The MINOR PLANET CIRCULARS/MINOR PLANETS AND COMETS are published, on behalf of Commission 20 of the International Astronomical Union, usually in batches on the date of each full moon, by:

Minor Planet Center
Smithsonian Astrophysical Observatory
Cambridge, MA 02138, U.S.A.

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

CORRECTED OBSERVATION.

The following observation corrects that previously published.

Object	Date	UT	R. A. (1950)	Decl.	Reference	Mag.	N Obs.
1984 SR *	1984 09	26.40416	00 31 00.22	+09 51 52.3	MPC 9191	16	1 675

Note 1: time originally given as 14 min later.

* * * * *

DELETED OBSERVATIONS.

The following observations are to be deleted.

Object	Date	UT	R. A. (1950)	Decl.	Reference	Obs.
351	1982 07	12.19340	18 00 46.33	-22 48 27.7	MPC 7344	688
457	1981 07	25.29375	19 42 46.50	-06 03 41.8	MPC 6256	688

* * * * *

IDENTIFICATION CHANGES.

Continuation to MPC 9173-9174.

Object	Date	UT	R. A. (1950)	Decl.	Old desig.	Mag.	Obs.
1932 SF *	1932 09	30.94611	22 24 34.29	-04 09 52.5	1932 RK		024
1979 WC8 *	1979 11	22.78148	01 49 12.72	+11 01 40.5	1979 WU1	16.5	095
1979 WD8 *	1979 11	22.78148	01 50 12.76	+11 12 39.4	1979 WW1	17.0	095
1984 WU1 *	1984 11	24.29097	02 27 40.38	+11 28 44.6	1978 RH	17.0	688
1984 YZ *	1984 12	22.95833	06 44 29.39	+18 49 06.1	1980 TX5	16.6	567
1984 YZ	1984 12	22.97083	06 44 28.96	+18 49 04.4	1980 TX5		567
1984 YZ	1984 12	22.98194	06 44 27.99	+18 49 02.6	1980 TX5		567

* * * * *

ROMAN NUMERAL DESIGNATIONS OF COMETS IN 1983.

The following tabulation continues that on MPC 8438.

Comet	T	Name	Year/letter	Ref.
1983 I	Jan. 19.0	IRAS	1983f	MPC 8052
1983 II	Mar. 15.2	P/Bowell-Skiff	1983c	MPC 8052
1983 III	Apr. 2.2	P/Kowal-Vavrova	1983t	MPC 8272
1983 IV	Apr. 7.5	P/Pons-Winnecke	1983b	IAUC 3765
1983 V	May 1.3	Sugano-Saigusa-Fujikawa	1983e	MPC 8052
1983 VI	May 2.7	IRAS	1983k	MPC 8671
1983 VII	May 21.3	IRAS-Araki-Alcock	1983d	MPC 8272

1983	VIII	May	22.4	P/Arend	1983q	IAUC 3867
1983	IX	June	1.3	P/du Toit-Neujmin-Delporte	1983g	IAUC 3816
1983	X	June	1.5	P/Tempel 2	1982d	IAUC 3676
1983	XI	July	9.8	P/Tempel 1	1982j	IAUC 3757
1983	XII	July	21.2	Cernis	1983l	MPC 8272
1983	XIII	Aug.	10.3	P/Kopff	1982k	IAUC 3757
1983	XIV	Aug.	23.8	P/IRAS	1983j	MPC 8386
1983	XV	Nov.	23.7	Shoemaker	1983p	MPC 8387
1983	XVI	Nov.	28.0	IRAS	1983o	MPC 8671
1983	XVII	Dec.	1.7	P/Harrington-Abell	1983r	IAUC 3867
1983	XVIII	Dec.	3.2	P/Johnson	1983h	IAUC 3824
1983	XIX	Dec.	27.8	P/Bradfield	1984a	MPC 9025

* * * * *

OBSERVATIONS OF COMETS.

Observations are published here for the following observatory codes:

024 Heidelberg-Konigstuhl. 0.4-m f/5 Bruce astrograph. Observers U. Gorze and H. Mandel.
033 Tautenburg. Observers F. Borngen and K. Kirsch.
046 Klet. Observer A. Mrkos.
114 Engelhardt Observatory, Zelenchukskaya Station. Observers V. N. Kitkin and T. K. Manikov. From Kiev Komet. Tsirk. Nos. 331 and 332.
115 Zelenchukskaya. 6-m reflector. Observers G. K. Nazarchuk, Yu. A. Shokin, A. I. Shapovalova and A. L. Shcherbanovskij. Communicated by Yu. V. Yatskiv and S. I. Major.
193 Sanglok. 1-m reflector. Observers Kiselyev and others. Longitude and Parallax 69.22, -335, -263 (see MPC 7759).
293 Burlington remote site, New Jersey. Observer T. Handley. Longitude and Parallax 285.59, -328, -271 (see MPC 7759).
330 Purple Mountain Observatory. Observers J.-x. Yang and S.-L. Wei.
372 Geisei. Observer T. Seki.
489 Hemingford Abbots. Observer A. Young. Measured by R. McNaught. Communicated by G. M. Hurst.
552 Osservatorio San Vittore. Observers C. Vacchi, G. Sassi, V. Goretti and E. Colombini.
565 Bassano Bresciano. Observers U. Quadri and V. Marinello.
567 Osservatorio Chaonis. Observer J. M. Baur.
657 Victoria. Observers J. B. Tatum, D. D. Balam and T. B. Lowe.
675 Palomar. Observation of comet 1984f by J. Gibson (1.2-m Schmidt). Other observations by C. Shoemaker and E. Shoemaker (0.46-m Schmidt).
688 Lowell Observatory, Anderson Mesa Station. Observer B. A. Skiff. Measured by S. J. Bus.
707 Chamberlin Observatory field station. 0.40-m f/5.5 reflector. Observers E. Everhart and L. Everhart.
801 Oak Ridge Observatory. Observers R. E. McCrosky, G. Schwartz, C.-Y. Shao and J. Huchra (assisted by C. M. Bardwell, D. W. E. Green and B. G. Marsden).
984 Eastfield. Observer H. B. Ridley. Measured by D. Buczynski.
993 Woolston. Observer D. Buczynski. Communicated by G. M. Hurst.

Object	Date	UT	R. A. (1950)	Decl.	Mag.	N Obs.
		Periodic Comet Swift-Gehrels				
/1981 XIX	1981 11	27.82813	23 11 40.17	+15 29 17.9		489
/1981 XIX	1981 11	27.83854	23 11 41.80	+15 29 26.2		489

/1981 XIX	1981	12	17.92882	00 13 14.56	+19 54 09.4				489
/1981 XIX	1981	12	17.93576	00 13 15.90	+19 54 14.3				489
/1981 XIX	1981	12	22.76562	00 29 38.49	+20 53 17.6				489
/1981 XIX	1981	12	22.77326	00 29 39.72	+20 53 19.1				489
/1981 XIX	1981	12	31.86875	01 01 23.82	+22 35 05.9				489
	Periodic Comet Churyumov-Gerasimenko								
/1982 VIII	1983	04	16.88715	08 36 05.58	+27 26 03.3		16	T	033
/1982 VIII	1983	04	16.90660	08 36 07.36	+27 25 49.9				033
	Periodic Comet Gunn								
/1982 X	1984	12	24.05068	02 06 36.14	+07 32 08.3				801
	Periodic Comet Halley								
/1982i	1983	09	15.02986	07 00 33.49	+11 14 55.1				115
/1982i	1983	09	15.05439	07 00 33.63	+11 14 57.7				115
/1982i	1983	09	18.03750	07 00 54.80	+11 11 23.4				115
/1982i	1984	09	20.94686	06 46 08.92	+13 05 06.9				193
/1982i	1984	09	20.98679	06 46 09.12	+13 05 01.7				193
/1982i	1984	09	21.97046	06 46 13.78	+13 03 50.5				193
/1982i	1984	09	22.77708	06 46 16.62	+13 02 44.5		20.5T		372
/1982i	1984	09	23.90899	06 46 20.25	+13 01 26.5				193
/1982i	1984	09	23.97844	06 46 20.40	+13 01 16.4				193
/1982i	1984	09	24.89891	06 46 22.30	+13 00 08.1				193
/1982i	1984	09	24.97704	06 46 22.52	+13 00 03.4				193
/1982i	1984	09	25.05972	06 46 23.01	+12 59 53.4		20.2T		115
/1982i	1984	09	25.89787	06 46 24.47	+12 58 54.0				193
/1982i	1984	09	25.97706	06 46 24.60	+12 58 44.2				193
/1982i	1984	09	26.06146	06 46 24.57	+12 58 38.6		20.2T	1	115
/1982i	1984	09	26.89750	06 46 25.52	+12 57 35.5				193
/1982i	1984	09	26.97701	06 46 25.76	+12 57 27.2				193
/1982i	1984	09	29.96245	06 46 24.97	+12 53 36.4				193
/1982i	1984	09	30.95137	06 46 23.81	+12 52 23.5				193
/1982i	1984	10	29.95689	06 39 59.97	+12 17 48.9				193
/1982i	1984	11	04.97908	06 37 07.96	+12 11 54.0				193
/1982i	1984	11	27.99240	06 20 55.68	+11 56 37.5				193
	Periodic Comet Tempel 1								
/1983 XI	1983	06	04.82252	12 40 51.15	+04 24 54.3				114
/1983 XI	1983	06	13.79616	12 50 16.96	+01 01 56.9				114
	Periodic Comet Kopff								
/1983 XIII	1983	05	11.96036	15 40 42.24	-09 29 47.6				114
/1983 XIII	1983	06	02.87026	15 27 53.77	-09 14 39.3				114
/1983 XIII	1983	06	13.81168	15 23 40.02	-09 47 54.3				114
	Periodic Comet Johnson								
/1983 XVIII	1984	12	24.09610	03 31 22.87	+03 55 08.0			2	801
	Periodic Comet Neujmin 1								
/1984c	1984	12	17.96616	22 46 23.33	+00 17 59.4				801
	Comet Shoemaker (1984f)								
/1984f	1985	01	01.55384	16 02 39.48	-15 35 10.0				675
	Periodic Comet Wolf-Harrington								
/1984g	1984	12	18.39308	10 11 59.65	-11 40 00.9				801
/1984g	1984	12	23.41059	10 14 04.64	-13 16 00.1				801

Periodic Comet Faye

/1984h	1984	12	03.45799	09	20	49.16	+02	51	24.7	657
/1984h	1984	12	18.33559	09	21	49.27	+01	48	35.4	801
/1984h	1984	12	23.35980	09	20	32.36	+01	37	58.5	801

Comet Austin (1984i)

/1984i	1984	10	20.95972	04	32	49.38	+49	25	27.5	984

Periodic Comet Arend-Rigaux

/1984k	1984	11	23.42986	08	07	19.84	-01	42	20.5	3 293
/1984k	1984	12	18.31586	08	46	31.37	+03	31	46.6	801
/1984k	1984	12	23.34004	08	51	50.70	+05	22	36.4	801
/1984k	1985	01	15.31542	09	03	37.72	+16	42	58.3	657

Periodic Comet Schaumasse

/1984m	1984	12	21.42767	13	35	11.81	+02	42	33.9	801
/1984m	1984	12	24.45545	13	45	23.91	+01	56	58.7	801
/1984m	1984	12	30.50660	14	04	59.36	+00	30	42.6	707
/1984m	1985	01	01.26146	14	10	27.17	+00	07	01.4	984

Periodic Comet Tsuchinshan 1

/1984p	1984	12	18.36561	09	38	50.70	+19	13	44.6			801
/1984p	1984	12	23.38733	09	48	37.01	+19	59	02.6			801
/1984p	1984	12	28.65800	09	58	08.68	+20	54	37.7	15	T	330
/1984p	1984	12	29.81389	10	00	06.34	+21	07	48.4	15	T	330
/1984p	1985	01	21.43900	10	28	44.94	+26	25	36.2			657

Periodic Comet Shoemaker 1

/1984q	1984	10	23.11111	22	52	13.25	+20	32	21.6	675
/1984q	1984	10	24.12569	22	51	51.23	+20	37	54.9	675
/1984q	1984	10	25.11285	22	51	32.28	+20	43	10.3	675
/1984q	1984	10	25.91688	22	51	18.25	+20	47	18.0	993
/1984q	1984	10	25.96181	22	51	17.36	+20	47	36.4	984
/1984q	1984	10	26.11736	22	51	15.56	+20	48	27.9	675
/1984q	1984	10	27.11180	22	51	01.61	+20	53	33.1	675
/1984q	1984	11	19.98996	22	57	13.44	+22	43	55.9	801
/1984q	1984	11	21.18958	22	58	04.11	+22	49	34.7	675
/1984q	1984	11	24.11805	23	00	19.47	+23	03	36.1	675
/1984q	1984	12	17.98524	23	27	00.92	+25	16	40.8	801
/1984q	1984	12	20.94681	23	31	11.07	+25	35	46.1	801
/1984q	1984	12	26.97573	23	40	09.17	+26	16	28.8	801

Comet Shoemaker (1984r)

/1984r	1984	12	18.02141	02	13	29.08	+13	10	45.2	801
/1984r	1984	12	27.00385	02	05	32.05	+12	28	46.2	801

Comet Shoemaker (1984s)

/1984s	1984	11	20.15552	02	04	57.05	+06	53	52.0			801
/1984s	1984	11	21.26180	02	05	49.91	+06	13	45.4			675
/1984s	1984	11	24.35347	02	08	38.24	+04	19	22.8			675
/1984s	1984	11	29.92335	02	15	14.59	+00	48	31.9			024
/1984s	1984	12	12.77836	02	39	04.26	-07	06	35.3	9.4	T	046
/1984s	1984	12	12.78553	02	39	05.10	-07	06	50.3			046
/1984s	1984	12	20.75451	03	00	10.80	-11	22	33.9			046
/1984s	1984	12	20.76389	03	00	12.49	-11	22	53.5			046
/1984s	1984	12	21.06539	03	01	05.89	-11	31	39.5			801
/1984s	1984	12	21.76944	03	03	12.78	-11	51	47.7			046
/1984s	1984	12	21.77523	03	03	13.72	-11	51	56.8			046
/1984s	1984	12	23.76383	03	09	22.57	-12	46	31.9			046

/1984s	1984	12	23.76962	03	09	23.62	-12	46	40.4			046
/1984s	1984	12	24.75035	03	12	31.78	-13	12	15.8			046
/1984s	1984	12	24.75625	03	12	32.83	-13	12	24.6			046
/1984s	1984	12	24.94653	03	13	08.69	-13	17	15.5			984
/1984s	1984	12	25.77014	03	15	51.04	-13	37	57.1			046
/1984s	1984	12	25.77604	03	15	52.13	-13	38	05.1			046
/1984s	1984	12	27.05987	03	20	08.93	-14	08	57.2			801
/1984s	1985	01	10.80903	04	15	31.07	-18	00	25.2	10	T 4	567
/1984s	1985	01	10.81527	04	15	32.26	-18	00	28.3			567
/1984s	1985	01	10.82187	04	15	33.77	-18	00	30.8			567
/1984s	1985	01	10.82812	04	15	35.42	-18	00	33.1			567
/1984s	1985	01	19.18341	04	49	39.89	-18	26	59.0			688
/1984s	1985	01	19.19027	04	49	41.60	-18	27	01.0			688
/1984s	1985	01	21.28507	04	58	15.72	-18	22	29.9			657
/1984s	1985	01	23.15366	05	05	54.51	-18	14	53.3			657

Comet Levy-Rudenko (1984t)

/1984t	1984	12	08.69946	18	37	27.83	+22	52	29.4			552
/1984t	1984	12	08.71578	18	37	27.34	+22	53	01.5			552
/1984t	1984	12	08.72689	18	37	26.98	+22	53	23.1			552
/1984t	1984	12	09.71667	18	36	56.23	+23	25	42.4			552
/1984t	1984	12	09.73229	18	36	55.87	+23	26	08.4			552
/1984t	1984	12	09.73715	18	36	55.71	+23	26	21.0			552
/1984t	1984	12	09.74618	18	36	55.45	+23	26	38.8			552
/1984t	1984	12	12.69404	18	35	19.51	+25	03	23.0			046
/1984t	1984	12	12.69722	18	35	19.40	+25	03	28.4			046
/1984t	1984	12	14.79653	18	34	06.20	+26	12	58.4			984
/1984t	1984	12	17.95205	18	32	08.40	+27	59	06.4			801
/1984t	1984	12	20.69722	18	30	17.49	+29	33	12.4			046
/1984t	1984	12	20.70041	18	30	17.36	+29	33	17.4			046
/1984t	1984	12	20.93441	18	30	07.46	+29	41	27.9			801
/1984t	1984	12	21.69907	18	29	34.67	+30	08	04.8			046
/1984t	1984	12	21.70307	18	29	34.60	+30	08	13.3			046
/1984t	1984	12	22.71029	18	28	50.50	+30	43	39.7			565
/1984t	1984	12	22.72330	18	28	49.95	+30	44	07.7			565
/1984t	1984	12	23.69763	18	28	05.82	+31	18	42.6			046
/1984t	1984	12	23.70075	18	28	05.66	+31	18	48.4			046
/1984t	1984	12	23.70885	18	28	05.58	+31	19	08.8			565
/1984t	1984	12	23.72058	18	28	04.96	+31	19	32.6			565
/1984t	1984	12	23.93911	18	27	54.87	+31	27	22.4			801
/1984t	1984	12	24.69965	18	27	19.50	+31	54	40.4			046
/1984t	1984	12	24.70278	18	27	19.40	+31	54	45.9			046
/1984t	1984	12	24.70677	18	27	19.14	+31	55	00.5			565
/1984t	1984	12	25.70312	18	26	31.55	+32	31	08.4	8.6T		046
/1984t	1984	12	25.70625	18	26	31.38	+32	31	14.5			046
/1984t	1985	01	01.70950	18	20	08.51	+37	00	46.9		5	565
/1984t	1985	01	01.72050	18	20	07.70	+37	01	14.1		5	565

Periodic Comet Shoemaker 2

/1984u	1984	12	18.07989	02	52	38.46	+30	39	12.4			801

Comet Hartley (1984v)

/1984v	1984	12	18.15861	04	38	10.00	-16	07	01.6			801
/1984v	1985	01	14.16354	04	15	49.4	-18	51	01	20	T	707

Note 1: position uncertain due to proximity of faint star. 2: inkdot measured. 3: very faint, diffuse, near edge of film. 4: nucleus not well defined. 5: image weak and diffuse.

OBSERVATIONS MADE AT TAUTENBURG BY R. ZIENER AND K.-H. MAU.

Plates taken with the 1.34-m (134/200/400 cm) Schmidt. Reductions by F. Borngen, using the SAO Catalog. Contact: S. Marx, Karl Schwarzschild Observatorium, DDR-6901 Tautenburg, Democratic Republic of Germany.

Object		Date	UT	R. A. (1950)	Decl.	Mag.	Obs.
1984 YU	*	1984 12	22.86979	05 56 47.96	+11 56 09.3	18.5	033
1984 YU		1984 12	22.89132	05 56 46.58	+11 56 06.8		033

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

Plates with the 0.6-m Maksutov reflector. Contact: A. Mrkos, Department of Astronomy and Astrophysics, Charles University, Svedska 8, C-15000 Prague 5, Czechoslovakia.

Object		Date	UT	R. A. (1950)	Decl.	Mag.	Obs.
336		1984 12	24.91424	07 03 48.68	+15 55 07.6		046
336		1984 12	24.92847	07 03 47.80	+15 55 06.6		046
336		1984 12	25.97083	07 02 39.86	+15 54 22.6		046
336		1984 12	25.98507	07 02 38.93	+15 54 21.6		046
586		1984 12	23.85671	05 49 59.83	+21 50 00.4		046
586		1984 12	23.87280	05 49 58.91	+21 50 00.4		046
823		1984 12	23.85671	05 51 54.16	+21 35 08.3		046
823		1984 12	23.87280	05 51 52.97	+21 35 06.3		046
991		1984 12	23.85671	05 46 48.84	+24 37 40.9		046
991		1984 12	23.87280	05 46 48.08	+24 37 38.6		046
1055		1984 12	24.91424	07 03 39.52	+16 20 53.8		046
1055		1984 12	24.92847	07 03 38.76	+16 20 58.0		046
1055		1984 12	25.97083	07 02 27.72	+16 23 45.8		046
1055		1984 12	25.98507	07 02 26.75	+16 23 50.0		046
1331		1984 12	26.00515	07 52 21.74	+20 08 10.0		046
1331		1984 12	26.01979	07 52 21.11	+20 08 13.8		046
1341		1984 12	26.00515	07 56 47.14	+21 25 13.5		046
1341		1984 12	26.01979	07 56 46.50	+21 25 19.1		046
1618		1984 12	26.00515	07 52 34.65	+21 26 50.5		046
1618		1984 12	26.01979	07 52 33.98	+21 26 52.7		046
2258		1984 12	26.00515	07 48 52.48	+21 56 34.2		046
2258		1984 12	26.01979	07 48 51.66	+21 56 32.9		046
2346		1984 12	25.97083	07 08 36.03	+16 34 35.6		046
2346		1984 12	25.98507	07 08 35.29	+16 34 35.8		046
2365		1984 12	26.00515	07 46 53.32	+20 37 41.6		046
2365		1984 12	26.01979	07 46 52.50	+20 37 40.4		046
2442		1984 11	28.93906	04 06 55.34	+14 05 41.8		046
2442		1984 11	28.95324	04 06 54.55	+14 05 32.6		046
1975 SF		1984 12	23.78542	03 56 10.17	+05 07 51.2		046
1975 SF		1984 12	23.79954	03 56 09.60	+05 08 00.0		046
1978 TZ6		1984 12	24.80972	05 41 02.26	+19 44 33.3		046
1978 TZ6		1984 12	24.82396	05 41 01.44	+19 44 37.8		046
1984 UB3		1984 10	28.92291	01 50 22.08	+12 18 55.4		046
1984 UB3		1984 10	28.93749	01 50 21.38	+12 18 52.4		046
1984 UD3		1984 10	30.88542	01 49 52.94	+10 00 22.5		046
1984 UD3		1984 10	30.89977	01 49 52.37	+10 00 13.2		046
1984 UO3	*	1984 10	28.92291	01 52 19.31	+09 58 12.9	16.8	046
1984 UO3		1984 10	28.93749	01 52 18.55	+09 58 15.1		046
1984 UO3		1984 10	29.86581	01 51 23.93	+09 57 04.0		046
1984 UO3		1984 10	29.87934	01 51 23.00	+09 57 06.2		046
1984 UO3		1984 10	30.88542	01 50 23.89	+09 55 50.6		046
1984 UO3		1984 10	30.89977	01 50 22.78	+09 55 47.3		046
1984 WA1		1984 12	12.73519	02 22 20.24	+20 37 45.9		046
1984 WA1		1984 12	12.74948	02 22 19.53	+20 38 02.1		046
1984 WC1		1984 11	28.93906	04 05 47.46	+14 39 02.6		046
1984 WC1		1984 11	28.95324	04 05 46.53	+14 39 02.8		046

1984 WD1		1984 11 28.93906	04 08 40.21	+13 51 20.5			046
1984 WD1		1984 11 28.95324	04 08 39.51	+13 51 24.8			046
1984 YG	*	1984 12 23.81921	05 28 22.12	+32 26 21.5		16.7	046
1984 YG		1984 12 23.83339	05 28 21.36	+32 26 25.6			046
1984 YH	*	1984 12 23.81921	05 29 11.36	+30 53 59.3		16.8	046
1984 YH		1984 12 23.83339	05 29 10.44	+30 54 02.9			046
1984 YJ	*	1984 12 23.81921	05 31 53.02	+31 35 38.8		16.5	046
1984 YJ		1984 12 23.83339	05 31 52.07	+31 35 40.9			046
1984 YK	*	1984 12 23.85671	05 43 11.31	+24 31 02.0		16.6	046
1984 YK		1984 12 23.87280	05 43 10.38	+24 31 04.9			046
1984 YL	*	1984 12 23.85671	05 45 32.09	+23 25 10.9		16.7	046
1984 YL		1984 12 23.87280	05 45 31.16	+23 25 06.1			046
1984 YM	*	1984 12 23.85671	05 47 03.99	+22 52 45.4		17.0	046
1984 YM		1984 12 23.87280	05 47 03.19	+22 52 49.9			046
1984 YN	*	1984 12 23.85671	05 51 54.55	+23 33 46.0		16.6	046
1984 YN		1984 12 23.87280	05 51 53.31	+23 33 48.7			046
1984 YO	*	1984 12 24.80972	05 45 13.23	+20 15 41.3		16.5	046
1984 YO		1984 12 24.82396	05 45 12.38	+20 15 44.8			046
1984 YP	*	1984 12 26.00515	07 49 59.58	+21 04 03.4		17.0	046
1984 YP		1984 12 26.01979	07 49 58.88	+21 04 06.4			046
1984 YQ	*	1984 12 26.00515	07 55 26.18	+23 20 15.5		17.0	046
1984 YQ		1984 12 26.01979	07 55 25.38	+23 20 23.3			046

OBSERVATIONS MADE AT THE BURLINGTON REMOTE SITE BY T. HANDLEY.

Films taken with a 0.20-m f/4 astrograph. Contact: T. Handley, 13 Linden Avenue, Burlington, NJ 08016, U.S.A.

Object	Date	UT	R. A. (1950)	Decl.	Obs.
1983 TB	1984 11 23.32917	05 52 05.22	+39 25 20.4		293
1983 TB	1984 11 23.34306	05 52 02.57	+39 25 30.3		293

OBSERVATIONS MADE AT THE PERTH OBSERVATORY, BICKLEY.

Plates taken with the 0.33-m astrograph by M. P. Candy, D. J. Gans, D. N. Harwood, C. Jekabsons, P. Jekabsons, J. Johnston and A. Verveer. Contact: M. P. Candy, Perth Observatory, Bickley, WA 6076, Australia.

Object	Date	UT	R. A. (1950)	Decl.	Obs.
1977 QB	1977 09 02.59306	17 35 45.69	-34 10 35.3		323
1977 QB	1977 09 07.51667	17 39 54.79	-33 34 36.9		323
1977 QB	1977 09 09.49514	17 41 45.14	-33 20 29.5		323
1977 QB	1977 09 18.53750	17 51 17.39	-32 17 55.4		323
1977 QB	1977 10 17.52014	18 31 51.04	-29 06 57.3		323
1977 QB	1977 11 30.51875	19 50 30.60	-23 27 49.5		323
1978 CA	1978 03 02.63681	10 07 23.31	+08 40 45.1		323
1978 CA	1978 03 03.61736	10 05 41.42	+11 53 13.5		323
1978 CT	*	1978 02 06.63343	09 56 53.66	+13 29 46.2		323
1978 CT		1978 02 07.63806	09 55 55.59	+13 37 40.9		323
1978 CT		1978 02 09.61944	09 53 57.59	+13 53 36.4		323
1978 CT		1978 02 09.68681	09 53 54.30	+13 54 03.5		323
1978 CT		1978 02 15.64862	09 47 49.23	+14 42 02.8		323
1978 CT		1978 03 08.61485	09 27 52.58	+17 11 59.1		323
1978 NE		1978 07 28.72569	20 41 26.69	-23 33 07.0		323
1978 NE		1978 07 28.75000	20 41 25.55	-23 33 21.1		323
1978 NE		1978 07 31.69097	20 39 03.16	-24 12 44.8		323
1978 NE		1978 07 31.70764	20 39 02.28	-24 12 57.7		323
1978 NE		1978 08 06.67500	20 34 13.74	-25 29 14.0		323
1978 NE		1978 08 06.68715	20 34 13.16	-25 29 22.8		323
1978 NE		1978 08 09.59583	20 31 57.88	-26 04 14.4		323
1978 NE		1978 08 09.61250	20 31 57.11	-26 04 26.1		323
1978 NE		1978 08 11.73542	20 30 21.99	-26 28 43.7		323
1978 NE		1978 08 11.75313	20 30 21.06	-26 28 52.8		323

1978	NF		1978	07	28.66667	20	34	22.19	-25	21	24.8	323
1978	NF		1978	07	28.69097	20	34	20.82	-25	21	44.1	323
1978	NF		1978	07	31.76111	20	31	46.05	-25	59	55.3	323
1978	NF		1978	07	31.77778	20	31	45.15	-26	00	09.0	323
1978	NF		1978	08	06.64792	20	26	53.40	-27	09	04.9	323
1978	NF		1978	08	06.66007	20	26	52.83	-27	09	12.4	323
1978	NF		1978	08	09.56667	20	24	34.86	-27	40	51.7	323
1978	NF		1978	08	09.58333	20	24	34.03	-27	41	02.5	323
1978	NF		1978	08	11.64167	20	23	00.17	-28	02	18.5	323
1978	NF		1978	08	11.65833	20	22	59.57	-28	02	27.0	323
1978	OJ	*	1978	07	28.62083	20	30	50.18	-24	41	12.8	323
1978	OJ		1978	07	28.64514	20	30	48.84	-24	41	29.3	323
1978	OJ		1978	07	31.72708	20	28	13.60	-25	14	11.6	323
1978	OJ		1978	07	31.74375	20	28	12.66	-25	14	21.1	323
1978	OJ		1978	08	06.59236	20	23	22.36	-26	13	15.5	323
1978	OJ		1978	08	06.60451	20	23	21.82	-26	13	22.1	323
1978	OJ		1978	08	11.57778	20	19	29.88	-26	59	00.4	323
1978	OJ		1978	08	11.59444	20	19	29.12	-26	59	07.9	323
1978	OK	*	1978	07	28.63125	20	26	39.49	-23	40	00.4	323
1978	OK		1978	07	31.72708	20	23	25.66	-23	59	33.7	323
1978	OK		1978	08	06.61944	20	17	19.56	-24	34	18.5	323
1978	OK		1978	08	06.63160	20	17	18.81	-24	34	21.9	323
1978	OK		1978	08	09.53750	20	14	25.04	-24	49	51.2	323
1978	OK		1978	08	09.54417	20	14	24.12	-24	49	56.7	323
1978	OL	*	1978	07	28.66667	20	29	21.14	-27	10	09.3	323
1978	OL		1978	07	28.69097	20	29	19.28	-27	09	43.5	323
1978	OM	*	1978	07	28.72569	20	36	46.00	-23	27	23.2	323
1978	OM		1978	07	28.75000	20	36	44.36	-23	27	23.2	323
1978	OM		1978	07	31.69097	20	33	32.48	-23	30	25.8	323
1978	OM		1978	07	31.70764	20	33	31.32	-23	30	26.7	323
1978	OM		1978	08	06.72847	20	27	01.19	-23	33	44.9	323
1978	OM		1978	08	06.74063	20	27	00.42	-23	33	43.5	323
1978	OM		1978	08	08.78611	20	24	52.11	-23	33	54.5	323
1978	OM		1978	08	08.80278	20	24	51.06	-23	33	52.9	323
1978	OM		1978	08	09.62639	20	24	00.86	-23	33	50.5	323
1978	OM		1978	08	09.64340	20	23	59.79	-23	33	50.8	323
1978	ON	*	1978	07	28.72569	20	41	00.58	-23	56	34.7	323
1978	ON		1978	07	28.75000	20	40	59.16	-23	56	37.1	323
1978	ON		1978	07	31.69097	20	38	16.07	-24	05	50.6	323
1978	ON		1978	07	31.70764	20	38	15.06	-24	05	53.6	323
1978	ON		1978	08	03.54097	20	35	37.47	-24	14	06.2	323
1978	ON		1978	08	03.55313	20	35	36.76	-24	14	07.9	323
1978	ON		1978	08	11.69653	20	28	15.97	-24	33	32.1	323
1978	ON		1978	08	11.71354	20	28	15.05	-24	33	32.8	323
1978	OO	*	1978	07	28.72569	20	41	48.60	-25	00	55.5	323
1978	OO		1978	07	28.75000	20	41	47.25	-25	01	00.5	323
1978	OO		1978	07	31.69097	20	38	59.72	-25	17	17.2	323
1978	OO		1978	07	31.70764	20	38	58.65	-25	17	22.4	323
1978	OO		1978	08	01.69167	20	38	02.20	-25	22	35.1	323
1978	OO		1978	08	01.71597	20	38	00.59	-25	22	42.8	323
1978	OO		1978	08	03.54097	20	36	15.93	-25	32	03.7	323
1978	OO		1978	08	03.55313	20	36	15.23	-25	32	08.1	323
1978	OO		1978	08	06.67500	20	33	16.15	-25	47	00.9	323
1978	OO		1978	08	06.68715	20	33	15.45	-25	47	04.0	323
1978	OO		1978	08	09.59583	20	30	33.22	-25	59	32.5	323
1978	OO		1978	08	09.61250	20	30	32.36	-25	59	37.1	323
1978	OO		1978	08	11.73542	20	28	37.62	-26	07	47.0	323
1978	OO		1978	08	11.75313	20	28	36.56	-26	07	49.0	323
1978	OP	*	1978	07	28.77431	20	37	23.24	-26	22	03.1	323

1978	OP		1978	07	28.79861	20	37	21.97	-26	22	18.2	323
1978	OP		1978	07	31.76111	20	34	53.19	-26	55	35.4	323
1978	OP		1978	07	31.77778	20	34	52.29	-26	55	47.1	323
1978	OQ	*	1978	07	28.77431	20	42	02.55	-25	29	33.0	323
1978	OQ		1978	07	28.79861	20	42	01.05	-25	29	34.7	323
1978	OQ		1978	08	01.69167	20	38	23.40	-25	33	26.1	323
1978	OQ		1978	08	01.71597	20	38	22.04	-25	33	26.7	323
1978	OQ		1978	08	06.67500	20	33	45.43	-25	35	57.1	323
1978	OQ		1978	08	06.68715	20	33	44.68	-25	35	57.1	323
1978	OQ		1978	08	09.59583	20	31	07.03	-25	36	04.1	323
1978	OQ		1978	08	09.61250	20	31	06.03	-25	36	03.2	323
1978	OQ		1978	08	11.69653	20	29	16.31	-25	35	28.7	323
1978	OQ		1978	08	11.71354	20	29	15.27	-25	35	26.9	323
1978	OQ		1978	08	11.73542	20	29	14.17	-25	35	27.3	323
1978	OQ		1978	08	11.75313	20	29	13.19	-25	35	24.9	323
1978	OR	*	1978	07	31.79722	20	25	53.47	-27	20	29.7	323
1978	OR		1978	07	31.81389	20	25	51.85	-27	20	32.7	323
1978	PA		1978	08	14.75382	00	08	07.17	-41	21	24.8	323
1978	PA		1978	08	21.72760	00	09	03.52	-44	38	00.5	323
1978	PA		1978	08	24.76146	00	08	45.37	-45	58	11.3	323
1978	PA		1978	09	04.71181	00	04	14.47	-50	06	29.6	323
1978	PA		1978	09	05.69792	00	03	35.92	-50	25	02.6	323
1978	PA		1978	09	05.87986	00	03	27.90	-50	28	20.3	323
1978	PA		1978	09	29.64028	23	43	06.22	-54	04	20.8	323
1978	PR4	*	1978	08	01.65278	20	32	51.92	-27	37	42.8	323
1978	PR4		1978	08	06.64792	20	27	23.76	-27	50	42.6	323
1978	PR4		1978	08	06.66007	20	27	23.05	-27	50	43.7	323
1978	PR4		1978	08	07.63611	20	26	20.70	-27	52	45.5	323
1978	PR4		1978	08	07.65556	20	26	19.55	-27	52	47.0	323
1978	PR4		1978	08	09.56667	20	24	20.69	-27	56	17.2	323
1978	PR4		1978	08	09.58333	20	24	19.74	-27	56	18.5	323
1978	PR4		1978	08	11.64167	20	22	15.56	-27	59	17.8	323
1978	PR4		1978	08	11.65833	20	22	14.64	-27	59	19.0	323
1978	PR4		1978	09	05.58958	20	06	21.71	-27	40	27.3	323
1978	PS4	*	1978	08	01.69167	20	41	20.82	-25	29	52.9	323
1978	PS4		1978	08	01.71597	20	41	19.00	-25	29	46.7	323
1978	PS4		1978	08	06.67500	20	35	43.65	-25	10	28.2	323
1978	PS4		1978	08	06.68715	20	35	42.90	-25	10	24.9	323
1978	PS4		1978	08	11.70417	20	30	17.87	-24	47	28.6	323
1978	PT4	*	1978	08	06.61944	20	15	53.73	-24	29	04.1	323
1978	PT4		1978	08	06.63160	20	15	53.09	-24	29	10.7	323
1978	PT4		1978	08	09.53750	20	13	19.91	-24	57	46.6	323
1978	PT4		1978	08	09.55417	20	13	19.02	-24	57	57.1	323
1978	PU4	*	1978	08	06.64792	20	28	48.70	-28	04	34.6	323
1978	PU4		1978	08	06.66007	20	28	47.92	-28	04	32.1	323
1978	PU4		1978	08	07.63611	20	27	43.87	-28	01	21.4	323
1978	PU4		1978	08	07.65556	20	27	42.64	-28	01	16.3	323
1978	PU4		1978	08	09.56667	20	25	40.57	-27	54	23.1	323
1978	PU4		1978	08	09.58333	20	25	39.56	-27	54	19.7	323
1978	PU4		1978	08	11.64167	20	23	30.95	-27	46	13.5	323
1978	PU4		1978	08	11.65833	20	23	29.88	-27	46	09.3	323
1978	PV4	*	1978	08	06.70625	20	40	30.99	-27	08	37.9	323
1978	PV4		1978	08	07.76875	20	39	18.06	-27	02	06.8	323
1978	PV4		1978	08	07.79306	20	39	16.43	-27	01	55.9	323
1978	PW4	*	1978	08	07.76875	20	35	29.28	-27	43	55.7	323
1978	PW4		1978	08	07.79306	20	35	27.91	-27	43	57.5	323
1978	PW4		1978	08	09.65625	20	33	55.22	-27	46	59.7	323
1978	PW4		1978	08	09.67917	20	33	54.12	-27	47	01.3	323
1978	PX4	*	1978	08	07.76875	20	41	45.63	-26	18	23.2	323

1978	PX4		1978	08	07.79306	20	41	44.16	-26	18	28.6	323
1978	PX4		1978	08	09.67014	20	39	44.63	-26	27	44.8	323
1978	PY4	*	1978	08	09.56667	20	22	20.63	-27	47	33.4	323
1978	PY4		1978	08	09.58333	20	22	19.56	-27	47	30.4	323
1978	PZ4	*	1978	08	09.59583	20	31	08.10	-25	10	35.3	323
1978	PZ4		1978	08	09.61250	20	31	07.13	-25	10	34.7	323
1978	PA5	*	1978	08	09.86944	00	21	35.46	-04	45	41.4	323
1978	PA5		1978	08	09.89444	00	21	36.02	-04	45	52.1	323
1978	PA5		1978	08	29.69653	00	23	24.45	-07	06	47.4	323
1978	PA5		1978	08	29.71736	00	23	23.78	-07	06	56.8	323
1978	PB5	*	1978	08	11.69653	20	23	53.01	-25	06	10.8	323
1978	PB5		1978	08	11.71354	20	23	51.34	-25	06	15.2	323
1978	PC5	*	1978	08	11.69653	20	24	34.03	-24	53	09.5	323
1978	PC5		1978	08	11.71354	20	24	32.85	-24	53	08.6	323
1978	PD5	*	1978	08	13.53750	20	10	17.15	-25	11	42.3	323
1978	PD5		1978	08	13.55417	20	10	16.05	-25	12	02.9	323
1978	PE5	*	1978	08	13.69653	20	34	18.36	-27	01	52.5	323
1978	PE5		1978	08	13.71319	20	34	17.84	-27	01	49.6	323
1978	RV16	*	1978	09	01.60000	20	04	49.30	-22	25	32.5	323
1978	RV16		1978	09	01.62083	20	04	49.09	-22	25	26.3	323
1978	VW6		1978	11	27.68888	04	40	13.44	+19	52	01.6	323
1978	VW6		1978	11	28.70764	04	39	13.76	+19	41	44.1	323
1978	WP11		1978	12	03.64722	04	32	09.78	+19	15	58.5	323
1978	WP11		1978	12	03.69653	04	32	06.76	+19	15	54.7	323
1978	WW11		1978	11	27.68888	04	40	40.72	+18	59	07.6	323
1978	WW11		1978	11	28.70764	04	39	33.31	+18	59	36.8	323
1978	WW11		1978	11	29.76319	04	38	23.27	+19	00	05.6	323
1978	WW11		1978	12	03.64722	04	34	04.49	+19	02	03.0	323
1978	WW11		1978	12	03.69653	04	34	01.15	+19	02	03.6	323
1978	WW11		1978	12	04.69653	04	32	54.79	+19	02	34.7	323
1978	WW11		1978	12	06.74878	04	30	39.71	+19	03	43.6	323
1979	CB	*	1979	02	04.78472	11	22	34.46	-05	55	58.6	323
1979	CB		1979	02	05.79514	11	21	33.37	-05	42	47.2	323
1979	HE3		1979	04	26.61319	13	39	14.51	-07	16	49.9	323
1979	HE3		1979	04	27.62847	13	38	20.23	-07	14	05.8	323
1979	HE3		1979	05	01.74792	13	34	48.97	-07	04	10.3	323
1979	HE3		1979	05	02.62986	13	34	06.24	-07	02	16.5	323
1979	HE3		1979	05	17.53472	13	24	44.50	-06	47	30.4	323
1979	HE3		1979	05	18.57083	13	24	18.83	-06	47	47.9	323
1979	HH3		1979	05	01.69722	13	38	11.49	-07	28	03.6	323
1979	HH3		1979	05	02.62986	13	37	18.89	-07	27	09.1	323
1979	HW6	*	1979	04	26.71875	15	24	59.91	-19	11	03.7	323
1979	HW6		1979	04	27.74722	15	24	11.18	-19	07	57.5	323
1979	HW6		1979	05	03.64306	15	19	07.05	-18	48	21.2	323
1979	HW6		1979	05	04.72639	15	18	06.81	-18	44	25.1	323
1979	HW6		1979	05	17.58750	15	05	43.47	-17	52	53.3	323
1979	HW6		1979	05	18.67500	15	04	40.99	-17	48	22.6	323
1979	JJ	*	1979	05	01.74792	13	31	40.65	-06	31	14.2	323
1979	JJ		1979	05	17.53472	13	21	56.51	-05	46	20.3	323
1979	JJ		1979	05	18.57083	13	21	25.91	-05	44	15.2	323
1979	JK	*	1979	05	01.74792	13	36	17.34	-06	41	03.1	323
1979	JK		1979	05	02.62986	13	35	40.75	-06	38	08.4	323
1979	JL	*	1979	05	03.64306	15	17	38.62	-18	47	38.9	323
1979	JL		1979	05	04.72639	15	16	42.44	-18	44	16.5	323
1979	JM	*	1979	05	03.64306	15	18	22.92	-18	11	07.0	323
1979	JM		1979	05	03.72639	15	17	28.79	-18	05	13.8	323
1979	KH1	*	1979	05	17.53472	13	20	50.27	-07	04	49.8	323
1979	KH1		1979	05	18.57083	13	20	21.89	-07	03	01.8	323
1979	KJ1	*	1979	05	17.53472	13	24	23.93	-07	31	31.6	323

1979	KJ1		1979	05	18.57083	13	23	44.36	-07	30	42.1	323
1979	KK1	*	1979	05	17.53472	13	25	44.89	-07	26	18.3	323
1979	KK1		1979	05	18.57083	13	25	09.11	-07	27	26.4	323
1979	KL1	*	1979	05	18.54722	13	11	39.55	-08	12	59.2	323
1979	KL1		1979	05	19.53715	13	11	58.27	-08	16	16.6	323
1979	KM1	*	1979	05	18.54722	13	12	28.81	-06	54	58.3	323
1979	KM1		1979	05	19.53715	13	12	54.03	-06	56	42.1	323
1979	KN1	*	1979	05	17.58750	15	00	58.92	-17	35	58.4	323
1979	KN1		1979	05	18.67500	15	00	01.34	-17	29	54.2	323
1979	KO1	*	1979	05	24.71736	15	35	25.27	-26	24	35.5	323
1979	KO1		1979	05	24.73993	15	35	23.99	-26	24	21.8	323
1979	KO1		1979	05	30.69653	15	30	25.13	-25	32	11.3	323
1979	KO1		1979	06	05.56806	15	26	07.68	-24	38	47.5	323
1979	KO1		1979	06	29.62639	15	19	29.39	-21	25	06.6	323
1979	KO1		1979	07	02.57813	15	20	06.83	-21	07	19.7	323
1979	KO1		1979	07	20.62847	15	30	31.30	-19	54	02.6	323
1979	OT16	*	1979	07	31.61319	20	47	53.25	-13	11	55.7	323
1979	OT16		1979	07	31.63750	20	47	51.92	-13	11	52.9	323
1979	QG10	*	1979	08	21.57014	15	56	29.33	-26	10	12.6	323
1979	QG10		1979	08	22.54097	15	57	29.57	-26	12	33.4	323
1979	SO12	*	1979	09	25.53889	17	37	00.19	-16	26	21.4	323
1979	SO12		1979	09	25.56360	17	36	59.37	-16	26	15.4	323
1979	SP12	*	1979	09	25.53889	17	38	13.63	-16	44	49.5	323
1979	SP12		1979	09	25.56360	17	38	14.24	-16	44	54.4	323
1979	VA		1979	11	18.50417	01	54	10.95	+24	44	16.1	323
1979	YZ9	*	1979	12	20.72153	07	27	55.62	+11	11	33.1	323
1979	YZ9		1979	12	20.74583	07	27	54.70	+11	11	40.1	323
1980	FF12	*	1980	03	20.71319	13	20	15.56	-10	36	17.2	323
1980	FF12		1980	03	20.73750	13	20	14.42	-10	36	12.9	323
1980	FF12		1980	03	21.72500	13	19	28.36	-10	34	12.6	323
1980	FF12		1980	03	21.74931	13	19	27.02	-10	34	06.4	323
1980	FF12		1980	04	10.62292	13	00	19.44	-09	24	51.0	323
1980	FF12		1980	04	10.72778	13	00	12.61	-09	24	24.6	323
1980	FG12	*	1980	03	20.71319	13	24	46.63	-10	38	20.4	323
1980	FG12		1980	03	20.73750	13	24	45.80	-10	38	02.0	323
1980	FG12		1980	03	21.72500	13	24	09.88	-10	25	08.0	323
1980	FG12		1980	03	21.74931	13	24	09.00	-10	24	48.4	323
1980	FG12		1980	03	24.61181	13	22	18.36	-09	45	57.1	323
1980	FG12		1980	04	14.69236	13	05	29.63	-04	17	45.8	323
1980	FH12	*	1980	03	20.75972	13	26	53.52	-21	53	07.2	323
1980	FH12		1980	03	20.78403	13	26	52.43	-21	53	09.3	323
1980	FH12		1980	03	21.68740	13	26	11.57	-21	54	32.6	323
1980	FH12		1980	03	24.64705	13	23	47.32	-21	57	35.3	323
1980	FH12		1980	04	09.69444	13	08	00.83	-21	34	23.0	323
1980	FH12		1980	04	11.68958	13	05	54.17	-21	27	05.1	323
1980	GN1	*	1980	04	15.72361	15	31	03.32	-12	05	18.1	323
1980	GN1		1980	04	15.74792	15	31	02.45	-12	05	13.8	323
1980	LF1	*	1980	06	09.57604	14	35	31.52	-19	50	27.1	323
1980	LF1		1980	06	17.56892	14	33	14.75	-19	27	04.6	323
1980	LG1	*	1980	06	11.48993	13	02	15.87	+06	37	02.4	323
1980	LG1		1980	06	17.50486	13	02	32.54	+05	37	07.9	323
1980	PP2	*	1980	08	12.78611	22	49	49.60	-01	48	07.9	323
1980	PP2		1980	08	13.87639	22	49	16.72	-01	53	55.3	323
1980	PP2		1980	08	14.71181	22	48	51.23	-01	58	35.7	323
1980	PP2		1980	08	15.73819	22	48	17.40	-02	04	33.1	323
1980	PP2		1980	08	18.73958	22	46	31.04	-02	23	28.9	323
1980	PP2		1980	09	08.71111	22	31	37.10	-05	15	03.1	323
1980	PP2		1980	09	09.71042	22	30	57.01	-05	23	42.4	323
1980	PP2		1980	09	10.64653	22	30	20.50	-05	31	47.3	323

1980	PQ2	*	1980	08	14.71181	22	41	24.11	-03 17 38.4	323
1980	PQ2		1980	08	15.73819	22	40	51.49	-03 29 00.8	323
1980	PQ2		1980	08	18.69861	22	39	12.37	-04 02 54.6	323
1980	PQ2		1980	09	08.66180	22	25	44.83	-08 30 12.2	323
1980	PR2	*	1980	08	15.67014	21	24	23.38	-19 15 00.1	323
1980	PR2		1980	08	15.69444	21	24	22.18	-19 15 09.0	323
1980	PS2	*	1980	08	15.67014	21	27	27.61	-18 55 32.5	323
1980	PS2		1980	08	15.69444	21	27	26.45	-18 55 39.5	323
1980	PT2	*	1980	08	15.67014	21	29	55.51	-18 16 02.2	323
1980	PT2		1980	08	15.69444	21	29	54.26	-18 16 09.0	323
1980	RD1		1980	09	08.71111	22	32	09.30	-04 03 23.0	323
1980	RD1		1980	09	09.71042	22	31	20.49	-04 07 21.3	323
1980	RD1		1980	09	10.64653	22	30	35.09	-04 10 56.3	323
1980	RF5	*	1980	09	02.63681	22	27	00.77	-02 49 42.5	323
1980	RF5		1980	09	03.67222	22	24	18.19	-02 56 36.7	323
1980	RG5	*	1980	09	04.57083	21	09	04.27	-22 09 58.6	323
1980	RG5		1980	09	08.57014	21	06	04.84	-21 45 10.0	323
1980	RG5		1980	09	08.60764	21	06	03.31	-21 44 56.2	323
1980	RH5	*	1980	09	08.71111	22	29	15.93	-05 06 44.8	323
1980	RH5		1980	09	09.71042	22	28	32.12	-05 13 37.8	323
1980	RH5		1980	09	10.64653	22	27	51.69	-05 20 05.2	323
1980	RJ5	*	1980	09	12.68680	22	50	23.13	-04 14 13.6	323
1980	RJ5		1980	09	17.68958	22	47	18.15	-04 36 49.4	323
1980	TJ15	*	1980	10	07.65000	22	54	07.21	-19 00 43.0	323
1980	TJ15		1980	10	07.67431	22	54	06.58	-19 00 44.6	323
1980	TJ15		1980	10	09.56458	22	53	19.95	-19 02 03.5	323
1980	TJ15		1980	10	09.58889	22	53	19.32	-19 02 03.8	323
1980	TJ15		1980	10	12.56944	22	52	16.64	-19 02 19.1	323
1980	TJ15		1980	10	12.58611	22	52	16.35	-19 02 19.1	323
1980	TK15	*	1980	10	10.70139	02	34	35.53	+06 34 08.0	323
1980	TK15		1980	10	10.72569	02	34	34.66	+06 34 01.9	323
1980	TK15		1980	10	16.69375	02	30	21.02	+05 59 46.7	323
1980	TK15		1980	10	16.71805	02	30	19.85	+05 59 38.5	323
1980	TL15	*	1980	10	10.70139	02	35	55.96	+07 08 42.5	323
1980	TL15		1980	10	10.72569	02	35	54.76	+07 08 33.4	323
1980	TL15		1980	10	16.69375	02	31	12.43	+06 28 31.7	323
1980	TL15		1980	10	16.71805	02	31	11.29	+06 28 23.2	323
1980	UC1	*	1980	10	16.69375	02	27	46.77	+06 11 03.2	323
1980	UC1		1980	10	16.71805	02	27	45.66	+06 10 52.9	323
1980	XH1		1980	12	11.69792	06	01	56.30	+16 44 57.8	323
1980	XH1		1980	12	11.72222	06	01	54.74	+16 44 46.8	323
1980	XH1		1980	12	14.75069	05	58	49.85	+16 24 02.4	323
1980	XH1		1980	12	15.68958	05	57	52.10	+16 17 46.0	323
1983	RJ		1979	04	26.61319	13	40	47.23	-06 54 36.2	323
1983	RJ		1979	04	27.62847	13	39	40.08	-06 51 44.6	323
1983	RJ		1979	05	01.69722	13	35	16.78	-06 41 07.4	323
1983	RJ		1979	05	01.74792	13	35	13.51	-06 40 59.6	323
1983	RJ		1979	05	02.62986	13	34	18.18	-06 38 51.7	323

OBSERVATIONS MADE AT GEISEI BY T. SEKI.
Plates taken with a 0.40-m reflector. Copied in part from Nihondaira Obs. Circ. Nos. 1494 and 1496. Contact: T. Seki, Kamimachi 2-9-35, Kochi, Japan.

Object	Date	UT	R. A. (1950)	Decl.	Mag.	N	Obs.
3178	1984	12 31.68681	03 56 57.13	+16 08 34.8		1	372
3178	1984	12 31.70208	03 56 56.96	+16 08 30.8		1	372
1933 SJ	1985	01 13.64410	08 57 40.42	+17 52 56.3	18		372
1933 SJ	1985	01 13.65521	08 57 39.66	+17 52 58.1			372
1984 WC	1984	12 22.54722	02 51 11.92	+18 00 39.3	17		372

1984 WC	1984 12 22.56250	02 51 11.96	+18 00 34.1				372
1984 WC	1985 01 14.56910	02 59 12.13	+16 10 29.5			17	372
1984 WC	1985 01 14.57882	02 59 12.48	+16 10 28.0				372

Note 1: measurer T. Urata.

OBSERVATIONS MADE AT HAUTE PROVENCE.

Plates taken with the 0.6-m f/5 OHP-Liege Schmidt. G. Sause assisted with the observing. Contact: F. Dossin, Institut d'Astrophysique, Universite de Liege, Avenue de Cointe 5, B-4200 Cointe Ougree, Belgium.

Object	Date	UT	R. A. (1950)	Decl.	Mag.	Obs.
1981 YH1	1984 10 27.98542	03 12 31.14	-07 33 34.8		15.5	511
1981 YH1	1984 10 28.02083	03 12 28.66	-07 33 35.9			511
1984 UP3 *	1984 10 27.98542	03 05 00.77	-08 48 21.7		15.7	511
1984 UP3	1984 10 28.02083	03 04 58.64	-08 48 18.8			511
1984 UQ3 *	1984 10 27.98542	03 06 29.20	-05 38 51.0		16.2	511
1984 UQ3	1984 10 28.02083	03 06 27.11	-05 38 53.3			511
1984 UR3 *	1984 10 27.98542	03 08 45.11	-07 50 46.2		17.5	511
1984 UR3	1984 10 28.02083	03 08 41.99	-07 50 29.9			511
1984 YV *	1984 12 23.05139	07 42 56.24	+22 24 55.3		14.0	511

OBSERVATIONS MADE AT THE OSSERVATORIO S. VITTORE.

Plates taken by C. Vacchi and G. Sassi; blinked by Vacchi, measured and reduced by Vacchi, V. Goretti and E. Colombini. Contact: E. Colombini, Via S. Vittore 44, I-40136 Bologna, Italy.

Object	Date	UT	R. A. (1950)	Decl.	Mag.	Obs.
2213	1984 11 20.88681	03 29 08.65	+08 15 15.5		15.8	552
2213	1984 11 20.90625	03 29 07.31	+08 15 15.1			552
2213	1984 11 20.92569	03 29 05.97	+08 15 14.7			552
2213	1984 11 20.94514	03 29 04.63	+08 15 14.3			552
2213	1984 11 20.96458	03 29 03.28	+08 15 14.0			552
3120	1984 08 26.85556	20 39 43.58	+01 41 22.2		16.8	552
3120	1984 08 26.87917	20 39 42.73	+01 41 14.4			552
3126	1984 08 26.90278	20 58 09.88	-03 11 17.1		16.3	552
3126	1984 08 26.92292	20 58 09.06	-03 11 24.3			552

OBSERVATIONS MADE AT REINTAL BY F. SEILER.

Films taken with a 0.30-m f/6 reflector, AGK3 or SAO reference stars. Contact: F. Frevert, Dilichstrasse 1, D-633 Wetzlar/Lahn, Federal Republic of Germany.

Object	Date	UT	R. A. (1950)	Decl.	Obs.
896	1984 09 01.93750	00 43 51.03	+18 15 27.8		556
896	1984 09 01.94444	00 43 50.82	+18 15 25.9		556
896	1984 09 01.95139	00 43 50.60	+18 15 25.4		556
896	1984 09 01.96528	00 43 49.99	+18 15 25.8		556
896	1984 09 29.85903	00 20 12.98	+16 02 09.2		556
896	1984 09 29.86597	00 20 12.63	+16 02 05.9		556
896	1984 09 29.87292	00 20 12.27	+16 02 02.2		556
896	1984 10 19.79583	00 03 14.27	+13 05 58.7		556
896	1984 10 19.80278	00 03 14.12	+13 05 53.1		556
896	1984 10 19.80972	00 03 13.71	+13 05 50.4		556
1431	1984 09 29.91458	01 03 34.09	-19 09 01.0		556
1431	1984 09 29.92847	01 03 33.34	-19 09 07.1		556
1431	1984 09 29.93542	01 03 32.98	-19 09 11.1		556
1431	1984 09 29.94236	01 03 32.66	-19 09 16.0		556
2621	1984 10 31.91111	04 09 02.53	+07 06 34.6		556
2621	1984 10 31.91806	04 09 02.31	+07 06 36.1		556
2621	1984 10 31.92500	04 09 01.95	+07 06 34.0		556
2621	1984 10 31.93194	04 09 01.66	+07 06 35.1		556
2621	1984 11 18.81389	03 54 03.31	+07 09 37.6		556

2621	1984 11 18.82083	03 54 02.92	+07 09 37.8			556
2621	1984 11 18.82778	03 54 02.43	+07 09 36.6			556
2621	1984 11 18.83472	03 54 02.26	+07 09 38.5			556
2649	1984 09 29.83125	23 05 12.16	+14 43 57.1			556
2649	1984 09 29.84514	23 05 11.49	+14 43 47.8			556
2649	1984 09 29.85208	23 05 11.30	+14 43 42.8			556

OBSERVATIONS MADE AT SEEWALCHEN BY M. BRESSLER.
Films taken with a 0.25-m f/6 reflector, AGK3 or SAO reference stars.
Contact: F. Frevert, Dilichstrasse 1, D-633 Wetzlar/Lahn, Federal Republic of Germany.

Object	Date	UT	R. A. (1950)	Decl.	Obs.
366	1984 09	04.89861	23 23 47.31	-03 37 52.4	563
366	1984 09	04.91181	23 23 46.60	-03 37 53.5	563
366	1984 09	04.92569	23 23 45.89	-03 37 55.4	563
366	1984 09	04.93819	23 23 45.14	-03 37 56.8	563
366	1984 09	04.95000	23 23 44.52	-03 37 57.7	563
366	1984 09	04.95556	23 23 44.43	-03 37 57.4	563
366	1984 09	04.96736	23 23 43.85	-03 37 59.5	563
366	1984 09	04.98125	23 23 42.96	-03 38 00.3	563
366	1984 09	04.99514	23 23 42.50	-03 38 02.1	563
366	1984 09	05.00903	23 23 41.70	-03 38 03.6	563
366	1984 09	05.02292	23 23 40.92	-03 38 05.5	563
366	1984 09	05.03681	23 23 40.33	-03 38 07.6	563
537	1984 05	26.89861	14 02 58.68	+02 30 46.3	563
537	1984 05	26.90556	14 02 58.52	+02 30 46.6	563
537	1984 05	26.91250	14 02 58.28	+02 30 45.9	563
537	1984 05	26.91944	14 02 58.06	+02 30 44.4	563
537	1984 05	26.92639	14 02 57.83	+02 30 45.1	563
537	1984 05	26.93333	14 02 57.54	+02 30 44.1	563
537	1984 05	26.94028	14 02 57.41	+02 30 44.2	563
894	1984 06	01.92222	16 24 04.46	-05 01 26.3	563
894	1984 06	01.93611	16 24 03.77	-05 01 25.2	563
894	1984 06	01.95000	16 24 03.12	-05 01 20.4	563
894	1984 06	01.96389	16 24 02.49	-05 01 18.2	563
894	1984 06	01.97778	16 24 01.79	-05 01 15.4	563
894	1984 06	01.99167	16 24 01.25	-05 01 11.9	563
896	1984 09	02.03194	00 43 47.43	+18 15 22.1	563
896	1984 09	02.04514	00 43 47.01	+18 15 20.5	563
896	1984 09	02.06250	00 43 46.39	+18 15 19.5	563
896	1984 09	02.07986	00 43 45.81	+18 15 18.0	563
896	1984 09	02.09722	00 43 45.08	+18 15 15.8	563
896	1984 09	02.11458	00 43 44.45	+18 15 15.6	563
896	1984 09	29.82639	00 20 14.95	+16 02 25.5	563
896	1984 09	29.84375	00 20 13.95	+16 02 17.0	563
896	1984 09	29.86111	00 20 12.84	+16 02 08.9	563
896	1984 09	29.87847	00 20 11.86	+16 02 01.2	563
896	1984 09	29.89583	00 20 10.97	+16 01 52.5	563
2277	1984 05	02.94097	14 57 38.44	+01 46 44.1	563
2277	1984 05	02.95833	14 57 37.55	+01 46 45.4	563
2277	1984 05	02.97569	14 57 36.49	+01 46 48.3	563
2277	1984 05	02.99306	14 57 35.63	+01 46 49.3	563
2277	1984 05	03.01042	14 57 34.57	+01 46 51.3	563
2277	1984 05	03.02778	14 57 33.64	+01 46 53.1	563
2957	1984 10	18.78611	23 01 01.12	+06 19 09.4	563
2957	1984 10	18.80069	23 01 00.88	+06 19 03.6	563
2957	1984 10	18.84722	23 01 00.17	+06 18 47.9	563
2957	1984 10	18.86319	23 00 59.84	+06 18 43.5	563
2957	1984 10	18.88194	23 00 59.58	+06 18 35.8	563

1982 FK	1984 10 24.81111	00 49 08.13	+07 46 28.2			563
1982 FK	1984 10 24.82500	00 49 07.58	+07 46 27.2			563
1982 FK	1984 10 24.83889	00 49 06.84	+07 46 26.7			563
1982 FK	1984 10 24.85278	00 49 06.24	+07 46 25.5			563
1982 FK	1984 10 24.86667	00 49 05.55	+07 46 24.6			563
1982 FK	1984 10 24.89444	00 49 04.24	+07 46 21.3			563
1982 FK	1984 10 28.79167	00 46 13.50	+07 42 00.9			563
1982 FK	1984 10 28.80556	00 46 13.06	+07 42 01.1			563
1982 FK	1984 10 28.81806	00 46 12.49	+07 41 58.2			563
1982 FK	1984 10 28.87361	00 46 10.10	+07 41 55.2			563
1982 FK	1984 10 28.90139	00 46 09.00	+07 41 54.7			563

OBSERVATIONS MADE AT BASSANO BRESCIANO BY U. QUADRI AND V. MARINELLO.

Plates taken with a 0.15-m astrometric reflector, measured with a one-axis machine, reduced using a modified dependence method and SAO reference-star positions. Contact: U. Quadri, Osservatorio Astronomico Brixia, Via S. Michele 4, I-25020 Bassano Bresciano, Brescia, Italy.

Object	Date	UT	R. A. (1950)	Decl.		Obs.
61	1984 10 30.81762	23 49 13.48	+20 33 23.6			565
61	1984 10 30.84922	23 49 12.53	+20 33 19.2			565
103	1984 12 21.81319	03 27 34.28	+11 11 20.8			565
103	1984 12 21.84346	03 27 33.34	+11 11 23.5			565
200	1984 12 23.83613	03 49 42.48	+30 44 36.2			565
200	1984 12 23.87135	03 49 41.33	+30 44 24.1			565
389	1984 09 22.79747	21 39 46.28	-03 26 19.8			565
389	1984 09 22.84550	21 39 44.84	-03 26 29.3			565
498	1984 12 22.81799	03 22 53.98	+10 47 33.3			565
498	1984 12 22.85301	03 22 53.12	+10 47 43.4			565
686	1984 08 18.83397	20 52 43.83	+15 33 25.2			565
686	1984 08 18.87014	20 52 42.22	+15 33 19.9			565

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

Films (Kodak 2415 emulsion) taken with a 0.25-m f/2 Schmidt (Celestron 10). Measurements on single-coordinate engine. Generally 6-8 reference stars from SAO Catalog, least-squares plate-constants solution (Tatum 1982, J. Roy. Astron. Soc. Canada 76, 97). Contact: J. B. Tatum, Dept of Physics, University of Victoria, P.O. Box 1700, Victoria, BC, V8W 2Y2, Canada.

Object	Date	UT	R. A. (1950)	Decl.		Obs.
1983 TB	1984 12 05.51951	04 38 00.22	+39 55 02.9			657
1983 TB	1984 12 19.15948	01 47 57.56	+26 34 19.9			657

OBSERVATIONS MADE WITH THE 1.2-M SCHMIDT AT PALOMAR BY J. GIBSON.

Coordination with J. G. Williams and with the Minor Planet Center. AGK3 and SAO reference stars. Contact: J. Gibson, Jet Propulsion Laboratory, MS 264-781, Pasadena, CA 91109, U.S.A.

Object		Date	UT	R. A. (1950)	Decl.	Mag.	Obs.
1983 SA		1984 10 05.45491	06 52 36.51	+55 09 45.7			675
1983 SA		1984 12 02.43196	06 23 40.87	+60 57 43.4			675
1984 YC		1984 12 31.51182	08 35 19.27	+10 03 00.6			675
1984 YC		1985 01 02.41530	08 33 01.67	+09 24 55.3			675
1984 YC		1985 01 12.26842	08 19 32.61	+06 09 38.0			675
1984 YR	*	1984 12 31.28266	05 35 52.82	+22 52 10.5		16.5	675
1984 YS	*	1984 12 31.28266	05 36 29.96	+23 03 20.3		16.5	675
1984 YT	*	1984 12 31.28266	05 41 15.25	+22 58 43.0		17.5	675

OBSERVATIONS MADE WITH THE 1.2-M SCHMIDT AT PALOMAR BY E. HELIN AND R. S. DUNBAR.

Contact: E. Helin, Jet Propulsion Laboratory, MS 183-501, 4800 Oak Grove Drive, Pasadena, CA 91109, U.S.A.

Object	Date	UT	R. A. (1950)	Decl.	Mag.	N	Obs.
1984 YA	1985 01	15.19375	04 11 36.24	+23 28 01.0	16	1	675
1984 YA	1985 01	15.22153	04 11 35.84	+23 28 22.8		1	675
1984 YA	1985 01	16.14167	04 11 22.72	+23 41 25.9		1	675
1984 YA	1985 01	16.15556	04 11 22.56	+23 41 35.7		1	675

Note 1: measured by D. Steele.

OBSERVATIONS MADE WITH THE 1.2-M SCHMIDT AT PALOMAR BY E. HELIN, E. SHOEMAKER, S. J. BUS AND R. WEEKS.

Contact: E. Helin, Jet Propulsion Laboratory, MS 183-501, 4800 Oak Grove Drive, Pasadena, CA 91109, U.S.A.

Object		Date	UT	R. A. (1950)	Decl.	Mag.	Obs.
203		1978 07	10.3431	20 45 36.3	-21 46 26	15	675
203		1978 07	11.4247	20 44 47.5	-21 49 16		675
203		1978 07	13.3825	20 43 15.3	-21 54 33		675
623		1978 07	10.3431	20 39 34.3	-22 00 53	15	675
623		1978 07	11.4247	20 38 31.0	-21 59 39		675
623		1978 07	13.3825	20 36 32.8	-21 57 21		675
828		1978 07	10.3431	20 54 13.1	-18 57 03	15	675
828		1978 07	11.4247	20 53 32.2	-18 59 45		675
828		1978 07	13.3825	20 52 15.2	-19 04 50		675
1430		1978 07	10.3431	20 35 15.1	-21 59 14	15	675
1430		1978 07	11.4247	20 34 27.3	-22 00 36		675
1717		1978 07	10.3431	21 00 01.6	-23 46 43	15	675
1717		1978 07	11.4247	20 59 03.4	-23 49 47		675
1717		1978 07	13.3825	20 57 14.5	-23 55 30		675
2930		1978 07	10.3431	20 55 41.6	-22 45 26	16	675
2930		1978 07	11.4247	20 54 54.6	-22 48 39		675
2930		1978 07	13.3825	20 53 26.5	-22 54 31		675
2950		1978 07	10.3431	20 38 39.9	-20 31 34	17	675
2950		1978 07	11.4247	20 37 52.9	-20 38 28		675
2950		1978 07	13.3825	20 36 25.8	-20 51 18		675
3067		1978 07	10.3431	20 57 00.6	-23 06 49	17	675
3067		1978 07	11.4247	20 56 05.5	-23 10 11		675
3067		1978 07	13.3825	20 54 20.8	-23 16 55		675
1978 NG4	*	1978 07	10.3431	20 33 52.1	-24 29 01	17	675
1978 NG4		1978 07	11.4247	20 33 12.9	-24 26 45		675
1978 NH4	*	1978 07	10.3431	20 34 24.1	-20 45 13	18	675
1978 NH4		1978 07	11.4247	20 33 18.9	-20 42 38		675
1978 NJ4	*	1978 07	10.3431	20 34 40.1	-23 47 56	18	675
1978 NJ4		1978 07	11.4247	20 33 41.1	-23 47 25		675
1978 NK4	*	1978 07	10.3431	20 35 04.9	-19 49 01	19	675
1978 NK4		1978 07	11.4247	20 34 07.9	-19 44 24		675
1978 NL4	*	1978 07	10.3431	20 35 59.4	-24 50 28	19	675
1978 NL4		1978 07	11.4247	20 35 16.8	-25 00 11		675
1978 NM4	*	1978 07	10.3431	20 36 02.8	-20 26 49	18	675
1978 NM4		1978 07	11.4247	20 35 20.1	-20 26 18		675
1978 NM4		1978 07	13.3825	20 34 01.2	-20 25 39		675
1978 NN4	*	1978 07	10.3431	20 36 13.0	-23 44 37	17	675
1978 NN4		1978 07	11.4247	20 35 29.8	-23 54 58		675
1978 NN4		1978 07	13.3825	20 34 09.6	-24 13 25		675
1978 NO4	*	1978 07	10.3431	20 36 42.2	-21 19 31	17	675
1978 NO4		1978 07	11.4247	20 35 51.6	-21 20 45		675
1978 NO4		1978 07	13.3825	20 34 16.8	-21 22 41		675
1978 NP4	*	1978 07	10.3431	20 38 03.3	-20 17 43	19	675
1978 NP4		1978 07	11.4247	20 37 10.7	-20 16 34		675
1978 NP4		1978 07	13.3825	20 35 32.0	-20 14 35		675
1978 NQ4	*	1978 07	10.3431	20 38 24.3	-21 53 39	17	675
1978 NQ4		1978 07	11.4247	20 37 22.8	-21 50 24		675

1978	NQ4		1978	07	13.3825	20	35	28.0	-21	44	58		675
1978	NR4	*	1978	07	10.3431	20	38	46.6	-19	05	34	19	675
1978	NR4		1978	07	11.4247	20	38	04.2	-19	16	08		675
1978	NR4		1978	07	13.3825	20	36	44.9	-19	35	12		675
1978	NS4	*	1978	07	10.3431	20	39	11.2	-21	43	56	17	675
1978	NS4		1978	07	11.4247	20	38	26.7	-21	48	33		675
1978	NS4		1978	07	13.3825	20	37	01.4	-21	57	09		675
1978	NT4	*	1978	07	10.3431	20	39	39.5	-18	59	39	19	675
1978	NT4		1978	07	11.4247	20	38	48.3	-19	06	41		675
1978	NT4		1978	07	13.3825	20	37	13.1	-19	19	39		675
1978	NU4	*	1978	07	10.3431	20	40	04.3	-19	48	43	19	675
1978	NU4		1978	07	11.4247	20	39	03.7	-19	49	24		675
1978	NU4		1978	07	13.3825	20	37	12.8	-19	50	52		675
1978	NV4	*	1978	07	10.3431	20	39	56.4	-22	38	26	16	675
1978	NV4		1978	07	11.4247	20	39	08.9	-22	41	28		675
1978	NV4		1978	07	13.3825	20	37	42.8	-22	46	54		675
1978	NW4	*	1978	07	10.3431	20	40	32.7	-22	46	48	18	675
1978	NW4		1978	07	11.4247	20	39	33.8	-22	50	37		675
1978	NW4		1978	07	13.3825	20	37	40.8	-22	57	30		675
1978	NX4	*	1978	07	10.3431	20	40	26.8	-21	15	28	16	675
1978	NX4		1978	07	11.4247	20	39	37.9	-21	18	37		675
1978	NX4		1978	07	13.3825	20	38	08.1	-21	24	31		675
1978	NY4	*	1978	07	10.3431	20	40	52.2	-20	57	10	18	675
1978	NY4		1978	07	11.4247	20	40	13.4	-21	02	25		675
1978	NY4		1978	07	13.3825	20	39	01.7	-21	12	18		675
1978	NZ4	*	1978	07	10.3431	20	41	13.6	-23	20	31	17	675
1978	NZ4		1978	07	11.4247	20	40	19.7	-23	25	14		675
1978	NZ4		1978	07	13.3825	20	38	37.1	-23	33	36		675
1978	NA5	*	1978	07	10.3431	20	41	52.9	-21	25	23	19	675
1978	NA5		1978	07	11.4247	20	40	53.7	-21	27	31		675
1978	NA5		1978	07	13.3825	20	39	03.0	-21	31	19		675
1978	NB5	*	1978	07	10.3431	20	41	40.2	-24	22	57	19	675
1978	NB5		1978	07	11.4247	20	40	54.2	-24	23	18		675
1978	NC5	*	1978	07	10.3431	20	41	55.5	-22	32	59	17	675
1978	NC5		1978	07	11.4247	20	40	57.9	-22	39	10		675
1978	NC5		1978	07	13.3825	20	39	12.0	-22	50	28		675
1978	ND5	*	1978	07	10.3431	20	41	52.7	-20	12	58	17	675
1978	ND5		1978	07	11.4247	20	41	09.6	-20	16	03		675
1978	ND5		1978	07	13.3825	20	39	47.5	-20	21	19		675
1978	NE5	*	1978	07	10.3431	20	41	58.2	-22	21	22	18	675
1978	NE5		1978	07	11.4247	20	41	11.6	-22	26	01		675
1978	NE5		1978	07	13.3825	20	39	45.0	-22	34	16		675
1978	NF5	*	1978	07	10.3431	20	42	11.9	-20	28	26	19	675
1978	NF5		1978	07	11.4247	20	41	29.8	-20	38	03		675
1978	NG5	*	1978	07	10.3431	20	42	18.4	-19	55	47	19	675
1978	NG5		1978	07	11.4247	20	41	39.5	-20	06	51		675
1978	NG5		1978	07	13.3825	20	40	24.3	-20	27	02		675
1978	NH5	*	1978	07	10.3431	20	43	18.1	-20	55	44	19	675
1978	NH5		1978	07	11.4247	20	42	27.4	-20	57	48		675
1978	NH5		1978	07	13.3825	20	40	51.8	-21	01	55		675
1978	NJ5	*	1978	07	10.3431	20	43	30.6	-24	41	47	17	675
1978	NJ5		1978	07	11.4247	20	42	33.6	-24	46	44		675
1978	NJ5		1978	07	13.3825	20	40	45.5	-24	55	52		675
1978	NK5	*	1978	07	10.3431	20	43	35.3	-21	45	27	18	675
1978	NK5		1978	07	11.4247	20	42	48.0	-21	46	46		675
1978	NK5		1978	07	13.3825	20	41	15.9	-21	49	13		675
1978	NL5	*	1978	07	10.3431	20	43	42.1	-24	00	12	17	675
1978	NL5		1978	07	11.4247	20	42	53.7	-24	09	11		675
1978	NL5		1978	07	13.3825	20	41	25.6	-24	25	18		675

1978	NM5	*	1978	07	10.3431	20	43	48.3	-19	20	38	18 675
1978	NM5		1978	07	11.4247	20	43	03.1	-19	23	39	675
1978	NM5		1978	07	13.3825	20	41	39.1	-19	28	57	675
1978	NN5	*	1978	07	10.3431	20	44	08.8	-21	18	30	19 675
1978	NN5		1978	07	11.4247	20	43	18.8	-21	25	15	675
1978	NN5		1978	07	13.3825	20	41	43.8	-21	37	33	675
1978	NO5	*	1978	07	10.3431	20	44	49.2	-21	16	04	18 675
1978	NO5		1978	07	11.4247	20	43	55.7	-21	21	05	675
1978	NO5		1978	07	13.3825	20	42	15.2	-21	30	14	675
1978	NP5	*	1978	07	10.3431	20	44	53.2	-22	13	30	18 675
1978	NP5		1978	07	11.4247	20	44	05.4	-22	15	04	675
1978	NP5		1978	07	13.3825	20	42	36.0	-22	17	58	675
1978	NQ5	*	1978	07	10.3431	20	45	02.0	-24	20	36	17 675
1978	NQ5		1978	07	11.4247	20	44	10.5	-24	20	46	675
1978	NQ5		1978	07	13.3825	20	42	35.3	-24	21	27	675
1978	NR5	*	1978	07	10.3431	20	44	54.7	-24	16	54	18 675
1978	NR5		1978	07	11.4247	20	44	13.4	-24	21	40	675
1978	NR5		1978	07	13.3825	20	42	55.3	-24	30	21	675
1978	NS5	*	1978	07	10.3431	20	45	07.8	-21	24	49	19 675
1978	NS5		1978	07	11.4247	20	44	20.9	-21	28	03	675
1978	NS5		1978	07	13.3825	20	42	50.7	-21	33	07	675
1978	NT5	*	1978	07	10.3431	20	45	30.3	-20	40	08	19 675
1978	NT5		1978	07	11.4247	20	44	43.0	-20	52	18	675
1978	NT5		1978	07	13.3825	20	43	14.6	-21	14	16	675
1978	NU5	*	1978	07	10.3431	20	45	36.4	-20	22	01	16 675
1978	NU5		1978	07	11.4247	20	44	52.5	-20	29	02	675
1978	NV5	*	1978	07	10.3431	20	45	41.7	-19	17	01	19 675
1978	NV5		1978	07	11.4247	20	44	54.8	-19	21	53	675
1978	NV5		1978	07	13.3825	20	43	27.8	-19	30	46	675
1978	NW5	*	1978	07	10.3431	20	45	55.2	-23	50	33	17 675
1978	NW5		1978	07	11.4247	20	45	00.5	-23	57	03	675
1978	NW5		1978	07	13.3825	20	43	16.9	-24	08	41	675
1978	NX5	*	1978	07	10.3431	20	45	55.1	-22	12	18	19 675
1978	NX5		1978	07	11.4247	20	45	09.2	-22	15	11	675
1978	NY5	*	1978	07	10.3431	20	45	56.9	-19	29	20	18 675
1978	NY5		1978	07	11.4247	20	45	10.7	-19	34	20	675
1978	NY5		1978	07	13.3825	20	43	40.8	-19	43	47	675
1978	NZ5	*	1978	07	10.3431	20	46	31.9	-21	38	50	17 675
1978	NZ5		1978	07	11.4247	20	45	51.3	-21	46	15	675
1978	NZ5		1978	07	13.3825	20	44	36.1	-21	59	43	675
1978	NA6	*	1978	07	10.3431	20	46	31.0	-24	15	42	18 675
1978	NA6		1978	07	11.4247	20	45	55.3	-24	19	03	675
1978	NA6		1978	07	13.3825	20	44	57.4	-24	29	14	675
1978	NB6	*	1978	07	10.3431	20	47	22.3	-23	13	59	19 675
1978	NB6		1978	07	11.4247	20	46	24.6	-23	20	10	675
1978	NB6		1978	07	13.3825	20	44	36.1	-23	31	01	675
1978	NC6	*	1978	07	10.3431	20	47	39.8	-20	07	48	19 675
1978	NC6		1978	07	11.4247	20	46	58.0	-20	13	40	675
1978	NC6		1978	07	13.3825	20	45	35.7	-20	24	48	675
1978	ND6	*	1978	07	10.3431	20	47	59.8	-19	00	06	16 675
1978	ND6		1978	07	11.4247	20	47	07.4	-18	58	42	675
1978	ND6		1978	07	13.3825	20	45	28.7	-18	46	17	675
1978	NE6	*	1978	07	10.3431	20	48	06.5	-22	30	35	17 675
1978	NE6		1978	07	11.4247	20	47	08.0	-22	33	54	675
1978	NE6		1978	07	13.3825	20	45	22.1	-22	40	04	675
1978	NF6	*	1978	07	10.3431	20	47	59.6	-23	31	57	18 675
1978	NF6		1978	07	11.4247	20	47	10.1	-23	40	55	675
1978	NF6		1978	07	13.3825	20	45	38.3	-23	46	58	675
1978	NG6	*	1978	07	10.3431	20	47	58.5	-22	00	17	18 675

1978	NG6		1978	07	11.4247	20	47	12.1	-22	04	09		675
1978	NG6		1978	07	13.3825	20	45	46.7	-22	11	01		675
1978	NH6	*	1978	07	10.3431	20	48	10.1	-22	59	59	19	675
1978	NH6		1978	07	11.4247	20	47	25.3	-23	03	00		675
1978	NH6		1978	07	13.3825	20	46	00.1	-23	08	25		675
1978	NJ6	*	1978	07	10.3431	20	48	15.2	-19	18	00	19	675
1978	NJ6		1978	07	11.4247	20	47	38.2	-19	22	28		675
1978	NK6	*	1978	07	10.3431	20	49	24.4	-24	31	01	19	675
1978	NK6		1978	07	11.4247	20	48	35.3	-24	38	31		675
1978	NK6		1978	07	13.3825	20	47	04.0	-24	52	12		675
1978	NL6	*	1978	07	10.3431	20	50	08.6	-19	47	30	19	675
1978	NL6		1978	07	11.4247	20	49	22.5	-19	50	16		675
1978	NL6		1978	07	13.3825	20	47	53.9	-19	55	16		675
1978	NM6	*	1978	07	10.3431	20	50	09.9	-22	11	19	19	675
1978	NM6		1978	07	11.4247	20	49	24.1	-22	19	46		675
1978	NM6		1978	07	13.3825	20	48	00.5	-22	35	10		675
1978	NN6	*	1978	07	10.3431	20	50	21.8	-21	27	23	19	675
1978	NN6		1978	07	11.4247	20	49	37.0	-21	34	47		675
1978	NN6		1978	07	13.3825	20	48	12.4	-21	48	30		675
1978	NO6	*	1978	07	10.3431	20	50	38.7	-25	02	45	17	675
1978	NO6		1978	07	11.4247	20	49	43.8	-25	00	13		675
1978	NO6		1978	07	13.3825	20	48	01.6	-24	56	08		675
1978	NP6	*	1978	07	10.3431	20	50	52.4	-24	54	54	18	675
1978	NP6		1978	07	11.4247	20	50	05.9	-25	05	42		675
1978	NQ6	*	1978	07	10.3431	20	50	52.6	-21	28	47	18	675
1978	NQ6		1978	07	11.4247	20	50	07.9	-21	32	32		675
1978	NQ6		1978	07	13.3825	20	48	46.3	-21	39	00		675
1978	NR6	*	1978	07	10.3431	20	51	09.6	-21	57	05	18	675
1978	NR6		1978	07	11.4247	20	50	21.7	-21	56	48		675
1978	NR6		1978	07	13.3825	20	48	50.3	-21	56	40		675
1978	NS6	*	1978	07	10.3431	20	51	27.5	-19	54	43	18	675
1978	NS6		1978	07	11.4247	20	50	40.5	-19	56	18		675
1978	NS6		1978	07	13.3825	20	49	13.3	-19	59	12		675
1978	NT6	*	1978	07	10.3431	20	52	06.7	-23	18	34	18	675
1978	NT6		1978	07	11.4247	20	51	31.3	-23	24	10		675
1978	NT6		1978	07	13.3825	20	50	22.3	-23	34	35		675
1978	NU6	*	1978	07	10.3431	20	52	49.4	-24	44	35	19	675
1978	NU6		1978	07	11.4247	20	52	06.5	-24	53	07		675
1978	NU6		1978	07	13.3825	20	50	42.9	-25	08	26		675
1978	NV6	*	1978	07	10.3431	20	53	34.5	-19	27	28	17	675
1978	NV6		1978	07	11.4247	20	52	51.0	-19	31	08		675
1978	NV6		1978	07	13.3825	20	51	27.2	-19	38	13		675
1978	NW6	*	1978	07	10.3431	20	54	08.4	-20	20	48	19	675
1978	NW6		1978	07	11.4247	20	53	19.7	-20	28	16		675
1978	NW6		1978	07	13.3825	20	51	46.0	-20	42	03		675
1978	NX6	*	1978	07	10.3431	20	54	53.1	-23	52	22	18	675
1978	NX6		1978	07	11.4247	20	54	03.3	-23	56	18		675
1978	NX6		1978	07	13.3825	20	52	29.3	-24	03	39		675
1978	NY6	*	1978	07	10.3431	20	55	24.1	-20	16	38	19	675
1978	NY6		1978	07	11.4247	20	54	38.8	-20	22	33		675
1978	NZ6	*	1978	07	10.3431	20	55	24.2	-20	08	29	18	675
1978	NZ6		1978	07	11.4247	20	54	44.0	-20	12	08		675
1978	NZ6		1978	07	13.3825	20	53	28.6	-20	18	26		675
1978	NA7	*	1978	07	10.3431	20	56	01.3	-24	14	28	18	675
1978	NA7		1978	07	11.4247	20	55	09.0	-24	21	27		675
1978	NA7		1978	07	13.3825	20	53	30.6	-24	34	00		675
1978	NB7	*	1978	07	10.3431	20	56	16.2	-21	14	10	17	675
1978	NB7		1978	07	11.4247	20	55	38.1	-21	24	50		675
1978	NB7		1978	07	13.3825	20	54	25.1	-21	44	20		675

1978	NC7	*	1978	07	10.3431	20	56	31.0	-24	34	48	18	675
1978	NC7		1978	07	11.4247	20	55	44.3	-24	39	08		675
1978	NC7		1978	07	13.3825	20	54	17.6	-24	46	53		675
1978	ND7	*	1978	07	10.3431	20	56	48.8	-21	01	05	18	675
1978	ND7		1978	07	11.4247	20	55	59.8	-21	04	13		675
1978	ND7		1978	07	13.3825	20	54	27.3	-21	09	46		675
1978	NE7	*	1978	07	10.3431	20	57	03.3	-24	07	30	19	675
1978	NE7		1978	07	11.4247	20	56	15.0	-24	08	06		675
1978	NE7		1978	07	13.3825	20	54	41.9	-24	08	48		675
1978	NF7	*	1978	07	10.3431	20	57	15.2	-19	28	43	17	675
1978	NF7		1978	07	11.4247	20	56	38.3	-19	32	16		675
1978	NF7		1978	07	13.3825	20	55	28.1	-19	39	02		675
1978	NG7	*	1978	07	10.3431	20	57	44.0	-19	48	36	17	675
1978	NG7		1978	07	11.4247	20	56	52.7	-19	55	24		675
1978	NG7		1978	07	13.3825	20	55	18.0	-20	08	15		675
1978	NH7	*	1978	07	10.3431	20	58	18.8	-20	28	21	18	675
1978	NH7		1978	07	11.4247	20	57	31.5	-20	31	46		675
1978	NH7		1978	07	13.3825	20	56	01.1	-20	38	00		675
1978	NJ7	*	1978	07	10.3431	20	58	21.5	-19	18	26	18	675
1978	NJ7		1978	07	11.4247	20	57	34.5	-19	24	03		675
1978	NJ7		1978	07	13.3825	20	56	06.5	-19	34	55		675
1978	NK7	*	1978	07	10.3431	20	58	39.3	-21	02	11	16	675
1978	NK7		1978	07	11.4247	20	57	48.0	-21	00	40		675
1978	NK7		1978	07	13.3825	20	56	12.1	-20	57	53		675
1978	NL7	*	1978	07	10.3431	20	58	45.6	-24	57	40	19	675
1978	NL7		1978	07	11.4247	20	58	01.3	-25	02	01		675
1978	NL7		1978	07	13.3825	20	56	37.5	-25	10	02		675
1978	NM7	*	1978	07	10.3431	20	59	41.4	-19	34	55	19	675
1978	NM7		1978	07	11.4247	20	58	54.3	-19	37	57		675
1978	NM7		1978	07	13.3825	20	57	24.6	-19	43	18		675
1978	NN7	*	1978	07	10.3431	20	59	39.9	-20	40	03	18	675
1978	NN7		1978	07	11.4247	20	58	59.5	-20	44	15		675
1978	NN7		1978	07	13.3825	20	57	41.3	-20	52	01		675
1978	NO7	*	1978	07	10.3431	21	00	01.2	-20	23	57	17	675
1978	NO7		1978	07	11.4247	20	59	15.0	-20	24	30		675
1978	NO7		1978	07	13.3825	20	57	48.4	-20	25	30		675
1978	NP7	*	1978	07	10.3431	20	59	55.9	-19	13	41	17	675
1978	NP7		1978	07	11.4247	20	59	16.1	-19	15	01		675
1978	NP7		1978	07	13.3825	20	58	12.2	-19	18	00		675
1978	NQ7	*	1978	07	10.3431	21	00	31.1	-19	57	10	17	675
1978	NQ7		1978	07	11.4247	20	59	40.6	-19	56	21		675
1978	NQ7		1978	07	13.3825	20	58	03.0	-19	54	29		675
1978	NR7	*	1978	07	10.3431	21	00	28.0	-24	26	09	17	675
1978	NR7		1978	07	11.4247	20	59	41.2	-24	27	13		675
1978	NR7		1978	07	13.3825	20	58	14.0	-24	29	06		675
1978	OJ		1978	07	10.3431	20	44	26.5	-21	19	25	15	675
1978	OJ		1978	07	11.4247	20	43	47.3	-21	31	01		675
1978	OJ		1978	07	13.3825	20	42	32.9	-21	52	20		675
1978	OK		1978	07	10.3431	20	43	14.7	-21	40	10	16	675
1978	OK		1978	07	11.4247	20	42	27.7	-21	46	56		675
1978	OK		1978	07	13.3825	20	40	58.1	-21	59	20		675
1978	OM		1978	07	10.3431	20	54	14.2	-22	57	22	16	675
1978	OM		1978	07	11.4247	20	53	24.8	-22	59	13		675
1978	OM		1978	07	13.3825	20	51	50.8	-23	02	57		675
1978	ON		1978	07	10.3431	20	56	05.2	-22	51	24	16	675
1978	ON		1978	07	11.4247	20	55	21.4	-22	55	18		675
1978	ON		1978	07	13.3825	20	53	57.2	-23	02	18		675
1978	OO		1978	07	10.3431	20	56	13.5	-23	10	49	16	675
1978	OO		1978	07	11.4247	20	55	36.0	-23	17	05		675

1978 OO	1978 07 13.3825	20 54 22.5	-23 28 46				675
1978 OP	1978 07 10.3431	20 50 44.6	-22 43 42			16	675
1978 OP	1978 07 11.4247	20 50 06.9	-22 56 28				675
1978 OP	1978 07 13.3825	20 48 56.2	-23 19 36				675
1978 OQ	1978 07 10.3431	20 57 02.9	-24 57 07			17	675
1978 OQ	1978 07 11.4247	20 56 20.4	-24 59 24				675
1978 OQ	1978 07 13.3825	20 54 58.4	-25 03 35				675
1978 PT4	1978 07 10.3431	20 39 15.1	-19 39 12			16	675
1978 PT4	1978 07 11.4247	20 38 30.3	-19 50 17				675
1978 PT4	1978 07 13.3825	20 37 04.6	-20 10 25				675

OBSERVATIONS MADE AT PALOMAR BY C. S. SHOEMAKER AND E. SHOEMAKER.

Four-minute exposures with the 0.46-m Schmidt telescope. Film pairs scanned by C. Shoemaker with a stereomicroscope; measured by her with a Mann comparator at the U.S. Geological Survey. Reference stars from the SAO Catalog. Contact: C. Shoemaker, P.O. Box 984, Flagstaff, AZ 86002, U.S.A.

Object	Date	UT	R. A. (1950)	Decl.		Mag.	Obs.
1975 QO	1984 11 21.28472	02 34 37.59	+38 38 17.1			16.5	675
1975 QO	1984 11 24.17361	02 32 29.64	+38 17 26.7				675
1984 SR	1984 10 22.36944	23 43 31.39	+17 39 15.0				675
1984 SR	1984 10 23.14444	23 42 20.92	+17 51 16.0				675
1984 SR	1984 10 24.18333	23 40 47.53	+18 07 07.6				675
1984 SS	1984 10 22.33680	23 19 59.40	+18 50 07.7				675
1984 SS	1984 10 23.11805	23 20 30.63	+18 27 12.9				675
1984 SS	1984 10 24.13055	23 21 11.60	+17 57 47.2				675
1984 ST	1984 10 22.37638	00 49 46.36	+49 52 08.3				675
1984 ST	1984 10 23.38472	00 47 46.47	+50 03 02.7				675
1984 ST	1984 10 26.25555	00 42 12.95	+50 29 52.9				675
1984 WS1 *	1984 11 21.28472	02 33 22.14	+35 18 30.5			17.5	675
1984 WS1	1984 11 21.30416	02 33 21.27	+35 18 22.4				675
1984 WT1 *	1984 11 21.28472	02 36 57.16	+37 14 35.4			16	675
1984 WT1	1984 11 24.17361	02 34 17.24	+36 54 04.7				675

OBSERVATIONS MADE AT THE LOWELL OBSERVATORY.

Plates with the 0.33-m photographic telescope. Observers R. Burnham and C. Slaughter. Measured by E. Bowell using a PDS scanning microdensitometer. SAO reference stars, global solutions. Contact: E. L. G. Bowell, Lowell Observatory, P.O. Box 1269, Flagstaff, AZ 86002, U.S.A.

Object	Date	UT	R. A. (1950)	Decl.		N	Obs.
803	1958 10 10.31972	00 58 13.50	+17 10 45.8			1	690
803	1958 10 11.30913	00 57 30.20	+17 04 56.0			1	690
803	1958 10 14.27229	00 55 21.22	+16 46 54.9			1	690
2389	1958 10 10.31972	01 00 54.05	+17 36 23.6			1	690
2389	1958 10 11.30913	00 59 50.43	+17 33 19.4			1	690
2389	1958 10 14.27229	00 56 41.84	+17 25 00.2			1	690
2957	1958 10 07.34444	00 55 46.54	+17 21 33.8			5	690
2957	1958 10 08.34747	00 55 00.55	+17 15 18.6			2	690
2957	1958 10 10.31972	00 53 30.01	+17 02 38.1				690
2957	1958 10 10.35594	00 53 28.53	+17 02 25.0			2	690
2957	1958 10 11.30913	00 52 44.92	+16 56 08.5			1	690
2957	1958 10 14.27229	00 50 30.81	+16 36 03.4			1	690

Note 1: time slightly in error on MPC 9342. 2: remeasurement of position on MPC 7826. 3: position uncertain. 5 = 2 + 3.

OBSERVATIONS MADE AT THE LINCOLN LABORATORY ETS, NEW MEXICO.

Real-time observations conducted under the direction of L. G. Taff; see Bull. Am. Astron. Soc. 11, 619; 12, 666; and 12, 743 (1980); and Publ. Astron. Soc. Pacific 93, 658 (1981). Observers are D. E. Beatty, E. R. Chavez, R. L. Irelan, D. F. Kostishack, R. C. Ramsey, J. M. Sorvari, L. G.

Taff, P. J. Trujillo and L. R. Ward. Contact: L. G. Taff, MIT Lincoln Laboratory, Lexington, MA 02173, U.S.A.

Object	Date	UT	R. A. (1950)	Decl.	Mag.	Obs.
1984 YC	1985 01	20.27660	08 07 23.13	+03 39 30.8	15	704
1984 YC	1985 01	20.27992	08 07 22.79	+03 39 27.9		704
1984 YC	1985 01	20.29567	08 07 21.25	+03 39 14.4		704
1984 YC	1985 01	20.29717	08 07 21.16	+03 39 14.9		704
1984 YC	1985 01	20.32088	08 07 18.72	+03 38 45.9		704
1984 YC	1985 01	22.19093	08 04 26.81	+03 05 41.7		704
1984 YC	1985 01	22.19383	08 04 26.42	+03 05 42.0		704
1984 YC	1985 01	25.18907	07 59 52.84	+02 14 34.6		704
1984 YC	1985 01	25.19341	07 59 52.67	+02 14 31.3		704

OBSERVATIONS MADE AT OAK RIDGE OBSERVATORY BY R. E. McCROSKY, C.-Y. SHAO AND G. SCHWARTZ.

Plates with the 1.5-m reflector, reduced using the Astrographic Catalogue. Coordination and verification by, and assistance with identifications from, C. M. Bardwell. Contact: R. E. McCrosky, Harvard-Smithsonian Center for Astrophysics, 60 Garden Street, Cambridge, MA 02138, U.S.A.

Object	Date	UT	R. A. (1950)	Decl.	Mag.	N Obs.
1538	1984 12	23.22271	05 16 05.56	+39 16 20.7		801
1734	1984 12	18.26393	06 36 03.35	+09 56 47.1		801
3122	1984 12	26.94606	23 21 11.72	+45 54 01.5		801
1931 CE	1984 11	21.39216	09 06 15.10	+28 03 33.5		801
1931 CE	1984 12	21.38228	09 13 04.89	+27 54 58.1		801
1931 VP	1984 12	20.99380	00 05 16.77	+11 08 29.9		801
1934 CX	1984 11	23.97802	23 07 00.88	+02 32 13.3		801
1934 CX	1984 12	23.99227	23 23 32.19	+03 20 45.7		801
1934 RP	1984 12	23.14337	04 55 55.44	+24 45 36.9		801
1938 DH2	1984 12	21.19949	04 17 12.46	+13 20 53.5		801
1948 KF	1984 11	26.29636	04 24 06.29	+21 55 42.6		801
1948 KF	1984 12	24.15516	03 54 10.51	+22 05 22.6		801
1949 PP	1984 12	24.12800	03 43 54.01	+17 05 39.5		801
1950 SJ	1984 11	25.40376	06 02 09.52	+16 04 32.4		801
1950 SJ	1984 12	21.25542	05 33 23.84	+14 15 06.6		801
1973 UU4	1984 11	21.31982	06 55 44.84	+10 31 59.3		801
1973 UU4	1984 12	18.26393	06 35 35.48	+09 43 10.9		801
1977 NQ	1984 12	23.16336	04 58 15.78	+23 42 37.6		801
1978 PT2	1984 11	27.33434	05 23 03.19	+23 35 50.0		801
1978 PT2	1984 12	23.18169	04 59 13.18	+23 01 41.4		801
1978 QO2	1984 12	21.08134	02 51 25.88	+16 01 40.9		801
1978 RH	1984 12	21.04731	02 18 21.79	+11 18 36.3		801
1978 RF6	1984 12	21.22859	05 15 58.87	+10 45 49.7		801
1978 SR6	1984 12	23.24641	06 17 53.98	+38 07 03.9		801
1980 BQ	1984 11	26.37006	05 37 51.87	+25 24 55.0		801
1980 BQ	1984 12	20.22433	05 16 09.26	+26 08 42.3		801
1980 PJ	1984 11	20.21436	04 52 47.59	+28 09 55.0		801
1980 PJ	1984 12	24.20595	04 14 26.76	+26 48 45.4		801
1980 RB	1984 11	27.24832	03 29 55.95	+11 54 25.4		801
1980 RB	1984 12	18.13326	03 14 30.46	+12 17 59.7		801
1980 RK	1984 12	18.10650	03 03 10.54	+27 53 15.5		801
1980 TX5	1984 12	21.27374	06 46 45.93	+18 52 25.4		801
1980 VN1	1984 12	18.04666	02 05 32.48	+08 57 07.4		801
1981 AD	1984 12	21.15299	03 19 25.29	-01 40 44.0		801
1981 EH26	1984 11	27.37516	05 29 58.54	+19 53 38.6		801
1981 EH26	1984 12	18.17732	05 10 49.29	+19 47 41.7		801
1981 YH1	1984 12	27.02307	02 17 40.19	+02 08 40.7		801
1982 BG1	1984 11	20.23427	04 52 59.46	+30 13 33.0		801
1982 BG1	1984 12	24.23516	04 16 27.19	+27 21 41.6		801

1982	BL1		1984	12	19.33062	07	20	50.83	+17	35	23.3	801
1982	DJ		1984	12	21.12913	03	03	15.64	+25	49	56.9	801
1982	DV		1984	12	23.44182	12	20	16.78	-10	11	16.4	1 801
1982	KD1		1984	12	24.17578	04	04	49.77	+23	02	32.0	801
1982	RA		1984	11	20.97384	19	48	11.62	+47	08	07.6	801
1982	RA		1984	12	26.95990	21	09	35.26	+60	11	41.4	801
1983	NR		1984	11	27.39824	05	42	43.57	+42	13	51.6	801
1983	NR		1984	12	24.28514	05	09	22.14	+40	40	10.1	801
1983	NU		1984	11	25.43231	06	23	25.11	+25	24	13.7	801
1983	TB		1984	12	18.06683	02	03	00.08	+28	38	50.2	801
1983	TB		1984	12	27.04516	00	13	39.28	+09	23	44.0	801
1984	QO		1984	12	23.96561	23	10	58.98	+03	50	21.1	801
1984	WL		1984	12	21.18222	04	11	51.57	+16	26	53.2	801
1984	YU		1984	12	18.20950	06	01	45.18	+12	04	04.5 18	801
1984	YU		1984	12	23.30644	05	56	19.97	+11	55	35.2 2	801
6560	P-L		1984	12	21.02305	01	25	28.07	+05	08	36.6	801
6611	P-L		1984	12	24.01549	23	50	47.96	-02	13	52.6	801
1984	YW	*	1984	12	18.10650	03	02	30.12	+27	53	38.5 18.5	801
1984	YX	*	1984	12	18.17732	05	12	26.99	+19	42	15.9 18	801
1984	YY	*	1984	12	23.16336	04	58	51.56	+23	32	15.8 16.5 2	801

Note 1: weak image. 2: measured in one direction only.

OBSERVATIONS MADE AT THE ESTACION DE ALTURA OF THE FELIX AGUILAR OBSERVATORY, EL LEONCITO.

Plates taken with the 0.50-m f/7.5 astrograph by M. R. Cesco, H. Mira, G. Sanchez and J. V. Vicentela. Coordination by C. E. Lopez and J. G. Sanguin. Contact: J. G. Sanguin, Observatorio Astronomico Felix Aguilar, Av. Benavidez 8175 Oeste, 5407 Marquesado, San Juan, Argentina.

Object	Date	UT	R. A. (1950)	Decl.	Obs.
58	1984 03	26.07053	09 57 27.86	+12 27 03.1	808
58	1984 03	26.10931	09 57 26.91	+12 27 12.7	808
191	1984 03	26.07053	09 48 03.18	+12 40 46.8	808
191	1984 03	26.10931	09 48 02.34	+12 40 58.3	808
383	1984 04	04.22568	14 14 16.36	-10 03 27.8	808
383	1984 04	04.25961	14 14 15.02	-10 03 20.5	808
383	1984 04	05.17931	14 13 39.36	-10 00 05.3	808
383	1984 04	05.21048	14 13 38.14	-09 59 59.5	808
434	1984 04	01.13102	11 16 11.78	+07 58 19.2	808
434	1984 04	01.15872	11 16 10.53	+07 58 52.2	808
434	1984 04	03.12556	11 14 53.09	+08 36 52.3	808
434	1984 04	03.15950	11 14 51.75	+08 37 29.9	808
434	1984 04	04.09651	11 14 17.21	+08 55 07.0	808
434	1984 04	04.12698	11 14 16.04	+08 55 41.2	808
475	1984 04	01.25049	14 12 32.91	-09 00 23.5	808
475	1984 04	01.28175	14 12 31.26	-09 00 22.5	808
475	1984 04	02.25538	14 11 39.83	-08 59 49.8	808
475	1984 04	02.28654	14 11 38.13	-08 59 49.5	808
475	1984 04	04.22568	14 09 52.65	-08 58 36.0	808
475	1984 04	04.25961	14 09 50.74	-08 58 34.6	808
475	1984 04	05.17931	14 08 59.19	-08 57 57.1	808
475	1984 04	05.21048	14 08 57.49	-08 57 55.8	808
505	1984 04	07.14338	12 45 41.69	+10 59 17.8	808
505	1984 04	07.17454	12 45 40.04	+10 59 24.4	808
505	1984 04	08.14273	12 44 50.04	+11 02 48.6	808
505	1984 04	08.17389	12 44 48.33	+11 02 55.0	808
562	1984 04	26.23105	15 08 56.74	-09 51 36.8	808
562	1984 04	26.26567	15 08 55.02	-09 51 34.2	808
599	1984 04	07.14338	12 47 08.09	+09 37 29.1	808
599	1984 04	07.17454	12 47 06.39	+09 37 33.3	808

599		1984	04	08.14273	12	46	13.99	+09	39	36.8	808
599		1984	04	08.17389	12	46	12.33	+09	39	41.3	808
619		1984	03	10.20771	10	35	00.45	-00	26	01.8	808
619		1984	03	10.25619	10	34	58.10	-00	25	32.2	808
619		1984	03	24.09607	10	25	31.34	+01	52	26.6	808
619		1984	03	24.13069	10	25	30.14	+01	52	47.0	808
619		1984	03	25.12798	10	24	56.79	+02	02	19.6	808
805		1984	04	04.09651	11	09	22.65	+08	20	57.9	808
805		1984	04	04.12698	11	09	21.70	+08	21	08.8	808
866		1984	04	07.14338	12	40	26.01	+08	53	16.5	808
866		1984	04	07.17454	12	40	24.54	+08	53	24.2	808
868		1984	04	26.23105	15	08	27.66	-09	09	26.4	808
868		1984	04	26.26567	15	08	25.94	-09	09	18.7	808
1098		1984	04	25.18323	14	20	41.22	-34	07	16.1	808
1098		1984	04	25.22617	14	20	38.50	-34	07	11.6	808
1098		1984	04	30.18272	14	15	32.07	-33	54	40.4	808
1098		1984	04	30.21735	14	15	29.94	-33	54	34.8	808
1310		1984	04	04.16715	12	27	47.86	-14	06	48.2	808
1310		1984	04	04.19763	12	27	45.22	-14	06	49.4	808
1310		1984	04	05.11940	12	26	29.65	-14	07	00.2	808
1310		1984	04	05.14988	12	26	27.03	-14	07	00.4	808
1321		1984	04	05.11940	12	19	33.78	-14	41	16.2	808
1321		1984	04	05.14988	12	19	32.16	-14	41	09.7	808
1733		1984	04	26.23105	15	12	03.24	-10	32	15.6	808
1733		1984	04	26.26567	15	12	01.22	-10	32	04.1	808
1867		1984	04	22.07437	11	45	33.88	-34	21	11.3	808
1867		1984	04	22.11385	11	45	32.90	-34	20	59.1	808
2000		1984	04	05.05292	11	22	59.13	-34	00	11.7	808
2000		1984	04	05.09101	11	22	56.80	-33	59	53.2	808
2000		1984	04	07.07931	11	21	05.00	-33	43	19.1	808
2000		1984	04	07.11394	11	21	03.05	-33	43	01.6	808
2311		1984	03	26.07053	09	58	23.85	+12	11	43.5	808
2311		1984	03	26.10931	09	58	22.92	+12	11	52.4	808
1984	FT	1984	04	07.14338	12	40	13.55	+08	47	50.2	808
1984	FT	1984	04	07.17454	12	40	12.19	+08	48	03.7	808
1984	FT	1984	04	08.14273	12	39	31.74	+08	54	11.9	808
1984	FT	1984	04	08.17389	12	39	30.46	+08	54	22.4	808
1984	HB2 *	1984	04	26.23105	15	11	08.91	-08	41	40.6	808
1984	HB2	1984	04	26.26567	15	11	07.23	-08	41	35.9	808

OBSERVATIONS MADE AT TOYOTA BY K. SUZUKI AND T. URATA.

Plates measured by T. Urata, reduced using five or six AGK3 reference stars. Copied in part from Nihondaira Obs. Circ. No. 1496. Contact: T. Urata, Nishitaka-cho 8-23, Shimizu, Shizuoka 424, Japan.

Object		Date	UT	R. A. (1950)	Decl.	Mag.	Obs.
2626		1984	12 23.59444	05 51 55.41	+25 44 01.2	16.5	881
2626		1984	12 23.61111	05 51 54.37	+25 44 00.8		881
3178		1985	01 15.50069	03 58 38.06	+15 14 16.8	15	881
3178		1985	01 15.52361	03 58 38.57	+15 14 13.9		881
1983	NU	1984	12 23.59444	05 55 05.05	+25 25 55.9	17.5	881
1983	NU	1984	12 23.61111	05 55 03.91	+25 25 56.6		881
1984	WC	1985	01 15.51250	02 59 50.84	+16 08 10.6	17	881
1984	WC	1985	01 15.53611	02 59 51.60	+16 08 06.7		881
1985	AA *	1985	01 15.57222	07 29 52.10	+15 17 24.3	17	881
1985	AA	1985	01 15.58889	07 29 50.84	+15 17 32.4		881
1985	AB *	1985	01 15.58056	07 35 59.37	+18 01 13.7	16	881
1985	AB	1985	01 15.59722	07 35 58.34	+18 01 10.3		881
1985	AC *	1985	01 15.58056	07 37 01.69	+16 54 57.9	16.5	881
1985	AC	1985	01 15.59722	07 37 00.59	+16 55 00.2		881

1985 AD	*	1985 01 15.61389	07 52 33.21	+20 18 32.5			17	1	881		
1985 AD		1985 01 15.63056	07 52 32.30	+20 18 34.4				1	881		
1985 AE	*	1985 01 15.61389	07 52 50.70	+19 45 08.8			17		881		
1985 AE		1985 01 15.63056	07 52 49.61	+19 45 11.7					881		
1985 AF	*	1985 01 15.61389	07 54 35.64	+18 47 38.3			15		881		
1985 AF		1985 01 15.63056	07 54 34.46	+18 47 34.2					881		
1985 BA	*	1985 01 17.57569	08 14 00.17	+21 07 55.2			17		881		
1985 BA		1985 01 17.59792	08 13 58.93	+21 07 56.8					881		

Note 1: object somewhat diffuse.

OBSERVATIONS MADE AT SHIZUOKA BY M. KIZAWA.
Copied from Nihondaira Obs. Circ. No. 1496. Contact: T. Urata, Nishitaka-cho 8-23, Shimizu, Shizuoka 424, Japan.

Object	Date	UT	R. A. (1950)	Decl.	Mag.	Obs.
3178	1984 12	20.55807	04 01 34.97	+17 19 16.8	14.5	883
3178	1984 12	20.57289	04 01 34.51	+17 19 11.1		883
3178	1984 12	23.43215	03 59 57.53	+16 58 51.9		883
3178	1984 12	23.47827	03 59 55.91	+16 58 33.3		883
3178	1984 12	24.55620	03 59 23.50	+16 51 15.1	14	883

OBSERVATIONS MADE AT KARASUYAMA BY K. INODA AND T. URATA.
Copied from Nihondaira Obs. Circ. No. 1496. Contact: T. Urata, Nishitaka-cho 8-23, Shimizu, Shizuoka 424, Japan.

Object	Date	UT	R. A. (1950)	Decl.	Mag.	Obs.
3178	1984 12	23.58388	03 59 52.31	+16 57 48.0	14	889
3178	1984 12	23.60390	03 59 51.64	+16 57 40.6		889
1984 YF	* 1984 12	23.58388	04 02 44.5	+17 37 16	16.5	889
1984 YF	1984 12	23.60390	04 02 44.0	+17 37 21		889

* * * * *

ORBITAL ELEMENTS OF ONE-OPPOSITION MINOR PLANETS.

The orbit computers and authors of double designations are B = C. M. Bardwell, b = F. N. Bowman, h = K. Hurukawa, I = H. Oishi, l = W. Landgraf, M = B. G. Marsden. For further information see MPC 7828.

Planet	B(1,0)	Epoch	M	Peri.	Node	Incl.	e	a	Arc	O	N	C
1977 QB		770825	310.60	29.10	325.31	14.48	0.1928	2.7265	91	7		M
1978 CT		780221	251.34	133.57	137.28	5.71	0.1562	2.2331	30	6		M
1978 NF	12.5	780731	0.42	193.85	111.45	14.40	0.1663	2.5550	32	0		M
1978 OK	14.0	780731	306.53	287.42	94.49	4.56	0.2206	2.3064	30	9		M
1978 ON	12.5	780731	309.14	341.92	25.29	3.37	0.1040	2.7505	32	0		M
1978 OP	13.5	780731	2.51	193.55	109.13	15.16	0.1573	2.7182	21	7		M
1978 OQ	14.0	780731	335.75	354.88	347.39	6.06	0.1977	2.8904	32	0		M
1978 PS4		780731	338.55	11.39	325.09	11.94	0.1677	2.5498	10	5		M
1978 PT4	13.0	780731	299.84	265.07	116.78	16.67	0.1578	2.6150	30	7		M
1978 PU4		780731	328.31	18.98	335.70	9.66	0.2281	2.5370	5	8		M
1978 WP11	17.0	781128	355.73	321.68	112.43	2.06	0.1722	2.5319	4	4		M
1978 WW11	16.0	781128	47.78	277.65	89.40	4.92	0.1420	2.4190	7	9		M
1979 HE3	15.5	790507	16.69	134.27	57.49	3.24	0.1373	2.4136	23	8		M
1979 HH3	14.0	790507	86.99	69.56	41.84	8.47	0.1266	2.4105	7	4		M
1979 HW6		790507	337.55	351.03	266.50	0.37	0.1287	2.2724	22	6		M
1979 JJ		790507	157.89	324.97	80.75	2.56	0.1576	2.9212	17	3		M
1979 KO1		790527	340.22	4.88	267.54	7.24	0.2239	2.4413	57	7		M
1979 TW1	14.5	791014	178.75	353.46	213.92	9.13	0.0369	2.6880	9	3	1	I
1979 TY1	15.3	791014	309.58	59.61	31.70	11.36	0.1631	2.4576	9	3	1	I
1979 TZ1	13.4	791014	260.61	148.97	340.09	1.24	0.0271	2.9032	39	0	1	I
1979 TC2	14.6	791014	286.85	276.03	211.02	13.79	0.2356	2.8098	9	3	1	I

1979 TH2	13.6	791123	334.23	45.14	25.51	1.17	0.1489	3.1607	39	3	1	I
1980 FF12		800322	319.69	249.40	350.00	2.86	0.0868	2.1682	21	6		M
1980 FG12		800322	280.16	106.71	196.53	22.71	0.2546	2.4079	25	6		M
1980 FH12		800322	333.82	272.81	312.89	7.59	0.0643	2.2727	22	6		M
1980 PP2		800809	5.69	131.50	187.81	3.71	0.1956	2.1544	29	8		M
1980 PQ2		800809	347.98	183.97	162.91	12.98	0.1727	2.6020	25	4		M
1980 RD1	14.0	800918	343.21	71.77	293.91	3.79	0.1255	2.7242	7	0		M
1980 RH5		800918	334.40	202.75	193.50	4.11	0.3445	2.9554	2	3		M
1980 TJ15		801008	325.00	298.85	105.92	7.71	0.2125	2.8394	5	6		M
1983 RL4	15.0	830923	353.37	212.49	166.09	17.67	0.2738	2.6330	31	9	1	B
1984 SR	15.5	841007	337.03	60.40	0.21	22.21	0.3559	2.3588	28	5		B
1984 SS	15.5	841007	17.78	113.45	219.76	23.07	0.2924	2.3014	26	5		B
1984 ST	16.5	841007	351.42	58.74	344.04	23.65	0.3192	2.4505	28	5		B
1984 SK1	14.5	840917	26.71	325.00	344.81	5.95	0.3048	3.0674	35	7	1	B
1984 UB3	13.5	841027	20.72	112.96	254.00	0.85	0.0839	2.9809	5	8		B
1984 UD3	15.0	841027	353.29	192.46	207.37	6.95	0.1012	2.3876	5	8	2	B
1984 UO3	14.5	841007	354.20	353.51	39.16	6.63	0.1207	2.5455	4	6	2	B
1984 WL	16.0	841206	351.44	192.95	253.88	25.22	0.2794	2.3502	23	8		B
1984 WA1	15.5	841206	24.53	322.72	54.22	25.86	0.2586	2.2873	15	8		B
1984 WC1	13.0	841206	45.82	286.95	87.78	9.85	0.0490	3.0465	3	6		B
1984 WD1	14.5	841206	26.76	282.75	96.03	7.71	0.2828	3.0563	3	6	2	B
1984 YC	13.0	841226	352.24	200.19	287.55	31.69	0.2540	2.7344	34	0		M
1984 YU	16.0	841226	50.18	168.71	208.94	7.26	0.2234	2.4539	5	4		B

Note 1: double designations 1979 TW1 = 1979 UU1 (I, JAM 1789); 1979 TY1 = 1979 UT1 (I, JAM 1789); 1979 TZ1 = 1979 UV1 = 1979 WT7 (I, 1790); 1979 TC2 = 1979 UX1 (I, JAM 1789); 1979 TH2 = 1979 WT (I, JAM 1788); 1983 RL4 = 1983 TA1 (b, h, l); 1984 SK1 = 1984 QB1 (b). 2: e assumed.

* * * * *

ORBITAL ELEMENTS BY W. LANDGRAF, ASTRONOMISCHE ARBEITSGEMEINSCHAFT, MAINZ.

The identifications are by W. Landgraf unless otherwise stated.

(1162) Larissa
Epoch 1985 Dec. 1.0 ET = JDE 2446400.5

			(1950.0)	P	Q
M	279.02388				
n	0.12614827	Peri.	217.73259	-0.21958158	+0.97536551
a	3.9374511	Node	39.59554	-0.88678427	-0.19052158
e	0.1131734	Incl.	1.89891	-0.40669102	-0.11119192
P	7.81	B(1,0)	10.6		

From 75 observations at 18 oppositions 1930-1983, mean residual 1".2.

(1297) Quadea
Epoch 1985 Dec. 1.0 ET = JDE 2446400.5

			(1950.0)	P	Q
M	7.96293				
n	0.18772587	Peri.	127.95122	+0.43296860	-0.89031446
a	3.0207859	Node	295.83445	+0.77003805	+0.44662532
e	0.0681018	Incl.	9.01229	+0.46859319	+0.08869039
P	5.25	B(1,0)	12.5		

From 52 observations at 17 oppositions 1927-1984, mean residual 1".3.

1984 SV = 1951 YE1 = 1969 RV1 = 1973 UX3
Epoch 1985 Dec. 1.0 ET = JDE 2446400.5

			(1950.0)	P	Q
M	46.90043				
n	0.26495262	Peri.	99.87786	+0.11224194	-0.99325823
a	2.4008069	Node	343.59289	+0.86669431	+0.11212177
e	0.1171546	Incl.	5.88880	+0.48604806	+0.02944138
P	3.72	B(1,0)	14.5		

Residuals in seconds of arc

511227	711	3.0-	0.6-	Y	840920	046	1.0-	0.8+	840930	046	1.8- 0.8-
511227	711	3.0+	1.0+	Y	840927	046	1.7+	0.9-	840930	046	0.7+ 0.7-
690913	095	1.0-	1.8+		840927	046	1.5+	0.9-	841026	688	0.2- (0.4-)
731029	095	0.6-	1.2+		840929	046	1.2+	0.3+	841026	688	2.6+ (0.3+)
840920	046	2.8-	0.4-		840929	046	1.3+	0.3-			

1984 SU3 = 1954 WK = 1971 QH3 = 1971 SZ3
Epoch 1985 Dec. 1.0 ET = JDE 2446400.5

M	107.55501		(1950.0)	P	Q
n	0.22917756	Peri.	315.05312	+0.99693678	+0.03781585
a	2.6445676	Node	42.91968	-0.00178988	+0.88614235
e	0.3092988	Incl.	5.76999	-0.07819108	+0.46186760
P	4.30	B(1,0)	15.0		

Residuals in seconds of arc

541117	760	1.0-	2.0+		840928	688	0.0	0.6-	841031	688	0.6+ 0.5+
541117	760	0.2-	1.0+		840928	688	0.2+	0.7-	841031	688	1.1+ 0.2+
710824	095	0.4-	1.1-		841026	688	0.8+	0.2-	841120	688	0.5- 2.1-
710922	095	0.3-	2.5+		841026	688	0.2-	0.3-	841120	688	0.0 1.1-

1984 SM4 = 1974 OH1 = 1975 TU5 = 1979 QS5
Epoch 1985 Dec. 1.0 ET = JDE 2446400.5

M	51.45063		(1950.0)	P	Q
n	0.21104426	Peri.	247.96768	+0.65456572	-0.75566601
a	2.7939611	Node	161.08994	+0.71680393	+0.61082782
e	0.0944770	Incl.	4.00596	+0.24028281	+0.23634351
P	4.67	B(1,0)	14.0		

Residuals in seconds of arc

740719	808	0.2+	0.2-		790830	809	0.1+	0.4+	841015	026	(3.7-) 1.4+
740719	808	0.2-	0.2-		790830	809	0.2-	0.1+	841017	026	0.1- 1.3-
751014	095	0.4-	(4.4-)		840930	026	0.8-	0.5-	841029	026	0.4+ 0.8+
751106	095	0.4+	(5.9-)		841002	026	0.6+	1.0+	841030	026	(4.3-) 2.3-

* * * * *

ORBITAL ELEMENTS BY S. NAKANO, TOKYO.

The following orbital elements have been taken in part from JAM 1791, 1794 and 1795. The identifications are by S. Nakano unless otherwise stated.

(3179)* 1962 FA = 1927 VA = 1951 EO = 1951 EQ2 = 1956 AC1 = 1983 CF3
Discovered 1962 Mar. 31 at La Plata.
Epoch 1985 Dec. 1.0 ET = JDE 2446400.5

M	206.50562		(1950.0)	P	Q
n	0.18126112	Peri.	270.19116	-0.00871755	-0.99996199
a	3.0921908	Node	180.30847	+0.92903227	-0.00803887
e	0.1609536	Incl.	1.73566	+0.36989598	-0.00337622
P	5.44	B(1,0)	13.5		

Residuals in seconds of arc

271101	024	1.4+	3.3-		560216	760	2.2-	1.3-	830210	675	0.6+ 1.0+
510305	760	4.9+	2.8+		620331	839	0.7-	2.7-	830210	675	0.6+ 0.2-
510305	760	4.1+	3.6+		620411	839	3.2-	1.0-	830211	675	1.5- 0.4+
510313	711	1.3-	1.9-	Y	620411	839	0.6-	1.3-	830211	675	1.3+ 1.0+
560113	760	(31.5-	8.8+)		620428	839	2.2-	0.9-	830215	675	1.2+ 0.5+
560216	760	2.1-	1.6-		620428	839	0.7-	1.0-	830215	675	0.0 0.2+

(3180)* 1962 RO = 1974 HL = 1977 DZ = 1979 YT2 = 1982 SD1

Discovered 1962 Sept. 7 at the Goethe Link Observatory, Indiana University.

Epoch 1985 Dec. 1.0 ET = JDE 2446400.5

		(1950.0)	P	Q
M	321.55013			
n	0.29583165	Peri. 43.78401	+0.79176063	-0.61075174
a	2.2306921	Node 353.83613	+0.53204563	+0.69748600
e	0.1477440	Incl. 5.27423	+0.30007091	+0.37482740
P	3.33	B(1,0) 15.5		

Residuals in seconds of arc

620907	760	2.1+	3.7-	740422	805	0.7-	0.3-	770219	381	1.4-	0.0
620907	760	(1.0-	8.7-)	740424	805	0.9-	1.5-	791224	095	0.5-	0.5+
620924	760	2.0-	2.2+	740425	805	0.8-	1.3-	820922	688	1.3+	0.6-
620924	760	0.8-	0.9+	770218	381	0.5-	1.7-	820922	688	0.7+	2.9-
620929	760	0.5+	0.4+	770218	381	3.0+	1.7-				
620929	760	0.6+	0.5-	770219	381	1.3-	1.0+				

1958 GQ = 1958 GH = 1954 KE = 1976 SC4

Epoch 1985 Dec. 1.0 ET = JDE 2446400.5 (J-P)

		(1950.0)	P	Q
M	155.19391			
n	0.23183320	Peri. 231.91131	-0.50141449	+0.86463198
a	2.6243384	Node 8.17945	-0.70802903	-0.38909762
e	0.2778554	Incl. 12.80986	-0.49727096	-0.31782791
P	4.25	B(1,0) 13.5		

Residuals in seconds of arc

540524	078	0.0	0.1+	580413	330	2.0+	0.1+	760929	095	0.1+	0.4-
580407	330	0.1+	0.6+	580425	330	1.8-	0.4-				
580408	760	(23.2-	69.8-)X	760924	095	0.5-	0.9+				

1967 JP = 1966 CU = 1966 DT

Epoch 1985 Dec. 1.0 ET = JDE 2446400.5 (J-P)

		(1950.0)	P	Q
M	134.54034			
n	0.17847607	Peri. 266.19549	-0.60275330	+0.79694212
a	3.1242822	Node 326.63458	-0.70045010	-0.55226256
e	0.1126223	Incl. 4.13375	-0.38217552	-0.24472296
P	5.52	B(1,0) 14.0		

Residuals in seconds of arc

660214	330	0.1+	0.3-	670506	808	0.1-	0.4-	670602	808	0.6+	1.5+
660224	330	0.1-	0.3+	670531	808	0.5-	1.2-				

1976 SE1 = 1976 QD1 = 1982 JJ3

The double designation 1976 SE1 = 1976 QD1 (JAM 1442) and the identification 1976 SE1 = 1982 JJ3 are by H. Oishi (JAM 1782).

Epoch 1985 Dec. 1.0 ET = JDE 2446400.5 (J-P)

		(1950.0)	P	Q
M	254.20658			
n	0.29389412	Peri. 182.37935	+0.98730322	-0.15871491
a	2.2404899	Node 186.76329	+0.14662513	+0.92626086
e	0.0962897	Incl. 3.15160	+0.06110168	+0.34183388
P	3.35	B(1,0) 15.0		

Residuals in seconds of arc

760826	095	0.1+	0.2-	760928	095	0.6-	0.4-	820516	675	1.0-	0.3+
760924	095	0.9-	1.5+	760929	095	0.1+	0.2-	820517	675	1.2+	0.7-
760925	095	(2.9-	21.2-)	820515	675	0.0	0.0	820518	675	0.8+	1.0+
760928	095	1.3+	0.8-	820516	675	1.0-	0.6-				

1979 SK11 = 1979 TF2 = 1979 UY1 = 1931 BQ = 1961 DA = 1969 TB5
= 1971 DG1 = 1978 GE3 = 1978 JR1

The triple designation 1979 SK11 = 1979 TF2 = 1979 UY1 is by H. Oishi (JAM 1790). The double designation 1979 SK11 = 1979 TF2 was independently suggested by N. S. Chernykh.

Epoch 1985 Dec. 1.0 ET = JDE 2446400.5 (J-P)

M	63.32480		(1950.0)	P	Q
n	0.29770218	Peri.	67.90657	-0.08576604	+0.99569330
a	2.2213427	Node	197.28484	-0.95216745	-0.09231494
e	0.0415000	Incl.	6.80380	-0.29329392	+0.00853277
P	3.31	B(1,0)	14.0		

Residuals in seconds of arc

310118	690	0.1+	0.0	710223	095	5.7+	0.5+	790924	095	0.6- 1.8-
310120	690	0.9+	0.4+	780408	095	1.2+	2.3+	791014	095	0.1+ 2.6-
610216	024	7.1-	2.4+	780506	095	1.7-	0.4+	791019	010	0.8+ 0.5+
691014	095	1.9+	5.2+	790921	049	0.9+	1.4+	791023	010	0.8+ 0.5+
710218	095	1.7+	2.6-	790921	049	5.1-	0.5-			

1979 SL11 = 1979 TA2 = 1979 UW1 = 1979 WP5 = 1978 BD = 1983 HG

The quadruple designation 1979 SL11 = 1979 TA2 = 1979 UW1 = 1979 WP5 (JAM 1790) and the identifications 1979 SL11 = 1978 BD = 1983 HG are by H. Oishi (JAM 1793).

Epoch 1985 Dec. 1.0 ET = JDE 2446400.5 (J-P)

M	129.48105		(1950.0)	P	Q
n	0.19194960	Peri.	264.25538	+0.37434383	+0.91672384
a	2.9763142	Node	28.99640	-0.69511060	+0.37704856
e	0.2931780	Incl.	16.73531	-0.61374910	+0.13210523
P	5.13	B(1,0)	13.5		

Residuals in seconds of arc

780118	809	0.8+	0.0	791014	095	0.2+	0.7-	830418	688	1.2- 1.2-
780119	809	1.2+	0.8-	791019	010	1.4+	0.9+	830418	688	0.7- 1.3-
780120	809	1.7-	1.1+	791023	010	0.8+	1.6+			
790924	095	0.5+	1.5-	791117	095	1.3-	3.0-			

* * * * *

ORBITAL ELEMENTS BY K. HURUKAWA, TOKYO ASTRONOMICAL OBSERVATORY.

The following orbital elements have been taken in part from JAM 1786 and JAM 1794. The identifications are by K. Hurukawa unless otherwise stated.

(3181)* 1964 EC = 1964 DE = 1932 RK = 1951 GC1 = 1975 NH1 = 1975 RD
= 1979 SC12 = 1979 UO4 = 1979 WU1 = 1979 WD8 = 1982 RE1

Discovered 1964 Mar. 8 at Tautenburg. The double designation and key identifications 1964 EC = 1964 DE = 1932 RK = 1951 GC1 = 1975 RD are by T. Urata (NOC 1490). The identifications 1964 EC = 1975 NH1 = 1979 SC12 = 1979 UO4 = 1979 WU1 = 1979 WD8 = 1982 RE1 are by K. Hurukawa. The identifications 1964 EC = 1975 NH1 = 1975 RD and 1964 EC = 1982 RE1 were also suggested by W. Landgraf and by F. N. Bowman, respectively. NOC 1490 and JAM 1786 also discuss possible observations in 1942; further investigation of this is in progress.

Epoch 1985 Dec. 1.0 ET = JDE 2446400.5

M	174.40640		(1950.0)	P	Q
n	0.29601796	Peri.	304.66908	-0.96633259	-0.25332910
a	2.2297560	Node	220.70870	+0.25282046	-0.90239776
e	0.0647749	Incl.	3.95699	+0.04778219	-0.34857231
P	3.33	B(1,0)	14.0		

Residuals in seconds of arc

320908	024	(4.4-	1.6+)	640311	033	0.2-	0.5-	750908	808	1.1+	0.4+
510407	711	1.9+	7.4+ Y	640311	033	0.0	0.0	750908	808	1.2-	1.5+
640217	760	0.6-	0.4-	640311	033	0.0	0.0	790924	095	0.4+	1.0+
640217	760	0.8+	0.2+	640311	033	0.7+	0.2-	791017	095	0.7+	0.1+
640308	033	0.5-	0.1+	640312	033	0.2+	0.2-	791116	095	1.4-	0.1+
640308	033	0.2-	0.2+	750712	095	1.2-	0.4-	791122	095	0.9-	2.8+
640308	033	0.1-	0.5-	750901	808	(4.1-	84.0-)	820911	046	0.5-	1.0-
640308	033	0.1-	0.2-	750901	808	(6.1+	83.1-)	820911	046	2.6-	2.1-
640309	033	0.0	0.0	750904	808	0.9+	1.8+	820914	046	2.0+	4.2-
640309	033	0.1+	0.6+	750904	808	0.1+	1.4+	820914	046	2.6+	2.1+
640309	033	0.2-	0.4+	750907	808	1.2-	0.7-	820915	046	0.3+	0.3+
640309	033	0.5+	0.4+	750907	808	0.5+	1.0+	820915	046	0.3+	0.4-

1979 SM11 = 1979 TJ2 = 1979 WS = 1951 GS = 1952 UJ1 = 1962 RL = 1971 FK = 1978 JJ = 1982 OE

The triple designation 1979 SM11 = 1979 TJ2 = 1979 WS is by H. Oishi (JAM 1788).

Epoch 1985 Dec. 1.0 ET = JDE 2446400.5 (J-P)

M	28.40740		(1950.0)	P	Q
n	0.29246267	Peri.	63.96468	+0.11993086	+0.99185088
a	2.2477946	Node	213.01155	-0.93670141	+0.09870106
e	0.1452049	Incl.	4.52617	-0.32894942	+0.08056008
P	3.37	B(1,0)	13.8		

Residuals in seconds of arc

510402	711	2.2-	0.0 Y	780505	095	0.8-	1.2+	791122	095	0.4+	2.1+
521025	760	(1.7-	53.2+)X	790924	095	0.1+	0.0	820724	688	1.2+	0.8-
620907	760	(95.4+	43.3+)X	791014	095	0.4-	1.2-	820724	688	0.1-	0.8-
710319	095	0.4+	3.3-	791116	095	0.6-	1.5-				

1984 UW = 1974 SM2

The identification was found independently by W. Landgraf.

Epoch 1985 Dec. 1.0 ET = JDE 2446400.5 (J-P)

M	96.71887		(1950.0)	P	Q
n	0.20201820	Peri.	77.88217	+0.95686823	-0.27990269
a	2.8765808	Node	298.32903	+0.22006494	+0.87321561
e	0.3095357	Incl.	5.07275	+0.18966973	+0.39893481
P	4.88	B(1,0)	14.7		

Residuals in seconds of arc

740920	095	0.6+	0.0	841026	688	2.2+	0.8-	841127	688	1.4-	1.4+
740922	095	0.6-	0.0	841120	688	1.3-	0.0	841127	688	1.5+	1.6-
841026	688	2.1-	1.1+	841120	688	1.1+	0.1-				

1984 WK = 1978 NX

The identification was found independently by W. Landgraf.

Epoch 1985 Dec. 1.0 ET = JDE 2446400.5 (J-P)

M	201.13253		(1950.0)	P	Q
n	0.36289501	Peri.	58.92204	+0.86618605	+0.39958614
a	1.9466278	Node	276.02122	-0.49521954	+0.76680394
e	0.0824335	Incl.	17.56289	+0.06692788	+0.50233717
P	2.72	B(1,0)	15.2		

Residuals in seconds of arc

780709	809	0.1-	0.8+	841025	675	0.6-	1.0-	841121	675	0.4-	0.2-
780710	809	0.2-	0.8-	841026	675	0.9+	1.3+				
780711	809	0.4+	0.1-	841121	675	0.0	0.2-				

ORBITAL ELEMENTS BY T. URATA, SHIMIZU, JAPAN.

The following orbital elements have been copied from NOC 1498.

(3182)* 1984 WC = 1946 WD = 1950 TG4 = 1957 JZ = 1980 XH1

Discovered 1984 Nov. 27 by T. Seki at Geisei. The identifications 1984 WC = 1946 WD = 1950 TG4 = 1957 JZ were found by T. Urata, 1984 WC = 1946 WD = 1950 TG4 = 1980 XH1 were found by W. Landgraf, and 1984 WC = 1980 XH1 was found by S. Nakano.

Epoch 1985 Dec. 1.0 ET = JDE 2446400.5

M	90.56662		(1950.0)	P	Q
n	0.23319397	Peri.	161.41939	+0.64316782	-0.73857945
a	2.6141139	Node	248.01872	+0.67198234	+0.67094464
e	0.1440147	Incl.	12.58686	+0.36711698	+0.06583076
P	4.23	B(1,0)	13.5		

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

461116	062	0.2-	0.0		801214	323	1.4-	1.5-		841202	372	0.4+	0.7+
461116	062	0.4-	0.5-		801215	323	0.4+	0.4+		841202	372	0.2-	0.6+
461123	062	0.6+	1.7+		841127	688	0.7+	1.6-		841222	372	2.7-	1.4-
501009	711	0.2-	0.8+	Y	841127	688	1.6+	1.1-		841222	372	1.6-	0.1+
501010	711	0.0	0.3-	Y	841127	372	(6.8+	3.1-)Y		850114	372	0.1+	1.5+
570505	076	(0.04-	0.03-)X		841128	372	0.2+	0.1-		850114	372	0.3-	1.5+
801211	323	0.6-	0.1+		841128	372	0.6+	4.2+		850115	881	1.8+	1.1-
801211	323	1.1-	0.8-		841129	372	0.9-	1.9-		850115	881	0.9-	1.6-
801212	330	2.8+	2.4+		841130	372	0.9+	2.1-					

* * * * *

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

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

(3183)* 1949 PP = 1949 QB1 = 1982 JF2

Discovered 1949 Aug. 2 by K. Reinmuth at Heidelberg. The identification 1949 PP = 1982 JF2 is by E. Bowell (MPC 8147). The double designation 1949 PP = 1949 QB1 is by K. Reinmuth (MPC 383).

Epoch 1985 Dec. 1.0 ET = JDE 2446400.5

M	135.39346		(1950.0)	P	Q
n	0.17299815	Peri.	208.40827	+0.91838681	+0.39455914
a	3.1898854	Node	128.32217	-0.35544284	+0.85574651
e	0.1293720	Incl.	2.17773	-0.17385641	+0.33469536
P	5.70	B(1,0)	13.0		

Residuals in seconds of arc

490802	024	0.8+	0.4+		820515	675	1.1+	0.0		841118	688	0.3-	0.4+
490820	690	1.5-	0.9-		820516	675	2.1-	1.3-		841118	688	1.3-	2.1-
490821	024	2.8-	1.4+		820516	675	0.4-	0.4-		841124	688	0.7+	3.3-
490822	024	0.3-	0.8+		820517	675	0.6+	1.8-		841124	688	0.2+	0.3-
490824	690	1.2-	0.7-		820518	675	0.1-	0.0		841125	801	0.8+	1.0+
490826	690	5.2+	1.5-		830908	801	0.1+	0.1-		841224	801	0.6+	1.2+

(3184)* 1949 QC = 1970 GR1 = 1975 SG = 1980 WF1

Discovered 1949 Aug. 22 by E. L. Johnson at Johannesburg. The identification 1949 QC = 1970 GR1 is by L. D. Schmadel (MPC 7834).

Epoch 1985 Dec. 1.0 ET = JDE 2446400.5

M	117.91117		(1950.0)	P	Q
n	0.22628676	Peri.	236.59639	+0.88799962	+0.43736695
a	2.6670426	Node	97.10879	-0.35985622	+0.85321093
e	0.2621847	Incl.	8.22785	-0.28628687	+0.28415004
P	4.36	B(1,0)	13.5		

Residuals in seconds of arc

490822	078	0.3+	2.0-	700411	805	0.5-	1.1-	841017	801	1.8-	1.2+
490825	078	0.6+	0.4+	700411	805	0.0	0.7-	841028	567	1.6+	0.1+
490828	078	2.0+	1.1-	700411	805	1.5-	1.8-	841028	567	1.5+	2.2+
490910	078	0.5-	1.2+	750926	808	0.7+	0.7-	841029	688	0.9-	3.1-
490915	078	1.2+	0.6-	801130	095	1.2-	1.2-	841029	688	0.0	1.9-
490920	078	3.0-	0.2+	801210	095	2.2+	1.1-				

(3185)* 1953 VY1 = 1953 XC = 1931 TP3 = 1942 VE = 1964 WH1 = 1978 OO = 1982 VC = 1982 VU5

Discovered 1953 Nov. 11 at the Goethe Link Observatory, Indiana University.

Epoch 1985 Dec. 1.0 ET = JDE 2446400.5

M	334.27625		(1950.0)	P	Q
n	0.27079172	Peri.	281.26874	+0.98847564	+0.13656154
a	2.3661692	Node	70.90788	-0.09720479	+0.90338317
e	0.1937037	Incl.	3.96364	-0.11604799	+0.40650927
P	3.64	B(1,0)	15.0		

Residuals in seconds of arc

311012	690	1.6-	2.5-	531205	760	0.2+	0.3-	780803	323	0.1+	1.2-
311014	690	6.7+	1.6-	531205	760	1.3+	2.7+	780806	323	0.7-	0.1+
311017	690	2.1+	1.1-	641130	330	0.1+	1.3-	780806	323	0.3-	0.3+
421105	062	0.0	0.9-	780710	675	0.1-	0.7+ Y	780809	323	2.4-	0.1-
421105	062	0.6-	1.9+	780711	675	3.9+	4.9+ Y	780809	323	0.9-	0.5-
421105	062	2.0-	0.3+	780713	675	3.5-	2.6+ Y	780811	323	1.2+	0.7-
421105	062	0.9+	1.2+	780728	323	1.3-	1.6-	780811	323	0.2+	1.0+
421107	062	0.4+	0.1+	780728	323	0.1+	1.6+	821107	095	1.2-	0.2-
531109	024	1.2+	1.6+	780731	323	0.7+	0.1-	821108	095	0.4+	0.6+
531111	760	1.5-	1.7+	780731	323	0.1-	0.0	821115	688	1.1+	0.4-
531111	760	3.6-	3.2+	780801	323	1.8+	0.5+	821115	688	0.8+	1.0-
531202	760	0.5+	2.9+	780801	323	0.1+	0.3+				
531202	760	0.5-	2.3+	780803	323	0.3-	0.6-				

(3186)* 1973 SD3 = 1978 PT1 = 1979 XT1

Dicovered 1973 Sept. 22 by N. S. Chernykh at the Crimean Astrophysical Observatory.

Epoch 1985 Dec. 1.0 ET = JDE 2446400.5

M	77.85218		(1950.0)	P	Q
n	0.17906690	Peri.	202.67965	+0.97747454	-0.21103879
a	3.1173998	Node	169.50268	+0.19565621	+0.90169646
e	0.1649096	Incl.	0.77980	+0.07913386	+0.37736733
P	5.50	B(1,0)	13.5		

Residuals in seconds of arc

730922	095	0.2+	1.1+	791218	095	1.5-	3.3+	841029	688	1.0-	2.1-
730926	095	0.8+	0.8+	841017	801	3.3-	0.5+	841029	688	1.6+	3.5-
731026	095	1.9-	0.3+	841018	801	1.0+	1.6+	841124	801	1.1-	1.8+
780808	095	1.0-	3.3+	841023	688	0.2+	2.5-				
791214	095	1.1+	0.6+	841023	688	4.4+	1.1-				

(3187)* 1977 TO3 = 1977 UT1 = 1958 CB = 1982 AG

Discovered 1977 Oct. 10 at the Purple Mountain Observatory. The double designation 1977 TO3 = 1977 UT1 is by B. G. Marsden (MPC 9160).

Epoch 1985 Dec. 1.0 ET = JDE 2446400.5

M	95.95850	(1950.0)		P	Q
n	0.28559486	Peri.	105.55010	+0.53568484	-0.84366189
a	2.2836829	Node	312.00334	+0.75510524	+0.49753499
e	0.0581467	Incl.	2.75567	+0.37796537	+0.20172643
P	3.45	B(1,0)	14.0		

Residuals in seconds of arc

580211	330	1.8+	5.6+	820115	046	0.7-	0.7-	841021	801	0.3-	1.3+
771010	330	0.5-	1.1+	820116	046	2.4-	0.9+	841122	801	0.9+	2.9+
771016	330	2.2+	1.0-	820116	046	1.6-	0.5+	841125	054	3.4-	0.7-
771020	069	1.4-	1.0+	820118	046	1.9+	1.5-	841126	801	0.1-	0.7+
820115	046	0.6-	0.6+	820118	046	2.0+	0.4+				

(3188)* 1978 OM = 1954 SJ = 1954 UE1 = 1961 TQ = 1977 EC7 = 1980 BN4

Discovered 1978 July 28 at the Perth Observatory.

Epoch 1985 Dec. 1.0 ET = JDE 2446400.5

M	1.51120	(1950.0)		P	Q
n	0.28451735	Peri.	22.04309	+0.99896733	+0.03106537
a	2.2894450	Node	336.10449	-0.04293462	+0.88416342
e	0.1336073	Incl.	4.69482	+0.01486224	+0.46614374
P	3.46	B(1,0)	14.5		

Residuals in seconds of arc

540923	760	0.2+	1.2-	770314	381	0.9+	0.9+	780731	323	0.6+	0.2+
540923	760	1.1+	0.3+	770314	381	0.4-	0.5+	780806	323	0.3+	0.6+
541023	760	2.1-	0.7-	770315	381	1.6+	0.9-	780806	323	0.7+	2.1+
541023	760	2.3-	0.6+	770315	381	1.1-	0.2+	780808	323	1.1+	0.2-
611007	760	1.3-	0.2+	780710	675	5.6-	2.4- Y	780808	323	1.3+	1.1+
611007	760	0.7-	0.8-	780711	675	2.6-	3.8+ Y	780809	323	0.6+	0.4-
611017	760	0.4+	1.9+	780713	675	0.2+	6.0- Y	780809	323	0.9+	0.8-
611017	760	1.1+	0.5+	780728	323	0.2+	0.8+	800122	095	1.5-	1.6+
770312	381	0.1+	0.2+	780728	323	0.3+	2.3+	800123	095	1.5+	0.4+
770312	381	0.3+	0.6+	780731	323	0.8+	0.3+				

(3189)* 1978 RF6 = 1981 EE25

Discovered 1978 Sept. 13 by N. S. Chernykh at the Crimean Astrophysical Observatory. The identification was found independently by B. G. Marsden (MPC 8149).

Epoch 1985 Dec. 1.0 ET = JDE 2446400.5

M	117.67915	(1950.0)		P	Q
n	0.17960201	Peri.	189.62151	+0.99229857	-0.12370889
a	3.1112047	Node	177.45911	+0.12098105	+0.95699727
e	0.1841949	Incl.	8.16569	+0.02659181	+0.26239726
P	5.49	B(1,0)	14.0		

Residuals in seconds of arc

780913	095	5.8-	2.2+	810306	413	1.3-	0.4+	810406	413	0.9+	0.2+
780927	095	0.4+	1.4+	810306	413	1.2+	0.0	830902	801	1.1+	0.8+
781003	095	0.6+	0.4-	810311	413	0.3-	0.5-	830909	801	0.8-	1.5-
781007	095	1.7+	0.7-	810315	413	2.1-	0.9+	841125	801	0.2+	0.3+
781102	095	2.2+	1.0-	810315	413	0.7+	0.3+	841221	801	0.2-	0.6-
810302	413	1.1-	0.1-	810405	413	3.7+	1.7-				
810302	413	0.1+	1.3-	810406	413	1.5-	2.9+				

(3190)* 1978 SR6 = 1981 EA25

Discovered 1978 Sept. 26 by L. Zhuravleva at the Crimean Astrophysical Observatory.

Epoch 1985 Dec. 1.0 ET = JDE 2446400.5

M	146.26884		(1950.0)	P	Q
n	0.18966798	Peri.	0.54737	+0.99974707	+0.02180534
a	3.0001297	Node	358.17568	-0.02123464	+0.83457526
e	0.1110387	Incl.	9.95999	-0.00740818	+0.55046221
P	5.20	B(1,0)	14.0		

Residuals in seconds of arc

780926	095	4.0+	0.0	810311	413	1.4-	1.2-	810410	413	0.0	0.4+
781002	095	2.2+	0.4-	810311	413	0.6+	1.1-	810410	413	0.5+	0.9-
781008	095	1.2-	0.9-	810315	413	1.5-	0.4-	830904	688	0.8+	0.6-
781101	095	2.8-	2.6-	810315	413	1.1+	0.7-	830904	801	0.5-	0.7+
810302	413	1.6-	0.2+	810405	413	2.1-	0.7+	830904	688	2.0+	3.6-
810302	413	1.1+	1.1-	810405	413	2.3+	0.8-	841120	801	0.4+	0.6-
810306	413	1.4-	1.4-	810406	413	1.3-	0.6+	841223	801	0.5-	0.8+
810306	413	2.6-	1.5-	810406	413	1.0+	0.8-				

(3191)* 1979 SX9 = 1975 XQ5 = 1982 HD

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

Epoch 1985 Dec. 1.0 ET = JDE 2446400.5

M	237.80953		(1950.0)	P	Q
n	0.20220968	Peri.	185.55964	-0.55666156	+0.82991852
a	2.8747589	Node	50.62102	-0.76029794	-0.49104674
e	0.0137437	Incl.	2.73779	-0.33477595	-0.26477980
P	4.87	B(1,0)	13.5		

Residuals in seconds of arc

751204	095	0.0	0.6+	820319	809	0.6-	0.7+	841003	801	1.2-	0.8+
790922	095	0.7+	1.8+	820321	809	0.6-	0.7+	841018	801	2.0+	0.2+
790928	095	0.7-	0.6-	820321	809	0.9-	0.3+	841029	688	0.5+	2.2-
791016	095	1.9-	1.3+	820321	809	0.8-	0.7+	841029	688	0.3-	1.1-
791111	095	1.6+	0.9-	820418	688	1.1+	0.0	841031	688	0.7+	0.5-
791116	095	0.4-	0.4+	820418	688	0.3+	1.7-	841031	688	0.3-	0.8-
820319	809	0.7-	1.6+	820426	688	3.3+	2.2-				
820319	809	0.7-	0.9+	820426	688	1.2-	2.2-				

(3192)* 1982 BY1 = 1975 JN

Discovered 1982 Jan. 30 by E. Bowell at the Anderson Mesa Station of the Lowell Observatory.

Epoch 1985 Dec. 1.0 ET = JDE 2446400.5

M	13.52391		(1950.0)	P	Q
n	0.26904722	Peri.	90.18081	-0.83440609	-0.54955793
a	2.3763863	Node	56.48273	+0.48356395	-0.76641479
e	0.1711166	Incl.	2.87820	+0.26444731	-0.33255743
P	3.66	B(1,0)	14.5		

Residuals in seconds of arc

750507	808	1.6-	1.0-	820216	046	0.1-	0.1-	841025	801	2.1+	1.1+
750511	808	0.7+	1.5-	820219	046	1.9-	0.4+	841029	688	1.5+	0.2-
820130	688	0.1+	0.8-	820219	046	0.9-	0.4+	841029	688	1.4-	1.9-
820130	688	0.6-	1.7-	820220	688	1.0+	1.2-	841031	688	0.9+	1.8-
820214	046	1.0+	1.8+	820220	688	1.0+	0.9-	841031	688	1.8-	1.0-
820214	046	2.1-	1.6+	820228	688	1.3+	0.2-	841121	801	0.1-	0.7+
820216	046	0.0	0.3+	820228	688	0.9+	1.3-				

(3193)* 1982 DJ = 1977 VQ2 = 1979 JA

Discovered 1982 Feb. 20 by E. Bowell at the Anderson Mesa Station of the Lowell Observatory.

Epoch 1985 Dec. 1.0 ET = JDE 2446400.5

M	82.02227		(1950.0)	P	Q
n	0.28335753	Peri.	76.10121	+0.04438272	-0.99881931
a	2.2956881	Node	11.41004	+0.87364500	+0.02921563
e	0.1063329	Incl.	5.73037	+0.48453543	+0.03881290
P	3.48	B(1,0)	14.5		

Residuals in seconds of arc

771110	069	1.6+	1.2+	820130	688	0.3-	0.9+	841026	688	0.5-	1.5-
771110	069	2.6-	0.1-	820220	688	0.5+	0.6-	841120	688	1.6-	2.8-
771119	069	0.1-	1.8+	820228	688	1.0-	0.8+	841120	688	1.0+	2.4-
771119	069(26.4+	5.2+)		820228	688	0.9+	0.1-	841126	801	0.3-	1.6+
790501	801	0.9-	1.2-	820321	688	0.6-	0.3-	841127	688	0.9+	0.1-
790502	801	0.4-	1.1-	820321	688	0.7+	1.5-	841127	688	3.0+	0.2-
820130	688	0.3+	1.0+	841026	688	0.1+	1.9-	841221	801	1.1-	1.3+

(3194)* 1982 KD1 = 1978 SY

Discovered 1982 May 27 by C. Shoemaker at Palomar.

Epoch 1985 Dec. 1.0 ET = JDE 2446400.5

M	165.16372		(1950.0)	P	Q
n	0.18835960	Peri.	256.82766	+0.76272671	+0.62357258
a	3.0140066	Node	64.31933	-0.49474390	+0.73336855
e	0.0966821	Incl.	10.96878	-0.41650501	+0.27079107
P	5.23	B(1,0)	13.0		

Residuals in seconds of arc

780927	095	0.4+	1.6+	820518	675	0.5-	0.2-	831005	474	0.1+	2.4-
781007	095	0.3-	1.6-	820524	675	1.0+	0.4+	841126	801	0.2-	0.4-
820515	675	0.0	1.1-	820527	675	2.2+	0.3+	841127	801	1.6-	0.6-
820516	675	1.4-	0.8-	830810	474	0.5-	1.8+	841224	801	2.8+	0.9-
820516	675	1.3-	0.0	830810	474	0.0	2.1+				
820517	675	1.3-	1.1-	831005	474	0.6+	2.7-				

1976 YP2 = 1980 FB9 = 1984 YA

Epoch 1985 Dec. 1.0 ET = JDE 2446400.5 (J-P)

M	189.26324		(1950.0)	P	Q
n	0.36679256	Peri.	277.25305	+0.91608961	-0.03689270
a	1.9328133	Node	85.46544	+0.20762317	+0.89551816
e	0.1247034	Incl.	23.61110	-0.34303418	+0.44349312
P	2.69	B(1,0)	15.0		

Residuals in seconds of arc

761216	095	0.3-	0.5-	800316	095	0.2-	1.6+	850115	675	0.4-	0.0
761218	095	0.9+	1.1-	841217	675	2.2-	1.4+	850116	675	0.6-	1.8+
761220	095	0.2-	0.1-	841217	675	0.8+	0.3+	850116	675	0.3+	0.1-
770113	095	2.7+	3.0-	850115	675	2.1-	1.9+				

1978 NE = 1982 MJ

Epoch 1985 Dec. 1.0 ET = JDE 2446400.5 (J-P)

M	283.91842		(1950.0)	P	Q
n	0.23619310	Peri.	174.87486	+0.35754140	+0.90321492
a	2.5919429	Node	115.89972	-0.86589959	+0.41584695
e	0.1813148	Incl.	15.30315	-0.34983144	-0.10617965
P	4.17	B(1,0)	13.5		

Residuals in seconds of arc

780710	675	0.0	1.0+	780731	323	1.2+	2.4+	780811	323	1.3+	0.7-
780711	675	0.8-	0.6+	780731	323	1.0+	2.7+	780811	323	0.1-	1.9+
780712	675	0.1-	1.4+	780806	323	0.0	1.4+	820624	675	0.3-	0.1+
780713	675	0.2-	1.7+	780806	323	0.5+	1.5+	820624	675	0.5+	0.2-
780728	323	2.2-	1.8-	780809	323	1.2-	0.3+	820626	675	0.4-	1.6+
780728	323	0.8-	3.7+	780809	323	0.6-	0.3+	820626	675	0.3-	1.0+

1978 OJ = 1982 JB5

Epoch 1985 Dec. 1.0 ET = JDE 2446400.5 (J-P)

M	234.55128		(1950.0)	P	Q
n	0.22311731	Peri.	198.48762	+0.63482246	+0.73954679
a	2.6922460	Node	111.56463	-0.67504369	+0.67175533
e	0.1487841	Incl.	13.92238	-0.37592082	+0.04260660
P	4.42	B(1,0)	13.5		

Residuals in seconds of arc

780710	675	1.1-	6.2- Y	780731	323	2.0+	0.7-	780811	323	0.9-	1.6-
780711	675	1.5+	1.1- Y	780731	323	1.2+	0.2+	820515	095	1.7+	1.7-
780713	675	4.5+	2.7+ Y	780806	323	1.3-	3.6-	820523	095	0.5-	0.7+
780728	323	2.5-	3.5-	780806	323	0.3-	3.1-	820526	095	2.4-	0.4-
780728	323	3.3-	4.1-	780811	323	1.2-	2.9-				

1978 PR4 = 1974 FM1 = 1984 EE1

Epoch 1985 Dec. 1.0 ET = JDE 2446400.5 (J-P)

M	156.77317		(1950.0)	P	Q
n	0.29437605	Peri.	171.71056	-0.90069523	+0.43200914
a	2.2380439	Node	34.00378	-0.40315195	-0.79164454
e	0.1023084	Incl.	4.71833	-0.16191544	-0.43204979
P	3.35	B(1,0)	14.5		

Residuals in seconds of arc

740321	095	1.4-	2.7-	780807	323	0.5-	0.4+	780905	323	2.4+	2.2+
780801	323	2.3-	0.2+	780809	323	0.4-	1.8-	840301	675	0.7+	0.9+
780806	323	0.1-	0.8-	780809	323	1.1+	1.3-	840301	675	1.2+	0.6+
780806	323	1.2+	0.3-	780811	323	0.8-	0.3-	840304	675	0.9+	1.2+

1981 EY8 = 1983 SD

The identification is by E. Bowell.

Epoch 1985 Dec. 1.0 ET = JDE 2446400.5 (J-P)

M	156.69518		(1950.0)	P	Q
n	0.21463353	Peri.	73.76310	+0.94624068	-0.30982391
a	2.7627305	Node	304.19728	+0.23683943	+0.85931617
e	0.2371618	Incl.	6.45176	+0.22030810	+0.40692119
P	4.59	B(1,0)	14.5		

Residuals in seconds of arc

810301	413	0.2-	0.9+	810315	413	0.8-	0.0	810412	413	1.1+	0.4+
810307	413	0.1+	0.2-	810315	413	0.2+	0.3+	830927	046	2.9+	3.3-
810307	413	0.7+	0.0	810405	413	0.4-	0.1-	830927	046	1.6+	2.4+
810311	413	1.2-	0.5+	810405	413	1.0+	1.2-	830928	046	1.9-	1.0+
810311	413	0.7+	1.5-	810412	413	1.2-	1.1+	830928	046	2.5-	0.1-

1984 QO

Epoch 1985 Dec. 1.0 ET = JDE 2446400.5 (J-P)

M	49.91993		(1950.0)	P	Q
n	0.24043709	Peri.	89.19225	+0.29026797	-0.95439534
a	2.5613520	Node	343.41403	+0.75148400	+0.27250677
e	0.2587326	Incl.	14.15663	+0.59246628	+0.12194098
P	4.10	B(1,0)	13.5		

From 11 observations 1984 Aug. 28-Dec. 23, mean residual 1".9.

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

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

Comet Bowell (1982 I)
Epoch 1982 Mar. 12.0 ET = JDE 2445040.5
T 1982 Mar. 12.29342 ET

q	3.3639432	(1950.0)	P	Q
z	-0.0170363	Peri.	134.89006	-0.35902793	+0.93294968
	+/-0.0000017	Node	114.05267	-0.86424976	-0.32158930
e	1.0573091	Incl.	1.66483	-0.35237948	-0.16181848

From 99 observations 1980 Feb. 11-1984 Oct. 19, mean residual 1".2.

Comet Austin (1984i)
Epoch 1984 Aug. 8.0 ET = JDE 2445920.5
T 1984 Aug. 12.13713 ET

q	0.2912839	(1950.0)	P	Q
z	+0.0005279	Peri.	353.12701	-0.99850870	+0.03327843
	+/-0.0000040	Node	170.87724	+0.05312757	+0.77475612
e	0.9998462	Incl.	164.15979	-0.01256305	+0.63138380

From 53 observations 1984 July 8-Nov. 27, mean residual 1".2.

Comet Shoemaker (1984r)
T 1984 Sept. 3.42962 ET

q	5.4908378	(1950.0)	P	Q
		Peri.	183.20989	+0.57655536	+0.81697515
		Node	238.00095	+0.74990477	-0.52345829
e	1.0	Incl.	179.21346	+0.32438671	-0.24195666

From 24 observations 1984 Oct. 23-Dec. 27.

Periodic Comet Shoemaker 1 (1984q)
Epoch 1984 Sept. 17.0 ET = JDE 2445960.5
T 1984 Sept. 16.62934 ET

q	1.9768480	(1950.0)	P	Q
n	0.13624479	Peri.	18.67652	+0.98769707	+0.00054352
a	3.7404408	Node	339.31109	-0.11700220	+0.66604349
e	0.4714933	Incl.	26.27180	+0.10375440	+0.74591271
P	7.23				

From 65 observations 1984 Sept. 27-Dec. 26, mean residual 1".3.

Comet Levy-Rudenko (1984t)
Epoch 1984 Dec. 6.0 ET = JDE 2446040.5
T 1984 Dec. 14.25568 ET

q	0.9179843	(1950.0)	P	Q
z	+0.0006778	Peri.	82.73912	+0.31109309	-0.83746405
	+/-0.0000496	Node	330.46638	-0.09121826	+0.44426980
e	0.9993778	Incl.	65.71222	+0.94599171	+0.31824253

From 72 observations 1984 Nov. 14-1985 Jan. 1, mean residual 1".2.

Comet Shoemaker (1984s)
Epoch 1985 Jan. 15.0 ET = JDE 2446080.5
T 1985 Jan. 3.88807 ET

q	1.2145093	(1950.0)	P	Q
z	+0.0239300	Peri.	229.23463	-0.01972154	-0.98644204
	+/-0.0000414	Node	222.75665	+0.97429263	+0.01761569
e	0.9709368	Incl.	13.88551	+0.22442130	-0.16316187

From 46 observations 1984 Oct. 25-1985 Jan. 23, mean residual 1".3.

Comet Shoemaker (1984f)
Epoch 1985 Sept. 12.0 ET = JDE 2446320.5
T 1985 Sept. 4.60428 ET

		(1950.0)	P	Q
q 2.6963220				
z -0.0002452	Peri.	235.46721	-0.65093405	+0.34869470
+/-0.0000328	Node	48.98509	+0.12306592	+0.92498589
e 1.0006611	Incl.	116.66132	-0.74909254	-0.15104010

From 58 observations 1984 May 27-1985 Jan. 1, mean residual 1".6.

Comet Hartley (1984v)
T 1985 Sept. 27.27284 ET

		(1950.0)	P	Q
q 4.0106942				
	Peri.	254.99574	+0.08086404	-0.34008715
	Node	249.54771	+0.61012274	-0.72641567
e 1.0	Incl.	89.39225	-0.78816955	-0.59721101

From 9 observations 1984 Nov. 17-1985 Jan. 14.

(3195)* 1978 PT2 = 1964 WA1
Discovered 1978 Aug. 8 by N. S. Chernykh at the Crimean Astrophysical Observatory.
Epoch 1985 Dec. 1.0 ET = JDE 2446400.5

		(1950.0)	P	Q
M 171.17461				
n 0.19827971	Peri.	55.98519	+0.87576582	+0.48250196
a 2.9126203	Node	275.16172	-0.44771024	+0.80018069
e 0.0604938	Incl.	0.86504	-0.18052633	+0.35623408
P 4.97	B(1,0)	13.5		

Residuals in seconds of arc

641127	330	0.0	0.5+	780906	809	0.3+	0.0	830902	688	1.6-	0.7-
780808	095	2.0-	0.0	780910	809	0.5+	2.5+	830906	688	1.1-	1.0-
780902	809	0.4+	0.6-	780910	809	0.7+	1.2-	830906	688	0.8+	0.7+
780902	809	0.6-	0.6-	780910	809	1.5+	0.4+	831004	688	1.9+	0.6+
780902	809	0.8+	0.1-	780910	809	1.7+	0.5-	831004	688	2.4-	2.3-
780902	809	0.3+	0.1-	780928	095	2.8-	1.9+	841127	801	0.0	0.7-
780903	095	2.8-	2.2+	830902	688	4.2+	0.8-	841223	801	0.1-	0.2+

(3196)* 1978 RY = 1976 GY5 = 1979 YS2
Discovered 1978 Sept. 1 by N. S. Chernykh at the Crimean Astrophysical Observatory.
Epoch 1985 Dec. 1.0 ET = JDE 2446400.5

		(1950.0)	P	Q
M 150.26199				
n 0.18689650	Peri.	329.49704	+0.95273552	+0.30174388
a 3.0297162	Node	13.08387	-0.23760946	+0.81250115
e 0.0197352	Incl.	8.96944	-0.18930603	+0.49879105
P 5.27	B(1,0)	14.0		

Residuals in seconds of arc

760402	095	0.8+	1.1+	780928	095	1.3+	0.9+	830902	801	0.6-	0.4+
780901	095	0.1-	0.2+	781004	095	0.2-	0.0	841025	801	0.2+	0.2-
780905	095	0.0	0.6+	781008	095	0.0	0.7-	841121	801	0.0	0.6+
780907	095	0.1+	0.2-	781009	095	0.8-	0.2+				
780912	095	0.6-	0.3-	791224	095	0.4-	0.0				

(3197)* 1981 AD = 1971 UO3
Discovered 1981 Jan. 1 by E. Bowell at the Lowell Anderson Mesa Station.
Epoch 1985 Dec. 1.0 ET = JDE 2446400.5

		(1950.0)	P	Q
M 77.79045				
n 0.22645833	Peri.	312.82325	+0.40769060	-0.87439791
a 2.6656953	Node	111.35882	+0.89831789	+0.33240482
e 0.1823270	Incl.	16.40904	+0.16374776	+0.35346192
P 4.35	B(1,0)	14.5		

Residuals in seconds of arc

711030	095	1.7+	3.5-	810130	688	1.3-	0.0	820428	688	1.7-	2.3-
810101	688	1.4-	0.2+	810228	688	0.2-	1.2+	841125	801	0.3+	1.1-
810101	688	0.0	0.7+	810228	688	0.6+	1.2+	841126	474	0.4+	0.7+
810114	688	0.9-	0.3+	820421	688	2.4+	2.5-	841126	474	0.4+	0.4+
810114	688	2.7+	3.7-	820421	688	3.2-	1.6+	841221	801	0.7-	0.0
810130	688	0.7-	1.6+	820428	688	0.8+	1.2-				

(3198)* 1981 YH1

Discovered 1981 Dec. 30 by F. Dossin at Haute Provence.

Epoch 1985 Dec. 1.0 ET = JDE 2446400.5

			(1950.0)	P	Q
M	63.04203				
n	0.30617823	Peri.	39.92065	-0.51534069	-0.80025635
a	2.1801507	Node	83.20524	+0.68608124	-0.59965493
e	0.2386104	Incl.	17.98605	+0.51353335	-0.00193299
P	3.22	B(1,0)	14.5		

Residuals in seconds of arc

811202	511	1.0+	2.3-	820223	511	2.6+	1.1+	841027	511	0.1-	0.3+
811230	511	0.0	0.9+	820225	511	2.1-	1.8+	841028	511	0.2+	0.0
820127	511	1.9-	0.9+	820226	511	1.2-	0.1+	841126	474	1.0+	1.4+
820127	511	1.3-	1.2+	820327	801	0.3+	1.0+	841126	474	1.0+	1.6+
820131	688	0.3-	1.1-	820420	801	0.5-	1.9+	841127	801	3.1-	0.4-
820131	688	2.3+	2.4-	820527	801	0.8+	0.8+	841227	801	0.2-	0.7-
820220	688	1.4+	1.6-	830810	474	0.0	1.2-				
820220	688	0.6+	2.5-	830810	474	0.6-	0.1-				

(3199)* 1982 RA

Discovered 1982 Sept. 13 by C. Shoemaker and E. Shoemaker at Palomar.

Epoch 1985 Dec. 1.0 ET = JDE 2446400.5

			(1950.0)	P	Q
M	194.85382				
n	0.49879731	Peri.	53.24906	+0.79616892	-0.57413682
a	1.5746595	Node	339.45577	+0.21130005	+0.55961131
e	0.2837208	Incl.	32.97512	+0.56698090	+0.59766385
P	1.98	B(1,0)	16.3		

Residuals in seconds of arc

820913	675	0.4+	1.8+	820922	688	0.5+	1.0-	840725	474	1.0+	1.8-
820913	675	0.0	1.8+	820923	474	0.4-	1.4-	840726	474	0.6+	1.1-
820916	413	1.0-	2.2+	820923	474	0.4+	1.9-	840726	474	0.7+	0.3-
820916	413	1.1+	0.4+	820924	675	0.3+	0.8+	840823	474	1.4-	0.2+
820916	413	(1.8+	3.5+)	821005	413	2.0-	1.9-	840823	474	0.9-	0.7+
820916	413	1.7-	0.9-	821005	413	0.3+	0.5+	840825	474	1.8+	0.5-
820917	675	1.1-	0.1-	821011	801	0.1+	0.1-	840825	474	1.0+	0.5-
820918	675	0.9-	1.1+	821012	675	(0.0	12.3+)	840831	688	0.8-	0.9+
820918	675	0.3-	1.7+	821012	675	(0.8-	11.2+)	840831	688	0.0	0.7+
820918	675	0.5-	0.4-	821013	675	0.9-	0.1-	840902	657	0.7+	0.1+
820918	675	0.5+	1.2+	821013	675	0.2+	2.2-	840919	657	0.7+	0.6-
820918	010	(2.3-	3.7+)	821017	801	0.1+	0.4+	840919	657	0.4-	0.3-
820919	675	(3.4-	1.7+)	821106	675	0.7+	0.0	840923	801	1.6-	0.3+
820919	675	(1.5-	3.6+)	821109	801	0.7-	1.9+	840926	801	1.0-	0.6-
820919	010	2.2+	2.7+	821204	675	0.6+	0.1+	840930	801	0.9-	0.2+
820919	010	(2.2+	3.9+)	821216	801	0.9+	0.4-	841016	801	0.2+	0.4+
820919	010	(2.9+	3.4+)	830108	801	0.5+	0.4-	841020	801	0.1+	0.7+
820920	675	0.2-	0.7-	830124	675	(9.5+	2.3+)	841021	568	0.1-	0.3+
820920	675	2.2+	0.7-	830115	801	1.1-	1.5-	841022	568	0.5+	0.7+
820920	675	2.5+	1.5-	840531	474	1.9-	0.9+	841120	801	0.7+	0.7-
820922	688	(1.3-	4.3-)	840531	474	1.3-	1.1+	841226	801	1.7-	1.6+
820922	688	1.2+	1.8-	840725	474	1.8+	1.9-				

(3200)* 1983 TB

Discovered 1983 Oct. 11 with the Infrared Astronomical Satellite.

Epoch 1985 Dec. 1.0 ET = JDE 2446400.5

M	205.43402	(1950.0)	P	Q
n	0.68757504	Peri. 321.66795	-0.64052893	+0.67088793
a	1.2713232	Node 265.04616	-0.57886942	-0.74155819
e	0.8901712	Incl. 22.02894	-0.50461161	-0.00090718
P	1.43	B(1,0) 16.0		

Residuals in seconds of arc

831011	500	(34.0-	17.8-)Y	831107	675	0.3-	0.2+	841120	801	0.1+	0.2-
831011	500	(6.0+	1.5-)Y	831107	381	0.5-	1.8+	841123	293	(6.0-	1.7-)
831011	500	(27.0-	9.3-)Y	831107	381	1.5+	0.9-	841123	293	0.3-	1.5+
831011	500	(2.4-	0.8+)Y	831109	801	0.2-	1.0+	841126	801	0.9-	0.1-
831011	500	(47.5-	19.2-)Y	831129	675	0.2+	0.6+	841127	688	2.1+	1.4-
831012	688	(1.7+	4.9-)	831130	675	3.9+	0.1+	841127	688	0.7+	1.3-
831012	688	(8.6+	1.2-)	831130	675	3.7+	2.4+	841127	688	0.3+	2.0-
831012	675	2.8+	1.2-	831203	801	1.1-	1.1+	841127	567	(4.8-	0.1-)
831012	675	1.0+	1.5-	831223	675	1.5+	0.1-	841128	567	(3.6-	0.2-)
831013	675	(4.2-	1.2+)	840102	801	1.9-	0.0	841128	567	1.6-	0.1+
831014	688	2.3-	0.5+	840124	675	0.8-	0.5+	841201	675	0.8-	0.4+
831014	688	1.8-	1.2-	840905	675	0.3+	0.6-	841202	675	0.7-	0.1-
831016	675	1.0+	0.7-	840906	675	0.5-	1.1-	841205	657	1.7+	0.1-
831018	675	1.0+	0.4-	840922	691	0.6+	0.3-	841218	801	1.6-	1.3-
831018	675	0.2-	0.2-	840922	691	0.6+	0.2+	841219	657	1.5-	0.4+
831027	688	(1.8+	2.5-)	840922	691	0.2-	0.2+	841221	568	0.8-	0.3-
831027	688	(3.1-	0.3-)	840929	691	(3.6+	0.3-)	841221	568	0.5-	0.3-
831027	688	0.5+	2.3+	840929	691	(6.3+	3.1-)	841222	568	0.1+	0.7+
831027	675	0.0	0.1-	840929	691	(3.6+	0.0)	841222	568	0.8+	1.0+
831027	675	0.1+	0.2-	841023	568	0.6-	1.7-	841223	568	0.5+	0.3+
831029	675	0.4+	0.1+	841025	801	1.3+	0.7-	841223	568	0.5+	1.1+
831101	801	1.5-	0.0	841025	372	(7.9+	4.8+)	841227	801	0.4-	0.5+
831106	675	0.1-	0.5-	841025	372	(8.4+	4.2+)				

(3201)* 6560 P-L = 1969 FE = 1979 DP

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

Epoch 1985 Dec. 1.0 ET = JDE 2446400.5

M	352.34325	(1950.0)	P	Q
n	0.29048045	Peri. 52.57998	-0.94827711	-0.31358895
a	2.2580044	Node 109.09714	+0.27224823	-0.88329313
e	0.0885098	Incl. 2.99178	+0.16325262	-0.34850424
P	3.39	B(1,0) 15.0		

Residuals in seconds of arc

600924	675	0.4+	0.4+	601022	675	1.6-	0.1-	840928	033	0.1-	0.5-
600926	675	1.0+	0.6-	601024	675	0.0	0.3-	840928	033	0.0	0.4+
600927	675	0.4+	0.2-	601026	675	0.8+	0.4+	841127	801	0.5+	1.2-
600928	675	0.5+	0.3+	690323	095	0.7-	1.7-	841221	801	0.2+	0.0
601017	675	1.0-	0.1+	790227	330	0.2+	0.7+				

1982 DV

Epoch 1985 Dec. 1.0 ET = JDE 2446400.5

M	91.45636	(1950.0)	P	Q
n	0.33994933	Peri. 349.23096	-0.88706265	+0.45721284
a	2.0332616	Node 218.18585	-0.41548588	-0.85097003
e	0.4568575	Incl. 5.92776	-0.20122460	-0.25846939
P	2.90	B(1,0) 16.5		

Residuals in seconds of arc

820228	809	0.6+	0.8+	820321	809	0.5+	0.3-	820424	688	2.1+	1.1+
820304	809	0.4+	0.4+	820321	809	0.8+	0.7-	820424	688	0.9-	0.5-
820305	809	0.1-	0.3+	820321	809	0.0	0.6-	820424	474	0.5-	2.4+
820306	809	0.3-	0.5+	820323	809	1.2+	1.2-	820424	474	0.6-	2.3+
820307	809	1.1-	1.1+	820323	809	1.2+	1.0-	820430	675	0.9-	0.2+
820309	809	0.9-	0.7+	820323	809	1.2+	1.0-	820521	491	2.3+	1.1+
820310	809	0.0	1.1+	820324	675	0.7+	1.1+	820521	491	1.5+	0.7+
820311	809	0.7+	0.8+	820324	675	0.5-	0.6-	820522	491	1.2+	0.2-
820312	809	0.9+	0.2-	820324	809	0.0	0.4-	820522	801	1.1-	0.5+
820313	809	0.0	0.2-	820324	809	0.4-	0.2-	820527	046	0.9-	2.2-
820314	809	0.1-	0.2-	820324	809	0.4-	0.4-	820527	046	0.2-	1.7-
820317	809	0.5-	0.3+	820325	809	0.6-	0.8+	820618	491	0.8+	0.4-
820318	809	0.5-	0.3+	820325	809	0.6-	0.9+	820618	491	0.6+	0.7-
820318	809	0.4+	0.9-	820325	809	0.7-	0.7+	820618	491	0.1-	0.0
820318	809	0.1+	0.8-	820327	474	0.5-	0.4+	820618	491	0.0	0.4-
820318	809	0.1-	0.8-	820327	474	0.0	0.5+	820814	675	0.3-	1.3+
820319	809	1.6-	1.8+	820328	805	1.2-	0.7+	820815	675	0.4-	0.2-
820319	809	0.1+	0.5-	820328	805	0.3+	1.4+	820819	801	0.4-	0.5-
820319	809	0.5+	0.9-	820328	372	2.3-	1.4+	820912	675	0.0	0.3+
820319	809	0.8+	0.4-	820331	809	0.3-	1.8-	820914	675	1.1-	0.6-
820319	809	0.5+	0.6-	820331	809	0.0	1.9-	841202	675	1.4-	0.6-
820319	809	1.0+	0.8-	820331	809	0.2+	1.7-	841223	801	0.6+	1.4-
820319	809	0.9+	0.6-	820423	474	1.4-	0.3-				
820321	809	0.8+	0.4-	820423	474	1.2-	0.0				

1983 SA
Epoch 1985 Dec. 1.0 ET = JDE 2446400.5

M	97.27140		(1950.0)	P	Q
n	0.11326151	Peri.	316.60390	+0.61343557	+0.78475789
a	4.2307220	Node	350.02849	-0.50889699	+0.30698946
e	0.7145723	Incl.	30.77923	-0.60392106	+0.53843525
P	8.70	B(1,0)	14.5		

Residuals in seconds of arc

830910	688	1.8-	1.4+	831009	675	0.8-	0.6-	831107	675	0.0	0.7+
830910	688	1.0+	0.4-	831010	801	3.6-	0.5+	831107	675	1.1+	0.4+
830912	675	1.8-	0.8-	831010	026	0.1-	0.5+	831108	026	1.4+	0.5+
830912	675	0.3-	3.0-	831011	688	0.8+	0.0	831109	801	0.6-	0.6+
830926	026	0.2+	0.9+	831012	688	0.4+	1.6-	831109	026	0.4+	0.1-
830928	026	0.7+	0.4+	831012	026	0.3+	0.1+	831130	801	2.3-	1.2-
831001	026	0.5+	0.3+	831013	026	1.0+	0.8-	831130	675	2.5-	0.2+
831001	026	0.1+	2.4+	831013	026	1.2+	0.0	831130	675	4.2-	0.3-
831002	026	1.4+	0.5+	831027	675	0.2-	0.6+	831201	026	2.3+	0.8-
831002	026	0.9+	0.1-	831027	046	0.6+	0.5+	831201	026	0.7+	0.2+
831003	026	0.8+	0.2+	831027	046	0.3+	1.9+	831215	675	0.3-	1.0-
831004	688	3.1+	0.6-	831027	026	1.1+	0.2+	840103	801	2.3-	0.5+
831004	688	1.8+	1.3-	831029	675	0.2-	1.0+	840124	675	0.3-	0.2-
831004	026	0.0	0.2+	831101	801	1.3-	0.5-	840202	801	1.8-	1.7-
831005	026	0.3+	0.2-	831101	026	0.8+	0.7-	840222	675	0.3-	0.2-
831006	675	0.8-	1.0+	831102	046	1.2-	0.5-	840303	801	0.3-	1.6+
831006	675	0.5-	0.4-	831102	046	1.7-	0.3-	841005	675	1.2-	4.0-
831007	801	1.7-	1.6+	831102	026	0.9+	0.0	841202	675	0.3+	0.2+
831009	675	0.5+	1.6-	831104	707	0.2-	0.6+				
831009	675	0.6-	0.2+	831106	026	1.6+	0.0				

1983 VA
Epoch 1985 Dec. 1.0 ET = JDE 2446400.5

M	167.10796		(1950.0)	P	Q
n	0.23365373	Peri.	11.68396	+0.03309818	-0.96163892
a	2.6106835	Node	76.87026	+0.89293029	-0.09394506
e	0.6917034	Incl.	16.23778	+0.44897662	+0.25773033
P	4.22	B(1,0)	17.5		

From 10 observations 1983 Oct. 27-1984 May 3, mean residual 1".3.

1983 XF
Epoch 1985 Dec. 1.0 ET = JDE 2446400.5

M	113.40548		(1950.0)	P	Q
n	0.17904107	Peri.	54.77470	-0.61339999	-0.78672075
a	3.1176996	Node	73.21030	+0.69898130	-0.58166974
e	0.5345053	Incl.	4.15467	+0.36764872	-0.20671423
P	5.50	B(1,0)	16.0		

From 43 observations 1983 Nov. 28-1984 May 25, mean residual 1".4.

1984 BC
Epoch 1985 Dec. 1.0 ET = JDE 2446400.5

M	94.36270		(1950.0)	P	Q
n	0.15458024	Peri.	41.93549	-0.95175421	-0.09531649
a	3.4384818	Node	130.11384	+0.05534612	-0.98826720
e	0.5466021	Incl.	22.42050	+0.30182898	-0.11934281
P	6.38	B(1,0)	17.0		

From 12 observations 1984 Jan. 30-May 25, mean residual 0".5.

* * * * *

EPHEMERIDES.

(3199) 1982 RA a,e,i = 1.57, 0.28, 33 Elements MPC 9427

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	Mag.
1984 12 16		20 33.57	+55 49.1	0.687	1.180	87.9	56.5	17.1
1984 12 21		20 48.27	+57 45.9					
1984 12 26		21 05.83	+59 46.3	0.698	1.206	90.0	54.6	17.2
1984 12 31		21 26.91	+61 48.3					
1985 01 05		21 52.35	+63 48.6	0.705	1.237	92.7	52.6	17.2
1985 01 10		22 23.14	+65 41.6					
1985 01 15		23 00.16	+67 19.3	0.714	1.271	95.6	50.4	17.2
1985 01 20		23 43.75	+68 31.5					
1985 01 25		00 32.91	+69 07.1	0.729	1.307	98.4	48.2	17.3
1985 01 30		01 24.88	+68 57.1					
1985 02 04		02 15.78	+67 58.5	0.755	1.346	100.4	46.1	17.4
1985 02 09		03 02.34	+66 15.4					
1985 02 14		03 42.94	+63 57.0	0.797	1.385	101.3	44.3	17.5
1985 02 19		04 17.53	+61 14.2					
1985 02 24		04 46.89	+58 16.8	0.856	1.426	100.9	43.0	17.7
1985 03 01		05 11.98	+55 12.7					
1985 03 06		05 33.71	+52 07.5	0.932	1.466	99.2	41.9	17.9
1985 03 11		05 52.80	+49 05.2					
1985 03 16		06 09.85	+46 08.5	1.025	1.507	96.4	41.0	18.2
1985 03 21		06 25.32	+43 18.9					
1985 03 26		06 39.54	+40 37.2	1.132	1.546	92.9	40.1	18.4
1985 03 31		06 52.76	+38 03.6					
1985 04 05		07 05.18	+35 38.1	1.250	1.585	88.9	39.1	18.7
1985 04 10		07 16.94	+33 20.2					
1985 04 15		07 28.17	+31 09.5	1.375	1.624	84.6	38.0	18.9

1985 04 25	07 49.37	+27 06.8	1.506	1.660	80.1	36.6	19.1
1985 05 05	08 09.32	+23 25.2					
1985 05 15	08 28.34	+20 00.1	1.773	1.730	70.9	33.5	19.5
1985 05 25	08 46.71	+16 47.7					
1985 06 04	09 04.57	+13 44.6	2.035	1.793	61.7	29.9	19.8
1985 06 14	09 22.04	+10 48.4					
1985 06 24	09 39.25	+07 56.9	2.278	1.849	52.7	25.9	20.0

Comet Levy-Rudenko (1984t) Elements MPC 9425

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	m1
1985 01 15	18 01.24	+47 32.5	0.820	1.076	72.6	60.7	8.7
1985 01 20	17 49.06	+52 34.0					
1985 01 25	17 30.37	+58 20.2	0.719	1.174	85.6	56.7	8.6
1985 01 30	16 58.44	+64 45.9					
1985 02 04	15 56.73	+71 12.5	0.646	1.284	101.7	48.7	8.6
1985 02 09	13 54.46	+75 25.8					
1985 02 14	11 21.26	+73 44.1	0.633	1.402	118.1	38.4	8.7
1985 02 19	09 48.58	+67 10.2					
1985 02 24	09 03.86	+59 16.5	0.700	1.524	128.0	30.7	9.1
1985 03 01	08 40.79	+51 43.0					
1985 03 06	08 28.04	+45 02.9	0.840	1.650	128.2	28.2	9.7
1985 03 11	08 20.84	+39 22.3					
1985 03 16	08 16.95	+34 36.2	1.031	1.776	122.5	28.2	10.3
1985 03 21	08 15.22	+30 36.4					
1985 03 26	08 14.97	+27 14.5	1.255	1.903	114.8	28.4	10.9
1985 03 31	08 15.80	+24 23.0					
1985 04 05	08 17.43	+21 56.0	1.499	2.030	106.9	28.1	11.4
1985 04 10	08 19.66	+19 48.5					
1985 04 15	08 22.36	+17 56.7	1.755	2.156	99.1	27.4	11.9
1985 04 25	08 28.86	+14 48.3	2.018	2.281	91.6	26.2	14.1
1985 05 05	08 36.38	+12 13.2					
1985 05 15	08 44.58	+10 00.1	2.548	2.527	77.3	23.0	15.1
1985 05 25	08 53.25	+08 01.7					
1985 06 04	09 02.21	+06 13.1	3.063	2.769	63.8	19.2	15.9
1985 06 14	09 11.33	+04 30.9					
1985 06 24	09 20.54	+02 52.7	3.543	3.005	50.7	15.2	16.5
1985 07 04	09 29.75	+01 17.0					
1985 07 14	09 38.90	-00 17.4	3.973	3.236	38.2	11.2	17.1

1983 XF a,e,i = 3.12, 0.53, 4 Elements MPC 9430

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	Mag.
1985 04 05	18 24.28	-23 46.4	3.118	3.423	99.1	16.8	21.5
1985 04 15	18 25.95	-23 52.8					
1985 04 25	18 25.40	-24 01.0	2.922	3.514	118.5	14.6	21.4
1985 05 05	18 22.59	-24 10.7					
1985 05 15	18 17.63	-24 21.3	2.772	3.602	139.6	10.5	21.2
1985 05 25	18 10.75	-24 31.7					
1985 06 04	18 02.41	-24 40.6	2.707	3.687	162.2	4.8	21.1
1985 06 14	17 53.23	-24 46.9					
1985 06 24	17 43.92	-24 50.1	2.755	3.768	174.2	1.6	20.9
1985 07 04	17 35.21	-24 50.5					
1985 07 14	17 27.70	-24 48.9	2.920	3.845	151.6	7.2	21.4

Comet Hartley (1984v) Elements MPC 9426

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	m2
1985 04 25	04 28.29	-20 04.9	4.835	4.225	47.8	10.2	17.2
1985 05 05	04 36.01	-20 29.7					
1985 05 15	04 44.42	-21 04.4	4.839	4.175	44.3	9.7	17.1

1985 05 25	04 53.43	-21 50.2						
1985 06 04	05 02.95	-22 48.4	4.780	4.131	45.3	10.1	17.1	
1985 06 14	05 12.90	-23 59.8						
1985 06 24	05 23.22	-25 25.6	4.671	4.093	50.1	11.0	17.0	
1985 07 04	05 33.81	-27 06.7						
1985 07 14	05 44.62	-29 03.8	4.527	4.062	56.9	12.1	16.9	
1985 07 24	05 55.57	-31 17.5						
1985 08 03	06 06.56	-33 48.0	4.368	4.039	64.6	13.1	16.8	
1985 08 13	06 17.52	-36 35.0						
1985 08 23	06 28.33	-39 37.9	4.219	4.022	71.9	13.8	16.7	
1985 09 02	06 38.87	-42 55.3						
1985 09 12	06 48.99	-46 25.2	4.100	4.013	78.0	14.2	16.6	
1985 09 22	06 58.49	-50 05.2						
1985 10 02	07 07.12	-53 51.8	4.027	4.011	81.9	14.3	16.6	
1985 10 12	07 14.55	-57 41.3						
1985 10 22	07 20.30	-61 29.7	4.008	4.016	83.4	14.2	16.6	
1985 11 01	07 23.71	-65 12.4						
1985 11 11	07 23.84	-68 45.2	4.038	4.029	82.4	14.1	16.6	
1985 11 21	07 19.30	-72 03.1						
1985 12 01	07 08.14	-75 00.8	4.103	4.049	80.0	13.9	16.6	
1985 12 11	06 47.84	-77 32.1						
1985 12 21	06 16.11	-79 29.0	4.182	4.076	77.0	13.6	16.7	

Comet Bowell (1982 I) Elements MPC 9425

Date ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	m2
1985 04 25	23 59.62	-01 31.4	10.832	10.024	35.0	3.3	20.2
1985 05 05	00 03.03	-01 10.3					
1985 05 15	00 06.09	-00 51.7	10.738	10.156	52.6	4.5	20.2
1985 05 25	00 08.74	-00 35.9					
1985 06 04	00 10.92	-00 23.3	10.581	10.287	70.5	5.3	20.2
1985 06 14	00 12.60	-00 14.0					
1985 06 24	00 13.75	-00 08.3	10.389	10.418	88.8	5.6	20.3
1985 07 04	00 14.33	-00 06.3					
1985 07 14	00 14.35	-00 08.0	10.194	10.549	107.8	5.3	20.3
1985 07 24	00 13.79	-00 13.3					
1985 08 03	00 12.69	-00 22.0	10.034	10.680	127.3	4.3	20.3
1985 08 13	00 11.09	-00 33.8					
1985 08 23	00 09.06	-00 48.2	9.943	10.810	147.5	2.9	20.3
1985 09 02	00 06.69	-01 04.6					
1985 09 12	00 04.08	-01 22.2	9.952	10.939	168.2	1.1	20.4
1985 09 22	00 01.35	-01 40.2					
1985 10 02	23 58.64	-01 57.8	10.080	11.069	170.5	0.9	20.5
1985 10 12	23 56.07	-02 14.1					
1985 10 22	23 53.76	-02 28.5	10.329	11.198	149.5	2.6	20.6
1985 11 01	23 51.82	-02 40.2					
1985 11 11	23 50.31	-02 48.8	10.682	11.326	128.6	3.9	20.7

1976 YP2 a,e,i = 1.93, 0.12, 24 Elements MPC 9423

Date ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	Mag.
1985 01 15	04 11.59	+23 25.1	1.089	1.886	130.9	23.2	17.1
1985 01 25	04 11.24	+25 39.4					
1985 02 04	04 15.34	+27 38.5	1.315	1.917	112.1	28.4	17.7
1985 02 14	04 23.26	+29 24.2					
1985 02 24	04 34.42	+30 57.7	1.568	1.948	96.6	30.3	18.1
1985 03 06	04 48.32	+32 19.5					
1985 03 16	05 04.48	+33 29.6	1.826	1.978	83.5	30.0	18.5
1985 03 26	05 22.54	+34 27.5					
1985 04 05	05 42.17	+35 12.9	2.076	2.007	72.0	28.3	18.8

1978 OJ a,e,i = 2.69, 0.15, 14 Elements MPC 9424

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	Mag.
1985	01 15	08 04.66	+22 27.7	2.098	3.080	175.2	1.5	17.4
1985	01 25	07 55.12	+23 30.2					
1985	02 04	07 46.10	+24 25.9	2.144	3.086	159.2	6.5	17.7
1985	02 14	07 38.53	+25 12.1					
1985	02 24	07 33.08	+25 47.9	2.301	3.090	135.9	12.9	18.1
1985	03 06	07 30.15	+26 13.6					
1985	03 16	07 29.80	+26 30.2	2.536	3.092	115.1	16.9	18.4
1985	03 26	07 31.95	+26 38.8					
1985	04 05	07 36.37	+26 40.2	2.811	3.093	96.8	18.7	18.6
1985	04 15	07 42.78	+26 35.0					
1985	04 25	07 50.90	+26 23.5	3.093	3.091	80.5	18.7	18.8

1984 YC a,e,i = 2.73, 0.25, 32 Elements MPC 9414

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	Mag.
1985	01 15	08 15.46	+05 17.2	1.083	2.042	162.4	8.4	14.9
1985	01 25	08 00.17	+02 17.8					
1985	02 04	07 45.94	-00 13.6	1.109	2.040	153.7	12.4	15.1
1985	02 14	07 34.50	-02 11.6					
1985	02 24	07 26.87	-03 37.8	1.236	2.045	133.2	20.6	15.5
1985	03 06	07 23.42	-04 38.5					
1985	03 16	07 23.91	-05 21.6	1.425	2.058	115.3	25.9	15.9
1985	03 26	07 27.91	-05 54.2					
1985	04 05	07 34.93	-06 22.4	1.643	2.077	100.8	28.2	16.3
1985	04 15	07 44.42	-06 50.7					
1985	04 25	07 55.98	-07 22.2	1.868	2.102	88.7	28.6	16.6

1978 NE a,e,i = 2.59, 0.18, 15 Elements MPC 9423

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	Mag.
1985	01 15	09 28.89	+20 50.4	2.097	3.021	155.7	7.7	17.7
1985	01 25	09 21.04	+22 15.0					
1985	02 04	09 11.96	+23 38.7	2.026	3.006	172.8	2.4	17.3
1985	02 14	09 02.59	+24 54.6					
1985	02 24	08 53.95	+25 57.4	2.075	2.989	152.7	8.7	17.7
1985	03 06	08 46.98	+26 44.1					
1985	03 16	08 42.27	+27 14.4	2.228	2.970	130.4	14.8	17.9
1985	03 26	08 40.15	+27 29.4					
1985	04 05	08 40.68	+27 31.1	2.447	2.949	110.5	18.5	18.2
1985	04 15	08 43.67	+27 21.3					
1985	04 25	08 48.90	+27 01.6	2.696	2.926	93.0	20.1	18.4
1985	05 05	08 56.07	+26 33.2					
1985	05 15	09 04.87	+25 56.9	2.945	2.901	77.6	19.9	18.6

1981 EY8 a,e,i = 2.76, 0.24, 6 Elements MPC 9424

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	Mag.
1985	01 15	09 32.81	+13 08.5	1.980	2.891	153.0	8.9	18.5
1985	01 25	09 24.27	+13 28.1					
1985	02 04	09 14.76	+13 52.1	1.952	2.937	177.0	1.0	18.1
1985	02 14	09 05.27	+14 16.7					
1985	02 24	08 56.77	+14 38.3	2.042	2.980	157.5	7.3	18.6
1985	03 06	08 50.06	+14 54.4					
1985	03 16	08 45.61	+15 03.6	2.238	3.023	134.8	13.5	19.0
1985	03 26	08 43.60	+15 05.3					
1985	04 05	08 43.99	+14 59.5	2.507	3.063	114.7	17.3	19.3
1985	04 15	08 46.56	+14 46.3					
1985	04 25	08 51.08	+14 26.0	2.815	3.101	96.9	18.8	19.6
1985	05 05	08 57.24	+13 58.8					
1985	05 15	09 04.78	+13 25.2	3.132	3.138	81.1	18.6	19.9

1976 QD1 a,e,i = 2.24, 0.10, 3 Elements MPC 9416

Date ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	Mag.
1985 01 15	12 58.12	-07 10.5	2.104	2.446	98.2	23.5	19.1
1985 01 25	13 04.38	-07 42.4					
1985 02 04	13 08.35	-07 58.8	1.855	2.451	115.8	21.2	18.8
1985 02 14	13 09.74	-07 58.0					
1985 02 24	13 08.31	-07 38.5	1.643	2.454	136.2	16.2	18.4
1985 03 06	13 04.06	-06 59.9					
1985 03 16	12 57.29	-06 04.2	1.500	2.456	159.3	8.2	18.0
1985 03 26	12 48.67	-04 55.5					
1985 04 05	12 39.24	-03 40.9	1.457	2.456	175.8	1.7	17.6
1985 04 15	12 30.19	-02 29.0					
1985 04 25	12 22.58	-01 27.4	1.522	2.454	151.5	11.3	18.1
1985 05 05	12 17.24	-00 42.1					
1985 05 15	12 14.52	-00 15.7	1.676	2.450	129.8	18.5	18.5
1985 05 25	12 14.51	-00 08.5					
1985 06 04	12 17.07	-00 19.5	1.887	2.444	111.2	22.8	18.8
1985 06 14	12 21.93	-00 46.3					
1985 06 24	12 28.81	-01 27.1	2.123	2.436	95.2	24.5	19.1

1979 SM11 a,e,i = 2.25, 0.15, 5 Elements MPC 9418

Date ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	Mag.
1985 02 24	15 37.04	-19 49.4	1.703	2.088	98.2	28.0	17.2
1985 03 06	15 49.29	-20 09.3					
1985 03 16	15 59.47	-20 16.7	1.455	2.058	113.0	26.4	16.8
1985 03 26	16 07.07	-20 11.1					
1985 04 05	16 11.65	-19 52.2	1.236	2.029	130.0	22.2	16.3
1985 04 15	16 12.83	-19 20.2					
1985 04 25	16 10.44	-18 35.2	1.067	2.003	150.0	14.5	15.8
1985 05 05	16 04.76	-17 39.1					
1985 05 15	15 56.59	-16 35.7	0.974	1.980	172.2	4.0	15.3
1985 05 25	15 47.26	-15 31.0					
1985 06 04	15 38.43	-14 32.9	0.969	1.960	162.3	9.1	15.4
1985 06 14	15 31.57	-13 48.4					
1985 06 24	15 27.70	-13 22.2	1.048	1.944	140.7	19.3	15.8
1985 07 04	15 27.31	-13 15.6					
1985 07 14	15 30.41	-13 27.0	1.186	1.932	122.4	26.4	16.2
1985 07 24	15 36.79	-13 53.4					
1985 08 03	15 46.10	-14 31.0	1.360	1.924	107.4	30.2	16.6

(3185) 1953 VY1 a,e,i = 2.37, 0.19, 4 Elements MPC 9420

Date ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	Mag.
1985 03 16	17 09.83	-21 41.9	2.182	2.498	96.5	23.3	19.2
1985 03 26	17 18.54	-21 58.5					
1985 04 05	17 25.10	-22 12.9	1.892	2.458	112.7	22.0	18.8
1985 04 15	17 29.17	-22 26.3					
1985 04 25	17 30.35	-22 39.3	1.633	2.417	131.1	18.3	18.4
1985 05 05	17 28.40	-22 52.3					
1985 05 15	17 23.25	-23 04.9	1.433	2.374	152.1	11.5	17.9
1985 05 25	17 15.18	-23 15.9					
1985 06 04	17 04.97	-23 24.0	1.318	2.330	175.4	2.0	17.3
1985 06 14	16 53.84	-23 28.6					
1985 06 24	16 43.22	-23 30.3	1.303	2.286	160.5	8.6	17.6
1985 07 04	16 34.51	-23 31.4					
1985 07 14	16 28.70	-23 34.5	1.380	2.242	138.1	17.6	17.9
1985 07 24	16 26.30	-23 41.9					
1985 08 03	16 27.46	-23 54.6	1.522	2.199	118.8	23.9	18.2
1985 08 13	16 32.00	-24 12.2					
1985 08 23	16 39.67	-24 33.8	1.698	2.156	102.4	27.3	18.4

(3179) 1962 FA a,e,i = 3.09, 0.16, 2 Elements MPC 9415

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	Mag.
1985	04 05	18 17.11	-21 31.4	3.250	3.574	100.7	16.0	19.2
1985	04 15	18 19.98	-21 24.4					
1985	04 25	18 20.87	-21 18.1	2.977	3.580	119.4	14.2	19.0
1985	05 05	18 19.70	-21 12.9					
1985	05 15	18 16.49	-21 08.9	2.753	3.585	139.7	10.5	18.7
1985	05 25	18 11.38	-21 06.0					
1985	06 04	18 04.69	-21 03.9	2.611	3.588	161.6	5.1	18.4
1985	06 14	17 56.94	-21 02.0					
1985	06 24	17 48.76	-21 00.2	2.576	3.590	174.8	1.5	18.2
1985	07 04	17 40.87	-20 58.7					
1985	07 14	17 33.92	-20 57.8	2.656	3.590	152.8	7.4	18.6
1985	07 24	17 28.44	-20 58.1					
1985	08 03	17 24.79	-21 00.1	2.834	3.589	131.6	12.2	18.8
1985	08 13	17 23.14	-21 04.2					
1985	08 23	17 23.52	-21 10.1	3.080	3.586	112.2	15.1	19.1
1985	09 02	17 25.87	-21 17.7					
1985	09 12	17 30.04	-21 26.3	3.362	3.582	94.3	16.3	19.3

(3096) 1981 QC1 a,e,i = 2.67, 0.20, 12 Elements MPC 9023

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	Mag.
1985	04 05	18 39.79	-09 18.9	2.175	2.463	94.4	23.9	18.2
1985	04 15	18 49.29	-08 16.6					
1985	04 25	18 56.87	-07 11.4	1.902	2.422	108.9	23.1	17.8
1985	05 05	19 02.25	-06 06.0					
1985	05 15	19 05.18	-05 03.6	1.658	2.383	124.7	20.4	17.5
1985	05 25	19 05.45	-04 08.2					
1985	06 04	19 03.00	-03 24.6	1.462	2.345	141.7	15.6	17.0
1985	06 14	18 58.00	-02 57.5					
1985	06 24	18 50.93	-02 51.4	1.338	2.309	157.0	9.9	16.7
1985	07 04	18 42.65	-03 08.9					
1985	07 14	18 34.27	-03 49.8	1.303	2.275	157.4	9.9	16.6
1985	07 24	18 26.96	-04 51.3					
1985	08 03	18 21.75	-06 07.9	1.356	2.244	142.0	16.2	16.8
1985	08 13	18 19.30	-07 33.4					
1985	08 23	18 19.93	-09 01.9	1.482	2.217	124.5	22.1	17.1
1985	09 02	18 23.70	-10 28.3					
1985	09 12	18 30.41	-11 48.7	1.656	2.194	108.5	25.8	17.4

1978 TM6 a,e,i = 2.48, 0.05, 4 Elements MPC 8797

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	Mag.
1985	04 05	18 57.09	-23 50.2	2.379	2.607	91.6	22.6	19.5
1985	04 15	19 05.89	-23 30.4					
1985	04 25	19 12.52	-23 11.5	2.118	2.605	107.6	21.6	19.2
1985	05 05	19 16.71	-22 54.8					
1985	05 15	19 18.22	-22 41.3	1.880	2.603	125.6	18.4	18.9
1985	05 25	19 16.83	-22 31.5					
1985	06 04	19 12.55	-22 25.4	1.694	2.599	146.1	12.6	18.5
1985	06 14	19 05.61	-22 21.8					
1985	06 24	18 56.60	-22 19.1	1.590	2.594	168.9	4.3	18.1
1985	07 04	18 46.49	-22 15.9					
1985	07 14	18 36.43	-22 10.9	1.588	2.589	167.4	4.9	18.1
1985	07 24	18 27.57	-22 04.3					
1985	08 03	18 20.89	-21 56.7	1.687	2.583	144.7	13.1	18.5
1985	08 13	18 16.92	-21 49.0					
1985	08 23	18 15.89	-21 41.9	1.866	2.576	124.4	18.9	18.8
1985	09 02	18 17.78	-21 35.1					
1985	09 12	18 22.35	-21 28.1	2.094	2.568	106.5	22.1	19.2

1981 DU a,e,i = 2.29, 0.16, 7 Elements MPC 7357

Date	ET	R. A. (1950)	Decl.	Delta	r	Variation		Mag.
1985	04 25	18 56.48	-23 11.4	1.384	1.985	-2.17	-6.2	18.8
1985	05 05	19 05.44	-22 20.3					
1985	05 15	19 11.28	-21 26.2	1.180	1.963	-2.59	-7.9	18.4
1985	05 25	19 13.58	-20 30.9					
1985	06 04	19 12.16	-19 36.1	1.020	1.944	-3.08	-8.9	17.9
1985	06 14	19 07.18	-18 43.1					
1985	06 24	18 59.24	-17 53.6	0.927	1.931	-3.42	-8.7	17.4
1985	07 04	18 49.65	-17 09.3					
1985	07 14	18 40.03	-16 32.0	0.918	1.922	-3.36	-7.8	17.4
1985	07 24	18 32.06	-16 03.4					
1985	08 03	18 27.04	-15 44.1	0.993	1.918	-2.95	-7.0	17.8
1985	08 13	18 25.61	-15 33.2					
1985	08 23	18 27.92	-15 28.6	1.132	1.919	-2.46	-6.5	18.3
1985	09 02	18 33.76	-15 27.3					
1985	09 12	18 42.70	-15 26.2	1.314	1.926	-2.05	-6.3	18.7
1985	09 22	18 54.32	-15 22.3					
1985	10 02	19 08.14	-15 13.1	1.522	1.938	-1.75	-6.2	19.1

(3108) 1972 QM a,e,i = 2.23, 0.17, 3 Elements MPC 9073

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	Mag.
1985	04 25	19 12.41	-18 18.7	1.896	2.392	107.0	23.7	18.8
1985	05 05	19 18.14	-17 54.1					
1985	05 15	19 21.24	-17 33.7	1.638	2.358	124.1	20.8	18.4
1985	05 25	19 21.40	-17 19.6					
1985	06 04	19 18.45	-17 13.3	1.426	2.323	143.8	15.0	17.9
1985	06 14	19 12.43	-17 15.6					
1985	06 24	19 03.73	-17 26.3	1.288	2.287	165.8	6.3	17.5
1985	07 04	18 53.29	-17 44.1					
1985	07 14	18 42.38	-18 06.9	1.244	2.249	168.0	5.4	17.3
1985	07 24	18 32.43	-18 32.4					
1985	08 03	18 24.75	-18 59.0	1.298	2.210	145.5	15.1	17.6
1985	08 13	18 20.19	-19 25.5					
1985	08 23	18 19.14	-19 50.9	1.425	2.171	125.1	22.4	18.0
1985	09 02	18 21.65	-20 14.1					
1985	09 12	18 27.47	-20 33.9	1.597	2.132	107.7	26.7	18.3
1985	09 22	18 36.27	-20 48.7					
1985	10 02	18 47.69	-20 57.0	1.788	2.093	92.9	28.5	18.5

1982 BH a,e,i = 1.82, 0.05, 21 Elements MPC 8541

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	Mag.
1985	04 25	19 02.01	-44 43.1	1.085	1.721	110.7	33.1	17.2
1985	05 05	19 17.68	-48 11.3					
1985	05 15	19 30.15	-51 53.1	0.956	1.723	122.2	29.8	16.9
1985	05 25	19 38.01	-55 43.2					
1985	06 04	19 39.61	-59 29.9	0.875	1.726	131.9	25.9	16.6
1985	06 14	19 33.16	-62 55.2					
1985	06 24	19 17.74	-65 35.7	0.848	1.732	136.4	23.9	16.5
1985	07 04	18 55.43	-67 08.6					
1985	07 14	18 31.85	-67 24.1	0.876	1.739	133.5	25.1	16.6
1985	07 24	18 13.65	-66 28.9					
1985	08 03	18 04.62	-64 42.7	0.952	1.749	125.5	28.2	16.9
1985	08 13	18 04.69	-62 25.3					
1985	08 23	18 12.21	-59 50.1	1.067	1.759	115.7	31.2	17.2
1985	09 02	18 25.16	-57 05.4					
1985	09 12	18 41.77	-54 14.7	1.210	1.771	105.7	33.2	17.5
1985	09 22	19 00.79	-51 19.7					
1985	10 02	19 21.29	-48 21.0	1.376	1.783	96.0	33.9	17.8