29 17 39.1			563
422	1986 11 28.92569	04 12 02.99	+29 17 37.4			563
422	1986 11 28.93958	04 12 01.98	+29 17 36.2			563
3018	1986 08 04.00556	21 56 37.05	-02 21 43.8			563
3018	1986 08 04.01994	21 56 36.32	-02 21 45.6			563
3018	1986 08 04.03333	21 56 35.83	-02 21 47.7			563
3018	1986 08 04.04722	21 56 35.19	-02 21 48.2			563
3018	1986 08 04.06111	21 56 34.53	-02 21 50.0			563
3030	1986 10 17.81736	01 00 22.10	+15 17 19.8			563
3030	1986 10 17.83333	01 00 21.30	+15 17 14.3			563
3106	1986 01 05.79514	05 18 01.31	+10 19 57.5			563
3106	1986 01 05.80556	05 18 00.84	+10 20 01.8			563
3106	1986 01 05.82639	05 18 00.08	+10 20 11.1			563
3106	1986 01 05.83681	05 17 59.74	+10 20 14.3			563
3175	1986 10 24.79375	00 42 26.88	+04 43 28.1			563
3175	1986 10 24.80764	00 42 26.26	+04 43 21.3			563
3175	1986 10 24.84931	00 42 24.74	+04 43 12.7			563
3175	1986 10 24.86319	00 42 24.04	+04 43 05.8			563
3560	1986 11 25.90278	05 02 47.19	+36 23 20.4			563
3560	1986 11 25.91319	05 02 46.63	+36 23 20.0			563
3560	1986 11 25.92222	05 02 46.02	+36 23 20.1			563
3560	1986 11 25.92917	05 02 45.58	+36 23 20.2			563
3560	1986 11 25.95625	05 02 43.99	+36 23 17.9			563
3577	1986 11 25.98125	06 13 41.68	+24 49 56.5			563
3577	1986 11 26.00208	06 13 41.00	+24 49 56.5			563
3577	1986 11 26.01597	06 13 40.55	+24 49 55.4			563
3577	1986 11 26.02639	06 13 40.31	+24 49 53.2			563

657 Victoria, Climenhaga Observatory
J. B. Tatum, Dept. of Physics, University of Victoria, P.O. Box 1700, Victoria, BC, V8W 2Y2, Canada
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1982 UM7	1987 03 30.20104	11 11 11.17	+03 28 35.5			657
9	1986 10 12.29896	04 43 08.18	+19 25 48.0			657
19	1986 10 12.30868	04 09 11.65	+20 24 50.0			657
145	1987 03 30.17986	04 21 05.43	+23 51 04.2			657
299	1987 03 29.24306	11 14 24.04	+02 21 33.4			657
299	1987 03 30.20104	11 13 40.09	+02 26 52.6			657
409	1986 10 13.45174	05 14 36.87	+23 13 26.8			657
507	1987 03 29.22743	09 05 36.88	+09 08 53.4			657
562	1986 10 12.29896	04 41 25.39	+18 23 36.9			657
597	1986 10 13.40556	03 11 40.82	+18 34 44.0			657
924	1987 03 30.22500	10 21 44.28	+13 03 16.9			657
1152	1987 03 29.29896	10 08 13.91	+09 23 27.2			657
1223	1987 03 30.22500	10 18 04.99	+13 49 41.5			657
1302	1987 03 30.22500	10 22 15.40	+13 57 40.5			657

675 Palomar
J. Gibson, ITT/Federal Electric Corporation and Jet Propulsion Laboratory, MS 238-332, Pasadena, CA 91109, U.S.A. (1)
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Flagstaff, AZ 86001, U.S.A. (6)
Observers T. Gehrels, J. Gibson, E. Helin, C. Kowal, A. Maury, J. Mueller,
D. Schneeberger, C. Shoemaker, E. Shoemaker, S. Singer-Brewster
Measurers J. Alu, S. J. Bus, J. Gibson, C. Shoemaker, S. Singer-Brewster,
C. J. van Houten, I. van Houten-Groeneveld
1.5-m reflector, 1.2-m and 0.46-m Schmidt telescopes

A904	PC		1984	11	21.19827	03	02	59.73	+31	19	21.6	6 675
1932	EO		1978	10	26.36580	02	35	22.78	+24	32	41.9	6 675
1932	EO		1978	10	27.40920	02	34	27.01	+24	31	18.8	6 675
1949	QH1		1985	02	20.44062	11	02	58.13	+03	42	23.6	19.5 6 675
1949	QH1		1985	02	22.47188	11	01	02.26	+03	55	18.4	6 675
1976	SZ3		1985	02	22.41493	10	31	46.36	+10	25	28.6	6 675
1976	SZ3		1985	02	23.38507	10	30	49.68	+10	30	53.0	6 675
1978	RL1		1987	04	01.22639	10	37	23.72	+09	26	59.2	17.0 2 675
1978	RL1		1987	04	01.27500	10	37	22.29	+09	27	07.8	2 675
1978	RL1		1987	04	03.20000	10	36	28.09	+09	32	53.7	2 675
1978	RL1		1987	04	03.24861	10	36	26.72	+09	33	01.6	2 675
1978	TQ5		1978	10	26.36580	02	35	25.00	+24	07	16.6	16.5 6 675
1978	TQ5		1978	10	27.40920	02	34	33.83	+24	05	01.5	6 675
1978	TU5		1978	10	26.36580	02	42	42.10	+26	31	04.4	17.0 6 675
1978	TU5		1978	10	27.40920	02	41	35.08	+26	27	24.8	6 675
1978	UX2	*	1978	10	26.36580	02	35	41.89	+25	02	45.6	18.5 6 675
1978	UX2		1978	10	27.40920	02	34	53.43	+24	52	37.6	6 675
1978	UY2	*	1978	10	26.36580	02	38	04.62	+24	37	54.1	18.2 6 675
1978	UY2		1978	10	27.40920	02	36	59.45	+24	37	16.8	6 675
1978	UZ2	*	1978	10	26.36580	02	38	58.64	+29	57	26.9	16.5 6 675
1978	UZ2		1978	10	27.40920	02	38	01.40	+29	55	58.3	6 675
1978	UA3	*	1978	10	26.36580	02	39	14.11	+26	49	05.6	17.2 6 675
1978	UA3		1978	10	27.40920	02	38	16.32	+26	47	58.4	6 675
1978	UB3	*	1978	10	26.36580	02	41	41.03	+25	25	18.1	19.0 6 675
1978	UB3		1978	10	27.40920	02	40	32.15	+25	22	53.0	6 675
1978	UC3	*	1978	10	26.36580	02	45	14.81	+26	32	31.6	18.0 6 675
1978	UC3		1978	10	27.40920	02	44	04.22	+26	29	06.4	6 675
1978	UD3	*	1978	10	26.36580	02	48	01.75	+28	41	05.7	18.2 6 675
1978	UD3		1978	10	27.40920	02	47	05.29	+28	27	16.2	6 675
1978	UE3	*	1978	10	26.36580	02	49	05.58	+27	35	08.9	20.0 6 675
1978	UE3		1978	10	27.40920	02	48	18.11	+27	26	30.5	6 675
1978	UF3	*	1978	10	26.36580	02	49	07.98	+24	09	37.5	18.8 6 675
1978	UF3		1978	10	27.40920	02	48	01.31	+23	54	17.9	6 675
1978	UG3	*	1978	10	26.36580	02	51	10.98	+26	36	49.2	17.8 6 675
1978	UG3		1978	10	27.40920	02	50	11.49	+26	35	48.8	6 675
1978	UH3	*	1978	10	26.36580	02	51	38.91	+25	57	18.5	16.2 6 675
1978	UH3		1978	10	27.40920	02	50	40.59	+25	54	51.5	6 675
1978	UJ3	*	1978	10	26.36580	02	55	35.67	+28	28	16.8	17.2 6 675
1978	UJ3		1978	10	27.40920	02	54	32.79	+28	27	10.9	6 675
1978	UK3	*	1978	10	26.36580	02	55	46.61	+27	33	06.9	17.0 6 675
1978	UK3		1978	10	27.40920	02	54	40.75	+27	36	36.9	6 675
1978	UL3	*	1978	10	26.36580	02	56	30.59	+28	44	09.3	17.8 6 675
1978	UL3		1978	10	27.40920	02	55	40.20	+28	40	17.5	6 675
1979	FV1		1985	02	20.32737	10	19	57.31	+13	41	51.5	16.5 6 675
1979	FV1		1985	02	22.35799	10	18	22.09	+13	47	09.1	6 675
1979	MR5		1985	02	20.44062	10	58	25.79	+03	22	27.5	20.5 6 675
1979	MR5		1985	02	22.47188	10	56	32.68	+03	33	03.5	6 675
1979	TA		1985	02	22.41493	10	39	49.32	+06	15	29.4	6 675
1979	TA		1985	02	23.38507	10	38	54.56	+06	20	19.7	6 675
1980	TP		1985	02	20.32737	10	24	51.00	+09	39	55.0	18.2 6 675
1980	TP		1985	02	22.35799	10	22	43.11	+09	53	33.5	6 675
1980	TL15		1985	02	20.32737	10	15	41.20	+11	46	39.5	16.2 6 675

1980	TL15		1985	02	22.35799	10	13	46.33	+12	04	25.5		6 675
1981	EM5		1984	11	20.19202	03	16	11.36	+25	47	01.8		6 675
1981	EM5		1984	11	21.19827	03	15	19.97	+25	41	32.1		6 675
1981	EB9		1985	02	22.41493	10	40	25.22	+10	37	50.0		6 675
1981	EB9		1985	02	23.38507	10	39	26.23	+10	39	47.3		6 675
1981	EJ9		1985	02	20.44063	10	54	15.53	+03	42	35.4		6 675
1981	EJ9		1985	02	22.47188	10	52	26.57	+03	48	37.8		6 675
1981	EA11		1985	02	20.32743	10	24	50.07	+14	02	43.7		6 675
1981	EA11		1985	02	22.35799	10	22	52.23	+14	07	56.7		6 675
1981	EH11		1985	02	20.44063	10	53	59.72	+09	16	08.0		6 675
1981	EH11		1985	02	22.47188	10	52	04.40	+09	20	50.8		6 675
1981	EO14		1985	02	20.44063	11	04	44.96	+05	03	00.1		6 675
1981	EO14		1985	02	22.47188	11	02	50.69	+05	06	22.8		6 675
1981	EW14		1985	02	20.44063	10	50	38.62	+06	30	00.6		6 675
1981	EW14		1985	02	22.47188	10	48	39.65	+06	33	53.6		6 675
1981	EW14		1985	02	23.38507	10	47	45.69	+06	35	42.8		6 675
1981	EC15		1985	02	20.44063	10	50	54.58	+07	36	22.1		6 675
1981	EC15		1985	02	22.47188	10	49	02.09	+07	39	15.7		6 675
1981	EX15		1985	02	20.44063	11	10	41.99	+03	43	04.2		6 675
1981	EX15		1985	02	22.47188	11	08	58.93	+03	50	55.0		6 675
1981	ER18		1985	02	20.44063	10	53	22.19	+08	24	54.0		6 675
1981	ER18		1985	02	22.47188	10	51	25.84	+08	30	21.1		6 675
1981	EF19		1985	02	22.41493	10	29	46.91	+08	18	57.7		6 675
1981	EF19		1985	02	23.38507	10	28	50.05	+08	22	47.0		6 675
1981	EU20		1985	02	20.44063	10	47	45.23	+06	49	22.4		6 675
1981	EU20		1985	02	22.41493	10	46	02.74	+06	59	03.0		6 675
1981	EU20		1985	02	23.38507	10	45	11.79	+07	03	50.7		6 675
1981	EF21		1985	02	20.44063	10	50	02.37	+03	56	06.0		6 675
1981	EF21		1985	02	22.47188	10	48	30.63	+04	15	11.2		6 675
1981	ED22		1985	02	20.32743	10	01	39.16	+10	23	37.1		6 675
1981	ED22		1985	02	22.35799	09	59	50.61	+10	35	26.2		6 675
1981	EV24		1979	10	18.30764	01	44	59.34	+13	40	23.3		6 675
1981	EV24		1979	10	18.35972	01	44	56.12	+13	40	11.0		6 675
1981	EV24		1985	02	20.44063	11	06	11.16	+07	38	33.6		6 675
1981	EV24		1985	02	22.47188	11	04	22.66	+07	46	54.1		6 675
1981	EL32		1985	02	20.32743	10	15	32.19	+14	33	36.0		6 675
1981	EL32		1985	02	22.35799	10	13	21.97	+14	35	30.4		6 675
1981	EB33		1985	02	22.41493	10	24	26.39	+07	53	35.5		6 675
1981	EB33		1985	02	23.38507	10	23	30.02	+07	55	45.3		6 675
1981	EW39		1978	10	26.36580	02	36	56.02	+25	39	43.7		6 675
1981	EW39		1978	10	27.40920	02	36	01.42	+25	38	15.4		6 675
1981	EG44		1984	11	20.19202	03	19	20.62	+28	37	48.9		6 675
1981	EG44		1984	11	21.19827	03	18	22.44	+28	36	16.7		6 675
1981	EE46		1978	10	26.36580	02	53	54.74	+24	01	36.7		6 675
1981	EE46		1978	10	27.40920	02	53	01.81	+23	58	38.0		6 675
1981	PQ		1985	02	20.44062	11	10	43.66	+05	07	24.3	17.5	6 675
1981	PQ		1985	02	22.47188	11	09	27.06	+05	17	36.2		6 675
1981	SE1		1987	04	30.29236	13	09	38.04	-01	17	11.5	17.0	2 675
1981	SE1		1987	05	02.27153	13	08	05.58	-01	05	58.0		2 675
1983	CN3		1987	04	28.34444	10	33	59.18	+20	38	34.4	17.5	2 675
1983	CN3		1987	04	30.25035	10	34	46.28	+20	40	08.0		2 675
1984	UW		1984	11	20.19201	03	21	39.56	+27	12	41.2	17.0	6 675
1984	UW		1984	11	21.19827	03	20	46.88	+27	06	57.6		6 675
1984	UX		1984	11	20.19201	03	21	37.29	+30	08	33.3	16.0	6 675
1984	UX		1984	11	21.19827	03	20	38.82	+30	09	13.6		6 675
1984	WM1		1984	11	21.19827	03	21	56.60	+29	52	22.0	17.5	6 675
1984	WC2	*	1984	11	20.19201	02	58	56.24	+25	25	25.5	17.5	6 675
1984	WC2		1984	11	21.19827	02	58	05.39	+25	17	58.7		6 675
1984	WD2	*	1984	11	20.19201	03	01	00.29	+27	21	01.8	17.2	6 675

1984	WD2		1984	11	21.19827	03	00	02.40	+27	18	04.0	6 675
1984	WE2	*	1984	11	20.19201	03	05	38.64	+25	13	37.9	17.5 6 675
1984	WE2		1984	11	21.19827	03	04	32.49	+25	10	36.1	6 675
1984	WF2	*	1984	11	20.19201	03	05	55.83	+26	17	56.4	18.2 6 675
1984	WF2		1984	11	21.19827	03	05	05.29	+26	12	07.6	6 675
1984	WG2	*	1984	11	20.19201	03	07	00.89	+29	04	21.6	16.5 6 675
1984	WG2		1984	11	21.19827	03	05	56.14	+29	02	09.3	6 675
1984	WH2	*	1984	11	20.19201	03	10	21.27	+26	42	50.0	18.5 6 675
1984	WH2		1984	11	21.19827	03	09	07.15	+26	46	45.3	6 675
1984	WJ2	*	1984	11	20.19201	03	13	17.06	+27	31	16.6	17.8 6 675
1984	WJ2		1984	11	21.19827	03	12	07.25	+27	28	23.1	6 675
1984	WK2	*	1984	11	20.19201	03	15	12.10	+26	48	16.6	18.8 6 675
1984	WK2		1984	11	21.19827	03	14	20.23	+26	38	24.5	6 675
1984	WL2	*	1984	11	20.19201	03	15	36.61	+30	57	52.7	17.0 6 675
1984	WL2		1984	11	21.19827	03	14	26.16	+30	54	03.3	6 675
1984	WM2	*	1984	11	20.19201	03	18	25.18	+30	27	24.6	18.0 6 675
1984	WM2		1984	11	21.19827	03	17	30.45	+30	22	51.3	6 675
1984	WN2	*	1984	11	20.19201	03	19	20.71	+25	54	11.5	17.2 6 675
1984	WN2		1984	11	21.19827	03	18	28.02	+25	48	39.8	6 675
1985	CV		1985	02	20.32737	10	20	01.81	+13	41	31.5	16.2 6 675
1985	CV		1985	02	22.35799	10	18	16.82	+14	02	00.1	6 675
1985	CA2		1985	02	20.32737	10	20	24.30	+14	49	17.7	16.5 6 675
1985	CA2		1985	02	22.35799	10	18	22.77	+15	06	14.7	6 675
1985	CC2		1985	02	20.32737	10	23	35.38	+13	56	22.7	16.2 6 675
1985	CC2		1985	02	22.35799	10	21	36.22	+14	11	43.6	6 675
1985	CE2		1985	02	20.44062	11	01	29.51	+05	58	37.4	17.2 6 675
1985	CE2		1985	02	22.47188	10	59	54.89	+06	14	40.1	6 675
1985	CL2		1985	02	20.32737	10	21	11.90	+09	42	07.7	18.0 6 675
1985	CL2		1985	02	22.35799	10	19	20.16	+09	54	56.7	6 675
1985	CR2		1985	02	20.44062	10	57	06.94	+05	45	47.3	18.2 6 675
1985	CR2		1985	02	22.47188	10	55	12.03	+05	56	59.5	6 675
1985	DU1		1985	02	20.44063	11	01	56.18	+06	44	11.3	19.0 6 675
1985	DU1		1985	02	22.47188	11	00	13.33	+06	52	22.7	6 675
1985	DV2		1985	02	20.44062	10	50	02.87	+05	42	11.1	18.2 6 675
1985	DV2		1985	02	22.47188	10	48	26.19	+05	52	21.8	6 675
1985	DE3	*	1985	02	20.32737	10	01	13.84	+14	20	31.7	17.8 6 675
1985	DE3		1985	02	22.35799	09	59	35.17	+14	30	20.4	6 675
1985	DF3	*	1985	02	20.32737	10	04	10.04	+14	29	32.0	18.0 6 675
1985	DF3		1985	02	22.35799	10	02	37.47	+14	43	41.0	6 675
1985	DG3	*	1985	02	20.32737	10	04	19.18	+11	52	25.8	16.5 6 675
1985	DG3		1985	02	22.35799	10	02	35.52	+12	09	40.8	6 675
1985	DH3	*	1985	02	20.32737	10	05	31.57	+09	57	41.5	17.2 6 675
1985	DH3		1985	02	22.35799	10	03	51.97	+10	10	48.6	6 675
1985	DJ3	*	1985	02	20.32737	10	05	57.18	+12	19	36.5	17.8 6 675
1985	DJ3		1985	02	22.35799	10	04	03.03	+12	58	37.3	6 675
1985	DK3	*	1985	02	20.32737	10	06	09.95	+10	28	54.6	17.5 6 675
1985	DK3		1985	02	22.35799	10	03	57.76	+10	35	05.0	6 675
1985	DL3	*	1985	02	20.32737	10	06	51.83	+10	39	55.0	17.2 6 675
1985	DL3		1985	02	22.35799	10	04	30.86	+10	44	32.8	6 675
1985	DM3	*	1985	02	20.32737	10	07	01.22	+09	42	36.0	19.8 6 675
1985	DM3		1985	02	22.35799	10	04	59.97	+09	58	42.1	6 675
1985	DN3	*	1985	02	20.32737	10	09	18.00	+13	15	55.6	17.0 6 675
1985	DN3		1985	02	22.35799	10	07	46.06	+13	50	09.2	6 675
1985	DO3	*	1985	02	20.32737	10	14	01.96	+13	16	29.4	17.5 6 675
1985	DO3		1985	02	22.35799	10	12	09.75	+13	28	59.5	6 675
1985	DP3	*	1985	02	20.32737	10	17	29.77	+11	51	13.9	16.8 6 675
1985	DP3		1985	02	22.35799	10	15	58.31	+12	07	48.3	6 675
1985	DQ3	*	1985	02	20.32737	10	17	46.11	+13	39	31.2	17.5 6 675
1985	DQ3		1985	02	22.35799	10	16	06.15	+13	48	06.4	6 675

1985	DR3	*	1985	02	20.32737	10	17	52.57	+12	18	49.3	17.2	6 675
1985	DR3		1985	02	22.35799	10	16	17.31	+12	30	11.1		6 675
1985	DS3	*	1985	02	20.32737	10	18	04.62	+11	53	53.0	17.0	6 675
1985	DS3		1985	02	22.35799	10	15	55.90	+12	05	16.9		6 675
1985	DT3	*	1985	02	20.32737	10	19	25.93	+14	53	07.9	18.8	6 675
1985	DT3		1985	02	22.35799	10	17	27.69	+15	02	21.7		6 675
1985	DU3	*	1985	02	20.32737	10	21	05.39	+09	47	33.2	17.5	6 675
1985	DU3		1985	02	22.35799	10	19	26.23	+10	10	35.5		6 675
1985	DV3	*	1985	02	20.32737	10	23	05.71	+13	09	03.9	18.8	6 675
1985	DV3		1985	02	22.35799	10	21	30.63	+13	37	22.0		6 675
1985	DW3	*	1985	02	20.44062	10	47	55.61	+06	46	02.7		6 675
1985	DW3		1985	02	22.41493	10	45	58.86	+06	54	27.2	16.8	6 675
1985	DW3		1985	02	23.38507	10	45	00.68	+06	58	39.3		6 675
1985	DX3	*	1985	02	20.44062	10	55	11.74	+03	43	08.3	17.8	6 675
1985	DX3		1985	02	22.47188	10	53	29.99	+03	53	47.9		6 675
1985	DY3	*	1985	02	20.44062	10	57	36.99	+03	31	47.4	16.8	6 675
1985	DY3		1985	02	22.47188	10	55	41.56	+03	40	46.6		6 675
1985	DZ3	*	1985	02	20.44062	11	05	42.06	+07	37	03.5	19.0	6 675
1985	DZ3		1985	02	22.47188	11	03	35.94	+07	45	08.2		6 675
1985	DA4	*	1985	02	20.44062	11	07	34.87	+06	49	05.8	18.5	6 675
1985	DA4		1985	02	22.47188	11	06	09.37	+06	57	33.2		6 675
1985	DB4	*	1985	02	20.44063	10	59	57.99	+08	49	31.0	18.0	6 675
1985	DB4		1985	02	22.47188	10	58	06.88	+08	53	27.8		6 675
1985	DC4	*	1985	02	20.46667	10	55	48.04	+08	34	47.0	16.8	6 675
1985	DC4		1985	02	22.47188	10	54	04.51	+08	55	00.4		6 675
1985	DD4	*	1985	02	22.41493	10	25	01.37	+08	46	03.5	17.0	6 675
1985	DD4		1985	02	23.38507	10	24	09.03	+08	52	41.9		6 675
1985	DE4	*	1985	02	22.41493	10	29	35.80	+07	54	16.9	17.0	6 675
1985	DE4		1985	02	23.38507	10	28	40.55	+07	58	34.7		6 675
1985	DF4	*	1985	02	22.41493	10	33	40.03	+09	48	20.5	16.8	6 675
1985	DF4		1985	02	23.38507	10	32	54.05	+09	52	37.9		6 675
1985	DG4	*	1985	02	22.41493	10	34	29.25	+09	58	44.2	17.2	6 675
1985	DG4		1985	02	23.38507	10	33	49.06	+10	05	18.7		6 675
1985	DH4	*	1985	02	22.41493	10	37	02.70	+11	43	12.4	17.5	6 675
1985	DH4		1985	02	23.38507	10	36	19.97	+11	50	43.4		6 675
1985	DJ4	*	1985	02	22.41493	10	38	30.70	+09	20	19.9	18.5	6 675
1985	DJ4		1985	02	23.38507	10	37	33.94	+09	27	39.3		6 675
1985	DK4	*	1985	02	22.41493	10	42	35.95	+07	28	13.6	17.5	6 675
1985	DK4		1985	02	23.38507	10	41	39.80	+07	30	44.2		6 675
1985	DL4	*	1985	02	22.41493	10	44	47.05	+12	15	31.5	16.5	6 675
1985	DL4		1985	02	23.38507	10	43	54.29	+12	23	34.2		6 675
1985	PA		1986	06	26.25769	11	27	06.11	+53	51	21.8		1 675
1985	PA		1986	06	26.26308	11	27	07.20	+53	51	17.7		1 675
1985	PA		1986	07	26.17917	13	01	33.55	+45	59	26.6		1 675
1985	PA		1986	07	26.18958	13	01	35.29	+45	59	14.7		1 675
1985	PA		1986	07	28.24222	13	07	31.99	+45	19	51.4		1 675
1985	PA		1986	07	28.25236	13	07	33.72	+45	19	39.8		1 675
1985	PA		1986	08	15.21375	13	57	20.71	+39	08	28.3		1 675
1985	PA		1986	08	15.22340	13	57	22.25	+39	08	15.6		1 675
1985	PA		1986	08	16.23281	14	00	03.93	+38	46	16.2		1 675
1985	PA		1986	08	16.23819	14	00	04.81	+38	46	08.9		1 675
1985	PF		1985	08	17.44479	22	01	41.26	-07	15	41.6	16.5	2 675
1985	PF		1985	08	19.36146	22	00	29.44	-07	46	27.6		2 675
1985	TB4	*	1985	10	11.38732	02	07	18.35	+37	41	14.0	16.5	3 675
1985	TB4		1985	10	11.41805	02	07	16.24	+37	41	17.0		3 675
1985	TB4		1985	11	07.28888	01	37	52.57	+36	16	27.9		3 675
1985	TB4		1985	11	07.31597	01	37	50.94	+36	16	17.0		3 675
1985	VF2		1985	10	11.38732	02	08	24.28	+37	59	21.3	17.2	3 675
1985	VF2		1985	10	11.41805	02	08	23.00	+37	59	14.1		3 675

1985	VF2	*	1985	11	07.28889	01	46	09.26	+35	20	14.2	17	3 675
1985	VF2		1985	11	07.31597	01	46	08.06	+35	19	59.9		3 675
1985	VF2		1985	11	08.28177	01	45	23.54	+35	11	25.9		3 675
1985	YP		1986	01	07.32882	06	47	03.40	+16	58	01.2	16.5	2 675
1985	YP		1986	01	07.35179	06	47	01.03	+16	57	36.9		2 675
1986	TP2		1985	02	20.44062	11	07	34.52	+06	52	38.0	17.8	6 675
1986	TP2		1985	02	22.47188	11	05	42.80	+07	08	48.0		6 675
1987	DD		1987	03	17.37060	11	21	38.82	+52	11	10.5		1 675
1987	DD		1987	03	17.39144	11	21	37.29	+52	11	10.3		1 675
1987	DD1		1987	04	01.22639	10	39	59.65	+13	01	21.9	16.2	2 675
1987	DD1		1987	04	01.27500	10	39	58.28	+13	01	44.3		2 675
1987	DL1	*	1987	02	22.19444	07	48	10.00	+27	58	37.7	18.5	2 675
1987	DL1		1987	02	22.20833	07	48	08.54	+27	58	33.3		2 675
1987	DM1	*	1987	02	22.19444	07	48	46.85	+26	48	00.7	19	2 675
1987	DM1		1987	02	22.20833	07	48	45.34	+26	48	10.0		2 675
1987	DN1	*	1987	02	22.19444	07	54	07.54	+28	22	16.3	17.5	2 675
1987	DN1		1987	02	22.20833	07	54	05.75	+28	22	06.1		2 675
1987	FD1	*	1987	03	28.31667	12	22	03.83	+26	40	25.3	16.8	2 675
1987	FD1		1987	03	28.36528	12	22	01.37	+26	40	32.6		2 675
1987	FD1		1987	04	03.28472	12	17	08.16	+26	51	10.3		2 675
1987	FD1		1987	04	03.33333	12	17	05.84	+26	51	13.9		2 675
1987	FF1	*	1987	03	28.31667	12	30	26.06	+21	53	52.8	16.0	2 675
1987	FF1		1987	03	28.36528	12	30	23.44	+21	54	04.7		2 675
1987	FF1		1987	04	03.28472	12	25	02.78	+22	15	02.8		2 675
1987	FF1		1987	04	03.33333	12	25	00.25	+22	15	10.8		2 675
1987	FG1	*	1987	03	28.31667	12	31	52.16	+24	59	34.5	16.5	2 675
1987	FG1		1987	03	28.36528	12	31	49.38	+24	59	35.0		2 675
1987	FG1		1987	04	03.28472	12	26	17.65	+24	56	19.6		2 675
1987	FG1		1987	04	03.33333	12	26	14.94	+24	56	16.3		2 675
1987	FH1	*	1987	03	31.39236	14	31	18.69	+20	01	26.9	17.2	2 675
1987	FH1		1987	03	31.44097	14	31	15.50	+20	01	35.5		2 675
1987	FJ1	*	1987	03	31.39236	14	42	52.37	+19	33	53.3	17.0	2 675
1987	FJ1		1987	03	31.44097	14	42	50.27	+19	34	19.0		2 675
1987	FK1	*	1987	03	31.39236	14	47	20.49	+21	53	12.0	17.0	2 675
1987	FK1		1987	03	31.44097	14	47	19.22	+21	53	54.5		2 675
1987	GE	*	1987	04	01.15764	09	14	26.08	+25	22	38.9	16	2 675
1987	GE		1987	04	01.20625	09	14	23.88	+25	21	24.0		2 675
1987	GF	*	1987	04	01.22639	10	41	45.87	+06	49	58.3	17.2	2 675
1987	GF		1987	04	01.27500	10	41	45.97	+06	50	55.9		2 675
1987	GF		1987	04	03.20000	10	41	54.90	+07	29	10.6		2 675
1987	GF		1987	04	03.24861	10	41	55.11	+07	30	06.3		2 675
1987	GF		1987	04	12.26972	10	44	06.97	+10	02	12.9		1 675
1987	GF		1987	04	12.28229	10	44	07.23	+10	02	23.5		1 675
1987	GF		1987	04	14.40278	10	44	58.49	+10	31	44.7		1 675
1987	GF		1987	04	14.41285	10	44	58.71	+10	31	52.2		1 675
1987	GG	*	1987	04	02.45625	15	32	16.05	+32	57	45.7	16.2	2 675
1987	GG		1987	04	02.50486	15	32	17.08	+32	58	48.3		2 675
1987	GG		1987	04	06.39375	15	33	29.20	+34	23	06.1		2 675
1987	GG		1987	04	06.45677	15	33	29.84	+34	24	22.6		2 675
1987	GG		1987	04	11.34792	15	34	09.34	+36	01	13.8	16.5R	1 675
1987	GG		1987	04	11.37917	15	34	09.30	+36	01	49.1		1 675
1987	GG		1987	04	13.38014	15	34	09.66	+36	38	15.8		1 675
1987	GG		1987	04	13.39250	15	34	09.59	+36	38	28.8		1 675
1987	GH	*	1987	04	01.22639	10	30	42.63	+10	36	11.1	18.0	2 675
1987	GH		1987	04	01.27500	10	30	41.41	+10	36	17.0		2 675
1987	GH		1987	04	03.20000	10	29	51.32	+10	40	27.5		2 675
1987	GH		1987	04	03.24861	10	29	50.09	+10	40	32.4		2 675
1987	GJ	*	1987	04	01.22639	10	31	11.09	+10	33	28.3	17.8	2 675
1987	GJ		1987	04	01.27500	10	31	09.19	+10	33	26.7		2 675

1987	GJ		1987	04	03.20000	10	29	55.85	+10	32	34.6	2 675
1987	GJ		1987	04	03.24861	10	29	54.09	+10	32	32.2	2 675
1987	GK	*	1987	04	01.22639	10	32	09.78	+10	39	25.5	17.0 2 675
1987	GK		1987	04	01.27500	10	32	08.88	+10	39	49.5	2 675
1987	GK		1987	04	03.20000	10	31	39.09	+10	56	12.8	2 675
1987	GK		1987	04	03.24861	10	31	38.30	+10	56	33.1	2 675
1987	GL	*	1987	04	01.22639	10	41	18.65	+08	26	56.9	18.5 2 675
1987	GL		1987	04	01.27500	10	41	15.69	+08	26	40.9	2 675
1987	GL		1987	04	03.20000	10	39	11.50	+08	16	37.6	2 675
1987	GL		1987	04	03.24861	10	39	09.00	+08	16	22.3	2 675
1987	GM	*	1987	04	01.22639	10	33	35.76	+10	14	00.7	17.5 2 675
1987	GM		1987	04	01.27500	10	33	34.5	+10	14	05.1	2 675
1987	GM		1987	04	03.20000	10	32	43.85	+10	16	44.1	2 675
1987	GM		1987	04	03.24861	10	32	42.72	+10	16	45.8	2 675
1987	GN	*	1987	04	01.22639	10	35	30.80	+10	09	40.8	17.5 2 675
1987	GN		1987	04	01.27500	10	35	29.61	+10	10	03.0	2 675
1987	GN		1987	04	03.20000	10	34	42.68	+10	26	01.2	2 675
1987	GN		1987	04	03.24861	10	34	41.63	+10	26	22.6	2 675
1987	GO	*	1987	04	01.22639	10	42	15.64	+10	47	08.2	16.5 2 675
1987	GO		1987	04	01.27500	10	42	14.46	+10	47	26.3	2 675
1987	GO		1987	04	03.20000	10	41	32.49	+10	59	39.5	2 675
1987	GO		1987	04	03.24861	10	41	31.27	+10	59	57.5	2 675
1987	GP	*	1987	04	01.22639	10	44	17.83	+10	19	03.4	18.0 2 675
1987	GP		1987	04	01.27500	10	44	16.38	+10	19	22.7	2 675
1987	GP		1987	04	03.20000	10	43	19.35	+10	32	31.5	2 675
1987	GP		1987	04	03.24861	10	43	18.04	+10	32	50.6	2 675
1987	GQ	*	1987	04	01.22639	10	46	07.27	+10	28	30.5	16.5 2 675
1987	GQ		1987	04	01.27500	10	46	05.35	+10	28	29.5	2 675
1987	GQ		1987	04	03.20000	10	44	51.01	+10	27	57.4	2 675
1987	GQ		1987	04	03.24861	10	44	49.03	+10	27	55.1	2 675
1987	GR	*	1987	04	01.22639	10	46	39.03	+10	11	59.8	17.5 2 675
1987	GR		1987	04	01.27500	10	46	37.67	+10	12	07.8	2 675
1987	GR		1987	04	03.20000	10	45	39.37	+10	18	25.1	2 675
1987	GR		1987	04	03.24861	10	45	37.97	+10	18	33.1	2 675
1987	GS	*	1987	04	01.22639	10	35	57.79	+10	20	40.6	18.2 2 675
1987	GS		1987	04	01.27500	10	35	56.10	+10	20	52.6	2 675
1987	GS		1987	04	03.20000	10	34	55.78	+10	29	17.7	2 675
1987	GS		1987	04	03.24861	10	34	54.48	+10	29	28.4	2 675
1987	GT	*	1987	04	01.22639	10	37	56.02	+12	06	37.4	17.0 2 675
1987	GT		1987	04	01.27500	10	37	54.29	+12	06	50.3	2 675
1987	GT		1987	04	03.20000	10	36	49.19	+12	15	55.4	2 675
1987	GT		1987	04	03.24861	10	36	47.47	+12	16	08.7	2 675
1987	GU	*	1987	04	01.22639	10	41	08.76	+12	18	04.0	17.5 2 675
1987	GU		1987	04	01.27500	10	41	06.82	+12	18	19.1	2 675
1987	GV	*	1987	04	01.22639	10	47	55.50	+11	45	14.3	17.8 2 675
1987	GV		1987	04	01.27500	10	47	54.15	+11	45	15.6	2 675
1987	GV		1987	04	03.20000	10	47	00.65	+11	45	46.3	2 675
1987	GV		1987	04	03.24861	10	46	59.20	+11	45	46.2	2 675
1987	GW	*	1987	04	01.22639	10	48	22.68	+11	55	23.1	18.0 2 675
1987	GW		1987	04	01.27500	10	48	20.48	+11	55	10.1	2 675
1987	GW		1987	04	03.20000	10	46	56.57	+11	46	01.2	2 675
1987	GW		1987	04	03.24861	10	46	54.61	+11	45	47.0	2 675
1987	GX	*	1987	04	03.28472	12	25	19.87	+22	32	02.9	17.0 2 675
1987	GX		1987	04	03.33333	12	25	17.50	+22	32	31.1	2 675
1987	GY	*	1987	04	01.22639	10	35	02.33	+09	38	18.0	16.5 2 675
1987	GY		1987	04	01.27500	10	35	00.91	+09	38	23.8	2 675
1987	GY		1987	04	03.20000	10	34	03.95	+09	42	45.3	2 675
1987	GY		1987	04	03.24861	10	34	02.44	+09	42	51.0	2 675
1987	GZ	*	1987	04	01.22639	10	38	14.05	+09	13	48.6	17.0 2 675

1987	GZ		1987	04	01.27500	10	38	12.59	+09	14	01.1		2 675
1987	GZ		1987	04	03.20000	10	37	17.28	+09	22	43.4		2 675
1987	GZ		1987	04	03.24861	10	37	16.01	+09	22	55.1		2 675
1987	GA1	*	1987	04	01.22639	10	38	33.28	+09	03	59.5	17.0	2 675
1987	GA1		1987	04	01.27500	10	38	31.57	+09	04	13.2		2 675
1987	GA1		1987	04	03.20000	10	37	26.61	+09	13	13.0		2 675
1987	GA1		1987	04	03.24861	10	37	25.08	+09	13	25.3		2 675
1987	GB1	*	1987	04	01.22639	10	40	48.07	+09	27	25.9	16.8	2 675
1987	GB1		1987	04	01.27500	10	40	46.69	+09	27	33.9		2 675
1987	GB1		1987	04	03.20000	10	39	53.54	+09	32	47.9		2 675
1987	GB1		1987	04	03.24861	10	39	52.42	+09	32	55.6		2 675
1987	HA	*	1987	04	23.22899	13	07	44.04	+34	23	49.6	17.7	3 675
1987	HA		1987	04	23.25729	13	07	42.09	+34	23	13.1		3 675
1987	HC		1987	04	21.21215	11	46	26.19	+00	44	56.3	16.8	3 675
1987	HC		1987	04	24.20920	11	45	57.73	+01	42	50.2		3 675
1987	HC		1987	04	25.24844	11	45	51.94	+02	01	57.6		3 675
1987	HC	*	1987	04	28.35625	11	45	46.92	+02	56	08.6	16.2	2 675
1987	HC		1987	04	30.25590	11	45	53.71	+03	27	01.8		2 675
1987	HC		1987	05	02.23476	11	46	08.06	+03	57	20.3		2 675
1987	HE	*	1987	04	23.32673	14	29	46.55	+19	47	18.9	17.8	3 675
1987	HE		1987	04	25.35277	14	28	25.95	+20	20	10.0		3 675
1987	HF	*	1987	04	28.34444	10	25	42.87	+23	22	48.4	17.5	2 675
1987	HF		1987	04	30.25035	10	26	06.12	+23	17	57.3		2 675
1987	HG	*	1987	04	30.26736	13	34	17.12	-00	49	32.9	17.0	2 675
1987	HG		1987	05	02.27656	13	32	44.95	-00	47	05.3		2 675
1987	HH	*	1987	04	30.26736	13	50	43.65	+03	13	21.9	17.0	2 675
1987	HH		1987	05	02.27656	13	48	52.94	+03	08	36.9		2 675
1987	HJ	*	1987	04	30.26736	13	55	51.37	+01	20	02.8	17.0	2 675
1987	HJ		1987	05	02.27656	13	54	18.17	+01	30	48.2		2 675
1987	HK	*	1987	04	21.37986	15	52	18.30	-21	55	06.0	18.2	3 675
1987	HK		1987	04	22.39357	15	51	43.42	-21	53	45.3		3 675
1987	HL	*	1987	04	25.33385	14	50	29.01	+14	46	55.8	18	3 675
1987	HL		1987	04	25.37094	14	50	27.48	+14	47	10.5		3 675
1987	HM	*	1987	04	27.33333	13	15	03.59	-08	07	00.9	17.0	2 675
1987	HM		1987	04	29.26250	13	13	45.20	-07	49	06.6		2 675
6582	P-L	*	1960	09	24.35002	23	53	29.19	-00	57	29.8	18.0	4 675
6582	P-L		1960	09	26.28543	23	52	04.25	-01	06	19.9		4 675
6582	P-L		1960	09	27.34237	23	51	18.06	-01	11	06.7		4 675
6582	P-L		1960	09	28.33822	23	50	34.68	-01	15	36.7		4 675
6582	P-L		1960	10	17.21390	23	38	22.69	-02	30	44.2		4 675
6582	P-L		1960	10	22.15559	23	35	55.89	-02	45	27.9		4 675
6582	P-L		1960	10	24.18787	23	35	02.55	-02	50	43.5		4 675
6582	P-L		1960	10	26.26113	23	34	12.93	-02	55	39.1		4 675
9522	P-L	*	1960	10	17.22501	23	29	31.39	-03	17	14.9	18.3	4 675
9522	P-L		1960	10	22.16324	23	27	09.49	-03	19	40.8		4 675
9522	P-L		1960	10	24.23753	23	26	20.21	-03	19	48.8		4 675
9522	P-L		1960	10	26.27157	23	25	37.90	-03	19	24.0		4 675
183			1987	04	22.44739	16	30	35.34	+12	40	26.1	17	3 675
183			1987	04	25.47118	16	29	01.39	+13	00	05.0		3 675
303			1985	02	20.44063	11	00	38.81	+07	07	58.8		6 675
303			1985	02	22.47188	10	59	03.17	+07	13	57.2		6 675
699			1978	10	26.36580	02	51	45.31	+29	33	51.2		6 675
699			1978	10	27.40920	02	50	46.70	+29	16	23.4		6 675
1091			1985	02	20.44063	10	54	16.21	+08	43	53.9		6 675
1091			1985	02	22.47188	10	52	51.91	+08	52	49.0		6 675
1148			1985	02	22.41493	10	47	32.53	+11	09	51.4		6 675
1148			1985	02	23.38507	10	46	50.65	+11	16	43.2		6 675
2027			1987	04	28.34444	10	35	35.95	+22	04	43.5	17.2	2 675
2027			1987	04	30.25035	10	35	42.37	+21	54	42.4		2 675

2057		1985	02	22.41493	10	26	18.21	+11	14	13.5	6 675
2057		1985	02	23.38507	10	25	31.27	+11	18	28.6	6 675
2064		1984	11	20.19201	03	00	32.37	+27	04	57.9	6 675
2064		1984	11	21.19827	02	59	21.56	+26	57	16.9	6 675
2117		1987	04	01.22639	10	38	45.43	+12	47	52.4	16.5 2 675
2117		1987	04	01.27500	10	38	43.72	+12	47	58.5	2 675
2117		1987	04	03.20000	10	37	44.46	+12	51	39.5	2 675
2117		1987	04	03.24861	10	37	42.89	+12	51	44.9	2 675
2199		1985	08	19.18715	20	25	36.74	-15	56	46.9	16.0 2 675
2199		1985	08	19.21563	20	25	36.03	-15	57	06.2	2 675
2199		1985	08	21.24618	20	24	44.32	-16	18	23.9	2 675
2199		1985	08	21.27326	20	24	43.96	-16	18	44.1	2 675
2209		1985	02	20.44063	10	58	36.22	+07	10	16.2	6 675
2209		1985	02	22.47188	10	57	02.13	+07	21	50.2	6 675
2353		1987	04	01.22639	10	39	20.84	+12	55	31.5	16.2 2 675
2353		1987	04	01.27500	10	39	19.16	+12	55	35.2	2 675
2353		1987	04	03.20000	10	38	13.99	+12	58	13.1	2 675
2353		1987	04	03.24861	10	38	12.37	+12	58	16.6	2 675
2924		1987	04	01.22639	10	48	14.86	+11	45	11.0	16.8 2 675
2924		1987	04	01.27500	10	48	13.31	+11	45	18.5	2 675
2924		1987	04	03.20000	10	47	11.39	+11	50	50.5	2 675
2924		1987	04	03.24861	10	47	09.98	+11	50	57.7	2 675
3292		1985	02	20.44062	11	03	32.30	+08	06	02.6	6 675
3292		1985	02	22.47188	11	02	01.31	+08	15	13.3	6 675
3302		1987	04	01.22639	10	36	24.29	+10	11	12.7	17.2 2 675
3302		1987	04	01.27500	10	36	22.65	+10	11	24.0	2 675
3302		1987	04	03.20000	10	35	20.37	+10	19	09.4	2 675
3302		1987	04	03.24861	10	35	18.80	+10	19	20.3	2 675
3323		1985	02	20.44063	10	59	34.14	+07	16	50.8	6 675
3323		1985	02	22.47188	10	57	45.16	+07	27	46.6	6 675
3478		1987	04	01.22639	10	48	47.66	+12	12	40.2	16.8 2 675
3478		1987	04	01.27500	10	48	45.85	+12	12	50.0	2 675
3478		1987	04	03.20000	10	47	36.73	+12	19	33.2	2 675
3478		1987	04	03.24861	10	47	35.10	+12	19	42.1	2 675
3510		1978	10	26.36580	02	45	51.59	+24	13	30.5	6 675
3510		1978	10	27.40920	02	44	51.30	+24	08	40.0	6 675
3554		1987	02	08.46486	14	19	26.44	+08	25	53.0	1 675
3554		1987	02	09.49139	14	19	10.84	+08	07	23.9	1 675
3554		1987	02	09.50486	14	19	10.52	+08	07	09.4	1 675

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Observers B. A. Skiff, S. J. Bus
Measurers E. Bowell, B. A. Skiff, S. J. Bus
1.8-m reflector + CCD (1) and 0.33-m photographic telescope
PDS scanning microdensitometer
AGK3 and Perth 70 secondary nets, global solutions
See also MPC 9533

1931	TW	1987	03	27.28936	12	59	34.15	-08	19	16.4	17.2 688
1931	TW	1987	03	27.37866	12	59	28.46	-08	18	53.8	688
1966	TE	1987	03	27.28936	13	05	44.38	-07	32	22.9	17.0 688
1966	TE	1987	03	27.37866	13	05	36.28	-07	32	50.5	688
1976	SJ4	1987	03	04.26442	11	28	43.49	-02	40	32.2	16.5 688
1976	SJ4	1987	03	04.33132	11	28	40.08	-02	40	00.5	688
1978	QX	1987	03	03.22265	10	29	49.02	+08	47	48.5	17.0 688
1978	QX	1987	03	03.29022	10	29	44.56	+08	48	12.7	688
1978	VB5	1987	03	03.24532	10	45	15.28	+22	06	53.6	17.2 P 688
1978	VB5	1987	03	03.31228	10	45	10.98	+22	07	19.4	688

1980	RU2		1987	03	03.26743	11	07	09.24	+08	13	03.5	17.2	688
1980	RU2		1987	03	03.33422	11	07	05.16	+08	13	14.7		688
1981	EF		1987	03	27.28936	12	48	38.78	-10	55	29.4	17.2	688
1981	EF		1987	03	27.37866	12	48	34.04	-10	55	23.6		688
1981	TC3		1987	03	03.22265	10	32	04.34	+05	23	49.8	17.5	688
1981	TC3		1987	03	03.29022	10	32	00.16	+05	24	15.1		688
1982	DU		1987	03	03.22265	10	45	37.61	+08	50	09.6	16.5	688
1982	DU		1987	03	03.29022	10	45	33.04	+08	49	57.3		688
1982	UJ2		1987	03	04.28703	12	05	41.27	+04	27	26.4	17.2	688
1982	UJ2		1987	03	04.35365	12	05	37.50	+04	27	41.6		688
1982	UM7		1987	03	04.26442	11	34	13.22	+00	03	37.3	16.8	688
1982	UM7		1987	03	04.33132	11	34	09.57	+00	04	06.9		688
1984	AQ		1986	11	25.16700	00	42	08.26	-10	08	51.3	1	688
1984	AQ		1986	11	25.17581	00	42	08.15	-10	08	49.6	1	688
1984	GA		1987	03	03.26743	11	09	54.21	+06	59	07.6	17.0	688
1984	GA		1987	03	03.33422	11	09	49.78	+06	59	27.6		688
1984	SH5		1987	03	03.22265	10	27	22.82	+06	37	00.5	17.2	688
1984	SH5		1987	03	03.29022	10	27	20.29	+06	37	14.1		688
1985	QQ		1987	03	27.26733	12	40	26.07	-03	16	14.0	17.2	688
1985	QQ		1987	03	27.35633	12	40	20.17	-03	15	53.5		688
1985	QS		1987	03	27.26733	12	22	37.65	-00	47	37.4	17.0	688
1985	QS		1987	03	27.35633	12	22	31.88	-00	47	17.2		688
1985	RK		1987	03	03.22265	10	44	00.63	+07	31	41.8	17.8	688
1985	RK		1987	03	03.29022	10	43	56.38	+07	31	55.9		688
1986	LA		1986	11	25.19306	00	05	55.88	+04	32	31.9	1	688
1986	LA		1986	11	25.19821	00	05	56.68	+04	32	30.4	1	688
1986	LA		1986	12	31.06936	01	29	26.28	+05	23	58.6	1	688
1986	LA		1986	12	31.07525	01	29	27.00	+05	24	00.3	1	688
1986	RA		1986	12	31.09565	02	07	31.36	-12	24	41.7	1	688
1986	RA		1986	12	31.10078	02	07	31.79	-12	24	37.1	1	688
1986	WA		1986	12	31.08236	01	42	20.38	+04	29	52.3	1	688
1986	WA		1986	12	31.08671	01	42	20.80	+04	29	51.8	1	688
1987	CJ		1987	03	03.26743	11	00	30.73	+08	26	07.7	16.5	688
1987	CJ		1987	03	03.33422	11	00	27.66	+08	26	39.7		688
1987	DF		1987	03	03.22265	10	29	12.80	+08	32	14.4	16.8	D 688
1987	DF		1987	03	03.29022	10	29	09.21	+08	33	26.3		688
1987	DD1		1987	03	03.26743	10	59	38.19	+07	56	17.5	16.2	688
1987	DD1		1987	03	03.33422	10	59	34.83	+07	57	05.1		688
1987	DH1		1987	03	03.24532	10	46	59.14	+22	16	33.1	17.0	688
1987	DH1		1987	03	03.31228	10	46	55.76	+22	16	57.2		688
1987	EG	*	1987	03	03.22265	10	26	08.41	+06	46	37.7	17.0	P 688
1987	EG		1987	03	03.29022	10	26	05.49	+06	47	14.3		688
1987	EH	*	1987	03	03.22265	10	36	30.51	+05	52	36.0	17.2	688
1987	EH		1987	03	03.29022	10	36	27.44	+05	53	09.1		688
1987	EK	*	1987	03	03.22265	10	48	13.33	+07	30	00.6	17.2	R 688
1987	EK		1987	03	03.29022	10	48	10.66	+07	30	20.7		688
1987	EL	*	1987	03	03.24532	10	42	16.54	+24	00	48.9	17.0	688
1987	EL		1987	03	03.31228	10	42	13.10	+24	01	03.7		688
1987	EM	*	1987	03	03.24532	10	46	10.23	+21	29	21.5	16.5	688
1987	EM		1987	03	03.31228	10	46	06.80	+21	30	02.8		688
1987	EN	*	1987	03	03.24532	10	47	15.23	+20	28	16.2	16.5	688
1987	EN		1987	03	03.31228	10	47	11.22	+20	28	41.7		688
1987	EO	*	1987	03	03.24532	10	51	15.69	+20	22	02.3	16.8	688
1987	EO		1987	03	03.31228	10	51	12.11	+20	22	38.7		688
1987	EP	*	1987	03	03.26743	10	52	50.05	+05	20	49.0	17.2	688
1987	EP		1987	03	03.33422	10	52	46.76	+05	21	19.6		688
1987	EQ	*	1987	03	03.26743	10	58	57.42	+05	14	35.3	17.0	688
1987	EQ		1987	03	03.33422	10	58	52.94	+05	14	56.4		688
1987	ER	*	1987	03	03.26743	11	13	32.43	+05	43	22.3	17.2	688

1987	ER		1987	03	03.33422	11	13	29.05	+05	43	55.4		688
1987	ES	*	1987	03	03.36022	12	28	39.30	-04	46	42.8	17.5	688
1987	ES		1987	03	03.40791	12	28	37.04	-04	46	42.1		688
1987	ET	*	1987	03	03.36022	12	34	43.76	-03	24	22.0	17.2	688
1987	ET		1987	03	03.40791	12	34	41.52	-03	24	20.4		688
1987	EU	*	1987	03	04.24197	09	51	38.40	-01	45	53.2	17.5	688
1987	EU		1987	03	04.30918	09	51	34.38	-01	45	42.5		688
1987	EV	*	1987	03	04.26442	11	38	31.27	-03	18	07.1	17.0	688
1987	EV		1987	03	04.33132	11	38	27.16	-03	17	56.3		688
1987	EW	*	1987	03	04.28703	11	47	00.68	+04	45	17.9	17.2	688
1987	EW		1987	03	04.35365	11	46	57.85	+04	45	38.7		688
1987	EX	*	1987	03	04.28703	11	49	10.86	+03	09	25.5	17.5	688
1987	EX		1987	03	04.35365	11	49	07.31	+03	10	01.0		688
1987	EY	*	1987	03	04.28703	11	51	11.12	+07	19	50.1	16.8	688
1987	EY		1987	03	04.35365	11	51	08.34	+07	20	16.9		688
1987	EZ	*	1987	03	04.28703	12	06	34.62	+01	10	51.8	16.5	R 688
1987	EZ		1987	03	04.35365	12	06	31.10	+01	10	58.9		688
1987	EA1	*	1987	03	04.28703	12	06	59.18	+05	29	02.5	17.2	688
1987	EA1		1987	03	04.35365	12	06	56.47	+05	29	23.9		688
1987	FB		1987	03	27.28936	12	59	47.87	-08	45	33.1	17.0	688
1987	FB		1987	03	27.37866	12	59	42.95	-08	45	23.9		688
1987	FC	*	1987	03	27.24528	12	35	01.14	-14	25	14.9	17.0	688
1987	FC		1987	03	27.33396	12	34	56.86	-14	24	44.5		688
1987	FD	*	1987	03	27.26733	12	18	45.40	+00	28	57.0	17.2	R 688
1987	FD		1987	03	27.35633	12	18	39.70	+00	29	16.8		R 688
1987	FE	*	1987	03	27.26733	12	20	01.04	+01	01	02.2	16.8	688
1987	FE		1987	03	27.35633	12	19	57.11	+01	01	30.2		688
1987	FF	*	1987	03	27.26733	12	24	04.72	-00	56	49.0	17.0	D 688
1987	FF		1987	03	27.35633	12	24	00.11	-00	56	00.7		688
1987	FG	*	1987	03	27.26733	12	41	19.37	+01	37	31.5	16.8	688
1987	FG		1987	03	27.35633	12	41	14.06	+01	37	27.0		688
1987	FH	*	1987	03	27.28936	12	51	04.11	-07	41	38.5	17.0	688
1987	FH		1987	03	27.37866	12	50	58.93	-07	41	16.2		688
1987	FJ	*	1987	03	27.31196	13	11	36.37	+00	41	31.6	16.5	688
1987	FJ		1987	03	27.40133	13	11	31.90	+00	42	06.6		688
1987	FK	*	1987	03	27.31196	13	28	25.50	-03	02	56.9	17.0	688
1987	FK		1987	03	27.40133	13	28	20.95	-03	02	51.4		688
1987	GC		1987	03	27.28936	12	55	41.30	-06	55	35.3	16.8	P 688
1987	GC		1987	03	27.37866	12	55	37.39	-06	54	33.1		P 688
1987	GD		1987	03	27.28936	12	59	56.54	-09	20	54.6	16.8	688
1987	GD		1987	03	27.37866	12	59	51.89	-09	20	21.7		688
16			1987	03	03.22265	10	46	14.27	+08	41	01.7		688
16			1987	03	03.29022	10	46	11.02	+08	41	24.7		688
26			1987	03	27.26733	12	43	33.20	-00	47	22.5		688
26			1987	03	27.35633	12	43	28.40	-00	46	59.7		688
34			1987	03	03.36022	12	33	20.24	-04	33	04.3		688
34			1987	03	03.40791	12	33	18.59	-04	32	48.3		688
45			1987	03	03.37970	15	33	36.15	-11	35	40.3		688
45			1987	03	03.38819	15	33	36.48	-11	35	40.1		688
61			1987	03	04.26442	11	22	25.73	-04	05	13.9		688
61			1987	03	04.33132	11	22	22.18	-04	05	09.4		688
63			1987	03	03.22265	10	28	04.11	+09	35	40.7		688
63			1987	03	03.29022	10	27	59.76	+09	35	55.0		688
75			1987	03	03.26743	11	11	10.46	+07	08	07.2		688
75			1987	03	03.33422	11	11	06.88	+07	08	24.9		688
81			1987	03	03.36022	12	30	34.76	-03	07	45.2		688
81			1987	03	03.40791	12	30	32.72	-03	07	38.5		688
98			1987	03	27.24528	12	15	26.04	-08	28	34.4		688
98			1987	03	27.33396	12	15	19.68	-08	28	45.2		688

100	1987	03	03.37970	15	33	16.89	-11	26	44.7	688
100	1987	03	03.38819	15	33	17.11	-11	26	44.6	688
101	1987	03	04.26442	11	36	50.74	+00	18	59.3	688
101	1987	03	04.33132	11	36	46.96	+00	19	09.6	688
174	1987	03	27.24528	12	16	44.56	-15	45	48.2	688
174	1987	03	27.33396	12	16	39.34	-15	45	41.9	688
182	1987	03	03.22265	10	48	26.16	+10	30	58.2	688
182	1987	03	03.29022	10	48	22.18	+10	31	25.0	688
192	1987	03	03.26743	10	52	21.65	+07	28	12.0	688
192	1987	03	03.33422	10	52	17.52	+07	28	28.4	688
201	1987	03	03.22265	10	43	20.08	+08	36	32.2	688
201	1987	03	03.29022	10	43	16.69	+08	36	58.7	688
221	1987	03	04.28703	12	01	07.26	+08	35	15.5	688
221	1987	03	04.35365	12	01	04.55	+08	35	45.7	688
229	1987	03	04.28703	11	52	43.45	+02	30	29.2	688
229	1987	03	04.35365	11	52	40.91	+02	30	44.2	688
236	1987	03	27.28936	13	05	09.91	-05	18	49.5	688
236	1987	03	27.37866	13	05	05.90	-05	18	15.2	688
264	1987	03	27.31196	13	16	54.30	+01	30	50.5	688
264	1987	03	27.40133	13	16	49.92	+01	31	10.2	688
270	1987	03	03.36022	12	22	13.72	-06	23	51.5	688
270	1987	03	03.40791	12	22	11.53	-06	23	39.4	688
281	1987	03	27.31196	13	17	20.20	-05	21	27.6	688
281	1987	03	27.40133	13	17	14.47	-05	21	05.4	688
299	1987	03	04.26442	11	36	19.81	-00	07	18.7	688
299	1987	03	04.33132	11	36	16.14	-00	06	57.3	688
312	1987	03	04.35365	11	49	54.75	+05	10	07.6	688
361	1987	03	04.28703	12	03	46.13	+07	34	02.4	688
361	1987	03	04.35365	12	03	43.44	+07	34	12.4	688
396	1987	03	03.26743	10	57	36.90	+02	22	54.0	688
396	1987	03	03.33422	10	57	33.34	+02	23	15.7	688
419	1987	03	04.26442	11	19	25.36	-01	43	02.0	688
419	1987	03	04.33132	11	19	21.75	-01	42	40.1	688
421	1987	03	04.26442	11	33	24.73	-00	49	36.0	688
421	1987	03	04.33132	11	33	21.44	-00	49	06.2	688
436	1987	03	04.28703	11	44	46.92	+01	05	27.4	688
436	1987	03	04.35365	11	44	43.35	+01	05	28.0	688
459	1987	03	27.26733	12	38	17.33	+02	15	28.6	688
459	1987	03	27.35633	12	38	12.18	+02	15	46.5	688
534	1987	03	27.26733	12	28	48.85	+02	16	41.4	688
534	1987	03	27.35633	12	28	44.60	+02	17	08.4	688
545	1987	03	03.36022	12	13	50.97	-08	45	44.7	688
545	1987	03	03.40791	12	13	48.99	-08	45	42.6	688
636	1987	03	04.28703	12	07	10.15	+07	07	27.3	688
636	1987	03	04.35365	12	07	07.20	+07	07	43.7	688
661	1987	03	27.24528	12	35	35.69	-12	35	55.9	688
661	1987	03	27.33396	12	35	30.98	-12	35	43.9	688
717	1987	03	27.26733	12	21	11.83	-03	12	12.1	688
717	1987	03	27.35633	12	21	08.02	-03	11	49.5	688
755	1987	03	27.28936	13	02	07.01	-05	09	20.0	688
755	1987	03	27.37866	13	02	03.26	-05	08	49.2	688
804	1987	03	27.24528	12	26	05.71	-12	03	37.5	688
804	1987	03	27.33396	12	26	00.58	-12	03	30.2	688
812	1987	03	04.28703	11	49	46.58	+07	02	48.6	17.0 688
812	1987	03	04.35365	11	49	42.56	+07	03	01.1	688
822	1987	03	03.26743	10	51	10.55	+06	12	31.9	688
822	1987	03	03.33422	10	51	06.41	+06	12	59.0	688
833	1987	03	27.28936	12	43	23.16	-09	28	31.5	688
833	1987	03	27.37866	12	43	18.62	-09	28	17.1	688

882	1987	03	27.24528	12	31	12.74	-11	33	03.7	688
882	1987	03	27.33396	12	31	08.90	-11	32	39.3	688
900	1987	03	04.26442	11	19	03.51	-00	34	25.2	688
900	1987	03	04.33132	11	19	00.08	-00	33	49.1	688
924	1987	03	03.22265	10	38	59.42	+10	35	09.5	688
924	1987	03	03.29022	10	38	56.25	+10	35	36.9	688
955	1987	03	03.22265	10	44	24.95	+11	52	38.0	688
955	1987	03	03.29022	10	44	20.57	+11	52	51.0	688
958	1987	03	03.36022	12	30	22.13	-05	55	47.0	688
958	1987	03	03.40791	12	30	20.62	-05	55	41.9	688
1016	1987	03	04.28703	11	53	57.40	+04	09	25.4	688
1016	1987	03	04.35365	11	53	53.26	+04	09	40.2	688
1054	1987	03	03.24532	10	44	32.73	+23	56	05.4	688
1054	1987	03	03.31228	10	44	29.33	+23	56	25.7	688
1065	1987	03	27.24528	12	32	57.01	-12	51	26.0	688
1065	1987	03	27.33396	12	32	51.61	-12	51	07.6	688
1070	1987	03	03.26743	11	00	40.22	+05	33	52.4	688
1070	1987	03	03.33422	11	00	37.31	+05	34	23.0	688
1074	1987	03	03.22265	10	24	47.52	+11	03	00.6	688
1074	1987	03	03.29022	10	24	44.30	+11	03	17.3	688
1097	1987	03	03.26743	10	58	09.63	+07	45	10.3	17.2 688
1097	1987	03	03.33422	10	58	06.04	+07	45	33.8	688
1138	1987	03	04.24197	09	51	05.90	-03	32	26.5	17.0 688
1138	1987	03	04.30918	09	51	02.63	-03	32	14.0	688
1142	1987	03	03.36022	12	29	07.95	-01	01	17.3	688
1142	1987	03	03.40791	12	29	06.41	-01	01	04.0	688
1152	1987	03	03.22265	10	29	01.63	+08	25	59.0	15.5 688
1152	1987	03	03.29022	10	28	57.44	+08	26	11.8	688
1201	1987	03	27.28936	12	58	35.72	-08	19	20.1	688
1201	1987	03	27.37866	12	58	31.48	-08	18	41.8	688
1206	1987	03	04.26442	11	22	13.45	-05	22	17.9	16.5 688
1206	1987	03	04.33132	11	22	09.65	-05	22	15.2	688
1274	1987	03	27.24528	12	23	11.93	-08	43	08.6	688
1274	1987	03	27.33396	12	23	06.19	-08	42	50.8	688
1275	1987	03	27.31196	13	14	43.01	-05	28	46.0	16.5 688
1275	1987	03	27.40133	13	14	39.04	-05	28	00.9	688
1328	1987	03	03.36022	12	21	14.72	-07	46	16.3	688
1328	1987	03	03.40791	12	21	13.19	-07	46	05.5	688
1340	1987	03	27.28936	12	57	59.82	-06	31	07.3	688
1340	1987	03	27.37866	12	57	55.87	-06	30	44.4	688
1361	1987	03	03.26743	10	57	28.57	+05	38	42.8	688
1361	1987	03	03.33422	10	57	25.64	+05	39	21.5	688
1376	1987	03	03.26743	10	52	11.48	+07	03	19.0	688
1376	1987	03	03.33422	10	52	07.49	+07	03	50.6	688
1406	1987	03	04.26442	11	31	27.53	-03	18	33.2	688
1406	1987	03	04.33132	11	31	23.49	-03	18	28.1	688
1447	1987	03	27.31196	13	18	58.99	-05	20	30.0	16.5 688
1447	1987	03	27.40133	13	18	54.22	-05	20	10.2	688
1458	1987	03	03.36022	12	28	16.78	-04	10	06.8	688
1458	1987	03	03.40791	12	28	15.07	-04	09	43.4	688
1536	1987	03	27.28936	12	50	30.89	-05	37	37.8	688
1536	1987	03	27.37866	12	50	25.72	-05	37	02.0	688
1539	1987	03	03.22265	10	40	40.67	+09	06	53.4	17.0 688
1539	1987	03	03.29022	10	40	37.63	+09	07	10.4	688
1602	1987	03	27.31196	13	37	34.63	-02	54	08.0	688
1602	1987	03	27.40133	13	37	30.15	-02	53	42.2	688
1661	1987	03	27.24528	12	29	26.04	-09	23	31.7	688
1661	1987	03	27.33396	12	29	20.53	-09	22	57.7	688
1672	1987	03	03.22265	10	42	09.02	+07	37	45.5	688

1672	1987	03	03.29022	10	42	05.76	+07	38	06.1			688
1677	1987	03	03.22265	10	46	15.08	+06	17	26.4		16.2	688
1677	1987	03	03.29022	10	46	10.68	+06	17	29.8			688
1678	1987	03	27.28936	12	54	56.87	-12	06	28.1			688
1678	1987	03	27.37866	12	54	52.45	-12	06	19.7			688
1691	1987	03	03.26743	10	51	09.09	+06	58	01.8			688
1691	1987	03	03.33422	10	51	05.93	+06	58	22.3			688
1720	1987	03	03.36022	12	27	48.43	-01	57	51.1			688
1720	1987	03	03.40791	12	27	46.38	-01	57	36.8			688
1733	1987	03	27.26733	12	34	01.16	+00	31	04.4		16.2	688
1733	1987	03	27.35633	12	33	55.95	+00	31	50.7			688
1745	1987	03	27.31196	13	14	20.48	-03	07	15.5			688
1745	1987	03	27.40133	13	14	16.11	-03	06	49.8			688
1748	1987	03	27.31196	13	25	05.66	-04	35	39.4			688
1748	1987	03	27.40133	13	25	02.53	-04	35	18.5			688
1825	1987	03	04.26442	11	18	53.83	-01	33	44.9			688
1825	1987	03	04.33132	11	18	50.18	-01	33	28.1			688
1924	1987	03	03.26743	10	49	20.46	+08	22	53.4			688
1924	1987	03	03.33422	10	49	16.31	+08	23	09.6			688
1965	1987	03	27.26733	12	35	24.88	-00	00	24.8		16.8	688
1965	1987	03	27.35633	12	35	20.10	+00	00	03.6			688
1967	1987	03	27.31196	13	19	31.28	-03	37	50.7		16.8	688
1967	1987	03	27.40133	13	19	26.44	-03	37	23.1			688
1977	1987	03	27.28936	12	44	04.32	-13	08	34.2		16.2	688
1977	1987	03	27.37866	12	43	59.40	-13	08	21.8			688
1986	1987	03	27.26733	12	22	33.83	-00	21	50.7			688
1986	1987	03	27.35633	12	22	29.95	-00	21	24.4			688
2009	1987	03	27.31196	13	22	49.41	-04	07	55.9		16.5	688
2009	1987	03	27.40133	13	22	45.71	-04	07	30.2			688
2053	1987	03	27.28936	12	45	49.01	-05	34	06.8			688
2053	1987	03	27.37866	12	45	44.81	-05	33	26.5			688
2060	1986	11	27.31887	05	13	42.44	+17	20	24.0		1	688
2060	1986	11	27.49625	05	13	39.79	+17	20	18.6		1	688
2060	1986	11	28.27573	05	13	28.60	+17	19	56.3		1	688
2060	1986	11	28.45284	05	13	26.01	+17	19	51.2		1	688
2060	1986	12	23.24163	05	07	16.97	+17	09	50.3		1	688
2060	1986	12	23.29176	05	07	16.23	+17	09	49.4		1	688
2060	1986	12	26.13447	05	06	35.14	+17	08	59.4		1	688
2060	1986	12	26.30781	05	06	32.62	+17	08	56.5		1	688
2060	1986	12	27.11142	05	06	21.15	+17	08	43.1		1	688
2060	1986	12	27.39870	05	06	17.04	+17	08	38.8		1	688
2060	1986	12	28.08946	05	06	07.31	+17	08	27.0		1	688
2060	1986	12	28.42804	05	06	02.49	+17	08	22.1		1	688
2060	1986	12	29.11431	05	05	52.92	+17	08	11.7		1	688
2060	1986	12	29.39394	05	05	48.97	+17	08	07.4		1	688
2060	1986	12	30.30100	05	05	36.43	+17	07	53.6		1	688
2060	1986	12	30.36242	05	05	35.57	+17	07	52.6		1	688
2060	1986	12	31.11052	05	05	25.25	+17	07	42.3		1	688
2060	1986	12	31.31075	05	05	22.45	+17	07	39.4		1	688
2071	1987	03	03.22265	10	39	08.41	+04	29	00.9		17.5	688
2071	1987	03	03.29022	10	39	04.12	+04	29	21.5			688
2114	1987	03	04.28703	11	48	23.20	+01	24	25.3		16.5	688
2114	1987	03	04.35365	11	48	20.22	+01	24	39.9			688
2126	1987	03	27.24528	12	19	18.76	-11	44	27.1		17.2	688
2126	1987	03	27.33396	12	19	13.20	-11	44	06.9			688
2164	1987	03	27.26733	12	23	43.92	+01	15	45.1			688
2164	1987	03	27.35633	12	23	39.93	+01	16	10.9			688
2165	1987	03	03.36022	12	20	17.28	-01	42	12.3		17.0	688
2165	1987	03	03.40791	12	20	15.61	-01	42	01.0			688

2178	1987	03	03.22265	10	37	40.68	+11	36	13.4		688
2203	1987	03	03.26743	11	00	09.39	+08	41	09.0	17.2	688
2203	1987	03	03.33422	11	00	06.28	+08	41	27.0		688
2225	1987	03	27.26733	12	36	53.96	+01	24	46.8		688
2225	1987	03	27.35633	12	36	49.52	+01	25	14.0		688
2236	1987	03	27.28936	12	53	44.82	-06	49	15.9	16.8	688
2236	1987	03	27.37866	12	53	39.31	-06	49	05.8		688
2242	1987	03	27.26733	12	24	42.93	-04	36	55.6		688
2242	1987	03	27.35633	12	24	37.22	-04	36	27.8		688
2249	1987	03	03.26743	10	56	56.55	+08	19	47.2		688
2249	1987	03	03.33422	10	56	53.49	+08	20	10.0		688
2276	1987	03	03.22265	10	40	58.78	+04	42	10.4		688
2276	1987	03	03.29022	10	40	54.65	+04	42	35.9		688
2282	1987	03	04.26442	11	39	15.81	-03	41	04.3		688
2282	1987	03	04.33132	11	39	11.98	-03	40	33.8		688
2306	1987	03	04.26442	11	22	09.18	-02	21	09.6	R	688
2306	1987	03	04.33132	11	22	05.65	-02	20	49.1		688
2361	1987	03	03.36022	12	29	07.36	-01	18	27.4		688
2361	1987	03	03.40791	12	29	05.81	-01	18	17.2		688
2390	1987	03	03.22265	10	36	46.70	+04	32	15.9		688
2390	1987	03	03.29022	10	36	42.75	+04	32	27.2		688
2394	1987	03	04.28703	12	05	18.11	+01	17	37.8	17.5	688
2394	1987	03	04.35365	12	05	15.21	+01	17	55.7		688
2450	1987	03	27.26733	12	23	27.66	+01	26	29.2		688
2450	1987	03	27.35633	12	23	23.57	+01	26	56.5		688
2492	1987	03	03.36022	12	22	16.70	-01	55	03.2		688
2492	1987	03	03.40791	12	22	15.14	-01	54	53.2		688
2501	1987	03	03.26743	11	06	26.41	+08	47	44.5		688
2501	1987	03	03.33422	11	06	22.17	+08	48	03.1		688
2530	1987	03	03.36022	12	29	59.53	-07	34	47.7		688
2530	1987	03	03.40791	12	29	57.91	-07	34	36.1		688
2560	1987	03	27.26733	12	33	21.74	+02	37	17.5	16.8	688
2560	1987	03	27.35633	12	33	17.47	+02	37	54.3		688
2631	1987	03	04.28703	12	00	40.58	+08	12	04.0	17.5	688
2661	1987	03	03.22265	10	23	24.53	+05	24	05.8	16.8	688
2661	1987	03	03.29022	10	23	20.97	+05	24	14.2		688
2666	1987	03	04.24197	09	40	40.95	-01	11	09.4	17.0	688
2666	1987	03	04.30918	09	40	38.40	-01	10	38.6		688
2667	1987	03	04.28703	12	01	50.59	+02	45	33.6	17.5	688
2667	1987	03	04.35365	12	01	47.76	+02	45	51.5	R	688
2688	1987	03	04.28703	12	02	53.16	+05	00	50.0	17.0	688
2688	1987	03	04.35365	12	02	50.42	+05	01	11.9		688
2722	1987	03	03.26743	10	57	16.41	+07	59	16.5		688
2722	1987	03	03.33422	10	57	13.12	+07	59	37.5		688
2729	1987	03	27.31196	13	21	51.56	-04	51	02.3		688
2729	1987	03	27.40133	13	21	47.63	-04	50	39.6		688
2731	1987	03	03.26743	11	08	01.95	+10	02	00.9		688
2731	1987	03	03.33422	11	07	59.14	+10	02	32.6		688
2857	1987	03	27.31196	13	25	38.51	-01	29	09.4		688
2857	1987	03	27.40133	13	25	34.29	-01	28	25.5		688
2861	1987	03	03.36022	12	10	16.98	-02	42	28.9		688
2861	1987	03	03.40791	12	10	14.88	-02	42	11.9		688
2909	1987	03	03.24532	10	58	43.33	+23	25	20.2		688
2909	1987	03	03.31228	10	58	39.83	+23	25	38.3		688
2916	1987	03	03.22265	10	42	43.64	+04	21	34.3	16.8	688
2916	1987	03	03.29022	10	42	39.19	+04	21	49.3		688
2924	1987	03	03.26743	11	09	17.21	+09	30	53.8		688
2924	1987	03	03.33422	11	09	14.07	+09	31	16.4		688
2975	1987	03	04.24197	09	50	07.96	-00	31	10.1	16.8	688

3017		1987	03	04.24197	09	47	34.16	-07	44	07.2		688
3017		1987	03	04.30918	09	47	30.79	-07	43	42.5		688
3022		1987	03	03.36022	12	16	27.12	-07	12	33.2		688
3034		1987	03	27.26733	12	40	49.49	-04	11	01.0	17.0 P	688
3034		1987	03	27.35633	12	40	43.93	-04	10	42.1		688
3093		1987	03	04.24197	09	41	08.00	-01	52	57.0		688
3093		1987	03	04.30918	09	41	04.97	-01	52	38.8		688
3134		1987	03	27.24528	12	24	55.01	-12	36	08.3	R	688
3134		1987	03	27.33396	12	24	51.51	-12	35	47.2		688
3161		1987	03	03.36022	12	20	11.14	-04	35	00.8		688
3161		1987	03	03.40791	12	20	08.65	-04	35	08.8		688
3171		1987	03	03.24532	10	35	28.70	+23	39	13.4	17.0	688
3171		1987	03	03.31228	10	35	25.12	+23	39	23.1		688
3261		1987	03	27.26733	12	28	49.58	-00	03	11.4		688
3261		1987	03	27.35633	12	28	45.35	-00	02	40.8		688
3302		1987	03	03.26743	10	59	19.54	+07	19	54.7		688
3302		1987	03	03.33422	10	59	15.72	+07	20	22.4		688
3372		1987	03	03.22265	10	44	31.69	+11	26	32.2		688
3372		1987	03	03.29022	10	44	27.90	+11	26	49.7		688
3378		1987	03	03.22265	10	45	22.58	+06	28	55.9	17.0	688
3378		1987	03	03.29022	10	45	17.97	+06	29	04.9		688
3379		1987	03	03.22265	10	37	22.38	+09	55	51.3		688
3379		1987	03	03.29022	10	37	18.47	+09	56	19.1		688
3453		1987	03	27.24528	12	27	18.41	-10	57	08.0	15.8	688
3453		1987	03	27.33396	12	27	13.16	-10	56	44.4		688
3458		1987	03	03.22265	10	35	02.56	+09	11	09.3	16.0	688
3458		1987	03	03.29022	10	34	58.83	+09	11	37.7		688
3478		1987	03	03.26743	11	14	19.01	+09	15	35.6		688
3478		1987	03	03.33422	11	14	14.96	+09	16	09.1		688
3553		1986	11	25.31659	04	24	39.60	-00	56	36.4	1	688
3553		1986	11	25.31970	04	24	39.22	-00	56	48.1	1	688
3553		1986	11	25.32478	04	24	38.63	-00	57	06.5	1	688

690 Lowell Observatory
E. Bowell, Lowell Observatory, 1400 West Mars Hill Road,
Flagstaff, AZ 86001, U.S.A.
Observer C. W. Tombaugh
Measurers E. Bowell, B. A. Skiff
0.33-m photographic telescope

1929	UF		1929	10	26.19444	02	10	22.77	+11	26	31.3	690
1929	UF		1929	10	27.21528	02	09	26.46	+11	20	29.1	690
1929	UK		1929	10	02.44792	02	35	32.61	+13	43	35.7	690
1929	UK		1929	10	26.19444	02	21	40.83	+10	22	58.6	690
1929	UK		1929	10	27.21528	02	20	55.18	+10	13	46.1	690
1929	UK		1929	11	03.21111	02	15	44.25	+09	12	17.2	D 690
1930	KP		1930	05	25.23611	15	13	15.39	-21	15	19.5	D 690
1930	KP		1930	05	27.22917	15	11	48.07	-21	02	36.6	R 690
1930	KP		1930	05	29.22778	15	10	24.92	-20	49	54.3	690
1930	KS		1930	05	25.23611	15	36	55.33	-16	04	01.4	R 690
1930	KS		1930	05	27.22917	15	35	21.53	-15	59	29.0	690
1930	KS		1930	05	29.22778	15	33	51.15	-15	55	01.5	D 690
1930	KS		1930	05	29.32986	15	33	45.80	-15	54	51.6	R 690
1930	KS		1930	05	31.22917	15	32	22.91	-15	50	52.9	P 690
1930	KS		1930	05	31.31944	15	32	18.47	-15	50	42.9	P 690
1930	KU	*	1930	05	25.23611	15	36	36.23	-20	59	46.6	17.0 690
1930	KU		1930	05	27.22917	15	34	40.94	-20	48	57.9	690
1930	KU		1930	05	29.22778	15	32	48.64	-20	38	01.3	690
1930	KU		1930	05	29.32986	15	32	42.27	-20	37	30.8	690
1930	KU		1930	05	31.22917	15	30	59.53	-20	27	17.0	690

1930	KU	1930	05	31.31944	15	30	54.89	-20	26	43.4	690
1930	MQ	1930	06	25.30208	18	27	35.85	-11	10	53.0	R 690
1930	MQ	1930	06	29.29236	18	23	53.38	-11	18	04.1	R 690
1931	AG	1931	01	10.21771	07	52	00.38	+33	53	20.0	690
1931	AG	1931	01	11.22569	07	50	44.75	+33	57	22.2	R 690
1931	AG	1931	01	12.22396	07	49	29.72	+34	01	07.0	R 690
40		1929	10	26.19444	02	41	00.52	+08	46	26.7	690
40		1929	10	27.21528	02	39	58.48	+08	42	34.0	690
40		1929	11	03.21111	02	32	42.53	+08	17	31.4	690
62		1930	05	25.23611	15	17	45.54	-15	14	34.0	690
62		1930	05	27.22917	15	16	18.25	-15	09	34.5	690
62		1930	05	29.22778	15	14	52.55	-15	04	43.5	690
62		1930	05	31.22917	15	13	28.49	-15	00	02.2	690
168		1930	05	29.32986	15	39	58.04	-16	14	33.5	690
168		1930	05	31.31944	15	38	34.84	-16	08	38.4	690
182		1929	10	02.44792	02	46	49.59	+12	18	59.1	690
182		1929	10	26.19444	02	31	38.74	+10	56	03.8	690
182		1929	10	27.21528	02	30	43.92	+10	51	51.8	690
182		1929	11	03.21111	02	24	19.05	+10	23	44.6	690
222		1929	10	02.44792	02	38	17.07	+13	08	02.4	690
222		1929	10	26.19444	02	21	58.62	+11	51	03.8	690
222		1929	10	27.21528	02	21	10.77	+11	47	23.6	690
222		1929	11	03.21111	02	15	43.98	+11	22	22.2	690
276		1929	10	26.19444	02	17	58.81	+11	53	30.4	690
276		1929	10	27.21528	02	17	14.31	+11	43	11.6	690
276		1929	11	03.21111	02	12	08.49	+10	32	34.4	690
288		1929	10	26.19444	02	38	13.32	+08	59	49.9	690
288		1929	10	27.21528	02	37	22.56	+08	55	34.7	690
288		1929	11	03.21111	02	31	28.29	+08	27	07.6	690
324		1931	01	10.21771	07	49	47.16	+32	21	53.2	690
324		1931	01	11.22569	07	48	29.61	+32	21	06.5	690
324		1931	01	12.22396	07	47	12.93	+32	20	10.6	690
526		1929	10	02.44792	02	33	20.34	+12	03	03.5	690
526		1929	10	26.19444	02	17	16.97	+10	30	27.6	690
526		1929	10	27.21528	02	16	28.75	+10	26	06.3	690
526		1929	11	03.21111	02	10	57.39	+09	56	37.5	690
536		1930	05	25.23611	15	13	43.17	-14	29	22.1	690
536		1930	05	27.22917	15	12	10.81	-14	31	17.1	690
536		1930	05	29.22778	15	10	39.70	-14	33	20.1	690
536		1930	05	31.22917	15	09	10.66	-14	35	31.1	690
694		1930	05	25.23611	15	26	23.39	-16	00	08.4	690
694		1930	05	27.22917	15	24	32.27	-15	40	54.6	690
694		1930	05	29.22778	15	22	42.84	-15	21	48.1	690
694		1930	05	31.22917	15	20	56.03	-15	02	48.7	690
748		1930	05	25.23611	15	33	29.94	-20	39	15.4	690
748		1930	05	27.22917	15	32	14.51	-20	34	15.7	690
748		1930	05	29.22778	15	30	59.97	-20	29	18.7	690
748		1930	05	29.32986	15	30	56.37	-20	29	03.1	690
748		1930	05	31.22917	15	29	47.08	-20	24	18.1	690
748		1930	05	31.31944	15	29	43.97	-20	24	06.0	R 690
858		1930	05	25.23611	15	34	59.52	-16	52	49.9	690
858		1930	05	27.22917	15	33	09.26	-16	54	58.9	690
858		1930	05	29.22778	15	31	20.31	-16	57	15.8	690
858		1930	05	29.32986	15	31	15.16	-16	57	21.7	690
858		1930	05	31.22917	15	29	34.62	-16	59	41.4	690
858		1930	05	31.31944	15	29	29.78	-16	59	48.2	690
910		1930	05	25.23611	15	14	35.96	-19	35	16.3	690
910		1930	05	27.22917	15	12	49.91	-19	37	02.6	690
910		1930	05	29.22778	15	11	06.87	-19	38	52.0	690

910		1930	05	31.22917	15	09	27.48	-19	40	43.6	690
936		1930	05	25.23611	15	27	15.24	-18	25	53.7	690
936		1930	05	27.22917	15	25	37.53	-18	21	35.5	690
936		1930	05	29.22778	15	24	01.58	-18	17	22.3	690
936		1930	05	31.22917	15	22	27.28	-18	13	13.4	690
971		1931	01	10.21771	08	02	17.51	+32	47	09.6	690
971		1931	01	11.22569	08	01	16.46	+32	57	35.7	690
971		1931	01	12.22396	08	00	15.48	+33	07	43.5	690
1003		1929	10	02.44792	02	40	34.48	+13	01	13.7	690
1003		1929	10	26.19444	02	25	16.30	+11	33	22.7	690
1003		1929	10	27.21528	02	24	27.67	+11	29	04.6	690
1003		1929	11	03.21111	02	18	52.00	+10	59	36.2	690
1137		1929	10	26.19444	02	15	39.20	+07	45	26.8	690
1137		1929	10	27.21528	02	14	38.70	+07	42	09.2	690
1256		1930	05	25.23611	15	12	10.56	-18	42	25.2	690
1256		1930	05	27.22917	15	10	57.47	-18	36	05.8	690
1256		1930	05	29.22778	15	09	45.98	-18	29	51.9	690
1256		1930	05	31.22917	15	08	36.57	-18	23	41.5	690
1670		1931	01	10.21771	07	52	19.66	+34	23	06.2	690
1670		1931	01	11.22569	07	51	18.02	+34	28	29.8	R 690
1670		1931	01	12.22396	07	50	17.19	+34	33	38.7	690
1953		1929	10	02.44792	02	32	52.07	+12	04	30.1	690
1953		1929	10	26.19444	02	16	45.98	+10	54	56.1	690
1953		1929	10	27.21528	02	15	56.39	+10	51	33.2	690
1953		1929	11	03.21111	02	10	15.64	+10	28	57.2	P 690
2305		1931	01	10.21771	07	55	33.18	+32	30	21.8	R 690
2305		1931	01	11.22569	07	54	30.54	+32	33	35.3	R 690
2305		1931	01	12.22396	07	53	27.76	+32	36	34.0	690
2728		1929	10	02.44792	02	40	27.34	+15	02	08.5	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
Measurer R. McCarty
0.91-m SPACEWATCH telescope, CCD in scanning mode
SAOC 1984
See also MPC 9198 and 10373

1984 KD		1987	03	27.27561	10	22	42.10	+33	35	23.5	18.9V 691
1984 KD		1987	03	27.29164	10	22	40.96	+33	35	25.2	s 691
1984 KD		1987	03	27.29667	10	22	40.47	+33	35	25.3	691

760 Goethe Link
F. K. Edmondson, Swain Hall West 319A, Indiana University,
Bloomington, IN 47401, U.S.A.
Measurer D. Owings et al.

1958 VQ		1958	11	11.26946	03	16	25.77	+18	36	45.9	760
1958 VQ		1958	11	11.31806	03	16	23.04	+18	36	43.5	760
1958 VT		1958	11	11.26946	03	14	37.13	+15	35	20.1	760
1958 VT		1958	11	11.31806	03	14	34.36	+15	35	07.4	760
1959 CU		1959	02	07.15979	07	38	28.62	+24	44	44.9	A 760
1959 CU		1959	02	07.20979	07	38	26.09	+24	44	36.4	A 760
1959 CY		1959	02	12.31946	09	40	58.76	+34	01	23.5	760
1959 CY		1959	02	12.36321	09	40	56.56	+34	01	45.4	760
1959 GT		1959	04	16.34255	13	55	29.65	-08	48	15.3	760
1959 GT		1959	04	16.38630	13	55	27.47	-08	48	58.4	760
1959 JH		1959	05	02.20628	13	26	04.32	-06	48	52.5	760
1959 JH		1959	05	02.25142	13	26	02.40	-06	48	46.4	760
1959 LC		1959	06	04.14234	15	00	34.41	-17	36	19.6	760

1959	LC	1959	06	04.18750	15	00	32.71	-17	36	06.1	760
1959	LE	1959	06	04.14234	14	57	38.52	-21	03	07.4	760
1959	LG	1959	06	04.14234	14	40	41.68	-22	00	49.3	760
1959	LK	1959	06	04.24028	15	54	08.49	-08	20	19.4	760
1959	LK	1959	06	04.28472	15	54	05.78	-08	20	14.0	760
1959	NJ	1959	07	10.21385	19	30	28.38	-19	23	36.6	760
1959	NJ	1959	07	10.25758	19	30	26.05	-19	23	40.0	760
1959	RB	1959	09	05.24078	22	09	54.08	-15	30	54.6	A 760
1959	RB	1959	09	05.28350	22	09	51.92	-15	31	02.4	A 760
1959	RD	1959	09	05.33107	00	20	09.36	-12	53	09.1	760
1959	RD	1959	09	05.37343	00	20	08.05	-12	53	40.9	760
1959	RH	1959	09	07.21126	22	59	05.32	-03	40	00.2	760
1959	RH	1959	09	07.25362	22	59	01.14	-03	39	39.4	760
1959	UL	1959	10	29.13877	01	45	06.58	+25	12	03.6	760
1959	UL	1959	10	29.18147	01	45	03.73	+25	11	47.5	760
1959	UM	1959	10	29.13877	01	40	54.07	+26	05	54.4	760
1959	UM	1959	10	29.18147	01	40	51.61	+26	05	34.9	760
1959	UN	1959	10	29.13877	01	48	20.95	+24	39	08.6	760
1959	UN	1959	10	29.18147	01	48	18.33	+24	38	52.0	V 760
1959	VA	1959	11	03.17677	01	16	42.21	+13	39	14.3	760
1959	VB	1959	11	03.17677	01	13	01.87	+17	21	36.2	760
3519		1959	06	04.14234	14	52	46.41	-16	45	11.7	760
3519		1959	06	04.18750	14	52	44.36	-16	45	04.0	760

801 Oak Ridge
R. E. McCrosky, Harvard-Smithsonian Center for Astrophysics,
60 Garden Street, Cambridge, MA 02138, U.S.A.
Observers R. E. McCrosky, C.-Y. Shao, G. Schwartz
1.5-m reflector
AC

1957	HK	1986	01	11.18413	04	40	40.20	+12	34	24.4	801
1957	HK	1987	03	27.35129	13	39	18.03	-13	05	38.9	801
1976	GM7	1987	02	27.29790	10	05	37.37	+05	46	28.1	801
1976	GM7	1987	04	02.07367	09	49	30.26	+09	24	17.1	801
1976	GO8	1987	02	25.33254	11	29	29.83	+04	35	19.0	17 801
1976	HQ	1987	02	25.42893	14	43	03.68	-06	34	49.1	801
1976	HQ	1987	03	27.36675	14	42	01.67	-05	02	12.4	801
1976	SN3	1987	02	24.33425	11	50	50.43	+02	39	41.0	801
1976	SN3	1987	03	29.23804	11	31	12.91	+05	07	54.7	801
1977	SN	1987	02	25.36196	11	37	40.89	+10	32	32.6	801
1977	SN	1987	03	29.19982	11	07	45.90	+13	46	33.2	801
1978	QX	1987	02	28.27808	10	32	56.06	+08	30	47.5	801
1978	QX	1987	03	30.13771	10	07	05.53	+10	48	44.2	801
1978	ST6	1987	02	27.16325	09	26	24.05	+05	24	39.7	801
1978	ST6	1987	03	30.11066	09	09	39.18	+07	57	53.7	801
1978	UN2	1987	02	27.35426	10	29	27.83	+34	38	13.6	801
1978	UN2	1987	04	02.09663	10	02	53.97	+32	58	51.1	801
1978	UO2	1987	02	25.38085	12	06	12.81	+15	21	12.5	801
1978	UO2	1987	04	02.29374	11	38	31.84	+17	12	02.2	801
1978	UO2	1987	05	01.16862	11	22	32.27	+16	41	11.3	801
1978	VB5	1987	02	25.27293	10	51	10.84	+21	30	16.2	801
1978	VB5	1987	03	30.18442	10	23	19.71	+23	00	31.5	801
1979	UY3	1987	02	25.41254	14	22	14.74	-14	15	10.7	801
1979	UY3	1987	03	29.34396	14	15	44.45	-14	05	22.6	801
1980	RU2	1987	02	25.28841	11	12	48.57	+07	58	25.8	801
1981	EF	1987	03	29.30496	12	46	50.57	-10	52	48.0	801
1981	PM	1985	12	16.21469	03	04	27.51	+16	28	49.5	801
1981	PM	1987	02	26.28837	10	47	43.59	-01	27	43.5	T 801

1981 PM		1987 03 27.15047	10	21	22.04	+01	53	17.5				801
1981 QP		1987 02 27.38532	10	34	15.43	+24	06	50.1				801
1981 QP		1987 04 02.18548	10	07	44.37	+25	21	48.1				801
1981 TC3		1987 02 28.29506	10	34	53.60	+05	06	54.2				801
1981 WG1		1987 04 02.04264	06	31	37.26	+19	35	04.8				801
1982 UJ2		1987 03 27.28267	11	42	55.14	+05	49	38.3				801
1982 UJ2		1987 03 29.28444	11	41	03.29	+05	54	30.2				801
1982 UO7		1987 02 24.38490	13	11	46.99	+01	04	16.1			w	801
1982 UO7		1987 03 27.29925	12	51	53.48	+04	09	11.4				801
1983 CN		1987 01 27.34380	09	40	32.71	+25	38	46.1			p	801
1983 CN3		1987 03 30.20594	10	33	17.07	+18	14	25.6				801
1983 NK		1987 02 27.27441	10	43	55.97	-11	28	27.2			U	801
1984 FC		1986 12 28.27205	04	08	53.21	+28	27	53.5				801
1984 GA		1987 02 26.30655	11	15	02.48	+06	36	03.4				801
1984 GA		1987 03 29.18465	10	44	25.00	+08	39	14.8				801
1984 SH5		1987 04 02.15480	10	11	52.41	+07	56	32.5				801
1985 QQ		1987 02 26.38102	13	05	17.31	-04	38	49.4				801
1985 QQ		1987 03 29.32227	12	38	11.11	-03	08	04.7				801
1985 QS		1987 02 24.36340	12	49	55.52	-02	23	24.9				801
1985 QS		1987 03 29.26758	12	20	32.50	-00	40	10.9				801
1985 RL		1986 11 30.36014	06	20	05.49	+20	01	41.1				801
1985 RL		1987 01 04.28731	05	49	13.24	+20	17	23.0				801
1985 TF1		1986 11 30.38868	09	27	36.36	+11	44	32.8			W	801
1986 XO2		1987 03 27.11596	09	27	57.22	+19	26	19.2				801
1986 XR5	*	1986 12 05.29282	03	45	39.53	+23	51	03.0		17.0		801
1987 DZ4	*	1987 02 27.09188	07	41	59.37	+20	47	27.8		18		801
1987 EN		1987 05 02.07126	10	26	40.85	+19	47	36.5				801
1987 EA1		1987 04 26.19214	11	32	28.47	+09	16	56.4				801
1987 EA1		1987 05 02.09567	11	31	03.76	+09	18	05.2				801
1987 GA		1987 04 26.15211	11	11	08.32	+18	25	29.4				801
1070		1987 03 29.18465	10	44	44.17	+08	48	11.2				801
1201		1987 03 27.31716	12	58	34.18	-08	19	09.0			t	801
2411		1987 01 30.26189	08	00	50.70	+20	09	59.8				801
3554		1987 03 29.21983	11	35	48.02	-16	41	50.5				801

809 European Southern Observatory
H. U. Norgaard-Nielsen, Danish Space Research Institute, Lundtoftevej 7, DK-2800 Lyngby, Denmark
1.5-m Danish telescope

1985 SA		1987 01 01.23306	07	51	16.6	+18	46	15				809
1985 SA		1987 01 02.21617	07	50	18.6	+18	51	08				809
1985 SA		1987 01 03.22765	07	49	17.6	+18	56	10				809
1987 AN	*	1987 01 01.23306	07	51	18.6	+18	46	19				809
1987 AN		1987 01 02.21617	07	50	17.6	+18	49	57				809
1987 AN		1987 01 03.22765	07	49	13.6	+18	53	41				809
1987 AN		1987 01 04.22084	07	48	10.4	+18	57	25				809
1987 AN		1987 01 06.29788	07	45	55.4	+19	05	22				809

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.

1982 UM7		1987 03 01.57604	11	36	28.57	-00	15	14.4		16		881
1982 UM7		1987 03 01.59688	11	36	27.53	-00	15	03.3				881
1986 UG		1986 11 05.66215	02	32	18.03	+09	40	51.9		17		881
1986 WF		1986 12 05.53021	02	12	23.91	+08	44	14.6		17		881
1986 WF		1986 12 05.55799	02	12	23.58	+08	44	17.4				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.

1986	DA		1986	03	07.65181	10	12	49.91	+32 57 44.9	883
1986	DA		1986	03	07.68572	10	12	51.74	+32 57 49.6	883
1986	DA		1986	03	12.63252	10	19	09.6	+33 01 58	883
1986	DA		1986	03	12.65022	10	19	10.8	+33 01 55	883
1986	DA		1986	03	15.69527	10	23	55.26	+32 52 46.2	883
1986	DA		1986	03	15.71761	10	23	57.27	+32 52 39.2	883
1986	DA		1986	03	17.57488	10	27	14.15	+32 42 25.8	883
1986	DA		1986	03	17.60992	10	27	17.39	+32 42 11.0	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	04	04.62755	12	51	01.07	-07 42 06.8	16.5	887
1931	TW		1987	04	04.65919	12	50	58.99	-07 41 57.8		887
1966	TE		1987	03	31.63773	12	59	00.56	-07 54 26.4	16.5	887
1966	TE		1987	03	31.65556	12	58	58.90	-07 54 30.9		887
1966	TE		1987	04	04.62755	12	52	36.87	-08 13 43.7	16.5	887
1966	TE		1987	04	04.65919	12	52	33.84	-08 13 51.5		887
1976	GO8		1987	03	31.53356	10	51	45.30	+04 53 15.1	16	887
1976	GO8		1987	03	31.56644	10	51	43.27	+04 53 15.0		887
1976	GO8		1987	03	31.58771	10	51	42.12	+04 53 14.6		887
1986	DA		1986	03	02.57604	10	07	57.55	+32 33 11.2		887
1986	DA		1986	03	02.58333	10	07	57.75	+32 33 14.1		887
1986	DA		1986	03	02.60278	10	07	58.42	+32 33 21.7		887
1986	DA		1986	03	02.60903	10	07	58.77	+32 33 25.1		887
1987	BB		1987	02	04.58472	08	30	15.41	+18 46 23.1	17	887
1987	BB		1987	02	04.61985	08	30	13.33	+18 46 31.5		887
1987	EB		1987	03	31.48785	09	22	05.18	+18 32 44.1	17	887
1987	EB		1987	03	31.62100	09	22	04.80	+18 32 53.0		887
1987	FB		1987	04	04.62755	12	52	11.21	-08 29 06.7	17	887
1987	GC	*	1987	04	04.63664	12	49	48.36	-05 21 03.5	16.5	887
1987	GC		1987	04	04.68137	12	49	46.35	-05 20 33.2		887
1987	GC		1987	04	24.53507	12	36	55.46	-01 43 44.8	16.5	887
1987	GC		1987	04	24.57727	12	36	54.05	-01 43 22.8		887
1987	GD		1987	03	31.63773	12	56	13.21	-08 53 15.9	16.5	887
1987	GD		1987	03	31.65556	12	56	12.25	-08 53 08.3		887
1987	GD	*	1987	04	04.62755	12	52	41.88	-08 26 19.9	16.5	887
1987	GD		1987	04	04.65919	12	52	40.04	-08 26 07.9		887
1987	GD		1987	04	24.54525	12	36	35.92	-06 11 17.1	17	887
1987	GD		1987	04	24.56736	12	36	34.84	-06 11 08.5		887
1987	GD		1987	04	24.59236	12	36	33.84	-06 10 59.4		887
844			1987	03	31.48785	09	20	35.96	+19 16 03.2	15.5	887
844			1987	03	31.62100	09	20	34.15	+19 15 49.3		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
1340			1987	04	04.63664	12	51	49.74	-05 54 05.1	16	887
1340			1987	04	04.68137	12	51	47.63	-05 53 52.4		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.

1987 DM	1987 03 20.48646	09 56 33.19	+16 56 46.0		17.5		888
1987 DM	1987 03 20.51354	09 56 33.19	+16 56 48.5				888
1987 DM	1987 03 24.51285	09 54 50.44	+17 01 12.0		17.5		888
1987 DM	1987 03 24.55451	09 54 49.26	+17 01 15.0				888
1987 DM	1987 03 26.53160	09 54 04.14	+17 02 54.0		17.5		888
1987 DM	1987 03 26.56146	09 54 03.33	+17 02 50.8				888
1987 DM	1987 03 29.53715	09 53 02.18	+17 04 41.4		17.5		888
1987 DM	1987 03 29.56076	09 53 01.72	+17 04 40.9				888
1987 EA	1987 03 20.50243	10 10 38.57	+15 56 18.1		17.5		888
1987 EA	1987 03 20.52465	10 10 37.84	+15 56 19.1				888
1987 EA	1987 03 24.53993	10 08 15.30	+15 58 00.0		17.5		888
1987 EA	1987 03 24.56771	10 08 14.37	+15 58 00.3				888
1987 EA	1987 03 26.54965	10 07 15.94	+15 57 37.7		17.5		888
1987 EA	1987 03 26.57257	10 07 15.22	+15 57 35.8				888
1987 EA	1987 03 29.54965	10 06 03.01	+15 55 28.1		17.5		888
1987 EA	1987 03 29.57188	10 06 02.51	+15 55 26.9				888

* * * * *

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, 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
1930 KP	14.0	300524	341.99	8.33	261.45	3.80	0.2779	2.5594	4	3		B
1930 KU	14.5	300524	338.02	10.49	257.90	2.51	0.1300	2.1919	6	6		B
1978 TQ5	13.0	781019	9.34	53.24	325.04	4.99	0.3032	3.1904	48	5	D	B
1978 VA6	14.6	781108	163.89	198.00	61.28	2.07	0.1549	3.2031	25	4	D	I
1979 MD1	13.8	790726	152.02	23.43	119.15	11.39	0.0543	3.0246	34	4	D	I
1979 ME1	16.2	790706	308.91	84.19	270.95	5.20	0.1257	2.2635	31	5	D	I
1979 MT1	16.5	790706	320.46	217.73	128.26	4.63	0.1777	2.3007	34	5	D	I
1979 MB2	14.1	790706	237.16	296.95	141.12	5.73	0.2701	2.5482	32	6	D	I
1979 ME3	15.0	790706	290.43	217.53	163.85	6.19	0.1460	3.1823	34	4	D	I
1979 MH3	15.8	790726	303.97	258.82	119.27	6.05	0.2174	2.4398	33	5	D	I
1979 MJ3	14.9	790726	233.10	255.45	174.08	5.44	0.0426	2.7320	31	5	D	I
1979 MO3	16.2	790726	5.41	153.51	138.09	3.38	0.1636	2.7480	31	5	D	I
1979 MS3	15.0	790706	9.83	32.36	249.91	3.72	0.1247	3.2073	34	6	D	I
1979 MB4	16.0	790706	39.84	82.97	161.29	5.26	0.1110	2.3180	35	8	D	I

1979	ML4	15.4	790706	64.75	321.30	248.43	6.05	0.1843	2.7464	5	3		I
1979	MO4	15.1	790706	66.08	62.01	161.21	2.20	0.0541	2.8487	30	4	D	I
1979	MH5	15.9	790726	10.20	23.04	264.38	2.51	0.1024	2.6850	31	5	D	I
1979	MK5	14.8	790706	111.05	315.38	220.77	2.65	0.0805	2.5812	34	5	D	I
1979	ML5	15.8	790706	289.94	210.09	171.31	5.17	0.1356	2.7584	34	5	D	I
1979	MU5	16.7	790726	9.44	157.83	128.72	1.66	0.1911	2.4287	31	4	D	I
1979	MF6	16.3	790706	300.95	234.70	138.34	6.27	0.1788	2.3309	5	3		I
1979	MP6	14.9	790706	39.50	325.39	271.06	4.65	0.2242	3.0445	5	3		I
1979	MT6	15.4	790706	63.11	307.51	279.70	10.72	0.0595	2.6159	35	5	D	I
1979	MB8	15.6	790706	56.54	50.02	161.56	5.22	0.2427	2.7365	5	3		I
1979	MK8	17.1	790706	18.22	66.56	197.94	1.94	0.2156	2.4150	5	3		I
1979	MN8	15.4	790706	309.58	171.27	199.83	4.03	0.2264	3.2115	33	4	D	I
1979	MP8	15.7	790706	50.22	312.03	279.64	3.88	0.1278	2.4550	30	5	D	I
1979	MR8	15.2	790706	172.51	357.26	125.95	8.95	0.0250	2.7116	30	4	D	I
1979	MY8	14.1	790706	83.45	76.12	131.14	2.80	0.0584	3.0859	30	4	D	I
1984	WM1	14.5	841116	341.07	107.45	332.63	5.28	0.1352	2.1586	7	5		B
1985	DU1	13.5	850204	171.87	358.96	344.43	4.09	0.1071	2.6785	10	0		B
1985	DV2	13.5	850224	34.77	263.86	213.34	1.22	0.0930	2.8766	7	6		B
1985	DW3	12.5	850204	252.49	317.82	331.09	4.73	0.2863	2.4083	3	3	D	B
1985	TW1	15.5	851002	29.18	13.25	320.75	7.86	0.2504	2.1552	4	4	D	b
1985	VF2	11.5	851022	296.54	200.79	270.26	19.83	0.1143	3.1911	28	5		B
1986	PC1	12.5	860729	17.08	135.46	157.85	1.58	0.1953	3.0800	39	7		N
1986	UG	14.0	861106	2.50	266.74	130.72	2.39	0.1475	2.2124	36	7	D	U
1986	VG1	9.5	861106	320.94	32.72	74.66	25.26	0.1409	5.1854	2	8	E	M
1987	AN		861216	173.63	156.95	133.99	3.25	0.1165	2.2158	5	4	E	G
1987	CJ	12.0	870214	18.65	342.78	155.71	10.46	0.0505	3.0165	29	6		B
1987	DD	12.0	870306	57.45	9.09	83.72	29.69	0.0750	2.6297	20	8		B
1987	DE	12.5	870214	348.67	8.30	150.50	23.94	0.1787	2.3237	9	7		G
1987	DF	13.5	870214	294.31	79.82	159.91	19.34	0.1872	2.2316	8	6		B
1987	DY4		870306	335.68	279.08	274.72	14.46	0.1026	3.2239	25	6		M
1987	GA	13.0	870415	334.72	167.59	49.18	11.08	0.2000	2.6918	31	0		N
1987	GD	13.5	870415	359.14	331.58	227.32	2.60	0.0750	2.3767	28	6		N
1987	GF	14.5	870326	33.79	294.04	177.36	21.27	0.3100	2.3052	13	8		B
1987	GG	13.5	870326	356.19	65.22	144.63	29.92	0.3066	2.5877	11	8		B

1978 TQ5 = 1978 WO (C. M. Bardwell)
1978 VA6 = 1978 WX11 (H. Oishi, JAM 2062)
1979 MD1 = 1979 OT7 (H. Oishi, JAM 2071)
1979 ME1 = 1979 OD1 (H. Oishi, JAM 2071)
1979 MT1 = 1979 OM8 (H. Oishi, JAM 2062)
1979 MB2 = 1979 OF1 (H. Oishi, JAM 2062)
1979 ME3 = 1979 OO11 (H. Oishi, JAM 2063)
1979 MH3 = 1979 ON6 (H. Oishi, JAM 2063)
1979 MJ3 = 1979 OY1 (H. Oishi, JAM 2063)
1979 MO3 = 1979 OB3 (H. Oishi, JAM 2064)
1979 MS3 = 1979 OZ7 (H. Oishi, JAM 2064)
1979 MB4 = 1979 OQ9 (H. Oishi, JAM 2064)
1979 MO4 = 1979 OB8 (H. Oishi, JAM 2065)
1979 MH5 = 1979 OL4 (H. Oishi, JAM 2065)
1979 MK5 = 1979 OY11 (H. Oishi, JAM 2066)
1979 ML5 = 1979 OR11 (H. Oishi, JAM 2066)
1979 MU5 = 1979 OC5 (H. Oishi, JAM 2066)
1979 MT6 = 1979 OZ11 (H. Oishi, JAM 2067)
1979 MN8 = 1979 OC12 (H. Oishi, JAM 2067)
1979 MP8 = 1979 OM4 (H. Oishi, JAM 2067)
1979 MR8 = 1979 OE7 (H. Oishi, JAM 2068)
1979 MY8 = 1979 OX5 (H. Oishi, JAM 2068)
1985 TW1 = 1985 TY3 (F. N. Bowman)
1986 UG = 1986 WF (T. Kobayashi, NOC 1647)

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

(539) Pamina
Epoch 1987 July 24.0 ET = JDE 2447000.5

M	73.77401	(1950.0)		P	Q
n	0.21760970	Peri.	95.48256	+0.97799798	-0.17204946
a	2.7374774	Node	274.46337	+0.11109036	+0.90819549
e	0.2128023	Incl.	6.79616	+0.17657545	+0.38154940
P	4.53	H	9.85	G 0.15	

From 58 observations at 28 oppositions 1904-1986, mean residual 1".0.

(1387) Kama
Epoch 1987 July 24.0 ET = JDE 2447000.5

M	116.74932	(1950.0)		P	Q
n	0.29052866	Peri.	124.93909	+0.84361673	+0.53565247
a	2.2577546	Node	202.74259	-0.51868018	+0.79501732
e	0.2088805	Incl.	5.52868	-0.13885853	+0.28464695
P	3.39	H	13.2	G 0.25	

From 27 observations at 7 oppositions 1935-1986, mean residual 1".3.

(1615) Bardwell
Epoch 1987 July 24.0 ET = JDE 2447000.5

M	5.93564	(1950.0)		P	Q
n	0.17971147	Peri.	247.94109	+0.75741485	-0.65279598
a	3.1099413	Node	152.80605	+0.60933517	+0.69930446
e	0.1929533	Incl.	1.68299	+0.23459197	+0.29125708
P	5.48	H	11.36	G 0.25	

From 48 observations at 14 oppositions 1926-1986, mean residual 1".0.

(1617) Alschmitt
Epoch 1987 July 24.0 ET = JDE 2447000.5

M	64.50777	(1950.0)		P	Q
n	0.17296349	Peri.	27.41603	-0.99406784	+0.04755776
a	3.1903115	Node	154.73167	-0.06619728	-0.97812948
e	0.1394002	Incl.	13.24682	+0.08629623	-0.20248701
P	5.70	H	10.9	G 0.25	

From 34 observations at 12 oppositions 1935-1986, mean residual 1".1.

(1645) Waterfield
Epoch 1987 July 24.0 ET = JDE 2447000.5

M	350.19172	(1950.0)		P	Q
n	0.18427273	Peri.	104.07294	+0.98346213	-0.18024758
a	3.0584074	Node	266.31346	+0.15856720	+0.90411717
e	0.1203985	Incl.	1.01589	+0.08751384	+0.38740540
P	5.35	H	11.5	G 0.25	

From 78 observations at 13 oppositions 1933-1985, mean residual 0".8.

(1683) Castafiore
Epoch 1987 July 24.0 ET = JDE 2447000.5

M	95.17826	(1950.0)		P	Q
n	0.21797929	Peri.	345.96861	+0.67765680	+0.72561954
a	2.7343822	Node	326.44613	-0.65210978	+0.51789882
e	0.1780005	Incl.	12.47603	-0.33990307	+0.45305308
P	4.52	H	11.7	G 0.25	

From 42 observations at 14 oppositions 1936-1986, mean residual 1".1.

(1748) Mauderli
Epoch 1987 July 24.0 ET = JDE 2447000.5

M	269.32017	(1950.0)	P	Q
n	0.12695552	Peri. 201.19489	+0.83634158	+0.54621144
a	3.9207425	Node 125.61177	-0.49431255	+0.78824617
e	0.2337500	Incl. 3.29677	-0.23703979	+0.28340967
P	7.76	H 10.52	G 0.15	

From 63 observations at 12 oppositions 1951-1984, mean residual 0".8.

(1756) Giacobini
Epoch 1987 July 24.0 ET = JDE 2447000.5

M	116.10278	(1950.0)	P	Q
n	0.24206371	Peri. 100.01093	+0.85422523	-0.51317321
a	2.5498595	Node 290.90778	+0.43513810	+0.79346747
e	0.2276484	Incl. 5.12097	+0.28452432	+0.32720427
P	4.07	H 12.8	G 0.25	

From 45 observations at 12 oppositions 1937-1985, mean residual 1".1.

(1760) Sandra
Epoch 1987 July 24.0 ET = JDE 2447000.5

M	222.55338	(1950.0)	P	Q
n	0.17615512	Peri. 336.27156	-0.87540449	+0.46926810
a	3.1516589	Node 232.22473	-0.41666358	-0.85417036
e	0.1196406	Incl. 8.43857	-0.24506825	-0.22400992
P	5.60	H 11.5	G 0.25	

From 39 observations at 10 oppositions 1935-1986, mean residual 1".0.

(1764) Cogshall
Epoch 1987 July 24.0 ET = JDE 2447000.5

M	244.85956	(1950.0)	P	Q
n	0.18177546	Peri. 82.78382	-0.57827400	+0.81563563
a	3.0863550	Node 151.86199	-0.76302487	-0.53272632
e	0.1292083	Incl. 2.23321	-0.28877715	-0.22570155
P	5.42	H 11.2	G 0.25	

From 58 observations at 15 oppositions 1935-1986, mean residual 0".9.

(1784) Benguella
Epoch 1987 July 24.0 ET = JDE 2447000.5

M	349.61782	(1950.0)	P	Q
n	0.26417969	Peri. 184.23958	+0.15814988	+0.98708233
a	2.4054875	Node 94.86136	-0.90513275	+0.15529729
e	0.1299073	Incl. 1.47418	-0.39461793	+0.03938566
P	3.73	H 11.81	G 0.25	

From 34 observations at 14 oppositions 1935-1986, mean residual 0".9.

(1798) Watts
Epoch 1987 July 24.0 ET = JDE 2447000.5

M	52.41246	(1950.0)	P	Q
n	0.30229263	Peri. 3.35280	+0.67956103	-0.72979620
a	2.1987930	Node 43.85634	+0.67051224	+0.57649905
e	0.1220534	Incl. 6.19730	+0.29767455	+0.36748653
P	3.26	H 12.6	G 0.25	

From 31 observations at 9 oppositions 1934-1986, mean residual 0".8.

(1808) Bellerophon
Epoch 1987 July 24.0 ET = JDE 2447000.5

M 282.75432		(1950.0)	P	Q
n 0.21654010	Peri.	46.22875	+0.51006364	-0.86009870
a 2.7464846	Node	13.11011	+0.77853167	+0.45765685
e 0.1805842	Incl.	2.04178	+0.36568228	+0.22534512
P 4.55	H 12.2		G 0.25	

From 36 observations at 9 oppositions 1960-1983, mean residual 0".8.

(1813) Imhotep
Epoch 1987 July 24.0 ET = JDE 2447000.5

M 194.30021		(1950.0)	P	Q
n 0.22396271	Peri.	166.42496	-0.93068184	+0.35685976
a 2.6854614	Node	34.82300	-0.34741695	-0.79322543
e 0.0801930	Incl.	8.10536	-0.11459835	-0.49340098
P 4.40	H 12.5		G 0.25	

From 16 observations at 6 oppositions 1960-1985, mean residual 1".0.

(1815) Beethoven
Epoch 1987 July 24.0 ET = JDE 2447000.5

M 342.46969		(1950.0)	P	Q
n 0.17453112	Peri.	352.69479	-0.23394429	-0.97123908
a 3.1711794	Node	110.82673	+0.89436025	-0.23285835
e 0.1734589	Incl.	2.71821	+0.38130015	-0.04971565
P 5.65	H 11.36		G 0.15	

From 29 observations at 8 oppositions 1932-1986, mean residual 1".0.

(1818) Brahms
Epoch 1987 July 24.0 ET = JDE 2447000.5

M 29.05006		(1950.0)	P	Q
n 0.30952797	Peri.	74.13629	+0.79979505	+0.59830869
a 2.1643930	Node	249.09020	-0.56868237	+0.72934577
e 0.1783599	Incl.	2.97757	-0.19216722	+0.33178526
P 3.18	H 14.1		G 0.25	

From 12 observations at 5 oppositions 1939-1986, mean residual 1".2.

(1847) Stobbe
Epoch 1987 July 24.0 ET = JDE 2447000.5

M 233.62352		(1950.0)	P	Q
n 0.23376040	Peri.	136.95826	-0.43114441	+0.88308306
a 2.6098893	Node	106.71593	-0.87138688	-0.35428363
e 0.0195282	Incl.	11.14627	-0.23409274	-0.30764821
P 4.22	H 10.7		G 0.25	

From 27 observations at 10 oppositions 1930-1985, mean residual 1".0.

(1874) Kacivelia
Epoch 1987 July 24.0 ET = JDE 2447000.5

M 103.46536		(1950.0)	P	Q
n 0.17796833	Peri.	192.63259	+0.99010707	+0.13709552
a 3.1302154	Node	159.41580	-0.12019959	+0.93858012
e 0.3025307	Incl.	4.87528	-0.07238825	+0.31665782
P 5.54	H 11.0		G 0.25	

From 42 observations at 10 oppositions 1941-1984, mean residual 0".9.

(1880) McCrosky
Epoch 1987 July 24.0 ET = JDE 2447000.5

M 137.47135		(1950.0)	P	Q
n 0.22546693	Peri.	186.76078	+0.54930242	+0.83219864
a 2.6735039	Node	116.58422	-0.76261899	+0.53623021
e 0.0761525	Incl.	4.84812	-0.34158325	+0.14107653
P 4.37	H	12.13	G 0.15	

From 48 observations at 10 oppositions 1940-1986, mean residual 1".0.

1985 RZ4 = 1976 SL7

The identification was also found independently by C. M. Bardwell, W. Landgraf and S. Nakano.

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

M 195.62967		(1950.0)	P	Q
n 0.22436474	Peri.	329.44813	+0.79040971	+0.61187299
a 2.6822578	Node	352.61408	-0.50555079	+0.62446419
e 0.1702682	Incl.	13.21729	-0.34593481	+0.48544405
P 4.39	H	12.5	G 0.25	

Residuals in seconds of arc

760925 095	0.2-	2.0-	850915 675	0.4-	1.6-	851011 675	0.0	1.0-
760928 095	0.2+	2.0+	850915 675	0.1+	1.9+	851013 675	0.3+	0.8+

1986 PM4 = 1986 RS = 1930 UF1 = 1934 NK = 1957 JC1 = 1972 QP = 1979 BQ1

The double designation 1986 PM4 = 1986 RS is by F. N. Bowman, E. W. Elst and B. G. Marsden, who each found it independently (MPC 11723).

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

M 67.08121		(1950.0)	P	Q
n 0.20976097	Peri.	43.87790	+0.88597122	+0.44412454
a 2.8053505	Node	289.31681	-0.45483905	+0.77609872
e 0.1559491	Incl.	8.12938	-0.09042366	+0.44768759
P 4.70	H	12.2	G 0.25	

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

301017 690(0.05+	0.02-)X	720905 095	0.5+	1.5-	860905 071(11.5+	5.0-)		
301019 690(84.8+	45.4-)X	790124 095	0.0	0.1-	860905 071 (2.1+	5.1-)		
340709 078(0.04+	0.00+)X	860808 071	1.0+	2.3-	860907 071	1.2-	0.6+	
570505 076(0.06+	0.05+)X	860808 071	1.0+	0.6+	860907 071	1.3-	1.0+	
720819 095	0.1-	0.8+	860809 071	0.2+	0.8+			

1987 DS = 1949 FF1 = 1952 VC = 1974 TC1 = 1979 SX5 = 1982 FO

Epoch 1987 July 24.0 ET = JDE 2447000.5

M 51.52499		(1950.0)	P	Q
n 0.18006750	Peri.	359.11486	-0.39177386	-0.91912704
a 3.1058406	Node	113.94915	+0.84437707	-0.37707807
e 0.1365110	Incl.	2.60000	+0.36543209	-0.11409472
P 5.47	H	11.7	G 0.25	

Residuals in seconds of arc

490326 094(37.9-	69.6+)X	741010 808	1.4+	1.4-	870225 046	0.2+	0.5-	
521112 760	3.0-	1.8+	790923 095	0.4+	4.0-	870225 046	0.0	1.7-
521112 760	2.1-	3.1+	820321 688	1.5+	1.7+	870303 046	1.0+	0.9+
521114 760	0.3+	1.5+	820321 688	0.9+	1.8+	870303 046	1.2-	1.6+
521114 760	1.1+	1.2+	870224 046	1.5-	1.4-			
741010 808	1.5+	0.9-	870224 046	0.5-	1.9-			

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

Comet Shoemaker (1987o)
T 1986 Nov. 20.58107 ET

		(1950.0)	P	Q
q 5.4639015	Peri.	17.42260	-0.24116164	-0.63176831
	Node	267.65392	-0.95485393	+0.01877152
e 1.0	Incl.	132.49753	-0.17347920	+0.77492995

From 8 observations 1987 Apr. 25-May 8.

Comet Torres (1987j)
T 1987 Apr. 9.57652 ET

		(1950.0)	P	Q
q 3.6242195	Peri.	328.95372	-0.76313858	-0.61532525
	Node	193.79343	-0.27494689	+0.03262117
e 1.0	Incl.	124.08202	-0.58482794	+0.78759806

From 8 observations 1987 Mar. 28-May 7.

(2847) 1959 CC1
Epoch 1987 July 24.0 ET = JDE 2447000.5

		(1950.0)	P	Q
M 217.78837				
n 0.30861991	Peri.	11.65127	-0.20580043	+0.97780793
a 2.1686364	Node	246.48229	-0.90119987	-0.20499126
e 0.1162429	Incl.	2.45116	-0.38142494	-0.04324623
P 3.19	H 12.6	G 0.25		

From 36 observations at 10 oppositions 1941-1986, mean residual 1".1.

(2906) Caltech
Epoch 1987 July 24.0 ET = JDE 2447000.5

		(1950.0)	P	Q
M 15.30087				
n 0.17558576	Peri.	296.65917	+0.81047593	-0.29125177
a 3.1584683	Node	84.06748	+0.51828039	+0.76086697
e 0.1201268	Incl.	30.72846	-0.27297290	+0.57987400
P 5.61	H 10.0	G 0.25		

From 18 observations at 5 oppositions 1974-1985, mean residual 0".8.

(3589)* 1984 AB1 = 1969 UZ1 = 1979 RA

Discovered 1984 Jan. 8 by J. Wagner at the Anderson Mesa Station of the Lowell Observatory. The identifications were found independently by L. Schmadel and W. Landgraf (MPC 9020).

Epoch 1987 July 24.0 ET = JDE 2447000.5

		(1950.0)	P	Q
M 84.13648				
n 0.29299914	Peri.	285.93619	+0.79726801	-0.59922929
a 2.2450455	Node	110.93426	+0.57930006	+0.72571189
e 0.1639544	Incl.	4.46544	+0.16963243	+0.33803330
P 3.36	H 13.6	G 0.25		

Residuals in seconds of arc

691017	095	1.8+	0.9-	840108	688	2.6-	0.0	840307	801	0.3-	2.3+
790901	095	2.9-	1.4-	840126	688	0.9+	1.1-	850524	801	3.1+	1.3-
810213	413	2.2-	2.0+	840126	688	0.1-	0.7+	861007	801	0.7+	1.1+
810502	413	0.8-	0.7+	840204	688	2.2+	1.0-	861029	801	0.1+	1.0+
840108	688	0.6-	1.2-	840204	688	0.7+	0.2-	861101	801	0.2+	1.2+

(3590)* 1984 CQ = 1954 JC = 1974 FE1

Discovered 1984 Feb. 5 by E. Bowell at the Anderson Mesa Station of the Lowell Observatory. The identifications are by W. Landgraf (MPC 8895).

Epoch 1987 July 24.0 ET = JDE 2447000.5

M	28.68390		(1950.0)	P	Q
n	0.29178589	Peri.	354.77022	-0.54484272	-0.83350470
a	2.2512645	Node	128.21023	+0.77347840	-0.54180598
e	0.0803850	Incl.	6.70491	+0.32384806	-0.10824134
P	3.38	H	13.2	G 0.25	

Residuals in seconds of arc

540504	760	2.4+	0.7+	840303	809	0.5-	0.2+	840309	809	1.1-	0.6+
740321	095	4.3-	3.7+	840303	809	0.0	0.0	840329	688	0.5-	0.2-
840128	688	3.1+	2.1-	840306	688	0.1-	0.2+	840330	688	1.2-	0.2-
840128	688	1.9+	1.5-	840306	688	0.7-	0.1-	840331	688	1.2+	0.3-
840205	688	2.0+	1.4-	840308	809	0.9-	0.4+	840331	688	0.2+	0.9-
840205	688	2.4+	2.1-	840308	809	0.9-	0.5+	870127	801	1.4-	1.8+
840226	688	0.5+	0.5-	840308	809	1.2-	0.8+	870225	801	0.3-	2.3+
840226	688	0.8+	0.1-	840309	809	1.0-	0.8+				
840303	809	0.5-	0.4+	840309	809	1.1-	0.9+				

1985 SA

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

M	221.46493		(1950.0)	P	Q
n	0.27825352	Peri.	180.91030	+0.52683236	+0.84276947
a	2.3236808	Node	120.88901	-0.77897775	+0.53070432
e	0.1349598	Incl.	7.39114	-0.34006078	+0.08995856
P	3.54	H	13.2	G 0.25	

Residuals in seconds of arc

850916	809	0.2-	0.4+	850920	809	1.1+	1.8-	851022	809	0.0	0.6-
850916	809	1.0-	0.4+	850920	809	1.5-	0.3-	860105	809	0.0	0.1-
850917	809	0.3-	0.8+	850921	809	1.1-	0.0	860105	809	0.1-	0.1+
850917	809	0.2-	0.6-	850921	809	0.7-	0.4-	870101	809	1.0+	0.6+
850918	809	(4.6-	0.1-)	850922	809	0.4-	0.3-	870102	809	1.6+	1.0+
850918	809	(3.2-	0.7-)	850922	809	0.3+	0.6-	870103	809	2.4-	1.2-
850919	809	1.4+	0.3-	850923	809	0.1+	0.5+				
850919	809	1.6+	0.0	850923	809	0.8-	0.6+				

* * * * *

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

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

(3302) 1977 RS6

Epoch 1987 July 24.0 ET = JDE 2447000.5

M	240.74985		(1950.0)	P	Q
n	0.25637993	Peri.	168.33227	+0.79349632	+0.60803125
a	2.4540309	Node	154.16673	-0.56297152	+0.74943249
e	0.0950988	Incl.	3.38400	-0.23114207	+0.26200945
P	3.84	H	12.9	G 0.25	

From 22 observations at 6 oppositions 1954-1987, mean residual 1".2.

(3591)* 1978 QJ2 = 1932 HB = 1973 UH1 = 1979 VD3 = 1984 UG1

Discovered 1978 Aug. 31 by N. S. Chernykh at the Crimean Astrophysical Observatory. The identification 1978 QJ2 = 1932 HB is by L. D. Schmadel (MPC 9291).

Epoch 1987 July 24.0 ET = JDE 2447000.5

M	259.93841	(1950.0)		P	Q
n	0.17597158	Peri.	256.48793	+0.23967584	+0.97080900
a	3.1538500	Node	27.38481	-0.88274454	+0.22187620
e	0.1565290	Incl.	1.15106	-0.40412568	+0.09110892
P	5.60	H	11.6	G	0.25

Residuals in seconds of arc

320424	024	0.1-	1.2-	780826	414	0.3+	0.2-	841030	046	0.8-	0.9-
731026	095	0.7-	0.1+	780831	095	1.5-	0.8-	841030	046	0.7-	1.2-
770518	675	0.3+	1.2-	780905	095	1.4-	0.6-	870224	046	1.2-	1.0-
770519	675	0.9+	0.7-	780927	095	1.3-	1.5-	870224	046	2.3-	0.9-
780823	414	0.5+	0.3+	791114	095	0.2+	2.5+	870225	046	0.6-	1.4-
780823	414	3.4-	0.5+	841028	046	5.9+	0.3+	870225	046	0.7-	1.6-
780824	414	0.5+	0.9+	841028	046	2.1+	2.1-	870227	801	1.9+	3.5+
780824	414	1.1+	0.6-	841029	046	1.5+	1.0+				
780826	414	0.1+	0.7+	841029	046	0.1-	0.9-				

(3592)* 1980 CT = 1964 VC2 = 1964 WJ = 1982 UN9

Discovered 1980 Feb. 15 by Z. Vavrova at Klet.

Epoch 1987 July 24.0 ET = JDE 2447000.5

M	84.54790	(1950.0)		P	Q
n	0.27420086	Peri.	62.46645	+0.13179768	-0.98957398
a	2.3465159	Node	20.21196	+0.83978777	+0.08033693
e	0.1896023	Incl.	9.67696	+0.52667436	+0.11953796
P	3.59	H	13.7	G	0.25

Residuals in seconds of arc

641111	330	1.3+	2.1-	800222	046	1.3-	1.3-	850815	474	0.3-	0.1-
641127	330	1.0-	0.4-	800223	046	0.0	1.6-	870127	054	1.1+	0.5+
800215	046	1.6-	1.1+	800223	046	1.2+	0.1+	870128	801	1.0+	1.4+
800215	046	0.6-	1.9-	821021	095	1.4+	0.2-	870218	054	1.7+	1.1+
800221	046	0.0	0.7-	821022	095	1.0-	0.5+	870219	054	0.9-	0.4+
800221	046	0.1+	0.8-	821111	095	1.4+	0.0	870219	054	2.7-	1.6+
800222	046	0.0	1.9-	850815	474	0.6-	0.1+	870224	801	0.1+	0.6+

(3593)* 1981 EB20 = 1976 SH9

Discovered 1981 Mar. 2 by S. J. Bus at Siding Spring in the course of the U.K. Schmidt-Caltech Asteroid Survey.

Epoch 1987 July 24.0 ET = JDE 2447000.5

M	52.72566	(1950.0)		P	Q
n	0.31228332	Peri.	205.05559	-0.47765042	-0.87833419
a	2.1516429	Node	273.48171	+0.80926560	-0.43124714
e	0.0937578	Incl.	1.11776	+0.34196384	-0.20628852
P	3.16	H	13.9	G	0.25

Residuals in seconds of arc

760929	095	0.5+	1.2-	840222	809	0.7+	0.9-	840304	809	0.2+	0.3+
810209	413	0.2-	0.3-	840222	809	1.0+	0.7-	840304	809	0.1+	0.1+
810213	413	0.1+	0.3+	840223	809	0.4+	1.1-	840304	809	0.1-	0.2-
810302	413	1.3-	1.1+	840223	809	0.3+	1.3-	840305	809	0.0	0.2+
810303	413	0.6-	0.4+	840223	809	0.4+	0.8-	840305	809	0.2+	0.4+
810307	413	0.6-	0.8+	840225	809	0.4+	0.3-	840305	809	0.7+	0.1+
810307	413	1.4+	0.4-	840225	809	0.5+	0.2-	840306	809	0.6+	0.5-
810308	095	0.2-	0.3-	840225	809	0.2+	0.7-	840306	809	0.6+	0.3-
810311	413	0.2-	0.7+	840226	809	0.6-	1.1-	840306	809	0.9+	0.2-
810311	413	1.0+	0.1+	840226	809	0.3-	1.1-	840306	567	0.7+	1.6-
810316	413	0.7-	0.5+	840226	809	0.3-	1.1-	840306	567	0.5-	2.4-
810316	413	0.9+	0.3+	840227	809	0.7+	0.1+	840308	809	0.3+	0.3+
810329	413	0.3-	0.6+	840227	809	0.9+	0.3+	840308	809	0.2+	0.2+
810329	413	0.8+	0.1-	840227	809	1.0+	0.3+	840308	809	0.4-	0.1+
810407	413	0.7-	0.2+	840229	809	0.4-	0.5-	840309	809	0.1+	0.2+
810407	413	0.7+	0.4-	840229	809	0.3-	0.6-	840309	809	0.2+	0.1-
810408	413	0.7-	0.7+	840229	809	0.1-	0.7-	840309	809	0.4+	0.1+
810408	413	1.6+	0.5-	840301	809	0.0	0.4-	840310	809	0.1+	0.1+
810411	413	0.6-	0.2+	840301	809	0.0	0.4-	840310	809	0.0	0.1+
810411	413	0.7+	1.1-	840301	809	0.0	0.5-	840310	809	0.1+	0.1-
810430	413	0.0	0.6-	840302	809	0.1-	0.7-	840604	801	1.1+	0.4+
810502	413	0.4+	0.8-	840302	809	0.0	0.9-	861201	801	0.1-	1.4+
840222	809	0.4+	0.7-	840302	809	0.0	1.0-	870128	801	0.2+	1.1+

(3594)* 1983 CN = 1951 ES = 1959 EW

Discovered 1983 Feb. 11 by E. Bowell at the Anderson Mesa Station of the Lowell Observatory. The key identification 1983 CN = 1959 EW is by E. Bowell (MPC 8062).

Epoch 1987 July 24.0 ET = JDE 2447000.5

M	33.51446		(1950.0)	P	Q
n	0.24433673	Peri.	162.74141	-0.80790228	-0.58348797
a	2.5340210	Node	340.84578	+0.50654743	-0.61586704
e	0.0281241	Incl.	14.59481	+0.30117039	-0.52938603
P	4.03	H	12.8	G 0.25	

Residuals in seconds of arc

510305	760	0.2+	0.6-	830211	688	2.4+	1.1-	851015	688	0.5-	0.4+
510305	760	1.4-	1.1+	830215	688	0.3+	1.8-	851015	688	0.5+	0.5-
590306	690	1.0-	0.9+	830215	688	0.3+	0.8-	870127	801	0.7-	2.1+
590307	690	0.0	0.5+	830219	688	1.8-	2.7-	870128	801	1.0+	1.0+
590309	690	2.9+	0.1+	830219	688	2.4+	1.8-	870224	801	0.6-	1.1+
590310	690	0.0	0.3-	830309	688	0.3-	0.2-				
830211	688	1.0+	1.5-	830309	688	3.4-	1.0-				

(3595)* 1985 TF1 = 1937 RQ = 1972 TH7 = 1976 QY = 1981 WW8

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

Epoch 1987 July 24.0 ET = JDE 2447000.5

M	171.89950		(1950.0)	P	Q
n	0.22672988	Peri.	118.42729	+0.98719049	+0.15477936
a	2.6635665	Node	232.69472	-0.15803699	+0.91534904
e	0.1240979	Incl.	2.78931	-0.02189174	+0.37172502
P	4.35	H	12.9	G 0.25	

Residuals in seconds of arc

370913	754	0.2+	0.7-	760827	675	0.3+	2.1+	851107	688	1.1-	0.2+
370913	754	0.1-	0.8-	811125	095	2.7+	2.2+	851107	688	0.1-	0.6+
370914	754	0.2-	0.4+	851015	688	1.0-	1.2-	861130	801	1.2-	0.7-
721006	095	(0.5+	6.5+)	851015	688	0.9-	0.8-	870129	801	0.5-	0.2+
721013	095	(5.3+	3.9+)	851020	688	0.2-	1.0-	870226	801	0.2+	0.5+
760826	095	0.4+	0.4+	851020	688	1.3+	0.6-				

(3596)* 1985 VO = 1950 TR4 = 1973 SS5

Discovered 1985 Nov. 14 by P. Jensen at Brorfelde.

Epoch 1987 July 24.0 ET = JDE 2447000.5

M	12.53783		(1950.0)	P	Q
n	0.08495245	Peri.	66.26758	+0.46043736	-0.88724674
a	5.1249006	Node	355.96971	+0.59613691	+0.33252577
e	0.0752845	Incl.	23.58274	+0.65773720	+0.31971836
P	11.60	H	9.5	G 0.25	

Residuals in seconds of arc

501013	012	0.7-	0.6+	851012	675	0.3+	0.5-	851115	054	0.6+	0.7-
501014	012	(39.4-	32.7-)	851012	675	0.0	0.8-	861229	801	0.2+	0.1-
730928	095	0.5+	0.6-	851014	675	0.3+	0.2-	870226	801	0.1-	0.1+
850916	675	1.0-	1.5+	851014	675	0.5-	0.8+				
850916	675	0.3-	0.1-	851114	054	0.7+	0.0				

1941 HD = 1970 EA2 = 1980 TO1 = 1983 HD1 = 1987 DD1

The key identification 1941 HD = 1987 DD1 is by E. Bowell and F. N. Bowman, who found it independently.

Epoch 1987 July 24.0 ET = JDE 2447000.5

M	338.70891		(1950.0)	P	Q
n	0.23421338	Peri.	72.60959	-0.60969464	+0.78810178
a	2.6065231	Node	159.11601	-0.78701014	-0.58919966
e	0.1402729	Incl.	13.73920	-0.09427345	-0.17815541
P	4.21	H	12.5	G 0.25	

Residuals in seconds of arc

410403	062	(83.9-	15.8+)	700304	805	0.2+	0.1-	870302	054	1.5-	1.9+
410403	062	(84.0-	13.8+)	801005	809	0.2-	0.2-	870303	688	0.0	0.2-
410419	062	0.2+	0.9+	801005	809	0.3+	0.5-	870303	688	1.8-	0.1+
410421	062	0.3+	1.1+	830418	688	1.0+	1.1-	870401	675	1.6+	0.6+
410428	062	0.6-	0.2-	830418	688	0.1-	1.9-	870401	675	2.0+	0.6-
700304	805	0.0	0.8-	870223	054	1.7-	0.4-				
700304	805	1.1+	0.7+	870224	054	0.3-	0.6-				

1973 FE1 = 1976 JE3 = 1987 HC

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

M	82.43378		(1950.0)	P	Q
n	0.35166466	Peri.	304.47857	-0.73509494	-0.67124570
a	1.9878538	Node	194.19446	+0.67566057	-0.73690418
e	0.0569325	Incl.	22.84671	-0.05584101	-0.08000898
P	2.80	H	13.0	G 0.25	

Residuals in seconds of arc

730327	095	1.0+	0.1-	760524	095	1.7+	0.2+	870428	675	1.3-	0.2+
730402	095	0.0	0.4+	870421	675	2.0+	1.2+	870430	675	1.0-	0.8+
730405	095	1.0-	3.2-	870424	675	0.3-	1.1+	870502	675	0.9-	0.6-
760503	095	1.8-	0.7-	870425	675	1.0+	0.8+				

1978 NU3 = 1978 OH = 1978 SJ = 1949 OO

The identification 1978 NU3 = 1949 OO is by W. Landgraf. The triple designation 1978 NU3 = 1978 OH = 1978 SJ is by H. Oishi (JAM 2044). The double designation 1978 NU3 = 1978 OH was independently found by O. Kippes (MPC 11722).

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

M	162.50983		(1950.0)		P		Q				
n	0.27179386	Peri.	185.29867		+0.78649519		+0.61325234				
a	2.3603541	Node	136.59395		-0.56262411		+0.76028044				
e	0.2202161	Incl.	6.10852		-0.25471440		+0.21423172				
P	3.63	H	14.5	G	0.25						

Residuals in seconds of arc

490728	024	1.2+	0.4+	780709	414	0.8+	0.9-	780927	809	0.6-	0.7-
490730	024	0.2-	2.7-	780730	414	0.5-	0.2-	780928	809	0.4-	0.1+
780709	414	1.4+	0.4-	780730	414	0.3+	0.1+	780929	809	1.2-	0.9-

1978 RU = 1985 DT3

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

M	100.83854		(1950.0)		P		Q				
n	0.23935946	Peri.	273.35874		+0.26387088		+0.96443840				
a	2.5690340	Node	11.97415		-0.85329647		+0.24074705				
e	0.2523889	Incl.	4.19863		-0.44973024		+0.10908451				
P	4.12	H	14.0	G	0.25						

Residuals in seconds of arc

780901	095	0.1+	0.4-	780912	095	1.1-	0.2-	781009	095	1.6-	1.3-
780905	095	1.6+	0.5+	780928	095	3.2+	1.0+	850220	675	0.6+	0.3-
780907	095	0.8-	0.2-	781004	095	0.9-	0.6+	850222	675	0.7-	0.5+

1978 SZ6 = 1972 GD1 = 1986 RX4

The identification 1978 SZ6 = 1972 GD1 is by L. D. Schmadel.

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

M	332.88566		(1950.0)		P		Q				
n	0.23394406	Peri.	124.59612		+0.24252118		-0.96929518				
a	2.6085284	Node	311.31504		+0.87139525		+0.23605047				
e	0.0294396	Incl.	3.10047		+0.42644320		+0.06889862				
P	4.21	H	13.0	G	0.25						

Residuals in seconds of arc

720412	095	0.4+	0.3-	781008	095	1.5-	0.7-	860908	071	1.4+	0.9+
780926	095	1.0+	0.8-	781101	095	0.9+	0.2+	860908	071	1.4-	1.0+
781002	095	0.0	0.3+	860908	071	0.9+	0.4-				

1978 VB = 1980 DV2 = 1985 DB4

The key identification 1978 VB = 1985 DB4 is by S. J. Bus.

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

M	296.11447		(1950.0)		P		Q				
n	0.20394368	Peri.	42.57593		+0.87851078		-0.47385207				
a	2.8584466	Node	345.35514		+0.34756148		+0.72112724				
e	0.1616602	Incl.	13.88876		+0.32774965		+0.50541045				
P	4.83	H	12.5	G	0.25						

Residuals in seconds of arc

781108	026	0.6+	0.0	781202	026	0.0	0.8+	850220	675	0.9+	0.5+
781124	026	1.1+	0.3-	781202	026	0.1-	0.4-	850222	675	0.6-	0.1+
781124	026	1.4-	0.1-	800220	095	0.3-	0.6-				

1979 KD = 1987 HJ

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

M	351.92811		(1950.0)		P		Q				
n	0.23626992	Peri.	100.60374		-0.33158471		+0.94092391				
a	2.5913811	Node	149.75044		-0.91006357		-0.29982911				
e	0.1552335	Incl.	7.83305		-0.24866822		-0.15736807				
P	4.17	H	13.5	G	0.25						

Residuals in seconds of arc

790519	809	0.3+	0.4+	790616	809	0.6+	0.0	790721 809 1.0- 1.1-
790520	809	0.2-	0.4+	790617	809	0.2-	0.5+	870430 675 0.3- 0.1-
790524	809	0.3+	0.0	790618	809	0.3+	0.3-	870502 675 0.1+ 0.3-

1980 FU = 1973 EP = 1978 UB3

The key identification 1980 FU = 1978 UB3 is by E. Bowell.

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

M	2.38390		(1950.0)	P	Q
n	0.28412150	Peri.	240.74887	-0.71280436	+0.70056188
a	2.2915755	Node	343.64477	-0.59505361	-0.62936083
e	0.1149954	Incl.	6.83474	-0.37124271	-0.33633019
P	3.47	H	14.5	G 0.25	

Residuals in seconds of arc

730307	029	2.4+	1.0+	800316	809	0.5-	0.1-	800317 809 0.1- 0.2+
730307	029	1.4-	0.6+	800316	809	0.1+	0.1-	800317 809 0.3- 0.0
781026	675	0.4-	0.6-	800316	809	0.3-	0.2-	800317 809 0.3+ 0.4-
781027	675	0.4+	0.3-	800316	809	0.2-	0.1-	800323 809 0.2- 0.8-
800221	095	0.4+	1.1-	800317	809	0.1-	0.5+	

1981 DG3

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

M	4.49220		(1950.0)	P	Q
n	0.17232852	Peri.	259.66407	-0.65722254	+0.74072299
a	3.1981498	Node	327.84608	-0.54748852	-0.59615994
e	0.0934145	Incl.	15.16707	-0.51799118	-0.30971401
P	5.72	H	11.5	G 0.25	

Residuals in seconds of arc

810209	413	0.0	1.0+	810308	413	1.1-	0.2+	870327 474 0.2+ 4.0+
810212	413	1.9+	0.2+	810308	413	0.0	0.4-	870327 474 0.6+ 2.2+
810228	413	2.0-	0.1+	810312	413	0.8-	0.6-	870403 474 0.4- 2.9-
810228	413	0.8+	0.2+	810312	413	0.4+	0.2-	870403 474 0.9- 2.7-
810306	413	1.5-	0.5+	810501	413	1.4+	0.9+	
810306	413	0.1+	1.0-	810502	413	0.8+	0.3+	

1981 EM5

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

M	130.45207		(1950.0)	P	Q
n	0.18147012	Peri.	193.94516	-0.26990112	-0.95235226
a	3.0898222	Node	271.85877	+0.89645800	-0.19468475
e	0.0543269	Incl.	8.17089	+0.35144906	-0.23478294
P	5.43	H	14.0	G 0.25	

Residuals in seconds of arc

810209	413	2.3+	1.1-	810310	413	1.4-	0.2-	810409 413 0.4+ 0.0
810209	413	1.5+	0.3-	810310	413	1.3+	1.1-	810502 413 1.0+ 1.0-
810302	413	3.9-	0.1+	810312	413	2.3-	0.9+	810503 413 1.3+ 1.1-
810302	413	1.9+	0.5-	810408	413	0.1-	0.9+	841120 675 0.1- 0.7+
810307	413	0.9-	0.0	810408	413	0.6+	0.4+	841121 675 0.2- 0.8+
810307	413	1.3+	1.1-	810409	413	1.9-	0.9+	

1981 EB9 = 1978 TG1

The identification 1981 EB9 = 1978 TG1 is by K. Hurukawa (JAM 1901) and L. D. Schmadel, who found it independently.

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

M	87.08882		(1950.0)	P	Q
n	0.23390316	Peri.	307.76757	+0.34675721	+0.93555069
a	2.6088325	Node	342.16254	-0.77680346	+0.24634176
e	0.1657432	Incl.	12.65623	-0.52567654	+0.25310205
P	4.21	H	13.5	G 0.25	

Residuals in seconds of arc

781002	095	0.5-	0.7+	810315	413	1.0-	0.2+	810410	413	1.2-	0.3+
810209	413	0.3-	0.3-	810315	413	0.4+	0.0	810410	413	1.5+	0.9-
810213	413	0.2+	0.3+	810405	413	1.1-	0.3-	810412	413	1.8-	1.0+
810301	413	1.1-	1.5+	810405	413	1.7+	1.2-	810412	413	2.3+	0.7-
810301	413	0.4+	0.6+	810406	413	1.7-	0.7+	810429	413	1.6+	0.0
810307	413	0.8+	0.1+	810406	413	0.3+	0.4-	850222	675	0.2+	0.3-
810311	413	0.6-	1.3+	810407	413	1.1-	0.0	850223	675	0.6-	0.4-
810311	413	1.6+	0.1+	810407	413	0.1+	0.8-				

1981 EJ9
Epoch 1987 July 24.0 ET = JDE 2447000.5 (J-P)

M	214.33083		(1950.0)	P	Q
n	0.24008273	Peri.	203.35149	-0.91131780	-0.40849430
a	2.5638718	Node	312.43529	+0.38782851	-0.80995738
e	0.1112221	Incl.	3.98620	+0.13816264	-0.42083424
P	4.11	H	16.0	G 0.25	

Residuals in seconds of arc

810209	413	0.6+	0.2-	810311	413	1.5+	1.1-	810412	413	1.9+	0.2-
810213	413	1.2+	0.1+	810315	413	0.4-	1.2-	810430	413	1.5-	0.3-
810301	413	0.8-	0.6+	810315	413	0.7+	0.1+	810502	413	0.5-	0.4+
810301	413	1.6+	0.5-	810406	413	3.4-	1.3+	850220	675	1.9+	1.6-
810307	413	2.7+	0.7-	810406	413	0.0	0.2+	850222	675	1.7-	0.4+
810307	413	0.9+	0.2+	810412	413	3.2-	1.4+				

1981 EH11
Epoch 1987 July 24.0 ET = JDE 2447000.5 (J-P)

M	15.38996		(1950.0)	P	Q
n	0.22955119	Peri.	359.29545	+0.95758576	+0.28053220
a	2.6417024	Node	343.93801	-0.26318062	+0.75849802
e	0.1855086	Incl.	13.76055	-0.11732632	+0.58820272
P	4.29	H	14.0	G 0.25	

Residuals in seconds of arc

810212	413	1.7-	0.6-	810307	413	0.4-	0.3+	810406	413	0.9-	0.0
810213	413	1.9+	0.8-	810307	413	1.6+	1.2+	810406	413	0.1+	0.2-
810301	413	2.3-	0.5+	810311	413	1.8-	0.8+	810412	413	1.6-	0.3-
810301	413	1.0+	0.2+	810311	413	0.8+	0.6+	810412	413	1.2-	1.0+
810301	413	0.1+	0.7-	810315	413	0.3-	0.3-	810429	413	2.7+	1.0-
810302	413	0.3-	0.8-	810315	413	0.5+	0.7+	850220	675	1.0-	0.0
810306	413	1.5+	0.1-	810405	413	0.2+	0.3+	850222	675	1.3+	0.0

1981 EO14
Epoch 1987 July 24.0 ET = JDE 2447000.5 (J-P)

M	56.10619		(1950.0)	P	Q
n	0.23101318	Peri.	338.80556	+0.74044454	+0.66611991
a	2.6305451	Node	338.62031	-0.57586289	+0.56000878
e	0.1669871	Incl.	14.22639	-0.34658883	+0.49261997
P	4.27	H	15.0	G 0.25	

Residuals in seconds of arc

810301	413	3.0-	0.1+	810312	413	2.5-	0.2+	810409	413	0.5+	0.3+
810301	413	1.4+	0.3+	810312	413	1.4+	0.0	810502	413	0.9-	1.0-
810306	413	1.1+	0.7-	810408	413	2.8+	0.1-	810503	413	0.1+	0.3-
810308	413	1.3-	0.6+	810408	413	2.6+	0.9-	850220	675	2.2+	0.4-
810308	413	1.4+	0.9+	810409	413	3.3-	0.8+	850222	675	2.3-	0.2+

1981 EW14
Epoch 1987 July 24.0 ET = JDE 2447000.5 (J-P)

M	320.75766		(1950.0)			P			Q		
n	0.22780655		Peri.	47.13793		+0.91329731			-0.39667568		
a	2.6551727		Node	335.78576		+0.27588474			+0.76938389		
e	0.1783134		Incl.	13.01852		+0.29962581			+0.50069636		
P	4.33		H	14.5		G	0.25				

Residuals in seconds of arc

810209	413	2.8-	0.5-	810308	413	1.2+	0.2-	810501	413	2.4-	1.1+
810212	413	0.9+	0.1-	810312	413	1.3+	0.6-	810503	413	2.1+	0.4-
810301	413	3.9+	0.6-	810312	413	3.1-	0.8+	850220	675	1.5+	0.6-
810306	413	2.9+	2.4-	810312	413	1.7-	0.0	850222	675	0.9+	0.5-
810308	413	1.0-	0.1+	810409	413	0.8-	1.0+	850223	675	2.0-	1.5+

1981 EC15
Epoch 1987 July 24.0 ET = JDE 2447000.5 (J-P)

M	203.19975		(1950.0)			P			Q		
n	0.23883055		Peri.	190.78999		-0.97999785			-0.19566860		
a	2.5728255		Node	337.82577		+0.18899331			-0.85792133		
e	0.1898603		Incl.	5.51983		+0.06233578			-0.47506294		
P	4.13		H	16.0		G	0.25				

Residuals in seconds of arc

810212	413	0.5-	0.5-	810306	413	0.4+	0.7-	810501	413	0.2+	0.5-
810212	413	0.3-	0.1+	810308	413	1.1-	0.3+	810503	413	0.3-	0.4+
810213	413	1.1+	0.9-	810308	413	0.1+	0.2+	850220	675	0.8-	0.3-
810301	413	0.1+	0.1-	810408	413	1.3+	0.1-	850222	675	1.2+	0.9+
810301	413	1.3+	0.4-	810409	413	1.5-	0.7+				
810306	413	0.9-	0.1-	810409	413	0.6+	0.2+				

1981 EX15 = 1978 NH5
Epoch 1987 July 24.0 ET = JDE 2447000.5 (J-P)

M	338.61525		(1950.0)			P			Q		
n	0.23427078		Peri.	57.07288		+0.91545074			-0.40091648		
a	2.6061025		Node	326.52510		+0.34486723			+0.82621293		
e	0.0815119		Incl.	3.62464		+0.20740431			+0.39577541		
P	4.21		H	15.5		G	0.25				

Residuals in seconds of arc

780710	675	(6.2-	9.5-)Y	810306	413	1.0-	0.4+	810409	413	0.6+	0.2-
780711	675	0.4+	0.3+ Y	810308	413	1.6-	0.5+	810501	413	1.3+	0.2-
780713	675	0.3-	0.5- Y	810308	413	1.6+	0.3+	810503	413	1.0+	0.1-
810212	413	1.4+	1.9-	810408	413	1.5-	0.1+	850220	675	0.3+	0.3-
810301	413	1.1-	0.3+	810408	413	(5.6-	1.0+)	850222	675	0.3-	0.2+
810301	413	0.6+	0.4+	810409	413	0.9-	0.0				

1981 ER18
Epoch 1987 July 24.0 ET = JDE 2447000.5 (J-P)

M	243.18099		(1950.0)			P			Q		
n	0.24068995		Peri.	130.40180		-0.42417033			-0.90528025		
a	2.5595578		Node	344.64649		+0.80174995			-0.36340047		
e	0.1651967		Incl.	5.06857		+0.42104222			-0.22001765		
P	4.09		H	15.5		G	0.25				

Residuals in seconds of arc

810202	413	0.1+	0.7-	810307	413	1.0+	0.5-	810408	413	1.0+	0.5-
810213	413	1.9+	0.1-	810311	413	1.3-	1.4+	810411	413	0.9+	1.2-
810302	413	0.3-	0.8+	810311	413	1.3+	0.1-	810430	413	0.5-	0.5+
810302	413	0.5+	0.3-	810316	413	1.6-	1.5+	810502	413	0.6-	0.6-
810303	413	2.0-	0.3-	810316	413	3.0+	0.6-	850220	675	0.2-	0.3-
810307	413	1.1-	0.0	810408	413	1.9-	1.2+	850222	675	0.1+	0.1-

1981 EF19
Epoch 1987 July 24.0 ET = JDE 2447000.5 (J-P)

M	256.34427	(1950.0)		P	Q
n	0.23833752	Peri.	122.33868	+0.06978071	-0.99706760
a	2.5763724	Node	323.61953	+0.89647509	+0.07649141
e	0.2275358	Incl.	3.03592	+0.43756492	+0.00229323
P	4.14	H	15.5	G 0.25	

Residuals in seconds of arc

810209	413	0.2-	0.3-	810307	413	1.1-	1.8+	810329	413	0.9-	0.1+
810213	413	0.4-	0.1-	810307	413	(3.5+	2.0-)	810430	413	0.1-	0.1-
810302	413	0.6-	1.1+	810311	413	0.7-	0.5+	810502	413	0.4-	0.7-
810302	413	(4.1-	0.2-)	810311	413	2.2+	1.0-	850222	675	0.1+	0.1-
810303	413	2.2+	1.0-	810316	413	(9.0-	3.8+)	850223	675	0.3-	0.4-

1981 EU20
Epoch 1987 July 24.0 ET = JDE 2447000.5 (J-P)

M	59.30891	(1950.0)		P	Q
n	0.23537134	Peri.	3.57766	+0.66363937	+0.74791907
a	2.5979723	Node	308.00097	-0.68673581	+0.60163977
e	0.1002002	Incl.	1.02794	-0.29660869	+0.28044009
P	4.19	H	14.0	G 0.25	

Residuals in seconds of arc

810209	413	0.7+	1.6-	810311	413	0.6-	0.7+	810430	413	0.7-	0.1-
810213	413	0.3+	0.6-	810316	413	(4.4-	0.8+)	810502	413	0.1+	0.1+
810302	413	0.3-	0.0	810316	413	0.1-	0.5+	850220	675	(6.1-	0.7+)
810303	413	1.6+	0.3-	810329	413	0.2-	1.3+	850222	675	1.0-	0.7+
810307	413	(4.1-	1.9+)	810408	413	1.8-	0.8+	850223	675	1.0+	0.4-
810307	413	1.8+	0.5-	810408	413	0.8+	1.4-				
810311	413	2.3-	1.5+	810411	413	0.0	0.3-				

1981 EF21
Epoch 1987 July 24.0 ET = JDE 2447000.5 (J-P)

M	191.97836	(1950.0)		P	Q
n	0.23970535	Peri.	12.69311	-0.99893615	+0.03456791
a	2.5665620	Node	169.14858	-0.04103944	-0.96826465
e	0.0969543	Incl.	9.33043	+0.02103183	-0.24752502
P	4.11	H	15.5	G 0.25	

Residuals in seconds of arc

810209	413	0.5+	0.4+	810311	413	1.9+	1.7-	850220	675	0.4+	0.1-
810213	413	(5.8-	0.7+)	810316	413	1.6-	1.6+	850222	675	0.5+	0.4+
810302	413	2.5+	1.1-	810329	413	0.6-	1.1+				
810307	413	0.3+	0.7+	810502	413	1.7-	0.2+				

1981 ED22
Epoch 1987 July 24.0 ET = JDE 2447000.5 (J-P)

M	147.60866	(1950.0)		P	Q
n	0.23320815	Peri.	41.12355	-0.81590029	+0.57817794
a	2.6140131	Node	174.19450	-0.54054806	-0.76022967
e	0.0672329	Incl.	2.33532	-0.20521822	-0.29624503
P	4.23	H	16.0	G 0.25	

Residuals in seconds of arc

810209	413	0.2+ 1.1-	810307	413	0.4+ 0.7+	810408	413	0.6+ 0.3+
810209	413	2.4+ 3.0-	810311	413	1.3- 0.4+	810411	413	0.5+ 1.8-
810213	413	1.2+ 0.3+	810316	413	(5.1+ 2.5-)	810426	413	1.0+ 2.7-
810302	413	(3.5- 2.1+)	810316	413	0.4- 1.0+	810502	413	2.9- 1.5+
810302	413	0.8- 0.5+	810329	413	0.9- 1.0+	810502	413	2.1+ 0.2+
810303	413	0.8- 1.8+	810407	413	1.5- 1.5+	850220	675	1.0- 1.0+
810307	413	1.5- 1.8+	810407	413	1.9+ 1.5-	850222	675	0.7+ 0.2-

1981 EV24
Epoch 1987 July 24.0 ET = JDE 2447000.5 (J-P)

M	258.62041	(1950.0)		P	Q
n	0.23886985	Peri.	101.88625	-0.16841509	-0.98571387
a	2.5725433	Node	357.80607	+0.88130208	-0.14960765
e	0.1282204	Incl.	3.18779	+0.44152350	-0.07736747
P	4.13	H	16.0	G 0.25	

Residuals in seconds of arc

791018	675	1.6+ 0.4-	810302	413	0.2+ 1.2-	810406	413	1.4+ 0.1-
791018	675	0.6- 1.1-	810306	413	2.9- 0.0	810410	413	1.8- 0.2+
810209	413	3.0+ 1.0-	810311	413	0.5- 1.4-	810426	413	1.5+ 1.4-
810213	413	0.0 1.6-	810315	413	1.1- 0.2+	850220	675	1.8+ 1.7+
810302	413	0.3+ 0.3-	810406	413	1.5- 0.7+	850222	675	0.2+ 1.9+

1981 EL32
Epoch 1987 July 24.0 ET = JDE 2447000.5 (J-P)

M	92.00751	(1950.0)		P	Q
n	0.23264853	Peri.	290.79150	+0.02800407	+0.99670524
a	2.6182034	Node	340.34563	-0.81211480	-0.02171480
e	0.0676944	Incl.	13.08042	-0.58282529	+0.07814815
P	4.24	H	15.5	G 0.25	

Residuals in seconds of arc

810209	413	0.2- 0.1+	810307	413	1.1+ 0.0	810429	413	0.0 0.5+
810213	413	0.7- 0.6+	810311	413	1.5+ 0.4-	850220	675	0.5+ 1.2+
810307	413	2.2- 0.2+	810315	413	0.6+ 1.2-	850222	675	0.6- 0.7-

1981 EB33
Epoch 1987 July 24.0 ET = JDE 2447000.5 (J-P)

M	58.92534	(1950.0)		P	Q
n	0.23000284	Peri.	340.60543	+0.63235452	+0.76677595
a	2.6382429	Node	328.33104	-0.68005055	+0.48121016
e	0.1854718	Incl.	12.13594	-0.37102428	+0.42484283
P	4.29	H	14.5	G 0.25	

Residuals in seconds of arc

810209	413	(4.2+ 1.8-)	810307	413	2.5+ 1.3-	810315	413	0.5+ 1.2+
810214	413	0.9- 0.1+	810311	413	0.8- 0.8+	810429	413	0.0 0.3-
810301	413	0.8+ 0.0	810311	413	0.4+ 0.8-	850222	675	1.8- 0.4+
810307	413	1.5- 0.4-	810315	413	1.1- 0.6+	850223	675	1.9+ 0.3-

1981 EW39
Epoch 1987 July 24.0 ET = JDE 2447000.5 (J-P)

M	336.95935		(1950.0)		P		Q				
n	0.17806457	Peri.	265.24605		-0.10107102		+0.99487365				
a	3.1290937	Node	358.93586		-0.82689288		-0.08586407				
e	0.1040850	Incl.	10.31964		-0.55320233		-0.05342080				
P	5.54	H	15.5	G	0.25						

Residuals in seconds of arc

781026	675	1.5-	0.5-	810302	413	2.1-	2.3-	810311	413	0.2+	0.5+
781027	675	1.4+	0.3-	810303	413	0.8+	0.3-	810316	413	1.5-	0.2+
810213	413	2.3+	0.4+	810307	413	0.9-	1.1+	810430	413	0.7+	0.2-
810302	413	0.5+	0.6+	810311	413	0.5-	0.4+	810502	413	0.6+	0.4-

1981 EE46
Epoch 1987 July 24.0 ET = JDE 2447000.5 (J-P)

M	294.26532		(1950.0)		P		Q				
n	0.18333703	Peri.	3.67193		+0.72947836		+0.68131502				
a	3.0688109	Node	313.18428		-0.62962888		+0.63423709				
e	0.1431773	Incl.	4.76656		-0.26726165		+0.36544926				
P	5.38	H	15.0	G	0.25						

Residuals in seconds of arc

781026	675	1.6+	0.0	810302	413	(6.9+	2.3-)	810315	413	(3.3-	1.1-)
781027	675	1.8-	0.9-	810303	413	1.3+	0.9+	810315	413	0.5-	2.6-
810209	413	0.4+	0.1+	810307	413	2.1-	1.3+	810430	413	0.2+	0.5+
810302	413	2.1-	1.0+	810307	413	2.2+	0.5-	810502	413	0.3+	0.3-

1982 DU
Epoch 1987 July 24.0 ET = JDE 2447000.5 (J-P)

M	49.44435		(1950.0)		P		Q				
n	0.19163507	Peri.	143.90256		-0.59492243		-0.79812479				
a	2.9795700	Node	341.97663		+0.64628822		-0.40456195				
e	0.2167290	Incl.	17.92102		+0.47788999		-0.44645990				
P	5.14	H	13.0	G	0.25						

Residuals in seconds of arc

820221	688	0.8+	0.5+	820323	046	2.0-	1.1-	820331	809	1.5+	0.6+
820221	688	1.9-	0.7-	820324	046	0.2-	1.1-	820331	809	0.5+	0.5+
820315	046	(6.0+	1.4+)	820324	046	1.3+	0.3-	820331	809	0.5+	0.8+
820315	046	2.9+	1.4+	820325	046	0.8+	0.6-	870303	688	1.8+	2.0+
820321	688	1.0+	0.4+	820326	046	1.4-	0.4-	870303	688	3.4+	1.6+
820321	688	0.1-	1.8-	820326	046	1.4-	0.1-	870304	046	1.2-	2.0-
820323	046	0.8-	1.1+	820326	046	1.6-	0.6+	870304	046	3.9-	1.4-

1982 HS1 = 1987 EA1
The identification is by E. Bowell.
Epoch 1987 July 24.0 ET = JDE 2447000.5 (J-P)

M	324.93776		(1950.0)		P		Q				
n	0.18373689	Peri.	148.40591		-0.19323929		+0.97868004				
a	3.0643569	Node	110.37304		-0.91491303		-0.15411775				
e	0.2141710	Incl.	4.25771		-0.35439063		-0.13576854				
P	5.36	H	13.0	G	0.25						

Residuals in seconds of arc

820418	688	0.1+	1.4-	820526	688	1.8+	0.4+	870426	801	0.3+	0.8-
820418	688	1.1-	1.8-	820526	688	1.5+	0.4+	870502	801	0.3+	0.3-
820428	688	0.1-	1.5+	870304	688	0.5+	1.2+				
820428	688	0.2+	1.8+	870304	688	0.3-	0.6-				

1983 AN = 1987 EN

The identification is by E. Bowell.

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

M	104.23110	(1950.0)	P	Q
n	0.26402332	Peri. 350.74877	+0.19500347	-0.97268352
a	2.4064419	Node 87.93147	+0.90769340	+0.13032898
e	0.1173852	Incl. 7.23968	+0.37157280	+0.19209668
P	3.73	H 12.5	G 0.25	

Residuals in seconds of arc

830109	688	0.6+	1.5+	830121	688	0.6-	0.3-	830309	688	0.8+	0.6-
830109	688	1.2+	0.3+	830215	688	0.6-	0.9-	870303	688	0.1-	0.1+
830116	688	0.1-	1.4-	830215	688	0.7-	0.4-	870303	688	0.4+	0.9+
830116	688	0.6-	0.7+	830309	688	0.7+	1.4-	870502	801	0.2+	0.2-

1983 RP2 = 1985 DJ4

The identification is by S. J. Bus.

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

M	24.11610	(1950.0)	P	Q
n	0.28794914	Peri. 222.64463	+0.97461961	-0.22091636
a	2.2712227	Node 150.06134	+0.21993444	+0.91467346
e	0.1710388	Incl. 4.16297	+0.04177865	+0.33847958
P	3.42	H 15.0	G 0.25	

Residuals in seconds of arc

830813	688	0.6-	1.1-	830904	688	0.8-	0.8+	830912	688	1.9+	0.7-
830813	688	0.2-	0.4+	830906	688	0.9+	1.1+	850222	675	1.0-	0.9-
830902	688	0.3-	0.3-	830906	688	2.3+	1.4+	850223	675	0.2+	0.2-
830902	688	1.9-	1.9+	830910	688	0.4-	0.5+				
830904	688	0.3+	1.1+	830910	688	0.3-	0.3-				

1986 CH = 1986 AV2 = 1976 FF = 1984 WN2

The key identification 1986 CH = 1984 WN2 is by S. J. Bus. The identification 1986 CH = 1976 FF was suggested by L. D. Schmadel. The double designation 1986 CH = 1986 AV2 is by F. N. Bowman (MPC 10817).

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

M	63.98498	(1950.0)	P	Q
n	0.19033722	Peri. 272.85082	-0.98741067	+0.03050151
a	2.9930991	Node 268.93161	+0.03294564	-0.92005469
e	0.0553074	Incl. 8.93048	-0.15470859	-0.39060086
P	5.18	H 12.0	G 0.25	

Residuals in seconds of arc

760331	095	0.2+	1.0+	860208	889	0.3-	0.5+	860302	889	1.1-	0.7+
841120	675	0.7+	1.4+	860208	889	0.1+	2.9+	860312	889	2.9-	0.6-
841121	675	0.7-	0.6+	860216	889	1.5+	1.4-	860312	889	0.6-	0.8-
860112	688	1.2+	0.4-	860216	889	1.0+	0.2+				
860112	688	1.4+	0.1+	860302	889	0.6-	0.0				

1986 TG = 1973 TB = 1985 DZ3

The key identification 1986 TG = 1985 DZ3 is by S. J. Bus. The identification 1986 TG = 1973 TB was suggested by D. W. E. Green.

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

M	116.34290	(1950.0)	P	Q
n	0.30435217	Peri. 334.60680	+0.79065904	+0.61157580
a	2.1888667	Node 347.56243	-0.53635731	+0.66913567
e	0.2431865	Incl. 7.70269	-0.29526111	+0.42217592
P	3.24	H 13.5	G 0.25	

Residuals in seconds of arc

731001	095	3.0+	5.1-	860930	046	0.6-	2.3+	861024	552	0.1-	0.2-
850220	675	0.4-	0.2-	860930	046	1.7+	0.9+	861024	552	0.5-	0.3-
850222	675	0.4-	0.8-	861001	046	0.8+	0.6-	861030	552	0.2-	0.3-
860903	026	2.5-	0.5+	861001	046	2.2+	0.6-	861030	552	0.6+	0.7-
860907	026	1.8-	0.3+	861001	026	0.0	0.6+	861031	054	0.2-	0.7+
860910	026	1.6+	0.4-	861003	054	1.8-	0.9+	861103	026	0.6+	0.1-
860911	026	3.8-	0.7+	861004	026	0.3+	0.2+	861104	552	1.8-	0.3+
860927	026	0.6-	0.8+	861004	054	1.2-	1.1+	861104	054	0.5+	1.4+
860929	046	0.4+	1.0+	861006	026	1.8-	0.6+	861104	552	2.1-	0.1-
860929	046	1.6+	0.1+	861008	026	1.6-	0.2-	861107	552	1.5+	1.0-
860929	046	2.4+	2.3-	861008	054	0.1-	0.2-	861107	552	0.4+	0.8-
860929	046	2.9+	2.6-	861008	054	0.8-	0.4+	861107	026	0.0	1.3+
860929	026	0.4+	0.2+	861023	026	0.1-	0.5+				

1986 XO2
Epoch 1987 July 24.0 ET = JDE 2447000.5

M	8.76473		(1950.0)	P	Q
n	0.27223100	Peri.	43.25209	-0.92286006	+0.34623036
a	2.3578219	Node	155.42281	-0.35520461	-0.93444566
e	0.2248883	Incl.	23.92662	+0.14885898	-0.08328173
P	3.62	H	12.0	G 0.25	

From 13 observations 1986 Dec. 2-1987 Mar. 27, mean residual 1".2.

6582 P-L = 1985 DF4

The identification is by E. Bowell.

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

M	185.01257		(1950.0)	P	Q
n	0.17634207	Peri.	103.93187	-0.42480193	-0.90528274
a	3.1494372	Node	11.20728	+0.82540545	-0.38847107
e	0.1565595	Incl.	0.75014	+0.37181871	-0.17191097
P	5.59	H	12.5	G 0.25	

Residuals in seconds of arc

600924	675	0.5-	0.3-	601017	675	0.1+	0.5-	850222	675	0.5-	0.0
600926	675	0.4-	0.3-	601022	675	0.2+	0.1-	850223	675	0.5+	0.1-
600927	675	1.0+	0.6+	601024	675	1.3-	1.3+				
600928	675	0.1+	0.2+	601026	675	1.0+	0.7-				

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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 Wiseman-Skiff (1987b)
Epoch 1986 Nov. 26.0 ET = JDE 2446760.5
T 1986 Nov. 22.75588 ET

q	1.5050077		(1950.0)	P	Q
n	0.15121246	Peri.	171.76257	+0.11873810	-0.94255445
a	3.4893484	Node	271.00455	+0.89221897	+0.23927434
e	0.5686852	Incl.	18.19703	+0.43571387	-0.23310705
P	6.52				

From 30 observations 1986 Dec. 28-1987 Mar. 27, mean residual 1".2.

Comet Levy (1987a)
Epoch 1987 Jan. 5.0 ET = JDE 2446800.5
T 1986 Dec. 17.53982 ET

q	0.9217973	(1950.0)	P	Q
z	-0.0008597	Peri. 95.26941	-0.05579536	-0.95813959
+/-	0.0001122	Node 16.42016	-0.51794824	-0.21267115
e	1.0007925	Incl. 96.58870	+0.85359036	-0.19167554

From 33 observations 1987 Jan. 8-Apr. 3, mean residual 0".9.

Comet Sorrells (1986n)
Epoch 1987 Mar. 26.0 ET = JDE 2446880.5
T 1987 Mar. 9.67668 ET

q	1.7209732	(1950.0)	P	Q
z	+0.0002270	Peri. 70.22589	+0.94623377	+0.04882813
+/-	0.0001017	Node 74.08720	-0.04925070	-0.95527181
e	0.9996094	Incl. 160.57824	+0.31971240	-0.29167035

From 100 observations 1986 Nov. 2-1987 May 7, mean residual 1".1.

Comet Nishikawa-Takamizawa-Tago (1987c)
Epoch 1987 Mar. 26.0 ET = JDE 2446880.5
T 1987 Mar. 17.34348 ET

q	0.8693801	(1950.0)	P	Q
z	+0.0054537	Peri. 200.40093	+0.90589836	-0.42335119
+/-	0.0001987	Node 175.31018	-0.36739110	-0.77265014
e	0.9952587	Incl. 172.23847	-0.21064647	-0.47305975

From 59 observations 1987 Jan. 21-May 3, mean residual 1".1.

Comet Wilson (1986l)
Epoch 1987 May 5.0 ET = JDE 2446920.5
T 1987 Apr. 20.78339 ET

q	1.1996521	(1950.0)	P	Q
z	-0.0002960	Peri. 238.29891	-0.47929616	-0.71644202
+/-	0.0000036	Node 110.95812	-0.50091689	+0.69759613
e	1.0003551	Incl. 147.12201	-0.72066460	-0.00839472

From 100 observations 1986 Aug. 5-1987 May 3, mean residual 1".1.

(3597)* 1941 UL = 1975 XW5 = 1980 VH1
Discovered 1941 Oct. 15 by L. Oterma at Turku.
Epoch 1987 July 24.0 ET = JDE 2447000.5

M	84.63720	(1950.0)	P	Q
n	0.17623708	Peri. 294.21425	+0.93481894	-0.35242097
a	3.1506816	Node 86.44529	+0.33963668	+0.85126587
e	0.2004433	Incl. 2.51164	+0.10373275	+0.38877483

P 5.59 H 11.7 G 0.25

Residuals in seconds of arc

411015	062	3.0+	3.4-	801010	095	0.5-	1.0-	850815	688	0.4-	0.8+
411027	062	0.8+	0.8-	801017	095	0.5-	2.0-	850815	688	1.5-	1.1+
411112	062	1.4-	1.2+	801106	330	3.3+	2.3+	861013	033	1.2-	0.1+
411115	062	2.2-	0.1-	801110	330	2.8+	2.1+	861013	033	1.1-	0.7+
751204	095	1.5+	0.9+	801130	330	2.7-	1.3+	861229	801	2.0-	0.1-

(3598)* 1977 KK1 = 1959 CK = 1978 QU = 1979 WL6
Discovered 1977 May 18 by E. Howell Bus at Palomar. The key identification 1977 KK1 = 1978 QU is by A. Lowe (MPC 11050).

Epoch 1987 July 24.0 ET = JDE 2447000.5

M 295.31169	(1950.0)	P	Q	
n 0.17446431	Peri. 71.46336	-0.60820701	+0.79376619	
a 3.1719888	Node 161.07461	-0.73327708	-0.55971279	
e 0.1088974	Incl. 0.77941	-0.30395553	-0.23802693	
P 5.65	H 11.6	G 0.25		

Residuals in seconds of arc

590208 024	0.9-	1.5-	791117 095	2.1+	0.2-	870202 054	1.6-	1.4+
770518 675	0.5+	0.2-	870126 054	1.5-	1.4+	870227 801	0.8+	0.2+
770519 675	0.6+	0.1+	870128 801	1.3+	0.2+	870228 801	0.5+	0.2-
780831 095	1.7-	0.6-	870202 688	0.0	0.1-			
780905 095	0.3-	0.7+	870202 688	0.2+	0.1-			

(3599)* 1978 PB3 = 1977 LX = 1979 WX6

Discovered 1978 Aug. 8 by N. S. Chernykh at the Crimean Astrophysical Observatory. The key identification 1978 PB3 = 1977 LX is by E. Bowell (MPC 11050).

Epoch 1987 July 24.0 ET = JDE 2447000.5

M 319.97590	(1950.0)	P	Q	
n 0.17544012	Peri. 53.56724	-0.79818814	+0.60235304	
a 3.1602161	Node 163.46639	-0.56144070	-0.73893086	
e 0.1240293	Incl. 1.64224	-0.21835758	-0.30191389	
P 5.62	H 11.9	G 0.25		

Residuals in seconds of arc

770612 675	0.3-	0.1-	780902 809	0.0	0.5-	780910 809	0.9+	1.8+
770613 675	0.2+	0.2-	780902 809	0.8-	1.1-	780910 809	0.5+	0.1+
780808 095	2.5-	0.8+	780906 809	0.4+	0.7-	791117 095	0.4+	1.5-
780902 809	0.2-	0.2-	780910 809	0.4-	2.1+	870128 801	0.1-	1.5+
780902 809	0.4+	0.9+	780910 809	0.7+	0.6-	870225 801	0.7+	0.6+

(3600)* 1978 SL7 = 1951 AU1 = 1980 EV = 1984 AG1

Discovered 1978 Sept. 26 by L. V. Zhuravleva at the Crimean Astrophysical Observatory. The key identification 1978 SL7 = 1984 AG1 is by E. Bowell (MPC 8675).

Epoch 1987 July 24.0 ET = JDE 2447000.5

M 288.22480	(1950.0)	P	Q	
n 0.24006081	Peri. 144.78621	-0.86412775	-0.50312631	
a 2.5640228	Node 5.05220	+0.42433109	-0.74133216	
e 0.1360508	Incl. 7.91745	+0.27060369	-0.44417400	
P 4.11	H 13.0	G 0.25		

Residuals in seconds of arc

510106 760	2.7-	1.3-	840108 688	0.2-	0.4+	850525 474	0.3+	1.6-
510106 760	2.6+	0.5+	840108 688	0.9-	2.5+	850525 474	0.7+	1.5-
780926 095	0.3+	0.7-	840126 688	0.6-	1.8-	861005 688	(7.8+	1.8-)
781002 095	0.6+	0.7+	840126 688	0.3-	2.0-	861005 688	(8.6+	1.7+)
781008 095	0.7-	0.5+	840204 688	1.0+	1.6-	861008 801	1.4+	0.7-
800315 095	0.7-	3.1+	840204 688	1.3+	1.5-	861101 801	1.8-	1.4-

(3601)* 1979 SP9 = 1977 KH1 = 1987 BQ

Discovered 1979 Sept. 22 by N. S. Chernykh at the Crimean Astrophysical Observatory. The identifications are by E. Bowell (MPC 10830 and unpublished).

Epoch 1987 July 24.0 ET = JDE 2447000.5

M 95.77213	(1950.0)	P	Q	
n 0.16832428	Peri. 346.02790	+0.67572128	-0.73630768	
a 3.2486645	Node 61.44853	+0.68010587	+0.60419245	
e 0.1483306	Incl. 2.30840	+0.28435322	+0.30463499	
P 5.86	H 12.2	G 0.25		

Residuals in seconds of arc

770518 675	0.4-	0.3-	790922 095	0.8-	1.1+	870126 033	0.4-	0.2-
770519 675	0.2+	0.4-	790928 095	0.2-	1.5-	870127 033	0.2-	0.0
780707 675	1.2-	0.4-	791016 095	1.3-	0.4+	870128 033	0.3+	0.2+
780708 675	0.6+	0.0	791111 095	3.0+	1.0-	870129 801	0.5-	0.3-
780709 675	0.7+	0.2-	791116 095	0.3-	0.3+	870224 801	0.6+	0.5-

(3602)* 1981 DQ2 = 1976 YR4

Discovered 1981 Feb. 28 by S. J. Bus at Siding Spring in the course of the U.K. Schmidt-Caltech Asteroid Survey. The identification is by L. D. Schmadel (MPC 8538).

Epoch 1987 July 24.0 ET = JDE 2447000.5

M	5.45251	(1950.0)	P	Q	
n	0.28893241	Peri.	231.97901	-0.39480453	-0.91478238
a	2.2660625	Node	241.47957	+0.87045799	-0.34266253
e	0.1319878	Incl.	5.58128	+0.29399367	-0.21390557
P	3.41	H	14.4	G	0.25

Residuals in seconds of arc

761218 095	0.4-	2.9+	810312 413	0.8-	0.7+	840105 688	0.1+	1.3-
810209 413	0.2-	1.5-	810312 413	0.5-	0.2+	840106 552	4.2-	1.0-
810212 413	0.1+	0.7+	810407 413	0.4+	0.8-	840106 552	2.0-	0.7+
810228 413	2.8-	0.1-	810407 413	2.5+	2.3-	840108 688	3.9+	0.6-
810228 413	0.4-	0.4+	810408 413	0.4-	0.1-	840108 688	2.3+	1.3+
810306 413	2.1-	1.5+	810408 413	0.9+	1.0-	861007 688	1.9-	1.6-
810306 413	0.6+	0.2-	810409 413	0.7+	0.0	861007 688	1.5+	0.1+
810308 413	1.1-	1.0+	810409 413	1.6+	0.1-	861101 801	0.2+	0.3+
810308 413	0.7+	0.2+	810501 413	0.5+	1.0-	861202 801	0.9+	1.8-

(3603)* 1981 RM = 1976 JP = 1985 RC2

Discovered 1981 Sept. 5 by L. Brozek at Klet. The key identification 1981 RM = 1985 RC2 is by E. Bowell (MPC 10159).

Epoch 1987 July 24.0 ET = JDE 2447000.5

M	218.22027	(1950.0)	P	Q	
n	0.23932250	Peri.	347.92226	-0.07385877	+0.99316119
a	2.5692934	Node	277.79238	-0.90716564	-0.10456990
e	0.1251930	Incl.	5.23624	-0.41424074	+0.05192285
P	4.12	H	12.9	G	0.25

Residuals in seconds of arc

760502 095	1.4-	3.8-	850914 688	0.6+	0.3-	861203 046	0.2-	1.8-
810905 046	0.0	0.7-	861129 046	(8.7+	1.3-)	861203 046	0.0	0.2+
810905 046	0.7-	0.2-	861129 046	(8.1+	0.4-)	861204 046	(11.6-	7.1-)
810906 046	0.8+	0.4-	861130 046	1.2-	0.7-	861207 046	(10.5+	1.0+)
810906 046	0.6+	0.9-	861130 046	0.3+	1.6-	861207 046	(8.1+	4.5+)
810906 046	0.8+	0.2-	861201 046	(5.6-	3.7-)	861209 046	2.7+	0.2+
810906 046	0.2-	0.7-	861201 046	1.4-	2.5-	861209 046	2.0+	3.7+
810925 095	0.6-	1.3+	861202 688	(6.9-	0.6+)			
850914 688	0.5-	0.3-	861202 688	1.9-	1.0-			

(3604)* 5550 P-L = 1971 FA1 = 1977 TK4 = 1983 AP

Discovered 1960 Oct. 17 by C. J. van Houten and I. van Houten-Groeneveld on Palomar Schmidt plates taken by T. Gehrels. The key identification 5550 P-L = 1983 AP was found independently by O. Kippes. The identifications 5550 P-L = 1971 FA1 = 1977 TK4 are by L. D. Schmadel (MPC 7841).

Epoch 1987 July 24.0 ET = JDE 2447000.5

M	334.94373	(1950.0)	P	Q	
n	0.23495381	Peri.	155.21489	-0.99280721	-0.09738750
a	2.6010442	Node	19.57861	+0.04067918	-0.82144983
e	0.1159937	Incl.	11.99430	+0.11260132	-0.56190377
P	4.19	H	12.9	G	0.25

Residuals in seconds of arc

601017	675	1.1+	0.1+	830112	688	2.6-	1.7+	830215	688	2.2+	1.8-
601022	675	0.2-	0.0	830112	688	1.7+	0.8+	840529	474	1.2+	0.3-
601025	675	1.2+	0.7-	830116	688	1.0+	1.0+	840529	474	1.4-	1.3-
601026	675	0.5-	0.3+	830116	688	3.1-	2.0-	850917	801	0.3+	0.1+
601026	675	0.7+	1.0-	830121	688	1.7-	0.4+	861128	801	0.8+	1.5+
710319	095	0.1+	0.6+	830121	688	0.7+	0.1-	870227	801	0.3+	0.1+
771007	095	2.0-	0.7-	830215	688	1.9+	2.8-				

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ORBITAL ELEMENTS BY S. NAKANO, SMITHSONIAN ASTROPHYSICAL OBSERVATORY.

The identifications are by S. Nakano unless otherwise stated.

(3605)* 1932 WB = 1971 GD = 1984 BY

Discovered 1932 Nov. 28 by E. Delporte at Uccle.

Epoch 1987 July 24.0 ET = JDE 2447000.5

M	13.82376		(1950.0)	P	Q
n	0.29176235	Peri.	199.44405	-0.52326368	-0.84955235
a	2.2513856	Node	282.15846	+0.79057904	-0.45471345
e	0.0795161	Incl.	3.91545	+0.31808789	-0.26738825
P	3.38	H	13.0	G 0.25	

Residuals in seconds of arc

321128	012	0.9+	2.2-	321229	012	2.3-	1.3+	840131	704	1.1+	1.9+
321130	024	(4.9-	0.8+)	321231	012	1.6-	0.7+	840201	704	0.7-	0.1-
321130	012	0.4+	1.8-	710402	805	0.3-	0.8-	840203	704	0.5-	2.0-
321217	024	(2.3+	6.3+)	840128	704	0.4+	0.2-	861201	801	0.0	0.1+
321219	012	(10.7-	2.3-)	840128	704	0.0	0.8+	861229	801	1.0-	2.7+
321223	024	1.0+	2.0-	840129	704	0.1-	0.3-	870129	801	0.9+	1.2-
321223	012	1.5+	2.3+	840130	704	0.0	0.2+	870202	801	0.3-	1.1-

(3606)* 1939 SF = 1973 WO = 1985 LE

Discovered 1939 Sept. 19 by Y. Vaisala at Turku.

Epoch 1987 July 24.0 ET = JDE 2447000.5

M	140.44274		(1950.0)	P	Q
n	0.23436294	Peri.	106.91585	+0.97780893	+0.05666580
a	2.6054141	Node	250.20085	-0.12083778	+0.93899032
e	0.2299058	Incl.	12.37806	+0.17113719	+0.33924351
P	4.21	H	12.4	G 0.25	

Residuals in seconds of arc

390919	062	1.0+	1.7+	731124	026	1.8-	2.0-	861228	688	0.8-	2.0+
390920	062	0.7-	0.2+	731124	026	0.8+	1.8-	861228	688	0.1+	0.4+
391007	062	0.9-	0.5+	850615	675	1.6+	0.9-	861228	801	1.2+	0.2-
391017	062	0.5-	1.4-	850615	675	0.9-	0.8-				
391020	062	0.6+	1.4+	861205	801	0.6+	0.2-				

(3607)* 1977 DO4 = 1957 FE = 1978 NW4 = 1979 YH3

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

Epoch 1987 July 24.0 ET = JDE 2447000.5

M	54.48693		(1950.0)		P		Q				
n	0.29268509	Peri.	127.27149		-0.62523001		-0.78043956				
a	2.2466512	Node	1.42937		+0.69940316		-0.56101096				
e	0.0691012	Incl.	2.83996		+0.34629851		-0.27600868				
P	3.37	H	14.5		G	0.25					

Residuals in seconds of arc

570324	839	0.2-	0.8+	770315	381	0.5+	0.9+	870131	046	(4.3-	1.0-)
770218	381	0.2+	1.3+	770315	381	1.4+	0.2+	870201	046	1.7-	2.5-
770218	381	0.1+	1.5+	780710	675	(0.5-	5.6+)Y	870201	046	0.9-	1.7-
770219	381	0.2+	0.1+	780711	675	(15.6+	3.7+)Y	870202	046	0.8+	1.8-
770219	381	0.7+	0.2-	780713	675	0.6-	2.2+ Y	870202	046	(3.5+	1.9-)
770312	381	0.6+	0.9+	791224	095	0.1-	4.8+	870226	801	1.4+	0.6+
770312	381	0.0	0.4+	870131	046	2.9-	1.0-				

(3608)* 1978 SD1 = 1966 UO = 1977 LB1

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

Epoch 1987 July 24.0 ET = JDE 2447000.5

M	184.61413		(1950.0)		P		Q				
n	0.15888486	Peri.	240.98085		+0.74087160		+0.64492793				
a	3.3760928	Node	78.19602		-0.53004550		+0.73292290				
e	0.1506777	Incl.	11.04663		-0.41250581		+0.21654558				
P	6.20	H	10.9		G	0.25					

Residuals in seconds of arc

661019	095	0.3-	0.7+	780927	095	0.6-	1.4+	861228	801	1.0-	0.1+
770612	675	0.3+	0.3+	781003	095	1.1+	1.3-	870127	801	0.9+	0.7+
770613	675	0.1-	0.7+	781007	095	0.5-	0.1-	870224	801	0.1+	0.1+

(3609)* 1980 VM1 = 1952 VB = 1963 UG = 1971 FE1

Discovered 1980 Nov. 13 at the Purple Mountain Observatory. The identifications were found independently by L. D. Schmadel (MPC 11147).

Epoch 1987 July 24.0 ET = JDE 2447000.5

M	43.90679		(1950.0)		P		Q				
n	0.17742201	Peri.	31.14745		-0.10600234		-0.99141502				
a	3.1366380	Node	65.03397		+0.89400992		-0.12872386				
e	0.2314556	Incl.	4.84378		+0.43532719		+0.02294387				
P	5.56	H	11.9		G	0.25					

Residuals in seconds of arc

521112	760	0.5+	0.7+	631022	760	1.2+	0.4-	801210	330	1.4+	1.1+
521112	760	0.8-	1.7+	631022	760	0.3-	0.6-	801227	330	4.2-	1.5+
521114	760	2.6-	0.4+	710319	095	0.1-	0.2-	870104	293	3.8+	2.2-
521114	760	1.4+	1.5+	801018	095	0.6+	0.8-	870130	801	1.8+	1.3+
631018	760	0.8+	0.9-	801113	330	0.4+	1.3-	870224	801	1.9+	1.0+
631018	760	0.4-	0.5-	801207	330	2.1+	2.4-	870228	801	1.9+	1.0+

(3610)* 1981 EA1 = 1967 UU = 1975 HE = 1976 SS9 = 1978 GB5

Discovered 1981 Mar. 5 by H. Debehogne and G. De Sanctis at the European Southern Observatory.

Epoch 1987 July 24.0 ET = JDE 2447000.5

M	14.13195		(1950.0)		P		Q				
n	0.31295448	Peri.	38.68471		-0.90007526		-0.43450240				
a	2.1485655	Node	115.53214		+0.39019245		-0.83717039				
e	0.0467915	Incl.	2.07962		+0.19394429		-0.33219483				
P	3.15	H	14.4		G	0.25					

Residuals in seconds of arc

671030	029	0.3-	0.2+		810305	809	0.7+	0.3-		810310	809	0.4-	1.2+
671030	029	0.2-	0.2-		810307	809	0.9-	1.5-		810310	809	0.1+	0.6+
671031	029	0.3+	0.0		810307	809	0.3-	1.4-		810310	809	0.1+	0.0
671031	029	1.2-	0.3-		810307	809	0.2+	1.2-		810314	809	0.0	0.1+
671031	029	1.0+	1.0+		810308	809	0.6-	0.9-		810314	809	0.9+	0.1+
750420	805	0.5+	0.5-		810308	809	0.5-	0.9-		810314	809	0.6+	0.1+
760929	095	2.0+	3.5-		810308	809	0.3-	0.7-		810315	809	0.0	0.8-
780401	808	1.8-	0.1-		810308	809	1.8-	0.3+		810315	809	0.2+	0.9-
780401	808	1.0-	0.9+		810309	809	1.6+	1.3+		810315	809	0.6-	0.9-
810305	809	0.1-	0.4-		810309	809	1.4+	1.1+		870130	801	0.4-	0.9+
810305	809	0.3+	0.4-		810309	809	1.2+	1.0+		870225	801	1.0-	0.8+

(3611)* 1981 YY1 = 1982 BJ8 = 1971 SQ = 1985 QG

Discovered 1981 Dec. 20 at the Purple Mountain Observatory.

Epoch 1987 July 24.0 ET = JDE 2447000.5

M	91.75604		(1950.0)	P	Q
n	0.21160043	Peri.	289.93317	+0.40704542	-0.90757200
a	2.7890632	Node	135.59640	+0.88341211	+0.36247765
e	0.2130626	Incl.	8.47221	+0.23215742	+0.21195051
P	4.66	H	12.7	G 0.25	

Residuals in seconds of arc

710916	808	0.4+	0.8-		850822	688	1.2+	2.0-		870224	046	1.5-	3.6-
811220	330	0.8+	0.1+		850912	688	3.3+	0.2-		870225	046	0.4+	4.1-
811223	330	3.7-	3.6+		850912	688	3.0-	1.8-		870225	046	0.0	3.1-
820120	330	2.5+	1.0-		870127	801	2.2+	1.1+					
850822	688	0.6+	3.4-		870224	046	2.5-	0.1-					

(3612)* 1982 TW = 1978 SH4 = 1980 BZ4

Discovered 1982 Oct. 13 by E. Bowell at the Anderson Mesa Station of the Lowell Observatory. The identification with 1980 BZ4 was erroneously given as with 1980 BX4 on MPC 10943.

Epoch 1987 July 24.0 ET = JDE 2447000.5

M	116.89342		(1950.0)	P	Q
n	0.25869098	Peri.	265.83342	+0.95441857	+0.29287243
a	2.4393935	Node	77.12918	-0.24502761	+0.87890621
e	0.1835846	Incl.	3.38377	-0.17043080	+0.37649649
P	3.81	H	13.5	G 0.25	

Residuals in seconds of arc

780928	095	1.5-	2.9+		821013	688	0.1-	1.4-		821021	688	1.4+	1.0-
800122	095	0.6+	2.1+		821015	323	0.9+	1.2+		861106	688	0.3+	1.0-
820915	688	0.2-	1.0+		821017	688	0.5-	1.4-		861106	688	0.9+	0.8+
820915	688	0.3-	0.6+		821020	323	0.4+	0.4+		870104	801	2.3-	0.2+
821013	688	0.7+	0.5-		821021	688	0.6-	0.6-					

(3613)* 1982 VJ11 = 1982 XY = 1949 UN = 1951 GR = 1973 FM1

Discovered 1982 Nov. 10 at the Purple Mountain Observatory.

Epoch 1987 July 24.0 ET = JDE 2447000.5

M	9.26243		(1950.0)	P	Q
n	0.27014163	Peri.	80.58547	-0.87965325	-0.45947942
a	2.3699638	Node	71.97691	+0.36968887	-0.82303346
e	0.0759312	Incl.	7.42192	+0.29923285	-0.33390805
P	3.65	H	12.7	G 0.25	

Residuals in seconds of arc

491028	760	0.5+	1.0+		821110	330	0.0	1.5-		821214	381	1.1+	0.2-
510402	711	0.5-	0.7+	Y	821117	330	0.8-	0.8-		821214	381	0.3-	0.5-
510402	711	(36.8-	4.4+)	Y	821213	381	0.1-	0.1+		870128	801	0.5+	0.4+
730327	095	0.2-	1.7-		821213	381	0.2-	0.4+		870226	801	0.2+	0.8+

(3614)* 1983 AE1 = 1983 CW3 = 1952 DO = 1959 RE = 1974 OL

Discovered 1983 Jan. 12 by N. G. Thomas at the Anderson Mesa Station of the Lowell Observatory.

Epoch 1987 July 24.0 ET = JDE 2447000.5

M 226.66529	(1950.0)	P	Q	
n 0.19182392	Peri. 309.26078	-0.52334722	+0.80679633	
a 2.9776081	Node 287.06643	-0.66638259	-0.58805680	
e 0.1333240	Incl. 16.66850	-0.53107620	-0.05717411	
P 5.14	H 10.8	G 0.25		

Residuals in seconds of arc

520226 760	0.8+	1.2+	830112 688	1.0-	1.3-	861101 801	1.3+	0.3+
520226 760	1.3+	1.3+	830112 688	1.3-	1.0-	861205 801	0.2-	0.3+
590907 760	1.0+	3.2-	830122 688	1.1-	0.2-	861229 801	0.3-	0.4+
590907 760	(3.0+	11.4+)	830122 688	0.3+	0.2+	870129 801	0.3-	0.1+
740725 095	0.4+	0.7+	830210 330	0.9-	2.2-			

(3615)* 1983 WZ = 1930 KS = 1951 AR = 1952 FK1 = 1969 JJ = 1970 PO = 1974 EM = 1976 SB7

Discovered 1983 Nov. 29 by E. Bowell at the Anderson Mesa Station of the Lowell Observatory. The identification 1983 WZ = 1930 KS was suggested by W. Landgraf.

Epoch 1987 July 24.0 ET = JDE 2447000.5

M 75.65856	(1950.0)	P	Q	
n 0.17524699	Peri. 97.80255	-0.59413637	+0.80395936	
a 3.1625374	Node 135.71343	-0.75161336	-0.54359200	
e 0.1213781	Incl. 2.09464	-0.28649490	-0.24115779	
P 5.62	H 11.2	G 0.25		

Residuals in seconds of arc

300525 690	2.0+	3.0+	520323 711	2.0-	4.1-	Y	831129 688	2.1-	2.4+
300527 690	(12.1-	0.4+)	520323 711	1.1-	0.3+	Y	831129 688	0.9+	1.8+
300529 690	1.1-	3.4+	690507 095	0.2-	0.2+		831204 046	0.5+	1.7-
300529 690	(9.4-	0.2+)	690519 095	0.4+	1.1+		831204 046	2.4+	0.7+
300531 690	(8.0+	0.3+)	700809 095	3.0-	0.6+		831205 046	0.6-	0.7+
300531 690	3.2+	0.8-	700829 095	1.1+	1.2-		831205 046	2.2+	1.6+
510109 760	1.7-	1.4+	740315 095	0.8+	0.1-		831208 046	1.6+	0.5-
510109 760	1.8-	2.2+	760925 095	0.2-	0.1+		831208 046	0.8-	1.1-

(3616)* 1984 JJ2 = 1950 HL1 = 1963 KE = 1975 BT1 = 1979 BO1

Discovered 1984 May 3 by L. V. Zhuravleva at the Crimean Astrophysical Observatory.

Epoch 1987 July 24.0 ET = JDE 2447000.5

M 265.28859	(1950.0)	P	Q	
n 0.23483216	Peri. 118.11789	-0.54386619	+0.81590178	
a 2.6019424	Node 117.59972	-0.82645606	-0.48021487	
e 0.1210787	Incl. 12.79416	-0.14553336	-0.32202169	
P 4.20	H 12.4	G 0.25		

Residuals in seconds of arc

500416 760	1.0-	1.3-	750118 330	1.8-	0.8+	840519 095	1.2+	1.5-
500416 760	2.5+	2.2+	750122 330	(2.2+	10.6-)	840530 095	0.4-	1.5+
630523 760	2.0-	1.4+	790124 095	0.7+	1.2-	861130 801	0.3+	0.5-
630523 760	0.7+	2.0-	840503 095	0.1-	0.5-	861228 801	0.1-	0.3+

(3617)* 1984 LJ = 1950 LM = 1971 FU

Discovered 1984 June 2 by B. A. Skiff at the Anderson Mesa Station of the Lowell Observatory.

Epoch 1987 July 24.0 ET = JDE 2447000.5
M 280.94439 (1950.0) P Q
n 0.23142215 Peri. 34.48423 -0.81351301 +0.58152654
a 2.6274397 Node 181.10952 -0.57382532 -0.80403692
e 0.1095052 Incl. 14.48965 -0.09445151 -0.12390121
P 4.26 H 12.1 G 0.25
Residuals in seconds of arc

500607 760	0.2-	0.4+	840523 095	1.1-	0.8+	870130 801	0.0	0.2-
500607 760	0.3+	0.5+	840526 095	1.7-	0.1-	870227 801	0.0	0.2-
710319 095	0.1-	0.2-	840602 688	1.8+	2.5-	870228 801	0.1+	0.1+
840504 095	0.1-	2.9+	840602 688	1.2+	2.3-			

1966 PG = 1929 UK = 1985 VM
Epoch 1987 July 24.0 ET = JDE 2447000.5 (J-P)
M 152.61860 (1950.0) P Q
n 0.21133953 Peri. 174.61252 +0.96823518 -0.24565609
a 2.7913637 Node 199.79790 +0.22394814 +0.93491879
e 0.2299779 Incl. 7.91200 +0.11121092 +0.25608582
P 4.66 H 12.0 G 0.25
Residuals in seconds of arc

291002 690	0.5+	0.1-	660814 095	2.2-	0.9-	851115 054	0.3-	0.7-
291026 690	0.3-	1.2+	660913 095	1.0-	0.1+	851115 054	0.1-	0.2-
291027 690	1.6-	1.0+	660914 095	3.3+	0.1-			
291103 690	0.8+	1.0+	851114 054	0.9+	1.9-			

1976 GK2 = 1986 EE1 = 1986 ES3
Epoch 1987 July 24.0 ET = JDE 2447000.5 (J-P)
M 66.62518 (1950.0) P Q
n 0.29094738 Peri. 167.77123 -0.13314291 +0.99080626
a 2.2555924 Node 94.57398 -0.91128581 -0.11286547
e 0.1104312 Incl. 1.37953 -0.38965514 -0.07459449
P 3.39 H 13.5 G 0.25
Residuals in seconds of arc

760401 095	0.3-	0.0	760502 095	0.4+	0.6+	860305 688	2.2+	1.6-
760404 095	0.1-	0.8-	860305 688	1.2-	1.2+	860312 809	0.9-	0.7+

1978 TU5 = 1953 VN = 1974 SN3 = 1975 XB6 = 1980 FX9 = 1981 RY2
Epoch 1987 July 24.0 ET = JDE 2447000.5 (J-P)
M 299.51895 (1950.0) P Q
n 0.27861010 Peri. 311.45224 -0.11527686 +0.99005793
a 2.3216977 Node 311.73938 -0.87607619 -0.13957868
e 0.0916907 Incl. 6.20108 -0.46818986 +0.01740916
P 3.54 H 13.0 G 0.25
Residuals in seconds of arc

531102 760(32.0-	14.1+)X		781008 095	0.6+	3.7-	800316 095	3.4-	3.0-
740922 095	0.3-	1.4-	781026 675	0.4-	1.8-	810902 095	0.1+	3.4+
751204 095	5.4+	6.2+	781027 675	0.5-	1.8-			

1980 GF = 1980 DS5 = 1980 FO10 = 1969 HA = 1984 JB2 = 1984 KD1

The double designations 1980 GF = 1980 FO10 and 1980 DS5 = 1980 FO10 are by B. G. Marsden and by N. S. Chernykh, respectively (MPC 9203, 11332). The identification 1980 GF = 1984 KD1 was suggested by N. S. Chernykh.

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

M	340.64814		(1950.0)			P			Q		
n	0.26398658		Peri.	42.22982		-0.99262804			+0.11975446		
a	2.4066652		Node	144.63525		-0.11802573			-0.92007288		
e	0.0763211		Incl.	1.84821		-0.02755902			-0.37299432		
P	3.73		H	13.5		G	0.25				

Residuals in seconds of arc

690422	095	1.5-	4.3-	800413	046	0.7-	0.7-	800415	046	0.5+	0.2+
800221	095	0.3+	0.6-	800413	046	0.8-	0.5+	800416	046	2.0-	0.1+
800316	095	0.9-	1.1-	800414	046	1.4+	1.0+	800416	046	0.4-	0.8+
800412	046	1.0+	0.8+	800414	046	(4.4+	0.9+)	840502	095	1.1+	0.3-
800412	046	1.7+	1.1+	800415	046	0.7+	0.2+	840525	095	0.3-	2.8+

1980 RS2 = 1953 TX = 1953 VO

The double designation 1953 TX = 1953 VO was suggested by O. Kippes (NAZ 12, 23).

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

M	358.98568		(1950.0)			P			Q		
n	0.29174671		Peri.	122.91840		+0.96038266			-0.27147326		
a	2.2514706		Node	252.90078		+0.22857703			+0.89662138		
e	0.1674602		Incl.	3.77855		+0.15942923			+0.34981762		
P	3.38		H	13.0		G	0.25				

Residuals in seconds of arc

531007	760	2.0-	3.2+	531102	760	2.1+	2.1-	801008	095	0.6+	0.1+
531007	760	1.3-	2.2+	800908	095	2.2+	0.9-	801012	095	1.2-	2.9-

1980 TA6 = 1928 HE = 1931 AG = 1955 DD = 1955 HB = 1970 SA1 = 1973 SC5

Epoch 1987 July 24.0 ET = JDE 2447000.5

M	190.93950		(1950.0)			P			Q		
n	0.29126341		Peri.	168.94393		-0.97867917			+0.19987538		
a	2.2539560		Node	22.75238		-0.19653559			-0.84440045		
e	0.1037600		Incl.	7.02436		-0.05967284			-0.49702889		
P	3.38		H	12.6		G	0.25				

Residuals in seconds of arc

280425	024	2.1-	2.1-	550223	760	0.5+	3.5+	730927	095	2.1-	2.6+
280507	024	1.5+	0.5+	550223	760	1.9+	1.1-	801013	095	0.6+	0.2-
310110	690	(0.2+	7.0-)	550416	760	0.3-	1.1-	801014	330	2.0+	0.8+
310111	690	(0.2-	5.4-)	550416	760	0.7-	1.4+	801028	330	1.6-	0.4-
310112	690	(6.4+	7.0-)	700930	095	1.0+	2.7-	801031	330	0.7-	0.7+

1983 BE = 1984 KA1

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

M	264.88206		(1950.0)			P			Q		
n	0.20130038		Peri.	76.06043		-0.95792533			+0.20188028		
a	2.8834152		Node	115.25816		-0.25737956			-0.91878501		
e	0.1294393		Incl.	13.03730		+0.12702290			-0.33923216		
P	4.90		H	12.0		G	0.25				

Residuals in seconds of arc

830110	675	0.3+	0.6-	830112	675	1.8+	1.2+	830121	688	0.4+	0.6+
830110	675	1.3+	0.8+	830112	675	0.2-	2.1+	830121	688	0.2-	0.8-
830111	675	2.9-	2.7-	830116	688	0.0	0.2+	840523	095	1.0+	0.3+
830111	675	0.9-	0.4-	830116	688	0.4+	0.3-	840526	095	1.0-	0.3-

1984 SM1 = 1955 QF1 = 1978 RX3 = 1978 SK4
Epoch 1987 July 24.0 ET = JDE 2447000.5 (J-P)

M	195.20017	(1950.0)		P	Q
n	0.17143643	Peri.	350.09326	+0.95694393	+0.28850791
a	3.2092349	Node	352.89047	-0.24549218	+0.74564059
e	0.0652479	Incl.	14.96535	-0.15489319	+0.60065240
P	5.75	H	12.0	G 0.25	

Residuals in seconds of arc

550825	760	3.0+	1.7+	840920	046	0.0	2.5-	840929	046	2.3-	1.2+
550825	760	1.7+	1.0+	840920	046	2.3+	1.9-	840930	046	0.6-	1.6+
550825	760	0.3+	0.9+	840927	046	1.6+	1.2-	840930	046	1.7-	1.5+
780903	095	(0.9-	11.2+)	840927	046	1.7+	1.0-				
780928	095	0.3+	1.0+	840929	046	0.8-	1.8+				

1985 CV = 1983 RZ3
Epoch 1987 July 24.0 ET = JDE 2447000.5 (J-P)

M	285.03184	(1950.0)		P	Q
n	0.23551149	Peri.	269.24539	+0.59490668	-0.79274504
a	2.5969416	Node	143.17895	+0.79702314	+0.56038168
e	0.1955694	Incl.	12.80419	+0.10411602	+0.23984927
P	4.18	H	13.0	G 0.25	

Residuals in seconds of arc

830902	688	1.2+	1.4-	850218	809	0.2-	0.1+	850225	809	0.0	0.5-
830902	688	0.9+	1.8-	850219	809	0.1-	0.7-	850225	809	0.3+	0.5-
830906	688	1.0-	1.8+	850219	809	0.0	0.7-	850226	809	0.4+	0.5-
830906	688	1.0-	1.0+	850219	809	0.2+	0.7-	850226	809	0.5+	0.7-
850212	675	1.2+	0.6+	850220	809	0.1+	0.8-	850226	809	0.8+	0.7-
850214	809	0.1-	0.3+	850220	809	0.2+	0.7-	850226	809	0.5-	0.3+
850214	809	0.2+	0.1+	850220	809	0.6+	0.8-	850226	809	0.3-	0.0
850214	809	0.1-	0.2+	850220	046	0.1-	1.1-	850226	809	0.2-	0.3-
850216	809	0.1+	0.8+	850220	046	0.7-	0.5-	850227	809	0.1+	0.9+
850216	809	0.3+	0.9+	850221	809	0.0	0.1+	850227	809	0.1-	0.3+
850216	809	0.7+	0.8+	850221	809	0.1-	0.2+	850227	809	0.4+	0.3+
850216	675	1.0+	0.9+	850221	809	0.2-	0.1+	850227	809	0.1+	0.1+
850216	046	2.4-	0.3+	850224	809	0.1-	0.2-	850227	809	0.0	0.1+
850216	046	2.5-	2.3-	850224	809	0.1-	0.0	850228	809	0.9-	0.6+
850217	809	1.0+	0.5+	850224	809	0.1+	0.1-	850228	809	0.8-	0.5+
850217	809	0.7+	0.5+	850224	809	0.1+	0.2+	850228	809	0.1-	0.4+
850217	809	1.0+	0.5+	850224	809	0.2+	0.4+	850228	809	0.0	0.4+
850218	809	0.6-	0.3-	850224	809	0.2+	0.1+	850228	809	0.1+	0.6+
850218	809	0.5-	0.1-	850225	809	0.1+	0.4-				

1985 QG4 = 1932 UD = 1977 DT5
The identification 1985 QG4 = 1977 DT5 was suggested by L. D. Schmadel.
Epoch 1987 July 24.0 ET = JDE 2447000.5 (J-P)

M	228.14813	(1950.0)		P	Q
n	0.27639559	Peri.	296.37543	+0.06152957	+0.99585155
a	2.3340824	Node	336.85606	-0.84410749	+0.01607759
e	0.2268654	Incl.	9.82015	-0.53263182	+0.08956113
P	3.57	H	14.0	G 0.25	

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

321031	094(0.04-	0.03+)X	850906	809	0.7+	0.9+	850913 809	0.0 0.6-
321031	094(12.9+	13.1+)X	850910	809	0.5-	0.1-	850913 809	0.6- 0.4-
770219	381	0.1+ 0.3+	850910	809	0.5-	0.2+	850914 809	0.5+ 0.0
770219	381	0.2- 0.5-	850910	809	0.9-	0.4+	850914 809	0.5+ 0.2-
850824	071	1.1- 0.9-	850911	809	0.4-	0.5-	850915 809	0.3+ 0.5-
850824	071	1.5+ 0.1+	850911	809	0.4-	0.3-	850916 809	0.5+ 0.7+
850905	809	0.4- 0.1+	850911	809	0.3-	0.5-	850916 809	0.1+ 0.3+
850905	809	0.2+ 0.4+	850912	809	0.2-	0.3-	850916 809	0.1- 0.0
850905	809	0.9+ 0.5+	850912	809	0.5-	0.3-	850917 809	0.4+ 0.9+
850906	809	0.2+ 0.4+	850912	809	0.4-	0.3-	850917 809	0.1- 0.3+
850906	809	0.1+ 0.5+	850913	809	1.0+	0.7-	850917 809	0.4- 0.3-

1986 EJ1 = 1969 ET1
Epoch 1987 July 24.0 ET = JDE 2447000.5 (J-P)

M	74.30735	(1950.0)	P	Q	
n	0.23409723	Peri.	228.72210	-0.50482772	+0.86159736
a	2.6073904	Node	11.31968	-0.68924237	-0.36542567
e	0.1529640	Incl.	15.63660	-0.51970562	-0.35229825
P	4.21	H 13.0	G 0.25		

Residuals in seconds of arc

690313	095	1.1- 3.8-	860309	413	0.4-	0.4-	860409 688	0.0 0.2-
690314	095	1.4+ 4.2+	860309	413	0.8+	0.7-	860409 688	1.0+ 0.3-
860305	688	2.0- 0.5-	860310	413	0.5+	1.0+		
860305	688	2.2- 0.5+	860310	413	1.9+	0.2+		

1987 GC = 1983 LH
Epoch 1987 July 24.0 ET = JDE 2447000.5 (J-P)

M	4.65124	(1950.0)	P	Q	
n	0.22315446	Peri.	24.80466	-0.78561393	+0.61632179
a	2.6919472	Node	193.66375	-0.59910655	-0.77972532
e	0.1081580	Incl.	13.31154	-0.15453835	-0.11034439
P	4.42	H 13.0	G 0.25		

Residuals in seconds of arc

830611	675	1.8- 0.1+	870327	688	0.8+	0.8-	870424 887	0.4+ 1.5+
830611	675	0.9+ 0.3+	870327	688	0.5-	2.3+	870424 887	0.2+ 1.1-
830613	675	0.5+ 0.2+	870404	887	0.4-	0.6-		
830614	675	0.5+ 0.5-	870404	887	0.4-	1.2-		

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ORBITAL ELEMENTS BY T. KOBAYASHI, GUNMA, JAPAN.

The identifications are by T. Kobayashi unless otherwise stated.

1931 UB = 1980 QC = 1984 UF1
Epoch 1987 July 24.0 ET = JDE 2447000.5

M	290.68097	(1950.0)	P	Q	
n	0.26086543	Peri.	115.16774	+0.98264759	+0.18448507
a	2.4258188	Node	234.20678	-0.17755629	+0.90564913
e	0.2212312	Incl.	1.35696	-0.05364209	+0.38179173
P	3.78	H 14.0	G 0.25		

Residuals in seconds of arc

311017	024	3.8+ 1.4+	800818	046(46.7-	12.2+)		841029 046	1.6+ 0.9+
311020	024	3.8- 1.7-	800818	046(47.0-	14.0+)		841030 046	1.0+ 1.1+
311102	024	1.6- 4.1+	841028	046	1.2-	2.1-	841030 046	1.0+ 1.6+
800817	046	1.0+ 0.4-	841028	046	1.1-	3.4-		
800817	046	0.3- 0.0	841029	046	1.0+	1.1-		

1936 PB = 1949 OB = 1958 TL = 1967 TD = 1971 OD1 = 1971 QB
Epoch 1987 July 24.0 ET = JDE 2447000.5

M	244.77312		(1950.0)		P		Q
n	0.22571632	Peri.	0.40418		+0.53971687		+0.83563736
a	2.6715342	Node	302.26316		-0.77267954		+0.44359615
e	0.3201173	Incl.	6.93208		-0.33417365		+0.32393311
P	4.37	H	12.5	G	0.25		

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

360815	094	2.0-	1.9+	490716	078	(23.8+	8.6-)Y	671004	095	0.3+	0.5+
360818	094	(0.00	0.03+)	581011	760	(26.4-	12.1-)	710728	095	2.8+	1.8-
360820	094	0.4-	1.5+	581011	760	3.3+	1.9-	710825	056	1.6-	0.2-
360824	012	2.3+	1.1+	581017	760	2.1-	0.2-	710825	056	1.5+	0.3-
360826	012	1.5-	1.2-	581017	760	0.4-	1.2+				

1938 HE = 1971 SH
Epoch 1987 July 24.0 ET = JDE 2447000.5

M	199.46779		(1950.0)		P		Q
n	0.27624406	Peri.	180.50598		+0.53094860		+0.84290719
a	2.3349312	Node	121.56626		-0.77707979		+0.52533870
e	0.1907018	Incl.	5.87304		-0.33799493		+0.11630443
P	3.57	H	12.5	G	0.25		

Residuals in seconds of arc

380419	029	0.9+	0.3-	380423	029	(13.7-	7.0-)Y	710925	808	0.8-	0.9-
380419	029	1.6+	1.3-	380424	029	3.5-	2.5+	710925	808	0.6+	0.7-
380420	029	0.8+	0.1+	380426	029	1.9+	6.1- Y	710926	805	0.0	2.1+
380420	029	0.0	0.2-	380427	029	0.8+	3.3+ Y	710926	805	0.1-	0.6-
380421	029	1.3-	0.4+	380427	029	2.0+	0.1+ Y				
380423	029	3.2-	1.5+	710925	808	0.3+	0.1+				

1949 QL = 1949 QZ = 1969 TV3
The double designation 1949 QL = 1949 QZ is by K. Reinmuth (MPC 383).
Epoch 1987 July 24.0 ET = JDE 2447000.5

M	138.58603		(1950.0)		P		Q
n	0.29747628	Peri.	25.60748		+0.99877928		-0.01931358
a	2.2224627	Node	335.37064		-0.00525000		+0.87367282
e	0.1968767	Incl.	6.26294		+0.04911599		+0.48613042
P	3.31	H	13.5	G	0.25		

Residuals in seconds of arc

490820	690	1.1-	0.4+	490824	690	0.7+	1.3-	691014	095	0.4+	1.4-
490821	024	2.3-	1.5+	490826	690	1.9+	1.1-				
490822	024	0.9+	0.3+	691011	095	0.5-	1.5+				

1973 UU5 = 1978 TQ2
Epoch 1987 July 24.0 ET = JDE 2447000.5

M	174.99044		(1950.0)		P		Q
n	0.19690018	Peri.	296.32627		-0.52527528		-0.85092795
a	2.9262087	Node	185.36294		+0.79076026		-0.48693940
e	0.0246148	Incl.	1.68014		+0.31429937		-0.19700673
P	5.01	H	13.0	G	0.25		

Residuals in seconds of arc

731027	033	0.3-	0.1-	731031	033	1.7-	0.7-	781003	095	0.0	0.7-
731027	033	1.0+	0.6-	731102	033	0.1-	0.0	781007	095	0.1-	1.0+
731028	033	0.5+	0.1+	731103	033	0.7+	1.1+				

1973 UV5 = 1953 VY3 = 1979 OE2
Epoch 1987 July 24.0 ET = JDE 2447000.5

M	330.24647	(1950.0)	P	Q
n	0.29407150	Peri. 257.31861	-0.30887466	-0.95020930
a	2.2395843	Node 210.77058	+0.90086447	-0.27838710
e	0.1312938	Incl. 4.62087	+0.30502401	-0.14001039
P	3.35	H 13.5	G 0.25	

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

531106 760	(0.06+	0.01+)X	731031 033	0.5-	0.3-	731103 033	0.3- 0.4-
731027 033	0.3-	0.3-	731101 033	0.3-	0.3+	790724 675	0.7+ 0.8+
731028 033	0.6+	0.3+	731102 033	0.8+	0.3+	790725 675	0.7- 0.8-

1984 UG = 1950 TB2 = 1977 LQ1 = 1978 RH5 = 1978 TW3
Epoch 1987 July 24.0 ET = JDE 2447000.5

M	249.76826	(1950.0)	P	Q
n	0.17524337	Peri. 253.28229	+0.68323899	+0.72919055
a	3.1625810	Node 59.87871	-0.65191198	+0.63276898
e	0.1196069	Incl. 2.53675	-0.32893046	+0.26054666
P	5.62	H 11.5	G 0.25	

Residuals in seconds of arc

501015 024	0.7+	1.6-	781004 095	0.8-	1.0+	841029 688	2.5+ 0.6-
770613 675	0.1-	0.3-	841020 046	1.3-	1.9+	841031 688	0.6- 1.1-
770614 675	0.1+	0.3-	841021 046	2.9-	0.2+	841031 688	0.9+ 0.4-
780906 095	0.1-	1.0+	841029 688	1.7+	0.6-		

1986 RD1 = 1939 PB
Epoch 1987 July 24.0 ET = JDE 2447000.5

M	47.65143	(1950.0)	P	Q
n	0.21059385	Peri. 52.01176	+0.98101273	-0.16880397
a	2.7979434	Node 317.46409	+0.10140231	+0.86615432
e	0.1998797	Incl. 8.12038	+0.16532267	+0.47040611
P	4.68	H 13.0	G 0.25	

Residuals in seconds of arc

390808 020	0.2-	0.7-	860902 046	2.3-	0.7-	860911 046	(6.2+ 3.4-)
390811 020	0.2+	0.8+	860904 046	1.5+	1.8+	860929 010	3.7- 0.2-
390811 020	(2.9+	10.4+)	860904 046	0.7+	0.7+	860929 010	2.7+ 1.1+
860902 046	1.7-	0.2-	860911 046	2.8+	2.5-		

9522 P-L = 1974 RB1 = 1987 FB

The key identification 9522 P-L = 1987 FB was found independently by E. Bowell.

Epoch 1987 July 24.0 ET = JDE 2447000.5

M	333.41142	(1950.0)	P	Q
n	0.21056324	Peri. 262.22075	-0.09576280	+0.99539055
a	2.7982146	Node 2.30337	-0.85447922	-0.07951910
e	0.1955672	Incl. 7.44875	-0.51058275	-0.05361319
P	4.68	H 13.0	G 0.25	

Residuals in seconds of arc

601017 675	0.2-	0.9+	740911 095	0.1+	0.1-	870327 688	0.8+ 2.0-
601022 675	1.2-	0.3+	870326 887	2.0-	2.6+	870331 887	0.4+ 0.1+
601024 675	0.7+	0.5-	870326 887	0.6+	1.8+	870331 887	2.5- 0.1+
601026 675	0.5+	0.4-	870327 688	1.8+	2.3-	870404 887	0.9+ 0.2-

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ORBITAL ELEMENTS BY K. HURUKAWA, TOKYO ASTRONOMICAL OBSERVATORY.

The identifications are by K. Hurukawa unless otherwise stated.

(3618)* 1979 QP8 = 1962 PA = 1974 WU = 1977 EA5

Discovered 1979 Aug. 20 by N. S. Chernykh at the Crimean Astrophysical Observatory. The key identifications 1979 QP8 = 1962 PA = 1974 WU are by T. Urata (NOC 1308). The identification 1979 QP8 = 1974 WU was also found by L. D. Schmadel (MPC 9681).

Epoch 1987 July 24.0 ET = JDE 2447000.5

M	166.44742	(1950.0)	P	Q	
n	0.17725784	Peri.	94.32418	+0.84702672	+0.53081098
a	3.1385742	Node	233.61804	-0.50043416	+0.77855946
e	0.1938573	Incl.	1.99492	-0.17919648	+0.33479078
P	5.56	H	12.5	G	0.25

Residuals in seconds of arc

620801	760	0.7+	1.0+	790820	095	0.5-	0.4-	840702	801	0.5-	0.8-
741118	095	1.2+	0.2+	790828	095	1.9+	0.4+	840725	801	1.6+	0.7-
770312	381	0.2+	0.8+	790923	095	1.1-	0.1-				
770312	381	0.3-	0.9+	791016	095	1.8-	0.0+				

(3619)* 1981 EU35 = 1960 SG = 1971 QQ

Discovered 1981 Mar. 2 by S. J. Bus at Siding Spring in the course of the U.K.-Caltech Asteroid Survey.

Epoch 1987 July 24.0 ET = JDE 2447000.5

M	102.29508	(1950.0)	P	Q	
n	0.26711818	Peri.	181.12743	+0.95125116	+0.30755674
a	2.3878136	Node	160.91166	-0.28239941	+0.89858324
e	0.2370066	Incl.	4.03712	-0.12398308	+0.31298086
P	3.69	H	14.0	G	0.25

Residuals in seconds of arc

600926	839	0.1-	0.4-	810303	413	0.3+	0.6+	810411	413	2.4-	0.9+
600926	839	0.4+	0.2-	810307	413	1.8-	0.7+	810411	413	0.6+	0.0+
710818	095	0.3+	3.8-	810311	413	0.1+	1.1-	810426	413	0.6+	0.9-
710824	095	0.2-	2.5+	810316	413	2.5+	1.0-	810502	413	0.2-	1.1-
810209	413	0.3+	1.4+	810316	413	0.2-	0.9+	861002	657	0.8+	1.1+
810213	413	1.0+	3.8-	810329	413	1.5-	0.8+	861007	801	0.7+	0.2-
810213	413	0.9+	0.5-	810329	413	0.5+	0.3+	861030	801	0.0+	1.0+
810302	413	0.5-	0.2+	810408	413	1.3-	0.8+	861202	688	1.1-	1.4-
810302	413	1.8+	2.4-	810408	413	1.5-	1.2+	861202	688	0.5-	1.8-

(3620)* 1981 RU2 = 1955 TG = 1978 EN4

Discovered 1981 Sept. 7 by L. G. Karachkina at the Crimean Astrophysical Observatory. The identifications were found independently by C. M. Bardwell (MPC 10026). The identification 1981 RU2 = 1955 TG was also found by L. D. Schmadel (MPC 10026).

Epoch 1987 July 24.0 ET = JDE 2447000.5

M	28.61396	(1950.0)	P	Q	
n	0.19054589	Peri.	121.74695	+0.81859645	-0.55293709
a	2.9909075	Node	272.26303	+0.46014867	+0.79329880
e	0.1103747	Incl.	8.94914	+0.34374854	+0.25482855
P	5.17	H	12.1	G	0.25

Residuals in seconds of arc

551011	760	0.8-	0.7+	811003	095	1.2-	1.2-	860911	688	1.1+	0.0+
551011	760	1.2-	0.5-	811023	095	1.4+	4.2+	860911	054	0.4-	0.4-
551012	760	3.2+	0.2-	860901	801	0.2-	1.5+	860929	054	0.2-	0.4-
551012	760	0.5-	1.6-	860905	688	2.7-	1.7+	861005	688	1.5-	0.4+
780306	095	0.2+	0.5+	860905	688	0.5+	0.8-	861005	688	2.3+	0.0+
810907	095	0.6+	1.9-	860909	054	1.5+	0.9+	861030	801	0.3-	0.5-
810927	095	0.8-	1.6-	860911	688	1.1-	0.5+	861031	801	0.1-	0.4-

(3621)* 1981 SQ1 = 1981 VB1 = 1970 QH1 = 1979 KS

Discovered 1981 Sept. 26 by N. G. Thomas at the Anderson Mesa Station of the Lowell Observatory. The double designation 1981 SQ1 = 1981 VB1 is by C. M. Bardwell (MPC 9952). The identifications were also found by L. D. Schmadel (MPC 10026).

Epoch 1987 July 24.0 ET = JDE 2447000.5

M	41.46318	(1950.0)	P	Q	
n	0.18127669	Peri.	175.65451	+0.98533248	+0.17058634
a	3.0920137	Node	174.51745	-0.15794099	+0.92163306
e	0.1995524	Incl.	2.69708	-0.06461079	+0.34855818
P	5.44	H	12.3	G	0.25

Residuals in seconds of arc

700831	095	0.5-	1.6+	860825	809	0.2-	0.3+	860831 809	0.9+ 0.5+
790519	809	0.6-	0.7-	860825	809	0.6+	0.5+	860831 809	1.2+ 0.3+
790519	809	0.3-	1.0-	860825	809	0.6+	0.7+	860901 809	0.5+ 0.5-
790521	809	0.0+	0.6-	860826	809	0.4-	0.5+	860901 809	0.6+ 0.3-
790523	809	0.2-	1.0-	860826	809	0.4-	0.4+	860901 809	0.6+ 0.7-
790523	809	0.7-	0.5-	860826	809	0.9-	0.5+	860902 809	0.4+ 0.5-
790524	809	0.2-	1.0-	860827	809	0.1+	0.4+	860902 809	0.5+ 0.9-
810926	688	0.1-	1.1-	860827	809	0.3+	0.4-	860902 809	0.3+ 0.8-
810926	688	2.5-	2.0-	860827	809	0.7+	0.5-	860903 809	0.3+ 0.7-
811006	095	1.0+	3.0+	860828	809	0.6-	0.0+	860903 809	0.4+ 0.6-
811021	095	2.2+	1.1-	860828	809	0.3-	0.2+	860903 809	0.2- 0.8-
811026	095	1.5-	4.7+	860828	809	0.3+	0.4+	860904 688	0.1+ 0.7-
811027	095	0.5-	1.1-	860829	809	1.2-	0.6+	860904 688	1.4- 0.3-
811102	688	1.7+	3.8-	860829	809	0.7-	0.5+	860908 801	0.9- 0.1-
811102	688	1.2+	3.1-	860829	809	0.5-	0.4+		
860805	801	0.8-	0.3-	860831	809	0.3+	0.4+		

(3622)* 1981 SX7 = 1975 WO = 1980 RA5 = 1983 CJ2

Discovered 1981 Sept. 29 by L. V. Zhuravleva at the Crimean Astrophysical Observatory. The identifications 1981 SX7 = 1975 WO = 1983 CJ2 were found independently by L. D. Schmadel (MPC 10027).

Epoch 1987 July 24.0 ET = JDE 2447000.5

M	302.11258	(1950.0)	P	Q	
n	0.15717304	Peri.	178.07681	+0.30063247	-0.95017447
a	3.4005619	Node	254.42047	+0.87385029	+0.30903133
e	0.0398210	Incl.	4.90682	+0.38210705	+0.04084243
P	6.27	H	11.5	G	0.25

Residuals in seconds of arc

751128	095	0.2+	2.6+	811023	095	0.9+	1.6+	860806 801	0.6+ 0.3-
800909	095	0.9-	0.1+	811124	095	0.5-	0.1-	860908 801	0.9+ 1.7-
810929	095	2.2+	3.1-	830215	688	0.4-	1.4-		
811002	095	2.6-	0.4-	830215	688	0.5-	1.7-		

(3623)* 1981 TG2 = 1952 VK = 1962 WT1 = 1971 UM4 = 1976 UG1 = 1983 CT1

Discovered 1981 Oct. 4 by L. G. Karachkina at the Crimean Astrophysical Observatory.

Epoch 1987 July 24.0 ET = JDE 2447000.5

M	110.21544	(1950.0)	P	Q	
n	0.20474541	Peri.	233.20742	+0.98700645	+0.15354310
a	2.8509741	Node	117.91616	-0.12498160	+0.91885105
e	0.0862026	Incl.	3.07222	-0.10098448	+0.36350689
P	4.81	H	12.3	G	0.25

Residuals in seconds of arc

521112	760	1.7-	0.8-		621130	760	0.5-	0.3+		811027	095	0.0+	1.5+
521112	760	1.6-	0.9-		711020	095	0.1+	0.5+		830204	046	1.5+	0.9-
521114	760	2.4+	0.3-		761022	026	0.7-	0.6-		830204	046	1.7-	0.5-
521114	760	1.4+	1.1-		761024	026	0.0+	1.1-		861106	688	1.1-	0.0+
521116	760	0.2+	0.0+		811004	095	1.1-	4.3-		861106	688	0.8+	0.2+
521116	760	0.0+	1.3+		811007	095	0.5-	1.3+		861228	801	1.2-	0.3+
621130	760	0.3+	0.6+		811022	095	3.1+	3.3+					

(3624)* 1982 TH2 = 9510 P-L = 1971 UD2 = 1978 PL3 = 1978 RG3 = 1980 DW3

Discovered 1982 Oct. 14 by L. V. Zhuravleva and L. G. Karachkina at the Crimean Astrophysical Observatory. The identification 1982 TH2 = 1978 PL3 was found independently by W. Landgraf (MPC 10028).

Epoch 1987 July 24.0 ET = JDE 2447000.5

M	101.05207		(1950.0)	P	Q
n	0.27210473	Peri.	49.20243	+0.57589448	-0.81749258
a	2.3585513	Node	5.64915	+0.72637327	+0.50763936
e	0.1191257	Incl.	4.17806	+0.37513654	+0.27204442
P	3.62	H	13.7	G 0.25	

Residuals in seconds of arc

601017	675	0.2+	0.6-		780808	095	0.1-	0.7+		821025	095	0.1+	1.0+
601022	675	1.5-	1.0-		780903	095	0.8-	0.6+		821109	095	0.5-	1.1+
601024	675	0.9+	0.1-		800220	095	0.4+	2.2-		821114	095	0.2+	0.6+
601026	675	0.7+	1.1-		821014	095	0.5+	1.8-		861228	801	0.4-	0.0+
711021	095	2.1+	1.8-		821020	095	0.6-	2.1+		870127	801	1.2-	1.0+

(3625)* 1984 HZ1 = 1984 JN1 = 1951 DD = 1952 HX2 = 1953 NE = 1953 PG = 1973 FH1

Discovered 1984 Apr. 27 at the European Southern Observatory. The double designations 1984 HZ1 = 1984 JN1 and 1953 NE = 1953 PG are by F. N. Bowman and A. Lowe (MPC 10610) and by O. Kippes (MPC 1331), respectively.

Epoch 1987 July 24.0 ET = JDE 2447000.5

M	119.42818		(1950.0)	P	Q
n	0.18526675	Peri.	103.86353	+0.83093893	+0.55320530
a	3.0474580	Node	222.59202	-0.53823650	+0.77236343
e	0.1231603	Incl.	5.01811	-0.14086152	+0.31211956
P	5.32	H	11.4	G 0.25	

Residuals in seconds of arc

510227	760	2.4-	4.9-		730402	095	2.0+	2.0+		840505	809	1.2-	0.2-
510227	760	1.4-	0.0+		840427	809	0.2+	0.1+		840505	095	4.9-	3.3-
520426	711	(4.6+	10.5-)		840427	809	0.1+	0.4+		861106	688	0.2+	0.4-
530714	760	0.8-	1.2+		840428	809	1.4+	0.8+		861106	688	2.4+	0.0+
530714	760	2.0+	0.4+		840428	809	(9.3+	0.6+)		861205	801	1.3-	1.3-
530809	760	1.4+	4.0-		840501	809	0.8+	0.1-		870104	801	1.4-	1.7+
530809	760	0.3+	0.4+		840501	809	0.0+	0.7+					
730327	095	4.0+	1.2+		840505	809	0.1-	0.5-					

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ORBITAL ELEMENTS BY H. OISHI, NIIZA, JAPAN.

The following orbital elements are from JAM 2057-2058, 2069 and 2072-2073. The identifications are by H. Oishi unless otherwise stated.

(3626)* 1929 PA = 1929 QJ = 1980 TQ5

Discovered 1929 Aug. 4 by M. Wolf at Heidelberg.

Epoch 1987 July 24.0 ET = JDE 2447000.5

M 117.12098		(1950.0)	P	Q
n 0.17689093	Peri.	38.66609	+0.77950873	+0.62251865
a 3.1429128	Node	282.69159	-0.59094136	+0.69402568
e 0.1647412	Incl.	4.08797	-0.20773646	+0.36166129
P 5.57	H 11.8		G 0.25	

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

290804	024	1.3-	1.3+	290814	024	0.0	0.5+	801010	095	0.7-	1.9+
290806	024	1.7+	0.4+	290815	662	0.0	2.4-	801015	095	2.2+	3.1+
290809	662	0.6+	2.8-	290830	024	2.4-	1.4+	801107	675	0.5-	1.4-
290809	662	3.6+	0.7-	801007	675	0.4-	0.5+	861205	801	1.4+	1.6-
290810	024	(0.06+	0.03+)X	801008	675	0.2-	0.7-	861228	801	0.6-	0.5-
290812	024	1.1+	0.7+	801009	675	0.7-	1.3-	870129	801	0.4-	0.3+
290813	024	2.9-	0.5+	801010	675	0.4-	0.4-				

(3627)* 1973 DS = 1973 GU = 1982 VQ10 = 1982 XK3 = 1984 HC

Discovered 1973 Feb. 28 by L. Kohoutek at Bergedorf.

Epoch 1987 July 24.0 ET = JDE 2447000.5

M 320.61297		(1950.0)	P	Q
n 0.27393911	Peri.	125.83664	-0.84422911	+0.50898380
a 2.3480104	Node	85.31669	-0.52984675	-0.74524351
e 0.1488291	Incl.	9.70231	-0.08086801	-0.43075236
P 3.60	H 13.4		G 0.25	

Residuals in seconds of arc

730228	029	0.7-	0.4+	821112	095	1.5+	0.9+	840430	675	0.1-	1.8-
730228	029	0.4+	0.5+	821213	381	0.9+	1.1-	870104	801	0.3-	0.1-
730309	029	0.5-	0.0	821214	381	0.6-	0.9-	870128	801	0.1-	1.2+
730401	095	0.6+	0.0	821214	381	0.3-	1.9-				
730404	095	0.6+	0.0	840429	675	0.9-	0.6-				

(3628)* 1979 WD = 1979 YB10 = 1930 MQ = 1962 JP = 1975 XT4 = 1978 JX = 1985 CQ2

Discovered 1979 Nov. 25 by Z. Vavrova at Klet.

Epoch 1987 July 24.0 ET = JDE 2447000.5

M 13.12352		(1950.0)	P	Q
n 0.24386995	Peri.	187.85124	+0.96208779	+0.26845436
a 2.5372534	Node	156.40504	-0.24322754	+0.92439253
e 0.3027318	Incl.	6.91047	-0.12339958	+0.27098100
P 4.04	H 12.8		G 0.25	

Residuals in seconds of arc

300625	690	0.3-	1.4-	850215	809	0.8-	0.0	850220	809	2.1+	0.3-
300629	690	0.2+	3.0-	850216	809	0.8-	0.2+	850221	809	1.7+	0.5-
620505	760	(8.1+	37.4+)X	850216	809	1.1-	0.3+	850221	809	1.4+	0.4-
751203	095	2.0+	0.4+	850216	809	1.1-	0.3+	850221	809	1.6+	0.4-
780505	095	0.5+	0.1-	850217	809	0.3-	0.1+	850222	809	0.2+	0.4-
791125	046	1.9+	0.8-	850217	809	0.6-	0.0	850222	809	0.1+	0.3-
791125	046	1.5+	1.0-	850217	809	0.3-	0.1+	850222	809	0.0	0.3-
791218	095	0.5+	0.8-	850218	809	0.2+	0.0	850224	809	2.4-	0.1+
791224	046	2.9-	1.6-	850218	809	0.1+	0.0	850224	809	2.2-	0.1+
791224	046	2.1-	0.7-	850218	809	0.1+	0.0	850224	809	2.3-	0.1+
850215	809	0.7-	0.1-	850220	809	2.3+	0.2-				
850215	809	0.7-	0.3-	850220	809	1.8+	0.1-				

(3629)* 1982 WK = 1982 XD = 1974 QB1 = 1974 SM3

Discovered 1982 Nov. 21 by A. Mrkos at Klet. The identifications are by T. Furuta (JAM 1970).

Epoch 1987 July 24.0 ET = JDE 2447000.5

M	108.32220	(1950.0)	P	Q
n	0.26455063	Peri. 171.95035	+0.68515300	-0.72395052
a	2.4032384	Node 234.75832	+0.66265727	+0.66532213
e	0.1028144	Incl. 5.64807	+0.30240818	+0.18232421
P	3.73	H 12.7	G 0.25	

Residuals in seconds of arc

740821 095	0.8+	2.8+	821204 046	0.8-	0.9-	870121 046	0.5-	0.1+
740922 095	1.5-	0.8-	821205 046	0.1-	1.2-	870124 809	0.1-	0.7+
821121 046	1.4-	1.2+	821205 046	0.8+	0.8-	870124 809	0.8+	0.2-
821121 046	1.8+	2.0+	861205 801	0.4+	0.9+	870127 801	0.3+	1.5+
821204 046	0.5-	2.2-	870121 046	0.7+	0.4-	870228 801	0.9-	1.0+

(3630)* 1984 QN = 1966 TK = 1970 PC1 = 1970 QS1 = 1980 XT1

Discovered 1984 Aug. 28 by A. Mrkos at Klet. The identification 1984 QN = 1980 XT1 was found independently by W. Landgraf (MPC 10517).

Epoch 1987 July 24.0 ET = JDE 2447000.5

M	256.54874	(1950.0)	P	Q
n	0.21399929	Peri. 321.56178	+0.47472665	+0.87865546
a	2.7681810	Node 336.64662	-0.77231546	+0.38809236
e	0.2063213	Incl. 7.38945	-0.42209411	+0.27811672
P	4.61	H 12.6	G 0.25	

Residuals in seconds of arc

661013 095	1.8-	1.7+	840829 046	1.6+	0.3+	840928 688	0.9+	0.1-
700811 095	0.2-	1.6+	840829 046	1.5+	1.1+	840928 688	1.3-	0.5-
700828 095	1.8+	4.3-	840831 046	0.8+	1.1-	870224 046	2.6-	2.7-
801210 095	1.5+	0.5+	840831 046	1.9-	1.2-	870224 046	2.5-	2.8-
840828 046	1.8+	0.9-	840925 688	0.5+	1.2-	870225 046	1.7-	1.2-
840828 046	1.3-	2.3-	840925 688	0.3+	0.6-	870225 046	1.5+	2.7-

1987 DM = 1976 SR4 = 1980 GK

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

M	98.18851	(1950.0)	P	Q
n	0.12292089	Peri. 26.68464	+0.56530847	-0.82421463
a	4.0060816	Node 28.92704	+0.74401644	+0.49214564
e	0.1294741	Incl. 3.92563	+0.35618235	+0.28011232
P	8.02	H 10.7	G 0.25	

Residuals in seconds of arc

760924 095	0.3+	0.7-	800416 046	2.3+	1.7-	870304 888	1.2-	0.6+
800412 046	0.1-	1.6-	800416 046	2.4-	1.9+	870320 888	0.2+	0.2-
800412 046	(4.3-	0.5+)	870228 888	0.2+	1.7-	870320 888	0.1+	0.2+
800413 046	0.1+	0.5+	870228 888	1.5+	2.0-	870324 888	1.3+	1.0-
800413 046	1.6+	1.8-	870302 888	0.5+	2.5+	870324 888	0.9-	0.3-
800414 046	0.4-	0.3+	870302 888	0.2-	2.1+	870326 888	0.4+	0.5+
800414 046	0.7+	0.4-	870303 888	(8.2-	1.2+)	870326 888	(1.4-	4.0-)
800415 046	0.1+	0.3+	870303 888	0.3+	1.1+	870329 888	0.5-	0.1+
800415 046	2.1-	1.8+	870304 888	1.2-	0.9-	870329 888	0.3-	1.1-

1987 EA = 1967 GL = 1980 BK6 = 1984 JY

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

M	26.51295	(1950.0)	P	Q
n	0.29337414	Peri. 141.90989	-0.99648022	-0.07833521
a	2.2431365	Node 33.63363	+0.05737574	-0.89691576
e	0.0950328	Incl. 3.08888	+0.06111630	-0.43520766
P	3.36	H 13.9	G 0.25	

Residuals in seconds of arc

670413	095	1.3+	2.6+	870303	888	1.1+	0.5-	870324	888	0.5- 1.7-
800122	095	0.1-	1.2-	870303	888	0.1+	0.1-	870324	888	0.1- 1.3-
840503	688	0.8+	0.8-	870304	888	0.9-	1.3+	870326	888	0.6- 1.1+
840503	688	1.7-	1.7-	870304	888	0.1-	0.4+	870326	888	1.0- 0.2-
870302	888	(4.1-	2.3-)	870320	888	1.3-	1.8-	870329	888	0.5+ 2.0+
870302	888	(6.1-	1.0+)	870320	888	1.7+	2.0-	870329	888	0.9+ 2.3+

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EPHEMERIDES.

Comet Torres (1987j) Elements MPC 11831

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	m1
1987	05 05	12 35.44	-35 04.9	2.756	3.631	145.5	9.1	15.8
1987	05 15	12 22.21	-30 27.4					
1987	05 25	12 12.57	-26 01.9	2.943	3.647	127.3	12.8	16.0
1987	06 04	12 06.16	-22 00.5					
1987	06 14	12 02.49	-18 29.4	3.267	3.672	105.5	15.5	16.2
1987	06 24	12 01.07	-15 29.5					
1987	07 04	12 01.49	-12 59.1	3.658	3.705	84.7	15.9	16.5
1987	07 14	12 03.39	-10 54.8					
1987	07 24	12 06.46	-09 12.8	4.055	3.747	65.3	14.3	16.8

Comet Shoemaker (1987o) Elements MPC 11831

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	m1
1987	05 05	16 38.94	+08 08.6	4.761	5.597	142.8	6.3	16.4
1987	05 15	16 28.30	+09 44.7					
1987	05 25	16 17.14	+11 10.1	4.747	5.631	147.9	5.5	16.4
1987	06 04	16 05.95	+12 22.0					
1987	06 14	15 55.18	+13 19.0	4.878	5.668	137.4	7.0	16.5
1987	06 24	15 45.23	+14 00.9					
1987	07 04	15 36.42	+14 28.5	5.131	5.708	120.0	8.9	16.6
1987	07 14	15 28.95	+14 43.8					
1987	07 24	15 22.91	+14 48.9	5.463	5.752	101.5	10.0	16.8
1987	08 03	15 18.32	+14 46.1					
1987	08 13	15 15.11	+14 37.7	5.825	5.799	83.6	10.0	17.0
1987	08 23	15 13.18	+14 25.8					
1987	09 02	15 12.42	+14 12.2	6.174	5.849	66.7	9.1	17.1
1987	09 12	15 12.68	+13 58.6					
1987	09 22	15 13.83	+13 46.2	6.475	5.902	51.5	7.6	17.3
1987	10 02	15 15.74	+13 36.4					
1987	10 12	15 18.27	+13 30.3	6.702	5.958	38.9	6.0	17.4

Comet Nishikawa-Takamizawa-Tago (1987c) Elements MPC 11845

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	m1
1987	05 15	21 04.03	-32 54.0	0.682	1.348	103.8	46.7	7.0
1987	05 20	20 10.19	-38 55.4					
1987	05 25	18 49.93	-43 44.8	0.554	1.474	138.5	27.1	6.9
1987	05 30	17 13.63	-44 19.8					
1987	06 04	15 51.35	-40 27.9	0.615	1.603	158.7	13.3	7.5
1987	06 09	14 55.97	-35 04.8					
1987	06 14	14 21.16	-30 12.1	0.835	1.733	138.7	22.8	8.5
1987	06 19	13 59.03	-26 20.1					
1987	06 24	13 44.60	-23 23.4	1.128	1.863	120.5	28.0	9.5
1987	06 29	13 35.05	-21 09.8					
1987	07 04	13 28.71	-19 28.5	1.448	1.992	106.5	29.3	10.3
1987	07 09	13 24.59	-18 11.4					
1987	07 14	13 22.05	-17 12.5	1.777	2.120	94.8	28.5	11.0

1987 07 19	13 20.69	-16 27.6					
1987 07 24	13 20.22	-15 53.7	2.105	2.247	84.5	26.7	11.6
1987 07 29	13 20.45	-15 28.4					
1987 08 03	13 21.23	-15 10.2	2.426	2.373	74.9	24.4	12.2
1987 08 08	13 22.45	-14 57.5					
1987 08 13	13 24.03	-14 49.4	2.735	2.498	65.8	21.7	12.7
1987 08 18	13 25.89	-14 45.2					
1987 08 23	13 28.00	-14 44.1	3.028	2.621	57.1	18.9	13.1
1987 08 28	13 30.31	-14 45.7					
1987 09 02	13 32.79	-14 49.5	3.303	2.742	48.6	16.0	13.5
1987 09 07	13 35.39	-14 55.2					
1987 09 12	13 38.10	-15 02.4	3.556	2.862	40.2	13.1	13.8
1987 09 17	13 40.90	-15 10.9					
1987 09 22	13 43.76	-15 20.5	3.786	2.981	31.9	10.3	14.1

(3362) Khufu a,e,i = 0.99, 0.47, 10 Elements MPC 10379

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	m1
1987 07 04	03 16.16		+28 35.3	0.400	0.803	47.6	110.8	19.6
1987 07 14	03 01.04		+24 12.5					
1987 07 24	02 54.30		+20 15.0	0.411	0.978	73.0	83.3	18.7
1987 08 03	02 49.73		+16 20.7					
1987 08 13	02 43.28		+12 03.4	0.387	1.128	97.1	63.0	18.2
1987 08 23	02 31.83		+06 59.0					
1987 09 02	02 12.84		+00 53.1	0.351	1.249	126.3	40.6	17.6
1987 09 12	01 45.48		-05 57.9					
1987 09 22	01 11.85		-12 34.0	0.359	1.341	157.1	16.9	17.2
1987 10 02	00 37.58		-17 37.3					
1987 10 12	00 08.92		-20 32.2	0.452	1.406	149.3	21.3	17.9
1987 10 22	23 49.00		-21 36.8					
1987 11 01	23 37.90		-21 25.5	0.611	1.443	126.6	33.5	19.0
1987 11 11	23 34.13		-20 27.0					
1987 11 21	23 35.93		-18 59.6	0.797	1.453	108.5	40.1	19.7
1987 12 01	23 41.94		-17 13.0					
1987 12 11	23 51.11		-15 13.5	0.984	1.438	93.8	43.1	20.2
1987 12 21	00 02.69		-13 04.3					
1987 12 31	00 16.22		-10 47.4	1.150	1.395	81.3	44.2	20.5
1988 01 10	00 31.35		-08 24.2					
1988 01 20	00 47.90		-05 55.5	1.279	1.326	70.4	44.3	20.7

Periodic Comet de Vico-Swift Elements MPC 11624

Date	ET	R. A. (1950)	Decl.	Delta	r	Variation		m2
1987 07 24	23 50.27		-05 16.5	1.488	2.225	-1.77	-15.5	20.8
1987 08 03	23 53.65		-04 35.6					
1987 08 13	23 54.38		-04 06.0	1.302	2.192	-2.08	-18.0	20.5
1987 08 23	23 52.39		-03 47.4					
1987 09 02	23 47.95		-03 38.2	1.184	2.168	-2.34	-19.9	20.2
1987 09 12	23 41.75		-03 34.7					
1987 09 22	23 34.80		-03 32.5	1.154	2.156	-2.42	-20.3	20.1
1987 10 02	23 28.35		-03 26.5					
1987 10 12	23 23.55		-03 12.3	1.217	2.154	-2.25	-19.0	20.3
1987 10 22	23 21.16		-02 47.2					
1987 11 01	23 21.61		-02 09.5	1.362	2.163	-1.95	-16.8	20.5

Periodic Comet Reinmuth 1 Elements MPC 10524

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	m2
1987 07 24	03 34.39		+11 35.7	3.240	2.978	66.2	18.2	20.5
1987 08 03	03 46.76		+12 02.8					
1987 08 13	03 58.63		+12 22.9	2.887	2.875	79.2	20.3	20.2
1987 08 23	04 09.81		+12 35.9					

1987 09 02	04 20.08	+12 41.6	2.528	2.772	93.1	21.3	19.9
1987 09 12	04 29.20	+12 40.4					
1987 09 22	04 36.88	+12 32.4	2.179	2.669	108.2	20.9	19.5
1987 10 02	04 42.76	+12 18.3					
1987 10 12	04 46.51	+11 59.3	1.859	2.567	125.2	18.5	18.9
1987 10 22	04 47.80	+11 36.8					
1987 11 01	04 46.36	+11 13.2	1.591	2.467	144.4	13.6	18.4
1987 11 11	04 42.20	+10 51.4					
1987 11 21	04 35.55	+10 34.9	1.403	2.369	164.1	6.6	17.8
1987 12 01	04 27.15	+10 27.6					
1987 12 11	04 18.14	+10 33.1	1.315	2.275	163.0	7.3	17.6
1987 12 21	04 09.82	+10 53.7					
1987 12 31	04 03.49	+11 30.4	1.327	2.187	142.0	16.1	17.8
1988 01 10	04 00.09	+12 22.2					
1988 01 20	04 00.12	+13 26.9	1.414	2.106	121.8	23.4	18.1
1988 01 30	04 03.74	+14 41.5					
1988 02 09	04 10.85	+16 02.4	1.544	2.033	104.8	28.0	18.3
1988 02 19	04 21.19	+17 26.3					
1988 02 29	04 34.49	+18 49.6	1.693	1.972	90.7	30.2	18.5
1988 03 10	04 50.43	+20 09.0					
1988 03 20	05 08.70	+21 21.4	1.846	1.923	79.0	30.6	18.7
1988 03 30	05 29.02	+22 23.8					
1988 04 09	05 51.08	+23 13.5	1.998	1.890	69.1	29.7	18.8
1988 04 19	06 14.59	+23 48.2					
1988 04 29	06 39.24	+24 06.2	2.148	1.872	60.6	27.9	18.9
1988 05 09	07 04.71	+24 06.2					
1988 05 19	07 30.70	+23 47.7	2.297	1.871	53.0	25.6	18.9
1988 05 29	07 56.91	+23 10.8					
1988 06 08	08 23.09	+22 16.3	2.446	1.887	46.0	22.8	19.0
1988 06 18	08 49.02	+21 05.4					
1988 06 28	09 14.54	+19 40.0	2.596	1.919	39.2	19.6	19.1

Comet Terasako (1987d) Elements MPC 11614

Date ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	m1
1987 07 24	05 52.50	+11 15.6	4.315	3.519	34.0	9.3	15.6
1987 08 03	06 00.52	+11 17.0					
1987 08 13	06 07.52	+11 14.0	4.348	3.754	48.5	11.7	15.9
1987 08 23	06 13.41	+11 07.6					
1987 09 02	06 18.07	+10 58.5	4.311	3.984	64.6	13.2	16.2
1987 09 12	06 21.40	+10 47.6					
1987 09 22	06 23.27	+10 35.7	4.223	4.207	82.3	13.7	16.4
1987 10 02	06 23.59	+10 23.7					
1987 10 12	06 22.27	+10 12.6	4.114	4.425	101.7	12.8	16.5
1987 10 22	06 19.28	+10 03.2					
1987 11 01	06 14.66	+09 56.5	4.025	4.638	122.7	10.4	16.7
1987 11 11	06 08.56	+09 53.3					
1987 11 21	06 01.20	+09 54.0	4.004	4.846	144.9	6.7	16.9
1987 12 01	05 52.96	+09 59.2					
1987 12 11	05 44.30	+10 08.8	4.094	5.050	164.5	3.0	17.1
1987 12 21	05 35.69	+10 22.7					
1987 12 31	05 27.62	+10 40.6	4.318	5.250	159.5	3.8	17.4

Periodic Comet Encke Elements MPC 10520

Date ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	m1
1987 08 03	10 38.49	+01 23.6	0.963	0.542	31.7	79.5	7.4
1987 08 08	11 16.51	-04 12.4					
1987 08 13	11 55.30	-09 39.5	0.888	0.727	44.4	77.0	9.2
1987 08 18	12 34.47	-14 40.6					
1987 08 23	13 13.21	-19 00.4	0.910	0.906	55.9	67.7	10.7

1987 08 28	13 50.53	-22 30.6					
1987 09 02	14 25.60	-25 10.8	1.009	1.073	64.2	57.9	12.0
1987 09 07	14 57.90	-27 06.6					
1987 09 12	15 27.25	-28 26.1	1.160	1.229	68.7	49.8	13.2
1987 09 17	15 53.76	-29 17.5					
1987 09 22	16 17.65	-29 48.0	1.343	1.375	70.0	43.3	14.2
1987 09 27	16 39.25	-30 03.2					
1987 10 02	16 58.85	-30 07.0	1.544	1.512	69.1	38.2	15.1
1987 10 07	17 16.76	-30 02.7					
1987 10 12	17 33.21	-29 52.3	1.757	1.642	66.7	33.9	16.0
1987 10 17	17 48.46	-29 37.3					
1987 10 22	18 02.67	-29 18.9	1.973	1.765	63.2	30.2	16.7
1987 10 27	18 16.00	-28 57.8					
1987 11 01	18 28.59	-28 34.6	2.190	1.881	58.9	26.9	17.3
1987 11 06	18 40.52	-28 09.8					
1987 11 11	18 51.89	-27 43.5	2.404	1.992	54.1	23.7	17.9
1987 11 16	19 02.77	-27 16.0					
1987 11 21	19 13.22	-26 47.5	2.611	2.098	48.9	20.8	18.4
1987 11 26	19 23.28	-26 18.1					
1987 12 01	19 33.00	-25 47.8	2.810	2.199	43.3	17.9	18.9
1987 12 06	19 42.41	-25 16.9					
1987 12 11	19 51.52	-24 45.3	2.998	2.296	37.5	15.1	19.3

1987 GC a,e,i = 2.69, 0.11, 13 Elements MPC 11855

Date ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987 05 05	12 32.65	-00 13.3	1.521	2.410	144.0	14.2	16.5
1987 05 15	12 30.98	+00 49.6					
1987 05 25	12 31.82	+01 28.6	1.689	2.405	123.8	20.5	16.9
1987 06 04	12 35.10	+01 44.4					
1987 06 14	12 40.63	+01 39.5	1.904	2.402	106.7	23.9	17.3
1987 06 24	12 48.13	+01 17.2					
1987 07 04	12 57.36	+00 40.1	2.141	2.401	91.9	25.0	17.6

9522 P-L a,e,i = 2.80, 0.20, 7 Elements MPC 11855

Date ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987 05 05	12 27.43	-07 24.6	1.565	2.464	145.5	13.4	16.6
1987 05 15	12 23.31	-07 18.3					
1987 05 25	12 21.94	-07 24.9	1.700	2.428	125.1	20.0	17.0
1987 06 04	12 23.36	-07 45.3					
1987 06 14	12 27.39	-08 19.4	1.884	2.395	107.6	23.8	17.3
1987 06 24	12 33.75	-09 05.9					
1987 07 04	12 42.20	-10 03.7	2.089	2.365	92.6	25.4	17.5

1981 DG3 a,e,i = 3.20, 0.09, 15 Elements MPC 11837

Date ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987 05 05	13 22.26	-31 34.6	1.955	2.904	155.7	8.2	15.8
1987 05 15	13 15.19	-30 47.5					
1987 05 25	13 10.35	-29 55.0	2.050	2.901	140.2	12.9	16.0
1987 06 04	13 08.06	-29 04.0					
1987 06 14	13 08.40	-28 19.7	2.222	2.900	122.7	17.1	16.3
1987 06 24	13 11.21	-27 45.4					
1987 07 04	13 16.30	-27 22.7	2.445	2.899	106.3	19.7	16.6
1987 07 14	13 23.40	-27 12.0					
1987 07 24	13 32.25	-27 12.4	2.693	2.901	91.4	20.5	16.9

1979 KD a,e,i = 2.59, 0.16, 8 Elements MPC 11836

Date ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987 05 05	13 52.27	+01 44.0	1.281	2.249	158.2	9.6	16.3
1987 05 15	13 45.76	+02 17.0					

1987 05 25	13 41.37	+02 24.7	1.370	2.230	138.4	17.6	16.7
1987 06 04	13 39.61	+02 07.6					
1987 06 14	13 40.63	+01 28.6	1.523	2.215	120.2	23.3	17.1
1987 06 24	13 44.33	+00 31.6					
1987 07 04	13 50.51	-00 40.0	1.714	2.203	104.7	26.5	17.4
1987 07 14	13 58.88	-02 02.4					
1987 07 24	14 09.17	-03 32.6	1.923	2.195	91.3	27.6	17.7

1986 CH a,e,i = 2.99, 0.06, 9 Elements MPC 11843

Date ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987 05 05	15 54.53	-27 52.1	1.922	2.889	159.8	6.9	16.2
1987 05 15	15 46.33	-27 10.5					
1987 05 25	15 37.75	-26 18.9	1.892	2.899	172.0	2.8	16.0
1987 06 04	15 29.78	-25 21.4					
1987 06 14	15 23.29	-24 23.4	1.971	2.908	152.2	9.4	16.3
1987 06 24	15 18.83	-23 29.7					
1987 07 04	15 16.73	-22 44.1	2.142	2.918	131.6	15.1	16.7
1987 07 14	15 17.05	-22 08.7					
1987 07 24	15 19.68	-21 44.0	2.377	2.928	113.1	18.6	17.1
1987 08 03	15 24.44	-21 29.6					
1987 08 13	15 31.11	-21 24.2	2.647	2.939	96.5	20.0	17.3
1987 08 23	15 39.46	-21 26.0					
1987 09 02	15 49.29	-21 33.4	2.927	2.949	81.4	19.8	17.6

1931 UB a,e,i = 2.43, 0.22, 1 Elements MPC 11855

Date ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987 05 05	15 58.75	-20 30.7	1.565	2.543	161.7	7.2	17.5
1987 05 15	15 49.37	-19 57.0					
1987 05 25	15 39.09	-19 18.1	1.486	2.496	174.2	2.3	17.1
1987 06 04	15 29.13	-18 37.9					
1987 06 14	15 20.68	-18 01.7	1.513	2.448	150.6	11.8	17.5
1987 06 24	15 14.60	-17 33.7					
1987 07 04	15 11.41	-17 17.1	1.624	2.400	129.1	19.2	17.8
1987 07 14	15 11.28	-17 13.2					
1987 07 24	15 14.10	-17 21.5	1.790	2.350	110.7	23.9	18.1
1987 08 03	15 19.70	-17 40.7					
1987 08 13	15 27.80	-18 08.7	1.979	2.300	94.9	26.0	18.3
1987 08 23	15 38.14	-18 43.1					
1987 09 02	15 50.51	-19 21.6	2.172	2.250	81.2	26.3	18.5

1973 UU5 a,e,i = 2.93, 0.02, 2 Elements MPC 11856

Date ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987 05 05	20 11.62	-18 02.9	2.611	2.994	102.3	19.2	18.3
1987 05 15	20 15.80	-17 43.8					
1987 05 25	20 17.85	-17 31.3	2.357	2.995	120.1	17.0	18.0
1987 06 04	20 17.61	-17 26.5					
1987 06 14	20 15.06	-17 29.8	2.148	2.997	139.8	12.6	17.7
1987 06 24	20 10.31	-17 41.0					
1987 07 04	20 03.67	-17 58.8	2.016	2.997	161.6	6.2	17.3
1987 07 14	19 55.74	-18 21.2					
1987 07 24	19 47.27	-18 45.7	1.985	2.998	174.7	1.8	17.1
1987 08 03	19 39.17	-19 09.7					
1987 08 13	19 32.26	-19 31.2	2.063	2.998	152.4	9.0	17.5
1987 08 23	19 27.19	-19 49.0					
1987 09 02	19 24.37	-20 02.4	2.235	2.998	131.3	14.7	17.9
1987 09 12	19 23.96	-20 11.0					
1987 09 22	19 25.93	-20 14.7	2.471	2.998	112.2	18.1	18.2
1987 10 02	19 30.14	-20 13.2					
1987 10 12	19 36.36	-20 06.2	2.741	2.997	94.9	19.4	18.4

6582 P-L a,e,i = 3.15, 0.16, 1 Elements MPC 11844

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	05 05	20 27.35	-19 58.7	3.338	3.638	99.2	15.9	18.7
1987	05 15	20 30.39	-19 50.1					
1987	05 25	20 31.63	-19 47.9	3.061	3.641	117.4	14.3	18.4
1987	06 04	20 30.96	-19 52.4					
1987	06 14	20 28.35	-20 03.4	2.829	3.642	137.4	10.9	18.2
1987	06 24	20 23.91	-20 20.2					
1987	07 04	20 17.85	-20 41.4	2.675	3.642	159.0	5.7	17.8
1987	07 14	20 10.62	-21 04.8					
1987	07 24	20 02.76	-21 28.0	2.626	3.641	178.0	0.6	17.5
1987	08 03	19 54.96	-21 49.0					
1987	08 13	19 47.89	-22 06.0	2.691	3.638	155.6	6.6	17.9
1987	08 23	19 42.10	-22 18.3					
1987	09 02	19 38.04	-22 25.6	2.860	3.634	134.1	11.5	18.2
1987	09 12	19 35.94	-22 27.8					
1987	09 22	19 35.86	-22 25.3	3.101	3.629	114.1	14.6	18.5
1987	10 02	19 37.76	-22 18.3					
1987	10 12	19 41.51	-22 06.9	3.383	3.622	95.8	15.9	18.7

1978 VB a,e,i = 2.86, 0.16, 14 Elements MPC 11836

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	05 25	21 24.75	-29 06.5	2.340	2.821	107.9	20.0	17.5
1987	06 04	21 29.12	-29 08.4					
1987	06 14	21 31.02	-29 18.7	2.077	2.788	125.1	17.3	17.1
1987	06 24	21 30.22	-29 36.3					
1987	07 04	21 26.56	-29 58.8	1.866	2.754	144.0	12.5	16.7
1987	07 14	21 20.16	-30 21.8					
1987	07 24	21 11.42	-30 39.9	1.735	2.721	162.4	6.5	16.3
1987	08 03	21 01.14	-30 47.1					
1987	08 13	20 50.47	-30 39.0	1.705	2.689	162.4	6.6	16.2
1987	08 23	20 40.62	-30 13.9					
1987	09 02	20 32.69	-29 32.6	1.778	2.656	143.3	13.1	16.5
1987	09 12	20 27.41	-28 38.0					
1987	09 22	20 25.10	-27 33.6	1.932	2.625	123.7	18.6	16.9
1987	10 02	20 25.79	-26 22.2					
1987	10 12	20 29.26	-25 05.6	2.138	2.595	105.8	21.7	17.1
1987	10 22	20 35.20	-23 45.0					
1987	11 01	20 43.26	-22 20.4	2.369	2.565	89.8	22.8	17.4

1985 CV a,e,i = 2.60, 0.20, 13 Elements MPC 11854

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	05 25	21 37.29	-08 27.4	2.336	2.686	98.9	21.9	17.9
1987	06 04	21 43.66	-08 09.1					
1987	06 14	21 48.18	-08 03.5	2.047	2.646	115.3	20.3	17.6
1987	06 24	21 50.61	-08 13.2					
1987	07 04	21 50.73	-08 40.9	1.794	2.605	134.0	16.3	17.1
1987	07 14	21 48.44	-09 28.0					
1987	07 24	21 43.80	-10 34.4	1.605	2.563	155.3	9.5	16.6
1987	08 03	21 37.13	-11 57.6					
1987	08 13	21 29.12	-13 31.9	1.507	2.520	178.3	0.7	16.0
1987	08 23	21 20.70	-15 09.6					
1987	09 02	21 12.99	-16 42.5	1.517	2.478	157.1	9.1	16.4
1987	09 12	21 07.02	-18 03.4					
1987	09 22	21 03.51	-19 08.2	1.622	2.435	134.8	17.0	16.8
1987	10 02	21 02.89	-19 54.8					
1987	10 12	21 05.23	-20 23.1	1.793	2.394	115.1	22.2	17.1
1987	10 22	21 10.39	-20 34.0					
1987	11 01	21 18.12	-20 28.4	1.998	2.353	98.1	24.7	17.4

(3615) 1983 WZ a,e,i = 3.16, 0.12, 2 Elements MPC 11851

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	06 14	22 24.07	-10 00.0	2.599	3.066	107.8	18.4	16.5
1987	06 24	22 26.52	-09 51.3					
1987	07 04	22 26.94	-09 54.7	2.378	3.089	126.2	15.4	16.3
1987	07 14	22 25.30	-10 10.5					
1987	07 24	22 21.65	-10 38.0	2.213	3.113	146.7	10.3	16.0
1987	08 03	22 16.24	-11 15.4					
1987	08 13	22 09.53	-11 59.4	2.136	3.136	169.1	3.5	15.6
1987	08 23	22 02.15	-12 45.7					
1987	09 02	21 54.86	-13 30.0	2.167	3.160	167.7	3.9	15.7
1987	09 12	21 48.40	-14 08.2					
1987	09 22	21 43.38	-14 37.4	2.307	3.183	145.3	10.4	16.1
1987	10 02	21 40.22	-14 56.0					
1987	10 12	21 39.14	-15 03.4	2.534	3.207	124.5	14.9	16.5
1987	10 22	21 40.13	-14 59.9					
1987	11 01	21 43.12	-14 45.9	2.818	3.229	105.6	17.2	16.8
1987	11 11	21 47.89	-14 22.3					
1987	11 21	21 54.24	-13 49.8	3.127	3.252	88.3	17.7	17.0

1981 EW14 a,e,i = 2.66, 0.18, 13 Elements MPC 11839

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	06 14	23 01.95	-11 36.5	2.006	2.397	99.7	24.7	18.9
1987	06 24	23 09.07	-10 23.6					
1987	07 04	23 14.07	-09 17.6	1.744	2.363	115.1	22.9	18.5
1987	07 14	23 16.64	-08 19.4					
1987	07 24	23 16.48	-07 30.0	1.516	2.330	133.0	18.6	18.1
1987	08 03	23 13.36	-06 50.0					
1987	08 13	23 07.35	-06 18.9	1.347	2.300	153.8	11.2	17.6
1987	08 23	22 58.82	-05 55.7					
1987	09 02	22 48.62	-05 38.1	1.265	2.273	176.6	1.5	17.0
1987	09 12	22 38.01	-05 22.6					
1987	09 22	22 28.35	-05 06.1	1.284	2.249	158.6	9.4	17.3
1987	10 02	22 20.86	-04 45.3					
1987	10 12	22 16.31	-04 17.6	1.395	2.227	136.5	18.0	17.8
1987	10 22	22 15.00	-03 41.8					
1987	11 01	22 16.91	-02 56.8	1.571	2.210	117.3	23.5	18.2
1987	11 11	22 21.75	-02 02.0					
1987	11 21	22 29.16	-00 57.8	1.784	2.197	100.9	26.2	18.5

1986 EJ1 a,e,i = 2.61, 0.15, 16 Elements MPC 11855

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	06 14	23 36.01	-17 11.0	2.203	2.493	94.2	24.0	17.7
1987	06 24	23 43.21	-16 39.7					
1987	07 04	23 48.19	-16 20.8	1.995	2.526	109.7	22.3	17.5
1987	07 14	23 50.70	-16 14.4					
1987	07 24	23 50.50	-16 20.0	1.810	2.559	127.5	18.4	17.2
1987	08 03	23 47.41	-16 35.8					
1987	08 13	23 41.51	-16 57.7	1.679	2.592	147.6	12.1	16.8
1987	08 23	23 33.13	-17 20.8					
1987	09 02	23 22.98	-17 38.7	1.633	2.624	166.1	5.3	16.5
1987	09 12	23 12.15	-17 45.5					
1987	09 22	23 01.76	-17 37.4	1.694	2.656	159.1	7.8	16.8
1987	10 02	22 52.91	-17 12.9					
1987	10 12	22 46.34	-16 32.9	1.858	2.688	138.5	14.3	17.2
1987	10 22	22 42.42	-15 39.6					
1987	11 01	22 41.20	-14 35.2	2.099	2.718	118.7	18.7	17.6
1987	11 11	22 42.52	-13 22.2					
1987	11 21	22 46.09	-12 02.2	2.386	2.748	100.8	20.7	18.0

1976 GK2 a,e,i = 2.26, 0.11, 1 Elements MPC 11852

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	07 04	00 12.30	-00 16.2	1.761	2.157	98.3	27.8	17.5
1987	07 14	00 20.47	+00 27.4					
1987	07 24	00 26.35	+00 55.5	1.565	2.181	113.6	25.3	17.2
1987	08 03	00 29.57	+01 05.9					
1987	08 13	00 29.87	+00 57.5	1.397	2.207	131.9	20.0	16.8
1987	08 23	00 27.11	+00 30.1					
1987	09 02	00 21.42	-00 14.8	1.283	2.232	153.6	11.6	16.4
1987	09 12	00 13.39	-01 12.5					
1987	09 22	00 03.97	-02 15.8	1.254	2.257	176.8	1.4	15.9
1987	10 02	23 54.45	-03 16.1					
1987	10 12	23 46.16	-04 04.9	1.328	2.282	157.5	9.6	16.5
1987	10 22	23 40.05	-04 36.9					
1987	11 01	23 36.73	-04 49.4	1.494	2.307	135.2	17.6	17.0
1987	11 11	23 36.35	-04 42.3					
1987	11 21	23 38.75	-04 17.3	1.724	2.331	115.8	22.4	17.5
1987	12 01	23 43.68	-03 36.4					
1987	12 11	23 50.76	-02 42.1	1.990	2.354	98.9	24.4	17.9

1981 EH11 a,e,i = 2.64, 0.19, 14 Elements MPC 11838

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	08 13	02 15.10	+22 05.8	1.777	2.195	100.2	27.0	18.0
1987	08 23	02 21.66	+24 06.8					
1987	09 02	02 25.51	+26 01.1	1.587	2.217	115.5	24.3	17.7
1987	09 12	02 26.24	+27 46.1					
1987	09 22	02 23.52	+29 17.8	1.433	2.242	133.0	19.1	17.4
1987	10 02	02 17.30	+30 30.5					
1987	10 12	02 08.09	+31 18.7	1.342	2.270	151.5	12.1	17.1
1987	10 22	01 56.94	+31 37.9					
1987	11 01	01 45.40	+31 28.2	1.341	2.301	160.8	8.2	16.9
1987	11 11	01 35.15	+30 55.3					
1987	11 21	01 27.49	+30 08.7	1.437	2.335	148.0	13.0	17.3
1987	12 01	01 23.18	+29 18.8					
1987	12 11	01 22.40	+28 34.3	1.619	2.370	129.5	18.7	17.8
1987	12 21	01 24.95	+28 00.6					
1987	12 31	01 30.49	+27 40.2	1.859	2.408	112.0	22.2	18.2
1988	01 10	01 38.58	+27 33.4					
1988	01 20	01 48.81	+27 39.0	2.133	2.446	96.4	23.6	18.6

1980 TA6 a,e,i = 2.25, 0.10, 7 Elements MPC 11853

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	08 13	03 07.83	+17 57.2	2.268	2.480	89.7	24.1	17.3
1987	08 23	03 16.22	+18 52.7					
1987	09 02	03 22.66	+19 42.0	2.010	2.473	105.1	23.2	17.0
1987	09 12	03 26.78	+20 25.0					
1987	09 22	03 28.16	+21 01.2	1.770	2.464	123.0	20.0	16.7
1987	10 02	03 26.46	+21 29.4					
1987	10 12	03 21.55	+21 48.2	1.576	2.454	143.8	13.9	16.2
1987	10 22	03 13.57	+21 55.7					
1987	11 01	03 03.19	+21 50.8	1.464	2.442	167.2	5.2	15.7
1987	11 11	02 51.56	+21 34.4					
1987	11 21	02 40.10	+21 09.7	1.459	2.428	165.6	5.8	15.8
1987	12 01	02 30.24	+20 42.4					
1987	12 11	02 23.05	+20 18.8	1.560	2.412	141.9	14.6	16.2
1987	12 21	02 19.05	+20 03.8					
1987	12 31	02 18.40	+20 00.7	1.741	2.395	120.6	20.7	16.6
1988	01 10	02 20.93	+20 10.2					
1988	01 20	02 26.33	+20 31.6	1.965	2.377	102.2	23.9	16.9

(3374) 1980 KO a,e,i = 2.95, 0.01, 3 Elements MPC 10394

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	09 02	03 23.43	+16 10.1	2.554	2.991	105.8	18.9	18.2
1987	09 12	03 26.43	+16 19.4					
1987	09 22	03 27.20	+16 21.0	2.308	2.991	124.3	16.1	17.9
1987	10 02	03 25.57	+16 14.7					
1987	10 12	03 21.58	+16 00.9	2.116	2.992	145.4	10.9	17.5
1987	10 22	03 15.46	+15 40.2					
1987	11 01	03 07.73	+15 14.4	2.013	2.992	168.5	3.8	17.1
1987	11 11	02 59.17	+14 46.1					
1987	11 21	02 50.70	+14 18.7	2.022	2.992	166.8	4.3	17.1
1987	12 01	02 43.23	+13 56.0					
1987	12 11	02 37.47	+13 41.1	2.144	2.992	143.4	11.3	17.5
1987	12 21	02 33.88	+13 36.3					
1987	12 31	02 32.67	+13 42.4	2.353	2.992	121.9	16.2	17.9
1988	01 10	02 33.83	+13 59.1					
1988	01 20	02 37.20	+14 25.5	2.615	2.992	102.8	18.7	18.2
1988	01 30	02 42.61	+15 00.1					
1988	02 09	02 49.80	+15 41.1	2.897	2.991	85.8	19.2	18.4

(3484) 1978 NE a,e,i = 2.59, 0.18, 15 Elements MPC 10950

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	09 02	03 28.93	-00 49.2	2.056	2.553	107.8	22.1	17.1
1987	09 12	03 32.37	-01 40.7					
1987	09 22	03 33.14	-02 40.3	1.884	2.592	124.8	18.5	16.9
1987	10 02	03 31.11	-03 44.2					
1987	10 12	03 26.36	-04 46.9	1.765	2.630	142.8	13.3	16.6
1987	10 22	03 19.23	-05 42.0					
1987	11 01	03 10.41	-06 22.6	1.730	2.668	156.2	8.7	16.4
1987	11 11	03 00.88	-06 42.8					
1987	11 21	02 51.69	-06 39.6	1.798	2.705	151.0	10.2	16.6
1987	12 01	02 43.82	-06 12.8					
1987	12 11	02 37.97	-05 24.8	1.964	2.740	133.8	15.0	17.0
1987	12 21	02 34.50	-04 19.6					
1987	12 31	02 33.53	-03 01.4	2.206	2.774	115.5	18.7	17.4
1988	01 10	02 34.96	-01 34.3					
1988	01 20	02 38.57	-00 01.6	2.490	2.807	98.3	20.3	17.7
1988	01 30	02 44.13	+01 34.0					
1988	02 09	02 51.38	+03 10.3	2.791	2.838	82.6	20.2	18.0

1981 EU20 a,e,i = 2.60, 0.10, 1 Elements MPC 11840

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	09 02	03 26.03	+20 01.7	2.081	2.527	104.3	22.8	18.6
1987	09 12	03 30.65	+20 23.1					
1987	09 22	03 32.63	+20 35.0	1.869	2.549	122.1	19.5	18.3
1987	10 02	03 31.72	+20 36.7					
1987	10 12	03 27.88	+20 27.6	1.703	2.570	142.8	13.6	17.9
1987	10 22	03 21.35	+20 07.3					
1987	11 01	03 12.76	+19 36.5	1.616	2.592	166.3	5.2	17.5
1987	11 11	03 03.12	+18 58.1					
1987	11 21	02 53.63	+18 16.2	1.637	2.613	168.6	4.3	17.5
1987	12 01	02 45.43	+17 36.6					
1987	12 11	02 39.40	+17 04.3	1.767	2.634	144.9	12.4	18.0
1987	12 21	02 36.01	+16 42.8					
1987	12 31	02 35.42	+16 34.1	1.983	2.655	123.5	18.0	18.4
1988	01 10	02 37.50	+16 37.9					
1988	01 20	02 42.03	+16 53.1	2.250	2.675	104.7	20.8	18.8
1988	01 30	02 48.73	+17 18.0					
1988	02 09	02 57.31	+17 50.4	2.539	2.694	88.2	21.5	19.1

(3492) 1985 DQ a,e,i = 2.62, 0.14, 14 Elements MPC 11049

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	09 02	03 37.24	+03 35.3	2.539	2.966	105.1	19.2	16.7
1987	09 12	03 40.40	+02 49.2					
1987	09 22	03 41.34	+01 54.2	2.311	2.976	122.7	16.5	16.5
1987	10 02	03 39.90	+00 52.6					
1987	10 12	03 36.11	-00 11.9	2.136	2.984	141.6	12.0	16.2
1987	10 22	03 30.15	-01 14.9					
1987	11 01	03 22.50	-02 10.7	2.048	2.990	157.7	7.2	15.9
1987	11 11	03 13.87	-02 53.8					
1987	11 21	03 05.13	-03 19.9	2.068	2.994	155.4	7.9	15.9
1987	12 01	02 57.16	-03 26.3					
1987	12 11	02 50.71	-03 12.9	2.194	2.997	137.7	12.8	16.3
1987	12 21	02 46.26	-02 41.5					
1987	12 31	02 44.07	-01 54.7	2.403	2.997	118.3	16.8	16.6
1988	01 10	02 44.17	-00 55.9					
1988	01 20	02 46.44	+00 11.7	2.660	2.996	100.3	18.9	16.9
1988	01 30	02 50.72	+01 25.5					
1988	02 09	02 56.78	+02 42.9	2.933	2.992	83.8	19.1	17.1

(3504) 1981 RV3 a,e,i = 3.11, 0.17, 2 Elements MPC 11240

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	09 02	03 41.16	+17 18.2	2.881	3.236	101.4	17.8	17.6
1987	09 12	03 44.07	+17 21.9					
1987	09 22	03 44.88	+17 18.6	2.648	3.268	120.0	15.4	17.3
1987	10 02	03 43.48	+17 08.5					
1987	10 12	03 39.90	+16 51.8	2.463	3.298	140.9	11.0	17.1
1987	10 22	03 34.33	+16 29.2					
1987	11 01	03 27.19	+16 01.9	2.363	3.328	163.8	4.8	16.7
1987	11 11	03 19.14	+15 32.1					
1987	11 21	03 10.93	+15 02.5	2.377	3.357	171.4	2.5	16.7
1987	12 01	03 03.37	+14 36.2					
1987	12 11	02 57.13	+14 16.1	2.509	3.385	148.1	8.9	17.1
1987	12 21	02 52.66	+14 04.1					
1987	12 31	02 50.24	+14 01.5	2.738	3.411	126.1	13.5	17.4
1988	01 10	02 49.91	+14 08.3					
1988	01 20	02 51.60	+14 23.9	3.030	3.437	106.2	16.0	17.7
1988	01 30	02 55.16	+14 47.1					
1988	02 09	03 00.39	+15 16.6	3.349	3.461	88.1	16.6	18.0

1985 CZ1 a,e,i = 2.34, 0.07, 6 Elements MPC 10309

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	09 02	03 35.76	+27 01.8	1.835	2.247	100.3	26.2	18.1
1987	09 12	03 44.26	+28 00.1					
1987	09 22	03 50.20	+28 50.7	1.604	2.234	116.0	23.8	17.8
1987	10 02	03 53.04	+29 32.1					
1987	10 12	03 52.42	+30 02.1	1.407	2.223	134.4	18.7	17.3
1987	10 22	03 48.15	+30 17.2					
1987	11 01	03 40.50	+30 13.3	1.271	2.213	155.5	10.7	16.8
1987	11 11	03 30.40	+29 47.9					
1987	11 21	03 19.29	+29 01.7	1.225	2.204	169.3	4.8	16.5
1987	12 01	03 08.95	+28 00.2					
1987	12 11	03 00.92	+26 52.7	1.282	2.196	151.1	12.5	16.9
1987	12 21	02 56.17	+25 48.6					
1987	12 31	02 55.10	+24 55.4	1.425	2.190	129.9	20.1	17.4
1988	01 10	02 57.63	+24 16.9					
1988	01 20	03 03.42	+23 53.4	1.625	2.186	111.4	24.8	17.8
1988	01 30	03 12.10	+23 43.8					
1988	02 09	03 23.21	+23 45.2	1.854	2.183	95.6	26.7	18.1

(3409) 1977 RE6 a,e,i = 2.86, 0.08, 1 Elements MPC 10533

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	09 02	03 44.29	+19 38.8	2.251	2.625	100.2	22.2	17.0
1987	09 12	03 50.54	+19 53.5					
1987	09 22	03 54.46	+20 00.0	2.015	2.630	117.2	19.8	16.7
1987	10 02	03 55.75	+19 57.9					
1987	10 12	03 54.26	+19 47.2	1.818	2.637	137.0	15.0	16.3
1987	10 22	03 50.02	+19 27.8					
1987	11 01	03 43.38	+19 00.2	1.693	2.645	159.6	7.5	15.9
1987	11 11	03 35.08	+18 26.4					
1987	11 21	03 26.10	+17 49.3	1.668	2.655	176.0	1.5	15.6
1987	12 01	03 17.62	+17 13.4					
1987	12 11	03 10.65	+16 43.2	1.756	2.665	151.9	10.0	16.1
1987	12 21	03 05.91	+16 22.2					
1987	12 31	03 03.80	+16 12.6	1.938	2.677	129.9	16.4	16.5
1988	01 10	03 04.38	+16 14.9					
1988	01 20	03 07.54	+16 28.1	2.183	2.689	110.4	20.1	16.9
1988	01 30	03 13.05	+16 50.7					
1988	02 09	03 20.62	+17 20.7	2.459	2.703	93.4	21.4	17.2

1985 JV1 a,e,i = 2.64, 0.11, 14 Elements MPC 11521

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	09 02	03 51.99	+13 49.6	2.268	2.631	99.6	22.2	16.3
1987	09 12	03 57.66	+14 23.4					
1987	09 22	04 01.08	+14 53.7	1.999	2.608	116.6	20.1	16.0
1987	10 02	04 01.87	+15 21.1					
1987	10 12	03 59.79	+15 46.5	1.769	2.585	136.3	15.5	15.5
1987	10 22	03 54.72	+16 09.9					
1987	11 01	03 46.88	+16 31.8	1.610	2.561	159.0	8.0	15.1
1987	11 11	03 36.93	+16 52.3					
1987	11 21	03 25.90	+17 11.9	1.552	2.538	175.6	1.7	14.7
1987	12 01	03 15.10	+17 32.0					
1987	12 11	03 05.82	+17 54.6	1.608	2.516	151.2	10.9	15.1
1987	12 21	02 59.00	+18 21.9					
1987	12 31	02 55.21	+18 55.7	1.759	2.494	128.6	17.9	15.5
1988	01 10	02 54.61	+19 36.6					
1988	01 20	02 57.07	+20 24.6	1.969	2.473	109.1	22.1	15.9
1988	01 30	03 02.36	+21 18.9					
1988	02 09	03 10.17	+22 18.0	2.207	2.453	92.3	23.7	16.1

1975 VY5 a,e,i = 3.20, 0.11, 24 Elements MPC 10165

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	09 02	04 01.71	+23 48.1	2.905	3.163	95.4	18.5	17.2
1987	09 12	04 05.84	+24 59.2					
1987	09 22	04 07.92	+26 10.4	2.612	3.141	112.9	17.1	16.9
1987	10 02	04 07.62	+27 21.4					
1987	10 12	04 04.71	+28 31.0	2.358	3.120	132.4	13.7	16.5
1987	10 22	03 59.10	+29 36.7					
1987	11 01	03 50.95	+30 35.5	2.178	3.098	153.4	8.2	16.1
1987	11 11	03 40.79	+31 23.9					
1987	11 21	03 29.47	+31 59.0	2.104	3.076	167.4	4.0	15.9
1987	12 01	03 18.16	+32 20.5					
1987	12 11	03 08.00	+32 30.4	2.150	3.055	152.0	8.7	16.1
1987	12 21	02 59.92	+32 32.7					
1987	12 31	02 54.56	+32 32.3	2.299	3.034	130.7	14.2	16.4
1988	01 10	02 52.13	+32 33.7					
1988	01 20	02 52.62	+32 39.8	2.518	3.014	111.0	17.7	16.7
1988	01 30	02 55.86	+32 52.3					
1988	02 09	03 01.57	+33 11.6	2.769	2.994	93.4	19.2	16.9

1981 JQ a,e,i = 2.53, 0.16, 6 Elements MPC 10544

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	09 02	03 49.91	+20 32.3	2.227	2.580	98.7	22.7	17.8
1987	09 12	03 56.63	+21 12.4					
1987	09 22	04 01.13	+21 47.9	1.950	2.547	115.3	20.9	17.4
1987	10 02	04 03.00	+22 18.4					
1987	10 12	04 01.93	+22 43.4	1.709	2.513	134.6	16.4	16.9
1987	10 22	03 57.74	+23 01.9					
1987	11 01	03 50.56	+23 12.1	1.535	2.478	156.8	9.1	16.4
1987	11 11	03 41.02	+23 13.1					
1987	11 21	03 30.15	+23 04.8	1.457	2.444	175.7	1.7	15.9
1987	12 01	03 19.37	+22 49.7					
1987	12 11	03 10.09	+22 32.1	1.490	2.409	153.0	10.7	16.4
1987	12 21	03 03.39	+22 17.2					
1987	12 31	02 59.91	+22 09.4	1.616	2.376	130.5	18.4	16.8
1988	01 10	02 59.82	+22 11.5					
1988	01 20	03 02.99	+22 24.1	1.803	2.343	111.0	23.1	17.1
1988	01 30	03 09.18	+22 46.5					
1988	02 09	03 18.02	+23 17.1	2.017	2.311	94.3	25.2	17.4

1936 OH a,e,i = 3.14, 0.28, 16 Elements MPC 11422

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	09 02	03 57.81	+15 28.2	2.912	3.210	97.9	18.1	17.2
1987	09 12	04 01.43	+14 53.6					
1987	09 22	04 02.98	+14 10.1	2.692	3.262	116.2	16.0	17.0
1987	10 02	04 02.34	+13 18.5					
1987	10 12	03 59.54	+12 19.9	2.515	3.313	136.7	11.9	16.7
1987	10 22	03 54.71	+11 16.2					
1987	11 01	03 48.22	+10 10.4	2.420	3.362	158.2	6.3	16.5
1987	11 11	03 40.66	+09 06.3					
1987	11 21	03 32.72	+08 07.7	2.436	3.410	168.3	3.4	16.4
1987	12 01	03 25.16	+07 18.6					
1987	12 11	03 18.66	+06 41.6	2.573	3.456	149.3	8.4	16.8
1987	12 21	03 13.69	+06 18.1					
1987	12 31	03 10.59	+06 08.0	2.810	3.501	127.8	12.8	17.1
1988	01 10	03 09.44	+06 10.3					
1988	01 20	03 10.21	+06 23.2	3.114	3.543	108.0	15.3	17.5
1988	01 30	03 12.80	+06 44.7					
1988	02 09	03 17.02	+07 12.8	3.448	3.585	89.9	16.0	17.7

1981 SW6 a,e,i = 3.16, 0.05, 9 Elements MPC 10027

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	09 02	03 50.20	+12 15.3	2.644	2.995	100.3	19.4	16.8
1987	09 12	03 55.23	+11 51.5					
1987	09 22	03 58.21	+11 18.8	2.394	2.996	117.8	17.2	16.5
1987	10 02	03 58.94	+10 38.2					
1987	10 12	03 57.36	+09 51.2	2.187	2.998	137.3	13.1	16.2
1987	10 22	03 53.53	+08 59.9					
1987	11 01	03 47.74	+08 07.7	2.058	3.001	157.8	7.2	15.8
1987	11 11	03 40.59	+07 18.5					
1987	11 21	03 32.81	+06 36.7	2.034	3.004	166.8	4.3	15.7
1987	12 01	03 25.30	+06 06.1					
1987	12 11	03 18.86	+05 49.2	2.122	3.008	148.8	9.8	16.0
1987	12 21	03 14.11	+05 47.1					
1987	12 31	03 11.45	+05 59.3	2.306	3.013	128.0	14.9	16.3
1988	01 10	03 11.04	+06 24.2					
1988	01 20	03 12.84	+06 59.7	2.554	3.018	108.8	18.0	16.7
1988	01 30	03 16.74	+07 43.3					
1988	02 09	03 22.53	+08 32.7	2.832	3.023	91.5	19.0	16.9

1986 OA a,e,i = 2.56, 0.05, 13 Elements MPC 11331

Date	ET	R. A. (1950)	Decl.	Delta	r	Variation		V
1987	09 02	03 53.52	+30 39.1	2.387	2.682	-1.09	+0.6	17.5
1987	09 12	04 00.30	+31 05.3					
1987	09 22	04 04.68	+31 23.0	2.133	2.680	-1.27	+1.0	17.2
1987	10 02	04 06.30	+31 30.7					
1987	10 12	04 04.93	+31 26.4	1.909	2.676	-1.44	+1.0	16.8
1987	10 22	04 00.51	+31 07.2					
1987	11 01	03 53.34	+30 30.7	1.750	2.673	-1.57	+0.4	16.4
1987	11 11	03 44.13	+29 35.9					
1987	11 21	03 33.97	+28 24.2	1.687	2.668	-1.57	-0.6	16.1
1987	12 01	03 24.15	+27 00.6					
1987	12 11	03 15.89	+25 32.9	1.740	2.663	-1.44	-1.3	16.4
1987	12 21	03 10.01	+24 09.1					
1987	12 31	03 06.99	+22 55.6	1.894	2.657	-1.27	-1.2	16.8
1988	01 10	03 06.91	+21 56.3					
1988	01 20	03 09.61	+21 12.2	2.117	2.650	-1.10	-0.8	17.1
1988	01 30	03 14.84	+20 42.8					
1988	02 09	03 22.27	+20 25.9	2.375	2.642	-0.98	-0.2	17.4

1981 EB9 a,e,i = 2.61, 0.17, 13 Elements MPC 11837

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	09 02	04 06.71	+33 23.0	2.490	2.725	92.4	21.7	18.6
1987	09 12	04 13.20	+34 34.5					
1987	09 22	04 17.24	+35 42.7	2.267	2.757	108.6	20.2	18.4
1987	10 02	04 18.42	+36 46.4					
1987	10 12	04 16.45	+37 43.1	2.072	2.788	126.9	16.6	18.1
1987	10 22	04 11.20	+38 28.9					
1987	11 01	04 02.91	+38 58.9	1.936	2.817	146.4	11.3	17.8
1987	11 11	03 52.27	+39 08.7					
1987	11 21	03 40.43	+38 55.8	1.894	2.845	160.7	6.6	17.6
1987	12 01	03 28.81	+38 21.3					
1987	12 11	03 18.77	+37 30.6	1.961	2.871	152.5	9.1	17.8
1987	12 21	03 11.26	+36 31.0					
1987	12 31	03 06.81	+35 30.4	2.131	2.896	133.4	14.3	18.2
1988	01 10	03 05.53	+34 34.9					
1988	01 20	03 07.21	+33 48.3	2.374	2.919	114.2	17.9	18.5
1988	01 30	03 11.58	+33 12.1					
1988	02 09	03 18.27	+32 46.4	2.657	2.940	96.7	19.5	18.8

(3584) 1981 TW a,e,i = 3.09, 0.11, 2 Elements MPC 11741

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	09 02	03 54.98	+22 47.1	2.439	2.752	97.1	21.3	17.1
1987	09 12	04 01.74	+23 13.8					
1987	09 22	04 06.33	+23 34.0	2.187	2.751	113.8	19.5	16.9
1987	10 02	04 08.45	+23 47.2					
1987	10 12	04 07.90	+23 53.0	1.971	2.751	133.0	15.4	16.5
1987	10 22	04 04.63	+23 50.4					
1987	11 01	03 58.86	+23 38.8	1.822	2.753	154.9	8.8	16.1
1987	11 11	03 51.18	+23 18.1					
1987	11 21	03 42.46	+22 49.6	1.770	2.757	176.8	1.2	15.7
1987	12 01	03 33.80	+22 16.3					
1987	12 11	03 26.30	+21 42.5	1.830	2.762	156.6	8.1	16.1
1987	12 21	03 20.76	+21 12.6					
1987	12 31	03 17.72	+20 50.1	1.992	2.769	134.2	14.7	16.5
1988	01 10	03 17.36	+20 37.1					
1988	01 20	03 19.62	+20 34.0	2.224	2.778	114.3	18.8	16.9
1988	01 30	03 24.32	+20 40.4					
1988	02 09	03 31.20	+20 54.6	2.495	2.788	96.7	20.6	17.2

(3344) Modena a,e,i = 2.42, 0.12, 9 Elements MPC 10301

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	09 02	04 06.60	+13 55.1	2.186	2.503	96.1	23.6	17.6
1987	09 12	04 12.99	+14 10.7					
1987	09 22	04 16.98	+14 20.6	1.962	2.527	112.9	21.5	17.3
1987	10 02	04 18.23	+14 25.7					
1987	10 12	04 16.50	+14 26.9	1.768	2.550	132.4	16.8	17.0
1987	10 22	04 11.74	+14 25.2					
1987	11 01	04 04.18	+14 21.8	1.638	2.571	154.9	9.4	16.6
1987	11 11	03 54.47	+14 18.1					
1987	11 21	03 43.64	+14 16.0	1.606	2.591	174.6	2.1	16.2
1987	12 01	03 32.94	+14 17.7					
1987	12 11	03 23.58	+14 25.6	1.689	2.610	154.1	9.5	16.7
1987	12 21	03 16.47	+14 41.3					
1987	12 31	03 12.15	+15 05.8	1.871	2.627	131.5	16.3	17.1
1988	01 10	03 10.75	+15 38.8					
1988	01 20	03 12.18	+16 19.6	2.120	2.643	111.5	20.3	17.5
1988	01 30	03 16.20	+17 06.6					
1988	02 09	03 22.51	+17 58.4	2.400	2.657	94.0	21.7	17.9

1985 GW a,e,i = 2.47, 0.14, 8 Elements MPC 11154

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	09 02	03 58.07	+12 04.9	2.130	2.488	98.5	23.7	18.1
1987	09 12	04 05.59	+12 07.2					
1987	09 22	04 10.93	+12 02.0	1.864	2.458	114.6	21.8	17.7
1987	10 02	04 13.72	+11 50.2					
1987	10 12	04 13.65	+11 33.1	1.633	2.428	133.3	17.4	17.3
1987	10 22	04 10.51	+11 12.7					
1987	11 01	04 04.39	+10 51.3	1.464	2.398	154.5	10.3	16.8
1987	11 11	03 55.82	+10 32.5					
1987	11 21	03 45.70	+10 19.6	1.388	2.368	170.6	3.9	16.4
1987	12 01	03 35.34	+10 16.6					
1987	12 11	03 26.11	+10 26.2	1.419	2.339	152.8	11.1	16.7
1987	12 21	03 19.13	+10 49.7					
1987	12 31	03 15.11	+11 27.0	1.543	2.310	130.9	18.8	17.1
1988	01 10	03 14.32	+12 16.5					
1988	01 20	03 16.72	+13 16.0	1.729	2.283	111.6	23.6	17.5
1988	01 30	03 22.10	+14 23.0					
1988	02 09	03 30.14	+15 34.7	1.943	2.257	95.1	25.8	17.7

(3628) 1979 WD a,e,i = 2.54, 0.30, 7 Elements MPC 11861

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	09 02	03 53.26	+13 04.0	1.437	1.887	99.4	31.8	16.2
1987	09 12	04 04.59	+12 43.4					
1987	09 22	04 12.84	+12 09.3	1.296	1.937	114.1	28.2	15.9
1987	10 02	04 17.57	+11 23.6					
1987	10 12	04 18.52	+10 29.5	1.181	1.993	132.1	21.8	15.6
1987	10 22	04 15.62	+09 30.7					
1987	11 01	04 09.25	+08 32.8	1.120	2.054	152.8	12.8	15.3
1987	11 11	04 00.38	+07 42.3					
1987	11 21	03 50.36	+07 05.5	1.143	2.118	167.3	5.9	15.1
1987	12 01	03 40.77	+06 47.2					
1987	12 11	03 33.00	+06 49.4	1.265	2.185	152.2	12.1	15.6
1987	12 21	03 27.88	+07 10.8					
1987	12 31	03 25.85	+07 48.9	1.473	2.253	132.0	18.9	16.3
1988	01 10	03 26.86	+08 39.4					
1988	01 20	03 30.66	+09 38.6	1.742	2.321	113.8	22.8	16.8
1988	01 30	03 36.93	+10 43.2					
1988	02 09	03 45.28	+11 50.1	2.047	2.390	97.8	24.1	17.2

4081 P-L a,e,i = 2.24, 0.15, 7 Elements MPC 5980

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	09 02	03 49.00	+18 33.5	1.498	1.938	99.3	30.9	18.4
1987	09 12	04 00.72	+18 22.9					
1987	09 22	04 09.69	+17 56.7	1.317	1.955	114.1	28.0	18.0
1987	10 02	04 15.37	+17 15.4					
1987	10 12	04 17.39	+16 19.9	1.163	1.976	132.1	22.0	17.6
1987	10 22	04 15.52	+15 11.9					
1987	11 01	04 09.95	+13 55.1	1.062	2.000	153.5	12.8	17.2
1987	11 11	04 01.50	+12 35.5					
1987	11 21	03 51.48	+11 20.6	1.045	2.027	171.4	4.2	16.9
1987	12 01	03 41.60	+10 19.2					
1987	12 11	03 33.44	+09 37.5	1.126	2.057	153.9	12.1	17.4
1987	12 21	03 28.07	+09 18.6					
1987	12 31	03 26.03	+09 21.6	1.292	2.088	132.6	20.3	17.9
1988	01 10	03 27.36	+09 43.5					
1988	01 20	03 31.79	+10 20.0	1.516	2.120	114.3	25.0	18.5
1988	01 30	03 38.98	+11 06.8					
1988	02 09	03 48.52	+11 59.9	1.772	2.153	98.6	26.9	18.9

(3497) 1941 HJ a,e,i = 2.69, 0.15, 11 Elements MPC 11236

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	09 02	04 10.82	+09 56.1	2.830	3.099	95.8	18.9	17.9
1987	09 12	04 15.73	+09 24.9					
1987	09 22	04 18.68	+08 45.7	2.564	3.098	113.0	17.4	17.6
1987	10 02	04 19.46	+07 59.3					
1987	10 12	04 17.94	+07 07.6	2.335	3.095	132.1	13.8	17.3
1987	10 22	04 14.12	+06 12.8					
1987	11 01	04 08.19	+05 18.4	2.178	3.090	152.1	8.6	17.0
1987	11 11	04 00.61	+04 28.5					
1987	11 21	03 52.05	+03 47.2	2.122	3.083	163.9	5.1	16.8
1987	12 01	03 43.38	+03 18.6					
1987	12 11	03 35.46	+03 05.0	2.181	3.075	150.2	9.1	17.0
1987	12 21	03 29.01	+03 07.3					
1987	12 31	03 24.55	+03 24.9	2.341	3.064	129.8	14.3	17.3
1988	01 10	03 22.33	+03 55.6					
1988	01 20	03 22.40	+04 37.3	2.569	3.052	110.2	17.6	17.6
1988	01 30	03 24.69	+05 27.2					
1988	02 09	03 29.02	+06 22.8	2.830	3.038	92.5	18.9	17.8

1979 FU2 a,e,i = 3.13, 0.08, 14 Elements MPC 8908

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	09 02	04 16.03	+21 23.0	3.111	3.313	92.6	17.7	17.4
1987	09 12	04 20.51	+22 00.7					
1987	09 22	04 23.07	+22 36.0	2.840	3.323	110.2	16.5	17.1
1987	10 02	04 23.46	+23 08.8					
1987	10 12	04 21.56	+23 38.8	2.602	3.332	130.0	13.3	16.9
1987	10 22	04 17.31	+24 05.0					
1987	11 01	04 10.88	+24 26.4	2.432	3.341	152.0	8.0	16.5
1987	11 11	04 02.71	+24 41.8					
1987	11 21	03 53.47	+24 50.8	2.364	3.349	174.1	1.7	16.2
1987	12 01	03 44.03	+24 53.7					
1987	12 11	03 35.30	+24 52.3	2.418	3.356	158.9	6.1	16.5
1987	12 21	03 28.05	+24 49.3					
1987	12 31	03 22.83	+24 47.5	2.583	3.362	136.1	11.7	16.8
1988	01 10	03 19.92	+24 49.2					
1988	01 20	03 19.39	+24 55.9	2.829	3.367	115.2	15.3	17.1
1988	01 30	03 21.16	+25 08.5					
1988	02 09	03 25.04	+25 26.8	3.117	3.372	96.4	16.9	17.4

(3365) 1985 CG2 a,e,i = 2.71, 0.17, 8 Elements MPC 10389

Date ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987 09 02	04 12.10	+16 16.9	2.495	2.762	94.4	21.4	17.3
1987 09 12	04 18.22	+16 00.1					
1987 09 22	04 22.13	+15 35.0	2.269	2.797	111.5	19.5	17.1
1987 10 02	04 23.57	+15 02.0					
1987 10 12	04 22.41	+14 22.1	2.075	2.832	131.0	15.4	16.8
1987 10 22	04 18.64	+13 36.5					
1987 11 01	04 12.50	+12 47.5	1.946	2.865	152.8	9.1	16.5
1987 11 11	04 04.56	+11 58.2					
1987 11 21	03 55.61	+11 12.0	1.917	2.897	170.9	3.1	16.2
1987 12 01	03 46.62	+10 33.2					
1987 12 11	03 38.58	+10 04.9	2.005	2.928	155.2	8.1	16.5
1987 12 21	03 32.23	+09 49.1					
1987 12 31	03 28.07	+09 46.6	2.196	2.958	133.3	14.0	17.0
1988 01 10	03 26.30	+09 56.5					
1988 01 20	03 26.91	+10 17.1	2.459	2.985	113.1	17.6	17.3
1988 01 30	03 29.77	+10 46.4					
1988 02 09	03 34.64	+11 22.2	2.759	3.012	95.2	19.0	17.6

1981 QJ a,e,i = 3.13, 0.19, 1 Elements MPC 7360

Date ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987 09 02	04 04.37	+21 01.8	2.243	2.543	95.3	23.3	17.7
1987 09 12	04 12.79	+21 28.4					
1987 09 22	04 19.03	+21 48.5	2.011	2.553	111.3	21.5	17.5
1987 10 02	04 22.71	+22 02.3					
1987 10 12	04 23.61	+22 09.9	1.810	2.567	129.8	17.4	17.1
1987 10 22	04 21.58	+22 10.8					
1987 11 01	04 16.74	+22 04.9	1.668	2.583	151.3	10.6	16.8
1987 11 11	04 09.62	+21 52.2					
1987 11 21	04 01.06	+21 33.5	1.617	2.603	175.0	1.9	16.3
1987 12 01	03 52.20	+21 11.2					
1987 12 11	03 44.24	+20 48.8	1.675	2.625	160.6	7.1	16.7
1987 12 21	03 38.14	+20 30.0					
1987 12 31	03 34.53	+20 18.0	1.836	2.650	138.0	14.4	17.1
1988 01 10	03 33.68	+20 14.6					
1988 01 20	03 35.56	+20 20.0	2.072	2.677	117.8	19.0	17.6
1988 01 30	03 40.00	+20 33.5					
1988 02 09	03 46.71	+20 53.6	2.351	2.706	100.2	21.0	17.9

(3389) 1984 DU a,e,i = 2.77, 0.14, 7 Elements MPC 10400

Date ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987 09 02	04 01.21	+12 54.3	2.056	2.407	97.6	24.6	17.1
1987 09 12	04 10.18	+12 41.8					
1987 09 22	04 16.98	+12 19.4	1.819	2.398	113.1	22.7	16.8
1987 10 02	04 21.23	+11 48.2					
1987 10 12	04 22.67	+11 09.7	1.615	2.392	131.0	18.3	16.4
1987 10 22	04 21.11	+10 26.3					
1987 11 01	04 16.64	+09 41.2	1.470	2.388	151.3	11.5	15.9
1987 11 11	04 09.77	+08 59.0					
1987 11 21	04 01.33	+08 24.4	1.413	2.388	167.8	5.0	15.6
1987 12 01	03 52.50	+08 02.3					
1987 12 11	03 44.55	+07 55.9	1.461	2.390	155.1	10.0	15.9
1987 12 21	03 38.49	+08 06.5					
1987 12 31	03 35.03	+08 33.4	1.602	2.395	134.4	17.1	16.3
1988 01 10	03 34.46	+09 14.2					
1988 01 20	03 36.76	+10 05.8	1.811	2.403	115.4	21.7	16.7
1988 01 30	03 41.76	+11 05.3					
1988 02 09	03 49.16	+12 09.3	2.058	2.414	98.8	23.8	17.1

1981 UE10 a,e,i = 3.17, 0.18, 2 Elements MPC 11237

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	09 02	04 13.58	+18 55.5	2.608	2.855	93.6	20.7	17.3
1987	09 12	04 20.02	+19 03.7					
1987	09 22	04 24.34	+19 05.6	2.379	2.887	110.5	19.0	17.0
1987	10 02	04 26.30	+19 01.7					
1987	10 12	04 25.74	+18 52.3	2.180	2.921	129.8	15.2	16.8
1987	10 22	04 22.64	+18 37.8					
1987	11 01	04 17.19	+18 18.7	2.044	2.956	151.7	9.2	16.4
1987	11 11	04 09.90	+17 56.2					
1987	11 21	04 01.50	+17 31.9	2.005	2.990	174.8	1.7	16.1
1987	12 01	03 52.93	+17 08.4					
1987	12 11	03 45.14	+16 48.4	2.083	3.026	159.8	6.5	16.4
1987	12 21	03 38.89	+16 34.5					
1987	12 31	03 34.73	+16 28.5	2.267	3.061	137.1	12.6	16.9
1988	01 10	03 32.89	+16 31.2					
1988	01 20	03 33.40	+16 42.2	2.530	3.097	116.5	16.5	17.2
1988	01 30	03 36.14	+17 00.8					
1988	02 09	03 40.90	+17 25.4	2.837	3.132	98.1	18.2	17.6

1986 JG a,e,i = 2.19, 0.13, 1 Elements MPC 10944

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	09 02	04 18.20	+22 41.2	2.053	2.317	91.9	25.8	17.9
1987	09 12	04 27.13	+23 07.0					
1987	09 22	04 33.64	+23 26.3	1.833	2.342	107.7	24.1	17.7
1987	10 02	04 37.30	+23 39.3					
1987	10 12	04 37.74	+23 46.0	1.633	2.365	126.3	19.9	17.3
1987	10 22	04 34.72	+23 45.3					
1987	11 01	04 28.25	+23 36.3	1.483	2.386	148.4	12.6	16.9
1987	11 11	04 18.87	+23 17.9					
1987	11 21	04 07.54	+22 50.1	1.421	2.405	173.1	2.8	16.4
1987	12 01	03 55.72	+22 15.4					
1987	12 11	03 44.93	+21 38.5	1.470	2.422	160.9	7.6	16.7
1987	12 21	03 36.41	+21 04.7					
1987	12 31	03 30.94	+20 38.8	1.621	2.436	137.2	15.9	17.2
1988	01 10	03 28.78	+20 23.7					
1988	01 20	03 29.83	+20 20.0	1.845	2.449	116.5	21.1	17.7
1988	01 30	03 33.84	+20 26.9					
1988	02 09	03 40.43	+20 42.5	2.107	2.458	98.7	23.4	18.0

(3503) 1981 EF17 a,e,i = 2.62, 0.18, 12 Elements MPC 11239

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	09 02	04 21.25	+13 30.3	2.405	2.651	92.7	22.3	18.7
1987	09 12	04 28.27	+12 54.4					
1987	09 22	04 33.07	+12 08.8	2.186	2.689	109.2	20.6	18.4
1987	10 02	04 35.38	+11 14.6					
1987	10 12	04 35.04	+10 13.3	1.995	2.726	128.0	16.8	18.2
1987	10 22	04 31.98	+09 07.2					
1987	11 01	04 26.40	+07 59.8	1.866	2.762	148.6	10.8	17.9
1987	11 11	04 18.77	+06 55.5					
1987	11 21	04 09.86	+05 59.2	1.831	2.796	164.7	5.4	17.6
1987	12 01	04 00.66	+05 15.8					
1987	12 11	03 52.19	+04 48.4	1.909	2.829	154.4	8.7	17.9
1987	12 21	03 45.28	+04 38.3					
1987	12 31	03 40.52	+04 45.0	2.089	2.860	133.9	14.3	18.3
1988	01 10	03 38.18	+05 06.3					
1988	01 20	03 38.27	+05 39.5	2.343	2.890	114.3	18.1	18.7
1988	01 30	03 40.69	+06 21.5					
1988	02 09	03 45.21	+07 09.5	2.635	2.918	96.6	19.6	19.0

2093 P-L a,e,i = 3.03, 0.05, 9 Elements MPC 9298

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	09 02	04 23.40	+19 05.0	2.914	3.104	91.3	19.0	19.0
1987	09 12	04 29.59	+18 53.4					
1987	09 22	04 33.88	+18 34.8	2.649	3.114	108.3	17.8	18.8
1987	10 02	04 36.02	+18 09.4					
1987	10 12	04 35.86	+17 37.6	2.412	3.123	127.5	14.7	18.5
1987	10 22	04 33.35	+16 59.9					
1987	11 01	04 28.60	+16 17.6	2.238	3.131	149.1	9.4	18.2
1987	11 11	04 21.99	+15 32.2					
1987	11 21	04 14.12	+14 46.2	2.160	3.139	170.8	2.9	17.8
1987	12 01	04 05.80	+14 02.7					
1987	12 11	03 57.92	+13 25.2	2.199	3.147	161.0	5.8	18.0
1987	12 21	03 51.24	+12 56.2					
1987	12 31	03 46.37	+12 37.8	2.350	3.154	138.5	11.9	18.4
1988	01 10	03 43.65	+12 30.4					
1988	01 20	03 43.19	+12 33.4	2.582	3.161	117.6	16.0	18.7
1988	01 30	03 44.94	+12 45.7					
1988	02 09	03 48.76	+13 05.4	2.860	3.167	98.9	17.9	19.0

(3515) 1982 UH2 a,e,i = 2.85, 0.01, 1 Elements MPC 11343

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	09 02	04 23.07	+22 57.7	2.677	2.873	90.7	20.6	17.4
1987	09 12	04 30.39	+23 19.5					
1987	09 22	04 35.73	+23 36.6	2.411	2.872	107.2	19.5	17.2
1987	10 02	04 38.79	+23 49.1					
1987	10 12	04 39.31	+23 56.6	2.170	2.872	126.0	16.3	16.8
1987	10 22	04 37.13	+23 58.9					
1987	11 01	04 32.30	+23 55.0	1.985	2.872	147.4	10.7	16.5
1987	11 11	04 25.16	+23 44.3					
1987	11 21	04 16.36	+23 26.8	1.891	2.871	171.0	3.1	16.0
1987	12 01	04 06.88	+23 03.6					
1987	12 11	03 57.83	+22 37.4	1.911	2.871	164.0	5.4	16.2
1987	12 21	03 50.19	+22 11.6					
1987	12 31	03 44.72	+21 50.0	2.042	2.870	140.6	12.6	16.6
1988	01 10	03 41.83	+21 35.1					
1988	01 20	03 41.62	+21 28.3	2.254	2.869	119.5	17.4	17.0
1988	01 30	03 44.02	+21 29.9					
1988	02 09	03 48.80	+21 38.9	2.514	2.868	100.8	19.7	17.3

(3501) 1971 QU a,e,i = 2.92, 0.09, 5 Elements MPC 11239

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	09 02	04 24.84	+23 18.8	2.727	2.912	90.2	20.3	17.1
1987	09 12	04 31.91	+23 28.1					
1987	09 22	04 36.95	+23 31.6	2.476	2.930	106.9	19.1	16.9
1987	10 02	04 39.69	+23 29.0					
1987	10 12	04 39.91	+23 20.4	2.249	2.948	125.9	15.9	16.6
1987	10 22	04 37.53	+23 05.4					
1987	11 01	04 32.62	+22 43.7	2.080	2.966	147.6	10.3	16.2
1987	11 11	04 25.58	+22 15.2					
1987	11 21	04 17.08	+21 41.0	2.002	2.983	171.4	2.8	15.8
1987	12 01	04 08.04	+21 03.0					
1987	12 11	03 59.48	+20 24.7	2.041	3.000	164.1	5.2	16.0
1987	12 21	03 52.28	+19 49.5					
1987	12 31	03 47.11	+19 20.8	2.191	3.017	140.6	11.9	16.4
1988	01 10	03 44.32	+19 00.6					
1988	01 20	03 44.01	+18 49.7	2.425	3.033	119.4	16.4	16.8
1988	01 30	03 46.09	+18 47.9					
1988	02 09	03 50.36	+18 54.0	2.708	3.048	100.6	18.5	17.1

1967 UR a,e,i = 2.24, 0.09, 5 Elements MPC 11742

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	09 02	04 24.89	+18 36.9	2.218	2.452	91.0	24.3	17.7
1987	09 12	04 33.59	+18 58.6					
1987	09 22	04 40.18	+19 15.3	1.965	2.450	106.7	23.1	17.4
1987	10 02	04 44.24	+19 27.6					
1987	10 12	04 45.40	+19 36.2	1.732	2.446	125.1	19.5	17.0
1987	10 22	04 43.37	+19 41.3					
1987	11 01	04 38.04	+19 43.0	1.549	2.441	146.7	12.9	16.6
1987	11 11	04 29.70	+19 41.1					
1987	11 21	04 19.09	+19 35.7	1.452	2.433	171.1	3.6	16.0
1987	12 01	04 07.43	+19 27.9					
1987	12 11	03 56.22	+19 20.0	1.465	2.424	163.1	6.8	16.2
1987	12 21	03 46.79	+19 15.2					
1987	12 31	03 40.15	+19 16.7	1.583	2.413	139.0	15.5	16.7
1988	01 10	03 36.78	+19 26.5					
1988	01 20	03 36.74	+19 45.1	1.776	2.400	118.0	21.2	17.1
1988	01 30	03 39.87	+20 12.0					
1988	02 09	03 45.84	+20 45.6	2.009	2.386	100.0	24.0	17.4

1980 RS2 a,e,i = 2.25, 0.17, 4 Elements MPC 11853

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	09 02	04 02.24	+23 55.3	1.501	1.884	95.2	32.2	16.5
1987	09 12	04 16.50	+24 28.4					
1987	09 22	04 28.29	+24 49.9	1.320	1.897	108.6	30.1	16.1
1987	10 02	04 37.01	+25 00.0					
1987	10 12	04 42.13	+24 59.0	1.157	1.914	125.2	25.2	15.7
1987	10 22	04 43.18	+24 46.7					
1987	11 01	04 39.97	+24 22.1	1.035	1.937	145.6	16.8	15.3
1987	11 11	04 32.92	+23 45.1					
1987	11 21	04 23.08	+22 56.5	0.983	1.963	169.7	5.1	14.8
1987	12 01	04 12.18	+22 00.3					
1987	12 11	04 02.20	+21 03.5	1.026	1.993	164.8	7.4	15.0
1987	12 21	03 54.70	+20 13.6					
1987	12 31	03 50.68	+19 36.6	1.162	2.026	141.5	17.6	15.7
1988	01 10	03 50.40	+19 14.8					
1988	01 20	03 53.67	+19 07.7	1.367	2.062	121.7	24.0	16.2
1988	01 30	04 00.14	+19 13.0					
1988	02 09	04 09.31	+19 27.3	1.613	2.099	105.1	27.0	16.7

1983 CS a,e,i = 3.21, 0.10, 2 Elements MPC 10957

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	09 02	04 26.06	+20 34.0	2.926	3.101	90.4	19.0	17.9
1987	09 12	04 32.92	+20 50.3					
1987	09 22	04 38.00	+21 02.3	2.635	3.082	107.0	18.1	17.7
1987	10 02	04 41.01	+21 10.3					
1987	10 12	04 41.75	+21 14.4	2.371	3.064	125.8	15.3	17.3
1987	10 22	04 40.06	+21 14.6					
1987	11 01	04 35.95	+21 10.8	2.164	3.045	147.0	10.2	17.0
1987	11 11	04 29.70	+21 03.0					
1987	11 21	04 21.84	+20 51.5	2.049	3.028	170.4	3.1	16.5
1987	12 01	04 13.19	+20 37.3					
1987	12 11	04 04.73	+20 22.4	2.048	3.011	165.3	4.8	16.6
1987	12 21	03 57.36	+20 09.3					
1987	12 31	03 51.84	+20 00.5	2.159	2.994	141.9	11.7	17.0
1988	01 10	03 48.65	+19 57.8					
1988	01 20	03 47.97	+20 02.3	2.355	2.979	120.6	16.5	17.3
1988	01 30	03 49.79	+20 13.9					
1988	02 09	03 53.95	+20 31.9	2.601	2.964	101.8	19.0	17.6

1978 PG3 a,e,i = 2.57, 0.01, 9 Elements MPC 11632

Date ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987 09 02	04 25.74	+31 20.0	2.414	2.596	88.8	22.9	17.5
1987 09 12	04 35.27	+32 15.0					
1987 09 22	04 42.72	+33 06.9	2.163	2.596	104.1	22.0	17.3
1987 10 02	04 47.65	+33 55.6					
1987 10 12	04 49.67	+34 40.1	1.931	2.596	121.5	19.1	17.0
1987 10 22	04 48.42	+35 18.3					
1987 11 01	04 43.76	+35 47.0	1.746	2.595	141.3	13.8	16.6
1987 11 11	04 35.95	+36 01.6					
1987 11 21	04 25.71	+35 58.0	1.640	2.594	161.0	7.1	16.2
1987 12 01	04 14.29	+35 34.2					
1987 12 11	04 03.22	+34 52.1	1.640	2.594	161.6	6.9	16.2
1987 12 21	03 53.91	+33 57.1					
1987 12 31	03 47.41	+32 57.0	1.747	2.592	141.9	13.6	16.6
1988 01 10	03 44.19	+31 59.0					
1988 01 20	03 44.32	+31 08.0	1.936	2.591	121.6	18.9	16.9
1988 01 30	03 47.61	+30 26.8					
1988 02 09	03 53.70	+29 55.7	2.175	2.590	103.5	21.7	17.3

1981 EE1 a,e,i = 2.45, 0.13, 3 Elements MPC 10820

Date ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987 09 02	04 24.32	+18 25.2	2.336	2.563	91.1	23.2	19.4
1987 09 12	04 33.31	+18 32.6					
1987 09 22	04 40.38	+18 33.3	2.058	2.537	106.8	22.3	19.0
1987 10 02	04 45.15	+18 27.8					
1987 10 12	04 47.28	+18 16.7	1.802	2.509	124.8	19.1	18.6
1987 10 22	04 46.45	+18 00.5					
1987 11 01	04 42.53	+17 39.9	1.598	2.482	145.7	13.0	18.2
1987 11 11	04 35.74	+17 15.9					
1987 11 21	04 26.64	+16 50.0	1.476	2.453	168.9	4.5	17.6
1987 12 01	04 16.29	+16 24.8					
1987 12 11	04 06.03	+16 03.5	1.462	2.424	164.1	6.4	17.7
1987 12 21	03 57.17	+15 49.4					
1987 12 31	03 50.77	+15 45.5	1.553	2.395	140.5	15.1	18.1
1988 01 10	03 47.40	+15 53.0					
1988 01 20	03 47.26	+16 11.5	1.721	2.366	119.5	21.2	18.5
1988 01 30	03 50.27	+16 39.9					
1988 02 09	03 56.16	+17 15.8	1.930	2.338	101.6	24.4	18.8

1986 JA1 a,e,i = 2.34, 0.23, 25 Elements MPC 11344

Date ET	R. A. (1950)	Decl.	Delta	r	Variation		V
1987 09 22	04 56.08	+20 24.7	2.313	2.719	-0.97	+4.4	17.4
1987 10 02	04 58.82	+19 19.7					
1987 10 12	04 58.84	+18 04.0	2.087	2.750	-1.06	+4.6	17.1
1987 10 22	04 55.99	+16 38.2					
1987 11 01	04 50.33	+15 03.8	1.914	2.778	-1.14	+4.5	16.8
1987 11 11	04 42.25	+13 23.7					
1987 11 21	04 32.42	+11 42.7	1.836	2.803	-1.18	+4.1	16.4
1987 12 01	04 21.84	+10 07.0					
1987 12 11	04 11.62	+08 42.7	1.877	2.824	-1.14	+3.8	16.6
1987 12 21	04 02.76	+07 34.8					
1987 12 31	03 56.02	+06 45.8	2.033	2.843	-1.02	+3.5	17.0
1988 01 10	03 51.79	+06 15.6					
1988 01 20	03 50.17	+06 02.4	2.271	2.858	-0.89	+3.2	17.4
1988 01 30	03 51.07	+06 03.2					
1988 02 09	03 54.27	+06 14.9	2.552	2.870	-0.78	+2.9	17.7
1988 02 19	03 59.51	+06 34.4					
1988 02 29	04 06.54	+06 58.9	2.842	2.879	-0.69	+2.7	17.9

2017 P-L a,e,i = 2.23, 0.22, 2 Elements MPC 7461

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	09 22	04 53.01	+24 12.2	1.660	2.126	103.2	27.4	18.8
1987	10 02	04 59.12	+24 19.7					
1987	10 12	05 01.83	+24 20.9	1.490	2.178	120.8	23.2	18.5
1987	10 22	05 00.78	+24 15.5					
1987	11 01	04 55.88	+24 03.0	1.360	2.228	142.1	15.9	18.2
1987	11 11	04 47.51	+23 42.2					
1987	11 21	04 36.57	+23 12.8	1.305	2.278	166.7	5.7	17.8
1987	12 01	04 24.49	+22 36.4					
1987	12 11	04 12.97	+21 56.9	1.355	2.326	167.4	5.3	17.9
1987	12 21	04 03.43	+21 19.6					
1987	12 31	03 56.86	+20 49.6	1.510	2.372	143.2	14.4	18.5
1988	01 10	03 53.64	+20 29.7					
1988	01 20	03 53.75	+20 20.8	1.746	2.416	122.0	20.2	19.0
1988	01 30	03 56.91	+20 22.3					
1988	02 09	04 02.73	+20 32.2	2.028	2.458	103.8	22.9	19.4
1988	02 19	04 10.81	+20 48.2					
1988	02 29	04 20.81	+21 08.0	2.329	2.497	87.9	23.4	19.8

(3514) 1971 UJ a,e,i = 3.94, 0.20, 4 Elements MPC 11342

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	09 22	04 47.93	+24 33.6	2.933	3.326	104.3	17.0	17.5
1987	10 02	04 50.81	+24 50.8					
1987	10 12	04 51.51	+25 04.8	2.703	3.353	123.0	14.4	17.3
1987	10 22	04 49.95	+25 15.2					
1987	11 01	04 46.18	+25 21.3	2.528	3.382	144.0	9.9	17.0
1987	11 11	04 40.49	+25 22.5					
1987	11 21	04 33.35	+25 18.3	2.442	3.411	166.7	3.8	16.7
1987	12 01	04 25.50	+25 09.0					
1987	12 11	04 17.74	+24 55.6	2.471	3.442	168.5	3.3	16.7
1987	12 21	04 10.87	+24 40.4					
1987	12 31	04 05.52	+24 25.6	2.617	3.474	145.7	9.2	17.1
1988	01 10	04 02.12	+24 13.6					
1988	01 20	04 00.85	+24 06.0	2.856	3.506	124.3	13.4	17.5
1988	01 30	04 01.74	+24 03.4					
1988	02 09	04 04.67	+24 06.1	3.155	3.539	104.9	15.6	17.8
1988	02 19	04 09.45	+24 13.3					
1988	02 29	04 15.90	+24 24.4	3.480	3.573	87.3	16.1	18.0

1981 EY17 a,e,i = 2.45, 0.16, 2 Elements MPC 9690

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	09 22	04 38.57	+19 39.5	1.542	2.073	107.1	27.6	17.6
1987	10 02	04 47.16	+19 38.5					
1987	10 12	04 52.77	+19 30.0	1.342	2.067	123.4	23.8	17.2
1987	10 22	04 54.94	+19 15.0					
1987	11 01	04 53.42	+18 54.6	1.185	2.066	143.1	16.8	16.7
1987	11 11	04 48.34	+18 30.3					
1987	11 21	04 40.31	+18 03.7	1.097	2.070	166.0	6.7	16.2
1987	12 01	04 30.59	+17 37.8					
1987	12 11	04 20.82	+17 16.0	1.104	2.077	167.7	5.8	16.2
1987	12 21	04 12.61	+17 02.3					
1987	12 31	04 07.19	+16 59.5	1.208	2.089	144.7	15.8	16.8
1988	01 10	04 05.21	+17 08.6					
1988	01 20	04 06.77	+17 28.7	1.386	2.105	124.4	22.7	17.3
1988	01 30	04 11.67	+17 57.7					
1988	02 09	04 19.54	+18 32.7	1.611	2.124	107.3	26.3	17.7
1988	02 19	04 29.95	+19 10.8					
1988	02 29	04 42.53	+19 49.2	1.859	2.147	92.7	27.4	18.1

(3506) 1984 CO1 a,e,i = 3.00, 0.10, 9 Elements MPC 11240

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	09 22	04 51.82	+32 41.0	2.327	2.723	102.3	21.1	16.4
1987	10 02	04 57.23	+33 31.0					
1987	10 12	04 59.94	+34 18.2	2.098	2.732	119.6	18.5	16.1
1987	10 22	04 59.64	+35 00.9					
1987	11 01	04 56.18	+35 36.5	1.914	2.742	139.0	13.7	15.8
1987	11 11	04 49.74	+36 01.3					
1987	11 21	04 40.90	+36 11.3	1.809	2.754	158.9	7.4	15.5
1987	12 01	04 30.66	+36 04.0					
1987	12 11	04 20.38	+35 39.7	1.807	2.766	163.7	5.7	15.4
1987	12 21	04 11.33	+35 01.9					
1987	12 31	04 04.58	+34 16.3	1.915	2.780	145.3	11.6	15.8
1988	01 10	04 00.73	+33 29.3					
1988	01 20	03 59.94	+32 45.7	2.111	2.795	125.0	16.8	16.1
1988	01 30	04 02.15	+32 08.6					
1988	02 09	04 07.07	+31 39.1	2.365	2.811	106.6	19.7	16.5
1988	02 19	04 14.35	+31 16.8					
1988	02 29	04 23.69	+31 00.8	2.645	2.827	90.2	20.5	16.8

1986 JN1 a,e,i = 1.95, 0.06, 24 Elements MPC 10945

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	09 22	05 03.65	+06 29.9	1.570	2.032	102.0	28.9	18.1
1987	10 02	05 10.05	+07 03.2					
1987	10 12	05 13.37	+07 42.8	1.346	2.022	118.4	25.7	17.7
1987	10 22	05 13.01	+08 33.0					
1987	11 01	05 08.44	+09 38.7	1.155	2.011	138.7	19.0	17.2
1987	11 11	04 59.49	+11 03.7					
1987	11 21	04 46.50	+12 48.3	1.033	1.998	162.9	8.3	16.6
1987	12 01	04 30.68	+14 49.1					
1987	12 11	04 14.12	+16 58.5	1.015	1.985	166.2	6.8	16.5
1987	12 21	03 59.09	+19 08.1					
1987	12 31	03 47.53	+21 12.7	1.106	1.971	141.1	18.2	17.0
1988	01 10	03 40.49	+23 10.5					
1988	01 20	03 38.19	+25 01.9	1.276	1.957	119.4	26.0	17.5
1988	01 30	03 40.42	+26 48.0					
1988	02 09	03 46.69	+28 29.3	1.484	1.942	101.7	29.8	17.9
1988	02 19	03 56.49	+30 05.7					
1988	02 29	04 09.38	+31 36.6	1.701	1.927	87.3	30.9	18.2

1985 JR a,e,i = 2.61, 0.11, 14 Elements MPC 11425

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	09 22	05 00.72	+19 04.8	2.452	2.835	101.9	20.3	17.1
1987	10 02	05 04.59	+19 32.6					
1987	10 12	05 06.04	+20 00.6	2.184	2.822	120.2	17.8	16.8
1987	10 22	05 04.79	+20 29.3					
1987	11 01	05 00.67	+20 58.8	1.963	2.807	141.3	12.8	16.4
1987	11 11	04 53.79	+21 28.3					
1987	11 21	04 44.56	+21 56.7	1.825	2.791	165.0	5.2	15.9
1987	12 01	04 33.82	+22 22.5					
1987	12 11	04 22.71	+22 45.3	1.800	2.774	169.7	3.6	15.8
1987	12 21	04 12.44	+23 05.4					
1987	12 31	04 04.10	+23 24.7	1.890	2.756	145.3	11.7	16.2
1988	01 10	03 58.41	+23 45.1					
1988	01 20	03 55.69	+24 08.5	2.072	2.737	123.2	17.5	16.6
1988	01 30	03 56.01	+24 35.8					
1988	02 09	03 59.17	+25 07.2	2.306	2.717	103.8	20.6	16.9
1988	02 19	04 04.91	+25 42.0					
1988	02 29	04 12.96	+26 19.3	2.559	2.696	87.0	21.5	17.1

(3543) 1964 VA3 a,e,i = 3.19, 0.16, 1 Elements MPC 11513

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	09 22	05 01.14	+21 37.2	3.242	3.582	101.6	15.9	17.5
1987	10 02	05 03.34	+21 36.9					
1987	10 12	05 03.53	+21 33.7	2.986	3.600	120.7	13.8	17.3
1987	10 22	05 01.60	+21 27.7					
1987	11 01	04 57.59	+21 18.8	2.782	3.616	142.0	9.7	17.0
1987	11 11	04 51.73	+21 07.1					
1987	11 21	04 44.42	+20 52.7	2.668	3.632	165.2	4.0	16.7
1987	12 01	04 36.27	+20 36.4					
1987	12 11	04 28.03	+20 19.3	2.671	3.646	170.5	2.5	16.6
1987	12 21	04 20.42	+20 03.1					
1987	12 31	04 14.11	+19 49.7	2.795	3.659	146.9	8.4	17.0
1988	01 10	04 09.54	+19 40.7					
1988	01 20	04 06.96	+19 37.0	3.017	3.670	124.9	12.7	17.3
1988	01 30	04 06.44	+19 38.9					
1988	02 09	04 07.93	+19 46.3	3.302	3.680	104.8	15.0	17.6
1988	02 19	04 11.28	+19 58.4					
1988	02 29	04 16.32	+20 14.3	3.611	3.689	86.7	15.6	17.8

(3542) 1964 TN2 a,e,i = 3.17, 0.10, 8 Elements MPC 11513

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	09 22	05 00.45	+27 00.4	2.747	3.102	101.2	18.5	17.1
1987	10 02	05 04.32	+27 02.3					
1987	10 12	05 05.85	+26 59.7	2.505	3.121	119.6	16.1	16.8
1987	10 22	05 04.88	+26 51.9					
1987	11 01	05 01.38	+26 38.3	2.309	3.139	140.4	11.6	16.5
1987	11 11	04 55.60	+26 18.0					
1987	11 21	04 48.01	+25 50.5	2.198	3.158	163.4	5.1	16.2
1987	12 01	04 39.35	+25 16.3					
1987	12 11	04 30.59	+24 37.4	2.199	3.176	171.4	2.6	16.1
1987	12 21	04 22.62	+23 56.6					
1987	12 31	04 16.25	+23 17.5	2.318	3.194	148.0	9.4	16.5
1988	01 10	04 11.99	+22 43.2					
1988	01 20	04 10.08	+22 15.8	2.533	3.212	126.1	14.3	16.9
1988	01 30	04 10.55	+21 56.1					
1988	02 09	04 13.26	+21 43.9	2.810	3.230	106.4	17.0	17.2
1988	02 19	04 18.01	+21 38.5					
1988	02 29	04 24.58	+21 38.3	3.113	3.248	88.8	17.8	17.4

(3516) 1982 UH7 a,e,i = 2.88, 0.08, 2 Elements MPC 11343

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	09 22	04 58.14	+20 04.3	2.304	2.704	102.4	21.3	17.2
1987	10 02	05 03.21	+20 00.7					
1987	10 12	05 05.79	+19 53.1	2.073	2.717	120.3	18.5	16.9
1987	10 22	05 05.64	+19 41.8					
1987	11 01	05 02.69	+19 27.5	1.887	2.730	140.9	13.3	16.5
1987	11 11	04 57.13	+19 10.6					
1987	11 21	04 49.44	+18 52.0	1.782	2.745	163.9	5.7	16.1
1987	12 01	04 40.44	+18 32.9					
1987	12 11	04 31.24	+18 15.2	1.784	2.760	170.4	3.4	16.1
1987	12 21	04 22.90	+18 01.2					
1987	12 31	04 16.37	+17 53.1	1.898	2.775	147.0	11.1	16.5
1988	01 10	04 12.24	+17 52.3					
1988	01 20	04 10.75	+17 59.2	2.103	2.791	125.4	16.7	16.9
1988	01 30	04 11.94	+18 13.5					
1988	02 09	04 15.62	+18 33.8	2.365	2.808	106.4	19.7	17.3
1988	02 19	04 21.55	+18 58.6					
1988	02 29	04 29.46	+19 26.2	2.652	2.824	89.6	20.5	17.6

(3332) 1978 NT1 a,e,i = 2.55, 0.08, 15 Elements MPC 10293

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	09 22	04 54.15	+03 46.3	1.868	2.331	104.5	24.6	16.0
1987	10 02	05 00.62	+02 47.3					
1987	10 12	05 04.42	+01 43.0	1.663	2.330	120.1	21.8	15.7
1987	10 22	05 05.26	+00 37.2					
1987	11 01	05 02.98	-00 24.4	1.501	2.330	137.3	16.8	15.3
1987	11 11	04 57.75	-01 15.3					
1987	11 21	04 50.04	-01 48.5	1.409	2.332	152.7	11.2	15.0
1987	12 01	04 40.80	-01 57.4					
1987	12 11	04 31.26	-01 38.9	1.411	2.336	153.9	10.7	15.0
1987	12 21	04 22.69	-00 53.2					
1987	12 31	04 16.16	+00 16.1	1.508	2.341	139.1	16.0	15.3
1988	01 10	04 12.36	+01 43.1					
1988	01 20	04 11.54	+03 21.8	1.683	2.349	121.2	21.0	15.7
1988	01 30	04 13.70	+05 06.6					
1988	02 09	04 18.62	+06 53.1	1.907	2.358	104.6	23.9	16.1
1988	02 19	04 26.00	+08 37.8					
1988	02 29	04 35.54	+10 18.1	2.156	2.368	89.7	24.7	16.3

1982 UT6 a,e,i = 2.84, 0.09, 2 Elements MPC 9032

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	09 22	05 01.07	+24 23.8	2.343	2.724	101.3	21.2	18.1
1987	10 02	05 06.18	+24 38.7					
1987	10 12	05 08.76	+24 50.4	2.111	2.741	119.2	18.5	17.8
1987	10 22	05 08.54	+24 58.7					
1987	11 01	05 05.41	+25 03.0	1.924	2.758	139.8	13.4	17.4
1987	11 11	04 59.55	+25 02.5					
1987	11 21	04 51.44	+24 55.9	1.815	2.775	163.0	6.0	17.0
1987	12 01	04 41.94	+24 43.1					
1987	12 11	04 32.20	+24 25.1	1.814	2.793	171.8	2.9	16.9
1987	12 21	04 23.34	+24 04.3					
1987	12 31	04 16.35	+23 44.1	1.927	2.810	148.1	10.7	17.4
1988	01 10	04 11.86	+23 27.5					
1988	01 20	04 10.12	+23 16.7	2.133	2.828	126.3	16.3	17.8
1988	01 30	04 11.14	+23 12.7					
1988	02 09	04 14.73	+23 15.0	2.396	2.846	107.0	19.4	18.2
1988	02 19	04 20.62	+23 22.8					
1988	02 29	04 28.53	+23 34.6	2.686	2.864	90.0	20.2	18.5

1981 SM1 a,e,i = 3.14, 0.19, 2 Elements MPC 7362

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	09 22	04 57.31	+20 30.2	2.226	2.634	102.6	21.8	17.3
1987	10 02	05 02.87	+20 32.7					
1987	10 12	05 05.88	+20 31.4	2.010	2.657	120.2	18.9	17.0
1987	10 22	05 06.12	+20 26.7					
1987	11 01	05 03.50	+20 19.3	1.840	2.682	140.7	13.6	16.7
1987	11 11	04 58.23	+20 09.3					
1987	11 21	04 50.82	+19 57.3	1.747	2.710	163.7	5.9	16.3
1987	12 01	04 42.11	+19 44.1					
1987	12 11	04 33.21	+19 31.4	1.761	2.739	171.4	3.1	16.2
1987	12 21	04 25.20	+19 21.0					
1987	12 31	04 19.00	+19 15.3	1.887	2.770	147.9	10.9	16.7
1988	01 10	04 15.20	+19 15.7					
1988	01 20	04 14.02	+19 22.8	2.104	2.802	126.5	16.4	17.1
1988	01 30	04 15.49	+19 36.3					
1988	02 09	04 19.40	+19 55.1	2.379	2.836	107.5	19.4	17.5
1988	02 19	04 25.51	+20 18.0					
1988	02 29	04 33.54	+20 43.2	2.682	2.871	90.7	20.2	17.8