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Prepared using the Tamkin Foundation Computer Network

EDITORIAL NOTICE

The Smithsonian Astrophysical Observatory is very pleased to acknowledge a gift from The Tamkin Foundation, of Los Angeles, for the establishment of the Tamkin Foundation Computing Network. The purchase of computers in this Gift Agreement has allowed the Minor Planet Center to upgrade and expand its capacity to calculate the orbits of minor planets and comets, as well to prepare the *Minor Planet Circulars* and perform related computations.

Contributors of perturbed orbital elements are advised that use of the Epoch 2000 Feb. 26.0 TT (rather than 1999 Aug. 10.0 TT) will become effective *after* the next batch of MPCs.

The 2000 edition of *Efemeridy Malykh Planet (Ephemerides of Minor Planets)* is now available from the Institute of Applied Astronomy, Russian Academy of Sciences, St. Petersburg. It is complete for numberings of minor planets through (9709). All orders and enquiries should be sent directly to the Institute: e-mail shor@ita.spb.su or FAX +7-812-275-1119. Payment is possible *only* by credit card (VISA, MasterCard) or by wire transfer to the IAA bank account. Checks can not be accepted.

ERRATA

MPC Line
32287 7
34917 - 2
36156 13

For = 1977 PC₁ read = 1977 PD₁
For = 1991 HO₃ read = 1991 HO₂
For Schmdidt read Schmidt

NEW OBSERVATORY CODES

The following listing is a continuation to that on MPC 36155. The longitudes λ are measured in degrees eastward from Greenwich, and the parallax constants $\rho \cos \phi'$ and $\rho \sin \phi'$ are the product of the geocentric distance (in earth equatorial radii) and the cosine and sine, respectively, of the geocentric latitude.

Obs.	λ	$\rho \cos \phi'$	$\rho \sin \phi'$	
172	7.0364	0.68593	+0.72539	Onnens
173	55.5061	0.93464	-0.35447	Ste. Clotilde, Reunion
174	25.5131	0.46536	+0.88219	Nyrola Observatory, Jyväskylä
854	249.1808	0.84619	+0.53135	Sabino Canyon Observatory, Tucson

CORRECTED OBSERVATIONS

The following observations correct those previously published.

Object	Date	UT	α_{2000}	δ_{2000}	Reference	Mag.	N Obs.
1999 UA ₃	1999 10 21.25179	02 50 50.21	+06 08 37.6	MPS 6953	16.9	R 1	757
1999 UA ₃	1999 10 21.28397	02 50 48.14	+06 08 35.4	MPS 6953	16.9	R 1	757
1999 UK ₃	* 1999 10 22.24217	02 09 08.56	+07 59 19.1	MPS 6954	16.1	R 1	757
1999 UK ₃	1999 10 22.25856	02 09 07.74	+07 59 15.1	MPS 6954	16.1	R 1	757
1999 UK ₃	1999 10 23.21994	02 08 20.49	+07 55 21.1	MPS 6954	16.0	R 2	757
1999 UK ₃	1999 10 23.23748	02 08 19.55	+07 55 19.2	MPS 6954	15.7	R 2	757

Note 1: time corrected by +1 hour. 2: time corrected by +2 hours.

DELETED OBSERVATIONS

The following observations are to be deleted.

Object	Date	UT	α_{2000}	δ_{2000}	Reference	Obs.
1995 WL ₄₂	1999 10 20.03817	03 45 14.89	+18 18 19.5	MPS 6651		120
1995 WL ₄₂	1999 10 20.05487	03 45 14.88	+18 18 20.2	MPS 6651		120

IDENTIFICATION CHANGES

Continuation to MPC 36155.

Object	Date	UT	α_{2000}	δ_{2000}	Originally	Mag.	Obs.
1969 EF ₂	* 1969 03 14.95227	11 51 41.46	+06 21 31.2	1969 EE	16.5		095
1985 QY ₆	* 1985 08 24.94771	23 24 21.68	-11 23 12.4	1985 QT ₄	17.0		095
1987 SW ₃₀	* 1987 09 23.95528	00 40 03.13	+12 10 46.8	1987 RC ₅	16.8	V	095
1988 KS ₁	* 1988 05 25.28438	14 32 12.88	-11 13 46.6	1988 KT			809
1989 TN ₁₈	* 1989 10 12.15590	01 23 47.27	+07 36 28.0	1989 TW ₁₀			809
1989 TN ₁₈	1989 10 12.16562	01 23 46.74	+07 36 23.8	1989 TW ₁₀			809
1989 TN ₁₈	1989 10 12.17326	01 23 46.31	+07 36 20.5	1989 TW ₁₀			809
1989 TN ₁₈	1989 10 12.18298	01 23 45.78	+07 36 16.4	1989 TW ₁₀			809
1990 WE ₁₆	* 1990 11 24.60833	02 34 25.50	+20 52 34.0	1990 UC ₃	17.5		402
1990 WE ₁₆	1990 11 24.62500	02 34 24.71	+20 52 27.5	1990 UC ₃			402
1991 RY ₄₁	* 1991 09 13.42309	02 06 07.76	+16 00 57.7	6242 P-L	19.0		675
1998 DU ₃₆	* 1998 02 28.18889	11 19 56.16	+00 22 39.8	1998 FU ₂₅			809
1998 DU ₃₆	1998 03 02.15424	11 17 56.67	+00 30 30.7	1998 FU ₂₅			809
1999 SC ₁₂	* 1999 09 20.00981	01 32 18.36	+09 14 14.5	1999 RQ ₂₁₃			557

1999 SC ₁₂	1999 09 20.01575	01 32 18.14	+09 14 14.0	1999 RQ ₂₁₃	557
1999 SC ₁₂	1999 09 20.01773	01 32 18.03	+09 14 13.2	1999 RQ ₂₁₃	557
1999 TZ ₃₅	* 1999 10 06.18666	22 50 55.44	-04 35 24.7	1999 TV ₂₄	20.4 704
1999 TZ ₃₅	1999 10 06.19989	22 50 55.16	-04 35 33.0	1999 TV ₂₄	20.7 704
1999 TZ ₃₅	1999 10 06.22654	22 50 54.59	-04 35 44.7	1999 TV ₂₄	20.4 704
1999 TA ₃₆	* 1999 10 09.02824	02 12 57.21	+15 25 35.4	1999 TB ₁₁	104
1999 TA ₃₆	1999 10 09.04375	02 12 56.30	+15 25 31.3	1999 TB ₁₁	17.9 V 104

IDENTIFICATIONS

The following identifications with numbered minor planets continue the list on MPC 34386:

	Note		Note
1977 EO ₇	= (11102) 1	1977 EO ₇	= (11102) 2
1986 TN ₄	= (11105) 1	1986 TN ₄	= (11105) 2
1990 UR ₁₃	= (11117) 1	1990 UR ₁₃	= (11117) 3
1991 JC ₆	= (11738) 1	1991 JC ₆	= (11738) 2
1998 YJ ₃₀	= (8241) 1		

Note 1: by M. E. Sansaturio. 2: by G. V. Williams. 3: by A. Milani.

OBSERVATIONS OF COMETS

Observations are published here for the following observatory codes:

046	Kleť. 0.57-m $f/5.2$ reflector + CCD. Observers J. Tichá, M. Tichý and Z. Moravec.
049	Kvistaberg. 1.0-m Schmidt + CCD. Observers T. Oja, O. Karlsson, C.-I. Lagerkvist and J. Warell. Measured by J. Warell, C.-I. Lagerkvist, A. Erikson, G. Hahn and S. Mottola.
104	San Marcello Pistoise. 0.40-m $f/5$ reflector + CCD. Observers L. Tesi, A. Boattini and M. Tombelli. Measured by A. Boattini, L. Tesi, M. Tombelli and G. Forti.
113	Drebach. 0.14-m $f/3.5$ camera. Observers J. Kandler and G. Lehmann.
118	Modra. 0.6-m $f/5.5$ reflector + CCD. Observers Š. Gajdoš, A. Galád and J. Tóth.
143	Gnosca. 0.20-m $f/6.3$ reflector + CCD. Observer S. Sposetti.
249	SOHO. SOHO-LASCO coronagraph C3. Observers S. Gregory and J. D. Shanklin. Measured by D. A. Biesecker. Reduction by B. G. Marsden.
322	Perth Observatory, Bickley-MCT. 0.25-m $f/4.5$ reflector + CCD. Observer J. D. Biggs.
327	Xinglong. 0.60-m Schmidt + CCD. Observers J. Zhu, X. M. Teng and X. Y. Li. Measured by X. M. Teng and J. Zhu.
349	Ageo. 0.18-m $f/5.5$ reflector + CCD. Observer K. Kadota. Measured by S. Yoshida and K. Kadota.
351	Sakamoto. 0.15-m $f/7.0$ lens + CCD. Observer Y. Kitamura.
352	Konan. 0.25-m $f/6$ reflector + CCD. Observer M. Hotta.
355	Hadano. 0.28-m $f/5.0$ reflector + CCD. Observer A. Asami.
360	Kuma Kogen. 0.60-m $f/5.8$ Ritchey-Chrétien + CCD. Observer A. Nakamura.
367	Yatsuka. 0.26-m $f/4.8$ reflector. Observer H. Abe.
372	Geisei. 0.60-m $f/3.5$ reflector. Observer T. Seki.
402	Dynic Astronomical Observatory. 0.60-m $f/3.7$ reflector + CCD. Observer A. Sugie.

411	Oizumi. 0.41-m $f/4.3$ reflector + CCD. Observer T. Kobayashi.
413	Siding Spring. 1.0-m $f/8$ reflector + CCD. Observer R. H. McNaught.
423	North Ryde. 0.20-m $f/4$ hyperbolic astrograph + CCD. Observer S. G. McAndrew.
428	Reedy Creek. 0.25-m $f/6.3$ Schmidt-Cassegrain + CCD. Observer J. Broughton.
461	JATE Asteroid Survey, Piskésetető. 0.60-m Schmidt + CCD. Observers K. Sárneczky, L. Kiss and G. Szabó. Measured by K. Sárneczky and L. Kiss.
467	Auckland. 0.50-m Cassegrain $f/6.4$ reflector + CCD. Observer I. P. Griffin.
470	Ceccano. 0.28-m $f/3.3$ Schmidt-Cassegrain + CCD. Observer G. Masi.
474	Mt. John. 1.0-m McClellan $f/7.7$ reflector + CCD. Observers I. P. Griffin and N. Brady.
504	Le Creusot. 0.40-m $f/5$ reflector + CCD. Observer J. C. Merlin.
540	Linz. 0.6-m $f/3$ reflector + CCD. Observers E. Meyer and E. Obermair. Measured by H. Raab.
557	Ondřejov. 0.65-m $f/3.6$ reflector + CCD. Observer L. Šarounová.
587	Sormano. 0.5-m reflector + CCD. Observers A. Testa and M. Cavagna.
596	Colleverde di Guidonia. 0.31-m $f/2.8$ Baker-Schmidt + CCD. Observer V. S. Casulli.
610	Pianoro. 0.25-m $f/4$ Schmidt-Cassegrain. Observer V. Goretti.
611	Starkenbug. 0.45-m $f/4.4$ reflector + CCD. Observers M. Busch, R. Kresken and R. Stoss.
619	Sabadell. 0.51-m $f/3.9$ reflector + CCD. Observers F. Casarramona and E. Vigil. Measured by F. Casarramona.
642	Oak Bay, Victoria. 0.20-m $f/3.7$ Schmidt-Cassegrain + CCD. Observer C. E. Spratt.
649	Louisberg. 0.35-m Schmidt-Cassegrain + CCD. Observer L. Robinson.
658	Dominion Astrophysical Observatory. 1.82-m Plaskett telescope + CCD. Observer D. D. Balam.
681	Calgary. 0.36-m $f/7$ Schmidt-Cassegrain + CCD. Observer G. W. Billings.
688	Lowell Observatory, Anderson Mesa Station. 1.8-m reflector + CCD. Observers R. L. Millis, L. H. Wasserman and M. F. Bielecki. Measured by L. H. Wasserman and M. W. Buie.
691	Kitt Peak. 0.91-m Spacewatch telescope. Observers J. Montani, A. E. Gleason and J. V. Scotti.
693	University of Arizona, Catalina Station. 1.5-m reflector + CCD. Observer C. W. Hergenrother.
699	LONEOS. 0.59-m Schmidt + CCD. Observers B. A. Skiff, M. E. Van Ness and W. Ferris. Measured by B. W. Koehn.
703	Catalina Sky Survey. 0.41-m $f/3$ Schmidt + CCD. Observers C. W. Hergenrother, T. B. Spahr, T. Swindle and H. Campins.
704	LINEAR. 1.0-m $f/2.15$ reflector + CCD. Observers M. Blythe, F. Shelly, M. Bezpalko, M. Elowitz and R. Huber. Measured by J. Stuart, H. Viggh and R. Sayer.
706	Salinas. 0.032-m Schmidt-Cassegrain + CCD. Observer J. Hall.
711	McDonald. 0.76-m reflector + CCD. Observer P. Shelus.
713	Thornton. 0.20-m $f/10$ Schmidt-Cassegrain + CCD. Observer R. A. Koff.
750	Hobbs Observatory, Fall Creek. 0.6-m $f/5$ telescope + CCD. Observer R. Elliott.
853	Biosphere 2 Observatory. 0.5-m $f/8.1$ reflector. Observer G. J. Garradd.
867	Saji Observatory. 1.03-m $f/4.8$ reflector + CCD. Observers M. Yamanishi, A. Miyamoto, M. Aimoto and T. Oribe.

888	Gekko.	0.50-m $f/4.0$ reflector + CCD.	Observer T. Kagawa.				
897	Chiyoda.	0.25-m $f/6.0$ reflector + CCD.	Observer T. Kojima.				
900	Moriyama.	0.25-m $f/6.3$ reflector + CCD.	Observer Y. Ikari.				
903	Fukuchiyama.	0.25-m $f/6.3$ Schmidt-Cassegrain + CCD.	Observer M. Yoshimi.				
946	Ametlla de Mar.	0.30-m $f/5.0$ reflector + CCD.	Observers J. Nomen and F. Pallas.				
965	Algarve.	0.5-m reflector + CCD.	Observers B. Ewen-Smith and K. White.				
Object	Date	UT	α_{2000}	δ_{2000}	Mag.	N	Obs.
C/1995 O1 (Hale-Bopp)							
C/1995 O1	1999 11	10.50130	06 54 05.15	-75 48 09.9	13.5 T		474
C/1995 O1	1999 11	10.50734	06 54 04.79	-75 48 10.0	13.2 T		474
C/1995 O1	1999 11	10.50992	06 54 04.74	-75 48 13.3	13.5 T		474
C/1995 O1	1999 11	12.66478	06 51 48.27	-76 00 00.1	13.0 N		474
C/1995 O1	1999 11	12.66703	06 51 48.18	-76 00 01.2	13.2 N		474
C/1995 O1	1999 11	12.66880	06 51 47.84	-76 00 02.3	13.4 N		474
C/1997 BA₆ (Spacewatch)							
C/1997 BA ₆	1999 11	12.61443	14 26 40.44	-75 53 01.7	12.7 N		474
C/1997 BA ₆	1999 11	12.61962	14 26 42.59	-75 53 05.0	12.6 N		474
C/1997 BA ₆	1999 11	12.62476	14 26 44.84	-75 53 07.7	12.9 N		474
C/1998 K2 (LINEAR)							
C/1998 K2	1999 11	13.28192	03 45 52.81	-28 47 14.9	17.5 T		704
C/1998 K2	1999 11	13.29570	03 45 52.11	-28 47 11.9	18.3 T		704
C/1998 K2	1999 11	13.30935	03 45 51.24	-28 47 09.2	17.9 T		704
C/1998 K2	1999 11	13.32300	03 45 50.52	-28 47 06.9	18.2 T		704
C/1998 K2	1999 11	13.33667	03 45 49.81	-28 47 05.7	18.2 T		704
C/1998 K2	1999 11	13.63271	03 45 33.58	-28 46 08.2	15.8 T		474
C/1998 K2	1999 11	13.63478	03 45 33.49	-28 46 08.4	15.8 T		474
C/1998 K2	1999 11	13.63748	03 45 33.34	-28 46 07.7	15.7 T		474
C/1998 K2	1999 11	15.53186	03 43 50.25	-28 39 43.4	16.3 T		474
C/1998 K2	1999 11	15.54585	03 43 49.56	-28 39 40.9	16.4 T		474
C/1998 M1 (LINEAR)							
C/1998 M1	1999 11	10.48108	21 51 57.42	+10 40 08.1	19.1 T	1	360
C/1998 M1	1999 11	10.48767	21 51 57.61	+10 40 07.4		1	360
C/1998 M1	1999 11	10.49219	21 51 57.66	+10 40 06.1		1	360
C/1998 M2 (LINEAR)							
C/1998 M2	1999 11	01.29252	00 24 26.39	+66 44 27.0	19.0 T		688
C/1998 M2	1999 11	01.36447	00 24 23.57	+66 43 47.8			688
C/1998 M5 (LINEAR)							
C/1998 M5	1999 11	04.78200	10 55 10.76	-08 06 07.7	15.5 T		349
C/1998 M5	1999 11	04.78757	10 55 10.80	-08 06 10.6			349
C/1998 M5	1999 11	16.84983	10 57 03.23	-10 30 14.8	14.7 T		360
C/1998 M5	1999 11	16.85208	10 57 03.26	-10 30 16.3			360
P/1998 U4 (Spahr)							
P/1998 U4	1999 11	09.79332	08 16 00.73	-12 45 02.5	18.3 T		402
P/1998 U4	1999 11	09.79561	08 16 00.77	-12 45 03.7			402
P/1998 U4	1999 11	09.79792	08 16 00.81	-12 45 03.8			402
P/1998 U4	1999 11	09.80022	08 16 00.88	-12 45 04.7			402
P/1998 U4	1999 11	16.63348	08 17 29.79	-13 27 21.1	16.7 T		474

P/1998 U4	1999 11	16.63961	08 17 29.77	-13 27 19.2	16.5 T		474
P/1998 U4	1999 11	17.59366	08 17 35.95	-13 33 31.1	16.9 T		474
P/1998 U4	1999 11	17.59844	08 17 35.97	-13 33 32.7	17.2 T		474
P/1998 U4	1999 11	17.60381	08 17 35.95	-13 33 34.3	17.4 T		474
C/1998 W3 (LINEAR)							
C/1998 W3	1999 11	16.72431	06 10 07.20	+67 25 40.1	18.0 T		360
C/1998 W3	1999 11	16.72830	06 10 06.68	+67 25 41.8			360
C/1998 W3	1999 11	16.73212	06 10 06.09	+67 25 44.2			360
C/1999 E1 (Li)							
C/1999 E1	1999 11	09.77468	10 21 29.72	+20 22 50.3	16.1 T		402
C/1999 E1	1999 11	09.77697	10 21 29.79	+20 22 51.0			402
C/1999 E1	1999 11	09.77927	10 21 29.91	+20 22 51.2			402
C/1999 E1	1999 11	16.38902	10 25 51.32	+20 52 34.0	16.4 T		703
C/1999 E1	1999 11	16.40152	10 25 51.95	+20 52 38.6	16.6 T		703
C/1999 E1	1999 11	16.41398	10 25 52.35	+20 52 41.4	16.4 T		703
C/1999 E1	1999 11	16.42646	10 25 52.74	+20 52 45.2	16.2 T		703
C/1999 E1	1999 11	16.84115	10 26 08.29	+20 54 47.1	16.7 T		360
C/1999 E1	1999 11	16.84514	10 26 08.44	+20 54 48.2			360
C/1999 H1 (Lee)							
C/1999 H1	1999 09	08.81215	05 34 40.89	+54 51 53.7	12.1 T		372
C/1999 H1	1999 09	21.92927	03 10 36.43	+59 14 57.4	13.0 N		610
C/1999 H1	1999 09	21.93205	03 10 34.04	+59 14 55.8			610
C/1999 H1	1999 09	21.93483	03 10 31.64	+59 14 54.3			610
C/1999 H1	1999 09	21.93760	03 10 29.25	+59 14 52.7			610
C/1999 H1	1999 09	21.94038	03 10 26.85	+59 14 51.2			610
C/1999 H1	1999 09	21.94300	03 10 24.60	+59 14 49.7			610
C/1999 H1	1999 09	27.46597	01 50 29.32	+56 40 01.2			372
C/1999 H1	1999 09	28.48750	01 36 34.82	+55 47 54.8	12.6 T		372
C/1999 H1	1999 09	29.68524	01 20 57.86	+54 38 29.5	13.1 T		372
C/1999 H1	1999 10	04.65104	00 25 57.20	+48 34 35.3			372
C/1999 H1	1999 10	05.76233	00 15 50.63	+47 01 51.0			372
C/1999 H1	1999 10	17.56319	23 07 00.30	+30 35 55.7	12.5 T		372
C/1999 H1	1999 10	20.59341	22 57 09.37	+26 59 51.8	13.0 T		352
C/1999 H1	1999 10	20.59689	22 57 08.82	+26 59 36.8			352
C/1999 H1	1999 10	20.66944	22 56 55.98	+26 54 42.4	13.4 T		372
C/1999 H1	1999 10	24.44744	22 47 26.69	+22 56 11.6			349
C/1999 H1	1999 10	24.45104	22 47 26.18	+22 55 58.3			349
C/1999 H1	1999 10	24.45310	22 47 25.93	+22 55 51.2	12.9 T		349
C/1999 H1	1999 10	25.09304	22 46 04.22	+22 18 42.1	14.9 T		750
C/1999 H1	1999 10	25.19118	22 45 51.86	+22 13 04.7	14.8 T		750
C/1999 H1	1999 10	25.20392	22 45 50.23	+22 12 21.3	14.8 T		750
C/1999 H1	1999 10	25.42778	22 45 23.14	+21 59 40.5	12.6 T		372
C/1999 H1	1999 10	27.13407	22 42 08.47	+20 26 17.0			642
C/1999 H1	1999 10	27.13929	22 42 07.83	+20 26 01.8			642
C/1999 H1	1999 10	27.14086	22 42 07.65	+20 25 54.8			642
C/1999 H1	1999 10	27.83667	22 40 54.92	+19 49 40.8	15.3 N		461
C/1999 H1	1999 10	27.83787	22 40 54.80	+19 49 37.3			461
C/1999 H1	1999 10	27.83896	22 40 54.70	+19 49 33.7			461
C/1999 H1	1999 10	27.83998	22 40 54.57	+19 49 30.6			461
C/1999 H1	1999 10	27.84722	22 40 53.89	+19 49 08.2			046
C/1999 H1	1999 10	27.84902	22 40 53.70	+19 49 02.7			046

C/1999 H1	1999 10 27.85067	22 40 53.53	+19 48 57.6		046	C/1999 H1	1999 11 10.52252	22 26 52.98	+10 51 37.0	13.0 T	900
C/1999 H1	1999 10 28.41756	22 39 57.47	+19 20 11.4	12.4 T	402	C/1999 H1	1999 11 10.53170	22 26 52.72	+10 51 21.1		900
C/1999 H1	1999 10 28.41882	22 39 57.37	+19 20 07.6		402	C/1999 H1	1999 11 13.43487	22 25 36.03	+09 31 22.7		349
C/1999 H1	1999 10 28.42008	22 39 57.24	+19 20 03.7		402	C/1999 H1	1999 11 13.44102	22 25 35.91	+09 31 12.8	13.3 T	349
C/1999 H1	1999 10 28.48337	22 39 50.96	+19 16 52.9		355	C/1999 H1	1999 11 13.44657	22 25 35.75	+09 31 04.7		349
C/1999 H1	1999 10 28.48593	22 39 50.71	+19 16 45.4	12.7 T	355	C/1999 H1	1999 11 18.47188	22 24 18.47	+07 33 19.7	13.9 T	360
C/1999 H1	1999 10 29.07706	22 38 54.95	+18 47 29.5	15.7 T	750	C/1999 H1	1999 11 18.47465	22 24 18.47	+07 33 15.9		360
C/1999 H1	1999 10 29.11453	22 38 51.38	+18 45 40.4	16.1 T	750	C/1999 H1	1999 11 19.42932	22 24 10.71	+07 13 29.1	13.4 T	402
C/1999 H1	1999 11 01.07970	22 34 47.31	+16 29 23.2	16.0 T	750	C/1999 H1	1999 11 19.43058	22 24 10.70	+07 13 27.7		402
C/1999 H1	1999 11 01.13847	22 34 42.91	+16 26 50.7	16.4 T	750	C/1999 H1	1999 11 19.43184	22 24 10.67	+07 13 26.3		402
C/1999 H1	1999 11 01.13937	22 34 43.06	+16 26 48.3		642	C/1999 H1	1999 11 20.77759	22 24 02.88	+06 46 48.9		046
C/1999 H1	1999 11 01.16167	22 34 41.45	+16 25 50.9		642	C/1999 H1	1999 11 20.77877	22 24 02.91	+06 46 47.7		046
C/1999 H1	1999 11 01.21497	22 34 37.26	+16 23 33.4	15.9 T	750	C/1999 H1	1999 11 20.77991	22 24 02.88	+06 46 46.4		046
C/1999 H1	1999 11 02.44236	22 33 12.96	+15 32 08.5	14.4 T	372	C/1999 H1	1999 11 20.78104	22 24 02.86	+06 46 44.9		046
C/1999 H1	1999 11 03.51325	22 32 05.54	+14 49 20.9		900	C/1999 H3 (LINEAR)					
C/1999 H1	1999 11 03.52068	22 32 05.08	+14 49 03.2	12.9 T	900	C/1999 H3	1999 09 27.43299	14 18 26.99	+35 49 01.8		867
C/1999 H1	1999 11 04.15635	22 31 28.53	+14 24 32.5	16.5 T	704	C/1999 H3	1999 09 27.43437	14 18 27.00	+35 49 01.1		867
C/1999 H1	1999 11 04.17249	22 31 27.57	+14 23 54.7	16.7 T	704	C/1999 H3	1999 09 27.43576	14 18 27.01	+35 49 00.1		867
C/1999 H1	1999 11 04.19020	22 31 26.38	+14 23 15.5	16.7 T	704	C/1999 J2 (Skiff)					
C/1999 H1	1999 11 04.20723	22 31 25.36	+14 22 34.2	17.2 T	704	C/1999 J2	1999 09 27.46043	15 39 03.69	+44 08 10.0		867
C/1999 H1	1999 11 04.44583	22 31 11.88	+14 13 36.3	12.0 T	360	C/1999 J2	1999 09 27.46633	15 39 03.82	+44 08 06.6		867
C/1999 H1	1999 11 04.44809	22 31 11.77	+14 13 31.3		360	C/1999 J2	1999 09 27.48196	15 39 04.16	+44 07 57.0		867
C/1999 H1	1999 11 04.46809	22 31 10.56	+14 12 44.9	13.2 T	351	C/1999 J2	1999 11 07.37786	15 58 11.91	+38 23 56.1	16.1 T	402
C/1999 H1	1999 11 04.47462	22 31 10.25	+14 12 30.1		351	C/1999 J2	1999 11 07.38060	15 58 12.05	+38 23 55.0		402
C/1999 H1	1999 11 04.48258	22 31 09.75	+14 12 12.0		351	C/1999 J2	1999 11 07.38336	15 58 12.20	+38 23 54.9		402
C/1999 H1	1999 11 05.13292	22 30 34.96	+13 48 06.2		642	C/1999 J2	1999 11 10.38646	15 59 49.61	+38 04 30.5	16.1 T	360
C/1999 H1	1999 11 05.13736	22 30 34.74	+13 47 56.8		642	C/1999 J2	1999 11 10.38889	15 59 49.69	+38 04 29.5		360
C/1999 H1	1999 11 05.14139	22 30 34.52	+13 47 47.8		642	C/1999 J3 (LINEAR)					
C/1999 H1	1999 11 05.41456	22 30 20.40	+13 37 53.9	12.9 T	402	C/1999 J3	1999 10 17.81111	07 31 00.36	-22 04 33.2		372
C/1999 H1	1999 11 05.41582	22 30 20.35	+13 37 51.2		402	C/1999 J3	1999 10 17.83490	07 30 55.59	-22 09 34.3		867
C/1999 H1	1999 11 05.41708	22 30 20.28	+13 37 48.5		402	C/1999 J3	1999 10 17.84045	07 30 54.48	-22 10 43.9		867
C/1999 H1	1999 11 05.45738	22 30 18.19	+13 36 21.2	12.3 T	355	C/1999 J3	1999 10 23.78930	07 07 26.42	-41 54 48.8	12.0 T	351
C/1999 H1	1999 11 05.46089	22 30 17.98	+13 36 13.2		355	C/1999 J3	1999 10 23.79282	07 07 25.45	-41 55 26.4		351
C/1999 H1	1999 11 05.46484	22 30 17.80	+13 36 04.8		355	C/1999 J3	1999 10 24.79727	07 02 28.05	-44 54 11.7	12.0 T	349
C/1999 H1	1999 11 05.49384	22 30 16.24	+13 35 01.9	12.7 T	349	C/1999 J3	1999 10 24.82911	07 02 17.98	-44 59 44.0		349
C/1999 H1	1999 11 05.49786	22 30 16.03	+13 34 53.6		349	C/1999 J3	1999 10 24.83226	07 02 17.10	-45 00 15.9		349
C/1999 H1	1999 11 05.49887	22 30 15.96	+13 34 51.4		349	C/1999 J3	1999 10 31.40978	06 19 24.11	-60 46 41.8	12.3 N	467
C/1999 H1	1999 11 06.01128	22 29 50.83	+13 16 35.6	16.3 T	750	C/1999 J3	1999 10 31.41652	06 19 20.53	-60 47 26.4	11.5 N	467
C/1999 H1	1999 11 06.05290	22 29 48.72	+13 15 08.2	16.6 T	750	C/1999 J3	1999 10 31.42294	06 19 17.41	-60 48 11.2	11.7 N	467
C/1999 H1	1999 11 06.14968	22 29 44.20	+13 11 44.1	14.6 T	706	C/1999 J3	1999 11 07.66863	05 03 49.28	-70 56 14.6	15.0 N	428
C/1999 H1	1999 11 06.16664	22 29 43.32	+13 11 07.5	14.6 T	706	C/1999 J3	1999 11 07.67369	05 03 45.30	-70 56 31.5	14.9 N	428
C/1999 H1	1999 11 06.42277	22 29 31.22	+13 02 13.9		349	C/1999 J3	1999 11 07.67709	05 03 42.68	-70 56 43.1	14.9 N	428
C/1999 H1	1999 11 06.42487	22 29 31.10	+13 02 09.1		349	C/1999 J3	1999 11 12.63639	03 56 02.26	-74 14 29.2	12.5 N	474
C/1999 H1	1999 11 08.72296	22 27 55.00	+11 46 12.9		143	C/1999 J3	1999 11 12.64508	03 55 54.65	-74 14 42.0	12.3 N	474
C/1999 H1	1999 11 08.72380	22 27 54.93	+11 46 11.2		143	C/1999 J3	1999 11 12.65586	03 55 45.57	-74 14 57.6	12.4 N	474
C/1999 H1	1999 11 08.72462	22 27 54.91	+11 46 09.7		143	C/1999 J3	1999 11 15.51675	03 15 38.96	-75 05 41.8	13.2 T	474
C/1999 H1	1999 11 08.72544	22 27 54.89	+11 46 07.9		143	C/1999 J3	1999 11 15.52722	03 15 29.98	-75 05 45.8	12.0 T	474
C/1999 H1	1999 11 08.74686	22 27 54.03	+11 45 27.6		143	C/1999 K5 (LINEAR)					
C/1999 H1	1999 11 09.43056	22 27 29.16	+11 24 16.3	13.5 T	372	C/1999 K5	1999 10 21.41290	18 15 30.91	-31 48 20.1	15.1 T	402
C/1999 H1	1999 11 09.43889	22 27 28.86	+11 24 01.3	13.5 T	372	C/1999 K5	1999 10 21.41417	18 15 30.86	-31 48 20.6		402
C/1999 H1	1999 11 09.48726	22 27 27.14	+11 22 32.0	13.6 T	351	C/1999 K5	1999 10 21.41669	18 15 30.93	-31 48 21.7		402
C/1999 H1	1999 11 09.49147	22 27 26.94	+11 22 24.0		351						
C/1999 H1	1999 11 09.50206	22 27 26.54	+11 22 05.5		351						

C/1999 K6 (LINEAR)

C/1999 K6	1999 10 29.44040	19 40 41.60	+31 41 00.9	17.3 T	402
C/1999 K6	1999 10 29.44270	19 40 41.81	+31 41 01.0		402
C/1999 K6	1999 10 29.44500	19 40 42.03	+31 41 00.7		402
C/1999 K6	1999 11 10.45781	20 04 07.36	+30 37 53.6	17.0 T	360
C/1999 K6	1999 11 10.46372	20 04 08.10	+30 37 51.9		360
C/1999 K6	1999 11 10.46788	20 04 08.53	+30 37 50.8		360
C/1999 K6	1999 11 19.40401	20 22 20.54	+29 58 06.4	17.6 T	402
C/1999 K6	1999 11 19.40631	20 22 20.89	+29 58 05.5		402
C/1999 K6	1999 11 19.41091	20 22 21.33	+29 58 04.7		402

C/1999 K8 (LINEAR)

C/1999 K8	1999 10 26.11723	21 20 24.40	+24 41 15.6		658
C/1999 K8	1999 10 26.12501	21 20 24.59	+24 41 10.0		658
C/1999 K8	1999 10 26.13299	21 20 24.77	+24 41 03.7		658
C/1999 K8	1999 10 26.76447	21 20 39.20	+24 33 13.8	15.7 T	046
C/1999 K8	1999 10 26.76844	21 20 39.23	+24 33 10.9		046
C/1999 K8	1999 10 26.76959	21 20 39.37	+24 33 10.1		046
C/1999 K8	1999 10 27.82674	21 21 04.29	+24 20 05.6	16.8 N	461
C/1999 K8	1999 10 27.83056	21 21 04.38	+24 20 02.7		461
C/1999 K8	1999 10 27.83304	21 21 04.42	+24 20 00.9		461
C/1999 K8	1999 10 28.49603	21 21 20.72	+24 11 51.1	15.4 T	355
C/1999 K8	1999 10 28.50003	21 21 20.82	+24 11 47.9		355
C/1999 K8	1999 11 03.08232	21 23 51.96	+23 04 13.6	17.2 T	704
C/1999 K8	1999 11 03.09835	21 23 52.52	+23 04 02.7	18.1 T	704
C/1999 K8	1999 11 03.11441	21 23 52.97	+23 03 50.7	17.5 T	704
C/1999 K8	1999 11 03.13091	21 23 53.44	+23 03 42.9	17.7 T	704
C/1999 K8	1999 11 03.14700	21 23 54.05	+23 03 31.4	17.7 T	704
C/1999 K8	1999 11 03.45231	21 24 02.86	+22 59 50.4	14.0 T	900
C/1999 K8	1999 11 03.46150	21 24 03.12	+22 59 43.4		900
C/1999 K8	1999 11 03.47830	21 24 03.59	+22 59 31.6	14.6 T	360
C/1999 K8	1999 11 03.48090	21 24 03.67	+22 59 29.8		360
C/1999 K8	1999 11 04.06769	21 24 21.41	+22 52 33.5	17.2 T	704
C/1999 K8	1999 11 04.08405	21 24 21.92	+22 52 20.0	17.6 T	704
C/1999 K8	1999 11 04.10040	21 24 22.35	+22 52 08.5	17.9 T	704
C/1999 K8	1999 11 04.11674	21 24 22.77	+22 52 03.7	19.8 T	704
C/1999 K8	1999 11 04.13317	21 24 23.30	+22 51 40.8	18.0 T	704
C/1999 K8	1999 11 04.50039	21 24 34.46	+22 47 25.3	15.1 T	351
C/1999 K8	1999 11 05.47007	21 25 04.50	+22 36 02.9		349
C/1999 K8	1999 11 05.47662	21 25 04.78	+22 35 57.7		349
C/1999 K8	1999 11 05.48013	21 25 04.86	+22 35 55.7	14.5 T	349
C/1999 K8	1999 11 07.41804	21 26 07.26	+22 13 25.6	14.6 T	402
C/1999 K8	1999 11 07.41929	21 26 07.27	+22 13 24.7		402
C/1999 K8	1999 11 07.42056	21 26 07.27	+22 13 24.1		402
C/1999 K8	1999 11 09.47189	21 27 16.70	+21 49 57.8	15.1 T	351
C/1999 K8	1999 11 09.47578	21 27 16.76	+21 49 56.6		351
C/1999 K8	1999 11 09.48093	21 27 17.10	+21 49 52.6		351
C/1999 K8	1999 11 10.47378	21 27 51.59	+21 38 39.8	14.7 T	360
C/1999 K8	1999 11 10.47604	21 27 51.68	+21 38 38.2		360
C/1999 K8	1999 11 13.46538	21 29 40.87	+21 05 31.7	14.6 T	349
C/1999 K8	1999 11 13.47005	21 29 41.04	+21 05 29.1		349

P/1999 RO₂₈ (LONEOS)

P/1999 RO ₂₈	1999 09 19.62397	00 20 37.57	-19 11 02.9		867
P/1999 RO ₂₈	1999 09 19.63022	00 20 38.81	-19 11 11.3		867
P/1999 RO ₂₈	1999 09 19.63612	00 20 39.86	-19 11 17.6		867
P/1999 RO ₂₈	1999 10 30.55388	02 09 05.08	-19 22 05.8	19.0 T	402
P/1999 RO ₂₈	1999 10 30.55618	02 09 05.39	-19 22 03.0		402
P/1999 RO ₂₈	1999 10 30.55848	02 09 05.55	-19 22 01.3		402
P/1999 RO ₂₈	1999 11 03.53314	02 15 11.91	-18 10 37.7	19.2 T	402
P/1999 RO ₂₈	1999 11 03.53544	02 15 12.08	-18 10 36.2		402
P/1999 RO ₂₈	1999 11 03.53775	02 15 12.19	-18 10 31.3		402
P/1999 RO ₂₈	1999 11 03.54006	02 15 12.46	-18 10 30.2		402
P/1999 RO ₂₈	1999 11 04.58872	02 16 42.55	-17 50 26.8	18.9 T	360
P/1999 RO ₂₈	1999 11 04.59253	02 16 42.83	-17 50 22.6		360
P/1999 RO ₂₈	1999 11 04.59670	02 16 43.14	-17 50 17.7		360

C/1999 S2 (McNaught-Watson)

C/1999 S2	1999 11 07.57067	02 36 13.52	-63 56 01.6	17.0 T	428
C/1999 S2	1999 11 10.50948	02 33 48.63	-63 46 08.6		322
C/1999 S2	1999 11 10.55875	02 33 46.65	-63 45 57.8		322
C/1999 S2	1999 11 10.64947	02 33 41.66	-63 45 35.6	15.9 T	474
C/1999 S2	1999 11 10.65817	02 33 41.14	-63 45 33.9	15.8 T	474
C/1999 S2	1999 11 10.66730	02 33 40.72	-63 45 31.4	15.9 T	474
C/1999 S2	1999 11 15.50585	02 29 51.35	-63 26 26.7	16.3 T	474
C/1999 S2	1999 11 15.51254	02 29 50.99	-63 26 25.4	16.3 T	474

C/1999 S3 (LINEAR)

C/1999 S3	1999 09 27.60122	01 07 49.60	+49 01 24.4	2	867
C/1999 S3	1999 09 27.60330	01 07 48.99	+49 01 29.9		867
C/1999 S3	1999 09 27.60990	01 07 47.14	+49 01 47.1		867
C/1999 S3	1999 10 01.59427	00 47 51.67	+51 46 01.6		867
C/1999 S3	1999 10 01.59531	00 47 51.34	+51 46 03.9		867
C/1999 S3	1999 10 01.59601	00 47 51.10	+51 46 05.5		867
C/1999 S3	1999 10 17.56866	23 06 25.63	+58 22 17.1	12.5 T	372
C/1999 S3	1999 10 20.46904	22 47 22.44	+58 42 16.5	12.3 T	351
C/1999 S3	1999 10 20.49059	22 47 14.06	+58 42 22.4		351
C/1999 S3	1999 10 20.55571	22 46 48.71	+58 42 38.2	12.7 T	352
C/1999 S3	1999 10 20.55918	22 46 47.39	+58 42 39.1		352
C/1999 S3	1999 10 20.67292	22 46 03.05	+58 43 06.9	13.0 T	372
C/1999 S3	1999 10 24.43890	22 22 47.75	+58 47 52.3		349
C/1999 S3	1999 10 24.43974	22 22 47.46	+58 47 52.2		349
C/1999 S3	1999 10 24.44066	22 22 47.22	+58 47 52.1	12.6 T	349
C/1999 S3	1999 10 24.55001	22 22 07.96	+58 47 42.2	13.1 T	402
C/1999 S3	1999 10 24.55126	22 22 07.51	+58 47 42.1		402
C/1999 S3	1999 10 24.55252	22 22 07.07	+58 47 41.9		402
C/1999 S3	1999 10 25.42083	22 17 04.17	+58 45 55.9	12.9 T	372
C/1999 S3	1999 10 25.45016	22 16 53.88	+58 45 50.4		900
C/1999 S3	1999 10 25.45942	22 16 50.63	+58 45 48.8		900
C/1999 S3	1999 10 26.09840	22 13 12.60	+58 43 51.2		658
C/1999 S3	1999 10 26.10657	22 13 09.64	+58 43 50.6		658
C/1999 S3	1999 10 26.11045	22 13 08.44	+58 43 48.9		658
C/1999 S3	1999 10 27.15633	22 07 20.14	+58 39 39.0		642
C/1999 S3	1999 10 27.16888	22 07 16.06	+58 39 36.4		642
C/1999 S3	1999 10 27.85390	22 03 33.70	+58 36 15.0		046
C/1999 S3	1999 10 27.85524	22 03 33.25	+58 36 14.6		046

C/1999 S3	1999 10 27.85642	22 03 32.87	+58 36 14.2		046
C/1999 S3	1999 10 27.85778	22 03 32.43	+58 36 13.7		046
C/1999 S3	1999 10 28.70502	21 59 05.57	+58 31 27.4	12.5 T	118
C/1999 S3	1999 10 28.71131	21 59 03.58	+58 31 25.3		118
C/1999 S3	1999 10 29.16376	21 56 43.32	+58 28 37.2	14.6 T	750
C/1999 S3	1999 10 29.17048	21 56 41.24	+58 28 34.2	14.7 T	750
C/1999 S3	1999 10 29.17850	21 56 38.79	+58 28 31.1	14.6 T	750
C/1999 S3	1999 10 29.18632	21 56 36.37	+58 28 27.8	14.8 T	750
C/1999 S3	1999 11 01.63847	21 40 05.82	+58 01 51.9		372
C/1999 S3	1999 11 02.45764	21 36 30.48	+57 54 31.1	14.1 T	372
C/1999 S3	1999 11 03.43078	21 32 23.86	+57 45 17.2	13.0 T	402
C/1999 S3	1999 11 03.43204	21 32 23.55	+57 45 16.5		402
C/1999 S3	1999 11 03.43330	21 32 23.24	+57 45 15.7		402
C/1999 S3	1999 11 03.48559	21 32 10.03	+57 44 45.2	12.6 T	360
C/1999 S3	1999 11 03.48785	21 32 09.44	+57 44 43.8		360
C/1999 S3	1999 11 03.53675	21 31 57.16	+57 44 14.0		900
C/1999 S3	1999 11 03.54593	21 31 54.86	+57 44 08.4	12.9 T	900
C/1999 S3	1999 11 03.84434	21 30 42.18	+57 41 12.3	12.9 T	113
C/1999 S3	1999 11 03.84765	21 30 41.34	+57 41 10.3	12.8 T	113
C/1999 S3	1999 11 04.42832	21 28 21.36	+57 35 26.8	12.9 T	351
C/1999 S3	1999 11 04.43676	21 28 19.29	+57 35 21.8		351
C/1999 S3	1999 11 04.57237	21 27 46.98	+57 33 57.3	13.5 T	903
C/1999 S3	1999 11 04.57618	21 27 46.08	+57 33 54.4		903
C/1999 S3	1999 11 05.48652	21 24 15.49	+57 24 37.3	12.5 T	349
C/1999 S3	1999 11 05.48829	21 24 15.18	+57 24 35.6		349
C/1999 S3	1999 11 05.48905	21 24 14.97	+57 24 35.0		349
C/1999 S3	1999 11 06.08839	21 22 01.18	+57 18 19.4	15.3 T	750
C/1999 S3	1999 11 06.09548	21 21 59.61	+57 18 14.8	15.4 T	750
C/1999 S3	1999 11 06.43448	21 20 45.59	+57 14 40.4	12.6 T	349
C/1999 S3	1999 11 06.43723	21 20 44.92	+57 14 39.0		349
C/1999 S3	1999 11 06.44068	21 20 44.23	+57 14 36.6		349
C/1999 S3	1999 11 07.50708	21 16 58.51	+57 03 10.3	13.7 T	351
C/1999 S3	1999 11 07.51078	21 16 57.87	+57 03 08.0		351
C/1999 S3	1999 11 07.51991	21 16 55.94	+57 03 02.2		351
C/1999 S3	1999 11 10.45854	21 07 32.26	+56 30 56.3	12.9 T	351
C/1999 S3	1999 11 10.46211	21 07 31.64	+56 30 53.5		351
C/1999 S3	1999 11 10.46712	21 07 30.71	+56 30 50.7		900
C/1999 S3	1999 11 10.47630	21 07 29.07	+56 30 44.5		900
C/1999 S3	1999 11 10.49088	21 07 26.56	+56 30 34.1		351
C/1999 S3	1999 11 13.37037	20 59 30.89	+55 59 04.3		411
C/1999 S3	1999 11 13.37822	20 59 29.59	+55 58 59.2		411
C/1999 S3	1999 11 13.47618	20 59 14.42	+55 57 54.1		349
C/1999 S3	1999 11 13.47962	20 59 13.85	+55 57 51.7	12.7 T	349
C/1999 S3	1999 11 13.48057	20 59 13.68	+55 57 50.9		349
C/1999 S3	1999 11 13.89632	20 58 11.12	+55 53 20.1	13.4 T	504
C/1999 S3	1999 11 13.89773	20 58 10.82	+55 53 19.6	13.4 T	504
C/1999 S3	1999 11 13.89905	20 58 10.72	+55 53 18.3	13.5 T	504
C/1999 S3	1999 11 13.90163	20 58 10.33	+55 53 16.5	13.3 T	504
C/1999 S3	1999 11 13.90333	20 58 10.06	+55 53 15.2	13.4 T	504
C/1999 S3	1999 11 13.90446	20 58 09.86	+55 53 14.8	13.2 T	504
C/1999 S3	1999 11 13.90547	20 58 09.76	+55 53 14.1	13.3 T	504
C/1999 S3	1999 11 18.45799	20 48 10.27	+55 06 04.0	12.7 T	360
C/1999 S3	1999 11 18.46042	20 48 09.99	+55 06 02.4		360

C/1999 S3	1999 11 18.48120	20 48 07.54	+55 05 49.5	13.4 T	402
C/1999 S3	1999 11 18.48245	20 48 07.40	+55 05 48.7		402
C/1999 S3	1999 11 18.48372	20 48 07.26	+55 05 47.9		402
C/1999 S3	1999 11 19.46485	20 46 17.31	+54 56 13.9	12.9 T	402
C/1999 S3	1999 11 19.46612	20 46 17.17	+54 56 13.2		402
C/1999 S3	1999 11 19.46737	20 46 17.04	+54 56 12.5		402
C/1999 S3	1999 11 20.74654	20 44 03.00	+54 44 07.3		046
C/1999 S3	1999 11 20.74889	20 44 02.77	+54 44 06.0	14.0 T	046
C/1999 S3	1999 11 20.75142	20 44 02.51	+54 44 04.8		046
C/1999 S3	1999 11 20.75389	20 44 02.24	+54 44 03.2		046

C/1999 S4 (LINEAR)

C/1999 S4	1999 10 09.75870	04 55 18.48	+35 14 16.6		867
C/1999 S4	1999 10 09.76530	04 55 18.13	+35 14 18.5		867
C/1999 S4	1999 10 09.77225	04 55 17.76	+35 14 20.7		867
C/1999 S4	1999 10 20.63505	04 43 38.24	+36 02 55.3	16.5 T	352
C/1999 S4	1999 10 20.63852	04 43 37.99	+36 02 55.4		352
C/1999 S4	1999 10 21.67241	04 42 17.87	+36 07 15.7	16.4 T	402
C/1999 S4	1999 10 21.67366	04 42 17.78	+36 07 15.7		402
C/1999 S4	1999 10 21.67492	04 42 17.67	+36 07 16.2		402
C/1999 S4	1999 10 23.56746	04 39 44.85	+36 14 56.3		402
C/1999 S4	1999 10 23.56998	04 39 44.69	+36 14 57.5	16.1 T	402
C/1999 S4	1999 10 24.59287	04 38 18.55	+36 18 58.1		402
C/1999 S4	1999 10 24.59413	04 38 18.44	+36 18 58.7		402
C/1999 S4	1999 10 24.59782	04 38 18.09	+36 18 59.9	15.7 T	402
C/1999 S4	1999 10 25.63360	04 36 48.37	+36 22 58.7	15.5 T	900
C/1999 S4	1999 10 25.64763	04 36 47.18	+36 23 01.5		900
C/1999 S4	1999 10 26.02917	04 36 13.47	+36 24 27.7	16.7 N	461
C/1999 S4	1999 10 26.03194	04 36 13.21	+36 24 28.3		461
C/1999 S4	1999 10 26.03495	04 36 12.94	+36 24 29.2		461
C/1999 S4	1999 10 27.82310	04 33 30.88	+36 30 57.4	15.6 T	049
C/1999 S4	1999 10 27.82870	04 33 30.38	+36 30 59.1	15.6 T	049
C/1999 S4	1999 10 27.83422	04 33 29.87	+36 31 00.1	15.6 T	049
C/1999 S4	1999 10 28.99678	04 31 40.26	+36 35 05.5		046
C/1999 S4	1999 10 28.99819	04 31 40.14	+36 35 05.6		046
C/1999 S4	1999 10 28.99936	04 31 40.00	+36 35 05.7		046
C/1999 S4	1999 10 29.00050	04 31 39.91	+36 35 06.1		046
C/1999 S4	1999 10 29.00200	04 31 39.75	+36 35 06.3		046
C/1999 S4	1999 11 01.05135	04 26 37.64	+36 44 51.3		619
C/1999 S4	1999 11 01.05676	04 26 37.05	+36 44 52.1		619
C/1999 S4	1999 11 01.06608	04 26 36.09	+36 44 53.8		619
C/1999 S4	1999 11 01.09006	04 26 33.59	+36 44 57.7		118
C/1999 S4	1999 11 01.09617	04 26 32.96	+36 44 58.4		118
C/1999 S4	1999 11 01.33333	04 26 08.65	+36 45 39.8	16.9 T	704
C/1999 S4	1999 11 01.34961	04 26 06.96	+36 45 43.1	17.0 T	704
C/1999 S4	1999 11 01.36633	04 26 05.18	+36 45 45.4	17.0 T	704
C/1999 S4	1999 11 01.38378	04 26 03.34	+36 45 48.8	17.1 T	704
C/1999 S4	1999 11 01.40014	04 26 01.45	+36 45 51.6	17.0 T	704
C/1999 S4	1999 11 03.68193	04 21 59.93	+36 52 08.3	15.9 T	900
C/1999 S4	1999 11 03.69457	04 21 58.55	+36 52 10.6		900
C/1999 S4	1999 11 03.87311	04 21 39.38	+36 52 35.9	15.4 T	049
C/1999 S4	1999 11 03.87844	04 21 38.80	+36 52 36.5	15.4 T	049
C/1999 S4	1999 11 03.88436	04 21 38.15	+36 52 37.3	15.5 T	049

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C/1999 S4	1999 11 03.96707	04 21 28.95	+36 52 51.9	15.3 T	113
C/1999 S4	1999 11 03.97780	04 21 27.77	+36 52 53.4	15.3 T	113
C/1999 S4	1999 11 03.98431	04 21 27.05	+36 52 54.4	15.4 T	113
C/1999 S4	1999 11 04.53833	04 20 26.33	+36 54 15.4	16.6 T	351
C/1999 S4	1999 11 04.54248	04 20 25.93	+36 54 15.3		351
C/1999 S4	1999 11 04.54468	04 20 25.66	+36 54 16.1		897
C/1999 S4	1999 11 04.55128	04 20 24.94	+36 54 17.1	15.8 T	897
C/1999 S4	1999 11 04.55519	04 20 24.50	+36 54 17.1		351
C/1999 S4	1999 11 04.55624	04 20 24.40	+36 54 17.8		897
C/1999 S4	1999 11 04.56704	04 20 23.19	+36 54 19.5	16.0 T	402
C/1999 S4	1999 11 04.56829	04 20 23.05	+36 54 19.7		402
C/1999 S4	1999 11 04.56955	04 20 22.90	+36 54 19.9		402
C/1999 S4	1999 11 04.63715	04 20 15.40	+36 54 30.0	15.4 T	360
C/1999 S4	1999 11 04.63993	04 20 15.07	+36 54 30.5		360
C/1999 S4	1999 11 04.70982	04 20 07.24	+36 54 39.8	15.8 T	349
C/1999 S4	1999 11 04.71347	04 20 06.78	+36 54 40.9		349
C/1999 S4	1999 11 04.77399	04 19 59.99	+36 54 48.9		349
C/1999 S4	1999 11 05.49631	04 18 39.66	+36 56 26.9		411
C/1999 S4	1999 11 05.49970	04 18 39.21	+36 56 27.5		411
C/1999 S4	1999 11 05.50420	04 18 38.73	+36 56 28.0		411
C/1999 S4	1999 11 05.55500	04 18 32.94	+36 56 35.6	15.7 T	355
C/1999 S4	1999 11 05.56258	04 18 32.10	+36 56 36.8		355
C/1999 S4	1999 11 05.56528	04 18 31.76	+36 56 36.8		355
C/1999 S4	1999 11 05.59002	04 18 28.97	+36 56 40.2		349
C/1999 S4	1999 11 05.59184	04 18 28.80	+36 56 40.5		349
C/1999 S4	1999 11 05.59418	04 18 28.50	+36 56 41.0	15.6 T	349
C/1999 S4	1999 11 05.71627	04 18 14.57	+36 56 57.6	15.8 T	402
C/1999 S4	1999 11 05.71753	04 18 14.44	+36 56 57.8		402
C/1999 S4	1999 11 05.71880	04 18 14.29	+36 56 58.1		402
C/1999 S4	1999 11 07.88538	04 14 04.65	+37 01 12.1	15.8 T	504
C/1999 S4	1999 11 07.88766	04 14 04.34	+37 01 12.3	16.0 T	504
C/1999 S4	1999 11 07.88899	04 14 04.25	+37 01 12.5	15.9 T	504
C/1999 S4	1999 11 07.89537	04 14 03.42	+37 01 12.7	15.4 T	504
C/1999 S4	1999 11 07.89722	04 14 03.24	+37 01 13.1	15.7 T	504
C/1999 S4	1999 11 07.89887	04 14 03.07	+37 01 13.7	15.8 T	504
C/1999 S4	1999 11 08.78395	04 12 17.77	+37 02 42.1	15.5 T	349
C/1999 S4	1999 11 08.79131	04 12 16.87	+37 02 43.0		349
C/1999 S4	1999 11 08.79659	04 12 16.27	+37 02 43.2		349
C/1999 S4	1999 11 09.52293	04 10 49.35	+37 03 46.6	15.5 T	351
C/1999 S4	1999 11 09.52844	04 10 48.54	+37 03 46.5		351
C/1999 S4	1999 11 09.53259	04 10 48.05	+37 03 47.1		351
C/1999 S4	1999 11 09.70290	04 10 27.27	+37 04 02.9	15.4 T	402
C/1999 S4	1999 11 09.70415	04 10 27.11	+37 04 02.7		402
C/1999 S4	1999 11 09.70542	04 10 26.96	+37 04 03.3		402
C/1999 S4	1999 11 10.62535	04 08 34.61	+37 05 12.3	15.1 T	360
C/1999 S4	1999 11 10.62778	04 08 34.29	+37 05 12.6		360
C/1999 S4	1999 11 13.52780	04 02 29.28	+37 07 31.5		349
C/1999 S4	1999 11 13.61490	04 02 17.98	+37 07 33.4		349
C/1999 S4	1999 11 13.61696	04 02 17.72	+37 07 34.4	15.2 T	349
C/1999 S4	1999 11 13.66597	04 02 11.37	+37 07 35.0	14.9 T	372
C/1999 S4	1999 11 18.53361	03 51 25.43	+37 06 27.2	15.1 T	402
C/1999 S4	1999 11 18.53486	03 51 25.25	+37 06 27.2		402
C/1999 S4	1999 11 18.53612	03 51 25.07	+37 06 27.0		402

C/1999 S4	1999 11 18.62222	03 51 13.24	+37 06 22.8	15.0 T	360
C/1999 S4	1999 11 18.62448	03 51 12.92	+37 06 22.7		360
C/1999 S4	1999 11 19.54983	03 49 06.15	+37 05 23.3		411
C/1999 S4	1999 11 19.55867	03 49 04.90	+37 05 22.6		411
C/1999 S4	1999 11 19.56876	03 49 03.49	+37 05 21.5		411
C/1999 S4	1999 11 20.86668	03 46 03.72	+37 03 34.7		046
C/1999 S4	1999 11 20.86809	03 46 03.51	+37 03 34.7		046
C/1999 S4	1999 11 20.86928	03 46 03.34	+37 03 34.4		046
C/1999 S4	1999 11 20.87109	03 46 03.10	+37 03 34.2		046

C/1999 T1 (McNaught-Hartley)

C/1999 T1	1999 10 24.57767	01 50 46.49	-41 21 46.9	15.9 T	402
C/1999 T1	1999 10 24.57892	01 50 46.41	-41 21 46.2		402
C/1999 T1	1999 10 24.58018	01 50 46.30	-41 21 46.9		402
C/1999 T1	1999 10 24.58146	01 50 46.42	-41 21 46.6		402
C/1999 T1	1999 10 27.52152	01 48 12.70	-41 39 44.1	16.4 T	423
C/1999 T1	1999 10 27.53818	01 48 11.82	-41 39 49.2	16.4 T	423
C/1999 T1	1999 10 30.56315	01 45 32.61	-41 56 28.6	15.8 T	402
C/1999 T1	1999 10 30.56567	01 45 32.57	-41 56 29.4		402
C/1999 T1	1999 10 30.56821	01 45 32.37	-41 56 28.8		402
C/1999 T1	1999 10 31.35900	01 44 50.66	-42 00 30.9	15.5 N	467
C/1999 T1	1999 10 31.36722	01 44 50.27	-42 00 33.2	15.5 N	467
C/1999 T1	1999 10 31.37020	01 44 50.10	-42 00 34.0	15.9 N	467
C/1999 T1	1999 11 02.52146	01 42 56.43	-42 10 56.5	16.2 T	428
C/1999 T1	1999 11 02.53234	01 42 55.79	-42 10 58.9	16.1 T	428
C/1999 T1	1999 11 02.55810	01 42 54.65	-42 11 06.0		372
C/1999 T1	1999 11 04.54958	01 41 09.74	-42 19 47.9	16.1 T	423
C/1999 T1	1999 11 04.56624	01 41 08.89	-42 19 51.2	16.4 T	423
C/1999 T1	1999 11 04.57500	01 41 08.44	-42 19 55.7	15.8 T	360
C/1999 T1	1999 11 04.57743	01 41 08.32	-42 19 56.3		360
C/1999 T1	1999 11 04.58003	01 41 08.19	-42 19 56.7		360
C/1999 T1	1999 11 04.58845	01 41 07.71	-42 19 56.5	16.5 T	423
C/1999 T1	1999 11 04.61042	01 41 06.69	-42 20 03.7		372
C/1999 T1	1999 11 07.65556	01 38 27.35	-42 31 41.4	15.8 T	428
C/1999 T1	1999 11 10.63167	01 35 54.20	-42 41 07.9	14.5 T	474
C/1999 T1	1999 11 10.63541	01 35 54.02	-42 41 08.6	14.5 T	474
C/1999 T1	1999 11 10.63838	01 35 53.86	-42 41 09.0	14.5 T	474
C/1999 T1	1999 11 15.55020	01 31 48.22	-42 52 44.6	14.4 T	474
C/1999 T1	1999 11 15.55167	01 31 48.12	-42 52 45.1	14.4 T	474
C/1999 T1	1999 11 18.51384	01 29 25.83	-42 57 21.0	15.5 T	423
C/1999 T1	1999 11 18.54715	01 29 24.18	-42 57 23.0	15.9 T	423
C/1999 T1	1999 11 19.45637	01 28 41.55	-42 58 26.4	15.8 T	423
C/1999 T1	1999 11 19.47302	01 28 40.75	-42 58 27.3	16.0 T	423
C/1999 T1	1999 11 19.49523	01 28 39.70	-42 58 28.8	15.9 T	423
C/1999 T1	1999 11 19.50918	01 28 39.06	-42 58 32.5	16.3 T	402
C/1999 T1	1999 11 19.51171	01 28 38.96	-42 58 32.5		402
C/1999 T1	1999 11 19.51423	01 28 38.85	-42 58 32.4		402

C/1999 T2 (LINEAR)

C/1999 T2	1999 10 20.60309	22 50 34.72	+28 53 09.2	16.1 T	352
C/1999 T2	1999 10 20.60656	22 50 34.48	+28 53 08.1		352
C/1999 T2	1999 10 23.55966	22 47 02.75	+28 38 39.6		402
C/1999 T2	1999 10 23.62135	22 46 58.24	+28 38 19.8	15.0 T	402
C/1999 T2	1999 10 24.54264	22 45 54.09	+28 33 41.8	15.8 T	402

C/1999 T2	1999 10 24.54391	22 45 54.00	+28 33 41.3		402
C/1999 T2	1999 10 24.54642	22 45 53.89	+28 33 39.0		402
C/1999 T2	1999 10 27.89627	22 42 07.75	+28 16 19.0		046
C/1999 T2	1999 10 27.89765	22 42 07.66	+28 16 18.6		046
C/1999 T2	1999 10 27.89891	22 42 07.56	+28 16 18.3		046
C/1999 T2	1999 10 27.90007	22 42 07.49	+28 16 18.0		046
C/1999 T2	1999 10 28.42771	22 41 33.16	+28 13 30.3	16.2 T	897
C/1999 T2	1999 10 28.44992	22 41 31.66	+28 13 23.7		897
C/1999 T2	1999 10 28.45771	22 41 31.17	+28 13 21.9		355
C/1999 T2	1999 10 28.46421	22 41 30.73	+28 13 20.1	16.5 T	355
C/1999 T2	1999 10 28.73819	22 41 13.07	+28 11 51.9	16.0 T	118
C/1999 T2	1999 10 28.74562	22 41 12.55	+28 11 50.0		118
C/1999 T2	1999 10 29.05370	22 40 52.43	+28 10 12.3	17.8 T	750
C/1999 T2	1999 10 29.05706	22 40 52.33	+28 10 11.2	17.5 T	750
C/1999 T2	1999 10 29.10138	22 40 49.58	+28 09 56.1	17.5 T	750
C/1999 T2	1999 10 29.10736	22 40 49.16	+28 09 55.0	17.9 T	750
C/1999 T2	1999 10 29.47992	22 40 25.19	+28 07 56.0	16.5 T	402
C/1999 T2	1999 10 29.48118	22 40 25.07	+28 07 55.6		402
C/1999 T2	1999 10 29.48244	22 40 25.00	+28 07 55.1		402
C/1999 T2	1999 11 01.14777	22 37 38.55	+27 53 35.3	19.7 T	750
C/1999 T2	1999 11 03.42313	22 35 23.01	+27 41 12.6	16.1 T	402
C/1999 T2	1999 11 03.42439	22 35 22.95	+27 41 12.2		402
C/1999 T2	1999 11 03.42565	22 35 22.88	+27 41 11.9		402
C/1999 T2	1999 11 03.47715	22 35 19.82	+27 40 56.0		900
C/1999 T2	1999 11 03.49032	22 35 19.03	+27 40 51.0	15.6 T	900
C/1999 T2	1999 11 03.87546	22 34 56.73	+27 38 44.2	16.6 T	113
C/1999 T2	1999 11 03.88927	22 34 55.94	+27 38 39.5	16.6 T	113
C/1999 T2	1999 11 04.45608	22 34 23.44	+27 35 34.3	16.6 T	360
C/1999 T2	1999 11 04.45903	22 34 23.29	+27 35 33.1		360
C/1999 T2	1999 11 05.49235	22 33 25.06	+27 29 54.8		355
C/1999 T2	1999 11 05.49506	22 33 24.89	+27 29 53.4		355
C/1999 T2	1999 11 05.50866	22 33 24.04	+27 29 48.3	16.4 T	349
C/1999 T2	1999 11 05.51712	22 33 23.60	+27 29 45.3		349
C/1999 T2	1999 11 05.51878	22 33 23.58	+27 29 45.1		349
C/1999 T2	1999 11 10.43312	22 29 04.46	+27 02 59.6	16.2 T	402
C/1999 T2	1999 11 10.43439	22 29 04.43	+27 02 59.3		402
C/1999 T2	1999 11 10.43566	22 29 04.30	+27 02 58.9		402
C/1999 T2	1999 11 10.49386	22 29 01.37	+27 02 39.8	15.6 T	900
C/1999 T2	1999 11 10.50156	22 29 00.98	+27 02 37.7	16.5 T	360
C/1999 T2	1999 11 10.50399	22 29 00.84	+27 02 36.8		360
C/1999 T2	1999 11 10.50656	22 29 00.74	+27 02 35.3		900
C/1999 T2	1999 11 13.85275	22 26 21.63	+26 44 40.8	15.7 T	504
C/1999 T2	1999 11 13.87146	22 26 20.71	+26 44 34.4	15.1 T	504
C/1999 T2	1999 11 13.87404	22 26 20.56	+26 44 33.6	15.6 T	504
C/1999 T2	1999 11 13.87580	22 26 20.53	+26 44 32.6	15.4 T	504
C/1999 T2	1999 11 13.88083	22 26 20.37	+26 44 31.7	15.5 T	504
C/1999 T2	1999 11 13.88483	22 26 20.12	+26 44 30.1	15.5 T	504
C/1999 T2	1999 11 13.88697	22 26 20.00	+26 44 29.0	15.7 T	504
C/1999 T2	1999 11 19.47206	22 22 25.27	+26 15 40.7	16.2 T	402
C/1999 T2	1999 11 19.47332	22 22 25.31	+26 15 40.0		402
C/1999 T2	1999 11 19.47458	22 22 25.21	+26 15 40.2		402

C/1999 T3 (LINEAR)					
C/1999 T3	1999 10 24.63907	02 54 09.30	+18 50 59.8	17.3 T	402
C/1999 T3	1999 10 24.64161	02 54 09.23	+18 50 57.7		402
C/1999 T3	1999 10 24.64413	02 54 09.06	+18 50 56.6		402
C/1999 T3	1999 10 27.88601	02 51 37.28	+18 17 58.5		046
C/1999 T3	1999 10 27.88753	02 51 37.20	+18 17 57.5		046
C/1999 T3	1999 10 27.88887	02 51 37.16	+18 17 56.4		046
C/1999 T3	1999 10 28.51159	02 51 07.68	+18 11 32.7	17.5 T	897
C/1999 T3	1999 10 28.52227	02 51 07.29	+18 11 26.9		897
C/1999 T3	1999 10 29.94282	02 49 59.78	+17 56 44.7		118
C/1999 T3	1999 10 29.94830	02 49 59.51	+17 56 41.1	16.5 T	118
C/1999 T3	1999 10 30.39707	02 49 38.10	+17 52 05.5	17.7 T	691
C/1999 T3	1999 10 30.41869	02 49 37.07	+17 51 50.1	17.4 T	691
C/1999 T3	1999 10 30.44033	02 49 36.02	+17 51 36.8	17.4 T	691
C/1999 T3	1999 11 02.01316	02 47 33.12	+17 24 40.5	16.8 T	470
C/1999 T3	1999 11 02.02249	02 47 32.66	+17 24 35.9	16.5 T	470
C/1999 T3	1999 11 03.54861	02 46 19.57	+17 08 28.3	17.1 T	367
C/1999 T3	1999 11 03.55174	02 46 19.43	+17 08 26.2		367
C/1999 T3	1999 11 03.55486	02 46 19.28	+17 08 24.9		367
C/1999 T3	1999 11 04.32131	02 45 42.49	+17 00 16.7	18.8 T	704
C/1999 T3	1999 11 04.33741	02 45 41.70	+17 00 07.2	18.6 T	704
C/1999 T3	1999 11 04.35357	02 45 40.91	+16 59 56.5	18.5 T	704
C/1999 T3	1999 11 04.36967	02 45 40.14	+16 59 46.8	18.7 T	704
C/1999 T3	1999 11 04.38575	02 45 39.36	+16 59 35.3	18.6 T	704
C/1999 T3	1999 11 04.55139	02 45 31.42	+16 57 50.4	17.1 T	360
C/1999 T3	1999 11 04.55476	02 45 31.25	+16 57 48.4	17.1 T	402
C/1999 T3	1999 11 04.55590	02 45 31.21	+16 57 47.5		360
C/1999 T3	1999 11 04.55602	02 45 31.19	+16 57 47.6		402
C/1999 T3	1999 11 04.55728	02 45 31.13	+16 57 46.6		402
C/1999 T3	1999 11 04.59301	02 45 29.40	+16 57 23.7	16.9 T	903
C/1999 T3	1999 11 04.62325	02 45 27.92	+16 57 05.5	16.3 T	355
C/1999 T3	1999 11 04.62604	02 45 27.69	+16 57 01.5		903
C/1999 T3	1999 11 04.62732	02 45 27.73	+16 57 02.0		355
C/1999 T3	1999 11 04.63425	02 45 27.40	+16 56 58.2		355
C/1999 T3	1999 11 07.60404	02 43 04.87	+16 25 19.0		903
C/1999 T3	1999 11 07.60841	02 43 04.70	+16 25 15.6	16.9 T	903
C/1999 T3	1999 11 08.68769	02 42 12.91	+16 13 43.6	17 T	888
C/1999 T3	1999 11 08.69476	02 42 12.54	+16 13 39.3		888
C/1999 T3	1999 11 09.67087	02 41 25.94	+16 03 10.0	16.9 T	402
C/1999 T3	1999 11 09.67212	02 41 25.87	+16 03 09.1		402
C/1999 T3	1999 11 09.67338	02 41 25.82	+16 03 08.6		402
C/1999 T3	1999 11 10.55938	02 40 43.65	+15 53 37.6	17.3 T	360
C/1999 T3	1999 11 10.56319	02 40 43.47	+15 53 35.2		360
C/1999 T3	1999 11 10.58005	02 40 42.61	+15 53 25.0	16.5 T	900
C/1999 T3	1999 11 10.59969	02 40 41.72	+15 53 12.6		900
C/1999 T3	1999 11 13.39818	02 38 29.06	+15 23 05.4	17.3 T	691
C/1999 T3	1999 11 13.42541	02 38 27.82	+15 22 49.8	17.4 T	691
C/1999 T3	1999 11 13.45283	02 38 26.52	+15 22 32.2	17.4 T	691
C/1999 T3	1999 11 16.57986	02 36 00.48	+14 48 54.1	17.5 T	360
C/1999 T3	1999 11 16.58385	02 36 00.30	+14 48 51.8		360
C/1999 T3	1999 11 18.49594	02 34 32.40	+14 28 22.2	16.8 T	402
C/1999 T3	1999 11 18.49845	02 34 32.30	+14 28 20.9		402
C/1999 T3	1999 11 18.50119	02 34 32.10	+14 28 19.1		402

C/1999 U1 (Ferris)						
C/1999 U1	1999 10 24.60964	04 33 12.45	+08 43 10.8	17.0 T	402	
C/1999 U1	1999 10 24.61090	04 33 12.35	+08 43 11.2		402	
C/1999 U1	1999 10 24.61216	04 33 12.19	+08 43 10.3		402	
C/1999 U1	1999 10 29.99397	04 28 07.26	+08 59 26.0		118	
C/1999 U1	1999 10 29.99905	04 28 06.99	+08 59 26.6	17.1 T	118	
C/1999 U1	1999 11 01.08007	04 26 04.17	+09 05 53.4		118	
C/1999 U1	1999 11 01.08411	04 26 03.93	+09 05 53.8	17.0 T	118	
C/1999 U1	1999 11 02.51525	04 24 38.00	+09 10 20.1	17.1 T	691	
C/1999 U1	1999 11 02.52059	04 24 37.69	+09 10 21.1	17.1 T	691	
C/1999 U1	1999 11 02.52557	04 24 37.40	+09 10 21.6	17.1 T	691	
C/1999 U1	1999 11 04.56081	04 22 33.64	+09 16 49.9	16.6 T	402	
C/1999 U1	1999 11 04.56206	04 22 33.50	+09 16 50.4		402	
C/1999 U1	1999 11 04.56332	04 22 33.46	+09 16 50.2		402	
C/1999 U1	1999 11 04.69219	04 22 25.45	+09 17 15.2	16.8 T	360	
C/1999 U1	1999 11 04.69608	04 22 25.17	+09 17 15.9	16.3 T	900	
C/1999 U1	1999 11 04.70451	04 22 24.68	+09 17 17.8		360	
C/1999 U1	1999 11 04.71567	04 22 24.01	+09 17 20.0		900	
C/1999 U1	1999 11 05.61302	04 21 28.73	+09 20 10.9		355	
C/1999 U1	1999 11 05.61625	04 21 28.50	+09 20 11.4	16.3 T	355	
C/1999 U1	1999 11 05.78530	04 21 17.95	+09 20 44.3	17 T	888	
C/1999 U1	1999 11 05.79375	04 21 17.37	+09 20 46.7		888	
C/1999 U1	1999 11 05.79900	04 21 17.07	+09 20 47.8		888	
C/1999 U1	1999 11 09.67371	04 17 14.05	+09 33 20.8	16.0 T	900	
C/1999 U1	1999 11 09.68312	04 17 13.42	+09 33 22.3	17.0 T	402	
C/1999 U1	1999 11 09.68439	04 17 13.31	+09 33 22.7		402	
C/1999 U1	1999 11 09.68565	04 17 13.25	+09 33 23.1		402	
C/1999 U1	1999 11 09.69331	04 17 12.72	+09 33 24.4		900	
C/1999 U1	1999 11 10.65590	04 16 11.55	+09 36 34.5	16.6 T	360	
C/1999 U1	1999 11 10.66076	04 16 11.25	+09 36 35.5		360	
C/1999 U1	1999 11 13.92384	04 12 41.89	+09 47 25.4	17.5 T	504	
C/1999 U1	1999 11 13.92763	04 12 41.63	+09 47 26.0	17.2 T	504	
C/1999 U1	1999 11 14.44358	04 12 08.21	+09 49 11.1	17.0 T	691	
C/1999 U1	1999 11 14.46810	04 12 06.60	+09 49 15.8	17.0 T	691	
C/1999 U1	1999 11 14.49212	04 12 05.03	+09 49 19.0	17.1 T	691	
C/1999 U1	1999 11 16.64410	04 09 45.57	+09 56 39.5	16.8 T	360	
C/1999 U1	1999 11 16.64878	04 09 45.28	+09 56 40.3		360	
C/1999 U1	1999 11 19.53201	04 06 37.62	+10 06 35.0	16.8 T	402	
C/1999 U1	1999 11 19.53326	04 06 37.52	+10 06 35.4		402	
C/1999 U1	1999 11 19.53579	04 06 37.33	+10 06 35.4		402	

C/1999 U2 (SOHO)						
C/1999 U2	1999 10 25.22090	13 46 44.1	-10 28 49		249	
Geocentric position (AU)	-0.00783519	-0.00677847	-0.00378340			
C/1999 U2	1999 10 25.27923	13 46 55.8	-10 20 01		249	
Geocentric position (AU)	-0.00783322	-0.00678036	-0.00378513			
C/1999 U2	1999 10 25.32090	13 47 08.4	-10 14 04		249	
Geocentric position (AU)	-0.00783182	-0.00678171	-0.00378636			
C/1999 U2	1999 10 25.34590	13 47 16.1	-10 10 36		249	
Geocentric position (AU)	-0.00783098	-0.00678251	-0.00378710			
C/1999 U2	1999 10 25.36256	13 47 23.8	-10 09 21		249	
Geocentric position (AU)	-0.00783042	-0.00678305	-0.00378760			

C/1999 U2	1999 10 25.38756	13 47 32.8	-10 06 01		249	
Geocentric position (AU)	-0.00782958	-0.00678386	-0.00378833			
C/1999 U2	1999 10 25.40423	13 47 39.0	-10 04 05		249	
Geocentric position (AU)	-0.00782902	-0.00678440	-0.00378882			
C/1999 U2	1999 10 25.44590	13 47 56.1	-10 00 12		249	
Geocentric position (AU)	-0.00782763	-0.00678574	-0.00379005			
C/1999 U2	1999 10 25.47090	13 48 09.0	-09 57 14		249	
Geocentric position (AU)	-0.00782680	-0.00678655	-0.00379078			
C/1999 U2	1999 10 25.48757	13 48 16.2	-09 55 47		249	
Geocentric position (AU)	-0.00782624	-0.00678708	-0.00379127			
C/1999 U2	1999 10 25.51257	13 48 28.6	-09 53 50		249	
Geocentric position (AU)	-0.00782541	-0.00678789	-0.00379201			
C/1999 U2	1999 10 25.52923	13 48 36.4	-09 52 26		249	
Geocentric position (AU)	-0.00782486	-0.00678843	-0.00379250			
C/1999 U2	1999 10 25.67923	13 50 09.0	-09 43 40		249	
Geocentric position (AU)	-0.00781991	-0.00679325	-0.00379687			
C/1999 U2	1999 10 25.69590	13 50 17.7	-09 42 45		249	
Geocentric position (AU)	-0.00781936	-0.00679378	-0.00379736			
C/1999 U2	1999 10 25.72090	13 50 31.7	-09 41 56		249	
Geocentric position (AU)	-0.00781854	-0.00679458	-0.00379809			
C/1999 U2	1999 10 25.73756	13 50 46.1	-09 41 21		249	
Geocentric position (AU)	-0.00781800	-0.00679512	-0.00379857			

P/1999 U3 (LINEAR)						
P/1999 U3	1999 10 30.32373	03 27 14.49	+58 17 44.3	18.5 N	704	
P/1999 U3	1999 10 30.34009	03 27 14.31	+58 17 50.7	19.1 N	704	
P/1999 U3	1999 10 30.37274	03 27 14.12	+58 18 01.6	19.6 N	704	
P/1999 U3	1999 10 30.38902	03 27 13.82	+58 18 06.5	18.6 N	704	
P/1999 U3	1999 10 31.31732	03 27 07.91	+58 22 25.6	18.3 T	704	
P/1999 U3	1999 10 31.33285	03 27 07.79	+58 22 31.9	17.7 N	853	
P/1999 U3	1999 10 31.33364	03 27 07.77	+58 22 32.3	19.4 T	704	
P/1999 U3	1999 10 31.33578	03 27 07.79	+58 22 32.6	17.4 N	853	
P/1999 U3	1999 10 31.33840	03 27 07.73	+58 22 33.3		853	
P/1999 U3	1999 10 31.34194	03 27 07.71	+58 22 34.2	17.8 N	853	
P/1999 U3	1999 10 31.35012	03 27 07.52	+58 22 35.8	19.4 T	704	
P/1999 U3	1999 10 31.38350	03 27 06.95	+58 22 45.3	18.5 T	704	
P/1999 U3	1999 10 31.71834	03 27 05.36	+58 24 04.7		557	
P/1999 U3	1999 10 31.72107	03 27 05.21	+58 24 04.7	16.6 T	540	
P/1999 U3	1999 10 31.72407	03 27 05.25	+58 24 05.5		540	
P/1999 U3	1999 10 31.72674	03 27 05.19	+58 24 06.0		540	
P/1999 U3	1999 10 31.72825	03 27 05.26	+58 24 07.2	17.0 N	557	
P/1999 U3	1999 10 31.72963	03 27 05.20	+58 24 06.9		540	
P/1999 U3	1999 10 31.73023	03 27 05.25	+58 24 07.7	16.2 T	557	
P/1999 U3	1999 10 31.73229	03 27 05.17	+58 24 07.5		540	
P/1999 U3	1999 10 31.74028	03 27 05.09	+58 24 09.8		540	
P/1999 U3	1999 10 31.74209	03 27 05.19	+58 24 11.5	17.2 T	046	
P/1999 U3	1999 10 31.74374	03 27 05.20	+58 24 11.8		046	
P/1999 U3	1999 10 31.74492	03 27 05.16	+58 24 11.9		046	
P/1999 U3	1999 10 31.74605	03 27 05.18	+58 24 12.5		046	
P/1999 U3	1999 10 31.74838	03 27 05.15	+58 24 13.1		046	
P/1999 U3	1999 10 31.75147	03 27 05.11	+58 24 14.1		046	
P/1999 U3	1999 10 31.75777	03 27 05.11	+58 24 16.4		046	
P/1999 U3	1999 10 31.76037	03 27 05.06	+58 24 16.5		046	

P/1999 U3	1999 10 31.82326	03 27 04.36	+58 24 33.4		611	P/1999 U3	1999 11 05.71296	03 26 00.71	+58 38 33.4		402
P/1999 U3	1999 10 31.83704	03 27 04.29	+58 24 37.7		611	P/1999 U3	1999 11 06.59083	03 25 46.14	+58 39 36.7		355
P/1999 U3	1999 10 31.88041	03 27 03.74	+58 24 49.7		557	P/1999 U3	1999 11 06.59637	03 25 45.98	+58 39 37.2		355
P/1999 U3	1999 10 31.88222	03 27 03.92	+58 24 51.2		619	P/1999 U3	1999 11 06.60370	03 25 45.86	+58 39 37.7		355
P/1999 U3	1999 10 31.89944	03 27 03.68	+58 24 55.1		619	P/1999 U3	1999 11 06.92767	03 25 40.38	+58 39 54.5		965
P/1999 U3	1999 10 31.91178	03 27 03.46	+58 24 58.3	17.7 T	587	P/1999 U3	1999 11 06.93925	03 25 40.09	+58 39 55.1		965
P/1999 U3	1999 10 31.94676	03 27 03.01	+58 25 07.4		587	P/1999 U3	1999 11 06.95123	03 25 39.81	+58 39 55.6		965
P/1999 U3	1999 10 31.96426	03 27 02.81	+58 25 12.5		619	P/1999 U3	1999 11 08.70660	03 25 04.82	+58 40 19.3		372
P/1999 U3	1999 10 31.97145	03 27 02.78	+58 25 14.2	16.8 T	946	P/1999 U3	1999 11 10.61267	03 24 25.05	+58 38 43.3	16.3 T	360
P/1999 U3	1999 10 31.97888	03 27 02.76	+58 25 16.4	16.8 T	946	P/1999 U3	1999 11 10.61510	03 24 24.93	+58 38 43.0		360
P/1999 U3	1999 10 31.99253	03 27 02.48	+58 25 19.3		946	P/1999 U3	1999 11 12.70729	03 23 36.75	+58 34 23.1		372
P/1999 U3	1999 11 01.15880	03 27 01.54	+58 25 58.1	17.1 T	713	P/1999 U3	1999 11 13.68587	03 23 13.90	+58 31 29.0	16.7 T	372
P/1999 U3	1999 11 01.17900	03 27 01.33	+58 26 03.7	17.2 T	713	P/1999 U3	1999 11 16.57014	03 22 06.18	+58 19 30.8	16.3 T	360
P/1999 U3	1999 11 01.20635	03 27 00.91	+58 26 10.1	17.0 T	713	P/1999 U3	1999 11 16.57257	03 22 06.11	+58 19 30.0		360
P/1999 U3	1999 11 01.24792	03 27 00.35	+58 26 21.1	16.9 T	713	C/1999 U4 (Catalina-Skiff)					
P/1999 U3	1999 11 01.51679	03 26 57.95	+58 27 23.7		897	C/1999 U4	1999 09 18.42038	02 28 23.82	+19 21 11.1	18.2 T 3	699
P/1999 U3	1999 11 01.52763	03 26 57.79	+58 27 26.0	16.6 T	897	C/1999 U4	1999 09 18.43314	02 28 23.61	+19 21 12.2		3 699
P/1999 U3	1999 11 01.59255	03 26 56.96	+58 27 42.5		897	C/1999 U4	1999 09 18.44589	02 28 23.29	+19 21 14.0		3 699
P/1999 U3	1999 11 01.64809	03 26 56.31	+58 27 56.3	16.8 T	372	C/1999 U4	1999 10 03.28927	02 22 48.04	+19 47 05.2	18.3 T 3	704
P/1999 U3	1999 11 01.79212	03 26 55.29	+58 28 20.6	16.7 T	470	C/1999 U4	1999 10 03.30045	02 22 47.73	+19 47 05.1	18.9 T 3	704
P/1999 U3	1999 11 01.80508	03 26 55.20	+58 28 25.9	16.5 T	470	C/1999 U4	1999 10 03.31164	02 22 47.44	+19 47 08.3	18.7 T 3	704
P/1999 U3	1999 11 01.81663	03 26 55.08	+58 28 28.9	16.7 T	104	C/1999 U4	1999 10 03.33395	02 22 46.70	+19 47 10.3	18.5 T 3	704
P/1999 U3	1999 11 01.82255	03 26 55.03	+58 28 30.1		104	C/1999 U4	1999 10 31.24836	02 08 48.20	+20 15 56.8	17.0 T	703
P/1999 U3	1999 11 01.83997	03 26 54.86	+58 28 33.8	17.3 T	596	C/1999 U4	1999 10 31.26037	02 08 47.84	+20 15 57.9	17.0 T	703
P/1999 U3	1999 11 01.85122	03 26 54.85	+58 28 38.2		596	C/1999 U4	1999 10 31.27238	02 08 47.40	+20 15 58.5	17.1 T	703
P/1999 U3	1999 11 01.85126	03 26 54.70	+58 28 36.0		104	C/1999 U4	1999 10 31.28440	02 08 47.01	+20 15 58.3	17.0 T	703
P/1999 U3	1999 11 01.85770	03 26 54.59	+58 28 38.3		104	C/1999 U4	1999 11 01.27779	02 08 14.92	+20 16 35.4	17.4 T	699
P/1999 U3	1999 11 02.65894	03 26 45.06	+58 31 26.4	17.0 T	372	C/1999 U4	1999 11 01.30836	02 08 13.91	+20 16 36.7		699
P/1999 U3	1999 11 03.15417	03 26 39.65	+58 32 53.5	17.3 T	713	C/1999 U4	1999 11 01.33894	02 08 12.93	+20 16 36.9		699
P/1999 U3	1999 11 03.17153	03 26 39.41	+58 32 56.9	17.1 T	713	C/1999 U4	1999 11 01.77912	02 07 58.78	+20 16 52.9		557
P/1999 U3	1999 11 03.19584	03 26 38.94	+58 33 02.9	17.4 T	713	C/1999 U4	1999 11 01.78110	02 07 58.72	+20 16 52.7		557
P/1999 U3	1999 11 03.53436	03 26 34.61	+58 33 58.4	17.0 T	367	C/1999 U4	1999 11 01.78308	02 07 58.65	+20 16 53.0		557
P/1999 U3	1999 11 03.53749	03 26 34.48	+58 33 58.5		367	C/1999 U4	1999 11 01.79495	02 07 58.29	+20 16 53.3		557
P/1999 U3	1999 11 03.54061	03 26 34.52	+58 33 59.2		367	C/1999 U4	1999 11 01.81109	02 07 57.67	+20 16 54.4	16.9 T	046
P/1999 U3	1999 11 03.64163	03 26 32.56	+58 34 17.7	16.6 T	900	C/1999 U4	1999 11 01.81336	02 07 57.60	+20 16 54.1		046
P/1999 U3	1999 11 03.66126	03 26 32.12	+58 34 21.2		900	C/1999 U4	1999 11 01.81672	02 07 57.48	+20 16 54.4		046
P/1999 U3	1999 11 04.52895	03 26 20.55	+58 36 24.2	17.0 T	402	C/1999 U4	1999 11 01.81969	02 07 57.42	+20 16 53.8		046
P/1999 U3	1999 11 04.53147	03 26 20.53	+58 36 24.8		402	C/1999 U4	1999 11 01.82154	02 07 57.36	+20 16 54.1		046
P/1999 U3	1999 11 04.53399	03 26 20.44	+58 36 25.1		402	C/1999 U4	1999 11 01.82410	02 07 57.32	+20 16 54.5		046
P/1999 U3	1999 11 04.59167	03 26 19.31	+58 36 33.4	16.8 T	367	C/1999 U4	1999 11 01.82730	02 07 57.23	+20 16 54.9		046
P/1999 U3	1999 11 04.59479	03 26 19.18	+58 36 33.4		367	C/1999 U4	1999 11 01.96572	02 07 52.67	+20 16 59.3		557
P/1999 U3	1999 11 04.59792	03 26 19.09	+58 36 33.8		367	C/1999 U4	1999 11 01.97060	02 07 52.51	+20 17 01.2	16.7 T	470
P/1999 U3	1999 11 04.60347	03 26 18.93	+58 36 34.4		367	C/1999 U4	1999 11 01.98554	02 07 51.97	+20 16 59.7	16.8 T	470
P/1999 U3	1999 11 04.62604	03 26 18.63	+58 36 38.4	16.3 T	360	C/1999 U4	1999 11 02.15926	02 07 46.50	+20 17 07.4		681
P/1999 U3	1999 11 04.63073	03 26 18.55	+58 36 39.0		360	C/1999 U4	1999 11 02.17127	02 07 46.14	+20 17 06.8	17.4 T	681
P/1999 U3	1999 11 04.65726	03 26 17.87	+58 36 41.5	16.3 T	355	C/1999 U4	1999 11 02.21400	02 07 44.65	+20 17 07.6	17.4 T	681
P/1999 U3	1999 11 04.67113	03 26 17.60	+58 36 43.1		355	C/1999 U4	1999 11 03.47765	02 07 03.89	+20 17 52.4	17.1 T	402
P/1999 U3	1999 11 04.67542	03 26 17.51	+58 36 43.6		355	C/1999 U4	1999 11 03.47892	02 07 03.86	+20 17 52.6		402
P/1999 U3	1999 11 04.72760	03 26 16.41	+58 36 50.4	17.0 T	372	C/1999 U4	1999 11 03.48017	02 07 03.82	+20 17 52.6		402
P/1999 U3	1999 11 05.56988	03 26 03.90	+58 38 20.3		349	C/1999 U4	1999 11 03.50432	02 07 03.03	+20 17 52.4	17.0 T	897
P/1999 U3	1999 11 05.57949	03 26 03.59	+58 38 20.6	16.5 T	349	C/1999 U4	1999 11 03.51330	02 07 02.74	+20 17 52.7		897
P/1999 U3	1999 11 05.70918	03 26 00.76	+58 38 33.3	16.8 T	402	C/1999 U4	1999 11 03.52395	02 07 02.37	+20 17 53.3	17.1 T	367
P/1999 U3	1999 11 05.71044	03 26 00.76	+58 38 33.4		402						

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C/1999 U4	1999 11 03.52708	02 07 02.27	+20 17 53.2		367	P/1999 V1	1999 11 06.49391	09 38 11.62	+11 21 52.8		711
C/1999 U4	1999 11 03.53020	02 07 02.16	+20 17 53.5		367	P/1999 V1	1999 11 07.46748	09 39 06.94	+11 12 34.1	4	711
C/1999 U4	1999 11 03.53525	02 07 01.98	+20 17 54.6		897	P/1999 V1	1999 11 07.48098	09 39 07.73	+11 12 24.9	4	711
C/1999 U4	1999 11 03.57403	02 07 00.69	+20 17 56.1	16.4 T	900	P/1999 V1	1999 11 07.49210	09 39 08.49	+11 12 20.2	4	711
C/1999 U4	1999 11 03.59269	02 07 00.12	+20 17 56.0		900	P/1999 V1	1999 11 07.85888	09 39 28.57	+11 08 47.7		327
C/1999 U4	1999 11 04.51580	02 06 30.36	+20 18 26.0	16.9 T	402	P/1999 V1	1999 11 07.87171	09 39 29.19	+11 08 39.8		327
C/1999 U4	1999 11 04.51958	02 06 30.21	+20 18 26.8		402	P/1999 V1	1999 11 07.88414	09 39 29.94	+11 08 31.9	18.3 T	327
C/1999 U4	1999 11 04.52084	02 06 30.19	+20 18 26.5		402	P/1999 V1	1999 11 07.89671	09 39 30.63	+11 08 25.0		327
C/1999 U4	1999 11 04.56285	02 06 28.80	+20 18 28.4	17.2 T	360	P/1999 V1	1999 11 08.81042	09 40 21.08	+10 59 41.6	17.9 T	372
C/1999 U4	1999 11 04.56736	02 06 28.65	+20 18 28.4		360	P/1999 V1	1999 11 08.89075	09 40 25.44	+10 58 54.7	17.9 T	327
C/1999 U4	1999 11 04.59422	02 06 27.82	+20 18 29.1		355	P/1999 V1	1999 11 08.89918	09 40 25.87	+10 58 49.9		327
C/1999 U4	1999 11 04.59786	02 06 27.61	+20 18 29.3	17.0 T	355	P/1999 V1	1999 11 08.90777	09 40 26.30	+10 58 44.9		327
C/1999 U4	1999 11 04.60125	02 06 27.54	+20 18 29.4		355	P/1999 V1	1999 11 09.73883	09 41 11.47	+10 50 48.4	17.8 T	897
C/1999 U4	1999 11 04.61763	02 06 27.02	+20 18 30.3	17.1 T	900	P/1999 V1	1999 11 09.74829	09 41 11.95	+10 50 43.3		897
C/1999 U4	1999 11 04.63723	02 06 26.38	+20 18 30.9		900	P/1999 V1	1999 11 09.75568	09 41 12.47	+10 50 38.4		897
C/1999 U4	1999 11 04.73356	02 06 23.27	+20 18 32.8	17 T	888	P/1999 V1	1999 11 09.76155	09 41 12.75	+10 50 35.1	18.0 T	897
C/1999 U4	1999 11 04.74071	02 06 23.01	+20 18 33.3		888	P/1999 V1	1999 11 09.78274	09 41 14.01	+10 50 22.5	17.8 T	402
C/1999 U4	1999 11 04.74579	02 06 22.83	+20 18 33.9		888	P/1999 V1	1999 11 09.78505	09 41 14.04	+10 50 21.7		402
C/1999 U4	1999 11 05.50681	02 05 58.44	+20 18 57.4		355	P/1999 V1	1999 11 09.78735	09 41 14.17	+10 50 20.8		402
C/1999 U4	1999 11 05.51383	02 05 58.21	+20 18 58.3	17.2 T	355	P/1999 V1	1999 11 09.83076	09 41 16.14	+10 49 56.6	17.3 T	900
C/1999 U4	1999 11 05.52924	02 05 57.70	+20 18 58.6		355	P/1999 V1	1999 11 09.83858	09 41 16.65	+10 49 52.5		900
C/1999 U4	1999 11 05.56483	02 05 56.56	+20 18 59.3	17 T	888	P/1999 V1	1999 11 13.82638	09 44 44.13	+10 11 55.7	17.8 T	372
C/1999 U4	1999 11 05.57218	02 05 56.30	+20 18 59.8		888	P/1999 V1	1999 11 16.82830	09 47 10.60	+09 43 30.6	18.1 T	360
C/1999 U4	1999 11 05.57942	02 05 56.07	+20 19 00.2		888	P/1999 V1	1999 11 16.83212	09 47 10.77	+09 43 28.8		360
C/1999 U4	1999 11 05.80742	02 05 48.81	+20 19 07.1	17.2 T	104	P/1999 V1	1999 11 16.83594	09 47 10.92	+09 43 26.8		360
C/1999 U4	1999 11 05.81487	02 05 48.53	+20 19 07.2		104	P/1999 V1	1999 11 21.14362	09 50 25.44	+09 03 08.3		046
C/1999 U4	1999 11 05.82188	02 05 48.27	+20 19 07.5		104	P/1999 V1	1999 11 21.14546	09 50 25.56	+09 03 07.2		046
C/1999 U4	1999 11 05.82576	02 05 48.16	+20 19 07.6		104	P/1999 V1	1999 11 21.14661	09 50 25.62	+09 03 06.6		046
C/1999 U4	1999 11 07.56593	02 04 52.24	+20 19 58.8		903	P/1999 V1	1999 11 21.14784	09 50 25.68	+09 03 05.6		046
C/1999 U4	1999 11 07.57149	02 04 51.99	+20 20 00.3	17.0 T	903						
C/1999 U4	1999 11 09.66492	02 03 45.24	+20 20 59.0	17.3 T	402						
C/1999 U4	1999 11 09.66617	02 03 45.17	+20 20 58.9		402	4P	1999 11 14.51168	10 03 09.67	+02 41 04.6	18.7 T	691
C/1999 U4	1999 11 09.66743	02 03 45.16	+20 20 59.1		402	4P	1999 11 14.52560	10 03 10.43	+02 40 58.5	18.7 T	691
C/1999 U4	1999 11 10.64583	02 03 14.13	+20 21 25.7	17.2 T	360	4P	1999 11 14.53970	10 03 11.19	+02 40 52.6	18.6 T	691
C/1999 U4	1999 11 10.64965	02 03 14.01	+20 21 25.6		360						
C/1999 U4	1999 11 16.62118	02 00 08.40	+20 23 51.0	17.4 T	360						
C/1999 U4	1999 11 16.62535	02 00 08.28	+20 23 51.3		360	10P	1999 09 28.46667	19 07 42.46	-31 28 54.4	13.5 T	372
C/1999 U4	1999 11 18.46145	01 59 12.93	+20 24 32.2	17.0 T	402	10P	1999 10 20.44553	20 17 33.29	-31 03 01.5	13.2 T	351
C/1999 U4	1999 11 18.46396	01 59 12.87	+20 24 31.7		402	10P	1999 10 20.45256	20 17 34.63	-31 02 57.6		351
C/1999 U4	1999 11 18.46817	01 59 12.72	+20 24 32.1		402	10P	1999 10 24.42682	20 30 12.35	-30 38 05.5	13.7 T	349
						10P	1999 10 24.42829	20 30 12.72	-30 38 05.5		349
						10P	1999 10 24.42943	20 30 12.88	-30 38 04.9		349
						10P	1999 11 02.42656	20 58 16.66	-29 22 12.4	11.9 T	372
						10P	1999 11 03.43173	21 01 21.31	-29 12 11.9		900
P/1999 V1	1999 11 05.43943	09 37 11.47	+11 32 03.7	17.6 T	703	10P	1999 11 03.43931	21 01 22.68	-29 12 07.2	13.8 T	900
P/1999 V1	1999 11 05.44850	09 37 12.27	+11 31 56.6	17.8 T	703	10P	1999 11 03.44479	21 01 23.70	-29 12 05.7	11.9 T	360
P/1999 V1	1999 11 05.45751	09 37 12.55	+11 31 52.2	17.5 T	703	10P	1999 11 03.44705	21 01 24.11	-29 12 03.9		360
P/1999 V1	1999 11 05.46704	09 37 13.18	+11 31 45.8	18.0 T	703	10P	1999 11 07.47053	21 13 35.70	-28 29 13.0	14.5 T	351
P/1999 V1	1999 11 06.43226	09 38 08.38	+11 22 28.9	18.7 T	649	10P	1999 11 07.47417	21 13 36.31	-28 29 12.7		351
P/1999 V1	1999 11 06.43507	09 38 08.49	+11 22 27.3	18.7 T	649	10P	1999 11 09.41528	21 19 24.95	-28 07 01.4	14.3 T	372
P/1999 V1	1999 11 06.43786	09 38 08.71	+11 22 25.8	18.6 T	649	10P	1999 11 13.40981	21 31 11.77	-27 18 41.6		349
P/1999 V1	1999 11 06.44715	09 38 09.20	+11 22 20.9	18.0 T	703	10P	1999 11 13.41410	21 31 12.50	-27 18 38.5		349
P/1999 V1	1999 11 06.45209	09 38 09.55	+11 22 18.0	17.6 T	703	10P	1999 11 13.41693	21 31 12.97	-27 18 36.6	12.5 T	349
P/1999 V1	1999 11 06.47319	09 38 10.79	+11 22 05.8		711	10P	1999 11 13.42661	21 31 14.65	-27 18 28.0	12.5 T	351
P/1999 V1	1999 11 06.48359	09 38 10.98	+11 21 59.7		711						

10P	1999 11 13.43163	21 31 15.45	−27 18 24.2		351	65P	1999 11 18.63576	05 54 32.19	+26 29 49.2		360
10P	1999 11 13.44155	21 31 17.26	−27 18 16.5		351	65P	1999 11 18.64080	05 54 31.99	+26 29 50.2		360
37P/Forbes						74P/Smirnova-Chernykh					
37P	1999 10 29.48676	23 48 57.94	+07 08 51.8	16.5 T	402	74P	1999 11 09.78045	07 38 56.45	+24 22 58.6		900
37P	1999 10 29.48802	23 48 57.88	+07 08 51.8		402	74P	1999 11 09.79025	07 38 56.53	+24 22 58.9	16.7 T	900
37P	1999 10 29.49054	23 48 57.81	+07 08 51.0		402	84P/Giclas					
37P	1999 11 07.85611	23 48 24.13	+06 57 16.7		504	84P	1999 10 18.74376	05 21 15.23	+12 58 34.6		867
37P	1999 11 07.86984	23 48 24.15	+06 57 16.0		504	84P	1999 10 18.74862	05 21 15.36	+12 58 34.8		867
37P	1999 11 08.52517	23 48 27.42	+06 56 56.0	16.7 T	360	84P	1999 10 18.75418	05 21 15.51	+12 58 34.5		867
37P	1999 11 08.52917	23 48 27.44	+06 56 56.0		360	84P	1999 10 23.63628	05 23 13.84	+12 58 18.5	15.8 T	402
37P	1999 11 13.84583	23 49 19.14	+06 56 05.7		587	84P	1999 10 23.63949	05 23 13.90	+12 58 18.7		402
37P	1999 11 13.93472	23 49 20.39	+06 56 08.4	17.2 T	587	84P	1999 11 04.40485	05 24 10.65	+13 02 54.9	18.6 T	704
50P/Arend						84P	1999 11 04.45381	05 24 09.90	+13 02 57.9	19.6 T	704
50P	1999 10 31.40965	07 58 14.21	+46 25 38.8	18.9 T	704	84P	1999 11 04.47034	05 24 09.55	+13 03 00.2	19.1 T	704
50P	1999 10 31.42601	07 58 15.44	+46 25 47.0	18.5 T	704	84P	1999 11 04.75052	05 24 07.30	+13 03 13.4	15.9 T	360
50P	1999 10 31.44256	07 58 16.74	+46 25 53.0	18.7 T	704	84P	1999 11 04.75608	05 24 07.22	+13 03 13.8		360
50P	1999 11 14.43913	08 13 58.48	+47 52 22.7	17.4 T	699	84P	1999 11 08.76096	05 23 10.97	+13 07 17.1	16.1 T	349
50P	1999 11 14.46459	08 13 59.57	+47 52 33.2		699	84P	1999 11 08.76352	05 23 10.78	+13 07 17.3		349
50P	1999 11 14.49006	08 14 00.91	+47 52 43.7		699	84P	1999 11 08.77565	05 23 10.51	+13 07 17.8		349
50P	1999 11 16.73976	08 15 42.84	+48 07 16.0	16.9 T	360	84P	1999 11 10.74410	05 22 30.52	+13 09 51.3	15.7 T	360
50P	1999 11 16.74427	08 15 42.98	+48 07 17.8		360	84P	1999 11 10.74792	05 22 30.42	+13 09 51.9		360
59P/Kearns-Kwee						84P	1999 11 13.64286	05 21 16.95	+13 14 28.3	15.4 T	474
59P	1999 11 09.80403	08 27 00.28	+25 50 55.9	15.6 T	900	84P	1999 11 13.64593	05 21 16.82	+13 14 30.0	14.9 T	474
59P	1999 11 09.81285	08 27 00.78	+25 50 54.4		900	84P	1999 11 13.64904	05 21 16.71	+13 14 30.1	14.8 T	474
59P	1999 11 16.42552	08 32 17.72	+25 25 46.7	18.9 T	704	84P	1999 11 13.75844	05 21 13.62	+13 14 28.8		355
59P	1999 11 16.43973	08 32 18.18	+25 25 44.0	19.4 T	704	84P	1999 11 13.76087	05 21 13.57	+13 14 29.3	15.7 T	355
59P	1999 11 16.46817	08 32 19.39	+25 25 38.6	19.9 T	704	84P	1999 11 13.76891	05 21 13.31	+13 14 29.9		355
59P	1999 11 16.48255	08 32 20.11	+25 25 33.3	18.7 T	704	84P	1999 11 16.67135	05 19 43.81	+13 19 50.4	15.7 T	360
59P	1999 11 16.77326	08 32 32.38	+25 24 31.9	16.7 T	360	84P	1999 11 16.67552	05 19 43.66	+13 19 51.0		360
59P	1999 11 16.77726	08 32 32.54	+25 24 31.2		360	88P/Howell					
63P/Wild 1						88P	1999 11 05.66353	04 51 42.92	+23 21 36.6	19.4 T	402
63P	1999 02 14.17831	02 56 49.20	+37 23 04.1		693	88P	1999 11 05.67043	04 51 42.60	+23 21 35.7		402
63P	1999 02 14.18247	02 56 49.44	+37 23 03.8	22.4 T	693	88P	1999 11 05.67503	04 51 42.37	+23 21 35.5		402
63P	1999 10 24.82613	11 09 40.68	+16 29 42.1		897	88P	1999 11 09.42792	04 48 34.23	+23 19 32.9	19.5 T	704
63P	1999 10 24.82861	11 09 40.99	+16 29 38.5		897	88P	1999 11 09.44230	04 48 33.55	+23 19 32.6	19.8 T	704
63P	1999 10 24.83117	11 09 41.40	+16 29 34.5		897	88P	1999 11 09.45668	04 48 32.78	+23 19 32.6	20.0 T	704
63P	1999 10 24.83398	11 09 41.79	+16 29 30.7	16.5 T	897	88P	1999 11 09.47107	04 48 32.03	+23 19 32.4	19.5 T	704
63P	1999 11 04.79237	11 32 06.46	+13 20 43.9		897	88P	1999 11 09.48544	04 48 31.25	+23 19 30.3	20.0 T	704
63P	1999 11 04.79657	11 32 06.99	+13 20 38.1	15.9 T	897	106P/Schuster					
63P	1999 11 04.81018	11 32 08.69	+13 20 24.4		897	106P	1999 10 24.56877	00 21 43.49	−25 57 58.1	13.9 T	402
63P	1999 11 04.81729	11 32 09.53	+13 20 16.0		897	106P	1999 10 24.57003	00 21 43.38	−25 57 56.3		402
63P	1999 11 04.82351	11 32 10.29	+13 20 10.2		897	106P	1999 10 24.57130	00 21 43.33	−25 57 55.0		402
65P/Gunn						106P	1999 11 03.47010	00 15 25.87	−21 41 46.3	14.5 T	402
65P	1999 10 24.71007	06 03 34.09	+25 53 44.8	18.4 T	402	106P	1999 11 03.47137	00 15 25.83	−21 41 44.2		402
65P	1999 10 24.71698	06 03 33.97	+25 53 46.6		402	106P	1999 11 04.50069	00 15 00.49	−21 12 20.3	13.7 T	360
65P	1999 10 24.72159	06 03 34.12	+25 53 47.6		402	106P	1999 11 04.50313	00 15 00.41	−21 12 16.2		360
65P	1999 11 05.67861	06 00 28.58	+26 11 21.7	17.6 T	402	106P	1999 11 04.55161	00 14 59.04	−21 10 52.0		900
65P	1999 11 05.68781	06 00 28.19	+26 11 22.3		402	106P	1999 11 04.56433	00 14 58.67	−21 10 30.2	13.6 T	900
65P	1999 11 05.69012	06 00 28.18	+26 11 23.0		402	106P	1999 11 07.48949	00 14 03.15	−19 44 30.5	14.3 T	351
65P	1999 11 18.63090	05 54 32.33	+26 29 48.8	18.9 T	360	106P	1999 11 07.49544	00 14 03.17	−19 44 20.3		351
						106P	1999 11 07.49925	00 14 02.98	−19 44 13.1		351

106P	1999 11 10.14556	00 13 33.29	-18 23 39.9	15.5 T	704	114P	1999 11 13.59521	02 23 28.96	+44 40 02.4		349
106P	1999 11 10.16189	00 13 33.03	-18 23 08.7	15.7 T	704	114P	1999 11 13.60260	02 23 28.76	+44 39 55.6	15.4 T	349
106P	1999 11 10.17830	00 13 32.63	-18 22 39.9	15.6 T	704	114P	1999 11 13.60503	02 23 28.75	+44 39 52.7		349
106P	1999 11 10.19473	00 13 32.58	-18 22 07.3	15.8 T	704	114P	1999 11 13.94792	02 23 22.77	+44 34 29.9		587
106P	1999 11 10.21110	00 13 32.38	-18 21 35.4	15.7 T	704	114P	1999 11 13.95359	02 23 22.68	+44 34 24.6	15.1 T	587
106P	1999 11 10.52500	00 13 29.94	-18 11 59.8	13.4 T	360	117P/Helin-Roman-Alu 1					
106P	1999 11 10.52743	00 13 29.92	-18 11 55.2		360	117P	1999 11 04.67205	03 01 09.92	+11 26 34.9	17.7 T	360
106P	1999 11 13.45461	00 13 22.26	-16 40 01.6	13.7 T	351	117P	1999 11 04.67760	03 01 09.68	+11 26 34.2		360
106P	1999 11 13.45961	00 13 22.25	-16 39 52.1		351	117P	1999 11 04.68420	03 01 09.45	+11 26 33.5		360
106P	1999 11 13.46440	00 13 22.29	-16 39 43.4		351	136P/Mueller 3					
106P	1999 11 13.48823	00 13 22.10	-16 38 58.8	13.9 T	349	136P	1999 10 18.71530	03 48 18.26	+06 41 19.6		867
106P	1999 11 13.49007	00 13 22.13	-16 38 55.2		349	136P	1999 10 18.72225	03 48 18.07	+06 41 18.3		867
106P	1999 11 13.49231	00 13 22.12	-16 38 51.0		349	136P	1999 11 05.65064	03 38 21.39	+05 40 01.7	16.8 T	402
106P	1999 11 15.17638	00 13 28.73	-15 44 56.2	13.9 T	699	136P	1999 11 05.65524	03 38 21.14	+05 40 01.1		402
106P	1999 11 15.19672	00 13 28.82	-15 44 16.3		699	136P	1999 11 05.65985	03 38 21.02	+05 40 00.4		402
106P	1999 11 15.21708	00 13 28.94	-15 43 34.4		699	136P	1999 11 08.64358	03 36 21.96	+05 31 34.6	17.5 T	360
106P	1999 11 15.49427	00 13 30.20	-15 34 30.5	13.3 T	474	136P	1999 11 08.64878	03 36 21.77	+05 31 33.8		360
106P	1999 11 15.49926	00 13 30.19	-15 34 21.9	13.8 T	474	136P	1999 11 08.65747	03 36 21.39	+05 31 32.7		360
106P	1999 11 20.78689	00 14 44.39	-12 41 38.9		046	137P/Shoemaker-Levy 2					
106P	1999 11 20.78818	00 14 44.40	-12 41 36.5		046	137P	1999 11 04.42483	20 27 57.07	-13 59 40.5	19.1 N	360
106P	1999 11 20.79051	00 14 44.44	-12 41 31.8		046	137P	1999 11 04.42934	20 27 57.48	-13 59 39.6		360
108P/Ciffréo						137P	1999 11 04.43403	20 27 57.92	-13 59 38.7		360
108P	1999 11 10.42105	21 23 11.94	-29 35 48.5	19.6 T	474	141P/Machholz 2					
108P	1999 11 10.42671	21 23 12.30	-29 35 49.0	20.7 T	474	141P-D	1999 10 25.41293	17 57 00.58	-11 58 54.0	17.3 T	402
108P	1999 11 10.43037	21 23 12.67	-29 35 44.4	20.3 T	474	141P-D	1999 10 25.41420	17 57 00.74	-11 58 54.7		402
108P	1999 11 10.43632	21 23 12.92	-29 35 40.1	20.4 T	474	141P-D	1999 10 25.41494	17 57 00.80	-11 58 54.1		867
108P	1999 11 12.42218	21 25 22.23	-29 13 51.8	19.6 T	474	141P-D	1999 10 25.41547	17 57 00.97	-11 58 56.5		402
108P	1999 11 12.42498	21 25 22.40	-29 13 50.7	19.3 T	474	141P-D	1999 10 25.41673	17 57 01.19	-11 58 54.9		402
108P	1999 11 12.42706	21 25 22.54	-29 13 48.5	19.6 T	474	141P-D	1999 10 25.41799	17 57 01.24	-11 58 55.7		402
114P/Wiseman-Skiff						141P-D	1999 10 25.42084	17 57 01.55	-11 58 54.1		867
114P	1999 09 19.67155	02 23 57.55	+44 11 59.6		867	141P-D	1999 10 29.38250	18 06 39.85	-11 59 42.5	16.8 T	402
114P	1999 09 19.67919	02 23 57.78	+44 12 05.2		867	141P-D	1999 10 29.38502	18 06 40.36	-11 59 41.3		402
114P	1999 09 19.69690	02 23 58.39	+44 12 16.8		867	141P-D	1999 10 29.38756	18 06 40.77	-11 59 42.7		402
114P	1999 09 19.70905	02 23 58.89	+44 12 25.6		867	141P-D	1999 10 29.40398	18 06 43.16	-11 59 42.5	17.0 T	402
114P	1999 10 24.63211	02 30 43.04	+47 34 52.2	16.3 T	402	141P-D	1999 10 29.41049	18 06 44.03	-11 59 42.4		402
114P	1999 10 24.63589	02 30 43.01	+47 34 52.4		402	141P-D	1999 10 29.41279	18 06 44.41	-11 59 42.9		402
114P	1999 10 24.66069	02 30 42.42	+47 34 48.7		402	141P-D	1999 11 01.70758	18 15 13.16	-11 59 17.6	15.4 T	540
114P	1999 10 31.24444	02 28 28.77	+47 06 40.9	17.3 T	704	141P-D	1999 11 01.70955	18 15 13.36	-11 59 16.8		540
114P	1999 10 31.26070	02 28 28.34	+47 06 35.0	18.0 T	704	141P-D	1999 11 01.73993	18 15 18.13	-11 59 17.0		540
114P	1999 10 31.29312	02 28 27.09	+47 06 22.4	18.5 T	704	141P-D	1999 11 01.74149	18 15 18.39	-11 59 17.1		540
114P	1999 10 31.30959	02 28 26.83	+47 06 12.7	17.8 T	704	141P-D	1999 11 01.74936	18 15 19.69	-11 59 16.9		540
114P	1999 11 03.60954	02 27 09.31	+46 41 16.1	15.8 T	900	141P-D	1999 11 02.40000	18 17 02.91	-11 59 01.7	16.9 T	372
114P	1999 11 03.61869	02 27 09.06	+46 41 11.4		900	141P-D	1999 11 02.40863	18 17 04.24	-11 58 56.0		413
114P	1999 11 04.61736	02 26 45.20	+46 32 09.4	15.6 T	360	141P-D	1999 11 02.40903	18 17 04.30	-11 59 01.5	16.9 T	372
114P	1999 11 04.62014	02 26 45.13	+46 32 07.7		360	141P-D	1999 11 03.39433	18 19 42.83	-11 58 42.1	16.1 T	402
114P	1999 11 05.52703	02 26 23.86	+46 23 18.5		349	141P-D	1999 11 03.39531	18 19 43.11	-11 58 41.4	15.1 T	360
114P	1999 11 05.53125	02 26 23.74	+46 23 15.7		349	141P-D	1999 11 03.39559	18 19 43.16	-11 58 41.9		402
114P	1999 11 05.53330	02 26 23.79	+46 23 15.5	16.0 T	349	141P-D	1999 11 03.39686	18 19 43.28	-11 58 41.6		402
114P	1999 11 06.11888	02 26 09.96	+46 17 11.3	18.3 T	750	141P-D	1999 11 03.39774	18 19 43.48	-11 58 41.3		360
114P	1999 11 06.13401	02 26 09.44	+46 17 04.0	18.2 T	750	141P-D	1999 11 03.40606	18 19 44.89	-11 58 40.3	16.3 T	367
114P	1999 11 10.60608	02 24 27.69	+45 23 29.4	15.2 T	360	141P-D	1999 11 03.40815	18 19 45.34	-11 58 39.9		367
114P	1999 11 10.60851	02 24 27.62	+45 23 27.3		360						

141P-D	1999 11 03.41023	18 19 45.51	-11 58 41.0		367
141P-D	1999 11 04.39566	18 22 26.52	-11 58 11.6	15.3 T	360
141P-D	1999 11 04.39826	18 22 26.93	-11 58 12.0		360
141P-D	1999 11 04.40069	18 22 27.38	-11 58 12.5		360
141P-A	1999 11 04.41679	18 22 48.07	-11 52 35.4		413
141P-D	1999 11 04.41679	18 22 29.84	-11 58 02.9		413
141P-A	1999 11 04.42303	18 22 49.09	-11 52 35.0		413
141P-A	1999 11 05.38969	18 25 29.44	-11 52 15.4	19.6 T	402
141P-A	1999 11 05.39346	18 25 30.01	-11 52 15.4		402
141P-D	1999 11 05.39655	18 25 12.48	-11 57 39.0		402
141P-A	1999 11 05.39780	18 25 30.84	-11 52 15.7		402
141P-D	1999 11 05.39906	18 25 12.61	-11 57 38.8		402
141P-A	1999 11 05.40159	18 25 31.41	-11 52 15.8		402
141P-D	1999 11 05.40285	18 25 13.33	-11 57 38.8		402
141P-A	1999 11 07.39155	18 31 08.22	-11 50 55.6	18.8 T	402
141P-D	1999 11 07.39218	18 30 50.06	-11 56 14.1	14.9 T	402
141P-A	1999 11 07.39407	18 31 08.79	-11 50 55.1		402
141P-D	1999 11 07.39470	18 30 50.42	-11 56 13.5		402
141P-D	1999 11 07.39722	18 30 50.93	-11 56 14.4		402
141P-A	1999 11 07.39925	18 31 09.45	-11 50 58.0		402
141P-A	1999 11 07.40178	18 31 09.89	-11 50 57.3		402
141P-D	1999 11 09.39063	18 36 37.95	-11 54 22.9	12.9 T	372
141P-D	1999 11 10.41389	18 39 39.82	-11 53 25.7	13.6 T	360
141P-D	1999 11 10.41649	18 39 40.35	-11 53 26.1		360
141P-D	1999 11 10.41910	18 39 40.78	-11 53 25.8		360
141P-D	1999 11 13.38078	18 48 42.12	-11 49 58.4	15.0 T	402
141P-D	1999 11 13.38204	18 48 42.28	-11 49 59.0		402
141P-D	1999 11 13.38331	18 48 42.47	-11 49 58.9		402
141P-A	1999 11 19.38303	19 08 22.89	-11 37 34.9	17.0 T	402
141P-A	1999 11 19.38556	19 08 23.50	-11 37 34.5		402
141P-A	1999 11 19.38682	19 08 23.59	-11 37 36.4		402
141P-A	1999 11 19.38935	19 08 24.17	-11 37 36.0		402

142P/Ge-Wang

142P	1988 11 28.42118	02 40 50.96	+02 26 05.6	17.0 T	372
142P	1988 11 28.51563	02 40 48.72	+02 25 56.2	16.9 T	372
142P	1988 11 30.54931	02 40 04.36	+02 22 44.4	17.1 T	372
142P	1999 10 09.66563	02 15 39.43	+03 29 07.3	19.7 T	372
142P	1999 10 18.64759	02 11 11.04	+02 15 53.2		867
142P	1999 10 18.65454	02 11 10.75	+02 15 50.7		867
142P	1999 10 18.66148	02 11 10.59	+02 15 47.1		867
142P	1999 10 18.66843	02 11 10.29	+02 15 44.0		867
142P	1999 10 21.57046	02 09 36.51	+01 53 20.3	18.8 T	402
142P	1999 10 21.57346	02 09 36.39	+01 53 20.0		402
142P	1999 10 21.57647	02 09 36.42	+01 53 17.9		402

Note 1: faint image. 2: the 1999 Sept. 26 observations from code 561 on *MPC* 35776 should be deleted. 3: prediscovery observation. 4: involved with star.

OBSERVATIONS OF MINOR PLANETS

The summary lists, for each observatory code, the designation of each object observed (an asterisk signifying a new discovery), with three numbers indicating the number of observations, the number of different nights on which the object was

observed and the arc (in days) covered by the observations; at the end of each observatory listing there is a count of the total number of observations, of the number of objects and of the number of discoveries followed by an asterisk, together with the total range of dates covered by the observations.

012 Uccle

E. W. Elst, Koninklijke Sterrenwacht van België, Ringlaan 3, B-1180 Brussels, Belgium [Thierry.Pauwels@oma.be] (1)

T. Pauwels, Koninklijke Sterrenwacht van België, Ringlaan 3, B-1180 Brussels, Belgium [Thierry.Pauwels@oma.be] (2)

Observers E. W. Elst, T. Pauwels, S. Ipatov, H. Boffin

Measurers E. W. Elst, T. Pauwels

0.85-m *f*/2.5 Schmidt + CCD

GSC-1.2

{1} 1998 FR₇₂, 2, 1, 0; 1998 FN₁₂₆, 2, 1, 0; 1998 HO₃₈, 4, 2, 6; 1999 RB₄₄, 2, 1, 0; 1999 SN₁, 8, 2, 2; 1999 VM₁ *, 8, 3, 14; 1999 VN₁ *, 10, 5, 14; 1999 VO₁ *, 8, 4, 14; 1999 VW₁₂ *, 6, 3, 11; (1491), 2, 1, 0; (1806), 4, 1, 0; (4546), 2, 1, 0; [58, 12, 4*, 1999/10/13–1999/11/15]

{2} 1995 UT₄, 6, 1, 0; 1998 HH₉₃, 4, 1, 0; 1999 RT₁, 4, 1, 0; 1999 RG₄₁, 14, 3, 20; 1999 RS₄₅, 10, 2, 13; 1999 RU₄₅, 4, 1, 0; 1999 RF₈₇, 3, 1, 0; 1999 RL₁₀₉, 5, 1, 0; 1999 RX₁₉₃, 4, 1, 0; 1999 RH₂₁₄, 4, 1, 0; 1999 TW₈, 5, 1, 0; 1999 TE₁₀, 5, 1, 0; 1999 TE₁₉, 8, 2, 5; 1999 TF₁₉, 4, 1, 0; 1999 TL₂₁, 5, 1, 0; 1999 VT₂₅, 3, 1, 0; 1999 VW₂₅, 4, 1, 0; 3195 T-1, 5, 1, 0; (1793), 4, 1, 0; (2730), 4, 1, 0; (2872), 5, 1, 0; (8417), 5, 1, 0; (8617), 5, 1, 0; (8833), 5, 1, 0; (11495), 4, 1, 0; [129, 25, 0*, 1999/10/18–1999/11/16]

046 Kleť

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Observers J. Tichá, M. Tichý, Z. Moravec

Measurers M. Tichý, Z. Moravec

0.57-m *f*/5.2 reflector + CCD

USNO-A2.0

1986 WZ, 6, 2, 1; 1988 TR₂, 3, 1, 0; 1995 PA, 7, 2, 1; 1995 SZ₁, 3, 1, 0; 1995 UQ₁, 4, 1, 0; 1995 UJ₂, 2, 1, 0; 1995 UT₂, 8, 2, 13; 1995 UW₂, 3, 1, 0; 1995 UT₄, 4, 1, 0; 1996 XW₁₈, 6, 2, 1; 1997 CU₅, 8, 2, 28; 1997 VB₁, 5, 1, 0; 1998 QR, 6, 2, 1; 1999 CU₃, 16, 4, 25; 1999 ML, 4, 1, 0; 1999 ND₄₃, 5, 1, 0; 1999 RU₂, 4, 1, 0; 1999 RV₂, 4, 1, 0; 1999 RB₃₂, 4, 1, 0; 1999 RA₃₃, 10, 2, 1; 1999 RD₃₆, 2, 1, 0; 1999 RO₃₆, 5, 1, 0; 1999 RP₃₆, 4, 1, 0; 1999 RY₄₁, 16, 3, 2; 1999 RF₉₄, 8, 2, 2; 1999 SL₅, 7, 2, 4; 1999 SM₅, 4, 1, 0; 1999 SK₁₀, 4, 1, 0; 1999 TE₅, 4, 1, 0; 1999 TO₁₁, 8, 2, 3; 1999 TP₁₁, 7, 2, 18; 1999 TK₁₂, 5, 1, 0; 1999 TN₁₂, 5, 1, 0; 1999 TT₁₂, 7, 2, 1; 1999 TW₁₆, 6, 1, 0; 1999 UQ, 5, 1, 0; 1999 UM₁, 4, 1, 0; 1999 UN₁, 15, 4, 19; 1999 US₃, 20, 4, 3; 1999 UU₃ *, 23, 5, 8; 1999 UV₃ *, 22, 4, 6; 1999 UA₅, 14, 3, 2; 1999 UG₅, 26, 5, 4; 1999 UZ₅, 5, 1, 0; 1999 VA *, 22, 5, 5; 1999 VB *, 27, 5, 5; 1999 VT, 8, 2, 1; 1999 VU, 8, 2, 1; 1999 VV, 8, 2, 1; 1999 VC₁, 5, 1, 0; 1999 VL₁, 4, 1, 0; 1999 VX₁ *, 8, 2, 1; 1999 VQ₅, 9, 2, 1; 1999 VR₅, 4, 1, 0; 1999 VN₆, 8, 2, 1; 1999 VR₆, 10, 1, 0; 1999 VS₆, 4, 1, 0; 1999 VQ₂₅ *, 12, 2, 1; 1999 VR₂₅ *, 7, 2, 1; 1999 WY, 8, 2, 2; (699), 3, 1, 0; (1323), 3, 1, 0; (2123), 4, 1, 0; (3364), 3, 1, 0; (4852), 3, 1, 0; (11825), 6, 2, 1; [512, 66, 7*, 1999/10/19–1999/11/21]

049 Kvistaberg

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G. Hahn, DLR - Institute Space Sensor Technology and of Planetary Exploration, Rutherfordstrasse 2, D-12489 Berlin, Germany [Gerhard.Hahn@DLR.de]

Observers T. Oja, O. Karlsson, C.-I. Lagerkvist, J. Warell

Measurers J. Warell, C.-I. Lagerkvist, A. Erikson, G. Hahn, S. Mottola

1.0m Schmidt + CCD

GSC, USNO-SA2.0

1978 RG₉, 3, 1, 0; 1979 QF₂, 3, 1, 0; 1980 FU, 3, 1, 0; 1992 YW₁, 3, 1, 0; 1993 NZ₁, 3, 1, 0; 1995 WP₁₇, 3, 1, 0; 1997 AP₄, 3, 1, 0; 1997 US₉, 6, 2, 15; 1998 AV₉, 3, 1, 0; 1998 FD₁₅, 3, 1, 0; 1998 KU₂, 6, 2, 3; 1998 KL₃₇, 3, 1, 0; 1998 KJ₄₇, 3, 1, 0; 1998 MK₃₀, 6, 2, 4; 1998 PG, 9, 3, 3; 1998 QR₁₅, 6, 2, 1; 1998 QS₅₂, 3, 1, 0; 1998 SY₁₆, 3, 1, 0; 1998 WT, 3, 1, 0; 1998 XZ₄₃, 3, 1, 0;

1998 XK₄₅, 3, 1, 0; 1998 XC₇₇, 3, 1, 0; 1998 YL₁, 3, 1, 0; 1998 YR₂₂, 3, 1, 0; 1998 YA₂₇, 3, 1, 0; 1999 RC₂, 3, 1, 0; 1999 RG₂₆, 3, 1, 0; 1999 RA₃₃, 3, 1, 0; 1999 RR₁₁₀, 3, 1, 0; 1999 TD₃, 3, 1, 0; 1999 TD₁₆, 9, 3, 11; 1999 TL₃₀, 3, 1, 0; 1999 TX₃₂, 3, 1, 0; 1999 UA₅, 3, 1, 0; 1999 VU₁₂, 3, 1, 0; 1999 VP₂₄ *, 9, 2, 2; 1105 T-2, 3, 1, 0; 1168 T-3, 6, 2, 9; (85), 3, 1, 0; (457), 3, 1, 0; (934), 3, 1, 0; (1225), 9, 3, 7; (1257), 3, 1, 0; (1285), 3, 1, 0; (1876), 3, 1, 0; (2002), 3, 1, 0; (2626), 3, 1, 0; (3251), 3, 1, 0; (3415), 3, 1, 0; (3416), 3, 1, 0; (3838), 3, 1, 0; (4042), 3, 1, 0; (4531), 3, 1, 0; (4866), 3, 1, 0; (4877), 3, 1, 0; (5402), 3, 1, 0; (6236), 3, 1, 0; (6985), 3, 1, 0; (7451), 3, 1, 0; (7553), 3, 1, 0; (9042), 3, 1, 0; (11839), 3, 1, 0; (11882), 3, 1, 0; (12008), 3, 1, 0; [231, 64, 1*, 1998/03/23–1999/11/15]

071 Bulgarian National Observatory

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[ivanova@astro.bas.bg]

Observers V. Ivanova, L. Vasileva, G. Apostolovska

Measurers L. Vasileva, G. Apostolovska

0.50-m $f/1.4$ Schmidt + CCD

USNO-A2.0

1999 TQ₁₂, 3, 1, 0; 1999 ML, 6, 2, 1; 1999 NZ₄, 8, 3, 2; 1999 OP₃, 9, 3, 2; 1999 OR₃, 6, 2, 1; (699), 6, 2, 1; (11500), 6, 2, 1; [44, 7, 0*, 1999/08/13–1999/08/18]

098 Asiago Observatory, Cima Ekar

U. Munari, Osservatorio Astronomico di Padova, Sede di Asiago, I-36012 Asiago
(VI), Italy [munari@astras.pd.astro.it]

Observers U. Munari, F. Castellani, M. Tombelli, P. Antolini

Measurers F. Castellani, M. Tombelli, G. Forti

0.67-m $f/3.2$ Schmidt

1998 FZ₆₄, 2, 1, 0; [2, 1, 0*, 1994/01/18]

104 San Marcello Pistoiese

L. Tesi, Osservatorio di Pian dei Termini, Viale Panoramico 45, I-51028 San
Marcello Pistoiese (PT), Italy [iau@arcetri.astro.it]

Observers L. Tesi, A. Boattini, M. Tombelli

Measurers G. Forti, L. Tesi, A. Boattini, M. Tombelli

0.40-m $f/5$ reflector + CCD

GSC

1994 ET, 4, 1, 0; 1998 CE₂, 4, 1, 0; 1999 ST₉, 7, 2, 11; 1999 SU₉, 4, 1, 0; 1999 TB₁, 3, 1, 0; 1999 TR₁, 2, 1, 0; 1999 TD₅, 1, 1, 0; 1999 TF₅, 2, 1, 0; 1999 TW₅, 3, 1, 0; 1999 TW₉, 3, 1, 0; 1999 TN₁₀, 3, 1, 0; 1999 TO₁₀, 3, 1, 0; 1999 TX₁₁, 3, 1, 0; 1999 VQ₅, 4, 1, 0; 1999 VS₆, 3, 1, 0; 1999 VN₁₁, 4, 1, 0; 1999 VO₁₁, 4, 1, 0; 1999 VU₁₁ *, 11, 3, 7; 1999 VV₁₁ *, 11, 3, 7; 1999 VW₂₀ *, 8, 2, 3; 1999 VF₂₂, 4, 1, 0; [91, 21, 3*, 1999/10/07–1999/11/12]

106 Črni vrh

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Observers H. Mikuž, S. Matičič, B. Dintinjana

0.19-m $f/4$ Baker-Schmidt + CCD, 0.36-m $f/6.7$ Schmidt-Cassegrain + CCD

USNO-A2.0

1992 SR₂₃, 3, 1, 0; 1998 HX, 3, 1, 0; 1998 HQ₁₉, 2, 1, 0; 1998 RM, 2, 1, 0; 1999 RE₂, 2, 1, 0; 1999 RW₃₂, 3, 1, 0; 1999 RZ₃₄, 2, 1, 0; 1999 RC₃₅, 3, 1, 0; 1999 RG₃₆, 2, 1, 0; 1999 RU₃₉, 3, 1, 0; 1999 RJ₄₂, 3, 1, 0; 1999 RQ₄₂, 3, 1, 0; 1999 RR₄₂, 2, 1, 0; 1999 RW₄₂, 2, 1, 0; 1999 RS₄₃, 2, 1, 0; 1999 RW₄₃, 3, 1, 0; 1999 RT₄₄, 3, 1, 0; 1999 RU₄₄, 3, 1, 0; 1999 RZ₉₈, 2, 1, 0; 1999 RW₁₀₀, 2, 1, 0; 1999 RE₁₀₂, 3, 1, 0; 1999 RA₁₀₃, 3, 1, 0; 1999 RH₁₀₃, 3, 1, 0; 1999 RT₁₀₃, 3, 1, 0; 1999 RV₁₀₃, 3, 1, 0; 1999 RJ₁₀₉, 3, 1, 0; 1999 RQ₁₀₉, 3, 1, 0; 1999 RR₁₀₉, 3, 1, 0; 1999 RX₁₁₀, 2, 1, 0; 1999 RA₁₂₄, 3, 1, 0; 1999 RV₁₂₅, 2, 1, 0; 1999 RB₁₄₅, 3, 1, 0; 1999 RB₁₅₈, 3, 1, 0; 1999 RA₁₆₈, 3, 1, 0; 1999 RN₁₇₈, 3, 1, 0; 1999 RE₁₉₀, 3, 1, 0; 1999 RA₁₉₂, 3, 1, 0; 1999 RK₁₉₄, 3, 1, 0; 1999 RQ₁₉₄, 3, 1, 0; 1999 RS₁₉₄, 3, 1, 0; 1999 RO₁₉₇, 3, 1, 0; 1999 RC₁₉₈, 3, 1, 0; 1999 RP₁₉₉, 2, 1, 0; 1999 RN₂₁₄, 3, 1, 0; 1999 SG, 3, 1, 0; 1999 SL, 3, 1, 0; 1999 SJ₂, 3, 1, 0; 1999 TU₆, 5, 2, 5; 1999 TA₈, 2, 1, 0; 1999 TP₁₃, 3, 1, 0; 1999 TT₁₃, 2, 1, 0; 1999 TD₁₆, 3, 1, 0; 1999 TE₁₆, 3, 1, 0; 1999 TV₁₈, 2, 1, 0; 1222 T-1, 3, 1, 0; 4220 T-1, 3, 1, 0; 4854 T-1, 3, 1, 0; 3086 T-2, 2, 1, 0; 5036 T-2, 3, 1, 0; 5485 T-2, 5, 2, 1; 1168 T-3, 2, 1, 0; 1177 T-3, 2, 1, 0; 4054 T-3, 3, 1, 0; 5078 T-3, 3, 1, 0; (139), 3, 1, 0; (290), 3, 1, 0; (326), 3, 1, 0; (377), 3, 1, 0; (1130), 3, 1, 0; (1223), 3, 1, 0; (1382), 3, 1, 0; (1383), 3, 1, 0; (1646), 3, 1, 0; (1668),

2, 1, 0; (1905), 3, 1, 0; (2464), 3, 1, 0; (2961), 2, 1, 0; (3053), 3, 1, 0; (3170), 3, 1, 0; (3429), 2, 1, 0; (3555), 3, 1, 0; (3929), 2, 1, 0; (3939), 3, 1, 0; (4226), 3, 1, 0; (4296), 3, 1, 0; (4644), 3, 1, 0; (4694), 3, 1, 0; (4749), 3, 1, 0; (5185), 3, 1, 0; (6308), 2, 1, 0; (6760), 2, 1, 0; (7630), 3, 1, 0; (8574), 2, 1, 0; (8738), 3, 1, 0; (8852), 3, 1, 0; (11954), 3, 1, 0; (12123), 2, 1, 0; (12133), 5, 2, 5; (12136), 3, 1, 0; (12141), 2, 1, 0; (12150), 3, 1, 0; (12162), 3, 1, 0; (12163), 2, 1, 0; (12164), 3, 1, 0; (12168), 3, 1, 0; (12172), 3, 1, 0; (12179), 3, 1, 0; [300, 108, 0*, 1999/10/01–1999/11/13]

107 Cavezzo

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Observers M. Nicolini, P. Negrelli, A. Vincenzi

Measurer M. Nicolini

0.40-m $f/5.5$ reflector + CCD

GSC

1995 OB, 7, 2, 1; 1999 VT₆ *, 7, 2, 1; [14, 2, 1*, 1999/11/07–1999/11/08]

108 Montelupo

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[iau@arcetri.astro.it]

Observers M. Tombelli, A. Boattini, L. Tesi, D. Guidetti, G. Forti, E. Masotti

Measurers M. Tombelli, A. Boattini, L. Tesi, S. Bartolini, G. Forti

0.30-m $f/5.7$ Schmidt-Cassegrain + CCD

GSC

1996 AF₄, 2, 1, 0; 1996 CU₈, 3, 1, 0; 1999 RV₂, 4, 1, 0; 1999 US₃, 1, 1, 0; 1999 VS₆, 3, 1, 0; (8925), 3, 1, 0; [16, 6, 0*, 1999/10/31–1999/11/09]

113 Volkssternwarte Drebach, Schönbrunn

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Observers G. Lehmann, J. Kandler

0.50-m $f/4.0$ reflector + CCD, 0.18-m $f/9.0$ refractor + CCD

USNO-A2.0

1988 PG₂, 2, 1, 0; 1988 PQ₂, 2, 1, 0; 1988 RY₂, 2, 1, 0; 1990 TZ₁, 2, 1, 0; 1990 TD₁₂, 2, 1, 0; 1991 RQ₄, 2, 1, 0; 1991 TH₃, 2, 1, 0; 1992 HD₇, 2, 1, 0; 1992 RX, 2, 1, 0; 1992 SX₁, 5, 2, 3; 1992 SQ₂₃, 3, 1, 0; 1993 HA₆, 2, 1, 0; 1998 FC₁₂₇, 4, 2, 3; 1999 RK₂₇, 4, 2, 3; 1999 RW₃₂, 4, 2, 3; 1999 RC₃₆, 5, 2, 3; 1999 RK₄₀, 2, 1, 0; 1999 RP₉₁, 8, 2, 3; 1999 US₃, 8, 1, 0; [63, 19, 0*, 1999/10/31–1999/11/03]

118 Modra

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Observers A. Galád, P. Kolény, J. Tóth, L. Kornoš, Š. Gajdoš

0.6-m $f/5.5$ reflector + CCD

USNO-A2.0

1989 VA, 2, 1, 0; 1995 UY₄₄, 2, 1, 0; 1996 DD₁, 6, 2, 2; 1997 UF₉, 2, 1, 0; 1997 WU₂₂, 2, 1, 0; 1998 FQ₂, 2, 1, 0; 1998 OH, 2, 1, 0; 1998 XS₁₆, 2, 1, 0; 1999 LF₆, 2, 1, 0; 1999 ND₄₃, 3, 1, 0; 1999 RC₂, 2, 1, 0; 1999 RV₂, 2, 1, 0; 1999 RH₂₇, 4, 2, 3; 1999 RQ₂₈, 2, 1, 0; 1999 RB₃₂, 2, 1, 0; 1999 RP₃₆, 3, 1, 0; 1999 RK₄₄, 5, 3, 4; 1999 SL₅, 4, 2, 3; 1999 SE₁₀, 5, 2, 2; 1999 SK₁₀, 4, 2, 4; 1999 TD₅, 5, 2, 2; 1999 TE₆, 6, 2, 2; 1999 TF₆, 8, 3, 4; 1999 TA₁₀, 8, 3, 4; 1999 TC₁₀, 6, 2, 2; 1999 TN₁₂, 2, 1, 0; 1999 TE₁₅, 5, 2, 2; 1999 TW₁₆, 6, 2, 2; 1999 TX₁₆, 5, 2, 3; 1999 TY₁₆, 5, 2, 2; 1999 TL₁₇, 5, 2, 2; 1999 TM₁₇, 10, 4, 17; 1999 TN₁₇, 9, 4, 17; 1999 UM₃, 5, 2, 2; 1999 US₃, 5, 2, 2; 1999 UU₄ *, 14, 5, 15; 1999 UV₄ *, 14, 5, 15; 1999 UA₅, 3, 1, 0; 1999 UG₅, 3, 1, 0; 1999 VU, 5, 2, 3; 1999 VV, 3, 1, 0; 1999 VN₆, 3, 1, 0; 1999 VS₆, 3, 1, 0; 1999 VL₁₂, 3, 1, 0; 1999 VF₂₂, 3, 1, 0; 1999 VG₂₂, 3, 1, 0; 1999 VX₂₅, 4, 1, 0; 1999 VY₂₇ *, 11, 3, 5; (1943), 2, 1, 0; (3362), 3, 1, 0; (3838), 2, 1, 0; (5066), 2, 1, 0; (6455), 2, 1, 0; (8176), 6, 3, 15; (8476), 2, 1, 0; (10115), 2, 1, 0; (11066), 4, 2, 18; (11438), 2, 1, 0; (11586), 2, 1, 0; [249, 59, 3*, 1999/10/27–1999/11/20]

120 Višnjan

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Observers K. Korlević, P. Korlević, M. Jurić, P. Radovan, A. Ritosa

Measurers K. Korlević, M. Jurić

0.41-m $f/4.3$ reflector + CCD USNO-SA1.0

1975 SU₁, 3, 1, 0; 1981 UB₂₃, 2, 1, 0; 1982 VS₂, 6, 3, 6; 1983 XE, 2, 1, 0; 1984 UN₂, 2, 1, 0; 1986 WZ, 2, 1, 0; 1990 ES₄, 2, 1, 0; 1991 LP₂, 2, 1, 0; 1991 PT₁₄, 8, 4, 5; 1991 TN₃, 3, 1, 0; 1991 VW₄, 2, 1, 0; 1991 VY₄, 12, 4, 5; 1992 JU₂, 3, 1, 0; 1993 FU₁₁, 2, 1, 0; 1993 FO₂₃, 2, 1, 0; 1993 FV₈₀, 7, 3, 12; 1993 JD, 2, 1, 0; 1993 SQ₃, 4, 2, 5; 1993 XQ₁, 4, 2, 2; 1994 CO₁, 2, 1, 0; 1994 YG, 2, 1, 0; 1995 OA₁, 10, 5, 6; 1995 QS, 6, 3, 5; 1995 TR, 5, 2, 5; 1995 WQ₁, 6, 2, 1; 1995 YS₂₁, 2, 1, 0; 1996 HE₁, 2, 1, 0; 1996 JN₆, 2, 1, 0; 1996 YD, 2, 1, 0; 1997 AR₁, 2, 1, 0; 1997 EU₂, 8, 4, 5; 1997 GL₂₁, 2, 1, 0; 1998 DZ₁₃, 2, 1, 0; 1998 FL₄₉, 3, 1, 0; 1998 FL₆₆, 2, 1, 0; 1998 HQ₁₉, 4, 2, 1; 1998 HK₃₆, 2, 1, 0; 1998 HO₃₈, 4, 2, 1; 1998 HN₄₉, 5, 2, 14; 1998 HJ₁₀₁, 2, 1, 0; 1998 HW₁₀₁, 2, 1, 0; 1998 VY₄, 12, 4, 5; 1998 HO₁₀₂, 4, 2, 1; 1998 HZ₁₄₇, 2, 1, 0; 1998 JA₂, 2, 1, 0; 1998 KP₁, 14, 6, 17; 1998 KS₁, 3, 1, 0; 1998 KD₅, 6, 3, 17; 1998 KW₄₇, 2, 1, 0; 1998 KE₄₈, 2, 1, 0; 1998 KG₆₄, 6, 3, 3; 1998 MT₃₂, 2, 1, 0; 1998 QN₁, 2, 1, 0; 1998 QK₃₈, 4, 2, 1; 1998 QZ₄₆, 2, 1, 0; 1998 QN₇₃, 3, 1, 0; 1998 UD₈, 2, 1, 0; 1999 ML, 2, 1, 0; 1999 RD₃₅, 2, 1, 0; 1999 RO₄₂, 2, 1, 0; 1999 RT₄₃, 8, 4, 5; 1999 RV₄₃, 2, 1, 0; 1999 RO₂₁₁, 2, 1, 0; 1999 SL, 4, 2, 1; 1999 SM₁, 4, 2, 1; 1999 SG₂, 2, 1, 0; 1999 SH₂, 4, 2, 3; 1999 SG₄, 4, 2, 2; 1999 SS₄, 2, 1, 0; 1999 SW₆, 2, 1, 0; 1999 SS₉, 4, 2, 1; 1999 SJ₁₁, 4, 2, 2; 1999 ST₁₁, 4, 2, 1; 1999 TG₁, 2, 1, 0; 1999 TK₁, 3, 1, 0; 1999 TN₁, 4, 2, 1; 1999 TO₁, 2, 1, 0; 1999 TQ₁, 2, 1, 0; 1999 TS₁, 4, 2, 2; 1999 TU₁, 2, 1, 0; 1999 TV₁, 2, 1, 0; 1999 TY₁, 2, 1, 0; 1999 TM₅, 2, 1, 0; 1999 TJ₆, 7, 3, 12; 1999 TP₆, 2, 1, 0; 1999 TR₆, 2, 1, 0; 1999 TW₆, 2, 1, 0; 1999 TC₇, 2, 1, 0; 1999 TM₇, 2, 1, 0; 1999 TJ₈, 2, 1, 0; 1999 TO₈, 2, 1, 0; 1999 TP₈, 2, 1, 0; 1999 TT₈, 8, 2, 1; 1999 TC₉, 2, 1, 0; 1999 TF₉, 2, 1, 0; 1999 TG₉, 2, 1, 0; 1999 TM₉, 2, 1, 0; 1999 TO₉, 5, 2, 12; 1999 TP₉, 2, 1, 0; 1999 TR₉, 2, 1, 0; 1999 TT₉, 4, 2, 1; 1999 TW₉, 2, 1, 0; 1999 TR₁₀, 2, 1, 0; 1999 TT₁₀, 4, 2, 2; 1999 TW₁₀, 6, 3, 3; 1999 TW₁₁, 6, 3, 3; 1999 TD₁₃, 2, 1, 0; 1999 TG₁₃, 4, 2, 1; 1999 TH₁₃, 4, 2, 1; 1999 TD₁₄, 7, 3, 3; 1999 TM₁₄, 6, 3, 20; 1999 TN₁₄, 4, 2, 1; 1999 TO₁₄, 2, 1, 0; 1999 TE₁₇, 8, 3, 3; 1999 TG₁₇, 7, 3, 2; 1999 TH₁₇, 4, 2, 1; 1999 TL₁₈, 2, 1, 0; 1999 TC₁₉, 4, 2, 1; 1999 TJ₂₅, 4, 2, 1; 1999 TL₂₆, 4, 2, 1; 1999 TN₂₇, 4, 2, 1; 1999 TG₃₂, 6, 2, 10; 1999 TP₃₃, 2, 1, 0; 1999 UO, 5, 2, 12; 1999 US, 4, 2, 2; 1999 UT, 8, 4, 5; 1999 UA₁, 4, 2, 2; 1999 UC₁, 4, 2, 2; 1999 UC₂, 3, 1, 0; 1999 UE₂, 3, 1, 0; 1999 UF₂, 2, 1, 0; 1999 UG₂, 8, 4, 5; 1999 UH₂, 2, 1, 0; 1999 UG₃, 4, 2, 1; 1999 UO₃, 2, 1, 0; 1999 UD₄ *, 12, 5, 14; 1999 UE₄ *, 10, 4, 11; 1999 UU₄, 2, 1, 0; 1999 UC₅, 8, 4, 12; 1999 UH₉, 6, 3, 3; 1999 UJ₉, 4, 2, 2; 1999 UM₁₁ *, 14, 6, 17; 1999 UN₁₁ *, 9, 4, 14; 1999 UM₁₅, 4, 2, 2; 1999 VQ, 8, 4, 5; 1999 VR, 2, 1, 0; 1999 VG₁, 9, 4, 5; 1999 VK₁, 2, 1, 0; 1999 VS₄ *, 9, 4, 8; 1999 VT₄ *, 6, 3, 7; 1999 VU₄ *, 6, 3, 7; 1999 VV₄ *, 10, 4, 12; 1999 VW₄ *, 10, 5, 16; 1999 VX₄ *, 8, 4, 7; 1999 VY₄ *, 6, 3, 5; 1999 VZ₄ *, 10, 5, 7; 1999 VA₅ *, 6, 3, 3; 1999 VB₅ *, 8, 4, 7; 1999 VC₅ *, 8, 4, 5; 1999 VD₅ *, 6, 3, 3; 1999 VE₅ *, 9, 4, 7; 1999 VF₅ *, 8, 4, 5; 1999 VG₅ *, 8, 4, 8; 1999 VU₆, 2, 1, 0; 1999 VC₇ *, 8, 3, 3; 1999 VD₇ *, 7, 3, 3; 1999 VE₇ *, 6, 3, 3; 1999 VF₇ *, 4, 2, 1; 1999 VG₇ *, 6, 3, 3; 1999 VH₇ *, 8, 4, 6; 1999 VJ₇ *, 8, 4, 6; 1999 VK₇ *, 6, 3, 3; 1999 VL₇ *, 10, 5, 6; 1999 VM₇ *, 6, 3, 3; 1999 VN₇ *, 6, 3, 3; 1999 VO₇ *, 6, 3, 3; 1999 VP₇ *, 6, 3, 3; 1999 VQ₇ *, 8, 4, 5; 1999 VR₇ *, 8, 4, 6; 1999 VS₇ *, 8, 4, 5; 1999 VT₇ *, 6, 3, 3; 1999 VU₇ *, 6, 3, 3; 1999 VV₇ *, 4, 2, 1; 1999 VW₇ *, 6, 3, 3; 1999 VX₇ *, 5, 2, 1; 1999 VY₇ *, 7, 3, 2; 1999 VZ₇ *, 4, 2, 1; 1999 VA₈ *, 5, 2, 1; 1999 VB₈ *, 10, 4, 5; 1999 VC₈ *, 7, 3, 2; 1999 VD₈ *, 7, 3, 2; 1999 VE₈ *, 6, 2, 1; 1999 VF₈ *, 11, 4, 5; 1999 VG₈ *, 8, 3, 2; 1999 VH₈ *, 4, 2, 1; 1999 VJ₈ *, 8, 3, 2; 1999 VK₈ *, 10, 5, 8; 1999 VE₉ *, 5, 2, 2; 1999 VF₉ *, 6, 3, 4; 1999 VG₉ *, 6, 3, 4; 1999 VH₉ *, 4, 2, 1; 1999 VJ₉ *, 4, 2, 1; 1999 VK₉ *, 8, 4, 5; 1999 VL₉ *, 6, 3, 4; 1999 VM₉ *, 6, 3, 4; 1999 VN₉ *, 6, 3, 2; 1999 VO₉ *, 6, 3, 2; 1999 VP₉ *, 6, 3, 2; 1999 VQ₉ *, 7, 3, 4; 1999 VR₉ *, 8, 3, 4; 1999 VD₁₁ *, 6, 3, 5; 1999 VE₁₁ *, 4, 2, 2; 1999 VF₁₁ *, 8, 4, 5; 1999 VG₁₁ *, 8, 4, 5; 1999 VH₁₁ *, 4, 2, 1; 1999 VJ₁₁ *, 4, 2, 1; 1999 VK₁₁ *, 4, 2, 1; 1999 VD₁₉ *, 6, 3, 5; 1999 VE₁₉ *, 6, 3, 5; 1999 VF₁₉ *, 4, 2, 4; 1999 VG₁₉ *, 5, 2, 4; 1999 VH₁₉ *, 6, 2, 4; 1999 VJ₁₉ *, 7, 3, 5; 1999 VK₁₉ *, 6, 3, 4; 1999 VL₁₉ *, 4, 2, 2; 1999 VM₁₉ *, 7, 3, 3; 1999 VN₁₉ *, 7, 3, 3; 1999 VO₁₉ *, 7, 3, 3; 1999 VP₁₉ *, 4, 2, 2; 1999 VX₁₉ *, 6, 3, 5; 1999 VY₁₉ *, 6, 3, 4; 1999 VZ₁₉ *, 4, 2, 2; 1999 VA₂₀ *, 6, 3, 3; 1999 VB₂₀ *, 10, 5, 6; 1999 VC₂₀ *, 6, 3, 3; 1999 VD₂₀ *, 6, 3, 3; 1999 VE₂₀ *, 8, 4, 5; 1999 VF₂₀ *, 4, 2, 3; 1999 VG₂₀ *, 6, 3, 5; 1999 VY₂₀ *, 6, 3, 3; 1999 VF₂₁ *, 4, 2, 3; 1999 VG₂₁ *, 6, 2, 1; 1999 VH₂₁ *, 4, 2, 1; 1999 VJ₂₁ *, 4, 2, 1; 1999 VL₂₁ *, 4, 2, 1; 1999 VM₂₁ *, 4, 2, 1; 1999 VN₂₁ *, 4, 2, 1; 1999 VO₂₁ *, 4, 2, 1; 1999 VP₂₁ *, 4, 2, 1; 1999 VQ₂₁ *, 8, 3, 3; 1999 VR₂₁ *, 4, 2, 1; 1999 VS₂₁ *, 4, 2, 1; 1999 VT₂₁ *, 4, 2, 1; 1999 VU₂₁ *, 4, 2, 1; 1999 VV₂₁ *, 4, 2, 1; 1999 VW₂₁ *, 4, 2, 1; 1999 VX₂₁ *, 4, 2, 1; 1999 VY₂₁ *, 4, 2, 1; 1999 VZ₂₁ *, 4, 2, 1; 1999 VA₂₂ *, 4, 2, 1; 1999 VB₂₂ *, 4, 2, 1; 1999 VC₂₂ *, 3, 2, 1; 2091 P-L, 2, 1, 0; 4119 P-L, 2, 1, 0; 6529 P-L, 2, 1, 0; 6585 P-L, 4, 2, 3; 2183 T-1, 9, 4, 6; 3105 T-1, 2, 1, 0; 1041 T-2, 3, 1, 0; 2638 T-2, 2, 1, 0; (263), 2, 1, 0; (307), 2, 1, 0; (822), 6, 2, 9; (832), 2, 1, 0; (960), 3, 1, 0; (981), 2, 1, 0; (1063), 2, 1, 0; (1147), 2, 1, 0; (1281), 4, 2, 1; (1489), 2, 1, 0; (1655), 2, 1, 0; (1664), 6, 3, 5; (1726), 8, 3, 3; (1829), 3, 1, 0; (1898), 4, 2, 3; (2066), 2, 1, 0; (2155), 6, 3, 17; (2158), 3, 1, 0; (2238), 6, 2, 10; (2377), 2, 1, 0; (2519), 2, 1, 0; (2534), 5, 2, 2; (2590), 4, 2, 2; (2616), 2, 1, 0; (2729), 6, 3, 5; (2787), 2, 1, 0; (2806), 3, 1, 0; (2841), 4, 2, 2; (2961), 4, 2, 2; (2975), 2, 1, 0; (3033), 2, 1, 0; (3046), 2, 1, 0; (3061), 4, 2, 3; (3241), 2, 1, 0; (3247), 2, 1, 0; (3395), 2, 1, 0; (3466), 2, 1, 0; (3733), 2, 1, 0; (3848), 4, 2, 1; (3916), 2, 1, 0; (4211), 2, 1, 0; (4364), 2, 1, 0; (4420), 2, 1, 0; (4595), 9, 4, 5; (4645), 4, 2, 2; (4655), 2, 1, 0; (4704), 4, 2, 2; (4802), 2, 1, 0; (5284), 3, 1, 0; (5337), 2, 1, 0; (5652), 4, 2, 3; (5733), 4, 2, 1; (5880), 6, 3,

4; (6226), 2, 1, 0; (6287), 2, 1, 0; (6520), 2, 1, 0; (6545), 2, 1, 0; (6558), 4, 2, 2; (6615), 3, 1, 0; (6632), 2, 1, 0; (6636), 2, 1, 0; (6748), 4, 2, 6; (6767), 2, 1, 0; (6814), 4, 2, 2; (6829), 2, 1, 0; (6890), 9, 4, 12; (7064), 2, 1, 0; (7354), 4, 2, 4; (7619), 2, 1, 0; (7693), 2, 1, 0; (7746), 2, 1, 0; (7834), 5, 2, 1; (8476), 2, 1, 0; (9031), 3, 1, 0; (9098), 4, 2, 2; (9131), 6, 3, 4; (9166), 4, 2, 3; (9207), 5, 2, 1; (9226), 2, 1, 0; (9241), 2, 1, 0; (9393), 4, 2, 1; (9408), 2, 1, 0; (9487), 4, 2, 3; (9544), 4, 2, 1; (9806), 2, 1, 0; (11799), 2, 1, 0; (11920), 8, 4, 5; (11942), 4, 2, 3; (12133), 2, 1, 0; [1574, 359, 117*, 1999/10/15–1999/11/13]

121 Kharkov University, Chuguevskaya Station

Yu. N. Krugly, Astronomical Observatory, Kharkov State University, Sumska
Street 35, Kharkov 310022, Ukraine [krugly@astron.kharkov.ua]

0.70-m $f/4$ reflector + CCD

GSC

1998 LF₆, 46, 1, 0; 1999 RH₂₇, 7, 1, 0; 1999 US₃, 14, 2, 1; (85), 3, 1, 0; (3838), 4, 1, 0; [74, 5, 0*, 1999/10/12–1999/11/11]

127 Bornheim

N. Ehring, Stationenweg 54, D-53332 Bornheim, Germany [norbert.ehring@t-online.de]

0.19-m $f/4$ FFC + CCD

GSC

1981 RF₂, 4, 2, 1; 1990 RT₂, 7, 3, 4; 1998 KS₄, 4, 2, 1; 1999 RN₁₆₂, 2, 1, 0; 1999 TU₁₇, 11, 5, 8; (11852), 4, 2, 1; [32, 6, 0*, 1999/10/27–1999/11/04]

132 Bedoin

P. Antonini, 47 rue Guillaume Puy, F-84000 Avignon, France
[Pierre.Antonini@wanadoo.fr]

0.305-m $f/3.0$ reflector + CCD

USNO

1999 TF₁₆, 4, 1, 0; 1999 UO₇ *, 8, 2, 4; 1999 VL₈ *, 6, 2, 4; 1999 VM₈ *, 6, 2, 4; [24, 4, 3*, 1999/10/31–1999/11/08]

143 Gnosca

S. Sposetti, CH-6525 Gnosca, Switzerland [spo@bluewin.ch]

0.20-m $f/7.1$ reflector + CCD

GSC

1990 WS₄, 3, 1, 0; 1994 EZ₆, 3, 1, 0; 1999 CU₃, 5, 1, 0; 1999 TW₁₀, 3, 2, 4; 1999 TX₁₀, 7, 2, 4; 1999 TY₁₀, 6, 2, 4; 1999 TA₁₁, 7, 2, 4; 1999 TB₁₂, 6, 2, 4; 1999 TC₁₂, 10, 3, 4; 1999 TD₁₂, 7, 2, 4; 1999 TE₁₂, 9, 5, 32; 1999 TF₁₂, 15, 4, 18; 1999 TG₁₂, 15, 5, 23; 1999 TX₁₃, 21, 6, 18; 1999 TY₁₃, 9, 3, 14; 1999 TZ₁₃, 11, 4, 18; 1999 TA₁₄, 12, 4, 18; 1999 TV₁₅, 7, 2, 4; 1999 TW₁₆, 6, 1, 0; 1999 UZ₃ *, 21, 7, 18; 1999 UA₄ *, 18, 5, 12; 1999 UO₁₁ *, 12, 5, 13; 1999 VF₇, 7, 2, 4; 1999 VO₈ *, 18, 5, 13; 1999 VP₈ *, 14, 4, 6; 1999 VX₁₀ *, 5, 2, 7; 1999 VY₁₀ *, 7, 2, 1; 1999 VZ₁₀ *, 11, 4, 6; 1999 VA₁₁ *, 18, 5, 5; 1999 VB₁₁ *, 11, 4, 5; 1999 VC₁₁ *, 5, 2, 1; 1999 VR₂₀ *, 10, 3, 5; 1999 VZ₂₂ *, 11, 3, 5; 1999 VA₂₃ *, 4, 2, 1; 1999 VB₂₃ *, 4, 2, 1; 1999 VC₂₃ *, 8, 2, 1; 1999 VD₂₃ *, 5, 2, 1; 1999 VE₂₃ *, 7, 2, 2; 1999 VK₂₃ *, 6, 2, 2; (461), 2, 1, 0; (8671), 12, 4, 4; [378, 41, 19*, 1999/10/12–1999/11/19]

145 's-Gravenwezel Observatory

T. Alderweireldt, Rozenlaan 14, B-2970 's-Gravenwezel, Belgium
[Tom.Alderweireldt@ping.be]

0.25-m $f/3.3$ Schmidt-Cassegrain + CCD

GSC-1.2, USNO-SA2.0

1994 PJ₁₀, 8, 2, 3; 1997 EY₄₅, 4, 1, 0; 1998 FB₅, 4, 1, 0; 1998 FQ₆₄, 4, 1, 0; 1998 FG₇₇, 3, 1, 0; 1998 HX, 4, 1, 0; 1998 HQ₂₇, 4, 1, 0; 1999 OH₃, 3, 1, 0; 1999 SN₄, 3, 1, 0; 1999 TG₂, 4, 1, 0; 1071 T-3, 4, 1, 0; (12078), 4, 1, 0; [49, 12, 0*, 1999/10/18–1999/11/15]

151 Eschenberg Observatory, Winterthur

M. Griesser, Breitenstrasse 2, CH-8542 Wiesendangen, Switzerland
[griesser@spectraweb.ch]

0.25-m $f/8.0$ reflector + CCD

GSC

1988 PG₂, 8, 2, 7; 1990 TZ₁, 3, 1, 0; 1992 SQ₂₃, 8, 2, 7; 1995 SX₂, 5, 1, 0; 1999 CU₃, 3, 1, 0; 1999 RH₂₇, 11, 2, 4; 1999 US₃, 29, 4, 11; 1999 VS₆, 5, 1, 0; (533), 4, 1, 0; (699), 3, 1, 0; (11854), 4, 1, 0; [83, 11, 0*, 1999/10/26–1999/11/07]

153 Stuttgart–Hoffeld

R. Stuber, Hoffeldstrasse 121, D-70597 Stuttgart, Germany [mailto:rolfstuber.de]

Observer R. Stuber

Measurer K. Stuber

0.25-m $f/7.2$ reflector + CCD

GSC

(485), 6, 3, 3; [6, 1, 0*, 1999/10/26–1999/10/29]

158 Promiod

G. A. Sala, CCD Astronomy Research Centre, Via Cottalorda 27, I-21022 Azzate

(VA), Italy [mailto:g.sala@skylink.it]

0.30-m $f/6.9$ Schmidt-Cassegrain + CCD

USNO-SA1.0

1999 VD₁₀ *, 6, 2, 1; [6, 1, 1*, 1999/11/08–1999/11/09]

159 Monte Agliale

S. Donati, Monte Agliale Astronomical Observatory, Borgo a Mozzano, Lucca,

Italy [mailto:ilra@comune.lucca.it]

Observers M. M. M. Santangelo, S. Donati, M. Ziboli

0.51-m $f/4.5$ Newtonian reflector + CCD

USNO-A1.0, USNO-A2.0

1999 PL, 5, 1, 0; 1999 SX₄, 6, 1, 0; 1999 SX₉, 3, 1, 0; 1999 TM, 2, 1, 0; 1999 TY₆, 7, 2, 1; 1999 TK₇, 4, 1, 0; 1999 TY₁₂, 6, 1, 0; 1999 TG₁₆, 4, 1, 0; 1999 TU₁₈, 4, 1, 0; 1999 VN₂ *, 22, 3, 6; 1999 VZ₂ *, 21, 3, 7; 1999 VR₁₁ *, 23, 4, 7; 1999 VX₂₀ *, 10, 2, 1; [117, 13, 4*, 1999/10/17–1999/11/12]

162 Potenza

A. M. Giambersio, 22 R. Scotellaro Street, I-85100 Potenza, Italy

[mailto:agiamber@tin.it]

0.20-m $f/6.3$ reflector + CCD

GSC

(4422), 4, 2, 3; [4, 1, 0*, 1999/11/13–1999/11/16]

163 Roeser Observatory, Luxembourg

M. Dawson, 66 rue JF Boch, L-1244 Luxembourg, Luxembourg [mailto:dawson@pt.lu]

0.457-m $f/4.5$ Newtonian + CCD

GSC-1.1

1985 UK₃, 4, 2, 1; 1991 EJ, 4, 2, 1; 1992 SF, 4, 2, 4; 1996 DO₁, 4, 2, 1; 1998 QQ₃₉, 4, 2, 1; 5568 P-L, 4, 2, 4; [24, 6, 0*, 1999/11/02–1999/11/16]

169 Rosignano

S. Puccini, Airali Observatory, Via Montegrappa 16, I-15030 Rosignano, Italy

[mailto:starfield@tin.it]

Observer S. Puccini

0.25-m Schmidt-Cassegrain + CCD

GSC

(1367), 5, 1, 0; (3200), 7, 2, 2; [12, 2, 0*, 1999/10/27–1999/11/12]

170 Observatorio de Begues

J. Manteca, c/Santpere, no. Casa 22, E-08859 Begues, Barcelona, Spain

[mailto:jmantecav@nexo.es]

Observer J. Manteca

Measurer S. Alonso

0.28-m $f/6.3$ Schmidt-Cassegrain + CCD

GSC-1.1

(1067), 3, 1, 0; [3, 1, 0*, 1999/10/27]

171 Flarestar Observatory, San Gwann

S. M. Brincat, Fl. 5 Ent. B, Silver Jubilee Apt., Ta' Zwejta, San Gwann SGN 09,

Malta [mailto:sbrincat@orbit.net.mt]

0.25-m $f/2.6$ Schmidt-Cassegrain + CCD

GSC-ACT

(2222), 4, 2, 4; (3838), 5, 2, 3; [9, 2, 0*, 1999/11/09–1999/11/17]

172 Onnens

B. Chardonnens, Le Chemin Neuf, CH-1756 Onnens, Switzerland

[mailto:bruno.chardonnens@com.mcnet.ch]

Observers B. Chardonnens, C. Chardonnens

Measurer B. Chardonnens

0.18-m $f/12$ reflector + CCD

USNO A2.0

(2786), 7, 3, 17; (3073), 6, 3, 17; (3415), 11, 4, 24; [24, 3, 0*, 1999/10/07–1999/10/31]

173 Ste. Clotilde, Reunion

R. Chassagne, 58C2 Route Gabriel Mace, F-97490 Ste. Clotilde, France

[mailto:robin.chassagne@wanadoo.fr]

0.30-m $f/2.7$ reflector + CCD

USNO

(1403), 6, 2, 1; [6, 1, 0*, 1999/11/12–1999/11/13]

174 Nyrola Observatory, Jyväskylä

A. Oksanen, Verkkoniementie 30, SF-40950 Muurame, Finland

[mailto:Arto.Oksanen@tietoenator.com]

Observers H. Hyvonen, M. Moilanen, A. Oksanen

0.41-m $f/3.3$ Schmidt-Cassegrain + CCD

GSC

1999 VO₂₄ *, 8, 2, 1; (3181), 2, 1, 0; (3945), 2, 1, 0; [12, 3, 1*, 1999/11/02–1999/11/15]

292 Burlington

T. Handley, 13 Linden Road, Burlington, NJ 08016, U.S.A.

0.30-m Schmidt-Cassegrain + focal reducer + CCD

GSC

1999 VW, 14, 5, 10; 1999 VO₉, 6, 2, 3; 1999 VH₁₁, 3, 1, 0; 1999 VJ₁₁, 12, 4, 7; 1999 VS₁₉, 5, 2, 4; 1999 VU₃₈, 3, 1, 0; [43, 6, 0*, 1999/10/12–1999/10/22]

294 Astrophysical Observatory, College of Staten Island

I. Robbins, The College of Staten Island, 2800 Victory Boulevard, Staten Island,

NY 10314, U.S.A. [mailto:robbins@postbox.csi.cuny.edu]

Observers I. Robbins, S. Joyce

Measurers S. Parello, M. Benjamin

0.41-m $f/4.7$ Schmidt-Cassegrain + CCD

GSC

(3314), 4, 2, 2; (8476), 4, 2, 2; [8, 2, 0*, 1999/10/06–1999/10/08]

322 Perth Observatory, Bickley-MCT

J. Biggs, Perth Observatory, Bickley, WA 6076, Australia

[mailto:jamieb@calm.wa.gov.au]

0.25-m $f/4.5$ reflector + CCD

GSC

1995 YV₃, 2, 1, 0; 1999 HX₂, 2, 1, 0; (2830), 2, 1, 0; [6, 3, 0*, 1999/10/18]

327 Peking Observatory, Xinglong Station

J. Zhu, Peking Astronomical Observatory, Chinese Academy of Sciences,
Zhongguancun, Peking 100101, Peoples Republic of China

[zj@bac.pku.edu.cn]

Observers J. Zhu, X. Zhou, X. M. Teng, X. Y. Li

Measurers X. Y. Li, X. M. Teng

0.60-m Schmidt + CCD

1978 TT₈, 3, 1, 0; 1981 EA₁₉, 9, 3, 15; 1988 CO₇, 9, 2, 11; 1988 RL₁₂, 9, 3, 2; 1992 RS₃, 6, 2, 10; 1993 SN₃, 9, 2, 1; 1994 UK₅, 6, 2, 1; 1996 BY₂, 7, 2, 1; 1996 WL₃, 3, 1, 0; 1997 XQ₅, 3, 1, 0; 1998 DB₃₆, 6, 2, 4; 1998 FC₅₈, 3, 1, 0; 1998 HN₁, 13, 4, 4; 1998 HT₅₁, 3, 1, 0; 1998 HW₉₆, 3, 1, 0; 1998 RF₂₃, 3, 1, 0; 1998 RO₃₁, 7, 2, 1; 1998 SN₁₄₅, 3, 1, 0; 1998 UY₁₈, 3, 1, 0; 1999 RB₃, 9, 3, 2; 1999 RC₃₅, 6, 2, 1; 1999 RZ₄₁, 13, 4, 3; 1999 RP₂₀₅, 6, 2, 1; 1999 SN₉, 3, 1, 0; 1999 SO₉, 3, 1, 0; 1999 SR₁₀, 6, 2, 2; 1999 SW₁₀, 3, 1, 0; 1999 SW₁₁, 3, 1, 0; 1999 TV, 3, 1, 0; 1999 TB₁, 6, 2, 1; 1999 TK₁, 9, 3, 10; 1999 TS₁, 10, 3, 4; 1999 TN₃, 6, 2, 2; 1999 TO₃, 6, 2, 15; 1999 TQ₅, 3, 1, 0; 1999 TV₅, 6, 2, 1; 1999 TZ₅, 9, 3, 11; 1999 TD₈, 9, 3, 2; 1999 TA₉, 9, 3, 3; 1999 TH₁₆, 3, 1, 0; 1999 TV₁₇, 6, 2, 1; 1999 TW₁₇, 3, 1, 0; 1999 TZ₁₇, 9, 3, 2; 1999 TB₁₈, 6, 2, 1; 1999 TF₁₈, 6, 2, 1; 1999 TJ₁₈, 6, 2, 1; 1999 TM₁₈, 3, 1, 0; 1999 TO₁₈, 6, 2, 2; 1999 TQ₁₈, 6, 2, 2; 1999 TR₁₈, 3, 1, 0; 1999 TY₁₉, 3, 1, 0; 1999 TC₂₇, 3, 1, 0; 1999 TU₃₀, 3, 1, 0; 1999 TD₃₂, 12, 4, 16; 1999 TG₃₂, 6, 2, 9; 1999 TU₃₃, 9, 3, 3; 1999 TY₃₅, 12, 4, 19; 1999 UN, 6, 2, 1; 1999 UO, 10, 3, 2; 1999 UV, 9, 3, 3; 1999 UP₃, 9, 2, 1; 1999 UA₆, 6, 2, 9; 1999 UB₆, 6, 2, 9; 1999 UC₆, 7, 2, 9; 1999 UD₆, 6, 2, 6; 1999 UE₆, 9, 3, 2; 1999 UF₆, 6, 2, 4; 1999 UG₆, 6, 2, 1; 1999 UH₆, 6, 2, 1; 1999 UJ₆, 6, 2, 1; 1999 UK₆, 6, 2, 1; 1999 UL₆, 6, 2, 1; 1999 UM₆, 6, 2, 1; 1999 UN₆, 6, 2, 1; 1999 UO₆, 7, 2, 1; 1999 UP₆, 6, 2, 2; 1999 UQ₆, 7, 2, 2; 1999 UR₆, 6, 2, 2; 1999 US₆, 6, 2, 2; 1999 VA₂, 9, 2, 2; 1999 VS₂₀, 8, 3, 3; 1999 VK₂₁, 7, 2, 3; 4220 T-1, 3, 1, 0; (822), 6, 2, 1; (1759), 7, 2, 1; (2263), 12, 3, 11; (3181), 6, 2, 1; (3364), 7, 2, 1; (3646), 6, 2, 1; (4394), 6, 2, 1; (4595), 6, 2, 1; (5365), 7, 2, 10; (7656), 3, 1, 0; (8837), 9, 2, 9; (11994), 3, 1, 0; [595, 95, 21*, 1995/10/28–1999/11/14]

355 Hadano

A. Asami, 28-1 Nishitawara, Hadano, Kanagawa-Ken, 257 Japan

[asami@st.rim.or.jp]

0.2-m $f/6.0$ reflector + CCD, 0.28-m $f/5.0$ reflector + CCD

GSC

1999 RH₂₇, 6, 2, 9; 1999 US₃, 3, 1, 0; 1999 VZ, 6, 2, 1; 1999 VR₁, 8, 2, 1; [23, 4, 0*, 1999/10/28–1999/11/06]

358 Nanyou

T. Okuni, 158-28, Mitsuma-dori, Nanyou, Yamagata-Ken, 999-22 Japan

0.28-m $f/6.3$ Schmidt-Cassegrain + CCD

GSC

1999 TZ₁₂, 3, 1, 0; 1999 TF₂₀, 2, 1, 0; 1999 TH₂₀, 3, 1, 0; 1999 VL₁₀, 9, 3, 5; [17, 4, 0*, 1999/11/03–1999/11/09]

360 Kuma Kogen Astronomical Observatory

A. Nakamura, Shimo-Hatanokawa, Kuma, Kamiukena-Gun, Ehime-Ken, 791-1212
Japan [a-nakamu@mx2.nisiq.net]

0.60-m $f/5.8$ Ritchey-Chrétien + CCD

GSC-ACT, USNO-A2.0

1989 VA, 3, 1, 0; 1995 SP₂, 4, 2, 6; 1995 WF, 3, 1, 0; 1997 AW₁₇, 2, 1, 0; 1997 DL, 4, 2, 6; 1997 GR₂₄, 3, 1, 0; 1997 UF₉, 3, 1, 0; 1997 WU₂₂, 3, 1, 0; 1998 KN, 3, 1, 0; 1998 KB₅, 10, 3, 8; 1998 OH, 3, 1, 0; 1998 QL₄₂, 3, 1, 0; 1998 XS₁₆, 6, 2, 20; 1999 CU₃, 3, 1, 0; 1999 NC₄₃, 3, 1, 0; 1999 RU₂, 3, 1, 0; 1999 RV₂, 3, 1, 0; 1999 RH₂₇, 3, 1, 0; 1999 RQ₂₈, 3, 1, 0; 1999 RG₃₃, 3, 1, 0; 1999 RP₃₆, 3, 1, 0; 1999 SL₅, 3, 1, 0; 1999 SE₁₀, 3, 1, 0; 1999 SK₁₀, 3, 1, 0; 1999 TD₄, 10, 4, 12; 1999 TD₅, 3, 1, 0; 1999 TE₅, 3, 1, 0; 1999 TA₁₀, 3, 1, 0; 1999 TK₁₂, 6, 2, 10; 1999 TX₁₆, 3, 1, 0; 1999 UG₅, 3, 1, 0; 1999 VU, 6, 2, 3; 1999 VV, 3, 1, 0; 1999 VS₅, 3, 1, 0; 1999 VN₆, 3, 1, 0; 1999 VO₆, 3, 1, 0; 1999 VR₆, 3, 1, 0; 1999 VS₆, 6, 2, 10; 1999 VN₈, 12, 4, 9; 1999 VO₁₁, 3, 1, 0; 1999 VP₁₁, 3, 1, 0; 1999 VL₁₂, 3, 1, 0; 1999 VX₂₂, 9, 3, 6; 1999 VT₂₅, 3, 1, 0; 1999 VZ₂₅, *

7, 2, 6; 1999 VA₂₆, 9, 3, 5; 1999 WN, 6, 2, 2; 1999 WO, 6, 2, 2; (7619), 2, 1, 0; (8924), 2, 1, 0; (9045), 2, 1, 0; (9195), 3, 1, 0; [211, 52, 6*, 1999/10/29–1999/11/18]

365 Kashiwara

F. Uto, 12-1 Shirakashi Cho 7 Chome, Kashiwara, Nara-Ken, 634 Japan

[nag01736@niftyserve.or.jp]

0.28-m $f/6.3$ refractor + CCD

GSC

1995 PA, 2, 1, 0; 1997 JE₁₀, 4, 2, 2; 1999 TK₁₉, 2, 1, 0; 1999 TM₁₉, 2, 1, 0; 1999 VG₂, 4, 2, 2; 1999 VT₁₂, 4, 2, 1; 1999 VY₂₃, 4, 2, 1; 1999 VZ₂₃, 4, 2, 1; [26, 8, 2*, 1999/11/06–1999/11/14]

367 Yatsuka

H. Abe, 461-2, Futago, Yatsuka-Cho, Shimane-Ken, 690-14 Japan

[abehiro@daikonshima.or.jp]

0.26-m $f/6.0$ reflector + CCD

GSC

1990 QT₄, 3, 1, 0; 1990 TW₁₂, 3, 1, 0; 1991 PL₁₇, 3, 1, 0; 1996 BY₁, 3, 1, 0; 1996 HE₁, 6, 2, 4; 1999 VZ, 12, 4, 4; [30, 6, 1*, 1999/11/03–1999/11/10]

376 Uenohara

N. Kawasato, 3-11-10, Hana-Koganei, Kodaira, Tokyo, 187 Japan

0.30-m reflector + CCD

GSC

1999 UE₈, 2, 1, 0; 1999 UK₈, 4, 1, 0; 1999 UN₈, 6, 2, 3; 1999 VH₄₀, 6, 2, 8; 1999 VJ₄₀, 6, 2, 8; 1999 VK₄₀, 4, 2, 3; [28, 6, 3*, 1999/11/05–1999/11/16]

385 Nihondaira Observatory

T. Urata, 1-8, Dobayashi 1 Chome, Shimizu, Shizuoka-Ken 424-0851, Japan

[urata@sannet.ne.jp]

0.31-m $f/4.0$ reflector + CCD

GSC-1.1, USNO-A2.0

1992 WO₃, 2, 1, 0; 1993 BP₃, 3, 1, 0; 1995 WJ₅, 3, 1, 0; 1997 AQ₆, 4, 1, 0; 1998 DB₂₄, 4, 2, 3; 1999 SM₈, 3, 1, 0; 1999 TF₁₃, 7, 3, 16; 1999 TG₁₃, 5, 2, 20; 1999 UQ₁, 4, 2, 12; 1999 UR₁, 3, 1, 0; 1999 UZ₂, 3, 1, 0; 1999 UL₃, 6, 2, 20; 1999 VR, 14, 5, 8; 1999 VT₁, 12, 5, 8; 1999 VK₂, 9, 3, 13; 1999 VL₂, 6, 2, 1; 1999 VX₂, 12, 4, 12; 1999 VY₂, 7, 3, 7; 1999 VJ₅, 3, 2, 4; 1999 VT₅, 7, 3, 10; 1999 VL₆, 12, 5, 11; 1999 VM₆, 6, 4, 5; 1999 VT₂₀, 7, 2, 6; 1999 VU₂₀, 3, 1, 0; 1999 VV₂₀, 6, 2, 6; 1999 VX₂₃, 8, 3, 6; 1999 WS, 5, 2, 1; 1999 WT, 5, 2, 1; 1999 WU, 5, 2, 1; 1999 WV, 5, 2, 1; 1999 WW, 6, 2, 1; [185, 31, 11*, 1999/10/29–1999/11/19]

392 JCPM Sapporo Station

K. Watanabe, 3-8-B203, Ashibetsu Chuo 3 Jo 4 Chome, Shiroishi-Ku, Sapporo 005,
Japan

0.30-m $f/2.7$ Schmidt camera

AGK3, SAOC

1999 TF₄, 2, 1, 0; 1999 TH₂₀, 2, 1, 0; [4, 2, 0*, 1999/11/04–1999/11/10]

399 Kushiro

H. Kaneda, Taiyo MS 2-H, 2-15, Kawazoe 8 Jo 2 Chime, Minami-Ku, Sapporo, 005
Japan

Observer S. Ueda

Measurer H. Kaneda

0.25-m $f/3.4$ hyperboloid astrocamera

GSC

1999 UU₂, 2, 1, 0; [2, 1, 0*, 1992/09/28]

402 Dync Astronomical Observatory

A. Sugie, Dync Astronomical Observatory, Taga 283-1, Taga, Inukami-Gun, Shiga-Ken, 522-0341 Japan [hhf00201@niftyserve.or.jp]

Observers A. Sugie, Y. Ikari
0.60-m $f/5.0$ reflector + CCD
GSC

1989 VA, 3, 1, 0; 1997 AP₁₀, 3, 1, 0; 1997 WU₂₂, 3, 1, 0; 1999 CU₃, 3, 1, 0; 1999 LF₆, 3, 1, 0; 1999 RV₂, 3, 1, 0; 1999 RH₂₇, 3, 1, 0; 1999 SM₅, 3, 1, 0; 1999 TD₅, 6, 2, 16; 1999 TA₁₀, 3, 1, 0; 1999 TD₁₀, 4, 2, 1; 1999 TN₁₂, 3, 1, 0; 1999 TW₁₆, 3, 1, 0; 1999 UM₃, 4, 1, 0; 1999 UG₅, 7, 2, 4; 1999 VT, 7, 2, 3; 1999 VU, 6, 2, 8; 1999 VV, 9, 3, 14; 1999 VZ, 9, 3, 4; 1999 VC₁, 4, 1, 0; 1999 VL₁, 4, 1, 0; 1999 VB₂ *, 14, 4, 6; 1999 VQ₅, 8, 2, 2; 1999 VR₅, 7, 2, 2; 1999 VN₆, 10, 3, 13; 1999 VO₆, 10, 3, 6; 1999 VP₆, 9, 3, 6; 1999 VR₆, 7, 2, 3; 1999 VS₆, 13, 4, 12; 1999 VL₁₁, 4, 1, 0; 1999 VN₁₁, 12, 3, 3; 1999 VO₁₁, 10, 3, 10; 1999 VP₁₁, 7, 2, 4; 1999 VQ₁₁, 10, 3, 9; 1999 VG₁₂ *, 9, 3, 4; 1999 VL₁₂, 3, 1, 0; 1999 VA₂₁ *, 9, 3, 10; 1999 VF₂₂, 4, 1, 0; 1999 VG₂₂, 7, 2, 5; 1999 VX₂₉, 6, 2, 6; (6199), 3, 1, 0; [255, 41, 3*, 1999/10/23–1999/11/19]

411 Oizumi

T. Kobayashi, 1717-2 Shimo-Koizumi, Oizumi-machi, Ora-gun, Gunma-ken, 370-0515 Japan [kobataka@sannet.ne.jp]
0.25-m $f/4.4$ reflector + CCD, 0.41-m $f/4.3$ reflector + CCD
GSC

1988 XV₁, 4, 2, 3; 1990 VD₈, 4, 2, 2; 1992 WM, 4, 2, 1; 1998 HC₉₉, 4, 2, 1; 1998 QW₇₀, 4, 2, 1; 1998 QR₇₁, 4, 2, 3; 1999 TB₁₃, 6, 3, 8; 1999 TC₁₃, 4, 2, 9; 1999 TD₁₃, 2, 1, 0; 1999 VT, 2, 1, 0; 1999 VJ₂ *, 9, 4, 8; 1999 VM₂ *, 6, 3, 8; 1999 VU₅ *, 6, 3, 8; 1999 VV₅ *, 8, 4, 8; 1999 VW₅ *, 8, 4, 14; 1999 VX₅ *, 6, 3, 8; 1999 VY₅ *, 6, 3, 8; 1999 VZ₅ *, 6, 3, 8; 1999 VA₆ *, 6, 3, 8; 1999 VB₆ *, 6, 3, 8; 1999 VC₆ *, 6, 3, 8; 1999 VD₆ *, 6, 3, 8; 1999 VE₆ *, 6, 3, 8; 1999 VF₆ *, 6, 3, 8; 1999 VG₆ *, 6, 3, 8; 1999 VH₆ *, 6, 3, 8; 1999 VJ₆ *, 6, 3, 8; 1999 VK₆ *, 6, 3, 8; 1999 VQ₈ *, 6, 3, 5; 1999 VR₈, 4, 2, 1; 1999 VF₁₀ *, 6, 3, 9; 1999 VG₁₀ *, 6, 3, 9; 1999 VH₁₀ *, 6, 3, 9; 1999 VJ₁₀ *, 6, 3, 9; 1999 VK₁₀ *, 6, 3, 9; 1999 VL₁₀ *, 6, 3, 9; 1999 VM₁₀ *, 4, 2, 1; 1999 VN₁₀ *, 6, 3, 9; 1999 VO₁₀ *, 6, 3, 9; 1999 VP₁₀ *, 6, 3, 9; 1999 VQ₁₀ *, 6, 3, 9; 1999 VR₁₀ *, 6, 3, 9; 1999 VS₁₀ *, 6, 3, 9; 1999 VT₁₀ *, 6, 3, 9; 1999 VU₁₀ *, 4, 2, 1; 1999 VV₁₀ *, 6, 3, 9; 1999 VW₁₀ *, 6, 3, 9; 1999 VN₂₃, 4, 2, 3; 1999 VS₂₄ *, 6, 3, 5; 1999 VT₂₄ *, 6, 3, 5; 1999 VU₂₄ *, 6, 3, 5; 1999 VV₂₄ *, 6, 3, 5; 1999 VW₂₄ *, 6, 3, 5; 1999 VX₂₄ *, 6, 3, 5; 1999 VY₂₄ *, 6, 3, 5; 1999 VZ₂₄ *, 6, 3, 5; 1999 VA₂₅ *, 6, 3, 5; 1999 VB₂₅ *, 6, 3, 5; 1999 VC₂₅ *, 6, 3, 5; 1999 VD₂₅ *, 6, 3, 5; 1999 VE₂₅ *, 4, 2, 3; 1999 VF₂₅ *, 6, 3, 5; 1999 VG₂₅ *, 6, 3, 5; 1999 VH₂₅ *, 6, 3, 5; 1999 VJ₂₅ *, 6, 3, 5; 1999 VK₂₅ *, 6, 3, 5; 1999 VL₂₅ *, 6, 3, 5; 1999 VM₂₅ *, 6, 3, 5; 1999 VN₂₅ *, 6, 3, 5; 1999 WG *, 4, 2, 2; 1999 WH *, 4, 2, 2; 1999 WJ *, 4, 2, 2; 1999 WK *, 4, 2, 2; 1999 WL *, 4, 2, 2; 1999 WM *, 4, 2, 2; 1999 WP *, 7, 3, 10; [420, 76, 64*, 1999/11/04–1999/11/19]

413 Siding Spring

R. H. McNaught, Research School of Astronomy and Astrophysics,
Siding Spring Observatory, Coonabarabran, NSW 2357, Australia
[rmn@aaocbn.aao.gov.au] (1)

A. Gnädig, c/o Archenhold-Sternwarte, Alt-Treptow 1, D-12435 Berlin, Germany
[doppler@mind.de] (5)

C.-I. Lagerkvist, Uppsala Observatory, Box 515, S-75120 Uppsala, Sweden
[classe@astro.uu.se] (8)

Observers R. H. McNaught, M. Hartley, M. A. Read, K. S. Russell
Measurers R. H. McNaught, O. Hernius, A. Boattini, G. Forti, M. Tombelli,
A. Gnädig

1.2-m U.K. Schmidt, 1.0-m $f/8$ reflector + CCD
USNO-A2.0, GSC-ACT

{1} 1999 DK₃, 2, 1, 0; 1999 KK₁, 2, 1, 0; 1999 KX₄, 2, 1, 0; 1999 LU₇, 2, 1, 0; 1999 LQ₂₈, 2, 1, 0; 1999 NC₄₃, 2, 1, 0; 1999 OW₃, 2, 1, 0; 1999 RM₂₈, 2, 1, 0; 1999 RR₂₈, 4, 2, 2; 1999 RC₄₃, 2, 1, 0; 1999 RD₄₃, 2, 1, 0; 1999 RL₄₅, 2, 1, 0; 1999 RM₄₅, 5, 2, 2; 1999 SO₅, 4, 2, 2; 1999 SD₁₀, 2, 1, 0; 1999 TX₂, 4, 2, 2; 1999 TZ₄, 2, 1, 0; 1999 TA₅, 3, 1, 0; 1999 TB₅, 2, 1, 0; 1999 TC₅, 4, 2, 2; 1999 TF₅, 3, 1, 0; 1999 TB₁₀, 3, 1, 0; 1999 TN₁₁, 2, 1, 0; 1999 TK₁₂, 2, 1, 0; 1999 TL₁₂, 2, 1, 0; 1999 TT₁₆, 3, 1, 0; 1999 TR₁₉, 4, 2, 2; 1999 TS₁₉, 2, 1, 0; 1999 TT₁₉, 2, 1, 0; 1999 UR, 2, 1, 0; 1999 UP₂, 5, 2, 1; 1999 UA₅, 2, 1, 0; 1999 UZ₅, 7, 3, 2; 1999 VT, 5, 2, 2; 1999 VU, 3, 1, 0; 1999 VV, 3, 1, 0; 1999 VC₁, 2, 1, 0; 1999 VL₁, 3, 1, 0; 1999 VN₆, 1, 1, 0; [108, 39, 0*, 1999/11/02–1999/11/04]

{5} 1991 VC₃, 2, 1, 0; 1994 JC, 1, 1, 0; 1997 XQ₅, 2, 1, 0; 1998 QP₆₃, 2, 1, 0; 1998 UY₁₈, 2, 1, 0; 1999 RO₁₇, 3, 2, 912; 1999 RJ₄₅, 2, 1, 0; 1999 TZ₁, 4, 2, 23; [18, 8, 0*, 1976/05/30–1996/03/24]

{8} 1999 RV₉₁, 1, 1, 0; 1999 SV₉, 1, 1, 0; [2, 2, 0*, 1993/04/17–1993/04/21]

417 Yanagida Astronomical Observatory

A. Tsuchikawa, Robu 1-1, Kanmachi, Fugeshi-gun, Ishikawa-ken, 928-03 Japan
Observer A. Tsuchikawa

0.60-m $f/8.0$ reflector + CCD
USNO-A2.0

1999 TG₂₀, 6, 3, 7; 1999 VC₂ *, 9, 4, 6; 1999 VD₂ *, 9, 4, 6; [24, 3, 2*, 1999/10/30–1999/11/10]

423 North Ryde

S. G. McAndrew, 2/32 Twin Rd, North Ryde, NSW 2113, Australia
[sgmcandrew@ozemail.com.au]

0.20-m $f/4$ hyperbolic astrograph + CCD
GSC

1991 VT, 2, 1, 0; 1994 XY₄, 2, 1, 0; 1999 SZ₅, 5, 2, 7; [9, 3, 0*, 1999/10/28–1999/11/19]

428 Reedy Creek

J. Broughton, 18 Branch Crescent, Reedy Creek, QLD 4228, Australia
[reedycrk@one.net.au]

0.25-m $f/6.3$ Schmidt-Cassegrain + CCD
GSC

1998 DH₁₁, 6, 3, 13; 1998 EP₈, 2, 1, 0; 1998 FN₁₂₆, 5, 3, 25; 1998 HW₁₀₁, 2, 1, 0; 1998 NF, 4, 2, 1; 1998 OW₁₁, 4, 2, 1; 1998 OG₁₂, 5, 2, 6; 1998 QE₄, 5, 2, 1; 1999 JM₈, 2, 1, 0; 1999 LF₆, 6, 2, 7; 1999 PF, 2, 1, 0; 1999 PU₁, 2, 1, 0; 1999 PD₄, 2, 1, 0; 1999 PE₄, 3, 2, 5; 1999 PH₄, 2, 1, 0; 1999 PO₄, 1, 1, 0; 1999 PP₄, 2, 1, 0; 1999 RU, 4, 2, 15; 1999 RQ₂₈, 3, 1, 0; 1999 RX₃₈, 4, 2, 15; 1999 RZ₃₈, 2, 1, 0; 1999 RG₄₄, 5, 3, 33; 1999 RH₄₄, 2, 1, 0; 1999 RJ₄₅, 2, 1, 0; 1999 RY₁₆₆, 6, 3, 3; 1999 SL, 2, 1, 0; 1999 TU₁₉, 3, 2, 1; 1999 UR₃, 4, 1, 0; 1999 VT₁₁ *, 6, 3, 3; 1999 VW₁₉ *, 6, 3, 5; (12077), 4, 2, 1; [108, 31, 2*, 1999/10/07–1999/11/14]

461 JATE Asteroid Survey, Piskésető

L. Kiss, Pf. 596, H-6701 Szeged, Hungary [l.kiss@physx.u-szeged.hu]

Observers K. Sárneczky, L. Kiss, Gy. Szabó
Measurers K. Sárneczky, L. Kiss

0.60-m Schmidt + CCD
USNO-A2.0

1970 JB, 3, 1, 0; 1999 RU₂₁₁, 13, 3, 6; 1999 SU₆, 3, 1, 0; 1999 SC₁₀, 4, 1, 0; 1999 US₃, 8, 1, 0; (3838), 3, 1, 0; [34, 6, 0*, 1999/10/22–1999/10/28]

470 Ceccano

G. Masi, Via Madonna de Loco 47, I-03023 Ceccano (FR), Italy
[gianmasi@fr.flashnet.it]

0.28-m $f/3.3$ Schmidt-Cassegrain + CCD
USNO-A2.0

1999 TZ₁₀, 2, 1, 0; 1999 VT, 2, 1, 0; 1999 VN₆, 2, 1, 0; [6, 3, 0*, 1999/11/01–1999/11/06]

474 Mount John

I. P. Griffin, Auckland Observatory, P.O. Box 24-180, Royal Oak, Auckland, New Zealand [iang@stardome.org.nz]

Observers I. P. Griffin, N. Brady
1.0-m $f/6.7$ McClellan reflector + CCD
USNO-A2.0

1997 GO₂₇, 3, 1, 0; 1998 AK₈, 3, 1, 0; 1998 KE₃, 3, 1, 0; 1998 OH, 2, 1, 0; 1998 PF, 7, 2, 2; 1999 JM₈, 3, 1, 0; 1999 NR₄, 8, 2, 1; 1999 OW₃, 4, 1, 0; 1999 VS₅, 7, 1, 0; 1999 VO₁₁, 16, 4, 7; 1999 VP₁₁, 17, 4, 7; 1999 VL₁₂, 7, 1, 0; 1999 VM₁₄ *, 16, 4, 3; 1999 VF₂₂, 5, 1, 0; 1999 VG₂₂, 5, 1, 0; 1999 VW₂₂ *, 10, 4, 4; (7482), 3, 1, 0; [119, 17, 2*, 1999/11/10–1999/11/17]

540 Linz

E. Meyer, F. Marklstrasse 1/62, A-4040 Linz, Austria [erich.meyer@ooenet.at]
Observers E. Meyer, E. Obermair

0.30-m $f/5.2$ Schmidt Cassegrain + CCD
USNO-A2.0

1999 ND₄₃, 3, 1, 0; 1999 RH₂₇, 4, 1, 0; 1999 TA₁₀, 9, 2, 2; 1999 US₃, 4, 1, 0; 1999 UG₅, 6, 1, 0; 1999 VL₁, 3, 1, 0; 1999 VN₆, 3, 1, 0; 1999 VU₂₅, 2, 1, 0; 1999 WY, 4, 1, 0; (1876), 4, 1, 0; [42, 10, 0*, 1999/10/27–1999/11/20]

557 Ondřejov

P. Pravec, Astronomical Institute, Czech Academy of Sciences, CZ-25165 Ondřejov, Czech Republic [ppravec@asu.cas.cz]

Observers P. Pravec, L. Šarounová, M. Wolf, P. Kušnirák

0.65-m $f/3.6$ reflector + CCD
USNO-SA1.0, USNO-SA2.0

1991 VE₃, 3, 1, 0; 1993 FU₄₉, 2, 1, 0; 1993 GC, 3, 1, 0; 1995 EA₈, 2, 1, 0; 1995 SP, 3, 1, 0; 1996 XA₁₂, 12, 3, 4; 1997 AE₁₈, 8, 3, 6; 1998 FD₆₁, 2, 1, 0; 1998 QR₁, 5, 2, 19; 1998 QX₂₁, 7, 3, 6; 1998 QO₆₀, 4, 2, 2; 1998 RH₇₄, 8, 3, 4; 1998 UL, 2, 1, 0; 1999 PP₁, 2, 1, 0; 1999 PH₃, 3, 1, 0; 1999 QL₂, 1, 1, 0; 1999 QM₂, 2, 1, 0; 1999 RR, 2, 1, 0; 1999 RG₁, 2, 1, 0; 1999 RH₂₇, 6, 1, 0; 1999 RK₃₁, 6, 2, 2; 1999 RP₃₁, 3, 1, 0; 1999 RQ₃₁, 2, 1, 0; 1999 RR₃₁, 2, 1, 0; 1999 RU₃₁, 2, 1, 0; 1999 RS₃₄, 2, 1, 0; 1999 RV₃₄, 5, 2, 17; 1999 RW₃₅, 5, 2, 16; 1999 RH₄₀, 2, 1, 0; 1999 RF₄₂, 2, 1, 0; 1999 RG₄₂, 2, 1, 0; 1999 RH₄₂, 5, 2, 1; 1999 RL₄₃, 4, 2, 17; 1999 RO₁₉₀, 2, 1, 0; 1999 RP₂₁₃, 2, 1, 0; 1999 SQ₁, 2, 1, 0; 1999 SV₂, 2, 1, 0; 1999 SW₂, 5, 2, 16; 1999 SO₄, 7, 2, 1; 1999 SW₁₀, 3, 1, 0; 1999 TR₃, 4, 2, 15; 1999 TS₃, 2, 1, 0; 1999 TT₃, 2, 1, 0; 1999 TU₃, 7, 3, 3; 1999 TV₃, 2, 1, 0; 1999 TX₃, 6, 3, 3; 1999 TY₃, 4, 2, 14; 1999 TA₄, 12, 4, 17; 1999 TB₄, 2, 1, 0; 1999 TC₈, 8, 4, 4; 1999 TZ₁₁, 2, 1, 0; 1999 TP₁₄, 2, 1, 0; 1999 TQ₁₄, 4, 2, 15; 1999 TG₁₅, 4, 2, 14; 1999 TS₁₅, 4, 2, 1; 1999 TT₁₅, 6, 2, 14; 1999 TM₁₆, 2, 1, 0; 1999 TN₁₆, 4, 2, 17; 1999 TQ₁₆, 2, 1, 0; 1999 TR₁₆, 6, 2, 15; 1999 TS₁₆, 4, 2, 13; 1999 TX₁₆, 6, 1, 0; 1999 TQ₁₇, 4, 2, 15; 1999 TR₁₇, 4, 2, 17; 1999 TS₁₇, 2, 1, 0; 1999 TP₂₀, 2, 1, 0; 1999 TQ₂₀, 2, 1, 0; 1999 UA, 5, 2, 13; 1999 UB, 2, 1, 0; 1999 UC, 2, 1, 0; 1999 UH₁, 3, 1, 0; 1999 UU₁, 3, 1, 0; 1999 UV₁, 8, 2, 9; 1999 UR₂, 4, 2, 3; 1999 UT₂, 7, 3, 16; 1999 UX₂, 2, 1, 0; 1999 UY₂, 2, 1, 0; 1999 US₃, 7, 2, 1; 1999 UF₄, 6, 2, 2; 1999 UK₄ *, 4, 2, 2; 1999 UP₄ *, 7, 3, 3; 1999 UQ₄ *, 9, 4, 4; 1999 UR₄ *, 9, 4, 4; 1999 US₄ *, 8, 4, 4; 1999 UT₄ *, 4, 2, 1; 1999 UA₅, 5, 2, 2; 1999 UG₅, 7, 2, 2; 1999 UZ₅, 6, 2, 3; 1999 UN₇ *, 5, 2, 4; 1999 US₁₅, 2, 1, 0; 1999 VH *, 5, 2, 1; 1999 VJ *, 10, 4, 14; 1999 VK *, 14, 4, 14; 1999 VS, 3, 1, 0; 1999 VT, 7, 2, 2; 1999 VU, 6, 2, 2; 1999 VV, 3, 1, 0; 1999 VY *, 9, 4, 14; 1999 VB₁, 3, 1, 0; 1999 VC₁, 5, 2, 1; 1999 VL₁, 9, 3, 2; 1999 VQ₅, 9, 2, 1; 1999 VR₅, 5, 2, 1; 1999 VN₆, 8, 2, 1; 1999 VQ₂₄ *, 16, 4, 6; 1999 VR₂₄ *, 9, 3, 4; 1999 VT₂₅, 3, 1, 0; 1999 VU₂₅, 3, 1, 0; 1999 VV₂₅, 8, 1, 0; 1999 VW₂₅, 4, 1, 0; 1999 VX₂₅, 4, 1, 0; 1999 VO₄₀ *, 9, 3, 4; 1999 WC, 6, 2, 3; 1999 WQ *, 4, 2, 3; 1999 WX *, 9, 2, 2; 1999 WY, 6, 2, 2; 1080 T-3, 6, 2, 1; (2141), 6, 1, 0; (4077), 6, 1, 0; (5286), 5, 1, 0; (5653), 3, 1, 0; (8857), 2, 1, 0; (9306), 2, 1, 0; (11579), 2, 1, 0; (11832), 6, 3, 3; [585, 125, 16*, 1999/10/15–1999/11/21]

560 Madonna di Dossobuono

L. Lai, Via Mantovana 130e, I-37062 Dossobuono (Verona), Italy
[astrofil@astboi.bo.cnr.it]

Observers L. Lai, I. Rocchetti, G. Vesentini

0.40-m $f/3.5$ reflector + CCD
GSC

1978 ST₇, 9, 2, 12; 1997 AG, 7, 2, 1; 1999 UT₃ *, 16, 4, 14; (11797), 3, 1, 0; (11913), 7, 2, 12; [42, 5, 1*, 1999/10/27–1999/11/10]

566 Haleakala-NEAT/GEODSS

E. F. Helin, MS 183-501, Jet Propulsion Laboratory, Pasadena, CA 91109, U.S.A.
[efh@ip1.jpl.nasa.gov]

Observers E. F. Helin, S. H. Pravdo, K. J. Lawrence, D. L. Rabinowitz, S. Groom, C. Clark, R. Bamberg, S. Levin, J. Lorre, S. Shaklan, R. Byrd, A. Esquibel, C. Cotton, D. Bascon

1-m $f/2.2$ Ritchey-Chrétien + CCD

1996 FG₁₉, 3, 1, 0; 1997 EA₃₄, 3, 1, 0; 1998 FB₁₂, 3, 1, 0; 1998 FQ₃₂, 3, 1, 0; 1998 FZ₄₄, 6, 2, 28; 1998 FK₄₅, 3, 1, 0; 1998 HX₆₇, 3, 1, 0; 1998 HW₉₆, 3, 1, 0; 1998 HF₁₃₅, 3, 1, 0; 1998 KV₃, 3, 1, 0; 1998 KE₁₅, 6, 2, 20; 1998 KB₁₈, 3, 1, 0; 1998 KC₁₈, 3, 1, 0; 1998 KH₃₂, 6, 1, 0; 1999 KG₁₃, 3, 1, 0; 1999 RV₉₁, 3, 1, 0; 1999 RM₁₀₇, 3, 1, 0; 1999 RH₁₃₀, 6, 2, 23; 1999 TP₂, 6, 2, 28; 1999 TL₁₄, 3, 1, 0; 3519 P-L, 3, 1, 0; [78, 21, 0*, 1995/12/20–1998/05/22]

568 Mauna Kea

D. J. Tholen, Institute for Astronomy, 2680 Woodlawn Drive, Honolulu, HI 96822, U.S.A. [tholen@hale.ifa.hawaii.edu] (2)

S. Sheppard, Institute for Astronomy, 2680 Woodlawn Drive, Honolulu, HI 96822, U.S.A. [sheppard@ifa.hawaii.edu] (5)

M. Holman, Harvard-Smithsonian Center for Astrophysics, 60 Garden Street, Cambridge, MA 02138, U.S.A. [mholman@cfa.harvard.edu] (6)

W. Romanishin, Dept. of Physics and Astronomy, University of Oklahoma, Norman, OK 73019, U.S.A. [wjr@mail.nhn.ou.edu] (8)

Observers B. Gladman (6), M. Holman (6), J. J. Kavelaars (6), J.-M. Petit (6), H. Scholl (6), S. Sheppard (5), W. Romanishin (8), S. Tegler (8)

Measurers M. Holman (6), S. Sheppard (5), W. Romanishin (8), D. J. Tholen (2)
2.24-m reflector + CCD, 10-m Keck Telescope

USNO-A2.0

{2} 1999 MM, 4, 2, 3; [4, 1, 0*, 1999/10/08–1999/10/11]

{5} 1998 UR₄₃, 4, 2, 30; 1998 VG₄₄, 2, 1, 0; 1998 WH₂₄, 2, 1, 0; 1998 WV₂₄, 2, 1, 0; 1999 TR₁₁, 4, 2, 3; [14, 5, 0*, 1999/10/08–1999/11/12]

{6} 1999 OG₄ *, 3, 1, 0; 1999 OH₄ *, 3, 1, 0; 1999 OJ₄ *, 2, 1, 0; 1999 OK₄ *, 3, 1, 0; 1999 OL₄ *, 3, 1, 0; 1999 OM₄ *, 3, 1, 0; 1999 ON₄ *, 3, 1, 0; 1999 OO₄ *, 3, 1, 0; [23, 8, 8*, 1999/07/18–1999/07/21]

{8} 1998 SG₃₅, 2, 1, 0; 1998 VG₄₄, 2, 1, 0; 1998 WH₂₄, 2, 1, 0; 1998 WV₂₄, 2, 1, 0; 1998 WX₂₄, 3, 1, 0; 1999 OY₃, 2, 1, 0; 1999 TR₁₁, 3, 1, 0; [16, 7, 0*, 1999/09/08–1999/10/07]

587 Sormano

P. Sicoli, Via Valli 9, I-23846 Garbagnate Monastero (Lecco), Italy

[sormano@tin.it]

Observers A. Testa, F. Manca, M. Cavagna, P. Sicoli

0.5-m reflector + CCD

GSC

1999 RC₃₂, 2, 1, 0; 1999 SL₅, 2, 1, 0; 1999 TW₁₆, 3, 1, 0; 1999 US₃, 3, 1, 0; 1999 UA₅, 2, 1, 0; 1999 VP₁₁, 2, 1, 0; 1999 VF₂₂, 2, 1, 0; 1999 VX₂₅, 2, 1, 0; 1999 VQ₂₇, 6, 2, 4; 1999 WY, 2, 1, 0; [26, 10, 0*, 1999/10/31–1999/11/20]

595 Farra d'Isonzo

L. Bittesini, Via dei Conventi 10, I-34070 Farra D'Isonzo (GO), Italy

[ccaf@tmedia.it]

Observers A. Toso, G. Lombardi, E. Pettarin, W. Boschin, F. Piani, M. Devetti

Measurers A. Toso, G. Lombardi, E. Pettarin

0.4-m $f/4.5$ reflector + CCD

GSC, USNO-SA1.0

1991 BB, 3, 1, 0; 1995 UY₈, 5, 2, 1; 1999 TX₈, 3, 1, 0; 1999 TR₁₅, 2, 1, 0; 1999 TC₁₆, 2, 1, 0; 1999 TP₁₉, 4, 2, 5; 1999 US₃, 2, 1, 0; 1999 VT, 3, 1, 0; 1999 VU, 2, 1, 0; 1999 VV, 2, 1, 0; 1999 VN₆, 2, 1, 0; 1999 VO₆, 5, 1, 0; 1999 VP₆, 3, 1, 0; 1999 VR₆, 3, 1, 0; 1999 VL₇, 4, 1, 0; 1999 VN₁₁, 5, 2, 2; 1999 VQ₁₁, 3, 1, 0; 1999 VC₂₁ *, 5, 2, 1; 1999 VD₂₁ *, 4, 2, 1; 1999 VF₂₂, 7, 2, 1; 1999 VG₂₂, 8, 2, 1; 1999 VT₂₅, 4, 1, 0; 1999 VW₂₅, 4, 1, 0; (5733), 4, 2, 1; [89, 24, 2*, 1999/10/30–1999/11/15]

596 Colleverde di Guidonia

V. S. Casulli, Via M. Rosa 1, I-00010 Colleverde di Guidonia (RM), Italy

[v.casulli@priminet.it]

0.40-m $f/3.2$ reflector + CCD

GSC

1988 RO₂, 3, 1, 0; 1995 QN₂, 3, 1, 0; 1995 QD₃, 3, 1, 0; 1995 VJ₂, 3, 1, 0; 1996 XY₁₄, 3, 1, 0; 1998 FN₁₂₆, 3, 1, 0; 1999 UT₃, 3, 1, 0; 1999 VQ₅, 3, 1, 0; 1999 VF₂₂, 2, 1, 0; [26, 9, 0*, 1999/11/05–1999/11/12]

609 Osservatorio Polino

G. Iatterì, Via Val Serra 45h, Terni, Italy
 Observers G. Iatterì, V. Scirri, G. Bernabei
 0.40-m $f/2.9$ reflector + CCD
 GSC

1999 RV₁₉₇, 4, 2, 7; [4, 1, 0*, 1999/11/02–1999/11/09]

610 Pianoro

V. Goretti, Via Resistenza 93, I-40065 Pianoro (BO), Italy
 [astrofil@astbo1.bo.cnr.it]

0.25-m $f/4$ Schmidt-Cassegrain + CCD
 GSC, USNO-A2.0

1981 EA₁₉, 5, 1, 0; 1983 RL, 5, 1, 0; 1985 TS, 5, 1, 0; 1995 SX₂, 5, 1, 0; 1995 WB₉, 5, 1, 0; 1998 FS₆₈, 10, 2, 12; 1998 KZ₄₆, 5, 1, 0; 1998 MC₄₅, 5, 1, 0; 1999 JM₈, 5, 1, 0; 1999 KQ₄, 5, 1, 0; 1999 NT₁, 5, 1, 0; 1999 OW₂, 5, 1, 0; 1999 RH₂₇, 5, 1, 0; 1999 RJ₄₂, 5, 1, 0; 1999 VZ₂₀ *, 19, 3, 11; (47), 5, 1, 0; (193), 5, 1, 0; (597), 5, 1, 0; (699), 15, 3, 16; (770), 5, 1, 0; (847), 5, 1, 0; (860), 5, 1, 0; (1146), 5, 1, 0; (1499), 5, 1, 0; (1648), 5, 1, 0; (1698), 5, 1, 0; (1770), 5, 1, 0; (1853), 5, 1, 0; (1889), 5, 1, 0; (1943), 5, 1, 0; (2222), 5, 1, 0; (2233), 10, 2, 4; (3200), 5, 1, 0; (3507), 5, 1, 0; (3573), 10, 2, 4; (3661), 10, 2, 4; (3838), 9, 1, 0; (3952), 5, 1, 0; (4052), 5, 1, 0; (4054), 5, 1, 0; (4164), 5, 1, 0; (4629), 5, 1, 0; (4645), 5, 1, 0; (4709), 5, 1, 0; (4727), 5, 1, 0; (5019), 5, 1, 0; (5075), 5, 1, 0; (5431), 5, 1, 0; (5564), 19, 3, 7; (6297), 5, 1, 0; (6372), 5, 1, 0; (6414), 10, 2, 4; (6532), 19, 3, 7; (6632), 5, 1, 0; (6731), 5, 1, 0; (7003), 5, 1, 0; (7634), 5, 1, 0; (7636), 5, 1, 0; (8692), 5, 1, 0; (8761), 10, 2, 12; (8875), 5, 1, 0; (8925), 5, 1, 0; (9661), 5, 1, 0; (10778), 5, 1, 0; (11573), 5, 1, 0; (11852), 5, 1, 0; (12155), 5, 1, 0; [421, 67, 1*, 1999/10/27–1999/11/19]

611 Starkenburg Sternwarte, Heppenheim

M. Busch, Giessener Strasse 4, D-64646 Heppenheim, Germany [mab@iez.com]
 Observers M. Busch, R. Stoss, P. Geffert, S. Kluegl, A. Seib, R. Kresken
 Measurers M. Busch, R. Stoss, S. Kluegl

0.30-m $f/6.3$ reflector + CCD, 0.45-m $f/4.4$ reflector + CCD
 USNO-SA2.0

1986 TR, 1, 1, 0; 1990 ES₄, 2, 1, 0; 1991 VA₃, 2, 1, 0; 1992 OJ₁, 2, 1, 0; 1994 JC, 5, 1, 0; 1994 VS₁, 3, 2, 3; 1998 FG₇₅, 6, 2, 3; 1998 KW₄₆, 2, 1, 0; 1999 RT₂₈, 2, 1, 0; 1999 RK₃₅, 2, 1, 0; 1999 TA₁₆, 3, 1, 0; 1999 TB₁₆, 1, 1, 0; 1999 TK₁₆, 3, 1, 0; 1999 TH₂₆, 5, 2, 2; 1999 UC₁, 7, 2, 5; 1999 US₃, 6, 2, 1; 1999 UB₄ *, 6, 3, 7; 1999 UC₄ *, 10, 4, 19; 1999 UG₅, 2, 1, 0; 1999 UZ₅, 3, 1, 0; 1999 VV₂, 2, 1, 0; 1999 VC₁, 1, 1, 0; 1999 VK₁, 2, 1, 0; 1999 VP₁ *, 2, 1, 0; 1999 VQ₁ *, 3, 1, 0; 1999 VU₆, 2, 1, 0; (4595), 2, 1, 0; (6558), 2, 1, 0; (11452), 2, 1, 0; (11526), 1, 1, 0; (11544), 2, 1, 0; (11596), 1, 1, 0; (11608), 2, 1, 0; [97, 33, 4*, 1999/09/11–1999/11/16]

619 Sabadell

F. Casarramona, P.O. Box 50, E-8200 Sabadell (BCN), Spain
 [astrosab@redestb.es]

Observers F. Casarramona, E. Vigil
 Measurer F. Casarramona

0.51-m $f/3.9$ reflector + CCD
 GSC

1999 US₃, 3, 1, 0; [3, 1, 0*, 1999/10/31]

620 Observatorio Astronómico de Mallorca

À. López, Observatori Astronòmic de Mallorca, Camí de l'observatori s/n, E-07144 Costitx, Balears, Spain [astroam@dinky.bitel.es]

Observers À. López, R. Pacheco
 0.30-m $f/3.3$ Schmidt-Cassegrain + CCD
 GSC, USNO-SA2.0

1999 TH₂₇, 5, 2, 5; 1999 UV₁, 6, 2, 5; 1999 VM₅, 7, 2, 5; 1999 VF₂₃ *, 7, 2, 5; 1999 VG₂₃ *, 6, 2, 5; 1999 VH₂₃ *, 6, 2, 5; 1999 VJ₂₃ *, 6, 2, 5; 1999 VA₂₄ *, 7, 2, 5; 1999 VB₂₄ *, 6, 2, 5; 1999 VC₂₄ *, 6, 2, 5; 1999 VD₂₄ *, 5, 2, 5; [67, 11, 8*, 1999/11/08–1999/11/14]

621 Bergisch Gladbach

W. Bickel, Schau ins Land 21, D-51429 Bergisch Gladbach, Germany [0220455671-0001@t-online.de]

0.60-m $f/5$ reflector + CCD
 USNO-A2.0

1996 TL₆₆, 8, 2, 1; 1997 CB₂₇, 7, 2, 1; 1998 FA₆₉, 12, 2, 3; 1998 SO₄₉, 6, 2, 11; 1998 WH₂₄, 6, 3, 2; 1999 RH₃, 21, 7, 51; 1999 RT₃₁, 27, 8, 66; 1999 RT₁₇₅, 6, 2, 2; 1999 RT₁₈₂, 9, 3, 3; 1999 RM₂₁₃, 15, 6, 50; 1999 RN₂₁₃, 13, 4, 26; 1999 TL₂₁, 10, 3, 5; 1999 UH₁₁ *, 11, 3, 4; 1999 UJ₁₁ *, 21, 3, 4; 1999 VR₂ *, 6, 2, 3; 1999 VS₂ *, 9, 3, 4; 1999 VT₂ *, 15, 2, 1; 1999 VU₂ *, 9, 2, 1; 1999 VV₂ *, 5, 2, 1; 1999 VW₂ *, 6, 2, 1; 1999 VC₄₀ *, 9, 3, 3; 1999 VD₄₀ *, 6, 2, 3; 1999 VE₄₀ *, 6, 2, 1; 1999 VF₄₀ *, 5, 2, 1; 1999 VG₄₀ *, 7, 2, 1; (2367), 8, 2, 3; (9437), 7, 2, 1; [270, 27, 13*, 1999/09/10–1999/11/16]

628 Mülheim-Ruhr

A. Martin, Turtle Star Observatory, Friedhostr. 15, D-45478 Mülheim-Ruhr, Germany [axelm@bph.ruhr-uni-bochum.de]

Observers A. Boeker, A. Martin
 0.2-m Schmidt-Cassegrain + CCD
 USNO-A2.0

1992 UT₂, 4, 1, 0; 1995 MB, 4, 1, 0; 1999 RL₄₂, 4, 1, 0; (797), 3, 1, 0; (3944), 4, 1, 0; (11855), 4, 1, 0; [23, 6, 0*, 1999/10/31–1999/11/01]

629 JATE Observatory, Szeged

L. Kiss, Pf. 596, H-6725 Szeged, Hungary [l.kiss@physx.u-szeged.hu]
 Observers K. Sárneczky

0.28-m Schmidt-Cassegrain + CCD
 GSC

1975 TU₃, 3, 1, 0; 1992 SQ₂₃, 1, 1, 0; 1999 RH₂₇, 3, 1, 0; (2193), 2, 1, 0; [9, 4, 0*, 1999/10/31–1999/11/01]

631 Hamburg-Georgswerder

M. Buck, Niedergeorgswerder Deich 96a, D-21109 Hamburg, Germany
 [michael.buck@jovice.net]

0.15-m $f/8$ refractor + CCD
 GSC

1955 RE₁, 4, 2, 4; 1980 PJ₁, 4, 2, 4; 1986 TR, 4, 2, 4; 1988 VG₄, 4, 2, 4; 1992 UU₅, 4, 2, 4; (11787), 4, 2, 4; [24, 6, 0*, 1999/11/04–1999/11/08]

637 Hamburg–Himmelsmoor

D. Husar, Himmelsmoor 18, D-22397 Hamburg, Germany
 [100655.3400@compuserve.com]

0.2-m $f/5.8$ reflector + CCD
 GSC

(5163), 35, 1, 0; [35, 1, 0*, 1999/10/19]

638 Detmold

U. Borcheld, Klusstraße 39, D-32756 Detmold, Germany
 [100265.2520@compuserve.com]

0.25-m Schmidt-Cassegrain + CCD
 GSC

(1865), 3, 1, 0; (1943), 3, 1, 0; (3314), 3, 1, 0; (3607), 3, 1, 0; [12, 4, 0*, 1999/10/31–1999/11/04]

641 Overberg

A. van Staden, 7 Sonop Street, Bredasdorp 7280, South Africa
 [andrev@otb.co.za]

0.20-m $f/7.9$ reflector + CCD
 GSC

1999 SN₁₀, 10, 4, 27; [10, 1, 0*, 1999/10/09–1999/11/05]

642 Oak Bay, Victoria

C. E. Spratt, 1431 St. Patrick Street, Victoria, BC V8S 4Y5, Canada
[cspratt@islandnet.com]

0.20-m $f/3.7$ Schmidt-Cassegrain + CCD
GSC

1999 SO₄, 2, 1, 0; (604), 7, 3, 4; (9067), 5, 2, 4; [14, 3, 0*, 1999/11/01–1999/11/05]

649 Powell Observatory, Louisburg

L. Robinson, 14680 W 144 St., Olathe, KS 66062, U.S.A.
[lrobinson@ix.netcom.com]

Observers S. Kranz, J. Duncan, R. Fredrick, N. Reuss, D. Probert, G. Machin,
S. Granger, A. Bozarth, T. Martinez

Measurers J. Duncan, R. Frederick, D. Probert, S. Granger, S. Kranz, R. Alonzi
0.30-m Schmidt-Cassegrain + CCD, 0.25-m Schmidt-Cassegrain + CCD
GSC-1.1

1981 EN₁₃, 3, 1, 0; 1991 VE₃, 4, 1, 0; 1998 FH₇₅, 2, 1, 0; 1999 TP₇, 3, 1, 0; 1999 TS₁₁, 3, 1, 0;
1999 TD₃₄, 3, 1, 0; 1999 UZ₃, 6, 1, 0; 1999 VC, 3, 1, 0; 1999 VT, 3, 1, 0; 1999 VA₁, 11, 4, 3;
1999 VB₁, 10, 3, 2; 1999 VA₂, 5, 2, 3; 1999 VN₆, 3, 1, 0; 1999 VA₁₁, 9, 2, 1; 1999 VT₁₉, 3, 1,
0; (8671), 5, 1, 0; (11436), 3, 1, 0; (11437), 3, 1, 0; (11441), 3, 1, 0; (11960), 3, 1, 0; [88, 20, 2*,
1999/10/25–1999/11/17]

651 Grasslands Observatory, Tucson

J. E. McGaha, 5100 Sabino Foothills, Tucson, AZ 85750, U.S.A.
[jmcgaha@azstarnet.com]

0.62-m $f/5.1$ Newtonian + CCD
GSC-1.1

1992 SQ₁, 6, 2, 1; 1999 VS₅, 6, 2, 1; 1999 VO₁₁, 3, 1, 0; 1999 VQ₁₁, 3, 1, 0; 1999 VJ₁₂, 3, 1, 0;
1999 VK₁₂, 3, 1, 0; 1999 VL₁₂, 3, 1, 0; 1999 VF₂₂, 6, 2, 1; 1999 VG₂₂, 3, 1, 0; 1999 VV₂₅, 3, 1, 0;
1999 VW₂₅, 2, 1, 0; 1999 VX₂₅, 3, 1, 0; 1999 WC, 3, 1, 0; [47, 13, 0*, 1999/11/10–1999/11/17]

658 Dominion Astrophysical Observatory, Victoria

D. D. Balam, Dept. of Physics, University of Victoria, P.O. Box 3055, Victoria, BC
V8W 3P6, Canada [universe@uvvm.uvic.ca]

1.82-m Plaskett telescope + CCD
USNO-A2.0

1999 SM₅, 3, 1, 0; 1999 TA₁₀, 3, 1, 0; 1999 TW₁₆, 3, 1, 0; [9, 3, 0*, 1999/10/29]

670 Camarillo

J. E. Rogers, 441 Rowland Avenue, Camarillo, CA 93010, U.S.A.
[johnrogers@csi.com]

0.30-m $f/6.7$ Helin Telescope + CCD
GSC-1.1

1998 XS₁₆, 4, 1, 0; 1999 GK₄, 2, 1, 0; 1999 JM₈, 3, 1, 0; 1999 RH₂₇, 3, 1, 0; 1999 VU, 2, 1, 0;
1999 VN₁₁, 5, 1, 0; 1999 VQ₁₁, 5, 1, 0; [24, 7, 0*, 1999/11/10–1999/11/16]

675 Palomar

A. Boattini, Istituto di Astrofisica Spaziale, Via Fosso del Cavaliere, I-00133 Rome,
Italy [boattini@ias.rm.cnr.it] (1)

E. F. Helin, MS 183-501, Jet Propulsion Laboratory, Pasadena, CA 91109, U.S.A.
[efh@alps.jpl.nasa.gov] (2)

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Netherlands [vanhouten@rnlh11.leidenuniv.nl] (4)

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E. Bowell, Lowell Observatory, 1400 West Mars Hill Road, Flagstaff, AZ 86001,
U.S.A. [elgb@lowell.edu] (6)

B. Gladman, Observatoire de Nice, Department Cassini, BP 229, F-06304 Nice
Cedex 4, France [gladman@obs-nice.fr] (8)

Observers J. A. Burns (8, H), T. Gehrels (4, L), B. Gladman (8, H), E. F. Helin
(2, S), K. Lawrence (2, S), P. D. Nicholson (8, H), C. S. Shoemaker (6, S),
E. M. Shoemaker (6, S)

Measurers A. Boattini (1), G. Forti (1), R. Gal (1), B. Gladman (8),
A. Gnädig (5), K. Lawrence (2), B. A. Skiff (6), C. J. van Houten (4), I. van
Houten-Groeneveld (4), A. Wisse (4)

5-m Hale reflector (H), 1.2-m Oschin Schmidt (L), 0.46-m Schmidt (S)

{1} 1999 US₃, 2, 1, 0; [2, 1, 0*, 1994/07/11]

{2} 1999 RV₇₄, 2, 1, 0; [2, 1, 0*, 1991/02/18]

{4} 2230 P-L *, 7, 4, 5; 2556 P-L *, 8, 8, 32; 2596 P-L *, 8, 8, 32; 2819 P-L *, 7, 4, 4; 3519 P-L *,
10, 5, 9; 3543 P-L *, 4, 4, 9; 4083 P-L *, 12, 8, 32; 4565 P-L *, 8, 4, 4; 6191 P-L *, 6, 6, 32;
6246 P-L *, 4, 4, 4; 6250 P-L *, 5, 5, 28; 6735 P-L *, 6, 6, 28; 6873 P-L *, 6, 3, 4; 7584 P-L *, 4,
4, 9; 9087 P-L *, 3, 3, 4; 1043 T-1 *, 5, 4, 3; 1099 T-1 *, 4, 3, 2; 1194 T-1 *, 6, 5, 9; 2072 T-1 *,
5, 4, 3; 2135 T-1 *, 4, 3, 2; 2171 T-1 *, 5, 4, 3; 3106 T-1 *, 7, 5, 9; 4200 T-1 *, 4, 3, 3; 1100 T-2 *,
10, 6, 16; 1174 T-2 *, 15, 8, 16; 1198 T-2 *, 15, 8, 16; 1247 T-2 *, 15, 8, 16; 1263 T-2 *, 17,
8, 16; 1329 T-2 *, 15, 8, 16; 2031 T-2 *, 16, 8, 16; 2064 T-2 *, 15, 8, 16; 3355 T-2 *, 9, 5,
10; 4184 T-2 *, 15, 8, 16; 4634 T-2 *, 11, 7, 16; 5068 T-2 *, 12, 6, 14; 1033 T-3 *, 10, 5, 11;
1050 T-3 *, 9, 5, 10; 1055 T-3 *, 6, 3, 5; 2061 T-3 *, 11, 6, 14; 2139 T-3 *, 13, 7, 15; 2248 T-3 *,
12, 6, 11; 2336 T-3 *, 13, 7, 15; 2612 T-3 *, 7, 4, 6; 2634 T-3 *, 11, 4, 9; 3191 T-3 *, 24, 7, 15;
3252 T-3 *, 11, 6, 14; 3387 T-3 *, 13, 7, 15; 3472 T-3 *, 13, 7, 15; 4366 T-3 *, 8, 4, 6; [464, 49,
49*, 1960/09/24–1977/10/22]

{5} 1991 VC₃, 6, 3, 25; 1999 RO₁₇, 4, 2, 1504; 1999 TZ₁, 6, 3, 12398; [16, 3, 0*, 1953/09/16–
1997/01/10]

{6} 1999 SO₉, 2, 1, 0; [2, 1, 0*, 1951/12/01]

{8} 1997 RT₅, 2, 1, 0; 1999 OG₄, 4, 1, 0; 1999 OH₄, 3, 1, 0; 1999 OJ₄, 3, 1, 0; 1999 OK₄, 6,
1, 0; 1999 OL₄, 3, 1, 0; 1999 OM₄, 2, 1, 0; 1999 ON₄, 3, 1, 0; 1999 OO₄, 3, 1, 0; [29, 9, 0*,
1999/08/09–1999/08/11]

678 Fountain Hills

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[cwjuels@futureone.com]

0.32-m $f/5.5$ reflector + CCD

GSC-1.1, GSC-ACT

1993 OX₆, 2, 1, 0; 1999 OR₂, 5, 2, 2; 1999 OJ₃, 12, 5, 5; 1999 RE₂, 3, 1, 0; 1999 RE₂₈, 2, 1, 0;
1999 RZ₃₄, 5, 2, 1; 1999 RL₃₉, 4, 2, 1; 1999 RU₂₀₆, 4, 2, 1; 1999 RF₂₁₀, 4, 2, 1; 1999 SS₉, 4, 2,
1; 1999 TZ₁, 6, 2, 3; 1999 TA₂, 3, 1, 0; 1999 TB₂, 3, 1, 0; 1999 TC₂, 2, 1, 0; 1999 TF₂, 3, 1, 0;
1999 TO₂, 2, 1, 0; 1999 TQ₂, 2, 1, 0; 1999 TR₂, 3, 1, 0; 1999 TS₂, 2, 1, 0; 1999 TA₃, 3, 1, 0;
1999 TO₇, 5, 2, 1; 1999 TD₈, 2, 1, 0; 1999 TE₈, 2, 1, 0; 1999 TF₈, 2, 1, 0; 1999 TG₈, 2, 1, 0;
1999 TH₈, 2, 1, 0; 1999 TF₁₁, 2, 1, 0; 1999 TG₁₁, 2, 1, 0; 1999 TH₁₁, 3, 1, 0; 1999 TU₁₂, 2, 1, 0;
1999 TW₁₂, 3, 1, 0; 1999 TX₁₄, 3, 1, 0; 1999 TY₁₄, 5, 2, 8; 1999 TA₁₅, 4, 2, 8; 1999 TH₁₆, 3, 1,
0; 1999 TJ₁₆, 4, 2, 8; 1999 TS₂₇, 5, 2, 1; 1999 UU₂, 2, 1, 0; 1999 UV₂, 4, 2, 7; 1999 UW₂, 5, 2,
4; 1999 UA₃, 4, 2, 1; 1999 UL₄, 9, 3, 3; 1999 UN₄, 9, 4, 5; 1999 UO₄, 8, 4, 5; 1999 UN₆, 5,
2, 1; 1999 UF₁₅, 4, 2, 1; 1999 VP *, 9, 4, 5; 1999 VQ *, 10, 4, 5; 1999 VS₁ *, 6, 3, 2; 1999 VF₂,
2, 1, 0; 1999 VG₂, 3, 1, 0; 1999 VH₂ *, 6, 2, 1; 1999 VL₅ *, 6, 2, 2; 1999 VM₅ *, 5, 2, 2;
1999 VN₅ *, 4, 2, 2; 1999 VO₅ *, 6, 2, 2; 1999 VP₅ *, 6, 2, 2; 1999 VW₆ *, 4, 2, 1; 1999 VX₆ *,
4, 2, 1; 1999 VY₆ *, 4, 2, 1; 1999 VZ₆ *, 4, 2, 1; 1999 VA₇ *, 4, 2, 1; 1999 VB₇ *, 4, 2, 1;
1999 VS₈ *, 4, 2, 1; 1999 VT₈ *, 4, 2, 1; 1999 VU₈ *, 4, 2, 1; 1999 VX₈ *, 4, 2, 1; 1999 VY₈ *,
4, 2, 1; 1999 VZ₈ *, 5, 2, 1; 1999 VA₉ *, 4, 2, 1; 1999 VB₉ *, 4, 2, 1; 1999 VC₉ *, 4, 2, 1;
1999 VD₉ *, 4, 2, 1; 1999 VS₉ *, 4, 2, 1; 1999 VT₉ *, 4, 2, 1; 1999 VU₉ *, 4, 2, 1; 1999 VV₉ *,
4, 2, 1; 1999 VW₉ *, 4, 2, 1; 1999 VX₉ *, 4, 2, 1; 1999 VY₉ *, 4, 2, 1; 1999 VZ₉ *, 4, 2, 1;
1999 VA₁₀ *, 4, 2, 1; 1999 VB₁₀ *, 4, 2, 1; 1999 VD₁₀, 2, 1, 0; 1999 VE₁₀ *, 4, 2, 1; 1999 VW₁₁ *,
6, 2, 1; 1999 VX₁₁ *, 7, 2, 1; 1999 VY₁₁ *, 6, 2, 1; 1999 VZ₁₁ *, 6, 2, 1; 1999 VA₁₂ *, 4, 2, 1;
1999 VB₁₂ *, 4, 2, 1; 1999 VC₁₂ *, 4, 2, 1; 1999 VD₁₂ *, 4, 2, 1; 1999 VE₁₂ *, 4, 2, 1; 1999 VM₁₂ *,
4, 2, 1; 1999 VN₁₂ *, 6, 2, 1; 1999 VO₁₂ *, 5, 2, 1; 1999 VP₁₂ *, 4, 2, 1; 1999 VQ₁₂ *, 4, 2, 1;
1999 VR₁₂ *, 4, 2, 1; 1999 VS₁₂ *, 4, 2, 1; 1999 VT₁₂ *, 4, 2, 1; 1999 VU₁₂ *, 4, 2, 1; 1999 VV₁₂ *,
4, 2, 1; 1999 VH₂₀ *, 5, 2, 2; 1999 VJ₂₀ *, 5, 2, 2; 1999 VK₂₀ *, 4, 2, 2; 1999 VL₂₀ *, 4, 2, 2;
1999 VM₂₀ *, 4, 2, 2; 1999 VN₂₀ *, 4, 2, 2; 1999 VO₂₀ *, 4, 2, 2; 1999 VP₂₀ *, 4, 2, 2; 1999 VQ₂₀ *,

5, 2, 2; 1999 VK₂₂ *, 4, 2, 1; 1999 VL₂₂ *, 4, 2, 1; 1999 VM₂₂ *, 4, 2, 1; 1999 VN₂₂ *, 4, 2, 1; 1999 VO₂₂ *, 4, 2, 1; 1999 VP₂₂ *, 4, 2, 1; 1999 VQ₂₂ *, 4, 2, 1; 1999 VR₂₂ *, 4, 2, 1; 1999 VS₂₂ *, 4, 2, 1; 1999 VT₂₂ *, 4, 2, 1; 1999 VL₂₃ *, 11, 4, 3; 1999 VO₂₃ *, 8, 3, 2; 1999 VP₂₃ *, 4, 2, 1; 1999 VQ₂₃ *, 4, 2, 1; 1999 VR₂₃ *, 4, 2, 1; 1999 VS₂₃ *, 4, 2, 1; 1999 VT₂₃ *, 5, 2, 1; 1999 VU₂₃ *, 4, 2, 1; 1999 VV₂₃ *, 4, 2, 1; 1999 VW₂₃ *, 4, 2, 1; 1999 VF₂₄ *, 4, 2, 1; 1999 VG₂₄ *, 4, 2, 1; 1999 VH₂₄ *, 4, 2, 1; 1999 VJ₂₄ *, 4, 2, 1; 1999 VK₂₄ *, 4, 2, 1; 1999 VL₂₄ *, 4, 2, 1; 1999 VM₂₄ *, 4, 2, 1; 1999 VN₂₄ *, 5, 2, 1; 1999 WB *, 5, 2, 1; [604, 142, 96*, 1999/10/28-1999/11/17]

681 Calgary

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0.36-m $f/7$ Schmidt-Cassegrain + CCD

USNO-A2.0

1988 XR₁, 4, 2, 2; 1990 SY₃, 5, 2, 2; 1999 TP₂₇, 4, 1, 0; 1999 UJ₃, 4, 2, 2; 1999 VT, 4, 1, 0; 1999 VN₁₁, 6, 1, 0; 1999 VF₂₂, 7, 1, 0; [34, 7, 0*, 1999/10/16-1999/11/11]

683 Goodricke-Pigott Observatory, Tucson

R. A. Tucker, 5500 West Nebraska Street, Tucson, AZ 85746, U.S.A.

[tucker@noao.edu]

0.35-m $f/11$ Schmidt-Cassegrain + CCD

GSC

1998 KQ₅₃, 2, 1, 0; 1999 TZ₃₃, 3, 1, 0; 1999 VV₂₂ *, 6, 2, 1; [11, 3, 1*, 1999/10/07-1999/11/14]

684 Prescott

P. G. Comba, 1411 Galaxy Lane, Prescott, AZ 86303, U.S.A.

[comba@northlink.com]

0.46-m $f/4.5$ reflector + CCD

GSC

1996 XN₅, 4, 2, 1; 1998 AV₉, 4, 2, 1; 1998 FD₆₁, 2, 1, 0; 1998 KJ₄₇, 4, 2, 1; 1999 RG, 4, 2, 1; 1999 RL, 4, 2, 1; 1999 RE₃₅, 4, 2, 1; 1999 TM₃, 4, 2, 3; 1999 TN₃, 4, 2, 3; 1999 TZ₉, 4, 2, 3; 1999 TH₁₀, 2, 1, 0; 1999 TK₁₀, 6, 2, 1; 1999 TQ₁₂, 3, 1, 0; 1999 TD₁₄, 2, 1, 0; 1999 TW₁₆, 2, 1, 0; 1999 UW₃ *, 6, 2, 1; 1999 UX₃ *, 6, 2, 1; 1999 UY₃ *, 5, 2, 1; (604), 2, 1, 0; (1770), 3, 1, 0; (7636), 6, 2, 1; [81, 21, 3*, 1999/10/14-1999/11/04]

688 Lowell Observatory, Anderson Mesa Station

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G. A. Snyder, Gettysburg College, 300 N. Washington St., Gettysburg, PA 17325,

U.S.A. [gsnyder@gettysburg.edu] (2)

Observers R. L. Millis, L. H. Wasserman, M. F. Bielecki, E. Anderson,

K. Burnham, D. Douglas

Measurers L. H. Wasserman, M. W. Buie, G. Snyder

1.8-m reflector + CCD, 0.8-m reflector + CCD

USNO-A2.0

{1} 1990 UM, 3, 1, 0; 1994 TB, 2, 1, 0; 1995 QY₉, 2, 1, 0; 1995 SM₅₅, 2, 1, 0; 1996 PF₃, 3, 1, 0; 1996 TL₆₆, 2, 1, 0; 1996 TO₆₆, 2, 1, 0; 1996 TP₆₆, 2, 1, 0; 1996 TS₆₆, 2, 1, 0; 1998 VG₄₄, 3, 1, 0; 1998 WH₂₄, 5, 2, 1; 1999 RG₃₃, 4, 2, 1; [32, 12, 0*, 1998/04/19-1999/11/01]

{2} 1999 TU₁₄, 5, 2, 1; [5, 1, 0*, 1999/10/20-1999/10/21]

691 Kitt Peak, Steward Observatory

R. S. McMillan, Space Sciences Building, University of Arizona, Tucson, AZ 85721,

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Observers J. A. Larsen, J. V. Scotti, J. L. Montani, N. L. Chabot, R. S. McMillan,

A. E. Gleason, M. T. Read

0.91-m Spacewatch telescope + CCD

USNO-A1.0

1971 UR, 6, 2, 14; 1976 QK₁, 3, 1, 0; 1977 DL₄, 3, 1, 0; 1977 TQ₆, 3, 1, 0; 1978 RD₂, 3, 1, 0; 1978 VW₂, 3, 1, 0; 1979 MX₈, 3, 1, 0; 1981 DT, 3, 1, 0; 1981 EU₉, 6, 2, 13; 1981 ES₁₆, 3, 1, 0;

1981 EL₁₈, 9, 3, 5; 1981 EQ₂₀, 3, 1, 0; 1981 EK₂₆, 3, 1, 0; 1981 EZ₂₆, 3, 1, 0; 1981 ET₃₇, 3, 1, 0; 1981 QN₃, 3, 1, 0; 1982 UO₆, 3, 1, 0; 1985 PC, 3, 1, 0; 1986 WZ, 3, 1, 0; 1988 RO₁₁, 3, 1, 0; 1989 GN₄, 3, 1, 0; 1990 ES₄, 3, 1, 0; 1990 RC₂, 3, 1, 0; 1990 SW₈, 3, 1, 0; 1990 WZ, 3, 1, 0; 1991 GH₅, 3, 1, 0; 1991 GY₇, 3, 1, 0; 1991 LZ, 3, 1, 0; 1991 LK₂, 6, 2, 2; 1991 PL₁₃, 6, 2, 2; 1991 RA₄, 6, 2, 12; 1991 RW₁₂, 3, 1, 0; 1991 UA, 9, 3, 4; 1991 UE₂, 6, 2, 4; 1992 ET₁₄, 6, 1, 0; 1992 SY₁₂, 9, 3, 14; 1992 SB₁₃, 3, 1, 0; 1992 SG₁₃, 6, 2, 9; 1992 SQ₂₃, 3, 1, 0; 1992 US₁, 6, 2, 1; 1992 WJ₂, 3, 1, 0; 1993 CK₁, 3, 1, 0; 1993 DT₁, 3, 1, 0; 1993 FZ₂₁, 9, 3, 13; 1993 FS₂₄, 3, 1, 0; 1993 RA₈, 3, 1, 0; 1993 TL₁₈, 3, 1, 0; 1993 XQ₁, 3, 1, 0; 1994 AG₁₀, 3, 1, 0; 1994 CM₁₁, 3, 1, 0; 1994 GB₉, 3, 1, 0; 1994 JF, 3, 1, 0; 1994 NA, 3, 1, 0; 1994 PJ₇, 3, 1, 0; 1994 PA₁₄, 3, 1, 0; 1994 VS₁, 6, 2, 11; 1995 BQ, 3, 1, 0; 1995 FM₁₁, 6, 2, 4; 1995 ON₄, 3, 1, 0; 1995 SM₅₅, 6, 1, 0; 1995 TZ₁, 3, 1, 0; 1995 TY₂, 6, 2, 10; 1995 UT₄, 3, 1, 0; 1995 UO₅, 3, 1, 0; 1995 UQ₁₁, 3, 1, 0; 1995 UK₂₈, 3, 1, 0; 1995 WK₁, 6, 2, 5; 1995 WM₃, 6, 2, 4; 1995 WL₁₃, 3, 1, 0; 1995 YM₉, 3, 1, 0; 1996 DQ₁, 6, 2, 6; 1996 VZ₈, 3, 1, 0; 1996 VU₁₇, 3, 1, 0; 1996 XK, 6, 2, 15; 1996 XC₁₅, 6, 2, 4; 1996 XU₁₉, 3, 1, 0; 1997 AP₄, 3, 1, 0; 1997 AN₅, 6, 2, 8; 1997 AR₁₆, 6, 2, 12; 1997 AY₁₇, 9, 3, 13; 1997 BA₃, 6, 2, 13; 1997 CX₂, 9, 3, 14; 1997 CK₂₉, 3, 1, 0; 1997 EP, 3, 1, 0; 1997 EZ₃, 3, 1, 0; 1997 EX₂₅, 3, 1, 0; 1997 EL₂₈, 3, 1, 0; 1997 FW₁, 3, 1, 0; 1997 FB₃, 6, 2, 10; 1997 FO₃, 3, 1, 0; 1997 FB₄, 12, 4, 14; 1997 FG₄, 3, 1, 0; 1997 GZ₆, 3, 1, 0; 1997 GE₂₀, 3, 1, 0; 1997 GL₂₁, 6, 2, 504; 1997 GN₂₂, 3, 1, 0; 1997 JB₁₃, 6, 2, 11; 1998 CO₃, 3, 1, 0; 1998 FD₃₅, 3, 1, 0; 1998 EQ₂, 3, 1, 0; 1998 EB₈, 3, 1, 0; 1998 FV₈, 3, 1, 0; 1998 FW₉, 3, 1, 0; 1998 FF₁₀, 6, 2, 1; 1998 FP₁₀, 3, 1, 0; 1998 FV₁₀, 3, 1, 0; 1998 FW₁₄, 6, 2, 17; 1998 FV₁₅, 3, 1, 0; 1998 FF₁₆, 3, 1, 0; 1998 FR₃₀, 6, 2, 7; 1998 FK₄₆, 6, 2, 6; 1998 FZ₄₆, 3, 1, 0; 1998 FK₄₇, 3, 1, 0; 1998 FX₄₇, 9, 3, 13; 1998 FE₄₉, 3, 1, 0; 1998 FL₄₉, 9, 3, 13; 1998 FT₅₇, 6, 2, 11; 1998 FC₅₈, 2, 1, 0; 1998 FG₅₈, 6, 2, 12; 1998 FN₅₈, 3, 1, 0; 1998 FD₆₁, 3, 1, 0; 1998 FR₆₂, 3, 1, 0; 1998 FS₆₂, 6, 2, 12; 1998 FS₆₅, 3, 1, 0; 1998 FM₆₈, 3, 1, 0; 1998 FG₇₁, 3, 1, 0; 1998 FK₇₁, 3, 1, 0; 1998 FL₇₄, 3, 1, 0; 1998 FG₇₅, 3, 1, 0; 1998 FQ₁₂₁, 3, 1, 0; 1998 FN₁₂₂, 3, 1, 0; 1998 FH₁₂₃, 3, 1, 0; 1998 GF₉, 3, 13; 1998 GO₃, 3, 1, 0; 1998 HD₈, 3, 1, 0; 1998 HR₁₈, 3, 1, 0; 1998 HY₃₁, 3, 1, 0; 1998 HU₃₂, 3, 1, 0; 1998 HO₃₈, 3, 1, 0; 1998 HT₄₂, 3, 1, 0; 1998 HN₄₉, 3, 1, 0; 1998 HD₅₂, 6, 2, 5; 1998 HG₅₃, 6, 2, 13; 1998 HK₉₄, 3, 1, 0; 1998 HA₉₈, 3, 1, 0; 1998 HH₉₉, 3, 1, 0; 1998 HZ₁₄₇, 3, 1, 0; 1998 JL₁, 6, 2, 6; 1998 KB, 6, 2, 12; 1998 KJ₁, 3, 1, 0; 1998 KW₄, 3, 1, 0; 1998 KP₆, 3, 1, 0; 1998 KH₃₂, 3, 1, 0; 1998 KT₃₂, 6, 2, 15; 1998 KE₃₇, 3, 1, 0; 1998 KR₄₇, 3, 1, 0; 1998 LB₃, 3, 1, 0; 1998 MC, 3, 1, 0; 1998 QO₂₆, 3, 1, 0; 1998 QW₄₂, 3, 1, 0; 1998 RP₂₈, 3, 1, 0; 1998 SH₄, 3, 1, 0; 1998 SM₁₆₅, 6, 2, 11; 1998 TF₃₅, 6, 2, 1; 1998 UP₆, 3, 1, 0; 1998 VG₄₄, 2, 1, 0; 1999 ND₄, 3, 1, 0; 1999 NV₆, 3, 1, 0; 1999 NT₈, 3, 1, 0; 1999 NM₉, 3, 1, 0; 1999 NA₁₀, 3, 1, 0; 1999 NL₃₉, 3, 1, 0; 1999 NX₄₂, 6, 2, 2; 1999 OF, 3, 1, 0; 1999 OW, 3, 1, 0; 1999 PY, 3, 1, 0; 1999 RN, 6, 1, 0; 1999 RR₁, 3, 1, 0; 1999 RW₁, 3, 1, 0; 1999 RD₃, 3, 1, 0; 1999 RK₃, 3, 1, 0; 1999 RU₁₄, 6, 2, 14; 1999 RU₁₈, 6, 2, 13; 1999 RO₂₀, 6, 2, 12; 1999 RH₂₁, 3, 1, 0; 1999 RK₂₁, 9, 3, 14; 1999 RU₂₁, 3, 1, 0; 1999 RA₂₂, 3, 1, 0; 1999 RB₂₂, 6, 2, 7; 1999 RF₂₂, 3, 1, 0; 1999 RL₂₂, 3, 1, 0; 1999 RG₂₃, 3, 1, 0; 1999 RR₂₃, 9, 3, 14; 1999 RU₂₇, 6, 2, 13; 1999 RU₂₇, 3, 1, 0; 1999 RS₂₈, 6, 2, 14; 1999 RJ₃₂, 3, 1, 0; 1999 RP₃₂, 3, 1, 0; 1999 RU₃₂, 6, 2, 6; 1999 RC₃₄, 3, 1, 0; 1999 RD₃₄, 6, 2, 13; 1999 RU₃₄, 3, 1, 0; 1999 RY₃₄, 3, 1, 0; 1999 RH₃₅, 6, 2, 5; 1999 RL₃₅, 6, 2, 17; 1999 RF₃₆, 6, 2, 15; 1999 RA₃₇, 3, 1, 0; 1999 RC₃₇, 6, 2, 15; 1999 RX₃₇, 3, 1, 0; 1999 RZ₃₇, 3, 1, 0; 1999 RA₃₈, 3, 1, 0; 1999 RM₃₈, 3, 1, 0; 1999 RN₃₈, 3, 1, 0; 1999 RV₄₁, 3, 1, 0; 1999 RQ₄₃, 3, 1, 0; 1999 RK₄₄, 3, 1, 0; 1999 RM₄₄, 6, 2, 13; 1999 RR₄₅, 3, 1, 0; 1999 RA₄₆, 3, 1, 0; 1999 RC₄₇, 6, 2, 2; 1999 RD₄₉, 6, 2, 2; 1999 RW₇₀, 3, 1, 0; 1999 RQ₈₁, 6, 2, 12; 1999 RA₈₃, 6, 2, 13; 1999 RB₈₄, 6, 2, 6; 1999 RC₈₅, 3, 1, 0; 1999 RD₈₅, 3, 1, 0; 1999 RS₈₆, 6, 2, 13; 1999 RJ₈₇, 3, 1, 0; 1999 RM₈₇, 3, 1, 0; 1999 RX₈₇, 3, 1, 0; 1999 RY₈₇, 6, 2, 14; 1999 RF₈₈, 6, 2, 1; 1999 RK₈₈, 6, 2, 1; 1999 RP₈₈, 3, 1, 0; 1999 RW₈₈, 3, 1, 0; 1999 RX₈₈, 9, 3, 12; 1999 RL₈₉, 3, 1, 0; 1999 RV₉₁, 6, 2, 2820; 1999 RB₉₂, 3, 1, 0; 1999 RJ₉₂, 3, 1, 0; 1999 RK₉₂, 3, 1, 0; 1999 RK₉₄, 3, 1, 0; 1999 RY₉₄, 3, 1, 0; 1999 RE₉₅, 3, 1, 0; 1999 RH₉₇, 6, 2, 2; 1999 RF₁₀₄, 9, 3, 13; 1999 RM₁₀₅, 3, 1, 0; 1999 RA₁₀₇, 6, 2, 1; 1999 RB₁₀₇, 6, 2, 2; 1999 RD₁₀₉, 6, 2, 4; 1999 RY₁₁₅, 3, 1, 0; 1999 RE₁₂₄, 6, 2, 14; 1999 RV₁₄₁, 9, 3, 539; 1999 RS₁₄₃, 6, 2, 11; 1999 RT₁₄₃, 3, 1, 0; 1999 RV₁₄₃, 6, 2, 4; 1999 RW₁₄₃, 3, 1, 0; 1999 RE₁₅₅, 3, 1, 0; 1999 RA₁₆₁, 3, 1, 0; 1999 RC₁₆₁, 3, 1, 0; 1999 RN₁₆₂, 9, 3, 12; 1999 RY₁₆₃, 3, 1, 0; 1999 RH₁₇₀, 3, 1, 0; 1999 RJ₁₇₀, 3, 1, 0; 1999 RP₁₇₄, 2, 1, 0; 1999 RT₁₇₅, 6, 2, 6; 1999 RG₁₇₆, 9, 3, 13; 1999 RH₁₇₆, 12, 4, 39; 1999 RN₁₇₆, 3, 1, 0; 1999 RQ₁₇₆, 9, 3, 39; 1999 RY₁₇₆, 3, 1, 0; 1999 RC₁₇₇, 3, 1, 0; 1999 RG₁₇₇, 6, 2, 13; 1999 RJ₁₇₇, 3, 1, 0; 1999 RF₁₈₂, 3, 1, 0; 1999 RV₁₈₂, 3, 1, 0; 1999 RX₁₈₂, 3, 1, 0; 1999 RA₁₈₃, 6, 1, 0; 1999 RM₁₈₃, 9, 3, 16; 1999 RM₁₈₅, 3, 1, 0; 1999 RX₁₈₇, 3, 1, 0; 1999 RY₁₈₈, 3, 1, 0; 1999 RC₁₈₉, 3, 1, 0; 1999 RF₁₉₀, 6, 2, 1; 1999 RK₁₉₀, 6, 2, 18; 1999 RC₁₉₄, 3, 1, 0; 1999 RD₁₉₄, 6, 2, 10; 1999 RG₁₉₄, 3, 1, 0; 1999 RO₁₉₄, 6, 2, 12; 1999 RR₁₉₈, 3, 1, 0; 1999 RH₂₁₃, 3, 1, 0; 1999 RD₂₁₄, 6, 2, 1; 1999 RM₂₁₄, 6, 2, 12; 1999 SE, 3, 1, 0; 1999 SJ, 6, 2, 11; 1999 SK, 6, 2, 11; 1999 SR₁, 3, 1, 0; 1999 SM₂, 3, 1, 0; 1999 SE₁₀, 6, 2, 1; 1999 TK, 6, 2, 11; 1999 TL, 6, 2, 11; 1999 TP, 3, 1, 0; 1999 TG, 6, 2, 12; 1999 TR₁, 3, 1, 0; 1999 TE₂, 12, 4, 2574; 1999 TH₂, 3, 1, 0; 1999 TP₂, 3, 1, 0; 1999 TF₄, 6, 2, 12; 1999 TV₅, 3, 1, 0; 1999 TE₆, 3, 1, 0; 1999 TB₈, 6, 2, 10; 1999 TL₈, 3, 1, 0; 1999 TX₈, 3, 1, 0; 1999 TK₉, 3, 1, 0; 1999 TL₉, 3, 1, 0; 1999 TO₉, 6, 2, 1; 1999 TP₉, 3, 1, 0; 1999 TQ₉, 6, 2, 4; 1999 TR₉, 3, 1, 0; 1999 TW₉, 9, 3, 9; 1999 TD₁₀, 3, 1, 0; 1999 TR₁₀, 6, 2, 1; 1999 TK₁₁, 3, 1, 0; 1999 TC₁₃, 6, 2, 14; 1999 TD₁₄, 3, 1, 0; 1999 TP₁₅, 3, 1, 0; 1999 TR₁₅, 3, 1, 0; 1999 TA₁₆, 3, 1, 0; 1999 TB₁₆, 6, 2, 12; 1999 TF₁₆, 3, 1, 0; 1999 TK₁₆, 6, 2, 4; 1999 TT₁₆, 3, 1, 0; 1999 TU₁₆, 3, 1, 0; 1999 TK₁₇, 3, 1, 0; 1999 TQ₁₈, 3, 1, 0; 1999 TB₁₉, 3, 1, 0; 1999 TG₁₉, 3, 1, 0; 1999 TU₂₀, 6, 2, 4; 1999 TV₂₀, 3, 1, 0; 1999 TA₂₁,

[illegible]

1999 VG17 *, 6, 2, 1; 1999 VH17 *, 6, 2, 1; 1999 VJ17 *, 6, 2, 1; 1999 VK17 *, 6, 2, 1; 1999 VL17 *, 6, 2, 1; 1999 VM17 *, 6, 2, 1; 1999 VN17 *, 6, 2, 1; 1999 VO17 *, 6, 2, 1; 1999 VP17 *, 6, 2, 1; 1999 VQ17 *, 6, 2, 1; 1999 VR17 *, 6, 2, 1; 1999 VS17 *, 6, 2, 1; 1999 VT17 *, 6, 2, 1; 1999 VU17 *, 6, 2, 1; 1999 VW17 *, 6, 2, 1; 1999 VX17 *, 6, 2, 1; 1999 VY17 *, 6, 2, 1; 1999 VZ17 *, 6, 2, 1; 1999 VA18 *, 6, 2, 1; 1999 VB18 *, 9, 3, 9; 1999 VC18 *, 6, 2, 1; 1999 VD18 *, 9, 3, 9; 1999 VE18 *, 6, 2, 1; 1999 VF18 *, 6, 2, 1; 1999 VG18 *, 6, 2, 1; 1999 VH18 *, 6, 2, 1; 1999 VJ18 *, 6, 2, 1; 1999 VK18 *, 6, 2, 1; 1999 VL18 *, 6, 2, 1; 1999 VM18 *, 6, 2, 1; 1999 VN18 *, 6, 2, 1; 1999 VO18 *, 6, 2, 1; 1999 VP18 *, 6, 2, 1; 1999 VQ18 *, 6, 2, 1; 1999 VR18 *, 6, 2, 1; 1999 VS18 *, 6, 2, 1; 1999 VT18 *, 6, 2, 1; 1999 VU18 *, 6, 2, 1; 1999 VV18 *, 6, 2, 1; 1999 VW18 *, 6, 2, 1; 1999 VX18 *, 6, 2, 1; 1999 VY18 *, 6, 2, 1; 1999 VZ18 *, 6, 2, 1; 1999 VL19, 6, 2, 3; 1999 VQ19 *, 6, 2, 7; 1999 VR21, 3, 1, 0; 1999 VY21, 3, 1, 0; 1999 VS25 *, 6, 2, 1; 1999 VF27 *, 6, 2, 8; 1999 VG27 *, 6, 2, 8; 1999 VH27 *, 6, 2, 8; 1999 VE38, 6, 2, 3; 1999 VF38, 6, 2, 3; 1999 VK38, 6, 2, 4; 1999 VR39 *, 6, 2, 1; 1999 VS39 *, 6, 2, 1; 1999 VT39 *, 6, 2, 1; 1999 VU39 *, 6, 2, 1; 1999 VV39 *, 6, 2, 1; 1999 VW39 *, 12, 4, 13; 1999 VX39 *, 6, 2, 1; 1999 VY39 *, 6, 2, 1; 1999 VZ39 *, 6, 2, 1; 1999 VA40 *, 6, 2, 1; 1999 VB40 *, 6, 2, 1; 1999 VC40 *, 6, 2, 3; 1999 VD40 *, 6, 2, 3; 1999 VE40 *, 6, 2, 3; 1999 VF40 *, 6, 2, 3; 1999 VG40 *, 6, 2, 3; 1999 VH40 *, 6, 2, 3; 1999 VJ40 *, 6, 2, 3; 1999 VK40 *, 6, 2, 3; 1999 VL40 *, 6, 2, 3; 1999 VM40 *, 6, 2, 3; 1999 VN40 *, 6, 2, 3; 1999 VO40 *, 6, 2, 3; 1999 VP40 *, 6, 2, 3; 1999 VQ40 *, 6, 2, 3; 1999 VR40 *, 6, 2, 3; 1999 VS40 *, 6, 2, 3; 1999 VT40 *, 6, 2, 3; 1999 VU40 *, 6, 2, 3; 1999 VV40 *, 6, 2, 3; 1999 VW40 *, 6, 2, 3; 1999 VX40 *, 6, 2, 3; 1999 VY40 *, 6, 2, 3; 1999 VZ40 *, 6, 2, 3; 1999 VA41 *, 6, 2, 3; 1999 VB41 *, 6, 2, 3; 1999 VC41 *, 6, 2, 3; 1999 VD41 *, 6, 2, 3; 1999 VE41 *, 6, 2, 3; 1999 VF41 *, 6, 2, 3; 1999 VG41 *, 6, 2, 3; 1999 VH41 *, 6, 2, 3; 1999 VJ41 *, 6, 2, 3; 1999 VK41 *, 6, 2, 3; 1999 VL41 *, 6, 2, 3; 1999 VM41 *, 6, 2, 3; 1999 VN41 *, 6, 2, 3; 1999 VO41 *, 6, 2, 7; 1999 VP41 *, 6, 2, 7; 1999 VQ41 *, 6, 2, 7; 1999 VR41 *, 6, 2, 7; 1999 VS41 *, 6, 2, 7; 1999 VT41 *, 6, 2, 7; 1999 VU41 *, 6, 2, 7; 1999 VV41 *, 6, 2, 7; 1999 VW41 *, 6, 2, 7; 1999 VX41 *, 6, 2, 7; 1999 VY41 *, 6, 2, 7; 1999 VZ41 *, 6, 2, 7; 1999 VA42 *, 6, 2, 7; 1999 VB42 *, 6, 2, 7; 1999 VC42 *, 6, 2, 7; 1999 VD42 *, 6, 2, 7; 1999 VE42 *, 6, 2, 7; 1999 VF42 *, 6, 2, 7; 1999 VG42 *, 6, 2, 7; 1999 VH42 *, 6, 2, 7; 1999 VJ42 *, 6, 2, 7; 1999 VK42 *, 6, 2, 7; 1999 VL42 *, 6, 2, 7; 1999 VM42 *, 6, 2, 7; 1999 VN42 *, 6, 2, 7; 1999 VO42 *, 6, 2, 7; 1999 VP42 *, 6, 2, 7; 1999 VQ42 *, 6, 2, 7; 1999 VR42 *, 6, 2, 7; 1999 VS42 *, 6, 2, 7; 1999 VT42 *, 6, 2, 7; 1999 VU42 *, 6, 2, 7; 1999 VV42 *, 6, 2, 7; 1999 VW42 *, 6, 2, 7; 1999 VX42 *, 6, 2, 7; 1999 VY42 *, 6, 2, 7; 1999 VZ42 *, 6, 2, 7; 1999 VA43 *, 6, 2, 7; 1999 VB43 *, 6, 2, 7; 1999 VC43 *, 6, 2, 7; 1999 VD43 *, 6, 2, 7; 1999 VE43 *, 6, 2, 7; 1999 VF43 *, 6, 2, 7; 2091 P-L, 9, 3, 11; 2113 P-L, 6, 2, 17; 2155 P-L, 3, 1, 0; 4893 P-L, 6, 2, 6; 6326 P-L, 3, 1, 0; 6335 P-L, 3, 1, 0; 6529 P-L, 6, 2, 5; 6585 P-L, 6, 2, 11; 1285 T-1, 3, 1, 0; 3105 T-1, 9, 3, 13; 3178 T-1, 3, 1, 0; 3243 T-1, 6, 2, 14; 3770 T-1, 3, 1, 0; 1038 T-2, 3, 1, 0; 1043 T-2, 6, 2, 12; 1114 T-2, 3, 1, 0; 1131 T-2, 3, 1, 0; 1474 T-2, 3, 1, 0; 2276 T-2, 3, 1, 0; 3270 T-2, 3, 1, 0; 2065 T-3, 3, 1, 0; 2622 T-3, 6, 2, 14; 4039 T-3, 3, 1, 0; 4054 T-3, 6, 2, 16; (290), 6, 2, 12; (372), 3, 1, 0; (661), 3, 1, 0; (1060), 6, 2, 18; (1382), 6, 2, 12; (1383), 3, 1, 0; (1519), 3, 1, 0; (1559), 3, 1, 0; (1664), 3, 1, 0; (1698), 3, 1, 0; (1726), 3, 1, 0; (1731), 6, 2, 2; (1743), 3, 1, 0; (1770), 3, 1, 0; (1791), 3, 1, 0; (1835), 3, 1, 0; (1865), 3, 1, 0; (1905), 3, 1, 0; (1909), 6, 2, 9; (1997), 9, 3, 4; (2153), 6, 2, 14; (2155), 3, 1, 0; (2246), 3, 1, 0; (2299), 3, 1, 0; (2355), 3, 1, 0; (2367), 3, 1, 0; (2589), 6, 2, 11; (2590), 6, 2, 1; (2616), 6, 2, 5; (2673), 6, 2, 11; (2686), 3, 1, 0; (2725), 6, 2, 7; (2810), 3, 1, 0; (2872), 6, 2, 1; (2961), 3, 1, 0; (2972), 3, 1, 0; (3247), 3, 1, 0; (3264), 3, 1, 0; (3306), 6, 2, 17; (3349), 3, 1, 0; (3395), 3, 1, 0; (3437), 3, 1, 0; (3533), 6, 2, 7; (3615), 6, 2, 11; (3716), 3, 1, 0; (3827), 3, 1, 0; (3980), 9, 3, 11; (3999), 6, 2, 1; (4088), 3, 1, 0; (4151), 6, 2, 14; (4158), 6, 2, 9; (4164), 3, 1, 0; (4296), 9, 3, 16; (4305), 9, 3, 5; (4329), 6, 2, 12; (4330), 3, 1, 0; (4337), 3, 1, 0; (4347), 3, 1, 0; (4394), 3, 1, 0; (4419), 3, 1, 0; (4629), 3, 1, 0; (4704), 6, 2, 1; (4784), 3, 1, 0; (4841), 3, 1, 0; (4842), 3, 1, 0; (4894), 6, 2, 12; (5098), 3, 1, 0; (5125), 3, 1, 0; (514

695 Kitt Peak

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47405, U.S.A. [thillwig@astro.indiana.edu] (7)

Observers M. W. Buie (1), S. D. Kern (1), R. M. Wagner (1), T. Hillwig (7),
C. Corson (7)

Measurers M. W. Buie (1), T. Hillwig (7)

GSC, USNO-A2.0

{1} 1990 WU₁, 2, 1, 0; 1992 UK₈, 3, 1, 0; 1994 RL₇, 4, 2, 1; 1998 UU₄₃, 3, 1, 0; 1998 WV₃₁,
4, 2, 1; 1999 VF₁₂ *, 6, 2, 1; 1999 VN₁₄ *, 4, 2, 1; 1999 VO₁₄ *, 4, 2, 1; 1999 VP₁₄ *, 4, 2, 1;
1999 VQ₁₄ *, 4, 2, 1; 1999 VR₁₄ *, 4, 2, 1; 1999 VS₁₄ *, 4, 2, 1; (2255), 2, 1, 0; (9203), 2, 1, 0;
[50, 14, 7*, 1999/11/10-1999/11/11]

{7} 1999 UT₆ *, 7, 2, 1; 1999 UU₆ *, 5, 2, 1; 1999 UV₆ *, 5, 2, 1; [17, 3, 3*, 1999/10/31-
1999/11/01]

696 F. L. Whipple Observatory, Mount Hopkins

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Cambridge, MA 02138, U.S.A. [mholman@cfa.harvard.edu]

Observers C. Ernst, M. Holman

Measurer C. Ernst

1.2-m $f/8$ reflector + CCD

USNO-A1.0

1993 SB, 5, 2, 1; 1996 TQ₆₆, 5, 2, 1; 1998 WW₂₄, 3, 2, 1; 1993 SC, 5, 2, 1; 1997 QJ₄, 5, 2, 1;
1998 UU₄₃, 6, 2, 1; [29, 6, 0*, 1999/11/09-1999/11/11]

699 Lowell Observatory-LONEOS

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Observers W. D. Ferris, B. A. Skiff, M. E. Van Ness, B. W. Koehn, L. Levy

Measurer B. W. Koehn

0.59-m LONEOS Schmidt + CCD

USNO-A2.0

1973 UQ₅, 3, 1, 0; 1975 TU₃, 3, 1, 0; 1977 TU₃, 3, 1, 0; 1978 NC, 3, 1, 0; 1978 NF, 3, 1, 0;
1978 PE, 3, 1, 0; 1978 RQ₁, 3, 1, 0; 1978 RD₂, 3, 1, 0; 1978 VB₃, 3, 1, 0; 1979 KO₁, 3, 1, 0;
1980 PJ₁, 3, 1, 0; 1981 DN₃, 3, 1, 0; 1981 EO₂, 3, 1, 0; 1981 EM₇, 3, 1, 0; 1981 EN₇, 3, 1, 0;
1981 EN₁₃, 3, 1, 0; 1981 ET₂₃, 3, 1, 0; 1981 EK₂₇, 3, 1, 0; 1981 KJ, 3, 1, 0; 1982 SC₈, 3, 1,
0; 1982 UA₆, 3, 1, 0; 1982 UH₉, 3, 1, 0; 1982 VS₂, 3, 1, 0; 1983 RL, 3, 1, 0; 1983 TX, 2, 1, 0;
1985 TS, 3, 1, 0; 1985 TZ₃, 3, 1, 0; 1986 QZ₂, 3, 1, 0; 1986 RP₂, 3, 1, 0; 1986 RB₁₂, 3, 1, 0;
1987 BF, 3, 1, 0; 1987 XC, 3, 1, 0; 1988 BO₃, 3, 1, 0; 1988 CO₇, 3, 1, 0; 1988 PG₂, 3, 1, 0;
1988 RY₂, 3, 1, 0; 1988 RL₆, 3, 1, 0; 1988 RX₁₂, 3, 1, 0; 1988 VG₄, 3, 1, 0; 1988 XJ₁, 3, 1,
0; 1988 XT₁, 3, 1, 0; 1989 CX, 2, 1, 0; 1989 CP₂, 3, 1, 0; 1989 SB₁, 3, 1, 0; 1989 UL, 3, 1, 0;
1989 WB₃, 3, 1, 0; 1989 YC₆, 3, 1, 0; 1990 BO, 3, 1, 0; 1990 DU₄, 3, 1, 0; 1990 QR₉, 3, 1, 0;
1990 RF₁₇, 3, 1, 0; 1990 UB₄, 3, 1, 0; 1990 WP₁, 3, 1, 0; 1990 WS₄, 3, 1, 0; 1990 WA₅, 3, 1, 0;
0; 1991 BZ, 3, 1, 0; 1991 CL, 3, 1, 0; 1991 EC, 3, 1, 0; 1991 EF₂, 6, 2, 1; 1991 FN₂, 3, 1, 0;
1991 GV₃, 3, 1, 0; 1991 GU₄, 3, 1, 0; 1991 GY₄, 3, 1, 0; 1991 GR₇, 3, 1, 0; 1991 LR, 3, 1, 0;
1991 LK₂, 3, 1, 0; 1991 NG₅, 3, 1, 0; 1991 PE₂, 3, 1, 0; 1991 PE₃, 3, 1, 0; 1991 PB₂₀, 3, 1, 0;
1991 RC₆, 3, 1, 0; 1991 RM₂₉, 3, 1, 0; 1991 TV₁, 3, 1, 0; 1991 UQ₂, 3, 1, 0; 1991 UD₃, 3, 1,
0; 1991 UF₃, 3, 1, 0; 1991 US₃, 3, 1, 0; 1991 VJ₁, 3, 1, 0; 1991 VE₂, 3, 1, 0; 1991 VC₃, 3, 1, 0;
0; 1991 VP₁₂, 3, 1, 0; 1991 YT, 3, 1, 0; 1992 AV₁, 3, 1, 0; 1992 BT₂, 3, 1, 0; 1992 EO, 3, 1, 0;
1992 EX₈, 3, 1, 0; 1992 PH₁, 3, 1, 0; 1992 PA₂, 3, 1, 0; 1992 PE₃, 3, 1, 0; 1992 QW, 3, 1, 0;
1992 RX, 3, 1, 0; 1992 RH₇, 1, 1, 0; 1992 SO, 3, 1, 0; 1992 SK₁₃, 3, 1, 0; 1992 SW₁₄, 3, 1, 0;
1992 SY₁₇, 3, 1, 0; 1992 UR₂, 3, 1, 0; 1992 UW₂, 2, 1, 0; 1992 UU₅, 3, 1, 0; 1992 WR, 3, 1, 0;
1992 WY₁, 3, 1, 0; 1992 WJ₃, 3, 1, 0; 1992 WV₃, 3, 1, 0; 1993 FV₁, 6, 2, 13; 1993 FP₂₉, 3, 1,
0; 1993 OY₉, 3, 1, 0; 1993 PV₅, 3, 1, 0; 1993 QD₃, 6, 2, 3; 1993 ST₁, 3, 1, 0; 1993 SN₃, 3, 1,
0; 1994 CD₈, 3, 1, 0; 1994 CN₁₃, 3, 1, 0; 1994 EQ₁, 3, 1, 0; 1994 EC₂, 3, 1, 0; 1994 GB₉, 3, 1,
0; 1994 GU₉, 3, 1, 0; 1994 PS, 3, 1, 0; 1994 VD₇, 3, 1, 0; 1994 WU, 3, 1, 0; 1994 WB₁, 3, 1,
0; 1995 BD, 3, 1, 0; 1995 DL₁, 3, 1, 0; 1995 FV₁₄, 3, 1, 0; 1995 OA₁, 3, 1, 0; 1995 QS, 3, 1, 0;
1995 QN₂, 3, 1, 0; 1995 QD₃, 3, 1, 0; 1995 SP, 3, 1, 0; 1995 SM₃, 2, 1, 0; 1995 SR₂₉, 3, 1, 0;
1995 UP₇, 3, 1, 0; 1995 UQ₁₆, 3, 1, 0; 1995 UK₂₈, 3, 1, 0; 1995 UQ₄₄, 3, 1, 0; 1995 UC₄₅, 3, 1,

0; 1995 UX₄₈, 3, 1, 0; 1995 VA₂, 3, 1, 0; 1995 WM₄, 3, 1, 0; 1995 WB₅, 3, 1, 0; 1995 WX₄₂,
3, 1, 0; 1995 YF₁, 3, 1, 0; 1995 YP₁, 3, 1, 0; 1996 CA₃, 3, 1, 0; 1996 EG, 3, 1, 0; 1996 HE₁, 3,
1, 0; 1996 KA, 3, 1, 0; 1996 VN₆, 3, 1, 0; 1996 WA₁, 3, 1, 0; 1996 XJ₁, 3, 1, 0; 1996 XM₅, 3,
1, 0; 1996 XT₁₉, 3, 1, 0; 1996 XX₃₁, 3, 1, 0; 1996 YD, 3, 1, 0; 1996 YY, 3, 1, 0; 1997 AQ, 3, 1,
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1997 AS₁₂, 3, 1, 0; 1997 AC₁₃, 3, 1, 0; 1997 CG₁, 3, 1, 0; 1997 DQ, 3, 1, 0; 1997 EV, 6, 2, 66;
1997 EU₂, 3, 1, 0; 1997 EW₄₅, 2, 1, 0; 1997 FU₂, 3, 1, 0; 1997 FC₅, 3, 1, 0; 1997 GT₂₂, 3, 1, 0;
1997 GH₂₇, 3, 1, 0; 1997 HK₁₆, 3, 1, 0; 1997 JA₁₁, 3, 1, 0; 1997 LU₁, 3, 1, 0; 1997 QD₂, 3, 1, 0;
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1998 FC₅₈, 3, 1, 0; 1998 FQ₆₄, 3, 1, 0; 1998 FK₆₅, 3, 1, 0; 1998 FC₆₆, 3, 1, 0; 1998 FO₆₈, 3, 1, 0;
1998 FL₇₅, 3, 1, 0; 1998 FP₇₉, 3, 1, 0; 1998 HQ₂₇, 3, 1, 0; 1998 HR₂₇, 3, 1, 0; 1998 HO₃₃, 3, 1, 0;
1998 HE₃₈, 3, 1, 0; 1998 HN₃₈, 3, 1, 0; 1998 HE₄₃, 6, 2, 1; 1998 HK₄₅, 3, 1, 0; 1998 HM₅₃, 6, 2, 1;
1998 HH₅₄, 3, 1, 0; 1998 HR₆₇, 9, 3, 61; 1998 HX₆₇, 9, 3, 31; 1998 HX₇₈, 3, 1, 0; 1998 HT₉₅, 3, 1,
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701 Sierra Vista

D. Healy, Junk Bond Observatory, 6929 Madera Dr, Sierra Vista, AZ 85635, U.S.A.
[76443.1440@compuserve.com]

Observer D. Healy

Measurer J. Medkeff

0.40-m $f/5$ Schmidt-Cassegrain + CCD

GSC-ACT

1995 UV₈, 6, 2, 9; 1996 XX₃₁, 6, 2, 9; 1998 HX, 6, 2, 12; (7851), 3, 1, 0; [21, 4, 0*, 1999/10/21–1999/11/11]

703 Catalina Sky Survey

C. W. Hergenrother, Space Sciences Building, University of Arizona, Tucson, AZ 85721, U.S.A. [chergen@pir1.lpl.arizona.edu]

Observers T. B. Spahr, C. W. Hergenrother, S. M. Larson, J. W. Brownlee, T. Swindle, H. Campins, D. J. Norlander, G. J. Garradd

Measurers T. B. Spahr, J. W. Brownlee, C. W. Hergenrother, S. M. Larson

0.41-m $f/3$ Schmidt + CCD

USNO-SA1.0, USNO-SA2.0, USNO-SA2.1

1971 QO₁, 4, 1, 0; 1971 UR, 4, 1, 0; 1973 UQ₅, 4, 1, 0; 1975 SX, 4, 1, 0; 1975 SU₁, 4, 1, 0; 1975 SZ₁, 4, 1, 0; 1975 TU₃, 8, 2, 5; 1976 QK₁, 4, 1, 0; 1976 YN₇, 4, 1, 0; 1977 TQ₆, 4, 1, 0; 1978 RQ₁, 4, 1, 0; 1978 RD₂, 12, 3, 16; 1978 RA₁₀, 4, 1, 0; 1978 UJ₅, 8, 2, 8; 1978 VP₉, 4, 1, 0; 1978 VQ₉, 4, 1, 0; 1978 XW, 8, 2, 5; 1979 EL, 4, 1, 0; 1979 KO₁, 4, 1, 0; 1979 MX₈, 4, 1, 0; 1980 FZ₂, 4, 1, 0; 1980 PJ₁, 4, 1, 0; 1980 TK₆, 8, 2, 5; 1981 DS₂, 8, 1, 0; 1981 DN₃, 8, 2, 16; 1981 EO₂, 12, 3, 16; 1981 EP₂, 4, 1, 0; 1981 EO₄, 4, 1, 0; 1981 ER₄, 4, 1, 0; 1981 EU₄, 4, 1, 0; 1981 EM₇, 4, 1, 0; 1981 EN₇, 4, 1, 0; 1981 EU₉, 4, 1, 0; 1981 ED₁₂, 4, 1, 0; 1981 EG₁₂, 4, 1, 0; 1981 EM₁₃, 4, 1, 0; 1981 EN₁₃, 4, 1, 0; 1981 EF₁₆, 8, 2, 4; 1981 EA₁₉, 4, 1, 0; 1981 EO₁₉, 4, 1, 0; 1981 EZ₁₉, 4, 1, 0; 1981 ET₂₃, 8, 2, 5; 1981 EH₂₇, 4, 1, 0; 1981 EK₂₇, 4, 1, 0; 1981 EV₂₈, 4, 1, 0; 1981 EQ₃₀, 4, 1, 0; 1981 EF₃₅, 4, 1, 0; 1981 EO₃₅, 4, 1, 0; 1981 KJ, 12, 3, 13; 1981 QR₂, 8, 2, 5; 1981 WF₉, 4, 1, 0; 1982 JD₂, 4, 1, 0; 1982 RK, 4, 1, 0; 1982 UA₆, 8, 2, 5; 1982 VS₂, 4,

1, 0; 1982 VU₂, 4, 1, 0; 1983 RL₃, 4, 1, 0; 1983 RP₃, 8, 2, 2; 1983 TX, 8, 2, 5; 1983 XE, 4, 1, 0; 1984 DQ, 4, 1, 0; 1984 EQ, 4, 1, 0; 1985 TS, 8, 2, 16; 1985 TZ₃, 4, 1, 0; 1985 VE, 8, 2, 1; 1986 QQ₁, 4, 1, 0; 1986 QQ₂, 7, 2, 1; 1986 TV₆, 4, 1, 0; 1987 BF, 4, 1, 0; 1987 DD₆, 4, 1, 0; 1988 CN₄, 4, 1, 0; 1988 FD₃, 8, 2, 1; 1988 FE₃, 4, 1, 0; 1988 PG₂, 4, 1, 0; 1988 PW₂, 4, 1, 0; 1988 QZ, 4, 1, 0; 1988 RJ₆, 4, 1, 0; 1988 RO₆, 4, 1, 0; 1988 RM₇, 8, 2, 3; 1988 RJ₈, 4, 1, 0; 1988 RW₁₀, 8, 2, 5; 1988 RO₁₁, 8, 2, 13; 1988 RL₁₂, 4, 1, 0; 1988 RX₁₂, 4, 1, 0; 1988 VT₁, 4, 1, 0; 1988 VC₂, 4, 1, 0; 1988 VL₂, 8, 2, 14; 1988 VX₂, 4, 1, 0; 1988 VG₄, 12, 3, 14; 1988 XJ₁, 4, 1, 0; 1989 AF₃, 4, 1, 0; 1989 CP₂, 4, 1, 0; 1989 DB, 4, 1, 0; 1989 GJ₄, 4, 1, 0; 1989 GL₄, 4, 1, 0; 1989 SD, 4, 1, 0; 1989 SB₁, 8, 2, 4; 1989 SZ₁, 4, 1, 0; 1989 SP₁₁, 4, 1, 0; 1989 TR₂, 4, 1, 0; 1989 TY₄, 4, 1, 0; 1989 TN₁₅, 4, 1, 0; 1989 TN₁₆, 4, 1, 0; 1989 US₄, 4, 1, 0; 1989 WB₃, 4, 1, 0; 1989 YC₆, 4, 1, 0; 1990 DW, 4, 1, 0; 1990 GD, 4, 1, 0; 1990 GN, 4, 1, 0; 1990 KR, 4, 1, 0; 1990 OZ, 4, 1, 0; 1990 OY₁, 4, 1, 0; 1990 OG₄, 4, 1, 0; 1990 OS₄, 4, 1, 0; 1990 QR, 4, 1, 0; 1990 QE₆, 4, 1, 0; 1990 QE₇, 4, 1, 0; 1990 QR₉, 4, 1, 0; 1990 SX₃, 4, 1, 0; 1990 SN₈, 4, 1, 0; 1990 TZ₁, 4, 1, 0; 1990 TD₁₂, 8, 2, 6; 1990 TJ₁₅, 4, 1, 0; 1990 UO₄, 4, 1, 0; 1990 VS₅, 4, 1, 0; 1990 VF₈, 12, 3, 8; 1990 WZ, 4, 1, 0; 1990 WN₂, 4, 1, 0; 1990 WQ₂, 4, 1, 0; 1990 WP₄, 4, 1, 0; 1990 WS₄, 4, 1, 0; 1991 BZ, 4, 1, 0; 1991 FH, 4, 1, 0; 1991 FL₂, 4, 1, 0; 1991 FN₂, 4, 1, 0; 1991 GR₂, 4, 1, 0; 1991 GU₄, 8, 2, 13; 1991 GC₆, 4, 1, 0; 1991 GP₇, 8, 2, 3; 1991 GR₇, 4, 1, 0; 1991 GD₈, 4, 1, 0; 1991 HK, 4, 1, 0; 1991 LZ, 4, 1, 0; 1991 LF₁, 4, 1, 0; 1991 NB₁, 8, 2, 7; 1991 NU₃, 4, 1, 0; 1991 PG₁, 4, 1, 0; 1991 PE₂, 4, 1, 0; 1991 PL₂, 8, 2, 5; 1991 PW₁₁, 4, 1, 0; 1991 PL₁₃, 8, 2, 8; 1991 PT₁₄, 4, 1, 0; 1991 PV₁₇, 8, 2, 2; 1991 RP₁, 8, 2, 2; 1991 RY₂, 8, 2, 13; 1991 RA₄, 4, 1, 0; 1991 RR₁₂, 4, 1, 0; 1991 RW₁₂, 4, 1, 0; 1991 RB₁₉, 4, 1, 0; 1991 RB₂₄, 4, 1, 0; 1991 TH₃, 4, 1, 0; 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1994 NF₁, 4, 1, 0; 1994 NW₁, 4, 1, 0; 1994 PK₅, 4, 1, 0; 1994 PN₅, 4, 1, 0; 1994 PJ₇, 4, 1, 0; 1994 PS₇, 12, 3, 42; 1994 PQ₁₁, 4, 1, 0; 1994 PX₁₁, 4, 1, 0; 1994 PB₁₄, 4, 1, 0; 1994 PK₁₈, 8, 2, 6; 1994 PG₂₂, 8, 2, 13; 1994 PC₂₉, 4, 1, 0; 1994 PW₂₉, 4, 1, 0; 1994 PH₃₀, 4, 1, 0; 1994 RL₇, 8, 2, 13; 1994 RN₇, 4, 1, 0; 1994 SH₉, 8, 2, 5; 1994 TC₂, 4, 1, 0; 1994 UO, 4, 1, 0; 1994 UZ₁, 4, 1, 0; 1994 VM₁, 8, 2, 5; 1994 VS₁, 4, 1, 0; 1994 VX₁, 4, 1, 0; 1994 WU, 4, 1, 0; 1994 WB₁, 4, 1, 0; 1994 WE₂, 4, 1, 0; 1994 WR₂, 4, 1, 0; 1994 XM, 4, 1, 0; 1994 YG, 8, 2, 3; 1994 YC₁, 4, 1, 0; 1995 BQ, 8, 2, 3; 1995 KM₁, 8, 2, 1; 1995 KJ₃, 4, 1, 0; 1995 OB, 8, 2, 13; 1995 OD, 8, 2, 5; 1995 OF, 4, 1, 0; 1995 OA₁, 4, 1, 0; 1995 OG₁₀, 4, 1, 0; 1995 QS, 4, 1, 0; 1995 QN₂, 4, 1, 0; 1995 QD₃, 4, 1, 0; 1995 RK, 8, 2, 13; 1995 SJ₁, 4, 1, 0; 1995 SZ₁, 4, 1, 0; 1995 SK₂, 4, 1, 0; 1995 SO₂, 4, 1, 0; 1995 SX₂, 4, 1, 0; 1995 SR₃, 4, 1, 0; 1995 SJ₇, 4, 1, 0; 1995 SH₂₆, 4, 1, 0; 1995 SR₂₉, 4, 1, 0; 1995 TA₁, 4, 1, 0; 1995 TB₈, 4, 1, 0; 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1996 AX₁, 4, 1, 0; 1996 BX, 4, 1, 0; 1996 BO₁, 8, 2, 12; 1996 BH₂, 4, 1, 0; 1996 BJ₂, 4, 1, 0; 1996 BN₆, 4, 1, 0; 1996 CZ, 4, 1, 0; 1996 CO₂, 4, 1, 0; 1996 CA₃, 4, 1, 0; 1996 CF₃, 4, 1, 0; 1996 CM₉, 4, 1, 0; 1996 DT, 4, 1, 0; 1996 DM₂, 4, 1, 0; 1996 EG, 8, 2, 5; 1996 HE₁, 4, 1, 0; 1996 HE₂, 4, 1, 0; 1996 HF₁₈, 4, 1, 0; 1996 KA, 8, 2, 6; 1996 TG₆, 8, 2, 4; 1996 VU₁₇, 4, 1, 0; 1996 VL₃₀, 4, 1, 0; 1996 WA₁, 4, 1, 0; 1996 WE₃, 4, 1, 0; 1996 WL₃, 4, 1,

0; 1996 XU, 4, 1, 0; 1996 XM₂, 4, 1, 0; 1996 XD₃, 4, 1, 0; 1996 XQ₅, 8, 2, 3; 1996 XC₁₅, 4, 1, 0; 1996 XY₁₇, 3, 1, 0; 1996 XW₁₈, 4, 1, 0; 1996 XG₁₉, 8, 2, 5; 1996 XT₁₉, 4, 1, 0; 1996 XX₃₁, 4, 1, 0; 1996 YD, 8, 2, 13; 1996 YF, 4, 1, 0; 1996 YX, 8, 2, 14; 1996 YY, 4, 1, 0; 1996 YC₁, 4, 1, 0; 1996 YG₁, 4, 1, 0; 1996 YO₁, 4, 1, 0; 1996 YR₁, 4, 1, 0; 1996 YE₂, 8, 2, 7; 1997 AD, 4, 1, 0; 1997 AG, 4, 1, 0; 1997 AV, 8, 2, 11; 1997 AC₁, 4, 1, 0; 1997 AK₁, 4, 1, 0; 1997 AD₂, 4, 1, 0; 1997 AZ₂, 4, 1, 0; 1997 AP₄, 4, 1, 0; 1997 AQ₄, 4, 1, 0; 1997 AM₅, 8, 2, 5; 1997 AX₅, 4, 1, 0; 1997 AR₆, 8, 2, 14; 1997 AB₇, 4, 1, 0; 1997 AH₈, 4, 1, 0; 1997 AA₁₀, 4, 1, 0; 1997 AM₁₁, 4, 1, 0; 1997 AS₁₂, 8, 2, 16; 1997 AC₁₃, 4, 1, 0; 1997 AD₁₃, 4, 1, 0; 1997 AG₁₃, 4, 1, 0; 1997 AJ₁₃, 4, 1, 0; 1997 AQ₁₅, 4, 1, 0; 1997 AU₁₇, 4, 1, 0; 1997 AW₁₇, 4, 1, 0; 1997 AX₁₇, 4, 1, 0; 1997 AZ₁₇, 4, 1, 0; 1997 AB₁₈, 8, 2, 14; 1997 AW₁₈, 4, 1, 0; 1997 BP₁, 4, 1, 0; 1997 BX₂, 4, 1, 0; 1997 BC₃, 4, 1, 0; 1997 BN₉, 4, 1, 0; 1997 CH₁, 8, 2, 7; 1997 CT₅, 4, 1, 0; 1997 CG₆, 4, 1, 0; 1997 CZ₆, 12, 2, 3; 1997 CF₉, 4, 1, 0; 1997 CC₂₀, 8, 2, 5; 1997 CR₂₁, 8, 2, 5; 1997 CA₂₂, 4, 1, 0; 1997 CB₂₆, 4, 1, 0; 1997 CF₂₉, 4, 1, 0; 1997 CK₂₉, 4, 1, 0; 1997 DQ, 8, 2, 7; 1997 EV, 12, 3, 41; 1997 EQ₂, 4, 1, 0; 1997 EU₂, 4, 1, 0; 1997 EX₇, 4, 1, 0; 1997 EX₁₃, 16, 3, 16; 1997 EG₂₇, 8, 2, 1; 1997 ER₃₁, 4, 1, 0; 1997 EN₃₂, 4, 1, 0; 1997 EA₃₄, 4, 1, 0; 1997 EM₃₆, 4, 1, 0; 1997 EH₄₆, 4, 1, 0; 1997 FW₁, 4, 1, 0; 1997 FC₃, 4, 1, 0; 1997 FG₃, 4, 1, 0; 1997 FK₃, 4, 1, 0; 1997 FB₄, 4, 1, 0; 1997 GO₁, 4, 1, 0; 1997 GP₆, 4, 1, 0; 1997 GB₇, 4, 1, 0; 1997 GZ₇, 8, 2, 1; 1997 GD₈, 4, 1, 0; 1997 GJ₈, 8, 2, 7; 1997 GF₉, 4, 1, 0; 1997 GM₁₁, 4, 1, 0; 1997 GK₁₆, 4, 1, 0; 1997 GX₁₈, 4, 1, 0; 1997 GX₂₁, 4, 1, 0; 1997 GN₂₂, 4, 1, 0; 1997 GQ₂₂, 8, 2, 3; 1997 GT₂₂, 8, 2, 6; 1997 GB₂₃, 4, 1, 0; 1997 GH₂₇, 12, 3, 13; 1997 GK₃₃, 4, 1, 0; 1997 GP₃₃, 4, 1, 0; 1997 GR₃₆, 4, 1, 0; 1997 GQ₄₁, 4, 1, 0; 1997 HQ, 4, 1, 0; 1997 HO₁, 8, 2, 3; 1997 HY₆, 4, 1, 0; 1997 HP₁₁, 8, 2, 1; 1997 HK₁₆, 8, 2, 5; 1997 JE₁₀, 4, 1, 0; 1997 JN₁₂, 8, 2, 3; 1997 JT₁₅, 4, 1, 0; 1997 JP₁₆, 4, 1, 0; 1997 KH₄, 4, 1, 0; 1998 AV₉, 4, 1, 0; 1998 BH₂₆, 4, 1, 0; 1998 CO₃, 4, 1, 0; 1998 DZ₁₃, 8, 2, 5; 1998 DB₂₄, 4, 1, 0; 1998 DT₃₄, 8, 2, 5; 1998 DB₃₆, 8, 2, 5; 1998 EE₁₀, 4, 1, 0; 1998 EY₁₁, 8, 2, 5; 1998 EW₁₂, 4, 1, 0; 1998 FJ, 8, 2, 13; 1998 FO₂, 4, 1, 0; 1998 FB₅, 4, 1, 0; 1998 FV₈, 4, 1, 0; 1998 FF₉, 4, 1, 0; 1998 FB₁₂, 4, 1, 0; 1998 FQ₁₄, 8, 2, 3; 1998 FY₁₄, 8, 2, 5; 1998 FD₁₅, 4, 1, 0; 1998 FF₁₆, 4, 1, 0; 1998 FZ₂₉, 8, 2, 3; 1998 FO₃₂, 8, 2, 7; 1998 FF₃₄, 4, 1, 0; 1998 FY₃₅, 8, 2, 8; 1998 FN₄₁, 12, 3, 33; 1998 FY₄₁, 4, 1, 0; 1998 FZ₄₆, 4, 1, 0; 1998 FR₄₇, 4, 1, 0; 1998 FB₄₉, 8, 2, 13; 1998 FE₄₉, 4, 1, 0; 1998 FL₄₉, 8, 2, 1; 1998 FM₄₉, 4, 1, 0; 1998 FQ₄₉, 4, 1, 0; 1998 FS₅₇, 8, 2, 14; 1998 FC₅₈, 8, 2, 29; 1998 FD₆₁, 4, 1, 0; 1998 FT₆₁, 4, 1, 0; 1998 FR₆₂, 8, 2, 13; 1998 FQ₆₄, 8, 2, 4; 1998 FE₆₄, 4, 1, 0; 1998 FC₆₅, 4, 1, 0; 1998 FH₆₅, 8, 2, 3; 1998 FK₆₅, 4, 1, 0; 1998 FT₆₅, 4, 1, 0; 1998 FC₆₆, 4, 1, 0; 1998 FO₆₈, 12, 3, 13; 1998 FS₆₈, 4, 1, 0; 1998 FA₆₉, 4, 1, 0; 1998 FM₇₀, 4, 1, 0; 1998 FG₇₁, 4, 1, 0; 1998 FZ₇₁, 4, 1, 0; 1998 FC₇₅, 4, 1, 0; 1998 FG₇₅, 4, 1, 0; 1998 FL₇₅, 4, 1, 0; 1998 FF₇₇, 4, 1, 0; 1998 FG₇₇, 4, 1, 0; 1998 FB₉₈, 4, 1, 0; 1998 FY₉₉, 4, 1, 0; 1998 FZ₉₉, 8, 2, 1; 1998 FU₁₀₂, 4, 1, 0; 1998 FJ₁₀₃, 4, 1, 0; 1998 FO₁₀₃, 8, 2, 7; 1998 FD₁₀₄, 3, 1, 0; 1998 FG₁₀₄, 4, 1, 0; 1998 FJ₁₀₅, 4, 1, 0; 1998 FK₁₀₆, 8, 2, 5; 1998 FG₁₀₇, 4, 1, 0; 1998 FX₁₀₈, 4, 1, 0; 1998 FZ₁₁₃, 4, 1, 0; 1998 FA₁₁₄, 4, 1, 0; 1998 FJ₁₁₄, 4, 1, 0; 1998 FK₁₁₅, 3, 1, 0; 1998 FC₁₁₇, 4, 1, 0; 1998 FY₁₁₇, 4, 1, 0; 1998 FB₁₁₈, 8, 2, 4; 1998 FC₁₁₈, 4, 1, 0; 1998 FM₁₂₁, 4, 1, 0; 1998 FQ₁₂₁, 8, 2, 5; 1998 FT₁₂₁, 4, 1, 0; 1998 FN₁₂₆, 4, 1, 0; 1998 FQ₁₃₃, 4, 1, 0; 1998 FQ₁₄₃, 4, 1, 0; 1998 FC₁₄₄, 4, 1, 0; 1998 GF, 4, 1, 0; 1998 GO₁₀, 8, 2, 29; 1998 HN₁, 4, 1, 0; 1998 HX₂, 12, 3, 57; 1998 HH₄, 4, 1, 0; 1998 HW₇, 4, 1, 0; 1998 HD₈, 4, 1, 0; 1998 HW₁₃, 4, 1, 0; 1998 HX₁₈, 4, 1, 0; 1998 HQ₁₉, 4, 1, 0; 1998 HN₂₁, 12, 3, 34; 1998 HQ₂₃, 4, 1, 0; 1998 HS₂₃, 4, 1, 0; 1998 HQ₂₇, 4, 1, 0; 1998 HR₂₇, 4, 1, 0; 1998 HF₃₀, 4, 1, 0; 1998 HY₃₁, 4, 1, 0; 1998 HU₃₂, 8, 2, 5; 1998 HK₃₃, 4, 1, 0; 1998 HO₃₃, 4, 1, 0; 1998 HY₃₅, 4, 1, 0; 1998 HK₃₆, 4, 1, 0; 1998 HE₃₈, 8, 2, 5; 1998 HN₃₈, 8, 2, 13; 1998 HO₃₈, 8, 2, 3; 1998 HT₄₂, 4, 1, 0;

4, 1, 0; 1998 QG₄₃, 4, 1, 0; 1998 QJ₆₉, 4, 1, 0; 1998 QU₉₀, 4, 1, 0; 1998 QB₉₆, 4, 1, 0; 1998 RY₅, 4, 1, 0; 1998 RC₅₈, 4, 1, 0; 1998 RH₇₆, 4, 1, 0; 1998 RM₇₈, 4, 1, 0; 1998 SX₇, 4, 1, 0; 1998 SH₂₅, 4, 1, 0; 1998 SG₆₀, 4, 1, 0; 1998 SK₆₁, 4, 1, 0; 1998 SZ₁₄₀, 4, 1, 0; 1998 UE, 4, 1, 0; 1998 UD₈, 4, 1, 0; 1998 UA₂₇, 4, 1, 0; 1998 VT₁₀, 4, 1, 0; 1998 VN₃₃, 4, 1, 0; 1998 PV₄₄, 4, 1, 0; 1998 WV₅, 4, 1, 0; 1998 XS₁₅, 4, 1, 0; 1999 CU₃, 4, 1, 0; 1999 FQ₃, 4, 1, 0; 1999 KR₄, 8, 2, 1; 1999 ML, 8, 2, 3; 1999 NP₂, 4, 1, 0; 1999 NT₄, 4, 1, 0; 1999 NV₁₁, 8, 2, 1; 1999 NT₅₆, 4, 1, 0; 1999 NU₅₆, 4, 1, 0; 1999 NV₅₆, 4, 1, 0; 1999 NY₅₆, 4, 1, 0; 1999 NA₅₇, 4, 1, 0; 1999 NB₅₇, 4, 1, 0; 1999 ND₅₇, 8, 2, 14; 1999 NF₅₇, 4, 1, 0; 1999 OD₂, 4, 1, 0; 1999 OE₂, 4, 1, 0; 1999 OJ₂, 4, 1, 0; 1999 OR₂, 4, 1, 0; 1999 OY₂, 8, 2, 7; 1999 OJ₃, 4, 1, 0; 1999 OO₃, 8, 2, 15; 1999 PY, 4, 1, 0; 1999 PB₁, 4, 1, 0; 1999 PO₄, 4, 1, 0; 1999 PB₅, 4, 1, 0; 1999 QT₁, 12, 2, 3; 1999 QU₁, 4, 1, 0; 1999 QB₂, 4, 1, 0; 1999 QQ₂, 4, 1, 0; 1999 RE, 8, 2, 3; 1999 RS, 4, 1, 0; 1999 RE₁, 4, 1, 0; 1999 RL₁, 4, 1, 0; 1999 RT₁, 3, 1, 0; 1999 RX₁, 8, 2, 5; 1999 RZ₁, 8, 2, 5; 1999 RA₂, 4, 1, 0; 1999 RD₂, 8, 2, 14; 1999 RE₂, 4, 1, 0; 1999 RR₂, 4, 1, 0; 1999 RZ₂, 4, 1, 0; 1999 RA₃, 8, 2, 5; 1999 RB₃, 8, 2, 5; 1999 RC₃, 8, 2, 5; 1999 RK₃, 4, 1, 0; 1999 RK₇, 4, 1, 0; 1999 RX₇, 4, 1, 0; 1999 RA₈, 4, 1, 0; 1999 RA₁₀, 12, 3, 35; 1999 RH₁₂, 4, 1, 0; 1999 RA₁₃, 4, 1, 0; 1999 RK₁₆, 4, 1, 0; 1999 RN₁₈, 4, 1, 0; 1999 RP₁₈, 4, 1, 0; 1999 RU₁₈, 4, 1, 0; 1999 RY₁₈, 4, 1, 0; 1999 RG₂₂, 8, 2, 11; 1999 RS₂₂, 4, 1, 0; 1999 RK₂₄, 4, 1, 0; 1999 RS₂₄, 8, 2, 35; 1999 RT₂₄, 8, 2, 7; 1999 RY₂₄, 4, 1, 0; 1999 RG₂₅, 8, 2, 7; 1999 RL₂₅, 8, 2, 7; 1999 RT₂₅, 4, 1, 0; 1999 RU₂₅, 8, 2, 5; 1999 RV₂₅, 8, 2, 5; 1999 RX₂₅, 4, 1, 0; 1999 RC₂₆, 8, 2, 5; 1999 RK₂₆, 4, 1, 0; 1999 RO₂₆, 4, 1, 0; 1999 RG₂₇, 4, 1, 0; 1999 RL₂₇, 8, 2, 13; 1999 RR₂₇, 8, 2, 2; 1999 RU₂₇, 4, 1, 0; 1999 RX₂₇, 8, 2, 2; 1999 RE₂₈, 4, 1, 0; 1999 RT₂₈, 4, 1, 0; 1999 RW₂₉, 4, 1, 0; 1999 RL₃₀, 4, 1, 0; 1999 RZ₃₀, 4, 1, 0; 1999 RK₃₁, 8, 2, 5; 1999 RL₃₁, 4, 1, 0; 1999 RM₃₁, 8, 2, 5; 1999 RR₃₁, 8, 2, 3; 1999 RU₃₁, 8, 2, 5; 1999 RX₃₁, 8, 2, 6; 1999 RS₃₂, 4, 1, 0; 1999 RW₃₂, 8, 2, 13; 1999 RZ₃₂, 4, 1, 0; 1999 RA₃₃, 4, 1, 0; 1999 RG₃₃, 4, 1, 0; 1999 RL₃₃, 4, 1, 0; 1999 RA₃₄, 4, 1, 0; 1999 RE₃₄, 4, 1, 0; 1999 RK₃₄, 4, 1, 0; 1999 RM₃₄, 8, 2, 5; 1999 RO₃₄, 4, 1, 0; 1999 RP₃₄, 4, 1, 0; 1999 RW₃₄, 4, 1, 0; 1999 RX₃₄, 8, 2, 3; 1999 RY₃₄, 8, 2, 3; 1999 RC₃₅, 4, 1, 0; 1999 RD₃₅, 4, 1, 0; 1999 RM₃₅, 4, 1, 0; 1999 RP₃₅, 8, 2, 5; 1999 RV₃₅, 4, 1, 0; 1999 RW₃₅, 8, 2, 3; 1999 RC₃₆, 8, 2, 13; 1999 RF₃₆, 12, 3, 16; 1999 RG₃₆, 4, 1, 0; 1999 RH₃₆, 8, 2, 3; 1999 RN₃₆, 4, 1, 0; 1999 RP₃₆, 4, 1, 0; 1999 RS₃₆, 8, 2, 5; 1999 RT₃₆, 4, 1, 0; 1999 RJ₃₇, 4, 1, 0; 1999 RY₃₇, 4, 1, 0; 1999 RZ₃₇, 4, 1, 0; 1999 RA₃₈, 4, 1, 0; 1999 RC₃₈, 4, 1, 0; 1999 RF₃₈, 4, 1, 0; 1999 RG₃₈, 4, 1, 0; 1999 RH₃₈, 4, 1, 0; 1999 RN₃₈, 4, 1, 0; 1999 RO₃₈, 4, 1, 0; 1999 RP₃₈, 8, 2, 5; 1999 RT₃₈, 4, 1, 0; 1999 RG₃₉, 4, 1, 0; 1999 RV₃₉, 4, 1, 0; 1999 RJ₃₉, 4, 1, 0; 1999 RB₄₀, 8, 2, 5; 1999 RC₄₀, 12, 3, 14; 1999 RV₄₀, 12, 3, 71; 1999 RJ₄₁, 4, 1, 0; 1999 RU₄₁, 4, 1, 0; 1999 RV₄₁, 4, 1, 0; 1999 RY₄₁, 4, 1, 0; 1999 RZ₄₁, 8, 2, 5; 1999 RC₄₂, 8, 2, 7; 1999 RF₄₂, 8, 2, 13; 1999 RH₄₂, 4, 1, 0; 1999 RJ₄₂, 12, 3, 16; 1999 RK₄₂, 4, 1, 0; 1999 RL₄₂, 4, 1, 0; 1999 RM₄₂, 4, 1, 0; 1999 RO₄₂, 4, 1, 0; 1999 RP₄₂, 4, 1, 0; 1999 RD₄₃, 4, 1, 0; 1999 RQ₄₃, 4, 1, 0; 1999 RS₄₃, 4, 1, 0; 1999 RT₄₃, 4, 1, 0; 1999 RU₄₃, 4, 1, 0; 1999 RW₄₃, 4, 1, 0; 1999 RZ₄₃, 4, 1, 0; 1999 RB₄₄, 4, 1, 0; 1999 RC₄₄, 4, 1, 0; 1999 RD₄₄, 4, 1, 0; 1999 RE₄₄, 4, 1, 0; 1999 RF₄₄, 8, 2, 3; 1999 RS₄₄, 4, 1, 0; 1999 RB₄₅, 8, 2, 29; 1999 RC₄₅, 4, 1, 0; 1999 RN₅₀, 4, 1, 0; 1999 RW₇₀, 4, 1, 0; 1999 RG₇₁, 4, 1, 0; 1999 RL₇₃, 4, 1, 0; 1999 RV₇₅, 4, 1, 0; 1999 RS₈₁, 4, 1, 0; 1999 RP₈₄, 4, 1, 0; 1999 RL₈₆, 4, 1, 0; 1999 RE₈₉, 4, 1, 0; 1999 RV₉₁, 4, 1, 0; 1999 RB₉₂, 4, 1, 0; 1999 RJ₉₂, 8, 2, 36; 1999 RK₉₂, 4, 1, 0; 1999 RL₉₂, 4, 1, 0; 1999 RM₉₂, 8, 2, 5; 1999 RQ₉₂, 12, 3, 74; 1999 RH₉₃, 4, 1, 0; 1999 RY₉₄, 8, 2, 30; 1999 RD₉₅, 8, 2, 6; 1999 RF₉₅, 4, 1, 0; 1999 RG₉₅, 8, 2, 7; 1999 RM₉₆, 4, 1, 0; 1999 RH₉₇, 4, 1, 0; 1999 RJ₉₇, 4, 1, 0; 1999 RZ₉₇, 4, 1, 0; 1999 RH₉₈, 4, 1, 0; 1999 RY₉₈, 4, 1, 0; 1999 RZ₉₈, 4, 1, 0; 1999 RW₁₀₀, 4, 1, 0; 1999 RE₁₀₂, 4, 1, 0; 1999 RN₁₀₂, 4, 1, 0; 1999 RT₁₀₂, 4, 1, 0; 1999 RZ₁₀₂, 4, 1, 0; 1999 RF₁₀₃, 4, 1, 0; 1999 RG₁₀₃, 4, 1, 0; 1999 RH₁₀₃, 4, 1, 0; 1999 RM₁₀₃, 4, 1, 0; 1999 RQ₁₀₃, 4, 1, 0; 1999 RZ₁₀₃, 4, 1, 0; 1999 RK₁₀₄, 4, 1, 0; 1999 RQ₁₀₄, 4, 1, 0; 1999 RX₁₀₄, 4, 1, 0; 1999 RZ₁₀₄, 4, 1, 0; 1999 RH₁₀₅, 8, 2, 30; 1999 RJ₁₀₅, 16, 3, 33; 1999 RO₁₀₅, 8, 2, 5; 1999 RL₁₀₆, 8, 2, 5; 1999 RU₁₀₆, 4, 1, 0; 1999 RB₁₀₇, 4, 1, 0; 1999 RG₁₀₇, 4, 1, 0; 1999 RL₁₀₇, 8, 2, 29; 1999 RM₁₀₇, 8, 2, 42; 1999 RO₁₀₇, 4, 1, 0; 1999 RX₁₀₈, 8, 2, 3; 1999 RD₁₀₉, 4, 1, 0; 1999 RH₁₀₉, 4, 1, 0; 1999 RJ₁₀₉, 4, 1, 0; 1999 RL₁₀₉, 4, 1, 0; 1999 RO₁₀₉, 8, 2, 3; 1999 RU₁₀₉, 4, 1, 0; 1999 RY₁₀₉, 4, 1, 0; 1999 RZ₁₀₉, 8, 2, 53; 1999 RF₁₁₀, 8, 2, 13; 1999 RH₁₁₀, 4, 1, 0; 1999 RX₁₁₀, 8, 2, 7; 1999 RZ₁₁₀, 4, 1, 0; 1999 RB₁₁₁, 4, 1, 0; 1999 RN₁₁₄, 4, 1, 0; 1999 RX₁₁₅, 4, 1, 0; 1999 RG₁₂₃, 4, 1, 0; 1999 RQ₁₂₃, 3, 1, 0; 1999 RR₁₂₃, 4, 1, 0; 1999 RA₁₂₄, 4, 1, 0; 1999 RB₁₂₄, 4, 1, 0; 1999 RE₁₂₄, 4, 1, 0; 1999 RG₁₂₄, 4, 1, 0; 1999 RJ₁₂₄, 7, 2, 2; 1999 RL₁₂₄, 8, 2, 15; 1999 RQ₁₂₄, 4, 1, 0; 1999 RL₁₂₅, 4, 1, 0; 1999 RV₁₂₅, 8, 2, 1; 1999 RZ₁₂₅, 4, 1, 0; 1999 RH₁₃₀, 4, 1, 0; 1999 RT₁₃₃, 4, 1, 0; 1999 RW₁₃₃, 4, 1, 0; 1999 RD₁₃₄, 8, 2, 1; 1999 RO₁₃₅, 4, 1, 0; 1999 RE₁₃₇, 4, 1, 0; 1999 RN₁₃₈, 4, 1, 0; 1999 RW₁₄₃, 4, 1, 0; 1999 RH₁₄₅, 4, 1, 0; 1999 RP₁₄₅, 4, 1, 0; 1999 RU₁₄₅, 4, 1, 0; 1999 RV₁₄₅, 4, 1, 0; 1999 RF₁₄₆, 4, 1, 0; 1999 RM₁₄₆, 8, 2, 33; 1999 RA₁₄₈, 4, 1, 0; 1999 RD₁₄₉, 4, 1, 0; 1999 RW₁₄₉, 4, 1, 0; 1999 RP₁₅₀, 4, 1, 0; 1999 RF₁₅₂, 8, 2, 33; 1999 RM₁₅₂, 4, 1, 0; 1999 RN₁₅₂, 4, 1, 0; 1999 RE₁₅₄, 4, 1, 0; 1999 RK₁₅₄, 4, 1, 0; 1999 RT₁₅₄, 4, 1, 0; 1999 RY₁₅₅, 4, 1, 0; 1999 RD₁₅₆, 4, 1, 0; 1999 RL₁₅₆, 4, 1, 0; 1999 RR₁₅₈, 4, 1, 0; 1999 RN₁₆₂, 4, 1, 0; 1999 RT₁₆₂, 4, 1, 0; 1999 RP₁₆₃, 4, 1, 0; 1999 RZ₁₆₈, 4, 1, 0; 1999 RD₁₆₉, 4, 1, 0; 1999 RV₁₆₉, 4, 1, 0; 1999 RY₁₈₀, 4, 1, 0; 1999 RK₁₈₁, 4, 1, 0; 1999 RS₁₈₂, 4, 1, 0; 1999 RA₁₈₃, 4, 1, 0; 1999 RM₁₈₃, 4, 1, 0; 1999 RT₁₈₃, 4, 1, 0; 1999 RK₁₉₀, 4, 1, 0; 1999 RO₁₉₀, 8, 1, 0; 1999 RA₁₉₂, 4, 1, 0; 1999 RO₁₉₃, 4, 1, 0; 1999 RQ₁₉₃, 4, 1, 0; 1999 RR₁₉₃, 4, 1, 0; 1999 RU₁₉₃, 4, 1, 0; 1999 RA₁₉₄, 4, 1, 0; 1999 RQ₁₉₄, 8, 2, 3; 1999 RR₁₉₄, 4, 1, 0; 1999 RC₁₉₅, 4, 1, 0; 1999 RZ₁₉₅, 4, 1, 0; 1999 RF₁₉₆, 4, 1, 0; 1999 RG₁₉₇, 4, 1, 0; 1999 RK₁₉₇, 4, 1, 0; 1999 RL₁₉₇, 8, 2, 7; 1999 RO₁₉₇,

8, 2, 7; 1999 RX₁₉₇, 4, 1, 0; 1999 RZ₁₉₇, 4, 1, 0; 1999 RC₁₉₈, 4, 1, 0; 1999 RX₁₉₈, 4, 1, 0; 1999 RE₁₉₉, 4, 1, 0; 1999 RN₁₉₉, 4, 1, 0; 1999 RO₁₉₉, 8, 2, 5; 1999 RP₁₉₉, 4, 1, 0; 1999 RS₁₉₉, 8, 2, 5; 1999 RY₂₀₀, 8, 2, 55; 1999 RB₂₀₁, 12, 3, 28; 1999 RK₂₀₁, 4, 1, 0; 1999 RQ₂₀₁, 8, 2, 7; 1999 RR₂₀₁, 4, 1, 0; 1999 RS₂₀₁, 4, 1, 0; 1999 RT₂₀₁, 4, 1, 0; 1999 RE₂₀₂, 8, 2, 15; 1999 RF₂₀₂, 12, 3, 15; 1999 RJ₂₀₂, 8, 2, 7; 1999 RM₂₀₂, 4, 1, 0; 1999 RN₂₀₂, 4, 1, 0; 1999 RQ₂₀₂, 8, 2, 7; 1999 RA₂₀₄, 4, 1, 0; 1999 RF₂₀₄, 8, 2, 8; 1999 RQ₂₀₄, 4, 1, 0; 1999 RK₂₀₅, 4, 1, 0; 1999 RP₂₀₅, 8, 2, 5; 1999 RR₂₀₅, 4, 1, 0; 1999 RW₂₀₅, 8, 2, 7; 1999 RA₂₀₆, 4, 1, 0; 1999 RB₂₀₆, 8, 2, 7; 1999 RC₂₀₆, 4, 1, 0; 1999 RL₂₀₆, 8, 2, 5; 1999 RN₂₀₆, 12, 3, 15; 1999 RT₂₀₆, 4, 1, 0; 1999 RC₂₀₇, 8, 2, 14; 1999 RQ₂₀₇, 8, 2, 29; 1999 RR₂₀₇, 8, 2, 5; 1999 RW₂₀₇, 4, 1, 0; 1999 RY₂₀₇, 4, 1, 0; 1999 RG₂₀₈, 4, 1, 0; 1999 RT₂₀₈, 4, 1, 0; 1999 RW₂₀₈, 4, 1, 0; 1999 RB₂₀₉, 12, 3, 54; 1999 RC₂₀₉, 4, 1, 0; 1999 RE₂₀₉, 4, 1, 0; 1999 RQ₂₀₉, 4, 1, 0; 1999 RV₂₀₉, 12, 3, 67; 1999 RD₂₁₀, 8, 2, 13; 1999 RO₂₁₀, 8, 2, 55; 1999 RW₂₁₀, 4, 1, 0; 1999 RX₂₁₀, 4, 1, 0; 1999 RB₂₁₁, 4, 1, 0; 1999 RH₂₁₁, 4, 1, 0; 1999 RJ₂₁₁, 4, 1, 0; 1999 RN₂₁₁, 4, 1, 0; 1999 RO₂₁₁, 8, 2, 3; 1999 RU₂₁₁, 8, 2, 151; 1999 RC₂₁₂, 4, 1, 0; 1999 RE₂₁₂, 8, 2, 5; 1999 RP₂₁₂, 4, 1, 0; 1999 RQ₂₁₂, 8, 2, 48; 1999 RM₂₁₄, 4, 1, 0; 1999 RO₂₁₄, 4, 1, 0; 1999 SE, 4, 1, 0; 1999 SG, 4, 1, 0; 1999 SH, 8, 2, 3; 1999 SL, 4, 1, 0; 1999 SY, 4, 1, 0; 1999 SH₁, 4, 1, 0; 1999 SN₁, 4, 1, 0; 1999 SO₁, 4, 1, 0; 1999 SQ₁, 4, 1, 0; 1999 SU₁, 12, 2, 13; 1999 SA₂, 7, 2, 2; 1999 SB₂, 4, 1, 0; 1999 SC₂, 16, 4, 47; 1999 SF₂, 4, 1, 0; 1999 SJ₂, 8, 2, 15; 1999 SU₂, 4, 1, 0; 1999 SV₂, 8, 2, 13; 1999 SW₂, 4, 1, 0; 1999 SX₃, 4, 1, 0; 1999 SY₃, 4, 1, 0; 1999 SZ₃, 8, 2, 5; 1999 SB₄, 4, 1, 0; 1999 SC₄, 8, 2, 5; 1999 SH₄, 4, 1, 0; 1999 SK₄, 4, 1, 0; 1999 SL₄, 8, 2, 4; 1999 SM₄, 4, 1, 0; 1999 SN₄, 4, 1, 0; 1999 SO₄, 8, 2, 3; 1999 SP₄, 4, 1, 0; 1999 SQ₄, 4, 1, 0; 1999 SR₄, 4, 1, 0; 1999 SS₄, 4, 1, 0; 1999 SU₆, 4, 1, 0; 1999 SV₆, 4, 1, 0; 1999 SW₆, 8, 2, 3; 1999 SN₉, 4, 1, 0; 1999 SO₉, 4, 1, 0; 1999 SS₉, 4, 1, 0; 1999 ST₉, 4, 1, 0; 1999 SU₉, 8, 1, 0; 1999 SV₉, 4, 1, 0; 1999 SR₁₀, 8, 2, 5; 1999 SS₁₀, 4, 1, 0; 1999 SW₁₀, 8, 2, 73; 1999 SP₁₁, 4, 1, 0; 1999 SQ₁₁, 4, 1, 0; 1999 SS₁₁, 4, 1, 0; 1999 SU₁₁, 4, 1, 0; 1999 SV₁₁, 4, 1, 0; 1999 SW₁₁, 12, 3, 73; 1999 TD, 4, 1, 0; 1999 TE, 4, 1, 0; 1999 TG, 4, 1, 0; 1999 TK, 8, 2, 30; 1999 TL, 8, 2, 30; 1999 TM, 8, 2, 3; 1999 TN, 8, 2, 3; 1999 TP, 4, 1, 0; 1999 TQ, 4, 1, 0; 1999 TS, 4, 1, 0; 1999 TU, 4, 1, 0; 1999 TV, 4, 1, 0; 1999 TW, 8, 2, 2; 1999 TY, 8, 2, 3; 1999 TZ, 4, 1, 0; 1999 TA₁, 4, 1, 0; 1999 TB₁, 8, 2, 57; 1999 TD₁, 4, 1, 0; 1999 TE₁, 4, 1, 0; 1999 TF₁, 4, 1, 0; 1999 TH₁, 4, 1, 0; 1999 TJ₁, 4, 1, 0; 1999 TK₁, 8, 2, 2; 1999 TL₁, 4, 1, 0; 1999 TM₁, 4, 1, 0; 1999 TN₁, 4, 1, 0; 1999 TO₁, 4, 1, 0; 1999 TP₁, 4, 1, 0; 1999 TQ₁, 4, 1, 0; 1999 TR₁, 4, 1, 0; 1999 TS₁, 4, 1, 0; 1999 TT₁, 4, 1, 0; 1999 TW₁, 4, 1, 0; 1999 TY₁, 4, 1, 0; 1999 TE₂, 4, 1, 0; 1999 TF₂, 4, 1, 0; 1999 TG₂, 4, 1, 0; 1999 TH₂, 4, 1, 0; 1999 TJ₂, 4, 1, 0; 1999 TA₃, 4, 1, 0; 1999 TD₃, 4, 1, 0; 1999 TM₃, 4, 1, 0; 1999 TN₃, 8, 2, 3; 1999 TO₃, 4, 1, 0; 1999 TP₃, 12, 3, 8; 1999 TU₃, 8, 2, 3; 1999 TW₃, 8, 2, 3; 1999 TY₃, 4, 1, 0; 1999 TA₄, 4, 1, 0; 1999 TD₄, 16, 4, 47; 1999 TF₄, 8, 2, 5; 1999 TJ₄, 4, 1, 0; 1999 TL₄, 4, 1, 0; 1999 TM₄, 8, 2, 13; 1999 TO₄, 4, 1, 0; 1999 TP₄, 4, 1, 0; 1999 TQ₄, 4, 1, 0; 1999 TT₄, 8, 2, 13; 1999 TW₄, 4, 1, 0; 1999 TD₅, 4, 1, 0; 1999 TJ₅, 4, 1, 0; 1999 TM₅, 8, 2, 3; 1999 TN₅, 4, 1, 0; 1999 TO₅, 4, 1, 0; 1999 TP₅, 4, 1, 0; 1999 TQ₅, 4, 1, 0; 1999 TR₅, 4, 1, 0; 1999 TS₅, 4, 1, 0; 1999 TT₅, 8, 2, 1; 1999 TU₅, 4, 1, 0; 1999 TW₅, 4, 1, 0; 1999 TY₅, 4, 1, 0; 1999 TZ₅, 4, 1, 0; 1999 TD₆, 4, 1, 0; 1999 TE₆, 4, 1, 0; 1999 TF₆, 4, 1, 0; 1999 TH₆, 4, 1, 0; 1999 TJ₆, 8, 2, 5; 1999 TK₆, 4, 1, 0; 1999 TL₆, 4, 1, 0; 1999 TM₆, 4, 1, 0; 1999 TO₆, 4, 1, 0; 1999 TQ₆, 4, 1, 0; 1999 TU₆, 4, 1, 0; 1999 TV₆, 4, 1, 0; 1999 TW₆, 4, 1, 0; 1999 TX₆, 8, 2, 5; 1999 TY₆, 8, 2, 3; 1999 TF₇, 4, 1, 0; 1999 TH₇, 4, 1, 0; 1999 TN₇, 4, 1, 0; 1999 TP₇, 8, 2, 13; 1999 TA₈, 4, 1, 0; 1999 TB₈, 16, 4, 81;

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T₁₇, 4, 1, 0; 1999 TZ₁₇, 4, 1, 0; 1999 TA₁₈, 4, 1, 0; 1999 TB₁₈, 4, 1, 0; 1999 TC₁₈, 4, 1, 0; 1999 TE₁₈, 8, 2, 29; 1999 TF₁₈, 4, 1, 0; 1999 TG₁₈, 4, 1, 0; 1999 TH₁₈, 4, 1, 0; 1999 TI₁₈, 8, 2, 28; 1999 TJ₁₈, 8, 2, 28; 1999 TK₁₈, 4, 1, 0; 1999 TL₁₈, 4, 1, 0; 1999 TM₁₈, 4, 1, 0; 1999 TN₁₈, 4, 1, 0; 1999 TO₁₈, 4, 1, 0; 1999 TP₁₈, 4, 1, 0; 1999 TQ₁₈, 8, 2, 28; 1999 TR₁₈, 8, 2, 28; 1999 TS₁₈, 4, 1, 0; 1999 TU₁₈, 4, 1, 0; 1999 TV₁₈, 4, 1, 0; 1999 TW₁₈, 4, 1, 0; 1999 TX₁₈, 4, 1, 0; 1999 TY₁₈, 8, 2, 28; 1999 UZ₁₈, 4, 1, 0; 1999 UA₁₉, 8, 2, 5; 1999 UB₁₉, 8, 2, 5; 1999 UC₁₉, 8, 2, 5; 1999 UD₁₉, 8, 2, 5; 1999 UE₁₉, 8, 2, 5; 1999 UF₁₉, 8, 2, 5; 1999 UG₁₉, 8, 2, 5; 1999 UH₁₉, 8, 2, 5; 1999 UI₁₉, 8, 2, 5; 1999 UJ₁₉, 8, 2, 5; 1999 UK₁₉, 8, 2, 5; 1999 UL₁₉, 8, 2, 5; 1999 UM₁₉, 8, 2, 5; 1999 UN₁₉, 8, 2, 5; 1999 UP₁₉, 8, 2, 5; 1999 UQ₁₉, 8, 2, 5; 1999 UR₁₉, 8, 2, 5; 1999 US₁₉, 8, 2, 5; 1999 UT₁₉, 8, 2, 5; 1999 UV₁₉, 8, 2, 5; 1999 UW₁₉, 8, 2, 5; 1999 UX₁₉, 8, 2, 5; 1999 UY₁₉, 8, 2, 5; 1999UZ₁₉, 8, 2, 5; 1999 VA₂₀, 8, 2, 29; 1999 VB₂₀, 8, 2, 29; 1999 VC₂₀, 8, 2, 29; 1999 VD₂₀, 8, 2, 29; 1999 VE₂₀, 8, 2, 29; 1999 VF₂₀, 8, 2, 29; 1999 VG₂₀, 8, 2, 29; 1999 VH₂₀, 8, 2, 29; 1999 VI₂₀, 8, 2, 29; 1999 VJ₂₀, 8, 2, 29; 1999 VK₂₀, 8, 2, 29; 1999 VL₂₀, 8, 2, 29; 1999 VM₂₀, 8, 2, 29; 1999 VN₂₀, 8, 2, 29; 1999 VO₂₀, 8, 2, 29; 1999 VP₂₀, 8, 2, 29; 1999 VQ₂₀, 8, 2, 29; 1999 VR₂₀, 8, 2, 29; 1999 VS₂₀, 8, 2, 29; 1999 VT₂₀, 8, 2, 29; 1999 VU₂₀, 8, 2, 29; 1999 VW₂₀, 8, 2, 29; 1999 VX₂₀, 8, 2, 29; 1999 VY₂₀, 8, 2, 29; 1999 VZ₂₀, 8, 2, 29; 1999 WA₂₁, 16, 4, 53; 1999 WB₂₁, 4, 1, 0; 1999 WC₂₁, 8, 2, 28; 1999 WD₂₁, 4, 1, 0; 1999 WE₂₁, 4, 1, 0; 1999 WF₂₁, 8, 2, 1; 1999 WG₂₁, 8, 2, 1; 1999 WH₂₁, 8, 2, 1; 1999 WI₂₁, 8, 2, 1; 1999 WJ₂₁, 8, 2, 1; 1999 WK₂₁, 8, 2, 1; 1999 WL₂₁, 8, 2, 1; 1999 WM₂₁, 8, 2, 1; 1999 WN₂₁, 8, 2, 1; 1999 WO₂₁, 8, 2, 1; 1999 WP₂₁, 8, 2, 1; 1999 WQ₂₁, 8, 2, 1; 1999 WR₂₁, 8, 2, 1; 1999 WS₂₁, 8, 2, 1; 1999 WT₂₁, 8, 2, 1; 1999 WU₂₁, 8, 2, 1; 1999 WV₂₁, 8, 2, 1; 1999 WX₂₁, 8, 2, 1; 1999 WY₂₁, 8, 2, 1; 1999 WZ₂₁, 8, 2, 1; 1999 XX₂₂, 12, 3, 33; 1999 YY₂₂, 12, 3, 33; 1999 ZZ₂₂, 12, 3, 33; 1999 AA₂₃, 8, 2, 5; 1999 AB₂₃, 8, 2, 5; 1999 AC₂₃, 8, 2, 5; 1999 AD₂₃, 8, 2, 5; 1999 AE₂₃, 8, 2, 5; 1999 AF₂₃, 8, 2, 5; 1999 AG₂₃, 8, 2, 5; 1999 AH₂₃, 8, 2, 5; 1999 AI₂₃, 8, 2, 5; 1999 AJ₂₃, 8, 2, 5; 1999 AK₂₃, 8, 2, 5; 1999 AL₂₃, 8, 2, 5; 1999 AM₂₃, 8, 2, 5; 1999 AN₂₃, 8, 2, 5; 1999 AO₂₃, 8, 2, 5; 1999 AP₂₃, 8, 2, 5; 1999 AQ₂₃, 8, 2, 5; 1999 AR₂₃, 8, 2, 5; 1999 AS₂₃, 8, 2, 5; 1999 AT₂₃, 8, 2, 5; 1999 AU₂₃, 8, 2, 5; 1999 AV₂₃, 8, 2, 5; 1999 AW₂₃, 8, 2, 5; 1999 AX₂₃, 8, 2, 5; 1999 AY₂₃, 8, 2, 5; 1999 AZ₂₃, 8, 2, 5; 1999 BA₂₄, 8, 2, 5; 1999 BB₂₄, 8, 2, 5; 1999 BC₂₄, 8, 2, 5; 1999 BD₂₄, 8, 2, 5; 1999 BE₂₄, 8, 2, 5; 1999 BF₂₄, 8, 2, 5; 1999 BG₂₄, 8, 2, 5; 1999 BH₂₄, 8, 2, 5; 1999 BI₂₄, 8, 2, 5; 1999 BJ₂₄, 8, 2, 5; 1999 BK₂₄, 8, 2, 5; 1999 BL₂₄, 8, 2, 5; 1999 BM₂₄, 8, 2, 5; 1999 BN₂₄, 8, 2, 5; 1999 BO₂₄, 8, 2, 5; 1999 BP₂₄, 8, 2, 5; 1999 BQ₂₄, 8, 2, 5; 1999 BR₂₄, 8, 2, 5; 1999 BS₂₄, 8, 2, 5; 1999 BT₂₄, 8, 2, 5; 1999 BU₂₄, 8, 2, 5; 1999 BV₂₄, 8, 2, 5; 1999 BW₂₄, 8, 2, 5; 1999 BX₂₄, 8, 2, 5; 1999 BY₂₄, 8, 2, 5; 1999 BZ₂₄, 8, 2, 5; 1999 CA₂₅, 8, 2, 5; 1999 CB₂₅, 8, 2, 5; 1999 CC₂₅, 8, 2, 5; 1999 CD₂₅, 8, 2, 5; 1999 CE₂₅, 8, 2, 5; 1999 CF₂₅, 8, 2, 5; 1999 CG₂₅, 8, 2, 5; 1999 CH₂₅, 8, 2, 5; 1999 CI₂₅, 8, 2, 5; 1999 CJ₂₅, 8, 2, 5; 1999 CK₂₅, 8, 2, 5; 1999 CL₂₅, 8, 2, 5; 1999 CM₂₅, 8, 2, 5; 1999 CN₂₅, 8, 2, 5; 1999 CO₂₅, 8, 2, 5; 1999 CP₂₅, 8, 2, 5; 1999 CQ₂₅, 8, 2, 5; 1999 CR₂₅, 8, 2, 5; 1999 CS₂₅, 8, 2, 5; 1999 CT₂₅, 8, 2, 5; 1999 CU₂₅,

[illegible]

8, 2, 7; 1999 VO₄₅ *, 8, 2, 7; 1999 VP₄₅ *, 8, 2, 7; 1999 VQ₄₅ *, 8, 2, 7; 1999 VR₄₅ *, 8, 2, 7; 1999 VS₄₅ *, 8, 2, 7; 1999 VT₄₅ *, 8, 2, 7; 1999 VU₄₅ *, 8, 2, 7; 1999 VV₄₅ *, 8, 2, 7; 1999 VW₄₅ *, 8, 2, 7; 1999 VX₄₅ *, 8, 2, 7; 1999 VY₄₅ *, 8, 2, 7; 1999 WY *, 4, 1, 0; 2040 P-L, 8, 2, 5; 2043 P-L, 8, 2, 1; 2054 P-L, 4, 1, 0; 2058 P-L, 4, 1, 0; 2091 P-L, 12, 3, 8; 2100 P-L, 4, 1, 0; 2129 P-L, 4, 1, 0; 2155 P-L, 4, 1, 0; 2588 P-L, 8, 2, 5; 2613 P-L, 8, 2, 5; 2665 P-L, 4, 1, 0; 3092 P-L, 4, 1, 0; 3093 P-L, 4, 1, 0; 3503 P-L, 4, 1, 0; 3504 P-L, 4, 1, 0; 3563 P-L, 4, 1, 0; 4024 P-L, 8, 2, 13; 4037 P-L, 16, 4, 14; 4060 P-L, 4, 1, 0; 4104 P-L, 8, 2, 28; 4214 P-L, 4, 1, 0; 4315 P-L, 8, 2, 3; 4626 P-L, 8, 2, 3; 4646 P-L, 4, 1, 0; 6056 P-L, 8, 2, 5; 6193 P-L, 4, 1, 0; 6242 P-L, 4, 1, 0; 6585 P-L, 4, 1, 0; 6614 P-L, 4, 1, 0; 6617 P-L, 4, 1, 0; 6622 P-L, 4, 1, 0; 9509 P-L, 4, 1, 0; 1182 T-1, 4, 1, 0; 1230 T-1, 4, 1, 0; 2120 T-1, 4, 1, 0; 2168 T-1, 4, 1, 0; 2208 T-1, 4, 1, 0; 3033 T-1, 8, 2, 13; 3041 T-1, 4, 1, 0; 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704 Lincoln Laboratory Experimental Test System, New Mexico

G. Stokes, MIT Lincoln Laboratory, 244 Wood Street, Lexington, MA 02420,

U.S.A. [stokes@ll.mit.edu]

Observers M. Blythe, F. Shelly, M. Bezpalko, M. Elowitz, R. Huber

Measurers J. Stuart, H. Viggh, R. Sayer

1.0-m $f/2.15$ reflector + CCD

USNO-SA1.0

1934 JP, 7, 2, 2; 1955 RE₁, 4, 1, 0; 1964 VL₁, 5, 1, 0; 1970 JB, 5, 1, 0; 1971 QO₁, 4, 1, 0; 1971 UR, 18, 4, 10; 1973 UK₅, 3, 1, 0; 1973 UQ₅, 22, 5, 13; 1975 NC, 10, 2, 11; 1975 SU₁, 30, 6, 13; 1975 SZ₁, 12, 2, 9; 1975 SB₂, 4, 1, 0; 1975 TU₃, 15, 3, 12; 1976 DA₁, 4, 1, 0; 1976 QK₁, 5, 1, 0; 1976 SL₅, 5, 1, 0; 1977 DG₃, 4, 1, 0; 1977 ER₅, 4, 1, 0; 1977 JA, 3, 1, 0; 1977 PB, 4, 1, 0; 1977 QN₁, 5, 1, 0; 1977 LR₇, 5, 1, 0; 1977 TU₃, 5, 1, 0; 1977 TQ₆, 15, 3, 13; 1978 CK, 5, 1, 0; 1978 NF, 7, 2, 3; 1978 PE, 5, 1, 0; 1978 QF₁, 5, 1, 0; 1978 RQ₁, 10, 2, 12; 1978 RD₂, 15, 3, 12; 1978 RT₆, 5, 1, 0; 1978 RG₉, 5, 1, 0; 1978 RQ₉, 3, 1, 0; 1978 RA₁₀, 3, 1, 0; 1978 SE₅, 4, 1, 0; 1978 SF₅, 3, 1, 0; 1978 SS₅, 19, 3, 13; 1978 ST₇, 5, 1, 0; 1978 TT₈, 15, 3, 8; 1978 VB₃, 4, 1, 0; 1978 VP₃, 5, 1, 0; 1978 VX₄, 8, 2, 8; 1978 VD₅, 11, 3, 6; 1978 VH₅, 14, 3, 13; 1978 VE₇, 4, 1, 0; 1978 VP₉, 5, 1, 0; 1978 VM₁₁, 5, 1, 0; 1978 XW, 18, 3, 12; 1979 EL, 5, 1, 0; 1979 KO₁, 5, 1, 0; 1979 MX₁, 14, 3, 13; 1979 MO₂, 10, 2, 6; 1979 MM₃, 3, 1, 0; 1979 MM₄, 9, 2, 3; 1979 MY₅, 4, 1, 0; 1979 MD₈, 13, 3, 14; 1979 MM₈, 14, 3, 13; 1979 MX₈, 9, 2, 63; 1979 OH₁, 4, 1, 0; 1980 CJ, 4, 1, 0; 1980 FR₂, 13, 3, 10; 1980 FZ₂, 3, 1, 0; 1980 RL₂, 15, 3, 13; 1980 TZ₅, 10, 2, 7; 1980 TK₆, 18, 4, 12; 1981 DD₁, 4, 1, 0; 1981 DS₂, 4, 1, 0; 1981 DN₃, 20, 4, 13; 1981 EO₂, 15, 3, 12; 1981

405; 1981 EU₄, 9, 2, 13; 1981 ET₅, 4, 1, 0; 1981 EW₅, 5, 1, 0; 1981 EM₆, 5, 1, 0; 1981 EM₇, 15, 3, 11; 1981 EB₈, 5, 1, 0; 1981 EU₉, 19, 4, 13; 1981 EV₉, 8, 2, 2; 1981 EE₁₀, 10, 2, 2; 1981 EE₁₁, 4, 1, 0; 1981 ED₁₂, 5, 1, 0; 1981 EG₁₂, 8, 2, 9; 1981 EM₁₃, 19, 4, 14; 1981 EN₁₃, 9, 2, 12; 1981 EF₁₆, 13, 3, 11; 1981 EG₁₆, 4, 1, 0; 1981 EO₁₆, 4, 1, 0; 1981 ES₁₆, 3, 1, 0; 1981 EL₁₈, 5, 1, 0; 1981 EA₁₉, 19, 4, 11; 1981 EO₁₉, 9, 2, 9; 1981 EZ₁₉, 13, 3, 11; 1981 EQ₂₀, 13, 3, 13; 1981 EK₂₂, 3, 1, 0; 1981 ET₂₃, 23, 3, 1, 0; 1981 ER₂₄, 3, 1, 0; 1981 EK₂₆, 11, 3, 13; 1981 EZ₂₆, 33, 6, 12; 1981 EG₂₇, 14, 3, 13; 1981 EH₂₇, 3, 1, 0; 1981 EK₂₇, 5, 1, 0; 1981 ET₂₇, 5, 1, 0; 1981 EU₂₈, 9, 2, 2; 1981 EV₂₈, 5, 1, 0; 1981 EQ₃₀, 5, 1, 0; 1981 EF₃₅, 14, 3, 13; 1981 EO₃₅, 4, 1, 0; 1981 EB₃₆, 4, 1, 0; 1981 EF₃₇, 5, 1, 0; 1981 ET₃₇, 6, 2, 3; 1981 EO₃₈, 10, 2, 1; 1981 EU₃₈, 20, 4, 11; 1981 EA₄₂, 3, 1, 0; 1981 EB₄₃, 4, 1, 0; 1981 EE₄₆, 3, 1, 0; 1981 ER₄₇, 10, 2, 2; 1981 JR₂, 4, 1, 0; 1981 KJ₂₅, 5, 12; 1981 QJ₂, 3, 1, 0; 1981 QN₃, 14, 3, 13; 1981 RF₂, 5, 1, 0; 1981 SE₇, 10, 2, 7; 1981 US₂₂, 4, 1, 0; 1981 UB₂₃, 15, 3, 13; 1981 UL₂₉, 15, 3, 11; 1981 VL₅, 1, 0; 1981 WF₉, 5, 1, 0; 1982 BJ₁₃, 5, 1, 0; 1982 JD₂, 10, 2, 11; 1982 RK₅, 5, 1, 0; 1982 RR₅, 5, 1, 0; 1982 SQ₇, 5, 1, 0; 1982 ST₇, 5, 1, 0; 1982 SC₈, 10, 2, 13; 1982 UA₆, 3, 1, 0; 1982 UD₆, 10, 2, 1; 1982 UH₉, 4, 1, 0; 1982 UE₁₂, 5, 1, 0; 1982 VS₂, 37, 5, 13; 1982 VU₂, 17, 4, 13; 1982 VC₃, 9, 2, 8; 1982 VY₃, 8, 2, 10; 1982 WA₁₄, 12, 3, 13; 1983 AA₅, 5, 1, 0; 1983 AC₁, 5, 1, 0; 1983 RL₅, 5, 1, 0; 1983 RL₃, 9, 2, 7; 1983 TX₈, 4, 1, 2; 1983 XC₁₅, 15, 3, 9; 1984 CE₅, 5, 1, 0; 1984 SE₆, 5, 1, 0; 1984 UN₂, 19, 4, 11; 1985 PC₁₄, 13, 13; 1985 PH₅, 5, 1, 0; 1985 PQ₉, 9, 2, 13; 1985 RP₅, 5, 1, 0; 1985 TN₁₀, 10, 2, 13; 1985 TS₁₅, 3, 13; 1985 TO₃, 8, 2, 2; 1985 UJ₃, 15, 2, 8; 1985 UK₃, 10, 2, 2; 1985 VE₁₅, 3, 11; 1986 PY₅, 5, 1, 0; 1986 PL₁, 4, 1, 0; 1986 QN₅, 5, 1, 0; 1986 QQ₁, 5, 1, 0; 1986 QC₂, 14, 3, 29; 1986 QZ₂, 5, 1, 0; 1986 QF₃, 5, 1, 0; 1986 RP₂, 5, 1, 0; 1986 TR₅, 5, 1, 0; 1986 TT₁₁, 3, 1, 0; 1986 WZ₁₄, 3, 12; 1987 BF₅, 5, 1, 0; 1987 CH₅, 5, 1, 0; 1987 DD₆, 9, 2, 9; 1987 HE₅, 5, 1, 0; 1987 OO₃, 3, 1, 0; 1987 SP₁₂, 4, 1, 0; 1987 XC₅, 5, 1, 0; 1987 YS₁, 4, 1, 0; 1987 YU₁, 5, 1, 0; 1988 BO₃, 10, 2, 12; 1988 BY₃, 5, 1, 0; 1988 BM₄, 5, 1, 0; 1988 BF₅, 24, 5, 13; 1988 BG₅, 7, 2, 2; 1988 BH₅, 5, 1, 0; 1988 BJ₅, 5, 1, 0; 1988 CN₄, 5, 1, 0; 1988 CO₇, 20, 4, 13; 1988 DE₄, 1, 0; 1988 FD₃, 5, 1, 0; 1988 FE₃, 5, 1, 0; 1988 PR₅, 5, 1, 0; 1988 PG₂, 10, 2, 12; 1988 PQ₂, 20, 4, 14; 1988 PW₂, 5, 1, 0; 1988 QF₃, 5, 1, 0; 1988 QY₅, 5, 1, 0; 1988 QZ₅, 5, 1, 0; 1988 RD₁, 5, 1, 0; 1988 RO₂, 5, 1, 0; 1988 RY₂, 5, 1, 0; 1988 RJ₃, 4, 1, 0; 1988 RT₃, 8, 2, 5; 1988 RP₄, 7, 2, 2; 1988 RZ₅, 8, 2, 8; 1988 RH₆, 5, 1, 0; 1988 RJ₆, 6, 2, 7; 1988 RL₆, 5, 1, 0; 1988 RO₆, 12, 3, 9; 1988 RM₇, 10, 2, 9; 1988 RJ₈, 5, 1, 0; 1988 RU₉, 5, 1, 0; 1988 RW₁₀, 5, 1, 0; 1988 RO₁₁, 19, 4, 12; 1988 RL₁₂, 18, 4, 11; 1988 RX₁₂, 4, 1, 0; 1988 SB₂, 5, 1, 0; 1988 SH₂, 5, 1, 0; 1988 TT₅, 5, 1, 0; 1988 TO₁, 10, 2, 2; 1988 TR₂, 5, 1, 0; 1988 VA₄, 4, 1, 0; 1988 VV₁₅, 15, 3, 14; 1988 VA₁, 3, 1, 0; 1988 VT₁, 5, 1, 0; 1988 VC₂, 14, 3, 11; 1988 VH₂, 3, 1, 0; 1988 VL₂, 10, 1, 0; 1988 VX₂, 10, 2, 12; 1988 VG₄, 5, 1, 0; 1988 XJ₁, 4, 1, 0; 1988 XR₁, 15, 3, 13; 1989 BV₁, 3, 1, 0; 1989 CP₂, 5, 1, 0; 1989 CJ₈, 5, 1, 0; 1989 DB₅, 5, 1, 0; 1989 DK₅, 5, 1, 0; 1989 EJ₆, 18, 4, 13; 1989 GR₃, 4, 1, 0; 1989 GJ₄, 15, 3, 12; 1989 GL₄, 5, 1, 0; 1989 GN₄, 24, 5, 13; 1989 GQ₆, 4, 1, 0; 1989 HA₅, 5, 1, 0; 1989 PF₃, 1, 0; 1989 RX₅, 5, 1, 0; 1989 SD₅, 5, 1, 0; 1989 SR₅, 5, 1, 0; 1989 SB₁, 9, 2, 11; 1989 SF₁, 3, 1, 0; 1989 SZ₁, 10, 2, 12; 1989 SZ₄, 9, 2, 13; 1989 SP₁₁, 9, 2, 5; 1989 TR₂, 20, 3, 13; 1989 TY₄, 3, 1, 0; 1989 TN₁₅, 7, 2, 5; 1989 TN₁₆, 19, 4, 11; 1989 UL₅, 5, 1, 0; 1989 UN₅, 5, 1, 0; 1989 US₄, 5, 1, 0; 1989 VA₁₀, 10, 2, 1; 1989 WB₃, 10, 2, 12; 1989 YA₄, 18, 4, 14; 1989 YC₆, 5, 1, 0; 1989 YE₆, 15, 3, 13; 1990 BO₅, 5, 1, 0; 1990 BA₂, 5, 1, 0; 1990 BC₂, 3, 1, 0; 1990 CD₁₀, 10, 2, 2; 1990 CE₅, 5, 1, 0; 1990 DZ₄, 4, 1, 0; 1990 DD₂, 8, 2, 11; 1990 EN₄, 4, 1, 0; 1990 ES₄, 7, 2, 8; 1990 EU₄, 5, 1, 0; 1990 FG₁₀, 10, 2, 1; 1990 FH₄, 4, 1, 0; 1990 FL₅, 5, 1, 0; 1990 FK₁, 5, 1, 0; 1990 FD₃, 10, 2, 1; 1990 GD₄, 4, 1, 0; 1990 GN₂₅, 14, 1990 HE₅, 5, 1, 0; 1990 HP₅, 5, 1, 0; 1990 KR₅, 5, 1, 0; 1990 KN₁, 15, 3, 13; 1990 OZ₁₁, 3, 4; 1990 OY₁, 29, 4, 13; 1990 OB₄, 8, 1, 0; 1990 OG₄, 4, 1, 0; 1990 OS₄, 10, 1, 0; 1990 OB₅, 5, 1, 0; 1990 QR₉, 9, 2, 1; 1990 QE₄, 4, 1, 0; 1990 QT₄, 5, 1, 0; 1990 QY₅, 5, 1, 0; 1990 QE₇, 5, 1, 0; 1990 QF₈, 3, 1, 0; 1990 QR₉, 10, 2, 13; 1990 RC₂, 3, 1, 0; 1990 RJ₅, 3, 1, 0; 1990 RN₈, 5, 1, 0; 1990 RF₁₇, 8, 2, 1; 1990 SS₃, 5, 1, 0; 1990 SX₃, 5, 1, 0; 1990 SZ₃, 5, 1, 0; 1990 SE₄, 5, 1, 0; 1990 SE₅, 13, 3, 13; 1990 SR₆, 4, 1, 0; 1990 SN₈, 16, 3, 12; 1990 SQ₈, 4, 1, 0; 1990 SW₈, 4, 1, 0; 1990 SX₈, 4, 1, 0; 1990 ST₁₄, 15, 3, 13; 1990 SU₁₅, 5, 1, 0; 1990 SL₂₈, 15, 3, 13; 1990 TJ₄, 4, 1, 0; 1990 TT₄, 4, 1, 0; 1990 TE₁, 5, 1, 0; 1990 TZ₁, 15, 3, 11; 1990 TS₄, 5, 1, 0; 1990 TF₆, 4, 1, 0; 1990 TD₁₂, 15, 3, 13; 1990 TJ₁₅, 9, 2, 1; 1990 UM₅, 5, 1, 0; 1990 UA₁, 10, 2, 13; 1990 UJ₁₀, 10, 2, 13; 1990 UB₄, 5, 1, 0; 1990 UO₄, 5, 1, 0; 1990 VE₁₀, 10, 2, 11; 1990 VQ₅, 5, 1, 0; 1990 VS₅, 5, 1, 0; 1990 VF₈, 15, 3, 12; 1990 WZ₁₀, 2, 9; 1990 WP₁, 4, 1, 0; 1990 WS₁, 5, 1, 0; 1990 WW₁, 5, 1, 0; 1990 WN₂, 5, 1, 0; 1990 WO₄, 5, 1, 0; 1990 WP₄, 5, 1, 0; 1990 WS₄, 15, 3, 13; 1990 WA₅, 5, 1, 0; 1991 AG₂, 3, 1, 0; 1991 BZ₅, 5, 1, 0; 1991 BV₁, 10, 1, 0; 1991 CM₁, 5, 1, 0; 1991 DG₁, 4, 1, 0; 1991 EC₅, 5, 1, 0; 1991 EJ₅, 5, 1, 0; 1991 EM₅, 5, 1, 0; 1991 EF₂, 9, 2, 12; 1991 EY₃, 9, 2, 13; 1991 EK₄, 5, 1, 0; 1991 FG₅, 5, 1, 0; 1991 FH₉, 9, 2, 11; 1991 FP₈, 8, 2, 11; 1991 FN₂, 10, 2, 10; 1991 GW₁, 5, 1, 0; 1991 GA₂, 7, 2, 7; 1991 GE₂, 4, 1, 0; 1991 GR₂, 14, 3, 12; 1991 GV₃, 15, 3, 13; 1991 GT₄, 10, 2, 13; 1991 GU₄, 10, 2, 13; 1991 GY₄, 25, 5, 12; 1991 GH₅, 14, 3, 8; 1991 GC₆, 10, 2, 13; 1991 GP₇, 20, 4, 13; 1991 GR₇, 20, 4, 11; 1991 GD₈, 15, 3, 13; 1991 GF₉, 9, 2, 9; 1991 HK₄, 1, 0; 1991 JC₁₀, 10, 2, 9; 1991 JD₃, 3, 1, 0; 1991 LR₅, 5, 1, 0; 1991 LZ₉, 9, 2, 8; 1991 LF₁, 5, 1, 0; 1991 LJ₂, 13, 3, 13; 1991 LK₂, 10, 2, 13; 1991 LP₂, 18, 4, 14; 1991 NB₁, 5, 1, 0; 1991 NV₁, 9, 2, 13; 1991 NU₃, 5, 1, 0; 1991 NG₅, 9, 2, 13; 1991 PG₁, 5, 1, 0; 1991 PT₁, 12, 3, 13; 1991 PE₂, 14, 3, 13; 1991 PQ₂, 24, 5, 13; 1991 PE₃, 10, 2, 13; 1991 PF₅, 4, 1, 0; 1991 PL₃, 13, 3, 10; 1991 PX₆, 18, 4, 13; 1991 PG₇, 5, 1, 0; 1991 PT₁₀, 3, 1, 0; 1991 PW₁₁, 9, 2, 12; 1991 PF₁₂, 9, 2, 2; 1991 PL₁₃, 15, 3, 12; 1991 PM₁₃, 4, 1, 0; 1991 PT₁₄, 14, 3, 13; 1991 PZ₁₄, 4,

1, 0; 1991 PV₁₇, 4, 1, 0; 1991 PH₁₈, 5, 1, 0; 1991 PO₁₈, 4, 1, 0; 1991 PY₁₈, 5, 1, 0; 1991 RA₃, 1, 0; 1991 RC₂, 5, 1, 0; 1991 RV₂, 3, 1, 0; 1991 RY₂, 10, 2, 31; 1991 RA₄, 18, 4, 12; 1991 RF₄, 12, 3, 7; 1991 RN₄, 4, 1, 0; 1991 RC₆, 5, 1, 0; 1991 RS₈, 4, 1, 0; 1991 RU₈, 12, 3, 13; 1991 RQ₉, 11, 3, 13; 1991 RX₁₀, 4, 1, 0; 1991 RZ₁₁, 3, 1, 0; 1991 RR₁₂, 5, 1, 0; 1991 RW₁₂, 14, 3, 13; 1991 RG₁₄, 5, 1, 0; 1991 RH₁₄, 3, 1, 0; 1991 RE₁₅, 4, 1, 0; 1991 RK₁₅, 5, 1, 0; 1991 RG₁₇, 4, 1, 0; 1991 RV₁₇, 10, 2, 2; 1991 RX₁₇, 5, 1, 0; 1991 RB₁₉, 3, 1, 0; 1991 RW₂₁, 5, 1, 0; 1991 RB₂₄, 9, 2, 13; 1991 RT₂₆, 4, 1, 0; 1991 RM₂₉, 5, 1, 0; 1991 SB₈, 8, 2, 14; 1991 SZ₁₅, 3, 13; 1991 SR₁, 3, 1, 0; 1991 TK₁₀, 2, 2; 1991 TE₁, 5, 1, 0; 1991 TV₁, 5, 1, 0; 1991 TC₂, 10, 2, 8; 1991 TG₂, 5, 1, 0; 1991 TQ₂, 4, 1, 0; 1991 TH₃, 8, 2, 7; 1991 TB₆, 5, 1, 0; 1991 TF₁₄, 5, 1, 0; 1991 TM₁₄, 15, 3, 12; 1991 UA₁₅, 3, 12; 1991 UN₁, 5, 1, 0; 1991 UE₂, 12, 3, 11; 1991 UJ₂, 5, 1, 0; 1991 UQ₂, 3, 1, 0; 1991 UD₃, 15, 3, 10; 1991 US₃, 4, 1, 0; 1991 UY₃, 15, 3, 14; 1991 VT₅, 5, 1, 0; 1991 VY₄, 1, 0; 1991 VD₁, 15, 3, 12; 1991 VJ₁, 4, 1, 0; 1991 VE₂, 13, 3, 12; 1991 VA₃, 4, 1, 0; 1991 VC₃, 15, 3, 59; 1991 VE₃, 5, 1, 0; 1991 VN₃, 3, 1, 0; 1991 VO₃, 4, 1, 0; 1991 VT₃, 5, 1, 0; 1991 VW₄, 5, 1, 0; 1991 VB₅, 8, 2, 1; 1991 VM₅, 3, 1, 0; 1991 VT₅, 5, 1, 0; 1991 VU₅, 3, 1, 0; 1991 VH₆, 3, 1, 0; 1991 VP₁₂, 15, 3, 13; 1991 WD₅, 5, 1, 0; 1991 XD₁₀, 10, 2, 12; 1991 YC₅, 5, 1, 0; 1991 YT₅, 5, 1, 0; 1991 YU₃, 3, 1, 0; 1991 YE₁, 5, 1, 0; 1992 AJ₁, 5, 1, 0; 1992 AV₁, 4, 1, 0; 1992 BD₅, 5, 1, 0; 1992 BP₂, 4, 1, 0; 1992 BQ₂, 3, 1, 0; 1992 BT₂, 5, 1, 0; 1992 CH₅, 5, 1, 0; 1992 DD₃, 10, 2, 13; 1992 DE₄, 15, 3, 13; 1992 DU₇, 4, 1, 0; 1992 DY₇, 9, 2, 3; 1992 EO₉, 2, 10; 1992 EO₆, 14, 3, 13; 1992 ES₆, 5, 1, 0; 1992 EZ₇, 10, 2, 1; 1992 EM₈, 5, 1, 0; 1992 EX₉, 5, 1, 0; 1992 EX₁₀, 9, 2, 10; 1992 EZ₁₁, 4, 1, 0; 1992 EN₁₂, 5, 1, 0; 1992 EE₁₄, 5, 1, 0; 1992 ET₁₄, 9, 2, 11; 1992 EW₁₆, 5, 1, 0; 1992 EU₃₀, 18, 4, 13; 1992 EE₃₂, 3, 1, 0; 1992 EV₃₂, 9, 2, 4; 1992 FA₂, 19, 4, 14; 1992 GA₅, 1, 0; 1992 GM₂, 13, 3, 7; 1992 HG₁₃, 13, 11; 1992 HH₁, 10, 2, 2; 1992 JU₂, 22, 5, 12; 1992 OJ₁, 5, 1, 0; 1992 OB₃, 5, 1, 0; 1992 OL₃, 5, 1, 0; 1992 OM₆, 8, 2, 10; 1992 PC₅, 5, 1, 0; 1992 PF₁₇, 17, 4, 13; 1992 PH₁, 5, 1, 0; 1992 PK₁, 5, 1, 0; 1992 PZ₁, 5, 1, 0; 1992 PA₂, 5, 1, 0; 1992 PK₂, 23, 4, 8; 1992 PL₂, 5, 1, 0; 1992 PM₂, 10, 2, 8; 1992 PO₂, 9, 2, 7; 1992 PV₂, 4, 1, 0; 1992 PC₃, 4, 1, 0; 1992 PE₃, 29, 6, 12; 1992 QT₅, 1, 0; 1992 QW₅, 5, 1, 0; 1992 QG₁, 14, 3, 503; 1992 RN₅, 5, 1, 0; 1992 RU₅, 5, 1, 0; 1992 RX₁₄, 13, 13; 1992 RW₂, 5, 1, 0; 1992 RL₃, 3, 1, 0; 1992 RS₃, 24, 5, 11; 1992 RV₃, 3, 1, 0; 1992 RH₇, 27, 6, 12; 1992 SO₁₀, 10, 2, 11; 1992 SQ₄, 4, 1, 0; 1992 SQ₁, 8, 2, 2; 1992 ST₂, 5, 1, 0; 1992 SY₁₂, 15, 3, 9; 1992 SB₁₃, 20, 4, 12; 1992 SG₁₃, 14, 3, 9; 1992 SW₁₄, 4, 1, 0; 1992 SS₁₆, 4, 1, 0; 1992 SA₁₇, 14, 3, 7; 1992 SY₁₇, 9, 2, 12; 1992 SQ₂₃, 20, 4, 13; 1992 SR₂₃, 4, 1, 0; 1992 SM₂₆, 5, 1, 0; 1992 UH₁, 5, 1, 0; 1992 US₁, 28, 6, 12; 1992 UL₂, 5, 1, 0; 1992 UR₂, 5, 1, 0; 1992 UT₂, 15, 3, 12; 1992 UW₂, 24, 5, 13; 1992 UX₂, 9, 2, 13; 1992 UJ₅, 5, 1, 0; 1992 UG₅, 15, 3, 12; 1992 UA₆, 7, 2, 2; 1992 UE₆, 5, 1, 0; 1992 UH₆, 5, 1, 0; 1992 UJ₆, 5, 1, 0; 1992 UK₈, 20, 4, 12; 1992 UR₈, 15, 3, 12; 1992 WM₅, 5, 1, 0; 1992 WR₂₄, 24, 5, 12; 1992 WZ₁₉, 3, 13; 1992 WD₁, 8, 2, 7; 1992 WY₁, 15, 3, 14; 1992 WJ₂, 15, 3, 13; 1992 WD₃, 5, 1, 0; 1992 WJ₃, 5, 1, 0; 1992 WO₃, 5, 1, 0; 1992 WV₃, 5, 1, 0; 1992 WX₃, 15, 3, 12; 1992 XE₅, 5, 1, 0; 1992 XK₁₃, 3, 8; 1992 YK₅, 5, 1, 0; 1992 YW₁, 4, 1, 0; 1992 YJ₂, 5, 1, 0; 1992 YR₂, 10, 2, 8; 1993 BP₃, 5, 1, 0; 1993 BN₄, 10, 2, 2; 1993 BE₅, 5, 1, 0; 1993 BL₁₂, 3, 1, 0; 1993 CB₄, 4, 1, 0; 1993 CK₁, 13, 3, 6; 1993 DM₄, 4, 1, 0; 1993 DT₁, 9, 3, 11; 1993 EU₅, 5, 1, 0; 1993 FB₁, 24, 5, 13; 1993 FV₁, 9, 2, 18; 1993 FQ₂, 3, 1, 0; 1993 FR₅, 15, 3, 58; 1993 FM₆, 5, 1, 0; 1993 FO₇, 5, 1, 0; 1993 FT₇, 3, 1, 0; 1993 FT₈, 9, 2, 14; 1993 FB₁₀, 9, 2, 1; 1993 FP₁₀, 5, 1, 0; 1993 FU₁₁, 10, 2, 12; 1993 FV₁₁, 5,

12; 1994 PR₁₄, 4, 1, 0; 1994 PG₁₈, 5, 1, 0; 1994 PU₁₈, 10, 2, 2; 1994 PG₂₂, 5, 1, 0; 1994 PH₂₂, 9, 2, 2; 1994 PN₂₂, 4, 1, 0; 1994 PX₂₂, 5, 1, 0; 1994 PL₂₃, 5, 1, 0; 1994 PC₂₉, 5, 1, 0; 1994 PH₂₉, 10, 2, 9; 1994 PH₃₀, 5, 1, 0; 1994 PT₃₁, 12, 3, 14; 1994 PL₃₄, 5, 1, 0; 1994 QA₁, 5, 1, 0; 1994 RV, 4, 1, 0; 1994 RY₁, 3, 1, 0; 1994 RL₇, 14, 3, 12; 1994 RN₇, 10, 2, 12; 1994 RR₁₁, 20, 4, 14; 1994 SO₅, 14, 3, 13; 1994 SH₀, 10, 3, 4; 1994 TZ, 4, 1, 0; 1994 TF₁, 3, 1, 0; 1994 TC₂, 5, 1, 0; 1994 UO, 15, 3, 13; 1994 UZ₁, 20, 4, 13; 1994 UK₅, 20, 4, 13; 1994 UT₁₁, 5, 1, 0; 1994 VM₁, 5, 1, 0; 1994 VS₁, 9, 2, 9; 1994 VX₁, 19, 4, 11; 1994 VW₂, 4, 1, 0; 1994 VT₆, 22, 5, 13; 1994 VD₇, 5, 1, 0; 1994 WU, 5, 1, 0; 1994 WB₁, 5, 1, 0; 1994 WF₁, 10, 2, 7; 1994 WE₂, 5, 1, 0; 1994 WW₂, 4, 1, 0; 1994 XM₂, 4, 1, 0; 1994 YG, 18, 4, 11; 1994 YA₁, 5, 1, 0; 1994 YC₁, 20, 4, 14; 1995 AF, 3, 1, 0; 1995 BD, 5, 1, 0; 1995 BL, 5, 1, 0; 1995 BQ, 20, 4, 13; 1995 BT, 5, 1, 0; 1995 BX, 5, 1, 0; 1995 CG, 5, 1, 0; 1995 CD₂, 4, 1, 0; 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3, 12; 1997 AN₅, 4, 1, 0; 1997 AO₅, 4, 1, 0; 1997 AX₅, 5, 1, 0; 1997 AZ₅, 4, 1, 0; 1997 AB₆, 3, 1, 0; 1997 AR₆, 3, 1, 0; 1997 AW₆, 4, 1, 0; 1997 AB₇, 18, 3, 13; 1997 AJ₇, 14, 3, 13; 1997 AL₇, 10, 2, 13; 1997 AM₇, 4, 1, 0; 1997 AG₈, 9, 2, 2; 1997 AH₈, 5, 1, 0; 1997 AU₉, 4, 1, 0; 1997 AA₁₀, 18, 4, 13; 1997 AD₁₀, 10, 2, 13; 1997 AM₁₁, 5, 1, 0; 1997 AS₁₂, 4, 1, 0; 1997 AB₁₃, 18, 4, 13; 1997 AC₁₃, 10, 2, 11; 1997 AD₁₃, 5, 1, 0; 1997 AF₁₃, 3, 1, 0; 1997 AG₁₃, 10, 2, 9; 1997 AJ₁₃, 5, 1, 0; 1997 AT₁₃, 3, 1, 0; 1997 AQ₁₅, 20, 4, 14; 1997 AR₁₆, 4, 1, 0; 1997 AN₁₇, 5, 1, 0; 1997 AR₁₇, 10, 2, 9; 1997 AU₁₇, 4, 1, 0; 1997 AW₁₇, 11, 3, 2; 1997 AX₁₇, 5, 1, 0; 1997 AZ₁₇, 19, 4, 13; 1997 AB₁₈, 4, 1, 0; 1997 AE₁₈, 5, 1, 0; 1997 AT₂₀, 4, 1, 0; 1997 AR₂₂, 26, 5, 13; 1997 BZ, 5, 1, 0; 1997 BP₁, 18, 4, 11; 1997 BX₂, 5, 1, 0; 1997 BZ₂, 5, 1, 0; 1997 BA₃, 3, 1, 0; 1997 BO₃, 5, 1, 0; 1997 BP₃, 5, 1, 0; 1997 BS₆, 5, 1, 0; 1997 BC₉, 5, 1, 0; 1997 BN₉, 4, 1, 0; 1997 CW, 15, 3, 13; 1997 CG₁, 8, 2, 3; 1997 CH₁, 5, 1, 0; 1997 CK₁, 4, 1, 0; 1997 CW₁, 5, 1, 0; 1997 CV₄, 4, 1, 0; 1997 CZ₅, 3, 1, 0; 1997 CZ₆, 19, 4, 13; 1997 CE₈, 5, 1, 0; 1997 CF₉, 9, 2, 7; 1997 CW₁₁, 9, 2, 1; 1997 CN₁₃, 5, 1, 0; 1997 CZ₁₄, 15, 3, 13; 1997 CM₁₉, 10, 2, 13; 1997 CP₁₉, 4, 1, 0; 1997 CV₁₉, 5, 1, 0; 1997 CZ₁₉, 8, 2, 13; 1997 CC₂₀, 8, 2, 10; 1997 CR₂₁, 7, 2, 10; 1997 CA₂₂, 4, 1, 0; 1997 CK₂₆, 13, 3, 7; 1997 CY₂₇, 4, 1, 0; 1997 CF₂₉, 5, 1, 0; 1997 CK₂₉, 15, 3, 12; 1997 DQ, 5, 1, 0; 1997 EJ, 5, 1, 0; 1997 EK, 5, 1, 0; 1997 EL, 5, 1, 0; 1997 EM, 9, 2, 8; 1997 EV, 9, 2, 52; 1997 EQ₂, 5, 1, 0; 1997 ER₂, 13, 3, 13; 1997 EU₂, 15, 3, 13; 1997 EN₄, 4, 1, 0; 1997 EK₆, 5, 1, 0; 1997 EG₇, 5, 1, 0; 1997 EO₇, 5, 1, 0; 1997 EX₇, 13, 3, 11; 1997 EL₁₁, 5, 1, 0; 1997 EX₁₃, 25, 5, 13; 1997 EY₂₀, 20, 4, 14; 1997 EE₂₃, 5, 1, 0; 1997 EX₂₅, 14, 3, 13; 1997 ER₂₆, 7, 2, 4; 1997 EL₂₈, 7, 2, 7; 1997 EQ₃₀, 5, 1, 0; 1997 ER₃₁, 13, 3, 6; 1997 EN₃₂, 8, 2, 3; 1997 EA₃₄, 7, 2, 7; 1997 EK₃₅, 4, 1, 0; 1997 EA₃₆, 4, 1, 0; 1997 EM₃₆, 5, 1, 0; 1997 EW₄₅, 7, 2, 13; 1997 EY₄₅, 10, 1, 0; 1997 EH₄₆, 5, 1, 0; 1997 EW₄₇, 5, 1, 0; 1997 FG₁, 5, 1, 0; 1997 FW₁, 9, 2, 9; 1997 FU₂, 5, 1, 0; 1997 FC₃, 17, 4, 6; 1997 FG₃, 9, 2, 10; 1997 FK₃, 5, 1, 0; 1997 FO₃, 10, 2, 2; 1997 FZ₃, 10, 2, 8; 1997 FB₄, 9, 2, 10; 1997 FG₄, 13, 3, 496; 1997 FJ₄, 3, 1, 0; 1997 FA₅, 5, 1, 0; 1997 GH₁, 5, 1, 0; 1997 GO₁, 5, 1, 0; 1997 GR₄, 3, 1, 0; 1997 GR₅, 13, 3, 13; 1997 GP₆, 4, 1, 0; 1997 GQ₇, 14, 3, 13; 1997 GB₈, 12, 3, 5; 1997 GJ₈, 5, 1, 0; 1997 GK₈, 5, 1, 0; 1997 GF₉, 11, 3, 12; 1997 GM₁₁, 5, 1, 0; 1997 GM₁₃, 5, 1, 0; 1997 GD₁₅, 15, 3, 13; 1997 GK₁₆, 14, 3, 14; 1997 GF₁₇, 5, 1, 0; 1997 GL₁₇, 10, 2, 11; 1997 GX₁₈, 5, 1, 0; 1997 GN₁₉, 5, 1, 0; 1997 GL₂₁, 19, 4, 456; 1997 GC₂₂, 15, 3, 13; 1997 GL₂₂, 3, 1, 0; 1997 GN₂₂, 18, 4, 12; 1997 GQ₂₂, 25, 5, 13; 1997 GT₂₂, 25, 5, 13; 1997 GB₂₃, 10, 2, 9; 1997 GQ₂₃, 14, 3, 13; 1997 GH₂₇, 18, 4, 12; 1997 GK₃₃, 8, 2, 7; 1997 GP₃₃, 13, 3, 12; 1997 GB₃₅, 5, 1, 0; 1997 GP₃₆, 24, 5, 13; 1997 GR₃₆, 15, 3, 13; 1997 GQ₄₁, 5, 1, 0; 1997 HO₁, 14, 3, 7; 1997 HS₃, 4, 1, 0; 1997 HY₆, 12, 3, 11; 1997 HP₈, 5, 1, 0; 1997 HX₈, 2, 1, 0; 1997 HP₁₁, 15, 3, 12; 1997 HK₁₆, 7, 2, 3; 1997 JU₃, 8, 2, 3; 1997 JE₁₀, 14, 2, 1; 1997 JN₁₂, 24, 5, 13; 1997 JD₁₄, 3, 1, 0; 1997 JB₁₅, 4, 1, 0; 1997 JE₁₅, 15, 3, 13; 1997 JM₁₅, 11, 3, 14; 1997 JT₁₅, 14, 3, 13; 1997 JP₁₆, 25, 3, 4; 1997 JT₁₆, 5, 1, 0; 1997 JW₁₈, 10, 2, 4; 1997 KU₂, 10, 2, 1; 1997 KH₄, 5, 1, 0; 1997 LU₁, 5, 1, 0; 1997 LH₄, 4, 1, 0; 1997 MR, 14, 3, 13; 1997 MG₁, 5, 1, 0; 1997 MC₃, 5, 1, 0; 1997 NQ₂, 5, 1, 0; 1997 PM₁, 4, 1, 0; 1997 PL₅, 4, 1, 0; 1997 QU₁, 3, 1, 0; 1997 QD₂, 5, 1, 0; 1997 SR₈, 3, 1, 0; 1997 SJ₂₅, 3, 1, 0; 1997 UF₉, 10, 2, 1; 1997 UC₂₂, 5, 1, 0; 1997 VG₁, 11, 3, 13; 1997 XH, 3, 1, 0; 1998 AV₉, 15, 3, 6; 1998 BF₈, 3, 1, 0; 1998 BH₂₆, 5, 1, 0; 1998 BQ₃₃, 5, 1, 0; 1998 BL₃₉, 3, 1, 0; 1998 CC₃, 3, 1, 0; 1998 CK₃, 3, 1, 0; 1998 CO₃, 14, 3, 9; 1998 DU, 4, 1, 0; 1998 DR₅, 4, 1, 0; 1998 DT₇, 6, 2, 7; 1998 DT₉, 9, 2, 2; 1998 DH₁₁, 5, 1, 0; 1998 DM₁₃, 4, 1, 0; 1998 DZ₁₃, 12, 3, 12; 1998 DD₁₈, 5, 1, 0; 1998 DG₂₀, 3, 1, 0; 1998 DJ₂₀, 4, 1, 0; 1998 DB₃₄, 3, 1, 0; 1998 DT₃₄, 15, 4, 10; 1998 DC₃₅, 3, 1, 0; 1998 DB₃₆, 9, 3, 10; 1998 ED, 5, 1, 0; 1998 EJ₂, 6, 2, 5; 1998 EW₂, 3, 1, 0; 1998 EP₃, 9, 2, 4; 1998 EE₈, 3, 1, 0; 1998 EK₈, 3, 1, 0; 1998 EA₉, 3, 1, 0; 1998 EC₉, 4, 1, 0; 1998 EB₁₀, 5, 1, 0; 1998 EE₁₀, 20,

1998 FZ₉₉, 5, 1, 0; 1998 FW₁₀₂, 4, 1, 0; 1998 FJ₁₀₃, 10, 2, 9; 1998 FD₁₀₄, 3, 1, 0; 1998 FG₁₀₄, 7, 1, 0; 1998 FH₁₀₄, 4, 1, 0; 1998 FJ₁₀₅, 3, 1, 0; 1998 FK₁₀₆, 12, 3, 11; 1998 FG₁₀₇, 4, 1, 0; 1998 FZ₁₀₉, 5, 1, 0; 1998 FT₁₁₀, 5, 1, 0; 1998 FB₁₁₁, 4, 1, 0; 1998 FE₁₁₂, 5, 1, 0; 1998 FR₁₁₃, 3, 1, 0; 1998 FZ₁₁₃, 9, 2, 10; 1998 FA₁₁₄, 3, 1, 0; 1998 FB₁₁₄, 3, 1, 0; 1998 FD₁₁₄, 3, 1, 0; 1998 FJ₁₁₄, 5, 1, 0; 1998 FX₁₁₄, 4, 1, 0; 1998 FK₁₁₅, 8, 2, 10; 1998 FB₁₁₆, 5, 1, 0; 1998 FG₁₁₆, 3, 1, 0; 1998 FB₁₁₇, 7, 2, 7; 1998 FC₁₁₇, 15, 3, 11; 1998 FD₁₁₇, 4, 1, 0; 1998 FG₁₁₇, 4, 1, 0; 1998 FY₁₁₇, 10, 2, 13; 1998 FC₁₁₈, 5, 1, 0; 1998 FE₁₁₈, 4, 1, 0; 1998 FN₁₁₈, 5, 1, 0; 1998 FU₁₂₀, 9, 2, 553; 1998 FM₁₂₁, 15, 3, 9; 1998 FQ₁₂₁, 18, 4, 12; 1998 FT₁₂₁, 14, 3, 10; 1998 FE₁₂₅, 5, 1, 0; 1998 FX₁₂₅, 3, 1, 0; 1998 FN₁₂₆, 5, 1, 0; 1998 FQ₁₃₃, 8, 2, 7; 1998 FQ₁₄₃, 19, 4, 530; 1998 FC₁₄₄, 15, 3, 11; 1998 FX₁₄₄ *, 10, 2, 9; 1998 FY₁₄₄ *, 12, 3, 26; 1998 GF₁₄, 3, 12; 1998 GK₅, 5, 1, 0; 1998 GO₁, 4, 1, 0; 1998 GE₇, 5, 1, 0; 1998 GH₈, 5, 1, 0; 1998 GE₉, 5, 1, 0; 1998 GO₁₀, 15, 3, 594; 1998 HN₁, 10, 2, 10; 1998 HX₁₂, 19, 4, 107; 1998 HF₃, 3, 1, 0; 1998 HH₄, 5, 1, 0; 1998 HO₅, 4, 1, 0; 1998 HW₇, 18, 4, 14; 1998 HD₈, 8, 2, 9; 1998 HE₈, 5, 1, 0; 1998 HA₁₃, 3, 1, 0; 1998 HW₁₃, 8, 2, 9; 1998 HQ₁₉, 20, 4, 12; 1998 HS₁₉, 3, 1, 0; 1998 HC₂₀, 14, 3, 13; 1998 HE₂₀, 5, 1, 0; 1998 HE₂₁, 4, 1, 0; 1998 HN₂₁, 3, 1, 0; 1998 HG₂₃, 4, 1, 0; 1998 HQ₂₃, 8, 2, 13; 1998 HS₂₃, 9, 2, 3; 1998 HT₂₃, 4, 1, 0; 1998 HM₂₆, 15, 3, 11; 1998 HQ₂₇, 19, 4, 12; 1998 HR₂₇, 5, 1, 0; 1998 HX₂₉, 9, 2, 4; 1998 HF₃₀, 14, 3, 11; 1998 HY₃₁, 10, 2, 12; 1998 HS₃₂, 3, 1, 0; 1998 HU₃₂, 19, 4, 12; 1998 HK₃₃, 10, 2, 11; 1998 HO₃₃, 15, 3, 12; 1998 HD₃₅, 9, 2, 531; 1998 HY₃₅, 9, 2, 12; 1998 HC₃₆, 9, 2, 4; 1998 HK₃₆, 24, 5, 12; 1998 HB₃₈, 5, 1, 0; 1998 HE₃₈, 18, 4, 12; 1998 HN₃₈, 15, 3, 10; 1998 HO₃₈, 20, 4, 12; 1998 HS₄₂, 3, 1, 0; 1998 HT₄₂, 14, 3, 11; 1998 HE₄₃, 5, 1, 0; 1998 HU₄₃, 9, 2, 3; 1998 HQ₄₄, 10, 2, 4; 1998 HW₄₄, 3, 1, 0; 1998 HB₄₅, 14, 3, 12; 1998 HK₄₅, 5, 1, 0; 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1998 HW₉₆, 5, 1, 0; 1998 HD₉₇, 5, 1, 0; 1998 HQ₉₇, 5, 1, 0; 1998 HV₉₇, 5, 1, 0; 1998 HA₉₈, 10, 2, 12; 1998 HB₉₉, 9, 2, 10; 1998 HC₉₉, 9, 2, 9; 1998 HH₉₉, 15, 3, 13; 1998 HL₉₉, 15, 3, 12; 1998 HM₁₀₀, 14, 3, 12; 1998 HQ₁₀₀, 14, 3, 12; 1998 HJ₁₀₁, 8, 1, 0; 1998 HV₁₀₁, 10, 2, 12; 1998 HW₁₀₁, 25, 5, 11; 1998 HO₁₀₂, 10, 2, 8; 1998 HG₁₀₃, 9, 2, 14; 1998 HT₁₀₇, 3, 1, 0; 1998 HH₁₁₄, 4, 1, 0; 1998 HO₁₁₇, 5, 1, 0; 1998 HC₁₁₈, 5, 1, 0; 1998 HW₁₁₈, 5, 1, 0; 1998 HN₁₁₉, 5, 1, 0; 1998 HF₁₂₁, 5, 1, 0; 1998 HE₁₂₃, 5, 1, 0; 1998 HK₁₂₄, 11, 2, 1; 1998 HG₁₂₅, 4, 1, 0; 1998 HD₁₂₉, 4, 1, 0; 1998 HV₁₄₃, 8, 2, 7; 1998 HH₁₄₇, 8, 2, 1; 1998 HT₁₄₇, 5, 1, 0; 1998 HZ₁₄₇, 10, 3, 8; 1998 HO₁₄₈, 14, 3, 13; 1998 HU₁₄₉, 9, 2, 2; 1998 HT₁₅₀, 3, 1, 0; 1998 HU₁₅₁ *, 9, 2, 9; 1998 HV₁₅₁ *, 8, 2, 9; 1998 HW₁₅₁ *, 8, 2, 30; 1998 JQ₅, 5, 1, 0; 1998 JT₁₄, 3, 13; 1998 JW₅, 1, 0; 1998 JH₁, 5, 1, 0; 1998 JJ₁, 14, 3, 13; 1998 JQ₁, 4, 1, 0; 1998 JY₁, 4, 1, 0; 1998 JY₁, 5, 1, 0; 1998 JZ₁, 4, 1, 0; 1998 JA₂, 27, 5, 12; 1998 JD₂, 9, 1, 0; 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1998 KL₃₅, 5, 1, 0; 1998 KM₃₅, 4, 1, 0; 1998 KS₃₅, 13, 3, 7; 1998 KT₃₆, 15, 3, 12; 1998 KE₃₇, 13, 3, 13; 1998 KL₃₇, 19, 4, 10; 1998 KM₃₇, 9, 2, 10; 1998 KV₃₇, 5, 1, 0; 1998 KK₃₈, 4, 1, 0; 1998 KN₃₈, 3, 1, 0; 1998 KZ₃₈, 5, 1, 0; 1998 KM₃₉, 16, 4, 13; 1998 KE₄₀, 5, 1, 0; 1998 KF₄₀, 5, 1, 0; 1998 KG₄₁, 9, 2, 8; 1998 KM₄₁, 9, 2, 11; 1998 KP₄₁, 9, 2, 13; 1998 KR₄₂, 3, 1, 0; 1998 KD₄₄, 9, 2, 12; 1998 KQ₄₄, 10, 2, 8; 1998 KR₄₄, 8, 2, 13; 1998 KT₄₄, 15, 3, 13; 1998 KV₄₄, 4, 1, 0; 1998 KH₄₅, 5, 1, 0; 1998 KM₄₆, 15, 3, 12; 1998 KO₄₆, 3, 1, 0; 1998 KW₄₆, 5, 1, 0; 1998 KX₄₆, 4, 1, 0; 1998 KZ₄₆, 10, 2, 1; 1998 KH₄₇, 5, 1, 0; 1998 KJ₄₇, 13, 3, 6; 1998 KR₄₇, 5, 1, 0; 1998 KV₄₇, 5, 1, 0; 1998 KW₄₇, 25, 5, 11; 1998 KX₄₇, 4, 1, 0; 1998 KZ₄₇, 5, 1, 0; 1998 KE₄₈, 15, 3, 13; 1998 KV₅₀, 10, 2, 11; 1998 KB₅₁, 8, 2, 9; 1998 KF₅₁, 5, 1, 0; 1998 KG₅₁, 5, 1, 0; 1998 KQ₅₁, 3, 1, 0; 1998 KS₅₁, 5, 1, 0; 1998 KW₅₁, 4, 1, 0; 1998 KL₅₂, 9, 2, 8; 1998 KQ₅₃, 5, 1, 0; 1998 KA₅₄, 4, 1, 0; 1998 KJ₅₄, 4, 1, 0; 1998 KP₅₄, 5, 1, 0; 1998 KR₅₄, 4, 1, 0; 1998 KW₅₄, 4, 1, 0; 1998 KB₅₅, 4, 1, 0; 1998 KU₅₅, 5, 1, 0; 1998 KC₅₆, 5, 1, 0; 1998 KL₅₈, 19, 4, 532; 1998 KM₆₁, 4, 1, 0; 1998 KG₆₄, 5, 1, 0; 1998 KL₆₅, 25, 5, 13; 1998 KH₆₆ *, 8, 2, 24; 1998 LA₅, 1, 0; 1998 LW₉, 2, 33; 1998 LN₂, 3, 1, 0; 1998 LB₃, 10, 2, 6; 1998 LH₃ *, 9, 2, 21; 1998 MC₁₇, 4, 62; 1998 MF₃, 10, 2, 2; 1998 MH₃, 3, 1, 0; 1998 MA₅, 9, 2, 2; 1998 MA₈, 5, 1, 0; 1998 MF₈, 8, 2, 11; 1998 MN₁₆, 4, 1, 0; 1998 MZ₂₃,

5, 1, 0; 1998 MS₂₉, 3, 1, 0; 1998 MY₂₉, 5, 1, 0; 1998 MZ₃₀, 5, 1, 0; 1998 MJ₃₁, 14, 3, 431; 1998 MF₃₂, 5, 1, 0; 1998 MT₃₂, 20, 4, 14; 1998 MD₃₃, 5, 1, 0; 1998 MR₃₃, 9, 2, 12; 1998 MT₃₄, 13, 3, 8; 1998 MW₃₄, 18, 4, 14; 1998 MR₃₅, 10, 2, 8; 1998 MX₃₅, 4, 1, 0; 1998 MF₃₇, 3, 1, 0; 1998 MK₃₇, 5, 1, 0; 1998 ML₃₇, 5, 1, 0; 1998 MB₃₈, 5, 1, 0; 1998 MC₄₅, 9, 2, 12; 1998 MJ₄₇, 4, 1, 0; 1998 MK₄₈ *, 7, 2, 6; 1998 ML₄₈ *, 13, 3, 32; 1998 NA₅, 5, 1, 0; 1998 OJ₃, 1, 0; 1998 OQ₁₈, 3, 12; 1998 OP₂, 10, 2, 13; 1998 OW₅, 5, 1, 0; 1998 OZ₅, 15, 3, 14; 1998 OH₆, 10, 2, 9; 1998 OZ₆, 4, 1, 0; 1998 OE₇, 4, 1, 0; 1998 OU₉, 24, 5, 13; 1998 OW₁₁, 5, 1, 0; 1998 OV₁₂, 10, 2, 13; 1998 ON₁₃, 5, 1, 0; 1998 OB₁₄, 5, 1, 0; 1998 OZ₁₄, 5, 1, 0; 1998 PQ₈, 2, 8; 1998 PA₁, 28, 6, 14; 1998 PD₁, 10, 2, 5; 1998 PN₁, 15, 3, 13; 1998 PO₁, 5, 1, 0; 1998 QT₄, 4, 1, 0; 1998 QW₅, 1, 0; 1998 QN₁, 19, 4, 14; 1998 QA₂, 5, 1, 0; 1998 QU₂, 5, 1, 0; 1998 QE₄, 4, 1, 0; 1998 QO₄, 4, 1, 0; 1998 QM₅, 10, 2, 13; 1998 QT₅, 4, 1, 0; 1998 QV₇, 10, 2, 13; 1998 QQ₈, 5, 1, 0; 1998 QT₈, 5, 1, 0; 1998 QM₉, 12, 3, 14; 1998 QX₉, 10, 2, 2; 1998 QR₁₀, 25, 5, 13; 1998 QS₁₁, 4, 1, 0; 1998 QZ₁₁, 4, 1, 0; 1998 QT₁₂, 4, 1, 0; 1998 QU₁₃, 4, 1, 0; 1998 QJ₁₆, 5, 1, 0; 1998 QM₁₆, 5, 1, 0; 1998 QP₁₆, 5, 1, 0; 1998 QT₁₆, 3, 1, 0; 1998 QF₁₇, 4, 1, 0; 1998 QL₁₈, 5, 1, 0; 1998 QT₁₉, 5, 1, 0; 1998 QV₁₉, 4, 1, 0; 1998 QY₁₉, 4, 1, 0; 1998 QM₂₀, 10, 2, 1; 1998 QJ₂₁, 20, 4, 14; 1998 QX₂₁, 5, 1, 0; 1998 QL₂₂, 9, 2, 2; 1998 QV₂₂, 23, 5, 13; 1998 QW₂₂, 5, 1, 0; 1998 QE₂₃, 5, 1, 0; 1998 QP₂₃, 5, 1, 0; 1998 QJ₂₅, 4, 1, 0; 1998 QM₂₅, 12, 3, 13; 1998 QN₂₅, 5, 1, 0; 1998 QA₂₆, 4, 1, 0; 1998 QF₂₆, 4, 1, 0; 1998 QK₂₆, 5, 1, 0; 1998 QO₂₆, 15, 3, 13; 1998 QL₃₀, 4, 1, 0; 1998 QR₃₀, 5, 1, 0; 1998 QY₃₀, 7, 2, 13; 1998 QV₃₂, 4, 1, 0; 1998 QL₃₃, 5, 1, 0; 1998 QL₃₄, 10, 2, 2; 1998 QM₃₄, 5, 1, 0; 1998 QV₃₄, 3, 1, 0; 1998 QW₃₄, 5, 1, 0; 1998 QX₃₅, 13, 3, 13; 1998 QL₃₇, 5, 1, 0; 1998 QW₃₇, 5, 1, 0; 1998 QK₃₈, 20, 4, 13; 1998 QQ₃₈, 4, 1, 0; 1998 QT₃₉, 5, 1, 0; 1998 QD₄₀, 7, 2, 2; 1998 QV₄₀, 9, 2, 2; 1998 QS₄₁, 15, 3, 14; 1998 QR₄₂, 5, 1, 0; 1998 QW₄₂, 13, 3, 8; 1998 QG₄₃, 5, 1, 0; 1998 QF₄₃, 5, 1, 0; 1998 QO₄₅, 5, 1, 0; 1998 QB₄₆, 4, 1, 0; 1998 QZ₄₆, 10, 1, 0; 1998 QA₄₇, 10, 2, 13; 1998 QP₄₇, 5, 1, 0; 1998 QG₄₈, 5, 1, 0; 1998 QF₄₉, 5, 1, 0; 1998 QO₅₀, 5, 1, 0; 1998 QU₅₀, 5, 1, 0; 1998 QE₅₂, 5, 1, 0; 1998 QH₅₂, 5, 1, 0; 1998 QK₅₃, 5, 1, 0; 1998 QW₅₃, 5, 1, 0; 1998 QE₅₄, 5, 1, 0; 1998 QO₅₄, 10, 2, 2; 1998 QY₅₄, 4, 1, 0; 1998 QS₅₅, 4, 1, 0; 1998 QV₆₃, 5, 1, 0; 1998 QB₆₉, 5, 1, 0; 1998 QJ₆₉, 10, 2, 12; 1998 QR₆₉, 15, 3, 12; 1998 QC₇₀, 5, 1, 0; 1998 QF₇₀, 4, 1, 0; 1998 QW₇₀, 3, 1, 0; 1998 QX₇₂, 3, 1, 0; 1998 QG₇₃, 20, 4, 14; 1998 QN₇₃, 5, 1, 0; 1998 QV₇₃, 5, 1, 0; 1998 QK₇₅, 5, 1, 0; 1998 QM₇₆, 15, 3, 14; 1998 QW₇₇, 5, 1, 0; 1998 QQ₈₄, 10, 2, 13; 1998 QW₈₅, 4, 1, 0; 1998 QG₈₆, 5, 1, 0; 1998 QN₈₆, 5, 1, 0; 1998 QW₉₅, 3, 1, 0; 1998 QB₉₆, 4, 1, 0; 1998 QA₉₈, 5, 1, 0; 1998 QE₉₉, 5, 1, 0; 1998 QO₉₉, 5, 1, 0; 1998 QQ₁₀₁, 5, 1, 0; 1998 QV₁₀₂, 5, 1, 0; 1998 QZ₁₀₂, 5, 1, 0; 1998 QF₁₀₄, 5, 1, 0; 1998 QO₁₀₄, 5, 1, 0; 1998 QO₁₀₅, 5, 1, 0; 1998 RM₅, 5, 1, 0; 1998 RP₅, 5, 1, 0; 1998 RY₅, 5, 1, 0; 1998 RK₆, 5, 1, 0; 1998 RX₁₂, 15, 3, 8; 1998 RN₁₃, 14, 3, 13; 1998 RU₁₅, 3, 1, 0; 1998 RP₂₈, 5, 1, 0; 1998 RO₃₁, 5, 1, 0; 1998 RX₃₂, 5, 1, 0; 1998 RN₃₅, 4, 1, 0; 1998 RO₃₈, 3, 1, 0; 1998 RW₃₈, 5, 1, 0; 1998 RK₄₇, 5, 1, 0; 1998 RJ₅₀, 3, 1, 0; 1998 RD₅₁, 5, 1, 0; 1998 RU₅₆, 4, 1, 0; 1998 RC₅₈, 15, 3, 14; 1998 RA₅₉, 4, 1, 0; 1998 RB₆₅, 15, 3, 7; 1998 RK₆₈, 5, 1, 0; 1998 RU₆₈, 4, 1, 0; 1998 RP₇₀, 20, 4, 14; 1998 RH₇₁, 5, 1, 0; 1998 RJ₇₂, 14, 3, 9; 1998 RW₇₅, 5, 1, 0; 1998 RH₇₆, 5, 1, 0; 1998 RB₇₇, 5, 1, 0; 1998 RQ₇₇, 9, 2, 2; 1998 RV₇₉, 10, 2, 2; 1998 RZ₇₉, 5, 1, 0; 1998 RB₈₀, 5, 1, 0; 1998 SK₁, 5, 1, 0; 1998 SH₄, 13, 3, 13; 1998 SV₅, 5, 1, 0; 1998 SQ₆, 8, 2, 2; 1998 SX₇, 20, 4, 13; 1998 SG₁₀, 5, 1, 0; 1998 SF₁₃, 5, 1, 0; 1998 SV₁₄, 4, 1, 0; 1998 SN₂₂, 4, 1, 0; 1998 SH₂₃, 4, 1, 0; 1998 SH₂₅, 5, 1, 0; 1998 SN₂₅, 5, 1, 0; 1998 SP₃₆, 5, 1, 0; 1998 SA₄₃, 5, 1, 0; 1998 SG₄₃, 5, 1, 0; 1998 SW₄₃, 8, 2, 2; 1998 SO₄₉, 3, 1, 0; 1998 SV₅₃, 9, 2, 13; 1998 SH₅₄, 4, 1

3; 1999 NF₄₉, 5, 1, 0; 1999 NK₄₉, 3, 1, 0; 1999 NZ₅₂, 4, 1, 0; 1999 NG₅₃, 5, 1, 0; 1999 NJ₅₃, 4, 1, 0; 1999 NJ₅₄, 3, 1, 0; 1999 NX₅₄, 4, 1, 0; 1999 NC₅₅, 4, 1, 0; 1999 NE₅₅, 4, 1, 0; 1999 NF₅₅, 5, 1, 0; 1999 NC₅₅, 5, 1, 0; 1999 NK₅₅, 4, 1, 0; 1999 NL₅₅, 4, 1, 0; 1999 NN₅₅, 3, 1, 0; 1999 NU₅₅, 5, 1, 0; 1999 NV₅₅, 5, 1, 0; 1999 NA₅₆, 5, 1, 0; 1999 ND₅₆, 5, 1, 0; 1999 NE₅₆, 5, 1, 0; 1999 NF₅₆, 5, 1, 0; 1999 NK₅₆, 5, 1, 0; 1999 NM₅₆, 10, 1, 0; 1999 NR₅₆, 4, 1, 0; 1999 NS₅₆, 8, 1, 0; 1999 NU₅₆, 9, 2, 2; 1999 NV₅₆, 5, 1, 0; 1999 NW₅₆, 5, 1, 0; 1999 NX₅₆, 13, 2, 1; 1999 NY₅₆, 5, 1, 0; 1999 NZ₅₆, 5, 1, 0; 1999 NA₅₇, 4, 1, 0; 1999 NB₅₇, 5, 1, 0; 1999 NC₅₇, 5, 1, 0; 1999 ND₅₇, 4, 1, 0; 1999 NF₅₇, 5, 1, 0; 1999 NH₅₇, 3, 1, 0; 1999 NR₅₉, 5, 1, 0; 1999 NJ₆₂, 3, 1, 0; 1999 OB₄, 1, 0; 1999 OC₈, 2, 3; 1999 OL₄, 1, 0; 1999 OO₃, 1, 0; 1999 OW₃, 1, 0; 1999 OB₁, 4, 1, 0; 1999 OZ₁, 9, 2, 1; 1999 OB₂, 4, 1, 0; 1999 OD₂, 5, 1, 0; 1999 OE₂, 5, 1, 0; 1999 OJ₂, 5, 1, 0; 1999 OL₂, 5, 1, 0; 1999 OW₂, 5, 1, 0; 1999 OB₃, 5, 1, 0; 1999 OG₃, 10, 2, 1; 1999 OH₃, 5, 1, 0; 1999 OJ₃, 20, 4, 13; 1999 OK₃, 4, 1, 0; 1999 OO₃, 5, 1, 0; 1999 OS₃, 4, 1, 0; 1999 PE₃, 3, 1, 0; 1999 PF₃, 3, 1, 0; 1999 PL₅, 1, 0; 1999 PV₄, 4, 1, 0; 1999 PY₄, 20, 4, 12; 1999 PZ₅, 1, 0; 1999 PB₁, 5, 1, 0; 1999 PC₁, 5, 1, 0; 1999 PR₁, 6, 2, 4; 1999 PX₁, 4, 1, 0; 1999 PA₂, 3, 1, 0; 1999 PN₃, 4, 1, 0; 1999 PB₄, 4, 1, 0; 1999 PT₄, 7, 2, 2; 1999 PB₅, 18, 4, 11; 1999 PS₅, 4, 1, 0; 1999 QA₅, 5, 1, 0; 1999 QC₃, 3, 1, 0; 1999 QJ₄, 4, 1, 0; 1999 QT₁, 3, 1, 0; 1999 QU₁, 5, 1, 0; 1999 QV₁, 5, 1, 0; 1999 QZ₁, 10, 2, 3; 1999 QA₂, 3, 1, 0; 1999 QB₂, 5, 1, 0; 1999 QL₂, 4, 1, 0; 1999 RA₅, 5, 1, 0; 1999 RB₄, 4, 1, 0; 1999 RC₅, 5, 1, 0; 1999 RM₅, 5, 1, 0; 1999 RT₅, 5, 1, 0; 1999 RE₁, 5, 1, 0; 1999 RH₁, 4, 1, 0; 1999 RK₁, 10, 2, 1; 1999 RL₁, 5, 1, 0; 1999 RN₁, 3, 1, 0; 1999 RP₁, 3, 1, 0; 1999 RS₁, 4, 1, 0; 1999 RT₁, 5, 1, 0; 1999 RU₁, 5, 1, 0; 1999 RW₁, 10, 3, 9; 1999 RA₂, 4, 1, 0; 1999 RD₂, 5, 1, 0; 1999 RR₂, 5, 1, 0; 1999 RV₂, 5, 1, 0; 1999 RZ₂, 7, 2, 3; 1999 RB₃, 8, 1, 0; 1999 RJ₃, 4, 1, 0; 1999 RL₃, 5, 1, 0; 1999 RM₃, 4, 1, 0; 1999 RH₄, 4, 1, 0; 1999 RL₆, 3, 1, 0; 1999 RK₇, 10, 2, 4; 1999 RK₉, 13, 3, 9; 1999 RA₁₀, 5, 1, 0; 1999 RD₁₀, 3, 1, 0; 1999 RG₁₀, 4, 1, 0; 1999 RS₁₀, 4, 1, 0; 1999 RU₁₀, 5, 1, 0; 1999 RY₁₀, 5, 1, 0; 1999 RD₁₁, 4, 1, 0; 1999 RG₁₁, 5, 1, 0; 1999 RT₁₁, 3, 1, 0; 1999 RV₁₁, 5, 1, 0; 1999 RH₁₂, 8, 2, 7; 1999 RV₁₂, 3, 1, 0; 1999 RZ₁₂, 3, 1, 0; 1999 RM₁₃, 5, 1, 0; 1999 RF₁₄, 5, 1, 0; 1999 RK₁₄, 10, 2, 7; 1999 RO₁₄, 3, 1, 0; 1999 RQ₁₄, 3, 1, 0; 1999 RJ₁₅, 3, 1, 0; 1999 RU₁₅, 3, 1, 0; 1999 RD₁₆, 3, 1, 0; 1999 RV₁₆, 9, 2, 5; 1999 RE₁₇, 7, 2, 7; 1999 RF₁₇, 4, 1, 0; 1999 RK₁₇, 3, 1, 0; 1999 RO₁₇, 5, 1, 0; 1999 RX₁₇, 3, 1, 0; 1999 RY₁₇, 12, 3, 9; 1999 RC₁₈, 3, 1, 0; 1999 RC₁₈, 5, 1, 0; 1999 RJ₁₈, 4, 1, 0; 1999 RN₁₈, 8, 2, 5; 1999 RP₁₈, 10, 2, 53; 1999 RB₁₈, 8, 2, 5; 1999 RT₁₈, 5, 1, 0; 1999 RU₁₈, 6, 2, 5; 1999 RY₁₈, 4, 1, 0; 1999 RO₁₉, 7, 2, 5; 1999 RS₁₉, 3, 1, 0; 1999 RN₂₀, 5, 1, 0; 1999 RO₂₀, 5, 1, 0; 1999 RU₂₀, 34, 2, 48; 1999 RK₂₁, 9, 2, 5; 1999 RL₂₁, 4, 1, 0; 1999 RF₂₂, 3, 1, 0; 1999 RG₂₂, 5, 1, 0; 1999 RK₂₂, 5, 1, 0; 1999 RQ₂₂, 5, 1, 0; 1999 RT₂₂, 4, 1, 0; 1999 RF₂₃, 5, 1, 0; 1999 RR₂₃, 4, 1, 0; 1999 RW₂₃, 4, 1, 0; 1999 RX₂₃, 3, 1, 0; 1999 RB₂₄, 10, 2, 5; 1999 RV₂₄, 9, 2, 3; 1999 RE₂₅, 8, 2, 58; 1999 RN₂₅, 5, 1, 0; 1999 RX₂₅, 17, 4, 10; 1999 RG₂₆, 5, 1, 0; 1999 RQ₂₆, 5, 1, 0; 1999 RF₂₇, 5, 1, 0; 1999 RH₂₇, 5, 1, 0; 1999 RK₂₇, 5, 1, 0; 1999 RL₂₇, 5, 1, 0; 1999 RP₂₇, 3, 1, 0; 1999 RT₂₇, 4, 1, 0; 1999 RV₂₇, 5, 1, 0; 1999 RW₂₇, 5, 1, 0; 1999 RY₂₇, 4, 1, 0; 1999 RB₂₈, 4, 1, 0; 1999 RD₂₈, 3, 1, 0; 1999 RQ₂₈, 5, 1, 0; 1999 RW₂₉, 4, 1, 0; 1999 RG₃₀, 4, 1, 0; 1999 RS₃₀, 5, 1, 0; 1999 RZ₃₀, 5, 1, 0; 1999 RA₃₁, 10, 2, 1; 1999 RC₃₁, 6, 2, 1; 1999 RJ₃₁, 4, 1, 0; 1999 RL₃₁, 9, 2, 11; 1999 RR₃₁, 15, 3, 7; 1999 RV₃₁, 3, 1, 0; 1999 RX₃₁, 9, 2, 10; 1999 RB₃₂, 5, 1, 0; 1999 RJ₃₂, 3, 1, 0; 1999 RO₃₂, 7, 2, 8; 1999 RP₃₂, 3, 1, 0; 1999 RW₃₂, 10, 2, 1; 1999 RC₃₃, 5, 1, 0; 1999 RG₃₃, 4, 1, 0; 1999 RM₃₃, 9, 2, 7; 1999 RN₃₃, 8, 1, 0; 1999 RS₃₃, 8, 2, 7; 1999 RB₃₄, 3, 1, 0; 1999 RE₃₄, 4, 1, 0; 1999 RM₃₄, 5, 1, 0; 1999 RP₃₄, 4, 1, 0; 1999 RS₃₄, 5, 1, 0; 1999 RW₃₄, 5, 1, 0; 1999 RX₃₄, 10, 2, 8; 1999 RY₃₄, 20, 4, 13; 1999 RZ₃₄, 10, 2, 1; 1999 RA₃₅, 8, 2, 1; 1999 RB₃₅, 5, 1, 0; 1999 RC₃₅, 20, 4, 11; 1999 RD₃₅, 5, 1, 0; 1999 RH₃₅, 5, 1, 0; 1999 RJ₃₅, 5, 1, 0; 1999 RM₃₅, 4, 1, 0; 1999 RN₃₅, 5, 1, 0; 1999 RO₃₅, 7, 2, 5; 1999 RP₃₅, 11, 3, 10; 1999 RW₃₅, 3, 1, 0; 1999 RC₃₆, 5, 1, 0; 1999 RF₃₆, 13, 3, 12; 1999 RG₃₆, 5, 1, 0; 1999 RH₃₆, 19, 4, 13; 1999 RN₃₆, 14, 3, 13; 1999 RP₃₆, 14, 3, 11; 1999 RR₃₆, 5, 1, 0; 1999 RC₃₇, 3, 1, 0; 1999 RE₃₇, 5, 1, 0; 1999 RJ₃₇, 9, 2, 7; 1999 RK₃₇, 5, 1, 0; 1999 RL₃₇, 3, 1, 0; 1999 RZ₃₇, 4, 1, 0; 1999 RC₃₈, 14, 3, 11; 1999 RL₃₈, 3, 1, 0; 1999 RM₃₈, 14, 3, 6; 1999 RN₃₈, 5, 1, 0; 1999 RO₃₈, 5, 1, 0; 1999 RP₃₈, 15, 3, 11; 1999 RT₃₈, 29, 5, 12; 1999 RU₃₈, 5, 1, 0; 1999 RX₃₈, 5, 1, 0; 1999 RY₃₈, 5, 1, 0; 1999 RZ₃₈, 5, 1, 0; 1999 RG₃₉, 10, 2, 56; 1999 RO₃₉, 10, 2, 5; 1999 RU₃₉, 5, 1, 0; 1999 RV₃₉, 5, 1, 0; 1999 RY₃₉, 5, 1, 0; 1999 RC₄₀, 5, 1, 0; 1999 RJ₄₁, 5, 1, 0; 1999 RV₄₁, 3, 1, 0; 1999 RW₄₁, 7, 2, 4; 1999 RY₄₁, 4, 1, 0; 1999 RZ₄₁, 9, 2, 3; 1999 RC₄₂, 5, 1, 0; 1999 RF₄₂, 5, 1, 0; 1999 RJ₄₂, 15, 3, 13; 1999 RK₄₂, 5, 1, 0; 1999 RL₄₂, 5, 1, 0; 1999 RM₄₂, 15, 3, 11; 1999 RW₄₂, 4, 1, 0; 1999 RC₄₃, 5, 1, 0; 1999 RD₄₃, 5, 1, 0; 1999 RM₄₃, 9, 2, 3; 1999 RQ₄₃, 5, 1, 0; 1999 RS₄₃, 10, 2, 13; 1999 RT₄₃, 5, 1, 0; 1999 RU₄₃, 9, 2, 13; 1999 RA₄₄, 10, 2, 8; 1999 RB₄₄, 5, 1, 0; 1999 RC₄₄, 5, 1, 0; 1999 RF₄₄, 4, 1, 0; 1999 RH₄₄, 9, 2, 7; 1999 RL₄₄, 5, 1, 0; 1999 RM₄₄, 9, 2, 5; 1999 RN₄₄, 4, 1, 0; 1999 RS₄₄, 3, 1, 0; 1999 RT₄₄, 14, 3, 12; 1999 RA₄₅, 4, 1, 0; 1999 RC₄₅, 4, 1, 0; 1999 RG₄₅, 5, 1, 0; 1999 RJ₄₅, 5, 1, 0; 1999 RQ₄₅, 5, 1, 0; 1999 RW₄₅, 8, 2, 8; 1999 RW₄₆, 3, 1, 0; 1999 RC₄₇, 5, 1, 0; 1999 RF₄₇, 3, 1, 0; 1999 RN₄₇, 3, 1, 0; 1999 RW₄₈, 4, 1, 0; 1999 RD₄₉, 10, 2, 119; 1999 RG₄₉, 4, 1, 0; 1999 RC₅₂, 4, 1, 0; 1999 RH₅₂, 4, 1, 0; 1999 RX₅₂, 5, 1, 0; 1999 RY₅₅, 5, 1, 0; 1999 RQ₅₇, 5, 1, 0; 1999 RF₆₂, 4, 1, 0; 1999 RO₆₃, 11, 3, 8; 1999 RE₆₄, 5, 1, 0; 1999 RN₆₄, 3, 1, 0; 1999 RA₇₁, 3, 1, 0; 1999 RR₇₁, 3, 1, 0; 1999 RF₇₂, 5, 1, 0; 1999 RO₇₂, 4, 1, 0; 1999 RA₇₃, 3, 1, 0; 1999 RL₇₃, 4, 1, 0; 1999 RR₇₄, 4, 1, 0; 1999 RR₇₅, 4, 1, 0; 1999 RF₈₁, 5, 1, 0; 1999 RQ₈₁, 12, 3, 9; 1999 RU₈₁, 4, 1, 0; 1999 RA₈₃, 9, 2, 7; 1999 RH₈₃, 3, 1, 0; 1999 RJ₈₃, 3, 1, 0; 1999 RN₈₄, 11, 3, 10; 1999 RS₈₄, 4, 1, 0; 1999 RA₈₆, 5, 1, 0; 1999 RL₈₆, 5, 1, 0; 1999 RS₈₆, 5, 1, 0; 1999 RW₈₆, 3, 1, 0; 1999 RK₈₈, 3, 1, 0; 1999 RW₈₈, 3, 1, 0; 1999 RB₈₉, 4, 1, 0; 1999 RE₈₉, 4, 1, 0; 1999 RY₈₉, 4, 1, 0; 1999 RN₉₁, 4, 1, 0; 1999 RO₉₁, 5, 1, 0; 1999 RP₉₁, 4, 1, 0; 1999 RT₉₁, 3,

1, 0; 1999 RC₉₂, 5, 1, 0; 1999 RF₉₂, 5, 1, 0; 1999 RK₉₂, 5, 1, 0; 1999 RQ₉₂, 3, 1, 0; 1999 RB₉₃, 4, 1, 0; 1999 RH₉₃, 14, 3, 6; 1999 RQ₉₃, 5, 1, 0; 1999 RT₉₃, 4, 1, 0; 1999 RK₉₄, 14, 3, 6; 1999 RE₉₅, 16, 4, 538; 1999 RG₉₅, 5, 1, 0; 1999 RM₉₅, 7, 2, 2; 1999 RH₉₇, 5, 1, 0; 1999 RS₉₈, 3, 1, 0; 1999 RZ₉₈, 18, 4, 10; 1999 RC₉₉, 4, 1, 0; 1999 RW₁₀₀, 5, 1, 0; 1999 RD₁₀₂, 4, 1, 0; 1999 RE₁₀₂, 5, 1, 0; 1999 RF₁₀₂, 5, 1, 0; 1999 RK₁₀₂, 5, 1, 0; 1999 RN₁₀₂, 5, 1, 0; 1999 RQ₁₀₂, 5, 1, 0; 1999 RR₁₀₂, 4, 1, 0; 1999 RS₁₀₂, 3, 1, 0; 1999 RT₁₀₂, 5, 1, 0; 1999 RY₁₀₂, 4, 1, 0; 1999 RZ₁₀₂, 5, 1, 0; 1999 RA₁₀₃, 5, 1, 0; 1999 RF₁₀₃, 3, 1, 0; 1999 RG₁₀₃, 5, 1, 0; 1999 RH₁₀₃, 7, 2, 10; 1999 RL₁₀₃, 4, 1, 0; 1999 RQ₁₀₃, 5, 1, 0; 1999 RT₁₀₃, 10, 2, 7; 1999 RV₁₀₃, 3, 1, 0; 1999 RZ₁₀₃, 5, 1, 0; 1999 RJ₁₀₄, 5, 1, 0; 1999 RK₁₀₄, 4, 1, 0; 1999 RQ₁₀₄, 5, 1, 0; 1999 RZ₁₀₄, 5, 1, 0; 1999 RJ₁₀₅, 5, 1, 0; 1999 RO₁₀₅, 5, 1, 0; 1999 RU₁₀₅, 5, 1, 0; 1999 RY₁₀₅, 4, 1, 0; 1999 RE₁₀₆, 12, 3, 9; 1999 RU₁₀₆, 3, 1, 0; 1999 RL₁₀₇, 10, 2, 39; 1999 RX₁₀₈, 10, 2, 48; 1999 RD₁₀₉, 3, 1, 0; 1999 RL₁₀₉, 5, 1, 0; 1999 RO₁₀₉, 3, 1, 0; 1999 RQ₁₀₉, 14, 3, 103; 1999 RR₁₀₉, 5, 1, 0; 1999 RY₁₀₉, 5, 1, 0; 1999 RZ₁₀₉, 5, 1, 0; 1999 RC₁₁₀, 4, 1, 0; 1999 RF₁₁₀, 8, 2, 104; 1999 RH₁₁₀, 5, 1, 0; 1999 RP₁₁₀, 4, 1, 0; 1999 RR₁₁₀, 5, 1, 0; 1999 RX₁₁₀, 5, 1, 0; 1999 RZ₁₁₀, 5, 1, 0; 1999 RJ₁₁₄, 7, 2, 5; 1999 RG₁₁₅, 8, 2, 5; 1999 RJ₁₁₅, 5, 1, 0; 1999 RY₁₁₅, 4, 1, 0; 1999 RA₁₁₆, 4, 1, 0; 1999 RX₁₁₆, 3, 1, 0; 1999 RE₁₁₈, 3, 1, 0; 1999 RF₁₁₈, 3, 1, 0; 1999 RX₁₁₈, 4, 1, 0; 1999 RL₁₁₉, 4, 1, 0; 1999 RW₁₁₉, 8, 2, 2; 1999 RP₁₂₀, 3, 1, 0; 1999 RV₁₂₀, 10, 2, 3; 1999 RV₁₂₂, 3, 1, 0; 1999 RE₁₂₃, 5, 1, 0; 1999 RK₁₂₃, 5, 1, 0; 1999 RZ₁₂₃, 4, 1, 0; 1999 RA₁₂₄, 4, 1, 0; 1999 RB₁₂₄, 8, 2, 8; 1999 RE₁₂₄, 9, 2, 5; 1999 RG₁₂₄, 5, 1, 0; 1999 RJ₁₂₄, 10, 2, 26; 1999 RQ₁₂₄, 15, 2, 47; 1999 RN₁₂₅, 12, 2, 2; 1999 RV₁₂₅, 4, 1, 0; 1999 RZ₁₂₅, 7, 2, 25; 1999 RF₁₂₆, 4, 1, 0; 1999 RT₁₂₈, 10, 2, 8; 1999 RB₁₂₉, 5, 1, 0; 1999 RC₁₂₉, 3, 1, 0; 1999 RM₁₂₉, 3, 1, 0; 1999 RS₁₂₉, 5, 1, 0; 1999 RC₁₃₀, 3, 1, 0; 1999 RE₁₃₀, 4, 1, 0; 1999 RH₁₃₀, 5, 1, 0; 1999 RS₁₃₀, 3, 1, 0; 1999 RA₁₃₂, 4, 1, 0; 1999 RG₁₃₂, 3, 1, 0; 1999 RP₁₃₂, 4, 1, 0; 1999 RA₁₃₃, 5, 1, 0; 1999 RT₁₃₃, 10, 2, 9; 1999 RW₁₃₃, 7, 2, 7; 1999 RD₁₃₄, 5, 1, 0; 1999 RT₁₃₄, 5, 1, 0; 1999 RD₁₃₅, 4, 1, 0; 1999 RF₁₃₅, 4, 1, 0; 1999 RY₁₃₅, 3, 1, 0; 1999 RA₁₃₇, 3, 1, 0; 1999 RB₁₃₇, 10, 2, 23; 1999 RT₁₃₇, 3, 1, 0; 1999 RA₁₄₁, 11, 3, 66; 1999 RY₁₄₁, 5, 1, 0; 1999 RL₁₄₂, 3, 1, 0; 1999 RL₁₄₃, 5, 1, 0; 1999 RT₁₄₃, 3, 1, 0; 1999 RW₁₄₃, 11, 3, 112; 1999 RS₁₄₄, 5, 1, 0; 1999 RA₁₄₅, 3, 1, 0; 1999 RB₁₄₅, 4, 1, 0; 1999 RH₁₄₅, 6, 2, 7; 1999 RP₁₄₅, 5, 1, 0; 1999 RU₁₄₅, 5, 1, 0; 1999 RF₁₄₆, 9, 2, 9; 1999 RM₁₄₆, 9, 2, 64; 1999 RA₁₄₈, 5, 1, 0; 1999 RH₁₄₈, 4, 1, 0; 1999 RM₁₄₈, 3, 1, 0; 1999 RA₁₄₉, 8, 2, 2; 1999 RD₁₄₉, 5, 1, 0; 1999 RM₁₄₉, 12, 3, 119; 1999 RW₁₄₉, 9, 2, 5; 1999 RX₁₄₉, 3, 1, 0; 1999 RB₁₅₀, 4, 1, 0; 1999 RC₁₅₀, 3, 1, 0; 1999 RB₁₅₁, 3, 1, 0; 1999 RF₁₅₁, 4, 1, 0; 1999 RM₁₅₁, 3, 1, 0; 1999 RN₁₅₁, 7, 2, 4; 1999 RC₁₅₁, 4, 1, 0; 1999 RB₁₅₂, 15, 3, 76; 1999 RF₁₅₂, 5, 1, 0; 1999 RG₁₅₂, 3, 1, 0; 1999 RR₁₅₂, 8, 2, 66; 1999 RX₁₅₂, 3, 1, 0; 1999 RB₁₅₃, 6, 2, 7; 1999 RG₁₅₄, 3, 1, 0; 1999 RK₁₅₄, 5, 1, 0; 1999 RM₁₅₄, 3, 1, 0; 1999 RT₁₅₄, 9, 2, 7; 1999 RC₁₅₅, 5, 1, 0; 1999 RY₁₅₅, 3, 1, 0; 1999 RZ₁₅₅, 11, 3, 9; 1999 RL₁₅₆, 12, 3, 66; 1999 RK₁₅₇, 4, 1, 0; 1999 RJ₁₅₇, 3, 1, 0; 1999 RZ₁₅₇, 3, 1, 0; 1999 RB₁₅₈, 8, 2, 4; 1999 RR₁₅₈, 8, 2, 7; 1999 RK₁₅₉, 3, 1, 0; 1999 RP₁₅₉, 4, 1, 0; 1999 RB₁₅₉, 3, 1, 0; 1999 RY₁₅₉, 5, 1, 0; 1999 RC₁₆₀, 3, 1, 0; 1999 RD₁₆₀, 8, 2, 7; 1999 RF₁₆₀, 4, 1, 0; 1999 RN₁₆₀, 10, 2, 7; 1999 RO₁₆₀, 5, 1, 0; 1999 RM₁₆₁, 5, 1, 0; 1999 RO₁₆₁, 5, 1, 0; 1999 RN₁₆₂, 10, 2, 6; 1999 RP₁₆₃, 8, 2, 66; 1999 RU₁₆₃, 4, 1, 0; 1999 RV₁₆₃, 8, 2, 66; 1999 RZ₁₆₃, 9, 2, 25; 1999 RV₁₆₄, 4, 1, 0; 1999 RF₁₆₅, 3, 1, 0; 1999 RJ₁₆₇, 5, 1, 0; 1999 RJ₁₆₇, 10, 2, 7; 1999 RO₁₆₇, 5, 1, 0; 1999 RA₁₆₈, 8, 2, 5; 1999 RK₁₆₈, 7, 2, 5; 1999 RN₁₆₈, 4, 1, 0; 1999 RU₁₆₈, 13, 3, 8;

1, 0; 1999 SO₁, 20, 4, 10; 1999 SQ₁, 3, 1, 0; 1999 ST₁, 4, 1, 0; 1999 SU₁, 10, 2, 1; 1999 SW₁, 5, 1, 0; 1999 SA₂, 5, 1, 0; 1999 SB₂, 7, 1, 0; 1999 SC₂, 15, 3, 44; 1999 SD₂, 9, 2, 2; 1999 SE₂, 4, 1, 0; 1999 SF₂, 10, 2, 12; 1999 SH₂, 5, 1, 0; 1999 SJ₂, 5, 1, 0; 1999 SO₂, 19, 4, 101; 1999 SP₂, 9, 2, 0; 1999 SU₂, 9, 2, 7; 1999 SV₂, 4, 1, 0; 1999 SW₂, 18, 3, 7; 1999 SY₂, 5, 1, 0; 1999 SX₃, 20, 4, 3; 1999 SC₃, 14, 3, 100; 1999 SD₃, 9, 1, 0; 1999 SN₃, 5, 1, 0; 1999 SS₃, 5, 1, 0; 1999 SX₃, 4, 1, 0; 1999 SY₃, 12, 3, 6; 1999 SZ₃, 13, 3, 6; 1999 SH₄, 5, 1, 0; 1999 SK₄, 5, 1, 0; 1999 SP₄, 5, 1, 0; 1999 SQ₄, 14, 3, 10; 1999 SR₄, 24, 5, 12; 1999 SS₄, 4, 1, 0; 1999 SZ₄, 8, 2, 7; 1999 SD₅, 4, 1, 0; 1999 SU₅, 9, 2, 8; 1999 SW₅, 4, 1, 0; 1999 SZ₅, 13, 3, 535; 1999 SV₆, 15, 3, 11; 1999 SW₆, 4, 1, 0; 1999 SL₈, 5, 1, 0; 1999 SM₈, 5, 1, 0; 1999 SQ₈, 10, 2, 60; 1999 SN₉, 5, 1, 0; 1999 SO₉, 14, 3, 52; 1999 SP₉, 4, 1, 0; 1999 SR₉, 10, 2, 1; 1999 SV₉, 20, 4, 514; 1999 SC₁₀, 8, 2, 1; 1999 SE₁₀, 19, 4, 9; 1999 SK₁₀, 5, 1, 0; 1999 SS₁₀, 10, 2, 27; 1999 SW₁₀, 8, 2, 18; 1999 SS₁₁, 19, 4, 574; 1999 TA₄, 4, 1, 0; 1999 TK₅, 5, 1, 0; 1999 TM₁₀, 19, 4, 11; 1999 TN₁₀, 10, 2, 112; 1999 TP₁₀, 10, 2, 6; 1999 TQ₅, 5, 1, 0; 1999 TS₅, 5, 1, 0; 1999 TT₅, 5, 1, 0; 1999 TU₁₅, 3, 6; 1999 TW₂₀, 4, 11; 1999 TZ₄, 1, 0; 1999 TB₁, 9, 2, 112; 1999 TE₁, 5, 1, 0; 1999 TH₁, 4, 1, 0; 1999 TK₁, 5, 1, 0; 1999 TM₁, 19, 3, 11; 1999 TN₁, 5, 1, 0; 1999 TO₁, 5, 1, 0; 1999 TP₁, 5, 1, 0; 1999 TQ₁, 5, 1, 0; 1999 TR₁, 14, 3, 12; 1999 TS₁, 42, 7, 605; 1999 TT₁, 5, 1, 0; 1999 TU₁, 5, 1, 0; 1999 TY₁, 22, 5, 61; 1999 TZ₁, 3, 1, 0; 1999 TA₂, 13, 3, 103; 1999 TB₂, 5, 1, 0; 1999 TC₂, 9, 2, 58; 1999 TD₂, 9, 2, 10; 1999 TE₂, 14, 3, 7; 1999 TF₂, 5, 1, 0; 1999 TG₂, 10, 2, 11; 1999 TH₂, 12, 3, 57; 1999 TJ₂, 5, 1, 0; 1999 TN₂, 9, 2, 58; 1999 TO₂, 9, 2, 58; 1999 TP₂, 4, 1, 0; 1999 TS₂, 5, 1, 0; 1999 TD₃, 10, 2, 39; 1999 TK₃, 4, 1, 0; 1999 TL₃, 4, 1, 0; 1999 TN₃, 19, 4, 63; 1999 TO₃, 13, 3, 11; 1999 TP₃, 5, 1, 0; 1999 TW₃, 15, 3, 11; 1999 TY₃, 5, 1, 0; 1999 TA₄, 5, 1, 0; 1999 TD₄, 10, 2, 27; 1999 TF₄, 5, 1, 0; 1999 TJ₄, 10, 2, 451; 1999 TL₄, 5, 1, 0; 1999 TM₄, 5, 1, 0; 1999 TP₄, 4, 1, 0; 1999 TQ₄, 3, 1, 0; 1999 TT₄, 8, 2, 52; 1999 TW₄, 5, 1, 0; 1999 TD₅, 9, 2, 1; 1999 TE₅, 5, 1, 0; 1999 TJ₅, 10, 2, 1; 1999 TK₅, 20, 4, 12; 1999 TQ₅, 5, 1, 0; 1999 TR₅, 4, 1, 0; 1999 TS₅, 5, 1, 0; 1999 TV₅, 10, 2, 1; 1999 TY₅, 5, 1, 0; 1999 TZ₅, 8, 2, 9; 1999 TA₆, 3, 1, 0; 1999 TE₆, 9, 2, 9; 1999 TH₆, 3, 1, 0; 1999 TJ₆, 24, 5, 456; 1999 TK₆, 4, 1, 0; 1999 TM₆, 5, 1, 0; 1999 TO₆, 5, 1, 0; 1999 TG₆, 8, 2, 45; 1999 TV₆, 18, 4, 117; 1999 TA₇, 15, 3, 11; 1999 TY₆, 5, 1, 0; 1999 TC₇, 5, 1, 0; 1999 TF₇, 3, 1, 0; 1999 TH₇, 7, 2, 506; 1999 TO₇, 10, 2, 8; 1999 TP₇, 4, 1, 0; 1999 TS₇, 5, 1, 0; 1999 TT₇, 4, 1, 0; 1999 TZ₇, 3, 1, 0; 1999 TB₈, 5, 1, 0; 1999 TD₈, 4, 1, 0; 1999 TF₈, 5, 1, 0; 1999 TG₈, 9, 2, 31; 1999 TH₈, 9, 2, 32; 1999 TJ₈, 5, 1, 0; 1999 TK₈, 4, 1, 0; 1999 TO₈, 3, 1, 0; 1999 TP₈, 14, 2, 10; 1999 TQ₈, 5, 1, 0; 1999 TS₈, 14, 3, 12; 1999 TT₈, 5, 1, 0; 1999 TG₉, 5, 1, 0; 1999 TB₉, 4, 1, 0; 1999 TD₉, 5, 1, 0; 1999 TF₉, 5, 1, 0; 1999 TG₉, 5, 1, 0; 1999 TK₉, 5, 1, 0; 1999 TL₉, 5, 1, 0; 1999 TM₉, 5, 1, 0; 1999 TO₉, 8, 2, 32; 1999 TP₉, 9, 2, 32; 1999 TQ₉, 5, 1, 0; 1999 TR₉, 10, 2, 32; 1999 TS₉, 10, 2, 8; 1999 TT₉, 5, 1, 0; 1999 TW₉, 24, 5, 574; 1999 TX₉, 10, 2, 1; 1999 TY₉, 5, 1, 0; 1999 TZ₉, 5, 1, 0; 1999 TA₁₀, 10, 2, 1; 1999 TC₁₀, 10, 2, 1; 1999 TG₁₀, 13, 3, 11; 1999 TH₁₀, 5, 1, 0; 1999 TR₁₀, 5, 1, 0; 1999 TS₁₀, 5, 1, 0; 1999 TT₁₀, 5, 1, 0; 1999 TW₁₀, 9, 2, 8; 1999 TF₁₁, 4, 1, 0; 1999 TG₁₁, 5, 1, 0; 1999 TH₁₁, 5, 1, 0; 1999 TK₁₁, 20, 4, 59; 1999 TL₁₁, 14, 3, 516; 1999 TM₁₁, 5, 1, 0; 1999 TO₁₁, 5, 1, 0; 1999 TQ₁₁, 4, 1, 0; 1999 TS₁₁, 5, 1, 0; 1999 TU₁₁, 10, 2, 12; 1999 TW₁₁, 5, 1, 0; 1999 TX₁₁, 4, 1, 0; 1999 TB₁₂, 15, 3, 12; 1999 TC₁₂, 8, 2, 21; 1999 TP₁₂, 20, 4, 11; 1999 TR₁₂, 4, 1, 0; 1999 TS₁₂, 5, 1, 0; 1999 TX₁₂, 15, 3, 11; 1999 TY₁₂, 5, 1, 0; 1999 TZ₁₂, 5, 1, 0; 1999 TC₁₃, 10, 2, 8; 1999 TD₁₃, 8, 2, 32; 1999 TF₁₃, 10, 2, 9; 1999 TG₁₃, 8, 2, 9; 1999 TH₁₃, 5, 1, 0; 1999 TJ₁₃, 10, 2, 10; 1999 TL₁₃, 5, 1, 0; 1999 TP₁₃, 5, 1, 0; 1999 TR₁₃, 7, 2, 937; 1999 TU₁₃, 7, 2, 4; 1999 TZ₁₃, 9, 2, 32; 1999 TA₁₄, 4, 1, 0; 1999 TD₁₄, 15, 3, 40; 1999 TE₁₄, 4, 1, 0; 1999 TF₁₄, 20, 4, 12; 1999 TG₁₄, 24, 5, 575; 1999 TH₁₄, 6, 2, 945; 1999 TL₁₄, 5, 1, 0; 1999 TM₁₄, 5, 1, 0; 1999 TN₁₄, 5, 1, 0; 1999 TO₁₄, 5, 1, 0; 1999 TS₁₄, 5, 1, 0; 1999 TW₁₄, 5, 1, 0; 1999 TX₁₄, 5, 1, 0; 1999 TZ₁₄, 5, 1, 0; 1999 TD₁₅, 15, 3, 106; 1999 TE₁₅, 8, 2, 9; 1999 TP₁₅, 3, 1, 0; 1999 TR₁₅, 3, 1, 0; 1999 TS₁₅, 10, 2, 8; 1999 TY₁₅, 10, 2, 112; 1999 TA₁₆, 8, 2, 8; 1999 TC₁₆, 5, 1, 0; 1999 TD₁₆, 4, 1, 0; 1999 TF₁₆, 5, 1, 0; 1999 TG₁₆, 5, 1, 0; 1999 TH₁₆, 18, 4, 552; 1999 TK₁₆, 4, 1, 0; 1999 TM₁₆, 3, 1, 0; 1999 TO₁₆, 5, 1, 0; 1999 TP₁₆, 5, 1, 0; 1999 TQ₁₆, 3, 1, 0; 1999 TS₁₆, 9, 2, 8; 1999 TW₁₆, 9, 2, 1; 1999 TB₁₇, 4, 1, 0; 1999 TC₁₇, 5, 1, 0; 1999 TE₁₇, 10, 2, 8; 1999 TF₁₇, 9, 2, 8; 1999 TG₁₇, 8, 2, 9; 1999 TJ₁₇, 9, 2, 26; 1999 TL₁₇, 5, 1, 0; 1999 TO₁₇, 5, 1, 0; 1999 TR₁₇, 4, 1, 0; 1999 TS₁₇, 8, 2, 39; 1999 TU₁₇, 5, 1, 0; 1999 TV₁₇, 5, 1, 0; 1999 TY₁₇, 5, 1, 0; 1999 TZ₁₇, 9, 2, 55; 1999 TA₁₈, 5, 1, 0; 1999 TF₁₈, 10, 2, 9; 1999 TJ₁₈, 5, 1, 0; 1999 TM₁₈, 5, 1, 0; 1999 TN₁₈, 5, 1, 0; 1999 TP₁₈, 5, 1, 0; 1999 TQ₁₈, 22, 5, 43; 1999 TR₁₈, 5, 1, 0; 1999 TT₁₈, 5, 1, 0; 1999 TU₁₈, 15, 3, 589; 1999 TY₁₈, 10, 2, 8; 1999 TB₁₉, 8, 2, 40; 1999 TF₁₉, 10, 2, 18; 1999 TG₁₉, 20, 4, 59; 1999 TH₁₉, 10, 2, 32; 1999 TJ₁₉, 5, 1, 0; 1999 TK₁₉, 5, 1, 0; 1999 TO₁₉, 5, 1, 0; 1999 TC₂₀, 23, 5, 13; 1999 TK₂₀, 5, 1, 0; 1999 TL₂₀, 3, 1, 0; 1999 TP₂₀, 5, 1, 0; 1999 TD₂₁, 7, 2, 39; 1999 TR₂₀, 4, 1, 0; 1999 TT₂₀, 3, 1, 0; 1999 TA₂₁, 10, 2, 32; 1999 TB₂₁, 5, 1, 0; 1999 TC₂₁, 4, 1, 0; 1999 TG₂₁, 10, 2, 1; 1999 TP₂₁, 10, 2, 8; 1999 TQ₂₁, 9, 2, 8; 1999 TR₂₁, 9, 2, 8; 1999 TC₂₅, 5, 1, 0; 1999 TJ₂₅, 5, 1, 0; 1999 TN₂₅, 5, 1, 0; 1999 TQ₂₅, 5, 1, 0; 1999 TB₂₆, 5, 1, 0; 1999 TD₂₆, 9, 2, 2; 1999 TF₂₆, 10, 2, 8; 1999 TH₂₆, 5, 1, 0; 1999 TJ₂₆, 5, 1, 0; 1999 TL₂₆, 10, 2, 8; 1999 TP₂₆, 10, 2, 8; 1999 TV₂₆, 10, 2, 8; 1999 TV₂₆, 5, 1, 0; 1999 TV₂₆, 5, 1, 0; 1999 TV₂₆, 5, 1, 0; 1999 TV₂₆, 10, 2, 8; 1999 TZ₂₆, 5, 1, 0; 1999 TA₂₇, 10, 2, 8; 1999 TB₂₇, 6, 1, 0; 1999 TC₂₇, 10, 2, 8; 1999 TE₂₇, 10, 2, 1; 1999 TF₂₇, 10, 2, 8; 1999 TK₂₇, 10, 2, 8; 1999 TL₂₇, 5, 1, 0; 1999 TN₂₇, 10, 2, 8; 1999 TP₂₇, 4, 1, 0; 1999 TQ₂₇, 10, 2, 8; 1999 TD₂₈, 5, 1, 0; 1999 TG₂₉, 3, 1, 0; 1999 TN₂₉, 3, 1, 0; 1999 TV₃₀, 5, 1, 0; 1999 TG₃₂, 5, 1, 0; 1999 TX₃₂, 3, 1, 0; 1999 TP₃₃, 5, 1, 0; 1999 TU₃₃, 3, 1, 0; 1999 TZ₃₃, 4, 1, 0; 1999 TU₃₄, 5, 1, 0; 1999 TB₃₅, 10, 2, 1; 1999 TR₃₅, 5, 1, 0; 1999 TY₃₅,

5, 1, 0; 1999 UA₅, 5, 1, 0; 1999 UB₄, 4, 1, 0; 1999 UD₁₉, 5, 596; 1999 UE₅, 5, 1, 0; 1999 UF₅, 5, 1, 0; 1999 UG₁₀, 10, 2, 39; 1999 UO₁₃, 3, 55; 1999 UP₅, 5, 1, 0; 1999 US₅, 5, 1, 0; 1999 UT₅, 5, 1, 0; 1999 UV₈, 2, 39; 1999 UW₅, 5, 1, 0; 1999 UA₁, 5, 1, 0; 1999 UC₁, 5, 1, 0; 1999 UD₁, 5, 1, 0; 1999 UE₁, 5, 1, 0; 1999 UF₁, 5, 1, 0; 1999 UG₁, 5, 1, 0; 1999 UJ₁, 5, 1, 0; 1999 UL₁, 5, 1, 0; 1999 UN₁, 5, 1, 0; 1999 UP₁, 15, 3, 59; 1999 UQ₁, 8, 2, 9; 1999 UR₁, 5, 1, 0; 1999 UU₁, 4, 1, 0; 1999 UV₁, 10, 2, 31; 1999 UY₁, 23, 5, 574; 1999 UA₂, 10, 2, 32; 1999 UC₂, 9, 2, 39; 1999 UE₂, 8, 2, 9; 1999 UG₂, 5, 1, 0; 1999 UY₂, 10, 2, 8; 1999 UR₂, 5, 1, 0; 1999 UT₂, 8, 2, 8; 1999 UW₂, 10, 2, 1; 1999 UX₂, 10, 2, 39; 1999 UY₂, 5, 1, 0; 1999 UZ₂, 5, 1, 0; 1999 UB₃, 10, 2, 1; 1999 UJ₃, 9, 2, 32; 1999 UL₃, 10, 2, 31; 1999 UM₃, 5, 1, 0; 1999 UO₃, 5, 1, 0; 1999 UP₃, 10, 2, 9; 1999 UR₃, 2, 1, 0; 1999 US₃, 10, 2, 1; 1999 UT₃, 5, 1, 0; 1999 UU₃, 5, 1, 0; 1999 UZ₃, 5, 1, 0; 1999 UB₄, 10, 2, 8; 1999 UD₄, 10, 2, 8; 1999 UE₄, 10, 2, 8; 1999 UG₄, 5, 1, 0; 1999 UJ₄, 3, 1, 0; 1999 UL₄, 5, 1, 0; 1999 UN₄, 10, 2, 1; 1999 UO₄, 10, 2, 1; 1999 UA₅, 5, 1, 0; 1999 UB₅, 4, 1, 0; 1999 UC₅, 15, 3, 40; 1999 UD₅, 5, 1, 0; 1999 UE₅ *, 20, 4, 3; 1999 UF₅ *, 18, 4, 3; 1999 UH₅ *, 7, 2, 1; 1999 UJ₅ *, 10, 2, 1; 1999 UK₅ *, 9, 2, 1; 1999 UL₅ *, 9, 2, 1; 1999 UM₅ *, 9, 2, 1; 1999 UO₅, 4, 1, 0; 1999 UP₅, 4, 1, 0; 1999 UQ₅, 4, 1, 0; 1999 UR₅, 5, 1, 0; 1999 UT₅, 5, 1, 0; 1999 UV₅, 9, 2, 31; 1999 UW₅, 4, 1, 0; 1999 UX₅, 5, 1, 0; 1999 UY₅, 5, 1, 0; 1999 UZ₅, 10, 2, 9; 1999 UH₆, 4, 1, 0; 1999 UJ₆, 9, 2, 8; 1999 UK₆, 5, 1, 0; 1999 UL₆, 5, 1, 0; 1999 UM₆, 10, 2, 9; 1999 UN₆, 14, 3, 40; 1999 UO₆, 10, 2, 8; 1999 UQ₆, 5, 1, 0; 1999 US₆, 5, 1, 0; 1999 UD₇ *, 6, 2, 1; 1999 UE₇ *, 7, 2, 1; 1999 UF₇ *, 10, 2, 1; 1999 UG₇ *, 10, 2, 1; 1999 UH₇ *, 10, 2, 1; 1999 UJ₇ *, 8, 2, 1; 1999 UK₇ *, 9, 2, 1; 1999 UL₇ *, 8, 2, 1; 1999 UM₇ *, 8, 2, 1; 1999 UR₇, 5, 1, 0; 1999 US₇, 10, 2, 8; 1999 UT₇, 10, 2, 8; 1999 UU₇, 10, 2, 11; 1999 UV₇, 5, 1, 0; 1999 UW₇, 10, 2, 8; 1999 UX₇, 10, 2, 8; 1999 UY₇, 7, 2, 8; 1999 UZ₇, 10, 2, 8; 1999 UA₈, 10, 2, 8; 1999 UB₈, 5, 1, 0; 1999 UC₈, 10, 2, 8; 1999 UD₈, 5, 1, 0; 1999 UE₈, 5, 1, 0; 1999 UF₈, 4, 1, 0; 1999 UG₈, 5, 1, 0; 1999 UH₈, 5, 1, 0; 1999 UJ₈, 5, 1, 0; 1999 UK₈, 5, 1, 0; 1999 UL₈, 9, 2, 8; 1999 UM₈, 5, 1, 0; 1999 UN₈, 4, 1, 0; 1999 UO₈, 5, 1, 0; 1999 UP₈, 5, 1, 0; 1999 UQ₈, 5, 1, 0; 1999 UR₈, 4, 1, 0; 1999 US₈, 5, 1, 0; 1999 UT₈, 15, 3, 12; 1999 UU₈, 5, 1, 0; 1999 UV₈, 10, 2, 8; 1999 UW₈, 4, 1, 0; 1999 UX₈, 5, 1, 0; 1999 UY₈, 4, 1, 0; 1999 UZ₈, 10, 2, 8; 1999 UA₉, 3, 1, 0; 1999 UB₉, 10, 2, 8; 1999 UC₉, 4, 1, 0; 1999 UD₉, 5, 1, 0; 1999 UE₉, 10, 2, 8; 1999 UF₉, 5, 1, 0; 1999 UG₉, 8, 2, 8; 1999 UH₉, 10, 2, 8; 1999 UJ₉, 10, 2, 8; 1999 UK₉, 10, 2, 8; 1999 UL₉, 3, 1, 0; 1999 UM₉, 10, 2, 32; 1999 UN₉, 10, 2, 8; 1999 UO₉ *, 9, 2, 1; 1999 UP₉ *, 6, 2, 1; 1999 UQ₉ *, 9, 2, 1; 1999 UR₉ *, 8, 2, 1; 1999 US₉ *, 9, 2, 1; 1999 UT₉ *, 10, 2, 1; 1999 UY₉ *, 8, 2, 1; 1999 UV₉ *, 10, 2, 1; 1999 UW₉ *, 10, 2, 1; 1999 UX₉ *, 15, 2, 1; 1999 UY₉ *, 8, 2, 1; 1999 UZ₉ *, 9, 2, 1; 1999 UA₁₀ *, 8, 2, 1; 1999 UB₁₀ *, 18, 2, 1; 1999 UC₁₀ *, 9, 2, 1; 1999 UD₁₀ *, 10, 2, 1; 1999 UE₁₀ *, 12, 2, 1; 1999 UF₁₀ *, 10, 2, 1; 1999 UG₁₀ *, 10, 2, 1; 1999 UH₁₀ *, 7, 2, 1; 1999 UJ₁₀ *, 7, 2, 1; 1999 UK₁₀ *, 9, 2, 1; 1999 UL₁₀ *, 10, 2, 1; 1999 UM₁₀ *, 10, 2, 1; 1999 UN₁₀ *, 6, 2, 1; 1999 UO₁₀ *, 9, 2, 1; 1999 UP₁₀ *, 8, 2, 1; 1999 UQ₁₀ *, 10, 2, 1; 1999 UR₁₀ *, 10, 2, 1; 1999 US₁₀ *, 9, 2, 1; 1999 UT₁₀ *, 10, 2, 1; 1999 UV₁₀ *, 9, 2, 1; 1999 UW₁₀ *, 10, 2, 1; 1999 UX₁₀ *, 18, 3, 40; 1999 UZ₁₀ *, 10, 2, 1; 1999 UA₁₁ *, 8, 2, 1; 1999 UB₁₁ *, 10, 2, 1; 1999 UC₁₁ *, 10, 2, 1; 1999 UD₁₁ *, 9, 2, 1; 1999 UE₁₁ *, 9, 2, 1; 1999 UF₁₁ *, 7, 2, 1; 1999 UG₁₁ *, 10, 2, 1; 1999 UJ₁₁, 9, 2, 31; 1999 UM₁₁, 9, 2, 8; 1999 UN₁₁, 10, 2, 8; 1999 UP₁₁ *, 8, 2, 3; 1999 UQ₁₁ *, 9, 2, 3; 1999 UR₁₁, 5, 1, 0; 1999 UT₁₁, 5, 1, 0; 1999 UV₁₁, 9, 2, 8; 1999 UV₁₁, 5, 1, 0; 1999 UW₁₁, 9, 2, 8; 1999 UX₁₁, 3, 1, 0; 1999 UZ₁₁, 4, 1, 0; 1999 UJ₁₂, 3, 1, 0; 1999 UN₁₂, 5, 1, 0; 1999 UT₁₂, 4, 1, 0; 1999 U

1999 VM₆ *, 5, 1, 0; 1999 VN₆ *, 5, 1, 0; 1999 VO₆ *, 18, 2, 1; 1999 VP₆ *, 18, 3, 2; 1999 VR₆ *, 26, 4, 3; 1999 VS₆ *, 10, 2, 2; 1999 VT₆ *, 5, 1, 0; 1999 VU₆ *, 10, 2, 8; 1999 VV₆ *, 9, 2, 8; 1999 VB₇ *, 5, 1, 0; 1999 VC₇ *, 5, 1, 0; 1999 VD₇ *, 10, 2, 8; 1999 VE₇ *, 10, 2, 8; 1999 VF₇ *, 10, 2, 8; 1999 VG₇ *, 5, 1, 0; 1999 VH₇ *, 5, 1, 0; 1999 VJ₇ *, 10, 2, 8; 1999 VK₇ *, 9, 2, 8; 1999 VL₇ *, 5, 1, 0; 1999 VM₇ *, 5, 1, 0; 1999 VN₇ *, 4, 1, 0; 1999 VO₇ *, 5, 1, 0; 1999 VP₇ *, 5, 1, 0; 1999 VQ₇ *, 5, 1, 0; 1999 VR₇ *, 10, 2, 8; 1999 VS₇ *, 5, 1, 0; 1999 VT₇ *, 5, 1, 0; 1999 VU₇ *, 5, 1, 0; 1999 VV₇ *, 10, 2, 9; 1999 VW₇ *, 15, 2, 8; 1999 VX₇ *, 10, 2, 8; 1999 VY₇ *, 8, 2, 9; 1999 VZ₇ *, 9, 2, 9; 1999 VA₈ *, 9, 2, 9; 1999 VB₈ *, 5, 1, 0; 1999 VD₈ *, 4, 1, 0; 1999 VK₈ *, 10, 2, 8; 1999 VO₈ *, 5, 1, 0; 1999 VQ₈ *, 5, 1, 0; 1999 VR₈ *, 5, 1, 0; 1999 VV₈ *, 8, 2, 9; 1999 VW₈ *, 10, 2, 8; 1999 VE₉ *, 5, 1, 0; 1999 VF₉ *, 5, 1, 0; 1999 VG₉ *, 5, 1, 0; 1999 VH₉ *, 5, 1, 0; 1999 VJ₉ *, 5, 1, 0; 1999 VK₉ *, 9, 2, 9; 1999 VL₉ *, 10, 2, 9; 1999 VM₉ *, 10, 2, 9; 1999 VN₉ *, 10, 2, 9; 1999 VO₉ *, 14, 3, 9; 1999 VP₉ *, 10, 2, 9; 1999 VQ₉ *, 4, 1, 0; 1999 VU₉ *, 5, 1, 0; 1999 VA₁₀ *, 5, 1, 0; 1999 VF₁₀ *, 5, 1, 0; 1999 VJ₁₀ *, 5, 1, 0; 1999 VK₁₀ *, 5, 1, 0; 1999 VL₁₀ *, 5, 1, 0; 1999 VP₁₀ *, 5, 1, 0; 1999 VS₁₀ *, 5, 1, 0; 1999 VT₁₀ *, 5, 1, 0; 1999 VU₁₀ *, 5, 1, 0; 1999 VV₁₀ *, 10, 2, 13; 1999 VY₁₀ *, 5, 1, 0; 1999 VZ₁₀ *, 4, 1, 0; 1999 VA₁₁ *, 4, 1, 0; 1999 VB₁₁ *, 5, 1, 0; 1999 VD₁₁ *, 10, 2, 8; 1999 VF₁₁ *, 10, 2, 8; 1999 VG₁₁ *, 4, 1, 0; 1999 VH₁₁ *, 10, 2, 2; 1999 VJ₁₁ *, 5, 1, 0; 1999 VK₁₁ *, 10, 2, 9; 1999 VL₁₁ *, 18, 4, 4; 1999 VM₁₁ *, 5, 1, 0; 1999 VN₁₁ *, 19, 4, 4; 1999 VO₁₁ *, 17, 3, 3; 1999 VP₁₁ *, 28, 4, 3; 1999 VQ₁₁ *, 13, 3, 6; 1999 VR₁₁ *, 5, 1, 0; 1999 VS₁₁ *, 8, 2, 9; 1999 VV₁₁ *, 15, 2, 1; 1999 VW₁₁ *, 4, 1, 0; 1999 VX₁₁ *, 5, 1, 0; 1999 VY₁₁ *, 5, 1, 0; 1999 VZ₁₂ *, 5, 1, 0; 1999 VD₁₂ *, 5, 1, 0; 1999 VE₁₂ *, 5, 1, 0; 1999 VF₁₂ *, 9, 2, 10; 1999 VG₁₂ *, 5, 1, 0; 1999 VH₁₂ *, 5, 1, 0; 1999 VJ₁₂ *, 5, 1, 0; 1999 VK₁₂ *, 5, 1, 0; 1999 VL₁₂ *, 15, 4, 8; 1999 VM₁₂ *, 4, 1, 0; 1999 VN₁₂ *, 5, 1, 0; 1999 VO₁₂ *, 5, 1, 0; 1999 VS₁₂ *, 5, 1, 0; 1999 VT₁₂ *, 5, 1, 0; 1999 VU₁₂ *, 10, 2, 2; 1999 VX₁₂ *, 10, 2, 2; 1999 VY₁₂ *, 10, 2, 1; 1999 VZ₁₂ *, 9, 2, 1; 1999 VA₁₃ *, 6, 2, 1; 1999 VB₁₃ *, 7, 2, 1; 1999 VC₁₃ *, 10, 2, 1; 1999 VD₁₃ *, 9, 2, 1; 1999 VE₁₃ *, 10, 2, 1; 1999 VF₁₃ *, 10, 2, 1; 1999 VG₁₃ *, 9, 2, 1; 1999 VH₁₃ *, 14, 2, 1; 1999 VJ₁₃ *, 10, 2, 1; 1999 VK₁₃ *, 8, 2, 1; 1999 VL₁₃ *, 10, 2, 1; 1999 VM₁₃ *, 10, 2, 1; 1999 VN₁₃ *, 14, 3, 2; 1999 VO₁₃ *, 10, 2, 1; 1999 VP₁₃ *, 10, 2, 1; 1999 VQ₁₃ *, 10, 2, 1; 1999 VR₁₃ *, 10, 2, 1; 1999 VS₁₃ *, 20, 3, 2; 1999 VT₁₃ *, 8, 2, 1; 1999 VU₁₃ *, 9, 2, 1; 1999 VV₁₃ *, 7, 2, 1; 1999 VW₁₃ *, 7, 2, 1; 1999 VX₁₃ *, 9, 2, 1; 1999 VY₁₃ *, 9, 2, 1; 1999 VZ₁₃ *, 7, 2, 1; 1999 VA₁₄ *, 8, 2, 1; 1999 VB₁₄ *, 20, 3, 2; 1999 VC₁₄ *, 9, 2, 1; 1999 VD₁₄ *, 10, 2, 1; 1999 VE₁₄ *, 10, 2, 1; 1999 VF₁₄ *, 7, 2, 1; 1999 VG₁₄ *, 7, 2, 1; 1999 VH₁₄ *, 6, 2, 1; 1999 VJ₁₄ *, 10, 2, 1; 1999 VK₁₄ *, 7, 2, 1; 1999 VL₁₄ *, 6, 2, 1; 1999 VQ₁₅ *, 5, 1, 0; 1999 VR₁₅ *, 5, 1, 0; 1999 VD₁₆ *, 5, 1, 0; 1999 VF₁₆ *, 5, 1, 0; 1999 VJ₁₆ *, 5, 1, 0; 1999 VW₁₆ *, 5, 1, 0; 1999 VH₁₇ *, 3, 1, 0; 1999 VM₁₇ *, 4, 1, 0; 1999 VT₁₇ *, 4, 1, 0; 1999 VU₁₇ *, 5, 1, 0; 1999 VV₁₇ *, 5, 1, 0; 1999 VF₁₈ *, 4, 1, 0; 1999 VG₁₈ *, 5, 1, 0; 1999 VH₁₈ *, 4, 1, 0; 1999 VL₁₈ *, 5, 1, 0; 1999 VN₁₈ *, 5, 1, 0; 1999 VO₁₈ *, 5, 1, 0; 1999 VZ₁₈ *, 3, 1, 0; 1999 VA₁₉ *, 5, 1, 0; 1999 VB₁₉ *, 4, 1, 0; 1999 VC₁₉ *, 5, 1, 0; 1999 VD₁₉ *, 10, 2, 8; 1999 VE₁₉ *, 10, 2, 8; 1999 VF₁₉ *, 5, 1, 0; 1999 VJ₁₉ *, 5, 1, 0; 1999 VP₁₉ *, 10, 2, 8; 1999 VR₁₉ *, 5, 1, 0; 1999 VS₁₉ *, 5, 1, 0; 1999 VU₁₉ *, 10, 2, 8; 1999 VV₁₉ *, 5, 1, 0; 1999 VX₁₉ *, 5, 1, 0; 1999 VY₁₉ *, 5, 1, 0; 1999 VZ₁₉ *, 10, 2, 6; 1999 VA₂₀ *, 10, 2, 8; 1999 VB₂₀ *, 10, 2, 8; 1999 VC₂₀ *, 10, 2, 8; 1999 VD₂₀ *, 9, 2, 8; 1999 VE₂₀ *, 5, 1, 0; 1999 VG₂₀ *, 5, 1, 0; 1999 VH₂₀ *, 5, 1, 0; 1999 VJ₂₀ *, 15, 3, 5; 1999 VB₂₁ *, 4, 1, 0; 1999 VC₂₁ *, 5, 1, 0; 1999 VG₂₁ *, 5, 1, 0; 1999 VH₂₁ *, 5, 1, 0; 1999 VJ₂₁ *, 5, 1, 0; 1999 VM₂₁ *, 8, 2, 8; 1999 VN₂₁ *, 10, 2, 8; 1999 VO₂₁ *, 5, 1, 0; 1999 VP₂₁ *, 10, 2, 8; 1999 VQ₂₁ *, 9, 2, 8; 1999 VR₂₁ *, 5, 1, 0; 1999 VZ₂₁ *, 3, 1, 0; 1999 VA₂₂ *, 5, 1, 0; 1999 VB₂₂ *, 10, 2, 8; 1999 VE₂₂ *, 4, 1, 0; 1999 VG₂₂ *, 5, 1, 0; 1999 VL₂₂ *, 10, 2, 1; 1999 VN₂₂ *, 5, 1, 0; 1999 VY₂₂ *, 5, 1, 0; 1999 VZ₂₂ *, 5, 1, 0; 1999 VB₂₃ *, 5, 1, 0; 1999 VC₂₃ *, 5, 1, 0; 1999 VL₂₃ *, 15, 2, 13; 1999 VY₂₃ *, 5, 1, 0; 1999 VE₂₄ *, 9, 2, 8; 1999 VF₂₄ *, 5, 1, 0; 1999 VG₂₄ *, 5, 1, 0; 1999 VR₂₄ *, 4, 1, 0; 1999 VQ₂₅ *, 5, 1, 0; 1999 VT₂₅ *, 15, 3, 3; 1999 VU₂₅ *, 8, 2, 2; 1999 VV₂₅ *, 17, 3, 2; 1999 VW₂₅ *, 17, 3, 3; 1999 VX₂₅ *, 10, 2, 1; 1999 VZ₂₅ *, 3, 1, 0; 1999 VB₂₆ *, 10, 2, 7; 1999 VC₂₆ *, 10, 2, 7; 1999 VD₂₆ *, 10, 2, 7; 1999 VE₂₆ *, 15, 2, 7; 1999 VF₂₆ *, 10, 2, 7; 1999 VG₂₆ *, 9, 2, 7; 1999 VH₂₆ *, 9, 2, 7; 1999 VJ₂₆ *, 10, 2, 7; 1999 VK₂₆ *, 6, 2, 7; 1999 VL₂₆ *, 10, 2, 7; 1999 VM₂₆ *, 9, 2, 7; 1999 VN₂₆ *, 9, 2, 7; 1999 VO₂₆ *, 10, 2, 7; 1999 VP₂₆ *, 10, 2, 7; 1999 VQ₂₆ *, 15, 2, 7; 1999 VR₂₆ *, 13, 2, 7; 1999 VS₂₆ *, 9, 2, 7; 1999 VT₂₆ *, 10, 2, 7; 1999 VU₂₆ *, 10, 2, 7; 1999 VV₂₆ *, 9, 2, 7; 1999 VW₂₆ *, 9, 2, 7; 1999 VX₂₆ *, 10, 2, 7; 1999 VY₂₆ *, 8, 2, 7; 1999 VZ₂₆ *, 7, 2, 7; 1999 VA₂₇ *, 7, 2, 7; 1999 VB₂₇ *, 10, 2, 7; 1999 VC₂₇ *, 8, 2, 7; 1999 VD₂₇ *, 9, 2, 7; 1999 VE₂₇ *, 8, 2, 7; 1999 VF₂₇ *, 10, 2, 9; 1999 VG₂₇ *, 10, 2, 9; 1999 VH₂₇ *, 10, 2, 9; 1999 VJ₂₇ *, 10, 2, 9; 1999 VK₂₇ *, 10, 2, 9; 1999 VL₂₇ *, 10, 2, 9; 1999 VM₂₇ *, 10, 2, 9; 1999 VN₂₇ *, 10, 2, 9; 1999 VO₂₇ *, 10, 2, 9; 1999 VP₂₇ *, 10, 2, 9; 1999 VQ₂₇ *, 10, 2, 9; 1999 VR₂₇ *, 10, 2, 9; 1999 VS₂₇ *, 10, 2, 9; 1999 VT₂₇ *, 10, 2, 9; 1999 VU₂₇ *, 10, 2, 9; 1999 VV₂₇ *, 10, 2, 9; 1999 VW₂₇ *, 10, 2, 9; 1999 VX₂₇ *, 10, 2, 9; 1999 VY₂₇ *, 10, 2, 9; 1999 VZ₂₇ *, 10, 2, 9; 1999 VA₂₈ *, 10, 2, 9; 1999 VB₂₈ *, 10, 2, 9; 1999 VC₂₈ *, 10, 2, 9; 1999 VD₂₈ *, 10, 2, 9; 1999 VE₂₈ *, 9, 2, 9; 1999 VF₂₈ *, 10, 2, 9; 1999 VG₂₈ *, 10, 2, 9; 1999 VH₂₈ *, 10, 2, 9; 1999 VJ₂₈ *, 10, 2, 9; 1999 VK₂₈ *, 10, 2, 9; 1999 VL₂₈ *, 10, 2, 9; 1999 VM₂₈ *, 10, 2, 9; 1999 VN₂₈ *, 10, 2, 9; 1999 VO₂₈ *, 10, 2, 9; 1999 VP₂₈ *, 10, 2, 9; 1999 VQ₂₈ *, 10, 2, 9; 1999 VR₂₈ *, 9, 2, 9; 1999 VS₂₈ *, 10, 2, 9; 1999 VT₂₈ *, 9, 2, 9; 1999 VU₂₈ *, 10, 2, 9; 1999 VV₂₈ *, 10, 2, 9; 1999 VW₂₈ *, 10, 2, 9; 1999 VX₂₈ *, 10, 2, 9; 1999 VY₂₈ *, 9, 2, 9; 1999 VZ₂₈ *, 8, 2, 9; 1999 VA₂₉ *, 10, 2, 9; 1999 VB₂₉ *, 13, 2, 9; 1999 VC₂₉ *, 8, 2, 9; 1999 VD₂₉ *, 10, 2, 9; 1999 VE₂₉ *, 10, 2, 9; 1999 VF₂₉ *, 10, 2, 9; 1999 VG₂₉ *, 10, 2, 9; 1999 VH₂₉ *, 9, 2, 9; 1999 VJ₂₉ *, 10, 2, 9; 1999 VK₂₉ *, 9, 2, 9; 1999 VL₂₉ *, 10, 2, 9; 1999 VM₂₉ *, 9, 2, 9; 1999 VN₂₉ *, 9, 2, 9; 1999 VO₂₉ *, 10, 2, 9; 1999 VP₂₉ *, 9, 2, 9; 1999 VQ₂₉ *, 8, 2, 9; 1999 VR₂₉ *, 10, 2, 9; 1999 VS₂₉ *, 8, 2, 9; 1999 VT₂₉ *, 8, 2, 9; 1999 VU₂₉ *, 10, 2, 9; 1999 VV₂₉ *, 9, 2, 9; 1999 VW₂₉ *, 7, 2, 9; 1999 VX₂₉ *, 10, 2, 9; 1999 VY₂₉ *, 10, 2, 9; 1999 VZ₂₉ *, 8, 2, 9; 1999 VA₃₀ *, 8, 2, 9; 1999 VB₃₀ *, 9, 2, 9; 1999 VC₃₀ *, 8, 2, 9; 1999 VD₃₀ *,

10, 2, 9; 1999 VE₃₀ *, 10, 2, 9; 1999 VF₃₀ *, 10, 2, 9; 1999 VG₃₀ *, 8, 2, 9; 1999 VH₃₀ *, 9, 2, 9; 1999 VJ₃₀ *, 8, 2, 9; 1999 VK₃₀ *, 9, 2, 9; 1999 VL₃₀ *, 10, 2, 9; 1999 VM₃₀ *, 10, 2, 9; 1999 VN₃₀ *, 10, 2, 9; 1999 VO₃₀ *, 10, 2, 9; 1999 VP₃₀ *, 9, 2, 9; 1999 VQ₃₀ *, 10, 2, 9; 1999 VR₃₀ *, 8, 2, 9; 1999 VS₃₀ *, 10, 2, 9; 1999 VT₃₀ *, 10, 2, 9; 1999 VU₃₀ *, 10, 2, 9; 1999 VV₃₀ *, 10, 2, 9; 1999 VW₃₀ *, 10, 2, 9; 1999 VX₃₀ *, 10, 2, 9; 1999 VY₃₀ *, 10, 2, 9; 1999 VZ₃₀ *, 10, 2, 9; 1999 VA₃₁ *, 9, 2, 9; 1999 VB₃₁ *, 9, 2, 9; 1999 VC₃₁ *, 9, 2, 9; 1999 VD₃₁ *, 10, 2, 9; 1999 VE₃₁ *, 10, 2, 9; 1999 VF₃₁ *, 9, 2, 9; 1999 VG₃₁ *, 10, 2, 9; 1999 VH₃₁ *, 9, 2, 9; 1999 VJ₃₁ *, 9, 2, 9; 1999 VK₃₁ *, 10, 2, 9; 1999 VL₃₁ *, 9, 2, 9; 1999 VM₃₁ *, 10, 2, 9; 1999 VN₃₁ *, 10, 2, 9; 1999 VO₃₁ *, 9, 2, 9; 1999 VP₃₁ *, 8, 2, 9; 1999 VQ₃₁ *, 9, 2, 9; 1999 VR₃₁ *, 8, 2, 9; 1999 VS₃₁ *, 7, 2, 9; 1999 VT₃₁ *, 8, 2, 9; 1999 VU₃₁ *, 8, 2, 9; 1999 VV₃₁ *, 9, 2, 9; 1999 VW₃₁ *, 9, 2, 9; 1999 VX₃₁ *, 8, 2, 9; 1999 VY₃₁ *, 9, 2, 9; 1999 VZ₃₁ *, 6, 2, 9; 1999 VA₃₂ *, 9, 2, 9; 1999 VB₃₂ *, 8, 2, 9; 1999 VC₃₂ *, 9, 2, 9; 1999 VD₃₂ *, 9, 2, 9; 1999 VE₃₂ *, 8, 2, 9; 1999 VF₃₂ *, 8, 2, 9; 1999 VG₃₂ *, 9, 2, 9; 1999 VH₃₂ *, 8, 2, 9; 1999 VJ₃₂ *, 9, 2, 9; 1999 VK₃₂ *, 8, 2, 9; 1999 VL₃₂ *, 9, 2, 9; 1999 VM₃₂ *, 9, 2, 9; 1999 VN₃₂ *, 6, 2, 9; 1999 VO₃₂ *, 8, 2, 9; 1999 VP₃₂ *, 9, 2, 9; 1999 VQ₃₂ *, 9, 2, 9; 1999 VR₃₂ *, 9, 2, 9; 1999 VS₃₂ *, 8, 2, 9; 1999 VT₃₂ *, 7, 2, 9; 1999 VU₃₂ *, 8, 2, 9; 1999 VV₃₂ *, 8, 2, 9; 1999 VW₃₂ *, 9, 2, 9; 1999 VX₃₂ *, 9, 2, 9; 1999 VY₃₂ *, 8, 2, 9; 1999 VZ₃₂ *, 9, 2, 9; 1999 VA₃₃ *, 9, 2, 9; 1999 VB₃₃ *, 8, 2, 9; 1999 VC₃₃ *, 9, 2, 9; 1999 VD₃₃ *, 7, 2, 9; 1999 VE₃₃ *, 8, 2, 9; 1999 VF₃₃ *, 9, 2, 9; 1999 VG₃₃ *, 8, 2, 9; 1999 VH₃₃ *, 9, 2, 9; 1999 VJ₃₃ *, 9, 2, 9; 1999 VK₃₃ *, 9, 2, 9; 1999 VL₃₃ *, 8, 2, 9; 1999 VM₃₃ *, 8, 2, 9; 1999 VN₃₃ *, 9, 2, 9; 1999 VO₃₃ *, 8, 2, 9; 1999 VP₃₃ *, 8, 2, 9; 1999 VQ₃₃ *, 8, 2, 9; 1999 VR₃₃ *, 8, 2, 9; 1999 VS₃₃ *, 8, 2, 9; 1999 VT₃₃ *, 8, 2, 9; 1999 VU₃₃ *, 9, 2, 9; 1999 VV₃₃ *, 9, 2, 9; 1999 VW₃₃ *, 9, 2, 9; 1999 VX₃₃ *, 9, 2, 9; 1999 VY₃₃ *, 8, 2, 9; 1999 VZ₃₃ *, 7, 2, 9; 1999 VA₃₄ *, 6, 2, 9; 1999 VB₃₄ *, 8, 2, 9; 1999 VC₃₄ *, 8, 2, 9; 1999 VD₃₄ *, 10, 2, 9; 1999 VE₃₄ *, 10, 2, 9; 1999 VF₃₄ *, 10, 2, 9; 1999 VG₃₄ *, 10, 2, 9; 1999 VH₃₄ *, 10, 2, 9; 1999 VJ₃₄ *, 10, 2, 9; 1999 VK₃₄ *, 10, 2, 9; 1999 VL₃₄ *, 10, 2, 9; 1999 VM₃₄ *, 10, 2, 9; 1999 VN₃₄ *, 7, 2, 9; 1999 VO₃₄ *, 10, 2, 9; 1999 VP₃₄ *, 10, 2, 9; 1999 VQ₃₄ *, 10, 2, 9; 1999 VR₃₄ *, 7, 2, 9; 1999 VS₃₄ *, 10, 2, 9; 1999 VT₃₄ *, 10, 2, 9; 1999 VU₃₄ *, 10, 2, 9; 1999 VV₃₄ *, 9, 2, 9; 1999 VW₃₄ *, 10, 2, 9; 1999 VX₃₄ *, 10, 2, 9; 1999 VY₃₄ *, 10, 2, 9; 1999 VZ₃₄ *, 9, 2, 9; 1999 VA₃₅ *, 10, 2, 9; 1999 VB₃₅ *, 9, 2, 9; 1999 VC₃₅ *, 9, 2, 9; 1999 VD₃₅ *, 9, 2, 9; 1999 VE₃₅ *, 9, 2, 9; 1999 VF₃₅ *, 9, 2, 9; 1999 VG₃₅ *, 9, 2, 9; 1999 VH₃₅ *, 8, 2, 9; 1999 VJ₃₅ *, 8, 2, 9; 1999 VK₃₅ *, 8, 2, 9; 1999 VL₃₅ *, 8, 2, 9; 1999 VM₃₅ *, 9, 2, 9; 1999 VN₃₅ *, 8, 2, 9; 1999 VO₃₅ *, 9, 2, 9; 1999 VP₃₅ *, 8, 2, 9; 1999 VQ₃₅ *, 8, 2, 9; 1999 VR₃₅ *, 9, 2, 9; 1999 VS₃₅ *, 10, 2, 9; 1999 VT₃₅ *, 9, 2, 9; 1999 VU₃₅ *, 10, 2, 9; 1999 VV₃₅ *, 9, 2, 9; 1999 VW₃₅ *, 9, 2, 9; 1999 VX₃₅ *, 8, 2, 9; 1999 VY₃₅ *, 8, 2, 9; 1999 VZ₃₅ *, 7, 2, 9; 1999 VA₃₆ *, 6, 2, 9; 1999 VB₃₆ *, 9, 2, 9; 1999 VC₃₆ *, 8, 2, 9; 1999 VD₃₆ *, 9, 2, 9; 1999 VE₃₆ *, 7, 2, 9; 1999 VF₃₆ *, 7, 2, 9; 1999 VG₃₆ *, 9, 2, 9; 1999 VH₃₆ *, 8, 2, 9; 1999 VJ₃₆ *, 8, 2, 9; 1999 VK₃₆ *, 8, 2, 9; 1999 VL₃₆ *, 9, 2, 9; 1999 VM₃₆ *, 9, 2, 9; 1999 VN₃₆ *, 9, 2, 9; 1999 VO₃₆ *, 9, 2, 9; 1999 VP₃₆ *, 8, 2, 9; 1999 VQ₃₆ *, 8, 2, 9; 1999 VR₃₆ *, 8, 2, 9; 1999 VS₃₆ *, 7, 2, 9; 1999 VT₃₆ *, 6, 2, 9; 1999 VU₃₆ *, 8, 2, 9; 1999 VV₃₆ *, 8, 2, 9; 1999 VW₃₆ *, 10, 2, 9; 1999 VX₃₆ *, 9, 2, 9; 1999 VY₃₆ *, 10, 2, 9; 1999 VZ₃₆ *, 7, 2, 9; 1999 VA₃₇ *, 10, 2, 9; 1999 VB₃₇ *, 10, 2, 9; 1999 VC₃₇ *, 10, 2, 9; 1999 VD₃₇ *, 10, 2, 9; 1999 VE₃₇ *, 10, 2, 9; 1999 VF₃₇ *, 10, 2, 9; 1999 VG₃₇ *, 10, 2, 9; 1999 VH₃₇ *, 9, 2, 9; 1999 VJ<

1999 VC₄₈ *, 10, 2, 1; 1999 VD₄₈ *, 10, 2, 1; 1999 VE₄₈ *, 10, 2, 1; 1999 VF₄₈ *, 10, 2, 1; 1999 VG₄₈ *, 7, 2, 1; 1999 VH₄₈ *, 8, 2, 1; 1999 VJ₄₈ *, 7, 2, 1; 1999 VK₄₈ *, 8, 2, 1; 1999 VL₄₈ *, 12, 2, 1; 1999 VM₄₈ *, 9, 2, 1; 1999 VN₄₈ *, 13, 2, 1; 1999 VO₄₈ *, 10, 2, 1; 1999 VP₄₈ *, 9, 2, 1; 1999 VQ₄₈ *, 10, 2, 1; 1999 VR₄₈ *, 8, 2, 1; 1999 VS₄₈ *, 10, 2, 1; 1999 VT₄₈ *, 10, 2, 1; 1999 VU₄₈ *, 10, 2, 1; 1999 VV₄₈ *, 10, 2, 1; 1999 VW₄₈ *, 10, 2, 1; 1999 VX₄₈ *, 10, 2, 1; 1999 VY₄₈ *, 10, 2, 1; 1999 VZ₄₈ *, 10, 2, 1; 1999 VA₄₉ *, 8, 2, 1; 1999 VB₄₉ *, 10, 2, 1; 1999 VC₄₉ *, 10, 2, 1; 1999 VD₄₉ *, 9, 2, 1; 1999 VE₄₉ *, 10, 2, 1; 1999 VF₄₉ *, 10, 2, 1; 1999 VG₄₉ *, 10, 2, 1; 1999 VH₄₉ *, 10, 2, 1; 1999 VJ₄₉ *, 10, 2, 1; 1999 VK₄₉ *, 10, 2, 1; 1999 VL₄₉ *, 10, 2, 1; 1999 VM₄₉ *, 9, 2, 1; 1999 VN₄₉ *, 9, 2, 1; 1999 VO₄₉ *, 7, 2, 1; 1999 VP₄₉ *, 9, 2, 1; 1999 VQ₄₉ *, 10, 2, 1; 1999 VR₄₉ *, 10, 2, 1; 1999 VS₄₉ *, 10, 2, 1; 1999 VT₄₉ *, 10, 2, 1; 1999 VU₄₉ *, 10, 2, 1; 1999 VV₄₉ *, 13, 2, 1; 1999 VW₄₉ *, 15, 2, 1; 1999 VX₄₉ *, 15, 2, 1; 1999 VY₄₉ *, 10, 2, 1; 1999 VZ₄₉ *, 10, 2, 1; 1999 VA₅₀ *, 10, 2, 1; 1999 VB₅₀ *, 10, 2, 1; 1999 VC₅₀ *, 9, 2, 1; 1999 VD₅₀ *, 9, 2, 1; 1999 VE₅₀ *, 10, 2, 1; 1999 VF₅₀ *, 8, 2, 1; 1999 VG₅₀ *, 9, 2, 1; 1999 VH₅₀ *, 10, 2, 1; 1999 VI₅₀ *, 10, 2, 1; 1999 VJ₅₀ *, 10, 2, 1; 1999 VK₅₀ *, 9, 2, 1; 1999 VL₅₀ *, 10, 2, 1; 1999 VM₅₀ *, 9, 2, 1; 1999 VN₅₀ *, 10, 2, 1; 1999 VO₅₀ *, 10, 2, 1; 1999 VP₅₀ *, 8, 2, 1; 1999 VQ₅₀ *, 10, 2, 1; 1999 VR₅₀ *, 10, 2, 1; 1999 VS₅₀ *, 10, 2, 1; 1999 VT₅₀ *, 10, 2, 1; 1999 VU₅₀ *, 10, 2, 1; 1999 VV₅₀ *, 9, 2, 1; 1999 VW₅₀ *, 10, 2, 1; 1999 VX₅₀ *, 10, 2, 1; 1999 VY₅₀ *, 10, 2, 1; 1999 VZ₅₀ *, 7, 2, 1; 1999 VA₅₁ *, 13, 2, 1; 1999 VB₅₁ *, 13, 2, 1; 1999 VC₅₁ *, 8, 2, 1; 1999 VD₅₁ *, 8, 2, 1; 1999 VE₅₁ *, 9, 2, 1; 1999 VF₅₁ *, 7, 2, 1; 1999 VG₅₁ *, 7, 2, 1; 1999 VH₅₁ *, 9, 2, 1; 1999 VJ₅₁ *, 9, 2, 1; 1999 VK₅₁ *, 8, 2, 1; 1999 VL₅₁ *, 7, 2, 1; 1999 VM₅₁ *, 9, 2, 1; 1999 VN₅₁ *, 8, 2, 1; 1999 VO₅₁ *, 8, 2, 1; 1999 VP₅₁ *, 9, 2, 1; 1999 VQ₅₁ *, 9, 2, 1; 1999 VR₅₁ *, 9, 2, 1; 1999 VS₅₁ *, 7, 2, 1; 1999 VT₅₁ *, 9, 2, 1; 1999 VU₅₁ *, 7, 2, 1; 1999 VV₅₁ *, 14, 2, 1; 1999 VW₅₁ *, 10, 2, 1; 1999 VX₅₁ *, 7, 2, 1; 1999 VY₅₁ *, 9, 2, 1; 1999 VZ₅₁ *, 9, 2, 1; 1999 VA₅₂ *, 6, 2, 1; 1999 VB₅₂ *, 8, 2, 1; 1999 VC₅₂ *, 7, 2, 1; 1999 VD₅₂ *, 7, 2, 1; 1999 VE₅₂ *, 7, 2, 1; 1999 VF₅₂ *, 8, 2, 1; 1999 VG₅₂ *, 7, 2, 1; 1999 VH₅₂ *, 8, 2, 1; 1999 VJ₅₂ *, 10, 2, 1; 1999 VK₅₂ *, 10, 2, 1; 1999 VL₅₂ *, 10, 2, 1; 1999 VM₅₂ *, 9, 2, 1; 1999 VN₅₂ *, 9, 2, 1; 1999 VO₅₂ *, 6, 2, 1; 1999 VP₅₂ *, 10, 2, 1; 1999 VQ₅₂ *, 10, 2, 1; 1999 VR₅₂ *, 7, 2, 1; 1999 VS₅₂ *, 10, 2, 1; 1999 VT₅₂ *, 10, 2, 1; 1999 VU₅₂ *, 9, 2, 1; 1999 VV₅₂ *, 10, 2, 1; 1999 VW₅₂ *, 9, 2, 1; 1999 VX₅₂ *, 10, 2, 1; 1999 VY₅₂ *, 10, 2, 1; 1999 VZ₅₂ *, 10, 2, 1; 1999 VA₅₃ *, 9, 2, 1; 1999 VB₅₃ *, 10, 2, 1; 1999 VC₅₃ *, 9, 2, 1; 1999 VD₅₃ *, 10, 2, 1; 1999 VE₅₃ *, 9, 2, 1; 1999 VF₅₃ *, 9, 2, 1; 1999 VG₅₃ *, 9, 2, 1; 1999 VH₅₃ *, 9, 2, 1; 1999 VJ₅₃ *, 8, 2, 1; 1999 VK₅₃ *, 7, 2, 1; 1999 VL₅₃ *, 8, 2, 1; 1999 VM₅₃ *, 8, 2, 8; 1999 VN₅₃ *, 10, 2, 8; 1999 VO₅₃ *, 10, 2, 8; 1999 VP₅₃ *, 9, 2, 8; 1999 VQ₅₃ *, 9, 2, 8; 1999 VR₅₃ *, 8, 2, 8; 1999 VS₅₃ *, 10, 2, 8; 1999 VT₅₃ *, 10, 2, 8; 1999 VU₅₃ *, 10, 2, 8; 1999 VV₅₃ *, 7, 2, 8; 1999 VW₅₃ *, 10, 2, 8; 1999 VX₅₃ *, 10, 2, 8; 1999 VY₅₃ *, 8, 2, 8; 1999 VZ₅₃ *, 9, 2, 8; 1999 VA₅₄ *, 9, 2, 8; 1999 VB₅₄ *, 9, 2, 8; 1999 VC₅₄ *, 9, 2, 8; 1999 VD₅₄ *, 9, 2, 8; 1999 VE₅₄ *, 8, 2, 8; 1999 VF₅₄ *, 10, 2, 8; 1999 VG₅₄ *, 10, 2, 8; 1999 VH₅₄ *, 10, 2, 8; 1999 VJ₅₄ *, 10, 2, 8; 1999 VK₅₄ *, 8, 2, 8; 1999 VL₅₄ *, 10, 2, 8; 1999 VM₅₄ *, 9, 2, 8; 1999 VN₅₄ *, 10, 2, 8; 1999 VO₅₄ *, 10, 2, 8; 1999 VP₅₄ *, 10, 2, 8; 1999 VQ₅₄ *, 9, 2, 8; 1999 VR₅₄

1999 VL₅₉ *, 6, 2, 8; 1999 VM₅₉ *, 10, 2, 8; 1999 VN₅₉ *, 9, 2, 8; 1999 VO₅₉ *, 9, 2, 8; 1999 VP₅₉ *, 9, 2, 8; 1999 VQ₅₉ *, 8, 2, 8; 1999 VR₅₉ *, 10, 2, 8; 1999 VS₅₉ *, 10, 2, 8; 1999 VT₅₉ *, 6, 2, 8; 1999 VU₅₉ *, 10, 2, 8; 1999 VV₅₉ *, 10, 2, 8; 1999 VW₅₉ *, 8, 2, 8; 1999 VX₅₉ *, 10, 2, 8; 1999 VY₅₉ *, 9, 2, 8; 1999 VZ₅₉ *, 8, 2, 8; 1999 VA₆₀ *, 9, 2, 8; 1999 VB₆₀ *, 10, 2, 8; 1999 VC₆₀ *, 10, 2, 8; 1999 VD₆₀ *, 9, 2, 8; 1999 VE₆₀ *, 10, 2, 8; 1999 VF₆₀ *, 9, 2, 8; 1999 VG₆₀ *, 10, 2, 8; 1999 VH₆₀ *, 8, 2, 8; 1999 VJ₆₀ *, 10, 2, 8; 1999 VK₆₀ *, 8, 2, 8; 1999 VL₆₀ *, 10, 2, 8; 1999 VM₆₀ *, 10, 2, 8; 1999 VN₆₀ *, 10, 2, 8; 1999 VO₆₀ *, 10, 2, 8; 1999 VP₆₀ *, 9, 2, 8; 1999 VQ₆₀ *, 10, 2, 8; 1999 VR₆₀ *, 9, 2, 8; 1999 VS₆₀ *, 10, 2, 8; 1999 VT₆₀ *, 9, 2, 8; 1999 VU₆₀ *, 10, 2, 8; 1999 VV₆₀ *, 9, 2, 8; 1999 VW₆₀ *, 10, 2, 8; 1999 VX₆₀ *, 10, 2, 8; 1999 VY₆₀ *, 10, 2, 8; 1999 VZ₆₀ *, 10, 2, 8; 1999 VA₆₁ *, 10, 2, 8; 1999 VB₆₁ *, 8, 2, 8; 1999 VC₆₁ *, 10, 2, 8; 1999 VD₆₁ *, 10, 2, 8; 1999 VE₆₁ *, 10, 2, 8; 1999 VF₆₁ *, 10, 2, 8; 1999 VG₆₁ *, 8, 2, 8; 1999 VH₆₁ *, 9, 2, 8; 1999 VJ₆₁ *, 9, 2, 8; 1999 VK₆₁ *, 10, 2, 8; 1999 VL₆₁ *, 7, 2, 8; 1999 VM₆₁ *, 8, 2, 8; 1999 VN₆₁ *, 10, 2, 8; 1999 VO₆₁ *, 10, 2, 8; 1999 VP₆₁ *, 10, 2, 8; 1999 VQ₆₁ *, 10, 2, 8; 1999 VR₆₁ *, 9, 2, 8; 1999 VS₆₁ *, 9, 2, 8; 1999 VT₆₁ *, 10, 2, 8; 1999 VU₆₁ *, 9, 2, 8; 1999 VV₆₁ *, 10, 2, 8; 1999 VW₆₁ *, 10, 2, 8; 1999 VX₆₁ *, 10, 2, 8; 1999 VY₆₁ *, 10, 2, 8; 1999 VZ₆₁ *, 7, 2, 8; 1999 VA₆₂ *, 9, 2, 8; 1999 VB₆₂ *, 10, 2, 8; 1999 VC₆₂ *, 9, 2, 8; 1999 VD₆₂ *, 10, 2, 8; 1999 VE₆₂ *, 9, 2, 8; 1999 VF₆₂ *, 9, 2, 8; 1999 VG₆₂ *, 10, 2, 8; 1999 VH₆₂ *, 9, 2, 8; 1999 VJ₆₂ *, 10, 2, 8; 1999 VK₆₂ *, 10, 2, 8; 1999 VL₆₂ *, 10, 2, 8; 1999 VM₆₂ *, 7, 2, 8; 1999 VN₆₂ *, 9, 2, 8; 1999 VO₆₂ *, 10, 2, 8; 1999 VP₆₂ *, 8, 2, 8; 1999 VQ₆₂ *, 10, 2, 8; 1999 VR₆₂ *, 10, 2, 8; 1999 VS₆₂ *, 10, 2, 8; 1999 VT₆₂ *, 8, 2, 8; 1999 VU₆₂ *, 9, 2, 8; 1999 VV₆₂ *, 9, 2, 8; 1999 VW₆₂ *, 10, 2, 8; 1999 VX₆₂ *, 10, 2, 8; 1999 VY₆₂ *, 10, 2, 8; 1999 VZ₆₂ *, 10, 2, 8; 1999 VA₆₃ *, 10, 2, 8; 1999 VB₆₃ *, 8, 2, 8; 1999 VC₆₃ *, 10, 2, 8; 1999 VD₆₃ *, 10, 2, 8; 1999 VE₆₃ *, 10, 2, 8; 1999 VF₆₃ *, 9, 2, 8; 1999 VG₆₃ *, 10, 2, 8; 1999 VH₆₃ *, 9, 2, 8; 1999 VJ₆₃ *, 10, 2, 8; 1999 VK₆₃ *, 10, 2, 8; 1999 VL₆₃ *, 10, 2, 8; 1999 VM₆₃ *, 10, 2, 8; 1999 VN₆₃ *, 8, 2, 8; 1999 VO₆₃ *, 10, 2, 8; 1999 VP₆₃ *, 8, 2, 8; 1999 VQ₆₃ *, 10, 2, 8; 1999 VR₆₃ *, 10, 2, 8; 1999 VS₆₃ *, 9, 2, 8; 1999 VT₆₃ *, 8, 2, 8; 1999 VU₆₃ *, 10, 2, 8; 1999 VV₆₃ *, 10, 2, 8; 1999 VW₆₃ *, 8, 2, 8; 1999 VX₆₃ *, 10, 2, 8; 1999 VY₆₃ *, 9, 2, 8; 1999 VZ₆₃ *, 9, 2, 8; 1999 VA₆₄ *, 9, 2, 8; 1999 VB₆₄ *, 9, 2, 8; 1999 VC₆₄ *, 10, 2, 8; 1999 VD₆₄ *, 10, 2, 8; 1999 VE₆₄ *, 10, 2, 8; 1999 VF₆₄ *, 10, 2, 8; 1999 VG₆₄ *, 10, 2, 8; 1999 VH₆₄ *, 10, 2, 8; 1999 VJ₆₄ *, 8, 2, 8; 1999 VK₆₄ *, 10, 2, 8; 1999 VL₆₄ *, 10, 2, 8; 1999 VM₆₄ *, 9, 2, 8; 1999 VN₆₄ *, 9, 2, 8; 1999 VO₆₄ *, 10, 2, 8; 1999 VP₆₄ *, 10, 2, 8; 1999 VQ₆₄ *, 10, 2, 8; 1999 VR₆₄ *, 10, 2, 8; 1999 VS₆₄ *, 10, 2, 8; 1999 VT₆₄ *, 7, 2, 8; 1999 VU₆₄ *, 10, 2, 8; 1999 VV₆₄ *, 10, 2, 8; 1999 VW₆₄ *, 9, 2, 8; 1999 VX₆₄ *, 9, 2, 8; 1999 VY₆₄ *, 10, 2, 8; 1999 VZ₆₄ *, 10, 2, 8; 1999 VA₆₅ *, 10, 2, 8; 1999 VB₆₅ *, 10, 2, 8; 1999 VC₆₅ *, 10, 2, 8; 1999 VD₆₅ *, 10, 2, 8; 1999 VE₆₅ *, 10, 2, 8; 1999 VF₆₅ *, 10, 2, 8; 1999 VG₆₅ *, 7, 2, 8; 1999 VH₆₅ *, 8, 2, 8; 1999 VJ₆₅ *, 11, 2, 8; 1999 VK₆₅ *, 10, 2, 8; 1999 VL₆₅ *, 7, 2, 8; 1999 VM₆₅ *, 10, 2, 8; 1999 VN₆₅ *, 10, 2, 8; 1999 VO₆₅ *, 8, 2, 8; 1999 VP₆₅ *, 7, 2, 8; 1999 VQ₆₅ *, 9, 2, 8; 1999 VR₆₅ *, 10, 2, 8; 1999 VS₆₅ *, 8, 2, 8; 1999 VT₆₅ *, 10, 2, 8; 1999 VU₆₅ *, 8, 2, 8; 1999 VV₆₅ *, 10, 2, 8; 1999 VW₆₅ *, 10, 2, 8; 1999 VX₆₅ *, 10, 2, 8; 1999 VY₆₅ *, 10, 2, 8; 1999 VZ₆₅ *, 10,

8, 2, 8; 1999 VX₇₀ *, 9, 2, 8; 1999 VY₇₀ *, 8, 2, 8; 1999 VZ₇₀ *, 7, 2, 8; 1999 VA₇₁ *, 9, 2, 8; 1999 VB₇₁ *, 8, 2, 8; 1999 VC₇₁ *, 8, 2, 8; 1999 VD₇₁ *, 8, 2, 8; 1999 VE₇₁ *, 9, 2, 8; 1999 VF₇₁ *, 8, 2, 8; 1999 VG₇₁ *, 8, 2, 8; 1999 VH₇₁ *, 9, 2, 8; 1999 VJ₇₁ *, 8, 2, 8; 1999 VK₇₁ *, 7, 2, 8; 1999 VL₇₁ *, 8, 2, 8; 1999 VM₇₁ *, 8, 2, 8; 1999 VN₇₁ *, 8, 2, 8; 1999 VO₇₁ *, 7, 2, 8; 1999 VP₇₁ *, 8, 2, 8; 1999 VQ₇₁ *, 8, 2, 8; 1999 VR₇₁ *, 8, 2, 8; 1999 VS₇₁ *, 8, 2, 8; 1999 VT₇₁ *, 8, 2, 8; 1999 VU₇₁ *, 8, 2, 8; 1999 WA, 10, 2, 8; 1999 WB, 5, 1, 0; 1999 WD, 9, 2, 9; 1999 WF, 10, 2, 9; 1999 WR, 10, 2, 8; 2040 P-L, 9, 2, 8; 2043 P-L, 4, 1, 0; 2054 P-L, 15, 3, 11; 2058 P-L, 10, 2, 9; 2091 P-L, 20, 4, 12; 2095 P-L, 7, 2, 2; 2100 P-L, 4, 1, 0; 2129 P-L, 4, 1, 0; 2155 P-L, 19, 4, 12; 2221 P-L, 3, 1, 0; 2506 P-L, 3, 1, 0; 2508 P-L, 4, 1, 0; 2514 P-L, 3, 1, 0; 2551 P-L, 15, 3, 13; 2555 P-L, 10, 2, 2; 2556 P-L, 14, 3, 58; 2588 P-L, 15, 3, 11; 2589 P-L, 5, 1, 0; 2592 P-L, 10, 2, 13; 2613 P-L, 15, 3, 12; 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(11920), 15, 3, 13; (11922), 20, 4, 13; (11923), 5, 1, 0; (11924), 9, 2, 9; (11925), 5, 1, 0; (11926), 5, 1, 0; (11927), 5, 1, 0; (11931), 15, 3, 10; (11932), 5, 1, 0; (11933), 5, 1, 0; (11934), 8, 2, 9; (11935), 9, 2, 9; (11936), 13, 3, 13; (11939), 5, 1, 0; (11941), 5, 1, 0; (11942), 24, 5, 12; (11943), 4, 1, 0; (11944), 15, 3, 12; (11945), 5, 1, 0; (11946), 11, 3, 6; (11947), 3, 1, 0; (11948), 12, 3, 6; (11949), 19, 4, 13; (11950), 3, 1, 0; (11952), 9, 2, 12; (11954), 9, 2, 6; (11956), 5, 1, 0; (11957), 14, 3, 11; (11960), 10, 2, 8; (11961), 5, 1, 0; (11962), 4, 1, 0; (11963), 5, 1, 0; (11965), 3, 1, 0; (11966), 7, 2, 3; (11967), 10, 2, 12; (11968), 9, 2, 9; (11969), 4, 1, 0; (11971), 10, 2, 11; (11974), 20, 4, 13; (11975), 12, 3, 3; (11976), 5, 1, 0; (11977), 5, 1, 0; (11978), 4, 1, 0; (11979), 13, 3, 7; (11983), 4, 1, 0; (11984), 3, 1, 0; (11985), 5, 1, 0; (11986), 5, 1, 0; (11987), 5, 1, 0; (11988), 14, 3, 11; (11989), 15, 3, 11; (11990), 10, 2, 3; (11991), 9, 2, 9; (11992), 10, 2, 12; (11994), 15, 3, 11; (11996), 4, 1, 0; (11997), 5, 1, 0; (11999), 5, 1, 0; (12000), 10, 2, 12; (12001), 10, 2, 3; (12003), 10, 2, 12; (12005), 5, 1, 0; (12008), 5, 1, 0; (12009), 5, 1, 0; (12011), 5, 1, 0; (12012), 3, 1, 0; (12014), 4, 1, 0; (12015), 14, 3, 6; (12017), 14, 3, 6; (12018), 5, 1, 0; (12019), 15, 3, 10; (12020), 4, 1, 0; (12021), 10, 2, 12; (12022), 8, 2, 3; (12023), 5, 1, 0; (12024), 8, 2, 7; (12025), 10, 2, 12; (12026), 5, 1, 0; (12028), 3, 1, 0; (12030), 4, 1, 0; (12031), 5, 1, 0; (12032), 3, 1, 0; (12034), 4, 1, 0; (12035), 14, 3, 12; (12038), 5, 1, 0; (12039), 5, 1, 0; (12040), 5, 1, 0; (12043), 5, 1, 0; (12044), 5, 1, 0; (12046), 15, 3, 11; (12047), 20, 4, 11; (12049), 14, 3, 12; (12050), 8, 2, 9; (12052), 4, 1, 0; (12055), 3, 1, 0; (12056), 5, 1, 0; (12059), 4, 1, 0; (12060), 5, 1, 0; (12061), 15, 3, 12; (12062), 5, 1, 0; (12064), 5, 1, 0; (12066), 7, 2, 3; (12069), 5, 1, 0; (12070), 7, 2, 3; (12073), 12, 3, 9; (12074), 7, 2, 7; (12075), 5, 1, 0; (12077), 8, 2, 7; (12078), 3, 1, 0; (12079), 4, 1, 0; (12081), 4, 1, 0; (12082), 5, 1, 0; (12084), 3, 1, 0; (12088), 5, 1, 0; (12089), 4, 1, 0; (12090), 9, 2, 7; (12091), 10, 2, 9; (12094), 4, 1, 0; (12095), 4, 1, 0; (12097), 5, 1, 0; (12101), 4, 1, 0; (12102), 4, 1, 0; (12103), 10, 2, 7; (12104), 5, 1, 0; (12105), 3, 1, 0; (12106), 10, 2, 6; (12107), 25, 5, 13; (12108), 5, 1, 0; (12111), 4, 1, 0; (12112), 5, 1, 0; (12113), 5, 1, 0; (12114), 5, 1, 0; (12115), 5, 1, 0; (12122), 4, 1, 0; (12123), 9, 2, 5; (12125), 9, 2, 5; (12126), 5, 1, 0; (12127), 7, 2, 10; (12129), 4, 1, 0; (12132), 5, 1, 0; (12133), 20, 4, 11; (12135), 5, 1, 0; (12137), 9, 2, 11; (12138), 4, 1, 0; (12139), 10, 2, 9; (12141), 15, 3, 12; (12142), 5, 1, 0; (12143), 9, 2, 7; (12146), 5, 1, 0; (12152), 14, 3, 7; (12155), 10, 2, 12; (12156), 10, 2, 4; (12157), 3, 1, 0; (12162), 5, 1, 0; (12163), 14, 3, 13; (12164), 14, 3, 12; (12165), 5, 1, 0; (12166), 4, 1, 0; (12167), 5, 1, 0;

(12170), 24, 5, 13; (12172), 4, 1, 0; (12174), 5, 1, 0; (12175), 15, 3, 12; (12179), 5, 1, 0; [64124, 8132, 1097*, 1997/04/08–1999/11/17]

706 Salinas

J. E. Hall, 10180 County Rd. 190, Salida, CO 81201, U.S.A. [teila@rmi.net]

0.25-m $f/6$ Newtonian reflector + CCD

GSC

1999 VF₂₂, 3, 1, 0; 1999 VG₂₂, 2, 1, 0; (7619), 3, 1, 0; [8, 3, 0*, 1999/11/14]

711 McDonald Observatory

P. J. Shelus, McDonald Observatory, University of Texas, Austin, TX 78712-1013, U.S.A. [pjs@astro.as.utexas.edu]

Observer J. G. Ries, P. J. Shelus

0.76-m $f/3.0$ reflector + CCD

GSC

1981 EM₇, 3, 1, 0; 1991 TX, 2, 1, 0; 1992 JE, 3, 1, 0; 1993 TL₁₈, 2, 1, 0; 1994 LC₁, 2, 1, 0; 1996 TL₆₆, 3, 2, 1; 1996 XG₁₉, 3, 1, 0; 1997 WU₂₂, 2, 1, 0; 1998 DD₁₀, 3, 1, 0; 1998 FA₇₃, 2, 1, 0; 1999 CF₉, 2, 2, 1; 1999 NZ₄, 2, 2, 1; 1999 OP₃, 4, 3, 23; 1999 OQ₃, 4, 4, 4; 1999 RB₃₂, 3, 1, 0; 1999 RD₃₂, 2, 1, 0; 1999 RH₃₅, 3, 1, 0; 1999 UG₅, 3, 1, 0; 1999 VT, 9, 3, 2; 1999 VU, 3, 1, 0; 1999 VV, 6, 2, 1; 1999 VL₁, 5, 2, 2; 1999 VR₃, 9, 3, 4; 1999 VQ₅, 7, 3, 2; 1999 VR₅, 12, 4, 3; 1999 VS₅, 6, 2, 1; 1999 VN₆, 6, 2, 1; 1999 VO₆, 9, 3, 2; 1999 VP₆, 9, 3, 2; 1999 VQ₆, 6, 2, 1; 1999 VR₆, 6, 2, 1; 1999 VS₆, 6, 2, 1; 1999 VL₁₁, 3, 1, 0; 1999 VM₁₁, 3, 1, 0; 1999 VN₁₁, 3, 1, 0; (636), 2, 1, 0; (1817), 2, 2, 4; (1876), 2, 2, 1; (1879), 3, 1, 0; (4197), 3, 1, 0; (4441), 3, 1, 0; (4450), 5, 2, 1; (4595), 3, 1, 0; (4704), 3, 1, 0; (5023), 3, 1, 0; (5435), 3, 3, 2; (6455), 3, 2, 2; (6456), 3, 1, 0; (6489), 2, 2, 29; (6890), 3, 2, 1; (6986), 5, 2, 2; (7424), 2, 1, 0; (7547), 2, 2, 2; (7769), 2, 1, 0; (8462), 2, 2, 1; (9101), 2, 1, 0; (11096), 3, 1, 0; (11811), 3, 1, 0; [220, 58, 0*, 1999/09/15–1999/11/08]

713 Thornton

R. A. Koff, 1915 W. 101st Ave., Thornton, CO 80221, U.S.A.

[Bob.Koff@worldnet.att.net]

0.20-m $f/10$ Schmidt-Cassegrain + CCD

USNO-A2.0

1999 US₃, 11, 2, 3; (3838), 8, 2, 4; (8875), 6, 2, 1; [25, 3, 0*, 1999/10/27–1999/11/10]

715 Las Cruces

D. Dixon, 5975 Moonrise Vista, Las Cruces, NM 88012, U.S.A.

[ddixon@lascruces.com]

Observers D. Dixon, J. Stevens, B. Stevens

0.2-m $f/6.5$ Schmidt-Cassegrain + CCD, 0.3-m $f/3.5$ Schmidt-Cassegrain + CCD

USNO-A2.0

1987 SL₃, 3, 1, 0; 1989 UA₁, 2, 1, 0; 1993 OX₆, 6, 2, 1; 1997 JE₁₀, 12, 5, 10; 1998 FK₂, 2, 1, 0; 1998 HJ₅₁, 2, 1, 0; 1998 HK₁₂₄, 3, 1, 0; 1998 KE₄₀, 7, 3, 2; 1999 RQ₂₀₇, 3, 1, 0; 1999 SA₁₀, 6, 2, 1; 1999 VF₂ *, 15, 5, 10; 1999 VG₂ *, 14, 6, 13; 1999 VH₂₂ *, 12, 5, 6; 9578 P-L, 2, 1, 0; 1310 T-2, 3, 1, 0; [92, 15, 3*, 1999/10/31–1999/11/19]

718 University of Utah Hansen Planetarium, Tooele

P. Wiggins, University of Utah Hansen Planetarium, 15 South State Street, Salt Lake City, UT 84111-1590, U.S.A. [p.wiggins@m.cc.utah.edu]

Observers P. Wiggins, H. Phaneuf

0.35-m $f/4.1$ Schmidt-Cassegrain + CCD

GSC

1991 VE₃, 6, 2, 2; 1992 YJ₂, 6, 2, 1; 1999 RC₃₈, 6, 2, 3; 1999 SW₁₀, 8, 1, 0; 1999 VS *, 18, 5, 8; 1999 VW₈, 6, 1, 0; 1999 VU₁₉ *, 12, 3, 2; 5485 T-2, 3, 1, 0; [65, 8, 2*, 1999/10/26–1999/11/16]

719 Etschorn Observatory

D. A. Klinglesmith III, 1215 Vista Drive, Socorro, NM 87801, U.S.A.

[TheKs@aol.com]

Observers D. A. Klinglesmith III, B. S. Smith, J. H. Crossley

0.355-m Schmidt-Cassegrain + CCD

GSC

1992 SQ₁, 3, 1, 0; 1999 TZ₁, 4, 2, 2; 1999 US₃, 4, 1, 0; 1999 VR₆, 4, 1, 0; 1999 VN₁₁, 2, 1, 0; 1999 VO₁₁, 4, 1, 0; 1999 VQ₁₁, 7, 2, 1; 1999 VF₂₂, 4, 1, 0; (699), 6, 3, 2; (3200), 6, 2, 4; (3581), 4, 2, 2; (3838), 3, 1, 0; (8875), 2, 1, 0; (9045), 1, 1, 0; [54, 14, 0*, 1999/10/31-1999/11/12]

721 Lime Creek

R. Linderholm, R2 Box 79, Cambridge, NE 69022, U.S.A. [lindh@swnebr.net]

0.25-m *f*/3.3 Schmidt-Cassegrain + CCD

GSC

1999 TK₁₃, 6, 3, 2; 1999 VD *, 8, 4, 6; 1999 VP₂ *, 4, 2, 1; 1999 VR₄ *, 6, 3, 7; [24, 4, 3*, 1999/10/31-1999/11/14]

723 Cottonwood Observatory, Ada

J. Waller, Rt#3 Box 175c, Ada, OK 74820, U.S.A. [jwaller@chickasaw.com]

0.30-m *f*/6 Schmidt-Cassegrain + CCD

GSC-ACT

1975 SZ₁, 3, 1, 0; 1990 TT, 3, 1, 0; 1992 SR₂₃, 3, 1, 0; 1993 FX₃₇, 3, 1, 0; 1993 OR₉, 3, 1, 0; 1995 WB₅, 5, 2, 2; 1996 XX₃₁, 6, 2, 2; 1996 YE₂, 11, 4, 7; 1998 FO₁₀₃, 8, 3, 7; 1998 FB₁₁₈, 4, 2, 1; 1998 HX, 2, 1, 0; 1998 HO₂₇, 12, 4, 4; 1998 JE, 5, 2, 1; 1999 RC₂, 3, 1, 0; 1999 RQ₁₀₉, 3, 1, 0; 1999 RT₁₁₇, 3, 1, 0; 1999 RG₁₂₄, 3, 1, 0; 1999 RL₁₂₄, 6, 2, 2; 1999 RT₁₃₇, 3, 1, 0; 1999 RQ₁₉₄, 6, 2, 2; 1999 RT₂₀₆, 3, 1, 0; 1999 SJ₂, 3, 1, 0; 1999 TQ₉, 6, 2, 2; 1999 TZ₁₃, 3, 1, 0; 1999 VW₄, 3, 1, 0; 1999 VD₁₁, 3, 1, 0; (1390), 3, 1, 0; (3945), 3, 1, 0; [122, 28, 0*, 1999/10/21-1999/11/16]

725 Fair Oaks Ranch

J. V. McClusky, McClusky Observatory, 31789 Sunland, Fair Oaks Ranch,

TX 78015, U.S.A. [mcclusky@lonestar.utsa.edu]

0.46-m *f*/4.5 Newtonian reflector + CCD

USNO-SA2.0

1998 VH₃₄, 6, 2, 1; (3427), 6, 2, 1; [12, 2, 0*, 1999/11/13-1999/11/14]

726 Brainerd

J. E. Wentworth, 6469 Madson Ave. N.W., Brainerd, MN 56401, U.S.A.

[jimw@brainerd.net]

0.280-m Schmidt-Cassigrain + CCD

GSC-1.1

1999 CU₃, 6, 1, 0; 1999 RH₂₇, 3, 1, 0; 1999 SK₁₀, 5, 1, 0; 1999 TZ₁, 3, 1, 0; 1999 TA₁₀, 3, 1, 0; 1999 US₃, 3, 1, 0; 1999 VU, 2, 1, 0; 1999 VS₆, 19, 2, 1; [44, 8, 0*, 1999/11/02-1999/11/15]

727 Zeno Observatory, Edmond

T. Stafford, 2947 Village Circle, Edmond, OK 73013, U.S.A.

[tstaffor@aignetplex.com]

0.15-m *f*/6 refractor + CCD

GSC, USNO-SA2.0

1988 CO₇, 3, 1, 0; 1995 QD₃, 6, 2, 4; 1997 CW, 3, 1, 0; 1999 RT₃₈, 3, 1, 0; 1999 RP₃₉, 5, 2, 13; 1999 RC₄₄, 5, 2, 2; 1999 SW₆, 2, 1, 0; 1999 TN, 5, 2, 13; 1999 VN *, 16, 6, 14; 1999 VO *, 7, 3, 3; 1999 VF₁ *, 15, 5, 13; 1999 VV₆ *, 12, 4, 7; 1999 VU₁₂, 2, 1, 0; 1999 VR₁₉ *, 12, 4, 6; 1999 VS₁₉ *, 12, 4, 6; 1999 VE₂₄ *, 9, 3, 3; 1999 WF *, 5, 2, 1; (1806), 3, 1, 0; (2383), 3, 1, 0; (4246), 2, 1, 0; (4305), 2, 1, 0; (4644), 2, 1, 0; (4877), 3, 1, 0; (5286), 3, 1, 0; (5501), 6, 2, 13; (6673), 3, 1, 0; (7570), 3, 1, 0; (7693), 6, 2, 2; (9042), 3, 1, 0; (9625), 3, 1, 0; (10612), 3, 1, 0; (11922), 6, 2, 1; (11949), 6, 2, 1; (12061), 3, 1, 0; [182, 34, 8*, 1999/11/02-1999/11/18]

732 Oaxaca

J. Roe, Apdo. No. 221, MX-68000 Oaxaca, Mexico [jamesroe@antequera.com]

0.25-m *f*/3.4 reflector + CCD

GSC-ACT

1985 TO₃, 6, 2, 1; 1991 EF₂, 6, 2, 1; 1991 VE₃, 8, 2, 1; 1994 UK₅, 6, 2, 3; 1995 UK₂₈, 18, 6, 14; 1996 HF₁₈, 6, 2, 1; 1997 MR, 3, 1, 0; 1998 SX₇, 9, 3, 5; 1999 SW₁₀, 8, 2, 1; 1999 TJ₉, 6, 2, 1; 1999 TN₁₄, 6, 2, 1; 1999 TY₁₇, 5, 2, 1; 1999 UP₃, 9, 3, 2; 1999 UG₄ *, 27, 7, 9; 1999 UH₄ *, 18, 6, 9; 1999 VG *, 26, 7, 15; 1999 VL *, 16, 5, 7; 1999 VM *, 11, 4, 7; 1999 VY₁ *, 13, 4,

12; 1999 VZ₁ *, 13, 5, 13; 1999 VA₂ *, 20, 7, 14; 1999 VV₁₉ *, 14, 5, 6; 1999 VR₂₁, 6, 2, 1; 1999 VS₂₁, 6, 2, 1; 1999 VT₂₁, 9, 3, 3; 1999 VU₂₁, 5, 2, 1; 5485 T-2, 6, 2, 1; (770), 3, 1, 0; (942), 6, 2, 1; (1770), 9, 2, 1; (2263), 11, 4, 3; (3071), 6, 2, 1; (3200), 5, 2, 1; (3362), 6, 2, 1; (3607), 6, 2, 1; (3838), 6, 2, 1; (4037), 6, 2, 1; (4546), 6, 2, 2; (4727), 6, 2, 1; (4761), 6, 2, 1; (5704), 6, 2, 1; (6430), 6, 2, 1; (6701), 6, 2, 1; (7436), 4, 2, 1; (7619), 6, 2, 1; (7622), 7, 2, 1; (7636), 9, 2, 1; (7670), 6, 2, 1; (7937), 6, 2, 2; (8176), 5, 2, 2; (8671), 5, 2, 1; (8714), 12, 2, 1; (8875), 6, 2, 1; (8898), 1, 1, 0; (8927), 23, 6, 8; (9045), 11, 4, 4; (9053), 6, 2, 2; (9054), 5, 2, 1; (9093), 5, 2, 1; (9305), 6, 2, 1; (9347), 6, 2, 2; (9356), 6, 2, 1; (9377), 6, 2, 2; (9393), 11, 4, 6; (9394), 6, 2, 1; (9462), 6, 2, 2; (11782), 4, 2, 1; (11783), 6, 2, 1; [560, 68, 9*, 1999/10/31-1999/11/20]

734 Farpoint Observatory, Eskridge

G. Hug, RTE 1 Box 35c, Eskridge, KS 66423, U.S.A. [frogstar@inlandnet.net]

Observers G. Hug, G. Bell, C. Lambrecht

Measurers G. Hug, G. Bell

0.30-m Schmidt-Cassegrain + CCD

GSC-1.1, USNO-A2.0

1999 PK₄, 2, 1, 0; 1999 RS₃₃, 4, 1, 0; 1999 RO₃₆, 8, 2, 11; 1999 TH₅, 5, 2, 14; 1999 TA₆, 5, 2, 12; 1999 TB₆, 6, 2, 15; 1999 TC₆, 8, 2, 10; 1999 TJ₁₃, 12, 3, 12; 1999 UB₂, 11, 3, 15; 1999 US₃, 5, 1, 0; 1999 UJ₄ *, 17, 4, 6; 1999 VW *, 16, 4, 10; 1999 VX *, 18, 4, 3; 1999 VR₅, 7, 2, 2; 1999 VV₇, 2, 1, 0; 1999 VV₈ *, 15, 4, 8; 1999 VS₁₁ *, 14, 4, 8; 1999 VA₁₉ *, 8, 2, 1; 1999 VB₁₉ *, 15, 3, 2; 1999 VC₁₉ *, 14, 3, 2; 1999 VD₂₂ *, 6, 2, 1; 1999 VE₂₂ *, 9, 2, 1; 1999 VU₂₂ *, 8, 2, 1; 1999 VM₂₃ *, 5, 2, 1; 1999 VN₂₃ *, 7, 2, 1; 1999 VY₂₅ *, 12, 3, 3; 1999 VW₂₇ *, 11, 3, 3; 1999 VX₂₇ *, 11, 3, 4; (1529), 5, 1, 0; (9660), 7, 2, 3; (12135), 9, 2, 2; [282, 31, 16*, 1999/10/29-1999/11/19]

735 George Observatory, Needville

W. G. Dillon, 4703 Birkenhead Circle, Missouri City, TX 77459, U.S.A.

[bdillon@houston.geoquest.slb.com]

Observers W. G. Dillon, R. Wicker, J. Dellinger

Measurer W. G. Dillon

0.46-m reflector + CCD

USNO-A2.0

1999 RN₃₃, 2, 1, 0; [2, 1, 0*, 1999/10/12]

739 Sunflower Observatory, Olathe

L. Robinson, Sunflower Observatory, 14680 W. 144 St., Olathe, KS 66062, U.S.A.

[lrobinson@ix.netcom.com]

0.30-m Schmidt-Cassegrain + CCD

GSC-1.1

1981 KJ, 4, 1, 0; 1999 RS₂, 3, 1, 0; 1999 RB₃₅, 14, 5, 22; 1999 RZ₄₃, 3, 1, 0; 1999 TP₇, 6, 2, 17; 1999 TS₁₁, 5, 2, 22; 1999 TU₂₆, 10, 3, 5; 1999 TD₃₄, 10, 2, 6; 1999 UA₂, 12, 4, 22; 1999 UB₄, 3, 1, 0; 1999 UH₄, 3, 1, 0; 1999 VC *, 12, 3, 2; 1999 VE *, 18, 5, 13; 1999 VF *, 22, 6, 5; 1999 VG, 2, 1, 0; 1999 VL, 2, 1, 0; 1999 VB₁, 3, 1, 0; 1999 VE₁ *, 16, 6, 14; 1999 VU₈, 2, 1, 0; 1999 VT₁₉, 6, 2, 6; 1999 VH₂₂, 3, 1, 0; 1999 VO₂₆, 3, 1, 0; 1999 WA *, 14, 4, 4; 1999 WD *, 11, 3, 3; (9544), 2, 1, 0; [189, 25, 6*, 1999/10/27-1999/11/20]

744 Doyan Rose Observatory, Indianapolis

J. Ruthroff, 5221 Graceland Ave., Indianapolis, IN 46254, U.S.A.

[jruthroff@sprintmail.com]

0.25-m *f*/5.5 Schmidt-Cassegrain + CCD

GSC-1.1, USNO-A2.0

1999 OM₂, 1, 1, 0; [1, 1, 0*, 1999/10/11]

747 Baton Rouge Observatory

W. R. Cooney, Jr., 10330 Dunn Dr., Baton Rouge, LA 70810, U.S.A.

[walt@sprintmail.com]

Observers W. R. Cooney, Jr., P. Motl

Measurer W. R. Cooney, Jr.

0.51-m *f*/8.4 reflector + CCD

USNO-A2.0

1998 HX₁₈, 6, 2, 2; 1999 TK₂₀, 6, 2, 2; 1999 UC₁, 3, 1, 0; 1999 UC₅, 6, 2, 2; 1999 VG₁ *, 12, 4, 16; 1999 VH₁ *, 10, 3, 5; 1999 VJ₁ *, 8, 3, 5; 1999 VK₁ *, 16, 5, 7; 1999 VP₁, 6, 2, 4; 1999 VQ₁, 3, 1, 0; 1999 VU₆ *, 9, 3, 2; 1999 VW₈ *, 11, 3, 10; 1999 WR *, 7, 2, 1; (461), 6, 1, 0; [109, 14, 7*, 1999/11/03–1999/11/20]

750 Hobbs Observatory, Fall Creek

R. Elliott, S475 County Road K, Fall Creek, WI 54742, U.S.A.

[elliottb@uwec.edu]

0.30-m $f/3.3$ reflector + CCD

GSC-ACT

1999 RH₂₇, 6, 2, 5; 1999 RL₂₇, 3, 1, 0; (12167), 4, 1, 0; (12174), 2, 1, 0; [15, 4, 0*, 1999/10/29–1999/11/06]

757 High Point

D. K. Chesney, 4210 Lauren Place, High Point, NC 27265, U.S.A.

[dkchesney@aol.com]

0.25-m Schmidt-Cassegrain + CCD

GSC, USNO-SA2.0

1997 GX₂₁, 4, 2, 1; 1999 RC₃₅, 2, 1, 0; 1999 TD, 2, 1, 0; 1999 TP₃, 2, 1, 0; 1999 TK₅, 4, 2, 11; 1999 TS₅, 2, 1, 0; 1999 TT₅, 4, 2, 11; 1999 TU₅, 2, 1, 0; 1999 TV₅, 2, 1, 0; 1999 TG₁₉, 2, 1, 0; 1999 UL₁, 4, 2, 11; 1999 UA₃, 2, 1, 0; 1999 VE₂ *, 6, 3, 3; 1999 VQ₂ *, 4, 2, 2; 1999 VH₅ *, 6, 3, 3; 1999 VC₁₀ *, 4, 2, 1; 1999 VH₁₂ *, 8, 4, 4; 1999 VY₂₂ *, 6, 3, 3; 1999 WE *, 7, 3, 2; (4798), 3, 2, 2; (6778), 2, 1, 0; [78, 21, 7*, 1999/10/28–1999/11/19]

784 Alfred University Observatory

R. Gutermuth, Stull Observatory, Alfred University, Alfred, NY 14803, U.S.A.

[gutermra@alfred.edu]

0.81-m $f/4$ reflector + CCD

USNO-A2.0

(3579), 4, 1, 0; (7547), 3, 1, 0; [7, 2, 0*, 1999/10/29]

808 Carlos U. Cesco Observatory, El Leoncito

C. E. Lopez, Felix Aguilar Observatory, Benavidez 8175 (Oeste), AR-5407

Marquesado-San Juan, Argentina [clopez@iinfo.unsj.edu.ar]

Observers M. R. Cesco, H. S. Lopez, J. E. Torres, J. A. Vicentela

Measurers R. A. Gil Hutton, C. E. Lopez, J. G. Sanguin

0.5-m $f/7.5$ double astrograph + CCD

PPM

1992 QG₁, 2, 1, 0; [2, 1, 0*, 1992/10/25]

809 European Southern Observatory

E. W. Elst, Observatoire Royal de Belgique, Avenue Circulaire 3, B-1180 Brussels, Belgium [elst@atmos.oma.be] (4)

C.-I. Lagerkvist, Uppsala Observatory, Box 515, S-75120 Uppsala, Sweden

[classe@astro.uu.se] (8)

Observers C.-I. Lagerkvist, M. Lindgren, G. Pizarro, O. Pizarro

Measurers E. W. Elst, O. Hernius, C.-I. Lagerkvist

1.0-m Schmidt

{4} 1992 OD₆, 2, 1, 0; 1994 PW₂₂, 6, 2, 1; 1998 MR₃₂, 6, 2, 11; 1999 PQ₁, 3, 1, 0; 1999 RB₁₅₂, 3, 1, 0; 1999 TU₆, 3, 1, 0; [23, 6, 0*, 1992/07/26–1998/03/04]

{8} 1986 QC₂, 2, 2, 2; 1995 QD₁₁ *, 3, 2, 1; 1995 SJ₇, 1, 1, 0; 1996 RS₂₈, 1, 1, 0; 1998 KB₄₄, 7, 6, 33; 1999 RO₁₇, 2, 2, 1; 1999 SF₂, 4, 4, 4; 1999 SN₄, 5, 4, 30; 1999 TK₁₁, 2, 2, 1; 1999 TC₁₂, 2, 2, 1; 1999 TY₁₈, 2, 2, 1; 1043 T-1, 1, 1, 0; [32, 12, 1*, 1995/08/20–1998/03/02]

846 Principia Astronomical Observatory, Elsah

D. A. Cornell, Physics Department, Principia College, Elsah, IL 62028, U.S.A.

[dcorn@prin.edu]

Observers D. A. Cornell, T. Long, A. Barron, D. McCall, J. Langton

0.41-m $f/10$ reflector + CCD

USNO-A2.0

(699), 6, 2, 2; [6, 1, 0*, 1999/10/27–1999/10/29]

849 Everstar Observatory, Olathe

G. Fedon, 21251 W. 123rd St., Olathe, KS 66061, U.S.A. [antares@everstar.com]

Observers M. Abraham, G. Fedon

0.25-m Schmidt-Cassegrain + CCD

GSC-1.1

1998 MC₄₅, 3, 1, 0; 1999 TN₁₄, 7, 2, 1; 1999 TD₃₄, 3, 1, 0; 1999 VC, 3, 1, 0; 1999 VT₁₉ *, 17, 4, 6; 1999 VE₂₁ *, 15, 4, 4; 1999 VS₂₁, 7, 2, 1; 1999 VU₂₁, 7, 2, 1; 1999 VJ₂₂ *, 10, 3, 2; (8671), 3, 1, 0; (8714), 2, 1, 0; (9093), 3, 1, 0; (9135), 3, 1, 0; (9305), 2, 1, 0; (9510), 7, 2, 1; (10635), 4, 1, 0; (12155), 4, 1, 0; [100, 17, 3*, 1999/11/03–1999/11/17]

850 Cordell-Lorenz Observatory, Sewanee

D. T. Durig, SPO 1242, Sewanee, TN 37383, U.S.A. [ddurig@sewanee.edu]

Observers D. T. Durig, W. A. Beckelheimer

Measurers D. T. Durig, J. L. Holcomb

0.3-m $f/5.7$ Schmidt-Cassegrain + CCD

GSC-1.1

1999 US₃, 9, 2, 1; 1999 VD₁ *, 7, 2, 1; 1999 WY, 4, 1, 0; [20, 3, 1*, 1999/10/28–1999/11/18]

852 River Moss Observatory, St. Peters

W. P. Norby, 654 River Moss Drive, St. Peters, MO 63376, U.S.A.

[wpnorby@prodigy.net]

0.25-m Schmidt-Cassegrain + CCD

GSC

(3071), 8, 3, 7; (5770), 9, 3, 7; (11845), 9, 3, 7; [26, 3, 0*, 1999/10/28–1999/11/04]

853 Biosphere 2 Observatory

G. J. Garradd, Biosphere 2 Center, 32540 S. Biosphere Road, Oracle, AZ 85623, U.S.A. [gordon@astro.bio2.edu]

Observers G. J. Garradd, B. Swift, D. J. Norlander, T. L. Laurence, S. Airieau

Measurer G. J. Garradd

0.5-m $f/8.1$ reflector

GSC-ACT, USNO-A2.0

1999 HP₁₁, 6, 2, 1; 1999 ND₄₃, 3, 1, 0; 1999 TA₅, 2, 1, 0; 1999 US₃, 15, 5, 8; 1999 UF₄ *, 23, 7, 10; 1999 UA₅, 6, 2, 3; 1999 UG₅, 10, 4, 14; 1999 UZ₅, 5, 1, 0; 1999 VT, 15, 6, 12; 1999 VU, 12, 4, 10; 1999 VV, 9, 3, 2; 1999 VC₁, 8, 3, 2; 1999 VL₁, 6, 2, 3; 1999 VQ₅, 9, 3, 9; 1999 VR₅, 7, 2, 3; 1999 VS₅, 10, 4, 6; 1999 VN₆, 6, 2, 3; 1999 VO₆, 8, 3, 6; 1999 VP₆, 7, 3, 8; 1999 VQ₆, 6, 2, 2; 1999 VR₆, 9, 3, 6; 1999 VS₆, 6, 2, 4; 1999 VL₁₁, 11, 4, 3; 1999 VM₁₁, 17, 5, 6; 1999 VN₁₁, 15, 5, 6; 1999 VO₁₁, 12, 4, 5; 1999 VP₁₁, 10, 3, 2; 1999 VQ₁₁, 8, 3, 4; 1999 VJ₁₂, 8, 3, 2; 1999 VK₁₂, 8, 3, 2; 1999 VL₁₂, 9, 3, 2; 1999 VF₂₂, 8, 3, 3; 1999 VG₂₂, 6, 2, 2; 1999 VT₂₅, 3, 1, 0; 1999 VX₂₅, 18, 3, 3; (6), 2, 1, 0; (13), 3, 1, 0; (63), 3, 1, 0; (5535), 4, 1, 0; [333, 39, 1*, 1999/10/28–1999/11/20]

854 Sabino Canyon Observatory, Tucson

J. E. McGaha, 5100 Sabino Foothills, Tucson, AZ 85750, U.S.A.

[jmcgaha@azstarnet.com]

0.305-m $f/6.1$ Schmidt-Cassegrain + CCD

GSC-1.1

1999 WC *, 3, 1, 0; [3, 1, 1*, 1999/11/16]

867 Saji Observatory

M. Yamanishi, 1071-1 Takayama, Saji, Yazu-Gun, Tottori-Ken, 689-13 Japan

[sajinet@infosakyu.ne.jp]

Observers M. Yamanishi, A. Miyamoto, M. Aimoto, T. Oribe

1.03-m $f/4.2$ reflector + CCD

GSC

1999 PQ₁, 3, 1, 0; 1999 VK₅ *, 17, 4, 8; 1999 VO₂₅ *, 7, 2, 1; 1999 VP₂₅ *, 6, 2, 1; [33, 4, 3*, 1999/09/01–1999/11/14]

886 Susono

M. Akiyama, 1655-23, Chabatake, Susono, Shizuoka-Ken, 410-11 Japan

0.25-m $f/6.3$ reflector + CCD

GSC

1990 VE, 2, 1, 0; 1991 JD, 2, 1, 0; 1991 YC, 4, 2, 9; 1992 WO₃, 2, 1, 0; 1992 YK, 4, 2, 10; 1995 WB₉, 4, 2, 10; 1997 CB₂₆, 4, 2, 10; 1999 UQ₁, 4, 2, 9; 1999 UZ₂, 10, 4, 16; 1999 UC₃, 8, 4, 16; 1999 UL₃, 6, 3, 7; 1999 VR, 2, 1, 0; 1999 VT₁, 2, 1, 0; 1999 VL₂, 2, 1, 0; 1999 VX₂, 2, 1, 0; 1999 VY₂, 2, 1, 0; 1999 VJ₅, 2, 1, 0; 1999 VU₂₀, 2, 1, 0; [64, 18, 0*, 1999/10/29–1999/11/14]

888 Gekko Observatory

T. Kagawa, 1308-222, Kuwahara, Kannami-cho, Tagata-gun, Shizuoka-Ken, 419-010, Japan

0.50-m $f/4.0$ reflector + CCD

GSC-1.1

1989 WB₃, 5, 2, 10; 1992 YK, 3, 1, 0; 1995 SK₂, 2, 1, 0; 1995 UB₈, 3, 1, 0; 1995 YR, 3, 1, 0; 1997 BS₆, 3, 1, 0; 1997 CB₂₆, 3, 1, 0; 1998 FF₁₆, 4, 2, 10; 1998 KT₃₆, 3, 1, 0; 1999 QH, 2, 1, 0; 1999 RE₁, 3, 1, 0; 1999 TZ₂, 6, 2, 1; 1999 TS₈, 5, 2, 9; 1999 TT₈, 2, 1, 0; 1999 TD₁₅, 5, 2, 10; 1999 UZ₂, 3, 1, 0; 1999 UC₃, 5, 2, 14; 1999 UM₃, 3, 1, 0; 1999 VR, 3, 1, 0; 1999 VV, 3, 1, 0; 1999 VR₁, 6, 2, 1; 1999 VU₁ *, 6, 2, 1; 1999 VV₁ *, 14, 5, 9; 1999 VW₁ *, 15, 6, 14; 1999 VN₆, 4, 1, 0; 1999 VR₈ *, 12, 4, 10; 1999 VB₂₁ *, 11, 4, 8; [137, 27, 5*, 1999/10/30–1999/11/19]

897 YGCO Chiyoda Station

T. Kojima, 45 Shimonakamori, Chiyoda, Ohra-Gun, Gunma-Ken, 370-0724 Japan

[kojitaku@sannet.ne.jp]

0.25-m $f/6.0$ reflector + CCD

GSC

1999 VR₁, 4, 2, 1; [4, 1, 0*, 1999/11/04–1999/11/05]

900 Moriyama

Y. Ikari, Katube-Cho 626, Moriyama, Shiga-Ken 524, Japan

[ikari@gold.ocn.ne.jp]

0.25-m $f/6.3$ Schmidt-Cassegrain + CCD

GSC

1989 VA, 2, 1, 0; 1999 CU₃, 2, 1, 0; 1999 GK₄, 4, 2, 10; 1999 JM₈, 4, 2, 10; 1999 LF₆, 2, 1, 0; 1999 RH₂₇, 2, 1, 0; 1999 SK₁₀, 2, 1, 0; 1999 VZ, 4, 2, 4; 1999 VR₁ *, 8, 3, 5; (699), 2, 1, 0; (3838), 2, 1, 0; (11066), 2, 1, 0; [36, 12, 1*, 1999/10/25–1999/11/10]

903 Fukuchiyama

M. Yoshimi, Osas 185-4-101, Fukuchiyama, Kyoto 620-0845, Japan

[myoshimi@silver.ocn.ne.jp]

Observer M. Yoshimi

0.25-m $f/6.3$ Schmidt-Cassegrain + CCD

GSC

1999 TD₃₄, 6, 2, 1; 1999 VK₆, 11, 2, 3; (6555), 5, 2, 1; [22, 3, 0*, 1999/11/10–1999/11/19]

905 Nachi-Katsuura Observatory

T. Urata, 1-8, Dobayashi 1 Chome, Shimizu, Shizuoka-Ken 424, Japan

[urata@sannet.ne.jp]

Observer Y. Shimizu

Measurer T. Urata

0.40-m $f/3.3$ Baker-Schmidt

GSC

1999 VX₂ *, 4, 2, 1; 1999 VY₂ *, 4, 2, 1; 1999 VJ₅ *, 4, 2, 1; 1999 VT₅ *, 2, 1, 0; 1999 VT₂₀ *, 4, 2, 5; 1999 VU₂₀ *, 2, 1, 0; 1999 VV₂₀ *, 2, 1, 0; 1999 VX₂₃ *, 2, 1, 0; [24, 8, 8*, 1999/11/04–1999/11/09]

910 Caussols-ODAS

A. Maury, Observatoire de la Côte d’Azur, B.P. 229, F-06304 Nice, France

[maury@obs-azur.fr]

G. Hahn, DLR Institute of Planetary Exploration, Rudower Chaussee 5, D-12489

Berlin, Germany [Gerhard.Hahn@DLR.de]

Observers A. Maury, D. Albanese, G. Hahn, M. Hoffmann

Measurers A. Maury, G. Hahn

0.90-m Schmidt + CCD

GSC

1998 HR₆₇, 3, 1, 0; 6056 P-L, 3, 1, 0; [6, 2, 0*, 1998/03/26–1998/05/08]

946 Ametlla de Mar

J. Nomen, Rio de Oro 25, bjos2, E-08034 Barcelona, Spain

[jnomen@astro.gea.cesca.es]

0.30-m $f/5.0$ reflector + CCD

USNO-SA1.0

1999 US₃, 3, 1, 0; 1999 WY, 2, 1, 0; [5, 2, 0*, 1999/10/31–1999/11/21]

947 Saint-Sulpice

B. Christophe, 63 rue Belliard, F-75018 Paris, France

[bernard.christophe@hol.fr]

0.60-m $f/5.6$ relector + CCD

GSC, USNO-SA1.0

(1390), 1, 1, 0; (1876), 4, 2, 1; (3314), 2, 1, 0; (3607), 5, 3, 7; (3838), 5, 2, 1; (3872), 2, 1, 0; (3922), 3, 2, 7; (4464), 3, 1, 0; (4546), 2, 1, 0; (7619), 3, 2, 1; (7796), 2, 1, 0; (8875), 3, 2, 1; (9045), 2, 1, 0; [37, 13, 0*, 1999/11/06–1999/11/13]

951 Highworth

J. W. Rock, 2 Spa Close, Highworth, Swindon, Wiltshire SN6 7PJ, England

[0C34@dia1.pipex.com]

0.30-m Newtonian reflector + CCD

GSC

(860), 6, 2, 7; [6, 1, 0*, 1999/10/04–1999/10/11]

952 Marxuquera

J. J. Gómez D., Cardenal Cisneros 55-4-8, E-46700 Gandia, Spain

[astsafor@arrakis.es]

0.25-m $f/6.3$ Schmidt-Cassegrain + CCD

GSC

1999 RH₂₇, 6, 1, 0; (3507), 2, 1, 0; (7634), 2, 1, 0; [10, 3, 0*, 1999/11/17]

975 Valencia

A. López, Observatorio Astronómico de Valencia, Avda. Blasco Ibanez 13, E-46010

Valencia, Spain [Alvaro.Lopez@uv.es]

Observers À. López G., A. Flores M.

Measurers À. López G., A. Flores M., J. A. Morano F., J. Pastor E.

0.15-m $f/15$ refractor

PPM, GSC

(6), 8, 4, 22; (7), 8, 4, 53; (13), 8, 4, 15; (14), 4, 2, 8; (16), 10, 5, 50; (18), 2, 1, 0; (29), 4, 2, 8; (51), 2, 1, 0; [46, 8, 0*, 1995/12/17–1996/02/16]

ORBITAL ELEMENTS

Orbital elements have been computed by the following contributors:

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G. V. Williams, Harvard-Smithsonian Center for Astrophysics, 60 Garden Street, Cambridge, MA 02138, U.S.A. [gwilliams@cfa.harvard.edu]

P/1998 U4 (Spahr)

Epoch 1999 Mar. 3.0 TT = JDT 2451240.5

<i>T</i> 1999 Feb. 26.4180 TT				Nakano	
<i>q</i>				P	Q
3.843286		(2000.0)			
<i>n</i> 0.0749714	ω	251.7363		+0.2889940	−0.9572027
<i>a</i> 5.570218	Ω	181.7170		+0.9484799	+0.2840640
<i>e</i> 0.310030	<i>i</i>	31.5189		−0.1298782	−0.0554127
<i>P</i> 13.1					

From 109 observations 1998 Oct. 27–1999 Nov. 17, mean residual 0^{''}.7.

C/1999 K5 (LINEAR)

Epoch 2000 June 25.0 TT = JDT 2451720.5

<i>T</i> 2000 July 4.3795 TT				Nakano	
<i>q</i>				P	Q
3.255421		(2000.0)			
<i>z</i> −0.000532	ω	241.4850		+0.1423895	−0.2436136
±0.000011	Ω	106.3818		−0.0686159	+0.9644779
<i>e</i> 1.001731	<i>i</i>	89.4734		−0.9874295	−0.1021506

From 137 observations 1999 May 20–Oct. 21, mean residual 0^{''}.5.

C/1999 K6 (LINEAR)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>T</i> 1999 July 24.6736 TT				Nakano	
<i>q</i>				P	Q
2.246977		(2000.0)			
<i>z</i> +0.002884	ω	56.7633		+0.2964708	+0.6925021
±0.000002	Ω	245.3721		−0.9185988	+0.3951862
<i>e</i> 0.993520	<i>i</i>	46.3439		+0.2613069	+0.6035468

From 282 observations 1999 May 20–Nov. 19, mean residual 0^{''}.5.

C/1999 K8 (LINEAR)

Epoch 2000 Apr. 6.0 TT = JDT 2451640.5

<i>T</i> 2000 Apr. 24.3380 TT				Nakano	
<i>q</i>				P	Q
4.200354		(2000.0)			
<i>z</i> −0.000214	ω	164.6290		+0.9722421	+0.1005615
±0.000007	Ω	195.3946		+0.0089596	+0.8862646
<i>e</i> 1.000900	<i>i</i>	52.7332		+0.2338053	−0.4521310

From 345 observations 1999 May 26–Nov. 13, mean residual 0^{''}.5.

P/1999 RO₂₈ (LONEOS)

<i>T</i> 1999 Oct. 2.3460 TT				Nakano	
<i>q</i>				P	Q
1.231710		(2000.0)			
<i>n</i> 0.1488849	ω	219.8626		+0.9860766	−0.1486520
<i>a</i> 3.525621	Ω	148.4490		+0.1638348	+0.9452182
<i>e</i> 0.650640	<i>i</i>	8.1894		−0.0284811	+0.2906288
<i>P</i> 6.62					

From 106 observations 1999 Sept. 7–Nov. 4.

C/1999 S2 (McNaught-Watson)

<i>T</i> 1997 Nov. 24.2296 TT				Marsden	
<i>q</i>				P	Q
6.491611		(2000.0)			
	ω	223.8597		+0.0794480	+0.4706831
	Ω	74.4042		−0.4557247	+0.8011420
<i>e</i> 1.0	<i>i</i>	65.8262		−0.8865681	−0.3696336

From 60 observations 1999 Sept. 19–Nov. 15.

C/1999 S3 (LINEAR)

<i>T</i> 1999 Nov. 9.0131 TT				Nakano	
<i>q</i>				P	Q
1.894930		(2000.0)			
<i>n</i> 0.0119608	ω	44.1267		+0.6547379	−0.7305105
<i>a</i> 18.936361	Ω	11.8780		+0.0824355	−0.1862432
<i>e</i> 0.899932	<i>i</i>	70.5605		+0.7513473	+0.6570144
<i>P</i> 82.4					

From 447 observations 1999 Sept. 24–Nov. 20.

C/1999 S4 (LINEAR)

<i>T</i> 2000 July 26.1193 TT				Marsden	
<i>q</i>				P	Q
0.764116		(2000.0)			
	ω	151.0668		+0.3088964	−0.8052926
	Ω	83.1512		−0.9408608	−0.1808808
<i>e</i> 1.0	<i>i</i>	149.3570		−0.1391546	−0.5646114

From 277 observations 1999 Sept. 27–Nov. 20.

C/1999 T1 (McNaught-Hartley)

<i>T</i> 2000 Dec. 13.3313 TT				Marsden	
<i>q</i>				P	Q
1.171612		(2000.0)			
	ω	344.7493		−0.9658648	−0.2555536
	Ω	182.4678		+0.1069692	−0.5425257
<i>e</i> 1.0	<i>i</i>	79.9552		−0.2359298	+0.8002239

From 106 observations 1999 Oct. 7–Nov. 19.

C/1999 T2 (LINEAR)

Epoch 2000 Dec. 2.0 TT = JDT 2451880.5

<i>T</i> 2000 Nov. 24.4849 TT				Nakano	
<i>q</i>				P	Q
3.037091		(2000.0)			
<i>z</i> −0.000653	ω	104.6758		−0.1558424	−0.9582535
±0.000022	Ω	14.8784		−0.7263223	−0.0533066
<i>e</i> 1.001983	<i>i</i>	110.9993		+0.6694543	−0.2809069

From 163 observations 1999 July 22–Nov. 19, mean residual 0^{''}.5.

C/1999 T3 (LINEAR)

<i>T</i>	2000 Aug. 29.5933 TT		Nakano	
<i>q</i>	5.368097	(2000.0)	P	Q
	ω	210.9979	+0.7111865	−0.2245401
	Ω	223.5096	+0.6531716	−0.1393668
<i>e</i>	1.0	<i>i</i> 104.6214	−0.2599627	−0.9644473

From 91 observations 1999 Oct. 3–Nov. 18.

C/1999 U1 (Ferris)

<i>T</i>	1998 Sept. 2.2435 TT		Nakano	
<i>q</i>	4.127948	(2000.0)	P	Q
	ω	290.8765	−0.0269094	+0.5730805
	Ω	58.2733	+0.7575503	+0.5462850
<i>e</i>	1.0	<i>i</i> 105.6440	−0.6522219	+0.6108613

From 99 observations 1999 Oct. 18–Nov. 19.

C/1999 U2 (SOHO)

<i>T</i>	1999 Oct. 25.23 TT		Marsden	
<i>q</i>	0.0492	(2000.0)	P	Q
	ω	22.22	−0.20554	−0.86885
	Ω	82.05	+0.81553	−0.40647
<i>e</i>	1.0	<i>i</i> 27.05	+0.54099	+0.28265

From 16 observations 1999 Oct. 25.

P/1999 U3 (LINEAR)

<i>T</i>	1999 Nov. 18.7020 TT		Nakano	
<i>q</i>	1.846556	(2000.0)	P	Q
<i>n</i>	0.0922972	ω 111.4691	+0.4771838	−0.8334617
<i>a</i>	4.849278	Ω 306.9404	+0.6202829	+0.5440327
<i>e</i>	0.619210	<i>i</i> 20.4026	+0.6225309	+0.0967987

P 10.7

From 96 observations 1999 Oct. 30–Nov. 16.

C/1999 U4 (Catalina-Skiff)

<i>T</i>	2001 Oct. 26.8568 TT		Marsden	
<i>q</i>	4.935942	(2000.0)	P	Q
	ω	77.0768	−0.1332293	−0.8977028
	Ω	32.3100	+0.2725426	−0.4406012
<i>e</i>	1.0	<i>i</i> 51.7888	+0.9528749	+0.0005061

From 75 observations 1999 Sept. 18–Nov. 18.

P/1999 V1 (Catalina)

<i>T</i>	1999 Oct. 22.1860 TT		Marsden	
<i>q</i>	2.961381	(2000.0)	P	Q
<i>n</i>	0.0510131	ω 185.9914	−0.5028133	−0.8290749
<i>a</i>	7.200261	Ω 294.4267	+0.8038023	−0.3443955
<i>e</i>	0.588712	<i>i</i> 15.5816	+0.3179318	−0.4404844

P 19.3

From 29 observations 1999 Nov. 5–21.

63P/Wild 1

Epoch 1999 Dec. 8.0 TT = JDT 2451520.5

<i>T</i>	1999 Dec. 27.0846 TT		Marsden	
<i>q</i>	1.960882	(2000.0)	P	Q
<i>n</i>	0.0744159	ω 167.9911	−0.9727575	−0.2316591
<i>a</i>	5.597905	Ω 358.5253	+0.1742761	−0.7057941
<i>e</i>	0.649711	<i>i</i> 19.9341	+0.1528749	−0.6694691

P 13.2

From 31 observations 1960–1999, mean residual 0''.7. Nongravitational parameters

 $A_1 = +0.69$, $A_2 = -0.1126$.**108P/Ciffréo**

Epoch 2000 Apr. 6.0 TT = JDT 2451640.5

<i>T</i>	2000 Apr. 18.4139 TT		Marsden	
<i>q</i>	1.713351	(2000.0)	P	Q
<i>n</i>	0.1359362	ω 358.0488	+0.6181011	−0.7645925
<i>a</i>	3.746099	Ω 53.7216	+0.7242647	+0.4635904
<i>e</i>	0.542631	<i>i</i> 13.0929	+0.3056005	+0.4477524

P 7.25

From 88 observations 1985–1999, mean residual 0''.8. Nongravitational parameters

 $A_1 = -0.95$, $A_2 = -0.0115$.**136P/Mueller 3**

Epoch 1999 Mar. 3.0 TT = JDT 2451240.5

<i>T</i>	1999 Mar. 20.3396 TT		Nakano	
<i>q</i>	3.010613	(2000.0)	P	Q
<i>n</i>	0.1131916	ω 225.4163	+0.9918348	−0.0653376
<i>a</i>	4.232463	Ω 137.9665	+0.0939420	+0.9551128
<i>e</i>	0.288685	<i>i</i> 9.4142	−0.0862479	+0.2889474

P 8.71

From 64 observations 1990–1999, mean residual 0''.9.

(12181)* 1964 VL₁ = 1951 YH₁ = 1997 JU₁₈

Discovered 1964 Nov. 9 at the Purple Mountain Observatory.

Id. T. B. Spahr (*MPC* 30647), G. V. Williams (*ibid.*)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	349.25161		(2000.0)	Williams	
<i>n</i>	0.22599632	ω 355.56562	+0.51827831	−0.85101778	
<i>a</i>	2.6693271	Ω 63.19673	+0.78752778	+0.43635159	
<i>e</i>	0.2575460	<i>i</i> 5.43854	+0.33344802	+0.29217465	

P 4.36 *H* 13.8 *G* 0.15 *U* 2

1951 12 27	711	(3.3−	3.9−)	Y	1998 06 26	426	0.7−	0.3−	1999 10 12	704	0.0	0.4+
1964 11 09	330	1.3+	1.1−		1998 06 26	426	0.5−	0.7−	1999 10 22	704	0.9−	0.2+
1964 11 27	330	0.4+	0.9+		1998 06 28	809	1.1+	1.3+	1999 10 22	704	(2.3−	1.8+)
1964 12 25	330	0.5−	0.0		1998 06 28	809	0.2+	0.8+	1999 10 22	704	0.6+	1.0+
1965 01 01	330	1.4−	0.3−		1998 06 28	809	0.0	0.3+	1999 10 22	704	0.5+	0.7+
1997 05 07	704	0.0	0.5+		1998 07 01	809	0.2+	0.4+	1999 10 22	704	0.3+	0.2+
1997 05 07	704	0.2+	0.1−		1998 07 01	809	0.4+	0.0	1999 11 03	704	0.2−	0.0
1997 05 07	704	0.2+	0.1−		1998 07 01	809	0.5+	0.1+	1999 11 03	704	0.3+	0.1+
1997 05 07	704	0.1−	0.4+		1999 10 12	704	0.4−	0.1+	1999 11 03	704	0.0	0.2−
1998 06 25	426	0.2+	0.3−		1999 10 12	704	1.2−	0.5−	1999 11 03	704	0.4+	0.3−
1998 06 25	426	0.7−	0.5−		1999 10 12	704	0.2+	0.3+	1999 11 03	704	0.0	0.1−
1998 06 26	426	1.0−	0.3−		1999 10 12	704	0.2+	0.0				

(12182)* 1973 UQ₅ = 1997 CH₅ = 1999 RS₃₈

Discovered 1973 Oct. 27 at Tautenburg.

Id. A. Doppler (*MPC* 36324)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

M	6.28854		(2000.0)	P	Q
n	0.26664520	ω	178.38935	+0.98708981	-0.16005238
a	2.3906364	Ω	190.82630	+0.14658688	+0.91803407
e	0.1478982	i	1.85428	+0.06454448	+0.36276258
P	3.70	H	14.9	G 0.15	U 1

Residuals in seconds of arc

1973 10 27	033	0.8-	0.0	1998 05 24	704	0.2-	1.0-	1999 11 04	704	0.2+	0.5+
1973 10 27	033	(5.9-	0.2-)	1998 05 24	704	1.0+	1.1-	1999 11 09	704	0.1-	0.4-
1973 10 28	033	0.2+	0.1+	1998 05 24	704	0.6-	0.8+	1999 11 09	704	0.2-	0.8-
1973 10 31	033	0.9-	0.3+	1998 05 24	704	1.0-	0.4-	1999 11 09	704	0.1-	0.8-
1973 11 02	033	0.6+	0.8+	1998 05 24	704	1.0-	0.3+	1999 11 09	704	0.1-	1.1-
1973 11 03	033	0.0	0.4+	1999 09 13	120	0.0	0.3-	1999 11 12	699	0.5+	1.0+
1995 08 19	809	0.2+	1.4+	1999 09 13	120	1.2+	0.1-	1999 11 12	699	0.4+	0.9+
1995 08 20	809	0.4-	0.7+	1999 09 14	120	0.9+	0.4-	1999 11 12	704	0.2+	0.1-
1995 08 22	809	0.2-	0.5+	1999 09 14	120	0.9+	0.2+	1999 11 12	699	0.0	0.9+
1995 09 17	809	0.1+	0.3-	1999 09 15	120	1.1+	0.3-	1999 11 12	704	0.0	0.1-
1995 09 17	691	0.0	0.1-	1999 09 15	120	(2.1+	0.9-)	1999 11 12	704	0.1-	0.2-
1995 09 17	691	0.5-	0.1-	1999 09 16	120	1.5-	0.4+	1999 11 12	704	0.4-	0.1+
1995 09 17	691	0.2+	0.1+	1999 09 16	120	1.0+	0.7-	1999 11 12	704	0.5-	0.1-
1995 09 18	809	0.1+	0.2-	1999 09 23	120	0.5+	0.3-	1999 11 14	704	0.4+	0.6-
1995 09 20	809	1.2+	0.1-	1999 11 01	703	0.2-	0.6+	1999 11 14	704	0.4+	0.8-
1995 09 22	809	0.8+	0.4-	1999 11 01	703	0.3-	0.7+	1999 11 14	704	0.6+	1.4-
1997 02 06	566	1.5+	0.6+	1999 11 01	703	1.2-	0.2+	1999 11 14	704	0.1+	0.9-
1997 02 06	566	0.3+	0.6+	1999 11 01	703	0.2-	0.0	1999 11 14	704	0.0	1.1-
1997 02 06	566	0.4+	0.3+	1999 11 04	704	0.4-	0.7+	1999 11 17	704	1.8-	0.4-
1997 02 07	566	0.3+	0.3-	1999 11 04	704	0.5-	0.7+	1999 11 17	704	0.1-	0.2-
1997 02 07	566	0.0	0.7-	1999 11 04	704	0.2-	0.5+	1999 11 17	704	0.0	0.3-
1997 02 07	566	0.3-	0.2-	1999 11 04	704	0.2-	0.4+				

(12183)* 1975 SU₁ = 1996 HW₁₅

Discovered 1975 Sept. 30 by S. J. Bus at Palomar.

Id. T. Kobayashi (*MPC* 27552)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

M	231.68725		(2000.0)	P	Q
n	0.16882051	ω	8.96623	-0.99920859	+0.03966535
a	3.2422954	Ω	173.30487	-0.03789402	-0.92649773
e	0.1160104	i	1.46270	-0.01209296	-0.37420396
P	5.84	H	13.1	G 0.15	U 1

Residuals in seconds of arc

1975 09 30	675	0.0	1.0+	1998 09 18	704	0.3-	0.7-	1999 11 04	704	0.2+	0.3-
1975 10 01	675	0.7-	0.4+	1998 09 25	699	1.4+	1.3-	1999 11 08	120	1.7+	1.0-
1975 10 02	675	0.4+	0.4+	1998 09 25	699	0.9+	0.1-	1999 11 08	120	1.2-	1.3+
1975 10 15	675	0.6-	0.3+	1998 09 25	699	0.5+	0.3+	1999 11 08	120	0.6-	0.1+
1975 10 16	675	0.1+	0.3+	1998 09 25	327	1.0+	1.5-	1999 11 09	704	0.2+	0.2+
1996 04 18	809	(0.9-	3.1+)	1998 09 25	327	0.2-	0.3-	1999 11 09	704	0.2+	0.0
1996 04 18	809	(1.9-	2.4+)	1998 09 25	327	0.8+	0.1-	1999 11 09	704	0.4+	0.3+
1996 04 18	809	(2.0-	2.4+)	1998 09 28	691	1.3-	0.2-	1999 11 09	704	0.3+	0.1+
1996 04 20	809	1.2-	1.9+	1998 09 28	691	1.5-	0.1-	1999 11 09	704	0.3-	0.7+
1996 04 20	809	1.5-	1.0+	1998 09 28	691	1.3-	0.3-	1999 11 12	704	0.1+	0.1-
1996 04 20	809	1.7-	0.8+	1998 10 15	704	(2.5-	0.4-)	1999 11 12	704	0.1-	0.2-
1996 05 19	809	1.6+	1.3+	1998 10 15	704	(1.7-	2.0+)	1999 11 12	704	0.5-	0.5-
1996 05 19	809	1.7+	1.3+	1998 10 15	704	(0.8-	2.2-)	1999 11 12	704	0.2-	0.6-
1996 05 19	809	(2.5+	0.8+)	1998 10 15	704	(0.1-	2.3-)	1999 11 12	704	0.3-	0.4-
1996 05 19	809	0.2+	0.3-	1999 10 12	704	(2.7+	0.1-)	1999 11 14	704	0.0	0.8+
1996 05 19	809	0.1-	0.1+	1999 10 12	704	1.4+	0.4-	1999 11 14	704	0.0	0.0
1996 05 19	809	0.2-	0.2-	1999 10 12	704	0.3-	0.5-	1999 11 14	704	0.0	0.3+
1996 05 22	809	(2.1+	0.6-)	1999 10 22	704	0.6+	0.4-	1999 11 14	704	0.1+	0.2-
1996 05 22	809	1.4+	0.6-	1999 10 22	704	0.1-	0.3+	1999 11 14	704	0.5+	0.2-
1996 05 22	809	1.3+	0.9-	1999 10 22	704	0.2+	0.1-	1999 11 15	704	0.5-	0.1-
1998 09 14	704	0.5-	0.2+	1999 10 22	704	0.4+	0.0	1999 11 15	704	0.7-	0.2+
1998 09 14	704	0.4-	1.2+	1999 10 22	704	0.5-	0.2-	1999 11 15	704	0.2-	0.1+

1998 09 14	704	0.3-	0.9-	1999 10 30	703	2.0-	0.3+	1999 11 15	704	0.3-	0.2+
1998 09 16	699	0.5+	0.3-	1999 10 30	703	0.2-	0.2+	1999 11 15	704	0.1-	0.5+
1998 09 16	699	0.8-	0.5+	1999 10 30	703	0.6+	0.3-	1999 11 17	704	0.1-	0.8+
1998 09 16	699	1.0+	1.7+	1999 10 30	703	0.8-	1.2+	1999 11 17	704	0.5+	0.6+
1998 09 18	704	0.0	0.9-	1999 11 04	704	0.1+	0.3-	1999 11 17	704	0.4+	0.0
1998 09 18	704	0.9-	1.5+	1999 11 04	704	0.3+	0.1-	1999 11 17	704	0.0	0.1-
1998 09 18	704	1.5+	0.8+	1999 11 04	704	0.6+	0.1+	1999 11 17	704	0.1-	0.4+
1998 09 18	704	0.2-	0.2+	1999 11 04	704	0.2-	0.2+				

(12184)* 1975 SB₂ = 1977 EO₆ = 1998 OQ₁

Discovered 1975 Sept. 30 by S. J. Bus at Palomar.

Id. G. V. Williams (*MPC* 32207)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

M	20.53678		(2000.0)	P	Q
n	0.29138792	ω	184.03480	+0.96890658	-0.24621296
a	2.2533139	Ω	190.31786	+0.23066336	+0.93462659
e	0.1273056	i	7.85522	+0.08952347	+0.25661707
P	3.38	H	15.3	G 0.15	U 1

Residuals in seconds of arc

1975 09 30	675	0.7+	0.5+	1998 05 26	704	1.2-	1.0-	1999 10 10	704	0.4-	1.2+
1975 10 01	675	0.5+	0.3+	1998 06 19	704	1.6+	0.8+	1999 10 10	704	0.1+	1.5+
1975 10 02	675	1.2+	0.0	1998 06 19	704	0.0	0.6-	1999 10 10	704	0.2+	0.5+
1975 10 15	675	1.3-	0.1-	1998 06 19	704	1.4-	0.5+	1999 10 20	704	0.2-	0.8-
1975 10 16	675	0.8-	1.1-	1998 06 19	704	1.5+	0.6+	1999 10 20	704	0.0	0.7+
1977 03 12	381	0.2-	1.1+	1998 07 16	910	0.9+	0.2+	1999 10 20	704	0.1+	0.0
1977 03 12	381	0.3+	0.0	1998 07 16	910	0.0	0.1-	1999 10 20	704	0.5-	0.1-
1995 06 28	691	0.1-	0.1+	1998 07 16	910	0.3+	0.1-	1999 11 04	704	0.5+	0.0
1995 06 28	691	0.4-	0.4+	1998 07 22	910	0.7-	0.3+	1999 11 04	704	0.2-	0.5-
1995 06 28	691	0.1-	0.1+	1998 07 22	910	0.5-	0.7+	1999 11 04	704	0.1-	0.2-
1998 05 26	704	0.3-	0.1-	1998 07 22	910	0.8-	0.4+	1999 11 04	704	0.0	0.5-
1998 05 26	704	0.8+	0.3-	1999 10 10	704	0.1+	0.6+				
1998 05 26	704	(0.8-	2.3+)	1999 10 10	704	0.3+	0.4+				

(12185)* 1976 SL₅ = 1976 UD₆ = 1994 SS₁₀ = 1998 QF₄

Discovered 1976 Sept. 24 by N. S. Chernykh at the Crimean Astrophysical

Observatory.

Id. C. M. Bardwell (d, *MPC* 9064), H. Oishi (d, *JAM* 1663), G. V. Williams(*MPC* 32438)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Bardwell

M	354.91956		(2000.0)	P	Q		
n	0.21706391	ω	29.07861	+0.71983984	-0.69369125		
a	2.7420643	Ω	14.92874	+0.61666259	+0.62257101		
e	0.0933895	i	5.56020	+0.31868144	+0.36221234		
P	4.54	H	14.0	G	0.15	U	2

Residuals in seconds of arc

1976 09 24	095	2.1-	0.9-	1998 08 17	704	0.2-	0.1-	1999 10 13	704	1.2-	1.1-
1976 10 22	381	0.4+	0.6-	1998 08 18	428	0.2+	0.8+	1999 10 13	704	0.2+	0.0
1976 10 22	381	0.9+	0.0	1998 08 18	428	0.0	0.6+	1999 10 13	704	0.2+	0.1-
1976 10 24	381	0.9+	0.7+	1998 08 19	428	0.4+	0.5+	1999 10 13	704	0.5+	0.7-
1994 09 29	691	0.5-	0.1-	1998 08 22	428	0.3+	0.0	1999 10 13	704	0.4+	0.6+
1994 09 29	691	0.7-	0.0	1998 08 22	428	0.2+	0.6-	1999 10 15	704	0.0	0.5+
1994 09 29	691	0.5-	0.0	1998 08 23	704	0.1+	0.6+	1999 10 15	704	1.1-	0.3-
1994 10 06	691	0.8+	0.3-	1998 08 23	704	0.4-	0.5+	1999 10 15	704	0.6+	0.2+
1994 10 06	691	0.6+	0.4-	1998 08 23	704	0.1-	0.4-	1999 10 15	704	0.4-	1.3+
1994 10 06	691	1.0+	0.2+	1998 08 25	428	0.2-	0.2+	1999 11 16	704	0.0	0.1+
1998 08 17	704	(0.5+	2.1-)	1998 09 13	428	0.0	0.2+	1999 11 16	704	0.1-	0.4-
1998 08 17	704	1.3+	1.3-	1998 09 28	428	0.7-	0.7-	1999 11 16	704	0.1+	0.3+
1998 08 17	704	0.6+	0.2-	1998 10 11	428	0.7-	0.2+	1999 11 16	704	0.1+	0.7+
1998 08 17	704	1.4-	0.9+	1998 10 11	428	0.4-	0.1-	1999 11 16	704	0.0	0.5+

(12186)* 1977 ER₅ = 1995 YW

Discovered 1977 Mar. 12 by H. Kosai and K. Hurukawa at the Kiso Station of the Tokyo Astronomical Observatory.

Id. T. Kobayashi (*MPC* 26557)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>		<i>P</i>		<i>Q</i>	
311.58994		(2000.0)			
<i>n</i>	0.19929473	ω	141.25891	+0.67193624	-0.74047558
<i>a</i>	2.9027224	Ω	266.51962	+0.67594162	+0.62091143
<i>e</i>	0.0634363	<i>i</i>	0.80694	+0.30266255	+0.25722542
<i>P</i>	4.95	<i>H</i>	13.6	<i>G</i>	0.15
				<i>U</i>	1

Residuals in seconds of arc

1977 03 12	381	1.0-	0.1-	1999 09 04	699	0.6+	1.6+	1999 10 07	704	0.3+	0.6-
1977 03 12	381	0.7-	0.4-	1999 09 04	699	0.7+	1.1+	1999 10 07	704	0.1-	0.2+
1977 03 14	381	0.7-	0.4-	1999 09 04	699	0.6+	0.3+	1999 10 07	704	0.4-	0.1+
1977 03 14	381	1.4+	1.5-	1999 09 07	704	0.1-	0.1-	1999 10 09	704	0.3+	0.3-
1977 03 15	381	0.8+	0.5-	1999 09 07	704	0.2-	0.3+	1999 10 09	704	0.2+	0.5-
1977 03 15	381	1.2-	0.6-	1999 09 07	704	0.5+	0.6-	1999 10 09	704	0.2+	0.4-
1995 12 19	411	0.5-	0.2-	1999 09 07	704	0.2+	0.2+	1999 10 09	704	0.2+	0.2-
1995 12 19	411	0.4-	0.6-	1999 09 07	704	0.2-	0.1-	1999 10 09	704	0.2+	0.6-
1995 12 21	411	0.5+	0.4+	1999 09 09	704	0.1+	0.3-	1999 10 11	704	0.1+	0.1-
1995 12 21	411	0.9-	0.6+	1999 09 09	704	0.3-	0.2-	1999 10 11	704	0.2+	0.2-
1995 12 22	566	0.3+	1.0+	1999 09 09	704	0.1-	0.5-	1999 10 11	704	0.0	0.7-
1995 12 22	566	0.4+	1.1+	1999 09 09	704	0.0	0.3-	1999 10 11	704	0.2+	0.0
1995 12 22	566	0.0	1.5+	1999 09 09	704	0.3-	0.1-	1999 10 11	704	0.7-	0.8-
1995 12 26	411	1.1+	0.1+	1999 09 29	703	0.1+	0.3+	1999 10 15	704	0.1+	0.1+
1995 12 26	411	1.6-	0.5-	1999 09 29	703	0.9-	0.2+	1999 10 15	704	0.1+	0.2-
1995 12 31	411	1.2+	0.7-	1999 09 29	703	0.1+	0.3+	1999 10 15	704	0.4+	0.2-
1995 12 31	411	0.3+	1.4-	1999 09 29	703	0.1-	0.4+	1999 10 15	704	0.3+	0.4-
1997 03 10	809	0.4+	0.4+	1999 10 05	704	0.1-	0.1-	1999 10 15	704	0.1-	0.8+
1997 03 10	809	1.2-	1.1-	1999 10 05	704	0.0	0.0	1999 11 06	704	0.5+	0.5-
1997 03 10	809	0.4-	0.6-	1999 10 05	704	0.1-	0.2-	1999 11 06	704	0.1+	1.2-
1997 03 11	809	0.1+	0.1-	1999 10 05	704	0.0	0.1-	1999 11 06	704	0.5+	1.3-
1997 03 11	809	0.5+	0.2+	1999 10 07	704	0.2-	0.7+	1999 11 06	704	1.3-	0.8-
1997 03 11	809	0.2-	0.6-	1999 10 07	704	0.5+	0.1-				

(12187)* 1977 RL₇ = 1990 SL₁

Discovered 1977 Sept. 11 by N. S. Chernykh at the Crimean Astrophysical Observatory.

Id. G. V. Williams (*MPC* 17197)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>		<i>P</i>		<i>Q</i>	
2.83735		(2000.0)			
<i>n</i>	0.22686200	ω	194.81212	+0.87753837	-0.47623231
<i>a</i>	2.6625323	Ω	194.04011	+0.46004973	+0.86907669
<i>e</i>	0.2431602	<i>i</i>	13.33130	+0.13520599	+0.13382264
<i>P</i>	4.34	<i>H</i>	13.7	<i>G</i>	0.15
				<i>U</i>	2

Residuals in seconds of arc

1977 09 11	095	1.2-	2.1+	1990 09 16	675	0.1-	0.0	1998 06 25	704	1.7+	0.6-
1977 10 07	675	(0.2+	3.5-)	1990 09 17	675	0.2+	0.0	1998 06 25	704	(3.0-	1.3-)
1977 10 11	675	1.2-	0.7-	1990 09 17	675	0.3-	0.2-	1998 06 25	704	(1.2+	2.2-)
1977 10 11	675	1.4-	0.5+	1990 09 18	675	0.4-	0.7+	1998 06 25	704	1.3-	1.5+
1977 10 12	675	1.3+	0.4-	1994 09 02	801	(1.5+	2.7-)	1999 10 10	704	1.8-	0.3+
1977 10 12	675	0.3+	0.6-	1994 09 02	801	(0.5+	2.5-)	1999 10 10	704	0.6-	0.5-
1977 10 16	675	0.6+	0.6-	1994 09 07	801	1.0+	0.2-	1999 10 10	704	0.7-	0.4+
1977 10 16	675	0.9+	0.7-	1994 09 07	801	0.5+	0.0	1999 10 10	704	0.6-	0.2+
1977 10 17	675	1.0-	0.5+	1994 10 04	801	0.2-	0.3+	1999 10 10	704	1.1-	0.3+
1977 10 17	675	0.3-	1.5+	1994 10 04	801	0.1+	1.2+	1999 10 19	704	0.3+	0.5+
1977 10 21	675	(1.1+	3.0-)	1998 05 28	704	0.8+	1.3-	1999 10 19	704	0.7+	0.0
1977 10 21	675	1.2-	0.1+	1998 05 28	704	1.2-	0.4-	1999 10 19	704	0.9+	0.2-
1977 10 21	675	(0.6+	2.7-)	1998 05 28	704	1.2+	0.5+	1999 10 19	704	1.0+	0.2-
1977 10 21	675	0.0	1.4+	1998 05 28	704	0.0	0.3-	1999 10 19	704	1.1+	0.5-
1977 10 22	675	0.7-	2.2-	1998 06 19	704	0.5+	0.2+	1999 11 05	704	0.4+	0.3+
1977 10 22	675	1.7+	0.8-	1998 06 19	704	1.8-	1.6-	1999 11 05	704	0.2-	0.3+

1977 10 22	675	1.1+	1.4-	1998 06 19	704	0.2+	0.9+	1999 11 05	704	0.1-	0.3+
1977 10 22	675	1.4+	1.0-	1998 06 19	704	0.6-	0.0	1999 11 05	704	0.1-	0.1+
1990 09 16	675	0.1-	0.1+	1998 06 25	704	0.2-	0.3+	1999 11 05	704	0.5+	0.4+

(12188)* 1978 PE = 1978 SN = 1992 OE₁₀

Discovered 1978 Aug. 9 by R. M. West at the European Southern Observatory.

Id. H. Oishi (d, *JAM* 2045), G. V. Williams (*MPC* 21560)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>		<i>P</i>		<i>Q</i>	
346.35292		(2000.0)			
<i>n</i>	0.28277556	ω	214.08605	+0.97458950	+0.21397115
<i>a</i>	2.2988368	Ω	133.41159	-0.17975295	+0.92360161
<i>e</i>	0.2306767	<i>i</i>	5.23412	-0.13365693	+0.31808241
<i>P</i>	3.49	<i>H</i>	14.8	<i>G</i>	0.15
				<i>U</i>	2

Residuals in seconds of arc

1978 08 09	809	0.7+	0.6-	1998 03 24	704	0.4+	0.4+	1999 09 07	699	0.0	0.2+
1978 09 27	809	0.0	0.6-	1998 03 24	704	0.0	0.9+	1999 09 07	699	0.2+	0.5+
1978 09 28	809	0.4-	0.3-	1998 03 24	704	0.4+	1.8+	1999 09 07	699	0.1+	0.1+
1978 09 29	809	0.3+	0.8-	1998 03 24	704	1.6+	0.5-	1999 09 07	704	0.1+	0.3+
1992 06 28	675	1.3-	0.9-	1998 03 24	704	1.2-	1.0+	1999 09 07	704	0.2+	0.2-
1992 07 27	809	0.3+	0.4-	1998 03 24	704	0.3-	1.9-	1999 09 07	704	0.0	0.2+
1992 07 27	809	0.6+	0.6-	1998 03 24	704	0.7-	0.3+	1999 09 07	704	0.1-	0.0
1992 07 27	809	0.7+	0.7-	1998 03 25	566	0.3+	0.5+	1999 09 07	704	0.1+	0.3+
1992 07 28	809	0.8-	0.7-	1998 03 25	566	0.3+	0.2+	1999 09 13	704	0.6+	0.5+
1992 07 28	809	0.2+	0.6-	1998 03 25	566	0.4+	0.4+	1999 09 13	704	0.7+	0.5-
1992 07 28	809	0.6+	0.8-	1998 04 19	704	1.9+	0.8-	1999 09 13	704	0.1+	0.3-
1992 08 03	809	0.7-	0.2-	1998 04 19	704	1.1+	0.4-	1999 09 13	704	0.4+	0.4-
1992 08 03	809	0.1-	0.1-	1998 04 19	704	0.2+	0.6-	1999 09 13	704	0.0	0.2-
1992 08 03	809	0.5+	0.0	1998 04 19	704	1.9+	1.4-	1999 09 13	106	1.3+	0.3+
1993 01 24	691	0.5-	0.6+	1998 04 19	704	1.5-	0.4-	1999 09 13	106	0.3-	0.2+
1995 06 03	691	0.1-	2.0+	1999 07 16	704	0.8-	0.8+	1999 09 13	106	0.6-	0.2-
1995 06 03	691	0.1-	1.3+	1999 07 16	704	0.3-	0.6+	1999 11 09	699	1.1-	0.6-
1995 06 03	691	0.2-	0.2+	1999 07 16	704	1.1+	0.6-	1999 11 09	699	0.4+	0.7+
1997 12 08	910	1.3-	0.7-	1999 08 08	699	0.5-	0.2+	1999 11 09	699	0.1-	1.3+
1997 12 08	910	1.2-	0.4-	1999 08 08	699	0.3+	0.6+	1999 11 10	704	0.5-	0.6-
1997 12 08	910	1.6-	0.5-	1999 08 08	699	0.1-	1.2+	1999 11 10	704	0.7-	0.5-
1998 03 24	704	0.0	0.0	1999 08 12	727	0.7-	0.2+	1999 11 10	704	0.2-	0.4+
1998 03 24	704	0.8-	0.3-	1999 08 12	727	0.7-	0.4+	1999 11 10	704	0.3-	1.2+
1998 03 24	704	0.4-	0.2+	1999 08 12	727	0.6-	0.4+	1999 11 10	704	0.1-	0.3+

(12189)* 1978 RQ₁ = 1991 GN₁₃ = 1998 HR₅

Discovered 1978 Sept. 5 by N. S. Chernykh at the Crimean Astrophysical Observatory.

Id. T. B. Spahr (*MPC* 31706), G. V. Williams (*ibid.*)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>		<i>P</i>		<i>Q</i>	
37.54702		(2000.0)			
<i>n</i>	0.28418372	ω	144.51412	+0.77857010	+0.62753026
<i>a</i>	2.2912365	Ω	176.60032	-0.59619027	+0.74253917
<i>e</i>	0.1502276	<i>i</i>	5.67419	-0.19592285	+0.23418232
<i>P</i>	3.47	<i>H</i>	14.4	<i>G</i>	0.15
				<i>U</i>	2

Residuals in seconds of arc

1978 09 05	095	(0.9+	3.1+)	1998 04 22	704	0.1-	0.5-	1999 10 15	704	0.5-	0.4+
1978 09 07	095	1.0-	1.2-	1998 04 22	704	0.2-	0.2-	1999 10 15	704	0.2-	0.4+
1978 09 12	095	0.1-	0.4-	1998 04 22	704	0.2-	0.0	1999 10 15	704	0.4-	0.4+
1978 09 28	095	2.4+	1.1+	1998 04 22	704	0.4-	0.2+	1999 10 19	704	0.3+	0.8-
1978 10 04	095	1.1-	0.6+	1998 04 24	910	0.8+	0.5-	1999 10 19	704	0.2+	0.5-
1978 10 09	095	0.1+	0.8-	1998 04 24	910	0.9+	0.5-	1999 10 19	704	0.5-	0.6-
1991 04 10	809	0.6+	0.2-	1998 04 24	910	0.7+	0.5-	1999 10 19	704	0.5+	0.6-
1991 04 10	809	0.8-	0.8+	1998 05 16	704	(2.6-	1.3+)	1999 10 19	704	0.0	1.1-
1991 04 10	809	0.7-	0.0	1998 05 16	704	2.0-	0.1-	1999 10 30	703	0.1-	0.3+
1998 03 25	699	1.0-	1.3+	1998 05 16	704	1.1-	0.7-	1999 10 30	703	0.1+	0.1+
1998 03 25	699	0.8-	1.0+	1998 05 16	704	(2.7-	2.7-)	1999 10 30	703	0.1+	0.2-
1998 03 25	699	0.2+	0.8+	1999 10 02	703	0.1-	0.3+	1999 10 30	703	0.3+	0.1-

1998 03 29	704	0.4−	0.6+	1999 10 02	703	0.4−	0.2−	1999 11 05	704	0.2+	0.0
1998 03 29	704	0.2−	0.2−	1999 10 02	703	0.4−	0.2+	1999 11 05	704	0.5+	0.3−
1998 03 29	704	0.4−	0.1+	1999 10 02	703	0.0	0.1−	1999 11 05	704	0.3+	0.1−
1998 03 29	704	(4.0+	0.4+)	1999 10 07	704	0.0	0.1−	1999 11 05	704	0.3+	0.2−
1998 03 29	704	(4.0−	2.6+)	1999 10 07	704	0.3−	1.5+	1999 11 05	704	0.7+	0.4+
1998 04 21	704	0.3+	0.3−	1999 10 07	704	0.8+	0.4+	1999 11 13	699	0.2+	0.5+
1998 04 21	704	0.5−	0.5−	1999 10 07	704	0.5−	0.6+	1999 11 13	699	0.2+	0.1−
1998 04 21	704	0.9+	0.9−	1999 10 10	704	0.0	0.0	1999 11 13	699	0.1−	0.4+
1998 04 21	704	0.2+	0.2+	1999 10 10	704	0.2−	0.1+	1999 11 17	704	0.8+	0.7−
1998 04 21	704	0.7+	0.3−	1999 10 10	704	0.7+	0.4−	1999 11 17	704	0.0	0.3−
1998 04 21	910	0.8+	0.5−	1999 10 10	704	0.2−	0.1+	1999 11 17	704	0.2−	0.8−
1998 04 21	910	0.7+	0.4−	1999 10 10	704	0.2−	0.1−	1999 11 17	704	0.2−	1.0−
1998 04 21	910	0.7+	0.5−	1999 10 15	704	0.5−	0.3+	1999 11 17	704	0.0	0.3−
1998 04 22	704	0.2−	0.5−	1999 10 15	704	0.8−	0.3+				

(12190)* 1978 SE₅ = 1986 RO₁₀ = 1990 TK₅

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

Id. H. Kaneda (*MPC* 17625), R. Nagata (*ibid.*)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

			Williams		
<i>M</i>	65.26381	(2000.0)	<i>P</i>	<i>Q</i>	
<i>n</i>	0.24124237	ω	143.89586	+0.97604507	+0.20782649
<i>a</i>	2.5556438	Ω	204.34834	−0.21748593	+0.94013607
<i>e</i>	0.0607161	<i>i</i>	8.98311	+0.00599171	+0.27009687
<i>P</i>	4.09	<i>H</i>	13.4	<i>G</i>	0.15
				<i>U</i>	1

Residuals in seconds of arc

1978 09 27	095	(0.9−	4.2+)	1994 09 29	563	1.7+	0.2+	1998 09 17	699	0.7+	0.0
1978 10 03	095	0.1+	0.9+	1994 09 29	563	(2.4+	1.3+)	1998 09 17	699	0.9+	0.1−
1978 10 07	095	0.3−	2.2+	1994 09 29	563	(2.2+	1.3−)	1998 09 17	699	0.7+	0.4+
1986 09 08	095	(2.7+	2.6−)	1998 06 19	699	0.2−	0.5−	1999 01 10	699	0.9−	0.2−
1990 09 16	675	0.1−	1.8−	1998 06 19	699	0.0	0.6−	1999 01 10	699	0.3−	0.3−
1990 09 16	675	(0.7+	2.8−)	1998 06 19	699	0.0	0.3−	1999 01 10	699	0.0	1.3−
1990 09 18	675	0.1+	0.4+	1998 06 25	699	0.2−	0.2+	1999 10 10	704	0.3+	0.1+
1990 09 18	675	0.3−	0.3−	1998 06 25	699	0.0	0.1−	1999 10 10	704	0.1+	1.0−
1990 09 19	675	(2.2+	2.2−)	1998 06 25	699	0.5−	0.1−	1999 10 10	704	0.6+	0.5+
1990 09 19	675	(0.9+	2.8−)	1998 08 22	566	0.2+	0.1+	1999 10 10	704	0.7+	0.2+
1990 09 20	675	0.1+	0.2−	1998 08 22	566	0.1−	0.1+	1999 10 10	704	0.5+	0.1+
1990 09 20	675	0.2−	0.4−	1998 08 22	566	0.4−	0.2+	1999 10 20	704	0.0	0.5−
1990 10 09	413	0.1+	0.2−	1998 08 24	704	(0.4−	2.9+)	1999 10 20	704	0.2−	0.9−
1990 10 09	413	0.1−	1.3+	1998 08 24	704	0.5−	0.3+	1999 10 20	704	0.3−	0.7−
1990 10 11	413	1.2−	0.1+	1998 08 24	704	0.5−	0.6−	1999 10 20	704	0.2−	0.8−
1993 03 23	675	0.2−	0.3+	1998 08 24	704	0.5−	0.8+	1999 10 20	704	0.1+	0.5−
1993 03 24	675	0.4−	0.1−	1998 08 27	704	0.2−	0.3−	1999 11 04	704	0.2−	0.4+
1993 05 21	675	0.7+	0.5+	1998 08 27	704	1.2+	0.5−	1999 11 04	704	0.4−	0.3+
1993 05 21	675	(2.4−	1.3+)	1998 08 27	704	0.2−	0.4−	1999 11 04	704	0.7−	0.0
1993 05 24	675	0.7−	0.2+	1998 08 27	704	0.2+	0.1−	1999 11 04	704	0.1−	0.0
1993 05 24	675	0.3+	0.6−	1998 08 27	704	0.1+	0.5+				

(12191)* 1978 TT₈ = 1978 WA₁₅ = 1995 WA₇

Discovered 1978 Oct. 9 by L. V. Zhuravleva at the Crimean Astrophysical Observatory.

Id. T. Furuta (*JAM* 1969), T. Urata (*MPC* 26394)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

			Williams		
<i>M</i>	30.01681	(2000.0)	<i>P</i>	<i>Q</i>	
<i>n</i>	0.23524885	ω	275.77567	+0.87973004	+0.46973471
<i>a</i>	2.5988689	Ω	56.22860	−0.39361141	+0.80637218
<i>e</i>	0.2726017	<i>i</i>	5.08310	−0.26673042	+0.35932326
<i>P</i>	4.19	<i>H</i>	13.6	<i>G</i>	0.15
				<i>U</i>	1

Residuals in seconds of arc

1978 10 09	095	1.5−	0.2+	1998 05 04	566	0.5+	0.1−	1999 10 10	327	0.1−	0.3+
1978 10 28	675	0.8+	0.2−	1998 05 18	699	0.7−	0.8−	1999 10 15	704	0.4+	0.0
1978 10 29	675	0.5+	0.4−	1998 05 18	699	0.1−	0.6−	1999 10 15	704	0.4+	0.1−
1978 11 01	095	1.7−	0.1−	1998 05 18	699	0.4+	0.7−	1999 10 15	704	0.3+	0.1−

1978 11 24	049	2.0+	0.2+	1998 05 22	704	0.2−	0.3−	1999 10 15	704	0.1+	0.1+
1978 11 24	049	(3.3+	0.7−)	1998 05 22	704	0.5−	0.0	1999 10 15	704	0.5−	0.1+
1995 11 18	905	0.1−	0.0	1998 05 22	704	0.1+	0.1+	1999 10 21	704	0.6−	0.8+
1995 11 18	905	0.1−	0.5−	1998 05 22	704	0.1−	0.7−	1999 10 21	704	0.3+	0.2−
1995 11 25	905	0.6−	0.2+	1998 05 22	704	0.4−	0.6−	1999 10 21	704	0.4+	0.5−
1995 11 25	905	0.7+	0.9+	1998 05 23	704	1.3−	0.0	1999 10 21	704	0.1−	0.4−
1998 04 21	704	1.3−	1.3+	1998 05 23	704	1.1−	0.0	1999 11 04	704	0.1−	0.3−
1998 04 21	704	0.1+	0.9−	1998 05 23	704	1.1−	0.3+	1999 11 04	704	0.1−	0.2−
1998 04 21	704	1.3−	0.2−	1998 05 23	704	0.7−	1.0+	1999 11 04	704	0.1−	0.7−
1998 04 21	704	0.1−	0.3−	1998 05 23	704	1.2−	0.2+	1999 11 04	704	0.1+	0.9−
1998 04 22	704	0.3−	0.2−	1998 05 24	704	0.2−	0.1+	1999 11 04	704	0.2+	0.9−
1998 04 22	704	0.9+	0.8+	1998 05 24	704	0.2−	0.6−	1999 11 09	704	1.3−	1.4+
1998 04 22	704	0.2−	0.5+	1998 05 24	704	0.3−	0.3−	1999 11 09	704	0.1−	0.0
1998 04 22	704	0.6+	0.4+	1998 05 24	704	0.4−	0.2−	1999 11 09	704	0.2+	0.1+
1998 04 22	704	0.0	0.9+	1998 05 24	704	1.2−	0.5+	1999 11 09	704	0.5+	0.1+
1998 05 01	704	1.8+	0.0	1999 10 10	704	1.6+	0.7−	1999 11 09	704	0.5+	0.3+
1998 05 01	704	1.2+	0.7−	1999 10 10	704	0.2+	0.4+	1999 11 12	704	0.2+	0.2−
1998 05 01	704	1.0+	0.5−	1999 10 10	704	0.2−	0.6−	1999 11 12	704	0.7−	0.5−
1998 05 01	704	1.2+	0.7−	1999 10 10	704	0.2−	1.3−	1999 11 12	704	0.3+	0.2−
1998 05 01	704	1.3+	0.8−	1999 10 10	704	0.8−	1.0+	1999 11 12	704	0.6+	0.7−
1998 05 04	566	1.0+	0.3−	1999 10 10	327	0.3+	0.2+	1999 11 12	704	0.4−	0.5−
1998 05 04	566	1.0+	0.3−	1999 10 10	327	0.3+	0.5+				

(12192)* 1978 VD₅ = 1980 FR₈ = 1988 TX₄

Discovered 1978 Nov. 7 by E. F. Helin and S. J. Bus at Palomar.

Id. S. Nakano (*MPC* 15404)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

			Nakano		
<i>M</i>	269.62048	(2000.0)	<i>P</i>	<i>Q</i>	
<i>n</i>	0.18168558	ω	282.77670	−0.28491371	−0.95855211
<i>a</i>	3.0873728	Ω	183.77789	+0.88764896	−0.26327604
<i>e</i>	0.1277707	<i>i</i>	1.24185	+0.36180590	−0.10892010
<i>P</i>	5.42	<i>H</i>	14.0	<i>G</i>	0.15
				<i>U</i>	1

Residuals in seconds of arc

1978 11 05	675	0.1−	0.2−	1999 10 01	703	0.6−	0.3−	1999 10 09	704	0.0	0.7+
1978 11 06	675	0.5+	0.3−	1999 10 01	703	1.1−	0.3+	1999 10 09	704	0.1−	0.3+
1978 11 07	675	0.3+	0.9+	1999 10 01	703	1.1+	0.8+	1999 10 09	704	0.1−	0.6+
1978 11 08	675	0.3−	0.4+	1999 10 01	703	0.7−	0.2+	1999 10 15	704	0.1−	0.6−
1978 11 29	675	0.3+	0.1+	1999 10 05	704	0.1−	0.7+	1999 10 15	704	0.3−	0.2−
1978 11 30	675	0.5−	1.0−	1999 10 05	704	0.4+	0.7+	1999 10 15	704	0.2+	1.0−
1980 03 23	809	0.2−	0.8+	1999 10 05	704	0.2+	0.5+	1999 10 15	704	0.1+	0.1−
1988 09 15	675	1.7+	2.1−	1999 10 05	704	0.4+	0.3+	1999 10 15	704	0.6+	0.7−
1988 09 15	675	0.2+	0.0	1999 10 05	704	0.4−	0.1+	1999 11 06	704	0.9−	0.8−
1988 10 04	807	0.2−	1.1−	1999 10 07	703	1.0−	0.4−	1999 11 06	704	0.6−	0.6−
1988 10 05	807	0.4+	0.8−	1999 10 07	703	0.2−	0.3+	1999 11 06	704	0.4+	0.5−
1988 10 08	807	0.5+	0.5−	1999 10 07	703	0.6+	1.2+	1999 11 09	704	0.6+	0.3+
1996 03 15	608	0.2+	0.3+	1999 10 07	703	0.1−	0.2−	1999 11 09	704	0.6+	0.1−
1996 03 15	608	0.3+	0.3+	1999 10 07	704	0.4−	0.6+	1999 11 09	704	0.5+	0.4−
1996 03 16	608	0.2+	0.1−	1999 10 07	704	0.8+	0.3+	1999 11 09	704	0.2−	0.1−
1996 03 16	608	0.3+	0.2+	1999 10 07	704	0.3−	0.1−	1999 11 12	704	0.5−	0.1−
1996 03 17	608	0.2+	0.7−	1999 10 07	704	0.7−	1.1+	1999 11 12	704	1.2+	0.4+
1996 03 17	608	0.2+	0.5−	1999 10 07	704	1.0−	0.1+	1999 11 12	704	0.5+	0.8−
1996 03 19	608	0.7−	0.5−	1999 10 09	704	0.1−	0.6+	1999 11 12	704	0.6−	0.3−
1996 03 19	608	0.8−	0.8−	1999 10 09	704	0.1+	0.3+				

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	15.55441	(2000.0)	P	Q
<i>n</i>	0.23047996	ω	319.32130	+0.61514159
<i>a</i>	2.6345954	Ω	91.13202	+0.77323237
<i>e</i>	0.1589909	<i>i</i>	14.78077	+0.15398873
<i>P</i>	4.28	<i>H</i>	11.9	<i>G</i> 0.15 <i>U</i> 1

Residuals in seconds of arc

1979 02 28	688	0.8–	0.1–	1998 11 26	595	0.9–	1.2–	1999 10 22	704	0.3–	0.2+
1979 02 28	688	1.2+	1.6–	1998 11 26	595	0.7+	0.9–	1999 10 22	704	0.2–	0.0
1979 03 04	688	0.4–	0.4–	1998 11 28	595	1.3+	1.0–	1999 10 22	704	0.2–	0.1+
1979 03 04	688	0.6–	0.8–	1998 11 28	595	1.4+	0.3+	1999 10 22	704	0.2–	0.2+
1979 03 23	688	(3.3–	0.3–)	1998 12 08	704	0.0	0.9–	1999 11 11	703	0.3+	0.6+
1979 03 23	688	(3.1–	3.6–)	1998 12 08	704	0.8–	1.1–	1999 11 11	703	0.0	0.6+
1979 03 23	688	0.5–	0.5–	1998 12 08	704	0.1–	0.1+	1999 11 11	703	0.0	0.4+
1990 11 15	675	(0.1–	2.4+)	1998 12 08	704	0.2+	0.3–	1999 11 11	703	(3.2+	0.9–)
1990 11 15	402	0.3–	0.4+	1998 12 08	704	1.2–	0.1+	1999 11 16	704	0.3–	0.1–
1990 11 15	402	0.2+	1.1+	1999 10 12	704	0.7+	0.4–	1999 11 16	704	0.4–	0.4–
1990 11 16	675	0.4+	0.2+	1999 10 12	704	0.6+	0.4–	1999 11 16	704	0.4–	0.6–
1990 11 16	402	0.8–	1.2–	1999 10 12	704	0.5+	0.3–	1999 11 16	704	0.5–	0.3–
1990 11 16	402	0.2–	0.2+	1999 10 12	704	0.4+	0.4–	1999 11 16	704	0.2+	0.2–
1998 11 20	595	0.3+	0.1–	1999 10 12	704	0.8+	0.3–				
1998 11 20	595	0.6+	1.0–	1999 10 22	704	0.4–	0.7+				

(12194)* 1979 KO₁ = 1983 NA₁ = 1983 OK

Discovered 1979 May 24 at the Perth Observatory.

Id. C. M. Bardwell (*MPC* 15877)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Bardwell

<i>M</i>	87.57559	(2000.0)	P	Q
<i>n</i>	0.25842812	ω	5.52220	+0.06088363
<i>a</i>	2.4410473	Ω	268.01265	–0.92055239
<i>e</i>	0.2264168	<i>i</i>	7.26465	–0.38584515
<i>P</i>	3.81	<i>H</i>	14.0	<i>G</i> 0.15 <i>U</i> 2

Residuals in seconds of arc

1979 05 24	323	0.2+	0.1+	1998 05 24	704	0.8+	0.3–	1999 10 13	704	0.1+	0.3+
1979 05 24	323	0.2–	2.1+	1998 05 24	704	(2.4+	0.7+)	1999 10 13	704	0.2–	0.3+
1979 05 30	323	2.0+	0.6+	1998 05 24	704	1.4+	1.0+	1999 10 13	704	0.0	0.3+
1979 06 05	323	1.8–	1.5+	1998 05 24	704	0.4+	0.8+	1999 10 13	704	0.0	0.8+
1979 06 29	323	0.0	2.4–	1998 06 13	689	0.0	1.0+	1999 11 03	704	0.4+	0.4–
1979 07 02	323	0.2+	0.3–	1998 06 16	704	0.2+	1.3–	1999 11 03	704	(3.4+	0.1–)
1979 07 20	323	(2.8–	0.6+)	1998 06 16	704	0.5–	1.4–	1999 11 03	704	1.3–	0.8–
1983 07 14	808	0.3+	1.0+	1998 06 16	704	1.0–	0.5–	1999 11 03	704	0.2–	0.4–
1983 07 14	808	0.5+	0.5+	1998 06 16	704	(2.3–	1.4–)	1999 11 03	704	0.0	0.3–
1983 07 16	808	0.5–	0.7–	1999 10 05	704	0.4+	0.1+	1999 11 09	699	0.3+	0.2+
1983 07 16	808	0.4–	0.7–	1999 10 05	704	1.2+	0.8–	1999 11 09	699	0.8+	0.4–
1998 05 01	566	0.1–	0.1–	1999 10 05	704	0.1–	0.8–	1999 11 09	699	0.8+	0.2–
1998 05 01	566	0.4–	0.0	1999 10 05	704	(0.8+	2.1–)	1999 11 13	703	0.0	0.1+
1998 05 01	566	0.5–	0.2–	1999 10 12	704	0.2–	0.2+	1999 11 13	703	0.2–	0.2+
1998 05 02	566	1.0–	1.2–	1999 10 12	704	0.5–	0.4+	1999 11 13	703	0.1+	0.1–
1998 05 02	566	0.7–	1.0–	1999 10 12	704	0.4–	0.4+	1999 11 13	703	0.6–	0.2–
1998 05 02	566	0.5–	0.2–	1999 10 12	704	0.5–	0.4+				
1998 05 24	704	0.9+	0.3+	1999 10 13	704	0.3+	0.3–				

(12195)* 1979 MM₄ = 1998 HE₁₉

Discovered 1979 June 25 by E. F. Helin and S. J. Bus at Siding Spring.

Id. A. Gnädig (*MPC* 31944)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	90.95526	(2000.0)	P	Q
<i>n</i>	0.30313333	ω	55.43461	–0.20500259
<i>a</i>	2.1947257	Ω	202.75799	–0.91323307
<i>e</i>	0.1672768	<i>i</i>	2.79893	–0.35210694
<i>P</i>	3.25	<i>H</i>	15.7	<i>G</i> 0.15 <i>U</i> 2

Residuals in seconds of arc

1979 06 23	413	1.5+	0.6+	1998 04 01	704	1.3–	1.3+	1999 10 10	704	0.0	1.3+
1979 06 24	413	0.2+	0.6+	1998 04 01	704	0.0	0.7+	1999 10 10	704	0.4–	0.1–
1979 06 25	413	0.2+	0.9+	1998 04 01	704	0.1–	0.4–	1999 10 10	704	0.3–	0.5–
1979 06 29	413	(3.0+	1.2+)	1998 04 01	704	1.4+	1.8+	1999 10 15	704	1.0+	1.1–
1979 07 24	413	0.4–	0.8–	1998 04 01	704	0.5–	0.9–	1999 10 15	704	0.4–	0.5–
1979 07 26	675	0.2–	0.4+	1998 04 18	704	1.9+	1.6–	1999 10 15	704	0.5+	0.0
1979 07 26	675	0.3–	0.1+	1998 04 18	704	0.1–	1.9+	1999 10 15	704	1.1–	0.4+
1979 07 27	675	0.3–	0.4+	1998 04 18	704	0.1+	1.4–	1999 10 20	704	1.1–	1.0–
1979 07 28	413	0.2+	1.0–	1998 04 18	704	0.3+	0.1–	1999 10 20	704	0.7+	0.6–
1979 08 23	675	1.0–	0.7–	1998 04 19	704	0.2+	0.5+	1999 10 20	704	0.9–	0.0
1995 06 01	691	0.3+	0.5–	1998 04 19	704	0.8+	0.1+	1999 10 20	704	1.3+	0.0
1995 06 01	691	0.7+	0.4–	1998 04 19	704	0.5–	0.6–	1999 11 09	704	0.0	0.5–
1995 06 01	691	1.3–	0.0	1998 04 19	704	1.3+	0.0	1999 11 09	704	1.0+	0.2+
1998 03 20	704	(3.0–	1.6+)	1998 04 19	704	1.3–	0.0	1999 11 09	704	0.2+	0.7+
1998 03 20	704	0.7–	0.2+	1999 10 04	691	1.2+	1.9+	1999 11 09	704	0.6+	0.6–
1998 03 20	704	0.3–	0.1–	1999 10 04	691	0.2+	0.2–	1999 11 09	704	0.8+	0.7–
1998 03 20	704	0.6–	1.0+	1999 10 04	691	0.2+	0.1–	1999 11 12	704	0.5–	0.9+
1998 03 29	704	0.4+	0.3–	1999 10 09	703	0.2–	0.4+	1999 11 12	704	0.5+	0.6+
1998 03 29	704	0.0	0.4+	1999 10 09	703	(1.4–	4.4–)	1999 11 12	704	1.2–	0.1–
1998 03 29	704	0.1+	0.1–	1999 10 09	703	1.8–	0.7–	1999 11 12	704	0.7–	0.7+
1998 03 29	704	0.6+	0.6–	1999 10 09	703	0.8+	0.5–				
1998 03 29	704	0.9–	1.8–	1999 10 10	704	0.1–	0.1–				

(12196)* 1979 MM₈ = 1978 EO₈ = 1987 SX₁₂

Discovered 1979 June 25 by E. F. Helin and S. J. Bus at Siding Spring.

Id. C. Atallah (*MPC* 13603), S. Nakano (*ibid.*)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Nakano

<i>M</i>	56.42874	(2000.0)	P	Q
<i>n</i>	0.25687850	ω	154.56376	+0.89034595
<i>a</i>	2.4508546	Ω	178.34984	–0.42782628
<i>e</i>	0.1263268	<i>i</i>	3.64547	–0.15572014
<i>P</i>	3.84	<i>H</i>	14.6	<i>G</i> 0.15 <i>U</i> 2

Residuals in seconds of arc

1978 03 15	675	(6.9–	62.7+)	1987 10 01	809	0.9+	1.0–	1999 10 10	704	0.2+	0.2+
1978 03 16	675	0.1–	1.8–	1987 10 01	809	0.6+	1.0–	1999 10 10	704	0.9–	0.4+
1979 06 23	413	2.0+	0.2–	1987 10 01	809	0.5+	1.1–	1999 10 10	704	0.1–	0.6+
1979 06 24	413	0.6+	0.7–	1995 10 19	608	0.0	0.6+	1999 10 10	704	0.5–	0.5+
1979 06 25	413	(2.4+	0.2–)	1995 10 19	608	0.3–	0.5+	1999 10 10	704	0.0	0.3–
1979 06 29	413	0.1–	0.1+	1995 11 01	608	1.3–	0.7+	1999 11 04	704	1.3–	0.8+
1979 07 24	413	1.3–	0.0	1995 11 01	608	0.9–	0.6+	1999 11 04	704	0.6–	0.2+
1979 07 26	675	1.4–	1.0+	1997 02 04	566	0.8+	0.0	1999 11 04	704	0.6–	0.2+
1979 07 26	675	1.1–	0.4+	1997 02 04	566	0.2+	0.1+	1999 11 04	704	1.1+	0.1+
1979 07 27	675	1.4–	0.2–	1997 02 04	566	0.4+	0.1–	1999 11 15	704	0.3–	0.4+
1979 07 28	413	0.2–	0.6–	1997 03 03	691	0.0	0.6–	1999 11 15	704	0.0	0.7–
1979 08 23	675	0.6+	0.1+	1997 03 03	691	0.1+	0.5–	1999 11 15	704	0.2–	0.4+
1987 09 19	809	1.1+	0.3–	1997 03 03	691	0.0	0.4–	1999 11 15	704	0.3–	0.3+
1987 09 19	809	1.1+	0.3–	1997 03 10	691	0.4–	0.4–	1999 11 15	704	0.1–	0.9+
1987 09 19	809	1.2+	0.3–	1997 03 10	691	0.5+	0.7–	1999 11 17	704	0.1+	0.9+
1987 09 24	809	0.1+	0.4–	1997 03 10	691	0.5+	0.7–	1999 11 17	704	0.3–	0.4–
1987 09 24	809	0.4+	0.2–	1997 03 11	691	0.6–	0.2–	1999 11 17	704	0.2–	0.4–
1987 09 24	809	0.5+	0.0	1997 03 11	691	0.7–	0.1–	1999 11 17	704	1.3+	1.2–
1987 09 24	095	(0.4–	7.0+)	1997 03 11	691	0.4–	0.3–	1999 11 17	704	0.5+	1.2–

(12197)* 1980 FR₂ = 1982 SE₆

Discovered 1980 Mar. 16 by C.-I. Lagerkvist at the European Southern Observatory.

Id. S. Nakano (*MPC* 26557)

1999 NOV. 23

M.P.C. 36659

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5									
<i>M</i>	1.14451		(2000.0)		P		Q		
<i>n</i>	0.24094329	ω	238.85085		+0.49347352		−0.86975702		
<i>a</i>	2.5577582	Ω	181.58676		+0.82627942		+0.46972519		
<i>e</i>	0.1933252	<i>i</i>	5.33149		+0.27156254		+0.15126458		
<i>P</i>	4.09	<i>H</i>	13.8		<i>G</i>	0.15	<i>U</i>	1	
Residuals in seconds of arc									
1980 03 16	809	0.3−	0.3+	1996 01 17	098	(1.3−	2.7−)	1998 08 17	704 (2.5− 0.7+)
1980 03 16	809	0.4+	0.7−	1996 01 17	098	0.6−	0.7+	1999 10 10	704 1.4+ 0.4+
1980 03 16	809	0.3+	0.0	1996 01 18	098	1.4−	0.6−	1999 10 10	704 0.2+ 0.2−
1980 03 16	809	0.2+	0.2−	1996 01 19	098	0.7−	1.7+	1999 10 10	704 0.2− 0.1−
1980 03 17	809	0.4+	0.1−	1996 01 19	098	1.2−	0.4−	1999 10 10	704 0.0 0.0
1980 03 17	809	0.3−	0.3−	1996 01 27	411	0.5+	0.9+	1999 10 10	704 0.5− 0.6−
1980 03 17	809	0.0	0.9−	1996 01 27	411	0.6+	0.1+	1999 10 21	704 0.9+ 0.1+
1980 03 17	809	0.2+	0.6−	1996 01 29	411	0.4−	0.0	1999 10 21	704 0.7+ 0.2+
1980 03 23	809	0.2+	0.1−	1996 01 29	411	0.9+	1.5+	1999 10 21	704 0.4+ 0.3−
1982 09 16	095	0.5−	0.1−	1996 01 29	411	0.7+	1.5+	1999 10 21	704 0.2+ 0.7−
1988 03 17	675	0.9+	0.5+	1996 03 16	721	0.6+	1.6−	1999 10 21	704 0.7+ 0.3+
1988 03 17	675	0.3−	0.8+	1996 03 16	721	(1.1+ 3.7−)		1999 11 17	704 0.3+ 0.1−
1993 04 26	691	(3.1− 1.5+)		1996 03 18	721	0.1+ 0.4−		1999 11 17	704 0.1− 0.3−
1993 04 26	691	(2.9− 1.2+)		1996 03 18	721	0.4− 0.3+		1999 11 17	704 0.4+ 0.5−
1993 04 26	691	(2.8− 1.4+)		1998 08 17	704	0.5+ 0.6+		1999 11 17	704 0.1− 0.5−
1996 01 15	098	1.1− 1.4+		1998 08 17	704	0.2− 0.1−		1999 11 17	704 0.3+ 1.0−
1996 01 15	098	0.5− 0.1+		1998 08 17	704	0.1− 0.5+			
1996 01 16	098	0.9− 1.4−		1998 08 17	704	0.4− 0.4+			

(12198)* 1980 PJ₁ = 1996 YM₂

Discovered 1980 Aug. 6 by R. M. West at the European Southern Observatory.

Id. S. Nakano (*MPC* 28838)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5									
<i>M</i>	331.03983		(2000.0)		P		Q		
<i>n</i>	0.31412777	ω	130.02577		+0.65473299		−0.75179045		
<i>a</i>	2.1432122	Ω	278.89405		+0.66709732		+0.62346096		
<i>e</i>	0.2417313	<i>i</i>	4.54746		+0.35539538		+0.21472669		
<i>P</i>	3.14	<i>H</i>	15.0		<i>G</i>	0.15	<i>U</i>	1	

Residuals in seconds of arc									
1980 08 06	809	0.2+	0.5+	1999 09 04	703	0.5+	0.5+	1999 10 14	850 0.8− 0.0
1980 08 07	809	0.2+	0.0	1999 09 04	703	0.1+	0.6+	1999 10 15	850 0.6− 0.3+
1980 08 09	809	0.1−	1.2−	1999 09 04	703	0.6+	0.2−	1999 10 15	850 0.6− 0.3+
1996 12 14	369	0.3+	0.0	1999 09 04	703	0.0	0.2+	1999 11 04	631 0.3− 0.2+
1996 12 14	369	0.1+	0.1+	1999 09 09	681	0.3−	0.0	1999 11 04	631 0.2+ 0.4+
1996 12 28	411	0.0	0.0	1999 09 09	681	0.0	0.1−	1999 11 08	699 0.2+ 0.1+
1996 12 28	411	0.0	0.1+	1999 09 12	681	0.1+	0.1−	1999 11 08	699 0.3+ 0.2−
1996 12 29	411	0.1−	0.1+	1999 09 12	681	0.0	0.1+	1999 11 08	699 0.1+ 0.1+
1996 12 29	411	0.2−	0.1−	1999 10 05	704	1.4−	1.7−	1999 11 08	631 0.4− 0.6+
1997 01 06	411	0.0	0.6−	1999 10 05	704	0.3+	0.6−	1999 11 08	631 0.4− 0.7+
1997 01 06	411	0.0	0.5−	1999 10 05	704	0.9+	0.3−	1999 11 13	703 0.4− 0.2+
1998 05 24	704	0.7−	0.5+	1999 10 05	704	1.5+	1.3−	1999 11 13	703 0.3− 0.1−
1998 05 24	704	0.4+	1.2−	1999 10 05	704	1.5+	1.4+	1999 11 13	703 0.0 0.0
1998 05 24	704	0.4+	1.4+	1999 10 14	850	0.5−	0.2−	1999 11 13	703 0.3− 0.0

(12199)* 1980 TK₆ = 1991 NU₁

Discovered 1980 Oct. 8 by L. V. Zhuravleva at the Crimean Astrophysical Observatory.

Id. E. Bowell (*MPC* 18621)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5									
<i>M</i>	357.07280		(2000.0)		P		Q		
<i>n</i>	0.26170455	ω	149.10236		+0.96838480		−0.23646836		
<i>a</i>	2.4206307	Ω	224.80335		+0.19959337		+0.92551801		
<i>e</i>	0.1102730	<i>i</i>	6.47435		+0.14964413		+0.29580251		
<i>P</i>	3.77	<i>H</i>	13.8		<i>G</i>	0.15	<i>U</i>	1	
Residuals in seconds of arc									
1980 09 13	675	0.2+	0.2−	1999 10 03	704	0.6−	0.1−	1999 10 29	703 0.5− 0.7+
1980 09 14	675	0.1−	0.1−	1999 10 07	704	0.5+	0.4+	1999 10 29	703 0.4− 0.4+
1980 10 08	095	(4.1− 6.1+)		1999 10 07	704	0.3+	0.3+	1999 10 29	703 0.0 0.6+
1980 10 12	095	(4.9− 6.2+)		1999 10 07	704	0.6+	0.1−	1999 10 29	703 0.7− 0.5+
1991 07 13	675	0.6−	0.6−	1999 10 07	704	0.5+	0.1+	1999 11 03	703 0.3− 0.3+
1991 07 13	675	0.2−	0.3−	1999 10 07	704	0.0	0.3+	1999 11 03	703 0.7− 0.3+
1991 07 19	675	0.9−	0.4−	1999 10 08	106	0.4−	0.4+	1999 11 03	703 0.3− 0.3+
1991 07 19	675	0.8+	0.1−	1999 10 08	106	0.1−	0.4+	1999 11 03	703 0.3− 0.2+
1991 08 05	675	0.8−	0.7−	1999 10 08	106	0.0	0.8+	1999 11 04	704 0.4− 0.4−
1991 08 05	675	1.4+	0.3−	1999 10 10	704	0.6+	0.3+	1999 11 04	704 0.3− 0.2−
1991 08 09	675	0.6+	0.1−	1999 10 10	704	0.7+	0.1+	1999 11 04	704 0.3− 0.0
1991 08 09	675	0.5+	0.7−	1999 10 10	704	1.1+	0.1−	1999 11 04	704 0.5− 0.1−
1991 09 13	675	(0.1− 2.4−)		1999 10 10	704	0.9+	0.2−	1999 11 04	704 0.3− 0.0
1991 09 13	675	(1.3+ 2.9−)		1999 10 10	704	0.9+	0.1−	1999 11 05	704 0.6− 0.5−
1998 05 22	704	0.3+	0.2+	1999 10 13	704	0.1−	0.2+	1999 11 05	704 0.5− 0.6−
1998 05 22	704	0.7−	0.9+	1999 10 13	704	0.1+	0.1−	1999 11 05	704 0.5− 0.4−
1998 05 22	704	0.3+	0.3+	1999 10 13	704	0.1+	0.1−	1999 11 05	704 0.6− 0.1−
1998 05 22	704	0.5+	1.5+	1999 10 13	704	0.0	0.3−	1999 11 05	704 0.6− 0.3−
1998 05 22	704	0.4+	1.0+	1999 10 15	704	0.1−	0.2+	1999 11 06	704 0.1− 0.3−
1998 05 24	704	0.4+	0.7+	1999 10 15	704	0.1+	0.4+	1999 11 06	704 0.3− 0.4−
1998 05 24	704	0.3−	0.3+	1999 10 15	704	0.2−	0.5+	1999 11 06	704 0.2+ 0.3−
1998 05 24	704	0.0	1.7+	1999 10 15	704	0.2−	0.1+	1999 11 16	704 0.1+ 0.4+
1998 05 24	704	0.4−	0.1+	1999 10 15	704	0.1−	0.3+	1999 11 16	704 0.2− 0.1+
1998 05 24	704	(4.0− 1.9−)		1999 10 21	704	0.2+	0.4+	1999 11 16	704 0.6+ 0.0
1999 10 03	704	0.9+	0.6+	1999 10 21	704	0.2+	0.6+	1999 11 16	704 0.0 0.1−
1999 10 03	704	0.4+	0.2−	1999 10 21	704	0.1+	0.4+	1999 11 16	704 0.1− 0.3−
1999 10 03	704	0.4+	0.4−	1999 10 21	704	0.1+	0.2+		
1999 10 03	704	0.1−	0.6+	1999 10 21	704	0.2+	0.3+		

(12200)* 1981 EM₇ = 1998 HF₅₂

Discovered 1981 Mar. 1 by S. J. Bus at Siding Spring in the course of the U.K. Schmidt-Caltech Asteroid Survey.

Id. G. V. Williams (*MPC* 31945)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5									
<i>M</i>	52.96042		(2000.0)		P		Q		
<i>n</i>	0.23668943	ω	73.82921		+0.43265550		+0.89901060		
<i>a</i>	2.5883131	Ω	222.01696		−0.86100807		+0.38974501		
<i>e</i>	0.2065305	<i>i</i>	5.80871		−0.26734683		+0.19969670		
<i>P</i>	4.16	<i>H</i>	13.3		<i>G</i>	0.15	<i>U</i>	1	

Residuals in seconds of arc									
1981 02 09	413	1.9+	0.6+	1999 10 02	703	0.0	0.3+	1999 10 11	106 0.4+ 0.1+
1981 03 01	413	0.1+	1.0−	1999 10 02	703	0.3−	0.3−	1999 10 11	106 0.0 0.1+
1981 03 07	413	0.6+	0.1−	1999 10 02	703	0.2+	0.0	1999 10 12	704 0.4+ 0.0
1981 03 11	413	1.1−	0.8+	1999 10 02	703	0.2−	0.1−	1999 10 12	704 0.2+ 0.1−
1981 03 11	413	0.1−	0.8−	1999 10 03	704	0.6+	0.5+	1999 10 12	704 0.5+ 0.2−
1981 03 15	413	1.6−	0.8+	1999 10 03	704	0.7−	1.3+	1999 10 12	704 0.3+ 0.0
1981 03 15	413	1.6+	0.9−	1999 10 03	704	0.4−	0.5+	1999 10 12	704 0.5+ 0.4−
1981 04 05	413	0.3+	1.7−	1999 10 03	704	0.4−	0.8+	1999 10 12	711 0.4+ 0.2−
1981 04 06	413	1.1−	0.6+	1999 10 03	704	0.6−	0.7+	1999 10 12	711 0.4+ 0.2−
1981 04 06	413	0.5+	1.0−	1999 10 06	704	0.1−	0.2+	1999 10 12	711 0.2− 0.0
1981 04 07	413	0.5−	0.4+	1999 10 06	704	0.0	0.1+	1999 10 13	704 0.5+ 0.5−
1981 04 10	413	0.1−	1.6+	1999 10 06	704	0.1+	0.1+	1999 10 13	704 0.4+ 0.1−
1981 04 10	413	0.8+	0.5−	1999 10 06	704	0.0	0.3+	1999 10 13	704 0.4+ 0.1−
1981 04 12	413	1.0−	1.6+	1999 10 06	704	0.0	0.3+	1999 10 13	704 0.5+ 0.1+
1981 04 12	413	(4.4+ 2.3−)		1999 10 07	704	0.1−	0.6+	1999 10 13	704 0.4+ 0.0
1981 04 30	413	0.1−	0.4+	1999 10 07	704	0.1−	0.1+	1999 10 18	

1995 10 15	327	0.1−	0.5−	1999 10 07	704	0.2+	0.3+	1999 10 18	691	0.5−	0.3−
1995 10 15	327	0.3+	0.5+	1999 10 07	704	0.1−	0.6−	1999 10 18	691	0.6−	0.2−
1995 10 15	327	0.4+	0.1+	1999 10 07	704	0.0	0.4−	1999 10 20	704	0.2−	0.2−
1995 10 28	327	0.4−	0.5+	1999 10 09	703	0.0	0.0	1999 10 20	704	0.2−	0.3−
1995 10 28	327	0.4−	0.2+	1999 10 09	703	0.2−	0.9−	1999 10 20	704	0.1−	0.0
1995 10 28	327	0.0	0.0	1999 10 09	704	0.5−	0.2+	1999 10 20	704	0.2−	0.2−
1998 04 21	704	0.2+	0.7+	1999 10 09	703	1.3+	0.1−	1999 10 20	704	0.4−	0.1+
1998 04 21	704	0.0	0.5+	1999 10 09	703	0.4−	0.1+	1999 11 04	703	0.1−	0.5+
1998 04 21	704	0.3−	1.4+	1999 10 09	704	0.2−	0.1−	1999 11 04	703	0.3−	0.2+
1998 04 21	704	0.4+	0.0	1999 10 09	704	0.1+	0.0	1999 11 04	703	0.1−	0.4+
1998 04 21	704	0.5−	0.7+	1999 10 09	704	0.2+	0.0	1999 11 04	703	0.7−	0.3+
1998 04 22	704	0.2+	0.1+	1999 10 09	704	0.0	0.0	1999 11 05	704	0.6−	0.0
1998 04 22	704	0.8−	0.5−	1999 10 10	704	0.1−	0.0	1999 11 05	704	0.3−	0.1−
1998 04 22	704	0.3+	0.1+	1999 10 10	704	0.1−	0.1−	1999 11 05	704	0.6−	0.0
1998 04 22	704	0.4+	0.4+	1999 10 10	704	0.2−	0.1−	1999 11 05	704	0.3−	0.2−
1998 04 22	704	0.3−	0.8+	1999 10 10	704	0.1−	0.4−	1999 11 05	704	0.3−	0.3+
1998 04 30	699	0.5+	0.3+	1999 10 10	704	0.3−	0.2−	1999 11 14	699	0.2+	0.3+
1998 04 30	699	0.6+	0.0	1999 10 10	704	0.1+	0.1+	1999 11 14	699	0.1+	1.1+
1998 04 30	699	0.3+	0.2+	1999 10 10	704	0.2−	0.4+	1999 11 14	704	0.4+	0.3+
1998 05 01	699	0.2−	0.1+	1999 10 10	704	0.0	0.5+	1999 11 14	704	0.1+	0.1+
1998 05 01	699	0.3+	0.3−	1999 10 10	704	0.3+	0.2+	1999 11 14	699	0.2+	1.6+
1998 05 01	699	0.5+	0.3−	1999 10 10	704	0.3+	0.3+	1999 11 14	704	0.3+	0.1+
1998 05 16	704	0.2−	0.1−	1999 10 11	704	1.6+	0.7+	1999 11 14	704	0.0	0.1+
1998 05 16	704	0.6−	0.9+	1999 10 11	704	0.3−	0.8+	1999 11 14	704	0.0	0.1+
1998 05 16	704	0.4−	0.2+	1999 10 11	704	0.3−	0.1−	1999 11 16	704	0.3+	0.5+
1998 05 16	704	0.5+	0.7−	1999 10 11	704	0.3−	0.2+	1999 11 16	704	0.7+	0.1−
1998 05 16	704	0.6−	0.1+	1999 10 11	704	0.0	0.8−	1999 11 16	704	0.2+	0.4+
1998 05 25	699	0.2−	1.5+	1999 10 11	704	1.2−	1.0−	1999 11 16	704	0.5+	0.5+
1998 05 25	699	0.8−	0.2+	1999 10 11	704	1.5−	1.5−	1999 11 16	704	0.5+	0.4+
1998 05 25	699	0.7+	0.0	1999 10 11	106	0.3−	0.1−				

(12201)* 1981 ED₁₂ = 1991 VS₁₄ = 1991 VN₁₅ = 1993 FY₂₆

Discovered 1981 Mar. 1 by S. J. Bus at Siding Spring in the course of the U.K. Schmidt-Caltech Asteroid Survey.

Id. G. V. Williams (*MPC* 23511)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	225.54357	(2000.0)	<i>P</i>	Williams	<i>Q</i>
<i>n</i>	0.24780204	ω	339.14245	−0.99741639	+0.00053014
<i>a</i>	2.5103414	Ω	201.27250	+0.01537082	−0.97523902
<i>e</i>	0.0795866	<i>i</i>	11.41998	−0.07017318	−0.22115282
<i>P</i>	3.98	<i>H</i>	14.3	<i>G</i>	0.15
				<i>U</i>	1

Residuals in seconds of arc

1981 02 09	413	1.4−	0.3−	1993 03 22	809	0.4−	0.8+	1998 08 28	704	0.3−	0.5+
1981 02 14	413	1.9+	0.2+	1993 03 26	809	0.1−	0.3+	1998 08 28	704	0.8−	0.5+
1981 03 01	413	0.7+	0.3−	1993 04 18	413	(3.1−	3.8+)	1998 08 28	704	0.3+	0.2−
1981 03 01	413	1.8+	2.0−	1997 03 11	809	0.1+	0.6+	1998 08 28	704	0.3+	0.6+
1981 03 06	413	1.4−	1.4+	1997 03 11	809	0.2+	0.2+	1999 10 10	704	0.2+	0.2−
1981 03 08	413	1.1−	0.5+	1997 03 11	809	0.0	0.5+	1999 10 10	704	0.3+	0.1−
1981 03 08	413	0.6+	1.0−	1997 03 13	809	0.1−	1.7−	1999 10 10	704	0.3+	0.5+
1981 03 12	413	0.7−	1.6+	1997 03 13	809	1.0−	1.4−	1999 10 10	704	0.4+	0.2−
1981 03 12	413	0.1+	0.6−	1997 03 13	809	1.0−	1.4−	1999 10 10	704	0.5+	0.1−
1981 04 06	413	1.2−	1.4+	1997 04 03	704	1.0+	0.1+	1999 10 20	704	0.3−	0.3+
1981 04 06	413	1.0+	1.9−	1997 04 03	704	0.4+	0.5−	1999 10 20	704	0.3+	0.2−
1981 04 08	413	0.5−	0.2+	1997 04 05	704	1.0+	1.0+	1999 10 20	704	0.9+	0.2−
1981 04 08	413	1.2+	2.3−	1997 04 05	704	0.4+	0.4+	1999 10 20	704	0.1+	0.4+
1981 04 09	413	0.8−	0.5+	1997 04 06	704	1.0+	0.3−	1999 11 05	704	0.3−	0.2−
1981 04 09	413	0.1−	1.6−	1997 04 06	704	0.8+	0.2+	1999 11 05	704	0.9−	0.7+
1981 05 01	413	0.3−	1.1−	1997 04 07	704	0.3−	0.3+	1999 11 05	704	0.4−	0.2−
1981 05 03	413	1.2−	1.0−	1997 04 07	704	0.4+	1.9+	1999 11 05	704	0.8−	0.0
1991 11 02	809	(2.5+	1.3−)	1997 04 07	704	0.7−	0.6+	1999 11 05	704	0.1−	0.1+
1991 11 02	809	0.6+	1.4−	1997 04 07	704	0.2−	0.0	1999 11 16	703	0.3−	0.5+
1991 11 02	809	0.6+	1.5−	1998 08 27	704	0.3−	0.8−	1999 11 16	703	0.1+	0.1+
1991 11 12	809	(3.5+	3.5−)	1998 08 27	704	0.6−	1.5−	1999 11 16	703	0.4−	0.2−
1991 11 12	809	(2.6+	3.9−)	1998 08 27	704	0.2−	1.1−	1999 11 16	703	0.1−	0.0

1991 11 12	809	(1.2+	5.7−)	1998 08 27	704	0.3+	0.6+
1993 03 21	809	1.1−	0.8+	1998 08 28	704	1.7+	1.5−

(12202)* 1981 EM₁₃ = 1991 GN₈

Discovered 1981 Mar. 1 by S. J. Bus at Siding Spring in the course of the U.K. Schmidt-Caltech Asteroid Survey.

Id. B. G. Marsden (*MPC* 18417)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	209.59360	(2000.0)	<i>P</i>	Marsden	<i>Q</i>
<i>n</i>	0.29926621	ω	311.20445	−0.99507159	+0.07061135
<i>a</i>	2.2135921	Ω	232.95975	−0.04210593	−0.93652640
<i>e</i>	0.0809639	<i>i</i>	5.00350	−0.08977544	−0.34341279
<i>P</i>	3.29	<i>H</i>	15.3	<i>G</i>	0.15
				<i>U</i>	2

Residuals in seconds of arc

1979 10 18	675	1.5−	0.8−	1991 04 08	809	1.0+	0.7−	1999 11 04	703	0.9−	0.0
1979 10 18	675	1.4+	1.1+	1991 04 08	809	0.7+	0.7−	1999 11 04	703	(2.5−	0.5+)
1981 02 09	413	0.1−	1.6+	1991 04 08	809	0.1−	0.7−	1999 11 04	703	(2.3−	0.6+)
1981 02 12	413	1.0+	0.9+	1991 04 10	809	0.5+	0.2+	1999 11 04	703	0.6+	1.4+
1981 03 01	413	1.6+	0.8−	1991 04 10	809	0.5+	1.7−	1999 11 09	704	0.4−	0.5−
1981 03 01	413	2.0+	0.7−	1991 04 10	809	0.0	0.7−	1999 11 09	704	0.6−	0.3−
1981 03 06	413	1.6−	1.1+	1991 04 15	675	0.2−	0.6+	1999 11 09	704	0.2−	0.4−
1981 03 06	413	0.6+	0.3−	1991 04 15	675	0.5+	0.3−	1999 11 09	704	0.1−	0.3−
1981 03 08	413	1.5−	1.7+	1991 04 19	809	1.2−	1.0+	1999 11 09	704	0.1−	0.6−
1981 03 12	413	0.6−	1.2+	1991 04 19	809	1.1−	0.1+	1999 11 12	704	0.3−	0.2+
1981 03 12	413	0.7+	0.2+	1991 04 19	809	1.4−	0.2−	1999 11 12	704	0.4+	0.0
1981 04 06	413	1.1−	1.1+	1999 10 22	704	0.8+	1.4−	1999 11 12	704	0.6+	0.3+
1981 04 06	413	(3.1+	2.2−)	1999 10 22	704	0.2−	1.0−	1999 11 12	704	0.1−	0.3−
1981 04 08	413	1.0−	0.1−	1999 10 22	704	0.5+	0.4−	1999 11 12	704	0.3−	0.3+
1981 04 08	413	0.5+	2.0−	1999 10 22	704	0.2−	1.1−	1999 11 17	704	0.4+	0.4+
1981 04 09	413	0.9−	0.6+	1999 11 03	704	0.1−	0.5−	1999 11 17	704	1.5+	1.4−
1981 04 09	413	1.0+	0.7−	1999 11 03	704	1.1−	0.9+	1999 11 17	704	0.4+	0.2−
1981 05 01	413	0.1−	1.7−	1999 11 03	704	0.8−	0.1−	1999 11 17	704	0.3+	0.1+
1981 05 03	413	0.3−	1.6−	1999 11 03	704	0.3−	0.0	1999 11 17	704	0.7+	0.2+

(12203)* 1981 EO₁₉

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

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	298.07126	(2000.0)	<i>P</i>	Williams	<i>Q</i>
<i>n</i>	0.19120289	ω	255.05182	+0.22885657	−0.97344918
<i>a</i>	2.9840521	Ω	181.73855	+0.94140784	+0.22252690
<i>e</i>	0.0750496	<i>i</i>	8.76179	+0.24774169	+0.05365132
<i>P</i>	5.15	<i>H</i>	14.2	<i>G</i>	0.15
				<i>U</i>	1

Residuals in seconds of arc

1953 10 10	675	0.1+	0.7−	1996 04 17	327	0.0	0.2−	1999 10 07	704	0.0	0.3+
1953 10 10	675	0.3−	1.3−	1996 04 17	327	0.0	0.2−	1999 10 09	704	0.4+	0.1−
1978 09 01	675	0.6+	0.0	1996 04 17	327	0.6−	1.2−	1999 10 09	704	1.4−	0.1+
1978 09 02	675	0.3−	0.0	1997 03 15	608	0.0	0.3−	1999 10 09	704	0.2+	0.3+
1981 02 09	413	1.6+	0.3−	1997 03 15	608	0.8−	0.4−	1999 10 09	704	0.4+	0.0
1981 02 13	413	0.1−	0.6−	1999 10 02	703	0.1−	0.7−	1999 10 09	704	0.7+	0.1+
1981 03 02	413	0.5+	1.8+	1999 10 02	703	1.2−	0.7−	1999 10 15	704	0.5−	1.4−
1981 03 02	413	(2.8+	2.4−)	1999 10 02	703	0.3−	0.4+	1999 10 15	704	0.1+	0.6−
1981 03 03	413	0.3−	0.7+	1999 10 02	703	1.0−	0.1+	1999 10 15	704	0.1+	1.1−
1981 03 03	413	0.5−	0.4+	1999 10 04	704	0.2+	1.3+	1999 10 15	704	0.2+	0.8−
1981 03 07	413	0.6−	0.9+	1999 10 04	704	0.0	1.0+	1999 11 01	703	1.0−	0.3+
1981 03 07	413	(2.9+	1.6−)	1999 10 04	704	0.1+	0.7−	1999 11 01	703	0.3−	0.1−
1981 03 11	413	1.2+	0.9−	1999 10 04	704	0.6−	0.7+	1999 11 01	703	0.3+	0.0
1981 03 16	413	1.4−	1.4+	1999 10 04	704	0.8+	1.0−	1999 11 01	703	0.4−	0.2−
1981 03 16	413	1.1+	1.7−	1999 10 07	704	0.1+	1.2+	1999 11 06	704	0.5−	0.2−
1981 03 29	413	1.2−	0.9+	1999 10 07	704	0.1−	0.2+	1999 11 06	704	0.2+	0.1−
1981 03 29	413	(4.9−	4.1+)	1999 10 07	704	0.4+	0.2+	1999 11 06	704	0.9+	0.7+
1981 04 08	413	2.2+	1.2−	1999 10 07	704	0.1−	0.2+	1999 11 06	704	0.9+	1.5+
1981 04 11	413	0.8−	0.0	1999 10 07	704	0.4+	0.5−	1999 11 15	704	0.3−	0.8+

1999 NOV. 23

M.P.C. 36661

1981 05 02	413	0.3−	1.0+	1999 10 07	704	0.4+	0.6+	1999 11 15	704	0.3+	0.0
1996 01 24	691	0.0	0.1+	1999 10 07	704	0.5+	0.6+	1999 11 15	704	0.6+	0.4−
1996 01 24	691	0.1+	0.2+	1999 10 07	704	0.2+	0.1+	1999 11 15	704	0.9−	0.9+
1996 01 24	691	0.0	0.1+	1999 10 07	704	0.1−	0.1+	1999 11 15	704	(2.0−	0.8−)

(12204)* 1981 EK₂₆ = 1978 RS₉

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

Id. H. Kaneda (*MPC* 15880)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

M	112.36721		(2000.0)	P	Q
n	0.24229375	ω	106.41180	−0.00200895	+0.99989542
a	2.5482453	Ω	163.45329	−0.93560049	+0.00317704
e	0.1176693	i	2.88251	−0.35305478	−0.01410880
P	4.07	H	14.8	G 0.15	U 1

Residuals in seconds of arc

1978 09 02	809	0.2+	1.0−	1981 04 26	413	(2.9+	1.5−)	1999 10 30	691	0.1−	0.1−
1978 09 02	809	0.8+	0.6+	1981 05 01	413	0.8+	0.1+	1999 10 30	691	0.1+	0.2+
1978 09 02	809	0.7−	0.3−	1988 07 21	704	0.3−	1.2−	1999 10 30	691	0.2−	0.0
1978 09 02	809	0.9+	0.3−	1988 07 21	704	0.0	0.8−	1999 11 04	704	0.8+	0.1+
1978 09 02	809	1.1−	1.0−	1988 07 21	704	1.0−	0.9−	1999 11 04	704	0.2−	0.9+
1978 09 06	809	1.0+	1.0−	1988 07 21	704	1.0+	0.3+	1999 11 04	704	0.1+	0.1+
1981 02 09	413	0.1−	0.2−	1988 07 26	704	0.5+	0.7+	1999 11 15	704	0.0	0.5−
1981 02 12	413	0.5+	1.6−	1988 07 26	704	(3.5+	0.3−)	1999 11 15	704	0.4+	0.8−
1981 02 13	413	0.2+	0.2+	1988 07 26	704	(2.1−	0.8−)	1999 11 15	704	0.9+	0.5−
1981 03 02	413	0.4+	2.4−	1988 07 26	704	(0.7+	2.4+)	1999 11 15	704	0.1+	1.6−
1981 03 06	413	(3.0−	0.5+)	1999 10 07	691	0.3−	0.6−	1999 11 15	704	0.2+	0.7−
1981 03 11	413	1.0−	0.9−	1999 10 07	691	0.1−	0.1−	1999 11 17	704	0.8−	0.5−
1981 03 11	413	(1.7+	2.7−)	1999 10 07	691	1.0−	1.2+	1999 11 17	704	0.8+	0.7−
1981 03 15	413	0.7−	0.8−	1999 10 10	704	0.1−	0.1−	1999 11 17	704	1.4+	0.0
1981 04 06	413	(3.5−	1.2+)	1999 10 10	704	0.9−	0.0				
1981 04 06	413	2.0−	0.1+	1999 10 10	704	0.6−	0.7+				

(12205)* 1981 EZ₂₆ = 1998 MP₄₆

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

Id. G. V. Williams (*MPC* 32211)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

M	220.95091		(2000.0)	P	Q
n	0.24562405	ω	270.13555	−0.98735330	−0.15657625
a	2.5251594	Ω	260.85627	+0.15361957	−0.90618940
e	0.0770638	i	1.44207	+0.03917262	−0.39281630
P	4.01	H	14.7	G 0.15	U 2

Residuals in seconds of arc

1978 07 09	675	1.6−	0.1+	1999 10 06	704	0.5−	0.2−	1999 11 14	704	0.3−	0.4−
1978 07 09	675	1.6+	0.2−	1999 10 12	704	0.2−	0.0	1999 11 14	704	0.3+	0.2+
1981 02 12	413	1.1−	0.3+	1999 10 12	704	0.7+	0.5−	1999 11 15	704	1.1−	0.5+
1981 02 12	413	0.9−	0.2−	1999 10 12	704	0.7+	0.0	1999 11 15	704	0.6+	0.2−
1981 02 13	413	1.0+	1.2+	1999 10 12	704	1.0+	0.4−	1999 11 15	704	0.2−	0.2−
1981 03 02	413	0.9+	1.3+	1999 11 04	704	0.6+	0.6+	1999 11 15	704	0.2+	0.2−
1981 03 06	413	0.9−	0.4+	1999 11 04	704	0.5−	0.1+	1999 11 15	704	0.5−	0.1−
1981 03 06	413	1.8+	0.2+	1999 11 04	704	(2.3−	0.3−)	1999 11 15	704	0.3+	0.2−
1981 03 11	413	1.0+	0.6−	1999 11 04	704	0.1−	0.6−	1999 11 15	704	0.9−	0.1−
1981 03 15	413	1.6−	0.4+	1999 11 09	704	1.1+	1.7+	1999 11 15	704	0.1+	0.2−
1981 04 05	413	1.5+	0.7−	1999 11 09	704	0.3+	0.2+	1999 11 15	704	0.5−	0.3−
1981 04 05	413	0.1+	0.0	1999 11 09	704	0.2+	0.1−	1999 11 15	704	0.2+	0.1−
1981 04 06	413	1.8−	0.1+	1999 11 09	704	0.3+	0.2−	1999 11 15	691	0.4−	0.1−
1981 04 06	413	0.6+	0.1−	1999 11 12	704	0.2−	0.1−	1999 11 15	691	0.4−	0.1−
1981 05 01	413	0.8+	1.1−	1999 11 12	704	0.3−	0.1+	1999 11 15	691	0.4−	0.1−
1981 05 03	413	1.2−	1.1−	1999 11 12	704	0.1−	0.1−	1999 11 16	704	0.2−	0.0
1998 06 25	691	0.1−	0.2+	1999 11 12	704	0.0	0.3+	1999 11 16	704	0.1−	0.3−
1998 06 25	691	0.1−	0.3+	1999 11 12	704	(2.7+	0.5+)	1999 11 16	704	1.5+	0.4+
1998 06 25	691	0.1−	0.4+	1999 11 14	704	0.5−	0.1+	1999 11 16	704	0.0	0.3−

1999 10 06	704	0.1+	1.2+	1999 11 14	704	0.1+	0.4+	1999 11 16	704	0.1−	0.4−
1999 10 06	704	0.6−	0.6+	1999 11 14	704	0.1+	0.8−				

(12206)* 1981 EG₂₇

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

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

M	164.92892		(2000.0)	P	Q
n	0.19090442	ω	272.80323	−0.67872824	+0.73384194
a	2.9871616	Ω	314.40854	−0.65703702	−0.62403376
e	0.0536234	i	2.27479	−0.32807063	−0.26843597
P	5.16	H	14.1	G 0.15	U 1

Residuals in seconds of arc

1978 10 04	675	(5.6−	1.9−)	1981 05 01	413	0.1+	1.6−	1999 10 13	704	0.6+	0.8+
1978 10 05	675	(5.7−	2.6−)	1981 05 03	413	0.0	0.9−	1999 10 13	704	0.2−	0.3+
1978 10 27	675	0.9−	1.0−	1996 02 16	010	1.0−	0.3−	1999 11 03	704	0.0	0.2+
1978 10 28	675	0.8+	0.2−	1996 02 16	010	0.1+	0.5−	1999 11 03	704	0.2+	0.5+
1978 10 29	675	0.3−	0.2−	1996 02 16	010	0.8−	0.1−	1999 11 03	704	0.7+	0.7+
1979 12 20	675	(7.6+	0.0)	1996 02 17	010	(2.9+	0.5+)	1999 11 03	704	0.8+	0.9−
1979 12 20	675	(4.7+	1.1−)	1996 02 17	010	0.3+	1.5+	1999 11 14	704	0.9−	1.0−
1981 02 12	413	0.8−	0.4+	1996 02 17	010	(3.9+	1.1+)	1999 11 14	704	1.1−	0.4−
1981 02 12	413	0.2+	0.5−	1998 07 26	691	0.3−	0.2+	1999 11 14	704	(2.3−	0.5+)
1981 03 02	413	1.3+	1.5+	1998 07 26	691	0.2−	0.1+	1999 11 14	704	0.9−	0.6−
1981 03 02	413	1.4+	0.5+	1998 07 26	691	0.1−	0.3+	1999 11 14	704	0.9−	0.2−
1981 03 06	413	0.4−	0.2+	1999 10 12	704	0.4+	0.9+	1999 11 16	704	0.5+	0.1−
1981 03 11	413	0.6−	0.2−	1999 10 12	704	0.9+	0.2−	1999 11 16	704	0.3+	0.1+
1981 03 11	413	1.3+	0.8+	1999 10 12	704	0.9+	0.0	1999 11 16	704	0.3−	1.2−
1981 03 15	413	2.0−	1.3+	1999 10 13	704	0.6+	0.7+	1999 11 16	704	0.4+	0.0
1981 04 09	413	0.4−	1.3−	1999 10 13	704	0.6+	0.4+	1999 11 16	704	1.0−	0.1+
1981 04 09	413	0.7+	0.8−	1999 10 13	704	0.4+	0.6+				

(12207)* 1981 EU₂₈ = 1975 NM = 1998 KQ₁₄

Discovered 1981 Mar. 1 by S. J. Bus at Siding Spring in the course of the U.K. Schmidt-Caltech Asteroid Survey.

Id. L. D. Schmadel (*MPC* 31947), G. V. Williams (*ibid.*)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

M	67.25045		(2000.0)	P	Q		
n	0.29648557	ω	19.44868	+0.72308277	+0.68779805		
a	2.2274109	Ω	296.92430	−0.64287711	+0.63622054		
e	0.1942137	i	4.11081	−0.25270602	+0.34951004		
P	3.32	H	14.5	G	0.15	U	1

Residuals in seconds of arc

1975 07 11	095	0.2+	1.6−	1998 05 22	704	0.4+	0.8−	1999 10 15	704	0.5−	0.4−
1981 02 09	413	0.3+	0.7−	1998 05 22	704	0.5+	0.5+	1999 10 15	704	0.2+	0.4+
1981 02 13	413	1.6−	1.8−	1998 05 22	704	0.2+	0.9+	1999 10 15	704	0.1−	0.1−
1981 03 01	413	1.1−	0.6+	1998 05 22	704	0.7+	0.8+	1999 10 15	704	0.1−	0.4+
1981 03 07	413	0.7+	0.3+	1998 05 22	704	0.0	0.9+	1999 10 15	704	0.1−	0.7+
1981 03 07	413	0.8+	0.5−	1998 05 24	704	0.6−	0.3−	1999 11 14	704	0.8+	0.1+
1981 03 11	413	0.9−	0.6+	1998 05 24	704	0.2−	0.1−	1999 11 14	704	0.5−	0.1+
1981 03 11	413	1.1+	0.4−	1998 05 24	704	0.5−	0.1−	1999 11 14	704	0.8−	0.0
1981 04 30	413	(0.9+	3.0−)	1998 05 24	704	0.1−	0.8−	1999 11 14	704	0.0	0.5−
1997 02 07	327	0.3+	0.0	1998 05 24	704	0.5−	0.0	1999 11 14	704	0.3+	0.4−
1997 02 07	327	0.4+	0.4+	1999 10 13	704	0.4−	0.3+	1999 11 16	704	0.4+	0.8−
1997 02 07	327	1.0−	0.2+	1999 10 13	704	0.3+	0.0	1999 11 16	704	0.2+	0.5−
1998 05 01	566	0.0	0.3+	1999 10 13	704	0.1+	0.8+	1999 11 16	704	0.7+	0.2−
1998 05 01	566	0.4+	0.0	1999 10 13	704	0.3−	0.5+	1999 11 16	704	0.3−	0.9−
1998 05 01	566	0.0	0.1+	1999 10 13	704	0.3+	0.2+				

(12208)* 1981 EF₃₅

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

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	312.27754		(2000.0)	P	Q
<i>n</i>	0.24719292	ω	271.92245	+0.22086674	-0.97518479
<i>a</i>	2.5144637	Ω	165.29070	+0.91700224	+0.20231386
<i>e</i>	0.0775113	<i>i</i>	3.44286	+0.33215172	+0.08990957
<i>P</i>	3.99	<i>H</i>	15.5	<i>G</i> 0.15	<i>U</i> 2

Residuals in seconds of arc

1981 02 13	413	1.0-	0.0	1997 03 07	691	0.7+	0.4-	1999 11 04	704	0.5-	0.0
1981 03 02	413	2.4-	1.6+	1997 03 07	691	1.0+	1.4-	1999 11 04	704	0.5+	1.2+
1981 03 03	413	0.1-	1.5+	1997 03 07	691	0.8+	0.7-	1999 11 15	704	0.1+	0.2-
1981 03 07	413	2.0+	0.3-	1998 06 28	711	0.0	0.5+	1999 11 15	704	0.0	0.0
1981 03 11	413	1.5+	0.5+	1998 06 28	711	0.5-	0.6+	1999 11 15	704	0.4+	0.0
1981 03 11	413	0.7+	0.6+	1999 11 01	703	0.6-	0.3+	1999 11 15	704	0.8+	0.3-
1981 05 02	413	1.4-	0.0	1999 11 01	703	0.6-	0.1-	1999 11 15	704	0.0	0.3-
1981 05 03	413	0.1+	0.6+	1999 11 01	703	0.1+	0.1-	1999 11 17	704	0.1-	0.1-
1983 10 30	675	0.9+	0.3-	1999 11 01	703	0.7-	1.6-	1999 11 17	704	1.1-	0.9+
1983 11 04	675	0.5+	1.1+	1999 11 04	704	0.3-	0.7-	1999 11 17	704	0.1-	0.9+
1993 03 23	691	1.1-	0.4-	1999 11 04	704	0.2+	0.0	1999 11 17	704	0.4+	0.4+
1993 03 23	691	0.7-	0.8-	1999 11 04	704	0.2+	0.4-				

(12209)* 1981 EF₃₇ = 1990 MH

Discovered 1981 Mar. 11 by S. J. Bus at Siding Spring in the course of the U.K. Schmidt-Caltech Asteroid Survey.

Id. G. V. Williams (*MPC* 16695)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	79.03594		(2000.0)	P	Q
<i>n</i>	0.24217847	ω	297.17815	+0.48592799	+0.87395261
<i>a</i>	2.5490540	Ω	1.96511	-0.68003175	+0.38452713
<i>e</i>	0.1221956	<i>i</i>	15.19869	-0.54902714	+0.29723008
<i>P</i>	4.07	<i>H</i>	12.6	<i>G</i> 0.15	<i>U</i> 1

Residuals in seconds of arc

1954 10 06	675	2.2+	2.1-	1981 04 11	413	1.4-	0.1+	1999 10 14	704	0.1-	0.5-
1954 10 06	675	0.6+	0.9-	1981 04 11	413	0.8+	0.5+	1999 10 14	704	0.1-	0.2-
1981 02 09	413	(3.4-	1.7-)	1981 04 30	413	0.8-	0.2-	1999 10 14	704	0.3-	0.2+
1981 02 12	413	(3.1+	1.5-)	1981 05 02	413	0.1-	0.1-	1999 10 14	704	0.4-	0.4+
1981 02 13	413	0.4-	0.4-	1990 06 20	413	0.2-	0.7-	1999 10 14	704	0.4-	0.5+
1981 03 11	413	1.8-	0.4-	1990 06 20	413	1.4-	0.1-	1999 10 16	744	1.7-	1.8+
1981 03 16	413	0.1+	0.9-	1990 06 22	413	0.3+	0.2+	1999 10 16	744	0.0	0.1-
1981 03 16	413	0.8+	0.2+	1990 08 19	413	1.6+	0.1-	1999 10 19	744	0.9-	0.7+
1981 03 29	413	1.3-	0.5-	1990 08 19	413	0.5+	0.2-	1999 10 19	744	1.5-	0.7+
1981 03 29	413	0.8+	0.3+	1991 12 01	675	1.0+	1.1-	1999 11 01	704	0.4+	0.2-
1981 04 07	413	1.5-	0.5+	1991 12 01	675	0.2-	0.8+	1999 11 01	704	0.3+	0.2-
1981 04 07	413	1.1+	0.8+	1997 03 10	104	0.7+	0.8-	1999 11 01	704	0.6+	0.4-
1981 04 08	413	1.4-	0.0	1997 03 10	104	0.6+	0.9-	1999 11 01	704	0.4+	0.5-
1981 04 08	413	1.7+	0.4+	1997 03 10	104	0.8+	1.1-	1999 11 01	704	0.4+	0.2-

(12210)* 1981 EA₄₂ = 1989 VY

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

Id. S. Nakano (*MPC* 15705)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Nakano

<i>M</i>	359.17602		(2000.0)	P	Q
<i>n</i>	0.30030914	ω	218.55745	+0.84515304	-0.53432706
<i>a</i>	2.2084641	Ω	173.68976	+0.51732097	+0.81081247
<i>e</i>	0.1077106	<i>i</i>	7.59299	+0.13451896	+0.23890946
<i>P</i>	3.28	<i>H</i>	15.4	<i>G</i> 0.15	<i>U</i> 2

Residuals in seconds of arc

1981 02 12	413	1.2-	0.6+	1989 12 02	809	1.0-	0.7-	1994 03 18	691	0.5+	0.3+
1981 02 12	413	0.0	1.3+	1989 12 02	809	1.2-	0.8-	1999 10 10	704	0.2+	0.1-
1981 02 13	413	0.0	0.3+	1989 12 03	809	0.5+	1.2-	1999 10 10	704	0.3+	0.4+
1981 03 02	413	2.0+	1.6-	1989 12 03	809	0.6-	1.7-	1999 10 10	704	1.4+	1.9-

1981 03 06	413	1.0-	1.2-	1989 12 03	809	1.6-	1.4-	1999 10 10	704	0.3-	0.6+
1981 03 06	413	1.2+	1.0-	1992 09 02	809	0.4+	0.8+	1999 10 10	704	1.3+	0.5+
1981 03 11	413	1.6-	0.9+	1992 09 02	809	0.1-	0.1-	1999 10 10	704	0.0	0.3+
1981 03 11	413	1.3-	2.0-	1992 09 02	809	1.0-	0.1-	1999 10 10	704	0.3+	0.9+
1981 04 26	413	(1.7+	4.6-)	1992 09 03	809	1.0+	1.1+	1999 10 10	704	0.4-	1.0+
1981 05 01	413	0.1-	0.4+	1992 09 22	809	(0.1-	2.4-)	1999 10 20	704	1.3-	1.5+
1989 11 03	809	(3.0+	2.6+)	1992 09 22	809	0.3+	1.8-	1999 10 20	704	0.4-	0.2+
1989 11 03	809	1.5+	1.3+	1992 09 22	809	0.6-	1.7-	1999 10 20	704	0.2-	0.9+
1989 11 03	809	0.9+	1.5+	1992 09 23	809	(1.1+	2.6-)	1999 10 20	704	1.2-	0.2+
1989 11 06	809	1.2+	0.5-	1992 09 23	809	(0.6+	2.8-)	1999 11 05	704	0.7-	0.4+
1989 11 06	809	1.3+	0.7-	1992 09 23	809	(0.6-	3.8-)	1999 11 05	704	0.1-	0.9+
1989 11 06	809	0.7+	0.4-	1994 03 18	691	0.5+	0.1-	1999 11 05	704	0.1-	0.6-
1989 12 02	809	0.5-	0.6-	1994 03 18	691	0.5+	0.1+				

(12211)* 1981 KJ = 1975 HB = 1988 VO₈

Discovered 1981 May 28 by H.-E. Schuster at the European Southern

Observatory.

Id. S. Nakano (*MPC* 16425)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Nakano

<i>M</i>	66.01798		(2000.0)	P	Q
<i>n</i>	0.17764015	ω	263.66788	+0.47496220	+0.86634400
<i>a</i>	3.1340696	Ω	36.03339	-0.66725775	+0.46898309
<i>e</i>	0.1490940	<i>i</i>	15.22312	-0.57374037	+0.17176420
<i>P</i>	5.55	<i>H</i>	12.5	<i>G</i> 0.15	<i>U</i> 1

Residuals in seconds of arc

1975 04 20	805	1.1+	0.1+	1999 10 03	704	0.7+	0.1+	1999 11 03	703	0.5-	0.7+
1981 05 28	809	0.5-	0.2-	1999 10 03	704	0.5-	0.4+	1999 11 03	703	0.2-	0.6+
1981 05 28	809	0.1-	0.4-	1999 10 05	704	0.4+	0.1-	1999 11 03	703	0.5-	0.6+
1981 06 03	809	0.2-	0.0	1999 10 05	704	0.6+	0.4+	1999 11 04	704	0.0	0.3-
1981 06 04	809	0.1+	0.2+	1999 10 05	704	0.1-	0.2+	1999 11 04	704	0.1+	0.1-
1981 06 09	809	0.4-	0.4+	1999 10 05	704	0.4+	0.2-	1999 11 04	704	0.2-	0.3-
1988 11 04	327	0.6+	1.5+	1999 10 05	704	0.0	0.3-	1999 11 04	704	0.5+	0.4-
1988 11 04	327	(1.2+	2.6+)	1999 10 07	704	0.1+	0.4-	1999 11 04	704	0.1-	0.6-
1988 11 04	033	0.7+	0.7-	1999 10 07	704	0.3+	0.3+	1999 11 05	704	0.1-	0.4-
1988 11 04	033	0.6-	0.1-	1999 10 07	704	0.4+	0.9+	1999 11 05	704	0.0	0.2-
1988 11 08	399	0.9-	0.8-	1999 10 07	704	0.3+	0.9+	1999 11 05	704	0.1-	0.7-
1988 11 08	399	0.9+	0.4+	1999 10 07	704	0.5-	0.2-	1999 11 05	704	0.4-	0.4-
1988 11 08	399	1.5-	1.8-	1999 10 10	704	0.1-	0.1-	1999 11 05	704	0.5-	0.3-
1988 11 11	399	0.8+	0.5-	1999 10 10	704	0.1+	0.1-	1999 11 06	704	0.0	0.2-
1988 11 11	399	1.5+	1.6-	1999 10 10	704	0.3-	0.2-	1999 11 06	704	0.2+	0.0
1988 11 14	399	(3.3-	1.6-)	1999 10 10	704	0.2-	0.4-	1999 11 06	704	0.0	0.4-
1988 11 14	399	1.0-	0.0	1999 10 10	704	0.1+	0.2-	1999 11 06	704	0.1-	0.1-
1988 11 14	399	1.1+	0.5+	1999 10 15	704	0.6+	0.2-	1999 11 06	704	0.4-	0.2-
1993 09 14	801	0.2+	0.8-	1999 10 15	704	0.2+	0.4-	1999 11 11	703	0.5-	0.1+
1993 09 19	675	0.4-	0.2-	1999 10 15	704	0.1+	0.1-	1999 11 11	703	0.0	0.3+
1993 09 19	675	0.0	0.1-	1999 10 15	704	0.1+	0.2-	1999 11 11	703	1.2-	0.3+
1993 09 20	801	0.2-	0.5+	1999 10 20	704	0.2-	0.2+	1999 11 11	703	0.3-	0.2+
1993 09 20	801	0.5-	0.7+	1999 10 20	704	0.1+	0.0	1999 11 12	699	0.2+	0.5-
1993 09 20	675	1.4+	0.1-	1999 10 20	704	0.5+	0.5-	1999 11 12	699	0.3+	0.2-
1993 09 20	675	0.6+	0.2-	1999 10 20	704	1.1+	0.6-	1999 11 12	699	0.1+	0.4+
1993 09 23	675	1.1-	0.1-	1999 10 20	704	0.6+	0.3-	1999 11 14	704	0.1-	0.1+
1993 09 23	675	0.7+	0.5+	1999 10 29	703	0.3-	0.2+	1999 11 14	704	0.2+	0.1+
1993 10 10	675	0.1-	0.1+	1999 10 29	703	0.8-	0.2+	1999 11 14	704	0.1+	0.0
1993 10 10	675	0.1+	0.2+	1999 10 29	703	0.0	0.4+	1999 11 14	704	0.1+	0.1+
1999 10 01	703	0.4-	0.3+	1999 10 29	703	0.1-	0.1-	1999 11 14	704	0.2+	0.4+
1999 10 01	703	0.1-	0.2-	1999 11 01	739	0.3-	0.0	1999 11 16	704	0.0	0.3+
1999 10 01	703	0.7-	0.1+	1999 11 01	739	0.9-	0.1+	1999 11 16	704	0.1+	0.2+
1999 10 01	703	0.5-	0.1+	1999 11 01	739	0.4-	0.3+	1999 11 16	704	0.1+	0.2+
1999 10 03	704	0.4+	1.4+	1999 11 01	739	0.6-	0.1+	1999 11 16	704	0.3-	0.4+
1999 10 03	704	1.0+	0.8+	1999 11 03	703	0.0	0.3+	1999 11 16	704	0.1-	0.4+

1999 NOV. 23

M.P.C. 36663

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Nakano

<i>M</i>	23.75980		(2000.0)	P	Q
<i>n</i>	0.27600814	ω	323.25087	+0.63957178	+0.76858356
<i>a</i>	2.3362615	Ω	346.48733	-0.68905346	+0.56447706
<i>e</i>	0.2377210	<i>i</i>	3.69897	-0.34081266	+0.30107300
<i>P</i>	3.57	<i>H</i>	14.7	<i>G</i>	0.15

Residuals in seconds of arc

1981 08 23	809	0.1+	0.4-	1981 09 05	809	1.1-	0.4-	1999 09 30	703	0.2+	0.0
1981 08 23	809	0.4+	0.6-	1981 09 05	809	0.8-	0.2-	1999 09 30	703	0.1-	0.3+
1981 08 23	809	0.8+	0.6-	1981 09 05	809	0.8-	0.7-	1999 10 04	704	0.1-	0.0
1981 08 24	809	0.4+	0.6-	1981 09 06	809	0.3-	0.4+	1999 10 04	704	0.9-	0.7+
1981 08 24	809	0.0	0.6-	1981 09 06	809	0.4+	0.1-	1999 10 04	704	0.5-	0.1-
1981 08 24	809	0.2+	0.5-	1981 09 06	809	0.4-	0.7-	1999 10 04	704	0.8-	0.1+
1981 08 25	809	0.1-	0.2-	1981 09 07	809	1.8-	0.5-	1999 10 04	704	0.1-	0.1-
1981 08 25	809	0.1+	0.2-	1981 09 07	809	1.8-	0.2-	1999 10 07	704	0.2-	0.1-
1981 08 25	809	0.5+	0.2-	1981 09 07	809	1.0-	1.2-	1999 10 07	704	0.1-	0.1+
1981 08 26	809	0.4+	0.3-	1994 01 12	691	0.8-	0.9-	1999 10 07	704	0.3+	0.2-
1981 08 26	809	1.8+	0.6-	1994 01 12	691	0.3+	0.3-	1999 10 07	704	0.0	0.3-
1981 08 27	809	0.2+	0.0	1994 01 12	691	0.0	0.1+	1999 10 07	704	0.2+	0.0
1981 08 27	809	0.8-	0.1+	1998 02 26	566	0.1-	0.2-	1999 10 09	704	0.2+	0.1-
1981 08 27	809	0.1-	0.9+	1998 02 26	566	0.0	0.4-	1999 10 09	704	0.1-	0.1-
1981 08 27	809	0.5+	0.8+	1998 02 26	566	0.1+	0.1-	1999 10 09	704	0.3-	0.0
1981 08 27	809	0.3-	0.9+	1998 03 20	704	0.5-	1.9+	1999 10 09	704	0.0	0.2-
1981 08 27	809	0.0	0.9+	1998 03 20	704	1.2+	0.2+	1999 10 09	704	0.2+	0.1-
1981 08 28	809	0.1-	1.1-	1998 03 20	704	0.1-	0.4+	1999 10 13	704	0.7+	0.1+
1981 08 28	809	0.4+	1.3-	1998 03 20	704	0.6-	1.2-	1999 10 13	704	0.4+	0.0
1981 08 28	809	0.2+	1.0-	1998 03 20	704	1.8+	0.4-	1999 10 13	704	0.4+	0.2-
1981 09 01	809	0.9+	0.3+	1998 03 22	704	0.2-	0.2+	1999 10 13	704	0.4+	0.2-
1981 09 01	809	1.6+	0.9+	1998 03 22	704	0.3-	0.2+	1999 10 13	704	0.4+	0.2-
1981 09 01	809	1.2+	0.3+	1998 03 22	704	0.3+	0.4-	1999 10 15	704	0.1+	0.4-
1981 09 01	809	1.1-	1.1+	1998 03 22	704	0.3+	0.4+	1999 10 15	704	1.0-	0.2+
1981 09 01	809	0.8-	1.1+	1998 03 26	704	1.0+	0.1+	1999 10 15	704	0.8-	0.2+
1981 09 01	809	0.5-	1.2+	1998 03 26	704	0.1+	0.6+	1999 10 15	704	0.8-	0.6+
1981 09 01	809	0.3-	0.2+	1998 03 26	704	0.4-	0.0	1999 10 19	704	0.1+	0.1-
1981 09 01	809	0.0	0.2+	1998 03 29	704	0.2+	0.4-	1999 10 19	704	0.2+	0.2-
1981 09 01	809	0.1+	0.6+	1998 03 29	704	0.9+	1.9+	1999 10 19	704	0.0	0.1-
1981 09 02	809	0.8+	0.8+	1998 03 29	704	1.2+	1.5+	1999 10 19	704	0.2-	0.1+
1981 09 02	809	1.1+	0.5+	1998 03 29	704	0.2+	1.2+	1999 10 19	704	0.0	0.2+
1981 09 02	809	0.2-	0.4+	1998 03 29	704	1.7-	0.8+	1999 10 29	703	0.7+	0.2-
1981 09 02	809	0.6+	0.4+	1999 08 13	699	0.4-	0.7+	1999 10 29	703	0.4+	0.5+
1981 09 02	809	1.4+	0.2+	1999 08 13	699	0.2+	0.6+	1999 10 29	703	0.5-	0.5+
1981 09 02	809	0.5-	0.4+	1999 08 13	699	0.1+	0.5+	1999 10 29	703	0.4+	0.1-
1981 09 02	809	0.4-	0.2+	1999 09 05	699	0.2-	0.1-	1999 11 03	703	0.4+	0.4+
1981 09 02	809	0.6-	0.3+	1999 09 05	699	0.5-	0.4-	1999 11 03	703	0.0	0.4+
1981 09 03	809	0.3-	0.1+	1999 09 05	699	0.2+	0.1-	1999 11 03	703	0.3+	0.3+
1981 09 03	809	0.3-	0.3+	1999 09 30	703	0.3-	0.3+	1999 11 03	703	0.2+	0.2+
1981 09 03	809	0.3-	0.1+	1999 09 30	703	0.0	0.3+				

(12213)* 1981 QN₃ = 1987 SL₁₃ = 1987 SQ₃₀ = 1998 MF₄₆

Discovered 1981 Aug. 26 by H. Debehogne at the European Southern Observatory.

Id. G. V. Williams (*MPC* 32215, *MPC* 34174)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	36.76678		(2000.0)	P	Q
<i>n</i>	0.17125445	ω	203.70295	+0.95435967	+0.29779596
<i>a</i>	3.2115016	Ω	138.95022	-0.26819160	+0.88796236
<i>e</i>	0.1925038	<i>i</i>	1.98066	-0.13141871	+0.35048595
<i>P</i>	5.76	<i>H</i>	13.5	<i>G</i>	0.15

Residuals in seconds of arc

1981 08 26	809	1.3+	0.5-	1998 06 23	699	0.1-	0.8+	1999 10 21	704	0.7+	0.4+
1981 08 26	809	1.7+	0.3-	1998 06 23	699	0.3-	1.5+	1999 10 21	704	0.0	0.2-
1981 08 26	809	1.5+	0.1+	1998 06 23	699	(0.4-	2.6+)	1999 10 21	704	0.4-	0.0
1981 08 27	809	0.8-	0.5-	1998 06 26	704	0.5-	0.2+	1999 10 21	704	0.6-	0.5+

1981 08 27	809	0.7-	0.3-	1998 06 26	704	0.2+	0.4+	1999 10 21	704	0.0	0.6-
1981 08 27	809	0.7-	0.3+	1998 06 26	704	0.0	0.1+	1999 11 04	704	1.0-	0.1+
1981 08 28	809	0.2+	0.1+	1998 06 26	704	1.6-	1.3-	1999 11 04	704	0.1-	0.7-
1981 08 28	809	0.9+	0.0	1998 08 17	704	0.5+	1.7+	1999 11 04	704	0.2-	0.3-
1981 08 28	809	1.2+	0.5-	1998 08 17	704	1.5+	0.3+	1999 11 04	704	1.2+	1.0+
1981 08 31	809	0.9-	0.7+	1998 08 17	704	1.4-	1.0-	1999 11 04	704	0.1-	0.4+
1981 08 31	809	1.2-	0.3+	1998 08 17	704	0.5+	1.4-	1999 11 15	704	0.0	0.1+
1981 08 31	809	1.5-	0.1+	1998 08 17	704	0.4+	0.6+	1999 11 15	704	0.0	0.2+
1981 09 05	809	0.4+	1.0-	1999 10 10	704	1.9+	0.4+	1999 11 15	704	0.2+	0.1+
1981 09 05	809	0.6+	0.6-	1999 10 10	704	0.1+	0.2+	1999 11 15	704	0.1-	0.6+
1981 09 05	809	0.1+	0.3+	1999 10 10	704	0.6+	0.2-	1999 11 15	704	0.2-	0.5+
1987 09 24	095	1.8-	0.2+	1999 10 10	704	0.0	0.2-	1999 11 16	691	0.2-	0.2+
1987 09 26	809	0.4+	0.1-	1999 10 10	704	0.3-	0.1+	1999 11 16	691	0.2-	0.2+
1987 09 26	809	0.1-	0.2-	1999 10 15	704	0.2+	0.5+	1999 11 16	691	0.1-	0.2+
1987 09 26	809	0.6-	0.5-	1999 10 15	704	0.3+	0.3-	1999 11 17	704	0.3-	0.4-
1996 01 26	691	0.2-	0.1-	1999 10 15	704	0.0	0.2-	1999 11 17	704	0.0	0.4-
1996 01 26	691	0.2-	0.4-	1999 10 15	704	0.4+	0.3-	1999 11 17	704	1.8-	1.4+
1996 01 26	691	0.1-	0.3-	1999 10 15	704	0.2+	1.2-	1999 11 17	704	0.7+	0.8-

(12214)* 1981 RF₂

Discovered 1981 Sept. 7 by L. G. Karachkina at the Crimean Astrophysical Observatory.

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	80.50138		(2000.0)	P	Q
<i>n</i>	0.17004466	ω	32.85681	+0.29134400	+0.92647825
<i>a</i>	3.2267158	Ω	255.05360	-0.92226981	+0.20589748
<i>e</i>	0.1428699	<i>i</i>	14.27517	-0.25404149	+0.31503061
<i>P</i>	5.80	<i>H</i>	11.9	<i>G</i>	0.15

Residuals in seconds of arc

1981 09 07	095	1.2-	0.8+	1998 07 30	610	1.2+	0.6-	1998 08 31	610	0.0	0.3-
1981 09 27	095	0.7+	2.0-	1998 07 30	610	1.0+	0.7-	1998 08 31	610	0.1-	0.3-
1981 10 03	095	0.0	1.2+	1998 07 30	610	0.9+	0.7-	1998 08 31	610	0.1-	0.4-
1987 11 23	675	0.3+	0.1+	1998 07 31	750	0.4+	0.2-	1998 10 09	689	0.6-	0.0
1987 11 23	675	0.9+	0.3+	1998 07 31	750	0.2+	0.5-	1999 09 26	699	0.4-	0.2-
1996 01 31	411	0.7-	0.8-	1998 07 31	682	1.4-	1.2-	1999 09 26	699	0.0	0.3+
1996 01 31	411	0.7-	1.3-	1998 07 31	682	0.6-	0.8-	1999 09 26	699	0.5-	0.1+
1996 02 02	411	1.3-	1.5-	1998 07 31	682	0.9-	0.6-	1999 10 05	704	0.7+	0.2+
1996 02 02	411	0.4-	0.8-	1998 08 01	682	0.4+	0.7-	1999 10 05	704	1.1+	0.4-
1996 02 02	411	0.1-	1.8-	1998 08 01	682	0.1+	0.1-	1999 10 05	704	0.6+	0.6-
1997 02 12	689(10.1-	1.0+)		1998 08 01	595	0.1-	0.5-	1999 10 05	704	0.5+	0.4-
1998 05 23	699	0.3+	0.4+	1998 08 01	595	0.6-	0.2-	1999 10 05	704	0.0	0.8-
1998 05 23	699	0.5+	0.7+	1998 08 13	952	0.3+	0.8-	1999 10 12	704	0.0	0.4+
1998 05 23	699	0.0	1.0+	1998 08 13	952	0.1-	0.8-	1999 10 12	704	0.1+	0.1+
1998 06 18	699	1.2+	0.2+	1998 08 19	566	0.6-	0.4-	1999 10 12	704	0.3-	0.1-
1998 06 18	699	1.2+	0.3+	1998 08 19	566	0.4-	0.4-	1999 10 12	704	0.2+	0.0
1998 06 18	699	1.0+	0.4+	1998 08 19	566	0.7-	0.4-	1999 10 12	704	0.2+	0.3+
1998 06 30	704 (4.3+	0.1+)		1998 08 20	154	1.6-	1.1+	1999 10 13	704	0.3-	0.1+
1998 06 30	704 (2.4+	0.1-)		1998 08 20	154	1.7-	1.0+	1999 10 13	704	0.4-	0.1+
1998 06 30	704	1.6+	0.2-	1998 08 20	154	1.8-	0.9+	1999 10 13	704	0.4-	0.0
1998 06 30	704	1.7+	1.5-	1998 08 20	154	1.9-	0.9+	1999 10 13	704	0.0	0.2+
1998 06 30	704	0.0	0.4-	1998 08 23	952	0.2-	0.9-	1999 10 13	704	0.0	0.1+
1998 07 26	699	1.0+	0.7+	1998 08 24	704	1.3+	0.4-	1999 11 03	704	0.5-	0.3+
1998 07 26	699	0.6+	0.8+	1998 08 24	704	0.1-	0.0	1999 11 03	704	0.5-	0.2+
1998 07 26	699	1.2+	0.5+	1998 08 24	704	1.1-	0.9-	1999 11 03	704	0.3-	0.0
1998 07 26	560	0.5-	0.1-	1998 08 24	704	0.6+	0.3-	1999 11 03	704	0.4-	0.2+
1998 07 26	560	0.2-	0.1+	1998 08 24	952	0.8+	0.3+	1999 11 03	704	0.4-	0.1+
1998 07 26	560	0.0	0.1-	1998 08 24	952	0.9+	0.3+	1999 11 03	127	0.7+	0.7-
1998 07 26	560	0.3+	0.0	1998 08 25	154	1.0-	0.5+	1999 11 03	127	0.5+	0.6-
1998 07 29	750	0.9+	0.9-	1998 08 25	154	1.2-	0.6+	1999 11 04	127	0.2+	0.3-
1998 07 29	750	0.8+	0.3+	1998 08 25	154	1.5-	0.7+	1999 11 04	127	0.1+	0.5-
1998 07 30	610	1.2+	0.6-	1998 08 25	154	0.2-	0.6+				

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Nakano

<i>M</i>	61.82110		(2000.0)	P	Q
<i>n</i>	0.28255813	ω	288.23204	+0.99073625	-0.07864974
<i>a</i>	2.3000159	Ω	76.39267	+0.11834335	+0.89988001
<i>e</i>	0.1538320	<i>i</i>	6.54038	-0.06660724	+0.42898741
<i>P</i>	3.49	<i>H</i>	14.3	<i>G</i> 0.15	<i>U</i> 1

Residuals in seconds of arc

1981 10 24	675	0.0	0.1-	1995 11 17	691	0.2-	0.1+	1998 07 16	699	0.2+	1.3-
1981 10 25	675	0.6+	0.1-	1995 11 17	691	0.3-	0.1+	1998 07 16	699	0.1-	0.6-
1981 10 26	675	0.3-	0.0	1995 11 17	691	0.1-	0.2+	1998 07 16	699	0.2+	0.5-
1981 11 24	095	(3.9- 0.7-)		1995 12 28	691	0.1+	0.0	1998 08 03	689	0.5+	0.0
1988 11 03	033	0.2+	0.4-	1995 12 28	691	0.1-	0.1+	1999 10 22	704	0.4-	0.7-
1988 11 03	033	0.2+	0.3+	1995 12 28	691	0.2-	0.1+	1999 10 22	704	0.1+	1.2-
1988 11 05	877	(6.2- 0.3-)	Y	1996 01 12	691	0.1-	0.1+	1999 10 22	704	0.1+	0.7-
1988 11 05	877	(6.6- 2.3-)	Y	1996 01 12	691	0.1-	0.2+	1999 10 22	704	1.5+	1.3-
1988 11 05	033	0.6-	0.0	1996 01 12	691	0.3-	0.0	1999 11 16	704	0.3-	0.2-
1988 11 06	033	0.2+	0.4-	1997 04 15	691	0.4-	0.3-	1999 11 16	704	0.0	0.3-
1988 11 06	675	0.2+	0.3+	1997 04 15	691	0.3-	0.1-	1999 11 16	704	0.3-	0.0
1988 11 06	675	0.1+	0.3-	1997 04 15	691	0.3-	0.2-	1999 11 16	704	0.3-	0.4-

(12216)* 1981 WF₉ = 1988 TK₂

Discovered 1981 Nov. 16 at the Perth Observatory.

Id. H. Kaneda (*MPC* 16695)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	31.87844		(2000.0)	P	Q
<i>n</i>	0.27554638	ω	141.74102	+0.97707495	+0.20734667
<i>a</i>	2.3388709	Ω	206.41295	-0.21207453	+0.92803589
<i>e</i>	0.1356605	<i>i</i>	6.23209	-0.01868002	+0.30944587
<i>P</i>	3.58	<i>H</i>	14.7	<i>G</i> 0.15	<i>U</i> 1

Residuals in seconds of arc

1981 11 16	323	0.3+	0.4+	1998 05 24	704	1.2-	0.2+	1999 10 10	704	0.0	1.1+
1981 11 17	323	1.1+	1.2+	1998 05 24	704	1.5-	0.4-	1999 10 10	704	0.2+	0.2-
1981 11 23	323	1.4-	0.5-	1998 06 03	704	0.3+	0.2-	1999 10 15	704	0.2-	0.1-
1988 10 04	046	(0.5- 3.1-)		1998 06 03	704	1.8+	0.8+	1999 10 15	704	0.1+	1.0+
1988 10 04	046	1.3+	2.1+	1998 06 03	704	0.4-	0.4+	1999 10 15	704	0.1-	0.5+
1988 10 07	675	0.7-	0.0	1998 06 03	704	1.5+	0.9-	1999 10 15	704	0.4-	0.4-
1988 10 07	675	0.3-	0.4-	1998 06 03	704	0.8+	0.4-	1999 10 21	704	0.8-	0.1+
1988 10 11	046	0.1-	0.8+	1998 06 18	704	0.5-	1.9+	1999 10 21	704	0.0	0.4+
1988 10 11	046	(0.7+ 3.2+)		1998 06 18	704	0.1-	0.1+	1999 10 21	704	0.7+	0.3-
1998 05 22	704	0.6+	0.0	1998 06 18	704	0.2+	0.4+	1999 10 21	704	1.0+	0.6-
1998 05 22	704	0.4-	0.4+	1998 06 18	704	0.4-	0.6-	1999 10 21	704	0.0	0.2-
1998 05 22	704	0.3-	1.0+	1998 06 22	691	0.7+	0.3+	1999 10 30	703	0.0	0.1-
1998 05 22	704	0.6-	0.3-	1998 06 22	691	0.6+	0.3-	1999 10 30	703	0.0	0.2+
1998 05 22	704	1.0-	0.5-	1998 06 22	691	0.7+	0.2+	1999 10 30	703	0.8+	0.9+
1998 05 22	699	0.1-	0.6+	1998 06 29	691	0.0	0.0	1999 10 30	703	0.2-	0.2+
1998 05 22	699	0.2+	0.6-	1998 06 29	691	0.4-	0.6+	1999 11 17	704	0.5-	0.4+
1998 05 22	699	1.0+	0.7+	1998 06 29	691	0.1-	0.2+	1999 11 17	704	0.1+	0.3+
1998 05 24	704	0.0	0.5+	1999 10 10	704	0.2-	0.9+	1999 11 17	704	0.0	0.4+
1998 05 24	704	0.7+	0.0	1999 10 10	704	0.6-	0.3+	1999 11 17	704	0.2-	0.1+
1998 05 24	704	1.4-	1.2+	1999 10 10	704	0.7+	0.7+	1999 11 17	704	0.4-	0.1+

(12217)* 1982 JD₂ = 1998 KM₂₃

Discovered 1982 May 15 at Palomar.

Id. G. V. Williams (*MPC* 31947)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	163.76502		(2000.0)	P	Q
<i>n</i>	0.30735716	ω	94.54649	-0.92717358	+0.36839788
<i>a</i>	2.1745722	Ω	107.08220	-0.36572607	-0.85069316
<i>e</i>	0.0682986	<i>i</i>	4.08298	-0.08120098	-0.37497221
<i>P</i>	3.21	<i>H</i>	15.0	<i>G</i> 0.15	<i>U</i> 2

Residuals in seconds of arc

1982 05 15	675	0.2+	1.2-	1998 05 23	566	0.2+	0.0	1999 10 14	327	0.9-	0.5-
1982 05 16	675	0.2+	1.6-	1998 05 23	566	0.2+	0.4+	1999 10 14	327	0.7-	0.6-
1982 05 16	675	1.9-	1.1-	1998 05 24	704	0.8+	0.2+	1999 10 14	327	0.6-	0.6-
1982 05 17	675	0.3-	0.7-	1998 05 24	704	0.6-	0.6+	1999 10 15	327	0.1+	0.2-
1982 05 18	675	0.2+	0.6-	1998 05 24	704	0.5-	0.0	1999 10 15	327	1.2-	0.5-
1994 04 05	691	0.2-	0.3+	1998 05 24	704	0.4-	1.5+	1999 10 15	327	0.3-	0.6+
1994 04 05	691	0.0	0.1-	1998 05 24	704	0.4+	1.2+	1999 10 15	327	0.1-	0.1+
1994 04 05	691	0.4+	0.2+	1998 06 27	699	1.2+	0.8+	1999 10 15	327	0.1-	0.1-
1998 04 22	704	0.2-	1.1-	1998 06 27	699	1.0+	0.2-	1999 10 15	327	0.4-	0.5-
1998 04 22	704	0.4-	0.2-	1998 06 27	699	0.5-	0.0	1999 10 18	327	0.1+	0.1+
1998 04 22	704	0.4-	0.1-	1999 09 15	691	0.1+	0.2+	1999 10 18	327	0.1+	0.0
1998 04 22	704	0.2-	0.3+	1999 09 15	691	0.1-	0.0	1999 10 18	327	0.1+	0.1+
1998 04 22	704	0.5+	1.1+	1999 09 15	691	1.0+	0.1+	1999 10 18	327	0.3-	0.0
1998 04 23	691	0.3+	0.3+	1999 10 04	703	0.9-	0.2+	1999 10 18	327	0.1+	1.0+
1998 04 23	691	0.6+	0.4+	1999 10 04	703	0.1+	0.4+	1999 10 18	327	0.1-	0.4+
1998 04 23	691	0.1+	0.3+	1999 10 04	703	0.1-	0.2-	1999 11 02	703	0.2-	0.5+
1998 05 01	704	0.3+	0.1+	1999 10 04	703	0.2-	0.4-	1999 11 02	703	0.3-	0.9+
1998 05 01	704	0.5+	0.6-	1999 10 07	704	0.1-	0.0	1999 11 02	703	0.5-	0.2+
1998 05 01	704	0.3+	0.6-	1999 10 07	704	0.4+	0.3+	1999 11 02	703	1.3+	1.3+
1998 05 01	704	0.6+	0.0	1999 10 07	704	0.7+	0.3+	1999 11 06	704	0.1+	0.1+
1998 05 01	704	(5.2- 0.4-)		1999 10 07	704	0.4-	0.1-	1999 11 06	704	0.4+	0.2+
1998 05 01	699	0.1+	0.2-	1999 10 07	704	0.4+	1.3-	1999 11 06	704	0.5+	0.3+
1998 05 01	699	0.9-	0.1-	1999 10 09	704	0.6+	0.2-	1999 11 06	704	0.5+	0.0
1998 05 01	699	0.8+	0.2-	1999 10 09	704	0.6+	0.1-	1999 11 06	704	1.4+	0.5+
1998 05 22	704	0.5-	0.8+	1999 10 09	704	0.0	0.0	1999 11 17	704	0.9+	0.2-
1998 05 22	704	0.4-	0.2+	1999 10 09	704	0.6+	0.5+	1999 11 17	704	0.4+	0.9+
1998 05 22	704	0.3-	0.3+	1999 10 09	704	0.1+	0.3-	1999 11 17	704	0.4-	0.4-
1998 05 22	704	0.3+	1.0+	1999 10 10	327	0.2-	0.2-	1999 11 17	704	0.3-	0.0
1998 05 22	704	0.2-	0.0	1999 10 10	327	0.4-	0.3-	1999 11 17	704	1.6-	1.4-
1998 05 23	566	0.3-	0.1-	1999 10 10	327	0.4-	0.4-				

(12218)* 1982 RK = 1992 TK₁

Discovered 1982 Sept. 15 by E. Bowell at the Anderson Mesa Station of the

Lowell Observatory.

Id. S. Nakano (*MPC* 21103)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Nakano

<i>M</i>	12.69280		(2000.0)	P	Q
<i>n</i>	0.29951942	ω	290.03132	+0.78052863	-0.61991911
<i>a</i>	2.2123444	Ω	108.36444	+0.60054709	+0.70787093
<i>e</i>	0.1410523	<i>i</i>	4.86381	+0.17354611	+0.33855433
<i>P</i>	3.29	<i>H</i>	13.3	<i>G</i> 0.15	<i>U</i> 2

Residuals in seconds of arc

1982 09 15	688	0.3+	0.2-	1992 11 26	675	0.8+	1.2-	1998 06 26	704	0.1-	0.7-
1982 09 15	688	0.1+	0.7+	1992 11 28	675	1.0+	0.9-	1998 06 26	704	(0.0	2.4+)
1982 09 22	688	(3.7-	2.2-)	1992 11 28	675	0.1+	1.6-	1999 10 10	704	0.2-	0.1-
1982 09 22	688	0.7-	0.4-	1994 03 05	596	(1.5-	4.5-)	1999 10 10	704	0.4-	0.3+
1982 10 09	688	1.6+	1.6-	1994 03 05	596	(0.3-	2.7-)	1999 10 10	704	0.0	0.4+
1982 10 09	688	(0.9-	2.4-)	1994 03 05	596	0.3+	0.2-	1999 10 10	704	0.0	0.7+
1982 10 17	688	0.8-	1.8-	1994 03 14	675	0.4-	1.3-	1999 10 10	704	0.4-	1.0+
1982 10 17	688	0.7+	1.3-	1994 03 14	675	1.0-	1.6-	1999 10 21	704	0.2+	0.4-
1992 09 30	675	0.5+	0.4-	1994 03 31	400	0.2-	0.4-	1999 10 21	704	0.1-	0.3-
1992 09 30	675	0.4+	0.0	1994 03 31	400	0.5-	0.6-	1999 10 21	704	0.1-	0.3-
1992 10 01	675	(2.7-	1.5-)	1994 04 03	675	0.8-	0.1+	1999 10 21	704	0.1+	0.5-
1992 10 01	675	1.1+	0.6-	1994 04 03	675	0.4-	1.4-	1999 10 21	704	0.1-	0.2-
1992 10 01	400	0.1+	0.4+	1994 04 08	801	0.4-	2.1-	1999 11 12	703	0.0	0.2+
1992 10 01	400	1.2-	0.8+	1994 04 08	801	0.4-	1.0-	1999 11 12	703	0.4+	0.3+
1992 10 03	675	0.9+	0.2-	1994 04 15	801	0.7-	0.7-	1999 11 12	703	0.1+	0.4+
1992 10 03	675	0.2+	0.2-	1994 04 15	801	0.0	0.2-	1999 11 12	703	0.2+	0.7+
1992 10 19	400	0.8-	0.5+	1997 02 26	689	(3.0+	2.5-)	1999 11 17	704	0.4-	0.3+
1992 10 19	400	0.2-	0.2+	1997 04 08	689	0.0	0.1-	1999 11 17	704	0.3-	0.0
1992 10 26	400	0.5-	0.4-	1997 04 09	689	0.8+	1.0-	1999 11 17	704	0.2+	0.2+
1992 10 26	400	0.2-	1.3-	1998 06 26	704	0.2-	1.0+	1999 11 17	704	0.3-	0.0
1992 11 26	675	0.7+	0.9-	1998 06 26	704	0.7+	0.2-	1999 11 17	704	0.0	0.0

1999 NOV. 23

M.P.C. 36665

(12219)* 1982 SC₈ = 1992 SH₂₅

Discovered 1982 Sept. 19 by L. I. Chernykh at the Crimean Astrophysical Observatory.

Id. T. Kobayashi (*MPC* 23970)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	62.51666	(2000.0)	P		Q	
<i>n</i>	0.29538925	ω	323.61820	+0.60616727	+0.79517213	
<i>a</i>	2.2329188	Ω	343.67472	−0.71543254	+0.53625514	
<i>e</i>	0.1752661	<i>i</i>	3.30448	−0.34744426	+0.28307546	
<i>P</i>	3.34	<i>H</i>	14.2	<i>G</i>	0.15	<i>U</i> 1

Residuals in seconds of arc

1982 09 19	095	(3.4− 1.7+)	1998 05 16	704	0.4−	1.3+	1999 10 15	704	0.2−	0.1−
1982 09 24	095	0.7+ 0.6−	1998 05 16	704	1.1+ 1.2−	1999 10 15	704	0.7+ 0.9−		
1982 09 27	095	1.5− 2.2+	1998 05 16	704	0.1− 0.1−	1999 10 15	704	0.2+ 0.2−		
1992 09 30	675	0.6+ 0.4−	1999 10 12	704	1.1+ 0.3−	1999 10 15	704	1.4− 0.0		
1992 09 30	675	0.5− 0.3−	1999 10 12	704	0.2+ 0.7+	1999 11 03	704	0.0 0.3−		
1992 10 03	675	0.1+ 0.7+	1999 10 12	704	0.3+ 1.3+	1999 11 03	704	0.2− 0.3−		
1992 10 03	675	0.2− 0.6−	1999 10 12	704	0.2+ 0.6+	1999 11 03	704	0.3− 0.2−		
1998 04 01	704	0.2− 0.3+	1999 10 12	704	0.3− 1.3+	1999 11 03	704	0.1− 0.4+		
1998 04 01	704	0.7+ 0.4−	1999 10 13	704	0.9+ 0.6−	1999 11 03	704	0.1− 0.2+		
1998 04 01	704	0.0 1.5+	1999 10 13	704	0.0 0.1−	1999 11 16	704	0.7+ 0.2−		
1998 04 01	704	0.2+ 0.1+	1999 10 13	704	0.1+ 0.2+	1999 11 16	704	1.1− 0.5+		
1998 04 01	704	0.2− 0.0	1999 10 13	704	0.2+ 0.6+	1999 11 16	704	0.2− 0.4−		
1998 04 22	704	0.2+ 0.1+	1999 10 13	704	0.6− 0.8+	1999 11 16	704	0.1− 0.6−		
1998 04 22	704	0.4− 0.4+	1999 10 13	704	0.9+ 0.4−	1999 11 16	704	0.1+ 0.4−		
1998 04 22	704	0.0 0.5+	1999 10 13	704	0.5+ 0.2+	1999 11 17	699	0.1− 0.3−		
1998 04 22	704	1.3+ 0.3+	1999 10 13	704	0.6+ 0.1−	1999 11 17	699	0.6− 0.0		
1998 04 22	704	0.1+ 0.5+	1999 10 13	704	1.0+ 1.3+	1999 11 17	699	0.9− 0.2−		
1998 05 16	704	0.3− 0.4+	1999 10 13	704	1.4− 0.6+					

(12220)* 1982 UD₆ = 1992 SQ₁₅

Discovered 1982 Oct. 20 by L. G. Karachkina at the Crimean Astrophysical Observatory.

Id. S. Nakano (*MPC* 28839)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	353.55475	(2000.0)	P		Q	
<i>n</i>	0.29164394	ω	84.02791	+0.83355619	−0.55075505	
<i>a</i>	2.2519950	Ω	309.38235	+0.48226206	+0.76346859	
<i>e</i>	0.1487199	<i>i</i>	3.19256	+0.26945758	+0.33731970	
<i>P</i>	3.38	<i>H</i>	14.3	<i>G</i>	0.15	<i>U</i> 2

Residuals in seconds of arc

1982 10 20	095	(1.6+ 2.5+)	1997 01 10	411	0.3−	1.1−	1999 10 13	704	0.6+ 0.5−
1982 10 22	095	0.2− 0.1−	1997 04 01	704	0.7+ 0.1+		1999 10 13	704	0.5+ 0.4−
1982 10 25	095	0.0 0.9+	1997 04 01	704	(4.3+ 0.7+)		1999 10 13	704	0.8+ 0.0
1982 11 09	095	(2.8+ 3.6+)	1999 10 05	704	0.7− 0.0		1999 11 16	704	0.4+ 0.3+
1982 11 14	095	(3.0+ 4.0+)	1999 10 05	704	0.9− 0.1−		1999 11 16	704	0.5+ 0.2+
1992 09 25	046	(3.7− 75.1−)	1999 10 05	704	0.3− 0.9−		1999 11 16	704	0.0 0.5+
1992 09 25	046	(0.3− 81.2−)	1999 10 05	704	1.3− 1.4−		1999 11 16	704	0.0 0.5+
1992 09 26	046	(3.3− 3.2+)	1999 10 13	704	0.7− 0.5−		1999 11 16	704	0.2− 0.8+
1992 09 26	046	1.1+ 1.3+	1999 10 13	704	0.4− 0.8−		1999 11 17	704	0.4− 0.5+
1992 10 04	675	0.7− 0.7−	1999 10 13	704	0.3− 0.9−		1999 11 17	704	0.2+ 0.0
1992 10 04	675	0.5− 0.5−	1999 10 13	704	0.1+ 0.5−		1999 11 17	704	0.2+ 0.6+
1997 01 09	411	0.5− 0.9+	1999 10 13	704	0.8+ 0.2+		1999 11 17	704	0.2+ 0.8+
1997 01 09	411	0.4− 0.3−	1999 10 13	704	(0.9− 2.4−)		1999 11 17	704	0.2+ 0.9+
1997 01 10	411	0.0 0.6−	1999 10 13	704	0.1+ 1.2−				

(12221)* 1982 VS₂ = 1986 US₁ = 1998 MD₃₀

Discovered 1982 Nov. 14 by H. Kosai and K. Hurukawa at the Kiso Station of the Tokyo Astronomical Observatory.

Id. G. V. Williams (*MPC* 32216, unpublished)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	63.18544	(2000.0)	P		Q	
<i>n</i>	0.23249551	ω	214.92943	+0.78388301	+0.62002467	
<i>a</i>	2.6193468	Ω	106.71833	−0.56150695	+0.73064743	
<i>e</i>	0.0850686	<i>i</i>	1.98170	−0.26502334	+0.28587366	
<i>P</i>	4.24	<i>H</i>	13.7	<i>G</i>	0.15	<i>U</i> 2

Residuals in seconds of arc

1982 11 14	381	3.0+	0.2−	1999 10 21	704	0.4+	0.6−	1999 11 13	704	0.0	0.2−
1982 11 14	381	2.0+	1.2−	1999 10 21	704	0.2−	0.1−	1999 11 13	704	0.4+	0.8−
1982 12 13	381	2.4+	0.5+	1999 10 21	704	0.1+	0.1+	1999 11 13	704	0.2+	0.4−
1982 12 13	381	2.3+	0.8+	1999 10 21	704	0.4+	0.2−	1999 11 13	704	0.0	0.3−
1982 12 14	381	1.5+	0.6+	1999 10 30	703	0.2+	0.0	1999 11 13	704	0.2+	0.4−
1982 12 14	381	2.4+	1.3+	1999 10 30	703	0.0	0.3+	1999 11 13	704	0.5+	0.4−
1986 10 27	010	(16.8−	1.3+)	1999 10 30	703	0.1+	0.1−	1999 11 13	704	0.0	0.3−
1986 10 27	010	0.0	2.9+	1999 10 30	703	0.0	0.5+	1999 11 13	704	0.8+	0.5−
1993 01 22	691	0.9−	1.2+	1999 11 04	704	0.0	0.2−	1999 11 13	704	0.2+	0.2+
1993 01 22	691	1.0−	0.9+	1999 11 04	704	0.1−	0.3+	1999 11 13	120	0.2−	0.1−
1993 01 22	691	1.6−	1.2+	1999 11 04	704	0.3+	0.6−	1999 11 13	120	0.4−	1.0−
1993 04 18	413	1.5−	1.4−	1999 11 04	704	0.7+	1.3−	1999 11 14	704	0.0	0.1−
1998 06 24	704	0.6−	1.0−	1999 11 04	704	0.5−	0.1−	1999 11 14	704	0.0	0.1−
1998 06 24	704	0.4+	1.2−	1999 11 07	120	0.7+	0.3+	1999 11 14	704	0.1+	0.2+
1998 06 24	704	0.1+	0.3+	1999 11 08	120	0.4+	0.4−	1999 11 14	704	0.1−	0.0
1998 06 26	704	0.7+	1.3−	1999 11 12	699	0.2−	1.1+	1999 11 14	704	0.0	0.1+
1998 06 26	704	1.5+	1.7−	1999 11 12	699	0.2−	1.2+	1999 11 15	704	0.5+	0.2−
1998 06 26	704	1.4+	1.6−	1999 11 12	699	0.2+	0.8+	1999 11 15	704	0.1+	0.2−
1998 06 26	704	0.8+	2.1−	1999 11 12	120	0.4+	0.1−	1999 11 15	704	0.2+	0.2−
1998 07 21	704	1.1+	0.1−	1999 11 12	120	0.0	0.4−	1999 11 15	704	0.2+	0.7−
1998 07 21	704	0.6+	2.7+	1999 11 13	704	0.1+	0.5−	1999 11 15	704	0.2−	0.6−
1998 07 21	704	1.3−	0.7+	1999 11 13	704	0.1−	0.4−	1999 11 17	704	0.2−	0.2−
1998 07 21	704	0.9+	0.7−	1999 11 13	704	0.4+	0.1−	1999 11 17	704	0.0	0.4+
1999 10 15	704	0.3−	0.1−	1999 11 13	704	0.2−	0.3−	1999 11 17	704	0.1−	0.1−
1999 10 15	704	0.3+	0.7+	1999 11 13	704	2.4−	1.7−	1999 11 17	704	0.1+	0.1−
1999 10 15	704	0.3+	0.6−	1999 11 13	704	0.2+	0.8−	1999 11 17	704	0.4−	0.3−
1999 10 15	704	0.1+	0.3−	1999 11 13	704	0.4−	0.5−				
1999 10 21	704	0.6+	0.3−	1999 11 13	704	0.4+	1.1−				

(12222)* 1982 WA

Discovered 1982 Nov. 19 at the Osservatorio S. Vittore, Bologna.

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	312.98723	(2000.0)	P		Q	
<i>n</i>	0.23230024	ω	209.51044	−0.22933109	−0.95663027	
<i>a</i>	2.6208145	Ω	254.23812	+0.92560792	−0.15725034	
<i>e</i>	0.1821579	<i>i</i>	10.75705	+0.30109337	−0.24521596	
<i>P</i>	4.24	<i>H</i>	13.6	<i>G</i>	0.15	<i>U</i> 2

Residuals in seconds of arc

1982 11 19	552	0.3+ 0.5+	1998 07 17	552	1.0− 0.3−	1999 10 13	704	1.0− 0.1−
1982 11 19	552	0.2− 0.9−	1998 08 14	552	0.9− 0.3+	1999 10 13	704	1.0− 0.2−
1982 11 20	552	0.2− 1.5+	1998 08 14	552	1.5+ 0.8−	1999 10 13	704	0.6− 0.6−
1982 11 20	552	0.1− 1.3+	1998 08 14	552	0.2+ 0.0	1999 10 13	704	0.8− 0.7−
1982 11 21	552	1.0− 1.1+	1998 08 15	552	0.6+ 0.4+	1999 10 15	704	0.4− 0.1−
1982 11 21	552	1.4− 1.0+	1998 08 15	552	0.4+ 0.6+	1999 10 15	704	0.4+ 0.0
1982 12 05	552	1.6+ 1.0−	1998 08 15	552	0.1− 0.9+	1999 10 15	704	0.1+ 0.2+
1982 12 05	552	0.7− 0.7+	1998 08 24	704	1.5+ 1.7+	1999 10 15	704	0.1+ 0.5−
1982 12 09	552	0.5− 0.3−	1998 08 24	704	0.1+ 0.6+	1999 10 15	704	0.5+ 1.0−
1982 12 09	552	0.4− 0.5+	1998 08 24	704	(3.3+ 0.7+)	1999 11 03	704	0.3+ 0.5+
1982 12 14	552	2.1+ 1.9+	1998 08 24	704	1.8+ 0.1+	1999 11 03	704	0.2− 0.4−
1982 12 14	552	0.3+ 2.0+	1998 08 24	704	0.3+ 0.3−	1999 11 03	704	0.2+ 0.7−
1982 12 16	552	(0.3+ 2.8+)	1998 08 27	704	1.0− 1.2−	1999 11 03	704	0.5+ 0.9−
1982 12 16	552	(2.9+ 4.9+)	1998 08 27	704	1.0− 1.6−	1999 11 14	704	0.0 0.3−
1983 01 09	552	(1.1− 2.8−)	1998 08 27	704	0.8+ 0.8−	1999 11 14	704	0.3+ 0.7−
1983 01 09	552	(1.3− 2.8−)	1998 08 27	704	0.3− 0.3−	1999 11 14	704	0.5− 0.4−
1983 02 14	801	(3.8+ 1.9−)	1998 09 18	552	1.4− 0.3+	1999 11 14	704	0.3− 0.6−
1997 05 30	552	0.6− 0.1+	1998 09 18	552	0.7− 0.2−	1999 11 14	704	0.2− 0.7−
1997 05 30	552	0.8+ 0.3+	1999 10 05	704	0.2+ 0.0	1999 11 16	704	0.4+ 0.0

1997 06 06	552	0.1−	1.1−	1999 10 05	704	0.0	0.1+	1999 11 16	704	0.1−	0.4−
1997 06 06	552	(3.1+	0.7−)	1999 10 05	704	0.6−	0.6−	1999 11 16	704	0.1+	0.4−
1998 07 17	552	0.1−	0.1−	1999 10 05	704	0.2−	0.0	1999 11 16	704	0.3+	0.3−
1998 07 17	552	1.4−	1.3+	1999 10 05	704	0.6+	0.2+	1999 11 16	704	0.2+	0.5−

(12223)* 1983 TX = 1983 VQ = 1994 WQ₂

Discovered 1983 Oct. 8 at the Oak Ridge Observatory.

Id. T. Kobayashi (*MPC* 24558), S. Nakano (d, *ibid.*)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Nakano

<i>M</i>	325.23669		(2000.0)	P	Q
<i>n</i>	0.18619644	ω	227.17976	+0.50943403	−0.85965778
<i>a</i>	3.0373055	Ω	192.36246	+0.83244783	+0.50360139
<i>e</i>	0.1169063	<i>i</i>	10.30021	+0.21796234	+0.08587285
<i>P</i>	5.29	<i>H</i>	13.1	<i>G</i> 0.15	<i>U</i> 1

Residuals in seconds of arc

1983 10 08	801	0.1+	1.9+	1999 10 09	704	0.3−	0.3+	1999 10 29	703	0.1−	0.1−
1983 10 09	801	0.3−	0.9+	1999 10 09	704	0.3−	0.0	1999 11 03	703	0.1−	0.2−
1983 10 10	801	0.9−	0.0	1999 10 09	704	0.2−	0.2−	1999 11 03	703	0.3−	0.2−
1983 11 09	801	0.8+	0.7−	1999 10 09	704	0.6−	0.0	1999 11 03	703	0.2−	0.4−
1991 04 17	675	0.1+	0.3+	1999 10 09	704	0.5−	0.0	1999 11 03	703	0.1−	0.4−
1994 11 28	399	1.9+	0.4−	1999 10 15	704	0.2+	0.0	1999 11 05	704	(1.6+	4.1−)
1994 11 28	399	1.3+	0.2−	1999 10 15	704	0.1+	0.1−	1999 11 05	704	0.1+	0.9−
1994 11 29	399	0.2+	1.8+	1999 10 15	704	0.4+	0.4−	1999 11 05	704	0.5+	0.5−
1994 11 29	399	0.9−	2.0+	1999 10 15	704	0.8+	0.3−	1999 11 14	699	0.3−	0.4+
1994 12 09	399	0.1−	0.4−	1999 10 19	704	0.6+	0.2+	1999 11 14	699	0.0	0.2−
1994 12 09	399	0.9−	0.0	1999 10 19	704	0.3+	0.3+	1999 11 17	704	0.6+	0.1−
1994 12 22	399	1.0−	0.1+	1999 10 19	704	0.0	0.1+	1999 11 17	704	0.5+	0.6−
1994 12 22	399	0.8−	1.1−	1999 10 19	704	0.3+	0.1−	1999 11 17	704	0.6+	0.3−
1999 10 07	704	0.5+	0.5+	1999 10 19	704	0.4+	0.1−	1999 11 17	704	0.2+	0.3−
1999 10 07	704	0.5−	0.4−	1999 10 29	703	(4.5−	0.6−)	1999 11 17	704	0.5+	0.6−
1999 10 07	704	0.0	0.3−	1999 10 29	703	1.2−	1.5+				
1999 10 07	704	1.4−	0.1+	1999 10 29	703	0.0	0.0				

(12224)* 1984 UN₂ = 1995 YG₄

Discovered 1984 Oct. 19 at the Oak Ridge Observatory.

Id. G. V. Williams (*MPC* 26559)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	27.51398		(2000.0)	P	Q
<i>n</i>	0.19807246	ω	140.62030	+0.92402794	+0.38223808
<i>a</i>	2.9146516	Ω	196.91279	−0.35746754	+0.85619325
<i>e</i>	0.0532833	<i>i</i>	1.60543	−0.13560728	+0.34760203
<i>P</i>	4.98	<i>H</i>	13.4	<i>G</i> 0.15	<i>U</i> 1

Residuals in seconds of arc

1984 09 27	033	0.4−	0.6−	1997 03 10	809	0.3+	0.8−	1999 10 15	704	0.1−	0.2+
1984 09 27	033	1.4−	0.2−	1997 03 11	809	0.9+	0.6+	1999 10 15	704	0.2−	1.3+
1984 10 03	801	1.9+	0.5−	1997 03 11	809	0.0	0.5+	1999 10 15	704	(1.0+	3.6+)
1984 10 19	801	0.4+	1.1+	1997 03 11	809	0.3+	0.4−	1999 10 15	704	0.9+	1.5+
1984 10 21	801	0.6−	0.6+	1999 10 02	703	0.5−	0.5+	1999 10 19	704	0.3+	0.4+
1995 12 28	595	0.6−	0.1−	1999 10 02	703	0.4−	0.3+	1999 10 19	704	0.6−	0.2+
1995 12 28	595	0.0	0.8−	1999 10 02	703	0.6−	0.2+	1999 10 19	704	0.1−	0.2+
1995 12 31	691	0.3+	0.0	1999 10 02	703	0.5−	0.0	1999 10 19	704	0.0	0.2+
1995 12 31	691	0.1+	0.1−	1999 10 04	704	1.0+	0.5−	1999 10 19	704	0.1+	0.2+
1995 12 31	691	0.2+	0.1−	1999 10 04	704	0.8+	0.4−	1999 11 05	704	0.2−	0.8+
1996 01 03	595	0.4+	0.6−	1999 10 04	704	0.0	0.9−	1999 11 05	704	0.6−	0.7+
1996 01 03	595	0.9+	0.1+	1999 10 04	704	0.5+	0.0	1999 11 05	704	0.5−	0.9+
1996 01 13	595	0.1−	0.2−	1999 10 04	704	0.4+	0.1+	1999 11 05	704	0.5−	0.4+
1996 01 13	595	0.8+	0.1−	1999 10 05	704	0.6+	0.3−	1999 11 05	704	0.6+	0.8+
1996 01 13	595	0.4−	0.4−	1999 10 05	704	0.5+	0.1−	1999 11 08	120	0.5−	0.2+
1996 01 14	327	0.1−	0.2−	1999 10 05	704	0.2+	0.0	1999 11 08	120	0.9+	0.6+
1996 01 14	327	0.2−	0.2+	1999 10 05	704	0.0	0.1−	1999 11 09	704	0.0	0.4+
1996 01 14	327	0.1−	0.5+	1999 10 05	704	0.3+	0.3−	1999 11 09	704	0.5−	0.5+
1996 01 15	595	0.3+	1.0+	1999 10 07	704	0.6+	0.1+	1999 11 09	704	0.2+	0.6+
1996 01 15	595	0.2−	0.9+	1999 10 07	704	0.0	0.4+	1999 11 09	704	0.5−	0.3+

1996 01 30	595	0.2−	1.1−	1999 10 07	704	0.0	0.3+	1999 11 12	704	0.3+	0.5+
1996 01 30	595	0.8−	1.0−	1999 10 07	704	0.2−	0.1+	1999 11 12	704	0.1+	0.3+
1996 01 31	595	0.9−	1.0+	1999 10 07	704	0.2−	0.0	1999 11 12	704	0.1+	0.2−
1996 01 31	595	0.1+	1.0−	1999 10 09	704	0.2−	0.8−	1999 11 12	704	0.4+	0.2+
1997 03 08	809	0.0	1.5+	1999 10 09	704	0.2+	0.7−	1999 11 12	704	0.6−	0.7+
1997 03 08	809	0.1+	1.0+	1999 10 09	704	0.4−	0.7−	1999 11 16	704	0.4+	1.1+
1997 03 08	809	1.7−	0.8+	1999 10 09	704	0.1−	0.9−	1999 11 16	704	0.2+	0.2−
1997 03 09	809	(0.7+	2.2+)	1999 10 09	704	1.0−	1.1−	1999 11 16	704	0.4+	0.2+
1997 03 09	809	0.1+	1.2+	1999 10 11	106	0.4+	0.2−	1999 11 16	704	0.7+	2.4−
1997 03 09	809	0.4+	1.6+	1999 10 11	106	1.1−	0.1−	1999 11 16	704	1.6−	1.1−
1997 03 10	809	0.7+	0.7−	1999 10 11	106	0.9−	0.0				
1997 03 10	809	0.9+	0.1−	1999 10 15	704	0.1−	0.1+				

(12225)* 1985 PQ = 1978 JM₁ = 1991 ED₁

Discovered 1985 Aug. 14 by E. Bowell at the Anderson Mesa Station of the Lowell Observatory.

Id. R. Nagata (*MPC* 18426)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	129.75091		(2000.0)	P	Q
<i>n</i>	0.29930211	ω	115.90388	−0.00215147	+0.99933030
<i>a</i>	2.2134151	Ω	153.89457	−0.94462192	+0.00995602
<i>e</i>	0.1941359	<i>i</i>	4.76187	−0.32815362	−0.03521126
<i>P</i>	3.29	<i>H</i>	14.2	<i>G</i> 0.15	<i>U</i> 2

Residuals in seconds of arc

1978 05 06	095	(2.8−	2.4−)	1998 06 24	704	0.5−	1.5−	1998 07 19	952	1.1−	0.4−
1985 08 14	688	1.1−	0.4−	1998 06 24	704	0.4+	1.8+	1998 07 19	952	0.3−	0.1+
1985 08 14	688	(4.4+	0.7+)	1998 06 24	704	1.0+	0.4+	1999 10 10	704	0.6+	0.8+
1985 08 20	688	0.5+	0.6−	1998 06 26	704	0.3+	0.2−	1999 10 10	704	0.0	0.6−
1985 08 20	688	0.0	1.2+	1998 06 26	704	0.4+	0.9+	1999 10 10	704	0.3−	0.8+
1985 08 22	688	1.0+	0.0	1998 06 26	704	1.4−	0.4+	1999 10 10	704	0.3−	0.5+
1985 08 22	688	(3.5+	2.9−)	1998 06 26	704	0.7+	1.3+	1999 11 04	704	0.4+	0.7+
1991 03 15	400	(1.2+	2.6+)	1998 06 26	704	(0.2+	3.0+)	1999 11 04	704	0.5−	0.5+
1991 03 15	400	1.0+	1.2+	1998 07 14	104	0.3+	0.4−	1999 11 04	704	0.7+	0.2−
1991 03 21	400	(0.8−	3.9+)	1998 07 14	104	0.3+	0.2−	1999 11 04	704	0.3+	0.4−
1991 03 21	400	(1.1−	3.4+)	1998 07 14	104	0.4+	0.2−	1999 11 17	704	1.0+	1.5+
1994 02 12	675	0.2−	1.6+	1998 07 18	952	0.4−	0.6+	1999 11 17	704	0.4+	0.2+
1994 02 12	675	1.1−	0.6+	1998 07 18	952	0.3+	0.3+	1999 11 17	704	0.2−	0.3+
1995 09 20	809	1.8−	0.2+	1998 07 19	952	0.1−	0.3−	1999 11 17	704	0.3−	0.1+
1995 09 23	809	(6.2+	1.7−)	1998 07 19	952	0.2−	0.9+	1999 11 17	704	0.4+	0.2+

(12226)* 1985 TN = 1992 UK₃

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

Id. S. Nakano (*MPC* 21566)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Nakano

<i>M</i>	353.16152		(2000.0)	P	Q
<i>n</i>	0.28529562	ω	4.75044	+0.86067942	−0.50773181
<i>a</i>	2.2852794	Ω	25.87200	+0.46422266	+0.75195183
<i>e</i>	0.1612269	<i>i</i>	4.98778	+0.20911303	+0.42044840
<i>P</i>	3.45	<i>H</i>	14.7	<i>G</i> 0.15	<i>U</i> 2

Residuals in seconds of arc

1985 09 20	095	1.0−	1.1−	1997 03 05	704	0.5+	2.0−	1999 10 13	704	(2.0+	2.2−)
1985 10 15	688	1.1+	1.4+	1997 03 06	704	0.3+	0.4+	1999 10 13	704	1.5+	0.1+
1985 10 15	688	(2.8+	0.1−)	1997 03 06	704	0.0	0.5+	1999 10 15	704	1.7+	0.4−
1985 10 20	688	2.1+	0.7−	1998 05 24	704	1.5−	0.0	1999 10 15	704	1.3+	0.3+
1985 10 20	688	0.1+	0.8−	1998 05 24	704	0.6−	1.0−	1999 10 15	704	0.3+	0.2−
1990 01 26	675	0.2−	0.8+	1998 05 24	704	0.3+	2.0−	1999 10 15	704	0.2+	0.2−
1990 01 26	675	0.7−	0.8+	1998 05 24	704	0.5+	0.4−	1999 10 15	704	0.1−	0.8+
1992 10 26	400	1.7+	0.1+	1999 10 03	704	1.0−	0.6+	1999 10 16	744	0.8−	0.5+
1992 10 26	400	1.7−	0.7+	1999 10 03	704	0.2−	0.6+	1999 10 16	744	(2.3−	2.1+)
1992 10 28	400	0.8−	0.3−	1999 10 03	704	0.3−	0.5−	1999 11 03	704	0.3−	0.4−
1992 10 28	400	(2.6−	0.5−)	1999 10 03	704	0.1−	0.3−	1999 11 03	704	0.0	0.3−
1992 11 15	400	1.6+	1.1+	1999 10 03	704	0.0	0.6+	1999 11 03	704	0.6−	0.2−

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1992 11 15	400	1.6–	1.0–	1999 10 13	704	0.8+	0.3–	1999 11 03	704	0.1–	0.1+
1992 11 23	033	0.9–	0.0	1999 10 13	704	0.8+	0.1–	1999 11 03	704	0.4–	0.2–
1992 11 23	033	1.4–	0.1–	1999 10 13	704	1.1+	0.4–	1999 11 16	704	0.2–	0.7+
1997 02 03	589	0.8–	0.5–	1999 10 13	704	0.5+	1.3+	1999 11 16	704	0.4–	0.5–
1997 02 03	589	0.5+	0.7–	1999 10 13	704	0.7–	1.4–	1999 11 16	704	0.6–	0.5–
1997 02 03	589	0.4–	0.5–	1999 10 13	704	0.3+	0.7–	1999 11 16	704	0.4–	0.3–
1997 03 05	704	0.6+	1.0–	1999 10 13	704	0.3+	1.4–	1999 11 16	704	0.4–	0.4–

(12227)* 1985 TO₃ = 1998 KC₂₈

Discovered 1985 Oct. 11 by C. S. Shoemaker at Palomar.

Id. G. V. Williams (*MPC* 31948)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>		(2000.0)		<i>P</i>		<i>Q</i>	
<i>n</i>	0.28762813	ω	82.63580	+0.99494077	+0.02276488		
<i>a</i>	2.2729078	Ω	276.02430	–0.06073304	+0.91215468		
<i>e</i>	0.1906182	<i>i</i>	5.64666	+0.08002724	+0.40921340		
<i>P</i>	3.43	<i>H</i>	14.5	<i>G</i>	0.15	<i>U</i>	2

Residuals in seconds of arc

1985 09 15	675	0.7+	1.3+	1998 05 24	704	0.3–	0.1–	1999 11 14	704	0.8–	0.1–
1985 09 15	675	0.4+	1.7–	1998 05 24	704	1.1+	1.9+	1999 11 14	704	0.8–	0.2–
1985 10 11	675	0.5–	0.6–	1998 05 24	704	0.2+	0.1–	1999 11 16	704	0.4+	0.3+
1985 10 13	675	0.2–	0.2+	1998 05 24	704	0.8–	1.4+	1999 11 16	704	0.3+	0.1+
1997 06 02	691	0.0	0.5–	1999 10 13	704	0.2+	0.6+	1999 11 16	704	0.1–	0.4+
1997 06 02	691	0.4–	0.5–	1999 10 13	704	0.1+	0.4+	1999 11 16	704	0.4–	0.3–
1997 06 02	691	0.1–	0.3–	1999 10 13	704	0.2+	0.5+	1999 11 16	704	0.7+	0.1–
1998 05 05	699	0.4+	0.7–	1999 10 13	704	0.6+	0.3+	1999 11 19	732	0.2–	0.2+
1998 05 05	699	0.2+	0.4+	1999 10 15	704	0.5+	0.6+	1999 11 19	732	0.2+	0.0
1998 05 05	699	(0.1+ 2.9+)		1999 10 15	704	0.0	0.7+	1999 11 19	732	0.5–	0.6–
1998 05 22	704	0.1+	0.0	1999 10 15	704	0.1+	1.0+	1999 11 20	732	0.2+	0.2+
1998 05 22	704	0.1+	0.2–	1999 10 15	704	0.2+	0.6+	1999 11 20	732	0.3+	0.7–
1998 05 22	704	0.1+	0.6–	1999 10 15	704	0.3+	0.2+	1999 11 20	732	0.2–	0.6–
1998 05 24	704	0.8–	0.3+	1999 11 14	704	0.6–	0.3+				

(12228)* 1985 TZ₃ = 1971 QO = 1995 OJ₁₀

Discovered 1985 Oct. 11 by S. L. Gaiser and J. P. Leech at Palomar.

Id. G. V. Williams (*MPC* 28582)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>		(2000.0)		<i>P</i>		<i>Q</i>	
<i>n</i>	0.28674219	ω	344.23404	+0.36146148	+0.92941497		
<i>a</i>	2.2775870	Ω	306.89806	–0.84508072	+0.29286326		
<i>e</i>	0.1734570	<i>i</i>	5.33725	–0.39393422	+0.22454160		
<i>P</i>	3.44	<i>H</i>	13.8	<i>G</i>	0.15	<i>U</i>	1

Residuals in seconds of arc

1971 08 18	095	1.2–	0.9+	1998 03 31	704	0.8+	0.2+	1999 10 12	704	0.1+	0.3–
1985 09 17	675	(2.8– 3.4+)		1998 03 31	704	0.8–	1.9–	1999 10 12	704	0.3+	0.2–
1985 09 17	675	(2.9– 0.3–)		1998 03 31	704	0.2+	0.1–	1999 10 12	704	0.4+	0.2+
1985 09 19	095	0.7+	0.5–	1998 03 31	704	1.0–	0.6–	1999 10 13	704	0.1–	0.3–
1985 09 21	095	2.0+	0.8+	1998 04 01	704	0.2+	0.2–	1999 10 13	704	0.3–	0.5–
1985 10 11	675	1.5–	1.1+	1998 04 01	704	0.3+	0.5–	1999 10 13	704	0.0	0.6–
1985 10 13	675	(13.0– 0.0)		1998 04 01	704	0.6–	0.4+	1999 10 13	704	0.1–	1.3–
1985 10 18	095	1.1+	0.8–	1998 04 01	704	0.2–	0.1+	1999 10 13	704	0.2+	0.8–
1994 02 12	675	0.2–	0.4+	1998 04 01	704	0.7+	0.1+	1999 11 08	699	0.0	0.5+
1994 02 12	675	0.2+	0.1–	1999 10 05	704	0.9+	0.7–	1999 11 08	699	0.5–	0.5+
1995 07 21	033	1.0+	1.4+	1999 10 05	704	0.3–	1.3–	1999 11 08	699	0.1+	0.3+
1995 07 22	033	0.8–	0.8–	1999 10 05	704	0.7+	0.0	1999 11 13	703	0.3–	0.4+
1995 07 23	033	0.1+	0.6–	1999 10 05	704	0.3–	0.0	1999 11 13	703	0.4–	0.5+
1995 07 26	033	0.2–	1.4–	1999 10 12	704	0.4–	0.2–	1999 11 13	703	0.3–	0.3+
1998 03 31	704	0.3–	0.6–	1999 10 12	704	0.2–	0.5–	1999 11 13	703	0.6–	0.1+

(12229)* 1985 UK₃ = 1991 JB

Discovered 1985 Oct. 17 by C.-I. Lagerkvist at Kvistaberg.

Id. T. Urata (*MPC* 18285)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>		(2000.0)		<i>P</i>		<i>Q</i>	
<i>n</i>	0.29176329	ω	265.09665	+0.57386179	+0.81731995		
<i>a</i>	2.2513807	Ω	40.06828	–0.71596259	+0.53133075		
<i>e</i>	0.1562087	<i>i</i>	4.60493	–0.39759304	+0.22288052		
<i>P</i>	3.38	<i>H</i>	13.5	<i>G</i>	0.15	<i>U</i>	2

Residuals in seconds of arc

1985 09 21	095	0.4+	1.1+	1998 05 28	704	0.4+	0.4–	1999 11 14	704	0.0	0.1+
1985 10 17	049	(3.3– 3.7–)		1998 05 28	704	(2.7+ 1.4–)		1999 11 14	704	0.0	0.0
1985 10 17	049	0.1–	1.3–	1998 05 28	704	1.0+	0.2–	1999 11 14	704	0.1+	0.4+
1985 10 18	095	(0.3+ 3.4+)		1998 05 28	704	1.0–	1.7–	1999 11 15	163	0.8–	1.1–
1985 10 20	049	(2.1– 2.8–)		1998 06 26	704	(2.5– 2.1+)		1999 11 15	163	0.1–	0.4–
1985 10 20	049	1.1–	1.2–	1998 06 26	704	0.4–	0.3+	1999 11 15	163	0.1–	0.7–
1985 11 12	095	0.5+	2.5+	1998 06 26	704	1.1–	1.3–	1999 11 15	163	0.1–	0.1+
1991 05 02	385	0.1–	0.6–	1998 06 26	704	0.3+	0.7–	1999 11 16	704	0.1–	0.4–
1991 05 02	385	(3.5– 1.7+)		1999 10 13	704	0.5–	0.2+	1999 11 16	704	0.0	0.5–
1991 05 03	385	1.4+	0.2+	1999 10 13	704	0.2+	0.5–	1999 11 16	704	0.1–	0.3–
1991 05 03	385	(1.4– 2.8+)		1999 10 13	704	1.4+	1.1–	1999 11 16	704	0.1–	0.3–
1991 05 13	675	0.9–	0.0	1999 10 13	704	0.5+	0.8–	1999 11 16	704	0.1+	0.1+
1991 05 13	675	0.3–	0.6+	1999 11 14	704	0.0	0.2–				
1998 05 28	704	0.9+	0.4+	1999 11 14	704	0.3–	0.4–				

(12230)* 1986 QN = 1978 QA₃ = 1982 QH₁

Discovered 1986 Aug. 25 by H. Debehogne at the European Southern

Observatory.

Id. S. Nakano (*MPC* 11639)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Nakano

<i>M</i>		(2000.0)		<i>P</i>		<i>Q</i>	
<i>n</i>	0.24129050	ω	239.44303	+0.81890435	–0.57290628		
<i>a</i>	2.5553040	Ω	155.45981	+0.55077991	+0.76768594		
<i>e</i>	0.2471368	<i>i</i>	4.73226	+0.16136036	+0.28711791		
<i>P</i>	4.08	<i>H</i>	13.6	<i>G</i>	0.15	<i>U</i>	1

Residuals in seconds of arc

1951 02 04	675	0.2–	0.1+	1986 09 01	809	0.6+	0.3+	1986 09 11	809	0.2+	0.7+
1951 02 04	675	0.2+	0.5+	1986 09 01	809	0.2+	0.2+	1986 09 11	809	0.3+	0.7+
1978 08 31	095	(2.6–	1.3–)	1986 09 01	809	0.0	0.1+	1986 09 12	809	0.8+	1.4+
1978 09 05	095	(4.5–	4.8+)	1986 09 02	809	0.6–	0.6–	1986 09 12	809	1.1+	1.0+
1982 08 15	095	(2.7–	1.4–)	1986 09 02	809	0.4–	0.6–	1986 09 12	809	1.0+	0.7+
1982 08 16	095	(3.7–	3.5+)	1986 09 02	809	0.0	0.8–	1998 06 24	704	0.3+	0.8–
1982 08 19	675	0.6+	0.8–	1986 09 03	809	0.2+	0.1–	1998 06 24	704	0.8–	0.0
1982 08 19	675	0.4–	0.7–	1986 09 03	809	0.1–	0.2+	1998 06 24	704	1.1+	0.2–
1982 09 13	675	0.4–	1.4–	1986 09 03	809	0.0	0.4–	1998 06 24	704	0.5+	1.0+
1982 09 13	675	0.0	1.3–	1986 09 05	809	0.2–	0.6+	1998 06 26	704	1.5–	0.1–
1986 08 08	095	1.5–	0.8–	1986 09 05	809	0.1+	0.6+	1998 06 26	704	0.6+	1.1–
1986 08 25	809	0.7–	0.3+	1986 09 05	809	0.2+	0.6+	1998 06 26	704	(2.4–	1.5–)
1986 08 25	809	0.1–	0.6+	1986 09 06	809	0.4–	0.1+	1998 06 26	704	1.4–	0.9+
1986 08 25	809	0.1+	0.6+	1986 09 06	809	0.5–	0.1+	1998 06 26	704	(0.5–	2.7+)
1986 08 26	809	0.3+	0.5+	1986 09 06	809	0.3–	0.1+	1999 10 10	704	0.5–	0.5–
1986 08 26	809	0.1+	0.3+	1986 09 07	809	1.4–	0.2+	1999 10 10	704	0.2+	0.8–
1986 08 26	809	0.3+	0.5+	1986 09 07	809	1.2–	0.1+	1999 10 10	704	0.6–	0.4+
1986 08 27	809	0.2–	0.3–	1986 09 07	809	1.0–	0.3+	1999 10 10	704	0.5–	0.5+
1986 08 27	809	0.0	0.1–	1986 09 07	095	0.6+	0.5–	1999 10 10	704	0.3–	0.5+
1986 08 27	809	0.5+	0.1+	1986 09 08	809	0.9–	0.2+	1999 10 21	704	0.0	0.4+
1986 08 28	809	0.3–	0.2–	1986 09 08	809	0.9–	0.2+	1999 10 21	704	0.1+	1.2+
1986 08 28	809	0.0	0.2+	1986 09 08	809	0.8–	0.1+	1999 10 21	704	0.6–	0.1+
1986 08 28	809	0.6+	0.2+	1986 09 09	809	0.4–	0.2–	1999 10 21	704	0.2+	0.3–
1986 08 29	809	0.2+	1.5–	1986 09 09	809	0.6–	0.1–	1999 10 21	704	0.9–	0.5–
1986 08 29	809	0.8+	0.9–	1986 09 09	809	0.3–	0.1–	1999 11 17	704	0.2+	0.2–
1986 08 29	809	1.2+	0.7–	1986 09 10	809	0.2+	0.6+	1999 11 17	704	0.5+	0.2+
1986 08 31	809	0.3+	0.7–	1986 09 10	809	0.5+	0.5+	1999 11 17	704	0.6+	0.2+
1986 08 31	809	1.5+	0.3–	1986 09 10	809	0.3+	0.8+	1999 11 17	704	0.2–	0.5–
1986 08 31	809	2.0+	0.1–	1986 09 11	809	0.3+	0.7+	1999 11 17	704	1.4+	0.6–

(12231)* 1986 QQ₁ = 1974 UR = 1997 GN₃₆

Discovered 1986 Aug. 27 by H. Debehogne at the European Southern Observatory.

Id. G. V. Williams (*MPC* 29911)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>		(2000.0)		P		Q	
<i>n</i>	0.24340928	ω	20.17296	+0.66855647	−0.74330578		
<i>a</i>	2.5404538	Ω	27.88632	+0.67537455	+0.59393250		
<i>e</i>	0.2152728	<i>i</i>	2.81802	+0.31129001	+0.30779977		
<i>P</i>	4.05	<i>H</i>	14.2	<i>G</i>	0.15	<i>U</i>	1

Residuals in seconds of arc

1974 10 19	808	1.4−	0.7+	1986 09 06	809	0.0	0.1−	1998 07 20	566	0.9−	1.1+
1974 10 19	808	1.2−	1.6+	1986 09 07	809	0.3+	0.4−	1998 07 20	566	0.8+	0.7+
1986 08 27	809	1.5−	0.2+	1986 09 07	809	0.5+	0.6−	1998 08 17	704	0.6−	0.4+
1986 08 27	809	1.3−	0.2+	1986 09 07	809	0.5+	0.5−	1998 08 17	704	1.0−	0.5−
1986 08 27	809	1.0−	0.2+	1986 09 08	809	0.5+	0.0	1998 08 17	704	(2.4−	2.1+)
1986 08 28	809	0.3−	0.1−	1986 09 08	809	0.8+	0.1−	1998 08 17	704	1.4−	0.8+
1986 08 28	809	0.2−	0.1+	1986 09 08	809	1.0+	0.0	1998 08 17	704	1.2−	1.0+
1986 08 28	809	0.1+	0.2+	1986 09 10	809	0.6+	0.4−	1999 10 12	704	0.3−	0.2+
1986 08 29	809	1.0−	0.2+	1986 09 10	809	0.4+	0.5−	1999 10 12	704	0.2−	1.0−
1986 08 29	809	0.6−	0.1+	1986 09 10	809	0.4+	0.7−	1999 10 12	704	0.2+	0.3−
1986 08 29	809	0.0	0.3+	1986 09 12	809	0.3+	0.7−	1999 10 12	704	0.2−	0.1+
1986 08 30	809	0.3+	0.0	1986 09 12	809	0.2+	0.8−	1999 10 22	704	1.0+	1.1+
1986 08 30	809	0.2+	0.2−	1986 09 12	809	0.4+	0.8−	1999 10 22	704	0.3−	0.8+
1986 08 30	809	0.4+	0.0	1997 04 06	704	0.3+	0.7−	1999 10 22	704	0.4+	0.2+
1986 09 03	809	0.3+	0.3+	1997 04 06	704	0.2−	0.5−	1999 10 22	704	1.2−	0.2+
1986 09 03	809	0.4+	0.5+	1997 04 11	704	0.4+	0.7−	1999 11 11	703	0.9+	0.1+
1986 09 03	809	0.2+	0.2+	1997 04 11	704	0.6+	0.2−	1999 11 11	703	0.5+	0.4+
1986 09 04	809	0.3+	0.5−	1997 05 07	704	0.6−	0.9+	1999 11 11	703	0.3−	0.4+
1986 09 04	809	0.4+	0.3−	1997 05 07	704	0.2+	0.8−	1999 11 11	703	0.2−	0.4−
1986 09 04	809	0.6+	0.6−	1997 05 07	704	0.1−	0.6+	1999 11 16	704	0.4−	0.2+
1986 09 05	809	1.0+	0.3−	1997 05 07	704	0.8−	0.4+	1999 11 16	704	0.1+	0.1−
1986 09 05	809	1.0+	0.5−	1998 07 02	699	0.2−	0.6+	1999 11 16	704	0.0	0.4−
1986 09 05	809	1.1+	0.4−	1998 07 02	699	0.3−	0.3+	1999 11 16	704	0.3+	0.2−
1986 09 06	809	0.4−	0.3−	1998 07 02	699	0.5+	0.2+	1999 11 16	704	0.2+	0.2+
1986 09 06	809	0.0	0.3−	1998 07 20	566	0.5+	1.7+				

(12232)* 1986 QZ₂ = 1982 SA₃ = 1982 UE₄ = 1985 FW₁

Discovered 1986 Aug. 28 by H. Debehogne at the European Southern Observatory.

Id. S. Nakano (*MPC* 12134)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>		(2000.0)		P		Q	
<i>n</i>	0.23868261	ω	247.72750	−0.19592486	+0.98008433		
<i>a</i>	2.5738834	Ω	11.12165	−0.82656134	−0.14729001		
<i>e</i>	0.1637725	<i>i</i>	9.66228	−0.52764553	−0.13319292		
<i>P</i>	4.13	<i>H</i>	13.2	<i>G</i>	0.15	<i>U</i>	1

Residuals in seconds of arc

1953 08 14	675	0.3+	0.2+	1993 01 23	675	1.6−	2.0+	1999 10 12	704	0.1+	0.0
1953 08 14	675	0.3+	0.2+	1993 01 23	675	0.1+	1.5−	1999 10 12	704	0.2+	0.3+
1982 09 20	095	(3.3+	2.4−)	1993 03 24	675	0.3−	0.4−	1999 10 12	704	0.0	0.4−
1982 09 24	033	0.1+	1.1−	1993 03 24	675	0.7−	0.3+	1999 10 12	704	0.1+	0.2+
1982 09 24	033	0.5+	0.7−	1994 08 05	675	0.7+	0.0	1999 10 12	704	0.3+	0.1−
1982 10 19	033	0.4+	0.4−	1994 08 05	675	0.4+	0.1+	1999 10 13	704	0.2+	0.3+
1982 10 19	033	0.3+	0.5−	1997 03 30	979	0.2−	0.2−	1999 10 13	704	0.3−	0.1+
1985 03 22	688	0.5+	1.2+	1997 03 30	979	0.4−	0.1+	1999 10 13	704	0.1+	0.1+
1985 03 22	688	1.7+	0.4−	1997 03 31	979	0.3−	0.5−	1999 10 13	704	0.2+	0.4+
1986 08 28	809	0.1−	0.2+	1997 04 05	979	0.2+	0.2−	1999 10 13	704	0.5+	0.5+
1986 08 28	809	0.1+	0.2+	1997 04 05	979	0.5−	0.4−	1999 10 17	106	0.6+	0.6−
1986 08 28	809	0.2+	0.2+	1997 04 05	979	0.1−	0.0	1999 10 18	106	1.4+	0.2+
1986 09 01	809	1.1−	0.3−	1997 04 07	979	0.5+	0.7−	1999 10 19	596	0.3+	0.1−
1986 09 01	809	1.0−	0.3−	1997 04 07	979	0.0	0.4−	1999 10 19	596	0.1−	0.1−

1986 09 01	809	0.7−	0.1−	1998 06 14	689	0.3−	0.3+	1999 11 03	704	0.3−	0.1+
1986 09 03	809	0.7−	0.8+	1998 06 25	423	0.2+	0.5−	1999 11 03	704	0.4+	0.3−
1986 09 03	809	0.7−	0.8+	1998 06 25	423	0.1+	0.7−	1999 11 03	704	0.2−	0.5−
1986 09 03	809	0.5−	0.8+	1998 06 25	423	0.0	0.2−	1999 11 03	704	0.0	0.5−
1986 09 07	809	0.9−	0.3−	1998 06 26	423	0.1−	0.3−	1999 11 03	704	0.1+	0.4−
1986 09 07	809	0.9−	0.3−	1998 06 26	423	0.0	0.1−	1999 11 09	699	0.5+	0.7+
1986 09 07	809	0.9−	0.4−	1999 10 05	704	0.1+	0.3−	1999 11 09	699	0.0	0.3+
1990 07 29	675	0.5+	0.3−	1999 10 05	704	0.1−	0.0	1999 11 09	699	0.5+	0.5+
1990 07 29	675	0.2+	0.3+	1999 10 05	704	0.3+	0.5+	1999 11 13	703	1.1−	0.1−
1990 07 30	675	0.6+	0.4+	1999 10 05	704	0.8+	0.2+	1999 11 13	703	1.2−	0.2+
1990 07 30	675	0.3−	0.3+	1999 10 05	704	1.7+	0.7+	1999 11 13	703	0.7−	0.5+
1990 09 15	675	1.1+	1.6−	1999 10 07	704	0.1−	0.9−	1999 11 13	703	0.3−	0.3−
1990 09 15	675	0.1+	0.9−	1999 10 07	704	0.3+	0.2+	1999 11 14	703	0.6−	0.2+
1990 09 17	675	0.2+	1.0+	1999 10 07	704	0.0	0.1+	1999 11 14	703	0.5−	0.0
1990 09 17	675	0.8+	0.5+	1999 10 07	704	0.3−	0.1−	1999 11 14	703	0.1−	0.0

(12233)* 1986 QF₃ = 1978 VW₁₂ = 1998 ML₂₈

Discovered 1986 Aug. 29 by H. Debehogne at the European Southern Observatory.

Id. G. V. Williams (*MPC* 32217), A. Doppler (*MPC* 34485)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>		(2000.0)		P		Q	
<i>n</i>	0.24098129	ω	259.85912	+0.94599641	−0.31514091		
<i>a</i>	2.5574894	Ω	118.47521	+0.32084889	+0.87667545		
<i>e</i>	0.2509706	<i>i</i>	4.96039	+0.04633342	+0.36349189		
<i>P</i>	4.09	<i>H</i>	14.1	<i>G</i>	0.15	<i>U</i>	1

Residuals in seconds of arc

1978 11 02	095	2.1−	1.1+	1986 09 07	809	0.1−	0.5+	1998 07 21	704	0.7−	0.3+
1986 08 29	809	1.4−	0.3−	1986 09 07	809	0.1−	0.5+	1998 07 21	704	0.0	0.4+
1986 08 29	809	1.2−	0.0	1986 09 09	809	0.7−	0.0	1998 07 21	704	(2.8+	0.5−)
1986 08 29	809	0.7−	0.2−	1986 09 09	809	0.5−	0.3−	1998 07 21	704	(0.7−	2.3+)
1986 08 31	809	1.0−	0.2−	1986 09 09	809	0.2−	0.6−	1999 10 10	704	0.5−	0.2−
1986 08 31	809	0.9−	0.3−	1986 09 11	809	1.1+	1.4+	1999 10 10	704	0.9+	0.9−
1986 08 31	809	0.8−	0.5−	1986 09 11	809	1.2+	1.4+	1999 10 10	704	0.5+	1.3+
1986 09 01	809	0.9+	0.4−	1986 09 11	809	1.6+	1.3+	1999 10 10	704	0.8+	0.6+
1986 09 01	809	0.9+	0.4−	1992 02 05	691	0.6+	0.0	1999 10 10	704	0.5+	0.4+
1986 09 01	809	0.8+	0.6−	1992 02 05	691	1.2+	0.5−	1999 10 10	704	0.3+	0.9−
1986 09 01	809	0.2+	1.3−	1998 06 24	704	0.3+	0.5−	1999 10 21	704	0.0	0.2+
1986 09 01	809	0.8+	1.5−	1998 06 24	704	0.3−	0.8−	1999 10 21	704	0.4+	0.1+
1986 09 01	809	1.5+	1.6−	1998 06 24	704	1.4−	1.5−	1999 10 21	704	0.4−	0.6+
1986 09 02	809	1.0+	1.0−	1998 06 24	704	0.4+	0.7+	1999 10 21	704	0.4+	0.2+
1986 09 02	809	1.2+	0.8−	1998 06 24	704	0.0	0.6+	1999 11 17	704	0.1−	0.0
1986 09 02	809	1.2+	0.7−	1998 06 26	704	0.3+	1.7+	1999 11 17	704	0.9−	0.1−
1986 09 06	809	0.6−	1.1+	1998 06 26	704	0.2−	1.8+	1999 11 17	704	0.5−	1.0+
1986 09 06	809	0.5−	1.0+	1998 06 26	704	0.9−	1.0+	1999 11 17	704	1.0−	0.8+
1986 09 06	809	0.5−	1.0+	1998 06 26	704	0.5+	1.1+	1999 11 17	704	0.8−	0.2+
1986 09 07	809	0.1−	0.9+	1998 06 26	704	(2.6−	0.7+)				

(12234)* 1986 RP₂ = 1980 DG₃ = 1990 RB₁₂

Discovered 1986 Sept. 6 by E. Bowell at the Anderson Mesa Station of the Lowell Observatory.

Id. A. Gnädig (*MPC* 31226)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

M	30.10598		(2000.0)	$\mathbf{P}$	$\mathbf{Q}$
n	0.23633601	ω	208.62628	+0.98657662	+0.10606725
a	2.5908928	Ω	144.60363	-0.07563600	+0.97066890
e	0.2040326	i	12.37787	-0.14472656	+0.21575825
P	4.17	H	13.5	G 0.15	U 1

1986 08 31	809	0.4+	0.2+	1998 05 23	704	0.7-	0.8+	1998 07 22	566	0.9+	0.5-
1986 08 31	809	0.4+	0.2+	1998 05 23	704	0.1-	0.5-	1998 07 22	566	0.2+	0.0
1986 08 31	809	0.4+	0.1+	1998 06 03	704	0.0	0.1+	1998 07 22	566	0.5+	1.4-
1986 09 02	809	1.2-	0.6-	1998 06 03	704	0.4+	0.8-	1999 10 19	704	0.3-	0.4+
1986 09 02	809	1.1-	0.8-	1998 06 03	704	0.4+	0.5-	1999 10 19	704	0.2+	0.8+
1986 09 02	809	0.9-	0.7-	1998 06 03	704	0.7+	1.0-	1999 10 19	704	0.5+	0.0
1986 09 06	688	0.9+	1.6+	1998 06 03	704	0.3-	0.3+	1999 10 19	704	0.3+	0.6-
1986 09 06	688	0.4+	0.6+	1998 06 19	704	0.1+	0.6+	1999 10 19	704	0.3+	0.5-
1986 09 13	809	0.3+	2.0+	1998 06 19	704	0.7+	0.1-	1999 11 06	704	0.3+	0.4+
1986 09 13	809	0.5+	1.8+	1998 06 19	704	0.4+	1.2+	1999 11 06	704	0.7+	0.4-
1986 09 13	809	0.7+	1.8+	1998 06 19	704	0.3+	0.1-	1999 11 06	704	(2.6-	1.5+)
1986 10 04	688	0.1-	0.8-	1998 06 19	704	0.2-	0.1+	1999 11 06	704	0.1-	1.6-
1986 10 04	688	1.4+	0.3-	1998 06 24	566	0.6-	1.0-	1999 11 06	704	0.2-	1.0-
1989 03 30	675	0.4-	0.3+	1998 06 24	566	0.5+	0.3-	1999 11 17	699	0.4-	1.1+
1989 04 01	675	0.4-	0.7+	1998 06 24	566	0.1+	0.4-	1999 11 17	699	0.2+	0.6+
1989 04 01	675	0.1-	0.5+	1998 06 27	699	0.4-	1.0+	1999 11 17	699	1.5-	1.5+
1990 09 15	675	0.7+	0.1-	1998 06 27	699	0.5-	0.9+				

(12235)* 1986 RB₁₂ = 1987 XQ

Discovered 1986 Sept. 9 by L. G. Karachkina at the Crimean Astrophysical Observatory.

Id. S. Nakano (*MPC* 14789)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

M	89.93940		(2000.0)	$\mathbf{P}$	$\mathbf{Q}$
n	0.17275461	ω	85.72794	+0.95503262	+0.15532391
a	3.1928826	Ω	265.19588	-0.24276588	+0.89867145
e	0.1176097	i	14.68186	+0.17022757	+0.41020009
P	5.71	H	11.7	G 0.15	U 2

Residuals in seconds of arc

1986 09 09	095	0.9-	2.1-	1998 11 14	704	0.1+	0.1+	1999 01 08	699	0.3-	0.5+
1986 09 13	095	0.4+	1.0+	1998 11 14	704	0.3-	0.1-	1999 01 11	704	0.4-	0.1-
1986 10 06	095	0.8+	0.6+	1998 11 15	758	0.1+	0.4+	1999 01 11	704	0.4-	0.6-
1987 12 14	046	2.0-	1.3-	1998 11 15	758	0.1-	0.3+	1999 01 11	704	0.4-	0.3-
1987 12 14	046	0.2+	1.6+	1998 11 15	758	0.2+	0.5+	1999 01 11	704	0.0	1.0-
1987 12 15	046	(0.1+	3.5+)	1998 11 16	704	0.7+	0.2-	1999 10 10	704	0.3+	0.4-
1987 12 15	046	1.9+	0.3-	1998 11 16	704	1.6+	0.4-	1999 10 10	704	0.2+	0.4-
1998 10 01	699	0.3-	0.2+	1998 11 16	704	0.1+	0.1+	1999 10 10	704	0.3+	1.2-
1998 10 01	699	0.4-	0.1-	1998 11 16	704	0.5-	0.8+	1999 10 10	704	0.8+	1.1-
1998 10 01	699	0.4-	0.1+	1998 11 20	127	0.3+	0.2-	1999 10 10	704	0.8+	1.4-
1998 10 18	704	0.4-	0.1-	1998 11 20	127	0.3+	0.5-	1999 10 20	704	0.8-	0.1-
1998 10 18	704	0.1+	0.3-	1998 12 09	689	0.4-	0.6+	1999 10 20	704	0.0	0.3+
1998 10 18	704	0.0	0.4-	1998 12 09	704	0.4-	0.6+	1999 10 20	704	0.2-	0.1+
1998 10 18	704	0.7-	0.4-	1998 12 09	704	0.8+	0.1+	1999 10 20	704	0.4-	0.2+
1998 11 11	127	0.2+	1.0-	1998 12 09	704	0.5+	0.7+	1999 10 20	704	0.3-	0.3+
1998 11 11	127	0.4+	1.2-	1998 12 09	704	0.1-	1.1+	1999 11 08	699	0.2-	1.2+
1998 11 14	704	0.1-	0.6+	1998 12 09	704	0.2-	0.1+	1999 11 08	699	0.3-	0.0
1998 11 14	704	0.1+	0.3+	1999 01 08	699	0.1-	0.5+	1999 11 08	699	0.4-	0.6+
1998 11 14	704	0.0	0.1-	1999 01 08	699	0.6-	0.6+				

(12236)* 1987 DD₆ = 1991 LM₄

Discovered 1987 Feb. 22 by H. Debehogne at the European Southern Observatory.

Id. H. Kaneda (*MPC* 18811), T. Kobayashi (*ibid.*)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

M	167.17990		(2000.0)	$\mathbf{P}$	$\mathbf{Q}$		
n	0.28125634	ω	41.97089	-0.95474716	+0.29586310		
a	2.3071075	Ω	155.18931	-0.28849501	-0.89642480		
e	0.0908486	i	4.15163	-0.07230829	-0.32998122		
P	3.50	H	14.6	G	0.15	U	2

Residuals in seconds of arc

1987 02 22	809	0.5+	0.4-	1987 03 07	809	0.2-	0.1+	1999 10 07	704	0.1-	0.1+
1987 02 22	809	0.8+	0.4-	1987 03 07	809	0.1-	0.2+	1999 10 07	704	0.9-	0.1-
1987 02 22	809	1.0+	0.1+	1991 06 06	809	1.3+	1.0+	1999 10 07	704	0.1+	0.2-

1987 02 23	809	1.6+	0.5-	1991 06 06	809	0.0	1.5+	1999 10 09	704	0.4+	0.3+
1987 02 23	809	1.8+	0.7-	1991 06 06	809	(0.4-	2.1+)	1999 10 09	704	0.5+	0.5+
1987 02 23	809	1.7+	0.8-	1991 06 08	809	0.4+	1.0+	1999 10 09	704	0.4+	0.3-
1987 02 24	809	(3.1+	1.4-)	1991 06 08	809	0.8-	1.4+	1999 10 09	704	0.1-	0.6+
1987 02 24	809	(2.9+	1.4-)	1991 06 08	809	0.2-	1.8+	1999 10 09	704	1.6+	0.1-
1987 02 24	809	(2.7+	1.3-)	1998 05 22	704	0.2+	0.1+	1999 10 15	704	1.1-	0.2-
1987 02 27	809	(2.8+	1.0-)	1998 05 22	704	0.2+	0.2+	1999 10 15	704	0.3+	0.7-
1987 02 27	809	(3.0+	1.0-)	1998 05 22	704	0.2+	0.4+	1999 10 15	704	1.0-	0.5-
1987 02 27	809	(2.9+	1.1-)	1998 05 24	704	0.5+	0.6-	1999 10 15	704	0.5-	0.4-
1987 02 28	809	1.8+	0.7-	1998 05 24	704	0.6+	0.3+	1999 10 15	704	0.2+	0.5+
1987 02 28	809	1.9+	0.7-	1998 05 24	704	(2.7+	0.8-)	1999 10 20	557	0.4+	0.7+
1987 02 28	809	2.1+	0.7-	1998 05 24	704	(2.2-	1.0-)	1999 10 20	557	0.0	0.3+
1987 03 01	809	0.8+	0.1-	1998 05 24	704	0.9-	1.1-	1999 10 20	557	0.5+	0.2+
1987 03 01	809	0.9+	0.1-	1998 06 03	704	0.4+	0.1+	1999 10 20	557	0.9-	0.6+
1987 03 01	809	1.1+	0.0	1998 06 03	704	0.8-	0.5-	1999 10 20	557	0.7-	0.1-
1987 03 02	809	0.2+	0.2+	1998 06 03	704	0.5+	0.1+	1999 10 20	557	0.5-	0.7+
1987 03 02	809	0.1-	0.4+	1998 06 03	704	0.8-	0.9+	1999 11 02	703	0.5-	1.9+
1987 03 02	809	0.0	0.3+	1998 06 24	704	0.1+	0.5-	1999 11 02	703	0.9-	0.6+
1987 03 03	809	0.6-	0.6+	1998 06 24	704	0.0	0.9-	1999 11 02	703	(2.2-	1.1+)
1987 03 03	809	0.4-	0.7+	1998 06 24	704	0.7-	0.8-	1999 11 02	703	0.7-	0.1+
1987 03 03	809	0.8-	0.8+	1998 06 24	704	0.4+	0.3+	1999 11 06	704	0.1-	0.4-
1987 03 04	809	1.3-	0.6+	1999 10 03	703	1.1-	0.8-	1999 11 06	704	0.3-	0.4-
1987 03 04	809	1.2-	0.6+	1999 10 03	703	0.0	0.4+	1999 11 06	704	0.5-	0.1-
1987 03 04	809	1.5-	0.5+	1999 10 03	703	0.1-	0.3+	1999 11 06	704	0.9+	0.4+
1987 03 05	809	1.6-	1.0+	1999 10 03	703	0.3-	0.4-	1999 11 15	704	0.1+	0.5+
1987 03 05	809	1.5-	0.9+	1999 10 04	704	0.9+	0.4+	1999 11 15	704	0.2-	0.5+
1987 03 05	809	1.3-	1.0+	1999 10 04	704	0.6+	0.0	1999 11 15	704	0.1+	0.1+
1987 03 06	809	1.2-	0.3+	1999 10 04	704	0.5+	0.3+	1999 11 15	704	0.0	1.0+
1987 03 06	809	1.0-	0.3+	1999 10 04	704	(2.3-	1.4+)	1999 11 15	704	0.1-	0.7+
1987 03 06	809	1.2-	0.5+	1999 10 07	704	0.1-	0.2-				
1987 03 07	809	0.6-	0.2+	1999 10 07	704	0.5+	0.3+				

(12237)* 1987 HE = 1994 JE

Discovered 1987 Apr. 23 by C. S. Shoemaker at Palomar.

Id. G. V. Williams (*MPC* 23669)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

M	214.55641		(2000.0)	P	Q
n	0.28354234	ω	13.94130	-0.99417840	+0.08283472
a	2.2946904	Ω	170.01399	-0.08344273	-0.99649458
e	0.1991378	i	23.41264	+0.06816606	-0.01170278
P	3.48	H	13.9	G	0.15
				U	2

Residuals in seconds of arc

1987 04 23	675	0.1-	1.1+	1994 06 09	693	1.1-	1.5+	1999 10 02	704	0.3-	0.6+
1987 04 25	675	1.2+	1.3+	1994 06 09	693	0.9+	0.2-	1999 10 02	704	0.2+	0.4+
1987 05 29	675	0.3-	2.0+	1998 07 17	699	0.5+	0.6-	1999 10 02	704	0.0	0.5+
1987 05 30	675	0.2-	1.6+	1998 07 17	699	0.0	0.3+	1999 10 02	704	0.4-	0.3+
1987 06 01	675	0.7-	0.9+	1998 07 17	699	0.6+	0.3-	1999 10 08	704	0.0	0.5-
1994 05 02	693	0.9-	0.9-	1998 08 24	704	0.6+	0.9-	1999 10 08	704	0.2+	0.4-
1994 05 02	693	1.0-	1.8-	1998 08 24	704	0.4+	0.3-	1999 10 08	704	0.3-	0.8-
1994 05 03	693	0.6+	0.8-	1998 08 24	704	0.8-	0.2+	1999 10 08	704	0.3-	0.2-
1994 05 03	693	0.5+	1.7-	1998 08 24	704	0.2+	1.0+	1999 10 08	704	0.4+	0.3-
1994 05 05	693	0.8-	0.2+	1998 08 27	704	0.1-	0.1-	1999 11 10	704	0.1+	0.2+
1994 05 05	693	0.8-	0.1+	1998 08 27	704	1.0+	0.4+	1999 11 10	704	0.4-	0.1-
1994 05 08	693	1.7+	0.9-	1998 08 27	704	1.4-	1.0+	1999 11 10	704	0.2-	0.4-
1994 05 08	693	0.6+	0.3+	1998 08 27	704	0.8-	0.9-	1999 11 10	704	0.2+	0.3+
1994 06 01	693	0.6-	1.0-	1998 08 27	704	0.2-	0.9+	1999 11 10	704	0.5+	0.5+
1994 06 01	693	0.1-	1.5-	1999 10 02	704	0.1+	0.3-				

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	35.01757		(2000.0)	P	Q
<i>n</i>	0.08388887	ω	176.78067	+0.71220463	-0.64969337
<i>a</i>	5.1681265	Ω	227.57729	+0.63573511	+0.75754485
<i>e</i>	0.1247659	<i>i</i>	21.10665	+0.29766664	-0.06343753
<i>P</i>	11.75	<i>H</i>	10.8	<i>G</i> 0.15	<i>U</i> 1

Residuals in seconds of arc

1986 11 30	381	0.9-	0.5-	1998 10 29	704	0.2+	0.8-	1999 10 21	704	0.3-	0.1+
1986 11 30	381	1.7+	1.8+	1998 10 29	704	0.3+	1.1-	1999 10 21	704	0.6-	0.1+
1986 12 01	381	1.1-	0.7-	1998 10 29	704	0.0	1.6-	1999 10 21	704	0.2-	0.1-
1986 12 01	381	0.3-	0.4-	1998 10 29	704	0.3-	1.5-	1999 10 22	704	0.5+	0.2-
1987 12 17	809	0.2-	0.4-	1998 11 11	699	0.5+	0.3+	1999 10 22	704	0.2+	0.4-
1987 12 17	809	1.0+	1.2+	1998 11 11	699	0.2+	0.1+	1999 10 22	704	0.4-	0.4-
1987 12 20	809	0.4-	0.2+	1998 11 11	699	0.1+	0.1+	1999 10 22	704	0.2-	0.6-
1987 12 20	809	1.0-	1.6-	1998 11 24	704	0.3+	0.2-	1999 10 22	704	0.4+	0.1-
1987 12 23	809	0.4+	0.9-	1998 11 24	704	0.1-	0.2+	1999 10 22	704	0.3-	0.1-
1987 12 23	809	0.0	1.4-	1998 11 24	704	0.4-	0.1+	1999 10 22	704	0.2+	0.0
1997 09 25	012	0.1+	0.1+	1998 11 24	704	0.7+	1.1+	1999 10 22	704	0.2+	0.5+
1997 09 26	012	0.0	0.1-	1998 12 15	704	0.3-	0.6+	1999 10 22	704	0.1-	0.6+
1997 09 26	012	0.3+	0.3+	1998 12 15	704	1.6-	0.6+	1999 10 22	704	1.2+	0.5-
1997 10 23	012	0.3+	0.4+	1998 12 15	704	0.0	0.4-	1999 10 22	704	0.4+	0.2+
1997 10 23	012	0.1-	0.1-	1999 10 19	704	0.5+	0.1-	1999 10 22	704	0.8+	0.2-
1997 10 23	012	0.6-	0.4-	1999 10 19	704	0.2-	0.4+	1999 11 06	704	0.2-	1.0+
1998 10 20	699	0.3+	0.9+	1999 10 19	704	0.2-	0.7+	1999 11 06	704	0.4-	0.0
1998 10 20	699	0.7-	1.0+	1999 10 19	704	0.2-	0.4+	1999 11 06	704	0.3-	0.5+
1998 10 20	699	0.7+	0.8+	1999 10 21	704	0.1-	0.5+	1999 11 06	704	0.1-	0.5+
1998 10 29	704	0.7+	0.5-	1999 10 21	704	0.1-	0.3+	1999 11 06	704	0.3-	0.3+

(12239)* 1988 CN₄ = 1976 GK₅ = 1990 TX₆

Discovered 1988 Feb. 13 by E. W. Elst at the European Southern Observatory.

Id. G. V. Williams (*MPC* 17440)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	319.37133		(2000.0)	P	Q
<i>n</i>	0.24122448	ω	253.40466	-0.38329523	-0.92165808
<i>a</i>	2.5557702	Ω	219.30417	+0.87953635	-0.34430431
<i>e</i>	0.1647475	<i>i</i>	5.45881	+0.28195848	-0.17888803
<i>P</i>	4.09	<i>H</i>	13.7	<i>G</i> 0.15	<i>U</i> 2

Residuals in seconds of arc

1976 04 02	095	(2.0+	4.1-)	1994 10 04	560	(3.8+	0.8+)	1998 08 26	699	0.8-	0.4+
1988 02 13	809	0.9+	0.8+	1994 10 04	560	0.4+	0.4-	1998 08 26	699	0.5+	1.8+
1988 02 15	809	0.3+	0.0	1994 10 04	560	0.7+	0.3-	1998 08 27	327	0.1-	0.3+
1988 02 16	809	0.3+	0.6-	1996 02 19	801	0.5+	1.6-	1998 08 27	327	0.1-	0.4+
1988 02 16	809	1.1+	0.6-	1996 02 19	801	0.1+	1.8-	1998 08 27	327	0.4-	0.2+
1988 02 16	809	0.5+	0.8-	1996 03 17	801	0.1+	0.8-	1998 09 14	704	0.2+	0.1+
1988 02 21	809	1.0+	1.1+	1996 03 17	801	0.1-	1.3-	1998 09 14	704	0.9+	0.5-
1988 02 21	809	0.9+	1.1+	1996 03 19	801	0.4+	0.5-	1998 09 14	704	0.5-	0.4-
1988 02 21	809	1.2+	1.0+	1996 03 19	801	0.1+	0.5-	1998 09 14	704	0.6+	1.2-
1988 02 23	809	1.9-	1.5+	1996 04 09	327	0.2-	0.2+	1998 09 14	704	0.4-	0.7-
1988 02 23	809	2.4-	1.3+	1996 04 09	327	0.2+	0.4+	1998 09 18	704	(0.1+	2.2+)
1988 02 23	809	2.0-	1.4+	1996 04 09	327	0.1-	0.0	1998 09 18	704	1.5-	2.0+
1990 10 09	413	0.8-	1.0-	1996 04 11	327	0.1+	0.4+	1998 09 18	704	1.1-	0.2-
1990 10 11	413	0.1+	0.6-	1996 04 11	327	0.0	0.8+	1998 09 18	704	0.8+	0.7+
1992 01 02	801	0.6+	0.8-	1996 04 11	327	0.6-	0.5+	1998 10 11	699	0.8-	0.0
1992 01 02	801	0.6+	0.5-	1996 04 13	327	0.1+	0.1-	1998 10 11	699	1.0-	0.8-
1992 01 07	801	0.8+	0.3-	1996 04 13	327	0.0	0.4+	1998 10 11	699	0.0	1.0-
1992 01 07	801	0.5+	0.5-	1996 04 13	327	0.2-	0.7-	1999 10 21	704	0.1+	0.4-
1992 02 08	399	0.5-	0.1-	1996 04 14	327	0.4+	0.3+	1999 10 21	704	0.1+	0.0
1992 02 08	399	0.2-	0.0	1996 04 14	327	0.2-	0.2-	1999 10 21	704	0.2-	0.9-
1994 08 12	809	(3.7-	5.2-)	1996 04 14	327	0.6+	0.1-	1999 10 21	704	0.1-	0.1+
1994 08 12	809	(3.6-	5.3-)	1998 08 17	704	0.5+	0.6+	1999 10 21	704	0.2+	0.3+
1994 08 12	809	(4.0-	4.9-)	1998 08 17	704	0.6+	0.4+	1999 11 13	703	0.6+	0.6+
1994 08 13	809	(1.2-	3.4-)	1998 08 17	704	0.1-	0.2-	1999 11 13	703	0.4+	0.4+

1994 08 13	809	(2.1-	3.8-)	1998 08 17	704	0.2+	0.1-	1999 11 13	703	0.1-	0.5+
1994 08 13	809	(1.1-	3.2-)	1998 08 17	704	0.3+	0.4+	1999 11 13	703	0.0	0.4+
1994 09 05	809	(2.1+	2.3-)	1998 08 23	704	0.7-	0.2+	1999 11 17	704	0.9-	0.9+
1994 09 05	809	(0.9+	2.9-)	1998 08 23	704	0.8-	1.4+	1999 11 17	704	0.9-	0.2+
1994 09 05	809	(1.0+	3.4-)	1998 08 23	704	0.0	1.0+	1999 11 17	704	0.4-	1.0+
1994 09 06	809	1.4+	1.3+	1998 08 23	704	0.9+	0.6+	1999 11 17	704	0.6-	1.0+
1994 09 06	809	(2.4+	0.4-)	1998 08 23	704	0.1+	0.1+	1999 11 17	704	0.1-	0.1+
1994 09 06	809	(2.5+	1.1+)	1998 08 26	699	0.1+	1.4+				

(12240)* 1988 PG₂ = 1981 UR₂₂ = 1995 OL₁₀

Discovered 1988 Aug. 13 at Tautenburg.

Id. S. J. Bus (*MPC* 20502), G. V. Williams (*MPC* 34487), A. Doppler (*ibid.*)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	346.61564		(2000.0)	P	Q
<i>n</i>	0.27388466	ω	255.41619	+0.87513377	-0.48234692
<i>a</i>	2.3483216	Ω	133.40579	+0.46185238	+0.80891083
<i>e</i>	0.2201735	<i>i</i>	3.03781	+0.14433733	+0.33616173
<i>P</i>	3.60	<i>H</i>	15.3	<i>G</i> 0.15	<i>U</i> 1

Residuals in seconds of arc

1977 09 08	413	0.1-	0.3-	1997 02 03	691	0.1+	0.5-	1999 10 31	151	1.3-	0.1+
1977 09 08	413	0.3+	0.3-	1997 02 03	691	0.0	0.6-	1999 10 31	151	0.0	0.0
1981 10 24	675	0.6+	0.1-	1997 02 07	691	0.2-	0.5-	1999 10 31	151	0.5-	0.3+
1981 10 25	675	0.5+	0.1+	1997 02 07	691	0.1+	0.5-	1999 10 31	113	0.3-	0.7-
1981 10 26	675	0.2+	0.3+	1997 02 07	691	0.2-	0.3-	1999 10 31	113	0.2-	0.7-
1988 08 13	033	1.2-	2.0-	1997 02 11	691	0.4+	0.7+	1999 11 01	703	0.4-	0.1-
1988 08 14	033	1.7-	1.5-	1997 02 11	691	0.3-	0.4-	1999 11 01	703	0.3-	0.2+
1988 08 14	033	0.1+	1.6-	1997 02 11	691	0.1-	0.3-	1999 11 01	703	0.5-	0.1+
1988 09 10	675	0.4+	0.0	1999 10 08	703	0.2+	0.4+	1999 11 01	703	0.0	0.3+
1988 09 10	675	0.1+	1.0-	1999 10 08	703	0.2+	0.3+	1999 11 05	704	0.3+	0.4-
1988 09 11	675	0.4-	0.8+	1999 10 08	703	0.2+	0.0	1999 11 05	704	0.8+	0.2-
1988 09 11	675	0.3-	0.2+	1999 10 08	703	0.3+	0.2+	1999 11 05	704	0.1-	0.3-
1988 09 12	675	0.2+	0.0	1999 10 10	704	0.7+	0.7+	1999 11 05	704	0.3+	0.5-
1988 09 12	675	0.5+	0.6-	1999 10 10	704	0.2+	0.6-	1999 11 05	704	0.2+	0.9-
1988 09 16	675	0.1-	1.7+	1999 10 10	704	0.6+	0.5-	1999 11 07	151	0.0	0.5+
1988 09 16	675	1.0-	1.6+	1999 10 10	704	0.2+	0.3-	1999 11 07	151	0.3-	1.1-
1988 10 07	675	0.3-	0.4+	1999 10 10	704	0.2-	0.8-	1999 11 07	151	0.3-	0.2-
1988 10 07	675	0.2+	1.7+	1999 10 15	704	0.0	0.3+	1999 11 07	151	0.5+	0.6+
1988 10 09	675	1.0+	0.1-	1999 10 15	704	0.2+	0.7-	1999 11 13	699	0.2-	0.2+
1988 10 09	675	0.1-	0.3+	1999 10 15	704	0.3+	0.8-	1999 11 13	699	0.1-	0.5+
1992 12 29	033	0.4-	1.0-	1999 10 15	704	0.7-	0.4-	1999 11 13	699	0.0	0.3+
1992 12 30	033	(2.3-	0.2+)	1999 10 20	704	0.4+	0.4-	1999 11 17	704	0.2-	0.5+
1993 01 01	033	0.8-	0.4-	1999 10 20	704	0.4+	0.3-	1999 11 17	704	0.2-	0.6+
1995 07 21	033(25.4+	11.8+)		1999 10 20	704	0.5+	0.0	1999 11 17	704	0.2-	0.3+
1995 07 23	033	1.1+	0.7-	1999 10 20	704	0.4+	0.2+	1999 11 17	704	0.2-	0.6+
1995 07 26	033	0.6+	1.0-	1999 10 20	704	0.4+	0.2-	1999 11 17	704	0.2-	0.4+
1997 02 03	691	0.4-	0.1-	1999 10 31	151	0.3+	0.7+				

(12241)* 1988 PQ₂ = 1998 HO₈₅

Discovered 1988 Aug. 13 at Tautenburg.

Id. G. V. Williams (*MPC* 31949)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	36.15004		(2000.0)	P	Q
<i>n</i>	0.27738333	ω	244.35215	+0.90030132	+0.43425749
<i>a</i>	2.3285334	Ω	89.89770	-0.38797208	+0.83147539
<i>e</i>	0.2314400	<i>i</i>	1.69796	-0.19732006	+0.34650990
<i>P</i>	3.55	<i>H</i>	15.1	<i>G</i> 0.15	<i>U</i> 2

1988 09 16	675	1.5-	0.9+	1998 05 01	704	0.2+	0.1+	1999 11 09	704	0.4-	0.4-
1988 11 02	413	0.2+	0.7+	1998 05 01	704	0.6+	0.7-	1999 11 09	704	0.2-	0.3-
1988 11 02	413	1.7-	0.4+	1998 05 01	704	0.7-	1.7-	1999 11 12	704	0.2+	0.6-
1997 02 06	691	0.2+	0.4-	1999 10 22	704	1.4+	0.3+	1999 11 12	704	0.4+	0.3-
1997 02 06	691	0.1-	0.9-	1999 10 22	704	1.4+	0.5+	1999 11 12	704	0.2+	0.2-
1997 02 06	691	0.1-	0.3-	1999 10 22	704	0.3+	0.5-	1999 11 12	704	0.2+	0.1+
1998 04 21	704	(1.1-	2.6-)	1999 10 22	704	0.2+	0.2-	1999 11 12	704	0.2-	0.1+
1998 04 21	704	0.8-	0.6+	1999 10 22	704	0.8+	0.7+	1999 11 17	704	0.2+	0.1-
1998 04 21	704	1.6-	0.7-	1999 11 03	704	0.5+	0.6-	1999 11 17	704	0.8-	0.1+
1998 04 21	704	1.1-	0.2+	1999 11 03	704	0.6+	0.8-	1999 11 17	704	0.9-	0.3-
1998 04 21	704	(4.7-	1.3-)	1999 11 03	704	0.2+	0.1-	1999 11 17	704	1.0-	1.0-
1998 04 22	704	0.5+	0.3-	1999 11 03	704	0.1+	0.6-	1999 11 17	704	0.6-	0.6-

(12242)* 1988 QY

Discovered 1988 Aug. 18 by C. S. Shoemaker at Palomar.

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	355.07003	(2000.0)	P	Q
<i>n</i>	0.08527785	ω 93.91511	+0.63709922	+0.69339034
<i>a</i>	5.1118554	Ω 222.66977	-0.73878914	+0.67385942
<i>e</i>	0.0676385	<i>i</i> 29.77927	+0.21976169	+0.25519269
<i>P</i>	11.56	<i>H</i> 10.5	<i>G</i> 0.15	<i>U</i> 0

Residuals in seconds of arc

1954 09 28	675	0.7-	0.4-	1989 11 02	675	0.2-	0.4-	1998 06 19	704	1.5+	0.5+
1954 09 28	675	1.2+	0.1+	1990 11 23	372	(0.8-	4.0-)	1998 06 25	704	0.3-	0.0
1954 09 28	675	0.1+	0.2+	1990 11 23	372	0.6-	0.6-	1998 06 25	704	1.3-	0.9-
1954 10 06	675	(4.1+	2.2+)	1991 12 25	950	0.2+	0.5+	1998 06 25	704	0.2+	0.6+
1954 10 06	675	0.1-	0.1+	1991 12 25	950	0.3+	0.2+	1998 06 25	704	0.1+	0.7+
1954 10 06	675	0.5+	0.5+	1997 05 03	809	0.2-	1.2-	1999 08 11	704	0.1+	0.0
1987 07 29	675	0.1+	0.7-	1997 05 03	809	0.7+	1.6-	1999 08 11	704	1.2+	0.9+
1987 07 29	675	1.3+	1.3+	1997 05 03	809	0.1+	1.5-	1999 08 11	704	1.9-	0.0
1987 07 31	675	2.3-	0.0	1997 05 04	809	0.0	0.7+	1999 08 11	704	0.2-	0.3+
1987 07 31	675	0.2-	0.9+	1997 05 04	809	0.4+	0.7+	1999 11 05	704	0.7+	0.3+
1988 08 18	675	0.2-	0.5-	1997 05 04	809	0.0	0.1+	1999 11 05	704	0.6+	0.0
1988 08 18	675	0.1+	1.0-	1997 05 08	691	0.1-	0.1+	1999 11 05	704	0.5+	0.4-
1988 09 10	675	1.2-	0.3-	1997 05 08	691	0.1-	0.2+	1999 11 05	704	0.1-	0.3+
1988 09 12	675	0.8-	1.3-	1997 05 08	691	0.8-	0.2+	1999 11 05	704	0.7+	0.6+
1988 09 13	675	0.3-	1.2-	1998 06 19	704	0.6+	0.9+				
1989 11 01	675	1.0+	0.5+	1998 06 19	704	(1.1+	2.7+)				

(12243)* 1988 RD₁ = 1980 BV₄ = 1993 PW₄

Discovered 1988 Sept. 9 by P. Jensen at Brorfelde.

Id. B. G. Marsden (*MPC* 22590), G. V. Williams (*MPC* 28841)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Marsden

<i>M</i>	31.78616	(2000.0)	P	Q
<i>n</i>	0.18975564	ω 40.88387	+0.99377112	+0.00028356
<i>a</i>	2.9992057	Ω 318.68948	-0.05725721	+0.85921102
<i>e</i>	0.1093943	<i>i</i> 9.71880	+0.09560633	+0.51162129
<i>P</i>	5.19	<i>H</i> 12.6	<i>G</i> 0.15	<i>U</i> 1

Residuals in seconds of arc

1980 01 22	095	1.1-	0.0	1993 08 15	010	0.6-	1.5-	1998 08 27	699	0.2-	0.7+
1988 09 07	400	0.3-	2.2+	1993 08 16	010	(0.0	2.5-)	1998 08 27	699	0.1-	0.1+
1988 09 07	400	2.1-	0.1+	1993 08 16	010	1.0-	0.9-	1998 08 30	699	0.3-	0.7+
1988 09 07	400	0.6-	1.0+	1993 08 16	010	0.1-	1.2-	1998 08 30	699	0.6-	0.7+
1988 09 09	054	0.1+	1.6+	1993 08 19	010	(2.4+	2.1+)	1998 08 30	699	0.5-	0.4+
1988 09 09	054	0.5+	0.9-	1993 08 19	010	(2.9+	2.0+)	1998 09 14	699	0.0	0.5+
1988 09 10	675	0.9+	1.0-	1993 08 20	010	(2.4+	1.9+)	1998 09 14	699	0.1-	0.8+
1988 09 10	675	1.2+	1.0-	1998 08 17	704	0.6+	0.0	1998 09 14	699	0.4-	0.4+
1988 09 11	675	0.8+	0.1+	1998 08 17	704	1.1+	0.2-	1998 10 14	704	0.2+	0.0
1988 09 11	675	0.0	0.2+	1998 08 17	704	0.8+	0.4-	1999 10 14	704	0.0	0.4+
1988 09 16	675	0.6+	0.7-	1998 08 17	704	1.3+	1.5-	1999 10 14	704	0.1-	0.6+
1988 09 16	675	1.4+	0.9-	1998 08 17	704	0.9+	1.3-	1999 10 14	704	0.2+	0.1+
1988 09 16	054	0.2+	0.3+	1998 08 23	704	0.4+	0.8+	1999 11 01	704	0.0	0.2+
1988 09 20	054	0.1-	0.4+	1998 08 23	704	0.2+	0.9+	1999 11 01	704	0.2-	0.3+

1988 09 20	054	0.2+	0.0	1998 08 23	704	0.5+	0.6+	1999 11 01	704	0.2+	0.3-
1991 02 10	675	0.9+	1.3-	1998 08 23	704	1.2-	0.3-	1999 11 01	704	0.2-	0.3+
1991 02 10	675	0.1+	0.9+	1998 08 23	704	1.1-	1.0+	1999 11 01	704	0.3-	0.5-
1993 08 15	010	0.3-	1.5-	1998 08 27	699	1.5-	0.2+				

(12244)* 1988 RY₂ = 1993 KS₃ = 1997 GG₃₈

Discovered 1988 Sept. 8 by F. Börngen at Tautenburg.

Id. G. V. Williams (*MPC* 29912)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	22.75875	(2000.0)	P	Q
<i>n</i>	0.18247698	ω 167.65400	+0.99812004	+0.05588602
<i>a</i>	3.0784398	Ω 189.25334	-0.06042264	+0.96605359
<i>e</i>	0.1075047	<i>i</i> 9.00272	+0.01027081	+0.25222452
<i>P</i>	5.40	<i>H</i> 13.3	<i>G</i> 0.15	<i>U</i> 1

Residuals in seconds of arc

1988 08 19	675	0.6+	0.2+	1998 07 20	566	0.1-	0.2-	1999 10 10	704	0.2+	0.6-
1988 08 19	675	0.2-	0.3-	1998 07 20	566	0.9+	0.2+	1999 10 20	704	1.0+	0.8+
1988 09 08	033	0.3-	0.9-	1998 07 25	113	0.3-	0.4-	1999 10 20	704	1.0+	1.0+
1988 09 08	033	0.3+	1.2-	1998 07 25	113	0.6+	0.1-	1999 10 20	704	0.7+	0.9+
1988 09 09	033	0.1-	1.0-	1998 08 14	113	0.3+	1.6+	1999 10 20	704	0.9+	1.0+
1988 09 10	033	0.3-	1.0-	1998 08 14	113	0.0	1.1+	1999 10 20	704	1.5+	1.1+
1988 09 11	033	0.3-	1.0-	1999 10 02	703	0.1+	0.0	1999 10 31	113	1.2-	0.2-
1988 10 13	675	0.6+	0.0	1999 10 02	703	0.1-	0.3+	1999 10 31	113	1.0-	0.3-
1988 10 13	675	0.3+	1.4+	1999 10 02	703	0.5-	0.2+	1999 11 05	704	0.1+	0.4+
1993 05 26	691	0.1+	0.8+	1999 10 02	703	0.6-	0.4-	1999 11 05	704	0.6-	0.0
1993 05 26	691	0.1+	0.0	1999 10 07	704	0.1+	0.1-	1999 11 05	704	0.1+	0.1+
1993 05 26	691	0.3-	0.3-	1999 10 07	704	0.4-	0.3-	1999 11 05	704	0.3-	0.4+
1997 04 02	704	0.3-	0.8+	1999 10 07	704	0.2-	0.3-	1999 11 05	704	0.5-	0.2+
1997 04 02	704	0.7+	0.9+	1999 10 10	704	0.2-	0.1-	1999 11 13	699	0.3-	0.2-
1998 07 19	113	0.8-	0.3-	1999 10 10	704	0.1+	0.4+	1999 11 13	699	0.3-	0.3+
1998 07 19	113	0.5-	0.3-	1999 10 10	704	0.2-	0.0	1999 11 13	699	0.0	0.5+
1998 07 20	566	0.4-	0.1+	1999 10 10	704	0.1-	0.3-				

(12245)* 1988 RM₇ = 1992 FJ₃ = 1993 OF₁₃

Discovered 1988 Sept. 9 by H. Debehogne at the European Southern

Observatory.

Id. G. V. Williams (*MPC* 22811)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	42.41372	(2000.0)	P	Q
<i>n</i>	0.18515115	ω 6.48660	+0.55797413	+0.82959462
<i>a</i>	3.0487263	Ω 297.43113	-0.76243540	+0.50252454
<i>e</i>	0.1937300	<i>i</i> 1.35059	-0.32765399	+0.24339652
<i>P</i>	5.32	<i>H</i> 14.2	<i>G</i> 0.15	<i>U</i> 1

Residuals in seconds of arc

1988 09 09	809	1.1-	0.0	1993 07 26	809	(2.2+	0.5+)	1999 10 09	704	0.3-	0.8-
1988 09 09	809	0.6-	0.0	1993 07 26	809	0.1+	0.2+	1999 10 15	704	1.2+	1.0-
1988 09 09	809	0.1+	0.0	1993 07 26	809	1.0+	0.3+	1999 10 15	704	0.0	0.8-
1988 09 14	807	0.6-	0.2-	1998 05 22	704	0.6+	1.5+	1999 10 15	704	0.1-	0.5-
1988 09 15	807	0.3+	0.2+	1998 05 22	704	1.1+	0.1-	1999 10 19	704	0.1-	0.5+
1988 09 16	807	0.6+	0.7+	1998 05 22	704	0.6-	0.3-	1999 10 19	704	0.3+	0.5+
1988 10 04	807	0.5+	0.4-	1998 05 22	704	(0.0	2.1+)	1999 10 19	704	0.3+	0.7+
1988 10 05	807	0.5+	0.2-	1998 05 24	704	1.0+	1.3+	1999 10 19	704	0.3+	0.5+
1988 10 07	807	0.7+	0.4-	1998 05 24	704	0.4-	0.8-	1999 10 19	704	0.5-	0.9+
1988 10 08	807	1.3+	0.2-	1998 05 24	704	1.7+	1.6+	1999 11 01	703	1.8-	0.7-
1992 03 25	691	0.6-	0.4-	1998 05 24	704	1.0-	0.5-	1999 11 01	703	0.2-	0.2-
1992 03 25	691	0.6-	0.7-	1998 05 24	704	0.3-	0.5+	1999 11 01	703	2.4-	0.7+
1993 07 12	809	0.3+	0.6-	1999 10 06	704	0.6+	0.9+	1999 11 01	703	1.9-	0.2-
1993 07 12	809	1.1-	0.2-	1999 10 06	704	0.2-	0.5+	1999 11 04	703	0.2-	1.3+

1993 07 19	809	0.2−	1.9−	1999 10 06	560	(0.3−	2.5+)	1999 11 05	704	0.8+	0.2−
1993 07 19	809	0.6−	1.8−	1999 10 07	560	0.5+	0.4−	1999 11 05	704	0.3+	0.1−
1993 07 23	809	0.5+	0.4−	1999 10 07	560	0.4+	0.5−	1999 11 05	704	1.1−	0.0
1993 07 23	809	0.4−	0.3−	1999 10 07	560	0.2−	1.5−	1999 11 14	704	0.1−	0.6+
1993 07 23	809	0.6+	0.8−	1999 10 07	560	0.2−	0.1+	1999 11 14	704	1.2+	0.7−
1993 07 23	809	0.1−	1.4+	1999 10 09	704	0.4−	0.8−	1999 11 14	704	1.2+	0.7−
1993 07 23	809	0.0	1.9+	1999 10 09	704	0.4+	0.2−	1999 11 14	704	0.2+	0.6+
1993 07 23	809	(4.1−	1.3+)	1999 10 09	704	0.0	0.8−	1999 11 14	704	0.3−	0.2−

(12246)* 1988 RJ₈ = 1981 SY₄ = 1981 UY₁₈ = 1998 KE₆₂

Discovered 1988 Sept. 11 by V. Shkodrov at Smolyan.

Id. M. W. Buie (*MPC* 32218), G. V. Williams (*ibid.*)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

				Williams			
<i>M</i>	19.62208		(2000.0)	<i>P</i>		<i>Q</i>	
<i>n</i>	0.27944629	<i>ω</i>	186.45671	+0.98993399		−0.14149652	
<i>a</i>	2.3170593	<i>Ω</i>	181.68698	+0.13407097		+0.94449394	
<i>e</i>	0.1166645	<i>i</i>	5.98857	+0.04533953		+0.29649610	
<i>P</i>	3.53	<i>H</i>	14.0	<i>G</i>	0.15	<i>U</i>	2

Residuals in seconds of arc

1981 09 25	095	0.2+	1.8+	1998 05 26	704	0.1−	0.2−	1998 06 26	704	0.0	0.1−
1981 10 26	095	(9.7−	1.0+)	1998 05 26	704	0.5−	0.5+	1999 10 10	704	0.0	0.4+
1988 09 11	675	1.5−	0.4−	1998 05 26	704	0.4−	0.2+	1999 10 10	704	0.2−	0.8+
1988 09 11	675	0.9−	0.2−	1998 05 26	704	0.2−	0.1−	1999 10 10	704	0.0	1.0+
1988 09 11	675	0.9+	1.9+	1998 05 26	704	0.3−	0.9+	1999 10 10	704	0.4−	1.3+
1988 09 11	071	0.3−	2.2+	1998 06 03	704	0.2+	0.2−	1999 10 10	704	0.1+	0.8+
1988 09 11	071	0.4+	1.8+	1998 06 03	704	0.2+	0.6+	1999 10 21	704	0.4+	0.7+
1988 09 16	675	0.2−	0.5−	1998 06 03	704	1.0−	0.6−	1999 10 21	704	0.8+	0.0
1988 09 16	675	0.1+	0.5−	1998 06 03	704	0.2+	0.4−	1999 10 21	704	0.5+	0.4+
1988 09 16	675	0.8−	0.4−	1998 06 03	704	0.9−	0.9+	1999 10 21	704	0.1+	0.1+
1988 09 16	675	0.4+	1.4−	1998 06 21	688	0.1+	0.0	1999 10 21	704	0.0	0.8−
1988 10 07	675	0.2+	1.1−	1998 06 21	688	0.3+	0.1−	1999 11 04	704	0.1+	0.1−
1988 10 07	675	0.7+	1.7−	1998 06 21	688	0.5+	0.0	1999 11 04	704	0.0	0.3−
1988 10 09	675	1.0+	1.6−	1998 06 24	704	0.1+	1.9+	1999 11 04	704	0.2+	0.1+
1988 10 09	675	0.2+	2.4−	1998 06 24	704	1.0+	0.4−	1999 11 04	704	0.2+	0.3−
1992 08 14	493	(3.2+	0.6+)	Y 1998 06 24	704	0.1−	0.4+	1999 11 04	704	0.5+	0.1−
1992 08 14	493	1.2−	0.4+	Y 1998 06 24	704	0.1+	0.3+	1999 11 16	703	0.6−	0.9+
1998 05 22	704	0.3+	0.4−	1998 06 24	704	0.8+	0.6+	1999 11 16	703	0.5−	0.9+
1998 05 22	704	0.8−	0.7+	1998 06 26	704	1.3+	0.1−	1999 11 16	703	0.6−	0.9+
1998 05 22	704	0.6−	0.1−	1998 06 26	704	0.5+	0.2+	1999 11 16	703	0.4−	0.9+
1998 05 22	704	0.9+	0.4+	1998 06 26	704	1.2−	0.6+				
1998 05 22	704	0.1+	0.2+	1998 06 26	704	0.1+	0.1+				

(12247)* 1988 RO₁₁ = 1978 WY₁₅

Discovered 1988 Sept. 14 by S. J. Bus at Cerro Tololo.

Id. S. J. Bus (*MPC* 19022)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

				Williams			
<i>M</i>	357.86987		(2000.0)	<i>P</i>		<i>Q</i>	
<i>n</i>	0.18652968	<i>ω</i>	0.14868	+0.92402019		−0.38224803	
<i>a</i>	3.0336869	<i>Ω</i>	22.33029	+0.35077022		+0.83860440	
<i>e</i>	0.1874619	<i>i</i>	1.28961	+0.15214116		+0.38810964	
<i>P</i>	5.28	<i>H</i>	13.8	<i>G</i>	0.15	<i>U</i>	1

Residuals in seconds of arc

1978 11 30	675	1.1+	0.2+	1999 10 10	704	0.4−	0.4+	1999 11 04	704	0.8+	0.2−
1978 12 01	675	0.1+	0.4+	1999 10 10	704	0.6−	0.4+	1999 11 04	704	1.0+	0.2−
1988 09 14	807	0.4+	0.4−	1999 10 10	704	0.1−	0.1+	1999 11 04	704	0.6+	0.3−
1988 09 15	807	0.5+	0.5−	1999 10 10	704	0.6−	0.3+	1999 11 04	704	1.0+	0.7+
1988 10 06	807	0.1−	0.3+	1999 10 10	704	0.6−	0.1+	1999 11 04	704	(3.1+	0.4+)
1988 10 07	807	0.5−	0.3−	1999 10 10	691	0.0	0.2−	1999 11 09	704	0.3−	0.5+
1988 11 04	807	1.5−	2.4−	1999 10 10	691	0.0	0.5+	1999 11 09	704	0.8+	0.9+
1988 11 06	807	0.2−	0.0	1999 10 10	691	0.1+	0.0	1999 11 09	704	1.4−	0.0
1993 08 13	675	0.4+	0.6+	1999 10 12	106	0.7−	0.0	1999 11 09	704	0.0	0.5+
1993 08 13	675	0.3+	1.4+	1999 10 12	106	0.8−	0.3−	1999 11 11	703	0.6−	0.1−
1994 11 27	010	0.2−	0.1+	1999 10 12	106	0.6−	0.1+	1999 11 11	703	0.5−	0.5+

1994 11 27	010	0.7−	0.8+	1999 10 21	704	0.4+	0.1−	1999 11 11	703	0.7−	0.3+
1994 11 28	010	0.9−	0.6−	1999 10 21	704	0.1−	0.4−	1999 11 11	703	0.5−	0.1+
1994 11 28	010	1.4−	0.3−	1999 10 21	704	0.4+	0.0	1999 11 14	704	0.5+	0.3+
1994 11 28	010	0.5+	0.4+	1999 10 21	704	0.2+	0.1−	1999 11 14	704	0.4+	0.2+
1994 11 29	010	0.6+	0.8−	1999 10 21	704	0.4−	0.5−	1999 11 14	704	0.2+	0.2−
1999 10 03	691	0.1+	0.4−	1999 10 29	703	0.4−	0.0	1999 11 14	704	0.2+	0.0
1999 10 03	691	0.1+	0.5−	1999 10 29	703	0.5−	0.1+	1999 11 14	704	0.2−	0.0
1999 10 03	691	0.2+	0.5−	1999 10 29	703	0.3−	0.0	1999 11 16	704	0.6+	0.0
1999 10 05	704	1.2+	0.2−	1999 10 29	703	0.5+	0.2−	1999 11 16	704	0.1+	0.0
1999 10 05	704	0.1−	1.2+	1999 10 29	691	0.1−	0.1−	1999 11 16	704	0.3+	0.3−
1999 10 05	704	0.8−	0.2+	1999 10 29	691	0.2−	0.1+	1999 11 16	704	0.4+	0.0
1999 10 05	704	1.5−	0.8−	1999 10 29	691	0.0	0.2−	1999 11 16	704	0.5+	0.2−

(12248)* 1988 RX₁₂ = 1992 JF₄

Discovered 1988 Sept. 14 by S. J. Bus at Cerro Tololo.

Id. G. V. Williams (*MPC* 22590)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

				Williams			
<i>M</i>	20.93484		(2000.0)	<i>P</i>		<i>Q</i>	
<i>n</i>	0.18821003	<i>ω</i>	167.26952	+0.99872383		−0.02708283	
<i>a</i>	3.0156033	<i>Ω</i>	194.48698	+0.01604834		+0.97049546	
<i>e</i>	0.1106957	<i>i</i>	9.81149	+0.04788701		+0.23959359	
<i>P</i>	5.24	<i>H</i>	13.1	<i>G</i>	0.15	<i>U</i>	1

Residuals in seconds of arc

1951 08 07	675	2.3−	0.5+	1994 11 07	675	0.2+	1.5−	1999 10 10	704	0.2−	0.4−
1951 08 07	675	1.4+	1.4+	1994 11 07	675	(0.4−	3.3−)	1999 10 10	704	0.2+	0.8−
1951 09 22	675	0.6+	0.7−	1997 04 11	809	0.6+	1.0+	1999 10 10	704	0.7−	0.5−
1951 09 22	675	0.5−	0.6−	1997 04 11	809	0.8+	1.1+	1999 10 20	704	0.2−	0.1−
1988 09 11	675	0.7−	1.3−	1997 04 11	809	0.3−	1.6+	1999 10 20	704	0.1−	0.2+
1988 09 11	675	0.1+	1.3−	1997 04 12	809	1.3+	0.4−	1999 10 20	704	0.4−	0.1+
1988 09 14	807	0.0	1.6+	1997 04 12	809	1.6+	0.1−	1999 10 20	704	0.0	0.3−
1988 09 15	807	0.0	1.7+	1997 04 12	809	1.0+	0.0	1999 10 20	704	0.4−	0.2+
1988 09 16	675	0.5+	0.3−	1998 06 25	704	1.5−	0.0	1999 11 05	704	0.7+	0.2−
1988 09 16	675	1.1+	0.1−	1998 06 25	704	0.9−	0.7−	1999 11 05	704	(2.2+	1.7−)
1988 10 05	807	0.6+	0.6−	1998 06 25	704	0.3−	0.1−	1999 11 05	704	0.3−	0.3−
1988 10 07	807	0.9+	0.1+	1998 06 25	704	0.1−	1.8−	1999 11 05	704	0.3−	0.5−
1988 11 03	807	1.5+	0.2−	1999 10 07	704	0.5+	1.1+	1999 11 12	699	0.2−	0.3+
1988 11 05	807	0.5+	0.6+	1999 10 07	704	0.4−	0.2−	1999 11 12	699	0.5−	0.8+
1991 02 09	675	1.1−	1.6−	1999 10 07	704	0.1+	0.9+	1999 11 12	699	0.1+	0.5+
1991 02 09	675	(1.7−	2.7−)	1999 10 08	703	0.5−	1.0+	1999 11 16	703	0.1−	0.5+
1991 02 10	675	(2.8−	0.6−)	1999 10 08	703	0.2−	0.5+	1999 11 16	703	0.2+	0.4+
1992 05 06	691	1.2−	0.6+	1999 10 08	703	0.1−	0.7+	1999 11 16	703	0.1+	0.6+
1992 05 06	691	0.9−	0.4+	1999 10 08	703	0.0	0.7+	1999 11 16	703	0.1+	0.4+
1994 11 05	675	0.7−	0.5−	1999 10 10	704	0.2+	0.7+				
1994 11 05	675	0.6+	0.5−	1999 10 10	704	0.2+	0.2−				

(12249)* 1988 SH₂ = 1978 TJ₇

Discovered 1988 Sept. 16 by S. J. Bus at Cerro Tololo.

Id. G. V. Williams (*MPC* 29096)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

M	49.07500		(2000.0)	P	Q
n	0.18981653	ω	225.04242	+0.88606921	+0.42460061
a	2.9985643	Ω	109.00322	-0.35029892	+0.87611344
e	0.1175969	i	11.34524	-0.30359846	+0.22834089
P	5.19	H	12.6	G 0.15	U 1

1988 11 05	807	0.2+	2.0-	1998 07 16	699	0.1+	0.3+	1999 10 19	704	0.3-	0.4+
1988 11 06	807	0.0	0.4-	1998 08 03	689	1.0-	0.2+	1999 10 19	704	0.2+	0.1-
1988 11 07	807	1.1+	1.4-	1998 08 04	689	0.0	0.3-	1999 10 19	704	0.5+	0.1-
1993 07 21	675	0.9-	0.1-	1998 08 17	704	0.1-	0.2-	1999 10 19	704	0.8+	0.0
1993 08 15	675	1.3-	0.1-	1998 08 17	704	0.2+	0.1+	1999 11 05	704	0.1-	0.4+
1993 08 15	675	0.9-	0.2+	1998 08 17	704	1.2+	0.5-	1999 11 05	704	0.3-	1.3+
1997 03 16	327	0.1-	0.4-	1998 08 17	704	1.1+	1.5-	1999 11 05	704	0.7-	0.5+
1997 03 16	327	0.2-	0.6-	1998 08 17	704	1.7+	0.8-	1999 11 05	704	0.6-	0.6+
1997 03 16	327	0.3+	1.9-	1998 08 23	704	1.0-	1.1+	1999 11 05	704	0.8-	0.8+
1997 05 15	563	0.4+	0.0	1998 08 23	704	(0.1-	2.1+)				
1997 05 15	563	0.9-	0.1-	1998 08 23	704	0.9+	0.1+				

(12250)* 1988 TT = 1991 EQ₈ = 1993 SX₂

Discovered 1988 Oct. 13 by S. Ueda and H. Kaneda at Kushiro.

Id. S. Nakano (*MPC* 24894)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

		Nakano			
<i>M</i>	59.66877	(2000.0)	P	Q	
<i>n</i>	0.18926367	ω	337.23809	+0.94793201	+0.31816349
<i>a</i>	3.0044008	Ω	4.28410	-0.25557409	+0.78626475
<i>e</i>	0.1003655	<i>i</i>	10.82686	-0.19001787	+0.52967890
<i>P</i>	5.21	<i>H</i>	12.9	<i>G</i>	0.15
				<i>U</i>	1

Residuals in seconds of arc

1988 10 03	399	(5.2+	1.9-)	1996 02 21	966	0.7-	0.1-	1998 09 25	704	0.6-	0.1-
1988 10 03	399	(2.4+	0.1-)	1996 02 22	966	0.4+	0.4-	1998 09 25	704	0.5-	0.9-
1988 10 03	399	(4.8+	3.5+)	1996 02 23	966	0.2+	0.4-	1998 09 25	704	0.6+	0.7-
1988 10 08	399	0.1+	1.0-	1996 02 25	596	1.0-	0.6-	1998 09 25	704	0.2+	0.9-
1988 10 13	399	1.8+	1.4-	1996 02 25	596	0.6-	0.5-	1998 09 25	704	0.8+	1.6-
1988 10 13	399	0.6+	0.6-	1996 02 25	596	0.6-	0.6-	1998 10 17	699	1.5-	0.2-
1988 10 13	399	1.4-	1.0-	1996 04 22	566	0.3+	1.7+	1998 10 17	699	1.0-	0.2-
1988 10 15	399	1.0-	0.1+	1996 04 22	566	(0.5+	2.2+)	1998 10 17	699	0.7-	0.0
1988 10 16	399	0.9+	1.3+	1996 04 22	566	0.3+	1.4+	1998 11 18	910	1.4-	1.6-
1988 10 16	399	(3.2+	2.2+)	1998 08 22	566	1.2+	0.7-	1998 11 18	910	1.8-	1.7-
1988 10 18	399	1.1-	0.9-	1998 08 22	566	2.0+	1.0-	1998 11 18	910	1.8-	1.3-
1988 10 18	399	0.6-	0.0	1998 08 22	566	0.3+	1.9-	1998 12 08	704	0.3-	0.5+
1991 03 12	675	0.3+	1.7-	1998 08 23	704	0.2+	0.7+	1998 12 08	704	0.3+	0.0
1991 03 12	675	0.2+	0.7-	1998 08 23	704	0.6+	0.4-	1998 12 08	704	0.4+	0.9+
1993 09 19	675	1.1-	0.0	1998 08 23	704	0.2-	0.6+	1998 12 08	704	0.4+	0.4-
1993 09 19	675	0.1+	1.2+	1998 08 23	704	0.1-	0.3-	1998 12 09	699	0.8-	0.7-
1993 09 19	400	0.6-	1.7+	1998 09 14	704	0.5+	0.2-	1998 12 09	699	1.1-	0.8-
1993 09 21	675	0.6+	0.8+	1998 09 14	704	0.4+	0.3+	1998 12 09	699	0.3-	0.8-
1993 09 21	675	1.1+	0.2-	1998 09 14	704	0.2+	0.9+	1999 10 14	704	0.1+	0.4+
1993 09 21	400	1.6-	0.1-	1998 09 14	704	0.0	1.2+	1999 10 14	704	0.1+	0.4+
1993 09 21	400	(2.4+	0.6+)	1998 09 14	704	0.2+	1.0+	1999 10 14	704	0.6+	0.0
1993 09 23	675	0.9+	2.0+	1998 09 18	704	0.7+	0.5+	1999 10 14	704	0.5+	0.3-
1993 09 23	675	0.2+	1.4+	1998 09 18	704	0.5-	0.4-	1999 11 01	704	0.1+	0.2+
1993 10 10	675	0.1-	0.0	1998 09 18	704	1.3+	0.2+	1999 11 01	704	0.1-	0.3-
1993 10 10	675	0.6+	0.0	1998 09 18	704	0.6+	0.0	1999 11 01	704	0.1-	0.5-
1996 02 16	566	0.6-	0.1+	1998 09 18	704	0.3+	0.5+	1999 11 01	704	0.2+	0.2-
1996 02 16	566	0.2+	0.2+	1998 09 22	699	0.2-	0.6-	1999 11 01	704	0.5+	0.1+
1996 02 16	566	0.6-	0.1+	1998 09 22	699	0.1-	0.3+				
1996 02 21	966	(3.2+	0.3+)	1998 09 22	699	0.1+	1.3+				

(12251)* 1988 TO₁ = 1983 XV

Discovered 1988 Oct. 9 by Y. Oshima at the Gekko Observatory.

Id. H. Oishi (*MPC* 13861)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

		Nakano			
<i>M</i>	355.80330	(2000.0)	P	Q	
<i>n</i>	0.18509123	ω	311.00039	+0.58052655	-0.81310473
<i>a</i>	3.0493842	Ω	103.46149	+0.75969970	+0.52187799
<i>e</i>	0.2500473	<i>i</i>	2.53457	+0.29299366	+0.25788381
<i>P</i>	5.32	<i>H</i>	13.9	<i>G</i>	0.15
				<i>U</i>	1

Residuals in seconds of arc

1983 12 04	046	(2.8+	3.3+)	1993 08 13	675	0.8-	0.5+	1999 10 13	704	0.1-	0.3+
1983 12 04	046	1.5-	0.1+	1993 08 13	675	0.3-	0.8+	1999 10 15	704	0.1+	0.1-
1983 12 05	046	0.9+	1.2-	1993 09 21	675	0.4+	0.1-	1999 10 15	704	0.1+	0.0
1983 12 05	046	0.9-	1.2-	1993 09 21	675	0.0	0.4+	1999 10 15	704	0.1+	0.1+
1983 12 08	046	1.6+	0.1-	1996 03 27	691	0.2+	0.1+	1999 10 15	704	0.4+	0.3+
1983 12 08	046	(3.8-	0.2+)	1996 03 27	691	0.1+	0.1+	1999 10 22	704	0.2-	0.6+
1988 10 09	888	0.9+	1.2+	1996 03 27	691	0.1+	0.1+	1999 10 22	704	0.7+	0.0
1988 10 09	888	1.0+	1.3+	1998 08 17	704	1.2-	0.6+	1999 10 22	704	0.5+	0.3-
1988 10 13	888	0.8-	0.7-	1998 08 17	704	1.0+	1.8+	1999 10 22	704	0.4+	0.1-
1988 10 13	888	1.0-	0.9-	1998 08 17	704	2.0+	0.4+	1999 10 22	704	0.5+	0.3+
1988 10 15	888	0.8-	0.7-	1998 08 17	704	0.3-	1.2-	1999 10 22	888	0.3-	0.1+
1988 10 15	888	0.1-	0.0	1998 08 23	704	1.0-	0.8-	1999 10 22	888	0.5+	0.8-
1988 10 18	046	(2.3-	1.8+)	1998 08 23	704	0.1+	0.7-	1999 11 15	704	1.0+	0.5+
1988 10 18	046	0.8-	1.7+	1998 08 23	704	1.0-	1.8+	1999 11 15	704	0.6+	0.6+
1988 11 02	888	1.1+	0.5-	1998 08 30	699	0.6-	0.7-	1999 11 15	704	0.0	1.7+
1988 11 02	888	1.4+	1.3-	1998 08 30	699	0.0	0.6+	1999 11 15	704	0.7-	1.6+
1988 11 04	046	(2.5-	0.9+)	1998 08 30	699	0.2+	0.4-	1999 11 15	704	1.2-	0.9+
1988 11 04	046	1.4-	0.5-	1999 10 12	704	(3.2+	0.3-)	1999 11 17	704	0.9-	0.8-
1988 11 05	046	1.6+	0.2+	1999 10 12	704	0.2+	0.2+	1999 11 17	704	0.5-	0.3+
1988 11 05	046	0.5-	1.0-	1999 10 12	704	0.9+	0.8-	1999 11 17	704	0.1+	0.6+
1988 11 07	888	0.0	1.0+	1999 10 13	704	0.3-	0.2+	1999 11 17	704	0.5-	0.6+
1988 11 07	888	0.3+	0.3+	1999 10 13	704	0.0	0.6+	1999 11 17	704	0.5-	0.6+
1988 11 10	046	1.5+	2.1-	1999 10 13	704	0.3-	0.1-				
1988 11 10	046	0.8-	1.6-	1999 10 13	704	0.1-	0.1-				

(12252)* 1988 VT₁ = 1996 HY₄

Discovered 1988 Nov. 8 by M. Koishikawa at the Ayashi Station of the Sendai

Observatory.

Id. G. V. Williams (*MPC* 27306)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

		Williams			
<i>M</i>	337.57262	(2000.0)	P	Q	
<i>n</i>	0.17972015	ω	242.89685	+0.50094180	-0.86540737
<i>a</i>	3.1098412	Ω	176.96898	+0.85027360	+0.48966392
<i>e</i>	0.2392933	<i>i</i>	12.32510	+0.16153057	+0.10629831
<i>P</i>	5.48	<i>H</i>	13.0	<i>G</i>	0.15
				<i>U</i>	1

Residuals in seconds of arc

1988 11 08	391	(3.9–	0.3+)	1993 09 18	010	0.0	1.4+	1999 10 09	704	0.6+	0.1–
1988 11 08	391	2.0–	0.8–	1993 09 20	675	0.9+	1.3–	1999 10 09	704	0.1+	0.3–
1988 11 09	391	1.5–	0.9–	1996 04 18	691	0.1–	0.2+	1999 10 19	704	0.2–	0.4–
1988 11 09	391	0.2–	0.0	1996 04 18	691	0.2–	0.0	1999 10 19	704	0.6–	0.8–
1988 11 10	391	0.1–	0.2+	1996 04 18	691	0.2–	0.1–	1999 10 19	704	0.2+	0.8–
1988 11 11	391	(0.5+	3.3+)	1996 04 23	691	0.2+	0.4–	1999 10 19	704	0.3+	1.1–
1988 11 11	391	(4.4+	3.5+)	1996 04 23	691	0.2+	0.5–	1999 10 19	704	0.3–	1.3–
1988 11 15	391	1.6+	0.2–	1996 04 23	691	0.3+	0.4–	1999 10 31	703	0.1–	0.8+
1988 11 15	391	1.6+	1.0–	1998 09 15	910	0.5–	1.0–	1999 10 31	703	0.4–	0.3+
1988 11 29	391	0.7+	1.1–	1998 09 15	910	0.7–	1.2–	1999 10 31	703	0.1+	0.2+
1988 11 29	391	(3.3+	1.9–)	1998 09 15	910	0.2–	1.6–	1999 10 31	703	0.2+	0.3+
1988 12 02	391	1.5–	0.7+	1999 10 09	703	0.1+	0.4+	1999 11 06	704	0.4–	0.3+
1988 12 03	391	1.7+	0.1+	1999 10 09	704	0.5+	0.5+	1999 11 06	704	0.2–	0.1+
1988 12 03	391	1.4–	0.8–	1999 10 09	703	0.1+	0.3+	1999 11 06	704	0.1+	0.4+
1988 12 06	391	0.1+	0.9+	1999 10 09	704	0.1+	0.2–	1999 11 06	704	0.3–	0.1–
1988 12 06	391	0.7+	0.7+	1999 10 09	703	0.0	0.4+	1999 11 06	704	0.0	0.0
1993 09 18	010	0.3+	1.8+	1999 10 09	703	0.1+	0.4+				
1993 09 18	010	0.1–	1.5+	1999 10 09	704	0.2+	0.2+				

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	326.79753		(2000.0)	P	Q
<i>n</i>	0.17501098	ω	144.00543	+0.53047874	-0.84079406
<i>a</i>	3.1653800	Ω	273.72375	+0.75026214	+0.52496842
<i>e</i>	0.1641193	<i>i</i>	6.21151	+0.39458715	+0.13218740
<i>P</i>	5.63	<i>H</i>	12.4	<i>G</i> 0.15	<i>U</i> 1

Residuals in seconds of arc

1988 11 03	054	0.0	0.5-	1999 10 12	704	0.3+	0.2-	1999 11 04	704	0.9+	0.0
1988 11 03	054	0.1-	0.3+	1999 10 12	704	0.4-	0.5-	1999 11 04	704	0.5+	0.2+
1988 11 04	054	0.1+	0.3-	1999 10 12	704	0.0	0.5-	1999 11 04	704	0.6+	0.1+
1988 12 07	054	0.0	0.2+	1999 10 12	704	0.1+	0.6-	1999 11 04	704	0.5+	0.4+
1994 12 09	411	1.2-	0.2+	1999 10 12	704	0.2-	0.7-	1999 11 04	703	0.2+	0.4+
1994 12 09	411	0.1+	0.2-	1999 10 12	704	0.3+	0.4-	1999 11 04	704	0.4+	1.0+
1994 12 10	411	0.2-	0.0	1999 10 12	704	0.0	0.3-	1999 11 04	703	0.1-	0.5+
1994 12 10	411	0.2-	0.2+	1999 10 12	704	0.1+	0.2-	1999 11 04	703	0.1+	0.2+
1994 12 28	411	0.6+	0.8-	1999 10 12	704	0.4-	0.6-	1999 11 04	703	0.4+	0.2+
1994 12 28	411	0.3+	0.5-	1999 10 12	704	0.0	0.5-	1999 11 04	631	0.0	0.2+
1994 12 29	411	0.1+	0.8-	1999 10 13	611	0.4-	0.0	1999 11 04	631	0.3-	0.2+
1994 12 29	411	0.0	0.5-	1999 10 13	611	0.2-	0.2+	1999 11 08	631	0.7+	0.3+
1994 12 29	411	0.1-	0.6-	1999 10 18	636	0.4-	0.3+	1999 11 08	631	0.2+	0.6+
1998 08 17	704	0.0	0.3-	1999 10 18	636	0.6-	0.7+	1999 11 11	703	0.2+	0.3+
1998 08 17	704	0.2+	1.2-	1999 10 18	636	0.6-	0.3+	1999 11 11	703	0.1+	0.1+
1998 08 17	704	0.2-	0.6-	1999 10 19	636	0.0	0.1+	1999 11 11	703	0.1+	0.2-
1998 08 17	704	0.8+	0.4-	1999 10 19	636	0.1-	0.1-	1999 11 11	703	0.5+	0.4+
1999 10 03	704	0.1+	1.0-	1999 10 19	636	0.1-	0.1+	1999 11 12	699	0.2+	0.3+
1999 10 03	704	0.4-	1.1-	1999 10 28	703	0.1+	0.8+	1999 11 12	699	0.5-	0.9+
1999 10 03	704	0.9-	1.0-	1999 10 28	703	0.0	0.6+	1999 11 12	699	0.1+	0.5+
1999 10 03	704	0.7-	0.9-	1999 10 28	703	0.1-	0.6+				
1999 10 03	704	1.2-	1.2-	1999 10 28	703	0.1+	0.5+				

(12254)* 1988 XJ₁ = 1977 XG₃

Discovered 1988 Dec. 7 by T. Hioki and N. Kawasato at Okutama.

Id. E. Bowell (*MPC* 20816)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	1.19549		(2000.0)	P	Q
<i>n</i>	0.17658880	ω	317.48524	+0.83783170	-0.49676949
<i>a</i>	3.1464967	Ω	73.62866	+0.54246683	+0.71092467
<i>e</i>	0.0509020	<i>i</i>	13.64880	+0.06138226	+0.49780136
<i>P</i>	5.58	<i>H</i>	12.6	<i>G</i> 0.15	<i>U</i> 1

Residuals in seconds of arc

1954 09 08	675	0.8+	0.1-	1993 10 09	376	0.5-	0.6-	1999 10 10	704	0.3-	0.5-
1954 09 08	675	0.2+	0.1+	1993 10 14	675	0.6+	0.0	1999 10 10	704	1.4-	0.6+
1977 12 07	675	0.1-	0.0	1995 01 04	010	0.1+	0.1-	1999 10 20	704	0.5+	0.2-
1977 12 08	675	0.1-	0.4-	1995 01 04	010	0.2-	0.2+	1999 10 20	704	0.0	0.7-
1988 12 05	381	0.4+	0.0	1995 01 04	010	0.7-	0.4+	1999 10 20	704	0.2+	0.4-
1988 12 06	381	0.6+	0.5+	1995 01 04	010	0.2-	0.4-	1999 10 20	704	0.5+	0.7-
1988 12 07	381	0.6+	0.4-	1995 01 05	010	0.1-	1.4-	1999 10 20	704	0.2+	0.6-
1988 12 07	877	(3.7-	2.8+)Y	1995 01 05	010	0.0	1.3-	1999 11 05	704	0.3+	0.0
1988 12 07	877	(4.7-	3.2+)Y	1996 04 13	376	1.5+	0.7-	1999 11 05	704	0.2+	0.0
1988 12 08	381	1.9+	0.2-	1996 04 13	376	0.6+	0.7+	1999 11 05	704	0.5+	0.2-
1988 12 11	877	2.4-	0.7+	1997 06 07	376	0.1+	0.3+	1999 11 05	704	0.8+	0.5+
1988 12 11	877	1.5-	1.9+	1997 06 07	376	0.9-	0.1+	1999 11 12	699	0.2+	0.2+
1988 12 14	877	2.1-	1.1-	1999 10 08	703	0.4-	0.8+	1999 11 12	699	0.0	0.3+
1988 12 14	877	1.4-	2.2+	1999 10 08	703	0.2+	0.8+	1999 11 12	699	0.1+	0.2+
1993 09 14	376	1.8-	0.9+	1999 10 08	703	0.0	0.4+	1999 11 16	703	0.0	0.2+
1993 09 14	376	0.2-	1.0+	1999 10 08	703	0.3+	0.5+	1999 11 16	703	0.0	0.3+
1993 09 21	675	1.4+	0.0	1999 10 10	704	1.2+	0.3-	1999 11 16	703	1.7-	0.7-
1993 09 21	675	1.3+	0.0	1999 10 10	704	0.5+	0.2-	1999 11 16	703	1.4+	0.5-
1993 10 09	376	1.4-	1.0-	1999 10 10	704	0.0	0.7-				

(12255)* 1988 XR₁ = 1997 FK₁

Discovered 1988 Dec. 7 by M. Arai and H. Mori at Yorii.

Id. G. V. Williams (*MPC* 29912)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	332.76880		(2000.0)	P	Q
<i>n</i>	0.27002958	ω	339.73166	+0.46849536	-0.87447734
<i>a</i>	2.3706193	Ω	82.15161	+0.82704560	+0.38408164
<i>e</i>	0.1065777	<i>i</i>	7.29006	+0.31065684	+0.29626115
<i>P</i>	3.65	<i>H</i>	13.5	<i>G</i> 0.15	<i>U</i> 1

Residuals in seconds of arc

1988 12 07	875	(2.7-	3.5-)	1997 04 05	124	0.7-	1.3+	1999 11 01	681	0.2-	0.1+
1988 12 07	875	(4.5-	3.2-)	1997 04 10	132	1.1-	0.6+	1999 11 01	681	0.2+	0.6+
1988 12 07	054	0.4+	1.0+	1997 04 10	132	1.0-	0.0	1999 11 04	704	0.8-	0.2+
1988 12 07	054	0.6+	0.6-	1997 04 11	132	0.6+	0.4-	1999 11 04	704	0.4-	0.2+
1988 12 14	875	0.5+	1.2-	1998 06 17	148	0.0	0.3+	1999 11 04	704	1.0-	0.0
1988 12 14	875	(3.2-	2.1-)	1998 06 17	148	0.2-	0.6+	1999 11 04	704	1.0-	0.4-
1988 12 16	875	(3.0+	0.7-)	1998 06 17	148	(2.7-	1.8+)	1999 11 04	704	0.7-	0.1-
1988 12 16	875	1.0-	0.6-	1998 06 26	704	0.5+	1.4-	1999 11 15	704	0.1+	0.0
1997 03 29	124	0.5-	0.1-	1998 06 26	704	0.6+	1.6+	1999 11 15	704	0.1+	0.0
1997 03 29	124	0.1+	0.1-	1998 06 26	704	1.0-	0.9+	1999 11 15	704	0.1+	0.0
1997 03 29	124	0.1+	0.1-	1999 10 10	704	1.5-	1.7-	1999 11 15	704	0.2+	0.1+
1997 03 30	124	0.1+	0.3+	1999 10 10	704	1.6+	1.8-	1999 11 15	704	0.1+	0.0
1997 03 30	124	0.8+	0.2+	1999 10 10	704	1.9+	0.1+	1999 11 17	704	0.1+	0.4+
1997 03 30	124	0.7-	0.0	1999 10 21	704	0.7+	0.6-	1999 11 17	704	0.1+	0.3+
1997 03 31	627	0.2+	0.1-	1999 10 21	704	0.4+	1.3+	1999 11 17	704	0.5+	0.7+
1997 03 31	627	1.0+	0.5-	1999 10 21	704	0.1+	0.6+	1999 11 17	704	0.0	0.7+
1997 03 31	627	0.3+	1.0-	1999 10 21	704	0.8-	0.6+	1999 11 17	704	0.2+	0.8+
1997 04 05	124	0.7-	0.4+	1999 10 30	681	0.2-	0.2+				
1997 04 05	124	1.8+	0.6+	1999 10 30	681	0.3-	0.2+				

(12256)* 1989 CJ₈

Discovered 1989 Feb. 8 by H. Debehogne at the European Southern

Observatory.

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	209.23636		(2000.0)	P	Q
<i>n</i>	0.25434873	ω	66.00689	-0.85029496	+0.51921273
<i>a</i>	2.4670787	Ω	145.09506	-0.52080043	-0.80645187
<i>e</i>	0.1942904	<i>i</i>	8.65603	-0.07593019	-0.28293732
<i>P</i>	3.88	<i>H</i>	13.7	<i>G</i> 0.15	<i>U</i> 1

Residuals in seconds of arc

1989 02 08	809	0.6-	0.0	1993 02 26	411	1.7+	1.6+	1998 09 13	699	0.5+	0.6-
1989 02 08	809	0.3-	0.0	1993 04 15	675	0.7-	1.9+	1998 09 13	699	0.4+	0.7-
1989 02 08	809	0.0	0.1+	1993 04 15	675	0.9-	1.8+	1998 09 14	704	0.3-	1.0-
1989 02 09	809	0.6-	0.3-	1997 03 19	327	0.2+	0.3-	1998 09 14	704	1.4-	0.7-
1989 02 09	809	0.4-	0.4-	1997 03 19	327	0.2+	0.2-	1998 09 14	704	1.2-	0.7-
1989 02 09	809	0.3-	0.3-	1997 03 19	327	0.1-	0.4-	1998 09 14	704	1.1-	0.9-
1989 02 10	809	0.3-	1.0+	1997 03 22	327	0.2+	0.1+	1998 09 18	704	0.6+	0.3-
1989 02 10	809	0.1-	1.0+	1997 03 22	327	0.0	0.0	1998 09 18	704	1.8-	0.5-
1989 02 10	809	0.1+	1.0+	1997 03 22	327	0.2+	0.1-	1998 09 18	704	0.3+	1.1-
1989 02 11	809	0.9-	0.2-	1997 03 23	327	0.3-	0.1-	1998 09 18	704	0.1+	0.3-
1989 02 11	809	0.8-	0.2-	1997 03 23	327	0.2+	0.3+	1998 09 18	704	0.0	0.0
1989 02 11	809	0.6-	0.3-	1997 03 23	327	0.1+	0.3+	1998 09 27	704	1.1-	0.0
1989 02 11	809	0.3-	0.5+	1997 04 01	127	0.1+	0.2+	1998 09 27	704	1.0+	0.5+
1989 02 11	809	0.1-	0.6+	1997 04 01	127	0.0	0.5+	1998 09 27	704	1.3-	0.6+
1989 02 11	809	0.1+	0.6+	1997 04 06	127	0.1+	0.5+	1998 09 27	704	0.1+	0.0
1989 02 12	809	0.4-	0.1+	1997 04 06	127	0.3+	0.8+	1998 09 27	699	0.3-	0.3+
1989 02 12	809	0.2-	0.0	1997 04 09	127	(0.2+	2.1+)	1998 09 27	704	0.9-	0.3-
1989 02 12	809	0.3-	0.3+	1997 04 09	127	0.3+	1.7+	1998 09 27	699	1.0-	0.6+
1989 02 17	809	0.9-	0.1-	1997 05 09	962	0.6-	0.8+	1998 09 27	699	0.1+	0.7+

1989 03 01	809	0.8+	2.0-	1998 08 26	809	0.7+	0.7+	1999 10 20	704	0.6-	0.5-
1989 03 01	809	1.2+	1.9-	1998 08 26	809	0.4+	0.7+	1999 11 05	704	0.4-	0.7+
1989 03 01	809	1.2+	1.8-	1998 08 26	809	0.7+	0.8+	1999 11 05	704	0.1-	0.4+
1993 02 25	411	0.1+	0.9+	1998 08 27	809	0.9+	1.4+	1999 11 05	704	0.4-	0.3+
1993 02 25	411	0.7+	0.2+	1998 08 27	809	1.8+	1.0+	1999 11 05	704	0.7-	1.1+
1993 02 26	411	0.8+	0.8+	1998 08 27	809	1.8+	0.9+	1999 11 05	704	0.7-	0.6+
1993 02 26	411	1.3+	0.2+	1998 09 13	699	0.6+	0.1-				

(12257)* 1989 GL₄ = 1993 FK₃₂

Discovered 1989 Apr. 3 by E. W. Elst at the European Southern Observatory.
Id. G. V. Williams (*MPC* 23514)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	169.37559		(2000.0)		P		Q
<i>n</i>	0.24322565	ω	27.71426	-0.61691539			+0.78101432
<i>a</i>	2.5417323	Ω	204.58267	-0.75836876			-0.62290405
<i>e</i>	0.1235110	<i>i</i>	13.50056	-0.21045716			-0.04480143
<i>P</i>	4.05	<i>H</i>	14.1	<i>G</i>	0.15	<i>U</i>	1

Residuals in seconds of arc

1989 04 03	809	2.1-	0.7-	1997 07 04	691	0.1-	1.4-	1999 10 20	704	0.1+	0.1-
1989 04 03	809	1.1-	0.1+	1998 08 24	704	0.3-	0.3-	1999 10 20	704	0.3+	0.2-
1989 04 03	809	0.6-	0.4-	1998 08 24	704	0.2+	1.1+	1999 10 20	704	0.2-	0.3-
1989 04 05	809	0.1+	0.3-	1998 08 24	704	0.9+	0.1+	1999 10 20	704	0.9+	0.0
1989 04 05	809	0.2+	0.1-	1998 08 24	704	0.9+	0.7-	1999 10 20	704	0.4+	0.3-
1989 04 09	809	0.6+	0.3+	1998 08 24	704	0.9-	0.9-	1999 11 05	704	0.4-	0.3+
1989 04 09	809	0.6+	0.8+	1998 08 27	704	0.5-	0.4+	1999 11 05	704	0.8-	0.3+
1989 04 09	809	1.6+	0.4+	1998 08 27	704	0.8+	0.5+	1999 11 05	704	0.5-	0.7-
1993 03 21	809	(0.5-	4.8+)	1998 08 27	704	0.7-	0.7+	1999 11 05	704	0.3-	0.0
1993 03 22	809	(1.7+	2.3+)	1998 08 27	704	0.7-	0.1+	1999 11 05	704	0.5-	0.5+
1993 03 26	809	1.9+	1.1+	1998 09 18	699	0.1+	0.2-	1999 11 16	703	0.1-	0.2+
1993 04 17	413	(4.0-	0.6+)	1998 09 18	699	0.1+	0.8-	1999 11 16	703	0.5+	0.4+
1997 06 04	566	0.9-	0.1-	1998 09 18	699	0.2+	0.3+	1999 11 16	703	0.3+	0.2-
1997 06 04	566	0.1-	0.2-	1999 10 10	704	(2.3-	1.6+)	1999 11 16	703	1.2-	0.0
1997 06 04	566	0.1-	0.0	1999 10 10	704	0.7+	0.0				
1997 07 04	691	0.3-	0.8-	1999 10 10	704	0.8+	0.4-				

(12258)* 1989 GN₄ = 1994 RF₂

Discovered 1989 Apr. 3 by E. W. Elst at the European Southern Observatory.
Id. G. V. Williams (*MPC* 23972)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	139.04246		(2000.0)		P		Q
<i>n</i>	0.23570030	ω	345.83002	-0.53088698			+0.84616590
<i>a</i>	2.5955494	Ω	252.08575	-0.77267723			-0.50585546
<i>e</i>	0.1390192	<i>i</i>	2.80114	-0.34803580			-0.16767087
<i>P</i>	4.18	<i>H</i>	14.2	<i>G</i>	0.15	<i>U</i>	1

Residuals in seconds of arc

1989 04 03	809	0.7-	0.2+	1998 06 26	704	0.3-	0.2+	1999 11 04	704	0.4+	0.1+
1989 04 03	809	0.6-	0.1-	1998 06 26	704	0.3-	0.3-	1999 11 04	704	1.4-	0.3+
1989 04 03	809	0.2-	0.4+	1998 06 26	704	0.2+	0.1-	1999 11 14	704	0.7+	0.1-
1989 04 05	809	0.2+	0.2+	1998 06 26	704	0.2+	0.9-	1999 11 14	704	0.6-	0.8+
1989 04 05	809	0.3-	1.8+	1998 08 17	704	0.4+	0.3-	1999 11 14	704	0.7+	0.4+
1989 04 09	809	1.5+	0.6+	1998 08 17	704	0.0	0.3-	1999 11 14	704	1.0+	0.2-
1989 04 09	809	1.2+	0.4+	1998 08 17	704	1.4+	0.3-	1999 11 14	704	0.7-	0.4-
1989 04 09	809	0.8+	0.7+	1998 08 17	704	1.5-	0.5-	1999 11 15	704	0.9+	0.2+
1994 09 01	691	0.3-	0.2+	1998 08 17	704	0.5-	0.3+	1999 11 15	704	0.3-	0.4+
1994 09 01	691	0.3+	0.7-	1999 10 10	704	0.0	0.2+	1999 11 15	704	0.7+	0.1-
1994 09 01	691	0.6-	0.3+	1999 10 10	704	0.1+	0.4-	1999 11 15	704	0.5+	0.2-
1994 09 08	691	0.1+	0.6+	1999 10 10	704	0.9-	0.2+	1999 11 15	704	0.6+	0.7+
1994 09 08	691	0.3+	0.3+	1999 10 10	704	0.3-	0.1+	1999 11 16	704	0.5+	0.6+
1994 09 08	691	0.4+	0.4+	1999 10 10	704	0.7-	0.5+	1999 11 16	704	1.5+	1.0+
1995 11 21	691	0.6-	0.4-	1999 10 21	704	1.4-	1.2+	1999 11 16	704	0.6-	0.5+
1995 11 21	691	0.4-	0.5-	1999 10 21	704	0.8-	0.3+	1999 11 16	704	0.2-	0.1+
1995 11 21	691	0.6-	0.5-	1999 10 21	704	0.0	0.3+	1999 11 16	704	0.9-	0.9+
1998 06 02	699	1.4-	1.0-	1999 10 30	691	1.8+	0.1+	1999 11 17	704	1.0-	1.3-

1998 06 02	699	1.5-	0.1+	1999 10 30	691	0.4+	0.0	1999 11 17	704	0.3+	0.0
1998 06 02	699	0.7-	0.6+	1999 10 30	691	0.5+	0.1+	1999 11 17	704	0.1+	1.1-
1998 06 23	699	1.3+	1.9+	1999 11 04	704	0.0	0.7+	1999 11 17	704	0.3-	0.2+
1998 06 23	699	0.3+	0.9+	1999 11 04	704	0.7-	0.3-				
1998 06 23	699	1.0+	0.5+	1999 11 04	704	0.3-	0.6+				

(12259)* 1989 SZ₁ = A920 HH = 1953 RY₁ = 1985 JU

Discovered 1989 Sept. 26 by E. W. Elst at the European Southern Observatory.

Id. S. Nakano (*MPC* 16030), G. V. Williams (*MPC* 31527)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	108.12230		(2000.0)		P		Q
<i>n</i>	0.30291506	ω	102.08200	-0.15596869			+0.98741397
<i>a</i>	2.1957799	Ω	158.89081	-0.93221397			-0.13836993
<i>e</i>	0.1602484	<i>i</i>	4.17481	-0.32657448			-0.07659901
<i>P</i>	3.25	<i>H</i>	14.6	<i>G</i>	0.15	<i>U</i>	2

Residuals in seconds of arc

1920 04 17	029	(7.5+	5.5+)	Y	1998 04 21	704	0.2+	0.2+	1999 10 08	703	0.0	0.6+
1953 09 06	675	0.1+	1.0+		1998 04 21	704	0.5-	0.2-	1999 10 08	703	0.2+	0.0
1953 09 06	675	0.7-	0.7+		1998 04 21	704	0.1+	0.8+	1999 10 08	703	0.4-	0.6-
1985 05 11	675	0.2+	0.4-		1998 04 21	113	1.5-	0.3+	1999 10 10	704	0.1+	0.2+
1985 05 13	675	0.1-	0.0		1998 04 21	113	1.8-	0.1-	1999 10 10	704	0.2+	0.1-
1989 09 26	809	0.0	0.6-		1998 04 22	704	0.8-	0.2-	1999 10 10	704	1.0-	1.0-
1989 09 26	809	0.1+	1.4-		1998 04 22	704	0.2-	0.4-	1999 10 10	704	0.1-	0.1+
1989 09 26	809	0.8+	1.0-		1998 04 22	704	0.1+	0.4-	1999 10 20	704	0.2-	0.4+
1989 09 28	809	1.4+	0.1+		1998 04 22	704	1.0-	0.3-	1999 10 20	704	0.1-	0.2+
1989 09 28	809	0.0	0.3+		1998 04 22	704	0.6-	0.6+	1999 10 20	704	0.5-	0.2+
1989 09 28	809	(0.7-	2.4-)		1998 04 30	566	0.3+	1.3-	1999 10 20	704	0.2+	0.0
1989 10 03	809	(3.5+	0.4-)		1998 04 30	566	0.3+	0.8-	1999 10 20	704	0.5-	0.0
1989 10 03	809	(2.6+	1.3-)		1998 04 30	566	0.4+	1.5-	1999 11 01	703	0.1+	0.8+
1989 10 03	809	(2.4+	1.3-)		1998 05 01	704	0.1-	0.2+	1999 11 01	703	0.0	0.4+
1989 11 02	675	0.8+	1.3-		1998 05 01	704	0.1-	0.5+	1999 11 01	703	0.1-	0.4-
1989 11 02	675	1.2-	0.6-		1998 05 01	704	0.1-	0.1+	1999 11 01	703	0.3-	0.7+
1989 11 05	675	0.6+	1.1-		1998 05 01	704	0.0	1.2+	1999 11 05	704	0.5+	0.3-
1989 11 05	675	0.3-	1.2-		1998 05 01	704	0.1+	0.8+	1999 11 05	704	0.5+	0.3-
1998 03 26	721	0.2+	0.9-		1998 05 25	699	0.4+	0.5-	1999 11 05	704	1.2+	0.4+
1998 03 26	721	0.4+	0.2+		1998 05 25	699	0.9+	0.0	1999 11 05	704	0.4+	0.2+
1998 03 28	721	0.8+	0.1-		1998 05 25	699	1.6+	0.1-	1999 11 05	704	0.8+	0.3-
1998 03 28	721	0.7+	0.6-		1998 06 17	704	0.3+	0.2+	1999 11 17	704	0.3+	0.6+
1998 04 20	113	1.1-	0.0		1998 06 17	704	(2.6+	2.0+)	1999 11 17	704	0.3-	0.1+
1998 04 20	113	1.0-	0.1+		1998 06 17	704	(2.6+	4.2+)	1999 11 17	704	0.3-	0.4+
1998 04 21	704	0.6+	0.6-		1998 06 17	704	1.9+	0.6+	1999 11 17	704	0.2-	0.5+
1998 04 21	704	0.3-	0.2-		1999 10 08	703	1.3-	0.3-	1999 11 17	704	0.1-	0.3+

(12260)* 1989 SP₁₁ = 1979 SY₈ = 1994 RB₂₉

Discovered 1989 Sept. 30 by H. Debehogne at the European Southern Observatory.

Id. S. Nakano (*MPC* 34177)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	340.74680		(2000.0)		P		Q
<i>n</i>	0.19572964	ω	57.49690	+0.99791675			-0.06337651
<i>a</i>	2.9378638	Ω	306.13396	+0.05303991			+0.91241493
<i>e</i>	0.1232771	<i>i</i>	0.85597	+0.03672763			+0.40432959
<i>P</i>	5.04	<i>H</i>	13.5	<i>G</i>	0.15	<i>U</i>	2

Residuals in seconds of arc

1979 09 24	095	1.0+	0.8+	1999 09 09	704	0.5-	0.2+	1999 09 14	703	0.1-	0.6+
1989 09 30	809	1.5-	1.2-	1999 09 10	704	0.1-	0.1+	1999 09 30	699	0.5-	0.4+
1989 09 30	809	0.9-	0.8-	1999 09 10	704	0.2+	0.3+	1999 09 30	699	0.6-	1.1+
1989 09 30	809	0.7-	0.8-	1999 09 10	704	0.0	0.1+	1999 09 30	699	0.9-	0.8+
1989 10 01	809	0.0	0.2+	1999 09 10	704	0.3+	0.1+	1999 10 02	704	1.9+	0.3-
1989 10 01	809	0.3+	0.2+	1999 09 10	704	0.0	0.3-	1999 10 02	704	2.0+	0.1+
1989 10 01	809	0.6+	0.1+	1999 09 10	704	0.1-	0.1-	1999 10 02	704	0.5+	0.0
1992 03 26	691	0.4-	0.7-	1999 09 10	704	0.6-	0.1+	1999 10 02	704	1.3+	0.3+

1992 03 26	691	0.2-	0.7-	1999 09 10	704	0.6-	0.0	1999 10 02	704	1.2+	0.0
1992 03 26	691	0.4-	0.8-	1999 09 10	704	0.3-	0.3-	1999 10 05	704	1.0+	0.2+
1994 09 01	033	0.5-	0.1-	1999 09 10	620	0.4-	0.5-	1999 10 05	704	0.5+	0.4-
1994 09 02	033	0.9+	0.1+	1999 09 10	620	0.3-	0.4-	1999 10 05	704	1.2-	0.7-
1994 09 04	033	1.4+	0.4-	1999 09 10	620	0.1-	0.2-	1999 10 05	704	1.0+	0.1+
1994 09 11	691	0.4-	0.4+	1999 09 10	620	0.3+	0.3+	1999 10 05	704	0.7-	1.9-
1994 09 11	691	0.2-	0.2+	1999 09 11	704	0.1-	0.1+	1999 10 07	704	0.3+	0.4+
1994 09 11	691	0.0	0.4+	1999 09 11	704	0.1-	0.2+	1999 10 07	704	0.8-	0.4-
1998 05 24	704	0.1+	0.4-	1999 09 11	704	0.2-	0.1+	1999 10 07	704	0.2-	0.4-
1998 05 24	704	(3.1-	0.0)	1999 09 11	704	0.1+	0.2+	1999 10 15	704	1.0+	0.1+
1998 05 24	704	0.7+	0.6-	1999 09 11	704	0.0	0.1+	1999 10 15	704	0.2-	0.5-
1998 05 24	704	0.5-	1.4+	1999 09 11	704	0.2+	0.0	1999 10 15	704	0.1-	0.6-
1998 05 24	704	(3.6-	0.1+)	1999 09 11	704	0.3-	0.2-	1999 10 15	704	0.5-	1.2-
1999 09 07	704	0.6-	0.4-	1999 09 11	704	0.1-	0.2-	1999 10 07	704	0.2-	0.4-
1999 09 07	704	0.4-	0.2-	1999 09 11	704	0.2-	0.0	1999 11 04	703	0.3+	0.6+
1999 09 07	704	0.3-	0.1-	1999 09 11	704	0.1+	0.2-	1999 11 04	703	0.2-	0.9+
1999 09 07	704	0.4-	0.2-	1999 09 11	704	0.0	0.1+	1999 11 04	703	0.3-	0.7+
1999 09 08	704	0.2-	0.8-	1999 09 11	704	0.0	0.1+	1999 11 04	703	0.4+	1.0+
1999 09 08	704	0.3+	0.5-	1999 09 11	704	0.1+	0.0	1999 11 07	704	0.5-	0.5-
1999 09 08	704	0.4-	0.3-	1999 09 11	704	0.4-	0.0	1999 11 07	704	0.3-	0.3-
1999 09 08	704	0.3-	0.3-	1999 09 11	704	0.1+	0.1-	1999 11 07	704	0.0	0.5+
1999 09 08	704	0.0	0.2+	1999 09 14	704	0.4+	0.4-	1999 11 07	704	0.5+	0.8+
1999 09 08	691	0.1-	0.1+	1999 09 14	704	0.0	0.5-	1999 11 07	704	0.2+	0.9+
1999 09 08	691	0.1-	0.3+	1999 09 14	704	0.1+	0.3-	1999 11 12	704	0.6+	0.2+
1999 09 08	691	0.2-	0.2+	1999 09 14	704	0.5+	0.6-	1999 11 12	704	0.2+	0.2-
1999 09 09	704	0.1-	0.0	1999 09 14	704	0.7+	0.4-	1999 11 12	704	0.8+	0.5+
1999 09 09	704	0.5-	0.1-	1999 09 14	703	0.3+	0.6+	1999 11 12	704	1.2+	0.5-
1999 09 09	704	0.0	0.1+	1999 09 14	703	0.4-	0.5+				
1999 09 09	704	0.2+	0.2+	1999 09 14	703	0.0	0.5+				

(12261)* 1989 TY₄ = 1989 SJ₄ = 1992 PG₁

Discovered 1989 Oct. 7 by E. W. Elst at the European Southern Observatory.

Id. S. Nakano (d, *MPC* 16003), B. G. Marsden (*MPC* 20818)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Marsden

M	65.88060		(2000.0)		P	Q	
n	0.29607979	ω	116.11852		+0.17769857	+0.98367541	
a	2.2294456	Ω	164.04041		-0.93574058	+0.17782923	
e	0.1571055	i	5.92615		-0.30465190	+0.02755829	
P	3.33	H	15.2	G	0.15	U	1

Residuals in seconds of arc

1989 09 26	809	1.5+	0.6+	1998 03 20	704	1.1-	0.6+	1998 04 19	704	1.2+	1.1-
1989 09 26	809	0.0	2.1-	1998 03 20	704	0.2+	0.5+	1998 04 19	704	0.3-	0.7-
1989 09 26	809	1.0+	1.2-	1998 03 22	704	0.8+	0.5-	1998 04 19	704	0.7+	1.6-
1989 09 29	675	0.3+	0.4-	1998 03 22	704	0.2-	1.0+	1998 04 19	704	0.7-	1.1-
1989 09 29	675	0.3+	1.4-	1998 03 22	704	0.7-	0.3+	1999 10 03	703	0.3+	1.0+
1989 10 03	809	0.9-	1.2-	1998 03 22	704	0.3-	0.2+	1999 10 03	703	0.3-	0.6+
1989 10 03	809	1.1-	1.9-	1998 03 22	704	0.5-	0.7-	1999 10 03	703	0.1-	1.0-
1989 10 03	809	1.6-	1.0-	1998 03 24	704	0.5-	0.1+	1999 10 03	703	(4.4+	0.6+)
1989 10 07	809	0.4+	0.9-	1998 03 24	704	0.7-	0.2-	1999 10 04	704	0.6-	0.1+
1989 10 07	809	0.1-	1.3-	1998 03 24	704	0.6-	0.3+	1999 10 04	704	0.8-	0.2-
1989 10 07	809	0.5+	0.1-	1998 03 24	704	0.9+	0.1-	1999 10 04	704	0.0	0.3-
1989 10 08	809	2.4+	1.1-	1998 03 24	704	0.6-	0.4-	1999 10 04	704	0.0	0.1-
1989 10 08	809	2.3+	0.8-	1998 03 24	704	0.1-	0.2+	1999 10 07	704	0.1-	0.7+
1989 10 08	809	0.9+	0.1+	1998 03 24	704	0.8-	0.6-	1999 10 07	704	0.5-	0.5-
1992 08 08	010	0.3-	1.3-	1998 03 24	704	0.4+	0.1-	1999 10 07	704	0.1+	0.4+
1992 08 08	010	0.0	0.5-	1998 03 24	704	1.0-	0.0	1999 10 07	704	0.3+	0.0
1992 08 08	010	1.1-	1.4-	1998 03 24	704	0.1+	0.2-	1999 10 07	704	0.2+	1.2+
1992 08 09	010	1.1+	0.5+	1998 03 24	566	0.8-	0.0	1999 10 09	704	0.4+	0.2+
1992 08 09	010	0.2-	0.1-	1998 03 24	566	0.7-	0.1-	1999 10 09	704	0.7+	0.2+
1992 08 09	010	1.7-	1.1-	1998 03 24	566	0.2-	0.1-	1999 10 09	704	0.4+	0.2+
1995 05 31	691	1.8+	0.0	1998 03 28	704	0.8+	0.2-	1999 10 09	704	0.0	0.0
1995 05 31	691	1.3+	0.3-	1998 03 28	704	0.4-	0.1+	1999 10 09	704	0.2+	0.6-
1995 05 31	691	1.2+	0.1-	1998 03 28	704	0.9+	0.8-	1999 11 01	703	0.2-	1.5+
1995 07 05	691	0.5-	0.2+	1998 03 28	704	0.2+	0.4-	1999 11 01	703	0.9-	0.5+
1995 07 05	691	0.6-	0.1+	1998 03 28	704	0.1-	1.4-	1999 11 01	703	0.4-	0.5+
1998 02 25	566	0.5-	1.7-	1998 03 29	704	0.1-	0.3+	1999 11 01	703	0.0	0.5+

1998 02 25	566	0.2-	1.3-	1998 03 29	704	0.8+	0.1-	1999 11 17	704	(0.4+	2.2+)
1998 02 25	566	0.1-	1.1-	1998 03 29	704	0.1+	1.0+	1999 11 17	704	0.6+	1.1+
1998 03 20	704	(3.6+	1.3-)	1998 03 29	704	0.5-	0.9-	1999 11 17	704	(0.4+	2.3+)
1998 03 20	704	0.6-	0.1-	1998 03 29	704	0.4-	0.2+				
1998 03 20	704	1.7-	0.9+	1998 04 19	704	1.4+	0.9-				

(12262)* 1989 UL = 1980 WE₂

Discovered 1989 Oct. 21 by K. Endate and K. Watanabe at Kitami.

Id. H. Kaneda (*MPC* 18293)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Nakano

M	31.69782		(2000.0)		P		Q
n	0.21300040	ω	189.25772		+0.67942427		-0.73142289
a	2.7768288	Ω	217.97841		+0.67911959		+0.65695430
e	0.1381709	i	5.43986		+0.27781153		+0.18284312
P	4.63	H	13.1	G	0.15	U	1

Residuals in seconds of arc

1980 11 30	095	1.1+	0.2+	1998 08 23	704	1.8+	0.0	1998 10 14	699	0.0	0.5-
1980 12 10	095	0.5+	0.1+	1998 08 23	704	1.8+	0.0	1998 10 14	699	0.6-	0.2-
1989 09 30	675	1.5+	1.1-	1998 08 23	704	(1.8+	2.6-)	1998 10 15	704	0.7+	0.2-
1989 09 30	675	0.5+	0.4+	1998 08 23	704	(0.4+	3.3-)	1998 10 15	704	1.1-	0.2-
1989 10 21	400	(2.6+	2.1+)	1998 09 14	704	0.1+	0.1-	1998 10 15	704	0.2-	0.7-
1989 10 21	400	(2.6+	0.6+)	1998 09 14	704	0.8+	0.3+	1998 10 15	704	0.1+	1.2-
1989 10 21	400	(3.9+	2.0+)	1998 09 14	704	1.0-	0.6+	1998 10 15	704	(0.4+	2.5-)
1989 10 22	046	(1.5-	3.2-)	1998 09 14	704	0.8-	0.6+	1998 11 25	699	0.6-	0.7-
1989 10 22	046	(3.8-	3.7-)	1998 09 16	699	0.3+	0.0	1998 11 25	699	0.6-	0.1-
1989 10 23	046	(0.7-	3.1-)	1998 09 16	699	0.4+	0.3+	1998 11 25	699	1.1-	0.0
1989 10 23	046	0.0	1.7-	1998 09 16	699	0.4+	0.3-	1998 12 06	327	0.4-	0.1-
1989 10 24	046	0.7-	1.3-	1998 09 18	704	0.6+	0.1+	1998 12 06	327	0.4-	0.3-
1989 10 24	046	0.6-	1.1+	1998 09 18	704	0.7+	0.4+	1998 12 06	327	0.5-	0.2-
1989 10 25	400	1.6-	0.1-	1998 09 18	704	0.5-	0.6+	1998 12 09	704	0.1-	0.6+
1989 10 25	400	1.5-	1.4+	1998 09 18	704	0.3-	0.1+	1998 12 09	704	0.0	0.9+
1989 10 28	046	(2.8-	0.1-)	1998 09 18	704	0.3-	0.7+	1998 12 09	704	1.2-	0.2+
1989 10 28	046	(3.3-	0.1+)	1998 09 26	704	0.0	1.2+	1998 12 09	704	0.3-	0.7-
1989 10 30	400	1.1-	0.2-	1998 09 26	704	0.7+	0.5+	1998 12 09	704	0.2-	0.1+
1989 10 30	400	(1.9-	3.7+)	1998 09 26	704	0.9-	0.4+	1999 01 13	699	0.3+	0.0
1989 11 03	675	0.1+	2.0-	1998 09 26	704	0.3-	1.1+	1999 01 13	699	0.1+	1.1-
1989 11 03	675	0.5+	1.7-	1998 09 26	704	0.5+	0.5+	1999 01 13	699	1.1-	1.0+
1989 11 04	675	0.5+	1.2-	1998 09 27	699	0.8+	0.8+	1999 10 20	704	0.5-	0.0
1989 11 04	675	1.2+	1.7-	1998 09 27	699	0.6+	0.1+	1999 10 20	704	0.3-	0.7-
1989 11 21	400	1.0-	0.6+	1998 09 27	704	0.5+	0.5+	1999 10 20	704	0.1-	0.3-
1989 11 21	400	1.1+	1.9+	1998 09 27	704	0.2+	0.3+	1999 10 20	704	0.3-	0.3-
1993 07 21	801	0.4-	0.3-	1998 09 27	699	0.8+	0.5+	1999 11 13	699	0.0	0.4+
1993 07 21	801	0.2+	0.6-	1998 09 27	704	0.4+	1.3+	1999 11 13	699	1.1+	0.5+
1993 07 22	801	0.4-	0.3-	1998 09 27	704	0.0	0.5+	1999 11 13	699	0.3+	0.7+
1993 07 22	801	0.4-	0.6-	1998 09 27	704	0.3-	1.0+	1999 11 17	704	0.1+	0.1+
1993 08 14	801	0.1-	0.1-	1998 10 14	704	0.2+	0.5-	1999 11 17	704	0.0	0.3-
1993 08 14	801	0.3-	0.4-	1998 10 14	704	0.5+	0.3+	1999 11 17	704	0.2-	0.0
1993 08 22	801	1.2+	0.4-	1998 10 14	704	0.3-	0.3-	1999 11 17	704	0.1+	0.8+
1993 08 22	801	0.1-	0.0	1998 10 14	704	0.0	1.1-	1999 11 17	704	0.4-	0.1-
1998 06 30	704	1.3-	0.7-	1998 10 14	704	0.9-	0.3+				
1998 06 30	704	0.0	0.5-	1998 10 14	699	0.3+	0.1-				

1999 NOV. 23

M.P.C. 36677

Residuals in seconds of arc

1989 12 30	413	2.1-	0.2+	1997 03 11	684	0.3-	0.0	1998 08 17	704	0.7-	0.8-
1989 12 30	413	0.1+	0.0	1997 03 11	684	0.4-	0.0	1999 10 12	704	0.7-	0.3+
1989 12 31	413	0.3+	0.3-	1997 03 30	684	0.3-	0.3-	1999 10 12	704	0.2-	0.3+
1989 12 31	413	0.8+	0.8+	1997 03 30	684	0.1-	0.3-	1999 10 12	704	1.4-	1.2+
1990 01 25	385	0.7+	0.6+	1997 04 08	684	0.2-	0.3+	1999 10 12	704	0.5+	0.0
1990 01 25	385	0.0	0.5-	1997 04 08	684	0.2-	0.3+	1999 11 03	704	1.0+	0.4-
1992 11 27	691	0.0	0.4+	1997 04 09	684	0.1-	0.2+	1999 11 03	704	0.8+	0.4+
1992 11 27	691	0.1+	0.4+	1997 04 09	684	0.2-	0.2+	1999 11 03	704	0.7+	0.0
1992 11 27	691	0.0	0.3+	1997 04 26	684	0.4+	0.2+	1999 11 09	704	0.2-	0.2+
1997 02 14	684	0.1+	0.5-	1997 04 26	684	0.3+	0.2+	1999 11 09	704	0.0	0.3+
1997 02 14	684	0.1+	0.4-	1997 04 26	684	0.5+	0.3+	1999 11 09	704	0.1-	0.2+
1997 02 14	684	0.1+	0.5-	1997 04 28	704	0.4-	0.5+	1999 11 09	704	0.0	0.5+
1997 02 15	684	0.1+	0.2-	1997 04 28	704	0.8-	0.6+	1999 11 09	704	0.1+	0.6+
1997 02 15	684	0.1+	0.1-	1997 04 28	704	1.0-	0.4+	1999 11 12	704	0.0	0.3+
1997 02 15	684	0.1+	0.2-	1997 04 28	704	0.9-	0.5+	1999 11 12	704	0.1+	0.2+
1997 02 16	684	0.1-	0.3-	1997 04 28	704	(3.6-	0.7+)	1999 11 12	704	0.1+	0.0
1997 02 16	684	0.0	0.1-	1997 04 29	704	1.1+	0.2+	1999 11 12	704	0.1-	0.0
1997 02 16	684	0.1-	0.2-	1997 04 29	704	0.9+	0.2+	1999 11 12	704	0.2+	0.6-
1997 03 03	684	0.4+	0.4-	1997 04 29	704	0.8+	0.1+	1999 11 17	704	0.3+	0.6-
1997 03 03	684	0.5+	0.4-	1997 04 29	704	1.1+	0.4-	1999 11 17	704	0.4-	1.0-
1997 03 03	684	0.5+	0.3-	1997 04 29	704	0.9+	0.9+	1999 11 17	704	0.0	0.5-
1997 03 04	691	0.7-	0.3+	1998 08 17	704	0.1-	0.8+	1999 11 17	704	0.7-	1.0-
1997 03 04	691	1.0-	0.0	1998 08 17	704	0.3-	0.4+	1999 11 17	704	0.3-	0.4+
1997 03 04	691	0.6-	0.1+	1998 08 17	704	1.0+	0.5-				

(12264)* 1990 CD = 1995 UM₄₄

Discovered 1990 Feb. 1 by A. Sugie at the Dynic Astronomical Observatory.

Id. S. Nakano (*MPC* 26168)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

		Nakano			
<i>M</i>	170.99146	(2000.0)	P	Q	
<i>n</i>	0.28581898	ω 320.12729	-0.38117074	+0.91985479	
<i>a</i>	2.2824889	Ω 287.28752	-0.82156307	-0.38296032	
<i>e</i>	0.1076448	<i>i</i> 5.56577	-0.42396106	-0.08490326	
<i>P</i>	3.45	<i>H</i> 13.8	<i>G</i> 0.15	<i>U</i> 2	

Residuals in seconds of arc

1990 01 21	402	0.9-	0.6+	1998 08 17	704	0.7-	0.5+	1999 10 13	704	0.5-	0.5+
1990 01 21	402	2.1+	1.4+	1998 08 17	704	0.8-	0.9+	1999 10 13	704	0.6+	0.9+
1990 02 01	402	0.3-	1.2-	1998 09 14	704	0.4-	0.6-	1999 10 13	704	0.7+	0.3+
1990 02 01	402	(2.8+	1.2+)	1998 09 14	704	0.3-	0.7-	1999 10 13	704	0.2+	0.4-
1990 02 02	402	0.9-	0.0	1998 09 14	704	1.3-	0.1+	1999 11 14	704	0.2+	0.2+
1990 02 02	402	0.6+	0.8+	1998 09 14	704	0.8-	0.1-	1999 11 14	704	1.4+	0.0
1990 02 16	402	0.3+	0.8+	1998 09 14	704	0.7-	0.5+	1999 11 14	704	0.5+	0.3-
1990 02 16	402	(2.7+	0.3+)	1998 09 15	610	1.1+	0.8+	1999 11 14	704	0.5-	0.5-
1995 10 26	408	0.8+	1.1-	1998 09 15	610	1.1+	0.5+	1999 11 14	704	0.8-	0.2-
1995 10 26	408	(3.3-	1.0-)	1998 09 15	610	1.0+	0.1+	1999 11 16	704	0.2-	0.8+
1995 10 27	408	0.5-	0.4-	1998 09 15	610	1.0+	0.2-	1999 11 16	704	0.6-	0.3+
1995 10 27	408	0.6+	0.6-	1998 11 17	699	0.4-	0.2+	1999 11 16	704	0.2-	0.2-
1998 08 17	704	0.3-	0.3-	1998 11 17	699	0.3-	0.3-	1999 11 16	704	0.2-	0.2+
1998 08 17	704	1.1+	0.3+	1998 11 17	699	1.1-	0.6-	1999 11 16	704	0.2-	0.5+
1998 08 17	704	0.3-	1.7+	1999 10 13	704	0.3+	0.4-				

(12265)* 1990 FG = 1982 DO₄ = 1996 RV₅

Discovered 1990 Mar. 23 by E. F. Helin at Palomar.

Id. T. Urata (*MPC* 27911)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

		Williams			
<i>M</i>	22.62611	(2000.0)	P	Q	
<i>n</i>	0.37303727	ω 2.36014	+0.99974307	+0.00479201	
<i>a</i>	1.9111784	Ω 357.07554	-0.01989295	+0.65402751	
<i>e</i>	0.0308498	<i>i</i> 25.73730	+0.01086615	+0.75645559	
<i>P</i>	2.64	<i>H</i> 14.1	<i>G</i> 0.15	<i>U</i> 2	

Residuals in seconds of arc

1982 02 20	033	(3.8-	2.3+)	1998 01 24	566	0.6-	1.6-	1998 04 06	423	0.4+	1.2+
1982 02 20	033	(5.7-	0.9+)	1998 01 24	566	0.1-	1.8-	1998 04 06	423	0.5+	0.9+
1990 03 18	399	(1.5-	2.4-)	1998 03 03	704	0.5-	0.0	1998 04 06	423	0.8-	1.1+
1990 03 18	399	1.1-	0.9-	1998 03 03	704	0.4-	0.4+	1999 09 24	704	0.3-	0.3+
1990 03 23	675	0.7+	0.7+	1998 03 03	704	0.7-	0.2+	1999 09 24	704	0.1-	0.1-
1990 03 23	675	0.2+	0.3+	1998 03 03	704	(0.1-	3.6+)	1999 09 24	704	0.5-	0.4+
1990 03 25	675	0.3-	0.3+	1998 03 03	704	1.6-	1.2-	1999 09 24	704	0.1-	0.3+
1990 03 25	675	0.3+	0.1+	1998 03 22	699	0.5+	1.2+	1999 09 24	704	0.4-	0.8+
1990 04 26	675	0.1-	0.6-	1998 03 22	699	0.6+	0.6+	1999 09 28	704	0.4-	0.2-
1990 04 26	675	0.9-	1.2-	1998 03 22	699	1.1+	0.7+	1999 09 28	704	0.0	0.1-
1990 04 27	675	1.2-	0.6+	1998 03 26	566	0.3-	0.4-	1999 09 28	704	0.1-	0.5-
1990 04 27	675	0.8-	1.2-	1998 03 26	566	0.4-	0.5-	1999 09 28	704	0.0	0.1+
1996 09 14	905	1.6-	1.4+	1998 03 26	566	0.2-	0.5-	1999 09 28	704	0.6+	1.0+
1996 09 14	905	0.7+	0.1+	1998 03 31	704	1.5+	0.3-	1999 10 30	704	0.1+	0.0
1996 09 18	905	0.5+	0.6+	1998 03 31	704	0.6+	0.6+	1999 10 30	704	(0.9-	2.2-)
1996 09 18	905	1.3+	0.1-	1998 03 31	704	0.6+	0.8+	1999 10 30	704	0.1-	0.7+
1996 10 04	385	1.1-	0.2+	1998 03 31	704	1.5+	0.4+	1999 10 30	704	2.0-	1.6+
1996 10 04	385	1.1-	0.1+	1998 03 31	704	(3.7+	3.3+)	1999 10 30	704	0.1+	0.1+
1996 10 04	385	0.9-	0.2+	1998 04 02	704	0.1+	0.9+	1999 10 31	704	0.1+	0.1+
1996 10 12	689	0.6-	1.2-	1998 04 02	704	(3.6+	2.2-)	1999 10 31	704	0.1+	0.0
1996 10 30	385	1.0+	0.8-	1998 04 02	704	0.6+	0.5+	1999 10 31	704	0.0	0.1+
1996 10 30	385	1.4+	0.9+	1998 04 02	704	0.6+	0.1+	1999 10 31	704	0.0	0.1+
1996 10 30	385	0.5+	0.4-	1998 04 05	423	0.7+	0.3+	1999 10 31	704	0.2+	0.1+
1996 12 01	689	0.0	0.5+	1998 04 05	423	0.7+	0.5+				
1998 01 24	566	0.2-	1.8-	1998 04 05	423	1.0+	0.2+				

(12266)* 1990 FL = 1994 LQ

Discovered 1990 Mar. 23 by E. F. Helin at Palomar.

Id. G. V. Williams (*MPC* 23671)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

		Williams			
<i>M</i>	179.29979	(2000.0)	P	Q	
<i>n</i>	0.26699530	ω 46.86971	-0.85614715	+0.50094463	
<i>a</i>	2.3885462	Ω 161.97159	-0.50562450	-0.86273567	
<i>e</i>	0.1878050	<i>i</i> 24.17714	+0.10656422	-0.06885963	
<i>P</i>	3.69	<i>H</i> 14.0	<i>G</i> 0.15	<i>U</i> 2	

Residuals in seconds of arc

1990 03 23	675	0.4+	0.9+	1995 09 08	608	0.7-	0.5+	1998 08 27	704	0.1-	0.8-
1990 03 23	675	0.3-	0.3-	1995 09 08	608	0.6-	0.5+	1998 08 27	704	0.8-	1.0+
1990 03 25	675	1.3+	0.1+	1995 10 04	608	0.2-	0.9+	1998 08 27	704	0.1-	0.3+
1990 03 25	675	0.9+	0.2-	1995 10 04	608	1.6+	1.1+	1998 08 27	704	0.0	0.4-
1990 04 25	675	0.9-	1.1+	1995 11 01	608	0.8-	0.2+	1999 09 14	704	0.9+	0.2+
1990 04 25	675	0.1-	0.1-	1995 11 01	608	0.5-	0.0	1999 09 14	704	0.2-	0.0
1990 04 28	675	0.6-	1.2-	1995 11 11	608	0.3+	1.1+	1999 09 14	704	1.4+	0.6-
1990 04 28	675	1.9-	0.5+	1995 11 11	608	0.7+	0.6+	1999 10 16	704	1.2-	0.8+
1994 06 10	693	1.7-	1.1+	1998 07 17	699	0.0	0.4-	1999 10 16	704	0.2+	0.6+
1994 06 10	693	(0.9-	2.2+)	1998 07 17	699	0.1+	0.4-	1999 10 16	704	0.7-	0.4-
1994 06 11	675	1.3+	0.4+	1998 07 17	699	0.4-	0.2+	1999 10 16	704	0.6-	0.1+
1994 06 11	675	0.1-	0.5-	1998 07 18	699	0.5+	0.8-	1999 10 16	704	1.0-	0.0
1994 06 12	693	0.1-	0.6+	1998 07 18	699	0.5-	0.2-	1999 11 10	704	(2.2+	1.0-)
1994 06 12	693	0.4-	0.5+	1998 07 18	699	0.3-	0.6-	1999 11 10	704	0.7+	0.6-
1994 06 13	675	0.5+	1.1+	1998 08 24	704	0.8-	1.2-	1999 11 10	704	0.9+	0.7-
1994 06 13	675	1.5+	0.1-	1998 08 24	704	0.3+	0.2+	1999 11 10	704	0.4+	0.8-
1994 07 07	801	0.3+	0.6-	1998 08 24	704	0.4-	0.5+	1999 11 10	704	0.9+	0.3-
1994 07 11	801	0.7+	0.5-	1998 08 24	704	(2.7-	1.1-)				
1994 07 11	801	0.7+	0.1+	1998 08 27	704	0.7-	0.1+				

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	255.74999		(2000.0)		P		Q				
<i>n</i>	0.36792254	ω	255.28905	−0.66700904	−0.68850514						
<i>a</i>	1.9288500	Ω	240.22777	+0.74469700	−0.62785117						
<i>e</i>	0.0702756	<i>i</i>	19.14768	−0.02291984	−0.36299254						
<i>P</i>	2.68	<i>H</i>	15.7	<i>G</i>	0.15	<i>U</i>	1				
Residuals in seconds of arc											
1990 05 26	675	0.5+	0.4−	1995 02 09	413	1.1−	0.5+	1999 10 14	704	0.3−	0.3−
1990 05 26	675	0.4+	0.5−	1995 02 09	413	1.1−	0.5+	1999 10 14	704	0.5−	0.1+
1990 05 31	691	1.0−	0.6+	1995 02 20	413	0.7−	0.1+	1999 10 14	704	0.3−	0.7−
1990 05 31	691	0.4−	0.7+	1995 02 20	413	0.7−	0.4+	1999 11 03	704	0.6−	0.1+
1990 05 31	691	1.1−	0.7+	1995 03 07	413	0.0	0.3+	1999 11 03	704	0.5−	0.3+
1990 06 01	691	0.4−	0.4−	1995 03 07	413	0.0	0.4+	1999 11 03	704	0.8−	0.3+
1990 06 01	691	0.1−	0.8+	1995 04 16	413	0.1+	0.5−	1999 11 03	704	0.5−	0.5−
1990 06 01	691	0.2−	0.3−	1995 04 16	413	0.4−	0.1+	1999 11 03	704	0.4+	0.2−
1990 06 01	691	0.1+	0.7+	1998 05 22	704	(2.9−	0.4+)	1999 11 12	704	0.3−	0.3−
1990 06 05	691	0.7+	0.2+	1998 05 22	704	0.1+	0.7−	1999 11 12	704	0.2−	0.1−
1990 06 05	691	0.1−	0.5−	1998 05 22	704	0.0	0.2−	1999 11 12	704	0.3−	0.1+
1990 06 05	691	1.8+	0.3+	1998 05 22	704	0.2+	0.2−	1999 11 12	704	0.0	0.0
1990 06 14	691	0.1+	1.0−	1998 05 24	704	0.6−	0.3−	1999 11 12	704	0.1−	0.1+
1990 06 14	691	0.2−	0.5−	1998 05 24	704	0.8+	0.3−	1999 11 16	704	0.6+	0.5+
1990 06 14	691	0.2−	0.8−	1998 05 24	704	1.1+	0.8−	1999 11 16	704	0.4+	0.1−
1995 02 03	413	0.9+	1.9−	1998 05 24	704	0.3−	0.6+	1999 11 16	704	1.8+	0.9+
1995 02 03	413	(6.0+	0.7+)	1998 05 24	704	1.4−	1.9+	1999 11 16	704	0.9+	0.5−
1995 02 07	413	1.4+	0.1+	1999 10 14	704	0.8−	0.3+	1999 11 16	704	0.4+	0.1+
1995 02 07	413	1.4+	0.5−	1999 10 14	704	0.2+	0.5−				

(12268)* 1990 OY₁ = 1989 EN₈

Discovered 1990 July 29 by H. E. Holt at Palomar.

Id. S. Nakano (*MPC* 30652)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Nakano

<i>M</i>	83.90110		(2000.0)		P		Q					
<i>n</i>	0.23498182	ω	209.98975		+0.22134979		+0.97038812					
<i>a</i>	2.6008375	Ω	72.94261		−0.87340860		+0.24137720					
<i>e</i>	0.1709708	<i>i</i>	5.80545		−0.43377609		+0.00916205					
<i>P</i>	4.19	<i>H</i>	13.3		<i>G</i>	0.15	<i>U</i>	1				
Residuals in seconds of arc												
1989 03 10	877	1.7−	0.7−	Y	1998 07 12	689	1.2−	0.6+	1999 11 01	703	0.1+	0.3+
1989 03 10	877	1.8+	1.2+	Y	1999 10 03	704	0.7+	0.2−	1999 11 04	704	0.6+	0.4−
1990 07 29	675	0.3+	0.9−		1999 10 03	704	0.7−	0.4−	1999 11 04	704	0.3+	0.0
1990 07 29	675	0.6−	0.4+		1999 10 03	704	0.3−	0.4+	1999 11 04	704	0.2+	0.4+
1990 07 30	675	0.1−	0.7+		1999 10 03	704	1.1−	0.6−	1999 11 04	704	0.3+	0.5−
1990 07 30	675	0.4−	0.5+		1999 10 07	704	0.5+	0.7+	1999 11 04	704	0.3+	0.6−
1990 09 15	675	0.1+	0.5−		1999 10 07	704	0.3−	0.4−	1999 11 15	704	0.5−	0.3+
1990 09 15	675	0.1+	0.5−		1999 10 07	704	0.4+	0.1+	1999 11 15	704	0.2−	0.2+
1990 09 17	675	0.2−	0.8−		1999 10 07	704	0.6−	0.1−	1999 11 15	704	0.5−	0.3+
1990 09 17	675	0.9+	0.9−		1999 10 08	703	0.1−	0.7+	1999 11 15	704	0.5−	0.2+
1990 09 20	675	0.1+	1.6−		1999 10 08	703	0.4−	0.3+	1999 11 15	704	0.5−	0.2+
1990 09 20	675	0.8+	0.7+		1999 10 08	703	0.5−	0.1+	1999 11 16	704	0.4−	0.0
1995 11 16	411	0.8+	0.4+		1999 10 08	703	0.0	0.1+	1999 11 16	704	0.1+	0.4+
1995 11 16	411	0.0	1.1−		1999 10 10	704	0.5−	0.1+	1999 11 16	704	0.9−	0.4−
1998 05 24	704	0.2−	0.9−		1999 10 10	704	0.1−	0.2+	1999 11 16	704	0.2−	0.3+
1998 05 24	704	0.6+	0.4+		1999 10 10	704	0.1−	0.1+	1999 11 16	704	0.7−	0.8−
1998 05 24	704	1.6+	1.8+		1999 10 10	704	0.3−	0.3+	1999 11 16	704	0.2+	0.8+
1998 05 24	704	0.1+	0.1−		1999 10 10	704	0.5+	0.2+	1999 11 16	704	0.3−	0.2−
1998 06 03	704	0.1+	1.1+		1999 10 15	704	0.5+	0.3−	1999 11 16	704	0.4−	0.3+
1998 06 03	704	0.5+	0.1−		1999 10 15	704	0.4+	0.0	1999 11 16	704	0.3−	0.4+
1998 06 03	704	0.1−	0.2−		1999 10 15	704	0.5+	0.0	1999 11 17	704	0.2+	0.1+
1998 06 03	704	0.9+	1.6+		1999 10 15	704	0.2+	0.1−	1999 11 17	704	0.3−	1.0+
1998 06 20	952	0.2−	1.1+		1999 10 20	704	0.8+	0.5−	1999 11 17	704	0.5+	0.9+
1998 06 21	952	0.0	0.7+		1999 10 20	704	0.1+	0.2−	1999 11 17	704	1.0+	1.1+
1998 06 21	952	0.4+	0.9+		1999 10 20	704	0.3+	0.0	1999 11 17	704	0.5−	0.4−
1998 06 24	704	1.3−	0.4−		1999 10 20	704	0.0	0.8−	1999 11 17	704	1.2−	0.9+
1998 06 24	704	0.4−	0.4−		1999 10 20	704	0.3+	0.5−	1999 11 17	704	0.1+	0.3+

1998 06 24	704	0.7+	0.3+	1999 11 01	703	0.3−	0.7+	1999 11 17	704	0.1−	0.6+
1998 06 24	704	0.3−	1.1−	1999 11 01	703	0.3−	0.3+	1999 11 17	704	0.4+	0.4−
1998 06 24	704	0.3−	0.7−	1999 11 01	703	0.1−	0.5+	1999 11 17	704	0.2−	1.2+

(12269)* 1990 QR

Discovered 1990 Aug. 19 by E. F. Helin at Palomar.

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	69.95255		(2000.0)		P		Q				
<i>n</i>	0.23219360	ω	123.58769		+0.39177304		+0.91901455				
<i>a</i>	2.6216168	Ω	169.20689		−0.90257658		+0.39314555				
<i>e</i>	0.1717286	<i>i</i>	13.55419		−0.17852003		+0.02913483				
<i>P</i>	4.24	<i>H</i>	13.1		<i>G</i>	0.15	<i>U</i>	2			
Residuals in seconds of arc											
1990 08 19	675	1.4+	0.6+	1998 05 20	610	1.9−	0.0	1998 06 20	952	0.2+	0.1+
1990 08 19	675	0.2+	0.8+	1998 05 20	610	(2.2−	0.1+)	1998 06 20	952	0.9−	0.6+
1990 08 21	675	0.5−	0.9−	1998 05 21	610	0.5−	0.6−	1998 06 22	636	0.6+	0.1−
1990 08 21	675	1.2−	1.4+	1998 05 21	610	0.2−	0.6−	1998 06 22	636	0.3+	0.3+
1990 08 26	095	(1.7+	2.4+)	1998 05 21	610	0.2+	0.5−	1998 06 22	636	0.3+	0.4+
1990 08 26	095	(1.5+	5.3+)	1998 05 21	610	0.5+	0.4−	1998 06 26	636	1.9+	1.1+
1990 08 30	095	0.1+	1.4−	1998 05 22	663	0.4+	0.9−	1998 06 26	636	0.0	0.1−
1990 08 30	095	0.4+	0.4−	1998 05 22	663	0.2−	0.1−	1998 07 26	699	0.2+	0.5+
1990 09 14	675	0.5−	1.9−	1998 05 23	663	0.1−	0.2−	1998 07 26	699	0.3−	0.2+
1990 09 14	675	(0.1−	2.7−)	1998 05 23	663	0.4−	0.1+	1998 07 26	699	0.2−	0.1+
1990 09 16	675	0.5+	0.9+	1998 05 23	704	0.5+	0.9+	1999 10 04	703	0.1−	0.0
1990 09 16	675	0.8+	0.1+	1998 05 23	704	0.6+	0.6+	1999 10 04	703	0.3−	0.3+
1990 09 23	675	0.4+	0.2−	1998 05 23	704	1.2+	1.0+	1999 10 04	703	0.1−	0.1−
1990 09 23	675	0.3−	1.4−	1998 05 23	704	1.7+	1.7+	1999 10 04	703	0.0	0.2−
1990 09 25	675	(0.2+	2.1−)	1998 05 23	704	0.3+	1.8+	1999 10 09	704	0.2+	0.1−
1990 09 25	675	0.3−	1.7−	1998 05 26	704	0.1+	0.1+	1999 10 09	704	0.3+	0.2+
1994 08 09	675	(2.9−	2.4+)	1998 05 26	704	0.2+	0.4+	1999 10 09	704	0.2−	0.3+
1994 08 09	675	(2.9−	0.6+)	1998 05 26	663	1.1−	0.2+	1999 10 09	704	0.2+	0.2+
1994 08 11	675	(2.3−	1.5+)	1998 05 26	704	1.1+	0.4+	1999 10 09	704	0.3+	0.1−
1994 08 11	675	1.5−	1.2+	1998 05 26	704	0.5+	1.7+	1999 11 02	703	0.7+	0.6−
1995 11 01	608	0.3+	0.2+	1998 05 26	704	0.1−	0.3−	1999 11 02	703	0.4+	1.0+
1995 11 01	608	0.0	0.1+	1998 05 26	663	2.0−	0.4+	1999 11 02	703	0.3−	0.4−
1995 11 06	608	0.0	0.6+	1998 06 04	757	0.9−	0.1−	1999 11 02	703	0.6−	0.4−
1995 11 06	608	0.0	0.7+	1998 06 04	757	0.6−	0.6−	1999 11 06	704	0.4−	0.6+
1995 11 11	608	0.1−	0.9+	1998 06 04	699	0.3+	0.3+	1999 11 06	704	0.6−	0.5+
1995 11 11	608	0.8+	0.4−	1998 06 04	699	0.0	0.1−	1999 11 06	704	0.5−	0.6+
1997 03 09	689	(39.6−	2.5+)	1998 06 04	699	0.1+	0.1−	1999 11 06	704	0.5−	0.4+
1998 05 18	127	(1.4+	2.3−)	1998 06 19	704	0.0	0.3−	1999 11 07	704	0.2−	0.7+
1998 05 18	127	(1.4+	2.2−)	1998 06 19	704	0.5+	0.3−	1999 11 07	704	0.1−	0.7+
1998 05 19	127	1.7+	1.0−	1998 06 19	704	0.0	0.1+	1999 11 07	704	0.1−	0.8+
1998 05 19	127	(2.1+	1.2−)	1998 06 19	704	0.3+	0.6−	1999 11 07	704	0.1−	0.7+
1998 05 20	610	0.9−	0.4−	1998 06 19	704	0.4−	1.0−	1999 11 07	704	0.1−	0.8+
1998 05 20	610	1.4−	0.2−	1998 06 20	952	0.2−	1.0+				

1999 NOV. 23

M.P.C. 36679

1990 08 18	809	(6.0− 0.3−)	1996 01 17	118	0.1+ 0.8−	1999 11 04	704	0.1− 0.0
1990 09 13	675	1.7+ 0.1+	1996 01 21	118	0.2+ 0.7−	1999 11 04	704	0.3+ 0.2−
1990 09 13	675	1.9+ 0.6+	1996 01 21	118	0.1− 0.6−	1999 11 04	704	0.6+ 0.0
1993 03 19	809	1.2+ 0.7−	1999 10 15	704	0.0 0.1+	1999 11 04	704	0.5+ 0.3−
1993 03 20	809	1.2− 0.1−	1999 10 15	704	0.7+ 0.2−	1999 11 12	699	0.7+ 0.3+
1993 03 24	809	0.7− 0.2+	1999 10 15	704	0.1− 0.2−	1999 11 12	699	0.0 1.9+
1993 04 18	413	(4.9− 3.0+)	1999 10 15	704	0.0 0.2+	1999 11 12	699	0.8+ 0.1+
1993 04 29	691	0.2+ 1.1−	1999 10 21	704	0.2− 0.1−	1999 11 17	704	2.2− 0.4+
1993 04 29	691	0.1− 0.3−	1999 10 21	704	1.0+ 0.8−	1999 11 17	704	0.0 0.4−
1993 04 29	691	0.1− 0.5−	1999 10 21	704	0.3+ 0.0	1999 11 17	704	0.3+ 0.4−
1996 01 15	118	0.2− 0.3−	1999 10 21	704	0.1− 0.2+	1999 11 17	704	0.1− 0.2−
1996 01 15	118	0.0 0.2−	1999 10 21	704	0.6− 0.4+	1999 11 17	704	0.0 0.2−

(12271)* 1990 RC₂ = 1997 EN₄₁ = 1998 KP₆₄

Discovered 1990 Sept. 14 by H. E. Holt at Palomar.

Id. S. Nakano (*MPC* 32659)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

M	341.58913		(2000.0)		$\mathbf{P}$		$\mathbf{Q}$
n	0.21874475	ω	166.13735		+0.99549275		−0.09157195
a	2.7279995	Ω	199.16855		+0.07826799		+0.94019183
e	0.0516424	i	4.30948		+0.05355666		+0.32810655
P	4.51	H	13.8	G	0.15	U	1

Residuals in seconds of arc

1990 09 14	675	0.1+ 0.9−	1998 06 03	704	0.9+ 1.4+	1999 10 06	704	0.1− 0.1−
1990 09 14	675	0.4+ 1.3−	1999 08 22	699	0.1+ 0.7+	1999 10 06	704	0.2− 0.1−
1990 09 15	675	0.6+ 0.4+	1999 08 22	699	0.1− 0.5+	1999 10 06	704	0.2− 0.1−
1990 09 15	675	0.7+ 0.8−	1999 08 22	699	0.0 1.1+	1999 10 07	704	0.2+ 0.8−
1990 09 18	675	(0.5+ 2.5−)	1999 09 07	704	0.0 0.6+	1999 10 07	704	0.1+ 0.4−
1990 09 18	675	(1.2+ 3.1−)	1999 09 07	704	0.3+ 0.1+	1999 10 07	704	0.4+ 0.3−
1990 09 20	675	0.8− 1.4−	1999 09 07	704	0.5+ 0.7+	1999 10 07	704	0.7− 0.1−
1990 09 20	675	0.9+ 1.5−	1999 09 07	704	0.8+ 1.2+	1999 10 07	704	0.6− 0.2−
1997 03 10	704	0.3+ 0.3−	1999 09 07	704	1.2+ 1.0+	1999 10 10	691	(2.1− 3.0−)
1997 03 10	704	0.3− 1.1+	1999 09 09	704	0.5− 0.2+	1999 10 10	691	0.1− 0.1+
1997 03 11	704	0.5− 0.2+	1999 09 09	704	0.0 0.1+	1999 10 10	691	0.1− 0.3+
1997 03 11	704	0.2− 0.4−	1999 09 09	704	0.3− 0.2+	1999 10 15	704	0.4+ 0.1+
1997 03 12	704	0.4+ 0.2−	1999 09 09	704	0.4− 0.1−	1999 10 15	704	0.3+ 0.2−
1997 03 12	704	0.4+ 0.1−	1999 09 09	704	0.9− 0.0	1999 10 15	704	0.0 0.8−
1998 05 22	704	(2.4+ 2.6−)	1999 09 11	699	1.0− 1.0+	1999 10 15	704	0.3+ 0.4−
1998 05 22	704	0.6+ 0.7−	1999 09 11	699	0.2+ 1.1+	1999 10 15	704	0.4+ 0.3+
1998 05 22	704	0.6− 1.6−	1999 09 11	699	0.1+ 1.5+	1999 10 18	691	0.1+ 0.0
1998 05 22	704	0.8+ 0.0	1999 09 14	704	0.3− 0.1−	1999 10 18	691	0.1+ 0.0
1998 05 24	704	0.4− 0.3+	1999 09 14	704	0.4− 0.5−	1999 10 18	691	0.0 0.0
1998 05 24	704	0.1+ 0.9−	1999 09 14	704	0.1− 0.2−	1999 11 11	691	0.1− 0.1+
1998 05 24	704	0.6− 0.3+	1999 09 14	704	0.2− 0.4−	1999 11 11	691	0.0 0.2+
1998 05 24	704	0.3+ 0.9+	1999 09 14	704	0.2− 0.4−	1999 11 11	691	0.0 0.1+
1998 05 24	704	1.9+ 0.9−	1999 10 03	691	0.4− 0.1−	1999 11 12	704	0.8− 0.5+
1998 06 03	704	1.0− 0.8−	1999 10 03	691	0.5− 0.2−	1999 11 12	704	1.3+ 0.9−
1998 06 03	704	0.7− 0.7−	1999 10 03	691	0.5− 0.2−	1999 11 12	704	0.7+ 0.4−
1998 06 03	704	0.9− 0.3+	1999 10 06	704	0.2− 0.6+			
1998 06 03	704	0.2− 1.6+	1999 10 06	704	0.0 0.3+			

(12272)* 1990 SZ₃

Discovered 1990 Sept. 22 by B. Roman at Palomar.

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

M	356.69393		(2000.0)		$\mathbf{P}$		$\mathbf{Q}$
n	0.22641724	ω	94.49125		+0.78912071		−0.58975018
a	2.6660179	Ω	301.74540		+0.45236120		+0.74709277
e	0.1752954	i	11.64892		+0.41552118		+0.30667101
P	4.35	H	13.1	G	0.15	U	1

Residuals in seconds of arc

1990 09 22	675	0.5− 0.8+	1996 01 12	411	0.2+ 0.1+	1999 10 14	704	0.1+ 0.7+
1990 09 22	675	0.2+ 0.3−	1998 06 24	704	(2.1+ 0.0)	1999 10 16	704	0.1+ 0.9−
1990 09 24	675	0.1+ 0.6+	1998 06 24	704	1.1+ 0.5+	1999 10 16	704	1.3+ 0.1−

1990 09 24	675	0.1− 0.2+	1998 06 24	704	0.1+ 0.5−	1999 10 16	704	0.8+ 0.6−
1990 10 15	675	0.1+ 0.9−	1998 06 24	704	1.3+ 1.7−	1999 10 16	704	1.7+ 1.3+
1990 10 15	675	0.2− 1.1−	1998 06 24	704	1.9− 0.0	1999 10 16	704	0.7+ 1.5+
1990 10 19	675	(0.4+ 2.7−)	1998 06 26	704	0.0 1.3+	1999 11 01	704	0.4− 0.2+
1994 09 03	675	0.9+ 0.5−	1998 06 26	704	1.6− 0.3+	1999 11 01	704	0.7− 0.9−
1994 09 03	675	1.5+ 0.2−	1998 06 26	704	0.6− 0.9+	1999 11 01	704	1.5− 0.5−
1996 01 11	411	0.2− 0.0	1999 10 14	704	0.5− 0.0	1999 11 01	704	0.4− 0.3+
1996 01 11	411	0.5+ 0.8−	1999 10 14	704	0.2− 0.3+	1999 11 01	704	0.7− 0.7+
1996 01 12	411	0.6− 0.4−	1999 10 14	704	0.0 0.0			

(12273)* 1990 TS₄ = 1990 UN₁₁ = 1988 FR₁ = 1996 BB₁₈

Discovered 1990 Oct. 9 by R. H. McNaught at Siding Spring.

Id. S. Nakano (d, *MPC* 20913; *MPC* 28298)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

M	17.94842		(2000.0)		P		Q
n	0.23031932	ω	296.42813		+0.77631979		−0.60693159
a	2.6358203	Ω	101.41902		+0.62230115		+0.69498043
e	0.0635680	i	9.99823		+0.10034372		+0.38553372
P	4.28	H	13.0	G	0.15	U	1

Residuals in seconds of arc

1988 03 18	033	0.3+ 0.0	1996 01 23	372	(2.4− 1.7+)	1999 10 10	704	0.4+ 0.0
1988 03 18	033	1.2− 0.1−	1996 01 23	372	(1.0− 2.5+)	1999 10 10	704	0.4+ 0.2+
1988 03 18	675	1.9+ 0.9+	1996 01 30	372	1.3+ 0.6−	1999 10 10	704	0.5+ 0.0
1988 03 18	675	0.2+ 0.5+	1998 07 31	120	0.6− 0.2+	1999 10 21	704	0.2+ 0.1−
1990 10 09	413	1.2− 1.1+	1998 07 31	120	0.2− 0.4+	1999 10 21	704	0.4+ 0.2−
1990 10 09	413	(4.2+ 2.1+)	1998 07 31	120	2.0− 0.3−	1999 10 21	704	0.0 0.0
1990 10 16	095	0.0 1.8−	1998 07 31	120	0.7− 0.6+	1999 10 21	704	0.0 0.1−
1990 10 16	095	(0.8− 3.3−)	1998 07 31	120	0.5+ 0.4−	1999 10 21	704	0.1+ 0.6−
1990 10 20	413	1.3+ 0.3+	1998 09 21	704	0.8+ 0.6+	1999 11 17	704	0.2+ 0.4+
1990 10 20	413	(4.2+ 2.2+)	1998 09 21	704	0.0 0.7+	1999 11 17	704	0.3− 0.0
1996 01 12	691	0.1− 0.7+	1998 09 21	704	0.7+ 1.3+	1999 11 17	704	0.1− 0.5+
1996 01 12	691	0.2+ 0.2+	1998 09 21	704	0.7+ 0.3+	1999 11 17	704	0.4− 0.4−
1996 01 12	691	0.1− 0.1+	1998 09 21	704	0.3− 0.7+	1999 11 17	704	0.3− 0.1−
1996 01 20	372	0.7− 0.8+	1999 10 10	704	0.4+ 0.4+			
1996 01 20	372	1.6− 1.8+	1999 10 10	704	0.1+ 0.1−			

(12274)* 1990 UJ₁ = 1992 EW₁

Discovered 1990 Oct. 19 by T. Hioki and S. Hayakawa at Okutama.

Id. G. V. Williams (*MPC* 20149)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

$\dot{M}$	339.29404		(2000.0)		P		Q
n	0.22468307	ω	196.58921		+0.45991337		−0.87273149
a	2.6797183	Ω	226.37450		+0.83822613		+0.48756314
e	0.1614847	i	13.07574		+0.29301305		−0.02493842
P	4.39	H	13.5	G	0.15	U	2

Residuals in seconds of arc

1990 10 19	877	(2.5− 1.5−)	1992 03 10	413	1.0+ 0.9−	1999 10 12	704	0.5+ 0.5−
1990 10 19	877	(0.6− 2.2+)	1992 03 11	413	0.2− 0.5+	1999 10 21	704	0.0 0.1−
1990 10 21	877	(2.8+ 0.9+)	1992 03 11	413	0.1+ 0.7−	1999 10 21	704	0.0 0.1−
1990 10 21	877	0.7+ 0.2+	1997 04 30	704	0.3− 1.1−	1999 10 21	704	0.1+ 0.3+
1990 10 24	046	(0.7+ 3.2−)	1997 04 30	704	0.7− 0.1+	1999 10 21	704	0.3+ 0.3−
1990 10 24	046	(0.5− 3.7−)	1997 04 30	704	0.3− 0.6+	1999 10 21	704	0.1+ 0.4−
1990 10 24	046	1.3− 1.1−	1997 04 30	704	0.5+ 0.4−	1999 11 04	704	0.1− 0.0
1990 10 24	046	0.5− 1.7−	1997 04 30	704	0.9− 0.0	1999 11 04	704	0.4− 0.1−
1990 10 26	877	0.6+ 0.7+	1997 05 01	704	0.3+ 0.3+	1999 11 04	704	0.4− 0.4+
1990 10 26	877	(2.3− 2.1−)	1997 05 01	704	0.9+ 0.8−	1999 11 04	704	0.6− 0.3+
1990 11 10	877	(2.5+ 0.9+)	1997 05 01	704	0.2− 0.5−	1999 11 04	704	0.6− 0.3+
1990 11 10	877	1.0+ 0.8−	1997 05 01	704	0.2+ 0.2−	1999 11 17	704	0.2+ 0.0
1990 11 10	046	(3.9+ 1.6+)	1997 05 01	704	0.1+ 0.6−	1999 11 17	704	0.2+ 0.3+
1990 11 10	046	1.2− 1.2+	1999 10 12	704	0.2+ 0.7+	1999 11 17	704	0.7− 0.1+
1990 11 12	877	0.1− 1.1−	1999 10 12	704	0.4+ 0.3+	1999 11 17	704	0.4− 0.1+
1990 11 12	877	1.0+ 0.5−	1999 10 12	704	1.1+ 0.2−	1999 11 17	704	0.3− 0.2−
1992 03 10	413	0.9− 0.2+	1999 10 12	704	1.1+ 0.5−			

(12275)* 1990 VS₅ = 1973 AZ₁

Discovered 1990 Nov. 15 by E. W. Elst at the European Southern Observatory.

Id. E. Goffin (*MPC* 18298)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>		(2000.0)		P		Q	
<i>n</i>	330.81523	ω	313.46895	+0.61164955	−0.77049473		
<i>a</i>	2.7644129	Ω	97.95488	+0.76806726	+0.52394664		
<i>e</i>	0.1548568	<i>i</i>	10.44263	+0.18962466	+0.36306720		
<i>P</i>	4.60	<i>H</i>	12.9	<i>G</i>	0.15	<i>U</i>	1

Residuals in seconds of arc

1973 01 01	095	(2.2− 4.5+)	1995 11 04	327	0.5+ 0.3+	1999 10 02	704	0.4− 0.1+
1973 01 02	095	0.4− 1.9−	1995 11 04	327	0.5+ 0.5+	1999 10 07	703	0.1− 0.4−
1990 11 15	809	0.6+ 0.2−	1995 11 04	327	0.1+ 0.1+	1999 10 07	703	0.0 0.0
1990 11 15	809	1.6+ 0.7−	1995 11 07	327	(1.4+ 2.7+)	1999 10 07	703	0.1− 0.0
1990 11 15	809	0.2+ 0.8−	1995 11 07	327	1.5+ 0.8+	1999 10 07	703	0.2− 0.0
1990 11 15	809	(3.6− 1.2−)	1995 11 07	327	0.2− 0.5−	1999 10 08	704	0.4+ 0.8+
1990 11 15	809	(3.2− 0.1+)	1995 11 18	327	0.7+ 0.0	1999 10 08	704	0.4− 0.5+
1990 11 15	809	(4.5− 1.2−)	1995 11 18	327	0.4+ 0.6+	1999 10 08	704	0.1− 0.5+
1990 11 17	809	1.1+ 1.1−	1995 11 18	327	0.2− 0.6+	1999 10 08	704	0.2− 0.4+
1990 11 17	809	0.5+ 0.3+	1996 01 18	399	1.0− 0.1+	1999 10 08	704	0.4− 0.2+
1990 11 17	809	0.5− 0.2−	1996 01 18	399	1.1− 0.3+	1999 11 02	703	0.0 0.0
1990 11 17	809	(3.0− 0.3−)	1998 05 29	704	0.7− 1.3−	1999 11 02	703	0.2+ 0.0
1990 11 17	809	(2.3− 0.5−)	1998 05 29	704	0.3− 0.1+	1999 11 02	703	0.1+ 0.3+
1990 11 17	809	(2.6− 0.4−)	1998 05 29	704	0.2+ 0.4−	1999 11 02	703	0.5+ 0.1+
1990 11 21	809	0.2+ 0.1+	1998 05 29	704	0.6+ 0.5−	1999 11 07	704	0.4− 0.1−
1990 11 21	809	0.1+ 0.4+	1998 05 29	704	0.4+ 0.1+	1999 11 07	704	0.7− 0.5−
1990 11 21	809	0.1+ 0.6+	1999 10 02	704	0.9+ 0.7+	1999 11 07	704	0.8− 0.5−
1990 11 23	809	0.4− 0.2−	1999 10 02	704	0.8+ 0.4+	1999 11 07	704	0.7− 0.6−
1990 11 23	809	0.5− 0.1+	1999 10 02	704	0.7+ 0.2+	1999 11 07	704	0.6− 1.0−
1990 11 23	809	1.1− 0.9−	1999 10 02	704	0.3+ 0.3+			

(12276)* 1990 WW₁ = 1992 DU₆

Discovered 1990 Nov. 18 by E. W. Elst at the European Southern Observatory.

Id. S. Nakano (*MPC* 32222)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>		(2000.0)		P		Q	
<i>n</i>	18.28110	ω	229.91219	+0.91637855	−0.39652562		
<i>a</i>	2.6860215	Ω	153.31350	+0.39432760	+0.87049638		
<i>e</i>	0.1456984	<i>i</i>	7.02593	+0.06896444	+0.29155357		
<i>P</i>	4.40	<i>H</i>	13.9	<i>G</i>	0.15	<i>U</i>	1

Residuals in seconds of arc

1990 11 11	809	0.6+ 0.4−	1998 06 26	704	(1.7− 2.9+)	1998 07 23	910	0.3− 0.1+
1990 11 11	809	0.1+ 0.7−	1998 06 26	704	1.5− 0.9+	1998 07 24	910	0.6− 0.0
1990 11 11	809	0.9− 0.5−	1998 06 26	704	0.1+ 1.0−	1999 10 10	704	0.8+ 0.7−
1990 11 18	809	1.6+ 0.8−	1998 06 26	704	1.0+ 1.3−	1999 10 10	704	0.2− 0.4−
1990 11 18	809	0.1− 0.4−	1998 06 26	704	1.2− 0.5−	1999 10 10	704	0.5+ 0.1+
1990 11 18	809	0.0 0.5−	1998 07 20	910	0.6+ 0.3+	1999 10 10	704	0.6+ 0.1+
1990 11 20	809	0.0 0.1+	1998 07 20	910	0.5+ 0.2+	1999 10 20	704	2.1− 0.6+
1990 11 20	809	0.6− 0.8−	1998 07 20	910	0.6+ 0.4+	1999 10 20	704	0.2+ 0.5+
1990 11 20	809	0.1− 0.4+	1998 07 20	566	0.6− 0.1−	1999 10 20	704	0.1− 0.7+
1992 02 29	809	0.2− 0.1−	1998 07 20	566	1.0− 0.1−	1999 10 20	704	0.0 0.9+
1992 03 03	809	0.5− 0.4−	1998 07 20	566	0.0 0.0	1999 11 04	704	0.1− 0.5+
1992 03 07	809	0.4+ 0.6−	1998 07 20	910	0.4− 0.4+	1999 11 04	704	0.2+ 1.3+
1998 06 22	910	1.6+ 0.1−	1998 07 21	910	0.5− 0.4+	1999 11 04	704	0.6+ 0.4+
1998 06 22	910	1.2+ 0.2−	1998 07 21	910	0.0 0.5+	1999 11 04	704	0.3− 0.5+
1998 06 22	910	1.2+ 0.3−	1998 07 23	910	0.5− 0.1+	1999 11 04	704	0.4− 0.6−

(12277)* 1990 WN₂

Discovered 1990 Nov. 17 by T. Seki at Geisei.

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>		(2000.0)		P		Q	
<i>n</i>	352.71049	ω	0.08742	+0.18867639	−0.95030577		
<i>a</i>	2.6567249	Ω	79.03986	+0.90085031	+0.06709161		
<i>e</i>	0.1335104	<i>i</i>	14.60950	+0.39098585	+0.30400274		
<i>P</i>	4.33	<i>H</i>	13.0	<i>G</i>	0.15	<i>U</i>	1

Residuals in seconds of arc

1990 11 17	372	0.2− 0.3−	1996 03 10	292	1.6+ 0.1+	1999 10 12	704	0.3− 0.5−
1990 11 17	372	1.1− 0.5+	1998 09 21	704	0.9+ 0.1−	1999 10 22	704	0.3+ 0.1+
1990 11 21	372	(2.5+ 0.1+)	1998 09 21	704	0.2− 1.0+	1999 10 22	704	0.2+ 0.1+
1990 11 21	372	1.9+ 1.1+	1998 09 21	704	0.4− 0.1−	1999 10 22	704	0.4+ 0.2+
1990 12 12	372	1.2− 0.1−	1998 09 21	704	0.5− 0.2−	1999 10 22	704	0.2+ 0.1−
1990 12 12	372	0.3+ 0.0	1998 09 21	704	0.3− 0.6+	1999 10 22	704	0.3+ 0.0
1991 01 09	372	(3.4− 0.3+)	1998 12 08	704	1.3+ 1.3−	1999 11 12	703	0.1+ 1.6−
1991 01 09	372	0.1− 0.4−	1998 12 08	704	1.2+ 0.5−	1999 11 12	703	0.2− 0.5+
1992 04 02	372	1.6+ 0.3−	1998 12 08	704	0.1+ 1.5+	1999 11 12	703	0.4− 0.9+
1992 04 02	372	0.7+ 0.3−	1998 12 08	704	1.2− 0.7+	1999 11 12	703	0.3+ 0.5+
1992 04 05	372	0.9− 0.9+	1998 12 08	704	1.6− 0.3−	1999 11 16	704	0.8− 0.3+
1992 04 05	372	0.7− 1.0+	1999 10 12	704	0.7− 0.2−	1999 11 16	704	0.5− 0.1+
1996 02 25	292	0.9− 0.3−	1999 10 12	704	0.1+ 0.0	1999 11 16	704	0.1+ 0.1+
1996 02 25	292	0.7− 0.1+	1999 10 12	704	2.0+ 0.8−	1999 11 16	704	0.4− 0.0
1996 03 10	292	0.4+ 0.5+	1999 10 12	704	0.1+ 0.4+	1999 11 16	704	0.3− 0.1−

(12278)* 1990 WQ₂ = 1996 EK₁₂

Discovered 1990 Nov. 21 by K. Endate and K. Watanabe at Kitami.

Id. G. V. Williams (*MPC* 27104)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>		(2000.0)		P		Q	
<i>n</i>	350.03130	ω	216.90065	+0.30539305	−0.94988536		
<i>a</i>	2.6834607	Ω	215.45661	+0.89882383	+0.31069564		
<i>e</i>	0.1674072	<i>i</i>	6.60563	+0.31440547	+0.03443876		
<i>P</i>	4.40	<i>H</i>	13.6	<i>G</i>	0.15	<i>U</i>	1

Residuals in seconds of arc

1990 11 14	675	0.1− 0.7+	1996 03 19	691	0.8+ 0.3−	1998 09 22	699	0.5− 0.1−
1990 11 14	675	0.6− 0.1−	1996 03 19	691	0.8+ 0.3−	1998 10 20	699	0.7− 0.3+
1990 11 17	809	0.6+ 0.9+	1996 03 19	691	0.5+ 0.2−	1998 10 20	699	0.3− 0.1−
1990 11 21	809	0.0 0.0	1998 08 17	704	1.0+ 0.7−	1998 10 20	699	0.5− 0.3+
1990 11 21	809	0.0 0.6−	1998 08 17	704	0.2+ 0.1+	1999 10 10	704	0.0 1.2−
1990 11 21	809	0.2− 0.4−	1998 08 17	704	0.4− 0.1+	1999 10 10	704	0.0 0.8−
1990 11 21	400	(2.4+ 0.3−)	1998 08 17	704	0.4− 0.1+	1999 10 10	704	0.0 1.1−
1990 11 21	400	1.5+ 0.6+	1998 08 17	704	0.2− 0.3−	1999 10 10	704	0.1− 0.9−
1990 11 22	809	0.5− 0.0	1998 08 23	704	0.2+ 0.6−	1999 10 10	704	0.1+ 1.5−
1990 11 22	809	1.4− 0.4+	1998 08 23	704	0.8+ 0.3−	1999 10 21	704	0.4− 0.3+
1990 11 22	809	0.6− 0.7+	1998 08 23	704	0.7+ 1.0+	1999 10 21	704	0.0 0.1−
1990 11 24	400	0.7+ 1.0+	1998 08 23	704	0.7+ 0.5+	1999 10 21	704	0.1+ 0.8−
1990 11 24	400	1.2− 0.5−	1998 08 30	699	0.1+ 0.2−	1999 10 21	704	0.1+ 0.6−
1990 12 08	400	1.6− 1.2−	1998 08 30	699	0.4+ 0.8−	1999 10 21	704	0.1− 0.6+
1990 12 08	400	1.8+ 1.9+	1998 08 30	699	0.2+ 0.2−	1999 11 13	703	0.3+ 0.1+
1990 12 13	400	1.4+ 0.6+	1998 09 15	699	0.5+ 0.4−	1999 11 13	703	0.5− 0.1−
1990 12 13	400	(0.9− 4.7+)	1998 09 15	699	0.0 0.8−	1999 11 13	703	0.2− 0.1−
1996 03 13	691	0.8− 0.3−	1998 09 15	699	0.6+ 0.3−	1999 11 13	703	0.1− 0.4−
1996 03 13	691	1.0− 0.1−	1998 09 22	699	1.8− 0.0			
1996 03 13	691	0.7− 0.2−	1998 09 22	699	0.6− 0.1−			

(12279)* 1990 WP₄ = 1979 MM

Discovered 1990 Nov. 16 by E. W. Elst at the European Southern Observatory.

Id. H. Kaneda (*MPC* 18435)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	178.13386		(2000.0)		P		Q				
<i>n</i>	0.21317766	ω	125.54362		-0.81621056		+0.54969689				
<i>a</i>	2.7752893	Ω	88.44091		-0.57075519		-0.71939144				
<i>e</i>	0.0902408	<i>i</i>	10.24889		-0.08965958		-0.42462841				
<i>P</i>	4.62	<i>H</i>	12.5		<i>G</i>	0.15	<i>U</i>	1			
Residuals in seconds of arc											
1979 06 22	805	1.6-	0.2+	1997 06 11	689	0.7+	0.0	1999 10 09	704	0.3+	0.4-
1979 06 22	805	1.2+	0.0	1998 08 20	699	0.4-	0.6-	1999 10 09	704	0.4+	0.1-
1979 06 25	805	0.6+	0.4+	1998 08 20	699	0.2-	1.1-	1999 10 19	704	0.2+	0.0
1988 05 10	675	0.8-	0.1-	1998 08 20	699	0.4-	0.6-	1999 10 19	704	0.3+	0.5-
1988 05 10	675	0.4-	0.1-	1998 09 21	704	1.4+	0.2+	1999 10 19	704	0.6-	0.2+
1990 11 14	675	0.7+	2.1+	1998 09 21	704	0.4+	0.5+	1999 10 19	704	0.1+	0.4-
1990 11 14	675	0.1+	0.4+	1998 09 21	704	0.9+	0.6+	1999 10 19	704	0.5-	0.4-
1990 11 16	809	0.4-	0.0	1998 09 21	704	0.6-	1.4+	1999 11 05	704	0.2-	1.3-
1990 11 17	809	0.6+	0.5-	1998 09 21	704	0.0	1.3+	1999 11 05	704	0.2-	1.1-
1990 11 21	809	0.3-	0.7+	1999 10 08	703	0.2-	0.2+	1999 11 05	704	0.1+	1.2-
1990 11 21	809	0.3-	0.4-	1999 10 08	703	0.2-	0.1+	1999 11 05	704	0.2-	1.4-
1990 11 21	809	0.4-	0.0	1999 10 08	703	0.6-	0.4+	1999 11 05	704	0.3-	1.5-
1990 11 22	809	0.2+	0.9+	1999 10 08	703	0.3-	0.4+	1999 11 16	703	0.0	0.2-
1990 11 22	809	0.0	1.0+	1999 10 09	704	1.1+	0.6+	1999 11 16	703	0.1+	0.5+
1990 11 22	809	0.3-	0.8+	1999 10 09	704	0.4+	0.2-	1999 11 16	703	0.2-	0.1+
1997 05 12	689	0.3-	0.8-	1999 10 09	704	1.3+	0.6-	1999 11 16	703	0.2-	0.3+

(12280)* 1990 WS₄ = 1976 UF₁₂ = 1989 PR

Discovered 1990 Nov. 16 by E. W. Elst at the European Southern Observatory.

Id. H. Kaneda (*MPC* 18435)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	9.77619		(2000.0)		P		Q				
<i>n</i>	0.21662027	ω	222.33937		+0.93791488		-0.34629021				
<i>a</i>	2.7458069	Ω	157.89726		+0.33076707		+0.87556662				
<i>e</i>	0.0858542	<i>i</i>	3.04221		+0.10444531		+0.33684742				
<i>P</i>	4.55	<i>H</i>	13.2		<i>G</i>	0.15	<i>U</i>	1			
Residuals in seconds of arc											
1976 10 22	381	0.3+	0.0	1998 06 19	684	1.5-	0.3+	1999 10 21	704	0.2-	0.6-
1976 10 22	381	0.4+	0.3-	1998 06 21	684	1.1-	0.3+	1999 10 30	703	0.2+	0.6+
1989 07 29	675	(3.5-	2.1-)	1998 06 21	684	1.0-	0.2+	1999 10 30	703	0.2-	0.3+
1989 07 29	675	2.4+	1.1-	1998 06 24	704	0.0	0.8+	1999 10 30	703	0.0	0.3+
1989 07 29	675	1.0+	0.1-	1998 06 24	704	1.4-	0.1-	1999 10 30	703	0.0	0.3+
1989 07 29	675	1.2+	1.4-	1998 06 24	704	0.0	1.2+	1999 11 04	704	0.4+	0.2+
1989 08 01	675	(4.3+	0.1-)	1998 06 24	704	0.1+	0.4+	1999 11 04	704	0.3-	0.7+
1989 08 01	675	(4.2+	2.1+)	1998 06 24	704	(2.1+	1.2+)	1999 11 04	704	0.4-	0.4+
1990 11 14	675	0.2-	1.8+	1998 06 26	809	1.5+	0.1+	1999 11 04	704	0.2-	0.6+
1990 11 14	675	0.7-	0.2+	1998 06 26	809	0.4-	1.1-	1999 11 04	704	0.2-	0.3+
1990 11 16	809	1.4+	0.9-	1998 06 26	809	1.0+	0.1-	1999 11 08	143	0.7+	1.0+
1990 11 17	809	(2.5+	0.1-)	1998 06 26	704	0.5-	0.0	1999 11 08	143	0.6+	1.1+
1990 11 21	809	0.7-	0.0	1998 06 26	704	0.3-	1.1+	1999 11 09	143	0.5+	1.1+
1990 11 21	809	1.2-	0.1+	1998 06 26	704	1.3-	0.7+	1999 11 12	699	0.3-	0.7+
1990 11 21	809	1.0-	0.6-	1998 06 26	704	1.0-	0.3-	1999 11 12	699	0.0	0.4+
1990 11 22	809	1.1-	0.1-	1998 06 27	809	(2.1+	1.2+)	1999 11 12	699	0.1+	0.3+
1990 11 22	809	1.6-	0.3-	1998 06 27	809	0.5+	0.8+	1999 11 15	704	0.3-	0.3-
1990 11 22	809	1.1-	0.1-	1998 06 27	809	1.2+	0.4+	1999 11 15	704	0.0	0.7-
1992 03 06	809	0.3-	0.0	1999 10 15	704	0.7+	0.2-	1999 11 15	704	0.0	0.4-
1995 12 18	691	0.1+	0.3+	1999 10 15	704	1.3+	0.2-	1999 11 15	704	0.0	0.2-
1995 12 18	691	0.1+	0.1+	1999 10 15	704	0.4+	1.1-	1999 11 15	704	0.0	0.2-
1995 12 18	691	0.3+	0.1+	1999 10 15	704	0.4-	0.9-	1999 11 17	704	0.4+	0.4-
1995 12 23	691	0.9+	0.2-	1999 10 21	704	0.4+	0.2+	1999 11 17	704	0.0	0.4-
1995 12 23	691	0.8+	0.3+	1999 10 21	704	0.0	0.2-	1999 11 17	704	0.5+	0.1+
1995 12 23	691	0.8+	0.2+	1999 10 21	704	0.0	0.3-	1999 11 17	704	0.5-	0.2-
1998 06 19	684	1.3-	0.4+	1999 10 21	704	0.1+	0.6-	1999 11 17	704	0.1+	0.6-

(12281)* 1990 WA₅

Discovered 1990 Nov. 16 by E. W. Elst at the European Southern Observatory.

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	136.51896		(2000.0)		P		Q			
<i>n</i>	0.21716172	ω	143.29250		-0.12622656		+0.98730657			
<i>a</i>	2.7412409	Ω	119.27141		-0.93439847		-0.08570251			
<i>e</i>	0.0142710	<i>i</i>	6.34463		-0.33311612		-0.13371919			
<i>P</i>	4.54	<i>H</i>	13.1		<i>G</i>	0.15	<i>U</i>	1		
Residuals in seconds of arc										
1985 09 21	675	2.1-	1.8-	1995 12 29	411	0.2+	0.2-	1998 11 20	699	0.1+
1985 09 21	675	(0.6-	3.1-)	1995 12 29	411	0.9-	0.8-	1998 11 20	699	0.2+
1990 11 14	675	0.2-	0.1+	1997 05 01	691	0.2+	0.1-	1998 11 20	699	0.4-
1990 11 16	809	(1.0+	2.2-)	1997 05 01	691	0.6+	0.2-	1999 10 20	704	0.8+
1990 11 17	809	(1.9+	2.3-)	1997 05 01	691	0.0	0.1-	1999 10 20	704	0.5-
1990 11 21	809	1.1+	0.4-	1998 08 17	704	0.7+	0.0	1999 10 20	704	0.0
1990 11 21	809	0.9+	1.0-	1998 08 17	704	0.2-	0.3-	1999 10 20	704	0.1+
1990 11 21	809	0.3-	0.9-	1998 08 17	704	0.2+	0.3-	1999 10 20	704	1.4-
1990 11 22	809	1.9+	0.6-	1998 08 17	704	0.3+	0.8-	1999 11 04	704	0.1-
1990 11 22	809	1.3+	0.7-	1998 08 17	704	0.3+	0.8-	1999 11 04	704	0.4-
1990 11 22	809	1.6+	1.0-	1998 09 14	699	0.4+	0.8+	1999 11 04	704	0.0
1990 12 26	413	(3.7+	0.2-)	1998 09 14	699	0.1+	0.8+	1999 11 04	704	0.2-
1992 02 28	675	0.1-	1.3+	1998 09 14	699	0.5+	0.6+	1999 11 04	704	0.3-
1992 02 28	675	0.2-	0.3-	1998 11 06	699	1.6-	0.3+	1999 11 12	699	0.0
1995 12 27	411	1.3-	0.4-	1998 11 06	699	0.4-	0.4-	1999 11 12	699	0.1-
1995 12 27	411	0.7-	0.0	1998 11 06	699	0.9-	0.2+	1999 11 12	699	0.2-

(12282)* 1991 BV₁ = 1951 GH₁ = 1993 TV₃₉ = 1996 JS₁

Discovered 1991 Jan. 21 by E. W. Elst at Haute Provence.

Id. A. Gnädig (*MPC* 30077), G. V. Williams (*ibid.*)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

M	266.96391		(2000.0)		P		Q			
n	0.21995617	ω	63.85920		-0.78192751		+0.62033087			
a	2.7179739	Ω	154.34009		-0.61054378		-0.74220556			
e	0.2530754	i	8.16138		-0.12580010		-0.25361492			
P	4.48	H	12.9		G	0.15	U	1		
Residuals in seconds of arc										
1951 04 08	711(22.2-	14.7+)Y	1996 05 14	691	0.7+	0.0	1998 12 14	699	0.4+	1.1-
1951 04 10	711(15.6-	12.0+)Y	1996 05 14	691	0.8+	0.1+	1998 12 14	699	0.5+	0.0
1991 01 21	511 (2.7-	0.9-)	1996 05 15	399	1.5-	0.8-	1999 10 20	704	0.1+	0.2+
1991 01 22	511 0.4-	2.2-	1996 05 15	399	1.7-	0.9-	1999 10 20	704	0.7-	0.8+
1991 01 22	511 0.3-	1.3-	1997 09 10	132	(2.3-	0.1-)	1999 10 20	704	0.3-	1.1+
1991 02 11	511 1.2+	0.4-	1997 09 10	132	1.2+	0.1+	1999 10 20	704	0.3-	1.4+
1991 02 11	511 (2.6+	0.6-)	1997 09 11	132	0.8+	1.0-	1999 11 17	704	0.1+	0.5+
1993 10 09	809 0.8-	1.4-	1997 09 28	566	0.2+	0.3+	1999 11 17	704	0.2+	0.0
1993 10 09	809 1.4-	1.4-	1997 09 28	566	1.2+	0.2-	1999 11 17	704	0.4-	1.7+
1993 10 09	809 1.2-	1.6-	1997 09 28	566	0.3-	1.1+	1999 11 17	704	0.1-	0.1-
1993 10 21	809 (0.6+	2.2+)	1998 11 13	704	0.8+	0.7+	1999 11 17	704	0.7-	0.8+
1993 10 21	809 0.3+	1.1+	1998 11 13	704	0.4+	0.7-	1999 11 17	704	0.6+	0.2-
1993 10 21	809 1.3-	0.9+	1998 11 13	704	0.4+	1.8-	1999 11 17	704	0.8-	0.8+
1996 05 11	399 0.1-	0.9-	1998 11 13	704	1.1+	0.7-	1999 11 17	704	0.3+	0.5-
1996 05 11	399 0.2-	0.7-	1998 11 13	704	0.6-	0.6-	1999 11 17	704	0.0	0.3+
1996 05 14	691 0.8+	0.1-	1998 12 14	699	0.1+	0.1+	1999 11 17	704	0.9+	0.7-

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	282.03085		(2000.0)	P	Q
<i>n</i>	0.20043543	ω	128.91638	-0.66046574	-0.75083570
<i>a</i>	2.8916988	Ω	2.44057	+0.64228126	-0.56877218
<i>e</i>	0.2446633	<i>i</i>	7.48409	+0.38892132	-0.33577368
<i>P</i>	4.92	<i>H</i>	13.0	<i>G</i>	0.15

Residuals in seconds of arc

1970 11 27	095	0.5+	0.9+	1998 08 17	704	0.9+	1.2+	1999 10 12	704	0.5-	0.1+
1981 02 03	330	0.9-	1.3+	1998 08 17	704	(2.1+	1.4+)	1999 10 12	704	0.7-	0.2-
1991 02 20	402	0.1-	0.8-	1998 08 17	704	1.3-	0.4-	1999 10 17	106	0.5+	0.2-
1991 02 20	402	0.0	1.2-	1998 08 17	704	(0.5-	2.8-)	1999 10 17	106	0.1-	0.5+
1991 03 07	399	(2.6-	1.1+)	1998 08 23	704	0.8-	1.4+	1999 10 22	704	0.2+	0.1+
1991 03 07	399	1.7-	1.8+	1998 08 23	704	(3.3+	0.6-)	1999 10 22	704	0.4+	0.3+
1991 03 09	675	0.9+	0.9-	1998 08 23	704	1.1+	0.0	1999 10 22	704	0.2+	0.3+
1991 03 09	675	0.8+	0.5+	1998 08 23	704	1.0-	0.3+	1999 10 22	704	0.1-	0.5+
1991 03 09	402	0.9+	0.0	1999 10 03	704	1.3+	0.6+	1999 10 22	704	0.4-	0.7+
1991 03 09	402	0.3-	1.2-	1999 10 03	704	0.1-	0.7-	1999 11 03	704	0.3+	0.2+
1991 03 10	399	1.8+	0.4+	1999 10 03	704	0.4+	0.5-	1999 11 03	704	0.4+	0.0
1991 03 10	399	(3.0-	3.3+)	1999 10 03	704	0.6-	1.2-	1999 11 03	704	0.2+	0.1+
1991 03 12	402	1.3-	0.3+	1999 10 07	704	0.5+	0.2-	1999 11 03	704	0.2+	0.4+
1991 03 12	402	0.6+	0.7-	1999 10 07	704	0.5-	0.3-	1999 11 03	704	0.1+	0.2+
1996 03 17	566	0.2-	0.9+	1999 10 07	704	0.6-	0.6-	1999 11 09	699	0.1-	0.0
1996 03 17	566	0.1-	0.8+	1999 10 12	704	0.2-	0.1-	1999 11 09	699	0.0	0.2-
1996 03 17	566	0.0	0.9+	1999 10 12	704	0.2-	0.1+	1999 11 09	699	0.3-	0.0
1998 08 17	704	0.5-	0.0	1999 10 12	704	0.2-	0.1-				

(12284)* 1991 FP = 1998 QL₆₇

Discovered 1991 Mar. 17 by E. F. Helin at Palomar.

Id. G. V. Williams (*MPC* 32446)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	155.56114		(2000.0)	P	Q
<i>n</i>	0.17122568	ω	26.53271	-0.82290416	+0.56698135
<i>a</i>	3.2118613	Ω	188.30589	-0.55605710	-0.81698740
<i>e</i>	0.1831132	<i>i</i>	14.79550	-0.11674436	-0.10518431
<i>P</i>	5.76	<i>H</i>	12.6	<i>G</i>	0.15

Residuals in seconds of arc

1991 03 17	675	1.7+	0.2-	1993 09 22	809	(0.3+	2.3-)	1999 10 09	704	0.4-	0.7-
1991 03 17	675	0.6-	0.4-	1993 09 22	809	1.2-	1.1-	1999 10 09	704	0.9-	0.9+
1991 03 18	675	1.9+	0.1-	1998 08 24	704	0.2-	0.5+	1999 10 09	704	0.2+	0.1-
1991 03 18	675	1.0+	1.2-	1998 08 24	704	0.7+	0.6-	1999 10 09	704	0.6+	0.4-
1991 04 09	675	1.2+	0.1-	1998 08 24	704	(2.1+	3.3-)	1999 10 09	704	0.2-	0.1+
1991 04 09	675	0.1+	0.3-	1998 08 24	704	1.0+	1.3-	1999 10 15	704	0.3-	0.2-
1991 04 12	675	1.0-	0.2+	1998 08 24	704	0.1-	0.4+	1999 10 15	704	0.0	0.7-
1991 04 12	675	0.0	0.1-	1998 08 27	704	0.3-	0.2-	1999 10 15	704	0.3+	0.1-
1991 04 14	675	0.9-	0.6+	1998 08 27	704	(3.1-	0.4-)	1999 10 15	704	0.2+	0.6-
1991 04 14	675	0.9+	1.0+	1998 08 27	704	0.7-	0.6+	1999 10 15	704	0.2+	0.5-
1991 04 16	675	0.3-	0.5+	1998 08 27	704	0.2-	1.1+	1999 11 06	704	1.1+	0.8+
1991 04 16	675	0.9-	0.6+	1999 10 03	703	1.6-	1.5+	1999 11 06	704	0.1+	0.0
1991 04 19	675	0.6-	0.5-	1999 10 03	703	1.2-	0.7+	1999 11 06	704	0.1-	0.1-
1991 04 19	675	0.2-	0.3-	1999 10 03	703	1.7-	1.0+	1999 11 06	704	0.2-	0.2-
1991 05 08	675	(0.9-	2.3-)	1999 10 03	703	(3.4-	0.4+)	1999 11 06	704	0.6+	0.2+
1991 05 08	675	0.5-	1.4-	1999 10 07	704	0.4+	0.3+	1999 11 17	704	0.5+	0.6-
1991 05 12	675	(0.0	2.2-)	1999 10 07	704	0.4+	0.4-	1999 11 17	704	0.5+	0.1-
1991 05 12	675	0.1-	1.0-	1999 10 07	704	0.9+	0.7-	1999 11 17	704	0.1+	0.8-
1993 09 22	809	1.6+	0.9-	1999 10 07	704	0.2+	0.8-				

(12285)* 1991 FN₂ = 1988 RL₁₁

Discovered 1991 Mar. 20 by H. Debehogne at the European Southern Observatory.

Id. T. Kobayashi (*MPC* 23976)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	258.72766		(2000.0)	P	Q
<i>n</i>	0.18908220	ω	330.54151	-0.62426113	-0.78082271
<i>a</i>	3.0063228	Ω	158.05681	+0.72909785	-0.59371178
<i>e</i>	0.0975260	<i>i</i>	3.80186	+0.28056082	-0.19447935
<i>P</i>	5.21	<i>H</i>	13.5	<i>G</i>	0.15

Residuals in seconds of arc

1988 09 14	807	0.2+	0.9-	1996 02 24	552	0.8+	0.3+	1999 10 15	704	0.1+	0.2-
1988 09 15	807	0.5+	1.0-	1996 02 24	552	0.1-	0.0	1999 10 15	704	0.3-	0.3+
1991 03 09	675	0.7+	0.8-	1996 03 11	327	0.0	0.1+	1999 10 15	704	0.5+	0.7-
1991 03 09	675	0.3+	1.1-	1996 03 11	327	0.6+	0.7-	1999 10 15	704	0.5+	0.4-
1991 03 20	809	1.4-	0.5-	1996 03 11	327	0.1+	0.4+	1999 10 19	704	(0.3-	2.2-)
1991 03 20	809	1.6-	0.9-	1996 03 13	327	0.3+	0.1-	1999 10 19	704	0.4+	0.6-
1991 03 20	809	1.0-	0.7-	1996 03 13	327	0.2-	0.6-	1999 10 19	704	0.2-	0.0
1991 03 21	809	0.1-	0.7+	1996 03 13	327	0.0	0.2+	1999 10 19	704	0.1+	0.4+
1991 03 21	809	0.1+	0.6+	1996 03 19	566	0.2-	0.0	1999 11 02	703	0.5-	0.5+
1991 03 21	809	0.4+	0.6+	1996 03 19	566	0.5+	0.5-	1999 11 02	703	0.4+	0.9-
1991 03 22	809	0.8-	0.3-	1996 03 19	566	0.3+	0.7-	1999 11 02	703	0.2-	0.6+
1991 03 22	809	0.5-	0.1-	1998 05 24	691	0.7+	0.1-	1999 11 02	703	0.2-	0.3+
1991 03 22	809	0.3-	0.3+	1998 05 24	691	0.7-	0.9-	1999 11 05	704	0.5+	0.3-
1991 03 24	809	0.6+	0.7-	1998 05 24	691	1.6-	1.2-	1999 11 05	704	0.5+	0.2-
1991 03 24	809	0.6+	0.7-	1998 08 17	704	0.7+	1.0+	1999 11 05	704	0.4+	0.3+
1991 03 24	809	0.6+	1.0-	1998 08 17	704	0.2+	0.4+	1999 11 05	704	0.8+	0.5+
1991 03 25	809	0.4+	0.3+	1998 08 17	704	0.1+	1.6+	1999 11 05	704	0.7-	0.5+
1991 03 25	809	0.3+	0.2+	1998 08 17	704	(0.7-	2.6+)	1999 11 14	699	0.1-	0.6+
1991 03 25	809	0.1-	0.1+	1999 10 07	704	0.1-	0.1+	1999 11 14	699	0.3+	0.4-
1996 02 15	566	0.3-	1.1+	1999 10 07	704	0.3-	0.1+	1999 11 14	699	0.8+	0.6-
1996 02 15	566	0.5-	0.9+	1999 10 07	704	0.1-	1.5-	1999 11 15	704	0.1+	0.4-
1996 02 15	566	0.7-	1.1+	1999 10 07	704	0.5+	0.7-	1999 11 15	704	0.2-	0.0
1996 02 16	552	0.3-	0.8+	1999 10 09	704	0.5-	0.1-	1999 11 15	704	0.3+	0.1+
1996 02 16	552	0.4+	0.1+	1999 10 09	704	0.5-	0.7+	1999 11 15	704	0.4-	0.0
1996 02 16	552	0.1-	0.5+	1999 10 09	704	1.3-	0.1-	1999 11 15	704	0.5+	0.1-
1996 02 24	552	0.6+	0.3-	1999 10 09	704	0.0	0.1+				
1996 02 24	552	0.1+	0.1-	1999 10 09	704	0.4-	0.3+				

(12286)* 1991 GY₄ = 1994 CH₂

Discovered 1991 Apr. 8 by E. W. Elst at the European Southern Observatory.

Id. K. Ichikawa (*MPC* 23238)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	125.24532		(2000.0)	P	Q
<i>n</i>	0.29389142	ω	197.48789	-0.23311520	+0.97195085
<i>a</i>	2.2404991	Ω	59.04157	-0.88780975	-0.19965566
<i>e</i>	0.0643722	<i>i</i>	2.08014	-0.39680115	-0.12429470
<i>P</i>	3.35	<i>H</i>	14.6	<i>G</i>	0.15

Residuals in seconds of arc

1991 04 08	809	(4.5- 1.9-)	1994 02 17	411	0.9- 0.4-	1999 10 21	704	0.0 0.4-
1991 04 08	809	(3.4- 0.8-)	1994 03 02	411	(0.1+ 2.3-)	1999 10 21	704	1.0+ 0.7-
1991 04 08	809	(3.7- 1.5-)	1994 03 02	411	0.2+ 0.3-	1999 11 04	704	0.6+ 0.9-
1991 04 10	809	(4.0- 1.1+)	1994 03 02	411	(3.1+ 0.9-)	1999 11 04	704	0.2+ 0.2+
1991 04 10	809	(3.3- 0.3+)	1994 03 04	411	0.7+ 0.2+	1999 11 04	704	0.0 0.5-
1991 04 10	809	(2.3- 0.1-)	1994 03 04	411	(2.1+ 0.1+)	1999 11 04	704	0.4- 0.6-
1991 04 11	033	0.5+ 0.5+	1994 03 04	411	0.3- 1.0+	1999 11 04	704	0.1+ 0.4-
1991 04 11	033	0.5- 0.8+	1998 05 22	704	(3.1+ 1.6+)	1999 11 09	704	0.5- 0.4+
1991 04 12	033	1.0- 2.0+	1998 05 22	704	(1.3+ 3.0+)	1999 11 09	704	0.5- 0.4+
1991 04 19	809	1.5+ 0.9-	1998 05 22	704	1.2- 1.3+	1999 11 09	704	0.4- 0.3+
1991 04 19	809	0.8- 0.7+	1998 05 22	704	0.6+ 0.2-	1999 11 09	704	0.6- 0.1-
1991 04 19	809	1.2+ 0.1+	1998 05 24	704	(2.5- 0.7-)	1999 11 09	704	0.5- 0.4-
1991 04 19	675	(0.4+ 2.2-)	1998 05 24	704	0.1+ 0.4-	1999 11 12	699	0.1- 0.1+
1991 04 19	675	0.4+ 0.3+	1998 05 24	704	1.6- 0.0	1999 11 12	699	0.2+ 0.5+
1991 04 19	675	0.8+ 1.0-	1998 05 24	704	(4.6- 1.0-)	1999 11 12	704	0.2+ 0.2+
1991 04 19	675	0.7- 0.2+	1998 06 03	704	1.6+ 0.6-	1999 11 12	699	0.6- 0.5+
1991 05 17	675	0.5+ 1.3-	1998 06 03	704	(2.3+ 4.0+)	1999 11 12	704	0.0 0.0
1991 05 17	675	0.5- 1.2-	1998 06 03	704	(3.1+ 0.5-)	1999 11 12	704	0.0 0.2+
1993 01 24	691	1.0- 0.3+	1998 06 03	704	0.1- 0.5+	1999 11 12	704	0.0 0.5+

1993 01 24	691	0.8−	0.7+	1998 06 24	704	0.4+	0.6+	1999 11 12	704	0.0	0.4+
1994 02 13	411	0.3−	1.2+	1998 06 24	704	0.2+	0.2+	1999 11 14	704	0.4+	0.2+
1994 02 13	411	1.7−	0.6+	1998 06 24	704	0.0	1.4+	1999 11 14	704	0.4+	0.1+
1994 02 13	411	0.4−	0.4+	1998 06 24	704	0.2−	0.3+	1999 11 14	704	0.4+	0.3+
1994 02 14	411	0.5+	0.9+	1998 06 24	704	(1.1−	2.2+)	1999 11 14	704	0.1+	0.5+
1994 02 14	411	0.6−	0.3+	1999 10 12	704	0.3+	0.9+	1999 11 14	704	0.2+	0.2+
1994 02 14	411	0.3+	1.2+	1999 10 12	704	0.2+	0.3+	1999 11 16	704	0.7+	0.7+
1994 02 16	411	1.8+	0.7+	1999 10 12	704	0.5+	0.6+	1999 11 16	704	0.3+	0.0
1994 02 16	411	0.2+	0.7−	1999 10 12	704	0.4−	0.0	1999 11 16	704	0.2+	0.3+
1994 02 16	411	0.2+	1.9−	1999 10 12	704	0.4−	0.1−	1999 11 16	704	0.0	0.3−
1994 02 17	411	0.0	1.9−	1999 10 21	704	0.5−	0.6−	1999 11 16	704	0.1+	0.1−
1994 02 17	411	0.5−	0.2−	1999 10 21	704	0.9−	0.5+				

(12287)* 1991 GH₅ = 1997 GT₂₃

Discovered 1991 Apr. 8 by E. W. Elst at the European Southern Observatory.
Id. G. V. Williams (*MPC* 30449)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>		<i>P</i>		<i>Q</i>	
89.10617		(2000.0)			
<i>n</i>	0.17114850	<i>ω</i>	74.65421	+0.30570192	+0.95121293
<i>a</i>	3.2128269	<i>Ω</i>	213.23847	−0.90015523	+0.27445980
<i>e</i>	0.1218075	<i>i</i>	4.36491	−0.31026907	+0.14094604
<i>P</i>	5.76	<i>H</i>	13.8	<i>G</i>	0.15
				<i>U</i>	1

Residuals in seconds of arc

1991 04 08	809	1.7+	0.9−	1997 05 07	704	0.3+	2.0+	1999 10 05	704	0.4+	0.1+
1991 04 08	809	0.8−	0.0	1997 05 07	704	0.4−	0.4+	1999 10 05	704	0.4−	0.0
1991 04 08	809	1.2−	1.6−	1998 07 26	699	0.1+	0.7−	1999 10 21	704	1.2−	1.8−
1991 04 10	809	1.5−	0.3+	1998 07 26	699	0.4+	1.0−	1999 10 21	704	0.8−	0.4+
1991 04 10	809	0.9−	0.0	1998 07 26	699	0.9+	1.1−	1999 10 21	704	0.6−	0.7+
1991 04 10	809	0.6−	0.4−	1998 08 23	704	0.6−	1.6−	1999 11 04	704	0.8−	0.1+
1991 04 19	809	0.3+	1.3−	1998 08 23	704	(2.6+	1.8+)	1999 11 04	704	0.1+	0.4+
1991 04 19	809	0.9−	1.5−	1998 08 23	704	1.4+	0.6+	1999 11 04	704	0.5+	0.3−
1991 04 19	809	0.6−	2.0−	1998 08 23	704	(2.4+	0.5−)	1999 11 04	704	0.5−	1.7−
1991 04 19	675	0.8+	0.0	1998 08 28	699	0.1−	0.1+	1999 11 04	704	0.0	0.0
1991 04 19	675	0.9+	0.7−	1998 08 28	699	0.0	1.3+	1999 11 09	704	0.6+	0.8+
1997 04 06	704	0.1+	0.0	1998 08 28	699	1.5−	0.4−	1999 11 09	704	1.0−	0.7+
1997 04 06	704	0.1−	0.1−	1998 08 30	699	0.2−	1.0−	1999 11 09	704	0.5+	1.5+
1997 04 07	704	0.0	0.3+	1998 08 30	699	0.2+	0.3+	1999 11 09	704	1.1+	1.1+
1997 04 07	704	1.2−	1.3−	1998 08 30	699	0.3+	0.6+	1999 11 12	704	0.7+	0.4+
1997 05 01	704	0.4+	0.5+	1999 10 03	703	0.1−	0.1−	1999 11 12	704	0.2+	0.1−
1997 05 01	704	0.8+	1.0+	1999 10 03	703	0.1+	0.5−	1999 11 12	704	0.7+	0.3−
1997 05 01	704	0.3+	0.6+	1999 10 03	703	0.0	0.2+	1999 11 12	704	0.2+	0.3−
1997 05 01	704	0.4+	0.6+	1999 10 03	703	0.4−	0.2−	1999 11 12	704	0.5−	0.7−
1997 05 01	704	0.4+	0.5+	1999 10 05	704	0.6+	0.2−	1999 11 16	691	0.1+	0.2−
1997 05 07	704	0.4+	0.6+	1999 10 05	704	0.3+	0.2−	1999 11 16	691	0.1−	0.3−
1997 05 07	704	0.2+	1.4+	1999 10 05	704	0.5+	0.1+	1999 11 16	691	0.1+	0.3−

(12288)* 1991 GC₆ = 1989 TW₅ = 1989 TR₁₇

Discovered 1991 Apr. 8 by E. W. Elst at the European Southern Observatory.
Id. H. Kaneda (*MPC* 18637), S. Nakano (d, *ibid.*)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>		<i>P</i>		<i>Q</i>	
316.95366		(2000.0)			
<i>n</i>	0.30072141	<i>ω</i>	44.34769	+0.33141191	−0.94183836
<i>a</i>	2.2064452	<i>Ω</i>	26.44638	+0.82710422	+0.26160038
<i>e</i>	0.1116689	<i>i</i>	7.18948	+0.45394356	+0.21096383
<i>P</i>	3.28	<i>H</i>	14.1	<i>G</i>	0.15
				<i>U</i>	2

Residuals in seconds of arc

1988 05 14	675	0.1−	0.7+	1994 02 10	809	1.2+	0.8+	1999 10 13	704	0.5−	0.4−
1988 05 14	675	0.4−	0.4+	1994 02 13	809	0.3−	0.3+	1999 10 13	704	0.3−	0.4−
1989 10 02	807	0.2−	0.4+	1994 02 13	809	0.1+	0.2−	1999 10 15	704	0.3−	0.2−
1989 10 06	807	0.4+	0.4+	1994 02 13	809	0.7−	0.5−	1999 10 15	704	0.5−	0.3−
1989 10 10	809	1.2−	1.7−	1994 03 09	010	(3.0−	2.2−)	1999 10 15	704	0.4−	0.4−
1989 10 10	809	0.5−	0.6−	1994 03 09	010	(3.8−	2.6−)	1999 10 15	704	0.7−	0.3−
1989 10 10	809	0.2+	0.6+	1994 03 09	010	(3.3−	2.7−)	1999 10 15	704	0.8−	0.3−

1989 10 10	809	1.0+	1.7+	1994 03 10	010	0.2+	1.6+	1999 10 22	704	0.3−	0.4−
1991 04 08	809	1.0−	1.0−	1994 03 10	010	0.7+	1.8+	1999 10 22	704	0.3−	0.4−
1991 04 08	809	1.5−	1.4−	1994 03 10	010	0.7+	1.6+	1999 10 22	704	0.2−	0.1−
1991 04 08	809	0.7−	1.9−	1999 10 03	704	0.0	0.0	1999 10 22	704	0.1+	0.4−
1991 04 10	809	0.0	0.5−	1999 10 03	704	1.1+	0.7+	1999 10 22	704	0.1−	0.2−
1991 04 10	809	0.5−	0.3−	1999 10 03	704	0.2+	0.5+	1999 11 03	704	1.0−	0.6−
1991 04 10	809	0.6+	0.6−	1999 10 03	704	0.7+	0.3+	1999 11 03	704	0.3−	0.4−
1991 04 19	809	0.7−	1.2+	1999 10 03	704	1.2+	1.1−	1999 11 03	704	0.3−	0.4−
1991 04 19	809	0.9−	0.8+	1999 10 06	704	0.3+	0.5−	1999 11 03	704	0.3−	0.4−
1991 04 19	809	0.4−	0.8+	1999 10 06	704	1.3+	0.4+	1999 11 03	704	0.4−	0.2−
1991 04 19	675	0.6+	1.5−	1999 10 06	704	1.0+	0.4+	1999 11 04	703	0.0	0.3+
1991 04 19	675	0.2+	1.3−	1999 10 06	704	0.3+	1.6+	1999 11 04	703	1.0−	0.1+
1991 05 15	675	0.2−	1.3−	1999 10 12	704	0.1+	0.4−	1999 11 04	703	1.3+	1.5+
1991 05 17	675	0.5+	1.0−	1999 10 12	704	0.4+	0.2−	1999 11 04	703	0.6−	0.1+
1991 05 17	675	0.6+	0.6−	1999 10 12	704	0.4+	0.1−	1999 11 16	704	0.2+	0.5−
1994 02 08	809	0.7−	1.1−	1999 10 12	704	0.5+	0.3−	1999 11 16	704	0.3+	0.5−
1994 02 08	809	1.5−	0.8−	1999 10 12	704	0.8+	0.8−	1999 11 16	704	0.6+	0.1−
1994 02 08	809	1.2−	0.8−	1999 10 13	704	0.1−	0.4−	1999 11 16	704	(2.9−	2.1−)
1994 02 10	809	1.4+	0.5+	1999 10 13	704	0.2+	0.1−	1999 11 16	704	0.3+	0.1+
1994 02 10	809	2.0+	0.4+	1999 10 13	704	0.5−	0.3−				

(12289)* 1991 GP₇ = 1969 UK = 1992 RQ₁

Discovered 1991 Apr. 8 by E. W. Elst at the European Southern Observatory.
Id. B. G. Marsden (*MPC* 21111), G. V. Williams (*MPC* 34492), A. Doppler (*ibid.*)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>		<i>P</i>		<i>Q</i>	
329.62195		(2000.0)			
<i>n</i>	0.29545885	<i>ω</i>	81.03644	+0.64853208	−0.76087495
<i>a</i>	2.2325681	<i>Ω</i>	328.49869	+0.68095440	+0.59273661
<i>e</i>	0.0938109	<i>i</i>	2.39165	+0.34015768	+0.26406935
<i>P</i>	3.34	<i>H</i>	14.1	<i>G</i>	0.15
				<i>U</i>	1

Residuals in seconds of arc

1969 10 16	095	(2.0+ 4.2+)	1998 06 18	704	(0.5− 2.6+)	1999 10 22	704	0.2+ 0.6+
1991 04 08	809	1.1+ 0.4+	1998 06 18	704	0.7− 0.7+	1999 10 22	704	0.2+ 0.5+
1991 04 08	809	0.4+ 0.6+	1998 06 18	704	1.1+ 0.1+	1999 11 03	704	0.4+ 0.2−
1991 04 08	809	0.7− 0.0	1999 10 05	704	1.8+ 0.1−	1999 11 03	704	0.3+ 0.2−
1991 04 10	809	0.4+ 0.8+	1999 10 05	704	0.6+ 0.7+	1999 11 03	704	0.6+ 0.5−
1991 04 10	809	1.6+ 0.4−	1999 10 05	704	0.3+ 0.7−	1999 11 03	704	0.1+ 0.3−
1991 04 10	809	0.5+ 0.1+	1999 10 05	704	0.2− 1.2+	1999 11 03	704	0.3+ 0.3−
1991 04 19	809	0.6− 0.1−	1999 10 11	106	0.1− 0.5+	1999 11 05	704	0.0 0.4−
1991 04 19	809	1.1− 0.1−	1999 10 11	106	0.3+ 0.1+	1999 11 05	704	0.2+ 0.1−
1991 04 19	809	1.3− 0.1+	1999 10 11	106	0.2+ 0.5+	1999 11 05	704	0.0 0.1−
1992 09 02	809	1.8+ 0.1−	1999 10 12	106	0.0 0.1−	1999 11 05	704	0.0 0.3−
1992 09 02	809	0.8+ 0.2−	1999 10 12	106	0.3+ 0.3+	1999 11 05	704	0.1+ 0.1+
1992 09 02	809	0.2− 0.4−	1999 10 12	704	0.4+ 0.3−	1999 11 11	703	0.7− 0.4+
1992 09 03	809	1.4+ 0.0	1999 10 12	704	0.3− 0.3−	1999 11 11	703	0.8− 0.3+
1992 09 22	809	0.1− 0.8−	1999 10 12	704	0.3− 0.2−	1999 11 11	703	0.4− 0.0
1992 09 22	809	1.2− 1.1−	1999 10 12	704	0.1+ 0.2−	1999 11 11	703	0.8− 0.3+
1992 09 22	809	0.9− 0.9−	1999 10 12	704	0.6− 0.2−	1999 11 14	704	0.3− 0.2−
1992 09 23	809	0.4+ 1.0+	1999 10 13	704	0.2+ 0.0	1999 11 14	704	0.2− 0.0
1992 09 23	809	1.3− 0.8+	1999 10 13	704	0.3+ 0.2−	1999 11 14	704	0.2− 0.2+
1992 09 23	809	0.5− 0.8+	1999 10 13	704	0.1− 0.3+	1999 11 14	703	0.2+ 0.4+
1998 05 24	704	0.4+ 0.3−	1999 10 13	704	0.1+ 0.2−	1999 11 14	704	0.3− 0.3+
1998 05 24	704	0.7+ 1.0+	1999 10 13	704	0.2− 0.1−	1999 11 14	703	0.2− 0.5+
1998 05 24	704	0.2+ 0.7+	1999 10 15	704	0.4− 0.1−	1999 11 14	704	0.0 0.2+
1998 05 24	704	0.0 1.4−	1999 10 15	704	0.3− 0.1+	1999 11 14	703	0.1− 0.2+
1998 06 03	704	0.8− 0.8−	1999 10 15	704	0.2− 0.1−	1999 11 14	703	0.4− 0.5+
1998 06 03	704	0.6− 0.9+	1999 10 15	704	0.2− 0.1+	1999 11 16	704	0.1− 0.1+
1998 06 03	704	(0.1− 3.1+)	1999 10 15	704	0.0 0.4+	1999 11 16	704	0.0 0.0
1998 06 03	704	0.9− 0.8+	1999 10 22	704	0.2− 0.5+	1999 11 16	704	0.1− 0.1+
1998 06 03	704	0.7+ 1.6−	1999 10 22	704	0.1− 0.4+	1999 11 16	704	0.1+ 0.2−
1998 06 18	704	0.6+ 0.7+	1999 10 22	704	0.0 0.4+	1999 11 16	704	0.4− 0.1−

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	68.53375		(2000.0)	P	Q
<i>n</i>	0.26228553	ω	47.67045	-0.33921994	+0.93785557
<i>a</i>	2.4170548	Ω	202.81374	-0.90904175	-0.34682434
<i>e</i>	0.2313366	<i>i</i>	10.88053	-0.24201843	-0.01182351
<i>P</i>	3.76	<i>H</i>	14.3	<i>G</i>	0.15

Residuals in seconds of arc

1973 11 02	033	0.0	1.1+	1999 09 08	704	0.1-	0.2-	1999 10 15	704	0.5-	0.4+
1991 06 14	675	1.2+	0.3+	1999 09 08	704	0.7+	0.0	1999 10 15	704	0.3-	0.3+
1991 06 14	675	1.0+	0.3-	1999 09 08	704	0.4+	0.2-	1999 10 30	703	0.9+	0.8+
1991 06 16	675	0.6+	0.4-	1999 09 12	610	0.5+	1.5-	1999 10 30	703	0.6-	1.3+
1991 06 16	675	1.0+	0.1-	1999 09 12	610	0.6+	0.7-	1999 10 30	703	0.0	0.6+
1991 07 10	675	1.2-	0.7-	1999 09 12	610	0.7+	0.3-	1999 10 30	703	0.4-	1.2+
1991 07 11	675	1.3-	1.0+	1999 09 12	610	0.9+	0.0	1999 11 06	704	1.2-	0.2-
1991 07 11	675	1.8-	0.2-	1999 09 12	610	1.0+	0.9+	1999 11 06	704	0.8-	0.4-
1991 08 11	801	0.0	0.2+	1999 09 16	704	0.1+	1.0+	1999 11 06	704	0.4-	0.6-
1991 08 11	801	0.1-	0.4+	1999 09 16	704	0.2+	0.5+	1999 11 06	704	0.3-	0.2+
1991 08 12	801	0.1+	0.0	1999 09 16	704	0.0	0.6+	1999 11 06	704	0.5-	0.3+
1991 08 12	801	0.1-	0.1+	1999 09 16	704	0.5-	0.2+	1999 11 13	691	0.2+	0.5-
1995 07 19	691	0.2-	0.1+	1999 10 09	704	0.5+	0.4-	1999 11 13	691	0.0	0.3-
1995 07 19	691	0.1+	0.2-	1999 10 09	704	0.0	0.1+	1999 11 13	691	0.0	0.5-
1995 07 19	691	0.3-	0.1+	1999 10 09	704	0.4-	0.3+	1999 11 14	704	0.4+	0.4-
1996 12 12	691	0.2-	0.4-	1999 10 09	704	0.4+	0.4-	1999 11 14	704	0.6+	0.9-
1996 12 12	691	0.2+	0.0	1999 10 09	704	0.2-	0.3+	1999 11 14	704	0.2-	0.2-
1996 12 12	691	0.3-	0.2-	1999 10 15	704	0.5-	0.4-	1999 11 14	704	0.3-	1.0-
1999 09 08	704	0.0	0.7-	1999 10 15	704	0.1-	0.1+				
1999 09 08	704	0.4-	0.5-	1999 10 15	704	0.1-	0.1-				

(12291)* 1991 LJ₂ = 1984 DQ₂ = 1998 QV₁₀₆

Discovered 1991 June 6 by E. W. Elst at the European Southern Observatory.

Id. A. Gnädig (*MPC* 33227)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	87.12675		(2000.0)	P	Q
<i>n</i>	0.16942756	ω	225.72413	+0.71440879	+0.68857884
<i>a</i>	3.2345462	Ω	90.32804	-0.60133009	+0.69508290
<i>e</i>	0.0656580	<i>i</i>	7.14713	-0.35780191	+0.20668562
<i>P</i>	5.82	<i>H</i>	12.5	<i>G</i>	0.15

Residuals in seconds of arc

1984 02 26	095	0.0	0.1-	1998 08 26	809	0.0	1.4+	1999 11 04	704	0.3+	0.2+
1991 05 18	809	1.3+	0.9+	1998 08 26	809	0.2-	1.3+	1999 11 04	704	0.2-	0.2-
1991 05 18	809	0.1-	0.3+	1998 09 27	699	0.0	1.1-	1999 11 04	704	0.0	0.3-
1991 05 18	809	0.6+	0.7+	1998 09 27	699	0.3-	0.9-	1999 11 04	704	0.2+	0.3-
1991 06 06	809	0.5+	0.7+	1998 09 27	699	0.1-	0.2-	1999 11 15	704	0.0	0.5+
1991 06 06	809	0.1-	0.1+	1998 12 08	704	0.8+	0.6-	1999 11 15	704	0.3-	0.4+
1991 06 06	809	0.3-	0.8+	1998 12 08	704	0.9-	0.1+	1999 11 15	704	0.6-	0.4+
1991 06 08	809	0.7-	0.0	1998 12 24	327	0.3+	0.2+	1999 11 15	704	0.3-	0.3+
1991 06 08	809	0.0	0.1-	1998 12 24	327	0.6-	0.4+	1999 11 15	704	0.4-	0.0
1991 06 08	809	0.2-	0.1-	1998 12 24	327	0.4-	0.5+	1999 11 17	704	0.2-	0.2+
1998 08 25	809	0.6+	0.0	1999 10 21	704	1.5+	0.4+	1999 11 17	704	0.4-	0.5+
1998 08 25	809	0.5+	0.8-	1999 10 21	704	0.5-	0.6+	1999 11 17	704	0.3-	0.5+
1998 08 25	809	0.1+	1.5-	1999 10 21	704	0.2-	0.0				
1998 08 26	809	0.2-	1.4+	1999 11 04	704	0.6+	0.8+				

(12292)* 1991 LK₂ = 1993 TG₃₈

Discovered 1991 June 6 by E. W. Elst at the European Southern Observatory.

Id. T. Kobayashi (*MPC* 23977)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	223.39554		(2000.0)	P	Q
<i>n</i>	0.17580664	ω	112.09875	-0.99224724	+0.06968374
<i>a</i>	3.1558223	Ω	72.01772	-0.10727535	-0.89829942
<i>e</i>	0.0845397	<i>i</i>	6.21102	+0.06274883	-0.43382292
<i>P</i>	5.61	<i>H</i>	13.2	<i>G</i>	0.15

Residuals in seconds of arc

1958 07 12	675	0.2-	0.9+	1998 09 18	704	1.1+	1.6+	1999 10 21	704	0.4-	0.1+
1990 03 30	675	(1.2+	2.2+)	1998 09 18	704	0.6+	0.4+	1999 10 21	704	0.2-	1.1-
1990 03 30	675	0.6-	0.3-	1998 09 18	704	0.3+	0.7-	1999 10 21	704	0.3-	0.3+
1991 05 18	809	0.3+	1.4-	1998 09 18	704	0.0	1.4-	1999 10 21	704	0.0	1.3-
1991 05 18	809	0.0	1.6-	1998 09 18	704	0.4-	1.0+	1999 11 04	704	0.7+	0.5-
1991 05 18	809	0.2+	1.5-	1998 09 26	704	1.5-	0.7-	1999 11 04	704	0.2-	0.3-
1991 06 06	809	(0.2+	2.6-)	1998 09 26	704	0.7-	1.6-	1999 11 04	704	0.4+	0.3-
1991 06 06	809	0.7-	1.8-	1998 09 26	704	0.6+	1.0+	1999 11 04	704	0.3-	0.3-
1991 06 06	809	(0.3-	2.2-)	1998 09 26	704	0.9-	0.2-	1999 11 04	704	0.5+	0.2-
1991 06 08	809	0.1-	1.6-	1998 09 27	704	0.3+	1.4-	1999 11 11	691	0.2+	0.5-
1991 06 08	809	0.1-	1.7-	1998 09 27	704	1.7+	0.1-	1999 11 11	691	0.2+	0.5-
1991 06 08	809	0.0	1.7-	1998 09 27	704	0.1+	0.1+	1999 11 11	691	0.3+	0.5-
1993 10 09	809	(1.6+	2.8+)	1998 09 27	704	1.4-	0.7-	1999 11 12	699	1.0+	1.7+
1993 10 09	809	(0.7+	3.2+)	1998 09 27	704	1.5-	1.7+	1999 11 12	699	0.3+	0.4+
1993 10 09	809	(0.7+	4.0+)	1999 10 10	704	0.6+	0.7-	1999 11 12	699	0.5+	0.6-
1993 10 11	809	(1.6+	2.4+)	1999 10 10	704	0.1-	0.1+	1999 11 13	691	0.1+	0.4-
1993 10 11	809	(1.1+	3.0+)	1999 10 10	704	0.5-	0.5-	1999 11 13	691	0.0	0.5-
1993 10 11	809	(1.6+	3.4+)	1999 10 10	704	0.7-	0.8-	1999 11 13	691	0.0	0.7-
1993 10 21	809	(3.0+	3.1+)	1999 10 10	704	0.4+	0.4-	1999 11 17	704	0.4+	1.3-
1993 10 21	809	(2.5+	2.2+)	1999 10 15	704	0.3+	0.4+	1999 11 17	704	0.2+	0.8-
1993 10 21	809	(2.3+	2.4+)	1999 10 15	704	0.4+	0.5-	1999 11 17	704	0.2-	0.0
1996 04 15	691	1.0-	0.6-	1999 10 15	704	0.7+	0.5-	1999 11 17	704	0.8+	0.6-
1996 04 15	691	0.8-	0.7-	1999 10 15	704	(0.1-	2.2-)	1999 11 17	704	0.4+	1.2-
1996 04 15	691	0.8-	0.7-	1999 10 21	704	0.3+	0.8-				

(12293)* 1991 NV₁ = 1988 XM₂ = 1995 XY

Discovered 1991 July 13 by H. E. Holt at Palomar.

Id. B. G. Marsden (*MPC* 26398)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Marsden

<i>M</i>	3.04294		(2000.0)	P	Q
<i>n</i>	0.26793302	ω	135.21593	+0.87513580	-0.47277815
<i>a</i>	2.3829699	Ω	253.25577	+0.40831507	+0.83580626
<i>e</i>	0.1217333	<i>i</i>	6.17739	+0.25964618	+0.27912133
<i>P</i>	3.68	<i>H</i>	13.9	<i>G</i>	0.15

Residuals in seconds of arc

1988 12 03	400	1.0+	0.3-	1995 12 09	608	1.4-	1.4+	1998 06 03	704	1.0-	0.8+
1988 12 03	400	1.0-	1.0+	1995 12 12	608	0.5+	0.3-	1998 06 03	704	0.4+	1.0+
1988 12 03	400	0.8-	0.1-	1995 12 12	608	0.3+	0.3-	1998 06 03	704	(2.8-	1.0-)
1991 07 13	675	1.7-	0.0	1995 12 13	608	0.3+	0.3+	1998 06 03	704	(2.1-	1.5+)
1991 07 13	675	(2.2-	0.1+)	1995 12 13	608	0.2+	0.3-	1999 10 13	704	0.4-	0.3+
1991 07 19	675	(4.3-	0.4-)	1995 12 21	608	0.1+	0.4+	1999 10 13	704	0.1-	0.5+
1991 07 19	675	0.4+	0.6-	1995 12 21	608	0.1+	0.7+	1999 10 13	704	0.2-	0.7+
1991 08 05	675	0.3+	1.0-	1995 12 22	608	0.3-	0.2+	1999 10 13	704	0.5+	0.2-
1991 08 05	675	0.8+	0.7-	1995 12 22	608	0.4-	0.1+	1999 10 13	704	1.2+	0.3+
1991 08 09	675	1.3+	0.3+	1996 01 30	327	0.5-	0.8+	1999 11 03	704	0.4+	0.2-
1991 08 09	675	1.1+	0.0	1996 01 30	327	0.1+	0.1-	1999 11 03	704	0.2-	0.8-
1991 09 06	033	0.5-	0.4-	1996 01 30	327	0.0	0.8+	1999 11 03	704	0.5-	0.3-
1991 09 10	033	1.4+	0.7+	1996 01 31	327	0.6-	0.1-	1999 11 03	704	0.0	0.1+
1991 09 12	033	0.5+	0.3+	1996 01 31	327	0.3-	1.5+	1999 11 16	704	0.6+	1.0-
1991 09 13	675	0.2+	0.1+	1996 01 31	327	0.8-	0.5+	1999 11 16	704	0.0	0.5-
1991 09 13	675	0.5-	0.9-	1996 02 03	327	0.3-	0.4-	1999 11 16	704	0.3+	0.5-
1991 09 13	033	0.1-	0.2-	1996 02 03	327	0.4-	0.7+	1999 11 16	704	0.1+	0.5-
1991 09 14	033	0.5-	0.1+	1996 02 03	327	0.5-	0.0	1999 11 16	704	0.1+	0.8-
1994 06 08	675	1.4+	0.5+	1998 05 28	689	0.8-	0.3+				
1995 12 09	608	1.5-	1.6+	1998 06 03	704	1.5-	0.5+				

(12294)* 1991 PQ₂ = 1984 SB₈ = 1995 UH₅₃

Discovered 1991 Aug. 2 by E. W. Elst at the European Southern Observatory.

1999 NOV. 23

M.P.C. 36685

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5					Williams				
<i>M</i>	83.10675		(2000.0)		P		Q		
<i>n</i>	0.26978509	ω	279.59738		+0.41260299		+0.91086851		
<i>a</i>	2.3720513	Ω	14.78048		-0.82164318		+0.37631911		
<i>e</i>	0.1201130	<i>i</i>	1.97536		-0.39326996		+0.16941809		
<i>P</i>	3.65	<i>H</i>	14.5	<i>G</i>	0.15	<i>U</i>	2		
Residuals in seconds of arc									
1984 09 21	010	1.3+	0.4-	1998 06 24	704	1.0-	0.9-	1999 11 05	704 0.1+ 0.4-
1991 07 14	675	1.7+	1.1-	1998 06 24	704	1.3+	0.9+	1999 11 05	704 0.7+ 0.4+
1991 07 14	675	1.8+	0.3-	1998 06 24	704	(0.3+ 2.4+)		1999 11 05	704 0.5+ 0.8-
1991 08 02	809	0.8-	0.8-	1998 06 24	704	0.2-	1.6+	1999 11 05	704 1.7+ 0.8+
1991 08 02	809	0.6-	0.2+	1998 06 26	704	1.3-	0.3-	1999 11 06	704 0.5+ 0.5+
1991 08 02	809	1.9-	0.5+	1998 06 26	704	0.5+	1.9+	1999 11 06	704 0.5+ 0.4+
1991 08 07	809	0.5+	1.3+	1998 06 26	704	0.4+	0.2-	1999 11 06	704 0.9+ 0.3+
1991 08 07	809	0.2+	0.9+	1999 10 12	704	0.7+	0.3-	1999 11 06	704 0.5+ 0.3+
1991 08 07	809	1.2-	0.6+	1999 10 12	704	0.4+	0.8-	1999 11 06	704 0.9+ 0.4+
1991 08 14	809	0.5-	0.7-	1999 10 12	704	0.2-	0.1-	1999 11 14	704 0.9- 0.1-
1991 08 14	809	0.6-	0.1-	1999 10 12	704	0.2-	0.0	1999 11 14	704 0.9- 0.1+
1991 08 14	809	1.3-	0.1+	1999 10 22	704	0.3+	0.2+	1999 11 14	704 0.9- 0.2+
1995 10 21	691	1.1+	0.0	1999 10 22	704	0.6-	0.7-	1999 11 14	704 1.1- 0.7+
1995 10 21	691	1.1+	0.1-	1999 10 22	704	1.2-	0.2-	1999 11 14	704 1.5- 0.0
1995 10 21	691	0.7+	0.1-	1999 10 22	704	0.8-	0.1-	1999 11 16	704 0.2+ 0.2+
1998 05 24	704	0.8+	0.8-	1999 10 22	704	0.6-	0.4-	1999 11 16	704 0.4- 0.2+
1998 05 24	704	0.1-	1.0-	1999 11 03	704	1.4-	0.7-	1999 11 16	704 0.3- 0.3-
1998 05 24	704	0.3-	1.4-	1999 11 03	704	0.2+	0.1-	1999 11 16	704 0.4- 0.0
1998 05 24	704	(2.3+ 2.7+)		1999 11 03	704	0.2-	0.3+	1999 11 16	704 0.6- 0.4+
1998 05 24	704	0.6+	0.3-	1999 11 03	704	0.2+	0.4+		
1998 06 24	704	0.7+	0.0	1999 11 05	704	1.5+	0.8-		

(12295)* 1991 PE₃ = 1980 TL₁ = 1989 AE₂ = 1989 AK₂

Discovered 1991 Aug. 2 by E. W. Elst at the European Southern Observatory.

Id. B. G. Marsden (*MPC* 19310), D. W. E. Green (d, *MPC* 14324)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5						Marsden	
<i>M</i>	339.20664		(2000.0)	P		Q	
<i>n</i>	0.26254294	ω	294.56788	+0.69892873		−0.71317025	
<i>a</i>	2.4154746	Ω	110.97816	+0.67523333		+0.63325509	
<i>e</i>	0.2105302	<i>i</i>	3.29881	+0.23570868		+0.30062633	
<i>P</i>	3.75	<i>H</i>	14.4	<i>G</i>	0.15	<i>U</i>	1

Residuals in seconds of arc											
1980 10 05	809	0.4+	0.6-	1991 09 05	809	(0.4+	2.4-)	1999 10 15	704	1.0-	1.0-
1989 01 04	046	1.7-	1.5-	1991 09 05	809	0.9-	1.8-	1999 10 16	611	0.1-	0.8+
1989 01 04	046	0.4+	1.8-	1991 09 05	809	0.9-	0.9-	1999 10 16	611	1.7+	0.0
1989 01 09	400	(4.4+	2.0-)	1991 09 06	809	1.1+	1.1-	1999 10 20	704	0.1-	0.1-
1989 01 09	400	(3.3+	1.6-)	1991 09 06	809	0.2-	0.6-	1999 10 20	704	0.5-	0.2-
1989 01 09	046	1.5-	1.4-	1991 09 06	809	1.3-	1.0-	1999 10 20	704	0.9-	0.9-
1989 01 09	046	0.2-	0.8-	1991 09 07	809	1.2-	1.2+	1999 10 20	704	0.6-	0.6-
1989 01 11	046	1.2+	0.8-	1991 09 07	809	(2.5-	1.2+)	1999 10 20	704	(2.1-	0.9-)
1989 01 11	046	0.8+	1.8-	1991 09 07	809	(2.6-	0.9+)	1999 11 04	704	0.3+	0.7+
1991 08 02	809	(3.4+	1.1+)	1995 08 28	809	1.1+	0.2-	1999 11 04	704	0.1+	0.7+
1991 08 02	809	(3.7+	2.3+)	1995 08 29	809	0.9+	0.6-	1999 11 04	704	0.1+	0.6+
1991 08 02	809	(2.1+	1.7+)	1995 08 31	809	0.5-	0.8-	1999 11 04	704	0.1+	0.5+
1991 08 07	809	1.1+	0.2+	1995 09 01	809	1.0-	1.9-	1999 11 04	704	0.4-	0.6+
1991 08 07	809	0.1+	0.6+	1995 09 23	809	(4.8+	2.5-)	1999 11 12	699	0.3-	1.0+
1991 08 07	809	0.4-	0.7-	1999 10 14	850	(3.7+	3.3+)	1999 11 12	699	0.1-	1.0+
1991 08 14	809	0.9+	1.5+	1999 10 14	850	0.9-	0.2-	1999 11 12	699	0.1-	1.1+
1991 08 14	809	1.1+	1.5+	1999 10 15	850	0.7-	0.0	1999 11 17	704	0.3-	0.4+
1991 08 14	809	0.8+	0.7+	1999 10 15	704	1.4+	0.6+	1999 11 17	704	0.1+	0.3+
1991 09 04	809	0.7+	1.6-	1999 10 15	704	0.7+	1.6-	1999 11 17	704	0.5+	0.4+
1991 09 04	809	0.3+	0.5-	1999 10 15	850	0.4-	0.0	1999 11 17	704	0.5+	0.3+
1991 09 04	809	0.6-	1.1-	1999 10 15	704	0.8-	1.3+	1999 11 17	704	0.2+	0.2+

(12296)* 1991 PL₁₃ = 1995 UB₁₈

Discovered 1991 Aug. 5 by H. E. Holt at Palomar.

Id. G. V. Williams (<i>MPC</i> 26169)											
Epoch 1999 Aug. 10.0 TT = JDT 2451400.5											
<i>M</i>	40.02587		(2000.0)		P		Q				
<i>n</i>	0.25664053		ω 47.12416		+0.70874656		+0.70489226				
<i>a</i>	2.4523694		Ω 268.03285		−0.65524492		+0.64285713				
<i>e</i>	0.1794578		<i>i</i> 1.62703		−0.26140468		+0.29976927				
<i>P</i>	3.84		<i>H</i> 14.6		<i>G</i> 0.15		<i>U</i>		2		
Residuals in seconds of arc											
1991 08 05	675	(1.6−	3.3−)	1998 04 21	704	0.0	0.6+	1999 10 15	704	0.7+	0.1+
1991 08 08	675	2.0−	1.2−	1998 04 21	704	0.5−	0.2−	1999 10 15	704	0.7+	0.0
1991 08 08	675	0.7−	0.1+	1998 04 21	704	0.3+	0.4−	1999 10 15	704	0.9+	0.4+
1991 08 08	675	(2.4−	1.2−)	1998 04 21	704	0.7−	0.2−	1999 10 21	704	0.8−	0.4+
1991 08 08	675	1.0−	0.4−	1998 04 22	704	0.9+	0.1−	1999 10 21	704	1.0−	0.4+
1991 09 01	372	0.6+	0.2+	1998 04 22	704	0.1+	0.6+	1999 10 21	704	0.6−	0.1+
1991 09 01	372	1.3+	0.9−	1998 04 22	704	0.5−	0.2−	1999 10 21	704	0.6−	0.5−
1991 09 07	372	0.2+	0.1−	1998 04 22	704	0.3−	1.3−	1999 10 21	704	0.5−	0.5+
1991 09 07	372	1.1+	1.0+	1998 04 22	704	0.4+	0.6+	1999 11 03	703	0.3−	0.6+
1991 09 09	372	0.7+	0.0	1998 04 30	699	1.6+	0.0	1999 11 03	703	0.4−	0.1−
1991 09 09	372	0.4+	1.4+	1998 04 30	699	0.1+	0.3+	1999 11 03	703	0.0	0.6+
1991 09 14	675	0.2+	0.2−	1998 04 30	699	0.4−	0.6+	1999 11 03	703	0.2+	0.4+
1991 09 14	675	0.1−	0.1−	1998 05 01	699	1.0+	0.1−	1999 11 04	704	0.0	0.6+
1995 10 18	691	0.5−	0.1+	1998 05 01	699	0.7+	0.0	1999 11 04	704	0.1−	0.2−
1995 10 18	691	0.2−	0.1+	1998 05 01	699	0.1−	0.5+	1999 11 04	704	0.2−	0.2+
1995 10 18	691	0.0	0.0	1998 05 16	704	0.5−	1.5+	1999 11 04	704	0.1+	0.2−
1995 10 23	691	0.3−	0.1+	1998 05 16	704	0.4+	0.4+	1999 11 04	704	0.0	0.6−
1995 10 23	691	0.3−	0.1+	1998 05 16	704	0.8+	0.8−	1999 11 11	703	0.2−	0.8+
1995 10 23	691	0.1−	0.1+	1998 05 16	704	0.4−	0.6−	1999 11 11	703	0.3−	0.1−
1995 10 28	691	0.1+	0.1−	1998 05 16	704	1.6−	1.5+	1999 11 11	703	1.0+	1.2+
1995 10 28	691	0.3+	0.1−	1999 10 03	704	0.6+	0.6−	1999 11 11	703	0.5−	0.3+
1995 10 28	691	0.2+	0.1+	1999 10 03	704	1.4+	0.9−	1999 11 13	691	0.2−	0.2−
1995 12 17	327	0.4+	0.2+	1999 10 03	704	0.1+	0.6+	1999 11 13	691	0.2−	0.3−
1995 12 17	327	0.3+	0.2+	1999 10 03	704	0.6+	0.9−	1999 11 13	691	0.2−	0.3−
1995 12 18	327	0.5−	0.1−	1999 10 03	704	0.6+	0.6−	1999 11 14	704	0.3+	0.2+
1995 12 18	327	0.1−	0.1−	1999 10 07	704	0.2+	0.2+	1999 11 14	704	0.1+	0.1+
1995 12 18	327	0.3−	0.1+	1999 10 07	704	0.2−	0.2−	1999 11 14	704	0.1−	0.0
1995 12 19	327	0.5+	0.1−	1999 10 07	704	0.0	0.2−	1999 11 14	704	0.0	0.2−
1995 12 19	327	0.5−	0.4−	1999 10 07	704	0.1+	0.4+	1999 11 14	704	0.1+	0.4−
1995 12 19	327	0.0	0.5+	1999 10 07	704	0.4−	0.3−	1999 11 15	691	0.1+	0.2−
1995 12 21	327	0.2−	0.1+	1999 10 10	704	0.1+	0.1+	1999 11 15	691	0.2+	0.3−
1995 12 21	327	0.4−	0.2+	1999 10 10	704	0.4−	0.8+	1999 11 15	691	0.0	0.1−
1995 12 21	327	1.8−	0.2+	1999 10 10	704	0.4−	0.4−	1999 11 16	704	0.0	0.2+
1998 04 19	688	0.2−	0.2+	1999 10 10	704	0.4−	0.4+	1999 11 16	704	0.1−	0.5−
1998 04 19	688	0.1−	0.2+	1999 10 10	704	1.0−	0.7+	1999 11 16	704	0.0	0.4−
1998 04 19	688	0.1+	0.4+	1999 10 15	704	0.6+	0.2+	1999 11 16	704	0.4+	0.4−
1998 04 21	704	0.1+	0.0	1999 10 15	704	0.7+	0.5+	1999 11 16	704	0.1+	0.1−

1991 09 06	809	0.7−	1.2−	1999 10 08	703	0.6+	0.5+	1999 11 01	703	0.0	0.9+
1991 09 06	809	0.7+	1.3−	1999 10 08	703	0.0	0.3+	1999 11 04	704	0.2+	0.1−
1991 09 06	809	1.1+	1.8−	1999 10 08	703	0.3−	0.2+	1999 11 04	704	0.6+	0.3−
1991 09 07	809	1.8−	0.2−	1999 10 08	703	0.4−	0.5+	1999 11 04	704	0.0	0.6−
1991 09 07	809	0.3+	1.4−	1999 10 10	704	0.3+	0.7−	1999 11 04	704	0.0	0.6−
1991 09 07	809	0.9−	1.6−	1999 10 10	704	0.4+	1.2−	1999 11 04	704	0.4+	0.4−
1995 09 19	691	0.3−	0.4+	1999 10 10	704	0.4−	0.5−	1999 11 05	120	1.2+	0.0
1995 09 19	691	0.4−	0.4+	1999 10 10	704	0.1−	0.4−	1999 11 05	120	(2.2+	0.5+)
1995 09 19	691	0.2−	0.4+	1999 10 10	704	0.7−	0.6−	1999 11 07	120	0.4+	1.0−
1995 09 24	691	0.4−	0.6+	1999 10 11	120	0.8+	0.3−	1999 11 07	120	0.1+	0.4+
1995 09 24	691	0.3+	0.3+	1999 10 11	120	0.5+	0.4−	1999 11 08	120	0.5+	0.1−
1995 09 24	691	0.2−	0.2+	1999 10 11	120	(2.9+	0.0)	1999 11 08	120	0.1−	1.0−
1996 11 09	589	(2.9−	1.7−)	1999 10 13	120	0.3+	0.1+	1999 11 10	120	0.7+	0.4+
1996 11 09	589	1.9−	0.1+	1999 10 13	120	(1.4−	2.2+)	1999 11 10	120	0.7+	0.2+
1996 11 09	589	1.7−	0.2−	1999 10 13	120	0.1−	0.2−	1999 11 15	704	0.2−	0.1−
1997 01 10	691	0.2+	0.6−	1999 10 15	120	0.4−	0.1+	1999 11 15	704	0.4+	0.6+
1997 01 10	691	0.3+	0.5−	1999 10 15	120	0.7−	0.9−	1999 11 15	704	0.3+	0.5+
1997 01 10	691	0.3+	0.5−	1999 10 15	704	1.3−	0.8−	1999 11 15	704	0.5+	0.7+
1997 01 16	691	0.1+	0.7−	1999 10 15	704	0.4−	0.1+	1999 11 15	704	0.2+	1.1+
1997 01 16	691	0.1−	0.5−	1999 10 15	704	0.1+	0.7+	1999 11 17	704	0.3+	0.2+
1997 01 16	691	0.1+	0.4−	1999 10 15	704	0.5−	0.3+	1999 11 17	704	0.4−	0.6+
1997 03 31	704	1.1−	1.4+	1999 10 16	120	0.8−	0.2+	1999 11 17	704	0.3−	0.1+
1997 03 31	704	1.5+	0.8−	1999 10 16	120	0.1+	1.1+	1999 11 17	704	0.4−	0.2−
1998 06 24	704	1.7+	0.3−	1999 10 20	704	0.5−	0.3+				

(12298)* 1991 PL₁₇ = 1989 AR₆

Discovered 1991 Aug. 6 by F. Börngen at Tautenburg.

Id. G. V. Williams (*MPC* 21578)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

				Williams			
<i>M</i>	11.45750		(2000.0)	P		Q	
<i>n</i>	0.26118145	ω	68.61747	+0.95631924		−0.26905118	
<i>a</i>	2.4238617	Ω	306.81253	+0.18598028		+0.86165368	
<i>e</i>	0.2395038	<i>i</i>	8.20820	+0.22553236		+0.43030732	
<i>P</i>	3.77	<i>H</i>	14.4	<i>G</i>	0.15	<i>U</i>	2

Residuals in seconds of arc

1989 01 11	033	0.0	0.2−	1991 09 12	095	(2.2−	3.1+)	1999 10 05	704	0.4−	1.0+
1989 01 11	033	0.1−	0.5−	1991 09 12	095	1.0−	0.0	1999 10 05	704	0.1−	0.4+
1989 01 14	033	0.0	0.4+	1991 09 14	095	(2.4−	3.8+)	1999 10 05	704	0.5−	0.1+
1991 08 06	033	0.4−	0.7+	1991 09 14	095	1.1−	0.8−	1999 10 05	704	0.6−	0.2+
1991 08 07	033	0.9+	0.1−	1995 08 23	033	0.1+	0.4−	1999 10 14	704	0.7+	0.4−
1991 08 07	033	0.7+	1.0+	1995 08 24	033	0.3+	0.1+	1999 10 14	704	0.4−	0.1+
1991 08 09	675	1.1+	0.7−	1995 08 24	033	0.2+	0.1−	1999 10 14	704	0.3+	0.3−
1991 09 04	095	0.1+	0.6+	1995 10 23	033	0.2+	0.6−	1999 11 10	367	0.1+	0.0
1991 09 12	675	0.8−	0.3−	1995 10 23	033	0.1−	0.0	1999 11 10	367	0.5+	0.1−
1991 09 12	675	(3.0−	0.8+)	1995 10 24	033	0.3+	0.1−	1999 11 10	367	0.1−	0.5+

(12299)* 1991 PV₁₇ = 4325 T-1

Discovered 1991 Aug. 7 by H. E. Holt at Palomar.

Id. G. V. Williams (*MPC* 20025)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

				Williams			
<i>M</i>	13.98992		(2000.0)	P		Q	
<i>n</i>	0.26534198	ω	317.56394	+0.84432228		−0.53341049	
<i>a</i>	2.3984578	Ω	74.73950	+0.50469998		+0.75973879	
<i>e</i>	0.1934037	<i>i</i>	3.02571	+0.17999392		+0.37184704	
<i>P</i>	3.71	<i>H</i>	14.3	<i>G</i>	0.15	<i>U</i>	2

Residuals in seconds of arc

1971 03 24	675	0.0	0.9−	1996 01 24	691	0.1+	0.2−	1999 11 12	703	0.1−	0.2+
1971 03 26	675	0.7−	0.6−	1996 01 24	691	0.2−	0.1−	1999 11 12	703	0.4−	0.3+
1971 03 26	675	0.5−	1.7−	1999 10 12	704	0.1−	0.4+	1999 11 12	703	0.2−	0.1+
1971 03 27	675	1.3−	2.1−	1999 10 12	704	0.3−	0.2+	1999 11 14	703	0.5−	0.5+
1991 08 07	675	0.5+	0.8−	1999 10 12	704	0.3+	0.5−	1999 11 14	703	0.4−	0.3−
1991 08 07	675	0.6−	0.1−	1999 10 12	704	0.3−	0.6+	1999 11 14	703	0.1+	0.1+
1991 09 12	675	0.0	0.7−	1999 10 12	704	0.2−	0.0	1999 11 14	703	0.2+	0.0

1991 09 12	675	0.6+	1.6−	1999 10 22	704	0.6+	0.4−	1999 11 16	704	1.0−	1.3−
1991 09 16	675	1.1+	0.7−	1999 10 22	704	0.3+	0.6−	1999 11 16	704	0.2+	1.0−
1991 09 16	675	0.5+	0.6−	1999 10 22	704	0.2+	0.3−	1999 11 16	704	0.3+	0.6−
1995 11 16	808	0.1−	0.0	1999 10 22	704	0.0	0.3−	1999 11 16	704	0.9+	0.3−
1995 11 16	808	(0.5+	2.4−)	1999 10 22	704	0.1+	0.8−				
1996 01 24	691	0.7−	0.9+	1999 11 12	703	0.0	0.5+				

(12300)* 1991 RX₁₀ = 1975 LE₁

Discovered 1991 Sept. 10 by H. E. Holt at Palomar.

Id. S. Nakano (*MPC* 19315)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

				Nakano			
<i>M</i>	47.41870		(2000.0)	P		Q	
<i>n</i>	0.25929322	ω	345.32938	+0.97314161		+0.23014396	
<i>a</i>	2.4356148	Ω	1.39949	−0.18259658		+0.78595102	
<i>e</i>	0.1024918	<i>i</i>	12.77248	−0.14019232		+0.57385952	
<i>P</i>	3.80	<i>H</i>	14.1	<i>G</i>	0.15	<i>U</i>	2

Residuals in seconds of arc

1964 08 08	675	0.0	0.9−	1991 10 03	402	(4.9+	3.8+)	1997 04 28	704	1.3−	0.4+
1975 06 01	413	0.2+	0.3−	1991 10 03	402	(2.6+	2.4+)	1997 04 28	704	0.5−	1.0−
1975 06 01	413	1.0+	0.1+	1993 04 09	695	0.3+	0.1+	1999 10 16	704	0.1+	1.1−
1975 06 03	413	0.3−	0.3−	1993 04 09	695	0.1+	0.0	1999 10 16	704	0.3−	1.6−
1975 06 03	413	0.0	0.1+	1993 04 09	695	0.1−	0.3−	1999 10 16	704	0.0	0.2+
1991 09 10	675	0.6−	0.7−	1993 04 09	695	0.2−	0.1−	1999 10 16	704	0.0	0.4+
1991 09 10	675	1.2+	1.2−	1995 10 24	689	0.1+	0.1+	1999 10 16	704	0.3+	0.4+
1991 09 14	675	0.7−	0.0	1995 10 25	689	0.1−	0.1+	1999 11 01	704	0.2+	0.1+
1991 09 14	675	0.6+	0.2−	1995 10 26	689	0.1−	0.4−	1999 11 01	704	0.1+	0.3+
1991 09 16	675	1.0+	0.8−	1995 10 27	689	0.3−	0.0	1999 11 01	704	0.2+	0.2+
1991 09 16	675	0.5−	0.3+	1995 11 12	689	0.7+	0.2+	1999 11 01	704	0.2+	0.1+
1991 10 03	402	0.6−	0.3+	1997 04 28	704	0.1−	0.2+				
1991 10 03	402	0.6−	1.7+	1997 04 28	704	0.1−	0.1−				

(12301)* 1991 RR₁₂ = 1984 UB₁

Discovered 1991 Sept. 4 by E. W. Elst at the European Southern Observatory.

Id. T. Kobayashi (*MPC* 24105)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

				Williams			
<i>M</i>	14.64778		(2000.0)	P		Q	
<i>n</i>	0.27014444	ω	17.52392	+0.74938079		−0.66169887	
<i>a</i>	2.3699473	Ω	23.95803	+0.60015671		+0.66337471	
<i>e</i>	0.2347111	<i>i</i>	3.40901	+0.27971477		+0.34941180	
<i>P</i>	3.65	<i>H</i>	15.1	<i>G</i>	0.15	<i>U</i>	1

Residuals in seconds of arc

1984 10 28	046	(2.9+	0.6+)	1991 09 07	809	0.3+	1.3−	1997 04 11	704	0.6+	1.3−
1984 10 28	046	0.5−	2.0−	1991 09 07	809	0.5−	1.5−	1997 04 12	816	0.5−	0.5−
1984 10 29	046	0.7−	0.6−	1996 01 16	327	0.2−	0.5+	1997 04 12	816	0.5−	0.9−
1984 10 29	046	0.3+	0.8−	1996 01 16	327	0.0	0.3+	1999 10 22	704	0.9−	1.2−
1984 10 30	046	1.1+	1.2+	1996 01 17	327	0.0	0.5+	1999 10 22	704	0.6+	1.3−
1984 10 30	046	0.1+	1.5+	1996 01 17	327	0.0	0.2+	1999 10 22	704	0.3+	2.0−
1991 08 14	809	1.4+	0.8−	1996 01 17	327	0.3−	0.0	1999 10 22	704	0.7+	1.5−
1991 08 14	809	1.4+	0.7−	1997 04 03	704	1.3+	0.4−	1999 11 11	703	0.8+	0.1−
1991 08 14	809	1.4+	0.2−	1997 04 03	704	0.1−	0.2+	1999 11 11	703	0.6−	0.6−
1991 09 04	809	0.7−	1.2+	1997 04 05	816	0.5−	0.1−	1999 11 11	703	0.2+	0.1−
1991 09 04	809	(0.8−	2.4+)	1997 04 05	816	0.5−	0.3+	1999 11 11	703	1.1−	0.2+
1991 09 04	809	(0.1+	2.2+)	1997 04 05	816	0.3+	0.3−	1999 11 16	704	0.2+	0.3−
1991 09 06	809	0.7−	0.3+	1997 04 11	816	1.0−	0.3−	1999 11 16	704	0.5−	0.5+
1991 09 06	809	1.0−	0.1−	1997 04 11	816	0.3+	0.1+	1999 11 16	704	0.5−	0.1−
1991 09 06	809	1.2−	0.0	1997 04 11	816	0.8−	0.0	1999 11 16	704	0.4−	0.5+
1991 09 07	809	0.7+	0.2−	1997 04 11	704	0.2+	0.5−	1999 11 16	704	0.7−	0.0

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Marsden

<i>M</i>	37.93138		(2000.0)	P	Q
<i>n</i>	0.26088505	ω	16.26742	+0.95475504	+0.29674117
<i>a</i>	2.4256972	Ω	326.45040	-0.27666826	+0.86199410
<i>e</i>	0.2193480	<i>i</i>	2.04121	-0.10907560	+0.41098765
<i>P</i>	3.78	<i>H</i>	14.8	<i>G</i> 0.15	<i>U</i> 1

Residuals in seconds of arc

1991 08 08	675	0.5-	0.9-	1997 02 10	691	0.5+	0.4-	1999 10 13	704	0.0	0.3+
1991 08 08	675	0.1+	0.7-	1997 02 10	691	0.5+	0.4-	1999 10 13	704	0.8+	0.5-
1991 09 13	675	0.0	0.8-	1997 02 10	691	0.2+	0.1+	1999 10 13	704	0.9+	0.7-
1991 09 13	675	0.7-	0.2-	1998 04 25	809	0.8-	1.5+	1999 11 14	704	0.1-	0.2+
1991 09 15	675	0.1-	0.2+	1998 04 25	809	0.1+	0.5-	1999 11 14	704	0.3+	0.3-
1991 09 15	675	0.3+	0.6+	1998 04 25	809	0.1+	1.0-	1999 11 14	704	0.2-	0.4-
1991 09 16	675	0.2-	0.1+	1998 04 28	809	(2.3+	1.5+)	1999 11 14	704	0.3-	0.4-
1991 09 16	675	0.3+	0.2+	1998 04 28	809	1.0+	1.4+	1999 11 14	704	0.1-	0.3-
1991 09 17	675	0.3+	0.2+	1998 04 28	809	1.9+	0.7+	1999 11 16	704	0.9-	0.1+
1991 09 17	675	0.5+	0.5+	1998 05 22	704	0.9-	1.2-	1999 11 16	704	0.6-	0.4+
1991 09 17	675	0.4+	0.4-	1998 05 22	704	0.5-	0.4-	1999 11 16	704	0.7-	0.1+
1991 09 17	675	0.0	0.3+	1998 05 22	704	0.1+	0.7+	1999 11 16	704	0.3-	0.2-
1994 05 02	691	0.6-	0.9-	1998 05 22	704	(4.1-	1.2+)	1999 11 16	704	0.0	0.3-
1994 05 02	691	0.7-	0.4-	1999 10 13	704	0.1-	0.8+				
1994 05 02	691	0.8-	0.3-	1999 10 13	704	0.8+	0.1+				

(12303)* 1991 RB₂₄ = 1972 KK = 1998 JM₄

Discovered 1991 Sept. 11 by H. E. Holt at Palomar.

Id. A. Gnädig (*MPC* 31954), G. V. Williams (*ibid.*)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	86.80995		(2000.0)	P	Q
<i>n</i>	0.26481424	ω	143.70666	+0.27157454	+0.96144932
<i>a</i>	2.4016432	Ω	141.99796	-0.89868367	+0.26938188
<i>e</i>	0.2131716	<i>i</i>	4.01941	-0.34440518	+0.05521420
<i>P</i>	3.72	<i>H</i>	14.7	<i>G</i> 0.15	<i>U</i> 1

Residuals in seconds of arc

1972 05 18	095	0.2+	1.5+	1998 05 24	704	0.0	0.6+	1998 07 15	691	0.1+	0.1+
1991 08 08	675	0.6+	1.0-	1998 05 24	699	0.1-	0.2+	1998 07 15	691	0.1+	0.3+
1991 08 08	675	0.7+	0.5-	1998 05 24	699	0.2+	0.4+	1998 07 15	691	0.1-	0.1+
1991 09 08	691	0.4-	0.5+	1998 05 24	704	0.1+	0.5+	1998 07 16	699	0.5-	0.4+
1991 09 08	691	0.3-	0.1-	1998 05 24	699	0.3+	0.4+	1998 07 16	699	0.7-	0.4+
1991 09 08	691	0.2-	0.3+	1998 05 24	704	0.1-	0.3+	1998 07 16	699	0.3-	0.3+
1991 09 11	675	0.3+	0.4-	1998 05 24	704	0.2+	0.8-	1999 10 10	704	0.7+	0.5-
1991 09 11	675	0.2+	0.6-	1998 05 24	704	0.0	0.2-	1999 10 10	704	0.3-	0.6+
1991 09 12	691	0.0	0.6+	1998 06 03	704	0.8+	0.1-	1999 10 10	704	0.1+	0.3-
1991 09 12	675	0.4+	0.1+	1998 06 03	704	0.2+	0.6+	1999 10 10	704	0.9-	0.3+
1991 09 12	691	0.1-	0.5+	1998 06 03	704	0.2-	0.4+	1999 10 21	704	0.2+	0.8+
1991 09 12	691	0.1-	0.6+	1998 06 03	704	0.7+	0.1-	1999 10 21	704	0.2-	1.0+
1991 09 12	675	0.3-	1.1-	1998 06 03	704	(0.5-	2.8-)	1999 10 21	704	0.6+	1.1+
1995 10 25	691	0.5-	0.1+	1998 06 16	704	1.4+	1.0-	1999 10 21	704	0.2+	0.2+
1995 10 25	691	0.5-	0.2+	1998 06 16	704	1.3+	1.2-	1999 10 21	704	0.5+	1.3+
1995 10 25	691	0.5-	0.2+	1998 06 16	704	0.3+	0.1+	1999 10 30	703	1.1-	1.3+
1998 05 02	910	0.8-	0.1+	1998 06 16	704	0.8-	0.3+	1999 10 30	703	0.8-	0.1+
1998 05 02	910	0.8-	0.1-	1998 06 16	704	0.8-	0.9-	1999 10 30	703	1.1-	0.1+
1998 05 02	910	0.8-	0.0	1998 06 18	704	0.3+	0.8+	1999 10 30	703	0.0	0.3+
1998 05 03	566	0.8-	0.5-	1998 06 18	704	0.1-	1.9-	1999 11 04	704	0.9+	1.3-
1998 05 03	566	0.6-	0.4-	1998 06 18	704	(0.0	2.7+)	1999 11 04	704	0.6+	0.7-
1998 05 03	566	0.1+	1.2-	1998 06 18	704	0.1+	0.4-	1999 11 04	704	0.4+	0.4-
1998 05 05	699	0.9-	0.6-	1998 06 18	704	0.2-	0.6+	1999 11 04	704	0.0	0.6-
1998 05 05	699	0.3-	0.2+	1998 06 19	691	0.1+	0.3-	1999 11 17	704	0.0	0.1+
1998 05 05	699	0.1-	0.6+	1998 06 19	691	0.0	0.2+	1999 11 17	704	0.6+	0.3-
1998 05 22	704	0.7+	0.1-	1998 06 19	691	0.0	0.1+	1999 11 17	704	0.4-	0.2-
1998 05 22	704	1.9+	0.2+	1998 06 30	699	0.3+	0.1-	1999 11 17	704	0.7+	0.3-
1998 05 22	704	1.1-	0.5+	1998 06 30	699	0.1+	0.1+	1999 11 17	704	0.3+	1.4-
1998 05 22	704	0.1-	0.6+	1998 06 30	699	0.1-	0.1+				

(12304)* 1991 SR₁ = 1949 WQ₁

Discovered 1991 Sept. 19 by S. Otomo at Kiyosato.

Id. E. Bowell (*MPC* 31532)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	313.30361		(2000.0)	P	Q
<i>n</i>	0.23418267	ω	158.38776	+0.98860214	-0.10746830
<i>a</i>	2.6067510	Ω	208.41571	+0.08361421	+0.97431254
<i>e</i>	0.1647373	<i>i</i>	12.80086	+0.12519773	+0.19790309
<i>P</i>	4.21	<i>H</i>	13.2	<i>G</i> 0.15	<i>U</i> 1

Residuals in seconds of arc

1949 11 23	675	0.0	0.3-	1998 03 25	699	0.5-	0.7+	1998 05 03	566	0.8-	0.5-
1949 11 23	675	0.1+	1.1-	1998 03 25	704	0.3-	0.4+	1998 05 03	566	0.7-	1.1-
1991 09 10	675	1.6+	1.7-	1998 03 25	704	0.1+	0.8+	1998 05 03	566	0.6-	0.5-
1991 09 10	675	0.2-	0.9-	1998 03 25	704	1.1-	0.1+	1998 05 16	704	0.3+	1.0-
1991 09 13	675	0.1-	0.2-	1998 03 25	704	0.6-	0.6-	1998 05 16	704	0.8+	1.1-
1991 09 13	675	0.2+	0.1-	1998 03 25	704	0.5-	0.1-	1998 05 16	704	1.3+	1.3-
1991 09 15	675	0.1+	0.9-	1998 03 29	704	0.3-	0.1-	1998 05 16	704	0.8+	0.6-
1991 09 15	675	0.4+	1.0-	1998 03 29	704	0.8-	0.3+	1998 05 16	704	(3.7-	0.6-)
1991 09 17	675	0.5-	0.7+	1998 03 29	704	0.6+	0.5+	1998 05 28	699	0.5+	0.3-
1991 09 17	675	0.5-	0.5-	1998 03 29	704	0.4-	0.6+	1998 05 28	699	0.7+	0.7-
1991 09 19	894	0.5+	1.7-	1998 03 29	704	0.4+	0.8+	1998 05 28	699	0.2-	1.9-
1991 09 19	894	0.4-	0.1-	1998 04 01	704	0.8-	0.1+	1999 07 12	704	1.1+	0.5+
1991 10 04	033	0.2-	0.6+	1998 04 01	704	0.0	0.2-	1999 07 12	704	0.5-	1.4+
1991 10 05	033	0.1-	0.0	1998 04 01	704	1.5-	0.1+	1999 07 12	704	0.3+	0.3-
1991 10 05	033	0.2+	0.5+	1998 04 01	704	0.5-	0.7-	1999 07 12	704	0.4-	0.2-
1991 10 13	894	(0.1-	2.7-)	1998 04 01	704	(6.3-	1.2+)	1999 07 16	127	(1.5+	2.7-)
1991 10 13	894	0.6-	0.5-	1998 04 20	704	0.0	0.6-	1999 07 16	127	(1.8+	2.5-)
1991 10 15	894	0.3+	0.1+	1998 04 20	704	0.4-	0.6+	1999 07 18	127	1.1-	1.0-
1991 10 18	894	0.6+	0.5-	1998 04 20	704	0.5-	0.2-	1999 07 18	127	0.8-	1.1-
1991 10 18	894	1.2+	0.7+	1998 04 20	704	0.6+	1.0+	1999 07 22	704	0.2+	0.5+
1991 10 28	894	0.7-	1.4-	1998 04 20	704	0.7-	0.5+	1999 07 22	704	0.3+	0.3+
1991 10 28	894	(2.1-	1.4+)	1998 04 22	704	0.2+	0.3-	1999 07 22	704	0.7+	1.1+
1998 03 22	704	0.3-	0.2-	1998 04 22	704	0.8+	1.7-	1999 07 22	704	0.4+	0.4+
1998 03 22	704	0.5+	0.3-	1998 04 22	704	0.1-	1.5-	1999 07 22	704	0.3+	0.3+
1998 03 22	704	0.7+	0.1-	1998 04 22	704	0.4+	0.9-	1999 08 01	611	(1.8-	2.3+)
1998 03 22	704	1.0+	0.6-	1998 04 22	704	0.7+	1.8-	1999 11 08	704	0.7-	0.4+
1998 03 22	704	0.6+	1.0-	1998 04 30	699	0.1-	0.7+	1999 11 08	704	0.8-	0.3+
1998 03 25	699	0.4-	0.2+	1998 04 30	699	0.6+	0.3+	1999 11 08	704	0.5-	0.1+
1998 03 25	699	0.1-	2.0+	1998 04 30	699	0.5-	0.4+				

(12305)* 1991 TE₁ = 1979 YN₅ = 1997 BT

Discovered 1991 Oct. 12 by R. H. McNaught at Siding Spring.

Id. G. V. Williams (*MPC* 29099)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	263.74815		(2000.0)	P	Q
<i>n</i>	0.24049641	ω	21.94398	-0.35439067	-0.89999816
<i>a</i>	2.5609257	Ω	89.56373	+0.81578353	-0.43022682
<i>e</i>	0.1167701	<i>i</i>	14.70248	+0.45706071	+0.07005855
<i>P</i>	4.10	<i>H</i>	13.3	<i>G</i> 0.15	<i>U</i> 2

Residuals in seconds of arc

1979 12 18	095	0.8+	0.8-	1997 01 24	327	0.6-	0.1+	1999 09 30	704	0.3+	1.2-
1991 10 12	413	0.0	0.5+	1997 02 05	327	0.2-	0.0	1999 09 30	699	0.1-	0.1+
1991 10 13	413	1.4-	0.6-	1997 02 05	327	0.3-	0.2-	1999 09 30	704	0.1+	0.5-
1991 10 15	413	0.6-	0.1+	1997 02 05	327	0.4-	0.1+	1999 09 30	699	0.1-	0.6+
1991 10 18	413	0.1+	0.3+	1997 04 26	689	0.7+	1.3-	1999 10 16	704	0.2-	0.2-
1997 01 22	327	0.1-	0.1-	1997 04 27	689	1.4-	0.6+	1999 10 16	704	0.2+	0.0
1997 01 22	327	0.1-	0.3+	1999 09 13	704	0.2+	0.9+	1999 10 16	704	0.5-	0.1-
1997 01 22	327	0.1-	0.0	1999 09 13	704	0.5+	0.4-	1999 10 16	704	0.2-	0.1+
1997 01 24	327	1.2+	0.1-	1999 09 13	704	0.6-	1.0+	1999 10 16	704	0.0	0.2+
1997 01 24	327	0.3-	0.0	1999 09 13	704	0.3+	0.9-	1999 11 10	704	0.2+	0.2-
1997 01 24	327	0.1-	0.5+	1999 09 30	704	0.0	0.4-	1999 11 10	704	0.1+	0.6+
1997 01 24	327	0.1+	0.0	1999 09 30	704	0.6+	0.8-	1999 11 10	704	0.7-	0.4+

1997 01 24 327 0.8+ 0.1+ 1999 09 30 699 0.1+ 0.2- 1999 11 10 704 0.1+ 0.5+
 1997 01 24 327 1.0+ 0.1+ 1999 09 30 704 0.6+ 0.3- 1999 11 10 704 0.6+ 0.9+

(12306)* 1991 TM₁₄ = 1972 TL₁₀ = 1997 FF₂ = 1998 MG₃₅

Discovered 1991 Oct. 7 by C. P. de Saint-Aignan at Palomar.

Id. A. Doppler (*MPC* 33229), G. V. Williams (*ibid.*)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

		Williams	
<i>M</i>	174.50343	<i>P</i>	<i>Q</i>
	(2000.0)		
<i>n</i>	0.25723230	ω	88.32257
<i>a</i>	2.4486068	Ω	119.96992
<i>e</i>	0.1192847	<i>i</i>	3.71082
<i>P</i>	3.83	<i>H</i>	13.9
		<i>G</i>	0.15
		<i>U</i>	1

Residuals in seconds of arc

1972 10 09	033	0.4+	0.0	1998 06 26	704	0.1-	0.5-	1999 10 15	704	0.4+	0.0
1972 10 09	033	1.0+	0.5-	1998 06 26	704	0.6-	0.0	1999 10 20	704	0.6-	0.6+
1972 10 09	033	0.1+	1.2-	1998 06 28	809	0.7+	0.7+	1999 10 20	704	0.7-	0.2+
1972 10 09	033	0.0	1.1-	1998 06 28	809	0.9+	0.7+	1999 10 20	704	0.2+	0.4+
1991 10 02	691	0.2-	0.2-	1998 06 28	809	0.7+	0.7+	1999 10 20	704	0.4-	0.5+
1991 10 02	691	0.1-	0.2-	1998 07 01	809	0.7+	1.3+	1999 10 20	704	0.8-	0.3+
1991 10 02	691	0.1+	0.3-	1998 07 01	809	1.9+	1.6+	1999 11 05	704	0.0	0.0
1991 10 07	675	1.0+	0.0	1998 07 01	809	(2.8+	1.7+)	1999 11 05	704	0.4-	0.6+
1991 10 07	675	0.1+	1.7-	1998 08 15	704	1.5+	0.3-	1999 11 05	704	0.7-	0.4+
1991 10 08	675	0.3-	1.1-	1998 08 15	704	1.4-	1.4+	1999 11 05	704	0.5-	0.4+
1997 03 31	704	0.6+	1.9+	1998 08 15	704	1.1-	1.6-	1999 11 05	704	0.2-	0.6+
1997 03 31	704	0.6+	0.3+	1998 08 15	704	1.0-	0.0	1999 11 15	704	0.0	0.3+
1997 04 01	704	1.2-	1.8+	1998 08 15	704	1.5-	1.3+	1999 11 15	704	0.2-	0.2+
1997 04 01	704	0.8+	1.5+	1999 10 10	704	0.8+	0.4+	1999 11 15	704	0.1+	0.1+
1998 06 24	704	0.7-	0.4-	1999 10 10	704	1.6+	0.1-	1999 11 15	704	0.5-	0.1-
1998 06 24	704	(2.5-	0.4+)	1999 10 10	704	0.3+	0.2+	1999 11 15	704	0.4-	0.0
1998 06 24	704	0.1-	1.2+	1999 10 10	704	0.2+	0.2+	1999 11 17	704	0.2+	0.6+
1998 06 24	704	(1.8-	2.7+)	1999 10 10	704	0.3+	0.1+	1999 11 17	704	0.4+	1.2+
1998 06 24	704	0.2-	1.1+	1999 10 15	704	0.4-	0.6+	1999 11 17	704	0.1+	0.0
1998 06 26	704	0.4-	0.8-	1999 10 15	704	0.2-	0.0	1999 11 17	704	0.0	0.6+
1998 06 26	704	0.8-	1.0+	1999 10 15	704	1.3-	0.8+	1999 11 17	704	0.0	0.6+

(12307)* 1991 UA = 1995 FX₁₅

Discovered 1991 Oct. 18 by S. Ueda and H. Kaneda at Kushiro.

Id. G. V. Williams (*MPC* 25215)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

		Williams	
<i>M</i>	357.94650	<i>P</i>	<i>Q</i>
	(2000.0)		
<i>n</i>	0.12312626	ω	28.38165
<i>a</i>	4.0016176	Ω	352.48528
<i>e</i>	0.2527881	<i>i</i>	2.35511
<i>P</i>	8.00	<i>H</i>	12.7
		<i>G</i>	0.15
		<i>U</i>	1

Residuals in seconds of arc

1991 09 13	675	0.4+	0.8+	1998 08 17	704	(1.4+	2.9-)	1999 11 03	703	0.1+	0.2+
1991 09 13	675	0.2+	0.9+	1999 10 02	703	0.1-	0.3+	1999 11 03	703	0.1+	0.5+
1991 09 14	675	0.4-	0.4+	1999 10 02	703	0.0	0.1+	1999 11 03	703	0.6-	0.5+
1991 09 15	675	0.4-	0.4+	1999 10 02	703	0.5-	0.3+	1999 11 03	703	0.3-	0.3+
1991 10 18	399	1.8+	0.6-	1999 10 02	703	0.4-	0.4+	1999 11 04	704	0.5+	0.3-
1991 10 18	399	1.7+	1.2-	1999 10 03	704	1.3+	0.4+	1999 11 04	704	0.7+	0.4-
1991 10 19	399	(2.1+	0.8-)	1999 10 03	704	0.1-	1.4-	1999 11 04	704	0.3+	0.1-
1991 10 19	399	1.4+	1.0-	1999 10 03	704	0.9+	0.2+	1999 11 04	704	0.9+	0.1+
1991 10 28	399	(0.5-	2.2-)	1999 10 03	704	0.0	0.2+	1999 11 04	704	0.1-	0.3+
1991 10 29	399	1.3-	0.7-	1999 10 03	704	0.9-	0.2+	1999 11 11	703	0.7+	0.4-
1991 10 29	399	1.4-	0.8-	1999 10 07	704	0.5+	0.2+	1999 11 11	703	0.2+	0.0
1991 10 31	399	0.8-	0.2-	1999 10 07	704	0.0	0.5-	1999 11 11	691	0.3-	0.3-
1991 10 31	399	0.0	0.8-	1999 10 07	704	0.2-	0.6+	1999 11 11	703	0.3+	0.4+
1995 03 28	691	0.1-	1.0+	1999 10 07	704	0.1+	0.5-	1999 11 11	703	0.3+	0.2+
1995 03 28	691	1.1+	0.9+	1999 10 07	704	0.6-	0.7-	1999 11 11	691	0.4-	0.3-
1995 03 28	691	0.5+	1.3+	1999 10 10	106	0.0	0.5+	1999 11 11	691	0.3-	0.4-
1995 04 06	691	0.1-	0.1-	1999 10 10	106	0.5-	0.5+	1999 11 13	691	0.0	0.4-
1995 04 06	691	0.1+	0.1+	1999 10 10	106	0.2-	0.4+	1999 11 13	691	0.0	0.3-

1995 04 06	691	0.1+	0.1+	1999 10 10	704	0.8-	0.8+	1999 11 13	691	0.1-	0.4-
1998 06 21	688	0.1+	0.3-	1999 10 10	704	0.4-	0.3+	1999 11 14	704	0.1+	0.1-
1998 06 21	688	0.3+	0.0	1999 10 10	704	0.6-	0.3+	1999 11 14	704	0.0	0.5-
1998 06 21	688	0.0	0.2+	1999 10 10	704	1.3-	0.2+	1999 11 14	704	0.3-	0.1-
1998 06 29	691	0.1-	0.4+	1999 10 15	704	0.1+	0.3+	1999 11 14	704	0.3-	0.4+
1998 06 29	691	0.6-	0.1-	1999 10 15	704	0.1+	0.5+	1999 11 14	704	0.8-	0.1-
1998 06 29	691	0.5-	0.2-	1999 10 15	704	0.4+	0.5+	1999 11 15	691	0.3+	0.7-
1998 07 16	699	0.3-	0.0	1999 10 15	704	0.4+	0.7+	1999 11 15	691	0.2+	0.0
1998 07 16	699	0.2+	1.5+	1999 10 15	704	0.8+	1.2+	1999 11 15	691	0.2+	0.0
1998 07 16	699	0.4-	1.1+	1999 10 21	704	0.2+	0.5+	1999 11 16	704	0.8-	0.1-
1998 08 17	704	0.5+	1.4-	1999 10 21	704	0.2+	0.7+	1999 11 16	704	0.4-	0.3-
1998 08 17	704	0.3+	0.4-	1999 10 21	704	0.3+	0.5+	1999 11 16	704	0.4-	0.9-
1998 08 17	704	(1.0+	2.1-)	1999 10 21	704	0.0	0.5+	1999 11 16	704	0.2-	0.1-
1998 08 17	704	(3.5+	2.5-)	1999 10 21	704	0.4+	0.5+	1999 11 16	704	1.0-	0.4+

(12308)* 1991 VB₅ = 1998 MK_s

Discovered 1991 Nov. 4 by A. Sugie at the Dynic Astronomical Observatory.

Id. A. Gnädig (*MPC* 32451)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

		Williams	
<i>M</i>	351.53453	<i>P</i>	<i>Q</i>
	(2000.0)		
<i>n</i>	0.24231358	ω	186.90837
<i>a</i>	2.5481063	Ω	194.93351
<i>e</i>	0.1224091	<i>i</i>	14.81575
<i>P</i>	4.07	<i>H</i>	13.4
		<i>G</i>	0.15
		<i>U</i>	1

Residuals in seconds of arc

1991 11 04	402	1.0+	1.3-	1998 06 03	704	0.3-	0.7-	1999 10 07	704	0.1-	0.6-
1991 11 04	402	0.3+	0.5+	1998 06 03	704	1.2-	0.8+	1999 10 09	704	0.1-	0.2-
1991 11 05	402	0.1+	0.8-	1998 06 19	704	0.1+	0.4-	1999 10 09	704	0.1-	0.0
1991 11 05	402	0.9-	0.5-	1998 06 19	704	0.5-	0.4+	1999 10 09	704	0.2+	0.1-
1991 11 30	402	1.2+	0.5-	1998 06 19	704	0.7+	0.9-	1999 10 09	704	0.2+	0.0
1991 11 30	402	1.4-	0.9-	1998 06 19	704	1.2+	0.3-	1999 10 09	704	0.2+	0.2-
1997 04 29	704	0.3+	0.9+	1998 06 19	704	0.1+	1.6-	1999 10 19	704	0.2+	0.6+
1997 04 29	704	0.2+	0.4+	1998 06 25	704	0.1-	1.2+	1999 10 19	704	0.2+	0.5+
1997 04 29	704	0.7-	0.4-	1998 06 25	704	0.0	0.8-	1999 10 19	704	0.3+	0.3+
1997 04 29	704	(0.2-	2.2-)	1998 06 25	704	0.2+	0.0	1999 10 19	704	0.3+	0.2+
1998 05 26	704	0.1+	0.4+	1998 06 25	704	0.4+	0.5+	1999 11 06	704	0.1-	0.2+
1998 05 26	704	0.5+	0.7-	1999 10 01	703	0.3-	0.5+	1999 11 06	704	0.3+	0.0
1998 05 26	704	0.5+	0.2+	1999 10 01	703	0.2-	0.5+	1999 11 06	704	0.3+	0.1+
1998 05 26	704	1.2-	0.0	1999 10 01	703	0.1-	0.5+	1999 11 06	704	0.3+	0.0
1998 05 26	704	1.3+	0.3-	1999 10 01	703	0.3-	0.4+	1999 11 06	704	0.0	0.1-
1998 06 03	704	0.3+	0.3+	1999 10 07	704	0.4-	0.8-	1999 11 07	704	0.3-	0.2+
1998 06 03	704	1.2-	0.2+	1999 10 07	704	0.4-	0.0	1999 11 07	704	0.0	0.5+
1998 06 03	704	0.7-	0.2+	1999 10 07	704	0.7-	0.3-	1999 11 07	704	0.3+	0.5+

(12309)* 1992 DD₃ = 1998 MJ

Discovered 1992 Feb. 25 by Spacewatch at Kitt Peak.

Id. S. Nakano (*MPC* 32452)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

		Nakano	
<i>M</i>	323.22958	<i>P</i>	<i>Q</i>
	(2000.0)		
<i>n</i>	0.21958983	ω	107.46164
<i>a</i>	2.7209960	Ω	322.00569
<i>e</i>	0.0311420	<i>i</i>	0.72082
<i>P</i>	4.49	<i>H</i>	14.1
		<i>G</i>	0.15
		<i>U</i>	1

Residuals in seconds of arc

1992 02 25	675	1.1+	0.1+	1998 06 17	691	0.5-	0.0	1999 10 22	704	0.0	0.4-
1992 02 25	675	1.2+	0.1+	1998 06 17	691	0.4-					

1999 NOV. 23

M.P.C. 36689

1992 03 06	691	0.3+	0.2+	1998 08 17	704	(1.8−	2.3−)	1999 11 04	703	0.4−	0.6+
1992 03 07	809	0.4+	0.9+	1998 08 17	704	0.1−	0.3+	1999 11 04	703	0.1−	0.5+
1992 04 06	809	0.3+	0.4−	1998 08 17	704	0.7−	0.1−	1999 11 04	703	0.9−	0.2+
1994 10 08	691	0.1−	0.5+	1999 10 12	704	0.6+	0.2−	1999 11 16	704	0.1+	0.1+
1994 10 08	691	0.1+	0.4+	1999 10 12	704	0.0	0.0	1999 11 16	704	0.0	0.4+
1994 10 08	691	0.1−	0.5+	1999 10 12	704	0.1+	0.6−	1999 11 16	704	0.2−	1.0+
1997 04 15	691	0.0	0.6−	1999 10 12	704	0.1−	0.0	1999 11 16	704	0.1−	0.2−
1997 04 15	691	0.1+	0.3−	1999 10 12	704	1.0−	0.1−	1999 11 16	704	0.2−	0.1+
1997 04 15	691	0.1+	0.3−	1999 10 22	704	0.2−	0.5−				
1998 06 17	691	0.7−	0.9+	1999 10 22	704	0.2+	0.5−				

(12310)* 1992 DE₄ = 1976 SJ₇ = 1985 RW₅

Discovered 1992 Feb. 29 by Spacewatch at Kitt Peak.

Id. G. V. Williams (*MPC* 23978)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>		(2000.0)		P		Q	
<i>n</i>	0.21801083	ω	225.58060	+0.99211781	−0.12394484		
<i>a</i>	2.7341185	Ω	141.52818	+0.12173608	+0.91845934		
<i>e</i>	0.1886618	<i>i</i>	1.69826	+0.02970833	+0.37559303		
<i>P</i>	4.52	<i>H</i>	14.2	<i>G</i>	0.15	<i>U</i>	1

Residuals in seconds of arc

1976 09 25	095	0.9+	0.1+	1994 08 13	809	0.1+	1.1+	1999 10 30	703	0.7+	0.5+
1976 09 28	095	(3.3+ 1.5−)		1994 09 05	809	0.4+	1.9−	1999 10 30	703	0.5−	0.2−
1985 09 15	095	1.5−	0.2−	1994 09 05	809	0.7+	1.7−	1999 11 04	704	0.2−	0.3−
1985 09 20	095	0.6−	0.8−	1994 09 05	809	0.3+	1.3−	1999 11 04	704	0.3+	0.1−
1990 11 14	675	1.5+	0.9+	1994 09 06	809	0.6+	0.5+	1999 11 04	704	0.1+	0.2−
1992 02 29	691	0.1+	1.0−	1994 09 06	809	0.1−	0.4+	1999 11 04	704	0.2+	0.5−
1992 02 29	691	0.3−	0.4−	1994 09 06	809	0.3−	0.0	1999 11 04	704	0.3+	0.1−
1992 02 29	691	0.3−	0.6−	1994 09 30	675	1.9−	0.7+	1999 11 15	704	0.3−	0.2−
1992 03 06	809	1.6−	0.6+	1995 12 27	566	0.2+	0.6+	1999 11 15	704	0.1−	0.4−
1992 03 09	809	0.2+	0.7−	1995 12 27	566	0.3+	0.6+	1999 11 15	704	0.1+	0.3−
1992 03 11	691	0.7−	0.4−	1995 12 27	566	0.4+	0.1+	1999 11 15	704	0.1−	0.0
1992 03 11	691	0.2−	0.9−	1997 04 03	704	0.4+	0.0	1999 11 15	704	0.1−	0.2+
1992 03 11	691	0.4−	0.7−	1997 04 03	704	1.7+	0.8+	1999 11 17	704	0.3+	0.3−
1992 04 06	809	0.9−	1.0−	1997 04 06	704	0.8−	1.0−	1999 11 17	704	0.2−	0.2−
1994 08 12	809	0.5+	0.1−	1997 04 06	704	1.8+	0.3−	1999 11 17	704	0.2−	0.2−
1994 08 12	809	0.7+	0.2−	1997 04 07	704	0.4−	0.5+	1999 11 17	704	0.2+	1.3+
1994 08 12	809	0.3−	0.1−	1997 04 07	704	1.0−	0.4+	1999 11 17	704	0.6−	1.0−
1994 08 13	809	1.2+	0.4+	1999 10 30	703	0.3−	0.1+				
1994 08 13	809	0.2+	0.2+	1999 10 30	703	0.3−	0.5+				

(12311)* 1992 EO₆ = 1990 SC₆

Discovered 1992 Mar. 1 at the European Southern Observatory in the course of the Uppsala-ESO Survey of Asteroids and Comets.

Id. G. V. Williams (*MPC* 23783)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>		(2000.0)		P		Q	
<i>n</i>	0.22811610	ω	2.36806	+0.57612148	−0.81391391		
<i>a</i>	2.6527649	Ω	52.46404	+0.74835337	+0.48834051		
<i>e</i>	0.1962438	<i>i</i>	5.42875	+0.32871153	+0.31475021		
<i>P</i>	4.32	<i>H</i>	14.5	<i>G</i>	0.15	<i>U</i>	1

Residuals in seconds of arc

1990 09 22	809	0.7+	0.3−	1998 07 19	428	0.6+	0.1+	1999 11 03	704	0.2+	0.3+
1990 09 22	809	0.6+	0.5−	1998 07 20	428	0.7−	0.7+	1999 11 03	704	0.7+	0.1−
1990 09 22	809	0.4−	0.5−	1999 10 12	704	0.5−	0.3−	1999 11 14	704	0.7−	0.6−
1990 09 25	809	0.7+	0.9−	1999 10 12	704	0.1+	0.3+	1999 11 14	704	0.0	0.0
1990 09 25	809	0.7+	0.5−	1999 10 12	704	0.4−	0.5+	1999 11 14	704	0.1−	0.1−
1990 09 25	809	0.6−	0.6−	1999 10 12	704	0.4−	0.6+	1999 11 14	704	0.0	0.1−
1992 03 01	809	0.1−	0.4−	1999 10 12	704	0.1+	0.6+	1999 11 14	704	0.2−	0.1+
1992 03 04	809	0.5−	0.2−	1999 10 22	704	0.6−	0.8−	1999 11 16	704	0.0	0.2−
1992 03 09	809	0.2−	0.6−	1999 10 22	704	1.0+	0.5+	1999 11 16	704	0.0	0.1−
1992 04 04	809	0.3−	1.2−	1999 10 22	704	(1.8+ 2.4+)		1999 11 16	704	0.3−	0.0
1997 05 08	691	0.2+	0.0	1999 10 22	704	1.0+	1.8+	1999 11 16	704	0.1−	0.1+

1997 05 08	691	0.1−	0.1−	1999 11 03	704	0.2−	0.0	1999 11 16	704	0.1−	0.1+
1997 05 08	691	0.1−	0.3−	1999 11 03	704	0.5+	0.4−				

(12312)* 1992 EM₈ = 1990 UP₅ = 1993 KR₂

Discovered 1992 Mar. 2 at the European Southern Observatory in the course of the Uppsala-ESO Survey of Asteroids and Comets.

Id. G. V. Williams (*MPC* 23783)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>		(2000.0)		P		Q	
<i>n</i>	0.21672148	ω	284.75491	+0.81088571	−0.57384437		
<i>a</i>	2.7449519	Ω	110.38955	+0.57290354	+0.73843856		
<i>e</i>	0.1284618	<i>i</i>	7.03165	+0.11935622	+0.35413433		
<i>P</i>	4.55	<i>H</i>	14.0	<i>G</i>	0.15	<i>U</i>	1

Residuals in seconds of arc

1990 10 16	809	1.0+	0.3+	1994 09 09	675	0.8+	0.3+	1999 10 02	704	1.0+	0.2−
1990 10 16	809	0.9+	0.4+	1994 09 09	675	0.6−	0.6+	1999 10 04	703	0.1−	0.3+
1990 10 16	809	0.4+	0.4+	1999 08 22	703	0.2−	0.6+	1999 10 04	703	0.1+	0.1+
1990 10 19	809	0.8−	0.3−	1999 08 22	703	0.2−	0.6+	1999 10 04	703	0.2+	0.1+
1990 10 19	809	1.7−	0.6−	1999 08 22	703	0.1−	0.7+	1999 10 04	703	0.0	0.2+
1990 10 19	809	(2.7− 0.9+)		1999 08 22	703	0.3+	0.1+	1999 10 09	704	0.8+	0.2+
1992 02 26	691	0.4+	0.1+	1999 09 14	120	0.2+	0.1−	1999 10 09	704	0.4+	0.2−
1992 02 26	691	0.4+	0.3+	1999 09 14	120	0.2+	0.1−	1999 10 09	704	0.5+	0.3+
1992 02 26	691	0.1−	0.1+	1999 09 30	703	0.4−	0.1−	1999 10 09	704	0.5+	0.2+
1992 03 02	809	0.4+	1.8+	1999 09 30	703	0.1−	0.6+	1999 10 09	704	0.5+	0.2−
1992 03 05	809	0.7−	0.3+	1999 09 30	703	0.2+	0.6+	1999 11 06	704	1.2−	0.2−
1992 03 07	809	1.5+	1.6−	1999 09 30	703	0.1−	0.3+	1999 11 06	704	0.6−	0.7−
1992 04 04	809	0.9−	0.9+	1999 10 02	704	0.1+	0.0	1999 11 06	704	1.2−	0.3−
1993 05 19	691	0.1+	0.6+	1999 10 02	704	0.3+	0.2−	1999 11 06	704	1.0−	0.5−
1993 05 19	691	0.3−	0.4+	1999 10 02	704	0.5+	0.1−	1999 11 06	704	1.9−	0.1−
1993 05 19	691	0.0	0.2+	1999 10 02	704	0.9+	0.1+				

(12313)* 1992 EX₁₀ = 1997 EA₅₅

Discovered 1992 Mar. 6 at the European Southern Observatory in the course of the Uppsala-ESO Survey of Asteroids and Comets.

Id. G. V. Williams (*MPC* 34841), A. Doppler (*ibid.*), M. E. Sansaturio (*ibid.*)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>		(2000.0)		P		Q	
<i>n</i>	0.20821404	ω	205.96550	−0.92675084	+0.37560811		
<i>a</i>	2.8192227	Ω	356.07547	−0.32384883	−0.80842728		
<i>e</i>	0.0560497	<i>i</i>	6.01443	−0.19040698	−0.45317092		
<i>P</i>	4.73	<i>H</i>	14.5	<i>G</i>	0.15	<i>U</i>	2

Residuals in seconds of arc

1983 05 10	413	0.2+	0.5−	1999 10 03	691	0.2+	0.1−	1999 10 15	704	0.3+	0.6−
1983 05 10	413	0.0	0.6+	1999 10 03	691	0.2+	0.1−	1999 10 20	704	0.0	0.7−
1992 02 25	675	0.4+	0.7−	1999 10 07	704	0.6+	0.4+	1999 10 20	704	0.7+	1.4−
1992 02 25	675	0.6−	1.8−	1999 10 07	704	0.7−	0.1−	1999 10 20	704	0.9+	0.7−
1992 03 06	809	1.7+	1.5+	1999 10 07	704	0.7+	0.5−	1999 10 20	704	0.1+	0.0
1992 03 08	809	0.3+	1.7+	1999 10 07	704	1.6−	0.3+	1999 10 20	704	0.2+	1.1−
1992 03 09	809	0.3+	1.8+	1999 10 09	691	0.1+	0.3+	1999 10 30	703	1.2−	1.7+
1992 04 06	809	1.3−	0.4−	1999 10 09	691	0.1−	0.1−	1999 10 30	703	0.3−	1.1−
1994 08 11	675	1.2−	0.9+	1999 10 09	691	0.1−	0.0	1999 10 30	703	0.4+	0.8+
1994 08 11	675	0.9+	0.3+	1999 10 10	704	0.3+	0.7+	1999 10 30	703	0.6−	0.6−
1994 09 30	691	0.2−	0.3−	1999 10 10	704	0.2+	1.0+	1999 11 04	704	0.7+	1.2−
1994 09 30	691	0.2−	0.4−	1999 10 10	704	1.6−	1.6+	1999 11 04	704	0.5+	0.4−
1994 09 30	691	0.1−	0.3+	1999 10 10	704	1.4−	1.8+	1999 11 04	704	0.1−	1.1−
1997 03 08	809	(1.7− 3.6−)		1999 10 14	691	0.5+	0.1+	1999 11 04	704	1.0−	0.1−
1997 03 08	809	(2.2− 2.8−)		1999 10 14	691	0.5+	0.3+	1999 11 14	704	0.2+	0.2−
1997 03 08	809	(1.9− 3.7−)		1999 10 14	691	0.5+	0.2+	1999 11 14	704	0.2−	0.1−
1997 03 09	809	0.2−	0.3−	1999 10 15	704	0.4+	0.3+	1999 11 14	704	0.7+	0.4−
1997 03 09	809	0.4−	1.0−	1999 10 15	704	0.0	0.3+	1999 11 14	704	0.0	0.2−
1997 03 09	809	0.4−	0.6−	1999 10 15	704	0.1−	0.0	1999 11 14	704	0.5+	0.3+
1999 10 03	691	0.3+	0.1+	1999 10 15	704	0.1−	0.2+				

(12314)* 1992 EE₁₄ = 1994 SB₁

Discovered 1992 Mar. 2 at the European Southern Observatory in the course of the Uppsala-ESO Survey of Asteroids and Comets.

Id. T. Kobayashi (*MPC* 24392)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>		192.35928		(2000.0)		P		Q	
<i>n</i>		0.21391846	ω	354.77381		−0.96564577		+0.25898464	
<i>a</i>		2.7688784	Ω	200.27485		−0.23613233		−0.90878081	
<i>e</i>		0.0377688	<i>i</i>	3.52992		−0.10848855		−0.32717639	
<i>P</i>		4.61	<i>H</i>	14.1		<i>G</i>	0.15	<i>U</i>	1

Residuals in seconds of arc

1992 02 28	675	(0.3−	2.2−)	1998 07 27	910	0.2+	0.3+	1999 10 10	704	0.6+	0.7−
1992 03 02	809	0.2+	0.6+	1998 07 27	910	0.1+	0.1+	1999 10 15	704	0.1−	0.2+
1992 03 05	809	0.2+	0.1−	1998 08 17	704	0.1−	0.1−	1999 10 15	704	0.6−	0.1+
1992 03 09	809	0.3−	0.4−	1998 08 17	704	(1.8−	2.7+)	1999 10 15	704	0.7−	0.8+
1994 09 27	691	0.0	0.0	1998 08 17	704	1.1−	0.9−	1999 10 15	704	0.3−	0.6+
1994 09 27	691	0.2−	0.1+	1998 08 17	704	0.1−	0.0	1999 10 21	704	0.6−	1.0+
1994 09 27	691	0.0	0.2+	1999 10 05	704	0.3+	0.4+	1999 10 21	704	0.2−	1.1−
1994 10 11	691	0.2+	0.3−	1999 10 05	704	0.3+	0.3−	1999 10 21	704	0.4−	1.5−
1994 10 11	691	0.1−	0.5−	1999 10 05	704	0.4+	0.4+	1999 11 04	704	0.7−	0.4−
1994 10 11	691	0.2+	0.3−	1999 10 05	704	0.1−	0.2+	1999 11 04	704	0.3−	0.3+
1998 07 24	910	0.5+	0.4+	1999 10 05	704	0.7−	1.0+	1999 11 04	704	0.1−	0.2−
1998 07 24	910	0.3+	0.2+	1999 10 10	704	1.0+	0.0	1999 11 04	704	0.4−	0.2+
1998 07 24	910	0.1+	0.1+	1999 10 10	704	1.9+	0.2+	1999 11 04	704	0.1+	0.0
1998 07 27	910	0.1+	0.3+	1999 10 10	704	0.6+	0.6−				

(12315)* 1992 FA₂ = 1994 TL₁

Discovered 1992 Mar. 28 by S. Ueda and H. Kaneda at Kushiro.

Id. T. Kobayashi (*MPC* 24230)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>		349.84995		(2000.0)		P		Q	
<i>n</i>		0.21745319	ω	345.64926		+0.50316575		−0.85767981	
<i>a</i>		2.7387908	Ω	74.04494		+0.80333988		+0.41905400	
<i>e</i>		0.0478439	<i>i</i>	6.32207		+0.31854240		+0.29795818	
<i>P</i>		4.53	<i>H</i>	12.7		<i>G</i>	0.15	<i>U</i>	1

Residuals in seconds of arc

1992 03 28	399	1.8−	1.2+	1998 09 14	704	0.4−	0.4−	1998 12 08	704	0.8+	1.4−
1992 03 28	399	1.5−	2.1−	1998 09 14	704	0.3+	0.3−	1998 12 08	704	0.3−	1.1+
1992 04 03	399	(0.1−	2.5−)	1998 09 14	704	0.9+	0.8−	1999 10 12	704	0.4−	0.8+
1992 04 03	399	(0.3−	2.8−)	1998 09 14	704	1.0+	1.6−	1999 10 12	704	0.1−	0.3−
1992 04 07	399	0.8+	1.7+	1998 09 14	699	0.2−	0.2+	1999 10 12	704	1.9+	0.9−
1992 04 07	399	1.2+	1.5+	1998 09 14	699	0.5−	0.4+	1999 10 12	704	1.9+	0.1+
1994 10 02	400	1.3+	0.0	1998 09 14	699	0.2−	0.8+	1999 11 03	704	0.8+	0.1+
1994 10 02	400	0.6+	0.3+	1998 09 18	704	1.0+	0.1+	1999 11 03	704	0.5+	0.3+
1994 10 03	400	1.8−	1.1−	1998 09 18	704	1.6+	1.3+	1999 11 03	704	0.1+	0.5+
1994 10 03	400	0.5−	0.3+	1998 09 18	704	0.4+	1.9+	1999 11 03	704	0.2+	0.4+
1994 10 26	400	0.2+	1.6+	1998 09 18	704	1.3−	1.2+	1999 11 03	704	0.2−	0.9+
1994 10 26	400	1.4+	1.5+	1998 09 21	704	0.4+	0.0	1999 11 09	704	0.1+	0.0
1997 05 03	809	0.7+	1.5+	1998 09 21	704	0.3+	0.2−	1999 11 09	704	0.2−	0.3+
1997 05 03	809	0.9+	1.5+	1998 09 21	704	0.7+	0.6+	1999 11 09	704	0.0	0.0
1997 05 03	809	1.5+	1.3+	1998 09 21	704	0.3+	0.1+	1999 11 09	704	0.5+	0.9−
1997 05 04	809	1.5+	2.1+	1998 09 21	704	0.5−	0.0	1999 11 09	704	1.0−	0.2+
1997 05 04	809	(1.3+	2.4+)	1998 09 24	699	0.7−	0.5+	1999 11 12	704	0.8−	1.1+
1997 05 04	809	1.6+	1.4+	1998 09 24	699	0.0	0.2+	1999 11 12	704	0.7−	0.6+
1998 07 31	699	0.8−	0.2−	1998 09 24	699	0.2−	0.1−	1999 11 12	704	0.4−	0.6+
1998 07 31	699	1.5−	0.3+	1998 11 20	699	1.0−	0.3−	1999 11 12	704	0.6−	0.5+
1998 07 31	699	1.0−	0.2−	1998 11 20	699	0.3−	0.4−	1999 11 12	704	0.7−	0.3+
1998 08 18	566	1.1−	0.1−	1998 11 20	699	0.9−	0.7−	1999 11 17	704	0.7−	0.2+
1998 08 18	566	1.5−	0.2−	1998 12 08	704	0.5−	1.4+	1999 11 17	704	0.2−	1.1+
1998 08 18	566	1.2−	0.5−	1998 12 08	704	0.4+	0.4+	1999 11 17	704	0.7−	2.1+
1998 09 14	704	0.8+	0.2−	1998 12 08	704	1.9+	0.6−	1999 11 17	704	0.4−	1.0+

(12316)* 1992 HG = 1950 TB₁ = 1998 MS₂₅

Discovered 1992 Apr. 27 by S. Otomo at Kiyosato.

Id. A. Doppler (*MPC* 32662)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>		40.58497		(2000.0)		P		Q	
<i>n</i>		0.18071603	ω	93.97880		+0.64084712		+0.76326364	
<i>a</i>		3.0984056	Ω	216.30363		−0.74782571		+0.59653583	
<i>e</i>		0.1153268	<i>i</i>	7.97263		−0.17341185		+0.24814032	
<i>P</i>		5.45	<i>H</i>	12.4		<i>G</i>	0.15	<i>U</i>	1

Residuals in seconds of arc

1950 10 13	024	0.5+	1.9−	1999 07 23	704	0.7+	0.3+	1999 10 09	704	0.1−	0.5−
1992 04 04	809	0.6+	1.6−	1999 07 23	704	0.7+	0.3−	1999 10 09	704	0.2−	0.7−
1992 04 04	809	0.2−	1.1−	1999 09 07	704	1.3+	0.3+	1999 10 15	704	0.2−	0.1+
1992 04 04	809	0.1−	1.5−	1999 09 07	704	0.4−	1.1−	1999 10 15	704	0.1−	0.1+
1992 04 06	809	(0.7+ 2.8−)		1999 09 07	704	0.2+	0.4−	1999 10 15	704	0.0	0.7+
1992 04 06	809	1.0+	1.8−	1999 09 18	703	0.5−	0.2−	1999 10 15	704	0.0	0.4+
1992 04 06	809	(0.3+ 2.5−)		1999 09 18	703	0.3−	0.0	1999 10 15	704	0.1+	0.7+
1992 04 24	691	0.1+	0.6+	1999 09 18	703	0.2−	0.2+	1999 10 19	704	0.2−	0.3−
1992 04 24	691	0.0	0.4+	1999 09 18	703	0.0	0.2−	1999 10 19	704	0.2−	0.3−
1992 04 24	691	(2.7+ 0.4+)		1999 09 20	681	0.1−	0.1+	1999 10 19	704	0.2−	0.6−
1992 04 25	809	1.3+	1.8−	1999 09 20	681	0.1−	0.1+	1999 10 19	704	0.2−	0.5−
1992 04 25	809	1.1+	1.5−	1999 09 21	681	0.2+	0.1−	1999 10 19	704	0.1−	0.7−
1992 04 25	809	0.1+	1.3−	1999 09 21	681	0.1+	0.2+	1999 10 30	703	0.4−	0.5+
1992 04 27	894	0.1+	0.2+	1999 09 30	703	0.2−	0.0	1999 10 30	703	0.3−	0.1+
1992 04 27	894	0.8−	0.3−	1999 09 30	703	0.1−	0.0	1999 10 30	703	0.6−	0.4+
1992 05 03	894	(0.5− 3.4−)		1999 09 30	703	0.4−	0.1−	1999 10 30	703	0.2+	0.1−
1992 05 03	894	1.0−	0.8+	1999 09 30	703	0.2−	0.1+	1999 11 03	703	0.3−	0.2+
1992 05 05	894	1.4−	0.0	1999 10 04	704	0.6+	0.2+	1999 11 03	703	0.5−	0.4+
1992 05 05	894	(2.4− 1.4+)		1999 10 04	704	0.1+	0.5+	1999 11 03	703	0.4−	0.3+
1992 05 08	691	0.6−	0.0	1999 10 04	704	0.2+	0.3+	1999 11 03	703	0.8−	0.2+
1992 05 08	691	0.8−	0.3+	1999 10 04	704	0.1+	0.3+	1999 11 05	704	0.1−	0.7+
1992 05 08	691	0.5−	0.2−	1999 10 04	704	0.5−	0.8+	1999 11 05	704	0.1−	0.2+
1998 06 24	704	1.8−	0.7+	1999 10 07	704	1.0+	0.7−	1999 11 05	704	0.4−	0.0
1998 06 24	704	0.4−	0.2−	1999 10 07	704	0.4−	1.0−	1999 11 05	704	0.1−	0.2−
1998 06 24	704	0.5+	0.2+	1999 10 07	704	0.2−	1.3−	1999 11 05	704	0.8−	0.3−
1998 06 24	704	0.9+	0.3−	1999 10 07	704	0.2−	1.4−	1999 11 14	704	1.6+	1.0+
1998 06 26	704	0.4+	0.0	1999 10 07	704	(0.6− 2.2−)		1999 11 14	704	1.7+	1.0−
1998 06 26	704	0.1−	0.3+	1999 10 09	703	0.1−	0.1+	1999 11 14	704	1.0+	0.0
1998 06 26	704	0.1−	0.7+	1999 10 09	703	0.1−	0.1−	1999 11 14	704	1.6+	1.1−
1998 06 26	704	0.2+	0.6+	1999 10 09	703	0.1−	0.2+	1999 11 14	704	(0.1+ 2.1−)	
1998 06 26	704	0.4−	1.1+	1999 10 09	703	0.3−	0.0	1999 11 16	704	1.1+	2.0+
1999 07 23	704	0.2−	0.1+	1999 10 09	704	0.0	0.6−	1999 11 16	704	(3.0+ 1.3−)	
1999 07 23	704	0.2+	0.2−	1999 10 09	704	0.1−	0.6−	1999 11 16	704	0.9+	1.4−
1999 07 23	704	0.4+	0.0	1999 10 09	704	0.2−	0.6−				

(12317)* 1992 HH₁ = 1994 UT₂

Discovered 1992 Apr. 24 by Spacewatch at Kitt Peak.

Id. S. Nakano (*MPC* 24392)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

$\dot{M}$	3.47544		(2000.0)	P	Q
n	0.21138454	ω	200.05315	+0.58548469	−0.80984018
a	2.7909619	Ω	214.13914	+0.75248319	+0.55985235
e	0.0616684	i	3.77684	+0.30162348	+0.17528327
P	4.66	H	13.3	G 0.15	U 1

1992 04 24	691	0.4−	0.2−	1998 08 26	699	0.6−	0.3+	1999 10 12	704	0.6−	0.6−
1992 04 24	691	0.4−	0.2−	1998 08 26	699	0.5−	0.0	1999 10 12	704	0.1+	0.3−
1992 04 24	691	0.6−	0.4−	1998 09 14	704	1.0+	0.3−	1999 10 22	704	0.7+	1.2−
1992 05 01	809	0.5+	0.5−	1998 09 14	704	0.5−	0.7−	1999 10 22	704	0.1+	1.8−
1992 05 01	809	0.8+	0.7−	1998 09 14	704	0.8+	0.9−	1999 10 22	704	0.8+	1.4−
1992 05 01	809	0.9+	0.6−	1998 09 14	704	1.4+	1.6−	1999 10 22	704	0.6+	1.4−
1992 05 02	809	0.3−	0.9−	1998 09 14	704	0.4+	0.9−	1999 11 15	704	0.6−	0.2+
1992 05 02	809	0.0	0.8−	1998 09 18	704	1.0+	0.9−	1999 11 15	704	0.3−	0.0
1992 05 02	809	0.4+	1.2−	1998 09 18	704	1.0+	1.2−	1999 11 15	704	0.5−	0.6−
1992 05 03	809	0.9−	0.2−	1998 09 18	704	1.7+	1.4−	1999 11 15	704	0.2−	0.3−
1992 05 03	809	0.7−	0.2−	1998 09 18	704	2.1−	1.7+	1999 11 15	704	0.2−	0.1−
1992 05 03	809	0.1−	0.4−	1998 09 18	704	0.9+	1.6+	1999 11 17	704	0.2−	0.1+
1992 05 08	691	0.1+	0.4−	1998 09 25	704	0.2+	0.6−	1999 11 17	704	0.1−	0.2−
1992 05 08	691	0.2−	0.4−	1998 09 25	704	0.4+	0.5−	1999 11 17	704	0.1−	0.5−
1992 05 08	691	0.1−	0.3−	1998 09 25	704	1.0+	1.5−	1999 11 17	704	0.1−	0.0
1994 10 31	399	0.4+	1.6+	1998 09 25	704	(1.4+	2.3−)	1999 11 17	704	0.1−	0.2+
1994 10 31	399	1.8−	0.3−	1998 09 25	704	0.7+	1.5−				

(12318)* 1992 HD₇ = 1998 QQ₆₁

Discovered 1992 Apr. 30 by F. Börngen at Tautenburg.

Id. E. Bowell (*MPC* 32453), G. V. Williams (*ibid.*)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

		Williams			
<i>M</i>	154.12729	(2000.0)	<i>P</i>	<i>Q</i>	
<i>n</i>	0.18924196	ω	69.18530	−0.87360657	+0.46565184
<i>a</i>	3.0046306	Ω	138.21876	−0.48660546	−0.83897761
<i>e</i>	0.2078586	<i>i</i>	12.24814	+0.00516585	−0.28157581
<i>P</i>	5.21	<i>H</i>	13.3	<i>G</i>	0.15 <i>U</i> 2

Residuals in seconds of arc

1983 09 12	413	1.3−	1.8−	1992 05 26	033	1.0+	0.6−	1999 09 14	704	0.3−	0.9+
1983 09 12	413	0.9+	0.5+	1992 05 27	033	1.3+	0.5−	1999 09 14	704	1.1−	0.1−
1983 10 07	413	0.2−	0.1−	1992 05 28	033	0.6+	0.2+	1999 09 14	704	1.1−	0.4+
1983 10 07	413	0.8+	0.8+	1998 08 17	704	0.3+	0.9−	1999 09 14	704	1.3−	0.3−
1992 04 30	033	1.5−	1.0+	1998 08 17	704	0.3−	0.3+	1999 10 08	704	0.3+	0.1+
1992 05 04	033	0.2+	0.7−	1998 08 17	704	1.0−	0.5−	1999 10 08	704	0.6−	0.4−
1992 05 04	033	0.0	0.5−	1998 08 17	704	0.7−	0.5−	1999 10 08	704	1.1+	0.9−
1992 05 05	033	0.5−	0.7−	1998 08 23	691	0.3+	1.0+	1999 10 08	704	0.6+	1.2−
1992 05 05	033	1.0−	0.2+	1998 08 23	691	0.3+	0.7+	1999 10 08	704	1.2+	0.1−
1992 05 23	033	0.3+	0.1+	1998 08 23	691	0.2+	0.6+	1999 10 31	113	0.4+	0.3+
1992 05 23	033	1.1−	0.2+	1998 08 30	699	0.2+	0.1−	1999 10 31	113	1.0+	0.4−
1992 05 24	033	0.2+	0.8−	1998 08 30	699	0.5+	1.4+				
1992 05 25	033	0.0	0.7+	1998 08 30	699	0.5+	0.9−				

(12319)* 1992 PC = 1989 VG₂ = 1995 LB₁

Discovered 1992 Aug. 2 at the Oak Ridge Observatory.

Id. G. V. Williams (*MPC* 25640, *MPC* 34498), A. Doppler (*MPC* 34498), A. Milani (*ibid.*)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

		Williams			
<i>M</i>	25.29241	(2000.0)	<i>P</i>	<i>Q</i>	
<i>n</i>	0.30203950	ω	158.16970	+0.99580213	+0.08830594
<i>a</i>	2.2000213	Ω	196.81777	−0.09134423	+0.94188372
<i>e</i>	0.2165469	<i>i</i>	4.77545	−0.00586072	+0.32412514
<i>P</i>	3.26	<i>H</i>	15.0	<i>G</i>	0.15 <i>U</i> 2

Residuals in seconds of arc

1989 11 02	046	(6.3+	1.6−)	1995 06 05	327	(0.6−	2.1−)	1998 05 24	704	0.3+	0.8+
1989 11 02	046	(5.3+	1.3−)	1995 06 06	327	1.6−	0.8−	1999 10 10	704	0.7−	0.1+
1991 03 09	675	0.1−	0.7+	1995 06 06	327	1.5−	0.7+	1999 10 10	704	0.2−	0.2+
1991 03 09	675	0.2+	1.2+	1995 06 06	327	1.8−	0.5−	1999 10 10	704	0.6−	0.8+
1992 07 30	801	0.6−	0.3+	1995 06 06	327	(2.7−	0.7−)	1999 10 10	704	0.3−	0.5+
1992 07 30	801	0.4−	0.5+	1995 06 06	327	(2.5−	1.0−)	1999 10 10	704	0.8−	0.7+
1992 08 02	801	0.5−	0.5+	1995 06 06	327	(3.0−	1.1−)	1999 10 15	704	0.9+	0.2+
1992 08 02	801	0.6−	0.6+	1998 04 21	704	1.7+	1.2+	1999 10 15	704	0.2+	0.6−
1992 08 03	801	(0.6−	2.1+)	1998 04 21	704	0.5+	0.2+	1999 10 15	704	0.3+	0.2+
1992 08 03	801	0.5−	0.2−	1998 04 21	704	1.4+	1.1−	1999 10 15	704	0.4−	0.7−

1992 08 03	801	0.5−	0.5+	1998 04 21	704	1.5+	0.3−	1999 10 21	704	0.3+	0.2+
1992 08 03	801	0.4−	0.5+	1998 04 21	704	0.3+	0.6−	1999 10 21	704	0.2+	0.2−
1992 09 01	801	1.0+	0.1+	1998 05 22	704	1.4−	0.5+	1999 10 21	704	0.3+	0.4−
1992 09 01	801	0.9+	0.1+	1998 05 22	704	1.1+	1.1−	1999 10 21	704	0.0	0.2−
1992 09 30	801	0.7+	0.0	1998 05 22	704	0.7+	1.8+	1999 11 17	704	0.1+	0.4+
1992 09 30	801	1.3+	0.5+	1998 05 22	704	(3.0−	0.2+)	1999 11 17	704	0.4+	0.2+
1992 10 02	801	0.8+	0.0	1998 05 24	704	0.3+	0.3+	1999 11 17	704	0.1+	0.3+
1992 10 02	801	0.9+	0.4−	1998 05 24	704	1.5−	0.2−	1999 11 17	704	0.3−	0.1+
1995 06 05	327	0.3+	1.2−	1998 05 24	704	1.1+	0.5−	1999 11 17	704	0.7−	0.3+
1995 06 05	327	0.4−	0.9−	1998 05 24	704	0.1−	1.0+				

(12320)* 1992 PH₁ = 1991 AD₃

Discovered 1992 Aug. 8 by E. W. Elst at Caussols.

Id. B. G. Marsden (*MPC* 21584)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

		Marsden			
<i>M</i>	110.89467	(2000.0)	<i>P</i>	<i>Q</i>	
<i>n</i>	0.30789859	ω	321.29427	−0.05334012	+0.99682810
<i>a</i>	2.1720222	Ω	305.57107	−0.89716629	−0.07381045
<i>e</i>	0.1011015	<i>i</i>	4.16416	−0.43846036	+0.02976167
<i>P</i>	3.20	<i>H</i>	15.2	<i>G</i>	0.15 <i>U</i> 1

Residuals in seconds of arc

1991 01 15	033	0.3+	1.0−	1992 08 09	010	0.0	0.8−	1999 10 12	704	0.2−	0.7−
1991 01 15	033	1.0−	1.8−	1992 08 09	010	0.2−	0.4+	1999 10 12	704	1.2−	0.5+
1991 01 16	033	0.8−	1.1−	1992 08 09	010	0.5−	0.2+	1999 10 12	704	(2.2−	2.3+)
1991 01 22	675	(1.2−	2.2−)	1998 04 30	566	0.0	0.6−	1999 10 13	704	0.1−	0.8+
1992 07 24	809	(3.3+	1.5+)	1998 04 30	566	0.0	0.6−	1999 10 13	704	0.1+	0.8+
1992 07 24	809	1.3+	1.3+	1998 04 30	566	0.5−	0.5−	1999 10 13	704	0.9−	0.8+
1992 07 24	809	0.2+	0.1−	1998 05 22	704	(1.6−	2.5+)	1999 10 13	704	0.4−	0.0
1992 07 26	809	0.3+	0.7−	1998 05 22	704	0.3−	0.4+	1999 10 13	704	0.2−	1.3+
1992 07 26	809	0.5−	0.9−	1998 05 22	704	0.3−	0.1−	1999 11 03	704	1.1+	0.3−
1992 07 26	809	0.3−	0.7−	1998 05 22	704	1.2+	0.6+	1999 11 03	704	0.4+	0.1+
1992 07 30	809	0.8+	0.2+	1998 05 22	704	0.1+	1.3−	1999 11 03	704	0.9+	0.4−
1992 07 30	809	0.5−	0.2+	1998 05 24	704	0.0	0.1−	1999 11 03	704	0.3+	0.2+
1992 07 30	809	0.8−	0.1+	1998 05 24	704	0.2+	0.2−	1999 11 03	704	0.2+	0.0
1992 08 08	010	1.8+	0.4−	1998 05 24	704	1.1+	0.1−	1999 11 12	699	1.2−	1.0−
1992 08 08	010	0.1+	1.0−	1998 05 24	704	0.5−	0.2+	1999 11 12	699	0.1+	0.0
1992 08 08	010	0.3−	1.5−	1998 05 24	704	1.0−	1.5+	1999 11 12	699	1.0+	1.7−

(12321)* 1992 PZ₁ = 1998 FU₅₆

Discovered 1992 Aug. 4 by H. E. Holt at Palomar.

Id. G. V. Williams (*MPC* 31534)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

		Williams			
<i>M</i>	40.03824	(2000.0)	<i>P</i>	<i>Q</i>	
<i>n</i>	0.29688222	ω	144.09545	+0.72160872	+0.69220108
<i>a</i>	2.2254265	Ω	172.06762	−0.65340781	+0.68658828
<i>e</i>	0.2163538	<i>i</i>	4.89215	−0.22877736	+0.22238300
<i>P</i>	3.32	<i>H</i>	15.1	<i>G</i>	0.15 <i>U</i> 1

Residuals in seconds of arc

1992 08 04	675	0.0	0.5−	1998 03 28	704	0.9−	1.5−	1999 10 03	704	0.7−	0.5−
1992 08 05	675	0.5+	1.4−	1998 03 29	704	0.2−	0.8−	1999 10 08	703	0.7+	0.3+
1992 08 05	675	0.1−	0.8−	1998 03 29	704	1.3+	1.7−	1999 10 08	703	0.1−	0.2+
1992 08 07	675	0.6+	0.7−	1998 03 29	704	0.2+	0.3−	1999 10 08	703	0.2−	0.2+
1992 08 07	675	0.1−	0.2−	1998 03 29	704	0.4−	0.9−	1999 10 08	703	0.3−	0.1−
1994 02 12	691	0.1−	0.1+	1998 03 29	704	0.5−	0.2−	1999 10 10	704	0.6+	0.7+
1994 02 12	691	0.2+	0.1+	1998 04 19	704	0.2+	0.2−	1999 10 10	704	0.7+	0.1+
1994 02 12	691	0.2−	0.2−	1998 04 19	704	0.7−	0.7+	1999 10 10	704	0.1+	0.6−
1998 03 20	704	0.6−	1.6−	1998 04 19	704	1.6+	1.1−	1999 10 10	704	0.1+	0.7−
1998 03 20	704	0.9−	0.8+	1998 04 19	704	0.4+	0.7−	1999 10 10	704	0.5+	0.4−
1998 03 20	704	0.9−	0.7+	1998 04 20	704	0.1+	0.1−	1999 10 20	704	0.6−	0.4−
1998 03 20	704	1.1−	0.2+	1998 04 20	704	1.1+	0.7+	1999 10 20	704	0.0	0.8−
1998 03 20	704	0.5−	0.9+	1998 04 20	704	0.7−	1.1−	1999 10 20	704	0.1−	1.1−
1998 03 22	704	0.3−	0.5+	1998 04 20	704	0.4+	0.4+	1999 10 20	704	0.1−	0.8−
1998 03 22	704	0.2+	0.8−	1998 04 20	704	(0.0	2.0+)	1999 10 20	704	0.2−	0.8−

1998 03 22	704	0.1+	1.0-	1998 04 24	699	0.8-	0.2+	1999 11 05	704	0.4-	0.3-
1998 03 22	704	0.1-	0.2-	1998 04 24	699	0.5-	0.8+	1999 11 05	704	0.0	0.6-
1998 03 22	704	0.1-	0.2+	1998 04 24	699	0.6-	0.2+	1999 11 05	704	0.4+	0.7-
1998 03 25	566	0.1+	0.4-	1999 09 13	120	0.3+	0.7-	1999 11 05	704	0.7-	0.2-
1998 03 25	566	0.2+	0.3-	1999 09 13	120	0.6+	1.0+	1999 11 05	704	0.4+	0.9-
1998 03 25	566	0.0	0.2-	1999 09 13	120	0.0	0.3-	1999 11 16	703	0.1+	0.1+
1998 03 28	704	0.4+	0.7-	1999 10 03	704	1.0+	0.1-	1999 11 16	703	0.8-	0.2-
1998 03 28	704	0.0	0.2-	1999 10 03	704	0.1+	0.2+	1999 11 16	703	0.2-	0.6+
1998 03 28	704	0.2+	1.1-	1999 10 03	704	0.9+	0.1+	1999 11 16	703	0.4-	0.1+
1998 03 28	704	0.4+	0.0	1999 10 03	704	0.4+	0.3+				

(12322)* 1992 QW = 1982 SO₉ = 1982 UY₃

Discovered 1992 Aug. 31 by E. F. Helin at Palomar.

Id. A. Gnädig (*MPC* 31534)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

				Williams			
<i>M</i>	13.18221		(2000.0)	P		Q	
<i>n</i>	0.29258553	ω	339.60544	+0.96691520		+0.25489396	
<i>a</i>	2.2471608	Ω	5.65665	-0.21734952		+0.84411110	
<i>e</i>	0.2045131	<i>i</i>	5.94079	-0.13354471		+0.47170492	
<i>P</i>	3.37	<i>H</i>	15.1	<i>G</i>	0.15	<i>U</i>	2

Residuals in seconds of arc

1982 09 20	095	(3.0+	3.7+)	1998 04 22	704	1.7+	0.7+	1999 10 22	704	0.2+	0.3-
1982 10 19	033	0.7+	0.7-	1998 04 22	704	1.2+	0.5+	1999 10 22	704	0.0	0.0
1982 10 19	033	0.3-	0.1-	1998 04 22	704	0.8+	0.5+	1999 10 29	703	0.0	0.2-
1992 08 24	675	0.1+	1.3+	1998 04 22	704	(2.0-	0.4+)	1999 10 29	703	0.5-	0.4-
1992 08 24	675	0.9-	0.8+	1999 10 07	704	0.4+	0.0	1999 10 29	703	0.1-	0.4-
1992 08 31	675	(0.8+	2.9+)	1999 10 07	704	0.7-	0.2-	1999 10 29	703	0.2+	0.0
1992 09 01	675	1.6+	1.0-	1999 10 07	704	0.6-	0.5+	1999 11 03	704	0.1+	1.9+
1992 09 01	675	1.5-	1.3+	1999 10 08	106	0.6+	0.1-	1999 11 03	704	0.5-	0.8+
1992 09 22	675	0.5-	0.5-	1999 10 08	106	0.5-	0.1-	1999 11 03	704	0.5-	0.6+
1992 09 22	675	1.1+	1.3-	1999 10 08	106	0.3-	0.0	1999 11 03	704	0.6-	0.2+
1998 02 28	561	0.1+	0.3+	1999 10 12	704	0.3+	0.0	1999 11 03	704	0.5-	1.0+
1998 02 28	561	0.0	0.3-	1999 10 12	704	0.2+	0.2-	1999 11 09	699	0.0	0.2+
1998 02 28	561	0.3-	0.1-	1999 10 12	704	0.1+	0.2-	1999 11 09	699	0.1-	0.8+
1998 03 22	704	0.9-	1.1-	1999 10 12	704	0.3+	0.4-	1999 11 09	699	0.2-	1.5+
1998 03 22	704	1.6-	1.8+	1999 10 12	704	0.1+	0.1-	1999 11 11	703	0.5+	0.7-
1998 03 22	704	0.6-	0.2+	1999 10 22	704	0.7+	0.4-	1999 11 11	703	0.4-	0.2-
1998 03 22	704	0.5-	1.4-	1999 10 22	704	0.4+	0.5-	1999 11 11	703	0.3-	0.4-
1998 04 22	704	0.9+	0.7+	1999 10 22	704	0.2+	0.2-	1999 11 11	703	0.2+	0.4-

(12323)* 1992 RX = 1978 EL₅ = 1995 PU

Discovered 1992 Sept. 4 by F. Börngen and L. D. Schmadel at Tautenburg.

Id. T. Urata (*MPC* 25640)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

				Williams			
<i>M</i>	146.13150		(2000.0)	P		Q	
<i>n</i>	0.30178906	ω	216.27771	-0.51600590		+0.85611985	
<i>a</i>	2.2012382	Ω	22.69848	-0.76768128		-0.44758085	
<i>e</i>	0.1530905	<i>i</i>	4.19477	-0.38000443		-0.25832187	
<i>P</i>	3.27	<i>H</i>	13.9	<i>G</i>	0.15	<i>U</i>	1

Residuals in seconds of arc

1953 10 31	675	0.6-	0.7-	1995 08 24	905	0.3-	0.0	1999 10 15	704	0.4-	0.2+
1953 10 31	675	0.3-	0.9+	1995 08 24	905	1.0+	0.2+	1999 10 18	113	0.4-	0.2+
1955 03 23	675	1.6+	0.2+	1998 06 14	423	0.2+	0.8+	1999 10 18	113	0.6-	0.0
1978 03 06	095	1.9-	1.8+	1998 06 14	423	0.0	1.0+	1999 10 22	704	0.2+	0.3-
1982 08 21	413	0.1+	0.4+	1998 06 14	423	0.0	0.2+	1999 10 22	704	0.4+	0.0
1982 08 21	413	1.3+	0.5+	1998 06 14	423	0.2+	0.2+	1999 10 22	704	0.5+	0.1+
1988 02 23	413	0.3+	0.2+	1998 06 16	423	0.1+	0.8+	1999 10 22	704	0.3+	0.1+
1988 02 23	413	0.0	0.6-	1998 06 16	423	0.5-	0.7+	1999 10 22	704	0.2+	0.3-
1991 02 10	675	0.3+	0.0	1998 06 18	423	0.5+	0.5+	1999 10 31	113	0.5-	0.2+
1991 02 10	675	1.1+	0.1-	1998 06 18	423	0.6-	1.1+	1999 11 01	113	0.2-	0.2+
1992 09 04	033	1.2-	0.9-	1998 06 26	704	1.1-	0.8-	1999 11 03	704	0.2+	0.3+
1992 09 04	033	0.5-	1.9-	1998 06 26	704	0.5-	0.5-	1999 11 03	704	1.1+	0.7+
1992 09 06	033	0.5-	0.4-	1998 06 26	704	0.9+	1.0-	1999 11 03	704	0.4-	0.8+

1992 09 07	033	0.5-	0.5+	1998 06 26	704	1.1+	1.3+	1999 11 03	704	0.3+	0.6+
1992 09 21	033	0.4+	0.2+	1998 06 26	704	0.8-	1.2-	1999 11 03	704	0.7+	0.2+
1992 09 22	033	0.1-	1.6-	1999 10 12	704	0.4+	0.3-	1999 11 12	699	0.6+	0.0
1992 09 23	033	0.0	0.1-	1999 10 12	704	0.3+	0.2-	1999 11 12	699	0.2+	0.6+
1992 09 24	033	0.2+	0.2-	1999 10 12	704	0.1-	1.4+	1999 11 12	699	0.3-	0.8+
1992 09 26	033	0.0	0.1+	1999 10 12	704	0.1+	0.1+	1999 11 14	704	0.2-	0.4-
1992 09 26	033	0.3-	0.3-	1999 10 12	704	0.2-	0.1-	1999 11 14	704	0.3-	0.1-
1992 09 26	033	0.4+	0.8+	1999 10 13	704	0.1+	0.2-	1999 11 14	704	0.3-	0.2-
1992 09 27	033	0.2+	0.0	1999 10 13	704	0.4+	0.3-	1999 11 14	704	0.3-	0.0
1992 09 27	033	0.0	0.5+	1999 10 13	704	0.6-	0.5-	1999 11 14	704	0.6-	0.0
1992 09 28	033	0.3+	0.8+	1999 10 13	704	0.1+	0.2-	1999 11 16	704	0.2+	0.4+
1992 09 28	033	0.1-	0.4+	1999 10 13	704	0.5-	0.1-	1999 11 16	704	0.3-	0.2-
1995 08 02	905	0.4+	0.9-	1999 10 15	704	0.1-	0.2+	1999 11 16	704	0.1-	0.1+
1995 08 02	905	0.5+	0.2-	1999 10 15	704	0.0	0.0	1999 11 16	704	0.2+	0.2+
1995 08 20	905	0.7-	0.6+	1999 10 15	704	0.1+	0.1-				
1995 08 20	905	0.2-	1.0+	1999 10 15	704	0.2-	0.2-				

(12324)* 1992 RS₃ = 1998 FF₆₁

Discovered 1992 Sept. 2 by E. W. Elst at the European Southern Observatory.

Id. G. V. Williams (*MPC* 31534)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

				Williams			
<i>M</i>	39.97322		(2000.0)	P		Q	
<i>n</i>	0.28987440	ω	103.89496	+0.62975517		+0.77659941	
<i>a</i>	2.2611505	Ω	205.16252	-0.72754096		+0.58184151	
<i>e</i>	0.1408973	<i>i</i>	2.34156	-0.27219950		+0.24156533	
<i>P</i>	3.40	<i>H</i>	15.0	<i>G</i>	0.15	<i>U</i>	1

Residuals in seconds of arc

1992 09 02	809	0.6+	0.2-	1998 04 19	704	0.3-	0.7-	1999 10 18	327	0.9-	0.9-
1992 09 02	809	0.7+	0.2+	1998 04 19	704	0.2+	1.4-	1999 10 18	327	0.6-	0.9-
1992 09 02	809	0.1-	0.2-	1998 04 19	704	0.3-	1.4-	1999 10 19	704	0.1+	0.8-
1992 09 03	809	0.2-	0.6+	1998 04 20	704	1.6+	1.3-	1999 10 19	704	0.0	0.8-
1992 09 22	809	1.0+	0.1-	1998 04 20	704	1.4+	0.2-	1999 10 19	704	0.1-	1.1-
1992 09 22	809	0.1-	1.3-	1998 04 20	704	0.1+	0.2-	1999 10 19	704	0.1-	0.8-
1992 09 22	809	0.7-	0.7-	1998 04 20	704	0.2+	0.0	1999 10 19	704	0.2+	0.7-
1992 09 23	809	0.1+	0.0	1998 04 20	704	0.6+	0.7-	1999 10 28	327	0.1+	0.0
1992 09 23	809	0.0	0.2-	1999 10 01	120	0.7-	0.7-	1999 10 28	327	0.0	0.3+
1992 09 23	809	0.5-	0.8-	1999 10 01	120	0.9-	0.7-	1999 10 28	327	0.5-	0.1+
1993 12 16	691	0.8-	1.3-	1999 10 02	703	0.2-	0.1-	1999 11 01	703	1.0-	0.6+
1993 12 16	691	0.5+	0.8-	1999 10 02	703	0.3-	0.1+	1999 11 01	703	0.4-	0.5+
1993 12 16	691	0.2-	0.6-	1999 10 02	703	0.0	0.3+	1999 11 01	703	0.4-	0.4+
1998 03 20	704	0.4-	0.4-	1999 10 02	703	0.3+	0.1+	1999 11 01	703	0.3-	0.2+
1998 03 20	704	0.1-	0.3+	1999 10 04	704	1.1+	0.7-	1999 11 05	704	0.6+	0.2+
1998 03 20	704	0.9+	0.3+	1999 10 04	704	0.0	1.0-	1999 11 05	704	0.3+	0.5+
1998 03 20	704	0.5+	1.1+	1999 10 04	704	0.5-	0.4-	1999 11 05	704	0.3+	0.2+
1998 03 20	704	1.3-	0.2+	1999 10 04	704	0.6+	0.0	1999 11 05	704	0.1-	0.3+
1998 03 22	704	0.7-	0.7-	1999 10 04	704	0.6+	0.5-	1999 11 06	704	0.3-	0.3+
1998 03 22	704	0.3-	0.3-	1999 10 05	704	0.4+	0.2+	1999 11 06	704	0.2-	0.4+
1998 03 22	704	1.0+	1.5-	1999 10 05	704	0.2+	0.2-	1999 11 06	704	0.2-	0.3+
1998 03 22	704	1.2-	0.1+	1999 10 05	704	0.5+	0.2+	1999 11 06	704	0.1-	0.7+
1998 03 28	704	0.4+	0.1+	1999 10 05	704	0.4+	0.0	1999 11 06	704	0.1+	0.6+
1998 03 28	704	0.6+	1.0+	1999 10 05	704	0.4+	0.1-	1999 11 09	704	1.4-	0.2+
1998 03 28	704	0.1+	0.7-	1999 10 07	704	0.2+	0.2+	1999 11 09	704	0.2-	0.2+
1998 03 28	704	0.8-	0.2+	1999 10 07	704	1.1+	0.4-	1999 11 09	704	0.0	0.3+
1998 03 28	704	0.9-	0.1-	1999 10 07	704	0.5+	0.7-	1999 11 09	704	0.0	0.1+
1998 03 29	704	0.2-	0.6-	1999 10 07	704	0.2+	1.0-	1999 11 09	704	0.1-	0.4+
1998 03 29	704	0.6-	0.2-	1999 10 10	704	0.3+	0.1+	1999 11 12	704	0.2+	0.3+
1998 03 29	704	0.2+	0.3+	1999 10 10	704	0.0	0.2-	1999 11 12	704	0.2+	0.1+
1998 03 29	704	0.4-	0.7+	1999 10 10	704	0.2+	0.1-	1999 11 12	704	0.4-	0.2-
1998 03 29	704	0.2-	0.1-	1999 10 10	704	0.5+	0.4-	1999 11 12	704	0.1+	0.1+
1998 04 01	704	0.2-	0.8-	1999 10 10	704	0.1+	0.5-	1999 11 12	704	0.8-	0.3-
1998 04 01	704	(0.2-	2.3+)	1999 10 15	704	0.2-	0.2-	1999 11 16	704	0.6+	0.8+
1998 04 01	704	1.3-	1.1+	1999 10 15	704	0.2+	0.1-	1999 11 16	704	0.4+	1.0+
1998 04 01	704	0.6-	0.8+	1999 10 15	704	0.1+	0.3+	1999 11 16	704	0.7+	0.2-
1998 04 01	704	(5.7-	3.4+)	1999 10 15	704	1.1+	0.7+	1999 11 16	704	0.2+	0.1+
1998 04 19	704	0.0	0.6-	1999 10 15	704	0.6+	1.2+	1999 11 16	704	1.8-	0.5+
1998 04 19	704	0.0	0.1-	1999 10 18	327	0.5-	0.9-				

(12325)* 1992 RH₇ = 1981 JD₆ = 1982 SE₃ = 1984 FJ₁

Discovered 1992 Sept. 2 by E. W. Elst at the European Southern Observatory.

Id. K. Kinoshita (*MPC* 23674)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

M	271.54971		(2000.0)		P		Q
n	0.29405026	ω	75.67914		-0.35626649		-0.93315316
a	2.2396922	Ω	35.31037		+0.82212841		-0.33744033
e	0.0804507	i	4.75876		+0.44404848		-0.12393224
P	3.35	H	14.4	G	0.15	U	1

Residuals in seconds of arc

1981 05 08	675	0.5+	0.7-	1999 10 05	704	0.6+	0.2+	1999 11 04	704	0.2+	0.3+
1981 05 09	675	(4.0+	0.8-)	1999 10 05	704	0.4+	0.6+	1999 11 04	704	0.0	0.4+
1982 09 24	033	0.1+	0.2+	1999 10 05	704	0.2-	0.2+	1999 11 04	704	0.3+	0.6+
1982 09 24	033	0.4-	0.1-	1999 10 05	704	0.3+	0.2+	1999 11 04	704	0.2-	0.4+
1984 03 28	801	0.3+	0.8-	1999 10 07	704	0.5+	0.1-	1999 11 04	704	0.4-	0.5+
1991 05 13	675	0.5+	1.0+	1999 10 07	704	0.1+	0.5+	1999 11 06	704	1.2-	0.5-
1991 05 13	675	1.0+	1.0+	1999 10 07	704	0.1+	0.3+	1999 11 06	704	0.5-	0.0
1992 09 02	809	0.3+	0.7+	1999 10 07	704	0.8+	0.1-	1999 11 06	704	0.8-	0.8-
1992 09 02	809	0.8-	0.0	1999 10 10	704	0.2+	0.0	1999 11 06	704	0.8-	0.9-
1992 09 02	809	0.6-	0.8+	1999 10 10	704	0.3+	0.4+	1999 11 06	704	0.3-	0.7-
1992 09 03	809	0.5+	0.6-	1999 10 10	704	0.3+	0.9+	1999 11 09	704	0.0	0.1+
1992 09 22	809	0.2-	0.7-	1999 10 10	704	1.0+	0.8+	1999 11 09	704	0.0	0.2-
1992 09 22	809	0.9-	1.1-	1999 10 12	106	0.2+	0.3+	1999 11 09	704	0.0	0.1-
1992 09 22	809	1.2-	1.7-	1999 10 12	106	0.3-	0.3-	1999 11 11	703	0.1-	0.1+
1992 09 23	809	1.4+	0.6-	1999 10 12	106	0.4+	0.4-	1999 11 11	703	0.5-	0.2+
1992 09 23	809	1.1+	1.1-	1999 10 15	704	0.1+	0.4-	1999 11 11	703	0.0	0.1-
1992 09 23	809	0.5+	0.2-	1999 10 15	704	0.1+	0.4-	1999 11 11	703	0.6-	0.4+
1994 02 08	809	0.6-	0.0	1999 10 15	704	0.3+	0.1+	1999 11 12	699	0.2+	1.2+
1994 02 08	809	0.8-	0.3-	1999 10 15	704	0.2+	0.5-	1999 11 12	704	0.0	0.6-
1994 02 08	809	1.1-	0.4-	1999 10 15	704	0.2+	0.1-	1999 11 12	704	0.1-	0.7-
1994 02 13	809	(1.9-	2.7+)	1999 10 21	704	0.5+	0.3-	1999 11 12	704	0.1-	0.1-
1994 02 13	809	(2.7-	3.0+)	1999 10 21	704	0.4+	0.2-	1999 11 12	704	0.1+	0.3-
1994 02 13	809	(3.7-	3.1+)	1999 10 21	704	0.5+	0.4-	1999 11 14	704	0.0	0.1-
1999 10 01	703	0.3+	1.3+	1999 10 21	704	0.1+	0.1-	1999 11 14	704	0.1-	0.1-
1999 10 01	703	0.1+	0.0	1999 10 21	704	0.4+	0.0	1999 11 14	704	0.1+	0.3-
1999 10 01	703	0.0	0.1+	1999 10 29	703	0.2-	0.0	1999 11 14	704	0.1+	0.6-
1999 10 01	703	0.4-	0.7+	1999 10 29	703	0.1-	0.2+	1999 11 14	704	0.4-	0.1+
1999 10 03	704	0.8+	0.6+	1999 10 29	703	0.5-	0.3+	1999 11 16	704	0.3+	0.1-
1999 10 03	704	0.0	0.0	1999 10 29	703	0.0	0.2+	1999 11 16	704	0.0	0.0
1999 10 03	704	0.0	1.8+	1999 11 03	703	0.7-	0.4+	1999 11 16	704	0.2+	0.7-
1999 10 03	704	1.0+	0.2-	1999 11 03	703	0.6-	0.2-	1999 11 16	704	0.8-	0.1+
1999 10 03	704	0.8-	0.2-	1999 11 03	703	0.2+	0.4+	1999 11 16	704	0.1-	0.1-
1999 10 05	704	0.6+	0.1+	1999 11 03	703	0.5-	0.4+				

(12326)* 1992 SF = 1975 TH₂ = 1994 EE₉ = 1997 AX₂₄

Discovered 1992 Sept. 21 by K. Endate and K. Watanabe at Kitami.

Id. G. V. Williams (*MPC* 30758)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

M	355.90025		(2000.0)		P		Q
n	0.28938791	ω	17.03944		+0.93856902		-0.34504590
a	2.2636839	Ω	3.16188		+0.30356452		+0.81777739
e	0.1875755	i	5.84276		+0.16412429		+0.46063376
P	3.41	H	14.5	G	0.15	U	1

Residuals in seconds of arc

1975 10 03	095	0.2-	1.0-	1994 03 13	691	0.6+	0.4-	1999 10 07	704	0.3+	0.4+
1992 09 21	400	0.8+	1.0-	1994 03 13	691	0.4+	0.2-	1999 10 07	704	0.5-	0.7+
1992 09 21	400	(0.6+	2.2-)	1994 03 13	691	0.2-	0.1+	1999 10 07	704	0.6-	0.7+
1992 09 23	400	(3.1+	0.2-)	1997 01 14	566	0.0	0.5-	1999 10 12	704	0.3-	0.1+
1992 09 23	400	(4.3+	1.1-)	1997 01 14	566	0.2+	0.2-	1999 10 12	704	0.0	0.4+
1992 09 28	400	1.2+	0.3-	1997 01 14	566	0.0	0.3-	1999 10 12	704	0.1-	0.5+
1992 09 28	400	0.7+	0.2-	1998 04 30	566	0.1+	0.3+	1999 10 12	704	0.0	0.4+
1992 09 30	400	0.9+	1.4+	1998 04 30	566	0.1-	0.2-	1999 10 12	704	0.4-	1.0+
1992 09 30	400	0.2+	1.3-	1998 04 30	566	0.2-	0.1+	1999 10 13	704	0.2-	0.0

1992 10 01	400	1.4-	0.6+	1998 05 24	704	0.8+	0.0	1999 10 13	704	0.2+	0.1-
1992 10 01	400	1.2+	0.0	1998 05 24	704	0.8-	2.0+	1999 10 13	704	0.3+	0.6+
1992 10 02	400	0.4-	0.4-	1998 05 24	704	0.9+	1.0+	1999 10 13	704	0.1+	0.3+
1992 10 02	400	1.3-	0.9+	1998 05 24	704	0.3-	1.5+	1999 10 13	704	0.2-	0.8+
1992 10 18	400	0.6-	0.4-	1999 10 05	704	0.4+	0.4-	1999 11 03	163	1.5-	0.1+
1992 10 18	400	1.2+	0.3+	1999 10 05	704	0.3+	0.2+	1999 11 03	163	0.8-	0.6+
1992 11 21	801	0.2-	0.2-	1999 10 05	704	0.0	0.1+	1999 11 07	163	0.5-	0.3-
1992 11 21	801	0.3-	0.2-	1999 10 05	704	0.1-	0.3+	1999 11 07	163	0.6+	0.3-
1992 11 28	801	0.1+	0.0	1999 10 05	704	0.3+	0.1+				
1992 11 28	801	0.4+	0.0	1999 10 07	704	0.2-	0.2-				

(12327)* 1992 SX₁ = 1980 FB₃

Discovered 1992 Sept. 21 by F. Börngen and L. D. Schmadel at Tautenburg.

Id. T. Kobayashi (*MPC* 24108)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

M	296.76597		(2000.0)		P		Q
n	0.28203446	ω	5.65309		+0.43163925		-0.90186082
a	2.3028621	Ω	58.77650		+0.82677090		+0.38742784
e	0.1117883	i	1.22570		+0.36074568		+0.19117197
P	3.49	H	15.3	G	0.15	U	2

Residuals in seconds of arc

1980 03 16	809	0.4+	0.1-	1998 05 24	704	1.3+	0.7-	1999 10 07	703	0.0	0.2+
1980 03 16	809	0.8+	0.6-	1998 05 24	704	1.0-	0.6-	1999 10 07	703	0.1-	0.2+
1980 03 16	809	0.6-	1.0+	1998 05 24	704	1.4-	0.2+	1999 10 07	704	1.0+	0.6-
1980 03 16	809	0.3+	0.0	1999 09 07	704	0.1-	0.4+	1999 10 07	704	0.3+	0.4-
1980 03 17	809	0.8+	1.4-	1999 09 07	704	0.1+	0.6+	1999 10 07	704	0.4+	0.2-
1980 03 17	809	0.4-	0.6+	1999 09 07	704	0.5-	0.0	1999 10 07	704	0.2+	0.4-
1980 03 17	809	0.3-	0.4+	1999 09 07	704	0.3-	0.2+	1999 10 07	704	0.3-	0.5-
1980 03 17	809	0.9-	0.2+	1999 09 07	704	1.0-	0.0	1999 10 15	704	0.1+	0.3-
1992 09 21	033	0.6-	1.1-	1999 09 14	704	0.1+	0.9+	1999 10 15	704	0.1+	0.7-
1992 09 22	033	(0.3-	3.9-)	1999 09 14	704	0.3+	0.3+	1999 10 15	704	0.5+	0.8-
1992 09 23	033	0.9-	1.1-	1999 09 14	704	0.1-	0.6+	1999 10 15	704	0.2+	0.5-
1992 09 24	033	0.2+	1.1-	1999 09 14	704	1.0+	0.3+	1999 10 15	704	0.4+	0.7-
1992 09 26	033	0.8+	0.8+	1999 09 14	704	0.6-	0.5-	1999 10 18	113	0.2-	0.7-
1992 09 27	033	0.7+	0.1-	1999 10 02	704	0.0	0.7+	1999 10 18	113	0.1-	0.2-
1992 09 28	033	0.9+	0.0	1999 10 02	704	0.2-	0.1+	1999 10 31	113	0.6-	0.7+
1998 05 22	704	1.0+	1.3+	1999 10 02	704	0.6+	0.3-	1999 10 31	113	0.7-	0.4+
1998 05 22	704	(0.5-	2.3+)	1999 10 02	704	0.3+	1.4+	1999 11 03	113	1.0-	0.2+
1998 05 22	704	0.4+	0.8-	1999 10 02	704	0.1+	0.4+	1999 11 03	113	0.5-	0.2-
1998 05 22	704	0.5+	0.1+	1999 10 07	703	0.4-	0.5+	1999 11 03	113	1.0-	0.7+
1998 05 24	704	0.9-	0.7+	1999 10 07	703	0.4+	1.0+				

(12328)* 1992 SK₁₃ = 1992 UY₆ = 1954 OW

Discovered 1992 Sept. 26 by A. Sugie at the Dyncin Astronomical Observatory.

Id. G. V. Williams (*MPC* 21905), S. Nakano (*MPC* 28848)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Nakano

M	2.36772		(2000.0)		P		Q
n	0.28718080	ω	59.59754		+0.98904313		-0.13362570
a	2.2752674	Ω	308.00840		+0.09256533		+0.89246928
e	0.1812891	i	4.56805		+0.11500150		+0.43086280
P	3.43	H	14.6	G	0.15	U	1

Residuals in seconds of arc

1954 07 29	675	0.3-	0.2+	1997 01 03	411	0.8-	0.6-	1999 09 26	699	0.4+	0.9+
1954 07 29	675	0.3+	0.1+	1997 01 14	411	0.0	0.4-	1999 09 26	699	0.2-	0.9+
1992 09 26	402	1.7+	0.0	1997 01 14	411	0.5+	0.6-	1999 10 12	704	0.3+	0.2+
1992 09 26	402	1.1+	0.4-	1997 02 02	691	0.0	0.5-	1999 10 12	704	0.2+	0.4+
1992 09 27	402	1.3+	0.4+	1997 02 02	691	0.1-	0.4-	1999 10 12	704	0.1+	0.1+
1992 09 27	402	0.1+	1.0-	1997 02 02	691	0.1+	0.2-	1999 10 12	704	0.1+	0.4+
1992 09 30	675	0.0	1.3-	1997 02 05	402	0.2-	0.3+	1999 10 12	704	0.1-	0.5+
1992 09 30	675	0.3+	1.5-	1997 02 05	402	0.1+	1.0+	1999 10 13	704	0.0	0.4+
1992 10 02	675	0.2-	0.7-	1997 02 05	402	0.8-	0.0	1999 10 13	704	0.2+	0.3+
1992 10 02	675	0.6-	0.9-	1997 02 09	402	0.2-	0.2+	1999 10 13	704	0.0	0.4+
1992 10 25	675	0.9-	0.4-	1997 02 09	402	0.1-	0.6+	1999 10 13	704	0.1+	0.4+

1992 10 25	675	0.7−	0.1−	1997 02 09	402	0.1−	0.4+	1999 10 13	704	0.1−	0.2+
1992 10 26	675	(1.5−	2.6+)	1998 05 24	704	0.4−	0.2+	1999 11 09	699	0.4−	0.6+
1992 10 26	675	0.6−	0.8+	1998 05 24	704	0.5+	0.1+	1999 11 09	699	0.6−	0.6+
1997 01 02	411	0.5+	0.5−	1998 05 24	704	1.7+	0.5+	1999 11 09	699	0.6−	1.1+
1997 01 02	411	0.4−	0.8−	1998 05 24	704	1.2−	0.8+				
1997 01 03	411	0.1+	1.2−	1999 09 26	699	(2.3−	2.3+)				

(12329)* 1992 SR₂₃ = 1981 UN₉ = 1990 BL₄ = 1998 FO₉₇ = 1999 RS₁₂₀

Discovered 1992 Sept. 23 by F. Börngen at Tautenburg.

Id. A. Doppler (*MPC* 36331)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

		Williams			
<i>M</i>	2.95971	(2000.0)	P	Q	
<i>n</i>	0.26639936	ω 55.78821	+0.75173135	+0.65523119	
<i>a</i>	2.3921070	Ω 263.15466	−0.62708751	+0.67519145	
<i>e</i>	0.1592167	<i>i</i> 4.31169	−0.20411085	+0.33880465	
<i>P</i>	3.70	<i>H</i> 13.9	<i>G</i> 0.15	<i>U</i> 2	

Residuals in seconds of arc

1981 10 30	381	0.1+	0.2−	1998 04 01	704	0.2+	0.8−	1999 09 09	704	0.0	0.6−
1981 10 30	381	0.4−	0.1−	1998 04 01	704	0.4−	1.0−	1999 09 09	704	0.1−	0.7−
1990 01 24	033	0.9+	0.3−	1998 04 01	704	0.8+	0.5−	1999 09 09	704	0.1+	0.7−
1990 01 25	033	0.1−	0.4+	1998 04 01	704	0.6−	0.1−	1999 09 09	704	0.3−	0.6−
1992 09 23	033	0.4+	0.6−	1999 05 21	704	0.2−	0.4−	1999 09 09	704	0.1+	0.1−
1992 09 25	033	0.0	0.4−	1999 05 21	704	0.8+	1.6+	1999 09 14	704	0.1+	0.5−
1992 09 25	033	0.2+	0.7−	1999 05 21	704	0.3+	0.3+	1999 09 14	704	0.3−	0.6−
1992 09 27	033	0.1−	0.2−	1999 05 21	704	0.2−	0.4−	1999 09 14	704	0.6−	0.8−
1992 09 28	033	0.3−	0.2−	1999 05 21	704	0.5−	1.1+	1999 09 14	704	0.0	1.1−
1992 09 29	033	0.2+	0.1−	1999 07 23	704	0.2+	0.3−	1999 09 14	704	0.7−	1.4−
1998 02 22	566	0.3−	0.3+	1999 07 23	704	0.7+	0.2−	1999 10 27	723	0.7+	0.3−
1998 02 22	566	0.2−	0.2−	1999 07 23	704	0.3+	0.2−	1999 10 27	723	0.4+	0.2−
1998 02 22	566	0.2−	0.3+	1999 07 23	704	0.0	0.2−	1999 10 27	723	1.2+	0.4−
1998 03 26	704	1.1−	0.6−	1999 09 06	699	0.0	1.0+	1999 10 27	106	0.1+	0.3+
1998 03 26	704	0.3−	1.4−	1999 09 06	699	0.3−	1.2+	1999 10 27	106	1.0+	0.5+
1998 03 26	704	0.8−	1.2−	1999 09 06	699	0.5+	0.7+	1999 10 27	106	1.0+	0.2+
1998 03 31	704	0.2+	0.8−	1999 09 07	704	0.0	0.2−	1999 11 07	704	0.2+	0.1−
1998 03 31	704	(1.8+	2.4−)	1999 09 07	704	0.1−	0.1+	1999 11 07	704	0.2−	0.0
1998 03 31	704	(2.3−	0.9+)	1999 09 07	704	0.3−	0.2−	1999 11 07	704	0.5−	0.2+
1998 03 31	704	0.8−	0.1−	1999 09 07	704	0.0	0.5−	1999 11 07	704	0.1+	0.3−
1998 04 01	704	0.3−	1.7−	1999 09 07	704	0.2−	0.2−				

(12330)* 1992 UX₂ = 1978 NE₄ = 1998 HV₉₈

Discovered 1992 Oct. 25 by N. Kawasato at Uenohara.

Id. G. V. Williams (*MPC* 31959)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

		Williams			
<i>M</i>	45.97997	(2000.0)	P	Q	
<i>n</i>	0.29182088	ω 124.63623	+0.91156655	+0.40757026	
<i>a</i>	2.2510846	Ω 211.41205	−0.40298734	+0.85955865	
<i>e</i>	0.2212069	<i>i</i> 5.96432	−0.08153300	+0.30829437	
<i>P</i>	3.38	<i>H</i> 14.8	<i>G</i> 0.15	<i>U</i> 1	

Residuals in seconds of arc

1978 07 10	095	0.4+	1.1−	1998 04 22	704	0.7−	0.5+	1998 05 24	704	0.6+	0.4+
1988 05 10	675	1.1−	0.1+	1998 04 22	704	1.6−	0.1+	1998 05 24	704	1.1+	0.7−
1988 05 10	675	0.2+	0.1+	1998 04 22	704	0.6−	0.1+	1998 05 28	699	0.4+	0.1−
1992 10 21	675	0.9+	1.3+	1998 05 01	704	0.5+	0.4−	1998 05 28	699	0.6−	0.1−
1992 10 21	675	1.2−	0.5+	1998 05 01	704	0.5+	0.2−	1998 05 28	699	0.1−	0.1−
1992 10 25	376	(1.2−	2.3+)	1998 05 01	704	0.9+	0.4+	1999 10 10	704	0.4−	0.4−
1992 10 25	376	1.2−	1.5−	1998 05 01	704	0.4+	0.4+	1999 10 10	704	1.0+	0.4+
1992 10 27	376	1.1−	1.4−	1998 05 01	704	0.2−	1.0+	1999 10 10	704	0.5−	1.4−
1992 10 27	376	0.6+	0.1−	1998 05 04	566	0.6+	0.3+	1999 10 10	704	0.3+	1.4−
1992 11 14	376	0.5−	1.2+	1998 05 04	566	1.0+	0.2+	1999 10 21	704	0.6+	0.1−
1992 11 14	376	(1.5−	2.4+)	1998 05 04	566	0.3+	0.6+	1999 10 21	704	0.1−	0.1−
1992 11 21	376	0.6+	1.1+	1998 05 05	699	0.8+	0.6−	1999 10 21	704	0.2+	0.3−
1992 11 21	376	1.5+	0.5+	1998 05 05	699	0.8+	0.2+	1999 10 21	704	1.0−	1.0−
1992 11 29	376	0.8−	1.5+	1998 05 05	699	0.9+	0.0	1999 10 21	704	0.4−	0.6−

1992 11 29	376	(2.8−	0.5−)	1998 05 18	699	0.1+	0.3−	1999 11 04	704	0.5+	0.1−
1998 04 18	327	0.2−	0.8+	1998 05 18	699	0.2+	0.5−	1999 11 04	704	0.0	0.7−
1998 04 18	327	0.2−	0.6+	1998 05 18	699	0.4−	0.1−	1999 11 04	704	0.1−	0.2−
1998 04 18	327	0.4+	0.5+	1998 05 22	704	0.0	0.6−	1999 11 04	704	0.1−	0.8−
1998 04 21	704	0.1−	0.3+	1998 05 22	704	1.2+	0.8−	1999 11 17	704	0.0	0.3+
1998 04 21	704	0.6−	0.0	1998 05 22	704	1.0−	0.2−	1999 11 17	704	0.3−	0.4+
1998 04 21	704	0.0	0.2−	1998 05 22	704	1.5−	1.0+	1999 11 17	704	0.1−	0.1+
1998 04 21	704	0.9−	0.5−	1998 05 22	704	0.9−	0.0	1999 11 17	704	0.2+	0.3+
1998 04 21	704	0.1−	0.3−	1998 05 24	704	0.5+	0.0	1999 11 17	704	0.1−	0.1+
1998 04 22	704	0.2−	0.6+	1998 05 24	704	0.6−	0.8−				
1998 04 22	704	0.1+	0.9+	1998 05 24	704	0.2−	0.6+				

(12331)* 1992 UH₆ = 1994 EF₁

Discovered 1992 Oct. 31 by N. Kawasato at Uenohara.

Id. S. Nakano (*MPC* 23341)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

		Nakano			
<i>M</i>	51.33493	(2000.0)	P	Q	
<i>n</i>	0.29800901	ω 292.23149	+0.99367605	+0.05423553	
<i>a</i>	2.2198133	Ω 64.77584	−0.00573906	+0.89899821	
<i>e</i>	0.1954043	<i>i</i> 6.23928	−0.11213819	+0.43458109	
<i>P</i>	3.31	<i>H</i> 13.6	<i>G</i> 0.15	<i>U</i> 1	

Residuals in seconds of arc

1992 10 25	675	0.7−	0.6+	1994 03 06	411	1.4+	0.4−	1999 10 12	704	0.4−	0.6−
1992 10 25	675	0.2+	0.9+	1994 03 06	411	1.1+	0.5−	1999 10 12	704	0.3+	0.4+
1992 10 31	376	0.2−	0.3−	1997 02 14	376	1.0−	1.3+	1999 10 12	704	0.3+	0.7−
1992 10 31	376	0.6+	0.7−	1997 02 14	376	1.4−	1.1+	1999 10 12	704	0.3+	0.1+
1992 11 02	376	0.7−	0.5−	1997 03 01	376	0.7−	0.4−	1999 10 22	704	0.1+	0.1−
1992 11 02	376	0.8−	0.2+	1997 03 01	376	1.0−	0.5+	1999 10 22	704	0.4−	0.7−
1992 11 18	376	0.8+	0.8−	1998 06 24	704	0.3+	0.7−	1999 10 22	704	0.3+	0.3+
1992 11 18	376	0.4−	0.6+	1998 06 24	704	0.8+	0.8+	1999 10 22	704	0.0	0.4−
1992 11 22	376	0.9+	0.2+	1998 06 24	704	0.5+	0.8−	1999 10 22	704	0.2+	0.4−
1992 11 22	376	0.2+	0.3+	1998 06 24	704	1.4−	1.3+	1999 11 16	704	0.1+	0.0
1992 11 28	675	0.8+	0.6−	1998 06 24	704	1.2+	1.0−	1999 11 16	704	0.4+	0.0
1992 11 28	675	0.3−	0.3−	1998 06 26	704	0.4−	0.4−	1999 11 16	704	0.3+	0.9−
1992 12 04	376	1.3−	1.7+	1998 06 26	704	0.9−	0.1+	1999 11 16	704	0.5+	0.4−
1992 12 04	376	(1.6−	2.6+)	1998 06 26	704	0.3−	0.4+	1999 11 16	704	0.9+	0.4−
1994 03 04	411	0.2+	0.2+	1998 06 26	704	0.5−	0.8−				
1994 03 04	411	0.5+	0.0	1999 10 12	704	0.4−	1.3−				

(12332)* 1992 UJ₆ = 1985 UW₆ = 1985 VD₆

Discovered 1992 Oct. 31 by N. Kawasato at Uenohara.

Id. S. Nakano (*MPC* 21592)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

		Nakano			
<i>M</i>	356.36438	(2000.0)	P	Q	
<i>n</i>	0.28531871	ω 185.21228	+0.85956041	−0.50865470	
<i>a</i>	2.2851561	Ω 205.54919	+0.47289520	+0.82824457	
<i>e</i>	0.1976788	<i>i</i> 6.55811	+0.19371638	+0.23511983	
<i>P</i>	3.45	<i>H</i> 14.3	<i>G</i> 0.15	<i>U</i> 2	

Residuals in seconds of arc

1985 10 18	095	(0.6+	3.5+)	1997 03 01	376	0.0	0.5+	1999 10 10	704	0.5+	1.0−
1985 11 12	095	(5.8+	1.7−)	1997 03 01	376	0.4+	0.6+	1999 10 10	704	0.4+	0.4−
1992 10 25	675	1.0+	0.3+	1998 05 22	704	0.7+	0.1−	1999 10 10	704	0.3−	0.7−
1992 10 25	675	0.7+	0.3+	1998 05 22	704	0.1−	0.4+	1999 10 10	704	1.5−	0.9−
1992 10 31	376	0.2+	1.2+	1998 05 22	704	0.7+	0.2−	1999 10 10	704	0.0	0.5−
1992 10 31	376	0.0	1.1+	1998 05 22	704	1.1−	0.8−	1999 10 15	704	0.1+	0.3−
1992 11 02	376	1.0−	0.8−	1998 05 22	704	0.2+	1.7−	1999 10 15	704	0.1−	0.3−
1992 11 02	376	1.1−	1.5+	1998 05 24	704	0.1+	0.1+	1999 10 15	704	0.5−	1.7−
1992 11 18	376	0.9−	0.5+	1998 05 24	704	0.1−	0.5+	1999 10 15	704	1.9+	1.4−
1992 11 18	376	0.9−	1.4+	1998 05 24	704	0.2−	0.7+	1999 10 21	704	0.3−	0.7+
1992 11 22	376	0.4−	0.6−	1998 05 24	704	0.9+	0.0	1999 10 21	704	0.3+	0.1+
1992 11 22	376	0.2−	0.1−	1998 05 24	704	0.8−	0.2−	1999 10 21	704	0.4+	0.1+
1992 11 28	675	0.5+	0.1+	1998 06 03	704	1.8−	0.1−	1999 10 21	704	0.5+	0.0
1992 11 28	675	0.4+	0.0	1998 06 03	704	1.0+	1.4+	1999 10 21	704	0.5+	0.6−

1999 NOV. 23

1992 12 04	376	(2.4+ 1.6+)	1998 06 03	704	(0.7- 2.2+)	1999 11 04	704	0.3+ 0.8+
1992 12 04	376	1.4+ 1.6-	1998 06 03	704	(4.8- 0.0)	1999 11 04	704	0.5- 0.5+
1997 02 14	376	0.1- 0.1-	1998 06 26	699	0.3- 0.8+	1999 11 04	704	0.7- 0.3+
1997 02 14	376	0.0 0.0	1998 06 26	699	0.0 0.3-	1999 11 04	704	0.2- 0.3+
1997 02 14	376	0.1+ 0.5-	1998 06 26	699	0.6+ 0.2-	1999 11 04	704	0.6- 0.3+

(12333)* 1992 WJ₂ = 1994 CC₁₅

Discovered 1992 Nov. 18 by S. Ueda and H. Kaneda at Kushiro.

Id. B. G. Marsden (*MPC* 23674)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Marsden

<i>M</i>	37.76781		(2000.0)	P	Q
<i>n</i>	0.27746058	ω	273.52153	+0.81334764	+0.57361944
<i>a</i>	2.3281012	Ω	51.50143	-0.47228771	+0.74846610
<i>e</i>	0.1487371	<i>i</i>	7.12626	-0.33972039	+0.33280510
<i>P</i>	3.55	<i>H</i>	13.9	<i>G</i>	0.15
				<i>U</i>	1

Residuals in seconds of arc

1991 05 15	675	0.3- 0.2+	1998 04 22	704	0.2- 0.2-	1999 10 15	704	(2.2- 0.4-)
1991 05 15	675	0.2- 0.9+	1998 04 30	699	0.6+ 0.7+	1999 10 15	704	0.4+ 0.7-
1992 11 18	399	1.0- 0.7+	1998 04 30	699	0.8+ 0.8+	1999 10 15	704	0.4+ 0.3-
1992 11 18	399	0.2- 1.3+	1998 04 30	699	0.5+ 0.6+	1999 10 15	704	0.1+ 0.6-
1992 11 21	399	1.3- 1.8+	1998 05 01	704	1.7+ 0.4+	1999 10 20	704	0.2- 0.3-
1992 11 21	399	(0.5+ 2.7+)	1998 05 01	704	1.2- 1.0+	1999 10 20	704	0.4- 0.2-
1992 11 25	691	1.4- 1.0+	1998 05 01	704	0.1- 0.2-	1999 10 20	704	0.0 0.4-
1992 11 25	691	0.7+ 0.2+	1998 05 01	704	0.8+ 0.3+	1999 10 20	704	0.1- 0.0
1992 11 25	691	0.8+ 0.2+	1998 05 01	704	0.2- 0.3+	1999 10 20	704	0.0 0.3-
1992 11 25	675	1.2+ 0.6-	1998 05 01	566	0.4+ 1.0-	1999 10 29	703	0.1- 1.0+
1992 11 25	675	0.7+ 0.6-	1998 05 01	566	0.8+ 0.5-	1999 10 29	703	0.7- 0.1-
1992 11 27	399	(2.3- 0.7-)	1998 05 01	566	0.3+ 0.3-	1999 10 29	703	0.4- 1.0+
1992 11 27	399	1.5- 1.3+	1998 05 02	566	0.3- 1.3-	1999 10 29	703	0.5- 1.0+
1992 11 28	675	1.0+ 0.0	1998 05 02	566	0.0 1.1-	1999 11 04	704	0.2+ 0.3+
1992 11 28	675	0.9+ 0.9-	1998 05 02	566	0.4+ 0.8-	1999 11 04	704	0.0 0.3-
1994 02 08	809	0.2+ 0.7-	1998 05 05	104	0.4+ 0.5+	1999 11 04	704	0.0 0.4-
1994 02 08	809	0.7- 0.0	1998 05 05	104	0.2+ 0.7+	1999 11 04	704	0.2+ 0.9-
1994 02 08	809	1.0- 0.6-	1998 05 05	104	0.4+ 0.7+	1999 11 04	704	0.0 0.8-
1994 02 10	809	0.3+ 0.4+	1998 05 22	691	0.7- 1.3+	1999 11 11	703	0.4- 0.5+
1994 02 10	809	0.3- 0.5+	1998 05 22	691	0.9- 1.1+	1999 11 11	703	0.6- 0.2+
1994 02 10	809	0.1+ 0.3-	1998 05 22	691	1.0- 1.2+	1999 11 11	703	0.6- 0.5+
1994 02 13	809	(2.7- 0.9-)	1998 05 25	699	0.4+ 1.0+	1999 11 11	703	0.7- 0.6+
1994 02 13	809	(3.0- 0.9-)	1998 05 25	699	0.6+ 1.4+	1999 11 12	704	0.0 0.2-
1994 02 13	809	(3.6- 0.3-)	1998 05 25	699	0.2+ 1.8+	1999 11 12	704	0.2- 0.2+
1998 04 21	688	0.2+ 0.1-	1999 10 02	703	0.0 0.6+	1999 11 12	704	0.1- 0.0
1998 04 21	688	0.1+ 0.0	1999 10 02	703	0.1+ 0.5+	1999 11 12	704	0.0 0.1+
1998 04 21	688	0.0 0.1-	1999 10 02	703	0.2- 0.6+	1999 11 12	704	0.1- 0.1-
1998 04 21	704	0.7+ 0.1-	1999 10 02	703	0.1- 0.4+	1999 11 16	691	0.0 0.0
1998 04 21	704	1.2- 0.3-	1999 10 03	704	0.4- 0.2-	1999 11 16	691	0.1+ 0.0
1998 04 21	704	0.4+ 0.4-	1999 10 03	704	0.2- 0.1+	1999 11 16	691	0.0 0.0
1998 04 21	704	1.2+ 0.0	1999 10 03	704	0.5+ 1.1+	1999 11 17	704	0.0 0.2+
1998 04 21	704	0.7+ 0.5+	1999 10 03	704	0.4- 0.6+	1999 11 17	704	0.3- 0.1+
1998 04 22	704	0.3+ 0.4-	1999 10 10	704	0.8+ 0.0	1999 11 17	704	0.2+ 0.1-
1998 04 22	704	0.1- 0.4-	1999 10 10	704	0.5+ 0.1-	1999 11 17	704	0.2- 0.2-
1998 04 22	704	0.8- 0.6-	1999 10 10	704	1.3+ 0.1+	1999 11 17	704	0.1- 0.4-
1998 04 22	704	0.8- 0.1+	1999 10 10	704	0.2- 0.1-			

(12334)* 1992 WD₃ = 1990 DD₁ = 1988 PN₄ = 1998 MW₂₉

Discovered 1992 Nov. 18 by A. Sugie at the Dynic Astronomical Observatory.

Id. S. Nakano (*MPC* 34187)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Nakano

<i>M</i>	349.28797		(2000.0)	P	Q
<i>n</i>	0.28902640	ω	278.26174	+0.38643051	-0.92101784
<i>a</i>	2.2655712	Ω	148.86277	+0.87910770	+0.35174727
<i>e</i>	0.1391381	<i>i</i>	5.43371	+0.27900019	+0.16733201
<i>P</i>	3.41	<i>H</i>	13.8	<i>G</i>	0.15
				<i>U</i>	1

M.P.C. 36695

Residuals in seconds of arc

1988 08 08	095	(3.4- 4.6-)	1995 08 30	809	0.4+ 0.5-	1999 10 10	704	0.7+ 0.4+
1988 08 08	095	(1.7+ 9.2-)	1996 12 01	327	0.2+ 1.1+	1999 10 10	704	0.3- 0.6+
1990 02 16	399	0.3+ 1.7-	1996 12 01	327	1.2+ 1.0-	1999 10 10	704	0.0 0.9+
1990 02 16	399	(0.3+ 2.6-)	1996 12 01	327	0.5+ 1.8-	1999 10 10	704	0.0 0.9+
1990 02 23	220	(0.3+ 7.4-)	1998 06 24	704	0.0 0.4-	1999 10 10	704	0.2- 1.0+
1990 02 24	220	(0.1+ 7.2-)	1998 06 24	704	0.3- 0.2-	1999 10 21	704	0.0 0.5+
1990 02 24	220	(5.9- 2.9-)	1998 06 24	704	1.4+ 0.6+	1999 10 21	704	0.5- 0.4+
1992 11 18	402	1.3+ 1.3-	1998 06 24	704	1.8+ 1.1-	1999 10 21	704	0.1- 0.2+
1992 11 18	402	0.4- 0.7+	1998 06 24	704	0.6+ 0.6+	1999 10 21	704	0.2- 0.6+
1992 11 21	402	0.3- 1.5-	1998 06 26	704	0.8+ 1.1+	1999 10 21	704	0.2- 0.1+
1992 11 21	402	0.1- 0.5+	1998 06 26	704	1.1+ 0.4+	1999 11 12	703	0.5- 0.6+
1994 06 09	691	1.1- 0.3+	1998 06 26	704	0.1+ 0.7-	1999 11 12	703	0.1- 0.1-
1994 06 09	691	0.9- 0.8+	1998 06 26	704	2.0+ 1.5+	1999 11 12	703	0.5+ 0.1+
1994 06 09	691	0.9- 0.7+	1998 07 21	704	0.1- 0.4-	1999 11 12	703	0.3+ 0.6+
1995 08 19	809	0.7+ 0.0	1998 07 21	704	1.0- 0.5-	1999 11 17	704	0.2- 0.4-
1995 08 20	809	0.2+ 0.1+	1998 07 21	704	1.9- 0.9+	1999 11 17	704	0.2- 0.6-
1995 08 22	809	0.4- 0.4+	1998 07 21	704	0.8- 0.1+	1999 11 17	704	0.4- 0.8-
1995 08 26	809	0.5- 0.2-	1998 07 26	704	1.7- 1.3-	1999 11 17	704	0.4- 0.8-
1995 08 27	809	0.9- 0.5-	1998 07 26	704	0.4- 1.7-	1999 11 17	704	0.3+ 0.6-
1995 08 29	809	0.1+ 0.4-	1998 07 26	704	1.2+ 0.1+			

(12335)* 1992 WJ₃ = 1994 GG₉

Discovered 1992 Nov. 21 by T. Seki at Geisei.

Id. S. Nakano (*MPC* 23520)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Nakano

<i>M</i>	172.64728		(2000.0)	P	Q
<i>n</i>	0.27988885	ω	44.47371	-0.78195594	+0.62324753
<i>a</i>	2.3146162	Ω	174.05280	-0.59614786	-0.74289168
<i>e</i>	0.0695298	<i>i</i>	5.74097	-0.18207865	-0.24428360
<i>P</i>	3.52	<i>H</i>	14.1	<i>G</i>	0.15
				<i>U</i>	1

Residuals in seconds of arc

1992 11 17	691	1.2+ 0.4+	1995 11 22	118	1.0+ 0.7-	1999 10 08	703	0.1+ 0.1-
1992 11 17	691	1.2+ 0.4+	1997 03 02	104	0.5+ 1.0+	1999 10 10	704	0.7+ 0.3+
1992 11 17	691	1.4+ 0.4+	1997 03 02	104	0.8+ 0.9+	1999 10 10	704	(2.7+ 1.7-)
1992 11 21	372	1.3- 2.1+	1997 03 02	104	0.8+ 0.9+	1999 10 10	704	0.1- 0.3-
1992 11 21	372	0.5- 1.2+	1998 06 25	704	0.5- 0.4-	1999 10 10	704	0.1- 1.0-
1992 11 23	372	0.1+ 0.8-	1998 06 25	704	0.4+ 0.2+	1999 10 20	704	0.2- 0.3-
1992 11 23	372	1.8+ 0.4-	1998 06 25	704	0.1+ 0.3+	1999 10 20	704	0.7- 0.0
1992 11 25	372	0.4- 0.4-	1998 06 25	704	0.9- 0.5+	1999 10 20	704	0.1+ 0.0
1992 11 25	372	0.3+ 0.4+	1998 06 26	704	1.8+ 1.4+	1999 10 20	704	0.0 0.2+
1994 04 11	399	1.4- 0.7-	1998 06 26	704	0.9+ 0.7+	1999 10 20	704	1.4+ 0.2-
1994 04 11	399	1.9- 0.3-	1998 06 26	704	(3.1+ 0.1+)	1999 11 04	704	0.3+ 0.5+
1994 04 13	399	(0.2- 3.1-)	1998 06 26	704	1.6+ 1.3+	1999 11 04	704	0.7- 0.3+
1994 04 13	399	(1.4- 2.5-)	1998 06 26	704	0.4+ 0.7+	1999 11 04	704	0.4- 0.2-
1995 09 18	372	(0.7+ 2.9-)	1999 10 08	120	0.4- 1.2-	1999 11 04	704	0.7- 0.4-
1995 09 18	372	(0.2+ 4.8-)	1999 10 08	120	0.6+ 0.4-	1999 11 04	704	0.1- 0.1+
1995 09 26	098	1.7- 1.8-	1999 10 08	120	0.9- 0.6-	1999 11 12	699	0.0 0.6+
1995 09 26	098	1.4- 0.8-	1999 10 08	120	0.2- 0.5-	1999 11 12	699	1.3- 0.1-
1995 10 16	372	1.1- 0.9-	1999 10 08	703	0.3- 0.6+	1999 11 12	699	0.4+ 0.3+
1995 10 16	372	0.3- 1.3+	1999 10 08	703	0.0 0.2+			
1995 11 22	118	(4.5+ 2.6+)	1999 10 08	703	0.2- 0.3+			

(12336)* 1992 WO₃ = 1953 PO₁

Discovered 1992 Nov. 23 by T. Urata at the Nihondaira Observatory.

Id. E. Bowell (*MPC* 23674)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	314.58212		(2000.0)	P	Q
<i>n</i>	0.28061677	ω	237.12071	-0.11101804	-0.96556596
<i>a</i>	2.3106117	Ω	221.35507	+0.98850630	-0.08284026
<i>e</i>	0.2617248	<i>i</i>	20.86068	+0.10261717	-0.24661685
<i>P</i>	3.51	<i>H</i>	13.7	<i>G</i>	0.15
				<i>U</i>	2

Residuals in seconds of arc

1953 08 11	675	1.0+	1.3+	1993 02 11	385	0.2+	0.0	1999 10 10	385	0.4+	0.0
1953 08 11	675	0.0	0.5+	1993 02 19	385	1.2-	0.3+	1999 10 20	385	0.2+	0.1-
1992 11 23	385	0.8+	1.0-	1993 02 19	385	0.6-	0.2+	1999 10 20	385	0.2+	0.2+
1992 11 23	385	0.2+	0.1+	1993 03 27	801	0.1+	1.2+	1999 11 02	703	0.5-	0.7+
1992 11 24	385	0.4+	0.6-	1993 03 27	801	0.5-	0.8+	1999 11 02	703	0.3+	0.3+
1992 11 24	385	0.3-	1.3-	1994 05 31	595	1.1+	1.1+	1999 11 02	703	0.2+	0.2+
1992 11 26	885	1.4-	0.4+	1994 05 31	595	0.1-	1.2+	1999 11 02	703	0.2+	0.1+
1992 12 03	885	0.2+	0.4-	1995 08 31	693	(0.6-	2.6-)	1999 11 04	886	0.5+	0.9+
1992 12 03	885	0.5-	0.2-	1995 08 31	693	(0.9-	3.3-)	1999 11 04	886	0.6+	0.5-
1992 12 14	385	0.8+	0.0	1995 09 18	693	0.7-	1.5-	1999 11 05	704	0.2-	0.2-
1992 12 14	385	0.3+	0.5-	1995 09 18	693	1.5-	0.8-	1999 11 05	704	0.1-	0.2+
1992 12 17	385	0.0	0.5+	1999 10 10	704	0.6+	0.1-	1999 11 05	704	0.0	0.2+
1992 12 17	385	0.3+	0.6+	1999 10 10	704	0.3-	0.1+	1999 11 05	704	0.4-	0.3+
1992 12 26	885	0.8-	0.3+	1999 10 10	704	1.1+	0.3+	1999 11 05	704	0.2-	0.3+
1992 12 26	885	1.0-	0.9-	1999 10 10	704	0.1+	0.4+	1999 11 19	385	0.3+	0.1+
1993 01 17	385	1.0-	0.2+	1999 10 10	704	1.4+	0.5+	1999 11 19	385	0.5+	0.1-
1993 01 17	385	0.6-	0.0	1999 10 10	385	0.4+	0.2+				
1993 02 11	385	0.9+	0.1+	1999 10 10	385	0.1+	0.1-				

(12337)* 1992 WV₃ = 1958 DL₁ = 1981 SL₆ = 1988 SB

Discovered 1992 Nov. 24 by Y. Kushida and O. Muramatsu at the Yatsugatake South Base Observatory.

Id. S. Nakano (*MPC* 21595)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>		<i>P</i>		<i>Q</i>	
324.12082		(2000.0)			
<i>n</i>	0.27814362	ω	53.38760	+0.40715125	-0.91312952
<i>a</i>	2.3242882	Ω	12.63510	+0.80513338	+0.34819163
<i>e</i>	0.1041166	<i>i</i>	5.39090	+0.43126338	+0.21203080
<i>P</i>	3.54	<i>H</i>	13.9	<i>G</i>	0.15
				<i>U</i>	1

Residuals in seconds of arc

1958 02 19	330	0.5-	0.8+	1992 11 24	896	0.2-	0.4+	1999 10 12	704	0.1-	0.6+
1981 09 28	095	0.9-	1.3+	1992 11 24	896	(4.5-	0.3+)	1999 10 12	704	0.2-	0.6+
1981 10 05	095	0.6+	1.7+	1992 11 26	896	(42.7-	38.6-)	Y 1999 10 12	704	0.6-	1.6+
1988 09 10	675	0.1+	0.9-	1992 12 03	896	1.4+	0.7+	Y 1999 10 13	704	0.5+	0.7-
1988 09 10	675	0.0	1.1-	1992 12 03	896	0.4-	0.1-	1999 10 13	704	0.7+	0.4+
1988 09 11	675	0.5-	0.8+	1992 12 15	896	1.2+	0.0	Y 1999 10 13	704	0.2-	0.2-
1988 09 11	675	1.2-	0.8+	1992 12 15	896	0.7-	1.4-	1999 10 13	704	0.8+	0.1+
1988 09 12	675	0.1-	0.6-	1992 12 29	896	0.8+	0.7+	Y 1999 10 13	704	0.0	0.4+
1988 09 12	675	0.5+	1.5-	1992 12 29	896	0.1-	0.9-	1999 10 15	704	0.2-	0.1+
1988 09 15	511	0.3-	1.0-	1996 12 26	327	1.0+	0.5-	1999 10 15	704	0.9+	0.5-
1988 09 15	511	0.3+	0.1+	1996 12 26	327	0.3+	0.3-	1999 10 15	704	0.5+	0.1+
1988 09 15	511	0.9+	0.8+	1996 12 26	327	0.7-	0.2-	1999 10 15	704	0.8-	0.7+
1988 09 16	511	0.7-	1.2-	1999 10 05	704	0.1+	1.5-	1999 10 16	611	0.4-	0.0
1988 09 16	511	(4.2+	0.1+)	1999 10 05	704	1.1+	0.5-	1999 10 16	611	0.1+	0.1-
1988 09 16	675	0.6+	1.3+	1999 10 05	704	0.9+	0.3+	1999 11 03	704	0.8-	0.6-
1988 09 16	675	0.5-	2.1+	1999 10 05	704	0.9+	0.1-	1999 11 03	704	1.0-	0.1-
1988 09 17	511	(2.3-	0.2+)	1999 10 05	704	0.0	1.3+	1999 11 03	704	0.9-	1.1-
1988 09 17	511	0.3-	0.7+	1999 10 07	704	0.7+	1.2-	1999 11 03	704	0.7-	0.7-
1988 10 07	675	0.6+	0.9-	1999 10 07	704	0.5-	0.7+	1999 11 03	704	0.4-	1.3-
1988 10 07	675	0.1-	1.0-	1999 10 07	704	0.1-	0.6+	1999 11 12	699	0.5-	0.5+
1988 10 09	675	1.1+	0.9-	1999 10 12	704	0.1-	0.1-	1999 11 12	699	0.7-	0.6+
1988 10 09	675	0.8+	1.0-	1999 10 12	704	0.1-	0.7+	1999 11 12	699	0.5-	0.2+

(12338)* 1992 XE = 1990 DA₈ = 1998 QY₁₆

Discovered 1992 Dec. 14 by S. Otomo at Kiyosato.

Id. S. Nakano (*MPC* 32453), G. V. Williams (*ibid.*)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>		<i>P</i>		<i>Q</i>	
329.02352		(2000.0)			
<i>n</i>	0.29065595	ω	5.96951	-0.27244371	-0.95625075
<i>a</i>	2.2570953	Ω	99.87603	+0.87823964	-0.29239411
<i>e</i>	0.1038722	<i>i</i>	6.21049	+0.39302616	-0.00949657
<i>P</i>	3.39	<i>H</i>	13.4	<i>G</i>	0.15
				<i>U</i>	2

Residuals in seconds of arc

1990 02 27	403	0.4-	0.1-	1998 07 24	566	0.2-	0.8-	1999 10 10	704	0.8+	0.4+
1990 02 27	403	0.4+	0.7-	1998 07 24	566	0.1-	0.8-	1999 10 10	704	0.9+	0.1+
1992 12 14	894	0.8-	0.4-	1998 07 24	566	0.4-	0.4-	1999 10 10	704	1.5+	0.1-
1992 12 14	894	0.5+	1.6-	1998 08 17	704	0.1-	0.2-	1999 10 10	704	1.2+	0.6-
1992 12 15	894	1.0+	0.3-	1998 08 17	704	0.8-	0.5+	1999 10 21	704	0.2+	0.4-
1992 12 15	894	1.6+	0.0	1998 08 17	704	0.5-	0.1-	1999 10 21	704	0.1+	0.4+
1992 12 19	894	0.1-	0.7-	1998 08 17	704	1.1-	0.1-	1999 10 21	704	0.2-	0.2+
1992 12 19	894	0.7+	0.9-	1998 08 17	704	0.7-	0.2+	1999 10 21	704	0.7-	0.3-
1992 12 30	894	0.1-	0.5-	1998 08 23	704	0.7+	0.3+	1999 10 21	704	0.1+	0.2+
1993 01 17	894	1.1-	1.7+	1998 08 23	704	0.6+	0.3+	1999 11 16	704	0.7-	0.2+
1993 01 19	894	1.2-	0.1-	1998 08 23	704	0.4-	0.5+	1999 11 16	704	0.1+	0.0
1993 01 19	894	1.4-	0.1+	1998 08 23	704	1.9+	0.5-	1999 11 16	704	0.3-	0.8+
1993 01 20	894	0.7-	0.6+	1998 09 24	699	0.6+	1.7+	1999 11 16	704	0.6-	0.5+
1993 01 22	894	0.6+	0.5+	1998 09 24	699	0.4-	0.3-	1999 11 16	704	0.6-	0.7+
1993 01 22	894	0.0	0.8+	1998 09 24	699	1.0+	0.3+				

(12339)* 1992 YW₁ = 1990 EK₁₀

Discovered 1992 Dec. 18 by E. W. Elst at Caussols.

Id. G. V. Williams (*MPC* 32662)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>		<i>P</i>		<i>Q</i>	
244.05036		(2000.0)			
<i>n</i>	0.28983110	ω	260.99004	-0.91589000	+0.39754140
<i>a</i>	2.2613757	Ω	302.41652	-0.33747431	-0.83770079
<i>e</i>	0.1120643	<i>i</i>	3.78557	-0.21738583	-0.37445723
<i>P</i>	3.40	<i>H</i>	14.1	<i>G</i>	0.15
				<i>U</i>	2

Residuals in seconds of arc

1990 03 08	809	0.1+	0.3+	1998 09 18	704	0.1-	0.7-	1998 10 14	699	1.1-	1.0+
1990 03 08	809	0.1+	0.2+	1998 09 18	704	0.7-	0.4+	1998 10 14	699	0.6-	0.8+
1990 03 08	809	0.2+	0.3+	1998 09 18	704	0.2-	0.1+	1998 10 14	699	0.6-	0.5+
1992 12 18	010	1.4+	0.9+	1998 09 18	704	0.4+	0.3+	1998 10 15	704	0.7-	0.9-
1992 12 19	010	1.3+	0.9+	1998 09 18	704	0.6+	0.0	1998 10 15	704	0.7-	0.3-
1992 12 19	010	0.6+	0.8+	1998 09 25	699	0.1-	0.7+	1998 10 15	704	0.5-	0.2+
1992 12 19	010	0.9+	1.3+	1998 09 25	699	0.6+	0.1+	1998 10 15	704	1.5-	0.2+
1992 12 19	010	0.9+	1.1+	1998 09 25	699	0.4-	0.5+	1998 10 15	704	0.3+	0.3+
1992 12 20	010	0.1+	1.3+	1998 09 26	704	0.8+	0.2+	1998 12 09	704	(2.8-	1.4-)
1993 01 16	010	0.3-	1.6-	1998 09 26	704	0.1+	1.4-	1998 12 09	704	0.9+	0.4+
1993 01 16	010	1.7-	1.9-	1998 09 26	704	0.2-	1.1-	1998 12 09	704	0.9-	0.2-
1993 01 16	010	1.7-	1.7-	1998 09 26	704	0.5+	0.2-	1999 10 12	704	0.2+	0.2-
1993 01 17	010	0.5-	0.9-	1998 09 26	704	0.0	0.9+	1999 10 12	704	0.3-	0.1+
1993 01 17	010	1.4-	1.0-	1998 09 27	699	0.2+	0.1-	1999 10 12	704	0.8+	1.4+
1993 01 17	010	0.6+	0.3-	1998 09 27	699	1.4+	0.0	1999 10 22	704	0.4+	0.3+
1998 08 23	704	(0.8+	2.5-)	1998 09 27	704	0.7+	0.9-	1999 10 22	704	0.1+	0.4-
1998 08 23	704	1.2-	1.4-	1998 09 27	704	1.4+	0.0	1999 10 22	704	0.5+	0.3+
1998 08 23	704	1.4+	0.2-	1998 09 27	699	0.5+	0.6-	1999 10 22	704	0.1+	0.5-
1998 08 23	704	(0.9+	2.3-)	1998 09 27	704	0.1+	0.3-	1999 10 22	704	0.1+	0.1-
1998 09 14	704	1.3+	0.4-	1998 09 27	704	0.2+	0.9+	1999 11 15	049	0.2-	0.1-
1998 09 14	704	1.0+	0.1+	1998 09 27	704	0.6+	0.0	1999 11 15	049	0.4-	0.1-
1998 09 14	704	0.1+	0.1-	1998 10 14	704	0.4-	0.9-	1999 11 15	049	0.5-	0.2-
1998 09 14	704	0.1+	0.3+	1998 10 14	704	1.1-	0.9+	1999 11 16	704	0.1-	1.0-
1998 09 16	699	0.4+	0.1-	1998 10 14	704	1.7-	1.9-	1999 11 16	704	0.6-	0.4-
1998 09 16	699	0.5+	0.5+	1998 10 14	704	0.6-	0.1+	1999 11 16	704	0.2-	0.1-
1998 09 16	699	0.1+	0.5+	1998 10 14	704	1.5-	1.4+	1999 11 16	704	0.1+	0.6+

Residuals in seconds of arc

1992 12 18	010	0.6+	0.6+	1998 05 22	704	0.7+	0.1+	1998 07 16	699	0.7+	0.9-
1992 12 19	010	0.5+	1.1+	1998 05 22	704	1.1+	0.6+	1999 10 02	704	0.1-	0.1+
1992 12 19	010	(0.8+	2.0+)	1998 05 22	704	0.3-	1.3+	1999 10 02	704	0.1-	0.3-
1992 12 19	010	0.2+	0.1+	1998 05 23	699	0.0	0.2+	1999 10 02	704	0.1+	0.2+
1992 12 19	010	0.9-	0.2-	1998 05 23	699	0.5+	0.3+	1999 10 02	704	0.3+	0.1+
1992 12 20	010	1.0-	0.4-	1998 05 23	699	0.3+	0.3-	1999 10 02	704	0.5+	0.1-
1993 01 16	010	1.1+	0.3-	1998 05 24	699	0.2+	0.6+	1999 10 08	704	0.2-	0.2+
1993 01 16	010	0.9+	0.6-	1998 05 24	704	0.2+	0.3-	1999 10 08	704	0.1-	0.2+
1993 01 16	010	0.3-	0.8-	1998 05 24	699	0.5+	0.4+	1999 10 08	704	0.1+	0.3+
1993 01 17	010	0.7-	0.5-	1998 05 24	704	0.3+	0.2+	1999 10 08	704	0.1+	0.1+
1993 01 17	010	0.6-	0.3+	1998 05 24	699	0.2+	0.8+	1999 10 08	704	0.0	0.6+
1993 01 17	010	0.4+	0.1-	1998 05 24	704	0.7+	0.3+	1999 11 02	703	0.4-	0.8+
1995 08 25	905	0.7+	0.4+	1998 05 24	704	0.1-	0.2-	1999 11 02	703	0.4-	0.7+
1995 08 25	905	1.2-	0.5-	1998 05 24	704	0.2-	0.4-	1999 11 02	703	0.5-	0.8+
1995 08 28	905	0.0	0.3-	1998 06 16	691	0.0	0.2+	1999 11 02	703	0.3-	0.8+
1995 08 28	905	0.2-	0.0	1998 06 16	691	0.1+	0.3-	1999 11 05	718	1.5-	0.3-
1995 08 29	413	0.7-	0.6-	1998 06 16	691	0.0	0.2-	1999 11 05	718	0.6-	0.3+
1995 08 29	413	0.9+	0.9+	1998 06 16	704	0.6-	1.1-	1999 11 05	718	0.9-	0.5+
1995 10 24	801	0.2+	0.8-	1998 06 16	704	0.8+	0.3+	1999 11 06	704	1.1-	0.8+
1995 10 24	801	0.5+	0.2+	1998 06 16	704	1.0-	0.8+	1999 11 06	704	0.9-	0.6+
1998 05 03	566	0.3-	1.5-	1998 06 16	704	1.4-	1.4-	1999 11 06	704	1.0-	0.8+
1998 05 03	566	0.9-	0.4+	1998 06 16	704	0.3-	0.1-	1999 11 06	704	1.5-	0.3+
1998 05 03	566	1.2-	0.5-	1998 06 27	699	0.9+	0.5-	1999 11 06	718	(3.3+	2.8-)
1998 05 05	699	(2.1-	1.0-)	1998 06 27	699	0.7+	0.2-	1999 11 06	718	(3.2+	2.9-)
1998 05 05	699	0.4+	0.8+	1998 06 27	699	0.2+	0.6-	1999 11 06	704	1.5-	1.1+
1998 05 05	699	1.9-	0.8+	1998 07 16	699	1.0-	0.2+	1999 11 06	718	(3.5+	2.7-)
1998 05 22	704	0.1-	0.1+	1998 07 16	699	0.7+	1.0-				

(12341)* 1993 BN₄ = 1995 SM₄

Discovered 1993 Jan. 27 by E. W. Elst at Caussols.

Id. S. Nakano (*MPC* 25960)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

M	5.33528		(2000.0)		$\mathbf{P}$	$\mathbf{Q}$	
n	0.26921309	ω	267.54513		+0.89925416	-0.43468668	
a	2.3754101	Ω	118.21653		+0.42014261	+0.82720988	
e	0.2219490	i	3.18006		+0.12174622	+0.35604958	
P	3.66	H	14.8	G	0.15	U	1

Residuals in seconds of arc

1993 01 27	010	1.0-	0.2+	1995 09 21	400	0.7+	0.4+	1999 10 22	704	0.1+	0.4-
1993 01 27	010	1.1-	0.5-	1995 09 30	400	0.4+	0.4+	1999 10 22	704	0.3+	0.6-
1993 01 27	010	1.5-	0.2+	1995 09 30	400	0.6-	0.6+	1999 10 22	704	0.1-	0.6-
1993 01 28	010	1.1+	1.3+	1997 02 03	691	0.1+	0.1+	1999 10 22	704	0.1-	0.8-
1993 01 28	010	0.2-	0.4+	1997 02 03	691	0.4+	0.0	1999 10 22	704	1.0+	1.0-
1993 01 28	010	0.5+	0.3+	1997 02 03	691	0.4+	0.2-	1999 11 15	704	0.6+	0.2-
1993 01 29	691	0.5+	0.1+	1998 06 21	749	1.4-	0.7-	1999 11 15	704	0.1-	0.1+
1993 01 29	691	0.6+	0.2+	1998 06 21	749	1.1-	0.1+	1999 11 15	704	0.3-	0.3+
1993 01 29	691	0.5+	0.2+	1998 06 21	749	0.9-	0.1+	1999 11 15	704	0.1-	0.3+
1994 05 14	691	0.6+	1.0-	1998 06 22	749	0.8+	0.3+	1999 11 15	704	1.1-	0.2-
1994 05 14	691	0.3+	0.8-	1998 06 22	749	0.7+	1.0-	1999 11 17	704	0.3+	0.1+
1994 05 14	691	0.2+	0.7-	1999 10 12	704	0.1+	0.1+	1999 11 17	704	0.1+	0.5-
1995 09 20	400	0.5+	0.0	1999 10 12	704	0.9+	0.1-	1999 11 17	704	0.8-	0.0
1995 09 20	400	1.4-	0.3+	1999 10 12	704	0.0	0.6-	1999 11 17	704	0.2-	0.4-
1995 09 21	400	0.0	0.0	1999 10 12	704	1.3+	0.7-	1999 11 17	704	0.6-	0.1-

(12342)* 1993 BL₁₂ = 1988 XC₅

Discovered 1993 Jan. 30 by Y. Kushida and O. Muramatsu at the Yatsugatake South Base Observatory.

Id. S. Nakano (*MPC* 21805)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Nakano

$\dot{M}$	322.07480		(2000.0)		$\mathbf{P}$		$\mathbf{Q}$
n	0.27132120	ω	15.60005		-0.00604413		-0.99759203
a	2.3630898	Ω	74.78442		+0.90963597		-0.03418392
e	0.1571589	i	4.10597		+0.41536233		+0.06034576
P	3.63	H	14.7	G	0.15	U	1

Residuals in seconds of arc

1988 12 05	381	1.5+	1.2-	1993 02 19	896	0.4-	0.3-	Y	1999 10 12	704	0.8-	0.3+
1988 12 06	381	0.6-	0.3-	1993 02 19	896	0.3+	2.0+	Y	1999 10 12	704	0.9-	0.2-
1988 12 07	381	0.3-	0.3-	1993 03 27	801	0.5-	0.0		1999 10 12	704	0.8-	0.1+
1988 12 08	381	0.1-	0.3-	1993 03 27	801	0.9-	0.5+		1999 10 22	704	0.2+	0.3+
1993 01 30	896	1.7+	0.7-	1995 09 21	033	0.8-	0.0		1999 10 22	704	0.7+	0.2-
1993 01 30	896	0.2+	0.8-	1995 09 21	033	0.1-	0.1-		1999 10 22	704	1.0+	0.1+
1993 02 10	896	(3.2-	0.0	)Y	1995 09 23	033	0.2+	0.5+	1999 10 22	704	0.4+	0.4+
1993 02 10	896	0.7+	0.3+	Y	1995 10 23	033	0.1-	0.2+	1999 11 03	704	0.0	0.4-
1993 02 13	402	0.8-	0.6-		1995 10 23	033	0.1-	0.4+	1999 11 03	704	0.4+	0.0
1993 02 13	402	0.7-	1.4+		1995 10 24	033	0.3+	0.7+	1999 11 03	704	0.2+	1.3+
1993 02 14	402	0.5+	0.2-		1995 10 25	033	0.1-	0.1+				
1993 02 14	402	0.2-	0.4-		1999 10 12	704	1.0-	0.6-				

(12343)* 1993 DT₁ = 1981 JA₆

Discovered 1993 Feb. 26 by Spacewatch at Kitt Peak.

Id. G. V. Williams (*MPC* 22060)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

M	113.65941		(2000.0)	$\mathbf{P}$	$\mathbf{Q}$		
n	0.23527672	ω	55.47242	-0.25112418	+0.96776658		
a	2.5986637	Ω	200.00952	-0.90536365	-0.24181733		
e	0.2415997	i	3.19844	-0.34242269	-0.07037201		
P	4.19	H	14.8	G	0.15	U	1

Residuals in seconds of arc

1981 05 08	675	1.2-	0.4-	1995 12 16	691	0.2-	0.0	1999 10 21	704	0.4+	0.2-
1981 05 09	675	0.9+	0.7-	1995 12 16	691	0.2-	0.2-	1999 10 21	704	0.9+	0.1+
1993 02 26	691	0.3+	0.2+	1995 12 16	691	0.1-	0.1+	1999 11 04	704	0.0	0.8-
1993 02 26	691	0.2-	0.1+	1995 12 22	691	0.2-	0.3-	1999 11 04	704	0.2-	1.1-
1993 02 26	691	0.0	0.0	1995 12 22	691	0.0	0.5-	1999 11 04	704	1.3-	1.9-
1993 03 03	691	0.4+	0.3-	1995 12 22	691	0.1-	0.5-	1999 11 09	704	1.5+	2.7+
1993 03 03	691	0.1-	0.2-	1997 02 15	691	0.1-	0.1-	1999 11 09	704	0.1+	1.8+
1993 03 03	691	0.2-	0.3-	1997 02 15	691	0.3-	0.3+	1999 11 09	704	0.2+	0.8+
1993 03 03	691	0.1+	0.2-	1997 02 15	691	0.4-	0.4+	1999 11 15	704	0.3-	0.8-
1993 03 03	691	0.2+	0.2+	1998 06 26	704	0.2+	0.3+	1999 11 15	704	0.0	0.7+
1993 03 03	691	0.2-	0.4-	1998 06 26	704	0.9-	0.6+	1999 11 15	704	0.6-	0.3+
1993 03 19	691	0.3+	0.3+	1998 06 26	704	0.2+	0.7-	1999 11 16	691	0.3+	0.0
1993 03 19	691	0.1-	0.0	1998 06 26	704	0.4+	0.5-	1999 11 16	691	0.0	0.1+
1993 03 19	691	0.2+	0.2-	1999 10 21	704	0.1+	0.0	1999 11 16	691	0.4+	2.3-

(12344)* 1993 FB₁

Discovered 1993 Mar. 18 by S. Shirai and S. Hayakawa at Hidaka.

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Nakano

M	171.60987		(2000.0)	$\mathbf{P}$	$\mathbf{Q}$		
n	0.23902124	ω	161.20346	-0.67831756	+0.72187504		
a	2.5714518	Ω	65.82357	-0.69192655	-0.56479971		
e	0.1464154	i	8.63983	-0.24723053	-0.39987212		
P	4.12	H	12.9	G	0.15	U	1

Residuals in seconds of arc

1993 01 19	801	0.3+	0.7-	1995 11 18	360	0.2+	0.2+	1999 10 21	704	0.4+	0.4-
1993 03 18	868	(1.9-	2.3+)	1995 11 18	360	0.5+	0.2+	1999 10 21	704	0.8+	0.4-
1993 03 18	868	2.1-	1.7+	1995 11 18	360	0.4+	0.1-	1999 10 21	704	0.2+	0.1-
1993 03 19	868	1.0+	0.9+	1997 03 27	689	(4.1+	2.5-)	1999 10 21	704	0.4+	0.3-
1993 03 19	868	1.5+	1.4-	1997 03 27	127	1.1+	0.1-	1999 11 04	704	0.0	0.5+
1993 03 20	868	0.4+	0.2-	1997 03 27	127	0.2+	0.5-	1999 11 04	704	0.6+	0.7-
1993 03 20	868	(5.0-	3.5+)	1997 03 31	127	0.0	0.5-	1999 11 04	704	0.1+	0.8+
1993 04 10	411	0.5-	0.0	1997 03 31	127	0.0	0.3-	1999 11 04	704	0.1-	0.4-

1993 04 10	411	0.0	0.4−	1997 04 01	127	1.2−	0.7−	1999 11 04	704	0.1−	0.6−
1993 04 10	411	0.5−	0.1+	1997 04 01	127	0.7−	0.8−	1999 11 09	704	0.0	0.2−
1993 04 17	868	1.2+	1.1+	1997 04 06	127	0.4−	0.3−	1999 11 09	704	0.4+	0.1+
1993 04 17	868	0.3−	0.4−	1997 04 06	127	0.6−	0.3−	1999 11 09	704	0.1+	0.2−
1993 04 24	411	0.0	0.6+	1998 09 21	704	0.0	0.4−	1999 11 09	704	0.1+	0.1+
1993 04 24	411	0.2+	0.1−	1998 09 21	704	0.6+	0.1−	1999 11 12	704	0.6−	0.0
1993 04 24	411	0.4−	0.5+	1998 09 21	704	0.8+	0.3−	1999 11 12	704	0.4−	0.2−
1993 06 18	801	0.4−	0.3−	1998 09 21	704	0.6+	1.4−	1999 11 12	704	0.5−	0.3−
1993 06 18	801	0.3−	0.8−	1998 09 21	704	1.1+	1.2−	1999 11 12	704	0.6−	0.5−
1994 08 09	801	0.5−	0.1+	1998 12 08	704	1.0+	0.2+	1999 11 12	704	0.4−	0.3−
1994 08 09	801	0.5−	0.3+	1998 12 08	704	1.1−	0.2−	1999 11 15	704	0.6−	0.0
1994 09 12	675	0.3+	1.7+	1998 12 08	704	(3.1−	0.8+)	1999 11 15	704	0.1−	0.1+
1994 09 12	675	0.6−	1.2+	1998 12 08	704	(3.9−	1.0+)	1999 11 15	704	0.3−	0.2+
1994 10 07	801	1.0−	2.1−	1999 10 11	106	1.4+	0.4+	1999 11 15	704	0.0	0.4+
1995 11 16	360	0.3+	0.0	1999 10 11	106	0.4+	0.5+	1999 11 15	704	0.4−	0.4+
1995 11 16	360	0.2+	0.1+	1999 10 15	704	0.2−	0.1−	1999 11 17	704	0.4+	0.1−
1995 11 16	360	0.2+	0.1+	1999 10 15	704	0.7−	0.2−	1999 11 17	704	0.0	1.1+
1995 11 17	360	0.1+	0.2+	1999 10 15	704	0.6−	0.7−	1999 11 17	704	0.4−	0.5−
1995 11 17	360	0.0	0.3+	1999 10 15	704	0.4−	0.9−	1999 11 17	704	0.2−	0.0
1995 11 17	360	0.2+	0.4+	1999 10 21	704	0.0	0.4−	1999 11 17	704	0.3−	0.2−

(12345)* 1993 FT₈ = 1995 UW₄₉

Discovered 1993 Mar. 17 at the European Southern Observatory in the course of the Uppsala-ESO Survey of Asteroids and Comets.

Id. S. Nakano (*MPC* 28300)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	347.01692	(2000.0)	P	Q	Nakano	
<i>n</i>	0.25715833	ω	313.97157	+0.49039466	−0.86969737	
<i>a</i>	2.4490763	Ω	106.58431	+0.81539032	+0.43517535	
<i>e</i>	0.1608881	<i>i</i>	3.35164	+0.30765518	+0.23291394	
<i>P</i>	3.83	<i>H</i>	13.8	<i>G</i>	0.15	<i>U</i> 2

Residuals in seconds of arc

1993 03 17	809	1.1−	0.8−	1996 01 14	691	0.5−	0.2+	1999 10 22	704	0.3+	0.7−
1993 03 17	809	0.8−	0.3−	1998 06 24	704	0.0	0.9−	1999 10 22	704	0.3+	0.8−
1993 03 18	809	0.0	0.5−	1998 06 24	704	1.2−	1.6−	1999 11 03	704	0.2−	0.0
1993 03 23	809	0.2+	0.1+	1998 06 24	704	1.5+	0.5−	1999 11 03	704	0.3−	0.1−
1993 04 16	413	0.9+	0.5−	1998 06 24	704	(0.9+	3.1−)	1999 11 03	704	0.3−	0.2+
1995 10 30	372	0.0	0.7+	1999 10 12	704	0.4−	0.7−	1999 11 03	704	0.1+	0.1+
1995 10 30	372	2.0+	1.1+	1999 10 12	704	0.1−	0.2−	1999 11 03	704	0.1+	0.0
1995 10 31	372	1.0+	1.1−	1999 10 12	704	0.1−	0.1−	1999 11 17	704	0.0	0.1+
1995 10 31	372	0.2+	1.0−	1999 10 12	704	0.3−	0.2+	1999 11 17	704	0.1+	0.4+
1995 11 30	691	0.7−	0.2+	1999 10 12	704	0.4−	0.6−	1999 11 17	704	0.1+	0.2−
1995 11 30	691	1.3−	0.4+	1999 10 22	704	0.4+	1.0−	1999 11 17	704	1.2−	0.8−
1995 11 30	691	0.6−	0.4+	1999 10 22	704	0.4+	0.8−				
1996 01 14	691	0.7−	0.2+	1999 10 22	704	0.6+	0.6−				

(12346)* 1993 FK₂₅ = 1987 TX

Discovered 1993 Mar. 21 at the European Southern Observatory in the course of the Uppsala-ESO Survey of Asteroids and Comets.

Id. S. Nakano (*MPC* 26173)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	354.87099	(2000.0)	P	Q	Nakano	
<i>n</i>	0.25384029	ω	187.21559	+0.61112687	−0.79110310	
<i>a</i>	2.4703719	Ω	225.11774	+0.72804313	+0.57472907	
<i>e</i>	0.1776976	<i>i</i>	2.10884	+0.31060770	+0.20938570	
<i>P</i>	3.88	<i>H</i>	14.0	<i>G</i>	0.15	<i>U</i> 1

Residuals in seconds of arc

1987 10 02	095	(3.2+	0.7−)	1997 04 01	809	0.3+	0.2+	1999 10 22	704	0.5+	1.0−
1991 11 07	691	0.3−	0.7+	1997 04 01	809	0.3+	1.4−	1999 10 22	704	0.4+	0.3−
1991 11 07	691	0.1+	0.5+	1998 06 24	704	0.0	0.9−	1999 10 22	704	0.6+	0.3−
1991 11 07	691	0.0	0.8+	1998 06 24	704	0.0	1.2−	1999 10 22	704	0.3+	0.8−
1993 03 21	809	1.0−	0.2+	1998 06 24	704	0.2−	0.0	1999 11 03	704	0.4−	1.5−
1993 03 22	809	0.4−	0.0	1998 06 24	704	(0.6−	2.7−)	1999 11 03	704	0.3−	0.0

1993 03 26	809	0.1−	0.5+	1998 06 26	704	0.6−	0.4−	1999 11 03	704	1.0−	1.2−
1993 04 18	413	(1.4−	3.2+)	1998 06 26	704	0.1−	0.9+	1999 11 03	704	1.6−	0.1+
1993 04 21	413	1.4+	0.2+	1998 06 26	704	1.0+	0.7−	1999 11 03	704	0.3+	0.0
1995 11 18	411	0.1+	0.6−	1999 10 12	704	(2.3+	0.4−)	1999 11 04	704	0.9−	0.2+
1995 11 18	411	0.2+	0.0	1999 10 12	704	0.3+	0.2−	1999 11 04	704	0.3+	1.3+
1995 11 20	411	0.5+	1.5−	1999 10 12	704	0.7+	0.2−	1999 11 04	704	0.2+	1.0+
1995 11 20	411	1.2−	0.3+	1999 10 12	704	0.7+	0.4−	1999 11 04	704	0.3−	0.3+
1997 04 01	809	0.3−	0.3−	1999 10 12	704	0.8+	0.6+	1999 11 04	704	0.0	0.1−

(12347)* 1993 FW₃₇ = 1997 HR₅

Discovered 1993 Mar. 19 at the European Southern Observatory in the course of the Uppsala-ESO Survey of Asteroids and Comets.

Id. G. V. Williams (*MPC* 29919)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	193.13450	(2000.0)	P	Q	Williams	
<i>n</i>	0.23433882	ω	359.93964	−0.99754010	+0.06857233	
<i>a</i>	2.6055929	Ω	184.07869	−0.06422781	−0.97723383	
<i>e</i>	0.1119086	<i>i</i>	11.80088	−0.02808100	−0.20077820	
<i>P</i>	4.21	<i>H</i>	14.0	<i>G</i>	0.15	<i>U</i> 2

Residuals in seconds of arc

1993 03 19	809	0.6−	1.7+	1998 06 20	688	0.1+	0.3−	1999 10 11	704	0.6+	0.9−
1993 03 20	809	0.8−	1.2+	1998 06 20	688	0.1+	0.3−	1999 10 11	704	0.4+	0.6−
1993 03 24	809	0.5−	1.0+	1998 06 20	688	0.2+	0.4−	1999 10 11	704	0.3+	0.8−
1993 04 18	413	0.8+	0.2+	1999 10 04	703	0.6+	0.2+	1999 10 11	704	0.2+	0.6−
1993 04 20	691	0.7+	0.6−	1999 10 04	703	0.4+	0.3−	1999 10 11	704	0.9+	0.8−
1993 04 20	691	0.6+	0.3−	1999 10 04	703	0.1+	0.5+	1999 10 11	704	0.4+	0.6−
1993 04 20	691	0.8+	0.5−	1999 10 04	703	0.3+	0.1−	1999 10 11	704	0.2−	1.4−
1993 06 24	691	0.3−	0.0	1999 10 07	704	0.2+	0.2+	1999 10 11	704	0.2−	1.0−
1993 06 24	691	0.4−	0.1−	1999 10 07	704	1.3−	0.4+	1999 11 02	703	0.4+	0.7−
1993 06 24	691	0.4−	0.2−	1999 10 07	704	0.1−	0.2+	1999 11 02	703	1.6−	1.3+
1997 04 28	704	1.0−	0.3−	1999 10 07	704	1.2−	0.1+	1999 11 02	703	1.2−	0.8+
1997 04 28	704	0.6−	0.8−	1999 10 09	704	0.4+	0.7−	1999 11 02	703	1.3−	1.7+
1997 04 28	704	1.0−	1.1−	1999 10 09	704	0.5+	0.6−	1999 11 06	704	0.2+	0.2+
1997 04 28	704	0.7−	1.3−	1999 10 09	704	0.1+	0.7−	1999 11 06	704	0.0	0.7+
1997 04 29	704	1.3+	0.7−	1999 10 09	704	0.5+	0.5−	1999 11 06	704	0.2+	0.7+
1997 04 29	704	1.4+	1.3−	1999 10 09	704	0.5+	0.2−	1999 11 06	704	0.5−	1.0+
1997 04 29	704	1.5+	0.4−	1999 10 11	704	0.8+	0.8−	1999 11 06	704	0.6−	1.4+
1997 04 29	704	1.9−	0.6−	1999 10 11	704	0.5+	0.8−				

(12348)* 1993 FX₄₀ = 1977 RV₉

Discovered 1993 Mar. 19 at the European Southern Observatory in the course of the Uppsala-ESO Survey of Asteroids and Comets.

Id. G. V. Williams (*MPC* 23527)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	116.02529	(2000.0)	P	Q	Williams	
<i>n</i>	0.22743491	ω	70.38056	−0.30091354	+0.95360954	
<i>a</i>	2.6580591	Ω	182.16758	−0.93933369	−0.29800074	
<i>e</i>	0.0936109	<i>i</i>	13.66943	−0.16463066	−0.04271314	
<i>P</i>	4.33	<i>H</i>	14.3	<i>G</i>	0.15	<i>U</i> 1

Residuals in seconds of arc

1977 09 09	675	0.4+	1.2−	1999 10 04	703	0.7+	0.4+	1999 11 03	703	0.7−	0.2+
1977 09 10	675	0.0	1.1−	1999 10 04	703	0.4+	0.1−	1999 11 03	703	0.3+	0.7+
1993 03 19	809	0.6−	0.7+	1999 10 04	703	0.6+	0.6−	1999 11 06	704	0.0	0.1+
1993 03 20	809	0.4+	0.6+	1999 10 04	703	0.4+	0.1+	1999 11 06	704	0.1−	0.3+
1993 03 24	809	0.9+	0.2+	1999 10 09	704	0.0	0.5+	1999 11 06	704	0.9+	0.5−
1993 04 16	413	0.2+	0.2+	1999 10 09	704	0.1+	0.1+	1999 11 06	704	0.7−	1.1+
1994 09 26	493	0.5−	1.2+	1999 10 09	704	0.4+	0.6−	1999 11 07	704	1.0+	0.5+
1994 09 26	493	0.5−	1.2+	1999 10 09	704	0.3+	0.0	1999 11 07	704	0.2−	0.0
1997 03 03	691	0.3−	0.0	1999 10 09	704	0.3−	0.1+	1999 11 07	704	1.0−	0.8+
1997 03 03	691	0.2−	0.1−	1999 11 03	703	0.5−	0.2+	1999 11 07	704	0.9+	0.7−
1997 03 03	691	0.3−	0.2−	1999 11 03	703	1.3−	0.7−	1999 11 07	704	0.7−	0.4+

(12349)* 1993 GO = 1985 JJ₂ = 1989 JD

Discovered 1993 Apr. 14 by A. Sugie at the Dynic Astronomical Observatory.
Id. K. Ichikawa (*MPC* 22241)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Nakano

<i>M</i>	212.08821		(2000.0)		P		Q
<i>n</i>	0.24358732	ω	144.41483	−0.91218305			+0.35846837
<i>a</i>	2.5392157	Ω	57.77558	−0.40879934			−0.76248912
<i>e</i>	0.1854062	<i>i</i>	13.57414	−0.02837574			−0.53861932
<i>P</i>	4.05	<i>H</i>	13.3	<i>G</i>	0.15	<i>U</i>	1

Residuals in seconds of arc

1985 05 14	675	0.4+	0.1−	1995 11 30	327	0.3+	1.3+	1998 09 21	704	0.9−	0.7+
1985 05 15	675	0.4+	1.1+	1995 12 10	900	0.3+	0.4+	1998 09 21	704	1.3−	0.8+
1989 05 02	323	(0.0	2.3+)	1995 12 10	900	0.2−	0.5+	1998 09 28	699	0.2−	0.1−
1989 05 05	323	0.1+	0.4−	1995 12 20	900	0.4−	0.4+	1998 09 28	699	1.3+	0.4+
1989 05 08	323	1.7−	0.0	1995 12 20	900	0.2+	0.9+	1998 09 28	699	0.9+	0.3−
1989 05 30	675	0.1+	0.6−	1997 04 07	367	0.1+	1.3+	1999 10 22	704	1.0−	0.5−
1989 05 30	675	0.5−	0.4+	1997 04 07	367	0.2+	1.0+	1999 10 22	704	0.7−	0.1−
1989 06 01	675	1.2+	0.0	1997 04 26	423	0.4−	0.1+	1999 10 22	704	0.1+	0.6+
1989 06 01	675	0.4−	1.0−	1997 04 27	423	0.4−	0.2+	1999 10 22	704	0.5−	0.4−
1993 04 14	402	0.3+	1.3+	1997 04 27	423	0.2−	0.2+	1999 10 22	704	1.0−	0.4−
1993 04 14	402	1.1−	1.0−	1997 04 27	423	0.1+	0.1+	1999 11 03	704	0.2−	0.1+
1993 04 17	402	0.6−	0.8−	1997 04 27	423	0.4−	0.4+	1999 11 03	704	0.5−	0.3−
1993 04 17	402	1.0+	1.5−	1997 04 28	423	0.4+	0.8−	1999 11 03	704	0.2−	0.7+
1993 04 25	900	1.3−	1.3+	1997 04 28	423	0.3+	0.4−	1999 11 03	704	0.7+	0.2+
1993 04 25	900	(2.0−	3.3−)	1997 04 28	367	0.0	0.3−	1999 11 03	704	0.3−	0.3+
1993 04 25	900	(0.4−	2.2−)	1997 04 28	367	0.3−	0.5−	1999 11 09	704	0.3+	0.2+
1993 05 14	900	0.3+	1.2+	1997 04 28	423	0.1−	0.3−	1999 11 09	704	0.4+	0.1−
1993 05 14	900	0.1−	1.5+	1997 05 17	367	0.6−	0.3−	1999 11 09	704	0.9+	0.1−
1993 05 15	361	0.1+	0.0	1997 05 17	367	0.6−	0.4+	1999 11 09	704	0.6+	0.5−
1993 05 15	361	0.5+	0.6−	1997 05 25	689	0.1+	0.2−	1999 11 09	704	0.5+	0.3−
1993 05 15	361	1.6+	0.5+	1997 05 26	367	0.2+	0.3−	1999 11 14	704	0.2+	0.1+
1995 11 17	411	0.7−	0.7+	1997 05 26	367	0.3+	0.2−	1999 11 14	704	0.2−	0.1−
1995 11 17	411	1.1−	0.1−	1997 05 31	367	0.5+	0.6+	1999 11 14	704	0.3−	0.5−
1995 11 17	327	0.4−	1.1+	1997 05 31	367	0.9+	0.5+	1999 11 14	704	0.3−	0.2−
1995 11 17	327	0.1+	0.7+	1997 06 05	801	1.2+	0.5+	1999 11 14	704	0.2−	0.6−
1995 11 17	327	0.0	0.4+	1997 06 06	801	1.4+	0.9+	1999 11 16	704	0.6+	0.1−
1995 11 24	411	0.1+	0.7+	1997 06 06	801	0.5+	0.5+	1999 11 16	704	0.5+	0.1−
1995 11 24	411	0.3+	0.3+	1998 09 21	704	0.1−	0.0	1999 11 16	704	0.1+	0.7−
1995 11 30	327	0.3−	0.8+	1998 09 21	704	0.7−	0.8+	1999 11 16	704	0.2+	0.0
1995 11 30	327	0.7−	0.8+	1998 09 21	704	(2.5−	0.1−)	1999 11 16	704	0.2+	0.2−

(12350)* 1993 HA₆

Discovered 1993 Apr. 23 by F. Börngen at Tautenburg.

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	180.60907		(2000.0)		P		Q
<i>n</i>	0.24205880	ω	181.58551	−0.71108360			+0.6990495
<i>a</i>	2.5498940	Ω	43.10065	−0.64387425			−0.60460404
<i>e</i>	0.1580574	<i>i</i>	6.30250	−0.28246426			−0.38173316
<i>P</i>	4.07	<i>H</i>	13.6	<i>G</i>	0.15	<i>U</i>	1

Residuals in seconds of arc

1982 07 20	413	1.3+	0.3+	1994 10 01	675	(0.3−	2.3−)	1998 09 27	704	0.1−	0.0
1982 07 20	413	1.4−	0.9+	1994 10 01	675	0.3−	1.3−	1998 09 27	704	0.5−	0.5+
1982 09 16	413	0.7−	1.0−	1998 08 19	113	0.8−	0.8−	1998 09 27	704	0.4−	2.0+
1982 09 16	413	1.4+	0.6−	1998 08 19	113	1.0−	0.5−	1998 09 27	704	0.5+	0.9+
1989 04 01	675	1.1+	0.3−	1998 09 14	704	0.2+	0.0	1998 09 27	704	(2.3−	0.4+)
1989 04 01	675	0.6−	0.5+	1998 09 14	704	0.8+	0.3+	1998 10 20	113	0.5−	0.2−
1993 03 26	691	0.2−	0.4+	1998 09 14	704	0.8+	0.3+	1998 10 20	113	0.1−	0.1+
1993 03 26	691	0.4−	0.2+	1998 09 14	704	0.8+	0.5+	1999 10 31	113	0.7−	0.4+
1993 03 26	691	0.3−	0.1+	1998 09 18	704	0.6−	1.2+	1999 11 01	113	0.5−	0.4+
1993 04 14	691	0.6−	0.1+	1998 09 18	704	0.3−	1.7−	1999 11 03	704	0.6+	0.2−
1993 04 14	691	0.7−	0.3+	1998 09 18	704	0.1−	0.1+	1999 11 03	704	0.2+	0.3+
1993 04 14	691	0.7−	0.2+	1998 09 18	704	0.3+	0.6−	1999 11 03	704	0.4+	0.4+
1993 04 18	413	(3.5+	3.0+)	1998 09 18	704	0.7+	0.6−	1999 11 03	704	0.5+	1.2−

1993 04 23	033	0.9+	0.6−	1998 09 20	113	0.4−	0.0	1999 11 14	704	0.0	0.1−
1993 04 23	033	0.9+	0.7−	1998 09 20	113	0.8−	0.7−	1999 11 14	704	0.0	0.3+
1993 04 24	033	0.3−	0.2−	1998 09 22	699	0.4+	0.6−	1999 11 14	704	0.3−	0.4+
1993 04 27	033	0.9+	0.3−	1998 09 22	699	0.9+	0.6+	1999 11 14	704	0.1−	0.4+
1994 08 03	675	0.6+	0.2+	1998 09 22	699	0.5+	0.2+	1999 11 14	704	0.2−	0.1−
1994 08 03	675	0.3+	1.5+	1998 09 25	704	0.2+	0.5−	1999 11 16	704	0.4−	0.1−
1994 09 12	675	0.5+	1.9−	1998 09 25	704	0.1+	0.6+	1999 11 16	704	0.2+	0.1+
1994 09 12	675	0.2−	1.3+	1998 09 25	704	0.4+	0.3−	1999 11 16	704	0.3+	0.2−
1994 09 12	675	0.2+	1.4−	1998 09 25	704	0.1−	0.7+	1999 11 16	704	0.1+	0.1+
1994 09 12	675	1.5−	0.4+	1998 09 25	704	0.7−	0.4+	1999 11 16	704	0.0	0.1−

(12351)* 1993 JD = 1991 XD₅ = 1998 QM₆₉

Discovered 1993 May 14 by S. Otomo at Kiyosato.

Id. G. V. Williams (*MPC* 32454), A. Doppler (*MPC* 34502), A. Milani (*ibid.*)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	183.02992		(2000.0)		P		Q
<i>n</i>	0.23518796	ω	0.04892	−0.72424352			+0.67325274
<i>a</i>	2.5993175	Ω	223.54629	−0.63271795			−0.73475892
<i>e</i>	0.1110648	<i>i</i>	12.49060	−0.27411554			−0.08282559
<i>P</i>	4.19	<i>H</i>	13.2	<i>G</i>	0.15	<i>U</i>	1

Residuals in seconds of arc

1991 12 01	809	(1.0+	2.2+)	1998 08 24	704	0.2−	0.0	1999 10 10	704	0.6+	1.1−
1991 12 01	809	0.2−	1.3+	1998 08 24	704	0.3+	0.3+	1999 10 10	704	1.6−	1.1−
1991 12 01	809	0.5+	1.0+	1998 08 24	704	0.1+	0.1−	1999 10 10	704	0.4−	1.2−
1993 05 14	400	(3.7+	1.4−)	1998 08 24	704	0.4+	0.2−	1999 10 15	704	1.0+	0.8−
1993 05 14	400	(4.1+	2.8−)	1998 08 24	704	0.3−	0.9−	1999 10 15	704	0.5+	1.0+
1993 05 14	894	0.4−	0.5−	1998 08 27	704	0.7−	0.3−	1999 10 15	704	0.2+	0.1+
1993 05 14	894	0.9+	1.2−	1998 08 27	704	0.2−	0.4+	1999 10 15	704	0.2+	0.1+
1993 05 16	400	(3.5−	1.0+)	1998 08 27	704	1.1−	0.2+	1999 10 21	704	0.3+	0.4−
1993 05 16	894	0.3+	0.7+	1998 08 27	704	1.1−	0.2+	1999 10 21	704	0.2−	0.7−
1993 05 16	894	1.5+	0.7+	1998 08 27	704	0.3−	0.6+	1999 10 21	704	0.3+	0.3−
1993 05 16	400	0.9−	1.0−	1998 09 19	704	0.5+	0.6−	1999 10 21	704	0.2+	0.5−
1993 05 17	675	0.1−	0.1+	1998 09 19	704	0.3−	0.0	1999 10 21	704	0.4−	0.6−
1993 05 17	675	0.8−	0.8−	1998 09 19	704	0.2+	1.9+	1999 11 01	120	0.9+	0.3+
1993 05 19	675	1.2+	0.3+	1998 09 19	704	0.7−	0.6−	1999 11 01	120	0.3+	0.3−
1993 05 23	894	(0.1−	2.1+)	1998 09 19	704	1.2+	0.7−	1999 11 04	704	0.1−	0.1+
1993 05 23	894	0.4+	0.1−	1998 09 23	704	0.6+	0.3+	1999 11 04	704	0.2+	0.4+
1993 05 24	361	0.1+	1.1−	1998 09 23	704	0.2+	0.2+	1999 11 04	704	0.5+	0.5+
1993 05 24	361	0.8−	1.7+	1998 09 23	704	0.3+	0.3−	1999 11 04	704	0.0	0.8+
1993 05 24	361	0.2+	1.1+	1998 09 23	704	0.2+	0.3−	1999 11 04	704	0.1−	0.7+
1993 05 25	894	1.1−	0.9−	1998 09 23	704	0.5−	0.2+	1999 11 17	704	0.9−	0.6−
1993 05 25	894	0.5−	0.8−	1998 12 09	704	1.7+	0.5+	1999 11 17	704	0.9−	0.3+
1993 05 27	361	1.2+	0.1−	1998 12 09	704	0.0	0.8+	1999 11 17	704	0.5−	0.7−
1993 06 09	894	0.4−	0.1+	1999 10 10	704	0.4+	0.8+	1999 11 17	704	0.7−	0.6−
1993 06 09	894	0.8−	0.1+	1999 10 10	704	0.2+	0.8−				

(12352)* 1993 OX₆ = 1980 AF = 1998 MO₂₆ = 1999 RF₁₉₃

Discovered 1993 July 20 by E. W. Elst at the European Southern Observatory.

Id. A. Doppler (*MPC* 36334)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

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1993 07 20	809	2.0+	0.3-	1998 07 21	704	0.0	0.7-	1999 11 05	715	0.4+	0.5-
1993 07 20	809	1.5+	0.2-	1998 07 21	704	0.3-	1.0-	1999 11 05	715	0.4-	0.2-
1993 07 24	809	(3.3+	1.5-)	1999 09 13	704	1.0+	0.4-	1999 11 06	715	0.2-	0.1-
1995 12 27	691	0.3+	0.5-	1999 09 13	704	0.7+	0.2+	1999 11 06	715	0.2-	0.3-
1995 12 27	691	0.3+	0.4-	1999 09 13	704	0.9+	0.2+	1999 11 06	715	0.2-	0.5-
1995 12 27	691	0.4+	0.2-	1999 09 13	704	0.9+	0.4-	1999 11 08	678	1.0-	0.2+
1998 06 24	704	0.8-	0.8+	1999 09 14	704	0.1+	0.1+	1999 11 08	678	1.4-	0.8+
1998 06 24	704	(0.5+	3.0+)	1999 09 14	704	0.2+	0.1-	1999 11 13	704	0.7+	1.4-
1998 06 24	704	0.8-	0.3-	1999 09 14	704	0.1+	0.0	1999 11 13	704	0.0	0.0
1998 06 24	704	(2.9-	0.1+)	1999 09 14	704	0.3+	0.3+	1999 11 13	704	1.1+	0.6+
1998 06 24	704	1.0-	1.5+	1999 09 14	704	0.1+	0.2+	1999 11 13	704	0.0	0.6+

(12353)* 1993 OR₉ = 1997 GJ₃

Discovered 1993 July 20 by E. W. Elst at the European Southern Observatory.

Id. G. V. Williams (*MPC* 29919)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	104.29611		(2000.0)		P		Q
<i>n</i>	0.19706593	ω	117.98265		-0.04441638		+0.99877016
<i>a</i>	2.9245677	Ω	149.44745		-0.93112785		-0.03339765
<i>e</i>	0.0125034	<i>i</i>	2.48397		-0.36197806		-0.03664385
<i>P</i>	5.00	<i>H</i>	13.2	<i>G</i>	0.15	<i>U</i>	1

Residuals in seconds of arc

1993 06 21	691	0.3-	0.3+	1998 06 24	704	0.4-	0.1+	1999 10 19	704	0.6+	0.3-
1993 06 21	691	0.1-	0.3+	1998 06 24	704	0.2-	0.8-	1999 10 19	704	0.1+	0.3-
1993 06 21	691	0.3-	0.4+	1998 06 24	704	0.2-	0.1-	1999 10 19	704	0.0	0.5-
1993 07 13	809	0.2+	1.0+	1998 06 24	704	0.6+	1.1-	1999 10 23	723	1.0-	0.8+
1993 07 13	809	0.3+	0.3+	1998 06 24	704	0.6+	0.6-	1999 10 23	723	(2.7-	1.1+)
1993 07 13	809	0.4-	0.5+	1999 10 04	704	0.9+	0.8-	1999 10 23	723	(2.2-	1.2+)
1993 07 20	809	(1.9+	2.3+)	1999 10 04	704	0.8+	0.6-	1999 11 05	704	0.4-	0.2+
1993 07 20	809	(1.3+	2.2+)	1999 10 04	704	0.9+	0.3-	1999 11 05	704	0.2-	0.3+
1993 07 20	809	(1.3+	2.1+)	1999 10 04	704	0.1-	1.0-	1999 11 05	704	0.8-	0.3+
1993 07 24	809	(2.9+	2.7+)	1999 10 07	120	0.1+	0.7+	1999 11 05	704	0.2-	0.9+
1993 07 26	809	(6.2+	0.7+)	1999 10 07	120	0.6+	0.2-	1999 11 05	704	0.9-	1.0+
1993 07 26	809	(3.4+	0.5-)	1999 10 09	704	0.8-	0.1+	1999 11 15	704	0.1+	0.5+
1993 07 26	809	0.2+	0.0	1999 10 09	704	0.2-	0.7+	1999 11 15	704	0.0	0.4+
1997 04 07	540	0.5+	0.3-	1999 10 09	704	0.4-	0.1-	1999 11 15	704	0.4+	0.4+
1997 04 07	540	0.9+	0.1-	1999 10 09	704	0.0	0.0	1999 11 15	704	0.1-	0.1+
1997 04 08	540	0.7+	0.6-	1999 10 09	704	0.1+	0.1+	1999 11 15	704	0.0	0.4+
1997 04 08	540	0.6+	0.5-	1999 10 15	704	0.2-	0.6-	1999 11 17	704	0.1-	0.0
1997 04 13	540	0.2-	0.1-	1999 10 15	704	0.6-	0.2-	1999 11 17	704	0.3+	0.3+
1997 04 13	540	0.3+	0.2-	1999 10 15	704	0.5-	0.1-	1999 11 17	704	0.3+	0.4+
1997 05 02	540	0.3-	0.6+	1999 10 15	704	0.5-	0.0	1999 11 17	704	0.1+	0.3-
1997 05 02	540	1.0-	0.6+	1999 10 15	704	0.3-	0.4+	1999 11 17	704	1.2+	0.3-
1997 05 10	540	1.5-	1.2+	1999 10 19	704	0.1+	0.8-				
1997 05 10	540	0.2+	0.4+	1999 10 19	704	0.4+	0.9-				

(12354)* 1993 QD₃ = 1996 DN

Discovered 1993 Aug. 18 by E. W. Elst at Caussols.

Id. S. Nakano (*MPC* 27106)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	292.17453		(2000.0)		P		Q
<i>n</i>	0.18291939	ω	294.47556		-0.12757161		-0.99047666
<i>a</i>	3.0734740	Ω	162.61605		+0.96114989		-0.13634198
<i>e</i>	0.0575685	<i>i</i>	9.98083		+0.24477821		+0.01915356
<i>P</i>	5.39	<i>H</i>	13.4	<i>G</i>	0.15	<i>U</i>	1

Residuals in seconds of arc

1993 08 18	010	1.1-	0.1-	1997 06 13	691	0.1-	0.5+	1999 10 09	704	0.7+	0.1+
1993 08 19	010	0.2-	0.2-	1997 06 13	691	0.3-	0.1-	1999 10 09	704	0.5+	0.5-
1993 08 19	010	0.4-	0.4+	1997 06 28	691	0.2-	0.5+	1999 10 09	704	0.4+	0.2-
1993 08 19	010	0.3-	0.2-	1997 06 28	691	0.1+	0.2+	1999 10 09	704	0.1+	0.0
1993 08 24	809	(4.3+	1.6+)	1997 06 28	691	0.2-	0.2+	1999 10 09	704	0.5+	0.1+
1993 08 24	809	(3.4+	1.0+)	1997 07 11	691	0.1+	0.2+	1999 11 03	703	0.2-	0.5+

1993 08 24	809	(2.8+	0.4+)	1997 07 11	691	0.1+	0.2+	1999 11 03	703	0.7-	0.2+
1993 09 21	675	(2.9+	0.0)	1997 07 11	691	0.1+	0.2+	1999 11 03	703	0.3-	0.0
1993 09 21	675	1.7+	0.3+	1998 08 23	704	1.1+	0.3+	1999 11 03	703	0.1-	0.3+
1996 02 19	411	0.8+	0.2+	1998 08 23	704	0.0	0.4+	1999 11 06	704	0.3+	0.1-
1996 02 19	411	0.5+	0.9+	1998 08 23	704	0.5-	0.2-	1999 11 06	704	0.3+	0.4-
1996 02 21	411	0.1-	1.2-	1998 08 23	704	0.1+	0.7-	1999 11 06	704	0.1+	0.3-
1996 02 21	411	0.6+	0.0	1999 10 03	703	0.1-	0.2-	1999 11 06	704	0.1+	0.1-
1996 02 21	411	0.6-	0.6-	1999 10 03	703	0.0	0.5+	1999 11 06	704	0.5+	0.4-
1996 02 27	411	0.6-	1.7+	1999 10 03	703	0.6-	0.4+	1999 11 13	699	0.3-	0.2-
1996 02 27	411	0.4-	0.2+	1999 10 03	703	0.4-	0.0	1999 11 13	699	0.6-	0.3+
1996 03 20	566	0.3+	0.4+	1999 10 07	703	0.3+	0.2+	1999 11 13	699	0.1+	0.3-
1996 03 20	566	0.0	0.1-	1999 10 07	703	0.1-	0.4+	1999 11 16	699	0.9-	0.8+
1996 03 20	566	0.3+	0.1-	1999 10 07	703	0.5+	0.2+	1999 11 16	699	0.9-	0.4+
1997 06 13	691	0.3+	0.6+	1999 10 07	703	0.4+	0.4+	1999 11 16	699	0.6-	0.7+

(12355)* 1993 QU₃ = 1979 TK₂ = 1998 RQ₁₂

Discovered 1993 Aug. 18 by E. W. Elst at Caussols.

Id. G. V. Williams (*MPC* 32664)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	33.37179		(2000.0)		P		Q
<i>n</i>	0.20584385	ω	216.05002		+0.69708637		-0.71696941
<i>a</i>	2.8408226	Ω	189.75980		+0.66459385		+0.64877190
<i>e</i>	0.0686742	<i>i</i>	1.70558		+0.26904574		+0.25504878
<i>P</i>	4.79	<i>H</i>	13.5	<i>G</i>	0.15	<i>U</i>	1

Residuals in seconds of arc

1979 10 14	095	0.9-	1.3-	1998 09 19	691	0.4-	0.2-	1998 10 19	699	0.1-	0.3+
1993 08 18	010	0.4+	1.1+	1998 09 19	691	0.4-	0.1-	1998 10 28	704	0.6+	0.2-
1993 08 19	010	(1.3+	2.7+)	1998 09 26	704	0.8+	1.8-	1998 10 28	704	0.2-	1.2-
1993 08 19	010	0.8+	1.5+	1998 09 26	704	0.5-	0.6-	1998 10 28	704	0.7-	1.2-
1993 08 19	010	1.2+	1.9+	1998 09 26	704	0.4-	0.2-	1998 10 28	704	0.1-	0.6-
1993 09 19	010	(1.9+	2.6+)	1998 09 26	704	0.1-	0.7-	1998 10 29	704	0.5+	0.1+
1993 09 19	010	(1.0+	2.6+)	1998 09 26	704	0.6-	0.2+	1998 10 29	704	1.6-	0.5+
1993 09 20	010	(2.6+	1.9+)	1998 09 27	704	0.5+	0.6+	1998 10 29	704	0.5-	0.2+
1993 09 20	010	0.9+	1.9+	1998 09 27	704	0.0	0.5+	1998 10 29	704	0.8+	0.2+
1993 09 20	010	0.8+	1.5+	1998 09 27	704	0.1+	0.9+	1998 10 29	704	0.7-	0.3-
1996 03 18	566	0.8-	0.4+	1998 09 27	704	0.4-	0.4+	1999 10 10	704	0.1+	0.1+
1996 03 18	566	0.4-	0.7+	1998 09 27	704	0.1-	0.9+	1999 10 10	704	0.8+	0.5-
1996 03 18	566	0.4-	0.7+	1998 10 14	704	0.3-	1.1-	1999 10 10	704	0.5+	0.8-
1998 09 14	704	0.1+	0.4+	1998 10 14	704	0.4+	0.6+	1999 10 21	704	0.9+	0.0
1998 09 14	704	0.0	0.2-	1998 10 14	704	(1.1-	4.0-)	1999 10 21	704	0.0	0.9+
1998 09 14	691	0.8-	0.1-	1998 10 14	704	0.5+	0.2+	1999 10 21	704	0.8+	0.5+
1998 09 14	704	0.6-	0.7-	1998 10 14	704	0.5+	1.8-	1999 10 21	704	1.1+	0.7-
1998 09 14	691	0.6-	0.1+	1998 10 15	704	1.0+	0.3-	1999 11 17	704	0.1+	0.7+
1998 09 14	691	0.8-	0.1+	1998 10 15	704	1.2+	1.3+	1999 11 17	704	0.3+	0.5+
1998 09 18	704	0.7-	0.1+	1998 10 15	704	0.3-	0.2-	1999 11 17	704	0.4+	0.1+
1998 09 18	704	0.6-	0.3-	1998 10 15	704	0.3+	0.0	1999 11 17	704	0.2-	1.2+
1998 09 18	704	(2.5-	1.0-)	1998 10 15	704	0.1-	0.4+	1999 11 17	704	0.6+	0.6+
1998 09 18	704	1.0-	1.9-	1998 10 19	699	0.5+	0.8+				
1998 09 19	691	0.7-	0.0	1998 10 19	699	0.7+	0.3-				

(12356)* 1993 RM₁₄ = 1991 GO₂ = 1998 QB₁₀₇

Discovered 1993 Sept. 15 by E. W. Elst at the European Southern

Observatory.

Id. G. V. Williams (*MPC* 32932)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

M	44.55781		(2000.0)		P		Q
n	0.19609488	ω	192.55343		+0.90538919		-0.42453910
a	2.9342147	Ω	192.57331		+0.39192156		+0.84116344
e	0.1048537	i	1.60027		+0.16330307		+0.33497854
P	5.03	H	13.3	G	0.15	U	1

1991 04 08	809	0.7−	0.6−	1998 09 14	704	0.3−	0.7+	1998 10 22	691	1.4−	0.0
1991 04 10	809	(0.2+	3.7−)	1998 09 18	704	0.4+	0.5+	1998 10 27	691	0.7−	0.2−
1991 04 10	809	(2.4−	3.5−)	1998 09 18	704	0.2−	0.5+	1998 10 27	691	1.0−	0.6+
1991 04 10	809	(3.4−	3.6−)	1998 09 18	704	0.2−	0.3−	1998 10 27	691	0.8−	0.4−
1993 09 15	809	(2.5+	1.5−)	1998 09 18	704	1.0−	0.1−	1998 11 25	699	0.9−	0.3−
1993 09 15	809	(1.0+	2.0−)	1998 09 25	699	0.4−	1.2+	1998 11 25	699	1.0−	0.5−
1993 09 15	809	0.7+	1.7−	1998 09 25	699	0.3−	0.9+	1998 11 25	699	0.9−	0.5+
1993 09 17	809	(2.3+	0.7−)	1998 09 25	699	0.2+	1.4+	1998 12 08	704	1.6−	1.8−
1993 09 17	809	1.2+	0.6−	1998 09 26	704	0.2−	0.5+	1998 12 08	704	1.4+	0.3+
1993 09 17	809	0.1+	0.7−	1998 09 26	704	0.0	0.0	1998 12 08	704	0.1+	2.0−
1993 09 18	809	1.5+	0.6−	1998 09 26	704	0.5−	0.2−	1998 12 08	704	0.9−	0.1+
1993 09 18	809	0.5+	0.7−	1998 09 26	704	0.2−	0.4−	1998 12 08	704	(1.8+	2.2−)
1993 09 18	809	0.4+	1.5−	1998 09 26	704	1.6+	1.9−	1998 12 15	699	0.1−	0.0
1993 09 18	809	0.2−	0.2−	1998 09 27	704	0.6+	0.5+	1998 12 15	699	0.4−	0.0
1993 09 18	675	0.4−	0.3+	1998 09 27	704	0.6+	0.8+	1998 12 15	699	0.3+	0.9+
1993 09 22	675	0.4−	0.4−	1998 09 27	704	1.6+	0.6+	1999 10 12	704	0.1+	0.2−
1993 09 22	675	0.6−	0.3+	1998 09 27	704	0.2+	0.1+	1999 10 12	704	1.0+	0.1−
1996 03 16	691	1.0−	0.4−	1998 09 27	704	0.2+	0.2−	1999 10 12	704	0.3+	0.1−
1996 03 16	691	0.9−	0.4−	1998 10 14	704	0.2−	0.5+	1999 10 12	704	0.3+	0.1−
1996 03 16	691	0.6−	0.3−	1998 10 14	704	1.1−	0.3−	1999 10 12	704	1.0−	0.1−
1996 03 18	566	0.3+	0.2−	1998 10 14	704	0.7+	0.8−	1999 10 21	704	0.5−	0.3+
1996 03 18	566	0.5+	0.4−	1998 10 14	704	0.6+	0.4−	1999 10 21	704	0.1−	0.1+
1996 03 18	566	0.8+	0.7−	1998 10 14	704	0.0	0.1−	1999 10 21	704	0.2−	0.1+
1996 04 22	566	(1.4+	2.3−)	1998 10 14	699	0.3−	0.1+	1999 10 21	704	0.1+	0.2−
1996 04 22	566	(1.7+	2.4−)	1998 10 14	699	0.2−	0.5+	1999 10 21	704	0.1+	0.4−
1996 04 22	566	(1.6+	2.2−)	1998 10 14	699	0.4−	0.7+	1999 11 12	703	0.3−	0.5+
1998 08 28	704	0.9+	0.1−	1998 10 15	704	0.6+	0.2+	1999 11 12	703	0.1+	0.3−
1998 08 28	704	1.7+	0.3+	1998 10 15	704	0.0	0.1+	1999 11 12	703	0.3+	0.2+
1998 08 28	704	(1.1−	3.2+)	1998 10 15	704	0.4+	1.3+	1999 11 12	703	0.2+	0.0
1998 08 28	704	(2.1−	0.4+)	1998 10 15	704	0.3+	0.4+				
1998 08 28	704	(3.3−	0.3−)	1998 10 15	704	0.5+	1.2−				

(12357)* 1993 ST₁ = 1998 QN₁₀

Discovered 1993 Sept. 16 by K. Endate and K. Watanabe at Kitami.

Id. E. Bowell (*MPC* 32455), G. V. Williams (*ibid.*)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

				Williams			
<i>M</i>	7.26429	(2000.0)		<i>P</i>	<i>Q</i>		
<i>n</i>	0.17759523	ω	214.26361	+0.88516607	−0.46472184		
<i>a</i>	3.1345980	Ω	173.30943	+0.45846964	+0.86287267		
<i>e</i>	0.0979122	<i>i</i>	11.22792	+0.07928816	+0.19870672		
<i>P</i>	5.55	<i>H</i>	12.9	<i>G</i>	0.15	<i>U</i>	1

Residuals in seconds of arc

1993 09 16	400	1.3−	0.1+	1998 08 17	704	0.3−	0.0	1999 10 09	704	0.0	0.6−
1993 09 16	400	0.2+	0.9+	1998 08 17	704	0.3+	0.5−	1999 10 09	704	0.1−	0.4−
1993 09 18	400	1.0−	0.1+	1998 08 17	704	0.1+	0.1−	1999 10 09	704	0.2+	0.3−
1993 09 18	400	0.7+	1.2+	1998 08 23	699	0.1+	0.9−	1999 10 09	704	0.0	0.7−
1993 10 11	400	0.3−	0.2−	1998 08 23	704	0.6−	1.0−	1999 10 19	704	1.4+	0.1+
1993 10 11	400	(2.9−	2.0−)	1998 08 23	704	0.4−	0.9−	1999 10 19	704	0.7−	0.3+
1993 10 12	675	(2.4+	0.4−)	1998 08 23	699	0.1+	0.2−	1999 10 19	704	0.1−	0.3+
1993 10 12	675	1.3+	0.3−	1998 08 23	704	0.2−	0.5−	1999 10 19	704	0.2−	0.5+
1996 03 17	566	0.2+	0.9−	1998 08 23	704	0.6−	0.5+	1999 10 19	704	1.4−	0.7−
1996 03 17	566	0.3−	0.6−	1998 08 23	699	0.1−	0.2−	1999 11 01	703	0.0	0.2+
1996 03 17	566	0.0	0.6−	1998 08 23	704	0.2+	0.5−	1999 11 01	703	0.0	0.3+
1996 04 23	566	0.3+	0.5+	1998 09 15	699	0.0	0.7+	1999 11 01	703	0.5+	0.4+
1996 04 23	566	0.5−	0.1−	1998 09 15	699	0.3+	1.0+	1999 11 01	703	0.4−	0.2+
1996 04 23	566	0.0	0.6+	1998 09 15	699	0.8−	0.3+	1999 11 05	704	0.2+	0.1−
1998 07 18	327	0.0	0.1+	1998 09 22	699	0.1+	0.6+	1999 11 05	704	0.3−	0.8−
1998 07 18	327	0.0	0.1+	1998 09 22	699	0.3−	0.3+	1999 11 05	704	0.4−	0.5−
1998 07 18	327	0.3+	0.4+	1998 09 22	699	0.5−	0.7−	1999 11 05	704	2.2+	0.6−
1998 07 31	699	1.0+	0.3+	1999 10 08	703	0.1+	0.3−	1999 11 13	699	0.2+	0.1+
1998 07 31	699	0.5+	0.2+	1999 10 08	703	0.2+	0.3−	1999 11 13	699	0.7−	0.0
1998 07 31	699	0.4+	0.6−	1999 10 08	703	0.2−	0.1−	1999 11 13	699	0.2−	0.6+
1998 08 17	704	0.5+	0.4+	1999 10 08	703	0.1−	0.1−				
1998 08 17	704	0.3+	0.4−	1999 10 09	704	0.1+	0.6+				

(12358)* 1993 SO₂ = 1997 KY₂

Discovered 1993 Sept. 22 by A. Vagnozzi at Stroncone.

Id. G. V. Williams (*MPC* 30080)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

				Williams			
<i>M</i>	264.34253	(2000.0)		<i>P</i>	<i>Q</i>		
<i>n</i>	0.21140758	ω	338.24658	−0.99256875	+0.10467654		
<i>a</i>	2.7907591	Ω	207.98250	−0.08269216	−0.95431361		
<i>e</i>	0.1119069	<i>i</i>	7.59928	−0.08927083	−0.27987204		
<i>P</i>	4.66	<i>H</i>	13.7	<i>G</i>	0.15	<i>U</i>	1

Residuals in seconds of arc

1993 09 22	589	0.8+	0.9−	1997 08 31	589	0.1+	0.8+	1998 10 28	704	0.5+	0.6+
1993 09 22	589	0.4+	0.0	1997 08 31	589	0.3−	0.4−	1998 10 28	704	0.3−	1.2+
1993 09 22	589	0.1−	1.1−	1998 09 18	589	0.5−	0.2+	1998 10 28	704	0.2+	1.7+
1993 09 23	589	0.6+	0.2−	1998 09 18	589	0.0	0.7+	1998 10 28	704	0.6+	0.8+
1993 09 23	589	0.4+	0.7−	1998 09 18	589	0.2−	0.3+	1998 11 10	704	1.1+	1.9−
1993 09 23	589	0.2−	1.6−	1998 09 26	704	(0.6+	3.6−)	1998 11 10	704	0.8−	0.7+
1993 09 23	595	0.4−	1.2−	1998 09 26	704	1.0+	0.7−	1998 11 10	704	1.4−	0.2−
1993 09 23	595	0.1+	0.5−	1998 09 26	704	1.2+	0.7−	1998 11 10	704	1.5−	0.8+
1993 09 23	595	0.6−	0.6−	1998 09 26	704	0.5+	0.3−	1998 11 10	699	1.4+	0.3+
1993 10 19	589	0.1−	0.0	1998 09 26	704	1.1+	0.4−	1998 11 10	699	1.3+	0.9+
1993 10 19	589	1.0+	0.2−	1998 09 27	704	0.6−	0.1−	1998 11 10	699	0.0	0.3−
1993 10 19	589	0.7+	0.8−	1998 09 27	704	0.3−	0.7+	1998 11 11	704	0.5+	1.1−
1997 05 30	691	0.4−	0.5−	1998 09 27	704	0.6−	0.6+	1998 11 11	704	0.3−	1.7+
1997 05 30	691	0.4−	0.1−	1998 09 27	704	1.8+	1.1−	1998 11 11	704	0.1−	0.1−
1997 05 30	691	0.5−	0.0	1998 09 27	704	0.5−	1.5−	1998 11 11	704	1.6+	1.1−
1997 06 05	691	0.4+	1.0−	1998 09 28	589	0.2−	0.3+	1998 11 11	704	1.3−	0.6+
1997 06 05	691	0.0	0.8−	1998 09 28	589	0.3−	0.0	1998 11 23	699	0.6+	0.9+
1997 06 05	691	0.3−	0.2+	1998 09 28	589	0.4−	0.0	1998 11 23	699	0.5+	0.1+
1997 06 15	691	0.3−	0.1+	1998 10 14	704	1.2−	0.1−	1998 11 23	699	0.6−	0.9+
1997 06 15	691	0.2−	0.3+	1998 10 14	704	0.9−	0.4+	1999 10 10	704	0.3−	0.1+
1997 06 15	691	0.1−	0.6+	1998 10 14	704	0.4+	1.2+	1999 10 10	704	0.2−	1.0−
1997 07 08	589	0.2−	0.3−	1998 10 14	704	0.5−	0.8−	1999 10 10	704	(0.0	2.2−)
1997 07 08	589	0.8+	0.5−	1998 10 15	704	0.1−	0.1−	1999 10 10	704	0.5+	1.2−
1997 07 08	589	0.2−	0.6+	1998 10 15	704	0.8−	1.6+	1999 10 20	704	0.6−	0.3−
1997 07 12	589	0.5−	0.8+	1998 10 15	704	0.5+	0.7−	1999 10 20	704	0.3−	0.5−
1997 07 12	589	0.7+	0.0	1998 10 15	704	0.3−	0.2−	1999 10 20	704	0.5−	0.4−
1997 07 12	589	0.4+	0.3−	1998 10 23	589	0.7+	0.3+	1999 10 20	704	0.0	0.8−
1997 08 08	589	0.1+	0.3+	1998 10 23	589	0.3−	0.4−	1999 11 12	703	0.3+	0.3−
1997 08 08	589	0.7+	0.3+	1998 10 23	589	0.9−	0.2+	1999 11 12	703	0.2+	0.6+
1997 08 08	589	0.1−	0.6+	1998 10 26	589	1.9−	0.5−	1999 11 12	703	0.6+	0.6+
1997 08 29	589	0.8−	0.2−	1998 10 26	589	0.9+	0.1−	1999 11 12	703	0.3−	0.1−

1993 10 10	675	0.1−	0.7−	1998 08 30	691	1.1−	0.6−	1999 11 04	704	0.0	0.3+
1993 10 12	809	(2.4+	0.2+)	1998 08 30	691	0.9−	0.0	1999 11 09	704	0.3+	0.2+
1993 10 12	809	1.6+	0.6−	1998 08 30	691	0.8−	0.1−	1999 11 09	704	0.6−	0.3+
1993 10 12	809	1.0+	0.0	1999 09 17	120	1.2+	1.1−	1999 11 09	704	0.4−	0.2−
1993 10 13	675	0.1−	0.4−	1999 09 17	120	0.6−	0.8−	1999 11 09	704	0.6−	0.1−
1993 10 13	675	1.2+	0.7−	1999 10 15	704	(2.4+	0.0)	1999 11 09	704	0.8−	0.2−
1993 10 22	809	(5.6+	5.5−)	1999 10 15	704	1.6+	0.5−	1999 11 12	699	0.3−	1.0+
1993 10 22	809	(2.1+	4.3−)	1999 10 15	704	1.0+	0.0	1999 11 12	699	0.9−	1.0+
1996 04 22	566	(3.7−	0.9−)	1999 10 15	704	1.3+	1.1−	1999 11 12	699	0.2−	0.8+
1996 04 22	566	0.1−	1.2−	1999 10 15	704	0.9−	0.6−	1999 11 12	704	0.1+	0.1−
1996 04 22	566	(3.8−	0.7−)	1999 10 16	611	0.4+	0.1+	1999 11 12	704	0.3−	0.3−
1996 04 22	566	0.3−	1.0−	1999 10 16	611	1.4−	0.7−	1999 11 12	704	0.1−	0.1−
1996 04 22	566	(3.3−	0.6−)	1999 10 21	704	0.8+	0.2+	1999 11 12	704	0.1−	0.0
1996 04 22	566	0.4−	0.6−	1999 10 21	704	0.5+	0.5+	1999 11 12	704	0.3−	0.1−
1998 08 17	704	0.4+	0.4+	1999 10 21	704	0.3+	0.1+	1999 11 17	704	0.4+	0.3−
1998 08 17	704	1.1+	0.2+	1999 10 21	704	0.4+	0.3−	1999 11 17	704	0.1+	0.2−
1998 08 17	704	0.8+	0.2+	1999 10 21	704	0.2−	0.5−	1999 11 17	704	0.3+	0.6−
1998 08 17	704	0.2+	0.1−	1999 10 28	327	0.3−	0.6+	1999 11 17	704	0.1+	0.7−
1998 08 17	704	0.4−	0.2+	1999 10 28	327	0.0	0.5+	1999 11 17	704	0.3+	0.6−
1998 08 23	691	0.1−	0.5−	1999 10 28	327	0.2−	1.4+				
1998 08 23	691	0.2−	0.0	1999 10 29	327	0.0	0.8+				

(12360)* 1993 SQ₃ = 1976 UM₅ = 1998 NJ

Discovered 1993 Sept. 22 by O. A. Naranjo at Mérida.

Id. G. V. Williams (*MPC* 32231)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

M	4.95287		(2000.0)		P		Q
n	0.17171188	ω	321.64177		+0.90887553		−0.41541947
a	3.2057955	Ω	62.94203		+0.39218546		+0.82105939
e	0.1975771	i	2.38373		+0.14190079		+0.39152029
P	5.74	H	12.9	G	0.15	U	1

Residuals in seconds of arc

1976 10 30	095	0.8+	0.5+	1998 07 02	699	0.2−	0.1−	1999 11 08	120	0.2−	0.8+
1993 09 22	303	0.5+	1.9−	1998 07 16	699	0.8+	0.6+	1999 11 09	704	0.0	0.4+
1993 09 22	303	0.3+	0.2−	1998 07 16	699	0.4+	0.8+	1999 11 09	704	0.3−	0.3+
1993 09 22	303	0.5−	0.4+	1998 07 16	699	0.1−	0.4+	1999 11 09	704	0.2−	0.2+
1993 09 23	303	(5.9+	0.0)	1998 08 17	704	0.3−	0.1+	1999 11 09	704	0.3−	0.2+
1993 10 09	809	(2.6−	1.3−)	1998 08 17	704	0.9+	1.8−	1999 11 09	704	0.5−	0.2+
1993 10 09	809	(2.7−	0.7−)	1998 08 17	704	1.0+	0.2+	1999 11 12	704	0.2−	0.1+
1993 10 09	809	(3.1−	0.8−)	1998 08 17	704	0.6−	1.9−	1999 11 12	704	0.3−	0.0
1993 10 10	675	(1.2−	2.5+)	1998 08 17	704	(2.0−	2.5−)	1999 11 12	704	0.4−	0.1−
1993 10 10	675	1.2−	0.5+	1999 10 15	704	1.2+	1.1−	1999 11 12	704	0.5−	0.2+
1993 10 11	809	0.0	0.8+	1999 10 15	704	1.0+	0.0	1999 11 12	704	0.6−	0.1+
1993 10 11	809	0.1+	0.1+	1999 10 15	704	0.7+	0.3+	1999 11 13	120	0.8−	0.7−
1993 10 11	809	0.5−	0.7+	1999 10 15	704	1.1−	0.1+	1999 11 13	120	1.3+	0.3−
1993 10 13	675	1.6−	0.8−	1999 10 22	704	0.9+	0.1−	1999 11 16	704	0.1+	0.0
1993 10 13	675	0.6−	0.7−	1999 10 22	704	0.3+	0.3+	1999 11 16	704	0.0	0.2−
1993 10 20	809	0.3+	1.1+	1999 10 22	704	0.8+	0.4−	1999 11 16	704	0.2−	0.1−
1993 10 20	809	0.2−	0.2+	1999 10 22	704	0.2+	0.3−	1999 11 16	704	0.0	0.5−
1993 10 20	809	0.6−	0.6+	1999 10 22	704	0.1+	0.0	1999 11 17	704	0.0	0.1−
1996 03 20	691	0.1−	0.1+	1999 11 03	704	0.8+	0.5−	1999 11 17	704	0.2+	0.2−
1996 03 20	691	0.3−	0.1+	1999 11 03	704	0.4+	0.4−	1999 11 17	704	0.2+	0.0
1996 03 20	691	0.3−	0.2+	1999 11 03	704	0.1+	0.1+	1999 11 17	704	0.0	0.2−
1998 07 02	699	0.3−	0.7+	1999 11 03	704	0.3+	0.4−	1999 11 17	704	0.2+	0.2−
1998 07 02	699	0.2−	0.3+	1999 11 08	120	0.4−	0.8+				

(12361)* 1993 TB = 1994 YT₄

Discovered 1993 Oct. 9 by N. Kawasato at Uenohara.

Id. G. V. Williams (*MPC* 32231)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

M	21.55184		(2000.0)		P		Q
n	0.17892943	ω	266.21716		+0.99049822		−0.12961718
a	3.1189963	Ω	101.22620		+0.13725982		+0.91096764
e	0.1887865	i	2.68589		+0.00854565		+0.39158313
P	5.51	H	13.7	G	0.15	U	1

Residuals in seconds of arc

1993 09 21	675	1.1+	0.6−	1994 12 31	691	0.1−	0.3+	1999 10 22	704	1.0+	0.2−
1993 09 21	675	0.4+	0.2−	1995 01 07	691	0.5−	0.3+	1999 10 22	704	0.5+	0.3−
1993 09 21	413	0.3+	1.6+	1995 01 07	691	1.0−	1.0+	1999 10 22	704	1.6−	0.7−
1993 09 21	413	0.5−	0.8+	1997 05 07	704	1.3+	0.8−	1999 11 04	704	0.2−	0.2+
1993 10 09	376	1.5−	0.2+	1997 05 07	704	0.4+	1.1−	1999 11 04	704	0.3+	0.7+
1993 10 09	376	0.7−	0.4−	1997 05 07	704	0.3+	0.1+	1999 11 04	704	0.3−	0.5+
1993 10 10	376	(2.2+	1.0+)	1997 05 07	704	0.5+	0.4−	1999 11 04	704	0.6+	0.9+
1993 10 10	376	(1.9+	2.4+)	1997 05 07	704	1.5−	0.0	1999 11 04	704	0.1+	0.3+
1993 10 13	675	0.8+	0.3+	1998 07 16	699	0.4+	0.1+	1999 11 15	704	0.1+	0.1−
1993 10 13	675	0.3+	0.2+	1998 07 16	699	0.1+	0.6+	1999 11 15	704	0.1−	0.1−
1993 10 15	675	0.5+	0.5−	1998 07 16	699	0.2−	0.4+	1999 11 15	704	0.6+	0.8−
1993 10 15	675	0.0	0.8−	1998 08 17	704	1.0−	0.1+	1999 11 15	704	0.4+	1.0−
1993 10 22	376	(0.4−	2.2−)	1998 08 17	704	0.8−	1.4−	1999 11 17	704	0.0	0.4−
1993 10 22	376	(1.0−	2.8−)	1998 08 17	704	0.4−	0.0	1999 11 17	704	0.6−	0.2−
1993 10 23	376	(4.6−	5.5−)	1998 08 17	704	0.0	0.5+	1999 11 17	704	0.3−	0.1+
1993 10 23	376	(1.9−	3.4−)	1999 10 22	704	0.6+	1.0−	1999 11 17	704	0.1−	0.4+
1994 12 31	691	0.1+	0.5+	1999 10 22	704	0.5+	0.4−	1999 11 17	704	0.1−	0.4−

(12362)* 1993 TS₁ = 1987 PK = 1987 SA₁₈

Discovered 1993 Oct. 15 by K. Endate and K. Watanabe at Kitami.

Id. A. Gnädig (*MPC* 30661), T. B. Spahr (*ibid.*), S. Nakano (d.*ibid.*)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Nakano

M	34.88017		(2000.0)		P		Q
n	0.17787766	ω	171.31148		+0.98852431		−0.13382023
a	3.1312791	Ω	196.87014		+0.11998250		+0.97741504
e	0.1030626	i	13.97516		+0.09178176		+0.16356032
P	5.54	H	13.0	G	0.15	U	1

Residuals in seconds of arc

1987 08 06	010	1.0+	0.8+	1998 08 24	704	0.2−	0.7+	1998 12 09	704	2.1+	0.1+
1987 08 06	010	0.7+	0.8+	1998 08 24	704	0.2−	0.0	1998 12 09	704	(0.1−	2.4−)
1987 08 06	010	0.3+	0.5+	1998 08 24	704	0.8−	0.4+	1999 10 10	704	0.6+	0.1+
1987 09 16	095	1.9−	1.7+	1998 08 27	704	0.6−	0.2+	1999 10 10	704	0.5−	0.3+
1993 10 15	400	(3.0+	0.1−)	1998 08 27	704	0.3+	0.5+	1999 10 10	704	1.1+	0.1+
1993 10 15	400	(0.8−	2.3+)	1998 08 27	704	0.0	0.1−	1999 10 10	704	0.0	0.9+
1993 10 16	400	1.0−	2.0−	1998 08 27	704	1.7+	0.6+	1999 10 19	704	0.6+	0.8+
1993 10 16	400	0.0	0.4+	1998 08 27	704	0.4−	0.4−	1999 10 19	704	0.6+	0.1+
1993 10 20	400	0.9−	1.7−	1998 09 19	704	0.3+	0.1−	1999 10 19	704	0.5+	0.9+
1993 10 20	400	0.9−	1.0−	1998 09 19	704	0.1−	0.3+	1999 10 19	704	0.2−	0.6+
1993 11 11	400	2.0+	0.1−	1998 09 19	704	0.6+	0.4+	1999 10 19	704	0.4−	0.3+
1993 11 11	400	0.2+	0.1+	1998 09 19	704	0.3−	0.1+	1999 10 31	703	(0.5−	2.9+)
1998 06 23	699	0.0	0.3−	1998 09 19	704	0.5+	0.2+	1999 10 31	703	0.9−	0.5+
1998 06 23	699	0.2+	1.0−	1998 09 23	704	0.7−	0.5−	1999 10 31	703	0.1−	0.2+
1998 06 23	699	0.4+	1.5−	1998 09 23	704	0.2+	0.0	1999 10 31	703	0.2−	0.5+
1998 08 18	566	0.0	0.6−	1998 09 23	704	0.2+	0.1+	1999 11 05	704	0.2−	0.8−
1998 08 18	566	0.5−	0.8−	1998 09 23	704	0.3+	0.2+	1999 11 05	704	0.2−	0.1−
1998 08 18	566	0.6−	0.7−	1998 12 09	704	0.9+	0.1−	1999 11 05	704	0.1+	0.3−
1998 08 24	704	0.8−	0.1+	1998 12 09	704	0.0	1.1+	1999 11 05	704	0.0	0.8−

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	146.62725		(2000.0)	P	Q
<i>n</i>	0.17329110	ω	136.69097	-0.54585955	+0.83668234
<i>a</i>	3.1862893	Ω	100.17791	-0.78060211	-0.48842640
<i>e</i>	0.1163901	<i>i</i>	2.60421	-0.30446296	-0.24779491
<i>P</i>	5.69	<i>H</i>	13.1	<i>G</i> 0.15	<i>U</i> 1

Residuals in seconds of arc

1989 12 30	413	1.3-	0.6+	1998 09 14	704	1.2+	1.3-	1999 10 11	704	0.2+	0.3-
1989 12 30	413	0.3+	0.5-	1998 09 18	704	0.8-	1.7+	1999 10 11	704	0.7-	0.7-
1989 12 31	413	0.6-	1.3-	1998 09 18	704	1.1+	0.2-	1999 10 11	704	0.6-	0.6-
1989 12 31	413	1.1+	0.7-	1998 09 18	704	0.1+	0.6-	1999 10 11	704	0.4-	0.7-
1993 10 09	809	0.7+	0.2-	1998 09 18	704	1.9+	0.6+	1999 10 11	704	1.0-	0.3-
1993 10 09	809	0.6+	0.9+	1998 09 18	704	0.6-	0.7+	1999 10 30	703	1.3+	0.4+
1993 10 09	809	0.4+	0.5+	1998 11 19	910	0.3-	1.1-	1999 10 30	703	0.0	0.4+
1993 10 11	809	1.0-	0.3+	1998 11 19	910	0.1-	1.2-	1999 10 30	703	0.3-	0.8+
1993 10 11	809	0.3-	0.5+	1998 11 19	910	0.5-	1.2-	1999 10 30	703	0.2-	0.0
1993 10 11	809	1.2-	0.2+	1999 10 02	703	0.0	0.4-	1999 11 04	704	0.1-	0.3-
1993 10 20	809	(1.2+ 2.5+)		1999 10 02	703	0.7-	0.8+	1999 11 04	704	0.3-	0.2+
1993 10 20	809	(1.1+ 2.6+)		1999 10 02	703	0.1+	0.6+	1999 11 04	704	0.5-	1.1+
1993 10 20	809	(1.0+ 2.5+)		1999 10 02	703	0.4+	0.5+	1999 11 04	704	0.1+	1.4+
1998 08 17	704	0.1+	0.2-	1999 10 03	704	0.4-	1.0-	1999 11 15	704	0.7+	0.5+
1998 08 17	704	0.6-	0.6+	1999 10 03	704	0.2-	0.4-	1999 11 15	704	0.0	0.6+
1998 08 17	704	1.3-	0.0	1999 10 03	704	0.2-	0.9-	1999 11 15	704	0.5+	0.2-
1998 08 17	704	0.1-	0.1-	1999 10 03	704	0.3-	0.6-	1999 11 15	704	0.8+	0.1-
1998 08 17	704	0.8-	0.7-	1999 10 10	704	0.2-	0.5-	1999 11 15	704	0.6+	0.2+
1998 09 14	704	0.4+	0.7+	1999 10 10	704	0.6-	0.4-	1999 11 17	704	1.1+	1.2+
1998 09 14	704	0.1-	0.7-	1999 10 10	704	0.5-	0.5-	1999 11 17	704	0.9+	0.6+
1998 09 14	704	0.7+	1.4-	1999 10 10	704	0.9-	1.0-	1999 11 17	704	0.8+	0.1-
1998 09 14	704	0.2+	0.6+	1999 10 10	704	0.1-	0.5-	1999 11 17	704	0.4+	0.4+

(12364)* 1993 XQ₁

Discovered 1993 Dec. 15 by T. Kobayashi at Oizumi.

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Nakano

<i>M</i>	327.53119		(2000.0)	P	Q
<i>n</i>	0.30910991	ω	200.00320	+0.71358548	-0.70039445
<i>a</i>	2.1663440	Ω	204.47762	+0.64777333	+0.66812680
<i>e</i>	0.0517793	<i>i</i>	2.15780	+0.26680607	+0.25110593
<i>P</i>	3.19	<i>H</i>	14.7	<i>G</i> 0.15	<i>U</i> 1

Residuals in seconds of arc

1989 08 01	675	1.0-	0.2+	1999 10 03	704	0.2-	0.7-	1999 11 03	703	1.1-	0.4+
1989 08 01	675	0.4+	0.7+	1999 10 03	704	0.2+	0.4-	1999 11 03	703	(2.2- 0.4+)	
1991 02 07	675	1.0+	0.1-	1999 10 03	704	0.1-	0.0	1999 11 03	703	0.5-	0.3+
1991 02 07	675	1.5+	0.4+	1999 10 03	704	0.3-	0.1-	1999 11 03	703	0.6-	0.7+
1993 12 15	411	1.3-	0.4-	1999 10 05	704	0.6+	0.1-	1999 11 04	704	0.2+	0.2-
1993 12 15	411	1.5-	0.9-	1999 10 05	704	0.0	0.5-	1999 11 04	704	0.5-	0.1+
1993 12 17	411	0.3+	0.1-	1999 10 05	704	0.3+	1.1-	1999 11 04	704	0.4-	0.1+
1993 12 17	411	0.6-	0.7+	1999 10 05	704	0.3+	0.8-	1999 11 04	704	0.2-	0.2+
1993 12 17	411	0.1-	1.6+	1999 10 05	704	0.3-	1.5-	1999 11 04	704	0.4-	0.4+
1993 12 23	411	0.9+	0.4-	1999 10 07	704	0.4+	0.7-	1999 11 05	704	0.5+	0.1+
1993 12 23	411	0.5+	0.2-	1999 10 07	704	0.5+	0.6-	1999 11 05	704	0.4+	0.1-
1993 12 23	411	0.7-	1.0+	1999 10 07	704	0.5+	0.5+	1999 11 05	704	0.1+	0.1+
1994 01 04	411	0.0	0.4-	1999 10 07	704	0.8+	0.9-	1999 11 05	704	0.6+	0.3+
1994 01 04	411	0.4-	1.1-	1999 10 07	704	0.3-	0.6-	1999 11 05	704	0.2+	0.7+
1994 01 04	411	0.1+	0.2-	1999 10 10	704	0.5+	0.1-	1999 11 09	704	0.2-	0.1-
1998 04 22	704	1.3+	0.7+	1999 10 10	704	0.6+	0.1-	1999 11 09	704	0.0	0.1+
1998 04 22	704	0.5-	1.6+	1999 10 10	704	0.0	0.0	1999 11 09	704	0.1+	0.2+
1998 04 22	704	0.1-	1.4+	1999 10 10	704	0.3-	0.1+	1999 11 09	704	0.3-	0.0
1998 04 22	704	0.5-	0.5-	1999 10 10	704	0.1+	0.1-	1999 11 09	704	0.1-	0.2-
1998 04 22	704	1.1-	1.0+	1999 10 15	704	0.6+	0.4+	1999 11 12	704	0.2+	0.3+
1998 05 22	704	0.1+	0.4+	1999 10 15	704	0.1-	0.7+	1999 11 12	704	0.1-	0.1+
1998 05 22	704	0.1-	1.2+	1999 10 15	704	0.2+	0.4+	1999 11 12	704	0.1+	0.5+
1998 05 22	704	0.4-	0.9-	1999 10 15	704	0.0	0.4-	1999 11 12	704	0.0	0.3+
1998 05 22	704	0.4+	0.4+	1999 10 15	704	0.3+	0.2+	1999 11 12	704	0.2+	0.4+
1998 05 22	704	0.1+	0.6-	1999 10 20	704	0.4-	0.2-	1999 11 12	691	0.1+	0.1-

1998 05 22	596	0.2-	0.3-	1999 10 20	704	0.1-	0.0	1999 11 12	691	0.1+	0.1-
1998 05 22	596	0.0	0.5+	1999 10 20	704	0.2-	0.3-	1999 11 12	691	0.2+	0.2-
1998 05 24	704	0.4-	0.6+	1999 10 20	704	0.6-	0.1-	1999 11 16	704	0.6+	0.3+
1998 05 24	704	2.0+	1.0-	1999 10 20	704	0.4-	0.1+	1999 11 16	704	0.2+	0.7+
1998 05 24	704	0.8-	0.3-	1999 10 27	120	0.3+	0.3+	1999 11 16	704	0.7+	0.3+
1998 05 24	704	0.6-	0.0	1999 10 27	120	0.5-	0.0	1999 11 16	704	0.7+	0.2+
1998 05 24	704	1.3+	0.4-	1999 10 29	703	0.8-	0.3+	1999 11 16	704	0.6+	0.3+
1999 10 01	703	0.1-	0.0	1999 10 29	703	0.6-	0.6+	1999 11 17	704	1.3-	0.5+
1999 10 01	703	0.6-	0.5-	1999 10 29	703	0.4-	0.4+	1999 11 17	704	0.5+	0.3+
1999 10 01	703	0.4-	0.0	1999 10 29	703	0.9-	0.2+	1999 11 17	704	1.2+	0.2-
1999 10 01	703	0.4+	0.3+	1999 10 29	120	0.0	0.3+	1999 11 17	704	0.4+	0.9+
1999 10 03	704	0.2+	0.3-	1999 10 29	120	1.1-	0.3+				

(12365)* 1993 YD

Discovered 1993 Dec. 17 by T. Kobayashi at Oizumi.

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Nakano

<i>M</i>	279.91313		(2000.0)	P	Q
<i>n</i>	0.17435838	ω	74.58909	-0.96457906	-0.08016792
<i>a</i>	3.1732735	Ω	100.31393	-0.01119215	-0.93940773
<i>e</i>	0.0206397	<i>i</i>	14.79994	+0.26355638	-0.33329601
<i>P</i>	5.65	<i>H</i>	12.7	<i>G</i> 0.15	<i>U</i> 1

Residuals in seconds of arc

1993 12 17	411	0.6+	0.6-	1996 07 12	801	0.9+	0.4-	1998 11 19	699	0.2+	0.2+
1993 12 17	411	0.4+	0.8-	1996 07 12	801	0.8+	1.0+	1998 11 19	699	0.3-	0.3+
1993 12 18	411	0.9-	1.6-	1998 11 13	704	0.2+	0.0	1998 11 24	747	0.3+	0.7+
1993 12 18	411	0.6+	0.0	1998 11 13	704	1.4+	0.5-	1998 11 24	747	0.4+	0.2+
1993 12 18	411	0.0	1.0-	1998 11 13	704	0.0	2.0-	1998 11 24	747	0.6+	0.5+
1993 12 21	411	0.3+	0.1+	1998 11 13	704	0.8+	1.4-	1998 11 24	747	0.5+	0.2+
1993 12 21	411	0.5+	0.6+	1998 11 13	704	0.1-	0.7-	1999 10 12	704	0.1+	0.7+
1993 12 21	411	0.6+	0.5-	1998 11 14	704	0.2-	0.0	1999 10 12	704	0.1-	0.9+
1994 01 02	411	0.7+	0.5+	1998 11 14	704	0.0	0.7-	1999 10 12	704	0.3+	0.3+
1994 01 02	411	1.3-	1.2+	1998 11 14	704	0.2+	0.5-	1999 10 12	704	1.2-	0.5+
1994 01 19	411	0.8+	0.8-	1998 11 14	704	0.0	0.2-	1999 10 12	704	0.7-	0.4+
1994 01 19	411	0.4-	0.4-	1998 11 14	704	0.8+	0.4-	1999 10 22	704	0.0	0.4-
1994 01 19	411	0.3-	0.1-	1998 11 14	367	0.1-	0.5+	1999 10 22	704	0.4-	0.0
1995 03 11	411	0.7-	1.6-	1998 11 14	367	0.6-	0.2+	1999 10 22	704	0.1+	0.0
1995 03 11	411	0.0	0.1+	1998 11 15	610	0.5-	1.1+	1999 10 22	704	0.3+	0.5-
1995 03 13	411	0.5+	0.9-	1998 11 15	610	0.5-	1.0+	1999 10 22	704	0.4-	0.1-
1995 03 13	411	0.8+	0.8+	1998 11 15	610	0.6-	1.1+	1999 11 11	703	0.1+	1.0+
1995 04 01	411	0.2-	0.1+	1998 11 15	610	0.6-	1.1+	1999 11 11	703	0.4+	0.9+
1995 04 01	411	1.1-	0.9+	1998 11 15	610	0.6-	1.1+	1999 11 11	703	0.6+	0.1+
1995 04 03	411	0.9-	0.5+	1998 11 16	610	1.0-	0.5-	1999 11 11	703	0.5+	0.4+
1995 04 03	411	0.6-	0.0	1998 11 16	610	0.8-	0.5-	1999 11 16	704	0.0	0.2-
1996 05 15	801	0.3+	0.4-	1998 11 16	610	0.6-	0.4-	1999 11 16	704	0.2-	0.2+
1996 05 15	801	0.6+	0.2-	1998 11 16	610	0.4-	0.4-	1999 11 16	704	0.7+	0.5+
1996 05 20	801	0.6-	0.4+	1998 11 16	610	0.0	0.4-	1999 11 16	704	0.5+	0.4+
1996 05 20	801	0.1-	0.5+	1998 11 19	699	0.1+	0.5+	1999 11 16	704	0.2+	1.3+

(12366)* 1994 CD_s = 1978 UB₆

1994 02 15	675	0.4−	0.6−	1999 10 15	704	0.1−	0.6−	1999 11 12	699	0.7−	1.0+
1994 02 15	675	0.8+	1.1−	1999 10 15	704	0.2+	0.0	1999 11 12	704	0.5+	0.5−
1994 02 20	413	0.2+	0.2−	1999 10 15	704	0.5+	0.5−	1999 11 12	699	0.2−	0.4−
1994 02 20	413	0.2+	0.0	1999 10 21	704	0.2+	0.6−	1999 11 12	704	0.3+	0.2−
1994 03 12	413	0.9−	0.4+	1999 10 21	704	0.1−	0.4−	1999 11 12	704	0.3+	0.0
1994 03 12	413	0.4+	0.4+	1999 10 21	704	0.5+	0.5−	1999 11 12	704	0.3+	0.4−
1995 08 26	801	0.2+	0.0	1999 10 21	704	0.1+	0.0	1999 11 14	704	0.2+	0.0
1995 08 26	801	0.0	0.6+	1999 10 21	704	0.1−	0.0	1999 11 14	704	0.4+	0.1+
1995 08 29	801	0.3+	0.9−	1999 11 01	703	0.1+	0.5+	1999 11 14	704	0.4+	0.0
1995 08 29	801	0.5+	0.7−	1999 11 01	703	0.1−	0.4+	1999 11 14	704	0.4+	0.0
1998 06 24	704	0.7+	1.2+	1999 11 01	703	0.1+	0.3+	1999 11 14	704	0.7+	0.1+
1998 06 24	704	0.5−	0.7+	1999 11 01	703	0.1+	0.7+	1999 11 17	704	0.3+	0.5+
1998 06 24	704	0.5−	1.7−	1999 11 04	704	0.2−	0.2+	1999 11 17	704	0.2−	0.3+
1998 06 24	704	(2.8−	0.9−)	1999 11 04	704	0.3−	0.1−	1999 11 17	704	0.0	0.3+
1999 10 05	704	0.5+	0.4−	1999 11 04	704	0.2−	0.3+	1999 11 17	704	0.7−	0.4+
1999 10 05	704	0.0	1.0−	1999 11 04	704	0.0	0.3+	1999 11 17	704	0.2+	0.5+
1999 10 05	704	0.1−	0.8−	1999 11 04	704	0.1+	0.0				
1999 10 05	704	0.1+	1.2−	1999 11 09	704	0.1+	0.1+				

(12367)* 1994 CN₈ = 1979 WY₁ = 1998 HX₆₂

Discovered 1994 Feb. 8 by O. A. Naranjo at Mérida.

Id. A. Doppler (*MPC* 33487)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

M	308.93889		(2000.0)	P	Q
n	0.29215470	ω	271.97815	+0.80403595	-0.59365376
a	2.2493695	Ω	124.44021	+0.56026528	+0.73776306
e	0.1417849	i	2.30627	+0.19907037	+0.32137343
P	3.37	H	14.5	G 0.15	U 2

Residuals in seconds of arc

1979 11 16	095	0.3−	0.9+	1999 08 07	699	0.6−	0.8+	1999 09 13	704	0.4−	0.2−
1994 02 08	303	0.5−	0.5+	1999 08 07	699	0.3−	0.6+	1999 09 13	704	0.0	0.7−
1994 02 08	303	0.5−	0.1+	1999 09 07	704	0.1+	0.3−	1999 09 30	704	0.9+	0.0
1994 02 08	303	0.8+	0.3−	1999 09 07	704	0.3−	0.3−	1999 09 30	704	0.2+	0.8+
1994 02 09	303	(2.8+	0.3−)	1999 09 07	704	0.2−	0.3−	1999 09 30	704	0.5+	0.9−
1994 02 10	303	0.2+	0.4−	1999 09 07	704	0.5−	0.3−	1999 09 30	704	0.1+	1.5−
1998 03 29	704	0.6−	1.3+	1999 09 07	704	0.4−	0.2−	1999 09 30	704	0.8−	0.9−
1998 03 29	704	0.1+	1.3+	1999 09 07	106	0.5+	0.4+	1999 10 04	703	0.8+	0.1+
1998 03 29	704	0.2−	0.2+	1999 09 07	106	0.1−	0.0	1999 10 04	703	0.3+	0.6+
1998 04 21	704	0.5+	0.8−	1999 09 08	106	1.1−	1.1+	1999 10 04	703	0.1−	0.2+
1998 04 21	704	0.4+	0.4+	1999 09 08	106	0.2+	0.6+	1999 10 04	703	0.5+	0.5+
1998 04 21	704	0.3−	0.4+	1999 09 08	106	0.9+	0.5+	1999 11 08	704	0.1+	1.9+
1998 04 21	704	0.5+	1.0−	1999 09 09	704	0.5−	0.6−	1999 11 08	704	(0.4+	4.0+)
1998 04 21	704	0.5+	1.3−	1999 09 09	704	0.1−	0.3−	1999 11 08	704	(0.1+	3.4+)
1998 04 22	704	0.1+	0.3+	1999 09 09	704	0.3+	0.5−	1999 11 15	704	0.9−	0.4−
1998 04 22	704	0.4+	0.4+	1999 09 09	704	0.1+	0.3−	1999 11 15	704	0.3−	0.2−
1998 04 22	704	0.3−	0.1+	1999 09 09	704	0.6+	0.2+	1999 11 15	704	0.2−	0.1+
1998 04 22	704	0.3+	0.5−	1999 09 13	704	0.3−	0.4−	1999 11 15	704	0.6+	0.3+
1998 04 22	704	0.8−	0.7+	1999 09 13	704	0.1−	0.0	1999 11 15	704	0.4+	0.3+
1999 08 07	699	0.0	0.4+	1999 09 13	704	0.2−	0.1−				

(12368)* 1994 CM₁₁ = 1976 GK = 1991 NU₇

Discovered 1994 Feb. 7 by E. W. Elst at the European Southern Observatory.

Id. K. Ichikawa (*MPC* 25218)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

M	119.50777		(2000.0)	P	Q
n	0.27242601	ω	204.43873	-0.43773844	+0.89883028
a	2.3566966	Ω	39.61172	-0.81909640	-0.38852184
e	0.2039764	i	1.98796	-0.37076427	-0.20286671
P	3.62	H	14.2	G 0.15	U 1

Residuals in seconds of arc

1976 04 01	095	(3.7−	5.9+)	1999 09 18	703	0.9−	0.3+	1999 10 21	704	1.3+	0.1−
1991 07 15	809	0.6+	1.0−	1999 09 18	703	0.4−	0.7−	1999 10 21	704	0.3+	0.1−
1991 07 15	809	0.7+	0.8−	1999 10 01	703	0.9−	0.5+	1999 10 21	704	0.7+	0.7−

1991 07 15	809	1.0+	1.5−	1999 10 01	703	1.4+	0.1−	1999 10 21	704	0.1−	0.0
1991 07 16	809	0.9−	0.7−	1999 10 01	703	0.2+	0.3−	1999 10 29	703	1.1−	1.1+
1991 07 16	809	0.4−	0.9−	1999 10 01	703	0.7+	0.9+	1999 10 29	703	0.1+	0.1+
1991 07 16	809	0.3+	0.9−	1999 10 03	704	0.3+	0.6+	1999 10 29	703	0.8−	0.2−
1994 02 07	809	0.9+	0.3+	1999 10 03	704	0.2−	0.1−	1999 10 29	703	0.2+	1.2+
1994 02 07	809	1.1−	0.4−	1999 10 03	704	0.4+	0.9+	1999 11 04	704	0.4−	0.3+
1994 02 07	809	1.8−	0.4−	1999 10 03	704	0.5+	0.2+	1999 11 04	704	0.2−	0.1−
1994 02 09	809	(2.3+	0.2−)	1999 10 03	704	0.0	0.5+	1999 11 04	704	0.7−	0.3−
1994 02 09	809	0.8+	0.7−	1999 10 05	704	0.2−	0.7+	1999 11 04	704	0.4+	0.8+
1994 02 09	809	1.7+	1.2−	1999 10 05	704	0.3+	0.1+	1999 11 04	704	0.2−	0.1−
1994 02 12	809	0.2+	1.7−	1999 10 05	704	0.3+	0.2+	1999 11 09	704	0.0	0.7−
1994 02 12	809	0.9−	1.8−	1999 10 05	704	0.2+	0.3+	1999 11 09	704	0.1−	0.7−
1994 02 12	809	(1.0−	2.8−)	1999 10 05	704	0.7+	0.6+	1999 11 09	704	0.6−	1.0−
1994 02 15	675	1.2−	0.8−	1999 10 07	704	0.1+	0.4−	1999 11 09	704	0.1−	0.8−
1994 02 15	675	1.6−	0.3−	1999 10 07	704	0.6−	0.2+	1999 11 12	704	0.3+	0.8−
1998 05 22	704	0.3−	0.6−	1999 10 07	704	0.4+	0.1−	1999 11 12	704	0.7+	0.9−
1998 05 22	704	0.4+	0.0	1999 10 10	704	0.1−	0.2−	1999 11 12	704	0.5+	0.3−
1998 05 22	704	0.8+	0.6+	1999 10 10	704	0.4+	0.1+	1999 11 12	704	0.1+	0.4−
1998 05 22	704	0.5−	0.2+	1999 10 10	704	0.1+	0.6−	1999 11 12	704	0.2+	0.4−
1998 05 22	704	0.6−	0.6+	1999 10 10	704	0.1−	0.4−	1999 11 15	691	0.2−	0.1+
1998 05 24	704	0.2+	0.5+	1999 10 10	704	0.5+	0.3−	1999 11 15	691	0.2−	0.1+
1998 05 24	704	0.3+	0.2−	1999 10 15	704	0.2+	0.6−	1999 11 15	691	0.3−	0.1+
1998 05 24	704	0.5+	0.6−	1999 10 15	704	0.2+	0.8−	1999 11 16	704	0.3−	0.3+
1998 05 24	704	0.5−	0.1−	1999 10 15	704	0.5−	0.7−	1999 11 16	704	0.4−	0.1+
1998 05 24	704	0.4−	1.2−	1999 10 15	704	0.1−	0.3−	1999 11 16	704	0.2+	0.4−
1999 09 18	703	0.4−	0.4−	1999 10 15	704	0.7+	0.1−	1999 11 16	704	0.4−	0.1+
1999 09 18	703	0.2−	0.1−	1999 10 21	704	0.5+	1.5−	1999 11 16	704	0.0	1.1−

(12369)* 1994 CJ₁₆ = 1991 LZ₃ = 1998 KO₆₅

Discovered 1994 Feb. 8 by E. W. Elst at the European Southern Observatory.

Id. A. Doppler (*MPC* 33240)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

M	166.91616		(2000.0)	$\mathbf{P}$	$\mathbf{Q}$		
n	0.28366808	ω	83.38531	-0.90141177	+0.42668225		
a	2.2940122	Ω	121.84865	-0.42351354	-0.83368545		
e	0.0878722	i	4.96238	-0.08996166	-0.35058641		
P	3.47	H	14.0	G	0.15	U	1

Residuals in seconds of arc

1991 06 06	809	1.3+	1.0+	1998 05 24	704	0.4−	1.8+	1999 10 07	704	1.0+	0.6−
1991 06 06	809	1.4+	1.4+	1998 05 24	704	0.9+	0.1+	1999 10 09	704	0.0	0.6+
1991 06 06	809	0.7+	1.6+	1998 06 03	704	(2.3+	0.3−)	1999 10 09	704	0.1−	0.4+
1991 06 08	809	0.2−	0.7+	1998 06 03	704	(2.8+	1.8−)	1999 10 09	704	0.1−	0.5+
1991 06 08	809	0.5−	1.3+	1998 06 03	704	0.8+	1.3+	1999 10 09	704	0.3+	0.6+
1991 06 08	809	1.4−	1.3+	1998 06 03	704	0.7+	0.8+	1999 10 09	704	0.3+	0.5+
1994 02 08	809	0.5+	0.9+	1998 06 24	704	0.5−	0.7+	1999 10 19	704	0.1+	0.4−
1994 02 08	809	0.3−	0.4+	1998 06 24	704	0.2+	0.5−	1999 10 19	704	0.8+	0.0
1994 02 08	809	0.9−	0.9+	1998 06 24	704	0.7−	0.3−	1999 10 19	704	0.3+	0.3−
1994 02 10	809	1.5+	0.3+	1998 06 24	704	0.7+	1.2−	1999 10 19	704	0.3+	0.2−
1994 02 10	809	1.3+	0.9+	1998 06 24	704	1.3+	1.7−	1999 10 19	704	0.1+	0.6−
1994 02 10	809	0.7+	0.0	1999 09 30	703	0.4−	0.2+	1999 11 03	703	0.7−	1.0+
1994 02 13	809	0.3+	0.4−	1999 09 30	703	0.1+	0.8+	1999 11 03	703	0.2+	0.2−
1994 02 13	809	0.5−	0.2+	1999 09 30	703	0.0	0.3+	1999 11 03	703	0.4−	0.4+
1994 02 13	809	1.1−	0.4+	1999 09 30	703	0.8−	0.7+	1999 11 03	703	0.4−	0.2+
1994 02 16	010	(1.5−	3.0+)	1999 10 04	703	0.0	0.5+	1999 11 06	704	0.3−	0.1+
1994 02 16	010	(0.8−	2.8+)	1999 10 04	703	0.3+	0.1+	1999 11 06	704	0.1+	0.1−
1998 05 22	704	0.1+	0.4−	1999 10 04	703	0.3−	0.3+	1999 11 06	704	0.4−	0.2+
1998 05 22	704	0.0	0.8−	1999 10 04	703	0.2−	0.2+	1999 11 06	704	0.3−	0.3+
1998 05 22	704	0.6+	0.6−	1999 10 07	704	0.3−	0.6+	1999 11 06	704	0.4−	0.3+
1998 05 22	704	1.1−	0.5−	1999 10 07	704	0.4−	0.7+	1999 11 07	704	0.9−	0.5−
1998 05 24	704	1.6−	1.6−	1999 10 07	704	0.4+	0.1+	1999 11 07	704	1.0−	0.0
1998 05 24	704	1.5−	0.0	1999 10 07	704	0.9+	0.5+	1999 11 07	704	0.5−	0.6−

1999 NOV. 23

M.P.C. 36705

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Nakano

<i>M</i>	191.46779		(2000.0)	P	Q
<i>n</i>	0.28202282	ω	25.90871	-0.93336384	+0.35891383
<i>a</i>	2.3029255	Ω	175.12064	-0.33619246	-0.87069782
<i>e</i>	0.1277038	<i>i</i>	2.41088	-0.12572417	-0.33625312
<i>P</i>	3.49	<i>H</i>	14.3	<i>G</i> 0.15	<i>U</i> 1

Residuals in seconds of arc

1980 04 08	675	1.3+	0.6-	1994 05 13	399	1.7-	1.3-	1999 10 21	704	0.4+	0.2-
1980 04 09	675	1.3+	0.8-	1998 05 27	699	0.4+	0.3+	1999 10 21	704	0.1-	0.8-
1980 04 12	046	(4.3-	0.3+)	1998 05 27	699	0.2+	0.4+	1999 10 30	691	0.7+	0.4+
1980 04 12	046	1.5+	1.3+	1998 05 27	699	0.4+	1.1+	1999 10 30	691	0.3+	0.1-
1980 04 13	046	0.1-	1.6+	1998 07 20	566	0.3-	0.6+	1999 10 30	691	0.4+	0.5+
1980 04 13	046	(0.7-	3.1+)	1998 07 20	566	0.3-	0.3+	1999 11 01	703	0.1-	0.4+
1980 04 14	046	0.2-	0.5+	1998 07 20	566	0.5-	0.1+	1999 11 01	703	0.7-	0.0
1980 04 14	046	1.7-	0.6+	1999 10 07	704	0.5-	0.5-	1999 11 01	703	0.2-	0.5+
1980 04 15	046	0.3-	1.8+	1999 10 07	704	0.9-	0.2-	1999 11 01	703	1.0-	0.5+
1980 04 15	046	(1.3-	2.6+)	1999 10 07	704	0.8-	0.1-	1999 11 04	704	1.3+	0.1-
1980 04 16	046	(2.7+	3.5+)	1999 10 08	691	0.5-	0.1-	1999 11 04	704	0.0	0.6+
1980 04 16	046	0.2+	0.0	1999 10 08	691	0.2-	0.2-	1999 11 04	704	0.4+	0.2-
1992 11 20	691	0.2-	0.1-	1999 10 08	691	0.0	0.1+	1999 11 04	704	0.3+	0.9+
1992 11 20	691	0.3-	0.2-	1999 10 10	704	0.7-	0.0	1999 11 12	699	0.1+	0.5+
1992 11 20	691	0.4-	0.1-	1999 10 10	704	1.0-	0.5-	1999 11 12	699	0.2+	0.8+
1994 04 08	400	0.2+	1.2-	1999 10 10	704	0.5-	0.2+	1999 11 12	699	0.4-	0.6+
1994 04 08	400	(5.2+	0.6+)	1999 10 10	704	0.2+	1.5+	1999 11 15	704	0.1-	0.5+
1994 04 09	400	0.9+	0.9+	1999 10 11	691	0.2+	0.1+	1999 11 15	704	0.1-	0.6+
1994 04 11	399	0.7+	0.1+	1999 10 11	691	0.3+	0.3-	1999 11 15	704	0.3+	0.7+
1994 04 11	399	0.2+	0.3+	1999 10 11	691	0.3+	0.0	1999 11 15	704	0.5+	0.5+
1994 04 13	399	0.7-	0.1-	1999 10 15	704	0.7-	0.6-	1999 11 15	704	0.3+	0.8+
1994 04 13	399	0.6-	0.6+	1999 10 15	704	0.3+	1.2-	1999 11 17	704	0.7+	0.1-
1994 04 16	400	1.1+	0.5-	1999 10 15	704	(0.8-	2.6-)	1999 11 17	704	0.3+	0.7+
1994 05 06	399	1.8-	0.1-	1999 10 15	704	0.5-	0.5-	1999 11 17	704	0.5+	0.1-
1994 05 06	399	0.2+	1.4-	1999 10 21	704	0.1+	0.7-	1999 11 17	704	0.2+	0.9-
1994 05 13	399	(2.6-	2.2-)	1999 10 21	704	0.3-	0.2+	1999 11 17	704	0.4+	1.0-

(12371)* 1994 GL₉ = 1989 YX₇

Discovered 1994 Apr. 14 by S. Otomo at Kiyosato.

Id. T. Kobayashi (*MPC* 23983)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Nakano

<i>M</i>	201.36240		(2000.0)	P	Q
<i>n</i>	0.28549406	ω	333.39427	-0.94908641	+0.31204359
<i>a</i>	2.2842204	Ω	224.85948	-0.27702207	-0.89199063
<i>e</i>	0.1001486	<i>i</i>	3.50893	-0.14997920	-0.32708029
<i>P</i>	3.45	<i>H</i>	14.5	<i>G</i> 0.15	<i>U</i> 1

Residuals in seconds of arc

1989 12 26	033	0.4+	0.3+	1998 07 29	910	0.6+	0.5+	1999 11 03	704	0.0	0.5-
1989 12 26	033	0.7+	0.4-	1998 07 29	910	0.9+	0.3+	1999 11 09	704	0.0	0.1-
1989 12 26	033	1.4+	0.0	1998 07 30	910	0.6+	0.1-	1999 11 09	704	0.0	0.7-
1992 10 21	675	0.8-	0.6+	1998 07 30	910	0.7+	0.0	1999 11 09	704	0.4-	0.6-
1992 10 21	675	1.2+	1.6+	1998 07 30	910	0.6+	0.1-	1999 11 09	704	0.4-	0.4-
1994 04 14	894	1.1-	0.3-	1998 08 17	704	0.5+	1.3+	1999 11 09	704	0.0	0.7-
1994 04 14	894	1.1-	0.9+	1998 08 17	704	0.6-	0.8-	1999 11 10	704	0.2+	0.8-
1994 04 15	894	0.4-	0.7-	1998 08 17	704	0.0	0.5-	1999 11 10	704	0.2-	0.0
1994 04 15	894	0.6-	0.7-	1999 10 22	704	0.6+	0.5-	1999 11 10	704	0.0	0.3-
1994 05 06	894	0.0	0.2-	1999 10 22	704	0.3+	0.8-	1999 11 10	704	0.1+	0.2-
1994 05 06	894	0.0	0.4-	1999 10 22	704	0.2-	0.8+	1999 11 10	704	0.3-	0.4-
1995 08 21	658	1.2-	0.7-	1999 10 22	704	0.5-	0.7+	1999 11 12	704	0.1+	0.0
1995 08 21	658	1.1-	0.7-	1999 10 22	704	0.6-	0.2+	1999 11 12	704	0.1-	0.7-
1995 08 21	658	1.2-	0.6-	1999 10 30	703	0.1+	0.1+	1999 11 12	704	0.2+	0.5+
1995 10 13	118	0.5-	0.7-	1999 10 30	703	0.2-	0.5+	1999 11 12	704	0.7-	0.5+
1995 10 13	118	0.8-	0.7-	1999 10 30	703	0.8-	1.4+	1999 11 12	704	0.2+	0.1+
1995 10 14	118	(0.5-	2.4-)	1999 10 30	703	0.2+	0.4+	1999 11 17	704	0.1+	0.0
1998 07 02	699	0.3-	0.3+	1999 11 03	704	0.3+	0.5-	1999 11 17	704	0.2-	0.7-
1998 07 02	699	0.5+	0.8-	1999 11 03	704	0.5+	0.6-	1999 11 17	704	0.1+	0.1+

1998 07 02	699	0.4+	0.0	1999 11 03	704	0.6+	0.3-	1999 11 17	704	0.6+	0.3+
1998 07 29	910	0.8+	0.4+	1999 11 03	704	0.2+	0.5-	1999 11 17	704	0.0	0.2-

(12372)* 1994 JF

Discovered 1994 May 6 by T. Kobayashi at Oizumi.

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Nakano

<i>M</i>	229.53608		(2000.0)	P	Q
<i>n</i>	0.28664059	ω	18.69588	-0.99536418	+0.09468538
<i>a</i>	2.2781252	Ω	166.70352	-0.09491810	-0.93877993
<i>e</i>	0.1023517	<i>i</i>	4.20820	-0.01551462	-0.33125053
<i>P</i>	3.44	<i>H</i>	14.5	<i>G</i> 0.15	<i>U</i> 1

Residuals in seconds of arc

1994 05 06	411	0.6-	0.4+	1997 03 01	886	0.3-	1.3-	1999 10 10	704	0.1-	0.2-
1994 05 06	411	0.5+	0.0	1997 03 01	886	0.8-	0.3+	1999 10 10	704	0.7+	0.7-
1994 05 08	411	1.1+	0.1+	1998 08 17	704	0.2+	0.1-	1999 10 10	704	1.3+	0.2-
1994 05 08	411	0.4+	0.2+	1998 08 17	704	0.6+	0.1-	1999 10 10	704	1.5+	0.8-
1994 05 08	411	0.8+	0.5+	1998 08 17	704	0.1-	0.2+	1999 10 31	691	0.3+	0.6-
1994 05 12	411	0.4+	0.3+	1998 08 17	704	0.5+	0.4+	1999 10 31	691	0.5+	0.5-
1994 05 12	411	0.9-	0.1-	1998 08 17	704	0.9-	0.0	1999 10 31	691	0.4+	0.7-
1994 05 12	411	0.9-	0.1+	1998 08 19	566	0.2-	0.8-	1999 11 04	704	0.3+	0.2+
1994 05 16	411	0.5-	1.1-	1998 08 19	566	0.2+	1.3-	1999 11 04	704	1.0-	0.0
1994 05 16	411	0.2+	0.1-	1998 08 19	566	0.4+	0.6+	1999 11 04	704	0.1-	0.0
1994 05 16	411	0.1-	0.7-	1998 08 23	704	1.1+	0.5-	1999 11 04	704	0.7-	0.8+
1994 06 06	691	0.5-	0.3-	1998 08 23	704	(2.3-	0.3-)	1999 11 04	704	0.4-	0.9+
1994 06 06	691	0.6-	0.1+	1998 08 23	704	1.2-	0.2-	1999 11 17	704	0.1+	0.1+
1994 06 06	691	1.8+	0.6+	1998 08 23	704	1.3-	0.1-	1999 11 17	704	0.0	0.5+
1995 10 01	691	0.2-	0.1-	1998 08 23	704	0.9-	0.1-	1999 11 17	704	0.5+	0.0
1995 10 01	691	0.2-	0.1-	1998 08 28	699	0.9+	0.4-	1999 11 17	704	0.5+	0.3+
1995 10 01	691	0.1-	0.1-	1998 08 28	699	0.5+	0.5+	1999 11 17	704	0.3-	0.4+
1997 02 14	886	0.1+	0.8-	1998 08 28	699	0.0	0.2+				
1997 02 14	886	0.8-	0.4+	1999 10 10	704	1.0-	0.1-				

(12373)* 1994 JE₉ = 1997 AP₂₂

Discovered 1994 May 15 by C. P. de Saint-Aignan at Palomar.

Id. G. V. Williams (*MPC* 29301)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	98.37202		(2000.0)	P	Q
<i>n</i>	0.25651404	ω	150.12964	-0.01557276	+0.99456034
<i>a</i>	2.4531755	Ω	118.80474	-0.93908193	+0.02082161
<i>e</i>	0.1119927	<i>i</i>	6.74982	-0.34334039	-0.10205979
<i>P</i>	3.84	<i>H</i>	14.0	<i>G</i> 0.15	<i>U</i> 1

Residuals in seconds of arc

1994 05 15	675	0.3+	0.3+	1998 05 22	704	0.3-	0.0	1998 07 02	699	0.1-	0.2+
1994 05 15	675	0.8-	0.7+	1998 05 22	704	0.3-	0.6+	1999 10 09	704	0.3-	0.2-
1994 05 16	675	0.7+	0.1+	1998 05 22	704	0.5-	0.1+	1999 10 09	704	0.3-	0.3+
1994 05 16	675	0.3-	0.5+	1998 05 22	704	0.4+	0.1+	1999 10 09	704	0.3-	0.1-
1994 06 07	675	0.5+	0.1+	1998 05 22	704	0.0	1.2+	1999 10 09	704	0.3-	0.0
1994 06 07	675	(2.9-	0.8-)	1998 05 24	704	0.8-	0.2-	1999 10 09	704	0.0	0.2+
1996 12 18	327	0.1+	1.1-	1998 05 24	704	0.8-	0.1+	1999 10 19	704	0.3+	0.2-
1996 12 18	327	0.3-	0.1+	1998 05 24	704	0.5-	0.3+	1999 10 19	704	0.1-	0.5-
1996 12 18	327	0.5+	0.5+	1998 05 24	704	0.1-	0.3-	1999 10 19	704	0.2-	0.1+
1997 01 09	691	0.1+	0.0	1998 05 24	704	1.6-	0.6-	1999 10 19	704	0.1-	0.5+
1997 01 09	691	0.1-	0.4-	1998 06 16	104	0.5+	0.4+	1999 10 19	704	0.0	0.2+
1997 01 09	691	0.1+	0.2-	1998 06 16	104	0.8+	0.3+	1999 11 03	703	0.1-	0.4+
1997 01 11	327	0.7+	0.1+	1998 06 16	104	0.8+	0.3+	1999 11 03	703	0.3-	0.9+
1997 01 11	327	0.4-	0.0	1998 06 24	704	0.3+	0.3+	1999 11 03	703	0.5-	0.4+
1997 01 11	327	0.1+	0.2-	1998 06 24	704	0.6+	0.2-	1999 11 03	703	0.8-	0.6+
1997 01 18	327	0.8+	0.2-	1998 06 24	704	0.2+	0.1+	1999 11 06	704	0.2-	0.0
1997 01 18	327	0.2-	0.3-	1998 06 24	704	0.5+	0.5+	1999 11 06	704	0.7+	0.5+
1997 01 18	327	0.4+	0.4-	1998 06 24	704	0.1+	0.4-	1999 11 06	704	0.4+	0.2+
1997 01 27	327	0.2+	1.0+	1998 06 26	704	0.3+	0.1+	1999 11 06	704	0.0	0.1+
1997 01 27	327	1.2-	1.2+	1998 06 26	704	(1.0-	2.7+)	1999 11 06	704	0.3-	0.3-
1997 01 27	327	0.5-	1.1+	1998 06 26	704	0.9+	0.0	1999 11 07	704	0.5+	1.2+

1997 02 06	327	0.3−	0.2+	1998 06 26	704	0.3−	0.0	1999 11 07	704	0.0	0.4−
1997 02 06	327	0.4+	0.7+	1998 07 02	699	0.4+	0.0	1999 11 07	704	0.0	0.4+
1997 02 06	327	0.3+	0.5+	1998 07 02	699	0.1+	0.2+				

(12374)* 1994 JG₉ = 1958 TP = 1974 OP = 1978 NV₂

Discovered 1994 May 15 by C. P. de Saint-Aignan at Palomar.

Id. G. V. Williams (*MPC* 25532)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	40.39079		(2000.0)		P		Q
<i>n</i>	0.24171782	ω	202.32149		+0.82506769		+0.54989575
<i>a</i>	2.5522915	Ω	123.66878		−0.49196369		+0.81221209
<i>e</i>	0.3073280	<i>i</i>	8.98060		−0.27791191		+0.19474645
<i>P</i>	4.08	<i>H</i>	14.0	<i>G</i>	0.15	<i>U</i>	1

Residuals in seconds of arc

1954 11 24	675	0.3+	0.7−	1998 04 23	704	0.7+	0.0	1998 05 28	704	0.3−	0.9−
1954 11 24	675	0.1−	0.9−	1998 04 23	704	0.1−	0.1−	1998 06 02	699	0.1+	0.1+
1958 10 13	760	0.6+	0.7−	1998 04 24	704	0.4+	0.3+	1998 06 02	699	0.1+	0.4−
1958 10 13	760	0.4+	0.5+	1998 04 24	704	0.2−	0.3−	1998 06 02	699	0.0	0.0
1974 07 25	095	(1.0+ 16.5−)		1998 04 24	704	0.7−	0.7+	1999 10 10	704	(1.9− 2.3+)	
1978 07 09	095	0.6−	1.1−	1998 04 24	704	0.6+	0.2+	1999 10 10	704	0.0	1.2+
1978 07 11	095	0.6+	0.8+	1998 05 01	699	0.5−	0.5−	1999 10 10	704	1.7+	0.2−
1986 05 04	675	1.7−	2.4+	1998 05 01	699	0.0	0.5+	1999 10 20	704	0.6+	0.2−
1986 05 04	675	0.0	1.1+	1998 05 01	699	0.3+	0.0	1999 10 20	704	0.4+	0.9−
1994 05 15	675	0.5+	0.7+	1998 05 23	704	0.1+	0.2−	1999 10 20	704	0.3+	1.1−
1994 05 15	675	0.3−	0.2+	1998 05 23	704	0.1−	0.7−	1999 10 20	704	0.1−	0.2−
1994 05 16	675	0.2+	0.6−	1998 05 23	704	0.0	0.9−	1999 10 20	704	0.2+	1.1−
1994 05 16	675	0.3+	0.3+	1998 05 23	704	0.4−	0.0	1999 11 05	704	0.2−	0.2−
1994 06 07	675	0.6−	0.3+	1998 05 23	704	0.5−	1.2−	1999 11 05	704	0.1−	0.0
1994 06 07	675	0.5−	0.4−	1998 05 27	699	0.0	0.4−	1999 11 05	704	0.3−	0.3−
1997 02 14	327	0.1−	0.4+	1998 05 27	699	0.5+	0.6−	1999 11 05	704	0.4−	0.1−
1997 02 14	327	1.0−	0.3+	1998 05 27	699	0.1+	0.5−	1999 11 16	703	0.4−	0.1+
1997 02 14	327	0.6−	0.2+	1998 05 28	704	0.0	1.1−	1999 11 16	703	0.2−	0.4+
1998 04 23	704	0.1−	0.5+	1998 05 28	704	0.3−	1.5−	1999 11 16	703	0.4−	0.1+
1998 04 23	704	0.2+	0.7+	1998 05 28	704	0.5+	0.9−	1999 11 16	703	0.3−	0.3+
1998 04 23	704	0.5+	0.4−	1998 05 28	704	0.6+	1.4−				

(12375)* 1994 NO₁ = 1991 RW₁₃

Discovered 1994 July 8 by E. W. Elst at Caussols.

Id. B. G. Marsden (*MPC* 23984)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	219.06126		(2000.0)		P		Q
<i>n</i>	0.29009534	ω	337.91950		−0.51554563		+0.85252604
<i>a</i>	2.2600023	Ω	260.95201		−0.77254490		−0.50592566
<i>e</i>	0.1781823	<i>i</i>	5.00128		−0.37065763		−0.13129578
<i>P</i>	3.40	<i>H</i>	13.9	<i>G</i>	0.15	<i>U</i>	2

Residuals in seconds of arc

1991 09 13	675	0.1−	1.6−	1998 09 26	704	(2.5+ 0.1+)		1998 10 29	704	0.3+	1.9+
1991 09 13	675	(0.3− 2.1−)		1998 09 26	704	0.9+	1.3−	1998 10 29	704	0.2−	0.6+
1991 09 15	675	0.3−	0.6−	1998 09 26	704	0.0	1.0−	1998 11 10	704	0.1−	0.7+
1991 09 15	675	1.1+	0.2+	1998 09 26	704	(2.1− 0.4−)		1998 11 10	704	1.3+	0.9+
1994 07 04	010	(3.0+ 0.3−)		1998 09 27	704	0.3+	0.3−	1998 11 10	704	0.9+	0.2−
1994 07 04	010	0.9+	0.7−	1998 09 27	704	0.6−	0.4−	1998 11 10	704	0.1+	0.2+
1994 07 04	010	(1.9+ 2.6−)		1998 09 27	704	0.7−	0.2+	1999 10 10	704	0.4+	0.6−
1994 07 05	010	(3.7+ 1.0+)		1998 09 27	704	0.1+	0.1+	1999 10 10	704	0.5+	0.4−
1994 07 05	010	(3.7+ 1.9+)		1998 09 27	704	0.9−	0.4+	1999 10 10	704	0.1+	0.6−
1994 07 05	010	(2.6+ 1.3+)		1998 10 12	699	0.5−	0.3+	1999 10 10	704	0.1+	1.6−
1994 07 08	010	0.1+	0.2−	1998 10 12	699	0.3−	0.9+	1999 10 21	704	0.2−	0.4+
1994 07 08	010	0.5−	0.2+	1998 10 12	699	0.2−	0.9+	1999 10 21	704	0.3−	1.3+
1994 07 08	010	0.5−	0.3+	1998 10 28	704	0.0	0.7−	1999 10 21	704	0.3+	0.8+
1994 07 14	010	(0.4+ 2.3+)		1998 10 28	704	0.2+	0.4−	1999 10 21	704	0.2−	1.0+
1994 07 14	010	0.5+	1.5+	1998 10 28	704	0.5+	1.0−	1999 11 17	704	0.0	0.8+
1994 07 14	010	1.2−	1.6+	1998 10 28	704	1.3−	0.6+	1999 11 17	704	0.4−	0.9+
1995 12 25	566	(0.9− 3.3−)		1998 10 28	704	0.9+	1.2+	1999 11 17	704	0.3−	0.4+

1995 12 25	566	(1.0− 3.4−)		1998 10 29	704	1.0−	1.2−	1999 11 17	704	1.2+	0.4+
1995 12 25	566	(1.1− 3.3−)		1998 10 29	704	1.1+	0.1−				
1998 09 26	704	0.5−	1.0−	1998 10 29	704	0.9−	0.3+				

(12376)* 1994 NW₁ = 1992 YF₃

Discovered 1994 July 8 by E. W. Elst at Caussols.

Id. B. G. Marsden (*MPC* 23984)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	134.40718		(2000.0)		P		Q
<i>n</i>	0.23936174	ω	89.22821		−0.73777918		+0.66976769
<i>a</i>	2.5690125	Ω	132.81589		−0.65598284		−0.68190899
<i>e</i>	0.2439604	<i>i</i>	6.59289		−0.15927460		−0.29395810
<i>P</i>	4.12	<i>H</i>	13.6	<i>G</i>	0.15	<i>U</i>	1

Residuals in seconds of arc

1989 01 08	675	1.0+	0.5+	1998 06 24	704	(2.5− 0.4+)		1999 10 02	704	0.7−	0.9−
1989 01 08	675	1.0+	1.4+	1998 06 26	704	0.3−	0.2−	1999 10 02	704	1.0−	0.5−
1992 12 31	385	0.9−	0.0	1998 06 26	704	0.6+	1.3+	1999 10 03	703	0.1−	0.0
1992 12 31	385	0.2−	0.1−	1998 06 26	704	1.7−	0.5−	1999 10 03	703	0.1+	0.0
1993 01 02	385	0.0	0.2−	1998 06 26	704	0.1−	0.4−	1999 10 03	703	0.1+	0.2+
1993 01 02	385	0.9−	0.3−	1998 07 15	610	0.4+	0.1−	1999 10 03	703	0.4−	0.5−
1994 07 05	010	1.7−	0.9+	1998 07 15	610	0.4+	0.2−	1999 10 09	704	0.1+	0.1−
1994 07 05	010	1.6−	1.3+	1998 07 15	610	0.2+	0.4−	1999 10 09	704	0.6+	0.0
1994 07 05	010	1.1−	0.7+	1998 07 15	610	0.1+	0.5−	1999 10 09	704	0.9+	0.4+
1994 07 08	010	0.9+	0.1−	1998 07 16	610	0.9+	0.9+	1999 10 09	704	0.6+	0.6+
1994 07 08	010	1.2+	0.4−	1998 07 16	610	0.3+	0.4+	1999 10 09	704	0.1+	0.1+
1994 07 08	010	1.6+	0.3−	1998 07 16	610	0.3−	0.2−	1999 11 02	703	0.3+	0.2−
1994 07 10	675	0.4−	0.9+	1998 07 16	610	0.9−	0.9−	1999 11 02	703	0.2−	0.6+
1994 07 10	675	0.5−	1.1+	1998 07 21	704	0.5+	0.5−	1999 11 02	703	0.3−	0.5+
1994 07 14	010	(0.2+ 3.4−)		1998 07 21	704	0.3−	0.7−	1999 11 02	703	2.5−	0.8+
1994 07 14	010	(0.0 4.0−)		1998 07 21	704	0.7+	0.8−	1999 11 06	704	0.2+	0.1+
1994 07 14	010	(0.8+ 3.1−)		1998 07 21	704	0.9+	1.3−	1999 11 06	704	0.9+	0.4−
1998 06 24	704	(0.1+ 2.1−)		1998 07 21	704	1.8+	0.2−	1999 11 06	704	0.3+	0.5+
1998 06 24	704	1.0−	1.0+	1999 10 02	704	0.4−	0.3−	1999 11 06	704	1.0+	0.2+
1998 06 24	704	1.1−	0.4+	1999 10 02	704	0.2+	0.1+	1999 11 06	704	0.9+	0.4−
1998 06 24	704	(2.6− 1.7+)		1999 10 02	704	0.1−	0.4−				

(12377)* 1994 PP = 1982 BS₄

Discovered 1994 Aug. 11 by E. F. Helin at Palomar.

Id. G. V. Williams (*MPC* 24113)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	10.54631		(2000.0)		P		Q
<i>n</i>	0.21440958	ω	53.65827		+0.89053533		−0.26646933
<i>a</i>	2.2646486	Ω	317.93382		−0.08250916		+0.70243293
<i>e</i>	0.2970656	<i>i</i>	33.38831		+0.44736905		+0.65998642
<i>P</i>	4.60	<i>H</i>	12.7	<i>G</i>	0.15	<i>U</i>	1

Residuals in seconds of arc

1982 01 26	381	2.4−	1.7−	1994 10 05	658	0.4−	0.1−	1996 03 11	608	0.1−	0.2+
1982 01 26	381	0.6+	0.4−	1994 10 06	658	0.3−	0.2−	1996 03 21	689	0.0	1.6+
1982 01 26	381	0.8−	0.8−	1994 10 06	658	0.4−	0.0	1996 03 22	689	0.9+	1.5+
1982 01 28	381	1.2−	0.1+	1994 10 06	658	0.3−	0.1−	1998 07 19	413	0.4+	0.8+
1994 08 11	675	(0.9− 3.8−)		1994 10 07	801	0.1−	0.2−	1998 07 19	413	0.5−	0.1−
1994 08 11	675	0.2+	1.6+	1994 10 07	801	0.0	0.0	1999 10 01	704	0.2+	0.2−
1994 08 11	675	(0.7− 3.9−)		1994 10 07	658	0.5−	0.2−	1999 10 01	704	0.9−	0.0
1994 08 13	657	(2.9+ 0.9+)		1994 10 07	658	0.6−	0.2−	1999 10 01	704	0.7−	0.7−
1994 08 13	657	0.6+	1.3+	1994 10 07	658	0.6−	0.2−	1999 10 01	704	1.2−	0.2−
1994 08 15	670	0.3+	0.6+	1994 10 08	675	(2.1+ 0.6−)		1999 10 01	704	1.3−	1.1−
1994 08 15	670	0.1−	1.1−	1994 10 08	675	0.1+	0.4−	1999 10 02	704	0.1−	0.4−
1994 08 15	670	0.3+	1.7−	1994 10 10	675	1.7+	0.7+	1999 10 02	704	0.1+	0.1−
1994 08 15	670	0.1+	1.2−	1994 10 10	675	0.6+	0.1+	1999 10 02	704	0.8−	0.3−
1994 08 16	657	0.2+	0.0	1994 10 30	801	0.2+	0.4−	1999 10 02	704	0.1−	0.1+
1994 08 16	657	1.4+	0.9−	1994 10 30	801	0.3+	0.3−	1999 10 02	704	0.2−	0.1−
1994 09 02	675	0.9+	1.3+	1994 11 03	801	0.5+	0.5−	1999 10 20	704	0.7+	0.6+
1994 09 02	675	(3.4+ 0.4+)		1994 11 03	801	0.1+	0.2−	1999 10 20	704	0.8+	0.3+

1994 09 04	675	0.0	1.7+	1995 12 23	801	1.1+	0.7-	1999 10 20	704	1.1+	0.5+
1994 09 04	675	0.5-	1.4+	1996 01 21	801	0.2+	0.7-	1999 10 20	704	1.6+	0.5+
1994 09 11	657	0.7-	0.9-	1996 01 21	801	0.5+	0.4-	1999 10 20	704	1.8+	1.6+
1994 09 29	658	0.4-	0.0	1996 02 04	608	1.0-	1.1+	1999 10 29	704	(1.7+ 3.0-)	
1994 09 29	658	0.3-	0.0	1996 02 04	608	0.9-	0.1-	1999 10 29	704	0.3+	1.2-
1994 09 29	658	0.3-	0.1-	1996 02 08	608	0.4+	0.1+	1999 10 29	704	(2.4- 1.0+)	
1994 10 02	657	1.0-	0.4+	1996 02 08	608	0.5+	0.1+	1999 10 29	704	(3.0- 2.6+)	
1994 10 02	657	0.1-	0.2-	1996 02 20	608	1.0+	0.4-	1999 10 30	704	0.3-	0.5+
1994 10 04	801	0.2-	0.0	1996 02 20	608	0.6+	0.3-	1999 10 30	704	0.2-	0.5+
1994 10 04	801	0.0	0.0	1996 02 29	608	0.1+	0.1+	1999 10 30	704	0.0	0.4+
1994 10 05	658	0.4-	0.1-	1996 02 29	608	0.4+	0.1+	1999 10 30	704	0.1-	0.0
1994 10 05	658	0.3-	0.1-	1996 03 11	608	0.0	0.2+	1999 10 30	704	0.1-	0.6+

(12378)* 1994 PK₁ = 1990 US₆ = 1998 JT₂

Discovered 1994 Aug. 15 by R. H. McNaught at Siding Spring.

Id. G. V. Williams (*MPC* 31965)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>		<i>P</i>		<i>Q</i>	
32.48724		(2000.0)		Williams	
<i>n</i>	0.22130445	ω	264.51729	+0.86164031	+0.42841589
<i>a</i>	2.7069233	Ω	69.87129	-0.26836262	+0.83964454
<i>e</i>	0.3300715	<i>i</i>	16.84571	-0.43076384	+0.33385158
<i>P</i>	4.45	<i>H</i>	14.0	<i>G</i>	0.15
				<i>U</i>	1

Residuals in seconds of arc

1990 10 21	675	1.0+	1.0-	1998 05 01	699	1.0-	0.6+	1998 06 16	704	1.5+	1.8+
1990 10 21	675	0.4+	1.5-	1998 05 01	699	0.2+	0.3-	1999 10 10	704	0.2-	0.1-
1994 08 15	413	0.3+	1.1-	1998 05 01	699	0.5+	1.4-	1999 10 10	704	0.6+	0.3+
1994 08 15	413	1.3+	0.0	1998 05 05	699	0.1-	0.9-	1999 10 10	704	0.3+	0.6+
1994 08 16	413	0.2-	0.1+	1998 05 05	699	0.3-	0.8-	1999 10 10	704	0.3-	1.5+
1994 08 16	413	0.2-	0.0	1998 05 05	699	0.3-	0.1-	1999 10 10	704	0.0	1.6+
1994 08 17	413	0.3-	0.1+	1998 05 22	704	1.1-	0.7+	1999 10 21	704	0.1-	0.1-
1994 08 17	413	0.4-	0.1+	1998 05 22	704	0.7+	0.2-	1999 10 21	704	0.0	0.1+
1994 08 26	413	0.2-	0.4+	1998 05 22	704	0.9+	0.8+	1999 10 21	704	0.4-	0.0
1994 08 26	413	0.2-	0.5+	1998 05 22	704	0.6-	0.9+	1999 10 21	704	0.4-	0.5+
1994 08 28	413	0.2-	0.2+	1998 05 22	704	0.6-	0.0	1999 10 21	704	0.7-	0.5-
1994 08 28	413	0.1-	0.3+	1998 05 24	704	0.1-	0.1+	1999 11 15	704	0.1+	0.4+
1994 09 17	413	0.3+	0.2-	1998 05 24	704	0.7+	0.3+	1999 11 15	704	0.3+	0.2+
1994 09 17	413	0.1+	0.5-	1998 05 24	704	0.9-	0.2-	1999 11 15	704	0.1+	0.3+
1998 04 23	704	0.3-	0.4+	1998 05 24	704	1.0+	0.8+	1999 11 15	704	0.2+	0.4+
1998 04 23	704	0.4+	0.3+	1998 05 24	704	1.5-	0.8-	1999 11 15	704	0.3+	0.3+
1998 04 23	704	1.2+	0.0	1998 05 25	699	0.2-	0.0	1999 11 17	704	0.3-	0.5-
1998 04 23	704	0.8+	0.2-	1998 05 25	699	0.1-	0.1-	1999 11 17	704	0.5-	0.4-
1998 04 23	704	0.1-	0.5-	1998 05 25	699	0.2-	0.3+	1999 11 17	704	0.1+	0.6-
1998 04 24	704	0.2+	0.2-	1998 06 16	704	0.2-	0.0	1999 11 17	704	0.4-	0.4-
1998 04 24	704	0.7-	0.1+	1998 06 16	704	0.1+	0.8-	1999 11 17	704	0.1-	0.4-
1998 04 24	704	0.1-	0.2-	1998 06 16	704	0.7+	0.2-				

(12379)* 1994 PQ₁₁ = 1995 WO₁ = 1998 NN₁

Discovered 1994 Aug. 10 by E. W. Elst at the European Southern

Observatory.

Id. G. V. Williams (*MPC* 26175), M. E. Sansaturio (unpublished)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>		<i>P</i>		<i>Q</i>	
180.29550		(2000.0)		Williams	
<i>n</i>	0.22122745	ω	240.82627	-0.97618384	+0.21229319
<i>a</i>	2.7075514	Ω	311.39243	-0.17255155	-0.88462376
<i>e</i>	0.0718493	<i>i</i>	3.41476	-0.13149550	-0.41517755
<i>P</i>	4.46	<i>H</i>	13.8	<i>G</i>	0.15
				<i>U</i>	1

Residuals in seconds of arc

1994 08 10	809	1.1+	2.6+	1998 07 26	704	0.1+	3.4-	1999 10 15	704	0.8+	0.1-
1994 08 10	809	0.9+	2.8+	1998 07 26	704	0.6-	1.5-	1999 10 15	704	0.9+	0.3-
1994 08 10	809	0.2-	2.6+	1998 07 26	704	1.2-	1.4-	1999 10 16	704	0.9+	0.3-
1994 08 11	809	0.8-	2.4+	1998 07 26	704	0.2-	0.3-	1999 10 16	704	0.3+	0.2-
1994 08 11	809	0.3-	1.6+	1998 07 26	704	2.7-	0.8+	1999 10 16	704	0.4+	0.1-
1994 08 11	809	0.6-	1.8+	1999 10 02	703	0.5-	0.1-	1999 10 16	704	1.3+	0.3-

1994 09 03	809	0.8-	0.8-	1999 10 02	703	0.1+	0.4-	1999 10 16	704	0.5+	0.4-
1994 09 03	809	1.5-	0.5-	1999 10 02	703	0.1-	0.5+	1999 10 18	691	0.3+	0.4-
1994 09 03	809	2.0-	0.9-	1999 10 02	703	0.3+	0.6+	1999 10 18	691	0.1+	0.2-
1994 09 04	809	0.0	0.7+	1999 10 03	704	0.4-	0.4+	1999 10 18	691	0.2-	0.1-
1994 09 04	809	1.4-	0.8+	1999 10 03	704	0.6+	1.1-	1999 10 21	704	0.4-	0.7-
1994 09 04	809	0.4-	0.4-	1999 10 03	704	0.6+	1.3-	1999 10 21	704	0.6-	0.5-
1995 11 16	966	0.6-	0.1+	1999 10 03	704	0.4+	1.1-	1999 10 21	704	0.7-	0.1+
1995 11 17	966	1.0+	2.0+	1999 10 03	704	0.6+	0.6-	1999 10 21	704	0.7-	0.7-
1995 11 17	966	1.7-	1.2+	1999 10 07	704	0.4-	0.0	1999 10 21	704	0.0	0.7+
1995 11 18	966	2.6+	0.8+	1999 10 07	704	0.6-	0.2-	1999 10 30	703	0.3+	0.7+
1995 11 18	966	0.8-	1.0+	1999 10 07	704	0.6-	0.6+	1999 10 30	703	0.3-	0.3+
1995 12 10	966	0.6-	1.0+	1999 10 07	704	0.1-	0.4+	1999 10 30	703	0.3+	0.4+
1995 12 10	966	0.8-	0.5+	1999 10 07	704	0.7-	0.2+	1999 10 30	703	0.1+	0.4+
1998 06 24	704	1.0+	0.7+	1999 10 10	704	0.5-	0.5-	1999 11 04	704	0.5+	0.1-
1998 06 24	704	0.3-	1.4-	1999 10 10	704	0.3+	0.6-	1999 11 04	704	0.4+	0.2-
1998 06 24	704	0.7-	0.2+	1999 10 10	704	0.6+	0.9-	1999 11 04	704	0.8+	0.1-
1998 06 24	704	1.5-	0.9+	1999 10 10	704	0.1-	0.9-	1999 11 04	704	0.4-	0.2-
1998 06 26	704	0.2+	0.5-	1999 10 10	704	0.3+	1.2-	1999 11 04	704	0.0	0.2+
1998 06 26	704	1.1-	1.9-	1999 10 11	106	1.0+	0.2+	1999 11 16	704	0.9-	0.2+
1998 06 26	704	0.1+	1.6-	1999 10 11	106	0.8+	1.1-	1999 11 16	704	0.2-	0.8-
1998 06 26	704	0.1-	1.4-	1999 10 11	106	0.1-	0.3-	1999 11 16	704	0.2+	0.0
1998 07 01	809	2.8+	1.4+	1999 10 15	704	0.1-	1.3-	1999 11 16	704	0.4-	0.3-
1998 07 01	809	2.5+	1.9+	1999 10 15	704	0.0	0.4-	1999 11 16	704	0.0	0.5-
1998 07 01	809	2.9+	1.7+	1999 10 15	704	0.4+	0.4-				

(12380)* 1994 PB₁₄ = 1979 FZ₂ = 1979 HD₂ = 1993 KB₃

Discovered 1994 Aug. 10 by E. W. Elst at the European Southern

Observatory.

Id. G. V. Williams (*MPC* 24748)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>		<i>P</i>		<i>Q</i>	
247.98418		(2000.0)		Williams	
<i>n</i>	0.21987135	ω	320.20337	-0.66766253	-0.74434106
<i>a</i>	2.7186729	Ω	171.65241	+0.70456769	-0.63764835
<i>e</i>	0.0629937	<i>i</i>	5.34845	+0.24043943	-0.19839596
<i>P</i>	4.48	<i>H</i>	13.3	<i>G</i>	0.15
				<i>U</i>	1

Residuals in seconds of arc

1979 03 31	095	0.2+	0.1-	1999 10 04	703	0.5-	0.2+	1999 10 19	704	0.4-	0.3-
1979 04 20	095	0.6-	1.3-	1999 10 04	703	0.1+	0.0	1999 10 19	704	0.2-	0.3-
1993 05 27	010	0.2-	0.8+	1999 10 04	703	0.3-	0.5-	1999 10 19	704	0.2-	0.5-
1993 05 27	010	(0.3+	2.4+)	1999 10 04	703	0.6-	0.3+	1999 11 02	703	0.7-	0.2+
1993 05 28	010	0.4+	1.3+	1999 10 07	704	0.9+	0.1+	1999 11 02	703	0.3-	0.3+
1993 05 29	010	0.1+	1.4+	1999 10 07	704	0.9-	1.3+	1999 11 02	703	1.0-	0.3+
1993 05 29	010	(0.4-	2.4+)	1999 10 07	704	0.8-	0.2-	1999 11 02	703	0.4-	1.2+
1993 05 29	010	0.3+	1.9+	1999 10 07	704	0.3+	0.7-	1999 11 05	704	0.0	0.2-
1994 08 10	809	0.7-	0.4+	1999 10 07	704	0.0	0.1+	1999 11 05	704	0.5+	0.1+
1994 08 10	809	0.8-	0.3+	1999 10 09	704	0.4+	0.6-	1999 11 05	704	0.2+	0.4+
1994 08 10	809	1.5-	1.0+	1999 10 09	704	0.3-	0.1+	1999 11 05	704	0.0	0.7+
1994 08 11	809	0.8-	1.3-	1999 10 09	704	0.2+	0.2-	1999 11 05	704	1.0+	0.4+
1994 08 11	809	1.6-	0.9-	1999 10 09	704	0.0	0.1+	1999 11 15	704	0.0	0.2+
1994 08 11	809	(2.2-	0.5-)	1999 10 09	704	0.1+	0.2+	1999 11 15	704	0.0	0.0
1994 09 03	809	0.6+	0.3-	1999 10 11	120	0.9+	0.5-	1999 11 15	704	0.1+	0.4+
1994 09 03	809	0.5+	0.3-	1999 10 11	120	0.4+	0.6-	1999 11 15	704	0.1-	0.5+
1994 09 03	809	1.0+	1.1-	1999 10 15	704	0.2-	0.1+	1999 11 15	704	0.0	0.4+
1994 09 04	809	1.4+	0.7-	1999 10 15	704	0.0	0.6-	1999 11 17	704	0.3+	1.4+
1994 09 04	809	1.4+	0.1-	1999 10 15	704	0.1+	0.7-	1999 11 17	704	0.5+	1.7+
1994 09 04	809	1.0+	0.7-	1999 10 15	704	0.2+	0.4-	1999 11 17	704	0.6-	0.6+
1997 04 11	704	0.0	0.7+	1999 10 19	704	0.2+	0.0	1999 11 17	704	0.2+	0.7+
1997 04 11	704	0.3+	0.2+	1999 10 19	704	0.1-	0.2-	1999 11 17	704	0.3-	1.1+

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	224.09818		(2000.0)	P	Q
<i>n</i>	0.21364586	ω	318.14290	-0.80702382	-0.59030790
<i>a</i>	2.7712331	Ω	185.74442	+0.57497567	-0.77940911
<i>e</i>	0.1001126	<i>i</i>	9.07302	+0.13459391	-0.20990001
<i>P</i>	4.61	<i>H</i>	13.4	<i>G</i> 0.15	<i>U</i> 1

Residuals in seconds of arc

1981 10 24	675	(0.1- 3.1+)	1999 10 04	691	0.2+ 1.0-	1999 10 09	704	0.2+ 0.5-
1981 10 25	675	0.2- 2.1+	1999 10 04	704	0.1- 0.5+	1999 10 09	704	0.5- 0.1-
1994 08 12	809	1.0+ 0.0	1999 10 04	704	0.2+ 0.1-	1999 10 09	704	0.4- 0.1-
1994 08 12	809	1.7+ 0.9+	1999 10 04	691	0.1+ 0.8-	1999 10 09	704	0.1- 0.2-
1994 08 12	809	1.0+ 0.5-	1999 10 04	704	0.2- 0.4-	1999 10 09	704	0.2- 0.3-
1994 08 13	809	(1.4+ 2.1+)	1999 10 04	704	0.3- 0.4-	1999 10 11	106	0.0 0.1-
1994 08 13	809	1.5+ 1.3+	1999 10 04	691	0.2+ 0.8-	1999 10 11	106	0.3+ 1.7-
1994 08 13	809	0.7+ 0.9+	1999 10 04	704	0.2- 0.0	1999 10 11	106	0.3+ 1.0+
1994 09 05	809	0.7- 0.7+	1999 10 05	704	0.1+ 0.5-	1999 10 15	704	0.1- 0.2-
1994 09 05	809	0.5- 0.0	1999 10 05	704	0.0 0.8-	1999 10 15	704	0.1- 0.3-
1994 09 05	809	1.0- 0.7-	1999 10 05	704	0.1+ 0.4-	1999 10 15	704	0.3+ 0.3-
1994 09 06	809	1.5- 0.1+	1999 10 05	704	0.2+ 0.7-	1999 10 15	704	0.3- 0.3-
1994 09 06	809	1.4- 0.5-	1999 10 05	704	0.2- 0.5-	1999 10 15	704	0.4- 0.0
1994 09 06	809	1.2- 0.6-	1999 10 07	703	0.1- 0.3-	1999 10 30	703	0.9+ 0.7+
1997 03 10	809	0.4+ 1.6-	1999 10 07	703	0.1- 0.2-	1999 10 30	703	0.1+ 0.3+
1997 03 10	809	0.1- 0.7-	1999 10 07	703	0.1- 0.0	1999 10 30	703	0.1- 0.2-
1997 03 10	809	0.1- 1.1-	1999 10 07	703	0.2+ 0.1+	1999 10 30	703	0.3- 0.4+
1997 03 11	809	0.0 0.9-	1999 10 07	704	0.1- 0.8-	1999 11 06	704	0.4+ 0.5+
1997 03 11	809	0.5- 1.8-	1999 10 07	704	0.0 0.9-	1999 11 06	704	0.6+ 0.4+
1997 03 11	809	0.5- 1.4-	1999 10 07	704	0.1+ 0.7-	1999 11 06	704	0.3+ 1.1+
1997 03 31	704	0.1+ 0.4+	1999 10 07	704	0.2- 0.2-	1999 11 06	704	0.8+ 0.9+
1997 03 31	704	0.4- 1.5+	1999 10 07	704	0.4+ 0.9-	1999 11 06	704	0.4+ 0.5+

(12382)* 1994 SO₅ = 1992 EX₃₅

Discovered 1994 Sept. 28 by Spacewatch at Kitt Peak.

Id. G. V. Williams (*MPC* 24234)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	84.61642		(2000.0)	P	Q
<i>n</i>	0.21164026	ω	165.31361	+0.43284586	+0.90137037
<i>a</i>	2.7887132	Ω	130.33283	-0.82882545	+0.40370943
<i>e</i>	0.0427411	<i>i</i>	0.99696	-0.35453186	+0.15668489
<i>P</i>	4.66	<i>H</i>	14.5	<i>G</i> 0.15	<i>U</i> 1

Residuals in seconds of arc

1992 03 06	809	0.4- 0.5-	1997 04 05	704	0.2- 0.2+	1999 10 21	704	0.6+ 0.2+
1992 04 06	809	0.1- 0.4-	1997 04 06	704	0.0 0.5+	1999 10 21	704	0.3+ 0.9-
1994 09 28	691	0.4- 0.2+	1997 04 06	704	0.0 0.4+	1999 11 04	704	0.7+ 0.3-
1994 09 28	691	0.2- 0.1-	1997 04 07	704	0.4+ 1.1-	1999 11 04	704	0.2+ 0.6-
1994 09 28	691	0.0 0.0	1997 04 07	704	(1.5- 2.2+)	1999 11 04	704	0.7+ 0.4+
1994 10 04	691	0.1- 0.1+	1997 04 07	704	(0.4+ 2.4+)	1999 11 04	704	0.7+ 0.2-
1994 10 04	691	0.1+ 0.0	1997 04 07	704	0.6- 0.7-	1999 11 04	704	0.1- 0.2+
1994 10 04	691	0.0 0.3+	1999 10 05	704	1.1+ 0.1+	1999 11 12	704	0.2- 0.2-
1994 10 12	691	0.1- 0.1+	1999 10 05	704	0.7+ 0.0	1999 11 12	704	0.8- 0.1+
1994 10 12	691	0.0 0.2+	1999 10 05	704	0.9+ 0.7-	1999 11 12	704	0.5- 0.3-
1994 10 12	691	0.1+ 0.4+	1999 10 05	704	0.6+ 0.4+	1999 11 12	704	0.4- 0.1+
1995 12 22	566	0.2+ 0.6+	1999 10 05	704	0.1+ 0.2+	1999 11 12	704	1.2- 0.5-
1995 12 22	566	0.1+ 0.0	1999 10 10	704	0.4- 0.1+	1999 11 17	704	1.1+ 0.7-
1995 12 22	566	0.0 0.1-	1999 10 10	704	0.2- 0.3+	1999 11 17	704	1.2- 0.6-
1997 04 03	704	0.0 1.4+	1999 10 10	704	1.4- 1.9+	1999 11 17	704	0.3- 0.2+
1997 04 03	704	0.3+ 0.8+	1999 10 10	704	1.3- 1.3+	1999 11 17	704	0.8+ 0.2-
1997 04 05	704	1.3+ 1.2+	1999 10 21	704	0.5- 0.2+			

(12383)* 1994 TF₁ = 1989 UP₆ = 1998 KV₃₅

Discovered 1994 Oct. 2 by K. Endate and K. Watanabe at Kitami.

Id. A. Doppler (*MPC* 33245), G. V. Williams (*ibid.*)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	342.20502		(2000.0)	P	Q
<i>n</i>	0.18261525	ω	298.91965	+0.98889097	+0.08771044
<i>a</i>	3.0768857	Ω	56.29043	-0.02172142	+0.88395203
<i>e</i>	0.1305678	<i>i</i>	8.29457	-0.14704702	+0.45927735
<i>P</i>	5.40	<i>H</i>	13.5	<i>G</i> 0.15	<i>U</i> 2

Residuals in seconds of arc

1989 10 26	033	1.0+ 0.5+	1998 05 22	704	0.2+ 0.3-	1999 09 11	704	1.0- 0.4+
1989 10 26	033	1.3+ 0.3+	1998 05 22	704	0.0 1.0-	1999 09 11	704	0.1- 0.6-
1989 10 28	033	0.2- 0.4-	1998 05 22	704	0.2+ 0.9+	1999 09 29	704	0.7- 0.1+
1992 04 26	691	1.2- 0.7-	1998 05 22	704	0.1+ 0.2+	1999 09 29	704	0.4- 0.3-
1992 04 26	691	0.9- 0.4-	1998 05 24	704	0.6+ 0.4-	1999 09 29	704	0.2- 1.1-
1994 10 02	400	1.6- 0.2+	1998 05 24	704	0.9- 1.1+	1999 09 29	704	0.5+ 1.9-
1994 10 02	400	0.2- 0.3+	1998 05 24	704	0.4+ 0.5-	1999 09 30	704	0.8+ 0.6+
1994 10 03	400	0.2- 0.5-	1998 05 24	704	1.3+ 1.2+	1999 09 30	704	0.4+ 0.3-
1994 10 03	400	1.0- 0.8+	1999 09 09	699	0.4+ 0.4-	1999 09 30	704	0.3+ 0.6+
1994 10 07	400	(2.8+ 1.1+)	1999 09 09	699	0.4- 0.2-	1999 09 30	704	0.6+ 0.3+
1994 10 07	400	(3.4+ 0.9-)	1999 09 09	699	0.1- 0.4-	1999 09 30	704	0.1+ 0.3-
1997 04 06	327	0.7+ 0.2-	1999 09 11	704	0.1+ 0.1+	1999 11 10	704	2.0+ 0.7-
1997 04 06	327	0.3+ 0.9+	1999 09 11	704	0.4- 0.7+	1999 11 10	704	0.7- 0.7+
1997 04 06	327	0.4- 0.9+	1999 09 11	704	0.3+ 0.7+	1999 11 10	704	0.0 1.3+

**(12384)* 1994 TC₂ = 1968 QV₁ = 1978 NQ₅ = 1989 SR₁₃ = 1997 EA₄₄
= 1999 RG₁₄₆**

Discovered 1994 Oct. 10 by V. S. Casulli and S. Valentini at Colleverde di

Guidonia.

Id. G. V. Williams (*MPC* 36338)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	17.06277		(2000.0)	P	Q
<i>n</i>	0.19074848	ω	350.21579	+0.68730598	+0.71905193
<i>a</i>	2.9887894	Ω	323.08268	-0.65432210	+0.55142667
<i>e</i>	0.0907808	<i>i</i>	9.85766	-0.31539355	+0.42295740
<i>P</i>	5.17	<i>H</i>	12.8	<i>G</i> 0.15	<i>U</i> 1

Residuals in seconds of arc

1968 08 31	095	1.8+ 2.3-	1999 08 08	699	0.8- 0.8+	1999 09 29	704	0.4- 0.1-
1978 07 10	675	0.6- 0.4- Y	1999 08 08	699	1.1- 0.9+	1999 09 29	704	0.3+ 0.2+
1978 07 11	675	(2.7- 8.4+) Y	1999 08 08	699	0.7- 0.7+	1999 09 29	704	0.4- 0.7-
1978 07 13	675	1.3+ 2.1- Y	1999 08 22	699	0.6- 0.8+	1999 09 29	704	0.1+ 0.6-
1989 09 28	493	(4.4- 0.0)	1999 08 22	699	0.2+ 0.4+	1999 09 29	704	0.7- 0.7-
1989 09 28	493	(3.8- 0.3-)	1999 08 22	699	0.2- 0.5+	1999 10 02	703	0.1- 0.2+
1989 10 03	493	0.4- 1.8-	1999 09 05	699	0.0 0.6+	1999 10 02	703	0.0 0.5+
1989 10 03	493	0.4- 1.2-	1999 09 05	699	0.1+ 0.2+	1999 10 02	703	0.3- 0.4+
1994 10 04	033	0.4+ 0.5-	1999 09 05	699	0.3+ 0.8+	1999 10 02	703	0.6- 0.4+
1994 10 06	033	0.8+ 0.9-	1999 09 07	704	0.1+ 0.0	1999 10 02	704	0.0 0.4+
1994 10 07	033	1.3+ 0.7-	1999 09 07	704	0.3+ 0.3+	1999 10 02	704	0.2- 0.5+
1994 10 10	596	(4.8+ 0.5+)	1999 09 07	704	0.1- 0.1+	1999 10 02	704	0.7- 0.5-
1994 10 10	596	(3.9+ 0.4+)	1999 09 07	704	0.1+ 0.6+	1999 10 02	704	0.7- 1.0+
1994 10 10	596	1.6+ 0.0	1999 09 07	704	0.1+ 0.2+	1999 10 02	704	0.0 0.6-
1994 10 11	596	1.3+ 1.2+	1999 09 09	704	0.3+ 0.3+	1999 11 04	703	0.1+ 0.2+
1994 10 11	596	1.9- 1.4+	1999 09 09	704	0.6+ 0.1-	1999 11 04	703	0.4+ 0.1-
1994 10 11	596	0.4- 1.2+	1999 09 09	704	0.3- 0.1+	1999 11 04	703	0.8- 0.2+
1994 10 12	596	(3.0+ 0.1-)	1999 09 09	704	0.2- 0.6-	1999 11 04	703	0.1+ 0.2+
1994 10 12	596	(2.7+ 0.4-)	1999 09 09	704	1.2- 1.0-	1999 11 07	704	0.3+ 0.3+
1994 10 12	596	(3.4+ 0.9-)	1999 09 14	704	0.1+ 0.2+	1999 11 07	704	0.0 0.0
1997 03 11	704	0.9+ 0.3+	1999 09 14	704	0.0 0.5+	1999 11 07	704	0.0 0.7-
1997 03 11	704	0.2+ 0.3-	1999 09 14	704	0.0 0.4+	1999 11 07	704	0.2- 0.8-
1997 03 12	704	0.0 0.3+	1999 09 14	704	0.2+ 0.2+	1999 11 07	704	0.9+ 0.4-
1997 03 12	704	0.2- 1.0+	1999 09 14	704	0.2- 0.2+			

(12385)* 1994 UO = 1989 WU₆ = 1989 WT₇ = 1997 LT₆

Discovered 1994 Oct. 31 by T. Kobayashi at Oizumi.

Id. G. V. Williams (*MPC* 30276)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	13.65286	(2000.0)	P		Q	
<i>n</i>	0.19990012	ω	237.67947	+0.91023861	-0.41324340	
<i>a</i>	2.8968589	Ω	146.70795	+0.39423500	+0.84536396	
<i>e</i>	0.0872004	<i>i</i>	2.75397	+0.12666660	+0.33851096	
<i>P</i>	4.93	<i>H</i>	13.5	<i>G</i>	0.15	<i>U</i>
Residuals in seconds of arc						
1989 11 22	494 (2.7+ 2.5-)	1997 06 07	809 (0.4+ 3.8+)	1999 10 21	704 0.6- 0.5+	
1989 11 25	494 0.7+ 1.8+	1997 06 07	809 (0.8+ 3.9+)	1999 10 30	703 0.1- 0.0	
1994 10 31	411 0.4- 0.6+	1997 06 08	809 (1.3+ 4.9+)	1999 10 30	703 0.4- 1.9-	
1994 10 31	411 1.3- 0.7-	1997 06 08	809 (1.4+ 3.8+)	1999 10 30	703 1.7+ 0.7-	
1994 11 01	411 0.4+ 1.0-	1997 06 08	809 (0.8+ 3.6+)	1999 10 30	703 0.1+ 0.1-	
1994 11 01	411 1.1+ 1.9-	1998 07 25	684 0.1- 0.5-	1999 11 04	704 0.3- 0.2+	
1994 11 03	411 0.6+ 0.5-	1998 07 25	684 0.3- 0.6-	1999 11 04	704 0.1+ 0.0	
1994 11 03	411 0.8- 0.1+	1998 07 25	684 0.1- 0.8-	1999 11 04	704 0.3+ 0.4+	
1994 11 09	411 1.0+ 0.8+	1998 07 26	684 0.2- 0.6-	1999 11 04	704 0.0 0.2-	
1994 11 09	411 0.7- 0.0	1998 07 26	684 0.2- 0.4-	1999 11 04	704 0.4+ 0.1+	
1994 11 27	411 0.4- 0.4+	1998 08 15	684 0.6+ 0.9-	1999 11 15	704 0.2- 0.4-	
1994 11 27	411 0.1- 1.0+	1998 08 15	684 0.6+ 0.9-	1999 11 15	704 0.0 0.3-	
1994 11 28	675 0.1+ 1.4+	1998 08 17	704 1.6+ 0.0	1999 11 15	704 0.1- 0.1-	
1994 11 28	675 0.4- 0.5+	1998 08 17	704 0.5- 0.9+	1999 11 15	704 0.1- 0.1-	
1994 12 02	691 0.6- 0.2-	1998 08 17	704 0.9- 0.2+	1999 11 15	704 0.1- 0.1+	
1994 12 02	691 0.6- 0.1+	1998 08 17	704 0.6- 0.1+	1999 11 17	704 0.6+ 0.2-	
1994 12 02	691 0.6- 0.1+	1998 08 17	684 0.5+ 0.4-	1999 11 17	704 0.3+ 0.4-	
1996 02 16	566 0.5- 1.3-	1998 08 17	684 0.6+ 0.3-	1999 11 17	704 0.1+ 1.0-	
1996 02 16	566 0.4- 1.4-	1999 10 21	704 1.2+ 0.2-	1999 11 17	704 0.6- 0.4-	
1996 02 16	566 0.5- 1.4-	1999 10 21	704 0.1+ 0.1+	1999 11 17	704 0.7- 0.4+	
1997 06 07	809 (1.7+ 3.7+)	1999 10 21	704 0.2+ 0.2+			

(12386)* 1994 UK₅ = 1991 CO₆ = 1992 JZ₄

Discovered 1994 Oct. 28 by Spacewatch at Kitt Peak.

Id. E. Bowell (*MPC* 28590), G. V. Williams (*ibid.*)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	341.56333	(2000.0)	P		Q	
<i>n</i>	0.20569815	ω	0.13711	+0.59121629	-0.80530392	
<i>a</i>	2.8421639	Ω	53.61972	+0.73990905	+0.51979751	
<i>e</i>	0.1479927	<i>i</i>	3.14330	+0.32093286	+0.28512480	
<i>P</i>	4.79	<i>H</i>	13.4	<i>G</i>	0.15	<i>U</i>
Residuals in seconds of arc						
1989 09 02	675 0.6+ 1.5-	1997 05 04	809 1.1+ 0.1-	1999 11 03	704 0.5- 0.1-	
1989 09 02	675 0.4+ 0.9+	1997 05 04	809 0.9- 1.0+	1999 11 03	704 0.3- 0.2+	
1989 09 27	675 0.3- 1.0+	1997 05 04	809 (1.1+ 2.2+)	1999 11 03	704 0.0 0.1-	
1989 09 27	675 0.8- 0.4+	1998 07 16	699 1.0+ 0.8-	1999 11 09	704 0.3- 0.3-	
1991 02 10	675 1.0+ 0.0	1998 07 16	699 1.2+ 0.2-	1999 11 09	704 0.4- 0.5-	
1991 02 10	675 0.9+ 1.4+	1998 07 16	699 1.0+ 0.3+	1999 11 09	704 0.3- 0.7-	
1992 05 07	691 0.0 0.5-	1999 10 15	704 0.5+ 1.5+	1999 11 09	704 0.4- 0.8-	
1992 05 07	691 0.3+ 1.1+	1999 10 15	704 1.1+ 0.3+	1999 11 09	704 0.5- 0.9-	
1992 05 07	691 0.7- 0.2-	1999 10 15	704 0.7+ 0.7+	1999 11 12	704 0.3+ 0.7-	
1994 10 05	033 0.8- 0.5+	1999 10 15	704 0.6+ 1.3+	1999 11 12	704 0.3- 0.4-	
1994 10 06	033 1.2- 0.6+	1999 10 15	704 0.5- 0.4+	1999 11 12	704 0.1+ 0.3-	
1994 10 07	033 1.0- 1.2+	1999 10 22	704 0.8+ 0.4-	1999 11 12	704 0.0 0.2-	
1994 10 08	691 0.0 0.8-	1999 10 22	704 0.5+ 0.4-	1999 11 12	704 0.1- 0.0	
1994 10 08	691 0.1- 0.3-	1999 10 22	704 1.0+ 0.7-	1999 11 12	732 0.4- 0.4+	
1994 10 08	691 0.0 0.2-	1999 10 22	704 0.7+ 0.6-	1999 11 12	732 0.6- 0.6+	
1994 10 28	691 0.3+ 0.6+	1999 10 22	704 0.2+ 0.3-	1999 11 12	732 0.3- 0.6+	
1994 10 28	691 0.1+ 0.2+	1999 10 28	327 0.2+ 0.5-	1999 11 15	732 0.6+ 0.0	
1994 10 28	691 0.0 0.4+	1999 10 28	327 0.4+ 0.3-	1999 11 15	732 0.2- 0.2+	
1994 11 01	691 0.3- 0.1+	1999 10 28	327 0.1+ 0.2+	1999 11 15	732 0.1- 0.2+	
1994 11 01	691 0.4- 0.1+	1999 10 29	327 0.0 0.2-	1999 11 16	704 0.4+ 0.2-	
1994 11 01	691 0.3- 0.5+	1999 10 29	327 0.3- 0.1+	1999 11 16	704 0.3+ 0.3-	
1997 05 03	809 (1.7- 2.6+)	1999 10 29	327 0.4+ 0.1+	1999 11 16	704 0.0 0.2-	
1997 05 03	809 (2.0- 2.2+)	1999 11 03	704 0.8- 0.1-	1999 11 16	704 0.1+ 0.4-	
1997 05 03	809 1.5- 0.5+	1999 11 03	704 0.3- 0.2-	1999 11 16	704 0.4- 0.6-	

(12387)* 1994 UT₁₁ = 1976 UP₅

Discovered 1994 Oct. 28 by K. Endate and K. Watanabe at Kitami.

Id. G. V. Williams (unpublished)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Nakano

<i>M</i>	317.81574		(2000.0)	P		Q	
<i>n</i>	0.21758909	ω	232.62930	-0.21701000	-0.94894880		
<i>a</i>	2.7376503	Ω	231.50583	+0.96231702	-0.16859913		
<i>e</i>	0.0621497	<i>i</i>	17.00656	+0.16386765	-0.26659052		
<i>P</i>	4.53	<i>H</i>	12.6	<i>G</i>	0.15	<i>U</i>	2
Residuals in seconds of arc							
1976 10 30	095 (8.9+ 8.9+)		1998 08 19	704 1.4-	0.5+	1998 09 19	704 0.1-
1994 10 03	675 1.0+ 1.4-		1998 08 19	704 0.1+	0.1-	1998 09 23	704 0.2+
1994 10 03	675 0.8+ 2.1-		1998 08 19	704 0.5+	0.0	1998 09 23	704 0.6-
1994 10 28	400 0.4+ 1.6-		1998 08 19	704 1.3-	0.1+	1998 09 23	704 0.4+
1994 10 28	400 0.3- 0.2-		1998 08 21	426 0.2-	0.3-	1998 09 23	704 0.5+
1994 11 03	400 1.1+ 0.9+		1998 08 21	426 0.0	0.1-	1998 10 18	699 0.1-
1994 11 03	400 1.3- 0.5-		1998 08 21	426 0.4-	0.2-	1998 10 18	699 1.0-
1994 11 29	400 0.1+ 1.0+		1998 08 23	426 0.1-	0.0	1998 10 18	699 0.2-
1994 11 29	400 1.6- 0.5-		1998 08 23	426 0.0	0.1+	1999 10 10	704 0.2+
1997 08 01	688 0.3+ 0.3-		1998 08 23	426 0.1+	0.1+	1999 10 10	704 0.2-
1997 08 01	688 0.3- 0.1-		1998 08 24	704 0.4-	0.2-	1999 10 10	704 0.4-
1998 05 22	688 0.2+ 0.5+		1998 08 24	704 0.4+	0.2-	1999 10 10	704 0.6-
1998 05 22	688 0.2+ 0.5+		1998 08 24	704 0.2-	0.2+	1999 10 10	704 0.5+
1998 05 22	688 0.1+ 0.5+		1998 08 24	704 0.3-	0.3+	1999 10 21	704 0.0
1998 06 30	704 0.9+ 0.0		1998 08 24	704 0.0	0.3+	1999 10 21	704 0.0
1998 06 30	704 1.1+ 1.0-		1998 08 27	704 0.2-	0.1+	1999 10 21	704 0.8+
1998 06 30	704 (1.4+ 2.2-)		1998 08 27	704 1.5+	1.6+	1999 11 04	704 0.1-
1998 06 30	704 0.4- 2.1-		1998 08 27	704 (2.9- 0.2+)		1999 11 04	704 0.2+
1998 06 30	704 (2.3- 0.1+)		1998 08 27	704 0.5-	0.0	1999 11 04	704 0.3+
1998 07 01	699 0.0 0.1-		1998 09 19	704 0.5-	0.4+	1999 11 04	704 0.2+
1998 07 01	699 1.2+ 0.3-		1998 09 19	704 0.0	0.1-	1999 11 04	704 0.1+
1998 07 01	699 0.8+ 0.4+		1998 09 19	704 0.5-	0.3+		
1998 08 19	704 0.7- 0.4+		1998 09 19	704 0.5+	0.0		

(12388)* 1994 VT₆ = 1997 GH₂₃

Discovered 1994 Nov. 1 by K. Endate and K. Watanabe at Kitami.

Id. G. V. Williams (*MPC* 29622)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	342.16013	(2000.0)	P		Q	
<i>n</i>	0.19649257	ω	328.04253	+0.73721235	-0.67370083	
<i>a</i>	2.9302542	Ω	74.40127	+0.63060669	+0.65872657	
<i>e</i>	0.1222874	<i>i</i>	3.06092	+0.24259669	+0.33497238	
<i>P</i>	5.02	<i>H</i>	13.5	<i>G</i>	0.15	<i>U</i>
Residuals in seconds of arc						
1994 11 01	400 1.4+ 0.4+	1997 05 05	704 0.7+ 0.5+	1999 10 20	704 0.2- 0.7+	
1994 11 01	400 1.3- 0.9-	1997 05 05	704 0.7+ 0.8+	1999 10 20	704 0.1+ 0.7+	
1994 11 03	400 1.0+ 0.3+	1997 05 05	704 0.7+ 0.8+	1999 10 20	704 0.4- 0.2+	
1994 11 03	400 0.9- 0.2-	1997 05 05	704 0.7+ 0.6+	1999 11 04	704 0.3+ 0.2+	
1994 11 04	675 0.6+ 0.3-	1998 06 26	704 1.4- 1.6-	1999 11 04	704 0.3+ 0.1+	
1994 11 06	675 1.3+ 0.7-	1998 06 26	704 0.1- 0.7-	1999 11 04	704 0.4+ 0.4+	
1994 11 06	675 0.2+ 0.8-	1998 06 26	704 1.5+ 0.5+	1999 11 04	704 0.7+ 0.6+	
1994 11 07	399 1.5- 0.3-	1998 06 26	704 (2.5+ 0.9-)	1999 11 04	704 0.3+ 0.5+	
1994 11 07	399 0.2+ 0.1-	1998 07 01	809 (4.5- 1.4-)	1999 11 09	704 0.4+ 0.2-	
1997 04 06	704 0.9+ 0.2-	1998 07 01	809 (4.3- 2.1-)	1999 11 09	704 0.3+ 0.3-	
1997 04 06	704 0.3- 1.3+	1998 07 01	809 (3.2- 1.7-)	1999 11 09	704 0.0 0.4-	
1997 04 07	809 1.8- 0.3-	1998 07 03	699 0.5- 1.0+	1999 11 12	704 0.0 0.1-	
1997 04 07	809 1.8- 0.6-	1998 07 03	699 0.2+ 0.1+	1999 11 12	704 0.2- 0.2-	
1997 04 07	809 (2.3- 0.3+)	1998 07 03	699 0.3+ 0.2+	1999 11 12	704 0.1- 0.1+	
1997 04 08	809 0.5+ 0.8-	1999 10 02	703 0.3+ 0.8+	1999 11 12	704 0.3- 0.3+	
1997 04 08	809 0.1- 0.5-	1999 10 02	703 0.5+ 0.5+	1999 11 12	704 0.3- 0.2+	
1997 04 08	809 0.8- 1.0-	1999 10 02	703 0.2- 0.5+	1999 11 15	704 2.7- 0.9+	
1997 04 08	704 0.7- 0.5+	1999 10 02	703 0.2- 0.1+	1999 11 15	704 0.3- 0.5+	
1997 04 08	704 0.0 0.7+	1999 10 10	704 0.1- 0.1-	1999 11 15	704 0.6- 0.8+	

1997 04 30	704	1.1+	1.4+	1999 10 10	704	0.2-	0.1-	1999 11 15	704	0.7-	0.2+
1997 04 30	704	0.2+	0.3+	1999 10 10	704	0.1+	0.1+	1999 11 17	704	0.2+	0.4+
1997 04 30	704	0.6+	0.9+	1999 10 10	704	0.4-	0.0	1999 11 17	704	0.4+	0.4-
1997 04 30	704	0.2+	0.8+	1999 10 10	704	0.5-	0.3+	1999 11 17	704	0.3+	0.2-
1997 04 30	704	0.6+	0.0	1999 10 20	704	0.1+	0.4+	1999 11 17	704	0.3-	0.1-
1997 05 05	704	0.7+	0.5+	1999 10 20	704	0.2+	0.4+	1999 11 17	704	0.1-	0.3+

(12389)* 1994 WU = 1983 VY₄ = 1998 QY₇₁

Discovered 1994 Nov. 25 by T. Kobayashi at Oizumi.

Id. S. Nakano (*MPC* 32461), G. V. Williams (*ibid.*)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

M	201.85858		(2000.0)		P	Q	
n	0.18013994	ω	299.14004	-0.95155974		+0.21776863	
a	3.1050079	Ω	254.14809	-0.13813481		-0.93347476	
e	0.1532968	i	13.03998	-0.27468681		-0.28495912	
P	5.47	H	12.5	G	0.15	U	1

Residuals in seconds of arc

1983 11 08	381	0.0	1.0+	1998 08 27	704	1.2-	0.4+	1999 10 05	704	0.1+	0.5-
1994 11 25	411	0.4+	0.2+	1998 08 27	704	1.4-	0.1-	1999 10 05	704	1.1-	0.3+
1994 11 25	411	0.1+	0.3-	1998 08 27	704	0.5-	0.2+	1999 10 05	704	0.6-	1.0-
1994 11 26	411	1.0-	0.2-	1998 09 16	411	1.0-	0.3-	1999 10 05	704	0.1-	0.2-
1994 11 26	411	1.2-	0.2-	1998 09 16	411	1.2-	0.0	1999 10 12	704	0.6-	0.6-
1994 12 03	098	(0.8-	3.0-)	1998 09 19	704	0.3+	0.3+	1999 10 12	704	0.1-	0.1-
1994 12 03	098	(0.6-	3.1-)	1998 09 19	704	1.5-	0.1-	1999 10 12	704	0.1-	0.3-
1994 12 04	098	1.7-	1.7-	1998 09 19	704	0.7+	1.7+	1999 10 12	704	0.4-	0.1-
1994 12 04	098	(1.0+	2.1+)	1998 09 19	704	0.2+	0.9+	1999 10 12	704	0.2+	0.1+
1994 12 04	411	0.2-	0.2+	1998 09 21	704	1.0+	0.4-	1999 10 13	704	0.3-	0.4-
1994 12 04	411	0.2+	0.2+	1998 09 21	699	0.3+	0.2+	1999 10 13	704	0.1+	0.5-
1994 12 04	098	1.3+	0.4+	1998 09 21	704	1.1+	0.1+	1999 10 13	704	0.2+	0.1+
1994 12 21	411	0.9+	0.9+	1998 09 21	699	1.1+	1.0-	1999 10 13	704	0.3-	0.5+
1994 12 21	411	1.3+	0.1+	1998 09 21	704	0.0	1.2-	1999 10 13	704	0.0	0.6+
1998 08 19	704	0.8-	0.3+	1998 09 21	699	0.3+	1.0+	1999 11 03	704	0.6+	0.0
1998 08 19	704	(2.4-	0.3-)	1998 09 21	704	(2.1+	0.8-)	1999 11 03	704	0.8+	0.1+
1998 08 19	704	(0.9+	3.4+)	1998 09 21	704	1.4+	0.3+	1999 11 03	704	1.2+	0.3+
1998 08 19	704	0.2-	0.9+	1998 09 23	704	0.2-	0.1+	1999 11 03	704	1.2+	0.1+
1998 08 19	704	1.4-	1.6+	1998 09 23	704	1.2+	0.1+	1999 11 03	704	0.6+	0.4+
1998 08 24	704	1.0-	0.9-	1998 09 23	704	0.4+	0.6-	1999 11 09	699	0.0	0.7+
1998 08 24	704	0.4+	0.3+	1998 09 23	704	0.2+	0.5-	1999 11 09	699	0.3-	0.3-
1998 08 24	704	0.3-	0.7-	1998 09 23	704	0.1+	0.4+	1999 11 09	699	0.3-	0.3+
1998 08 24	704	0.3+	1.2-	1998 09 23	704	0.9+	0.7-	1999 11 10	703	0.2-	0.4-
1998 08 24	704	0.4+	0.6+	1998 09 23	704	0.1+	0.0	1999 11 10	703	0.0	0.2+
1998 08 27	704	0.6-	0.1+	1998 09 23	704	(1.0+	2.3-)	1999 11 10	703	0.2-	0.2+
1998 08 27	704	0.5+	0.7-	1998 09 23	704	0.7+	1.1-	1999 11 10	703	0.4-	0.4+

(12390)* 1994 WB₁ = 1998 KO₈

Discovered 1994 Nov. 27 by T. Kobayashi at Oizumi.

Id. G. V. Williams (*MPC* 31966)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	238.35422		(2000.0)		P	Q	
<i>n</i>	0.38992257	ω	88.10627	-0.83983576		-0.37370258	
<i>a</i>	1.8555976	Ω	69.77270	+0.14941136		-0.85642977	
<i>e</i>	0.1515011	<i>i</i>	24.80975	+0.52187368		-0.35619436	
<i>P</i>	2.53	<i>H</i>	14.8	<i>G</i>	0.15	<i>U</i>	1

Residuals in seconds of arc

1955 03 27	675	0.0	0.8+	1994 12 11	108	0.1-	0.4-	1998 06 18	704	0.1+	0.6-
1955 03 27	675	0.7+	0.1+	1994 12 11	108	0.2+	0.2+	1998 06 18	704	0.6-	0.7+
1994 11 27	411	0.1+	0.5-	1994 12 11	108	0.3-	1.1-	1998 06 18	704	0.1-	0.7+
1994 11 27	411	0.1+	0.6-	1994 12 14	411	0.8+	0.2+	1998 06 18	704	0.1+	0.3-
1994 11 28	411	0.7+	0.5-	1994 12 14	411	0.2+	1.2+	1998 07 13	699	1.0+	1.1+
1994 11 28	411	1.3+	0.3+	1994 12 22	411	0.0	0.2+	1998 07 13	699	0.7+	0.7+
1994 11 28	411	0.2+	0.6+	1994 12 22	411	0.1+	0.2+	1998 07 13	699	0.4-	1.1+
1994 11 29	411	0.0	0.7+	1994 12 22	411	0.5+	0.1+	1999 10 09	704	0.1-	1.3-
1994 11 29	411	0.3+	0.0	1994 12 23	587	0.1-	0.6+	1999 10 09	704	0.3+	0.5-

1994 11 29	411	0.2-	0.3-	1994 12 23	587	0.1-	0.3+	1999 10 09	704	0.1-	0.3-
1994 12 03	411	0.0	0.3+	1994 12 23	587	0.0	0.3-	1999 10 09	704	1.0-	0.2-
1994 12 03	411	0.3-	0.5+	1995 01 02	411	0.0	1.2-	1999 10 09	704	0.5-	0.8+
1994 12 03	411	0.3-	0.3+	1995 01 02	411	0.7+	1.3-	1999 10 10	704	0.4-	0.4-
1994 12 04	098	1.5-	0.9+	1995 01 02	411	0.6+	1.2-	1999 10 19	704	0.0	0.4-
1994 12 04	098	1.6-	0.6-	1995 01 05	411	0.4-	0.7-	1999 10 19	704	0.0	0.2+
1994 12 04	098	1.5-	0.3-	1995 01 05	411	0.1-	0.6-	1999 10 19	704	0.1-	0.2-
1994 12 04	411	1.0-	0.0	1995 01 05	411	0.1-	0.6-	1999 10 19	704	0.5-	0.3-
1994 12 04	411	0.0	0.5-	1995 01 19	411	0.3+	0.1+	1999 11 05	704	0.3+	0.3+
1994 12 04	411	0.2-	0.2+	1995 01 19	411	0.2-	0.5-	1999 11 05	704	0.1-	0.1-
1994 12 04	098	(1.2+	3.1-)	1998 05 23	699	0.6+	0.3+	1999 11 05	704	0.3-	0.5+
1994 12 09	411	0.4+	0.1+	1998 05 23	699	0.8+	0.4+	1999 11 05	704	0.6+	0.2+
1994 12 09	411	1.1+	0.1+	1998 05 23	699	1.0+	0.2+	1999 11 05	704	0.1+	0.4+
1994 12 10	589	0.4+	0.5+	1998 05 24	699	1.0+	0.7+	1999 11 12	699	0.2+	0.3-
1994 12 10	589	0.2+	0.6+	1998 05 24	699	0.8+	0.6+	1999 11 12	699	0.1+	0.0
1994 12 10	589	1.0+	0.4+	1998 05 24	699	0.8+	0.8+	1999 11 12	699	0.3-	0.0
1994 12 10	589	0.6+	0.6+	1998 06 16	704	0.3+	0.3-	1999 11 16	703	0.7-	0.6+
1994 12 10	108	0.5+	0.3+	1998 06 16	704	0.2-	0.1+	1999 11 16	703	0.5-	0.6+
1994 12 10	108	0.5-	1.2+	1998 06 16	704	1.4-	1.1-	1999 11 16	703	0.5-	0.1+
1994 12 10	108	0.2-	1.9+	1998 06 16	704	0.7-	1.1-	1999 11 16	703	0.7-	0.4+
1994 12 11	108	0.4+	0.8+	1998 06 16	704	1.6-	0.6-				
1994 12 11	108	0.1+	0.1+	1998 06 18	704	0.3+	0.2+				

(12391)* 1994 WE₂ = 1982 BN₇ = 1991 CN₆

Discovered 1994 Nov. 26 by K. Endate and K. Watanabe at Kitami.

Id. E. Bowell (*MPC* 28591), G. V. Williams (*ibid.*)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

M	55.67304		(2000.0)		P		Q
n	0.21664143	ω	266.03356	+0.98611161		-0.05384129	
a	2.7456281	Ω	97.00314	+0.11001275		+0.92045170	
e	0.2178363	i	9.10798	-0.12442301		+0.38713020	
P	4.55	H	13.1	G	0.15	U	1

Residuals in seconds of arc

1982 01 26	381	0.7-	0.3+	1998 09 21	704	1.1+	0.4+	1998 12 08	704	1.5-	0.1+
1982 01 26	381	0.5+	0.1+	1998 09 21	704	0.5+	0.7-	1999 10 12	704	1.6-	1.3+
1991 02 10	675	0.4-	1.4-	1998 09 21	704	0.5+	0.0	1999 10 12	704	0.4+	0.3+
1991 02 10	675	0.2-	1.8-	1998 09 21	704	0.4+	1.1-	1999 10 12	704	0.1+	0.2+
1994 11 26	400	(2.1-	0.2+)	1998 09 21	704	(0.7+	2.4-)	1999 10 22	704	0.4+	0.5-
1994 11 26	400	0.3+	2.0-	1998 09 22	701	0.3+	0.0	1999 10 22	704	0.0	0.0
1994 11 29	400	0.3+	0.3+	1998 09 22	701	0.4+	0.0	1999 10 22	704	0.1-	0.4-
1994 11 29	400	1.7+	0.1-	1998 09 25	701	0.5+	0.1+	1999 10 22	704	0.5+	0.7-
1994 12 02	905	0.3-	0.6+	1998 09 25	701	0.2+	0.1+	1999 11 11	703	0.4+	0.2+
1994 12 02	905	0.1-	0.6+	1998 10 11	423	0.7-	0.1+	1999 11 11	703	0.4-	0.7+
1994 12 30	400	0.8-	0.5-	1998 10 11	423	0.4-	0.2-	1999 11 11	703	0.3+	0.5+
1994 12 30	400	(3.1+	1.1-)	1998 10 11	423	0.1+	0.5+	1999 11 11	703	0.2-	0.6+
1998 09 16	423	0.4+	0.5-	1998 10 14	423	0.7-	0.2-	1999 11 16	704	0.2-	0.4-
1998 09 16	423	0.2+	0.4-	1998 10 14	423	0.2+	0.3-	1999 11 16	704	0.5-	0.3+
1998 09 16	423	0.4-	0.3-	1998 12 08	704	0.3-	1.1+	1999 11 16	704	0.1+	0.1-
1998 09 17	423	0.1-	0.1-	1998 12 08	704	1.0-	0.9+	1999 11 16	704	0.0	0.1+
1998 09 17	423	0.1-	0.1-	1998 12 08	704	1.1-	0.5-	1999 11 16	704	0.8+	0.3+
1998 09 17	423	0.1+	0.0	1998 12 08	704	1.2-	0.7+				

(12392)* 1994 WR₂ = 1

Residuals in seconds of arc

1952 10 23	760	0.2-	1.9-	1997 06 07	809	1.4-	1.5-	1999 10 12	704	1.2+	1.5-
1952 10 23	760	1.7+	1.0-	1997 06 07	809	1.5-	0.6-	1999 10 12	704	1.8+	0.0
1994 11 30	411	0.2-	1.2-	1997 06 07	809	1.2-	0.8-	1999 10 22	704	0.6-	0.1+
1994 11 30	411	0.5+	0.4-	1997 06 08	809	(0.1-	3.1+)	1999 10 22	704	0.9-	0.5-
1994 12 03	411	0.2-	0.1-	1997 06 08	809	(0.7-	3.7+)	1999 10 22	704	0.6-	0.2+
1994 12 03	411	0.3-	0.2-	1997 06 08	809	(1.5-	2.4+)	1999 10 22	704	0.4-	0.2-
1994 12 07	411	0.0	0.0	1998 09 21	704	0.1+	0.2+	1999 10 22	704	0.4-	0.1-
1994 12 07	411	0.1-	0.3-	1998 09 21	704	0.3+	0.2-	1999 11 11	703	0.4+	0.6+
1994 12 22	411	0.4+	0.1-	1998 09 21	704	0.4-	0.6+	1999 11 11	703	0.4-	0.7+
1994 12 22	411	0.3-	0.7-	1998 09 21	704	0.7+	0.7+	1999 11 11	703	0.1+	0.9+
1997 05 04	809	0.7+	0.1-	1998 09 21	704	0.7-	0.3+	1999 11 11	703	0.4-	0.3+
1997 05 04	809	0.3+	1.0-	1999 10 12	704	1.8+	0.3-				
1997 05 04	809	0.4+	1.5-	1999 10 12	704	0.5+	0.7+				

(12393)* 1994 YC₁ = 1993 TC₄₈ = 1996 FE₁₇

Discovered 1994 Dec. 28 by T. Kobayashi at Oizumi.

Id. G. V. Williams (*MPC* 28301)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	273.35912		(2000.0)	P	Q
<i>n</i>	0.18135955	ω	76.37036	-0.81776430	-0.57551417
<i>a</i>	3.0910718	Ω	68.49359	+0.52523382	-0.75098343
<i>e</i>	0.1056338	<i>i</i>	0.41305	+0.23535289	-0.32373960
<i>P</i>	5.43	<i>H</i>	13.2	<i>G</i> 0.15	<i>U</i> 1

Residuals in seconds of arc

1993 09 19	691	1.4-	0.5+	1996 03 24	809	0.1+	1.1+	1999 10 30	703	0.2+	1.1+
1993 09 19	691	0.9-	0.2+	1996 03 24	809	0.2-	0.6-	1999 10 30	703	0.4+	0.4+
1993 09 19	691	1.0-	0.1+	1996 03 24	809	0.1+	0.5-	1999 11 03	704	0.4-	0.3-
1993 10 12	809	(2.3+	0.2-)	1996 03 26	809	(1.7+	4.3+)	1999 11 03	704	0.7-	0.3-
1993 10 12	809	0.9+	1.7-	1996 03 26	809	(1.3+	3.9+)	1999 11 03	704	0.9-	0.2-
1993 10 12	809	0.9+	1.8-	1996 03 26	809	(1.1+	4.2+)	1999 11 03	704	1.2-	0.4+
1993 10 22	809	(4.2+	2.9-)	1996 03 26	809	1.8+	1.3+	1999 11 03	704	0.7-	0.2+
1993 10 22	809	1.3+	1.8-	1996 03 26	809	0.1-	0.5+	1999 11 09	704	0.0	0.7+
1993 10 22	809	(4.7-	1.3+)	1996 03 26	809	0.3-	0.9+	1999 11 09	704	0.4-	0.8+
1994 12 28	411	0.4-	1.4-	1996 04 23	566	0.4-	1.2-	1999 11 09	704	0.5-	1.0+
1994 12 28	411	0.5+	0.3-	1996 04 23	566	0.8-	1.0-	1999 11 09	704	0.9-	1.0+
1994 12 29	411	0.2-	0.1-	1996 04 23	566	0.6-	1.0-	1999 11 09	704	0.4-	1.5+
1994 12 29	411	0.5-	0.2+	1997 07 09	327	0.2-	0.6+	1999 11 12	704	0.1+	0.3+
1995 01 05	411	0.2+	0.0	1997 07 09	327	0.3+	0.7+	1999 11 12	704	0.6-	0.3+
1995 01 05	411	0.0	0.2-	1997 07 09	327	0.5+	0.9+	1999 11 12	704	0.5-	0.1+
1995 01 07	411	0.3+	0.4-	1998 09 27	704	0.0	1.3+	1999 11 12	704	0.8-	0.1-
1995 01 07	411	0.3-	0.5-	1998 09 27	704	0.5-	0.3+	1999 11 12	704	0.4-	0.2-
1995 01 19	411	0.6+	0.7-	1998 09 27	704	1.9+	0.8-	1999 11 17	704	0.0	0.3-
1995 01 19	411	0.8+	0.1-	1999 10 22	704	2.0+	0.6+	1999 11 17	704	0.5+	0.5+
1995 03 23	033	0.3+	0.3-	1999 10 22	704	1.1+	0.5-	1999 11 17	704	0.3+	0.2+
1995 03 23	033	0.0	0.3-	1999 10 22	704	0.1-	0.5+	1999 11 17	704	0.5+	0.3+
1996 03 22	809	0.4+	0.8+	1999 10 22	704	1.0+	0.3-	1999 11 17	704	0.9+	0.4+
1996 03 22	809	0.1+	0.8+	1999 10 30	703	0.7-	0.1+				
1996 03 22	809	0.6-	1.4+	1999 10 30	703	0.3-	0.3+				

(12394)* 1995 BQ = 1982 UB₅ = 1996 FF₂₂

Discovered 1995 Jan. 23 by T. Kobayashi at Oizumi.

Id. B. G. Marsden (*MPC* 28855), A. Doppler (*MPC* 34509)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Marsden

<i>M</i>	324.71197		(2000.0)	P	Q
<i>n</i>	0.17481162	ω	310.26141	+0.19395652	-0.98086101
<i>a</i>	3.1677862	Ω	128.54648	+0.90656734	+0.17254888
<i>e</i>	0.2417846	<i>i</i>	1.25313	+0.37485535	+0.09021403
<i>P</i>	5.64	<i>H</i>	13.7	<i>G</i> 0.15	<i>U</i> 1

Residuals in seconds of arc

1982 10 20	033	0.3+	0.7-	1996 03 24	809	(1.2-	5.1+)	1999 10 29	703	0.9-	0.0
1993 09 15	809	0.4-	0.3+	1996 03 24	809	(0.6+	3.1+)	1999 10 29	703	0.1-	0.9+
1993 09 15	809	(2.2-	0.0)	1996 03 27	809	(1.5+	2.5+)	1999 11 01	703	0.1+	0.6+

1993 09 15	809	(3.0-	1.0+)	1996 03 27	809	(0.5+	3.0+)	1999 11 01	703	0.2-	0.3+
1993 09 20	691	0.5+	0.5-	1996 03 27	809	(0.8-	2.9+)	1999 11 01	703	0.0	0.7+
1993 09 20	691	0.1+	0.6-	1998 08 20	691	0.1+	0.1-	1999 11 01	703	0.3-	0.3+
1993 09 20	691	0.4+	0.7-	1998 08 20	691	0.6+	0.3+	1999 11 04	704	0.5-	0.7-
1995 01 23	411	0.6-	0.9+	1998 08 20	691	0.4+	0.1+	1999 11 04	704	0.4-	0.1-
1995 01 23	411	0.8+	0.3-	1998 08 31	691	0.7-	0.4+	1999 11 04	704	0.4-	0.1+
1995 01 25	411	0.4-	0.3-	1998 08 31	691	0.1-	0.1-	1999 11 04	704	0.2-	0.5+
1995 01 25	411	0.9+	0.4-	1998 08 31	691	0.4-	0.1+	1999 11 04	704	0.6-	0.0
1995 01 28	399	(0.5-	2.3+)	1999 10 10	704	0.4+	0.7-	1999 11 09	704	0.5+	0.5-
1995 01 28	399	1.1-	1.9+	1999 10 10	704	0.4+	0.7-	1999 11 09	704	0.5-	0.4-
1995 01 29	411	0.1+	1.1-	1999 10 10	704	0.0	0.4-	1999 11 09	704	0.4-	0.4-
1995 01 29	411	0.5+	0.2+	1999 10 10	704	0.0	0.0	1999 11 09	704	0.9+	1.0+
1995 01 30	411	0.4+	0.3+	1999 10 10	704	1.2-	0.7-	1999 11 09	704	(2.1-	0.2-)
1995 01 30	411	0.0	0.3+	1999 10 10	411	0.0	0.8-	1999 11 09	704	0.3+	0.6+
1995 02 03	399	1.3-	0.0	1999 10 10	411	1.0+	0.1-	1999 11 12	704	0.0	0.6+
1995 02 03	399	0.6-	0.7-	1999 10 15	704	0.5-	0.6-	1999 11 12	704	0.1+	1.2+
1995 02 06	399	1.0+	0.9-	1999 10 15	704	1.1-	0.8-	1999 11 12	704	0.1-	1.3+
1995 02 06	399	1.0+	2.0-	1999 10 15	704	0.5-	0.8-	1999 11 12	704	0.2-	1.2+
1995 02 07	411	0.6-	0.7-	1999 10 15	704	0.7-	0.8-	1999 11 16	691	0.3+	0.0
1995 02 08	411	0.5+	0.6-	1999 10 21	704	0.0	0.2+	1999 11 16	691	0.3+	0.0
1995 02 08	411	1.2-	1.4-	1999 10 21	704	0.4+	0.2+	1999 11 16	691	0.2+	0.1-
1995 02 10	411	0.2+	0.7+	1999 10 21	704	0.3+	0.3-	1999 11 17	704	0.5+	0.3-
1995 02 10	411	0.3+	0.1-	1999 10 21	704	0.3+	0.0	1999 11 17	704	0.5+	0.0
1995 02 19	411	0.2-	1.5+	1999 10 21	704	0.1+	0.3+	1999 11 17	704	0.5+	0.2+
1995 02 19	411	0.4-	1.3+	1999 10 29	703	0.2+	0.0	1999 11 17	704	0.3+	0.0
1996 03 24	809	(2.3-	4.4+)	1999 10 29	703	0.2-	1.0+	1999 11 17	704	0.8+	0.2-

(12395)* 1995 CD₂

Discovered 1995 Feb. 8 by D. J. Asher at Siding Spring.

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	180.01243		(2000.0)	P	Q
<i>n</i>	0.16948666	ω	22.21505	-0.28040008	+0.91604858
<i>a</i>	3.2337941	Ω	232.70423	-0.92596555	-0.33685270
<i>e</i>	0.0430937	<i>i</i>	21.12896	-0.25291027	+0.21768156
<i>P</i>	5.82	<i>H</i>	12.0	<i>G</i> 0.15	<i>U</i> 1

Residuals in seconds of arc

1995 02 08	413	0.5-	1.1-	1998 10 02	704	1.3-	1.9+	1999 01 08	704	0.5+	0.6-
1995 02 08	413	0.4-	0.7+	1998 10 02	704	(0.5+	2.1+)	1999 01 08	704	0.4-	0.5+
1995 02 09	413	0.3-	0.0	1998 10 02	704	0.7+	1.2+	1999 01 08	704	1.3-	0.3-
1995 02 09	413	0.4-	0.1-	1998 10 02	704	0.2+	1.4+	1999 01 08	704	0.0	1.1-
1995 02 20	413	0.7+	0.7+	1998 10 18	704	0.2+	0.1-	1999 01 08	704	1.5+	0.1+
1995 02 20	413	0.8+	0.6+	1998 10 18	704	0.3+	1.2-	1999 01 11	704	0.0	0.4-
1995 03 07	413	0.3+	0.5+	1998 10 18	704	0.5+	0.6-	1999 01 11	704	1.1-	0.6+
1995 03 07	413	0.6+	0.6+	1998 10 18	704	0.2+	0.2+	1999 01 11	704	0.7-	1.3-
1995 04 17	413	0.9-	0.0	1998 10 18	704	0.6-	1.0-	1999 01 11	704	(2.1-	1.6+)
1995 04 17	413	0.9-	0.0	1998 10 29	699	0.2-	0.3+	1999 10 10	704	0.1-	0.5+
1995 06 02	413	0.6+	0.3-	1998 10 29	699	0.1-	0.5+	1999 10 10	704	0.1-	0.3-
1995 06 02	413	0.8+	0.2-	1998 10 29	699	0.5-	0.5-	1999 10 10	704	0.1+	0.4-
1996 05 14	566	0.2+	0.5-	1998 11 14	704	0.4+	0.5+	1999 10 20	704	0.3+	0.9+
1996 05 14	566	0.0	0.2-	1998 11 14	704	0.5-	0.7-	1999 10 20	704	0.8-	0.4+
1996 05 14	566	0.3+	0.2-	1998 11 14	704	0.3+	0.1+	1999 10 20	704	0.5+	0.6+
1997 05 21	327	0.4-	0.3-	1998 11 14	704	1.0+	0.1+	1999 10 20	704	1.0-	0.1+
1997 05 21	327	0.6-	0.1-	1998 11 14	704	1.5+	0.4+	1999 11 05	704	0.4+	0.7-
1997 05 21	327	0.2+	0.3-	1998 12 20	097	0.1-	0.3-	1999 11 05	704	0.4+	0.2-
1997 05 21	327	0.6+	0.2-	1998 12 20	097	0.1-	0.3-	1999 11 05	704	0.8-	1.8-
1998 10 02	704	0.4-	1.1+	1998 12 20	097	0.2+	0.3-	1999 11 05	704	0.2+	0.6-

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	283.27332		(2000.0)	P	Q
<i>n</i>	0.17511351	ω	77.91092	-0.81176892	-0.48319046
<i>a</i>	3.1641443	Ω	72.39433	+0.30410243	-0.82920824
<i>e</i>	0.3008220	<i>i</i>	20.12546	+0.49855084	-0.28096384
<i>P</i>	5.63	<i>H</i>	12.7	<i>G</i> 0.15	<i>U</i> 1

Residuals in seconds of arc

1984 03 29	675	0.6+	0.8+	1995 03 01	657	0.6+	0.1+	1999 10 20	704	0.3+	0.1+
1984 03 29	675	0.3-	1.0-	1995 03 02	657	0.7+	0.2-	1999 10 20	704	0.2+	0.0
1984 03 31	675	0.8+	0.5+	1995 03 02	657	0.7+	0.1-	1999 10 20	704	0.4+	0.2+
1984 03 31	675	0.1+	0.0	1995 03 02	657	0.8+	0.0	1999 10 20	704	0.2+	0.4+
1984 04 29	675	0.8+	0.1+	1995 04 02	693	1.0-	0.4+	1999 10 20	704	0.1-	0.4+
1984 04 29	675	1.9-	0.1-	1995 04 02	693	1.0-	0.4+	1999 11 05	704	0.1-	0.5-
1995 02 24	693	0.0	0.4+	1995 04 02	693	1.0-	0.4+	1999 11 05	704	0.0	0.2-
1995 02 24	693	0.3+	0.2+	1995 05 19	658	0.6-	1.0-	1999 11 05	704	0.2+	0.0
1995 02 26	693	0.6-	0.3+	1995 05 19	658	0.6-	0.9-	1999 11 05	704	0.4+	0.6-
1995 02 26	693	0.1+	0.3-	1995 05 19	658	0.7-	0.7-	1999 11 05	704	0.3-	0.5-
1995 03 01	657	0.4+	0.2+	1996 06 26	696	1.0+	0.4+	1999 11 12	699	0.4+	0.0
1995 03 01	657	0.3+	0.2-	1996 06 26	696	0.1+	0.4+	1999 11 12	699	1.5-	0.6+
1995 03 01	657	0.7+	0.2+	1996 06 26	696	0.7-	0.0	1999 11 12	699	0.1+	0.0

(12397)* 1995 FV₁₄ = 1978 GN₁ = 1978 JN₂ = 1981 UZ₂ = 1993 VA₈

Discovered 1995 Mar. 27 by Spacewatch at Kitt Peak.

Id. G. V. Williams (*MPC* 25434)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	293.10880		(2000.0)	P	Q
<i>n</i>	0.17450728	ω	136.06665	-0.98519222	-0.14709505
<i>a</i>	3.1714681	Ω	35.75321	+0.08303324	-0.85883299
<i>e</i>	0.1017715	<i>i</i>	8.67085	+0.15000591	-0.49068211
<i>P</i>	5.65	<i>H</i>	12.9	<i>G</i> 0.15	<i>U</i> 2

Residuals in seconds of arc

1978 04 07	095	(3.7-	0.1+)	1995 04 23	691	0.0	1.1-	1998 11 11	704	0.4-	0.5-
1978 05 09	095	1.9-	0.1+	1995 04 23	691	0.4+	0.5-	1998 11 11	704	0.9+	0.5+
1981 10 30	381	1.3+	0.4-	1995 04 23	691	0.3-	0.6-	1998 11 16	566	0.5-	1.7-
1981 10 30	381	1.3+	0.8-	1998 10 29	704	1.0-	0.9+	1998 11 16	566	0.5-	1.2-
1993 11 12	033	0.1+	1.2+	1998 10 29	704	1.6-	0.0	1998 11 16	566	0.3+	1.4-
1993 11 13	033	0.1-	0.9+	1998 10 29	704	1.0-	0.1+	1998 11 20	699	0.4+	0.7+
1995 03 24	033	0.3-	0.8+	1998 10 29	704	0.5-	0.3+	1998 11 20	699	0.4+	1.4+
1995 03 24	033	0.8+	1.0+	1998 10 29	704	2.0-	0.2-	1998 11 20	699	0.8+	1.2+
1995 03 27	691	0.2-	0.5-	1998 11 10	704	0.7+	0.1+	1999 10 13	704	0.1+	1.7+
1995 03 27	691	0.2-	0.3-	1998 11 10	704	1.7+	0.4-	1999 10 13	704	0.1+	0.1-
1995 03 27	691	0.0	0.4-	1998 11 10	704	(1.5-	2.3-)	1999 10 13	704	0.5-	0.2-
1995 03 27	033	0.0	0.0	1998 11 10	704	0.4+	0.9-	1999 10 13	704	0.1+	1.3-
1995 03 28	033	0.1+	0.4+	1998 11 10	704	(0.3-	2.4-)	1999 11 08	699	0.0	0.1-
1995 04 08	691	0.1+	0.7-	1998 11 11	704	1.0+	0.9-	1999 11 08	699	0.3-	0.5+
1995 04 08	691	0.0	0.8-	1998 11 11	704	0.2-	0.3+	1999 11 08	699	0.2+	0.7+
1995 04 08	691	0.2-	0.8-	1998 11 11	704	0.7+	1.5-				

(12398)* 1995 KJ₃ = 1996 VG₁₇ = 1998 FT₅₀

Discovered 1995 May 25 by Spacewatch at Kitt Peak.

Id. A. Doppler (*MPC* 33249)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	102.76535		(2000.0)	P	Q
<i>n</i>	0.30978045	ω	171.31697	-0.35083265	+0.93626480
<i>a</i>	2.1632168	Ω	78.14325	-0.86026710	-0.31463421
<i>e</i>	0.1285951	<i>i</i>	1.05498	-0.36994185	-0.15624834
<i>P</i>	3.18	<i>H</i>	15.8	<i>G</i> 0.15	<i>U</i> 2

Residuals in seconds of arc

1994 01 10	691	0.1+	0.1-	1998 03 20	704	(3.5-	1.1-)	1999 10 09	704	0.0	0.3+
1994 01 10	691	0.3-	0.1-	1998 03 22	704	0.2-	0.4-	1999 10 09	703	0.6-	0.3+
1994 01 10	691	0.5+	0.1+	1998 03 22	704	0.9-	0.6-	1999 10 09	704	0.9+	0.2-

1995 05 25	691	0.8-	0.0	1998 03 22	704	0.3+	0.6-	1999 10 09	704	0.1+	0.4+
1995 05 25	691	0.6-	0.0	1998 03 22	704	0.1+	0.5-	1999 10 19	704	1.7+	0.2+
1995 05 25	691	0.8-	0.2-	1998 03 22	704	0.6-	1.2+	1999 10 19	704	0.7-	0.5-
1995 05 26	691	1.4-	0.1+	1998 04 19	704	1.6-	1.2+	1999 10 19	704	0.9+	0.0
1995 05 26	691	1.3-	0.4-	1998 04 19	704	(0.6-	2.3+)	1999 10 19	704	0.1+	0.9-
1995 05 26	691	(2.3-	0.7+)	1998 04 19	704	(0.9-	2.0+)	1999 11 01	703	(4.5+	0.3-)
1995 05 31	691	1.6+	0.5-	1998 04 19	704	1.2+	0.1+	1999 11 01	703	2.0-	0.5+
1995 05 31	691	1.6+	0.6-	1998 04 19	704	1.1-	1.2+	1999 11 01	703	1.7-	1.7+
1995 05 31	691	1.3+	0.2-	1999 10 02	703	1.9-	0.6+	1999 11 01	703	1.4-	1.5+
1996 11 06	691	0.1-	0.1+	1999 10 02	703	1.5-	0.2+	1999 11 09	704	0.4-	0.1-
1996 11 06	691	0.2+	0.1+	1999 10 02	703	0.2-	0.1+	1999 11 09	704	0.6+	0.6-
1996 11 06	691	0.4-	0.1-	1999 10 02	703	1.9-	0.7+	1999 11 09	704	0.5+	1.3-
1996 11 13	691	0.3-	0.2+	1999 10 05	704	0.2+	0.1-	1999 11 09	704	1.4-	1.8-
1996 11 13	691	0.0	0.2+	1999 10 05	704	0.2+	0.3-	1999 11 09	704	0.1+	1.1-
1996 11 13	691	0.2-	0.1+	1999 10 05	704	0.3-	1.2+	1999 11 12	704	1.0+	0.4-
1998 02 01	327	0.3+	0.8+	1999 10 05	704	0.2+	0.1+	1999 11 12	704	0.4+	0.6+
1998 02 01	327	0.2+	0.5+	1999 10 05	704	0.3+	0.7-	1999 11 12	704	0.3+	0.1-
1998 02 01	327	0.8+	0.4+	1999 10 09	703	0.6-	0.6+	1999 11 12	704	0.8-	0.1-
1998 03 20	704	0.6+	0.4-	1999 10 09	704	0.6+	0.5-	1999 11 12	704	0.3+	0.9+
1998 03 20	704	0.4+	0.7-	1999 10 09	703	0.1-	0.3-	1999 11 16	704	0.1+	0.8-
1998 03 20	704	0.3-	1.0-	1999 10 09	704	0.0	0.7+	1999 11 16	704	1.4+	1.9-
1998 03 20	704	1.0+	0.7-	1999 10 09	703	0.2+	0.3+	1999 11 16	704	2.4+	1.9-

(12399)* 1995 OD

Discovered 1995 July 19 by A. Boattini and L. Tesi at San Marcello Pistoiese.

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	63.16552		(2000.0)	P	Q
<i>n</i>	0.28335713	ω	341.95839	+0.57703107	+0.81661112
<i>a</i>	2.2956902	Ω	323.28031	-0.74652535	+0.52067474
<i>e</i>	0.0529680	<i>i</i>	1.29084	-0.33126280	+0.24908651
<i>P</i>	3.48	<i>H</i>	15.0	<i>G</i> 0.15	<i>U</i> 1

Residuals in seconds of arc

1995 07 19	104	0.4-	0.2-	1998 04 25	809	(1.9-	4.6+)	1999 10 03	691	0.5+	0.0
1995 07 19	104	0.2-	0.1-	1998 04 25	809	(1.6-	4.6+)	1999 10 06	704	0.4+	0.2-
1995 07 19	104	0.4-	0.2-	1998 04 28	809	1.7-	0.9+	1999 10 06	704	0.0	0.1-
1995 07 19	104	1.0-	0.3-	1998 04 28	809	(2.2-	1.6+)	1999 10 06	704	0.0	0.2-
1995 07 19	104	0.2+	0.7-	1998 04 28	809	(2.5-	2.3+)	1999 10 06	704	0.1-	0.2-
1995 07 19	104	0.1-	1.2-	1998 05 05	699	1.0+	0.2-	1999 10 06	704	0.1+	0.1+
1995 07 19	104	0.0	1.3-	1998 05 05	699	0.7+	0.9-	1999 10 10	704	0.3+	0.1+
1995 07 19	104	0.1+	1.0-	1998 05 05	699	0.4-	0.1-	1999 10 10	704	0.1+	0.3+
1995 07 20	104	0.3+	0.0	1998 05 05	104	0.9+	0.8+	1999 10 10	704	0.7+	0.1+
1995 07 24	104	0.6+	0.1+	1998 05 05	104	1.4+	1.2+	1999 10 10	704	0.6+	0.2-
1995 07 24	104	0.1-	0.1+	1998 05 05	104	1.5+	1.5+	1999 10 10	704	0.6+	0.5-
1995 07 24	104	0.3+	0.3+	1998 05 08	104	0.4+	0.1+	1999 10 10	691	0.5-	0.5+
1995 07 24	104	0.8-	0.0	1998 05 08	104	0.4+	0.1+	1999 10 10	691	0.8-	0.6+
1995 07 24	104	0.5-	0.1+	1998 05 08	104	0.0	0.1+	1999 10 10	691	0.6-	0.6+
1995 07 24	104	0.0	0.0	1998 05 08	104	0.1-	0.0	1999 10 15	704	0.0	0.5-
1995 07 26	104	0.1-	0.6+	1998 05 19	104	0.5-	0.2+	1999 10 15	704	0.1-	0.3+
1995 07 26	104	0.1+	0.9+	1998 05 19	104	0.3-	0.1+	1999 10 15	704	0.0	0.2+
1995 07 26	104	0.2+	1.3+	1998 05 19	104	0.2-	0.0	1999 10 15	704	0.2-	0.1-
1995 07 30	104	1.0-	1.4+	1998 05 19	104	0.0	0.3+	1999 10 15	704	0.5+	0.1+
1995 07 30	104	1.0-	0.5+	1998 05 20	104	0.7-	1.0+	1999 10 16	104	0.9+	0.1+
1995 07 30	104	0.6-	0.2+	1998 05 20	104	0.6-	0.8+	1999 10 16	104	0.7+	0.1+
1995 08 01	104	0.4+	0.1+	1998 05 20	104	0.6-	0.9+	1999 10 16	104	0.3+	0.1-
1995 08 01	104	0.8+	0.4+	1998 05 20	104	0.3-	0.8+	1999 10 21	704	0.2+	0.3-
1995 08 01	104	0.6+	0.6+	1998 05 21	104	0.0	0.3-	1999 10 21	704	0.0	0.2+
1995 08 01	104	1.5+	1.0+	1998 05 21	104	0.3+	0.2-	1999 10 21	704	0.3-	0.0
1995 08 02	104	0.1+	0.5-	1998 05 21	104	0.6-	0.4-	1999 10 21	704	0.6-	0.4-
1995 08 02	104	0.6-	0.1-	1998 05 22	704	0.4-	0.3+	1999 10 21	704	1.4-	1.0-
1995 08 03	104	1.5+	0.3-	1998 05 22	704	1.2-	0.8-	1999 10 29	703	0.9+	0.1+
1995 08 03	104	0.3+	0.2+	1998 05 22	704	1.6-	1.7-	1999 10 29	703	0.0	0.4-
1995 08 03	104	0.3+	0.8+	1998 05 22	704	1.5+	1.7-	1999 10 29	703	0.5+	0.1-
1995 10 14	104	0.2-	0.2-	1998 05 23	699	0.8+	0.0	1999 10 29	703	0.4-	0.2+
1995 10 14	104	0.1-	0.9+	1998 05 23	699	0.2+	0.2+	1999 11 03	703	0.8-	0.1-
1995 10 14	104	0.2+	1.5+	1998 05 23	699	0.3+	0.5+	1999 11 03	703	0.0	1.1+
1995 10 15	104	0.8-	1.1-	1998 05 24	704	0.2-	0.8-	1999 11 03	703	0.1-	0.4+

1995 10 15	104	0.8−	0.7−	1998 05 24	704	0.9−	0.1+	1999 11 03	703	0.8−	0.0
1995 10 15	104	0.4−	0.8−	1998 05 24	704	1.7−	0.2+	1999 11 04	704	0.4−	0.1+
1996 12 04	104	0.7+	0.4−	1998 05 24	704	0.9+	1.0−	1999 11 04	704	0.4−	0.4−
1996 12 04	104	0.2−	0.1+	1998 06 02	701	0.4+	0.1−	1999 11 04	704	0.6−	0.3+
1996 12 04	104	1.1−	0.2+	1998 06 02	701	0.6+	0.4−	1999 11 04	704	0.7−	0.4+
1996 12 05	104	0.8+	0.3−	1998 06 02	701	0.1+	0.0	1999 11 04	704	0.8−	0.3+
1996 12 05	104	0.3+	0.1−	1998 06 03	701	0.6+	0.5+	1999 11 14	704	0.4−	0.1−
1996 12 05	104	0.1+	0.5+	1998 06 03	701	0.0	0.8−	1999 11 14	704	0.2+	0.3+
1996 12 05	104	0.2+	0.7+	1999 10 01	104	0.3+	0.8−	1999 11 14	704	0.1−	0.0
1996 12 15	104	0.4−	0.1−	1999 10 01	104	0.3+	0.5+	1999 11 14	704	0.0	0.5+
1996 12 15	104	0.1−	0.1−	1999 10 01	104	0.2+	1.0−	1999 11 14	704	0.2−	0.2+
1996 12 15	104	0.6−	0.1+	1999 10 03	704	1.1+	0.3−	1999 11 16	704	0.0	0.2−
1996 12 18	608	0.8−	0.8+	1999 10 03	704	0.6+	0.5−	1999 11 16	704	0.1+	0.3+
1996 12 18	608	1.0−	0.4+	1999 10 03	704	0.1−	0.3−	1999 11 16	704	0.1+	0.3+
1997 01 01	104	1.2+	0.4+	1999 10 03	704	0.4+	0.5−	1999 11 16	704	0.1+	0.5−
1997 01 01	104	1.1+	0.4+	1999 10 03	691	0.3+	0.0	1999 11 16	704	0.6−	0.1−
1998 04 25	809	(2.6−	4.7+)	1999 10 03	691	0.4+	0.0				

(12400)* 1995 OA₁ = 1991 KR₂ = 1998 KL₁₅

Discovered 1995 July 28 by T. Okuni at Nanyou.

Id. G. V. Williams (*MPC* 31967)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	40.00619		(2000.0)		P		Q
<i>n</i>	0.27495600	ω	105.46667	+0.86725830		+0.49263552	
<i>a</i>	2.3422176	Ω	225.08365	−0.48679840		+0.80881321	
<i>e</i>	0.1705093	<i>i</i>	5.82958	−0.10435692		+0.32114084	
<i>P</i>	3.58	<i>H</i>	14.3	<i>G</i>	0.15	<i>U</i>	1

Residuals in seconds of arc

1991 05 18	809	0.1−	0.2−	1998 05 24	704	1.0+	0.2+	1999 11 10	120	0.5+	0.5−
1991 05 18	809	0.2+	0.2−	1998 05 24	704	0.5+	0.0	1999 11 12	699	0.4+	0.4+
1991 05 18	809	0.1−	0.4−	1998 05 24	704	1.1−	0.2−	1999 11 12	699	0.0	0.3+
1995 07 28	358	0.3+	0.2+	1999 10 05	704	1.3+	1.5+	1999 11 12	699	0.5+	0.1+
1995 07 28	358	0.0	0.1−	1999 10 05	704	(2.7+	0.7+)	1999 11 12	704	0.5−	0.6−
1995 07 29	358	1.0+	1.0−	1999 10 05	704	(2.9+	1.6−)	1999 11 12	704	0.0	0.5−
1995 07 29	358	0.0	1.4−	1999 10 12	704	0.9+	0.7−	1999 11 12	704	0.0	0.8−
1995 07 30	358	0.1+	0.9+	1999 10 12	704	0.4+	1.1−	1999 11 12	704	0.3−	0.8−
1995 07 30	358	0.8+	0.3−	1999 10 12	704	0.6+	0.4−	1999 11 12	704	0.2−	0.8−
1995 08 08	358	(3.9+	2.1+)	1999 10 12	704	0.6+	1.1−	1999 11 12	120	0.0	0.4−
1995 08 08	358	1.1−	1.7−	1999 10 22	704	0.6+	0.3−	1999 11 12	120	0.6+	0.2+
1995 08 17	358	0.7+	1.2+	1999 10 22	704	0.1−	0.0	1999 11 13	704	0.1−	0.3−
1995 08 17	358	(0.5+	2.9+)	1999 10 22	704	0.2+	0.2+	1999 11 13	704	0.2−	0.6−
1995 08 18	358	0.9−	1.5+	1999 10 22	704	0.4+	0.1−	1999 11 13	704	0.2+	0.0
1995 08 18	358	0.5−	0.1−	1999 10 22	704	0.1+	0.1+	1999 11 13	704	0.3−	0.3−
1998 04 22	704	0.3−	0.4−	1999 10 30	703	0.5+	0.2+	1999 11 13	704	0.1−	0.5−
1998 04 22	704	0.0	0.2+	1999 10 30	703	0.3−	0.5+	1999 11 13	704	0.3+	0.2+
1998 04 22	704	1.8−	0.6+	1999 10 30	703	0.0	0.4+	1999 11 13	704	0.5−	1.0−
1998 04 22	704	0.7−	0.5−	1999 10 30	703	0.3−	0.0	1999 11 13	704	0.3−	0.2−
1998 04 22	704	0.1−	0.3+	1999 11 04	704	0.0	0.2−	1999 11 13	704	0.3−	0.1−
1998 04 25	699	0.2+	0.4−	1999 11 04	704	0.1+	0.2+	1999 11 13	120	0.2+	0.4+
1998 04 25	699	0.1−	0.0	1999 11 04	704	0.1−	0.1−	1999 11 13	120	0.0	0.3−
1998 04 25	699	0.3−	0.1−	1999 11 04	704	0.3+	0.7+	1999 11 15	704	0.0	0.1−
1998 05 01	704	0.1+	0.1+	1999 11 04	704	0.8+	0.2+	1999 11 15	704	0.2+	0.2−
1998 05 01	704	0.0	1.1−	1999 11 07	120	0.1−	0.2+	1999 11 15	704	0.0	0.3−
1998 05 01	704	(2.2+	1.7−)	1999 11 08	120	0.1−	0.4−	1999 11 15	704	0.3+	0.3−
1998 05 01	704	0.8+	0.9−	1999 11 08	120	0.0	0.2−	1999 11 15	704	0.0	0.5−
1998 05 22	704	0.1−	0.6−	1999 11 08	120	0.7−	0.2−	1999 11 17	704	0.2−	0.2−
1998 05 22	704	0.8+	0.5−	1999 11 09	704	0.3−	0.2−	1999 11 17	704	0.2−	0.1−
1998 05 22	704	0.4−	1.7−	1999 11 09	704	0.5+	1.6+	1999 11 17	704	0.2−	0.3−
1998 05 22	704	0.3+	0.1−	1999 11 09	704	1.3−	0.4−	1999 11 17	704	0.4−	0.1+
1998 05 22	704	0.7−	1.0−	1999 11 09	704	0.5−	0.0	1999 11 17	704	0.4−	0.4+
1998 05 24	704	0.7+	0.1−	1999 11 09	704	0.4−	0.1+				
1998 05 24	704	0.5−	1.5−	1999 11 10	120	0.2−	0.3−				

(12401)* 1995 OG₁₀ = 1999 RS₃₅

Discovered 1995 July 21 by F. Börngen at Tautenburg.

Id. A. Doppler (*MPC* 36339)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	46.22016		(2000.0)		P		Q
<i>n</i>	0.26603647	ω	152.48497	+0.28915504		+0.95697835	
<i>a</i>	2.3942818	Ω	134.31116	−0.88436764		+0.27669116	
<i>e</i>	0.1755460	<i>i</i>	1.93175	−0.36644678		+0.08737533	
<i>P</i>	3.70	<i>H</i>	15.2	<i>G</i>	0.15	<i>U</i>	1

Residuals in seconds of arc

1995 07 21	033	0.2+	0.8+	1999 08 22	699	0.4+	0.4+	1999 10 01	106	0.3−	0.3−
1995 07 22	033	1.0+	0.4+	1999 08 22	699	1.0+	1.6+	1999 10 02	704	0.5−	0.0
1995 07 23	033	1.6−	0.9−	1999 08 22	699	0.5−	0.7−	1999 10 02	704	0.3+	0.4+
1995 07 26	033	0.2+	0.4+	1999 09 07	704	0.2+	0.2−	1999 10 02	704	0.0	0.2+
1997 01 15	566	0.4−	0.5+	1999 09 07	704	0.4+	0.3−	1999 10 02	704	0.1−	0.8+
1997 01 15	566	0.7+	0.6+	1999 09 07	704	0.0	1.0−	1999 10 02	704	0.8+	0.1−
1997 01 15	566	0.3−	0.3+	1999 09 07	704	0.3−	0.6−	1999 10 06	106	1.2−	0.5−
1998 02 25	566	0.6+	0.7−	1999 09 07	704	0.4−	0.1+	1999 10 06	106	0.4−	0.4+
1998 02 25	566	0.3+	0.9−	1999 09 11	120	0.8+	0.7−	1999 10 06	106	0.6−	0.5+
1998 02 25	566	0.5−	1.1−	1999 09 12	120	0.1−	0.7−	1999 10 07	703	0.3−	0.7+
1998 03 20	704	0.6−	0.8+	1999 09 12	120	0.7−	0.4+	1999 10 07	703	0.7−	0.6+
1998 03 20	704	0.2+	0.6+	1999 09 12	120	0.9+	0.9+	1999 10 07	703	0.4−	0.1+
1998 03 20	704	0.2+	0.3+	1999 09 14	704	0.3+	0.1−	1999 10 07	703	0.5−	0.4+
1998 03 20	704	0.3+	0.1+	1999 09 14	704	0.2−	0.1−	1999 10 07	704	0.8+	0.0
1998 03 20	704	0.2+	0.4−	1999 09 14	704	0.1+	0.1−	1999 10 07	704	1.0+	0.3−
1998 03 25	566	0.8−	0.4−	1999 09 14	704	0.6+	0.4−	1999 10 07	704	0.5+	0.2−
1998 03 25	566	0.9−	0.6−	1999 09 14	120	1.2+	0.4−	1999 10 07	704	0.0	0.2−
1998 03 25	566	1.2−	0.4−	1999 09 14	120	0.9−	0.6−	1999 10 07	704	0.3−	0.5−
1998 04 19	704	0.8+	0.2+	1999 09 20	848	0.1−	0.3−	1999 11 03	703	0.9−	1.1−
1998 04 19	704	0.6+	0.5+	1999 09 20	848	0.2+	0.3−	1999 11 03	703	0.1+	1.0−
1998 04 19	704	(2.2+	1.4+)	1999 09 20	848	0.8+	0.4+	1999 11 03	703	0.0	0.5+
1998 04 19	704	1.0+	1.5+	1999 10 01	106	0.3−	0.2+	1999 11 03	703	0.3−	0.2+
1998 04 19	704	1.0−	1.1−	1999 10 01	106	0.2+	0.3−				

(12402)* 1995 PK = 1992 SH₂₃

Discovered 1995 Aug. 3 by S. Otomo at Kiyosato.

Id. S. Nakano (*MPC* 25645)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	30.92366		(2000.0)		P		Q
<i>n</i>	0.29635193	ω	234.96306	+0.98943855		−0.12850143	
<i>a</i>	2.2280805	Ω	132.31885	+0.14375087		+0.92933538	
<i>e</i>	0.1296121	<i>i</i>	5.20451	−0.01862895		+0.34615477	
<i>P</i>	3.33	<i>H</i>	14.4	<i>G</i>	0.15	<i>U</i>	1

Residuals in seconds of arc

1992 09 29	675	1.8+	0.9−	1998 05 22	704	0.0	1.3−	1998 06 26	704	0.1−	0.6+
1992 09 29	675	0.1+	0.2−	1998 05 22	704	0.6+	2.0+	1998 06 26	704	1.1−	0.1+
1992 10 04	675	0.7+	0.9−	1998 05 22	704	0.5−	0.0	1999 10 10	704	0.2+	0.8−
1992 10 04	675	1.1−	0.6−	1998 05 22	704	(1.0+	3.0+)	1999 10 10	704	0.5−	0.2−
1995 08 03	894	0.4−	0.2+	1998 05 24	704	0.6+	0.7+	1999 10 10	704	0.7+	0.7−
1995 08 03	894	0.3+	1.1+	1998 05 24	704	0.1+	0.2−	1999 10 10	704	0.1−	0.2−
1995 08 04	894	0.1−	0.4+	1998 05 24	704	0.7−	0.5+	1999 10 10	704	0.0	0.1−
1995 08 04	894	0.6−	0.0	1998 05 24	704	1.8+	0.8+	1999 10 21	704	0.1+	0.1−
1995 08 04	327	0.2+	0.6+	1998 05 24	704	0.4−	0.4−	1999 10 21	704	0.7−	1.0+
1995 08 04	327	0.8+	0.4+	1998 06 03	704	0.9+	1.0−	1999 10 21	704	0.2−	1.1+
1995 08 04	327	0.8+	0.3+	1998 06 03	704	0.5−	0.7−	1999 10 21	704	0.8−	0.5+
1995 08 16	894	0.3−	0.6+	1998 06 03	704	0.0	1.5−	1999 11 04	704	0.4−	0.0
1995 08 16	894	1.8−	1.7−	1998 06 03	704	0.6−	1.4−	1999 11 04	704	0.3+	0.3+
1997 02 04	566	0.6−	0.2−	1998 06 03	704	0.2+	0.5−	1999 11 04	704	0.1−	0.1+
1997 02 04	566	0.3−	0.2−	1998 06 24	704	0.5+	0.5−	1999 11 04	704	0.2+	0.2−
1997 02 04	566	0.5−	0.2−	1998 06 24	704	0.4+	0.2+	1999 11 04	704	0.1−	0.2+
1997 02 08	566	0.3−	0.3−	1998 06 24	704	0.8+	0.7+	1999 11 17	704	0.8+	0.1+
1997 02 08	566	0.2−	0.1+	1998 06 24	704	0.0	1.6+	1999 11 17	704	0.5+	0.5+
1997 02 08	566	0.6−	0.1−	1998 06 24	704	1.5−	0.9+	1999 11 17	704	0.2+	0.8+
1997 03 04	704	0.5+	0.0	1998 06 26	704	0.1+	0.1−	1999 11 17	704	0.7+	0.7+

1997 03 04 704 0.5+ 0.2+ 1998 06 26 704 0.4+ 0.0 1999 11 17 704 1.0- 0.3+
 1997 03 06 704 0.7+ 0.3- 1998 06 26 704 0.3- 1.0-

(12403)* 1995 QD₃ = 1980 TW₆ = 1980 TJ₁₀ = 1989 BF₁ = 1993 CE₁

Discovered 1995 Aug. 31 by T. Kobayashi at Oizumi.

Id. T. Kobayashi (*MPC* 25733)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Nakano

<i>M</i>	326.59219	(2000.0)	P	Q
<i>n</i>	0.26233424	ω	110.43773	+0.40185349 -0.91538982
<i>a</i>	2.4167556	Ω	315.84395	+0.82678707 +0.37396700
<i>e</i>	0.1927270	<i>i</i>	1.97307	+0.39362026 +0.14903073
<i>P</i>	3.76	<i>H</i>	13.9	<i>G</i> 0.15 <i>U</i> 1

Residuals in seconds of arc

1980 10 08	095 (5.2+ 1.4+)	1997 03 06	809 0.6- 0.9-	1999 11 04	703 1.0- 1.2+
1980 10 15	095 (11.3+ 3.3+)	1997 03 06	809 0.5- 0.8-	1999 11 04	703 0.1+ 0.1+
1989 01 26	046 0.6- 0.1-	1999 10 15	704 1.8+ 0.5-	1999 11 08	727 0.1+ 0.2-
1989 01 26	046 0.1+ 1.9+	1999 10 15	704 0.5+ 1.2+	1999 11 08	727 0.0 0.2-
1989 01 27	046 0.3- 1.0-	1999 10 15	704 1.3- 0.9+	1999 11 08	727 0.1+ 0.1-
1989 01 27	046 0.5- 0.4-	1999 10 16	611 0.1+ 0.8+	1999 11 12	699 0.1- 0.4+
1989 01 28	046 0.8+ 2.1-	1999 10 16	611 0.3+ 0.8+	1999 11 12	699 0.3- 0.6+
1989 01 28	046 0.1+ 0.7-	1999 10 22	704 0.9+ 0.0	1999 11 12	699 0.6- 0.4+
1993 02 13	372 0.3+ 0.0	1999 10 22	704 0.3+ 0.3-	1999 11 12	596 0.6- 0.1-
1993 02 13	372 0.0 0.9+	1999 10 22	704 0.4+ 0.1-	1999 11 12	596 0.2- 0.2-
1993 02 17	372 (2.5- 2.8+)	1999 10 22	704 0.3+ 0.0	1999 11 12	596 0.3- 0.6-
1993 02 17	372 (2.8- 2.4+)	1999 10 22	704 0.4- 0.1+	1999 11 14	704 0.4+ 0.3-
1995 08 31	411 1.4+ 1.5-	1999 11 03	704 0.3+ 0.1-	1999 11 14	704 0.1+ 0.6-
1995 08 31	411 0.2+ 0.0	1999 11 03	704 0.5+ 0.0	1999 11 14	704 0.0 0.5-
1995 09 01	411 0.9- 0.3-	1999 11 03	704 0.3+ 0.1-	1999 11 14	704 0.1+ 0.6-
1995 09 01	411 0.6+ 0.3-	1999 11 03	704 0.5+ 0.0	1999 11 14	704 0.8- 0.5-
1995 09 01	411 0.4+ 0.7-	1999 11 03	704 0.6+ 0.2+	1999 11 16	704 0.0 0.0
1995 09 17	411 0.8+ 0.5-	1999 11 04	727 0.2- 0.2-	1999 11 16	704 0.3- 0.0
1995 09 17	411 0.0 0.3-	1999 11 04	727 0.0 0.1-	1999 11 16	704 0.1- 0.1+
1995 10 13	411 0.8- 0.3-	1999 11 04	727 0.1- 0.3-	1999 11 16	704 0.4- 0.4+
1995 10 13	411 0.0 0.1-	1999 11 04	703 0.0 0.2+	1999 11 16	704 0.6- 0.2+
1997 03 06	809 0.1+ 0.5-	1999 11 04	703 0.2- 0.3+		

(12404)* 1995 QW₃

Discovered 1995 Aug. 31 by T. B. Spahr at the University of Arizona's Catalina Station.

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	42.84204	(2000.0)	P	Q
<i>n</i>	0.27984852	ω	88.76167	+0.84090187 +0.43172986
<i>a</i>	2.3148386	Ω	245.57788	-0.51463990 +0.82446002
<i>e</i>	0.1528369	<i>i</i>	21.00206	+0.16742106 +0.36588933
<i>P</i>	3.52	<i>H</i>	14.5	<i>G</i> 0.15 <i>U</i> 1

Residuals in seconds of arc

1995 08 31	693 0.0 0.5-	1996 12 16	696 0.1- 0.3-	1999 10 14	704 0.6- 0.6+
1995 08 31	693 0.5+ 1.0-	1996 12 16	696 0.2- 0.2-	1999 10 14	704 0.0 0.2-
1995 09 07	608 0.3- 1.4-	1996 12 16	696 0.1- 0.1-	1999 10 14	704 0.2+ 0.1+
1995 09 07	608 0.1- 0.5-	1997 02 01	696 0.2- 0.6-	1999 10 14	704 0.1- 0.1+
1995 09 08	608 (0.6+ 2.3-)	1997 02 01	696 0.2- 0.5-	1999 11 03	704 0.5- 0.2-
1995 09 08	608 0.2+ 0.4-	1997 02 01	696 0.2- 0.6-	1999 11 03	704 0.8- 0.7-
1995 09 16	816 0.2+ 0.2+	1998 05 22	704 1.2+ 0.7-	1999 11 03	704 0.1- 0.1-
1995 09 16	816 0.1+ 0.2+	1998 05 22	704 0.1+ 0.2+	1999 11 03	704 0.4+ 0.4-
1995 09 16	816 0.1+ 0.1+	1998 05 22	704 0.7- 0.4-	1999 11 03	704 0.4+ 0.2-
1995 09 16	816 0.2+ 0.1+	1998 05 22	704 (2.5+ 1.0+)	1999 11 14	704 0.3+ 0.1+
1995 09 21	657 (0.8- 3.6+)	1998 05 22	704 1.2- 1.7+	1999 11 14	704 0.1+ 0.0
1995 09 21	657 (0.8- 2.2+)	1998 05 24	704 0.2+ 0.3+	1999 11 14	704 0.1- 0.0
1995 09 21	657 0.8- 0.7+	1998 05 24	704 0.7+ 0.6-	1999 11 14	704 0.2- 0.0
1995 09 25	816 0.1+ 0.0	1998 05 24	704 1.4+ 1.1-	1999 11 14	704 0.2- 0.2-
1995 09 25	816 0.2+ 0.1+	1998 05 24	704 0.6- 0.8-	1999 11 16	704 0.5- 0.4+
1995 09 25	816 0.4+ 0.0	1998 05 24	704 (2.3+ 0.2-)	1999 11 16	704 0.2+ 0.2-
1995 12 12	608 0.0 0.4-	1998 06 16	704 1.2- 0.2+	1999 11 16	704 0.2- 0.3-

1995 12 12 608 0.0 0.6- 1998 06 16 704 0.6+ 0.9+ 1999 11 16 704 0.5+ 0.2+
 1995 12 13 608 0.2+ 0.8+ 1998 06 16 704 0.1- 1.4- 1999 11 16 704 0.7+ 0.3+
 1995 12 13 608 0.2+ 0.8+ 1998 06 16 704 0.7- 0.5+
 1995 12 13 608 0.2+ 0.5+ 1999 10 14 704 0.5+ 0.1+

(12405)* 1995 RK

Discovered 1995 Sept. 15 by F. Manca and V. Giuliani at Sormano.

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	55.81200	(2000.0)	P	Q
<i>n</i>	0.26945634	ω	59.26409	+0.61445235 +0.78443162
<i>a</i>	2.3739803	Ω	248.88698	-0.75124586 +0.54907201
<i>e</i>	0.1134272	<i>i</i>	5.18791	-0.24099372 +0.28842152
<i>P</i>	3.66	<i>H</i>	15.1	<i>G</i> 0.15 <i>U</i> 1

Residuals in seconds of arc

1995 09 15	587 0.7- 0.7-	1998 04 22	704 1.1- 0.3-	1999 10 22	704 1.0+ 1.5-
1995 09 15	587 0.5+ 0.6+	1998 05 01	704 0.7+ 1.0-	1999 10 22	704 0.0 0.3-
1995 09 17	587 0.9- 0.3+	1998 05 01	704 (0.2- 2.8-)	1999 10 22	704 0.9+ 1.2-
1995 09 17	587 0.6- 0.2-	1998 05 01	704 0.6+ 0.3-	1999 10 29	703 0.3- 0.6+
1995 09 21	587 0.3+ 0.7-	1998 05 01	704 0.1+ 0.4-	1999 10 29	703 0.1+ 0.8+
1995 09 21	587 0.1- 0.9-	1998 05 01	704 0.3+ 0.3+	1999 10 29	703 1.2- 2.1+
1995 09 22	587 0.3- 0.6-	1998 05 05	699 0.1- 0.7+	1999 10 29	703 0.1+ 0.2+
1995 09 22	587 0.2+ 0.6+	1998 05 05	699 0.2+ 0.2+	1999 11 04	704 0.2- 0.1-
1995 09 29	587 0.5+ 0.6-	1998 05 05	699 0.0 0.8+	1999 11 04	704 0.3+ 0.2-
1995 09 30	587 0.1- 0.5-	1998 05 22	704 0.4+ 0.3+	1999 11 04	704 0.2- 0.2+
1995 10 11	587 0.2- 0.3-	1998 05 22	704 (1.7- 2.2+)	1999 11 04	704 0.1+ 0.6+
1995 10 11	587 1.6- 0.2-	1998 05 22	704 0.2- 0.9+	1999 11 04	704 0.3- 0.0
1995 10 16	587 1.0- 1.3-	1998 05 22	704 0.6+ 0.1+	1999 11 08	704 0.2+ 0.9+
1995 10 16	587 0.4- 0.2-	1998 05 22	704 0.5- 0.5-	1999 11 08	704 0.6+ 0.3+
1995 10 27	704 1.1+ 0.9+	1998 05 22	587 0.6+ 0.1-	1999 11 08	704 0.4+ 0.0
1995 10 27	704 1.4+ 1.3+	1998 05 22	587 0.5- 0.7-	1999 11 08	704 0.2- 0.1+
1995 10 28	704 0.9+ 0.7+	1998 05 24	704 1.0- 0.4-	1999 11 08	704 0.9+ 0.0
1995 10 28	704 0.9+ 0.5+	1998 05 24	704 0.1- 1.0-	1999 11 11	703 0.0 0.6+
1995 12 20	704 1.2+ 1.6+	1998 05 24	704 0.9+ 2.1+	1999 11 11	703 1.0- 0.2+
1995 12 20	704 1.3+ 0.2-	1998 05 24	704 0.1- 0.8+	1999 11 11	703 0.5+ 0.3-
1995 12 20	704 0.2- 0.4-	1999 10 03	704 0.2+ 0.6-	1999 11 11	703 0.0 0.8+
1995 12 22	704 (2.7- 0.7-)	1999 10 03	704 0.6- 0.2+	1999 11 14	704 0.1+ 0.6+
1995 12 22	704 (0.9- 3.0-)	1999 10 03	704 0.0 0.6-	1999 11 14	704 0.3- 0.1+
1997 01 10	587 0.6- 0.0	1999 10 03	704 1.3- 1.3+	1999 11 14	704 0.1+ 0.1+
1997 01 10	587 0.1+ 0.2+	1999 10 04	557 0.2- 0.3+	1999 11 14	704 0.1- 0.1-
1997 01 11	587 0.1+ 0.7-	1999 10 04	557 0.2- 0.2+	1999 11 14	704 0.7- 0.2-
1997 01 11	587 0.0 0.0	1999 10 12	704 0.7- 0.6-	1999 11 16	704 0.3- 0.4-
1998 04 22	704 0.3+ 0.6+	1999 10 12	704 0.1+ 0.3+	1999 11 16	704 0.9+ 0.2-
1998 04 22	704 0.9- 0.1-	1999 10 12	704 0.3- 0.2-	1999 11 16	704 0.1+ 0.9-
1998 04 22	704 1.0+ 0.0	1999 10 12	704 0.2- 0.2-	1999 11 16	704 0.2+ 0.9-
1998 04 22	704 0.7- 1.5-	1999 10 22	704 0.9+ 0.6-	1999 11 16	704 0.1- 0.0

(12406)* 1995 SZ₁ = 1981 US₈ = 1991 NK₇

Discovered 1995 Sept. 25 at Kleť.

Id. A. Doppler (*MPC* 34512, *MPC* 35295), M. E. Sansaturio (*MPC* 34512),

G. V. Williams (*MPC* 35295)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	2.69624	(2000.0)	P	Q
<i>n</i>	0.27766254	ω	120.74087	+0.67246128 -0.73876294
<i>a</i>	2.3269722	Ω	286.93131	+0.66196172 +0.62752207
<i>e</i>	0.1482911	<i>i</i>	2.69622	+0.33106268 +0.24585642
<i>P</i>	3.55	<i>H</i>	14.9	<i>G</i> 0.15 <i>U</i> 1

Residuals in seconds of arc

1981 10 30	381 0.0 0.5-	1995 10 05	046 0.3- 0.7-	1997 03 05	046 1.0+ 0.1-
1981 10 30	381 0.2+ 0.6-	1995 10 05	046 0.3- 0.8-	1997 03 11	046 1.5- 0.2-
1991 07 12	809 0.3+ 0.0	1995 10 05	046 0.3- 0.4-	1997 03 11	046 0.2- 0.1+
1991 07 12	809 0.0 0.0	1995 10 05	046 0.2- 0.3-	1997 03 11	046 0.0 0.0
1991 07 12	809 0.2- 0.4+	1995 10 05	046 0.3- 0.2-	1997 04 01	046 0.0 0.1-
1991 07 14	809 (95.2- 54.6+)	1995 10 12	046 0.0 0.6-	1997 04 01	046 0.0 0.2-

1991 07 14	809(95.3– 55.0+)	1995 10 12	046	0.2–	0.6–	1997 04 03	046	0.6–	0.1+
1991 07 14	809(95.3– 55.5+)	1995 10 12	046	0.2–	0.8–	1997 04 03	046	0.5–	0.2+
1995 09 25	046 0.4+	1995 10 21	046	0.1+	0.2–	1997 04 03	046	0.6+	0.4–
1995 09 25	046 0.6+	1995 10 21	046	0.2+	0.2–	1999 10 22	704	0.3+	0.2–
1995 09 25	046 0.7+	1995 10 21	046	0.1+	0.2–	1999 10 22	704	0.1–	0.4–
1995 09 25	046 0.5+	1995 11 10	046	0.1+	0.2+	1999 10 22	704	1.0+	0.8–
1995 09 25	046 0.6+	1995 11 10	046	0.2+	0.2+	1999 10 22	704	1.1+	0.1+
1995 09 25	046 0.5+	1995 11 10	046	0.2+	0.2+	1999 11 05	046	0.3+	0.5+
1995 09 26	046 0.7+	1995 11 11	046	0.1–	0.3+	1999 11 05	046	0.4+	0.2+
1995 09 26	046 0.5–	1995 11 11	046	0.2–	0.3+	1999 11 05	046	0.0	0.2–
1995 09 26	046 0.4+	1995 11 11	046	0.1–	0.4+	1999 11 12	703	0.5+	0.0
1995 09 26	046 0.1–	1995 11 26	046	0.2–	0.1+	1999 11 12	703	0.5+	0.7+
1995 09 26	046 0.1+	1995 11 26	046	0.5+	0.0	1999 11 12	703	0.2+	0.4–
1995 09 28	046 0.4–	1995 11 26	046	0.2–	0.2–	1999 11 12	703	0.9–	0.6+
1995 09 28	046 0.5–	1995 12 17	046	0.4+	0.3–	1999 11 16	704	1.3–	0.1+
1995 10 03	046 0.6–	1995 12 17	046	0.3+	0.2–	1999 11 16	704	0.8–	0.5–
1995 10 03	046 0.5–	1995 12 17	046	0.1–	0.0	1999 11 16	704	0.1–	1.0+
1995 10 03	046 0.7–	1997 03 05	046	0.4+	0.1–	1999 11 16	704	0.4–	1.1+
1995 10 05	046 0.3–	1997 03 05	046	0.3+	0.4–	1999 11 16	704	0.3+	0.1–

(12407)* 1995 SC₂

Discovered 1995 Sept. 23 at the Osservatorio S. Vittore, Bologna.

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

M	338.91635		(2000.0)	P	Q
n	0.26436745	ω	223.50827	+0.90588463	-0.42186181
a	2.4043484	Ω	161.34292	+0.41355443	+0.86199195
e	0.1261103	i	6.73040	+0.09135516	+0.28107383
P	3.73	H	14.3	G 0.15	U 1

Residuals in seconds of arc

1995 09 23	552	0.1+	0.0	1997 03 02	552	0.1+	0.3–	1998 06 22	552	1.8+	0.5–
1995 09 23	552	0.3+	0.2–	1997 03 02	552	0.1–	0.2+	1998 06 22	552	0.2–	0.0
1995 09 23	552	0.1+	0.0	1997 03 07	552	0.2–	0.6+	1999 10 02	704	0.0	0.2–
1995 09 25	552	0.0	0.5+	1997 03 07	552	0.4–	0.0	1999 10 02	704	0.4+	0.1+
1995 09 25	552	0.6+	0.6+	1997 03 10	552	0.6–	1.3+	1999 10 02	704	0.3+	0.1+
1995 09 29	552	0.1+	0.5–	1997 03 10	552	0.2+	0.5+	1999 10 02	704	0.1+	0.0
1995 09 29	552	0.0	1.0+	1997 03 10	552	0.9–	0.7+	1999 10 02	704	0.1+	0.1–
1995 10 20	552	1.0–	1.1–	1997 03 11	552	1.1–	0.3–	1999 10 06	106	0.3+	0.9+
1995 10 20	552	0.3–	0.6–	1997 03 11	552	1.2–	0.1+	1999 10 06	106	0.5–	0.3+
1997 02 06	552	0.1+	0.1+	1997 03 11	552	1.2–	0.9+	1999 10 07	106	0.1–	0.7+
1997 02 06	552	0.5+	0.1–	1997 03 31	704	0.2+	0.3+	1999 10 07	704	0.4+	0.2+
1997 02 06	552	0.1+	0.3–	1997 03 31	704	1.0+	0.1+	1999 10 07	704	0.0	0.3+
1997 02 07	552	0.4–	0.6–	1997 04 01	704	0.5–	0.7+	1999 10 07	704	0.1+	0.1–
1997 02 07	552	0.2+	0.6–	1997 04 01	704	1.8+	0.4+	1999 10 07	704	0.2+	0.2+
1997 02 07	552	0.2–	0.9–	1998 05 23	699	0.4+	0.6+	1999 10 07	704	0.1–	0.1–
1997 02 08	552	0.8–	0.5–	1998 05 23	699	0.4+	0.5+	1999 10 08	552	0.1–	0.2–
1997 02 08	552	0.4–	0.1–	1998 05 23	699	0.3–	0.1+	1999 10 08	552	0.3–	0.1+
1997 02 10	552	0.5+	0.3–	1998 05 24	704	0.5+	0.8–	1999 10 09	704	0.2+	0.1+
1997 02 10	552	0.1–	0.2–	1998 05 24	704	1.3–	0.7+	1999 10 09	704	0.2+	0.2+
1997 02 10	552	0.3–	0.0	1998 05 24	704	0.7–	1.6–	1999 10 09	704	0.0	0.1+
1997 02 16	552	0.2+	1.0–	1998 05 24	704	(2.9– 1.1–)		1999 10 09	704	0.4+	0.2–
1997 02 16	552	0.1–	0.7–	1998 05 26	552	0.2+	0.1–	1999 10 09	704	0.1+	0.0
1997 02 16	552	0.6+	0.1–	1998 05 26	552	0.6+	0.1+	1999 11 07	704	0.4+	0.2–
1997 02 27	552	0.5+	0.1+	1998 05 30	552	1.0–	1.5–	1999 11 07	704	0.3–	0.3–
1997 02 27	552	0.7+	0.1+	1998 05 30	552	0.0	0.5–	1999 11 07	704	0.2+	0.8–
1997 02 27	552	0.5+	0.8–	1998 05 30	552	0.2–	0.2–	1999 11 07	704	1.1–	0.7–
1997 02 28	552	0.2+	0.0	1998 06 13	552	0.5+	0.5+	1999 11 07	704	0.4+	2.6–
1997 02 28	552	0.1+	0.1–	1998 06 13	552	0.0	0.7–	1999 11 07	704	0.1–	0.5–
1997 02 28	552	0.6+	0.2–	1998 06 13	552	0.2–	0.4–	1999 11 07	704	0.8–	0.2–
1997 02 28	552	0.3+	0.6+	1998 06 22	552	1.1–	0.4+				
1997 03 02	552	0.1+	0.3–	1998 06 22	552	0.3–	0.4–				

(12408)* 1995 SP₂

Discovered 1995 Sept. 20 by A. Nakamura at Kuma Kogen.

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Nakano

M	34.46529		(2000.0)	P	Q
n	0.26568437	ω	266.45154	+0.96982510	+0.20359904
a	2.3963967	Ω	81.76789	−0.13230767	+0.90156805
e	0.1519621	i	7.78816	−0.20477781	+0.38173613
P	3.71	H	15.1	G 0.15	U 1

Residuals in seconds of arc

1995 09 20	360	0.3–	0.4–	1997 03 01	360	0.7–	0.1+	1999 10 10	704	0.1–	0.3+
1995 09 20	360	0.3–	0.6–	1997 03 04	360	0.0	0.2+	1999 10 10	704	0.5–	0.5–
1995 09 20	360	0.1–	0.3–	1997 03 04	360	0.0	0.2+	1999 10 10	704	0.2–	0.8+
1995 09 24	360	0.4–	0.7+	1998 05 19	360	0.1–	0.1+	1999 10 20	360	0.0	0.2+
1995 09 24	360	0.6–	0.4+	1998 05 19	360	0.2–	0.1+	1999 10 20	360	0.2–	0.4+
1995 09 24	360	0.4–	0.3+	1998 05 22	704	0.4+	0.9–	1999 11 04	704	0.2+	0.0
1995 10 03	360	0.4–	0.7+	1998 05 22	704	0.6+	0.1–	1999 11 04	704	0.4+	1.0+
1995 10 03	360	0.4–	0.5+	1998 05 22	704	0.9+	0.2–	1999 11 04	704	0.2+	0.1–
1995 10 03	360	0.4–	0.7+	1998 05 22	704	1.8–	1.0–	1999 11 04	704	0.1–	0.1+
1995 10 12	360	0.3+	0.1+	1998 05 22	360	0.4–	0.3–	1999 11 04	704	0.4+	0.5–
1995 10 12	360	0.6+	0.3–	1998 05 22	360	0.7–	0.7–	1999 11 04	360	0.2+	0.3+
1995 10 12	360	0.7+	0.2+	1998 05 24	704	0.7+	0.7–	1999 11 04	360	0.3+	0.2+
1995 10 17	360	0.2+	0.2–	1998 05 24	704	1.0–	0.3+	1999 11 10	360	0.7+	0.1–
1995 10 17	360	0.1+	0.2–	1998 05 24	704	0.6+	1.7+	1999 11 10	360	0.6+	0.2+
1995 10 20	360	0.8+	0.0	1998 05 24	704	0.3+	1.3–	1999 11 15	704	0.2+	0.4–
1995 10 20	360	0.5+	0.1–	1998 05 24	704	0.3–	0.1+	1999 11 15	704	1.1–	0.2+
1995 11 12	360	0.1+	0.5–	1998 06 01	809	(2.5+ 2.9+)		1999 11 15	704	0.0	0.4–
1995 11 12	360	0.3+	0.4–	1998 06 01	809	(2.0+ 3.3+)		1999 11 15	704	0.4–	0.4–
1995 11 12	360	0.0	0.2–	1998 06 01	809	(1.8+ 2.6+)		1999 11 15	704	0.3–	0.2–
1995 11 21	360	0.1+	0.9–	1998 06 02	809	0.8+	0.8+	1999 11 17	704	0.5+	0.1–
1995 11 21	360	0.0	1.0–	1998 06 02	809	0.4+	1.0+	1999 11 17	704	0.0	0.3–
1997 02 04	360	0.1+	0.0	1998 06 02	809	0.4–	0.3–	1999 11 17	704	0.2+	0.1+
1997 02 04	360	0.1+	0.0	1998 06 16	360	0.1–	0.0	1999 11 17	704	0.0	0.3–
1997 02 04	360	0.0	0.5–	1998 06 16	360	0.0	0.1+	1999 11 17	704	0.3–	0.2–
1997 02 09	360	0.5+	0.1+	1999 10 10	704	0.6–	0.3–				
1997 02 09	360	0.0	0.2+	1999 10 10	704	0.2–	0.0				

(12409)* 1995 SL₃

Discovered 1995 Sept. 28 at Kleť.

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

M	55.25442		(2000.0)	P	Q
n	0.26060146	ω	53.02318	+0.52423358	+0.85151598
a	2.4274567	Ω	248.59636	−0.78467279	+0.47845979
e	0.1806656	i	0.61448	−0.33085914	+0.21446858
P	3.78	H	15.7	G 0.15	U 1

Residuals in seconds of arc

1995 09 28	046	0.2+	0.1+	1995 10 28	046	0.2+	0.5+	1999 10 02	691	0.2−	0.3−
1995 09 28	046	0.2−	0.3+	1995 10 28	046	0.3−	0.6+	1999 10 06	704	0.2+	0.1−
1995 09 28	046	0.6+	0.1−	1995 11 26	046	0.7+	0.1−	1999 10 06	704	0.2−	0.4−
1995 09 28	046	0.2−	0.0	1995 11 26	046	0.6+	0.0	1999 10 06	704	0.4+	0.8−
1995 09 28	046	0.3+	0.5−	1995 11 26	046	0.5+	0.2+	1999 10 06	704	0.5+	1.1−
1995 09 28	046	0.1−	0.1+	1995 12 17	046	0.1−	1.0+	1999 10 06	704	0.0	0.3−
1995 09 29	046	1.2−	0.2+	1995 12 17	046	0.1−	0.1+	1999 10 08	046	0.0	0.6+
1995 09 29	046	0.2+	0.8+	1995 12 17	046	0.1+	0.0	1999 10 08	046	0.0	0.0
1995 09 29	046	0.3−	0.3−	1997 01 16	046	0.1+	0.0	1999 10 08	046	0.6−	0.1+
1995 09 29	046	0.5+	0.7+	1997 01 16	046	0.0	0.1−	1999 10 10	704	0.3+	0.3−
1995 10 02	046	0.7−	0.5−	1997 01 16	046	1.0+	0.1+	1999 10 10	704	0.6+	0.0
1995 10 02	046	0.5−	0.2−	1997 01 17	046	0.2+	0.3+	1999 10 10	704	0.6+	0.0
1995 10 02	046	0.6+	0.5−	1997 01 17	046	0.3−	0.9+	1999 10 13	691	0.1+	0.1+
1995 10 03	046	0.1−	0.4+	1997 01 17	046	0.8−	1.3+	1999 10 13	691	0.0	0.1−
1995 10 03	046	0.7−	0.6−	1998 04 21	704	0.6+	0.3−	1999 10 13	691	0.1+	0.1−
1995 10 03	046	0.2−	0.3−	1998 04 21	704	0.3+	1.8+	1999 10 15	704	0.2−	0.7+
1995 10 04	046	0.2−	0.1+	1998 04 21	704	0.2+	0.1+	1999 10 15	704	0.6+	1.5+
1995 10 04	046	0.2−	0.2+	1998 04 21	704	0.1−	0.9+	1999 10 15	704	(0.4+	3.1+)
1995 10 04	046	0.3−	0.3−	1998 04 21	704	0.2−	1.2+	1999 10 15	704	(1.0+	2.5+)
1995 10 05	046	0.3+	1.5+	1998 04 22	704	0.7+	0.6−	1999 11 05	704	0.2+	0.5−
1995 10 05	046	0.4−	0.0	1998 04 22	704	0.3+	0.0	1999 11 05	704	1.3−	0.3+

1995 10 05	046	0.0	0.0	1998 04 22	704	1.4+	0.8+	1999 11 05	704	0.0	0.2-
1995 10 12	046	1.0-	0.1+	1998 04 22	704	0.2+	0.6-	1999 11 05	704	0.7-	0.4-
1995 10 12	046	0.1-	0.5-	1998 04 22	704	1.3+	0.1-	1999 11 05	704	0.2+	0.3+
1995 10 12	046	0.6-	0.0	1998 05 20	691	0.9-	0.9+	1999 11 12	704	0.1+	0.3-
1995 10 22	046	0.4+	1.0+	1998 05 20	691	0.7-	1.3+	1999 11 12	704	0.2-	0.6+
1995 10 22	046	0.4+	0.9+	1998 05 20	691	0.8-	1.1+	1999 11 12	704	0.4-	0.6+
1995 10 22	046	0.0	1.2+	1999 10 02	691	0.2-	0.2-	1999 11 12	704	0.1-	0.6+
1995 10 28	046	0.1+	0.3+	1999 10 02	691	0.1-	0.3-	1999 11 12	704	0.1-	0.3+

(12410)* 1995 SM₃ = 1993 DE

Discovered 1995 Sept. 26 by P. Sicoli and P. Ghezzi at Sormano.

Id. G. V. Williams (*MPC* 25966)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>		(2000.0)		P		Q	
<i>n</i>	271.93046	ω	139.71097	-0.58500701	-0.81030389		
<i>a</i>	2.4279111	Ω	345.98130	+0.70296611	-0.48553385		
<i>e</i>	0.1652097	<i>i</i>	8.13293	+0.40448171	-0.32812267		
<i>P</i>	3.78	<i>H</i>	14.5	<i>G</i>	0.15	<i>U</i>	1

Residuals in seconds of arc

1993 02 17	372	1.8-	1.0-	1997 03 08	587	1.7+	1.0+	1999 10 13	704	0.5-	0.5-
1993 02 17	372	1.2+	1.3-	1997 03 08	587	0.7+	0.1-	1999 10 13	704	0.6+	0.6-
1993 02 19	372	0.8-	0.5-	1997 03 12	104	1.0+	0.2+	1999 10 13	704	0.0	0.6-
1993 02 19	372	1.0-	1.0-	1997 03 12	104	0.9+	0.2+	1999 10 13	704	0.3-	0.9-
1995 09 26	587	0.4-	0.2-	1997 03 12	104	0.6+	0.4+	1999 11 03	704	0.7-	0.2+
1995 09 27	587	0.1+	0.1+	1997 03 12	587	0.7+	0.2+	1999 11 03	704	0.8-	0.2+
1995 09 28	587	0.4+	0.4-	1997 03 12	587	0.3-	0.9+	1999 11 03	704	1.2-	0.6-
1995 09 28	587	0.9+	0.3+	1997 03 31	587	0.3-	0.8+	1999 11 03	704	0.1-	0.7+
1995 09 29	587	0.1+	0.8-	1997 03 31	587	0.3-	1.6+	1999 11 04	704	0.1-	0.4+
1995 09 29	587	1.2+	0.0	1997 03 31	587	0.5-	1.4+	1999 11 04	704	0.0	1.1+
1995 09 30	587	0.2+	0.9-	1999 10 12	704	0.4+	0.5+	1999 11 04	704	0.0	0.7+
1995 10 01	587	0.3-	0.2+	1999 10 12	704	0.4+	0.1-	1999 11 04	704	0.2+	0.8+
1995 10 16	587	0.6-	1.3+	1999 10 12	704	0.1-	0.3-	1999 11 04	704	0.6+	1.3+
1995 10 16	587	0.3-	0.8+	1999 10 12	704	0.3+	0.4-	1999 11 09	699	0.3+	1.2+
1995 10 17	587	0.7-	0.5+	1999 10 12	704	0.2+	0.6-	1999 11 09	699	0.7-	0.4+
1995 10 17	587	0.8-	0.6+	1999 10 13	704	0.6-	0.3+				

(12411)* 1995 SQ₃ = A917 SA

Discovered 1995 Sept. 20 by K. Endate and K. Watanabe at Kitami.

Id. S. Nakano (*MPC* 32240)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>		(2000.0)		P		Q	
<i>n</i>	304.08272	ω	184.81908	-0.19147688	-0.97649423		
<i>a</i>	2.3263712	Ω	276.24413	+0.90380043	-0.13609914		
<i>e</i>	0.0789521	<i>i</i>	5.71404	+0.38272887	-0.16714080		
<i>P</i>	3.55	<i>H</i>	13.7	<i>G</i>	0.15	<i>U</i>	2

Residuals in seconds of arc

1917 09 22	024	0.1-	0.2-	Y	1998 06 21	688	0.2-	0.5+	1999 10 05	704	0.4-	0.1+
1917 09 23	024(30.8+	10.0+	Y	1998 06 21	688	0.3-	0.3+	1999 10 05	704	0.9-	1.0+	
1917 09 24	024(25.2+	9.6+	Y	1998 06 24	704	0.5-	0.5+	1999 10 05	704	1.0-	0.2+	
1917 09 26	024(17.6+	13.3+	Y	1998 06 24	704	0.7-	0.2+	1999 10 05	704	0.0	0.0	
1917 09 27	024(19.4+	5.8-	Y	1998 06 24	704	0.4+	0.2+	1999 10 05	704	0.1-	0.3+	
1995 09 20	400	(1.6+	4.2+	1998 06 24	704	0.0	0.6+	1999 10 13	704	(2.6-	1.2-)	
1995 09 20	400	(3.2+	0.2+	1998 06 24	704	0.7+	1.7+	1999 10 13	704	0.4-	1.2-	
1995 09 21	400	1.8+	0.7-	1998 06 26	704	0.7-	0.1-	1999 10 13	704	0.2-	1.3-	
1995 09 21	400	1.7+	1.0-	1998 06 26	704	0.4-	1.4+	1999 10 13	704	0.1+	1.1-	
1995 09 30	400	0.3+	1.4-	1998 06 26	704	0.2+	0.2+	1999 11 14	704	0.2+	1.0+	
1995 09 30	400	0.2+	1.1-	1998 06 26	704	0.4-	0.0	1999 11 14	704	0.2+	0.9+	
1995 10 11	400	0.9+	0.1-	1998 06 28	809	(3.3+	1.7+)	1999 11 14	704	0.2+	0.9+	
1995 10 11	400	0.2+	0.6+	1998 06 28	809	(3.3+	1.6+)	1999 11 14	704	0.2+	0.6+	
1997 04 21	327	0.0	0.6-	1998 06 28	809	(3.9+	1.5+)	1999 11 14	704	0.0	0.5+	
1997 04 21	327	0.7+	0.3-	1998 07 01	809	(3.3+	0.6+)	1999 11 16	704	0.1-	1.3+	
1997 04 21	327	0.1+	0.5-	1998 07 01	809	(4.1+	0.9+)	1999 11 16	704	0.2+	1.1+	
1998 06 16	691	1.3-	0.4+	1998 07 01	809	(3.8+	0.6+)	1999 11 16	704	0.3-	0.9+	

1998 06 16	691	0.9-	0.4+	1998 07 26	704	0.8+	0.6-	1999 11 16	704	0.3-	1.0+
1998 06 16	691	0.8-	0.4+	1998 07 26	704	(2.3+	0.6-)	1999 11 16	704	0.1-	0.9+
1998 06 21	688	0.6-	0.6+	1998 07 26	704	(2.7+	2.6-)				

(12412)* 1995 ST₄ = 1955 SY = 1992 YW

Discovered 1995 Sept. 20 by K. Endate and K. Watanabe at Kitami.

Id. T. Kobayashi (*MPC* 25966), S. Nakano (*ibid.*)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>		(2000.0)		P		Q	
<i>n</i>	19.40679	ω	213.96261	+0.99025049	-0.12833094		
<i>a</i>	2.3667179	Ω	153.25374	+0.13867338	+0.94498893		
<i>e</i>	0.1506443	<i>i</i>	6.91418	-0.01317827	+0.30087721		
<i>P</i>	3.64	<i>H</i>	13.6	<i>G</i>	0.15	<i>U</i>	1

Residuals in seconds of arc

1955 09 18	760	0.2+	0.4-	1998 05 23	704	1.2-	1.8-	1998 07 01	699	0.3-	0.1+
1955 09 18	760	0.1-	0.5-	1998 05 26	704	0.0	0.1+	1998 07 01	699	0.2-	0.3+
1992 12 21	372	0.0	1.8+	1998 05 26	704	0.7-	0.3+	1999 10 10	704	0.6-	0.4+
1992 12 21	372	1.4+	0.1-	1998 05 26	704	0.3-	0.4-	1999 10 10	704	0.1+	0.0
1992 12 23	372	1.1-	1.7-	1998 05 26	704	0.6-	0.0	1999 10 10	704	0.5-	0.3+
1992 12 23	372	0.4+	0.8-	1998 05 26	704	0.6-	1.0+	1999 10 10	704	0.4-	0.1+
1992 12 25	372	0.4+	0.1+	1998 06 19	704	0.4+	0.4-	1999 10 10	704	0.3-	0.2+
1995 09 20	400	0.5-	0.8+	1998 06 19	704	0.8-	0.8+	1999 10 20	704	0.0	0.8+
1995 09 20	400	1.1+	0.1+	1998 06 19	704	0.7+	0.5-	1999 10 20	704	0.3+	0.5+
1995 09 21	400	0.6+	0.5+	1998 06 19	704	1.6+	0.4+	1999 10 20	704	0.2-	0.6+
1995 09 21	400	0.6-	0.2-	1998 06 19	704	0.1-	0.3+	1999 10 20	704	0.6-	0.1-
1995 09 30	400	0.2+	0.4-	1998 06 25	704	0.5+	0.3+	1999 10 20	704	0.3+	0.8-
1995 09 30	400	0.0	0.2-	1998 06 25	704	0.8+	0.5-	1999 11 05	704	0.3+	0.2+
1998 05 23	704	0.5-	0.0	1998 06 25	704	0.5+	0.6-	1999 11 05	704	0.3-	0.5-
1998 05 23	704	0.5-	0.6+	1998 06 25	704	0.3+	0.0	1999 11 05	704	0.1+	0.3-
1998 05 23	704	0.1-	0.1-	1998 06 25	704	0.2-	0.3-	1999 11 05	704	0.3+	0.8-
1998 05 23	704	0.4+	0.1-	1998 07 01	699	0.1+	0.2-	1999 11 05	704	0.6-	0.2-

(12413)* 1995 SQ₂₉ = 2141 T-1

Discovered 1995 Sept. 26 by T. V. Kryachko at the Zelenchukskaya Station of the Engelhardt Observatory.

Id. A. Milani (*MPC* 34195), G. V. Williams (*ibid.*)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>		(2000.0)		P		Q	
<i>n</i>	38.21791	ω	291.95327	+0.88413997	+0.46518805		
<i>a</i>	2.4304674	Ω	40.35980	-0.40002022	+0.80183775		
<i>e</i>	0.1918611	<i>i</i>	3.85604	-0.24141322	+0.37504174		
<i>P</i>	3.79	<i>H</i>	14.6	<i>G</i>	0.15	<i>U</i>	1

Residuals in seconds of arc

1971 03 24	675	(3.9- 1.2-)	1998 04 22	704	0.5- 0.2+	1999 11 03	704	0.4- 0.4-
1971 03 25	675	1.0- 0.1+	1998 04 22	704	0.4- 1.3+	1999 11 03	704	0.7- 0.8-
1971 03 25	675	0.5- 0.8+	1998 05 01	704	0.8+ 1.3-	1999 11 03	704	0.5- 0.6-
1971 03 26	675	0.5+ 0.7-	1998 05 01	704	0.4+ 0.5+	1999 11 03	704	(0.6+ 2.3-)
1971 04 02	675	1.8+ 1.3-	1998 05 01	704	0.3- 0.7-	1999 11 03	704	0.9- 1.8-
1995 09 26	114	0.1- 0.1-	1998 05 01	704	0.8+ 1.7+	1999 11 14	704	0.1+ 0.5+
1995 09 26	114	(2.3- 1.6-)	1998 05 18	699	0.2- 0.4-	1999 11 14	704	0.3+ 0.2+
1995 09 28	114	0.8- 0.4-	1998 05 18	699	1.2+ 1.2+	1999 11 14	704	0.3+ 0.5+
1995 09 29	114	0.5- 0.3+	1998 05 18	699	0.4+ 0.2-	1999 11 14	704	0.1+ 0.2+
1995 10 01	114	0.5- 0.3+	1998 05 24	704	0.1- 0.3+	1999 11 14	704	0.1- 0.2+
1995 10 01	114	1.1- 0.2+	1998 05 24	704	(0.4+ 2.4-)	1999 11 15	704	0.1+ 0.4+
1995 10 16	114	(4.4- 0.9-)	1998 05 24	704	0.2+ 0.5-	1999 11 15	704	0.2+ 0.4+
1995 10 16	114	0.5- 0.0	1998 05 24	704	(2.8+ 0.1-)	1999 11 15	704	0.3+ 0.7+
1995 10 17	114	0.3+ 0.7-	1998 05 24	704	(1.3- 2.1-)	1999 11 15	704	0.2+ 0.5+
1995 10 18	114	0.2- 0.2+	1999 10 12	704	1.2+ 0.8+	1999 11 15	704	0.1+ 0.0
1995 10 19	114	0.9+ 0.6-	1999 10 12	704	0.8+ 0.7+	1999 11 16	704	0.6+ 0.6+
1995 10 19	114	0.2- 0.4-	1999 10 12	704	0.3+ 0.1+	1999 11 16	704	0.7+ 0.5+
1997 02 15	691	1.1- 0.6+	1999 10 22	704	0.5+ 0.3-	1999 11 16	704	0.1- 0.5+
1997 02 15	691	1.2- 0.4+	1999 10 22	704	0.5+ 0.1+	1999 11 16	704	0.3+ 0.2+
1997 02 15	691	1.0- 0.4+	1999 10 22	704	0.4+ 0.2-	1999 11 16	704	0.4+ 0.3+

1998 04 22 704 1.0- 0.3+ 1999 10 22 704 0.9- 0.8-
 1998 04 22 704 0.1- 0.5- 1999 10 22 704 0.3+ 0.3+

(12414)* 1995 SR₂₉ = 1991 RK₃₇ = 1998 KN₂₀

Discovered 1995 Sept. 26 by T. V. Kryachko at the Zelenchukskaya Station of the Engelhardt Observatory.

Id. G. V. Williams (*MPC* 31969)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>		<i>P</i>		<i>Q</i>	
37.80090		(2000.0)			
<i>n</i>	0.26114294	ω	267.58321	+0.89708885	+0.44037062
<i>a</i>	2.4241000	Ω	66.28734	-0.38809002	+0.82439064
<i>e</i>	0.2015471	<i>i</i>	2.26152	-0.21122910	+0.35560343
<i>P</i>	3.77	<i>H</i>	14.6	<i>G</i>	0.15
				<i>U</i>	1

Residuals in seconds of arc

1991 09 15	675	(4.8+ 2.0-)	1998 05 01	704	0.6+ 0.0	1999 11 09	704	0.0 1.1-
1991 09 15	675	(4.6+ 0.9-)	1998 05 01	704	(2.3+ 1.5+)	1999 11 09	704	0.2- 1.2-
1993 01 25	691	0.2+ 1.5+	1998 05 22	704	(0.3+ 2.9-)	1999 11 09	704	0.4- 1.2-
1993 01 25	691	0.4+ 1.4+	1998 05 22	704	0.3- 0.3+	1999 11 10	704	0.5- 0.7-
1995 09 26	114	0.5- 0.5+	1998 05 22	704	1.0- 0.5-	1999 11 10	704	0.0 0.7-
1995 09 26	114	1.6- 0.7-	1998 05 22	704	0.1- 1.5-	1999 11 10	704	1.2+ 1.9-
1995 09 28	114	1.4- 1.2+	1998 05 22	704	0.4+ 1.2-	1999 11 10	704	0.5+ 0.7-
1995 09 28	114	0.5+ 0.1+	1998 05 24	704	1.0- 0.8-	1999 11 12	704	0.1+ 0.8-
1995 10 01	114	(2.6- 0.7-)	1998 05 24	704	0.9+ 1.2-	1999 11 12	704	0.0 0.9-
1995 10 01	114	0.1- 1.0+	1998 05 24	704	0.3- 0.0	1999 11 12	704	0.0 0.5-
1995 10 16	114	1.0- 0.1-	1998 05 24	704	0.5- 2.1-	1999 11 12	704	0.1+ 0.8-
1995 10 16	114	0.4- 0.1-	1998 05 24	704	1.7- 1.6-	1999 11 12	704	0.2- 0.6-
1995 10 17	114	0.0 0.1-	1999 10 22	704	0.4+ 0.8+	1999 11 16	704	0.1+ 0.1+
1995 10 17	114	1.1- 0.0	1999 10 22	704	1.2+ 1.1-	1999 11 16	704	0.5+ 0.4-
1995 10 18	114	(3.4+ 1.0+)	1999 10 22	704	0.7- 0.3+	1999 11 16	704	0.5+ 0.3-
1995 10 19	114	(2.6+ 1.1+)	1999 10 30	703	0.5- 0.7+	1999 11 16	704	0.2+ 0.5-
1995 10 19	114	1.8+ 0.3-	1999 10 30	703	0.1- 0.8+	1999 11 16	704	0.2+ 0.4-
1995 10 21	399	0.7+ 1.0+	1999 10 30	703	0.4- 0.6+	1999 11 17	699	1.2- 0.4+
1995 10 21	399	0.3+ 0.9+	1999 10 30	703	1.1- 0.8+	1999 11 17	699	0.2- 0.9+
1995 10 27	399	0.4+ 1.0+	1999 11 03	704	0.4+ 0.8-	1999 11 17	699	0.2- 1.0+
1995 10 27	399	0.2+ 1.0+	1999 11 03	704	0.8+ 0.6-	1999 11 17	704	0.3- 0.3+
1997 02 04	566	0.0 0.8+	1999 11 03	704	0.1+ 1.0-	1999 11 17	704	0.8+ 0.3-
1997 02 04	566	0.6+ 1.0+	1999 11 03	704	0.2+ 0.8-	1999 11 17	704	0.9+ 0.6-
1997 02 04	566	0.3+ 0.9+	1999 11 03	704	0.1+ 0.6-	1999 11 17	704	0.2+ 0.6-
1998 05 01	704	0.6- 0.8-	1999 11 09	704	0.0 0.9-	1999 11 17	704	1.1+ 1.2-
1998 05 01	704	0.5+ 0.6+	1999 11 09	704	0.1- 0.9-			

(12415)* 1995 SW₅₂ = 1978 WR₁₇

Discovered 1995 Sept. 22 by K. Endate and K. Watanabe at Kitami.

Id. S. Nakano (*MPC* 25967)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>		<i>P</i>		<i>Q</i>	
79.28498		(2000.0)			
<i>n</i>	0.28583665	ω	73.86524	+0.78417137	+0.61585980
<i>a</i>	2.2823948	Ω	248.05710	-0.59607888	+0.71347097
<i>e</i>	0.1657931	<i>i</i>	4.70634	-0.17252603	+0.33417942
<i>P</i>	3.45	<i>H</i>	13.9	<i>G</i>	0.15
				<i>U</i>	1

Residuals in seconds of arc

1978 11 30	675	0.6- 0.4+	1998 06 24	704	0.6- 0.2+	1999 10 12	704	0.4+ 0.2-
1978 12 01	675	0.1- 0.3+	1998 06 24	704	1.9- 1.1+	1999 10 22	704	0.2+ 0.6+
1988 09 11	675	0.4+ 0.5+	1998 06 26	704	0.1+ 0.6-	1999 10 22	704	0.0 0.5+
1988 09 11	675	0.1+ 0.8+	1998 06 26	704	1.3- 0.4+	1999 10 22	704	0.0 0.2+
1995 09 22	400	0.3+ 0.1-	1998 06 26	704	0.8+ 1.3+	1999 10 22	704	0.0 0.2+
1995 09 22	400	0.4+ 0.5-	1998 06 26	704	0.5+ 1.1-	1999 10 22	704	0.1+ 0.7+
1995 09 30	400	1.0+ 0.3+	1998 06 26	704	0.5+ 1.5-	1999 11 17	704	0.8+ 0.2-
1995 09 30	400	0.8- 1.8-	1999 10 12	704	0.8+ 0.9-	1999 11 17	704	0.3- 0.4+
1995 10 10	400	0.6- 0.6+	1999 10 12	704	0.5+ 0.3+	1999 11 17	704	1.7- 2.1-
1995 10 10	400	0.7- 0.1-	1999 10 12	704	0.0 0.3-			
1998 06 24	704	1.7+ 0.5-	1999 10 12	704	0.5+ 0.3-			

(12416)* 1995 TS = 1976 SN₄ = 1991 RU₂₃ = 1993 DB₃

Discovered 1995 Oct. 2 by T. Kobayashi at Oizumi.

Id. S. Nakano (*MPC* 25967), T. Kobayashi (*ibid.*)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>		<i>P</i>		<i>Q</i>	
25.13296		(2000.0)			
<i>n</i>	0.26070610	ω	1.09125	+0.99952947	+0.03066869
<i>a</i>	2.4268071	Ω	357.15113	-0.02822164	+0.91279185
<i>e</i>	0.1861709	<i>i</i>	0.60614	-0.01201598	+0.40727198
<i>P</i>	3.78	<i>H</i>	14.3	<i>G</i>	0.15
				<i>U</i>	1

Residuals in seconds of arc

1976 09 24	095	1.7- 0.4+	1995 10 20	411	0.5- 0.1+	1999 11 03	704	0.2+ 0.4-
1976 09 29	095	1.8+ 0.2+	1995 10 20	411	0.8+ 0.3-	1999 11 03	704	0.1- 0.3+
1991 08 08	675	1.3- 0.6-	1995 10 27	399	0.6- 0.2-	1999 11 03	704	0.4- 0.3+
1991 08 08	675	1.0+ 0.0	1995 10 27	399	0.9- 0.6-	1999 11 03	704	0.2+ 0.8+
1991 09 11	675	1.0+ 0.5-	1995 10 28	399	1.3- 0.0	1999 11 09	704	0.3+ 0.2+
1991 09 11	675	0.4+ 0.4-	1995 10 28	399	0.9- 0.4-	1999 11 09	704	0.2+ 0.1+
1991 09 16	675	0.1- 0.7-	1995 12 23	566	0.8- 0.0	1999 11 09	704	0.4+ 0.3+
1991 09 16	675	0.1- 0.5-	1995 12 23	566	0.5- 0.1+	1999 11 09	704	0.3+ 0.8+
1993 02 20	010	(0.7- 3.0-)	1995 12 23	566	0.2- 0.3+	1999 11 09	704	0.1+ 0.4+
1993 02 20	010	(1.0- 3.5-)	1995 12 23	566	0.1+ 0.1+	1999 11 12	704	0.1+ 0.0
1993 02 20	010	(0.7+ 4.5-)	1995 12 23	566	0.1+ 0.2+	1999 11 12	704	0.0 0.1+
1993 02 22	010	0.9- 2.1-	1995 12 23	566	0.0 0.1+	1999 11 12	704	0.3+ 0.1+
1993 02 23	010	(0.8- 3.8-)	1997 02 26	689	(3.4- 2.4+)	1999 11 12	704	0.0 0.0
1994 05 03	691	0.6- 0.4-	1998 06 03	704	1.2- 0.8+	1999 11 12	704	0.3+ 0.1+
1994 05 03	691	0.9- 0.1-	1998 06 03	704	1.2+ 1.4+	1999 11 16	704	0.1- 0.0
1995 10 02	411	1.0- 0.0	1998 06 03	704	0.6+ 2.0+	1999 11 16	704	0.2+ 0.5+
1995 10 02	411	0.1+ 0.6+	1998 06 03	704	0.7+ 0.4+	1999 11 16	704	0.6+ 0.2-
1995 10 14	411	0.9+ 0.3+	1999 10 12	704	0.2- 0.0	1999 11 16	704	0.5+ 0.4-
1995 10 14	411	0.5- 0.5-	1999 10 12	704	0.2- 0.8-	1999 11 16	704	0.9+ 0.3-
1995 10 14	411	0.1+ 1.3+	1999 10 12	704	0.6- 0.1+			
1995 10 20	411	0.3- 0.5+	1999 10 12	704	0.3+ 0.0			

(12417)* 1995 TC₈ = 1971 UA₄ = 1992 YQ₅

Discovered 1995 Oct. 2 by S. Otomo at Kiyosato.

Id. T. B. Spahr (*MPC* 30665)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>		<i>P</i>		<i>Q</i>	
60.29912		(2000.0)			
<i>n</i>	0.28727894	ω	234.31833	+0.98493630	+0.15091184
<i>a</i>	2.2747492	Ω	116.86654	-0.11153718	+0.92751523
<i>e</i>	0.1617249	<i>i</i>	5.43005	-0.13213606	+0.34196653
<i>P</i>	3.43	<i>H</i>	14.3	<i>G</i>	0.15
				<i>U</i>	1

Residuals in seconds of arc

1971 10 22	805	0.6- 1.7+	1995 10 20	894	1.3+ 0.9-	1999 10 10	704	0.1- 0.3-
1971 10 22	805	0.5- 0.7+	1998 06 24	704	0.7- 0.0	1999 10 10	704	1.3- 0.6-
1971 10 22	805	0.6+ 1.0-	1998 06 24	704	0.9+ 0.3-	1999 10 10	704	0.4- 0.6-
1992 12 29	033	0.1+ 0.4-	1998 06 24	704	(2.4- 1.3+)	1999 10 21	704	0.0 0.3+
1992 12 30	033	0.8- 0.1-	1998 06 24	704	(1.5- 2.4+)	1999 10 21	704	0.5+ 0.2-
1993 01 01	033	0.2+ 1.2-	1998 06 26	704	0.8+ 1.7-	1999 10 21	704	0.4+ 1.5-
1995 10 02	894	0.1- 0.6+	1998 06 26	704	0.6- 0.4-	1999 10 21	704	1.2+ 0.8-
1995 10 02	894	1.0- 0.6+	1998 06 26	704	0.6- 1.4-	1999 11 12	703	0.3+ 0.7-
1995 10 19	894	0.0 0.4-	1998 06 26	704	(3.4- 1.2-)	1999 11 12	703	0.2+ 0.8+
1995 10 19	894	0.2- 0.1-	1999 10 10	704	0.4- 0.2-	1999 11 12	703	0.3- 0.2-
1995 10 20	894	0.6+ 1.0-	1999 10 10	704	0.4- 0.9-	1999 11 12	703	0.4+ 0.7+

(12418)* 1995 UX₂ = 1997 DD

Discovered 1995 Oct. 23 by the Beijing Schmidt CCD Asteroid Program at Xinglong.

Id. G. V. Williams (*MPC* 29304)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	108.09126		(2000.0)	P	Q				
<i>n</i>	0.19138632	ω	219.71493	-0.34595938	+0.93261234				
<i>a</i>	2.9821452	Ω	30.45437	-0.80109492	-0.23663321				
<i>e</i>	0.1230332	<i>i</i>	11.68986	-0.48842505	-0.27246825				
<i>P</i>	5.15	<i>H</i>	13.5	<i>G</i>	0.15	<i>U</i>	1		
Residuals in seconds of arc									
1992 03 26	691	0.2-	0.1+	1997 04 06	327	0.0	0.7+	1999 10 15	704 0.1+ 0.6+
1992 03 26	691	0.1+	0.3-	1997 04 06	327	0.3+	0.9+	1999 10 19	704 0.4+ 0.7+
1992 03 26	691	0.0	0.2+	1999 10 03	703	0.2+	0.1-	1999 10 19	704 0.3+ 0.5+
1995 10 23	327	0.3+	0.8-	1999 10 03	703	0.6-	0.1-	1999 10 19	704 0.1- 0.4+
1995 10 23	327	0.2-	0.1+	1999 10 03	703	0.2-	0.3+	1999 10 19	704 0.1+ 0.6+
1995 10 23	327	0.1-	0.1+	1999 10 03	703	(2.4+ 3.3+)		1999 10 19	704 0.3- 0.7+
1995 10 24	327	0.8-	0.1-	1999 10 04	704	0.2-	0.5-	1999 11 01	703 0.4- 0.1+
1995 10 24	327	0.5-	0.9-	1999 10 04	704	0.8-	0.8-	1999 11 01	703 0.3+ 0.2-
1995 10 24	327	0.2+	0.7-	1999 10 04	704	1.1-	0.5-	1999 11 01	703 0.2+ 0.3+
1995 12 05	327	0.2-	1.0-	1999 10 04	704	0.2-	0.6-	1999 11 01	703 0.7- 0.3-
1995 12 05	327	0.1+	0.1-	1999 10 04	704	0.6+	0.8+	1999 11 05	704 0.9- 0.6-
1995 12 05	327	0.8-	0.3-	1999 10 07	704	0.4+	1.2+	1999 11 05	704 0.6+ 0.2+
1995 12 26	327	0.5+	0.2-	1999 10 07	704	0.2+	1.2+	1999 11 05	704 0.4- 0.1+
1995 12 26	327	1.0+	0.3+	1999 10 07	704	0.5+	1.0-	1999 11 05	704 0.1- 0.3-
1995 12 26	327	0.4+	0.0	1999 10 07	120	0.7-	0.6+	1999 11 09	704 0.5+ 0.2+
1997 02 16	327	0.8-	0.2+	1999 10 07	120	(2.0- 0.2-)		1999 11 09	704 0.4- 0.0
1997 02 16	327	0.1+	0.2+	1999 10 09	704	0.4+	0.1+	1999 11 09	704 0.2+ 0.6+
1997 02 16	327	0.8+	0.1+	1999 10 09	704	0.7-	0.4+	1999 11 09	704 0.2+ 0.1+
1997 02 20	327	0.1-	0.7+	1999 10 09	704	0.2-	1.0+	1999 11 12	704 0.2- 0.0
1997 02 20	327	0.8+	0.4-	1999 10 09	704	0.3-	0.1-	1999 11 12	704 0.1+ 0.5-
1997 02 20	327	0.3-	0.0	1999 10 09	704	0.1-	0.3+	1999 11 12	704 0.7- 0.4-
1997 03 02	327	1.1+	0.9+	1999 10 15	704	0.3+	0.2+	1999 11 12	704 0.6- 0.2+
1997 03 02	327	0.1+	0.8+	1999 10 15	704	0.1+	0.2+	1999 11 12	704 0.6- 0.4+
1997 03 02	327	1.0+	0.3+	1999 10 15	704	0.5+	0.2+		
1997 04 06	327	0.5+	1.1+	1999 10 15	704	0.2+	0.1-		

(12419)* 1995 UP₄ = 1976 US₂₀ = 1991 RA₂₆

Discovered 1995 Oct. 25 by T. Kobayashi at Oizumi.

Id. T. Kobayashi (*MPC* 26180), S. Nakano (*ibid.*)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Nakano

<i>M</i>	14.47050		(2000.0)	P	Q				
<i>n</i>	0.26252986	ω	330.37363	+0.83014081	-0.54375616				
<i>a</i>	2.4155549	Ω	63.07569	+0.53487414	+0.71424922				
<i>e</i>	0.1364882	<i>i</i>	7.94695	+0.15740355	+0.44065552				
<i>P</i>	3.75	<i>H</i>	13.4	<i>G</i>	0.15	<i>U</i>	1		
Residuals in seconds of arc									
1976 10 24	808	0.5+	0.9+	1995 11 04	411	0.6-	0.3+	1998 06 26	704 0.2+ 0.8-
1976 10 24	808	(0.0 3.0+)		1995 11 11	411	0.7-	0.5+	1998 06 26	704 0.3+ 1.4+
1990 05 26	675	0.5-	0.6+	1995 11 11	411	0.1-	0.1+	1998 06 26	704 0.6+ 0.4+
1990 05 26	675	0.4+	1.8-	1995 11 24	411	1.0-	0.5+	1998 06 26	704 (3.1- 1.2+)
1991 09 12	675	0.6+	0.9-	1995 11 24	411	0.5-	0.2+	1998 06 26	426 0.4- 0.5+
1991 09 12	675	0.9+	1.1-	1995 11 26	046	1.0-	0.3+	1998 06 26	426 0.5- 0.4+
1991 09 15	675	0.4+	1.0-	1995 11 26	046	1.3-	0.0	1998 06 26	426 0.6- 0.1+
1991 09 15	675	0.7+	1.4-	1995 11 27	046	0.0	0.4+	1999 10 09	703 0.4+ 0.5+
1991 09 15	095	0.5+	0.9-	1995 11 27	046	0.0	0.4+	1999 10 09	703 0.9+ 0.5+
1991 09 15	095	(0.3+ 2.5-)		1995 11 27	046	0.0	0.5+	1999 10 09	703 0.2+ 0.8+
1995 10 25	411	1.0+	0.1+	1997 03 09	689	1.7-	0.5+	1999 10 09	703 0.0 0.5+
1995 10 25	411	0.2-	0.0	1998 06 24	704	1.1-	0.9+	1999 10 13	704 1.0+ 0.4-
1995 10 26	411	0.6+	1.2-	1998 06 24	704	0.9+	1.5+	1999 10 13	704 0.5+ 0.5+
1995 10 26	411	0.0	0.4-	1998 06 24	704	1.6+	0.4-	1999 10 13	704 0.0 0.2+
1995 10 28	327	0.2-	0.3+	1998 06 24	704	0.7+	1.3+	1999 10 13	704 0.5+ 0.2+
1995 10 28	327	0.1+	0.6+	1998 06 24	704	(0.9- 3.7+)		1999 11 16	704 0.1- 0.6-
1995 10 28	327	0.9-	0.4+	1998 06 25	426	0.2-	0.5+	1999 11 16	704 0.8+ 0.2-
1995 11 02	411	0.2-	0.3-	1998 06 25	426	0.1-	0.6+	1999 11 16	704 0.5+ 0.2-
1995 11 02	411	0.4-	0.3-	1998 06 25	426	0.2-	0.6+	1999 11 16	704 0.9+ 0.6+
1995 11 04	411	0.2-	0.3-	1998 06 26	704	0.4-	0.7+	1999 11 16	704 0.0 1.0+

(12420)* 1995 UT₄ = 1991 UF₄

Discovered 1995 Oct. 25 by T. Kobayashi at Oizumi.

Id. T. Kobayashi (*MPC* 26180)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Nakano

<i>M</i>	292.35956		(2000.0)	P	Q				
<i>n</i>	0.24107012	ω	52.34064	-0.23361193	-0.95273455				
<i>a</i>	2.5568610	Ω	52.30122	+0.79679923	-0.30206054				
<i>e</i>	0.1405250	<i>i</i>	14.20943	+0.55725798	+0.03250101				
<i>P</i>	4.09	<i>H</i>	13.5	<i>G</i>	0.15	<i>U</i>	2		
Residuals in seconds of arc									
1991 10 30	033	0.8-	0.4+	1999 10 07	704	0.5-	0.0	1999 11 04	704 0.4- 0.4-
1991 10 31	033	0.2+	0.0	1999 10 08	703	0.2-	0.5+	1999 11 04	704 0.8- 1.0-
1991 11 01	033	0.4+	0.3-	1999 10 08	703	0.2-	0.8+	1999 11 15	046 0.1- 0.3+
1993 04 17	675	0.1+	0.2-	1999 10 08	703	0.2-	0.8+	1999 11 15	046 0.1- 0.2+
1995 10 25	411	1.0+	0.1-	1999 10 08	703	0.6-	0.5+	1999 11 15	046 0.2+ 0.5+
1995 10 25	411	0.5+	0.2-	1999 10 10	704	0.1+	0.1-	1999 11 15	046 0.2- 0.6+
1995 10 26	411	1.1-	0.1+	1999 10 10	704	0.0	0.1+	1999 11 15	012 0.5- 0.1-
1995 10 26	411	0.6+	0.5-	1999 10 10	704	0.2-	0.3-	1999 11 15	012 0.4- 0.1-
1995 11 02	411	0.9+	0.6-	1999 10 10	704	0.2-	0.0	1999 11 15	012 0.4- 0.0
1995 11 02	411	0.1-	0.8-	1999 10 10	704	0.1+	0.4+	1999 11 15	012 0.4- 0.1-
1995 12 18	801	0.3+	0.6-	1999 10 15	704	0.3+	0.0	1999 11 15	012 0.5- 0.0
1995 12 18	801	0.4+	0.8-	1999 10 15	704	0.6+	0.5-	1999 11 15	012 0.8- 0.1-
1995 12 23	801	0.4+	0.2+	1999 10 15	704	0.2+	0.1-	1999 11 16	691 0.1- 0.1+
1995 12 23	801	0.3+	0.2+	1999 10 15	704	0.5+	0.4-	1999 11 16	691 0.0 0.1+
1998 08 16	426	0.1+	0.2-	1999 10 15	704	0.5+	0.3-	1999 11 16	691 0.0 0.1+
1998 08 16	426	1.1-	0.3-	1999 10 20	704	0.2+	0.1+	1999 11 17	704 0.2+ 0.2-
1998 08 17	426	0.0	0.0	1999 10 20	704	0.0	0.3+	1999 11 17	704 0.4+ 0.3+
1998 08 17	426	0.5+	0.6-	1999 10 20	704	0.0	0.0	1999 11 17	704 0.3+ 0.4+
1998 08 17	426	0.5+	0.0	1999 10 20	704	0.1-	0.3+	1999 11 17	704 0.2+ 0.0
1999 10 07	704	0.8+	0.1-	1999 10 20	704	0.1-	0.4+	1999 11 17	704 0.3+ 0.1+
1999 10 07	704	0.3-	0.6+	1999 11 04	704	0.3-	0.5-		
1999 10 07	704	0.8+	0.2+	1999 11 04	704	0.5-	0.5-		

(12421)* 1995 UH₅ = 1991 RO₂₀

Discovered 1995 Oct. 16 by T. V. Kryachko at the Engelhardt Observatory.

Id. S. Nakano (*MPC* 25968)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Nakano

<i>M</i>	37.68065		(2000.0)			P		Q		
<i>n</i>	0.25682615	ω	288.41523			+0.89923931		+0.43187062		
<i>a</i>	2.4511876	Ω	46.06624			-0.35589769		+0.81487432		
<i>e</i>	0.1233866	<i>i</i>	5.55319			-0.25437275		+0.38661041		
<i>P</i>	3.84	<i>H</i>	14.0			<i>G</i>	0.15	<i>U</i>	1	
Residuals in seconds of arc										
1991 09 14	675	0.6+	0.9-	1998 06 03	704	0.4-	0.1-	1999 10 29	703	0.7+ 0.4-
1991 09 14	675	0.5+	1.1-	1998 06 03	704	0.6+	0.2-	1999 10 29	703	0.2- 0.2-
1991 09 16	675	0.2+	0.5-	1998 06 03	704	0.5+	0.8-	1999 10 29	703	0.3- 0.1+
1991 09 16	675	0.4+	0.4-	1998 06 03	704	1.4+	0.9-	1999 10 29	703	0.0 0.4+
1994 05 04	691	0.0	0.2-	1999 09 13	120	0.2-	0.1-	1999 11 01	703	0.1- 0.1+
1994 05 04	691	0.1-	0.2+	1999 09 13	120	0.1+	0.5-	1999 11 01	703	0.2+ 0.3+
1994 05 04	691	0.0	0.2+	1999 09 14	120	1.4-	0.4-	1999 11 01	703	0.3+ 0.2+
1995 10 16	114	0.9+	1.4+	1999 09 14	120	0.2-	0.4-	1999 11 01	703	0.1+ 0.0
1995 10 16	114	(2.3- 1.1-)		1999 10 05	704	2.0+	0.5-	1999 11 04	704	0.3+ 0.0
1995 10 17	114	(4.7- 1.2-)		1999 10 05	704	0.5+	0.1-	1999 11 04	704	0.3+ 0.1+
1995 10 17	114	0.0	1.5+	1999 10 05	704	1.2+	0.2-	1999 11 04	704	0.1+ 0.2-
1995 10 18	114	0.6-	1.0+	1999 10 05	704	0.2+	1.1-	1999 11 04	704	0.2+ 0.1+
1995 10 19	114	0.0	0.9+	1999 10 05	704	0.6-	0.2-	1999 11 04	704	0.2+ 0.3+
1995 10 19	114	1.5-	0.4+	1999 10 10	704	0.2+	0.4-	1999 11 12	704	0.3- 0.0
1995 10 21	399	0.4-	1.0+	1999 10 10	704	0.0	0.0	1999 11 12	704	0.3- 0.3+
1995 10 21	399	0.5-	1.2+	1999 10 10	704	0.1+	0.2-	1999 11 12	704	0.6- 0.4+
1995 10 27	399	(3.1- 1.4+)		1999 10 10	704	0.5-	0.1+	1999 11 12	704	0.4- 0.6+
1995 10 27	399	0.9-	1.6-	1999 10 10	704	0.7-	0.1-	1999 11 12	704	0.4- 0.8+
1998 05 22	704	0.5+	1.0+	1999 10 12	106	0.0	0.2+	1999 11 14	704	0.1- 0.3-
1998 05 22	704	(2.4+ 0.9+)		1999 10 12	106	0.1-	0.5+	1999 11 14	704	0.1- 0.4-

1998 05 22	704	0.9-	1.2+	1999 10 12	106	0.7-	0.5+	1999 11 14	704	0.2+	0.4-
1998 05 22	704	0.1+	0.8-	1999 10 16	120	0.1-	0.3-	1999 11 14	704	0.3+	0.4-
1998 05 22	704	1.1-	0.4+	1999 10 16	120	1.2-	0.5-	1999 11 14	704	0.2+	0.5-
1998 05 24	704	0.2-	0.2+	1999 10 21	704	0.2+	0.3-	1999 11 16	704	0.1-	0.1+
1998 05 24	704	0.5-	0.2+	1999 10 21	704	0.0	0.4+	1999 11 16	704	0.2+	0.0
1998 05 24	704	0.9+	0.8+	1999 10 21	704	0.4+	0.2+	1999 11 16	704	0.5-	0.0
1998 05 24	704	0.3-	0.8+	1999 10 21	704	0.2+	0.1+	1999 11 16	704	0.3+	0.1+
1998 06 03	704	0.3+	0.6+	1999 10 21	704	0.3+	0.2+	1999 11 16	704	0.4+	0.1+

(12422)* 1995 US₈ = 1990 JK₁ = 1990 KO₁

Discovered 1995 Oct. 27 by S. Ueda and H. Kaneda at Kushiro.

Id. G. V. Williams (d, *MPC* 18002), S. Nakano (*MPC* 26406)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Nakano

<i>M</i>	116.61556		(2000.0)	<i>P</i>	<i>Q</i>
<i>n</i>	0.26473143	ω	213.94506	+0.22197833	+0.95509586
<i>a</i>	2.4021440	Ω	69.56308	-0.84161324	+0.28931564
<i>e</i>	0.0863603	<i>i</i>	12.08964	-0.49235432	-0.06394032
<i>P</i>	3.72	<i>H</i>	13.0	<i>G</i>	0.15
				<i>U</i>	2

Residuals in seconds of arc

1990 05 15	898	0.0	0.3+	1997 03 08	399	1.8+	1.0+	1999 11 09	704	0.0	0.6-
1990 05 15	898	0.4-	0.9-	1997 03 08	399	0.1+	0.2-	1999 11 09	704	0.2-	0.1-
1990 05 19	898	0.9-	1.4-	Y 1999 10 15	704	0.4+	0.5+	1999 11 12	704	0.2-	0.2-
1990 05 19	898	(2.7+	4.5-)Y	1999 10 15	704	0.2+	0.4-	1999 11 12	704	0.2-	0.2-
1995 10 27	399	0.5+	0.5+	1999 10 15	704	0.5+	0.6+	1999 11 12	704	0.4-	0.1-
1995 10 27	399	1.3+	0.1-	1999 10 15	704	0.6+	0.6+	1999 11 12	704	0.3-	0.0
1995 10 28	399	(2.6-	1.8+)	1999 10 22	704	1.9+	0.6-	1999 11 12	704	0.4-	0.1+
1995 10 28	399	(3.5-	0.9+)	1999 10 22	704	1.6+	0.9-	1999 11 16	704	0.5-	0.0
1995 11 16	399	0.9+	0.0	1999 10 22	704	1.1-	0.0	1999 11 16	704	0.4-	0.3-
1995 11 16	399	0.5-	1.5+	1999 10 22	704	0.0	0.4+	1999 11 16	704	0.0	0.1+
1995 11 17	399	1.2+	0.6+	1999 11 03	704	0.9+	0.3-	1999 11 16	704	0.5-	0.4-
1995 11 17	399	0.4-	0.1+	1999 11 03	704	0.4+	0.4-	1999 11 16	704	0.1+	0.3-
1995 11 25	399	1.7-	0.2-	1999 11 03	704	0.8+	0.8-	1999 11 17	704	0.0	0.2+
1995 11 25	399	1.6-	0.4-	1999 11 03	704	0.6+	0.0	1999 11 17	704	0.4-	0.1-
1995 12 14	399	1.2-	0.8+	1999 11 03	704	0.1-	0.3-	1999 11 17	704	0.4-	0.4-
1995 12 14	399	0.1-	0.8+	1999 11 09	704	0.1+	0.5-	1999 11 17	704	0.4-	0.2-
1997 03 03	399	0.2+	0.7+	1999 11 09	704	0.2-	0.4-	1999 11 17	704	0.4-	0.0
1997 03 03	399	0.9-	0.6+	1999 11 09	704	0.2-	0.7-				

(12423)* 1995 UQ₁₆ = 1998 KQ₆

Discovered 1995 Oct. 17 by Spacewatch at Kitt Peak.

Id. G. V. Williams (*MPC* 31970)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	70.47966		(2000.0)	<i>P</i>	<i>Q</i>
<i>n</i>	0.23751107	ω	201.07818	+0.27741546	+0.95707469
<i>a</i>	2.5823404	Ω	85.10385	-0.86897774	+0.28722845
<i>e</i>	0.1664356	<i>i</i>	4.83371	-0.40977841	+0.03883118
<i>P</i>	4.15	<i>H</i>	13.9	<i>G</i>	0.15
				<i>U</i>	1

Residuals in seconds of arc

1995 10 17	691	0.3-	0.3-	1998 06 16	704	0.1+	0.8-	1999 10 19	704	0.6+	0.1+
1995 10 17	691	0.0	0.4-	1998 06 16	704	1.9-	0.5-	1999 10 19	704	0.4+	0.1-
1995 10 17	691	0.0	0.4-	1998 06 16	704	0.2-	0.2+	1999 10 19	704	0.1+	0.3+
1995 10 23	691	0.3+	0.3-	1998 06 16	704	1.2-	1.7-	1999 10 29	703	0.3-	0.0
1995 10 23	691	0.3+	0.4-	1998 06 18	704	0.7+	0.8-	1999 10 29	703	0.3-	0.3-
1995 10 28	691	0.0	0.2-	1998 06 18	704	1.1+	0.7-	1999 10 29	703	0.6-	0.1+
1995 10 28	691	0.6+	0.5-	1998 06 18	704	1.3+	1.2-	1999 10 29	703	0.1-	0.1+
1997 01 10	691	0.2-	0.6-	1998 06 18	704	1.5+	1.3-	1999 11 03	703	0.4+	0.4+
1997 01 10	691	0.0	0.3-	1998 06 18	704	(2.9-	1.8-)	1999 11 03	703	0.2-	0.0
1997 01 10	691	0.1-	0.1-	1998 06 29	699	0.3-	0.5+	1999 11 03	703	0.2+	0.0
1998 05 22	704	0.3-	0.1+	1998 06 29	699	1.0+	0.8+	1999 11 03	703	0.4+	0.3+
1998 05 22	704	0.4-	0.0	1998 06 29	699	0.2-	0.7+	1999 11 05	704	0.2+	0.7-
1998 05 22	704	0.7-	0.3-	1998 06 30	699	0.4-	0.5+	1999 11 05	704	0.1-	0.0
1998 05 22	704	0.8-	0.8-	1998 06 30	699	0.2-	0.7+	1999 11 05	704	0.3+	0.0
1998 05 22	699	0.3+	0.2+	1998 06 30	699	0.1-	0.3+	1999 11 05	704	0.1-	0.8+

1998 05 22	704	1.3-	0.6-	1999 10 01	703	0.2-	0.4+	1999 11 05	704	0.1+	0.3+
1998 05 22	699	0.2-	0.3+	1999 10 01	703	0.0	0.8-	1999 11 14	699	0.4-	0.1+
1998 05 22	699	0.5+	0.4-	1999 10 01	703	0.5-	0.5-	1999 11 14	699	0.3+	0.9+
1998 05 23	699	0.0	0.7+	1999 10 01	703	0.1+	0.2+	1999 11 14	699	0.2-	0.8+
1998 05 23	699	0.2-	0.1+	1999 10 07	704	0.2+	0.7+	1999 11 15	704	0.3+	0.6-
1998 05 23	699	0.2-	0.4+	1999 10 07	704	0.1+	0.0	1999 11 15	704	0.2+	0.8-
1998 05 24	704	0.1-	0.0	1999 10 07	704	0.4+	0.7+	1999 11 15	704	0.2+	1.0-
1998 05 24	704	0.6+	0.3-	1999 10 07	704	0.5+	0.7+	1999 11 15	704	0.1+	0.7-
1998 05 24	704	0.0	0.6-	1999 10 07	704	0.1-	0.6+	1999 11 15	704	0.3-	1.0-
1998 05 24	704	1.0+	0.7+	1999 10 09	704	0.1+	0.4+	1999 11 17	704	0.1+	0.8-
1998 05 24	704	0.4-	0.4-	1999 10 09	704	0.2-	0.3+	1999 11 17	704	0.4+	0.6-
1998 06 03	704	0.0	0.2+	1999 10 09	704	1.0-	0.2-	1999 11 17	704	0.3-	0.2-
1998 06 03	704	1.0-	0.5+	1999 10 09	704	0.3-	0.1-	1999 11 17	704	0.0	1.2-
1998 06 03	704	0.1-	0.6-	1999 10 09	704	0.4-	0.8-	1999 11 17	704	0.1-	0.0
1998 06 03	704	0.6+	0.5+	1999 10 19	704	0.7+	0.5+				
1998 06 16	704	0.5+	0.1+	1999 10 19	704	0.0	0.1+				

(12424)* 1995 VM = 1978 WB₁₇ = 1980 DP₄

Discovered 1995 Nov. 2 by T. Kobayashi at Oizumi.

Id. T. Kobayashi (*MPC* 26183)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Nakano

<i>M</i>	139.10817		(2000.0)	<i>P</i>	<i>Q</i>
<i>n</i>	0.23182082	ω	172.43300	-0.58786980	+0.77755736
<i>a</i>	2.6244265	Ω	61.29125	-0.75489472	-0.42812512
<i>e</i>	0.1219662	<i>i</i>	14.74225	-0.29076289	-0.46055774
<i>P</i>	4.25	<i>H</i>	13.0	<i>G</i>	0.15
				<i>U</i>	2

Residuals in seconds of arc

1978 11 30	675	0.4+	0.7-	1999 10 07	703	0.3-	0.0	1999 11 05	704	0.1+	0.0
1978 12 01	675	0.1+	0.1-	1999 10 07	703	0.4-	0.1-	1999 11 05	704	0.6-	0.2-
1980 02 21	095	0.2-	0.7-	1999 10 07	703	0.2-	0.1+	1999 11 06	704	0.1+	0.0
1995 11 02	411	0.1+	0.7-	1999 10 07	703	0.2+	0.0	1999 11 06	704	0.3+	0.5+
1995 11 02	411	0.2-	0.2+	1999 10 09	704	0.4+	0.5-	1999 11 06	704	0.4+	0.1+
1995 11 04	411	0.8-	0.4-	1999 10 09	704	0.1+	0.3-	1999 11 06	704	0.0	0.4+
1995 11 04	411	0.7-	0.8+	1999 10 09	704	0.4+	0.1-	1999 11 06	704	0.0	0.1+
1995 11 11	411	1.1-	0.1-	1999 10 09	704	0.2+	0.5-	1999 11 06	704	0.0	0.0
1995 11 11	411	0.5-	0.2-	1999 10 09	704	0.2+	0.4-	1999 11 06	704	0.5-	0.1+
1995 12 14	608	0.2+	0.0	1999 10 19	704	0.0	0.3-	1999 11 06	704	0.4+	0.5+
1995 12 14	608	0.2+	0.2+	1999 10 19	704	0.0	0.3-	1999 11 06	704	0.3+	0.1+
1995 12 15	608	0.3+	0.7+	1999 10 19	704	0.3-	0.2-	1999 11 06	704	0.0	0.3-
1995 12 15	608	0.5+	0.6+	1999 10 19	704	0.0	0.5-	1999 11 07	704	0.2+	0.6+
1995 12 15	608	0.3+	0.6+	1999 10 19	704	0.4-	0.4-	1999 11 07	704	0.1+	0.1+
1995 12 16	608	0.2+	0.2+	1999 11 05	704	0.3+	0.1-	1999 11 07	704	0.2-	0.3+
1995 12 16	608	0.2-	0.2+	1999 11 05	704	0.6+	0.2-	1999 11 07	704	0.4+	0.2-
1995 12 16	608	0.2+	0.1-	1999 11 05	704	0.3-	0.3+				

(12425)* 1995 VG₂

Discovered 1995 Nov. 12 by Y. Shimizu and T. Urata at the Nachi-Katsuura

Observatory.

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Nakano

<i>M</i>	88.05424		(2000.0)	<i>P</i>	<i>Q</i>
<i>n</i>	0.27980719	ω	303.65287	+0.87293378	+0.48369350
<i>a</i>	2.3150665	Ω	27.57863	-0.38978155	+0.76976926
<i>e</i>	0.1412126	<i>i</i>	7.87854	-0.29335466	+0.41652837
<i>P</i>	3.52	<i>H</i>	14.0	<i>G</i>	0.15
				<i>U</i>	1

Residuals in seconds of arc

1995 11 12	905	0.3+	0.4+	1996 02 21	887	0.9+	0.2-	1998 09 16	888	0.1-	0.2-
1995 11 12	905	0.8+	0.1+	1996 02 21	887	0.2-	0.4-	1998 09 22	701	0.5+	0.4+
1995 11 16	905	0.9+	0.1+	1996 02 21	887	0.1-	0.5+	1998 09 22	701	0.4+	0.5+
1995 11 16	905	0.4-	0.1-	1997 02 14	385	0.7+	0.3+	1999 10 13	704	1.4+	0.3-
1995 11 24	905	0.6-	0.3+	1997 02 14	385	0.7+	0.5+	1999 10 13	704	0.3+	1.9-
1995 11 24	905	0.2+	0.1-	1997 02 18	385	1.3+	1.4+	1999 10 13	704	0.5-	1.2-
1995 12 01	385	0.2-	0.4+	1997 02 18	385	0.1-	0.4+	1999 10 13	704	0.4-	1.7-
1995 12 01	385	0.9-	0.2+	1997 03 05	385	0.5-	0.5-	1999 11 16	703	0.3-	0.5-

1995 12 01	385	0.7−	0.3+	1997 03 05	385	0.5−	0.0	1999 11 16	703	0.2−	0.2+
1995 12 15	905	0.5−	0.1−	1997 03 09	385	0.3−	0.1−	1999 11 16	703	0.2+	1.3+
1996 01 13	385	0.0	0.2+	1997 03 09	385	0.0	0.0	1999 11 16	703	0.9−	0.6+
1996 01 13	385	0.2+	0.3+	1998 09 16	888	0.2−	0.4+				
1996 01 13	385	0.4−	0.2+	1998 09 16	888	0.8−	0.1+				

(12426)* 1995 VL₂ = 1975 EB₄ = 1991 RN₂₁

Discovered 1995 Nov. 14 by AMOS at Haleakala.

Id. G. V. Williams (*MPC* 26407)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	23.86639		(2000.0)	P	Q
<i>n</i>	0.27151208	ω	132.36498	+0.79772115	−0.59978556
<i>a</i>	2.3619822	Ω	264.58419	+0.53319759	+0.74991905
<i>e</i>	0.0714643	<i>i</i>	3.59572	+0.28167589	+0.27906756
<i>P</i>	3.63	<i>H</i>	14.0	<i>G</i>	0.15
				<i>U</i>	1

Residuals in seconds of arc

1951 09 09	675	0.2−	0.5+	1996 01 15	608	0.7−	0.8−	1998 08 29	958	0.7+	0.2+
1951 09 09	675	0.0	0.9+	1996 01 17	608	0.2+	0.2+	1998 08 29	958	0.1+	0.5−
1975 03 15	095	(1.0+	5.3+)	1996 01 17	608	0.0	0.3+	1999 10 12	704	1.6+	0.8+
1991 09 15	675	(1.1−	2.2−)	1997 02 10	608	0.7−	0.4−	1999 10 12	704	0.8+	0.5−
1991 09 15	675	0.2−	1.0−	1997 02 10	608	0.9−	0.2−	1999 10 12	704	1.2+	0.6−
1991 09 17	675	0.6+	0.6−	1997 02 13	608	0.2+	1.1+	1999 10 12	704	1.3+	0.4−
1991 09 17	675	1.6−	0.9−	1997 02 13	608	(2.9−	0.3−)	1999 10 22	704	0.3−	0.4+
1995 11 14	608	0.1−	0.4+	1997 02 22	608	(3.5−	0.9+)	1999 10 22	704	0.3−	0.3+
1995 11 14	608	0.3−	0.3+	1997 02 22	608	(3.1−	0.0)	1999 10 22	704	0.8−	0.4+
1995 11 19	608	0.1+	0.6−	1998 08 17	704	0.5−	0.1+	1999 10 22	704	0.6−	0.2+
1995 11 19	608	0.1+	0.6−	1998 08 17	704	0.8+	0.4−	1999 10 22	704	0.7−	0.3+
1995 11 20	608	0.4+	0.4−	1998 08 17	704	1.1−	1.3−	1999 11 12	703	0.2+	0.2+
1995 11 20	608	0.6+	0.2+	1998 08 17	704	(0.4+	2.2−)	1999 11 12	703	0.2+	0.2+
1995 12 21	608	0.2−	0.2+	1998 08 17	704	0.5+	1.4−	1999 11 12	703	0.0	0.3+
1995 12 21	608	0.4−	0.3+	1998 08 23	704	0.2+	1.0+	1999 11 12	703	0.2+	0.4+
1995 12 22	608	1.6−	0.2+	1998 08 23	704	1.0−	1.1+	1999 11 17	704	0.0	0.0
1995 12 22	608	1.3−	0.1+	1998 08 23	704	1.1+	0.1−	1999 11 17	704	0.3+	0.5−
1995 12 23	608	0.9+	0.1+	1998 08 23	704	0.1−	0.8+	1999 11 17	704	0.8−	1.1−
1995 12 23	608	0.9+	0.0	1998 08 25	958	0.2−	0.0	1999 11 17	704	0.1+	0.5−
1996 01 13	608	0.4+	0.3+	1998 08 25	958	0.3+	0.2+	1999 11 17	704	0.2+	0.8−
1996 01 13	608	0.6+	0.3+	1998 08 25	958	0.9+	0.9+				
1996 01 15	608	0.5−	0.2+	1998 08 29	958	0.2+	0.0				

(12427)* 1995 WM₃ = 1997 CW₁₈

Discovered 1995 Nov. 21 at Farra d'Isonzo.

Id. G. V. Williams (*MPC* 29112)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	22.54884		(2000.0)	P	Q
<i>n</i>	0.23731858	ω	273.95934	+0.95468075	+0.29662647
<i>a</i>	2.5837365	Ω	68.78690	−0.26161108	+0.87546779
<i>e</i>	0.1238995	<i>i</i>	1.50238	−0.14193068	+0.38153491
<i>P</i>	4.15	<i>H</i>	15.0	<i>G</i>	0.15
				<i>U</i>	1

Residuals in seconds of arc

1991 12 30	691	0.3+	0.3−	1997 02 07	691	0.3+	0.4+	1999 10 20	704	0.6−	0.2+
1991 12 30	691	0.2+	0.7−	1997 02 07	691	0.1+	0.4+	1999 10 20	704	0.4+	0.1+
1991 12 30	691	1.1+	0.6−	1997 02 07	691	0.0	0.0	1999 10 20	704	1.1−	0.4−
1995 11 14	691	0.1−	0.2−	1997 02 11	691	0.0	0.2+	1999 10 31	691	0.2−	0.3−
1995 11 14	691	0.0	0.1−	1997 02 11	691	0.1+	0.1+	1999 10 31	691	0.2−	0.3−
1995 11 14	691	0.3−	0.0	1997 02 11	691	0.0	0.1+	1999 10 31	691	0.3−	0.2−
1995 11 16	691	0.2−	0.2+	1998 05 22	704	1.0+	1.4+	1999 11 03	703	0.8−	0.3+
1995 11 16	691	0.1−	0.1+	1998 05 22	704	0.8−	0.1+	1999 11 03	703	0.8−	0.2−
1995 11 16	691	0.2−	0.0	1998 05 22	704	1.1−	0.1+	1999 11 03	703	0.4−	0.4+
1995 11 19	691	0.4−	0.1−	1998 05 22	704	(0.3+	3.8+)	1999 11 03	703	0.1−	0.1−
1995 11 19	691	0.1−	0.2−	1998 05 26	595	0.7+	1.2+	1999 11 04	691	0.2+	0.3−
1995 11 19	691	0.1−	0.2−	1998 05 26	595	0.6+	0.9−	1999 11 04	691	0.1+	0.1−
1995 11 21	595	0.5+	0.3+	1999 10 01	703	0.9−	0.1−	1999 11 04	691	0.2+	0.1−
1995 11 21	595	1.2−	0.3−	1999 10 01	703	0.4−	0.4+	1999 11 05	704	0.2−	0.1−

1995 11 22	595	0.5+	0.4+	1999 10 01	703	1.4+	0.1+	1999 11 05	704	0.0	0.3−
1995 11 22	595	0.0	0.0	1999 10 01	703	0.5−	1.4+	1999 11 05	704	0.1+	0.5−
1995 11 30	595	1.4−	1.2−	1999 10 02	120	0.0	0.4+	1999 11 05	704	0.2−	0.6+
1995 11 30	595	0.4+	0.1−	1999 10 02	120	0.9+	1.2+	1999 11 05	704	0.6+	0.4+
1995 12 18	691	0.1−	0.1−	1999 10 10	704	0.3−	0.1−	1999 11 09	704	0.3+	0.1−
1995 12 18	691	0.4−	0.3−	1999 10 10	704	0.4+	0.2−	1999 11 09	704	0.1+	0.4−
1995 12 18	691	0.4−	0.3−	1999 10 10	704	0.2+	0.1+	1999 11 09	704	0.4+	0.2−
1995 12 22	566	0.4+	0.2+	1999 10 10	704	0.7−	0.4+	1999 11 09	704	0.0	0.4−
1995 12 22	566	0.6+	0.5+	1999 10 10	704	0.3+	0.3−	1999 11 12	704	0.4+	0.3−
1995 12 22	566	0.2+	0.2+	1999 10 15	704	0.1+	0.0	1999 11 12	704	0.6+	0.0
1996 01 12	691	0.3−	0.2−	1999 10 15	704	0.1+	0.2+	1999 11 12	704	0.7+	0.2+
1996 01 12	691	0.3−	0.0	1999 10 15	704	0.4+	0.4+	1999 11 12	704	0.3+	0.0
1996 01 12	691	0.6−	0.1−	1999 10 15	704	0.2+	0.2−	1999 11 12	704	0.2+	0.3+
1996 01 14	595	0.7+	1.5+	1999 10 17	120	0.1+	0.5+	1999 11 17	704	0.3−	0.6+
1996 01 14	595	0.4−	1.1+	1999 10 17	120	0.8−	0.7−	1999 11 17	704	0.3+	1.1+
1996 01 15	595	0.6−	0.8+	1999 10 20	704	0.5+	0.1−	1999 11 17	704	0.6+	0.6−
1996 01 15	595	0.8+	1.0+	1999 10 20	704	0.1−	0.5+	1999 11 17	704	0.6−	1.3−

(12428)* 1995 WJ₅ = 1982 VR₁₁ = 1990 SL₁₅

Discovered 1995 Nov. 24 by T. Kobayashi at Oizumi.

Id. S. Nakano (*MPC* 26410)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	114.34515		(2000.0)	P	Q
<i>n</i>	0.23746116	ω	16.27277	+0.15494654	+0.97688675
<i>a</i>	2.5827022	Ω	262.81954	−0.92214092	+0.08953260
<i>e</i>	0.0815611	<i>i</i>	8.53528	−0.35446818	+0.19410358
<i>P</i>	4.15	<i>H</i>	12.8	<i>G</i>	0.15
				<i>U</i>	2

Residuals in seconds of arc

1982 11 09	095	(5.1−	8.6+)	1998 06 04	699	0.1+	0.0	1998 08 24	704	0.0	0.8+
1990 09 18	675	0.6+	1.6−	1998 06 04	699	0.3−	0.5−	1998 08 24	704	1.6−	0.3−
1990 09 18	675	1.0+	1.7−	1998 06 18	699	0.0	0.3−	1998 08 24	470	1.5−	0.4−
1990 09 20	675	0.2+	0.1−	1998 06 18	699	0.1+	0.0	1998 08 24	470	0.6−	0.5−
1990 09 20	675	0.1+	1.0−	1998 06 18	699	0.2−	0.3+	1998 08 26	470	0.6−	0.7+
1995 11 18	905	0.4−	0.6+	1998 06 27	699	0.2−	0.1+	1998 08 26	470	1.0−	0.5+
1995 11 18	905	0.6−	0.0	1998 06 27	699	0.3−	0.8−	1998 08 26	470	0.6−	0.7+
1995 11 22	867	0.3+	0.7−	1998 06 27	699	0.2+	0.1−	1999 09 03	704	0.2+	0.4−
1995 11 22	867	0.3+	1.1−	1998 06 29	704	0.9−	0.3+	1999 09 03	704	0.4−	0.2+
1995 11 24	411	0.3+	0.4−	1998 06 29	704	0.3−	1.1+	1999 09 03	704	0.3−	0.4+
1995 11 24	411	0.3−	0.1−	1998 06 29	704	1.5−	0.2+	1999 10 15	704	0.2−	0.3+
1995 11 25	867	0.2−	0.1+	1998 06 29	704	(1.4−	2.4−)	1999 10 15	704	0.7+	0.7−
1995 11 25	905	0.1−	0.7+	1998 06 29	704	(3.1−	0.3−)	1999 10 15	704	1.3−	1.4−
1995 11 25	867	0.1−	0.1+	1998 07 15	699	(1.6+	2.6−)	1999 11 14	704	0.2+	0.3+
1995 11 25	905	0.3+	0.7+	1998 07 15	699	0.3−	1.1−	1999 11 14	704	0.3+	0.6+
1995 11 25	867	0.1−	0.2+	1998 07 15	699	0.6+	1.8−	1999 11 14	704	0.5+	0.9+
1995 11 26	411	0.2−	0.0	1998 07 20	566	0.1−	0.4−	1999 11 14	704	0.2−	1.0+
1995 11 26	411	0.3−	0.3+	1998 07 20	566	0.2−	0.2−	1999 11 14	704	0.3+	1.0+
1995 11 28	411	0.3−	0.6−	1998 07 20	566	0.2+	0.4−	1999 11 16	704	0.0	0.1+
1995 11 28	411	0.4+	0.1−	1998 07 30	610	1.8+	1.7+	1999 11 16	704	0.2+	0.0
1995 12 01	411	0.3−	0.1−	1998 07 30	610	1.6+	1.5+	1999 11 16	704	0.1+	0.2−
1995 12 01	411	0.0	0.0	1998 07 30	610	1.5+	1.3+	1999 11 16	704	0.2+	0.1−
1995 12 17	905	0.1+	0.2+	1998 07 30	610	1.4+	1.1+	1999 11 16	704	0.1+	0.3

1999 NOV. 23

M.P.C. 36721

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Nakano

<i>M</i>	357.67758		(2000.0)		P		Q		
<i>n</i>	0.26296315	ω	292.92131		+0.28206472		-0.95878354		
<i>a</i>	2.4129007	Ω	140.64427		+0.89883594		+0.25160598		
<i>e</i>	0.1438848	<i>i</i>	3.09683		+0.33546006		+0.13201724		
<i>P</i>	3.75	<i>H</i>	14.3		<i>G</i>	0.15	<i>U</i>	1	
Residuals in seconds of arc									
1989 03 04	675	(4.3+ 1.9-)	1995 12 22	411	0.0	0.6+	1997 05 07	704	0.8+ 1.0+
1989 03 04	675	(3.7+ 0.8-)	1995 12 22	411	0.4+	0.0	1997 05 07	704	0.6+ 0.1+
1989 03 05	675	1.8+ 1.2-	1997 04 06	704	0.8-	0.1+	1998 08 17	704	0.3+ 0.3+
1989 03 05	675	(2.4- 1.0+)	1997 04 06	704	0.4-	0.8-	1998 08 17	704	0.6+ 0.2-
1993 01 22	691	1.0- 0.0	1997 04 07	809	0.2+ 0.2+	1998 08 17	704	0.1+ 1.5-	
1993 01 22	691	1.1- 0.1+	1997 04 07	809	0.5+ 0.8+	1998 08 17	704	0.9- 0.7+	
1993 01 22	691	0.9- 0.2-	1997 04 07	809	0.4+ 0.6+	1998 08 19	566	0.2- 0.2+	
1993 04 14	691	1.8- 0.1-	1997 04 08	809	0.8+ 0.4-	1998 08 19	566	0.4- 0.1+	
1993 04 14	691	2.0- 0.1-	1997 04 08	809	0.3+ 0.5+	1998 08 19	566	0.8- 0.1-	
1993 04 14	691	1.2- 0.6+	1997 04 08	809	0.2- 0.1+	1999 10 10	704	0.1+ 0.5+	
1993 04 18	413	0.4- 0.2-	1997 04 11	704	0.6+ 1.1-	1999 10 10	704	0.2- 0.2-	
1995 11 26	411	0.2+ 0.1-	1997 04 11	704	0.3+ 1.0-	1999 10 10	704	0.1+ 0.4-	
1995 11 26	411	0.6+ 1.0-	1997 05 01	704	0.7+ 0.0	1999 10 10	704	0.7+ 0.6-	
1995 11 28	411	0.1+ 0.1+	1997 05 01	704	0.9+ 0.4+	1999 11 17	704	0.1- 0.6+	
1995 11 28	411	0.2+ 0.0	1997 05 01	704	0.6+ 0.2+	1999 11 17	704	0.2+ 0.7+	
1995 12 01	411	0.2- 0.3-	1997 05 01	704	0.3+ 0.1+	1999 11 17	704	1.0- 1.4+	
1995 12 01	411	0.3- 0.2+	1997 05 01	704	0.2+ 0.2-	1999 11 17	704	0.1- 1.0+	
1995 12 10	411	0.1- 0.0	1997 05 07	704	0.4+ 0.1+				
1995 12 10	411	0.2+ 0.1-	1997 05 07	704	0.5+ 0.3+				

(12430)* 1995 XB₂ = 1990 EZ₆ = 1997 BV₁

Discovered 1995 Dec. 14 by the Beijing Schmidt CCD Asteroid Program at Xinglong.

Id. G. V. Williams (*MPC* 29113)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

M	69.87054		(2000.0)		P		Q		
n	0.27297068	ω	267.12544		+0.69421361		+0.71924266		
a	2.3535606	Ω	46.88042		-0.64449147		+0.63817866		
e	0.0394086	i	2.16084		-0.32046562		+0.27462336		
P	3.61	H	13.8		G	0.15	U	1	
Residuals in seconds of arc									
1990 03 02	809	0.1- 0.1-	1997 04 01	704	0.1+ 1.4+	1999 11 03	704	0.3- 0.3-	
1990 03 02	809	0.1+ 0.0	1997 04 01	704	1.5+ 0.1+	1999 11 03	704	0.6- 0.3-	
1990 03 02	809	0.5+ 0.0	1997 05 29	327	0.0 0.2+	1999 11 04	703	(2.7- 0.3-	
1990 03 03	809	0.4- 0.3+	1997 05 29	327	(2.7- 0.2-)	1999 11 04	703	(2.1+ 0.3+	
1990 03 03	809	0.0 0.4+	1997 05 29	327	0.2+ 1.2-	1999 11 04	703	0.4- 0.9+	
1990 03 03	809	0.2+ 0.5+	1998 05 24	327	0.2- 0.5-	1999 11 04	703	0.0 1.3+	
1995 12 14	327	0.0 1.0-	1998 05 24	327	0.7- 0.8-	1999 11 09	704	0.2+ 0.0	
1995 12 14	327	0.6- 0.2-	1998 05 24	327	0.1- 1.8-	1999 11 09	704	0.3+ 0.3-	
1995 12 14	327	0.0 0.9-	1998 05 24	327	1.0+ 1.3-	1999 11 09	704	0.0 0.3-	
1995 12 15	327	0.0 0.2-	1998 05 25	327	0.0 0.2-	1999 11 09	704	0.1- 0.5-	
1995 12 15	327	0.3- 0.4-	1998 05 25	327	0.3- 1.0-	1999 11 09	704	0.0 0.8-	
1995 12 15	327	0.0 0.4-	1998 05 25	327	0.0 0.9-	1999 11 12	704	0.3+ 0.1+	
1995 12 16	327	1.0+ 0.1+	1999 10 15	704	0.4+ 0.2+	1999 11 12	704	0.1+ 0.2+	
1995 12 16	327	1.4+ 0.3-	1999 10 15	704	0.7+ 0.3-	1999 11 12	704	0.1+ 0.1+	
1995 12 16	327	1.0+ 0.6-	1999 10 15	704	0.6+ 0.4+	1999 11 12	704	0.0 0.2+	
1997 01 29	411	1.7- 0.9-	1999 10 15	704	0.3+ 0.0	1999 11 12	704	0.1+ 0.0	
1997 01 29	411	1.2- 0.8-	1999 10 15	704	0.0 0.3-	1999 11 14	704	1.9- 0.5-	
1997 01 30	411	0.1+ 1.8-	1999 10 22	704	0.5+ 0.3-	1999 11 14	704	0.2- 0.3-	
1997 01 30	411	0.5+ 1.9-	1999 10 22	704	0.4+ 0.7-	1999 11 14	704	0.1+ 0.9-	
1997 02 04	411	0.5+ 0.2+	1999 10 22	704	0.3+ 0.3+	1999 11 14	704	0.1- 0.7-	
1997 02 04	411	0.6+ 0.7+	1999 10 22	704	0.2+ 0.0	1999 11 16	704	0.2+ 0.2+	
1997 02 13	411	1.8- 0.4-	1999 10 22	704	0.6+ 0.1-	1999 11 16	704	0.0 0.4+	
1997 02 13	411	1.2- 0.4-	1999 11 03	704	0.5- 0.2-	1999 11 16	704	0.1+ 0.3+	
1997 03 31	704	1.2+ 0.6-	1999 11 03	704	0.5- 0.0	1999 11 16	704	0.1- 0.2-	
1997 03 31	704	1.0+ 0.6-	1999 11 03	704	0.4- 0.2-	1999 11 16	704	0.1- 0.3+	

(12431)* 1995 YY₁₀ = 1992 AV₆

Discovered 1995 Dec. 18 by Spacewatch at Kitt Peak.

Id. G. V. Williams (*MPC* 27719)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	22.31608		(2000.0)		P		Q		
<i>n</i>	0.24134877	ω	284.92860		+0.69816107		-0.67530485		
<i>a</i>	2.5548927	Ω	118.20676		+0.71546695		+0.64601845		
<i>e</i>	0.0843684	<i>i</i>	15.65299		+0.02604161		+0.35584199		
<i>P</i>	4.08	<i>H</i>	13.8		<i>G</i>	0.15	<i>U</i>	2	
Residuals in seconds of arc									
1992 01 01	691	0.1+ 0.4+	1996 02 14	098	1.5- 0.4-	1999 10 10	704	0.4- 0.2+	
1992 01 01	691	0.3+ 0.5+	1996 02 15	098	0.4- 1.8+	1999 10 10	704	1.2- 0.5+	
1992 01 01	691	0.0 0.2+	1996 02 15	098	0.2- 0.2-	1999 10 10	704	1.4- 0.0	
1992 01 30	691	0.3+ 0.1-	1996 02 23	098	0.9+ 1.8-	1999 10 10	704	0.4- 0.5+	
1992 01 30	691	0.0 0.2+	1996 02 23	098	1.4- 0.3-	1999 10 10	704	0.8- 0.3+	
1992 01 30	691	0.4- 0.2+	1998 08 20	699	0.4+ 0.3+	1999 10 20	704	0.6- 0.1-	
1995 12 18	691	0.3+ 0.1+	1998 08 20	699	0.3+ 0.6+	1999 10 20	704	0.7+ 1.1-	
1995 12 18	691	0.1+ 0.0	1998 08 20	699	0.5+ 0.9+	1999 10 20	704	0.4+ 0.3-	
1995 12 18	691	0.5+ 0.3+	1998 09 21	704	0.2+ 0.4-	1999 10 20	704	0.0 1.0-	
1995 12 23	691	0.3+ 0.0	1998 09 21	704	0.5- 0.5+	1999 11 12	703	0.1+ 0.7+	
1995 12 23	691	0.1+ 0.0	1998 09 21	704	0.4- 1.1-	1999 11 12	703	1.2+ 0.2-	
1995 12 23	691	0.2+ 0.2+	1998 09 21	704	0.3+ 0.8-	1999 11 12	703	0.2- 0.3+	
1996 02 14	098	1.1+ 1.7-	1998 09 21	704	0.8- 0.4-	1999 11 12	703	1.8+ 0.5+	

(12432)* 1996 AR₁ = 1998 MY₄₁

Discovered 1996 Jan. 12 by N. Sato and T. Urata at Chichibu.

Id. B. G. Marsden (*MPC* 32243)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Marsden

<i>M</i>	319.19469		(2000.0)		P		Q		
<i>n</i>	0.18485713	ω	104.38487		+0.61319896		-0.77917718		
<i>a</i>	3.0519582	Ω	307.04266		+0.64747162		+0.58996450		
<i>e</i>	0.0472217	<i>i</i>	9.36506		+0.45251247		+0.21171873		
<i>P</i>	5.33	<i>H</i>	13.0		<i>G</i>	0.15	<i>U</i>	1	
Residuals in seconds of arc									
1993 08 16	691	0.2- 0.2-	1998 06 28	809	0.1+ 0.0	1999 10 03	704	(1.8+ 2.2-)	
1993 08 16	691	0.1- 0.6+	1998 07 01	809	(4.8+ 2.6+)	1999 10 03	704	0.5- 0.2-	
1993 08 16	691	0.2- 0.3+	1998 07 01	809	(4.3+ 2.3+)	1999 10 03	704	0.1- 0.7-	
1996 01 12	369	0.1- 0.1+	1998 07 01	809	(4.4+ 2.3+)	1999 10 03	704	0.4+ 0.3-	
1996 01 12	369	0.2- 0.1+	1999 07 23	704	0.6+ 0.9+	1999 10 04	888	0.5- 0.2-	
1996 01 12	369	0.2- 0.4-	1999 07 23	704	0.0 0.3+	1999 10 04	888	0.1- 0.0	
1996 01 13	369	0.6- 0.1-	1999 07 23	704	0.7+ 0.5+	1999 10 04	888	0.1+ 0.1-	
1996 01 13	369	0.4- 0.7+	1999 09 08	704	0.2+ 0.0	1999 10 12	704	0.4- 0.3+	
1996 01 13	369	0.4- 0.0	1999 09 08	704	0.0 0.3+	1999 10 12	704	0.2- 0.3-	
1996 01 18	369	0.7- 0.4-	1999 09 08	704	0.1- 0.7+	1999 10 12	704	0.1- 0.5-	
1996 01 18	369	0.3- 0.6-	1999 09 08	704	0.1+ 0.3-	1999 10 12	704	0.3- 0.2-	
1996 01 18	369	0.3- 0.7-	1999 09 08	704	0.6+ 0.2+	1999 10 12	704	0.1- 0.4-	
1996 02 10	691	0.3+ 0.2-	1999 09 18	704	0.5+ 0.9-	1999 10 31	703	0.6- 0.6+	
1996 02 10	691	0.4+ 0.2-	1999 09 18	704	0.3+ 0.6-	1999 10 31	703	0.1- 0.3+	
1996 02 10	691	1.2+ 0.7-	1999 09 18	704	0.2+ 0.5-	1999 10 31	703	0.1- 0.9+	
1998 06 24	704	0.8+ 0.8-	1999 09 18	704	0.4+ 0.3-	1999 10 31	703	0.1+ 0.3+	
1998 06 24	704	0.5- 0.4-	1999 09 18	704	0.6+ 0.3-	1999 11 04	704	0.0 0.4+	
1998 06 24	704	1.2+ 0.0	1999 10 03	704	0.3+ 0.2+	1999 11 04	704	0.1+ 0.3-	
1998 06 24	704	1.6- 0.4+	1999 10 03	704	0.3- 0.3+	1999 11 04	704	0.8- 0.4+	
1998 06 28	809	0.7+ 0.4-	1999 10 03	704	0.8+ 1.9-	1999 11 04	704	0.1- 0.1-	
1998 06 28	809	0.2+ 1.4-	1999 10 03	704	0.3+ 0.2+	1999 11 04	704	0.7- 0.6+	

(12433)* 1996 AF₄ = 1990 TV₅

Discovered 1996 Jan. 15 by U. Munari and M. Tombelli at Cima Ekar.

Id. G. V. Williams (*MPC* 26908)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

M	333.54036		(2000.0)	P	Q		
n	0.23182519	ω	220.45249	+0.24472618	-0.96764768		
a	2.6243936	Ω	215.50651	+0.91462992	+0.25140042		
e	0.2406778	i	6.06614	+0.32180927	+0.02134920		
P	4.25	H	14.9	G	0.15	U	1

Residuals in seconds of arc

1990 10 09	413	1.0-	0.8-	1996 03 14	098	1.5-	1.3-	1999 11 04	704	0.1-	0.0
1990 10 11	413	1.2+	0.5+	1997 05 04	809	(3.0-	1.7-)	1999 11 04	704	0.7+	0.3+
1996 01 15	098	1.7-	1.3-	1997 05 04	809	1.2-	1.4-	1999 11 04	704	0.1+	0.1+
1996 01 15	098	(3.5-	0.3-)	1997 05 04	809	1.0+	0.8-	1999 11 04	704	0.4+	0.0
1996 01 16	098	0.6+	0.6-	1999 10 12	704	0.3-	0.8-	1999 11 04	704	0.2+	0.5-
1996 01 17	098	0.5+	0.1+	1999 10 12	704	0.5-	0.4-	1999 11 09	108	2.0-	2.0+
1996 01 17	098	1.0+	0.5+	1999 10 12	704	0.9-	0.5-	1999 11 09	108	0.6+	0.2-
1996 01 18	098	0.7-	0.9+	1999 10 12	704	0.9-	0.7-	1999 11 17	704	0.5+	0.7+
1996 01 19	098	0.8+	0.6+	1999 10 12	704	0.4-	0.4-	1999 11 17	704	0.8+	0.5+
1996 01 19	098	0.1+	0.5+	1999 10 21	704	0.3+	0.2+	1999 11 17	704	0.8+	0.8-
1996 02 13	098	1.0+	0.9+	1999 10 21	704	0.2+	0.9-	1999 11 17	704	0.1+	0.4+
1996 02 15	098	0.1+	0.8-	1999 10 21	704	0.4-	0.4-	1999 11 17	704	0.1-	0.3+
1996 02 17	098	0.2+	0.9-	1999 10 21	704	0.8-	0.4-				
1996 03 14	098	1.1-	0.5+	1999 10 21	704	0.9+	1.0-				

(12434)* 1996 BM = 1987 DS₃

Discovered 1996 Jan. 16 by T. Kobayashi at Oizumi.

Id. S. Nakano (*MPC* 34860), A. Gnädig (*ibid.*), M. E. Sansaturio (*ibid.*)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Nakano

M	282.43059		(2000.0)	$\mathbf{P}$	$\mathbf{Q}$
n	0.21697229	ω	174.13716	-0.61395635	-0.78858409
a	2.7428362	Ω	313.73285	+0.72224937	-0.54358274
e	0.1279536	i	2.73955	+0.31845478	-0.28749425
P	4.54	H	14.2	G 0.15	U 1

Residuals in seconds of arc

1953 10 01	675	(3.5-	2.6-)	1996 01 27	411	0.6-	0.2+	1999 10 15	704	0.1+	0.6+
1953 10 01	675	1.7-	2.1-	1996 02 12	411	1.0-	0.5+	1999 11 03	704	0.3-	0.2-
1954 12 22	675	1.0+	0.2+	1996 02 12	411	0.2+	0.2-	1999 11 03	704	0.4-	0.1-
1954 12 22	675	0.2+	0.7+	1996 02 19	411	0.3+	0.3+	1999 11 03	704	1.0+	0.9-
1983 05 10	413	0.7-	0.9-	1996 02 19	411	1.6-	0.6-	1999 11 03	704	0.3-	1.0-
1983 05 10	413	0.3+	0.1-	1998 08 17	704	0.9+	1.2+	1999 11 03	704	0.4+	0.4-
1987 02 23	010	0.3+	0.4-	1998 08 17	704	1.4-	1.5+	1999 11 14	704	0.3-	0.1+
1987 02 23	010	1.6+	0.9+	1998 08 17	704	0.8-	2.1+	1999 11 14	704	0.2-	0.4-
1987 02 23	010	1.4+	1.1+	1998 08 17	704	0.4-	0.9-	1999 11 14	704	0.3-	0.2-
1993 07 23	809	1.3+	0.7+	1998 08 17	704	1.8-	0.5-	1999 11 14	704	0.5-	0.2-
1993 07 23	809	1.4+	0.6-	1999 10 13	704	1.2+	0.7+	1999 11 14	704	1.2-	0.1+
1993 07 23	809	(2.8+	0.3+)	1999 10 13	704	1.5+	0.1-	1999 11 16	704	0.4-	0.1-
1996 01 16	411	1.6-	0.5+	1999 10 13	704	0.3-	1.2+	1999 11 16	704	0.1-	0.6-
1996 01 16	411	0.1+	0.9-	1999 10 15	704	1.1+	0.4+	1999 11 16	704	0.5+	0.8-
1996 01 18	411	0.5-	0.6+	1999 10 15	704	0.9+	0.7+	1999 11 16	704	0.3-	0.2-
1996 01 18	411	0.5+	0.3+	1999 10 15	704	0.0	0.9+	1999 11 16	704	0.5+	0.2-
1996 01 27	411	0.3-	0.9+	1999 10 15	704	1.4+	0.1-				

(12435)* 1996 BX = 1997 GG₆

Discovered 1996 Jan. 17 by K. Endate and K. Watanabe at Kitami.

Id. G. V. Williams (*MPC* 29629)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

M	187.40846		(2000.0)	$\mathbf{P}$	$\mathbf{Q}$		
n	0.19950773	ω	105.78627	-0.95481071	+0.29171327		
a	2.9006561	Ω	91.20072	-0.28980872	-0.87130091		
e	0.0135489	i	3.26375	-0.06593497	-0.39463665		
P	4.94	H	13.4	G	0.15	U	1

Residuals in seconds of arc

1996 01 17	400	0.5+	0.2-	1998 07 14	327	0.1-	0.3+	1999 10 15	704	0.2-	0.2-
1996 01 17	400	0.1+	0.0	1998 07 14	327	0.2+	0.3+	1999 10 15	704	0.1-	0.2+
1996 01 19	400	0.2+	0.2+	1998 07 14	327	0.1-	0.4-	1999 10 20	704	0.4-	0.3+
1996 01 19	400	0.0	1.1-	1998 07 14	327	0.2+	0.4-	1999 10 20	704	0.1-	0.2+
1996 01 23	400	0.1-	0.3+	1998 08 17	704	0.3-	0.6+	1999 10 20	704	0.1-	1.0+
1996 01 23	400	0.2-	0.3+	1998 08 17	704	0.4-	0.2-	1999 10 20	704	0.3-	0.2+
1996 02 11	400	0.5-	0.4+	1998 08 17	704	0.2-	0.5+	1999 10 20	704	0.2-	0.9+
1996 02 11	400	0.2-	0.0	1998 08 17	704	0.5+	0.1+	1999 10 30	703	1.0-	0.2+
1997 04 02	704	1.3+	0.7+	1998 08 17	704	1.4+	0.3-	1999 10 30	703	0.9-	0.4+
1997 04 02	704	0.6-	0.8+	1998 08 30	699	0.4-	0.1-	1999 10 30	703	0.9-	0.3+
1997 04 06	704	0.1-	0.8+	1998 08 30	699	1.0-	0.0	1999 10 30	703	1.4-	0.4+
1997 04 06	704	0.4-	0.6+	1998 08 30	699	0.5-	0.2+	1999 11 05	704	0.8+	0.4+
1997 04 07	704	0.4+	0.9+	1999 10 02	703	0.6-	0.2+	1999 11 05	704	0.3+	0.4+
1997 04 07	704	0.2+	1.3+	1999 10 02	703	0.5+	0.4+	1999 11 05	704	0.3+	0.8+
1997 04 08	704	0.4-	1.5+	1999 10 02	703	0.4-	0.4-	1999 11 05	704	0.2+	0.2+
1997 04 08	704	0.2+	1.0+	1999 10 02	703	0.5-	0.1-	1999 11 05	704	0.3-	0.5+
1997 04 30	704	0.5+	0.4+	1999 10 10	143	0.1-	0.2-	1999 11 15	704	0.3+	0.4+
1997 04 30	704	0.6+	0.4+	1999 10 10	143	0.8-	0.7+	1999 11 15	704	0.4+	0.3+
1997 04 30	704	0.2+	0.6+	1999 10 10	143	0.4-	0.3+	1999 11 15	704	0.6+	0.8+
1997 04 30	704	0.2+	0.6+	1999 10 10	704	0.3-	0.1-	1999 11 15	704	0.5+	0.3+
1997 04 30	704	0.3+	0.8+	1999 10 10	704	0.3-	0.1+	1999 11 15	704	0.3+	0.3+
1997 05 01	704	0.4+	0.3+	1999 10 10	704	0.1-	0.2+	1999 11 17	704	0.0	0.5+
1997 05 01	704	0.6+	0.8+	1999 10 10	704	0.4-	0.1+	1999 11 17	704	0.8+	0.4+
1997 05 01	704	0.1-	0.2+	1999 10 10	704	0.3-	0.7+	1999 11 17	704	0.1+	1.3+
1997 05 01	704	0.6+	0.3+	1999 10 15	704	0.5-	0.0	1999 11 17	704	0.7+	0.2+
1997 05 01	704	0.9+	0.6+	1999 10 15	704	0.0	0.2+	1999 11 17	704	0.2+	0.0

(12436)* 1996 BY₁ = 1952 UZ = 1977 AA₂

Discovered 1996 Jan. 24 by T. Kobayashi at Oizumi.

Id. G. V. Williams (*MPC* 29113)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

M	30.02848		(2000.0)	$\mathbf{P}$	$\mathbf{Q}$
n	0.21197782	ω	24.86195	+0.98770455	-0.15014627
a	2.7857519	Ω	343.59595	+0.10473680	+0.84231116
e	0.1742230	i	8.86905	+0.11605998	+0.51765626
P	4.65	H	12.9	G 0.15	U 1

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

1952 10 24	760	(0.03-	0.02+)	X	1996 01 30	411	0.2+	0.1+	1999 10 14	704	0.6-	0.8+
1977 01 13	095	0.5+	0.4-		1996 02 12	411	0.6-	0.3+	1999 10 14	704	0.2-	1.3+
1988 05 15	675	0.6-	0.0		1996 02 12	411	0.5-	0.8+	1999 11 01	704	0.6+	1.5-
1988 05 15	675	0.6+	0.2+		1996 02 23	411	0.1-	0.4+	1999 11 01	704	0.7+	0.9-
1994 11 07	675	0.1-	0.4-		1996 02 23	411	0.3-	0.5-	1999 11 01	704	0.9+	0.2-
1994 11 07	675	0.8-	0.6-		1998 08 17	704	0.3+	0.5+	1999 11 01	704	1.6+	0.2-
1996 01 24	411	0.4-	0.7-		1998 08 17	704	0.5+	0.7-	1999 11 01	704	0.0	0.4+
1996 01 24	411	0.9+	0.9+		1998 08 17	704	0.1-	0.7+	1999 11 10	367	0.5-	0.1-
1996 01 25	411	0.3+	0.2-		1998 08 17	704	0.4-	0.5+	1999 11 10	367	0.3-	0.6+
1996 01 25	411	0.4-	0.3-		1999 10 14	704	0.5+	0.1-	1999 11 10	367	0.9-	0.5+
1996 01 30	411	0.1+	0.3+		1999 10 14	704	0.0	0.7+				

(12437)* 1996 BN₆

Discovered 1996 Jan. 18 by Spacewatch at Kitt Peak.

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

M	55.47569		(2000.0)	$\mathbf{P}$	$\mathbf{Q}$		
n	0.18890693	ω	239.77978	+0.68390628	+0.72645854		
a	3.0081821	Ω	73.53057	-0.64292616	+0.64372160		
e	0.1683390	i	4.02469	-0.34484511	+0.24058366		
P	5.22	H	13.8	G	0.15	U	1

Residuals in seconds of arc

1993 07 25	675	0.1+	0.4-	1997 04 04	566	0.1-	0.7-	1999 10 20	704	1.3+	0.7-
1993 07 25	675	0.3-	0.7-	1998 06 24	704	0.5-	0.6+	1999 10 20	704	0.9+	0.1+
1994 12 28	691	0.5+	0.9+	1998 06 24	704	0.7-	0.5-	1999 10 20	704	0.0	0.4-
1994 12 28	691	0.4+	0.1-	1998 06 24	704	0.6+	0.4+	1999 10 20	704	0.6+	0.1+

1999 NOV. 23

M.P.C. 36723

1994 12 28	691	0.5+	0.0	1998 06 24	704	1.1-	1.9+	1999 10 20	704	0.2+	0.6-
1995 11 22	691	0.3+	0.3-	1998 06 26	704	1.5+	1.0-	1999 11 01	703	1.6-	0.5+
1995 11 22	691	0.3-	0.4+	1998 06 26	704	1.4+	1.9+	1999 11 01	703	1.1-	0.8+
1995 11 22	691	0.1+	0.1-	1998 06 26	704	0.1-	1.1+	1999 11 01	703	1.1-	0.8+
1996 01 18	691	0.2-	0.7+	1998 06 26	704	1.0-	0.4+	1999 11 01	703	1.6-	1.3+
1996 01 18	691	0.1-	0.8+	1998 06 26	704	0.0	0.4-	1999 11 04	704	0.2-	0.0
1996 01 18	691	0.1-	0.5+	1999 10 10	704	1.2+	0.8+	1999 11 04	704	0.4-	0.1-
1996 01 25	691	0.3+	0.4+	1999 10 10	704	1.1+	0.7-	1999 11 04	704	0.1-	0.1+
1996 01 25	691	0.4+	0.5+	1999 10 10	704	0.6+	0.1-	1999 11 04	704	0.1-	0.4-
1996 01 25	691	0.4+	0.5+	1999 10 10	704	0.8+	0.2-	1999 11 04	704	0.3-	0.5-
1996 02 10	691	0.5-	0.4+	1999 10 10	704	0.2-	0.4-	1999 11 12	704	0.3-	0.1-
1996 02 10	691	0.2-	0.4+	1999 10 15	704	0.1+	0.1+	1999 11 12	704	1.4-	1.0-
1996 02 10	691	0.2-	0.3+	1999 10 15	704	0.6+	0.2+	1999 11 12	704	0.1-	0.6-
1997 04 04	566	0.5-	0.8-	1999 10 15	704	0.5+	0.1+				
1997 04 04	566	0.1-	1.0-	1999 10 15	704	0.5+	0.1-				

(12438)* 1996 CZ = 1990 TQ₁₁

Discovered 1996 Feb. 9 by W. Offutt at W & B Observatory, Cloudcroft.

Id. B. G. Marsden (*MPC* 26909)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

			Marsden			
<i>M</i>	315.91194	(2000.0)	<i>P</i>	<i>Q</i>		
<i>n</i>	0.23408926	<i>ω</i>	276.42019	-0.55940779	-0.82768333	
<i>a</i>	2.6074444	<i>Ω</i>	207.74293	+0.79343056	-0.51906882	
<i>e</i>	0.2611920	<i>i</i>	5.51740	+0.23985593	-0.21332573	
<i>P</i>	4.21	<i>H</i>	14.5	<i>G</i>	0.15	<i>U</i> 1

Residuals in seconds of arc

1990 10 11	033	0.7+	0.8-	1996 03 05	709	0.2+	0.3-	1997 06 29	709	0.3+	0.7-
1990 10 12	033	0.3+	1.0+	1996 03 05	709	0.5+	0.5-	1997 07 01	709	0.0	0.6-
1990 10 12	033	1.3+	0.6+	1996 03 16	709	1.1-	0.7+	1997 07 01	709	0.1+	0.3-
1990 10 13	033	1.5-	0.1-	1996 03 16	709	1.0-	0.7+	1997 07 01	709	0.4-	0.1-
1994 10 09	691	0.6-	0.4-	1996 03 16	709	1.2-	0.9+	1997 07 01	709	0.5-	0.1+
1994 10 09	691	0.4-	0.4-	1996 03 16	709	1.1-	0.9+	1997 07 01	709	0.5+	0.4-
1996 02 09	709	0.1+	0.4-	1996 04 23	709	0.4+	0.5+	1997 07 11	696	0.1+	0.1-
1996 02 09	709	0.2+	0.3-	1996 04 23	709	0.7+	0.5+	1997 07 11	696	0.1-	0.2-
1996 02 09	709	0.2+	0.3-	1996 04 23	709	0.7+	0.5+	1997 07 12	696	0.1-	0.3-
1996 02 09	709	0.3+	0.4-	1996 04 23	709	0.5+	0.6+	1997 07 12	696	0.0	0.4-
1996 02 09	709	0.3+	0.3-	1996 04 23	709	0.8+	0.5+	1999 10 10	704	0.7+	1.4-
1996 02 09	709	0.2+	0.3-	1996 04 23	709	0.8+	0.6+	1999 10 10	704	0.4+	0.7-
1996 02 09	709	0.2+	0.3-	1996 04 23	709	0.7+	0.6+	1999 10 10	704	0.9+	1.0-
1996 02 10	709	0.3-	0.3-	1996 04 23	709	0.5+	0.6+	1999 10 10	704	0.9+	1.7-
1996 02 10	709	0.4-	0.3-	1996 05 24	709	0.2+	0.1-	1999 10 21	704	0.0	0.8+
1996 02 10	709	0.3-	0.4-	1996 05 24	709	0.2+	0.0	1999 10 21	704	0.2-	0.1+
1996 02 10	709	0.4-	0.3-	1996 05 24	709	0.4+	0.1-	1999 10 21	704	0.2+	0.5+
1996 02 10	709	0.3-	0.3-	1996 05 24	709	0.4+	0.1-	1999 10 21	704	0.6-	0.5+
1996 02 10	709	0.3-	0.3-	1996 05 24	709	0.3+	0.2-	1999 10 21	704	1.1-	1.2+
1996 02 11	709	0.8-	0.7-	1996 05 24	709	0.3+	0.0	1999 11 13	703	0.1-	0.6+
1996 02 11	709	0.5-	0.7-	1996 05 24	709	0.1+	0.0	1999 11 13	703	0.2+	0.1+
1996 02 11	709	0.5-	0.6-	1996 05 24	709	0.4+	0.2-	1999 11 13	703	0.3-	0.8+
1996 02 11	709	0.5-	0.6-	1997 06 29	709	0.2+	0.0	1999 11 13	703	0.3+	0.2+
1996 03 05	709	0.8+	0.0	1997 06 29	709	0.1+	0.1-				
1996 03 05	709	0.1-	0.3-	1997 06 29	709	0.1-	0.2-				

(12439)* 1996 CA₃ = 1985 HJ

Discovered 1996 Feb. 15 by T. Okuni at Nanyou.

Id. S. Nakano (*MPC* 26910)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

			Nakano			
<i>M</i>	183.86936	(2000.0)	<i>P</i>	<i>Q</i>		
<i>n</i>	0.17561771	<i>ω</i>	136.06882	-0.79640419	+0.60358437	
<i>a</i>	3.1580852	<i>Ω</i>	81.09560	-0.56487664	-0.72012066	
<i>e</i>	0.1189383	<i>i</i>	2.19077	-0.21599710	-0.34221652	
<i>P</i>	5.61	<i>H</i>	12.3	<i>G</i>	0.15	<i>U</i> 1

Residuals in seconds of arc

1985 04 18	046	0.6-	2.0-	1997 06 29	704	0.2+	0.3+	1999 11 01	703	1.1+	0.5-
1985 04 18	046	0.7-	1.9+	1997 06 29	704	0.1+	0.7+	1999 11 01	703	0.2-	0.7+
1985 04 19	046	0.3+	1.3-	1997 06 29	704	0.1+	1.0+	1999 11 01	703	0.5-	0.5+
1985 04 19	046	0.2+	0.4+	1998 08 26	809	(2.7+	2.2+)	1999 11 04	704	0.1-	0.4-
1985 04 20	046	0.6+	1.2-	1998 08 26	809	(2.6+	1.7+)	1999 11 04	704	0.1+	0.3+
1985 04 20	046	(0.1+	5.5+)	1998 08 26	809	(2.0+	2.7+)	1999 11 04	704	0.0	0.2-
1985 04 21	046	(0.4+	2.9-)	1998 08 27	809	(2.2+	2.6+)	1999 11 04	704	0.3+	0.4-
1985 04 21	046	(2.3-	3.8+)	1998 08 27	809	(3.1+	2.8+)	1999 11 04	704	0.0	0.6-
1985 04 23	688	0.3+	0.1-	1998 08 27	809	(3.7+	3.3+)	1999 11 09	704	0.0	0.4+
1985 04 23	688	0.4-	1.0+	1998 10 10	699	0.0	1.0-	1999 11 09	704	0.2+	0.5+
1996 02 15	358	0.1-	0.6+	1998 10 10	699	0.7-	0.6+	1999 11 09	704	0.2-	0.4+
1996 02 15	358	0.1-	1.3-	1998 10 10	699	1.3-	0.2+	1999 11 09	704	0.5-	0.6+
1996 02 16	358	0.7+	0.9-	1999 10 10	704	0.4+	0.2-	1999 11 09	704	0.2+	0.4+
1996 02 16	358	1.2-	0.5+	1999 10 10	704	0.6+	0.3-	1999 11 12	699	1.2-	0.5+
1996 02 23	358	1.7+	0.4+	1999 10 10	704	0.3+	0.7-	1999 11 12	699	0.0	0.9+
1996 02 23	358	0.2-	0.3+	1999 10 10	704	0.0	0.3-	1999 11 12	704	0.2+	0.3+
1996 03 10	399	0.5-	0.7+	1999 10 10	704	0.4-	0.5-	1999 11 12	699	0.3-	0.8+
1996 03 10	399	1.2-	1.3-	1999 10 15	704	0.2-	0.2-	1999 11 12	704	0.1-	0.0
1996 03 12	399	0.1-	1.3+	1999 10 15	704	0.0	0.3-	1999 11 12	704	0.1-	0.1-
1996 03 12	399	1.3-	1.2+	1999 10 15	704	0.5-	0.1+	1999 11 12	704	0.1-	0.2-
1996 03 19	358	0.0	1.8+	1999 10 15	704	0.6-	0.2+	1999 11 12	704	0.3-	0.2-
1996 03 19	358	0.7+	2.1-	1999 10 21	704	0.0	0.4-	1999 11 17	704	0.1+	0.1+
1996 03 21	566	0.7+	0.2+	1999 10 21	704	0.5+	0.9-	1999 11 17	704	0.4+	0.6+
1996 03 21	566	0.6+	0.2+	1999 10 21	704	0.4+	1.1-	1999 11 17	704	0.1+	0.2+
1996 03 21	566	0.5+	0.5+	1999 10 21	704	1.3+	1.1-	1999 11 17	704	0.0	0.3+
1997 06 29	704	0.6+	0.9-	1999 10 21	704	0.1+	0.2-	1999 11 17	704	0.1-	0.5+
1997 06 29	704	0.1+	0.4+	1999 11 01	703	0.3+	1.3+				

(12440)* 1996 CF₃ = 1998 QX₁₆

Discovered 1996 Feb. 11 by K. Endate and K. Watanabe at Kitami.

Id. G. V. Williams (*MPC* 32469)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

			Williams			
<i>M</i>	112.16961	(2000.0)	<i>P</i>	<i>Q</i>		
<i>n</i>	0.18325528	<i>ω</i>	148.99369	+0.08782807	+0.98153777	
<i>a</i>	3.0697173	<i>Ω</i>	125.51390	-0.95136915	+0.13321113	
<i>e</i>	0.0353813	<i>i</i>	12.04868	-0.29526762	-0.13725308	
<i>P</i>	5.38	<i>H</i>	12.6	<i>G</i>	0.15	<i>U</i> 1

Residuals in seconds of arc

1996 02 11	400	0.9+	0.0	1998 08 17	704	0.3-	0.4-	1998 09 14	704	0.5+	0.1-
1996 02 11	400	0.9-	1.8-	1998 08 17	704	0.3+	1.4-	1999 10 09	704	0.8+	0.3+
1996 02 13	400	0.1+	0.5+	1998 08 21	566	1.4-	0.8-	1999 10 09	704	1.1+	0.3-
1996 02 13	400	(1.6-	3.0-)	1998 08 21	566	1.2-	0.8-	1999 10 09	704	0.4+	0.2-
1996 02 26	400	0.0	1.2-	1998 08 21	566	1.4-	0.7-	1999 10 09	704	0.1-	0.4-
1996 02 26	400	0.3-	0.2-	1998 08 23	704	1.0+	0.4+	1999 10 09	704	0.4+	1.4-
1996 03 13	400	0.3-	0.0	1998 08 23	704	0.1-	0.6+	1999 10 31	703	0.5+	0.7+
1996 03 13	400	0.1-	0.0	1998 08 23	704	0.6+	1.1+	1999 10 31	703	0.0	0.5+
1997 08 01	566	0.3+	0.2+	1998 08 23	704	0.1+	0.4-	1999 10 31	703	0.2+	0.3+
1997 08 01	566	0.4-	0.4+	1998 08 23	704	0.6-	0.5-	1999 10 31	703	0.1-	0.2-
1997 08 01	566	0.6+	0.3+	1998 08 27	699	0.3-	0.3+	1999 11 06	704	0.6-	0.1+
1998 07 04	699	(3.3+	1.3-)	1998 08 27	699	0.4-	0.5+	1999 11 06	704	0.7-	0.2+
1998 07 04	699	0.0	0.1+	1998 08 27	699	0.2-	0.4+	1999 11 06	704	0.7-	0.3+
1998 07 04	699	0.1+	0.9-	1998 09 14	704	0.6+	0.2+	1999 11 06	704	0.4-	0.2-
1998 08 17	704	0.2+	0.3-	1998 09 14	704	0.3+	0.1-	1999 11 06	704	0.7-	0.4+
1998 08 17	704	1.0+	0.4+	1998 09 14	704	0.3+	0.2+				
1998 08 17	704	0.3+	1.3-	1998 09 14	704	1.3+	1.1+				

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Nakano

<i>M</i>	166.29187		(2000.0)	P	Q
<i>n</i>	0.17430876	ω	69.17217	-0.71939036	+0.68884218
<i>a</i>	3.1738757	Ω	154.10758	-0.68871436	-0.69066103
<i>e</i>	0.0418388	<i>i</i>	11.79962	-0.09027760	-0.22019035
<i>P</i>	5.65	<i>H</i>	13.4	<i>G</i>	0.15
				<i>U</i>	1

Residuals in seconds of arc

1996 02 10	691	0.2+	0.5-	1997 05 31	118	0.2-	0.4+	1998 09 14	704	1.3-	0.9-
1996 02 10	691	0.1-	0.3-	1997 05 31	118	0.5+	0.6+	1998 09 14	704	(3.9-	3.1-)
1996 02 10	691	0.4+	0.4-	1997 06 01	118	0.1-	0.3+	1998 09 22	120	0.3-	0.9+
1996 02 19	411	1.4-	1.4+	1997 06 01	118	0.4-	0.5+	1998 09 22	120	1.7-	0.3+
1996 02 19	411	0.4-	1.9+	1997 06 01	118	0.1-	0.3+	1998 09 22	120	0.2-	0.6-
1996 02 21	411	0.2-	0.8+	1997 06 08	118	0.2+	0.6+	1998 10 14	910	0.4-	0.0
1996 02 21	411	0.6+	0.9+	1997 06 08	118	0.6+	0.6+	1998 10 14	910	0.5-	0.5+
1996 02 21	411	0.3+	0.7+	1997 06 08	118	0.2+	0.6+	1998 10 14	910	0.3-	0.1+
1996 02 27	411	0.8-	0.9-	1998 07 26	699	0.4+	0.4-	1999 10 04	703	0.3+	0.1-
1996 02 27	411	0.2-	0.3+	1998 07 26	699	0.6-	0.0	1999 10 04	703	0.2+	0.7+
1996 03 09	411	1.0-	0.2+	1998 07 26	699	0.4+	1.5+	1999 10 04	703	0.6+	0.6-
1996 03 09	411	0.7+	1.5-	1998 08 17	704	0.1+	0.1+	1999 10 04	703	0.0	0.6+
1996 03 22	411	0.3+	0.9+	1998 08 17	704	0.5+	0.2+	1999 10 09	704	0.4+	0.3-
1996 03 22	411	0.8+	0.2-	1998 08 17	704	0.4+	0.1-	1999 10 09	704	0.4+	0.3-
1996 04 09	104	1.8+	0.1-	1998 08 17	704	0.3+	0.6+	1999 10 09	704	0.0	0.6+
1996 04 09	104	1.1+	0.1-	1998 08 17	704	1.0+	0.1+	1999 10 09	704	0.4-	0.1+
1996 04 09	104	0.6+	0.9-	1998 08 23	699	0.7+	0.2+	1999 10 09	704	0.3-	0.0
1996 04 10	104	0.2-	0.4-	1998 08 23	704	1.1+	1.8-	1999 11 06	704	0.4-	0.2+
1996 04 10	104	0.3-	0.3-	1998 08 23	704	1.0+	1.0-	1999 11 06	704	0.7+	0.2+
1996 04 10	104	0.1-	0.1-	1998 08 23	699	0.0	0.4-	1999 11 06	704	0.0	0.1+
1996 04 12	104	0.1-	0.0	1998 08 23	704	1.4+	0.8+	1999 11 06	704	0.5-	0.7+
1996 04 12	104	0.3-	0.3-	1998 08 23	699	0.4+	0.2-	1999 11 06	704	0.7+	0.2-
1996 04 12	104	0.6-	0.3-	1998 08 23	704	0.5+	1.8+	1999 11 07	704	0.7-	1.6+
1996 04 14	104	0.4-	0.8-	1998 09 14	704	0.4-	0.6-	1999 11 07	704	0.4-	0.2+
1996 04 14	104	0.7-	0.6-	1998 09 14	704	1.5-	1.0-	1999 11 07	704	0.5-	0.5-
1997 05 31	118	0.0	0.3-	1998 09 14	704	1.5-	1.7-	1999 11 07	704	0.6-	0.2+

(12442)* 1996 DO₁

Discovered 1996 Feb. 23 by A. Vagnozzi at Stroncone.

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	150.53115		(2000.0)	P	Q
<i>n</i>	0.18660580	ω	319.90884	-0.29487267	+0.94112571
<i>a</i>	3.0328618	Ω	292.36506	-0.82450433	-0.33804753
<i>e</i>	0.1365879	<i>i</i>	10.29831	-0.48295209	+0.00250419
<i>P</i>	5.28	<i>H</i>	12.3	<i>G</i>	0.15
				<i>U</i>	1

Residuals in seconds of arc

1996 02 23	589	0.2-	0.4+	1996 03 19	589	0.3-	0.3-	1998 08 27	704	0.9+	0.1+
1996 02 23	589	0.1-	0.3-	1996 03 19	589	0.6+	0.6+	1998 08 27	704	0.2-	0.8+
1996 02 23	589	0.1+	0.2+	1996 03 19	589	0.7+	0.4+	1998 08 27	704	0.4-	0.4-
1996 02 24	589	0.7+	0.7-	1996 03 19	589	0.1-	0.5+	1998 08 27	704	0.8-	0.1-
1996 02 24	589	0.0	0.0	1996 04 14	589	0.1+	1.0-	1998 09 18	589	0.1+	0.7-
1996 02 24	589	0.5+	0.5-	1996 04 14	589	0.6+	0.8-	1998 09 18	589	0.1+	0.5-
1996 02 24	589	0.1+	0.2+	1996 04 14	589	1.3+	0.4-	1998 09 18	589	0.1+	0.3-
1996 02 24	596	0.3-	0.4-	1996 04 16	589	0.4+	0.5+	1998 09 19	704	0.4+	0.3+
1996 02 24	108	(0.3+	2.5+)	1996 04 16	589	0.0	0.2-	1998 09 19	704	0.0	0.5-
1996 02 24	596	0.1-	0.1-	1996 05 05	589	0.1+	0.4-	1998 09 19	704	0.2-	0.3-
1996 02 24	596	0.0	0.0	1996 05 05	589	0.3+	0.2-	1998 09 19	589	0.4+	0.3+
1996 02 24	108	(1.2+	2.3-)	1996 05 05	589	0.4+	0.3-	1998 09 19	589	0.6-	0.2-
1996 02 25	589	0.9-	0.1+	1996 05 17	589	1.7-	0.2-	1998 09 19	589	0.2-	0.0
1996 02 25	589	1.4-	0.3+	1996 05 17	589	0.4-	0.0	1998 09 23	589	0.0	0.0
1996 02 25	596	0.4-	0.1-	1996 05 17	589	0.6-	1.6+	1998 09 23	589	0.2-	0.0
1996 02 25	589	0.7-	0.2-	1997 07 02	589	0.2-	0.7+	1998 09 23	589	0.3+	0.7+
1996 02 25	596	0.6-	0.2+	1997 07 02	589	0.5-	0.2+	1998 09 28	589	0.3-	0.2+
1996 02 26	589	(4.5-	1.0+)	1997 07 02	589	0.6-	0.2+	1998 09 28	589	0.1+	0.0
1996 02 26	589	(5.0-	1.1+)	1997 07 12	589	0.6+	0.5-	1998 10 12	704	1.6-	1.5+
1996 02 26	589	(4.9-	1.0+)	1997 07 12	589	0.3-	0.1-	1998 10 12	704	0.2-	0.8+
1996 02 27	589	(3.7-	1.6+)	1997 07 12	589	0.9+	1.2-	1998 10 12	704	0.6-	0.2+

1996 02 27	589	(4.4-	1.0+)	1997 07 12	589	0.3+	0.8-	1998 10 23	589	1.3+	1.2-
1996 02 27	589	(4.0-	0.8+)	1997 07 26	589	0.1-	0.9+	1998 10 23	589	1.5+	0.2-
1996 02 28	589	1.1-	0.1-	1997 07 26	589	0.3+	0.1-	1998 10 23	589	1.2+	1.0-
1996 02 28	589	0.3-	0.4-	1997 07 26	589	0.9-	0.5+	1998 12 09	704	0.2+	0.8+
1996 02 28	589	0.4-	0.5+	1997 08 22	589	0.2+	1.2-	1998 12 09	704	0.8-	0.1+
1996 02 28	589	0.1+	1.1-	1997 08 22	589	0.2-	1.2-	1998 12 09	704	1.4+	0.9-
1996 02 28	589	1.2-	0.2+	1997 08 22	589	0.1+	0.3+	1998 12 09	704	0.0	0.0
1996 02 29	589	0.4+	0.6+	1997 08 22	589	0.1-	0.4-	1999 10 14	704	0.0	0.7-
1996 02 29	589	0.6-	0.1+	1997 08 24	704	0.3+	0.0	1999 10 14	704	0.4-	0.2-
1996 03 11	589	0.2-	0.4-	1997 08 24	704	0.4-	0.3+	1999 10 14	704	0.5-	0.1+
1996 03 11	589	0.3+	0.9-	1997 08 24	704	1.0-	1.9-	1999 10 14	704	0.6-	0.3+
1996 03 13	589	0.5-	0.6-	1997 08 24	704	1.0-	0.0	1999 10 14	704	1.0-	0.0
1996 03 13	589	0.1+	0.4+	1997 08 24	704	0.5-	0.0	1999 11 15	163	0.7+	0.1+
1996 03 13	589	0.8+	0.1+	1997 08 26	589	0.2+	0.7+	1999 11 15	163	0.6+	0.1+
1996 03 13	589	1.0+	0.5-	1997 08 26	589	0.7+	0.7+	1999 11 15	163	0.4+	0.2+
1996 03 14	589	0.4+	0.2-	1997 08 26	589	0.9+	0.8+	1999 11 16	163	0.6+	0.2-
1996 03 14	589	0.9+	0.6+	1997 08 26	589	0.5+	0.4-				
1996 03 14	589	0.5+	1.0+	1997 08 27	704	0.3+	0.1+				

(12443)* 1996 EQ₂ = 1997 GX₄₁ = 1998 MT₁₀

Discovered 1996 Mar. 15 by AMOS at Haleakala.

Id. A. Doppler (*MPC* 32950)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	320.53001		(2000.0)	P	Q
<i>n</i>	0.17989059	ω	206.45660	+0.74067468	-0.66657071
<i>a</i>	3.1078765	Ω	196.24468	+0.65735118	+0.74486430
<i>e</i>	0.2131436	<i>i</i>	17.51075	+0.13889007	+0.02933708
<i>P</i>	5.48	<i>H</i>	12.3	<i>G</i>	0.15
				<i>U</i>	2

Residuals in seconds of arc

1996 03 15	608	1.1-	0.1+	1998 06 25	704	0.3+	0.3+	1999 10 04	704	0.0	0.2-
1996 03 15	608	1.4-	0.1+	1998 06 25	704	0.8+	0.5+	1999 10 07	703	0.2+	0.2+
1996 03 16	608	0.8+	1.2-	1999 09 07	703	0.3-	0.3+	1999 10 07	703	0.1+	0.5+
1996 03 16	608	0.7+	1.0-	1999 09 07	703	0.3-	0.4+	1999 10 07	703	0.1-	0.3+
1996 03 17	608	0.4+	0.2-	1999 09 07	703	0.2-	0.4+	1999 10 07	703	0.1-	0.2+
1996 03 17	608	0.5+	0.0	1999 09 07	703	0.6-	0.7+	1999 10 09	704	0.3-	0.1+
1996 03 18	608	(0.5+	2.2-)	1999 09 08	704	0.1-	0.7-	1999 10 09	704	0.3-	0.4+
1996 03 18	608	(0.3+	2.4-)	1999 09 08	704	0.3-	0.7-	1999 10 09	704	0.3-	0.4+
1997 04 08	809	0.3-	0.1-	1999 09 08	704	0.2+	0.4-	1999 10 09	704	0.1-	0.4+
1997 04 08	809	0.4-	0.2-	1999 09 08	704	0.3-	0.7-	1999 10 09	704	0.1-	0.6+
1997 04 08	809	0.5-	1.2-	1999 09 08	704	0.1-	0.5-	1999 10 16	611	0.1-	0.2+
1997 04 09	809	(3.8+	3.1+)	1999 09 09	704	0.3-	0.4-	1999 10 16	611	0.6+	0.0
1997 04 09	809	(4.6+	3.1+)	1999 09 09	704	0.5-	0.5-	1999 11 06	704	0.4-	0.2+
1997 04 09	809	(4.3+	2.6+)	1999 09 09	704	0.3-	0.3-	1999 11 06	704	0.2-	0.1+
1997 04 10	809	(2.7+	2.3+)	1999 09 09	704	0.1-	0.4-	1999 11 06	704	0.2-	0.0
1997 04 10	809	(3.7+	2.1+)	1999 09 09	704	0.2-	0.2-	1999 11 06	704	0.4+	0.5+
1997 04 10	809	(3.3+	2.3+)	1999 09 11	106	0.3-	0.6+	1999 11 06	704	0.5+	0.0
1997 05 09	691	0.2+	0.7+	1999 09 11	106	0.1-	0.5+	1999 11 14	704	0.1-	0.6-
1997 05 09	691	0.2+	1.6+	1999 09 11	106	0.3+	0.4-	1999 11 14	704	0.1+	0.3-
1997 05 09	691	0.4+	0.5+	1999 09 16	704	0.3+	0.2+	1999 11 14	704	0.1+	0.2+
1998 06 19	704	1.0-	0.5+	1999 09 16	704	0.2+	0.5+	1999 11 14	704	0.3+	0.4-
1998 06 19	704	0.3-	0.7-	1999 09 16	704	0.6+	0.2-	1999 11 14	704	0.4+	0.8-
1998 06 19	704	1.3+	0.1+	1999 09 16	704	0.1+	0.2-	1999 11 16	704	0.6+	0.3-
1998 06 19	704	0.8-	0.8-	1999 10 04	704	0.6+	0.2+	1999 11 16	704	0.3-	0.0
1998 06 25	704	0.5+	0.7-	1999 10 04	704	0.6+	0.1+	1999 11 16	704	0.6-	0.7-
1998 06 25	704	0.1-	0.3-	1999 10 04	704	0.1+	0.5+	1999 11 16	704	0.4+	0.6-
1998 06 25	704	0.2-	0.8-	1999 10 04	704	0.4+	0.2+	1999 11 16	704	0.0	0.7-

1999 NOV. 23

M.P.C. 36725

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	43.75677	(2000.0)	P	Q
<i>n</i>	0.08157776	ω 64.49937	+0.06459336	+0.95765735
<i>a</i>	5.2652806	Ω 213.22199	−0.99529128	+0.08218682
<i>e</i>	0.0715281	<i>i</i> 30.80375	+0.07227005	+0.27593064
<i>P</i>	12.08	<i>H</i> 10.1	<i>G</i> 0.15	<i>U</i> 2

Residuals in seconds of arc

1996 03 24	809	(3.2− 2.4−)	1997 06 11	824	0.4−	1.1−	1999 07 13	739	0.0	0.1−
1996 03 24	809	(3.5− 1.5−)	1997 06 15	824	1.8−	0.7+	1999 07 13	739	0.1+	0.4−
1996 03 24	809	(4.1− 1.9−)	1997 06 15	824	1.1−	0.8+	1999 07 13	739	0.3−	0.5−
1996 03 27	809	(3.4− 1.4−)	1997 06 15	824	0.0	0.5+	1999 07 19	118	0.0	0.7−
1996 03 27	809	(2.9− 1.6−)	1997 06 17	709	0.2−	0.0	1999 07 19	118	0.1−	0.5−
1996 03 27	809	(2.9− 1.1−)	1997 06 17	709	0.3−	0.0	1999 07 19	118	0.0	0.7−
1996 04 15	809	1.5+ 1.6−	1997 06 17	709	0.3−	0.1−	1999 08 04	827	0.5−	0.2+
1996 04 15	809	1.5+ 0.7−	1997 06 17	709	0.3−	0.1−	1999 08 04	827	0.6−	0.6+
1996 04 15	809	1.0+ 1.2−	1997 06 17	709	0.2−	0.1−	1999 08 04	827	0.3−	0.2+
1996 04 17	809	0.2+ 1.9−	1997 06 24	824	0.0	0.1−	1999 08 11	704	1.2+	0.0
1996 04 17	809	(0.5+ 2.2−)	1997 06 24	824	0.1+	0.1−	1999 08 11	704	0.2+	0.3−
1996 04 17	809	(0.1+ 2.7−)	1997 06 24	824	0.2+	0.1−	1999 08 11	704	0.2+	0.5−
1996 05 13	566	0.3− 0.1−	1997 06 29	684	0.5+	0.3+	1999 08 11	704	0.4−	0.5−
1996 05 13	566	0.3− 0.4−	1997 06 29	684	0.5+	0.3+	1999 10 03	704	0.6+	1.5+
1996 05 13	566	0.3− 0.1+	1997 06 29	684	0.5+	0.2+	1999 10 03	704	1.0+	0.1−
1996 06 08	809	1.1+ 0.0	1997 06 30	684	0.2+	0.2+	1999 10 03	704	0.5+	0.3−
1996 06 08	809	1.0+ 0.8−	1997 06 30	684	0.3+	0.2+	1999 10 03	704	0.5+	0.1+
1996 06 08	809	0.7+ 0.9−	1997 06 30	684	0.4+	0.1+	1999 10 03	704	0.3−	1.6−
1996 06 10	809	1.9− 1.6+	1997 07 06	824	0.5+	0.3+	1999 10 10	704	0.2+	0.2+
1996 06 10	809	1.1− 1.4+	1997 07 06	824	0.4+	0.3+	1999 10 10	704	0.3−	0.3−
1996 06 10	809	1.9− 0.5+	1997 07 06	824	0.4+	0.3+	1999 10 10	704	0.0	0.0
1997 06 04	012	0.1− 0.5+	1997 07 08	824	0.5+	0.6+	1999 10 10	704	0.0	0.5+
1997 06 04	012	0.0 0.8+	1997 07 08	824	0.5+	0.6+	1999 10 10	704	0.7+	0.1−
1997 06 05	012	0.1+ 0.8+	1997 07 08	824	0.5+	0.7+	1999 11 04	704	0.5−	0.3+
1997 06 09	012	0.0 0.1+	1998 06 27	704	0.7+	0.6+	1999 11 04	704	0.8−	0.5−
1997 06 09	012	0.4− 0.0	1998 06 27	704	(0.6− 3.1+)		1999 11 04	704	0.8+	0.4+
1997 06 10	012	0.7− 0.3−	1998 06 27	704	1.7−	1.4+	1999 11 04	704	0.6−	0.1−
1997 06 11	824	0.1− 1.6−	1998 06 27	704	0.6−	0.5−	1999 11 04	704	0.4−	0.8−
1997 06 11	824	0.5− 1.5−	1998 06 27	704	0.4+	0.3−				

(12445)* 1996 HE₂ = 1997 SX₄

Discovered 1996 Apr. 24 by T. Okuni at Nanyou.

Id. G. V. Williams (*MPC* 30763)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	168.18195	(2000.0)	P	Q
<i>n</i>	0.17975160	ω 200.98384	+0.05465945	+0.98438699
<i>a</i>	3.1094784	Ω 72.45354	−0.88929798	+0.12419042
<i>e</i>	0.0303305	<i>i</i> 10.10662	−0.45405006	−0.12473567
<i>P</i>	5.48	<i>H</i> 12.7	<i>G</i> 0.15	<i>U</i> 1

Residuals in seconds of arc

1996 04 24	358	(1.8− 2.3+)	1998 09 29	704	0.7+	0.0	1998 12 11	699	0.8+	0.8+
1996 04 24	358	0.0 0.6+	1998 09 29	704	0.7+	0.0	1998 12 11	699	0.6+	0.2+
1996 04 25	358	1.2+ 0.3−	1998 09 29	704	1.3−	0.2−	1999 01 17	699	1.7+	0.8+
1996 04 25	358	0.4− 0.3+	1998 09 29	704	0.9+	1.1−	1999 01 17	699	1.5−	0.7+
1996 05 13	358	0.2+ 0.5+	1998 10 29	704	0.0	0.4+	1999 01 17	699	1.0−	0.6−
1996 05 13	358	0.4− 0.9+	1998 10 29	704	0.8−	0.7+	1999 10 13	704	0.2+	0.5+
1996 05 14	358	0.5+ 0.9+	1998 10 29	704	1.1−	0.2+	1999 10 13	704	0.5−	0.1−
1996 05 14	358	0.5− 1.4−	1998 10 29	704	0.4−	1.2+	1999 10 13	704	0.4−	0.4−
1997 09 26	426	0.7− 0.6−	1998 10 29	704	1.1−	0.3+	1999 10 13	704	0.9+	0.1+
1997 09 26	426	0.1+ 0.5+	1998 11 10	704	0.2−	0.0	1999 10 13	704	0.9+	0.3+
1997 09 28	426	0.2+ 0.0	1998 11 10	704	0.3+	0.4−	1999 11 12	703	0.0	0.2+
1997 09 28	426	0.0 0.3−	1998 11 10	704	0.1−	0.3−	1999 11 12	703	0.0	0.7+
1997 09 28	426	0.1− 0.8+	1998 11 10	704	0.5−	1.1+	1999 11 12	703	0.2−	1.0+
1997 09 30	426	1.0− 0.2+	1998 11 10	704	0.8+	1.4−	1999 11 12	703	0.9−	0.4+
1997 09 30	426	0.2− 0.1−	1998 11 11	704	0.0	1.9−	1999 11 16	704	0.3−	0.8−
1997 10 07	426	0.0 0.4+	1998 11 11	704	0.4+	0.6−	1999 11 16	704	0.4−	0.8−

1997 10 07	426	0.3+ 0.8+	1998 11 11	704	0.5+ 0.3−	1999 11 16	704	1.2+ 0.1+
1997 10 07	426	1.1+ 0.2+	1998 12 11	699	0.3+ 1.0+	1999 11 16	704	0.0 0.9+

(12446)* 1996 PZ₆ = 1977 TE

Discovered 1996 Aug. 15 by R. H. McNaught and J. B. Child at Macquarie.

Id. G. V. Williams (*MPC* 27924)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	17.18736	(2000.0)	P	Q
<i>n</i>	0.36279958	ω 266.35513	+0.90797861	+0.11437321
<i>a</i>	1.9469653	Ω 86.76567	+0.05478191	+0.92136693
<i>e</i>	0.1168678	<i>i</i> 23.81270	−0.41542001	+0.37148587
<i>P</i>	2.72	<i>H</i> 15.0	<i>G</i> 0.15	<i>U</i> 2

Residuals in seconds of arc

1977 10 04	809	0.7+ 1.8−	1998 04 02	429	0.7−	0.3+	1998 04 30	704	0.2−	0.1+
1977 10 08	809	0.5− 0.4+	1998 04 02	429	1.0+	0.1+	1998 04 30	704	0.2+	0.2+
1977 10 09	809	0.3− 2.0+	1998 04 18	699	1.4+	0.5+	1998 04 30	704	0.6+	0.8+
1996 08 13	413	0.2+ 0.8−	1998 04 18	699	1.0+	1.1+	1998 04 30	704	1.0+	0.1+
1996 08 13	413	0.3− 0.6+	1998 04 18	699	(1.0+ 2.3+)		1998 05 29	704	(2.6− 0.9+)	
1996 08 15	424	0.2− 0.5+	1998 04 21	699	0.8−	0.3+	1998 05 29	704	0.7−	1.1+
1996 08 15	424	0.6− 0.1−	1998 04 21	699	1.2+	0.6+	1998 05 29	704	0.9−	0.6−
1996 08 16	424	0.1+ 0.8−	1998 04 21	699	0.4+	0.7−	1999 09 14	704	0.6−	0.1−
1996 08 16	424	0.5+ 1.3+	1998 04 22	566	0.7+	0.5−	1999 09 14	704	0.5−	0.1−
1996 08 20	424	0.4− 0.6+	1998 04 22	566	0.1−	0.5−	1999 09 14	704	0.2−	0.4+
1996 08 20	424	0.8− 0.1−	1998 04 22	566	0.0	0.6−	1999 09 14	704	1.2−	0.4−
1996 09 17	424	0.5− 0.5−	1998 04 28	704	0.9−	0.5−	1999 09 14	704	0.9−	0.1+
1996 09 17	424	0.2− 0.1−	1998 04 28	704	0.0	0.8+	1999 11 07	704	0.2−	0.2−
1996 09 17	424	1.0+ 0.3−	1998 04 28	704	0.3+	0.6+	1999 11 07	704	0.2−	0.0
1996 09 17	424	0.3+ 0.4+	1998 04 28	704	0.6−	0.9+	1999 11 07	704	0.6−	0.3−
1996 10 12	424	1.1+ 0.4−	1998 04 28	704	0.2−	1.9+	1999 11 07	704	0.4−	0.0
1996 10 12	424	0.4+ 0.3+	1998 04 28	429	1.8−	0.9−	1999 11 07	704	0.8−	0.1+
1996 11 02	424	0.6− 1.1+	1998 04 28	429	(1.5+ 2.5−)		1999 11 09	704	1.5+ 0.8+	
1996 11 02	424	1.9− 0.5+	1998 04 28	429	(1.0− 3.6−)		1999 11 09	704	1.5+ 0.8+	
1998 04 02	429	0.3+ 0.7+	1998 04 28	429	0.5+ 1.4−		1999 11 09	704	1.0+ 0.5+	

(12447)* 1996 XA₁₂ = 1979 SW₁ = 1985 JA₁ = 1998 NK

Discovered 1996 Dec. 4 by Spacewatch at Kitt Peak.

Id. E. Bowell (*MPC* 32246), G. V. Williams (*ibid.*)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	133.90901	(2000.0)	P	Q
<i>n</i>	0.30966311	ω 192.58112	+0.15862308	+0.98285411
<i>a</i>	2.1637632	Ω 86.60194	−0.89751135	+0.18321476
<i>e</i>	0.2086124	<i>i</i> 5.40345	−0.41147552	−0.02073996
<i>P</i>	3.18	<i>H</i> 14.2	<i>G</i> 0.15	<i>U</i> 2

Residuals in seconds of arc

1979 09 22	095	0.6−	1.7+	1998 07 16	699	0.5−	0.1−	1999 10 22	704	0.3+	0.8−
1985 05 13	675	(6.6−	1.4−)	1998 07 16	699	0.5−	0.2+	1999 10 22	704	1.3+	0.4+
1985 05 14	675	0.5+	1.1+	1998 07 16	699	0.3−	0.0	1999 11 15	557	0.1−	0.1−
1996 12 04	691	0.4−	0.1−	1998 07 24	566	1.0−	0.6−	1999 11 15	557	0.1−	0.3+
1996 12 04	691	0.7−	0.3−	1998 07 24	566	0.7−	0.4−	1999 11 15	557	0.1+	0.3+
1996 12 04	691	0.0	0.4−	1998 07 24	566	0.9−	0.5−	1999 11 15	557	0.0	0.5+
1996 12 09	691	0.3+	0.2−	1998 08 17	704	0.9+	1.0+	1999 11 16	557	0.1+	0.5+
1996 12 09	691	0.3+	0.3−	1998 08 17	704	1.6+	0.8−	1999 11 16	557	0.1−	0.6+
1996 12 09	691	0.2+	0.9−	1998 08 17	704	1.5+	1.5−	1999 11 16	704	0.2+	0.3+
1996 12 14	691	0.5−	0.0	1998 08 17	704	0.7+	0.4−	1999 11 16	704	0.1+	1.0+
1996 12 14	691	0.1−	0.2−	1998 08 17	704	0.4+	0.8−	1999 11 16	704	0.7+	0.5+
1996 12 14	691	0.0	0.3−	1998 08 23	689	0.6−	0.2+	1999 11 16	704	0.3−	0.2+
1998 06 29	704	0.4+	1.9+	1998 12 08	704	(2.2−	0.3−)	1999 11 16	704	0.1+	0.3+
1998 06 29	704	0.1−	0.6+	1998 12 08	704	0.6−	0.3+	1999 11 19	557	0.0	0.8+
1998 06 29	704	(1.2−	2.9+)	1998 12 08	704	1.3+	0.2−	1999 11 19	557	0.6−	0.7+
1998 06 29	704	(2.5−	0.0)	1998 12 08	704	1.5−	1.2−	1999 11 19	557	0.1−	0.0
1998 07 02	699	0.0	0.5+	1998 12 08	704	0.0	0.3−	1999 11 19	557	0.4−	0.0
1998 07 02	699	0.2−	0.9+	1999 10 22	704	0.1−	0.0	1999 11 19	557	0.1−	0.1+
1998 07 02	699	0.3−	0.4+	1999 10 22	704	0.2−	0.6+	1999 11 19	557	0.2+	0.5+

(12448)* 1996 XW₁₈ = 1995 QD₁₀

Discovered 1996 Dec. 12 at Klet.

Id. S. Nakano (*MPC* 28872)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

			Nakano		
<i>M</i>	77.46659	(2000.0)	P	Q	
<i>n</i>	0.28320364	ω 192.20829	+0.60867830	+0.78395654	
<i>a</i>	2.2965196	Ω 115.41255	-0.71609654	+0.60910679	
<i>e</i>	0.1315977	<i>i</i> 7.77281	-0.34163793	+0.12000444	
<i>P</i>	3.48	<i>H</i> 14.3	<i>G</i> 0.15	<i>U</i> 1	

Residuals in seconds of arc

1995 08 21	372	0.6-	1.6-	1997 02 09	046	0.1+	0.6+	1998 06 17	046	0.2-	0.1-
1995 08 21	372	1.0-	1.9+	1997 02 10	046	0.4+	0.6+	1998 06 17	046	0.1-	0.0
1995 08 22	372	0.1-	1.2-	1997 02 10	046	0.0	0.7+	1998 06 17	046	0.3-	0.0
1995 08 22	372	1.8+	1.3+	1997 02 10	046	0.1+	0.5+	1998 06 24	704	0.1+	0.6+
1995 08 31	372	(5.1-	2.5-)	1998 03 31	046	0.8-	0.1+	1998 06 24	704	1.4-	0.1+
1995 08 31	372	0.6-	0.3+	1998 03 31	046	0.9-	0.1+	1998 06 24	704	0.6-	0.2+
1996 12 12	046	0.3+	0.0	1998 03 31	046	0.8-	0.2+	1998 06 24	704	0.1+	0.1-
1996 12 12	046	0.1-	0.1+	1998 04 07	046	0.8-	0.1+	1998 06 24	704	0.1+	0.2-
1996 12 12	046	0.3-	0.1+	1998 04 07	046	0.6-	0.2+	1998 08 11	046	0.8+	0.4+
1996 12 12	046	0.3+	0.1+	1998 04 07	046	1.0-	0.3+	1998 08 11	046	0.3-	1.3-
1996 12 12	046	0.1+	0.1-	1998 05 08	046	0.3-	0.3+	1998 08 11	046	0.1+	0.2-
1996 12 13	046	0.6-	0.3-	1998 05 08	046	0.2-	0.3+	1998 08 14	046	0.3-	0.2+
1996 12 13	046	0.5-	0.1-	1998 05 08	046	0.4-	0.4+	1998 08 14	046	0.2+	1.3-
1996 12 13	046	0.1-	0.2+	1998 05 09	046	0.0	0.7+	1998 08 14	046	0.1+	0.9-
1996 12 13	046	0.4-	0.1+	1998 05 09	046	0.3-	1.4+	1998 08 14	046	0.5-	0.4+
1996 12 13	046	0.2-	0.1+	1998 05 09	046	0.0	0.1+	1998 10 07	120	0.2+	0.4+
1996 12 17	046	0.6-	0.4-	1998 05 23	704	0.7+	0.4+	1999 10 07	120	(2.3+	0.2-)
1996 12 17	046	0.7-	0.2-	1998 05 23	704	0.3+	0.4-	1999 10 08	120	1.7+	0.7-
1996 12 17	046	0.4-	0.4-	1998 05 23	704	1.0+	0.1-	1999 10 08	120	0.2+	0.5+
1996 12 22	046	0.1-	0.1+	1998 05 23	704	(2.0+	2.8+)	1999 11 01	046	0.0	0.3+
1996 12 22	046	0.2+	0.1+	1998 05 23	704	0.3+	1.3-	1999 11 01	046	0.0	0.4+
1996 12 22	046	0.6-	0.1+	1998 05 26	704	0.5+	0.2-	1999 11 01	046	0.2-	0.5+
1997 01 02	411	0.1+	0.3-	1998 05 26	704	0.2+	0.1+	1999 11 02	046	0.1-	0.3+
1997 01 02	411	0.7+	0.5-	1998 05 26	704	0.1-	0.3-	1999 11 02	046	0.1+	0.2+
1997 01 03	411	0.5-	1.8-	1998 05 26	704	0.3+	0.1-	1999 11 02	046	0.1-	0.2+
1997 01 03	411	0.4+	1.4-	1998 05 28	046	0.4+	0.1+	1999 11 04	704	0.1+	0.2-
1997 01 08	046	0.3+	0.1-	1998 05 28	046	0.5+	0.2+	1999 11 04	704	0.2+	0.6-
1997 01 08	046	0.2+	0.0	1998 05 28	046	0.6+	0.1+	1999 11 04	704	0.4+	0.4-
1997 01 08	046	0.3+	0.2-	1998 05 28	046	0.5+	0.1-	1999 11 04	704	0.0	0.4-
1997 01 12	046	0.4+	0.2+	1998 05 28	046	0.4+	0.0	1999 11 04	704	0.0	0.2-
1997 01 13	046	0.4+	0.0	1998 05 28	046	0.4+	0.1-	1999 11 16	703	1.5-	0.1+
1997 01 13	046	0.4+	0.3+	1998 06 16	046	0.3+	0.2-	1999 11 16	703	0.7-	0.4+
1997 02 09	046	0.3+	0.4+	1998 06 16	046	0.2-	0.1+	1999 11 16	703	0.2+	0.0
1997 02 09	046	0.2+	0.5+	1998 06 16	046	0.2+	0.2-	1999 11 16	703	0.5-	0.5+

(12449)* 1996 XL₃₁ = 1983 CB₅ = 1989 YK₃

Discovered 1996 Dec. 14 by T. Kobayashi at Oizumi.

Id. S. Nakano (*MPC* 28875)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

			Nakano		
<i>M</i>	169.55873	(2000.0)	P	Q	
<i>n</i>	0.27682494	ω 74.08613	-0.82261976	+0.56685920	
<i>a</i>	2.3316637	Ω 140.41590	-0.54467235	-0.76322432	
<i>e</i>	0.1060450	<i>i</i> 3.99149	-0.16318321	-0.31009560	
<i>P</i>	3.56	<i>H</i> 13.9	<i>G</i> 0.15	<i>U</i> 1	

Residuals in seconds of arc

1983 02 14	381	0.3-	0.1+	1998 06 26	704	0.7-	0.0	1999 10 15	704	0.2-	0.2-
1989 12 30	413	0.6+	0.2-	1998 06 26	704	0.8+	0.6-	1999 10 15	704	0.9+	0.5-
1989 12 30	413	0.0	0.0	1998 06 26	704	(2.8+	1.4-)	1999 10 15	704	0.0	0.6-
1989 12 31	413	0.3-	0.5-	1998 07 14	104	0.4+	0.3-	1999 10 20	704	0.1+	0.3-
1989 12 31	413	0.7+	1.2+	1998 07 14	104	0.9+	0.1-	1999 10 20	704	0.4+	0.3+
1996 12 14	411	0.3+	0.5-	1998 07 14	104	0.7+	0.4-	1999 10 20	704	0.2-	0.3-
1996 12 14	411	0.2-	0.1-	1998 07 21	704	1.2+	1.1-	1999 10 20	704	0.6+	0.1-
1996 12 16	411	0.1+	0.4-	1998 07 21	704	0.0	0.9-	1999 10 20	704	0.4+	0.2+

1996 12 16	411	0.2+	0.4+	1998 07 21	704	1.1+	1.8+	1999 11 05	704	0.6+	0.3+
1996 12 29	411	0.3+	1.3-	1998 07 21	704	0.6+	0.8+	1999 11 05	704	0.1-	0.1+
1996 12 29	411	1.4-	0.6-	1999 10 08	703	0.9-	0.1+	1999 11 05	704	0.3+	0.2+
1997 01 13	411	0.3-	0.1-	1999 10 08	703	0.3-	0.4-	1999 11 05	704	0.3+	0.3+
1997 01 13	411	0.3+	0.3-	1999 10 08	703	0.3-	0.2-	1999 11 05	704	0.2+	1.2+
1998 06 24	704	0.8-	1.2-	1999 10 08	703	1.2-	0.6+	1999 11 07	704	0.2-	0.4-
1998 06 24	704	0.7-	0.7+	1999 10 10	704	0.1-	0.2-	1999 11 17	704	0.1-	0.2-
1998 06 24	704	1.2-	0.3+	1999 10 10	704	0.1-	0.1-	1999 11 17	704	0.2+	0.0
1998 06 24	704	0.3-	0.4-	1999 10 10	704	0.3-	0.2-	1999 11 17	704	0.1+	0.3+
1998 06 24	704	0.2+	0.4-	1999 10 10	704	0.3-	0.1-	1999 11 17	704	0.1+	0.0
1998 06 26	704	0.0	0.7-	1999 10 10	704	0.1+	0.1+				
1998 06 26	704	2.0-	0.1+	1999 10 15	704	0.1-	0.0				

(12450)* 1996 YD = 1984 HE₂ = 1994 ET₇

Discovered 1996 Dec. 20 by T. Kobayashi at Oizumi.

Id. S. Nakano (*MPC* 28875)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

			Nakano		
<i>M</i>	256.21870	(2000.0)	P	Q	
<i>n</i>	0.29005293	ω 86.68027	-0.64741301	-0.76155056	
<i>a</i>	2.2602226	Ω 43.71533	+0.68090991	-0.59561907	
<i>e</i>	0.0891835	<i>i</i> 2.48408	+0.34237128	-0.25549691	
<i>P</i>	3.40	<i>H</i> 13.9	<i>G</i> 0.15	<i>U</i> 1	

Residuals in seconds of arc

1984 04 29	809	1.1+	0.6+	1999 10 05	704	0.5-	0.2+	1999 10 29	703	0.2-	0.1-
1984 04 29	809	0.4+	0.6+	1999 10 05	704	0.6-	0.2+	1999 10 29	703	0.8-	0.6-
1984 05 02	809	0.7-	0.1-	1999 10 05	704	1.6-	0.4+	1999 11 04	704	0.4+	0.3-
1984 05 02	809	0.7-	0.9-	1999 10 07	691	0.0	0.7+	1999 11 04	704	0.3+	0.3-
1994 03 14	675	0.2+	0.3-	1999 10 07	691	0.0	0.6+	1999 11 04	704	0.6+	0.4-
1994 03 14	675	1.0-	0.1-	1999 10 07	691	0.0	0.5+	1999 11 04	704	0.5+	0.8-
1994 03 14	372	0.6+	0.8+	1999 10 07	704	0.0	0.1+	1999 11 04	704	0.0	0.7-
1994 03 14	372	1.0+	0.4+	1999 10 07	704	0.5-	0.7+	1999 11 05	704	0.1+	0.1+
1994 03 17	372	1.5+	2.1+	1999 10 07	704	0.7-	0.2+	1999 11 05	704	0.5+	0.1-
1994 04 03	675	0.7-	0.7-	1999 10 07	704	1.8-	1.0+	1999 11 05	704	0.6+	0.3-
1994 04 03	675	0.7-	0.9+	1999 10 10	704	0.1-	0.1+	1999 11 05	704	0.5+	0.4-
1994 04 04	675	0.0	0.9-	1999 10 10	704	0.2-	0.5+	1999 11 05	704	0.3+	1.3-
1996 12 20	411	0.0	0.7-	1999 10 10	704	0.4-	1.0+	1999 11 09	704	0.4+	0.8-
1996 12 20	411	0.4+	0.5+	1999 10 10	704	0.8-	0.5+	1999 11 09	704	0.5+	1.0-
1996 12 21	411	0.5+	0.3+	1999 10 10	704	0.2-	1.0+	1999 11 09	704	0.4+	1.0-
1996 12 21	411	0.4+	0.2-	1999 10 12	691	0.1+	0.3+	1999 11 09	704	0.2+	1.1-
1996 12 29	411	0.6-	0.3+	1999 10 12	691	0.0	0.1+	1999 11 09	704	0.2+	1.4-
1996 12 29	411	0.8-	0.1+	1999 10 12	691	0.0	0.2+	1999 11 11	703	0.3-	0.4+
1997 01 07	411	0.1+	0.6+	1999 10 15	704	0.6+	0.3-	1999 11 11	703	0.3-	0.1+
1997 01 07	411	0.4-	0.9+	1999 10 15	704	0.3-	0.0	1999 11 11	703	0.4-	0.2+
1997 01 26	411	0.3+	0.2-	1999 10 15	704	0.2+	0.4-	1999 11 11	703	0.1-	0.4+
1997 01 26	411	0.5+	0.8-	1999 10 15	704	0.5-	0.1+	1999 11 12	699	0.3-	0.2+
1999 09 30	691	0.5+	0.3+	1999 10 16	704	0.3+	0.1-	1999 11 12	699	0.6-	0.6+
1999 09 30	691	0.4+	0.0	1999 10 16	704	0.5+	0.4-	1999 11 12	699	0.1-	0.5+
1999 09 30	691	0.2+	0.4+	1999 10 16	704	0.5+	0.1-	1999 11 12	704	0.2-	0.0
1999 10 02	703	0.5-	0.6+	1999 10 16	704	0.5+	0.1-	1999 11 12	704	0.0	0.3-
1999 10 02	703	0.5-	0.7+	1999 10 16	704	0.4+	0.3+	1999 11 12	704	0.1-	0.5-
1999 10 02	703	0.0	0.1-	1999 10 21	704	0.7+	0.1+	1999 11 12	704	0.2-	0.2-
1999 10 02	703	0.4-	0.1-	1999 10 21	704	0.2+	0.2+	1999 11 12	704	0.3-	0.2-
1999 10 03	704	0.2+	1.3+	1999 10 21	704	0.5+	0.4+	1999 11 16	704	0.9+	0.5-
1999 10 03	704	0.2+	0.8+	1999 10 21	704	0.3+	0.0	1999 11 16	704	0.7+	0.6-
1999 10 03	704	0.5-	0.2-	1999 10 21	704	0.1-	0.0	1999 11 16	704	0.2+	0.8-
1999 10 03	704	0.9-	0.7+	1999 10 27	120	0.7+	1.2+	1999 11 16	704	0.7+	0.7-
1999 10 03	704	1.1-	0.1+	1999 10 27	120	0.1+	0.8+	1999 11 16	704	0.7+	0.8-
1999 10 05	704	0.1+	0.7+	1999 10 29	703	0.4-	0.1-				
1999 10 05	704	0.6-	0.6+	1999 10 29	703	0.0	0.0				

1999 NOV. 23

M.P.C. 36727

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Nakano

M	300.83993		(2000.0)	P	Q
n	0.29051599	ω	357.64762	+0.24875938	-0.96364234
a	2.2578202	Ω	77.93643	+0.89026169	+0.18782257
e	0.1210888	i	5.72380	+0.38151395	+0.19004241
P	3.39	H	14.3	G 0.15	U 1

Residuals in seconds of arc

1980 01 22	095	0.3+	0.3+	1998 05 24	704	0.4-	1.3-	1999 10 09	704	0.2+	0.2-
1989 11 26	364	0.7-	1.2+	1998 05 24	704	0.3-	0.8-	1999 10 09	704	0.1+	0.0
1989 11 26	364	0.7+	2.0-	1998 05 28	689	1.4+	0.9+	1999 10 09	704	0.0	0.1+
1989 12 01	364	0.5+	0.5+	1998 06 01	809	(3.3+ 1.4-)		1999 10 09	619	0.3+	0.4-
1989 12 01	364	0.0	2.0-	1998 06 01	809	(3.0+ 1.5-)		1999 10 09	619	0.0	0.0
1991 05 18	675	1.2-	1.3-	1998 06 01	809	(2.4+ 2.6-)		1999 10 10	619	0.0	0.7-
1996 12 20	411	0.3-	0.5-	1998 06 02	809	(1.9+ 2.5-)		1999 10 10	619	0.9+	0.2+
1996 12 20	411	0.5+	0.5-	1998 06 02	809	1.0+	2.1-	1999 11 02	703	0.1+	0.4+
1996 12 21	411	0.1+	0.5-	1998 06 02	809	1.5+	2.1-	1999 11 02	703	0.4+	0.5+
1996 12 21	411	0.2-	0.3-	1998 06 03	704	0.5-	1.5+	1999 11 02	703	0.5-	0.6+
1996 12 30	411	0.3-	0.6+	1998 06 03	704	0.4-	1.8+	1999 11 02	703	0.2-	0.5+
1996 12 30	411	0.2-	0.6+	1998 06 03	704	1.1+	2.1+	1999 11 06	704	0.3-	0.0
1997 01 07	411	0.4-	0.3+	1998 06 03	704	(0.3+ 2.3+)		1999 11 06	704	0.3-	0.3-
1997 01 07	411	0.1+	0.4+	1998 06 24	704	(2.3- 1.0-)		1999 11 06	704	0.3-	0.4-
1997 01 26	411	0.4-	0.5-	1998 06 24	704	0.9+	0.9+	1999 11 06	704	0.2-	0.2-
1997 01 26	411	0.3+	0.6-	1998 06 24	704	1.9-	0.0	1999 11 06	704	0.3-	0.5-
1998 05 22	704	(0.2+ 2.2-)		1998 06 24	704	2.0-	0.5+	1999 11 17	704	0.3+	0.0
1998 05 22	704	0.3+	1.1-	1999 10 04	703	0.1-	0.4+	1999 11 17	704	0.3+	0.3-
1998 05 22	704	0.3+	0.8+	1999 10 04	703	0.4-	0.1+	1999 11 17	704	0.4+	0.1+
1998 05 22	704	0.1+	0.4-	1999 10 04	703	0.4-	0.1+	1999 11 17	704	0.6+	0.5-
1998 05 24	704	0.5-	1.2-	1999 10 04	703	0.1+	0.1-	1999 11 17	704	0.1-	0.6-
1998 05 24	704	0.5-	1.4-	1999 10 09	704	0.0	0.1-				
1998 05 24	704	0.1-	0.9-	1999 10 09	704	0.1+	0.1-				

(12452)* 1996 YO = 1979 OA₁ = 1992 OD₆

Discovered 1996 Dec. 20 by T. Kobayashi at Oizumi.

Id. S. Nakano (*MPC* 28876)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Nakano

M	313.49291		(2000.0)	P	Q
n	0.30772247	ω	192.06600	+0.10140249	-0.99424476
a	2.1728508	Ω	252.12162	+0.91574644	+0.10686136
e	0.0901995	i	2.08151	+0.38874927	+0.00761670
P	3.20	H	15.0	G 0.15	U 2

Residuals in seconds of arc

1979 07 24	675	(6.0- 1.2-)		1996 12 30	411	0.1-	1.0+	1999 11 09	704	0.9-	0.5+
1979 07 24	413	0.6+	0.7-	1996 12 30	411	0.2+	0.7+	1999 11 09	704	0.6-	0.4-
1979 07 25	675	0.7-	0.4+	1997 01 07	411	0.0	0.5+	1999 11 09	704	0.8-	0.4-
1992 07 26	809	0.8-	1.4-	1997 01 07	411	0.1-	1.3+	1999 11 12	704	0.2+	0.4-
1992 07 26	809	0.9-	0.0	1997 01 26	411	0.2+	0.4+	1999 11 12	704	0.2-	0.0
1992 07 30	809	0.4+	0.5+	1997 01 26	411	0.5+	1.1+	1999 11 12	704	0.1-	0.0
1992 07 30	809	0.4+	1.1+	1999 10 12	704	0.4+	0.1-	1999 11 12	704	0.1-	0.1-
1992 07 30	809	0.4-	0.3+	1999 10 12	704	0.2-	0.7-	1999 11 12	704	0.1-	0.3+
1992 07 31	809	0.4+	2.1+	1999 10 12	704	0.5+	0.9-	1999 11 16	704	0.1-	0.1+
1992 07 31	809	0.3-	1.3+	1999 10 12	704	0.6+	1.2-	1999 11 16	704	0.1-	0.0
1992 07 31	809	0.5-	1.6+	1999 11 03	704	0.2+	0.1+	1999 11 16	704	0.2+	0.3-
1996 12 20	411	0.1+	0.2+	1999 11 03	704	0.2+	0.5-	1999 11 16	704	1.5+	0.8+
1996 12 20	411	0.6+	0.3+	1999 11 03	704	0.6-	0.7-	1999 11 16	704	0.2-	0.3+
1996 12 21	411	0.1-	0.1+	1999 11 09	704	0.0	0.3-				
1996 12 21	411	0.4+	0.3+	1999 11 09	704	0.0	0.4+				

(12453)* 1996 YY = 1986 QF₅

Discovered 1996 Dec. 20 by T. Kobayashi at Oizumi.

Id. S. Nakano (*MPC* 28876)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Nakano

M	119.98529		(2000.0)	P	Q		
n	0.24163668	ω	318.99671	-0.39490609	+0.90294371		
a	2.5528628	Ω	287.12150	-0.78982174	-0.42792922		
e	0.2592465	i	10.21811	-0.46928755	-0.03961359		
P	4.08	H	13.2	G	0.15	U	1

Residuals in seconds of arc

1986 08 29	095	(2.0- 2.6+)		1998 06 26	704	0.5+	0.3-	1999 10 10	411	0.3+	0.2+
1986 09 06	095	(0.8+ 3.4+)		1998 06 26	704	0.3+	0.1-	1999 10 10	411	0.1-	0.0
1986 09 08	095	0.4+	0.8-	1998 06 26	704	0.2+	1.1-	1999 10 10	411	0.2+	0.0
1992 12 24	691	0.7-	0.1+	1998 06 26	704	0.4+	1.4-	1999 10 11	411	0.8-	0.4-
1992 12 24	691	0.6+	0.0	1998 06 26	704	(0.2- 3.0-)		1999 10 11	411	0.5+	0.2-
1992 12 24	691	0.0	0.1-	1998 07 03	367	0.6+	0.1-	1999 10 14	704	0.1-	0.2-
1996 12 20	411	0.3+	0.1-	1998 07 03	367	0.6+	0.0	1999 10 14	704	0.1-	0.3-
1996 12 20	411	0.7+	0.2+	1998 07 03	367	0.9+	0.0	1999 10 14	704	0.1-	0.1-
1996 12 21	411	0.2-	0.1+	1998 07 19	952	0.1+	1.3+	1999 10 14	704	0.1-	0.2-
1996 12 21	411	0.1+	0.1-	1998 07 19	952	0.5+	2.0+	1999 10 14	704	0.0	0.1+
1996 12 30	411	0.2-	0.1-	1998 07 20	952	0.2-	2.0+	1999 10 18	411	0.4-	0.2+
1996 12 30	411	0.3-	0.1-	1998 07 20	952	0.0	0.9+	1999 10 18	411	0.2-	0.2+
1997 01 07	411	0.1-	0.4-	1998 07 21	704	1.9-	0.6-	1999 11 08	699	0.3-	0.3+
1997 01 07	411	0.4-	0.2-	1998 07 21	704	0.2-	0.3-	1999 11 08	699	0.4-	0.4+
1997 01 26	411	0.2-	0.0	1998 07 21	704	0.6-	0.3-	1999 11 08	699	0.2-	0.2-
1997 01 26	411	0.6+	0.1+	1999 10 05	704	0.8+	0.4-	1999 11 10	703	0.3-	0.6+
1998 06 24	704	0.7+	2.1-	1999 10 05	704	(2.5+ 1.0-)		1999 11 10	703	0.7-	0.2+
1998 06 24	704	0.2-	0.2+	1999 10 05	704	1.4+	0.0	1999 11 10	703	0.4-	0.4+
1998 06 24	704	0.3+	0.5-	1999 10 05	704	0.8+	0.4-	1999 11 10	703	0.2-	0.0
1998 06 24	704	1.8-	0.8+	1999 10 05	704	0.3+	0.7-				

(12454)* 1996 YO₁ = 1982 BE₁₅

Discovered 1996 Dec. 18 by the Beijing Schmidt CCD Asteroid Program at Xinglong.

Id. G. V. Williams (*MPC* 28877)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

M	163.36262		(2000.0)	P	Q		
n	0.26120552	ω	299.95659	-0.83009657	+0.55697467		
a	2.4237127	Ω	273.90265	-0.50189783	-0.76723448		
e	0.1190626	i	1.53999	-0.24297789	-0.31801017		
P	3.77	H	14.5	G	0.15	U	1

Residuals in seconds of arc

1982 01 30	675	0.4-	0.4+	1998 06 17	426	0.4-	0.8-	1999 10 21	704	0.4+	0.6-
1982 01 31	675	0.5+	0.3-	1998 06 17	426	0.5+	0.0	1999 11 04	704	0.5-	0.0
1996 12 18	327	0.7+	0.5+	1999 10 03	691	0.1+	0.1-	1999 11 04	704	1.1+	0.4-
1996 12 18	327	0.0	0.0	1999 10 03	691	0.2+	0.1-	1999 11 04	704	0.0	0.2-
1996 12 18	327	1.5+	0.0	1999 10 03	691	0.2+	0.1-	1999 11 04	704	0.3+	0.1-
1996 12 22	327	0.3-	0.1-	1999 10 06	704	0.3-	0.2-	1999 11 04	704	0.5+	0.0
1996 12 22	327	0.7+	0.0	1999 10 06	704	0.2-	0.1-	1999 11 11	703	0.2+	0.5+
1996 12 22	327	0.0	0.1+	1999 10 06	704	0.2-	0.3-	1999 11 11	703	0.4-	0.5+
1997 01 02	327	0.3+	0.4-	1999 10 06	704	0.3-	0.2+	1999 11 11	703	1.1-	0.7-
1997 01 02	327	0.7-	0.1-	1999 10 06	704	0.1-	0.1+	1999 11 11	703	1.2-	0.3+
1997 01 02	327	0.0	0.0	1999 10 10	704	1.0+	0.8-	1999 11 14	704	0.4-	0.0
1997 01 11	327	0.2-	0.2-	1999 10 10	704	0.3+	0.9+	1999 11 14	704	0.0	0.7+
1997 01 11	327	0.7-	0.0	1999 10 10	704	0.1-	0.3-	1999 11 14	704	0.4+	1.2+
1997 01 11	327	0.8-	0.2-	1999 10 10	704	0.5-	0.1-	1999 11 14	704	1.5-	0.3-
1997 02 03	566	0.4-	0.3-	1999 10 10	704	0.2-	0.2-	1999 11 14	704	0.8-	2.0+
1997 02 03	566	0.0	0.2-	1999 10 15	704	0.9+	0.4-	1999 11 16	704	0.0	0.6-
1997 02 03	566	0.1-	0.2-	1999 10 15	704	0.0	0.1-	1999 11 16	704	0.3+	0.9-
1998 06 16	426	0.3-	0.2+	1999 10 15	704	0.5+	0.3+	1999 11 16	704	0.6+	0.3+
1998 06 16	426	0.0	0.1+	1999 10 21	704	0.3-	0.6-	1999 11 16	704	0.2-	0.6-
1998 06 17	426	0.2+	0.3+	1999 10 21	704	0.5+	0.1+				
1998 06 17	426	0.1+	0.6-	1999 10 21	704	0.8+	0.2+				

Id. K. Ichikawa (*MPC* 29120)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	124.30173		(2000.0)	P		Q	
<i>n</i>	0.26317565	ω	323.83717	-0.23610949		+0.97114439	
<i>a</i>	2.4116017	Ω	292.48449	-0.88278112		-0.22883336	
<i>e</i>	0.1404320	<i>i</i>	2.08575	-0.40614013		-0.06718529	
<i>P</i>	3.75	<i>H</i>	14.6	<i>G</i>	0.15	<i>U</i>	1

Residuals in seconds of arc

1987 08 22	809	0.2+	0.5+	1997 01 07	721	0.5-	0.5-	1999 10 12	704	0.6-	0.6+
1987 08 22	809	0.5+	0.9+	1997 01 07	721	0.2+	0.5-	1999 10 12	704	0.9+	0.2-
1987 08 22	809	(4.0+	0.6+)	1997 01 09	411	0.8-	0.3-	1999 10 12	704	0.4-	0.0
1991 09 15	691	0.1+	0.6-	1997 01 09	411	0.9+	0.6-	1999 10 12	704	0.6-	0.4-
1991 09 15	691	0.2+	0.4-	1997 01 14	411	0.9+	0.5+	1999 10 22	704	1.0-	0.6-
1991 09 15	691	0.2+	0.4-	1997 01 14	411	0.7+	0.4+	1999 10 22	704	0.1-	0.5+
1994 05 03	474	0.8-	0.6-	1997 01 26	411	0.4+	0.8+	1999 10 22	704	0.8-	0.2+
1994 05 03	474	1.5-	1.1+	1997 01 26	411	1.8+	1.4+	1999 10 22	704	1.4-	0.5-
1994 05 04	474	0.9-	1.4+	1997 02 04	691	0.0	0.8-	1999 11 14	704	0.3+	0.3+
1994 05 04	474	0.1-	0.7+	1997 02 04	691	0.1-	0.2-	1999 11 14	704	0.7-	0.8+
1997 01 02	411	0.6-	0.3+	1997 02 04	691	0.0	0.5-	1999 11 14	704	0.2-	0.7+
1997 01 02	411	0.0	1.2-	1997 02 09	691	0.6+	0.0	1999 11 14	704	0.2-	0.0
1997 01 03	411	1.7-	0.1-	1997 02 09	691	1.0+	0.1-	1999 11 14	704	0.5-	0.2+
1997 01 03	411	0.1-	0.6+	1997 02 09	691	0.9+	0.0	1999 11 16	704	0.6+	0.5+
1997 01 06	721	1.2-	0.3+	1998 06 26	704	1.3+	0.1+	1999 11 16	704	0.2+	0.1-
1997 01 06	721	0.7+	0.7-	1998 06 26	704	1.1-	0.1+	1999 11 16	704	0.5+	0.1+
1997 01 06	721	0.2+	0.2-	1998 06 26	704	1.1+	0.2+	1999 11 16	704	0.6-	0.1-
1997 01 06	721	(2.3-	0.6-)	1998 06 26	704	0.9+	0.1+	1999 11 16	704	0.4-	0.5+
1997 01 07	721	0.8+	0.3-	1998 06 26	704	0.3+	0.0				

(12456)* 1997 AC₁ = 1998 KE₈

Discovered 1997 Jan. 2 by N. Sato at Chichibu.

Id. E. Bowell (*MPC* 31982)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	55.41564		(2000.0)	P		Q	
<i>n</i>	0.25305336	ω	260.94044	+0.53321002		+0.84548489	
<i>a</i>	2.4754908	Ω	41.32486	-0.75788615		+0.49264669	
<i>e</i>	0.0820269	<i>i</i>	2.51918	-0.37589316		+0.20604500	
<i>P</i>	3.89	<i>H</i>	14.6	<i>G</i>	0.15	<i>U</i>	1

Residuals in seconds of arc

1994 05 02	691	0.1-	0.2+	1998 05 24	704	0.1+	1.1-	1999 10 19	704	0.5+	0.1+
1994 05 02	691	0.3+	0.4+	1998 05 24	704	(0.3-	2.4-)	1999 10 19	704	0.1-	0.8+
1997 01 02	369	1.6-	0.1-	1998 05 25	699	0.7+	0.2+	1999 10 19	704	0.1-	0.6+
1997 01 02	369	0.7+	0.5-	1998 05 25	699	0.2+	0.2-	1999 10 19	704	0.2+	0.6+
1997 01 03	369	1.1-	0.5+	1998 05 25	699	0.4+	0.1+	1999 11 01	703	0.3-	0.5-
1997 01 03	369	0.0	0.4+	1999 10 02	703	0.4-	0.4+	1999 11 01	703	0.6-	0.0
1997 01 06	369	0.2+	0.6-	1999 10 02	703	0.2-	0.2+	1999 11 01	703	1.3-	0.1-
1997 01 06	369	0.2-	1.6+	1999 10 02	703	0.3-	0.3-	1999 11 01	703	0.6+	0.6+
1997 01 06	369	0.9-	1.6+	1999 10 02	703	0.8-	0.5-	1999 11 05	704	0.5-	0.3-
1997 01 09	369	0.1+	0.9-	1999 10 04	704	0.1+	0.3-	1999 11 05	704	0.1+	0.7+
1997 01 09	369	0.2+	0.4+	1999 10 04	704	0.2+	0.5+	1999 11 05	704	0.6-	0.2-
1997 01 15	369	0.2+	0.4-	1999 10 04	704	0.6+	0.3-	1999 11 05	704	0.5+	0.7-
1997 01 15	369	0.2-	0.7+	1999 10 04	704	0.3-	0.4+	1999 11 05	704	1.0-	0.7-
1997 01 30	369	0.6-	0.2+	1999 10 05	704	0.0	0.0	1999 11 06	704	0.4+	0.1-
1997 02 01	369	0.3-	0.3-	1999 10 05	704	0.3+	0.4+	1999 11 06	704	0.4-	0.3-
1997 02 01	369	0.6+	0.2-	1999 10 05	704	0.2-	0.1+	1999 11 06	704	0.3+	0.3-
1997 02 04	566	1.2+	0.3-	1999 10 05	704	0.0	0.4+	1999 11 06	704	0.5-	0.5-
1997 02 04	566	0.3-	0.3-	1999 10 05	704	0.2+	0.4+	1999 11 06	704	0.2+	0.5-
1997 02 04	566	0.3+	0.3-	1999 10 09	704	0.3+	0.2+	1999 11 09	704	0.3+	0.4+
1997 02 09	369	0.0	0.1+	1999 10 09	704	0.0	0.1-	1999 11 09	704	0.3+	0.3+
1997 02 09	369	0.7+	0.5-	1999 10 09	704	0.3-	0.5-	1999 11 09	704	0.4+	0.4+
1997 03 01	369	0.1+	0.6-	1999 10 09	704	0.2-	0.5-	1999 11 09	704	0.1+	0.2+
1997 03 01	369	1.4+	0.2+	1999 10 09	704	0.1+	0.1-	1999 11 09	704	0.0	0.3+
1998 05 22	704	1.5+	0.3-	1999 10 15	704	1.0+	0.1-	1999 11 12	704	(3.0-	0.8-)
1998 05 22	704	0.6-	1.0+	1999 10 15	704	0.7+	0.2-	1999 11 12	704	0.1-	0.6-

1998 05 22	704	(0.5-	2.8-)	1999 10 15	704	0.6+	0.2-	1999 11 12	704	0.5-	0.1+
1998 05 22	704	1.4-	0.1-	1999 10 15	704	0.3+	0.4-	1999 11 12	704	0.1+	0.1+
1998 05 23	699	0.5-	0.4+	1999 10 15	704	0.5+	0.1+	1999 11 16	704	0.5-	0.5+
1998 05 23	699	0.5+	0.5+	1999 10 16	120	0.9+	0.0	1999 11 16	704	0.4-	0.7-
1998 05 23	699	0.2+	0.4+	1999 10 16	120	(5.3+	0.8-)	1999 11 16	704	0.4-	0.4-
1998 05 24	704	0.4-	0.1-	1999 10 17	120	0.3-	0.8+	1999 11 16	704	0.3+	0.0
1998 05 24	704	0.5-	0.5-	1999 10 17	120	0.2+	0.3+				
1998 05 24	704	0.3-	0.0	1999 10 19	704	0.3-	0.2+				

(12457)* 1997 AK₁ = 1989 YG₈ = 1989 YJ₈ = 1991 LG₂

Discovered 1997 Jan. 2 by T. Kobayashi at Oizumi.

Id. S. Nakano (*MPC* 28878), H. Kaneda (d, *MPC* 16879)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	279.77148		(2000.0)	P		Q	
<i>n</i>	0.28694217	ω	14.81445	-0.23893583		-0.96645847	
<i>a</i>	2.2765287	Ω	89.07635	+0.88105465		-0.25654309	
<i>e</i>	0.0800553	<i>i</i>	5.40416	+0.40823079		-0.01198604	
<i>P</i>	3.43	<i>H</i>	14.0	<i>G</i>	0.15	<i>U</i>	1

Residuals in seconds of arc

1989 12 28	511	1.8+	0.9-	1997 01 14	411	0.0	0.2+	1999 10 19	704	0.6-	0.2-
1989 12 28	511	(1.8+	2.3-)	1997 01 14	411	0.2+	0.1+	1999 10 30	703	0.1+	0.3+
1989 12 29	511	0.3+	0.4+	1997 01 26	411	0.4+	0.4-	1999 10 30	703	0.3-	0.2-
1989 12 29	511	1.4+	0.8-	1997 01 26	411	0.6+	0.2-	1999 10 30	703	0.5-	0.1-
1989 12 29	511	1.3+	0.5-	1998 06 03	704	0.2+	0.3-	1999 10 30	703	0.1-	0.1+
1990 01 03	511	0.5-	0.1+	1998 06 03	704	1.2+	1.2-	1999 11 05	704	0.2+	0.3-
1990 01 03	511	0.7+	0.3+	1998 06 03	704	0.4-	1.2-	1999 11 05	704	0.1+	0.2-
1990 01 04	511	1.2-	0.4-	1999 10 02	703	0.0	0.1+	1999 11 05	704	0.2+	0.2-
1990 01 04	511	(2.9+	0.0)	1999 10 02	703	0.8-	0.1+	1999 11 05	704	0.2+	0.1-
1991 06 06	809	1.1+	0.9+	1999 10 02	703	(3.4-	0.2+)	1999 11 05	704	0.3-	0.0
1991 06 06	809	0.5+	1.7+	1999 10 02	703	1.8-	1.3+	1999 11 06	704	0.2+	0.2+
1991 06 06	809	1.1-	2.1+	1999 10 07	704	0.6+	0.3+	1999 11 06	704	0.1+	0.0
1991 06 08	809	0.0	0.3-	1999 10 07	704	0.2-	0.0	1999 11 06	704	0.1+	0.1-
1991 06 08	809	0.1-	0.3-	1999 10 07	704	0.1-	0.4-	1999 11 06	704	0.5+	0.1-
1991 06 08	809	0.7-	0.1-	1999 10 07	704	0.2-	1.0-	1999 11 06	704	0.3-	0.3+
1996 12 14	691	0.3-	0.1+	1999 10 09	704	0.5+	0.4-	1999 11 14	699	0.4-	0.1+
1996 12 14	691	0.2-	0.1+	1999 10 09	704	0.2+	0.7-	1999 11 14	699	0.0	0.3+
1996 12 14	691	0.2-	0.1+	1999 10 09	704	0.4-	0.0	1999 11 14	699	0.2-	0.3+
1997 01 02	411	0.9-	0.2+	1999 10 09	704	0.0	0.3-	1999 11 17	704	0.9+	0.5+
1997 01 02	411	0.4-	0.5+	1999 10 09	704	0.1-	0.6-	1999 11 17	704	0.6+	0.9+
1997 01 03	411	0.2+	0.2+	1999 10 19	704	0.3-	0.2+	1999 11 17	704	0.5+	0.3+
1997 01 03	411	0.3-	0.4+	1999 10 19	704	0.3+	0.1+	1999 11 17	704	0.5+	0.8+
1997 01 07	411	0.3+	0.4+	1999 10 19	704	0.1-	0.2-	1999 11 17	704	0.0	0.2+
1997 01 07	411	0.5+	0.3+	1999 10 19	704	0.5-	0.4+				

(12458)* 1997 AR₁ = 1998 MR₃₁

Discovered 1997 Jan. 2 by T. Kobayashi at Oizumi.

Id. G. V. Williams (*MPC* 32248)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	130.15211		(2000.0)	P		Q	
<i>n</i>	0.26358006	ω	175.59276	-0.27214433		+0.96054072	
<i>a</i>	2.4091343	Ω	78.60763	-0.88463433		-0.22625852	
<i>e</i>	0.1699612	<i>i</i>	3.35895	-0.37862853		-0.16176714	
<i>P</i>	3.74	<i>H</i>	14.2	<i>G</i>	0.15	<i>U</i>	1

Residuals in seconds of arc

1991 10 01	691	0.3-	0.3+	1998 06 2

(12462)* 1997 AO₅ = 1991 RD₃₇ = 1998 HH₇₂
 Discovered 1997 Jan. 7 by T. Kobayashi at Oizumi.
 Id. S. Nakano (*MPC* 32472), T. Kobayashi (*ibid.*)
 Epoch 1999 Aug. 10.0 TT = JDT 2451400.5 Nakano

<i>M</i>	322.98390		(2000.0)		P		Q
<i>n</i>	0.24550171	<i>ω</i>	295.55743		+0.97044429		−0.22065394
<i>a</i>	2.5259982	<i>Ω</i>	77.31439		+0.24124815		+0.87679984
<i>e</i>	0.1994428	<i>i</i>	5.74883		+0.00609965		+0.42723984
<i>P</i>	4.01	<i>H</i>	13.4		<i>G</i> 0.15		<i>U</i> 1

Residuals in seconds of arc

1991 09 15	675	0.4+	1.2−	1998 04 21	704	1.0−	0.0	1999 07 14	704	0.6+	0.3−
1991 09 15	675	0.3+	1.3−	1998 04 21	704	1.0−	0.4−	1999 07 14	704	0.6+	0.2−
1997 01 07	411	0.3+	0.0	1998 04 21	704	0.0	1.3−	1999 07 14	704	0.5+	0.2−
1997 01 07	411	0.6−	0.5−	1998 04 21	704	0.3−	0.4−	1999 07 14	704	0.1+	1.0−
1997 01 08	411	0.3−	0.2+	1998 04 22	704	0.1−	0.4+	1999 09 11	704	0.2−	0.3+
1997 01 08	411	0.5−	0.1−	1998 04 22	704	1.0−	0.2−	1999 09 11	704	0.1−	0.6+

1997 01 09	691	0.4+	0.3-	1998 04 22	704	0.3+	0.1-	1999 09 11	704	0.5-	0.4+
1997 01 09	691	0.6+	0.5-	1998 04 22	704	0.0	0.2+	1999 09 11	704	0.5-	0.5+
1997 01 09	691	0.4+	0.5-	1998 04 22	704	0.2+	0.8-	1999 09 11	704	0.9-	0.8+
1997 01 13	411	1.5-	0.0	1998 05 16	704	2.1+	1.6+	1999 11 10	704	0.0	0.1-
1997 01 13	411	0.1-	0.6+	1998 05 16	704	1.2+	0.5-	1999 11 10	704	0.5+	0.6-
1997 01 28	411	0.4+	0.4-	1998 05 16	704	(0.5+	2.3+)	1999 11 10	704	0.2-	0.4-
1997 01 28	411	0.4+	0.0	1998 05 16	704	0.4-	0.4+	1999 11 10	704	0.3+	0.5+
1998 04 21	704	0.1-	0.4+	1999 07 14	704	0.1-	0.4+				

(12463)* 1997 AL₇ = 1991 RV₂₄

Discovered 1997 Jan. 9 by T. Kobayashi at Oizumi.

Id. S. Nakano (*MPC* 29123)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

		Williams					
<i>M</i>	126.49232	(2000.0)		P		Q	
<i>n</i>	0.26742161	ω	109.53894	-0.18844071		+0.98136765	
<i>a</i>	2.3860070	Ω	149.52285	-0.92650219		-0.16497601	
<i>e</i>	0.0842078	<i>i</i>	4.24219	-0.32570507		-0.09849090	
<i>P</i>	3.69	<i>H</i>	13.7	<i>G</i>	0.15	<i>U</i>	1

Residuals in seconds of arc

1991 09 10	675	1.0+	0.1+	1997 01 27	327	0.7-	0.1+	1999 10 10	704	0.9-	0.6-
1991 09 10	675	0.1+	0.9+	1997 02 04	566	0.1+	0.1-	1999 10 15	704	0.1-	0.1+
1991 09 14	675	0.7-	2.0-	1997 02 04	566	0.2+	0.3+	1999 10 15	704	0.5+	0.6+
1991 09 14	675	0.1-	0.2-	1997 02 04	566	0.3+	0.1+	1999 10 15	704	0.9+	0.4-
1997 01 09	411	0.1+	0.4+	1997 02 16	411	0.8-	0.6+	1999 10 15	704	0.1-	0.0
1997 01 09	411	0.9+	0.7-	1997 02 16	411	0.3-	0.0	1999 10 20	704	0.2-	0.9+
1997 01 10	691	0.6+	0.5-	1997 02 16	411	0.3-	0.1-	1999 10 20	704	0.3+	1.0+
1997 01 10	691	0.7+	0.5-	1998 06 24	704	0.3-	0.7-	1999 10 20	704	0.6+	0.6-
1997 01 10	691	0.6+	0.6-	1998 06 24	704	(0.2-	3.0-)	1999 10 20	704	0.2+	0.5+
1997 01 10	411	0.9+	0.5-	1998 06 24	704	0.2-	0.8-	1999 10 20	704	0.1-	0.2-
1997 01 10	411	0.6-	0.5-	1998 06 24	704	0.2+	0.4-	1999 11 04	704	0.4-	0.0
1997 01 13	411	0.2-	0.1+	1998 06 26	704	0.4+	1.1+	1999 11 04	704	0.3-	0.1+
1997 01 13	411	0.1-	0.2-	1998 06 26	704	(2.4+	0.5-)	1999 11 04	704	0.5-	0.4+
1997 01 16	691	(2.1-	0.5-)	1998 06 26	704	0.1+	0.5-	1999 11 04	704	0.7-	0.5+
1997 01 16	691	(2.5-	0.5-)	1998 06 26	704	0.6-	0.3+	1999 11 04	704	0.1-	0.8+
1997 01 16	691	(2.4-	0.2-)	1998 06 26	704	0.5+	0.5-	1999 11 17	704	0.0	0.5-
1997 01 27	411	0.3-	0.2-	1999 10 10	704	0.9+	0.4+	1999 11 17	704	0.2-	0.3-
1997 01 27	411	0.3-	0.0	1999 10 10	704	0.2+	0.2-	1999 11 17	704	0.5-	0.5-
1997 01 27	327	0.1-	0.2-	1999 10 10	704	1.1+	1.0-	1999 11 17	704	0.3-	0.1+
1997 01 27	327	1.3-	0.3-	1999 10 10	704	0.7+	1.2-	1999 11 17	704	0.3-	0.2-

(12464)* 1997 AH₈ = 1989 YE₉

Discovered 1997 Jan. 2 by Spacewatch at Kitt Peak.

Id. A. Gnädig (*MPC* 34871)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

		Williams					
<i>M</i>	280.59479	(2000.0)		P		Q	
<i>n</i>	0.28324025	ω	336.33318	-0.34096308		-0.93547375	
<i>a</i>	2.2963217	Ω	133.45636	+0.88165243		-0.35250702	
<i>e</i>	0.0586245	<i>i</i>	7.35397	+0.32624098		-0.02505308	
<i>P</i>	3.48	<i>H</i>	14.4	<i>G</i>	0.15	<i>U</i>	1

Residuals in seconds of arc

1989 11 07	675	1.1+	0.5+	1997 04 01	704	0.2-	0.8+	1999 10 19	704	0.2+	0.5+
1989 11 07	675	2.0-	0.2-	1997 04 01	704	0.6+	0.3+	1999 10 19	704	0.1+	0.1+
1989 12 07	675	0.4-	0.1+	1997 04 01	704	1.3+	0.5+	1999 10 31	703	0.3-	0.3-
1989 12 07	675	1.3+	0.4-	1997 04 01	704	1.4+	0.1+	1999 10 31	703	0.1+	0.7+
1989 12 31	413	0.8-	0.8+	1999 10 08	703	0.5-	0.7+	1999 10 31	703	0.4-	0.4+
1989 12 31	413	1.1+	0.1+	1999 10 08	703	0.0	0.1+	1999 10 31	703	0.1-	0.3-
1994 03 09	413	0.3-	0.7-	1999 10 08	703	0.1-	0.5+	1999 11 05	704	0.0	0.5-
1994 03 09	413	0.4-	0.0	1999 10 08	703	0.2-	0.2+	1999 11 05	704	0.1-	0.2-
1997 01 02	691	1.3-	0.3-	1999 10 09	704	0.7+	0.1+	1999 11 05	704	0.6+	0.9-
1997 01 02	691	1.3-	0.2-	1999 10 09	704	0.4+	0.3-	1999 11 05	704	0.7-	0.4-
1997 01 02	691	1.0-	0.3-	1999 10 09	704	0.7+	0.5-	1999 11 05	704	0.1+	0.7-
1997 01 10	691	(0.9-	6.8-)	1999 10 09	704	0.4+	0.8-	1999 11 13	699	0.3-	0.0
1997 01 10	691	0.6-	0.4-	1999 10 09	704	0.4-	0.6-	1999 11 13	699	0.0	0.7+

1997 01 10	691	0.5-	0.6-	1999 10 19	704	0.2+	0.2+	1999 11 13	699	0.1-	0.3+
1997 03 31	704	1.3+	0.2+	1999 10 19	704	0.0	0.5+				
1997 03 31	704	1.1+	0.1+	1999 10 19	704	0.2-	0.6+				

(12465)* 1997 AD₁₀ = 1950 PF = 1991 NN₇

Discovered 1997 Jan. 3 by Spacewatch at Kitt Peak.

Id. K. Ichikawa (*MPC* 29123)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

		Williams					
<i>M</i>	29.42358	(2000.0)		P		Q	
<i>n</i>	0.26374612	ω	191.93109	+0.92157315		+0.38602771	
<i>a</i>	2.4081230	Ω	145.27131	-0.34998220		+0.87193644	
<i>e</i>	0.1996143	<i>i</i>	4.13265	-0.16797438		+0.30118009	
<i>P</i>	3.74	<i>H</i>	14.8	<i>G</i>	0.15	<i>U</i>	1

Residuals in seconds of arc

1950 08 12	760	1.9-	0.6-	1998 04 21	704	0.6-	0.9-	1999 10 08	703	0.4+	0.3-
1950 08 12	760	2.0+	1.0+	1998 04 21	704	0.3+	0.3-	1999 10 08	703	0.6-	0.0
1991 07 12	809	0.7-	0.3+	1998 04 21	704	0.2+	0.2+	1999 10 10	704	0.6+	0.4+
1991 07 12	809	0.3-	0.2+	1998 04 21	704	0.5+	0.1-	1999 10 10	704	0.4+	0.1+
1991 07 12	809	0.3-	0.1+	1998 04 22	704	1.0-	0.4-	1999 10 10	704	0.0	0.2+
1991 07 16	809	(2.2+	0.2-)	1998 04 22	704	0.1+	0.3+	1999 10 10	704	0.3-	0.0
1991 07 16	809	(2.9+	0.3-)	1998 04 22	704	2.0+	0.5+	1999 10 10	704	0.2-	0.2-
1991 07 16	809	(3.2+	0.2-)	1998 04 22	704	0.6-	0.1-	1999 10 20	704	0.0	0.6+
1997 01 03	691	0.2-	0.2+	1998 05 01	704	0.5-	0.2-	1999 10 20	704	0.0	0.1+
1997 01 03	691	0.1-	0.7-	1998 05 01	704	0.3-	1.1-	1999 10 20	704	0.3+	0.7+
1997 01 03	691	0.1+	0.1+	1998 05 01	704	0.5-	0.6+	1999 10 20	704	0.1-	0.3+
1997 01 10	691	0.0	0.1+	1998 05 01	704	1.2-	0.5-	1999 10 20	704	0.2-	0.5-
1997 01 10	691	0.2-	0.1+	1998 05 22	704	1.8+	0.7+	1999 11 04	704	0.1+	0.2-
1997 01 10	691	0.1-	0.1-	1998 05 22	704	(3.4-	1.6+)	1999 11 04	704	0.2-	0.2+
1997 01 17	691	0.3-	0.3-	1998 05 22	704	(2.0-	1.1-)	1999 11 04	704	0.3+	0.1-
1997 01 17	691	0.3-	0.1+	1998 05 22	704	(0.5-	2.2+)	1999 11 04	704	0.3-	0.2-
1997 01 17	691	0.3-	0.0	1998 05 24	704	0.3-	0.6+	1999 11 04	704	0.1+	0.2-
1997 02 12	327	0.4-	0.7+	1998 05 24	704	0.3+	1.5-	1999 11 17	704	0.1+	0.4-
1997 02 12	327	0.4-	0.6+	1998 05 24	704	0.3-	0.7-	1999 11 17	704	0.6+	0.4-
1997 02 12	327	0.3+	0.9+	1998 05 24	704	1.3+	0.1-	1999 11 17	704	0.6+	0.4-
1997 02 12	327	0.4+	0.6+	1999 10 08	703	0.5-	0.5+	1999 11 17	704	0.1-	0.2-
1998 04 21	704	0.1+	0.8+	1999 10 08	703	0.6-	0.3-	1999 11 17	704	0.7+	0.3-

(12466)* 1997 AS₁₂ = 1987 SA₈ = 1998 KS₄₂

Discovered 1997 Jan. 10 by T. Kobayashi at Oizumi.

Id. E. Bowell (*MPC* 31984), G. V. Williams (*ibid.*)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

		Williams					
<i>M</i>	150.07908	(2000.0)		P		Q	
<i>n</i>	0.25806054	ω	127.24984	-0.56600055		+0.80906677	
<i>a</i>	2.4433648	Ω	107.54319	-0.79916001		-0.49131053	
<i>e</i>	0.1754277	<i>i</i>	9.55572	-0.20245161		-0.32252895	
<i>P</i>	3.82	<i>H</i>	13.7	<i>G</i>	0.15	<i>U</i>	1

Residuals in seconds of arc

1987 09 18	010	1.1-	0.4-	1998 06 24	699	0.3+	0.3-	1999 10 09	704	1.5+	0.3+
1987 09 18	010	0.8+	1.1+	1998 06 24	699	0.9+	0.1+	1999 10 09	704	0.7+	0.3+
1997 01 10	411	0.7-	0.6+	1998 06 26	691	0.5-	0.1+	1999 10 09	704	0.6+	0.2-
1997 01 10	411	0.3+	0.9+	1998 06 26	691	0.0	0.1+	1999 10 09	704	0.3+	0.0
1997 01 11	411	0.7+	0.7+	1998 06 26	691	0.1-	0.3+	1999 10 09	704	0.4+	0.6-
1997 01 11	411	0.0	0.2-	1998 06 29	704	0.8+	0.2+	1999 10 19	704	0.1-	0.1+
1997 01 14	411	0.5+	0.4+	1998 06 29	704	0.8+	1.4+	1999 10 19	704	0.9+	0.1+
1997 01 14	411	0.2-	0.0	1998 06 29	704	(2.2-	1.8-)	1999 10 19	704	0.0	0.3+
1997 01 27	411	0.9+	0.7+	1998 06 29	704	0.1-	0.7+	1999 10 19	704	0.6-	0.0
1997 01 27	411	0.3+	1.0+	1998 06 29	691	0.9-	0.4+	1999 10 19	704	0.1-	0.4+
1997 02 06	566	0.6-	0.6-	1998 06 29	691	0.5-	0.5+	1999 10 31	703	1.0-	0.3+
1997 02 06	566	0.8-	0.7-	1998 06 29	691	0.7-	0.3+	1999 10 31	703	0.2-	0.2-
1997 02 06	566	0.3-	0.7-	1998 07 16	699	0.0	0.7+	1999 10 31	703	0.5-	0.1-
1997 02 07	566	0.0	0.1+	1998 07 16	699	0.4-	0.8+	1999 10 31	703	0.6-	0.7-
1997 02 07	566	0.5+	0.2+	1998 07 16	699	0.3-	0.7+	1999 11 05	704	0.9-	0.6+
1997 02 07	566	0.4+	0.2+	1998 08 17	704	0.1+	0.1-	1999 11 05	704	0.1+	0.9-

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1997 02 12	411	0.4+	0.1-	1998 08 17	704	0.2-	0.2-	1999 11 05	704	0.4-	0.8-
1997 02 12	411	0.5-	0.5+	1998 08 17	704	0.6+	1.3-	1999 11 05	704	1.3+	0.6-
1998 05 27	699	1.0-	0.1+	1998 08 17	704	0.8+	1.4-	1999 11 13	699	0.5+	0.8+
1998 05 27	699	0.9-	0.2+	1998 08 17	704	0.9+	1.1-	1999 11 13	699	0.1-	0.3-
1998 05 27	699	1.5-	0.3+	1998 08 23	704	0.2+	0.9+	1999 11 13	699	1.3-	0.3-
1998 06 02	699	0.6+	0.4+	1998 08 23	704	1.1+	0.9-	1999 11 16	703	0.3-	0.5+
1998 06 02	699	0.4+	0.4+	1998 08 23	704	(2.2+	2.4-)	1999 11 16	703	0.2+	0.7+
1998 06 02	699	0.2+	0.7+	1998 08 23	704	1.2-	0.5+	1999 11 16	703	0.4-	0.8+
1998 06 24	699	0.6+	0.0	1998 08 23	704	1.0-	1.1-	1999 11 16	703	0.7-	0.5+

(12467)* 1997 AX₁₇ = 1977 XX

Discovered 1997 Jan. 15 by T. Kobayashi at Oizumi.

Id. S. Nakano (*MPC* 29125)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

				Nakano			
<i>M</i>	74.52941		(2000.0)	P	Q		
<i>n</i>	0.31802948	ω	296.15586	+0.98453948	+0.16877182		
<i>a</i>	2.1256469	Ω	54.16249	-0.13284058	+0.89387768		
<i>e</i>	0.0428578	<i>i</i>	3.31541	-0.11417265	+0.41532970		
<i>P</i>	3.10	<i>H</i>	14.6	<i>G</i>	0.15	<i>U</i>	2

Residuals in seconds of arc

1977 12 07	675	0.2-	0.4-	1997 02 14	411	0.2-	0.5+	1999 10 12	704	0.3+	0.4+
1977 12 08	675	0.3+	0.2-	1998 07 16	699	0.0	0.1+	1999 10 22	704	0.1+	0.2+
1988 03 18	675	0.2+	1.3+	1998 07 16	699	0.3-	0.5+	1999 10 22	704	0.4+	0.8+
1988 03 18	675	0.6+	0.0	1998 07 16	699	0.4-	0.2+	1999 10 22	704	0.4+	0.3+
1997 01 15	411	0.0	1.2-	1998 08 17	704	(1.9-	3.3-)	1999 10 22	704	0.6+	0.4-
1997 01 15	411	0.8-	0.2-	1998 08 17	704	(0.5+	2.5-)	1999 11 11	703	1.0-	1.0+
1997 01 16	411	0.1+	0.1+	1998 08 17	704	0.5+	1.7+	1999 11 11	703	0.5+	1.2+
1997 01 16	411	0.5+	1.1-	1998 08 17	704	(0.1+	3.0+)	1999 11 11	703	0.4+	0.0
1997 01 28	411	0.0	0.1+	1998 08 17	699	0.3+	0.8+	1999 11 11	703	0.2+	1.6+
1997 01 28	411	0.5+	0.5+	1998 08 17	699	0.1-	0.7+	1999 11 16	704	0.0	0.3+
1997 02 02	691	0.4-	0.0	1998 08 17	699	0.6-	0.3-	1999 11 16	704	0.1-	0.9+
1997 02 02	691	0.3-	0.7+	1999 10 12	704	0.2-	0.3+	1999 11 16	704	0.1-	0.4+
1997 02 02	691	0.3-	0.1-	1999 10 12	704	0.4+	1.2-	1999 11 16	704	0.7+	0.7+
1997 02 14	411	0.0	0.2+	1999 10 12	704	0.5-	0.7-	1999 11 16	704	0.4+	0.1-

(12468)* 1997 AE₁₈ = 1988 ON

Discovered 1997 Jan. 14 by L. Šarounová at Ondřejov.

Id. G. V. Williams (*MPC* 32473)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

				Williams			
<i>M</i>	154.63076		(2000.0)	P	Q		
<i>n</i>	0.29833491	ω	311.54939	-0.20188887	+0.97554556		
<i>a</i>	2.2181964	Ω	306.59658	-0.86328896	-0.21915684		
<i>e</i>	0.1341725	<i>i</i>	6.21387	-0.46257222	-0.01676736		
<i>P</i>	3.30	<i>H</i>	14.7	<i>G</i>	0.15	<i>U</i>	1

Residuals in seconds of arc

1988 07 17	675	1.4-	0.2+	1997 03 11	557	0.4-	0.1-	1998 09 14	699	0.8-	0.0
1988 07 17	675	1.6+	0.7-	1997 04 01	557	0.4-	0.2+	1998 09 14	699	0.8-	0.1-
1997 01 14	557	0.0	0.4-	1997 04 01	557	0.1-	0.5+	1998 10 14	699	0.6+	0.4-
1997 01 14	557	0.0	0.7-	1998 08 01	557	0.3-	0.0	1998 10 14	699	0.1+	0.4-
1997 01 14	557	0.5-	0.4-	1998 08 01	557	0.2-	0.1-	1998 10 14	699	0.0	0.7+
1997 01 14	557	0.4+	0.5-	1998 08 01	557	0.3-	0.1-	1998 10 20	699	0.1+	0.9-
1997 01 14	557	0.1-	0.2+	1998 08 01	557	0.2-	0.0	1998 10 20	699	0.1+	0.8-
1997 01 15	557	0.1+	0.2-	1998 08 10	557	0.5+	0.0	1998 10 20	699	0.1+	0.4+
1997 01 15	557	0.1+	0.4-	1998 08 10	557	0.3+	0.1-	1999 10 18	557	0.2+	0.0
1997 01 17	557	0.1-	0.1-	1998 08 10	557	0.4+	0.0	1999 10 18	557	0.0	0.2-
1997 01 17	557	0.0	0.0	1998 08 17	704	0.1-	0.6-	1999 10 20	557	0.3+	0.1+
1997 02 01	557	0.1-	0.5-	1998 08 17	704	0.2-	0.2+	1999 10 20	557	0.0	0.1+
1997 02 01	557	0.2-	0.3-	1998 08 17	704	0.6-	1.0+	1999 10 20	557	0.2+	0.1+
1997 02 03	691	0.4-	0.3-	1998 08 17	704	0.5-	1.7+	1999 10 20	557	0.1-	0.0
1997 02 03	691	0.0	0.3-	1998 08 17	704	0.7-	0.4+	1999 11 15	557	0.1+	0.0
1997 02 03	691	0.2+	0.3-	1998 08 23	704	0.4+	0.3-	1999 11 15	557	0.2-	0.1+
1997 02 07	691	0.7+	0.4-	1998 08 23	704	1.4+	0.6-	1999 11 15	557	0.2-	0.7+
1997 02 07	691	0.2+	0.3-	1998 08 23	704	1.0+	0.8-	1999 11 15	557	0.0	0.4+

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1997 02 07	691	0.3+	0.2-	1998 08 23	704	1.4+	0.1+	1999 11 16	704	0.3+	0.2+
1997 02 08	557	0.1-	0.2+	1998 08 23	704	0.5+	0.1-	1999 11 16	704	0.8+	0.0
1997 02 08	557	0.0	0.2+	1998 08 27	699	0.1+	0.5-	1999 11 16	704	0.2+	0.1+
1997 02 08	557	0.1+	0.2+	1998 08 27	699	0.1+	0.6-	1999 11 16	704	0.7-	0.0
1997 02 26	557	0.8-	0.5-	1998 08 27	699	0.2-	0.9-	1999 11 16	704	0.2-	0.3-
1997 02 26	557	0.5-	0.2-	1998 09 07	557	0.2-	0.3-	1999 11 19	557	0.4-	0.2+
1997 02 26	557	0.6-	0.3-	1998 09 07	557	0.2-	0.3-	1999 11 19	557	0.1+	0.3-
1997 03 11	557	0.3-	0.1-	1998 09 07	557	0.4-	0.0	1999 11 19	557	1.0+	0.9+
1997 03 11	557	0.3-	0.1+	1998 09 14	699	0.6-	0.2-	1999 11 21	557	0.6-	0.1-

(12469)* 1997 AW₁₈

Discovered 1997 Jan. 9 by N. Sato at Chichibu.

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

				Nakano			
<i>M</i>	230.42873		(2000.0)	P	Q		
<i>n</i>	0.28528144	ω	198.55735	-0.95837000	-0.27980650		
<i>a</i>	2.2853552	Ω	325.03384	+0.27292452	-0.83916751		
<i>e</i>	0.0878820	<i>i</i>	5.69599	+0.08389968	-0.46637562		
<i>P</i>	3.45	<i>H</i>	14.6	<i>G</i>	0.15	<i>U</i>	1

Residuals in seconds of arc

1995 09 02	010	0.7+	0.3-	1997 04 07	566	0.6-	0.1+	1998 06 28	809	0.8+	1.9+
1995 09 02	010	0.2-	1.0-	1997 04 07	566	1.0-	0.4+	1998 07 01	809	(0.3-	3.4+)
1995 09 02	010	0.7+	1.2-	1998 06 24	704	(0.6+	2.3-)	1998 07 01	809	0.2+	1.7+
1997 01 09	369	0.0	0.3-	1998 06 24	704	1.3+	0.4-	1998 07 01	809	(0.6+	2.9+)
1997 01 09	369	0.0	0.8-	1998 06 24	704	0.2-	1.4+	1999 10 12	704	1.1+	0.1-
1997 01 15	369	0.1-	0.0	1998 06 24	704	1.9-	1.4-	1999 10 12	704	0.0	0.2-
1997 01 15	369	0.7+	1.9-	1998 06 25	426	0.2-	0.2+	1999 10 12	704	0.0	0.2+
1997 01 18	369	0.1+	0.3+	1998 06 25	426	0.1-	0.1-	1999 10 12	704	0.9-	0.4+
1997 01 18	369	0.2+	0.3-	1998 06 25	426	0.5-	0.1+	1999 10 12	704	0.6-	0.5+
1997 01 18	369	0.5+	0.8+	1998 06 26	704	0.9+	1.4-	1999 10 13	704	0.1+	0.7-
1997 01 30	369	0.4-	0.1-	1998 06 26	704	1.3-	0.2-	1999 10 13	704	0.1+	0.8-
1997 01 30	369	0.5-	0.0	1998 06 26	704	0.2+	0.5+	1999 10 13	704	0.1-	0.3+
1997 02 09	369	0.2+	0.7-	1998 06 26	704	1.6+	1.5-	1999 10 13	704	0.9-	0.0
1997 02 09	369	0.1-	0.4-	1998 06 26	426	0.2-	0.4-	1999 11 13	703	0.1+	0.1+
1997 03 01	369	0.8-	0.5-	1998 06 26	426	0.3-	0.5-	1999 11 13	703	0.1+	0.2+
1997 03 04	369	0.0	1.1+	1998 06 26	426	0.0	0.4-	1999 11 13	703	0.6+	1.1+
1997 03 04	369	0.1+	0.0	1998 06 28	809	(1.0+	2.7+)	1999 11 13	703	0.3-	0.7+
1997 04 07	566	0.2+	0.5-	1998 06 28	809	(0.8+	2.4+)				

(12470)* 1997 BC₉ = 1978 NK₃ = 1978 PW = 1988 NG₁ = 1989 YT₂

Discovered 1997 Jan. 31 by U. Munari and M. Tombelli at Cima Ekar.

Id. G. V. Williams (*MPC* 29927), G. Forti (*ibid.*)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

				Williams			
<i>M</i>	96.23102		(2000.0)	P	Q		
<i>n</i>	0.29584088	ω	186.88355	+0.84422871	+0.53393718		
<i>a</i>	2.2306457	Ω	140.72803	-0.48816401	+0.80201488		
<i>e</i>	0.2342317	<i>i</i>	4.23870	-0.22130020	+0.26773723		
<i>P</i>	3.33	<i>H</i>	14.4	<i>G</i>	0.15	<i>U</i>	2

Residuals in seconds of arc

1978 07 10	095	1.4-	1.0+	1998 06 25	104	0.0	0.7-	1998 08 17	704	1.9-	0.7+
1978 08 08	095	0.1+	0.2+	1998 06 26	809	(3.0+	0.7-)	1998 08 17	704	1.7-	1.2+
1988 07 14	046	0.6+	0.5-	1998 06 26	809	(2.3+	0.9-)	1998 08 17	704	1.0-	1.3+
1988 07 14	046	1.8+	0.5+	1998 06 26	809	1.7+	1.2-	1998 08 17	704	(0.1+	2.9+)
1989 12 30	413	2.1-	1.1+	1998 06 26	704	1.2+	1.7+	1998 09 15	108	0.5+	0.0
1989 12 30	413	(2.5+	1.0-)	1998 06 26	704	0.4+	0.2-	1998 09 15	108	(2.6+	0.2-)
1989 12 31	413	0.4-	1.3+	1998 06 26	704	0.4-	0.0	1998 09 15	108	(2.9+	0.6-)
1989 12 31	413	2.0+	0.3+	1998 06 26	704	0.2-	0.8-	1998 09 15	108	(3.3+	0.9-)
1991 03 19	413	(0.7+	2.3+)	1998 06 27	809	(3.0+	0.7-)	1998 09 19	108	1.4+	0.6-
1997 01 31	098	0.9-	0.4+	1998 06 27	809	(2.6+	1.6-)	1998 09 19	108	0.8+	0.6-
1997 01 31	098	0.8+	1.4-	1998 06 27	809	(2.1+	0.7-)	1998 09 19	108	(1.4+	2.5-)
1997 02 07	098	0.4-	0.9-	1998 07 02	610	0.2-	0.1+	1998 10 19	699	1.3-	0.5+
1997 02 07	098	0.5+	1.2-	1998 07 02	610	0.1+	0.2+	1998 10 19	699	1.3-	0.2-
1997 02 08	098	0.8-	1.6+	1998 07 03	610	0.3+	0.1+	1998 10 19	699	1.1-	0.2-
1997 02 08	098	0.3-	1.4+	1998 07 03	610	0.7+	0.2+	1998 11 06	699	0.2-	0.1+

1997 03 03	098	0.3+	0.7-	1998 07 04	610	0.2-	0.2-	1998 11 06	699	0.0	0.2+
1997 03 03	098	1.4-	0.1-	1998 07 04	610	0.2-	0.2-	1998 11 06	699	0.1+	0.5-
1997 03 07	098	(2.5-	2.1+)	1998 07 04	610	0.5-	0.1-	1998 12 08	704	1.2+	1.4-
1997 03 08	098	(2.5-	1.7+)	1998 07 04	610	0.5-	0.2-	1998 12 08	704	0.5+	0.7-
1997 03 10	098	0.6-	0.3-	1998 07 04	610	0.6-	0.2-	1998 12 08	704	(0.1+	2.9-)
1997 03 11	098	0.4-	0.3-	1998 07 29	610	0.3+	1.4+	1998 12 08	704	0.2+	1.7-
1997 03 13	098	(3.4-	1.3-)	1998 07 29	610	0.2+	1.1+	1998 12 08	704	0.0	0.8-
1997 03 13	098	1.1+	1.2-	1998 07 29	610	0.2+	0.9+	1999 10 10	704	1.2+	0.5+
1998 05 26	104	0.0	0.1+	1998 07 29	610	0.3+	0.6+	1999 10 10	704	0.0	0.2+
1998 05 26	104	0.5-	0.5+	1998 08 11	108	0.4-	1.2-	1999 10 10	704	0.0	0.9+
1998 05 26	104	0.4-	0.6+	1998 08 11	108	0.3+	0.1-	1999 10 10	704	0.0	1.3+
1998 06 24	704	(2.8+	0.9+)	1998 08 11	108	0.2+	0.5-	1999 11 17	704	1.1+	0.1-
1998 06 24	704	(2.8-	0.3-)	1998 08 11	108	0.0	0.3-	1999 11 17	704	1.2+	0.5+
1998 06 24	704	(1.3+	3.8-)	1998 08 12	108	0.6-	0.1-	1999 11 17	704	0.8+	0.5+
1998 06 24	704	(3.1-	0.8-)	1998 08 12	108	0.7-	0.6-	1999 11 17	704	0.1+	0.8+
1998 06 25	104	0.7+	0.5-	1998 08 12	108	0.0	0.9-	1999 11 17	704	0.1-	0.3+
1998 06 25	104	0.1+	0.3-	1998 08 12	108	1.6+	0.9+				

(12471)* 1997 CZ₆ = 1976 SO₃ = 1991 PA₂₈ = 1995 SL₅₅ = 1998 HZ₉₈

Discovered 1997 Feb. 6 at Haleakala by the JPL Near-Earth Asteroid Tracking program.

Id. A. Doppler (*MPC* 32956)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	18.14716		(2000.0)	P	Q		
<i>n</i>	0.25906366	ω	164.58611	+0.96487813	+0.26269790		
<i>a</i>	2.4370534	Ω	180.18385	-0.24523610	+0.90055787		
<i>e</i>	0.2121361	<i>i</i>	2.40275	-0.09417781	+0.34638899		
<i>P</i>	3.80	<i>H</i>	14.8	<i>G</i>	0.15	<i>U</i>	1

Residuals in seconds of arc

1976 09 24	095	1.0-	0.9+	1998 04 22	704	0.3+	0.2+	1999 10 29	703	0.6-	0.6+
1976 09 29	095	0.9+	0.3-	1998 04 22	704	0.3-	0.5+	1999 10 29	703	0.0	1.1+
1991 08 05	809	(2.1+	3.3-)	1998 04 22	704	(1.3-	2.3+)	1999 10 29	703	0.9-	0.1+
1991 08 05	809	(1.1+	3.0-)	1998 05 01	704	0.3+	0.0	1999 10 29	703	1.6-	0.5+
1991 08 05	809	(1.9+	2.9-)	1998 05 01	704	0.8+	0.0	1999 11 01	703	(1.1-	3.3-)
1994 04 06	691	0.7-	0.9+	1998 05 01	704	1.4+	0.5-	1999 11 01	703	0.1-	0.5+
1994 04 06	691	0.8-	0.7+	1998 05 01	704	0.8+	0.4+	1999 11 01	703	0.1-	0.4+
1994 04 06	691	0.6-	0.0	1998 05 24	704	0.9+	1.4-	1999 11 01	703	0.2-	0.7+
1995 09 21	399	0.6-	0.5+	1998 05 24	704	1.9-	1.3-	1999 11 01	703	0.1-	0.1+
1995 09 21	399	0.0	0.6-	1998 05 24	704	0.9+	0.1+	1999 11 01	703	0.4-	0.5+
1995 09 30	399	0.6-	0.6+	1998 05 24	704	0.2-	0.5+	1999 11 01	703	0.1-	0.3+
1995 09 30	399	0.3+	1.2+	1998 05 24	704	0.0	1.2-	1999 11 01	703	0.1+	0.4+
1997 02 01	691	0.6+	0.3-	1999 10 08	703	0.2+	0.5+	1999 11 04	704	0.3+	0.4-
1997 02 01	691	0.6+	0.1+	1999 10 08	703	0.4+	0.6+	1999 11 04	704	0.3-	0.5-
1997 02 01	691	0.4+	0.1+	1999 10 08	703	0.0	0.5+	1999 11 04	704	0.2+	0.6-
1997 02 06	566	0.1-	0.5+	1999 10 08	703	0.2-	0.4+	1999 11 04	704	0.1+	0.7-
1997 02 06	566	0.3+	0.1-	1999 10 10	704	0.4+	0.2+	1999 11 04	704	0.0	1.2-
1997 02 06	566	0.3+	0.6-	1999 10 10	704	0.2+	0.3-	1999 11 15	704	0.0	0.5+
1997 02 07	691	0.7+	0.1-	1999 10 10	704	0.2+	0.3-	1999 11 15	704	0.1+	0.4+
1997 02 07	691	0.6+	0.0	1999 10 10	704	0.2+	0.7-	1999 11 15	704	0.2-	0.6+
1997 02 07	691	0.4+	0.0	1999 10 10	704	0.5-	0.4-	1999 11 15	704	0.1-	0.5+
1997 02 08	566	1.7-	0.2+	1999 10 15	704	0.3+	0.4-	1999 11 16	704	0.2+	0.3+
1997 02 08	566	1.4-	0.1-	1999 10 15	704	0.3+	0.3-	1999 11 16	704	0.5+	0.3+
1997 02 08	566	0.2+	0.4+	1999 10 15	704	0.2+	0.2+	1999 11 16	704	0.2+	0.4+
1998 04 21	704	1.3-	1.7+	1999 10 15	704	0.1+	0.3-	1999 11 16	704	0.2+	0.5+
1998 04 21	704	0.2+	1.1+	1999 10 15	704	0.1+	0.2-	1999 11 16	704	0.3+	0.4+
1998 04 21	704	1.1-	1.1-	1999 10 21	704	0.2+	0.2-	1999 11 17	704	0.1+	0.1+
1998 04 21	704	0.2-	1.7+	1999 10 21	704	0.4+	0.0	1999 11 17	704	0.3+	0.4-
1998 04 21	704	0.4+	0.3+	1999 10 21	704	0.2+	0.4-	1999 11 17	704	0.1-	0.4+
1998 04 22	704	0.9+	0.1+	1999 10 21	704	0.4+	0.3-	1999 11 17	704	0.2+	0.3+
1998 04 22	704	0.8+	1.5+	1999 10 21	704	0.3+	0.6-	1999 11 17	704	0.8-	1.0+

(12472)* 1997 CW₁₁ = 1994 GE₇

Discovered 1997 Feb. 3 by Spacewatch at Kitt Peak.

Id. G. V. Williams (*MPC* 29128)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	22.13229		(2000.0)	P	Q		
<i>n</i>	0.26691597	ω	323.10196	+0.98036107	+0.19590513		
<i>a</i>	2.3890194	Ω	25.62818	-0.16611168	+0.88221938		
<i>e</i>	0.1306759	<i>i</i>	3.00269	-0.10629711	+0.42814734		
<i>P</i>	3.69	<i>H</i>	16.6	<i>G</i>	0.15	<i>U</i>	2

Residuals in seconds of arc

1994 04 11	691	0.3+	0.2-	1997 02 03	691	0.2-	0.1-	1999 10 12	704	0.8-	0.2-
1994 04 11	691	0.9-	0.8+	1997 02 03	691	0.4-	0.3+	1999 10 12	704	0.6-	0.3-
1994 04 11	691	0.0	0.4-	1997 02 04	691	0.3-	0.2+	1999 10 12	704	0.0	0.3+
1994 04 19	691	1.1+	0.2-	1997 02 04	691	0.3-	0.2-	1999 10 12	704	0.4-	0.5+
1994 04 19	691	0.1+	0.1-	1997 02 06	691	0.3+	0.1-	1999 11 14	704	1.1+	0.5+
1994 04 19	691	0.3-	0.5+	1997 02 06	691	0.1+	0.5-	1999 11 14	704	1.1-	0.0
1995 08 28	809	1.1-	0.2-	1997 02 06	691	0.1+	0.2-	1999 11 14	704	0.5+	1.0-
1995 08 29	809	1.1-	0.8-	1997 02 10	691	0.1+	0.1+	1999 11 14	704	0.2-	0.2-
1995 08 30	809	0.1+	0.1-	1997 02 10	691	0.1+	0.2+	1999 11 15	704	0.3+	1.2+
1995 08 30	809	0.2+	0.3+	1997 02 10	691	0.5+	0.0	1999 11 15	704	0.4+	0.5+
1995 09 20	809	0.1+	0.5+	1999 10 06	704	0.6+	0.4-	1999 11 15	704	0.2-	0.9+
1995 09 22	809	0.0	0.2+	1999 10 06	704	0.3-	0.4-	1999 11 15	704	0.0	0.0
1995 09 22	809	1.2+	0.4-	1999 10 06	704	0.8+	1.4-	1999 11 15	704	0.5+	0.9+
1995 09 23	809	0.7+	0.1+	1999 10 06	704	0.3-	0.1-				
1997 02 03	691	0.4-	0.4-	1999 10 06	704	0.7-	0.3-				

(12473)* 1997 CM₁₉ = 1990 UN₁₄

Discovered 1997 Feb. 10 by P. G. Comba at Prescott.

Id. K. Ichikawa (*MPC* 29928)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	86.83292		(2000.0)	P	Q		
<i>n</i>	0.22430723	ω	218.01043	+0.47162159	+0.85093528		
<i>a</i>	2.6827109	Ω	81.23279	-0.74084349	+0.52460187		
<i>e</i>	0.1665721	<i>i</i>	13.53247	-0.47825099	+0.02649564		
<i>P</i>	4.39	<i>H</i>	13.9	<i>G</i>	0.15	<i>U</i>	1

Residuals in seconds of arc

1990 10 20	413	0.7-	0.4-	1998 05 23	684	0.2+	0.3+	1999 10 21	704	0.1-	0.3+
1990 10 20	413	0.6+	0.8+	1998 05 23	684	0.3+	0.7+	1999 10 21	704	0.3+	0.5+
1990 10 27	413	0.2-	0.4+	1998 05 24	684	0.4+	0.0	1999 10 21	704	0.2-	0.7-
1997 02 10	684	0.0	0.3+	1998 05 24	684	0.1+	0.0	1999 11 04	704	0.4+	0.6+
1997 02 10	684	0.1+	0.2+	1998 07 18	684	0.2-	0.8-	1999 11 04	704	0.1+	0.8-
1997 02 12	684	0.1-	0.5+	1998 07 18	684	0.1-	0.5-	1999 11 04	704	0.3+	0.2+
1997 02 12	684	0.1-	0.4+	1998 07 18	684	0.0	0.6-	1999 11 04	704	0.6+	0.8+
1997 02 14	684	0.4+	0.2+	1998 08 12	684	0.3-	0.7+	1999 11 04	704	0.0	0.9-
1997 02 14	684	0.1+	0.2+	1998 08 12	684	0.5-	0.3+	1999 11 17	704	0.8+	0.1-
1997 02 14	684	0.1+	0.3+	1998 08 12	684	0.1-	0.2+	1999 11 17	704	0.1-	0.4-
1998 04 22	684	0.3+	0.1+	1998 08 14	684	0.1-	0.5+	1999 11 17	704	0.4-	0.4+
1998 04 22	684	0.2+	0.2-	1998 08 14	684	0.0	0.8+	1999 11 17	704	1.0-	0.0
1998 04 23	684	0.7+	0.6-	1998 08 14	684	0.2-	0.6+	1999 11 17	704	0.3-	0.2+

(12474)* 1997 CZ₁₉ = 1990 EQ₆ = 1992 YS₅

Discovered 1997 Feb. 12 by T. Kobayashi at Oizumi.

Id. S. Nakano (*MPC* 29641)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

M	35.50667		(2000.0)	P	Q
n	0.28272414	ω	249.79650	+0.97706387	-0.20530382
a	2.2991155	Ω	122.01264	+0.21163979	+0.90684934
e	0.0808143	i	3.82318	+0.02355412	+0.36806877
P	3.49	H	13.9	G 0.15	U 1

1990 03 03	809	(2.9+ 0.1-)	1997 03 09	411	0.7+ 1.1+	1999 10 21	704	1.2+ 0.6-
1990 03 03	809	(3.2+ 0.2-)	1997 03 09	411	0.3+ 0.3+	1999 11 04	704	0.5- 0.4+
1990 03 04	809	0.4+ 0.1-	1998 07 21	704	0.8+ 0.2+	1999 11 04	704	0.3+ 0.2+
1990 03 04	809	0.5+ 0.0	1998 07 21	704	(0.9+ 2.6+)	1999 11 04	704	0.3- 0.8-
1990 03 04	809	0.7+ 0.0	1998 07 21	704	(0.4+ 3.4+)	1999 11 04	704	0.3+ 0.7-
1992 12 17	399	0.1+ 0.7-	1998 07 21	704	0.7- 1.8-	1999 11 04	704	1.3+ 0.1-
1992 12 17	399	0.5- 0.5+	1999 10 12	704	0.8- 0.1-	1999 11 17	704	1.1+ 0.6+
1997 02 12	411	0.4+ 0.8-	1999 10 12	704	0.8- 0.4-	1999 11 17	704	0.4+ 0.7+
1997 02 12	411	0.3+ 1.0-	1999 10 12	704	1.2- 0.3-	1999 11 17	704	1.6- 0.9+
1997 02 13	411	0.5- 0.2+	1999 10 12	704	0.9- 0.3-			
1997 02 13	411	1.0- 0.3+	1999 10 12	704	0.4- 0.4-			

(12475)* 1997 CC₂₀ = 1972 TJ₁₀ = 1991 XW₆

Discovered 1997 Feb. 12 by T. Kobayashi at Oizumi.

Id. S. Nakano (*MPC* 30671), G. V. Williams (*ibid.*)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Nakano

<i>M</i>	139.19157		(2000.0)		P		Q
<i>n</i>	0.21985596	ω	103.21441	-0.61978548	+0.78279097		
<i>a</i>	2.7187998	Ω	128.34414	-0.74472177	-0.56428105		
<i>e</i>	0.1227993	<i>i</i>	4.07367	-0.24749836	-0.26234555		
<i>P</i>	4.48	<i>H</i>	14.0	<i>G</i>	0.15	<i>U</i>	1

Residuals in seconds of arc

1972 10 09	033	0.5+ 0.5-	1998 06 26	704	0.4- 1.1-	1999 10 19	704	0.3+ 0.2+
1972 10 09	033	0.3+ 1.3-	1998 06 26	704	1.0+ 1.8-	1999 10 19	704	0.4- 0.0
1972 10 09	033	0.3+ 0.6-	1998 06 28	684	0.5- 0.9+	1999 10 19	704	0.8+ 0.3+
1991 12 07	691	0.0 0.6+	1998 06 28	684	0.6- 0.5+	1999 10 29	703	(0.4+ 2.4-)
1991 12 07	691	0.5- 0.5-	1998 08 12	684	0.2- 0.1+	1999 10 29	703	(2.4- 1.1+)
1991 12 07	691	0.2- 0.1-	1998 08 12	684	0.1+ 0.0	1999 10 29	703	0.0 0.8-
1997 02 12	411	1.3+ 0.7+	1998 08 14	684	0.1+ 0.3+	1999 10 29	703	0.0 0.2+
1997 02 12	411	0.7- 0.8+	1998 08 14	684	0.1- 0.3+	1999 11 03	703	0.7- 0.1+
1997 02 13	411	0.3- 0.7+	1998 08 17	704	0.5- 0.2-	1999 11 03	703	0.3- 0.1+
1997 02 13	411	0.7- 0.5+	1998 08 17	704	0.3+ 0.7-	1999 11 03	703	0.6- 0.1-
1997 02 16	411	0.0 0.3-	1998 08 17	704	(3.3- 3.2+)	1999 11 03	703	0.5- 0.5+
1997 02 16	411	0.3+ 1.4+	1998 08 17	704	(3.9- 1.5+)	1999 11 05	704	0.6+ 0.2-
1997 02 26	411	0.3+ 0.1-	1999 10 09	704	0.7- 0.5+	1999 11 05	704	0.5- 0.2+
1997 02 26	411	0.3+ 0.5-	1999 10 09	704	0.2- 0.6+	1999 11 05	704	0.0 0.5+
1997 03 09	411	0.8+ 0.2-	1999 10 09	704	0.3- 0.8+	1999 11 05	704	0.5+ 0.4+
1997 03 09	411	0.1+ 0.2-	1999 10 09	704	0.7- 0.1+	1999 11 05	704	0.6+ 0.3+
1998 06 21	688	0.1- 0.4+	1999 10 15	704	0.2- 0.7+	1999 11 15	704	0.1+ 1.8-
1998 06 21	688	0.2- 0.8+	1999 10 15	704	0.9+ 1.1+	1999 11 15	704	0.1- 0.7-
1998 06 21	688	0.3- 0.7+	1999 10 15	704	0.6- 0.7+	1999 11 15	704	0.4- 0.7-
1998 06 26	704	0.0 0.4+	1999 10 15	704	0.6+ 1.2+			
1998 06 26	704	0.7+ 2.0+	1999 10 19	704	0.4+ 0.7+			

(12476)* 1997 EU₂ = 1982 BS₃ = 1995 UF₅₃

Discovered 1997 Mar. 4 by T. Kobayashi at Oizumi.

Id. S. Nakano (*MPC* 29929), G. V. Williams (*ibid.*)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Nakano

<i>M</i>	264.94486		(2000.0)		P		Q
<i>n</i>	0.26581742	ω	35.51183	-0.74135952	-0.66915825		
<i>a</i>	2.3955970	Ω	102.40196	+0.60300347	-0.69762539		
<i>e</i>	0.1452383	<i>i</i>	3.00034	+0.29457237	-0.25601962		
<i>P</i>	3.71	<i>H</i>	14.8	<i>G</i>	0.15	<i>U</i>	1

Residuals in seconds of arc

1982 01 20	033	0.7+ 1.4+	1999 10 09	691	0.2- 0.1-	1999 11 04	704	0.4+ 0.6-
1982 01 20	033	0.5+ 1.2+	1999 10 09	691	0.0 0.1-	1999 11 04	704	0.5+ 0.5-
1995 10 19	691	0.5- 0.1+	1999 10 09	691	0.1- 0.0	1999 11 04	704	0.3+ 0.9-
1995 10 19	691	0.5- 0.0	1999 10 10	704	0.2+ 0.1+	1999 11 08	120	0.9- 0.1-
1995 10 19	691	1.0- 0.1-	1999 10 10	704	0.1+ 0.2-	1999 11 08	120	0.5- 1.4-
1996 12 27	327	0.9- 0.6-	1999 10 10	704	0.1- 0.1-	1999 11 10	120	0.2+ 0.8-
1996 12 27	327	(2.2+ 0.8-)	1999 10 10	704	0.8- 1.3+	1999 11 10	120	1.5+ 1.3-
1996 12 27	327	1.4+ 0.1-	1999 10 10	704	0.0 0.6-	1999 11 12	699	1.0- 0.8+
1997 03 04	411	0.3- 0.1+	1999 10 15	691	0.2- 0.2-	1999 11 12	699	0.3+ 0.3-

1997 03 04	411	0.0 0.4+	1999 10 15	691	0.4- 0.9+	1999 11 12	699	0.4- 0.3+
1997 03 05	411	0.8- 0.7-	1999 10 15	691	0.2- 0.1-	1999 11 12	120	0.1+ 0.4-
1997 03 05	411	0.2+ 0.2-	1999 10 19	691	0.5- 0.1+	1999 11 12	120	0.2- 0.4-
1997 03 09	411	0.2- 0.2-	1999 10 19	691	0.5- 0.1+	1999 11 13	120	0.5+ 0.2+
1997 03 09	411	0.0 0.3+	1999 10 19	691	0.6- 0.0	1999 11 13	120	0.7+ 0.2-
1997 03 12	411	1.6+ 0.8+	1999 10 21	704	1.2+ 0.2+	1999 11 15	704	0.2- 0.3-
1997 03 12	411	0.5- 0.3-	1999 10 21	704	0.7- 0.6+	1999 11 15	704	0.0 0.1+
1997 04 10	411	0.7- 0.2+	1999 10 21	704	0.6+ 0.1+	1999 11 15	704	0.1- 0.1+
1997 04 10	411	0.4- 0.2+	1999 10 21	704	0.2+ 0.1+	1999 11 15	704	0.2+ 0.2+
1998 06 28	691	0.1- 0.2+	1999 11 01	703	0.3- 0.8+	1999 11 15	704	0.6+ 1.3+
1998 06 28	691	0.7- 0.5+	1999 11 01	703	0.1+ 0.4+	1999 11 17	704	0.4+ 0.0
1998 06 28	691	0.5- 0.4+	1999 11 01	703	1.5- 0.1+	1999 11 17	704	0.0 0.2+
1998 07 03	691	0.6+ 0.5+	1999 11 01	703	0.7- 1.3+	1999 11 17	704	0.9+ 0.2+
1998 07 03	691	0.6+ 0.7+	1999 11 04	704	0.3+ 0.6-	1999 11 17	704	0.7+ 0.1+
1998 07 03	691	0.6+ 0.5+	1999 11 04	704	0.6+ 0.4-	1999 11 17	704	0.3+ 0.3+

(12477)* 1997 EY₂₀ = 1995 XS₂

Discovered 1997 Mar. 4 by Spacewatch at Kitt Peak.

Id. G. V. Williams (*MPC* 29929)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	175.12575		(2000.0)		P		Q
<i>n</i>	0.25899702	ω	29.09891	-0.69787354	+0.71614432		
<i>a</i>	2.4374715	Ω	196.65191	-0.66399211	-0.65239864		
<i>e</i>	0.1272199	<i>i</i>	2.09592	-0.26849021	-0.24801881		
<i>P</i>	3.81	<i>H</i>	14.2	<i>G</i>	0.15	<i>U</i>	1

Residuals in seconds of arc

1995 12 02	327	0.1- 0.8+	1998 07 15	699	0.2+ 0.2-	1999 11 03	704	0.1- 1.3-
1995 12 02	327	0.4+ 0.3+	1998 07 26	809	1.1+ 1.5+	1999 11 03	704	1.1+ 0.1-
1995 12 02	327	0.4- 0.2+	1998 07 26	809	0.2+ 1.0+	1999 11 03	704	0.1+ 0.5+
1995 12 07	327	0.0 0.4+	1998 07 26	809	0.2+ 1.6+	1999 11 03	704	0.5+ 0.3+
1995 12 07	327	0.4+ 0.7+	1998 07 27	809	0.7- 1.4+	1999 11 03	704	0.3- 0.5+
1995 12 07	327	0.9- 0.1-	1998 07 27	809	1.3- 1.2+	1999 11 09	704	0.0 0.2-
1997 03 04	691	0.3- 0.1+	1998 07 27	809	0.7- 1.0+	1999 11 09	704	0.1- 0.1-
1997 03 04	691	0.3- 0.0	1998 08 17	704	0.5+ 1.4-	1999 11 09	704	0.4- 0.1+
1997 03 04	691	0.0 0.6-	1998 08 17	704	1.0+ 0.9-	1999 11 09	704	0.3- 0.1+
1997 03 11	691	0.5+ 0.2+	1998 08 17	704	0.0 1.6-	1999 11 09	704	0.4- 0.3+
1997 03 11	691	0.2+ 0.0	1998 08 17	704	0.3+ 1.3-	1999 11 15	704	0.2+ 0.4+
1997 03 11	691	0.2- 0.1+	1998 08 17	704	0.4- 1.0-	1999 11 15	704	0.2- 0.3+
1997 04 24	327	0.3+ 0.7+	1998 08 28	699	1.2- 0.1-	1999 11 15	704	0.1+ 0.5-
1997 04 24	327	0.3+ 0.7+	1998 08 28	699	0.3- 0.3-	1999 11 15	704	0.5+ 0.1+
1997 04 24	327	0.2- 0.0	1998 08 28	699	0.2- 0.3-	1999 11 15	704	0.0 0.3-
1997 04 25	327	0.2+ 0.7+	1999 10 22	704	0.1+ 0.0	1999 11 17	704	0.6- 0.4+
1997 04 25	327	0.3+ 0.5+	1999 10 22	704	0.0 0.0	1999 11 17	704	1.0+ 0.3+
1997 04 25	327	0.2+ 0.7+	1999 10 22	704	0.2- 0.5+	1999 11 17	704	0.0 0.1+
1998 07 15	699	0.2- 0.4+	1999 10 22	704	0.3- 0.0	1999 11 17	704	0.3+ 0.1-
1998 07 15	699	0.8+ 1.1+	1999 10 22	704	0.6- 0.3-	1999 11 17	704	0.7- 0.6-

(12478)* 1997 EX₂₅ = 1995 SG₂₂

Discovered 1997 Mar. 7 by T. Okuni at Nanyou.

Id. S. Nakano (*MPC* 29929)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Nakano

<i>M</i>	273.61888		(2000.0)		P		Q
<i>n</i>	0.27351851	ω	359.89091	-0.70673456	-0.70664043		
<i>a</i>	2.3504169	Ω	135.07881	+0.64913604	-0.66703820		
<i>e</i>	0.1594505	<i>i</i>	2.79494	+0.28133373	-0.23604945		
<i>P</i>	3.60	<i>H</i>	14.9	<i>G</i>	0.15	<i>U</i>	1

Residuals in seconds of arc

1995 09 19	691	0.0	0.1+	1998 07 02	691	0.1-	0.3+	1999 11 01	691	0.1-	0.2-
1995 09 19	691	0.2-	0.1+	1998 07 02	691	0.0	0.2+	1999 11 01	691	0.1-	0.2-
1995 09 19	691	0.0	0.2+	1998 07 02	691	0.2-	0.1+	1999 11 04	704	0.1-	0.4+
1995 09 24	691	0.2-	0.1-	1998 07 15	691	0.3-	0.1-	1999 11 04	704	0.2-	0.6+
1995 09 24	691	0.4+	0.1-	1998 07 15	691	0.2-	0.1+	1999 11 04	704	0.1-	0.7+
1995 09 24	691	0.0	0.2-	1998 07 15	691	0.5-	0.1-	1999 11 04	704	0.7-	0.8+

1997 03 07	358	0.5−	0.9+	1998 07 27	691	0.1+	0.2+	1999 11 04	704	0.5−	0.9+
1997 03 07	358	0.4−	1.0−	1998 07 27	691	0.1+	0.4+	1999 11 15	704	0.4+	0.1+
1997 03 08	358	(0.8+	2.7+)	1998 08 17	704	0.7+	0.3−	1999 11 15	704	0.1+	0.0
1997 03 08	358	0.6+	0.4−	1998 08 17	704	1.6−	0.4+	1999 11 15	704	0.4+	0.0
1997 03 18	358	0.5−	0.6+	1998 08 17	704	0.4+	1.1+	1999 11 15	704	0.1+	0.3−
1997 03 18	358	0.3−	0.5−	1998 08 17	704	(2.0−	2.4−)	1999 11 15	704	0.1−	0.2−
1997 04 01	358	0.7−	0.5−	1999 10 21	704	0.1+	0.1−	1999 11 17	704	0.3−	0.8+
1997 04 01	358	2.0+	1.7+	1999 10 21	704	0.1+	0.6−	1999 11 17	704	0.2+	1.0+
1997 04 01	358	0.6+	1.1+	1999 10 21	704	0.3+	0.4−	1999 11 17	704	0.1−	0.3+
1998 06 19	696	0.5+	0.1−	1999 10 21	704	1.4+	0.6−	1999 11 17	704	1.0−	0.5−
1998 06 19	696	0.7+	0.2+	1999 11 01	691	0.2−	0.3−				

(12479)* 1997 EG₂₇ = 1998 QF₂₂

Discovered 1997 Mar. 5 by Spacewatch at Kitt Peak.

Id. G. V. Williams (*MPC* 32475)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

				Williams			
<i>M</i>	244.69211	(2000.0)		P	Q		
<i>n</i>	0.28548468	ω	7.31947	−0.99496779	+0.10015475		
<i>a</i>	2.2842704	Ω	178.42018	−0.09636897	−0.94879738		
<i>e</i>	0.0435066	<i>i</i>	5.93421	−0.02742482	−0.29958732		
<i>P</i>	3.45	<i>H</i>	15.0	<i>G</i>	0.15	<i>U</i>	1

Residuals in seconds of arc

1995 10 27	691	0.1+	0.5−	1998 08 17	704	0.4−	0.7−	1998 09 18	704	1.0+	1.6−
1995 10 27	691	0.3+	0.2−	1998 08 17	704	0.7+	0.3+	1998 09 18	704	0.0	0.0
1995 10 27	691	0.0	0.4−	1998 08 17	704	0.7+	0.0	1998 09 18	704	1.1−	0.6−
1997 03 05	691	0.1+	0.0	1998 08 17	704	(2.7−	0.4+)	1998 11 06	910	(2.1−	0.2+)
1997 03 05	691	0.1−	0.1+	1998 08 23	691	0.4+	0.3+	1998 11 06	910	1.8−	0.2+
1997 03 05	691	0.1+	0.0	1998 08 23	691	0.4+	0.1+	1998 11 06	910	1.6−	0.2+
1997 03 13	691	0.4+	0.2−	1998 08 23	691	0.6+	0.1+	1999 10 10	704	1.1+	0.9−
1997 03 13	691	0.2+	0.7−	1998 08 23	704	0.7+	0.2+	1999 10 10	704	0.3−	0.1+
1997 03 13	691	0.4+	0.5−	1998 08 23	704	(1.8+	2.2−)	1999 10 10	704	0.6+	1.0−
1997 03 14	691	0.5−	0.7−	1998 08 23	704	1.4−	0.7−	1999 10 10	704	0.2+	1.2+
1997 03 14	691	0.3−	0.6−	1998 08 23	704	0.9+	0.6+	1999 10 21	704	0.9+	0.4−
1997 03 14	691	0.6−	0.6−	1998 08 23	704	0.8+	1.0+	1999 10 21	704	0.6−	0.6+
1997 04 03	816	0.0	0.3−	1998 09 14	704	0.1−	1.3+	1999 10 21	704	0.3−	0.4+
1997 04 03	816	0.1+	0.5−	1998 09 14	704	0.9−	1.2−	1999 11 12	703	0.4−	0.9−
1997 04 03	816	0.1+	0.2−	1998 09 14	704	0.4−	0.8−	1999 11 12	703	0.7+	0.3−
1997 04 03	816	0.1+	0.3−	1998 09 14	704	0.4−	1.1−	1999 11 12	703	0.2+	0.2−
1997 04 05	816	0.2−	0.5+	1998 09 14	704	0.3+	0.4−	1999 11 12	703	0.7−	0.7+
1997 04 05	816	0.3−	0.4+	1998 09 17	910	0.4+	0.4+	1999 11 13	703	0.0	0.2−
1997 04 05	816	0.1−	0.4+	1998 09 17	910	0.8+	0.5+	1999 11 13	703	0.3+	0.1−
1997 04 05	816	0.1−	0.4+	1998 09 17	910	0.6+	0.5+	1999 11 13	703	1.1−	0.4+
1998 08 17	704	0.1+	0.2−	1998 09 18	704	1.1−	0.5−	1999 11 13	703	(2.2−	4.6−)

(12480)* 1997 EW₄₅ = 1995 WG₄₃

Discovered 1997 Mar. 9 by the Beijing Schmidt CCD Asteroid Program at Xinglong.

Id. G. V. Williams (*MPC* 29645)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

				Williams			
<i>M</i>	205.85811	(2000.0)		P	Q		
<i>n</i>	0.24325010	ω	101.98684	−0.93355719	+0.33707942		
<i>a</i>	2.5415619	Ω	97.80730	−0.35762957	−0.85330859		
<i>e</i>	0.1848955	<i>i</i>	7.06494	−0.02391812	−0.39779632		
<i>P</i>	4.05	<i>H</i>	14.0	<i>G</i>	0.15	<i>U</i>	1

Residuals in seconds of arc

1995 11 30	691	0.1+	0.3+	1997 03 30	327	0.3+	0.3+	1998 09 21	704	(1.0−	2.5−)
1995 11 30	691	0.1−	0.2+	1997 03 30	327	0.3+	1.0+	1998 09 21	704	0.6−	1.8+
1995 12 14	691	0.1+	0.1+	1997 04 02	327	0.1+	0.3+	1998 09 21	704	0.1−	0.5−
1995 12 14	691	0.3−	0.2+	1997 04 02	327	0.5+	0.2+	1999 10 08	703	0.1+	0.3−
1995 12 14	691	0.1+	0.3+	1997 04 02	327	0.3+	0.2+	1999 10 08	703	0.0	0.1+
1997 03 09	327	0.4+	0.4+	1997 04 13	327	0.2−	0.2+	1999 10 08	703	0.8−	0.6+
1997 03 09	327	0.2−	0.1−	1997 04 13	327	0.1−	0.1+	1999 10 08	703	0.9−	0.5−
1997 03 09	327	0.3−	0.1−	1997 04 13	327	0.0	0.1+	1999 10 10	704	0.0	0.6−

1997 03 16	327	0.3+	0.4+	1997 04 15	327	0.2−	0.0	1999 10 10	704	0.3+	0.3−
1997 03 16	327	0.2+	0.2+	1997 04 15	327	0.1−	0.0	1999 10 10	704	0.2−	0.2−
1997 03 16	327	0.1+	0.2+	1997 04 15	327	0.1+	0.1−	1999 10 10	704	0.4−	0.2+
1997 03 18	327	0.3+	0.3+	1997 04 24	327	0.8−	0.4−	1999 10 10	704	0.6−	0.3−
1997 03 18	327	0.3+	0.3+	1997 04 24	327	0.1−	0.5−	1999 11 04	704	0.4+	0.0
1997 03 18	327	0.3+	0.4+	1997 04 24	327	0.4−	0.4−	1999 11 04	704	0.4−	0.8+
1997 03 22	327	0.1+	0.7+	1997 05 20	327	0.6−	0.3−	1999 11 04	704	0.6−	0.7+
1997 03 22	327	0.0	0.1+	1997 05 20	327	0.2−	0.1−	1999 11 04	704	0.1−	0.6+
1997 03 22	327	0.1+	0.2+	1997 05 20	327	0.4+	0.1+	1999 11 12	699	0.5+	1.2+
1997 03 28	327	0.5+	0.0	1997 05 27	689	0.0	0.7−	1999 11 12	699	1.9+	0.9−
1997 03 28	327	0.2−	0.2+	1998 08 19	699	0.1−	1.1+	1999 11 17	704	0.4+	0.3+
1997 03 28	327	0.1−	0.1+	1998 08 19	699	0.1−	1.0+	1999 11 17	704	0.1+	0.0
1997 03 30	327	0.6+	0.0	1998 08 19	699	0.8−	0.4+	1999 11 17	704	0.0	0.5−

(12481)* 1997 EW₄₇ = 1978 EJ₇ = 1989 TP₁₅

Discovered 1997 Mar. 12 by E. W. Elst at the European Southern

Observatory.

Id. K. Ichikawa (*MPC* 30766)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

				Williams			
<i>M</i>	134.30566	(2000.0)		P	Q		
<i>n</i>	0.21222537	ω	66.04490	−0.13762862	+0.98949163		
<i>a</i>	2.7835852	Ω	196.23138	−0.95661677	−0.14439165		
<i>e</i>	0.1556180	<i>i</i>	9.12427	−0.25679315	+0.00757460		
<i>P</i>	4.64	<i>H</i>	13.4	<i>G</i>	0.15	<i>U</i>	1

Residuals in seconds of arc

1978 03 05	095	0.9−	1.0+	1998 08 17	704	0.9−	0.3+	1998 09 30	691	(2.6+	0.8+)
1989 10 03	809	0.2−	1.5−	1998 08 17	704	1.2−	0.5+	1998 09 30	691	0.2+	0.0
1989 10 03	809	0.1+	1.4−	1998 08 17	704	1.2−	0.4−	1998 09 30	691	0.3+	0.2+
1989 10 03	809	0.5+	1.4−	1998 08 23	704	0.7+	0.1+	1998 12 09	704	0.2+	0.8+
1989 10 05	809	1.0+	0.8+	1998 08 23	704	0.7+	0.1−	1998 12 09	704	0.1+	1.1−
1989 10 05	809	1.1+	1.3+	1998 08 23	704	1.5+	0.5+	1998 12 09	704	0.5−	1.0+
1989 10 06	809	1.3−	0.2−	1998 08 23	704	0.4+	0.1−	1998 12 09	704	0.4−	0.6−
1989 10 06	809	1.0−	0.2−	1998 09 14	704	0.1+	0.3−	1998 12 09	704	1.0−	1.5+
1989 10 06	809	0.9−	0.2−	1998 09 14	704	0.0	0.9−	1999 10 10	704	0.2+	0.8+
1989 10 07	809	1.1+	0.1−	1998 09 14	704	0.1+	0.7−	1999 10 10	704	0.3−	0.0
1989 10 07	809	1.3+	0.1−	1998 09 14	704	0.4−	1.4+	1999 10 10	704	(2.6−	1.8−)
1989 10 07	809	1.5+	0.0	1998 09 14	704	1.0−	0.3−	1999 10 20	704	1.0+	0.1+
1997 03 12	809	0.7+	0.4−	1998 09 25	704	0.5+	0.8+	1999 10 20	704	0.3+	0.0
1997 03 12	809	0.0	1.3−	1998 09 25	704	0.1−	0.1−	1999 10 20	704	0.1+	0.0
1997 03 12	809	0.5−	0.4−	1998 09 25	704	0.4+	0.2−	1999 10 20	704	1.0+	0.3−
1997 03 13	809	0.3+	0.4+	1998 09 25	704	0.8+	0.2−	1999 10 20	704	1.3+	0.6−
1997 03 13	809	0.9+	0.1−	1998 09 25	704	0.3−	0.6+	1999 11 04	704	1.0−	0.7+
1997 03 13	809	0.4−	1.2+	1998 09 27	704	0.1+	0.1+	1999 11 04	704	0.5−	0.1+
1997 04 01	809	(3.4+	0.4+)	1998 09 27	704	0.3+	0.1−	1999 11 04	704	0.9−	0.6+
1997 04 01	809	(3.4+	0.5+)	1998 09 27	704	0.4−	0.4+	1999 11 04	704	0.7−	0.3−
1997 04 01	809	(3.0+	0.1+)	1998 09 27	704	0.2−	0.7+	1999 11 04	704	0.5−	0.1+
1998 08 17	704	1.3−	0.4−	1998 09 27	704	0.9−	0.2+				

(12482)* 1997 FG₁

Discovered 1997 Mar. 23 at the Astronomical and Geophysical Observatory,

Modra.

1999 NOV. 23

M.P.C. 36735

1997 03 23	118	0.2+	0.6+	1997 05 15	118	0.9+	0.6-	1998 08 17	704	0.9+	1.2-
1997 03 27	118	0.8+	0.0	1997 05 27	118	0.6-	0.7-	1998 08 17	704	1.5-	0.6+
1997 03 27	118	0.5+	0.0	1997 05 27	118	0.6-	1.3-	1998 08 17	704	0.5+	1.4+
1997 03 27	118	0.4+	0.5-	1997 06 01	118	0.3+	0.0	1998 08 17	704	0.8-	0.1+
1997 03 30	118	0.0	0.1-	1997 06 01	118	0.6+	0.4+	1998 08 17	704	0.2+	0.4-
1997 03 30	118	0.1-	0.3-	1997 06 10	118	0.4+	1.0+	1999 10 09	704	0.7-	0.7+
1997 03 31	118	0.2-	0.1-	1997 06 10	118	0.0	0.8+	1999 10 09	704	0.1-	0.3+
1997 04 01	118	(2.5-	1.6-)	1997 06 10	118	0.4+	0.5+	1999 10 09	704	0.2-	0.4-
1997 04 01	118	(2.4-	1.5-)	1998 07 19	118	0.9+	0.1-	1999 10 09	704	0.7+	0.0
1997 04 03	118	0.5-	0.0	1998 07 19	118	0.6+	0.2-	1999 10 09	704	0.1-	0.5-
1997 04 03	118	0.3-	0.0	1998 07 19	118	1.4+	0.5-	1999 10 14	118	0.0	0.0
1997 04 08	118	0.7-	0.3-	1998 07 20	118	0.4+	0.2-	1999 10 14	118	0.2-	0.2-
1997 04 08	118	0.3-	0.3+	1998 07 21	118	0.6+	0.2-	1999 10 14	118	0.1-	0.0
1997 04 08	118	0.2-	0.4+	1998 07 26	691	0.4+	0.5+	1999 11 06	704	0.3+	0.3-
1997 04 28	118	0.1-	0.6+	1998 07 26	691	0.3+	0.3+	1999 11 06	704	0.6+	0.4-
1997 04 28	118	0.1+	0.5+	1998 07 26	691	0.2+	0.1-	1999 11 06	704	0.4+	0.0
1997 04 28	118	0.1+	0.6+	1998 08 03	118	0.5-	1.4-	1999 11 06	704	0.1+	0.8-
1997 04 29	118	0.5-	0.9-	1998 08 03	118	0.3-	1.0-	1999 11 06	704	0.3+	1.0-
1997 04 29	118	1.1-	1.0-	1998 08 03	118	0.3-	0.3-				
1997 04 29	118	1.5-	0.9-	1998 08 05	118	0.5+	0.0				

(12483)* 1997 FW₁ = 1989 TC₇

Discovered 1997 Mar. 28 by the Beijing Schmidt CCD Asteroid Program at Xinglong.

Id. A. Gnädig (*MPC* 33257), G. V. Williams (*ibid.*)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

				Williams			
<i>M</i>	84.98935	(2000.0)		P		Q	
<i>n</i>	0.19788027	<i>ω</i>	230.23665	-0.03499808		+0.99098976	
<i>a</i>	2.9165385	<i>Ω</i>	38.35767	-0.84137007		+0.04059497	
<i>e</i>	0.1220859	<i>i</i>	12.02462	-0.53932509		-0.12763754	
<i>P</i>	4.98	<i>H</i>	13.5	<i>G</i>	0.15	<i>U</i>	1

Residuals in seconds of arc

1955 10 23	675	1.1-	0.4+	1999 09 09	704	0.2-	0.6+	1999 10 15	704	1.0-	0.3+
1955 10 23	675	0.8+	0.9-	1999 09 09	704	0.4+	0.5+	1999 10 15	704	0.3+	0.3-
1989 10 07	809	0.1-	1.4-	1999 09 09	704	0.3+	0.6+	1999 10 15	704	0.5+	0.3-
1989 10 07	809	0.5-	1.5-	1999 09 09	704	0.1-	0.4+	1999 10 15	704	0.4-	0.3+
1989 10 07	809	0.8-	1.4-	1999 09 09	704	0.6-	0.1-	1999 11 01	703	0.3-	0.7+
1989 10 08	809	2.4+	0.8-	1999 09 09	704	0.1+	0.4-	1999 11 01	703	0.4-	0.5+
1989 10 08	809	2.3+	0.3-	1999 09 09	704	0.0	0.8-	1999 11 01	703	0.9-	0.6+
1989 10 08	809	2.3+	1.0-	1999 09 09	704	0.7+	0.7-	1999 11 01	703	(2.3-	1.9+)
1997 03 28	327	0.1+	0.1-	1999 10 04	704	1.6-	0.4-	1999 11 06	704	0.3-	0.5+
1997 03 28	327	0.7-	0.4-	1999 10 04	704	0.3-	0.0	1999 11 06	704	0.1+	0.6+
1997 03 28	327	0.2+	0.1-	1999 10 04	704	0.2-	0.4-	1999 11 06	704	0.4-	1.0+
1997 04 02	327	0.4-	0.0	1999 10 04	704	0.3-	0.4-	1999 11 06	704	0.5+	1.4+
1997 04 02	327	0.7-	0.0	1999 10 07	704	0.7+	0.2-	1999 11 11	691	0.2+	0.2-
1997 04 02	327	0.6+	0.0	1999 10 07	704	0.3+	0.7-	1999 11 11	691	0.2+	0.0
1997 04 13	327	0.4-	0.1+	1999 10 07	704	0.2+	0.3-	1999 11 11	691	0.2+	0.1-
1997 04 13	327	0.3-	0.2-	1999 10 07	704	0.1+	0.0	1999 11 15	704	0.3-	0.4+
1997 04 13	327	0.0	0.2-	1999 10 07	704	0.0	0.2+	1999 11 15	704	0.3-	0.6+
1997 04 25	327	0.3+	0.1-	1999 10 09	704	0.4-	0.3+	1999 11 15	704	0.6-	0.7+
1997 04 25	327	0.2+	0.4-	1999 10 09	704	0.1-	0.2+	1999 11 15	704	0.5-	0.3+
1997 04 25	327	0.0	0.5-	1999 10 09	704	0.4+	0.2+	1999 11 15	704	0.6-	0.2-
1999 09 09	704	0.1+	0.1-	1999 10 09	704	0.3-	0.1+				
1999 09 09	704	0.3-	0.2+	1999 10 09	704	0.1+	0.1+				

(12484)* 1997 FO₃ = 1998 QZ₁₂

Discovered 1997 Mar. 31 by the Lincoln Laboratory Near-Earth Asteroid Research Team at Socorro.

Id. G. V. Williams (*MPC* 32476)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

				Williams			
<i>M</i>	119.26286	(2000.0)		P		Q	
<i>n</i>	0.21374919	<i>ω</i>	102.54731	-0.01298363		+0.99981680	
<i>a</i>	2.7703399	<i>Ω</i>	166.68473	-0.93948349		-0.00738217	
<i>e</i>	0.1110901	<i>i</i>	3.50096	-0.34234807		-0.01765988	
<i>P</i>	4.61	<i>H</i>	14.5	<i>G</i>	0.15	<i>U</i>	1

Residuals in seconds of arc

1992 03 02	809	(3.2-	0.2+)	1997 04 06	566	(3.2-	0.4+)	1999 10 10	704	0.4-	0.4+
1994 10 09	691	0.3-	0.4+	1997 05 02	910	0.7-	0.7-	1999 10 21	704	0.7+	0.6-
1994 10 09	691	0.2-	0.2+	1997 05 02	910	0.9-	0.8-	1999 10 21	704	0.3-	0.3+
1994 10 09	691	0.1+	0.6+	1997 05 02	910	1.0-	0.8-	1999 10 21	704	0.3+	0.0
1997 03 10	809	1.5+	0.9-	1998 08 17	704	1.3+	0.5-	1999 10 21	704	0.2-	0.6-
1997 03 10	809	1.1+	0.5-	1998 08 17	704	0.7+	0.5+	1999 10 30	691	0.1+	0.1+
1997 03 10	809	1.3+	0.8-	1998 08 17	704	0.1-	0.7-	1999 10 30	691	0.3+	0.0
1997 03 11	809	0.1+	1.2+	1998 08 17	704	0.1+	1.3+	1999 10 30	691	0.1+	0.0
1997 03 11	809	1.5+	1.4+	1998 08 23	704	0.9-	0.6-	1999 11 15	704	0.4-	0.1+
1997 03 11	809	1.0+	1.8+	1998 08 23	704	(2.7-	1.2-)	1999 11 15	704	0.3+	0.3-
1997 03 31	704	0.3+	0.4-	1998 08 23	704	0.5-	1.1-	1999 11 15	704	1.1-	0.0
1997 03 31	704	0.5+	1.0-	1998 08 23	704	0.5+	1.0+	1999 11 15	704	0.6-	1.0-
1997 04 03	704	1.0-	1.7+	1998 08 28	699	0.5-	0.7+	1999 11 15	704	1.3-	0.4-
1997 04 03	704	1.1-	1.3+	1998 08 28	699	0.8-	0.4+	1999 11 17	704	0.4+	0.1+
1997 04 05	704	0.5-	0.4+	1998 08 28	699	0.3-	0.9+	1999 11 17	704	0.2+	0.2+
1997 04 05	704	0.7-	1.3+	1999 10 10	704	0.5+	1.6+	1999 11 17	704	0.1+	0.4-
1997 04 06	566	(2.6-	0.5+)	1999 10 10	704	0.7+	0.9+	1999 11 17	704	0.2-	0.4+
1997 04 06	566	(2.2-	0.4+)	1999 10 10	704	0.4+	0.1+	1999 11 17	704	0.4+	0.1+

(12485)* 1997 GO₁ = 1972 TN₁ = 1976 YK₅ = 1987 QN₁₂

Discovered 1997 Apr. 7 at Haleakala by the JPL Near-Earth Asteroid

Tracking program.

Id. K. Ichikawa (*MPC* 30766)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

				Williams			
<i>M</i>	34.74645	(2000.0)		P		Q	
<i>n</i>	0.26064734	<i>ω</i>	73.32257	+0.93465437		-0.35450765	
<i>a</i>	2.4271718	<i>Ω</i>	307.43244	+0.31171238		+0.85392138	
<i>e</i>	0.1933815	<i>i</i>	1.97054	+0.17104563		+0.38097586	
<i>P</i>	3.78	<i>H</i>	14.3	<i>G</i>	0.15	<i>U</i>	1

Residuals in seconds of arc

1972 10 07	095	0.4-	1.0+	1997 04 08	557	0.7-	0.0	1998 07 21	704	1.1+	0.4-
1976 12 18	095	0.2+	0.6+	1997 04 08	557	0.4-	0.1+	1998 07 21	704	1.1+	0.0
1987 08 28	095	1.4+	1.2-	1997 04 08	557	0.3-	0.2+	1998 07 26	704	1.1+	0.6+
1987 09 16	095	0.5-	1.2-	1997 04 08	557	0.3-	0.0	1998 07 26	704	0.7+	0.2+
1997 03 31	704	(2.2+	0.4-)	1997 04 10	910	0.4-	0.1+	1998 07 26	704	0.2+	0.2+
1997 03 31	704	0.7+	0.2-	1997 04 10	910	0.3-	0.3+	1998 07 26	704	1.4+	1.2+
1997 04 03	704	1.4+	0.5-	1997 04 10	910	0.5-	0.1+	1999 10 12	704	0.6-	0.6-
1997 04 03	704	0.3+	0.5+	1998 06 24	704	0.2-	0.7+	1999 10 12	704	0.6+	0.3+
1997 04 03	704	0.1+	0.1-	1998 06 24	704	0.0	0.8-	1999 10 12	704	0.4-	0.2+
1997 04 03	704	0.1+	0.3-	1998 06 24	704	0.1-	0.1+	1999 10 12	704	0.4+	0.1+
1997 04 05	704	(2.6+	1.1+)	1998 06 24	704	0.8+	0.5-	1999 10 22	704	0.1+	0.4+
1997 04 05	704	1.1+	0.4-	1998 06 26	809	0.7-	0.5-	1999 10 22	704	0.3+	0.4-
1997 04 06	704	1.0+	1.4-	1998 06 26	809	0.4-	0.3-	1999 10 22	704	0.1+	0.1-
1997 04 06	704	1.4+	1.3-	1998 06 26	809	0.7-	0.7-	1999 10 22	704	0.6+	0.4-
1997 04 07	704	0.7+	0.3+	1998 06 26	704	0.5-	0.2-	1999 10 22	704	0.3+	0.0
1997 04 07	704	0.0	1.3+	1998 06 26	704	0.2-	0.0	1999 11 11	703	(0.6-	2.1-)
1997 04 07	566	(2.9+	0.5+)	1998 06 26	704	1.9-	1.3-	1999 11 11	703	0.0	0.1-
1997 04 07	566	0.7-	0.2+	1998 06 26	704	0.8-	0.4+	1999 11 11	703	0.0	0.5+
1997 04 07	566	(2.5-	0.1-)	1998 06 27	809	1.7-	0.5-	1999 11 11	703	0.7-	1.0+
1997 04 07	046	0.4-	0.0	1998 06 27	809	(2.2-	0.1-)	1999 11 16	704	0.6-	1.5-
1997 04 07	046	0.5-	0.1-	1998 06 27	809	(2.7-	0.3-)	1999 11 16	704	0.2-	1.5-
1997 04 08	046	0.8-	0.0	1998 07 01	809	(3.3+	2.1+)	1999 11 16	704	0.3-	0.6-
1997 04 08	557	0.4-	0.0	1998 07 01	809	(3.7+	1.9+)	1999 11 16	704	0.5-	1.0-
1997 04 08	557	0.5-	0.1+	1998 07 01	809	(3.9+	1.0+)	1999 11 16	704	0.5-	1.2-
1997 04 08	557	0.6-	0.1-	1998 07 21	704	0.7+	0.4-				
1997 04 08	557	0.6-	0.0	1998 07 21	704	0.6+	0.0				

(12486)* 1997 GP₆ = 1998 QZ₆₁

Discovered 1997 Apr. 2 by the Lincoln Laboratory Near-Earth Asteroid Research Team at Socorro.

Id. E. Bowell (*MPC* 32476), G. V. Williams (*ibid.*)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>		246.66913		(2000.0)		P		Q	
<i>n</i>	0.26266841	ω	152.02782	−0.99263065	+0.11142426				
<i>a</i>	2.4147054	Ω	34.47186	−0.12081741	−0.87964933				
<i>e</i>	0.0769776	<i>i</i>	4.82768	−0.00935619	−0.46238696				
<i>P</i>	3.75	<i>H</i>	14.3	<i>G</i>	0.15	<i>U</i>	1		

Residuals in seconds of arc

1993 04 14	691	0.4−	0.1−	1997 05 01	704	0.3−	0.1+	1998 09 27	704	0.9+	0.1−
1993 04 14	691	0.2+	0.1−	1998 08 23	704	0.7−	0.4−	1998 09 27	704	0.3+	0.4+
1993 04 14	691	0.2+	0.3+	1998 08 23	704	0.7−	0.7+	1998 09 27	704	0.5−	0.4−
1997 04 02	704	0.5+	0.1−	1998 08 23	704	0.6+	0.4−	1998 09 27	704	0.0	1.1+
1997 04 02	704	0.5+	0.1+	1998 08 23	704	0.7−	0.6−	1998 10 13	704	1.5−	1.4+
1997 04 06	704	0.3+	0.1+	1998 08 23	704	0.0	1.6−	1998 10 13	704	1.3+	0.6−
1997 04 06	704	0.3+	0.9+	1998 08 30	699	0.2+	0.0	1998 10 13	704	0.5−	1.9+
1997 04 07	704	0.0	0.1−	1998 08 30	699	0.7+	0.5−	1998 10 20	699	0.8+	0.8−
1997 04 07	704	0.6+	0.6+	1998 08 30	699	0.5+	0.4+	1998 10 20	699	0.8−	0.3−
1997 04 07	704	0.1−	0.0	1998 09 14	704	0.9+	0.1−	1998 10 20	699	0.2−	0.6−
1997 04 07	704	0.7+	0.7+	1998 09 14	704	1.7+	0.1−	1999 10 13	704	0.3−	0.9+
1997 04 08	704	0.2+	0.5+	1998 09 14	704	0.7−	1.1+	1999 10 13	704	0.7+	0.2−
1997 04 08	704	0.6+	0.3+	1998 09 14	704	0.1−	1.9+	1999 10 13	704	0.2+	0.0
1997 04 08	704	0.6−	1.1+	1998 09 18	704	0.3−	0.3−	1999 10 13	704	0.8+	0.5−
1997 04 08	704	0.2+	0.7+	1998 09 18	704	0.2−	1.6−	1999 11 12	703	0.3−	0.6+
1997 04 30	704	0.2+	0.1−	1998 09 18	704	1.2+	1.6+	1999 11 12	703	0.3−	0.9+
1997 04 30	704	0.2+	0.1+	1998 09 18	704	0.2−	0.5+	1999 11 12	703	1.0−	1.0+
1997 04 30	704	0.3+	0.4−	1998 09 18	704	1.9−	0.8−	1999 11 12	703	0.0	0.4+
1997 04 30	704	0.1+	0.2+	1998 09 25	704	0.7−	0.4+	1999 11 16	704	0.2−	0.7−
1997 04 30	704	0.1−	0.1−	1998 09 25	704	0.6−	0.8−	1999 11 16	704	0.6+	0.5−
1997 05 01	704	0.9−	0.2−	1998 09 25	704	0.3−	0.3−	1999 11 16	704	0.1−	0.1+
1997 05 01	704	0.6−	0.2−	1998 09 25	704	0.1+	0.4+	1999 11 16	704	0.7+	1.2+
1997 05 01	704	0.1−	0.2−	1998 09 25	704	0.6−	1.0+				
1997 05 01	704	0.3−	0.1−	1998 09 27	704	0.0	0.6+				

(12487)* 1997 GJ₈ = 1980 BE = 1998 MJ₁₃

Discovered 1997 Apr. 2 by the Lincoln Laboratory Near-Earth Asteroid Research Team at Socorro.

Id. G. V. Williams (*MPC* 32253)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>		263.66477		(2000.0)		P		Q	
<i>n</i>	0.18256516	ω	237.54271	−0.17102794	−0.97798417				
<i>a</i>	3.0774484	Ω	222.82535	+0.95268651	−0.13320101				
<i>e</i>	0.0958760	<i>i</i>	10.13076	+0.25127249	−0.16063764				
<i>P</i>	5.40	<i>H</i>	13.3	<i>G</i>	0.15	<i>U</i>	1		

Residuals in seconds of arc

1980 01 21	801	0.3−	1.1−	1998 06 19	704	0.8+	0.1−	1999 10 04	704	0.0	0.1+
1997 04 02	704	1.2+	0.2+	1998 06 19	704	0.1−	1.3−	1999 10 06	560	0.2−	0.7−
1997 04 02	704	0.7+	0.1+	1998 06 25	704	1.5+	0.7−	1999 10 06	560	0.2+	0.8−
1997 04 06	704	0.6−	0.5−	1998 06 25	704	0.1+	0.9−	1999 10 06	560	0.2−	0.1−
1997 04 06	704	0.2+	0.2+	1998 06 25	704	1.9−	1.4−	1999 10 07	560	0.7+	0.6+
1997 04 06	704	0.1+	0.0	1998 06 25	704	(3.7−	0.8−)	1999 10 07	560	0.6−	0.9+
1997 04 06	704	0.2+	1.6+	1999 08 20	143	1.5−	0.0	1999 10 07	560	0.4+	0.1+
1997 04 08	704	0.6−	0.1−	1999 08 20	143	0.0	0.1+	1999 10 07	560	0.8−	0.4+
1997 04 08	704	0.3+	0.9+	1999 08 20	143	0.2−	1.0+	1999 10 19	704	0.1−	0.3−
1997 04 30	704	0.0	0.7+	1999 09 08	704	0.3+	0.3+	1999 10 19	704	0.0	0.2−
1997 04 30	704	0.0	0.6+	1999 09 08	704	0.6+	0.3−	1999 10 19	704	0.5+	0.6−
1997 04 30	704	0.3+	0.3+	1999 09 08	704	1.2+	0.1+	1999 10 19	704	0.4−	0.2+
1997 04 30	704	0.9+	0.1+	1999 09 08	704	0.4+	0.1+	1999 10 19	704	1.2−	0.5−
1997 04 30	704	0.1+	0.6+	1999 09 08	704	0.0	0.2−	1999 10 28	703	0.9−	0.0
1997 05 01	704	0.0	0.4+	1999 09 08	704	0.4+	0.1+	1999 10 28	703	0.9−	0.4+

1997 05 01	704	0.4+	0.2+	1999 09 08	704	0.7+	0.5−	1999 10 28	703	0.5−	0.3+
1997 05 01	704	0.6+	0.0	1999 09 08	704	0.3+	0.2+	1999 10 28	703	0.2+	0.6+
1997 05 01	704	0.3+	0.1−	1999 09 08	704	1.0+	0.4−	1999 11 04	703	0.4−	1.0+
1997 05 01	704	0.6+	0.3+	1999 09 08	704	0.3+	0.2−	1999 11 04	703	0.1−	0.4+
1997 05 05	704	0.5−	0.2+	1999 10 03	703	1.1−	0.2−	1999 11 04	703	0.4−	0.9+
1997 05 05	704	0.7−	0.2+	1999 10 03	703	0.1−	0.3+	1999 11 04	703	0.2+	0.6+
1997 05 05	704	0.8−	0.1+	1999 10 03	703	0.3−	0.1+	1999 11 05	704	0.7+	0.7+
1997 05 05	704	1.0−	0.2−	1999 10 03	703	0.0	0.5+	1999 11 05	704	0.8+	0.1+
1997 05 05	704	1.0−	0.3−	1999 10 04	704	0.1−	2.0−	1999 11 05	704	0.1−	0.6+
1998 06 19	704	0.6−	0.5−	1999 10 04	704	0.0	0.6−	1999 11 05	704	0.1+	0.1+
1998 06 19	704	1.0+	1.3+	1999 10 04	704	0.1−	0.7+	1999 11 05	704	0.1+	0.4+

(12488)* 1997 GD₁₅ = 1998 MY₄₇

Discovered 1997 Apr. 3 by the Lincoln Laboratory Near-Earth Asteroid Research Team at Socorro.

Id. B. G. Marsden (*MPC* 32477)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>		41.94179		(2000.0)		P		Q	
<i>n</i>	0.21850088	ω	79.75524	+0.97368230	+0.22630954				
<i>a</i>	2.7300290	Ω	267.16105	−0.21824358	+0.89175797				
<i>e</i>	0.0839355	<i>i</i>	1.54670	−0.06566978	+0.39185675				
<i>P</i>	4.51	<i>H</i>	14.2	<i>G</i>	0.15	<i>U</i>	1		

Residuals in seconds of arc

1992 03 02	809	1.6−	0.5+	1997 04 06	704	0.7−	1.0+	1999 10 22	704	1.7+	0.4+
1994 09 13	691	0.5+	0.1−	1997 04 07	704	1.0+	1.5+	1999 10 22	704	0.3−	0.5+
1994 09 13	691	0.4+	0.2−	1997 04 07	704	0.9−	0.2+	1999 10 22	704	0.7+	0.7+
1994 09 13	691	0.7+	0.1−	1998 06 16	691	1.3−	1.0−	1999 11 03	704	0.1+	0.3−
1994 09 29	691	0.4+	0.2+	1998 06 16	691	1.6−	1.0−	1999 11 03	704	0.2+	0.6+
1994 09 29	691	0.4−	0.3−	1998 06 16	691	1.7−	0.9−	1999 11 03	704	0.0	1.0+
1994 09 29	691	0.1+	0.3−	1998 06 24	704	(2.0−	2.1−)	1999 11 03	704	0.3+	0.5+
1997 03 11	809	1.4+	0.3−	1998 06 24	704	(1.6−	2.4−)	1999 11 03	704	0.2−	1.4+
1997 03 11	809	1.2+	1.4−	1998 06 24	704	(1.1−	2.2−)	1999 11 14	704	0.5−	0.0
1997 03 11	809	1.6+	1.2−	1998 06 24	704	(2.4−	1.6−)	1999 11 14	704	0.5−	0.1+
1997 03 13	809	0.1+	1.6+	1998 06 28	809	0.2+	1.1+	1999 11 14	704	0.7−	0.3+
1997 03 13	809	0.5+	0.5+	1998 06 28	809	0.3−	0.5+	1999 11 14	704	0.8−	0.0
1997 03 13	809	0.4−	0.6−	1998 06 28	809	1.0+	1.1+	1999 11 14	704	1.0−	0.1+
1997 04 03	704	0.7−	0.3−	1998 07 01	809	0.4+	1.1+	1999 11 16	704	(0.2−	3.0+)
1997 04 03	704	0.4−	1.1+	1998 07 01	809	0.6+	1.7+	1999 11 16	704	0.1+	0.5+
1997 04 05	704	0.9+	0.5+	1998 07 01	809	0.1−	1.2+	1999 11 16	704	0.1+	0.1−
1997 04 05	704	0.3+	0.8+	1999 10 22	704	0.3+	0.0	1999 11 16	704	0.5−	0.0
1997 04 06	704	0.1−	0.1−	1999 10 22	704	0.4+	0.4+	1999 11 16	704	0.5−	0.4+

(12489)* 1997 GR₃₆ = 1974 VW₂ = 1995 UW₄₈

Discovered 1997 Apr. 7 by the Lincoln Laboratory Near-Earth Asteroid Research Team at Socorro.

Id. G. V. Williams (*MPC* 30086)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>		324.22041		(2000.0)		P		Q	
<i>n</i>	0.23794429	ω	5.90889	+0.18068496	−0.97905540				
<i>a</i>	2.5792050	Ω	73.70902	+0.89833110	+0.12543824				
<i>e</i>	0.1938234	<i>i</i>	5.60971	+0.40044249	+0.16036137				
<i>P</i>	4.14	<i>H</i>	14.4	<i>G</i>	0.15	<i>U</i>	2		

Residuals in seconds of arc

1974 11 09	808	0.3−	0.8−	1997 04 11	704	0.8+	0.5−	1999 10 30	703	0.4−	0.5+
1974 11 09	808	0.1+	1.0+	1997 04 11	704	1.1+	0.1−	1999 10 30	703	0.5−	0.8+
1995 10 28	327	0.2−	0.3−	1997 04 30	704	0.0	0.1+	1999 10 30	703	0.5−	0.5+
1995 10 28	327	0.8−	0.2+	1997 04 30	704	0.3+	0.7+	1999 10 30	703	0.0	0.9+
1995 10 29	327	0.4+	0.2−	1997 04 30	704	0.4+	0.3+	1999 11 04	704	0.4−	1.4+
1995 10 29	327	0.6+	0.0	1997 04 30	704	0.5+	0.0	1999 11 04	704	0.6−	0.1+
1995 10 29	327	0.2+	0.7+	1997 04 30	704	0.5+	0.6+	1999 11 04	704	0.5−	0.2+
1997 04 06	704	(1.4+	2.5−)	1997 05 27	910	0.2−	0.1−	1999 11 04	704	0.2−	0.5+
1997 04 06	704	0.9−	1.1−	1997 05 27	910	0.2−	0.0	1999 11 04	704	0.6−	0.0
1997 04 06	704	0.0	0.7−	1997 05 27	910	0.3+	0.0	1999 11 15	704	1.7+	0.9+

1999 NOV. 23

M.P.C. 36737

1997 04 06	704	0.2+	0.0	1997 05 29	910	0.0	0.5+	1999 11 15	704	(0.7-	2.5+)
1997 04 07	809	(2.2-	0.1-)	1997 05 29	910	0.1-	0.1+	1999 11 15	704	0.0	0.1+
1997 04 07	809	(3.6-	0.1+)	1997 05 29	910	0.2-	0.1+	1999 11 15	704	0.2+	0.0
1997 04 07	704	0.2-	0.4+	1998 08 02	428	0.7+	1.2+	1999 11 15	704	0.0	0.4-
1997 04 07	809	(3.4-	0.9-)	1998 08 02	428	1.0-	0.7+	1999 11 17	704	0.2-	0.2-
1997 04 07	704	0.4+	0.3-	1999 10 10	704	(0.7-	2.1-)	1999 11 17	704	0.1-	0.1+
1997 04 08	809	0.7+	1.7+	1999 10 10	704	0.5+	1.7-	1999 11 17	704	0.0	0.2-
1997 04 08	809	0.5-	2.0+	1999 10 10	704	0.6-	0.4-	1999 11 17	704	0.0	0.2+
1997 04 08	809	0.3-	1.6+	1999 10 10	704	0.5+	1.2+	1999 11 17	704	0.1+	0.1-

(12490)* 1997 JB₁₃ = 1991 GH₉

Discovered 1997 May 3 by E. W. Elst at the European Southern Observatory.
Id. G. V. Williams (*MPC* 30673)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

M			Williams			Q		
161.38845			(2000.0)			P		
<i>n</i>	0.17159187	ω	55.84062	-0.92914784	+0.36959361			
<i>a</i>	3.2072901	Ω	145.84732	-0.34437258	-0.85614110			
<i>e</i>	0.1214027	<i>i</i>	0.94012	-0.13450581	-0.36114123			
<i>P</i>	5.74	<i>H</i>	14.3	<i>G</i>	0.15	<i>U</i>	1	

Residuals in seconds of arc

1991 04 10	809	0.1-	1.7-	1997 05 03	809	0.1+	0.2-	1998 09 13	691	0.6-	0.9-
1991 04 10	809	1.0-	0.5-	1997 05 03	809	0.9-	1.1-	1998 09 13	691	0.9-	0.6-
1991 04 10	809	1.2-	0.0	1997 05 04	809	1.0+	1.0-	1999 10 05	704	0.3+	0.5-
1991 04 19	809	0.4-	0.6-	1997 05 04	809	(0.6+	2.3-)	1999 10 05	704	0.1+	0.3-
1991 04 19	809	(2.4-	0.9+)	1997 05 04	809	0.0	0.3+	1999 10 05	704	0.1-	0.5-
1991 04 19	809	0.3+	0.6-	1997 05 07	704	0.1+	0.1+	1999 10 05	704	0.3+	0.2-
1993 09 20	691	1.3+	0.6-	1997 05 07	704	0.2+	0.1+	1999 10 05	704	0.1+	0.5-
1993 09 20	691	1.0+	0.6-	1997 05 07	704	0.4-	0.4+	1999 11 01	691	0.4+	0.5-
1993 09 20	691	0.9+	0.4-	1997 05 07	704	0.8+	0.3-	1999 11 01	691	0.5+	0.6-
1996 02 16	566	0.3-	1.8-	1998 08 26	691	0.1+	0.7-	1999 11 01	691	0.3+	0.5-
1996 02 16	566	1.1-	1.6-	1998 08 26	691	0.0	0.5-	1999 11 12	691	0.1+	0.7-
1996 02 16	566	0.4-	1.9-	1998 08 26	691	0.1+	0.5-	1999 11 12	691	0.0	0.5-
1997 05 03	809	0.5+	1.5-	1998 09 13	691	0.9-	0.7-	1999 11 12	691	0.0	0.4-

(12491)* 1997 JE₁₅ = 1990 BJ₅ = 1996 CM₂

Discovered 1997 May 3 by E. W. Elst at the European Southern Observatory.
Id. G. V. Williams (*MPC* 30283, unpublished), A. Milani (unpublished)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

M			Williams			Q		
80.28107			(2000.0)			P		
<i>n</i>	0.19954137	ω	175.31066	+0.76954113	+0.63798178			
<i>a</i>	2.9003300	Ω	144.99702	-0.58747913	+0.72446645			
<i>e</i>	0.0515543	<i>i</i>	2.80089	-0.25034918	+0.26101266			
<i>P</i>	4.94	<i>H</i>	13.4	<i>G</i>	0.15	<i>U</i>	1	

Residuals in seconds of arc

1990 01 29	033	0.6+	1.0+	1998 07 26	809	0.9+	0.6+	1998 10 20	910	0.6-	0.3-
1990 01 29	033	0.7+	0.8+	1998 07 26	699	0.2+	0.0	1998 10 20	910	0.7-	0.2-
1996 02 12	399	0.5+	0.5+	1998 07 26	699	0.1-	1.0-	1998 11 18	910	2.3-	0.3-
1996 02 12	399	1.1-	2.0+	1998 07 26	699	0.5+	0.3-	1998 11 18	910	2.9-	0.3-
1996 02 16	399	1.1-	0.2-	1998 07 27	809	1.5+	0.8+	1998 11 18	910	2.4-	0.6-
1996 02 16	399	0.7-	0.5-	1998 07 27	809	1.0+	1.1+	1998 12 08	704	0.0	1.7-
1996 02 24	399	0.9+	2.1-	1998 07 27	809	0.9+	1.2+	1998 12 08	704	1.6-	0.9+
1996 02 24	399	1.1-	0.4+	1998 08 17	704	0.2-	0.5-	1998 12 08	704	3.1-	0.5+
1996 03 22	566	0.5-	1.0+	1998 08 17	704	0.4-	1.0-	1999 10 21	704	1.4+	0.9+
1996 03 22	566	0.5-	0.3+	1998 08 17	704	0.2+	0.4-	1999 10 21	704	0.2+	0.0
1996 03 22	566	0.6-	0.3+	1998 08 17	704	0.2+	0.5-	1999 10 21	704	0.3+	0.8-
1997 05 03	809	0.3-	1.5+	1998 08 17	704	0.2-	0.6-	1999 10 21	704	0.2-	0.1-
1997 05 03	809	0.4+	2.2+	1998 08 23	704	0.8+	0.3+	1999 11 04	704	0.4+	0.7+
1997 05 03	809	0.2-	0.8+	1998 08 23	704	0.9+	0.1+	1999 11 04	704	0.2+	0.6+
1997 05 04	809	1.3-	2.1+	1998 08 23	704	0.7+	0.6+	1999 11 04	704	0.4+	1.0+
1997 05 04	809	0.8-	2.3+	1998 08 23	704	0.7+	0.3+	1999 11 04	704	0.1-	0.6+
1997 05 04	809	1.8-	1.1+	1998 08 23	704	0.6+	0.7+	1999 11 04	704	0.2-	1.4+
1997 05 07	566	0.8-	0.5-	1998 09 14	704	0.3-	0.5+	1999 11 15	704	0.1-	1.2+
1997 05 07	566	0.6-	0.9-	1998 09 14	704	1.2+	1.6+	1999 11 15	704	0.0	0.9+

1997 05 07	566	1.8-	0.8-	1998 09 14	704	1.0-	0.7-	1999 11 15	704	0.4-	0.9+
1997 06 07	809	2.3+	0.6+	1998 09 14	704	0.7-	0.2-	1999 11 15	704	0.3-	0.9+
1997 06 07	809	2.4+	0.5+	1998 09 14	704	0.2+	0.1+	1999 11 15	704	0.7-	0.9+
1997 06 07	809	2.0+	0.2+	1998 09 18	704	0.7-	0.2+	1999 11 17	704	0.1-	0.6+
1997 06 08	809	2.4+	1.4+	1998 09 18	704	0.8-	0.8-	1999 11 17	704	0.1+	0.7+
1997 06 08	809	2.9+	1.7+	1998 09 18	704	0.1+	1.2-	1999 11 17	704	0.4+	1.1+
1997 06 08	809	2.5+	1.7+	1998 09 18	704	0.8-	1.7+	1999 11 17	704	0.4+	1.5+
1998 07 26	809	1.4+	0.7+	1998 09 18	704	2.3-	0.2+	1999 11 17	704	0.4+	1.1+
1998 07 26	809	0.8+	0.6+	1998 10 20	910	0.7-	0.2-				

(12492)* 1997 JP₁₆ = 1989 VH₂

Discovered 1997 May 3 by E. W. Elst at the European Southern Observatory.
Id. G. V. Williams (*MPC* 32480)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

M			Williams			Q		
158.61043			(2000.0)			P		
<i>n</i>	0.20267841	ω	129.48086	-0.47979426	+0.87550063			
<i>a</i>	2.8703249	Ω	111.75761	-0.82276880	-0.42623990			
<i>e</i>	0.0419649	<i>i</i>	3.54403	-0.30471130	-0.22763611			
<i>P</i>	4.86	<i>H</i>	12.9	<i>G</i>	0.15	<i>U</i>	1	

Residuals in seconds of arc

1989 11 02	046	0.7-	0.7-	1998 08 23	699	0.6+	0.9+	1999 10 21	704	0.0	0.0
1989 11 02	046	1.1-	1.8-	1998 08 23	704	0.8+	1.5+	1999 10 21	704	0.6+	0.3-
1992 05 02	691	1.0+	0.8-	1998 09 14	704	0.4+	0.0	1999 10 21	704	0.2+	0.1-
1992 05 02	691	1.3+	0.7-	1998 09 14	704	0.8-	0.1+	1999 10 30	703	0.3-	0.9+
1992 05 02	691	1.1+	1.0-	1998 09 14	704	0.5-	0.2+	1999 10 30	703	0.3-	0.9+
1995 11 04	327	0.2+	0.1-	1998 09 14	704	0.2-	0.9+	1999 10 30	703	0.7+	0.1+
1995 11 04	327	0.3+	0.2-	1998 09 14	704	0.4-	0.0	1999 10 30	703	0.4-	1.0+
1995 11 04	327	0.2-	0.2+	1998 09 16	699	0.1+	0.1-	1999 11 04	704	0.1-	0.6+
1997 05 03	809	1.1-	1.7+	1998 09 16	699	0.4+	0.2+	1999 11 04	704	0.0	0.4+
1997 05 03	809	0.3-	1.7+	1998 09 16	699	0.2+	0.5+	1999 11 04	704	0.2-	0.9+
1997 05 03	809	0.7-	1.8+	1998 09 18	704	0.1-	0.6+	1999 11 04	704	0.3-	0.8+
1997 05 04	809	(1.3+	2.5+)	1998 09 18	704	0.2+	0.7-	1999 11 04	704	0.5-	0.6+
1997 05 04	809	0.9+	2.0+	1998 09 18	704	0.7+	0.3-	1999 11 15	704	0.1-	0.4+
1997 05 04	809	(1.0+	2.4+)	1998 09 18	704	1.1-	0.9+	1999 11 15	704	0.1-	0.5+
1997 05 04	809	(1.1+	2.3+)	1998 09 18	704	0.7-	1.3+	1999 11 15	704	0.1+	0.4+
1997 05 04	809	(0.4+	2.1+)	1998 09 25	704	0.7+	0.1-	1999 11 15	704	0.4-	0.3+
1997 05 04	809	0.8+	1.4+	1998 09 25	704	0.3+	0.4-	1999 11 15	704	0.1+	0.4+
1997 06 07	809	0.2-	1.8+	1998 09 25	704	0.5+	1.2-	1999 11 15	704	0.2-	0.3+
1997 06 07	809	0.5-	1.5+	1998 09 25	704	0.3-	1.5-	1999 11 15	704	0.0	0.7+
1997 06 07	809	0.5-	1.0+	1998 09 25	704	0.0	1.0-	1999 11 15	704	0.4-	0.1+
1997 06 08	809	(2.0+	4.0+)	1998 12 08	704	(1.8-	2.4-)	1999 11 15	704	0.3-	0.7+
1997 06 08	809	(1.7+	4.1+)	1998 12 08	704	1.6-	0.9-	1999 11 15	704	0.3-	0.1+
1997 06 08	809	(1.5+	4.1+)	1998 12 08	704	(2.1-	2.1-)	1999 11 15	704	0.2-	0.5+
1998 08 17	704	0.5-	0.7+	1998 12 08	704	(3.0-	0.6-)	1999 11 15	704	0.1+	0.4+
1998 08 17	704	0.7+	0.0	1999 10 10	704	1.6+	0.1-	1999 11 15	704	0.2-	0.3+
1998 08 17	704	0.3+	0.0	1999 10 10	704	0.3+	0.3-	1999 11 15	704	0.1+	0.5+
1998 08 17	704	0.4-	0.7-	1999 10 10	704	1.1-	0.9-	1999 11 15	704	0.1+	0.4+
1998 08 17	704	0.2-	1.0-	1999 10 15	704	0.1+	0.2+	1999 11 17	704	0.2-	0.5+
1998 08 23	699	0.3+	0.4+	1999 10 15	704	1.0+	0.3+	1999 11 17	704	0.1-	0.6+
1998 08 23	704	0.4+	0.1-	1999 10 15	704	0.2-	0.2+	1999 11 17	704	0.0	0.4+
1998 08 23	704	0.3-	0.4-	1999 10 15	704	0.7-	0.8-	1999 11 17	704	0.1-	0.5+
1998 08 23	699	0.2+	0.7+	1999 10 21	704	0.4+	0.2+	1999 11 17	704	0.1+	0.5+
1998 08 23	704	0.6+	1.1+	1999 10 21	704	0.1+	0.1-				

Residuals in seconds of arc

1991 08 05	809	0.6+	0.1+	1997 09 01	118	0.6+	0.3-	1998 11 11	704	0.5+	0.9-
1991 08 05	809	0.1-	1.2-	1997 09 02	118	0.0	0.2-	1998 11 11	704	0.2+	0.1-
1991 08 05	809	0.4-	0.3-	1997 09 02	118	0.0	0.6-	1998 11 11	704	0.1-	0.9+
1997 07 31	691	0.1-	0.4+	1997 09 02	118	0.3+	0.6-	1998 11 11	704	1.0-	0.0
1997 07 31	691	1.0-	0.8+	1997 09 22	684	0.3-	0.6+	1998 11 11	704	0.4-	0.8-
1997 07 31	691	0.8-	0.5+	1997 09 22	684	0.3-	0.0	1998 11 19	699	0.5+	0.2-
1997 08 04	684	0.1-	0.3+	1997 09 22	684	0.0	0.3-	1998 11 19	699	0.5+	0.6-
1997 08 04	684	0.1+	0.6+	1997 09 23	684	0.5-	0.4-	1998 11 19	699	0.1+	0.1-
1997 08 05	684	0.2-	0.2+	1997 09 23	684	0.3-	0.1-	1998 12 11	699	0.3-	0.9+
1997 08 05	684	0.0	0.2+	1997 10 02	684	0.1-	0.3-	1998 12 11	699	0.3-	0.2+
1997 08 05	684	0.0	0.4+	1997 10 02	684	0.1-	0.1-	1998 12 11	699	0.7-	0.1-
1997 08 10	684	0.2-	0.3+	1997 10 02	684	0.4-	0.2-	1999 10 10	704	0.7+	0.2+
1997 08 10	684	0.5-	0.4-	1997 09 17	684	0.7+	0.3+	1999 10 10	704	0.4-	0.1+
1997 08 10	684	0.1-	0.4+	1998 09 17	684	0.6+	0.1+	1999 10 10	704	0.5-	0.2+
1997 08 11	684	0.1+	0.5+	1998 09 18	684	0.4+	0.2-	1999 10 21	704	0.6+	0.8+
1997 08 11	684	0.0	0.4+	1998 09 18	684	0.5+	0.2-	1999 10 21	704	0.6+	0.2-
1997 08 11	684	0.1+	0.3+	1998 10 20	684	0.3-	0.2+	1999 10 21	704	1.7+	1.3+
1997 08 23	684	0.3+	0.4+	1998 10 20	684	0.3-	0.0	1999 10 21	704	1.1-	0.2+
1997 08 23	684	0.5+	0.1+	1998 10 24	684	0.3-	0.0	1999 10 21	704	0.4+	0.2-
1997 08 23	684	0.2+	0.3+	1998 10 24	684	0.3-	0.2-	1999 11 17	704	0.2+	0.1-
1997 09 01	684	0.2+	0.0	1998 10 29	704	0.5+	0.1+	1999 11 17	704	0.6-	0.2-
1997 09 01	684	0.3+	0.2-	1998 10 29	704	0.7-	0.5+	1999 11 17	704	0.7-	0.3-
1997 09 01	684	0.3+	0.0	1998 10 29	704	0.0	0.2-	1999 11 17	704	0.4-	0.6+
1997 09 01	118	0.5+	0.1+	1998 10 29	704	0.3-	0.3-				
1997 09 01	118	0.8+	0.3-	1998 10 29	704	0.9+	0.5-				

(12494)* 1998 DH₁₁ = 1988 OB = 1990 HR₁

Discovered 1998 Feb. 25 at Haleakala by the JPL Near-Earth Asteroid

Tracking program.

Id. G. V. Williams (*MPC* 31559)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>		(2000.0)		<i>P</i>		<i>Q</i>	
<i>n</i>	0.36960360	<i>ω</i>	161.20222	+0.50922071	+0.81401779		
<i>a</i>	1.9229969	<i>Ω</i>	138.10415	-0.83349911	+0.54733367		
<i>e</i>	0.0315306	<i>i</i>	24.73458	-0.21441434	-0.19442451		
<i>P</i>	2.67	<i>H</i>	14.9	<i>G</i>	0.15	<i>U</i>	1

Residuals in seconds of arc

1988 07 18	675	0.7-	0.1-	1998 03 25	566	0.4-	0.1+	1999 09 14	704	0.4-	0.7-
1988 07 19	675	0.3+	2.0-	1998 03 25	566	0.2-	0.0	1999 09 14	704	0.5-	0.5-
1988 07 20	675	1.4+	2.1-	1998 03 25	566	0.3-	0.1+	1999 09 14	704	0.0	0.6-
1990 04 20	675	0.7-	1.9-	1998 04 19	699	0.2-	0.2-	1999 10 21	428	0.2+	0.3-
1990 04 22	675	1.4-	1.2-	1998 04 19	699	0.2+	0.3+	1999 10 21	428	0.1+	0.8-
1998 02 25	566	0.1+	1.1-	1998 04 19	699	0.2+	0.2+	1999 11 02	428	0.1+	0.4-
1998 02 25	566	0.2-	0.7-	1998 04 22	566	0.1+	0.4-	1999 11 02	428	0.4+	0.7-
1998 02 25	566	0.1-	0.9-	1998 04 22	566	0.4+	0.4-	1999 11 03	428	0.0	0.0
1998 02 26	566	0.2+	0.1-	1998 04 22	566	0.5+	0.3-	1999 11 03	428	0.3-	0.2-
1998 02 26	566	0.2+	0.3-	1999 09 13	704	0.3+	0.6-	1999 11 13	704	1.4+	0.1+
1998 02 26	566	0.1+	0.1+	1999 09 13	704	0.5+	0.4-	1999 11 13	704	0.0	0.0
1998 02 27	566	0.0	0.2-	1999 09 13	704	(1.2- 2.5-)		1999 11 13	704	0.3+	0.1+
1998 02 27	566	0.2+	0.8-	1999 09 14	704	0.2-	0.9-	1999 11 13	704	0.1-	0.1+
1998 02 27	566	0.0	0.5-	1999 09 14	704	0.2-	0.7-	1999 11 13	704	0.7-	0.0

(12495)* 1998 FJ = 1988 DJ₃

Discovered 1998 Mar. 18 by F. B. Zoltowski at Woomera.

Id. A. Gnädig (*MPC* 34907), M. E. Sansaturio (*ibid.*)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>		(2000.0)		<i>P</i>		<i>Q</i>	
<i>n</i>	0.31170121	<i>ω</i>	3.28528	+0.19406895	+0.98077893		
<i>a</i>	2.1543209	<i>Ω</i>	277.90576	-0.90050412	+0.16992165		
<i>e</i>	0.1471695	<i>i</i>	1.17128	-0.38913953	+0.09591313		
<i>P</i>	3.16	<i>H</i>	15.3	<i>G</i>	0.15	<i>U</i>	1

Residuals in seconds of arc

1988 02 16	809	1.4+	1.2+	1998 04 01	704	0.0	0.0	1999 10 06	704	1.1+	0.5-
1988 02 16	809	0.1+	0.9+	1998 04 01	704	0.1+	0.3+	1999 10 06	704	0.9-	1.2-
1988 02 16	809	0.4-	0.9+	1998 04 01	704	0.0	0.4+	1999 10 06	704	0.7+	0.9-
1995 05 29	413	0.2+	0.6-	1998 04 01	704	0.0	0.1-	1999 10 06	704	0.1-	0.8-
1995 05 29	413	0.2-	1.4+	1998 04 01	704	0.2-	0.6-	1999 10 12	704	0.2+	0.4+
1997 02 03	691	0.6-	0.5-	1998 04 02	426	0.1-	0.2-	1999 10 12	704	0.5+	0.3+
1997 02 03	691	0.7-	0.3-	1998 04 02	426	0.0	0.3-	1999 10 12	704	0.3+	0.2-
1997 02 03	691	0.5-	0.3-	1998 04 02	426	0.1+	0.2-	1999 10 12	704	0.6+	0.4-
1998 03 18	426	0.3+	0.4+	1998 04 17	426	0.5-	0.6-	1999 10 21	704	0.3+	0.1-
1998 03 18	426	0.4-	0.2-	1998 04 17	426	0.8-	0.3-	1999 10 21	704	0.4+	0.3+
1998 03 18	426	0.6+	0.2-	1998 04 17	426	0.1+	0.0	1999 10 21	704	0.1+	0.4-
1998 03 20	704	0.0	0.0	1998 04 19	704	0.0	0.1-	1999 10 21	704	0.2+	0.3-
1998 03 20	704	0.5+	0.4-	1998 04 19	704	0.1-	0.6-	1999 10 21	704	0.1-	1.0-
1998 03 20	704	1.1-	0.8-	1998 04 19	704	0.3+	0.5+	1999 10 29	703	1.3-	0.6+
1998 03 20	704	0.2+	0.5+	1998 04 19	704	0.3-	0.3+	1999 10 29	703	0.1-	0.5+
1998 03 20	704	0.4-	0.1-	1998 04 19	704	0.5+	0.0	1999 10 29	703	0.1+	0.2+
1998 03 20	426	0.7-	0.5-	1998 04 20	704	0.3+	0.1+	1999 10 29	703	0.9-	0.2+
1998 03 20	426	0.2-	0.2-	1998 04 20	704	(2.2- 1.9+)		1999 11 04	704	0.4+	0.0
1998 03 20	426	0.2+	0.0	1998 04 20	704	0.1-	0.4+	1999 11 04	704	0.7+	0.1+
1998 03 21	426	0.1+	0.0	1998 04 20	704	0.1-	0.9+	1999 11 04	704	0.1+	0.6-
1998 03 21	426	0.2-	0.7-	1998 04 20	552	0.3+	0.9-	1999 11 04	704	0.9+	1.3-
1998 03 21	426	0.4+	0.2-	1998 04 20	552	0.0	0.5+	1999 11 04	704	0.1-	0.6-
1998 03 22	704	1.3-	0.8-	1998 04 22	426	0.4-	0.3-	1999 11 11	703	0.3-	0.8+
1998 03 22	704	0.9+	0.4+	1998 04 22	426	0.0	0.8-	1999 11 11	703	0.8-	0.4+
1998 03 22	704	0.4+	1.7-	1998 04 22	426	0.7-	0.5-	1999 11 11	703	0.5-	0.6+
1998 03 22	704	1.0+	0.1-	1998 04 22	552	0.3-	0.5-	1999 11 11	703	0.2-	0.3-
1998 03 28	704	0.1+	0.0	1998 04 22	552	0.1-	0.8-	1999 11 14	704	0.4+	0.2+
1998 03 28	704	0.6-	0.5+	1998 04 22	552	0.1-	1.0-	1999 11 14	704	0.2+	0.1-
1998 03 28	704	0.2+	0.0	1998 04 25	552	0.1+	0.2-	1999 11 14	704	0.5+	0.1+
1998 03 28	704	0.5-	0.7+	1998 04 25	552	0.2+	0.8-	1999 11 14	704	0.2-	0.1+
1998 03 28	704	0.1-	0.1+	1998 04 25	552	0.2+	0.2+	1999 11 14	704	0.2+	0.1+
1998 03 29	704	0.2+	0.2-	1998 05 15	426	0.4-	0.1-	1999 11 16	704	0.2+	0.2+
1998 03 29	704	0.3+	0.4+	1998 05 15	426	0.1-	0.2+	1999 11 16	704	0.9-	0.1-
1998 03 29	704	0.3-	0.4+	1998 05 15	426	0.1-	0.3+	1999 11 16	704	0.4+	0.1+
1998 03 29	704	0.5+	0.9+	1998 05 18	426	0.5-	0.1-	1999 11 16	704	0.2+	0.2-
1998 03 29	704	0.4+	0.9+	1998 05 18	426	0.0	0.5+	1999 11 16	704	0.4-	0.1-

(12496)* 1998 FF₉ = 1991 PX₁₃ = 1995 SL₄

Discovered 1998 Mar. 22 by Spacewatch at Kitt Peak.

Id. G. V. Williams (*MPC* 31747)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>		(2000.0)		<i>P</i>		<i>Q</i>	
<i>n</i>	0.25804313	<i>ω</i>	231.69350	+0.70035633	+0.71069927		
<i>a</i>	2.4434747	<i>Ω</i>	82.90231	-0.63223623	+0.66081850		
<i>e</i>	0.1881309	<i>i</i>	3.83608	-0.33132816	+0.24129954		
<i>P</i>	3.82	<i>H</i>	14.4	<i>G</i>	0.15	<i>U</i>	1

Residuals in seconds of arc

1991 08 06	675	0.4-	0.6-	1998 04 21	910	1.6+	0.5-	1999 10 09	704	0.5-	0.4+
1991 08 06	675	0.7-	0.5-	1998 04 22	704	(2.3+	0.5+)	1999 10 09	704	0.5-	0.6+
1991 08 10	675	0.3+	0.4-	1998 04 22	704	0.3-	0.2+	1999 10 09	704	0.3-	0.5+
1991 08 10	675	0.0	0.2-	1998 04 22	704	0.3-	0.3+	1999 10 09	888	0.1+	0.3+
1995 09 20	400	0.3-	1.4-	1998 04 22	704	0.5+	0.3-	1999 10 09	888	0.2+	0.9+
1995 09 20	400	0.6+	1.0-	1998 04 22	704	0.5+	0.5+	1999 10 09	888	0.0	1.4+
1995 09 21	400	1.9+	1.2+	1998 04 24	910	1.3+	0.6-	1999 10 15	704	0.6-	0.3+
1995 09 21	400	0.2+	0.9+	1998 04 24	910	1.5+	0.4-	1999 10 15	704	0.6-	0.2-
1995 09 30	400	(2.5-	1.0-)	1998 04 24	910	1.5+	0.5-	1999 10 15	704	0.6-	0.8-
1995 09 30	400	0.0	1.5+	1998 05 16	704	0.4-	0.5+	1999 10 15	704	1.7+	0.2-
1997 01 10	566	0.1-	0.6-	1998 05 16	704	0.1-	1.2+	1999 11 03	703	0.4-	0.3+
1997 01 10	566	0.3+	0.6-	1998 05 16	704	1.0+	1.7+	1999 11 03	703	0.8-	0.7+
1997 01 10	566	0.1+	0.2-	1998 05 16	704	0.2+	1.2+	1999 11 03	703	1.4-	0.2+
1998 03 22	691	0.5-	1.0+	1999 09 30	703	0.3-	0.0	1999 11 03	703	0.4-	0.1+
1998 03 22	691	0.6-	0.7+	1999 09 30	703	0.9-	0.2-	1999 11 05	704	0.4+	0.1-
1998 03 22	691	0.5-	0.8+	1999 09 30	703	0.4+	0.3-	1999 11 05	704	0.5+	0.2-
1998 03 25	691	1.0-	0.2+	1999 09 30	703	0.1+	0.3+	1999 11 05	704	0.1-	0.1-

1999 NOV. 23

M.P.C. 36739

1998 03 25	691	1.2-	0.3+	1999 10 04	703	0.2-	0.3-	1999 11 05	704	0.7+	0.5-
1998 03 25	691	0.9-	0.7+	1999 10 04	703	0.3-	0.2+	1999 11 05	704	0.2+	1.2-
1998 03 29	704	0.6-	1.2+	1999 10 04	703	0.4-	0.1-	1999 11 15	704	0.1+	0.1+
1998 03 29	704	1.0-	1.0+	1999 10 04	703	0.3-	0.1-	1999 11 15	704	0.2-	0.4-
1998 03 29	704	0.8-	0.3+	1999 10 07	106	0.3-	0.3-	1999 11 15	704	0.1+	0.0
1998 03 29	704	0.3-	0.2-	1999 10 07	106	0.6-	0.3-	1999 11 15	704	0.1+	0.1-
1998 03 29	704	0.3+	1.5-	1999 10 07	106	0.9-	0.4-	1999 11 15	704	0.1+	0.1+
1998 04 21	704	2.0+	0.2-	1999 10 07	704	1.1+	0.9+	1999 11 17	704	0.2+	1.1+
1998 04 21	704	0.6-	0.3-	1999 10 07	704	0.4-	0.6+	1999 11 17	704	0.2-	0.2-
1998 04 21	704	0.8-	0.1-	1999 10 07	704	0.5+	0.7+	1999 11 17	704	0.2-	0.9+
1998 04 21	704	0.5-	0.3+	1999 10 07	704	0.8+	0.2-	1999 11 17	704	0.1+	0.0
1998 04 21	704	0.7-	0.7+	1999 10 07	704	0.7-	1.1+	1999 11 17	704	0.0	0.1+
1998 04 21	910	1.7+	0.5-	1999 10 09	704	0.1-	0.1+				
1998 04 21	910	1.5+	0.5-	1999 10 09	704	0.1+	0.5+				

(12497)* 1998 FQ₁₄ = 1990 TR₆

Discovered 1998 Mar. 26 by the OCA-DLR Asteroid Survey at Caussols.
Id. G. V. Williams (*MPC* 31992)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5				Williams	
M	48.03110		(2000.0)	P	Q
n	0.22422705	ω	76.37615	+0.22501884	+0.97284868
a	2.6833503	Ω	206.81431	-0.93392580	+0.19950687
e	0.2871323	i	6.89409	-0.27775731	+0.11731345
P	4.40	H	14.7	G	0.15
				U	1

Residuals in seconds of arc

1990 10 09	413	0.6-	0.9+	1998 04 18	704	0.5-	1.2+	1999 10 09	704	0.1+	0.3-
1990 10 11	413	0.0	1.1+	1998 04 18	704	0.7-	0.4+	1999 10 09	704	0.1-	0.7-
1995 11 17	691	0.0	0.4-	1998 04 18	704	0.1+	0.1+	1999 10 10	106	0.2-	0.8+
1995 11 17	691	0.1+	0.3-	1998 04 18	704	1.2-	1.1-	1999 10 10	106	0.2-	0.7+
1995 11 17	691	0.2+	0.6-	1998 04 19	704	0.3+	0.3+	1999 10 10	106	0.5+	0.7+
1998 03 20	704	0.7+	0.3+	1998 04 19	704	0.3-	0.9+	1999 10 15	704	0.7+	0.1+
1998 03 20	704	0.6-	0.7+	1998 04 19	704	0.4-	0.8+	1999 10 15	704	0.2-	0.4+
1998 03 20	704	0.7+	0.5+	1998 04 19	704	0.5+	1.1+	1999 10 15	704	0.0	0.2-
1998 03 20	704	0.1-	1.1+	1998 04 19	704	0.4-	0.1+	1999 10 15	704	0.9-	0.1+
1998 03 20	704	0.2-	0.4-	1999 07 23	704	0.9-	1.1+	1999 10 15	704	0.8-	0.8-
1998 03 22	704	1.3+	1.0+	1999 07 23	704	0.5+	1.3+	1999 10 19	704	0.1-	0.4+
1998 03 22	704	0.0	0.3+	1999 07 23	704	1.0+	0.7+	1999 10 19	704	0.8+	0.1-
1998 03 22	704	0.7-	0.7+	1999 10 01	703	0.4-	0.6+	1999 10 19	704	0.5+	0.4+
1998 03 22	704	1.4+	0.3-	1999 10 01	703	0.4+	0.2+	1999 10 19	704	0.5+	0.1+
1998 03 23	691	0.8+	0.7+	1999 10 01	703	0.1+	0.6+	1999 10 19	704	0.4+	1.2+
1998 03 23	691	0.8+	0.6+	1999 10 01	703	0.8-	0.4+	1999 11 01	703	0.7-	0.2+
1998 03 23	691	0.7+	0.6+	1999 10 04	704	0.9+	0.6+	1999 11 01	703	0.5+	0.6-
1998 03 26	910	1.2+	0.8-	1999 10 04	704	0.4+	0.1-	1999 11 01	703	0.7-	0.1-
1998 03 27	910	0.9+	0.5-	1999 10 04	704	0.2+	0.1+	1999 11 01	703	0.1-	0.1+
1998 03 27	910	1.0+	0.6-	1999 10 04	704	1.3-	0.9-	1999 11 04	703	1.1-	0.8+
1998 03 28	910	1.2+	0.9-	1999 10 04	704	0.5-	0.2-	1999 11 04	703	1.2-	1.4+
1998 03 28	910	1.0+	0.9-	1999 10 06	704	(3.6+ 0.4+)		1999 11 04	703	1.3-	0.5-
1998 03 28	910	1.0+	0.8-	1999 10 06	704	0.2-	0.0	1999 11 04	703	0.7-	0.0
1998 03 28	704	0.5-	0.3-	1999 10 06	704	0.2+	0.1+	1999 11 05	704	0.2-	0.3+
1998 03 28	704	0.4-	0.4+	1999 10 06	704	0.1+	0.0	1999 11 05	704	0.8+	0.0
1998 03 28	704	0.8-	0.4-	1999 10 06	560	0.7-	0.4-	1999 11 05	704	0.1-	0.7+
1998 03 28	704	0.3-	0.4+	1999 10 06	560	0.8-	0.6-	1999 11 05	704	0.5-	0.4+
1998 03 28	704	0.9-	0.1-	1999 10 06	560	0.2+	0.3-	1999 11 09	704	0.3+	0.5+
1998 03 29	704	0.2+	0.7-	1999 10 07	704	0.2+	1.2-	1999 11 09	704	0.2+	0.0
1998 03 29	704	0.8+	0.2-	1999 10 07	704	0.4+	0.7-	1999 11 09	704	0.2-	0.1+
1998 03 29	704	0.8-	0.8+	1999 10 07	704	0.9-	1.4-	1999 11 09	704	0.3-	0.1-
1998 03 29	704	0.8-	1.0+	1999 10 07	704	0.6+	0.6-	1999 11 09	704	0.1-	0.1-
1998 03 29	704	0.3-	0.5-	1999 10 07	704	0.0	0.1-	1999 11 12	704	0.3+	0.7+
1998 04 01	704	0.3-	0.4+	1999 10 08	560	1.3+	1.5-	1999 11 12	704	0.5+	0.8+
1998 04 01	704	1.5-	0.3-	1999 10 08	560	0.4+	0.6-	1999 11 12	704	0.3+	0.9+
1998 04 01	704	1.1-	1.4+	1999 10 09	704	0.4+	0.3-	1999 11 12	704	0.2+	0.7+
1998 04 01	704	0.0	0.5-	1999 10 09	704	0.0	0.2-	1999 11 12	704	0.5+	0.9+
1998 04 18	704	0.0	0.6-	1999 10 09	704	0.4+	0.4-				

(12498)* 1998 FY₁₄ = 1990 RC₁₁

Discovered 1998 Mar. 26 by the OCA-DLR Asteroid Survey at Caussols.
Id. A. Gnädig (*MPC* 34909), M. E. Sansaturio (*ibid.*)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5						Williams					
<i>M</i>	43.82503		(2000.0)		P		Q				
<i>n</i>	0.22586592	ω	285.43043		+0.27993262		+0.96001366				
<i>a</i>	2.6703545	Ω	0.84839		-0.76937384		+0.22645349				
<i>e</i>	0.2508463	<i>i</i>	13.24005		-0.57419651		+0.16459827				
<i>P</i>	4.36	<i>H</i>	13.8		<i>G</i>	0.15	<i>U</i>	1			
Residuals in seconds of arc											
1990 09 14	675	0.9+	0.9-	1998 04 01	704	0.2+	0.9+	1999 10 09	704	0.2-	0.1+
1990 09 14	675	0.3+	1.0-	1998 04 01	704	0.2-	1.4+	1999 10 09	704	0.1+	0.4+
1993 03 22	675	0.1-	1.4-	1998 04 01	704	0.7-	0.3+	1999 10 09	704	0.0	0.1-
1993 03 22	675	1.2-	0.6+	1998 04 01	704	0.4-	0.4+	1999 10 09	704	0.2-	0.3+
1997 12 08	910	1.2-	0.2+	1998 04 18	704	0.2-	0.3+	1999 10 09	704	0.2-	0.2-
1997 12 08	910	1.3-	0.0	1998 04 18	704	0.6-	1.0+	1999 10 13	704	0.3-	0.1+
1997 12 08	910	0.9-	0.3-	1998 04 18	704	0.0	0.5+	1999 10 13	704	0.5-	0.5+
1998 02 26	566	0.2-	0.2-	1998 04 18	704	0.3-	0.4+	1999 10 13	704	0.1+	0.4+
1998 02 26	566	0.2+	0.4-	1998 04 19	704	0.7+	0.4+	1999 10 13	704	0.0	0.4+
1998 02 26	566	0.4-	0.4-	1998 04 19	704	0.2-	0.6+	1999 10 13	704	0.0	0.6+
1998 03 20	704	0.2+	0.3-	1998 04 19	704	0.2-	0.6+	1999 10 15	704	0.2-	0.4-
1998 03 20	704	0.2+	0.8-	1998 04 19	704	0.2-	0.9+	1999 10 15	704	0.4-	0.2-
1998 03 20	704	0.6-	0.3+	1998 04 19	704	0.4+	1.2+	1999 10 15	704	0.1+	0.4-
1998 03 20	704	0.4+	1.7-	1998 04 20	704	0.7-	0.5+	1999 10 15	704	0.1-	0.7-
1998 03 20	704	0.2+	1.2-	1998 04 20	704	0.9-	1.4+	1999 10 15	704	0.1-	0.7-
1998 03 22	704	0.2-	0.7-	1998 04 20	704	1.1-	1.4+	1999 10 16	704	0.2+	0.3-
1998 03 22	704	0.1+	0.4-	1998 04 20	704	(0.7-	2.2+)	1999 10 16	704	0.3+	0.5+
1998 03 22	704	0.2-	0.7-	1998 04 20	704	1.2-	0.8+	1999 10 16	704	0.0	0.1+
1998 03 22	704	0.1+	0.7+	1998 05 02	699	0.3+	0.9+	1999 10 16	704	0.0	0.3+
1998 03 22	704	0.4+	1.0-	1998 05 02	699	1.3+	0.3+	1999 10 16	704	0.1+	0.0
1998 03 24	691	0.5+	0.8+	1998 05 02	699	1.0+	0.9+	1999 10 19	704	0.1-	0.1-
1998 03 24	691	0.4+	0.5+	1999 09 05	699	0.4-	0.6+	1999 10 19	704	0.3-	0.2-
1998 03 24	691	0.4+	0.5+	1999 09 05	699	0.0	0.3+	1999 10 19	704	0.1-	0.0
1998 03 26	910	1.3+	0.2+	1999 09 05	699	0.4-	0.7+	1999 10 19	704	0.1+	0.0
1998 03 27	910	1.5+	0.4+	1999 09 07	704	0.3-	0.2-	1999 10 19	704	0.1-	0.0
1998 03 27	910	1.3+	0.4+	1999 09 07	704	0.7-	0.5+	1999 10 29	703	0.1-	1.0+
1998 03 28	910	1.2+	0.3+	1999 09 07	704	0.1-	0.2+	1999 10 29	703	0.4-	0.6+
1998 03 28	910	1.2+	0.2+	1999 09 07	704	0.7-	0.3-	1999 10 29	703	0.6-	0.5+
1998 03 28	910	1.1+	0.3+	1999 09 07	704	0.7-	0.9-	1999 10 29	703	0.7-	0.7+
1998 03 28	704	0.3+	0.3+	1999 09 30	703	0.5-	0.0	1999 11 03	703	0.5-	0.7+
1998 03 28	704	0.3-	0.3+	1999 09 30	703	0.4-	0.4+	1999 11 03	703	0.3-	0.4+
1998 03 28	704	0.2+	0.1-	1999 09 30	703	0.5-	0.1+	1999 11 03	703	0.4-	1.0+
1998 03 28	704	0.6-	0.1-	1999 09 30	703	0.4-	0.5+	1999 11 03	703	0.1-	0.1+
1998 03 28	704	0.5-	0.0	1999 10 04	704	0.1-	0.3+	1999 11 05	704	0.6+	0.2+
1998 03 28	910	1.5+	0.0	1999 10 04	704	0.2-	0.3+	1999 11 05	704	0.8+	0.3-
1998 03 28	910	1.4+	0.0	1999 10 04	704	0.2-	0.2-	1999 11 05	704	0.1-	0.6+
1998 03 29	910	1.4+	0.0	1999 10 04	704	0.3+	0.3+	1999 11 05	704	0.2-	0.4+
1998 03 29	704	0.1+	0.3+	1999 10 04	704	0.1+	0.5+	1999 11 05	704	0.3-	0.7+
1998 03 29	704	0.7+	0.0	1999 10 07	704	0.3-	0.3+	1999 11 13	699	1.0-	0.2-
1998 03 29	704	0.0	0.0	1999 10 07	704	0.5-	0.5+	1999 11 13	699	0.2+	0.1+
1998 03 29	704	1.0+	0.4+	1999 10 07	704	0.3-	0.7+	1999 11 13	699	0.7+	0.6-
1998 03 29	704	0.0	0.1-	1999 10 07	704	0.2-	0.6+				
1998 04 01	704	0.0	0.5-	1999 10 07	704	0.8+	1.4+				

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	358.33481		(2000.0)	P	Q
<i>n</i>	0.29948795	ω	6.24851	+0.95866708	+0.28084251
<i>a</i>	2.2124993	Ω	337.28019	-0.26590271	+0.82718323
<i>e</i>	0.2287149	<i>i</i>	6.78960	-0.10125803	+0.48671901
<i>P</i>	3.29	<i>H</i>	13.9	<i>G</i>	0.15

Residuals in seconds of arc

1943 09 23	020	(2.0- 4.0-)	1998 04 01	704	1.9- 0.4-	1999 09 29	703	0.1- 0.3+
1943 10 03	020	0.6+ 1.1-	1998 04 01	704	0.3- 0.6-	1999 09 29	703	0.3- 0.3+
1991 01 17	033	0.3+ 0.9-	1998 04 01	704	1.4- 0.2+	1999 09 29	703	0.4- 0.2+
1991 01 17	033	0.3+ 0.7-	1998 04 18	704	0.6- 0.8-	1999 09 29	703	0.6- 0.1+
1991 01 18	033	(3.0+ 1.6-)	1998 04 18	704	0.3+ 0.5-	1999 10 04	704	(3.8- 0.9-)
1998 02 27	566	0.1- 0.5+	1998 04 18	704	0.1- 0.8-	1999 10 04	704	0.2- 0.3-
1998 02 27	566	0.0 0.1+	1998 04 18	704	(0.1+ 2.3-)	1999 10 04	704	0.1+ 0.1-
1998 02 27	566	0.0 0.4+	1998 04 19	704	1.1- 0.7-	1999 10 04	704	0.1- 0.5-
1998 03 20	704	0.8+ 0.7+	1998 04 19	704	0.8- 0.0	1999 10 04	704	0.4- 0.4-
1998 03 20	704	0.2- 0.2+	1998 04 19	704	0.8- 0.3+	1999 10 16	145	0.6+ 0.8-
1998 03 20	704	0.5+ 0.6+	1998 04 19	704	(2.2- 0.4-)	1999 10 16	145	0.6+ 0.7-
1998 03 20	704	0.2+ 0.2+	1998 04 19	704	0.4- 0.5-	1999 10 16	145	0.5+ 0.8-
1998 03 20	704	0.3+ 0.4+	1999 07 16	704	0.1+ 0.4-	1999 10 16	145	0.5+ 0.8-
1998 03 22	704	0.5+ 0.5+	1999 07 16	704	0.3- 0.7-	1999 10 19	704	1.6+ 0.3+
1998 03 22	704	0.5+ 0.5+	1999 07 16	704	0.1+ 0.5-	1999 10 19	704	0.0 0.0
1998 03 22	704	0.8+ 0.3+	1999 07 16	704	0.7+ 0.4-	1999 10 19	704	0.1- 0.2-
1998 03 22	704	0.9+ 0.3+	1999 07 16	704	0.0 1.3-	1999 10 19	704	0.1+ 0.5-
1998 03 22	704	1.0+ 0.2-	1999 08 10	106	0.6+ 0.2-	1999 10 19	704	(2.2- 0.4-)
1998 03 28	704	0.3+ 0.2+	1999 08 10	106	0.7+ 0.9+	1999 10 21	716	0.6- 0.0
1998 03 28	704	0.1- 0.8+	1999 08 10	106	0.7- 0.2+	1999 10 21	716	0.2- 0.3-
1998 03 28	704	0.1- 0.2-	1999 08 13	699	0.2+ 0.6+	1999 10 22	716	0.7+ 0.2+
1998 03 28	704	0.4- 0.6-	1999 08 13	699	0.2+ 1.3+	1999 10 22	716	0.2+ 0.1-
1998 03 28	704	0.8- 0.8-	1999 08 13	699	0.2+ 0.7+	1999 11 12	703	0.0 0.2+
1998 03 29	704	0.2+ 0.4-	1999 09 07	704	0.5+ 0.6-	1999 11 12	703	0.2- 0.3+
1998 03 29	704	0.6+ 0.3-	1999 09 07	704	0.3+ 0.3-	1999 11 12	703	0.0 0.3+
1998 03 29	704	0.3- 0.3-	1999 09 07	704	0.2+ 0.5-	1999 11 12	703	0.3- 0.3+
1998 03 29	704	0.2- 1.0-	1999 09 07	704	0.5- 0.0	1999 11 15	699	0.6- 0.2-
1998 03 29	704	0.5- 1.0-	1999 09 08	699	0.2- 1.0+	1999 11 15	699	0.7- 0.1+
1998 04 01	704	0.6- 0.5-	1999 09 08	699	0.3- 0.5+	1999 11 15	699	0.4- 0.1+
1998 04 01	704	0.6+ 0.1+	1999 09 08	699	0.3- 0.3+			

(12500)* 1998 FB₄₉ = 1986 WZ₉ = 1992 OW₉

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Research Team at Socorro.

Id. G. V. Williams (*MPC* 31752)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	51.24481		(2000.0)	P	Q
<i>n</i>	0.29963805	ω	333.03470	+0.51762082	+0.85538173
<i>a</i>	2.2117604	Ω	328.12685	-0.77809977	+0.46099433
<i>e</i>	0.1766383	<i>i</i>	2.14550	-0.35585029	+0.23623364
<i>P</i>	3.29	<i>H</i>	14.9	<i>G</i>	0.15

Residuals in seconds of arc

1986 11 30	381	0.3- 0.7+	1998 03 29	704	0.6+ 0.5+	1999 10 13	704	0.2+ 0.1-
1986 11 30	381	(4.1+ 2.7+)	1998 03 29	704	0.7- 0.1-	1999 10 13	704	0.6- 0.0
1986 12 01	381	0.5+ 1.7+	1998 03 29	704	0.4- 0.5-	1999 10 15	704	0.0 0.1-
1986 12 01	381	0.1- 0.0	1998 03 29	428	0.8+ 0.0	1999 10 15	704	0.1+ 0.4-
1992 07 30	809	1.3- 0.1-	1998 03 29	428	0.6- 0.1+	1999 10 15	704	0.0 0.4-
1992 07 30	809	0.8- 0.1+	1998 04 01	704	0.1- 0.7+	1999 10 15	704	0.2+ 0.4-
1992 07 30	809	0.2- 0.1+	1998 04 01	704	0.1- 0.5+	1999 10 15	704	0.0 0.0
1992 07 31	809	0.0 0.7+	1998 04 01	704	0.9- 0.3-	1999 10 21	704	0.0 0.3-
1992 07 31	809	0.4+ 0.5+	1998 04 01	704	0.7- 0.6+	1999 10 21	704	0.1- 0.3-
1992 07 31	809	1.1+ 0.5+	1998 04 18	704	1.0+ 0.3-	1999 10 21	704	0.1- 0.7-
1996 12 17	566	0.9- 0.5-	1998 04 18	704	0.7+ 0.5-	1999 10 21	704	0.0 0.4-
1996 12 17	566	0.4- 0.8-	1998 04 18	704	0.6- 1.5-	1999 10 21	704	0.3- 0.1-
1996 12 17	566	0.5- 0.3-	1998 04 18	704	0.9+ 0.8-	1999 10 29	703	0.4- 0.3+
1998 02 23	566	0.1+ 0.3+	1998 04 18	704	(3.2- 0.5-)	1999 10 29	703	0.7- 0.3-

1998 02 23	566	0.6+ 0.1-	1998 04 19	704	0.3+ 0.7-	1999 10 29	703	0.8- 0.1+
1998 02 23	566	0.4+ 0.1-	1998 04 19	704	0.1+ 0.5+	1999 10 29	703	0.4- 0.2-
1998 03 20	704	0.1- 0.9-	1998 04 19	704	0.0 0.0	1999 11 04	704	0.2+ 0.0
1998 03 20	704	0.3+ 0.0	1998 04 19	704	0.3+ 0.6-	1999 11 04	704	0.1- 0.2-
1998 03 20	704	0.3+ 0.1+	1998 04 19	704	0.3+ 0.6-	1999 11 04	704	0.2+ 0.1-
1998 03 20	704	0.7+ 1.1+	1999 10 03	704	0.1- 0.1+	1999 11 04	704	0.2- 0.2-
1998 03 20	704	0.1+ 0.0	1999 10 03	704	0.3- 0.5-	1999 11 04	704	0.4- 0.1+
1998 03 22	704	0.3- 0.1-	1999 10 03	704	0.1- 0.4-	1999 11 11	703	0.0 0.4+
1998 03 22	704	0.3- 0.0	1999 10 03	704	0.1- 0.2+	1999 11 11	703	0.5- 0.1+
1998 03 22	704	0.3+ 0.5-	1999 10 03	704	0.0 0.0	1999 11 11	703	0.5- 0.3-
1998 03 22	704	0.1+ 0.4-	1999 10 07	704	0.1+ 0.1-	1999 11 11	703	0.9- 0.2+
1998 03 22	704	0.2- 0.3-	1999 10 07	704	0.1- 0.8-	1999 11 14	704	0.2+ 0.6+
1998 03 27	428	0.4+ 0.6+	1999 10 07	704	0.8- 0.3-	1999 11 14	704	0.3+ 0.6+
1998 03 27	428	0.7- 1.3+	1999 10 07	704	0.9+ 0.8-	1999 11 14	704	0.1- 1.5+
1998 03 28	704	0.3+ 0.3+	1999 10 07	704	0.2+ 0.3-	1999 11 14	704	0.3+ 0.8+
1998 03 28	704	0.1+ 1.0+	1999 10 10	704	0.3+ 0.1+	1999 11 14	704	0.3+ 0.9+
1998 03 28	704	0.3- 0.1+	1999 10 10	704	0.2+ 0.1-	1999 11 16	704	0.5+ 1.1+
1998 03 28	704	0.3- 0.0	1999 10 10	704	1.3+ 0.3-	1999 11 16	704	0.6+ 0.7+
1998 03 28	704	0.6- 0.6+	1999 10 10	704	0.0 0.3-	1999 11 16	704	0.7+ 0.6+
1998 03 28	428	0.0 0.6+	1999 10 10	704	0.3+ 0.3-	1999 11 16	704	0.5+ 0.2+
1998 03 28	428	1.0- 0.3-	1999 10 13	704	(2.3- 0.7-)	1999 11 16	704	0.5+ 0.6+
1998 03 29	704	0.2+ 0.7+	1999 10 13	704	0.1+ 0.1+			
1998 03 29	704	0.6+ 0.2+	1999 10 13	704	0.0 0.2+			

(12501)* 1998 FL₆₆ = 1977 LK₁ = 1980 EA

Discovered 1998 Mar. 20 by the Lincoln Laboratory Near-Earth Asteroid

Research Team at Socorro.

Id. G. V. Williams (*MPC* 31757)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	65.13684		(2000.0)	P	Q
<i>n</i>	0.27689839	ω	268.14745	+0.31259893	+0.94987386
<i>a</i>	2.3312513	Ω	20.07037	-0.86603388	+0.28700931
<i>e</i>	0.1971249	<i>i</i>	0.77542	-0.39021434	+0.12395692
<i>P</i>	3.56	<i>H</i>	14.2	<i>G</i>	0.15

Residuals in seconds of arc

1977 06 13	675	1.4+	0.3+	1998 04 20	704	0.7+	0.1+	1999 10 10	704	0.6+	1.1+
1977 06 14	675	1.7-	0.4+	1998 04 20	704	0.2-	0.3-	1999 10 12	106	0.0	0.5+
1980 03 10	801	1.0+	2.0+	1998 04 20	704	0.7+	0.2-	1999 10 12	106	1.0-	0.1-
1980 03 12	801	0.4+	0.9+	1998 04 22	704	0.5-	0.3+	1999 10 12	106	0.3-	0.5+
1980 03 13	801	0.3+	1.4-	1998 04 22	704	0.3-	0.4+	1999 10 12	691	0.1-	0.1+
1997 01 14	599	0.5-	0.6+	1998 04 22	704	0.2-	0.3+	1999 10 12	691	0.0	0.1+
1997 01 14	599	0.8-	0.8+	1998 04 22	704	0.1-	0.6+	1999 10 12	691	0.0	0.1+
1998 03 20	704	0.2+	0.3+	1998 04 22	704	0.2-	0.9+	1999 10 15	704	0.3-	0.7+
1998 03 20	704	0.5-	0.3+	1998 04 30	699	1.0-	0.1-	1999 10 15	704	0.6-	0.8+
1998 03 20	704	0.2+	0.6+	1998 04 30	699	0.4+	0.2-	1999 10 15	704	0.5-	0.8+
1998 03 20	704	0.2-	0.1-	1998 05 01	699	0.7+	0.0	1999 10 15	704	0.9-	0.9+
1998 03 20	704	0.2-	0.1+	1998 05 01	699	0.9+	0.2+	1999 10 15	704	0.2-	1.0+
1998 03 22	704	0.1-	0.3+	1998 05 01	699	0.7+	0.3-	1999 10 21	704	0.5+	0.1-
1998 03 22	704	0.3+	0.2+	1998 05 16	704	1.0+	1.0-	1999 10 21	704	0.4+	0.2+
1998 03 22	704	0.5-	0.4+	1998 05 16	704	0.2+	2.0-	1999 10 21	704	0.7+	0.1-
1998 03 22	704	1.1-	0.2+	1998 05 16	704	(3.7+	1.5+)	1999 10 21	704	0.6+	0.2-
1998 03 22	704	0.6-	0.6+	1998 05 16	704	(1.6-	3.4-)	1999 10 21	704	0.6+	0.2-
1998 03 24	699	0.1-	0.2+	1998 05 16	704	(2.7-	0.1+)	1999 11 04	704	0.5+	0.5-
1998 03 24	699	0.1-	0.6+	1999 10 01	691	0.1+	0.1+	1999 11 04	704	0.8+	0.2-
1998 03 24	699	0.9-	0.2+	1999 10 01	703	0.3+	0.6+	1999 11 04	704	0.3+	0.4-
1998 03 25	704	0.2-	0.0	1999 10 01	703	0.4-	0.2+	1999 11 04	704	0.3+	1.2-
1998 03 25	704	0.0	0.1+	1999 10 01	703	0.8-	0.1-	1999 11 04	704	0.8+	0.5-
1998 03 25	704	0.2-	0.1-	1999 10 01	691	0.2+	0.1-	1999 11 06	704	0.2+	0.2-
1998 03 25	704	0.1-	0.5-	1999 10 01	703	0.6-	0.2+	1999 11 06	704	0.2+	0.2-
1998 03 25	704	1.5-	1.4-	1999 10 01	691	0.2+	0.0	1999 11 06	704	0.1-	0.2-
1998 03 28	704	0.2+	0.1+	1999 10 03	704	0.0	1.1+	1999 11 06	704	0.2+	0.1-
1998 03 28	704	0.4-	0.3-	1999 10 03	704	1.0+	0.7+	1999 11 06	704	0.1+	0.1-
1998 03 28	704	0.3+	0.3+	1999 10 03	704	0.2+	0.1-	1999 11 07	120	0.3+	0.6-
1998 03 28	704	0.4-	0.4-	1999 10 03	704	0.6+	0.1-	1999 11 07	120	0.4-	0.6-
1998 03 28	704	0.1+	0.2+	1999 10 03	704	0.5-	1.0-	1999 11 09	704	0.4-	0.4-

1998 03 29	704	0.3+	0.3+	1999 10 05	704	0.3+	0.4+	1999 11 09	704	0.0	0.8-
1998 03 29	704	1.1+	1.5-	1999 10 05	704	0.5+	0.7+	1999 11 09	704	0.4-	0.6-
1998 03 29	704	0.4+	1.2+	1999 10 05	704	1.7-	1.8+	1999 11 09	704	0.4-	0.7-
1998 03 29	704	0.3+	0.5+	1999 10 05	704	0.3-	0.3-	1999 11 12	704	0.2-	0.8-
1998 03 29	704	0.1+	0.7-	1999 10 07	691	0.4-	0.3+	1999 11 12	704	0.2-	0.6-
1998 04 04	699	0.3+	0.3-	1999 10 07	691	0.2-	0.1-	1999 11 12	704	0.2-	0.8-
1998 04 04	699	1.0+	0.0	1999 10 07	704	0.6+	0.1+	1999 11 12	704	0.1+	0.6-
1998 04 04	699	0.2+	0.6+	1999 10 07	704	0.7+	0.5+	1999 11 12	704	0.3-	0.4-
1998 04 19	704	1.4-	0.7-	1999 10 07	691	0.3-	0.0	1999 11 16	704	0.6-	0.8-
1998 04 19	704	0.3+	0.0	1999 10 07	704	0.8+	0.3+	1999 11 16	704	0.4+	0.4-
1998 04 19	704	0.2+	1.0-	1999 10 10	704	0.6+	0.6+	1999 11 16	704	0.6-	0.6-
1998 04 19	704	(0.4-	2.2-)	1999 10 10	704	0.4+	0.6+	1999 11 16	704	0.3-	0.7-
1998 04 20	704	0.2-	0.4-	1999 10 10	704	0.1+	0.9+	1999 11 16	704	0.6-	1.0-
1998 04 20	704	0.1-	0.0	1999 10 10	704	0.7+	0.9+				

(12502)* 1998 FO₆₈ = 1991 NZ₂

Discovered 1998 Mar. 20 by the Lincoln Laboratory Near-Earth Asteroid Research Team at Socorro.

Id. G. V. Williams (*MPC* 31758)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

M	55.60555		(2000.0)	P	Q
n	0.26408787	ω	328.49833	+0.42588057	+0.90460553
a	2.4060450	Ω	326.69860	-0.82326015	+0.37930326
e	0.2104037	i	1.85118	-0.37532448	+0.19446816
P	3.73	H	14.5	G 0.15	U 1

Residuals in seconds of arc

1991 07 04	809	0.2-	0.2-	1998 04 04	699	1.1+	0.0	1999 10 10	704	0.5+	0.3-
1991 07 04	809	0.2+	0.1+	1998 04 04	699	0.5-	0.8+	1999 10 10	704	0.9+	0.5-
1991 07 04	809	0.7+	0.3+	1998 04 04	699	0.2+	0.4+	1999 10 10	704	0.7+	0.2-
1991 07 05	809	0.3-	0.3-	1998 04 18	704	1.0-	1.3-	1999 10 12	106	0.0	0.3+
1991 07 05	809	0.2+	0.2-	1998 04 18	704	0.2-	0.4+	1999 10 12	106	0.5-	0.2+
1991 07 05	809	0.7+	0.0	1998 04 18	704	0.3-	0.2+	1999 10 12	106	0.4-	0.1+
1994 03 05	691	0.3+	0.6+	1998 04 18	704	0.5-	0.1-	1999 10 13	704	0.2+	0.2-
1994 03 05	691	0.1-	0.7+	1998 04 20	704	0.1-	0.2-	1999 10 13	704	0.1-	0.2-
1994 03 05	691	0.1+	0.5+	1998 04 20	704	1.0+	0.6+	1999 10 13	704	0.0	0.3-
1995 09 01	809	1.4-	2.0-	1998 04 20	704	0.9-	0.8-	1999 10 13	704	0.1+	0.1-
1995 09 18	809	0.1+	0.9-	1998 04 20	704	1.3+	1.6+	1999 10 15	704	0.2+	0.5-
1995 09 19	809	0.4+	1.1-	1998 04 20	704	0.6+	0.0	1999 10 15	704	0.0	0.2+
1995 09 19	809	(1.2+	2.3-)	1998 04 22	704	1.3+	0.1-	1999 10 15	704	0.0	0.1+
1995 09 20	809	(1.8+	2.2-)	1998 04 22	704	0.4+	0.1-	1999 10 15	704	0.1+	0.0
1998 03 20	704	0.0	0.5+	1998 04 22	704	0.8+	0.3-	1999 10 15	704	0.0	0.5+
1998 03 20	704	1.4-	0.5-	1998 04 22	704	0.1+	0.5-	1999 10 21	704	0.1-	0.1-
1998 03 20	704	0.0	0.4+	1998 04 22	704	0.1-	0.7-	1999 10 21	704	0.2+	0.3-
1998 03 20	704	0.1+	0.1+	1998 04 24	699	0.4+	0.1+	1999 10 21	704	0.4+	0.5+
1998 03 20	704	1.7-	0.4-	1998 04 24	699	0.9+	0.1+	1999 10 29	703	0.8-	0.3+
1998 03 22	704	0.4-	0.4+	1998 04 24	699	0.2+	0.1+	1999 10 29	703	0.0	0.1-
1998 03 22	704	0.0	0.0	1998 05 01	699	0.4-	0.2-	1999 10 29	703	0.6-	0.2+
1998 03 22	704	1.3-	0.1-	1998 05 01	699	0.5+	0.3+	1999 10 29	703	0.5-	0.1-
1998 03 22	704	0.3-	0.7-	1998 05 01	699	1.1-	0.1-	1999 10 29	703	0.5-	0.1-
1998 03 22	704	0.3+	0.3-	1998 05 01	566	0.4+	0.1-	1999 11 03	703	0.1+	0.0
1998 03 22	699	1.4-	0.4-	1998 05 01	566	0.3-	0.3+	1999 11 03	703	0.8-	1.1-
1998 03 22	699	0.2-	0.1-	1998 05 01	566	0.2-	0.2+	1999 11 03	703	0.6-	0.1-
1998 03 22	699	0.0	0.7-	1998 05 02	566	0.1-	0.3-	1999 11 03	703	0.2-	0.1-
1998 03 24	699	0.1+	0.4-	1998 05 02	566	0.1+	0.7-	1999 11 04	704	0.3+	0.1-
1998 03 24	699	0.0	0.4-	1998 05 02	566	0.5+	0.1-	1999 11 04	704	0.3+	0.4+
1998 03 24	699	0.7-	1.2-	1999 10 03	704	0.1+	0.4+	1999 11 04	704	0.3-	0.3+
1998 03 25	704	0.5-	0.4-	1999 10 03	704	0.3-	0.0	1999 11 04	704	0.1-	0.2+
1998 03 25	704	0.0	0.6+	1999 10 03	704	(0.8+	2.4-)	1999 11 04	704	0.5-	0.1+
1998 03 25	704	0.8-	0.8+	1999 10 03	704	0.1+	0.3+	1999 11 11	703	0.9-	0.6+
1998 03 25	704	(1.1+	2.1+)	1999 10 03	704	(0.1+	2.0-)	1999 11 11	703	0.2+	0.4-
1998 03 28	704	0.3-	0.9-	1999 10 03	704	0.0	0.0	1999 11 11	703	0.2-	0.5+
1998 03 28	704	0.1-	0.7-	1999 10 03	704	1.2+	0.7-	1999 11 11	703	0.2-	0.2+
1998 03 28	704	0.5+	1.6-	1999 10 03	704	0.4-	0.6-	1999 11 12	699	0.2-	0.2+
1998 03 28	704	0.2-	0.9-	1999 10 03	704	0.1-	0.9-	1999 11 12	699	0.6-	0.3-
1998 03 28	704	0.3-	1.0-	1999 10 06	704	0.2+	0.2-	1999 11 12	699	0.8+	0.3-

1998 03 29	704	1.3+	1.9-	1999 10 06	704	0.2+	0.5-	1999 11 14	704	0.5+	0.5-
1998 03 29	704	1.7-	0.8+	1999 10 06	704	0.1+	0.0	1999 11 14	704	0.6+	0.5-
1998 03 29	704	0.3-	0.3+	1999 10 06	704	0.2+	0.1+	1999 11 14	704	0.2+	0.9-
1998 03 29	704	1.6-	0.2+	1999 10 06	704	0.2-	0.1-	1999 11 14	704	0.6+	1.2-
1998 03 29	704	0.4+	0.9-	1999 10 07	704	0.0	0.0	1999 11 14	704	0.4+	0.6-
1998 04 01	704	0.2-	0.1-	1999 10 07	704	0.5+	0.7-	1999 11 16	704	0.7+	0.0
1998 04 01	704	0.2+	0.2-	1999 10 07	704	(2.1+	0.3+)	1999 11 16	704	1.1+	0.1-
1998 04 01	704	0.6+	0.2+	1999 10 07	704	0.1+	0.6+	1999 11 16	704	0.7+	0.2-
1998 04 01	704	0.1-	0.4-	1999 10 10	704	0.1+	0.1-	1999 11 16	704	0.5+	0.1+
1998 04 01	704	0.3+	0.4-	1999 10 10	704	0.2+	0.0	1999 11 16	704	1.0+	0.0

(12503)* 1998 FC₇₅ = 1995 VO₁₂

Discovered 1998 Mar. 24 by the Lincoln Laboratory Near-Earth Asteroid Research Team at Socorro.

Id. G. V. Williams (*MPC* 31762)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

M	49.36550		(2000.0)	P	Q
n	0.21528199	ω	72.07650	-0.00112560	+0.99888727
a	2.7571745	Ω	198.05565	-0.96539379	-0.01338144
e	0.1239054	i	8.74982	-0.26079410	+0.04522348
P	4.58	H	13.9	G 0.15	U 2

Residuals in seconds of arc

1991 12 08	691	0.3-	0.7+	1998 03 29	704	0.6-	0.7+	1999 09 09	704	0.4-	0.3+
1991 12 08	691	0.6+	0.4+	1998 03 29	704	0.1+	0.3-	1999 09 09	704	0.2-	0.5+
1991 12 08	691	0.1-	0.1-	1998 04 20	704	0.1-	0.4+	1999 09 09	704	0.5-	1.0+
1995 11 15	691	0.2-	0.3+	1998 04 20	704	0.1+	0.5+	1999 09 09	704	0.0	0.6+
1995 11 15	691	0.2-	0.1+	1998 04 20	704	1.1-	0.4+	1999 09 14	704	0.1-	1.2-
1995 11 15	691	0.1-	0.2+	1998 04 20	704	0.5+	1.0-	1999 09 14	704	0.3+	0.1-
1995 11 20	691	0.2-	0.0	1998 04 20	704	0.7-	0.5-	1999 09 14	704	0.2+	0.6-
1995 11 20	691	0.4+	0.2+	1998 04 21	704	0.9+	0.2+	1999 09 14	704	0.2-	0.1-
1995 11 20	691	0.3-	0.2+	1998 04 21	704	0.5-	0.2+	1999 09 29	704	0.5+	0.7+
1998 03 22	704	0.9+	0.1+	1998 04 21	704	0.2-	0.2+	1999 09 29	704	0.5+	0.5+
1998 03 22	704	0.4-	0.3-	1998 04 21	704	0.1+	0.0	1999 09 29	704	0.1+	0.7+
1998 03 22	704	1.0+	0.9-	1998 04 21	704	0.2+	0.5-	1999 09 29	704	0.4-	0.1+
1998 03 22	704	1.1+	0.1-	1998 04 22	704	0.7+	0.8-	1999 10 08	704	1.0+	0.0
1998 03 22	704	0.0	0.1+	1998 04 22	704	0.4-	0.8-	1999 10 08	704	0.6+	0.6+
1998 03 24	704	0.3-	0.8+	1998 04 22	704	0.9-	0.8-	1999 10 08	704	1.5+	0.2-
1998 03 24	704	0.0	0.4+	1998 04 22	704	0.4-	0.9-	1999 10 15	704	0.5-	0.2+
1998 03 24	704	0.7+	0.9-	1998 04 22	704	(3.9+	0.9-)	1999 10 15	704	0.8+	0.3+
1998 03 24	704	(0.8+	2.1-)	1998 04 25	699	0.3-	0.5+	1999 10 15	704	0.4+	0.0
1998 03 24	704	0.5+	0.4+	1998 04 25	699	0.1+	0.4+	1999 10 15	704	0.3-	0.2-
1998 03 25	704	0.4+	0.5+	1998 04 25	699	0.7+	0.5-	1999 10 15	704	0.1+	0.6-
1998 03 25	704	0.2+	0.3+	1999 09 08	704	0.4-	0.2-	1999 11 04	703	0.6+	0.6+
1998 03 25	704	0.3+	0.6+	1999 09 08	704	0.3-	0.0	1999 11 04	703	1.0-	0.6-
1998 03 25	704	0.4+	1.7+	1999 09 08	704	1.2-	0.1+	1999 11 04	703	0.7-	1.1+
1998 03 25	704	0.3-	1.4+	1999 09 08	699	0.1+	0.5+	1999 11 04	703	0.1-	0.7-
1998 03 29	704	0.3-	0.8+	1999 09 08	699	0.4+	0.0	1999 11 07	704	(2.3+	0.8+)
1998 03 29	704	0.8-	0.5+	1999 09 08	699	0.5+	0.1+	1999 11 07	704	0.6-	0.1-
1998 03 29	704	1.1-	0.6+	1999 09 09	704	0.8-	0.4-	1999 11 07	704	0.5-	0.4-

1988 09 16	095	(2.4− 4.0−)	1998 03 25	704	0.2− 0.3−	1999 09 08	703	0.5+ 0.1−
1988 09 16	095	(0.1− 2.7−)	1998 03 25	704	0.1+ 0.0	1999 09 08	703	0.2+ 1.0−
1991 05 13	033	0.3+ 0.9+	1998 03 25	704	0.3− 1.5−	1999 09 13	704	0.2+ 0.1−
1991 05 13	033	0.5+ 1.2+	1998 03 25	704	0.4− 0.5+	1999 09 13	704	0.1+ 0.3−
1991 05 14	033	0.0 0.9−	1998 03 25	704	0.2− 0.8−	1999 09 13	704	0.6− 0.3−
1994 02 10	809	(2.7+ 1.5−)	1998 04 19	704	0.0 0.5+	1999 09 13	704	0.0 0.5−
1994 02 10	809	(1.6+ 3.2−)	1998 04 19	704	0.3+ 0.0	1999 09 13	704	0.5− 0.1−
1994 02 10	809	(0.9+ 3.6−)	1998 04 19	704	0.1− 0.2−	1999 09 13	428	0.6− 0.2−
1994 02 13	809	(1.9+ 3.5−)	1998 04 19	704	0.5− 0.2+	1999 09 13	428	0.6− 0.1−
1994 02 13	809	(0.9+ 4.3−)	1998 04 20	704	0.4+ 0.5−	1999 09 14	428	0.1+ 0.3−
1994 02 13	809	(1.5+ 3.9−)	1998 04 20	704	0.6− 0.4+	1999 09 14	428	0.3− 0.1−
1994 03 09	010	0.5− 1.1−	1998 04 20	704	0.2− 0.0	1999 09 30	704	0.4+ 0.2+
1994 03 09	010	1.1− 0.6−	1998 04 20	704	0.8− 1.2−	1999 09 30	704	0.0 0.3−
1994 03 09	010	1.1− 1.3−	1998 04 20	704	(2.3− 0.4+)	1999 09 30	704	0.3+ 0.3+
1998 03 22	704	0.5+ 1.6−	1998 04 22	704	0.2+ 1.0+	1999 09 30	704	1.3+ 0.4−
1998 03 22	704	0.4− 0.6−	1998 04 22	704	0.3+ 0.7+	1999 09 30	704	0.6− 0.8−
1998 03 22	704	1.4− 0.2−	1998 04 22	704	0.6+ 0.4+	1999 11 10	704	0.5+ 0.2−
1998 03 22	704	0.5+ 1.2−	1998 04 22	704	0.2− 0.2+	1999 11 10	704	0.4+ 0.0
1998 03 22	704	0.4+ 0.5+	1998 04 22	704	1.4− 1.4+	1999 11 10	704	0.5+ 0.1+
1998 03 24	704	1.1+ 1.3−	1999 09 07	699	0.0 0.3+	1999 11 10	704	0.9+ 0.9−
1998 03 24	704	0.6+ 0.5+	1999 09 07	699	0.3+ 0.2−	1999 11 10	704	0.0 0.1−
1998 03 24	704	0.2− 0.7+	1999 09 07	699	0.5+ 0.2+			

(12505)* 1998 FN₇₇ = 1976 QG = 1978 BH = 1989 RK₄ = 1991 EC₂

Discovered 1998 Mar. 24 by the Lincoln Laboratory Near-Earth Asteroid

Research Team at Socorro.

Id. G. V. Williams (*MPC* 31763)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	28.10642		(2000.0)		P		Q
<i>n</i>	0.30485270	ω	199.24717	+0.91194497			+0.40547896
<i>a</i>	2.1864658	Ω	136.66122	−0.36343852			+0.86928206
<i>e</i>	0.2127948	<i>i</i>	5.24969	−0.19044374			+0.28272869
<i>P</i>	3.23	<i>H</i>	14.1	<i>G</i>	0.15	<i>U</i>	1

Residuals in seconds of arc

1976 08 26	095	(6.9− 2.4+)	1998 03 25	704	0.2+ 0.5−	1999 10 10	681	0.1+ 0.2−
1978 01 31	801	1.4+ 0.8+	1998 04 20	704	1.0+ 0.9−	1999 10 10	704	0.5+ 1.3+
1978 02 01	801	0.1− 1.1+	1998 04 20	704	0.5− 0.3+	1999 10 10	704	0.6+ 0.3−
1989 09 08	095	0.7− 1.9+	1998 04 20	704	1.1+ 0.3−	1999 10 10	704	1.0+ 0.4−
1991 03 09	809	0.9− 0.5+	1998 04 20	704	0.1− 0.2−	1999 10 10	704	0.2− 1.4−
1991 03 09	809	0.3− 0.2+	1998 04 20	704	0.8+ 0.4+	1999 10 16	681	0.2+ 0.2+
1991 03 09	809	0.6+ 0.2−	1998 04 22	704	0.6+ 0.1−	1999 10 16	681	0.1+ 0.1−
1991 03 11	809	0.0 1.4+	1998 04 22	704	0.3− 0.6+	1999 10 16	611	1.3− 0.1+
1991 03 11	809	0.1− 1.4+	1998 04 22	704	0.6+ 0.1+	1999 10 16	611	(3.5+ 0.6+)
1991 03 11	809	0.1− 1.7+	1998 04 22	704	0.0 0.1−	1999 10 20	704	0.2+ 0.3+
1994 01 30	010	0.9− 1.0−	1998 04 24	704	0.1− 0.8−	1999 10 20	704	0.3+ 0.7−
1994 01 30	010	0.9+ 0.4+	1998 04 24	704	0.4− 0.5+	1999 10 20	704	0.2+ 1.0−
1998 03 24	704	1.8− 0.6−	1998 04 24	704	0.1− 0.8−	1999 10 20	704	0.0 1.2−
1998 03 24	704	0.4− 0.7−	1998 04 24	704	0.2− 0.0	1999 10 20	704	0.1+ 1.4−
1998 03 24	704	0.5− 0.9−	1998 04 24	704	0.1− 0.4+	1999 11 05	704	0.3+ 0.0
1998 03 24	704	0.7− 0.3−	1998 05 16	704	0.2+ 0.7+	1999 11 05	704	0.1− 0.2−
1998 03 24	704	0.5− 0.4+	1998 05 16	704	1.1− 0.6−	1999 11 05	704	0.1− 0.2−
1998 03 25	704	0.1+ 0.5−	1998 05 16	704	0.4+ 0.2+	1999 11 05	704	0.1− 0.1+
1998 03 25	704	0.0 1.7−	1998 05 16	704	1.4− 0.2−	1999 11 05	704	0.4− 0.1+
1998 03 25	704	0.4+ 0.2−	1998 05 16	704	0.9+ 0.1+			
1998 03 25	704	0.4+ 0.0	1999 10 10	681	0.2+ 0.1+			

(12506)* 1998 FR₁₀₈ = 1990 DP₈ = 1999 RN₁₁₃

Discovered 1998 Mar. 31 by the Lincoln Laboratory Near-Earth Asteroid

Research Team at Socorro.

Id. A. Doppler (*MPC* 36363)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	138.02001		(2000.0)		P		Q
<i>n</i>	0.25079765	ω	284.47527	−0.99319122			−0.05707816
<i>a</i>	2.4903119	Ω	252.33047	+0.09063786			−0.92625753
<i>e</i>	0.0405049	<i>i</i>	6.11835	−0.07318455			−0.37254405
<i>P</i>	3.93	<i>H</i>	14.6	<i>G</i>	0.15	<i>U</i>	1

Residuals in seconds of arc

1990 02 24	809	1.1+ 0.3+	1998 04 01	704	0.8− 0.4−	1998 04 20	704	(2.4− 2.7−)
1990 02 24	809	0.2+ 0.4−	1998 04 01	704	1.1− 0.1−	1999 07 13	704	0.9+ 0.7+
1990 02 24	809	1.4− 0.1−	1998 04 18	704	0.3− 0.4+	1999 07 13	704	0.0 0.6+
1996 12 15	691	0.7+ 0.3−	1998 04 18	704	0.2+ 0.7+	1999 07 13	704	0.7− 0.4−
1996 12 15	691	0.3+ 0.6+	1998 04 18	704	0.3− 0.8+	1999 07 13	704	0.6− 0.6+
1996 12 15	691	0.7+ 0.5−	1998 04 18	704	0.1− 0.7−	1999 07 13	704	0.5− 0.4−
1997 02 07	691	0.5− 0.1+	1998 04 18	704	0.4− 0.5−	1999 09 09	704	0.2+ 0.1−
1997 02 07	691	0.8− 0.9−	1998 04 19	704	1.8+ 0.3+	1999 09 09	704	0.2+ 0.4+
1997 02 07	691	0.9− 0.3+	1998 04 19	704	0.1− 0.4−	1999 09 09	704	0.3+ 0.3−
1998 03 31	704	0.2− 0.5+	1998 04 19	704	0.0 0.9+	1999 09 09	704	0.2− 0.7+
1998 03 31	704	0.3− 1.0−	1998 04 19	704	0.6− 0.4+	1999 09 13	704	0.6+ 0.0
1998 03 31	704	0.6+ 0.9−	1998 04 19	704	1.2+ 0.5−	1999 09 13	704	0.2+ 0.9−
1998 03 31	704	0.1− 0.5−	1998 04 20	704	0.1− 0.1+	1999 09 13	704	0.2− 0.4−
1998 04 01	704	0.2− 0.2+	1998 04 20	704	1.0+ 0.2+	1999 09 13	704	0.1− 0.7−
1998 04 01	704	0.7− 0.0	1998 04 20	704	0.2+ 0.2−	1999 09 13	704	0.2+ 1.2−
1998 04 01	704	0.4− 0.5−	1998 04 20	704	0.7+ 0.1−			

(12507)* 1998 FZ₁₀₉ = 1981 UM₉ = 1999 RO₁₃₃

Discovered 1998 Mar. 31 by the Lincoln Laboratory Near-Earth Asteroid

Research Team at Socorro.

Id. E. Bowell (*MPC* 36363), A. Doppler (*ibid.*), M. E. Sansaturio (*ibid.*)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	24.16759		(2000.0)		P		Q
<i>n</i>	0.21062404	ω	24.99466	+0.42016221			+0.89923705
<i>a</i>	2.7976760	Ω	270.04897	−0.85170036			+0.34445889
<i>e</i>	0.1985921	<i>i</i>	6.99629	−0.31316166			+0.26966795
<i>P</i>	4.68	<i>H</i>	13.4	<i>G</i>	0.15	<i>U</i>	1

Residuals in seconds of arc

1981 10 30	381	0.6− 0.5−	1998 04 19	704	0.4− 0.4+	1999 09 09	704	0.1− 0.3+
1981 10 30	381	0.4− 0.8−	1998 04 19	704	0.0 0.1+	1999 09 09	704	0.1+ 0.5+
1994 07 12	808	1.2+ 1.8+	1998 04 20	704	0.5+ 0.0	1999 09 09	704	0.5+ 0.4+
1994 07 12	808	0.3− 0.5+	1998 04 20	704	0.8+ 0.3+	1999 09 10	704	0.2+ 0.3+
1995 11 24	691	0.1+ 0.5+	1998 04 20	704	0.1− 0.1−	1999 09 10	704	0.7+ 0.3+
1995 11 24	691	0.2+ 0.6+	1998 04 20	704	0.2− 0.7−	1999 09 10	704	0.2+ 0.3−
1995 11 24	691	0.3+ 0.6+	1998 04 20	704	0.6− 0.1+	1999 09 10	704	0.4− 0.8−
1996 12 07	691	0.7+ 0.8+	1999 07 12	704	0.0 1.1−	1999 09 10	704	1.2− 1.0+
1996 12 07	691	0.5+ 0.9+	1999 07 12	704	0.4+ 0.5+	1999 09 14	704	0.0 0.0
1996 12 07	691	1.1+ 0.8+	1999 07 12	704	0.3− 0.1−	1999 09 14	704	0.1+ 0.1−
1998 03 31	704	0.1− 0.0	1999 07 12	704	0.2+ 0.3−	1999 09 14	704	0.0 0.4−
1998 03 31	704	0.1− 0.6−	1999 07 12	704	0.5− 0.4+	1999 09 14	704	0.0 0.2−
1998 03 31	704	0.4− 0.3+	1999 07 23	704	0.5− 1.0−	1999 09 14	704	0.3− 0.0
1998 03 31	704	0.7− 0.4+	1999 07 23	704	0.0 0.8−	1999 10 02	703	0.1+ 0.1−
1998 03 31	704	0.5− 0.5−	1999 07 23	704	0.6− 0.5+	1999 10 02	703	0.2− 0.1+
1998 04 01	704	0.1− 0.4+	1999 09 04	703	0.1− 0.4+	1999 10 02	703	0.0 0.2−
1998 04 01	704	0.4− 0.5+	1999 09 04	703	0.0 0.2+	1999 10 02	703	0.3− 0.1+
1998 04 01	704	0.8− 0.9+	1999 09 04	703	0.4− 0.2+	1999 10 07	703	0.3− 0.0
1998 04 01	704	0.4+ 0.2−	1999 09 04	703	0.4− 0.3−	1999 10 07	703	0.2− 0.1+
1998 04 18	704	0.0 0.2+	1999 09 08	699	0.1+ 0.1+	1999 10 07	703	0.1+ 0.1+
1998 04 18	704	1.0+ 0.1+	1999 09 08	704	0.3+ 0.1+	1999 10 07	703	0.2− 0.2+
1998 04 18	704	0.6+ 0.2−	1999 09 08	699	0.1+ 0.5+	1999 11 07	704	0.8− 0.2−
1998 04 18	704	0.2+ 1.1−	1999 09 08	704	0.1+ 0.0	1999 11 07	704	2.2+ 0.3−
1998 04 18	704	0.2− 0.8−	1999 09 08	704	0.4+ 0.0	1999 11 07	704	0.3− 0.1−
1998 04 19	704	0.1− 0.1+	1999 09 08	699	0.1+ 0.3+	1999 11 07	704	0.4− 0.9−
1998 04 19	704	0.2+ 0.3+	1999 09 09	704	0.0 0.0	1999 11 07	704	0.2+ 0.4−
1998 04 19	704	0.3− 0.9+	1999 09 09	704	0.2+ 0.1−			

(12508)* 1998 FZ₁₁₃ = 1988 VU₁₃ = 1999 RZ₁₉₆

Discovered 1998 Mar. 31 by the Lincoln Laboratory Near-Earth Asteroid Research Team at Socorro.

Id. G. V. Williams (*MPC* 35971)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>		(2000.0)		P		Q	
<i>n</i>	0.26288919	ω	96.48982	+0.89748493	+0.42890788		
<i>a</i>	2.4133533	Ω	238.15662	-0.43714429	+0.83414924		
<i>e</i>	0.1645373	<i>i</i>	6.94761	-0.05852918	+0.34674641		
<i>P</i>	3.75	<i>H</i>	14.0	<i>G</i>	0.15	<i>U</i>	2

Residuals in seconds of arc

1988 11 04	327	0.2-	0.2+	1998 04 22	704	0.1+	0.7+	1999 09 18	704	0.0	0.5-
1988 11 04	327	0.2+	1.1+	1998 04 22	704	0.0	0.1+	1999 09 18	704	0.0	0.3-
1992 09 26	691	0.3-	0.1+	1998 04 22	704	0.7+	0.1-	1999 09 29	703	0.3-	0.4+
1992 09 26	691	0.3-	0.0	1998 04 22	704	0.0	0.8+	1999 09 29	703	0.6-	0.3+
1992 09 26	691	0.2-	0.1-	1998 04 22	704	0.2-	1.5+	1999 09 29	703	0.4-	0.3+
1996 09 19	696	0.3+	0.6-	1999 07 23	704	0.4+	0.2+	1999 09 29	703	1.0-	0.9+
1996 09 19	696	0.5-	0.5-	1999 07 23	704	0.6+	0.2-	1999 10 04	704	0.2+	0.8+
1996 09 19	696	0.1+	0.7-	1999 07 23	704	0.2-	0.3+	1999 10 04	704	0.3+	0.1+
1998 03 25	704	0.0	0.6-	1999 07 23	704	0.0	0.2-	1999 10 04	704	0.7+	0.3+
1998 03 25	704	0.2+	0.6+	1999 07 23	704	0.5-	0.4-	1999 10 04	704	0.5+	0.8+
1998 03 25	704	0.6+	0.8+	1999 09 08	699	0.3-	0.8+	1999 10 04	704	0.1+	0.6+
1998 03 25	704	0.1+	0.2+	1999 09 08	704	0.4-	0.3+	1999 10 19	704	0.6+	0.5+
1998 03 25	704	0.3-	0.4-	1999 09 08	699	0.5-	0.8+	1999 10 19	704	(0.7- 2.5+)	
1998 03 31	704	0.8-	0.5+	1999 09 08	704	0.4-	0.0	1999 10 19	704	1.0+	0.6-
1998 03 31	704	1.1-	0.4+	1999 09 08	704	0.5-	0.1+	1999 10 19	704	0.8+	0.2-
1998 03 31	704	0.4-	0.3-	1999 09 08	704	0.4-	0.1-	1999 10 19	704	0.1+	1.3-
1998 03 31	704	0.3+	0.1-	1999 09 08	699	0.2-	0.0	1999 10 30	703	(2.9- 2.3+)	
1998 04 01	704	0.3-	0.5-	1999 09 08	704	0.0	0.0	1999 10 30	703	0.4-	0.9+
1998 04 01	704	0.2-	0.7+	1999 09 16	704	0.0	0.7-	1999 10 30	703	0.4-	0.8+
1998 04 01	704	0.3-	0.1-	1999 09 16	704	0.2-	0.4-	1999 10 30	703	0.2-	0.8+
1998 04 01	704	0.0	0.1+	1999 09 16	704	0.2+	1.1-	1999 11 06	704	0.1+	0.4+
1998 04 01	704	1.1-	0.3-	1999 09 16	704	0.1-	1.7-	1999 11 06	704	0.0	0.4+
1998 04 19	704	1.3+	0.6-	1999 09 18	704	0.3+	0.4-	1999 11 06	704	0.3+	1.0+
1998 04 19	704	0.6+	0.2-	1999 09 18	704	0.1-	0.2-	1999 11 06	704	0.4+	0.7+
1998 04 19	704	0.3-	1.2+	1999 09 18	704	0.6+	0.3-	1999 11 06	704	0.7+	0.5+
1998 04 19	704	0.1+	0.2+	1999 09 18	704	0.0	0.2-	1999 11 16	704	0.4-	1.0-
1998 04 20	704	0.7+	0.1+	1999 09 18	704	0.2+	0.3-	1999 11 16	704	0.2-	0.4+
1998 04 20	704	1.1+	0.1+	1999 09 18	704	0.2-	0.2-	1999 11 16	704	0.1+	0.7+
1998 04 20	704	0.9+	0.3-	1999 09 18	704	0.2+	0.3-	1999 11 16	704	0.4-	0.7+
1998 04 20	704	0.4-	0.9-	1999 09 18	704	0.3-	0.4-				

(12509)* 1998 FY₁₁₇ = 1991 GJ₇ = 1995 OO₁₀

Discovered 1998 Mar. 31 by the Lincoln Laboratory Near-Earth Asteroid Research Team at Socorro.

Id. G. V. Williams (*MPC* 31768)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>		(2000.0)		P		Q	
<i>n</i>	0.28087169	ω	37.67686	+0.61656333	+0.78449810		
<i>a</i>	2.3092134	Ω	270.48706	-0.73752766	+0.54599722		
<i>e</i>	0.1718125	<i>i</i>	3.80886	-0.27550428	+0.29402340		
<i>P</i>	3.51	<i>H</i>	14.9	<i>G</i>	0.15	<i>U</i>	1

Residuals in seconds of arc

1991 04 08	809	(0.1+ 2.8+)	1998 04 20	704	0.6-	0.7-	1999 10 12	704	0.6+	0.7+	
1991 04 08	809	0.6-	1.3+	1998 04 21	704	0.1+	0.0	1999 10 12	704	0.2+	0.5+
1991 04 08	809	0.7-	1.9+	1998 04 21	704	0.0	0.5+	1999 10 12	704	0.2-	0.7+
1991 04 10	809	(2.4+ 0.8+)	1998 04 21	704	0.6+	0.3-	1999 10 12	704	0.5+	0.3+	
1991 04 10	809	1.9+	0.6+	1998 04 21	704	0.7+	0.3-	1999 10 12	704	0.3+	0.2+
1991 04 10	809	1.0+	1.0+	1998 04 21	704	(3.0+ 0.8+)	1999 10 15	704	0.2-	0.7+	
1995 07 21	033	0.7-	1.2+	1998 04 22	704	(2.9- 1.1+)	1999 10 15	704	0.2+	0.7+	
1995 07 23	033	0.4+	0.9-	1998 04 22	704	0.3+	0.2-	1999 10 15	704	0.1+	0.5+
1995 07 23	033	0.2+	0.5+	1998 04 22	704	0.1-	0.5-	1999 10 15	704	0.4-	0.4+

1998 03 25	704	0.5+	0.0	1998 04 22	704	1.0+	0.6-	1999 10 22	704	0.2-	0.8+
1998 03 25	704	0.1+	1.4+	1998 04 22	704	1.4+	0.0	1999 10 22	704	0.9-	0.3+
1998 03 25	704	0.4-	0.3+	1998 04 25	699	0.1-	0.0	1999 10 22	704	0.5-	0.4+
1998 03 25	704	0.7+	1.1-	1998 04 25	699	0.7-	0.2-	1999 10 22	704	1.0-	0.7+
1998 03 25	704	0.7+	0.6+	1998 04 25	699	0.5+	0.2-	1999 10 22	704	0.9-	0.8+
1998 03 31	704	0.1-	0.7-	1998 04 30	699	0.4+	0.5+	1999 11 03	704	0.2+	0.4-
1998 03 31	704	0.6-	0.2+	1998 04 30	699	1.5+	1.2+	1999 11 03	704	0.1-	0.3-
1998 03 31	704	1.6-	1.2-	1998 04 30	699	0.6+	0.5+	1999 11 03	704	0.0	0.6-
1998 03 31	704	(3.2- 1.9-)		1998 05 16	704	0.6+	0.3+	1999 11 03	704	0.9-	1.0-
1998 03 31	704	1.2-	0.3+	1998 05 16	704	0.3-	0.5-	1999 11 03	704	0.3-	0.9-
1998 04 01	704	0.7-	0.1-	1998 05 16	704	1.0-	1.4+	1999 11 04	703	0.4-	0.1+
1998 04 01	704	1.1+	0.9-	1998 05 16	704	2.0-	0.6+	1999 11 14	703	0.5-	0.4+
1998 04 01	704	0.7-	0.1+	1999 10 03	704	1.2+	0.6+	1999 11 14	703	0.2-	0.6+
1998 04 01	704	(2.2+ 1.5+)		1999 10 03	704	0.6+	0.6-	1999 11 14	703	0.3-	1.1+
1998 04 01	704	1.5-	1.3+	1999 10 03	704	0.1+	0.4-	1999 11 16	704	0.9+	0.6-
1998 04 20	704	0.1-	0.4-	1999 10 07	704	1.1+	0.2+	1999 11 16	704	0.4-	0.5-
1998 04 20	704	0.6+	1.0-	1999 10 07	704	0.6+	0.4-	1999 11 16	704	0.0	0.3-
1998 04 20	704	0.4+	0.1-	1999 10 07	704	0.1-	0.4+	1999 11 16	704	0.2+	0.0
1998 04 20	704	0.4-	0.3-	1999 10 07	704	0.3+	0.6-	1999 11 16	704	0.4-	0.1+

(12510)* 1998 FM₁₂₁ = 1969 OK₁ = 1988 TP₃

Discovered 1998 Mar. 20 by the Lincoln Laboratory Near-Earth Asteroid Research Team at Socorro.

Id. A. Gnädig (*MPC* 32005)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>		(2000.0)		P		Q	
<i>n</i>	0.26529066	ω	97.66449	+0.94634118	+0.31745982		
<i>a</i>	2.3987670	Ω	243.84257	-0.31666545	+0.87355783		
<i>e</i>	0.2188419	<i>i</i>	3.86345	-0.06450855	+0.36893899		
<i>P</i>	3.72	<i>H</i>	14.7	<i>G</i>	0.15	<i>U</i>	2

Residuals in seconds of arc

1969 07 20	074	(3.6- 0.0)	1998 04 20	704	0.6-	0.2+	1999 09 09	704	0.4-	0.1-
1969 07 20	074	1.3- 1.0-	1998 04 20	704	0.2-	1.7+	1999 09 09	704	0.0	0.4+
1969 07 20	074	1.0- 0.4+	1998 04 20	704	0.5+	0.2+	1999 09 14	704	0.2-	0.0
1969 07 20	074	0.7- 0.2+	1998 04 20	704	0.5+	0.0	1999 09 14	704	0.1+	0.2-
1969 07 20	074	0.8+ 0.2-	1999 07 23	704	0.8+	0.7+	1999 09 14	704	0.1-	0.6+
1969 07 20	074	1.6+ 0.3-	1999 07 23	704	0.4+	0.0	1999 09 14	704	0.3+	0.1-
1988 10 10	400	(1.1+ 3.7-)	1999 07 23	704	0.6+	1.0+	1999 09 14	704	0.3-	0.4-
1988 10 10	400	1.0+ 1.9+	1999 08 31	327	0.2-	0.1+	1999 10 02	704	0.2+	0.0
1998 03 20	704	1.1+ 0.3-	1999 08 31	327	0.3-	0.1-	1999 10 02	704	0.6+	1.2-
1998 03 20	704	0.7- 0.5-	1999 08 31	327	0.3-	0.1-	1999 10 02	704	0.4+	0.6-
1998 03 20	704	0.6+ 0.2+	1999 09 01	327	0.1+	0.1-	1999 10 02	704	0.3-	0.8-
1998 03 20	704	0.5- 0.0	1999 09 01	327	0.2-	0.1-	1999 10 07	704	0.5+	0.8+
1998 03 22	704	0.7+ 0.2-	1999 09 01	327	0.2-	0.5-	1999 10 07	704	0.3+	0.5+
1998 03 22	704	0.7- 0.5+	1999 09 05	703	0.2+	0.3+	1999 10 07	704	0.5-	1.0-
1998 03 22	704	1.8+ 0.0	1999 09 05	703	0.4+	0.4+	1999 10 15	704	0.4-	0.9+
1998 03 28	704	1.6+ 0.8-	1999 09 05	703	0.6+	0.8+	1999 10 15	704	0.3+	1.1+
1998 03 28	704	1.8- 1.4-	1999 09 05	703	0.2-	0.9+	1999 10 15	704	0.7+	0.5+
1998 03 28	704	0.7+ 1.4+	1999 09 08	106	0.5+	0.3+	1999 10 15	704	0.8+	0.6+
1998 03 28	704	(5.0- 0.0)	1999 09 08	106	0.4+	0.2+	1999 10 15	704	0.6+	0.5-
1998 03 29	704	0.6+ 0.2-	1999 09 08	106	0.3+	0.1+	1999 11 02	703	0.5-	0.3-
1998 03 29	704	0.3+ 0.4-	1999 09 08	704	0.1+	0.3+	1999 11 02	703	0.1-	0.1+
1998 03 29	704	0.5+ 0.9+	1999 09 08	704	0.3+	0.2-	1999 11 02	703	0.2-	0.0
1998 03 29	704	1.1- 1.7+	1999 09 08	704	0.2+	0.2-	1999 11 02	703	0.4-	0.2+
1998 03 29	704	(3.5- 0.6-)	1999 09 08	704	0.2-	0.5+	1999 11 07	704	1.1-	0.1+
1998 04 01	704	1.1- 0.6+	1999 09 08	704	0.1-	0.1+	1999 11 07	704	0.7-	0.7-
1998 04 01	704	0.2+ 0.5+	1999 09 09	704	0.1+	0.1-	1999 11 07	704	0.5-	0.9-
1998 04 01	704	(0.9- 4.4+)	1999 09 09	704	0.4+	0.2-	1999 11 07	704	0.7-	0.4-
1998 04 01	704	1.2- 1.8-	1999 09 09	704	0.1+	0.1+	1999 11 07	704	0.3-	0.6+
1998 04 01	704	(5.2- 0.3+)	1999 09 09	704	0.0	0.2+	1999 11 14	704	0.8-	0.4-
1998 04 18	704	0.5+ 0.2+	1999 09 09	704	0.1-	0.1-	1999 11 14	704	0.9-	0.5-
1998 04 18	704	0.8- 1.4+	1999 09 09	704	0.0	0.2-	1999 11 14	704	0.1-	1.2-
1998 04 18	704	0.6- 0.3+	1999 09 09	704	0.2+	0.3-	1999 11 14	704	0.7-	0.2-
1998 04 18	704	(5.4- 0.5+)	1999 09 09	704	0.1-	0.0	1999 11 14	704	1.0-	0.1-
1998 04 19	704	0.8+ 0.2-	1999 09 09	704	0.1+	0.1-	1999 11 16	704	0.7-	0.6-

1998 04 19	704	0.3−	0.7−	1999 09 09	704	0.0	0.0	1999 11 16	704	0.3−	0.7+
1998 04 19	704	(3.3−	0.1+)	1999 09 09	704	0.1−	0.2+	1999 11 16	704	0.2−	0.5−
1998 04 19	704	(2.8−	1.1+)	1999 09 09	704	0.1+	0.1−	1999 11 16	704	0.9−	0.2−
1998 04 19	704	(1.8−	2.2+)	1999 09 09	704	0.2+	0.0	1999 11 16	704	1.1−	0.1−

(12511)* 1998 FQ₁₂₁ = 1998 HW₁₂₉ = 1977 EB₉ = 1978 TT₆ = 1985 SC₆

Discovered 1998 Mar. 20 by the Lincoln Laboratory Near-Earth Asteroid

Research Team at Socorro.

Id. G. V. Williams (*MPC* 32262)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

M	51.63656		(2000.0)	P	Q
n	0.28290345	ω	53.79251	+0.50144936	+0.86518094
a	2.2981439	Ω	246.30373	−0.79492395	+0.45924568
e	0.1856951	i	0.20256	−0.34153252	+0.20138357
P	3.48	H	14.6	G 0.15	U 2

Residuals in seconds of arc

1977 03 14	381	1.1−	1.3+	1998 04 19	704	0.4+	1.3−	1999 10 15	704	0.1−	0.3−
1977 03 14	381	1.6+	0.1+	1998 04 19	704	0.1−	1.8−	1999 10 15	704	0.0	0.0
1977 03 15	381	0.2−	1.1−	1998 04 20	704	0.5+	0.2−	1999 10 15	704	0.1−	0.7−
1977 03 15	381	(4.2−	0.3−)	1998 04 20	704	0.2+	0.1−	1999 10 20	704	0.7+	1.2−
1978 10 02	095	(1.7+	12.0+)	1998 04 20	704	0.6+	0.6−	1999 10 20	704	0.5+	1.1−
1985 09 21	095	0.2−	1.4+	1998 04 20	704	0.8+	1.5−	1999 10 20	704	0.5+	1.2−
1992 10 23	010	0.1+	1.2−	1998 04 20	704	0.1−	0.8−	1999 10 20	704	0.9+	1.2−
1992 10 23	010	0.4−	0.4−	1998 05 02	699	1.5+	1.9−	1999 10 20	704	0.8+	1.2−
1998 03 02	910	0.1+	1.0+	1998 05 02	699	1.2−	1.5−	1999 10 29	703	0.7−	0.3+
1998 03 03	910	0.2+	0.6+	1998 05 02	699	0.1−	0.0	1999 10 29	703	0.5−	0.1−
1998 03 03	910	0.2+	0.6+	1999 10 01	703	0.6−	0.4+	1999 10 29	703	0.7−	0.4+
1998 03 20	704	0.5+	0.6−	1999 10 01	703	0.6−	0.3−	1999 10 29	703	0.3−	0.3−
1998 03 20	704	(5.6−	0.1−)	1999 10 01	703	0.6−	0.9+	1999 11 03	703	0.2−	0.6+
1998 03 20	704	0.1+	0.3+	1999 10 01	703	0.3−	0.3−	1999 11 03	703	1.7−	1.0+
1998 03 20	704	0.4−	0.6−	1999 10 03	704	0.4+	0.0	1999 11 03	703	0.7−	0.5+
1998 03 20	704	0.3−	0.8−	1999 10 03	704	0.7+	0.7+	1999 11 03	703	0.0	0.1+
1998 03 22	704	0.3−	0.4+	1999 10 03	704	0.7+	0.2+	1999 11 04	704	0.1+	0.2−
1998 03 22	704	0.5−	0.3+	1999 10 03	704	0.8+	0.8+	1999 11 04	704	0.1−	0.2−
1998 03 22	704	0.2−	0.2+	1999 10 03	704	0.0	0.5+	1999 11 04	704	0.0	0.5−
1998 03 22	704	0.8+	0.8+	1999 10 05	704	0.4+	0.2+	1999 11 04	704	0.2+	0.2−
1998 03 28	704	0.1+	0.5+	1999 10 05	704	0.2+	0.0	1999 11 04	704	0.2+	0.2−
1998 03 28	704	0.2+	0.3+	1999 10 05	704	0.7+	0.3−	1999 11 09	704	0.3−	0.9+
1998 03 28	704	0.3−	0.2+	1999 10 05	704	0.9+	1.3−	1999 11 09	704	0.0	1.4+
1998 03 28	704	0.5−	0.7−	1999 10 05	704	0.5−	1.6−	1999 11 09	704	0.6−	0.7+
1998 03 28	704	0.2−	0.2−	1999 10 07	704	1.1+	0.1+	1999 11 12	704	0.5−	0.4−
1998 03 29	704	(3.0−	0.2−)	1999 10 07	704	0.2+	0.2−	1999 11 12	704	0.1−	0.6−
1998 03 29	704	0.6−	0.0	1999 10 07	704	0.9+	0.0	1999 11 12	704	0.3−	0.5−
1998 03 29	704	1.6−	0.3−	1999 10 07	704	0.5+	0.0	1999 11 12	704	0.0	0.2−
1998 03 29	704	0.3−	1.2+	1999 10 07	704	0.5+	0.2+	1999 11 12	704	0.0	0.2−
1998 03 29	704	0.7−	0.1−	1999 10 10	106	0.0	0.2+	1999 11 14	691	0.0	0.2−
1998 04 01	704	0.1−	0.6+	1999 10 10	106	0.0	0.3+	1999 11 14	691	0.0	0.1−
1998 04 01	704	0.1+	0.2+	1999 10 10	106	0.8−	0.3+	1999 11 14	691	0.0	0.4−
1998 04 01	704	0.7−	0.9+	1999 10 10	704	0.7+	0.1−	1999 11 16	704	0.2−	0.3−
1998 04 01	704	0.5−	0.9+	1999 10 10	704	0.3+	0.3−	1999 11 16	704	0.2−	0.4+
1998 04 01	704	0.1−	1.2+	1999 10 10	704	0.1+	0.1+	1999 11 16	704	0.4−	0.5+
1998 04 19	704	0.7+	0.4−	1999 10 10	704	0.2+	0.1+	1999 11 16	704	0.6−	1.0+
1998 04 19	704	0.4+	0.5−	1999 10 15	704	0.3+	0.1−	1999 11 16	704	0.0	0.0
1998 04 19	704	0.1−	0.1+	1999 10 15	704	0.1+	0.2−				

(12512)* 1998 HW₇ = 1985 SE₃ = 1985 SQ₅ = 1995 MF₂

Discovered 1998 Apr. 21 at Višnja.

Id. G. V. Williams (*MPC* 31771), N. S. Chernykh (d, *ibid.*)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

M	64.16689		(2000.0)	P	Q		
n	0.28816887	ω	84.16005	+0.62454477	+0.77851461		
a	2.2700635	Ω	224.68964	−0.74694680	+0.57220194		
e	0.1917468	i	5.06754	−0.22806645	+0.25787581		
P	3.42	H	14.6	G	0.15	U	1

Residuals in seconds of arc

1985 09 19	095	1.0−	1.3−	1998 04 25	699	0.1+	0.1+	1999 10 22	704	0.2−	0.1−
1985 09 21	095	1.5+	0.7−	1998 05 01	704	0.2−	0.5−	1999 10 22	704	0.2+	0.5−
1995 06 24	691	0.2−	0.1−	1998 05 01	704	0.8−	0.2−	1999 10 22	704	0.6−	0.7−
1995 06 24	691	0.4−	0.0	1998 05 01	699	1.0+	0.7−	1999 10 30	703	0.3−	0.0
1995 06 24	691	0.3−	0.1−	1998 05 01	704	0.1+	0.0	1999 10 30	703	0.1−	0.6+
1995 06 29	691	0.3+	0.2+	1998 05 01	699	1.6+	0.5−	1999 10 30	703	1.0+	0.4+
1995 06 29	691	0.3+	0.1+	1998 05 01	699	1.1+	0.0	1999 10 30	703	0.0	0.1+
1995 06 29	691	0.3+	0.0	1998 05 01	704	0.3+	0.5−	1999 11 03	704	0.4−	0.5−
1998 04 21	704	0.5−	0.1−	1998 05 01	704	0.0	0.3−	1999 11 03	704	0.4−	0.1+
1998 04 21	704	1.1−	0.2−	1998 05 01	566	0.0	0.6−	1999 11 03	704	0.4−	0.0
1998 04 21	704	0.0	0.1+	1998 05 01	566	0.1−	0.6−	1999 11 03	704	0.2−	0.3−
1998 04 21	704	0.2−	1.3+	1998 05 01	566	0.2+	0.5−	1999 11 12	704	0.2+	0.2+
1998 04 21	704	0.6−	0.3+	1998 05 02	566	0.6+	0.8−	1999 11 12	704	0.2−	0.1+
1998 04 21	120	0.0	0.5+	1998 05 02	566	0.1−	0.8−	1999 11 12	704	0.0	0.4+
1998 04 21	120	0.7−	0.6+	1998 05 02	566	0.6+	0.7−	1999 11 12	704	0.2−	0.2+
1998 04 21	120	0.2+	0.4+	1998 05 16	704	0.7−	0.3+	1999 11 12	704	0.7−	0.0
1998 04 22	704	0.3−	0.3+	1998 05 16	704	0.4−	0.0	1999 11 15	704	0.4+	0.3−
1998 04 22	704	0.8−	0.4+	1998 05 16	704	1.1−	0.3−	1999 11 15	704	0.6+	0.0
1998 04 22	704	0.2−	0.2+	1998 05 16	704	0.0	1.3−	1999 11 15	704	0.3+	0.2+
1998 04 22	704	0.0	0.3−	1998 05 16	704	1.8−	1.4−	1999 11 15	704	0.4+	0.1+
1998 04 22	704	0.3−	0.1−	1998 05 25	699	0.7+	0.4−	1999 11 15	704	0.7+	0.3+
1998 04 23	120	0.1+	0.7+	1998 05 25	699	0.7+	0.7−	1999 11 17	704	0.4+	0.7−
1998 04 23	120	0.4+	0.7+	1998 05 25	699	0.6+	0.2−	1999 11 17	704	0.1+	0.2−
1998 04 25	699	0.0	0.3+	1999 10 22	704	0.4+	0.3−	1999 11 17	704	0.8−	1.4−
1998 04 25	699	0.0	0.1+	1999 10 22	704	0.3−	0.8−	1999 11 17	704	0.5+	1.0−

(12513)* 1998 HC₂₀ = 1980 VV

Discovered 1998 Apr. 27 by P. G. Comba at Prescott.

Id. A. Gnädig (*MPC* 34916)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

M	12.88716		(2000.0)	P	Q		
n	0.31210062	ω	334.04835	+0.99935511	−0.03095237		
a	2.1524825	Ω	27.74372	+0.03576993	+0.90249011		
e	0.1785779	i	2.24085	−0.00314154	+0.42959695		
P	3.16	H	15.1	G	0.15	U	2

Residuals in seconds of arc

1980 11 11	046	0.5−	0.5−	1998 04 30	699	0.5+	1.1−	1998 06 27	684	0.5−	0.3+
1980 11 11	046	0.5+	0.3+	1998 04 30	699	(2.4+	1.1−)	1998 06 27	684	0.5−	0.5+
1993 12 14	691	0.1−	0.1+	1998 04 30	699	0.8−	0.1−	1999 10 06	704	0.6−	0.1−
1993 12 14	691	0.5−	0.4−	1998 05 01	704	0.2+	0.3−	1999 10 06	704	0.1+	0.0
1993 12 14	691	0.1−	0.4−	1998 05 01	704	0.0	0.1−	1999 10 06	704	0.2+	0.2−
1994 01 08	691	0.7+	0.2−	1998 05 01	699	0.1−	0.2−	1999 10 06	704	0.0	0.1−
1994 01 08	691	0.4−	0.1−	1998 05 01	704	0.5+	0.3+	1999 10 06	704	0.4+	0.3+
1997 01 10	675	0.1+	0.1−	1998 05 01	699	0.9+	0.5+	1999 10 12	704	0.1+	1.7−
1997 01 10	675	0.2−	0.4−	1998 05 01	684	0.0	0.6−	1999 10 12	704	(2.1+	1.7−)
1998 04 21	704	0.5−	0.6−	1998 05 01	704	1.0+	0.5+	1999 10 12	704	(2.1+	1.2−)
1998 04 21	704	0.8+	0.5+	1998 05 01	699	0.2−	0.0	1999 10 12	704	(2.8+	1.2−)
1998 04 21	704	0.0	1.3+	1998 05 01	684	0.1+	0.8−	1999 10 12	704	1.9+	0.9+
1998 04 21	704	(2.2−	1.7+)	1998 05 01	704	0.1+	2.0+	1999 11 03	704	0.7+	0.0
1998 04 21	704	0.7−	0.6+	1998 05 02	684	0.1+	1.2−	1999 11 03	704	0.4−	0.3+
1998 04 22	704	0.3−	0.9+	1998 05 02	684	0.1−	1.4−	1999 11 03	704	0.9−	0.4+
1998 04 22	704	0.6−	0.8+	1998 05 15	684	0.5−	0.0	1999 11 03	704	0.7−	0.1+
1998 04 22	704	0.2−	0.7−	1998 05 15	684	0.2−	0.0	1999 11 03	704	0.6−	0.0
1998 04 22	704	0.5+	0.9−	1998 05 16	684	0.4−	0.1+	1999 11 14	704	0.1+	0.1−
1998 04 22	704	0.8−	0.1+	1998 05 16	684	0.0	0.1+	1999 11 14	704	0.3+	0.0
1998 04 23	120	1.6+	0.1+	1998 05 16	704	0.0	1.0+	1999 11 14	704	0.6−	0.0
1998 04 23	120	0.2+	0.4+	1998 05 16	704	(2.0−	2.1+)	1999 11 14	704	(3.1−	0.7+)

1999 NOV. 23

M.P.C. 36745

1998 04 23	120	0.9+	1.4+	1998 05 16	704	0.3+	0.2-	1999 11 16	704	0.3+	0.7+
1998 04 27	684	0.0	0.4-	1998 05 16	704	0.4+	0.1-	1999 11 16	704	0.2-	0.6+
1998 04 27	684	0.1-	0.3-	1998 06 26	684	0.5-	0.3+	1999 11 16	704	0.2-	0.6+
1998 04 28	684	0.2+	0.7-	1998 06 26	684	0.5-	0.8+	1999 11 16	704	0.2-	0.5+
1998 04 28	684	0.0	0.6-	1998 06 26	684	0.5-	0.7+	1999 11 16	704	0.2+	0.7+

(12514)* 1998 HM₂₆ = 1995 US₄₉ = 1995 WH₄₁

Discovered 1998 Apr. 20 by Spacewatch at Kitt Peak.

Id. G. V. Williams (*MPC* 32010)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

				Williams			
<i>M</i>	12.52472		(2000.0)	P	Q		
<i>n</i>	0.24226787	ω	169.33257	+0.97242911	+0.23315392		
<i>a</i>	2.5484268	Ω	177.17232	-0.22019605	+0.92448322		
<i>e</i>	0.1681279	<i>i</i>	5.31406	-0.07678101	+0.30161238		
<i>P</i>	4.07	<i>H</i>	14.4	<i>G</i>	0.15	<i>U</i>	2

Residuals in seconds of arc

1994 06 06	691	0.0	0.4+	1998 05 22	704	0.2-	0.5+	1999 10 15	704	0.3-	0.1+
1994 06 06	691	0.1+	0.2+	1998 05 22	704	0.7-	0.5+	1999 10 15	704	0.5-	0.3+
1994 06 06	691	0.2-	0.4+	1998 05 22	704	0.2+	0.8-	1999 10 15	704	0.4-	0.0
1995 10 25	372	0.7-	0.5-	1998 05 22	704	0.4-	0.0	1999 10 15	704	0.7-	0.2-
1995 10 25	372	0.1-	1.0+	1998 05 22	704	0.2-	0.3-	1999 10 19	704	0.4-	0.2-
1995 11 26	691	0.1-	0.1+	1998 05 24	704	0.1-	0.0	1999 10 19	704	0.9-	0.2+
1995 11 26	691	0.1+	0.5+	1998 05 24	704	0.6+	0.0	1999 10 19	704	0.2-	0.3-
1995 11 26	691	0.1-	0.0	1998 05 24	704	0.8+	0.1+	1999 10 19	704	0.0	0.3-
1995 11 27	691	0.3+	0.1+	1998 05 24	704	(2.6+ 0.0)		1999 10 19	704	0.2+	0.6-
1995 11 27	691	0.5+	0.2+	1999 10 04	703	0.1+	0.2+	1999 11 06	704	0.2-	0.1-
1995 11 27	691	0.2+	0.0	1999 10 04	703	0.1+	0.2-	1999 11 06	704	0.2+	0.6+
1998 04 20	691	0.3+	0.3+	1999 10 04	703	0.5-	0.3+	1999 11 06	704	0.4+	0.2-
1998 04 20	691	0.4+	0.3+	1999 10 04	703	0.1-	0.1+	1999 11 06	704	0.1+	0.2-
1998 04 20	691	0.2+	0.2+	1999 10 07	704	0.7+	0.4-	1999 11 06	704	0.8+	0.3-
1998 04 22	704	0.2-	0.2+	1999 10 07	704	0.4+	0.0	1999 11 15	704	0.2-	0.5+
1998 04 22	704	1.0+	0.1+	1999 10 07	704	0.1+	0.5+	1999 11 15	704	0.4-	0.1-
1998 04 22	704	1.0+	1.1-	1999 10 07	704	0.3+	0.2-	1999 11 15	704	0.2-	0.4+
1998 04 22	704	1.4-	0.7+	1999 10 07	704	0.1-	0.0	1999 11 15	704	0.3-	0.7+
1998 04 28	691	0.2-	0.1+	1999 10 09	704	0.7+	0.1+	1999 11 15	704	0.9-	0.4+
1998 04 28	691	0.1-	0.2+	1999 10 09	704	0.3+	0.0	1999 11 17	704	0.3+	1.1+
1998 04 28	691	0.2-	0.3+	1999 10 09	704	0.1+	0.0	1999 11 17	704	0.0	0.2+
1998 05 01	704	0.3+	0.5-	1999 10 09	704	0.1+	0.2+	1999 11 17	704	0.2-	0.3+
1998 05 01	704	0.4+	1.2-	1999 10 09	704	0.5+	0.2-	1999 11 17	704	0.9+	0.8-
1998 05 01	704	1.2-	0.6+	1999 10 10	120	0.1+	0.5-	1999 11 17	704	0.1-	0.8-
1998 05 01	704	(3.2+	0.3+)	1999 10 11	120	0.1-	0.4-				

(12515)* 1998 HE₄₃ = 1972 RX₂ = 1991 RG₃₂ = 4855 T-1

Discovered 1998 Apr. 30 by Spacewatch at Kitt Peak.

Id. G. V. Williams (*MPC* 32013)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

				Williams			
<i>M</i>	36.89471		(2000.0)	P	Q		
<i>n</i>	0.25874992	ω	164.09923	+0.84011314	+0.54182450		
<i>a</i>	2.4390231	Ω	163.02127	-0.50659133	+0.80040225		
<i>e</i>	0.1380583	<i>i</i>	4.95480	-0.19384307	+0.25648090		
<i>P</i>	3.81	<i>H</i>	14.2	<i>G</i>	0.15	<i>U</i>	1

Residuals in seconds of arc

1971 04 16	675	0.1+	1.2+	1998 05 05	699	0.2-	0.5-	1999 10 10	704	0.7-	0.8+
1971 04 16	675	0.3+	1.6+	1998 05 05	699	0.1+	0.4-	1999 10 15	704	0.2+	0.3+
1971 05 13	675	0.5-	0.5-	1998 05 22	704	0.1+	0.2+	1999 10 15	704	0.3+	0.3+
1971 05 14	675	0.2-	0.0	1998 05 22	704	1.5-	0.1+	1999 10 15	704	0.6+	0.5+
1971 05 16	675	0.6+	2.0-	1998 05 22	704	1.1-	0.2-	1999 10 15	704	0.2-	0.2+
1972 09 04	095	(0.2- 2.9+)		1998 05 22	704	0.4+	0.3+	1999 10 19	704	0.1-	0.1-
1991 09 07	399	(1.7- 3.5-)		1998 05 22	704	0.5-	0.8-	1999 10 19	704	0.2+	0.5-
1991 09 07	399	(0.7+ 3.6-)		1998 05 24	704	0.2-	1.4+	1999 10 19	704	0.0	0.1+
1995 09 25	691	0.0	0.4-	1998 05 24	704	0.5+	0.3-	1999 10 19	704	0.5-	0.2+
1995 09 25	691	0.3+	0.6-	1998 05 24	704	0.2+	0.3+	1999 10 19	704	0.0	0.1-
1995 09 25	691	0.1-	0.6-	1998 05 24	704	0.6+	1.0+	1999 10 30	703	0.3-	0.0

1998 04 30	691	0.4+	0.5+	1998 05 24	704	1.2-	1.7+	1999 10 30	703	0.5-	0.2+
1998 04 30	691	0.3+	0.4+	1998 06 16	704	0.8+	0.3+	1999 10 30	703	0.4-	0.1+
1998 04 30	691	0.4+	0.3+	1998 06 16	704	(2.6+ 0.1-)		1999 10 30	703	0.2-	0.1+
1998 05 01	704	0.4+	0.0	1998 06 16	704	0.2+	0.4+	1999 11 05	704	0.3-	0.0
1998 05 01	704	0.2+	0.3+	1998 06 16	704	(1.2- 2.3+)		1999 11 05	704	0.1-	0.2+
1998 05 01	704	0.4+	1.0+	1998 06 16	704	0.8-	0.6+	1999 11 05	704	0.2-	0.1+
1998 05 01	704	0.7+	0.7-	1999 10 07	704	0.2+	0.2+	1999 11 05	704	0.2-	0.2+
1998 05 01	699	0.5+	0.4-	1999 10 07	704	0.5+	0.2-	1999 11 05	704	0.0	0.3+
1998 05 01	699	0.7+	0.5-	1999 10 07	704	0.4-	0.5+	1999 11 13	699	0.6-	0.2+
1998 05 01	699	0.3+	0.1-	1999 10 07	704	0.3-	0.6-	1999 11 13	699	0.3+	0.2+
1998 05 02	691	0.1-	0.2+	1999 10 10	704	0.3-	0.1+	1999 11 13	699	0.0	0.2+
1998 05 02	691	0.1+	0.3+	1999 10 10	704	0.3-	0.7+	1999 11 14	699	0.2+	0.2+
1998 05 02	691	0.2-	0.4+	1999 10 10	704	0.1-	0.5+	1999 11 14	699	0.3+	1.1+
1998 05 05	699	0.3-	0.6-	1999 10 10	704	0.2+	0.6+	1999 11 14	699	1.2+	0.2+

(12516)* 1998 HB₄₅ = 1989 SP₈

Discovered 1998 Apr. 20 by the Lincoln Laboratory Near-Earth Asteroid

Research Team at Socorro.

Id. G. V. Williams (*MPC* 32267)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

				Williams			
<i>M</i>	91.29410		(2000.0)	P	Q		
<i>n</i>	0.30320154	ω	253.75884	-0.04681048	+0.99870218		
<i>a</i>	2.1943966	Ω	13.60536	-0.88080872	-0.03179193		
<i>e</i>	0.0779086	<i>i</i>	4.89403	-0.47115261	-0.03978992		
<i>P</i>	3.25	<i>H</i>	14.8	<i>G</i>	0.15	<i>U</i>	2

Residuals in seconds of arc

1989 09 25	809	1.4+	0.3-	1998 04 21	704	0.8-	0.7-	1999 10 09	703	1.5+	0.2-
1989 09 25	809	0.5+	0.1-	1998 04 21	704	0.5-	0.2+	1999 10 09	703	0.7-	0.9+
1989 09 25	809	0.3-	0.3-	1998 04 22	704	0.4+	0.0	1999 10 09	703	0.7-	0.3+
1989 09 26	809	1.8-	1.4+	1998 04 22	704	0.2+	0.3+	1999 10 14	691	0.1-	0.2-
1989 09 26	809	1.0-	1.3+	1998 04 22	704	0.3-	0.5+	1999 10 14	691	0.1-	0.0
1989 09 26	809	0.5-	1.2+	1998 04 22	704	0.7+	0.3-	1999 10 14	691	0.0	0.2-
1996 10 18	327	0.2-	0.2-	1998 04 22	704	0.9+	0.8+	1999 10 14	120	0.4+	0.1-
1996 10 18	327	0.1+	0.1+	1998 05 16	704	0.5-	1.1-	1999 10 14	120	0.1+	0.2-
1996 10 18	327	0.2-	0.5+	1998 05 16	704	0.2+	0.6-	1999 10 15	704	0.5-	0.1+
1996 10 18	327	0.1+	0.2+	1998 05 16	704	0.9-	0.9-	1999 10 15	704	0.2-	0.3+
1998 03 25	699	1.2+	0.1+	1998 05 16	704	0.6-	0.8+	1999 10 15	704	0.4-	0.4-
1998 03 25	699	0.0	1.2+	1998 05 16	704	(3.3- 0.2-)		1999 10 15	704	0.2+	1.6+
1998 03 25	699	1.7+	0.7+	1999 10 02	703	0.9-	0.6+	1999 10 20	704	0.1-	0.1+
1998 03 25	704	0.7+	0.6+	1999 10 02	703	0.1+	0.5+	1999 10 20	704	0.1-	0.3+
1998 03 25	704	1.0+	0.4+	1999 10 02	703	0.4-	0.3+	1999 10 20	704	0.4-	0.5+
1998 03 25	704	0.7+	0.1+	1999 10 02	703	0.0	0.2+	1999 10 20	704	0.4-	0.4+
1998 03 25	704	0.5+	0.2+	1999 10 03	704	0.0	0.1+	1999 10 20	704	0.1+	0.6+
1998 03 25	704	0.4-	0.2+	1999 10 03	704	0.0	0.5+	1999 11 04	704	0.0	0.4+
1998 03 29	704	0.9+	0.5+	1999 10 03	704	0.0	1.0-	1999 11 04	704	0.0	0.0
1998 03 29	704	0.2-	0.2+	1999 10 03	704	0.3+	0.2-	1999 11 04	704	0.1-	0.0
1998 03 29	704	0.4+	0.3-	1999 10 06	704	0.1-	0.1-	1999 11 04	703	0.3-	0.6+
1998 03 29	704	1.0+	0.1+	1999 10 06	704	0.2+	0.1-	1999 11 04	704	0.1+	0.9-
1998 03 29	704	0.2+	0.8-	1999 10 06	704	0.1-	0.1-	1999 11 04	703	0.1-	0.4+
1998 04 01	704	0.0	0.7+	1999 10 06	704	0.0	0.1-	1999 11 04	704	0.3-	0.2+
1998 04 01	704	0.0	1.2+	1999 10 06	704	0.0	0.3-	1999 11 04	703	0.0	0.4+
1998 04 01	704	0.2+	0.9+	1999 10 07	704	0.5+	0.4-	1999 11 04	703	0.2-	0.5+
1998 04 01	704	0.1-	0.4+	1999 10 07	704	0.5-	0.2-	1999 11 14	704	0.3+	0.1-
1998 04 01	704	0.3+	0.6+	1999 10 07	704	0.8-	0.3-	1999 11 14	704	0.3-	0.2+
1998 04 20	704	0.2-	0.8+	1999 10 07	704	0.1+	0.0	1999 11 14	704	0.7+	0.1+
1998 04 20	704	(2.5- 0.6-)		1999 10 07	704	0.2+	0.1-	1999 11 14	704	0.4+	0.2-
1998 04 20	704	0.7-	0.2+	1999 10 07	120	0.6-	0.7-	1999 11 14	704	0.1-	0.1-
1998 04 20	704	0.6-	0.2+	1999 10 07	120	0.6+	0.1+	1999 11 16	704	0.1+	0.0
1998 04 20	704	1.5-	0.1+	1999 10 08	106	0.3-	0.6+	1999 11 16	704	0.4+	0.2-
1998 04 21	704	0.4-	0.3+	1999 10 08	106	0.2+	0.2-	1999 11 16	704	0.1-	0.3+
1998 04 21	704	0.5+	0.8+	1999 10 08	106	0.2-	0.4+	1999 11 16	704	0.4+	0.4+
1998 04 21	704	0.2-	0.5-	1999 10 09	703	(2.3- 1.2-)					

(12517)* 1998 HD₅₂ = 1977 RH₁₇ = 1995 SS₁₃

Discovered 1998 Apr. 30 by the Lowell Observatory Near-Earth Object Search at the Anderson Mesa Station.

Id. A. Doppler (*MPC* 35983)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>		<i>P</i>		<i>Q</i>	
85.75619		(2000.0)			
<i>n</i>	0.27343668	ω	120.58823	+0.11301098	+0.99358281
<i>a</i>	2.3508858	Ω	155.89936	−0.91546714	+0.10594647
<i>e</i>	0.1949003	<i>i</i>	0.65379	−0.38619740	+0.03960476
<i>P</i>	3.60	<i>H</i>	15.9	<i>G</i>	0.15
				<i>U</i>	1

Residuals in seconds of arc

1977 09 09	675	0.4+	0.9−	1998 04 21	704	0.0	0.5−	1998 05 20	691	0.0	0.9+
1977 09 10	675	0.8+	1.0−	1998 04 21	704	1.0+	0.2+	1999 10 05	704	1.5+	0.2+
1992 11 24	691	0.8−	0.3−	1998 04 21	704	0.5−	1.0+	1999 10 05	704	0.4+	0.4−
1992 11 24	691	0.3−	0.2−	1998 04 21	704	1.2−	1.8+	1999 10 05	704	0.2−	0.9−
1992 11 24	691	0.1−	0.1−	1998 04 22	704	0.5+	0.4+	1999 10 10	704	0.3+	0.3+
1995 08 25	809	0.3−	1.1+	1998 04 22	704	0.4+	0.4−	1999 10 10	704	0.8−	1.1−
1995 08 26	809	0.2+	0.9+	1998 04 22	704	0.1+	0.8−	1999 10 10	704	0.6+	0.2+
1995 09 01	809	0.2+	0.4+	1998 04 22	704	0.4−	0.1+	1999 10 10	704	1.3−	0.9+
1995 09 18	691	0.5−	0.7+	1998 04 22	704	0.5−	1.2−	1999 10 29	691	0.5+	0.2+
1995 09 18	691	0.7−	0.5+	1998 04 30	699	1.4+	0.2−	1999 10 29	691	0.3+	0.2+
1995 09 18	809	1.7+	0.0	1998 04 30	699	1.5+	0.3−	1999 10 29	691	0.5+	0.2+
1995 09 18	691	0.7−	0.4+	1998 04 30	699	0.7+	0.2+	1999 11 03	691	0.4−	0.4+
1995 09 19	809	1.0+	0.1+	1998 05 01	704	0.1+	0.1−	1999 11 03	691	0.4−	0.5+
1995 09 19	809	0.4−	0.3−	1998 05 01	704	0.6+	0.8+	1999 11 03	691	0.2−	0.5+
1995 09 20	809	0.0	0.2−	1998 05 01	699	1.3+	0.1−	1999 11 09	704	1.1+	1.8+
1995 09 22	809	0.9+	1.0−	1998 05 01	699	0.5+	1.0+	1999 11 09	704	0.4−	0.4+
1995 09 22	691	1.5−	0.2+	1998 05 01	704	0.1+	0.2−	1999 11 09	704	0.0	0.7+
1995 09 22	691	0.8−	0.0	1998 05 01	699	0.8−	0.4−	1999 11 09	704	0.3+	0.3+
1995 09 22	691	0.5−	0.1+	1998 05 01	704	0.3+	1.1+	1999 11 09	704	0.1−	0.8+
1995 09 23	809	0.2+	0.8−	1998 05 01	704	0.1+	1.3+	1999 11 12	704	2.1−	2.7+
1995 09 23	809	(7.0+	2.9−)	1998 05 16	704	0.4−	1.7+	1999 11 12	704	0.4−	1.1+
1995 09 24	809	0.1+	0.3+	1998 05 16	704	0.6−	1.3+	1999 11 12	704	0.3−	0.1+
1995 09 27	691	0.8−	0.2+	1998 05 16	704	0.7−	1.7−	1999 11 12	704	0.8−	0.4+
1995 09 27	691	0.1−	0.3+	1998 05 16	704	(2.0−	2.6−)	1999 11 12	704	0.8+	0.0
1995 09 27	691	0.1−	0.1+	1998 05 20	691	0.0	0.8+				
1998 04 21	704	0.8−	0.5+	1998 05 20	691	0.0	0.9+				

(12518)* 1998 HM₅₂ = 1982 YN = 1994 CQ₁₄

Discovered 1998 Apr. 27 by F. B. Zoltowski at Woomera.

Id. G. V. Williams (*MPC* 32014)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>		<i>P</i>		<i>Q</i>	
65.00714		(2000.0)			
<i>n</i>	0.28679575	ω	235.86501	+0.77679759	+0.62069665
<i>a</i>	2.2773035	Ω	85.53409	−0.53693293	+0.74107315
<i>e</i>	0.2159358	<i>i</i>	6.12656	−0.32907223	+0.25602004
<i>P</i>	3.44	<i>H</i>	13.8	<i>G</i>	0.15
				<i>U</i>	1

Residuals in seconds of arc

1982 12 22	511	0.5−	1.8−	1998 05 22	704	0.2−	0.7−	1998 06 30	699	0.0	0.1−
1982 12 23	511	0.3−	1.7−	1998 05 22	704	1.1−	0.2+	1998 06 30	699	0.0	0.1+
1994 02 08	809	(2.5+	0.8+)	1998 05 22	704	0.7−	0.7−	1998 07 16	699	0.0	0.2+
1994 02 08	809	1.4+	0.9+	1998 05 22	704	1.0−	0.1+	1998 07 16	699	0.1−	0.4+
1994 02 08	809	1.7+	0.9+	1998 05 22	699	0.2+	0.7+	1998 07 16	699	0.4−	0.1−
1994 02 10	809	1.5+	0.5+	1998 05 22	704	1.0−	0.5+	1998 07 20	566	0.3−	0.5−
1994 02 10	809	1.1+	0.1−	1998 05 22	699	0.2−	0.2+	1998 07 20	566	1.1+	0.2−
1994 02 10	809	0.2+	0.3−	1998 05 22	699	0.4−	0.5+	1998 07 20	566	0.3+	0.4+
1994 02 13	809	(1.6−	2.6+)	1998 05 24	704	1.6+	0.8+	1998 08 05	426	0.8−	0.2−
1994 02 13	809	(1.1−	2.5+)	1998 05 24	704	(2.3−	2.5−)	1998 08 05	426	0.5−	0.4−
1994 02 13	809	(2.3−	3.0+)	1998 05 24	704	0.0	0.4+	1998 08 05	426	0.1+	0.7−
1997 02 06	566	1.5−	0.4−	1998 05 24	704	0.7+	0.4+	1998 08 12	426	0.6+	0.8−
1997 02 06	566	1.7−	0.4−	1998 05 24	704	0.0	0.5+	1998 08 12	426	0.5+	1.2−
1997 02 06	566	1.2−	0.5−	1998 05 24	699	0.4−	0.2+	1999 10 09	703	0.2+	0.4+
1998 04 22	704	0.7+	0.2+	1998 05 24	699	0.1+	0.3+	1999 10 09	703	0.3+	0.4+

1998 04 22	704	0.1−	0.3+	1998 05 24	699	0.1−	0.2+	1999 10 09	703	0.7+	0.6+
1998 04 22	704	0.4−	0.3−	1998 05 28	699	0.1+	0.0	1999 10 09	703	(2.1+	2.1+)
1998 04 22	704	1.2−	0.1+	1998 05 28	699	0.4+	0.3−	1999 10 12	704	0.1+	0.3−
1998 04 22	704	1.3−	0.5+	1998 05 28	699	0.2−	0.2−	1999 10 12	704	0.2+	0.6−
1998 04 27	426	0.2−	0.4+	1998 06 16	704	1.0+	0.1−	1999 10 12	704	0.4+	0.5−
1998 04 27	426	0.4−	0.1+	1998 06 16	704	1.4+	0.8−	1999 10 12	704	0.0	0.6−
1998 04 28	691	0.2+	0.2+	1998 06 16	704	0.8+	0.1+	1999 10 12	704	0.7+	0.2+
1998 04 28	691	0.2+	0.3+	1998 06 16	704	0.1+	0.8−	1999 11 03	704	0.5+	0.2−
1998 04 28	691	0.1+	0.1+	1998 06 16	704	1.2−	0.6−	1999 11 03	704	0.5+	0.4+
1998 05 05	426	0.3−	0.4−	1998 06 18	704	1.3+	0.3+	1999 11 03	704	1.0+	1.3+
1998 05 05	426	0.1−	0.5−	1998 06 18	704	1.9+	1.4−	1999 11 03	704	0.0	0.5+
1998 05 05	426	0.3−	0.5−	1998 06 18	704	(2.3−	0.6+)	1999 11 03	704	0.7−	1.2+
1998 05 15	426	0.1−	0.4−	1998 06 18	704	0.2−	0.1−	1999 11 17	704	0.2+	0.2−
1998 05 15	426	0.2−	0.6−	1998 06 18	704	(2.3−	0.5−)	1999 11 17	704	1.5−	0.7−
1998 05 15	426	0.2−	0.4−	1998 06 27	699	0.0	0.4+	1999 11 17	704	0.1+	0.5−
1998 05 17	426	0.4−	0.5−	1998 06 27	699	0.3+	0.8+	1999 11 17	704	0.1−	0.5−
1998 05 17	426	0.6−	0.5−	1998 06 27	699	0.2−	0.5+				
1998 05 17	426	0.2−	0.6−	1998 06 30	699	0.2−	0.3+				

(12519)* 1998 HH₅₅

Discovered 1998 Apr. 21 by the Lincoln Laboratory Near-Earth Asteroid Research Team at Socorro.

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>		<i>P</i>		<i>Q</i>	
97.61564		(2000.0)			
<i>n</i>	0.27082636	ω	31.44052	−0.27486058	+0.96133179
<i>a</i>	2.3659674	Ω	222.61250	−0.88730595	−0.26047027
<i>e</i>	0.1927016	<i>i</i>	1.44838	−0.37032393	−0.08942278
<i>P</i>	3.64	<i>H</i>	14.9	<i>G</i>	0.15
				<i>U</i>	2

Residuals in seconds of arc

1995 09 26	010	0.1−	0.7+	1998 04 25	699	0.2−	0.1+	1999 10 09	703	0.1−	0.7+
1995 09 26	010	(1.1−	2.3+)	1998 04 25	699	0.3−	0.0	1999 10 09	691	0.0	0.3−
1995 09 26	010	0.8−	1.8+	1998 05 16	704	0.2+	0.6+	1999 10 09	691	0.0	0.3−
1996 12 17	566	0.3−	0.4+	1998 05 16	704	0.5+	1.2+	1999 10 09	691	0.1+	0.3−
1996 12 17	566	0.0	0.3+	1998 05 16	704	1.3−	0.4+	1999 10 10	704	0.2−	0.3−
1996 12 17	566	0.0	0.3+	1998 05 16	704	1.4−	0.9−	1999 10 10	704	0.1−	0.6−
1998 03 25	704	0.2+	0.0	1999 09 12	703	(2.8+	1.1−)	1999 10 10	704	0.6−	0.7−
1998 03 25	704	0.7+	0.6+	1999 09 12	703	0.2+	0.9−	1999 10 10	704	0.6−	0.4−
1998 03 25	704	0.1−	1.7+	1999 09 12	703	1.7−	0.5+	1999 10 10	704	0.9−	0.8−
1998 03 25	699	0.4+	1.1+	1999 09 12	703	1.2−	0.4−	1999 10 15	704	0.2+	0.3−
1998 03 25	704	(1.0+	2.2+)	1999 09 12	046	0.2−	0.4−	1999 10 15	704	0.1+	0.3−
1998 03 25	699	0.6+	0.3−	1999 09 12	557	0.3−	0.3−	1999 10 15	704	0.2−	0.7−
1998 03 25	699	0.1−	0.2−	1999 09 12	046	0.2−	0.2−	1999 10 15	704	0.6+	1.0−
1998 03 25	704	0.4−	0.2+	1999 09 12	557	1.0−	0.4−	1999 10 15	704	0.5+	0.6−
1998 03 29	704	0.2+	0.2−	1999 09 12	046	0.1+	0.5−	1999 10 19	691	0.3+	0.6+
1998 03 29	704	0.5+	0.5−	1999 09 12	046	0.4−	0.2−	1999 10 19	691	0.2+	0.1−
1998 03 29	704	0.5−	0.2+	1999 09 12	557	1.0−	0.5−	1999 10 19	691	0.2+	0.1+
1998 03 29	704	0.0	0.2+	1999 09 12	046	0.4−	0.1+	1999 10 20	704	0.2+	0.7+
1998 03 29	704	0.1+	0.6−	1999 09 12	557	0.7−	0.3−	1999 10 20	704	0.1+	0.1−

1998 04 22 704 0.5− 0.9− 1999 10 09 703 0.1− 0.3+ 1999 11 16 704 1.6+ 0.1+
 1998 04 25 699 0.4+ 0.3− 1999 10 09 703 0.2− 0.8+ 1999 11 16 704 1.2+ 0.3−

(12520)* 1998 HV₇₈ = 1938 RA = 1955 UF₁ = 1975 NJ₁ = 1992 US₁₀
 = 1992 XQ

Discovered 1998 Apr. 21 by the Lincoln Laboratory Near-Earth Asteroid
 Research Team at Socorro.

Id. A. Gnädig (*MPC* 32268)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	22.87969	(2000.0)	<i>P</i>	<i>Q</i>
<i>n</i>	0.29265700	<i>ω</i>	101.28835	+0.99163961
<i>a</i>	2.2467950	<i>Ω</i>	252.93883	−0.12400433
<i>e</i>	0.2938671	<i>i</i>	4.80073	+0.03569043
<i>P</i>	3.37	<i>H</i>	14.4	<i>U</i>

Residuals in seconds of arc

1938 09 01	024	0.5−	1.2−	1998 04 22	704	0.4−	0.1+	1999 10 12	704
1955 10 25	760	1.4+	0.8+	1998 04 22	704	0.6+	0.0	1999 10 22	704
1955 10 25	760	(6.5+	1.7+)	1998 04 22	704	0.3+	1.1+	1999 10 22	704
1975 07 12	095	0.7−	1.0+	1998 05 16	691	0.7−	0.3+	1999 10 22	704
1992 09 28	095	0.1+	0.1−	1998 05 16	691	0.8−	0.3+	1999 11 03	704
1992 09 28	095	1.2−	1.8+	1998 05 16	691	0.6−	0.5+	1999 11 03	704
1992 10 20	095	0.3+	0.2+	1998 05 18	691	0.8+	0.2+	1999 11 03	704
1992 10 28	095	1.3+	1.2−	1998 05 18	691	0.1+	0.5+	1999 11 03	704
1992 12 13	010	(1.1−	2.0−)	1998 05 18	691	0.4+	0.4+	1999 11 03	704
1992 12 14	010	(3.1−	1.7−)	1999 10 09	703	(4.9−	1.9+)	1999 11 17	704
1998 04 21	704	0.1+	0.4−	1999 10 09	703	0.3+	0.8+	1999 11 17	704
1998 04 21	704	1.6+	0.2+	1999 10 09	703	1.5+	0.3+	1999 11 17	704
1998 04 21	704	0.7+	0.1+	1999 10 09	703	1.8−	0.4+	1999 11 17	704
1998 04 21	704	0.7−	0.6−	1999 10 12	704	0.4−	1.0+	1999 11 17	704
1998 04 21	704	1.0+	0.2−	1999 10 12	704	1.0−	1.2+		
1998 04 22	704	0.4−	0.1+	1999 10 12	704	1.4+	0.3+		

(12521)* 1998 HT₉₅ = 1991 RE₂₁ = 1996 YN₃

Discovered 1998 Apr. 21 by the Lincoln Laboratory Near-Earth Asteroid

Research Team at Socorro.

Id. G. V. Williams (*MPC* 32018)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	63.93076	(2000.0)	<i>P</i>	<i>Q</i>
<i>n</i>	0.25586258	<i>ω</i>	182.60274	+0.38469355
<i>a</i>	2.4573378	<i>Ω</i>	110.02743	−0.84571362
<i>e</i>	0.1751411	<i>i</i>	3.67816	−0.36983693
<i>P</i>	3.85	<i>H</i>	13.3	<i>U</i>

Residuals in seconds of arc

1991 09 14	675	0.6+	1.0−	1998 05 05	132	1.0+	0.1+	1999 10 10	704
1991 09 14	675	0.3+	1.2−	1998 05 05	132	0.3+	0.3+	1999 10 10	704
1991 09 16	675	0.1+	0.2−	1998 05 05	132	2.0+	0.4−	1999 10 15	704
1991 09 16	675	0.1+	0.3−	1998 05 22	704	0.3+	0.1−	1999 10 15	704
1996 12 20	327	0.2+	0.3−	1998 05 22	704	0.3−	0.5+	1999 10 15	704
1996 12 20	327	0.8+	0.4−	1998 05 22	704	0.3−	0.0	1999 10 15	704
1996 12 20	327	0.4+	0.4−	1998 05 22	704	0.5−	0.0	1999 10 19	704
1996 12 22	327	1.1−	0.3−	1998 05 22	704	0.8−	0.2+	1999 10 19	704
1996 12 22	327	0.9−	0.6−	1998 05 23	704	0.5−	0.2+	1999 10 19	704
1996 12 22	327	0.3+	0.6−	1998 05 23	704	1.5−	0.1+	1999 10 19	704
1998 04 21	704	0.0	0.6−	1998 05 23	704	1.1−	0.2+	1999 10 19	704
1998 04 21	704	0.3+	0.4−	1998 05 23	704	1.0−	0.5−	1999 11 05	704
1998 04 21	704	0.3+	0.2−	1998 05 23	704	0.6−	0.9−	1999 11 05	704
1998 04 21	704	0.6+	1.1+	1998 05 24	704	0.1+	0.2+	1999 11 05	704
1998 04 21	704	0.8+	0.9+	1998 05 24	704	0.6−	0.6+	1999 11 05	704
1998 04 22	704	0.7+	0.6−	1998 05 24	704	0.7−	0.6+	1999 11 05	704
1998 04 22	704	0.4+	0.2−	1998 05 24	704	0.2+	0.3−	1999 11 14	699
1998 04 22	704	0.5+	0.6−	1998 05 24	704	0.6−	0.6−	1999 11 14	699
1998 04 22	704	0.2+	1.0−	1998 05 27	699	0.7−	0.9+	1999 11 14	699

1998 04 22	704	0.9+	1.5−	1998 05 27	699	1.0−	0.8+	1999 11 15	704
1998 04 27	905	0.4−	0.5+	1998 05 27	699	0.8−	1.0+	1999 11 15	704
1998 04 27	905	0.4−	0.4+	1998 06 02	699	0.5−	0.2+	1999 11 15	704
1998 04 27	905	0.3+	0.6+	1998 06 02	699	0.6−	0.0	1999 11 15	704
1998 05 01	704	0.6+	0.2−	1998 06 02	699	0.2−	0.1+	1999 11 15	704
1998 05 01	699	0.6+	0.2+	1999 10 07	704	1.0−	1.0+	1999 11 17	704
1998 05 01	704	0.8+	0.5+	1999 10 07	704	0.4−	0.3+	1999 11 17	704
1998 05 01	699	0.9+	0.4+	1999 10 07	704	0.1−	0.3+	1999 11 17	704
1998 05 01	704	0.2+	0.5+	1999 10 07	704	0.2−	0.3+	1999 11 17	704
1998 05 01	699	0.9+	0.3+	1999 10 10	704	0.1+	0.4+	1999 11 17	704
1998 05 01	704	1.2+	0.2+	1999 10 10	704	0.2+	0.3+		
1998 05 01	704	0.1−	1.1+	1999 10 10	704	0.0	0.3+		

(12522)* 1998 HL₉₉ = 1975 SC₁ = 1992 SK₂

Discovered 1998 Apr. 21 by the Lincoln Laboratory Near-Earth Asteroid
 Research Team at Socorro.

Id. G. V. Williams (*MPC* 32020)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	9.56639	(2000.0)	<i>P</i>	<i>Q</i>
<i>n</i>	0.28886270	<i>ω</i>	200.64453	+0.99897930
<i>a</i>	2.2664270	<i>Ω</i>	157.03535	−0.02999998
<i>e</i>	0.1418597	<i>i</i>	3.09719	−0.03376908
<i>P</i>	3.41	<i>H</i>	14.8	<i>U</i>

Residuals in seconds of arc

1975 09 30	675	0.1−	0.7−	1998 04 22	704	0.9+	1.0+	1999 10 20	704
1975 10 01	675	0.2−	1.3−	1998 05 22	704	0.2−	1.0−	1999 10 20	704
1975 10 02	675	1.1+	0.0	1998 05 22	704	1.1+	0.6−	1999 10 20	704
1992 09 21	033	(0.1+	3.9−)	1998 05 22	704	0.6+	0.2−	1999 10 20	704
1992 09 22	033	0.3+	1.4−	1998 05 22	704	0.5−	0.9+	1999 11 05	704
1992 09 23	033	0.3−	0.6+	1998 05 24	704	0.2+	0.0	1999 11 05	704
1992 09 24	033	0.6+	0.8−	1998 05 24	704	0.6+	0.8+	1999 11 05	704
1992 09 26	033	0.3+	1.5+	1998 05 24	704	0.3−	1.5+	1999 11 05	704
1992 09 27	033	0.3+	0.1−	1998 05 24	704	0.1−	0.1+	1999 11 05	704
1992 09 28	033	1.4−	0.1+	1998 05 24	704	0.0	1.3−	1999 11 15	704
1998 04 21	704	0.3+	0.1−	1999 10 02	703	0.1−	0.8+	1999 11 15	704
1998 04 21	704	0.1+	0.4−	1999 10 02	703	0.0	0.7+	1999 11 15	704
1998 04 21	704	0.4−	1.0−	1999 10 02	703	0.0	1.0+	1999 11 15	704
1998 04 21	704	1.4−	0.9+	1999 10 02	703	0.2−	0.4+	1999 11 15	704
1998 04 21	704	0.0	0.2−	1999 10 10	704	0.0	0.9+	1999 11 17	704
1998 04 22	704	1.3−	0.3−	1999 10 10	704	0.1+	0.5+	1999 11 17	704
1998 04 22	704	1.3+	0.7+	1999 10 10	704	0.4−	0.5+	1999 11 17	704
1998 04 22	704	0.2−	1.0+	1999 10 10	704	0.1−	0.4+	1999 11 17	704
1998 04 22	704	(0.9−	2.1+)	1999 10 10	704	0.3−	0.4+	1999 11 17	704

(12523)* 1998 HH₁₀₀ = 1991 RQ₃₀ = 1994 GT₁₀

Discovered 1998 Apr. 21 by the Lincoln Laboratory Near-Earth Asteroid
 Research Team at Socorro.

Id. A. Gnädig (*MPC* 32269)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	9.20606	(2000.0)	<i>P</i>	<i>Q</i>
<i>n</i>	0.25451825	<i>ω</i>	273.58459	+0.98575920
<i>a</i>	2.4659831	<i>Ω</i>	78.70394	−0.08130095
<i>e</i>	0.2192077	<i>i</i>	5.90726	−0.14720379
<i>P</i>	3.87	<i>H</i>	13.3	<i>U</i>

Residuals in seconds of arc

1991 09 14	675	0.1+	0.1+	1998 05 01	704	0.6+	1.1−	1999 10 02	703
1991 09 14	675	0.2−	0.2+	1998 05 01	704	0.1−	0.8−	1999 10 02	703
1991 09 15	675	0.6+	0.7−	1998 05 22	704	0.6+	0.5+	1999 10 09	704
1991 09 15	675	0.0	0.9−	1998 05 22	704	0.1−	0.3+	1999 10 09	704
1994 04 14	675	(4.4−	0.4+)	1998 05 22	704	1.3+	1.6+	1999 10 09	704
1994 04 14	675	(4.8−	0.8−)	1998 05 22	704	0.3+	0.6+	1999 10 09	704
1994 04 15	675	(3.5−	1.2−)	1998 05 22	704	(3.9−	2.3−)	1999 10 09	704
1994 04 15	675	(2.2−	1.0+)	1998 05 23	704	0.2+	0.0	1999 10 19	704

1997 01 11	691	0.3+	0.1-	1998 05 23	704	0.8+	0.4+	1999 10 19	704	0.3+	0.1+
1997 01 11	691	0.2-	0.2-	1998 05 23	704	0.8+	0.3+	1999 10 19	704	0.1+	0.0
1997 01 11	691	0.2-	0.1-	1998 05 23	704	0.2+	0.1+	1999 10 19	704	0.3+	0.3-
1998 04 21	704	0.1-	0.4+	1998 05 23	704	0.9+	0.4+	1999 10 19	704	0.1-	0.2-
1998 04 21	704	0.4-	0.4+	1998 05 23	704	0.1+	0.2+	1999 10 30	703	0.3-	0.0
1998 04 21	704	1.1-	0.3+	1998 05 23	704	0.1+	0.8+	1999 10 30	703	0.4-	0.3+
1998 04 21	704	0.4-	0.1+	1998 05 23	704	0.8+	0.2-	1999 10 30	703	0.5-	0.2+
1998 04 21	704	1.0-	0.3+	1998 05 23	704	1.0+	0.2+	1999 10 30	703	0.2-	0.2+
1998 04 22	704	0.3-	0.1-	1998 05 23	704	0.3+	0.1-	1999 11 05	704	0.3+	0.3+
1998 04 22	704	1.7-	0.7+	1998 05 24	704	0.3+	0.1-	1999 11 05	704	0.1+	0.5+
1998 04 22	704	0.0	0.5+	1998 05 24	704	0.2+	0.1-	1999 11 05	704	0.4+	0.4+
1998 04 22	704	1.0-	0.9+	1998 05 24	704	0.3+	0.5+	1999 11 05	704	0.5+	0.8+
1998 04 22	704	1.0-	1.0+	1998 05 24	704	0.2-	0.0	1999 11 05	704	0.1+	0.4+
1998 04 25	699	0.2+	1.0+	1998 05 24	704	(0.4-	3.2-)	1999 11 06	704	0.3+	0.4+
1998 04 25	699	0.9-	0.7+	1998 05 28	699	1.0+	0.4+	1999 11 06	704	0.3+	0.4+
1998 04 25	699	0.3+	0.7+	1998 05 28	699	0.6+	0.3+	1999 11 06	704	0.2+	0.3+
1998 04 30	566	0.0	0.4-	1998 05 28	699	0.9+	0.4+	1999 11 06	704	0.2+	0.4+
1998 04 30	566	0.5-	0.3-	1999 09 15	106	0.4-	0.3+	1999 11 06	704	0.1-	0.6+
1998 04 30	566	0.4-	0.7-	1999 09 15	106	0.3-	0.2+	1999 11 17	704	0.1+	0.5+
1998 05 01	704	0.4+	0.8-	1999 09 15	106	0.5-	0.3+	1999 11 17	704	0.4-	0.8+
1998 05 01	704	0.2+	1.2-	1999 10 02	703	0.7-	0.3+	1999 11 17	704	0.4-	0.6+
1998 05 01	704	(1.3-	2.2-)	1999 10 02	703	0.3-	0.2+	1999 11 17	704	0.5-	0.7+

(12524)* 1998 HG₁₀₃ = 1995 QY₁₀

Discovered 1998 Apr. 25 by E. W. Elst at the European Southern Observatory.

Id. G. V. Williams (*MPC* 32270)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

M	47.23562		(2000.0)		P	Q	
n	0.27909431	ω	234.19896	+0.91469162		+0.40395288	
a	2.3190070	Ω	101.97250	-0.36648808		+0.84228623	
e	0.1961538	i	0.74392	-0.17036939		+0.35689772	
P	3.53	H	14.9	G	0.15	U	1

Residuals in seconds of arc

1994 04 03	691	0.5-	1.2-	1998 04 25	809	0.8-	1.0+	1998 05 24	704	0.7+	0.4-
1994 04 03	691	0.4-	1.0-	1998 04 25	809	0.2+	0.9-	1998 05 24	704	0.5-	0.6+
1994 04 03	691	0.4-	1.0-	1998 04 25	809	(0.7-	2.3-)	1998 06 16	691	0.5+	0.1-
1995 08 19	809	0.6+	0.0	1998 04 25	809	0.4-	1.9-	1998 06 16	691	0.5+	0.2-
1995 08 20	809	0.2-	0.3-	1998 04 25	699	0.4-	0.5+	1998 06 16	691	0.4+	0.2+
1995 08 22	809	0.1-	0.0	1998 04 25	699	0.1-	0.1+	1999 10 12	704	1.1+	0.9+
1995 08 24	809	0.9+	0.1+	1998 04 25	699	0.3+	1.4+	1999 10 12	704	0.4+	0.2-
1995 08 25	809	1.3+	0.1+	1998 04 28	809	(2.8+	0.1-)	1999 10 12	704	1.0-	0.1-
1995 08 26	809	0.2+	0.1-	1998 04 28	809	1.6+	0.4+	1999 10 12	704	0.1+	0.1-
1995 08 27	809	0.3-	0.4-	1998 04 28	809	(4.7+	0.5+)	1999 11 03	704	0.3-	0.6+
1995 08 27	809	0.3+	0.7-	1998 05 22	704	0.3-	0.1+	1999 11 03	704	0.0	0.6+
1995 08 28	809	0.1+	0.4-	1998 05 22	704	0.9-	1.0-	1999 11 03	704	0.4+	0.9+
1995 09 17	809	0.8-	0.1-	1998 05 22	704	0.1-	1.0-	1999 11 03	704	0.4-	0.5+
1995 09 18	809	0.3+	0.0	1998 05 22	704	(0.1-	2.5-)	1999 11 17	704	1.0+	0.3-
1995 09 18	809	(1.4+	2.8+)	1998 05 23	699	1.4+	0.1-	1999 11 17	704	0.2+	1.2-
1995 09 20	809	0.7-	0.1-	1998 05 23	699	0.4-	1.4+	1999 11 17	704	0.3-	1.0-
1995 09 22	809	0.4-	0.3-	1998 05 23	699	0.5+	0.0	1999 11 17	704	1.2-	0.9-
1995 09 29	809	0.1-	0.3-	1998 05 24	704	1.4+	1.1-	1999 11 17	704	0.3+	0.7-
1998 04 25	809	2.0-	0.2-	1998 05 24	704	0.0	1.0+				
1998 04 25	809	1.3-	0.7-	1998 05 24	704	0.4-	0.6+				

(12525)* 1998 HT₁₄₇ = 1990 SP₁₄

Discovered 1998 Apr. 23 by the Lincoln Laboratory Near-Earth Asteroid Research Team at Socorro.

Id. G. V. Williams (*MPC* 34918), A. Gnädig (*ibid.*), M. E. Sansaturio (*ibid.*)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

M	57.95255		(2000.0)		P		Q
n	0.22527823	ω	105.72372	+0.33661451		+0.94148276	
a	2.6749966	Ω	184.07303	-0.93009310		+0.32955320	
e	0.1932189	i	14.13527	-0.14702888		+0.07074531	
P	4.38	H	14.6	G	0.15	U	1

Residuals in seconds of arc

1990 09 25	809	0.2+	1.1-	1998 04 24	704	0.2-	0.5-	1999 10 04	703	0.7+	0.0
1990 09 25	809	0.7+	1.0-	1998 04 24	704	1.0+	0.0	1999 10 07	704	0.7+	1.9-
1990 09 25	809	1.2+	1.0-	1998 05 01	699	0.0	0.9-	1999 10 07	704	0.5+	1.7-
1990 09 26	809	0.9-	2.0+	1998 05 01	699	1.0+	1.3-	1999 10 07	704	0.3+	1.0-
1990 09 26	809	0.6-	1.8+	1998 05 01	699	0.1-	0.8-	1999 10 07	704	1.0-	0.1-
1990 09 26	809	1.0-	2.0+	1998 05 23	704	0.2-	0.2-	1999 10 09	704	0.2+	0.2-
1995 12 15	413	1.4-	0.1-	1998 05 23	704	0.9-	0.4+	1999 10 09	704	0.4+	0.2-
1995 12 15	413	1.0+	0.5+	1998 05 23	704	1.3+	0.1-	1999 10 09	704	0.0	0.2-
1998 03 24	691	0.1-	1.0+	1998 05 23	704	0.3+	0.9-	1999 10 09	704	0.3+	0.1+
1998 03 24	691	0.1-	0.7+	1998 05 23	704	0.5-	0.4-	1999 10 09	704	0.1+	0.5-
1998 03 24	691	0.1-	0.7+	1998 05 27	699	0.1+	1.3-	1999 11 02	703	1.2-	0.2+
1998 04 17	691	(2.3+	1.4+)	1998 05 27	699	0.3+	0.3-	1999 11 02	703	0.5-	0.0
1998 04 17	691	0.1-	0.3+	1998 05 27	699	0.1-	0.7+	1999 11 02	703	0.2-	0.3+
1998 04 17	691	0.3+	0.2+	1998 06 02	699	0.0	0.9+	1999 11 02	703	0.3-	1.7+
1998 04 23	704	0.3-	0.1-	1998 06 02	699	0.2-	0.8+	1999 11 06	704	0.2+	0.8-
1998 04 23	704	0.4-	0.2+	1998 06 02	699	0.1-	0.1+	1999 11 06	704	0.6+	0.6+
1998 04 23	704	0.3+	0.4+	1999 10 04	703	1.0-	0.8+	1999 11 06	704	0.1+	0.2-
1998 04 23	704	0.2-	0.1-	1999 10 04	703	0.4+	0.5+	1999 11 06	704	0.2+	1.4-
1998 04 23	704	1.4-	1.0-	1999 10 04	703	1.4-	0.1-	1999 11 06	704	1.8+	0.2-

(12526)* 1998 HZ₁₄₇ = 1991 NK₀ = 3384 T-3

Discovered 1998 Apr. 25 by E. W. Elst at the European Southern Observatory.

Id. G. V. Williams (*MPC* 32025)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

M	107.38068		(2000.0)		P		Q
n	0.27122684	ω	198.49809	-0.21684504		+0.97611001	
a	2.3636379	Ω	58.98015	-0.89362305		-0.19283529	
e	0.1831356	i	0.91547	-0.39295811		-0.10011896	
P	3.63	H	15.2	G	0.15	U	2

Residuals in seconds of arc

1977 10 07	675	0.1-	0.7-	1998 05 22	704	0.0	0.1+	1999 10 10	704	0.6-	1.1+
1977 10 11	675	(2.9-	2.7+)	1998 05 22	704	0.3+	0.5-	1999 10 10	704	0.1+	1.0+
1977 10 11	675	1.3-	0.3+	1998 05 22	704	0.3+	0.5+	1999 10 13	691	0.8-	0.4+
1977 10 12	675	0.4+	0.0	1998 05 22	704	0.5+	1.0+	1999 10 13	691	0.5-	0.5+
1977 10 12	675	1.0+	1.1+	1998 05 23	699	0.3-	0.0	1999 10 13	691	0.4-	0.4+
1977 10 16	675	0.7+	1.9-	1998 05 23	699	0.4+	0.1+	1999 10 16	704	0.5-	0.1+
1977 10 16	675	0.3+	0.6-	1998 05 23	699	0.5+	0.5+	1999 10 16	704	1.0+	0.3+
1977 10 17	675	0.3-	0.7-	1998 05 25	699	0.4-	0.1-	1999 10 16	704	0.0	0.1+
1977 10 17	675	0.7+	1.0-	1998 05 25	699	0.1+	0.1-	1999 10 16	704	0.6-	0.6+
1991 07 15	809	0.9-	0.7-	1998 05 25	699	0.7+	0.3+	1999 10 16	704	0.9-	0.4-
1991 07 15	809	0.1-	0.1+	1998 06 01	691	0.7-	0.3-	1999 11 04	704	0.0	1.2-
1991 07 15	809	1.1+	0.6+	1998 06 01	691	0.9-	0.0	1999 11 04	704	0.2+	1.1-
1998 04 25	809	(2.5+	3.9+)	1998 06 01	691	0.6-	0.3+	1999 11 04	704	0.3-	0.2-
1998 04 25	809	(1.3+	3.3+)	1998 06 20	691	0.1-	0.9-	1999 11 09	704	0.1-	0.2-
1998 04 25	809	(1.7+	3.4+)	1998 06 20	691	0.1-	0.0	1999 11 09	704	0.9+	0.2-
1998 04 28	809	0.8+	0.6-	1998 06 20	691	0.4-	0.2-	1999 11 09	704	0.1+	0.8-
1998 04 28	809	0.3+	0.1+	1999 10 05	704	0.3-	0.2+	1999 11 12	704	0.9+	0.3+
1998 04 28	809	0.8+	0.4-	1999 10 05	704	0.8-	0.8+	1999 11 12	704	0.0	0.3+
1998 04 28	809	(2.6-	0.7-)	1999 10 05	704	0.2-	0.5+	1999 11 12	704	0.2-	0.4+
1998 04 28	809	(2.1-	1.0-)	1999 10 05	704	0.5-	0.2+	1999 11 12	704	0.5+	0.3-
1998 04 28	809	(2.1-	0.9+)	1999 10 07	691	0.0	0.7+	1999 11 12	120	1.5-	0.8+
1998 05 05	699	0.3-	1.1+	1999 10 07	691	0.1+	1.0+	1999 11 12	120	0.9+	0.5+
1998 05 05	699	0.3-	1.0+	1999 10 07	691	0.0	1.0+	1999 11 16	691	0.8+	0.4-
1998 05 05	699	0.1-	0.0	1999 10 10	704	0.5-	0.8+	1999 11 16	691	0.7+	0.1-
1998 05 22	704	0.1+	0.3+	1999 10 10	704	0.0	0.3+	1999 11 16	691	0.5+	0.3-

1999 NOV. 23

M.P.C. 36749

(12527)* 1998 JE₃ = 1988 VS₁₂ = 1994 EQ₅

Discovered 1998 May 1 by the Lowell Observatory Near-Earth Object Search at the Anderson Mesa Station.

Id. G. V. Williams (*MPC* 32029)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>		(2000.0)		P		Q	
<i>n</i>	0.27168675	ω	109.63762	+0.40058425	+0.91621836		
<i>a</i>	2.3609697	Ω	184.00930	−0.88047016	+0.38228332		
<i>e</i>	0.1344682	<i>i</i>	7.17113	−0.25358341	+0.12001413		
<i>P</i>	3.63	<i>H</i>	14.1	<i>G</i>	0.15	<i>U</i>	1

Residuals in seconds of arc

1988 11 04	327	1.0−	1.8−	1998 05 23	704	0.8−	0.4+	1998 07 17	699	0.1+	0.5+
1988 11 04	327	0.3+	0.9−	1998 05 23	704	0.3−	0.1+	1998 07 17	699	0.5+	0.1−
1994 03 10	675	0.2−	0.3−	1998 05 23	704	1.3+	0.5−	1999 10 07	704	0.2−	0.0
1994 03 10	675	1.6+	0.3−	1998 05 23	704	0.6−	0.9−	1999 10 07	704	0.6−	0.1+
1994 03 11	675	0.3−	1.0−	1998 05 23	704	0.5−	1.6−	1999 10 07	704	0.3−	0.0
1995 09 18	809	1.3+	0.5−	1998 05 25	704	0.1+	0.1+	1999 10 07	704	1.2−	0.6−
1995 09 19	809	0.8+	0.0	1998 05 25	704	0.1+	0.1−	1999 10 08	703	0.1−	0.4+
1998 04 23	704	0.1+	0.0	1998 05 25	704	0.0	1.0+	1999 10 08	703	0.8−	0.2+
1998 04 23	704	0.4−	0.2−	1998 05 25	699	0.2−	0.2+	1999 10 08	703	0.6−	0.3+
1998 04 23	704	0.9+	0.2−	1998 05 25	704	0.7+	0.4−	1999 10 08	703	0.6−	0.2−
1998 04 23	704	0.5−	0.2+	1998 05 25	699	0.0	0.0	1999 10 20	704	0.1−	0.0
1998 04 24	704	0.3+	0.5−	1998 05 25	699	0.1+	0.2−	1999 10 20	704	0.3+	0.0
1998 04 24	704	1.2+	0.5−	1998 05 28	704	0.8+	0.3−	1999 10 20	704	0.3+	0.1−
1998 04 24	704	1.0+	0.0	1998 05 28	704	1.0−	0.2−	1999 10 20	704	0.4+	0.0
1998 05 01	699	0.1+	1.1+	1998 05 28	704	0.6−	1.3+	1999 10 20	704	0.2+	0.1+
1998 05 01	699	0.4−	0.4+	1998 05 28	704	0.5−	0.2−	1999 11 05	704	0.4+	0.6+
1998 05 01	699	0.8+	0.9+	1998 06 02	699	0.2−	0.6+	1999 11 05	704	0.5+	0.8+
1998 05 05	699	0.6+	0.1+	1998 06 02	699	0.2−	0.6+	1999 11 05	704	0.4+	0.6+
1998 05 05	699	0.5+	0.0	1998 06 02	699	0.2+	0.5+	1999 11 05	704	0.6+	1.0+
1998 05 05	699	1.1+	0.0	1998 06 16	704	(2.0+	0.0)	1999 11 05	704	0.6+	0.7+
1998 05 22	704	0.1−	0.1−	1998 06 16	704	1.3−	0.4+	1999 11 13	699	0.7−	0.1+
1998 05 22	704	0.4+	0.2−	1998 06 16	704	0.6−	0.3+	1999 11 13	699	0.0	0.2+
1998 05 22	704	0.2−	0.0	1998 06 16	704	(0.2−	4.2−)	1999 11 13	699	0.5−	0.2+
1998 05 22	704	0.0	0.1−	1998 06 16	704	1.8−	0.0				
1998 05 22	704	1.7−	0.1−	1998 07 17	699	0.4−	0.4+				

(12528)* 1998 KL₃₁ = 1989 JM

Discovered 1998 May 22 by the Lincoln Laboratory Near-Earth Asteroid

Research Team at Socorro.

Id. G. V. Williams (*MPC* 32278)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>		(2000.0)		P		Q	
<i>n</i>	0.22531216	ω	169.46310	−0.31638027	+0.91578127		
<i>a</i>	2.6747280	Ω	81.74509	−0.88753204	−0.19363736		
<i>e</i>	0.1265005	<i>i</i>	14.48193	−0.33494835	−0.35192219		
<i>P</i>	4.37	<i>H</i>	13.1	<i>G</i>	0.15	<i>U</i>	2

Residuals in seconds of arc

1989 05 05	046	1.9−	1.4−	1998 05 24	704	(2.7+	0.8+)	1998 06 26	699	0.3−	0.5−
1989 05 05	046	0.7−	1.1−	1998 05 24	704	0.6−	0.8−	1999 09 11	699	0.0	0.8+
1989 05 07	046	2.0−	2.1−	1998 06 03	704	1.2+	1.1+	1999 09 11	699	0.6+	0.6−
1989 05 07	046	1.5−	1.7−	1998 06 03	704	0.5+	1.2+	1999 09 11	699	0.6+	0.4+
1989 05 08	046(27.6−	19.3+)		1998 06 03	704	0.8+	0.5−	1999 09 13	704	0.6+	0.6−
1989 05 08	046(22.6−	23.6+)		1998 06 03	704	0.5+	0.4+	1999 09 13	704	0.8+	0.7−
1989 05 09	046	0.3+	1.3−	1998 06 16	704	0.3−	0.2−	1999 09 13	704	0.0	0.3−
1989 05 09	046	0.2−	0.8−	1998 06 16	704	0.4−	0.9+	1999 09 13	704	0.1−	0.8−
1989 05 09	046	0.6+	1.5−	1998 06 16	691	0.2−	0.0	1999 09 13	704	0.3+	0.9−
1989 05 09	046	1.1+	0.4−	1998 06 16	704	0.8−	0.0	1999 09 30	704	0.2+	0.4−
1991 12 04	691	0.4+	0.7+	1998 06 16	691	0.0	0.2+	1999 09 30	704	0.0	0.3−
1991 12 04	691	0.1−	0.6+	1998 06 16	704	0.5−	0.1+	1999 09 30	704	0.2+	0.3−
1991 12 04	691	2.0−	1.3−	1998 06 16	691	0.0	0.2+	1999 09 30	704	0.1−	0.7−
1998 05 22	704	1.1−	0.6+	1998 06 16	704	0.2+	0.3−	1999 09 30	704	0.2−	0.2−

1998 05 22	704	0.1−	0.4+	1998 06 18	704	0.2−	0.5−	1999 11 10	704	0.6+	0.1+
1998 05 22	704	0.1−	0.3−	1998 06 18	704	0.2−	1.1−	1999 11 10	704	1.0+	0.2+
1998 05 22	704	1.0+	1.3−	1998 06 18	704	1.1+	0.4+	1999 11 10	704	0.3+	0.9−
1998 05 22	704	0.2+	0.8−	1998 06 18	704	0.4+	0.6+	1999 11 10	704	0.5+	0.2−
1998 05 23	699	0.3+	0.4+	1998 06 18	704	0.2−	0.3+	1999 11 10	704	0.8−	1.0−
1998 05 23	699	0.3+	0.1+	1998 06 21	691	0.0	0.3+	1999 11 15	699	0.3−	0.6+
1998 05 23	699	0.3+	0.1+	1998 06 21	691	0.2+	0.2+	1999 11 15	699	0.5−	0.2−
1998 05 24	704	0.6−	0.8+	1998 06 21	691	0.3+	0.4+	1999 11 15	699	1.5+	0.4−
1998 05 24	704	0.8+	1.5+	1998 06 26	699	0.9−	0.2−				
1998 05 24	704	0.5−	1.1+	1998 06 26	699	0.5+	0.1+				

(12529)* 1998 KG₄₁ = 1977 DG₁ = 1982 UQ₁ = 1994 CP₁₉

Discovered 1998 May 22 by the Lincoln Laboratory Near-Earth Asteroid

Research Team at Socorro.

Id. M. E. Sansaturio (*MPC* 34920)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>		(2000.0)		P		Q	
<i>n</i>	0.29122930	ω	307.25902	+0.89964232	−0.43498934		
<i>a</i>	2.2541320	Ω	78.55367	+0.41181380	+0.81657093		
<i>e</i>	0.0291499	<i>i</i>	2.20960	+0.14509681	+0.37946831		
<i>P</i>	3.38	<i>H</i>	14.2	<i>G</i>	0.15	<i>U</i>	1

Residuals in seconds of arc

1977 02 18	381	0.3−	0.3−	1998 05 24	704	1.0+	0.6−	1999 10 07	704	0.8−	0.3−
1977 02 18	381	0.9−	1.5−	1998 05 24	704	0.3−	0.2+	1999 10 07	704	0.8+	0.2+
1977 02 19	381	0.0	0.1−	1998 05 24	704	0.2−	0.2−	1999 10 10	106	0.9+	0.7+
1977 02 19	381	1.3−	0.0	1998 05 24	704	0.4−	0.6−	1999 10 10	704	0.1+	0.1−
1982 10 16	046	1.6+	2.3−	1998 06 03	704	0.7−	1.2+	1999 10 10	704	0.1+	0.6−
1982 10 16	046	1.3+	0.2+	1998 06 03	704	0.1+	0.2+	1999 10 10	704	0.4−	0.7−
1982 10 21	046	1.0+	0.2+	1998 06 03	704	0.7−	0.7−	1999 10 10	704	0.7−	0.9−
1982 10 21	046	0.7−	2.1−	1998 06 03	704	1.3−	0.5+	1999 10 15	704	0.4−	0.1+
1994 02 07	809	0.6−	0.2−	1998 06 03	704	0.5−	1.7−	1999 10 15	704	0.5−	0.1+
1994 02 07	809	0.9−	0.5−	1998 07 02	699	1.9+	0.3−	1999 10 15	704	0.6−	0.2−
1994 02 07	809	(2.7−	0.7+)	1998 07 02	699	0.3+	1.0−	1999 10 15	704	0.9−	0.2−
1994 02 10	809	0.9+	0.7−	1998 07 02	699	0.4+	0.2−	1999 11 09	704	0.1−	0.2+
1994 02 10	809	0.5+	0.4−	1999 10 02	703	0.9−	1.9+	1999 11 09	704	0.7+	0.3+
1994 02 10	809	0.2+	0.6−	1999 10 02	703	0.7−	1.6+	1999 11 09	704	1.1−	1.0−
1994 02 13	809	1.8+	1.7+	1999 10 02	703	0.3−	0.9+	1999 11 09	704	0.1−	0.1−
1994 02 13	809	0.5+	1.2+	1999 10 02	703	0.1−	0.9+	1999 11 17	704	0.3−	0.7+
1994 02 13	809	0.7+	1.0+	1999 10 03	704	0.9+	0.3+	1999 11 17	704	0.5+	0.6+
1998 05 22	704	0.0	0.5+	1999 10 03	704	0.4−	0.1−	1999 11 17	704	0.1−	0.5+
1998 05 22	704	0.1+	1.7+	1999 10 03	704	0.3+	0.0	1999 11 17	704	0.1−	1.1+
1998 05 22	704	0.3−	1.3+	1999 10 03	704	0.3−	0.1−	1999 11 17	704	0.1+	0.4+
1998 05 22	704	0.5−	1.5+	1999 10 07	704	0.7+	0.1+				
1998 05 24	704	1.1+	0.2−	1999 10 07	704	0.1+	0.0				

(12530)* 1998 KO₄₆ = 1991 VR₅ = 1993 CC₁

Discovered 1998 May 22 by the Lincoln Laboratory Near-Earth Asteroid

Research Team at Socorro.

Id. S. Nakano (*MPC* 32485)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>		(2000.0)		P		Q	
<i>n</i>	0.23434767	ω	133.76499	−0.20906457	+0.97456836		
<i>a</i>	2.6055273	Ω	124.00093	−0.92284242	−0.16932941		
<i>e</i>	0.0547130	<i>i</i>	5.58447	−0.32350253	−0.14677893		
<i>P</i>	4.21	<i>H</i>	14.2	<i>G</i>	0.15	<i>U</i>	2

Residuals in seconds of arc

1991 11 02	809	1.4+	1.3−	1998

1993 02 13	372	(7.1+ 3.0-)	1998 06 24	704	0.3- 0.2-	1999 10 02	704	0.1- 0.3+
1993 02 17	372	0.2+ 0.3+	1998 06 24	704	(1.7- 2.5+)	1999 10 02	704	0.4+ 0.2+
1993 02 17	372	0.1- 0.5+	1998 06 26	704	1.0+ 1.8-	1999 10 02	704	0.9+ 0.2+
1995 10 19	697	0.8- 0.6+	1998 06 26	704	0.4+ 0.3-	1999 10 08	704	0.9- 0.6-
1995 10 19	697	0.8- 0.5+	1998 06 26	704	0.5+ 0.2+	1999 10 08	704	0.3- 0.3-
1995 10 19	697	0.8- 0.6+	1998 06 26	704	0.1- 0.7-	1999 10 08	704	0.6- 0.0
1995 10 19	697	0.9- 0.5+	1999 09 08	699	1.9- 1.1+	1999 10 08	704	0.8- 0.3-
1998 05 22	704	0.8+ 1.0-	1999 09 08	699	0.9+ 1.0+	1999 10 08	704	0.4- 1.1+
1998 05 22	704	0.3+ 0.3+	1999 09 08	699	0.9- 0.6-	1999 11 07	704	1.1+ 0.8-
1998 05 22	704	0.3+ 1.0-	1999 09 14	704	0.3+ 0.3-	1999 11 07	704	0.4+ 0.1+
1998 05 22	704	0.2+ 1.6-	1999 09 14	704	0.4+ 0.2-	1999 11 07	704	1.4+ 0.1-
1998 05 22	704	1.7- 0.2-	1999 09 14	704	0.0 0.0			

(12531)* 1998 KQ₅₁ = 1997 HV₅

Discovered 1998 May 23 by the Lincoln Laboratory Near-Earth Asteroid Research Team at Socorro.

Id. G. V. Williams (*MPC* 32034)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	242.92300		<i>P</i>	<i>Q</i>
<i>n</i>	0.19118761	ω	277.78170	+0.14068234
<i>a</i>	2.9842112	Ω	163.82873	+0.96744591
<i>e</i>	0.0892311	<i>i</i>	11.16278	+0.21037321
<i>P</i>	5.16	<i>H</i>	12.9	<i>G</i> 0.15
				<i>U</i> 1

Residuals in seconds of arc

1994 09 03	809	0.3+ 1.0-	1998 06 03	704	0.4+ 0.5+	1999 09 07	704	0.1+ 0.1+
1994 09 03	809	0.0 1.5-	1998 06 03	704	0.6- 0.6-	1999 09 07	704	0.2+ 0.2+
1994 09 03	809	0.2+ 1.3-	1998 06 03	704	1.0- 1.6-	1999 09 07	704	0.1- 0.3-
1997 04 28	704	1.3- 0.2-	1998 06 15	699	0.1- 0.5-	1999 09 09	704	0.8+ 0.2+
1997 04 28	704	1.0- 0.0	1998 06 15	699	0.3+ 0.2-	1999 09 09	704	0.3+ 0.0
1997 04 28	704	0.2- 0.1-	1998 06 15	699	1.1+ 0.2-	1999 09 09	704	0.2+ 0.1+
1997 04 28	704	1.1- 0.1+	1998 06 19	704	1.3+ 0.0	1999 09 09	704	0.1- 0.6+
1997 04 28	704	(3.4- 1.2+)	1998 06 19	704	0.6+ 1.2-	1999 09 09	704	0.4+ 0.4-
1997 04 29	704	0.8+ 0.1-	1998 06 19	704	1.1+ 1.9-	1999 09 13	704	0.5+ 1.1+
1997 04 29	704	0.9+ 0.8+	1998 06 19	704	0.0 0.9-	1999 09 13	704	0.8+ 0.2+
1997 04 29	704	0.3+ 1.1+	1998 06 19	704	0.7- 1.7-	1999 09 13	704	0.2+ 0.2+
1997 04 29	704	0.9+ 0.6+	1998 06 26	699	1.0+ 1.4+	1999 09 13	704	0.6+ 0.5+
1997 04 29	704	1.1+ 0.2+	1998 06 26	699	0.1+ 0.5+	1999 09 13	704	0.9- 0.1+
1998 05 23	704	0.4- 0.2-	1998 06 26	699	1.2+ 1.9+	1999 10 13	704	0.5- 0.0
1998 05 23	704	0.9- 0.2+	1999 07 13	704	0.4- 0.0	1999 10 13	704	0.3+ 0.1+
1998 05 23	704	0.2+ 0.5+	1999 07 13	704	0.6- 0.1-	1999 10 13	704	0.5+ 0.2-
1998 05 23	704	0.5- 0.3-	1999 07 13	704	0.5- 0.3+	1999 10 13	704	0.5+ 0.3-
1998 05 23	704	1.6- 0.8+	1999 07 13	704	0.6- 0.6+	1999 10 13	704	0.4+ 0.7-
1998 05 25	699	0.4- 1.6+	1999 07 13	704	0.5- 0.7+	1999 10 15	704	0.1+ 0.2+
1998 05 25	699	0.2- 0.4+	1999 08 13	699	0.8- 0.0	1999 10 15	704	0.5+ 0.3+
1998 05 25	699	0.1- 0.3+	1999 08 13	699	0.8- 0.9+	1999 10 15	704	0.1+ 0.3-
1998 05 26	704	0.6+ 0.5-	1999 08 13	699	0.4- 0.7+	1999 10 15	704	0.0 0.2+
1998 05 26	704	0.3- 0.3+	1999 09 05	699	0.0 0.8+	1999 10 15	704	0.5+ 0.6-
1998 05 26	704	0.9- 0.9-	1999 09 05	699	1.1- 0.5+	1999 11 10	704	0.9- 0.3+
1998 05 26	704	0.1+ 0.4-	1999 09 05	699	0.6- 0.3+	1999 11 10	704	1.1+ 0.2+
1998 05 26	704	0.1+ 0.5+	1999 09 07	704	0.2+ 0.6-	1999 11 10	704	0.2+ 1.3+
1998 06 03	704	(2.9- 0.7+)	1999 09 07	704	0.3+ 0.8-			

(12532)* 1998 KW₅₄ = 1993 RT₃ = 9101 P-L

Discovered 1998 May 23 by the Lincoln Laboratory Near-Earth Asteroid Research Team at Socorro.

Id. G. V. Williams (*MPC* 32283)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	34.42134		<i>P</i>	<i>Q</i>
<i>n</i>	0.17850161	ω	129.55365	+0.72961841
<i>a</i>	3.1239779	Ω	187.65613	-0.68148673
<i>e</i>	0.2308526	<i>i</i>	16.49456	-0.05685786
<i>P</i>	5.52	<i>H</i>	12.8	<i>G</i> 0.15
				<i>U</i> 1

Residuals in seconds of arc

1960 10 17	675	0.2- 0.3-	1998 06 03	704	0.8- 1.5+	1999 10 07	704	0.6+ 0.5-
1960 10 22	675	0.6+ 0.9+	1998 06 03	704	0.5- 0.6+	1999 10 07	704	1.2+ 0.4-
1960 10 24	675	0.5- 2.2+	1998 06 03	704	1.7- 0.9+	1999 10 07	704	0.5+ 0.2-
1960 10 26	675	0.2- 0.3-	1998 06 15	699	0.4+ 0.2-	1999 10 09	704	0.1+ 0.8-
1993 08 21	675	0.9- 1.1+	1998 06 15	699	0.1+ 0.2-	1999 10 09	704	0.0 0.7-
1993 08 21	675	(2.2- 2.7+)	1998 06 15	699	0.2- 0.2+	1999 10 09	704	0.2+ 0.5-
1993 08 23	675	(2.8- 1.7+)	1998 06 19	704	0.7+ 0.5-	1999 10 09	704	0.1+ 0.6-
1993 08 23	675	(4.7- 0.5+)	1998 06 19	704	0.5+ 0.1-	1999 10 09	704	0.0 0.3-
1993 09 12	675	(7.5- 31.9-)	1998 06 19	704	0.7- 0.2-	1999 10 10	327	0.0 0.2-
1993 09 14	675	0.3+ 0.2-	1998 06 19	704	0.1- 0.5-	1999 10 10	327	0.0 0.4-
1993 09 14	675	0.4+ 0.1-	1998 06 19	704	0.1+ 0.0	1999 10 10	327	0.3+ 0.3+
1998 05 23	704	1.6- 0.2+	1998 07 26	699	0.4- 0.1+	1999 10 14	327	0.8- 0.1+
1998 05 23	704	0.7+ 0.2-	1998 07 26	699	0.2- 0.6-	1999 10 14	327	0.5- 0.2+
1998 05 23	704	0.2+ 0.8-	1998 07 26	699	0.5- 0.0	1999 10 14	327	0.7- 0.0
1998 05 23	704	0.1+ 0.2-	1998 07 28	691	0.8+ 0.4-	1999 11 02	703	0.2+ 0.3+
1998 05 23	704	0.4+ 0.2-	1998 07 28	691	0.5+ 0.5-	1999 11 02	703	0.5+ 0.0
1998 05 26	704	0.8+ 0.3-	1998 07 28	691	0.6+ 0.5-	1999 11 02	703	0.1+ 0.4+
1998 05 26	704	0.1- 0.4+	1999 10 04	703	0.2- 0.2-	1999 11 02	703	0.3+ 0.1+
1998 05 26	704	0.2- 0.1+	1999 10 04	703	0.0 0.0	1999 11 06	704	0.5- 0.5+
1998 05 26	704	0.8+ 0.7-	1999 10 04	703	0.1+ 0.1-	1999 11 06	704	0.3- 0.5+
1998 05 26	704	0.7+ 0.4+	1999 10 04	703	1.0- 0.4-	1999 11 06	704	0.7- 0.7+
1998 06 03	704	0.1- 0.2-	1999 10 07	704	0.5+ 0.6-	1999 11 06	704	0.2- 0.6+
1998 06 03	704	0.2- 0.2+	1999 10 07	704	0.5+ 0.8-			

(12533)* 1998 LA = 1994 NR₁₁

Discovered 1998 June 2 by T. Stafford at Zeno Observatory, Edmond.

Id. G. V. Williams (*MPC* 32284)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	109.37181		<i>P</i>	<i>Q</i>
<i>n</i>	0.23810863	ω	126.90153	-0.39030142
<i>a</i>	2.5780181	Ω	119.96009	-0.87007998
<i>e</i>	0.2114227	<i>i</i>	5.01457	-0.30104091
<i>P</i>	4.14	<i>H</i>	14.7	<i>G</i> 0.15
				<i>U</i> 2

Residuals in seconds of arc

1994 07 08	809	0.1+	1.9-	1998 06 04	727	1.4+	0.9+	1998 07 14	727	0.4-	0.1-
1994 07 08	809	0.0	1.9-	1998 06 12	727	1.5+	0.1+	1998 07 14	727	0.8-	0.1+
1994 07 08	809	0.8-	1.7-	1998 06 12	727	0.8+	0.3-	1998 07 14	727	0.5-	0.1-
1994 07 09	809	0.8+	0.5-	1998 06 12	727	0.3+	0.4+	1998 07 15	727	0.7-	0.4-
1994 07 09	809	0.6+	0.8-	1998 06 12	727	0.3-	0.7+	1998 07 15	727	0.4-	0.7-
1994 07 09	809	0.3-	0.4-	1998 06 15	727	0.5-	0.2+	1998 07 15	727	0.3-	0.1-
1997 02 13	327	0.1-	0.0	1998 06 15	727	0.6-	0.0	1999 10 04	703	(2.3-	0.9-)
1997 02 13	327	0.6+	0.3+	1998 06 15	727	0.4-	0.1+	1999 10 04	703	0.3-	0.6-
1997 02 13	327	0.5-	0.0	1998 06 16	727	0.3-	0.1+	1999 10 04	703	0.4-	0.8+
1998 05 22	704	1.5+	0.0	1998 06 16	727	0.4-	0.1+	1999 10 04	703	1.1-	1.0-
1998 05 22	704	0.8-	0.3+	1998 06 16	727	0.4-	0.2+	1999 10 09	704	0.5+	0.8+
1998 05 22	704	0.5+	0.0	1998 06 24	704	0.6+	0.2+	1999 10 09	704	0.1+	0.7+
1998 05 22	704	1.3-	0.4-	1998 06 24	727	0.2+	0.0	1999 10 09	704	0.2+	0.8+
1998 05 24	704	0.2+	0.7-	1998 06 24	727	0.2+	0.0	1999 10 09	704	0.4-	0.5+
1998 05 24	704	0.7-	0.3+	1998 06 24	704	0.3+	0.6+	1999 10 09	704	0.0	0.4+
1998 05 24	704	0.5+	1.1+	1998 06 24	727	0.4+	0.2-	1999 10 19	704	0.3+	0.5+
1998 05 24	704	(2.2+	0.5+)	1998 06 24	704	0.2+	0.5+	1999 10 19	704	1.0-	0.4+
1998 05 24	704	(2.1-	2.5+)	1998 06 24	704	0.2+	0.4+	1999 10 19	704	0.3-	0.9+
1998 06 02	727	0.4+	0.3+	1998 06 24	704	0.2-	0.3+	1999 10 19	704	1.4+	1.0+
1998 06 02	727	0.9+	0.2+	1998 06 25	727	0.3+	0.2-	1999 10 19	704	0.1-	0.0
1998 06 02	727	1.3+	0.4+	1998 06 26	704	0.2+	0.1+	1999 11 03	703	0.7-	0.9+
1998 06 03	727	0.4+	0.4+	1998 06 26	704	1.1-	0.0	1999 11 03	703	0.3+	0.4+
1998 06 03	727	0.4+	0.7+	1998 06 26	704	0.6-	0.0	1999 11 03	703	0.9-	0.7+
1998 06 03	727	0.4+	0.8+	1998 06 26	704	0.8-	0.2+	1999 11 03	703	0.2-	0.3-
1998 06 03	704	(2.5+	0.7+)	1998 06 26	704	1.4-	1.7+	1999 11 06	704	0.3+	0.4-
1998 06 03	704	0.3-	0.2-	1998 06 30	727	1.3-	0.2+	1999 11 06	704	0.8+	0.3+
1998 06 03	704	1.7+	0.4+	1998 06 30	727	1.2-	0.2+	1999 11 06	704	0.7+	0.5-
1998 06 03	704	1.8+	0.0	1998 06 30	727	1.0-	0.3+	1999 11 06	704	0.7-	0.5-
1998 06 04	727	1.3+	0.1+	1998 07 14	727	0.5-	0.4+	1999 11 06	704	0.6-	0.2+

1999 NOV. 23

M.P.C. 36751

(12534)* 1998 LB₃ = 1977 UN₅ = 1990 RY₄Discovered 1998 June 1 by E. W. Elst at the European Southern Observatory.
Id. S. Nakano (*MPC* 32486)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Nakano

M	314.28262		(2000.0)		P		Q
n	0.22261397	ω	217.48055		+0.58210320		-0.81171955
a	2.6962972	Ω	197.08720		+0.77973623		+0.57385578
e	0.1107800	i	9.32608		+0.23058031		+0.10863204
P	4.43	H	13.7	G	0.15	U	2

Residuals in seconds of arc

1977 10 18	675	0.7-	0.1+	1999 09 18	703	0.4-	0.0	1999 10 09	704	0.2-	0.5-
1977 10 19	675	0.2+	0.5+	1999 09 23	461	0.2+	0.1+	1999 10 11	106	1.2+	0.3-
1990 09 15	675	0.3+	0.8-	1999 09 23	461	0.1+	0.0	1999 10 11	106	2.0-	1.8-
1990 09 15	675	0.8+	0.4-	1999 09 23	461	0.1+	0.2+	1999 10 11	106	0.1-	1.1-
1990 09 20	675	0.3+	0.6-	1999 09 25	461	0.2-	0.3+	1999 10 15	704	0.2+	0.3+
1990 09 20	675	0.1-	0.4+	1999 09 25	461	0.3-	0.1+	1999 10 15	704	0.7+	0.2+
1997 03 06	809	(0.5+	2.8-)	1999 09 25	461	0.2-	0.1+	1999 10 15	704	0.8+	0.9+
1997 03 06	809	(0.5+	2.9-)	1999 09 29	461	0.2+	0.3+	1999 10 15	704	(2.7+	2.1+)
1997 03 06	809	(0.5+	3.0-)	1999 09 29	461	0.0	0.4+	1999 10 15	164	0.1+	0.2-
1998 06 01	809	(3.6+	1.0+)	1999 09 29	461	0.3+	0.2+	1999 10 15	164	0.9-	0.3+
1998 06 01	809	(3.1+	0.7+)	1999 10 01	703	0.4-	0.2+	1999 10 15	164	0.0	1.1+
1998 06 01	809	(2.7+	1.4+)	1999 10 01	703	0.5-	0.1+	1999 10 16	164	0.5-	0.1+
1998 06 02	809	(5.6-	2.8-)	1999 10 01	703	0.2-	0.0	1999 10 16	164	0.3+	0.2+
1998 06 02	809	(4.9-	3.6-)	1999 10 01	703	0.4-	0.1+	1999 10 16	164	0.2-	1.2+
1998 06 02	809	(5.1-	4.5-)	1999 10 04	704	0.2-	1.1+	1999 10 30	703	0.3+	0.5+
1998 06 19	704	0.4-	0.6-	1999 10 04	704	0.2-	0.4+	1999 10 30	703	0.1+	0.1-
1998 06 19	704	1.0+	0.5+	1999 10 04	704	0.1+	0.2+	1999 10 30	703	0.4-	0.4+
1998 06 19	704	0.1+	1.6+	1999 10 04	704	0.0	0.2+	1999 10 30	703	0.3-	0.0
1998 06 19	704	0.2-	0.1-	1999 10 04	704	0.0	0.0	1999 10 31	691	0.1+	0.3-
1998 06 19	704	0.1-	0.0	1999 10 05	704	0.3-	0.1-	1999 10 31	691	0.0	0.3-
1998 06 22	703	1.0+	0.0	1999 10 05	704	0.1-	0.0	1999 10 31	691	0.1+	0.3-
1998 06 22	703	0.9-	0.4-	1999 10 05	704	0.1-	0.1+	1999 11 06	704	0.1+	0.3-
1998 06 22	703	0.6-	0.5-	1999 10 05	704	0.1-	0.2-	1999 11 06	704	0.1-	0.4-
1998 06 22	703	0.1+	1.3-	1999 10 05	704	0.1-	0.0	1999 11 06	704	0.0	0.5-
1999 07 23	704	0.6+	0.8+	1999 10 07	704	0.1+	0.1-	1999 11 06	704	0.1-	0.5-
1999 07 23	704	1.1-	0.4+	1999 10 07	704	0.0	0.1+	1999 11 06	704	0.1-	0.5-
1999 07 23	704	0.5-	0.2+	1999 10 07	704	0.0	0.1-	1999 11 12	704	0.8+	0.6+
1999 07 23	704	0.6-	0.5+	1999 10 07	704	0.1+	0.0	1999 11 12	704	1.5+	1.0-
1999 07 23	704	0.0	0.5+	1999 10 07	704	0.1+	0.1+	1999 11 12	704	1.3+	0.5-
1999 09 18	703	0.4-	0.5-	1999 10 09	704	0.1+	0.2-	1999 11 12	704	0.5+	0.3-
1999 09 18	703	0.5+	0.3+	1999 10 09	704	0.3+	0.2-	1999 11 12	704	0.7-	1.4-
1999 09 18	703	0.1-	0.2+	1999 10 09	704	0.0	0.4-				

(12535)* 1998 MZ₃₀ = 1957 YD = 1990 QK₁₃Discovered 1998 June 24 by the Lincoln Laboratory Near-Earth Asteroid
Research Team at Socorro.Id. G. V. Williams (*MPC* 32286)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

M	17.55241		(2000.0)		P		Q
n	0.23452330	ω	235.94727		+0.92963399		-0.35555132
a	2.6042263	Ω	144.60082		+0.36837777		+0.89043388
e	0.1264885	i	9.61638		+0.00885804		+0.28409640
P	4.20	H	13.5	G	0.15	U	1

Residuals in seconds of arc

1957 12 19	330	0.8-	0.0	1998 07 21	704	0.6+	0.7-	1999 10 10	704	0.3+	0.4-
1957 12 22	330	0.8+	0.4-	1998 07 21	704	1.1-	0.5+	1999 10 10	704	0.5+	0.3-
1990 08 16	809	0.1+	0.6+	1998 07 21	704	0.4-	0.3+	1999 10 20	704	0.4+	0.1+
1990 08 16	809	0.7+	0.9+	1998 07 21	704	0.7+	0.2-	1999 10 20	704	0.2+	0.2-
1990 08 16	809	1.0-	0.1-	1998 07 26	704	1.2-	0.1-	1999 10 20	704	0.4+	0.5+
1998 06 24	704	0.5-	0.2+	1998 07 26	704	0.7-	0.1-	1999 10 20	704	0.0	0.1+
1998 06 24	704	0.9+	1.7-	1998 07 26	704	0.3-	0.7-	1999 10 20	704	0.6+	0.7-
1998 06 24	704	1.2+	1.6+	1998 07 26	704	0.3+	0.2-	1999 11 05	704	0.0	0.3-
1998 06 24	704	1.0-	1.4+	1998 08 15	704	(2.6+	0.3+)	1999 11 05	704	0.3-	0.2-

1998 06 26	704	0.4-	1.7-	1998 08 15	704	(0.7-	2.2-)	1999 11 05	704	0.2-	0.1+
1998 06 26	704	1.3+	0.0	1998 08 15	704	(0.8+	3.1-)	1999 11 05	704	0.0	0.2-
1998 06 26	704	0.4-	0.3+	1999 10 10	704	0.3-	0.5+	1999 11 05	704	0.5-	0.1-
1998 06 26	704	0.3+	0.0	1999 10 10	704	0.4-	0.2-				
1998 06 26	704	0.6+	0.9-	1999 10 10	704	0.3-	0.1-				

(12536)* 1998 MD₃₃ = 1989 YJ₃ = 1997 GL₂₉Discovered 1998 June 24 by the Lincoln Laboratory Near-Earth Asteroid
Research Team at Socorro.Id. A. Doppler (*MPC* 33509), G. V. Williams (*ibid.*)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

M	345.93704		(2000.0)		P		Q
n	0.18439892	ω	272.35595		+0.72037679		-0.68125391
a	3.0570119	Ω	130.62196		+0.68478927		+0.66880426
e	0.1958441	i	9.87668		+0.11009512		+0.29764739
P	5.34	H	12.8	G	0.15	U	1

Residuals in seconds of arc

1989 12 30	413	0.2-	1.5+	1998 06 26	809	1.2+	1.6+	1999 10 09	704	0.8+	0.4-
1989 12 30	413	0.3+	1.3+	1998 06 26	809	1.8+	1.7+	1999 10 09	703	0.2-	0.2+
1989 12 31	413	0.1-	0.9+	1998 06 26	704	0.5-	0.0	1999 10 09	703	0.0	0.2+
1989 12 31	413	0.4+	0.6+	1998 06 26	704	0.8-	0.1-	1999 10 09	704	0.6+	0.4-
1997 04 13	691	0.1+	0.0	1998 06 26	704	(2.2-	0.1+)	1999 10 09	703	0.4-	0.0
1997 04 13	691	0.1+	0.0	1998 06 26	704	(2.1-	1.2+)	1999 10 09	704	0.6-	1.2-
1997 04 13	691	0.0	0.1+	1998 06 27	809	0.7+	1.1+	1999 10 31	703	0.0	0.2+
1997 04 15	691	0.1+	0.0	1998 06 27	809	0.3+	0.0	1999 10 31	703	0.1-	0.2+
1997 04 15	691	0.1+	0.1+	1998 06 27	809	1.1+	0.9+	1999 10 31	703	0.2-	0.3+
1997 04 15	691	0.2+	0.2+	1998 07 26	704	0.5-	0.1-	1999 10 31	703	0.0	0.4+
1998 06 24	704	0.4-	1.3+	1998 07 26	704	0.2+	0.3-	1999 11 06	704	0.1+	0.3+
1998 06 24	704	1.3-	0.5+	1998 07 26	704	0.8+	0.4-	1999 11 06	704	0.1+	0.5+
1998 06 24	704	1.7-	0.1+	1998 07 26	704	0.5-	1.3-	1999 11 06	704	0.2-	0.5+
1998 06 24	704	1.0-	0.1-	1999 10 09	704	0.7-	0.4+	1999 11 06	704	0.1-	0.3+
1998 06 24	704	(3.1-	0.6+)	1999 10 09	704	1.1+	0.4-	1999 11 06	704	0.4-	0.2+
1998 06 26	809	(1.6+	2.4+)	1999 10 09	703	0.1-	0.2+				

(12537)* 1998 MT₃₄ = 1984 JC₁ = 1987 DZ₃ = 1994 GK₁₁Discovered 1998 June 24 by the Lincoln Laboratory Near-Earth Asteroid
Research Team at Socorro.Id. G. V. Williams (*MPC* 32287)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

M	148.21036		(2000.0)		P		Q	
n	0.28724420	ω	9.72016		-0.35325477		+0.93171589	
a	2.2749326	Ω	239.63606		-0.86476197		-0.35960716	
e	0.1409326	i	5.61082		-0.35692829		-0.05087432	
P	3.43	H	14.4		G	0.15	U	2

Residuals in seconds of arc

1984 05 03	688	(2.5+	3.4-)	1998 06 26	704	0.5+	0.5-	1999 10 22	704	0.6-	1.5-
1984 05 03	688	0.0	1.7-	1998 06 26	704	1.1-	1.0+	1999 11 09	704	0.6+	0.2+
1987 02 23	010	0.1-	0.3+	1998 06 26	704	0.4-	0.6-	1999 11 09	704	0.6+	0.3+
1987 02 24	010	0.2+	0.4-	1998 06 27	910	0.8+	0.2-	1999 11 09	704	0.1-	0.6-
1987 02 24	010	(3.0+	1.0-)	1998 06 27	910	0.9+	0.2-	1999 11 09	704	0.5+	0.3+
1992 11 23	691	0.2-	1.4+	1998 06 27	910	0.7+	0.2-	1999 11 12	704	1.1+	0.3+
1992 11 23	691	0.5-	0.5+	1998 07 20	566	1.0-	0.8-	1999 11 12	704	1.3-	0.8-
1992 11 23	691	0.7-	0.4+	1998 07 20	566	1.1-	0.8-	1999 11 12	704	0.5-	0.1-
1994 04 06	033	0.5+	0.2+	1998 07 20	566	0.8-	1.0-	1999 11 12	704	0.2+	0.1+
1994 04 06	033	0.2+	0.6+	1998 08 17	118	0.1+	1.2+	1999 11 12	704	0.7+	0.5-
1994 04 08	033	0.7-	0.3+	1998 08 17	118	0.3+	1.6+	1999 11 17	704	0.6-	0.6-
1998 06 24	704	0.9+	0.4+	1998 08 19	118	0.4+	0.0	1999 11 17	704	0.6-	0.6-
1998 06 24	704	(2.8+	4.9+)	1998 08 19	118	0.0	0.3-	1999 11 17	704	0.5-	0.

(12538)* 1998 OH

Discovered 1998 July 19 at Haleakala by the JPL Near-Earth Asteroid Tracking program.

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i> 259.49188		(2000.0)		P		Q	
<i>n</i>	0.51487688	ω	321.59947	−0.96248216	−0.00366519		
<i>a</i>	1.5417021	Ω	220.83795	+0.02463372	−0.99696003		
<i>e</i>	0.4061865	<i>i</i>	24.51380	−0.27022450	−0.07782844		
<i>P</i>	1.91	<i>H</i>	16.1	<i>G</i>	0.15	<i>U</i>	2

Residuals in seconds of arc

1991 10 10	675	0.7−	0.1−	1998 07 26	118	0.1−	0.6−	1998 08 15	108	0.0	1.4+
1991 10 10	675	0.8−	0.2−	1998 07 28	587	0.0	0.1−	1998 08 15	108	(2.0−	2.6+)
1993 11 09	675	1.0−	1.1−	1998 07 28	587	0.2+	0.6−	1998 08 26	658	0.5−	0.0
1993 11 09	675	1.2+	0.6−	1998 07 30	620	1.8+	1.3−	1998 08 26	658	1.0−	0.2−
1993 11 10	675	0.8+	2.0−	1998 07 30	620	0.0	0.6+	1998 08 26	658	0.7−	0.0
1993 11 10	675	0.0	1.1−	1998 07 30	620	1.2−	0.2+	1998 08 27	557	0.3−	0.3+
1998 07 19	566	0.3−	0.3+	1998 07 31	557	0.3+	0.0	1998 08 27	557	0.1+	0.1+
1998 07 19	566	0.3−	0.5+	1998 07 31	557	0.6+	0.6−	1998 08 28	658	0.1−	0.3+
1998 07 19	566	0.6−	0.4+	1998 07 31	557	0.1−	0.3−	1998 08 28	658	0.2−	0.3+
1998 07 20	566	0.6−	0.7+	1998 08 06	046	0.5+	0.2−	1998 08 28	658	0.7−	0.3+
1998 07 20	566	0.1−	0.3+	1998 08 06	557	0.2−	0.0	1998 08 29	658	0.1+	0.0
1998 07 20	566	0.3+	0.4+	1998 08 06	046	0.3+	0.4−	1998 08 29	658	0.5−	0.1+
1998 07 24	566	0.0	0.4+	1998 08 06	557	0.2+	0.0	1998 08 29	658	0.4−	0.1−
1998 07 24	566	0.1−	0.4+	1998 08 06	557	0.2+	0.3−	1998 09 17	360	0.7+	0.1−
1998 07 24	566	0.3+	0.7+	1998 08 06	046	0.6+	0.3−	1998 09 17	360	0.2+	0.3+
1998 07 24	598	0.5−	0.0	1998 08 07	954	0.2+	0.0	1998 09 17	360	0.5+	0.1+
1998 07 24	598	0.4−	0.1−	1998 08 07	046	0.1−	0.1−	1998 09 22	658	0.5−	0.3+
1998 07 24	598	0.4−	0.0	1998 08 07	046	0.8+	0.2+	1998 09 22	658	1.1−	0.6+
1998 07 24	598	0.4−	0.2+	1998 08 07	046	0.4+	0.1−	1998 09 22	658	0.8−	0.4+
1998 07 24	557	0.2−	0.4−	1998 08 07	954	0.3+	0.2+	1998 09 23	658	0.6−	0.5−
1998 07 24	557	0.1+	0.0	1998 08 08	954	0.3+	0.0	1998 09 23	658	0.5+	0.6−
1998 07 25	673	0.5−	1.2+	1998 08 08	954	0.3+	0.1+	1998 11 16	711	1.3−	0.7+
1998 07 25	673	0.4−	1.1+	1998 08 10	046	0.1+	0.3+	1998 11 16	711	1.6−	0.5+
1998 07 25	402	0.1−	0.3+	1998 08 10	046	0.1−	0.1+	1998 11 17	711	1.5−	0.3+
1998 07 25	402	0.6−	0.8+	1998 08 10	046	0.0	0.4+	1999 09 28	413	0.1−	0.4+
1998 07 25	402	0.4−	0.2−	1998 08 11	046	0.1+	0.0	1999 09 28	413	0.0	0.7+
1998 07 25	587	0.6+	0.8−	1998 08 11	046	0.2+	0.0	1999 10 18	658	0.5+	0.5+
1998 07 25	587	0.5+	0.2−	1998 08 11	046	0.1+	0.0	1999 10 18	658	0.2+	0.8+
1998 07 25	611	0.2+	0.3+	1998 08 11	046	0.2+	0.2−	1999 10 18	658	0.1+	0.8+
1998 07 25	611	0.3+	0.3+	1998 08 14	587	0.1−	0.2−	1999 11 02	118	0.3+	0.8+
1998 07 25	611	0.1−	0.1−	1998 08 14	587	0.9+	0.2−	1999 11 102	118	0.1+	1.0+
1998 07 26	557	0.2−	0.1−	1998 08 14	118	0.3+	0.1+	1999 11 16	474	0.1−	0.4+
1998 07 26	557	0.2+	0.5−	1998 08 14	118	0.3+	0.4+	1999 11 16	474	0.8+	0.4+
1998 07 26	046	0.1−	0.1−	1998 08 15	046	0.4+	0.1+	1999 11 16	360	0.1−	1.1+
1998 07 26	046	0.0	0.2+	1998 08 15	046	0.4+	0.2+	1999 11 16	360	0.2+	1.1+
1998 07 26	046	0.1−	0.2−	1998 08 15	046	0.1+	0.3+	1999 11 16	360	0.1−	0.6+
1998 07 26	046	0.1+	0.1+	1998 08 15	046	0.4+	0.9−				
1998 07 26	118	0.0	1.0−	1998 08 15	108	0.1+	0.1+				

(12539)* 1998 OP₂ = 1981 UA₉ = 1997 EV₄₈

Discovered 1998 July 16 by Spacewatch at Kitt Peak.

Id. G. V. Williams (*MPC* 32289)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i> 144.36814		(2000.0)		P		Q	
<i>n</i>	0.21744347	ω	303.59048	−0.48843934	+0.87067614		
<i>a</i>	2.7388724	Ω	297.06842	−0.77751230	−0.46436652		
<i>e</i>	0.0576449	<i>i</i>	3.72682	−0.39610810	−0.16213201		
<i>P</i>	4.53	<i>H</i>	13.6	<i>G</i>	0.15	<i>U</i>	1

Residuals in seconds of arc

1981 10 30	381	0.2+	0.1−	1998 07 30	120	0.0	0.7−	1999 10 22	704	0.3+	0.4+
1981 10 30	381	0.2−	0.2−	1998 07 30	120	0.3−	0.3−	1999 10 22	704	0.6+	0.1−
1997 03 11	809	0.2−	0.7−	1998 08 17	704	0.1−	0.1−	1999 10 22	704	1.0+	0.4−
1997 03 11	809	0.8−	1.3−	1998 08 17	704	0.7+	0.1+	1999 10 22	704	0.6+	0.7+

1997 03 11	809	0.4−	0.9−	1998 08 17	704	0.1−	0.2+	1999 10 22	704	1.0+	0.9−
1997 03 12	809	1.3+	1.9+	1998 08 17	704	0.9−	0.3+	1999 10 22	704	(2.1+	0.8−)
1997 03 12	809	0.9+	1.8+	1998 08 17	704	0.3−	0.2+	1999 10 29	703	0.4−	0.1+
1997 03 12	809	0.2+	1.7+	1998 08 19	566	1.0−	0.2+	1999 10 29	703	0.1−	0.3−
1998 07 02	691	0.0	0.5+	1998 08 19	566	0.8+	0.0	1999 10 29	703	0.5−	0.3+
1998 07 02	691	0.1+	0.3+	1998 08 19	566	0.5−	0.5+	1999 10 29	703	0.1−	0.4+
1998 07 02	699	0.5+	0.0	1998 08 25	120	0.0	0.3+	1999 11 03	704	1.0−	0.4+
1998 07 02	691	0.2+	0.1−	1998 08 25	120	0.5+	0.2−	1999 11 03	704	0.9−	0.4+
1998 07 02	699	1.4+	0.1−	1998 08 25	120	0.1−	0.2+	1999 11 03	704	1.2−	0.2+
1998 07 02	699	0.1−	0.2−	1998 08 25	120	0.2+	0.3+	1999 11 03	704	1.0−	0.6+
1998 07 16	691	0.1+	0.4+	1999 10 03	704	1.4+	0.7+	1999 11 03	704	0.8−	0.4+
1998 07 16	691	0.1+	0.2+	1999 10 03	704	0.4+	0.6+	1999 11 11	703	0.6−	0.2+
1998 07 16	691	0.1−	0.0	1999 10 03	704	0.1−	0.6−	1999 11 11	703	0.0	0.3+
1998 07 26	691	0.6+	0.5+	1999 10 03	704	0.6+	0.3+	1999 11 11	703	0.4−	0.2+
1998 07 26	691	0.8+	0.3+	1999 10 03	704	0.8−	0.1−	1999 11 11	703	0.2−	0.6+
1998 07 26	691	0.9+	0.3+	1999 10 07	704	1.1+	0.3+	1999 11 14	703	0.4−	0.8+
1998 07 27	691	1.0−	0.3+	1999 10 07	704	0.1+	0.6−	1999 11 14	703	0.0	0.4+
1998 07 27	691	1.2−	0.2+	1999 10 07	704	0.3−	0.5+	1999 11 14	703	0.1−	0.4+
1998 07 27	691	1.0−	0.2+	1999 10 07	704	0.8−	0.1+	1999 11 14	703	0.2+	0.4+
1998 07 29	120	1.0−	0.6−	1999 10 12	704	0.1+	0.4−	1999 11 16	704	0.4+	0.6−
1998 07 29	120	0.2−	0.2−	1999 10 12	704	0.3−	0.1−	1999 11 16	704	0.4+	0.2−
1998 07 29	120	0.1−	0.4−	1999 10 12	704	0.2+	0.3−	1999 11 16	704	0.5+	0.7−
1998 07 30	120	0.2+	0.3−	1999 10 12	704	0.2−	0.2−	1999 11 16	704	0.6+	0.7−
1998 07 30	120	0.8+	0.7−	1999 10 12	704	0.2−	0.8−	1999 11 16	704	0.3+	0.2−

(12540)* 1998 OU₉ = 1979 TM₂ = 1979 WW₇ = 1996 DA₅

Discovered 1998 July 26 by E. W. Elst at the European Southern

Observatory.

Id. G. V. Williams (*MPC* 32490), A. Doppler (*MPC* 34532)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i> 290.58176		(2000.0)		P		Q	
<i>n</i>	0.19936005	ω	204.67406	−0.27746897	−0.96061227		
<i>a</i>	2.9020883	Ω	261.43810	+0.88401120	−0.24902933		
<i>e</i>	0.0143308	<i>i</i>	0.88832	+0.37621161	−0.12332256		
<i>P</i>	4.94	<i>H</i>	13.1	<i>G</i>	0.15	<i>U</i>	1

Residuals in seconds of arc

1979 10 14	095	0.9−	1.0−	1998 08 23	704	0.2+	0.8−	1999 11 03	704	0.5+	1.0+
1979 11 22	095	1.0+	0.1−	1998 08 23	704	0.9−	0.7+	1999 11 04	703	0.3+	0.5+
1993 10 20	691	0.4+	0.4+	1998 08 23	704	0.1+	0.8−	1999 11 04	703	0.0	0.2+
1993 10 20	691	0.3−	0.5+	1998 08 23	704	(2.9−	1.9−)	1999 11 04	703	0.4−	0.6+
1993 10 20	691	1.7+	0.9−	1998 08 28	699	0.7−	1.2+	1999 11 04	703	0.4−	0.8+
1996 02 16	010	0.2−	0.3−	1998 08 28	699	0.1−	0.2−	1999 11 09	704	0.7+	0.1−
1996 02 16	010	0.7−	0.7−	1998 08 28	699	0.4+	0.6+	1999 11 09	704	0.4+	0.2−
1996 02 16	010	0.1+	0.6−	1998 09 18	958	0.5−	0.5−	1999 11 09	704	0.1+	0.0
1996 02 17	010	(0.1−	2.7−)	1998 09 18	958	0.0	0.3−	1999 11 09	704	0.5+	0.2−
1996 02 17	010	(0.1−	2.6−)	1998 09 19	958	1.6−	0.1+	1999 11 09	704	0.5+	0.1+
1996 02 17	010	(0.4−	2.7−)	1998 09 19	958	0.5−	1.8+	1999 11 12	699	0.1+	0.8+
1996 04 18	566	0.2+	0.2−	1998 09 20	958	(2.0+	3.5+)	1999 11 12	699	0.4−	0.6+
1996 04 18	566	0.4+	0.0	1998 09 21	699	0.0	0.3−	1999 11 12	699	0.3−	0.6+
1996 04 18	566	0.6−	0.8−	1998 09 21	699	0.4−	0.1−	1999 11 12	704	0.7+	0.1−
1998 07 26	809	(2.2+	1.8−)	1998 09 21	699	0.6−	0.2+	1999 11 12	704	0.1−	0.3−
1998 07 26	809	1.3+	2.0−	1999 10 12	704	0.6+	0.0	1999 11 12	704	0.6+	0.7−
1998 07 26	809	(1.1+	2.2−)	1999 10 12	704	0.4−	1.0+	1999 11 12	704	0.2+	0.9−
1998 07 27	809	(2.3+	1.9−)	1999 10 12	704	0.7+	1.0−	1999 11 12	704	0.3+	0.6−
1998 07 27	809	(2.6+	1.8−)	1999 10 12	704	0.0	0.3−	1999 11 14	704	0.2+	0.3−
1998 07 27	809	(1.9+	2.2−)	1999 10 12	704	0.8−	1.1−	1999 11 14	704	0.1−	0.3−
1998 08 17	704	0.7+	0.3−	1999 10 22	704	0.5−	0.1−	1999 11 14	704	0.1+	0.4−
1998 08 17	704	0.8+	0.2−	1999 10 22	704	0.6−	0.3−	1999 11 14	704	0.2+	0.4−
1998 08 17	704	0.1−	0.9+	1999 10 22	704	0.9−	0.1+	1999 11 14	704	0.0	0.2−
1998 08 17	704	0.2+	0.5−	1999 10 22	704	1.5−	0.0	1999 11 16	704	0.2+	0.0
1998 08 17	704	0.1−	0.0	1999 10 22	704	1.6−	0.2+	1999 11 16	704	0.2+	0.1+
1998 08 21	566	0.6+	0.7−	1999 11 03	704	0.3+	0.1+	1999 11 16	704	0.1+	0.1−
1998 08 21	566	0.3+	0.8−	1999 11 03	704	0.9+	1.0+	1999 11 16	704	0.0	0.0
1998 08 21	566	(0.5+	2.4−)	1999 11 03	704	0.7−	0.2+	1999 11 16	704	0.2+	0.3+

(12541)* 1998 PD₁ = 1993 RS₁₃

Discovered 1998 Aug. 15 at Višnjan.

Id. G. V. Williams (*MPC* 32689)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>		110.93095		(2000.0)		P		Q	
<i>n</i>		0.18813311	ω	104.58846		+0.12878803		+0.99136179	
<i>a</i>		3.0164252	Ω	172.67487		-0.96819023		+0.13111081	
<i>e</i>		0.1172540	<i>i</i>	11.21981		-0.21452580		+0.00342764	
<i>P</i>		5.24	<i>H</i>	13.2		<i>G</i>	0.15	<i>U</i>	1

Residuals in seconds of arc

1993 09 14	809	2.0+	0.7+	1998 08 23	704	0.9+	0.5-	1999 10 08	703	0.1+	0.1-
1993 09 14	809	0.5-	0.4+	1998 08 23	704	0.0	0.2+	1999 10 08	703	0.1-	0.3-
1993 09 14	809	1.1-	0.1+	1998 08 23	704	0.2-	0.7+	1999 10 08	703	0.4-	0.2-
1993 09 19	809	0.6+	0.3+	1998 09 14	704	0.2-	0.3-	1999 10 08	703	0.0	0.3+
1993 09 19	809	0.6-	0.8+	1998 09 14	704	0.3-	0.7-	1999 10 19	704	0.1+	1.2-
1993 09 19	809	0.6-	0.7-	1998 09 14	704	0.2-	0.4-	1999 10 19	704	1.4+	0.8-
1996 02 17	691	0.2-	0.9-	1998 09 14	704	1.2-	0.8-	1999 10 19	704	0.2-	0.6-
1996 02 17	691	0.4-	0.7-	1998 09 14	704	0.6-	0.4-	1999 10 19	704	0.7+	0.1+
1996 02 17	691	0.0	0.0	1998 09 18	704	0.9-	0.4-	1999 10 19	704	0.3+	0.7-
1998 08 15	120	1.2+	0.5-	1998 09 18	704	0.3+	0.7+	1999 11 05	704	0.3+	0.2-
1998 08 15	120	0.0	0.7-	1998 09 18	704	0.3+	0.3+	1999 11 05	704	0.6+	0.1+
1998 08 15	120	0.3+	0.3-	1998 09 18	704	0.1-	0.8-	1999 11 05	704	0.9-	0.3+
1998 08 16	120	1.2+	0.4-	1998 09 18	704	(2.3-	0.1-)	1999 11 05	704	0.4-	0.3+
1998 08 16	120	0.6+	0.5+	1998 09 22	120	0.3+	0.3-	1999 11 05	704	0.2-	0.5+
1998 08 16	120	0.2+	0.6-	1998 09 22	120	0.4-	0.1+	1999 11 10	704	1.1-	0.7-
1998 08 17	704	0.6+	0.1+	1998 09 22	120	0.2+	0.4-	1999 11 10	704	0.7-	0.2-
1998 08 17	704	0.5+	0.1+	1998 11 06	910	1.1-	0.6+	1999 11 10	704	0.3-	0.9+
1998 08 17	704	1.5+	0.7+	1998 11 06	910	1.6-	0.6+	1999 11 10	704	0.1+	0.0
1998 08 17	704	0.2+	0.4+	1998 11 06	910	1.2-	0.1+	1999 11 10	704	0.0	1.7+
1998 08 17	704	0.8+	1.8+	1998 11 08	910	1.8-	0.4-	1999 11 13	699	0.2+	0.2+
1998 08 23	704	0.8+	0.2+	1998 11 08	910	1.7-	0.1-	1999 11 13	699	0.4+	0.1-
1998 08 23	704	0.6+	1.5-	1998 11 08	910	1.8-	0.1-	1999 11 13	699	1.1+	0.4+

(12542)* 1998 PN₁ = 1993 TF₂₃ = 1997 HQ₁₇

Discovered 1998 Aug. 10 by J. Broughton at Reedy Creek.

Id. G. V. Williams (*MPC* 32494)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>		49.73027		(2000.0)		P		Q	
<i>n</i>		0.17373407	ω	295.64827		+0.86489702		+0.49946638	
<i>a</i>		3.1808710	Ω	34.45004		-0.42311338		+0.77889690	
<i>e</i>		0.1424247	<i>i</i>	5.05711		-0.27005223		+0.37927952	
<i>P</i>		5.67	<i>H</i>	14.0		<i>G</i>	0.15	<i>U</i>	1

Residuals in seconds of arc

1993 10 09	809	0.2+	1.3-	1998 08 11	428	0.5+	0.6+	1999 10 22	461	0.1+	0.3+
1993 10 09	809	0.4-	1.6-	1998 08 12	428	0.1-	0.1-	1999 10 22	704	0.4-	0.8-
1993 10 09	809	0.4-	1.7-	1998 08 13	428	0.9+	0.4+	1999 10 22	704	0.1+	0.6-
1993 10 11	809	(5.2+	3.9+)	1998 08 13	428	0.2+	0.1+	1999 10 22	704	0.2+	0.6-
1993 10 11	809	(4.6+	3.3+)	1998 08 17	704	0.9+	0.6+	1999 10 22	704	0.3+	0.9-
1993 10 11	809	(4.5+	3.9+)	1998 08 17	704	0.7+	0.2+	1999 10 22	704	1.2+	1.2-
1993 10 12	809	1.5+	1.2+	1998 08 17	704	0.6+	0.3-	1999 11 03	704	0.3-	0.4-
1993 10 12	809	1.2+	0.5+	1998 08 17	704	0.3+	1.5-	1999 11 03	704	0.7-	0.1-
1993 10 12	809	1.1+	1.3+	1998 08 17	704	(2.2+	1.7-)	1999 11 03	704	1.0-	0.4-
1993 10 22	809	(3.4+	3.1-)	1998 08 19	566	1.0-	1.2-	1999 11 03	704	0.5-	1.2-
1993 10 22	809	1.5-	1.9-	1998 08 19	566	1.2-	1.1-	1999 11 03	704	0.9-	0.5-
1993 10 22	809	(8.4-	2.7+)	1998 08 19	566	0.6-	0.5-	1999 11 04	703	2.1-	0.6+
1997 04 02	704	0.1+	0.0	1998 08 19	428	0.5+	0.1-	1999 11 04	703	0.3+	0.8+
1997 04 02	704	0.5-	0.8+	1998 08 25	428	0.2-	0.2+	1999 11 04	703	0.2-	0.5+
1997 04 30	704	0.8-	0.4+	1998 09 13	428	0.0	0.5+	1999 11 04	703	0.3+	0.6+
1997 04 30	704	0.6+	0.1-	1998 09 13	428	1.2-	0.7+	1999 11 12	699	0.9+	0.6+
1997 04 30	704	0.7+	0.4-	1998 10 10	428	1.0-	1.2+	1999 11 12	699	1.5-	1.0+
1997 04 30	704	1.2-	0.6-	1998 10 10	428	0.2+	1.3+	1999 11 12	699	0.7+	0.3+
1997 04 30	704	0.5+	0.6-	1999 10 06	704	0.5+	0.0	1999 11 14	704	0.4+	0.1+
1997 04 30	704	1.0-	0.7+	1999 10 06	704	0.2-	0.3-	1999 11 14	704	0.6+	0.5+

1997 04 30	704	0.7+	0.3+	1999 10 06	704	0.1-	0.8+	1999 11 14	704	0.5+	0.3+
1997 04 30	704	0.3+	0.0	1999 10 06	704	0.0	0.6+	1999 11 14	704	0.5+	0.1+
1997 05 01	704	0.1+	0.5+	1999 10 06	704	1.1-	0.6+	1999 11 14	704	0.2+	0.3+
1997 05 01	704	0.9-	0.7-	1999 10 12	704	0.3+	0.1-	1999 11 16	704	0.1-	0.2+
1997 05 01	704	1.0-	0.5-	1999 10 12	704	0.1+	0.3-	1999 11 16	704	0.2-	0.5-
1997 05 01	704	1.3+	0.6-	1999 10 12	704	0.2-	0.0	1999 11 16	704	2.0+	0.3-
1997 05 01	704	0.2+	0.5-	1999 10 12	704	0.1+	0.0	1999 11 16	704	0.4-	0.5+
1998 08 10	428	0.2+	0.9+	1999 10 12	704	0.1+	0.3+	1999 11 16	704	0.1-	0.3+
1998 08 10	428	0.4-	0.5+	1999 10 22	461	0.1+	0.6+				

(12543)* 1998 QM₅ = 1998 KR₁₉ = 1976 GV₁ = 1994 LA₃

Discovered 1998 Aug. 23 by F. B. Zoltowski at Woomera.

Id. G. V. Williams (*MPC* 32974)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>		75.01003		(2000.0)		P		Q	
<i>n</i>		0.27097972	ω	98.59246		+0.41411453		+0.90960348	
<i>a</i>		2.3650747	Ω	195.99931		-0.87573185		+0.38807640	
<i>e</i>		0.1834908	<i>i</i>	7.00737		-0.24819929		+0.14838538	
<i>P</i>		3.64	<i>H</i>	13.8		<i>G</i>	0.15	<i>U</i>	1

Residuals in seconds of arc

1976 04 01	095	(4.5-	5.2-)	1998 05 24	704	0.9+	0.1+	1999 10 10	704	0.5+	0.2+
1976 04 04	095	0.6-	1.9-	1998 05 24	704	0.4+	0.3+	1999 10 10	704	0.2+	0.1+
1994 04 02	691	0.5-	0.9-	1998 08 23	426	0.3+	0.6-	1999 10 10	704	0.4+	0.2+
1994 04 02	691	0.7-	0.3-	1998 08 23	426	0.1-	0.0	1999 10 10	704	0.3+	0.0
1994 04 02	691	0.7-	0.9+	1998 08 23	426	0.2-	0.2-	1999 10 10	704	0.2+	0.1+
1994 06 07	587	0.1+	0.7+	1998 08 24	426	0.8+	0.1-	1999 10 15	704	0.7+	0.1+
1994 06 07	587	0.2-	0.4+	1998 08 24	426	1.1+	0.0	1999 10 15	704	0.8+	0.1+
1994 06 07	587	0.2+	0.4+	1998 08 24	426	1.3+	0.1-	1999 10 15	704	0.8+	0.0
1994 06 14	587	1.1+	0.0	1998 09 01	426	0.6-	0.2+	1999 10 15	704	0.0	0.0
1994 06 14	587	0.9+	0.0	1998 09 01	426	0.0	0.4+	1999 10 21	704	0.1+	0.6+
1994 06 14	587	1.9+	1.0+	1998 09 01	426	0.4-	0.6+	1999 10 21	704	0.0	0.1+
1998 04 22	704	0.3-	0.6+	1998 09 10	426	0.4-	0.1+	1999 10 21	704	0.2+	0.4+
1998 04 22	704	0.5-	0.1-	1998 09 10	426	0.6-	0.3+	1999 10 21	704	0.0	0.5+
1998 04 22	704	1.3-	0.1-	1998 09 10	426	0.5-	0.5+	1999 10 21	704	0.4-	0.4+
1998 04 22	704	0.1+	1.2+	1998 09 12	426	0.3-	0.3+	1999 11 04	704	0.2-	0.1-
1998 04 22	704	0.2+	1.0+	1998 09 12	426	0.2-	0.5-	1999 11 04	704	0.5-	0.3+
1998 05 01	704	0.1-	0.2-	1998 09 12	426	0.3-	0.2+	1999 11 04	704	0.3-	0.3-
1998 05 01	704	0.7+	0.3-	1998 09 28	426	0.5-	0.6-	1999 11 04	704	0.6-	0.6-
1998 05 01	704	0.5-	0.6-	1998 09 28	426	0.1+	0.3-	1999 11 04	704	0.8-	0.6-
1998 05 01	704	0.3+	0.0	1998 09 28	426	0.2-	0.7-	1999 11 12	699	1.0-	0.7-
1998 05 01	704	0.8+	0.2-	1998 10 09	426	0.1-	0.0	1999 11 17	704	0.1+	0.4+
1998 05 22	704	0.7+	0.7+	1998 10 09	426	0.2+	0.0	1999 11 17	704	0.4+	0.3+
1998 05 22	704	0.1+	0.1-	1998 10 09	426	0.0	0.3-	1999 11 17	704	0.2-	0.4+
1998 05 22	704	1.1-	0.1-	1999 10 08	703	0.2+	0.1-	1999 11 17	704	0.1-	0.2+
1998 05 22	704	0.2-	1.0+	1999 10 08	703	0.6+	0.3+	1999 11 17	704	0.6-	0.9+
1998 05 22	704	0.2-	0.3+	1999 10 08	703	0.2-	0.0				
1998 05 24	704	0.5+	0.2+	1999 10 08	703	0.3-	0.3+				

(12544)* 1998 QX₉ = 1971 SD₃ = 1987 OG₁ = 1997 KJ₃

Discovered 1998 Aug. 17 by the Lincoln Laboratory Near-Earth Asteroid

Research Team at Socorro.

1996 04 22	691	0.1-	0.7-	1998 08 17	704	0.6-	0.4+	1999 10 21	704	0.1+	0.3+
1996 04 22	691	0.0	0.2-	1998 08 17	704	0.4+	0.6-	1999 11 15	704	0.1+	0.6+
1996 04 22	691	0.1-	0.4-	1998 08 23	704	0.3+	1.5+	1999 11 15	704	0.1+	0.3+
1997 05 31	691	0.6-	0.9+	1998 08 23	704	1.4+	1.0+	1999 11 15	704	0.3+	0.1-
1997 05 31	691	0.2+	0.3+	1998 08 23	704	(2.7-	0.2-)	1999 11 15	704	0.5-	0.1+
1997 05 31	691	0.2+	0.4+	1998 08 23	704	0.1-	1.3-	1999 11 15	704	0.8-	0.3+
1997 06 07	691	0.1-	0.4+	1998 08 29	699	0.1+	0.3+	1999 11 17	704	0.0	0.4-
1997 06 07	691	0.1+	0.1+	1998 08 29	699	0.8-	0.5-	1999 11 17	704	0.4+	0.5+
1997 06 07	691	0.1+	0.2+	1998 08 29	699	0.9-	0.9+	1999 11 17	704	0.5+	0.4+
1998 07 15	699	0.7-	0.4+	1999 10 10	704	0.4-	0.3+	1999 11 17	704	0.1+	0.7+
1998 07 15	699	0.6-	0.7-	1999 10 10	704	0.2+	0.3-	1999 11 17	704	0.2-	0.6-

(12545)* 1998 QT₁₉ = 1987 GZ = 1993 OB₁₄ = 1997 GZ₄₀

Discovered 1998 Aug. 17 by the Lincoln Laboratory Near-Earth Asteroid Research Team at Socorro.

Id. G. V. Williams (*MPC* 32694)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>		119.07121		(2000.0)		P		Q	
<i>n</i>		0.20943050	ω	116.07235		+0.19558561		+0.98037030	
<i>a</i>		2.8082953	Ω	165.14296		-0.93090129		+0.19358592	
<i>e</i>		0.0482727	<i>i</i>	5.57436		-0.30849482		+0.03739752	
<i>P</i>	4.71	<i>H</i>	13.8	<i>G</i>	0.15	<i>U</i>	1		

Residuals in seconds of arc

1987 04 01	675	0.1+	1.2+	1998 07 26	699	0.5-	1.4+	1998 09 21	699	0.5-	0.6-
1987 04 01	675	1.0+	0.0	1998 07 26	699	1.8+	0.7+	1998 09 21	699	0.7-	0.3-
1987 04 03	675(12.1-	0.9+)		1998 08 17	704	0.5+	0.6-	1998 09 21	699	0.3-	0.1+
1987 04 03	675(10.3-	0.1-)		1998 08 17	704	1.2+	0.3-	1998 11 12	910	0.2-	0.3+
1992 04 27	691	1.5-	0.2-	1998 08 17	704	0.5-	1.5-	1998 11 12	910	0.7-	0.2-
1992 04 27	691	(4.0-	0.3+)	1998 08 17	704	0.0	0.0	1998 11 12	910	0.9-	0.1+
1992 04 27	691	0.2+	1.8-	1998 08 17	704	0.1-	0.9+	1999 10 21	704	0.4-	0.6+
1993 07 23	010	1.1-	1.0-	1998 08 23	704	0.1-	0.2-	1999 10 21	704	0.4+	0.5-
1993 07 23	010	0.2-	1.3-	1998 08 23	704	0.2+	0.1+	1999 10 21	704	0.8+	0.4-
1993 07 23	010	0.7+	0.6+	1998 08 23	704	0.6-	0.9+	1999 10 21	704	0.7-	0.1+
1997 04 06	704	0.9+	0.8+	1998 08 23	704	(1.2-	3.1+)	1999 11 04	704	0.2-	1.0-
1997 04 06	704	0.7+	0.2-	1998 09 14	704	0.5-	1.1-	1999 11 04	704	0.4-	0.8-
1997 04 07	809	1.4-	0.6-	1998 09 14	704	2.0+	0.7+	1999 11 04	704	0.4+	1.1-
1997 04 07	809	1.3-	0.2-	1998 09 14	704	0.1-	1.8-	1999 11 04	704	0.4+	1.1-
1997 04 07	809	1.6-	0.7-	1998 09 14	704	0.3-	0.7+	1999 11 04	704	0.5-	1.0-
1997 04 08	809	1.2+	2.1-	1998 09 18	704	0.7+	0.8+	1999 11 17	699	0.4+	0.7-
1997 04 08	809	0.6+	0.9-	1998 09 18	704	1.0-	0.4-	1999 11 17	699	0.9-	0.1-
1997 04 08	809	0.1-	0.8-	1998 09 18	704	0.4+	1.0-	1999 11 17	699	1.1+	0.7-
1998 07 26	699	0.9+	0.8+	1998 09 18	704	(2.9-	1.3+)				

(12546)* 1998 QJ₂₁ = 1982 SW₅ = 1993 TN₄₃ = 1997 HD₁₆

Discovered 1998 Aug. 17 by the Lincoln Laboratory Near-Earth Asteroid Research Team at Socorro.

Id. G. V. Williams (*MPC* 32695)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>		83.82101		(2000.0)		P		Q	
<i>n</i>		0.18192536	ω	155.69517		+0.53467590		+0.84500110	
<i>a</i>		3.0846595	Ω	146.62436		-0.77819411		+0.49683073	
<i>e</i>		0.1648304	<i>i</i>	1.01427		-0.32944743		+0.19781904	
<i>P</i>	5.42	<i>H</i>	13.3	<i>G</i>	0.15	<i>U</i>	1		

Residuals in seconds of arc

1982 09 16	095	0.5-	0.9+	1998 08 23	704	0.0	0.1+	1998 11 12	910	0.9-	0.3-
1993 10 10	809	1.4+	1.3+	1998 08 23	699	0.4-	0.1+	1999 10 12	704	0.9+	0.6+
1993 10 10	809	0.0	0.4+	1998 09 14	704	0.2+	1.2-	1999 10 12	704	0.0	0.2+
1993 10 10	809	1.4-	0.3+	1998 09 14	704	0.4+	0.7+	1999 10 12	704	1.3-	1.1+
1993 10 22	809	0.4+	1.8-	1998 09 14	704	0.1-	0.6+	1999 11 03	704	0.9+	0.4+
1993 10 22	809	(0.8-	2.1-)	1998 09 14	704	0.5+	0.2+	1999 11 03	704	1.3+	0.1-
1993 10 22	809	(2.4-	1.8-)	1998 09 14	704	0.2-	0.3+	1999 11 03	704	0.3-	0.4-
1997 04 29	691	0.1-	0.1-	1998 09 15	587	0.2+	0.4-	1999 11 03	704	0.5+	0.7-
1997 04 29	691	0.3-	0.5-	1998 09 15	587	1.2-	0.7-	1999 11 03	704	0.5+	1.1-

1997 04 29	691	0.2-	0.1-	1998 09 15	587	0.3+	0.6-	1999 11 09	704	0.0	0.1-
1997 05 08	691	0.1-	0.3+	1998 09 16	587	0.2+	0.2+	1999 11 09	704	0.0	0.2+
1997 05 08	691	0.2+	0.1+	1998 09 16	587	0.3+	1.1-	1999 11 09	704	0.0	0.3+
1997 05 08	691	0.4+	0.2+	1998 09 17	587	0.5+	0.4-	1999 11 09	704	0.1-	0.3+
1998 08 17	704	0.9+	0.5+	1998 09 17	587	0.4+	0.1+	1999 11 09	704	0.1-	0.6+
1998 08 17	704	0.3-	0.2+	1998 09 18	704	0.3+	0.0	1999 11 12	704	0.4-	0.1-
1998 08 17	704	0.4-	0.5+	1998 09 18	704	(1.2+	2.4-)	1999 11 12	704	0.3-	0.2-
1998 08 17	704	0.3-	0.4+	1998 09 18	704	1.9+	1.6-	1999 11 12	704	0.6-	0.1-
1998 08 17	704	0.2+	0.4+	1998 09 18	704	0.3-	0.1-	1999 11 12	704	0.4-	0.7-
1998 08 23	704	0.4+	0.2-	1998 09 18	704	0.7-	1.1-	1999 11 12	704	0.5-	0.6-
1998 08 23	699	0.4-	0.5+	1998 09 21	699	0.0	0.5+	1999 11 17	704	0.0	0.2-
1998 08 23	704	0.0	1.0-	1998 09 21	699	0.5+	0.1-	1999 11 17	704	0.2-	0.3+
1998 08 23	704	0.8-	1.2+	1998 09 21	699	0.3+	0.2-	1999 11 17	704	0.0	0.4+
1998 08 23	699	0.1-	0.4+	1998 11 12	910	0.8-	0.3-	1999 11 17	704	0.0	0.3+
1998 08 23	704	0.6-	1.1+	1998 11 12	910	0.8-	0.1-	1999 11 17	704	0.1+	0.1-

(12547)* 1998 QL₂₂ = 1987 QY₃ = 1987 SD₉ = 1990 EL₁

Discovered 1998 Aug. 17 by the Lincoln Laboratory Near-Earth Asteroid Research Team at Socorro.

Id. G. V. Williams (*MPC* 32695)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>		32.73479		(2000.0)		P		Q	
<i>n</i>		0.17424977	ω	90.31127		+0.97113514		-0.20127511	
<i>a</i>		3.1745919	Ω	281.30293		+0.13124639		+0.89898741	
<i>e</i>		0.1328975	<i>i</i>	7.50052		+0.19917559		+0.38898581	
<i>P</i>	5.66	<i>H</i>	13.3	<i>G</i>	0.15	<i>U</i>	1		

Residuals in seconds of arc

1987 08 31	010	1.9+	0.6+	1998 08 17	704	0.2+	0.5+	1998 09 25	327	1.0+	0.2-
1987 08 31	010	0.2+	0.3-	1998 08 17	704	0.1+	0.1+	1998 09 25	327	1.8+	1.0-
1987 08 31	010	0.2-	0.8-	1998 08 23	704	0.3+	0.8-	1999 10 13	704	0.5-	0.3-
1987 09 21	010	1.1-	0.8-	1998 08 23	704	1.4-	1.0+	1999 10 13	704	0.5-	0.1-
1987 09 22	010	0.1+	0.4-	1998 08 23	704	1.3-	0.1+	1999 10 13	704	0.1-	0.0
1990 02 24	809	0.2-	1.8-	1998 08 23	704	0.1-	1.6+	1999 10 13	704	0.3-	1.0+
1990 02 24	809	0.9-	1.5-	1998 09 14	704	0.0	0.1-	1999 10 13	704	0.7+	1.0+
1990 02 24	809	1.4-	1.5-	1998 09 14	704	0.2-	0.3+	1999 11 14	704	0.0	0.1-
1990 03 02	809	(0.3-	2.7-)	1998 09 14	704	0.4+	1.0-	1999 11 14	704	0.0	0.0
1990 03 02	809	(0.1-	2.6-)	1998 09 14	704	0.5+	1.1-	1999 11 14	704	0.4+	0.3+
1990 03 02	809	(0.2-	2.9-)	1998 09 14	704	0.8+	1.2-	1999 11 14	704	0.2-	0.2+
1990 03 04	809	(2.4-	2.3-)	1998 09 18	704	0.2+	0.1-	1999 11 14	704	0.1-	0.1-
1990 03 04	809	(2.9-	2.8-)	1998 09 18	704	1.0-	0.7-	1999 11 16	704	0.4+	0.3+
1990 03 04	809	(1.4+	3.1-)	1998 09 18	704	(1.4+	2.6-)	1999 11 16	704	0.9+	0.4-
1998 08 17	704	0.4-	0.3-	1998 09 18	704	0.7-	0.2+	1999 11 16	704	0.3-	1.7-
1998 08 17	704	0.3-	0.3+	1998 09 18	704	0.5+	1.4-	1999 11 16	704	0.2-	0.5+
1998 08 17	704	0.2-	1.2+	1998 09 25	327	1.3+	0.4-				

(12548)* 1998 QJ₂₅ = 1989 EG₉ = 1997 JA₁₈ = 1997 LV₁₃

Discovered 1998 Aug. 17 by the Lincoln Laboratory Near-Earth Asteroid Research Team at Socorro.

Id. G. V. Williams (*MPC* 32697)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>		341.53632		(2000.0)		P		Q	
<i>n</i>		0.26660838	ω	330.96928		-0.17541268		-0.98372214	
<i>a</i>		2.3908565	Ω	129.10570		+0.91268127		-0.17734259	
<i>e</i>		0.1602677	<i>i</i>	2.88096		+0.36911150		-0.02898874	
<i>P</i>	3.70	<i>H</i>	14.4	<i>G</i>	0.15	<i>U</i>	1		

Residuals in seconds of arc

1989 03 05	033	0.5+	1.3+

1997 05 04	809	0.7–	1.6–	1998 08 23	704	0.1–	0.7–	1999 10 10	704	0.4–	0.6+
1997 06 08	809	(1.8+	3.6+)	1998 08 23	704	1.2–	0.0	1999 10 10	704	0.0	0.5+
1997 06 08	809	(1.5+	3.8+)	1998 08 23	699	0.5–	0.2+	1999 10 10	704	0.5–	0.2+
1997 06 08	809	(2.3+	3.0+)	1998 08 23	704	(3.0–	1.2+)	1999 10 21	704	0.3–	0.7–
1997 06 09	809	1.6+	1.1+	1998 09 14	704	0.6+	0.2–	1999 10 21	704	0.6–	0.1–
1997 06 09	809	1.3+	1.3+	1998 09 14	704	0.7–	1.0+	1999 10 21	704	0.1–	0.3+
1997 06 09	809	1.1+	0.4–	1998 09 14	704	0.4+	0.4–	1999 11 17	704	1.1–	0.8–
1998 08 17	704	0.1+	0.2–	1998 09 14	704	0.5+	0.6+	1999 11 17	704	1.1+	1.3–
1998 08 17	704	0.3–	0.0	1998 09 14	704	0.1+	0.2+	1999 11 17	704	0.5+	1.3–
1998 08 17	704	0.5–	0.1–	1998 09 18	704	0.3–	0.4+	1999 11 17	704	(0.3+	2.1–)
1998 08 17	704	0.1+	0.1+	1998 09 18	704	1.0–	0.1+				
1998 08 17	704	0.2+	1.2–	1998 09 18	704	1.5–	0.8–				

(12549)* 1998 QO₂₆ = 1996 HM₁₅ = 1996 KG₇

Discovered 1998 Aug. 17 by the Lincoln Laboratory Near-Earth Asteroid

Research Team at Socorro.

Id. G. V. Williams (*MPC* 32697)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i> 304.74227			(2000.0)			P		Q	
<i>n</i>	0.17134341	ω	252.72844	–0.26087994	–0.96451700				
<i>a</i>	3.2103898	Ω	212.48098	+0.91194935	–0.23242778				
<i>e</i>	0.1533630	<i>i</i>	4.33617	+0.31668602	–0.12523689				
<i>P</i>	5.75	<i>H</i>	13.0	<i>G</i> 0.15	<i>U</i> 2				

Residuals in seconds of arc

1996 04 17	809	(0.6–	3.3+)	1998 08 17	704	0.2–	1.3+	1999 10 21	704	0.8+	0.4+
1996 04 17	809	(1.8–	2.3+)	1998 08 17	704	1.2–	1.0–	1999 10 21	704	0.2–	0.5+
1996 04 17	809	(1.3–	2.5+)	1998 08 23	704	1.4+	0.7–	1999 11 01	703	0.0	0.1+
1996 04 18	809	0.8–	0.8+	1998 08 23	704	0.2+	0.4–	1999 11 01	703	0.3+	0.2+
1996 04 18	809	0.1–	0.9+	1998 08 23	704	(2.6+	0.3+)	1999 11 01	703	0.7–	0.0
1996 04 18	809	0.4–	0.7+	1998 08 23	704	0.3+	1.0–	1999 11 01	703	0.2–	0.5+
1996 04 18	809	0.4–	0.8+	1998 08 26	699	0.3+	0.3+	1999 11 04	704	0.2+	0.0
1996 04 18	809	0.1–	0.2+	1998 08 26	699	0.5–	0.2+	1999 11 04	704	0.8+	0.3–
1996 04 18	809	0.3–	0.3–	1998 08 26	699	0.4+	0.0	1999 11 04	704	0.1+	0.6–
1996 05 16	566	0.1–	1.0–	1998 08 28	691	0.9–	0.0	1999 11 04	704	0.2–	0.3–
1996 05 16	566	0.3–	1.5–	1998 08 28	691	0.7–	0.1+	1999 11 04	704	0.2+	0.8–
1996 05 16	566	0.6+	0.1–	1998 09 15	699	0.3+	0.7–	1999 11 12	691	0.1+	0.0
1996 05 16	566	0.1+	1.1–	1998 09 15	699	0.3–	1.4+	1999 11 12	691	0.1+	0.1+
1996 05 16	566	0.9+	0.3–	1998 09 15	699	0.0	0.4+	1999 11 12	691	0.2+	0.1+
1996 05 16	566	0.6+	0.1+	1999 10 10	704	0.7+	0.2+	1999 11 15	704	0.3–	0.1+
1996 05 19	809	(3.1+	0.5+)	1999 10 10	704	0.6+	0.7–	1999 11 15	704	0.1–	0.2+
1996 05 19	809	(3.5+	0.4–)	1999 10 10	704	0.6–	0.3+	1999 11 15	704	0.2–	0.0
1996 05 19	809	(3.5+	0.1–)	1999 10 10	704	1.3+	1.1–	1999 11 15	704	0.1+	0.0
1996 05 22	809	(2.9+	1.2–)	1999 10 10	704	0.7–	1.0–	1999 11 15	704	0.1–	0.4–
1996 05 22	809	(2.6+	0.7–)	1999 10 15	704	0.3+	0.5+	1999 11 17	704	0.3–	0.4+
1996 05 22	809	(2.4+	0.9–)	1999 10 15	704	0.2–	0.1+	1999 11 17	704	0.3–	0.4+
1997 07 02	704	0.7+	0.5+	1999 10 15	704	0.3–	0.6–	1999 11 17	704	0.2+	0.5+
1997 07 02	704	0.1+	0.5–	1999 10 15	704	0.7–	0.2–	1999 11 17	704	0.3–	0.3+
1997 07 02	704	0.1+	0.1–	1999 10 21	704	0.3+	0.7–	1999 11 17	704	0.3–	0.0
1997 07 02	704	0.5–	0.1–	1999 10 21	704	0.1–	0.0				
1998 08 17	704	0.5+	0.5+	1999 10 21	704	0.2–	0.3+				

(12550)* 1998 QR₃₀ = 1949 WQ = 1986 VO₂ = 1989 MC

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Research Team at Socorro.

Id. G. V. Williams (*MPC* 32698)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i> 213.59564			(2000.0)			P		Q	
<i>n</i>	0.23460703	ω	15.73580	–0.95531082	+0.29554264				
<i>a</i>	2.6036066	Ω	181.49443	–0.28988163	–0.94059071				
<i>e</i>	0.0820397	<i>i</i>	13.26011	–0.05787812	–0.16716361				
<i>P</i>	4.20	<i>H</i>	12.8	<i>G</i> 0.15	<i>U</i> 1				

Residuals in seconds of arc

1949 11 30	675	0.0	0.6–	1998 08 23	704	0.2+	0.5+	1998 12 09	704	0.2+	1.7–
1949 11 30	675	0.3+	0.3+	1998 08 23	704	0.8+	0.5+	1998 12 09	704	0.8–	0.2+
1986 11 03	010	(3.8+	4.6–)	1998 09 14	704	1.0–	0.3+	1999 10 19	704	0.3+	0.4+
1986 11 03	010	(3.6+	4.8–)	1998 09 14	704	0.9–	0.0	1999 10 19	704	0.9+	0.7–
1989 06 30	675	0.2+	0.9–	1998 09 14	704	0.9–	1.0–	1999 10 19	704	1.4+	0.7–
1989 06 30	675	0.7+	1.4–	1998 09 14	704	0.3–	0.9–	1999 10 19	704	1.1+	0.8–
1989 07 03	675	1.5–	1.0–	1998 09 14	704	0.7–	0.4–	1999 10 19	704	1.1+	1.1–
1989 07 03	675	0.4–	1.7–	1998 09 18	704	0.4+	0.8+	1999 10 31	703	0.3–	0.1–
1990 09 28	675	0.9–	0.0	1998 09 18	704	0.1–	0.6+	1999 10 31	703	0.0	0.3–
1998 08 04	699	0.1–	0.5–	1998 09 18	704	0.3+	1.5+	1999 10 31	703	0.7–	0.1–
1998 08 04	699	0.6+	0.3–	1998 09 18	704	0.5–	1.9+	1999 10 31	703	0.8–	0.3–
1998 08 04	699	1.0+	0.5–	1998 09 18	704	0.9–	0.9+	1999 11 05	704	0.4–	0.1–
1998 08 17	704	0.2–	0.4–	1998 09 21	699	0.4+	0.4–	1999 11 05	704	0.3–	0.0
1998 08 17	704	0.2+	0.1–	1998 09 21	699	0.1–	0.0	1999 11 05	704	0.5–	0.1+
1998 08 17	704	0.7+	0.0	1998 09 21	699	0.4+	0.0	1999 11 05	704	0.4–	0.5–
1998 08 17	704	1.0+	0.2+	1998 10 11	699	1.2+	0.2+	1999 11 05	704	0.5–	0.8–
1998 08 17	704	(2.3+	0.1+)	1998 10 11	699	0.3+	0.6+	1999 11 17	699	0.1–	0.1+
1998 08 23	704	0.2+	0.4–	1998 10 11	699	0.8+	0.1+	1999 11 17	699	0.1–	0.5–
1998 08 23	704	0.0	0.7+	1998 12 09	704	1.6–	0.1–	1999 11 17	699	0.1–	0.1+

(12551)* 1998 QQ₃₉ = 1978 EW₄ = 1979 PG = 1987 SN₂₁ = 1991 XV

Discovered 1998 Aug. 17 by the Lincoln Laboratory Near-Earth Asteroid

Research Team at Socorro.

Id. A. Gnädig (*MPC* 32975), G. V. Williams (*ibid.*)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i> 152.09130			(2000.0)			P		Q	
<i>n</i>	0.26137305	ω	257.15214	–0.07814826	+0.99684362				
<i>a</i>	2.4226769	Ω	8.40332	–0.87354189	–0.06170718				
<i>e</i>	0.0954254	<i>i</i>	5.49226	–0.48043461	–0.04995016				
<i>P</i>	3.77	<i>H</i>	13.1	<i>G</i> 0.15	<i>U</i> 2				

Residuals in seconds of arc

1953 12 07	675	0.9+	0.2–	1998 08 23	704	0.1–	0.1+	1998 11 24	699	0.3+	0.1–
1978 03 06	095	(2.9–	5.1+)	1998 08 23	704	1.9+	0.6+	1998 12 08	704	1.1–	1.9–
1979 08 14	808	0.4–	0.7–	1998 08 23	704	0.5–	0.1+	1998 12 08	704	(1.4–	2.9–)
1979 08 14	808	1.0+	0.4–	1998 08 23	704	0.4+	0.1+	1998 12 08	704	1.2+	1.0–
1983 10 01	413	0.8–	0.5–	1998 09 14	704	0.5–	0.0	1998 12 08	704	1.7+	0.4–
1983 10 01	413	0.7–	0.1+	1998 09 14	704	0.4–	0.0	1998 12 08	704	1.0+	1.3–
1987 09 18	095	0.5–	2.4+	1998 09 14	704	0.6–	1.9+	1998 12 09	699	0.5–	0.5+
1991 12 04	399	0.0	0.2+	1998 09 14	704	0.7–	0.6+	1998 12 09	699	0.0	0.4–
1991 12 04	399	1.4–	0.8+	1998 09 14	704	1.5–	0.7+	1998 12 09	699	0.5+	1.2+
1994 07 03	413	0.2+	1.4–	1998 09 18	704	0.4+	0.4–	1999 10 13	704	0.1–	0.4–
1994 07 03	413	0.6+	1.1–	1998 09 18	704	0.6+	0.3–	1999 10 13	704	0.1+	0.9–
1998 07 31	699	0.2–	0.5+	1998 09 18	704	0.2+	1.5+	1999 10 13	704	0.8+	0.2–
1998 07 31	699	0.0	0.4+	1998 09 18	704	(0.8–	2.1+)	1999 10 13	704	0.5–	0.7–
1998 07 31	699	0.1+	0.5+	1998 09 18	704	0.5–	0.1–	1999 10 13	704	0.8+	0.7–
1998 08 17	704	0.4+	0.7–	1998 11 09	910	0.2+	0.6–	1999 11 15	163	0.1+	0.3–
1998 08 17	704	0.0	0.5–	1998 11 09	910	0.2+	0.7–	1999 11 15	163	0.1–	0.0
1998 08 17	704	0.1+	0.2–	1998 11 09	910	0.3+	0.6–	1999 11 15	163	0.5–	0.9–
1998 08 17	704	0.8–	0.2–	1998 11 24	699	0.6+	0.7–	1999 11 16	163	0.2–	0.3+
1998 08 17	704	0.1–	0.8+	1998 11 24	699	0.6–	1.0–				

(12552)* 1998 QQ₄₅ = 1979 FQ₁ = 1987 SW₂₃

Discovered 1998 Aug. 17 by the

Residuals in seconds of arc

1979 03 23	095	0.9–	1.0–	1998 09 18	704	0.8+	0.4+	1998 10 23	725	0.2+	0.7–
1979 03 29	095	0.1–	0.5–	1998 09 18	704	0.1+	0.7+	1998 10 23	725	0.0	0.8–
1987 09 23	095	(0.2–	4.0–)	1998 09 18	704	0.9+	0.8+	1998 10 23	725	0.2+	0.8–
1997 08 01	566	0.5–	0.2+	1998 09 18	704	1.0–	0.5+	1998 12 09	704	1.9–	0.5–
1997 08 01	566	0.1+	0.0	1998 09 25	699	0.0	0.8+	1998 12 09	704	1.4+	0.2–
1997 08 01	566	0.2–	0.6+	1998 09 25	699	0.4–	0.4+	1998 12 09	704	0.6+	1.9–
1998 08 17	704	0.8+	0.3+	1998 09 25	699	0.2–	0.4+	1998 12 09	704	0.2–	0.6+
1998 08 17	704	0.2+	0.1–	1998 09 27	699	0.3+	0.2+	1998 12 09	704	(2.4–	2.6+)
1998 08 17	704	0.8+	0.4–	1998 09 27	699	0.2+	0.1–	1999 09 27	704	0.4+	1.0–
1998 08 17	704	0.0	0.2–	1998 09 27	699	0.8–	0.1+	1999 09 27	704	0.0	0.8–
1998 08 17	704	0.8–	0.1–	1998 10 11	699	0.1+	0.5+	1999 09 27	704	0.5–	1.0–
1998 08 23	704	1.4+	1.2–	1998 10 11	699	0.1+	0.4–	1999 09 27	704	0.2+	0.5–
1998 08 23	704	0.0	1.5+	1998 10 11	699	0.1–	0.1–	1999 10 16	704	0.1+	0.9+
1998 08 23	704	0.9–	0.4–	1998 10 12	704	1.3+	0.7–	1999 10 16	704	0.2+	0.6+
1998 08 23	704	1.6–	0.2+	1998 10 12	704	0.3–	0.5–	1999 10 16	704	0.0	0.8+
1998 08 23	704	(2.8–	0.8–)	1998 10 13	725	0.3–	0.5–	1999 10 16	704	0.1+	0.0
1998 09 14	704	0.2–	0.3–	1998 10 13	725	0.0	0.8–	1999 10 16	704	0.5–	0.4+
1998 09 14	704	0.7–	1.1+	1998 10 13	725	0.2–	0.7–	1999 11 01	704	1.0+	1.1+
1998 09 14	704	(2.1+	0.6+)	1998 10 13	725	0.2–	0.6–	1999 11 01	704	0.4–	0.5+
1998 09 14	704	0.9+	0.8+	1998 10 13	734	0.1–	0.9–	1999 11 01	704	0.2–	0.3+
1998 09 16	699	0.3+	0.6+	1998 10 13	734	0.2+	0.8–	1999 11 01	704	0.3–	0.3+
1998 09 16	699	0.5+	0.9+	1998 10 13	734	0.2+	0.6–	1999 11 01	704	0.2–	0.4+
1998 09 16	699	0.2+	0.5+	1998 10 13	725	0.3–	0.7–				
1998 09 18	704	0.4+	1.2+	1998 10 13	725	0.1–	0.6–				

(12553)* 1998 QZ₄₆ = 1987 DX = 1989 YV₅ = 1992 WU₉

Discovered 1998 Aug. 17 by the Lincoln Laboratory Near-Earth Asteroid Research Team at Socorro.

Id. G. V. Williams (*MPC* 32501)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

M	286.19925		(2000.0)		P	Q
n	0.30143470	ω	53.41976		-0.93241846	-0.35652021
a	2.2029631	Ω	105.62731		+0.30887369	-0.87107588
e	0.0571747	i	3.51652		+0.18759759	-0.33781674
P	3.27	H	14.3	G	0.15	U 2

Residuals in seconds of arc

1987 02 25	046	1.1+	1.6–	1998 08 23	704	0.3–	1.6–	1998 09 25	704	(2.6–	0.1+)
1987 02 25	046	0.7–	0.6–	1998 08 23	704	1.4–	0.1+	1998 09 27	704	1.6+	1.1–
1989 12 29	511	1.8–	1.1–	1998 08 30	699	1.2+	0.6+	1998 09 27	704	0.2+	1.1+
1989 12 29	511	1.0–	0.2–	1998 08 30	699	0.4+	1.1+	1998 09 27	704	0.4+	0.4–
1989 12 30	511	1.3–	0.1–	1998 08 30	699	0.8+	0.7–	1998 09 27	704	(1.5+	2.9–)
1989 12 30	511	1.4+	0.2+	1998 09 14	704	0.3–	0.9–	1999 10 10	704	0.0	0.0
1992 11 27	399	1.8+	1.1+	1998 09 14	704	0.4–	0.2+	1999 10 10	704	0.6–	0.4+
1992 11 27	399	(2.9+	0.7+)	1998 09 14	704	0.6+	1.0–	1999 10 10	704	0.2–	0.1+
1998 06 29	704	1.1–	0.7–	1998 09 14	704	0.5+	0.8–	1999 11 09	120	0.2–	0.1–
1998 06 29	704	0.6–	0.6–	1998 09 16	699	0.8+	1.5+	1999 11 09	120	0.0	0.4+
1998 06 29	704	0.7+	0.3–	1998 09 16	699	0.6+	0.8+	1999 11 16	704	0.9+	0.1–
1998 06 29	704	(3.4–	2.7–)	1998 09 16	699	0.4+	0.3+	1999 11 16	704	0.3+	0.2–
1998 08 17	704	0.4+	0.2–	1998 09 18	704	0.8–	0.7–	1999 11 16	704	0.4+	0.1–
1998 08 17	704	0.1–	0.3–	1998 09 18	704	0.6–	0.9–	1999 11 16	704	0.5–	0.3–
1998 08 17	704	0.2+	0.1+	1998 09 18	704	1.0–	0.2–	1999 11 16	704	0.3+	0.1+
1998 08 17	704	0.1–	0.0	1998 09 18	704	0.6–	0.3+	1999 11 16	704	0.6–	0.8+
1998 08 17	704	0.7+	0.6+	1998 09 18	704	0.4–	1.2+	1999 11 16	704	0.2+	0.5–
1998 08 23	704	0.6–	0.1–	1998 09 25	704	(2.8–	0.1–)	1999 11 16	704	0.3–	0.1–
1998 08 23	704	0.9–	0.6+	1998 09 25	704	(2.7–	0.0)	1999 11 16	704	0.2+	0.3–
1998 08 23	704	0.4+	1.4–	1998 09 25	704	0.7–	0.1+	1999 11 16	704	0.5+	0.9+

(12554)* 1998 QA₄₇ = 1987 SC₃ = 1992 OH₈ = 1993 TG₄₆

Discovered 1998 Aug. 17 by the Lincoln Laboratory Near-Earth Asteroid Research Team at Socorro.

Id. G. V. Williams (*MPC* 32711)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

M	97.69872		(2000.0)	P	Q
n	0.17555685	ω	172.46152	+0.39416164	+0.91396052
a	3.1588151	Ω	120.70775	−0.84895282	+0.40230823
e	0.1400230	i	6.44450	−0.35201664	+0.05314371
P	5.61	H	13.0	G 0.15	U 1

Residuals in seconds of arc

1987 09 21	071	0.2–	0.7–	1997 08 01	566	0.3+	0.5+	1998 09 18	704	0.3+	1.1–
1987 09 21	071	1.4+	2.2–	1997 08 01	566	0.6–	0.6+	1998 09 18	704	0.8+	0.2–
1987 09 22	071	(7.4–	1.7+)	1998 08 17	704	(0.2+	2.3+)	1998 09 18	704	1.1–	0.1–
1987 09 23	071	(6.3–	0.0)	1998 08 17	704	(0.2–	2.6+)	1999 10 20	704	0.4–	0.5+
1987 09 23	071	(6.6–	1.0+)	1998 08 17	704	(0.1–	2.5+)	1999 10 20	704	0.6+	0.5–
1987 09 23	071	(4.7–	4.0–)	1998 08 17	704	1.7+	1.4+	1999 10 20	704	0.8–	0.2+
1987 09 24	095	(4.6–	4.7–)	1998 08 21	566	0.9–	0.3+	1999 10 20	704	0.6+	0.8–
1987 09 24	071	(8.0–	1.1–)	1998 08 21	566	1.4–	0.6+	1999 10 20	704	0.2–	0.6–
1987 09 25	071	(7.0–	1.3–)	1998 08 21	566	0.7–	0.3+	1999 11 04	704	0.0	0.1–
1987 09 27	095	1.2–	1.3–	1998 08 23	704	0.3–	0.7+	1999 11 04	704	0.2+	0.4–
1992 07 22	809	0.2–	0.5–	1998 08 23	704	1.5–	0.8+	1999 11 04	704	0.2+	0.6–
1992 07 22	809	0.1+	0.4–	1998 08 23	704	1.8–	0.5+	1999 11 04	704	0.3+	0.8–
1992 07 22	809	0.2+	0.4–	1998 08 23	704	0.4–	0.3–	1999 11 04	704	0.1–	0.5–
1992 07 23	809	0.2+	0.5–	1998 08 23	704	1.4–	0.3+	1999 11 12	699	0.1+	0.1–
1992 07 23	809	0.4+	0.4–	1998 09 14	704	0.7+	0.1+	1999 11 12	699	0.0	0.0
1992 07 23	809	1.0+	0.5–	1998 09 14	704	0.3+	0.4+	1999 11 12	699	0.0	0.4+
1993 10 10	809	(0.7+	2.6+)	1998 09 14	704	1.3+	0.2+	1999 11 17	704	0.6–	0.0
1993 10 10	809	(0.2+	2.7+)	1998 09 14	704	0.3+	0.4+	1999 11 17	704	0.1–	0.2+
1993 10 10	809	(0.8+	2.6+)	1998 09 16	699	(2.7+	0.3–)	1999 11 17	704	0.3+	0.1+
1993 10 20	809	0.3+	1.1+	1998 09 16	699	0.3+	0.3+	1999 11 17	704	0.2–	0.3+
1993 10 20	809	0.4+	1.3+	1998 09 16	699	0.5+	0.3–	1999 11 17	704	0.0	0.4+
1993 10 20	809	0.1–	1.0+	1998 09 18	704	0.5+	0.2–				
1997 08 01	566	0.1–	0.3+	1998 09 18	704	0.9+	0.0				

(12555)* 1998 QP₄₇ = 1974 VB₂ = 1978 OG = 1991 ES₂

Discovered 1998 Aug. 17 by the Lincoln Laboratory Near-Earth Asteroid Research Team at Socorro.

Id. G. V. Williams (*MPC* 32501)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

M	62.07182		(2000.0)	P	Q
n	0.20066897	ω	202.59537	+0.99052276	+0.13545152
a	2.8894548	Ω	149.59259	−0.11814548	+0.92473531
e	0.0830823	i	2.57612	−0.07004500	+0.35569298
P	4.91	H	12.6	G 0.15	U 1

Residuals in seconds of arc

1974 11 15	095	0.9+	1.4+	1998 08 23	704	0.4–	0.6+	1998 09 27	704	0.0	0.3–
1974 11 17	095	(0.4+	5.5–)	1998 08 23	704	0.3–	1.1+	1998 09 29	327	1.3–	0.5–
1978 07 30	414	2.1–	0.2+	1998 08 30	699	0.1+	0.5+	1998 09 29	327	1.2–	0.5–
1978 07 30	414	0.1+	0.2+	1998 08 30	699	0.2–	0.1+	1998 09 29	327	1.1–	0.5–
1991 03 11	809	0.1–	0.8+	1998 08 30	699	0.4–	0.3+	1998 11 23	699	0.3–	0.1+
1991 03 11	809	0.3+	0.9+	1998 09 14	704	0.3+	0.0	1998 11 23	699	0.4–	0.2–
1991 03 11	809	0.6+	1.3+	1998 09 14	704	1.1–	0.6–	1998 11 23	699	0.2+	0.4–
1991 03 13	809	0.8+	0.4+	1998 09 14	704	0.1–	0.3–	1998 12 08	704	0.3+	0.1–
1991 03 13	809	0.7+	0.5+	1998 09 14	704	0.2–	1.2–	1998 12 08	704	0.4+	0.3–
1991 03 13	809	1.3+	0.5+	1998 09 18	699	0.5+	0.4–	1998 12 08	704	1.4–	1.1+
1992 05 02	809	1.1+	0.4+	1998 09 18	699	0.3+	0.3–	1998 12 08	704	0.8–	0.0
1992 05 02	809	1.0–	1.1+	1998 09 18	704	0.1–	0.6+	1998 12 08	704	0.2+	1.3–
1992 05 02	809	0.3–	0.3–	1998 09 18	699	0.6+	0.0	1999 10 12	704	0.7–	0.3+
1998 06 29	704	0.5–	0.1–	1998 09 18	704	0.3+	0.3+	1999 10 12	704	0.1–	0.3–
1998 06 29	704	0.2+	0.4+	1998 09 18	704	1.0–	1.4+	1999 10 12	704	0.5–	0.3–
1998 06 29	704	(1.7–	2.9+)	1998 09 18	704	1.2+	0.3+	1999 10 12	704	0.4–	0.3–
1998 06 29	704	0.4–	1.0+	1998 09 18	704	0.1–	1.8+	1999 10 12	704	0.7–	0.5–
1998 06 29	704	0.3+	1.0–	1998 09 25	704	0.8+	0.5–	1999 10 22	704	0.5–	0.5+
1998 08 17	704	0.2+	0.6+	1998 09 25	704	0.4–	0.4–	1999 10 22	704	0.1–	0.2+
1998 08 17	704	0.6+	0.5+	1998 09 25	704	0.8–	0.9+	1999 10 22	704	0.8+	0.5–
1998 08 17	704	1.0+	0.3+	1998 09 25	704	1.2–	0.0	1999 10 22	704	0.6+	0.0

1998 08 17	704	0.8+	0.0	1998 09 25	704	0.9-	0.3+	1999 11 17	704	0.2-	0.1+
1998 08 17	704	0.2+	0.7+	1998 09 27	704	0.7+	0.6-	1999 11 17	704	0.4-	0.0
1998 08 23	704	0.1-	0.3+	1998 09 27	704	0.8+	0.7-	1999 11 17	704	0.4-	0.1-
1998 08 23	704	0.6+	1.9+	1998 09 27	704	1.5+	0.6-	1999 11 17	704	0.2-	1.0+
1998 08 23	704	0.8+	0.1+	1998 09 27	704	1.4+	0.3-	1999 11 17	704	0.5-	0.8+

(12556)* 1998 QG₄₈ = 1984 YZ₅ = 1989 EV₄ = 1993 FR₂₄ = 1997 JW₆
= 1997 JE₁₆

Discovered 1998 Aug. 17 by the Lincoln Laboratory Near-Earth Asteroid Research Team at Socorro.

Id. G. V. Williams (*MPC* 32712)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

			Williams		
<i>M</i>	337.52160	(2000.0)	P	Q	
<i>n</i>	0.26823093	ω	267.88655	-0.31571144	-0.94802758
<i>a</i>	2.3812052	Ω	200.65200	+0.90910035	-0.29025915
<i>e</i>	0.0627762	<i>i</i>	6.45052	+0.27177719	-0.13035846
<i>P</i>	3.67	<i>H</i>	14.3	<i>G</i>	0.15
				<i>U</i>	1

Residuals in seconds of arc

1984 12 22	033	0.4-	1.3+	1997 05 04	809	(0.2-	2.3-)	1998 09 14	704	0.1+	0.5+
1984 12 22	033	1.0-	0.4+	1997 05 05	691	0.4-	0.0	1998 09 14	704	0.9-	0.6+
1989 03 02	809	0.1-	0.8-	1997 05 05	691	0.4-	0.2-	1998 09 14	704	0.7-	0.5+
1989 03 02	809	0.2-	0.7-	1997 05 09	691	0.6-	0.0	1998 09 14	704	1.1-	0.0
1989 03 02	809	0.5-	0.7-	1997 05 09	691	0.6-	0.5+	1998 09 18	704	0.1-	0.0
1989 03 03	809	1.0+	0.1-	1997 05 09	691	1.9-	0.1-	1998 09 18	704	0.2-	0.9+
1989 03 03	809	0.7+	0.2+	1998 08 17	704	1.0+	0.3-	1998 09 18	704	1.1-	0.8+
1989 03 03	809	1.0+	0.0	1998 08 17	704	1.1+	0.7-	1998 09 18	704	0.5-	0.1+
1993 03 21	809	0.3+	1.1+	1998 08 17	704	1.1+	1.2-	1998 09 18	704	0.8+	1.4+
1993 03 22	809	0.6+	0.9+	1998 08 17	704	0.5+	0.6-	1999 10 20	704	1.3-	0.1-
1993 03 26	809	0.2-	0.3+	1998 08 17	704	0.1+	0.2-	1999 10 20	704	0.3-	0.3-
1997 05 03	809	1.6+	1.5+	1998 08 23	704	0.8+	1.2-	1999 10 20	704	0.0	0.1-
1997 05 03	809	(3.2+	1.6+)	1998 08 23	704	1.0-	0.7+	1999 11 17	704	0.6-	1.4+
1997 05 03	809	1.9+	0.3-	1998 08 23	704	(2.1+	0.2-)	1999 11 17	704	0.4+	0.2+
1997 05 04	809	0.5+	0.6+	1998 08 23	704	(0.9+	2.2-)	1999 11 17	704	0.2+	0.3+
1997 05 04	809	0.1-	0.4+	1998 08 23	704	0.0	1.1+	1999 11 17	704	0.3+	0.5+
1997 05 04	809	0.7+	0.5+	1998 08 30	699	0.0	0.2+	1999 11 17	704	0.6+	0.2+
1997 05 04	809	1.5-	0.6-	1998 08 30	699	0.1+	0.2-				
1997 05 04	809	(0.6-	2.2-)	1998 08 30	699	0.3+	0.6+				

(12557)* 1998 QQ₅₄ = 1996 FL₁₇

Discovered 1998 Aug. 27 by the Lowell Observatory Near-Earth Object Search at the Anderson Mesa Station.

Id. G. V. Williams (*MPC* 32976)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

			Williams		
<i>M</i>	3.88632	(2000.0)	P	Q	
<i>n</i>	0.17564848	ω	190.59820	+0.51590969	-0.85433038
<i>a</i>	3.1577164	Ω	228.37613	+0.79198257	+0.50366736
<i>e</i>	0.0095459	<i>i</i>	4.82709	+0.32649778	+0.12821388
<i>P</i>	5.61	<i>H</i>	12.7	<i>G</i>	0.15
				<i>U</i>	1

Residuals in seconds of arc

1993 12 15	691	0.3-	0.1+	1998 09 18	704	0.3-	1.0-	1998 10 14	699	0.1-	0.1+
1993 12 15	691	0.2-	0.2+	1998 09 18	704	0.8-	0.7-	1998 10 14	699	0.1+	0.4+
1993 12 15	691	0.3+	0.4+	1998 09 18	704	0.6-	0.6-	1998 10 15	704	0.0	0.6-
1996 03 22	809	0.1-	0.4+	1998 09 18	704	0.2+	0.8-	1998 10 15	704	0.5+	0.4-
1996 03 22	809	0.4-	0.1-	1998 09 18	704	0.1-	0.1-	1998 10 15	704	0.3-	0.0
1996 03 22	809	0.1-	0.2-	1998 09 26	704	0.4+	0.3-	1998 10 15	704	0.5+	0.1+
1996 03 26	809	1.6+	0.1+	1998 09 26	704	0.2+	0.3+	1998 10 15	704	0.3+	0.8-
1996 03 26	809	0.3+	0.9+	1998 09 26	704	0.2+	0.2-	1999 10 12	704	0.1-	0.1-
1996 03 26	809	0.6+	0.3+	1998 09 26	704	0.1+	0.4-	1999 10 12	704	0.3+	0.7+
1996 05 15	566	0.6-	0.1-	1998 09 26	704	0.4+	0.2-	1999 10 12	704	0.6-	0.1-
1996 05 15	566	0.1-	0.9+	1998 09 27	704	0.5-	0.6+	1999 10 12	704	0.4+	1.3-
1996 05 15	566	0.5-	0.3+	1998 09 27	704	0.7-	0.3+	1999 11 15	704	0.1+	0.2+
1998 08 27	699	0.3+	1.2+	1998 09 27	704	0.3-	0.8+	1999 11 15	704	0.1+	0.2+

1998 08 27	699	0.8+	0.9+	1998 09 27	704	0.5-	1.0+	1999 11 15	704	0.0	0.0
1998 08 27	699	0.6+	0.7+	1998 09 27	704	1.0-	1.4+	1999 11 15	704	0.1-	0.3+
1998 08 28	699	0.0	0.5+	1998 10 14	704	0.3-	1.1-	1999 11 15	704	0.2+	0.3+
1998 08 28	699	0.5+	0.0	1998 10 14	704	1.6+	0.6-	1999 11 17	704	0.1-	0.2+
1998 08 28	699	0.2+	0.4+	1998 10 14	704	0.5-	0.0	1999 11 17	704	0.2-	0.2-
1998 09 14	704	0.7+	0.3-	1998 10 14	704	0.7-	0.3+	1999 11 17	704	0.2+	0.2+
1998 09 14	704	0.4+	0.4+	1998 10 14	704	0.5-	0.3-	1999 11 17	704	0.1+	0.2+
1998 09 14	704	0.6-	0.7+	1998 10 14	699	0.4-	0.1+	1999 11 17	704	0.4-	0.0

(12558)* 1998 QV₆₃ = 1979 SJ₈ = 1984 UK₄ = 1993 PY₆

Discovered 1998 Aug. 31 by the Beijing Schmidt CCD Asteroid Program at Xinglong.

Id. G. V. Williams (*MPC* 32718)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

			Williams		
<i>M</i>	59.24517	(2000.0)	P	Q	
<i>n</i>	0.20889606	ω	200.62088	+0.93020160	-0.36704710
<i>a</i>	2.8130830	Ω	180.91529	+0.34632734	+0.87875553
<i>e</i>	0.1096381	<i>i</i>	4.26817	+0.12158273	+0.30506579
<i>P</i>	4.72	<i>H</i>	13.3	<i>G</i>	0.15
				<i>U</i>	1

Residuals in seconds of arc

1979 09 24	095	2.0+	1.7-	1998 09 23	327	0.3-	0.2+	1998 10 28	704	0.3+	0.5-
1984 10 20	095	1.0-	2.2-	1998 09 23	327	1.1-	0.2-	1998 10 29	704	0.3+	0.5-
1993 08 13	675	0.0	0.6-	1998 09 23	327	1.1-	0.2-	1998 10 29	704	0.3+	0.2-
1993 08 13	675	0.4+	0.1-	1998 09 23	327	0.9-	0.1-	1998 10 29	704	0.9+	0.6+
1993 08 15	010	0.4-	1.6+	1998 09 26	704	0.1-	1.0+	1998 10 29	704	0.2-	0.4-
1993 08 15	010	(0.7-	2.8+)	1998 09 26	704	0.7+	0.9+	1998 10 29	704	0.0	0.1-
1993 08 15	010	0.5-	1.6+	1998 09 26	704	0.1-	1.7+	1998 11 11	699	0.7-	0.3-
1993 08 17	010	0.8-	1.3+	1998 09 26	704	0.6-	1.2+	1998 11 11	699	0.5-	0.3-
1993 08 17	010	0.2-	1.8+	1998 09 26	704	0.6+	0.6+	1998 11 11	699	0.4-	0.1+
1993 08 19	010	0.3-	0.8-	1998 09 27	691	0.2+	0.3-	1998 12 08	699	1.3-	0.3-
1993 08 19	010	0.1-	0.3-	1998 09 27	691	0.2-	0.3+	1998 12 08	699	0.6-	0.4-
1993 08 19	010	0.2-	0.2-	1998 09 27	704	0.2-	1.1+	1998 12 08	699	0.2-	0.3-
1998 08 27	327	0.2-	0.1+	1998 09 27	704	0.7+	0.3-	1998 12 15	699	0.8-	0.6+
1998 08 27	327	0.2-	0.2+	1998 09 27	691	0.4+	0.3-	1998 12 15	699	0.0	1.2-
1998 08 27	327	0.2-	0.3+	1998 09 27	704	0.1-	1.6+	1998 12 15	699	0.2+	0.4-
1998 08 31	327	0.1-	0.0	1998 09 27	704	1.0+	0.4+	1999 01 11	704	0.0	0.9+
1998 08 31	327	0.3-	0.2+	1998 09 27	704	0.9-	0.7+	1999 01 11	704	0.5+	1.3+
1998 08 31	327	0.1-	0.1+	1998 10 10	699	0.5-	0.0	1999 01 11	704	1.3+	1.2+
1998 09 04	327	0.2-	0.5+	1998 10 10	699	0.3-	0.1+	1999 10 10	704	0.8+	0.7+
1998 09 04	327	0.3-	0.2-	1998 10 10	699	0.3-	0.1+	1999 10 10	704	0.0	0.8+
1998 09 04	327	0.6-	0.4-	1998 10 14	704	0.1+	1.2-	1999 10 10	704	0.1+	0.2+
1998 09 15	699	0.0	0.3-	1998 10 14	704	0.6-	0.6-	1999 10 10	704	1.1-	0.3+
1998 09 15	699	0.3+	0.2+	1998 10 14	704	0.0	0.0	1999 10 20	704	0.8+	1.0+
1998 09 15	699	0.1+	0.4+	1998 10 14	704	0.2+	0.6-	1999 10 20	704	0.1+	0.0
1998 09 17	327	1.5+	0.4+	1998 10 14	704	0.4+	1.4-	1999 10 20	704	0.5-	0.4-
1998 09 17	327	1.5+	0.4+	1998 10 19	699	0.1-	0.4-	1999 10 20	704	0.2-	0.2-
1998 09 17	327	1.7+	0.3+	1998 10 19	699	0.1+	0.4-	1999 11 17	704	0.2+	0.6+
1998 09 23	691	0.0	0.7-	1998 10 19	699	0.2-	0.1+	1999 11 17	704	0.7+	0.4+
1998 09 23	691	0.2-	0.4-	1998 10 28	704	0.6+	0.6+	1999 11 17	704	0.4+	0.3+
1998 09 23	691	0.0	0.7-	1998 10 28	704	0.5+	1.1-	1999 11 17	704	0.1+	0.9+
1998 09 23	327	0.0	0.1-	1998 10 28	704	0.2+	0.9-	1999 11 17	704	0.3-	0.6+
1998 09 23	327	0.1-	0.1-	1998 10 28	704	0.3+	0.7-				

(12559)* 1998 QB₆₉ = 1967 EM = 1969 OA₁ = 1988 XS₁

Discovered 1998 Aug. 24 by the Lincoln Laboratory Near-Earth Asteroid Research Team at Socorro.

Id. S. Nakano (*MPC* 32978)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Residuals in seconds of arc

1967 03 09	095	(2.4– 5.4–)	1998 08 24	704	1.4– 1.3+	1999 10 15	704	0.6+ 0.2–
1967 03 11	095	1.0+ 0.7–	1998 08 27	704	0.1– 0.1+	1999 10 15	704	0.8+ 0.1–
1969 07 17	095	1.3+ 1.4–	1998 08 27	704	0.1+ 0.5+	1999 10 15	704	0.3+ 0.5–
1988 12 10	897	2.0– 0.1+	1998 08 27	704	0.1– 0.9+	1999 10 15	704	0.5+ 0.3–
1988 12 10	897	0.8– 0.4–	1998 08 27	704	0.4– 0.8+	1999 10 18	744	0.2+ 0.3–
1988 12 17	897	1.5– 1.6+	1998 08 27	704	0.3– 0.3–	1999 10 18	744	1.1– 0.3–
1988 12 17	897	0.6+ 0.7+	1998 09 01	327	0.0 0.1–	1999 10 18	744	0.4– 0.4–
1992 07 05	675	1.1– 0.6–	1998 09 01	327	0.1– 0.1+	1999 11 01	704	0.5+ 0.1–
1992 07 05	675	0.7– 0.7–	1998 09 01	327	0.2– 0.1+	1999 11 01	704	0.6+ 0.2–
1998 08 02	699	1.5– 0.2+	1998 09 01	327	0.1– 0.2+	1999 11 01	704	0.8+ 0.3–
1998 08 02	699	0.5+ 0.6–	1998 09 01	327	0.1– 0.0	1999 11 01	704	0.9+ 0.4–
1998 08 02	699	0.1– 0.1–	1998 09 01	327	0.2– 0.0	1999 11 01	704	0.9+ 0.2–
1998 08 24	704	0.5+ 0.1+	1998 09 22	327	0.0 0.2–	1999 11 14	699	0.3– 0.6+
1998 08 24	704	0.5– 0.4+	1998 09 22	327	0.8+ 0.3+	1999 11 14	699	0.1– 0.7+
1998 08 24	704	0.6– 0.3–	1998 09 22	327	0.8+ 0.1+	1999 11 14	699	0.2+ 0.4+
1998 08 24	704	1.4+ 0.4–	1998 09 22	327	0.0 0.6–			

(12560)* 1998 RC₅₈ = 1982 VC₄ = 1996 EV₃

Discovered 1998 Sept. 14 by the Lincoln Laboratory Near-Earth Asteroid Research Team at Socorro.

Id. G. V. Williams (*MPC* 32999)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

M	148.41909		(2000.0)	$\mathbf{P}$	$\mathbf{Q}$
n	0.17607913	ω	115.21012	-0.26455711	+0.96417024
a	3.1525656	Ω	139.43331	-0.89529971	-0.23799384
e	0.1211096	i	1.72958	-0.35839639	-0.11719504
P	5.60	H	13.1	G 0.15	U 1

Residuals in seconds of arc

1982 11 14	381	0.5– 0.1+	1998 09 16	699	0.4+ 0.1+	1998 10 22	910	0.2– 0.2–
1982 11 14	381	0.9+ 1.0+	1998 09 16	699	0.9+ 0.1+	1999 10 22	704	0.4– 0.1+
1982 12 13	381	0.6– 0.8–	1998 09 18	704	1.5+ 0.2–	1999 10 22	704	0.6– 0.4–
1982 12 13	381	0.5+ 0.6+	1998 09 18	704	1.1+ 0.1–	1999 10 22	704	0.5– 0.0
1982 12 14	381	0.8– 0.1+	1998 09 18	704	1.3+ 0.5–	1999 10 22	704	1.0+ 0.7+
1982 12 14	381	0.0 0.6+	1998 09 18	704	1.0+ 0.6–	1999 10 22	704	0.3– 0.1+
1996 03 11	691	0.2– 0.0	1998 09 18	704	1.8+ 0.3+	1999 10 30	703	0.1– 0.1+
1996 03 11	691	0.1– 0.2+	1998 09 26	704	0.7+ 0.8–	1999 10 30	703	0.8– 0.0
1996 03 11	691	0.1– 0.3+	1998 09 26	704	0.5– 0.2–	1999 10 30	703	0.1+ 0.3+
1996 03 18	691	0.4– 0.2+	1998 09 26	704	0.8– 0.3–	1999 10 30	703	1.3– 0.4+
1996 03 18	691	0.4– 0.2–	1998 09 26	704	0.2– 0.4+	1999 11 03	704	0.0 0.3+
1996 03 18	691	0.5– 0.0	1998 09 26	704	1.2– 0.6+	1999 11 03	704	0.7+ 0.6+
1996 03 19	566	0.5+ 0.5–	1998 09 27	704	0.0 0.4–	1999 11 03	704	0.8+ 0.5–
1996 03 19	566	0.3+ 0.3–	1998 09 27	704	0.4+ 0.4–	1999 11 03	704	0.7– 0.6+
1996 03 19	566	0.4+ 0.2–	1998 09 27	704	0.3– 0.5+	1999 11 03	704	0.2+ 1.1+
1996 04 19	566	0.3– 0.4–	1998 09 27	704	0.5+ 0.8–	1999 11 15	704	0.2– 0.5–
1996 04 19	566	0.6– 1.1–	1998 09 27	704	1.1– 0.7–	1999 11 15	704	0.0 0.6–
1996 04 19	566	0.7– 0.7–	1998 10 14	910	0.4– 0.3–	1999 11 15	704	0.4+ 0.1–
1996 04 19	566	0.6– 0.4–	1998 10 14	910	0.5– 0.4–	1999 11 15	704	0.1– 0.4–
1996 04 19	566	0.9– 0.8–	1998 10 14	910	0.4– 0.3–	1999 11 15	704	0.1+ 0.3–
1996 04 19	566	1.7+ 1.0–	1998 10 18	910	0.5– 0.2–	1999 11 17	704	0.5– 0.2–
1998 09 14	704	0.1– 0.4–	1998 10 18	910	0.5– 0.1–	1999 11 17	704	0.3+ 0.4–
1998 09 14	704	0.2+ 0.1–	1998 10 18	910	0.3– 0.2–	1999 11 17	704	0.4+ 0.5–
1998 09 14	704	1.3– 0.5+	1998 10 22	910	0.4– 0.1–	1999 11 17	704	0.9+ 0.4–
1998 09 16	699	0.9+ 0.0	1998 10 22	910	0.5– 0.1–	1999 11 17	704	0.8+ 0.9–

(12561)* 1998 SX₇ = 1990 DT₇ = 1991 MB

Discovered 1998 Sept. 20 by Spacewatch at Kitt Peak.

Id. A. Gnädig (*MPC* 33277)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

M	211.98363		(2000.0)	$\mathbf{P}$	$\mathbf{Q}$
n	0.17925196	ω	153.83341	-0.95567034	$+0.29429420$
a	3.1152538	Ω	43.28515	-0.27244800	-0.87197689
e	0.1283902	i	0.77106	-0.11165257	-0.39121252
P	5.50	H	12.5	G 0.15	U 1

Residuals in seconds of arc

1990 02 18	399	1.6+ 0.9+	1998 09 20	691	0.0 0.1+	1999 11 03	704	1.0– 0.4–
1990 02 18	399	0.9+ 1.0+	1998 09 20	691	0.2– 0.1+	1999 11 03	704	0.3– 0.4+
1990 02 18	399	1.5– 1.5–	1998 09 21	691	0.0 0.1+	1999 11 03	704	0.5– 0.3+
1991 06 29	809	0.3+ 0.9–	1998 09 21	691	0.2– 0.0	1999 11 03	704	0.3– 0.3+
1991 06 29	809	1.3+ 0.9–	1998 09 21	691	0.2– 0.3+	1999 11 03	704	0.3– 0.2+
1991 06 30	809	(2.1+ 0.9–)	1998 09 23	691	0.3– 0.3+	1999 11 04	703	0.3– 0.3+
1991 07 01	809	0.7– 1.1+	1998 09 23	691	0.6– 0.4+	1999 11 04	703	0.6– 0.3+
1991 07 01	809	0.8– 1.3+	1998 09 23	691	0.5– 0.0	1999 11 04	703	0.5+ 0.7–
1991 07 02	809	0.7– 1.5+	1998 09 26	704	0.3– 0.1+	1999 11 04	703	0.0 0.7+
1991 07 04	809	0.7– 1.4+	1998 09 26	704	1.4– 0.3+	1999 11 09	704	0.5– 0.1+
1991 07 04	809	0.8– 1.6+	1998 09 26	704	1.5– 0.6+	1999 11 09	704	0.2– 0.1+
1991 07 04	809	0.7– 1.7+	1998 09 26	704	1.1– 1.2+	1999 11 09	704	0.1– 0.5+
1991 07 05	809	0.1+ 0.6+	1998 09 26	704	0.9– 1.0+	1999 11 09	704	0.5– 0.2+
1991 07 05	809	0.6+ 0.8+	1998 09 27	704	0.2+ 0.2–	1999 11 09	704	0.7– 0.2–
1991 07 05	809	0.8+ 0.9+	1998 09 27	704	0.5– 1.1+	1999 11 10	732	0.5– 1.5+
1992 08 02	675	1.5+ 0.6–	1998 09 27	704	0.2+ 0.2–	1999 11 10	732	0.9– 1.1+
1992 08 02	675	1.4+ 1.6–	1998 09 27	704	0.9+ 0.8–	1999 11 10	732	0.9– 1.6+
1996 03 19	566	0.1– 0.6+	1998 09 27	704	0.2+ 0.6–	1999 11 12	704	0.3– 0.2+
1996 03 19	566	0.2– 0.8+	1998 09 30	691	0.3+ 0.3–	1999 11 12	704	0.1+ 0.0
1996 03 19	566	0.1– 0.8+	1998 09 30	691	0.4+ 0.2+	1999 11 12	704	0.1+ 0.0
1996 04 08	327	(8.4– 4.3+)	1998 09 30	691	0.5+ 0.1–	1999 11 12	704	0.2+ 0.2+
1996 04 08	327	(9.1– 3.8+)	1998 10 12	910	1.1+ 0.6+	1999 11 12	704	0.2– 0.4+
1996 04 19	566	0.3+ 0.5–	1998 10 12	910	1.0+ 0.7+	1999 11 14	732	0.1+ 1.2+
1996 04 19	566	0.4+ 0.4–	1998 10 12	910	1.1+ 0.7+	1999 11 14	732	0.2+ 0.4+
1996 04 19	566	0.5+ 0.6–	1999 10 12	704	1.3+ 0.0	1999 11 14	732	0.1+ 1.2+
1996 04 20	566	0.6+ 0.3–	1999 10 12	704	0.3+ 0.2–	1999 11 15	732	0.2+ 0.6+
1996 04 20	566	0.2+ 1.0–	1999 10 12	704	0.2+ 0.2–	1999 11 15	732	0.5+ 0.8+
1996 04 20	566	0.1– 1.0–	1999 10 12	704	0.2+ 1.4–	1999 11 15	732	0.7– 1.1+
1998 08 26	691	0.6+ 0.5–	1999 10 12	704	0.2– 0.3–	1999 11 16	704	0.1– 0.1–
1998 08 26	691	0.3+ 0.6–	1999 10 22	704	0.5+ 1.2–	1999 11 16	704	0.1+ 0.3–
1998 08 26	691	0.2+ 0.5–	1999 10 22	704	0.2+ 1.2–	1999 11 16	704	0.1+ 0.0
1998 09 17	699	0.5+ 0.1–	1999 10 22	704	0.5+ 1.2–	1999 11 16	704	0.1+ 0.3–
1998 09 17	699	0.7+ 0.7–	1999 10 22	704	0.2+ 1.1–	1999 11 16	704	0.2– 0.1–
1998 09 17	699	0.2– 0.5–	1999 10 22	704	0.3– 0.5–			

(12562)* 1998 SP₃₆ = 1973 FQ = 1984 DO₁ = 1987 SO₁₅ = 1987 SV₂₅ = 1990 FA₂

Discovered 1998 Sept. 19 by Spacewatch at Kitt Peak.

Id. G. V. Williams (*MPC* 33023)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

M	203.32360		(2000.0)	$\mathbf{P}$	$\mathbf{Q}$		
n	0.17519080	ω	205.47102	-0.77857028	$+0.62547083$		
a	3.1632137	Ω	13.61922	-0.53221406	-0.61491420		
e	0.0911628	i	12.54194	-0.33253048	-0.48027781		
P	5.63	H	11.8	G	0.15	U	1

Residuals in seconds of arc

1973 03 26	095	1.2+ 1.7+	1998 09 19	691	0.1+ 0.2–	1998 10 28	704	0.6+ 0.4–
1984 02 26	095	(3.2+ 1.2–)	1998 09 19	691	0.1+ 0.4–	1998 10 28	704	1.0+ 0.9–
1987 09 24	095	0.0 0.9+	1998 09 19	691	0.0 0.3–	1998 10 28	704	0.3+ 0.4–
1987 09 25	095	1.9– 2.1+	1998 09 26	704	0.1– 0.5+	1998 10 29	704	2.0– 1.6+
1990 03 16	046	0.9– 0.4–	1998 09 26	704	1.0– 0.3+	1998 10 29	704	(2.4– 1.4+)
1990 03 16	046	1.7– 0.2+	1998 09 26	704	0.4– 0.1–	1998 10 29	704	(2.3– 2.1+)
1990 03 17	046	0.7– 0.9–	1998 09 26	704	0.5– 0.3+	1998 10 29	704	(2.2– 1.8+)
1990 03 17	046	(2.1– 1.5–)	1998 09 26	704	0.8– 1.2+	1998 10 29	704	(2.0– 2.6+)
1990 03 17	046	0.3+ 0.4–	1998 09 27	704	0.5+ 0.0	1998 12 24	699	0.5– 1.1+
1990 03 17	046	0.2+ 1.1–	1998 09 27	704	0.1+ 0.7–	1998 12 24	699	0.4+ 0.6+

1990 03 18	046	1.3-	0.4+	1998 09 27	704	0.3+	0.3-	1998 12 24	699	0.5+	0.4+
1990 03 18	046	0.5-	0.5+	1998 09 27	691	0.9-	0.2-	1999 09 27	704	0.4-	0.1-
1990 03 18	046	0.4+	0.3+	1998 09 27	704	0.2+	1.0-	1999 09 27	704	0.4-	0.4+
1990 03 18	046	1.6+	0.6-	1998 09 27	691	1.2-	0.2-	1999 09 27	704	0.3+	0.4-
1990 03 19	046	0.1+	0.2+	1998 09 27	704	0.9+	0.1-	1999 09 27	704	0.3-	0.1-
1990 03 19	046	1.7+	0.4+	1998 09 27	691	1.0-	0.3-	1999 09 27	704	1.4+	0.8-
1998 08 28	704	(3.1+	0.2+)	1998 10 14	704	0.4+	0.1-	1999 10 14	704	0.6+	0.3-
1998 08 28	704	0.3+	0.6-	1998 10 14	704	1.2+	0.9+	1999 10 14	704	0.3+	0.1+
1998 08 28	704	0.4+	0.5-	1998 10 14	704	1.2-	0.0	1999 10 14	704	0.1-	0.2-
1998 08 28	704	(0.6+	2.2-)	1998 10 14	704	0.7+	0.1+	1999 10 14	704	0.3-	0.4+
1998 08 28	704	(2.5-	3.0-)	1998 10 14	704	0.1-	0.8-	1999 10 15	704	0.2+	0.0
1998 09 13	691	0.6+	0.5-	1998 10 14	699	0.1-	0.0	1999 10 15	704	0.1-	0.0
1998 09 13	691	0.4+	0.4-	1998 10 14	699	0.0	0.1+	1999 10 15	704	0.1+	0.1-
1998 09 13	691	0.7+	0.1-	1998 10 14	699	0.0	0.0	1999 10 15	704	0.1-	0.2-
1998 09 14	704	0.2+	0.4+	1998 10 15	704	0.7+	0.5-	1999 10 15	704	0.2+	0.2+
1998 09 14	704	0.4-	0.1-	1998 10 15	704	0.1+	0.0	1999 11 01	704	0.4-	0.2+
1998 09 18	704	0.1-	0.6+	1998 10 15	704	0.5+	1.0-	1999 11 01	704	0.6+	0.4+
1998 09 18	704	0.3-	0.6+	1998 10 15	704	0.8+	0.1-	1999 11 01	704	0.3-	0.1+
1998 09 18	704	0.5+	0.7+	1998 10 15	704	0.3-	0.2-	1999 11 01	704	0.4-	0.2-
1998 09 18	704	0.2-	0.1+	1998 10 28	704	0.5+	0.1-	1999 11 01	704	0.4-	0.8-
1998 09 18	704	0.8-	0.1+	1998 10 28	704	0.3+	0.4-				

(12563)* 1998 SA₄₃ = 1980 TA₁₃ = 1989 UH = 1996 FM

Discovered 1998 Sept. 20 by the Beijing Schmidt CCD Asteroid Program at Xinglong.

Id. G. V. Williams (*MPC* 32727)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	61.41424		(2000.0)		P		Q
<i>n</i>	0.21710674	ω	255.16196	+0.93071965		-0.36499606	
<i>a</i>	2.7417037	Ω	126.24011	+0.34564785		+0.85708902	
<i>e</i>	0.0856325	<i>i</i>	1.64919	+0.11953450		+0.36356056	
<i>P</i>	4.54	<i>H</i>	12.8	<i>G</i>	0.15	<i>U</i>	1

Residuals in seconds of arc

1980 10 10	095	1.4+	1.8-	1998 09 26	704	0.2-	0.2+	1998 10 28	704	0.2-	0.1-
1980 10 17	095	0.3-	1.6-	1998 09 26	704	0.7+	0.4-	1998 10 28	704	0.6-	0.1+
1989 10 20	881	0.7-	0.1-	1998 09 26	704	0.2-	0.2-	1998 10 28	704	0.1+	0.2+
1989 10 20	881	0.0	1.7+	1998 09 27	704	(0.2+	3.1-)	1998 10 28	704	0.4+	0.5-
1996 03 17	566	0.1+	1.4+	1998 09 27	704	0.3-	0.3+	1998 10 29	704	0.1-	0.3+
1996 03 17	566	0.1-	1.3+	1998 09 27	704	0.9+	0.1+	1998 10 29	704	0.0	0.4+
1996 03 17	566	0.0	1.0+	1998 09 27	704	1.8+	0.8+	1998 10 29	704	0.2-	0.8+
1996 03 19	566	0.0	0.5+	1998 09 27	704	0.2+	0.1-	1998 10 29	704	0.3-	0.2+
1996 03 19	566	0.3+	0.3+	1998 10 02	327	0.3-	0.2+	1998 10 29	704	0.4-	0.1+
1996 03 19	566	0.3+	0.5+	1998 10 02	327	0.0	0.4+	1998 11 11	699	0.6+	0.1+
1996 04 17	566	0.6+	0.2-	1998 10 02	327	0.2+	0.5+	1998 11 11	699	0.2+	0.2+
1996 04 17	566	0.3+	0.0	1998 10 02	120	0.6-	0.1+	1998 11 11	699	0.5+	0.0
1996 04 17	566	0.4+	0.5-	1998 10 02	120	0.4+	0.1+	1998 12 08	699	0.1+	0.0
1998 09 14	704	0.2-	0.1-	1998 10 02	120	0.2+	0.1+	1998 12 08	699	0.8-	0.0
1998 09 14	704	0.0	0.2-	1998 10 02	120	0.3+	0.3+	1998 12 08	699	0.1+	0.2-
1998 09 14	704	0.5-	1.0+	1998 10 02	120	0.5+	0.2-	1999 01 10	699	0.1-	0.4+
1998 09 15	699	0.5+	0.0	1998 10 02	120	0.1+	0.2-	1999 01 10	699	0.9-	0.8+
1998 09 15	699	0.1-	0.1-	1998 10 10	699	0.1+	0.1+	1999 01 10	699	1.3-	1.5+
1998 09 15	699	0.3+	0.3+	1998 10 10	699	0.0	0.2+	1999 10 10	704	0.4+	0.7+
1998 09 18	704	0.2+	0.2+	1998 10 10	699	0.1-	0.2+	1999 10 10	704	0.4+	0.3-
1998 09 18	704	0.2+	1.4+	1998 10 14	704	0.5-	0.4-	1999 10 10	704	0.7+	0.6-
1998 09 18	704	0.7+	0.1-	1998 10 14	704	0.0	0.5+	1999 10 10	704	1.5+	0.9-
1998 09 18	704	0.8+	0.6+	1998 10 14	704	0.6-	0.8+	1999 10 10	704	1.3+	0.9-
1998 09 18	704	0.4-	0.0	1998 10 14	704	0.7-	0.2-	1999 10 21	704	1.2-	0.1-
1998 09 20	327	1.1-	0.5-	1998 10 14	704	0.5-	0.8+	1999 10 21	704	0.5-	0.0
1998 09 20	327	1.1-	0.6-	1998 10 15	704	0.4+	0.9-	1999 10 21	704	0.7-	0.0
1998 09 20	327	1.8+	0.7+	1998 10 15	704	0.3-	0.0	1999 10 21	704	0.4-	0.4-
1998 09 23	120	0.0	0.7+	1998 10 15	704	0.2-	0.8-	1999 10 21	704	0.5-	0.5-
1998 09 24	120	0.1+	0.3+	1998 10 15	704	0.2+	0.6-	1999 11 16	704	0.1-	0.5+
1998 09 24	120	0.5+	0.0	1998 10 15	704	1.4-	0.1-	1999 11 16	704	0.0	0.3+
1998 09 24	327	1.4-	0.0	1998 10 15	120	0.7+	1.2-	1999 11 16	704	0.2-	0.1+
1998 09 24	327	1.0-	0.0	1998 10 19	699	0.3-	0.2-	1999 11 16	704	0.4-	0.1+

1998 09 24	327	1.4-	0.1-	1998 10 19	699	0.5-	0.1-	1999 11 16	704	0.0	0.2-
1998 09 26	704	0.2-	0.4-	1998 10 19	699	0.2-	0.1-				
1998 09 26	704	1.5+	1.4-	1998 10 28	704	0.6+	0.7+				

(12564)* 1998 SO₄₉ = 1988 RA₇ = 1991 EG₅ = 1993 SK₁₃

Discovered 1998 Sept. 22 by W. Bickel at Bergisch Gladbach.

Id. S. Nakano (*MPC* 33026)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	147.33624		(2000.0)		P		Q
<i>n</i>	0.20675146	ω	114.15397	+0.41451707		+0.91004152	
<i>a</i>	2.8325026	Ω	180.33507	-0.84484080		+0.38475132	
<i>e</i>	0.0411194	<i>i</i>	1.61471	-0.33825968		+0.15424284	
<i>P</i>	4.77	<i>H</i>	13.6	<i>G</i>	0.15	<i>U</i>	1

Residuals in seconds of arc

1988 09 09	809	0.4+	0.8+	1998 09 23	621	0.2-	0.7-	1998 11 10	704	0.2+	0.7+
1988 09 09	809	0.2+	0.1+	1998 09 23	621	0.6-	0.3-	1998 11 10	704	0.3+	0.9+
1988 09 09	809	0.0	0.4-	1998 09 23	621	0.0	0.4-	1998 11 10	704	0.3-	1.2+
1991 03 14	809	1.5-	1.7+	1998 09 23	621	0.5-	0.2-	1998 11 11	704	1.4+	0.2-
1991 03 14	809	0.1-	1.1+	1998 09 24	621	0.4-	0.8-	1998 11 11	704	0.2-	0.3+
1991 03 14	809	1.2+	0.6+	1998 09 24	621	0.3-	0.5-	1998 11 11	704	0.7+	0.7+
1993 09 16	809	(2.8-	2.7-)	1998 09 26	704	0.3-	1.4-	1998 11 11	704	0.4-	1.1+
1993 09 16	809	(1.0-	3.1-)	1998 09 26	704	0.4-	1.5-	1998 11 11	704	1.5+	1.4+
1993 09 16	809	(0.8-	3.3-)	1998 09 26	704	0.1-	1.5-	1998 11 19	621	0.0	0.4+
1993 09 23	809	(0.9-	3.3-)	1998 09 26	704	0.4-	0.6-	1998 11 19	621	0.1+	0.4+
1993 09 23	809	(1.3-	3.5-)	1998 09 26	704	0.4+	0.6-	1998 11 19	621	0.1+	0.3+
1993 09 23	809	(2.1-	3.3-)	1998 09 27	704	0.9-	0.0	1998 11 20	621	0.3+	0.1-
1996 03 16	566	0.4+	1.4-	1998 09 27	704	0.5+	0.3+	1998 11 20	621	0.5+	0.2-
1996 03 16	566	1.1+	1.1-	1998 09 27	704	0.8-	0.2+	1998 11 20	621	0.1+	0.0
1996 03 16	566	0.5+	1.8-	1998 09 27	704	0.5-	0.9+	1998 11 20	621	0.4+	0.1+
1996 04 21	566	0.6-	0.0	1998 09 27	704	0.8-	0.1+	1998 11 21	621	0.5+	0.3-
1996 04 21	566	1.1-	0.1+	1998 10 10	699	1.3+	0.4+	1998 11 21	621	0.3+	0.3-
1996 04 21	566	0.4-	0.4-	1998 10 10	699	0.8+	0.3-	1998 11 21	621	0.2+	0.2-
1997 07 02	704	0.1+	0.1-	1998 10 10	699	0.5+	0.9+	1998 11 21	621	0.3+	0.2-
1997 07 02	704	0.5+	0.0	1998 10 17	699	0.2+	0.5-	1998 12 17	621	0.0	0.1+
1997 07 02	704	0.3-	0.4+	1998 10 17	699	0.4+	0.3-	1998 12 17	621	0.5+	0.2-
1997 07 02	704	0.4-	0.3+	1998 10 17	699	0.0	0.3-	1999 10 21	704	0.4+	1.6-
1997 07 02	704	0.5-	0.1-	1998 10 28	704	0.1-	0.5+	1999 10 21	704	0.8+	0.7+
1998 09 16	411	0.2-	0.0	1998 10 28	704	0.4+	0.4-	1999 10 21	704	0.3-	0.7+
1998 09 16	411	1.0-	0.6+	1998 10 28	704	0.8-	0.3-	1999 11 04	621	0.0	0.0
1998 09 18	809	1.5-	1.9-	1998 10 28	704	0.7-	0.3+	1999 11 04	621	0.1+	0.0
1998 09 18	809	(2.2-	2.9-)	1998 10 28	704	0.1-	0.4+	1999 11 04	621	0.1+	0.1-
1998 09 18	809	(3.1-	2.8-)	1998 10 29	704	0.2-	0.8+	1999 11 15	621	0.1+	0.1-
1998 09 20	809	0.2-	1.7-	1998 10 29	704	0.3+	1.3+	1999 11 15	621	0.1+	0.2-
1998 09 20	809	(1.6-	2.4-)	1998 10 29	704	0.1-	0.1+	1999 11 15	621	0.0	0.2-
1998 09 20	809	(1.9-	2.6-)	1998 10 29	704	0.7-	0.8+	1999 11 17	704	1.6-	0.2+
1998 09 22	621	0.1-	0.7-	1998 10 29	704	(2.8-	0.6-)	1999 11 17	704	0.1-	0.3-
1998 09 22	621	0.1+	0.8-	1998 11 10	704	1.0+	1.1+	1999 11 17	704	0.6+	0.5-
1998 09 23	621	0.1+	0.6-	1998 11 10	704	0.9-	0.4+				

1996 05 19	809	1.2+	0.5+	1998 09 14	704	0.5+	0.8-	1999 10 10	704	0.1-	0.6+
1996 05 19	809	1.1+	0.7+	1998 09 14	704	1.7-	1.5-	1999 10 10	704	0.3+	0.0
1996 05 19	809	0.8+	0.0	1998 09 14	704	0.4+	0.1+	1999 10 10	704	0.2+	0.0
1997 05 31	327	0.5+	0.0	1998 09 14	704	0.3-	0.0	1999 10 10	704	0.6-	0.5-
1997 05 31	327	0.5+	0.3+	1998 09 16	699	0.5-	0.4+	1999 10 10	704	0.9+	0.3-
1997 05 31	327	0.3-	0.4+	1998 09 16	699	0.5-	0.4+	1999 11 04	704	0.2+	0.3+
1997 06 01	327	0.5+	0.6+	1998 09 16	699	0.6+	0.3+	1999 11 04	704	0.0	0.6+
1997 06 01	327	0.3-	0.2+	1998 09 18	704	0.3-	0.4+	1999 11 04	704	0.4+	0.1+
1997 06 01	327	0.6-	0.2-	1998 09 18	704	0.5+	0.6+	1999 11 04	704	0.3-	0.4+
1997 06 01	327	0.4-	0.1+	1998 09 18	704	0.2-	0.8+	1999 11 04	704	0.7-	0.1+
1998 08 17	704	0.2+	0.3-	1998 09 18	704	0.6-	0.9+	1999 11 17	704	0.2-	0.3+
1998 08 17	704	0.6-	0.5-	1998 09 18	704	(1.8-	2.1+)	1999 11 17	704	0.3-	0.2+
1998 08 17	704	1.3-	1.7-	1998 09 25	699	0.7-	1.0+	1999 11 17	704	0.3+	1.4+
1998 08 17	704	1.2+	0.7-	1998 09 25	699	0.7-	2.0+	1999 11 17	704	0.1-	0.1+
1998 08 17	704	1.3+	0.9+	1998 09 25	699	0.3+	0.3+				

(12566)* 1998 SH₅₄ = 1978 EV₉

Discovered 1998 Sept. 16 by the Lowell Observatory Near-Earth Object Search at the Anderson Mesa Station.

Id. G. V. Williams (*MPC* 33028)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	314.47991		(2000.0)		P		Q
<i>n</i>	0.17193015	ω	274.76135		-0.42396771		-0.90515889
<i>a</i>	3.2030818	Ω	200.40904		+0.86187925		-0.39284081
<i>e</i>	0.1049040	<i>i</i>	5.04063		+0.27823649		-0.16236835
<i>P</i>	5.73	<i>H</i>	13.4	<i>G</i>	0.15	<i>U</i>	1

Residuals in seconds of arc

1978 03 15	675	0.0	0.0	1998 09 18	704	1.3-	0.9+	1998 10 14	704	0.2-	1.5-
1978 03 16	675	0.4+	1.0+	1998 09 18	704	0.0	0.8-	1998 10 14	704	1.8+	0.4+
1992 09 23	809	(3.1-	2.7-)	1998 09 18	704	1.2+	0.3-	1998 10 14	704	0.4-	0.4-
1992 09 23	809	(2.4-	2.5-)	1998 09 18	704	0.4+	0.2-	1998 10 15	704	0.2-	1.1-
1992 09 23	809	(2.8-	3.3-)	1998 09 18	704	0.9-	0.2+	1998 10 15	704	0.9+	0.6-
1993 12 14	691	0.7+	0.1+	1998 09 25	699	0.4+	1.0+	1998 10 15	704	(2.8+	0.5-)
1993 12 14	691	0.3-	0.2+	1998 09 25	699	1.1+	0.6+	1998 10 15	704	1.0-	0.2-
1993 12 14	691	0.5-	0.5-	1998 09 25	699	0.4-	1.0+	1998 10 24	691	0.4-	0.1+
1996 05 21	566	0.6-	0.4-	1998 09 26	704	0.0	0.0	1998 10 24	691	0.5-	0.2-
1996 05 21	566	0.5-	0.1+	1998 09 26	704	0.6-	0.8-	1998 10 24	691	0.1-	0.1+
1996 05 21	566	0.8-	0.6-	1998 09 26	704	0.7-	1.2-	1999 10 10	704	0.1+	0.1-
1997 07 27	910	0.9+	0.3+	1998 09 26	704	0.0	0.3-	1999 10 10	704	0.3-	0.1+
1997 07 27	910	1.2+	0.5+	1998 09 26	704	0.7+	1.0+	1999 10 10	704	0.4-	0.2-
1997 07 27	910	0.6+	0.5+	1998 09 27	704	0.2+	0.0	1999 10 10	704	0.0	0.3-
1998 09 14	704	0.5-	0.6-	1998 09 27	704	1.2+	0.8+	1999 11 17	704	0.8+	0.7+
1998 09 14	704	1.0-	0.0	1998 09 27	704	0.5-	1.1+	1999 11 17	704	0.6+	0.2-
1998 09 14	704	0.6-	0.2-	1998 09 27	704	0.1+	0.1-	1999 11 17	704	0.1+	0.1+
1998 09 16	699	1.3-	1.6+	1998 09 27	704	0.1-	0.9-	1999 11 17	704	0.0	0.2-
1998 09 16	699	0.8+	1.2+	1998 10 14	704	0.6+	1.2-				
1998 09 16	699	0.3-	0.8+	1998 10 14	704	0.5-	0.6-				

(12567)* 1998 SU₇₁ = 1981 WT₃ = 1994 AO₁₅ = 1997 ND₄

Discovered 1998 Sept. 21 by E. W. Elst at the European Southern Observatory.

Id. B. G. Marsden (*MPC* 33037)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	334.11244		(2000.0)		P		Q
<i>n</i>	0.17143039	ω	323.54724		-0.41336655		-0.91038279
<i>a</i>	3.2093038	Ω	150.85653		+0.84401132		-0.39057833
<i>e</i>	0.1051265	<i>i</i>	2.14185		+0.34172062		-0.13657139
<i>P</i>	5.75	<i>H</i>	12.9	<i>G</i>	0.15	<i>U</i>	1

Residuals in seconds of arc

1981 11 24	033	(0.1-	3.7-)	1998 09 26	704	0.6+	0.3-	1998 11 11	704	0.5+	1.0+
1981 11 24	033	0.3+	0.2-	1998 09 26	704	0.1+	0.7-	1998 11 11	704	0.8+	0.2-
1994 01 14	033	0.8-	0.3-	1998 09 26	704	0.6+	0.9-	1998 11 11	704	0.8-	1.0+
1994 01 14	033	0.1+	0.5-	1998 09 26	704	0.2+	1.9-	1998 11 11	704	0.9+	0.3-

1994 01 17	033	0.2+	0.1+	1998 09 26	704	0.9+	1.2-	1998 11 15	566	0.8-	1.2-
1997 07 06	691	0.3+	0.1+	1998 09 27	704	0.1-	0.5-	1998 11 15	566	0.4-	0.8-
1997 07 06	691	0.1+	0.2-	1998 09 27	704	0.1+	0.1-	1998 11 15	566	0.2-	0.5-
1997 07 06	691	0.3+	0.2-	1998 09 27	704	0.7+	0.1-	1999 10 10	704	0.2-	0.4+
1997 07 10	691	0.0	0.3-	1998 09 27	704	0.4-	0.2-	1999 10 10	704	0.0	0.2+
1997 07 10	691	0.2-	0.1+	1998 09 27	704	1.0-	1.5-	1999 10 10	704	1.0+	0.5-
1997 07 10	691	0.2-	0.2-	1998 10 28	704	0.3-	0.4+	1999 10 10	704	0.4+	0.0
1998 09 18	809	(0.7-	2.7+)	1998 10 28	704	1.1-	1.3+	1999 10 10	704	0.1+	0.2-
1998 09 18	809	(0.6-	2.4+)	1998 10 28	704	1.2-	0.5+	1999 10 21	704	0.2+	0.6-
1998 09 18	809	(1.8-	2.4+)	1998 10 28	704	0.0	0.5+	1999 10 21	704	0.1+	0.8-
1998 09 20	809	(1.6+	2.4+)	1998 10 29	704	0.2-	1.6+	1999 10 21	704	0.2+	0.3-
1998 09 20	809	(1.2+	3.0+)	1998 10 29	704	0.5-	0.9+	1999 10 21	704	0.1-	0.0
1998 09 20	809	(1.4+	2.1+)	1998 10 29	704	0.9+	1.0+	1999 10 21	704	0.3-	0.4+
1998 09 21	809	(1.5-	3.2+)	1998 10 29	704	(2.7+	0.4-)	1999 11 17	704	0.9-	0.1-
1998 09 21	809	(1.8-	2.7+)	1998 10 29	704	(0.6-	3.0-)	1999 11 17	704	0.2+	0.7+
1998 09 21	809	(1.8-	2.8+)	1998 11 10	704	0.5+	0.7+	1999 11 17	704	0.1-	0.8-
1998 09 23	809	1.2+	0.2-	1998 11 10	704	0.9-	1.2+	1999 11 17	704	0.2-	0.0
1998 09 23	809	0.8+	0.1+	1998 11 10	704	1.0-	0.1-	1999 11 17	704	0.5+	0.4+
1998 09 23	809	1.0+	0.0	1998 11 10	704	1.4-	1.0+				

(12568)* 1998 VB₅ = 1981 QL₃ = 1995 DO₁₃

Discovered 1998 Nov. 11 by K. Korlević at Višnja.

Id. G. V. Williams (*MPC* 33317)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	199.95356		(2000.0)		P		Q
<i>n</i>	0.18427043	ω	225.39672		-0.12373170		+0.99221869
<i>a</i>	3.0584328	Ω	37.50227		-0.90385493		-0.10691912
<i>e</i>	0.0588531	<i>i</i>	1.30604		-0.40955675		-0.06379953
<i>P</i>	5.35	<i>H</i>	13.0	<i>G</i>	0.15	<i>U</i>	1

Residuals in seconds of arc

1981 08 25	809	(1.6- 3.3+)	1996 06 14	566	0.1- 1.2-	1998 11 25	691	0.2+ 0.2-
1981 08 25	809	(1.2- 2.9+)	1998 11 11	704	0.1- 0.1+	1998 11 25	691	0.5+ 0.1+
1981 08 25	809	(0.3- 3.4+)	1998 11 11	704	1.2- 0.6-	1998 11 26	120	0.6- 1.0+
1981 08 26	809	2.4- 2.0-	1998 11 11	704	0.4+ 0.5-	1998 11 26	120	0.3+ 0.2-
1981 08 26	809	2.4- 1.1-	1998 11 11	704	1.8- 1.0-	1998 12 08	699	0.2+ 1.3+
1981 08 27	809	1.3+ 1.5+	1998 11 11	120	0.8- 0.1+	1998 12 08	699	0.4+ 0.7+
1981 08 27	809	0.9+ 2.4+	1998 11 11	120	0.6- 0.3-	1998 12 08	699	0.3- 0.4+
1981 08 27	809	(1.7+ 2.9+)	1998 11 12	120	(2.9- 0.3-)	1998 12 11	691	0.1- 0.3-
1981 09 04	809	0.3- 0.2+	1998 11 12	120	1.0- 1.0+	1998 12 11	691	0.3- 0.3-
1981 09 04	809	0.0 0.1+	1998 11 16	566	0.1- 0.2-	1998 12 11	691	0.3- 0.0
1981 09 04	809	0.9+ 0.8+	1998 11 16	566	0.2+ 0.0	1998 12 14	704	0.3+ 0.6+
1981 09 05	809	0.1+ 0.1+	1998 11 16	566	0.2- 0.1+	1998 12 14	704	0.6+ 0.3-
1981 09 05	809	0.5+ 0.0	1998 11 18	704	0.5+ 0.2-	1998 12 14	704	1.0+ 0.2-
1981 09 05	809	0.3+ 0.2-	1998 11 18	704	0.2- 0.9-	1998 12 14	704	0.4+ 0.7+
1981 09 06	809	1.0+ 0.7-	1998 11 18	704	0.2- 0.3-	1998 12 17	691	0.7- 0.2-
1981 09 06	809	0.6+ 0.5-	1998 11 18	704	(1.4+ 2.2-)	1998 12 17	691	1.1- 0.1-
1981 09 06	809	0.3- 0.8-	1998 11 18	704	(2.9- 0.3-)	1998 12 17	691	1.4- 0.2+
1981 09 07	809	0.6- 0.6+	1998 11 21	704	0.8+ 0.6-	1999 02 14	691	0.2+ 0.3-
1981 09 07	809	0.4- 0.7+	1998 11 21	704	0.6+ 0.7-	1999 02 14	691	0.5+ 0.3-
1981 09 07	809	0.0 0.4+	1998 11 21	704	1.2+ 0.8-	1999 02 14	691	0.7+ 0.2-
1994 01 17	010	1.0- 0.4-	1998 11 21	704	1.0+ 0.8+	1999 10 21	704	0.3+ 0.1-
1994 01 17	010	1.4+ 0.2+	1998 11 21	704	0.0 1.7+	1999 10 21	704	1.0+ 0.1-
1994 01 17	010	0.1+ 0.1-	1998 11 24	704	0.3+ 0.3-	1999 10 21	704	(1.4- 2.2+)
1995 02 22	033	0.1- 0.1+	1998 11 24	704	1.4+ 1.5-	1999 11 16	704	0.1+ 0.4+
1995 02 23	033	0.2+ 0.2-	1998 11 24	704	(0.3+ 2.3-)	1999 11 16	704	0.5- 0.4-
1995 02 24	033	0.0 0.8+	1998 11 24	704	0.1+ 1.4-	1999 11 16	704	0.2- 0.3-
1996 06 14	566	0.3- 0.8-	1998 11 24	704	(0.3+ 2.4-)	1999 11 16	704	0.1- 0.6+
1996 06 14	566	0.0 0.6-	1998 11 25	691	0.2+ 0.3-	1999 11 16	704	0.2- 0.8+

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5					Williams						
M	96.80048	(2000.0)			P		Q				
n	0.17309144	ω	212.46901		+0.98508621		+0.16195974				
a	3.1887392	Ω	138.08635		-0.13337312		+0.93204573				
e	0.1125138	i	4.98855		-0.10870495		+0.32412929				
P	5.69	H	12.5	G	0.15	U	1				
Residuals in seconds of arc											
1975 10 30	033	0.2+	0.1+	1998 11 11	704	0.6-	0.4-	1998 12 11	699	0.3+	0.5+
1986 09 29	095	0.6-	0.3-	1998 11 11	699	0.3+	0.1-	1998 12 11	699	0.0	1.0+
1995 02 05	691	0.3+	0.0	1998 11 11	704	0.1-	0.4-	1998 12 11	699	0.6-	1.1+
1995 02 05	691	0.0	0.5-	1998 11 11	699	0.1-	0.2-	1999 10 10	704	0.5+	0.2-
1995 02 05	691	0.0	0.2-	1998 11 14	699	0.1-	0.1+	1999 10 10	704	0.5-	0.7+
1995 03 23	691	0.2-	0.4-	1998 11 14	699	0.0	0.1-	1999 10 10	704	0.2-	0.7+
1995 03 23	691	0.1-	0.1-	1998 11 14	699	0.3-	0.6+	1999 10 10	704	0.7-	1.3+
1995 03 23	691	0.2-	0.2-	1998 11 18	704	0.6-	0.5+	1999 10 10	704	0.7-	0.9+
1995 04 04	691	0.2+	0.2-	1998 11 18	704	0.4+	0.1-	1999 10 21	704	0.1+	0.2+
1995 04 04	691	0.1+	0.2-	1998 11 18	704	0.4+	0.2+	1999 10 21	704	0.4+	0.1-
1995 04 04	691	0.2+	0.4-	1998 11 18	704	0.5+	0.7+	1999 10 21	704	0.0	0.3-
1998 11 10	704	0.1+	0.3-	1998 11 18	704	(2.5+	0.1+)	1999 10 21	704	0.0	0.7+
1998 11 10	704	0.2+	0.9-	1998 11 21	704	0.7-	0.3+	1999 11 17	704	0.2-	0.3-
1998 11 10	704	0.3+	0.5-	1998 11 21	704	0.4+	0.1-	1999 11 17	704	0.2+	0.0
1998 11 10	704	0.7+	1.9-	1998 11 21	704	0.3+	0.7-	1999 11 17	704	1.1-	1.0-
1998 11 11	699	0.1+	0.0	1998 11 21	704	0.6+	0.4-	1999 11 17	704	0.1+	0.9+
1998 11 11	704	0.4-	0.1+	1998 11 21	704	0.3+	0.0	1999 11 17	704	0.3+	0.5

(12570)* 1998 WV₅ = 1980 HE

Discovered 1998 Nov. 18 by Y. Shimizu and T. Urata at the Nachi-Katsuura Observatory.

Id. S. Nakano (*MPC* 35342), A. Doppler (*ibid.*), M. E. Sansaturio (*ibid.*)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5						Nakano					
<i>M</i>	209.90568		(2000.0)		P		Q				
<i>n</i>	0.18672596		ω 352.36745		−0.44692318		+0.86691741				
<i>a</i>	3.0315606		Ω 250.86349		−0.80791732		−0.49708672				
<i>e</i>	0.1073902		<i>i</i> 13.51041		−0.38409539		+0.03686450				
<i>P</i>	5.28		<i>H</i> 12.4	<i>G</i> 0.15	<i>U</i> 1						
Residuals in seconds of arc											
1951 11 28	675	1.7−	0.8−	1998 11 23	888	0.1+	0.6+	1999 02 04	888	0.3−	0.8+
1951 11 28	675	1.6+	0.4+	1998 11 23	385	1.2+	0.0	1999 02 04	888	1.3−	0.9+
1980 04 18	808	0.1+	0.7+	1998 11 23	385	0.9+	0.5+	1999 10 10	704	0.7−	0.5−
1980 04 18	808	0.0	0.7−	1998 11 23	888	0.4+	0.6+	1999 10 10	704	0.7−	1.7−
1987 09 29	675	2.0−	0.3−	1998 11 26	888	1.0+	0.1+	1999 10 10	704	0.7+	0.8−
1987 09 29	675	1.5+	0.5+	1998 11 26	888	0.8+	0.3+	1999 10 10	704	0.6+	0.9−
1998 11 10	704	0.2+	0.6+	1998 12 11	888	0.2−	0.6−	1999 10 10	704	0.1+	0.8−
1998 11 10	704	0.3−	0.8+	1998 12 11	888	0.1+	0.6−	1999 10 20	704	0.8+	0.5+
1998 11 10	704	0.1−	0.2+	1998 12 22	888	0.3−	0.6−	1999 10 20	704	0.1+	0.3+
1998 11 10	704	1.3−	0.5+	1998 12 22	888	0.6−	0.5−	1999 10 20	704	0.7−	0.5−
1998 11 10	704	(2.3−	1.6+)	1999 01 08	699	0.8−	0.5+	1999 10 20	704	0.5−	0.1−
1998 11 16	566	0.0	0.7−	1999 01 08	699	1.1+	0.4−	1999 10 20	704	0.1+	0.2+
1998 11 16	566	0.3+	1.0−	1999 01 08	699	0.2−	1.3+	1999 11 12	703	0.4+	0.3−
1998 11 16	566	0.4−	0.1−	1999 01 13	888	0.4−	0.4−	1999 11 12	703	0.3+	1.4+
1998 11 18	905	1.6+	1.6−	1999 01 13	888	0.4−	0.3−	1999 11 12	703	0.3−	1.2+
1998 11 18	905	1.6−	0.6−	1999 01 22	888	0.2−	0.3−	1999 11 12	703	0.1−	1.5+
1998 11 23	888	0.4+	0.4+	1999 01 22	888	0.4−	0.2+				

(12571)* 1999 NM₂ = 1987 SG₉ = 1996 BE₄ = 1998 FL₁₀₈

Discovered 1999 July 12 by the Lincoln Laboratory Near-Earth Asteroid Research Team at Socorro.

Id. G. V. Williams (*MPC* 35396)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5						Williams					
<i>M</i>	358.51195		(2000.0)		P		Q				
<i>n</i>	0.24268837		ω 106.59801		+0.84202886		+0.52511377				
<i>a</i>	2.5454822		Ω 221.94701		-0.53792543		+0.80029171				
<i>e</i>	0.1881665		<i>i</i> 10.64371		-0.04029427		+0.28946280				
<i>P</i>	4.06		<i>H</i> 14.3		<i>G</i>	0.15	<i>U</i>		2		
Residuals in seconds of arc											
1987 09 21	010	1.0-	1.1-	1999 07 12	704	0.0	0.5+	1999 09 10	704	0.2+	0.2+
1987 09 22	010	0.6+	1.2+	1999 07 12	704	0.4+	0.4+	1999 09 10	106	0.3-	0.2+
1996 01 22	704	0.9+	1.5+	1999 07 12	704	0.0	0.5+	1999 09 10	106	0.5-	0.3+
1996 01 22	704	0.5+	0.2+	1999 07 13	704	0.1-	0.2-	1999 09 10	106	0.2-	0.5-
1996 01 23	704	0.3-	0.3+	1999 07 13	704	0.7+	0.2+	1999 09 16	704	0.5+	0.2-
1996 01 24	704	0.9+	1.0-	1999 07 13	704	0.0	0.1+	1999 09 16	704	0.2+	0.3-
1998 03 31	704	0.0	0.3-	1999 07 13	704	0.1+	0.3+	1999 09 16	704	0.3+	0.0
1998 03 31	704	0.1+	0.4-	1999 07 13	704	0.3+	0.2+	1999 09 16	704	0.1-	0.3-
1998 03 31	704	0.9+	0.8+	1999 07 22	704	1.0+	1.2-	1999 09 16	704	0.4-	0.1+
1998 03 31	704	0.1-	1.7+	1999 07 22	704	1.6+	0.2+	1999 09 19	699	0.9-	0.4+
1998 04 01	704	0.1+	0.1-	1999 07 22	704	0.0	0.1-	1999 09 19	699	0.2-	1.1+
1998 04 01	704	0.3-	0.8-	1999 07 22	704	0.2-	0.8+	1999 10 02	704	0.4-	0.4-
1998 04 01	704	0.7+	0.2+	1999 09 04	682	0.3-	0.3+	1999 10 02	704	0.2-	0.4+
1998 04 01	704	0.7-	0.7-	1999 09 04	682	0.4-	0.0	1999 10 02	704	0.6-	0.0
1998 04 01	704	0.1+	0.1+	1999 09 04	682	0.6+	0.1+	1999 10 02	704	0.3-	0.1-
1998 04 19	704	0.2+	0.1+	1999 09 04	682	0.8+	0.2+	1999 10 02	704	0.6-	0.1+
1998 04 19	704	0.3+	1.6-	1999 09 04	682	0.3+	0.3-	1999 10 09	704	0.6-	0.3+
1998 04 19	704	0.8+	0.5+	1999 09 08	699	0.4-	0.6+	1999 10 09	704	1.1-	0.2-
1998 04 19	704	(0.0	3.1+)	1999 09 08	699	0.4-	0.3+	1999 10 09	704	0.5-	0.3-
1998 04 19	704	0.5-	0.4-	1999 09 08	704	0.2+	0.2-	1999 10 09	704	0.8-	0.3-
1998 04 20	704	0.8+	1.2+	1999 09 08	699	0.1-	0.0	1999 10 09	704	0.1-	0.6-
1998 04 20	704	0.7-	0.1+	1999 09 08	704	0.2+	0.1-	1999 11 07	704	0.1-	0.4-
1998 04 20	704	0.5-	0.5-	1999 09 08	704	0.0	0.5-	1999 11 07	704	0.3+	0.3-
1998 04 20	704	1.0-	0.9+	1999 09 08	704	0.1-	0.4-	1999 11 07	704	0.6-	0.1-
1998 04 20	704	(5.6-	0.9+)	1999 09 08	704	0.1-	0.2-	1999 11 07	704	0.1+	0.1+
1999 07 12	704	0.7+	0.7-	1999 09 10	704	0.2+	0.1-				
1999 07 12	704	0.8+	0.0	1999 09 10	704	0.3+	0.2+				

(12572)* 1999 NN₈ = 1974 HX = 1996 TS₈

Discovered 1999 July 13 by the Lincoln Laboratory Near-Earth Asteroid Research Team at Socorro.

Id. G. V. Williams (*MPC* 35398)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5						Williams					
M	68.07562		(2000.0)		$\mathbf{P}$	$\mathbf{Q}$					
n	0.28354470		ω	322.99031	-0.54742296		+0.83382854				
a	2.2946777		Ω	273.71465	-0.74972587		-0.52641096				
e	0.1064136		i	4.08693	-0.37180535		-0.16619709				
P	3.48 <th>H</th> <td>14.7<th>G</th><td>0.15<th>U</th><td>1<td colspan="3"></td></td></td></td>		H	14.7 <th>G</th> <td>0.15<th>U</th><td>1<td colspan="3"></td></td></td>	G	0.15 <th>U</th> <td>1<td colspan="3"></td></td>	U	1 <td colspan="3"></td>			
Residuals in seconds of arc											
1974 04 22	805	0.6+	0.3-	1999 07 16	704	0.0	0.1+	1999 10 13	704	0.4+	0.9-
1974 04 24	805	0.9-	0.3-	1999 07 16	704	0.7-	0.6-	1999 10 13	704	0.6+	0.5-
1996 10 09	566	0.6-	0.0	1999 07 23	704	0.5-	0.3-	1999 10 13	704	0.1+	0.3-
1996 10 09	566	0.1+	0.2+	1999 07 23	704	1.1-	0.3-	1999 10 13	704	0.0	0.8-
1996 10 09	566	0.2+	0.7+	1999 07 23	704	0.6-	0.3+	1999 10 13	704	0.6+	0.2-
1996 10 13	566	0.5+	0.3-	1999 07 23	704	0.5-	0.1-	1999 10 15	704	0.2+	0.7-
1996 10 13	566	0.2-	0.4+	1999 07 23	704	0.5-	0.1+	1999 10 15	704	0.4+	0.5-
1996 10 13	566	0.4-	0.0	1999 09 07	704	0.5+	0.3+	1999 10 15	704	0.5+	0.1+
1998 02 22	566	0.5-	1.7-	1999 09 07	704	0.4+	0.1-	1999 10 15	704	0.4+	0.7-
1998 02 22	566	0.9-	1.8-	1999 09 07	704	1.4+	0.9-	1999 10 15	704	0.3-	0.4-
1998 02 22	566	0.4-	1.2-	1999 09 07	704	0.0	0.2+	1999 10 16	704	0.6+	0.1-
1999 07 13	704	0.0	0.5+	1999 09 09	704	0.4+	0.8+	1999 10 16	704	0.0	0.8-
1999 07 13	704	0.2+	0.1+	1999 09 09	704	0.3+	0.4+	1999 10 16	704	0.8+	0.5-
1999 07 13	704	0.3+	0.0	1999 09 09	704	0.5+	0.4-	1999 10 16	704	0.1-	1.3-
1999 07 13	704	0.3+	0.0	1999 09 09	704	0.1+	0.1+	1999 11 08	704	0.0	0.1-
1999 07 13	704	0.3-	0.1-	1999 09 13	704	0.8+	0.6+	1999 11 08	704	0.0	0.2+

1999 07 16 704 0.7- 0.2- 1999 09 13 704 0.5+ 0.3- 1999 11 08 704 1.1- 0.8+
 1999 07 16 704 0.5- 0.6- 1999 09 13 704 0.5- 0.2-

(12573)* 1999 NJ₅₃ = 1990 WT₃ = 1998 KY₁₈

Discovered 1999 July 12 by the Lincoln Laboratory Near-Earth Asteroid
 Research Team at Socorro.

Id. G. V. Williams (*MPC* 36018)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	311.50430	(2000.0)	P	Q
<i>n</i>	0.19570731	ω	146.22388	+0.96608172 -0.20998320
<i>a</i>	2.9380872	Ω	226.66342	+0.16648502 +0.95140264
<i>e</i>	0.1152893	<i>i</i>	11.92663	+0.19740530 +0.22525558
<i>P</i>	5.04	<i>H</i>	13.0	<i>G</i> 0.15 <i>U</i> 2

Residuals in seconds of arc

1990 11 21	809 0.6- 0.8-	1998 05 22	704 0.6+ 0.5+	1999 09 08	704 0.5- 0.3-
1990 11 21	809 0.9+ 0.6-	1998 05 22	704 0.6+ 0.8+	1999 09 08	704 0.3- 0.6-
1990 11 21	809 0.1+ 1.0-	1998 05 22	704 (1.5- 2.4+)	1999 09 09	704 0.3- 0.3+
1990 11 22	809 (1.2- 2.2-)	1998 05 22	699 0.5+ 0.1+	1999 09 09	704 0.1+ 0.2-
1990 11 22	809 0.7- 1.6-	1998 05 22	699 0.4- 0.4-	1999 09 09	704 0.0 0.1-
1990 11 22	809 (0.4- 2.4-)	1998 05 22	699 0.0 0.5+	1999 09 09	704 0.1- 0.6-
1993 06 20	691 0.0 0.6+	1998 05 24	704 0.3- 0.4+	1999 09 09	704 0.4- 0.4-
1993 06 20	691 0.1- 0.4+	1998 05 24	704 0.7- 0.5-	1999 09 09	704 0.0 0.2-
1998 04 22	704 0.2+ 0.2+	1998 05 24	704 0.5+ 0.4+	1999 09 09	704 0.2- 0.6-
1998 04 22	704 0.0 0.3-	1998 05 24	704 0.8+ 1.8+	1999 09 09	704 0.2+ 0.6-
1998 04 22	704 1.5- 1.6-	1998 05 24	704 0.8- 0.5-	1999 09 09	704 0.2+ 0.3+
1998 04 22	704 0.0 0.9-	1999 07 12	704 0.5+ 0.2-	1999 09 09	704 0.0 1.5+
1998 04 25	699 1.7- 0.6-	1999 07 12	704 0.6- 0.1-	1999 09 14	704 0.6+ 0.5+
1998 04 25	699 0.4- 1.3-	1999 07 12	704 0.5+ 0.1-	1999 09 14	704 0.4+ 0.2-
1998 04 25	699 0.7+ 0.2-	1999 07 12	704 0.4+ 0.1+	1999 09 14	704 0.3+ 0.1-
1998 05 01	704 0.5- 0.2-	1999 07 22	704 0.1+ 0.5+	1999 09 14	704 1.3+ 0.5-
1998 05 01	704 1.0- 0.4-	1999 07 22	704 0.1- 1.0+	1999 09 14	704 1.1+ 1.2-
1998 05 01	704 0.1- 1.1-	1999 07 22	704 0.7- 0.0	1999 11 07	704 0.2- 0.1-
1998 05 01	704 0.4+ 0.6-	1999 07 22	704 0.9- 0.2+	1999 11 07	704 0.0 0.1-
1998 05 01	704 0.2+ 1.2-	1999 07 22	704 0.2- 0.1+	1999 11 07	704 0.4+ 0.4+
1998 05 22	704 1.2+ 1.1-	1999 09 08	704 0.2- 0.7-	1999 11 07	704 0.0 0.2+
1998 05 22	704 1.6+ 0.8+	1999 09 08	704 0.2- 0.5-		

(12574)* 1999 RT = 1990 RX₁₀ = 1998 MG₈

Discovered 1999 Sept. 4 by C. W. Juels at Fountain Hills.

Id. G. V. Williams (*MPC* 36028)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	250.99048	(2000.0)	P	Q
<i>n</i>	0.22358383	ω	337.20455	-0.07935359 -0.98231709
<i>a</i>	2.6884943	Ω	116.98433	+0.94141110 -0.12978655
<i>e</i>	0.0876502	<i>i</i>	10.96991	+0.32779286 +0.13493919
<i>P</i>	4.41	<i>H</i>	12.9	<i>G</i> 0.15 <i>U</i> 1

Residuals in seconds of arc

1990 09 14	675 0.2+ 1.9-	1998 07 01	699 0.1+ 0.2-	1999 09 11	704 0.4+ 0.4-
1990 09 14	675 0.2+ 1.3-	1998 07 01	699 0.5+ 0.1-	1999 09 11	704 0.2+ 0.3-
1997 02 03	691 0.8+ 0.3+	1998 07 01	699 0.3+ 0.3-	1999 09 11	704 0.0 0.2-
1997 02 03	691 0.6+ 0.0	1999 07 16	704 0.2- 0.8+	1999 09 11	704 0.0 1.2-
1997 02 03	691 1.3- 0.2+	1999 07 16	704 0.5+ 1.1+	1999 09 11	704 0.0 0.4+
1998 05 26	704 0.2- 0.1+	1999 07 16	704 0.2- 0.3+	1999 09 18	678 0.4- 0.4-
1998 05 26	704 0.6- 0.4+	1999 07 16	704 0.2- 0.6+	1999 09 18	678 0.9+ 0.9-
1998 05 26	704 0.6+ 0.7-	1999 09 04	678 0.1+ 0.0	1999 09 29	704 0.7+ 0.1+
1998 05 26	704 0.1- 0.6-	1999 09 04	678 0.3- 0.1+	1999 09 29	704 0.6- 0.1+
1998 05 26	704 0.2- 1.1+	1999 09 04	678 0.3+ 0.8+	1999 09 29	704 0.4- 0.9+
1998 06 03	704 0.4- 0.3-	1999 09 05	678 0.1+ 0.2-	1999 09 29	704 0.3- 0.3-
1998 06 03	704 1.2+ 1.2+	1999 09 05	678 0.8- 0.6+	1999 09 29	704 0.5- 0.8+
1998 06 03	704 1.5+ 0.6+	1999 09 05	678 0.8- 0.1+	1999 09 30	704 0.3+ 0.3-
1998 06 03	704 0.3+ 0.5-	1999 09 05	678 0.6- 0.4+	1999 09 30	704 0.2+ 0.3-
1998 06 03	704 1.7- 0.4-	1999 09 07	678 0.4+ 0.5+	1999 09 30	704 0.1+ 0.2+
1998 06 19	704 0.5+ 0.5-	1999 09 07	678 0.4- 0.2+	1999 09 30	704 1.3+ 0.1-

1998 06 19	704 0.7- 0.0	1999 09 07	678 0.7- 0.5+	1999 11 09	699 1.0+ 0.0
1998 06 19	704 0.0 1.3+	1999 09 07	678 0.9- 0.1+	1999 11 09	699 1.0- 0.9+
1998 06 19	704 0.7+ 1.1+	1999 09 07	699 0.4+ 0.6+	1999 11 09	699 0.2+ 0.1+
1998 06 19	704 0.6+ 0.2+	1999 09 07	699 0.1- 0.3+	1999 11 10	704 0.2+ 0.4-
1998 06 25	704 1.0- 1.0-	1999 09 07	699 0.2+ 0.4+	1999 11 10	704 0.1- 0.4-
1998 06 25	704 0.1+ 0.3-	1999 09 11	678 0.3+ 0.7+	1999 11 10	704 0.3- 0.4+
1998 06 25	704 0.5- 0.1-	1999 09 11	678 0.1- 0.1-	1999 11 10	704 0.2- 0.6-
1998 06 25	704 0.8- 1.0-	1999 09 11	678 0.5- 1.2-	1999 11 10	704 1.1+ 0.9-

(12575)* 1999 RH₁ = 1982 XN₁ = 1996 XF₃₂ = 1998 KP₁₃

Discovered 1999 Sept. 4 by P. Pietrapiana and L. Sannino at Monte Viseggi.

Id. S. Nakano (*MPC* 36383)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Nakano

<i>M</i>	286.08023	(2000.0)	P	Q
<i>n</i>	0.28383936	ω	341.91997	+0.46456986 -0.88468488
<i>a</i>	2.2930893	Ω	80.38228	+0.81724785 +0.41144819
<i>e</i>	0.0923019	<i>i</i>	2.25690	+0.34099969 +0.21918726
<i>P</i>	3.47	<i>H</i>	14.6	<i>G</i> 0.15 <i>U</i> 1

Residuals in seconds of arc

1982 12 13	381 0.4- 0.2-	1999 09 04	126 0.3+ 0.4+	1999 09 09	126 0.8+ 0.4+
1982 12 13	381 1.0+ 0.3+	1999 09 05	126 0.0 0.5+	1999 09 09	126 0.6+ 0.3+
1982 12 14	381 0.8- 0.8+	1999 09 05	126 1.7- 1.0+	1999 09 13	704 0.3- 0.3+
1982 12 14	381 0.0 0.2-	1999 09 05	126 0.7- 0.8-	1999 09 13	704 0.2- 0.2+
1996 12 04	098 0.2- 1.0+	1999 09 05	126 0.1- 0.0	1999 09 13	704 0.0 0.1+
1996 12 04	098 0.4- 0.3+	1999 09 05	126 0.1+ 0.1+	1999 09 13	704 0.8- 0.1+
1996 12 06	098 0.4- 0.8+	1999 09 07	699 0.1+ 0.3+	1999 09 14	704 1.0+ 0.6-
1996 12 06	098 0.6+ 1.4+	1999 09 07	704 0.2- 0.2-	1999 09 14	704 0.4+ 0.9-
1996 12 08	098 0.2- 0.6-	1999 09 07	704 0.1- 0.1-	1999 09 14	704 0.1- 0.8-
1996 12 08	098 (2.8+ 0.7+)	1999 09 07	704 0.1+ 0.4+	1999 09 14	704 1.0- 0.3-
1998 04 22	704 0.3- 0.7+	1999 09 07	699 1.4- 0.1-	1999 09 14	704 0.5+ 0.5-
1998 04 22	704 0.3+ 1.9+	1999 09 07	704 0.1- 0.5+	1999 09 14	704 0.4- 1.6-
1998 04 22	704 0.2+ 1.2+	1999 09 07	704 0.1+ 0.1+	1999 09 14	704 1.6+ 0.9-
1998 04 22	704 0.1- 0.0	1999 09 07	699 0.0 0.5+	1999 09 30	704 0.1+ 0.2-
1998 04 22	704 0.4+ 0.8-	1999 09 07	126 0.2+ 0.4+	1999 09 30	704 0.1+ 0.4+
1998 04 29	566 0.9+ 1.0-	1999 09 07	126 0.5+ 0.7+	1999 09 30	704 0.0 0.3-
1998 04 29	566 0.7+ 0.6-	1999 09 07	126 0.5+ 0.4+	1999 09 30	704 0.3- 0.2-
1998 04 29	566 0.6+ 0.4-	1999 09 08	126 0.7+ 0.5+	1999 09 30	704 0.2+ 0.1+
1998 05 22	704 0.3- 0.5-	1999 09 08	703 0.6- 0.2+	1999 10 01	126 0.0 0.2+
1998 05 22	704 0.8- 1.1+	1999 09 08	703 0.0 0.3+	1999 10 01	126 0.2- 0.0
1998 05 22	704 (0.0 2.7+)	1999 09 08	703 0.4- 0.4+	1999 10 01	126 0.4- 0.1+
1998 05 22	704 0.3+ 0.3-	1999 09 08	703 0.1- 0.1-	1999 10 07	704 1.2+ 1.2-
1998 05 22	704 0.0 1.2+	1999 09 08	126 0.7+ 0.3+	1999 10 07	704 0.5- 0.2+
1998 05 24	704 0.8+ 1.4-	1999 09 08	126 0.1- 0.3+	1999 10 07	704 0.6- 0.2+
1998 05 24	704 0.3+ 0.4+	1999 09 08	126 0.3- 0.3-	1999 10 07	704 0.0 0.1-
1998 05 24	704 0.3- 1.3+	1999 09 08	126 0.1- 0.1-	1999 10 07	704 0.0 0.5-
1998 05 24	704 0.5- 0.4-	1999 09 09	704 0.2- 0.2-	1999 11 15	704 0.0 0.4+
1998 05 24	704 0.9- 1.3+	1999 09 09	704 0.3- 0.5-	1999 11 15	704 0.3+ 1.1-
1999 07 16	704 0.2- 0.1-	1999 09 09	704 0.1- 0.3+	1999 11 15	704 0.2+ 0.2-
1999 07 16	704 1.1- 0.7+	1999 09 09	704 1.2+ 0.9+	1999 11 15	704 0.4+ 0.4-
1999 07 16	704 0.9- 0.1-	1999 09 09	704 0.2+ 0.6+		
1999 09 04	126 0.1- 0.5+	1999 09 09	126 0.4+ 0.2+		

**(12576)* 1999 RP₁ = 1978 WQ₂₁ = 1989 GE₄ = 1989 GG₇ = 1997 GC₂₆
 = 1998 KH₂₁**

Discovered 1999 Sept. 5 by P. G. Comba at Prescott.

Id. B. G. Marsden (*MPC* 36383)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Marsden

<i>M</i>	290.37098	(2000.0)	P	Q
<i>n</i>	0.23032548	ω	51.81205	+0.68868722 -0.72503012
<i>a</i>	2.6357733	Ω	354.64792	+0.64184898 +0.61374734
<i>e</i>	0.0691009	<i>i</i>	3.94763	+0.33725331 +0.31248284
<i>P</i>	4.28	<i>H</i>	14.0	<i>G</i> 0.15 <i>U</i> 1

1999 NOV. 23

M.P.C. 36763

Residuals in seconds of arc

1978 11 28	675	0.1+	0.6+	1998 05 24	704	0.3+	0.5+	1999 09 09	704	0.4-	1.2-
1978 11 29	675	0.2+	0.7+	1998 05 24	704	1.7+	0.4+	1999 09 09	704	0.6+	0.6+
1989 04 03	809	0.5-	0.8-	1999 09 05	715	1.2+	1.6-	1999 09 09	704	0.2-	0.8+
1989 04 03	809	1.7+	0.5-	1999 09 05	715	1.1+	1.5-	1999 09 09	704	1.0+	1.0+
1989 04 03	809	0.2+	1.3-	1999 09 05	684	(4.3+ 1.1-)		1999 09 13	704	0.2-	0.3-
1989 04 06	809	1.9-	1.0+	1999 09 05	684	(4.7+ 1.2-)		1999 09 13	704	0.1+	0.0
1989 04 06	809	0.7-	0.8+	1999 09 06	684	0.2-	0.6-	1999 09 13	704	0.4-	0.0
1989 04 06	809	0.9-	1.7+	1999 09 06	684	0.3-	0.5-	1999 09 13	704	0.4-	0.4-
1997 04 09	046	0.2+	0.1-	1999 09 07	704	0.2-	0.3-	1999 09 28	684	0.1+	0.5-
1997 04 09	046	0.3-	0.1-	1999 09 07	704	0.1-	0.3+	1999 09 28	684	0.1+	0.2-
1997 04 09	046	0.2+	0.2-	1999 09 07	704	0.2-	0.0	1999 09 29	684	0.4+	0.6-
1997 04 09	046	0.1+	0.1+	1999 09 07	704	0.1-	0.1-	1999 09 29	684	0.2+	0.2-
1997 04 13	046	0.1-	0.2-	1999 09 07	704	0.0	0.5+	1999 09 29	704	0.2+	0.7-
1997 04 13	046	0.1+	0.4-	1999 09 08	715	0.8-	0.9+	1999 09 29	704	0.1-	0.4-
1997 04 13	046	0.1-	0.5-	1999 09 08	715	0.1-	0.3-	1999 09 29	704	0.9+	0.3+
1997 04 13	046	0.6-	0.3-	1999 09 08	715	0.4-	0.8+	1999 09 30	704	1.5+	0.0
1997 04 13	046	0.6+	0.4-	1999 09 08	715	0.1-	1.0+	1999 09 30	704	0.6+	0.1-
1998 05 22	704	(2.3+ 0.7+)		1999 09 08	684	0.8-	0.4-	1999 09 30	704	0.5+	0.1-
1998 05 22	704	0.6-	1.4+	1999 09 08	684	0.6-	0.6-	1999 10 04	703	0.4+	0.4+
1998 05 22	704	1.0+	1.6-	1999 09 09	704	0.2-	0.3-	1999 10 04	703	0.1+	0.5+
1998 05 22	704	0.6+	0.5+	1999 09 09	704	0.6-	0.1+	1999 10 04	703	0.4-	0.0
1998 05 22	704	0.6-	0.8-	1999 09 09	704	0.6-	0.1+	1999 10 04	703	0.5+	0.5+
1998 05 24	704	1.1+	0.8-	1999 09 09	704	0.9-	0.3+	1999 11 10	704	0.8-	0.5+
1998 05 24	704	0.1-	0.4-	1999 09 09	704	0.7-	0.6+	1999 11 10	704	0.3-	0.5-
1998 05 24	704	0.9-	0.7+	1999 09 09	704	0.2+	1.1-	1999 11 10	704	0.1-	1.2+

(12577)* 1999 RA₁₃ = 1986 UN₄ = 1994 NN₁₂ = 1997 AB₈ = 1998 KC₁₃

Discovered 1999 Sept. 7 by the Lincoln Laboratory Near-Earth Asteroid

Research Team at Socorro.

Id. G. V. Williams (*MPC* 36387)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	9.63248	(2000.0)	P	Q
<i>n</i>	0.21691193	ω 20.41260	+0.79864080	+0.59832067
<i>a</i>	2.7433449	Ω 302.67066	-0.56226231	+0.70351195
<i>e</i>	0.0916759	<i>i</i> 4.40767	-0.21455528	+0.38351442
<i>P</i>	4.54	<i>H</i> 14.2	<i>G</i> 0.15	<i>U</i> 1

Residuals in seconds of arc

1986 10 31	675	(2.1- 3.3+)	1998 05 01	704	0.1+	0.0	1999 09 08	704	0.1+	0.3-
1986 10 31	675	0.8- 2.3+	1998 05 01	704	0.1+	0.5+	1999 09 08	704	0.3-	0.3-
1986 11 05	675	(22.5+ 1.0-)	1998 05 01	704	0.3-	0.6-	1999 09 08	704	0.6-	0.2-
1986 11 05	675	(20.7+ 0.2+)	1998 05 01	704	0.2-	0.2+	1999 09 09	704	0.0	0.4-
1994 07 08	809	0.8- 0.1-	1998 05 22	704	1.4-	0.4-	1999 09 09	704	0.7-	0.5-
1994 07 08	809	0.1- 0.0	1998 05 22	704	0.4-	1.7+	1999 09 09	704	1.0-	0.8-
1994 07 08	809	0.6+ 0.0	1998 05 22	704	0.3-	0.6+	1999 09 09	704	0.8-	0.9-
1994 07 09	809	0.2- 1.0-	1998 05 22	704	0.4+	0.6-	1999 09 09	704	0.2-	1.3-
1994 07 09	809	0.7+ 1.0-	1998 05 22	704	0.5+	1.5+	1999 09 14	704	0.1-	0.2-
1994 07 09	809	1.2+ 1.3-	1998 05 24	704	1.3+	0.2-	1999 09 14	704	0.2-	0.5-
1997 01 02	691	0.2- 0.1-	1998 05 24	704	(1.4+ 2.3+)		1999 09 14	704	0.2+	0.2+
1997 01 02	691	0.3- 0.1-	1998 05 24	704	0.8-	0.0	1999 09 14	704	0.1-	0.2-
1997 01 02	691	0.2+ 0.1-	1999 09 05	699	1.1+	1.4+	1999 09 14	704	0.1-	0.1-
1997 01 10	691	0.2+ 0.4-	1999 09 05	699	0.1-	0.8+	1999 10 02	703	1.1-	0.5+
1997 01 10	691	0.0 0.2-	1999 09 05	699	0.6+	1.1+	1999 10 02	703	0.3-	0.3+
1997 01 10	691	0.3+ 0.2-	1999 09 07	704	0.4-	0.6+	1999 10 02	703	0.2+	0.0
1998 04 21	704	1.0- 0.5-	1999 09 07	704	0.1+	0.5+	1999 10 02	703	1.5+	1.6+
1998 04 21	704	0.5+ 0.2-	1999 09 07	704	0.3-	0.3+	1999 11 04	703	0.8-	0.8+
1998 04 21	704	2.0+ 0.8+	1999 09 07	704	0.2-	0.7+	1999 11 04	703	0.6+	1.2-
1998 04 21	704	0.4- 1.5+	1999 09 07	704	0.2+	0.4+	1999 11 04	703	1.3+	0.1-
1998 04 21	704	1.0+ 1.7+	1999 09 08	704	0.6-	0.2-	1999 11 04	703	0.9+	0.9+

(12578)* 1999 RF₁₇ = 1978 RF₇

Discovered 1999 Sept. 7 by the Lincoln Laboratory Near-Earth Asteroid

Research Team at Socorro.

Id. M. E. Sansaturio (*MPC* 36389)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	22.67476	(2000.0)	P	Q
<i>n</i>	0.28233072	ω 340.46926	+0.62010073	+0.78161278
<i>a</i>	2.3012508	Ω 327.74965	-0.70191648	+0.51431878
<i>e</i>	0.1264169	<i>i</i> 7.26731	-0.35041166	+0.35292725
<i>P</i>	3.49	<i>H</i> 15.2	<i>G</i> 0.15	<i>U</i> 2

Residuals in seconds of arc

1978 09 02	809	0.4- 0.6-	1998 04 01	704	(4.7- 1.7-)	1999 09 14	704	0.3+	0.2-
1978 09 02	809	0.2+ 0.2-	1999 07 16	704	1.3- 0.4-	1999 09 14	704	0.5+	0.5-
1978 09 02	809	0.9+ 0.1-	1999 07 16	704	0.6- 1.0-	1999 09 14	704	0.4+	0.5-
1978 09 02	809	0.2- 1.3-	1999 07 16	704	0.1+ 0.4-	1999 09 14	704	0.8+	0.3-
1978 09 06	809	0.2- 1.1-	1999 07 16	704	0.0 1.0-	1999 09 14	703	0.1+	0.3+
1978 09 10	809	0.6- 1.2+	1999 08 22	699	0.0 1.1+	1999 09 14	703	0.6+	0.8+
1978 09 10	809	1.2+ 1.7-	1999 08 22	699	0.2- 0.7+	1999 09 14	703	0.2+	0.6+
1978 09 10	809	0.4+ 1.3+	1999 08 22	699	1.0+ 0.4+	1999 09 14	703	0.2+	0.3+
1978 09 10	809	0.7+ 0.1-	1999 09 04	703	0.5+ 0.4+	1999 10 02	704	1.2-	0.1+
1992 09 23	691	0.9- 0.6-	1999 09 04	703	0.1+ 0.4+	1999 10 02	704	1.1+	0.2-
1992 09 23	691	0.0 0.3-	1999 09 04	703	0.1- 0.6+	1999 10 02	704	0.3-	0.6-
1992 09 23	691	0.4- 0.1+	1999 09 04	703	0.6- 1.5+	1999 10 02	704	0.8-	0.1+
1994 01 21	691	0.5- 0.5-	1999 09 07	704	0.3- 0.1-	1999 10 02	704	0.5-	0.2+
1994 01 21	691	0.2- 0.6-	1999 09 07	704	0.4- 0.2+	1999 10 07	703	0.5+	0.4+
1994 01 21	691	0.0 0.3-	1999 09 07	704	0.1+ 0.1+	1999 10 07	703	1.4+	0.6+
1998 03 24	566	(1.3- 2.0-)	1999 09 07	704	0.3+ 0.4+	1999 10 07	703	0.5+	0.4-
1998 03 24	566	(2.2- 2.5-)	1999 09 07	704	0.3- 0.2+	1999 10 07	703	0.1+	0.1+
1998 03 24	566	(1.7- 2.7-)	1999 09 08	704	0.0 0.2+	1999 10 07	704	0.3-	0.5-
1998 03 29	704	0.5- 0.8-	1999 09 08	704	0.4- 0.2-	1999 10 07	704	0.7-	0.3-
1998 03 29	704	0.8- 1.3+	1999 09 08	704	0.0 0.0	1999 10 07	704	0.9-	0.9-
1998 03 29	704	0.1- 0.8-	1999 09 08	704	0.1+ 0.0	1999 10 07	704	0.5-	0.6-
1998 03 29	704	1.5- 0.0	1999 09 09	704	0.0 0.7-	1999 10 07	704	0.5-	0.1-
1998 03 29	704	1.4- 0.7-	1999 09 09	704	0.1+ 0.6-	1999 11 06	704	0.0	0.3+
1998 04 01	704	0.3- 0.6-	1999 09 09	704	0.2+ 0.2-	1999 11 06	704	0.0	0.4+
1998 04 01	704	1.3+ 0.7+	1999 09 09	704	0.4+ 0.1+	1999 11 06	704	(0.7+ 2.9-)	
1998 04 01	704	1.2+ 0.7-	1999 09 09	704	0.2+ 0.4-	1999 11 06	704	(3.2+ 4.9-)	
1998 04 01	704	1.0+ 0.7-	1999 09 14	704	0.5+ 0.3-				

(12579)* 1999 RA₂₈ = 1994 TO₁₂ = 1997 CE₁₉ = 1998 HU₁₀₂

Discovered 1999 Sept. 5 at the Osservatorio S. Vittore, Bologna.

Id. A. Doppler (*MPC* 36396)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	53.16623	(2000.0)	P	Q
<i>n</i>	0.18172581	ω 237.77855	+0.09006533	+0.99578901
<i>a</i>	3.0869172	Ω 37.40053	-0.90401658	+0.08894620
<i>e</i>	0.1720190	<i>i</i> 1.61349	-0.41790222	+0.02219950
<i>P</i>	5.42	<i>H</i> 14.5	<i>G</i> 0.15	<i>U</i> 1

Residuals in seconds of arc

1994 10 10	691	0.0	0.1-	1998 05 01	566	0.1+	0.6-	1999 09 08	552	0.0	0.2-
1994 10 10	691	0.5+	1.3-	1998 05 05	699	0.6+	0.5+	1999 09 08	552	0.0	0.6+
1994 10 10	691	0.1-	0.4-	1998 05 05	699	0.9-	0.0	1999 09 09	704	0.3+	0.8+
1994 10 12	691	0.1+	0.4+	1998 05 05	699	0.1-	0.6+	1999 09 09	704	0.1-	0.0
1994 10 12	691	0.1+	0.2-	1998 05 24	704	0.8-	0.6-	1999 09 09	704	0.1-	0.2+
1994 10 12	691	0.3+	0.3-	1998 05 24	704	0.8+	0.7+	1999 09 09	704	0.1+	0.4+
1997 02 01	327	0.9+	0.1+	1998 05 24	704	0.7-	0.5+	1999 09 09	704	0.2-	0.4-
1997 02 01	327	0.8-	0.7+	1998 05 24	704	0.9+	0.4-	1999 09 10	552	0.2+	0.2+
1997 02 01	327	1.1+	0.6+	1998 05 24	704	0.9-	0.8+	1999 09 10	552	0.0	0.8-
1997 02 06	327	1.0-	0.2+	1999 08 12	699	0.6+	0.4-	1999 09 10	552	0.7-	0.4-
1997 02 06	327	0.6+	0.0	1999 08 12	699	0.5-	1.4+	1999 09 11	552	0.6-	0.0
1997 02 06	327	1.4-	0.2+	1999 08 12	699	0.5+	0.1-	1999 09 11	552	0.2+	0.0
1997 02 06	327	0.2+	0.5+	1999 09 04	691	0.5-	0.1+	1999 09 11	552	0.3+	0.5+
1997 02 06	327	0.1-	0.8+	1999 09 04	691	0.4-	0.4+	1999 09 12	552	0.2-	0.8-
1997 02 06	327	1.6+	0.1-	1999 09 04	691	0.4-	0.4+	1999 09 12	552	0.4+	0.3-
1998 04 25	809	(2.8+	0.9+)	1999 09 05	552	1.0-	0.9-	1999 09 14	704	1.5+	1.0-
1998 04 25	809	(2.3+	0.4+)	1999 09 05	552	0.0	1.3-	1999 09 14	704	0.8+	0.3+
1998 04 25	809	2.0+	0.3-	1999 09 05	552	0.6-	0.7+	1999 09 14	704	0.3-	0.2-
1998 04 28	809	(3.2+	0.6+)	1999 09 07	704	0.0	0.9+	1999 09 14	704	0.1-	1.6+

M.P.C. 36764

1998 04 28	809	(2.6+ 0.1+)	1999 09 07	704	0.1- 0.5+	1999 10 08	552	0.0 0.7+
1998 04 28	809	(2.6+ 0.3+)	1999 09 07	704	1.0+ 0.2-	1999 10 08	552	0.1+ 0.3-
1998 05 01	566	0.2- 0.4-	1999 09 07	704	0.9- 0.9+			
1998 05 01	566	0.7- 0.7-	1999 09 08	552	1.1- 0.4+			

(12580)* 1999 RM₃₃ = 1978 WG₁₆

Discovered 1999 Sept. 8 by L. Bernasconi at St. Michel sur Meurthe.

Id. G. V. Williams (*MPC* 36399)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	350.80266		(2000.0)		P		Q	
<i>n</i>	0.18386088	ω	309.63179		+0.98769411		+0.15356531	
<i>a</i>	3.0629730	Ω	41.55910		-0.12629433		+0.89488933	
<i>e</i>	0.2454207	<i>i</i>	2.56010		-0.09225018		+0.41903553	
<i>P</i>	5.36	<i>H</i>	14.2		<i>G</i>	0.15	<i>U</i>	1

Residuals in seconds of arc

1978 11 30	675	0.1+ 0.2+	1999 08 12	699	0.7- 0.9+	1999 09 13	704	0.1+ 0.1-
1978 12 01	675	0.1- 1.1+	1999 08 12	699	0.4- 0.9+	1999 09 13	704	0.2- 0.0
1994 11 29	691	0.2- 0.5-	1999 09 07	704	0.1- 0.2-	1999 09 13	704	0.1+ 0.5-
1994 11 29	691	0.6- 0.4-	1999 09 07	704	0.1- 0.2+	1999 09 13	704	0.3- 0.3-
1994 11 29	691	0.1- 0.5-	1999 09 07	704	0.2- 0.0	1999 09 30	704	0.4+ 0.5+
1995 11 23	691	0.3- 0.0	1999 09 07	704	0.6+ 0.6+	1999 09 30	704	0.2+ 0.1+
1995 11 23	691	0.3- 0.2-	1999 09 07	704	0.2- 0.9+	1999 09 30	704	0.2- 0.0
1995 11 23	691	0.0 0.0	1999 09 08	703	0.1- 0.1-	1999 09 30	704	0.3+ 1.1+
1996 01 26	691	0.1- 0.1+	1999 09 08	703	0.3+ 0.6+	1999 09 30	704	0.2+ 0.2+
1996 01 26	691	0.5- 0.1+	1999 09 08	703	0.1+ 0.2-	1999 10 07	704	0.4+ 0.8-
1996 01 26	691	0.3- 0.2+	1999 09 08	703	0.1- 0.2-	1999 10 07	704	0.5- 0.6-
1996 02 16	691	0.6+ 0.7-	1999 09 08	164	0.2+ 0.1-	1999 10 07	704	0.2+ 0.2-
1996 02 16	691	0.7+ 0.1+	1999 09 08	164	0.1- 0.1+	1999 10 07	704	0.1- 0.2-
1996 02 16	691	0.8+ 0.2+	1999 09 09	164	0.2+ 1.1+	1999 10 07	704	0.7- 0.0
1998 05 22	704	1.7- 0.5+	1999 09 09	704	0.5- 1.5-	1999 11 08	704	0.6- 0.5-
1998 05 22	704	(0.3+ 2.4-)	1999 09 09	704	0.8+ 0.7-	1999 11 08	704	0.0 0.2-
1998 05 22	704	0.2+ 0.9-	1999 09 09	704	0.0 0.3-	1999 11 08	704	0.5- 0.3-
1998 05 22	704	1.0+ 0.6+	1999 09 09	704	0.3+ 0.0	1999 11 08	704	0.1+ 2.0+
1999 07 16	704	0.7- 0.5-	1999 09 10	164	0.2+ 0.2-	1999 11 15	704	0.5+ 0.4+
1999 07 16	704	0.4+ 0.2-	1999 09 10	164	0.2- 0.4-	1999 11 15	704	0.1- 0.1+
1999 07 16	704	0.6- 0.1+	1999 09 10	164	0.2- 0.5-	1999 11 15	704	0.9+ 0.3-
1999 07 16	704	1.1+ 0.4+	1999 09 10	164	0.6- 0.8-	1999 11 15	704	0.4+ 0.3-
1999 08 12	699	0.3+ 0.8+	1999 09 13	704	0.2+ 0.0	1999 11 15	704	0.4+ 0.1-

(12581)* 1999 RE₃₄ = 1992 RQ₄ = 1998 KT₁₇

Discovered 1999 Sept. 8 at Višnja.

Id. G. V. Williams (*MPC* 36037), M. E. Sansaturio (*MPC* 36400)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	168.80823		(2000.0)		P		Q	
<i>n</i>	0.29020145	ω	193.77806		-0.99589504		+0.09000081	
<i>a</i>	2.2594514	Ω	351.36828		-0.07576753		-0.88715215	
<i>e</i>	0.0932898	<i>i</i>	3.68241		-0.04952112		-0.45261564	
<i>P</i>	3.40	<i>H</i>	15.1		<i>G</i>	0.15	<i>U</i>	2

Residuals in seconds of arc

1992 09 02	809	1.2- 1.0+	1998 05 24	704	0.3- 0.3+	1999 10 06	704	0.8+ 0.2+
1992 09 02	809	0.9- 0.6+	1998 05 24	704	0.4- 1.4-	1999 10 07	703	0.1+ 0.7+
1992 09 02	809	0.9- 0.3-	1999 09 07	704	0.7- 0.7-	1999 10 07	703	0.2- 0.8-
1992 09 03	809	0.6- 0.9+	1999 09 07	704	0.4+ 1.2-	1999 10 07	703	0.2- 0.3-
1992 09 23	809	2.0+ 0.7-	1999 09 07	704	0.1+ 0.6-	1999 10 07	703	0.0 0.3+
1992 09 23	809	1.3+ 0.8-	1999 09 07	704	0.4- 1.8-	1999 10 07	704	0.7- 0.1+
1992 09 23	809	0.9+ 1.4-	1999 09 07	704	0.7- 0.4-	1999 10 07	704	0.3- 1.0+
1993 11 10	691	0.1- 0.0	1999 09 08	120	0.4- 0.7+	1999 10 07	704	0.1+ 0.1-
1993 11 10	691	0.1- 0.1+	1999 09 08	120	0.7- 0.3-	1999 10 07	704	1.5+ 0.0
1993 11 10	691	0.0 0.1-	1999 09 11	120	1.2+ 1.3-	1999 10 07	704	0.7+ 0.1-
1998 04 22	704	0.9+ 0.5+	1999 09 11	120	(3.8- 0.7+)	1999 10 09	704	0.1- 0.6+
1998 04 22	704	0.3+ 1.1-	1999 09 12	120	0.4+ 0.2-	1999 10 09	704	0.0 0.1+
1998 04 22	704	0.6- 0.5-	1999 09 12	120	0.5- 0.2+	1999 10 09	704	0.4- 0.5+
1998 04 22	704	0.4- 0.3-	1999 09 13	120	1.5- 0.0	1999 10 09	704	0.3+ 0.5+

1999 NOV. 23

1998 05 01	704	0.3- 0.6-	1999 09 13	120	0.2- 0.8-	1999 10 09	704	0.2- 0.4+
1998 05 01	704	1.4+ 1.0-	1999 09 29	120	0.4- 0.6+	1999 10 15	704	0.3- 0.0
1998 05 01	704	1.2+ 0.6-	1999 09 29	120	(2.1+ 0.1+)	1999 10 15	704	0.6- 0.9-
1998 05 01	704	(0.8+ 2.2-)	1999 10 04	704	0.2+ 0.5+	1999 10 15	704	0.1- 0.7+
1998 05 01	704	(5.3- 1.2+)	1999 10 04	704	0.8+ 1.1-	1999 11 03	703	(4.3- 2.4-)
1998 05 22	704	1.5+ 0.4+	1999 10 04	704	0.3+ 0.6+	1999 11 03	703	0.4+ 0.3+
1998 05 22	704	1.4- 1.3+	1999 10 04	704	0.8- 0.2-	1999 11 03	703	0.5- 1.2+
1998 05 22	704	0.1+ 1.5+	1999 10 04	704	0.9+ 1.1+	1999 11 03	703	0.2- 0.8+
1998 05 22	704	0.8+ 0.9-	1999 10 06	704	1.2+ 0.7+	1999 11 06	704	0.2- 0.3-
1998 05 24	704	1.0- 0.6+	1999 10 06	704	0.4+ 0.3+	1999 11 06	704	0.2+ 0.1+
1998 05 24	704	1.0- 0.3+	1999 10 06	704	0.8+ 0.1-	1999 11 06	704	1.1- 0.0
1998 05 24	704	0.5- 1.9+	1999 10 06	704	0.7+ 0.0	1999 11 06	704	0.9- 0.7-

(12582)* 1999 RY₃₄ = 1950 FG = 1962 WM₁ = 1982 US₁ = 1985 QT₅
= 1989 XG₂ = 1998 ME₂₇

Discovered 1999 Sept. 11 at Višnja.

Id. A. Doppler (*MPC* 36402), G. V. Williams (*ibid.*)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	261.34739		(2000.0)		P		Q	
<i>n</i>	0.29161747	ω	61.67001		-0.67101932		-0.74014499	
<i>a</i>	2.2521312	Ω	70.54505		+0.66295786		-0.62539538	
<i>e</i>	0.1160501	<i>i</i>	2.66250		+0.33199389		-0.24711540	
<i>P</i>	3.38	<i>H</i>	13.6		<i>G</i>	0.15	<i>U</i>	2

Residuals in seconds of arc

1950 03 19	012	0.7+ 1.6+	1999 09 11	120	0.3+ 0.0	1999 11 01	703	0.2+ 0.4+
1962 11 30	760	0.2+ 1.6+	1999 09 12	120	0.2+ 0.2+	1999 11 01	703	0.1- 0.4+
1962 11 30	760	(1.4- 4.0+)	1999 09 12	120	0.0 0.4-	1999 11 04	704	0.6+ 0.1-
1982 10 16	046	(1.4- 4.5-)	1999 09 12	120	0.1- 0.2+	1999 11 04	704	0.5+ 0.2-
1982 10 16	046	1.2+ 2.1-	1999 09 13	120	0.0 0.2+	1999 11 04	704	0.4+ 0.3-
1982 10 21	046	0.7- 0.9-	1999 09 13	120	0.1+ 0.3+	1999 11 04	704	0.4+ 0.2-
1982 10 21	046	1.4+ 0.5-	1999 09 22	120	0.3- 0.8+	1999 11 04	704	0.7+ 0.3-
1985 08 24	095	1.3- 0.6+	1999 09 22	120	0.3- 0.5+	1999 11 09	704	0.1- 0.9-
1989 12 01	071	1.4- 0.2+	1999 10 07	704	1.6+ 1.4+	1999 11 09	704	0.1- 0.9-
1989 12 01	071	(3.3- 0.1+)	1999 10 07	704	0.6- 0.7+	1999 11 09	704	0.2- 1.1-
1989 12 01	071	(18.5- 2.2-)	1999 10 07	704	0.5- 0.8+	1999 11 09	704	0.2- 1.0-
1998 06 24	704	0.2- 0.0	1999 10 08	703	0.0 0.5+	1999 11 09	704	0.3- 1.1-
1998 06 24	704	0.6+ 0.8+	1999 10 08	703	0.1+ 0.3+	1999 11 12	704	0.2+ 0.0
1998 06 24	704	(2.5+ 0.7+)	1999 10 08	703	0.1- 0.4+	1999 11 12	704	0.3+ 0.1+
1998 06 24	704	0.2- 1.5+	1999 10 08	703	0.3- 0.4+	1999 11 12	704	0.3+ 0.2+
1998 06 26	704	0.2- 0.3+	1999 10 10	120	0.0 0.3+	1999 11 12	704	0.2+ 0.3+
1998 06 26	704	1.2- 0.1-	1999 10 10	120	0.2- 0.1+	1999 11 12	704	0.2+ 0.3+
1998 06 26	704	1.4+ 0.8+	1999 10 10	120	0.5+ 0.5+	1999 11 16	691	0.5+ 0.1+
1998 06 26	704	1.5- 0.5-	1999 10 16	611	1.6- 1.5-	1999 11 16	691	0.5+ 0.0
1998 07 21	704	0.4- 0.6-	1999 10 16	611	0.3- 0.1+	1999 11 16	691	0.6+ 0.1+
1998 07 21	704	0.2+ 0.4+	1999 10 29	703	0.1+ 0.3+	1999 11 17	704	0.4- 0.5-
1998 07 21	704	(2.2+ 0.9+)	1999 10 29	703	0.1- 0.4+	1999 11 17	704	0.0 0.2+
1998 07 21	704	0.0 0.7-	1999 10 29	703	0.1- 0.3+	1999 11 17	704	0.1+ 0.4+
1998 07 21	704	1.7+ 0.2+	1999 10 29	703	0.0 0.1+	1999 11 17	704	1.2- 0.1+
1999 09 11	120	0.3- 0.2+	1999 11 01	703	0.3- 0.6+	1999 11 17	704	0.4- 0.6+
1999 09 11	120	0.6- 0.2-	1999 11 01	703	0.1- 0.6+			

(12583)* 1999 RC₃₅ = 1958 VC₁ = 1978 TP₁ = 1979 YO₂ = 1994 UG₁

Discovered 1999 Sept. 11 by D. K. Chesney at High Point.

Id. G. V. Williams (*MPC* 36038)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	332.04247		(2000.0)		P		Q	
<i>n</i>	0.19118682	ω	14.79938		+0.74669396		-0.65958885	
<i>a</i>	2.9842194	Ω	27.07575		+0.58948141		+0.59630551	
<i>e</i>	0.0754661	<i>i</i>	10.88703		+0.30815546		+0.45756125	
<i>P</i>	5.16	<i>H</i>	12.3		<i>G</i>	0.15	<i>U</i>	2

Residuals in seconds of arc

1958 11 13

1999 NOV. 23

M.P.C. 36765

1978 10 03	095	0.4−	0.1−	1999 10 05	704	0.3+	0.3+	1999 10 28	327	0.3−	0.1+
1979 12 24	095	0.2+	1.1−	1999 10 05	704	0.3+	0.2+	1999 10 29	757	0.7+	0.4−
1994 10 25	399	0.3−	0.1+	1999 10 05	704	0.2+	0.4+	1999 10 29	757	0.2+	0.1+
1994 10 25	399	0.3−	0.5+	1999 10 05	704	0.3+	0.4+	1999 10 30	703	0.2−	0.2+
1994 10 26	399	0.4−	0.8−	1999 10 07	727	0.3−	0.0	1999 10 30	703	0.6−	0.0
1994 10 26	399	0.4+	1.2−	1999 10 07	727	0.1−	0.3+	1999 10 30	703	0.5−	0.2+
1995 02 02	691	0.4−	1.0+	1999 10 07	727	0.3−	0.4+	1999 10 30	703	0.3−	0.1−
1995 02 02	691	1.0−	0.7+	1999 10 07	704	0.1+	0.1+	1999 11 05	704	0.3−	0.3+
1995 02 02	691	0.6−	0.9+	1999 10 07	704	0.1+	0.2+	1999 11 05	704	0.0	0.5+
1999 09 11	757	0.3−	0.6+	1999 10 07	704	0.1−	0.2+	1999 11 05	704	0.1−	0.1+
1999 09 11	757	0.5−	0.0	1999 10 07	704	0.3−	0.7+	1999 11 05	704	0.0	0.8+
1999 09 12	757	0.8−	0.3+	1999 10 09	704	0.2+	0.1+	1999 11 05	704	0.4−	0.7+
1999 09 12	757	0.2−	0.5+	1999 10 09	704	0.0	0.3−	1999 11 06	704	0.1−	0.1+
1999 09 13	757	0.2−	0.3−	1999 10 09	704	0.3+	0.1−	1999 11 05	704	0.2−	0.1−
1999 09 13	757	0.3+	0.1+	1999 10 09	704	0.2−	0.4−	1999 11 06	704	0.1−	0.2−
1999 09 17	757	0.2−	0.1−	1999 10 09	704	0.1+	0.5−	1999 11 06	704	0.1−	0.3−
1999 09 17	757	0.1+	0.4+	1999 10 15	704	0.3+	0.4−	1999 11 06	704	0.3−	0.4−
1999 09 23	757	0.5+	0.1−	1999 10 15	704	0.4−	0.7−	1999 11 13	106	0.2−	0.0
1999 09 23	757	0.5−	1.0−	1999 10 15	704	0.1−	0.8−	1999 11 13	106	0.9−	0.3−
1999 09 23	848	0.1+	0.3−	1999 10 15	704	(7.3−	1.7−)	1999 11 13	106	0.4−	0.1+
1999 09 23	848	0.2+	0.1−	1999 10 19	704	0.9+	0.1−	1999 11 14	704	1.3+	0.2−
1999 09 23	848	0.0	0.4−	1999 10 19	704	0.3+	0.2−	1999 11 14	704	0.2+	0.1−
1999 10 02	703	0.5−	0.2+	1999 10 19	704	0.5+	0.1+	1999 11 14	704	0.1+	0.3+
1999 10 02	703	0.1−	0.3+	1999 10 19	704	0.5+	0.2+	1999 11 14	704	0.5+	0.5−
1999 10 02	703	0.4−	0.0	1999 10 19	704	0.6+	0.1+	1999 11 14	704	0.7−	0.2+
1999 10 02	703	0.1+	0.3−	1999 10 19	120	0.5+	0.6+	1999 11 16	704	1.4+	0.6−
1999 10 04	704	0.2+	0.3−	1999 10 19	120	0.6+	1.0+	1999 11 16	704	0.1+	0.5−
1999 10 04	704	0.1+	0.2−	1999 10 27	327	0.3−	0.0	1999 11 16	704	0.6+	0.3−
1999 10 04	704	0.8+	0.3−	1999 10 27	327	0.2−	0.1+	1999 11 16	704	0.2+	1.4−
1999 10 04	704	0.1+	0.6+	1999 10 27	327	0.3−	0.1−	1999 11 16	704	0.7−	1.3−

(12584)* 1999 RF₃₆ = 1977 UX₄ = 1988 VU₁₁ = 1998 KP₁₈

Discovered 1999 Sept. 12 at Višnjan.

Id. G. V. Williams (*MPC* 36402)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

M	27.87076		(2000.0)	$\mathbf{P}$	$\mathbf{Q}$
n	0.26978205	ω	299.12594	+0.93094933	+0.35568710
a	2.3720692	Ω	40.19672	−0.27447382	+0.83080420
e	0.1374982	i	7.35139	−0.24082662	+0.42807836
P	3.65	H	14.6	G 0.15	U 1

Residuals in seconds of arc

1977 10 18	675	0.3−	0.6−	1999 09 12	120	1.0−	0.4−	1999 10 29	703	0.6−	0.3+
1977 10 19	675	0.1+	0.4−	1999 09 13	120	0.6+	0.7−	1999 10 29	703	0.6−	0.1−
1988 11 03	327	0.6+	1.5−	1999 09 13	120	0.0	0.9−	1999 10 29	703	1.3−	0.9+
1988 11 03	327	0.1−	1.1−	1999 09 16	120	1.1−	0.0	1999 10 30	691	0.4−	0.0
1988 11 04	327	2.2+	0.2+	1999 09 16	120	0.2+	0.2−	1999 10 30	691	0.4−	0.1−
1994 04 10	691	0.1−	0.2−	1999 09 16	120	1.0+	0.8−	1999 10 30	691	0.3−	0.0
1994 04 10	691	0.0	0.0	1999 09 17	120	0.8+	1.7−	1999 11 04	704	0.2+	0.1+
1994 04 10	691	0.1+	0.7−	1999 09 17	120	0.3−	0.2−	1999 11 04	704	0.0	0.0
1997 03 03	327	0.4−	0.6−	1999 09 18	703	0.6−	0.5+	1999 11 04	704	0.0	0.8−
1997 03 03	327	0.4−	0.5−	1999 09 18	703	0.7+	0.7+	1999 11 11	703	0.0	0.2+
1997 03 03	327	0.2−	0.4−	1999 09 18	703	0.4+	0.5+	1999 11 11	703	0.0	0.1+
1998 04 22	704	0.6+	0.7−	1999 09 18	703	0.0	1.0+	1999 11 11	703	0.6−	0.4+
1998 04 22	704	0.1−	0.7+	1999 10 02	120	0.7+	0.4−	1999 11 11	703	0.6−	0.4+
1998 04 22	704	0.2−	0.8−	1999 10 02	120	0.0	0.1+	1999 11 14	704	0.2+	0.2−
1998 04 22	704	0.6+	1.0−	1999 10 02	703	0.1−	0.4−	1999 11 14	704	0.3+	0.1−
1998 04 22	704	1.2−	0.8−	1999 10 02	703	0.0	0.0	1999 11 14	704	0.2+	0.1−
1998 04 25	699	0.7+	0.4−	1999 10 02	703	0.1+	0.4+	1999 11 14	703	0.6−	0.4+
1998 04 25	699	1.0+	0.4+	1999 10 02	703	0.2−	0.1+	1999 11 14	704	0.2+	0.1+
1998 04 25	699	0.4+	0.5−	1999 10 03	704	0.1+	0.7−	1999 11 14	703	0.3−	0.2+
1998 05 22	704	0.8−	0.3+	1999 10 03	704	0.4+	0.6+	1999 11 14	704	0.1+	0.1+
1998 05 22	704	0.9−	1.0−	1999 10 03	704	0.6−	1.2−	1999 11 14	703	0.2−	0.2+
1998 05 22	704	0.1+	0.6+	1999 10 03	704	0.2+	1.2+	1999 11 14	691	0.6+	0.1+
1998 05 22	704	0.3+	0.6−	1999 10 03	704	0.9−	0.6+	1999 11 14	703	0.1−	0.4+
1998 05 24	704	0.7+	0.1−	1999 10 07	704	1.1+	0.9−	1999 11 14	691	0.5+	0.1+
1998 05 24	704	(0.4−	2.7−)	1999 10 07	704	0.2+	0.1−	1999 11 14	691	0.6+	0.0

1998 05 24	704	1.4−	0.3+	1999 10 07	704	0.2−	1.2−	1999 11 16	704	0.1+	0.1−
1998 05 24	704	1.2−	0.4+	1999 10 12	106	0.2−	0.3+	1999 11 16	704	0.3+	0.5+
1998 05 24	704	0.3+	0.8+	1999 10 12	106	0.4+	0.1+	1999 11 16	704	0.0	0.7+
1999 09 12	120	0.6−	0.7−	1999 10 12	106	0.1−	0.1−	1999 11 16	704	0.1+	0.3+
1999 09 12	120	0.8+	0.1−	1999 10 29	703	0.5−	0.2+	1999 11 16	704	0.4+	0.6+

(12585)* 1999 RN₆₄ = 1997 CN₂₄ = 1998 HK₁₄₂

Discovered 1999 Sept. 7 by the Lincoln Laboratory Near-Earth Asteroid Research Team at Socorro.

Id. A. Doppler (*MPC* 36414)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

M	345.61577		(2000.0)	$\mathbf{P}$	$\mathbf{Q}$
n	0.24189439	ω	220.75740	+0.98092612	+0.17181733
a	2.5510493	Ω	129.11362	−0.13353073	+0.93546296
e	0.1827897	i	6.72790	−0.14125680	+0.30884924
P	4.07	H	14.7	G 0.15	U 1

Residuals in seconds of arc

1995 08 30	809	0.7+	0.5−	1998 04 21	704	1.7−	0.4−	1999 09 07	704	0.4−	0.6+
1995 08 31	809	0.9+	0.5−	1998 04 23	704	1.1−	0.9+	1999 09 13	704	0.1+	0.4−
1995 08 31	809	0.3+	0.5−	1998 04 23	704	1.1+	0.1−	1999 09 13	704	0.2+	0.3−
1995 09 01	809	0.8−	1.6−	1998 04 23	704	1.6+	1.2−	1999 09 13	704	0.2+	0.2+
1996 11 12	691	0.3−	0.3+	1998 04 23	704	0.5−	1.1+	1999 09 13	704	0.2−	0.1+
1996 11 12	691	0.1−	0.4+	1998 04 23	704	0.6+	0.7+	1999 09 13	704	0.2+	0.6−
1996 11 12	691	0.4−	0.3+	1998 08 08	699	0.1+	1.1+	1999 09 30	704	1.3+	0.2−
1997 02 09	691	0.4+	0.1−	1998 08 08	699	0.6−	0.1+	1999 09 30	704	0.2+	0.6−
1997 02 09	691	0.4+	0.3−	1998 08 08	699	0.0	0.0	1999 09 30	704	0.6−	1.1+
1997 02 09	691	0.2+	0.2−	1999 09 07	699	0.3−	0.5+	1999 09 30	704	0.5+	0.8+
1997 02 14	691	0.3−	0.1+	1999 09 07	699	0.4−	0.7+	1999 09 30	704	0.3+	0.9−
1997 02 14	691	0.4+	0.4−	1999 09 07	699	0.1+	0.2+	1999 11 10	704	0.1+	0.1−
1997 02 14	691	0.5−	1.0+	1999 09 07	704	0.2−	0.2+	1999 11 10	704	0.1−	0.4+
1998 04 21	704	0.8−	0.5−	1999 09 07	704	0.3−	0.4+	1999 11 10	704	0.2−	0.2−
1998 04 21	704	0.5+	1.9−	1999 09 07	704	0.2−	0.3+				
1998 04 21	704	0.2+	1.0+	1999 09 07	704	0.4−	0.0				

(12586)* 1999 RQ₈₁ = 1949 WV

Discovered 1999 Sept. 7 by the Lincoln Laboratory Near-Earth Asteroid Research Team at Socorro.

Id. G. V. Williams (*MPC* 36418)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

M	351.57462		(2000.0)	$\mathbf{P}$	$\mathbf{Q}$
n	0.21535252	ω	144.66645	+0.99346051	+0.11024352
a	2.7565725	Ω	209.04697	−0.11367245	+0.93059457
e	0.1785198	i	3.50797	−0.01071354	+0.34905604
P	4.58	H	13.7	G 0.15	U 2

Residuals in seconds of arc

1949 11 19	675	0.3+	0.2+	1999 09 09	704	0.1−	0.3+	1999 10 06	704	0.1−	0.2−
1949 11 19	675	1.4+	0.4−	1999 09 09	704	0.1+	0.4−	1999 10 06	704	0.2+	0.2−
1949 11 21	675	0.6−	0.5−	1999 09 09	704	0.2+	0.4−	1999 10 06	704	0.1+	0.1−
1949 11 21	675	0.8−	0.9−	1999 09 09	704	0.2−	0.7−	1999 10 07	704	0.1−	0.0
1993 03 22	809	1.6−	0.5+	1999 09 09	704	0.1−	1.1−	1999 10 07	704	0.3+	0.4−

1998 05 01	704	0.3−	0.2−	1999 09 14	704	0.6−	0.1−	1999 11 12	704	0.5−	0.3+
1999 07 23	704	0.2−	0.0	1999 10 02	704	0.3+	0.0	1999 11 12	691	0.1+	0.1+
1999 07 23	704	0.1+	0.3+	1999 10 02	704	0.5+	0.5−	1999 11 12	704	0.2+	0.0
1999 07 23	704	0.0	0.4+	1999 10 02	704	0.1+	0.6−	1999 11 12	704	0.8+	0.2−
1999 07 23	704	0.4+	0.4+	1999 10 02	704	0.4+	0.2−	1999 11 12	691	0.2+	0.2+
1999 07 23	704	0.8+	0.4+	1999 10 02	704	0.7+	0.8−	1999 11 12	704	0.2+	0.4−
1999 09 07	704	0.2+	0.2+	1999 10 03	691	0.2−	0.1−	1999 11 12	691	0.2+	0.2+
1999 09 07	704	0.3+	0.1+	1999 10 03	691	0.3−	0.2−	1999 11 16	704	0.0	0.9−
1999 09 07	704	0.1+	0.5+	1999 10 03	691	0.0	0.2−	1999 11 16	704	0.1+	0.5+
1999 09 07	704	0.0	0.1+	1999 10 06	704	0.1+	0.4−	1999 11 16	704	0.0	0.2+
1999 09 07	704	0.2−	0.2−	1999 10 06	704	0.4+	0.3−	1999 11 16	704	0.1+	0.3+

(12587)* 1999 RD₉₅ = 1976 SV₈ = 1990 UC₆ = 1995 YK₂₂

Discovered 1999 Sept. 7 by the Lincoln Laboratory Near-Earth Asteroid Research Team at Socorro.

Id. G. V. Williams (*MPC* 36425)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	22.65603		(2000.0)	P	Q		
<i>n</i>	0.21445776	<i>ω</i>	346.86640	+0.83010053	+0.55720356		
<i>a</i>	2.7642344	<i>Ω</i>	339.22760	−0.50599627	+0.73659023		
<i>e</i>	0.0979297	<i>i</i>	3.45688	−0.23430939	+0.38335236		
<i>P</i>	4.60	<i>H</i>	13.3	<i>G</i>	0.15	<i>U</i>	1

Residuals in seconds of arc

1976 09 28	095	0.9+	0.9−	1999 09 05	699	0.4−	0.2−	1999 10 06	704	0.1+	0.1+
1990 10 24	046	(3.0−	1.2−)	1999 09 07	704	0.9+	0.2−	1999 10 06	704	0.3−	0.2−
1990 10 24	046	1.2−	0.4−	1999 09 07	704	0.4+	0.5−	1999 10 06	704	0.2+	0.1−
1992 01 30	691	0.4−	0.1+	1999 09 07	704	0.0	0.2−	1999 10 06	704	0.1−	0.2−
1992 01 30	691	0.1+	0.5+	1999 09 07	704	0.3+	0.6−	1999 10 06	704	0.0	0.1+
1992 01 30	691	0.2+	0.3+	1999 09 07	704	0.7−	1.1−	1999 10 07	703	0.1+	0.2−
1995 12 17	327	0.4+	0.2−	1999 09 08	699	0.2+	0.3+	1999 10 07	703	0.1−	0.2−
1995 12 17	327	0.3+	0.2+	1999 09 08	699	0.1+	1.1+	1999 10 07	703	0.1−	0.2+
1995 12 18	327	0.1−	0.0	1999 09 08	699	0.1−	1.5+	1999 10 07	703	0.0	0.1+
1995 12 18	327	0.5+	0.0	1999 09 09	704	0.0	0.0	1999 10 07	704	0.0	0.1−
1995 12 18	327	0.1−	0.4−	1999 09 09	704	0.2−	0.1−	1999 10 07	704	0.1+	0.2+
1998 05 24	704	0.4+	0.5+	1999 09 09	704	0.1−	0.0	1999 10 07	704	0.3+	0.2−
1998 05 24	704	0.1+	0.3+	1999 09 09	704	0.3−	0.2−	1999 10 07	704	0.4+	0.3+
1998 05 24	704	0.1−	0.7+	1999 09 09	704	0.2−	0.1+	1999 10 07	704	0.2+	0.2+
1998 05 24	704	0.5+	0.4−	1999 09 29	703	0.2−	0.4+	1999 10 29	703	0.5+	0.3+
1998 05 24	704	0.7−	0.2−	1999 09 29	703	0.2−	0.0	1999 10 29	703	0.3+	0.3+
1998 06 16	704	1.0+	0.4−	1999 09 29	703	0.1+	0.1−	1999 10 29	703	0.0	0.1−
1998 06 16	704	0.4+	0.9−	1999 09 29	703	0.0	0.2+	1999 10 29	703	0.1−	0.6+
1998 06 16	704	0.2+	0.4+	1999 10 04	704	0.2−	0.1−	1999 11 04	703	0.3−	0.2+
1998 06 16	704	0.3−	0.9−	1999 10 04	704	0.8−	0.4+	1999 11 04	703	0.1+	0.1+
1998 06 16	704	1.4−	1.5+	1999 10 04	704	0.1−	0.2−	1999 11 04	703	0.0	0.1+
1999 09 05	699	0.5−	0.3+	1999 10 04	704	0.4+	0.2−	1999 11 04	703	0.2−	0.0
1999 09 05	699	0.1−	0.0	1999 10 04	704	0.1−	0.1−				

(12588)* 1999 RR₉₈ = 1980 RU₁ = 1998 HO₁₂₂ = 4038 T-1

Discovered 1999 Sept. 7 by the Lincoln Laboratory Near-Earth Asteroid Research Team at Socorro.

Id. G. V. Williams (*MPC* 36043), M. E. Sansaturio (*MPC* 36426)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	347.15120		(2000.0)	P	Q		
<i>n</i>	0.25986790	<i>ω</i>	198.00149	+0.98638942	−0.16085085		
<i>a</i>	2.4320227	<i>Ω</i>	171.04606	+0.16440666	+0.96801159		
<i>e</i>	0.1910618	<i>i</i>	12.65648	−0.00252371	+0.19256313		
<i>P</i>	3.79	<i>H</i>	14.4	<i>G</i>	0.15	<i>U</i>	2

Residuals in seconds of arc

1971 03 24	675	0.2+	0.8−	1998 04 24	704	0.5−	0.6+	1999 09 08	699	0.2−	0.2+
1971 03 26	675	(4.6+	1.5−)	1998 05 01	699	0.2−	0.4−	1999 09 08	699	0.2+	0.1−
1971 03 26	675	0.3−	0.3+	1998 05 01	699	0.4−	0.5−	1999 09 14	704	0.7+	0.3+
1971 03 26	675	0.5−	0.9+	1998 05 01	699	1.4+	0.0	1999 09 14	704	0.6+	0.1−
1971 03 27	675	0.2+	2.0−	1998 05 23	704	0.7+	0.3−	1999 09 14	704	0.9+	0.3+

1971 03 27	675	0.3−	2.1−	1998 05 23	704	(4.7−	0.5+)	1999 09 14	704	0.7+	0.5+
1971 04 02	675	0.1−	0.2−	1998 05 23	704	(2.4−	0.9+)	1999 09 14	704	0.6+	0.5+
1980 09 15	511	0.3+	1.6+	1998 05 23	704	(2.7−	1.8+)	1999 10 02	704	0.9−	0.9−
1980 09 15	511	0.1−	0.4+	1998 05 23	704	(3.7−	0.9+)	1999 10 02	704	1.4−	0.8−
1980 09 15	511	0.4−	0.4−	1999 08 13	699	(2.7+	1.2+)	1999 10 02	704	0.1−	1.1−
1998 04 23	704	0.9−	0.2−	1999 08 13	699	0.5+	0.3+	1999 10 02	704	1.0−	0.6−
1998 04 23	704	0.1−	0.6−	1999 08 13	699	0.4+	0.4+	1999 10 02	704	1.1−	1.0−
1998 04 23	704	0.4+	0.4−	1999 09 07	704	0.3+	0.2−	1999 10 05	703	0.1+	0.4−
1998 04 23	704	(0.8+	2.5+)	1999 09 07	704	0.3+	0.6−	1999 10 05	703	0.3+	0.3−
1998 04 24	704	0.8−	0.0	1999 09 07	704	0.4+	1.3−	1999 10 05	703	0.2+	0.3−
1998 04 24	704	0.4+	0.3+	1999 09 08	699	0.1+	0.1+	1999 10 05	703	0.2+	0.2−

(12589)* 1999 RR₁₁₄ = 1985 BW₁ = 1998 ER₁₉

Discovered 1999 Sept. 9 by the Lincoln Laboratory Near-Earth Asteroid Research Team at Socorro.

Id. G. V. Williams (*MPC* 36431), A. Doppler (*ibid.*)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	13.90351		(2000.0)	P	Q		
<i>n</i>	0.30877066	<i>ω</i>	333.60193	+0.68048253	+0.73260410		
<i>a</i>	2.1679306	<i>Ω</i>	339.26790	−0.66441168	+0.60805365		
<i>e</i>	0.1522955	<i>i</i>	2.48064	−0.30903177	+0.30587905		
<i>P</i>	3.19	<i>H</i>	15.2	<i>G</i>	0.15	<i>U</i>	2

Residuals in seconds of arc

1985 01 20	691	0.4−	1.2−	1999 09 07	704	0.3−	0.2−	1999 09 30	699	0.5−	0.4+
1985 01 20	691	0.3−	1.5−	1999 09 07	704	0.1−	0.5−	1999 10 02	678	0.0	0.3−
1985 01 20	691	0.2−	0.9−	1999 09 07	704	0.1+	0.5−	1999 10 02	678	0.6−	0.4−
1996 10 05	691	0.0	0.1+	1999 09 07	704	0.0	0.3−	1999 10 02	678	0.1−	0.3−
1996 10 05	691	0.1−	0.1−	1999 09 09	704	0.2+	0.2−	1999 10 02	704	0.6−	0.8−
1996 10 18	566	0.4−	0.1−	1999 09 09	704	0.4−	0.7−	1999 10 02	704	1.3+	0.6−
1996 10 18	566	0.1+	0.1−	1999 09 09	704	0.0	0.8−	1999 10 02	704	0.3+	0.5−
1996 10 18	566	0.2−	0.0	1999 09 09	704	0.4+	0.7−	1999 10 02	704	0.2−	0.8+
1997 12 07	910	0.9−	1.1+	1999 09 09	704	0.0	0.9−	1999 10 03	678	1.0−	0.2+
1997 12 07	910	0.2−	0.8+	1999 09 09	704	0.0	0.4−	1999 10 03	678	0.2+	0.1+
1997 12 07	910	0.3−	0.8+	1999 09 09	704	0.1+	0.0	1999 10 07	704	(2.9+	1.1−)
1998 02 07	809	(2.1+	4.4+)	1999 09 09	704	0.6−	0.4−	1999 10 07	704	1.9+	0.8−
1998 02 07	809	(1.9+	4.4+)	1999 09 09	704	0.3+	0.0	1999 10 07	704	(0.7−	3.1+)
1998 02 07	809	(1.5+	4.5+)	1999 09 09	704	0.3+	0.4−	1999 11 04	703	0.5+	1.8+
1998 02 23	566	0.1−	1.0+	1999 09 14	704	0.4−	0.1−	1999 11 04	703	0.2+	0.9+
1998 02 23	566	0.0	0.6+	1999 09 14	704	0.1−	0.0	1999 11 04	703	0.0	0.2+
1998 02 23	566	0.0	0.5+	1999 09 14	704	0.3−	0.2−	1999 11 04	703	1.3−	0.1+
1998 03 03	809	0.9−	1.6−	1999 09 14	704	0.3−	0.4−	1999 11 07	704	0.5−	1.0+
1998 03 03	809	0.6−	1.0−	1999 09 14	704	0.2+	0.4−	1999 11 07	704	0.2+	1.6+
1998 03 03	809	0.5−	1.0−	1999 09 27	699	1.4+	0.0	1999 11 07	704	0.9+	0.5−
1998 03 04	809	1.1+	0.4−	1999 09 27	699	1.0+	0.6+	1999 11 12	704	0.2+	0.5+
1998 03 04	809	0.9+	0.1+	1999 09 27	699	0.4−	1.5+	1999 11 12	704	0.1−	0.5+
1998 03 04	809	0.7+	0.2−	1999 09 30	699	0.0	0.9+	1999 11 12	704	0.1+	0.6+
1999 09 07	704	0.2+	0.3−	1999 09 30	699	0.1−	0.5+	1999 11 12	704	0.3+	0.5−

(12590)* 1999 RN₁₂₅ = 1980 PN₄ = 1998 KV₂₅

Discovered 1999 Sept. 9 by the Lincoln Laboratory Near-Earth Asteroid Research Team at Socorro.

Id. A. Doppler (*MPC* 36436)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

M	30.58872		(2000.0)	P	Q
n	0.20962290	ω	107.15034	+0.49995491	+0.86583301
a	2.8065766	Ω	192.90035	−0.82402025	+0.46865980
e	0.0391958	i	4.99783	−0.26652527	+0.17518903
P	4.70	H	13.5	G 0.15	U 1

1995 10 20	691	0.1+	0.0	1999 08 08	699	0.7−	1.3+	1999 10 02	704	0.1−	0.5−
1998 04 22	704	(0.9+	2.1−)	1999 08 08	699	1.2−	0.5−	1999 10 02	704	0.4−	0.4+
1998 04 22	704	1.3−	0.8+	1999 08 22	699	0.8−	0.1+	1999 10 02	704	0.8−	1.2−
1998 04 22	704	0.4+	0.2−	1999 08 22	699	1.5−	0.6+	1999 10 06	704	0.2+	0.2+
1998 04 22	704	1.3−	0.1−	1999 08 22	699	0.4−	0.2+	1999 10 06	704	0.2−	0.2−
1998 04 22	704	0.1+	0.8−	1999 09 07	704	0.2+	0.4+	1999 10 06	704	0.2+	0.4−
1998 05 01	704	0.6−	0.5−	1999 09 07	704	0.7+	0.5+	1999 10 06	704	0.2−	0.6−
1998 05 01	704	0.3−	0.8−	1999 09 07	704	0.6+	0.9+	1999 10 06	704	0.6−	0.5−
1998 05 01	704	0.6−	0.9−	1999 09 07	704	0.5+	0.0	1999 11 08	704	0.1−	0.3+
1998 05 01	704	0.6−	0.6+	1999 09 07	704	0.6+	0.2−	1999 11 08	704	0.2−	1.1−
1998 05 05	699	0.9+	0.6−	1999 09 09	704	0.4+	0.2−	1999 11 08	704	1.1+	0.4+
1998 05 05	699	0.7−	0.1+	1999 09 09	704	0.5+	0.7+	1999 11 08	704	0.1+	1.2−
1998 05 05	699	0.6+	1.0−	1999 09 09	704	1.0+	0.1+	1999 11 08	704	0.0	0.5−
1998 05 22	704	0.2+	0.1−	1999 09 09	704	0.3+	0.2+	1999 11 08	704	0.1+	0.6−
1998 05 22	704	0.7+	0.2−	1999 09 09	704	0.6+	0.1+	1999 11 08	704	0.1+	0.4+
1998 05 22	704	0.5+	0.4−	1999 09 14	704	0.7+	0.1−	1999 11 10	704	0.4−	0.6−
1998 05 22	704	0.8−	0.2+	1999 09 14	704	1.0+	0.8−	1999 11 10	704	0.3−	1.1−
1998 05 22	704	0.2+	0.5+	1999 09 14	704	0.0	0.1+	1999 11 10	704	0.1−	0.6−
1998 05 23	699	0.4−	0.6−	1999 09 14	704	0.4+	0.6−	1999 11 10	704	0.7+	0.6−
1998 05 23	699	1.0+	0.2+	1999 09 14	704	0.8+	0.2−	1999 11 10	704	0.8−	1.2−
1998 05 23	699	1.3+	1.8+	1999 10 02	703	1.0−	1.0+				
1998 05 24	704	0.6+	0.9−	1999 10 02	703	0.6−	0.8+				

(12591)* 1999 RT₁₃₃ = 1959 SO = 1970 SM = 1992 WE = 1998 FJ₉₉
 Discovered 1999 Sept. 9 by the Lincoln Laboratory Near-Earth Asteroid
 Research Team at Socorro.

Id. S. Nakano (*MPC* 36440), A. Doppler (*ibid.*)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

				Nakano	
<i>M</i>	11.28286	<i>P</i>	(2000.0)	<i>Q</i>	
<i>n</i>	0.27014348	ω	61.31820	+0.71418686	+0.69422948
<i>a</i>	2.3699529	Ω	254.55720	−0.67019422	+0.64140268
<i>e</i>	0.1253307	<i>i</i>	5.31847	−0.20193278	+0.32657011
<i>P</i>	3.65	<i>H</i>	13.9	<i>G</i>	0.15

Residuals in seconds of arc

1959 09 30	024	0.3+	0.5−	1999 09 04	703	0.2−	0.4+	1999 10 02	703	0.5−	0.4+
1970 09 27	095	0.6+	1.7−	1999 09 04	703	0.3−	0.6+	1999 10 02	704	0.1−	0.7+
1992 11 16	399	(3.4−	3.2−)	1999 09 04	703	1.0−	1.0+	1999 10 02	704	0.1+	0.1−
1992 11 16	399	(2.0−	2.7−)	1999 09 08	699	0.0	0.9+	1999 10 02	704	0.3−	0.2+
1992 11 18	399	1.5−	0.5+	1999 09 08	704	0.1+	0.1−	1999 10 02	704	0.3+	0.4−
1992 11 18	399	0.4+	0.0	1999 09 08	699	0.0	0.5+	1999 10 02	704	0.7−	1.3−
1998 02 26	566	0.6+	0.5+	1999 09 08	704	0.3+	0.3−	1999 10 07	703	0.4+	0.6+
1998 02 26	566	0.8+	0.4+	1999 09 08	704	0.4+	0.8−	1999 10 07	703	0.5+	0.1−
1998 02 26	566	0.6+	0.6+	1999 09 08	699	0.1+	0.9+	1999 10 07	703	0.2−	0.3+
1998 03 26	566	0.3+	0.4−	1999 09 09	704	0.0	0.0	1999 10 07	703	0.2−	0.5+
1998 03 26	566	0.3+	0.5−	1999 09 09	704	0.2+	0.3+	1999 10 11	106	0.7−	0.8+
1998 03 26	566	0.2+	0.5−	1999 09 09	704	0.0	0.2−	1999 10 11	106	0.1−	0.8+
1998 03 31	704	0.0	0.8−	1999 09 09	704	0.3+	0.2−	1999 10 11	106	0.4+	0.3+
1998 03 31	704	0.3−	0.4−	1999 09 09	704	0.2−	0.2−	1999 11 04	703	0.1+	0.7+
1998 03 31	704	0.1+	0.8+	1999 09 10	704	0.6−	0.5+	1999 11 04	703	0.9−	0.0
1998 03 31	704	0.5−	0.2+	1999 09 10	704	0.1+	0.0	1999 11 04	703	0.5−	0.2+
1998 03 31	704	0.2−	0.2−	1999 09 10	704	0.1−	0.1−	1999 11 04	703	0.4−	0.2+
1998 04 01	704	0.5+	1.3−	1999 09 10	704	0.1−	0.3−	1999 11 07	704	0.4+	0.4+
1998 04 01	704	0.3−	0.8+	1999 09 10	704	0.1+	0.5−	1999 11 07	704	0.2−	0.5+
1998 04 01	704	0.2−	0.4+	1999 09 14	704	0.3−	0.2−	1999 11 07	704	0.3+	0.4+
1998 04 01	704	0.4−	0.6+	1999 09 14	704	0.2+	0.5−	1999 11 07	704	0.1−	0.3+
1998 04 01	704	1.0−	0.4+	1999 09 14	704	0.6−	0.5−	1999 11 07	704	0.6+	0.7+
1999 07 12	704	0.0	1.3−	1999 09 14	704	0.4−	0.1−	1999 11 16	704	1.0+	0.1−
1999 07 12	704	0.2−	0.1−	1999 09 14	704	0.2−	0.1−	1999 11 16	704	(2.5+	0.5−)
1999 07 12	704	0.5+	1.2−	1999 10 02	703	0.1+	0.2+	1999 11 16	704	1.7+	1.7−
1999 07 12	704	0.1−	0.3+	1999 10 02	703	0.1−	0.1+	1999 11 16	704	0.8+	1.8−
1999 09 04	703	0.3+	0.3+	1999 10 02	703	0.2−	0.3+	1999 11 16	704	1.4+	0.4−

(12592)* 1999 RD₁₃₄ = 1990 SS₁₉ = 1991 YP₁ = 1997 EA₂₇

Discovered 1999 Sept. 9 by the Lincoln Laboratory Near-Earth Asteroid
 Research Team at Socorro.

Id. G. V. Williams (*MPC* 36441), A. Doppler (*ibid.*)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

				Williams	
<i>M</i>	10.91825	<i>P</i>	(2000.0)	<i>Q</i>	
<i>n</i>	0.21532018	ω	31.96934	+0.73808567	+0.66551213
<i>a</i>	2.7568484	Ω	285.88907	−0.64079562	+0.63993079
<i>e</i>	0.1098164	<i>i</i>	6.62782	−0.21121203	+0.38416427
<i>P</i>	4.58	<i>H</i>	13.5	<i>G</i>	0.15

Residuals in seconds of arc

1990 09 18	675	(0.1+	2.6−)	1999 09 08	704	0.0	0.2+	1999 10 02	704	0.7+	0.3+
1990 09 18	675	1.0+	1.7−	1999 09 08	704	0.8−	0.2−	1999 10 02	704	0.8+	0.2−
1991 12 28	033	0.3+	0.4+	1999 09 08	699	0.1+	0.0	1999 10 02	704	0.8+	0.6−
1992 01 02	033	0.3+	0.5+	1999 09 08	699	0.0	0.2−	1999 10 02	704	(0.5+	2.3−)
1992 01 03	033	1.0−	0.5−	1999 09 08	699	0.1−	0.5+	1999 10 11	106	0.5+	0.3−
1997 01 11	691	0.2−	0.0	1999 09 09	704	0.4−	0.3−	1999 10 11	106	0.1−	0.0
1997 01 11	691	0.2−	0.1−	1999 09 09	704	0.4−	0.4−	1999 10 11	106	0.0	0.0
1997 01 11	691	0.2−	0.3−	1999 09 09	704	0.2−	0.0	1999 11 03	703	0.0	0.1+
1997 03 05	691	0.1+	0.3−	1999 09 09	704	0.2−	0.1+	1999 11 03	703	0.4+	0.9+
1997 03 05	691	0.0	0.5−	1999 09 09	704	0.1−	0.1+	1999 11 03	703	0.1−	0.4−
1997 03 05	691	0.1+	0.4−	1999 09 14	704	0.2−	0.5−	1999 11 03	703	0.7−	0.8+
1997 03 13	691	0.6−	0.4−	1999 09 14	704	0.3−	0.3−	1999 11 04	703	0.2+	0.0
1997 03 13	691	0.4+	0.6−	1999 09 14	704	0.3−	0.2−	1999 11 04	703	0.6+	0.8+
1997 03 13	691	0.1+	0.5−	1999 09 14	704	0.4−	0.3−	1999 11 04	703	0.4+	0.2+
1998 03 31	704	0.6+	0.2+	1999 09 14	704	0.4−	0.2−	1999 11 04	703	0.3+	0.1+
1998 03 31	704	0.2−	0.2+	1999 10 02	703	0.3+	0.2−	1999 11 07	704	0.1+	0.4−
1998 03 31	704	0.2+	0.1−	1999 10 02	703	0.0	0.4−	1999 11 07	704	0.7+	0.8−
1998 03 31	704	0.4+	1.1−	1999 10 02	703	0.3+	0.3+	1999 11 07	704	0.5−	0.0
1998 03 31	704	1.8−	0.9−	1999 10 02	703	0.3−	0.0	1999 11 07	704	0.5−	0.3+
1999 09 08	704	0.3−	0.3−	1999 10 02	704	1.1+	0.1+	1999 11 07	704	0.2−	0.1+

(12593)* 1999 RQ₁₃₆ = 1981 US₂₄ = 1998 FU₃₅

Discovered 1999 Sept. 9 by the Lincoln Laboratory Near-Earth Asteroid
 Research Team at Socorro.

Id. G. V. Williams (*MPC* 36442)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

				Williams	
<i>M</i>	37.91410	<i>P</i>	(2000.0)	<i>Q</i>	
<i>n</i>	0.26555603	ω	126.58391	+0.26000416	+0.96527660
<i>a</i>	2.3971688	Ω	158.44492	−0.90645190	+0.25301358
<i>e</i>	0.0887821	<i>i</i>	3.94510	−0.33278038	+0.06500171
<i>P</i>	3.71	<i>H</i>	14.6	<i>G</i>	0.15

Residuals in seconds of arc

1981 10 24	675	1.3+	0.1−	1998 03 22	704	0.6−	0.0	1999 09 13	704	0.1−	0.1+
1981 10 25	675	1.1−	0.7−	1998 04 19	704	0.5+	0.3+	1999 09 13	704	0.1+	0.1+
1997 01 10	691	0.1+	0.4−	1998 04 19	704	0.1+	0.1+	1999 09 13	704	0.5−	0.3−
1997 01 10	691	0.0	0.0	1998 04 19	704	1.6+	0.5−	1999 09 29	704	0.8−	0.1+
1997 01 10	691	0.1+	0.1−	1998 04 19	704	(2.9+	1.5−)	1999 09 29	704	0.4−	0.1+
1998 02 25	566	0.1+	0.7−	1999 09 07	704	0.5+	1.6−	1999 09 29	704	0.7−	0.4+
1998 02 25	566	0.0	1.0−	1999 09 07	704	0.4+	0.0	1999 09 29	704	(2.3−	1.4+)
1998 02 25	566	0.1−	0.7−	1999 09 07	704	0.7+	0.1+	1999 09 30	704	0.7−	0.0
1998 03 20	704	0.3−	0.2+	1999 09 07	704	0.5+	0.4−	1999 09 30	704	0.3−	0.1+
1998 03 20	704	0.3−	0.4+	1999 09 07	704	0.6+	0.6+	1999 09 30	704	0.4−	0.3−
1998 03 20	704	0.2+	0.1−	1999 09 09	704	(2.1+	0.3−)	1999 09 30	704	0.8−	0.1+
1998 03 20	704	0.6+	0.0	1999 09 09	704	0.3+	0.1+	1999 09 30	704	0.9−	0.2−
1998 03 20	704	0.2+	0.6−	1999 09 09	704	0.5+	1.2−	1999 10 04	703	0.6−	0.7+
1998 03 22	704	0.3−	0.7−	1999 09 09	704	0.7+	0.6−	1999 10 04	703	0.5+	0.2+
1998 03 22	704	0.8−	0.7+	1999 09 09	704	0.6+	0.9−	1999 10 04	703	0.4+	0.7+
1998 03 22	704	0.9−	0.2−	1999 09 13	704	0.3+	0.3−	1999 10 04	703	0.2+	0.1+
1998 03 22	704	1.0−	0.4−	1999 09 13	704	0.3+	0.1+				

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	354.40366		(2000.0)	P	Q
<i>n</i>	0.21557180	ω	100.63437	+0.92705082	+0.37092125
<i>a</i>	2.7547028	Ω	237.61339	-0.36433070	+0.85671883
<i>e</i>	0.1831347	<i>i</i>	3.71528	-0.08854328	+0.35839960
<i>P</i>	4.57	<i>H</i>	14.0	<i>G</i> 0.15	<i>U</i> 1

Residuals in seconds of arc

1990 09 19	675	0.0	0.3-	1998 04 22	704	1.6-	0.3-	1999 09 14	704	0.5-	0.3-
1990 09 19	675	0.5+	1.0-	1998 04 22	704	0.5+	0.5+	1999 09 29	704	0.2+	1.4+
1995 12 19	566	0.4-	0.4+	1998 04 22	704	0.6-	1.9-	1999 09 29	704	0.3-	0.7-
1995 12 19	566	0.8-	0.3+	1998 04 22	704	0.0	0.4-	1999 09 29	704	0.6-	0.7+
1995 12 19	566	0.6-	0.3+	1999 09 07	704	0.2+	0.1-	1999 09 29	704	1.2+	1.0-
1995 12 20	566	0.6+	0.9-	1999 09 07	704	0.6+	0.1+	1999 10 02	703	(2.4-	0.2+)
1995 12 20	566	0.7+	0.6-	1999 09 07	704	0.3+	0.1-	1999 10 02	703	2.0-	0.1+
1995 12 20	566	0.6+	0.4-	1999 09 07	704	0.7+	0.1+	1999 10 02	703	1.5-	0.0
1998 04 01	704	(1.5+	2.5-)	1999 09 07	704	0.5+	0.2+	1999 10 02	703	1.7-	0.5-
1998 04 01	704	(2.7-	0.9-)	1999 09 09	704	0.2-	0.0	1999 11 04	703	0.8+	0.3-
1998 04 01	704	1.8+	0.2-	1999 09 09	704	0.2-	0.1-	1999 11 04	703	0.2+	1.0+
1998 04 01	704	(3.9-	1.1+)	1999 09 09	704	0.4+	0.3-	1999 11 04	703	0.8+	0.2+
1998 04 21	704	0.4+	0.3+	1999 09 09	704	0.3+	0.2+	1999 11 04	703	0.1-	0.5+
1998 04 21	704	0.4+	1.4+	1999 09 09	704	0.9+	0.9+	1999 11 07	704	0.3+	0.0
1998 04 21	704	0.1+	0.6-	1999 09 14	704	0.1-	0.1-	1999 11 07	704	0.3+	0.1-
1998 04 21	704	1.0+	0.2-	1999 09 14	704	0.3-	0.4-	1999 11 07	704	0.3+	0.1-
1998 04 21	704	0.5-	1.5-	1999 09 14	704	0.6-	0.1-	1999 11 07	704	0.2+	0.4-
1998 04 22	704	1.7-	1.1+	1999 09 14	704	0.2-	0.1-	1999 11 07	704	0.2+	0.1-

(12595)* 1999 RD₁₄₉ = 1989 US₉ = 1992 PE₆ = 1998 FJ₃₄

Discovered 1999 Sept. 9 by the Lincoln Laboratory Near-Earth Asteroid

Research Team at Socorro.

Id. G. V. Williams (*MPC* 36447)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	353.10612		(2000.0)	P	Q
<i>n</i>	0.28704648	ω	0.14116	+0.92945068	+0.36835819
<i>a</i>	2.2759771	Ω	338.20841	-0.33855665	+0.82909994
<i>e</i>	0.1719397	<i>i</i>	3.21583	-0.14663163	+0.42060140
<i>P</i>	3.43	<i>H</i>	15.0	<i>G</i> 0.15	<i>U</i> 2

Residuals in seconds of arc

1989 10 25	400(42.9-	3.6-)	1998 03 29	704	0.3-	1.1+	1999 09 13	704	0.6+	1.1-	
1989 10 25	400(43.3-	1.6-)	1998 03 29	704	0.8-	0.1-	1999 09 13	704	0.8+	0.7-	
1989 10 25	400(45.4-	6.6-)	1998 03 29	704	1.4-	0.4+	1999 09 13	704	0.7+	0.0	
1992 08 01	809	0.2-	0.6+	1998 03 29	704	(0.6+	3.3-)	1999 09 13	704	0.9+	0.9-
1992 08 01	809	0.7+	0.7+	1998 03 29	704	(4.9-	0.4-)	1999 09 13	704	0.6+	1.0-
1992 08 01	809	1.5+	0.9+	1998 04 01	704	1.2-	1.1-	1999 09 26	699	0.8-	0.1+
1992 08 03	809	1.7-	0.5+	1998 04 01	704	(2.3+	0.1-)	1999 09 26	699	0.9-	1.0+
1992 08 03	809	0.8-	0.4+	1998 04 01	704	0.7-	0.8+	1999 09 26	699	0.4-	0.0
1992 08 03	809	0.4-	0.2+	1998 04 01	704	1.2-	0.2-	1999 09 29	704	0.5+	0.3-
1992 08 04	809	0.1-	0.0	1998 04 01	704	0.9-	1.5+	1999 09 29	704	0.7+	1.6-
1992 08 04	809	0.0	0.0	1998 04 19	704	0.4-	0.5+	1999 09 29	704	0.4-	0.1+
1992 08 04	809	0.4+	0.1+	1998 04 19	704	(1.0+	2.2-)	1999 09 29	704	0.6-	0.9-
1994 01 19	691	0.3+	0.4+	1998 04 19	704	(2.2-	0.0)	1999 09 30	704	0.2+	0.1-
1994 01 19	691	0.4-	0.8+	1998 04 19	704	0.8-	1.0+	1999 09 30	704	0.3-	0.7-
1994 01 19	691	0.3-	0.5+	1998 04 19	704	(1.8-	2.0+)	1999 09 30	704	0.1+	0.8-
1998 03 20	704	1.3+	0.0	1999 08 07	699	0.4-	0.4+	1999 09 30	704	0.2-	0.9-
1998 03 20	704	0.9+	0.5-	1999 08 07	699	0.8-	1.1+	1999 09 30	704	1.3-	0.1-
1998 03 20	704	1.1-	1.9-	1999 08 07	699	1.0-	0.8+	1999 10 10	106	0.3+	1.2+
1998 03 20	704	0.5+	1.2-	1999 09 07	704	0.2+	0.8-	1999 10 10	106	0.0	0.4+
1998 03 20	704	1.0+	1.2-	1999 09 07	704	0.1-	0.3-	1999 11 04	703	1.6+	0.2+
1998 03 22	704	0.6-	0.8-	1999 09 07	704	0.1-	0.5-	1999 11 04	703	0.0	1.2+
1998 03 22	704	0.1-	0.1-	1999 09 07	704	0.3-	0.7-	1999 11 04	703	0.3-	0.4+
1998 03 22	704	0.4+	1.9-	1999 09 07	704	0.5-	0.4-	1999 11 04	703	1.1-	1.1+
1998 03 22	704	1.7+	0.8+	1999 09 09	704	0.6+	0.3-	1999 11 07	704	1.0+	0.2-
1998 03 22	704	(2.3-	0.8-)	1999 09 09	704	0.3+	0.6-	1999 11 07	704	1.2+	0.5+
1998 03 25	566	0.7+	1.0-	1999 09 09	704	0.4-	0.4-	1999 11 07	704	1.4+	0.5+

1998 03 25	566	0.4+	1.0-	1999 09 09	704	0.3+	0.3-	1999 11 07	704	0.4+	0.5+
1998 03 25	566	0.2+	1.5-	1999 09 09	704	0.7+	1.3-	1999 11 07	704	1.2+	0.8+

(12596)* 1999 RT₁₅₄ = 1977 LR₁ = 1980 FC₇ = 1992 XY = 1998 FF₂₇

Discovered 1999 Sept. 9 by the Lincoln Laboratory Near-Earth Asteroid

Research Team at Socorro.

Id. A. Doppler (*MPC* 36451)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	13.94358		(2000.0)	P	Q
<i>n</i>	0.27272126	ω	14.74318	+0.66793896	+0.74312715
<i>a</i>	2.3549954	Ω	297.18286	-0.68730285	+0.59521640
<i>e</i>	0.1925594	<i>i</i>	2.59299	-0.28543358	+0.30574413
<i>P</i>	3.61	<i>H</i>	14.8	<i>G</i> 0.15	<i>U</i> 2

Residuals in seconds of arc

1977 06 13	675	0.1-	0.3+	1998 03 29	704	0.3+	0.3+	1999 09 14	704	0.3-	0.1+
1977 06 14	675	0.1-	0.3+	1998 03 29	704	0.8+	0.2+	1999 09 14	704	0.1+	0.2-
1980 03 23	809	0.0	0.5-	1998 03 29	704	0.9-	1.2-	1999 09 14	704	0.4-	0.2-
1992 12 13	010	0.5-	0.9-	1998 03 29	704	0.6+	1.4+	1999 09 14	704	0.4-	0.1+
1992 12 14	010	0.6+	1.2+	1998 03 29	704	0.9+	0.1+	1999 09 14	704	0.1-	0.0
1998 02 26	566	0.2+	0.2-	1999 07 16	704	0.5+	0.2-	1999 10 02	704	0.4+	0.1+
1998 02 26	566	0.5+	0.2-	1999 07 16	704	0.8+	0.8-	1999 10 02	704	0.2+	0.9-
1998 02 26	566	0.5+	0.2-	1999 07 16	704	0.8+	0.8-	1999 10 02	704	0.5+	0.1-
1998 02 28	809	(3.5+	0.6-)	1999 07 16	704	0.8+	0.4+	1999 10 02	704	0.5+	0.5-
1998 03 02	809	(0.7-	3.3-)	1999 08 22	699	0.2-	1.5+	1999 11 04	703	0.1+	0.0
1998 03 20	704	1.3+	1.6-	1999 08 22	699	0.4+	1.1+	1999 11 04	703	0.2+	0.1+
1998 03 20	704	0.7+	0.9+	1999 08 22	699	0.1-	1.1+	1999 11 04	703	0.4+	0.8+
1998 03 20	704	0.1-	1.1-	1999 09 07	704	0.5-	0.5-	1999 11 04	703	0.0	0.0
1998 03 20	704	0.6-	1.5+	1999 09 07	704	0.2-	0.2-	1999 11 07	704	0.2-	0.4+
1998 03 20	704	1.2-	0.6-	1999 09 07	704	0.3-	0.3-	1999 11 07	704	0.2+	0.4+
1998 03 22	704	0.2-	0.1+	1999 09 07	704	0.2-	0.3+	1999 11 07	704	0.7-	0.1+
1998 03 22	704	1.6-	0.5+	1999 09 07	704	0.4-	0.2-	1999 11 07	704	1.1-	0.8-
1998 03 22	704	1.1+	0.6+	1999 09 09	704	0.2-	0.1-	1999 11 07	704	0.7-	0.2+
1998 03 22	704	0.4-	1.0+	1999 09 09	704	0.2-	0.1+	1999 11 14	704	0.1-	0.0
1998 03 26	704	0.7-	1.0+	1999 09 09	704	0.2-	0.4+	1999 11 14	704	0.1-	0.3+
1998 03 26	704	0.2+	1.1+	1999 09 09	704	0.0	0.0	1999 11 14	704	0.2-	0.1+
1998 03 26	704	0.0	0.5-	1999 09 09	704	0.1-	0.1+	1999 11 14	704	0.2+	0.0

(12597)* 1999 RL₁₅₈ = 1987 GR = 1992 EO₂₉ = 1994 PD₂₃

Discovered 1999 Sept. 9 by the Lincoln Laboratory Near-Earth Asteroid

Research Team at Socorro.

Id. G. V. Williams (*MPC* 36453), A. Gnädig (*ibid.*)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	155.38546		(2000.0)	P	Q
<i>n</i>	0.19635547	ω	45.65735	-0.99899985	+0.02974716
<i>a</i>	2.9316180	Ω	136.01512	-0.03990663	-0.92992233
<i>e</i>	0.0141127	<i>i</i>	2.75523	+0.02016818	-0.36655091
<i>P</i>	5.02	<i>H</i>	13.8	<i>G</i> 0.15	<i>U</i> 2

Residuals in seconds of arc

1987 04 01	675	(3.9+	2.1+)	1998 06 03	704	1.2+	1.1+	1999 09 07	704	0.5+	0.2+
1987 04 01	675	(7.4+	0.2+)	1998 06 03	704	0.1+	0.3-	1999 09 09	704	0.1+	0.5-
1987 04 03	675	0.6+	1.4+	1998 06 03	704	0.5+	0.0	1999 09 09	704	0.1+	0.0
1987 04 03	675	1.7+	0.3+	1998 06 03	704	0.9-	0.7-	1999 09 09	704	0.5-	0.2+
1992 03 03	809	0.1-	0.9-	1998 06 26	704	0.8-	0.3-	1999 09 09	704	0.3+	0.4+
1992 03 07	809	1.7-	0.2+	1998 06 26	704	1.0+	0.4-	1999 09 09	704	0.5+	0.5+
1992 04 06	809	(2.3-	0.6+)	1998 06 26	704	1.5-	1.6+	1999 09 13	704	0.4-	0.5+
1994 08 12	809	(2.6+	0.3+)	1998 06 26	704	0.3+	1.0-	1999 09 13	704	0.9+	0.1+
1994 08 12	809	1.8+	0.2-	1998 06 26	704	(2.3-	1.0-)	1999 09 13	704	0.8-	0.7-
1994 08 12	809	1.2+	0.6+	1999 09 07	699	0.0	0.7+	1999 09 13	704	0.4+	0.1+
1994 08 13	809	0.3+	1.5-	1999 09 07	704	0.9+	0.0	1999 09 13	704	0.9-	0.2+
1994 08 13	809	0.0	1.8-	1999 09 07	699	0.2-	0.4+	1999 09 30	704	0.4-	0.8-
1994 08 13	809	0.4-	1.7-	1999 09 07	704	0.9+	0.3-	1999 09 30	704	0.0	0.4-
1994 09 06	809	1.8-	1.1+	1999 09 07	704	0.6+	0.7+	1999 09 30	704	0.8-	0.3+

1994 09 06 809 1.7- 0.6+ 1999 09 07 704 0.0 0.7+ 1999 09 30 704 0.4- 0.1-
 1994 09 06 809 (2.1- 0.3+) 1999 09 07 699 0.3- 1.2+

(12598)* 1999 RC₁₅₉ = 1988 BF₄ = 1998 KL₅₄

Discovered 1999 Sept. 9 by the Lincoln Laboratory Near-Earth Asteroid Research Team at Socorro.

Id. G. V. Williams (*MPC* 36453), A. Gnädig (*ibid.*)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i> 163.22314		(2000.0)		P		Q	
<i>n</i>	0.21758210	ω	20.41364	-0.99120991	-0.10918063		
<i>a</i>	2.7377089	Ω	152.98394	+0.08655316	-0.96228319		
<i>e</i>	0.0747456	<i>i</i>	9.46738	+0.10005732	-0.24917995		
<i>P</i>	4.53	<i>H</i>	14.2	<i>G</i>	0.15	<i>U</i>	1
Residuals in seconds of arc							
1988 01 20	809 0.2- 0.2+	1998 05 26	704 0.3+ 0.0	1999 09 08	703 0.5+ 0.2+		
1988 01 20	809 0.1- 0.1-	1998 05 26	704 0.9+ 0.4-	1999 09 08	703 0.4+ 0.7+		
1988 01 20	809 0.2+ 0.4-	1998 05 26	704 1.2+ 1.7+	1999 09 09	704 0.4- 0.3+		
1988 01 20	809 0.4+ 0.6-	1998 06 19	704 1.0- 1.8-	1999 09 09	704 0.1- 0.1-		
1988 01 20	809 0.7+ 0.3-	1998 06 19	704 0.1+ 0.1-	1999 09 09	704 0.4- 0.3-		
1988 01 21	809 0.9- 0.6-	1998 06 19	704 1.4+ 1.7+	1999 09 09	704 0.7+ 0.1+		
1988 01 21	809 0.8- 0.6-	1998 06 19	704 0.3+ 0.2-	1999 09 09	704 1.0- 0.5-		
1993 04 16	413 0.5+ 0.8-	1998 06 19	704 1.5- 0.8+	1999 09 13	704 0.7+ 0.4+		
1997 03 02	691 0.0 0.6+	1999 09 07	699 0.3- 0.7-	1999 09 13	704 0.2+ 0.0		
1997 03 02	691 0.2- 0.9+	1999 09 07	704 0.3+ 0.6-	1999 09 13	704 0.7- 0.0		
1997 03 02	691 0.3+ 0.5+	1999 09 07	699 0.3- 0.5+	1999 09 13	704 0.9+ 0.0		
1998 05 23	704 1.3- 1.8-	1999 09 07	704 0.1- 1.6-	1999 09 30	704 0.1+ 0.9-		
1998 05 23	704 0.5+ 0.0	1999 09 07	704 0.8- 0.4-	1999 09 30	704 0.9- 0.5+		
1998 05 23	704 0.8+ 0.7+	1999 09 07	704 0.3+ 1.2-	1999 09 30	704 0.6- 0.3+		
1998 05 23	704 0.1- 0.9-	1999 09 07	699 0.5- 1.2+	1999 10 04	703 0.5+ 0.8+		
1998 05 23	704 1.0- 0.7+	1999 09 07	704 0.1+ 1.2-	1999 10 04	703 1.7+ 1.4+		
1998 05 26	704 0.9- 1.4-	1999 09 08	703 0.1+ 0.2-	1999 10 04	703 0.1- 0.4-		
1998 05 26	704 0.4- 1.2+	1999 09 08	703 0.6+ 0.5+	1999 10 04	703 0.2- 0.5+		

(12599)* 1999 RT₁₆₀ = 1996 VV₉ = 1998 HF₁₁₃

Discovered 1999 Sept. 9 by the Lincoln Laboratory Near-Earth Asteroid Research Team at Socorro.

Id. G. V. Williams (*MPC* 36455), A. Gnädig (*ibid.*)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i> 221.46554		(2000.0)		P		Q	
<i>n</i>	0.28317526	ω	346.05096	-0.48657736	-0.87001249		
<i>a</i>	2.2966731	Ω	132.99642	+0.81160915	-0.48383287		
<i>e</i>	0.0458261	<i>i</i>	6.24041	+0.32331572	-0.09478411		
<i>P</i>	3.48	<i>H</i>	15.0	<i>G</i>	0.15	<i>U</i>	1
Residuals in seconds of arc							
1994 01 10	691 0.1- 0.4+	1998 04 23	704 0.3+ 0.1-	1999 09 07	704 0.3- 0.1-		
1994 01 10	691 0.1+ 0.3+	1998 04 23	704 0.2- 0.3-	1999 09 07	704 0.4- 0.3+		
1994 01 10	691 0.2+ 0.5+	1998 04 23	704 0.7+ 0.5+	1999 09 07	699 0.0 1.0+		
1996 11 03	691 0.3- 0.2+	1998 04 24	704 1.1+ 0.0	1999 09 08	703 0.1- 0.8+		
1996 11 03	691 0.2- 0.1-	1998 04 24	704 0.4+ 1.8+	1999 09 08	703 1.4- 0.1+		
1996 11 03	691 0.3- 0.0	1998 04 24	704 1.1+ 0.3-	1999 09 08	703 1.0+ 0.0		
1996 11 04	691 0.2- 0.2-	1998 04 24	704 0.3- 1.0-	1999 09 08	703 0.5+ 0.2-		
1996 11 04	691 0.3- 0.2-	1998 04 24	704 0.3+ 0.9-	1999 09 08	703 0.3- 0.4+		
1996 11 04	691 0.4- 0.1+	1998 05 16	704 0.5- 0.0	1999 09 08	703 0.7- 0.0		
1996 11 07	691 1.7+ 0.2-	1998 05 16	704 0.4- 0.5+	1999 09 08	703 0.7+ 1.0-		
1996 11 07	691 0.0 0.2+	1998 05 16	704 0.1- 1.6+	1999 09 08	703 1.0- 0.8-		
1996 11 07	691 0.1+ 0.2+	1998 05 16	704 1.8- 0.4+	1999 09 09	704 0.4+ 0.5-		
1998 03 24	704 0.9- 0.2-	1998 05 16	704 0.8+ 1.4+	1999 09 09	704 0.5+ 0.2-		
1998 03 24	704 0.3- 0.6+	1998 05 23	699 0.4+ 0.6-	1999 09 09	704 0.2- 0.1-		
1998 03 24	704 0.6- 0.6-	1998 05 23	699 0.1+ 0.3+	1999 09 09	704 0.3- 0.9-		
1998 03 24	704 0.3+ 0.0	1998 05 23	699 0.2+ 1.0+	1999 09 09	704 0.0 0.6+		
1998 03 24	704 1.4- 0.2-	1998 08 12	699 0.3+ 0.1-	1999 09 13	704 0.4- 1.0+		
1998 04 21	704 1.2- 0.3+	1999 08 12	699 0.2- 0.4+	1999 09 13	704 0.1+ 0.1+		
1998 04 21	704 0.5- 0.7-	1999 08 12	699 0.6+ 0.8-	1999 09 13	704 0.5+ 0.6+		

1998 04 21 704 0.5- 0.3- 1999 09 07 699 0.5- 0.2+ 1999 09 13 704 0.4+ 0.8+
 1998 04 21 704 0.8+ 0.7- 1999 09 07 704 0.2- 0.2- 1999 09 30 704 0.3+ 0.2-
 1998 04 21 704 1.5+ 0.6- 1999 09 07 704 0.1- 0.1+ 1999 09 30 704 0.5- 0.1+
 1998 04 23 704 0.0 0.9- 1999 09 07 704 0.4- 0.1- 1999 09 30 704 0.7+ 0.4-
 1998 04 23 704 0.4+ 0.5- 1999 09 07 699 0.4+ 0.2+ 1999 09 30 704 0.5+ 0.3-

**(12600)* 1999 RM₁₇₇ = 1951 EN₁ = 1953 SP = 1987 QC₂ = 1991 EJ₆
 = 1998 MN₂₆**

Discovered 1999 Sept. 9 by the Lincoln Laboratory Near-Earth Asteroid Research Team at Socorro.

Id. G. V. Williams (*MPC* 36463)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i> 129.12884		(2000.0)		P		Q	
<i>n</i>	0.17105188	ω	69.63322	-0.88599745	+0.46297732		
<i>a</i>	3.2140365	Ω	137.93509	-0.43845093	-0.81844698		
<i>e</i>	0.1480434	<i>i</i>	2.19843	-0.15089499	-0.34028891		
<i>P</i>	5.76	<i>H</i>	12.2	<i>G</i>	0.15	<i>U</i>	1
Residuals in seconds of arc							
1951 03 10	760 0.1+ 0.4+	1998 06 24	704 0.2+ 0.8+	1999 09 14	704 0.2+ 0.2-		
1951 03 10	760 0.3+ 1.0+	1998 06 24	704 1.7- 0.1+	1999 09 14	704 0.2- 0.4-		
1953 09 06	675 0.0 0.6-	1998 06 24	704 1.6+ 0.5+	1999 09 14	704 0.2+ 0.0		
1953 09 06	675 0.3+ 1.1-	1998 06 26	704 0.2- 0.6-	1999 09 14	704 0.3- 0.1-		
1953 09 17	675 1.2+ 0.3-	1998 06 26	704 0.3- 0.3-	1999 09 14	704 0.2- 0.1+		
1953 09 17	675 0.7+ 1.4-	1998 06 26	704 0.0 0.2-	1999 09 30	699 0.6- 0.3+		
1987 08 21	809 1.6- 1.0-	1998 06 26	704 0.4- 0.3+	1999 09 30	699 0.1+ 0.5-		
1987 08 21	809 0.7+ 0.5-	1998 06 26	704 0.9+ 0.5+	1999 09 30	699 0.3- 0.3+		
1987 08 21	809 0.2+ 0.5-	1999 09 07	704 0.2- 0.5-	1999 10 02	704 0.7+ 1.6+		
1987 08 26	809 2.3- 1.1-	1999 09 07	704 0.3- 0.0	1999 10 02	704 0.0 0.7+		
1987 08 26	809 0.8- 0.2-	1999 09 07	704 0.4- 0.1+	1999 10 02	704 0.0 0.2+		
1987 08 26	809 1.0- 0.6-	1999 09 07	704 0.3- 0.1-	1999 10 02	704 0.3+ 0.4+		
1987 08 28	809 0.3+ 1.1+	1999 09 07	704 0.2- 0.1-	1999 10 07	704 0.1- 0.4-		
1987 08 28	809 0.9+ 2.1+	1999 09 09	704 0.1+ 0.1+	1999 10 07	704 0.1+ 0.1+		
1987 08 28	809 1.3+ 1.8+	1999 09 09	704 0.3+ 0.4-	1999 10 07	704 0.3+ 1.5+		
1991 03 05	071 0.1- 0.8+	1999 09 09	704 0.0 0.1+	1999 10 07	704 0.7- 1.0+		
1991 03 05	071 0.4+ 0.5+	1999 09 09	704 0.3+ 0.2+				
1998 06 24	704 0.5+ 0.1-	1999 09 09	704 0.2+ 1.0+				

(12601)* 1999 RO₁₇₈ = 1988 VA₆

Discovered 1999 Sept. 9 by the Lincoln Laboratory Near-Earth Asteroid Research Team at Socorro.

Id. G. V. Williams (*MPC* 36464)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i> 343.02237		(2000.0)		P		Q	
<i>n</i>	0.26286487	ω	315.78827	+0.99882108	-0.02591196		
<i>a</i>	2.4135021	Ω	45.74490	+0.04117860	+0.90005894		
<i>e</i>	0.1817727	<i>i</i>	3.28552	-0.02570534	+0.43499710		
<i>P</i>	3.75	<i>H</i>	14.8	<i>G</i>	0.15	<i>U</i>	2
Residuals in seconds of arc							
1988 11 05	046 (0.7+ 7.6+)	1998 04 22	704 0.5- 0.5+	1999 09 30	704 0.5- 0.2+		
1988 11 05	046 (0.6- 6.4+)	1998 04 22	704 0.4- 0.2+	1999 09 30	704 0.3- 0.6+		
1988 11 11	046 0.2- 0.2+	1999 07 16	704 0.3- 0.1+	1999 09 30	704 0.3- 0.2-		
1988 11 11	046 0.2+ 1.0-	1999 07 16	704 0.4+ 1.1-	1999 09 30	704 0.5- 0.3+		
1988 11 14	399 0.3- 0.3-	1999 07 16	704 0.5+ 0.3-	1999 10 02	704 0.7- 0.1+		
1988 11 14	399 1.9+ 1.5+	1999 09 07	699 0.9+ 0.5-	1999 10 02	704 1.0- 0.4+		
1988 11 14	399 1.9- 0.1+	1999 09 07	699 0.7+ 0.2+	1999 10 02	704 0.9- 0.9+		
1994 04 02	691 0.3- 0.9-	1999 09 07	704 0.3+ 0.2-	1999 10 02	704 0.4- 0.4+		
1994 04 02	691 0.0 0.7-	1999 09 07	704 0.4+ 0.2-	1999 10 02	704 1.3- 0.2+		
1994 04 02	691 0.2+ 0.2-	1999 09 07	704 0.2+ 0.2+	1999 10 07	704 0.1- 0.4+		
1996 12 09	691 0.4+ 0.1+	1999 09 07	699 1.6+ 0.2-	1999 10 07	704 0.4- 0.4+		
1996 12 09	691 0.2+ 0.1+	1999 09 07	704 0.6+ 0.6-	1999 10 07	704 0.7- 0.3+		
1996 12 09	691 0.5+ 0.1+	1999 09 07	704 0.1+ 0.5-	1999 10 07	704 0.2+ 0.6+		
1997 01 15	566 0.1+ 0.1+	1999 09 09	704 0.3+ 0.0	1999 10 07	704 0.8- 1.4+		

1997 01 15	566	0.1−	0.2+	1999 09 09	704	0.4+	0.1+	1999 11 08	704	0.1−	0.7−
1997 01 15	566	0.5−	0.1+	1999 09 09	704	0.7+	0.5+	1999 11 08	704	0.3+	1.6−
1998 03 29	704	1.0+	0.2+	1999 09 09	704	1.1+	0.7+	1999 11 08	704	0.6+	0.9−
1998 03 29	704	0.7−	1.0+	1999 09 09	704	(2.4+	2.1+)	1999 11 08	704	0.6+	1.1−
1998 03 29	704	1.3−	0.1+	1999 09 13	704	0.1+	0.1+	1999 11 15	704	0.3−	0.1+
1998 03 29	704	(1.0−	2.2+)	1999 09 13	704	0.2−	0.1+	1999 11 15	704	0.0	0.0
1998 03 29	704	1.4+	1.3+	1999 09 13	704	0.2−	0.6−	1999 11 15	704	0.3−	0.8+
1998 04 22	704	0.8+	1.1+	1999 09 13	704	0.4−	0.3−	1999 11 15	704	0.9−	0.4+
1998 04 22	704	1.2+	0.8+	1999 09 13	704	0.2−	0.2−	1999 11 15	704	0.4+	0.4+
1998 04 22	704	0.0	0.3+	1999 09 30	704	0.4−	0.7+				

(12602)* 1999 RT₁₈₃ = 1992 RT₆ = 1996 VQ₃ = 1998 FR₃₆

Discovered 1999 Sept. 9 by the Lincoln Laboratory Near-Earth Asteroid

Research Team at Socorro.

Id. A. Doppler (*MPC* 36467)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	60.61570		(2000.0)		P		Q
<i>n</i>	0.28110809	ω	262.42265		+0.04085444		+0.99891576
<i>a</i>	2.3079186	Ω	10.00067		−0.85855200		+0.04652334
<i>e</i>	0.0965800	<i>i</i>	7.38475		−0.51109625		+0.00169720
<i>P</i>	3.51	<i>H</i>	14.6	<i>G</i>	0.15	<i>U</i>	1

Residuals in seconds of arc

1992 09 02	809	0.8+	0.8−	1998 03 26	566	1.4−	0.6+	1999 09 09	704	0.3−	0.3−
1992 09 02	809	0.5−	0.0	1998 03 26	566	1.6−	0.7+	1999 09 11	699	0.4−	0.7+
1992 09 02	809	0.2−	0.5−	1998 03 26	566	1.6−	0.6+	1999 09 11	699	1.1−	1.3+
1992 09 03	809	0.6+	0.1+	1998 04 19	704	0.6+	0.2+	1999 09 11	699	0.9−	0.4+
1996 11 01	327	0.5−	0.0	1998 04 19	704	0.9+	1.0+	1999 09 14	704	0.4−	0.4−
1996 11 01	327	0.9−	0.1−	1998 04 19	704	1.0+	1.0+	1999 09 14	704	0.3−	0.6−
1996 11 01	327	0.2+	0.3+	1998 04 19	704	0.5+	0.2+	1999 09 14	704	0.3+	0.1−
1996 11 01	327	0.8−	0.3−	1998 04 19	704	1.1+	0.4−	1999 09 14	704	0.3−	0.1+
1996 11 09	327	0.9+	0.8+	1999 07 16	704	0.6+	1.7−	1999 09 14	704	0.4−	0.1+
1996 11 09	327	0.4+	0.3+	1999 07 16	704	0.6+	0.4+	1999 10 07	704	0.2−	0.4+
1996 11 09	327	0.3+	0.4+	1999 07 16	704	0.1+	0.1−	1999 10 07	704	0.5+	0.0
1998 02 26	566	0.8−	0.5−	1999 08 22	703	0.0	0.2+	1999 10 07	704	0.0	0.7+
1998 02 26	566	0.9−	0.5−	1999 08 22	703	0.1−	1.0+	1999 10 07	704	0.2−	0.7+
1998 02 26	566	0.8−	0.2−	1999 08 22	703	0.1−	0.8+	1999 10 07	704	0.2−	0.7+
1998 03 20	704	0.5−	0.6+	1999 08 22	703	0.1+	1.1+	1999 11 01	703	0.4−	0.2+
1998 03 20	704	1.0+	0.1−	1999 09 07	704	0.1+	0.2−	1999 11 01	703	0.7−	0.7+
1998 03 20	704	1.3+	0.4−	1999 09 07	704	0.1+	0.2+	1999 11 01	703	0.1−	0.5+
1998 03 20	704	1.6+	1.7−	1999 09 07	704	0.6+	0.1+	1999 11 01	703	0.8−	0.9+
1998 03 20	704	(2.1+	0.9−)	1999 09 07	704	0.3+	0.3+	1999 11 12	704	0.9+	0.9−
1998 03 22	704	0.5+	0.7+	1999 09 07	704	0.7+	0.3+	1999 11 12	704	1.3+	1.8−
1998 03 22	704	0.2+	1.0+	1999 09 09	704	0.4−	0.1−	1999 11 12	704	1.3+	0.0
1998 03 22	704	0.8+	0.5+	1999 09 09	704	0.3−	0.2+	1999 11 12	704	0.3−	0.2−
1998 03 22	704	0.9+	0.9+	1999 09 09	704	0.6−	0.2−				
1998 03 22	704	0.3+	0.7+	1999 09 09	704	1.1−	0.5−				

(12603)* 1999 RF₁₈₄ = 1981 TD₄ = 1981 VH₂ = 1992 WQ = 1998 MB₆

Discovered 1999 Sept. 9 by the Lincoln Laboratory Near-Earth Asteroid

Research Team at Socorro.

Id. A. Doppler (*MPC* 36467)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	305.65248		(2000.0)		P		Q
<i>n</i>	0.27155237	ω	354.01857		+0.54748120		−0.83532366
<i>a</i>	2.3617485	Ω	62.77701		+0.77007679		+0.47953974
<i>e</i>	0.1972642	<i>i</i>	3.22251		+0.32748448		+0.26884199
<i>P</i>	3.63	<i>H</i>	14.7	<i>G</i>	0.15	<i>U</i>	1

Residuals in seconds of arc

1981 10 07	095	2.2+	1.0+	1998 06 25	691	0.4−	0.6+	1999 09 14	704	0.0	0.2+
1981 11 03	033	0.9−	0.5−	1999 07 16	704	0.4+	0.9−	1999 09 30	704	0.5+	0.1+
1981 11 03	033	0.8−	0.4−	1999 07 16	704	0.5+	0.3−	1999 09 30	704	0.7+	0.4−
1992 11 16	400	0.1+	0.0	1999 07 16	704	0.7−	0.2+	1999 09 30	704	0.4+	0.4−
1992 11 16	400	0.4−	1.2−	1999 09 07	704	0.5−	0.1−	1999 09 30	704	0.8+	0.4−

1992 11 17	400	0.2−	0.7−	1999 09 07	704	0.4−	0.1−	1999 09 30	704	0.1+	0.1−
1992 11 17	400	0.5−	0.4+	1999 09 07	704	0.6−	0.5−	1999 10 07	704	0.6−	0.3+
1992 11 23	372	(3.8−	22.7+)	1999 09 07	704	0.2−	0.5+	1999 10 07	704	0.3−	0.4−
1992 11 23	372	(3.6−	22.2+)	1999 09 07	704	0.0	0.2+	1999 10 07	704	0.1+	0.7+
1996 12 12	327	0.9+	0.6+	1999 09 09	704	0.7−	0.3−	1999 10 07	704	0.1−	0.2+
1996 12 12	327	0.7+	0.5+	1999 09 09	704	0.5−	0.2+	1999 10 07	704	0.2−	0.1+
1996 12 12	327	0.2+	0.9+	1999 09 09	704	0.6−	0.5−	1999 11 08	704	0.6+	1.0−
1998 05 22	704	0.9+	1.4−	1999 09 09	704	0.6−	0.7−	1999 11 08	704	1.6+	0.4−
1998 05 22	704	(2.7−	0.9+)	1999 09 09	704	1.0−	0.5−	1999 11 08	704	0.4+	0.1−
1998 05 22	704	0.9+	0.1+	1999 09 11	699	1.2+	0.9+	1999 11 08	704	0.4−	1.9+
1998 05 22	704	0.3−	0.5+	1999 09 11	699	0.4+	0.4+	1999 11 15	704	0.5+	0.7+
1998 06 19	691	0.1+	0.8+	1999 09 11	699	0.4+	0.3+	1999 11 15	704	0.3+	0.6+
1998 06 19	691	0.1−	0.3+	1999 09 14	704	0.3−	0.3+	1999 11 15	704	0.1−	0.5+
1998 06 19	691	0.2−	0.4+	1999 09 14	704	0.1−	0.1−	1999 11 15	704	0.0	0.5+
1998 06 25	691	0.7−	0.1+	1999 09 14	704	0.5−	0.3+	1999 11 15	704	0.3+	0.7+
1998 06 25	691	0.3−	0.3+	1999 09 14	704	0.2−	0.1+				

(12604)* 1999 RC₁₉₄ = 1991 LK₃ = 1998 HK₇₇

Discovered 1999 Sept. 7 by the Lincoln Laboratory Near-Earth Asteroid

Research Team at Socorro.

Id. G. V. Williams (*MPC* 36471)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	109.50346		(2000.0)		P		Q
<i>n</i>	0.27232611	ω	17.21630		−0.59943605		+0.79808947
<i>a</i>	2.3572729	Ω	216.02152		−0.74605796		−0.58473284
<i>e</i>	0.0317415	<i>i</i>	5.96067		−0.28995506		−0.14539845
<i>P</i>	3.62	<i>H</i>	14.6	<i>G</i>	0.15	<i>U</i>	1

Residuals in seconds of arc

1991 06 06	809	0.3+	0.7+	1998 04 22	704	0.2+	0.0	1999 09 29	703	0.5+	0.5+
1991 06 06	809	0.6−	0.2−	1998 04 22	704	0.0	0.1+	1999 09 29	703	0.6−	0.0
1991 06 06	809	0.7−	0.8−	1998 05 01	699	0.5+	0.1−	1999 09 29	703	0.1−	0.3+
1991 06 08	809	0.7+	1.0−	1998 05 01	699	0.0	0.2+	1999 10 04	704	0.6−	0.2−
1991 06 08	809	0.2+	0.3−	1998 05 01	699	0.1−	0.8−	1999 10 04	704	0.3−	0.0
1991 06 08	809	0.2−	0.3−	1998 05 16	704	0.4+	0.6+	1999 10 04	704	0.1+	0.1+
1992 10 23	691	0.8−	0.6+	1998 05 16	704	0.8+	1.1+	1999 10 04	704	1.0−	0.7−
1992 10 23	691	0.4−	0.3−	1998 05 16	704	0.0	0.9+	1999 10 07	704	0.6−	0.1−
1992 10 23	691	0.9+	0.2+	1998 05 16	704	1.5−	1.1+	1999 10 07	704	0.2−	0.1−
1992 11 16	691	0.1−	0.1+	1998 05 16	704	(2.4−	1.1−)	1999 10 07	704	0.4−	0.2−
1992 11 16	691	0.0	0.1+	1998 05 23	691	0.0	0.5+	1999 10 07	704	0.3+	0.5+
1992 11 16	691	0.4+	0.2+	1998 05 23	691	0.7−	0.8+	1999 10 07	704	0.4−	0.0
1998 04 01	704	0.6−	0.2+	1998 05 23	691	0.1−	0.6+	1999 11 06	704	0.3+	0.3+
1998 04 01	704	0.8−	0.2+	1999 09 07	704	0.6+	0.2−	1999 11 06	704	1.0−	0.5−
1998 04 01	704	0.0	0.0	1999 09 07	704	1.1+	0.1+	1999 11 06	704	1.3−	0.6−
1998 04 01	704	0.5−	0.2+	1999 09 07	704	1.0+	0.3+	1999 11 06	704	0.3−	0.7−
1998 04 01	704	0.9−	0.5+	1999 09 07	704	1.5+	0.3+	1999 11 14	704	0.4−	0.4+
1998 04 21	704	0.3+	0.3−	1999 09 07	704	0.6+	0.5+	1999 11 14	704	0.2+	0.8+
1998 04 21	704	0.7+	0.3−	1999 09 08	699	0.2−	0.4+	1999 11 14	704	0.1−	0.6−
1998 04 21	704	0.6+	1.5−	1999 09 08	699	0.4−	0.6+	1999 11 14	704	0.5+	0.5−
1998 04 21	704	0.8+	0.5−	1999 09 08	699	0.2+	0.9+	1999 11 14	691	0.3−	0.3−
1998 04 21	704	0.1+	0.5−	1999 09 16	704	0.4+	0.5−	1999 11 14	691	0.3−	0.3−
1998 04 22	704	0.6+	0.0	1999 09 16	704	0.4−	0.0	1999 11 14	691	0.5−	0.3−
1998 04 22	704	0.4+	0.1+	1999 09 16	704	0.2+	0.1−				
1998 04 22	704	0.1+	0.1+	1999 09 29	703	0.7+	0.2+				

Residuals in seconds of arc

1991 11 04	691	0.8–	0.1+	1998 05 24	699	0.3+	0.0	1999 10 09	740	0.1+	0.2+
1991 11 04	691	(0.5+ 5.4–)		1998 05 24	704	0.0	1.5–	1999 10 09	740	0.5–	0.5–
1991 11 04	691	0.3–	0.3+	1998 05 24	699	1.7–	0.9–	1999 10 09	740	0.2–	0.2+
1991 11 05	691	0.3–	0.3+	1999 09 16	120	1.3–	1.1+	1999 10 09	740	0.2+	0.2+
1991 11 05	691	0.2–	0.3+	1999 09 17	120	1.0–	0.0	1999 10 10	740	0.0	0.4+
1991 11 05	691	0.3–	0.3+	1999 09 17	120	0.0	0.6+	1999 10 10	740	0.1–	0.6+
1991 11 06	691	0.1–	0.3+	1999 09 17	120	0.3–	0.2–	1999 10 10	740	1.9+	1.0+
1991 11 06	691	0.3–	0.5+	1999 09 18	120	0.9–	0.9+	1999 10 10	715	1.4–	0.5–
1991 11 06	691	0.2+	0.9+	1999 09 18	120	1.0–	0.2+	1999 10 11	843	1.4+	0.2+
1993 02 23	691	1.0+	0.2+	1999 09 21	120	0.4–	0.2+	1999 10 11	843	0.5+	0.1+
1993 02 23	691	0.7+	0.2+	1999 09 21	120	0.2+	0.3+	1999 10 12	843	1.1+	0.4+
1993 02 23	691	0.7+	0.2+	1999 09 21	120	0.1–	0.7–	1999 10 12	843	0.3–	0.6+
1995 10 25	327	0.6+	0.3–	1999 10 01	120	0.6+	0.1+	1999 10 12	843	1.3+	0.6+
1995 10 25	327	0.3+	0.9–	1999 10 01	120	1.3+	0.3+	1999 11 01	691	0.0	0.4–
1995 10 25	327	0.4+	0.7–	1999 10 02	703	0.3–	0.4+	1999 11 01	691	0.0	0.4–
1997 01 17	691	0.1+ 0.0		1999 10 02	703	0.5–	0.1+	1999 11 01	691	0.0	0.3–
1997 01 17	691	0.3+	0.3–	1999 10 02	703	0.4–	0.1+	1999 11 06	704	0.0	0.5–
1997 01 17	691	0.1–	0.1+	1999 10 02	703	0.7–	0.1–	1999 11 06	704	0.3+	0.2+
1997 02 07	566	1.5–	0.7–	1999 10 04	470	1.3+	1.1–	1999 11 06	704	0.3+	0.3–
1997 02 07	566	0.6–	0.7–	1999 10 04	470	0.9–	1.8–	1999 11 06	704	0.9–	0.6–
1997 02 07	566	0.7–	0.6–	1999 10 04	470	0.1+	1.0–	1999 11 06	704	0.6+	0.1+
1998 05 22	704	0.5–	0.1–	1999 10 07	704	0.3+	1.1–	1999 11 12	704	0.9+	1.5–
1998 05 22	704	0.1+	0.9–	1999 10 07	704	0.7+	0.4+	1999 11 12	704	1.0+	1.0–
1998 05 22	704	(1.8– 3.0–)		1999 10 07	704	0.1–	1.7+	1999 11 12	691	0.1–	0.3–
1998 05 22	704	0.6+	0.7–	1999 10 07	704	0.0	0.4+	1999 11 12	704	0.3–	0.7–
1998 05 22	704	(5.4– 0.1–)		1999 10 08	106	0.4–	0.1–	1999 11 12	704	0.7–	1.3–
1998 05 24	704	(2.5– 1.8+)		1999 10 08	106	0.8–	0.0	1999 11 12	691	0.0	0.2–
1998 05 24	699	0.1+ 0.1+		1999 10 08	106	0.0	0.1–	1999 11 12	691	0.0	0.3–
1998 05 24	704	0.1+	1.0+	1999 10 09	740	0.9+	0.2–				

(12606)* 2043 P-L = 1991 TW₆

Discovered 1960 Sept. 24 by C. J. van Houten and I. van Houten-Groeneveld on Palomar Schmidt plates taken by T. Gehrels.
Id. T. Kobayashi (*MPC* 23984)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

M	63.95567		(2000.0)	$\mathbf{P}$	$\mathbf{Q}$		
n	0.25453184	ω	294.97805	+0.32576275	+0.94539145		
a	2.4658953	Ω	354.00378	−0.82647652	+0.27927509		
e	0.2615900	i	5.85721	−0.45914616	+0.16804891		
P	3.87	H	14.8	G	0.15	U	1

Residuals in seconds of arc

1960 09 24	675	0.9–	0.2–	1998 04 18	704	0.3+	0.4–	1998 05 16	704	1.0+	0.1–
1960 09 26	675	0.8–	0.3+	1998 04 18	704	0.8–	0.1–	1998 05 16	704	0.4+	1.5–
1960 09 28	675	0.0	0.6+	1998 04 18	704	0.5+	1.5–	1998 05 16	704	(2.7– 0.5+)	
1960 09 29	675	0.3+	0.7–	1998 04 18	704	2.0–	1.0–	1999 10 07	704	0.8+	0.2–
1960 10 17	675	0.5+	0.3+	1998 04 18	704	(4.3– 0.6+)		1999 10 07	704	0.2+	0.3–
1960 10 22	675	0.4–	1.0+	1998 04 19	557	0.1–	0.4+	1999 10 07	704	0.0	0.5–
1960 10 25	675	0.2+	0.2+	1998 04 19	557	0.6+	0.7+	1999 10 12	704	0.1+	1.2+
1960 10 26	675	0.3+	0.1–	1998 04 19	557	1.1–	0.3–	1999 10 12	704	0.5+	1.3+
1991 10 02	033	0.6–	1.1+	1998 04 19	557	1.6–	0.6+	1999 10 12	704	0.1+	0.1+
1991 10 02	033	0.3–	0.7+	1998 04 19	704	0.8+	0.1–	1999 10 12	704	0.1–	0.8+
1991 10 03	033	0.2–	0.1+	1998 04 19	704	0.7+	0.3+	1999 10 22	704	0.5–	0.3+
1991 10 04	033	0.5–	0.5+	1998 04 19	704	0.2–	0.4+	1999 10 22	704	0.8–	0.3–
1991 10 09	033	0.1+ 0.0		1998 04 19	704	0.5–	0.7+	1999 10 22	704	0.3+	0.3–
1991 10 09	033	0.3+	0.2–	1998 04 19	704	0.3+	0.5+	1999 10 22	704	0.1–	0.5–
1998 03 24	699	0.6+	0.6+	1998 04 20	704	0.5+	0.5+	1999 10 22	704	0.1–	0.0
1998 03 24	699	0.4+	1.4+	1998 04 20	704	0.0	0.5+	1999 11 03	704	0.0	0.6–
1998 03 24	699	0.8–	0.7+	1998 04 20	704	0.8–	0.0	1999 11 03	704	0.1–	0.3–
1998 03 25	704	(2.3– 2.6+)		1998 04 20	704	0.4–	0.1–	1999 11 03	704	0.2+	0.3–
1998 03 25	704	0.3+	0.2+	1998 04 20	704	1.1+	1.4+	1999 11 03	704	0.0	0.4–
1998 03 25	704	0.3–	0.5+	1998 04 20	704	0.2–	0.0	1999 11 09	699	0.3+	0.4–
1998 03 25	704	0.0	0.2+	1998 04 20	704	0.3+	0.0	1999 11 09	699	0.0	0.1–
1998 03 29	704	0.3–	0.2+	1998 04 20	704	0.7+	1.5+	1999 11 09	699	0.5–	0.5+
1998 03 29	704	0.3+	0.2+	1998 04 20	704	0.7+	1.4–	1999 11 13	703	0.4+	0.2–

1998 03 29	704	0.2–	0.7+	1998 04 20	704	(2.3–	1.2+)	1999 11 13	703	0.6–	0.4+
1998 03 29	704	0.4–	1.0+	1998 04 22	704	0.3+	0.6–	1999 11 13	703	0.1–	0.5+
1998 03 29	704	0.6–	1.1+	1998 04 22	704	0.6+	0.6+	1999 11 13	703	0.5+	0.3–
1998 04 01	704	0.1+	0.5+	1998 04 22	704	0.3+	1.6–	1999 11 14	703	0.1+	0.0
1998 04 01	704	0.8+	0.1–	1998 04 22	704	1.4+	1.4–	1999 11 14	703	0.2+	0.0
1998 04 01	704	1.9–	0.3–	1998 04 22	704	0.6–	1.9–	1999 11 14	703	0.4–	0.4–
1998 04 01	704	0.9+	0.4–	1998 05 16	704	(2.4+	1.2–)	1999 11 14	703	0.2–	0.1+
1998 04 01	704	0.2+	1.2+	1998 05 16	704	0.8+	0.5–				

(12607)* 2058 P-L = 1993 FB₂₈

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

Id. G. V. Williams (*MPC* 25435), A. Milani (*ibid.*)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

M	75.82832		(2000.0)	$\mathbf{P}$	$\mathbf{Q}$		
n	0.22769423	ω	8.44178	+0.27431193	+0.96090124		
a	2.6560405	Ω	277.48551	−0.88449409	+0.23672359		
e	0.0349267	i	2.17951	−0.37738994	+0.14363409		
P	4.33	H	14.5	G	0.15	U	1

Residuals in seconds of arc

1960 09 24	675	1.2–	0.8+	1999 10 01	703	0.1–	0.2+	1999 10 15	704	0.2–	0.7–
1960 09 26	675	0.6–	0.4+	1999 10 01	703	0.1+	0.5+	1999 10 20	704	1.1–	0.4–
1960 09 28	675	0.3–	0.2+	1999 10 04	704	1.0+	0.9+	1999 10 20	704	0.1–	0.5–
1960 09 29	675	0.2+	0.9+	1999 10 04	704	(2.6+ 0.3+)		1999 10 20	704	0.7–	0.5+
1960 10 17	675	0.5–	0.0	1999 10 04	704	0.3+	0.3–	1999 10 20	704	0.4–	0.1–
1960 10 22	675	0.5–	0.3+	1999 10 04	704	(2.6+ 1.1–)		1999 10 20	704	0.6–	0.1+
1960 10 25	675	0.4+	1.3+	1999 10 10	704	1.5–	0.7–	1999 11 04	703	0.1+	0.1–
1960 10 26	675	0.3+	1.1+	1999 10 10	704	0.1–	0.0	1999 11 04	703	0.9–	1.1–
1993 03 21	809	1.6–	1.5+	1999 10 10	704	0.3+	0.3+	1999 11 04	703	0.2+	0.9+
1993 03 22	809	1.2+	0.3–	1999 10 10	704	0.0	0.4–	1999 11 04	703	1.1–	0.3+
1993 03 26	809	1.1+	0.2–	1999 10 10	704	0.3–	0.2–	1999 11 05	704	1.4+	0.2+
1993 04 17	413	(1.8– 5.5+)		1999 10 13	704	0.0	0.3+	1999 11 05	704	0.9–	1.3+
1997 03 10	704	0.1+	0.5–	1999 10 13	704	0.1–	0.2+	1999 11 05	704	0.4+	0.7+
1997 03 10	704	0.6–	0.6+	1999 10 13	704	0.0	0.1+	1999 11 05	704	1.0+	0.2–
1997 03 11	704	0.1+	0.3+	1999 10 13	704	0.8–	0.2+	1999 11 05	704	0.5+	0.1+
1997 03 11	704	0.1+	0.8+	1999 10 13	704	0.3+	1.0+	1999 11 14	704	1.9+	0.4–
1997 03 12	704	0.4–	0.8+	1999 10 15	704	0.2+	0.0	1999 11 14	704	0.7+	1.0–
1997 03 12	704	1.0+	0.7–	1999 10 15	704	0.4+	0.4–	1999 11 14	704	0.9+	1.0–
1999 10 01	703	0.3–	0.2+	1999 10 15	704	0.1+	0.7–	1999 11 14	704	1.2+	0.8–
1999 10 01	703	1.0–	0.4–	1999 10 15	704	0.0	0.7–	1999 11 14	704	0.9+	0.7–

(12608)* 2091 P-L = 1978 WR₁₃

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

Id. K. Hurukawa (*MPC* 9297)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

M	346.88532		(2000.0)	$\mathbf{P}$	$\mathbf{Q}$		
n	0.27871303	ω	133.18448	+0.92667618	-0.37148661		
a	2.3211215	Ω	248.69703	+0.32459375	+0.86765906		
e	0.1172280	i	3.51833	+0.18949973	+0.33040196		
P	3.54	H	15.3	G	0.15	U	1

Residuals in seconds of arc

1960 09 24	675	0.7+	0.1+	1999 10 11	704

1996 12 17	691	0.2+	0.8-	1999 10 16	704	0.1-	0.1+	1999 11 10	120	1.1-	0.5+
1996 12 17	691	0.2+	0.7-	1999 10 16	704	0.1-	0.3-	1999 11 11	703	0.1+	0.3+
1996 12 17	691	0.0	0.8-	1999 10 16	704	0.0	0.0	1999 11 11	703	0.4-	1.4+
1998 06 01	691	0.3-	0.1+	1999 10 16	704	0.2+	0.0	1999 11 11	691	0.1-	0.1-
1998 06 01	691	0.1-	0.4+	1999 10 16	704	0.3-	0.0	1999 11 11	703	0.2-	0.4+
1998 06 01	691	0.0	0.3+	1999 10 16	704	0.0	0.1-	1999 11 11	703	0.2+	0.4+
1999 10 03	704	0.1+	0.7-	1999 10 16	704	0.4-	0.0	1999 11 11	691	0.1-	0.1-
1999 10 03	704	1.0+	2.1-	1999 10 16	704	0.0	0.0	1999 11 11	691	0.1-	0.0
1999 10 03	704	0.7+	0.5-	1999 10 21	704	0.0	0.6+	1999 11 12	699	0.1-	1.1+
1999 10 03	704	0.6+	0.1+	1999 10 21	704	0.5+	0.5+	1999 11 12	699	0.5-	0.9+
1999 10 07	704	0.9+	0.2-	1999 10 21	704	0.1+	0.4+	1999 11 12	699	0.8-	0.6+
1999 10 07	704	0.0	0.3+	1999 10 21	704	0.1+	0.6+	1999 11 14	704	0.3-	0.3+
1999 10 07	704	0.5+	0.4-	1999 10 21	704	0.2-	1.1+	1999 11 14	704	0.1-	0.0
1999 10 07	704	0.0	0.8-	1999 11 03	703	0.0	0.1-	1999 11 14	704	0.2-	0.1+
1999 10 07	704	0.1-	0.7-	1999 11 03	703	0.3+	0.4-	1999 11 14	704	0.3-	0.1+
1999 10 10	704	0.3-	0.1+	1999 11 03	703	0.1+	0.0	1999 11 14	704	0.3-	0.3+
1999 10 10	704	0.2-	0.3+	1999 11 03	703	0.1-	0.1-	1999 11 15	691	0.1-	0.0
1999 10 10	704	0.1+	0.1-	1999 11 04	691	0.2+	0.2-	1999 11 15	691	0.1+	0.0
1999 10 10	704	0.0	0.8-	1999 11 04	704	0.2+	0.4-	1999 11 15	691	0.1-	0.1-
1999 10 10	704	0.1+	0.1-	1999 11 04	691	0.2+	0.2-	1999 11 16	704	0.3-	0.0
1999 10 11	704	0.3+	0.2+	1999 11 04	704	0.2-	0.1-	1999 11 16	704	0.3-	0.2+
1999 10 11	704	0.0	0.8-	1999 11 04	704	0.3-	0.0	1999 11 16	704	0.3+	0.2+
1999 10 11	704	0.0	0.3-	1999 11 04	691	0.3+	0.2-	1999 11 16	704	0.5-	0.8+
1999 10 11	704	0.1+	0.7-	1999 11 04	703	0.1-	0.0	1999 11 16	704	0.5-	0.2+

(12609)* 2155 P-L = 1997 GY₁₁

Discovered 1960 Sept. 24 by C. J. van Houten and I. van Houten-Groeneveld on Palomar Schmidt plates taken by T. Gehrels.
Id. A. Milani (*MPC* 34263)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

				Williams			
<i>M</i>	29.34572	(2000.0)		P	Q		
<i>n</i>	0.17834816	ω	34.03560	+0.90348634	+0.42841511		
<i>a</i>	3.1257696	Ω	300.59210	-0.39657113	+0.82390338		
<i>e</i>	0.1816072	<i>i</i>	0.87530	-0.16261540	+0.37100365		
<i>P</i>	5.53	<i>H</i>	13.8	<i>G</i>	0.15	<i>U</i>	2

Residuals in seconds of arc

1960 09 24	675	0.0	0.6-	1999 10 06	704	0.4-	0.8+	1999 11 04	704	0.5-	0.1-
1960 09 26	675	0.5+	0.0	1999 10 06	704	0.3-	0.8+	1999 11 04	704	0.5+	0.3-
1960 09 28	675	0.4-	0.4+	1999 10 06	704	0.6-	0.7+	1999 11 04	704	0.5+	0.1-
1960 09 29	675	0.4+	0.5+	1999 10 10	704	0.3-	0.3+	1999 11 04	704	0.6+	0.6-
1960 10 26	675	0.6-	0.1-	1999 10 10	704	0.2+	0.2+	1999 11 05	704	0.1+	0.5+
1996 02 10	691	0.4-	0.6-	1999 10 10	704	0.5+	0.4-	1999 11 05	704	0.1+	0.2+
1996 02 10	691	0.1-	0.8-	1999 10 10	704	0.6+	0.2+	1999 11 05	704	0.0	0.5+
1996 02 10	691	0.4-	1.0-	1999 10 10	704	0.7+	0.0	1999 11 05	704	0.3-	0.3+
1997 04 03	704	0.2+	1.7+	1999 10 15	704	0.4+	0.1+	1999 11 05	704	0.0	0.5+
1997 04 03	704	0.8-	0.2-	1999 10 15	704	0.7+	0.2+	1999 11 14	704	0.4-	0.6+
1997 04 05	704	0.3+	0.5+	1999 10 15	704	0.6+	0.1-	1999 11 14	704	0.5-	0.2-
1997 04 05	704	1.4+	1.0+	1999 10 15	704	0.3+	0.3+	1999 11 14	704	0.5-	0.7-
1997 04 06	704	(0.1+ 2.5+)		1999 10 15	704	0.7+	0.2+	1999 11 14	704	0.6-	0.2-
1997 04 06	704	1.2+	1.7+	1999 10 21	704	0.2-	0.4-	1999 11 14	704	0.9-	0.8-
1997 04 07	704	0.7+	1.6+	1999 10 21	704	0.6-	0.5-	1999 11 15	691	0.0	0.5+
1997 04 07	704	0.1+	1.0+	1999 10 21	704	0.8-	0.8-	1999 11 15	691	0.1-	0.5+
1999 10 03	704	0.2+	0.6+	1999 10 21	704	0.3-	0.4-	1999 11 15	691	0.0	0.4+
1999 10 03	704	0.4+	0.2+	1999 10 21	704	0.1-	0.4-	1999 11 16	704	0.9-	0.1-
1999 10 03	704	0.1+	0.7+	1999 11 03	703	1.0-	0.2+	1999 11 16	704	0.3+	0.8+
1999 10 03	704	0.2+	0.2+	1999 11 03	703	0.3-	1.2-	1999 11 16	704	0.7+	0.8+
1999 10 03	704	0.1+	0.1+	1999 11 03	703	1.2-	0.5-	1999 11 16	704	1.2+	0.3+
1999 10 06	704	0.1+	0.8+	1999 11 03	703	1.1-	0.3-				
1999 10 06	704	0.2-	0.8+	1999 11 04	704	0.1+	0.5+				

(12610)* 2551 P-L = 1977 DD₆ = 1998 QF₁₃

Discovered 1960 Sept. 24 by C. J. van Houten and I. van Houten-Groeneveld on Palomar Schmidt plates taken by T. Gehrels.
Id. G. V. Williams (*MPC* 32502)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

				Williams			
<i>M</i>	72.72097	(2000.0)		P	Q		
<i>n</i>	0.20515039	ω	295.31161	+0.77701379	+0.62934608		
<i>a</i>	2.8472208	Ω	25.69279	-0.56607938	+0.70773831		
<i>e</i>	0.1023624	<i>i</i>	1.73893	-0.27532474	+0.32098285		
<i>P</i>	4.80	<i>H</i>	13.5	<i>G</i>	0.15	<i>U</i>	1

Residuals in seconds of arc

1960 09 24	675	0.1+	1.2-	1998 08 17	704	0.8-	0.4+	1999 11 03	704	0.6+	0.1+
1960 09 26	675	0.2+	0.7-	1998 08 17	704	1.1-	0.8+	1999 11 03	704	0.0	0.2+
1960 09 28	675	0.1-	0.7-	1998 08 17	704	1.3-	1.2+	1999 11 03	704	0.2+	0.3+
1960 09 29	675	0.9+	1.3-	1998 08 17	704	0.8-	1.3+	1999 11 03	704	0.2+	0.2+
1960 10 17	675	0.2-	0.0	1998 08 23	704	1.4+	0.9-	1999 11 03	704	0.7+	0.2+
1960 10 22	675	0.0	0.3-	1998 08 23	704	1.0+	0.2+	1999 11 12	704	0.1+	0.4+
1960 10 25	675	0.6+	0.6+	1998 08 23	704	1.2+	1.2-	1999 11 12	704	0.3-	0.0
1960 10 26	675	(3.6- 1.0-)		1998 08 23	704	0.4-	1.1-	1999 11 12	704	0.2-	0.2+
1977 02 19	381	1.5+	0.5-	1998 08 23	704	(0.9- 2.0-)		1999 11 12	704	0.5-	0.1+
1977 02 19	381	1.1-	0.0	1998 08 27	699	0.4+	0.2+	1999 11 12	704	0.1-	0.1+
1995 12 27	691	0.1-	0.7-	1998 08 27	699	0.7+	0.1-	1999 11 16	704	0.6-	0.1-
1995 12 27	691	0.2-	0.4-	1998 08 27	699	0.4+	0.6+	1999 11 16	704	0.5-	0.0
1995 12 27	691	0.2-	0.5-	1999 10 22	704	0.4+	0.1-	1999 11 16	704	0.3-	0.5+
1997 04 14	691	0.3-	0.2-	1999 10 22	704	0.0	0.3-	1999 11 16	704	0.4-	0.2+
1997 04 14	691	0.3-	0.0	1999 10 22	704	0.4+	0.6+	1999 11 16	704	0.1-	0.4+
1997 04 14	691	0.0	0.0	1999 10 22	704	0.1+	0.0				
1998 08 17	704	0.7-	0.1+	1999 10 22	704	0.4-	0.2+				

(12611)* 2555 P-L = 1982 SF₁₁ = 1993 TK₄₂ = 1998 QE₉

Discovered 1960 Sept. 24 by C. J. van Houten and I. van Houten-Groeneveld on Palomar Schmidt plates taken by T. Gehrels.
Id. A. Gnädig (*MPC* 32502), G. V. Williams (*ibid.*)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

				Williams			
<i>M</i>	18.62105	(2000.0)		P	Q		
<i>n</i>	0.17996828	ω	195.22493	+0.91411884	-0.40539476		
<i>a</i>	3.1069820	Ω	188.69930	+0.37631392	+0.85426647		
<i>e</i>	0.2268463	<i>i</i>	2.45081	+0.15091247	+0.32539803		
<i>P</i>	5.48	<i>H</i>	14.0	<i>G</i>	0.15	<i>U</i>	1

Residuals in seconds of arc

1960 09 24	675	0.2+	0.2+	1993 10 22	809	0.3+	0.3-	1999 10 12	704	0.1+	0.3+
1960 09 26	675	0.0	0.2-	1993 10 22	809	0.6-	0.1+	1999 11 15	704	0.5+	0.1+
1960 09 28	675	0.1+	0.4+	1998 08 17	704	1.2-	0.1-	1999 11 15	704	0.8-	0.3-
1960 09 29	675	0.4-	0.1+	1998 08 17	704	0.9-	0.2+	1999 11 15	704	0.3+	1.0-
1960 10 17	675	0.2-	0.3+	1998 08 17	704	0.2-	0.1+	1999 11 15	704	0.5+	0.3-
1960 10 22	675	0.8-	0.4+	1998 08 17	704	0.3-	1.4-	1999 11 15	704	0.1-	0.8-
1960 10 25	675	0.6+	0.5+	1998 08 17	704	0.3+	0.3+	1999 11 17	704	0.0	0.0
1960 10 26	675	0.3-	0.2+	1998 08 23	704	1.9+	0.1-	1999 11 17	704	0.2+	0.0
1982 09 27	095	0.4+	0.8-	1998 08 23	704	0.2+	0.3+	1999 11 17	704	0.2+	0.6-
1993 10 10	809	(0.6+ 3.4+)		1998 08 23	704	1.5+	0.7-	1999 11 17	704	0.5+	0.0
1993 10 10	809	(0.3- 2.5+)		1998 08 23	704	0.8-	0.9-	1999 11 17	704	0.4-	0.0
1993 10 10	809	1.5-	1.5+	1999 10 12	704	1.3-	0.7-				
1993 10 22	809	1.8+	0.6-	1999 10 12	704	0.2-	1.0+				

(12612)* 2592 P-L = 1993 BC₇

Discovered 1960 Sept. 24 by C. J. van Houten and I. van Houten-Groeneveld on Palomar Schmidt plates taken by T. Gehrels.
Id. B. G. Marsden (*MPC* 21805)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

M	141.12807		(2000.0)	$\mathbf{P}$	$\mathbf{Q}$
n	0.25570903	ω	74.37944	-0.32433124	+0.94592871
a	2.4583215	Ω	176.68129	-0.89919646	-0.30655787
e	0.0877005	i	5.25601	-0.29369196	-0.10602428
P	3.85	H	14.1	G 0.15	U 1

Residuals in seconds of arc

1960 09 24	675	0.7+	0.2+	1997 03 10	704	1.7+	0.3+	1999 10 21	704	1.0-	0.3-
1960 09 28	675	0.8-	0.9+	1997 03 11	704	1.7+	1.6+	1999 10 21	704	0.9-	0.5-
1960 09 29	675	0.1+	0.1-	1997 03 11	704	1.9+	1.2+	1999 10 21	704	0.4-	0.3+
1960 10 17	675	0.9+	0.8-	1998 06 26	704	0.5+	0.0	1999 11 04	704	1.0+	0.4+
1960 10 22	675	0.6-	1.4+	1998 06 26	704	0.4-	0.8+	1999 11 04	704	0.8+	0.1+
1960 10 25	675	0.2+	0.4-	1998 06 26	704	0.2-	1.5-	1999 11 04	704	1.1+	0.3+
1960 10 26	675	0.4-	0.2+	1998 06 26	704	1.0-	0.4-	1999 11 04	704	0.7+	0.2-
1993 01 23	809	0.2+	1.0-	1998 06 27	699	0.1+	0.2+	1999 11 04	704	0.4+	0.2+
1993 01 23	809	1.7-	0.4+	1998 06 27	699	0.2-	0.3-	1999 11 17	704	0.5-	1.2+
1993 01 23	809	1.3-	1.4-	1998 06 27	699	0.1+	0.1+	1999 11 17	704	0.5+	0.3+
1993 01 28	809	0.2-	0.2-	1998 06 29	704	(0.6-	3.2+)	1999 11 17	704	0.1-	1.0-
1993 01 28	809	1.5-	0.0	1998 06 29	704	1.0+	0.1-	1999 11 17	704	0.9-	0.0
1993 01 28	809	1.1-	0.5-	1998 06 29	704	(2.4+	0.9+)	1999 11 17	704	0.1+	0.0
1997 03 10	704	(2.3+	0.1-)	1998 06 29	704	0.6-	0.5+				

(12613)* 4024 P-L = 1990 RT₁

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

Id. E. Bowell (*MPC* 17651)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

				Williams			
				P	Q		
<i>M</i>	30.57072	(2000.0)					
<i>n</i>	0.22880880	ω	52.81368	+0.93337367	+0.35544013		
<i>a</i>	2.6474082	Ω	286.31806	-0.34353224	+0.84462243		
<i>e</i>	0.1390231	<i>i</i>	2.97195	-0.10391920	+0.40034393		
<i>P</i>	4.31	<i>H</i>	14.0	<i>G</i>	0.15	<i>U</i>	1

Residuals in seconds of arc

1960 09 24	675	0.4+	0.4-	1999 10 11	106	0.6-	0.2-	1999 10 22	704	0.3-	0.3+
1960 09 25	675	0.0	0.1+	1999 10 11	106	0.4+	0.1+	1999 10 29	703	0.1+	0.2+
1960 09 26	675	0.1+	0.4-	1999 10 12	704	0.4+	0.1-	1999 10 29	703	0.1-	0.1+
1960 09 28	675	0.8-	0.8-	1999 10 12	704	0.4-	0.4+	1999 10 29	703	0.6-	0.2+
1960 10 17	675	0.5+	0.0	1999 10 12	704	0.1-	0.5+	1999 10 29	703	0.1+	0.2-
1960 10 22	675	1.1+	0.1-	1999 10 12	704	0.3+	0.5+	1999 11 03	704	1.0-	1.0-
1960 10 24	675	0.3+	0.7+	1999 10 12	704	0.1-	0.3+	1999 11 03	704	0.6-	0.6-
1960 10 26	675	0.6-	0.7-	1999 10 13	704	0.0	0.6+	1999 11 03	704	0.4-	1.5-
1990 09 15	675	0.8-	0.8-	1999 10 13	704	0.1+	0.6+	1999 11 03	704	0.5-	1.3-
1990 09 15	675	0.3+	0.5-	1999 10 13	704	0.2+	0.8+	1999 11 03	704	0.4-	1.4-
1990 09 20	675	1.4+	0.6+	1999 10 13	704	0.4+	0.7+	1999 11 11	703	0.9-	0.4+
1990 09 20	675	0.8-	0.4-	1999 10 13	704	0.4+	0.9+	1999 11 11	703	0.4-	0.5-
1993 03 21	809	(2.9-	1.7+)	1999 10 15	704	0.1+	1.0+	1999 11 11	703	2.0+	0.7-
1993 03 22	809	0.4-	0.2-	1999 10 15	704	0.8+	1.1+	1999 11 11	703	0.3-	0.3+
1993 03 26	809	0.0	0.0	1999 10 15	704	0.3+	0.8+	1999 11 16	704	0.1-	0.1-
1993 04 17	413	(3.2-	2.0-)	1999 10 15	704	0.6+	0.7+	1999 11 16	704	0.6+	0.1-
1998 06 24	704	(3.3+	0.1-)	1999 10 22	704	0.1-	0.3+	1999 11 16	704	0.8+	0.4-
1998 06 24	704	0.5+	1.4+	1999 10 22	704	0.6-	0.2+	1999 11 16	704	0.3+	0.0
1998 06 24	704	(0.1+	2.8+)	1999 10 22	704	0.7-	0.3+	1999 11 16	704	0.3+	0.2-
1999 10 11	106	0.0	0.1-	1999 10 22	704	0.0	0.9+				

(12614)* 4119 P-L = 1989 RZ₁

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

Id. T. Kobayashi (*MPC* 15423)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

				Williams			
				P	Q		
<i>M</i>	37.06919	(2000.0)					
<i>n</i>	0.30522366	ω	138.74561	+0.86773099	+0.49679403		
<i>a</i>	2.1846938	Ω	191.49602	-0.47393258	+0.81763530		
<i>e</i>	0.2170850	<i>i</i>	4.44533	-0.14976929	+0.29097801		
<i>P</i>	3.23	<i>H</i>	14.9	<i>G</i>	0.15	<i>U</i>	1

Residuals in seconds of arc

1951 12 27	675	0.1-	0.4+	1998 03 22	704	0.7-	0.2-	1998 05 01	699	0.6+	1.2+
1951 12 27	675	0.8-	0.6+	1998 03 22	704	(3.8-	1.0+)	1998 05 01	699	0.9-	0.1-
1960 09 24	675	0.5-	0.4+	1998 03 25	704	0.8-	0.7-	1998 05 01	699	0.8-	0.9+

1960 09 25	675	0.1+	0.1+	1998 03 25	704	0.6+	1.0+	1998 05 16	704	0.6+	1.7-
1960 09 26	675	0.1-	0.5+	1998 03 25	704	0.3-	1.2+	1998 05 16	704	1.0+	0.4+
1960 09 28	675	0.0	0.2+	1998 03 25	704	0.3+	0.1+	1998 05 16	704	1.2-	0.2+
1960 10 17	675	0.4+	0.4+	1998 03 25	704	(0.8-	2.6+)	1998 05 16	704	0.9-	0.3-
1960 10 22	675	0.4-	0.5+	1998 03 26	566	0.2-	0.2+	1999 10 15	704	0.1+	0.1+
1960 10 25	675	0.4+	0.6+	1998 03 26	566	0.1-	0.5+	1999 10 15	704	0.0	0.3-
1960 10 26	675	0.3-	0.7+	1998 03 26	566	0.4-	0.5+	1999 10 15	704	0.4-	0.4-
1989 09 04	511	0.9-	0.8+	1998 03 28	704	0.3+	0.8-	1999 10 15	704	0.1-	0.8-
1989 09 04	511	0.6-	1.0+	1998 03 28	704	0.2+	0.5+	1999 10 21	704	0.4+	0.3-
1989 09 08	511	0.2-	0.4+	1998 03 28	704	0.3+	0.0	1999 10 21	704	0.0	0.0
1989 09 08	511	1.8+	1.3+	1998 03 28	704	1.2+	0.2-	1999 10 21	704	0.1-	0.2-
1989 09 25	809	0.2-	0.3-	1998 03 28	704	1.3+	1.7-	1999 10 21	704	0.2-	1.1+
1989 09 25	809	0.7+	0.3-	1998 03 29	704	0.2+	0.7+	1999 10 21	704	0.6-	0.3-
1989 09 25	809	1.7+	0.4-	1998 03 29	704	0.4-	0.6+	1999 11 01	120	0.4+	0.4+
1989 09 26	809	1.5-	0.9-	1998 03 29	704	0.6-	0.6+	1999 11 01	120	0.2+	0.8-
1989 09 26	809	1.0-	0.9-	1998 03 29	704	0.5-	0.1-	1999 11 04	704	0.0	0.1+
1989 09 26	809	0.3-	1.0-	1998 03 29	704	0.8-	0.8+	1999 11 04	704	0.0	0.2+
1998 03 20	704	1.5+	0.8-	1998 04 22	704	0.5+	1.0-	1999 11 04	704	0.6+	0.4+
1998 03 20	704	0.9+	0.7-	1998 04 22	704	0.2+	0.0	1999 11 04	704	0.1+	0.9+
1998 03 20	704	1.7+	0.4+	1998 04 22	704	0.1+	0.1-	1999 11 04	704	0.2+	1.0+
1998 03 20	704	0.3+	0.7+	1998 04 22	704	0.2+	0.6+	1999 11 17	704	0.2+	0.5-
1998 03 20	704	(2.1-	0.4+)	1998 04 22	704	0.5-	0.9+	1999 11 17	704	0.2-	0.1-
1998 03 22	704	0.4-	0.0	1998 04 30	699	0.3-	0.3-	1999 11 17	704	0.0	0.4-
1998 03 22	704	(2.3-	0.1-)	1998 04 30	699	0.8-	0.5+	1999 11 17	704	0.0	0.3-
1998 03 22	704	0.3-	0.7+	1998 04 30	699	0.4+	0.9-				

(12615)* 4626 P-L

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

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

				Williams			
				P	Q		
<i>M</i>	290.29542	(2000.0)					
<i>n</i>	0.20261883	ω	53.47576	+0.14005937	-0.99000395		
<i>a</i>	2.8708875	Ω	28.48640	+0.89695082	+0.11975862		
<i>e</i>	0.0560281	<i>i</i>	1.99451	+0.41935975	+0.07449864		
<i>P</i>	4.86	<i>H</i>	13.9	<i>G</i>	0.15	<i>U</i>	1

Residuals in seconds of arc

1951 11 08	675	1.5-	0.4+	1999 10 05	704	0.0	0.2-	1999 10 19	704	0.4+	0.3-
1951 11 08	675	1.5+	0.7-	1999 10 05	704	0.3+	0.2+	1999 10 19	704	0.0	0.4+
1951 12 27	675	0.9-	1.2-	1999 10 05	704	0.2+	0.1+	1999 10 19	704	0.4+	0.7+
1951 12 27	675	1.1+	0.2+	1999 10 05	704	0.4+	0.1+	1999 10 19	704	0.2-	0.6+
1960 09 24	675	0.0	0.7-	1999 10 07	683	0.4+	0.1-	1999 10 19	704	0.1-	0.5-
1960 09 26	675	0.3+	1.3-	1999 10 07	683	0.3+	0.5-	1999 11 01	703	0.0	0.2-
1960 09 27	675	0.5+	0.3+	1999 10 07	683	1.2+	0.1+	1999 11 01	703	0.5+	0.0
1960 09 28	675	0.1+	0.3-	1999 10 07	704	0.1-	0.2+	1999 11 01	703	0.5-	1.6+
1960 10 17	675	0.3-	0.7-	1999 10 07	704	0.5-	0.6+	1999 11 01	703	0.5+	0.1+
1960 10 25	675	0.1+	1.0-	1999 10 07	704	0.2+	0.5+	1999 11 04	703	(2.1-	1.1+)
1960 10 26	675	1.3+	0.6-	1999 10 07	704	0.2+	0.3+	1999 11 04	703	1.4-	0.4+
1990 10 30	675	(3.3-	0.8-)	1999 10 07	704	0.0	0.1-	1999 11 04	703	0.6-	1.0+
1994 08 11	675	0.0	0.1+	1999 10 08	683	0.9+	0.2+	1999 11 04	703	0.1-	0.1+
1994 09 30	691	0.1+	0.3+	1999 10 08	683	0.6+	0.2+	1999 11 05	704	0.0	1.4+
1994 09 30	691	0.0	0.1+	1999 10 08	683	0.7+	0.1+	1999 11 05	704	1.0+	1.0+
1994 09 30	691	0.1-	0.1+	1999 10 09	704	0.1-	0.3+	1999 11 05	704	0.1+	0.1+
1997 02 07	327	0.2-	0.8+	1999 10 09	704	0.2+	0.0	1999 11 05	704	1.8-	0.1-
1997 02 07	327	0.8+	0.5+	1999 10 09	704	0.1+	0.1+	1999 11 05	704	0.6+	0.6-
1997 02 07	327	0.0	0.3+	1999 10 09	704	0.6+	0.1-	1999 11 09	704	0.1+	0.1-
1999 10 02	703	0.6-	0.3+	1999 10 09	704	1.0-	0.3+	1999 11 09	704	0.1+	0.2-
1999 10 02	703	1.4-	0.2-	1999 10 15	704	0.4-	0.0	1999 11 09	704	0.3-	0.1-
1999 10 02	703	0.8-	0.2-	1999 10 15	704	0.1-	0.1-	1999 11 09	704	0.0	0.4-
1999 10 02	703	0.5+	0.0	1999 10 15	704	0.0	0.0	1999 11 09	704	0.7-	0.6-
1999 10 04	704	0.0	0.2+	1999 10 15	704	0.2+	0.0	1999 11 12	704	0.7+	0.9-
1999 10 04	704	1.1-	0.5+	1999 10 15	704	0.0	0.4+	1999 11 12	704	0.1+	0.6+
1999 10 04	704	0.2-	0.2+	1999 10 16	145	0.1-	0.5+	1999 11 12	704	(2.6-	0.0)
1999 10 04	704	1.5-	1.2-	1999 10 16	145	0.1-	0.2-	1999 11 12	704	0.1-	0.7+
1999 10 04	704	0.2-	0.6-	1999 10 16	145	0.2-	0.3-	1999 11 12	704	0.4-	0.7-
1999 10 05	704	0.4+	0.2+	1999 10 16	145	0.2+	0.1-				

(12616)* 4874 P-L = 1990 SU₇

Discovered 1960 Sept. 26 by C. J. van Houten and I. van Houten-Groeneveld on Palomar Schmidt plates taken by T. Gehrels.

Id. B. G. Marsden (*MPC* 17462)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>		(2000.0)		P		Q	
<i>n</i>	354.58394	ω	341.55216	+0.80745363	−0.58796287		
<i>a</i>	2.6429009	Ω	54.55617	+0.54841834	+0.71805444		
<i>e</i>	0.1004802	<i>i</i>	3.38822	+0.21738436	+0.37242112		
<i>P</i>	4.30	<i>H</i>	14.6	<i>G</i>	0.15	<i>U</i>	1

Residuals in seconds of arc

1960 09 26	675	0.1−	0.4−	1997 04 11	704	0.9−	0.9+	1999 11 09	704	0.7−	0.7+
1960 09 27	675	0.5−	0.2+	1999 10 15	704	0.2+	0.2+	1999 11 09	704	0.7−	0.3+
1960 09 28	675	0.6−	0.3−	1999 10 15	704	0.9+	0.9−	1999 11 09	704	0.6−	0.4+
1960 10 17	675	0.1+	0.7+	1999 10 15	704	0.4+	0.5−	1999 11 09	704	0.3−	0.2+
1960 10 25	675	0.4+	0.0	1999 10 15	704	0.3−	0.2+	1999 11 12	704	0.6−	0.0
1960 10 26	675	0.7+	0.2+	1999 10 22	704	0.1−	1.1−	1999 11 12	704	0.6−	0.1+
1990 09 14	809	0.7−	0.1+	1999 10 22	704	0.6+	0.4−	1999 11 12	704	0.7−	0.2+
1990 09 14	809	1.9−	1.0−	1999 10 22	704	0.4+	0.2+	1999 11 12	704	0.4−	0.5+
1990 09 14	809	0.8−	0.1−	1999 10 22	704	0.7+	0.4−	1999 11 12	704	0.5−	0.2+
1990 09 22	809	0.3+	0.4+	1999 10 22	704	1.9+	0.3−	1999 11 16	704	0.1+	0.3−
1990 09 22	809	0.3−	0.3+	1999 11 03	704	0.1+	0.3+	1999 11 16	704	0.2−	0.2−
1990 09 22	809	1.0+	0.2−	1999 11 03	704	0.3+	0.0	1999 11 16	704	0.3+	0.4−
1990 09 25	809	1.4+	0.2+	1999 11 03	704	0.3+	0.1+	1999 11 16	704	0.2−	0.2+
1990 09 25	809	0.9+	0.3+	1999 11 03	704	0.7+	0.1−	1999 11 16	704	0.6−	0.2−
1990 09 25	809	0.1−	0.4+	1999 11 03	704	0.5+	0.1−				
1997 04 11	704	1.1+	0.5−	1999 11 09	704	0.6−	0.6+				

(12617)* 5568 P-L = 1977 RY = 1986 XB₂

Discovered 1960 Oct. 17 by C. J. van Houten and I. van Houten-Groeneveld on Palomar Schmidt plates taken by T. Gehrels.

Id. T. Kobayashi (*MPC* 12583, *MPC* 14797)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>		(2000.0)		P		Q	
<i>n</i>	32.61594	ω	321.90383	+0.98847810	+0.13326132		
<i>a</i>	2.6417104	Ω	30.66895	−0.07921759	+0.85955127		
<i>e</i>	0.1248283	<i>i</i>	8.08981	−0.12897913	+0.49336906		
<i>P</i>	4.29	<i>H</i>	13.5	<i>G</i>	0.15	<i>U</i>	1

Residuals in seconds of arc

1960 10 17	675	0.9−	1.0+	1990 09 22	809	0.0	1.2−	1999 10 13	704	0.6−	0.1−
1960 10 22	675	0.1+	0.0	1990 09 22	809	0.5−	0.5−	1999 10 13	704	1.5+	0.2−
1960 10 25	675	0.7+	0.2+	1990 09 24	095	0.1−	0.1−	1999 10 13	704	1.2+	0.1+
1960 10 26	675	1.0+	0.2+	1990 09 24	095	0.0	0.2−	1999 10 13	704	0.3+	0.7+
1977 09 07	095	(0.7−	2.9+)	1990 09 25	809	(1.2−	2.0−)	1999 10 13	704	0.9−	1.8+
1980 04 08	675	1.4−	0.7+	1990 09 25	809	1.2−	1.1−	1999 11 02	163	0.1−	0.8−
1980 04 09	675	0.6−	0.7+	1990 09 25	809	1.2−	1.6−	1999 11 03	163	1.2+	0.5−
1986 12 01	010	(1.5−	3.7−)	1992 03 05	950	1.0−	0.9−	1999 11 07	163	0.6+	0.2−
1986 12 01	010	(3.4−	5.2−)	1992 03 06	950	1.0−	0.9−	1999 11 07	163	0.8+	0.3+
1986 12 01	010	(4.5−	5.2−)	1993 04 25	809	0.1+	1.1−	1999 11 16	704	0.3−	0.4+
1986 12 03	010	(3.0−	0.6−)	1993 04 25	809	0.5+	0.9−	1999 11 16	704	0.2−	0.4+
1986 12 03	010	1.2−	0.8−	1993 04 25	809	1.3+	0.9−	1999 11 16	704	0.2−	0.2+
1990 09 15	809	(2.3+	0.7+)	1999 10 13	704	0.2−	0.1−	1999 11 16	704	0.4−	0.0
1990 09 15	809	1.5+	1.0+	1999 10 13	704	0.9−	0.0	1999 11 16	704	0.1−	0.2+
1990 09 15	809	0.7+	0.7+	1999 10 13	704	0.3+	0.1+				
1990 09 22	809	0.6+	0.9−	1999 10 13	704	0.6+	0.2−				

(12618)* 6217 P-L = 1980 GG₁

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

Id. H. Kaneda (*MPC* 15905)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>		(2000.0)		P		Q	
<i>n</i>	182.18848	ω	10.82658	−0.88944868	+0.45011953		
<i>a</i>	3.1229482	Ω	196.63141	−0.43727737	−0.88852523		
<i>e</i>	0.1309554	<i>i</i>	16.06539	−0.13292686	−0.08896806		
<i>P</i>	5.52	<i>H</i>	13.2	<i>G</i>	0.15	<i>U</i>	1

Residuals in seconds of arc

1960 09 24	675	0.1+	1.4+	1998 08 24	704	0.2−	0.6−	1999 10 02	703	0.4−	0.2−
1960 09 25	675	0.5+	0.4+	1998 08 24	704	0.3+	1.2+	1999 10 02	703	0.2+	0.5+
1960 09 26	675	0.1−	0.0	1998 08 27	704	0.0	0.4+	1999 10 09	704	0.7−	0.1+
1960 09 28	675	0.3−	0.4−	1998 08 27	704	0.5−	0.9−	1999 10 09	704	0.2+	1.0+
1960 10 22	675	0.1+	0.1−	1998 08 27	704	0.3+	1.2+	1999 10 09	704	0.1−	0.3−
1960 10 24	675	0.2−	0.8+	1998 08 27	704	1.8−	0.2+	1999 10 09	704	0.1−	0.7+
1960 10 26	675	0.3−	0.8−	1998 09 19	704	0.1+	0.0	1999 10 09	704	0.3+	0.2+
1980 04 14	805	1.5−	1.7+	1998 09 19	704	1.1+	0.9+	1999 10 19	704	0.3−	0.6−
1980 04 15	805	0.8+	2.0−	1998 09 19	704	0.6+	1.2−	1999 10 19	704	0.2+	0.2+
1980 04 16	805	0.8+	1.2+	1998 09 19	704	0.5+	1.2−	1999 10 19	704	0.4−	0.5+
1998 08 19	704	1.1+	0.8−	1998 09 19	704	0.8+	0.0	1999 10 19	704	0.7+	0.5−
1998 08 19	704	0.9−	1.2+	1998 09 23	704	0.6−	1.1−	1999 10 19	704	0.3+	0.7−
1998 08 19	704	2.0+	0.7+	1998 09 23	704	0.4+	1.2+	1999 11 05	704	0.1−	0.4+
1998 08 19	704	0.2+	1.8−	1998 09 23	704	0.6−	1.6+	1999 11 05	704	0.0	0.3−
1998 08 19	704	1.6−	1.0+	1998 09 23	704	0.7−	0.3+	1999 11 05	704	0.2−	0.3−
1998 08 24	704	1.9−	1.3−	1998 09 23	704	1.6+	0.3−	1999 11 05	704	0.4+	0.6−
1998 08 24	704	0.1+	1.4−	1999 10 02	703	0.5+	0.7+				
1998 08 24	704	(0.3+	2.1+)	1999 10 02	703	0.6−	0.3−				

(12619)* 6242 P-L = 1989 EF₄

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

Id. S. Nakano (*MPC* 14630)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>		(2000.0)		P		Q	
<i>n</i>	250.42535	ω	293.41247	−0.89869916	−0.43397459		
<i>a</i>	2.4571408	Ω	220.94486	+0.42932843	−0.84109741		
<i>e</i>	0.0744750	<i>i</i>	5.54226	+0.08953720	−0.32283308		
<i>P</i>	3.85	<i>H</i>	14.4	<i>G</i>	0.15	<i>U</i>	1

Residuals in seconds of arc

1960 09 24	675	0.3−	0.9+	1995 12 02	327	0.2+	0.2−	1999 11 04	704	0.1+	0.7−
1960 09 25	675	0.3+	1.3+	1995 12 02	327	0.4−	0.1−	1999 11 04	704	0.3+	0.0
1960 09 26	675	0.6−	0.9+	1995 12 07	327	0.2+	0.0	1999 11 04	704	1.4+	0.8+
1960 09 28	675	0.0	0.5+	1995 12 07	327	0.0	0.3+	1999 11 04	704	0.9−	0.1−
1960 10 22	675	0.1−	0.3−	1995 12 07	327	0.1+	0.3−	1999 11 04	704	0.2+	0.2+
1960 10 24	675	0.1+	0.3−	1998 07 29	560	0.8+	1.6−	1999 11 15	704	1.1−	0.8−
1960 10 26	675	0.0	0.6+	1998 07 29	560	0.5−	1.7−	1999 11 15	704	0.1−	0.4−
1989 03 02	809	0.6−	0.1−	1998 07 29	560	1.3+	1.6−	1999 11 15	704	0.1−	0.7−
1989 03 02	809	0.9−	0.6−	1999 10 22	704	0.5+	1.1+	1999 11 15	704	0.5−	1.0−
1989 03 02	809	0.3−	0.9−	1999 10 22	704	0.3+	0.4+	1999 11 15	704	0.3−	1.1−
1989 03 03	809	0.5+	0.8+	1999 10 22	704	0.9+	0.2−	1999 11 17	704	0.8+	0.3−
1989 03 03	809	0.6+	0.2−	1999 10 22	704	0.0	0.5−	1999 11 17	704	0.8+	0.3−
1989 03 03	809	0.1−	0.3+	1999 10 22	704	0.1+	0.4−	1999 11 17	704	0.7+	0.6−
1995 10 19	596	0.3−	0.7+	1999 10 30	703	1.0−	0.3+	1999 11 17	704	0.4+	0.8−
1995 10 19	596	1.0−	0.6+	1999 10 30	703	0.3+	0.2−	1999 11 17	704	0.5+	0.9−
1995 10 19	596	1.4−	0.5+	1999 10 30	703	0.8+	0.1+				
1995 12 02	327	0.6−	0.1−	1999 10 30	703	0.6−	1.0+				

(12620)* 6335 P-L = 1996 DD₇

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

Id. G. V. Williams (*MPC* 26912)

1999 NOV. 23

M.P.C. 36775

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	146.99184		(2000.0)	P	Q
<i>n</i>	0.17920492	ω	60.28089	-0.49473473	+0.86904404
<i>a</i>	3.1157989	Ω	180.06686	-0.80270504	-0.45697700
<i>e</i>	0.1320778	<i>i</i>	0.90771	-0.33301977	-0.18956389
<i>P</i>	5.50	<i>H</i>	13.6	<i>G</i> 0.15	<i>U</i> 1

Residuals in seconds of arc

1960 09 24	675	0.0	0.3-	1998 08 23	704	(4.6-	1.5+)	1999 10 19	691	0.4+	0.2-
1960 09 25	675	1.4-	0.2-	1998 09 14	704	0.3+	0.6-	1999 10 19	691	0.5+	0.2-
1960 09 26	675	0.3-	0.8+	1998 09 14	704	0.6+	0.4-	1999 10 21	704	0.8+	1.6-
1960 09 28	675	0.4+	0.7+	1998 09 14	704	0.7+	0.7+	1999 10 21	704	0.2-	0.4+
1960 10 17	675	0.3-	0.8+	1998 09 14	704	1.7-	1.3+	1999 10 21	704	0.3-	0.1+
1960 10 22	675	0.6+	0.1-	1998 09 18	704	0.6+	1.3+	1999 10 21	704	0.8+	0.8+
1960 10 25	675	0.4+	1.0-	1998 09 18	704	0.3-	0.1+	1999 11 04	704	1.3-	0.3+
1960 10 26	675	0.6+	1.2-	1998 09 18	699	1.0-	0.4+	1999 11 04	704	0.8-	1.0-
1996 02 16	010	0.7-	0.0	1998 09 18	704	1.7-	0.8-	1999 11 04	704	0.6-	0.3-
1996 02 16	010	1.3-	1.2+	1998 09 18	704	1.4+	0.0	1999 11 04	704	1.5-	1.1-
1996 02 16	010	1.2+	0.7+	1998 09 18	704	1.2-	1.1+	1999 11 12	704	0.2+	0.7+
1996 02 17	010	0.4+	0.0	1998 09 20	691	0.4+	0.2+	1999 11 12	704	0.1-	0.1+
1996 02 17	010	1.1-	1.2+	1998 09 20	691	0.2+	0.4+	1999 11 12	704	0.1-	0.2+
1996 02 17	010	1.7+	0.2+	1998 09 20	691	0.0	0.2+	1999 11 12	704	0.8+	0.7+
1998 08 17	704	0.6+	0.0	1998 09 23	691	0.2-	0.1+	1999 11 12	704	0.3+	0.8+
1998 08 17	704	0.5-	0.2+	1998 09 23	691	0.2-	0.3+	1999 11 12	691	0.1-	0.0
1998 08 17	704	0.3-	1.8+	1998 09 23	691	0.4-	0.2+	1999 11 12	691	0.4-	0.0
1998 08 17	704	(1.0+	2.1+)	1999 10 10	704	0.1-	0.2-	1999 11 12	691	0.1-	0.1+
1998 08 17	704	0.4+	1.0-	1999 10 10	704	0.4+	0.1-	1999 11 16	704	0.2+	0.4-
1998 08 23	704	0.1-	1.3-	1999 10 10	704	0.1-	0.3+	1999 11 16	704	0.7-	0.6-
1998 08 23	704	(1.9+	2.4-)	1999 10 10	704	1.4+	0.1+	1999 11 16	704	0.3+	0.2+
1998 08 23	704	0.7+	0.2+	1999 10 19	691	0.5+	0.2-				

(12621)* 6585 P-L = 1997 JJ₁₂

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

Id. B. G. Marsden (*MPC* 29937)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Marsden

<i>M</i>	30.49871		(2000.0)	P	Q
<i>n</i>	0.17972835	ω	207.62073	+0.99709000	+0.07289036
<i>a</i>	3.1097466	Ω	148.17519	-0.05977573	+0.92931688
<i>e</i>	0.1348894	<i>i</i>	2.42670	-0.04731158	+0.36201815
<i>P</i>	5.48	<i>H</i>	13.8	<i>G</i> 0.15	<i>U</i> 1

Residuals in seconds of arc

1960 09 24	675	0.4+	0.3+	1998 07 16	691	0.3-	0.4+	1999 11 04	691	0.3-	0.1+
1960 09 26	675	0.1+	0.1-	1998 07 27	691	0.1-	0.4+	1999 11 04	691	0.3-	0.0
1960 09 27	675	1.1+	0.6+	1998 07 27	691	0.1-	0.2+	1999 11 04	691	0.1-	0.2-
1960 09 28	675	1.2+	0.6+	1998 07 27	691	0.1+	0.3+	1999 11 09	120	1.6-	0.6+
1960 10 17	675	0.3+	0.4-	1998 08 17	704	(1.7-	2.3+)	1999 11 09	120	0.7-	0.9+
1960 10 22	675	1.2-	1.4-	1998 08 17	704	0.1+	0.2-	1999 11 12	699	0.4+	0.5+
1960 10 24	675	0.6-	1.1-	1998 08 17	704	1.1+	0.9-	1999 11 12	699	0.3+	0.8+
1960 10 26	675	0.7-	1.1-	1998 08 17	704	(0.1+	2.4-)	1999 11 12	699	0.2+	0.5+
1997 04 11	704	0.1+	1.8+	1998 08 23	704	0.5-	0.0	1999 11 12	120	0.1-	0.3+
1997 04 11	704	0.5+	0.2-	1998 08 23	704	(1.3+	2.2-)	1999 11 12	120	0.2-	0.6+
1997 05 03	809	(0.6+	2.3+)	1998 08 23	704	1.3-	0.1+	1999 11 15	704	0.3-	0.3+
1997 05 03	809	(0.5+	2.2+)	1998 08 23	704	(0.5-	2.3+)	1999 11 15	704	0.1-	0.3+
1997 05 03	809	0.2-	0.9+	1999 10 21	704	0.7+	0.3-	1999 11 15	704	0.6-	0.5-
1997 05 04	809	(1.0+	2.5+)	1999 10 21	704	0.4+	0.1-	1999 11 15	704	0.3-	0.0
1997 05 04	809	(0.1-	2.9+)	1999 10 21	704	1.4+	1.9-	1999 11 15	704	0.3-	0.4+
1997 05 04	809	(1.5-	4.2+)	1999 10 21	704	0.9+	1.3-	1999 11 15	691	0.4-	0.2+
1997 05 07	704	1.1+	1.0-	1999 10 30	703	0.5-	0.8+	1999 11 15	691	0.4-	0.3+
1997 05 07	704	0.6+	0.2-	1999 10 30	703	0.2-	0.4+	1999 11 15	691	0.3-	0.3+
1997 05 07	704	0.3-	0.3-	1999 10 30	703	0.6-	1.0+	1999 11 17	704	0.3-	0.0
1997 05 07	704	1.1-	1.1+	1999 10 30	703	0.2-	0.7+	1999 11 17	704	0.2-	0.2+
1998 07 02	699	0.3+	1.3+	1999 11 04	704	1.1+	0.4+	1999 11 17	704	0.2-	0.1+
1998 07 02	699	0.2-	0.6+	1999 11 04	704	1.0+	0.1+	1999 11 17	704	0.1-	0.2+

1998 07 02	699	1.2+	0.1+	1999 11 04	704	0.3+	0.7-	1999 11 17	704	0.2-	0.1+
1998 07 16	691	0.9-	0.4+	1999 11 04	704	0.4+	0.3-				
1998 07 16	691	0.1-	0.2+	1999 11 04	704	0.8+	0.3-				

(12622)* 6614 P-L = 1993 FV₃₆

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

Id. G. V. Williams (*MPC* 23532)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	67.44164		(2000.0)	P	Q
<i>n</i>	0.22945383	ω	187.65963	+0.58021550	+0.81333445
<i>a</i>	2.6424443	Ω	117.81581	-0.74466239	+0.55107022
<i>e</i>	0.0801847	<i>i</i>	2.77765	-0.32989074	+0.18657086
<i>P</i>	4.30	<i>H</i>	14.2	<i>G</i> 0.15	<i>U</i> 1

Residuals in seconds of arc

1960 09 24	675	0.5-	0.8-	1995 11 29	104	0.7+	0.3-	1999 10 20	704	0.3+	0.8+
1960 09 26	675	0.5+	0.3-	1995 11 29	104	0.4+	0.3-	1999 10 20	704	0.6+	0.8+
1960 09 27	675	1.4+	0.1-	1995 11 29	104	0.6+	0.4-	1999 10 30	703	0.2-	0.1+
1960 09 28	675	0.4+	0.5+	1997 04 01	557	0.4+	0.3+	1999 10 30	703	0.6-	0.2-
1960 10 17	675	0.0	0.7+	1997 04 01	557	0.4+	0.4+	1999 10 30	703	0.1-	0.3-
1960 10 22	675	1.5-	0.0	1999 10 10	704	0.1+	0.3-	1999 10 30	703	0.7-	0.6+
1960 10 24	675	0.2-	0.2-	1999 10 10	704	0.3+	0.5-	1999 11 05	704	0.6+	0.3+
1960 10 26	675	0.1-	0.3+	1999 10 10	704	0.8+	1.1-	1999 11 05	704	0.4-	0.4-
1993 03 19	809	0.9-	0.9+	1999 10 10	704	1.0+	0.2-	1999 11 05	704	0.7+	0.1+
1993 03 20	809	0.6+	0.1-	1999 10 10	704	0.2-	0.0	1999 11 05	704	2.5+	0.2-
1993 03 24	809	0.0	0.6-	1999 10 11	704	0.4+	0.4-	1999 11 05	704	0.6+	0.9-
1995 11 20	104	0.9-	1.6+	1999 10 11	704	0.0	0.3-	1999 11 15	704	0.8-	0.4+
1995 11 20	104	0.6-	0.8+	1999 10 11	704	1.0-	0.6-	1999 11 15	704	0.2-	0.4+
1995 11 20	104	0.3+	0.1+	1999 10 11	704	0.2-	0.6-	1999 11 15	704	0.3-	0.5+
1995 11 20	104	0.4-	1.1-	1999 10 11	704	0.6-	0.3+	1999 11 15	704	0.2-	0.0
1995 11 21	104	1.4+	0.2-	1999 10 15	704	1.1-	0.8+	1999 11 15	704	0.3+	0.3+
1995 11 21	104	0.1-	0.7-	1999 10 15	704	0.3-	0.6+	1999 11 17	704	0.5+	0.5+
1995 11 23	104	0.4-	0.2-	1999 10 15	704	1.0-	0.1-	1999 11 17	704	0.4-	0.1+
1995 11 23	104	1.1-	0.4-	1999 10 15	704	0.6-	0.7+	1999 11 17	704	0.2+	0.5-
1995 11 23	104	0.9-	0.7-	1999 10 20	704	0.0	0.1+	1999 11 17	704	0.3+	0.7+
1995 11 29	104	1.1+	0.3-	1999 10 20	704	0.2-	0.4+	1999 11 17	704	0.7-	0.6+

(12623)* 9544 P-L = 1991 TZ₉

Discovered 1960 Oct. 17 by C. J. van Houten and I. van Houten-Groeneveld on Palomar Schmidt plates taken by T. Gehrels.

Id. G. V. Williams (*MPC* 20516)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	55.18432		(2000.0)	P	Q
<i>n</i>	0.25584783	ω	171.21519	+0.90994127	+0.41409926
<i>a</i>	2.4574323	Ω	164.26146	-0.38547811	+0.86490004
<i>e</i>	0.0552813	<i>i</i>	4.86269	-0.15301474	+0.28367186
<i>P</i>	3.85	<i>H</i>	14.4	<i>G</i> 0.15	<i>U</i> 2

Residuals in seconds of arc

1960 09 24	675	0.2-	0.1-	1997 04 28	704	1.3-	1.2+	1999 10 10	704	0.7+	0.1+
1960 10 17	675	0.7+	0.8+	1997 04 28	704	0.9+	1.3+	1999 10 21	704	0.9+	0.2+
1960 10 22	675	1.8-	0.1-	1997 04 28	704	0.0	0.7-	1999 10 21	704	0.5+	0.4+
1960 10 24	675	0.1+	0.8+	1997 04 28	704	1.5-	0.4-	1999 10 21	704	0.4+	0.2+
1960 10 26	675	0.5+	0.9+	1997 04 28	704	(3.6-	0.7-)	1999 10 21	704	0.7+	0.4-
1991 10 09	691	0.2-	0.1-	1997 04 29	704	0.7+	0.4-	1999 10 21	704	0.3-	0.3+
1991 10 09	691	0.1-	0.1-	1997 04 29	704	1.0+	0.1+	1999 11 04	704	0.5-	0.1-
1991 10 09	691	0.0	0.1-	1997 04 29	704	1.0+	0.5+	1999 11 04	704	0.4-	0.5-
1991 10 10	691	0.1+	0.2-	1997 04 29	704	0.2-	0.6+	1999 11 04	704	0.8-	0.0
1991 10 10	691	0.1+	0.2-	1999 10 10	704	(0.6+	2.1+)	1999 11 04	704	0.5-	0.7-
1991 10 10	691	0.1+	0.0	1999 10 10	704	0.0	1.3+	1999 11 04	704	0.2-	0.5-

(12624)* 9565 P-L = 1988 SZ₃ = 1995 SV₄

Discovered 1960 Oct. 17 by C. J. van Houten and I. van Houten-Groeneveld on Palomar Schmidt plates taken by T. Gehrels.
Id. S. Nakano (*MPC* 25969), T. Kobayashi (*ibid.*)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>		50.40956		(2000.0)		P		Q	
<i>n</i>		0.28178356	ω	207.75416		+0.97227890		+0.22834473	
<i>a</i>		2.3042289	Ω	138.94562		-0.19782385		+0.91804541	
<i>e</i>		0.1434360	<i>i</i>	4.39441		-0.12465739		+0.32411620	
<i>P</i>		3.50	<i>H</i>	14.6		<i>G</i>	0.15	<i>U</i>	1

Residuals in seconds of arc

1960 10 17	675	0.4-	0.4+	1995 09 30	400	0.8-	0.3-	1998 06 26	704	0.5+	1.0+
1960 10 22	675	0.9-	0.0	1997 01 31	691	0.3+	0.2-	1998 06 26	704	0.3+	0.8+
1960 10 24	675	0.9+	0.0	1997 01 31	691	0.1-	0.1+	1999 10 21	704	0.0	0.2-
1960 10 26	675	0.5+	0.0	1997 01 31	691	0.3+	0.2-	1999 10 21	704	0.0	0.1-
1988 09 10	675	0.1+	0.5-	1997 02 08	566	0.3-	0.9-	1999 10 21	704	0.3+	0.2-
1988 09 10	675	0.2+	0.7-	1997 02 08	566	0.4-	0.9-	1999 10 21	704	0.6-	0.1+
1988 09 16	095	(3.4-	6.4-)	1997 02 08	566	0.1+	0.8-	1999 10 21	704	0.3-	0.2+
1988 09 16	095	0.2-	1.2-	1998 06 24	704	0.0	0.8+	1999 11 17	704	0.5+	0.6+
1995 09 20	400	1.4+	0.6+	1998 06 24	704	1.6-	0.2-	1999 11 17	704	0.2-	0.4+
1995 09 20	400	0.6+	0.0	1998 06 24	704	0.5-	0.2-	1999 11 17	704	0.3-	0.9-
1995 09 21	400	0.6+	0.3+	1998 06 24	704	0.5-	1.4-	1999 11 17	704	0.4-	0.6-
1995 09 21	400	0.4-	0.6-	1998 06 26	704	1.0+	2.0-				
1995 09 30	400	0.4-	0.3+	1998 06 26	704	0.3+	0.5-				

(12625)* 9578 P-L = 1982 SH₁₀ = 1982 UV₁₁ = 1984 BS₁ = 1993 SD₁₄

Discovered 1960 Oct. 17 by C. J. van Houten and I. van Houten-Groeneveld on Palomar Schmidt plates taken by T. Gehrels.
Id. G. V. Williams (*MPC* 26415)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>		323.45281		(2000.0)		P		Q	
<i>n</i>		0.17908159	ω	74.77267		+0.20218855		-0.97932557	
<i>a</i>		3.1172294	Ω	3.58104		+0.85446294		+0.17319891	
<i>e</i>		0.1110396	<i>i</i>	5.89966		+0.47855290		+0.10451584	
<i>P</i>		5.50	<i>H</i>	12.6		<i>G</i>	0.15	<i>U</i>	2

Residuals in seconds of arc

1960 10 17	675	0.4+	0.3+	1993 09 22	675	0.0	0.1-	1998 09 24	699	1.3-	0.1-
1960 10 22	675	1.0-	0.1-	1993 09 23	809	1.5+	0.7-	1998 09 24	699	0.3-	0.2-
1960 10 24	675	0.7+	0.5-	1993 09 23	809	0.8+	1.3-	1998 09 24	699	0.6+	0.3+
1960 10 26	675	0.3+	0.5-	1993 09 23	809	0.4+	1.3-	1999 10 12	704	0.6+	0.4-
1982 09 26	095	(2.9+	1.0-)	1993 09 23	095	0.7-	1.2+	1999 10 12	704	0.4-	0.1+
1982 10 22	095	(3.3-	1.1+)	1993 10 17	033	1.0+	0.8-	1999 10 12	704	0.3-	0.1+
1984 01 24	381	(6.5+	9.4-)	1993 10 17	033	0.5+	0.3-	1999 10 12	704	0.9-	0.2+
1984 01 24	381	(3.0-	4.9-)	1998 08 17	704	0.6+	0.1+	1999 10 12	704	1.0-	0.8+
1993 09 15	809	(2.4+	2.9+)	1998 08 17	704	0.1+	0.8+	1999 10 13	704	0.3+	1.3-
1993 09 15	809	(1.0+	2.9+)	1998 08 17	704	0.5-	0.4+	1999 10 13	704	0.4+	0.1-
1993 09 15	809	1.2+	1.9+	1998 08 17	704	0.5+	0.4-	1999 10 13	704	0.6-	0.2+
1993 09 16	809	(2.0+	2.8-)	1998 08 17	704	0.4-	0.9-	1999 10 13	704	0.1+	1.0+
1993 09 16	809	(1.6+	2.7-)	1998 08 23	704	0.1+	0.8+	1999 10 13	704	1.0-	0.7+
1993 09 16	809	(1.3+	2.3-)	1998 08 23	704	1.3-	0.4-	1999 11 03	704	1.0+	0.0
1993 09 17	809	0.4-	0.1-	1998 08 23	704	1.4-	1.9+	1999 11 03	704	0.5+	0.2-
1993 09 17	809	1.3-	0.5-	1998 08 23	704	1.3+	0.0	1999 11 03	704	0.2+	0.3-
1993 09 17	809	(2.4-	0.1-)	1998 08 27	699	0.1+	0.0	1999 11 03	704	0.5+	0.1+
1993 09 18	809	1.5+	0.5+	1998 08 27	699	0.8+	0.2+	1999 11 03	704	0.4+	0.2+
1993 09 18	809	1.7-	0.2+	1998 08 27	699	0.4+	0.0	1999 11 06	715	0.1-	0.1+
1993 09 18	809	1.3-	0.3-	1998 09 14	704	0.3-	0.4-	1999 11 06	715	0.1+	0.0
1993 09 18	675	0.1+	0.4-	1998 09 14	704	0.8+	0.6+	1999 11 12	699	0.2-	0.5+
1993 09 18	675	0.5-	0.7+	1998 09 14	704	1.0-	1.1-	1999 11 12	699	0.1-	0.2+
1993 09 22	675	0.3+	0.6-	1998 09 14	704	0.0	0.2+	1999 11 12	699	0.3-	0.1+

(12626)* 1116 T-1 = 1995 WL₂₂ = 1997 CG₅ = 1998 KV₂₁ = 1999 RP₁₃₀

Discovered 1971 Mar. 25 by C. J. van Houten and I. van Houten-Groeneveld on Palomar Schmidt plates taken by T. Gehrels.
Id. A. Doppler (*MPC* 36493)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>		312.03050		(2000.0)		P		Q	
<i>n</i>		0.22394641	ω	126.37965		+0.89996223		-0.43503775	
<i>a</i>		2.6855916	Ω	259.42360		+0.39014759		+0.83279325	
<i>e</i>		0.1082794	<i>i</i>	1.65923		+0.19455808		+0.34234130	
<i>P</i>		4.40	<i>H</i>	14.4		<i>G</i>	0.15	<i>U</i>	1

Residuals in seconds of arc

1971 03 24	675	0.5-	0.2+	1998 05 22	704	1.0+	0.5+	1999 09 07	704	0.6+	0.4-
1971 03 25	675	0.7+	0.3+	1998 05 22	704	1.9-	0.3+	1999 09 07	704	0.4+	0.3-
1971 03 25	675	0.4+	0.9+	1998 05 23	704	1.0-	1.1+	1999 09 07	704	0.8+	0.6-
1971 03 26	675	(3.4+	0.8-)	1998 05 23	704	0.5-	1.4-	1999 09 07	704	1.0+	0.3-
1971 03 27	675	0.3-	0.2-	1998 05 23	704	0.6+	0.8+	1999 09 07	704	0.7+	0.5-
1971 04 02	675	0.6+	1.0-	1998 05 23	704	(6.8-	0.5+)	1999 09 09	704	0.1+	0.8-
1995 11 18	691	0.4-	0.2-	1998 05 24	704	0.4+	0.2+	1999 09 09	704	0.3+	0.7-
1995 11 18	691	0.3-	0.1-	1998 05 24	704	0.8-	1.1+	1999 09 09	704	0.6+	0.3-
1995 11 18	691	0.4-	0.1+	1998 05 24	704	1.5-	0.2+	1999 09 09	704	0.6+	0.5+
1995 11 23	691	0.7-	0.1+	1998 05 24	704	1.5-	0.3+	1999 09 09	704	0.8+	0.7-
1995 11 23	691	1.2-	0.1-	1999 08 22	703	0.7-	1.1+	1999 09 13	704	0.8+	0.2+
1995 11 23	691	0.9-	0.3-	1999 08 22	703	0.4-	0.1-	1999 09 13	704	1.0+	0.6+
1997 02 06	566	(2.1+	0.4-)	1999 08 22	703	0.8-	0.0	1999 09 13	704	0.3+	0.1-
1997 02 06	566	0.9+	0.1-	1999 08 22	703	0.1+	0.1-	1999 09 13	704	0.5+	0.1+
1997 02 06	566	1.0+	0.2-	1999 08 22	703	0.5-	0.4-	1999 09 13	704	0.6+	0.3+
1997 02 07	566	0.1-	1.2-	1999 08 22	703	0.8-	0.4-	1999 11 08	704	0.6+	0.2-
1997 02 07	566	0.0	1.2-	1999 08 22	703	0.2-	0.2+	1999 11 08	704	0.2+	0.3-
1997 02 07	566	0.6-	1.2-	1999 08 22	703	0.7-	0.0	1999 11 08	704	0.9-	0.0
1998 05 22	704	0.9+	0.8+	1999 09 04	699	0.8-	0.6+	1999 11 08	704	0.0	0.1-
1998 05 22	704	0.2-	1.5-	1999 09 04	699	0.3+	1.1+				
1998 05 22	704	0.7+	1.7-	1999 09 04	699	0.5+	0.1-				

(12627)* 1230 T-1 = 1984 BF₃

Discovered 1971 Mar. 25 by C. J. van Houten and I. van Houten-Groeneveld on Palomar Schmidt plates taken by T. Gehrels.
Id. E. Bowell (*MPC* 25076)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>		88.21840		(2000.0)		P		Q	
<i>n</i>		0.29299191	ω	302.02477		+0.01972432		+0.99961059	
<i>a</i>		2.2450824	Ω	329.08700		-0.90385896		+0.00938882	
<i>e</i>		0.1398962	<i>i</i>	2.20197		-0.42737564		+0.02627777	
<i>P</i>		3.36	<i>H</i>	15.4		<i>G</i>	0.15	<i>U</i>	2

Residuals in seconds of arc

1971 03 24	675	0.2+	0.7+	1998 04 01	704	0.4-	0.9+	1999 10 13	704	0.1-	0.6-
1971 03 25	675	1.3+	0.5+	1998 04 21	704	1.4-	1.1-	1999 10 15	704	0.2+	0.6-
1971 03 25	675	0.6-	0.2-	1998 04 21	704	0.3-	0.5+	1999 10 15	704	1.6+	1.5-
1971 03 26	675	1.0+	1.8-	1998 04 21	704	0.1+	0.5+	1999 10 15	704	0.6+	0.5-
1971 03 27	675	1.2-	0.8-	1998 04 21	704	0.4-	0.8+	1999 10 15	704	0.0	0.7+
1971 04 02	675	1.7-	0.5-	1998 04 21	704	1.2-	0.9+	1999 10 15	704	0.6+	0.5+
1971 04 16	675	(1.6+	4.4-)	1998 04 22	704	0.1-	0.7-	1999 10 21	704	0.2+	0.2+
1971 04 16	675	(1.7+	2.9-)	1998 04 22	704	0.2+	0.4-	1999 10 21	704	0.7-	0.8+
1984 01 25	675	0.8-	0.5-	1998 04 22	704	0.5+	0.6-	1999 10 21	704	0.2+	0.4+
1984 01 26	675	0.6+	0.1+	1998 04 22	704	1.3+	0.4-	1999 10 21	704	0.4+	0.5+
1998 03 25	704	0.8+	0.3+	1998 04 22	704	1.3+	0.5-	1999 10 29	703	0.4+	0.1-
1998 03 25	704	(2.2+	0.7+)	1998 04 25	699	0.5-	0.6-	1999 10 29	703	0.8-	0.7+
1998 03 25	704	(2.1-	0.1+)	1998 04 25	699	0.1-	0.4+	1999 10 29	703	0.5+	1.1+
1998 03 25	704	0.4+	1.4+	1998 04 25	699	0.7-	0.3+	1999 10 29	703	0.2+	0.1+
1998 03 29	704	0.5+	1.2+	1999 10 10	704	1.5-	0.2-	1999 11 04	704	0.6-	0.6+
1998 03 29	704	0.2+	1.2-	1999 10 10	704	0.4-	0.4-	1999 11 04	704	1.0-	0.1-
1998 03 29	704	0.9+	0.4-	1999 10 10	704	0.8-	0.1+	1999 11 04	704	0.2+	0.1-</

1998 03 29	704	0.5+	0.5−	1999 10 10	704	0.5+	0.1+	1999 11 04	704	0.4+	0.2−
1998 04 01	704	0.5−	0.8+	1999 10 13	704	0.3−	0.5−	1999 11 14	704	(0.9+	3.3+)
1998 04 01	704	0.7+	0.1+	1999 10 13	704	0.1+	0.8−	1999 11 14	704	0.1+	1.5+
1998 04 01	704	0.5−	1.0+	1999 10 13	704	0.3−	0.4−	1999 11 14	704	(0.3+	2.9+)
1998 04 01	704	(2.2−	0.5+)	1999 10 13	704	0.1−	0.9−	1999 11 14	704	(0.2+	2.4+)

(12628)* 2120 T-1 = 1986 EZ₂

Discovered 1971 Mar. 25 by C. J. van Houten and I. van Houten-Groeneveld on Palomar Schmidt plates taken by T. Gehrels.

Id. S. Nakano (*MPC* 28880)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

				Nakano			
<i>M</i>		(2000.0)		P		Q	
<i>n</i>	0.26129667	ω	98.47035	−0.58188919		+0.81257424	
<i>a</i>	2.4231491	Ω	135.88960	−0.76385782		−0.53189445	
<i>e</i>	0.1242996	<i>i</i>	2.76582	−0.27915266		−0.23835142	
<i>P</i>	3.77	<i>H</i>	14.9	<i>G</i>	0.15	<i>U</i>	1

Residuals in seconds of arc

1971 03 24	675	1.5−	0.8−	1998 06 24	704	1.6−	0.7+	1999 10 15	704	0.9−	0.1−
1971 03 25	675	1.3−	0.1+	1998 06 24	704	0.7+	0.6−	1999 10 15	704	0.6+	0.5−
1971 03 25	675	0.7−	0.5+	1998 06 24	704	1.2−	1.4−	1999 10 15	704	0.6−	0.1−
1971 03 26	675	0.2+	0.9−	1998 06 24	704	0.7+	1.4+	1999 11 01	703	1.0−	1.4+
1971 03 27	675	0.5−	0.4+	1998 06 26	809	(1.9−	2.3−)	1999 11 01	703	0.4+	0.4+
1971 04 02	675	1.9+	1.1−	1998 06 26	809	(2.1−	2.5−)	1999 11 01	703	2.1−	1.2+
1971 04 16	675	1.8+	1.6−	1998 06 26	809	(1.6−	2.4−)	1999 11 01	703	0.1+	0.1+
1971 04 16	675	(2.6+	1.8−)	1998 06 26	704	1.0−	0.5−	1999 11 04	704	0.9+	1.5−
1971 05 13	675	0.3−	0.6+	1998 06 26	704	0.0	1.0+	1999 11 04	704	0.6−	0.8−
1971 05 14	675	0.3−	0.3+	1998 06 26	704	0.7+	1.1+	1999 11 04	704	0.8+	0.6−
1971 05 16	675	0.1+	1.7+	1998 06 26	704	0.7−	0.2+	1999 11 05	704	0.9+	1.6+
1986 03 12	809	0.6−	1.5−	1998 06 26	704	(2.8−	0.5−)	1999 11 05	704	0.2+	0.9+
1997 01 06	411	0.2+	0.3+	1998 06 27	809	1.1+	1.8−	1999 11 05	704	0.1+	0.1−
1997 01 06	411	0.4+	0.1+	1998 06 27	809	0.4+	2.1−	1999 11 15	704	0.2−	0.3−
1997 01 07	411	0.7+	0.4−	1998 06 27	809	0.9+	1.4−	1999 11 15	704	0.6+	0.3−
1997 01 07	411	0.7+	0.4+	1999 10 02	691	0.1−	0.4−	1999 11 15	704	0.9+	0.7−
1997 02 03	566	(2.6+	0.1+)	1999 10 02	691	0.2−	0.3−	1999 11 15	704	0.6+	0.4−
1997 02 03	566	1.1−	0.3−	1999 10 02	691	0.1−	0.4−	1999 11 15	704	1.3+	0.4−
1997 02 03	566	1.3−	0.1+	1999 10 10	704	0.1−	0.2−	1999 11 17	704	0.8−	0.9−
1997 02 14	691	0.1+	0.4−	1999 10 10	704	0.5+	0.3+	1999 11 17	704	0.6+	1.3−
1997 02 14	691	0.2+	0.2+	1999 10 10	704	0.8−	0.6−	1999 11 17	704	0.3+	0.5−
1997 02 14	691	0.1+	0.2−	1999 10 10	704	0.3+	0.2−	1999 11 17	704	(3.1+	0.6−)
1998 06 24	704	0.6+	0.2−	1999 10 15	704	0.9−	0.6+				

(12629)* 2168 T-1 = 1980 TT₁₀ = 1991 RY

Discovered 1971 Mar. 25 by C. J. van Houten and I. van Houten-Groeneveld on Palomar Schmidt plates taken by T. Gehrels.

Id. G. V. Williams (*MPC* 21951)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

				Williams			
<i>M</i>		(2000.0)		P		Q	
<i>n</i>	0.26190837	ω	176.67804	+0.99987237		+0.01292400	
<i>a</i>	2.4193747	Ω	182.63687	−0.01455720		−0.97921524	
<i>e</i>	0.1289980	<i>i</i>	11.77936	+0.00658204		+0.20241165	
<i>P</i>	3.76	<i>H</i>	14.0	<i>G</i>	0.15	<i>U</i>	1

Residuals in seconds of arc

1971 03 24	675	0.3+	1.0−	1998 06 03	704	0.5+	1.3+	1999 10 19	704	0.1−	0.6−
1971 03 24	675	0.7+	1.2+	1998 06 03	704	1.8+	1.6−	1999 11 01	703	0.1−	0.3+
1971 03 25	675	1.8−	0.3−	1998 06 03	704	0.6−	0.1+	1999 11 01	703	0.2−	0.4+
1971 03 25	675	1.4−	0.3−	1998 06 19	704	0.3−	0.1−	1999 11 01	703	0.1+	0.5+
1971 03 26	675	0.8−	1.3−	1998 06 19	704	0.4+	0.1−	1999 11 01	703	0.2−	0.4+
1971 03 27	675	0.6−	0.1−	1998 06 19	704	0.2−	0.9−	1999 11 05	704	0.0	0.1+
1971 04 02	675	0.9+	0.8−	1998 06 19	704	0.5+	1.0−	1999 11 05	704	0.2+	0.7+
1971 04 16	675	0.7+	0.6−	1998 06 19	704	0.1+	1.4−	1999 11 05	704	0.6−	0.1+
1971 04 16	675	1.7+	0.7−	1998 06 25	699	0.2−	0.8−	1999 11 05	704	0.0	0.0
1971 05 13	675	0.5−	1.1+	1998 06 25	699	0.4−	0.5−	1999 11 06	704	0.3−	0.2+
1971 05 14	675	0.1−	1.8+	1998 06 25	699	1.3−	0.5−	1999 11 06	704	0.1−	0.5+

1971 05 16	675	0.9+	1.2+	1998 06 26	699	0.1−	0.1−	1999 11 06	704	0.1−	0.2−
1980 10 08	095	0.4+	1.6−	1998 06 26	699	0.2+	0.2+	1999 11 06	704	0.3+	0.3−
1991 09 07	372	1.3−	0.8+	1998 06 26	699	0.9−	0.8+	1999 11 06	704	0.1−	0.5−
1991 09 07	372	0.4−	0.8+	1999 10 08	703	0.2+	0.6−	1999 11 07	704	0.2−	0.2−
1991 09 09	372	1.2+	0.1−	1999 10 08	703	0.1+	0.1−	1999 11 07	704	0.3−	0.1+
1998 05 23	704	1.8−	1.0+	1999 10 08	703	0.3−	0.6−	1999 11 07	704	0.0	0.6−
1998 05 23	704	0.1+	0.1−	1999 10 08	703	0.0	0.2−	1999 11 07	704	0.6−	0.5−
1998 05 23	704	0.0	1.4+	1999 10 19	704	0.7+	0.3−	1999 11 07	704	0.2−	0.6−
1998 05 23	704	0.0	1.4+	1999 10 19	704	0.5+	0.4−	1999 11 13	699	0.3+	1.0+
1998 06 03	704	1.0+	0.6−	1999 10 19	704	0.5+	0.8−	1999 11 13	699	0.2+	1.0+
1998 06 03	704	1.2+	0.1−	1999 10 19	704	0.2+	0.2−	1999 11 13	699	0.1−	1.1+

(12630)* 3033 T-1 = 1998 KW₁₇

Discovered 1971 Mar. 26 by C. J. van Houten and I. van Houten-Groeneveld on Palomar Schmidt plates taken by T. Gehrels.

Id. G. V. Williams (*MPC* 32036)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

				Williams			
<i>M</i>		(2000.0)		P		Q	
<i>n</i>	54.16544	ω	301.88850	+0.61797879		+0.78609964	
<i>a</i>	2.4387980	Ω	6.32235	−0.67860457		+0.54119895	
<i>e</i>	0.1400843	<i>i</i>	6.37613	−0.39698620		+0.29858172	
<i>P</i>	3.81	<i>H</i>	14.1	<i>G</i>	0.15	<i>U</i>	1

Residuals in seconds of arc

1971 03 24	675	2.0−	0.9−	1998 05 22	704	0.3−	0.0	1999 10 22	704	0.0	0.1+
1971 03 25	675	1.3−	0.8+	1998 05 24	704	0.6+	0.1+	1999 10 22	704	0.3−	0.1+
1971 03 26	675	0.2−	2.3+	1998 05 24	704	0.1+	0.5−	1999 10 29	703	0.2−	0.6+
1971 03 26	675	0.0	1.3−	1998 05 24	704	0.2+	0.7+	1999 10 29	703	0.3−	0.1+
1971 03 26	675	0.3−	1.5+	1998 05 24	704	0.3−	1.3+	1999 10 29	703	0.5−	0.8+
1971 03 26	675	0.5+	1.2−	1998 05 24	704	0.2−	0.9+	1999 10 29	703	0.0	0.6+
1971 03 27	675	0.5−	0.8−	1999 10 03	704	0.0	0.4+	1999 11 03	704	0.2+	0.7−
1971 03 27	675	0.7−	0.6+	1999 10 03	704	0.2−	0.3+	1999 11 03	704	0.4+	0.1−
1971 04 02	675	0.4−	0.3+	1999 10 03	704	0.0	0.7+	1999 11 03	704	0.2+	1.0−
1971 04 16	675	0.8+	0.8+	1999 10 03	704	0.2−	0.5+	1999 11 03	704	0.3+	0.6−
1971 04 16	675	0.9+	0.4−	1999 10 03	704	0.5−	0.2+	1999 11 03	704	0.1+	0.4−
1971 05 13	675	1.9+	1.9−	1999 10 07	704	0.2+	0.8−	1999 11 03	704	0.5+	0.2−
1971 05 14	675	1.3+	1.5−	1999 10 07	704	0.1+	0.4+	1999 11 03	704	0.7+	1.2+
1996 12 10	327	0.2+	0.6+	1999 10 07	704	0.2−	0.1−	1999 11 03	704	0.4+	0.1+
1996 12 10	327	0.8+	1.1+	1999 10 08	106	0.1−	0.7−	1999 11 03	704	0.7+	0.1+
1996 12 10	327	0.4−	0.6+	1999 10 08	106	0.9−	0.4+	1999 11 04	704	0.3+	0.3+
1998 04 22	704	0.3+	0.3−	1999 10 08	106	0.7−	0.2+	1999 11 04	704	0.3+	0.1+
1998 04 22	704	0.1−	0.1+	1999 10 12	704	0.1−	0.5−	1999 11 04	704	0.4+	0.5+
1998 04 22	704	0.1+	0.2−	1999 10 12	704	0.1−	0.3−	1999 11 04	704	0.1+	0.1−
1998 04 22	704	0.6+	0.4+	1999 10 12	704	0.1−	0.4−	1999 11 04	704	0.7+	0.9−
1998 04 22	704	0.1+	0.8−	1999 10 12	704	0.1+	0.6−	1999 11 11	703	0.2+	0.5+
1998 05 22	704	0.1−	0.2+	1999 10 12	704	0.1−	0.5−	1999 11 11	703	0.9−	0.6+
1998 05 22	704	0.4+	0.9+	1999 10 22	704	0.1−	0.3+	1999 11 11	703	(2.5−	0.4−)
1998 05 22	704	1.2+	0.6+	1999 10 22	704	0.2−	0.6+	1999 11 11	703	1.0−	0.9+
1998 05 22	704	0.2+	0.4+	1999 10 22	704	0.1−	0.2+				

(12631)* 3051 T-1 = 1997 FP₂

Discovered 1971 Mar. 26 by C. J. van Houten and I. van Houten-Groene

1971 03 25	675	0.1+	0.7-	1997 04 03	704	0.4+	1.4+	1999 10 10	704	0.5-	0.6-
1971 03 26	675	0.1+	2.3-	1998 06 18	699	0.9-	0.5+	1999 10 10	704	0.2+	0.6-
1971 03 26	675	0.1+	1.9-	1998 06 18	699	0.1-	0.4-	1999 10 10	704	0.9-	1.0-
1971 03 27	675	1.2-	0.3+	1998 06 18	699	0.5-	0.4+	1999 10 20	704	0.8+	0.1+
1971 04 02	675	0.7-	0.8-	1998 08 24	704	0.4+	0.2-	1999 10 20	704	0.2+	0.4-
1971 04 16	675	2.1-	0.4-	1998 08 24	704	0.3+	0.3-	1999 10 20	704	0.2+	0.3-
1971 04 16	675	0.8-	0.8+	1998 08 24	704	0.3+	0.3-	1999 10 20	704	0.4+	0.6-
1971 05 13	675	0.1-	0.6+	1998 08 24	704	0.9-	0.7+	1999 11 05	704	0.1-	0.5-
1971 05 14	675	0.3+	1.3+	1998 08 27	704	0.4+	0.1-	1999 11 05	704	0.4+	0.5-
1997 03 10	809	(0.8-	3.2-)	1998 08 27	704	0.1+	1.0-	1999 11 05	704	0.1+	0.7+
1997 03 10	809	(1.1-	2.2-)	1998 08 27	704	0.3+	1.0-	1999 11 05	704	0.4+	0.1+
1997 03 10	809	(0.7-	2.1-)	1998 08 27	704	0.4+	1.3-	1999 11 12	699	0.9-	0.2+
1997 03 11	809	0.1+	0.8-	1998 08 27	704	0.9+	1.4-	1999 11 12	699	0.2-	0.1-
1997 03 11	809	0.6+	1.8-	1998 09 15	699	0.3-	0.5+	1999 11 12	699	0.3-	0.7+
1997 03 11	809	0.2-	1.9-	1998 09 15	699	0.2+	0.7+				

(12632)* 3105 T-1 = 1986 ED₅

Discovered 1971 Mar. 26 by C. J. van Houten and I. van Houten-Groeneveld on Palomar Schmidt plates taken by T. Gehrels.

Id. D. W. E. Green (*MPC* 19323)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	175.84780		(2000.0)	<i>P</i>		<i>Q</i>	
<i>n</i>	0.26067390	ω	233.62822	-0.94180412	+0.33560875		
<i>a</i>	2.4270070	Ω	325.96936	-0.29633603	-0.85593900		
<i>e</i>	0.1117400	<i>i</i>	1.97440	-0.15871344	-0.39336393		
<i>P</i>	3.78	<i>H</i>	14.5	<i>G</i>	0.15	<i>U</i>	1

Residuals in seconds of arc

1971 03 24	675	0.7+	0.4-	1998 06 24	704	1.2+	0.2+	1999 10 21	704	0.1+	0.1+
1971 03 25	675	1.4+	1.1-	1998 06 24	704	(1.2-	2.3+)	1999 10 29	120	1.1-	1.1-
1971 03 26	675	0.1+	1.9-	1998 06 24	704	0.5+	0.7-	1999 10 29	120	0.6+	0.1-
1971 03 26	675	0.6+	0.8-	1998 06 26	704	(1.0+	2.0+)	1999 11 02	691	0.2+	0.4-
1971 03 27	675	0.0	0.3+	1998 06 26	704	1.1-	0.2+	1999 11 02	691	0.2+	0.4-
1971 04 02	675	1.6-	0.9+	1998 06 26	704	1.3+	0.3+	1999 11 02	691	0.4+	0.4-
1971 04 02	675	(3.1-	0.1+)	1998 06 26	704	0.9-	0.3-	1999 11 03	691	0.0	0.3-
1971 04 16	675	0.5-	0.5+	1999 10 07	704	0.6+	0.5-	1999 11 03	691	0.0	0.3-
1971 04 16	675	0.8-	0.1+	1999 10 07	704	0.3-	1.0+	1999 11 03	691	0.1+	0.3-
1971 05 13	675	0.1-	1.4-	1999 10 07	704	0.5-	0.4+	1999 11 04	704	0.0	0.4-
1971 05 14	675	0.6-	1.1-	1999 10 07	704	0.8+	0.1-	1999 11 04	704	0.9+	0.5-
1982 01 30	675	0.3+	0.2-	1999 10 07	704	0.1+	0.6+	1999 11 04	704	0.3+	0.0
1982 01 31	675	1.2-	0.8+	1999 10 08	104	0.9+	0.7+	1999 11 04	703	0.3-	0.7+
1986 03 04	809	0.6+	0.1-	1999 10 08	104	0.3-	1.2+	1999 11 04	704	0.0	0.4-
1986 03 04	809	0.9-	0.1+	1999 10 09	104	1.6+	0.9+	1999 11 04	703	0.5-	0.4-
1986 03 05	809	0.4+	1.0-	1999 10 09	104	0.1+	0.6-	1999 11 04	704	0.7+	0.4+
1986 03 05	809	1.7+	0.6-	1999 10 10	704	0.5+	0.1+	1999 11 04	703	0.7+	0.6-
1986 03 10	809	1.1-	0.3+	1999 10 10	704	0.2-	0.6-	1999 11 04	703	0.2+	0.6+
1986 03 10	809	0.9-	0.9+	1999 10 10	704	0.9-	0.5+	1999 11 14	704	0.7-	0.2+
1986 03 14	809	0.6-	0.4-	1999 10 13	704	0.1+	0.3-	1999 11 14	704	0.1-	0.0
1986 03 14	809	0.1+	0.9+	1999 10 13	704	0.3-	0.3-	1999 11 14	704	0.4+	0.2-
1991 09 10	691	0.2-	0.4-	1999 10 13	704	0.2+	0.4-	1999 11 14	704	0.0	0.1+
1991 09 10	691	0.1-	0.1-	1999 10 13	704	0.2-	0.0	1999 11 14	704	0.3+	0.1+
1991 09 10	691	0.2-	0.6-	1999 10 13	704	0.1-	0.2-	1999 11 15	691	0.1+	0.0
1995 10 23	691	0.6-	0.4-	1999 10 15	704	0.5+	0.4-	1999 11 15	691	0.1+	0.1-
1995 10 23	691	0.3-	0.2-	1999 10 15	704	1.6-	1.1+	1999 11 15	691	0.1-	0.2-
1995 10 23	691	0.4-	0.8-	1999 10 15	704	(0.8-	2.6+)	1999 11 16	704	0.6-	0.0
1995 10 28	691	0.2-	0.2-	1999 10 21	704	0.7+	0.3+	1999 11 16	704	0.1+	0.5-
1995 10 28	691	0.0	0.6-	1999 10 21	704	0.1+	0.2+	1999 11 16	704	0.3+	1.1-
1995 10 28	691	0.1+	0.5-	1999 10 21	704	0.6+	0.6+	1999 11 16	704	0.5-	0.8-
1998 06 24	704	0.4-	0.5-	1999 10 21	704	0.6+	0.4+	1999 11 16	704	0.2-	0.0

(12633)* 3119 T-1 = 1995 WR₂₂ = 1997 ED₅₀

Discovered 1971 Mar. 26 by C. J. van Houten and I. van Houten-Groeneveld on Palomar Schmidt plates taken by T. Gehrels.

Id. G. V. Williams (*MPC* 26415), A. Milani (*MPC* 34269)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	255.03798		(2000.0)	<i>P</i>		<i>Q</i>	
<i>n</i>	0.26477532	ω	260.88746	-0.88879851	-0.45757243		
<i>a</i>	2.4018786	Ω	251.87839	+0.43041598	-0.81408122		
<i>e</i>	0.1075661	<i>i</i>	1.55446	+0.15741443	-0.35763003		
<i>P</i>	3.72	<i>H</i>	15.1	<i>G</i>	0.15	<i>U</i>	1

Residuals in seconds of arc

1971 03 24	675	0.4+	1.1-	1997 03 05	809	0.5-	0.5-	1999 11 03	704	0.3-	0.6+
1971 03 25	675	1.4+	1.5-	1997 03 06	809	0.7+	1.4+	1999 11 03	704	0.2+	0.2-
1971 03 26	675	0.7+	1.0-	1997 03 06	809	0.2+	0.9+	1999 11 09	704	0.2-	0.1-
1971 03 26	675	0.2+	0.7-	1997 03 06	809	0.0	0.5+	1999 11 09	704	0.1-	0.0
1971 03 27	675	0.5-	0.1+	1997 04 06	566	(2.3+	1.3+)	1999 11 09	704	0.4-	0.5-
1971 04 02	675	1.0-	0.2-	1997 04 06	566	0.9+	0.5+	1999 11 09	704	0.2+	0.1-
1971 04 02	675	1.6-	1.1-	1997 04 06	566	0.7+	0.7+	1999 11 09	704	0.2-	1.0-
1971 04 16	675	0.7-	0.2-	1998 08 17	704	0.2-	1.0-	1999 11 12	704	0.4+	0.1+
1971 04 16	675	1.0-	0.7-	1998 08 17	704	0.9+	0.4-	1999 11 12	704	0.0	0.1-
1971 05 13	675	1.0+	0.7+	1998 08 17	704	0.3+	0.1+	1999 11 12	704	0.2+	0.0
1971 05 14	675	0.8-	1.1+	1998 08 17	704	1.0-	0.7+	1999 11 12	704	0.0	0.0
1995 11 18	691	0.1-	0.1+	1998 09 16	691	0.5+	0.4+	1999 11 12	704	0.2-	0.1-
1995 11 18	691	0.1-	0.0	1998 09 16	691	0.4+	0.6-	1999 11 16	704	0.6-	1.0-
1995 11 18	691	0.2-	0.2+	1998 09 16	691	0.4+	0.1-	1999 11 16	704	1.3+	0.1+
1995 11 28	691	0.5-	1.0-	1999 10 22	704	0.5-	0.4-	1999 11 16	704	1.1+	0.6+
1995 11 28	691	0.3-	0.3-	1999 10 22	704	0.2+	0.5+	1999 11 16	704	0.8+	0.2-
1995 11 28	691	0.5-	0.5-	1999 10 22	704	1.6-	1.1+	1999 11 16	704	1.0+	0.0
1997 03 05	809	0.5-	0.4+	1999 11 03	704	0.4+	0.4+				
1997 03 05	809	0.6-	0.0	1999 11 03	704	0.4-	0.1+				

(12634)* 3178 T-1 = 1995 UD₂₂ = 1996 XG₁₂

Discovered 1971 Mar. 26 by C. J. van Houten and I. van Houten-Groeneveld on Palomar Schmidt plates taken by T. Gehrels.

Id. G. V. Williams (*MPC* 28607)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	113.96354		(2000.0)	<i>P</i>		<i>Q</i>	
<i>n</i>	0.25936202	ω	237.68691	-0.20399774	+0.97884642		
<i>a</i>	2.4351841	Ω	20.55949	-0.88255296	-0.17696903		
<i>e</i>	0.1484095	<i>i</i>	2.55251	-0.42365694	-0.10267250		
<i>P</i>	3.80	<i>H</i>	15.2	<i>G</i>	0.15	<i>U</i>	2

Residuals in seconds of arc

1971 03 24	675	1.8-	0.7-	1995 10 19	691	0.0	0.2+	1999 10 06	704	0.1+	0.4-
1971 03 25	675	0.0	0.7+	1995 10 19	691	0.0	0.1+	1999 10 06	704	0.3+	0.3-
1971 03 26	675	0.0	2.0+	1995 10 22	691	0.5-	0.1-	1999 10 06	704	0.7-	0.8-
1971 03 26	675	(0.9-	3.8-)	1995 10 22	691	0.3-	0.0	1999 10 06	704	0.2-	0.0
1971 03 26	675	0.1+	0.3-	1995 10 22	691	0.3-	0.2+	1999 10 06	704	0.5-	0.4-
1971 03 26	675	(0.0	3.9-)	1995 11 14	691	0.7+	0.0	1999 11 14	704	0.2+	0.6+
1971 03 27	675	0.8+	0.1+	1995 11 14	691	0.4+	0.1-	1999 11 14	704	0.3-	0.1+
1971 03 27	675	0.7+	2.4-	1995 11 14	691	0.3-	0.3-	1999 11 14	704	0.5+	0.1+
1971 04 02	675	1.2+	0.2-	1996 12 04	691	0.5+	0.0	1999 11 14	704	0.3+	0.4+
1971 04 16	675	(8.3+	3.2-)	1996 12 04	691	0.4+	0.1+	1999 11 14	704	0.1+	0.2-
1971 04 16	675	0.1+	1.0+	1996 12 04	691	0.5+	0.1+	1999 11 15	691	0.2+	0.3+
1971 04 16	675	(8.4+	3.2-)	1996 12 09	691	0.4-	0.2-	1999 11 15	691	0.7+	0.6+
1971 04 16	675	1.4-	0.7-	1996 12 09	691	0.4-	0.1+	1999 11 15	691	0.1+	0.4+
1991 10 03	691	0.2+	0.1-	1996 12 09	691	0.6-	0.2+	1999 11 16	704	1.1-	0.6-
1991 10 03	691	0.2+	0.3-	1996 12 14	691	0.1-	0.2-	1999 11 16	704	0.1+	0.6+
1991 10 03	691	0.1-	0.1-	1996 12 14	691	0.1-	0.1-	1999 11 16	704	0.8+	0.0
1995 10 19	691	0.0	0.2+	1996 12 14	691	0.2+	0.1-	1999 11 16	704	0.5-	0.6-

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5					Williams				
M	52.92187		(2000.0)		P		Q		
n	0.18936133	ω	130.05022		+0.65137780		+0.75875119		
a	3.0033678	Ω	180.60528		-0.73932430		+0.63413353		
e	0.0968336	i	10.35237		-0.17060642		+0.14890031		
P	5.20	H	13.2	G	0.15	U	2		
Residuals in seconds of arc									
1952 09 15	675	0.1-	1.6+	1997 03 09	809	0.5+	1.5+	1999 10 15	327 0.1- 0.4-
1952 09 15	675	0.4-	1.3+	1997 03 09	809	1.1+	1.5+	1999 10 15	327 0.1- 0.1-
1971 03 24	675	0.9-	0.8-	1997 03 09	809	0.6+	1.9+	1999 10 15	327 0.3- 0.1-
1971 03 24	675	0.1+	0.8-	1999 10 07	704	1.4+	0.1-	1999 10 18	327 0.5- 0.0
1971 03 25	675	2.0-	0.6+	1999 10 07	704	0.7+	0.7+	1999 10 18	327 0.2- 0.1+
1971 03 26	675	(2.7- 3.1-)		1999 10 07	704	0.8+	0.3+	1999 10 18	327 0.4- 0.3+
1971 03 26	675	(3.3- 3.2-)		1999 10 07	704	0.2+	0.3+	1999 10 27	327 0.4- 0.1+
1971 03 27	675	(1.4+ 3.7-)		1999 10 07	704	0.3+	0.6-	1999 10 27	327 0.4+ 0.9+
1971 04 02	675	0.5-	0.3-	1999 10 09	704	0.3-	0.2-	1999 10 27	327 1.3+ 0.3-
1971 04 16	675	1.4+	1.2-	1999 10 09	704	0.0	0.7-	1999 11 06	704 0.4+ 0.4+
1971 04 16	675	1.6+	0.4-	1999 10 09	704	0.1+	1.1-	1999 11 06	704 0.1- 0.2+
1971 05 13	675	1.0-	0.3-	1999 10 09	704	0.1+	0.4-	1999 11 06	704 0.4+ 0.5+
1971 05 14	675	0.2-	1.3-	1999 10 11	704	0.1+	0.1-	1999 11 06	704 0.5+ 0.3-
1971 05 16	675	0.2-	0.7-	1999 10 11	704	0.1-	0.2-	1999 11 06	704 1.4- 0.3+
1997 03 08	809	0.8+	0.5+	1999 10 11	704	0.1-	0.4-	1999 11 08	106 1.8- 0.5+
1997 03 08	809	0.5-	1.3+	1999 10 11	704	0.0	0.2-	1999 11 08	106 0.3+ 0.7+
1997 03 08	809	0.4-	0.2+	1999 10 11	704	0.3-	0.4-	1999 11 08	106 1.0- 1.1-

(12636)* 4854 T-1 = 1973 UC₅

Discovered 1971 May 13 by C. J. van Houten and I. van Houten-Groeneveld on Palomar Schmidt plates taken by T. Gehrels.
Id. S. Nakano (*MPC* 19881)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5						Nakano				
M	62.13364		(2000.0)		P		Q			
n	0.18957534	ω	272.66074		+0.55064848		+0.82907198			
a	3.0011070	Ω	31.37914		−0.67246065		+0.50949816			
e	0.0721161	i	10.74599		−0.49455325		+0.23032861			
P	5.20 <th>H</th> <td>12.9</td> <th>G</th> <td>0.15<th>U</th><td colspan="3">1</td></td>	H	12.9	G	0.15 <th>U</th> <td colspan="3">1</td>	U	1			
Residuals in seconds of arc										
1971 04 16	675	1.6+	1.4−	1994 11 23	411	0.7−	0.9−	1999 11 05	704	0.6+ 0.5−
1971 04 16	675	0.2−	0.3−	1994 11 24	411	0.6+	0.4−	1999 11 05	704	0.7+ 0.4−
1971 05 13	675	0.8−	1.9+	1994 11 24	411	0.4+	0.2−	1999 11 05	704	1.1+ 0.2−
1971 05 14	675	0.5−	0.4+	1994 11 24	411	0.3+	0.0	1999 11 05	704	0.7+ 0.5−
1971 05 16	675	0.2−	0.2−	1994 11 30	675	0.6−	0.1−	1999 11 09	704	0.0 0.1+
1973 10 27	033	0.5−	0.9+	1994 11 30	675	0.6+	2.0+	1999 11 09	704	0.2− 0.4+
1973 10 27	033	0.0	0.1−	1994 12 02	675	1.2−	0.5+	1999 11 09	704	0.2− 0.4+
1973 10 28	033	0.7−	1.2+	1994 12 02	675	0.3−	0.5+	1999 11 09	704	0.2− 0.7+
1989 11 02	675	0.3+ 1.1−		1999 10 20	704	0.1− 0.1−		1999 11 09	704	0.5− 0.5+
1989 11 02	675	0.1+ 1.1+		1999 10 20	704	0.1− 0.4−		1999 11 12	704	0.3− 0.4−
1994 11 01	411	0.6+ 0.3−		1999 10 20	704	0.1− 0.1−		1999 11 12	704	0.3+ 0.5−
1994 11 01	411	0.0 0.2+		1999 10 20	704	0.1+ 0.2−		1999 11 12	704	0.1+ 0.4−
1994 11 04	675	0.9+ 2.0−		1999 10 20	704	0.1− 0.7−		1999 11 12	704	0.3− 0.6−
1994 11 04	675	(1.1− 2.8−)		1999 10 28	106	0.4− 0.0		1999 11 12	704	0.3− 0.5−
1994 11 06	675	1.5− 1.1−		1999 10 28	106	0.4+ 0.6+		1999 11 16	704	0.3+ 0.4−
1994 11 06	675	0.5− 0.9−		1999 10 28	106	1.0+ 0.4+		1999 11 16	704	0.1+ 0.2−
1994 11 06	675	0.3+ 1.7+		1999 11 02	703	0.0 0.4+		1999 11 16	704	0.3− 0.3−
1994 11 06	675	0.3+ 0.5+		1999 11 02	703	0.3+ 1.1+		1999 11 16	704	0.1− 0.1+
1994 11 07	675	0.3− 0.7+		1999 11 02	703	0.8− 0.7+		1999 11 16	704	0.1− 0.6−
1994 11 07	675	0.2+ 0.7+		1999 11 02	703	0.4− 0.2+				
1994 11 23	411	0.3− 0.7−		1999 11 05	704	0.6+ 0.6−				

(12637)* 1053 T-2 = 1982 YK₄ = 1990 RQ₁

Discovered 1973 Sept. 29 by C. J. van Houten and I. van Houten-Groeneveld on Palomar Schmidt plates taken by T. Gehrels.
Id. E. Bowell (*MPC* 17652), G. V. Williams (*MPC* 19328)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5				Williams					
<i>M</i>	353.60067	(2000.0)		P		Q			
<i>n</i>	0.23150121	ω	223.04872	+0.60944853		−0.79282119			
<i>a</i>	2.6268415	Ω	189.40271	+0.73174509		+0.56378154			
<i>e</i>	0.1988550	<i>i</i>	0.93123	+0.30515833		+0.23148422			
<i>P</i>	4.26	<i>H</i>	14.1	<i>G</i>	0.15	<i>U</i>	1		
Residuals in seconds of arc									
1971 03 24	675	(2.8+ 2.1−)	1990 09 18	095	(0.7+ 4.3−)	1996 01 26	691	0.3+	0.2+
1971 03 24	675	0.5+ 1.2+	1990 09 18	095	(3.3+ 1.2+)	1996 01 26	691	0.4+	0.2+
1971 03 25	675	2.4− 1.2−	1990 09 22	809	1.6− 0.0	1997 04 30	704	0.5+	1.5−
1971 03 25	675	1.7− 0.9−	1990 09 22	809	1.3− 0.4−	1997 04 30	704	0.9+	1.1−
1971 03 25	675	1.5− 0.5+	1990 09 22	809	0.8− 0.8−	1997 04 30	704	1.2+	0.5−
1971 03 26	675	0.2+ 1.0−	1990 09 22	095	(1.2− 3.5−)	1997 04 30	704	0.3+	0.1−
1971 03 27	675	1.4− 0.7+	1990 09 22	095	0.2+ 1.9−	1997 05 01	704	0.1+	0.2−
1971 04 02	675	2.0− 0.7+	1990 09 23	809	1.9− 0.6−	1997 05 01	704	0.5+	0.3−
1973 09 19	675	1.6+ 1.2−	1990 09 23	809	1.6− 0.6−	1997 05 01	704	0.4+	1.1−
1973 09 19	675	0.0 0.8−	1990 09 23	809	0.9− 0.5−	1997 05 01	704	0.7+	0.2−
1973 09 20	675	1.1+ 0.3−	1990 09 24	809	0.6− 0.8−	1997 05 01	704	0.6+	0.9−
1973 09 24	675	0.1+ 0.4−	1990 09 24	809	0.3− 0.7−	1998 06 28	809	0.3+	1.1+
1973 09 24	675	0.2+ 0.2+	1990 09 24	809	0.2+ 0.8−	1998 06 28	809	0.7+	1.2+
1973 09 25	675	1.4− 0.2−	1990 09 29	809	0.0 0.0	1998 06 28	809	0.6+	1.0+
1973 09 25	675	0.1+ 0.7−	1990 09 29	809	0.0 0.2+	1999 10 12	704	0.5+	0.8+
1973 09 29	675	0.0 1.1+	1990 09 29	809	0.1+ 0.3+	1999 10 12	704	0.3−	0.1+
1973 09 29	675	0.6+ 0.1+	1990 10 22	675	0.0 0.1−	1999 10 12	704	0.6+	0.1+
1973 09 30	675	0.2+ 1.1+	1990 10 22	675	0.2+ 0.3−	1999 10 12	704	0.5+	0.2+
1973 09 30	675	0.6+ 0.5+	1992 02 25	675	1.8− 0.2−	1999 10 22	704	0.1+	0.6−
1973 10 04	675	0.4+ 0.1−	1992 02 25	675	0.2+ 1.2−	1999 10 22	704	1.1+	0.4−
1973 10 04	675	1.0+ 0.2−	1992 02 29	691	0.2− 0.3−	1999 10 22	704	0.0 0.6+	
1973 10 05	675	(0.6+ 2.9+)	1992 02 29	691	0.4− 0.5−	1999 10 22	704	0.2+ 0.9−	
1973 10 05	675	1.7+ 1.1+	1992 02 29	691	0.2− 0.5−	1999 10 22	704	0.6+	0.4−
1982 12 23	095	2.2+ 0.5−	1992 03 07	809	0.3+ 0.1−	1999 11 17	704	0.3−	1.1+
1990 09 14	675	1.9+ 1.7−	1992 03 11	691	0.3− 0.6−	1999 11 17	704	0.3−	0.1+
1990 09 14	675	(0.2+ 2.9−)	1992 03 11	691	0.2− 0.1+	1999 11 17	704	0.0 0.2+	
1990 09 18	675	0.5+ 1.7−	1992 03 11	691	0.3− 0.5−	1999 11 17	704	0.6−	0.0
1990 09 18	675	(1.9+ 2.3−)	1996 01 26	691	0.5+ 0.5+	1999 11 17	704	0.5−	0.3−

(12638)* 1063 T-2 = 1988 XF₁

Discovered 1973 Sept. 29 by C. J. van Houten and I. van Houten-Groeneveld on Palomar Schmidt plates taken by T. Gehrels.
Id. T. Kobayashi (*MPC* 15075)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5						Williams					
M	319.32675		(2000.0)			P		Q			
n	0.26979326		ω	255.33894		−0.06133069		−0.99806917			
a	2.3720034		Ω	198.18584		+0.92743940		−0.05334793			
e	0.1782064		i	1.80342		+0.36891015		−0.03181073			
P	3.65 <th>H</th> <td colspan="2">15.1</td> <th>G</th> <td colspan="2">0.15</td> <th>U</th> <td colspan="2">2</td>		H	15.1		G	0.15		U	2	
Residuals in seconds of arc											
1955 10 25	675	0.7+	0.7−	1988 12 02	399	0.2−	0.0	1999 10 22	704	0.1+	0.3+
1955 10 25	675	0.1−	0.5−	1988 12 02	399	1.7−	0.2+	1999 10 22	704	0.7−	0.1−
1973 09 19	675	0.2+	1.6−	1988 12 02	399	0.6+	0.6−	1999 11 03	704	0.2+	0.5+
1973 09 19	675	0.2−	0.1+	1988 12 02	399	0.7+	1.1+	1999 11 03	704	0.8+	0.1−
1973 09 20	675	0.2−	0.6−	1988 12 03	400	1.6+	1.2+	1999 11 03	704	1.0+	0.2−
1973 09 24	675	1.1+	0.2−	1988 12 03	400	1.0−	0.5+	1999 11 03	704	0.1+	0.4+
1973 09 24	675	0.8−	0.3+	1988 12 03	400	1.2−	1.5−	1999 11 03	704	0.9+	0.1−
1973 09 25	675	0.7−	1.9−	1997 04 01	809	0.1−	1.1−	1999 11 15	704	1.3+	0.0
1973 09 25	675	0.2−	0.4+	1997 04 01	809	0.8−	0.4−	1999 11 15	704	0.4−	1.0+
1973 09 29	675	0.7+	0.8+	1997 04 01	809	0.0	0.6−	1999 11 15	704	0.6+	0.1−
1973 09 29	675	0.7+	0.9−	1999 10 12	704	0.1+	0.1+	1999 11 15	704	0.9−	0.6−
1973 09 30	675	0.2+	0.9+	1999 10 12	704	0.4−	0.6−	1999 11 17	704	0.2+	0.2+
1973 09 30	675	0.6−	0.4+	1999 10 12	704	0.3−	0.4−	1999 11 17	704	1.2+	1.1−
1973 10 04	675 (1.2−	2.9−)		1999 10 12	704	0.2−	0.5−	1999 11 17	704	0.1+	0.5−
1973 10 04	675	1.0+	0.1−	1999 10 12	704	0.0	0.2−	1999 11 17	704	0.3+	0.4−

1973 10 05 675 0.1+ 0.6+ 1999 10 22 704 0.5- 0.6+ 1999 11 17 704 1.4- 0.3-
 1973 10 05 675 0.7- 1.0+ 1999 10 22 704 1.3- 0.8+

(12639)* 1105 T-2 = 1982 XA₄

Discovered 1973 Sept. 29 by C. J. van Houten and I. van Houten-Groeneveld
 on Palomar Schmidt plates taken by T. Gehrels.

Id. T. Kobayashi (*MPC* 15075)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

		Williams			
<i>M</i>	282.90430	(2000.0)	P	Q	
<i>n</i>	0.23195247	ω	304.27231	-0.62220221	-0.78284900
<i>a</i>	2.6234334	Ω	184.20971	+0.73279264	-0.58085914
<i>e</i>	0.1361166	<i>i</i>	2.68815	+0.27546207	-0.22304733
<i>P</i>	4.25	<i>H</i>	14.2	<i>G</i>	0.15 <i>U</i> 1

Residuals in seconds of arc

1973 09 19	675	1.7+	1.6-	1994 09 06	809	(0.3+	2.3+)	1999 10 21	704	0.2-	0.4-
1973 09 19	675	1.4+	1.9-	1994 09 06	809	0.5-	1.3+	1999 10 21	704	0.2-	0.1+
1973 09 20	675	0.3-	1.4-	1994 09 06	809	(0.0	2.8+)	1999 10 21	704	0.6-	0.0
1973 09 24	675	1.3-	1.9-	1997 05 03	809	(3.1+	3.4-)	1999 10 21	704	0.1-	0.6-
1973 09 24	675	1.7+	0.9-	1997 05 03	809	(3.0+	2.2-)	1999 10 30	703	0.2+	0.8+
1973 09 25	675	0.8-	1.6-	1997 05 03	809	(2.6+	3.6-)	1999 10 30	703	0.8-	1.0+
1973 09 25	675	1.3-	0.1-	1997 05 04	809	(5.0+	0.6-)	1999 10 30	703	(3.2-	1.5+)
1973 09 29	675	0.5+	2.1-	1997 05 04	809	(4.2+	1.4-)	1999 10 30	703	0.4-	0.6+
1973 09 29	675	(0.7+	2.8-)	1997 05 04	809	(4.2+	0.6-)	1999 11 04	704	0.5-	0.2+
1973 09 30	675	0.4-	0.0	1997 06 07	809	0.7-	1.7+	1999 11 04	704	0.0	0.1+
1973 09 30	675	0.4+	0.4-	1997 06 07	809	(0.9-	2.1+)	1999 11 04	704	0.1+	0.8-
1973 10 04	675	0.5+	1.8-	1997 06 07	809	0.4-	1.4+	1999 11 04	704	1.0-	0.5+
1973 10 04	675	0.8+	2.1-	1997 06 08	809	1.0+	0.3+	1999 11 04	704	0.6-	0.0
1973 10 05	675	0.8+	0.3+	1997 06 08	809	1.2+	1.0+	1999 11 14	049	1.5+	0.8+
1973 10 05	675	0.4+	0.4+	1997 06 08	809	0.3+	1.7+	1999 11 14	049	1.6+	0.8+
1982 12 13	381	0.3-	0.5+	1998 07 26	809	0.6+	0.7+	1999 11 14	049	1.5+	1.0+
1982 12 14	381	0.8+	0.1+	1998 07 26	809	0.8+	1.1+	1999 11 15	704	0.3-	0.7+
1982 12 14	381	0.6+	1.6+	1998 07 26	809	0.4-	0.5-	1999 11 15	704	0.2-	0.7+
1994 08 12	809	0.3-	0.3-	1998 07 27	809	(2.8-	1.6-)	1999 11 15	704	0.5-	1.0+
1994 08 12	809	0.4-	0.1-	1998 07 27	809	(2.7-	2.1-)	1999 11 15	704	0.3-	0.6+
1994 08 12	809	0.2-	0.3+	1998 07 27	809	(2.9-	1.2-)	1999 11 15	704	0.6-	1.0+
1994 08 13	809	0.8-	1.6+	1998 08 17	704	0.1-	0.3-	1999 11 17	704	0.3-	0.6+
1994 08 13	809	0.9-	1.1+	1998 08 17	704	1.7-	1.6+	1999 11 17	704	0.6-	0.5+
1994 08 13	809	(0.8-	2.1+)	1998 08 17	704	1.0-	1.3+	1999 11 17	704	0.5-	0.4+
1994 09 05	809	1.1+	1.4+	1998 08 17	704	0.4-	0.4+	1999 11 17	704	1.3-	0.1+
1994 09 05	809	0.4+	1.1+	1998 08 17	704	0.0	1.0+				
1994 09 05	809	0.3+	1.7+	1999 10 21	704	1.2+	1.1+				

(12640)* 1231 T-2 = 1993 RC₁₀

Discovered 1973 Sept. 29 by C. J. van Houten and I. van Houten-Groeneveld
 on Palomar Schmidt plates taken by T. Gehrels.

Id. B. G. Marsden (*MPC* 24115)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

		Marsden			
<i>M</i>	6.53514	(2000.0)	P	Q	
<i>n</i>	0.19608224	ω	45.19136	+0.58242387	-0.81286826
<i>a</i>	2.9343407	Ω	9.19176	+0.73621492	+0.52473824
<i>e</i>	0.0512867	<i>i</i>	1.88547	+0.34463027	+0.25277453
<i>P</i>	5.03	<i>H</i>	13.8	<i>G</i>	0.15 <i>U</i> 1

Residuals in seconds of arc

1973 09 19	675	0.6-	0.6-	1993 09 14	691	0.1-	1.0-	1998 09 27	704	1.1-	1.5+
1973 09 19	675	0.2+	1.4-	1993 09 19	809	(2.5+	2.5+)	1998 10 10	699	0.8-	0.4-
1973 09 20	675	0.2+	0.7-	1993 09 19	809	0.4+	1.9+	1998 10 10	699	0.8+	1.2-
1973 09 24	675	0.3+	1.1-	1993 09 19	809	(1.5+	2.7+)	1998 10 10	699	1.2+	0.2+
1973 09 24	675	0.0+	0.6-	1996 04 19	566	0.3+	0.5+	1999 01 05	910	1.8-	0.6-
1973 09 25	675	(1.6-	3.1-)	1996 04 19	566	0.5-	0.1-	1999 01 05	910	1.8-	0.6-
1973 09 25	675	1.5-	0.0	1996 04 19	566	0.2-	0.2-	1999 01 05	910	1.9-	0.6-
1973 09 29	675	0.3+	0.4-	1998 09 14	704	0.7+	1.3+	1998 10 13	704	1.2-	0.2+
1973 09 29	675	1.1+	1.2-	1998 09 14	704	1.2+	0.8+	1999 10 13	704	0.1+	0.4+
1973 09 30	675	0.5-	1.1-	1998 09 14	704	0.3+	0.3+	1999 10 13	704	0.3+	0.0

1973 09 30	675	0.3-	1.3-	1998 09 14	704	0.1+	1.9+	1999 10 13	704	0.2+	0.0
1973 10 04	675	1.2+	0.4+	1998 09 18	704	0.2+	0.6+	1999 10 13	704	0.5+	0.0
1973 10 04	675	0.5+	0.8-	1998 09 18	704	0.9-	0.1-	1999 11 14	704	0.2+	0.3+
1973 10 05	675	1.7+	0.5-	1998 09 18	704	1.3-	1.3+	1999 11 14	704	0.3-	0.4+
1973 10 05	675	2.3+	1.2-	1998 09 18	704	1.6-	1.7+	1999 11 14	704	0.5-	0.7+
1993 09 14	809	(2.3+	3.0+)	1998 09 18	704	1.6-	1.3+	1999 11 16	704	1.1+	0.0
1993 09 14	809	(0.7+	2.4+)	1998 09 27	704	0.7+	0.5-	1999 11 16	704	0.3+	0.3+
1993 09 14	809	0.2+	1.7+	1998 09 27	704	0.2+	0.2-	1999 11 16	704	0.1+	0.5+
1993 09 14	691	0.0	0.6-	1998 09 27	704	0.4-	0.5-	1999 11 16	704	0.1+	0.3+
1993 09 14	691	0.3-	0.4-	1998 09 27	704	0.4+	1.3+	1999 11 16	704	0.0	0.4-

(12641)* 1310 T-2 = 1977 XY₂ = 1988 VO₁₀

Discovered 1973 Sept. 29 by C. J. van Houten and I. van Houten-Groeneveld
 on Palomar Schmidt plates taken by T. Gehrels.

Id. G. V. Williams (*MPC* 20832, unpublished), M. E. Sansaturio (unpublished)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

		Williams			
<i>M</i>	339.01461	(2000.0)	P	Q	
<i>n</i>	0.26646993	ω	345.44074	+0.85588639	-0.51651828
<i>a</i>	2.3916846	Ω	45.68847	+0.47802556	+0.77106396
<i>e</i>	0.1866940	<i>i</i>	2.06898	+0.19735769	+0.37238319
<i>P</i>	3.70	<i>H</i>	15.0	<i>G</i>	0.15 <i>U</i> 2

Residuals in seconds of arc

1951 11 28	675	1.0-	0.4-	1973 10 04	675	1.0+	1.0-	1999 11 02	703	0.6-	1.0+
1951 11 28	675	1.0-	0.1+	1973 10 04	675	0.4+	0.6-	1999 11 02	703	0.3-	0.7+
1973 09 19	675	0.9-	1.2-	1973 10 04	675	2.2+	0.6-	1999 11 05	704	1.0-	0.5+
1973 09 19	675	2.1-	0.3-	1973 10 05	675	0.9+	2.0-	1999 11 05	704	0.7-	0.1+
1973 09 20	675	1.3-	1.3-	1973 10 05	675	1.1+	0.0	1999 11 05	704	0.5-	0.3+
1973 09 20	675	1.8+	2.4+	1973 10 05	675	0.3-	1.7-	1999 11 05	704	0.4-	0.1+
1973 09 20	675	1.3-	1.0-	1973 10 05	675	0.7+	0.1+	1999 11 05	704	0.4-	0.0
1973 09 24	675	0.4+	2.9+	1977 12 07	675	1.4-	0.5+	1999 11 09	704	0.3-	0.3-
1973 09 24	675	0.1-	0.8+	1977 12 08	675	1.7-	0.1+	1999 11 09	704	0.2-	0.3-
1973 09 24	675	0.3+	2.8+	1988 11 12	046	3.9+	0.6-	1999 11 09	704	0.1-	0.5-
1973 09 24	675	0.1-	0.8-	1988 11 12	046	(7.1+	2.0-)	1999 11 09	704	0.1-	0.6-
1973 09 25	675	1.2-	1.4+	1994 06 05	691	0.5+	0.1-	1999 11 09	704	0.5-	0.8-
1973 09 25	675	0.3+	0.7-	1994 06 05	691	0.2+	0.5-	1999 11 12	704	0.6-	0.0
1973 09 25	675	0.8-	0.6-	1994 06 05	691	0.3+	0.3-	1999 11 12	704	0.0	0.1-
1973 09 25	675	1.3-	1.7+	1997 02 02	327	0.6-	0.1-	1999 11 12	704	0.2-	0.3-
1973 09 25	675	0.8-	0.5+	1997 02 02	327	1.3-	0.2-	1999 11 12	704	0.0	0.2-
1973 09 29	675	1.8+	2.5-	1997 02 02	327	0.1+	0.6-	1999 11 12	704	0.5-	0.4-
1973 09 29	675	0.3+	0.0	1999 10 07	106	1.8-	1.1+	1999 11 16	704	0.9+	0.8+
1973 09 29	675	2.8+	1.0-	1999 10 31	715	0.5-	0.4+	1999 11 16	704	1.2+	0.4+
1973 09 29	675	0.7+	0.3-	1999 10 31	715	0.5-	0.6+	1999 11 16	704	0.1+	0.8+
1973 09 30	675	0.2+	0.1-	1999 10 31	715	0.9-	0.3+	1999 11 16	704	0.1+	0.5+
1973 09 30	675	0.8-	0.1+	1999 11 02	703	0.8-	0.4+	1999 11 16	704	0.1+	0.9+
1973 10 04	675	0.0	1.9-	1999 11 02	703	1.0-	1.2+				

(12642)* 1348 T-2 = 1997 LD₉

Discovered 1973 Sept. 29 by C. J. van Houten and I. van Houten-Groeneveld
 on Palomar Schmidt plates taken by T. Gehrels.

Id. A. Gnädig (*MPC* 32732)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

		Williams			
<i>M</i>	308.13346	(2000.0)	P	Q	
<i>n</i>	0.27197503	ω	297.34064	-0.60395690	-0.79690308
<i>a</i>	2.3593010	Ω	189.84713	+0.75626184	-0.56765537
<i>e</i>	0.1750827	<i>i</i>	4.51862	+0.25160305	-0.20667089
<i>P</i>	3.62	<i>H</i>	14.4	<i>G</i>	0.15 <i>U</i> 1

Residuals in seconds of arc

1973 09 19	675	0.2+	0.1-	1991 09 13	691	0.4-	0.6-	1998 09 11	910	1.0+	0.8+
1973 09 19	675	0.3+</									

1973 09 25	675	0.3+	1.8-	1997 06 07	809	1.2+	0.6+	1999 10 10	704	0.2-	0.2+
1973 09 29	675	0.7+	0.3+	1997 06 08	809	1.9-	0.5-	1999 10 10	704	0.2+	0.1-
1973 09 29	675	0.4+	1.4+	1997 06 08	809	1.2-	0.1-	1999 10 10	704	0.6+	0.1+
1973 09 29	675	0.3+	0.3+	1997 06 08	809	1.5-	0.3+	1999 10 21	704	0.3-	0.9+
1973 09 29	675	0.2-	1.1-	1998 08 17	704	0.0	1.0-	1999 10 21	704	0.7-	0.9+
1973 09 30	675	1.5+	0.8-	1998 08 17	704	0.2+	1.5+	1999 10 21	704	(0.1- 2.1+)	
1973 09 30	675	1.9+	0.2+	1998 08 17	704	0.4-	0.9+	1999 10 21	704	0.3-	0.6+
1973 10 04	675	(2.9+ 2.8-)		1998 08 17	704	0.4+	0.9-	1999 10 21	704	0.0	1.9+
1973 10 04	675	1.6+	2.0-	1998 08 17	704	1.5-	1.2-	1999 11 17	704	0.3+	0.2+
1973 10 05	675	0.6-	0.7+	1998 09 01	327	0.1+	0.3+	1999 11 17	704	0.4+	0.0
1973 10 05	675	0.2+	1.2+	1998 09 01	327	0.1+	0.1+	1999 11 17	704	0.5+	0.1-
1991 09 13	691	0.6-	0.2+	1998 09 01	327	0.2-	1.0+	1999 11 17	704	0.3+	0.2-
1991 09 13	691	0.4-	0.0	1998 09 11	910	0.7+	0.8+	1999 11 17	704	0.1-	0.5-

(12643)* 3180 T-2 = 1992 JB₅ = 1997 JF₁₇

Discovered 1973 Sept. 30 by C. J. van Houten and I. van Houten-Groeneveld on Palomar Schmidt plates taken by T. Gehrels.

Id. B. G. Marsden (*MPC* 30089)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

M	142.80431		(2000.0)	P	Q
n	0.19409398	ω	138.56644	-0.28958609	+0.95570997
a	2.9543459	Ω	114.54026	-0.89266749	-0.24986990
e	0.0343257	i	3.30983	-0.34537610	-0.15551041
P	5.08	H	13.6	G 0.15	U 1

Residuals in seconds of arc

1973 09 19	675	0.6-	0.7+	1998 07 27	809	(2.0+ 0.1-)	1999 10 10	704	0.1-	0.0	
1973 09 19	675	0.1+	0.7-	1998 07 27	809	0.8+	0.3+	1999 10 15	704	0.0	0.2+
1973 09 20	675	1.6+	0.7-	1998 07 31	699	1.7-	0.1-	1999 10 15	704	0.4-	0.2+
1973 09 24	675	0.1+	1.3-	1998 07 31	699	0.5-	0.9+	1999 10 15	704	0.2+	0.3-
1973 09 24	675	0.0	1.2-	1998 07 31	699	0.3-	0.5-	1999 10 15	704	0.4-	0.5-
1973 09 25	675	0.4-	2.1-	1998 08 17	704	1.9-	0.1+	1999 10 21	704	0.5-	1.2-
1973 09 25	675	0.4-	1.8-	1998 08 17	704	0.9-	1.0+	1999 10 21	704	0.1+	0.5+
1973 09 29	675	1.0+	0.6-	1998 08 17	704	(2.1- 1.9+)	1999 10 21	704	0.1+	0.2+	
1973 09 29	675	0.2-	0.6-	1998 08 17	704	(2.4- 1.8+)	1999 10 21	704	0.1-	0.6+	
1973 09 30	675	0.3+	0.1-	1998 08 17	704	(3.4- 1.2+)	1999 10 30	703	1.0-	0.1+	
1973 09 30	675	0.1+	1.4-	1998 08 23	704	1.4-	0.8+	1999 10 30	703	0.1-	0.1+
1973 10 04	675	(2.9+ 0.2+)		1998 08 23	704	0.1+	0.2+	1999 10 30	703	0.2-	0.7+
1973 10 04	675	2.1+	1.9-	1998 08 23	704	0.9+	0.2-	1999 10 30	703	1.0-	0.7-
1973 10 05	675	1.6+	1.2-	1998 08 23	704	(2.7- 0.7-)	1999 11 04	704	0.2+	0.9+	
1973 10 05	675	(4.1+ 0.8-)		1998 09 14	704	1.2-	1.4+	1999 11 04	704	0.5-	0.6+
1992 05 03	809	(2.6+ 1.3+)		1998 09 14	704	(0.9- 2.2+)	1999 11 04	704	0.3+	1.9+	
1992 05 03	809	(9.3+ 1.8+)		1998 09 14	704	1.0-	0.2-	1999 11 04	704	0.3-	1.1+
1992 05 03	809	(9.8+ 1.7+)		1998 09 14	704	0.4-	1.7+	1999 11 04	704	0.9-	0.9+
1997 05 03	809	0.6+	1.2+	1998 09 14	704	0.1+	1.1-	1999 11 12	699	0.3+	0.0
1997 05 03	809	0.4+	0.5+	1998 09 18	704	0.9+	0.1-	1999 11 12	699	0.1+	0.9+
1997 05 03	809	0.4-	0.9+	1998 09 18	704	1.6-	0.3+	1999 11 12	699	0.2-	0.8+
1997 05 04	809	(2.3- 0.9+)		1998 09 18	704	0.4+	0.4+	1999 11 15	704	0.4-	0.0
1997 05 04	809	(2.4- 1.1+)		1998 09 18	704	(2.1- 2.8+)	1999 11 15	704	0.0	0.0	
1997 05 04	809	(2.5- 1.0+)		1998 09 18	704	0.3-	0.8+	1999 11 15	704	0.2+	0.1+
1997 05 04	809	(0.3+ 3.0-)		1998 09 21	699	0.2+	1.2+	1999 11 15	704	0.0	0.5+
1997 05 04	809	(0.8- 2.5-)		1998 09 21	699	0.5-	1.4+	1999 11 15	704	0.5+	0.6+
1997 05 04	809	(1.1- 2.2-)		1998 09 21	699	0.1-	1.8+	1999 11 17	704	0.0	0.2+
1998 07 26	809	1.6+	0.2+	1999 10 10	704	0.5+	0.6+	1999 11 17	704	0.5+	0.5+
1998 07 26	809	1.4+	0.1-	1999 10 10	704	0.9-	0.8+	1999 11 17	704	0.1+	0.1-
1998 07 26	809	0.8+	0.1+	1999 10 10	704	0.2+	0.4-	1999 11 17	704	0.4+	0.3-
1998 07 27	809	1.4+	0.3+	1999 10 10	704	0.3+	0.9+	1999 11 17	704	0.7+	0.9-

(12644)* 3285 T-2 = 1982 BE₆ = 1988 XT₂

Discovered 1973 Sept. 30 by C. J. van Houten and I. van Houten-Groeneveld on Palomar Schmidt plates taken by T. Gehrels.

Id. T. Kobayashi (*MPC* 15257)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

M	6.26962		(2000.0)	P	Q		
n	0.26817511	ω	320.09609	+0.95842938	-0.28012020		
a	2.3815356	Ω	56.25250	+0.27560702	+0.85963355		
e	0.2300128	i	3.74261	+0.07385051	+0.42727372		
P	3.68	H	14.4	G	0.15	U	2

Residuals in seconds of arc

1951 09 08	675	0.8+	0.4-	1998 05 22	704	0.1+	1.2-	1999 11 09	704	0.5+	0.6-
1951 09 08	675	1.0+	0.4-	1998 05 22	704	(2.4- 0.9-)		1999 11 09	704	0.3+	0.5-
1973 09 29	675	0.6-	2.2+	1998 05 24	704	0.7-	1.2-	1999 11 09	704	1.0+	0.8+
1973 09 29	675	1.2-	0.2-	1998 05 24	704	0.1+	0.2+	1999 11 09	704	0.7+	0.7+
1973 09 30	675	0.6-	2.0-	1998 05 24	704	0.0	1.7-	1999 11 09	704	0.4-	0.1+
1973 09 30	675	0.8-	0.5-	1998 05 24	704	0.5+	0.5-	1999 11 12	704	0.4+	0.5-
1973 10 04	675	0.6+	1.2+	1998 05 24	704	1.1-	0.8-	1999 11 12	704	0.2+	0.3-
1973 10 04	675	0.3-	0.7+	1999 10 12	704	0.2-	0.8-	1999 11 12	704	0.2+	0.2-
1973 10 05	675	0.1+	0.4+	1999 10 12	704	0.0	1.0-	1999 11 12	704	0.2+	0.1+
1973 10 05	675	0.1-	0.2+	1999 10 12	704	0.5+	0.6-	1999 11 12	704	0.0	0.2+
1982 01 26	381	1.2-	2.1+	1999 10 12	704	0.2+	0.3-	1999 11 14	704	0.1+	0.4-
1982 01 26	381	(0.1+ 3.7+)		1999 10 12	704	0.8+	0.8-	1999 11 14	704	0.2-	0.4-
1988 12 11	400	(0.1+ 3.8+)		1999 10 22	704	(0.2- 2.6-)		1999 11 14	704	0.2-	0.6-
1988 12 11	400	0.1+	0.5+	1999 10 22	704	(1.2+ 2.3-)		1999 11 14	704	0.6-	0.4-
1988 12 11	400	0.1+	0.5+	1999 10 22	704	(1.9+ 3.0-)		1999 11 14	704	0.4-	0.2-
1988 12 12	872	1.0+	0.1+	1999 10 22	704	1.0+	0.3+	1999 11 16	704	0.1+	0.7-
1988 12 12	872	(0.3- 2.8-)		1999 11 03	704	0.6+	0.8-	1999 11 16	704	0.3-	1.0-
1988 12 12	872	(0.8+ 2.8-)		1999 11 03	704	0.5+	0.1-	1999 11 16	704	0.3-	0.7-
1998 05 22	704	0.7+	1.5-	1999 11 03	704	0.0	1.2-	1999 11 16	704	0.4-	0.4-
1998 05 22	704	0.2-	1.6-	1999 11 03	704	0.6-	0.5-	1999 11 16	704	0.4-	0.4-
1998 05 22	704	0.6-	0.5-	1999 11 03	704	0.9-	0.4+				

(12645)* 4240 T-2 = 1988 WD

Discovered 1973 Sept. 29 by C. J. van Houten and I. van Houten-Groeneveld on Palomar Schmidt plates taken by T. Gehrels.

Id. D. W. E. Green (*MPC* 15086)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

M	343.39511		(2000.0)	P	Q
n	0.26779053	ω	319.21881	+0.71024985	-0.70134553
a	2.3838151	Ω	85.42818	+0.66060415	+0.63436129
e	0.1891866	i	3.47929	+0.24320221	+0.32511568
P	3.68	H	14.7	G 0.15	U 1

Residuals in seconds of arc

1973 09 19	675	1.4+	0.7-	1988 12 07	399	0.8-	0.8+	1997 02 06	691	0.3+	0.1-
1973 09 19	675	0.6+	1.9-	1993 01 22	691	0.4-	0.0	1997 02 06	691	0.6+	0.2-
1973 09 20	675	1.3-	0.1+	1993 01 22	691	0.4-	0.0	1999 10 10	704	0.5-	0.5-
1973 09 24	675	0.1-	2.5+	1993 01 22	691	0.1+	0.2+	1999 10 10	704	0.1-	0.1+
1973 09 24	675	1.4-	1.4+	1993 01 26	691	0.3-	0.1-	1999 10 10	704	0.1-	0.2-
1973 09 25	675	0.5+	0.1+	1993 01 26	691	0.0	0.1-	1999 10 10	704	0.2+	0.0
1973 09 25	675	0.2-	0.3+	1993 01 26	691	0.3-	0.1-	1999 10 10	704	1.2+	0.1+
1973 09 29	675	1.7+	1.2-	1995 08 29	809	0.5+	0.0	1999 11 04	704	0.2+	0.0
1973 09 29	675	1.3+	1.3-	1995 08 30	809	0.7+	0.0	1999 11 04	704	0.2-	0.3-
1973 09 30	675	0.7-	0.0	1995 08 30	809	0.9+	0.1+	1999 11 04	704	0.0	0.4-
1973 09 30	675	1.6-	0.1+	1995 08 31	809	0.6+	0.1-	1999 11 04	704	0.1+	0.0
1973 10 04	675	0.4+	0.4-	1995 10 26	801	0.0	0.6+	1999 11 04	704	0.0	0.2-
1973 10 04	675	0.1-	0.0	1995 10 26	801	1.3-	0.2-	1999 11 15	704	0.0	0.3+
1973 10 05	675	0.9+	0.3-	1995 10 27	801	0.7-	0.1+	1999 11 15	704	0.1+	0.2+
1973 10 05	675	1.0-	0.8+	1995 10 27	801	0.3-	0.3+	1999 11 15	704	0.2-	0.3+
1988 11 30	399	(13.8+	2.4-)	1995 11 18	801	0.9-	0.7-	1999 11 15	704	0.0	0.6+
1988 11 30	399	(14.3+	1.9-)	1995 11 22	801	1.0-	0.3+	1999 11 15	704	0.0	0.7+
1988 12 02	399	(0.7-	3.0-)	1995 11 23	801	0.8-	0.3+	1999 11 17	704	0.2+	0.1+
1988 12 02	399	0.5+	0.7-	1997 01 31	691	0.5-	0.0	1999 11 17	704	0.4-	0.1-
1988 12 07	399	1.0+	0.0	1997 01 31	691	0.1-	0.1-	1999 11 17	704	0.2+	0.4-
1988 12 07	399	1.4-	0.5-	1997 01 31	691	0.3-	0.4-	1999 11 17	704	0.0	0.8-
1988 12 07	399	1.0+	1.0+	1997 02 06	691	0.3+	0.2+	1999 11 17	704	0.3+	0.4-

(12646)* 5175 T-2 = 1998 FC₁₁₃ = 1999 RX₁₂₅

Discovered 1973 Sept. 25 by C. J. van Houten and I. van Houten-Groeneveld on Palomar Schmidt plates taken by T. Gehrels.

Id. A. Doppler (*MPC* 36494)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>		359.51211		(2000.0)		P		Q	
<i>n</i>		0.22596884	ω	8.72169		+0.85902458		+0.50251364	
<i>a</i>		2.6695436	Ω	320.61436		-0.47849391		+0.72025106	
<i>e</i>		0.2251013	<i>i</i>	8.86248		-0.18198997		+0.47824517	
<i>P</i>	4.36		<i>H</i>	14.3		<i>G</i>	0.15	<i>U</i>	2

Residuals in seconds of arc

1973 09 24	675	0.5+	0.7-	1998 04 01	704	0.3+	0.5-	1999 09 09	704	0.1-	0.3-
1973 09 24	675	0.6+	0.5-	1998 04 01	704	1.0+	0.1+	1999 09 09	704	0.0	0.2+
1973 09 25	675	0.7+	0.9-	1998 04 01	704	1.3-	0.1+	1999 09 09	704	0.1+	0.1-
1973 09 25	675	0.4+	0.8-	1998 04 01	704	(0.3-	2.4-)	1999 09 09	704	0.1-	0.2+
1973 09 29	675	1.1-	1.3+	1999 07 16	704	0.9+	1.5-	1999 09 09	704	0.2-	0.3+
1973 09 29	675	0.9-	0.1-	1999 07 16	704	0.3+	0.4-	1999 09 14	704	0.3-	0.1-
1973 09 30	675	1.0-	0.3-	1999 07 16	704	1.0+	0.1-	1999 09 14	704	0.4+	0.3+
1973 09 30	675	0.3+	0.2+	1999 07 16	704	0.2-	0.6+	1999 09 14	704	0.3+	0.2-
1973 10 04	675	0.4+	0.1-	1999 08 07	699	0.3-	0.5+	1999 09 14	704	0.1+	0.0
1973 10 04	675	0.4+	0.1+	1999 08 07	699	0.3-	0.4+	1999 09 14	704	0.1+	0.2+
1973 10 05	675	0.6+	0.5-	1999 08 07	699	0.0	0.5+	1999 09 29	704	0.0	1.4-
1973 10 05	675	0.9+	0.8+	1999 08 22	699	0.6-	0.2+	1999 09 29	704	0.2+	0.4+
1997 01 12	566	0.2-	0.4+	1999 08 22	699	0.3-	0.6+	1999 09 29	704	0.7+	1.3+
1997 01 12	566	0.5+	0.1+	1999 08 22	699	0.1-	0.3+	1999 11 03	703	1.7-	0.1-
1997 01 12	566	0.4-	0.0	1999 09 05	699	0.0	0.4+	1999 11 03	703	0.6-	0.5+
1997 02 04	566	0.1+	0.4-	1999 09 05	699	0.0	0.2+	1999 11 03	703	0.7-	0.2+
1997 02 04	566	0.3+	0.3-	1999 09 05	699	0.2+	0.5+	1999 11 03	703	0.1-	1.4+
1997 02 04	566	0.2+	0.2-	1999 09 07	704	0.4+	0.5-	1999 11 07	704	0.2+	1.1+
1998 03 31	704	0.2+	1.1+	1999 09 07	704	0.4+	0.5-	1999 11 07	704	0.9-	1.3-
1998 03 31	704	0.7-	0.5-	1999 09 07	704	0.4+	0.6-	1999 11 07	704	0.1+	0.1-
1998 03 31	704	(1.7-	2.3-)	1999 09 07	704	0.0	0.2-	1999 11 07	704	0.4+	0.1+
1998 03 31	704	(5.1-	0.5+)	1999 09 07	704	0.2+	0.3-	1999 11 07	704	1.9-	1.5-

(12647)* 5332 T-2 = 1981 ES₆

Discovered 1973 Sept. 30 by C. J. van Houten and I. van Houten-Groeneveld on Palomar Schmidt plates taken by T. Gehrels.

Id. S. Nakano (*MPC* 15088)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>		290.61762		(2000.0)		P		Q	
<i>n</i>		0.19175464	ω	219.18398		-0.13334016		-0.97975737	
<i>a</i>		2.9783252	Ω	238.95786		+0.94745912		-0.08181586	
<i>e</i>		0.0566034	<i>i</i>	10.03656		+0.29076040		-0.18270651	
<i>P</i>	5.14		<i>H</i>	14.4		<i>G</i>	0.15	<i>U</i>	2

Residuals in seconds of arc

1973 09 29	675	0.4-	1.0+	1981 05 03	413	1.6+	0.6-	1999 11 04	704	0.2-	0.2+
1973 09 29	675	0.7-	0.3+	1991 01 20	413	0.4+	0.4+	1999 11 04	704	0.8+	0.6-
1973 09 30	675	0.3-	1.4+	1999 10 12	704	0.5-	1.0-	1999 11 04	704	0.5+	0.3+
1973 09 30	675	0.1-	0.5+	1999 10 12	704	0.9-	0.3-	1999 11 04	704	0.3+	0.0
1973 10 05	675	0.5+	1.3-	1999 10 12	704	0.3-	0.9-	1999 11 11	703	0.4+	0.3+
1973 10 05	675	0.9+	1.4-	1999 10 12	704	0.3+	0.5+	1999 11 11	703	1.3-	0.8+
1981 02 09	413	0.8+	0.4+	1999 10 22	704	0.0	0.7+	1999 11 11	703	0.3-	0.1-
1981 03 06	413	0.7-	1.2-	1999 10 22	704	0.5+	0.1-	1999 11 11	703	(2.9-	0.5+)
1981 03 08	413	1.0-	0.4+	1999 10 22	704	0.8-	0.3+	1999 11 14	704	0.5-	0.0
1981 03 08	413	0.2+	0.6-	1999 10 22	704	0.2-	0.6-	1999 11 14	704	1.2+	0.2+
1981 03 12	413	1.2-	0.3-	1999 11 04	704	0.3+	0.3+	1999 11 14	704	0.2+	0.1-
1981 03 12	413	(5.2+	2.6-)	1999 11 04	704	0.0	0.1+	1999 11 14	704	0.6+	0.6+
1981 04 09	413	0.3+	1.5+	1999 11 04	704	0.2+	1.0-	1999 11 14	704	(0.4+	2.9+)
1981 04 09	413	(2.8+	0.3-)	1999 11 04	704	0.3+	0.1+				
1981 05 01	413	(2.6+	2.7-)	1999 11 04	704	0.8-	0.1-				

(12648)* 1135 T-3 = 1995 OF₅

Discovered 1977 Oct. 17 by C. J. van Houten and I. van Houten-Groeneveld on Palomar Schmidt plates taken by T. Gehrels.

Id. G. V. Williams (*MPC* 25646)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>		91.12291		(2000.0)		P		Q	
<i>n</i>		0.26805576	ω	298.68336		-0.19092249		+0.97914644	
<i>a</i>		2.3822424	Ω	320.11689		-0.85859183		-0.20086247	
<i>e</i>		0.0806227	<i>i</i>	6.21623		-0.47578217		-0.03043873	
<i>P</i>	3.68		<i>H</i>	14.4		<i>G</i>	0.15	<i>U</i>	1

Residuals in seconds of arc

1958 07 12	675	0.2+	0.1+	1999 09 06	703	0.1-	1.2+	1999 10 10	704	0.5+	0.7-
1958 07 12	675	0.2+	0.0	1999 09 06	703	0.2-	1.0+	1999 10 10	704	0.6+	0.4-
1977 10 07	675	1.0-	0.6-	1999 09 06	703	1.1-	0.5-	1999 10 10	704	0.1+	0.4-
1977 10 11	675	0.1-	0.4+	1999 09 08	704	0.3-	0.7-	1999 10 10	704	0.0	0.4+
1977 10 11	675	0.6+	0.4+	1999 09 08	704	0.2+	0.7-	1999 10 20	704	0.6+	0.5-
1977 10 12	675	0.7+	1.2+	1999 09 08	704	0.8-	0.9-	1999 10 20	704	0.0	0.1+
1977 10 12	675	0.3+	1.1+	1999 09 08	704	0.5-	0.7-	1999 10 20	704	1.1+	1.2-
1977 10 16	675	1.4-	0.5+	1999 09 08	704	0.6+	0.4-	1999 10 20	704	0.4+	0.4-
1977 10 16	675	0.8-	0.0	1999 09 18	704	0.9+	0.3-	1999 10 20	704	0.1-	0.5+
1977 10 17	675	0.1-	0.8-	1999 09 18	704	0.7+	0.2+	1999 10 29	703	0.6-	0.7+
1977 10 17	675	0.4+	1.0-	1999 09 18	704	0.0	0.3-	1999 10 29	703	0.2-	0.9+
1977 10 22	675	(0.4-	4.4-)	1999 09 18	704	1.4+	0.1-	1999 10 29	703	0.2+	0.1+
1977 10 22	675	(0.3-	2.9-)	1999 09 18	704	0.5+	0.2+	1999 10 29	703	0.3-	0.5+
1995 07 22	691	0.1-	0.1-	1999 09 30	703	0.0	0.2+	1999 11 05	704	1.3+	0.1+
1995 07 22	691	0.0	0.1+	1999 09 30	703	0.4-	0.1+	1999 11 05	704	0.5+	0.0
1995 07 22	691	0.0	0.1+	1999 09 30	703	0.2-	0.5+	1999 11 05	704	0.5+	0.1+
1995 07 27	691	0.3-	0.2+	1999 09 30	703	0.0	0.1+	1999 11 05	704	0.5-	0.4+
1995 07 27	691	0.1+	0.0	1999 10 03	704	0.2+	0.0	1999 11 05	704	0.8-	0.4+
1995 07 27	691	0.5-	0.1+	1999 10 03	704	0.2+	0.4+	1999 11 12	703	0.2-	0.5+
1998 04 28	566	0.3+	0.3+	1999 10 03	704	0.3-	0.4-	1999 11 12	703	0.9-	0.0
1998 04 28	566	0.1+	0.4+	1999 10 03	704	0.2+	0.1-	1999 11 12	703	0.2+	0.2-
1998 04 28	566	0.1-	0.4+	1999 10 03	704	0.2+	0.0	1999 11 12	703	0.7-	1.4+
1999 07 23	704	0.4+	0.4-	1999 10 09	703	0.1+	0.3+	1999 11 13	699	1.4-	0.7-
1999 07 23	704	0.6+	0.4-	1999 10 09	703	0.5-	0.0	1999 11 13	699	0.1+	0.5-
1999 07 23	704	0.1+	0.2+	1999 10 09	703	0.1-	0.1+	1999 11 13	699	1.7-	0.2-
1999 07 23	704	0.1+	0.2-	1999 10 09	703	0.4-	0.5+				
1999 07 23	704	0.4-	0.2-	1999 10 10	704	0.7+	0.2-				

(12649)* 2035 T-3 = 1988 RW

Discovered 1977 Oct. 16 by C. J. van Houten and I. van Houten-Groeneveld on Palomar Schmidt plates taken by T. Gehrels.

Id. S. Nakano (*MPC* 13688)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>		359.44205		(2000.0)		P		Q	
<i>n</i>		0.08445216	ω	340.41858		+0.74632564		+0.66417438	
<i>a</i>		5.1451205	Ω	337.78297		-0.59439671		+0.63585945	
<i>e</i>		0.1475248	<i>i</i>	6.56781		-0.29948389		+0.39313503	
<i>P</i>	11.67		<i>H</i>	11.6		<i>G</i>	0.15	<i>U</i>	2

Residuals in seconds of arc

1977 10 07	675	0.7+	1.1+	1988 09 16	675	1.3+	0.1-	1999 09 07	691	0.0	0.5+
1977 10 11	675	0.9-	1.9+	1988 09 16	675	0.7+	0.4-	1999 09 07	704	0.1+	0.8-
1977 10 11	675	0.8-	1.5+	1988 09 16	675	0.7+	0.2+	1999 09 07	704	0.1-	0.5+
1977 10 12	675	0.6-	0.1+	1988 10 05	807	1.5+	0.3-	1999 09 07	704	0.2-	0.1+
1977 10 12	675	1.4-	0.1-	1988 10 07	807	1.3+	1.0-	1999 09 07	704	0.7+	0.1+
1977 10 16	675	1.0+	1.7-	1988 10 07	675	2.1-	0.3-	1999 09 07	704	0.0	0.4-
1977 10 16	675	0.9-	1.7-	1988 10 07	675	(0.6+	3.3-)	1999 09 13	699	0.5+	0.6+
1977 10 17	675	1.1-	0.2-	1988 10 09	675	0.4+	1.7-	1999 09 13	704	1.2+	0.1-
1977 10 17	675	1.5-	0.7+	1988 10 09	675	(0.7+	3.2-)	1999 09 13	704	0.1+	0.2+
1977 10 21	675	0.7+	0.3+	1988 11 03	807	1.0+	0.3-	1999 09 13	699	0.3+	0.6+
1977 10 21	675	1.8+	0.0	1988 11 05	807	0.3+	0.4-	1999 09 13	704	0.7-	0.2+
1977 10 22	675	0.8+	0.0	1989 10 29	807	0.1-	0.0	1999 09 13	704	0.5+	0.5+

1977 10 22	675	1.0+	0.7+	1989 10 31	807	0.0	0.4+	1999 09 13	699	0.2+	0.5+
1988 09 11	675	0.6-	0.0	1999 07 14	704	0.5-	0.7-	1999 09 13	704	0.4-	0.7+
1988 09 11	675	1.1+	0.8-	1999 07 14	704	0.5-	0.9-	1999 11 10	704	0.1+	0.2-
1988 09 11	675	1.2-	0.5-	1999 07 14	704	1.1-	0.9-	1999 11 10	704	0.2-	0.4+
1988 09 12	675	1.9-	0.4-	1999 07 14	704	0.9-	0.1-	1999 11 10	704	0.2-	0.1+
1988 09 14	807	0.5+	0.1+	1999 07 14	704	1.0-	0.5-	1999 11 10	704	0.1+	0.0
1988 09 15	807	0.7+	0.8+	1999 09 07	691	0.3+	0.5+	1999 11 10	704	0.5+	2.0+
1988 09 16	675	0.7-	0.1+	1999 09 07	691	0.1+	0.4+				

(12650)* 2247 T-3 = 1987 HG₂ = 1991 NV₂

Discovered 1977 Oct. 16 by C. J. van Houten and I. van Houten-Groeneveld on Palomar Schmidt plates taken by T. Gehrels.

Id. G. V. Williams (*MPC* 19883, *MPC* 34569), A. Doppler (*MPC* 34569), A. Milani (*ibid.*)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5				Williams			
<i>M</i>	95.43544	(2000.0)		P	Q		
<i>n</i>	0.27135212	ω	320.12421	-0.06111046	+0.99646103		
<i>a</i>	2.3629103	Ω	306.29608	-0.89653613	-0.08021463		
<i>e</i>	0.2113475	<i>i</i>	4.10637	-0.43873508	+0.02512021		
<i>P</i>	3.63	<i>H</i>	14.7	<i>G</i>	0.15	<i>U</i>	1

Residuals in seconds of arc

1977 10 07	675	0.6+	0.2+	1991 07 04	809	0.6+	0.4-	1999 10 22	704	1.2-	0.0
1977 10 11	675	0.8-	0.5+	1991 07 04	809	1.1+	0.1-	1999 10 22	704	0.3-	0.3-
1977 10 11	675	1.1-	0.7+	1991 07 04	809	1.6+	0.1-	1999 10 22	704	0.8+	0.7+
1977 10 12	675	0.9-	0.4-	1991 07 05	809	0.2-	0.2-	1999 10 22	704	0.4+	0.7+
1977 10 12	675	0.8-	1.0-	1991 07 05	809	0.2+	0.0	1999 11 03	704	0.5+	0.3-
1977 10 16	675	0.4+	2.4-	1991 07 05	809	0.6+	0.2+	1999 11 03	704	0.4+	1.3+
1977 10 16	675	0.8+	2.0-	1994 02 15	675	0.4+	0.6-	1999 11 03	704	0.3-	1.0+
1977 10 17	675	0.3+	0.5+	1994 02 15	675	1.1+	0.3-	1999 11 03	704	0.1+	0.7+
1977 10 17	675	0.4+	0.5-	1998 05 22	704	0.6+	0.7+	1999 11 03	704	0.2+	0.2+
1977 10 21	675	1.7+	1.1-	1998 05 22	704	0.2+	0.4+	1999 11 11	703	0.5-	0.5+
1977 10 21	675	0.2+	0.7-	1998 05 22	704	0.2+	1.1+	1999 11 11	703	0.5+	1.4+
1977 10 22	675	1.0+	0.2-	1998 05 22	704	0.3+	0.7+	1999 11 11	703	1.0-	0.3+
1977 10 22	675	1.7+	1.4-	1998 05 22	704	0.3-	1.0+	1999 11 11	703	0.5-	0.3-
1987 04 23	010	1.3-	0.6+	1999 10 12	704	0.3+	0.3-	1999 11 14	703	0.3-	1.2+
1987 04 23	010	1.0-	0.4-	1999 10 12	704	0.8-	1.1+	1999 11 14	703	0.1-	0.1+
1987 04 23	010	0.4+	1.2-	1999 10 12	704	1.2-	1.0+	1999 11 14	703	0.5-	1.3+
1991 07 03	809	1.9-	0.4+	1999 10 12	704	0.0	0.3-	1999 11 14	703	0.6-	0.5+
1991 07 03	809	1.1-	0.8+	1999 10 12	704	0.2-	0.6+				
1991 07 03	809	0.5-	1.0+	1999 10 22	704	0.2-	0.6+				

(12651)* 2268 T-3 = 1991 GB₈

Discovered 1977 Oct. 16 by C. J. van Houten and I. van Houten-Groeneveld on Palomar Schmidt plates taken by T. Gehrels.

Id. B. G. Marsden (*MPC* 18446)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5				Marsden			
<i>M</i>	15.88457	(2000.0)		P	Q		
<i>n</i>	0.18321551	ω	163.30045	+0.87887795	-0.46092756		
<i>a</i>	3.0701615	Ω	224.81696	+0.41531842	+0.86611121		
<i>e</i>	0.1307941	<i>i</i>	10.04671	+0.23470016	+0.19338345		
<i>P</i>	5.38	<i>H</i>	13.7	<i>G</i>	0.15	<i>U</i>	1

Residuals in seconds of arc

1977 10 07	675	1.8+	0.9+	1991 04 10	809	1.7+	1.8-	1998 08 27	704	1.3+	0.6+
1977 10 11	675	0.2+	1.0+	1991 04 15	675	0.6-	0.6-	1998 08 27	704	1.0-	0.3-
1977 10 11	675	0.7-	0.2-	1991 04 19	809	(0.6-	2.5-)	1999 10 10	704	0.7-	0.1+
1977 10 12	675	0.4-	1.1-	1991 04 19	809	(0.0	2.4-)	1999 10 10	704	0.1-	0.7-
1977 10 12	675	1.5-	0.1-	1991 04 19	809	(0.6+	2.9-)	1999 10 10	704	0.2-	0.5-
1977 10 16	675	0.2+	2.0-	1993 09 22	675	1.0-	1.2-	1999 10 10	704	0.0	0.9-
1977 10 16	675	0.4-	1.4-	1993 09 22	675	0.3-	0.9-	1999 10 10	704	0.6+	1.0-
1977 10 17	675	0.7-	1.2+	1997 07 01	910	1.5-	0.3+	1999 11 04	704	0.2+	0.5+
1977 10 17	675	0.8-	0.5+	1997 07 01	910	1.6-	0.5+	1999 11 04	704	0.1-	0.7+
1977 10 21	675	0.9+	1.2-	1997 07 01	910	1.5-	0.3+	1999 11 04	704	0.2-	0.2-

1977 10 21	675	0.2-	1.0-	1998 08 24	704	1.5+	0.3+	1999 11 04	704	0.3-	0.0
1977 10 22	675	0.8+	0.4-	1998 08 24	704	0.1-	0.3+	1999 11 04	704	0.2+	0.7+
1977 10 22	675	1.7+	0.2+	1998 08 24	704	1.9+	0.1-	1999 11 17	704	0.4+	0.0
1991 04 08	809	0.3-	0.8-	1998 08 24	704	0.8+	0.9+	1999 11 17	704	0.0	0.0
1991 04 08	809	0.3-	1.7-	1998 08 24	704	0.2+	1.2-	1999 11 17	704	0.7-	0.1+
1991 04 08	809	(1.7-	2.5-)	1998 08 27	704	1.6-	0.8+	1999 11 17	704	0.2+	0.2-
1991 04 10	809	(0.2+	2.2-)	1998 08 27	704	0.9+	1.2+	1999 11 17	704	0.3+	1.2+
1991 04 10	809	1.3+	1.7-	1998 08 27	704	1.2-	0.8-				

(12652)* 2622 T-3 = 1997 MX₁ = 1998 QP₉₇

Discovered 1977 Oct. 16 by C. J. van Houten and I. van Houten-Groeneveld on Palomar Schmidt plates taken by T. Gehrels.

Id. A. Doppler (*MPC* 32735)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5				Williams			
<i>M</i>	145.52594	(2000.0)		P	Q		
<i>n</i>	0.18183847	ω	14.61862	-0.48764546	+0.86548161		
<i>a</i>	3.0856419	Ω	226.34673	-0.81606679	-0.49853559		
<i>e</i>	0.1347481	<i>i</i>	9.11707	-0.31022071	-0.04902909		
<i>P</i>	5.42	<i>H</i>	14.2	<i>G</i>	0.15	<i>U</i>	1

Residuals in seconds of arc

1977 10 16	675	0.0	2.2-	1997 07 02	691	0.2-	0.2+	1999 11 04	704	0.5-	0.6+
1977 10 16	675	1.2+	2.2-	1997 07 02	691	0.1+	0.3-	1999 11 04	704	1.1+	0.6+
1977 10 17	675	0.0	0.3-	1998 08 24	704	0.9+	1.1+	1999 11 04	704	0.6-	0.5+
1977 10 17	675	0.6-	0.9+	1998 08 24	704	(1.0+	2.3+)	1999 11 04	704	1.1-	0.2+
1977 10 21	675	0.5+	1.4-	1998 08 24	704	1.4-	0.3+	1999 11 09	704	0.4-	0.7+
1977 10 21	675	(4.2+	1.5-)	1998 08 27	704	1.6+	1.2+	1999 11 09	704	0.5+	1.1+
1997 06 08	809	(1.8+	3.7+)	1998 08 27	704	0.0	0.1+	1999 11 09	704	0.3+	1.4+
1997 06 08	809	(1.1+	3.6+)	1998 08 27	704	0.1-	1.3-	1999 11 12	704	0.5+	0.9-
1997 06 08	809	(1.6+	3.8+)	1998 08 27	704	0.7-	0.3-	1999 11 12	704	0.4-	0.3-
1997 06 09	809	1.1+	1.3+	1998 08 27	704	0.8-	0.6+	1999 11 12	704	0.3-	0.0
1997 06 09	809	0.7+	0.8+	1999 10 05	704	0.6+	0.5-	1999 11 12	704	1.6+	0.1-
1997 06 09	809	0.3+	0.9+	1999 10 05	704	0.2-	0.7+	1999 11 13	691	0.3-	0.2+
1997 06 26	691	0.5-	0.4-	1999 10 05	704	0.3-	0.7+	1999 11 13	691	0.3-	0.3+
1997 06 26	691	1.3-	0.1-	1999 10 30	691	0.4-	0.4+	1999 11 13	691	0.0	0.5+
1997 06 26	691	0.5-	0.6-	1999 10 30	691	0.2-	0.1+				
1997 07 02	691	0.3+	0.3-	1999 10 30	691	0.4-	0.1+				

(12653)* 2664 T-3 = 1995 OP₇

Discovered 1977 Oct. 11 by C. J. van Houten and I. van Houten-Groeneveld on Palomar Schmidt plates taken by T. Gehrels.

Id. T. Kobayashi (*MPC* 25733)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5				Williams			
<i>M</i>	299.69871	(2000.0)		P	Q		
<i>n</i>	0.26918634	ω	82.98357	+0.20432478	-0.97889662		
<i>a</i>	2.3755675	Ω	355.22200	+0.88032328	+0.18534497		
<i>e</i>	0.1396872	<i>i</i>	2.46085	+0.42811484	+0.08607350		
<i>P</i>	3.66	<i>H</i>	15.8	<i>G</i>	0.15	<i>U</i>	1

Residuals in seconds of arc

1977 10 07	675	0.4+	1.5-	1997 02 14	327	0.1-	0.5-	1999 10 10	704	0.1-	0.2-
1977 10 07	675	(3.8+	3.2-)	1997 02 14	327	0.6-	0.0	1999 10 15	704	0.4-	0.1+
1977 10 11	675	0.8+	1.1-	1997 02 14	327	0.2+	0.1+	1999 10 15	704	0.5-	0.3+
1977 10 11	675	0.2+	1.2-	1999 10 02	703	0.4-	0.3+	1999 10 15	704	0.4-	0.3-
1977 10 11	675	(0.6+	2.8-)	1999 10 02	703	0.3+	0.3+	1999 10 15	704	0.4-	0.2-
1977 10 11	675	1.1+	0.5-	1999 10 02	703	0.1+	0.2+	1999 10 20	704	1.0-	0.4-
1977 10 12	675	0.4+	1.5-	1999 10 02	703	0.3-	0.3+	1999 10 20	704	0.9-	0.6+
1977 10 12	675	0.5+	1.4-	1999 10 04	704	0.8-	0.3-	1999 10 20	704	0.8-	0.6+
1977 10 12	675	(0.3-	2.9-)	1999 10 04	704	0.2+	0.7+	1999 10 20	704	0.5-	1.0+
1977 10 12	675	0.3+	1.0-	1999 10 04	704	0.3-	0.5-	1999 10 20	704	0.8-	0.5+
1988 10 13	675	0.9+	0.5-	1999 10 04	704	0.8+	0.3+	1999 11 05	704	0.9-	0.4+
1988 10 13	675	0.2+	2.2-	1999 10 04	704	0.5-	0.4-	1999 11 05	704	1.2+	0.2-
1995 07 24	691	0.6-	0.3+	1999 10 06	704	0.1-	0.1+	1999 11 05	704	0.8+	0.3+
1995 07 24	691	0.5-	0.3+	1999 10 06	704	1.1-	0.1+	1999 11 05	704	0.0	0.6+
1995 07 24	691	0.2-	0.5+	1999 10 06	704	0.3-	0.0	1999 11 05	704	0.2+	1.2+

1995 08 01	691	0.1+	0.3+	1999 10 06	704	0.4-	0.5+	1999 11 14	704	0.5+	1.9+
1995 08 01	691	0.1+	0.3+	1999 10 06	704	0.1-	0.4+	1999 11 14	704	1.0+	0.8+
1995 08 01	691	0.2+	0.7+	1999 10 10	704	0.0	0.5+	1999 11 14	704	0.8+	0.3-
1997 02 06	327	1.5+	0.1-	1999 10 10	704	0.1+	0.2+	1999 11 14	704	0.0	0.3+
1997 02 06	327	1.0-	0.2+	1999 10 10	704	0.2-	0.5+	1999 11 14	704	0.8+	0.4+
1997 02 06	327	0.1+	0.7+	1999 10 10	704	0.2+	0.1+				

(12654)* 4118 T-3 = 1980 FL₂

Discovered 1977 Oct. 16 by C. J. van Houten and I. van Houten-Groeneveld on Palomar Schmidt plates taken by T. Gehrels.

Id. T. Kobayashi (*MPC* 15425)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>			Williams		
39.90089			(2000.0)		
<i>n</i>			<i>P</i>		
0.18269319			<i>Q</i>		
<i>a</i>			172.16723		
3.0760104			+0.98696210		
<i>e</i>			+0.16086974		
0.1101235			-0.15649750		
<i>P</i>			+0.96665289		
5.39			-0.03760768		
<i>H</i>			+0.19925640		
13.7			<i>U</i>		
<i>G</i>			1		
0.15					

Residuals in seconds of arc

1977 10 07	675	0.9-	0.9-	1980 03 23	809	0.0	0.3-	1998 08 27	704	0.5-	0.1+
1977 10 11	675	1.9+	1.5-	1993 09 15	809	1.8+	1.6-	1998 08 27	704	0.4-	0.2+
1977 10 11	675	0.5+	1.4-	1993 09 15	809	0.3+	1.8-	1999 10 19	704	0.5+	1.0+
1977 10 12	675	0.1-	2.0-	1993 09 15	809	0.3-	1.5-	1999 10 19	704	0.4-	1.0+
1977 10 12	675	0.3-	1.7-	1993 09 19	675	0.6-	0.3-	1999 10 19	704	0.1+	0.7+
1977 10 16	675	0.4-	1.1+	1993 09 19	675	0.8-	0.9-	1999 10 19	704	0.1-	0.6+
1977 10 16	675	0.5+	1.1+	1993 09 22	809	1.2+	0.8+	1999 10 19	704	0.3+	0.4+
1977 10 17	675	0.2+	1.5-	1993 09 22	809	1.4+	0.2+	1999 11 01	703	0.1-	0.1-
1977 10 17	675	0.4-	1.5-	1993 09 22	809	0.9+	0.6-	1999 11 01	703	0.6-	0.6+
1977 10 21	675	0.2-	0.8-	1993 09 23	675	0.0	0.4-	1999 11 01	703	0.2-	0.0
1977 10 21	675	0.2-	1.0+	1993 10 10	675	0.8-	0.6+	1999 11 01	703	0.4-	0.7+
1977 10 22	675	0.6-	0.3-	1993 10 10	675	0.2-	0.0	1999 11 05	704	0.0	0.5+
1977 10 22	675	0.6+	0.8+	1993 10 15	675	1.0+	0.5-	1999 11 05	704	0.5+	0.1+
1980 03 16	809	0.3-	0.4-	1993 10 15	675	1.2-	0.4+	1999 11 05	704	0.4-	0.1+
1980 03 16	809	0.4+	1.1-	1998 08 24	704	0.8-	0.4+	1999 11 05	704	0.3+	0.5+
1980 03 16	809	0.1-	0.4-	1998 08 24	704	0.1+	0.4+	1999 11 05	704	0.0	0.0
1980 03 16	809	0.1-	0.9-	1998 08 24	704	0.3+	0.0	1999 11 16	703	0.4+	0.1+
1980 03 17	809	0.1-	0.6-	1998 08 24	704	0.6-	1.0+	1999 11 16	703	0.7-	0.4+
1980 03 17	809	0.2+	0.8-	1998 08 27	704	0.4-	1.4+	1999 11 16	703	0.2+	0.5+
1980 03 17	809	0.4-	0.8-	1998 08 27	704	0.1-	0.9+	1999 11 16	703	0.3-	0.2+
1980 03 17	809	0.6-	1.3-	1998 08 27	704	0.7+	0.1+				

(12655)* 5041 T-3 = 1987 QA₂

Discovered 1977 Oct. 16 by C. J. van Houten and I. van Houten-Groeneveld on Palomar Schmidt plates taken by T. Gehrels.

Id. H. Kaneda (*MPC* 16039)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>			Williams		
137.28839			(2000.0)		
<i>n</i>			<i>P</i>		
0.18562264			<i>Q</i>		
<i>a</i>			117.55795		
3.0435615			+0.00462850		
<i>e</i>			+0.99550470		
0.1003294			-0.97406514		
<i>P</i>			-0.22622043		
5.31			-0.09110517		
<i>H</i>			<i>U</i>		
12.8			1		
<i>G</i>					
0.15					

Residuals in seconds of arc

1977 10 11	675	0.7+	0.3-	1998 08 26	809	1.2-	0.3-	1998 09 27	704	0.4+	0.9+
1977 10 11	675	0.1+	1.0-	1998 08 26	809	1.9-	0.4-	1998 09 27	704	1.1-	1.7+
1977 10 12	675	2.1+	2.2-	1998 08 27	809	0.0	0.7+	1998 09 27	704	0.3+	0.1+
1977 10 12	675	(1.9+)	3.1-)	1998 08 27	809	0.3-	0.0	1998 09 27	704	0.5-	0.5+
1977 10 16	675	(2.2+)	2.6-)	1998 08 27	809	0.6-	0.8-	1998 10 14	704	0.3+	0.9+
1977 10 16	675	1.3+	2.1-	1998 09 14	704	0.1+	0.2+	1998 10 14	704	0.6+	1.2+
1977 10 17	675	(1.5+)	2.8-)	1998 09 14	704	0.3+	0.3-	1998 10 14	704	1.2+	0.5+
1977 10 17	675	1.1+	2.3-	1998 09 14	704	0.7-	0.3-	1998 10 14	704	1.3+	0.3-
1977 10 21	675	0.5+	0.4-	1998 09 17	699	0.7+	0.6+	1998 10 14	704	1.5-	1.4-
1977 10 21	675	0.4+	0.2+	1998 09 17	699	0.5+	0.3+	1998 10 15	704	0.1-	0.6+
1977 10 22	675	0.8-	2.2+	1998 09 17	699	0.5+	0.4+	1998 10 15	704	0.2-	0.6+
1977 10 22	675	0.3+	1.6-	1998 09 18	704	0.1-	0.7+	1998 10 15	704	0.1-	0.4+

1987 08 21	809	(1.0-	2.8+)	1998 09 18	704	0.6+	0.6+	1998 10 15	704	0.4-	0.6+
1987 08 21	809	0.6-	2.4+	1998 09 18	704	0.3-	0.7+	1998 10 15	704	0.1-	0.5+
1987 08 21	809	0.1+	2.1+	1998 09 18	704	0.6-	2.0+	1999 10 19	704	0.3+	0.8+
1987 08 25	809	0.3-	0.1+	1998 09 18	704	0.6+	0.7+	1999 10 19	704	0.4-	0.6+
1987 08 25	809	0.8-	0.2-	1998 09 26	704	0.2-	0.3-	1999 10 19	704	0.8+	0.2+
1987 08 25	809	0.5-	0.5+	1998 09 26	704	0.4+	1.1-	1999 10 19	704	0.4-	0.1+
1987 08 26	809	1.9-	2.4-	1998 09 26	704	0.4+	0.0	1999 10 19	704	0.6-	0.7-
1987 08 26	809	1.3-	1.8-	1998 09 26	704	0.0	0.4-	1999 10 31	703	0.8-	0.4+
1987 08 26	809	1.3-	1.2-	1998 09 26	704	0.7+	0.5-	1999 10 31	703	1.4-	0.5-
1987 08 28	809	0.5+	1.2-	1998 09 27	699	0.5+	0.2+	1999 10 31	703	0.5-	0.2-
1987 08 28	809	1.7+	0.9-	1998 09 27	704	0.1-	0.2+	1999 10 31	703	0.2-	0.1-
1987 08 28	809	0.1+	2.3-	1998 09 27	704	0.1-	0.2+	1999 11 05	704	0.7+	0.3+
1987 08 31	809	1.0-	1.6-	1998 09 27	699	0.3+	0.5+	1999 11 05	704	0.5-	0.9-
1987 08 31	809	0.7-	0.4-	1998 09 27	704	0.8+	0.5+	1999 11 05	704	0.0	1.2-
1987 08 31	809	0.8+	0.1+	1998 09 27	704	0.5-	0.9+	1999 11 05	704	0.2-	0.8-
1997 08 01	688	1.2+	1.1-	1998 09 27	699	0.1-	0.5+	1999 11 05	704	0.5-	0.3-
1997 08 01	688	1.0+	1.0-	1998 09 27	704	0.9+	0.7+				
1998 08 26	809	1.3-	0.6+	1998 09 27	704	0.7+	1.1+				

(12656)* 5170 T-3 = 1992 CC

Discovered 1977 Oct. 16 by C. J. van Houten and I. van Houten-Groeneveld on Palomar Schmidt plates taken by T. Gehrels.

Id. S. Nakano (*MPC* 20039)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>			Nakano		
251.14685			(2000.0)		
<i>n</i>			<i>P</i>		
0.23074962			<i>Q</i>		
<i>a</i>			26.20237		
2.6325425			-0.99638442		
<i>e</i>			-0.00130926		
0.1785176			-0.01880945		
<i>P</i>			+0.08285097		
4.27			-0.23634113		
<i>H</i>			<i>U</i>		
13.6			2		
<i>G</i>					
0.15					

Residuals in seconds of arc

1977 10 12	675	(0.7- 2.3-)	1992 03 04	809	0.6+ 0.8+	1998 09 27	704	0.1- 1.1+
1977 10 12	675	0.2- 1.5-	1992 03 07	809	0.3+ 0.7-	1998 09 27	704	0.3- 0.3-
1977 10 16	675	(2.7+ 2.6-)	1992 04 04	809	0.6- 0.3-	1998 09 27	704	(2.3- 0.2+)
1977 10 16	675	(2.7+ 3.1-)	1996 02 19	801	0.3+ 1.6-	1998 09 27	704	0.6- 0.9-
1977 10 17	675	1.5+ 1.6-	1996 02 19	801	0.5- 1.3-	1998 09 29	704	(2.8- 2.3+)
1977 10 17	675	0.2- 1.5-	1996 03 18	801	0.0 0.0	1998 09 29	704	(2.5- 0.2+)
1977 10 21	675	(0.3- 2.8+)	1996 03 18	801	0.1+ 0.1-	1998 09 29	704	2.1- 1.6+
1977 10 21	675	(0.8- 2.6+)	1996 03 21	801	0.3- 0.2+	1998 09 29	704	2.0- 1.4-
1992 02 04	675	0.2- 0.7+	1996 03 21	801	0.2- 0.2+	1999 10 10	704	0.2+ 0.2+
1992 02 04	675	0.5- 0.2-	1998 09 14	704	1.3- 1.6+	1999 10 10	704	0.2- 1.4+
1992 02 04	877	1.4+ 0.6-	1998 09 14	704	0.6+ 0.9-	1999 10 10	704	0.6+ 0.8-
1992 02 04	877	0.9- 0.8-	1998 09 14	704	0.5+ 1.2-	1999 10 10	704	0.7+ 0.5+
1992 02 08	877	0.3+ 0.2-	1998 09 14	704	0.3+ 0.3+	1999 10 10	704	0.5+ 0.6-
1992 02 08	877	0.5+ 0.8-	1998 09 14	704	0.4- 1.9+	1999 10 19	704	0.5+ 1.4+
1992 02 25	675	0.0 0.2+	1998 09 18	704	1.1+ 1.6+	1999 10 19	704	0.3+ 1.1+
1992 02 25	675	0.9+ 0.4-	1998 09 18	704	(0.2- 2.5+)	1999 10 19	704	0.1- 0.2+
1992 02 26	877	0.3+ 0.9-	1998 09 18	704	0.5+ 0.7+	1999 10 19	704	0.2- 0.9+
1992 02 26	877	0.3+ 0.0	1998 09 26	704	0.8+ 1.0-	1999 11 05	704	0.6- 0.2-
1992 02 27	675	0.8- 0.1+	1998 09 26	704	(1.1- 2.5-)	1999 11 05	704	0.3- 0.5+
1992 02 27	675	1.3- 0.1+	1998 09 26	704	1.2+ 0.3-	1999 11 05	704	0.4- 0.9+
1992 02 28	675	0.5- 0.2+	1998 09 26	704	1.1+ 1.5-	1999 11 05	704	0.8- 0.4+
1992 03 02	809	0.2+ 1.7+	1998 09 27	704	0.5+ 1.5-	1999 11 05	704	0.1- 0.1-

1999 NOV. 23

M.P.C. 36785

Residuals in seconds of arc

1977 03 12	381	0.3+	0.0	1999 09 07	704	0.7+	0.2+	1999 09 11	699	1.3-	0.2-
1977 03 12	381	0.8-	0.4-	1999 09 07	704	0.3-	0.1-	1999 09 11	699	0.2+	0.5-
1977 03 14	381	0.4+	1.0+	1999 09 07	704	0.3-	0.1+	1999 09 14	704	0.2+	0.5-
1977 03 14	381	1.2+	0.5+	1999 09 09	704	0.4+	0.2-	1999 09 14	704	1.5-	0.5-
1977 03 15	381	1.5+	0.5-	1999 09 09	704	0.4+	0.3-	1999 09 14	704	0.1-	0.3-
1977 03 15	381	2.6-	0.5-	1999 09 09	704	0.2+	0.6+	1999 09 14	704	0.3+	1.2+
1999 09 07	704	0.2+	0.2+	1999 09 09	704	1.0+	0.0				
1999 09 07	704	0.3-	0.2+	1999 09 11	699	0.3+	0.2+				

1977 QO₃ = 1999 SM₁

Id. A. Doppler

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams			
<i>M</i>		<i>P</i>	<i>Q</i>
3.51908		(2000.0)	
<i>n</i>	0.27173530	ω 91.63606	+0.99018229 -0.13842678
<i>a</i>	2.3606884	Ω 276.32108	+0.11922172 +0.90887089
<i>e</i>	0.2365578	<i>i</i> 1.11944	+0.07297403 +0.39343580
<i>P</i>	3.63	<i>H</i> 14.1	<i>G</i> 0.15 <i>U</i> 4

Residuals in seconds of arc

1977 08 23	095	0.0	0.3-	1999 09 27	848	0.1+	0.0	1999 11 08	120	0.4+	0.7+
1977 09 09	095	0.7-	0.5+	1999 09 27	848	0.4-	0.4+	1999 11 08	120	0.0	0.7+
1977 09 18	095	0.6+	0.1+	1999 09 28	848	0.5+	0.8+	1999 11 09	120	0.0	0.7+
1999 09 17	120	1.9+	0.2+	1999 09 28	848	0.3-	0.1-	1999 11 09	120	0.3+	0.7+
1999 09 17	120	0.1-	0.1-	1999 09 28	848	0.4-	0.3+	1999 11 12	704	0.1-	0.0
1999 09 22	120	0.0	0.4-	1999 11 03	704	0.3+	0.8-	1999 11 12	704	0.1+	0.1-
1999 09 22	120	0.5-	0.3-	1999 11 03	704	0.1+	0.4-	1999 11 12	704	0.0	0.0
1999 09 23	120	0.1-	0.6-	1999 11 03	704	0.0	0.4-	1999 11 12	704	0.0	0.0
1999 09 23	120	0.3-	0.7-	1999 11 03	704	0.1-	0.4-	1999 11 12	704	0.0	0.0
1999 09 27	848	0.6-	0.2-	1999 11 03	704	0.6-	0.4-				

1978 SX₄ = 1999 KR₁₅

Id. M. E. Sansaturio

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams			
<i>M</i>		<i>P</i>	<i>Q</i>
197.16089		(2000.0)	
<i>n</i>	0.26421620	ω 210.30658	+0.70941097 -0.70300042
<i>a</i>	2.4052659	Ω 194.71213	+0.67983943 +0.70135928
<i>e</i>	0.2545155	<i>i</i> 11.41532	+0.18588823 +0.11783703
<i>P</i>	3.73	<i>H</i> 14.4	<i>G</i> 0.15 <i>U</i> 5

Residuals in seconds of arc

1978 09 27	095	2.5-	3.5+	1978 10 01	049	1.1+	2.0+	1999 05 18	704	0.6-	0.3-
1978 09 30	049	1.0+	2.1-	1978 10 03	095	0.3+	1.7-	1999 05 18	704	0.1+	0.1-
1978 09 30	049	0.7+	1.0-	1978 10 07	095	0.5+	0.1-	1999 05 19	704	0.3+	1.6-
1978 10 01	049	0.2+	0.3+	1978 11 02	095	0.7-	0.1+	1999 05 19	704	1.4-	1.3-
1978 10 01	049	0.9-	0.5-	1999 05 18	704	1.5+	1.5+				
1978 10 01	049	0.2+	0.5-	1999 05 18	704	0.1+	1.7+				

1978 VA = 1999 TU₁₀

Id. M. E. Sansaturio

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams			
<i>M</i>		<i>P</i>	<i>Q</i>
331.58720		(2000.0)	
<i>n</i>	0.23598269	ω 43.63112	-0.16988359 -0.91582046
<i>a</i>	2.5934783	Ω 59.40498	+0.74760137 -0.36034725
<i>e</i>	0.3375463	<i>i</i> 25.00743	+0.64205277 +0.17726460
<i>P</i>	4.18	<i>H</i> 14.7	<i>G</i> 0.15 <i>U</i> 4

Residuals in seconds of arc

1978 11 05	675	0.2+	0.6-	1999 10 08	703	0.8-	0.7-	1999 10 13	046	0.1+	0.1+
1978 11 06	675	0.5-	0.7+	1999 10 08	703	0.7+	0.6-	1999 10 13	046	0.2+	0.3+
1978 11 07	675	0.1-	0.2+	1999 10 08	703	0.2+	0.1-	1999 10 13	046	0.1-	0.6-
1978 11 08	675	0.3+	0.4-	1999 10 09	703	0.7+	0.4-	1999 10 13	046	0.2-	0.1-
1999 10 08	703	0.6-	1.1+	1999 10 09	703	0.1-	0.8+	1999 10 13	046	0.1-	0.2+

1978 VO₂ = 1999 TZ₁₃

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams			
<i>M</i>		<i>P</i>	<i>Q</i>
288.95169		(2000.0)	
<i>n</i>	0.23246233	ω 212.46555	-0.11049260 -0.98781653
<i>a</i>	2.6195961	Ω 244.08558	+0.93590369 -0.06630467
<i>e</i>	0.1004062	<i>i</i> 6.99837	+0.33447821 -0.14079135
<i>P</i>	4.24	<i>H</i> 13.6	<i>G</i> 0.15 <i>U</i> 5

Residuals in seconds of arc

1978 10 30	010	0.5+	0.6-	1999 10 11	143	0.3-	0.0	1999 11 04	704	0.0	0.2+
1978 11 01	010	0.3-	0.1-	1999 10 11	143	0.2-	0.1-	1999 11 04	704	0.4-	0.1+
1978 11 01	010	(6.8-	0.7+)	1999 10 11	143	0.6+	0.2-	1999 11 04	704	0.5+	0.2-
1978 11 30	675	0.1-	0.7-	1999 10 11	143	0.1+	0.4-	1999 11 04	704	0.7+	0.6-
1978 12 01	675	0.2+	0.7-	1999 10 11	143	0.6+	0.3-	1999 11 11	703	0.0	0.6-
1999 10 03	704	0.6-	1.0-	1999 10 26	143	0.5+	0.2+	1999 11 11	703	0.4-	0.5+
1999 10 03	704	0.7-	0.0	1999 10 27	143	0.6+	0.5+	1999 11 11	703	0.1-	0.8+
1999 10 03	704	1.1-	1.6-	1999 10 27	143	0.9+	1.1+	1999 11 11	703	0.3-	0.1+
1999 10 03	704	0.6-	1.1-	1999 10 27	143	0.8+	0.4+	1999 11 12	143	0.2+	0.8+
1999 10 03	704	1.5-	1.1-	1999 10 27	143	0.0	0.4+	1999 11 13	143	0.4+	0.2+
1999 10 07	704	0.2-	0.4-	1999 10 27	143	0.5+	0.5+	1999 11 13	143	0.2+	0.4+
1999 10 07	704	0.6-	0.6-	1999 10 27	143	0.4+	0.6+	1999 11 13	143	0.0	0.3+
1999 10 07	704	0.5-	0.6-	1999 10 31	703	0.0	0.3+	1999 11 15	723	1.6+	1.2+
1999 10 07	704	0.2-	0.3-	1999 10 31	703	0.3-	0.6+	1999 11 15	723	0.7-	0.7+
1999 10 07	704	0.5-	0.5-	1999 10 31	703	0.1-	0.2+	1999 11 15	723	(2.7-	1.7-)
1999 10 11	143	0.9-	0.8+	1999 10 31	703	0.2+	0.4+				

1981 ER₄ = 1999 VN₂

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams			
<i>M</i>		<i>P</i>	<i>Q</i>
304.16606		(2000.0)	
<i>n</i>	0.19459369	ω 240.82229	-0.04071739 -0.99489123
<i>a</i>	2.9492860	Ω 211.91854	+0.96665483 -0.01582958
<i>e</i>	0.1160422	<i>i</i> 10.06241	+0.25282511 -0.09970385
<i>P</i>	5.06	<i>H</i> 13.8	<i>G</i> 0.15 <i>U</i> 4

Residuals in seconds of arc

1981 02 02	413	0.1+	1.2-	1999 10 02	703	0.9-	0.2+	1999 11 05	159	0.1-	0.3-
1981 02 14	413	0.5+	0.9-	1999 10 02	703	0.2-	0.4+	1999 11 05	159	0.2-	0.2-
1981 03 02	413	2.2-	1.0+	1999 10 02	703	1.1-	0.2+	1999 11 05	159	0.0	0.2-
1981 03 02	413	2.0+	0.6-	1999 10 03	704	0.6+	0.3+	1999 11 05	159	0.4-	0.0
1981 03 07	413	0.9-	1.5+	1999 10 03	704	0.5+	0.5+	1999 11 05	159	0.2-	0.2-
1981 03 07	413	1.3+	0.1-	1999 10 03	704	0.1+	0.1-	1999 11 05	159	1.0-	0.1-
1981 03 10	413	1.1-	2.4+	1999 10 03	704	0.4+	0.1-	1999 11 05	159	0.1-	0.2-
1981 03 10	413	1.4+	0.5-	1999 10 03	704	0.1-	0.8-	1999 11 05	159	0.0	0.2-
1981 03 12	413	1.2-	0.3+	1999 11 02	159	0.4-	0.9+	1999 11 05	159	0.2-	0.3-
1981 03 12	413	1.3+	1.0-	1999 11 02	159	1.0-	0.2-	1999 11 08	159	1.5+	0.1+
1981 04 12	413	0.1-	0.0	1999 11 02	159	0.4-	0.3+	1999 11 08	159	0.2-	0.1+
1981 04 12	413	0.7-	0.3+	1999 11 02	159	0.7-	0.4-	1999 11 08	159	1.9+	0.1+
1981 05 03	413	(2.2-	3.1-)	1999 11 02	159	0.3+	0.5+	1999 11 08	159	(2.9-	0.1+)
1998 08 24	704	0.4-	1.2+	1999 11 04	704	0.1-	0.0	1999 11 08	159	0.0	0.3+
1998 08 24	704	0.5-	1.9+	1999 11 04	704	0.1-	0.4-	1999 11 08	159	1.8+	2.0+
1998 08 24	704	0.4+	1.8-	1999 11 04	704	0.3+	0.3-	1999 11 08	159	(2.0-	3.6+)
1998 08 24	704	0.2+	0.3-	1999 11 04	704	0.4+	0.1-	1999 11 08	159	1.2-	1.1-
1999 10 02	703	0.0	0.2+	1999 11 04	704	0.7+	0.5+				

1981 EP₁₄ = 1999 VK₃₁

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams			
<i>M</i>		<i>P</i>	<i>Q</i>
143.14008		(2000.0)	
<i>n</i>	0.29692402	ω 19.40475	-0.38090311 +0.92212779
<i>a</i>	2.2252176	Ω 228.26909	-0.85986763 -0.38022345
<i>e</i>	0.1293630	<i>i</i> 5.21046	-0.33991247 -0.07148754
<i>P</i>	3.32	<i>H</i> 14.5	<i>G</i> 0.15 <i>U</i> 5

Residuals in seconds of arc

1981 02 09	413	0.2-	1.0+	1981 04 06	413	0.9-	1.1+	1999 11 03	704	0.0	0.4+
1981 02 12	413	0.1-	0.1+	1981 04 06	413	1.7+	0.5-	1999 11 03	704	0.0	0.0

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1981 03 01	413	0.9−	0.8+	1981 04 08	413	1.1−	0.5+	1999 11 03	704	0.5+	0.5+
1981 03 01	413	1.2+	0.8−	1981 04 08	413	0.1−	0.8−	1999 11 03	704	0.5+	0.5−
1981 03 06	413	1.2−	0.8+	1981 04 09	413	0.7−	0.4−	1999 11 12	704	0.0	0.5−
1981 03 06	413	1.6+	0.9−	1981 04 09	413	0.1+	0.8−	1999 11 12	704	0.1−	0.5−
1981 03 08	413	0.9−	1.3+	1981 05 01	413	0.1+	0.8−	1999 11 12	704	0.0	0.4−
1981 03 12	413	0.7−	0.9+	1981 05 03	413	0.1+	1.5−	1999 11 12	704	0.3−	0.4−
1981 03 12	413	1.8+	0.5−	1999 11 03	704	0.3−	0.8+	1999 11 12	704	0.2−	0.6−

1981 EA₃₂ = 1999 UF₂₅

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

				Williams			
<i>M</i>	340.04351		(2000.0)	P	Q		
<i>n</i>	0.19067282	ω	161.67973	+0.77920071	−0.60884124		
<i>a</i>	2.9895801	Ω	236.74745	+0.55050220	+0.77834405		
<i>e</i>	0.1120720	<i>i</i>	10.25350	+0.29965577	+0.15327388		
<i>P</i>	5.17	<i>H</i>	14.9	<i>G</i>	0.15	<i>U</i>	5

Residuals in seconds of arc

1981 02 09	413	0.3−	0.3+	1981 04 09	413	1.1−	1.3+	1999 10 28	703	0.3−	0.6+
1981 03 06	413	1.9−	0.5+	1981 04 09	413	2.5+	1.0−	1999 10 28	703	0.1−	0.4−
1981 03 06	413	(6.5−	0.8+)	1981 05 01	413	2.0+	0.8+	1999 11 04	703	0.1+	0.1+
1981 03 08	413	3.0+	1.7−	1981 05 03	413	0.4−	0.2+	1999 11 04	703	0.2−	0.1+
1981 03 08	413	3.9+	0.8−	1999 10 28	703	0.2−	0.9+	1999 11 04	703	0.4+	0.9−
1981 03 12	413	1.0−	0.1+	1999 10 28	703	0.4−	0.2+	1999 11 04	703	0.6+	0.2−

1981 EE₃₆ = 1996 DQ₆ = 1999 VA₄₈

Id. G. V. Williams, A. Gnädig, M. E. Sansaturio

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

				Williams			
<i>M</i>	333.29129		(2000.0)	P	Q		
<i>n</i>	0.18999813	ω	79.50190	+0.68801388	−0.72013125		
<i>a</i>	2.9966533	Ω	326.45324	+0.58601618	+0.62423957		
<i>e</i>	0.0682681	<i>i</i>	9.34254	+0.42804432	+0.30287942		
<i>P</i>	5.19	<i>H</i>	14.2	<i>G</i>	0.15	<i>U</i>	4

Residuals in seconds of arc

1981 03 06	413	1.6−	1.0−	1996 02 16	010	0.5+	2.1+	1999 11 03	704	0.3−	1.4+
1981 03 06	413	0.5+	2.8−	1996 02 17	010	0.2+	2.5−	1999 11 04	704	0.1+	0.3−
1981 03 08	413	2.1−	0.9+	1996 02 17	010	1.3−	0.9−	1999 11 04	704	0.5−	0.7−
1981 03 12	413	0.4−	0.8+	1996 02 17	010	1.0−	2.0−	1999 11 04	704	0.6+	0.7−
1981 03 12	413	0.5+	0.9+	1999 11 03	704	0.7+	0.8+	1999 11 04	704	0.3−	0.4−
1981 05 01	413	2.6+	0.1+	1999 11 03	704	0.1+	0.5−	1999 11 04	704	0.3−	0.1+
1996 02 16	010	1.1+	1.8+	1999 11 03	704	0.8+	0.0				
1996 02 16	010	1.1+	2.2+	1999 11 03	704	0.6−	0.0				

1981 EP₃₆ = 1999 VF₃₆

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

				Williams			
<i>M</i>	44.68316		(2000.0)	P	Q		
<i>n</i>	0.19306064	ω	104.50185	+0.98245141	+0.12180270		
<i>a</i>	2.9648784	Ω	248.65770	−0.16394091	+0.92509017		
<i>e</i>	0.1070737	<i>i</i>	8.72293	+0.08895288	+0.35968360		
<i>P</i>	5.11	<i>H</i>	14.4	<i>G</i>	0.15	<i>U</i>	5

Residuals in seconds of arc

1981 02 02	413	0.4−	2.0−	1981 04 09	413	1.8−	0.9+	1999 11 03	704	0.8+	1.1+
1981 03 07	413	0.5+	0.4+	1981 04 09	413	0.1−	0.6−	1999 11 12	704	0.0	0.1−
1981 03 07	413	1.7+	1.0−	1981 04 29	413	0.3−	0.0	1999 11 12	704	0.2−	0.4+
1981 03 10	413	0.6−	1.3+	1999 11 03	704	0.4−	1.2−	1999 11 12	704	0.0	0.0
1981 03 10	413	1.0+	0.8+	1999 11 03	704	0.1+	0.8−	1999 11 12	704	0.3−	0.7+

1999 NOV. 23

1982 VG₄ = 1991 LC₄ = 1999 TM₃₁

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

				Doppler			
<i>M</i>	221.17593		(2000.0)	P	Q		
<i>n</i>	0.28518400	ω	300.40759	−0.86132084	−0.50715511		
<i>a</i>	2.2858757	Ω	209.14970	+0.48488923	−0.80274523		
<i>e</i>	0.1134956	<i>i</i>	3.57035	+0.15168667	−0.31367786		
<i>P</i>	3.46	<i>H</i>	15.5	<i>G</i>	0.15	<i>U</i>	2

Residuals in seconds of arc

1982 11 14	381	0.2+	1.2−	1991 06 06	809	0.2−	1.4−	1999 10 04	704	0.4−	0.6+
1982 11 14	381	1.4+	0.1+	1991 06 08	809	1.0+	0.6+	1999 10 06	704	0.3+	0.2−
1982 12 13	381	1.2−	1.0+	1991 06 08	809	0.4−	0.1+	1999 10 06	704	0.5+	0.0
1982 12 13	381	1.0−	0.1−	1991 06 08	809	1.3−	0.5+	1999 10 06	704	(0.7+	2.6−)
1982 12 14	381	0.3+	0.7−	1999 10 04	704	0.2−	0.2−	1999 10 06	704	0.4+	0.3−
1982 12 14	381	0.1+	0.1−	1999 10 04	704	0.1+	0.3+	1999 10 06	704	0.2−	0.4+
1991 06 06	809	1.2+	0.5−	1999 10 04	704	0.1+	0.4−				
1991 06 06	809	0.4−	0.1+	1999 10 04	704	0.8−	0.2+				

1988 BG = 1999 RS₁₉₉

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

				Williams			
<i>M</i>	301.89965		(2000.0)	P	Q		
<i>n</i>	0.23195907	ω	126.61733	+0.48285229	−0.85340349		
<i>a</i>	2.6233837	Ω	293.38874	+0.71953988	+0.51444510		
<i>e</i>	0.1612188	<i>i</i>	12.35310	+0.49911525	+0.08395669		
<i>P</i>	4.25	<i>H</i>	12.4	<i>G</i>	0.15	<i>U</i>	4

Residuals in seconds of arc

1988 01 13	046	2.2+	1.8+	1988 01 23	552	0.3−	1.5−	1999 09 08	704	0.2−	0.0
1988 01 13	046	1.2+	1.4+	1988 01 24	399	0.2+	1.3+	1999 09 08	704	0.2−	0.0
1988 01 14	046	0.6+	1.5−	1988 01 24	399	0.7+	0.4+	1999 09 18	704	0.1+	0.1−
1988 01 14	046	3.6+	0.6−	1988 01 24	399	1.3−	1.0+	1999 09 18	704	0.2−	0.0
1988 01 15	046	0.8−	2.0−	1988 01 25	399	0.1−	1.7+	1999 09 18	704	0.2−	0.0
1988 01 15	046	1.3+	0.4+	1988 01 25	399	0.9+	0.9−	1999 09 18	704	0.1−	0.0
1988 01 18	399	1.6−	1.5−	1988 01 25	399	0.0	0.6−	1999 09 18	704	0.2−	0.0
1988 01 18	399	0.9−	0.3+	1988 02 07	399	0.2−	1.0−	1999 11 11	703	0.0	0.2−
1988 01 18	399	0.7−	0.0	1988 02 07	399	0.0	0.7+	1999 11 11	703	0.2−	0.1−
1988 01 18	071	0.3+	3.2−	1988 02 08	399	0.5+	0.3+	1999 11 11	703	0.3+	0.2−
1988 01 18	071	0.1+	1.9+	1988 02 08	399	2.6+	0.0	1999 11 11	703	0.8+	0.1−
1988 01 18	071	0.1−	0.0	1988 02 08	399	1.9+	0.8+	1999 11 12	703	0.1−	0.2+
1988 01 19	071	4.0−	4.9−	1988 02 12	399	1.2−	0.1−	1999 11 12	703	0.6−	0.2+
1988 01 20	399	0.1−	3.1+	1988 02 12	399	0.8−	0.6−	1999 11 12	703	0.1+	0.3−
1988 01 20	399	0.2−	2.3+	1999 09 08	704	0.8+	0.6+	1999 11 12	703	0.1−	0.2−
1988 01 20	399	2.9−	2.5+	1999 09 08	704	0.2+	0.1+				
1988 01 23	552	0.8−	1.1−	1999 09 08	704	0.2−	0.0				

1988 XV₁

Id. T. Kobayashi (1999 observations)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

				Nakano			
<i>M</i>	20.45939		(2000.0)	P	Q		
<i>n</i>	0.17954707	ω	301.27484	+0.92230079	−0.22100989		
<i>a</i>	3.1118393	Ω	73.14728	+0.35397121	+0.81236430		
<i>e</i>	0.2390642	<i>i</i>	19.34584	−0.15513100	+0.53964699		
<i>P</i>	5.49	<i>H</i>	11.3	<i>G</i>	0.15	<i>U</i>	5

Residuals in seconds of arc

1988 12 02	400	0.3+	0.6+	1988 12 11	399	1.7−	0.1−	1989 01 04	399	0.2−	0.9−
1988 12 02	400	0.7+	0.7−	1988 12 15	399	0.3+	0.4+	1999 11 13	411	0.1−	0.5+
1988 12 11	399	1.2+	0.6−	1988 12 15	399	1.5−	1.3+	1999 11 13	411	0.1+	0.3−
1988 12 11	399	0.0	0.9−	1989 01 04	399	1.3+	0.5−	1999 11 16	411	0.8−	0.3+
1988 12 11	399	0.0	0.5−	1989 01 04	399	0.2−	1.5+	1999 11 16	411	0.6+	0.0

**1989 EZ = 1937 ND = 1949 KB₁ = 1969 EF₂ = 1970 SJ₁ = 1998 KY₁₇
= 1999 TB₂₇**

Id. S. Nakano

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	77.03330		(2000.0)	P		Q	
<i>n</i>	0.24097208	ω	257.93076	+0.14629560	+0.98828399		
<i>a</i>	2.5575545	Ω	20.63424	-0.85281087	+0.14828192		
<i>e</i>	0.2073087	<i>i</i>	7.09082	-0.50130951	+0.03615563		
<i>P</i>	4.09	<i>H</i>	12.6	<i>G</i>	0.15	<i>U</i>	1

Residuals in seconds of arc

1937 07 05	078(34.8+ 58.8-)	X	1998 05 24	704	0.4+	0.6+	1999 10 06	704	0.4-	0.4+	
1949 05 20	078	0.3+	0.4-	1998 05 24	704	1.7+	0.5-	1999 11 04	704	0.6-	0.1-
1969 03 14	095	(1.8+ 5.1-)		1998 05 24	704	(3.8+ 0.2-)		1999 11 04	704	0.4-	0.1+
1970 09 30	095	1.4-	0.8+	1998 05 24	704	(3.2+ 0.3-)		1999 11 04	704	(4.3- 0.3-)	
1989 03 09	888	0.5+	0.8+	1999 10 03	704	0.4+	0.1+	1999 11 04	704	0.2-	0.3+
1989 03 09	888	0.5-	0.9+	1999 10 03	704	0.4+	0.5+	1999 11 04	704	0.2+	0.2-
1989 03 10	888	0.3+	1.4+	1999 10 03	704	0.0	0.5+	1999 11 04	704	0.0	0.2-
1989 03 10	888	(3.2- 3.8+)		1999 10 03	704	0.2+	0.1-	1999 11 11	703	0.3-	0.3+
1998 05 22	704	0.6+	0.5+	1999 10 03	704	0.2+	0.0	1999 11 11	703	0.0	0.2+
1998 05 22	704	0.6+	0.7+	1999 10 06	704	0.0	1.6+	1999 11 11	703	0.2-	0.1+
1998 05 22	704	(4.0+ 0.5+)		1999 10 06	704	0.4-	0.6+	1999 11 11	703	0.1+	0.4+
1998 05 22	704	1.1-	1.7+	1999 10 06	704	0.0	0.3+				
1998 05 22	704	0.2-	1.5+	1999 10 06	704	0.0	0.1+				

1989 GM₁ = 1998 MR₈ = 1999 VG₁₀

Id. S. Nakano

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	31.82522		(2000.0)	P		Q	
<i>n</i>	0.23362043	ω	130.48121	+0.97467326	+0.18196334		
<i>a</i>	2.6109316	Ω	219.54171	-0.20940132	+0.94666149		
<i>e</i>	0.2088140	<i>i</i>	11.78299	+0.07850552	+0.26593488		
<i>P</i>	4.22	<i>H</i>	13.0	<i>G</i>	0.15	<i>U</i>	2

Residuals in seconds of arc

1989 04 03	809	1.0+	1.4-	1989 04 10	809	1.6-	0.1-	1998 06 25	704	0.6+	0.3-
1989 04 03	809	0.3+	1.1-	1989 04 10	809	1.9-	0.4-	1998 06 25	704	0.6+	0.1-
1989 04 03	809	0.1+	0.1+	1989 04 10	809	2.0-	0.1+	1998 06 25	704	0.0	0.3-
1989 04 05	809	0.7+	1.5+	1998 06 19	704	0.2-	0.3+	1999 11 09	411	0.4+	0.6-
1989 04 05	809	0.7+	1.4+	1998 06 19	704	0.4-	0.3+	1999 11 09	411	0.0	0.4-
1989 04 05	809	1.2+	0.2-	1998 06 19	704	0.1+	0.4-	1999 11 10	411	0.2-	0.6-
1989 04 08	809	0.6+	0.2-	1998 06 19	704	0.6-	0.0	1999 11 10	411	0.2+	0.2-
1989 04 08	809	0.8+	0.4-	1998 06 19	704	0.8-	0.3+	1999 11 18	411	0.4+	1.0+
1989 04 08	809	0.1+	0.4+	1998 06 25	704	0.7+	0.2-	1999 11 18	411	0.9-	0.3+

1989 SM₁ = 1999 UG₁₄

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	357.56380		(2000.0)	P		Q	
<i>n</i>	0.19921430	ω	238.95202	+0.96611050	-0.25450991		
<i>a</i>	2.9035036	Ω	135.75187	+0.25284133	+0.89945258		
<i>e</i>	0.1694062	<i>i</i>	3.53904	+0.05197854	+0.35526013		
<i>P</i>	4.95	<i>H</i>	14.7	<i>G</i>	0.15	<i>U</i>	6

Residuals in seconds of arc

1989 09 26	809	0.8-	0.3+	1989 10 03	809	2.4+	1.9-	1999 10 29	703	0.2+	0.2+
1989 09 26	809	0.7-	1.2+	1989 10 07	809	0.4-	1.7+	1999 10 29	703	0.0	0.5+
1989 09 26	809	0.5-	1.5-	1989 10 07	809	1.4-	1.2+	1999 10 29	703	0.2+	0.1-
1989 09 28	809	0.1+	0.9+	1989 10 07	809	1.7-	1.6+	1999 11 03	703	0.0	0.2-
1989 09 28	809	0.2-	0.8+	1989 10 08	809	0.4-	1.0-	1999 11 03	703	0.6-	0.2-
1989 09 28	809	1.3-	0.7+	1989 10 08	809	0.8-	0.9-	1999 11 03	703	0.2+	0.4-
1989 10 03	809	3.5+	1.6-	1989 10 08	809	0.6-	0.2-	1999 11 03	703	0.6-	0.3+
1989 10 03	809	2.8+	1.3-	1999 10 29	703	0.6+	0.1-				

1989 SQ₅ = 1999 VY₃

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	351.67524		(2000.0)	P		Q	
<i>n</i>	0.29527910	ω	189.63407	+0.99736428	-0.07195022		
<i>a</i>	2.2334740	Ω	174.46613	+0.07134228	+0.94895638		
<i>e</i>	0.1879731	<i>i</i>	5.57173	+0.01322043	+0.30709112		
<i>P</i>	3.34	<i>H</i>	16.6	<i>G</i>	0.15	<i>U</i>	5

Residuals in seconds of arc

1989 09 26	809	0.6-	0.0	1989 10 03	809	2.2+	1.8+	1999 10 04	704	0.7-	0.7-
1989 09 26	809	0.7-	0.0	1989 10 03	809	0.2-	1.0+	1999 11 01	703	1.4-	0.1+
1989 09 26	809	0.8-	0.6-	1989 10 07	809	0.3-	0.8-	1999 11 01	703	0.5+	0.4+
1989 09 28	809	0.4+	0.1+	1989 10 07	809	1.2-	1.2-	1999 11 01	703	0.3+	0.4-
1989 09 28	809	0.9+	0.5+	1989 10 07	809	0.3-	0.9-	1999 11 01	703	0.1+	0.3-
1989 09 28	809	1.2+	0.1-	1999 10 04	704	0.4-	0.8+	1999 11 02	703	0.1+	0.2+
1989 09 29	675	0.1+	1.3-	1999 10 04	704	0.6+	1.0+	1999 11 02	703	0.1-	0.2+
1989 09 29	675	0.3-	1.2-	1999 10 04	704	0.3+	0.3+	1999 11 02	703	0.4+	0.3+
1989 10 03	809	0.4+	0.4+	1999 10 04	704	0.7-	0.5+	1999 11 02	703	0.5+	0.0

1989 WA₁ = 1967 GZ = 1974 HY₂ = 1999 UA₃

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	252.09160		(2000.0)	P		Q	
<i>n</i>	0.29085045	ω	59.74724	-0.62392440	-0.76473791		
<i>a</i>	2.2560890	Ω	69.74210	+0.64505588	-0.62020579		
<i>e</i>	0.0638222	<i>i</i>	9.87661	+0.44115898	-0.17470176		
<i>P</i>	3.39	<i>H</i>	13.7	<i>G</i>	0.15	<i>U</i>	3

Residuals in seconds of arc

1967 04 11	033	0.4+	0.2+	1989 11 25	403	2.0+	1.3+	Y	1999 11 06	757	0.2-	0.6-
1967 04 11	033	(4.5+ 0.2-)		1989 12 03	403	(0.1+ 6.0+)	Y		1999 11 06	757	0.6+	0.1+
1974 04 25	805	0.2-	0.2+	1999 10 18	757	0.2+	0.3+		1999 11 14	678	0.8-	0.3+
1989 11 21	403	1.9-	1.7-	1999 10 18	757	0.6+	0.3+		1999 11 14	678	0.3+	0.1+
1989 11 21	403	0.3+	0.0	1999 10 21	757	0.2+	0.5-		1999 11 15	678	0.2-	0.1+
1989 11 25	403	0.4-	0.1-	Y	1999 10 21	757	1.0-	0.4+	1999 11 15	678	0.3+	0.4+

1989 YO₃ = 1990 BA₃ = 1999 VO₅₆Id. S. Nakano (d. *MPC* 16553), G. V. Williams

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	152.34094		(2000.0)	P		Q	
<i>n</i>	0.27578889	ω	150.61203	-0.73021470	+0.68284539		
<i>a</i>	2.3374996	Ω	72.47259	-0.63136627	-0.66181430		
<i>e</i>	0.0656512	<i>i</i>	1.35525	-0.26108067	-0.30939296		
<i>P</i>	3.57	<i>H</i>	14.3	<i>G</i>	0.15	<i>U</i>	6

Residuals in seconds of arc

1989 12 30	413	1.8+	1.0-	1999 11 04	704	0.6-	0.2+	1999 11 12	704	0.2+	0.1-
1989 12 30	413	0.5-	0.2+	1999 11 04	704	0.4-	0.1+	1999 11 12	704	0.1+	0.1+
1989 12 31	413	3.0-	1.1-	1999 11 04	704	0.3-	0.3+	1999 11 12	704	0.5+	0.3+
1989 12 31	413	1.6+	0.2-	1999 11 04	704	0.3+	0.3-	1999 11 12	704	0.1+	0.1-
1990 01 29	033	0.0	0.2+	1999 11 04	704	0.0	0.0				
1990 01 29	033	0.0	1.7+	1999 11 12	704	0.2+	0.1-				

1990 EV₁ = 1999 VU₁

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	231.42956		(2000.0)	P		Q	
<i>n</i>	0.27379372	ω	329.56882	-0.93023480	-0.36610599		
<i>a</i>	2.3488416	Ω	189.06226	+0.36054024	-0.89907077		
<i>e</i>	0.1325156	<i>i</i>	9.16671	+0.06836628	-0.24007949		
<i>P</i>	3.60	<i>H</i>	14.2	<i>G</i>	0.15	<i>U</i>	4

Residuals in seconds of arc

1990 02 24	809	0.3+	0.9+	1990 03 20	095	(2.6+	0.6+)	1990 04 17	809	0.4-	0.2+
1990 02 24	809	0.4-	0.9+	1990 03 20	095	0.8+	0.9+	1990 04 17	809	1.8-	0.4+
1990 02 24	809	0.1+	0.7+	1990 04 04	809	0.5-	0.7+	1999 11 04	888	0.2-	0.1-

1990 03 02	809	0.4−	0.0	1990 04 04	809	0.5−	0.8+	1999 11 04	888	0.1−	0.1−
1990 03 02	809	0.1−	0.2−	1990 04 04	809	0.1−	0.2+	1999 11 04	888	0.1−	0.1+
1990 03 02	809	0.1+	0.6−	1990 04 15	809	0.8+	0.9−	1999 11 05	888	0.0	0.1−
1990 03 04	809	0.1−	0.8−	1990 04 16	809	0.2+	0.6−	1999 11 05	888	0.3+	0.3+
1990 03 04	809	0.2−	0.8−	1990 04 16	809	0.2−	0.8−	1999 11 05	888	0.2+	0.2−
1990 03 04	809	0.4+	1.2−	1990 04 16	809	1.7+	0.4+				

1990 SE₄ = 1999 TK₁

Id. S. Nakano

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

				Williams			
<i>M</i> 237.66545 (2000.0)				P		Q	
<i>n</i>	0.22180193	ω	278.66179	−0.67183362	−0.74060563		
<i>a</i>	2.7028743	Ω	213.55684	+0.68780165	−0.61778108		
<i>e</i>	0.0071703	<i>i</i>	1.23913	+0.27489722	−0.26429119		
<i>P</i>	4.44	<i>H</i>	13.4	<i>G</i>	0.15	<i>U</i>	4

Residuals in seconds of arc

1990 09 20	372	(1.9−	2.3−)	1999 10 04	704	0.0	0.6−	1999 10 28	327	0.2−	0.2+
1990 09 20	372	(3.2−	1.4−)	1999 10 04	704	0.7−	0.0	1999 10 28	327	0.3−	0.2+
1990 09 26	372	1.6−	0.3−	1999 10 04	704	0.1+	0.1+	1999 10 29	120	0.4+	0.0
1990 09 26	372	0.2−	1.0+	1999 10 04	704	0.2+	0.4−	1999 10 29	120	0.1−	0.2+
1990 10 15	372	1.2+	0.5+	1999 10 07	704	0.9+	0.6−	1999 10 29	120	0.3−	0.8−
1990 10 15	372	0.3+	0.4−	1999 10 07	704	0.9+	0.7−	1999 10 30	703	0.7−	0.1+
1998 05 29	704	0.1−	0.9−	1999 10 07	704	0.4+	0.3−	1999 10 30	703	0.0	0.1+
1998 05 29	704	0.2+	0.8−	1999 10 07	704	0.2−	0.1−	1999 10 30	703	1.1−	0.2+
1998 05 29	704	0.5+	0.7−	1999 10 16	120	0.5+	0.3+	1999 10 30	703	1.2−	0.4+
1998 05 29	704	1.3−	1.6+	1999 10 16	120	0.7−	0.4+	1999 11 01	703	0.2−	0.4−
1998 05 29	704	0.7+	0.7+	1999 10 18	327	0.2+	0.5+	1999 11 01	703	0.4−	0.1−
1999 10 01	120	0.6+	0.2−	1999 10 18	327	0.5+	0.4+	1999 11 01	703	0.1−	0.2−
1999 10 01	120	0.1−	0.0	1999 10 18	327	0.3+	0.5+	1999 11 01	703	0.3−	0.1−
1999 10 02	703	0.3−	0.4+	1999 10 19	120	0.2−	0.4−	1999 11 12	704	0.7+	0.2−
1999 10 02	703	0.1+	0.1−	1999 10 19	120	0.7−	0.9−	1999 11 12	704	0.6+	0.0
1999 10 02	703	0.1−	0.4+	1999 10 19	120	0.2+	0.1−	1999 11 12	704	0.5+	0.1−
1999 10 02	703	0.2−	0.4+	1999 10 27	327	0.4−	0.3−	1999 11 12	704	0.4+	0.0
1999 10 02	120	1.4+	0.3+	1999 10 27	327	0.1+	0.4+	1999 11 12	704	0.3−	0.0
1999 10 02	120	0.1+	0.3−	1999 10 27	327	0.4−	0.3+				
1999 10 04	704	0.8+	0.5−	1999 10 28	327	0.4−	0.3+				

1990 TG₂ = 1999 RS₉₀

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

				Doppler			
<i>M</i> 325.74548 (2000.0)				P		Q	
<i>n</i>	0.21644322	ω	27.21756	+0.80050516	−0.59812192		
<i>a</i>	2.7473040	Ω	9.79137	+0.50121087	+0.63337494		
<i>e</i>	0.1933866	<i>i</i>	12.90103	+0.32860181	+0.49100546		
<i>P</i>	4.55	<i>H</i>	15.1	<i>G</i>	0.15	<i>U</i>	5

Residuals in seconds of arc

1990 10 10	033	0.1−	0.5+	1999 09 07	704	0.2+	0.3−	1999 09 14	704	0.1−	0.1−
1990 10 11	033	0.0	0.2−	1999 09 07	704	0.3−	0.5−	1999 09 14	704	0.2+	0.0
1990 10 11	033	0.1+	0.4+	1999 09 07	704	0.1+	0.1+	1999 09 14	704	0.5+	0.0
1990 10 12	033	0.7−	0.7−	1999 09 07	704	0.3−	0.1−	1999 09 14	704	0.1+	0.3+
1990 10 13	033	0.7+	0.3−	1999 09 07	704	0.4−	0.8+				
1990 10 14	033	0.1−	0.3+	1999 09 14	704	0.0	0.3−				

1990 TS₉ = 1999 UH₂₆

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

				Williams			
<i>M</i> 215.32771 (2000.0)				P		Q	
<i>n</i>	0.21892858	ω	181.15100	−0.97143320	−0.23512207		
<i>a</i>	2.7264722	Ω	345.13081	+0.21872011	−0.83445137		
<i>e</i>	0.1442361	<i>i</i>	7.20259	+0.09208174	−0.49840598		
<i>P</i>	4.50	<i>H</i>	14.2	<i>G</i>	0.15	<i>U</i>	7

Residuals in seconds of arc

1990 10 10	033	0.3+	0.1−	1990 10 14	033	0.4−	0.4−	1999 11 04	703	0.0	0.2+
1990 10 11	033	0.0	0.0	1999 10 30	703	0.7−	0.4+	1999 11 04	703	0.5+	0.2−

1990 10 11	033	0.2−	1.0+	1999 10 30	703	0.1−	0.5+	1999 11 04	703	0.7+	0.4−
1990 10 12	033	0.1+	0.2−	1999 10 30	703	0.2+	0.5+	1999 11 04	703	0.6−	0.8−
1990 10 13	033	0.3+	0.6−	1999 10 30	703	0.1−	0.1+				

1990 UM = 1999 SM₈

Id. A. Doppler

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

				Williams			
<i>M</i> 335.61709 (2000.0)				P		Q	
<i>n</i>	0.21499223	ω	305.74624	+0.94541295	−0.27229250		
<i>a</i>	2.7596513	Ω	70.65164	+0.32474985	+0.83284405		
<i>e</i>	0.3163964	<i>i</i>	10.93789	−0.02705360	+0.48189998		
<i>P</i>	4.58	<i>H</i>	13.9	<i>G</i>	0.15	<i>U</i>	3

Residuals in seconds of arc

1990 10 20	385	1.2+	1.7+	1998 04 20	688	0.3−	0.6−	1999 09 30	704	0.3+	0.0
1990 10 20	385	(2.7+	0.4−)	1999 09 11	704	0.0	0.0	1999 09 30	704	0.8+	0.5+
1990 10 21	385	(4.9−	0.8−)	1999 09 11	704	0.4−	0.3+	1999 09 30	704	0.8+	0.6+
1990 10 21	385	1.9−	1.3−	1999 09 11	704	0.8−	0.0	1999 09 30	704	0.9+	0.5+
1990 10 26	385	0.1+	1.8−	1999 09 11	704	0.6−	0.2+	1999 11 07	385	0.2−	0.6−
1990 10 26	385	0.0	0.2+	1999 09 11	704	0.7−	0.5−	1999 11 07	385	1.1+	0.2−
1990 11 10	385	0.8−	0.8−	1999 09 29	704	2.0+	0.5−	1999 11 07	385	0.6−	0.3−
1990 11 10	385	0.5+	0.2−	1999 09 29	704	0.8+	0.8−	1999 11 13	704	0.5−	0.3+
1990 11 22	385	1.6+	0.6−	1999 09 29	704	0.2+	0.4−	1999 11 13	704	0.5−	0.2−
1990 11 22	385	0.2+	1.5+	1999 09 29	704	0.6−	0.7−	1999 11 13	704	0.1−	0.4−
1998 04 20	688	0.2−	0.5−	1999 09 29	704	1.7−	1.3+	1999 11 13	704	0.4−	0.0
1998 04 20	688	0.5−	0.7−	1999 09 30	704	0.9+	0.3+	1999 11 13	704	1.3−	1.0+

1990 VV₂ = 1999 RF₂₁₀

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

				Williams			
<i>M</i> 327.75331 (2000.0)				P		Q	
<i>n</i>	0.21400609	ω	176.60139	+0.72201508	−0.68313190		
<i>a</i>	2.7681224	Ω	227.13700	+0.63120500	+0.71527817		
<i>e</i>	0.1587338	<i>i</i>	8.60410	+0.28332751	+0.14733614		
<i>P</i>	4.61	<i>H</i>	13.0	<i>G</i>	0.15	<i>U</i>	4

Residuals in seconds of arc

1990 11 12	364	1.0−	0.3−	1990 11 21	095	0.0	0.3−	1999 09 08	704	0.9−	0.4−
1990 11 12	364	0.6−	1.4−	1990 11 21	095	(0.8+	2.6−)	1999 09 18	704	0.3+	0.5+
1990 11 12	875	(2.8+	1.6+)	1990 11 22	364	(6.5+	9.3+)	1999 09 18	704	0.1+	0.3+
1990 11 12	875	0.7+	0.2−	1990 11 22	364	0.7+	1.5+	1999 09 18	704	0.1−	0.4+
1990 11 14	095	0.2−	1.7−	1990 11 22	875	0.4+	0.4+	1999 09 18	704	0.2+	0.7+
1990 11 15	875	0.2+	0.8+	1990 11 23	095	(2.8−	0.4+)	1999 09 18	704	0.6−	0.2+
1990 11 15	875	0.7−	1.2+	1990 11 23	095	0.8−	1.1−	1999 11 14	678	1.3−	0.6−
1990 11 15	095	(7.6+	5.2+)	1999 09 08	704	1.1+	0.3+	1999 11 14	678	0.0	0.3−
1990 11 15	095	(0.2−	4.7−)	1999 09 08	704	0.2−	0.6+	1999 11 15	678	0.7+	0.2−
1990 11 21	364	(1.0+	3.7+)	1999 09 08	704	0.7+	1.6−	1999 11 15	678	0.2+	0.4−
1990 11 21	364	1.3+	1.5+	1999 09 08	704	0.1−	0.0				

1990 VD₈

Id. T. Kobayashi (1999 observations)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

				Williams			
<i>M</i> 11.12413 (2000.0)				P		Q	
<i>n</i>	0.22400241	ω	85.57463	+0.96088936	−0.27116782		
<i>a</i>	2.6851441	Ω	290.15141	+0.22436063	+0.88125799		
<i>e</i>	0.2819946	<i>i</i>	3.43270	+0.16233898	+0.38710770		
<i>P</i>	4.40	<i>H</i>	14.1	<i>G</i>	0.15	<i>U</i>	5

Residuals in seconds of arc

1990 10 15	675	(2.4+	3.1−)	1990 11 11	675	0.4−	0.2+	1999 11 16	411	0.1−	0.7−
1990 10 15	675	(1.0+	2.8−)	1990 11 13	675	0.0	1.2+	1999 11 16	411	0.5+	0.7−
1990 10 17	675	0.6−	1.2−	1990 11 13	675	0.6−	0.1+	1999 11 18	411	0.4+	0.0
1990 10 17	675	1.2+	0.8−	1990 11 24	402	0.8+	0.4+	1999 11 18	411	0.9−	0.5+
1990 11 11	675	0.6−	0.6+	1990 11 24	402	(1.9+	3.3+)				

1990 WB₇ = 1979 WA₄ = 1996 HO₂

Id. M. E. Sansaturio, G. V. Williams

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

				Williams					
<i>M</i>	183.28001		(2000.0)	P		Q			
<i>n</i>	0.26726805	ω	185.46891	+0.99978393		−0.01956475			
<i>a</i>	2.3869208	Ω	175.63362	+0.02077912		+0.94995506			
<i>e</i>	0.1366873	<i>i</i>	5.29271	−0.00057320		+0.31177332			
<i>P</i>	3.69	<i>H</i>	14.3	<i>G</i>	0.15	<i>U</i>	5		

Residuals in seconds of arc

1979 11 17	095	0.0	0.7−	1990 11 21	809	1.5−	1.7+	1996 04 17	691	0.4−	0.4+
1990 11 17	809	2.8−	0.3−	1990 11 22	809	0.2−	2.0+	1996 04 17	691	0.2−	0.7+
1990 11 19	809	1.7+	0.4−	1990 11 22	809	0.0	0.9+	1996 04 17	691	0.1−	1.0+
1990 11 19	809	0.4+	1.7−	1990 11 22	809	0.1−	0.5+	1996 04 19	691	0.3+	0.7−
1990 11 19	809	0.5+	2.9−	1990 11 22	809	1.8+	0.3−	1996 04 19	691	0.1+	0.6−
1990 11 21	809	2.0−	1.1+	1990 11 22	809	2.4+	0.4−	1996 04 19	691	0.3+	0.7−
1990 11 21	809	2.2−	1.6+	1990 11 22	809	1.9+	1.2−				

1991 EO₅ = 1996 AR₁₈ = 1998 MJ₁₁

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

				Doppler					
<i>M</i>	328.62405		(2000.0)	P		Q			
<i>n</i>	0.18465884	ω	222.36455	+0.86259595		−0.50442389			
<i>a</i>	3.0541426	Ω	167.75566	+0.49905092		+0.83597174			
<i>e</i>	0.1127713	<i>i</i>	10.46810	+0.08292407		+0.21611987			
<i>P</i>	5.34	<i>H</i>	13.9	<i>G</i>	0.15	<i>U</i>	2		

Residuals in seconds of arc

1991 03 14	809	0.5+	0.6−	1996 01 14	691	0.2−	0.2+	1998 06 19	704	0.2+	1.2+
1991 03 14	809	0.4+	0.2−	1996 01 14	691	0.2−	0.0	1998 06 19	704	0.1−	0.8−
1991 03 14	809	0.5+	0.2+	1996 01 14	691	0.0	0.1−	1998 06 25	704	0.9+	1.3−
1991 03 15	809	0.9−	1.6+	1996 01 21	691	0.0	0.6−	1998 06 25	704	0.7+	0.2−
1991 03 15	809	0.7−	1.7+	1996 01 21	691	0.2+	0.2+	1998 06 25	704	0.1−	0.2+
1991 03 15	809	0.7−	1.8+	1996 01 21	691	0.1+	0.2+	1998 06 25	704	0.7+	0.2−
1991 03 17	809	0.1+	1.5−	1998 06 19	704	0.5−	0.3+	1998 06 25	704	0.8−	0.3−
1991 03 17	809	0.2+	1.5−	1998 06 19	704	0.7−	0.7−				
1991 03 17	809	0.5+	1.4−	1998 06 19	704	0.4−	1.8+				

1991 RY₂

Id. E. Bowell (1999 observations)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

				Williams					
<i>M</i>	23.31884		(2000.0)	P		Q			
<i>n</i>	0.25214353	ω	61.48369	+0.94676587		+0.31511528			
<i>a</i>	2.4814422	Ω	280.08498	−0.31377296		+0.85754437			
<i>e</i>	0.1377408	<i>i</i>	3.83523	−0.07197853		+0.40659564			
<i>P</i>	3.91	<i>H</i>	15.1	<i>G</i>	0.15	<i>U</i>	4		

Residuals in seconds of arc

1991 09 09	033	0.0	0.3+	1991 10 07	033	0.2+	0.8−	1999 11 03	704	0.1−	0.4−
1991 09 10	033	0.3+	0.5+	1991 10 07	033	0.9+	0.5+	1999 11 03	704	0.4−	0.5−
1991 09 12	033	0.2−	0.0	1999 10 03	704	0.1+	0.6+	1999 11 03	704	0.4−	0.5−
1991 09 12	033	0.3+	0.2−	1999 10 03	704	0.3+	0.3+	1999 11 03	704	0.3+	0.3−
1991 09 13	033	(0.4+ 3.1−)		1999 10 03	704	0.4−	1.0+	1999 11 03	704	0.5−	0.5−
1991 10 03	033	1.1−	0.8−	1999 10 03	704	0.2−	0.9+	1999 11 11	703	0.6+	0.3+
1991 10 03	033	0.0	0.9−	1999 10 03	704	0.2−	0.3−	1999 11 11	703	0.0	0.0
1991 10 04	033	0.0	0.1−	1999 10 29	703	0.2+	0.1−	1999 11 11	703	0.2+	0.5+
1991 10 04	033	0.5+	0.5+	1999 10 29	703	0.2−	0.4+	1999 11 11	703	0.8+	0.5−
1991 10 04	033	0.2+	0.2+	1999 10 29	703	0.1−	0.1−				
1991 10 05	033	0.7−	0.2+	1999 10 29	703	0.2+	0.0				

1991 RQ₅ = 1999 UM₁₆

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

				Williams					
<i>M</i>	112.29053		(2000.0)	P		Q			
<i>n</i>	0.25542715	ω	231.70030	−0.23467825		+0.97091133			
<i>a</i>	2.4601298	Ω	24.85163	−0.85284711		−0.18219522			
<i>e</i>	0.1008045	<i>i</i>	6.49112	−0.46645250		−0.15535796			
<i>P</i>	3.86	<i>H</i>	14.4	<i>G</i>	0.15	<i>U</i>	5		

Residuals in seconds of arc

1991 09 13	675	0.7−	0.7−	1991 10 07	675	0.0	0.2+	1999 11 04	704	0.2+	0.1−
1991 09 13	675	0.2−	0.2−	1991 10 08	675	0.5+	0.2−	1999 11 04	704	0.1−	0.4+
1991 09 16	675	0.3+	0.2+	1999 10 29	703	0.5−	0.4+	1999 11 04	704	0.5+	0.5+
1991 09 16	675	0.4+	0.0	1999 10 29	703	0.6−	0.1−	1999 11 04	704	0.2+	0.1−
1991 09 17	675	(3.5− 0.3−)		1999 10 29	703	0.3+	0.4−	1999 11 04	704	0.2+	0.5+
1991 10 02	675	0.3−	0.9+	1999 10 29	703	0.1−	0.3−	1999 11 11	703	0.0	0.6−
1991 10 02	675	0.3+	0.0	1999 11 03	703	0.3−	0.4−	1999 11 11	703	0.2+	0.8−
1991 10 03	675	0.1−	0.6−	1999 11 03	703	0.5−	0.3+	1999 11 11	703	0.3−	0.7−
1991 10 03	675	1.1−	1.1+	1999 11 03	703	1.6+	1.7+	1999 11 11	703	0.7−	0.3−
1991 10 07	675	0.9+	0.6−	1999 11 03	703	0.1−	0.0				

1991 RD₁₈ = 1998 MO₂₁ = 1999 UL₁₄

Id. A. Doppler, G. V. Williams

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

				Williams					
<i>M</i>	103.23262		(2000.0)	P		Q			
<i>n</i>	0.25736551	ω	108.75219	−0.05668353		+0.99806778			
<i>a</i>	2.4477618	Ω	157.95141	−0.93964696		−0.04471617			
<i>e</i>	0.0431936	<i>i</i>	3.88731	−0.33741749		−0.04314120			
<i>P</i>	3.83	<i>H</i>	14.5	<i>G</i>	0.15	<i>U</i>	4		

Residuals in seconds of arc

1991 09 13	675	0.2+	1.2+	1998 06 24	704	0.8−	0.2+	1999 10 29	703	0.0	0.4−
1991 09 13	675	1.6−	0.5+	1998 06 24	704	0.3−	0.1−	1999 10 29	703	0.4+	0.0
1991 09 16	675	0.3+	0.3+	1998 06 26	704	1.4−	0.5+	1999 11 03	703	0.3+	0.2−
1991 09 16	675	0.2+	0.3+	1998 06 26	704	0.4+	0.6−	1999 11 03	703	0.3+	0.3−
1991 09 17	675	1.3+	1.9−	1998 06 26	704	0.4−	0.1+	1999 11 03	703	0.2+	0.9+
1991 09 17	675	0.2−	0.6−	1998 06 26	704	0.0	0.7+	1999 11 03	703	0.7−	0.1+
1998 06 24	704	0.8+	0.7−	1999 10 29	703	0.2+	0.0				
1998 06 24	704	1.6+	0.1−	1999 10 29	703	0.7−	0.0				

1991 VC₃

Id. A. Gnädig (1976, 1989 observations)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

				Williams					
<i>M</i>	51.46545		(2000.0)	P		Q			
<i>n</i>	0.27631435	ω	4.91989	+0.29529707		−0.87649344			
<i>a</i>	2.3345352	Ω	68.32264	+0.86201826		+0.07282620			
<i>e</i>	0.1972637	<i>i</i>	24.15109	+0.41197593		+0.47587351			
<i>P</i>	3.57	<i>H</i>	13.8	<i>G</i>	0.15	<i>U</i>	2		

Residuals in seconds of arc

1976 06 04	413	0.3+	0.5−	1991 12 08	675	1.5+	0.2+	1998 11 13	704	0.1−	0.2+
1976 06 04	413	0.1−	0.9−	1991 12 08	675	1.1+	0.9+	1998 12 08	704	0.3−	0.6−
1989 03 05	675	0.9−	1.2+	1991 12 14	894	0.3−	0.0	1998 12 08	704	0.7−	0.4−
1989 03 05	675	0.0	0.0	1991 12 14	894	1.2−	1.0+	1998 12 08	704	1.4−	0.1−
1989 03 09	675	0.4−	0.8+	1991 12 31	675	0.4−	0.8−	1998 12 08	704	0.0	0.0
1989 03 09	675	2.2+	0.8−	1991 12 31	675	0.6+	0.6+	1998 12 08	704	1.3−	0.6−
1989 03 30	675	0.1+	0.6+	1992 01 07	033	0.2+	0.1−	1999 01 11	704	0.6+	0.9+
1989 03 30	675	0.5+	0.3+	1992 01 07	033	0.3−	0.6+	1999 01 11	704	0.5+	1.7+
1991 11 13	894	0.8−	1.2−	1992 01 09	675	0.5−	1.5−	1999 01 11	704	0.6+	0.9+
1991 11 13	894	0.8−	1.0−	1992 01 09	675	0.0	1.8−	1999 01 11	704	0.1−	0.7+
1991 11 14	894	0.5−	0.6+	1992 01 10	675	0.9+	0.1+	1999 01 11	704	0.3+	0.1−
1991 12 02	675	0.1−	0.9−	1992 01 10	675	(2.5+ 0.7−)		1999 02 02	699	1.8−	0.6+
1991 12 02	675	0.8+	0.5−	1998 11 13	704	0.0	0.8+	1999 02 02	699	1.7+	0.4−
1991 12 04	675	1.9+	0.1−	1998 11 13	704	0.6−	0.9+	1999 02 02	699	(0.6+ 3.2+)	
1991 12 07	894	0.2+	0.4−	1998 11 13	704	0.0	0.4+				
1991 12 07	894	0.9+	0.6−	1998 11 13	704	1.1−	1.0+				

1992 BM₄ = 1999 VW₅₁

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>		(2000.0)		P		Q	
<i>n</i>	0.22940316	ω	75.38847	-0.26438760	-0.96409602		
<i>a</i>	2.6428334	Ω	29.97767	+0.86458024	-0.24836127		
<i>e</i>	0.0582928	<i>i</i>	2.85193	+0.42731745	-0.09399753		
<i>P</i>	4.30	<i>H</i>	15.3	<i>G</i>	0.15	<i>U</i>	6

Residuals in seconds of arc

1992 01 29	691	0.2+	0.4-	1992 02 09	691	0.0	0.3-	1999 11 04	704	0.7-	0.0
1992 01 29	691	0.1+	0.2-	1992 02 09	691	0.1-	0.1-	1999 11 04	704	0.2+	0.4-
1992 01 29	691	0.0	0.3+	1999 11 03	704	0.6-	0.2+	1999 11 04	704	0.5-	0.9+
1992 01 30	691	0.1+	0.1+	1999 11 03	704	0.4+	0.2-	1999 11 04	704	0.2-	0.3-
1992 01 30	691	0.1-	0.6+	1999 11 03	704	0.5-	0.0	1999 11 04	704	0.8+	0.3+
1992 01 30	691	0.1+	0.2-	1999 11 03	704	0.0	0.7-				
1992 02 09	691	0.2-	0.1+	1999 11 04	704	1.2+	0.2+				

1992 UR₈ = 1985 UN₁ = 1987 FP₁ = 1999 TH₉Id. G. V. Williams (*MPC* 36331), M. E. Sansaturio

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>		(2000.0)		P		Q	
<i>n</i>	0.27718288	ω	186.73347	-0.87118515	+0.48828863		
<i>a</i>	2.3296559	Ω	22.71630	-0.44404614	-0.73927465		
<i>e</i>	0.0675969	<i>i</i>	7.60320	-0.20942652	-0.46373182		
<i>P</i>	3.56	<i>H</i>	13.8	<i>G</i>	0.15	<i>U</i>	3

Residuals in seconds of arc

1985 10 22	033	0.6+	1.0-	1999 10 07	704	0.3-	0.2+	1999 11 04	704	0.3+	0.6+
1987 03 22	033	0.2+	0.4+	1999 10 07	704	0.5-	0.0	1999 11 04	704	0.4+	0.3+
1987 03 23	033	0.3+	0.4+	1999 10 07	704	0.4-	0.1-	1999 11 04	703	0.2+	0.1-
1992 10 27	372	0.4-	0.7-	1999 10 07	704	1.0-	0.4+	1999 11 04	704	0.2+	0.4+
1992 10 27	372	(2.7-	0.8+)	1999 10 07	704	0.2-	0.1-	1999 11 04	703	0.3-	0.2+
1992 10 31	033	0.3+	0.5+	1999 10 07	120	0.6+	0.4-	1999 11 04	704	0.4+	0.4+
1992 10 31	033	0.4-	0.1+	1999 10 07	120	0.1-	0.4-	1999 11 04	703	0.4-	0.2+
1992 11 01	033	0.1-	0.3+	1999 10 08	120	0.0	0.2+	1999 11 04	703	0.0	0.1+
1999 10 06	704	0.1+	0.5-	1999 10 08	120	0.5-	0.1-	1999 11 14	704	1.0+	0.3-
1999 10 06	704	0.1+	0.4-	1999 10 09	703	0.5-	0.4+	1999 11 14	704	0.2+	0.0
1999 10 06	704	0.0	0.4-	1999 10 09	703	0.4-	0.1+	1999 11 14	704	0.4+	0.2-
1999 10 06	704	0.0	0.6-	1999 10 09	703	0.6-	0.1+	1999 11 14	704	0.3+	0.0
1999 10 06	704	0.0	0.4-	1999 10 09	703	0.4-	0.3+	1999 11 14	704	0.1-	0.0
1999 10 07	704	0.6-	0.2-	1999 11 03	703	0.1-	0.6+	1999 11 16	704	0.5+	0.3+
1999 10 07	704	0.0	0.1-	1999 11 03	703	0.3-	0.1-	1999 11 16	704	0.2+	0.4+
1999 10 07	704	0.4-	0.6+	1999 11 03	703	0.0	0.5-	1999 11 16	704	0.8+	0.2+
1999 10 07	704	0.3+	0.0	1999 11 03	703	0.2-	0.2+	1999 11 16	704	0.2+	0.1+
1999 10 07	704	0.0	0.3+	1999 11 04	704	0.4+	0.0	1999 11 16	704	0.1+	0.0

1992 WM

Id. T. Kobayashi (1999 observations)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>		(2000.0)		P		Q	
<i>n</i>	0.28603891	ω	65.92935	-0.44563422	-0.88937993		
<i>a</i>	2.2813188	Ω	50.92887	+0.76619188	-0.43787518		
<i>e</i>	0.0777130	<i>i</i>	7.55290	+0.46299044	-0.13141033		
<i>P</i>	3.45	<i>H</i>	14.1	<i>G</i>	0.15	<i>U</i>	5

Residuals in seconds of arc

1992 10 25	675	0.0	0.1-	1992 11 18	399	(0.0	2.8+)	1999 11 03	704	0.3-	0.5+
1992 10 25	675	1.4+	0.7+	1992 11 27	399	1.2-	0.1-	1999 11 09	411	0.4+	0.3-
1992 10 28	400	0.1-	1.4-	1992 11 27	399	(3.6-	2.1+)	1999 11 09	411	0.3+	1.0+
1992 10 28	400	1.7+	0.5+	1999 11 03	704	0.7+	0.7-	1999 11 10	411	0.9-	0.1+
1992 11 16	399	1.4-	0.2+	1999 11 03	704	0.0	0.1-	1999 11 10	411	0.2+	0.8-
1992 11 16	399	0.6-	1.1+	1999 11 03	704	0.1+	0.3-				
1992 11 18	399	(2.6-	1.3+)	1999 11 03	704	0.2-	0.5-				

1993 FV₁ = 1978 RD₁₁

Id. A. Doppler

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>		(2000.0)		P		Q	
<i>n</i>	0.23884390	ω	331.86841	-0.65479019	-0.75146183		
<i>a</i>	2.5727245	Ω	158.70939	+0.72852091	-0.65604119		
<i>e</i>	0.1027191	<i>i</i>	12.88393	+0.20126375	-0.07010754		
<i>P</i>	4.13	<i>H</i>	13.1	<i>G</i>	0.15	<i>U</i>	3

Residuals in seconds of arc

1978 09 06	809	0.0	0.1-	1999 09 08	699	0.4+	1.1+	1999 09 21	699	0.1-	0.6+
1993 03 23	010	0.9+	0.3+	1999 09 14	704	0.5-	0.6-	1999 09 21	699	0.7+	0.7+
1993 03 23	010	0.5+	0.7+	1999 09 14	704	0.4-	0.3-	1999 10 02	704	0.3+	0.2-
1993 03 23	010	0.3+	0.3-	1999 09 14	704	0.3-	0.2-	1999 10 02	704	0.5-	1.3-
1993 03 25	010	1.5-	0.2+	1999 09 14	704	0.4-	0.2-	1999 10 02	704	0.6+	0.2+
1999 09 08	699	0.2-	1.0+	1999 09 14	704	0.2-	0.1-	1999 10 02	704	0.5+	0.4-
1999 09 08	699	0.2-	0.6+	1999 09 21	699	0.0	0.2+				

1993 FV₁₃ = 1999 VD₁ = 1999 VR₁

Id. S. Nakano, G. V. Williams (d)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>		(2000.0)		P		Q	
<i>n</i>	0.23142158	ω	330.59444	+0.98816184	+0.11133590		
<i>a</i>	2.6274441	Ω	23.72063	-0.02519173	+0.79641117		
<i>e</i>	0.1491313	<i>i</i>	15.21118	-0.15133258	+0.59441868		
<i>P</i>	4.26	<i>H</i>	13.9	<i>G</i>	0.15	<i>U</i>	4

Residuals in seconds of arc

1993 03 17	809	1.1-	0.1+	1999 11 04	355	1.0+	0.0	1999 11 05	355	0.0	0.2-
1993 03 18	809	0.3+	0.1+	1999 11 04	355	0.4+	0.1+	1999 11 05	355	0.0	0.3-
1993 03 23	809	1.1+	0.2-	1999 11 04	355	0.1+	0.7-	1999 11 05	355	0.0	0.2-
1993 04 16	413	0.3-	0.1+	1999 11 04	355	0.5+	1.0-	1999 11 05	888	0.0	0.2-
1999 11 03	704	0.1-	0.1+	1999 11 04	900	0.2-	0.5+	1999 11 05	888	0.0	0.1-
1999 11 03	704	0.7-	0.2-	1999 11 04	900	0.2-	0.6+	1999 11 05	888	0.1-	0.0
1999 11 03	704	0.0	0.1+	1999 11 04	900	0.4+	0.2+	1999 11 05	897	0.6-	0.5-
1999 11 03	704	0.1-	0.1-	1999 11 04	900	0.0	0.6+	1999 11 05	897	0.1-	0.2-
1999 11 03	704	0.0	0.3+	1999 11 04	888	0.4+	0.4-	1999 11 09	900	0.2-	0.2+
1999 11 04	850	1.8+	0.5+	1999 11 04	888	0.0	0.0	1999 11 09	900	0.4-	0.3+
1999 11 04	850	0.1-	0.0	1999 11 04	888	0.2-	0.4-	1999 11 11	703	0.3+	0.1-
1999 11 04	850	0.7-	0.0	1999 11 05	850	0.1+	0.5-	1999 11 11	703	0.0	0.1-
1999 11 04	850	0.2-	0.2+	1999 11 05	850	0.0	0.1-	1999 11 11	703	0.1+	0.2+
1999 11 04	850	0.6-	0.1-	1999 11 05	900	0.3-	1.7+	1999 11 11	703	0.0	0.3-
1999 11 04	897	0.2-	0.1-	1999 11 05	900	0.2-	0.4+				
1999 11 04	897	0.0	0.1-	1999 11 05	355	0.1-	0.4+				

1993 FJ₂₆ = 1999 VK₅₁

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>		(2000.0)		P		Q	
<i>n</i>	0.22113139	ω	329.30462	+0.19259918	+0.97971160		
<i>a</i>	2.7083354	Ω	311.73848	-0.88455301	+0.14888969		
<i>e</i>	0.1892312	<i>i</i>	4.25887	-0.42481941	+0.13415307		
<i>P</i>	4.46	<i>H</i>	14.2	<i>G</i>	0.15	<i>U</i>	5

Residuals in seconds of arc

1993 03 21	809	1.2-	0.5-	1999 11 03	704	0.6-	1.1-	1999 11 04	704	0.4-	0.0
1993 03 22	809	0.4+	0.0	1999 11 03	704	0.1-	0.1+	1999 11 04	704	0.5-	0.6-
1993 03 26	809	0.8+	0.7+	1999 11 03	704	0.7+	0.6+	1999 11 04	704	0.3+	0.1+
1993 04 18	413	0.0	0.2-	1999 11 04	704	0.1+	0.3+	1999 11 04	704	0.4+	0.6+

1999 NOV. 23

M.P.C. 36791

1993 FJ₃₃ = 1999 VQ₃₄

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	33.16352		(2000.0)	P		Q	
<i>n</i>	0.23810135	ω	308.83607	+0.99698700	+0.05576579		
<i>a</i>	2.5780707	Ω	48.03756	-0.02631301	+0.89701661		
<i>e</i>	0.1118029	<i>i</i>	4.15819	-0.07296950	+0.43846479		
<i>P</i>	4.14	<i>H</i>	13.8	<i>G</i>	0.15	<i>U</i>	5
Residuals in seconds of arc							
1993 03 19	809	1.1+	0.8-	1999 11 03	704	0.3+	0.8-
1993 03 20	809	0.3+	1.3-	1999 11 03	704	0.3+	0.1-
1993 03 24	809	0.2+	0.4-	1999 11 03	704	0.4+	0.2+
1993 04 18	413	1.6-	2.5+	1999 11 03	704	0.6+	0.1+
1999 11 03	704	0.5+	0.2-	1999 11 12	704	0.5-	0.1+

1993 FH₃₄ = 1993 HA₈ = 1999 UJ₁₉

Id. G. V. Williams (d, *MPC* 26379; unpublished)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	287.90859		(2000.0)	P		Q	
<i>n</i>	0.23493617	ω	49.44884	+0.01416019	-0.99772105		
<i>a</i>	2.6011743	Ω	39.88794	+0.88349025	-0.01841182		
<i>e</i>	0.0245101	<i>i</i>	5.90462	+0.46823547	+0.06491305		
<i>P</i>	4.20	<i>H</i>	14.9	<i>G</i>	0.15	<i>U</i>	5
Residuals in seconds of arc							
1993 03 19	809	0.6+	0.7+	1993 03 26	691	0.3-	0.4-
1993 03 20	809	0.6+	0.5+	1993 04 18	413	1.2+	0.2-
1993 03 24	809	0.2-	0.8+	1999 10 30	691	0.6+	0.2+
1993 03 26	691	0.6-	0.7-	1999 10 30	691	0.7+	0.2+
1993 03 26	691	1.3-	0.8-	1999 10 30	691	0.7+	0.1-

1993 FN₄₉ = 1999 VG₁₂

Id. S. Nakano

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	153.68100		(2000.0)	P		Q	
<i>n</i>	0.24147757	ω	234.38911	-0.49076927	+0.87128767		
<i>a</i>	2.5539841	Ω	6.22055	-0.79385324	-0.44628859		
<i>e</i>	0.0617250	<i>i</i>	0.96401	-0.35908573	-0.20416732		
<i>P</i>	4.08	<i>H</i>	14.6	<i>G</i>	0.15	<i>U</i>	6
Residuals in seconds of arc							
1993 03 19	809	0.4+	0.3-	1999 11 09	402	1.0-	0.3+
1993 03 20	809	0.6+	0.4+	1999 11 10	402	0.9+	0.8-
1993 03 24	809	0.4-	0.2+	1999 11 10	402	0.1-	1.1-
1993 04 17	413	0.6-	0.4-	1999 11 10	402	0.4+	1.3+
1999 11 09	402	0.7-	0.3-	1999 11 12	704	0.7-	0.3-
1999 11 09	402	0.6+	0.6+	1999 11 12	704	0.2-	0.3-

1993 LC₁ = 1999 SW₅

Id. A. Doppler

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	28.66805		(2000.0)	P		Q	
<i>n</i>	0.36076271	ω	274.04437	+0.63504687	+0.73742393		
<i>a</i>	1.9542868	Ω	38.70492	-0.47767291	+0.60891651		
<i>e</i>	0.0801057	<i>i</i>	21.58568	-0.60707830	+0.29227834		
<i>P</i>	2.73	<i>H</i>	15.8	<i>G</i>	0.15	<i>U</i>	4
Residuals in seconds of arc							
1993 04 20	413	0.0	0.6-	1993 06 15	413	0.6-	0.0
1993 04 20	413	2.0+	0.4+	1993 06 18	413	0.7-	0.4-
1993 06 13	413	(2.9+	0.7+)	1993 06 18	413	0.5-	0.3+
1993 06 13	413	0.7+	0.1+	1999 09 13	704	0.7-	0.1+
1993 06 14	413	0.5-	0.0	1999 09 13	704	0.1+	0.0

1993 06 14	413	0.5+	1.1+	1999 09 13	704	0.1-	0.2+	1999 10 01	704	0.4+	0.7-
1993 06 15	413	1.0-	0.3-	1999 09 13	704	0.3+	0.4-	1999 10 01	704	0.7-	0.3+

1993 NW₁ = 1999 VD₅₅

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	78.01374		(2000.0)	P		Q	
<i>n</i>	0.19934919	ω	82.86063	+0.47507341	+0.87981046		
<i>a</i>	2.9021938	Ω	215.51678	-0.81747063	+0.43477626		
<i>e</i>	0.0370710	<i>i</i>	1.52428	-0.32564862	+0.19210193		
<i>P</i>	4.94	<i>H</i>	13.7	<i>G</i>	0.15	<i>U</i>	6
Residuals in seconds of arc							
1993 07 12	809	1.3-	0.4-	1993 07 26	809	2.5-	0.4-
1993 07 12	809	1.0-	0.3-	1993 07 26	809	0.7+	0.7-
1993 07 12	809	0.3-	0.1-	1993 07 26	809	0.1+	0.5+
1993 07 19	809	1.7+	2.0+	1993 07 26	809	1.5+	0.2-
1993 07 19	809	1.1+	1.1+	1999 11 04	704	0.7+	0.1+
1993 07 19	809	1.2+	1.2+	1999 11 04	704	1.0+	0.3-
1993 07 26	809	0.6-	1.7-	1999 11 04	704	0.3-	0.3-
1993 07 26	809	0.6-	0.9-	1999 11 04	704	0.2-	0.6-

1993 TK₁₇ = 1999 VD₁₆

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	23.08559		(2000.0)	P		Q	
<i>n</i>	0.16766860	ω	324.94148	+0.96595454	+0.20392446		
<i>a</i>	3.2571285	Ω	24.79226	-0.04094197	+0.72811905		
<i>e</i>	0.0612551	<i>i</i>	22.31316	-0.25545171	+0.65441383		
<i>P</i>	5.88	<i>H</i>	13.8	<i>G</i>	0.15	<i>U</i>	5
Residuals in seconds of arc							
1993 09 21	675	0.2+	0.4+	1993 10 20	809	0.1-	0.7+
1993 09 21	675	0.4-	0.5+	1993 10 20	809	0.3-	0.3+
1993 10 09	809	1.4+	0.2-	1999 11 02	691	0.4-	0.0
1993 10 09	809	0.3+	0.2-	1999 11 02	691	0.5-	0.0
1993 10 09	809	0.4+	1.3-	1999 11 02	691	0.3-	0.1-
1993 10 11	809	0.7-	0.1-	1999 11 03	691	0.3-	0.2-
1993 10 11	809	0.4-	0.3-	1999 11 03	691	0.4-	0.2-
1993 10 11	809	0.3-	0.3-	1999 11 03	691	0.2-	0.2-
1993 10 20	809	0.1-	0.4+	1999 11 04	704	0.1+	0.0

1994 EK₁ = 1999 VY₄₃

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	156.52516		(2000.0)	P		Q	
<i>n</i>	0.27458899	ω	186.78486	-0.84630339	+0.52979422		
<i>a</i>	2.3443042	Ω	25.44912	-0.48246481	-0.71808218		
<i>e</i>	0.0599014	<i>i</i>	7.43106	-0.22582796	-0.45130485		
<i>P</i>	3.59	<i>H</i>	14.7	<i>G</i>	0.15	<i>U</i>	4
Residuals in seconds of arc							
1994 03 06	411	0.2+	0.4-	1994 03 15	411	0.5+	0.3+
1994 03 06	411	0.7-	0.8-	1994 04 03	411	0.3+	0.0
1994 03 10	411	0.1+	0.1+	1994 04 03	411	0.2-	0.3+
1994 03 10	411	0.4+	0.3+	1994 04 03	411	0.2-	0.6-
1994 03 10	411	0.2-	0.3+	1999 11 03	703	0.4+	0.2-
1994 03 15	411	0.3-	0.1-	1999 11 03	703	0.3-	0.2-
1994 03 15	411	0.0	0.5+	1999 11 03	703	0.3-	0.1-

1994 ER₅ = 1999 VN₆₉

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	188.87023		(2000.0)	P		Q	
<i>n</i>	0.28888586	ω	159.15569	-0.96689831	+0.25218340		
<i>a</i>	2.2663059	Ω	35.52311	-0.24255521	-0.86110172		
<i>e</i>	0.1212023	<i>i</i>	3.83625	-0.07921253	-0.44148313		
<i>P</i>	3.41	<i>H</i>	15.1	<i>G</i>	0.15	<i>U</i>	5

Residuals in seconds of arc

1994 02 08	809	0.4+	0.9-	1994 02 16	010	2.0-	0.9+	1999 11 04	704	0.0	0.6+
1994 02 08	809	0.2-	0.6-	1994 02 16	010	2.1-	0.1+	1999 11 04	704	0.5+	0.9+
1994 02 08	809	0.0	0.7-	1994 03 09	010	0.7+	0.5+	1999 11 04	704	0.3-	0.1+
1994 02 10	809	1.3+	0.5+	1994 03 09	010	0.6-	0.8+	1999 11 12	704	0.1-	0.8-
1994 02 10	809	1.3+	0.8+	1994 03 09	010	0.1+	0.4+	1999 11 12	704	0.3+	0.1-
1994 02 10	809	0.5-	0.1-	1994 03 10	010	0.6+	0.3-	1999 11 12	704	0.2-	0.4-
1994 02 13	809	1.3+	0.1+	1994 03 10	010	0.0	1.0-	1999 11 12	704	0.2-	0.2-
1994 02 13	809	0.2+	0.3+	1994 03 10	010	0.1+	0.8-	1999 11 12	704	0.6+	0.7-
1994 02 13	809	0.3-	0.1-	1999 11 04	704	0.5-	0.6+				

1994 EJ₆ = 1999 VJ₉

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	319.89391		(2000.0)	P	Q
<i>n</i>	0.29695046	ω	353.58777	+0.37449571	-0.92347140
<i>a</i>	2.2250856	Ω	74.39412	+0.85451562	+0.30881871
<i>e</i>	0.0477192	<i>i</i>	4.96686	+0.35993891	+0.22766548
<i>P</i>	3.32	<i>H</i>	15.2	<i>G</i> 0.15	<i>U</i> 5

Residuals in seconds of arc

1994 02 08	809	0.3-	1.3+	1994 03 09	010	0.7-	0.4+	1999 11 04	704	0.1-	0.2-
1994 02 08	809	0.7+	0.5+	1994 03 10	010	1.1+	0.3+	1999 11 04	691	0.1-	0.0
1994 02 08	809	0.0	1.2+	1994 03 10	010	0.2-	0.0	1999 11 04	691	0.3-	0.2-
1994 02 10	809	0.1-	0.1-	1994 03 10	010	0.7+	0.4-	1999 11 04	691	0.4-	0.0
1994 02 10	809	0.3-	0.3-	1999 11 04	704	0.6-	0.4+	1999 11 08	120	0.3+	0.2+
1994 02 10	809	0.1-	1.3-	1999 11 04	704	0.5+	0.5+	1999 11 08	120	0.1+	0.2+
1994 03 09	010	0.1+	0.5-	1999 11 04	704	0.3-	0.4+	1999 11 09	120	0.9+	0.4-
1994 03 09	010	0.8-	1.1-	1999 11 04	704	0.0	0.4-	1999 11 09	120	0.1-	0.5-

1994 GK₉ = 1999 VL₃₅

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	200.69122		(2000.0)	P	Q
<i>n</i>	0.29080658	ω	337.14856	-0.91243437	+0.40239464
<i>a</i>	2.2563159	Ω	226.79941	-0.35791182	-0.87290873
<i>e</i>	0.1295921	<i>i</i>	5.86155	-0.19840024	-0.27587842
<i>P</i>	3.39	<i>H</i>	13.8	<i>G</i> 0.15	<i>U</i> 5

Residuals in seconds of arc

1994 04 11	675	1.6+	0.9+	1994 05 06	675	1.7-	0.4-	1999 11 12	704	0.1+	0.1+
1994 04 11	675	1.1+	0.3-	1994 05 06	675	0.2-	1.6+	1999 11 12	704	0.2+	0.3+
1994 04 15	675	2.5-	0.8-	1999 11 03	704	0.8-	0.0	1999 11 12	704	0.1-	0.1-
1994 04 15	675	0.8-	0.2-	1999 11 03	704	0.0	0.0	1999 11 12	704	0.1-	0.2-
1994 05 04	675	(5.8+	1.2+)	1999 11 03	704	0.1+	0.3-				
1994 05 04	675	2.5+	0.7-	1999 11 12	704	0.4+	0.3+				

1994 JC

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Gnädig

<i>M</i>	314.71684		(2000.0)	P	Q
<i>n</i>	0.15894233	ω	137.53333	-0.93764837	-0.14844332
<i>a</i>	3.3752789	Ω	37.63672	-0.13093532	-0.68676326
<i>e</i>	0.5142344	<i>i</i>	30.97632	+0.32198055	-0.71156223
<i>P</i>	6.20	<i>H</i>	15.4	<i>G</i> 0.15	<i>U</i> 2

Residuals in seconds of arc

1976 07 02	413	0.8-	1.9+	1994 05 13	675	0.1+	0.8-	1994 06 20	413	0.4+	0.0
1994 05 04	675	1.5+	1.7+	1994 05 15	046	1.0-	0.7+	1994 08 15	413	0.1-	0.1+
1994 05 04	675	0.5+	1.8-	1994 05 15	046	1.0-	0.4+	1994 08 15	413	0.2+	0.6-
1994 05 05	675	(0.7-	2.6+)	1994 05 16	360	0.2+	0.1+	1994 08 16	413	0.6+	1.4-
1994 05 05	675	0.4+	1.3+	1994 05 16	360	0.2-	0.4+	1994 08 16	413	1.3-	0.9-
1994 05 08	675	1.8+	1.6-	1994 05 17	046	0.3+	0.1+	1994 08 17	413	0.5-	0.4-
1994 05 08	675	0.3-	1.2+	1994 05 17	046	0.1-	0.2+	1994 08 17	413	0.9-	1.0-
1994 05 10	801	0.9-	1.0-	1994 05 17	046	0.4-	0.4+	1994 08 26	413	0.0	0.2+
1994 05 10	801	0.4-	0.9-	1994 05 17	046	0.2-	1.0+	1994 08 26	413	0.3+	1.0+
1994 05 10	675	1.4+	1.2-	1994 05 31	587	0.4-	0.6-	1994 08 26	413	0.5-	0.7+
1994 05 11	801	0.8-	1.0+	1994 05 31	587	(2.6+	0.4+)	1999 11 16	611	0.2-	0.2-

1994 05 11	801	0.6-	1.4+	1994 06 03	360	0.7+	0.0	1999 11 16	611	0.7+	1.0-
1994 05 12	360	0.0	0.1+	1994 06 03	360	0.7+	0.3-	1999 11 16	611	0.6-	1.1+
1994 05 12	360	0.1+	0.2-	1994 06 17	413	0.3+	0.3+	1999 11 16	611	1.6+	1.6+
1994 05 13	675	0.7-	1.0-	1994 06 17	413	0.2+	0.2+	1999 11 16	611	1.4-	1.3-

1994 PC₉ = 1999 VU₃₈

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	350.14736		(2000.0)	P	Q
<i>n</i>	0.22774792	ω	214.23702	+0.70711236	-0.70710062
<i>a</i>	2.6556231	Ω	190.76263	+0.64983835	+0.65035540
<i>e</i>	0.0755733	<i>i</i>	0.27920	+0.27875118	+0.27757264
<i>P</i>	4.33	<i>H</i>	14.3	<i>G</i> 0.15	<i>U</i> 4

Residuals in seconds of arc

1994 08 10	809	0.3+	0.5-	1994 09 04	809	0.2-	1.3+	1999 11 10	704	0.1+	0.1+
1994 08 10	809	0.2-	1.2-	1994 09 04	809	0.2+	0.3+	1999 11 10	704	0.0	0.5+
1994 08 10	809	0.3-	0.6-	1994 09 09	691	(2.6-	0.4+)	1999 11 10	704	0.2-	0.7+
1994 08 11	809	0.4+	0.9-	1994 09 09	691	1.7-	0.0	1999 11 12	704	1.1+	0.1+
1994 08 11	809	0.8+	0.3-	1994 09 09	691	(2.9-	0.3+)	1999 11 12	704	0.2-	0.4-
1994 08 11	809	0.2+	0.7-	1999 10 19	292	0.6+	0.8-	1999 11 12	704	0.2-	0.2-
1994 09 03	809	0.1-	1.1+	1999 10 19	292	0.0	0.3-	1999 11 12	704	0.2-	0.3-
1994 09 03	809	0.1-	1.0+	1999 10 19	292	0.2-	0.5-	1999 11 12	704	0.3-	0.1-
1994 09 03	809	0.1+	0.6+	1999 11 10	704	1.0-	0.1+				
1994 09 04	809	0.7+	0.1-	1999 11 10	704	0.5+	0.6+				

1994 PX₂₁ = 1999 UY₂₆

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	27.65032		(2000.0)	P	Q
<i>n</i>	0.21450410	ω	11.54296	+0.95355729	+0.29939330
<i>a</i>	2.7638363	Ω	330.96958	-0.28149396	+0.84671267
<i>e</i>	0.0697187	<i>i</i>	3.90492	-0.10718975	+0.43981964
<i>P</i>	4.59	<i>H</i>	15.2	<i>G</i> 0.15	<i>U</i> 5

Residuals in seconds of arc

1994 08 12	809	1.0+	0.3-	1994 09 05	809	0.4-	1.2-	1999 10 31	703	0.1-	0.5-
1994 08 12	809	0.0	0.3-	1994 09 05	809	1.0-	0.3-	1999 10 31	703	0.9+	0.4+
1994 08 12	809	0.7+	1.3+	1994 09 06	809	1.4+	0.9+	1999 11 04	703	0.9-	0.7+
1994 08 13	809	0.1-	0.6-	1994 09 06	809	0.0	0.8+	1999 11 04	703	0.1-	0.3+
1994 08 13	809	0.9-	0.7-	1994 09 06	809	1.0+	0.1+	1999 11 04	703	0.0	0.1-
1994 08 13	809	0.9-	0.5+	1999 10 31	703	0.8+	0.1+	1999 11 04	703	0.0	1.0-
1994 09 05	809	0.9-	0.2-	1999 10 31	703	0.6-	0.1+				

1994 RO₆ = 1999 VW₁₅

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	256.07565		(2000.0)	P	Q
<i>n</i>	0.20939278	ω	177.10191	-0.52683592	-0.84918177
<i>a</i>	2.8086324	Ω	304.68725	+0.77893336	-0.46516252
<i>e</i>	0.0409411	<i>i</i>	2.54605	+0.34015692	-0.25002830
<i>P</i>	4.71	<i>H</i>	16.4	<i>G</i> 0.15	<i>U</i> 6

Residuals in seconds of arc

1994 09 12	691	0.0	0.2-	1994 09 28	691	0.1+	1.0-	1999 11 02	691	0.3-	0.2-
1994 09 12	691	0.0	0.2-	1994 09 28	691	0.4+	0.3+	1999 11 02	691	0.1-	0.1+
1994 09 12	691	0.3+	0.2+	1994 09 28	691	0.4-	0.0	1999 11 02	691	0.1+	0.0
1994 09 14	691	1.0+	0.6+	1994 09 29	691	0.1+	0.5-	1999 11 03	691	0.0	0.0
1994 09 14	691	0.5-	0.0	1994 09 29	691	0.6-	0.2+	1999 11 03	691	0.2+	0.0
1994 09 14	691	0.6-	0.1-	1994 09 29	691	0.2+	0.8+	1999 11 03	691	0.0	0.0

1994 TH₁ = 1979 WR₁ = 1999 VC₄

Id. G. V. Williams, E. Bowell

1999 NOV. 23

M.P.C. 36793

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5									
<i>M</i>		(2000.0)		P		Q		Williams	
<i>n</i>	0.19607095	ω	322.76358	+0.98525671	−0.07334827				
<i>a</i>	2.9344534	Ω	42.26652	+0.14675245	+0.82670570				
<i>e</i>	0.1163636	<i>i</i>	13.28552	−0.08793707	+0.55783306				
<i>P</i>	5.03	<i>H</i>	13.1	<i>G</i>	0.15	<i>U</i>	4		
Residuals in seconds of arc									
1979 11 16	095	0.2−	0.1+	1999 09 14	704	0.7−	0.7−	1999 10 03	703
1994 10 02	400	(2.1−	0.9−)	1999 09 14	704	0.5−	0.4−	1999 10 03	703
1994 10 02	400	1.8+	0.0	1999 09 21	699	0.3+	0.6+	1999 11 01	703
1994 10 03	400	1.1+	1.9−	1999 09 21	699	0.7+	1.2+	1999 11 01	703
1994 10 03	400	0.0	0.5+	1999 09 21	699	0.2−	0.4+	1999 11 01	703
1994 10 07	400	0.6+	0.2+	1999 10 02	704	0.0	0.4+	1999 11 01	703
1994 10 07	400	0.6+	0.5−	1999 10 02	704	0.1−	0.2+	1999 11 02	703
1994 10 31	675	1.0−	0.1−	1999 10 02	704	0.1+	0.2+	1999 11 02	703
1994 10 31	675	1.0−	0.6−	1999 10 02	704	0.2−	0.2+	1999 11 02	703
1999 09 14	704	0.1+	0.0	1999 10 02	704	0.1−	0.1+	1999 11 02	703
1999 09 14	704	0.5−	0.3+	1999 10 03	703	0.1+	0.2+		
1999 09 14	704	0.0	0.0	1999 10 03	703	0.0	0.1+		

1994 WO = 1999 VO

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5									
<i>M</i>		(2000.0)		P		Q		Williams	
<i>n</i>	0.19191535	ω	313.00624	+0.99507234	−0.02756403				
<i>a</i>	2.9766624	Ω	48.80986	+0.06944551	+0.87936829				
<i>e</i>	0.2593021	<i>i</i>	7.27110	−0.07076979	+0.47534370				
<i>P</i>	5.14	<i>H</i>	14.3	<i>G</i>	0.15	<i>U</i>	5		
Residuals in seconds of arc									
1994 11 25	411	0.1−	0.3+	1999 11 02	727	0.5−	0.6+	1999 11 05	727
1994 11 25	411	0.9−	0.3+	1999 11 03	727	0.0	0.2+	1999 11 05	727
1994 11 26	411	0.9+	0.4+	1999 11 03	727	0.4−	0.1−	1999 11 12	704
1994 11 26	411	1.1+	0.7−	1999 11 04	704	0.0	0.2−	1999 11 12	704
1994 12 04	411	0.6+	0.5−	1999 11 04	704	0.4+	0.2+	1999 11 12	704
1994 12 04	411	0.7−	0.9−	1999 11 04	704	0.1+	0.0	1999 11 12	704
1994 12 29	411	0.6−	0.3+	1999 11 04	704	0.6+	0.3−	1999 11 12	704
1994 12 29	411	0.4−	0.6+	1999 11 04	704	0.0	0.8−		
1999 11 02	727	0.3−	0.2−	1999 11 05	727	0.2−	0.1−		

1994 WE₄ = 1978 VR₁₅ = 1999 VW₂₆

Id. G. V. Williams, T. B. Spahr

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5									
<i>M</i>		(2000.0)		P		Q		Williams	
<i>n</i>	0.18928410	ω	268.89513	+0.88858657	+0.42374105				
<i>a</i>	3.0041847	Ω	66.01307	−0.30565343	+0.83250775				
<i>e</i>	0.1144926	<i>i</i>	11.08514	−0.34203786	+0.35689546				
<i>P</i>	5.21	<i>H</i>	12.4	<i>G</i>	0.15	<i>U</i>	5		
Residuals in seconds of arc									
1978 11 01	095	0.3+	0.6−	1994 12 04	411	0.2−	0.6+	1999 11 03	704
1994 11 30	411	0.4+	0.3−	1994 12 22	411	0.0	0.7−	1999 11 03	704
1994 11 30	411	0.9−	0.2−	1994 12 22	411	0.0	0.7+	1999 11 03	704
1994 12 03	411	0.3−	0.3+	1994 12 24	411	0.6+	0.3−	1999 11 10	704
1994 12 03	411	0.5−	0.2+	1994 12 24	411	1.4+	1.2−	1999 11 10	704
1994 12 04	411	0.1−	0.9+	1999 11 03	704	0.2+	0.0	1999 11 10	704
1994 12 04	411	0.3−	0.2+	1999 11 03	704	0.3−	0.1+	1999 11 10	704

1994 WP₈ = 1985 BD₁ = 1999 TV₃₃

Id. G. V. Williams (MPC 36338), M. E. Sansaturio

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5									
<i>M</i>		(2000.0)		P		Q		Williams	
<i>n</i>	0.18147772	ω	181.48211	+0.92070773	−0.38433800				
<i>a</i>	3.0897298	Ω	201.51204	+0.35992228	+0.90332043				
<i>e</i>	0.0636085	<i>i</i>	10.63703	+0.15084172	+0.19051641				
<i>P</i>	5.43	<i>H</i>	14.8	<i>G</i>	0.15	<i>U</i>	4		
Residuals in seconds of arc									
1985 01 18	691	0.0	0.1−	1994 12 04	691	0.1−	0.3+	1999 10 04	704
1985 01 18	691	0.6−	0.3−	1994 12 04	691	0.3−	0.2+	1999 10 06	704
1985 01 18	691	0.6+	0.4+	1994 12 10	691	0.3−	0.1−	1999 10 06	704
1994 11 28	691	0.3+	0.1+	1994 12 10	691	0.4−	0.1−	1999 10 06	704
1994 11 28	691	0.5+	0.1+	1994 12 10	691	0.2−	0.1+	1999 10 06	704
1994 11 28	691	0.6+	0.5−	1999 10 04	704	1.5+	0.5+	1999 10 06	704
1994 12 04	691	0.1−	0.0	1999 10 04	704	1.3−	0.7+		

1995 BQ₂ = 1999 UM₉

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5									
<i>M</i>		(2000.0)		P		Q		Williams	
<i>n</i>	0.17650344	ω	239.80750	−0.22205298	−0.92349269				
<i>a</i>	3.1475110	Ω	226.64314	+0.97488018	−0.20457183				
<i>e</i>	0.2008754	<i>i</i>	25.48208	+0.01735277	−0.32451751				
<i>P</i>	5.58	<i>H</i>	13.4	<i>G</i>	0.15	<i>U</i>	2		
Residuals in seconds of arc									
1995 01 29	413	0.2−	0.2+	1995 06 05	413	0.4−	0.5+	1999 10 29	703
1995 01 29	413	1.9+	0.6−	1995 06 05	413	0.2+	0.5+	1999 10 29	703
1995 02 01	413	0.2+	0.0	1999 10 03	704	0.5−	0.1−	1999 11 01	703
1995 02 01	413	0.0	0.0	1999 10 03	704	0.5+	0.3−	1999 11 01	703
1995 02 01	413	0.1+	0.3−	1999 10 03	704	0.5+	0.2+	1999 11 01	703
1995 02 02	413	0.3−	0.1−	1999 10 03	704	0.3−	0.1+	1999 11 01	703
1995 02 02	413	0.1+	0.1−	1999 10 03	704	0.2+	0.4−	1999 11 04	704
1995 02 09	413	0.5−	0.5−	1999 10 03	703	0.0	0.1−	1999 11 04	704
1995 02 09	413	0.5−	0.5−	1999 10 03	703	0.0	0.1−	1999 11 04	704
1995 02 20	413	0.2−	0.3−	1999 10 03	703	0.2−	0.3+	1999 11 04	704
1995 02 20	413	0.2−	0.1−	1999 10 03	703	0.1+	0.1−	1999 11 04	704
1995 03 07	413	0.2−	1.0+	1999 10 29	703	0.3−	0.1+		
1995 03 07	413	0.4−	0.8+	1999 10 29	703	0.3−	0.0		

1995 OH = 1999 UX₁₃

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5									
<i>M</i>		(2000.0)		P		Q		Williams	
<i>n</i>	0.27999953	ω	48.06728	+0.44690139	+0.89166070				
<i>a</i>	2.3140062	Ω	248.61162	−0.84201558	+0.39198800				
<i>e</i>	0.2100491	<i>i</i>	4.45040	−0.30214056	+0.22646547				
<i>P</i>	3.52	<i>H</i>	15.0	<i>G</i>	0.15	<i>U</i>	4		
Residuals in seconds of arc									
1995 07 22	609	0.5+	0.9+	1995 07 29	589	0.1+	0.2−	1999 10 29	703
1995 07 22	609	0.8−	0.2−	1995 07 29	589	0.5−	0.4+	1999 10 29	703
1995 07 22	609	0.5+	0.5−	1995 08 08	589	1.0+	0.5+	1999 11 03	703
1995 07 22	609	0.5+	0.3+	1995 08 08	589	0.3+	2.0−	1999 11 03	703
1995 07 24	589	1.1−	0.4−	1995 09 11	589	0.6+	0.9+	1999 11 03	703
1995 07 24	589	0.4−	0.2+	1995 09 11	589	0.9−	0.5+	1999 11 03	703
1995 07 24	589	0.8+	0.5+	1999 10 29	703	1.3+	1.0+		
1995 07 29	589	0.7−	0.7−	1999 10 29	703	1.2−	0.7+		

1995 PA

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5									
<i>M</i>		(2000.0)		P		Q		Williams	
<i>n</i>	0.27549228	ω	316.28971	+0.95915003	−0.27789885				
<i>a</i>	2.3391770	Ω	59.91505	+0.27345764	+0.86281367				
<i>e</i>	0.2051113	<i>i</i>	3.50818	+0.07247164	+0.42228521				
<i>P</i>	3.58	<i>H</i>	15.9	<i>G</i>	0.15	<i>U</i>	4		

Residuals in seconds of arc

1995 08 01	046	1.3+	1.2+	1995 08 23	046	0.7+	0.5+	1999 11 02	046	0.7−	0.5+
1995 08 01	046	0.6+	0.7+	1995 08 23	046	0.4−	0.6+	1999 11 02	046	0.3−	0.6+
1995 08 01	046	1.5−	0.1+	1995 08 30	046	0.8+	0.2−	1999 11 03	704	0.2+	1.0−
1995 08 01	046	0.8−	1.9−	1995 08 30	046	0.9+	1.4+	1999 11 03	704	0.2+	0.2−
1995 08 03	046	0.0	0.0	1995 08 30	046	0.5−	0.9+	1999 11 03	704	0.2+	0.1+
1995 08 03	046	0.2+	0.3+	1995 09 16	046	0.1−	0.3−	1999 11 03	704	0.0	0.1−
1995 08 03	046	0.1−	0.2−	1995 09 16	046	0.1−	0.6−	1999 11 03	704	0.4−	0.9+
1995 08 03	046	0.5+	0.6−	1995 09 16	046	0.0	0.3+	1999 11 12	704	0.2−	0.0
1995 08 03	046	0.5+	0.7−	1995 09 28	046	0.8−	0.1−	1999 11 12	704	0.1+	0.6−
1995 08 03	046	0.2−	0.2+	1995 09 28	046	0.1−	1.3+	1999 11 12	704	0.3−	0.4−
1995 08 03	046	0.2−	0.2+	1995 09 29	046	0.1+	0.1−	1999 11 12	704	0.3−	0.7−
1995 08 03	046	0.4−	0.1+	1995 09 29	046	0.8−	0.5−	1999 11 12	704	0.5−	0.6−
1995 08 04	046	1.0−	0.0	1995 09 29	046	0.5−	0.2+	1999 11 14	365	0.7+	0.7−
1995 08 04	046	0.4−	0.6−	1995 10 15	046	0.6+	0.4+	1999 11 14	365	1.7+	1.4−
1995 08 04	046	0.5−	0.3−	1995 10 15	046	0.2+	0.2−	1999 11 16	704	0.4+	0.3−
1995 08 05	046	0.7+	0.3+	1995 10 15	046	0.2−	0.8+	1999 11 16	704	0.1−	0.2−
1995 08 05	046	0.4−	0.6−	1999 11 01	046	0.3−	0.7+	1999 11 16	704	0.6+	0.1+
1995 08 12	046	0.3+	0.7−	1999 11 01	046	0.3−	0.7+	1999 11 16	704	0.1+	0.0
1995 08 12	046	0.7+	0.6−	1999 11 01	046	0.5−	0.8+	1999 11 16	704	0.5+	0.0
1995 08 12	046	0.4+	0.3−	1999 11 01	046	0.2−	0.7+				
1995 08 23	046	0.3+	1.1−	1999 11 02	046	0.6−	0.6+				

1995 SJ₇ = 1999 RW₇₈

Id. A. Doppler

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	5.41207		(2000.0)	P	Q
<i>n</i>	0.24513185	ω	149.52643	+0.85334023	+0.52135314
<i>a</i>	2.5285384	Ω	179.04815	−0.49133711	+0.80495207
<i>e</i>	0.1602736	<i>i</i>	4.01159	−0.17435106	+0.28327208
<i>P</i>	4.02	<i>H</i>	17.0	<i>G</i> 0.15	<i>U</i> 6

Residuals in seconds of arc

1995 09 17	691	0.4−	0.4−	1999 09 07	704	1.7+	1.5−	1999 09 11	704	0.9−	1.4−
1995 09 17	691	0.4−	0.1−	1999 09 11	704	0.6+	0.3+	1999 09 11	704	0.7−	0.8−
1995 09 17	691	0.2−	0.3−	1999 09 11	704	0.7−	0.1−	1999 09 11	704	0.7+	0.1−
1995 09 20	809	1.0+	0.3+	1999 09 11	704	0.1+	0.2+	1999 09 11	704	0.6+	1.6−
1995 09 22	691	0.1+	0.2+	1999 09 11	704	0.3−	0.9+	1999 09 11	704	0.8−	1.1+
1995 09 22	691	0.0	0.0	1999 09 11	704	0.1+	0.1+	1999 09 14	703	0.7−	0.8+
1995 09 22	691	0.1+	0.1−	1999 09 11	704	0.0	0.8+	1999 09 14	703	1.8+	0.1+
1999 09 07	704	0.5−	1.5+	1999 09 11	704	0.2+	0.0	1999 09 14	703	0.6−	0.2−
1999 09 07	704	0.2−	0.0	1999 09 11	704	0.2−	0.2−	1999 09 14	703	0.4−	0.4+

1995 SW₃₄ = 1999 UD₁₃

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	339.11647		(2000.0)	P	Q
<i>n</i>	0.24348727	ω	13.56111	+0.93842714	−0.34546649
<i>a</i>	2.5399112	Ω	6.65106	+0.31473613	+0.85164795
<i>e</i>	0.1865097	<i>i</i>	1.34706	+0.14246289	+0.39414295
<i>P</i>	4.05	<i>H</i>	16.1	<i>G</i> 0.15	<i>U</i> 4

Residuals in seconds of arc

1995 09 22	691	0.0	0.1+	1995 10 20	010	0.8−	0.3−	1999 10 29	703	1.9+	2.1−
1995 09 22	691	0.4−	0.0	1995 10 20	010	0.1−	1.2−	1999 10 29	703	0.1−	1.0+
1995 09 22	691	0.2−	0.1+	1995 10 23	010	1.1+	1.7+	1999 11 03	703	0.1−	0.0
1995 09 27	691	0.0	0.2+	1995 10 23	010	0.6+	0.8+	1999 11 03	703	0.4+	1.1−
1995 09 27	691	0.1+	0.3+	1995 10 23	010	0.4+	1.2+	1999 11 03	703	0.3−	0.2+
1995 09 27	691	0.0	0.3+	1999 10 29	703	0.9−	1.2+	1999 11 03	703	0.3+	0.0
1995 10 20	010	1.9−	0.7−	1999 10 29	703	0.1−	1.8−				

1995 TN₇ = 1999 VU₃₄

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	337.41369		(2000.0)	P	Q
<i>n</i>	0.25561990	ω	139.63906	+0.49818724	−0.86680389
<i>a</i>	2.4588929	Ω	280.47078	+0.78979356	+0.46386157
<i>e</i>	0.1787963	<i>i</i>	1.25043	+0.35782064	+0.18298486
<i>P</i>	3.86	<i>H</i>	16.2	<i>G</i> 0.15	<i>U</i> 4

Residuals in seconds of arc

1995 10 15	691	0.1−	0.3−	1995 10 27	046	0.3+	0.1+	1999 11 03	704	0.2+	0.5−
1995 10 15	691	0.2−	0.2−	1995 11 16	691	0.7−	0.3+	1999 11 03	704	0.0	0.0
1995 10 15	691	0.0	0.0	1995 11 16	691	0.5−	0.0	1999 11 03	704	0.2+	0.1−
1995 10 22	691	0.2−	0.1−	1995 11 16	691	0.5−	0.1−	1999 11 12	704	0.2−	0.2+
1995 10 22	691	0.1+	0.0	1995 11 21	691	0.3+	0.0	1999 11 12	704	0.1+	0.2+
1995 10 22	691	0.0	0.1+	1995 11 21	691	0.4+	0.1−	1999 11 12	704	0.0	0.1−
1995 10 27	046	0.3+	0.1−	1995 11 21	691	0.4+	0.1+	1999 11 12	704	0.2−	0.2+
1995 10 27	046	0.1+	0.0	1999 11 03	704	0.0	0.4+	1999 11 12	704	0.2+	0.0
1995 10 27	046	0.3+	0.2+	1999 11 03	704	0.3−	0.6−				

1995 UM = 1999 VN₆₃

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	321.94462		(2000.0)	P	Q
<i>n</i>	0.25480044	ω	192.47850	+0.43239788	−0.89863549
<i>a</i>	2.4641621	Ω	231.94959	+0.83515213	+0.43010855
<i>e</i>	0.1177897	<i>i</i>	5.39725	+0.33993086	+0.08637641
<i>P</i>	3.87	<i>H</i>	16.3	<i>G</i> 0.15	<i>U</i> 5

Residuals in seconds of arc

1995 10 17	587	0.1+	0.4−	1995 10 20	587	0.8+	0.4+	1999 11 04	704	0.7+	0.4+
1995 10 17	587	1.0−	0.0	1995 10 20	587	0.6+	1.1+	1999 11 04	704	2.0−	1.1−
1995 10 17	587	1.5−	1.2+	1995 10 23	587	0.3−	1.5−	1999 11 04	704	0.1−	1.0−
1995 10 18	587	0.2−	0.1−	1995 10 23	587	0.6−	0.8−	1999 11 12	704	0.9−	1.3+
1995 10 19	587	1.8+	0.1+	1995 10 26	587	0.2+	0.1+	1999 11 12	704	0.5+	0.7+
1995 10 19	587	0.0	0.6+	1995 10 31	587	0.7−	0.4−	1999 11 12	704	0.5+	0.5+
1995 10 20	587	0.7+	0.2−	1999 11 04	704	0.5+	0.2−	1999 11 12	704	0.8+	0.5−

1995 UY₈

Id. E. Bowell (1999 observations)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	323.60773		(2000.0)	P	Q
<i>n</i>	0.25446728	ω	7.61264	+0.30317397	−0.95046892
<i>a</i>	2.4663124	Ω	64.75972	+0.87026095	+0.24686176
<i>e</i>	0.1618714	<i>i</i>	4.34416	+0.38824144	+0.18886001
<i>P</i>	3.87	<i>H</i>	14.3	<i>G</i> 0.15	<i>U</i> 4

Residuals in seconds of arc

1995 10 28	400	0.1+	0.3+	1995 11 21	400	0.5+	0.4+	1999 11 12	704	0.1+	0.3−
1995 10 28	400	1.5−	0.1+	1999 11 04	704	0.0	0.2−	1999 11 12	704	0.0	0.4−
1995 10 30	400	0.6−	0.1+	1999 11 04	704	0.3−	0.0	1999 11 12	704	0.1+	0.4−
1995 10 30	400	0.6+	0.1+	1999 11 04	704	0.4−	0.0	1999 11 12	595	0.3+	1.1+
1995 11 02	400	1.3+	0.5−	1999 11 04	704	0.2+	0.0	1999 11 12	595	0.0	0.2−
1995 11 02	400	(2.6+	0.3+)	1999 11 04	704	0.0	0.1+	1999 11 12	595	0.0	0.2−
1995 11 21	400	0.5−	0.5−	1999 11 12	704	0.0	0.4−	1999 11 13	595	0.2−	1.0+
1995 11 21	400	0.2+	0.4−	1999 11 12	704	0.0	0.4−	1999 11 13	595	0.0	0.5+

1995 UC₄₅ = 1980 KY

Id. E. Bowell (1998, 1999 observations), S. Nakano

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	87.66620		(2000.0)	P	Q
<i>n</i>	0.28586709	ω	303.85659	+0.95964693	+0.25310788
<i>a</i>	2.2822328	Ω	41.85599	−0.15611183	+0.84193514
<i>e</i>	0.0701034	<i>i</i>	10.58155	−0.23389497	+0.47653082
<i>P</i>	3.45	<i>H</i>	13.4	<i>G</i> 0.15	<i>U</i> 3

Residuals in seconds of arc

1980 05 17	095	0.5+	0.7+	1995 11 12	400	0.9-	0.1+	1998 11 20	699	1.7-	0.0
1995 10 28	400	3.2+	0.8-	1995 11 15	400	0.2-	0.1-	1998 11 20	699	0.2-	0.2-
1995 10 28	400	0.1+	0.7+	1995 11 15	400	0.4+	0.1+	1998 12 08	704	0.5+	0.3-
1995 10 30	400	1.5+	0.5-	1995 12 17	399	1.7-	0.4+	1998 12 08	704	1.0-	0.8+
1995 10 30	400	1.4-	1.0-	1995 12 17	399	0.4-	0.2-	1998 12 08	704	1.3+	0.9+
1995 11 02	400	0.7+	0.7+	1995 12 19	399	0.3-	0.2-	1998 12 08	704	1.4+	0.8+
1995 11 02	400	0.1-	0.4+	1995 12 19	399	0.7-	0.1+				
1995 11 12	400	0.9-	0.1+	1998 11 20	699	0.5-	0.5-				

1995 WQ₁

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

M	6.91260		(2000.0)	$\mathbf{P}$	$\mathbf{Q}$
n	0.24358670	ω	132.14973	+0.79633140	-0.60130224
a	2.5392200	Ω	264.91735	+0.53374582	+0.74952550
e	0.2331553	i	3.77114	+0.28455526	+0.27685220
P	4.05	H	14.6	G 0.15	U 4

Residuals in seconds of arc

1995 11 19	595	0.2-	0.0	1995 12 22	411	0.0	0.1+	1996 02 14	595	0.1-	0.5-
1995 11 19	595	0.3+	0.5-	1995 12 22	411	0.5-	0.7+	1996 02 14	595	0.6-	0.1-
1995 11 19	595	0.0	0.1-	1995 12 31	691	0.3-	0.0	1996 02 15	595	0.1-	0.8+
1995 11 19	595	0.6+	0.2-	1995 12 31	691	0.4-	0.1-	1996 02 15	595	1.4+	0.9+
1995 12 02	595	0.4-	0.7+	1995 12 31	691	0.4-	0.2-	1999 11 08	120	(3.6+	0.5+)
1995 12 02	595	0.7+	0.4+	1996 01 16	595	0.3+	0.3-	1999 11 08	120	0.3-	0.7-
1995 12 02	595	0.3+	0.7-	1996 01 16	595	0.1-	0.4-	1999 11 08	120	0.3-	0.3+
1995 12 03	595	0.0	0.2+	1996 01 16	595	0.1-	0.0	1999 11 09	120	0.1+	0.8+
1995 12 04	595	1.0-	0.1-	1996 01 17	595	1.0-	0.4+	1999 11 09	120	0.5+	0.3+
1995 12 21	411	0.5+	0.6+	1996 01 17	595	0.3+	0.3-	1999 11 09	120	0.0	0.7-
1995 12 21	411	0.3-	0.3+	1996 01 19	595	0.9+	1.0-				
1995 12 22	411	0.5+	0.3+	1996 01 19	595	0.2+	0.6-				

1995 WE₃ = 1999 VE₆₈

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

M	202.30323		(2000.0)	P	Q
n	0.24309970	ω	131.70007	-0.95229277	+0.29709162
a	2.5426101	Ω	65.68988	-0.29779428	-0.85453456
e	0.0928337	i	4.39402	-0.06676113	-0.42603669
P	4.05	H	14.3	G 0.15	U 6

Residuals in seconds of arc

1995 11 20	595	0.5+	0.4+	1995 11 28	595	0.2-	0.0	1999 11 04	704	0.2+	0.7+
1995 11 20	595	0.3-	0.2+	1995 12 01	595	0.0	0.1-	1999 11 12	704	0.1+	0.2-
1995 11 21	595	0.4-	1.1-	1995 12 01	595	0.2+	0.6-	1999 11 12	704	0.0	0.2+
1995 11 21	595	0.2+	0.9-	1999 11 04	704	0.6-	0.0	1999 11 12	704	0.4-	0.0
1995 11 22	595	0.0	0.8+	1999 11 04	704	0.1+	0.4-	1999 11 12	704	0.1-	0.2-
1995 11 22	595	0.4+	1.2+	1999 11 04	704	0.5+	0.2-	1999 11 12	704	0.2-	0.4+
1995 11 28	595	0.4-	0.0	1999 11 04	704	0.4+	0.5-				

1995 WT₇ = 1988 GP₁

Id. E. Bowell (1999 observations), G. V. Williams

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	226.34368	(2000.0)	<i>P</i>	<i>Q</i>			
<i>n</i>	0.22515474	ω	94.98686	-0.96207433	-0.17142117		
<i>a</i>	2.6759746	Ω	75.26180	+0.06278137	-0.89614502		
<i>e</i>	0.1448933	<i>i</i>	12.67477	+0.26546464	-0.40931514		
<i>P</i>	4.38	<i>H</i>	13.5	<i>G</i>	0.15	<i>U</i>	3

Residuals in seconds of arc

1988 04 11	046	1.7+	0.6+	1995 11 30	327	0.1-	0.3+	1995 12 22	411	0.1-	0.2+
1988 04 11	046	1.6-	0.4-	1995 11 30	327	0.2+	0.2+	1999 10 04	703	0.2-	0.3+
1995 11 27	411	0.2-	0.8-	1995 12 01	411	0.4+	0.0	1999 10 04	703	0.3+	0.2-
1995 11 27	411	0.2+	0.9-	1995 12 01	411	0.3+	0.0	1999 10 04	703	0.1-	0.1+
1995 11 28	411	0.8-	0.3-	1995 12 09	411	0.4-	1.4+	1999 10 04	703	0.3-	0.1+

1995 11 28	411	0.2-	0.2-	1995 12 09	411	0.5-	0.1+
1995 11 30	327	0.1-	0.1-	1995 12 22	411	1.5+	0.2-

1995 WP₂₂ = 1998 ML₂₀ = 1999 VQ₃₁

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

M	104.85374		(2000.0)	$\mathbf{P}$	$\mathbf{Q}$		
n	0.26211801	ω	13.07585	-0.05373896	+0.99816622		
a	2.4180845	Ω	253.84890	-0.91874700	-0.06035531		
e	0.1951351	i	1.66223	-0.39117268	+0.00462929		
P	3.76	H	14.8	G	0.15	U	5

Residuals in seconds of arc

1995 11 18	691	0.2+	0.1-	1998 06 24	704	0.3+	0.5-	1999 11 03	704	1.1-	0.2+
1995 11 18	691	0.0	0.1-	1998 06 24	704	0.4-	1.2-	1999 11 03	704	1.0-	0.6+
1995 11 18	691	0.0	0.1+	1998 06 24	704	0.0	0.5+	1999 11 03	704	0.6-	0.6+
1995 11 23	691	0.0	0.1-	1998 06 24	704	0.3-	0.3-	1999 11 12	704	0.1+	0.0
1995 11 23	691	0.6-	0.2-	1998 06 26	704	0.3+	1.0-	1999 11 12	704	0.1+	0.0
1995 11 23	691	0.4-	0.1-	1998 06 26	704	0.4+	0.0	1999 11 12	704	0.6+	0.2+
1995 11 28	691	0.9+	0.0	1998 06 26	704	0.3+	0.7+	1999 11 12	704	0.3+	0.2+
1995 11 28	691	0.4+	0.2-	1998 06 26	704	0.3+	0.9+	1999 11 12	704	0.2+	0.2+
1995 11 28	691	0.0	0.4-	1998 06 26	704	0.5-	1.4+				
1998 06 24	704	0.3-	0.2-	1999 11 03	704	1.0+	0.6-				

1995 XT₁ = 1999 WU

Id. T. Urata, S. Nakano

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

M	328.18032		(2000.0)	$\mathbf{P}$	$\mathbf{Q}$
n	0.23856709	ω	163.70484	+0.14840046	-0.98660763
a	2.5747142	Ω	277.72328	+0.89952794	+0.16310986
e	0.2403113	i	3.91723	+0.41088537	-0.00075167
P	4.13	H	15.3	G 0.15	U 4

Residuals in seconds of arc

1995 12 15	385	0.3+	0.6+	1995 12 23	566	0.6-	0.0	1996 02 10	887	0.1-	1.3-
1995 12 15	385	0.4+	0.1-	1995 12 23	566	0.0	0.3+	1996 02 10	887	0.8+	0.9-
1995 12 15	385	0.1+	0.5+	1995 12 26	887	0.6+	0.4+	1996 02 10	887	0.2+	0.9-
1995 12 17	385	1.0+	0.8-	1995 12 26	887	0.2-	0.8+	1996 02 10	887	0.5-	0.7-
1995 12 17	385	0.2+	0.1+	1995 12 26	887	0.0	0.7+	1999 11 18	385	0.6-	0.5-
1995 12 17	385	0.8+	0.1+	1996 01 13	385	0.4-	0.4-	1999 11 18	385	0.2-	0.4-
1995 12 19	887	0.3+	0.2+	1996 01 13	385	0.8-	0.6-	1999 11 19	385	0.6+	0.1-
1995 12 19	887	0.3+	0.1-	1996 01 13	385	0.1+	0.8-	1999 11 19	385	0.1+	0.2-
1995 12 19	887	0.0	0.0	1996 01 26	887	0.5-	0.6+	1999 11 19	385	0.0	0.2-
1995 12 19	887	0.1-	0.4+	1996 01 26	887	0.6-	0.9+				
1995 12 23	566	0.8-	0.0	1996 01 26	887	0.2-	1.3+				

1995 YX₃ = 1999 VK₂

Id. T. Urata

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

M	7.60596		(2000.0)	$\mathbf{P}$	$\mathbf{Q}$		
n	0.21187567	ω	253.94720	+0.97455470	-0.00833837		
a	2.7866472	Ω	106.11106	+0.08331588	+0.94118671		
e	0.1480615	i	13.48269	-0.20809035	+0.33778403		
P	4.65	H	13.6	G	0.15	U	4

Residuals in seconds of arc

1995 12 31	385	1.5+	0.5-	1996 01 24	887	0.0	0.3+	1999 11 06	385	0.2+	0.1-
1996 01 01	385	0.7+	0.5+	1996 01 24	887	0.3-	0.2+	1999 11 06	385	0.9+	0.1-
1996 01 01	385	0.2-	0.4+	1996 01 26	887	0.3-	0.2-	1999 11 06	385	0.2+	0.1+
1996 01 01	385	0.3-	0.3+	1996 01 26	887	0.5+	0.2+	1999 11 18	385	0.3-	0.3-
1996 01 13	385	0.6-	0.4-	1996 01 26	887	0.1+	0.4-	1999 11 18	385	0.4+	0.6+
1996 01 13	385	0.7-	0.3-	1999 11 05	385	0.4-	0.6+	1999 11 18	385	0.1+	0.8-
1996 01 13	385	0.8-	0.1-	1999 11 05	385	0.6-	0.6-				
1996 01 24	887	0.4+	0.1+	1999 11 06	385	0.3-	0.7+				

1995 YO₇

Id. E. Bowell (1999 observations)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i> 332.23989 (2000.0)			Williams			<i>Q</i>		
<i>n</i>	0.23882835	ω	174.88391	+0.60840857	−0.77226823			
<i>a</i>	2.5728362	Ω	237.51230	+0.72022967	+0.63406444			
<i>e</i>	0.1588970	<i>i</i>	12.52087	+0.33332902	+0.03954828			
<i>P</i>	4.13	<i>H</i>	14.9	<i>G</i> 0.15	<i>U</i> 4			

Residuals in seconds of arc

1995 12 16	691	0.2−	0.4−	1995 12 27	691	0.2+	0.3+	1999 11 03	704	0.4+	0.4+
1995 12 16	691	0.1−	0.2−	1999 10 29	703	0.4+	0.1−	1999 11 03	704	0.5+	0.6+
1995 12 16	691	0.2−	0.2−	1999 10 29	703	0.1+	0.3−	1999 11 11	703	0.1+	0.0
1995 12 20	691	0.4−	0.1−	1999 10 29	703	0.3+	0.4−	1999 11 11	703	0.3−	0.1−
1995 12 20	691	0.1−	0.1−	1999 10 29	703	0.9−	0.4−	1999 11 11	703	0.6−	0.0
1995 12 20	691	0.1−	0.0	1999 11 03	704	0.2−	0.2−	1999 11 11	703	0.0	0.0
1995 12 27	691	0.8+	0.3+	1999 11 03	704	0.1−	0.8+				
1995 12 27	691	0.1+	0.4+	1999 11 03	704	0.4+	0.2−				

1996 CJ₁ = 6873 P-L = 1991 VL₁₂Id. T. Kobayashi (*MPC* 26754), M. E. Sansaturio

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i> 345.18233 (2000.0)			Williams			<i>Q</i>		
<i>n</i>	0.29089566	ω	123.16465	−0.99705145	+0.05140056			
<i>a</i>	2.2558552	Ω	59.84067	−0.07088360	−0.90133266			
<i>e</i>	0.1442447	<i>i</i>	3.77838	+0.02939243	−0.43006677			
<i>P</i>	3.39	<i>H</i>	15.6	<i>G</i> 0.15	<i>U</i> 3			

Residuals in seconds of arc

1960 09 24	675	0.3−	0.9−	1996 02 12	411	0.5+	1.8+	1998 12 14	704	0.2−	0.2−
1960 09 24	675	0.7−	0.4−	1996 02 18	691	0.0	0.3−	1998 12 14	704	0.4−	1.0−
1960 09 26	675	0.4+	1.5−	1996 02 18	691	0.0	0.0	1998 12 14	704	0.2+	1.0−
1960 09 26	675	0.7+	0.7−	1996 02 18	691	0.1−	0.2+	1998 12 14	704	0.2+	0.6−
1960 09 28	675	0.3+	0.0	1996 02 18	411	1.1−	2.3+	1998 12 16	704	0.4+	0.8−
1960 09 28	675	0.8+	0.2−	1996 02 18	411	0.3+	0.4−	1998 12 16	704	0.5+	1.0−
1991 11 08	691	0.3+	0.2+	1996 02 23	411	0.4+	0.6−	1998 12 16	704	0.0	0.5+
1991 11 08	691	0.2−	0.4+	1996 02 23	411	0.5+	0.0	1998 12 16	704	0.4+	0.4+
1991 11 08	691	0.2−	0.6+	1996 03 12	411	2.6+	2.0−	1998 12 17	704	0.2−	0.1+
1991 11 12	691	0.8+	1.1+	1996 03 12	411	3.3+	1.0−	1998 12 17	704	0.2−	0.0
1991 11 12	691	0.3+	0.4+	1996 04 16	608	4.5−	1.3−	1998 12 17	704	0.3+	0.5−
1991 11 12	691	0.5+	0.9+	1996 04 16	608	2.2−	1.3−	1998 12 17	704	1.5−	0.6+
1996 02 11	411	0.7−	0.3+	1998 12 09	411	0.2−	0.1−	1998 12 17	704	0.3−	0.0
1996 02 11	411	0.7+	0.0	1998 12 09	411	0.5−	0.5−				
1996 02 12	411	0.8−	0.1+	1998 12 14	704	0.5−	0.6+				

1996 GE₆ = 1979 BG₁ = 1999 VP₉

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i> 329.47756 (2000.0)			Williams			<i>Q</i>		
<i>n</i>	0.18344074	ω	13.82292	+0.23728452	−0.96590411			
<i>a</i>	3.0676480	Ω	62.53619	+0.87981916	+0.16848397			
<i>e</i>	0.1457585	<i>i</i>	6.70266	+0.41184257	+0.19657672			
<i>P</i>	5.37	<i>H</i>	13.6	<i>G</i> 0.15	<i>U</i> 3			

Residuals in seconds of arc

1979 01 24	095	0.0	0.1−	1996 04 23	691	0.3−	0.3−	1999 11 10	120	(2.3+	0.1+)
1996 04 11	691	0.7−	0.1+	1999 11 03	704	0.3−	0.0	1999 11 10	120	0.2+	0.2+
1996 04 11	691	0.1−	0.2+	1999 11 03	704	0.9−	0.1−	1999 11 10	120	0.6+	0.4−
1996 04 11	691	0.3−	0.4+	1999 11 03	704	0.1+	0.1+	1999 11 12	704	0.2+	0.1+
1996 04 18	691	0.9+	0.1+	1999 11 03	704	0.1−	0.2−	1999 11 12	704	0.0	0.1+
1996 04 18	691	0.5+	0.1+	1999 11 03	704	0.4−	0.3−	1999 11 12	704	0.1+	0.2+
1996 04 18	691	0.5+	0.1−	1999 11 08	120	0.0	0.1−	1999 11 12	704	0.1−	0.2+
1996 04 23	691	0.4−	0.2−	1999 11 09	120	0.5−	0.0	1999 11 12	704	0.2+	0.2+
1996 04 23	691	0.1−	0.2−	1999 11 09	120	0.8+	0.2+				

1996 HL₂₀ = 1999 VG₂₀

Id. G. V. Williams, E. Bowell

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i> 252.47657 (2000.0)			Williams			<i>Q</i>		
<i>n</i>	0.16969123	ω	91.13112	−0.94802818	−0.31561752			
<i>a</i>	3.2311946	Ω	70.47182	+0.27224983	−0.87024981			
<i>e</i>	0.1167583	<i>i</i>	2.45376	+0.16468941	−0.37822063			
<i>P</i>	5.81	<i>H</i>	13.3	<i>G</i> 0.15	<i>U</i> 5			

Residuals in seconds of arc

1996 04 18	809	0.2−	0.2+	1996 05 22	809	0.7+	1.3−	1999 11 12	704	0.1+	0.1−
1996 04 18	809	0.2+	1.2+	1996 05 22	809	(0.6−	2.7−)	1999 11 12	704	0.5+	0.4−
1996 04 18	809	0.2+	0.9+	1996 05 22	809	(0.6+	3.3−)	1999 11 12	704	0.0	0.3−
1996 04 20	809	0.2+	0.4+	1996 05 23	809	0.5−	0.3−	1999 11 12	704	0.6+	0.1−
1996 04 20	809	0.3+	0.2+	1996 05 23	809	0.5+	0.8−	1999 11 12	120	0.7−	0.6−
1996 04 20	809	0.3−	0.0	1996 05 23	809	0.1−	0.5−	1999 11 12	120	0.8−	0.1−
1996 05 14	566	0.7−	0.6−	1999 11 08	120	0.8+	2.1−	1999 11 13	120	0.3−	1.3+
1996 05 14	566	0.5−	0.3−	1999 11 08	120	(3.6+	1.6−)	1999 11 13	120	0.6+	0.6+
1996 05 14	566	0.5−	0.6−	1999 11 12	704	0.3−	0.1−				

1996 LF = 1990 FE₄ = 1999 VL₆

Id. S. Nakano, M. E. Sansaturio

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i> 240.75539 (2000.0)			Williams			<i>Q</i>		
<i>n</i>	0.17364851	ω	97.50897	−0.95714996	−0.09163662			
<i>a</i>	3.1819158	Ω	77.52976	−0.03954281	−0.89837367			
<i>e</i>	0.1352362	<i>i</i>	16.34076	+0.28688032	−0.42956663			
<i>P</i>	5.68	<i>H</i>	13.0	<i>G</i> 0.15	<i>U</i> 3			

Residuals in seconds of arc

1990 03 26	402	(4.8+	0.5−)	1996 06 12	658	0.3+	0.4−	1999 11 04	704	0.0	0.7−
1990 03 26	402	0.6+	1.0+	1996 06 12	658	0.3+	0.4−	1999 11 04	704	0.1+	0.4−
1996 06 06	557	0.6−	0.2−	1996 06 14	557	0.2−	0.2−	1999 11 07	385	0.3−	0.1−
1996 06 06	557	0.7−	0.1−	1996 06 14	557	0.0	0.2−	1999 11 07	385	0.9−	0.4−
1996 06 06	557	0.8−	0.7−	1996 06 14	557	0.2+	0.1+	1999 11 08	385	0.0	0.4−
1996 06 06	557	0.7−	0.1−	1996 06 16	557	0.3+	1.3−	1999 11 08	385	1.3−	0.7−
1996 06 07	557	0.5−	0.4−	1996 06 16	557	0.3+	0.7−	1999 11 12	385	0.1+	0.3−
1996 06 07	557	0.6−	0.0	1996 06 16	557	0.4+	0.3+	1999 11 12	385	0.2+	0.1−
1996 06 07	557	0.8−	0.0	1996 07 03	557	1.0+	1.2−	1999 11 12	385	1.4+	0.3−
1996 06 08	557	0.7−	0.4−	1996 07 03	557	0.0	0.7−	1999 11 14	385	0.3+	0.1+
1996 06 08	557	0.3−	0.2−	1996 07 03	557	1.3+	1.2+	1999 11 14	385	0.2+	0.2−
1996 06 08	557	0.9−	0.1−	1996 07 03	557	0.4+	1.2+	1999 11 18	385	0.5+	0.1+
1996 06 10	557	0.3−	0.1+	1999 11 04	704	0.5+	0.1−	1999 11 18	385	0.8+	0.1−
1996 06 10	557	0.1−	0.5+	1999 11 04	704	0.5−	0.1−	1999 11 18	385	0.7+	0.1−
1996 06 12	658	0.4+	0.4−	1999 11 04	704	0.1−	0.0				

1996 PF₃ = 1999 TU₁₉

Id. A. Doppler

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i> 287.03473 (2000.0)			Williams			<i>Q</i>		
<i>n</i>	0.36786340	ω	305.87350	−0.08547438	−0.97317641			
<i>a</i>	1.9290567	Ω	146.99942	+0.99278737	−0.10127784			
<i>e</i>	0.0949706	<i>i</i>	23.08938	+0.08406761	+0.20656832			
<i>P</i>	2.68	<i>H</i>	15.9	<i>G</i> 0.15	<i>U</i> 2			

Residuals in seconds of arc

1996 08 15	566	0.5−	0.2−	1996 09 12	566	0.1−	0.6+	1998 05 27	704	(0.7+	2.5−)
1996 08 15	566	0.7−	0.2−	1996 09 12	566	0.6−	0.6+	1999 09 13	704	(2.4−	1.5+)
1996 08 15	566	0.1−	0.5−	1996 09 13	566	0.5+	0.0	1999 09 13	704	(2.5−	0.2+)
1996 08 16	566	0.4−	0.3−	1996 09 13	566	0.6+	0.3+	1999 09 13	704	0.1+	1.0+
1996 08 16	566	0.6−	1.2−	1996 09 13	566	0.9+	0.3−	1999 09 13	704	1.5−	1.1+
1996 08 16	566	0.2+	0.0	1996 10 11	608	1.1+	0.5+	1999 10 15	413	(0.3−	3.3−)
1996 08 19	566	0.1−	0.1+	1996 10 11	608	1.0+	0.6+	1999 10 15	413	0.2−	0.4+
1996 08 19	566	0.2−	0.3+	1998 04 19	688	0.1+	0.3−	1999 10 17	413	0.1+	0.4−

1999 NOV. 23

1996 08 19	566	0.3+	0.4−	1998 04 19	688	0.0	0.1−	1999 10 17	413	0.0	0.5−
1996 08 20	566	0.1+	0.6−	1998 04 19	688	0.5+	0.3−	1999 10 17	413	0.2−	0.1−
1996 08 20	566	0.1+	0.4−	1998 05 27	704	1.0+	0.9+	1999 11 02	428	1.0+	0.2+
1996 08 20	566	0.5−	0.4+	1998 05 27	704	0.9−	0.1+	1999 11 03	428	0.9+	0.4−
1996 09 12	566	0.5−	0.4+	1998 05 27	704	0.8−	0.7+	1999 11 03	428	0.6−	0.7−

1996 RS₂₈ = 1978 EW₈ = 1997 UY₁₁

Id. A. Doppler

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

				Williams			
<i>M</i>	333.98392	(2000.0)		P	Q		
<i>n</i>	0.08303808	ω	102.29133	−0.39527422	−0.91852396		
<i>a</i>	5.2033679	Ω	11.00325	+0.82453932	−0.35887112		
<i>e</i>	0.1377866	<i>i</i>	2.54863	+0.40483726	−0.16590738		
<i>P</i>	11.87	<i>H</i>	12.1	<i>G</i> 0.15	<i>U</i>	4	

Residuals in seconds of arc

1978 03 15	675	0.1−	0.2+	1996 10 15	809	0.1+	0.2−	1997 11 01	691	0.1+	0.0
1978 03 16	675	0.2+	0.0	1997 10 23	691	0.1+	0.2−	1997 11 01	691	0.1+	0.0
1996 09 11	809	0.5+	0.3+	1997 10 23	691	0.4−	0.3+	1997 11 01	691	0.0	0.1−
1996 09 17	809	0.8−	0.1+	1997 10 23	691	0.0	0.1+				

1996 WL₃ = 1999 RK₁₅₉

Id. A. Doppler

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

				Williams			
<i>M</i>	353.85367	(2000.0)		P	Q		
<i>n</i>	0.30115565	ω	339.26011	+0.93930192	+0.34308971		
<i>a</i>	2.2043237	Ω	0.67793	−0.29930143	+0.82106805		
<i>e</i>	0.2327378	<i>i</i>	5.64385	−0.16772167	+0.45622002		
<i>P</i>	3.27	<i>H</i>	16.5	<i>G</i> 0.15	<i>U</i>	3	

Residuals in seconds of arc

1996 11 18	327	0.4−	0.3−	1999 09 07	704	0.1+	0.2−	1999 09 09	704	0.0	0.8−
1996 11 18	327	0.0	0.8+	1999 09 07	704	0.3+	0.7−	1999 09 13	704	0.0	0.1+
1996 11 18	327	0.0	0.4+	1999 09 07	704	0.1−	0.1+	1999 09 13	704	0.2−	0.3−
1996 11 28	327	0.5+	0.3−	1999 09 08	703	0.2+	0.0	1999 09 13	704	0.0	0.2+
1996 11 28	327	0.3+	0.8−	1999 09 08	703	0.2+	0.3+	1999 09 13	704	0.1+	0.2+
1996 11 28	327	0.7−	0.4+	1999 09 08	703	0.1+	0.6+	1999 09 13	704	0.2+	0.1+
1996 11 30	327	0.1+	0.9−	1999 09 08	703	0.0	0.8+	1999 11 12	704	0.1−	0.0
1996 11 30	327	0.1+	0.2+	1999 09 09	704	0.2−	0.0	1999 11 12	704	0.9+	0.5−
1996 11 30	327	0.0	0.8+	1999 09 09	704	0.6−	0.8+	1999 11 12	704	0.4−	0.0
1999 09 07	704	0.5+	0.2+	1999 09 09	704	0.5−	0.7−				
1999 09 07	704	0.3+	0.3−	1999 09 09	704	0.5−	0.1−				

1996 XJ₁₂ = 1999 VB₆₁

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

				Williams			
<i>M</i>	213.31008	(2000.0)		P	Q		
<i>n</i>	0.27558947	ω	121.74741	−0.99868315	−0.02375842		
<i>a</i>	2.3386270	Ω	56.92844	+0.00222055	−0.90549219		
<i>e</i>	0.1651261	<i>i</i>	3.11043	+0.05125462	−0.42369733		
<i>P</i>	3.58	<i>H</i>	15.8	<i>G</i> 0.15	<i>U</i>	5	

Residuals in seconds of arc

1996 12 04	691	0.5+	0.3+	1996 12 14	691	0.2+	0.1+	1999 11 04	704	0.5−	0.4+
1996 12 04	691	0.7+	0.1+	1997 01 12	566	0.1−	0.1−	1999 11 04	704	0.8+	0.3+
1996 12 04	691	0.3+	0.1−	1997 01 12	566	0.1−	0.0	1999 11 04	704	0.3+	0.1−
1996 12 09	691	0.6−	0.3+	1997 01 12	566	0.1−	0.3−	1999 11 04	704	0.4+	1.1+
1996 12 09	691	0.6−	0.2+	1997 01 14	566	0.1−	0.4−	1999 11 12	704	0.0	0.5+
1996 12 09	691	0.7−	0.3+	1997 01 14	566	0.6+	0.1−	1999 11 12	704	1.2−	0.6−
1996 12 14	691	0.1+	0.2+	1997 01 14	566	0.0	0.2−	1999 11 12	704	0.3+	0.9−
1996 12 14	691	0.0	0.0	1999 11 04	704	0.1−	1.1−				

1996 YE₂

Id. J. Waller (1999 observations), E. Howell (1999 observations)

M.P.C. 36797

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

				Williams			
<i>M</i>	300.14778	(2000.0)		P	Q		
<i>n</i>	0.27931646	ω	135.61483	+0.27695127	−0.95821048		
<i>a</i>	2.3177772	Ω	298.18521	+0.85743910	+0.28009432		
<i>e</i>	0.0930176	<i>i</i>	4.66126	+0.43370056	+0.05813640		
<i>P</i>	3.53	<i>H</i>	14.1	<i>G</i> 0.15	<i>U</i>	4	

Residuals in seconds of arc

1996 12 22	327	0.7−	0.2+	1997 01 18	327	0.3−	0.2−	1999 11 09	723	0.0	0.6+
1996 12 22	327	0.3+	0.1+	1997 01 18	327	0.3−	0.1+	1999 11 09	723	0.7+	0.6+
1996 12 22	327	0.5−	0.3−	1997 02 06	657	1.0+	0.7+	1999 11 09	723	0.7−	0.3+
1996 12 24	327	0.1−	0.2+	1997 02 06	657	0.8+	0.1+	1999 11 11	723	1.6−	0.1−
1996 12 24	327	0.2−	0.5+	1997 02 06	657	0.2+	0.6−	1999 11 11	723	(2.9− 0.1+)	
1996 12 24	327	0.2−	0.9−	1999 10 28	703	0.5−	0.2+	1999 11 15	723	1.4+	1.5−
1997 01 02	327	0.2−	0.2+	1999 10 28	703	0.1−	0.1+	1999 11 15	723	1.5+	0.5−
1997 01 02	327	0.5−	0.0	1999 10 28	703	0.0	0.4+	1999 11 15	723	0.8+	0.6−
1997 01 02	327	0.8+	0.1+	1999 10 28	703	0.6−	0.1+	1999 11 16	723	0.4−	0.4+
1997 01 11	327	0.4−	0.2−	1999 11 04	703	0.6+	1.1−	1999 11 16	723	0.4+	0.1−
1997 01 11	327	0.2+	0.2−	1999 11 04	703	0.4−	0.2+	1999 11 16	723	0.7−	0.2+
1997 01 11	327	0.7+	0.1−	1999 11 04	703	0.1−	0.7+				
1997 01 18	327	0.5−	0.4+	1999 11 04	703	0.2−	0.2+				

1997 AD₂

Id. E. Howell (1999 observations)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

				Williams			
<i>M</i>	124.21888	(2000.0)		P	Q		
<i>n</i>	0.27764479	ω	225.14137	−0.19032685	+0.98045974		
<i>a</i>	2.3270713	Ω	33.97852	−0.87375311	−0.14607642		
<i>e</i>	0.0626122	<i>i</i>	5.10636	−0.44758373	−0.13175878		
<i>P</i>	3.55	<i>H</i>	14.1	<i>G</i> 0.15	<i>U</i>	5	

Residuals in seconds of arc

1997 01 03	411	0.7+	0.6+	1997 01 26	411	0.2+	0.4+	1999 11 03	704	(0.1+ 2.6−)	
1997 01 03	411	0.1−	0.4−	1997 01 26	411	0.1−	0.1+	1999 11 03	704	0.6−	0.2+
1997 01 04	411	0.4−	0.2−	1999 11 03	704	0.2−	0.0	1999 11 03	704	0.1+	1.7−
1997 01 04	411	0.3+	0.0	1999 11 03	704	0.0	0.1−	1999 11 04	703	0.5+	0.8+
1997 01 08	411	0.5−	0.2−	1999 11 03	704	(1.9+ 4.4−)		1999 11 04	703	0.0	0.1+
1997 01 08	411	0.1−	0.1+	1999 11 03	704	0.1+	0.0	1999 11 04	703	0.0	0.4+
1997 01 14	411	0.2−	0.0	1999 11 03	704	(0.2− 3.2−)		1999 11 04	703	0.3+	0.3+
1997 01 14	411	0.3+	0.4−	1999 11 03	704	0.2−	0.1+				

1997 AS₂ = 1999 UM₅

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

				Williams			
<i>M</i>	7.87884	(2000.0)		P	Q		
<i>n</i>	0.28897316	ω	61.95827	+0.92554662	−0.16108644		
<i>a</i>	2.2658494	Ω	305.26006	−0.07520086	+0.80875089		
<i>e</i>	0.2017625	<i>i</i>	24.81227	+0.37109066	+0.56566170		
<i>P</i>	3.41	<i>H</i>	14.9	<i>G</i> 0.15	<i>U</i>	5	

Residuals in seconds of arc

1997 01 03	411	0.1+	1.1+	1997 01 10	411	1.1−	1.0−	1999 10 29	704	0.7−	0.6−
1997 01 03	411	0.1+	0.2−	1997 01 15	411	0.1+	0.2−	1999 10 30	704	0.1+	0.6+
1997 01 03	411	0.9+	0.3−	1997 01 15	411	0.1+	0.6−	1999 10 30	704	0.1−	0.7+
1997 01 03	411	0.2+	0.2+	1997 01 27	411	0.2+	0.6+	1999 10 30	704	0.2−	0.1−
1997 01 04	411	0.3−	0.3−	1997 01 27	411	0.4+	0.0	1999 10 30	704	0.2+	0.2+
1997 01 04	411	0.5−	0.7+	1999 10 29	704	0.3+	0.2−	1999 10 30	704	0.6+	0.4+
1997 01 04	411	0.9+	0.1+	1999 10 29	704	0.2+	0.3−				
1997 01 10	411	0.9−	0.3−	1999 10 29	704	0.5−	0.7−				

1997 AN₅

Id. E. Howell (1999 observations)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	332.49515		(2000.0)	P		Q		Williams			
<i>n</i>	0.29093204	ω	349.91504	+0.61432232		−0.78423880					
<i>a</i>	2.2556672	Ω	62.12762	+0.73063015		+0.52370234					
<i>e</i>	0.1266056	<i>i</i>	5.65125	+0.29797260		+0.33272415					
<i>P</i>	3.39	<i>H</i>	14.7	<i>G</i>	0.15	<i>U</i>	4				
Residuals in seconds of arc											
1997 01 07	411	0.9+	0.3+	1997 01 12	411	0.1−	0.4+	1999 11 04	691	0.1−	0.1−
1997 01 07	411	0.5−	0.3−	1997 01 28	411	0.1+	0.1+	1999 11 04	691	0.0	0.1−
1997 01 08	411	0.3−	0.1−	1997 01 28	411	0.0	0.2+	1999 11 04	691	0.2−	0.2−
1997 01 08	411	0.3−	0.7+	1999 11 04	704	0.3+	0.1−	1999 11 12	691	0.3−	0.2+
1997 01 11	411	0.0	0.5−	1999 11 04	704	0.5+	0.1−	1999 11 12	691	0.3−	0.2+
1997 01 11	411	0.3−	0.3−	1999 11 04	704	0.4+	0.1+	1999 11 12	691	0.3−	0.1+
1997 01 12	411	0.5+	0.5−	1999 11 04	704	(3.7+	0.4+)				

1997 AO₆ = 1999 VM₇

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	266.26210		(2000.0)	P		Q		Williams			
<i>n</i>	0.30027569	ω	38.01116	−0.61580456		−0.78486728					
<i>a</i>	2.2086281	Ω	90.10621	+0.70491491		−0.58797613					
<i>e</i>	0.1274277	<i>i</i>	3.95951	+0.35196549		−0.19562061					
<i>P</i>	3.28	<i>H</i>	16.1	<i>G</i>	0.15	<i>U</i>	5				
Residuals in seconds of arc											
1996 12 28	327	0.2+	0.3+	1997 01 06	376	0.3−	0.6−	1999 11 04	704	0.1−	0.5+
1996 12 28	327	0.5+	0.1−	1997 01 06	376	0.4−	0.2−	1999 11 04	704	0.9+	0.3+
1996 12 28	327	0.9−	0.3+	1997 01 10	376	1.9+	0.8+	1999 11 07	120	0.4+	0.6−
1997 01 03	376	0.8+	0.5+	1997 01 10	376	0.5+	0.4−	1999 11 07	120	0.6+	0.2+
1997 01 03	376	(0.5+	3.0+)	1997 01 16	376	1.1−	0.7+	1999 11 08	120	1.0−	0.5+
1997 01 03	376	0.3+	0.3−	1997 02 01	376	0.1−	0.1−	1999 11 08	120	1.0−	1.7−
1997 01 04	327	0.7−	0.9+	1997 02 01	376	0.2+	0.2−	1999 11 10	120	1.6+	0.2+
1997 01 04	327	0.2−	0.3−	1999 11 04	704	1.3−	0.7−	1999 11 10	120	0.0	0.2+
1997 01 04	327	1.4−	0.6−	1999 11 04	704	0.3−	0.0				
1997 01 06	376	0.8+	0.7−	1999 11 04	704	0.2+	1.0+				

1997 AN₇ = 1999 UC₈

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	266.97372		(2000.0)	P		Q		Williams			
<i>n</i>	0.28473947	ω	263.41940	−0.59451908		−0.80355127					
<i>a</i>	2.2882542	Ω	223.10314	+0.75358573		−0.54415171					
<i>e</i>	0.1209084	<i>i</i>	2.44884	+0.28045606		−0.24125561					
<i>P</i>	3.46	<i>H</i>	14.3	<i>G</i>	0.15	<i>U</i>	3				
Residuals in seconds of arc											
1996 11 12	691	0.2+	0.4−	1997 03 31	704	1.0+	0.4+	1999 11 04	704	0.0	0.4−
1996 11 12	691	0.4+	0.3−	1997 03 31	704	0.5+	0.5+	1999 11 04	704	0.5+	0.2−
1996 11 12	691	0.4+	0.2−	1997 04 01	704	0.3+	0.0	1999 11 04	704	0.1−	0.3−
1997 01 09	411	1.1−	0.7+	1997 04 01	704	0.2+	0.5+	1999 11 04	704	0.6+	0.6−
1997 01 09	411	0.4−	0.6+	1999 10 29	703	0.0	0.0	1999 11 12	704	0.4+	0.1+
1997 01 10	411	0.4−	0.5−	1999 10 29	703	0.2+	0.1−	1999 11 12	704	0.2+	0.0
1997 01 10	411	0.3−	0.1+	1999 10 29	703	0.2−	0.1+	1999 11 12	704	0.3+	0.3+
1997 01 13	411	0.1+	0.1+	1999 10 29	703	0.8−	0.1+	1999 11 12	704	0.1+	0.1+
1997 01 13	411	0.3−	0.3+	1999 11 01	703	0.3−	0.5+	1999 11 12	704	0.1+	0.2−
1997 01 27	411	0.1+	1.0−	1999 11 01	703	0.4−	0.0	1999 11 12	691	0.1+	0.6+
1997 01 27	411	0.0	1.0−	1999 11 01	703	0.5−	0.1−	1999 11 12	691	0.0	0.2+
1997 02 14	411	0.1−	0.1+	1999 11 01	703	0.3−	0.4+	1999 11 12	691	0.3−	0.1+
1997 02 14	411	0.3+	0.2+	1999 11 04	704	0.2+	0.4+				

1997 AU₁₂ = 1999 VS₄₈

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	286.99370		(2000.0)	P		Q		Williams			
<i>n</i>	0.28196567	ω	135.39161	−0.15224180		−0.98624195					
<i>a</i>	2.3032366	Ω	323.22379	+0.87407839		−0.10393406					
<i>e</i>	0.0403431	<i>i</i>	6.17656	+0.46131269		−0.12854779					
<i>P</i>	3.50	<i>H</i>	14.1	<i>G</i>	0.15	<i>U</i>	5				
Residuals in seconds of arc											
1997 01 10	411	0.3−	1.3−	1997 01 27	411	0.5+	0.4+	1999 11 03	704	0.0	0.5+
1997 01 10	411	0.5+	0.2−	1997 02 12	411	0.1−	0.6−	1999 11 04	704	0.3−	0.2−
1997 01 11	411	0.2−	0.2+	1997 02 12	411	1.2−	0.1+	1999 11 04	704	0.2−	0.3−
1997 01 11	411	0.2+	0.6+	1999 11 03	704	0.0	0.6+	1999 11 04	704	0.6+	0.2−
1997 01 14	411	0.8−	0.2+	1999 11 03	704	0.1+	0.1+	1999 11 04	704	0.3−	0.5−
1997 01 14	411	0.7+	0.0	1999 11 03	704	0.0	0.4+	1999 11 04	704	0.0	0.3−
1997 01 27	411	0.8+	0.4+	1999 11 03	704	0.0	0.1−				

1997 AM₁₃ = 1999 VX₆₀

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	223.06179		(2000.0)	P		Q		Williams			
<i>n</i>	0.27128341	ω	104.24530	−0.92659884		−0.36199289					
<i>a</i>	2.3633093	Ω	54.62864	+0.27848552		−0.84256666					
<i>e</i>	0.0419233	<i>i</i>	7.17610	+0.25270616		−0.39880142					
<i>P</i>	3.63	<i>H</i>	14.5	<i>G</i>	0.15	<i>U</i>	5				
Residuals in seconds of arc											
1997 01 10	376	0.1−	0.3−	1997 01 27	411	1.4−	0.1+	1999 11 04	704	0.0	0.7+
1997 01 10	376	0.3+	0.4−	1997 01 27	411	0.2−	0.1−	1999 11 12	704	0.3−	0.1−
1997 01 11	411	0.5+	0.9+	1997 02 12	411	0.4+	0.1+	1999 11 12	704	0.2−	0.5−
1997 01 11	411	0.6−	0.3−	1997 02 12	411	0.2+	0.7−	1999 11 12	704	0.4−	0.6−
1997 01 12	411	0.8+	0.4−	1999 11 04	704	1.1+	0.2+	1999 11 12	704	0.1−	0.4−
1997 01 12	411	0.3−	0.9+	1999 11 04	704	0.1−	0.3+	1999 11 12	704	0.3−	0.5−
1997 01 16	376	0.2+	0.1+	1999 11 04	704	0.1−	0.3+				
1997 01 16	376	0.3+	0.2+	1999 11 04	704	0.5+	0.7+				

1997 BK₃ = 1999 VY₆₈

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	229.17624		(2000.0)	P		Q		Williams			
<i>n</i>	0.27625763	ω	120.30482	−0.98756952		−0.15603363					
<i>a</i>	2.3348547	Ω	50.72524	+0.13448296		−0.90125413					
<i>e</i>	0.1487965	<i>i</i>	1.40438	+0.08136821		−0.40422085					
<i>P</i>	3.57	<i>H</i>	15.4	<i>G</i>	0.15	<i>U</i>	5				
Residuals in seconds of arc											
1997 01 30	587	0.6+	0.8−	1997 02 08	587	0.1−	0.1+	1997 03 05	704	0.1+	0.6+
1997 01 30	587	0.6+	0.4+	1997 02 08	587	0.1−	0.0	1997 03 05	704	0.0	0.2−
1997 01 30	587	0.7+	0.9+	1997 02 08	587	0.2−	0.3−	1997 03 06	704	0.9+	0.4+
1997 01 30	587	1.3+	0.6+	1997 02 10	587	0.2−	0.1−	1997 03 06	704	0.1−	0.2+
1997 01 31	587	2.3−	0.4−	1997 02 10	587	0.1−	0.2−	1999 11 04	704	0.8−	0.8−
1997 01 31	587	0.2+	1.1+	1997 02 10	587	0.3−	0.3−	1999 11 04	704	0.1−	0.3−
1997 02 04	566	0.6−	0.3−	1997 02 10	587	0.5+	0.0	1999 11 04	704	0.3−	0.0
1997 02 04	566	0.3−	0.5−	1997 02 14	587	0.6+	0.4+	1999 11 04	704	1.6−	0.6−
1997 02 04	566	0.3−	0.1−	1997 02 14	587	0.2−	0.2−	1999 11 12	704	0.7+	0.6+
1997 02 06	587	0.5−	0.0	1997 02 14	587	0.2+	0.1−	1999 11 12	704	0.2+	0.2+
1997 02 06	587	0.4−	0.0	1997 03 02	587	0.3−	0.1+	1999 11 12	704	0.6+	0.4+
1997 02 07	587	0.1+	0.4−	1997 03 02	587	0.3−	0.5−	1999 11 12	704	0.8+	0.5+
1997 02 07	587	0.1+	0.1−	1997 03 04	704	0.9+	0.4+	1999 11 12	704	0.4+	0.3+
1997 02 07	587	0.7−	1.3−	1997 03 04	704	0.0	0.5+				

1997 CM₄ = 1999 VX₁

Id. M. Tichý

1999 NOV. 23

M.P.C. 36799

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Marsden

<i>M</i>	355.38530		(2000.0)	P	Q
<i>n</i>	0.29260525	ω	39.20221	+0.78288592	-0.62216432
<i>a</i>	2.2470599	Ω	359.26950	+0.54715140	+0.68932774
<i>e</i>	0.1053894	<i>i</i>	4.90866	+0.29616714	+0.37113182
<i>P</i>	3.37	<i>H</i>	15.6	<i>G</i> 0.15	<i>U</i> 5

Residuals in seconds of arc

1997 02 03	046	0.3-	0.0	1997 02 09	046	0.2+	0.6-	1999 11 05	046	0.2+	0.3-
1997 02 03	046	0.3-	0.4-	1997 02 09	046	0.1+	0.1-	1999 11 05	046	0.0	0.3-
1997 02 03	046	0.2+	0.5-	1997 02 10	046	0.4-	0.1+	1999 11 05	046	0.1+	0.0
1997 02 03	046	0.2-	0.2-	1997 02 10	046	0.4-	0.1+	1999 11 05	046	0.1+	0.1-
1997 02 03	046	0.2-	0.5-	1997 02 10	046	0.5-	0.2+	1999 11 05	046	0.5+	0.1+
1997 02 06	046	0.1+	0.5+	1997 03 01	046	0.3-	0.6-	1999 11 06	046	0.7-	0.4+
1997 02 06	046	0.6	0.3+	1997 03 01	046	0.1-	0.0	1999 11 06	046	0.3-	0.2+
1997 02 06	046	0.4+	0.7+	1997 03 01	046	0.2-	0.7+	1999 11 06	046	0.1+	0.1+
1997 02 06	046	0.2+	0.4+	1997 03 05	046	0.6+	0.2-				
1997 02 09	046	0.2+	0.5-	1997 03 05	046	0.7+	0.2+				

1997 CU₅ = 1997 AE₈

Id. G. V. Williams (d, MPC 30798)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Marsden

<i>M</i>	228.54508		(2000.0)	P	Q
<i>n</i>	0.27325667	ω	22.38029	-0.93522489	-0.34821367
<i>a</i>	2.3519181	Ω	137.07097	+0.30893181	-0.89094017
<i>e</i>	0.0908762	<i>i</i>	5.39557	+0.17296108	-0.29150103
<i>P</i>	3.61	<i>H</i>	15.7	<i>G</i> 0.15	<i>U</i> 3

Residuals in seconds of arc

1997 01 02	691	0.3+	0.3-	1997 02 10	046	0.3+	0.6-	1997 03 09	046	0.4-	0.2-
1997 01 02	691	0.5+	0.4-	1997 02 10	046	0.3+	0.4+	1997 03 09	046	0.2-	0.1-
1997 01 02	691	0.5+	0.4-	1997 02 10	046	0.3-	0.4-	1997 04 02	046	0.1+	0.3-
1997 01 10	691	0.5+	0.3-	1997 02 17	046	0.5+	0.3+	1997 04 02	046	0.2+	0.9+
1997 01 10	691	0.5+	0.3-	1997 02 17	046	0.1+	0.8-	1997 04 09	046	0.4-	0.2+
1997 01 10	691	0.6+	0.4-	1997 02 17	046	0.2-	0.3-	1997 04 09	046	0.1-	0.8+
1997 02 07	046	0.7-	0.3+	1997 02 27	046	0.6+	0.3+	1997 04 09	046	0.2+	0.1+
1997 02 07	046	0.2-	0.3+	1997 02 27	046	0.4+	0.6+	1999 10 19	046	0.8-	0.4+
1997 02 07	046	0.8-	0.6+	1997 02 27	046	0.3+	0.0	1999 10 19	046	0.3-	0.1-
1997 02 07	046	0.6-	0.3+	1997 03 05	046	0.3+	0.1-	1999 10 19	046	0.3-	0.4-
1997 02 07	046	0.7-	0.1+	1997 03 05	046	0.2+	0.4+	1999 10 19	046	0.5-	0.2+
1997 02 07	046	0.4-	0.3+	1997 03 05	046	0.5+	0.1+	1999 11 15	046	0.5+	0.7+
1997 02 07	046	0.6-	0.2+	1997 03 08	046	0.2+	0.1+	1999 11 15	046	1.1+	0.7+
1997 02 09	046	0.2-	0.2-	1997 03 08	046	0.5+	0.1+	1999 11 15	046	0.4-	0.8-
1997 02 09	046	0.1-	0.3-	1997 03 08	046	0.1+	0.2+	1999 11 15	046	0.5+	0.2+
1997 02 09	046	0.7-	0.2-	1997 03 09	046	0.6-	0.5-				

1997 CG₂₆ = 1999 VZ₂₉

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	222.75353		(2000.0)	P	Q
<i>n</i>	0.26582312	ω	132.87538	-0.99817270	-0.00495311
<i>a</i>	2.3955627	Ω	46.93776	-0.02259784	-0.89371781
<i>e</i>	0.1083789	<i>i</i>	4.72810	+0.05604106	-0.44860222
<i>P</i>	3.71	<i>H</i>	14.5	<i>G</i> 0.15	<i>U</i> 5

Residuals in seconds of arc

1997 02 14	411	1.3-	0.6-	1997 03 09	411	0.6+	0.6+	1999 11 12	704	0.4-	0.5+
1997 02 14	411	0.8-	0.9-	1997 03 09	411	0.6+	0.8+	1999 11 12	704	0.4-	0.8+
1997 02 16	411	0.4+	0.5+	1999 11 03	704	0.2+	0.5-	1999 11 12	704	0.2-	0.4+
1997 02 16	411	0.5+	0.0	1999 11 03	704	0.1+	0.6-	1999 11 12	704	0.4-	0.8+
1997 02 26	411	0.2+	0.0	1999 11 03	704	0.0	0.5-				
1997 02 26	411	0.2-	0.4-	1999 11 03	704	1.0+	0.8-				

1997 DW = 1999 VR₄₄

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	116.68149		(2000.0)	P	Q
<i>n</i>	0.21366451	ω	264.76561	-0.44894492	+0.89196520
<i>a</i>	2.7710719	Ω	338.31091	-0.75195907	-0.40938241
<i>e</i>	0.1094391	<i>i</i>	8.30050	-0.48270697	-0.19184401
<i>P</i>	4.61	<i>H</i>	14.5	<i>G</i> 0.15	<i>U</i> 4

Residuals in seconds of arc

1997 01 31	098	1.3-	0.5+	1997 03 02	108	0.7+	0.1+	1999 11 04	703	0.1-	0.6+
1997 01 31	098	0.5-	1.7-	1997 03 02	108	1.0+	0.8+	1999 11 04	703	0.0	0.2-
1997 02 07	098	0.2-	1.0-	1997 03 02	108	0.2+	0.6-	1999 11 04	703	0.2-	0.3+
1997 02 07	098	2.3+	0.9+	1997 03 03	098	1.1-	0.3-	1999 11 04	703	0.3-	0.7-
1997 02 08	098	0.1-	0.1+	1997 03 03	098	1.1-	1.6+	1999 11 11	703	0.6-	0.1-
1997 02 08	098	0.0	0.6+	1997 03 07	098	0.4-	0.9-	1999 11 11	703	0.4-	1.1+
1997 02 28	108	0.0	0.5+	1997 03 08	098	0.2+	1.1-	1999 11 11	703	0.1-	0.7-
1997 02 28	108	0.6+	1.1+	1997 03 10	098	0.6-	0.7-	1999 11 11	703	1.7+	0.2-
1997 02 28	108	0.2-	0.6-	1997 03 11	098	0.6+	0.5+				

1997 EF = 1999 VK₆₈

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	203.04445		(2000.0)	P	Q
<i>n</i>	0.25785310	ω	127.69657	-0.93589102	+0.34624789
<i>a</i>	2.4446751	Ω	72.64411	-0.34084288	-0.84332673
<i>e</i>	0.1359984	<i>i</i>	3.90277	-0.08907376	-0.41098956
<i>P</i>	3.82	<i>H</i>	14.3	<i>G</i> 0.15	<i>U</i> 5

Residuals in seconds of arc

1997 03 01	411	0.2+	0.7-	1997 03 12	411	0.3+	0.2+	1999 11 04	704	0.0	0.6-
1997 03 01	411	1.0-	0.5-	1997 04 10	411	0.5-	0.2+	1999 11 12	704	0.0	0.4+
1997 03 02	411	0.2+	0.7+	1997 04 10	411	0.6+	0.1-	1999 11 12	704	0.5-	0.3+
1997 03 02	411	0.6+	0.1+	1999 11 04	704	0.6-	0.5-	1999 11 12	704	0.1-	0.1+
1997 03 07	411	0.2-	0.3-	1999 11 04	704	0.6+	0.8+	1999 11 12	704	0.7+	0.2-
1997 03 07	411	0.2-	0.4+	1999 11 04	704	0.2-	0.3+	1999 11 12	704	0.5-	0.2-
1997 03 12	411	0.0	0.1-	1999 11 04	704	0.7+	0.2-				

1997 EM = 1990 VM₁₃Id. A. Doppler (MPC 32956); 1997 EM = 1983 EP₂ (*ibid.*) is invalid

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	106.92362		(2000.0)	P	Q
<i>n</i>	0.21783228	ω	198.20850	-0.01366928	+0.99798700
<i>a</i>	2.7356123	Ω	71.04463	-0.90906551	+0.01338991
<i>e</i>	0.1449843	<i>i</i>	3.75435	-0.41642893	-0.06198913
<i>P</i>	4.52	<i>H</i>	13.7	<i>G</i> 0.15	<i>U</i> 5

Residuals in seconds of arc

1990 11 14	372	0.9+	0.1+	1997 03 08	411	1.4-	1.1-	1999 11 04	704	0.0	0.2-
1990 11 14	372	0.7-	0.6-	1997 03 08	411	0.2-	0.2+	1999 11 04	704	0.2-	0.7+
1997 03 01	411	0.4-	0.5-	1997 03 09	411	1.0-	0.5+	1999 11 04	704	0.9-	0.1+
1997 03 01	411	0.5-	0.7+	1997 03 09	411	0.2-	1.0+	1999 11 12	704	0.2+	0.5-
1997 03 02	411	0.3-	0.5-	1997 03 12	411	1.5+	0.9-	1999 11 12	704	0.2+	0.2-
1997 03 02	411	0.5-	0.4+	1997 03 12	411	1.1+	0.5-	1999 11 12	704	0.5+	0.0
1997 03 07	411	1.8+	0.7+	1999 11 04	704	0.3-	0.2+	1999 11 12	704	0.3-	0.5+
1997 03 07	411	0.0	0.2+	1999 11 04	704	0.6+	0.0				

1997 ED₇ = 1999 UV₅

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	338.77942		(2000.0)	P	Q
<i>n</i>	0.25908165	ω	139.66641	+0.79052141	-0.60497264
<i>a</i>	2.4369406	Ω	257.81639	+0.53380274	+0.75691774
<i>e</i>	0.1235784	<i>i</i>	5.59559	+0.30021748	+0.24715105
<i>P</i>	3.80	<i>H</i>	15.8	<i>G</i> 0.15	<i>U</i> 4

Residuals in seconds of arc

1997 03 03	691	0.2+	0.0	1997 03 16	691	0.2+	0.4+	1999 10 31	703	0.2−	0.1−
1997 03 03	691	0.1+	0.2−	1999 10 03	704	0.4−	1.0−	1999 10 31	703	0.4+	0.3+
1997 03 03	691	0.1+	0.0	1999 10 03	704	0.0	0.3+	1999 11 03	704	0.3+	0.5−
1997 03 08	691	0.2−	0.1−	1999 10 03	704	0.3+	0.3−	1999 11 03	704	0.3+	0.0
1997 03 08	691	0.2−	0.0	1999 10 03	704	0.2+	1.1+	1999 11 03	704	0.1+	0.1−
1997 03 08	691	0.2−	0.2−	1999 10 29	703	0.6+	0.0	1999 11 03	704	0.1+	0.1+
1997 03 09	691	0.1−	0.0	1999 10 29	703	0.5−	0.1+	1999 11 03	704	0.5−	1.0−
1997 03 09	691	0.0	0.2−	1999 10 29	703	0.2+	0.1+	1999 11 11	703	0.3−	0.2+
1997 03 09	691	0.1−	0.0	1999 10 29	703	0.3−	0.1+	1999 11 11	703	0.0	0.3−
1997 03 16	691	0.3+	0.0	1999 10 31	703	0.2−	0.4+	1999 11 11	703	0.0	0.5+
1997 03 16	691	0.1−	0.4+	1999 10 31	703	0.6−	0.1−	1999 11 11	703	0.4+	0.4+

1997 EP₂₅ = 1999 VL₂

Id. T. Urata

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams				Williams			
(2000.0)				(2000.0)			
P				Q			
<i>M</i>	286.30889						
<i>n</i>	0.28784539	<i>ω</i>	120.94072	−0.39295393	−0.91954282		
<i>a</i>	2.2717639	<i>Ω</i>	352.19216	+0.82977898	−0.35209364		
<i>e</i>	0.0894079	<i>i</i>	2.24053	+0.39630046	−0.17455964		
<i>P</i>	3.42	<i>H</i>	14.6	<i>G</i>	0.15	<i>U</i>	4

Residuals in seconds of arc

1997 03 04	704	0.2+	0.4+	1997 03 11	385	0.4−	0.0	1999 11 03	704	0.0	0.2−
1997 03 04	704	0.8+	0.3+	1997 03 31	385	0.8−	0.3−	1999 11 05	385	0.1−	0.6+
1997 03 05	704	0.3+	0.3+	1997 03 31	385	0.9−	0.6−	1999 11 05	385	0.3+	0.4+
1997 03 05	704	1.1+	0.3−	1997 04 12	385	0.8+	0.6−	1999 11 06	385	0.5−	0.2−
1997 03 05	385	0.2−	0.2+	1997 04 12	385	0.5−	0.3−	1999 11 06	385	0.0	0.3−
1997 03 05	385	0.8−	0.0	1999 11 03	704	0.5−	0.5−	1999 11 06	385	0.0	0.1−
1997 03 08	385	0.3+	0.0	1999 11 03	704	0.2−	0.4−	1999 11 06	385	0.1+	0.2−
1997 03 08	385	0.1+	0.1+	1999 11 03	704	0.2−	0.2−	1999 11 14	886	1.0+	1.9+
1997 03 11	385	0.3−	0.5+	1999 11 03	704	0.1−	0.3−	1999 11 14	886	0.1+	0.9−

1997 EE₂₉ = 1999 VH₃₀

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams				Williams			
(2000.0)				(2000.0)			
P				Q			
<i>M</i>	234.53647						
<i>n</i>	0.26061820	<i>ω</i>	227.75550	−0.98989168	−0.14164282		
<i>a</i>	2.4273527	<i>Ω</i>	304.10036	+0.13254705	−0.90589238		
<i>e</i>	0.1239683	<i>i</i>	0.49785	+0.05045530	−0.39911942		
<i>P</i>	3.78	<i>H</i>	15.0	<i>G</i>	0.15	<i>U</i>	5

Residuals in seconds of arc

1997 03 05	691	0.0	0.8+	1997 03 16	120	0.0	0.3−	1999 11 03	704	1.2+	0.4+
1997 03 05	691	0.3−	0.6+	1997 03 16	120	0.2+	0.4−	1999 11 03	704	0.2+	0.5+
1997 03 05	691	0.4−	1.3+	1997 03 16	120	0.1−	0.5−	1999 11 03	704	0.6+	0.1−
1997 03 13	120	0.8+	0.6−	1997 03 16	120	0.3+	0.3−	1999 11 03	704	1.0+	0.6−
1997 03 13	120	0.4+	0.4+	1997 03 16	120	0.1−	0.3−	1999 11 12	704	0.1−	0.2+
1997 03 13	120	0.3+	0.1−	1997 04 07	691	0.6−	0.0	1999 11 12	704	0.8−	0.6−
1997 03 13	120	0.9+	0.6−	1997 04 07	691	0.1−	0.1+	1999 11 12	704	0.5−	0.2−
1997 03 13	120	0.4+	0.0	1997 04 07	691	0.5−	0.2+	1999 11 12	704	0.6−	0.1+
1997 03 13	120	1.0−	1.1−	1997 04 16	691	0.2+	0.5+	1999 11 12	704	1.0−	0.1+
1997 03 15	691	0.1−	0.3+	1997 04 16	691	0.1−	0.0				
1997 03 15	691	0.0	0.3+	1997 04 16	691	0.3−	0.4−				

1997 FG₄

Id. E. Bowell (1999 observations)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams				Williams			
(2000.0)				(2000.0)			
P				Q			
<i>M</i>	54.29487						
<i>n</i>	0.22389204	<i>ω</i>	139.27162	+0.90742189	+0.41966058		
<i>a</i>	2.6860264	<i>Ω</i>	195.95622	−0.40311973	+0.85475753		
<i>e</i>	0.0326911	<i>i</i>	4.52569	−0.11865919	+0.30540884		
<i>P</i>	4.40	<i>H</i>	14.4	<i>G</i>	0.15	<i>U</i>	4

Residuals in seconds of arc

1997 03 11	809	1.0+	0.8+	1997 04 06	704	0.0	0.6−	1998 08 17	704	0.9+	0.6−
1997 03 11	809	0.7+	1.1+	1997 04 07	704	1.2+	0.5−	1998 08 17	704	(1.2+	2.1+)
1997 03 11	809	0.6+	0.8+	1997 04 07	704	0.1+	0.4−	1998 08 17	704	0.4−	0.4+
1997 03 13	809	0.3+	0.8−	1997 04 07	704	0.7+	0.2−	1999 10 30	691	0.1−	0.1−
1997 03 13	809	0.2−	0.4+	1997 04 07	704	0.2−	0.7+	1999 10 30	691	0.1+	0.0
1997 03 13	809	0.4−	0.3+	1997 05 09	691	1.7−	0.0	1999 10 30	691	0.2+	0.1−
1997 03 31	704	0.5+	0.7−	1997 05 09	691	1.4−	0.2+	1999 11 04	704	0.3−	0.3+
1997 03 31	704	0.1+	0.7+	1997 05 09	691	1.8−	0.1+	1999 11 04	704	0.3−	0.2+
1997 04 03	704	0.1+	0.8−	1998 06 26	704	(2.7+	2.3+)	1999 11 04	704	0.7−	0.1−
1997 04 03	704	0.1+	0.4−	1998 06 26	704	(3.5+	2.5+)	1999 11 04	704	0.0	0.1−
1997 04 05	704	0.1+	0.1+	1998 06 26	704	(5.0+	1.0−)	1999 11 04	704	1.2+	0.4−
1997 04 05	704	0.3−	0.3−	1998 06 26	704	(4.8+	0.6−)				
1997 04 06	704	0.1+	0.4−	1998 08 17	704	0.5−	0.5+				

1997 GJ₁ = 1999 RX₉₁

Id. A. Doppler

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams				Williams			
(2000.0)				(2000.0)			
P				Q			
<i>M</i>	355.04559						
<i>n</i>	0.19070520	<i>ω</i>	173.48868	+0.99906456	+0.04123176		
<i>a</i>	2.9892416	<i>Ω</i>	184.21464	−0.04312290	+0.97243210		
<i>e</i>	0.1873365	<i>i</i>	10.21732	+0.00322814	+0.22951201		
<i>P</i>	5.17	<i>H</i>	15.1	<i>G</i>	0.15	<i>U</i>	4

Residuals in seconds of arc

1997 04 02	691	0.0	0.1−	1997 04 08	691	0.1+	0.4−	1999 09 09	704	0.5−	0.4+
1997 04 02	691	0.0	0.5−	1999 09 07	704	0.2+	0.2+	1999 09 09	704	0.5+	0.4−
1997 04 02	691	0.7−	0.7−	1999 09 07	704	0.5+	0.2+	1999 09 09	704	0.5−	0.6−
1997 04 07	691	0.1−	0.2+	1999 09 07	704	0.1+	0.3−	1999 10 07	704	0.1+	0.1−
1997 04 07	691	0.2−	0.1+	1999 09 07	704	0.1+	0.0	1999 10 07	704	0.3−	0.2−
1997 04 07	691	0.2−	0.1+	1999 09 07	704	0.6+	1.1+	1999 10 07	704	0.1+	0.2+
1997 04 08	691	0.4+	0.1+	1999 09 09	704	0.6−	0.6−	1999 10 07	704	0.4−	0.4+
1997 04 08	691	0.3+	0.2+	1999 09 09	704	0.0	0.2−	1999 10 07	704	0.5+	0.9−

1997 GT₁ = 1999 VB₅₈

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams				Williams			
(2000.0)				(2000.0)			
P				Q			
<i>M</i>	6.96366						
<i>n</i>	0.23849514	<i>ω</i>	177.77246	+0.93856805	−0.34492070		
<i>a</i>	2.5752320	<i>Ω</i>	202.41408	+0.31617242	+0.87218230		
<i>e</i>	0.0705663	<i>i</i>	1.64445	+0.13829324	+0.34688289		
<i>P</i>	4.13	<i>H</i>	15.7	<i>G</i>	0.15	<i>U</i>	5

Residuals in seconds of arc

1997 03 11	691	1.5+	0.3+	1997 04 08	691	0.2−	0.1+	1999 11 04	704	0.1+	0.4−
1997 03 11	691	0.5−	0.0	1997 04 12	691	0.2+	0.4−	1999 11 04	704	0.8−	0.0
1997 03 11	691	0.4−	0.1−	1997 04 12	691	0.5+	0.2−	1999 11 12	704	0.5−	0.1−
1997 04 02	691	0.1+	0.0	1997 04 12	691	0.2−	0.1−	1999 11 12	704	0.1−	0.2+
1997 04 02	691	0.4+	0.3+	1997 04 16	691	0.1−	0.0	1999 11 12	704	0.1+	0.5+
1997 04 02	691	1.7−	0.0	1997 04 16	691	0.4−	0.0	1999 11 12	704	0.5+	0.8+
1997 04 08	691	0.1+	0.0	1997 04 16	691	0.2+	0.2+				
1997 04 08	691	0.4+	0.3−	1999 11 04	704	0.6+	1.1−				

1997 GT₃ = 1999 TL₆

Id. S. Nakano

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

M	70.29099		(2000.0)	P	Q
n	0.18337305	ω	275.63774	+0.38973248	+0.91955232
a	3.0684029	Ω	17.56198	-0.76508590	+0.35371044
e	0.0806379	i	9.59998	-0.51259356	+0.17120881
P	5.37	H	13.7	G 0.15	U 4

1999 NOV. 23

M.P.C. 36801

1997 03 13	809	0.2−	1.4−	1999 10 02	703	0.3−	0.7+	1999 10 07	704	1.1+	0.2+
1997 03 13	809	0.9−	1.3−	1999 10 02	703	0.2+	0.4+	1999 10 07	704	0.1−	0.4+
1997 03 13	809	0.1−	1.0−	1999 10 02	703	0.3−	0.4+	1999 10 07	120	0.3+	0.1−
1997 04 02	400	0.4−	1.2+	1999 10 04	704	1.2+	0.9−	1999 10 07	120	1.0+	0.5+
1997 04 02	400	0.8+	0.2+	1999 10 04	704	0.2+	0.3−	1999 10 09	120	0.9−	0.3−
1997 04 03	704	1.5+	1.8+	1999 10 04	704	0.9−	0.5−	1999 10 09	120	1.8−	1.0−
1997 04 03	704	0.8+	1.4+	1999 10 04	704	0.5−	0.9+	1999 10 14	120	0.6+	0.1+
1997 04 03	400	(1.0+	2.6+)	1999 10 06	704	0.2+	0.5+	1999 10 14	120	0.4+	0.3−
1997 04 03	400	0.7+	1.3+	1999 10 06	704	0.2−	0.2+	1999 10 30	703	0.4−	0.5−
1997 04 05	704	0.4+	1.3+	1999 10 06	704	0.2−	0.2+	1999 10 30	703	0.6−	0.8−
1997 04 05	704	0.2−	1.0+	1999 10 06	704	0.0	0.1+	1999 10 30	703	0.5−	0.1−
1997 04 10	400	0.2−	0.1+	1999 10 06	704	0.1−	0.2+	1999 10 30	703	0.0	0.1−
1997 04 10	400	0.1−	0.4−	1999 10 06	120	1.1+	1.3+				

1997 GV₁₀ = 1999 VM₅₆

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

				Williams			
<i>M</i>	282.92164		(2000.0)	P	Q		
<i>n</i>	0.25392980	ω	281.05954	−0.36994008	−0.92903337		
<i>a</i>	2.4697914	Ω	190.65914	+0.86538710	−0.34206192		
<i>e</i>	0.1613750	<i>i</i>	1.99202	+0.33800812	−0.14103422		
<i>P</i>	3.88	<i>H</i>	16.1	<i>G</i>	0.15	<i>U</i>	5

Residuals in seconds of arc

1997 04 03	704	0.5+	0.1+	1997 05 03	691	0.3−	0.2−	1999 11 04	704	0.1+	0.5−
1997 04 03	704	0.4−	1.1−	1997 05 03	691	0.6−	0.0	1999 11 04	704	0.3−	0.3+
1997 04 06	704	0.4+	0.9+	1997 05 09	691	0.4+	0.0	1999 11 12	704	0.3−	0.0
1997 04 06	704	0.2−	0.7+	1997 05 09	691	0.6+	0.4−	1999 11 12	704	0.2−	0.1+
1997 04 30	691	0.1+	0.1+	1997 05 09	691	0.5+	0.1−	1999 11 12	704	0.5+	0.1+
1997 04 30	691	0.2+	0.2−	1999 11 04	704	0.6−	0.4−	1999 11 12	704	0.3+	0.5+
1997 04 30	691	1.1−	0.1−	1999 11 04	704	0.0	0.4−	1999 11 12	704	0.3+	0.3+
1997 05 03	691	0.3−	0.1−	1999 11 04	704	0.3+	0.2−				

1997 GS₁₆ = 1999 UX₁₆

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

				Williams			
<i>M</i>	243.13271		(2000.0)	P	Q		
<i>n</i>	0.19639836	ω	307.12916	−0.49013168	−0.87163587		
<i>a</i>	2.9311911	Ω	172.21585	+0.81026619	−0.45758604		
<i>e</i>	0.0221540	<i>i</i>	1.97737	+0.32130926	−0.17568701		
<i>P</i>	5.02	<i>H</i>	13.6	<i>G</i>	0.15	<i>U</i>	4

Residuals in seconds of arc

1997 03 11	809	0.0	0.3+	1997 04 05	704	1.9+	0.2+	1999 10 30	703	0.5+	0.0
1997 03 11	809	0.0	0.2−	1997 04 06	327	0.7−	0.0	1999 10 30	703	0.6−	0.0
1997 03 11	809	0.4−	0.3+	1997 04 06	327	0.8−	0.0	1999 10 30	703	0.4+	0.1+
1997 03 13	809	0.9−	0.0	1997 04 06	327	1.2−	0.1−	1999 11 03	703	0.0	0.1−
1997 03 13	809	0.1+	0.1−	1997 04 07	704	0.5+	0.2−	1999 11 03	703	0.6−	0.1+
1997 03 13	809	0.7+	0.1−	1997 04 07	704	0.4+	0.1+	1999 11 03	703	0.2−	0.6+
1997 04 03	704	0.6+	0.8+	1997 04 10	327	0.5−	0.0	1999 11 03	703	0.3+	0.4+
1997 04 03	704	0.3+	0.1+	1997 04 10	327	0.5−	0.2−	1999 11 12	704	1.4+	0.3+
1997 04 05	704	(0.8+	5.5+)	1997 04 10	327	0.4−	0.3−	1999 11 12	704	0.1−	0.2−
1997 04 05	704	0.8+	0.2+	1997 04 10	327	0.5−	0.3−	1999 11 12	704	0.9+	1.1−
1997 04 05	704	0.7+	0.3−	1999 10 30	703	0.1−	0.1−	1999 11 12	704	1.8−	0.4−

1997 GS₂₂ = 1999 VJ₂₈

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

				Williams			
<i>M</i>	245.71422		(2000.0)	P	Q		
<i>n</i>	0.21232035	ω	101.30757	−0.85941583	−0.50895743		
<i>a</i>	2.7827550	Ω	48.11878	+0.43990239	−0.78457712		
<i>e</i>	0.0235456	<i>i</i>	3.74650	+0.26055769	−0.35412015		
<i>P</i>	4.64	<i>H</i>	14.6	<i>G</i>	0.15	<i>U</i>	4

Residuals in seconds of arc

1997 04 06	704	1.0+	0.4−	1997 05 01	704	0.4−	0.3−	1999 11 03	704	0.1−	0.1−
1997 04 06	704	0.0	0.5−	1997 05 01	704	0.1−	0.2−	1999 11 03	704	0.8+	0.0
1997 04 08	704	0.7−	0.3+	1997 05 05	704	0.4+	0.2−	1999 11 03	704	0.5+	0.4+

1997 04 08	704	0.6−	0.9+	1997 05 05	704	0.0	0.1−	1999 11 03	704	0.0	0.1−
1997 04 30	704	0.0	0.3+	1997 05 05	704	0.2−	0.5+	1999 11 03	704	0.1+	0.2−
1997 04 30	704	0.4+	0.1+	1997 05 05	704	0.2+	0.1+	1999 11 12	704	0.3−	0.1−
1997 04 30	704	0.3−	0.5+	1997 05 05	704	0.6−	0.1−	1999 11 12	704	0.1+	0.1−
1997 04 30	704	0.2+	0.2+	1997 05 05	704	0.3−	0.1−	1999 11 12	704	0.1+	0.0
1997 04 30	704	0.1+	0.0	1997 05 05	704	0.4+	1.4−	1999 11 12	704	0.8−	0.3+
1997 05 01	704	0.1+	0.1−	1997 05 05	704	0.2+	0.6+	1999 11 12	704	0.4−	0.4−
1997 05 01	704	0.3−	0.1−	1997 05 05	704	0.3+	0.6−				
1997 05 01	704	0.2−	0.1−	1997 05 05	704	0.4+	0.6+				

1997 GP₂₄ = 1999 VX₆₈

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

				Williams			
<i>M</i>	81.44963		(2000.0)	P	Q		
<i>n</i>	0.19034211	ω	254.33451	+0.55690815	+0.81820516		
<i>a</i>	2.9930419	Ω	50.39911	−0.67325327	+0.54538953		
<i>e</i>	0.0604608	<i>i</i>	10.68105	−0.48639834	+0.18190816		
<i>P</i>	5.18	<i>H</i>	14.3	<i>G</i>	0.15	<i>U</i>	4

Residuals in seconds of arc

1997 04 07	809	0.6+	0.5+	1997 04 30	704	0.5+	0.0	1997 05 05	704	0.8−	0.5−
1997 04 07	809	1.4−	0.1−	1997 04 30	704	0.5+	0.6+	1997 05 05	704	0.0	0.0
1997 04 07	704	0.1−	0.5−	1997 04 30	704	0.2+	0.6−	1999 11 04	704	0.2+	0.8+
1997 04 07	809	0.4+	0.3−	1997 05 05	704	0.0	0.2+	1999 11 04	704	0.6+	0.6+
1997 04 07	704	0.2−	0.7+	1997 05 05	704	0.0	0.0	1999 11 04	704	1.1+	0.8−
1997 04 08	809	0.8−	0.9+	1997 05 05	704	0.2−	0.1+	1999 11 12	704	0.5+	0.2+
1997 04 08	809	0.5+	1.0+	1997 05 05	704	0.5+	0.5+	1999 11 12	704	0.9−	0.6−
1997 04 08	809	0.0	0.8+	1997 05 05	704	0.1+	0.6−	1999 11 12	704	0.6−	0.5−
1997 04 08	704	0.4+	1.2−	1997 05 05	704	0.2−	0.1+	1999 11 12	704	0.6−	0.0
1997 04 08	704	0.2−	1.4−	1997 05 05	704	0.1−	0.2+	1999 11 12	704	0.2−	0.2+
1997 04 30	704	0.1+	0.3−	1997 05 05	704	0.0	0.1−				

1997 GH₃₆ = 1999 UJ₃

Id. A. Doppler

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

				Williams			
<i>M</i>	257.14907		(2000.0)	P	Q		
<i>n</i>	0.22271923	ω	102.01589	−0.74479718	−0.65155897		
<i>a</i>	2.6954477	Ω	37.59552	+0.48253891	−0.67498581		
<i>e</i>	0.1032673	<i>i</i>	13.65660	+0.46090494	−0.34621535		
<i>P</i>	4.43	<i>H</i>	13.7	<i>G</i>	0.15	<i>U</i>	4

Residuals in seconds of arc

1997 04 06	704	0.2+	0.7+	1997 05 07	704	0.9+	1.0+	1999 10 23	681	0.0	0.9+
1997 04 06	704	0.3+	1.0+	1997 05 07	704	0.3+	0.9+	1999 10 30	681	0.3−	0.5−
1997 04 07	704	1.3+	1.3+	1997 05 07	704	0.1+	1.0+	1999 10 30	681	0.8−	0.2+
1997 04 07	704	0.3−	0.8−	1997 05 07	704	0.2+	1.2+	1999 11 01	681	0.6−	0.8+
1997 04 07	704	0.5+	0.2+	1999 10 03	704	0.7+	0.2+	1999 11 01	681	0.5−	0.3+
1997 04 07	704	1.0−	1.6−	1999 10 03	704	0.1+	0.2−	1999 11 04	704	0.1−	0.1+
1997 04 07	704	0.7+	1.3−	1999 10 03	704	0.2+	0.5+	1999 11 04	704	0.3+	0.0
1997 04 07	704	0.0	0.0	1999 10 03	704	0.5−	0.3+	1999 11 04	704	1.3+	0.9+
1997 04 11	704	0.4+	0.2+	1999 10 03	704	0.3−	0.5−	1999 11 04	704	0.4+	0.4+
1997 04 11	704	0.4−	1.6+	1999 10 21	681	1.1−	0.4+	1999 11 11	703	0.6−	0.5+
1997 05 01	704	0.0	0.6+	1999 10 21	681	0.4−	0.2+	1999 11 11	703	0.8−	0.2+
1997 05 01	704	0.1+	0.1+	1999 10 21	681	0.2+	0.5+	1999 11 11	703	0.2−	0.3+
1997 05 01	704	0.1+	0.6+	1999 10 21	681	0.8−	0.1+	1999 11 11	703	0.4−	0.2+
1997 05 01	704	0.3+	0.4+	1999 10 23	681	0.2+	1.1+				
1997 05 01	704	0.5+	0.0	1999 10 23	681	0.1−	0.4+				

1997 HS₁₂ = 1999 VC₂₀

Id. G. V. Williams, E. Bowell

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	208.18346		(2000.0)	P		Q					
<i>n</i>	0.22208497	ω	314.92798	−0.98294550		+0.18312923					
<i>a</i>	2.7005773	Ω	235.63113	−0.16247654		−0.90758345					
<i>e</i>	0.1398892	<i>i</i>	1.16537	−0.08613657		−0.37783061					
<i>P</i>	4.44	<i>H</i>	14.5	<i>G</i>	0.15	<i>U</i>	5				
Residuals in seconds of arc											
1997 04 06	704	0.2−	0.9+	1997 05 01	704	0.1+	0.5+	1999 11 10	120	0.2+	0.1−
1997 04 06	704	0.1−	1.1−	1997 05 01	704	0.2+	0.5+	1999 11 10	120	(2.0+ 2.3+)	
1997 04 06	704	0.4+	0.4+	1997 05 01	704	0.2+	0.3+	1999 11 12	704	0.8−	0.2+
1997 04 06	704	0.2−	0.1−	1997 05 05	704	0.1+	0.4+	1999 11 12	704	0.3−	0.6+
1997 04 08	704	0.5−	0.5−	1997 05 05	704	0.0	0.2+	1999 11 12	704	0.8−	0.8+
1997 04 08	704	0.3+	0.8−	1997 05 05	704	0.2−	0.2+	1999 11 12	704	0.5−	0.3+
1997 04 30	704	0.3+	0.7+	1997 05 05	704	0.1+	0.6−	1999 11 12	704	0.0	0.4−
1997 04 30	704	0.1−	0.3−	1997 05 05	704	0.6−	0.5−	1999 11 12	120	0.8+	0.2+
1997 04 30	704	0.3+	0.0	1999 11 04	704	0.6+	0.5+	1999 11 12	120	0.7+	0.3+
1997 04 30	704	0.2−	0.8−	1999 11 04	704	0.5+	0.4+	1999 11 13	120	0.3+	0.4+
1997 04 30	704	0.1+	0.1−	1999 11 04	704	0.0	0.8−	1999 11 13	120	0.2+	0.4+
1997 05 01	704	0.4+	0.7+	1999 11 04	704	0.7−	1.6−				
1997 05 01	704	0.3−	0.4+	1999 11 04	704	0.2−	0.5−				

1997 LE₄ = 1999 VN₄₀

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	38.25609		(2000.0)	P			Q				
<i>n</i>	0.16933513	ω	103.17925		+0.88928104		+0.34133049				
<i>a</i>	3.2357230	Ω	237.64965		−0.40874208		+0.89176157				
<i>e</i>	0.0801104	<i>i</i>	21.12178		+0.20520513		+0.29707709				
<i>P</i>	5.82	<i>H</i>	13.4	<i>G</i>	0.15	<i>U</i>	5				
Residuals in seconds of arc											
1997 06 09	684	0.0	0.2−	1997 06 11	684	0.2−	0.1+	1999 11 10	703	0.5−	0.5−
1997 06 09	684	0.3+	0.1−	1997 06 11	684	0.1+	0.0	1999 11 11	703	0.2−	0.4−
1997 06 09	684	0.0	0.1−	1997 06 11	684	0.1+	0.1+	1999 11 11	703	0.1+	0.1+
1997 06 10	684	0.1+	0.0	1999 11 10	703	0.5−	0.4+	1999 11 11	703	0.1+	0.0
1997 06 10	684	0.2−	0.1+	1999 11 10	703	0.1−	0.2+	1999 11 11	703	0.3+	0.2+
1997 06 10	684	0.2−	0.0	1999 11 10	703	0.8+	0.0				

1997 MK₃ = 1998 XN₅₆

Id. M. E. Sansaturio

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	77.59391		(2000.0)	P		Q					
<i>n</i>	0.26963466	ω	192.36043	+0.42669584		−0.90411204					
<i>a</i>	2.3729335	Ω	232.38590	+0.83217986		+0.40229907					
<i>e</i>	0.1884749	<i>i</i>	1.63701	+0.35412899		+0.14400306					
<i>P</i>	3.66	<i>H</i>	15.0	<i>G</i>	0.15	<i>U</i>	5				
Residuals in seconds of arc											
1997 06 28	704	0.8+	0.9+	1997 07 02	704	0.3−	0.2−	1998 12 16	704	0.6+	0.2−
1997 06 28	704	0.6+	0.4+	1997 07 02	704	0.5−	0.2−	1998 12 16	704	0.6−	0.0
1997 06 28	704	0.4−	0.2+	1997 07 02	704	0.0	0.3−	1998 12 16	704	0.4+	0.6+
1997 06 28	704	0.6−	0.3−	1997 07 02	704	0.3−	0.3−	1998 12 16	704	0.2+	1.3+
1997 06 28	704	0.3−	1.7+	1997 07 02	704	0.2−	0.3−	1998 12 22	704	0.3+	0.6+
1997 06 28	704	0.0	1.1−	1998 12 15	704	0.2−	0.6−	1998 12 22	704	0.9+	0.3−
1997 06 29	704	0.1+	0.0	1998 12 15	704	0.4−	0.2+	1998 12 22	704	1.1+	0.4−
1997 06 29	704	1.7+	0.5+	1998 12 15	704	0.3−	0.5−	1998 12 22	704	0.1−	0.4+
1997 06 29	704	0.2−	0.3+	1998 12 15	704	0.3−	0.6−	1998 12 22	704	1.7−	0.3+
1997 06 29	704	0.2−	0.5−	1998 12 15	704	0.0	0.5−				
1997 06 29	704	0.2−	0.5−	1998 12 16	704	0.2+	0.1−				

1997 SR₄ = 1980 RY₆

Id. M. E. Sansaturio

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	150.91089		(2000.0)	P			Q				
<i>n</i>	0.22975952	ω	10.35235	+0.96720090			+0.23692552				
<i>a</i>	2.6401000	Ω	335.35107	−0.24592016			+0.78310868				
<i>e</i>	0.2995990	<i>i</i>	12.68614	−0.06360584			+0.57498443				
<i>P</i>	4.29	<i>H</i>	16.4	<i>G</i>	0.15		<i>U</i>	5			
Residuals in seconds of arc											
1980 09 13	675	0.7−	0.5+	1997 09 27	691	0.1−	0.1−	1997 10 01	691	0.1−	0.1+
1980 09 14	675	0.7+	0.5−	1997 09 28	691	1.2+	1.0+	1997 10 01	691	0.1+	0.1−
1997 09 27	691	0.2+	0.2−	1997 09 28	691	0.0	0.4−	1997 10 01	691	0.3−	0.2+
1997 09 27	691	0.4−	0.1−	1997 09 28	691	0.5−	0.4−				

1997 XQ₅ = 1983 VX₂

Id. A. Gnädig

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

M	120.09167		(2000.0)	P			Q				
n	0.21191545	ω	59.58292		+0.08442389		−0.99472444				
a	2.7862984	Ω	25.76871		+0.86205299		+0.04358268				
e	0.2968588	i	7.70337		+0.49973718		+0.09286467				
P	4.65	H	14.9	G	0.15		U	3			
Residuals in seconds of arc											
1976 05 30	413	0.4−	0.3−	1997 12 01	327	0.0	0.1+	1997 12 04	327	0.1−	0.6−
1976 05 30	413	0.1+	0.5−	1997 12 01	327	0.2−	0.2−	1997 12 17	327	0.0	0.2+
1983 11 08	381	0.7+	0.0	1997 12 01	327	0.2−	0.0	1997 12 17	327	0.7+	0.1+
1983 11 08	381	0.5−	0.5−	1997 12 01	327	0.2−	0.2−	1997 12 17	327	0.4+	0.3+
1997 12 01	327	0.2−	0.1+	1997 12 04	327	0.2+	0.0				
1997 12 01	327	0.1−	0.0	1997 12 04	327	0.0	0.1+				

1998 DQ₂₃ = 1999 VO₁₃

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	269.15415		(2000.0)				P		Q		
<i>n</i>	0.36963642	ω	95.78554				−0.26332778		−0.96257612		
<i>a</i>	1.9228831	Ω	10.19284				+0.67777738		−0.23186371		
<i>e</i>	0.0772038	<i>i</i>	21.22845				+0.68649567		−0.14030833		
<i>P</i>	2.67	<i>H</i>	16.1			<i>G</i>	0.15		<i>U</i>	5	
Residuals in seconds of arc											
1998 02 27	910	0.9−	0.1−	1998 03 03	910	0.4+	0.4−	1999 11 02	704	0.2−	0.0
1998 02 27	910	0.0	0.0	1998 03 03	910	0.1+	0.1−	1999 11 02	704	0.1+	0.3−
1998 02 27	910	0.4−	0.0	1998 03 03	910	0.4+	0.0	1999 11 02	704	0.3+	0.1−
1998 02 28	910	0.2−	0.1+	1998 03 25	704	0.6+	0.6+	1999 11 02	704	0.1+	0.8+
1998 02 28	910	0.0	0.2+	1998 03 25	704	0.5+	0.9+	1999 11 03	704	0.2−	0.0
1998 02 28	910	0.1−	0.5−	1998 03 25	704	0.6−	0.5−	1999 11 03	704	1.1−	0.1−
1998 03 02	910	0.0	0.3+	1998 03 25	704	0.2+	1.3+	1999 11 03	704	0.7+	0.2+
1998 03 02	910	0.1+	0.1+	1998 03 25	704	0.4−	2.2−	1999 11 03	704	0.3+	0.2−
1998 03 02	910	0.3+	0.4+	1999 11 02	704	0.3+	0.1−	1999 11 03	704	0.4−	0.0

1998 EW₆ = 1999 VP₁₃

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

M	222.40628		(2000.0)	P		Q					
n	0.36553835	ω	141.48161	−0.89093193		−0.44734761					
a	1.9372281	Ω	12.66586	+0.27499551		−0.66851857					
e	0.0868580	i	20.90362	+0.36141081		−0.59410693					
P	2.70	H	15.8	G	0.15	U	5				
Residuals in seconds of arc											
1998 03 03	910	0.8−	0.3+	1998 03 27	428	0.4+	0.6−	1998 04 01	704	0.7−	0.5+
1998 03 03	910	0.8−	0.2+	1998 03 27	428	0.0	0.0	1998 04 01	704	0.0	1.2+
1998 03 03	910	0.8−	0.2+	1998 03 27	428	0.2+	0.4−	1999 11 02	704	0.1−	0.1+
1998 03 06	910	0.7−	0.2+	1998 03 28	428	0.1+	0.7−	1999 11 02	704	1.3+	0.3−
1998 03 06	910	0.7−	0.5+	1998 03 30	428	0.5+	0.4+	1999 11 02	704	0.6+	0.6+
1998 03 06	910	0.4−	0.2+	1998 03 30	428	0.7−	0.2+	1999 11 02	704	0.2+	0.2−

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1998 03 06	910	0.4−	0.9−	1998 03 31	704	0.3+	0.1+	1999 11 02	704	0.2−	0.1+
1998 03 06	910	0.5−	0.5−	1998 03 31	704	0.4+	0.2−	1999 11 03	704	0.4−	0.5+
1998 03 06	910	0.0	0.2−	1998 03 31	704	0.1+	0.5−	1999 11 03	704	0.2−	0.3+
1998 03 25	910	2.1+	0.4+	1998 03 31	704	0.4−	0.4+	1999 11 03	704	0.6−	0.2+
1998 03 25	910	1.9+	0.2+	1998 03 31	704	2.1−	1.5−	1999 11 03	704	0.7−	1.2−
1998 03 25	910	2.1+	0.5+	1998 04 01	704	0.4−	0.7+	1999 11 03	704	0.6−	0.5+
1998 03 26	428	1.0+	0.0	1998 04 01	704	0.0	0.3+				
1998 03 26	428	0.6+	0.2−	1998 04 01	704	0.5−	0.0				

1998 FB₁₂ = 1999 TP₃₁

Id. A. Doppler

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	14.02355		(2000.0)	P	Q		
<i>n</i>	0.31286692	ω	357.10943	+0.87792644	+0.47865408		
<i>a</i>	2.1489664	Ω	334.28287	−0.43874658	+0.79452313		
<i>e</i>	0.1793415	<i>i</i>	1.53681	−0.19169402	+0.37366197		
<i>P</i>	3.15	<i>H</i>	14.6	<i>G</i>	0.15	<i>U</i>	4

Residuals in seconds of arc

1998 03 20	704	0.6+	0.7−	1998 03 29	704	0.4−	0.7+	1999 10 01	703	0.0	0.2+
1998 03 20	704	1.3+	0.3−	1998 03 29	704	0.1+	0.4+	1999 10 01	703	0.2−	0.1+
1998 03 20	704	0.9+	0.4−	1998 04 01	704	0.1−	0.0	1999 10 01	703	0.1−	0.0
1998 03 20	704	0.9+	1.0−	1998 04 01	704	1.0−	0.5+	1999 10 04	704	0.2+	0.0
1998 03 20	704	0.6+	0.7−	1998 04 01	704	0.6+	0.0	1999 10 04	704	0.1+	0.6−
1998 03 22	704	0.2−	0.3+	1998 04 01	704	1.3+	1.0−	1999 10 04	704	0.1−	0.7−
1998 03 22	704	0.6−	0.1−	1998 04 01	704	1.3+	0.1−	1999 10 04	704	0.6+	0.2−
1998 03 22	704	0.1−	0.0	1998 04 19	704	0.3+	0.5−	1999 10 04	704	0.2+	1.2−
1998 03 22	704	0.8−	0.7+	1998 04 19	704	0.0	0.6+	1999 10 06	704	0.1−	0.1−
1998 03 22	704	1.0−	0.6+	1998 04 19	704	0.1+	1.4+	1999 10 06	704	0.1−	0.2−
1998 03 24	566	0.5−	0.0	1998 04 19	704	0.3+	0.2+	1999 10 06	704	0.3−	0.2−
1998 03 24	566	0.8−	0.1−	1998 04 19	704	1.2−	0.9+	1999 10 06	704	0.1−	0.2−
1998 03 24	566	0.8−	0.3+	1998 04 30	566	0.2+	0.3−	1999 10 06	704	0.5−	0.3−
1998 03 26	566	0.2−	0.2+	1998 04 30	566	0.4+	0.6−	1999 11 04	703	0.2+	0.5+
1998 03 26	566	0.2−	0.0	1998 04 30	566	0.5−	0.7−	1999 11 04	703	0.0	0.2+
1998 03 26	566	0.0	0.4+	1999 08 13	699	0.4−	0.7+	1999 11 04	703	0.4−	0.9+
1998 03 29	704	0.1−	0.1+	1999 08 13	699	0.1+	1.2+	1999 11 04	703	0.0	0.8+
1998 03 29	704	0.3+	0.1−	1999 08 13	699	0.5−	0.3+				
1998 03 29	704	0.1−	0.6+	1999 10 01	703	0.9+	0.6+				

1998 FL₁₂ = 1999 VB₁₄

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	198.73767		(2000.0)	P	Q		
<i>n</i>	0.36761329	ω	161.82664	−0.99049609	+0.02919124		
<i>a</i>	1.9299316	Ω	21.25396	−0.11431552	−0.71811894		
<i>e</i>	0.0877625	<i>i</i>	21.76352	+0.07648170	−0.69530789		
<i>P</i>	2.68	<i>H</i>	15.5	<i>G</i>	0.15	<i>U</i>	4

Residuals in seconds of arc

1998 03 07	691	0.0	0.3−	1998 04 28	566	0.9+	0.1−	1999 11 03	704	0.1−	0.2+
1998 03 07	691	0.3+	0.4−	1998 04 28	566	0.3+	0.3−	1999 11 03	704	0.1−	0.4−
1998 03 07	691	0.3−	0.8−	1998 04 28	566	0.4+	0.4−	1999 11 03	704	0.1−	0.1−
1998 03 26	910	1.1+	0.3+	1998 04 30	566	1.1−	0.1+	1999 11 03	704	0.3−	0.2−
1998 03 26	910	1.3+	0.4+	1998 04 30	566	0.8−	0.1−	1999 11 03	704	0.2−	0.1+
1998 03 26	910	1.2+	0.1+	1998 04 30	566	1.1−	0.2+	1999 11 03	704	1.1−	0.3−
1998 03 27	910	0.4−	0.5−	1999 11 02	704	0.0	0.3+	1999 11 03	704	0.2+	0.1+
1998 03 27	910	0.5−	0.6−	1999 11 02	704	0.1+	0.2+	1999 11 04	704	0.3−	0.1+
1998 03 27	910	0.6−	0.5−	1999 11 02	704	0.2+	0.1+	1999 11 04	704	0.2−	0.5−
1998 04 01	704	0.0	0.0	1999 11 02	704	0.5+	0.1+	1999 11 04	704	0.2+	0.2−
1998 04 01	704	0.5+	0.7+	1999 11 02	704	0.7+	0.6+	1999 11 04	704	0.2−	0.6−
1998 04 01	704	0.2−	1.7+	1999 11 03	704	0.5+	0.2+	1999 11 04	704	0.0	0.4−
1998 04 01	704	0.8−	0.0	1999 11 03	704	0.6+	0.3+				
1998 04 01	704	0.6−	0.0	1999 11 03	704	0.0	0.2−				

1998 FG₁₅ = 1999 UK₁₀

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	116.63767		(2000.0)	P	Q		
<i>n</i>	0.36895813	ω	248.21976	−0.13766859	+0.98655619		
<i>a</i>	1.9252390	Ω	14.71274	−0.73132030	−0.04128635		
<i>e</i>	0.0525522	<i>i</i>	20.28698	−0.66799550	−0.15812120		
<i>P</i>	2.67	<i>H</i>	16.2	<i>G</i>	0.15	<i>U</i>	5

Residuals in seconds of arc

1998 03 20	704	0.3+	1.2−	1998 03 29	704	0.9+	0.7+	1998 03 29	104	0.7+	1.6+
1998 03 20	704	0.2−	0.2−	1998 03 29	704	0.4+	0.2+	1998 04 19	704	0.9−	0.4−
1998 03 20	704	0.6+	1.5+	1998 03 29	704	0.2−	0.4−	1998 04 19	704	0.4−	0.3−
1998 03 20	704	0.9−	0.7+	1998 03 29	704	0.1−	0.4−	1998 04 19	704	1.0−	1.0+
1998 03 20	704	0.5+	1.0+	1998 03 29	658	0.7−	0.2−	1998 04 19	704	0.4−	0.6+
1998 03 22	704	0.2+	1.0−	1998 03 29	658	0.6−	0.1−	1998 04 19	704	0.0	0.2−
1998 03 22	704	0.7−	1.4−	1998 03 29	658	0.7−	0.2−	1998 04 20	704	0.7+	0.4−
1998 03 22	704	0.1+	0.6−	1998 03 29	704	0.1−	0.0	1998 04 20	704	0.9+	0.5+
1998 03 22	704	1.8+	0.5−	1998 03 29	704	0.3+	0.9−	1998 04 20	704	0.4+	0.9−
1998 03 22	704	0.3−	2.0−	1998 03 29	704	0.2+	0.4+	1998 04 20	704	0.4+	0.7−
1998 03 28	106	0.0	0.3−	1998 03 29	704	0.1−	0.3−	1999 10 31	704	0.5−	0.3+
1998 03 28	106	0.4+	0.1+	1998 03 29	704	1.8−	0.6+	1999 10 31	704	0.0	0.3+
1998 03 28	106	0.3+	0.1−	1998 03 29	704	0.5−	0.0	1999 10 31	704	0.6+	0.9−
1998 03 28	046	0.5+	0.8−	1998 03 29	422	0.9−	0.3+	1999 10 31	704	0.4−	1.0+
1998 03 28	046	0.4−	0.5+	1998 03 29	422	0.3+	0.1+	1999 10 31	704	0.1+	0.6+
1998 03 28	046	0.2+	0.1−	1998 03 29	422	0.4+	0.6+	1999 11 01	704	0.1+	0.8−
1998 03 28	046	0.1+	0.4−	1998 03 29	104	1.3+	0.9+	1999 11 01	704	0.2+	0.6+
1998 03 28	046	0.7−	0.3−	1998 03 29	104	0.3−	1.4+	1999 11 01	704	0.1−	0.7−
1998 03 28	046	0.0	0.1−	1998 03 29	104	0.4+	1.5+	1999 11 01	704	0.0	0.5−

1998 FM₄₅ = 1982 DO₃ = 1999 JV₁₁₀

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	269.81368		(2000.0)	P	Q		
<i>n</i>	0.12797366	ω	206.00687	+0.92773926	+0.36721483		
<i>a</i>	3.8999197	Ω	132.28213	−0.32477093	+0.88238157		
<i>e</i>	0.0589047	<i>i</i>	5.17497	−0.18391224	+0.29420407		
<i>P</i>	7.70	<i>H</i>	12.6	<i>G</i>	0.15	<i>U</i>	4

Residuals in seconds of arc

1982 02 21	033	0.3−	0.4+	1998 03 22	704	0.9−	0.1+	1999 05 13	704	0.2+	0.2−
1982 02 21	033	0.3+	0.5−	1998 03 22	704	0.7−	0.5−	1999 05 18	704	0.6+	0.6+
1998 03 20	704	0.3+	0.7−	1998 03 22	704	0.0	0.9+	1999 05 18	704	0.2+	0.6−
1998 03 20	704	0.5−	0.2−	1998 03 22	704	(2.6+	2.9−)	1999 05 18	704	0.3−	1.8+
1998 03 20	704	1.2+	0.9+	1999 05 13	704	0.4+	0.9−	1999 05 18	704	1.2−	0.1+
1998 03 20	704	0.1+	0.5+	1999 05 13	704	0.2−	0.6−				
1998 03 20	704	0.6+	0.9−	1999 05 13	704	0.3+	0.1−				

1998 FR₄₈ = 1999 RL₁₉₄

Id. A. Doppler

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	351.79676		(2000.0)	P	Q		
<i>n</i>	0.30832847	ω	95.61053	+0.98930242	+0.14126773		
<i>a</i>	2.1700028	Ω	256.27212	−0.14422633	+0.90973156		
<i>e</i>	0.1776562	<i>i</i>	2.14675	−0.02189730	+0.39042531		
<i>P</i>	3.20	<i>H</i>	15.3	<i>G</i>	0.15	<i>U</i>	4

Residuals in seconds of arc

1998 03 20	704	0.3+	1.2−	1998 03 29	704	0.0	1.4−	1999 08 12	699	0.1−	0.4+
1998 03 20	704	0.7+	0.2+	1998 03 29	704	0.7+	0.8+	1999 08 12	699	0.1+	0.5+
1998 03 20	704	0.3+	1.6+	1998 03 29	704	0.2+	0.4−	1999 09 07	704	0.1−	0.4+
1998 03 20	704	1.2+	0.7+	1998 03 29	704	0.7−	0.6+	1999 09 07	704	0.3+	0.1+
1998 03 20	704	(4.8−	0.0)	1998 03 29	704	0.1−	0.2−	1999 09 07	704	0.2+	0.9−
1998 03 22	704	1.5−	0.0	1999 07 23	704	0.3−	0.2−	1999 09 07	704	0.3+	0.8−
1998 03 22	704	0.8−	1.5−	1999 07 23	704	0.9+	0.2−	1999 09 07	704	0.5+	0.2−
1998 03 22	704	(3.9−	0.0)	1999 07 23	704	0.1−	0.9+	1999 09 08	699	0.1−	0.3+
1998 03 22	704	0.1+	1.5+	1999 07 23	704	0.7+	0.4−	1999 09 08	699	0.4−	0.4+

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1998 03 22	704	(6.0− 2.6+)	1999 07 23	704	0.2− 0.2−	1999 09 08	699	1.1− 0.7+
1998 03 28	704	0.5+ 0.6+	1999 07 23	704	0.7+ 0.1−	1999 09 16	704	0.4− 0.3−
1998 03 28	704	0.3+ 1.3−	1999 07 23	704	0.8− 0.2−	1999 09 16	704	0.6+ 0.6−
1998 03 28	704	1.1− 0.6−	1999 07 23	704	0.6− 0.0	1999 09 16	704	0.2+ 0.2+
1998 03 28	704	0.4− 0.0	1999 08 12	699	0.5− 0.2+	1999 09 16	704	0.4+ 0.1−

1998 FS₅₇

Id. E. Bowell (1999 observations)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	28.42982		(2000.0)	P	Q			
<i>n</i>	0.23701813	ω	322.69412	+0.68673463	+0.72650691			
<i>a</i>	2.5859195	Ω	350.59242	−0.62622607	+0.57442025			
<i>e</i>	0.3143692	<i>i</i>	8.49650	−0.36910222	+0.37713271			
<i>P</i>	4.16	<i>H</i>	14.8	<i>G</i>	0.15	<i>U</i>	4	

Residuals in seconds of arc

1998 03 20	704	0.1− 0.5+	1998 03 29	704	0.9+ 1.6−	1999 10 03	704	0.0 0.4−
1998 03 20	704	1.0− 1.9−	1998 03 29	704	0.2+ 1.0−	1999 10 03	704	0.4+ 0.4+
1998 03 20	704	(2.7+ 0.8−)	1998 03 29	704	1.6+ 0.6−	1999 10 28	703	0.6− 0.1+
1998 03 20	704	0.3+ 0.2−	1998 04 01	704	(1.0− 2.4−)	1999 10 28	703	0.3+ 0.3+
1998 03 22	704	0.5− 1.8+	1998 04 01	704	0.4− 0.2+	1999 10 28	703	0.3− 0.3−
1998 03 22	704	(1.2+ 3.2+)	1998 04 01	704	0.4+ 0.9+	1999 10 28	703	0.4+ 0.1+
1998 03 22	704	1.2+ 1.0−	1998 04 01	704	0.9+ 1.3+	1999 11 03	704	0.5+ 0.4+
1998 03 22	704	0.1− 1.2+	1998 04 01	704	0.4− 0.7+	1999 11 03	704	0.3+ 0.2−
1998 03 28	704	1.0− 0.1+	1998 04 19	704	0.7+ 0.2−	1999 11 03	704	0.9+ 0.1+
1998 03 28	704	1.8− 0.6+	1998 04 19	704	0.1− 0.1−	1999 11 03	704	0.4+ 0.6+
1998 03 28	704	0.8− 1.6−	1998 04 19	704	1.0− 0.0	1999 11 11	703	0.8− 0.3−
1998 03 28	704	0.3+ 1.3+	1998 04 19	704	0.4+ 0.6−	1999 11 11	703	0.8− 0.3+
1998 03 28	704	(3.7− 0.9−)	1999 10 03	704	0.2+ 0.3−	1999 11 11	703	0.1− 0.4−
1998 03 29	704	0.2+ 0.1−	1999 10 03	704	1.0− 0.3−	1999 11 11	703	0.1+ 0.1+

1998 FK₆₅ = 1999 UT₇

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	79.74675		(2000.0)	P	Q			
<i>n</i>	0.29594916	ω	64.35123	+0.18341370	+0.98176473			
<i>a</i>	2.2301016	Ω	216.32840	−0.92946408	+0.15664110			
<i>e</i>	0.1774118	<i>i</i>	4.83907	−0.32008740	+0.10771066			
<i>P</i>	3.33	<i>H</i>	15.2	<i>G</i>	0.15	<i>U</i>	4	

Residuals in seconds of arc

1998 03 20	704	0.7− 0.1−	1998 04 01	704	0.2+ 0.9+	1999 10 03	703	0.4− 0.7+
1998 03 20	704	0.2− 0.3+	1998 04 01	704	0.4+ 0.5+	1999 10 03	703	0.2+ 0.9+
1998 03 20	704	0.8+ 0.8−	1998 04 04	699	0.5+ 1.0+	1999 10 03	703	0.5+ 0.0
1998 03 20	704	0.6+ 0.5−	1998 04 04	699	0.5+ 0.8+	1999 10 03	703	0.6+ 0.2+
1998 03 20	704	0.2+ 1.3−	1998 04 04	699	0.5+ 0.9+	1999 10 29	703	0.1+ 0.4−
1998 03 22	704	0.1+ 0.4−	1998 04 18	704	0.7+ 0.1+	1999 10 29	703	1.2− 0.1+
1998 03 22	704	(3.3− 4.0−)	1998 04 18	704	0.3+ 0.1+	1999 10 29	703	0.8− 0.3+
1998 03 22	704	0.5− 0.4−	1998 04 18	704	0.1− 0.2−	1999 10 29	703	0.4− 0.7+
1998 03 22	704	0.1− 0.8−	1998 04 18	704	(1.1− 2.7−)	1999 11 01	703	0.1+ 0.3+
1998 03 22	699	1.0− 1.8−	1998 04 18	704	0.3− 1.2−	1999 11 01	703	1.0− 0.3−
1998 03 22	699	0.2+ 1.0+	1998 04 20	704	0.0 0.2+	1999 11 01	703	0.4− 0.5−
1998 03 22	699	0.9− 0.4−	1998 04 20	704	0.2− 0.3+	1999 11 01	703	0.3+ 0.9+
1998 03 25	704	0.1− 0.6+	1998 04 20	704	0.4− 0.4−	1999 11 04	704	0.2− 0.0
1998 03 25	704	0.8+ 0.1+	1998 04 20	704	0.6+ 0.7−	1999 11 04	704	0.0 0.1−
1998 03 25	704	0.3− 0.7+	1998 04 20	704	0.3+ 0.3−	1999 11 04	704	0.6− 0.0
1998 03 25	704	0.5+ 0.7+	1998 04 22	704	0.0 0.2−	1999 11 04	704	0.5− 0.2−
1998 03 25	704	0.3− 0.3+	1998 04 22	704	0.3+ 0.4+	1999 11 04	704	0.3+ 0.1+
1998 03 25	566	0.5− 0.5−	1998 04 22	704	0.1− 0.7−	1999 11 12	704	0.7+ 0.5−
1998 03 25	566	1.0− 0.1−	1998 04 22	704	1.5− 1.0+	1999 11 12	704	0.3+ 0.1−
1998 03 25	566	0.4− 0.2−	1998 04 22	704	0.3+ 0.5+	1999 11 12	704	0.7+ 0.4−
1998 04 01	704	0.2+ 0.8+	1998 04 24	699	0.0 0.2−	1999 11 12	704	0.7+ 0.3−
1998 04 01	704	0.5+ 0.5+	1998 04 24	699	0.6+ 0.2+	1999 11 12	704	0.9+ 0.2−
1998 04 01	704	0.5− 0.1+	1998 04 24	699	0.8+ 0.0			

1998 FA₆₉

Id. W. Bickel (1999 observations)

1999 NOV. 23

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	67.39877		(2000.0)	P	Q			
<i>n</i>	0.29737149	ω	301.57651	+0.44911145	+0.89346499			
<i>a</i>	2.2229848	Ω	355.10402	−0.80135576	+0.40063184			
<i>e</i>	0.1844814	<i>i</i>	2.94455	−0.39513018	+0.20301341			
<i>P</i>	3.31	<i>H</i>	14.7	<i>G</i>	0.15	<i>U</i>	4	

Residuals in seconds of arc

1998 03 20	704	0.5+ 0.3−	1998 03 28	704	0.1+ 0.2−	1999 10 31	621	0.0 0.0
1998 03 20	704	0.1− 0.4+	1998 03 28	704	1.2− 1.2−	1999 10 31	621	0.1− 0.1+
1998 03 20	704	0.3+ 0.7+	1998 03 29	704	0.3+ 0.1+	1999 10 31	621	0.1− 0.2+
1998 03 20	704	0.7− 1.8+	1998 03 29	704	0.4− 0.9+	1999 10 31	621	0.2− 0.1+
1998 03 22	704	0.3− 0.3+	1998 03 29	704	0.7− 0.2+	1999 10 31	621	0.1− 0.2+
1998 03 22	704	0.9− 0.8−	1998 03 29	704	0.2+ 0.1+	1999 10 31	621	0.0 0.1+
1998 03 22	704	1.3− 0.1−	1998 03 29	704	0.3+ 0.1−	1999 11 01	621	0.1− 0.1+
1998 03 22	704	0.3+ 0.2−	1998 04 01	704	0.4+ 0.1−	1999 11 01	621	0.1− 0.2+
1998 03 22	704	(0.6− 2.1−)	1998 04 01	704	0.2− 0.5−	1999 11 01	621	0.0 0.1+
1998 03 22	699	0.1− 0.2+	1998 04 01	704	0.1+ 0.0	1999 11 03	704	0.6+ 0.3−
1998 03 22	699	1.0+ 0.6+	1998 04 01	704	0.2− 0.1+	1999 11 03	704	0.6+ 0.1+
1998 03 22	699	0.1+ 0.8+	1998 04 01	704	0.9+ 0.9−	1999 11 03	704	0.1− 0.3−
1998 03 24	699	0.5+ 0.6−	1998 04 18	704	0.4− 0.1−	1999 11 03	704	0.1+ 0.8−
1998 03 24	699	0.6+ 0.1+	1998 04 18	704	0.3+ 0.4+	1999 11 03	704	0.3− 0.7−
1998 03 24	699	0.3+ 0.4+	1998 04 18	704	0.6− 0.2+	1999 11 04	621	0.6− 0.0
1998 03 25	704	0.1+ 0.7−	1998 04 18	704	0.3− 0.1+	1999 11 04	621	0.3− 0.2+
1998 03 25	704	0.2+ 0.6−	1998 04 20	704	0.0 0.8−	1999 11 04	621	0.1− 0.1+
1998 03 25	704	0.6+ 0.8−	1998 04 20	704	0.3− 0.5+	1999 11 04	704	0.0 0.0
1998 03 25	704	0.0 0.4−	1998 04 20	704	0.0 0.7+	1999 11 04	704	0.5+ 0.5+
1998 03 25	704	0.1− 0.7−	1998 04 20	704	0.2+ 0.3+	1999 11 04	704	0.3+ 0.1−
1998 03 26	566	0.2− 0.2+	1998 04 20	704	0.0 0.9+	1999 11 04	703	0.0 0.2+
1998 03 26	566	0.4− 0.4+	1998 04 22	704	0.7+ 0.2−	1999 11 04	704	0.0 0.0
1998 03 26	566	0.2− 0.4+	1998 04 22	704	0.2− 1.0+	1999 11 04	703	0.6− 0.1−
1998 03 28	704	0.2+ 0.1−	1998 04 22	704	0.4+ 0.8−	1999 11 04	704	0.2+ 0.2−
1998 03 28	704	0.2− 0.2−	1998 04 22	704	0.0 0.0	1999 11 04	703	0.1+ 0.2−
1998 03 28	704	0.4+ 0.4−	1998 04 22	704	0.1+ 1.0−	1999 11 04	703	0.2+ 0.6+

1998 FA₇₀ = 1999 VE₃₀

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	41.44429		(2000.0)	P	Q			
<i>n</i>	0.27406611	ω	255.11074	+0.74239973	+0.66695181			
<i>a</i>	2.3472850	Ω	63.01240	−0.58408408	+0.69068144			
<i>e</i>	0.2689180	<i>i</i>	4.07908	−0.32815916	+0.27952537			
<i>P</i>	3.60	<i>H</i>	15.2	<i>G</i>	0.15	<i>U</i>	5	

Residuals in seconds of arc

1998 03 20	704	1.4− 0.5+	1998 04 20	704	4.5− 0.3+	1999 11 03	704	0.1− 0.5−
1998 03 20	704	0.6− 0.8−	1998 04 22	704	0.2− 0.5−	1999 11 03	704	0.9− 0.3−
1998 03 20	704	1.0+ 1.7+	1998 04 22	704	1.5+ 0.3−	1999 11 03	704	1.3+ 0.0
1998 03 20	704	0.2+ 0.4+	1998 04 22	704	0.7+ 0.5−	1999 11 03	704	0.4+ 0.3−
1998 03 22	704	1.1− 0.8−	1998 04 22	704	2.2− 1.4−	1999 11 03	704	0.3+ 0.3−
1998 03 22	704	0.7− 0.8+	1998 05 01	691	1.5+ 0.3−	1999 11 12	704	0.3+ 0.0
1998 03 22	704	0.4+ 0.9+	1998 05 01	691	1.3+ 0.3−	1999 11 12	704	0.4− 0.1−
1998 03 22	704	1.5+ 1.1+	1998 05 01	691	1.2+ 0.6−	1999 11 12	704	0.2− 0.0
1998 04 20	704	0.2− 0.1+	1998 05 16	691	0.0 0.7−	1999 11 12	704	0.0 0.2+
1998 04 20	704	0.7+ 0.3+	1998 05 16	691	0.2+ 1.1−	1999 11 12	704	0.4− 0.3+
1998 04 20	704	0.3+ 1.2+	1998 05 16	691	0.4+ 0.9−			

1998 FC₇₁ = 1999 UQ₆

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

M	95.90126		(2000.0)	P	Q
n	0.29454418	ω	58.01685	−0.21232450	+0.97709274
a	2.2371877	Ω	199.73987	−0.91035670	−0.20314533
e	0.1139387	i	2.44786	−0.35520275	−0.06341734
P	3.35	H	15.3	G 0.15	U 4

1999 NOV. 23

M.P.C. 36805

Residuals in seconds of arc

1998 03 20	704	1.4+	0.9+	1998 03 25	704	0.9+	0.4-	1998 04 22	704	0.4+	0.1+
1998 03 20	704	0.4-	0.6-	1998 03 25	704	0.8+	1.0+	1998 04 24	699	0.2-	0.1-
1998 03 20	704	1.8+	1.8-	1998 03 25	704	1.8+	0.6-	1998 04 24	699	0.1-	0.6+
1998 03 20	704	(2.7+	0.0)	1998 04 01	704	0.0	0.4+	1998 04 24	699	0.1-	0.4+
1998 03 20	704	1.8-	0.1-	1998 04 01	704	0.0	0.6+	1999 10 29	327	0.9-	0.2-
1998 03 22	704	0.0	0.9+	1998 04 01	704	0.3+	0.2+	1999 10 29	327	0.0	0.2+
1998 03 22	704	0.6-	0.8-	1998 04 01	704	0.4-	0.2+	1999 10 29	327	0.1+	0.3+
1998 03 22	704	0.2-	1.4-	1998 04 01	704	0.6+	0.0	1999 10 29	327	0.6-	0.1-
1998 03 22	704	(2.3-	0.2-)	1998 04 20	704	1.1+	0.0	1999 10 31	327	0.5-	0.5-
1998 03 24	704	0.5-	0.8+	1998 04 20	704	0.2+	0.6+	1999 10 31	327	0.2-	0.2+
1998 03 24	704	0.5-	0.7-	1998 04 20	704	0.5-	0.7+	1999 10 31	327	0.0	0.9+
1998 03 24	704	1.7-	0.9-	1998 04 20	704	0.5+	1.0+	1999 11 12	704	0.2+	0.4+
1998 03 24	704	1.2-	1.0+	1998 04 20	704	0.8-	0.2+	1999 11 12	704	0.3+	1.5+
1998 03 24	704	(3.0-	1.3-)	1998 04 22	704	0.2-	0.3+	1999 11 12	704	0.5+	0.2-
1998 03 25	704	0.1-	0.7+	1998 04 22	704	0.6-	1.3-	1999 11 12	704	0.7+	0.5-
1998 03 25	704	0.1+	0.1-	1998 04 22	704	0.6+	0.1-	1999 11 12	704	0.3-	0.1-

1998 FR₇₂

Id. E. Bowell (1999 observations)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>		(2000.0)		P		Q	
<i>n</i>	0.28334991	ω	286.37816	+0.64166875	+0.76673905		
<i>a</i>	2.2957292	Ω	23.57161	-0.68399100	+0.58344044		
<i>e</i>	0.2212923	<i>i</i>	2.76616	-0.34701228	+0.26778441		
<i>P</i>	3.48	<i>H</i>	14.9	<i>G</i>	0.15	<i>U</i>	4

Residuals in seconds of arc

1998 03 20	704	1.5+	1.4-	1998 04 20	704	0.6+	0.7-	1999 10 06	704	0.0	0.2-
1998 03 20	704	1.0-	0.5+	1998 04 20	704	1.4+	0.3+	1999 10 06	704	0.9-	0.2-
1998 03 20	704	1.1-	1.6+	1998 04 22	704	1.3-	0.6+	1999 11 03	704	0.3+	0.4+
1998 03 20	704	0.9-	0.2-	1998 04 22	704	0.8+	0.1-	1999 11 03	704	0.1-	0.6+
1998 03 22	704	0.7-	0.3+	1998 04 22	704	0.2-	0.2-	1999 11 03	704	0.5-	0.2-
1998 03 22	704	1.0+	1.7+	1998 04 22	704	0.4-	0.7-	1999 11 03	704	(2.8-	0.8+)
1998 03 22	704	(1.2+	2.8+)	1998 04 22	704	0.0	1.0-	1999 11 14	012	0.3-	0.2+
1998 03 22	704	0.7+	1.6-	1999 10 06	704	1.1+	0.6-	1999 11 14	012	0.3-	0.3+
1998 04 20	704	0.8-	0.1-	1999 10 06	704	0.8+	0.8-				
1998 04 20	704	0.1-	0.2+	1999 10 06	704	0.4+	0.7-				

1998 FM₇₈ = 1999 VO₃

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>		(2000.0)		P		Q	
<i>n</i>	0.30573165	ω	247.04486	+0.74185250	+0.66671872		
<i>a</i>	2.1822732	Ω	71.05918	-0.58412145	+0.69503007		
<i>e</i>	0.1565485	<i>i</i>	4.34750	-0.32932811	+0.26910844		
<i>P</i>	3.22	<i>H</i>	15.1	<i>G</i>	0.15	<i>U</i>	4

Residuals in seconds of arc

1998 03 24	704	0.3-	1.1+	1998 04 20	704	(3.1-	0.2-)	1999 09 18	703	1.4+	1.8-
1998 03 24	704	0.3+	0.0	1998 04 22	704	0.2-	1.5-	1999 11 01	691	0.4-	0.1-
1998 03 24	704	1.3+	0.8-	1998 04 22	704	(2.2-	0.3-)	1999 11 01	691	0.4-	0.1-
1998 03 24	704	(2.7-	1.3+)	1998 04 22	704	0.2-	0.9-	1999 11 01	691	0.1+	0.5+
1998 03 24	704	1.0-	0.1-	1998 04 22	704	0.7-	0.5-	1999 11 02	691	0.0	0.5-
1998 03 25	704	0.3-	0.2-	1998 04 22	704	0.6-	0.4+	1999 11 02	691	0.0	0.4-
1998 03 25	704	1.1+	1.7+	1998 05 16	704	0.9-	0.3+	1999 11 02	691	0.1-	0.4-
1998 03 25	704	(2.9+	0.4+)	1998 05 16	704	0.3+	0.9-	1999 11 04	704	0.1-	0.1+
1998 03 25	704	0.9+	1.0+	1998 05 16	704	0.1+	0.1-	1999 11 04	704	0.3-	0.1+
1998 03 25	704	0.0	0.5+	1998 05 16	704	1.2+	0.7+	1999 11 04	704	0.2+	0.5-
1998 04 20	704	0.3-	1.3-	1998 05 16	704	(6.5-	1.7+)	1999 11 04	704	0.4+	1.0+
1998 04 20	704	0.4+	1.2-	1999 09 18	703	0.8-	0.1+	1999 11 04	704	0.1-	0.2-
1998 04 20	704	1.3-	0.7+	1999 09 18	703	0.8+	0.5+				
1998 04 20	704	0.3-	0.3-	1999 09 18	703	0.1+	0.2+				

1998 FO₁₀₃

Id. J. Waller (1999 observations), E. Bowell (1999 observations)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>		(2000.0)		P		Q	
<i>n</i>	0.28161124	ω	335.20551	+0.43694977	+0.89771897		
<i>a</i>	2.3051687	Ω	320.63693	-0.80973229	+0.36529675		
<i>e</i>	0.1754938	<i>i</i>	5.09749	-0.39167400	+0.24629033		
<i>P</i>	3.50	<i>H</i>	14.7	<i>G</i>	0.15	<i>U</i>	4

Residuals in seconds of arc

1998 02 24	566	0.6-	0.3-	1998 04 01	704	0.4+	0.5-	1999 11 04	703	0.5+	0.0
1998 02 24	566	0.4-	0.1-	1998 04 01	704	0.5+	0.1+	1999 11 04	703	0.3+	0.2-
1998 02 24	566	0.4-	0.2-	1998 04 18	704	0.3+	0.6-	1999 11 04	703	0.4+	0.2+
1998 03 30	910	1.1+	0.0	1998 04 18	704	0.2-	0.9+	1999 11 04	703	0.7+	0.5+
1998 03 30	910	0.8+	0.1+	1998 04 18	704	1.5-	0.6+	1999 11 09	723	(2.3-	1.3+)
1998 03 30	910	0.9+	0.7+	1998 04 18	704	0.8-	0.8+	1999 11 09	723	0.7-	0.9+
1998 03 31	704	0.2+	0.4+	1998 04 19	704	0.0	0.1+	1999 11 09	723	0.3-	0.3-
1998 03 31	704	(2.0-	0.7+)	1998 04 19	704	0.2-	0.4-	1999 11 11	723	0.9-	0.0
1998 03 31	704	0.0	0.4+	1998 04 19	704	0.3+	1.3-	1999 11 11	723	(3.8+	0.6-)
1998 03 31	704	0.8+	0.2+	1998 04 19	704	1.2-	0.2-	1999 11 16	723	0.5-	0.6-
1998 03 31	704	0.5-	1.3-	1999 10 28	703	0.2+	0.5+	1999 11 16	723	0.0	0.8-
1998 04 01	704	0.8-	0.1-	1999 10 28	703	0.1-	0.4+	1999 11 16	723	0.2+	0.6-
1998 04 01	704	0.8+	0.8+	1999 10 28	703	0.3+	0.2+				
1998 04 01	704	0.4+	0.2+	1999 10 28	703	0.2-	0.1-				

1998 FN₁₀₉ = 1999 UL₂₃

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>		(2000.0)		P		Q	
<i>n</i>	0.30668948	ω	319.21551	-0.46702204	+0.88096413		
<i>a</i>	2.1777271	Ω	282.81734	-0.78964863	-0.45424619		
<i>e</i>	0.0362933	<i>i</i>	4.47673	-0.39792644	-0.13252396		
<i>P</i>	3.21	<i>H</i>	14.7	<i>G</i>	0.15	<i>U</i>	4

Residuals in seconds of arc

1998 03 31	704	0.0	0.1-	1998 04 19	704	1.7-	0.9+	1999 10 28	703	0.0	0.4-
1998 03 31	704	0.0	0.7+	1998 04 19	704	0.1+	0.5-	1999 10 28	703	0.1-	0.8+
1998 03 31	704	0.2-	0.5+	1998 04 19	704	0.1+	0.1+	1999 10 28	703	0.4-	0.3+
1998 03 31	704	0.8-	0.2+	1998 04 19	704	0.4-	0.3+	1999 10 28	703	0.2-	0.4-
1998 03 31	704	0.0	0.9+	1998 04 19	704	0.4+	0.3-	1999 11 04	703	0.7+	0.3-
1998 04 01	704	0.9+	0.0	1998 04 20	704	0.0	0.3-	1999 11 04	703	0.7+	0.3+
1998 04 01	704	0.2+	0.8-	1998 04 20	704	0.6+	0.0	1999 11 04	703	0.3-	0.1-
1998 04 01	704	0.7-	0.7+	1998 04 20	704	0.2+	0.1-	1999 11 04	703	0.4-	0.3-
1998 04 01	704	0.5+	0.5-	1998 04 20	704	0.3+	0.4+				
1998 04 01	704	0.4+	1.6-	1998 04 20	704	0.1-	0.6-				

1998 FP₁₁₃ = 1999 UK₂₃

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>		(2000.0)		P		Q	
<i>n</i>	0.26017863	ω	340.14021	+0.57006141	+0.81855026		
<i>a</i>	2.4300859	Ω	324.51184	-0.73637901	+0.47084151		
<i>e</i>	0.1369187	<i>i</i>	6.99999	-0.36438432	+0.32906496		
<i>P</i>	3.79	<i>H</i>	14.5	<i>G</i>	0.15	<i>U</i>	4

Residuals in seconds of arc

1998 03 25	566	0.4+	0.2-	1998 04 01	704	0.4+	1.6+	1998 04 30	566	0.3+	0.5-
1998 03 25	566	0.9-	0.4-	1998 04 18	704	0.1+	0.0	1998 04 30	566	0.2+	0.3-
1998 03 25	566	1.0-	0.2-	1998 04 18	704	0.0	0.8+	1999 10 28	703	0.9+	0.9-
1998 03 31	704	0.1+	0.3-	1998 04 18	704	0.2+	0.4-	1999 10 28	703	0.1+	0.3+
1998 03 31	704	1.7+	0.2+	1998 04 18	704	0.4+	0.5+	1999 10 28	703	1.1-	1.0+
1998 03 31	704	0.4+	0.2+	1998 04 18	704	3.5-	0.9-	1999 10 28	703	0.2-	0.7+
1998 03 31	704	0.5+	2.1-	1998 04 19	704	0.4+	0.7+	1999 11 04	703	0.3+	0.0
1998 04 01	704	0.3-	0.0	1998 04 19	704	0.5+	0.2-	1999 11 04	703	0.1+	0.1+
1998 04 01	704	0.7+	0.1+	1998 04 19	704	0.1-	0.5+	1999 11 04	703	0.3+	0.6-
1998 04 01	704	0.9-	0.4+	1998 04 19	704	0.4+	0.5+	1999 11 04	703	0.4-	0.5-
1998 04 01	704	0.1-	0.9+	1998 04 30	566	0.2+	0.8-				

1998 FB₁₁₈

Id. J. Waller (1999 observations), E. Bowell (1999 observations)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	60.04924		(2000.0)		P		Q
<i>n</i>	0.28494428	ω	306.51171		+0.45657749		+0.88950881
<i>a</i>	2.2871576	Ω	350.60532		-0.77782667		+0.38947169
<i>e</i>	0.1235873	<i>i</i>	6.20287		-0.43188270		+0.23892654
<i>P</i>	3.46	<i>H</i>	15.0		<i>G</i>	0.15	<i>U</i> 4

Residuals in seconds of arc

1998 03 25	704	1.1+	1.4-	1998 04 20	704	0.1+	1.1+	1999 10 31	703	0.0	0.4+
1998 03 25	704	0.7-	0.1+	1998 04 20	704	0.3+	1.3+	1999 10 31	703	0.1+	0.1+
1998 03 25	704	0.3-	0.4-	1998 04 20	704	0.5-	0.1-	1999 10 31	703	0.1+	0.3+
1998 03 25	704	0.4+	0.1+	1998 04 21	704	0.2-	0.4+	1999 10 31	703	0.2+	0.5+
1998 03 25	704	0.4-	0.2+	1998 04 21	704	(2.3+	1.4-)	1999 11 04	703	0.5+	0.0
1998 03 31	704	0.4-	0.3+	1998 04 21	704	0.1-	0.4+	1999 11 04	703	0.2-	0.5+
1998 03 31	704	0.0	0.5-	1998 04 21	704	0.1-	0.0	1999 11 04	703	0.3+	0.1+
1998 03 31	704	(2.5+	0.5+)	1998 04 30	699	0.4+	0.9+	1999 11 04	703	0.0	0.6-
1998 03 31	704	0.5+	0.5-	1998 04 30	699	0.5+	0.5+	1999 11 12	723	0.5-	0.5-
1998 04 01	704	0.2+	0.2-	1998 04 30	699	1.3+	1.1+	1999 11 12	723	0.5-	0.9-
1998 04 01	704	(2.3+	1.4-)	1998 05 16	704	0.1+	0.3-	1999 11 13	723	(2.9-	0.4-)
1998 04 01	704	0.5-	0.4+	1998 05 16	704	0.1+	1.3-	1999 11 13	723	(2.7-	0.8-)
1998 04 01	704	0.1+	1.0-	1998 05 16	704	0.1-	1.3-				
1998 04 20	704	0.5-	1.0+	1998 05 16	704	1.1-	1.0-				

1998 FU₁₂₀ = 1996 VS₆ = 1999 VC

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	24.03235		(2000.0)		P		Q
<i>n</i>	0.31777054	ω	93.42652		+0.86238972		+0.50598501
<i>a</i>	2.1268015	Ω	236.17735		-0.47187949		+0.79183057
<i>e</i>	0.1749279	<i>i</i>	1.11884		-0.18334045		+0.34202855
<i>P</i>	3.10	<i>H</i>	15.2		<i>G</i>	0.15	<i>U</i> 4

Residuals in seconds of arc

1996 11 13	369	(10.8+	30.3+)	1998 04 01	704	0.9+	1.0+	1999 11 01	739	0.5-	0.1+
1996 11 13	369	(11.5+	30.6+)	1998 04 01	704	0.8+	1.1-	1999 11 02	739	0.4+	0.3-
1996 11 13	369	(11.2+	31.1+)	1998 04 01	704	(2.5-	0.1-)	1999 11 02	739	0.8-	0.6+
1996 11 15	369	0.6-	0.1+	1998 04 18	704	0.5+	0.1+	1999 11 02	739	1.2+	1.2-
1996 11 15	369	0.2+	0.5-	1998 04 18	704	1.5+	0.6-	1999 11 03	649	0.1+	0.1-
1996 11 15	369	0.6-	0.0	1998 04 18	704	1.2-	0.2-	1999 11 03	649	0.4+	0.2-
1996 11 15	369	0.5+	0.2-	1998 04 18	704	1.2+	1.0-	1999 11 03	649	0.1-	0.2+
1996 11 15	369	0.5-	0.4+	1998 04 19	704	1.5+	0.7-	1999 11 03	849	(3.0-	0.5-)
1996 11 15	369	1.1+	0.5-	1998 04 19	704	1.6-	1.2+	1999 11 03	849	1.0+	0.4+
1998 03 20	704	0.1+	0.9+	1998 04 19	704	0.7-	1.5+	1999 11 03	849	0.0	0.5-
1998 03 20	704	0.0	0.9+	1998 04 19	704	1.1-	1.8-	1999 11 03	739	0.0	0.1-
1998 03 20	704	1.4-	1.5-	1998 04 19	704	0.5-	0.6-	1999 11 03	739	0.1+	0.1-
1998 03 20	704	1.4+	0.3-	1999 10 03	704	0.8+	0.7+	1999 11 03	703	0.0	1.4+
1998 03 20	704	0.6-	0.2+	1999 10 03	704	0.1+	0.3+	1999 11 03	703	1.6-	0.2+
1998 03 22	704	1.2+	0.8+	1999 10 03	704	0.1-	0.2-	1999 11 03	703	0.3-	0.5+
1998 03 22	704	0.7-	1.5+	1999 10 03	704	0.1-	0.5+	1999 11 03	703	0.4+	0.1-
1998 03 22	704	1.0+	0.6+	1999 10 03	704	0.2-	0.5+	1999 11 04	704	0.3+	0.2+
1998 03 22	704	0.5-	1.6+	1999 11 01	739	0.4-	0.4-	1999 11 04	704	0.1+	0.2-
1998 03 29	704	0.5+	0.2-	1999 11 01	739	0.5-	0.4-	1999 11 04	704	0.3+	0.2+
1998 03 29	704	0.9-	1.0+	1999 11 01	739	0.2+	0.4-	1999 11 04	704	0.2+	0.1-
1998 03 29	704	1.2-	1.1-	1999 11 01	739	(2.2-	0.1-)	1999 11 04	704	0.2+	0.1-
1998 03 29	704	0.6-	1.5-	1999 11 01	739	0.2-	0.2+				
1998 04 01	704	0.5+	0.4-	1999 11 01	739	1.0-	0.6-				

1998 FQ₁₂₂ = 1999 VN₄₃

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	30.63341		(2000.0)		P		Q
<i>n</i>	0.23127014	ω	282.71355		+0.59245825		+0.80206040
<i>a</i>	2.6285909	Ω	24.10728		-0.64872339		+0.53051830
<i>e</i>	0.2672392	<i>i</i>	10.64471		-0.47765174		+0.27431632
<i>P</i>	4.26	<i>H</i>	14.8		<i>G</i>	0.15	<i>U</i> 4

Residuals in seconds of arc

1998 03 20	704	1.2+	0.8-	1998 04 20	704	0.4+	0.4-	1999 11 01	703	0.0	0.1+
1998 03 20	704	0.5+	1.1+	1998 04 20	704	1.4-	2.1-	1999 11 01	703	0.5+	0.2-
1998 03 20	704	0.1-	0.5+	1998 04 20	704	0.1-	0.5+	1999 11 01	703	0.2-	0.2-
1998 03 20	704	0.8+	0.2+	1998 04 22	704	0.1+	1.8-	1999 11 04	703	0.6+	0.2+
1998 03 22	704	0.2+	0.4-	1998 04 22	704	0.2+	1.2+	1999 11 04	703	0.2+	0.1+
1998 03 22	704	2.2-	1.6-	1998 04 22	704	0.3-	0.2-	1999 11 04	703	0.4-	0.2+
1998 03 22	704	0.3+	0.4+	1998 04 22	704	0.7+	0.6+	1999 11 04	703	0.2-	0.4-
1998 03 22	704	0.8-	0.6+	1998 04 22	704	0.3+	1.4+				
1998 04 20	704	0.0	0.5+	1999 11 01	703	0.5-	0.1+				

1998 FN₁₂₆ = 1976 JR₅

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	73.84385		(2000.0)		P		Q
<i>n</i>	0.31107870	ω	1.06356		+0.40399675		+0.91370839
<i>a</i>	2.1571940	Ω	292.76593		-0.83962707		+0.35135894
<i>e</i>	0.1595623	<i>i</i>	2.72628		-0.36306061		+0.20416629
<i>P</i>	3.17	<i>H</i>	15.0		<i>G</i>	0.15	<i>U</i> 2

Residuals in seconds of arc

1976 05 03	809	0.1-	0.5-	1998 03 29	428	0.6-	0.6-	1998 04 28	428	0.4+	0.2-
1998 03 20	704	(2.6-	1.2-)	1998 03 29	428	0.1-	0.4-	1998 04 28	428	0.5+	0.5-
1998 03 20	704	0.6-	0.2+	1998 04 01	704	1.1-	0.5-	1998 05 18	428	1.4+	0.2-
1998 03 20	704	0.0	1.7+	1998 04 01	704	0.6-	0.0	1998 05 18	428	0.7+	0.1+
1998 03 20	704	1.1-	1.6+	1998 04 01	704	0.7-	0.0	1998 05 26	428	1.1+	0.1+
1998 03 20	704	1.9-	1.0+	1998 04 01	704	0.3-	1.4-	1998 05 26	428	1.3+	0.1-
1998 03 24	699	0.1-	0.6+	1998 04 01	704	0.6-	0.7-	1998 06 18	428	0.9+	0.5-
1998 03 24	699	0.2-	0.6+	1998 04 04	428	0.2-	0.0	1998 06 18	428	0.7+	0.0
1998 03 24	699	0.4-	0.3+	1998 04 04	428	0.3-	0.0	1998 07 15	428	1.0-	0.5-
1998 03 25	704	(2.5-	0.1-)	1998 04 04	428	0.5-	0.1+	1998 07 15	428	1.6-	0.4-
1998 03 25	704	0.1-	0.5-	1998 04 18	704	0.6+	0.3-	1999 10 09	428	0.2+	0.2-
1998 03 25	704	1.0-	0.5+	1998 04 18	704	0.9+	0.6+	1999 10 09	428	0.4-	0.8-
1998 03 25	704	0.4-	0.2-	1998 04 18	704	0.1+	0.4-	1999 10 29	428	0.1+	0.1-
1998 03 25	704	0.5-	0.2+	1998 04 18	704	0.1+	0.8-	1999 11 03	704	0.1-	0.2-
1998 03 26	566	0.6-	0.0	1998 04 19	704	0.7+	0.6+	1999 11 03	704	0.7+	0.3-
1998 03 26	566	0.4-	0.5-	1998 04 19	704	1.6+	1.0+	1999 11 03	704	0.3+	0.6-
1998 03 26	566	0.6-	0.1+	1998 04 19	704	1.8+	1.2+	1999 11 03	704	0.5+	0.3-
1998 03 28	704	0.1-	0.6-	1998 04 19	704	1.5+	0.5+	1999 11 03	704	0.6+	0.3-
1998 03 28	704	0.2-	0.1+	1998 04 19	428	0.3+	0.2-	1999 11 03	428	0.0	0.3-
1998 03 28	704	0.1-	0.5-	1998 04 19	428	0.6+	0.1-	1999 11 03	428	0.1-	0.1-
1998 03 28	704	0.0	0.6-	1998 04 20	704	0.8+	0.4+	1999 11 04	703	0.3-	0.1-
1998 03 28	704	0.2-	0.9-	1998 04 20	704	0.2+	0.8+	1999 11 04	703	0.2-	0.3+
1998 03 28	428	0.5-	0.3-	1998 04 20	704	0.2+	0.1-	1999 11 04	703	0.4-	0.5+
1998 03 28	428	0.6-	0.6-	1998 04 20	704	0.6+	0.1+	1999 11 04	703	0.7-	0.1+
1998 03 29	704	1.2-	0.1-	1998 04 20	704	0.2+	0.3+	1999 11 12	012	0.3-	1.0+
1998 03 29	704	1.5-	0.5-	1998 04 22	704	1.3+	0.2+	1999 11 12	012	0.2+	0.4-
1998 03 29	704	1.1-	0.0	1998 04 22	704	1.0+	1.0+	1999 11 12	596	0.2+	0.7+
1998 03 29	704	1.3-	0.2+	1998 04 22	704	1.2+	0.3-	1999 11 12	596	0.2-	0.8+
1998 03 29	704	1.2-	0.3+	1998 04 22	704	1.2+	0.2-	1999 11 12	596	0.2-	0.8+
1998 03 29	428	0.0	0.7-	1998 04 22	704	1.4+	0.3-				

1999 NOV. 23

M.P.C. 36807

1998 HX

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	38.70281		(2000.0)	P	Q
<i>n</i>	0.26636415	ω	194.40406	+0.61163619	+0.78809339
<i>a</i>	2.3923178	Ω	113.35112	-0.71817635	+0.58986158
<i>e</i>	0.1007538	<i>i</i>	4.33233	-0.33184921	+0.17598897
<i>P</i>	3.70	<i>H</i>	13.7	<i>G</i> 0.15	<i>U</i> 3

Residuals in seconds of arc

1998 03 24	704	0.9-	1.0+	1998 04 21	704	0.3+	0.8-	1998 05 28	699	0.3-	0.8-
1998 03 24	704	0.9+	0.1+	1998 04 22	704	0.5+	0.3-	1998 05 28	699	0.3+	1.0+
1998 03 24	704	0.1-	0.7-	1998 04 22	704	0.9+	0.2+	1999 10 01	106	0.4-	0.1+
1998 03 24	704	0.1-	0.1-	1998 04 22	704	0.2+	0.3+	1999 10 01	106	0.1-	0.4+
1998 03 24	704	1.1-	1.2-	1998 04 22	704	0.1+	0.4+	1999 10 01	106	0.1+	0.4+
1998 04 04	699	0.2+	0.9-	1998 04 22	704	0.2-	0.2+	1999 10 21	701	1.6-	0.1+
1998 04 04	699	0.1+	0.2-	1998 04 26	691	0.5+	0.7+	1999 10 21	701	0.1-	0.1+
1998 04 04	699	1.2-	0.5+	1998 04 26	691	0.4+	0.5+	1999 10 21	701	0.7+	0.2+
1998 04 17	691	0.2-	0.7+	1998 04 26	691	0.5+	0.6+	1999 11 02	701	0.2+	0.8-
1998 04 17	691	0.0	0.5+	1998 05 16	704	0.0	0.2-	1999 11 02	701	0.6+	0.3-
1998 04 17	691	0.0	0.3+	1998 05 16	704	0.2-	0.1+	1999 11 02	701	0.1+	0.8-
1998 04 19	691	0.6+	0.9+	1998 05 16	704	0.5-	0.2-	1999 11 07	145	0.1+	0.3-
1998 04 19	691	0.5+	0.8+	1998 05 16	704	1.1-	1.6-	1999 11 07	145	0.2-	0.3+
1998 04 19	691	1.0+	0.5+	1998 05 16	704	1.1-	0.4-	1999 11 07	145	0.1-	0.8+
1998 04 21	704	0.2-	0.5+	1998 05 25	699	0.7-	0.3-	1999 11 07	145	0.0	0.9+
1998 04 21	704	0.6+	0.1+	1998 05 25	699	0.3-	0.1-	1999 11 13	723	0.7+	0.3-
1998 04 21	704	0.0	0.7-	1998 05 25	699	0.1-	0.7-	1999 11 13	723	0.0	0.4-
1998 04 21	704	0.6+	0.9-	1998 05 28	699	0.0	0.3+				

1998 HF₄ = 1999 SB₆

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Doppler

<i>M</i>	343.95928		(2000.0)	P	Q
<i>n</i>	0.26474009	ω	282.78730	+0.99291355	+0.02116773
<i>a</i>	2.4020917	Ω	76.08946	+0.03031356	+0.90634376
<i>e</i>	0.1346209	<i>i</i>	6.91932	-0.11490763	+0.42201055
<i>P</i>	3.72	<i>H</i>	15.8	<i>G</i> 0.15	<i>U</i> 5

Residuals in seconds of arc

1998 04 19	691	0.2-	0.2+	1998 04 22	691	0.5+	0.1+	1999 09 30	704	0.1-	0.1-
1998 04 19	691	0.6-	0.5+	1998 04 22	704	0.5-	1.0-	1999 09 30	704	0.0	0.2+
1998 04 19	691	0.6-	0.1+	1998 04 22	691	0.5+	0.1-	1999 09 30	704	0.6+	0.3-
1998 04 21	704	0.9-	1.1-	1998 04 22	704	0.4+	0.4-	1999 09 30	704	0.7-	1.4-
1998 04 21	704	1.3+	0.7-	1998 04 22	704	0.1-	0.5+	1999 10 01	704	0.8+	0.3-
1998 04 21	704	0.4-	0.6+	1998 04 22	704	1.0+	0.9+	1999 10 01	704	0.1-	0.7+
1998 04 21	704	(3.6-	0.1-)	1998 04 26	691	0.3-	0.2+	1999 10 01	704	0.4+	0.4+
1998 04 22	691	0.3+	0.3+	1998 04 26	691	0.4-	0.2+	1999 10 01	704	0.5-	0.2-
1998 04 22	704	0.5+	0.1-	1998 04 26	691	0.6-	0.1-	1999 10 01	704	0.4-	1.0+

1998 HO₂₇

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	6.24296		(2000.0)	P	Q
<i>n</i>	0.26851605	ω	256.99040	+0.99131909	+0.07893647
<i>a</i>	2.3795192	Ω	98.40966	-0.03312702	+0.92387330
<i>e</i>	0.0774800	<i>i</i>	6.10138	-0.12723627	+0.37446917
<i>P</i>	3.67	<i>H</i>	13.5	<i>G</i> 0.15	<i>U</i> 3

Residuals in seconds of arc

1998 04 21	691	0.1-	0.6+	1998 05 25	699	0.7+	0.4-	1998 07 20	566	0.7-	0.6-
1998 04 21	691	0.1-	0.4+	1998 05 25	699	0.5+	0.2-	1998 07 20	566	0.0	0.8-
1998 04 21	691	0.2-	0.2+	1998 06 16	704	0.1-	0.4-	1998 07 20	566	0.3-	0.7-
1998 04 29	691	0.4+	0.3+	1998 06 16	704	0.0	0.5-	1999 11 12	723	1.0-	0.1+
1998 04 29	691	0.7+	0.1-	1998 06 16	704	0.2+	0.3+	1999 11 12	723	0.3+	0.1-
1998 04 29	691	0.1+	0.2-	1998 06 16	704	(2.6+	1.7-)	1999 11 12	723	0.8+	0.2-
1998 05 22	704	0.7-	0.0	1998 06 18	704	0.4+	0.3+	1999 11 14	723	0.2+	0.0
1998 05 22	704	0.5-	0.1-	1998 06 18	704	0.5+	1.6+	1999 11 14	723	0.2-	0.1+
1998 05 22	704	0.7-	0.8-	1998 06 18	704	(0.8-	2.9+)	1999 11 14	723	0.2+	0.3-

1998 05 22	704	0.9+	0.4-	1998 06 18	704	(0.7+	4.2+)	1999 11 15	723	0.5+	0.1-
1998 05 22	704	0.2+	0.3+	1998 06 18	704	0.4+	1.1+	1999 11 15	723	0.0	0.2-
1998 05 24	704	0.3+	0.2-	1998 06 27	699	0.2+	0.0	1999 11 15	723	0.3-	0.4+
1998 05 24	704	0.4-	0.3-	1998 06 27	699	0.3+	0.1-	1999 11 16	723	0.3-	0.3+
1998 05 24	704	0.2-	0.1-	1998 06 27	699	0.2+	0.5+	1999 11 16	723	0.2-	0.2+
1998 05 24	704	0.5-	0.0	1998 06 30	699	0.5-	0.0	1999 11 16	723	0.1-	0.3+
1998 05 24	704	0.9-	0.1+	1998 06 30	699	0.1-	0.0				
1998 05 25	699	0.6+	0.4-	1998 06 30	699	0.7-	1.0+				

1998 HE₃₂ = 1999 VE₂₈

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	72.44236		(2000.0)	P	Q
<i>n</i>	0.29651590	ω	53.12623	+0.37351436	+0.92728157
<i>a</i>	2.2272590	Ω	238.82466	-0.86018243	+0.33605437
<i>e</i>	0.1790866	<i>i</i>	1.68895	-0.34723654	+0.16497375
<i>P</i>	3.32	<i>H</i>	14.9	<i>G</i> 0.15	<i>U</i> 4

Residuals in seconds of arc

1998 03 25	704	0.4+	0.7+	1998 04 01	704	0.1-	1.1-	1998 05 16	704	0.4+	0.9-
1998 03 25	704	0.5-	0.0	1998 04 20	704	0.1+	0.4+	1998 05 16	704	0.4-	0.5+
1998 03 25	704	0.3+	0.1+	1998 04 20	704	0.6-	0.6+	1998 05 16	704	0.1+	0.1+
1998 03 25	704	0.3+	0.7-	1998 04 20	704	0.2+	0.4-	1998 05 16	704	0.3-	0.6-
1998 03 25	704	1.2-	0.3+	1998 04 20	704	0.3-	0.4+	1999 11 03	704	0.3+	0.5-
1998 03 29	704	0.4+	0.0	1998 04 20	704	0.8-	0.0	1999 11 03	704	0.3+	0.3+
1998 03 29	704	0.1-	0.2+	1998 04 22	704	0.1+	0.2+	1999 11 03	704	0.4-	0.7+
1998 03 29	704	1.1-	0.5+	1998 04 22	704	1.3+	0.8-	1999 11 03	704	0.4-	1.1+
1998 03 29	704	1.0+	0.2+	1998 04 22	704	0.6-	0.1+	1999 11 03	704	0.1+	0.9+
1998 03 29	704	2.1-	0.7+	1998 04 22	704	0.6+	0.3+	1999 11 12	704	0.2-	0.6-
1998 04 01	704	0.6+	0.7-	1998 04 22	704	0.2-	0.5+	1999 11 12	704	0.4-	0.7-
1998 04 01	704	0.7+	0.3-	1998 04 24	699	0.2+	0.2+	1999 11 12	704	0.1+	0.5-
1998 04 01	704	0.3+	0.2+	1998 04 24	699	0.6+	0.3+	1999 11 12	704	0.5+	0.4-
1998 04 01	704	0.7+	1.2-	1998 04 24	699	0.2+	0.3+				

1998 HN₃₂ = 1999 UU₁

Id. A. Doppler

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	48.53433		(2000.0)	P	Q
<i>n</i>	0.27816116	ω	104.11484	+0.49091793	+0.87073543
<i>a</i>	2.3241905	Ω	195.38493	-0.83515226	+0.46099354
<i>e</i>	0.1252673	<i>i</i>	6.19406	-0.24803282	+0.17118638
<i>P</i>	3.54	<i>H</i>	15.2	<i>G</i> 0.15	<i>U</i> 4

Residuals in seconds of arc

1998 03 22	704	0.8-	0.2+	1998 04 18	704	0.2+	0.1+	1999 10 04	704	(0.3-	2.7-)
1998 03 22	704	(2.4-	0.6+)	1998 04 18	704	0.7-	0.8+	1999 10 07	704	0.3-	0.2-
1998 03 22	704	0.9+	0.9-	1998 04 18	704	0.7-	1.1+	1999 10 07	704	0.0	0.3+
1998 03 22	704	1.6+	1.2-	1998 04 18	704	0.2+	1.5+	1999 10 07	704	0.5+	0.2-
1998 03 22	704	(4.7-	2.0+)	1998 04 18	704	1.1-	1.6-	1999 10 07	704	0.5+	0.0
1998 03 25	704	0.7+	0.2-	1998 04 20	704	1.3-	0.3-	1999 10 07	704	0.5-	0.1+
1998 03 25	704	0.2-	0.3+	1998 04 20	704	0.8+	0.1-	1999 10 17	557	0.1+	0.1+
1998 03 25	704	1.1+	0.0	1998 04 20	704	1.2-	0.4+	1999 10 17	557	0.1-	0.1+
1998 03 25	704	0.1+	0.8+	1998 04 20	704	0.8+	0.7+	1999 10 17	557	0.3+	0.1+
1998 03 25	704	0.6-	0.3-	1998 04 20	704	1.9-	0.9+	1999 10 18	557	0.2+	0.1-
1998 03 26	566	0.0	0.3-	1998 04 22	704	0.7+	0.7-	1999 10 18	557	0.0	0.2-
1998 03 26	566	0.3-	0.6+	1998 04 22	704	0.3+	0.3-	1999 11 01	703	0.4-	1.2+
1998 03 26	566	0.4-	0.0	1998 04 22	704	1.1+	1.1-	1999 11 01	703	0.6-	0.3+
1998 04 01	704	0.9-	0.4+	1998 04 22	704	1.4+	1.1-	1999 11 01	703	0.1+	0.3+
1998 04 01	704	0.8-	0.3+	1998 04 22	704	1.6+	0.9-	1999 11 01	703	0.4-	0.3-
1998 04 01	704	0.8-	0.1+	1999 10 04	704	0.0	0.5-	1999 11 01	557	0.4+	0.5-
1998 04 01	704	0.3-	0.7-	1999 10 04	704	0.2+	0.0	1999 11 01	557	0.6+	0.6-
1998 04 01	704	0.0	0.8-	1999 10 04	704	0.2-	1.5-	1999 11 01	557	0.3+	0.4-

1998 HL₃₄ = 1999 VE₆₀

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>		(2000.0)		P		Q	
<i>n</i>	0.29076652	ω	257.30390	+0.64514608	+0.76193065		
<i>a</i>	2.2565231	Ω	53.02181	−0.67041166	+0.60027802		
<i>e</i>	0.1559923	<i>i</i>	4.09111	−0.36651705	+0.24316245		
<i>P</i>	3.39	<i>H</i>	15.4	<i>G</i>	0.15	<i>U</i>	4

Residuals in seconds of arc

1998 03 22	704	0.8+	0.4+	1998 04 20	704	1.0+	2.5+	1999 11 04	704	0.4+	0.1+
1998 03 22	704	0.2−	0.0	1998 04 20	704	0.7−	1.1−	1999 11 04	704	0.5−	0.5−
1998 03 22	704	0.5+	0.4−	1998 04 22	704	0.7+	0.9−	1999 11 04	704	0.6−	0.2−
1998 03 22	704	0.2−	0.9−	1998 04 22	704	0.8−	0.4−	1999 11 04	704	0.1−	0.8−
1998 03 25	704	1.6−	0.8+	1998 04 22	704	1.1+	0.1+	1999 11 04	704	0.7−	0.4−
1998 03 25	704	0.4+	0.6+	1998 04 22	704	0.2+	0.6+	1999 11 12	704	0.3+	0.3+
1998 03 25	704	0.3+	1.1−	1998 04 22	704	1.0−	1.2+	1999 11 12	704	0.3+	0.3+
1998 03 25	704	0.3−	0.3+	1998 05 16	704	0.0	2.1+	1999 11 12	704	0.1+	0.4+
1998 04 20	704	0.3−	2.1−	1998 05 16	704	0.6+	1.5−	1999 11 12	704	0.5+	0.1+
1998 04 20	704	0.0	1.2−	1998 05 16	704	0.2−	0.5−	1999 11 12	704	0.3+	0.3+
1998 04 20	704	0.2+	2.5+	1998 05 16	704	0.7−	1.5−				

1998 HC₃₆ = 1999 TQ₆

Id. A. Doppler

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>		(2000.0)		P		Q	
<i>n</i>	0.30979267	ω	241.88404	+0.99704214	+0.06755183		
<i>a</i>	2.1631599	Ω	114.22263	−0.04846241	+0.92275622		
<i>e</i>	0.1272316	<i>i</i>	2.30366	−0.05965203	+0.37941758		
<i>P</i>	3.18	<i>H</i>	15.4	<i>G</i>	0.15	<i>U</i>	4

Residuals in seconds of arc

1998 03 25	704	0.7−	1.2−	1998 04 21	704	0.7−	0.3−	1999 10 06	120	0.2+	0.0
1998 03 25	704	0.0	0.1+	1998 04 21	704	0.5+	0.9+	1999 10 06	120	1.6+	0.4−
1998 03 25	704	0.0	1.3−	1998 04 22	704	(2.1+	1.4−)	1999 10 07	704	0.3−	0.4+
1998 03 25	704	2.0−	1.1+	1998 04 22	704	0.9+	1.2+	1999 10 07	704	0.2−	0.0
1998 03 29	704	0.8−	0.2−	1998 04 22	704	0.1−	0.2−	1999 10 07	704	0.0	0.4−
1998 03 29	704	0.2−	0.7+	1998 04 22	704	(1.7−	3.0+)	1999 10 07	704	0.2−	0.5−
1998 03 29	704	1.2+	1.2−	1999 10 04	704	0.4+	0.1+	1999 10 07	120	0.2−	0.2+
1998 03 29	704	1.1+	0.0	1999 10 04	703	0.4−	0.6+	1999 10 07	120	1.3+	0.3−
1998 03 29	704	0.1+	0.1−	1999 10 04	704	0.3+	0.4−	1999 10 07	120	0.2+	0.2−
1998 04 20	704	0.1+	0.9+	1999 10 04	703	0.7−	0.7+	1999 10 07	120	0.3+	1.1−
1998 04 20	704	0.2+	1.2−	1999 10 04	703	0.6−	0.4+	1999 10 08	120	0.5−	0.2−
1998 04 20	704	0.4+	1.3+	1999 10 04	704	0.7+	0.9−	1999 10 08	120	0.2−	0.1+
1998 04 20	704	0.6+	0.6−	1999 10 04	703	0.9−	0.7+	1999 11 01	703	0.6−	0.1−
1998 04 20	704	0.4+	0.5−	1999 10 04	704	0.2+	0.3−	1999 11 01	703	0.6−	0.5+
1998 04 21	704	0.3−	0.8−	1999 10 04	704	0.7+	0.2+	1999 11 01	703	0.5−	0.1+
1998 04 21	704	1.5−	0.0	1999 10 06	120	0.6+	0.3−	1999 11 01	703	0.2−	0.0

1998 HO₄₃ = 1999 VB₄

Id. G. V. Williams, E. Bowell

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>		(2000.0)		P		Q	
<i>n</i>	0.27497549	ω	117.90802	+0.47968054	+0.87744188		
<i>a</i>	2.3421070	Ω	180.76159	−0.84000765	+0.45871179		
<i>e</i>	0.1236717	<i>i</i>	6.59525	−0.25356208	+0.14028272		
<i>P</i>	3.58	<i>H</i>	14.7	<i>G</i>	0.15	<i>U</i>	3

Residuals in seconds of arc

1998 03 02	910	0.1−	0.2+	1998 04 20	704	0.9−	1.3+	1998 05 16	704	0.1−	0.5+
1998 03 02	910	0.0	0.2+	1998 04 20	704	0.0	1.3+	1999 10 03	703	0.3+	0.8+
1998 03 02	910	0.1−	0.1+	1998 04 20	704	0.1−	0.9+	1999 10 03	703	0.2−	0.1+
1998 03 22	704	0.2−	0.2−	1998 04 21	704	0.1−	0.1+	1999 10 03	703	0.3−	0.6+
1998 03 22	704	1.3+	0.4+	1998 04 21	704	0.1+	0.3+	1999 10 03	703	0.1−	0.4+
1998 03 22	704	0.8+	0.8+	1998 04 21	704	0.0	0.9+	1999 10 04	704	0.1+	0.1+
1998 03 22	704	0.1−	0.9−	1998 04 21	704	0.5−	0.7+	1999 10 04	704	0.0	0.5+

1998 03 25	704	0.3+	0.5+	1998 04 21	704	0.1+	0.2−	1999 10 04	704	0.2−	0.1+
1998 03 25	704	0.4−	0.4+	1998 04 22	704	0.3+	0.1+	1999 10 04	704	1.0−	0.3−
1998 03 25	704	0.4−	0.3−	1998 04 22	704	0.2−	0.8−	1999 10 04	704	0.6−	0.3+
1998 03 25	704	0.6−	0.1+	1998 04 22	704	0.1−	0.9−	1999 11 01	703	0.1+	0.1+
1998 03 25	704	0.3−	0.4−	1998 04 22	704	0.5+	0.6−	1999 11 01	703	0.2−	0.1−
1998 03 29	704	0.5+	0.1−	1998 04 22	704	0.7+	0.5−	1999 11 01	703	0.3−	0.1−
1998 03 29	704	(2.8+	0.4+)	1998 05 03	566	0.6−	0.2−	1999 11 01	703	0.5+	0.6+
1998 03 29	704	0.2+	0.3+	1998 05 03	566	0.5−	0.3−	1999 11 02	703	0.7+	0.1+
1998 03 29	704	0.5+	0.5+	1998 05 03	566	0.6−	0.7−	1999 11 02	703	0.4+	0.5−
1998 03 29	704	0.0	0.0	1998 05 16	704	0.4+	0.8−	1999 11 02	703	0.2−	0.2−
1998 04 20	704	0.2+	0.4+	1998 05 16	704	0.2−	0.6+	1999 11 02	703	0.2+	0.1+
1998 04 20	704	0.6+	0.9−	1998 05 16	704	0.4+	0.0				

1998 HR₅₁ = 1999 TD₁₇

Id. A. Doppler

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>		(2000.0)		P		Q	
<i>n</i>	0.30894322	ω	167.15461	−0.35242049	+0.93450658		
<i>a</i>	2.1671232	Ω	82.19278	−0.86301701	−0.30388026		
<i>e</i>	0.1213064	<i>i</i>	2.89123	−0.36194121	−0.18534898		
<i>P</i>	3.19	<i>H</i>	15.4	<i>G</i>	0.15	<i>U</i>	4

Residuals in seconds of arc

1998 03 22	704	1.0+	0.1+	1998 03 29	704	0.2+	0.2+	1998 04 30	699	0.4+	0.4−
1998 03 22	704	1.2+	0.8+	1998 03 29	704	0.3−	0.8+	1998 05 01	699	0.0	0.5−
1998 03 22	704	0.8+	0.6+	1998 03 29	704	0.2−	0.9+	1998 05 01	699	0.0	0.5−
1998 03 22	704	0.5+	0.2+	1998 04 20	704	0.3+	0.6−	1998 05 01	699	0.3+	0.1−
1998 03 22	704	0.3+	0.5+	1998 04 20	704	0.1+	0.5−	1998 05 16	704	0.2+	0.7−
1998 03 25	704	0.1−	0.1−	1998 04 20	704	0.6−	0.1+	1998 05 16	704	0.9−	1.7+
1998 03 25	704	0.2−	0.1+	1998 04 20	704	0.1+	0.1+	1998 05 16	704	1.6+	0.5−
1998 03 25	704	0.6−	0.0	1998 04 20	704	0.4+	0.3+	1998 05 16	704	(1.9+	2.6−)
1998 03 25	704	0.4−	0.4−	1998 04 22	704	0.0	0.3−	1998 05 16	704	(3.4−	0.3−)
1998 03 25	704	1.0−	0.7−	1998 04 22	704	0.3−	0.9−	1999 10 14	120	0.4+	1.4−
1998 03 26	566	0.8−	0.2−	1998 04 22	704	0.1−	1.0−	1999 10 15	120	1.4+	0.2−
1998 03 26	566	0.5−	0.0	1998 04 22	704	0.1−	0.6−	1999 10 15	120	0.3−	1.2−
1998 03 26	566	0.8−	0.1−	1998 04 22	704	0.3+	0.8−	1999 10 15	120	0.3−	0.1+
1998 03 29	704	1.0−	0.3+	1998 04 30	699	0.0	0.5−				
1998 03 29	704	0.6−	0.1−	1998 04 30	699	0.2+	0.3+				

1998 HT₅₁ = 1999 UZ₈

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

M	47.51644	(2000.0)		P		Q	
n	0.28420892	ω	250.71040	+0.72517389		+0.68580246	
a	2.2911011	Ω	65.93668	−0.60369784		+0.67628740	
e	0.1487609	i	3.86993	−0.33116724		+0.26890581	
P	3.47	H	14.7	G	0.15	U	3

Residuals in seconds of arc

1996 12 19	327	0.2−	0.3+	1998 04 30	699	0.0	0.2+	1999 10 29	703	0.3+	0.0
1996 12 19	327	0.3−	0.2+	1998 05 01	699	0.7+	0.3−	1999 11 01	703	0.1−	0.3+
1996 12 19	327	0.5+	0.1−	1998 05 01	699	0.3−	0.9+	1999 11 01	703	0.4−	0.2+
1998 04 21	704	0.1+	0.2−	1998 05 01	699	0.4−	0.3+	1999 11 01	703	0.7−	0.5+
1998 04 21	704	0.1−	0.0	1998 05 16	704	0.4−	1.5+	1999 11 01	703	0.5−	0.9+
1998 04 21	704	0.1−	0.2+	1998 05 16	704	0.3+	0.4+	1999 11 04	704	0.8+	0.5−
1998 04 21	704	0.2+	1.0−	1998 05 16	704	0.8+	1.9+	1999 11 04	704	0.8+	0.8−
1998 04 21	704	0.6−	0.1+	1998 05 16	704	0.6+	0.2−	1999 11 04	704	1.3+	0.3−
1998 04 22	704	0.8−	0.1−	1998 05 16	704	(3.1−	2.9+)	1999 11 04	704	0.9+	0.8−
1998 04 22	704	0.0	0.6−	1998 05 25	699	1.0+	0.5−	1999 11 04	704	0.8+	0.3−
1998 04 22	704	0.0	0.8−	1998 05 25	699	(0.8+	2.5+)	1999 11 12	704	0.3−	0.1−
1998 04 22	704	0.2−	0.4−	1998 05 25	699	0.0	0.3+	1999 11 12	704	0.5−	0.1−
1998 04 22	704	0.0	1.1−	1999 10 29	703	0.3+	0.8+	1999 11 12	704	0.5−	0.0
1998 04 30	699	0.1+	0.2+	1999 10 29	703	0.7−	0.3+	1999 11 12	704	0.5−	0.0
1998 04 30	699	0.3−	0.2+	1999 10 29	703	0.7−	0.2+	1999 11 12	704	0.6−	0.3+

1999 NOV. 23

M.P.C. 36809

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	57.27525		(2000.0)	P	Q
<i>n</i>	0.27134392	ω	248.84022	+0.61446483	+0.78510661
<i>a</i>	2.3629579	Ω	59.31157	-0.68617316	+0.58044044
<i>e</i>	0.2106390	<i>i</i>	5.18536	-0.38935763	+0.21609375
<i>P</i>	3.63	<i>H</i>	14.1	<i>G</i>	0.15

Residuals in seconds of arc

1998 04 21	704	0.5+	0.1+	1998 04 30	699	0.5-	0.4+	1999 11 04	704	0.0	0.1+
1998 04 21	704	0.1+	0.1+	1998 05 01	699	0.2+	0.6+	1999 11 04	704	0.1+	0.3+
1998 04 21	704	0.0	0.5-	1998 05 01	699	0.5-	0.2+	1999 11 04	704	0.0	0.1-
1998 04 21	704	0.1-	0.8-	1998 05 01	699	0.6-	0.3+	1999 11 04	704	0.5+	1.0+
1998 04 21	704	(0.9-	2.6-)	1998 05 16	704	0.7-	0.0	1999 11 04	704	0.4+	0.4+
1998 04 22	704	0.7+	0.1-	1998 05 16	704	0.3+	1.4+	1999 11 12	704	0.2-	0.0
1998 04 22	704	0.2-	0.4-	1998 05 16	704	1.0+	0.2+	1999 11 12	704	0.3-	0.1-
1998 04 22	704	0.2-	0.3-	1998 05 16	704	1.0+	0.2-	1999 11 12	704	0.3-	0.3-
1998 04 22	704	0.3+	0.6-	1998 05 16	704	0.8-	0.9+	1999 11 12	704	0.1-	0.2-
1998 04 22	704	0.1+	0.9-	1998 05 25	699	0.7+	0.8-	1999 11 12	704	0.3-	0.4-
1998 04 30	699	0.1-	0.5+	1998 05 25	699	0.2-	0.2+				
1998 04 30	699	0.5-	0.8+	1998 05 25	699	0.3-	0.6-				

1998 HR₆₇ = 1999 UB₃

Id. A. Doppler

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	96.11439		(2000.0)	P	Q
<i>n</i>	0.29938337	ω	249.93448	-0.00268830	+0.99904347
<i>a</i>	2.2130145	Ω	20.06153	-0.86336371	+0.01970374
<i>e</i>	0.1453524	<i>i</i>	7.30985	-0.50457495	-0.03903726
<i>P</i>	3.29	<i>H</i>	14.7	<i>G</i>	0.15

Residuals in seconds of arc

1998 03 25	699	0.3+	0.6+	1998 04 22	704	0.1-	0.0	1999 10 21	653	0.3+	0.1-
1998 03 25	699	0.1+	1.1+	1998 04 22	704	0.8-	0.1+	1999 10 22	653	0.7+	0.4-
1998 03 25	699	0.1+	0.5+	1998 04 22	704	0.0	0.5+	1999 10 22	653	0.1+	0.4-
1998 03 26	910	0.6+	0.3+	1998 05 16	704	0.6-	0.4+	1999 10 29	703	0.9-	0.6-
1998 03 26	910	0.4+	0.2+	1998 05 16	704	0.1+	0.1-	1999 10 29	703	0.6-	0.5-
1998 03 26	910	0.5+	0.1+	1998 05 16	704	0.6-	0.6-	1999 10 29	703	0.1+	0.0
1998 04 01	704	0.3+	0.3-	1998 05 16	704	0.4-	1.6+	1999 10 29	703	0.7-	0.2+
1998 04 01	704	0.0	0.0	1998 05 16	704	0.3-	0.2+	1999 11 03	704	0.1+	0.1-
1998 04 01	704	0.4+	0.5-	1998 05 25	699	0.1+	0.0	1999 11 03	704	0.3+	0.1-
1998 04 01	704	0.7+	0.7-	1998 05 25	699	0.0	0.2+	1999 11 03	704	0.1-	0.1-
1998 04 01	704	0.0	0.7-	1998 05 25	699	0.4-	0.3-	1999 11 03	704	0.9+	0.5+
1998 04 04	699	0.5+	0.2+	1999 10 03	704	0.1-	0.4+	1999 11 03	704	0.3+	0.2+
1998 04 04	699	0.1+	0.9-	1999 10 03	704	1.0+	1.2+	1999 11 04	704	0.0	0.3-
1998 04 04	699	0.6-	0.0	1999 10 03	704	0.5-	0.3-	1999 11 04	704	0.2+	0.6-
1998 04 21	704	0.5+	0.2-	1999 10 03	704	0.5-	0.2-	1999 11 04	704	0.1-	0.0
1998 04 21	704	0.0	0.2-	1999 10 03	704	0.3+	0.4+	1999 11 04	704	0.1+	0.1-
1998 04 21	704	0.5-	0.4+	1999 10 03	703	0.2-	0.6+	1999 11 04	704	1.0+	0.4+
1998 04 21	704	0.4-	0.5+	1999 10 03	703	0.9-	1.5+	1999 11 11	703	0.0	0.5-
1998 04 21	704	0.3-	0.0	1999 10 03	703	0.2-	1.0+	1999 11 11	703	0.3-	0.1-
1998 04 22	704	0.4+	0.7-	1999 10 03	703	0.4-	0.6+	1999 11 11	703	0.4-	0.1-
1998 04 22	704	0.5+	0.5-	1999 10 21	653	0.8+	0.3-	1999 11 11	703	0.6-	0.7-

1998 HL₉₃ = 1999 VT₂₆

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	78.34469		(2000.0)	P	Q
<i>n</i>	0.29178143	ω	46.85212	+0.42908947	+0.90154608
<i>a</i>	2.2512874	Ω	248.63471	-0.84510293	+0.37894866
<i>e</i>	0.1737035	<i>i</i>	3.42583	-0.31887812	+0.20883623
<i>P</i>	3.38	<i>H</i>	14.9	<i>G</i>	0.15

Residuals in seconds of arc

1998 04 21	704	0.1+	1.0+	1998 05 01	704	0.1+	0.1+	1998 05 23	704	0.3+	0.8-
1998 04 21	704	0.4-	0.6-	1998 05 01	704	0.8-	0.2+	1998 05 23	704	0.4+	0.5-
1998 04 21	704	0.6-	0.7-	1998 05 18	699	0.3+	1.2+	1999 11 03	704	1.1-	0.9+

1998 04 21	704	0.0	0.6-	1998 05 18	699	0.7+	1.0+	1999 11 03	704	0.4-	0.4-
1998 04 21	704	0.9-	0.2+	1998 05 18	699	0.1-	0.6+	1999 11 03	704	0.6-	0.7-
1998 04 22	704	0.2+	0.9+	1998 05 22	704	0.2+	0.4+	1999 11 03	704	0.6-	0.3+
1998 04 22	704	0.7+	1.1+	1998 05 22	704	1.3-	0.9-	1999 11 03	704	0.1+	0.1-
1998 04 22	704	0.7+	0.2-	1998 05 22	704	1.2+	0.4+	1999 11 10	704	1.2+	0.3-
1998 04 22	704	0.5+	0.7-	1998 05 22	704	0.4-	1.4-	1999 11 10	704	0.4+	0.4-
1998 04 22	704	1.1+	1.1-	1998 05 22	704	1.3-	0.1-	1999 11 10	704	0.6+	0.2+
1998 05 01	704	0.2-	0.2-	1998 05 23	704	0.8+	0.1+	1999 11 10	704	0.2+	0.3+
1998 05 01	704	0.9-	0.8+	1998 05 23	704	0.1+	0.5-	1999 11 10	704	0.3+	0.0
1998 05 01	704	0.6-	0.1+	1998 05 23	704	0.1-	0.1-				

1998 HV₉₅ = 1999 TF₂₀

Id. S. Nakano

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	17.09266		(2000.0)	P	Q
<i>n</i>	0.27928325	ω	262.97505	+0.97688924	+0.19288640
<i>a</i>	2.3179610	Ω	85.87324	-0.14071357	+0.90468528
<i>e</i>	0.1781545	<i>i</i>	5.29816	-0.16089471	+0.37992023
<i>P</i>	3.53	<i>H</i>	15.0	<i>G</i>	0.15

Residuals in seconds of arc

1998 04 21	704	0.8+	0.4+	1998 05 01	704	0.1+	0.6+	1999 10 09	358	1.8-	1.0+
1998 04 21	704	0.9-	0.3+	1998 05 01	704	0.5-	1.2+	1999 10 09	358	1.2+	1.5+
1998 04 21	704	0.5+	0.1+	1998 05 01	704	0.4-	0.9+	1999 10 18	358	(5.0-	2.1+)
1998 04 21	704	0.2+	0.1-	1998 05 01	704	0.9-	0.5+	1999 10 18	358	1.7-	0.2+
1998 04 21	704	0.2-	0.1-	1999 10 07	704	1.4+	0.5+	1999 10 18	358	0.6+	0.8-
1998 04 22	704	0.8-	1.8-	1999 10 07	704	0.3+	0.6+	1999 11 01	703	0.2+	0.6+
1998 04 22	704	0.0	0.4-	1999 10 07	704	0.2+	0.3-	1999 11 01	703	0.4-	0.0
1998 04 22	704	0.4-	1.0-	1999 10 08	358	1.5+	1.8-	1999 11 01	703	0.1+	0.3+
1998 04 22	704	1.1+	0.5-	1999 10 08	358	1.9-	0.4-	1999 11 01	703	0.2+	0.5+
1998 04 30	557	1.1+	0.2-	1999 10 08	358	0.6-	1.2-	1999 11 03	358	1.2+	0.4-
1998 04 30	557	0.4+	0.3+	1999 10 09	358	(3.1-	1.4+)	1999 11 03	358	0.5-	0.1-

1998 HC₉₉

Id. T. Kobayashi (1999 observations)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	47.83676		(2000.0)	P	Q
<i>n</i>	0.29243969	ω	264.38558	+0.86023860	+0.50497311
<i>a</i>	2.2479079	Ω	65.26698	-0.43159950	+0.79490734
<i>e</i>	0.1831036	<i>i</i>	4.46141	-0.27149846	+0.33633982
<i>P</i>	3.37	<i>H</i>	14.9	<i>G</i>	0.15

Residuals in seconds of arc

1998 04 21	704	0.2+	0.6+	1998 04 29	566	0.7+	1.6-	1999 11 03	704	0.5+	0.1+
1998 04 21	704	0.2+	0.2-	1998 05 22	704	0.2+	0.7-	1999 11 03	704	0.1+	0.4+
1998 04 21	704	1.4-	0.4-	1998 05 22	704	0.9-	1.1+	1999 11 03	704	0.3+	0.5+
1998 04 21	704	0.2-	0.5-	1998 05 22	704	1.9+	0.5-	1999 11 09	411	0.7-	0.3-
1998 04 21	704	0.2+	1.2+	1998 05 22	704	0.5+	1.9+	1999 11 09	411	0.7-	0.2-
1998 04 22	704	0.1+	0.5+	1998 05 22	704	1.8-	0.8-	1999 11 10	411	0.1-	0.1-
1998 04 22	704	0.4+	0.8+	1998 05 24	704	0.3-	0.8+	1999 11 10	411	0.3+	0.9-
1998 04 22	704	0.4+	0.1+	1998 05 24	704	0.5-	0.5-	1999 11 12	704	0.0	0.4-
1998 04 22	704	0.8-	0.6-	1998 05 24	704	0.7+	0.6+	1999 11 12	704	0.2+	0.3+
1998 04 22	704	0.5-	0.5-	1998 05 24	704	0.9-	0.0	1999 11 12	704	(2.3-	0.4-)
1998 04 29	566	0.8+	0.2-	1998 05 24	704	0.2-	1.0-	1999 11 12	704	0.2+	0.6+
1998 04 29	566	1.3+	0.1+	1999 11 03	704	0.6-	0.4-	1999 11 12	704	0.3+	0.4+

1998 HY₁₀₀ = 1999 VU₅₆

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	108.32921		(2000.0)	P	Q
<i>n</i>	0.29291674	ω	203.80393	-0.21640901	+0.97526258
<i>a</i>	2.2454666	Ω	53.72771	-0.88652895	-0.17696961
<i>e</i>	0.1172822	<i>i</i>	3.20369	-0.40894200	-0.13245625
<i>P</i>	3.36	<i>H</i>	15.3	<i>G</i>	0.15

Residuals in seconds of arc

1998 04 21	704	0.3+	0.0	1998 05 22	704	0.5+	0.6+	1999 11 04	704	0.0	0.1+
1998 04 21	704	0.8+	0.1-	1998 05 22	704	0.1+	0.2-	1999 11 04	704	0.3+	0.3-
1998 04 21	704	1.1-	0.1-	1998 05 22	704	0.4+	1.2-	1999 11 04	704	0.4-	0.0
1998 04 21	704	0.5-	0.0	1998 05 22	704	1.0-	0.1-	1999 11 04	704	0.6+	0.2+
1998 04 21	704	0.1-	0.1+	1998 05 24	704	0.1+	0.5+	1999 11 12	704	0.3+	0.2-
1998 04 22	704	0.1+	0.3+	1998 05 24	704	0.7+	0.1+	1999 11 12	704	0.1-	0.1-
1998 04 22	704	0.1-	0.4+	1998 05 24	704	0.2+	0.7+	1999 11 12	704	0.1+	0.2+
1998 04 22	704	0.6-	0.4-	1998 05 24	704	0.2-	1.2-	1999 11 12	704	0.1-	0.1+
1998 04 22	704	1.2+	0.0	1998 05 24	704	0.9-	1.0+	1999 11 12	704	0.1-	0.3+
1998 05 22	704	0.1+	0.2-	1999 11 04	704	0.7-	0.0				

1998 HZ₁₀₁ = 1999 VH₁₇

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams			
<i>M</i>	108.84821	(2000.0)	<i>P</i>
<i>n</i>	0.28069878	ω 23.65001	-0.27600244
<i>a</i>	2.3101616	Ω 230.42563	-0.89741839
<i>e</i>	0.0862425	<i>i</i> 5.89346	-0.34418437
<i>P</i>	3.51	<i>H</i> 15.9	<i>G</i> 0.15

Residuals in seconds of arc

1998 04 22	704	(2.3+ 0.3-)	1998 05 22	704	0.6- 0.8-	1999 11 02	691	0.5- 0.4-
1998 04 22	704	(1.1+ 2.2+)	1998 05 22	704	(3.4+ 0.4-)	1999 11 02	691	0.1+ 0.2-
1998 04 22	704	1.2+ 0.2+	1998 05 22	704	1.6+ 0.1-	1999 11 02	691	0.1+ 0.2-
1998 04 22	704	0.3+ 0.1-	1998 05 22	704	0.5- 0.3+	1999 11 03	691	0.1+ 0.2-
1998 04 25	809	0.5- 0.9+	1998 05 22	704	1.6+ 0.6+	1999 11 03	691	0.2+ 0.1-
1998 04 25	809	1.0- 0.0	1998 05 24	704	0.9- 0.8+	1999 11 03	691	0.1+ 0.0
1998 04 25	809	0.7- 0.4-	1998 05 24	704	1.0- 0.2-	1999 11 04	704	0.5+ 1.6+
1998 04 28	809	0.4+ 0.7-	1998 05 24	704	0.5+ 0.9-	1999 11 04	704	0.2+ 0.3+
1998 04 28	809	(2.0- 0.1+)	1998 05 24	704	0.3+ 0.2-	1999 11 04	704	0.8- 0.8-
1998 04 28	809	(2.1- 0.3-)	1998 05 24	704	0.9- 0.5+			

1998 HF₁₀₂ = 1999 VZ₅₁

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams			
<i>M</i>	131.50790	(2000.0)	<i>P</i>
<i>n</i>	0.31301085	ω 330.15003	-0.40502901
<i>a</i>	2.1483075	Ω 275.94349	-0.83290272
<i>e</i>	0.1197858	<i>i</i> 1.69211	-0.37712672
<i>P</i>	3.15	<i>H</i> 15.3	<i>G</i> 0.15

Residuals in seconds of arc

1998 04 25	809	0.2- 2.7+	1998 05 22	704	0.5+	0.2-	1998 06 27	699	0.9+	0.7+
1998 04 25	809	0.7- 1.4+	1998 05 22	704	0.4+	0.8-	1998 06 27	699	0.7+	0.8+
1998 04 25	809	0.7- 1.4+	1998 05 22	704	0.0	0.9-	1998 06 27	699	0.1+	0.7+
1998 04 28	809	1.8+ 2.7+	1998 05 22	704	0.2-	0.2+	1999 11 03	704	0.4+	0.4+
1998 04 28	809	0.9+ 1.1+	1998 05 22	704	1.2+	1.2-	1999 11 03	704	0.1+	0.4+
1998 04 28	809	0.6+ 1.8+	1998 05 22	699	0.2-	0.4-	1999 11 03	704	0.8-	0.9+
1998 05 01	704	0.0	1998 05 22	699	0.4-	0.2+	1999 11 03	704	0.1+	0.9+
1998 05 01	704	0.3+ 1.4-	1998 05 22	699	0.0	0.2-	1999 11 04	704	0.1-	1.1+
1998 05 01	704	0.0	1998 05 24	704	0.6+	0.5-	1999 11 04	704	0.1-	0.4-
1998 05 01	704	0.3+ 0.5-	1998 05 24	704	0.8-	0.2+	1999 11 04	704	0.1+	0.8+
1998 05 05	699	0.7- 0.7-	1998 05 24	704	0.8-	0.2+	1999 11 04	704	0.1-	0.5+
1998 05 05	699	0.3- 1.1-	1998 05 24	704	0.4-	0.4+	1999 11 04	704	0.7-	0.1+
1998 05 05	699	0.7- 1.0-	1998 05 24	704	1.1-	0.8+				

1998 HE₁₀₃ = 1999 VN₅₂

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams			
<i>M</i>	110.23329	(2000.0)	<i>P</i>
<i>n</i>	0.30145874	ω 230.39502	+0.03451424
<i>a</i>	2.2028460	Ω 41.78085	-0.87779046
<i>e</i>	0.1818149	<i>i</i> 6.64893	-0.47779983
<i>P</i>	3.27	<i>H</i> 14.9	<i>G</i> 0.15

Residuals in seconds of arc

1998 04 25	809	0.5+	1.8+	1998 05 22	704	0.0	0.4-	1998 06 18	704	4.5-	0.2-
1998 04 25	809	0.1+	0.5+	1998 05 23	699	1.4+	0.1+	1999 11 03	704	0.6+	0.2+
1998 04 25	809	0.5+	1.3+	1998 05 23	699	1.3+	1.1-	1999 11 03	704	0.8-	0.4-
1998 04 28	809	0.7-	0.3+	1998 05 23	699	0.5+	0.5-	1999 11 03	704	1.5-	1.1-
1998 04 28	809	0.8-	0.2+	1998 05 24	704	0.1+	0.6-	1999 11 03	704	0.1-	1.4-
1998 04 28	809	0.1+	0.2+	1998 05 24	704	0.4+	0.7-	1999 11 04	704	0.3+	0.6+
1998 05 05	699	0.7-	0.6-	1998 05 24	704	0.7-	0.6-	1999 11 04	704	0.2-	0.9+
1998 05 05	699	0.3-	0.5+	1998 05 24	704	0.0	0.5-	1999 11 04	704	2.0+	0.7+
1998 05 05	699	0.4-	0.9-	1998 05 24	704	0.1-	0.1+	1999 11 04	704	0.2-	0.1+
1998 05 22	704	0.2+	0.9-	1998 06 18	704	1.4+	1.2+	1999 11 04	704	0.1-	0.3+
1998 05 22	704	0.2-	1.1-	1998 06 18	704	1.4+	2.6+				
1998 05 22	704	0.4-	0.5-	1998 06 18	704	0.8+	0.3+				

1998 HA₁₂₀ = 1999 NM₃₂

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Nakano			
<i>M</i>	333.49293	(2000.0)	<i>P</i>
<i>n</i>	0.18301879	ω 217.23033	+0.93514377
<i>a</i>	3.0723612	Ω 123.93508	-0.25237881
<i>e</i>	0.1165044	<i>i</i> 12.18609	-0.24861831
<i>P</i>	5.39	<i>H</i> 13.6	<i>G</i> 0.15

Residuals in seconds of arc

1998 04 23	704	0.6-	0.1+	1998 04 24	704	1.3+	0.9+	1999 07 14	704	0.1+	0.4+
1998 04 23	704	0.0	0.1-	1998 04 24	704	0.3+	0.1+	1999 07 14	704	0.5-	0.1-
1998 04 23	704	(1.7+	2.5-)	1998 04 24	566	0.1-	0.4-	1999 07 16	704	0.1-	0.4-
1998 04 23	704	0.7-	0.6-	1998 04 24	566	0.2-	0.3-	1999 07 16	704	0.2-	0.2+
1998 04 24	704	0.5+	0.2+	1998 04 24	566	0.3-	0.2-	1999 07 16	704	0.2-	0.0
1998 04 24	704	0.2-	0.3+	1999 07 14	704	0.9+	0.2-				

1998 HP₁₃₉ = 1999 UB₁₇

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams			
<i>M</i>	139.37113	(2000.0)	<i>P</i>
<i>n</i>	0.30264356	ω 233.02653	-0.83349159
<i>a</i>	2.1970929	Ω 340.45865	-0.48467181
<i>e</i>	0.0765142	<i>i</i> 3.63262	-0.26530174
<i>P</i>	3.26	<i>H</i> 15.0	<i>G</i> 0.15

Residuals in seconds of arc

1998 03 25	704	0.4+	0.2+	1998 04 01	704	0.8+	0.4-	1998 05 16	704	0.6+	0.5+
1998 03 25	704	0.1+	1.1+	1998 04 01	704	0.4+	0.6-	1998 05 16	704	1.2-	1.1-
1998 03 25	704	0.2-	0.1+	1998 04 21	704	1.1-	1.0-	1998 05 16	704	1.4+	0.7-
1998 03 25	704	0.2-	0.4+	1998 04 21	704	0.4-	0.6+	1999 10 30	703	0.4+	0.2-
1998 03 25	704	0.2-	0.2-	1998 04 21	704	1.0+	0.2-	1999 10 30	703	0.7+	0.8+
1998 03 29	704	0.2+	0.0	1998 04 21	704	0.0	0.7-	1999 10 30	703	0.4+	0.3+
1998 03 29	704	0.1-	0.2+	1998 04 21	704	0.2+	0.5-	1999 10 30	703	0.3+	0.4+
1998 03 29	704	0.4-	0.6-	1998 04 22	704	1.1-	0.5+	1999 11 03	703	0.6-	0.5+
1998 03 29	704	0.2-	1.2+	1998 04 22	704	0.0	0.2+	1999 11 03	703	1.9-	0.1-
1998 03 29	704	1.1-	0.6+	1998 04 22	704	0.8-	0.3+	1999 11 03	703	0.0	0.6+
1998 04 01	704	0.4+	0.0	1998 04 22	704	0.1-	0.7+	1999 11 03	703	0.6-	0.1+
1998 04 01	704	0.2-	0.3+	1998 04 22	704	1.2+	1.8+				
1998 04 01	704	0.6+	0.7-	1998 05 16	704	1.0+	0.1-				

1998 HY₁₄₇ = 1999 VG₂₉

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams			
<i>M</i>	129.45446	(2000.0)	<i>P</i>
<i>n</i>	0.31358618	ω 205.27102	-0.32856549
<i>a</i>	2.1456791	Ω 45.55430	-0.86178939
<i>e</i>	0.1231137	<i>i</i> 1.58187	-0.38647609
<i>P</i>	3.14	<i>H</i> 15.4	<i>G</i> 0.15

Residuals in seconds of arc

1998 04 25	809	1.6+	1.8+	1998 05 22	704	0.2-	0.7-	1998 06 16	704	0.7+	0.4-
1998 04 25	809	0.9+	1.5+	1998 05 22	704	1.4+	0.1-	1998 06 16	704	0.6+	2.5+
1998 04 25	809	0.6+	1.4+	1998 05 22	704	3.1-	0.0	1998 06 16	704	0.9-	1.2-

1999 NOV. 23

1998 04 25	699	0.3+	0.3−	1998 05 23	699	0.0	0.6−	1998 06 16	704	0.5+	1.4+
1998 04 25	699	0.9−	0.4−	1998 05 23	699	0.1+	0.1−	1999 11 03	704	0.9−	0.6+
1998 04 25	699	0.0	1.0+	1998 05 23	699	0.7+	0.1−	1999 11 03	704	0.1+	0.7+
1998 04 28	809	0.4+	2.2−	1998 05 24	704	0.3+	0.4−	1999 11 03	704	0.9−	1.0+
1998 04 28	809	0.2−	1.7−	1998 05 24	704	0.2+	0.1+	1999 11 03	704	0.3−	0.0
1998 04 28	809	0.7+	1.6−	1998 05 24	704	0.3+	0.4+	1999 11 03	704	0.4−	1.0+
1998 04 28	809	0.0	0.9+	1998 05 24	704	0.7−	0.9−	1999 11 12	704	0.3+	0.0
1998 04 28	809	0.4−	0.9+	1998 05 24	704	0.6−	0.6−	1999 11 12	704	0.8+	0.0
1998 04 28	809	1.3−	2.1+	1998 05 25	699	0.1+	0.2−	1999 11 12	704	0.4+	0.3−
1998 05 22	704	0.2+	0.3−	1998 05 25	699	0.3+	0.0	1999 11 12	704	0.2+	0.1+
1998 05 22	704	0.2−	0.3+	1998 05 25	699	0.0	0.1+	1999 11 12	704	0.1+	0.3−

1998 HS₁₄₈ = 1999 VA₅₄

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

				Williams			
<i>M</i>	68.75560		(2000.0)	P		Q	
<i>n</i>	0.24262078	ω	282.85400	+0.34931265		+0.93700435	
<i>a</i>	2.5459549	Ω	7.59207	−0.85407944		+0.31922161	
<i>e</i>	0.1449681	<i>i</i>	0.81452	−0.38539460		+0.14184645	
<i>P</i>	4.06	<i>H</i>	15.2	<i>G</i>	0.15	<i>U</i>	5

Residuals in seconds of arc

1998 04 25	809	0.2−	1.8−	1998 05 22	699	0.2+	0.2+	1999 11 04	704	0.5−	0.0
1998 04 25	809	0.1−	0.3−	1998 05 22	699	0.0	0.1+	1999 11 04	704	0.1+	0.1+
1998 04 25	809	0.3−	1.0−	1998 05 22	704	2.0+	2.4−	1999 11 04	704	0.2−	0.3−
1998 04 28	809	1.0+	1.3−	1998 05 22	699	2.4−	3.2+	1999 11 04	704	0.3+	0.0
1998 04 28	809	0.2−	0.1−	1998 05 24	704	0.7+	0.8−	1999 11 04	704	0.0	0.7+
1998 04 28	809	1.0−	0.3−	1998 05 24	704	1.0+	0.5+	1999 11 12	704	0.7+	1.2+
1998 05 22	704	1.5+	0.4−	1998 05 24	704	0.3−	1.7+	1999 11 12	704	0.2+	1.0−
1998 05 22	704	0.1+	1.1+	1998 05 24	704	1.6−	1.6−	1999 11 12	704	0.2−	1.5−
1998 05 22	704	0.1−	0.1+	1998 05 24	704	0.6−	1.1+	1999 11 12	704	0.4+	1.1−

1998 HU₁₄₈ = 1999 VN₂₉

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

				Williams			
<i>M</i>	76.66631		(2000.0)	P		Q	
<i>n</i>	0.24085926	ω	49.46107	+0.33789793		+0.94004019	
<i>a</i>	2.5583531	Ω	240.34505	−0.87884414		+0.29750530	
<i>e</i>	0.2541287	<i>i</i>	3.05816	−0.33683523		+0.16677840	
<i>P</i>	4.09	<i>H</i>	14.7	<i>G</i>	0.15	<i>U</i>	5

Residuals in seconds of arc

1998 04 25	809	0.1+	1.9−	1998 05 24	704	0.3+	1.2−	1998 06 18	704	2.3+	0.4−
1998 04 25	809	0.5−	1.2−	1998 05 24	704	0.0	0.6+	1998 06 18	704	2.6−	0.7−
1998 04 25	809	0.4−	0.6−	1998 05 24	704	0.5+	0.8+	1999 11 03	704	0.5−	1.0−
1998 04 28	809	0.4+	1.0−	1998 05 24	704	0.7−	1.1−	1999 11 03	704	1.8−	0.9−
1998 04 28	809	0.5+	1.2−	1998 06 16	704	0.1−	0.9−	1999 11 03	704	0.2−	0.1−
1998 04 28	809	0.4+	0.2+	1998 06 16	704	1.5−	0.3−	1999 11 03	704	1.0−	1.8−
1998 05 22	704	0.4+	0.4+	1998 06 16	704	0.2+	0.2+	1999 11 12	704	1.0+	0.7−
1998 05 22	704	0.3−	0.7+	1998 06 16	704	0.1+	0.6−	1999 11 12	704	0.7+	0.8−
1998 05 22	704	0.2−	0.7+	1998 06 16	704	0.2+	1.4+	1999 11 12	704	0.7+	0.1−
1998 05 22	704	0.5−	0.5+	1998 06 18	704	1.2−	2.0−	1999 11 12	704	0.8+	0.6−
1998 05 22	704	0.8+	1.1+	1998 06 18	704	0.7+	0.0	1999 11 12	704	1.3+	0.2−
1998 05 24	704	0.5−	0.1−	1998 06 18	704	0.9+	1.1+				

1998 HT₁₄₉ = 1999 VL₈

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				Williams			
<i>M</i>	41.84120		(2000.0)	P		Q	
<i>n</i>	0.21308183	ω	264.51842	+0.60993573		+0.78429757	
<i>a</i>	2.7761213	Ω	43.74317	−0.64653664		+0.57524153	
<i>e</i>	0.1499861	<i>i</i>	9.43823	−0.45822351		+0.23232414	
<i>P</i>	4.63	<i>H</i>	14.0	<i>G</i>	0.15	<i>U</i>	3

Residuals in seconds of arc

1998 04 25	809	1.0−	0.4+	1998 05 22	428	0.4−	0.5−	1998 06 16	704	0.7+	0.3+
1998 04 25	809	0.4+	0.0	1998 05 22	428	0.3−	0.8−	1998 06 16	704	0.5−	0.7+

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1998 04 25	809	0.3−	0.9+	1998 05 24	704	0.7−	0.2−	1998 06 16	704	1.5+	1.4+
1998 04 28	809	0.9+	0.9+	1998 05 24	704	0.8−	0.3+	1998 06 16	704	0.2+	1.6+
1998 04 28	809	0.9+	0.5−	1998 05 24	704	0.3−	0.8+	1998 06 18	428	0.9+	0.4−
1998 04 28	809	1.0+	0.0	1998 05 24	704	0.5−	1.3+	1998 07 27	428	0.0	0.2−
1998 05 21	428	0.3−	0.7−	1998 05 24	704	0.6−	0.4+	1998 07 27	428	0.4−	0.3−
1998 05 21	428	0.1−	0.6−	1998 05 25	428	0.2+	0.4−	1999 11 04	132	0.1+	0.2+
1998 05 22	704	0.1+	0.4−	1998 05 25	428	0.7−	0.3−	1999 11 04	132	0.0	1.0−
1998 05 22	704	0.2−	0.3−	1998 05 26	428	0.2−	0.5−	1999 11 04	132	0.1−	0.4+
1998 05 22	704	0.0	0.6−	1998 06 02	428	0.1+	0.8−	1999 11 08	132	0.2−	0.2−
1998 05 22	704	0.6+	0.8−	1998 06 02	428	0.4−	0.6−	1999 11 08	132	0.0	0.7+
1998 05 22	704	0.5−	0.1+	1998 06 16	704	1.1+	0.1−	1999 11 08	132	0.3+	0.1−

1998 JE

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

				Williams			
<i>M</i>	10.45584		(2000.0)	P		Q	
<i>n</i>	0.27886113	ω	238.42894	+0.92766468		+0.36766218	
<i>a</i>	2.3202996	Ω	99.92966	−0.31619700		+0.86643077	
<i>e</i>	0.0909513	<i>i</i>	3.80051	−0.19863962		+0.33781985	
<i>P</i>	3.53	<i>H</i>	14.7	<i>G</i>	0.15	<i>U</i>	4

Residuals in seconds of arc

1998 03 22	691	0.2−	0.0	1998 04 22	704	0.1+	0.7−	1998 05 16	704	0.7−	0.6−
1998 03 22	691	0.5−	0.0	1998 04 22	704	(3.7−	0.6+)	1998 05 16	704	(4.0−	1.9−)
1998 03 22	691	0.3−	0.1−	1998 05 01	691	0.7+	0.2+	1998 05 28	699	1.3−	1.0−
1998 03 29	704	0.0	0.2+	1998 05 01	691	0.8+	0.3+	1998 05 28	699	1.9−	0.4+
1998 03 29	704	1.0−	0.6−	1998 05 01	691	0.5+	0.6+	1998 05 28	699	0.7−	0.4−
1998 03 29	704	0.6−	0.1−	1998 05 02	691	0.8+	0.1+	1999 11 15	723	1.0−	0.4+
1998 03 29	704	0.7+	0.5+	1998 05 02	691	0.4+	0.5+	1999 11 15	723	0.5−	0.2+
1998 03 29	704	0.4+	0.5−	1998 05 02	691	0.1+	0.3+	1999 11 16	723	0.5+	0.2+
1998 04 22	704	1.3+	1.0+	1998 05 16	704	0.6−	0.7−	1999 11 16	723	0.0	0.4+
1998 04 22	704	1.2+	0.0	1998 05 16	704	0.5−	1.4+	1999 11 16	723	0.4+	0.4+
1998 04 22	704	0.9+	0.1+	1998 05 16	704	(2.4−	0.8+)				

1998 JX = 1999 VD₆₂

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

				Williams			
<i>M</i>	103.92216		(2000.0)	P		Q	
<i>n</i>	0.28813903	ω	34.63405	−0.16733460		+0.98385240	
<i>a</i>	2.2702202	Ω	225.82611	−0.92338496		−0.17897250	
<i>e</i>	0.1741096	<i>i</i>	5.08020	−0.34548422		+0.00181765	
<i>P</i>	3.42	<i>H</i>	15.6	<i>G</i>	0.15	<i>U</i>	5

Residuals in seconds of arc

1998 04 21	704	0.5−	0.1+	1998 05 01	566	0.3+	0.4+	1998 06 02	691	0.1−	0.2+
1998 04 21	704	3.2+	0.8+	1998 05 01	566	0.1+	0.0	1998 06 02	691	0.2−	0.4+
1998 04 21	704	0.7−	1.6+	1998 05 01	566	0.8+	0.2+	1998 06 02	691	0.6−	0.1+
1998 04 21	704	0.4+	0.6+	1998 05 02	566	0.4+	0.4+	1999 11 04	704	0.3−	0.6+
1998 04 21	704	0.6+	1.9+	1998 05 02	566	0.1+	0.3+	1999 11 04	704	0.1+	0.4+
1998 04 22	704	1.6−	0.0	1998 05 02	566	0.6+	0.4+	1999 11 04	704	0.1+	0.2+
1998 04 22	704	0.7−	4.3−	1998 05 18	699	0.2+	0.8−	1999 11 04	704	0.0	0.5+
1998 04 22	704	2.6−	2.1−	1998 05 18	699	0.5+	0.1−	1999 11 04	704	0.3+	0.2+
1998 04 22	704	0.1+	1.4−	1998 05 18	699	0.3+	0.3+	1999 11 12	704	0.0	0.1+
1998 04 22	704	0.8−	1.4−	1998 05 22	699	0.3−	0.2−	1999 11 12	704	0.2+	0.3−
1998 05 01	704	0.2−	0.8+	1998 05 22	699	0.2+	0.3−	1999 11 12	704	0.0	0.1−
1998 05 01	704	1.2+	0.8+	1998 05 22	699	0.2−	0.0	1999 11 12	704	0.4+	0.4−
1998 05 01	704	0.6−	1.1+	1998 05 22	566	0.9+	0.1+	1999 11 12	704	0.9−	0.0
1998 05 01	704	0.1−	1.3+	1998 05 22	566	0.2−	0.4−				
1998 05 01	704	0.1+	1.0+	1998 05 22	566	0.4−	0.9−				

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	45.74031		(2000.0)	P	Q
<i>n</i>	0.24444171	ω	120.79551	+0.67478425	+0.73800232
<i>a</i>	2.5332954	Ω	191.64499	-0.68424261	+0.62340694
<i>e</i>	0.1780870	<i>i</i>	1.23066	-0.27654706	+0.25829510
<i>P</i>	4.03	<i>H</i>	14.6	<i>G</i> 0.15	<i>U</i> 4

Residuals in seconds of arc

1998 04 22	704	0.1+	0.1-	1998 05 22	704	0.3+	0.7-	1999 11 05	120	1.2+	0.1+
1998 04 22	704	1.5-	0.1+	1998 05 22	699	(2.3+ 0.5-)		1999 11 07	120	1.2+	0.2-
1998 04 22	704	1.0-	0.1+	1998 05 22	699	0.2-	0.4+	1999 11 07	120	0.3+	0.0
1998 04 22	704	1.6+	0.1+	1998 05 22	699	0.1-	0.2-	1999 11 07	120	0.2+	0.9+
1998 04 22	704	0.2-	0.1+	1998 05 24	704	0.8+	0.3+	1999 11 10	120	0.5-	0.2-
1998 05 01	704	0.1+	0.3-	1998 05 24	704	1.9+	1.4-	1999 11 10	120	0.5+	0.5+
1998 05 01	704	0.0	0.3-	1998 05 24	704	1.4-	0.2-	1999 11 12	704	0.1+	0.4-
1998 05 01	704	0.2+	0.7-	1998 05 24	704	0.5-	1.3-	1999 11 12	704	0.4+	0.1-
1998 05 01	704	0.3+	0.4-	1998 05 24	704	1.0-	0.4+	1999 11 12	704	0.1-	0.6-
1998 05 01	704	0.2-	0.7-	1999 10 27	120	1.5-	1.1-	1999 11 12	704	0.9-	0.2+
1998 05 18	699	0.6-	0.6+	1999 10 27	120	1.0+	0.7+	1999 11 12	704	0.3-	0.5-
1998 05 18	699	1.0+	0.8+	1999 11 04	704	0.1-	0.4-	1999 11 12	120	0.2-	0.2+
1998 05 18	699	0.2+	0.4+	1999 11 04	704	0.1-	0.1-	1999 11 12	120	0.2+	0.4-
1998 05 22	704	0.2-	0.9+	1999 11 04	704	0.2+	0.3-	1999 11 13	120	0.7-	0.4+
1998 05 22	704	1.0+	0.9+	1999 11 04	704	0.0	0.1+	1999 11 13	120	0.0	0.2-
1998 05 22	704	1.3-	0.3-	1999 11 04	704	0.0	0.6+	1999 11 13	120	0.4-	0.1-
1998 05 22	704	0.4+	0.6+	1999 11 05	120	0.3-	0.0				

1998 KU₄ = 1999 VS₅₂

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	36.83233		(2000.0)	P	Q
<i>n</i>	0.28426551	ω	272.55385	+0.96885948	+0.21067551
<i>a</i>	2.2907970	Ω	75.30716	-0.13737026	+0.89448932
<i>e</i>	0.1510533	<i>i</i>	7.72986	-0.20601147	+0.39434083
<i>P</i>	3.47	<i>H</i>	14.6	<i>G</i> 0.15	<i>U</i> 5

Residuals in seconds of arc

1998 05 05	699	0.2+	0.5+	1998 05 24	704	0.6+	0.3+	1998 06 20	691	0.0	0.0
1998 05 05	699	1.1+	0.9-	1998 05 24	699	0.4+	0.1+	1998 06 27	691	0.4+	0.6+
1998 05 05	699	0.1+	0.5+	1998 05 24	699	0.8+	0.6-	1998 06 27	691	0.4+	0.8+
1998 05 22	704	0.2-	0.9+	1998 05 24	704	0.7+	0.1-	1998 06 27	691	1.4+	0.9+
1998 05 22	704	0.7+	0.3+	1998 05 24	704	0.8-	0.9-	1998 07 01	691	0.1-	0.4+
1998 05 22	704	0.1+	0.2+	1998 06 16	704	0.7+	0.7-	1998 07 01	691	0.9-	0.9+
1998 05 22	704	1.0+	0.9-	1998 06 16	704	0.1+	0.3+	1998 07 01	691	1.0-	0.4+
1998 05 22	704	0.2-	0.8-	1998 06 16	704	0.5-	2.0-	1999 11 03	704	0.0	0.1-
1998 05 22	699	0.1+	0.1+	1998 06 16	704	1.5-	1.0-	1999 11 03	704	0.2+	0.2+
1998 05 22	699	0.2+	0.1+	1998 06 16	704	4.3-	1.2+	1999 11 03	704	0.2-	0.2-
1998 05 22	699	0.3+	0.5+	1998 06 18	704	3.8+	2.1+	1999 11 03	704	0.2-	0.4+
1998 05 23	699	0.3+	0.5+	1998 06 18	704	2.0-	1.4-	1999 11 03	704	0.5-	0.2-
1998 05 23	699	0.1+	0.3+	1998 06 18	704	1.2+	0.3-	1999 11 04	704	0.5+	0.5+
1998 05 23	699	0.7+	0.1-	1998 06 18	704	0.4+	0.5+	1999 11 04	704	0.5-	1.1+
1998 05 24	704	0.1-	0.2+	1998 06 18	704	3.6-	0.3-	1999 11 04	704	0.2-	0.5+
1998 05 24	704	0.4-	0.5+	1998 06 20	691	0.1+	0.1+	1999 11 04	704	0.2+	0.4+
1998 05 24	699	0.2+	0.1-	1998 06 20	691	0.0	0.0	1999 11 04	704	0.0	0.3+

1998 KJ₃₃ = 1999 VZ₂₅

Id. S. Nakano

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	52.88227		(2000.0)	P	Q
<i>n</i>	0.27871019	ω	78.78737	+0.86997903	+0.48640080
<i>a</i>	2.3211372	Ω	252.06435	-0.47906799	+0.79491318
<i>e</i>	0.1636544	<i>i</i>	4.88010	-0.11674910	+0.36266692
<i>P</i>	3.54	<i>H</i>	15.8	<i>G</i> 0.15	<i>U</i> 4

Residuals in seconds of arc

1998 05 22	704	0.5+	0.7+	1998 06 19	428	0.3-	0.8-	1999 11 10	360	0.1-	0.3-
1998 05 22	704	0.1+	1.5-	1998 06 19	428	0.2-	1.0-	1999 11 10	360	0.1+	0.0

1998 05 22	704	0.1-	0.4-	1998 06 20	428	0.6-	0.5+	1999 11 10	360	0.2+	0.0
1998 05 22	704	0.4+	0.2-	1998 06 20	428	0.6-	0.2+	1999 11 12	704	0.8-	0.6-
1998 05 24	704	1.1+	1.0-	1998 06 25	691	0.2+	0.4+	1999 11 12	704	0.2+	0.4-
1998 05 24	704	0.2+	0.1-	1998 06 25	691	0.0	0.5+	1999 11 12	704	0.0	0.6-
1998 05 24	704	0.3+	1.6+	1998 06 25	691	0.3+	0.7+	1999 11 16	360	0.1+	0.5+
1998 05 24	704	0.7-	0.5-	1998 06 25	428	0.2-	1.0-	1999 11 16	360	0.0	0.7+
1998 05 24	704	0.9-	1.2+	1998 07 15	428	0.1+	0.0	1999 11 16	360	0.1-	0.2+
1998 06 18	428	0.3+	0.1+	1999 11 10	360	0.3+	0.1-				

1998 KQ₃₅ = 1999 UP₂₅

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	65.33666		(2000.0)	P	Q
<i>n</i>	0.26839992	ω	65.02904	+0.59240657	+0.80074960
<i>a</i>	2.3802055	Ω	241.58807	-0.77072752	+0.53126293
<i>e</i>	0.1125575	<i>i</i>	5.78309	-0.23459230	+0.27669437
<i>P</i>	3.67	<i>H</i>	15.2	<i>G</i> 0.15	<i>U</i> 5

Residuals in seconds of arc

1998 05 22	704	0.2+	0.5-	1998 06 18	704	1.2+	1.6-	1998 07 02	691	0.7-	0.1+
1998 05 22	704	0.3+	1.4-	1998 06 18	704	3.6-	1.2-	1998 07 02	691	0.8-	0.4+
1998 05 22	704	1.5+	1.3+	1998 06 20	691	0.2+	0.2+	1998 07 02	691	0.7-	0.3+
1998 05 22	704	0.1-	0.9+	1998 06 20	691	0.2+	0.3+	1999 10 29	703	0.9+	0.6-
1998 05 24	704	1.2-	0.2-	1998 06 20	691	0.2+	0.3+	1999 10 29	703	0.4-	1.2+
1998 05 24	704	0.4+	0.9+	1998 06 28	691	0.6+	0.2+	1999 10 29	703	1.5-	0.9-
1998 05 24	704	0.2+	0.8-	1998 06 28	691	0.6+	0.2+	1999 10 29	703	0.6-	0.4+
1998 05 24	704	0.7-	0.5-	1998 06 28	691	0.5+	0.1+	1999 11 04	703	0.1-	0.2-
1998 06 18	704	1.7+	1.7+	1998 06 29	699	1.1+	0.8+	1999 11 04	703	0.9+	0.4-
1998 06 18	704	1.5-	1.6-	1998 06 29	699	0.5+	0.7+	1999 11 04	703	0.1+	0.3+
1998 06 18	704	0.2-	0.2-	1998 06 29	699	0.1+	0.5-	1999 11 04	703	0.8+	0.3-

1998 KB₄₄ = 1999 TY₂₃

Id. A. Doppler

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	150.11970		(2000.0)	P	Q
<i>n</i>	0.26082585	ω	145.14737	-0.92419385	+0.38079189
<i>a</i>	2.4260642	Ω	57.26147	-0.35786945	-0.83654983
<i>e</i>	0.1294251	<i>i</i>	2.00176	-0.13339863	-0.39393135
<i>P</i>	3.78	<i>H</i>	15.3	<i>G</i> 0.15	<i>U</i> 5

Residuals in seconds of arc

1995 08 20	809	(0.7- 2.4+)		1998 05 22	704	(1.4- 3.1+)		1998 06 03	704	1.0+	1.4+
1995 08 27	809	0.9-	1.7-	1998 05 22	704	1.1-	1.5+	1998 06 03	704	0.7+	0.7-
1995 08 27	809	0.6+	0.6-	1998 05 22	704	0.3+	0.5+	1998 06 03	704	1.5-	0.1+
1995 08 29	809	0.6+	0.5+	1998 05 24	704	0.5-	1.0+	1999 10 04	691	0.1-	0.2+
1995 08 30	809	0.7+	0.3+	1998 05 24	704	0.5+	0.4-	1999 10 04	691	0.2-	0.0
1995 09 20	809	0.4-	0.3-	1998 05 24	704	0.5+	1.5-	1999 10 04	691	0.3-	0.2-
1995 09 22	809	0.1-	0.7+	1998 05 24	704	1.6+	0.4-	1999 10 06	691	0.0	0.4+
1998 05 22	704	0.0	0.0	1998 06 03	704	1.1-	0.8-	1999 10 06	691	0.1+	0.4+
1998 05 22	704	0.8-	0.5-	1998 06 03	704	0.6+	0.4+	1999 10 06	691	0.0	0.5+

1998 KD₄₇ = 1999 VX₃₅

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	106.58989		(2000.0)	P	Q
<i>n</i>	0.29263594	ω	50.57400	+0.17105948	+0.98384929
<i>a</i>	2.2469027	Ω	229.35779	-0.92396453	+0.14160927
<i>e</i>	0.1469930	<i>i</i>	3.98393	-0.34209386	+0.10948693
<i>P</i>	3.37	<i>H</i>	15.1	<i>G</i> 0.15	<i>U</i> 5

Residuals in seconds of arc

1998 05 22	704	1.1-	0.6-	1998 06 01	809	0.2-	0.9+	1999 11 03	704	0.3+	0.9+
1998 05 22	704	0.1-	1.3+	1998 06 01	809	0.9-	1.1+	1999 11 03	704	0.2+	0.1-
1998 05 22	704	0.8+	1.5-	1998 06 02	809	1.2+	1.4-	1999 11 03	704	0.4-	0.6-
1998 05 22	704	0.1+	0.9-	1998 06 02	809	0.1+	1.3-	1999 11 03	704	0.3+	0.2+
1998 05 24	704	0.9-	0.4-	1998 06 02	809	0.4-	1.1-	1999 11 12	704	0.5+	0.2-
1998 05 24	704	0.2-	0.3+	1998 06 24	704	0.1+	0.5-	1999 11 12	704	0.5+	0.2-

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1998 05 24	704	1.2+	1.1+	1998 06 24	704	0.1+	0.2+	1999 11 12	704	0.4-	0.2+
1998 05 24	704	0.2-	0.4-	1998 06 24	704	0.2-	0.3+	1999 11 12	704	0.5-	0.1-
1998 05 24	704	0.7+	0.9+	1998 06 24	704	0.0	0.2-	1999 11 12	704	0.4-	0.5-
1998 06 01	809	0.2-	1.5+	1998 06 24	704	0.1+	0.3+				

1998 KE₄₇ = 1988 PV₃ = 1999 VE₅₈

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

M	117.69361		(2000.0) <th>P</th> <th>Q</th>	P	Q
n	0.28353924	ω	31.19821	-0.17832735	+0.98306441
a	2.2947072	Ω	228.56535	-0.91398637	-0.18138922
e	0.1410311	i	3.22940	-0.36445613	-0.02612109
P	3.48	H	15.3	G 0.15	U 4

Residuals in seconds of arc

1988 08 12	511	0.2+	0.1-	1998 06 21	749	0.3+	0.1-	1998 06 26	704	0.9+	1.4+
1988 08 12	511	0.3-	0.4+	1998 06 22	749	0.2+	0.2+	1998 06 26	704	0.3-	0.1+
1998 05 22	704	1.4+	2.1-	1998 06 22	749	0.0	0.3-	1998 06 26	704	0.3-	0.3+
1998 05 22	704	0.1+	2.2-	1998 06 22	749	0.2+	0.0	1999 11 04	704	0.1+	0.4-
1998 05 22	704	1.1+	0.9-	1998 06 22	749	0.1+	0.3-	1999 11 04	704	0.8-	1.3+
1998 05 22	704	1.1+	0.9-	1998 06 22	749	0.2-	0.2-	1999 11 04	704	0.1+	0.6-
1998 05 22	704	2.2-	1.6+	1998 06 24	704	0.2-	0.3+	1999 11 04	704	0.3-	0.0
1998 05 24	704	0.0	0.4+	1998 06 24	704	0.4+	0.4-	1999 11 04	704	1.1+	0.0
1998 05 24	704	0.6+	0.3+	1998 06 24	704	0.5-	0.4+	1999 11 12	704	0.3+	0.5-
1998 05 24	704	2.2-	0.2+	1998 06 24	704	0.6-	0.0	1999 11 12	704	0.2-	0.3-
1998 05 24	704	0.6-	0.1+	1998 06 24	704	0.6-	1.0+	1999 11 12	704	0.2+	0.7-
1998 05 24	704	0.9+	0.2-	1998 06 26	704	0.6+	0.2-	1999 11 12	704	0.2+	0.7-
1998 06 21	749	0.1-	0.3+	1998 06 26	704	0.1-	0.8-	1999 11 12	704	0.1-	0.7-

1998 KO₅₃ = 1975 XB₅ = 1999 SB₉

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

M	187.55023		(2000.0)	$\mathbf{P}$	$\mathbf{Q}$
n	0.23608822	ω	32.02885	-0.85026951	-0.48003906
a	2.5927054	Ω	117.79151	+0.41660853	-0.86444986
e	0.1010413	i	14.12445	+0.32168166	-0.14929478
P	4.17	H	14.4	G 0.15	U 3

Residuals in seconds of arc

1975 12 03	095	0.0	0.0	1998 05 26	704	0.0	0.3-	1999 09 29	704	0.2-	0.2+
1998 05 23	704	0.2+	0.7-	1998 05 26	704	0.0	0.9+	1999 09 29	704	0.1+	0.2-
1998 05 23	704	0.2+	0.5-	1998 05 26	704	0.5+	0.3+	1999 09 30	704	0.4+	1.0+
1998 05 23	704	0.7-	0.4+	1998 05 26	704	0.0	0.4-	1999 09 30	704	0.1-	0.6-
1998 05 23	704	0.7-	0.4+	1998 05 26	704	0.3-	0.0	1999 09 30	704	0.2+	0.1-
1998 05 23	704	0.8+	0.1-	1999 09 29	704	0.4-	0.2-				

1998 KD₅₈ = 1999 VD₃₈

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

M	324.16635		(2000.0)	$\mathbf{P}$	$\mathbf{Q}$
n	0.24383806	ω	194.95076	+0.59829677	-0.78460139
a	2.5374747	Ω	218.69715	+0.75926373	+0.61997963
e	0.1130310	i	15.07536	+0.25604602	-0.00509112
P	4.04	H	15.3	G 0.15	U 4

Residuals in seconds of arc

1998 05 28	327	0.2-	0.5-	1998 06 04	327	0.3+	0.4-	1999 11 10	704	0.0	0.3-
1998 05 28	327	0.2-	0.1-	1998 06 04	327	0.1-	0.0	1999 11 10	704	0.4-	0.2-
1998 05 28	327	0.6+	0.2-	1998 06 04	327	0.4+	0.2-	1999 11 10	704	0.2-	0.2-
1998 05 28	327	0.6-	0.1-	1999 11 03	703	0.1-	0.8-	1999 11 10	704	0.4-	0.2+
1998 05 29	327	0.3+	0.6+	1999 11 03	703	0.0	1.0-	1999 11 10	704	0.8+	0.1-
1998 05 29	327	0.4-	0.8+	1999 11 03	703	0.4-	1.7+	1999 11 12	704	0.0	0.1-
1998 05 29	327	0.3+	0.2+	1999 11 03	703	0.1-	0.3-	1999 11 12	704	0.0	0.1-
1998 05 29	327	0.0	0.5-	1999 11 04	703	0.0	0.5-	1999 11 12	704	0.1+	0.1+
1998 05 29	327	0.4+	0.4+	1999 11 04	703	1.6+	2.7+	1999 11 12	704	0.1-	0.2+
1998 05 29	327	0.5-	0.2+	1999 11 04	703	0.0	0.8-	1999 11 12	704	0.3-	0.3+
1998 06 04	327	0.4-	0.2-	1999 11 04	703	0.4-	0.7-				

1998 KJ₅₈ = 1999 UT₁₃

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

M	274.58521		(2000.0)	P	Q
n	0.28622509	ω	211.59659	+0.01120843	-0.99724764
a	2.2803294	Ω	237.85660	+0.93451996	+0.03652223
e	0.0705545	i	4.96564	+0.35573420	-0.06452336
P	3.44	H	15.9	G 0.15	U 4

Residuals in seconds of arc

1998 05 21	428	0.2+	0.8+	1998 06 02	428	0.1+	0.6+	1999 10 29	703	0.3-	0.4-
1998 05 22	428	0.2-	0.5+	1998 06 18	428	0.3+	0.3+	1999 10 29	703	0.4+	0.6-
1998 05 24	704	0.2+	2.0-	1998 06 21	691	0.1-	0.1+	1999 10 29	703	0.8+	0.5+
1998 05 24	704	0.1-	0.9-	1998 06 21	691	0.5+	0.1-	1999 11 03	703	0.7-	0.2+
1998 05 24	704	0.9-	0.4+	1998 06 21	691	0.7+	0.3-	1999 11 03	703	0.3+	0.6+
1998 05 24	704	0.0	0.1+	1998 06 28	691	0.9-	0.3-	1999 11 03	703	0.3-	0.0
1998 05 25	428	0.2+	0.2+	1998 06 28	691	0.3-	0.1-	1999 11 03	703	1.0-	0.6+
1998 05 25	428	0.1+	0.3-	1998 06 28	691	0.2-	0.1-				
1998 06 02	428	0.3+	1.1+	1999 10 29	703	0.8+	0.8-				

1998 KG₆₄

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

M	103.86393		(2000.0)	P	Q
n	0.27652733	ω	128.01000	-0.03074389	+0.99920795
a	2.3333363	Ω	140.20570	-0.92897563	-0.01923688
e	0.1488760	i	2.26224	-0.36886188	-0.03483403
P	3.56	H	15.0	G 0.15	U 4

Residuals in seconds of arc

1998 05 22	704	0.5+	0.2-	1998 06 03	704	0.0	0.7-	1999 11 04	704	0.7-	0.2-
1998 05 22	704	0.9+	0.0	1998 06 03	704	0.1+	0.3+	1999 11 04	704	0.6-	0.5-
1998 05 22	704	0.2+	1.0+	1998 06 03	704	0.4+	0.8+	1999 11 07	120	0.3-	0.4+
1998 05 22	704	0.4+	0.1+	1998 06 03	704	(4.4-	1.2+)	1999 11 07	120	0.6-	0.2+
1998 05 22	704	0.9-	0.6+	1998 06 29	699	0.5-	0.0	1999 11 08	120	1.0+	1.0+
1998 05 24	704	0.8-	0.5+	1998 06 29	699	0.5-	0.6-	1999 11 08	120	0.5+	0.8+
1998 05 24	704	0.2+	0.2+	1998 06 29	699	0.1+	0.1-	1999 11 10	120	0.0	0.1-
1998 05 24	704	0.2+	0.5+	1999 11 04	704	0.1+	0.1+	1999 11 10	120	0.2+	0.3-
1998 05 24	704	0.1-	1.4-	1999 11 04	704	0.3-	1.0-				
1998 05 24	704	0.3-	0.5-	1999 11 04	704	0.4+	0.5+				

1998 KK₆₄ = 1999 TY₅

Id. S. Nakano

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

M	122.21833		(2000.0)	P	Q
n	0.26080394	ω	208.99528	-0.54974239	+0.83496930
a	2.4262001	Ω	27.67721	-0.75579047	-0.48458873
e	0.1206658	i	3.04694	-0.35575844	-0.26076815
P	3.78	H	14.8	G 0.15	U 5

Residuals in seconds of arc

1998 05 22	704	0.5+	1.5+	1999 10 02	703	0.7-	0.3+	1999 10 16	120	0.5+	1.1-
1998 05 22	704	0.7-	1.2+	1999 10 02	703	0.5-	0.3+	1999 10 16	120	0.5+	0.9-
1998 05 22	704	1.4+	0.8+	1999 10 02	703	0.1-	1.0+	1999 10 17	120	(3.2+	0.6+)
1998 05 22	704	0.5-	1.4-	1999 10 02	703	0.5-	0.4-	1999 10 17	120	0.3-	0.1-
1998 05 24	704	0.3-	0.1-	1999 10 04	704	0.3-	0.5+	1999 10 19	120	0.3+	0.4-
1998 05 24	704	0.2+	0.2+	1999 10 04	704	0.2-	0.7-	1999 10 19	120	1.8+	1.5-
1998 05 24	704	0.8-	0.0	1999 10 04	704	0.1-	0.6+	1999 11 01	703	0.1-	0.1-
1998 05 24	704	0.3+	1.3-	1999 10 04	704	0.0	1.6-	1999 11 01	703	1.4-	0.3-
1998 05 24	704	0.3-	1.0-	1999 10 06	104	0.6+	0.5-	1999 11 01	703	1.4-	0.8+
1998 06 03	704	(2.4-	1.1-)	1999 10 06	104	0.0	0.4-	1999 11 01	703	0.7-	0.7+
1998 06 03	704	0.1-	0.3+	1999 10 06	104	0.3-	0.5-	1999 11 12	704	0.4-	0.7-
1998 06 03	704	0.5+	0.1+	1999 10 07	704	0.2-	0.0	1999 11 12	704	0.6+	0.4+
1998 06 03	704	(2.1-	0.6+)	1999 10 07	704	0.1-	0.3+	1999 11 12	704	0.0	0.3+
1998 06 03	704	0.3-	0.3-	1999 10 07	704	0.2+	0.1+	1999 11 12	704	0.4+	0.1-
1999 10 02	104	1.1-	1.3+	1999 10 07	104	0.2-	0.1-	1999 11 12	704	0.9+	0.7+
1999 10 02	104	1.6+	1.2+	1999 10 07	104	1.1+	0.7+				

1998 MN₇ = 1993 SO₁₁ = 1999 UM₆

Id. G. V. Williams, A. Gnädig, M. E. Sansaturio

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	17.03619		(2000.0)	P		Q	
<i>n</i>	0.17596873	ω	337.05781	+0.99845193		−0.05539823	
<i>a</i>	3.1538841	Ω	26.11938	+0.05262477		+0.91188053	
<i>e</i>	0.2145952	<i>i</i>	0.64799	+0.01801073		+0.40670006	
<i>P</i>	5.60	<i>H</i>	14.3	<i>G</i>	0.15	<i>U</i>	3

Residuals in seconds of arc

1993 09 16	809	(2.7+ 5.6+)	1998 07 01	426	0.9+ 0.5−	1999 11 03	704	0.4+ 0.6+
1993 09 16	809	(2.7+ 5.0+)	1998 07 03	426	0.5− 0.2+	1999 11 03	704	0.4+ 0.2+
1993 09 16	809	(1.8+ 4.4+)	1998 07 03	426	0.7− 0.5−	1999 11 03	704	1.3+ 0.8+
1993 09 23	809	(0.8+ 2.6+)	1998 08 16	426	0.1− 0.5+	1999 11 04	703	0.0 0.2+
1993 09 23	809	0.5− 1.0+	1998 08 16	426	0.5+ 0.1+	1999 11 04	703	0.3− 0.1+
1993 09 23	809	0.3− 0.7+	1998 08 17	426	0.0 0.6+	1999 11 04	703	0.0 0.5+
1998 06 22	426	0.4− 0.6−	1999 10 28	327	0.1− 0.4−	1999 11 04	703	0.0 0.7+
1998 06 22	426	0.1+ 1.0−	1999 10 28	327	0.1− 0.2−	1999 11 12	704	0.6+ 1.0−
1998 06 22	426	0.2− 0.4−	1999 10 28	327	1.2− 0.5−	1999 11 12	704	0.7+ 0.6−
1998 06 25	426	0.5+ 0.1+	1999 10 29	327	1.9− 0.7−	1999 11 12	704	0.7+ 1.0−
1998 06 25	426	1.1− 0.1−	1999 10 29	327	0.7− 0.3−	1999 11 12	704	0.6+ 0.9−
1998 06 25	426	0.1+ 0.2−	1999 10 29	327	0.7− 0.0	1999 11 12	704	0.4+ 0.2−
1998 07 01	426	0.7+ 0.2+	1999 11 03	704	0.0 0.2−			
1998 07 01	426	0.6+ 0.5−	1999 11 03	704	0.4+ 0.2+			

1998 ML₁₆ = 1999 TU₁₄

Id. A. Doppler

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	249.18583		(2000.0)	P		Q	
<i>n</i>	0.18471879	ω	150.65360	−0.58738995		−0.80926470	
<i>a</i>	3.0534818	Ω	335.31576	+0.73874709		−0.53212723	
<i>e</i>	0.0863163	<i>i</i>	1.09491	+0.33049324		−0.24885991	
<i>P</i>	5.34	<i>H</i>	14.3	<i>G</i>	0.15	<i>U</i>	5

Residuals in seconds of arc

1998 06 27	691	0.4− 0.2−	1999 10 10	688	0.6− 0.2+	1999 10 13	688	0.3− 0.1−
1998 06 27	691	0.1− 0.3−	1999 10 10	688	0.1− 0.1+	1999 10 13	688	0.2− 0.2−
1998 06 27	691	0.2+ 0.2−	1999 10 11	688	0.2+ 1.4+	1999 10 14	688	0.3− 0.0
1998 06 28	691	0.1− 0.1−	1999 10 11	688	0.8+ 1.4+	1999 10 14	688	0.2− 0.1+
1998 06 28	691	0.1+ 0.1−	1999 10 11	688	0.7+ 1.2+	1999 10 15	688	0.7+ 0.4−
1998 06 28	691	0.2+ 0.1+	1999 10 11	688	0.3+ 1.0+	1999 10 20	688	0.2+ 0.2−
1998 07 03	691	0.2− 0.1−	1999 10 12	688	0.4+ 1.0−	1999 10 20	688	0.4− 0.4−
1998 07 03	691	0.3+ 0.8+	1999 10 12	688	0.9− 0.7−	1999 10 21	688	0.5+ 0.2+
1999 10 10	688	0.2+ 0.8−	1999 10 12	688	0.9− 0.4+	1999 10 21	688	0.1+ 0.4−
1999 10 10	688	0.1+ 0.5−	1999 10 12	688	0.2+ 0.5−	1999 10 21	688	0.3− 0.0
1999 10 10	688	0.3− 0.6−	1999 10 13	688	0.2+ 0.2−			

1998 MR₃₂ = 1992 GZ₂ = 1995 WR₂₆ = 1999 TA₂₇

Id. A. Doppler

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	357.45702		(2000.0)	P		Q	
<i>n</i>	0.19741227	ω	159.68608	+0.92902934		−0.36937145	
<i>a</i>	2.9211461	Ω	222.01105	+0.33484789		+0.86421802	
<i>e</i>	0.0688805	<i>i</i>	1.85473	+0.15742099		+0.34160203	
<i>P</i>	4.99	<i>H</i>	14.0	<i>G</i>	0.15	<i>U</i>	1

Residuals in seconds of arc

1992 04 04	809	0.5+ 0.5−	1998 06 24	704	(0.2+ 2.5−)	1999 10 03	704	0.1− 0.6−
1992 04 04	809	0.4+ 1.2−	1998 06 24	704	1.0− 1.2−	1999 10 06	704	0.9+ 0.2+
1992 04 04	809	0.3+ 1.3−	1998 06 26	809	(1.1− 4.6−)	1999 10 06	704	0.4+ 0.4−
1992 04 06	809	0.5− 1.5−	1998 06 26	809	(1.8− 4.2−)	1999 10 06	704	0.5+ 0.3−
1992 04 06	809	1.6− 1.2−	1998 06 26	809	(1.6− 4.5−)	1999 10 06	704	0.3+ 0.3−
1992 04 06	809	1.2− 1.9−	1998 06 26	704	0.2− 1.1+	1999 11 03	703	0.8+ 0.5−
1993 07 12	809	(3.1− 1.4−)	1998 06 26	704	1.5+ 0.8−	1999 11 03	703	1.7− 0.4+

1993 07 12	809	(3.6− 3.0−)	1998 06 26	704	1.0− 0.4−	1999 11 03	703	0.4− 0.6+
1993 07 12	809	(4.3− 3.3−)	1998 06 26	704	0.2+ 1.1+	1999 11 03	703	0.3− 0.3−
1993 07 23	809	0.8− 0.4+	1998 06 27	809	(0.3+ 4.7−)	1999 11 04	704	0.1− 0.1+
1993 07 23	809	0.4+ 0.8+	1998 06 27	809	(0.4+ 4.9−)	1999 11 04	704	0.1− 0.5−
1993 07 23	809	0.3− 1.0+	1998 06 27	809	(0.0 4.3−)	1999 11 04	704	0.1+ 0.6−
1995 11 18	691	0.2+ 0.8+	1999 10 01	703	0.2− 0.4−	1999 11 04	704	0.3+ 0.8−
1995 11 18	691	0.4+ 0.8+	1999 10 01	703	0.3− 0.2−	1999 11 04	704	0.2− 0.7−
1995 11 28	691	0.2+ 1.0+	1999 10 01	703	0.9− 0.1+	1999 11 12	704	0.5+ 0.2−
1995 11 28	691	0.0 1.1+	1999 10 01	703	0.0 0.7−	1999 11 12	704	0.8+ 0.4+
1995 11 28	691	0.0 0.8+	1999 10 03	704	0.2+ 0.1−	1999 11 12	704	0.7+ 0.9−
1998 06 24	704	1.1− 0.3+	1999 10 03	704	0.9− 0.9+	1999 11 12	704	0.9+ 0.6−
1998 06 24	704	0.1+ 0.6−	1999 10 03	704	0.0 0.0	1999 11 12	704	0.8+ 0.9−
1998 06 24	704	1.3+ 0.6+	1999 10 03	704	0.3+ 0.5−			

1998 MZ₄₁ = 1999 VU₁₀

Id. S. Nakano

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	44.69349		(2000.0)	P		Q	
<i>n</i>	0.23513194	ω	256.35952	+0.90939388		+0.34544966	
<i>a</i>	2.5997303	Ω	83.03604	−0.22967328		+0.88141039	
<i>e</i>	0.1846742	<i>i</i>	13.49637	−0.34677507		+0.32214942	
<i>P</i>	4.19	<i>H</i>	14.9	<i>G</i>	0.15	<i>U</i>	6

Residuals in seconds of arc

1998 06 26	428	(0.8+ 3.6+)	1998 07 05	428	0.6− 0.5−	1999 11 04	704	0.5+ 0.8+
1998 06 26	428	(0.2− 4.0+)	1998 07 16	428	0.0 0.5+	1999 11 09	411	0.3− 0.5+
1998 06 30	428	0.1− 0.9+	1999 11 04	704	0.6− 0.4−	1999 11 09	411	1.2+ 1.0−
1998 06 30	428	0.8− 0.3−	1999 11 04	704	0.1− 0.1+	1999 11 10	411	0.7− 0.3−
1998 07 01	428	0.2+ 0.0	1999 11 04	704	0.0 0.4+	1999 11 10	411	0.6− 0.3−
1998 07 02	428	1.3+ 0.7−	1999 11 04	704	0.7+ 0.1+			

1998 MV₄₂ = 1992 WA₂ = 1999 VL₂₅

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	314.76404		(2000.0)	P		Q	
<i>n</i>	0.28671279	ω	177.31560	−0.06171706		−0.99562145	
<i>a</i>	2.2777427	Ω	276.21610	+0.91441237		−0.02820903	
<i>e</i>	0.1251911	<i>i</i>	4.04969	+0.40005128		−0.08911893	
<i>P</i>	3.44	<i>H</i>	14.3	<i>G</i>	0.15	<i>U</i>	5

Residuals in seconds of arc

1992 11 18	399	0.5+ 0.1+	1998 06 24	704	1.5− 1.9−	1998 06 27	809	0.9− 0.7+
1992 11 18	399	1.1+ 0.4+	1998 06 24	704	(4.3− 1.3−)	1999 11 13	411	0.8− 1.0+
1992 11 21	399	0.5− 0.3+	1998 06 26	809	0.3+ 0.4+	1999 11 13	411	0.6− 0.9−
1992 11 21	399	1.1− 0.5−	1998 06 26	809	0.1− 0.4+	1999 11 16	411	0.6+ 0.9−
1998 06 24	704	0.6+ 0.4−	1998 06 26	809	0.4+ 0.3+	1999 11 16	411	0.1+ 0.5−
1998 06 24	704	1.3+ 1.0−	1998 06 27	809	0.9− 0.3+	1999 11 18	411	(2.7− 3.3+)
1998 06 24	704	1.7+ 0.3−	1998 06 27	809	0.8− 1.2+	1999 11 18	411	0.7+ 0.6+

1998 NF

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	130.42657		(2000.0)	P		Q	
<i>n</i>	0.26214273	ω	163.08644	−0.51071444		+0.85765811	
<i>a</i>	2.4179325	Ω	76.16621	−0.79577772		−0.44517074	
<i>e</i>	0.1331644	<i>i</i>	3.53941	−0.32543598		−0.25738218	
<i>P</i>	3.76	<i>H</i>	15.0	<i>G</i>	0.15	<i>U</i>	5

Residuals in seconds of arc

1998 07 01	428	1.0+ 0.1−	1998 07 05	428	0.6+ 0.1−	1998 09 13	428	0.7− 0.8−
1998 07 02	428	0.4− 0.3−	1998 07 15	428	0.1− 0.0	1999 11 09	428	0.3− 0.3−
1998 07 02	428	0.5+ 0.3+	1998 07 20	428	0.1− 0.1−	1999 11 09	428	0.0 0.5+
1998 07 02	428	0.5+ 0.8+	1998 07 27	428	0.3− 0.2+	1999 11 10	428	0.3− 0.2−
1998 07 04	428	1.7− 0.3+	1998 09 13	428	0.7+ 0.4−	1999 11 10	428	0.4+ 0.4+

1998 NV = 1999 SQ₈

Id. A. Doppler

1999 NOV. 23

M.P.C. 36815

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	324.18335	(2000.0)	P	Q
<i>n</i>	0.22267325	ω	289.63564	+0.77988600
<i>a</i>	2.6958187	Ω	108.12374	+0.61636622
<i>e</i>	0.3136843	<i>i</i>	8.86929	+0.10895189
<i>P</i>	4.43	<i>H</i>	14.7	<i>G</i> 0.15 <i>U</i> 4

Residuals in seconds of arc

1998 07 15	691	0.2−	0.0	1999 09 11	704	0.8−	0.2−	1999 09 30	704	0.4+	0.0
1998 07 15	691	0.3−	0.1−	1999 09 11	704	0.9−	0.4+	1999 09 30	704	0.6−	0.3−
1998 07 15	691	0.1+	0.1−	1999 09 11	704	0.6+	0.7+	1999 09 30	704	0.2+	0.1+
1998 07 19	691	0.5+	0.1+	1999 09 29	704	1.0+	0.3+	1999 09 30	704	0.3+	0.2−
1998 07 24	691	0.5−	0.4−	1999 09 29	704	0.4+	1.0−	1999 11 10	704	0.1+	0.4−
1998 07 24	691	0.1+	0.2−	1999 09 29	704	0.1+	0.2+	1999 11 10	704	0.2−	0.1−
1998 07 24	691	0.1+	0.1+	1999 09 29	704	0.8+	0.0	1999 11 10	704	0.4−	0.2−
1999 09 11	704	0.4−	0.7+	1999 09 29	704	0.4+	0.4−	1999 11 10	704	0.4−	0.3−
1999 09 11	704	1.2−	0.3+	1999 09 30	704	0.3+	0.3−	1999 11 10	704	0.1+	0.3+

1998 OM = 1999 VX₃₇

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	112.24211	(2000.0)	P	Q
<i>n</i>	0.23325064	ω	37.63150	+0.16056574
<i>a</i>	2.6136905	Ω	242.46457	−0.95250196
<i>e</i>	0.1561203	<i>i</i>	13.39727	−0.25876371
<i>P</i>	4.23	<i>H</i>	13.9	<i>G</i> 0.15 <i>U</i> 5

Residuals in seconds of arc

1998 07 17	699	0.1−	0.9−	1998 08 24	704	0.1+	0.8+	1999 11 03	704	0.3−	0.6−
1998 07 17	699	0.3+	0.8−	1998 08 24	704	0.4−	1.1+	1999 11 03	704	0.1+	0.3−
1998 07 17	699	0.2+	0.2−	1998 08 27	704	0.0	0.2+	1999 11 12	704	0.1−	0.2−
1998 07 18	699	0.4−	0.1−	1998 08 27	704	0.6−	0.4−	1999 11 12	704	0.2−	0.3+
1998 07 18	699	0.3−	0.3+	1998 08 27	704	0.1−	0.2−	1999 11 12	704	0.1+	0.2+
1998 07 18	699	0.9+	0.7+	1998 08 27	704	0.5−	0.6+	1999 11 12	704	0.2+	0.0
1998 08 24	704	0.0	0.9−	1999 11 03	704	0.2−	0.2+	1999 11 12	704	0.2+	0.2+
1998 08 24	704	0.9+	0.3−	1999 11 03	704	0.1+	0.2−				

1998 OS = 1999 UX₂₄

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	256.00342	(2000.0)	P	Q
<i>n</i>	0.21452527	ω	222.51485	−0.60446613
<i>a</i>	2.7636545	Ω	264.94933	+0.75644746
<i>e</i>	0.0720407	<i>i</i>	6.09017	+0.24981581
<i>P</i>	4.59	<i>H</i>	15.6	<i>G</i> 0.15 <i>U</i> 5

Residuals in seconds of arc

1998 07 20	910	0.3+	0.2+	1998 07 26	910	0.4−	0.3+	1999 10 28	703	0.3−	0.3+
1998 07 20	910	0.4+	0.4+	1998 07 27	910	0.6−	0.1+	1999 10 28	703	0.4+	0.2+
1998 07 20	910	0.4+	0.2+	1998 07 27	910	0.3−	0.2+	1999 10 28	703	0.9−	0.2+
1998 07 20	910	0.1+	0.4−	1998 07 29	910	0.5+	0.1−	1999 10 28	703	0.1−	0.1−
1998 07 21	910	0.1+	0.6−	1998 07 29	910	0.8+	0.1+	1999 11 04	703	0.4+	0.2−
1998 07 21	910	0.1+	0.3−	1998 07 29	910	0.8+	0.1−	1999 11 04	703	0.3−	0.0
1998 07 23	910	0.2−	0.2+	1998 07 30	910	0.0	0.1−	1999 11 04	703	0.4−	0.3−
1998 07 24	910	0.4−	0.2+	1998 07 30	910	0.2−	0.0	1999 11 04	703	1.2+	0.2−
1998 07 24	910	0.3−	0.1+	1998 07 30	910	0.9−	0.3−				

1998 OR₈ = 1999 VX₇

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	9.82593	(2000.0)	P	Q
<i>n</i>	0.12499673	ω	180.83919	+0.93251881
<i>a</i>	3.9615969	Ω	200.33054	+0.33155683
<i>e</i>	0.2525367	<i>i</i>	2.31037	+0.14310395
<i>P</i>	7.89	<i>H</i>	13.3	<i>G</i> 0.15 <i>U</i> 4

Residuals in seconds of arc

1998 07 26	809	0.6+	0.4+	1998 08 17	704	0.5−	1.3−	1999 11 07	120	0.8−	0.4−
1998 07 26	809	0.7+	0.4+	1998 08 23	704	1.0+	1.0+	1999 11 08	120	1.5+	0.2+
1998 07 26	809	0.9+	0.1−	1998 08 23	704	0.3−	0.4−	1999 11 08	120	0.1+	0.2−
1998 07 27	809	0.9−	0.4+	1998 08 23	704	0.5+	0.9+	1999 11 08	120	0.5+	0.4−
1998 07 27	809	1.2−	0.9+	1998 08 23	704	1.1−	0.9−	1999 11 08	120	0.2−	0.3−
1998 07 27	809	1.2−	1.1+	1999 11 04	704	0.2+	0.4−	1999 11 12	704	0.0	0.7−
1998 08 17	704	0.6−	0.4−	1999 11 04	704	0.3+	0.3+	1999 11 12	704	0.2+	0.2−
1998 08 17	704	0.9−	0.7−	1999 11 04	704	1.9−	1.7+	1999 11 12	704	0.0	0.5−
1998 08 17	704	1.9+	0.1−	1999 11 04	704	0.2+	2.0+	1999 11 12	704	0.0	0.4−
1998 08 17	704	1.1+	1.4−	1999 11 04	704	0.0	0.1+	1999 11 12	704	0.1−	0.4−

1998 ON₁₁ = 1999 VX

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	339.37697	(2000.0)	P	Q
<i>n</i>	0.19825354	ω	181.85300	+0.50910241
<i>a</i>	2.9128765	Ω	237.54326	+0.78992430
<i>e</i>	0.0183096	<i>i</i>	1.07906	+0.34181039
<i>P</i>	4.97	<i>H</i>	13.1	<i>G</i> 0.15 <i>U</i> 6

Residuals in seconds of arc

1998 07 26	809	1.2+	1.1−	1998 08 23	704	(0.8−	3.6+)	1999 11 04	734	0.5−	0.1−
1998 07 26	809	1.6+	0.5−	1998 08 23	704	0.0	0.8+	1999 11 04	734	0.6−	0.4−
1998 07 26	809	0.7+	0.3−	1998 08 23	699	0.1+	1.2+	1999 11 05	734	0.1−	1.3−
1998 07 27	809	0.2+	1.1−	1999 11 03	734	0.1−	1.1+	1999 11 05	734	1.3−	1.7−
1998 07 27	809	0.6−	1.1−	1999 11 03	734	0.1−	0.4+	1999 11 05	734	1.1−	0.8−
1998 07 27	809	0.5−	1.5−	1999 11 03	734	0.4+	0.4+	1999 11 06	734	0.1+	0.1+
1998 08 17	704	0.3−	0.4+	1999 11 03	734	0.4−	1.0+	1999 11 06	734	0.5+	0.0
1998 08 17	704	1.0−	0.4+	1999 11 03	734	0.1+	0.4+	1999 11 06	734	0.2−	0.0
1998 08 17	704	0.3+	0.3+	1999 11 03	734	0.2+	0.8+	1999 11 06	734	0.0	0.2+
1998 08 17	704	0.7−	0.2−	1999 11 03	704	1.0+	0.2−	1999 11 06	734	0.4+	0.1+
1998 08 17	704	0.2+	1.2−	1999 11 03	704	1.3+	0.1+	1999 11 12	704	0.5+	0.1−
1998 08 23	704	0.6+	0.2+	1999 11 03	704	0.1+	1.0−	1999 11 12	704	0.4+	0.2+
1998 08 23	699	0.2−	0.5+	1999 11 03	704	0.5+	0.1−	1999 11 12	704	0.2+	0.0
1998 08 23	704	1.2−	1.7+	1999 11 04	734	0.3−	0.7+	1999 11 12	704	0.4+	0.2+
1998 08 23	699	0.3−	1.5+	1999 11 04	734	0.9−	0.5−	1999 11 12	704	0.1−	0.0

1998 QE₄

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	75.77350	(2000.0)	P	Q
<i>n</i>	0.19043500	ω	217.52909	+0.86400234
<i>a</i>	2.9920685	Ω	113.37326	−0.40490982
<i>e</i>	0.0907778	<i>i</i>	10.73707	−0.29924571
<i>P</i>	5.18	<i>H</i>	13.9	<i>G</i> 0.15 <i>U</i> 3

Residuals in seconds of arc

1998 08 17	428	0.0	0.2−	1998 09 28	428	0.6−	0.6+	1999 11 04	704	1.0−	1.3−
1998 08 18	428	0.0	0.4−	1998 09 28	428	0.7−	0.8−	1999 11 04	704	0.4−	0.0
1998 08 18	428	0.6−	0.2−	1998 10 07	428	0.4+	0.9+	1999 11 04	704	0.4−	0.3−
1998 08 19	428	1.0+	0.3−	1998 10 07	428	0.4+	0.5−	1999 11 04	704	0.0	0.3−
1998 08 19	428	0.3−	0.3+	1998 10 21	428	0.5−	0.1+	1999 11 09	428	0.3+	0.7+
1998 09 15	428	(1.9−	5.1+)	1998 10 21	428	0.0	0.2−	1999 11 09	428	0.4+	0.6+
1998 09 15	428	0.6+	0.3+	1998 11 10	428	0.8+	0.1−	1999 11 09	428	0.8+	0.0
1998 09 22	699	(0.5+	2.3+)	1998 12 09	428	0.3−	0.2−	1999 11 10	428	0.6+	0.1+
1998 09 22	699	(3.0+	2.9+)	1998 12 19	428	0.0	0.5+	1999 11 10	428	0.2−	0.1+
1998 09 22	699	(1.2+	2.7+)	1998 12 19	428	0.2−	0.5+				

1998 QU₁₀ = 1999 VF₄₈

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	90.09871	(2000.0)	P	Q
<i>n</i>	0.16787506	ω	323.19165	+0.26589127
<i>a</i>	3.2544574	Ω	322.12568	−0.85978979
<i>e</i>	0.0491682	<i>i</i>	5.55361	−0.43596257
<i>P</i>	5.87	<i>H</i>	13.3	<i>G</i> 0.15 <i>U</i> 5

Residuals in seconds of arc

1998 08 17	704	0.3−	0.0	1998 09 15	691	0.1−	0.2−	1999 11 03	704	1.0−	0.2−
1998 08 17	704	0.2−	2.3+	1998 09 15	691	0.0	0.2+	1999 11 03	704	1.0−	0.1+
1998 08 17	704	0.1−	0.2+	1998 09 15	691	0.1−	0.0	1999 11 04	704	0.7+	0.3−
1998 08 17	704	0.7+	0.4+	1998 09 20	691	0.2+	0.1−	1999 11 04	704	0.1+	0.1+
1998 08 17	704	0.3−	0.5+	1998 09 20	691	0.2−	0.1−	1999 11 04	704	0.5+	0.3+
1998 08 23	704	1.2+	0.1−	1998 09 20	691	0.2+	0.8+	1999 11 04	704	0.0	0.4−
1998 08 23	704	0.1+	0.9+	1999 11 03	704	0.1−	0.1+	1999 11 04	704	1.1+	0.3−
1998 08 23	704	0.9−	2.4−	1999 11 03	704	0.1+	0.2+				
1998 08 23	704	0.2−	2.2−	1999 11 03	704	0.6−	0.4+				

1998 QE₁₁ = 1981 PV = 1999 UY₁₀

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	62.66540		(2000.0)		P		Q
<i>n</i>	0.17446212	ω	347.00521		+0.73839288		+0.64751058
<i>a</i>	3.1720154	Ω	329.89228		−0.58025155		+0.46765277
<i>e</i>	0.1047133	<i>i</i>	22.06376		−0.34363365		+0.60169007
<i>P</i>	5.65	<i>H</i>	12.9	<i>G</i>	0.15	<i>U</i>	3

Residuals in seconds of arc

1981 08 05	474	0.4+	0.5+	1998 08 23	704	0.0	0.6+	1999 10 31	704	0.5+	0.7−
1981 08 05	474	1.0−	0.4+	1998 08 29	699	0.6+	0.1−	1999 11 01	704	0.5+	0.7+
1998 08 17	704	0.6+	0.2+	1998 08 29	699	0.2+	0.5−	1999 11 01	704	0.6+	0.1+
1998 08 17	704	0.2+	0.2+	1998 08 29	699	0.0	0.1+	1999 11 01	704	0.4−	0.0
1998 08 17	704	0.6+	0.7+	1999 09 22	704	0.5−	0.4+	1999 11 01	704	0.3+	0.4+
1998 08 17	704	0.5−	0.1−	1999 09 22	704	0.3+	0.4+	1999 11 01	704	0.5−	0.2−
1998 08 17	704	0.2+	0.4−	1999 09 22	704	0.3−	0.8+	1999 11 01	704	0.2+	0.1−
1998 08 23	704	0.2+	0.1+	1999 09 22	704	1.1−	0.5+	1999 11 01	704	0.5+	0.3+
1998 08 23	704	1.4+	0.5−	1999 10 31	704	0.4+	0.0	1999 11 01	704	0.1+	0.0
1998 08 23	704	1.9−	1.4−	1999 10 31	704	0.0	0.6−	1999 11 01	704	0.5−	0.7−
1998 08 23	704	0.9−	0.0	1999 10 31	704	0.2+	0.1+	1999 11 01	704	0.2−	0.8−

1998 QS₃₃ = 1999 VN₃₇

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	22.12560		(2000.0)		P		Q
<i>n</i>	0.18434691	ω	138.30040		+0.89972313		−0.42820021
<i>a</i>	3.0575869	Ω	247.23687		+0.37226603		+0.85395414
<i>e</i>	0.0688191	<i>i</i>	5.25878		+0.22785148		+0.29564659
<i>P</i>	5.35	<i>H</i>	13.8	<i>G</i>	0.15	<i>U</i>	4

Residuals in seconds of arc

1998 08 17	704	0.1+	0.3+	1998 09 21	704	0.2−	1.1+	1998 10 11	699	0.5+	0.9−
1998 08 17	704	0.1−	0.0	1998 09 21	704	0.3+	1.0+	1998 10 11	699	0.1−	0.6−
1998 08 17	704	1.7+	0.5−	1998 09 21	699	0.5+	1.6+	1999 11 03	704	1.1+	0.3−
1998 08 17	704	0.7−	1.1−	1998 09 21	704	0.9+	0.1+	1999 11 03	704	0.1+	0.1+
1998 08 17	704	0.4−	1.6−	1998 09 21	699	0.0	0.7+	1999 11 03	704	0.5−	0.1+
1998 08 23	704	1.3+	0.2−	1998 09 21	704	0.9−	1.4−	1999 11 12	704	0.1−	0.4−
1998 08 23	704	0.6+	0.6−	1998 09 21	699	1.2−	1.5+	1999 11 12	704	0.2−	0.1−
1998 08 23	704	0.3−	0.7+	1998 09 23	704	0.3+	1.2−	1999 11 12	704	0.2−	0.0
1998 08 23	704	1.2−	1.1−	1998 09 23	704	1.5−	0.4+	1999 11 12	704	0.1+	0.1−
1998 08 26	699	0.1+	0.6+	1998 09 23	704	0.5+	0.1−	1999 11 12	704	0.3−	0.6+
1998 08 26	699	0.7−	0.8+	1998 09 23	704	0.5+	1.0+				
1998 08 26	699	0.0	0.6+	1998 10 11	699	0.2−	1.4−				

1998 QO₆₀

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	164.05288		(2000.0)		P		Q
<i>n</i>	0.22592409	ω	283.55961		+0.36315367		+0.93134622
<i>a</i>	2.6698961	Ω	7.89133		−0.76180462		+0.31330883
<i>e</i>	0.1867279	<i>i</i>	11.21981		−0.53644490		+0.18555809
<i>P</i>	4.36	<i>H</i>	13.3	<i>G</i>	0.15	<i>U</i>	3

Residuals in seconds of arc

1998 08 28	557	0.4−	0.3−	1998 10 21	557	0.3−	0.3−	1998 11 21	557	0.3−	0.1−
1998 08 28	557	0.0	0.2+	1998 10 30	557	0.3−	0.2−	1998 11 21	557	0.2+	0.6+

1998 09 01	557	0.3−	0.7−	1998 10 30	557	0.0	0.1−	1998 11 21	557	0.1+	0.2+
1998 09 01	557	0.0	0.4−	1998 11 14	704	0.3−	0.4−	1998 12 08	557	0.1−	0.4−
1998 09 14	557	0.2+	0.6+	1998 11 14	704	0.5−	0.3−	1998 12 08	557	0.2−	0.2−
1998 09 14	557	1.0+	0.3+	1998 11 14	704	0.0	0.2−	1998 12 24	699	0.8+	1.3+
1998 09 20	557	0.2+	1.0+	1998 11 14	704	0.9−	0.1+	1998 12 24	699	0.5+	1.1+
1998 09 20	557	0.5+	0.4+	1998 11 14	704	(0.9+	2.2+)	1998 12 24	699	1.6−	1.3+
1998 09 25	557	0.1+	0.3+	1998 11 16	704	1.4+	1.2−	1999 11 02	557	0.3−	0.8−
1998 09 25	557	0.0	0.0	1998 11 16	704	0.2+	0.6+	1999 11 02	557	0.0	0.0
1998 09 25	557	0.1+	0.2+	1998 11 16	704	0.2+	1.5−	1999 11 04	557	0.0	0.2+
1998 10 13	557	0.3−	0.2−	1998 11 16	704	(0.5−	3.4−)	1999 11 04	557	0.1+	0.2+
1998 10 13	557	0.3−	0.1−	1998 11 16	704	0.3+	0.8−				

1998 QP₆₃

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	69.16704		(2000.0)		P		Q
<i>n</i>	0.22499364	ω	221.46791		+0.93363094		−0.35343351
<i>a</i>	2.6772518	Ω	159.00928		+0.35635144		+0.89954800
<i>e</i>	0.4961575	<i>i</i>	9.39315		+0.03670045		+0.25670636
<i>P</i>	4.38	<i>H</i>	18.0	<i>G</i>	0.15	<i>U</i>	2

Residuals in seconds of arc

1976 11 16	413	0.6+	2.5−	1998 09 02	704	0.8−	0.1−	1998 09 19	402	0.4−	1.1−
1976 11 16	413	0.3−	1.4−	1998 09 02	704	0.0	1.8+	1998 09 19	402	0.3+	1.1−
1998 08 31	704	1.3−	1.8−	1998 09 02	704	0.9+	1.2−	1998 09 19	888	0.6−	1.2−
1998 08 31	704	(1.5−	2.5+)	1998 09 02	704	0.2−	0.5+	1998 09 19	888	0.6−	1.1−
1998 08 31	704	0.2−	0.4+	1998 09 02	704	1.9−	0.9+	1998 09 19	888	0.4−	1.1−
1998 08 31	704	1.1+	1.0+	1998 09 02	704	1.0+	1.7−	1998 09 28	426	0.6−	0.3−
1998 08 31	611	1.4+	1.1+	1998 09 02	704	0.6+	1.0+	1998 09 28	426	0.8−	0.0
1998 08 31	611	1.3+	0.2+	1998 09 02	704	0.4−	0.9+	1998 09 28	426	0.6−	0.0
1998 08 31	611	0.5+	0.2+	1998 09 02	704	0.2−	0.2+	1998 10 02	422	0.9−	0.4−
1998 09 01	046	0.8+	0.2−	1998 09 02	704	0.9−	1.6+	1998 10 02	422	0.9−	0.7−
1998 09 01	046	0.1+	0.2−	1998 09 02	704	0.4−	0.8−	1998 10 02	422	0.2−	0.2−
1998 09 01	046	0.6+	0.6−	1998 09 02	704	1.3−	0.9+	1998 10 13	422	0.5+	0.1+
1998 09 01	046	0.8+	0.0	1998 09 02	704	(4.3−	0.4+)	1998 10 13	422	0.5+	0.3+
1998 09 01	557	0.3+	0.1−	1998 09 02	402	0.0	0.0	1998 10 13	422	0.8+	0.1−
1998 09 01	557	0.6+	0.0	1998 09 02	402	0.0	0.2+	1998 10 16	704	0.4−	1.7+
1998 09 01	426	0.5−	0.4−	1998 09 02	402	0.2+	0.5+	1998 10 16	704	0.6−	0.8+
1998 09 01	426	1.0−	0.3−	1998 09 02	402	0.1−	0.3−	1998 10 16	704	1.0−	0.4+
1998 09 01	426	0.4+	0.0	1998 09 03	426	1.4−	0.2−	1998 10 16	704	(2.2−	2.3−)
1998 09 01	422	1.3−	0.1−	1998 09 03	426	0.0	0.3−	1998 10 25	426	0.4+	0.3+
1998 09 01	422	0.8+	0.4+	1998 09 03	426	0.0	0.1−	1998 10 25	426	0.6+	0.4+
1998 09 01	422	0.8−	0.1+	1998 09 03	426	0.5+	0.8−	1998 10 25	426	0.6+	0.6+
1998 09 01	422	0.4+	0.7+	1998 09 04	954	0.8−	1.2−	1998 10 25	402	0.3+	0.7+
1998 09 02	704	1.2+	0.8−	1998 09 04	954	1.0−	0.6−	1998 10 25	402	0.7+	0.7+
1998 09 02	704	0.7+	0.5+	1998 09 04	954	0.6−	1.0−	1998 10 25	402	0.4+	0.9+
1998 09 02	704	1.7−	0.5+	1998 09 04	954	1.0−	0.9−	1998 10 27	422	0.3+	0.8+
1998 09 02	704	1.4+	1.2+	1998 09 04	954	0.6−	0.7−	1998 10 27	422	0.6+	0.5+
1998 09 02	704	1.5+	1.1+	1998 09 04	734	1.2+	0.2+	1998 10 27	422	0.7+	0.8+
1998 09 02	704	1.6−	0.6+	1998 09 04	734	0.6−	0.7−	1998 10 30	587	0.6+	0.5+
1998 09 02	704	0.0	0.5−	1998 09 04	734	(2.5−	1.3+)	1998 10 30	587	0.1−	0.0
1998 09 02	704	(1.5+	2.0−)	1998 09 04	402	0.8−	0.7+	1998 11 28	402	1.0−	0.5−
1998 09 02	704	0.8−	1.2+	1998 09 04	402	0.2−	0.7−	1998 11 28	402	0.6−	0.4−
1998 09 02	704	0.5+	1.5+	1998 09 04	402	1.1+	0.0	1998 11 28	402	0.5−	0.2−
1998 09 02	704	(3.6−	0.1+)	1998 09 04	402	(2.3+	2.2−)	1998 12 08	426	0.1−	0.5−
1998 09 02	704	(5.1−	1.3+)	1998 09 12	402	1.1+	0.5+	1998 12 08	426	0.9−	0.7−
1998 09 02	704	(4.0−	0.2−)	1998 09 12	402	1.4+	0.0	1998 12 08	426	0.3+	0.5−
1998 09 02	704	1.2+	1.1+	1998 09 12	402	0.6+	0.4+				
1998 09 02	704	0.1+	1.8−	1998 09 19	402	0.2+	1.3−				

1999 NOV. 23

M.P.C. 36817

Residuals in seconds of arc

1998 08 24	704	0.2+	0.2+	1998 10 16	699	0.5−	0.9+	1999 11 03	704	0.2−	0.8+
1998 08 24	704	0.8−	0.3−	1998 10 16	699	0.3+	0.8+	1999 11 03	704	0.5−	0.7−
1998 08 24	704	0.2−	0.2−	1998 10 18	327	0.4−	0.4−	1999 11 03	704	0.1+	0.0
1998 08 24	704	0.3+	0.6+	1998 10 18	327	0.4+	0.1−	1999 11 12	704	1.3+	1.1+
1998 08 24	704	0.2+	0.6+	1998 10 18	327	0.4+	0.2−	1999 11 12	704	0.1+	0.0
1998 08 27	704	0.4+	0.3−	1998 10 22	327	0.3+	0.6−	1999 11 12	704	0.2−	0.6−
1998 08 27	704	0.4−	0.2+	1998 10 22	327	0.1+	0.1+	1999 11 12	704	0.4−	0.2−
1998 08 27	704	0.4+	0.8−	1998 10 22	327	0.0	0.5−	1999 11 12	704	0.1−	0.2−
1998 10 16	699	0.5−	0.3+	1998 10 22	327	0.0	0.2−				

1998 QW₇₀

Id. T. Kobayashi (1999 observations)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams				Williams			
<i>M</i>	72.81119	(2000.0)		<i>P</i>	<i>Q</i>		
<i>n</i>	0.17336496	ω	89.25866	+0.78493728	+0.60230546		
<i>a</i>	3.1853842	Ω	233.69389	−0.61555988	+0.73146362		
<i>e</i>	0.1527139	<i>i</i>	10.38480	−0.07042367	+0.31967032		
<i>P</i>	5.69	<i>H</i>	13.6	<i>G</i>	0.15	<i>U</i>	4

Residuals in seconds of arc

1998 08 24	704	0.7−	0.3+	1998 09 18	699	0.1+	1.5+	1998 09 27	327	1.2−	0.4−
1998 08 24	704	0.4+	0.7−	1998 09 19	704	1.0+	0.1+	1998 09 27	327	0.9−	0.3−
1998 08 24	704	1.1+	0.3+	1998 09 19	704	0.2+	0.8+	1998 09 29	327	0.8−	0.7+
1998 08 24	704	(0.8−	2.4+)	1998 09 19	704	0.4+	0.9+	1998 09 29	327	0.4−	0.7−
1998 08 24	704	0.9−	0.7+	1998 09 19	704	1.2+	0.0	1998 09 29	327	1.4−	0.1+
1998 08 27	704	0.1−	0.8−	1998 09 19	704	1.2+	0.2−	1999 11 03	704	1.2+	0.3+
1998 08 27	704	0.5−	0.2−	1998 09 23	704	0.7+	0.9−	1999 11 03	704	0.4+	1.1−
1998 08 27	704	0.4−	0.4+	1998 09 23	704	0.8+	0.5−	1999 11 03	704	(1.0+	2.6−)
1998 08 27	704	1.3−	1.0−	1998 09 23	704	0.2+	0.9−	1999 11 09	411	0.2+	0.3+
1998 08 27	704	0.2+	1.0+	1998 09 23	704	0.3−	0.5−	1999 11 09	411	0.1+	1.4+
1998 09 18	699	0.4+	1.1+	1998 09 23	704	0.8+	1.0−	1999 11 10	411	0.3−	0.3+
1998 09 18	699	0.7+	0.5+	1998 09 27	327	0.7−	0.2−	1999 11 10	411	1.4−	1.1−

1998 QR₇₁

Id. T. Kobayashi (1999 observations)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Nakano				Williams			
<i>M</i>	14.65039	(2000.0)		<i>P</i>	<i>Q</i>		
<i>n</i>	0.17478255	ω	128.90458	+0.80567256	−0.56949609		
<i>a</i>	3.1681373	Ω	266.39918	+0.48027200	+0.78906888		
<i>e</i>	0.1015813	<i>i</i>	9.39925	+0.34674274	+0.23031394		
<i>P</i>	5.64	<i>H</i>	13.7	<i>G</i>	0.15	<i>U</i>	5

Residuals in seconds of arc

1998 08 24	704	0.0	0.3+	1998 09 18	699	0.4+	0.1−	1998 09 23	704	0.4−	0.7+
1998 08 24	704	0.4+	1.7−	1998 09 18	699	0.1+	0.2−	1998 09 23	704	0.1−	1.2+
1998 08 24	704	0.1−	0.6+	1998 09 18	699	1.5+	1.7+	1998 09 23	704	0.1−	0.9−
1998 08 24	704	0.2+	0.6−	1998 09 19	704	0.7−	1.0−	1999 11 13	411	0.0	0.5−
1998 08 24	704	0.4−	0.9+	1998 09 19	704	0.9−	0.8+	1999 11 13	411	1.6+	0.9+
1998 08 27	704	0.1−	0.4−	1998 09 19	704	0.6+	1.3−	1999 11 16	411	0.3−	0.1+
1998 08 27	704	0.9+	0.9+	1998 09 19	704	0.7−	0.4−	1999 11 16	411	1.3−	0.3−
1998 08 27	704	0.2−	0.4+	1998 09 19	704	1.0+	0.9−				
1998 08 27	704	2.0−	1.8+	1998 09 23	704	0.8+	1.7−				

1998 QL₇₃ = 1999 VD₈

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams				Williams			
<i>M</i>	316.42008	(2000.0)		<i>P</i>	<i>Q</i>		
<i>n</i>	0.18522221	ω	221.59833	−0.14419065	−0.97994738		
<i>a</i>	3.0479466	Ω	237.12806	+0.94564045	−0.09551640		
<i>e</i>	0.0631613	<i>i</i>	9.42395	+0.29150162	−0.17487066		
<i>P</i>	5.32	<i>H</i>	13.5	<i>G</i>	0.15	<i>U</i>	5

Residuals in seconds of arc

1998 08 24	704	0.5+	0.5+	1998 08 30	699	0.6+	1.1+	1999 11 03	704	0.8−	0.4+
1998 08 24	704	0.5+	0.6+	1998 09 16	699	1.4+	0.4−	1999 11 03	704	1.0−	0.5+

1998 08 24	704	0.6−	0.3+	1998 09 16	699	1.1+	0.2−	1999 11 03	704	0.8−	1.0+
1998 08 24	704	0.9−	0.4−	1998 09 16	699	0.8+	0.3−	1999 11 03	704	1.0−	0.1−
1998 08 24	704	0.1−	0.6+	1998 09 19	704	0.4−	0.8−	1999 11 08	120	1.6+	0.3−
1998 08 27	704	1.0−	0.6−	1998 09 19	704	1.5−	1.9−	1999 11 08	120	0.4+	0.5−
1998 08 27	704	0.7−	0.7+	1998 09 19	704	0.5+	0.1−	1999 11 09	120	0.1−	0.1−
1998 08 27	704	1.3−	0.4+	1998 09 19	704	0.1−	0.5−	1999 11 09	120	0.5+	0.0
1998 08 27	704	0.7+	0.6+	1998 09 23	704	0.0	0.5−	1999 11 09	120	0.6+	0.7−
1998 08 27	704	(1.8−	2.1−)	1998 09 23	704	0.4−	0.2+	1999 11 10	120	0.3+	0.3+
1998 08 30	699	0.5+	0.2−	1998 09 23	704	0.3−	0.6+	1999 11 10	120	0.2+	0.0
1998 08 30	699	0.2−	0.8+	1998 09 23	704	0.9+	0.4−				

1998 QC₇₅ = 1999 VF₃₀

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams				Williams			
<i>M</i>	91.47120	(2000.0)		<i>P</i>	<i>Q</i>		
<i>n</i>	0.15540329	ω	64.35181	+0.52783793	+0.83886403		
<i>a</i>	3.4263305	Ω	238.14723	−0.82457453	+0.46857256		
<i>e</i>	0.0957915	<i>i</i>	9.00978	−0.20362700	+0.27703230		
<i>P</i>	6.34	<i>H</i>	13.1	<i>G</i>	0.15	<i>U</i>	5

Residuals in seconds of arc

1998 08 24	704	0.7−	0.6−	1998 09 16	699	0.5+	1.3+	1999 11 03	704	0.2+	0.3−
1998 08 24	704	0.9−	1.5+	1998 09 19	704	0.0	0.3−	1999 11 03	704	1.3+	0.1+
1998 08 24	704	0.3+	0.3−	1998 09 19	704	1.3−	0.3−	1999 11 03	704	0.4+	0.5+
1998 08 24	704	0.1+	1.0−	1998 09 19	704	0.2−	0.3−	1999 11 03	704	0.8−	0.6−
1998 08 27	704	1.6+	0.4−	1998 09 23	704	0.3+	0.8−	1999 11 03	704	0.5−	0.2−
1998 08 27	704	0.9+	0.4−	1998 09 23	704	0.4+	0.2+	1999 11 12	704	0.0	0.3+
1998 08 27	704	1.0−	1.3+	1998 09 23	704	1.5−	0.1−	1999 11 12	704	0.3−	0.1−
1998 08 27	704	0.2−	1.4−	1998 09 23	704	0.1+	0.4+	1999 11 12	704	0.2−	0.1+
1998 08 27	704	0.3+	0.5+	1998 09 27	699	0.5−	0.2+	1999 11 12	704	0.4−	0.1+
1998 09 16	699	0.7+	0.5+	1998 09 27	699	0.8+	0.5−	1999 11 12	704	0.2+	0.1−
1998 09 16	699	0.4−	1.0+	1998 09 27	699	0.7+	0.1−				

1998 QC₉₅ = 1999 VO₄₇

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams				Williams			
<i>M</i>	197.98137	(2000.0)		<i>P</i>	<i>Q</i>		
<i>n</i>	0.22921551	ω	255.86138	−0.91822953	+0.35151013		
<i>a</i>	2.6442756	Ω	304.41317	−0.22015687	−0.83600978		
<i>e</i>	0.2259892	<i>i</i>	12.77833	−0.32921950	−0.42134104		
<i>P</i>	4.30	<i>H</i>	13.1	<i>G</i>	0.15	<i>U</i>	4

Residuals in seconds of arc

1998 08 19	704	0.0	0.0	1998 09 19	704	0.1−	0.1−	1999 11 03	704	0.3−	0.4−
1998 08 19	704	0.3−	0.6+	1998 09 19	704	0.3+	0.7+	1999 11 03	704	0.0	0.4−
1998 08 19	704	0.1−	0.2+	1998 09 19	704	1.0+	0.7+	1999 11 03	704	0.4+	0.6+
1998 08 19	704	0.0	0.6−	1998 09 19	704	1.1−	0.6+	1999 11 03	704	0.6+	0.7+
1998 08 19	704	0.7−	0.5+	1998 09 19	704	1.2−	0.4+	1999 11 04	704	0.1−	0.1+
1998 08 27	704	0.6+	0.3−	1998 09 23	704	0.4+	0.1−	1999 11 04	704	0.2−	0.0
1998 08 27	704	0.0	0.7−	1998 09 23	704	0.2+	0.1−	1999 11 04	704	0.2−	0.1−
1998 08 27	704	0.5+	0.5−	1998 09 23	704	0.5+	0.8−	1999 11 04	704	0.0	0.1−
1998 08 27	704	1.1+	0.1−	1998 09 23	704	0.5−	0.6−	1999 11 04	704	0.3−	0.0
1998 08 27	704	0.6−	0.2+	1999 11 03	704	0.1+	0.5−				

1998 QK₉₅ = 1999 VC₅₃

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams				Williams			
<i>M</i>	26.74916	(2000.0)		<i>P</i>	<i>Q</i>		
<i>n</i>	0.19147746	ω	136.15080	+0.84999806	−0.50273100		
<i>a</i>	2.9811989	Ω	254.64992	+0.42708598	+0.83253969		
<i>e</i>	0.1188117	<i>i</i>	9.39211	+0.30838427	+0.23267834		
<i>P</i>	5.15	<i>H</i>	13.2	<i>G</i>	0.15	<i>U</i>	4

Residuals in seconds of arc

1998 08 19	704	0.8+	1.1−	1998 09 19	704	0.3−

1998 08 19	704	0.0	0.7−	1998 09 21	699	0.4+	0.5−	1999 11 03	704	0.3−	0.2−
1998 08 24	704	0.4+	0.5+	1998 09 21	699	0.4−	0.2+	1999 11 04	704	0.4−	0.0
1998 08 24	704	0.2+	0.1+	1998 09 21	699	0.0	0.3+	1999 11 04	704	0.2+	0.2−
1998 08 24	704	0.1−	0.8+	1998 09 23	704	0.2+	0.2+	1999 11 04	704	0.3−	0.2+
1998 08 24	704	1.0+	0.6+	1998 09 23	704	0.3−	0.7+	1999 11 04	704	0.7−	0.2+
1998 08 24	704	0.9−	1.4+	1998 09 23	704	0.1−	0.2−	1999 11 04	704	0.7+	0.6−
1998 09 19	704	0.2−	0.1−	1998 09 23	704	0.2−	0.3+				

1998 RF₂₃ = 1997 LB₁₇

Id. A. Doppler

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams				Williams			
(2000.0)				(2000.0)			
P				Q			
<i>M</i>	34.04377						
<i>n</i>	0.21600954	ω	264.91225	+0.87402270	−0.47737621		
<i>a</i>	2.7509800	Ω	123.57341	+0.47764261	+0.80997513		
<i>e</i>	0.1130395	<i>i</i>	6.23808	+0.08911707	+0.34066440		
<i>P</i>	4.56	<i>H</i>	14.3	<i>G</i>	0.15	<i>U</i>	5

Residuals in seconds of arc

1997 06 08	809	0.7+	0.0	1998 09 14	704	0.8−	1.5+	1998 09 18	704	1.4+	1.0−
1997 06 08	809	0.0	0.2−	1998 09 14	704	0.8+	0.4+	1998 09 18	704	0.8+	2.0−
1997 06 08	809	0.8+	0.4+	1998 09 14	704	0.7−	0.2−	1998 09 18	704	0.1−	0.8−
1997 06 09	809	1.3−	0.3+	1998 09 14	704	0.8−	0.8+	1998 09 26	327	0.8+	0.8+
1997 06 09	809	1.1−	0.2+	1998 09 14	704	(4.6−	0.5−)	1998 09 26	327	0.5−	0.2+
1997 06 09	809	0.9+	0.7−	1998 09 18	704	(2.6+	0.9−)	1998 09 26	327	0.9−	0.5+

1998 RO₄₀ = 1999 VA₈

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams				Williams			
(2000.0)				(2000.0)			
P				Q			
<i>M</i>	56.25456						
<i>n</i>	0.17243663	ω	275.36879	+0.98273222	+0.16056877		
<i>a</i>	3.1968066	Ω	75.41507	−0.10827423	+0.90200444		
<i>e</i>	0.0652571	<i>i</i>	5.45208	−0.15004692	+0.40075636		
<i>P</i>	5.72	<i>H</i>	13.5	<i>G</i>	0.15	<i>U</i>	5

Residuals in seconds of arc

1998 09 14	704	0.2+	0.5+	1998 09 27	699	0.5−	0.7−	1999 11 08	120	0.5−	0.6+
1998 09 14	704	0.2−	0.4−	1998 09 27	699	1.1+	0.1+	1999 11 09	120	0.3+	0.1−
1998 09 14	704	0.5−	0.7−	1998 09 27	699	0.8−	0.7−	1999 11 09	120	0.9+	0.0
1998 09 14	704	0.5−	0.1−	1999 11 03	704	0.8−	0.5−	1999 11 12	704	0.1+	0.2+
1998 09 18	704	0.4+	0.8+	1999 11 03	704	0.6+	0.7+	1999 11 12	704	0.1+	0.2−
1998 09 18	704	0.4−	0.4−	1999 11 03	704	0.1−	0.0	1999 11 12	704	0.2−	0.4−
1998 09 18	704	0.8+	0.3+	1999 11 03	704	0.2−	0.0	1999 11 12	704	0.0	1.0−
1998 09 18	704	0.0	0.6+	1999 11 08	120	0.4+	0.1−	1999 11 12	704	0.6−	0.2−
1998 09 18	704	0.5+	0.7+	1999 11 08	120	0.0	1.2+				

1998 RO₄₄ = 1984 DW₂ = 1984 GW = 1999 VV₇

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams				Williams			
(2000.0)				(2000.0)			
P				Q			
<i>M</i>	254.92720						
<i>n</i>	0.17130415	ω	96.30629	−0.91962017	−0.38219906		
<i>a</i>	3.2108803	Ω	61.25577	+0.30694487	−0.84324389		
<i>e</i>	0.0997946	<i>i</i>	5.93631	+0.24511955	−0.37797304		
<i>P</i>	5.75	<i>H</i>	13.0	<i>G</i>	0.15	<i>U</i>	4

Residuals in seconds of arc

1984 02 26	095	0.6−	0.9−	1998 09 26	704	1.3+	0.6−	1999 11 03	704	0.6+	0.1−
1984 04 03	095	0.3+	0.3+	1998 09 26	704	1.5−	1.6−	1999 11 03	704	0.3−	0.4−
1998 09 14	704	0.4+	1.5+	1998 09 26	704	0.1+	0.4−	1999 11 03	704	0.1+	0.6−
1998 09 14	704	1.7−	0.7−	1998 09 27	704	0.0	0.3−	1999 11 03	704	0.3+	0.7−
1998 09 14	704	0.6+	0.3−	1998 09 27	704	1.0+	0.7+	1999 11 07	120	0.1+	1.1+
1998 09 14	704	0.8−	0.8+	1998 09 27	704	0.1−	0.2−	1999 11 08	120	0.9+	0.9+
1998 09 18	704	1.4+	1.2+	1998 09 27	704	1.0+	1.2−	1999 11 08	120	0.5−	0.2+
1998 09 18	704	0.2+	0.1−	1998 09 27	699	0.2+	0.7−	1999 11 08	120	(2.8−	0.5+)
1998 09 18	704	0.5+	0.7+	1998 09 27	704	0.6−	0.4+	1999 11 12	704	0.0	0.0
1998 09 18	704	0.2−	1.9+	1998 09 27	699	0.7+	0.5−	1999 11 12	704	0.5−	0.0
1998 09 18	704	0.2−	0.6+	1998 09 27	699	0.0	0.8−	1999 11 12	704	0.1−	0.2+
1998 09 24	699	0.7−	0.5−	1998 11 07	910	0.6−	0.2−	1999 11 12	704	0.5−	0.2+

1998 09 24	699	0.7+	0.4+	1998 11 07	910	0.6−	0.2−	1999 11 12	704	0.5−	0.1+
1998 09 24	699	0.5−	0.3+	1998 11 07	910	0.3−	0.1+	1999 11 19	734	0.4+	0.0
1998 09 26	704	0.1−	1.1−	1999 11 03	704	0.4+	0.0	1999 11 19	734	0.6−	0.6−

1998 RU₅₆ = 1992 GJ₄Id. G. V. Williams (*MPC* 32998); 1998 RU₅₆ = 1980 RJ₄ (*ibid.*) is invalid

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams				Williams			
(2000.0)				(2000.0)			
P				Q			
<i>M</i>	314.83234						
<i>n</i>	0.22238862	ω	272.91872	−0.56783870	−0.82259499		
<i>a</i>	2.6981184	Ω	211.74024	+0.77602567	−0.52285188		
<i>e</i>	0.0664718	<i>i</i>	3.26314	+0.27448747	−0.22352493		
<i>P</i>	4.43	<i>H</i>	13.5	<i>G</i>	0.15	<i>U</i>	3

Residuals in seconds of arc

1992 04 04	809	0.1+	0.3+	1998 09 26	704	0.5−	0.2−	1998 10 17	327	0.7−	0.7−
1992 04 04	809	0.1−	0.0	1998 09 26	704	0.4−	0.4+	1998 10 17	327	0.1−	1.2−
1992 04 04	809	0.0	0.7−	1998 09 26	704	0.2−	0.1+	1998 10 19	327	0.3−	0.7−
1992 04 06	809	1.3−	0.3−	1998 09 26	704	0.2−	1.1+	1998 10 19	327	0.5−	0.4−
1992 04 06	809	0.6−	0.3+	1998 09 27	704	1.4+	0.8−	1998 10 19	327	0.5−	0.7−
1992 04 06	809	0.4−	0.4−	1998 09 27	704	0.0	0.5−	1998 10 20	327	0.4+	1.5−
1992 04 25	809	0.3+	0.1+	1998 09 27	704	0.7+	0.9−	1998 10 20	327	1.0+	0.9−
1992 04 25	809	0.4+	0.7−	1998 09 27	704	0.5+	1.0−	1998 10 20	327	0.3−	0.6−
1992 04 25	809	1.0+	0.6−	1998 09 27	704	1.0+	1.4−	1999 10 10	704	0.1+	1.5+
1998 09 14	704	0.6+	0.8+	1998 09 27	704	0.2−	0.1+	1999 10 10	704	0.4+	0.5+
1998 09 14	704	1.3−	0.6−	1998 09 27	704	0.2−	0.4+	1999 10 10	704	0.2−	0.3+
1998 09 14	704	0.0	0.0	1998 09 27	704	0.1−	1.0+	1999 10 21	704	0.3+	0.9−
1998 09 18	704	0.3+	0.9+	1998 09 27	704	0.5−	0.5+	1999 10 21	704	0.5+	0.4−
1998 09 18	704	0.4−	0.1−	1998 09 27	704	0.3+	1.1+	1999 10 21	704	0.2−	0.1+
1998 09 18	704	0.8−	0.6+	1998 09 29	327	0.5+	0.8+	1999 10 21	704	0.4−	0.2−
1998 09 18	704	0.1−	0.4+	1998 09 29	327	0.5+	1.0−	1999 10 21	704	0.4−	1.2−
1998 09 18	704	0.3−	1.2+	1998 09 29	327	0.8+	0.2+	1999 11 17	704	0.6−	0.1+
1998 09 25	699	1.5+	0.7+	1998 10 16	691	0.5−	0.4−	1999 11 17	704	0.2+	0.0
1998 09 25	699	0.3+	1.2+	1998 10 16	691	0.3−	0.5−	1999 11 17	704	0.2−	0.3+
1998 09 25	699	0.1+	0.0	1998 10 16	691	0.6−	0.4+	1999 11 17	704	0.4+	0.3−
1998 09 26	704	0.5−	0.8+	1998 10 17	327	0.1−	1.0−				

1998 RN₆₂ = 1999 VH₃₅

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams				Williams			
(2000.0)				(2000.0)			
P				Q			
<i>M</i>	154.80671						
<i>n</i>	0.18443507	ω	111.83194	−0.34334532	+0.93904182		
<i>a</i>	3.0566124	Ω	138.07391	−0.87121076	−0.31137712		
<i>e</i>	0.1381489	<i>i</i>	1.52077	−0.35086437	−0.14575579		
<i>P</i>	5.34	<i>H</i>	13.5	<i>G</i>	0.15	<i>U</i>	6

Residuals in seconds of arc

1998 09 14	704	0.9+	0.4−	1998 09 26	704	0.4−	0.8−	1999 11 03	704	0.7−	1.0+
1998 09 14	704	1.7−	0.2+	1998 09 26	704	1.0+	0.8−	1999 11 03	704	1.1+	0.2−
1998 09 14	704	0.7−	0.7−	1998 09 26	704	0.9−	2.7−	1999 11 03	704	0.5+	0.9+
1998 09 18	704	1.2−	0.9+	1998 09 26	704	1.0+	2.2−	1999 11 12	704	0.3−	0.8−
1998 09 18	704	0.6+	1.2+	1998 09 27	704	0.2+	0.1+	1999 11 12	704	0.0	0.5−
1998 09 18	704	1.9+	1.2+	1998 09 27	704	0.7+	1.0+	1999 11 12	704	0.5−	0.4−
1998 09 18	704	1.1−	0.8+	1998 09 27	704	1.6−	1.0+	1999 11 12	704	0.1−	0.1−
1998 09 18	704	0.1+	0.5+	1998 09 27	704	1.2+	1.2+	1999 11 12	704	0.1+	0.2+
1998 09 26	704	1.1+	0.5−	1998 09 27	704	0.9−	0.0				

1999 NOV. 23

M.P.C. 36819

Residuals in seconds of arc

1998 09 14	704	0.3+	0.6-	1998 09 27	704	0.3+	0.2-	1998 10 29	704	0.4-	1.9+
1998 09 14	704	0.4-	1.3-	1998 09 27	704	0.0	0.6+	1998 10 29	704	0.4+	2.0+
1998 09 14	704	0.4+	1.1-	1998 09 27	704	0.9-	0.4+	1998 11 10	699	0.3-	0.5-
1998 09 18	704	1.0+	0.5-	1998 09 27	704	0.3-	0.2+	1998 11 10	699	0.4+	0.7-
1998 09 18	704	0.9+	0.2+	1998 09 27	704	0.6-	0.5+	1998 11 10	699	0.9+	0.7-
1998 09 18	704	0.5-	0.2+	1998 10 20	739	(2.0+	0.9-)	1998 12 24	699	0.2-	0.5-
1998 09 18	704	0.5+	0.2-	1998 10 20	739	0.9-	0.8-	1998 12 24	699	0.4+	0.4+
1998 09 18	704	0.8-	0.5+	1998 10 20	739	1.0+	1.1-	1998 12 24	699	0.1+	0.3-
1998 09 25	699	0.7+	1.0+	1998 10 28	704	0.1+	0.7+	1999 11 15	557	0.6+	0.3+
1998 09 25	699	0.6+	0.2+	1998 10 28	704	0.2+	0.1+	1999 11 15	557	0.3-	0.3-
1998 09 25	699	0.3-	0.1+	1998 10 28	704	0.4+	0.4+	1999 11 15	557	0.3+	0.1-
1998 09 26	704	0.6-	0.5-	1998 10 28	704	1.5-	0.4+	1999 11 15	557	0.0	0.2-
1998 09 26	704	0.3+	0.9-	1998 10 28	704	0.4+	0.2-	1999 11 16	557	0.2-	0.1+
1998 09 26	704	1.2+	1.1-	1998 10 29	704	0.7-	0.3+	1999 11 16	557	0.3-	0.3-
1998 09 26	704	0.4+	1.1-	1998 10 29	704	1.5-	0.9+	1999 11 19	557	0.6+	0.6-
1998 09 26	704	0.3-	0.3-	1998 10 29	704	1.0-	1.3+	1999 11 19	557	0.7-	0.3+

1998 SQ = 1999 VF₃₅

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

M	344.21016		(2000.0)	$\mathbf{P}$	$\mathbf{Q}$		
n	0.08197752	ω	253.65855	+0.24127216	-0.97045727		
a	5.2481495	Ω	182.38010	+0.89627464	+0.22308715		
e	0.0951384	i	0.90142	+0.37212836	+0.09189563		
P	12.02	H	10.9	G	0.15	U	4

Residuals in seconds of arc

1998 09 14	699	0.0	0.3+	1998 09 27	704	0.0	0.4+	1998 11 11	704	0.1-	0.1-
1998 09 14	699	0.5+	0.7-	1998 09 27	704	1.7+	0.3-	1998 11 14	699	0.1-	0.6-
1998 09 14	699	0.4-	0.6+	1998 09 27	704	0.0	0.1-	1998 11 14	699	0.8+	0.7+
1998 09 16	910	0.1-	0.4-	1998 09 27	704	0.5+	1.4+	1998 11 23	699	1.7+	0.1+
1998 09 16	910	0.1+	0.3-	1998 10 15	470	(6.5-	3.4+)	1998 11 23	699	2.0+	0.1+
1998 09 16	910	0.0	0.4-	1998 10 15	470	(6.8-	3.2+)	1998 11 23	699	1.5+	0.5+
1998 09 18	910	0.1+	0.0	1998 10 15	470	(5.9-	3.1+)	1999 01 15	691	0.2-	0.5-
1998 09 18	910	0.2+	0.1+	1998 10 28	704	0.9+	0.4-	1999 01 15	691	0.1-	0.6-
1998 09 18	910	0.0	0.1+	1998 10 28	704	0.2+	1.1+	1999 01 15	691	0.1-	0.5-
1998 09 18	809	1.7+	1.8-	1998 10 28	704	0.8+	0.3-	1999 01 20	691	0.5+	0.6-
1998 09 18	809	0.1+	2.3-	1998 10 28	704	0.4+	0.1-	1999 01 20	691	0.3+	0.5-
1998 09 18	809	0.9-	2.6-	1998 10 29	704	0.3+	0.1-	1999 01 20	691	0.0	0.7-
1998 09 20	910	0.0	0.1+	1998 10 29	704	0.6+	0.3+	1999 11 03	704	0.3+	0.0
1998 09 20	910	0.3+	0.2+	1998 10 29	704	0.8+	1.2-	1999 11 03	704	0.2-	0.5-
1998 09 20	910	0.4+	0.0	1998 10 29	704	0.2+	0.4+	1999 11 03	704	0.6-	0.0
1998 09 20	809	2.7+	0.9-	1998 10 29	704	0.2-	0.7+	1999 11 03	704	1.4-	0.9+
1998 09 20	809	1.9+	0.2-	1998 11 10	704	0.1-	0.5+	1999 11 12	704	0.8+	0.0
1998 09 20	809	1.2+	0.1-	1998 11 10	704	0.2+	0.9-	1999 11 12	704	0.5+	0.0
1998 09 26	704	0.3+	0.8+	1998 11 10	704	0.4-	0.1-	1999 11 12	704	0.7+	0.1-
1998 09 26	704	0.6-	0.7+	1998 11 10	704	1.1-	0.9-	1999 11 12	704	0.3+	0.2+
1998 09 26	704	0.8+	0.1-	1998 11 11	704	0.1-	2.1-	1999 11 12	704	0.4-	0.0
1998 09 26	704	1.1-	0.9+	1998 11 11	704	0.4-	0.2+				
1998 09 27	704	1.5+	0.8-	1998 11 11	704	0.7+	0.2+				

1998 SS₂ = 1999 WW

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Urata

M	121.81032		(2000.0)	$\mathbf{P}$	$\mathbf{Q}$
n	0.23846971	ω	57.46852	+0.70885954	+0.67335216
a	2.5754151	Ω	259.25127	-0.69735645	+0.62433212
e	0.1822833	i	12.34436	-0.10588731	+0.39598771
P	4.13	H	13.2	G 0.15	U 3

Residuals in seconds of arc

1998 09 16	905	1.5+	0.8-	1998 10 02	385	0.2-	0.4+	1998 11 19	888	0.2+	0.4-
1998 09 16	905	1.0+	1.9+	1998 10 02	385	0.6-	0.2+	1998 11 19	888	0.4+	0.3-
1998 09 19	385	0.4-	0.2-	1998 10 02	385	0.3-	0.0	1998 11 19	888	0.2+	0.4-
1998 09 19	385	0.2+	0.1-	1998 10 11	888	0.4+	0.4-	1998 12 11	385	0.1-	0.4+
1998 09 19	385	0.5+	0.1+	1998 10 11	888	0.3+	0.2-	1998 12 11	385	0.0	0.6+
1998 09 19	385	0.0	0.3-	1998 10 11	888	0.1+	0.5-	1998 12 11	385	0.3-	0.2+

1998 09 19	385	0.1-	0.1-	1998 10 18	886	0.2-	0.8-	1998 12 24	888	0.1-	0.2+
1998 09 19	888	0.2-	0.1-	1998 10 18	886	0.1-	0.8-	1998 12 24	888	0.0	0.3+
1998 09 19	888	0.0	0.3-	1998 10 18	886	0.0	0.8-	1999 01 08	704	1.5-	0.9+
1998 09 20	385	0.0	0.5-	1998 10 18	888	0.4+	0.0	1999 01 08	704	(2.9-	1.6+)
1998 09 20	385	0.2+	0.2+	1998 10 18	888	0.4+	0.0	1999 01 08	704	0.9+	1.2-
1998 09 20	385	0.2+	0.0	1998 10 18	888	0.2+	0.1-	1999 01 08	704	0.6+	0.8-
1998 09 24	888	0.1+	0.0	1998 10 24	886	0.1+	0.1-	1999 01 08	704	0.2+	0.6-
1998 10 02	704	0.5-	0.0	1998 10 24	886	0.3-	1.4-	1999 02 06	385	0.1-	1.5+
1998 10 02	704	0.0	0.9+	1998 10 29	699	0.6+	0.3+	1999 02 06	385	0.5-	0.1+
1998 10 02	704	0.8+	0.6+	1998 10 29	699	0.2+	0.4+	1999 11 18	385	0.4+	0.8+
1998 10 02	704	0.8+	0.5-	1998 10 29	699	1.0-	0.6+	1999 11 18	385	0.9+	0.4-
1998 10 02	704	0.8-	0.4+	1998 11 07	888	0.1+	0.2+	1999 11 18	385	0.0	0.4-
1998 10 02	888	0.8-	0.5+	1998 11 07	888	0.2+	0.2+	1999 11 19	385	0.1-	0.4-
1998 10 02	888	0.5-	0.4+	1998 11 07	888	0.2+	0.2+	1999 11 19	385	0.8-	0.4+
1998 10 02	888	0.6-	0.4+	1998 11 16	566	0.3+	0.1-	1999 11 19	385	0.2-	0.2+
1998 10 02	886	1.5-	0.8-	1998 11 16	566	0.5+	0.4-				
1998 10 02	886	1.4-	1.8+	1998 11 16	566	0.5+	0.2-				

1998 SN₂₇ = 1987 BM₃

Id. E. Bowell (1999 observations), M. E. Sansaturio

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

M	229.33142		(2000.0)	$\mathbf{P}$	$\mathbf{Q}$		
n	0.22832064	ω	296.69979	-0.68848390	+0.57150460		
a	2.6511803	Ω	281.60832	-0.38861918	-0.81052728		
e	0.0985290	i	27.11867	-0.61234389	-0.12817188		
P	4.32	H	13.5	G	0.15	U	5

Residuals in seconds of arc

1987 01 30	010	0.2-	0.3-	1998 09 25	703	1.6+	1.0+	1998 10 18	703	0.8-	0.4-
1987 01 30	010	1.1+	0.3+	1998 09 26	703	0.1-	0.3+	1998 10 18	703	0.8-	0.1-
1987 01 30	010	0.8-	0.0	1998 09 26	703	0.5+	0.2+	1998 11 19	704	0.0	0.1-
1998 09 24	703	0.1-	0.4-	1998 09 26	703	0.6+	0.6-	1998 11 19	704	0.6-	0.8-
1998 09 24	703	0.2-	0.1+	1998 10 14	703	0.9-	0.1-	1998 11 19	704	0.3-	0.2-
1998 09 24	703	0.1+	0.3+	1998 10 14	703	1.3-	0.5-	1998 11 19	704	0.8+	1.2+
1998 09 25	703	2.7+	0.5+	1998 10 18	703	1.1-	0.5-	1998 11 19	704	(4.8-	0.0)

1998 SG₃₅

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Marsden

M	235.00298		(2000.0)	$\mathbf{P}$	$\mathbf{Q}$
n	0.04034868	ω	337.66105	-0.87501992	-0.48303341
a	8.4187932	Ω	173.18999	+0.47480601	-0.86922597
e	0.3064037	i	15.61603	+0.09433665	-0.10547483
P	24.43	H	11.2	G	0.15
				U	4

Residuals in seconds of arc

1998 09 13	691	0.9-	0.4+	1998 09 29	684	(2.8+	0.5+)	1998 12 17	950	0.3+	0.1-
1998 09 13	691	0.4-	0.5+	1998 09 29	684	(2.3+	0.4-)	1998 12 17	950	0.3+	0.1-
1998 09 19	691	0.6+	0.1-	1998 09 30	691	0.1+	0.4-	1998 12 18	950	0.0	0.2-
1998 09 19	691	0.1+	0.0	1998 09 30	691	0.1-	0.0	1998 12 18	950	0.2+	0.0
1998 09 19	691	0.2+	0.1-	1998 09 30	691	0.4+	0.4-	1998 12 18	950	0.0	0.0
1998 09 20	691	0.5-	0.7+	1998 10 15	950	0.2+	0.3-	1999 09 08	691	0.4+	0.1-
1998 09 20	691	0.2+	0.2+	1998 10 15	950	0.2+	0.2-	1999 09 08	691	0.2+	0.1-
1998 09 23	691	0.5-	0.3+	1998 10 16	950	0.3+	0.3-	1999 09 08	691	0.0	0.1+
1998 09 23	691	0.2-	0.7+	1998 10 16	950	0.3+	0.3-	1999 09 14	691	0.8+	0.2+
1998 09 23	691	0.2-	0.4+	1998 10 17	950	0.3+	0.4-	1999 09 14	691	0.4+	0.2-
1998 09 26	691	0.2-	0.1+	1998 10 17	950	0.3+	0.3-	1999 09 14	691	0.6-	0.5-
1998 09 26	691	0.5-	0.4+	1998 10 18	950	0.3+	0.2-	1999 10 07	568	0.6-	0.4+
1998 09 26	691	0.2-	0.5-	1998 12 17	950	0.6-	0.2-	1999 10 07	568	0.6-	0.4+

1998 TF₃₅

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Marsden

<i>M</i>	25.56335		(2000.0)	P	Q				
<i>n</i>	0.00710015	ω	300.68875	+0.97543678	+0.13768853				
<i>a</i>	26.8096465	Ω	51.95769	-0.03101773	+0.85865096				
<i>e</i>	0.3975370	<i>i</i>	12.61078	-0.21808483	+0.49372098				
<i>P</i>	138.82	<i>H</i>	9.4	<i>G</i>	0.15	<i>U</i>	5		
Residuals in seconds of arc									
1998 10 12	691	0.0	0.2+	1998 10 18	691	0.1+	0.1+	1999 10 16	691
1998 10 12	691	0.1-	0.2-	1998 10 28	691	0.0	0.0	1999 10 16	691
1998 10 12	691	0.1-	0.6-	1998 10 28	691	0.2-	0.2-	1999 10 17	691
1998 10 18	691	0.1-	0.4+	1998 10 28	691	0.0	0.2-	1999 10 17	691
1998 10 18	691	0.5+	0.4+	1999 10 16	691	0.5-	0.7-	1999 10 17	691

1998 UY₁₈

Id. A. Gnädig (1996 observations)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	23.78226		(2000.0)	P	Q				
<i>n</i>	0.24196908	ω	183.13068	+0.05893303	-0.99670502				
<i>a</i>	2.5505243	Ω	263.49565	+0.91710166	+0.07610728				
<i>e</i>	0.0921360	<i>i</i>	3.21556	+0.39427330	-0.02804975				
<i>P</i>	4.07	<i>H</i>	15.0	<i>G</i>	0.15	<i>U</i>	5		
Residuals in seconds of arc									
1996 03 24	413	1.3-	1.0+	1997 07 02	704	0.9-	0.4+	1998 11 11	120
1996 03 24	413	1.5+	0.8-	1998 10 27	120	(4.1+	1.5+)	1998 11 11	120
1996 03 25	327	1.0+	0.1+	1998 10 27	120	(2.6+	1.1+)	1998 11 11	120
1996 03 25	327	0.5-	0.1-	1998 10 27	120	0.4+	0.5+	1998 11 13	120
1996 03 25	327	0.1+	1.6+	1998 10 28	120	0.4+	0.4+	1998 11 13	120
1997 07 02	704	0.1-	0.9+	1998 10 28	120	0.1+	0.5-	1998 11 13	120
1997 07 02	704	0.9+	0.8+	1998 10 28	120	0.3-	0.7-	1998 11 15	120
1997 07 02	704	0.1-	0.8-	1998 10 28	120	0.1+	0.7+	1998 11 15	120

1998 UR₄₃

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Marsden

<i>M</i>	340.17003		(2000.0)	P	Q				
<i>n</i>	0.00392852	ω	15.28716	+0.35738276	-0.92584609				
<i>a</i>	39.7786487	Ω	53.92505	+0.84016296	+0.26125834				
<i>e</i>	0.2212500	<i>i</i>	8.74097	+0.40792617	+0.27304414				
<i>P</i>	251	<i>H</i>	7.7	<i>G</i>	0.15	<i>U</i>	6		
Residuals in seconds of arc									
1998 10 22	695	0.3+	0.6-	1998 12 17	950	0.2-	0.0	1999 10 10	568
1998 10 22	695	0.1+	0.3-	1998 12 17	950	0.1+	0.1-	1999 11 09	568
1998 11 18	695	0.5-	0.3+	1998 12 18	950	0.1-	0.1+	1999 11 09	568
1998 11 18	695	0.4-	0.5+	1998 12 18	950	0.4+	0.2+		
1998 11 18	695	0.3+	0.1-	1999 10 10	568	0.1-	0.1-		

1998 UU₄₃

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Marsden

<i>M</i>	291.56806		(2000.0)	P	Q				
<i>n</i>	0.00408620	ω	266.06800	-0.72548029	-0.67594399				
<i>a</i>	38.7486562	Ω	231.34681	+0.67874969	-0.67153642				
<i>e</i>	0.2648879	<i>i</i>	9.54745	+0.11391750	-0.30354335				
<i>P</i>	241	<i>H</i>	7.2	<i>G</i>	0.15	<i>U</i>	7		
Residuals in seconds of arc									
1998 10 22	695	0.3-	0.4+	1999 11 10	695	1.3+	0.1+	1999 11 11	696
1998 10 22	695	0.1+	0.2+	1999 11 10	695	0.8+	0.1-	1999 11 11	696
1998 12 14	950	0.2+	0.3-	1999 11 10	696	0.4-	0.2-	1999 11 11	696
1998 12 14	950	0.0	0.3-	1999 11 10	696	0.5-	0.3-		
1999 11 10	695	0.7+	0.1+	1999 11 10	696	0.7-	0.1-		

1998 VN₁₁ = 1979 SJ₁₃

Id. M. E. Sansaturio

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	184.50827		(2000.0)	P	Q				
<i>n</i>	0.31489358	ω	176.97151	+0.26031548	+0.96496348				
<i>a</i>	2.1397359	Ω	108.11548	-0.88657612	+0.25238001				
<i>e</i>	0.1449129	<i>i</i>	1.98276	-0.38238545	+0.07176227				
<i>P</i>	3.13	<i>H</i>	14.7	<i>G</i>	0.15	<i>U</i>	5		
Residuals in seconds of arc									
1979 09 20	675	0.1-	0.0	1998 11 10	704	0.2-	0.3-	1998 11 11	704
1979 09 21	675	0.2+	0.2-	1998 11 10	704	0.6-	0.2-	1998 11 11	704
1998 10 14	699	0.4-	0.4+	1998 11 10	704	0.3+	1.1-	1998 11 11	704
1998 10 14	699	0.2-	0.7+	1998 11 10	704	0.4-	1.4-	1998 11 14	699
1998 10 14	699	0.1+	0.3+	1998 11 11	704	0.3+	0.3-	1998 11 14	699
1998 11 10	704	0.3+	0.3+	1998 11 11	704	0.8+	0.4-	1998 11 14	699

1998 VR₂₇ = 1983 AQ₅ = 1983 CT₇ = 1986 SQ₁

Id. E. Bowell (1999 observations), G. V. Williams, N. S. Chernykh (d)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	315.39925		(2000.0)	P	Q				
<i>n</i>	0.17657565	ω	270.74394	-0.86580076	-0.49397839				
<i>a</i>	3.1466529	Ω	239.65682	+0.48798100	-0.79820400				
<i>e</i>	0.0890584	<i>i</i>	5.30817	+0.11074106	-0.34475459				
<i>P</i>	5.58	<i>H</i>	12.7	<i>G</i>	0.15	<i>U</i>	4		
Residuals in seconds of arc									
1983 01 14	095	1.9-	0.4-	1998 11 11	704	0.6-	0.6-	1998 11 19	691
1983 02 10	095	1.8+	0.3-	1998 11 11	704	0.9-	0.0	1998 11 19	691
1986 09 29	010	0.4+	1.0-	1998 11 11	704	0.7-	0.4-	1998 11 19	691
1998 10 18	699	0.9-	0.6+	1998 11 11	704	1.0-	0.4+	1998 11 20	699
1998 10 18	699	0.6-	0.2-	1998 11 11	704	0.4-	0.5-	1998 11 20	699
1998 10 18	699	0.9-	0.6+	1998 11 12	910	1.2+	0.0	1998 11 20	699
1998 11 10	704	0.4-	0.1-	1998 11 12	910	1.3+	0.2+	1998 11 23	757
1998 11 10	704	0.3-	0.5-	1998 11 12	910	2.6+	1.1+	1998 11 23	757
1998 11 10	704	1.0-	0.1+	1998 11 16	566	0.1+	0.4-	1998 11 23	757
1998 11 10	704	1.2-	1.3+	1998 11 16	566	0.4+	0.2-		
1998 11 10	704	0.6-	0.1+	1998 11 16	566	0.1-	0.4-		

1998 VH₃₄

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	84.75610		(2000.0)	P	Q				
<i>n</i>	0.17469145	ω	49.94680	+0.98808141	+0.11560921				
<i>a</i>	3.1692387	Ω	303.18446	-0.14954716	+0.87742043				
<i>e</i>	0.1542981	<i>i</i>	6.97523	+0.03647987	+0.46558339				
<i>P</i>	5.64	<i>H</i>	13.0	<i>G</i>	0.15	<i>U</i>	4		
Residuals in seconds of arc									
1998 11 11	725	0.3+	0.1+	1998 11 16	725	0.1+	0.0	1999 01 13	725
1998 11 11	725	0.6+	0.3+	1998 11 22	725	0.2+	0.5+	1999 01 13	725
1998 11 11	725	0.2+	0.2+	1998 11 26	725	0.3+	0.2+	1999 01 15	725
1998 11 11	725	0.4+	0.2+	1998 11 26	725	0.7+	0.2+	1999 01 15	725
1998 11 14	704	1.6+	0.7-	1998 11 26	725	0.3-	0.6+	1999 11 13	725
1998 11 14	704	(2.4+	2.4-)	1998 12 01	725	0.2-	0.9+	1999 11 13	725
1998 11 14	704	0.6+	1.2-	1998 12 01	725	0.2+	0.7+	1999 11 13	725
1998 11 14	704	0.9-	1.4-	1998 12 01	725	1.0-	0.1-	1999 11 14	725
1998 11 14	704	0.6-	1.7-	1998 12 09	725	0.8-	0.5+	1999 11 14	725
1998 11 16	725	0.1-	0.0	1998 12 09	725	0.9-	0.0	1999 11 14	725
1998 11 16	725	0.1-	0.0	1998 12 09	725	1.4-	0.2+		

1999 NOV. 23

M.P.C. 36821

1998 VG₄₄

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	340.58110		(2000.0)	P		Q	
<i>n</i>	0.00397324	ω	321.85388	+0.00411447	−0.99911561		
<i>a</i>	39.4795951	Ω	127.87110	+0.93000660	−0.01155621		
<i>e</i>	0.2523911	<i>i</i>	3.03867	+0.36751978	+0.04042826		
<i>P</i>	248	<i>H</i>	6.5	<i>G</i>	0.15	<i>U</i>	6

Residuals in seconds of arc

1998 11 14	691	0.0	0.0	1999 03 18	691	0.8+	0.9−	1999 10 09	568	0.2−	0.4−
1998 11 14	691	0.6+	0.0	1999 03 19	691	0.2−	0.3−	1999 10 09	568	0.1−	0.4−
1998 11 14	691	0.2−	0.0	1999 03 19	691	0.0	0.2−	1999 10 30	688	0.2+	0.3−
1998 11 26	691	0.1+	0.3+	1999 03 20	691	0.8+	0.7+	1999 10 30	688	0.6+	0.5+
1998 11 26	691	0.3−	0.1+	1999 03 20	691	0.6−	0.3−	1999 10 30	688	0.3−	0.5+
1998 11 26	691	0.4−	0.4+	1999 10 07	568	0.1+	0.4+	1999 11 04	691	0.2−	0.1−
1999 03 18	691	0.5−	0.3−	1999 10 07	568	0.0	0.4+	1999 11 04	691	0.1−	0.1−

1998 WH₂₄

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Marsden

<i>M</i>	316.68171		(2000.0)	P		Q	
<i>n</i>	0.00313288	ω	62.23245	−0.36284365	−0.91813953		
<i>a</i>	46.2566099	Ω	49.95661	+0.76488684	−0.39106907		
<i>e</i>	0.1265779	<i>i</i>	12.00714	+0.53225240	−0.06391238		
<i>P</i>	315	<i>H</i>	4.7	<i>G</i>	0.15	<i>U</i>	6

Residuals in seconds of arc

1998 11 19	695	0.2−	0.1−	1998 11 26	688	0.2−	0.1+	1999 01 22	568	0.3+	0.4+
1998 11 19	695	0.0	0.2−	1998 11 26	688	0.1−	0.2+	1999 01 22	568	0.1+	0.3+
1998 11 24	688	0.6−	0.1+	1998 11 26	688	0.2−	0.2+	1999 01 23	568	0.2+	0.5+
1998 11 24	688	0.4−	0.4+	1998 11 26	688	0.1+	0.1+	1999 10 07	568	0.1+	0.1+
1998 11 24	688	0.1+	0.5+	1998 11 26	688	0.1+	0.1+	1999 10 07	568	0.1+	0.1+
1998 11 24	688	0.2−	0.5+	1998 11 26	688	0.1+	0.2+	1999 10 08	568	0.3+	0.5−
1998 11 24	688	0.2+	0.2+	1998 11 26	688	0.1+	0.3+	1999 10 08	568	0.2+	0.4−
1998 11 24	688	0.1−	0.2+	1998 11 26	688	0.0	0.1−	1999 10 18	621	0.3−	0.3+
1998 11 25	688	0.2+	0.0	1998 11 26	688	0.5+	0.3+	1999 10 18	621	0.3+	0.0
1998 11 25	688	0.1+	0.2+	1998 11 26	688	0.3+	0.1+	1999 10 19	621	0.1+	0.1−
1998 11 25	688	0.1−	0.1−	1998 12 10	684	1.0+	1.3−	1999 10 19	621	0.3−	0.3−
1998 11 25	688	0.1+	0.0	1998 12 10	684	0.9−	1.3−	1999 10 20	621	0.2−	0.2−
1998 11 25	688	0.1−	0.2+	1998 12 11	950	0.6+	0.6−	1999 10 20	621	0.1−	0.1−
1998 11 25	688	0.1+	0.5+	1998 12 12	684	0.3−	1.4−	1999 10 30	688	0.1−	0.9+
1998 11 25	688	0.0	0.1+	1998 12 12	684	0.1+	0.7−	1999 10 30	688	0.0	0.2−
1998 11 25	688	0.1−	0.1+	1999 01 06	684	0.0	0.4−	1999 10 30	688	0.2−	0.5+
1998 11 25	688	0.1+	0.1+	1999 01 06	684	0.4+	0.4−	1999 10 31	688	0.1+	0.1−
1998 11 26	688	0.2−	0.0	1999 01 09	684	0.8−	0.2−	1999 10 31	688	0.1+	0.0
1998 11 26	688	0.1−	0.1+	1999 01 09	684	0.2−	0.8+				

1998 WV₂₄

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Marsden

<i>M</i>	295.20282		(2000.0)	P		Q	
<i>n</i>	0.00394980	ω	298.29029	−0.52505641	−0.85106601		
<i>a</i>	39.6356322	Ω	183.38296	+0.78977316	−0.48656040		
<i>e</i>	0.1089883	<i>i</i>	1.50901	+0.31713423	−0.19734645		
<i>P</i>	250	<i>H</i>	7.5	<i>G</i>	0.15		

Residuals in seconds of arc

1998 11 18	695	0.5+	0.1+	1999 01 22	568	0.1−	0.2+	1999 10 10	568	0.1+	0.1+
1998 11 18	695	0.6+	0.1−	1999 01 23	568	0.1+	0.2+	1999 10 10	568	0.0	0.2+
1998 11 26	695	0.6−	0.0	1999 09 08	568	0.0	0.2−				
1998 11 27	695	0.6−	0.3−	1999 09 08	568	0.1−	0.2−				

1998 WW₂₄

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Marsden

<i>M</i>	22.66298		(2000.0)	P		Q	
<i>n</i>	0.00384370	ω	138.36820	+0.96115324	−0.19604711		
<i>a</i>	40.3617252	Ω	233.97401	+0.14312529	+0.95589119		
<i>e</i>	0.2569641	<i>i</i>	13.90066	+0.23600761	+0.21871799		
<i>P</i>	256	<i>H</i>	7.8	<i>G</i>	0.15	<i>U</i>	6

Residuals in seconds of arc

1998 11 18	695	0.1−	0.2+	1998 11 27	695	0.1+	0.1−	1999 01 23	568	0.1−	0.1−
1998 11 18	695	0.2−	0.2−	1998 12 17	950	0.6−	0.1−	1999 01 09	696	0.1−	0.1−
1998 11 18	695	0.3−	0.1+	1998 12 17	950	0.1+	0.2+	1999 01 09	696	0.1+	0.3+
1998 11 26	695	0.2+	0.1−	1998 12 18	950	0.1−	0.1−	1999 11 10	696	0.0	0.2−
1998 11 26	695	0.6+	0.1−	1999 01 22	568	0.2+	0.4+				

1998 WU₃₁

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Marsden

<i>M</i>	23.51983		(2000.0)	P		Q	
<i>n</i>	0.00392964	ω	138.48582	+0.95927828	−0.26563025		
<i>a</i>	39.7711097	Ω	237.16385	+0.21951752	+0.91507727		
<i>e</i>	0.2028799	<i>i</i>	6.56415	+0.17775614	+0.30343726		
<i>P</i>	251	<i>H</i>	8.3	<i>G</i>	0.15	<i>U</i>	6

Residuals in seconds of arc

1998 11 18	695	0.0	0.2−	1998 12 18	950	0.3−	0.1−	1999 10 09	568	0.2+	0.1−
1998 11 18	695	0.1−	0.0	1999 01 22	568	0.1−	0.1+	1999 10 09	568	0.1+	0.1+
1998 11 18	695	0.1+	0.2+	1999 01 23	568	0.0	0.1+	1999 10 11	568	0.1−	0.1−
1998 12 18	950	0.3+	0.1−	1999 10 06	568	0.1−	0.2+	1999 10 11	568	0.1−	0.1−

1998 WV₃₁

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Marsden

<i>M</i>	40.71769		(2000.0)	P		Q	
<i>n</i>	0.00396943	ω	275.83865	+0.89772609	+0.43229622		
<i>a</i>	39.5048817	Ω	58.57534	−0.35449752	+0.82324458		
<i>e</i>	0.2692250	<i>i</i>	5.70991	−0.26157096	+0.36795154		
<i>P</i>	248	<i>H</i>	7.7	<i>G</i>	0.15	<i>U</i>	5

Residuals in seconds of arc

1998 11 19	695	0.1−	0.1+	1998 12 17	950	0.1−	0.1−	1999 11 10	695	0.0	0.3−
1998 11 19	695	0.0	0.1+	1998 12 18	950	0.1+	0.0	1999 11 10	695	0.2−	0.1−
1998 11 19	695	0.1−	0.2+	1998 12 18	950	0.2+	0.4−	1999 11 11	695	0.2−	0.2+
1998 12 17	950	0.1−	0.1+	1999 01 22	568	0.3+	0.0	1999 11 11	695	0.5+	0.3+
1998 12 17	950	0.0	0.1−	1999 01 23	568	0.2−	0.0				

1999 HP₁₁

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	347.15298		(2000.0)	P		Q	
<i>n</i>	0.48845863	ω	311.76773	+0.81872627	+0.56873879		
<i>a</i>	1.5968012	Ω	14.17358	−0.38286582	+0.64313982		
<i>e</i>	0.5477807	<i>i</i>	18.79480	−0.42790308	+0.51274492		
<i>P</i>	2.02	<i>H</i>	19.4	<i>G</i>	0.15	<i>U</i>	5

Residuals in seconds of arc

1999 04 19	691	0.7−	0.1+	1999 04 22	691	0.0	0.2−	1999 05 16	691	0.7+	0.3−
1999 04 19	691	0.4−	0.1−	1999 04 22	691	0.2−	0.4−	1999 05 16	691	0.3−	0.4+
1999 04 19	691	1.1−	0.2+	1999 04 22	691	0.9+	0.1+	1999 11 08	853	0.2−	0.8−
1999 04 20	691	0.3−	0.3+	1999 05 06	691	0.2−	0.1−	1999 11 08	853	0.1+	0.1+
1999 04 20	691	0.2−	0.3−	1999 05 06	691	0.7−	0.1−	1999 11 08	853	0.7+	0.6−
1999 04 20	691	0.2−	0.0	1999 05 07	711	1.4+	0.2+	1999 11 09	853	0.3−	0.2+
1999 04 21	691	1.9+	0.0	1999 05 07	711	0.2+	0.5−	1999 11 09	853	0.4−	0.4+
1999 04 21	691	0.1+	0.2+	1999 05 07	711	0.3−	0.4−	1999 11 09	853	0.1+	0.6+
1999 04 21	691	0.2+	0.5+	1999 05 16	691	1.0−	0.4+				

1999 KG₁₃ = 1990 WW₆ = 1999 JS₁₂₅

Id. A. Doppler

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	108.99527		(2000.0)	P	Q
<i>n</i>	0.27639221	ω	348.31172	-0.72820870	-0.68398149
<i>a</i>	2.3340967	Ω	148.39426	+0.63528277	-0.69739858
<i>e</i>	0.1963304	<i>i</i>	4.74757	+0.25715345	-0.21401997
<i>P</i>	3.57	<i>H</i>	15.3	<i>G</i> 0.15	<i>U</i> 3

Residuals in seconds of arc

1990 11 21	809	1.2-	0.5+	1997 11 06	704	0.7-	0.3-	1999 05 18	704	1.2+	0.1+
1990 11 21	809	0.5-	0.8-	1997 11 06	704	0.5-	0.0	1999 05 19	704	1.2-	1.9-
1990 11 21	809	0.6-	0.8+	1997 11 06	704	0.9-	0.5-	1999 05 19	704	1.4+	0.8+
1990 11 22	809	1.3+	0.0	1997 11 06	704	1.0-	0.6+	1999 05 19	704	0.3+	0.6+
1990 11 22	809	0.1+	0.6-	1999 05 10	704	1.7+	0.8+	1999 05 19	704	1.0-	0.5-
1990 11 22	809	1.0+	0.5-	1999 05 10	704	1.7-	1.3+	1999 06 06	699	1.3+	1.1-
1997 10 30	566	1.6+	0.4+	1999 05 10	704	1.7-	0.6-	1999 06 06	699	0.5+	0.3-
1997 10 30	566	1.5+	0.2+	1999 05 18	704	0.5-	0.3-	1999 06 06	699	0.2+	0.1-
1997 10 30	566	(2.0+	0.3+)	1999 05 18	704	0.9+	0.7+				
1997 11 06	704	(2.1-	1.3+)	1999 05 18	704	1.3-	0.3+				

1999 LB₈ = 1998 BL₃₂

Id. A. Doppler

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	325.96777		(2000.0)	P	Q
<i>n</i>	0.28305421	ω	170.26994	+0.70237347	+0.70844252
<i>a</i>	2.2973278	Ω	144.29191	-0.66077728	+0.68505188
<i>e</i>	0.2067451	<i>i</i>	6.80351	-0.26465998	+0.16974426
<i>P</i>	3.48	<i>H</i>	15.4	<i>G</i> 0.15	<i>U</i> 5

Residuals in seconds of arc

1998 01 27	910	0.5-	0.4-	1999 05 17	704	0.6+	0.2-	1999 06 08	704	0.9-	0.1+
1998 01 27	910	0.4-	0.2-	1999 05 17	704	1.0+	0.3-	1999 06 08	704	0.4-	0.8+
1998 01 28	910	0.1-	0.3-	1999 05 17	704	1.5+	1.7-	1999 06 08	704	0.1-	0.4+
1998 01 30	910	0.5+	0.1+	1999 05 17	704	1.9-	0.6-	1999 06 08	704	1.4-	0.3+
1998 01 30	910	0.1+	0.4+	1999 05 17	704	0.1+	0.9+	1999 06 14	704	0.3+	0.2+
1998 01 30	910	0.4+	0.4+	1999 06 07	699	0.5+	0.5-	1999 06 14	704	0.4+	0.6-
1999 05 10	699	0.6-	0.5+	1999 06 07	699	1.3+	0.0	1999 06 14	704	0.1-	0.5-
1999 05 10	699	0.4-	0.0	1999 06 07	699	1.1+	0.5+	1999 06 14	704	0.6-	0.1+
1999 05 10	699	0.2-	0.7+	1999 06 08	704	0.4-	0.3-	1999 06 14	704	0.3+	0.3+

1999 NC₄₉ = 1981 SD

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Doppler

<i>M</i>	346.82659		(2000.0)	P	Q
<i>n</i>	0.27052396	ω	154.32413	+0.86710545	+0.49810829
<i>a</i>	2.3677303	Ω	175.79434	-0.46597695	+0.81398015
<i>e</i>	0.1718946	<i>i</i>	3.15310	-0.17605007	+0.29887194
<i>P</i>	3.64	<i>H</i>	15.9	<i>G</i> 0.15	<i>U</i> 5

Residuals in seconds of arc

1981 09 30	801	1.7+	0.3-	1999 07 13	704	0.2+	0.3-	1999 07 19	704	0.2+	0.5+
1981 10 01	801	1.5-	0.1+	1999 07 13	704	0.4+	0.2-	1999 07 19	704	0.1-	0.1+
1981 10 06	801	0.0	0.1+	1999 07 13	704	0.2-	0.3-	1999 07 19	704	0.2-	0.6+
1999 07 13	704	0.1-	0.1-	1999 07 13	704	0.2-	0.3-				

1999 OZ₁ = 1995 UQ₄₉

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	6.24318		(2000.0)	P	Q
<i>n</i>	0.24047578	ω	80.40102	+0.91174417	+0.34688797
<i>a</i>	2.5610722	Ω	259.04740	-0.40559115	+0.84496745
<i>e</i>	0.2417778	<i>i</i>	12.94770	+0.06494906	+0.40706111
<i>P</i>	4.10	<i>H</i>	14.2	<i>G</i> 0.15	<i>U</i> 5

Residuals in seconds of arc

1995 10 23	033	0.0	0.5+	1999 07 23	704	0.1-	0.8+	1999 11 03	704	1.3+	0.4+
1995 10 23	033	0.1-	1.2+	1999 07 23	704	0.3+	1.0+	1999 11 04	704	0.1+	0.6-
1995 10 24	033	0.4-	0.5+	1999 07 23	704	0.1+	0.8+	1999 11 04	704	0.3-	0.3-
1999 07 22	704	0.2-	0.2-	1999 07 23	704	0.2+	0.7+	1999 11 04	704	0.1-	0.4-
1999 07 22	704	0.3+	1.3-	1999 07 23	704	0.3+	1.1+	1999 11 04	704	0.0	0.4-
1999 07 22	704	0.1+	0.6-	1999 11 03	704	0.4+	0.2+	1999 11 04	704	0.1+	0.7-
1999 07 22	704	0.8-	1.0-	1999 11 03	704	0.3-	0.5-				
1999 07 22	704	0.1-	0.4-	1999 11 03	704	0.3-	0.3-				

1999 OR₂ = 1985 XH₁ = 1992 WN₈

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	284.85956		(2000.0)	P	Q
<i>n</i>	0.27497828	ω	173.07850	-0.07308536	-0.97556922
<i>a</i>	2.3420911	Ω	280.95967	+0.90461509	+0.02261993
<i>e</i>	0.1179725	<i>i</i>	12.18261	+0.41991674	-0.21852466
<i>P</i>	3.58	<i>H</i>	13.8	<i>G</i> 0.15	<i>U</i> 5

Residuals in seconds of arc

1985 12 14	010	(30.0-	2.8+)	1999 07 22	704	0.3-	0.3-	1999 11 10	703	0.6-	0.3+
1985 12 14	010	(21.6-	3.7+)	1999 07 22	704	0.6+	0.1+	1999 11 10	703	0.6-	0.4+
1992 11 26	675	0.0	0.0	1999 07 23	704	0.0	0.0	1999 11 10	703	0.3-	0.2+
1992 11 26	675	1.5+	0.4+	1999 07 23	704	0.4+	0.2-	1999 11 11	678	0.5+	0.1-
1992 11 30	675	0.6-	0.1+	1999 07 23	704	0.2-	0.1+	1999 11 11	678	0.5+	0.9-
1992 12 01	675	0.8-	0.7-	1999 07 23	704	0.6-	0.9-	1999 11 13	678	0.3-	0.3+
1999 07 22	704	0.1+	0.5-	1999 07 23	704	0.4-	0.0	1999 11 13	678	0.5+	0.3+
1999 07 22	704	0.5+	1.4+	1999 11 10	703	0.5-	0.0	1999 11 13	678	0.7+	0.2-

1999 OG₃ = 1992 WQ₄

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	358.32975		(2000.0)	P	Q
<i>n</i>	0.28310314	ω	137.70992	+0.94700078	-0.15261133
<i>a</i>	2.2970631	Ω	233.28380	+0.10429112	+0.97834130
<i>e</i>	0.2362472	<i>i</i>	20.64781	+0.30383037	+0.13985021
<i>P</i>	3.48	<i>H</i>	14.5	<i>G</i> 0.15	<i>U</i> 4

Residuals in seconds of arc

1992 11 19	675	1.3+	1.8-	1999 07 23	704	0.1-	0.2+	1999 11 03	704	0.1+	0.2-
1992 11 19	675	0.0	1.4-	1999 07 23	704	0.4+	0.4+	1999 11 03	704	0.0	0.0
1992 11 21	675	0.3+	1.1+	1999 07 23	704	0.4+	1.0+	1999 11 03	704	0.0	0.1-
1992 11 21	675	0.7-	4.3+	1999 07 23	704	0.4-	0.5+	1999 11 03	704	0.0	0.1+
1992 11 24	675	0.7-	0.8-	1999 07 23	704	1.5+	1.0-	1999 11 04	704	0.2-	0.0
1992 11 24	675	0.3-	1.6-	1999 07 23	704	0.1+	0.4-	1999 11 04	704	0.1+	0.1+
1999 07 22	704	0.2+	0.5-	1999 07 23	704	0.3+	0.7-	1999 11 04	704	0.2-	0.0
1999 07 22	704	0.2-	0.2+	1999 07 23	704	0.7-	0.1-	1999 11 04	704	0.1-	0.1+
1999 07 22	704	0.5-	0.3+	1999 07 23	704	0.1+	0.1-	1999 11 04	704	0.1-	0.2+
1999 07 22	704	0.8-	0.1+	1999 07 23	704	0.2+	0.3-				
1999 07 22	704	0.5-	0.2+	1999 11 03	704	0.3+	0.1-				

1999 OH₃ = 1998 KN₃₈

Id. A. Doppler

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	19.93830		(2000.0)	P	Q
<i>n</i>	0.21170150	ω	98.73299	+0.90710038	+0.30438895
<i>a</i>	2.7881754	Ω	243.98636	-0.37834002	+0.89232001
<i>e</i>	0.2140727	<i>i</i>	18.87410	+0.18446608	+0.33333523
<i>P</i>	4.66	<i>H</i>	13.5	<i>G</i> 0.15	<i>U</i> 3

Residuals in seconds of arc

1998 05 22	704	0.4+	0.4+	1999 07 23	704	0.2+	0.4+	1999 10 08	360	0.2-	0.3+
1998 05 22	704	0.4+	0.1+	1999 07 23	704	0.2-	0.1+	1999 10 08	360	0.2-	0.3+
1998 05 22	704	(0.3+	2.4+)	1999 07 23	704	0.5-	0.7+	1999 10 08	360	0.1-	0.4+
1998 05 22	704	0.1-	0.7-	1999 07 23	704	0.6-	0.3+	1999 10 09	360	0.2-	0.3+
1998 05 24	704	0.3+	0.5-	1999 09 03	704	0.5-	0.6-	1999 10 09	360	0.4-	0.4+
1998 05 24	704	(2.4+	0.1-)	1999 09 03	704	1.4+	0.4-	1999 10 09	360	0.3-	0.4+

1999 NOV. 23

1998 05 24	704	(1.3+	2.3-)	1999 09 03	704	0.2-	0.6-	1999 11 02	704	0.2+	0.1-
1998 05 24	704	0.3+	0.6+	1999 10 04	360	0.3-	0.3+	1999 11 02	704	0.2-	0.8-
1998 06 29	699	0.2+	0.5-	1999 10 04	360	0.5-	0.3+	1999 11 02	704	0.1-	0.7-
1998 06 29	699	0.9-	0.2+	1999 10 04	360	0.5-	0.2+	1999 11 02	704	0.1-	0.7-
1998 06 29	699	0.6-	0.5-	1999 10 04	360	0.3-	0.3+	1999 11 02	704	0.4+	0.7-
1999 07 22	704	0.2+	0.0	1999 10 05	704	0.9+	0.4+	1999 11 07	145	0.5-	0.8+
1999 07 22	704	0.0	0.1+	1999 10 05	704	1.0+	0.5-	1999 11 07	145	1.0-	0.0
1999 07 22	704	0.2+	0.2+	1999 10 05	704	1.0+	0.1+	1999 11 07	145	(2.4-	1.4+)
1999 07 22	704	0.1-	0.3-	1999 10 05	704	1.4+	1.5-				
1999 07 22	704	0.2+	0.5+	1999 10 05	704	(2.1+	0.7-)				

1999 OJ₃ = 1998 KL₅₈

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>		(2000.0)		Williams		<i>Q</i>	
<i>n</i>	0.23035066	<i>ω</i>	110.03697	+0.83351802	+0.43496342		
<i>a</i>	2.6355813	<i>Ω</i>	226.03482	-0.47772925	+0.87714314		
<i>e</i>	0.2484897	<i>i</i>	28.24913	+0.27752924	+0.20353560		
<i>P</i>	4.28	<i>H</i>	14.2	<i>G</i>	0.15	<i>U</i>	3

Residuals in seconds of arc

1998 04 21	704	0.5+	1.3+	1999 07 22	704	0.1+	1.5-	1999 11 04	678	0.3-	0.6+
1998 04 21	704	0.8-	1.7+	1999 07 22	704	0.2-	0.2-	1999 11 04	678	0.4-	1.0+
1998 04 21	704	0.7-	0.8+	1999 07 23	704	0.9-	0.5+	1999 11 04	704	0.1+	0.0
1998 04 21	704	1.4+	0.5-	1999 07 23	704	0.8+	0.0	1999 11 04	704	0.6-	0.2+
1998 04 21	704	1.5-	1.6+	1999 07 23	704	0.7+	0.3+	1999 11 04	704	0.1-	0.4+
1998 05 01	704	1.4+	0.8+	1999 07 23	704	0.2+	0.2+	1999 11 04	704	0.2-	0.0
1998 05 01	704	1.9+	0.2-	1999 10 05	704	0.4-	0.0	1999 11 04	704	0.5-	0.7+
1998 05 01	704	(2.5+	0.2-)	1999 10 05	704	0.4-	0.1-	1999 11 05	678	0.3-	0.3+
1998 05 01	704	1.1+	1.7-	1999 10 05	704	0.1+	0.4+	1999 11 05	678	0.3-	0.2+
1998 05 22	704	1.4+	1.6-	1999 10 05	704	0.8-	0.2-	1999 11 11	703	0.2+	0.4-
1998 05 22	704	0.7+	0.9+	1999 10 05	704	0.3-	0.4+	1999 11 11	703	0.3-	0.4+
1998 05 22	704	0.3+	1.0+	1999 10 31	678	0.3+	0.1-	1999 11 11	703	0.4+	0.2+
1998 05 22	704	0.3-	0.9+	1999 10 31	678	0.6+	0.7-	1999 11 11	703	0.0	0.1+
1998 05 22	704	1.2-	0.9-	1999 11 01	678	0.1-	0.1-	1999 11 14	704	0.2+	0.2-
1998 05 23	704	0.7-	0.7-	1999 11 01	678	0.0	0.0	1999 11 14	704	0.1-	0.2-
1998 05 23	704	1.6-	0.0	1999 11 01	678	0.2+	0.1-	1999 11 14	704	0.0	0.6-
1998 05 23	704	0.3-	0.7-	1999 11 03	704	0.1+	0.2+	1999 11 14	704	0.2-	0.0
1998 05 23	704	0.9-	1.5+	1999 11 03	704	0.2-	0.2+	1999 11 14	704	0.2-	0.2-
1998 05 23	704	1.4-	0.2-	1999 11 03	678	0.7+	0.6+	1999 11 16	704	0.5+	0.0
1998 05 24	704	1.0-	0.5-	1999 11 03	678	0.1-	0.6+	1999 11 16	704	0.9+	0.1+
1998 05 24	704	0.4+	1.9+	1999 11 03	704	0.0	0.1+	1999 11 16	704	0.9+	0.1+
1998 05 24	704	0.0	1.5+	1999 11 03	704	0.1-	0.0	1999 11 16	704	0.8+	0.4+
1999 07 22	704	0.0	0.4+	1999 11 03	704	0.1-	0.2+	1999 11 16	704	0.8+	0.3+
1999 07 22	704	0.0	0.6-	1999 11 04	678	0.5-	1.5+				

1999 PQ₁ = 1997 EU₃₄

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>		(2000.0)		Nakano		<i>Q</i>	
<i>n</i>	0.19460689	<i>ω</i>	187.05046	-0.87487496	+0.48416716		
<i>a</i>	2.9491526	<i>Ω</i>	21.92278	-0.44262867	-0.78809642		
<i>e</i>	0.0475112	<i>i</i>	2.03610	-0.19665620	-0.38011339		
<i>P</i>	5.06	<i>H</i>	14.8	<i>G</i>	0.15	<i>U</i>	4

Residuals in seconds of arc

1994 08 13	809	0.9+	1.7+	1999 08 08	867	0.0	0.0	1999 08 11	385	0.9+	0.4-
1994 08 13	809	0.8-	0.7+	1999 08 08	385	1.7-	0.6-	1999 08 11	385	0.3-	0.0
1994 08 13	809	0.7-	1.2-	1999 08 08	867	0.2+	0.4+	1999 09 01	867	0.2-	0.1-
1997 03 04	704	1.7-	0.5+	1999 08 08	385	1.1-	1.7-	1999 09 01	867	1.1+	0.2-
1997 03 04	704	1.1+	1.5-	1999 08 08	867	1.1+	0.6+	1999 09 01	867	0.6+	0.4-
1997 03 06	704	2.0+	0.9-	1999 08 09	867	0.1-	0.4+				
1997 03 06	704	1.6-	1.4+	1999 08 09	867	0.2+	0.4+				

1999 RS₂ = 1998 FX₁₄₄

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>		(2000.0)		Williams		<i>Q</i>	
<i>n</i>	0.25699571	<i>ω</i>	205.34223	+0.77701830	+0.62704600		
<i>a</i>	2.4501094	<i>Ω</i>	115.71232	-0.56658574	+0.73494623		
<i>e</i>	0.2066632	<i>i</i>	3.51760	-0.27426841	+0.25820021		
<i>P</i>	3.84	<i>H</i>	15.5	<i>G</i>	0.15	<i>U</i>	4

Residuals in seconds of arc

1998 03 20	704	1.2+	1.0+	1999 09 07	470	0.0	0.5-	1999 09 13	704	0.0	0.2+
1998 03 20	704	2.2+	0.1+	1999 09 07	470	0.2+	0.0	1999 09 13	704	0.5+	0.1+
1998 03 20	704	1.2+	1.5+	1999 09 08	684	0.3-	0.3-	1999 09 13	704	0.1-	0.7-
1998 03 20	704	2.3-	1.6-	1999 09 08	684	0.3-	0.3-	1999 09 13	704	0.0	0.2+
1998 03 20	704	1.1-	2.0+	1999 09 08	470	0.2+	0.2+	1999 09 13	704	0.2+	0.4+
1998 03 29	704	0.4-	0.4+	1999 09 08	470	0.7+	1.1+	1999 09 15	747	0.3-	0.0
1998 03 29	704	2.3+	2.5+	1999 09 09	704	0.1+	0.3+	1999 09 15	747	0.1-	0.2+
1998 03 29	704	0.4+	1.6+	1999 09 09	704	0.6-	0.7+	1999 09 15	747	0.3-	0.0
1998 03 29	704	1.1+	0.3+	1999 09 09	704	0.3-	0.4+	1999 09 15	747	0.1-	0.0
1998 03 29	704	1.7-	0.6-	1999 09 09	704	0.6-	0.8+	1999 09 17	739	0.4+	1.2-
1999 09 06	470	0.5-	0.1+	1999 09 09	704	0.3-	0.3+	1999 09 17	739	0.3-	1.1-
1999 09 06	470	0.9+	0.8+	1999 09 09	704	0.3-	0.3+	1999 09 17	739	0.4-	0.2-
1999 09 06	470	0.1-	0.5+	1999 09 09	704	1.3+	0.8-	1999 09 17	739	0.1-	1.0-
1999 09 07	704	0.2+	0.3-	1999 09 09	704	0.4-	0.9-	1999 09 30	470	0.2-	0.3-
1999 09 07	704	0.0	0.4+	1999 09 09	704	0.5-	0.4-	1999 09 30	470	1.4-	0.3-
1999 09 07	704	0.1+	0.6+	1999 09 12	557	0.3-	0.2-	1999 11 03	739	0.7+	1.4+
1999 09 07	704	0.1+	0.1+	1999 09 12	557	0.2-	0.1-	1999 11 03	739	3.0-	6.1+
1999 09 07	704	0.7+	0.5+	1999 09 12	557	0.0	0.3-	1999 11 03	739	2.4+	1.3+

1999 RM₁₃ = 1997 JQ₁₁

Id. A. Doppler

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>		(2000.0)		Williams		<i>Q</i>	
<i>n</i>	0.17523394	<i>ω</i>	31.44661	-0.22177972	-0.97506501		
<i>a</i>	3.1626944	<i>Ω</i>	71.36798	+0.89290076	-0.20632276		
<i>e</i>	0.1640274	<i>i</i>	0.47605	+0.39184434	-0.08172606		
<i>P</i>	5.62	<i>H</i>	13.2	<i>G</i>	0.15	<i>U</i>	6

Residuals in seconds of arc

1997 05 03	809	0.9+	0.3-	1999 09 07	704	0.3+	0.3-	1999 09 08	704	0.1+	0.4-
1997 05 03	809	0.2-	1.3-	1999 09 07	704	0.2+	1.3-	1999 09 08	704	1.1-	0.5-
1997 05 03	809	1.5-	1.1-	1999 09 07	704	0.0	1.1-	1999 09 09	704	0.2-	0.1+
1997 05 04	809	1.3+	0.7+	1999 09 07	704	0.2+	0.4-	1999 09 09	704	0.2-	0.5+
1997 05 04	809	0.6-	0.6+	1999 09 08	704	0.4-	0.4-	1999 09 09	704	0.1-	2.2+
1997 05 04	809	0.1+	1.5+	1999 09 08	704	0.3+	0.4+	1999 09 09	704	0.2+	0.6+
1999 09 07	704	1.2+	0.1+	1999 09 08	704	0.2+	0.4-	1999 09 09	704	0.7-	1.0+

1999 RY₁₅ = 1099 T-1

Id. A. Doppler

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>		(2000.0)		Williams		<i>Q</i>	
<i>n</i>	0.26170268	<i>ω</i>	207.11102	+0.33612429	-0.94150294		
<i>a</i>	2.4206422	<i>Ω</i>	223.26005	+0.87041265	+0.32040974		
<i>e</i>	0.1618187	<i>i</i>	2.03579	+0.35972528	+0.10445003		
<i>P</i>	3.77	<i>H</i>	15.5	<i>G</i>	0.15	<i>U</i>	5

Residuals in seconds of arc

1971 03 24	675	1.1-	0.3-	1999 09 08	704	0.7+	1.0-	1999 09 10	704	0.4-	0.4+
1971 03 25	675	0.6+	0.1-	1999 09 09	704	0.1+	0.2-	1999 09 10	704	0.1+	0.7+
1971 03 25	675	1.0-	1.1+	1999 09 09	704	0.3+	0.7+	1999 09 10	704	0.5-	0.8+
1971 03 26	675	1.5+	0.7-	1999 09 09	704	0.2+	0.3-	1999 09 10	704	0.3-	0.1+
1999 09 07	704	0.6+	0.7-	1999 09 09	704	0.1+	0.1+	1999 09 10	704	0.3-	0.4+
1999 09 07	704	0.5+	0.4+	1999 09 09	704	0.2+	0.7+	1999 09 10	704	0.2-	0.6+
1999 09 07	704	0.1-	0.8-	1999 09 09	704	1.0-	0.2-	1999 10 06	704	0.3-	0.3+
1999 09 07	704	1.0+	0.6-	1999 09 09	704	1.0-	0.2+	1999 10 06	704	0.1-	0.5-
1999 09 08	704	0.0	0.4-	1999 09 09	704	0.6-	0.7+	1999 10 06	704	0.5+	0.2+

1999 09 08 704 0.1+ 0.5- 1999 09 09 704 0.7+ 0.5+ 1999 10 06 704 0.5+ 0.2-
 1999 09 08 704 0.4- 0.7- 1999 09 09 704 0.1- 0.5- 1999 10 06 704 0.4- 0.3-

1999 RO₁₇ = 1989 EH = 1998 MS₄₄

Id. A. Gnädig

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

				Williams					
<i>M</i>	210.77419		(2000.0)	P		Q			
<i>n</i>	0.24230320	ω	321.32703	-0.78435655		-0.62030890			
<i>a</i>	2.5481791	Ω	180.34239	+0.60927874		-0.77001377			
<i>e</i>	0.1961391	<i>i</i>	12.52391	+0.11646554		-0.14931735			
<i>P</i>	4.07	<i>H</i>	14.4	<i>G</i>	0.15	<i>U</i>	2		

Residuals in seconds of arc

1982 07 24	413	1.3-	0.9-	1998 06 25	704	1.4+	1.9+	1999 09 09	704	0.1+	0.4+
1985 01 21	413	1.1+	1.1+	1998 06 25	704	(1.0-	3.1+)	1999 09 09	704	0.7-	1.0+
1985 01 21	413	0.5-	0.4-	1999 09 04	703	0.1-	0.7+	1999 09 09	704	0.1-	0.8-
1989 03 01	675	0.6+	0.2+	1999 09 04	703	0.1-	1.6+	1999 09 14	704	0.4-	0.8-
1989 03 05	675	(3.0-	0.3-)	1999 09 04	703	0.0	0.9+	1999 09 14	704	0.1+	0.0
1992 11 28	675	0.5+	0.3-	1999 09 04	703	(1.1-	2.5+)	1999 09 14	704	0.3+	0.8-
1992 11 28	675	0.5-	0.5+	1999 09 07	704	0.5-	0.1+	1999 09 14	704	0.4+	0.6-
1995 09 19	809	(1.8+	2.6-)	1999 09 07	704	0.1-	0.2-	1999 09 14	703	0.2-	0.0
1995 09 20	809	(2.6+	3.3-)	1999 09 07	704	0.2-	0.1+	1999 09 14	703	0.2-	0.7+
1997 01 10	675	1.5-	0.2-	1999 09 07	704	0.1-	0.3-	1999 09 14	703	0.5-	0.4+
1997 01 10	675	0.5+	0.0	1999 09 07	704	0.1+	0.6-	1999 09 14	703	0.2+	0.4+
1998 06 19	704	0.2+	1.2-	1999 09 08	704	1.3+	0.6+	1999 10 06	704	0.1+	0.0
1998 06 19	704	0.2-	1.4-	1999 09 08	704	1.1+	0.5+	1999 10 06	704	0.1-	0.1-
1998 06 19	704	0.3-	0.9+	1999 09 08	704	0.1-	0.5+	1999 10 06	704	0.6-	0.0
1998 06 19	704	(3.4-	0.3+)	1999 09 08	704	0.1+	0.8-	1999 10 06	704	0.2+	0.4-
1998 06 25	704	0.6-	0.7+	1999 09 09	704	0.2+	0.6-	1999 10 06	704	0.6+	0.5-

1999 RB₂₂ = 1974 DJ = 1985 QY₆ = 1985 RE₅ = 1985 SV₁ = 1988 FX₂

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

				Williams					
<i>M</i>	169.59288		(2000.0)	P		Q			
<i>n</i>	0.21387793	ω	167.11435	-0.99933777		+0.00785926			
<i>a</i>	2.7692281	Ω	13.48798	-0.02547889		-0.84821739			
<i>e</i>	0.0620320	<i>i</i>	8.76161	+0.02597780		-0.52958992			
<i>P</i>	4.61	<i>H</i>	12.9	<i>G</i>	0.15	<i>U</i>	2		

Residuals in seconds of arc

1974 02 19	029	0.3+	0.7+	1988 03 23	809	1.9-	1.0-	1999 09 08	704	0.4+	0.0
1974 02 20	029	0.5+	0.6+	1988 03 23	809	0.7-	0.1+	1999 09 08	704	0.1+	0.1-
1985 08 24	095	0.7+	1.7+	1988 03 24	809	2.3+	1.1-	1999 09 08	704	0.3+	0.0
1985 09 11	095	2.2-	2.2+	1988 03 24	809	0.7+	0.1+	1999 11 04	691	0.3+	0.3+
1985 09 19	095	0.4+	2.1-	1999 09 07	704	0.7-	0.6-	1999 11 04	691	0.1+	0.4+
1988 03 17	809	0.3-	0.1+	1999 09 07	704	0.4-	0.0	1999 11 04	691	0.1+	0.4+
1988 03 17	809	0.8-	0.4+	1999 09 07	704	0.7-	0.5-	1999 11 11	691	0.5+	0.1-
1988 03 17	809	0.0	0.2+	1999 09 07	704	0.3+	0.3-	1999 11 11	691	0.6+	0.2-
1988 03 18	809	0.6+	0.6+	1999 09 07	704	0.1+	0.7-	1999 11 11	691	0.5+	0.1-
1988 03 18	809	0.6-	0.4-	1999 09 08	704	0.2-	0.2-				

1999 RL₂₅ = 1978 EJ₁₀ = 1991 RS₃₀

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

				Williams					
<i>M</i>	344.99260		(2000.0)	P		Q			
<i>n</i>	0.25306558	ω	14.09428	+0.98864933		-0.14748178			
<i>a</i>	2.4754111	Ω	354.15546	+0.09539347		+0.76359247			
<i>e</i>	0.0967073	<i>i</i>	16.34921	+0.11607151		+0.62862999			
<i>P</i>	3.89	<i>H</i>	14.2	<i>G</i>	0.15	<i>U</i>	3		

Residuals in seconds of arc

1978 03 15	675	0.6-	0.2-	1999 09 07	704	0.4+	0.3-	1999 10 28	703	0.2-	0.9+
1978 03 16	675	0.2+	0.3-	1999 09 07	704	0.4+	0.7-	1999 10 28	703	1.2-	1.3+
1991 09 15	675	0.7-	0.0	1999 09 07	704	0.0	0.7-	1999 11 04	703	0.2+	0.5-
1991 09 15	675	1.4-	1.2+	1999 09 08	704	0.1-	0.5-	1999 11 04	703	0.6+	0.3-
1991 09 16	675	1.0+	0.5-	1999 09 08	704	0.0	0.1+	1999 11 04	703	0.4+	0.4-
1991 09 16	675	1.2+	0.9-	1999 09 08	704	1.2-	2.3+	1999 11 04	703	0.3+	0.8-

1999 09 07 704 0.8+ 0.3- 1999 10 28 703 0.3- 1.1-
 1999 09 07 704 0.4+ 0.2- 1999 10 28 703 0.1- 0.8+

1999 RL₃₃ = 1977 EZ₄ = 1979 YP₉ = 1989 VL₂ = 1998 KF₁₃

Id. G. V. Williams (*MPC* 36399), M. E. Sansaturio

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

				Williams					
<i>M</i>	266.45478		(2000.0)	P		Q			
<i>n</i>	0.28678085	ω	109.55770	+0.18824828		-0.98103799			
<i>a</i>	2.2773823	Ω	329.47636	+0.86361567		+0.18771320			
<i>e</i>	0.1244865	<i>i</i>	5.21000	+0.46768638		+0.04825168			
<i>P</i>	3.44	<i>H</i>	14.6	<i>G</i>	0.15	<i>U</i>	2		

Residuals in seconds of arc

1977 03 12	381	1.3-	0.4+	1999 09 09	704	1.2+	1.1+	1999 09 30	704	0.3-	0.5-
1977 03 12	381	2.1+	0.5+	1999 09 09	704	0.4+	0.7+	1999 09 30	704	0.1+	0.7-
1979 12 25	095	0.3-	1.9+	1999 09 11	678	0.5+	0.0	1999 09 30	704	0.3-	0.3-
1989 11 04	095	0.9+	0.5-	1999 09 11	678	0.6-	0.4-	1999 10 01	704	(2.2-	0.1-)
1989 11 04	095	(3.6+	1.5-)	1999 09 11	678	0.0	0.1-	1999 10 01	704	1.4+	0.9+
1998 05 22	704	0.3-	0.1-	1999 09 13	848	0.6-	0.6-	1999 10 01	704	0.7-	0.1+
1998 05 22	704	1.7+	0.9-	1999 09 13	848	0.8-	0.6+	1999 10 01	704	0.2-	0.1+
1998 05 22	704	0.6-	1.5+	1999 09 13	848	1.2-	0.5-	1999 10 01	704	1.0-	0.4-
1998 05 22	704	1.0+	0.1-	1999 09 13	848	0.1-	0.7+	1999 10 01	704	1.1-	1.5+
1998 05 22	704	0.4-	0.3+	1999 09 13	848	1.1-	0.4+	1999 10 01	704	(2.1-	0.7-)
1998 05 24	704	0.0	0.6+	1999 09 14	704	1.0+	0.4-	1999 10 01	704	1.7-	0.2-
1998 05 24	704	0.3-	0.2+	1999 09 14	704	0.2-	0.4+	1999 10 06	704	0.9+	0.5+
1998 05 24	704	0.9-	0.9+	1999 09 14	704	0.4+	0.1+	1999 10 06	704	0.0	0.4+
1998 05 24	704	0.8+	0.9-	1999 09 14	704	0.1-	0.2-	1999 10 06	704	0.1-	0.1-
1998 05 24	704	0.4-	0.6+	1999 09 14	704	0.2-	0.1+	1999 10 06	704	0.1-	0.1-
1999 09 07	704	0.2+	0.0	1999 09 18	678	(2.4-	1.8-)	1999 10 06	704	0.9-	0.3+
1999 09 07	704	0.4+	0.3+	1999 09 18	678	0.8+	0.4+	1999 10 07	704	0.8+	0.3-
1999 09 07	704	0.2+	0.2+	1999 09 18	678	0.2-	1.7-	1999 10 07	704	0.0	0.9+
1999 09 07	704	0.2+	0.1-	1999 09 29	704	0.2-	0.0	1999 10 07	704	0.2+	0.5+
1999 09 07	704	0.3+	0.0	1999 09 29	704	0.5-	1.0-	1999 10 07	704	0.8-	0.6-
1999 09 09	678	(2.8+	0.1+)	1999 09 29	704	0.5+	0.3+	1999 11 04	703	1.5-	1.0+
1999 09 09	678	0.2-	0.4-	1999 09 29	704	0.4+	0.4+	1999 11 04	703	1.0+	0.7+
1999 09 09	704	0.5+	0.1-	1999 09 29	704	0.7+	0.6-	1999 11 04	703	0.9-	0.3+
1999 09 09	704	0.7+	0.1-	1999 09 30	704	0.1-	0.4-	1999 11 04	703	0.5-	0.6+
1999 09 09	704	1.3+	0.2+	1999 09 30	704	0.4-	0.1-				

1999 RX₃₄ = 1998 FZ₄₄

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

				Williams					
<i>M</i>	40.02440		(2000.0)	P		Q			
<i>n</i>	0.31685998	ω	233.66618	+0.71884878		+0.69429243			
<i>a</i>	2.1308741	Ω	82.33405	-0.62600529		+0.66831593			
<i>e</i>	0.1823866	<i>i</i>	2.01512	-0.30228102		+0.26704276			
<i>P</i>	3.11	<i>H</i>	14.9	<i>G</i>	0.15	<i>U</i>	4		

Residuals in seconds of arc

1998 02 26	566	0.6-	0.7-	1998 04 19	704	0.2-	0.5-	1999 10 29	703	0.1+	0.3+
1998 02 26	566	0.2-	0.9-	1998 04 19	704	0.2-	0.1-	1999 10 29	703	0.2-	0.4-
1998 02 26	566	0.4-	0.7-	1998 04 19	704	0.5-	0.5+	1999 10 29	703	0.2-	0.3+
1998 03 20	704	0.3+	0.1-	1999 09 11	120	0.7+	0.5+	1999 11 01	703	0.4-	0.6+
1998 03 20	704	0.3-	0.2-	1999 09 11	120	0.6+	0.0	1999 11 01	703	0.0	0.1+
1998 03 20	704	0.4+	0.6+	1999 0							

1999 RB₄₀ = 1998 HL₆₀

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>		(2000.0)		P		Q	
<i>n</i>	61.48061	ω	269.20902	+0.26319488	+0.96209384		
<i>a</i>	2.5540768	Ω	16.59072	-0.75533822	+0.25156829		
<i>e</i>	0.2119119	<i>i</i>	14.48959	-0.60016050	+0.10530354		
<i>P</i>	4.08	<i>H</i>	15.2	<i>G</i>	0.15	<i>U</i>	4

Residuals in seconds of arc

1998 04 21	704	0.2+	0.2+	1998 04 22	704	1.6-	0.8+	1999 10 30	703	1.4+	0.6+
1998 04 21	704	0.6+	0.5+	1999 09 12	703	1.2-	1.7-	1999 10 30	703	0.8+	0.2-
1998 04 21	704	0.6+	0.6-	1999 09 12	703	0.1-	0.9-	1999 10 30	703	0.4+	0.1+
1998 04 21	704	0.2-	0.8+	1999 09 12	703	0.1+	0.6+	1999 10 30	703	0.4-	0.2-
1998 04 21	704	0.3+	0.6-	1999 09 12	703	0.6-	0.2+	1999 11 04	703	1.2-	0.0
1998 04 22	704	0.2-	1.1-	1999 09 14	703	0.2-	0.5+	1999 11 04	703	0.6+	0.1-
1998 04 22	704	0.2+	0.6+	1999 09 14	703	0.6+	0.0	1999 11 04	703	1.3-	0.3+
1998 04 22	704	0.1-	0.8-	1999 09 14	703	0.7-	0.4-	1999 11 04	703	0.5+	0.5-
1998 04 22	704	0.1-	0.0	1999 09 14	703	1.4+	1.3+				

1999 RU₄₃ = 1998 HU₁₅₁

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>		(2000.0)		P		Q	
<i>n</i>	56.40461	ω	265.04868	+0.52735630	+0.81156926		
<i>a</i>	2.5813435	Ω	40.26839	-0.53947954	+0.54851663		
<i>e</i>	0.2156413	<i>i</i>	22.89800	-0.65639711	+0.20120847		
<i>P</i>	4.15	<i>H</i>	12.6	<i>G</i>	0.15	<i>U</i>	4

Residuals in seconds of arc

1998 04 22	704	0.3+	0.2-	1999 10 02	120	0.5+	0.1-	1999 10 12	106	0.3-	0.0
1998 04 22	704	0.5+	0.2+	1999 10 03	704	0.2+	0.3-	1999 10 29	703	0.3-	0.0
1998 04 22	704	0.0	1.3-	1999 10 03	704	0.4+	0.1-	1999 10 29	703	0.2+	0.1+
1998 04 22	704	0.3-	1.1-	1999 10 03	704	0.1-	0.6-	1999 10 29	703	0.4-	0.3+
1998 04 22	704	0.5-	0.7+	1999 10 03	704	0.2+	0.0	1999 10 29	703	0.1-	0.0
1998 05 01	704	0.9+	1.8+	1999 10 03	704	0.4-	0.1-	1999 11 03	704	0.7-	0.2-
1998 05 01	704	0.3+	0.3+	1999 10 03	703	0.2-	0.5+	1999 11 03	704	0.5-	0.5-
1998 05 01	704	0.0	0.9+	1999 10 03	703	0.6-	0.5+	1999 11 03	704	0.3-	0.1-
1998 05 01	704	0.9+	1.1+	1999 10 03	703	0.2-	0.5+	1999 11 03	704	0.5-	0.5+
1999 09 13	120	0.2-	0.5-	1999 10 03	703	0.2-	0.4+	1999 11 03	704	0.1-	0.3+
1999 09 13	120	0.0	0.3-	1999 10 07	704	1.5+	0.1-	1999 11 16	704	0.5-	0.2-
1999 09 14	120	0.7+	0.4-	1999 10 07	704	0.4+	1.2+	1999 11 16	704	0.3-	0.1-
1999 09 14	120	0.0	0.2-	1999 10 07	704	0.6+	1.3+	1999 11 16	704	0.5-	0.1-
1999 09 17	120	0.5+	0.1+	1999 10 07	704	0.5-	0.4+	1999 11 16	704	0.6-	0.2-
1999 09 17	120	0.4+	0.1+	1999 10 12	106	0.3+	0.2+				
1999 10 02	120	0.2+	0.0	1999 10 12	106	0.1+	0.3+				

1999 RA₄₄ = 1992 SO₂₆

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>		(2000.0)		P		Q	
<i>n</i>	268.74112	ω	75.18372	-0.61017014	-0.78592910		
<i>a</i>	2.2757585	Ω	52.86001	+0.67006183	-0.57929506		
<i>e</i>	0.1145793	<i>i</i>	7.20929	+0.42274053	-0.21617743		
<i>P</i>	3.43	<i>H</i>	14.3	<i>G</i>	0.15	<i>U</i>	6

Residuals in seconds of arc

1992 09 23	033	0.7+	0.6+	1999 09 18	703	0.4-	0.5-	1999 11 04	704	0.3-	0.1+
1992 09 25	033	0.4+	0.1-	1999 09 18	703	1.0-	0.2+	1999 11 04	704	0.5-	0.1+
1992 09 25	033	0.3-	0.2+	1999 09 18	703	1.0-	1.5+	1999 11 04	704	0.4-	0.2+
1992 09 27	033	0.5-	0.8-	1999 09 18	703	0.1+	1.6+	1999 11 04	704	0.0	0.1-
1992 09 28	033	0.0	0.5-	1999 09 22	120	0.6+	1.5+	1999 11 12	704	0.1+	0.2-
1999 09 15	120	0.2-	0.1-	1999 09 22	120	0.2-	0.2+	1999 11 12	704	0.0	0.0
1999 09 15	120	1.3+	0.1+	1999 09 22	120	1.0+	0.8-	1999 11 12	704	0.2+	0.2-
1999 09 16	120	0.3-	1.0-	1999 10 20	120	1.1+	0.6-	1999 11 12	704	0.4+	0.0
1999 09 16	120	0.7-	0.7-	1999 10 20	120	0.2+	0.2-	1999 11 12	704	0.2+	0.1+
1999 09 16	120	0.0	0.5-	1999 11 04	704	0.5-	0.0				

1999 RB₄₄ = 1987 YL₄

Id. A. Doppler

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>		(2000.0)		P		Q	
<i>n</i>	335.25464	ω	16.71137	+0.56129869	-0.81832586		
<i>a</i>	0.24393756	Ω	39.38474	+0.73529076	+0.42452028		
<i>e</i>	2.5367847	<i>i</i>	11.23612	+0.37985691	+0.38746009		
<i>P</i>	0.1704219	<i>H</i>	14.1	<i>G</i>	0.15	<i>U</i>	3

Residuals in seconds of arc

1987 12 23	010	0.7-	0.2+	1999 10 02	120	0.1-	0.1-	1999 11 03	704	0.1-	0.6-
1987 12 23	010	0.6+	0.2-	1999 10 02	120	0.2+	0.2+	1999 11 03	704	0.0	0.6-
1987 12 23	010	0.0	0.2+	1999 10 03	704	0.0	0.5-	1999 11 04	703	0.0	0.6+
1999 09 15	120	0.1+	0.3+	1999 10 03	704	0.4+	0.0	1999 11 04	703	0.1-	0.8+
1999 09 15	120	2.0-	0.2-	1999 10 03	704	0.5+	0.2+	1999 11 04	703	0.3-	0.7+
1999 09 16	120	0.0	0.2-	1999 10 03	704	0.0	0.2+	1999 11 04	703	0.0	0.6+
1999 09 16	120	0.4+	0.3-	1999 10 03	704	0.1+	0.4+	1999 11 10	012	0.2-	0.6-
1999 09 16	120	0.4+	0.0	1999 11 03	704	0.2+	0.2-	1999 11 10	012	0.4+	0.6-
1999 09 22	120	0.3+	0.4+	1999 11 03	704	0.2-	0.2-				
1999 09 22	120	0.1+	0.0	1999 11 03	704	0.0	0.4-				

1999 RC₄₄ = 1986 TX₁

Id. S. Nakano

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>		(2000.0)		P		Q	
<i>n</i>	5.97770	ω	328.03690	+0.96522410	-0.21662003		
<i>a</i>	0.23177595	Ω	45.23401	+0.26136348	+0.81164716		
<i>e</i>	2.6247653	<i>i</i>	11.89562	-0.00561854	+0.54249852		
<i>P</i>	0.1689407	<i>H</i>	13.2	<i>G</i>	0.15	<i>U</i>	4

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

1986 10 02	026	(5.6-	0.7-)	1999 09 22	120	0.4+	0.4-	1999 10 16	611	1.2+	0.6+
1986 10 04	026	1.2-	1.0+	1999 10 03	704	0.7+	1.4-	1999 11 02	727	0.4+	0.9-
1986 10 06	026	0.7+	0.6+	1999 10 03	704	1.7+	0.6-	1999 11 02	727	0.4+	0.9-
1986 10 07	688	0.5+	0.1-	1999 10 03	704	1.4+	0.3+	1999 11 02	727	0.5+	0.8-
1986 10 07	688	1.1-	1.3-	1999 10 03	704	0.3+	1.3+	1999 11 03	704	0.4+	0.5-
1986 10 08	026	1.2+	0.6-	1999 10 07	704	0.7+	1.3-	1999 11 03	704	0.1+	0.5-
1986 10 27	026	(0.03-	0.00-)	1999 10 07	704	0.9-	0.7-	1999 11 03	704	0.2+	0.4-
1999 09 15	120	0.5+	0.1+	1999 10 07	704	0.4+	0.8+	1999 11 03	704	0.3+	0.1-
1999 09 15	120	0.4-	0.1+	1999 10 07	704	0.6-	1.3-	1999 11 03	704	0.1+	0.1+
1999 09 16	120	0.7-	0.5-	1999 10 07	704	0.2-	1.2+	1999 11 04	727	0.4-	0.1+
1999 09 16	120	1.1-	0.2-	1999 10 12	106	0.5-	0.3+	1999 11 04	727	0.7-	0.7+
1999 09 16	120	0.7-	0.2+	1999 10 12	106	0.2-	0.3+	1999 11 04	703	0.4-	0.5+
1999 09 18	703	0.7-	0.1+	1999 10 12	106	0.1+	0.6+	1999 11 04	703	0.5-	0.4+
1999 09 18	703	0.0	0.4+	1999 10 12	106	0.1-	0.4+	1999 11 04	703	0.7-	0.4+
1999 09 18	703	0.3+	0.6+	1999 10 12	106	0.7-	0.2+	1999 11 04	703	0.4-	0.4+
1999 09 18	703	0.2+	0.4+	1999 10 12	106	0.2-	0.4+				
1999 09 22	120	0.3-	0.0	1999 10 16	611	0.1-	0.0				

1999 RJ₄₅

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>		(2000.0)		P		Q	
<i>n</i>	349.65934	ω	241.80087	+0.96484766	-0.15613546		
<i>a</i>	0.20360409	Ω	126.40795	+0.20623055	+0.94841908		
<i>e</i>	2.8616184	<i>i</i>	15.22869	-0.16290473	+0.27590392		
<i>P</i>	0.4435517	<i>H</i>	15.0	<i>G</i>	0.15	<i>U</i>	2

Residuals in seconds of arc

1984 08 26	413	0.0	0.6+	1999 09 15	859	0.4+	0.5-	1999 09 18	678	0.6-	0.1-
1984 08 26	413	0.1-	0.9-	1999 09 15	859	0.5+	0.5-	1999 09 18	678	0.6-	0.2+
1999 07 16	704	0.0	0.7+	1999 09 15	711	0.4+	0.4+	1999 09 18	848	0.5-	0.5+
1999 07 16	704	0.1+	1.1+	1999 09 15	848	0.3-	0.0	1999 09 18	678	0.8-	0.1+
1999 07 16	704	1.0+	0.9-	1999 09 15	848	0.2+	0.1-	1999 09 18	848	0.3-	0.4+
1999 07 16	704	0.3-	0.3+	1999 09 15	848	0.2+	0.4+	1999 09 18	428	0.1-	0.2-

1999 09 09	699	0.1+	0.0	1999 09 15	848	0.1-	0.3-	1999 09 18	428	0.2-	0.0
1999 09 09	699	0.2-	1.4-	1999 09 15	848	0.2+	0.4+	1999 09 18	413	0.3+	0.5-
1999 09 09	699	0.4+	0.2-	1999 09 15	428	0.6-	0.3-	1999 09 18	413	0.2+	0.8-
1999 09 11	704	0.4-	0.0	1999 09 15	428	0.6-	0.3-	1999 09 20	413	0.1-	0.4-
1999 09 11	704	0.2-	0.6-	1999 09 15	428	0.8-	0.3-	1999 09 20	413	0.0	0.3-
1999 09 11	704	0.6-	0.1-	1999 09 15	620	(1.2-	2.2-)	1999 09 20	413	0.1+	0.2-
1999 09 11	704	0.3-	0.1-	1999 09 15	620	(0.5-	2.4-)	1999 09 28	413	0.2+	0.5-
1999 09 11	704	0.4-	0.1-	1999 09 15	620	0.3-	1.9-	1999 09 28	413	0.2+	0.7-
1999 09 13	413	1.2+	1.2-	1999 09 16	595	0.2-	0.0	1999 09 30	704	0.5+	0.1+
1999 09 13	413	0.4+	0.4-	1999 09 16	046	0.0	0.1+	1999 09 30	704	0.7+	0.3+
1999 09 14	413	0.3+	0.5-	1999 09 16	595	0.2-	0.0	1999 09 30	704	0.5+	0.0
1999 09 14	413	0.4+	0.5-	1999 09 16	046	0.5-	0.6+	1999 09 30	704	0.7+	0.3-
1999 09 14	413	0.5+	0.5-	1999 09 16	046	0.1-	0.3-	1999 09 30	704	0.5+	0.6-
1999 09 14	413	0.4+	0.3-	1999 09 16	595	0.2+	0.1-	1999 10 06	704	0.4+	0.3+
1999 09 14	413	0.5+	0.5-	1999 09 16	848	0.3-	0.6+	1999 10 06	704	0.4+	0.3-
1999 09 14	413	0.3+	0.5-	1999 09 16	848	0.3+	0.4+	1999 10 06	704	0.4+	0.2-
1999 09 14	046	0.2+	0.3-	1999 09 16	848	0.2+	0.8+	1999 10 06	704	1.1-	1.0+
1999 09 14	595	0.2-	0.6+	1999 09 16	426	0.3-	0.3+	1999 10 06	413	0.2+	0.5-
1999 09 14	046	0.1+	0.1-	1999 09 16	428	0.5-	1.8+	1999 10 06	413	0.1+	0.2-
1999 09 14	046	0.2+	0.4-	1999 09 16	426	0.2-	0.2+	1999 10 20	402	0.2+	0.2-
1999 09 14	046	0.1+	0.1-	1999 09 16	428	0.4-	1.7+	1999 10 20	402	0.2+	0.3-
1999 09 14	595	1.0+	0.0	1999 09 16	426	0.3-	0.1+	1999 10 20	402	0.2+	0.3-
1999 09 14	595	0.1-	1.0+	1999 09 16	952	0.9-	1.0+	1999 11 02	428	0.1+	0.6-
1999 09 15	118	0.2+	0.2-	1999 09 16	952	1.2-	1.3+	1999 11 02	428	0.2+	0.5-
1999 09 15	113	0.1-	0.7-	1999 09 17	952	1.1-	1.9+	1999 11 13	704	0.1-	0.2+
1999 09 15	118	0.1+	0.2-	1999 09 17	952	0.2-	1.3+	1999 11 13	704	0.6-	0.5+
1999 09 15	118	0.2+	0.1-	1999 09 17	952	0.0	1.7+	1999 11 13	704	0.4-	0.3+
1999 09 15	113	0.2+	0.8-	1999 09 17	952	0.5-	1.3+	1999 11 13	704	0.0	0.6+
1999 09 15	113	0.5+	0.4-	1999 09 17	848	0.0	0.1+	1999 11 13	704	0.1-	0.4+
1999 09 15	859	0.5+	0.7-	1999 09 17	848	0.0	0.4+				
1999 09 15	859	0.6+	0.5-	1999 09 17	848	0.7-	0.1+				

1999 RC₄₇ = 1986 QC₂

Id. G. V. Williams, A. Doppler

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	17.52480		(2000.0)		P		Q
<i>n</i>	0.22590216	ω	309.33910	+0.30790601		+0.94872796	
<i>a</i>	2.6700688	Ω	338.26986	-0.80269667		+0.21871008	
<i>e</i>	0.1854818	<i>i</i>	11.13151	-0.51075624		+0.22821295	
<i>P</i>	4.36	<i>H</i>	14.1	<i>G</i>	0.15	<i>U</i>	2

Residuals in seconds of arc

1986 08 28	809	0.5-	0.9+	1986 09 10	809	0.0	0.3+	1999 07 14	704	0.1+	0.2+
1986 08 28	809	0.1+	1.1+	1986 09 10	809	0.0	0.2+	1999 07 14	704	0.2+	0.5+
1986 08 28	809	0.2+	1.1+	1986 09 10	809	0.0	0.1+	1999 07 14	704	0.3+	0.1+
1986 08 30	809	0.5+	0.3-	1986 09 12	809	0.0	1.6+	1999 09 07	704	0.8-	0.0
1986 08 30	809	0.4+	0.2-	1986 09 12	809	0.0	1.7+	1999 09 07	704	0.2-	0.1-
1986 08 30	809	0.4+	0.3-	1986 09 12	809	0.1+	1.8+	1999 09 07	704	0.0	0.7+
1986 09 01	809	0.4+	0.1-	1986 02 28	809	(4.1+	1.2-)	1999 09 07	704	0.4-	0.1-
1986 09 01	809	0.3+	0.1-	1986 03 02	809	(1.1+	5.7+)	1999 09 07	704	0.6-	0.7+
1986 09 01	809	0.2+	0.1-	1986 03 20	704	0.5+	0.5+	1999 09 11	699	0.2-	0.2-
1986 09 04	809	0.1-	1.1-	1986 03 20	704	0.0	0.3-	1999 09 11	699	1.5-	0.1-
1986 09 04	809	0.4-	1.0-	1986 03 20	704	0.7-	0.2+	1999 09 11	704	0.5-	0.3-
1986 09 04	809	0.1-	1.1-	1986 03 20	704	1.0-	0.2-	1999 09 11	699	0.3-	1.1+
1986 09 06	809	0.2-	1.5-	1986 03 20	704	1.4-	0.4-	1999 09 11	704	0.7-	0.3-
1986 09 06	809	0.0	1.5-	1986 03 29	704	0.8+	1.4-	1999 09 11	704	0.2-	0.4-
1986 09 06	809	0.1+	1.6-	1986 03 29	704	0.1+	1.0-	1999 09 11	704	0.7-	0.4-
1986 09 08	809	0.0	0.9-	1986 03 29	704	0.6-	0.3+	1999 09 11	704	0.6+	0.1-
1986 09 08	809	0.0	0.9-	1986 03 29	704	0.9+	0.5+	1999 10 29	691	1.1+	0.7+
1986 09 08	809	0.1+	1.0-	1986 03 29	704	0.6+	0.4-	1999 10 29	691	1.0+	0.5+
1986 09 08	809	0.5-	0.5-	1986 04 18	704	0.3-	0.1+	1999 10 29	691	0.8+	0.4+
1986 09 08	809	0.1-	0.5-	1986 04 18	704	0.3-	0.0	1999 10 31	691	0.0	0.0
1986 09 08	809	0.2-	0.7-	1986 04 18	704	0.1-	0.2-	1999 10 31	691	0.5-	1.1-
1986 09 10	809	0.6+	0.4+	1986 04 18	704	(2.5-	0.9+)	1999 10 31	691	0.4+	0.3-
1986 09 10	809	0.6+	0.1-	1999 07 14	704	0.5+	0.6+				
1986 09 10	809	0.7+	0.1-	1999 07 14	704	0.8+	0.6+				

1999 RE₆₄ = 1972 TU₇ = 1989 YM₅

Id. A. Doppler

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	306.29913		(2000.0)		P		Q
<i>n</i>	0.17993438	ω	322.38594	+0.71376651		-0.69842708	
<i>a</i>	3.1073722	Ω	82.00277	+0.65473418		+0.63885469	
<i>e</i>	0.1827325	<i>i</i>	3.02834	+0.24871775		+0.32258999	
<i>P</i>	5.48	<i>H</i>	13.5	<i>G</i>	0.15	<i>U</i>	2

Residuals in seconds of arc

1972 10 06	095	0.5-	1.3+	1999 09 07	704	0.3+	0.3-	1999 09 30	704	0.3-	0.3+
1989 12 28	511	0.6+	0.3+	1999 09 07	704	0.5+	0.1-	1999 09 30	704	0.0	0.3-
1989 12 28	511	0.6-	0.6-	1999 09 07	704	0.3+	0.7-	1999 09 30	704	0.1-	0.1+
1999 08 08	699	0.4-	0.6+	1999 09 09	704	0.5+	0.4-	1999 09 30	704	0.2-	0.7-
1999 08 08	699	0.0	0.2+	1999 09 09	704	0.2-	0.3-	1999 09 30	704	0.5-	0.3+
1999 08 08	699	0.3+	1.0+	1999 09 09	704	0.1+	0.3+	1999 11 10	704	0.1-	0.3-
1999 09 07	699	0.1+	0.4+	1999 09 09	704	0.4+	1.0+	1999 11 10	704	0.3+	0.1+
1999 09 07	699	0.3-	0.3+	1999 09 09	704	0.2-	1.0+	1999 11 10	704	0.4-	0.5-
1999 09 07	699	1.1-	1.2+	1999 09 29	704	0.3+	0.7-	1999 11 10	704	0.3+	0.9-
1999 09 07	704	0.1+	0.0	1999 09 29	704	0.2-	0.9-	1999 11 10	704	0.9+	0.2-
1999 09 07	704	0.0	0.3-	1999 09 29	704	0.1+	1.9-				

1999 RL₆₅ = 1993 FF₇₅ = 1997 EC₂₇

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	30.68818		(2000.0)		P		Q
<i>n</i>	0.20898417	ω	52.61796	+0.46886929		+0.88177069	
<i>a</i>	2.8122922	Ω	245.41793	-0.82719956		+0.41795896	
<i>e</i>	0.0861647	<i>i</i>	3.24030	-0.30968124		+0.21861099	
<i>P</i>	4.72	<i>H</i>	15.9	<i>G</i>	0.15	<i>U</i>	4

Residuals in seconds of arc

1993 03 21	809	0.7-	0.2-	1997 03 13	691	0.5+	0.5-	1999 09 09	704	0.3-	0.5-
1993 03 22	809	0.7+	0.2+	1997 03 13	691	0.2+	0.3+	1999 09 09	704	0.7+	0.3+
1997 03 05	691	0.2-	0.1-	1999 09 07	704	1.1+	0.4+	1999 09 09	704	0.4+	0.5+
1997 03 05	691	0.2-	0.0	1999 09 07	704	0.9-	0.1+	1999 09 09	704	1.2+	0.4+
1997 03 05	691	0.3-	0.1+	1999 09 07	704	0.9-	0.1-				
1997 03 13	691	0.0	0.2+	1999 09 07	704	1.2-	1.1-				

1999 RP₆₆ = 1994 PY₂₄

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	316.52859		(2000.0)		P		Q
<i>n</i>	0.19951911	ω	308.29946	+0.86100292		-0.50562240	
<i>a</i>	2.9005457	Ω	82.13603	+0.48223646		+0.77725678	
<i>e</i>	0.1589267	<i>i</i>	3.18017	+0.16162293		+0.37445679	
<i>P</i>	4.94	<i>H</i>	15.3	<i>G</i>	0.15	<i>U</i>	7

Residuals in seconds of arc

1994 08 12	809	0.2+	0.1+	1999 09 07	704	0.3-	0.0	1999 09 13	704	0.2-	0.5+
1994 08 12	809	0.1+	0.0	1999 09 07	704	0.4-	0.3-	1999 09 13	704	0.4-	0.2-
1994 08 12	809	0.3+	1.1+	1999 09 07	704	0.2-	0.3+	1999 09 13	704	0.3-	0.8-
1994 08 13	809	0.3+	0.5-	1999 09 07	704	0.3+	0.1-	1999 09 13	704	0.2+	0.7+
1994 08 13	809	0.1-	0.1+	1999 09 07	704	0.8+	0.4-				
1994 08 13	809	0.9-	0.8-	1999 09 13	704	0.5+	0.1+				

1999 RJ₇₁ = 1978 WA₁₂

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

M	321.47895		(2000.0)		P		Q
n	0.18249768	ω	270.85776		+0.83009205		-0.55618491
a	3.0782069	Ω	122.93559		+0.52872269		+0.76219675
e	0.1915674	i	2.73647		+0.17719907		+0.33123173
P	5.40	H	15.9	G	0.15	U	6

Residuals in seconds of arc

1978 11 29	675	0.7+	0.3+	1999 09 09	704	1.1+	2.3+	1999 09 11	704	0.3-	0.2-
1978 11 30	675	0.7-	0.3-	1999 09 11	704	0.1-	0.2-	1999 09 11	704	0.7+	0.4-
1999 09 07	704	0.2+	0.2-	1999 09 11	704	1.2-	0.2+	1999 09 11	704	0.3+	0.1-
1999 09 07	704	0.3-	0.1-	1999 09 11	704	0.8+	0.1-	1999 09 11	704	0.9-	0.6-
1999 09 07	704	0.3-	0.3-	1999 09 11	704	0.7+	0.2+	1999 09 11	704	0.5+	0.1+
1999 09 07	704	0.1-	0.0	1999 09 11	704	0.0	0.3-	1999 09 13	704	0.1+	0.8+
1999 09 07	704	0.0	0.2+	1999 09 11	704	0.1+	0.9-	1999 09 13	704	0.7-	0.6+
1999 09 09	704	0.1-	0.3-	1999 09 11	704	0.1-	0.3-	1999 09 13	704	0.3-	0.3+
1999 09 09	704	0.3-	0.1-	1999 09 11	704	0.1+	0.6-	1999 09 13	704	0.3+	0.0
1999 09 09	704	0.2-	0.1+	1999 09 11	704	0.2+	0.7-				
1999 09 09	704	0.0	0.5+	1999 09 11	704	0.2-	0.2+				

1999 RL₈₆ = 1991 PZ₁₉

Id. A. Doppler

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

M	345.92942		(2000.0)	P	Q
n	0.25259490	ω	256.18993	+0.99670284	-0.05310649
a	2.4784852	Ω	106.82733	+0.07251917	+0.92216514
e	0.2167853	i	3.67453	-0.03639270	+0.38313334
P	3.90	H	16.5	G 0.15	U 4

Residuals in seconds of arc

1991 08 02	809	0.3+	0.1+	1999 09 05	699	1.2+	0.2+	1999 09 14	704	0.3+	0.1+
1991 08 02	809	0.2-	0.2-	1999 09 05	699	1.9+	1.4-	1999 09 14	704	0.3+	0.2+
1991 08 02	809	0.9-	0.8+	1999 09 05	699	0.6-	1.5+	1999 09 14	704	0.3+	0.4+
1991 08 14	809	0.6+	0.0	1999 09 07	704	0.7+	0.3-	1999 10 01	704	0.8-	1.1-
1991 08 14	809	1.2+	0.0	1999 09 07	704	0.5+	0.4-	1999 10 01	704	0.5+	0.1+
1991 08 14	809	0.8-	1.6-	1999 09 07	704	0.5-	0.8+	1999 10 01	704	0.6-	0.6+
1999 08 22	703	0.2+	0.9+	1999 09 07	704	0.1+	1.0+	1999 10 01	704	0.0	1.3-
1999 08 22	703	1.5-	0.3+	1999 09 07	704	0.7-	0.2-	1999 10 01	704	0.4+	0.8-
1999 08 22	703	1.2-	0.1-	1999 09 14	704	0.9-	0.0				
1999 08 22	703	0.6+	0.5+	1999 09 14	704	0.8-	0.0				

1999 RF₈₈ = 1998 KC₂₅

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

M	72.79522		(2000.0)	P	Q
n	0.21724469	ω	272.55241	-0.07070206	+0.99745404
a	2.7405429	Ω	353.37171	-0.88014805	-0.06677330
e	0.1050698	i	4.62578	-0.46940454	-0.02503527
P	4.54	H	14.3	G 0.15	U 4

Residuals in seconds of arc

1998 05 22	704	1.0-	0.3-	1998 05 24	704	0.4+	0.5-	1999 09 14	704	0.0	0.5-
1998 05 22	704	0.4-	1.2+	1999 09 07	704	0.5-	0.0	1999 09 14	704	0.5-	0.3-
1998 05 22	704	0.1+	0.5-	1999 09 07	704	0.0	0.0	1999 11 02	691	0.3+	0.2-
1998 05 22	704	0.0	0.1-	1999 09 07	704	0.5+	0.3+	1999 11 02	691	0.1+	0.1-
1998 05 22	704	1.0+	1.5+	1999 09 07	704	0.0	0.5+	1999 11 02	691	0.0	0.2-
1998 05 24	704	0.1+	0.5+	1999 09 14	704	0.6+	0.2-	1999 11 03	691	0.1+	0.2+
1998 05 24	704	0.5+	0.5-	1999 09 14	704	0.1+	0.1-	1999 11 03	691	0.1+	0.3+
1998 05 24	704	0.6-	1.4-	1999 09 14	704	0.0	0.2+	1999 11 03	691	0.8-	0.2+

1999 RS₈₉ = 1995 SN₅₄

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Doppler

M	341.72625		(2000.0)	P	Q
n	0.24413542	ω	220.59772	+0.96413376	-0.26180440
a	2.5354138	Ω	154.47957	+0.26210606	+0.91325910
e	0.2900152	i	5.81374	+0.04179126	+0.31211580
P	4.04	H	15.3	G 0.15	U 4

Residuals in seconds of arc

1995 09 21	033	0.9+	0.6-	1999 09 07	704	(2.3-	3.6+)	1999 09 14	704	0.1-	0.1-
1995 09 21	033	0.9-	0.5+	1999 09 07	704	0.1+	0.2-	1999 09 14	704	0.1+	0.0
1995 09 23	033	0.0	0.1+	1999 09 07	704	0.4-	0.5-	1999 09 14	704	0.0	0.1-

1999 09 07	704	0.3+	0.7+	1999 09 14	704	0.2+	0.0
1999 09 07	704	0.0	0.1+	1999 09 14	704	0.1-	0.2+

1999 RG₉₀ = 1975 VG₅ = 1987 UB₈ = 1991 SN₂ = 1993 FP₁₆

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Doppler

M	311.86848		(2000.0)	P	Q
n	0.24398447	ω	300.43461	+0.48133924	-0.87351536
a	2.5364595	Ω	120.61902	+0.83039242	+0.42787955
e	0.2689217	i	4.84520	+0.28064384	+0.23214220
P	4.04	H	15.1	G 0.15	U 3

Residuals in seconds of arc

1975 11 02	095	0.5+	0.5+	1993 03 18	809	0.1-	0.3+	1999 09 14	704	0.4+	0.2+
1987 10 23	095	0.6-	1.8-	1993 03 23	809	(3.4-	4.1-)	1999 09 14	704	0.0	0.1-
1991 09 15	675	1.0-	1.9+	1999 09 07	704	0.2+	0.1-	1999 09 14	704	0.0	0.5+
1991 09 15	675	0.4+	1.0+	1999 09 07	704	0.2+	0.6-	1999 09 14	704	0.3+	0.0
1991 09 16	675	(0.4-	2.3-)	1999 09 07	704	0.1-	0.2-	1999 09 14	704	0.0	0.3+
1991 09 16	675	0.4-	0.4-	1999 09 07	704	0.0	0.7-				
1993 03 17	809	0.1+	0.0	1999 09 07	704	0.0	0.1-				

1999 RO₉₁ = 1995 SA₅₃

Id. A. Doppler

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

M	315.10368		(2000.0)	P	Q
n	0.25453156	ω	282.69071	+0.59722542	-0.80177591
a	2.4658972	Ω	130.61594	+0.74660439	+0.54576458
e	0.2214349	i	1.64905	+0.29309330	+0.24350855
P	3.87	H	15.0	G 0.15	U 5

Residuals in seconds of arc

1995 09 28	327	0.1-	0.1+	1999 09 04	699	0.2+	0.7+	1999 09 14	704	0.0	0.0
1995 09 28	327	0.3+	0.0	1999 09 07	704	0.5-	0.5+	1999 09 14	704	0.6-	1.4-
1995 09 28	327	0.7+	0.4-	1999 09 07	704	0.2+	0.1+	1999 10 02	704	0.2+	0.1-
1995 09 29	327	0.2-	0.1-	1999 09 07	704	0.2+	0.2+	1999 10 02	704	0.3-	0.4-
1995 09 29	327	0.1-	0.5-	1999 09 07	704	0.4-	0.1+	1999 10 02	704	0.1+	0.1-
1995 09 29	327	0.0	0.7-	1999 09 07	704	0.1+	0.5-	1999 10 02	704	0.5+	0.6-
1999 09 04	699	0.6+	1.4+	1999 09 14	704	0.2-	0.8+	1999 10 02	704	0.1+	0.2+
1999 09 04	699	0.5-	0.5+	1999 09 14	704	0.3-	0.3+				

1999 RP₉₁ = 1976 SL₁ = 1987 ON₁ = 1998 LH₃

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

M	48.79974		(2000.0)	P	Q
n	0.17266442	ω	234.42744	+0.36625104	+0.93026842
a	3.1939943	Ω	57.07091	-0.84524336	+0.34224694
e	0.1404257	i	1.46558	-0.38913215	+0.13216542
P	5.71	H	12.9	G 0.15	U 1

Residuals in seconds of arc

1976 09 24	095	0.2-	0.4+	1999 09 04	699	0.1-	0.6+	1999 10 02	704	0.2-	0.5-
1987 07 28	010	0.3+	0.4-	1999 09 04	699	0.6-	0.3+	1999 10 02	704	0.8+	0.6-
1987 07 28	010	0.9+	0.5-	1999 09 04	699	0.7+	0.5+	1999 10 02	704	0.7+	0.9-
1987 07 28	010	0.9-	0.0	1999 09 07	704	0.2-	0.2+	1999 10 02	704	0.3+	0.4-
1998 06 03	704	0.7+	0.3+	1999 09 07	704	0.2+	0.0	1999 10 31	113	1.5-	0.1-
1998 06 03	704	0.8+	0.8-	1999 09 07	704	0.0	0.2-	1999 10 31	113	1.3-	0.2+
1998 06 03	704	0.3-	0.4+	1999 09 07	704	0.1-	0.3-	1999 11 03	113	0.1-	1.8+
1998 06 03	704	1.2+	1.1-	1999 09 07	704	0.1-	0.0	1999 11 03	113	0.2-	0.2+
1998 06 24	704	0.5+	0.8+	1999 09 14	704	0.0	0.3-	1999 11 03	113	(0.2+	2.5+)
1998 06 24	704	0.1-	0.1+	1999 09 14	704	0.0	0.8-	1999 11 03	113	0.3-	0.1-
1998 06 24	704	1.4-	0.3-	1999 09 14	704	0.1+	0.4+	1999 11 03	113	0.9+	1.9+
1998 06 24	704	0.7-	0.3+	1999 09 14	704	0.0	0.4-	1999 11 03	113	0.0	0.1-
1998 06 24	704	0.6-	1.5+	1999 09 14	704	0.9+	1.0-				

1999 RM₉₂ = 1993 SN₅

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	148.42376	(2000.0)	P	Q
<i>n</i>	0.17142726	ω	10.88053	-0.90938943
<i>a</i>	3.2093430	Ω	193.69842	-0.38196128
<i>e</i>	0.1087426	<i>i</i>	0.25893	-0.16467071
<i>P</i>	5.75	<i>H</i>	13.4	<i>G</i> 0.15

Residuals in seconds of arc

1993 09 19	010	0.8+	1.7+	1999 09 07	704	1.0-	0.3-	1999 10 29	703	1.3+	0.9-
1993 09 19	010	1.0+	0.6+	1999 09 09	704	0.1-	0.0	1999 10 29	703	0.9-	0.6+
1993 09 20	010	0.7+	0.5-	1999 09 09	704	0.8+	0.2-	1999 11 03	703	0.2-	0.3+
1993 09 20	010	0.1+	1.4-	1999 09 09	704	0.7-	0.7+	1999 11 03	703	0.2+	0.3-
1993 09 20	010	2.4-	0.7-	1999 09 09	704	0.3+	0.5-	1999 11 03	703	0.2-	0.5-
1999 09 07	704	0.1+	0.3+	1999 09 09	704	0.1-	0.7-	1999 11 03	703	0.1+	0.4+
1999 09 07	704	0.2+	1.3+	1999 10 29	703	0.0	0.1+				
1999 09 07	704	0.2-	0.5+	1999 10 29	703	0.1+	0.3-				

1999 RO₉₄ = 1976 GG₇ = 1994 TV₂ = 1997 GV₃₄

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Doppler

<i>M</i>	184.28202	(2000.0)	P	Q
<i>n</i>	0.18714045	ω	151.02026	-0.98833471
<i>a</i>	3.0270826	Ω	21.45972	+0.07723925
<i>e</i>	0.0399139	<i>i</i>	10.66956	+0.13125775
<i>P</i>	5.27	<i>H</i>	13.3	<i>G</i> 0.15

Residuals in seconds of arc

1976 04 04	095	0.3-	0.4-	1997 04 11	704	0.1-	0.1-	1999 09 14	704	0.1+	0.5+
1994 10 02	400	0.7+	0.2-	1997 04 11	704	0.8-	0.5+	1999 09 14	704	0.2-	0.5+
1994 10 02	400	1.5+	0.8+	1999 09 07	704	0.5+	0.1-	1999 09 14	704	0.9-	0.2+
1994 10 03	400	1.0-	0.3+	1999 09 07	704	0.5+	0.4-	1999 09 14	704	0.3-	0.7+
1994 10 03	400	1.3-	0.8-	1999 09 07	704	0.4+	0.3-	1999 09 14	704	0.2-	0.4+
1997 04 03	704	0.8+	0.0	1999 09 07	704	0.3+	0.7-				
1997 04 03	704	0.7+	0.4+	1999 09 07	704	0.4-	0.7-				

1999 RB₁₀₇ = 1997 GV₈

Id. G. V. Williams, A. Doppler

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	300.90089	(2000.0)	P	Q
<i>n</i>	0.22044423	ω	53.65069	+0.41590715
<i>a</i>	2.7139607	Ω	11.90411	+0.77557303
<i>e</i>	0.1707563	<i>i</i>	9.08574	+0.47487653
<i>P</i>	4.47	<i>H</i>	15.1	<i>G</i> 0.15

Residuals in seconds of arc

1997 04 03	704	0.2+	0.5+	1999 09 14	704	0.9+	0.3-	1999 10 29	691	0.0	0.1+
1997 04 03	704	0.6+	0.1+	1999 09 14	704	0.8+	0.0	1999 10 29	691	0.1+	0.0
1997 04 05	704	1.8-	0.4-	1999 09 14	704	0.7+	0.4-	1999 10 29	691	0.2+	0.0
1997 04 05	704	1.0+	0.3-	1999 09 14	704	0.3+	0.9-	1999 10 31	691	0.1-	0.1-
1999 09 08	704	0.6-	0.6-	1999 09 14	703	0.2-	1.3+	1999 10 31	691	0.1-	0.0
1999 09 08	704	0.3+	0.0	1999 09 14	703	1.4-	0.9+	1999 10 31	691	0.1-	0.1-
1999 09 08	704	0.4-	0.2+	1999 09 14	703	0.0	0.3-				
1999 09 08	704	0.2-	0.2+	1999 09 14	703	0.0	0.1-				

1999 RM₁₀₇ = 1993 QF₂

Id. S. Nakano

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	302.89033	(2000.0)	P	Q
<i>n</i>	0.17409049	ω	140.86606	+0.20575453
<i>a</i>	3.1765280	Ω	297.24149	+0.88915053
<i>e</i>	0.1614821	<i>i</i>	1.93737	+0.40874981
<i>P</i>	5.66	<i>H</i>	13.7	<i>G</i> 0.15

Residuals in seconds of arc

1993 08 16	010	0.6+	0.4+	1999 09 08	704	0.9-	0.8-	1999 10 04	704	0.0	0.6-
1993 08 16	010	0.7+	0.6-	1999 09 08	704	0.8-	0.1+	1999 10 04	704	0.9+	0.3-
1993 08 16	010	0.6+	2.0-	1999 09 09	704	0.3+	0.3+	1999 10 04	704	0.4+	0.3-
1993 08 17	010	1.5-	1.2+	1999 09 09	704	0.4+	0.6-	1999 10 04	704	0.2-	0.2+
1996 03 21	566	0.3+	0.0	1999 09 09	704	0.7-	0.0	1999 10 06	704	0.4+	0.0
1996 03 21	566	0.5-	0.5-	1999 09 09	704	0.1+	0.1-	1999 10 06	704	0.5+	0.1-
1996 03 21	566	0.2-	0.3-	1999 09 09	704	0.3-	1.3-	1999 10 06	704	(3.8+	0.0)
1999 09 05	699	1.6-	1.8+	1999 09 18	703	0.8+	0.4+	1999 10 30	703	0.3-	0.7-
1999 09 05	699	0.3-	1.5+	1999 09 18	703	0.5+	0.4+	1999 10 30	703	0.1+	0.1+
1999 09 05	699	0.5-	1.9+	1999 09 18	703	0.0	0.1-	1999 10 30	703	0.1-	0.5-
1999 09 08	704	0.2+	0.3-	1999 09 18	703	0.1+	0.1-	1999 10 30	703	0.1-	0.1+
1999 09 08	704	0.2+	0.7-	1999 10 04	704	0.6+	0.4-				

1999 RW₁₁₄ = 1997 EV₄₀

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Doppler

<i>M</i>	90.08895	(2000.0)	P	Q
<i>n</i>	0.18504156	ω	297.81975	-0.50030769
<i>a</i>	3.0499299	Ω	301.67286	-0.73729704
<i>e</i>	0.0908274	<i>i</i>	8.00906	-0.45396618
<i>P</i>	5.33	<i>H</i>	14.2	<i>G</i> 0.15

Residuals in seconds of arc

1997 03 10	704	0.5+	0.1-	1999 09 09	704	0.1-	0.1+	1999 09 09	704	0.2-	0.6-
1997 03 10	704	0.5-	0.3+	1999 09 09	704	0.0	0.4+	1999 09 09	704	0.1+	0.1-
1997 03 11	704	0.4-	0.4-	1999 09 09	704	0.5-	0.1+	1999 09 09	704	0.3-	1.2-
1997 03 11	704	0.1+	0.3+	1999 09 09	704	0.0	0.5+	1999 09 14	704	0.0	0.1-
1997 03 12	704	0.2+	0.1+	1999 09 09	704	0.0	0.3+	1999 09 14	704	0.8+	0.2-
1997 03 12	704	0.2+	0.1-	1999 09 09	704	0.2-	0.2+	1999 09 14	704	0.0	0.1+
1999 09 09	704	0.2+	0.1-	1999 09 09	704	0.2+	0.1-	1999 09 14	704	0.7-	0.5+
1999 09 09	704	0.5+	0.1-	1999 09 09	704	0.1+	0.1+	1999 09 14	704	0.0	0.3-
1999 09 09	704	0.0	0.3+	1999 09 09	704	0.3+	0.3+				

1999 RZ₁₂₅ = 1991 RY₂₄

Id. A. Doppler

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	98.90354	(2000.0)	P	Q
<i>n</i>	0.24505407	ω	254.38979	-0.75556252
<i>a</i>	2.5290734	Ω	324.89273	-0.45868299
<i>e</i>	0.1239422	<i>i</i>	14.83823	-0.46769134
<i>P</i>	4.02	<i>H</i>	13.7	<i>G</i> 0.15

Residuals in seconds of arc

1991 09 12	675	0.6+	1.3-	1999 09 09	704	0.3+	0.0	1999 10 02	703	1.3-	0.9+
1991 09 12	675	0.8+	1.5+	1999 09 09	704	0.2-	0.3+	1999 10 02	703	0.3+	0.8+
1991 09 14	675	0.5-	0.8+	1999 09 09	704	0.1-	0.3-	1999 10 02	703	0.4-	0.3+
1991 09 14	675	0.6-	1.5-	1999 09 09	704	0.2-	0.1+	1999 10 02	703	0.1-	0.8+
1999 09 05	699	0.6+	0.9+	1999 09 09	704	0.5-	0.5+	1999 10 02	704	1.7+	0.9-
1999 09 05	699	0.5+	0.3+	1999 09 14	704	0.7-	0.0	1999 10 02	704	0.6+	1.0-
1999 09 05	699	0.2-	0.2+	1999 09 14	704	0.2+	0.2-	1999 10 02	704	0.6-	0.3-
1999 09 07	704	0.4+	0.5-	1999 09 14	704	0.5-	0.0	1999 10 02	704	0.8-	0.5-
1999 09 07	704	0.4+	0.6-	1999 09 14	704	0.1-	0.1+				
1999 09 07	704	0.0	0.4-	1999 09 14	704	0.1+	0.1-				

1999 RH₁₃₀ = 1988 RL₅

Id. A. Doppler

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	322.68423	(2000.0)	P	Q
<i>n</i>	0.26818531	ω	217.07466	+0.92735258
<i>a</i>	2.3814752	Ω	164.87023	+0.35404443
<i>e</i>	0.2152519	<i>i</i>	2.82448	+0.12111866
<i>P</i>	3.68	<i>H</i>	15.6	<i>G</i> 0.15

Residuals in seconds of arc

1988 09 02	809	0.7−	0.6+	1999 08 08	699	0.0	0.7+	1999 09 07	704	0.2+	0.2+
1988 09 02	809	0.4+	0.5+	1999 08 08	699	0.5+	0.3−	1999 09 09	704	0.1−	0.8−
1988 09 02	809	1.5+	0.5+	1999 08 22	703	1.4−	0.2−	1999 09 09	704	0.2+	1.1−
1988 09 06	809	1.4−	1.0−	1999 08 22	703	0.1+	1.2+	1999 09 09	704	0.2+	0.6+
1988 09 06	809	0.2−	1.0−	1999 08 22	703	1.1−	0.2−	1999 09 09	704	0.0	0.2−
1988 09 06	809	0.9+	1.1−	1999 08 22	703	0.6+	0.1−	1999 09 09	704	0.1−	0.3+
1997 01 11	566	0.1+	0.1+	1999 09 04	699	0.0	0.3+	1999 09 13	704	0.2+	0.0
1997 01 11	566	0.2+	0.0	1999 09 04	699	0.1+	0.4+	1999 09 13	704	0.1−	0.0
1997 01 11	566	0.3+	0.0	1999 09 04	699	0.3−	0.6+	1999 09 13	704	0.2+	0.5−
1997 02 03	566	0.4−	0.2+	1999 09 07	704	0.1+	0.2+	1999 09 13	704	0.4−	0.3+
1997 02 03	566	0.3−	0.0	1999 09 07	704	0.3+	0.6−	1999 09 13	704	0.2−	0.1+
1997 02 03	566	0.1+	0.2+	1999 09 07	704	0.1−	0.8+				
1999 08 08	699	0.6+	0.2−	1999 09 07	704	0.0	0.6+				

1999 RU₁₃₆ = 1991 RB₃₈

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	355.88233		(2000.0)	P		Q
<i>n</i>	0.24317152	ω	168.43707	+0.89842527	+0.43767851	
<i>a</i>	2.5421095	Ω	165.44844	−0.41335270	+0.87029434	
<i>e</i>	0.2389425	<i>i</i>	8.15279	−0.14822809	+0.22588776	
<i>P</i>	4.05	<i>H</i>	16.2	<i>G</i>	0.15	<i>U</i> 3

Residuals in seconds of arc

1991 09 15	675	0.1+	0.4−	1999 09 07	704	0.5+	0.1−	1999 09 13	704	0.0	0.1+
1991 09 15	675	0.3−	0.9+	1999 09 07	704	0.4+	0.8−	1999 09 13	704	0.1+	0.5+
1999 08 22	699	0.9−	0.5+	1999 09 07	704	0.8+	1.0−	1999 09 30	704	1.0−	0.2+
1999 08 22	703	0.7−	0.4+	1999 09 09	704	0.3+	0.3−	1999 09 30	704	0.2−	0.6−
1999 08 22	703	0.0	0.1−	1999 09 09	704	0.3+	0.6−	1999 09 30	704	0.0	0.4+
1999 08 22	699	1.6−	1.0+	1999 09 09	704	0.2+	0.6−	1999 09 30	704	0.2−	0.3+
1999 08 22	703	0.1+	0.7+	1999 09 09	704	0.1+	0.2−	1999 09 30	704	0.6−	0.1−
1999 08 22	703	0.0	0.5−	1999 09 09	704	0.3−	0.3−	1999 10 04	703	0.0	0.1−
1999 08 22	699	0.1+	0.5+	1999 09 13	704	0.5+	0.1+	1999 10 04	703	0.5+	0.2−
1999 09 07	704	1.3+	0.0	1999 09 13	704	0.8+	0.1−	1999 10 04	703	0.3+	0.4+
1999 09 07	704	0.3+	0.6−	1999 09 13	704	0.1−	0.6+	1999 10 04	703	1.3−	0.3+

1999 RJ₁₄₂ = 1997 FK

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	111.44214		(2000.0)	P		Q
<i>n</i>	0.17338509	ω	88.59424	−0.59043371	+0.80547514	
<i>a</i>	3.1851377	Ω	145.05653	−0.77136145	−0.54459168	
<i>e</i>	0.0784931	<i>i</i>	5.10533	−0.23746482	−0.23372996	
<i>P</i>	5.68	<i>H</i>	13.9	<i>G</i>	0.15	<i>U</i> 5

Residuals in seconds of arc

1997 03 20	700	1.4+	1.6−	1999 09 09	704	0.1+	0.7+	1999 09 14	704	0.2+	0.3+
1997 03 20	700	0.0	0.6−	1999 09 09	704	0.1−	0.7−	1999 09 14	704	0.2+	0.3+
1997 03 20	700	1.6−	0.9+	1999 09 09	704	0.1−	0.3−	1999 09 14	704	0.3+	0.4−
1997 03 20	700	0.6−	0.4−	1999 09 09	704	0.1−	0.1−	1999 09 14	704	0.2−	0.0
1997 03 21	700	0.4+	0.1−	1999 09 09	704	0.2+	0.3+				
1997 03 21	700	0.5+	1.8+	1999 09 14	704	0.5−	0.1−				

1999 RS₁₄₃ = 1998 KH₆₆

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	2.29365		(2000.0)	P		Q
<i>n</i>	0.17858003	ω	157.78414	+0.96488173	+0.26172665	
<i>a</i>	3.1230633	Ω	187.15505	−0.25984851	+0.93847772	
<i>e</i>	0.1132582	<i>i</i>	10.36732	−0.03849687	+0.22529699	
<i>P</i>	5.52	<i>H</i>	14.0	<i>G</i>	0.15	<i>U</i> 3

Residuals in seconds of arc

1998 05 26	704	0.4−	0.1−	1999 09 09	704	0.3−	0.6+	1999 10 06	704	0.2−	0.1−
1998 05 26	704	0.3−	0.3−	1999 09 14	704	0.5−	0.1+	1999 10 07	691	0.1−	0.5−
1998 05 26	704	1.6+	1.4−	1999 09 14	704	0.3+	0.1−	1999 10 07	691	0.0	0.1−
1998 05 26	704	0.8−	0.5−	1999 09 14	704	0.6+	0.2+	1999 10 07	691	0.1−	0.3−

1998 06 19	704	1.1−	0.6+	1999 09 14	704	0.6+	0.0	1999 10 07	704	0.3−	1.4+
1998 06 19	704	0.8+	1.7+	1999 09 14	704	0.3+	0.6+	1999 10 07	704	0.2−	0.3−
1998 06 19	704	0.2+	0.1+	1999 10 02	704	0.1+	0.5−	1999 10 07	704	0.3+	0.4+
1998 06 19	704	(0.7−	2.9−)	1999 10 02	704	0.0	0.6+	1999 10 07	704	0.2−	0.3−
1999 09 07	704	0.5+	0.4+	1999 10 02	704	0.0	0.3−	1999 10 07	704	0.4+	0.0
1999 09 07	704	0.1−	0.6−	1999 10 02	704	1.5−	0.6−	1999 10 31	691	0.2+	0.2+
1999 09 07	704	0.2+	1.3−	1999 10 02	704	1.0−	0.0	1999 10 31	691	0.3+	0.0
1999 09 09	704	0.4+	0.6+	1999 10 06	704	0.2−	0.1−	1999 10 31	691	0.2+	0.1+
1999 09 09	704	0.1−	0.3−	1999 10 06	704	0.1−	0.4−	1999 11 11	691	0.4+	0.2+
1999 09 09	704	0.3−	0.4−	1999 10 06	704	0.0	0.1−	1999 11 11	691	0.1+	0.2+
1999 09 09	704	0.3+	0.6+	1999 10 06	704	0.0	0.2−	1999 11 11	691	0.3+	0.2+

1999 RV₁₄₃ = 1998 KA₁₆

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	192.24058		(2000.0)	P		Q
<i>n</i>	0.27542958	ω	319.12171	−0.90130825	−0.43236920	
<i>a</i>	2.3395320	Ω	195.32408	+0.41892666	−0.85448553	
<i>e</i>	0.0498751	<i>i</i>	5.74693	+0.11019930	−0.28794333	
<i>P</i>	3.58	<i>H</i>	15.3	<i>G</i>	0.15	<i>U</i> 4

Residuals in seconds of arc

1998 05 22	704	0.1−	0.8+	1999 09 09	704	0.1+	0.2+	1999 09 14	704	0.5−	0.4+
1998 05 22	704	0.0	0.8+	1999 09 09	704	0.3+	0.1−	1999 09 14	704	0.4−	0.1−
1998 05 22	704	0.8+	1.5−	1999 09 09	704	0.5+	0.1+	1999 10 31	691	0.1+	0.2+
1998 05 22	704	0.0	1.4+	1999 09 09	704	0.2+	0.7−	1999 10 31	691	0.3+	0.1+
1998 05 24	704	1.0+	0.4−	1999 09 09	704	0.4+	0.3+	1999 10 31	691	0.0	0.2+
1998 05 24	704	0.6+	1.3−	1999 09 14	704	0.0	0.1+	1999 11 04	691	0.0	0.2−
1998 05 24	704	2.1−	0.6−	1999 09 14	704	0.1−	0.1−	1999 11 04	691	0.0	0.2−
1998 05 24	704	0.2−	0.8+	1999 09 14	704	0.5−	0.0	1999 11 04	691	0.2−	0.0

1999 RQ₁₄₅ = 1998 HK₆₀

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	29.41508		(2000.0)	P		Q
<i>n</i>	0.22238358	ω	21.61647	+0.44903038	+0.89046827	
<i>a</i>	2.6981592	Ω	275.12962	−0.83025285	+0.38531216	
<i>e</i>	0.1017487	<i>i</i>	4.24602	−0.33023011	+0.24207602	
<i>P</i>	4.43	<i>H</i>	14.9	<i>G</i>	0.15	<i>U</i> 5

Residuals in seconds of arc

1998 04 21	704	0.2+	0.3+	1998 04 22	704	1.0+	0.3+	1999 09 09	704	0.2−	0.0
1998 04 21	704	0.9−	0.9−	1998 04 22	704	0.2+	0.5+	1999 09 14	704	0.2+	0.5−
1998 04 21	704	0.6+	0.1−	1998 04 22	704	0.2+	0.0	1999 09 14	704	0.6+	0.6−
1998 04 21	704	0.5−	0.5+	1999 09 09	704	0.7−	0.2+	1999 09 14	704	0.8−	0.5+
1998 04 21	704	0.1−	0.6+	1999 09 09	704	0.0	0.4−	1999 09 14	704	0.3−	0.3+
1998 04 22	704	0.7−	0.8−	1999 09 09	704	0.5+	0.5−	1999 09 14	704	0.1+	0.4+
1998 04 22	704	0.0	0.4−	1999 09 09	704	0.7+	0.6+				

1999 RY₁₄₇ = 1985 TL₂

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	306.60505		(2000.0)	P		Q
<i>n</i>	0.27937304	ω	86.57344	+0.68114166	−0.72530109	
<i>a</i>	2.3174643	Ω	319.88171	+0.59497860	+0.62787983	
<i>e</i>	0.1905952	<i>i</i>	8.92083	+0.42666908	+0.28232120	
<i>P</i>	3.53	<i>H</i>	15.6	<i>G</i>	0.15	<i>U</i> 5

Residuals in seconds of arc

1985 10 15	054	0.0	0.4−	1999 09 09	704	0.1+	0.0	1999 09 14	704	0.2−	0.4−
1985 10 18	054	0.1−	0.4+	1999 09 09	704	0.1+	0.4−	1999 09 14	704	0.7+	0.1−
1999 09 09	704	0.1−	0.3+	1999 09 09	704	0.1+	0.1−	1999 09 14	704	0.4−	0.6+
1999 09 09	704	0.6−	0.5+	1999 09 14	704	0.3+	0.1+	1999 09 14	704	0.0	0.5−

1999 RM₁₄₉ = 1981 US₂₉

Id. A. Doppler

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	347.47106		(2000.0)	P	Q
<i>n</i>	0.27129816	ω	359.83388	+0.98194895	+0.18894902
<i>a</i>	2.3632236	Ω	349.26298	-0.17348470	+0.88151931
<i>e</i>	0.2518782	<i>i</i>	2.65596	-0.07536125	+0.43269154
<i>P</i>	3.63	<i>H</i>	16.1	<i>G</i> 0.15	<i>U</i> 3

Residuals in seconds of arc

1981 10 24	675	0.7+	1.4+	1999 09 07	704	0.0	0.1-	1999 09 13	704	0.4+	0.1+
1981 10 25	675	0.1-	0.4-	1999 09 07	704	0.1+	0.6-	1999 09 13	704	0.2+	0.1+
1981 10 26	675	0.8-	0.4-	1999 09 07	704	0.4-	0.2-	1999 09 13	704	0.2+	0.2-
1999 07 16	704	0.2-	0.8-	1999 09 07	704	0.3-	0.4-	1999 09 13	704	0.2+	0.6+
1999 07 16	704	0.4+	0.8-	1999 09 07	704	0.5-	0.7-	1999 09 13	704	0.0	0.1-
1999 07 16	704	0.1+	0.1-	1999 09 09	704	0.1+	0.1-	1999 11 12	704	0.4+	0.5-
1999 07 16	704	0.6-	0.7+	1999 09 09	704	0.2+	0.2+	1999 11 12	704	0.6-	0.1-
1999 08 07	699	0.4-	1.2+	1999 09 09	704	0.5+	0.5+	1999 11 12	704	0.4+	0.1-
1999 08 07	699	0.3+	0.8+	1999 09 09	704	0.1+	0.3+				
1999 08 07	699	0.1+	0.0	1999 09 09	704	0.7-	0.3-				

1999 RL₁₅₁ = 1998 HD₃₅

Id. A. Doppler

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	26.49089		(2000.0)	P	Q
<i>n</i>	0.23291417	ω	168.37253	+0.47933775	+0.87492583
<i>a</i>	2.6162070	Ω	130.22870	-0.81226723	+0.47197852
<i>e</i>	0.1161632	<i>i</i>	5.17385	-0.33235113	+0.10835616
<i>P</i>	4.23	<i>H</i>	14.9	<i>G</i> 0.15	<i>U</i> 5

Residuals in seconds of arc

1998 03 25	704	0.0	1.0-	1998 04 21	704	1.3+	1.0+	1999 09 09	704	1.6+	1.7-
1998 03 25	704	0.1-	0.0	1998 04 21	704	0.3-	0.1-	1999 09 09	704	0.5-	1.0-
1998 03 25	704	0.0	0.2-	1998 04 21	704	0.2+	1.2-	1999 09 09	704	0.9-	1.4-
1998 03 25	704	0.1+	1.0+	1998 04 21	704	1.4-	1.1+	1999 09 13	704	0.5-	0.4+
1998 04 20	704	0.3-	0.9-	1999 09 07	704	0.0	0.1+	1999 09 13	704	0.5+	0.9+
1998 04 20	704	0.6+	0.4+	1999 09 07	704	0.3-	0.3+	1999 09 13	704	0.0	0.4-
1998 04 20	704	0.2-	0.6+	1999 09 07	704	0.3-	0.9+	1999 09 13	704	0.2+	0.1+
1998 04 20	704	0.1+	0.6-	1999 09 07	704	0.4+	0.7+	1999 09 13	704	0.2-	0.7+
1998 04 21	704	(1.1+	2.4-)	1999 09 07	704	0.0	0.4+				

1999 RM₁₅₁ = 1998 FJ₁₄₃

Id. A. Doppler

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	25.06890		(2000.0)	P	Q
<i>n</i>	0.23904118	ω	285.52212	+0.52041973	+0.85373798
<i>a</i>	2.5713088	Ω	15.87317	-0.75742127	+0.47080479
<i>e</i>	0.1023102	<i>i</i>	3.59895	-0.39430487	+0.22242821
<i>P</i>	4.12	<i>H</i>	15.0	<i>G</i> 0.15	<i>U</i> 4

Residuals in seconds of arc

1998 03 29	704	0.7+	0.9-	1998 04 01	704	0.9-	1.2+	1999 09 13	704	0.3+	0.4-
1998 03 29	704	1.0+	0.8-	1998 04 01	704	0.2-	1.1+	1999 09 13	704	0.0	0.7-
1998 03 29	704	0.9-	0.4-	1999 09 09	704	0.1-	0.2+	1999 09 13	704	0.4-	0.1-
1998 03 29	704	0.4-	0.3-	1999 09 09	704	0.5+	0.1+	1999 09 13	704	0.5+	0.2+
1998 03 29	704	(0.1-	2.9-)	1999 09 09	704	1.2-	0.0	1999 11 12	704	0.1-	0.0
1998 04 01	704	1.5-	0.2+	1999 09 09	704	0.5-	0.1-	1999 11 12	704	0.2-	0.7-
1998 04 01	704	1.6+	0.7+	1999 09 09	704	1.6+	0.3+	1999 11 12	704	0.6+	0.3+
1998 04 01	704	0.4+	1.1-	1999 09 13	704	0.8-	0.8+				

1999 RB₁₅₂ = 1994 CF₄

Id. A. Doppler

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	19.05145		(2000.0)	P	Q
<i>n</i>	0.25450654	ω	146.01745	+0.45538808	+0.88848537
<i>a</i>	2.4660587	Ω	150.95300	-0.84059565	+0.45007711
<i>e</i>	0.2639532	<i>i</i>	6.70691	-0.29329277	+0.08957869
<i>P</i>	3.87	<i>H</i>	14.7	<i>G</i> 0.15	<i>U</i> 3

Residuals in seconds of arc

1994 02 10	691	0.5+	0.3+	1999 08 07	699	0.2+	0.0	1999 09 09	704	0.9-	0.6-
1994 02 10	691	0.2+	0.2+	1999 08 07	699	0.0	0.7+	1999 09 09	704	0.7-	0.6-
1994 02 10	691	0.1-	0.1-	1999 08 22	699	0.1+	1.1+	1999 09 09	704	1.2-	0.9-
1994 02 19	691	0.0	0.3+	1999 08 22	699	0.0	1.3+	1999 09 13	704	0.0	0.1+
1994 02 19	691	0.1+	0.4+	1999 08 22	699	1.3-	1.7+	1999 09 13	704	0.0	0.3-
1994 02 19	691	0.1-	0.6+	1999 09 04	699	0.1-	1.0+	1999 09 13	704	0.1-	0.2-
1998 03 04	809	(0.3-	2.3+)	1999 09 04	699	0.1+	1.3+	1999 09 13	704	0.0	0.1-
1998 03 04	809	0.5+	1.7+	1999 09 04	699	0.1+	0.8+	1999 09 13	704	0.0	0.1-
1998 03 04	809	(0.4+	2.3+)	1999 09 07	704	0.3-	0.0	1999 09 30	704	0.7+	1.6+
1999 07 16	704	0.0	0.1-	1999 09 07	704	0.4-	0.0	1999 09 30	704	0.7+	0.3-
1999 07 16	704	0.0	0.0	1999 09 07	704	0.2-	0.4-	1999 09 30	704	0.1+	0.2-
1999 07 16	704	0.1+	0.5-	1999 09 07	704	0.2-	0.3-	1999 09 30	704	2.0+	1.3-
1999 07 16	704	0.3+	0.5-	1999 09 07	704	0.5-	0.8-	1999 09 30	704	0.2-	0.2-
1999 07 16	704	0.9+	0.5-	1999 09 09	704	0.2+	0.1-				
1999 08 07	699	0.3+	0.5+	1999 09 09	704	0.3+	0.1-				

1999 RV₁₅₂ = 1989 TS₃ = 1994 RU₈Id. G. V. Williams (*MPC* 36450), M. E. Sansaturio

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	348.31409		(2000.0)	P	Q
<i>n</i>	0.19161385	ω	166.06517	+0.98750155	+0.15689384
<i>a</i>	2.9797840	Ω	184.98168	-0.15602324	+0.95965817
<i>e</i>	0.1535920	<i>i</i>	9.94731	-0.02230341	+0.23332494
<i>P</i>	5.14	<i>H</i>	15.0	<i>G</i> 0.15	<i>U</i> 4

Residuals in seconds of arc

1989 10 07	809	0.6+	0.2-	1994 09 14	691	0.1+	0.1-	1999 09 09	704	0.1-	0.1+
1989 10 07	809	0.3-	1.0-	1999 09 07	704	0.3+	0.1-	1999 09 09	704	1.7+	0.5-
1989 10 07	809	0.1+	0.1-	1999 09 07	704	0.2-	0.4+	1999 09 14	704	0.5-	0.4+
1989 10 08	809	0.3-	0.2+	1999 09 07	704	0.3-	0.3+	1999 09 14	704	0.3+	0.6+
1989 10 08	809	0.0	0.1+	1999 09 07	704	0.1-	0.2+	1999 09 14	704	0.3+	0.3+
1989 10 08	809	0.1-	1.0+	1999 09 07	704	0.3-	0.6-	1999 09 14	704	1.1-	0.1-
1994 09 12	691	0.5-	0.0	1999 09 08	699	0.5+	0.3-	1999 09 14	704	0.9-	0.0
1994 09 12	691	0.1-	0.2-	1999 09 08	699	0.8+	0.1+	1999 09 30	699	0.5-	0.4+
1994 09 12	691	0.4+	0.2-	1999 09 08	699	0.7-	0.6+	1999 09 30	699	0.5+	0.1-
1994 09 14	691	0.0	0.0	1999 09 09	704	0.3-	1.1-	1999 09 30	699	1.2+	0.5+
1994 09 14	691	0.1+	0.1-	1999 09 09	704	0.5-	0.6-				

1999 RS₁₅₆ = 1998 HB₁₂₆

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Doppler

<i>M</i>	12.31080		(2000.0)	P	Q
<i>n</i>	0.19247500	ω	147.03685	+0.78270979	+0.62203451
<i>a</i>	2.9708895	Ω	174.35962	-0.60714754	+0.77051211
<i>e</i>	0.1391228	<i>i</i>	12.30118	-0.13688409	+0.13922701
<i>P</i>	5.12	<i>H</i>	15.1	<i>G</i> 0.15	<i>U</i> 5

Residuals in seconds of arc

1998 04 23	704	0.1-	0.3-	1998 04 24	704	1.7-	0.1+	1999 09 14	704	0.5+	0.1+
1998 04 23	704	0.4+	1.2+	1999 09 09	704	0.2+	0.3+	1999 09 14	704	0.1-	0.1+
1998 04 23	704	0.4+	0.1-	1999 09 09	704	0.3+	0.1-	1999 09 14	704	0.2-	0.5+
1998 04 23	704	(3.9-	1.5+)	1999 09 09	704	0.0	0.3-	1999 09 14	704	0.1+	0.2-
1998 04 24	704	0.2-	0.4+	1999 09 09	704	0.2-	0.1-	1999 09 14	704	0.3-	0.3-
1998 04 24	704	1.2+	1.3-	1999 09 09	704	0.2-	0.1+				

1999 RZ₁₆₃ = 1992 EJ₁₅

Id. A. Doppler

1999 NOV. 23

M.P.C. 36831

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	315.54521		(2000.0)	P	Q
<i>n</i>	0.20571247	ω	225.97066	+0.81527950	-0.57732309
<i>a</i>	2.8420321	Ω	169.03002	+0.57546111	+0.79911755
<i>e</i>	0.1411201	<i>i</i>	13.65238	+0.06452783	+0.16765798
<i>P</i>	4.79	<i>H</i>	14.1	<i>G</i> 0.15	<i>U</i> 4

Residuals in seconds of arc

1992 03 01	809	0.2-	0.6-	1999 09 07	704	0.1-	0.0	1999 09 14	704	0.2-	0.0
1992 03 03	809	0.7-	1.0-	1999 09 07	704	0.4-	0.5-	1999 09 14	704	0.3-	0.1+
1992 03 06	809	0.6+	0.3-	1999 09 07	704	0.1-	0.3-	1999 09 14	704	1.0-	0.4-
1999 08 08	699	0.3+	1.1-	1999 09 07	704	0.3-	0.2-	1999 09 14	704	0.7-	0.4-
1999 08 08	699	0.0	0.1-	1999 09 09	704	0.0	0.3+	1999 10 02	704	0.1+	0.0
1999 08 08	699	0.1-	0.3+	1999 09 09	704	0.3-	0.1+	1999 10 02	704	0.7+	0.8-
1999 08 22	699	0.3+	0.4-	1999 09 09	704	0.1+	0.3+	1999 10 02	704	0.6+	0.1-
1999 08 22	699	0.2-	0.1-	1999 09 09	704	0.6+	1.3+	1999 10 02	704	0.4+	0.5-
1999 08 22	699	0.3-	0.4-	1999 09 09	704	1.5+	1.5+				
1999 09 07	704	0.3-	0.2-	1999 09 14	704	0.1-	0.4-				

1999 RS₁₆₅ = 1990 DU₂Id. S. Nakano; 1990 DU₂ = 1999 JF₂₆ (MPC 35281) is invalid

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	263.22502		(2000.0)	P	Q
<i>n</i>	0.27361862	ω	284.85135	-0.13640736	-0.99064513
<i>a</i>	2.3498436	Ω	172.98517	+0.92076395	-0.12823816
<i>e</i>	0.1844142	<i>i</i>	1.83333	+0.36549525	-0.04666054
<i>P</i>	3.60	<i>H</i>	15.2	<i>G</i> 0.15	<i>U</i> 4

Residuals in seconds of arc

1990 02 24	809	0.1+	0.1+	1999 09 07	704	0.2+	0.3-	1999 09 14	704	0.9-	1.1+
1990 02 24	809	0.7+	0.0	1999 09 07	704	0.1+	0.4-	1999 09 14	704	0.0	0.0
1990 02 24	809	1.2+	0.0	1999 09 07	704	0.1-	0.3-	1999 09 14	704	0.6+	0.3-
1990 02 25	809	0.4-	0.6+	1999 09 07	704	0.3-	0.1-	1999 09 17	691	0.5-	0.1+
1990 02 25	809	0.0	0.5+	1999 09 07	704	0.1-	0.3-	1999 09 17	691	0.1-	0.1+
1990 02 25	809	0.5+	0.8+	1999 09 09	704	0.3+	0.3+	1999 09 17	691	0.2-	0.2+
1990 03 02	809	1.0-	1.4-	1999 09 09	704	1.2+	1.0-	1999 10 07	704	0.1-	0.3-
1990 03 02	809	0.7-	0.9-	1999 09 09	704	0.0	1.1+	1999 10 07	704	0.0	0.7+
1990 03 02	809	0.6-	0.5-	1999 09 09	704	0.2-	0.0	1999 10 07	704	0.9-	0.1-
1999 09 05	691	0.0	0.4-	1999 09 11	699	0.0	0.1-	1999 10 07	704	0.5+	0.2+
1999 09 05	691	0.1-	0.5-	1999 09 11	699	0.5+	0.4+				
1999 09 05	691	0.1-	0.3-	1999 09 11	699	0.6+	0.4-				

1999 RY₁₇₆ = 1998 HV₁₅₁

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	17.26939		(2000.0)	P	Q
<i>n</i>	0.24681365	ω	131.87581	+0.80303639	+0.59575430
<i>a</i>	2.5170389	Ω	191.58262	-0.56587909	+0.75470373
<i>e</i>	0.0814363	<i>i</i>	4.13275	-0.18685129	+0.27477100
<i>P</i>	3.99	<i>H</i>	15.4	<i>G</i> 0.15	<i>U</i> 4

Residuals in seconds of arc

1998 04 22	704	1.2+	0.3+	1999 09 09	704	1.4-	2.6-	1999 10 06	704	0.3+	0.2-
1998 04 22	704	0.3-	0.5+	1999 09 14	704	0.6+	0.4-	1999 10 06	704	0.4+	0.1-
1998 04 22	704	1.0-	2.0-	1999 09 14	704	0.5+	0.2-	1999 10 06	704	0.4+	0.6-
1998 05 01	704	1.0-	0.2+	1999 09 14	704	0.2+	0.2-	1999 10 06	704	0.2+	0.2-
1998 05 01	704	1.7-	2.0-	1999 09 14	704	0.1+	0.2-	1999 10 09	691	0.1+	0.1-
1998 05 01	704	2.4+	0.2+	1999 09 14	704	0.2-	0.1+	1999 10 09	691	0.0	0.0
1998 05 01	704	0.4-	2.4+	1999 10 02	691	0.4-	0.0	1999 10 09	691	0.1-	0.3+
1998 05 01	704	0.9+	0.2+	1999 10 02	691	0.2-	0.0	1999 10 29	691	0.3-	0.1+
1999 09 09	704	0.3-	2.2+	1999 10 02	691	0.2-	0.2+	1999 10 29	691	0.1-	0.1+
1999 09 09	704	0.0	1.8+	1999 10 06	704	0.5+	0.0	1999 10 29	691	0.2-	0.0

1999 RQ₁₉₃ = 1998 HF₁₃₅

Id. A. Doppler, S. Nakano

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	56.94450		(2000.0)	P	Q
<i>n</i>	0.27628784	ω	158.66254	+0.36470536	+0.92828693
<i>a</i>	2.3346845	Ω	132.64648	-0.86794183	+0.36716177
<i>e</i>	0.1920412	<i>i</i>	5.66584	-0.33714535	+0.05895429
<i>P</i>	3.57	<i>H</i>	15.1	<i>G</i> 0.15	<i>U</i> 4

Residuals in seconds of arc

1998 03 26	566	0.4-	0.3+	1998 04 20	704	0.2+	0.4+	1999 09 30	703	0.1-	0.0
1998 03 26	566	0.1-	0.1+	1998 04 20	704	0.3-	0.1+	1999 09 30	703	0.5+	0.4+
1998 03 26	566	0.3-	0.5+	1998 04 20	704	0.2-	0.6-	1999 09 30	703	0.5-	0.6+
1998 04 04	699	0.7+	0.7+	1999 09 15	691	0.1+	0.3+	1999 10 04	703	0.2+	0.1-
1998 04 04	699	0.6+	1.0+	1999 09 15	691	0.3+	0.2+	1999 10 04	703	0.2-	0.2+
1998 04 04	699	0.6+	0.0	1999 09 15	691	1.0+	0.1-	1999 10 04	703	0.2+	0.2-
1998 04 19	704	0.8-	0.4-	1999 09 16	691	0.1-	0.1+	1999 10 04	703	0.1-	0.0
1998 04 19	704	0.0	0.7-	1999 09 16	691	0.2-	0.1+	1999 11 03	703	0.0	0.4-
1998 04 19	704	0.2+	0.4-	1999 09 18	691	0.4+	0.1-	1999 11 03	703	0.2-	0.8-
1998 04 19	704	0.5+	1.3-	1999 09 18	691	0.4+	0.1-	1999 11 03	703	0.0	0.1-
1998 04 20	704	0.3+	0.3-	1999 09 18	691	0.5+	0.1-	1999 11 03	703	0.4-	0.3-
1998 04 20	704	0.7-	0.5+	1999 09 30	703	1.4-	0.4+				

1999 RK₁₉₄ = 1978 TE₈ = 1978 WH₂₀

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	337.90725		(2000.0)	P	Q
<i>n</i>	0.23417980	ω	155.89971	+0.94102068	-0.33563855
<i>a</i>	2.6067723	Ω	223.78504	+0.29953247	+0.88513871
<i>e</i>	0.2500774	<i>i</i>	3.54138	+0.15735430	+0.32229835
<i>P</i>	4.21	<i>H</i>	14.7	<i>G</i> 0.15	<i>U</i> 4

Residuals in seconds of arc

1978 10 08	095	0.2-	0.7-	1999 09 08	699	0.7+	0.3+	1999 10 04	704	0.1-	0.1-
1978 11 28	675	1.1-	0.7+	1999 09 08	699	0.2-	0.2-	1999 10 04	704	0.0	0.3-
1978 11 29	675	1.3+	0.4+	1999 09 16	704	0.7-	0.3+	1999 10 07	704	0.1-	0.1-
1999 09 07	704	0.1-	0.3+	1999 09 16	704	0.7-	0.3-	1999 10 07	704	0.3-	0.4-
1999 09 07	704	0.1+	0.4+	1999 09 16	704	0.0	0.1+	1999 10 07	704	0.2+	0.4-
1999 09 07	704	0.1+	0.6+	1999 09 16	704	0.5-	0.1+	1999 10 07	704	0.3-	0.9-
1999 09 07	704	0.2+	0.2+	1999 10 04	704	0.0	0.8+	1999 11 01	106	0.3-	0.6+
1999 09 07	704	0.2+	0.2+	1999 10 04	704	0.9+	0.9-	1999 11 01	106	0.0	0.4-
1999 09 08	699	0.1+	0.3+	1999 10 04	704	1.1+	0.2-	1999 11 01	106	0.5-	0.3+

1999 RF₁₉₆ = 1998 HW₁₅₁

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	342.44327		(2000.0)	P	Q
<i>n</i>	0.23313043	ω	164.73401	+0.99726900	-0.01073258
<i>a</i>	2.6145888	Ω	196.41230	-0.00084797	+0.98765560
<i>e</i>	0.1435498	<i>i</i>	14.98788	+0.07385004	+0.15627294
<i>P</i>	4.23	<i>H</i>	14.4	<i>G</i> 0.15	<i>U</i> 3

Residuals in seconds of arc

1998 04 23	704	0.8-	0.6+	1999 09 08	704	0.0	0.1+	1999 10 01	703	0.1-	0.1+
1998 04 23	704	0.5+	0.1-	1999 09 08	704	0.0	0.0	1999 10 01	703	0.1+	0.1+
1998 04 23	704	0.5+	0.8-	1999 09 08	704	1.0-	0.4-	1999 10 01	703	0.3+	0.5+
1998 04 23	704	0.9+	1.8-	1999 09 16	704	0.2-	0.9-	1999 11 02	703	0.3+	0.1-
1998 05 23	704	0.9+	0.1+	1999 09 16	704	0.3+	0.3+	1999 11 02	703	0.9+	0.8+
1998 05 23	704	1.1-	1.0+	1999 09 16	704	0.1+	0.1-	1999 11 02	703	0.3+	0.6-
1998 05 23	704	0.1-	0.4+	1999 09 16	704	0.3+	0.2-	1999 11 02	703	0.3-	0.2+
1998 05 23	704	0.7-	0.5+	1999 10 01	703	0.7-	0.2+				

1999 RL₁₉₇ = 1989 WM₁ = 1998 MV₂₆

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

M	273.51559		(2000.0)		P		Q				
n	0.18417637	ω	192.95914		+0.04606411		-0.98855691				
a	3.0594740	Ω	254.53909		+0.92928965		+0.09515958				
e	0.0712914	i	8.57108		+0.36646807		-0.11704654				
P	5.35	H	12.4		G	0.15	U	4			
Residuals in seconds of arc											
1989 11 25	391	4.0+	2.3-	1998 06 24	704	1.5-	0.0	1999 09 16	704	0.5+	0.7-
1989 11 25	391	3.4+	2.0-	1998 06 26	704	0.8+	0.5-	1999 09 16	704	0.2+	0.2-
1989 11 26	391	0.6+	1.0+	1998 06 26	704	0.5+	0.1+	1999 10 28	703	1.0-	0.5+
1989 11 26	391	0.9-	0.1-	1998 06 26	704	0.3+	0.7-	1999 10 28	703	0.8-	0.6+
1989 11 27	391	0.2-	0.4-	1998 06 26	704	0.0	0.1+	1999 10 28	703	1.1-	0.7+
1989 12 04	391	1.6-	0.3+	1999 09 08	704	0.2+	0.4-	1999 10 28	703	0.1-	0.1-
1989 12 04	391	1.6-	0.9+	1999 09 08	704	0.1+	0.3-	1999 11 04	703	0.2-	0.2+
1989 12 05	391	0.7-	1.4-	1999 09 08	704	0.1+	0.1+	1999 11 04	703	0.1-	0.7+
1989 12 05	391	2.9-	1.8+	1999 09 08	704	0.6+	0.3-	1999 11 04	703	0.3+	0.7+
1998 06 24	704	0.6+	1.3-	1999 09 08	704	0.2+	0.3+	1999 11 04	703	0.0	0.7+
1998 06 24	704	0.3+	1.8+	1999 09 16	704	0.2+	0.5-				
1998 06 24	704	0.7-	0.9-	1999 09 16	704	0.3+	0.4-				

1999 RT₁₉₈ = 1994 GC₉

Id. A. Doppler

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

M	268.45751		(2000.0)			P		Q			
n	0.28096701	ω	247.94533			+0.04228343		-0.99040793			
a	2.3086911	Ω	200.96280			+0.99724640		+0.04986597			
e	0.3088068	i	21.57326			+0.06092402		-0.12886242			
P	3.51	H	13.5			G	0.15	U	3		
Residuals in seconds of arc											
1994 04 11	399	1.0+	1.5+	1998 06 19	704	1.2+	0.2-	1999 09 09	699	0.1-	0.1-
1994 04 11	399	(0.7+	2.6+)	1998 06 19	704	0.1-	1.0-	1999 09 10	704	0.3+	0.2-
1994 04 13	399	1.0-	0.6+	1998 06 25	699	0.1+	1.0-	1999 09 10	704	0.5-	1.1-
1994 04 13	399	(0.1+	2.3-)	1998 06 25	699	(2.3+	1.7+)	1999 09 10	704	0.5+	0.4-
1998 05 26	704	0.0	0.7-	1998 06 25	699	0.1-	1.6+	1999 09 10	704	0.5+	0.4+
1998 05 26	704	(0.1+	2.4-)	1999 06 21	704	1.0+	0.8-	1999 09 16	704	0.3-	0.1-
1998 05 26	704	0.1+	0.1-	1999 06 21	704	0.7+	0.6-	1999 09 16	704	0.3-	0.5+
1998 05 26	704	0.1+	1.6-	1999 06 21	704	0.8+	0.4+	1999 09 16	704	0.3-	0.6+
1998 05 26	704	0.9-	1.4-	1999 06 21	704	0.0	1.0-	1999 09 16	704	0.3-	0.1+
1998 06 03	704	0.2+	1.1+	1999 06 21	704	0.4+	0.0	1999 09 16	704	0.4-	0.2+
1998 06 03	704	(2.2+	0.1+)	1999 08 11	704	0.0	0.0	1999 10 04	704	0.1-	0.6+
1998 06 03	704	0.3+	1.1+	1999 08 11	704	0.4+	0.4-	1999 10 04	704	0.1-	0.4+
1998 06 03	704	1.4-	0.7-	1999 08 11	704	0.2+	0.2+	1999 10 04	704	0.2-	0.7+
1998 06 03	704	(0.3+	3.3-)	1999 08 11	704	0.2+	0.3+	1999 10 04	704	0.1-	0.8+
1998 06 19	704	1.6+	1.5+	1999 09 09	699	1.1-	0.2-	1999 10 04	704	0.0	0.5+
1998 06 19	704	1.2-	0.4+	1999 09 09	699	0.7-	0.1+				

1999 RM₁₉₉ = 1973 TK = 1988 VA₈ = 1998 FK₁₀₈

Id. A. Doppler, G. V. Williams

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

M	3.85481		(2000.0)			P		Q		
n	0.26598437	ω	359.23570			+0.93418431		+0.35084445		
a	2.3945945	Ω	339.84787			-0.32634199		+0.76672761		
e	0.2671662	i	10.85290			-0.14422407		+0.53762156		
P	3.71	H	13.6			G	0.15	U	2	
Residuals in seconds of arc										
1973 10 01	095	0.1-	0.1+	1998 04 01	704	0.3-	0.3+	1999 09 08	704	0.3+ 0.1+
1988 11 03	033	0.2-	0.0	1998 04 01	704	0.3+	0.3+	1999 09 18	704	0.3- 0.1-
1988 11 03	033	0.3+	0.1-	1998 04 01	704	0.5-	0.3-	1999 09 18	704	0.3- 0.4-
1998 03 31	704	1.2+	0.9-	1998 04 01	704	0.1+	0.2+	1999 09 18	704	0.3- 0.2-
1998 03 31	704	0.2-	0.1-	1999 09 08	704	0.4+	0.0	1999 09 18	704	0.4- 0.0
1998 03 31	704	1.0-	0.3+	1999 09 08	704	0.8+	0.1+	1999 09 18	704	0.5- 0.0

1998 03 31	704	0.2+	0.0	1999 09 08	704	0.2+	0.3+
1998 04 01	704	0.3+	0.1+	1999 09 08	704	0.3+	0.1+

1999 RB₂₀₁ = 1991 VZ

Id. G. V. Williams, A. Doppler

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

M	359.36190		(2000.0)			P		Q		
n	0.24001752	ω	112.69327			+0.95622800		+0.23899169		
a	2.5643310	Ω	233.88553			-0.27864038		+0.91989357		
e	0.1826661	i	12.06471			+0.08937305		+0.31093212		
P	4.11	H	14.8		G	0.15		U	3	
Residuals in seconds of arc										
1991 11 04	399	0.1-	1.5-	1999 09 08	704	0.2-	0.5-	1999 10 03	704	0.0 0.2+
1991 11 04	399	0.2+	1.5-	1999 09 08	704	0.3-	0.4-	1999 10 03	704	0.3- 0.2-
1991 11 05	399	0.7+	0.3-	1999 09 08	704	0.2-	0.4-	1999 10 03	704	0.1+ 0.0
1991 11 05	399	0.7-	1.6+	1999 09 18	704	0.2+	0.3+	1999 10 03	704	0.1- 0.2+
1998 05 01	704	0.5-	0.6-	1999 09 18	704	0.0	0.1-	1999 10 28	703	0.2- 0.5+
1998 05 01	704	0.7+	0.0	1999 09 18	704	1.0+	0.7-	1999 10 28	703	0.7- 1.4+
1998 05 01	704	(2.6-	0.6-)	1999 09 18	704	0.4+	0.4+	1999 10 28	703	0.7- 0.2+
1998 05 01	704	0.1-	1.5+	1999 09 18	704	0.3+	0.5+	1999 10 28	703	(2.3- 1.1+)
1999 07 22	704	0.2-	0.8-	1999 10 03	703	0.5-	0.4+	1999 10 31	703	0.2- 0.6+
1999 07 22	704	0.3+	1.2-	1999 10 03	703	0.1+	0.6+	1999 10 31	703	0.4+ 0.3-
1999 07 22	704	(0.5+	3.2-)	1999 10 03	703	0.2-	0.1+	1999 10 31	703	0.6+ 0.8+
1999 09 08	704	0.1-	0.3-	1999 10 03	703	0.2-	0.2+	1999 10 31	703	0.1- 0.1+
1999 09 08	704	0.0	0.2-	1999 10 03	704	0.1-	0.1-			

1999 RJ₂₀₂ = 1998 HF₁₃

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

M	42.31855		(2000.0)			P		Q			
n	0.24308692	ω	10.59871			+0.29371724		+0.94878744			
a	2.5426992	Ω	276.55729			-0.88535849		+0.22414181			
e	0.2215740	i	6.72451			-0.36037553		+0.22262714			
P	4.05	H	14.4			G	0.15	U	4		
Residuals in seconds of arc											
1998 04 18	704	0.6-	0.3-	1999 09 08	704	0.2+	0.8+	1999 10 28	703	0.1+	0.8+
1998 04 18	704	1.1+	1.0+	1999 09 08	704	0.1+	0.1+	1999 10 28	703	0.8-	0.3-
1998 04 18	704	0.1+	1.5-	1999 09 08	704	0.1-	0.1+	1999 10 28	703	0.3-	0.3-
1998 04 18	704	0.8-	0.4-	1999 09 08	704	0.1-	0.2+	1999 10 28	703	0.7-	0.0
1998 04 19	704	0.3+	0.3-	1999 09 08	704	0.0	0.6+	1999 11 04	703	0.8+	0.6+
1998 04 19	704	1.3+	0.3+	1999 09 18	704	0.5+	0.6-	1999 11 04	703	0.4+	0.3-
1998 04 19	704	0.4-	0.2+	1999 09 18	704	0.2-	0.4-	1999 11 04	703	0.3+	0.5-
1998 04 19	704	0.4+	0.0	1999 09 18	704	0.1-	0.7-	1999 11 04	703	0.2-	0.4+
1998 04 19	704	1.4-	0.9+	1999 09 18	704	0.1+	0.5-				

1999 RF₂₀₄ = 1998 KZ₂₀

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

M	26.14997		(2000.0)			P		Q		
n	0.20888939	ω	61.27440			+0.72225778		+0.67849814		
a	2.8131429	Ω	255.64860			-0.67298812		+0.64475100		
e	0.1574228	i	7.95666			-0.15947002		+0.35204606		
P	4.72	H	14.0		G	0.15		U	4	
Residuals in seconds of arc										
1998 05 22	704	0.4+	0.4-	1999 09 08	704	0.1-	0.1+	1999 09 18	704	0.5+ 0.6-
1998 05 22	704	0.0	0.8+	1999 09 08	704	0.5-	0.4+	1999 11 04	703	0.0 0.0
1998 05 22	704	0.8-	0.1-	1999 09 08	704	0.9-	0.8+	1999 11 04	703	0.1+ 0.1-
1998 05 22	704	0.9+	0.2-	1999 09 08	704	0.3-	0.5+	1999 11 04	703	0.1+ 0.2+
1998 05 22	704	0.2+	0.4-	1999 09 08	704	0.5-	1.1+	1999 11 04	703	0.2- 0.2-
1998 05 24	704	0.4-	0.4+	1999 09 18	704	0.5+	0.8-	1999 11 12	703	0.2+ 0.9-
1998 05 24	704	1.1-	1.3+	1999 09 18	704	0.8+	0.6-	1999 11 12	703	0.3- 0.6+
1998 05 24	704	2.2+	1.4-	1999 09 18	704	0.2+	0.6-	1999 11 12	703	0.1- 0.5-
1998 05 24	704	1.5-	0.4-	1999 09 18	704	0.2+	0.2+	1999 11 12	703	0.4+ 0.1+

1999 NOV. 23

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1999 RW₂₀₅ = 1981 UK₂₇

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	112.62334		(2000.0)		P		Q				
<i>n</i>	0.27054454	ω	348.14185		−0.67832770		+0.72387002				
<i>a</i>	2.3676102	Ω	238.99559		−0.66153967		−0.67632309				
<i>e</i>	0.1597082	<i>i</i>	8.45533		−0.31974489		−0.13637914				
<i>P</i>	3.64	<i>H</i>	14.5		<i>G</i>	0.15	<i>U</i>	5			
Residuals in seconds of arc											
1981 10 24	675	0.4+	0.6+	1999 09 18	704	1.2+	0.2+	1999 10 28	703	0.8−	0.7+
1981 10 25	675	0.0	0.4−	1999 09 18	703	0.5−	0.2−	1999 10 28	703	0.9+	0.6+
1981 10 26	675	0.5−	0.0	1999 09 18	704	0.3+	0.9+	1999 10 28	703	0.9−	0.3−
1999 09 08	704	0.0	0.4−	1999 09 18	703	0.7−	0.2−	1999 10 28	703	0.2+	0.2−
1999 09 08	704	0.2−	0.1+	1999 09 18	703	1.0−	0.2+	1999 11 04	703	0.1+	0.0
1999 09 08	704	0.4+	0.4−	1999 09 18	704	1.8+	1.0+	1999 11 04	703	0.6−	1.1−
1999 09 08	704	0.3−	0.1−	1999 09 18	703	0.8−	0.1+	1999 11 04	703	0.1+	0.8−
1999 09 08	704	0.2−	0.2−	1999 09 18	704	1.3+	0.4−	1999 11 04	703	0.1−	0.1−

1999 RU₂₀₆ = 1990 RH₉ = 1994 NP₈

Id. A. Doppler

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	324.89809		(2000.0)		P		Q				
<i>n</i>	0.22463688	ω	110.82687		+0.67119347		−0.71817777				
<i>a</i>	2.6800857	Ω	295.63342		+0.58157993		+0.66377766				
<i>e</i>	0.2154981	<i>i</i>	11.75199		+0.45963476		+0.20885380				
<i>P</i>	4.39	<i>H</i>	13.2		<i>G</i>	0.15	<i>U</i>	4			
Residuals in seconds of arc											
1990 09 14	675	0.5+	0.5−	1994 07 12	809	0.1+	1.1−	1999 09 18	704	0.1−	0.1+
1990 09 14	675	0.4+	1.2−	1994 07 12	809	(1.8+	2.4−)	1999 09 18	704	0.1−	0.1+
1990 09 18	675	0.5+	0.9−	1999 09 08	704	0.0	0.1+	1999 09 18	704	0.2−	0.3+
1990 09 18	675	1.1+	1.2−	1999 09 08	704	0.4+	0.6+	1999 09 18	704	0.2−	0.2+
1994 07 11	809	0.8−	1.5+	1999 09 08	704	0.1+	0.6+	1999 11 15	678	0.9−	0.4−
1994 07 11	809	1.0−	1.1+	1999 09 08	704	0.2+	0.9+	1999 11 15	678	1.0−	0.3+
1994 07 11	809	0.3−	0.5+	1999 09 08	704	0.5−	1.0+	1999 11 16	678	0.8+	0.6−
1994 07 12	809	1.1+	0.4−	1999 09 18	704	0.1−	0.2+	1999 11 16	678	0.1+	0.2−

1999 RR₂₀₇ = 1992 TD = 1998 HD₁₈

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

M	2.71387		(2000.0)		$\mathbf{P}$		$\mathbf{Q}$				
n	0.28493564	ω	121.52815		+0.95605996		+0.27922452				
a	2.2872038	Ω	222.44320		−0.29314265		+0.90623589				
e	0.1677199	i	7.60800		−0.00409207		+0.31744319				
P	3.46	H	15.1		G	0.15	U	3			
Residuals in seconds of arc											
1992 10 01	801	0.0	0.2+	1998 04 20	704	0.6−	1.5+	1999 09 18	703	0.0	0.3+
1992 10 01	801	0.6+	0.2+	1998 04 20	704	(5.0−	0.3−)	1999 09 18	704	0.1+	0.1−
1992 10 02	801	0.3−	0.1+	1998 04 22	704	0.3+	1.0+	1999 09 18	703	0.2−	0.6+
1992 10 02	801	0.4−	0.0	1998 04 22	704	0.3+	0.7+	1999 09 18	704	0.1−	0.2−
1998 04 18	704	0.9+	0.0	1998 04 22	704	1.5+	0.4+	1999 09 18	703	0.7+	0.3+
1998 04 18	704	0.7+	0.2+	1998 04 22	704	(5.1−	0.8+)	1999 10 29	703	0.1+	0.4+
1998 04 18	704	0.2+	1.5+	1999 09 08	704	0.2−	0.2−	1999 10 29	703	0.2+	0.5+
1998 04 18	704	0.3+	0.8−	1999 09 08	704	0.6−	0.1−	1999 10 29	703	0.4−	0.1+
1998 04 19	704	1.3+	0.2+	1999 09 08	704	0.1+	0.5−	1999 10 29	703	0.5−	0.1+
1998 04 19	704	0.5+	0.7−	1999 09 08	704	0.2−	0.3−	1999 11 03	703	0.1+	0.0
1998 04 19	704	2.4+	0.8−	1999 09 08	704	0.7+	0.7+	1999 11 03	703	0.1−	0.2+
1998 04 19	704	1.7+	0.1+	1999 09 18	704	0.1−	0.0	1999 11 03	703	0.1−	0.7+
1998 04 20	704	0.9−	0.0	1999 09 18	704	0.2+	0.3−	1999 11 03	703	0.5−	0.1+
1998 04 20	704	0.8+	1.2−	1999 09 18	703	0.2+	0.1+				
1998 04 20	704	1.5+	0.3+	1999 09 18	704	0.0	0.6−				

1999 RT₂₀₈ = 1998 MK₄₈

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

M	71.11526		(2000.0)		P		Q				
n	0.19314507	ω	57.99761		+0.21243929		+0.96877475				
a	2.9640144	Ω	224.84940		−0.94652627		+0.17149744				
e	0.0702382	i	10.44439		−0.24281179		+0.17906455				
P	5.10	H	14.1		G	0.15	U	4			
Residuals in seconds of arc											
1998 06 19	704	0.2+	1.0−	1999 09 18	704	0.0	0.9−	1999 10 04	704	1.0+	1.6−
1998 06 19	704	0.8+	0.5+	1999 09 18	704	1.3+	0.7−	1999 10 04	704	0.3−	0.4−
1998 06 19	704	0.8+	1.7−	1999 09 18	704	0.3−	0.8+	1999 10 09	703	0.1−	0.0
1998 06 19	704	2.9−	1.3+	1999 09 18	704	0.1−	0.2+	1999 10 09	703	0.3−	0.0
1998 06 25	704	1.1+	0.1+	1999 10 03	704	0.3−	0.2−	1999 10 09	703	0.3−	0.1+
1998 06 25	704	0.5+	1.5+	1999 10 03	704	0.2+	0.4−	1999 10 09	703	0.4−	0.4+
1998 06 25	704	0.3−	0.7−	1999 10 03	704	0.4−	0.5+	1999 10 30	703	0.1−	0.9+
1999 09 08	704	0.1+	0.7+	1999 10 03	704	0.5−	0.4+	1999 10 30	703	1.4+	1.0−
1999 09 08	704	0.1+	0.8+	1999 10 03	704	0.2−	0.5+	1999 10 30	703	1.2+	0.1−
1999 09 08	704	0.1−	0.1+	1999 10 04	704	0.4+	0.2−	1999 10 30	703	2.1−	1.1+
1999 09 08	704	0.2−	0.7+	1999 10 04	704	0.8+	0.6−				
1999 09 08	704	0.0	0.7+	1999 10 04	704	0.6−	1.6−				

1999 RU₂₁₁ = 1988 VB₈ = 1996 EF₁₀

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

M	358.87537		(2000.0)			P		Q			
n	0.17700192	ω	27.94787			+0.98729125		−0.14246090			
a	3.1415989	Ω	339.87008			+0.07810204		+0.82093259			
e	0.2008182	i	11.80956			+0.13840542		+0.55296888			
P	5.57	H	13.2	G	0.15	U	2				
Residuals in seconds of arc											
1988 11 03	033	0.1−	0.3−	1999 09 08	704	1.2+	0.5−	1999 10 26	461	0.0	0.0
1988 11 03	033	0.2+	0.1+	1999 09 08	704	0.6+	0.3−	1999 10 26	461	0.1−	0.4+
1996 03 12	691	0.1+	0.2−	1999 09 18	704	0.9+	1.0−	1999 10 26	461	0.3+	0.4+
1996 03 12	691	0.2+	0.0	1999 09 18	704	0.3+	0.9−	1999 10 27	461	0.6−	0.5+
1996 03 12	691	0.1+	0.0	1999 09 18	704	0.8+	1.0−	1999 10 27	461	0.2−	0.7+
1996 03 17	691	0.4−	0.0	1999 09 18	704	0.5+	0.6−	1999 10 27	461	0.8−	0.0
1996 03 17	691	0.2−	0.3−	1999 09 18	704	0.5+	0.8−	1999 10 27	461	0.8−	0.4+
1996 03 17	691	0.4−	0.1−	1999 10 03	704	0.6+	0.4+	1999 11 03	704	0.4+	0.1−
1999 06 13	703	0.7−	1.5+	1999 10 03	704	0.4−	0.0	1999 11 03	704	0.1−	0.4−
1999 06 13	703	0.5+	0.7+	1999 10 03	704	0.5−	0.6+	1999 11 03	704	0.4−	0.1−
1999 06 13	703	1.0−	1.0+	1999 10 03	704	0.2+	0.3+	1999 11 03	704	0.3−	0.7−
1999 06 13	703	1.1−	0.8+	1999 10 03	704	0.4−	0.0	1999 11 03	704	0.6−	0.5−
1999 07 23	704	0.1+	0.1−	1999 10 22	461	0.3−	0.5+	1999 11 11	703	0.4−	0.7+
1999 07 23	704	0.4+	0.2+	1999 10 22	461	0.1−	0.4+	1999 11 11	703	0.0	0.4+
1999 07 23	704	0.2+	0.9−	1999 10 22	461	0.2−	0.2+	1999 11 11	703	0.5−	0.1+
1999 09 08	704	0.6+	1.3−	1999 10 25	461	0.2+	0.4+	1999 11 11	703	0.4−	0.4+
1999 09 08	704	0.5+	0.5−	1999 10 25	461	0.4−	0.0				
1999 09 08	704	1.0+	0.6−	1999 10 25	461	0.5−	0.1+				

1999 SP₁ = 1994 WO₈

Id. A. Doppler

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

M	293.56918	(2000.0)		P		Q					
n	0.17957064	ω	233.15807	+0.07228480		−0.98921491					
a	3.1115671	Ω	213.38372	+0.97285500		+0.09808213					
e	0.2023684	i	13.38656	+0.21983645		−0.10878307					
P	5.49	H	15.1	G	0.15	U	5				
Residuals in seconds of arc											
1994 11 28	691	0.0	0.1−	1999 09 19	557	0.1−	0.4−	1999 09 21	557	0.1+	0.5−
1994 11 28	691	0.1+	0.2−	1999 09 19	557	0.0	0.1−	1999 09 21	557	0.1+	0.5+
1994 11 28	691	0.2−	0.0	1999 09 20	557	0.1−	0.2+	1999 09 27	557	0.4−	0.8+
1994 12 03	691	0.0	0.0	1999 09 20	557	0.2+	0.3+	1999 09 27	557	0.4−	0.3−

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1994 12 03	691	0.4+	0.1-	1999 09 20	557	0.3+	0.5+	1999 10 01	557	0.5-	0.1+
1994 12 03	691	0.2-	0.3+	1999 09 21	557	0.3+	0.6-	1999 10 01	557	0.7+	0.4-

1999 SH₂ = 1995 QD₁₁

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	342.24803		(2000.0)	P	Q
<i>n</i>	0.26322152	ω	254.13049	+0.76190447	-0.64725360
<i>a</i>	2.4113215	Ω	146.19393	+0.60938426	+0.70393559
<i>e</i>	0.1975075	<i>i</i>	2.44712	+0.21943657	+0.29246787
<i>P</i>	3.74	<i>H</i>	15.3	<i>G</i> 0.15	<i>U</i> 4

Residuals in seconds of arc

1995 08 24	809	0.2+	0.1+	1999 10 02	691	0.0	0.1+	1999 11 04	704	0.4+	0.2-
1995 08 25	809	0.4-	0.8+	1999 10 02	691	0.1-	0.0	1999 11 04	704	0.9-	0.1-
1995 08 25	809	0.0	0.4-	1999 10 02	691	0.3-	0.2+	1999 11 05	120	0.3-	0.2+
1999 09 22	120	0.0	0.6-	1999 10 20	120	0.6+	0.8+	1999 11 06	120	0.1-	0.0
1999 09 22	120	0.3+	0.4-	1999 10 20	120	0.4-	0.4+	1999 11 08	120	0.2-	0.0
1999 09 22	120	0.0	0.9-	1999 11 04	704	0.4+	0.1+	1999 11 08	120	0.3-	0.2-
1999 09 23	120	0.1+	0.5-	1999 11 04	704	0.2+	0.2+				
1999 09 23	120	0.1+	0.4-	1999 11 04	704	0.4+	0.4+				

1999 SS₃ = 1976 SD₁₁ = 1981 RL₁ = 1987 RC₅ = 1987 SU₂₄= 1998 RW₃₈

Id. G. V. Williams, A. Doppler

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	344.92285		(2000.0)	P	Q
<i>n</i>	0.17463927	ω	78.14395	+0.27189352	-0.96194414
<i>a</i>	3.1698700	Ω	355.77650	+0.67495898	+0.21073850
<i>e</i>	0.0928639	<i>i</i>	21.63632	+0.68593316	+0.17393318
<i>P</i>	5.64	<i>H</i>	11.9	<i>G</i> 0.15	<i>U</i> 2

Residuals in seconds of arc

1976 09 23	033	(3.4-	0.7+)	1998 09 18	704	0.9+	1.7+	1999 09 24	704	0.2+	0.3+
1976 09 24	033	0.6+	1.2-	1998 09 18	704	(0.1+	2.4+)	1999 09 24	704	1.3+	0.6+
1981 09 04	809	0.3+	0.5-	1998 09 18	704	0.6-	1.7+	1999 09 24	704	1.3+	0.5-
1981 09 04	809	2.1+	0.9-	1998 09 18	704	0.9+	1.9+	1999 09 24	704	0.6+	1.1-
1981 09 04	809	0.6+	0.9-	1998 10 20	699	0.2-	0.3-	1999 09 24	704	0.6+	0.3+
1987 09 03	095	(2.2-	3.4+)	1998 10 20	699	0.1-	0.2-	1999 09 28	704	0.2+	0.1+
1987 09 23	095	0.6+	1.1-	1998 10 20	699	0.7-	0.3-	1999 09 28	704	0.1+	0.1+
1998 08 30	699	0.7-	0.3-	1998 11 10	699	0.1-	0.0	1999 09 28	704	0.3+	0.1+
1998 08 30	699	0.6-	0.0	1998 11 10	699	0.2-	0.9+	1999 09 28	704	0.2-	0.4-
1998 08 30	699	0.8-	0.4-	1998 11 10	699	0.0	0.1+	1999 09 28	704	0.7+	0.2-
1998 09 14	704	0.5-	0.6-	1998 12 09	704	0.0	0.8-	1999 10 30	704	0.5-	0.2+
1998 09 14	704	0.6-	0.5-	1998 12 09	704	0.3-	0.3-	1999 10 30	704	0.8-	0.4+
1998 09 14	704	0.5-	0.3-	1998 12 09	704	0.6-	0.3-	1999 10 30	704	0.7-	0.3+
1998 09 14	704	1.4-	0.0	1998 12 09	704	0.2-	0.9-	1999 10 30	704	0.8-	0.3+
1998 09 18	704	0.4+	1.3+	1998 12 09	704	1.5+	1.2+	1999 10 30	704	1.0-	0.3+

1999 SB₄ = 1980 FV₄ = 1997 ES₅₂

Id. A. Doppler

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	32.93765		(2000.0)	P	Q
<i>n</i>	0.17601625	ω	314.79680	+0.74736548	+0.66436710
<i>a</i>	3.1533163	Ω	3.59586	-0.56894946	+0.64601910
<i>e</i>	0.1145694	<i>i</i>	7.16476	-0.34313460	+0.37586655
<i>P</i>	5.60	<i>H</i>	14.1	<i>G</i> 0.15	<i>U</i> 4

Residuals in seconds of arc

1980 03 16	809	0.1-	0.1-	1999 09 29	120	0.2-	0.2+	1999 10 06	704	0.0	0.2-
1980 03 16	809	0.2+	1.1-	1999 09 29	120	0.0	0.2-	1999 10 06	704	0.3-	0.7-
1980 03 16	809	0.1-	0.7+	1999 09 29	120	0.5-	0.1-	1999 10 07	704	0.0	0.6-
1980 03 16	809	0.6-	0.5-	1999 09 30	703	0.5-	0.4-	1999 10 07	704	0.1+	0.1+
1980 03 17	809	0.4-	0.2-	1999 09 30	703	0.3-	0.3-	1999 10 07	704	0.7+	0.9+
1980 03 17	809	1.0-	1.4-	1999 09 30	703	0.7+	0.2-	1999 10 07	703	0.3+	0.1+
1980 03 17	809	0.4-	0.4-	1999 09 30	703	0.4-	0.1-	1999 10 07	704	0.3+	0.3+

1999 NOV. 23

1980 03 17	809	0.2+	0.7-	1999 09 30	120	(2.3+	2.7+)	1999 10 07	703	0.3+	0.2-
1997 03 08	809	1.4+	1.1+	1999 09 30	120	0.2-	1.2+	1999 10 07	704	0.3-	0.7+
1997 03 08	809	1.4+	1.4+	1999 10 02	120	1.1-	0.4-	1999 10 07	703	0.2-	0.0
1997 03 08	809	1.7+	0.9+	1999 10 02	120	0.7+	0.5+	1999 10 07	703	0.5+	0.0
1997 03 09	809	0.4+	1.7+	1999 10 04	704	1.0+	0.1-	1999 10 14	120	0.1+	0.3-
1997 03 09	809	0.6+	1.6+	1999 10 04	704	0.5+	1.0+	1999 10 14	120	0.5-	0.5+
1997 03 09	809	0.8-	1.4+	1999 10 04	704	0.5+	0.6+	1999 11 03	703	1.4-	0.4+
1999 09 05	699	0.3+	0.9+	1999 10 04	704	0.8+	0.5+	1999 11 03	703	1.0-	0.3-
1999 09 05	699	1.3+	0.3-	1999 10 04	704	0.2+	0.9+	1999 11 03	703	0.3-	0.1+
1999 09 05	699	0.8-	0.1+	1999 10 06	704	0.2-	0.3+	1999 11 03	703	0.7-	0.6+
1999 09 29	120	1.4-	1.0-	1999 10 06	704	0.2+	0.1+				
1999 09 29	120	0.8-	0.4-	1999 10 06	704	0.0	0.3-				

1999 SL₄ = 1977 RX₅ = 1988 TE₂

Id. A. Doppler, G. V. Williams

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	326.81230		(2000.0)	P	Q
<i>n</i>	0.17895880	ω	214.29679	+0.59408716	-0.80394105
<i>a</i>	3.1186550	Ω	199.30057	+0.75523458	+0.56909265
<i>e</i>	0.2924369	<i>i</i>	4.71847	+0.27691366	+0.17266251
<i>P</i>	5.51	<i>H</i>	13.6	<i>G</i> 0.15	<i>U</i> 4

Residuals in seconds of arc

1977 09 09	095	0.1-	0.7+	1999 09 30	120	0.2-	0.1-	1999 10 07	704	0.3-	0.1+
1988 10 03	046	1.4+	1.7-	1999 10 02	120	0.3-	0.6+	1999 10 07	703	0.1+	0.5+
1988 10 03	046	1.1+	0.4-	1999 10 02	120	0.7-	0.7+	1999 10 07	703	0.0	0.4+
1988 10 04	046	1.4+	2.0-	1999 10 04	704	0.1-	0.5+	1999 10 16	120	0.5+	0.2+
1988 10 04	046	1.8+	2.2-	1999 10 04	704	0.4-	0.2-	1999 10 16	120	0.3+	0.3-
1988 10 09	046	(1.0-	3.4-)	1999 10 04	704	0.1+	0.4+	1999 10 17	120	0.6+	0.1-
1988 10 09	046	2.2-	1.6-	1999 10 04	704	0.2+	0.7+	1999 10 17	120	0.4+	0.1+
1988 10 14	046	0.5-	0.2-	1999 10 04	704	0.4-	0.4+	1999 10 19	120	0.6-	0.4-
1988 10 14	046	1.4-	1.2-	1999 10 06	704	0.8+	1.6+	1999 10 19	120	0.9-	0.3-
1988 10 16	046	(0.7+	3.6-)	1999 10 06	704	0.1+	0.4+	1999 10 19	120	0.0	0.4-
1988 10 16	046	1.9+	1.6-	1999 10 06	704	0.1+	0.2+	1999 10 19	120	0.8-	0.5-
1999 09 29	120	0.2+	0.1+	1999 10 06	704	0.1+	0.1+	1999 10 30	703	0.2+	0.1+
1999 09 29	120	0.4+	0.0	1999 10 06	704	0.4-	0.0	1999 10 30	703	0.2+	0.2+
1999 09 29	120	0.1+	0.2-	1999 10 07	704	0.0	0.6+	1999 10 30	703	0.2-	0.2+
1999 09 30	703	0.0	0.4+	1999 10 07	704	0.1-	0.1+	1999 10 30	703	0.2-	0.3+
1999 09 30	703	0.1-	0.4+	1999 10 07	704	0.1+	0.5+	1999 11 03	703	0.3-	0.5+
1999 09 30	703	0.2-	0.2+	1999 10 07	703	0.1+	0.2+	1999 11 03	703	0.2-	0.3+
1999 09 30	703	0.1-	0.4+	1999 10 07	704	0.1-	0.2+	1999 11 03	703	0.4-	0.2+
1999 09 30	120	1.2-	0.1+	1999 10 07	703	0.0	0.2+	1999 11 03	703	0.1+	0.3+

1999 SN₄ = 1980 TL₃ = 1984 UL₅ = 1997 EB₂₈

Id. S. Nakano

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	301.37776		(2000.0)	P	Q
<i>n</i>	0.25949097	ω	61.24397	+0.28567800	-0.95754481
<i>a</i>	2.4343773	Ω	12.34152	+0.80400991	+0.21751796
<i>e</i>	0.1292291	<i>i</i>	10.42578	+0.52149415	+0.18919270
<i>P</i>	3.80	<i>H</i>	13.9	<i>G</i> 0.15	<i>U</i> 1

Residuals in seconds of arc

1980 10 14	511	0.7+	0.8+	1999 09 05	699	0.1-	0.3+	1999 10 07	704	0.1-	0.4-
1980 10 14	511	0.5-	0.5+	1999 09 05	699	0.7+	0.1+	1999 10 07	704	0.2+	0.6-
1980 10 14	511	1.7-	0.2+	1999 09 05	699	0.8-	0.4-	1999 10 07	704	0.2+	0.3-
1984 10 30	010	0.6+	0.6-	1999 09 29	120	0.2-	0.3+	1999 10 07	704	0.0	0.4-
1995 08 30	809	0.7+	0.3-	1999 09 29	120	0.6-	0.3+	1999 10 07	120	0.5+	0.3-
1995 08 31	809	0.9+	0.7-	1999 09 30	120	0.5-	0.2+	1999 10 07	120	0.2+	0.2-
1995 08 31	809	0.2+	0.7+	1999 09 30	120	0.3-	0.6+	1999 11 04	703	0.1-	0.3+
1995 09 01	809	1.2-	0.4+	1999 10 06	704	0.1-	0.3-	1999 11 04	703	0.1-	0.6+
1995 09 29	809	0.1+	0.1-	1999 10 06	704	0.1+	0.3-	1999 11 04	703	0.4-	0.3+
1997 03 07	691	0.0	0.1+	1999 10 06	704	0.1-	0.3-	1999 11 04	703	0.0	0.4+
1997 03 07	691	0.1+	0.1+	1999 10 06	704	0.1-	0.2-	1999 11 12	145	0.0	0.4+
1997 03 07	691	0.2+	0.2+	1999 10 06	704	0.1+	0.3-	1999 11 12	145	0.1-	0.1+
1997 03 13	691	0.0	0.1+	1999 10 06	120	1.1+	0.0	1999 11 12	145	0.1+	0.1+

1997 03 13 691 0.1- 0.2- 1999 10 06 120 0.3+ 0.5-
 1997 03 13 691 0.3- 0.3- 1999 10 07 704 0.1+ 0.5-

1999 SP₄ = 1976 SP₃ = 1990 VK₉ = 1990 VR₁₅Id. A. Doppler, G. V. Williams, B. G. Marsden (d, *MPC* 20606)

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	314.42810		(2000.0)	P	Q
<i>n</i>	0.21497200	ω	227.07657	+0.39673831	-0.91642666
<i>a</i>	2.7598244	Ω	199.73685	+0.88099430	+0.39622400
<i>e</i>	0.1897362	<i>i</i>	8.95124	+0.25777462	+0.05629135
<i>P</i>	4.58	<i>H</i>	14.2	<i>G</i> 0.15	<i>U</i> 4

Residuals in seconds of arc

1976 09 24	095	0.0	0.0	1999 10 01	104	0.4-	0.9+	1999 10 14	106	0.4-	0.0
1990 11 10	046	(3.0-	0.7+)	1999 10 01	104	0.3-	1.0+	1999 10 14	106	0.3-	0.3+
1990 11 10	046	0.6+	1.8+	1999 10 02	104	0.1+	0.7+	1999 10 16	120	0.0	0.1+
1990 11 13	809	0.7+	0.6+	1999 10 04	704	0.9+	0.6-	1999 10 16	120	0.2-	0.4+
1990 11 13	809	0.7+	0.7+	1999 10 04	704	0.1+	0.6-	1999 10 17	120	0.6-	0.9+
1990 11 13	809	(2.5-	0.6-)	1999 10 04	704	0.9+	1.0-	1999 10 17	120	0.7-	0.3+
1990 11 15	809	1.4-	1.4-	1999 10 04	704	0.9+	0.2-	1999 11 01	703	0.1-	0.6+
1990 11 15	809	0.6-	1.0-	1999 10 04	704	0.3+	0.5-	1999 11 01	703	0.3-	0.0
1990 11 15	809	0.3-	0.0	1999 10 07	704	0.4+	0.9-	1999 11 01	703	0.1-	0.4+
1999 09 29	120	0.1+	0.8-	1999 10 07	704	0.4-	0.7-	1999 11 01	703	0.4+	0.2+
1999 09 29	120	0.9-	0.4-	1999 10 07	704	0.1+	1.0-	1999 11 12	704	0.3+	0.2+
1999 09 29	120	(2.1-	1.1-)	1999 10 07	704	0.1-	1.0-	1999 11 12	704	0.6+	1.4-
1999 09 30	104	1.1-	0.7+	1999 10 07	704	0.3+	0.5-	1999 11 12	704	0.4+	0.4-
1999 09 30	104	0.2-	0.1+	1999 10 11	106	0.3+	0.1+	1999 11 12	704	0.2+	0.8-
1999 09 30	120	0.6-	0.6+	1999 10 11	106	0.4+	0.2+	1999 11 12	704	0.7-	0.9-
1999 09 30	120	0.5+	1.0+	1999 10 11	106	0.1+	0.8+				
1999 10 01	104	0.2+	1.1+	1999 10 14	106	0.3+	0.3+				

1999 SL₆ = 1998 HT₁₁₂

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Doppler

<i>M</i>	14.20734		(2000.0)	P	Q
<i>n</i>	0.23756066	ω	214.20979	+0.80875686	+0.56003390
<i>a</i>	2.5819809	Ω	110.73000	-0.48747748	+0.80919051
<i>e</i>	0.1480672	<i>i</i>	11.07458	-0.32905630	+0.17768721
<i>P</i>	4.15	<i>H</i>	15.7	<i>G</i> 0.15	<i>U</i> 6

Residuals in seconds of arc

1998 04 23	704	1.3+	0.8-	1998 04 24	704	1.7-	0.0	1999 10 01	704	0.6+	0.5-
1998 04 23	704	0.9-	0.3+	1998 04 24	704	0.3+	0.2+	1999 10 01	704	1.0+	0.1-
1998 04 23	704	1.2+	1.0+	1999 09 30	704	0.3-	0.7-	1999 10 01	704	0.0	0.6+
1998 04 23	704	0.8-	1.0+	1999 09 30	704	0.2+	0.0	1999 10 01	704	0.1-	0.5+
1998 04 23	704	0.8+	1.1-	1999 09 30	704	0.2+	0.4-	1999 10 01	704	0.1+	0.2+
1998 04 24	704	0.5-	0.3-	1999 09 30	704	1.3-	0.9+				
1998 04 24	704	0.2+	0.1-	1999 09 30	704	0.4-	0.5-				

1999 SR₇ = 1981 SV₈ = 1981 UL₂₅ = 1998 HY₁₉Id. A. Doppler; 1981 UU₂₅ = 1981 SV₈ (*MPC* 20606) is invalid

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Doppler

<i>M</i>	352.54124		(2000.0)	P	Q
<i>n</i>	0.26907283	ω	289.26302	+0.92212235	+0.37384797
<i>a</i>	2.3762356	Ω	48.91859	-0.28636498	+0.83266752
<i>e</i>	0.1508597	<i>i</i>	7.59600	-0.26016431	+0.40853702
<i>P</i>	3.66	<i>H</i>	14.8	<i>G</i> 0.15	<i>U</i> 3

Residuals in seconds of arc

1981 09 24	033	0.1+	0.2+	1998 04 20	704	0.5-	0.3-	1999 09 29	704	0.2-	0.4-
1981 09 24	033	0.3-	0.1-	1998 04 22	704	0.6+	0.6-	1999 09 29	704	1.3-	1.4+
1981 10 25	675	0.1-	0.4-	1998 04 22	704	0.2-	0.7-	1999 09 30	704	0.2+	0.3+
1981 10 26	675	0.2+	0.3+	1998 04 22	704	0.0	0.3+	1999 09 30	704	0.1-	0.1+
1998 04 20	704	0.5+	0.2-	1998 04 22	704	0.6+	1.2+	1999 09 30	704	1.3+	0.1+
1998 04 20	704	0.9-	0.8-	1999 09 29	704	0.2+	0.3-	1999 09 30	704	0.9+	0.1-

1998 04 20 704 0.1+ 0.7+ 1999 09 29 704 0.5- 0.3- 1999 09 30 704 0.3- 0.3-
 1998 04 20 704 0.1- 0.4+ 1999 09 29 704 0.2- 0.6-

1999 SA₉ = 1998 GU₄

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Doppler

<i>M</i>	34.99616		(2000.0)	P	Q
<i>n</i>	0.23187013	ω	165.37483	+0.24869364	+0.94809738
<i>a</i>	2.6240545	Ω	118.68703	-0.90980088	+0.29884305
<i>e</i>	0.1634103	<i>i</i>	13.05424	-0.33228576	-0.10864707
<i>P</i>	4.25	<i>H</i>	14.6	<i>G</i> 0.15	<i>U</i> 6

Residuals in seconds of arc

1998 04 02	704	0.0	0.2+	1998 04 03	704	0.2-	0.1+	1999 09 30	704	0.2-	0.3+
1998 04 02	704	0.3+	0.8+	1998 04 03	704	0.6-	0.3+	1999 09 30	704	0.5+	0.3+
1998 04 02	704	0.8+	1.0-	1998 04 03	704	(2.5-	0.4-)	1999 09 30	704	0.3+	0.4-
1998 04 02	704	0.2+	0.1+	1999 09 29	704	0.0	1.5-	1999 09 30	704	0.0	0.1+
1998 04 02	704	0.2-	0.2+	1999 09 29	704	0.7+	0.1-	1999 09 30	704	0.4+	0.1+
1998 04 03	704	0.1-	0.1-	1999 09 29	704	0.8-	0.2-				
1998 04 03	704	0.2-	0.5-	1999 09 29	704	0.8-	1.2+				

1999 SO₉ = 1982 VR = 1989 GM₈ = 1998 HM₄₀

Id. S. Nakano

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	327.85743		(2000.0)	P	Q
<i>n</i>	0.22341997	ω	308.91182	+0.98837075	+0.10639421
<i>a</i>	2.6898086	Ω	45.28298	-0.03957168	+0.86980873
<i>e</i>	0.2185352	<i>i</i>	8.79460	-0.14682421	+0.48178112
<i>P</i>	4.41	<i>H</i>	13.1	<i>G</i> 0.15	<i>U</i> 2

Residuals in seconds of arc

1951 12 01	675	0.2-	0.4-	1998 03 25	704	0.4+	0.0	1998 04 22	704	1.2-	0.6-
1951 12 01	675	0.5-	0.9+	1998 03 29	704	1.4+	0.5+	1998 05 16	704	1.4-	0.3+
1982 11 15	046	(1.6+	5.5-)	1998 03 29	704	0.2+	0.8+	1998 05 16	704	1.1-	0.2+
1982 11 15	046	(1.4+	5.8-)	1998 03 29	704	1.1+	0.2+	1998 05 16	704	0.7-	0.1+
1982 11 16	046	0.7+	1.1-	1998 03 29	704	1.0+	0.0	1998 05 16	704	0.4-	0.0
1982 11 16	046	1.8+	1.5-	1998 03 29	704	0.7+	0.4+	1999 09 27	465	(0.0	2.3-)
1989 04 06	033	0.2+	0.8+	1998 04 20	704	0.8-	0.4+	1999 09 27	465	0.8+	1.7-
1989 04 07	033	0.0	0.0	1998 04 20	704	(4.1-	0.3+)	1999 10 01	465	(2.6-	0.1-)
1989 04 09	033	1.8-	0.3-	1998 04 20	704	0.1-	1.4-	1999 10 01	465	1.8-	0.5-
1989 04 09	033	0.3-	0.5-	1998 04 20	704	0.2+	0.2-	1999 10 01	465	0.5+	0.2-
1997 02 17	327	0.5-	1.0+	1998 04 20	704	1.8-	0.9-	1999 10 03	465	1.0-	0.4-
1997 02 17	327	0.5-	0.2+	1998 04 21	704	0.4-	0.2+	1999 10 03	465	0.3-	0.1+
1997 02 17	327	0.6-	0.4+	1998 04 21	704	0.2+	0.6-	1999 10 05	465	0.0	0.6-
1998 03 25	699	1.0+	0.4+	1998 04 21	704	0.6-	0.5+	1999 10 05	465	0.2+	0.6-
1998 03 25	699	1.7+	0.5-	1998 04 21	704	0.2-	0.5-	1999 10 15	413	0.0	0.5-
1998 03 25	699	1.5+	0.5-	1998 04 21	704	0.8-	0.8-	1999 10 15	413	0.0	0.6-
1998 03 25	704	0.7+	0.2-	1998 04 22	704	1.7-	1.1-	1999 10 16	465	1.2+	0.3+
1998 03 25	704	1.5+	0.1-	1998 04 22	704	0.5-	0.4+	1999 10 16	465	1.1-	1.7+
1998 03 25	704	1.4+	0.2-	1998 04 22	704	(2.3-	0.1+)	1999 10 16	465	0.3+	0.7+
1998 03 25	704	1.0+	0.9+	1998 04 22	704	0.2-	0.9-	1999 10 16	465	0.1-	1.7+

1999 SS₉ = 1991 VW₁₃ = 1995 YO₁₂

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	314.81966		(2000.0)	P	Q
<i>n</i>	0.24230602	ω	8.47398	+0.28222014	-0.95508207
<i>a</i>	2.5481594	Ω	65.17298	+0.87424535	+0.21724435
<i>e</i>	0.2240826	<i>i</i>	5.71571	+0.39502768	+0.20155180
<i>P</i>	4.07	<i>H</i>	15.0	<i>G</i> 0.15	<i>U</i> 4

Residuals in seconds of arc

1991 11 13	399	(3.5-	0.2-)	1999 09 30	703	0.4-	0.2-	1999 11 03	703	0.5-	0.1+
1991 11 13	399	0.9-	0.2-	1999 09 30	703	0.2-	0.2-	1999 11 03	703	1.1-	0.1+
1995 12 19	691	0.7+	0.4+	1999 09 30	703	0.3-	0.5-	1999 11 03	703	0.9-	0.1-
1995 12 19	691	0.4+	0.5+	1999 09 30	703	0.1-	0.3-	1999 11 12	120	0.1-	0.1-
1995 12 19	691	0.5+	0.2+	1999 10 02	120	0.1+	1.1+	1999 11 12	120	0.0	0.7-

M.P.C. 36836

1995 12 27	691	0.2+	0.2−	1999 10 02	120	0.1+	1.1+	1999 11 13	120	0.6+	0.1−
1995 12 27	691	0.1+	0.1−	1999 10 07	120	0.7+	0.9+	1999 11 13	120	0.6+	0.0
1995 12 27	691	0.3+	0.1−	1999 10 07	120	1.1+	0.6+	1999 11 15	678	0.0	0.6+
1995 12 27	566	(3.2+	1.4−)	1999 10 07	704	1.0+	0.9−	1999 11 15	678	0.5−	0.6−
1995 12 27	566	(2.7+	1.9−)	1999 10 07	704	1.3+	0.1+	1999 11 16	678	1.3−	0.7−
1995 12 27	566	(3.1+	1.3−)	1999 10 07	704	1.0+	0.1+	1999 11 16	678	1.5−	0.2+
1999 09 29	120	0.1+	0.8−	1999 10 07	704	0.4−	0.3−				
1999 09 29	120	0.1−	0.2+	1999 11 03	703	0.1−	0.1+				

1999 SU₉ = 1978 WJ₂₀

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

M	332.18093		(2000.0)		P		Q
n	0.28176073	ω	21.54671		+0.83413009		−0.55139600
a	2.3043533	Ω	11.94540		+0.49584231		+0.73869309
e	0.1355243	i	3.81301		+0.24159346		+0.38767896
P	3.50	H	15.7	G	0.15	U	4

Residuals in seconds of arc

1978 11 28	675	0.9−	1.2−	1999 10 04	704	0.5−	0.4+	1999 10 07	704	0.1−	1.1−
1978 11 29	675	1.2+	0.7+	1999 10 06	704	0.1+	0.1−	1999 10 07	704	0.1+	0.6−
1999 09 05	699	0.5+	0.6+	1999 10 06	704	0.2+	0.3−	1999 10 28	104	0.9−	0.4+
1999 09 05	699	0.1−	1.6+	1999 10 06	704	0.1+	0.2−	1999 10 28	104	0.1−	0.5+
1999 09 05	699	0.7−	0.5−	1999 10 06	704	0.1+	0.3−	1999 10 28	104	0.3+	0.6+
1999 09 30	104	1.5+	0.5−	1999 10 06	704	0.3+	0.0	1999 10 28	104	0.1+	0.8+
1999 09 30	104	0.1−	0.6−	1999 10 06	108	0.7+	1.5−	1999 11 04	703	0.2−	0.0
1999 10 01	104	0.3−	0.5+	1999 10 06	108	1.0−	1.5−	1999 11 04	703	0.6−	0.3+
1999 10 01	104	0.3−	0.8+	1999 10 06	104	0.9+	0.3−	1999 11 04	703	0.8−	0.2−
1999 10 01	104	1.1−	0.4+	1999 10 06	104	0.8+	0.3−	1999 11 04	703	0.9+	0.8+
1999 10 02	104	0.3+	1.3+	1999 10 06	104	0.8+	0.3−	1999 11 04	703	0.3+	0.5+
1999 10 04	704	0.5−	0.8+	1999 10 07	704	0.2+	0.5−	1999 11 04	703	0.3+	0.1+
1999 10 04	704	0.7−	0.0	1999 10 07	704	0.0	0.4−	1999 11 04	703	0.8+	0.4−
1999 10 04	704	0.0	0.5+	1999 10 07	704	0.5−	0.2−	1999 11 04	703	1.1−	0.2−

1999 SR₁₀ = 1998 FQ₁₄₃

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

M	1.55083		(2000.0)		P		Q
n	0.28637180	ω	136.89729		+0.96855041		+0.24219559
a	2.2795505	Ω	209.23054		−0.24796797		+0.92063585
e	0.1325586	i	6.70564		−0.02054219		+0.30622040
P	3.44	H	15.5	G	0.15	U	3

Residuals in seconds of arc

1998 03 29	704	1.7+	0.1−	1999 09 08	704	0.1−	0.1−	1999 10 07	704	1.1+	0.2−
1998 03 29	704	0.9−	1.9+	1999 09 08	704	0.2−	0.1+	1999 10 07	704	0.1−	0.1−
1998 03 29	704	0.6−	0.0	1999 09 08	704	0.0	0.5−	1999 10 07	704	0.8+	0.9−
1998 03 29	704	0.5−	0.5+	1999 09 18	703	0.9−	0.0	1999 10 07	704	0.7+	1.4−
1998 04 01	704	0.2−	0.8+	1999 09 18	703	0.7−	0.2+	1999 10 27	327	0.3−	0.6−
1998 04 01	704	(0.5+	2.8+)	1999 09 18	703	0.3+	0.8+	1999 10 27	327	0.3+	0.3−
1998 04 01	704	1.2+	0.3+	1999 09 18	703	0.2−	0.8+	1999 10 27	327	0.4+	0.1−
1998 04 01	704	0.5−	0.0	1999 09 29	327	0.1−	0.5−	1999 10 29	703	0.8−	0.1+
1998 04 22	704	0.4+	0.7−	1999 09 29	327	0.4−	0.5−	1999 10 29	703	1.6−	1.3+
1998 04 22	704	0.0	0.8−	1999 09 29	327	0.3−	0.5−	1999 10 29	703	0.7−	0.1+
1998 04 22	704	(3.4+	1.0−)	1999 10 04	704	0.4+	0.7+	1999 10 29	703	0.5+	0.8+
1998 04 22	704	0.3−	1.0−	1999 10 04	704	0.6+	0.6+	1999 10 29	327	0.1+	0.1−
1999 07 23	704	0.1+	0.1+	1999 10 04	704	0.3+	0.5+	1999 10 29	327	0.2−	0.7−
1999 07 23	704	0.6+	1.3−	1999 10 04	704	0.4+	1.8+	1999 10 29	327	0.2+	0.3−
1999 07 23	704	0.5−	0.6+	1999 10 04	704	0.7+	0.7+	1999 11 03	703	0.4−	0.6+
1999 07 23	704	0.3−	0.2−	1999 10 04	327	0.1+	0.0	1999 11 03	703	(2.1−	0.5+)
1999 07 23	704	0.1−	0.8+	1999 10 04	327	0.1−	0.4+	1999 11 03	703	0.4−	0.2−
1999 09 08	704	0.7+	0.1+	1999 10 04	327	0.6−	0.4−	1999 11 03	703	0.5−	0.9−
1999 09 08	704	0.1−	0.2−	1999 10 07	704	0.4+	0.2−				

1999 SW₁₀ = 1998 KO₄₁

Id. G. V. Williams, A. Doppler

1999 NOV. 23

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

M	18.19745		(2000.0)		P		Q
n	0.19822805	ω	285.78506		+0.91709530		+0.33096360
a	2.9131263	Ω	55.39194		−0.17402667		+0.83392827
e	0.2057197	i	15.66675		−0.35867942		+0.44161832
P	4.97	H	14.0	G	0.15	U	2

Residuals in seconds of arc

1997 04 06	327	1.3+	0.0	1999 09 30	703	0.0	0.5+	1999 11 03	703	0.1−	0.3+
1997 04 06	327	0.1−	1.1+	1999 09 30	703	0.4+	0.1−	1999 11 03	718	0.4+	0.3+
1997 04 06	327	0.0	0.6+	1999 09 30	703	0.2+	0.3+	1999 11 03	703	0.1+	0.3+
1998 05 22	704	0.3−	1.0+	1999 10 02	704	0.2−	0.5−	1999 11 03	718	1.0−	0.2−
1998 05 22	704	0.1+	1.0+	1999 10 02	704	0.3+	0.2−	1999 11 03	718	0.3−	0.8+
1998 05 22	704	0.6+	0.3−	1999 10 02	704	0.2+	0.3−	1999 11 03	703	0.0	0.0
1998 05 22	704	1.1−	1.0+	1999 10 02	704	0.1+	0.8−	1999 11 03	557	0.0	0.1−
1998 05 24	704	1.6+	0.9−	1999 10 02	704	0.1+	0.7−	1999 11 03	557	0.1+	0.1−
1998 05 24	704	0.4+	0.9−	1999 10 04	703	0.1−	0.1+	1999 11 03	557	0.1−	0.2−
1998 05 24	704	0.5−	1.2+	1999 10 04	703	0.1+	0.5+	1999 11 04	732	0.7−	0.2+
1999 08 22	703	0.7−	0.4+	1999 10 04	703	0.0	0.1+	1999 11 04	732	0.1−	0.1−
1999 08 22	703	0.3+	0.3+	1999 10 04	703	0.5−	0.2+	1999 11 04	732	0.6−	0.5+
1999 08 22	703	0.2+	0.1+	1999 11 03	718	0.3−	0.7−	1999 11 04	732	1.0+	0.8−
1999 08 22	703	0.4+	0.2−	1999 11 03	718	0.5+	0.7+	1999 11 04	732	(2.1−	2.1+)
1999 09 14	704	1.1+	0.4−	1999 11 03	718	0.9−	0.5+	1999 11 05	732	0.3−	0.2+
1999 09 14	704	1.0+	0.0	1999 11 03	703	0.1+	0.3+	1999 11 05	732	0.5−	0.3−
1999 09 14	704	0.4−	0.1−	1999 11 03	718	0.2+	0.6+	1999 11 05	732	0.5−	0.2−
1999 09 30	703	0.1+	0.1+	1999 11 03	718	0.8−	1.2+				

1999 SH₁₁ = 1984 JO = 1998 KX₃₃

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

M	55.76121		(2000.0)		P		Q
n	0.21225119	ω	224.74746		+0.42040200		+0.89539854
a	2.7833594	Ω	70.62382		−0.78283456		+0.43968996
e	0.1890329	i	8.94682		−0.45872890		+0.07024375
P	4.64	H	13.7	G	0.15	U	3

Residuals in seconds of arc

1984 05 07	675	0.2−	0.5−	1998 05 22	704	2.0−	0.4+	1999 09 30	703	1.8−	0.2−
1984 05 08	675	0.3−	0.1+	1998 05 24	704	0.1−	0.0	1999 09 30	703	0.3−	0.4+
1984 05 09	675	0.5+	0.3+	1998 05 24	704	0.4+	0.5−	1999 09 30	703	0.4−	0.7+
1998 05 22	704	0.5+	0.6+	1998 05 24	704	0.9+	0.6+	1999 10 04	703	1.6+	0.1−
1998 05 22	704	0.0	0.4−	1998 05 24	704	0.7+	0.2−	1999 10 04	703	0.4−	1.3−
1998 05 22	704	0.2−	0.0	1998 05 24	704	0.6−	2.0−	1999 10 04	703	0.4+	0.0
1998 05 22	704	0.5+	1.4+	1999 09 30	703	0.9+	0.2+	1999 10 04	703	0.1−	0.3+

1999 ST₁₁ = 1998 HA₉₂

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

M	16.03488		(2000.0)		P		Q
n	0.27567754	ω	286.32906		+0.95370723		+0.28037864
a	2.3381290	Ω	57.50628		−0.20225007		+0.86563103
e	0.1421232	i	7.40923		−0.22257007		+0.41481409
P	3.58	H	14.7	G	0.15	U	4

Residuals in seconds of arc

1998 04 21	704	0.0	0.0	1998 04 22	704	0.7+	0.7+	1999 10 07	704	0.3+	0.1−
1998 04 21	704	0.5−	1.2−	1999 09 30	703	0.9+	0.9−	1999 10 07	704	0.3−	0.5+
1998 04 21	704	0.1−	1.1−	1999 09 30	703	0.3−	0.5+	1999 10 07	704	0.4+	0.1+
1998 04 21	704	0.7−	0.2−	1999 09 30	703	0.2+	0.7−	1999 10 07	704	0.1−	0.1−
1998 04 21	704	0.3+	1.0+	1999 09 30	703	0.3+	0.2−	1999 10 07	704	0.4−	0.5+
1998 04 22	704	0.1+	0.2+	1999 10 04	703	0.2−	0.0	1999 11 12	120	0.3−	0.1+
1998 04 22	704	0.7+	0.1+	1999 10 04	703	0.0	0.2+	1999 11 12	120	0.1+	0.2−

1999 NOV. 23

M.P.C. 36837

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	332.21912		(2000.0)	P	Q
<i>n</i>	0.27346670	ω	338.51516	+0.75200987	-0.65051150
<i>a</i>	2.3507138	Ω	62.51586	+0.62088555	+0.64488066
<i>e</i>	0.0929583	<i>i</i>	6.88688	+0.22131943	+0.40120284
<i>P</i>	3.60	<i>H</i>	14.4	<i>G</i> 0.15	<i>U</i> 3

Residuals in seconds of arc

1981 10 24	095	0.8+	1.7-	1999 09 30	703	0.0	0.2+	1999 10 07	704	0.6-	0.2+
1996 12 02	327	0.1+	0.0	1999 09 30	703	0.4-	0.3-	1999 10 29	703	0.1+	0.2+
1996 12 02	327	0.1-	0.1-	1999 10 04	703	0.2-	0.3+	1999 10 29	703	0.3-	0.2+
1996 12 02	327	0.0	0.1+	1999 10 04	703	0.0	0.2+	1999 10 29	703	0.1+	0.2+
1999 08 22	703	0.2+	0.3-	1999 10 04	703	0.2-	0.2+	1999 10 29	703	0.0	0.1+
1999 08 22	703	0.4-	0.2-	1999 10 04	703	0.1-	0.2-	1999 11 03	703	0.2-	0.2+
1999 08 22	703	0.0	0.2+	1999 10 07	704	0.6+	0.1+	1999 11 03	703	0.0	0.3+
1999 08 22	703	0.3+	0.1+	1999 10 07	704	0.3+	0.2+	1999 11 03	703	0.2-	0.1+
1999 09 30	703	0.4+	0.1+	1999 10 07	704	0.2+	0.0	1999 11 03	703	0.3-	0.1-
1999 09 30	703	0.1-	0.1-	1999 10 07	704	0.0	0.2-				

1999 TT = 1998 HH₅₄

Id. A. Doppler

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	18.06020		(2000.0)	P	Q
<i>n</i>	0.27343936	ω	310.66968	+0.88045605	+0.47204814
<i>a</i>	2.3508705	Ω	21.27819	-0.38972687	+0.77383125
<i>e</i>	0.1336591	<i>i</i>	7.02112	-0.27001871	+0.42232186
<i>P</i>	3.60	<i>H</i>	15.3	<i>G</i> 0.15	<i>U</i> 4

Residuals in seconds of arc

1998 03 25	704	0.8+	1.0+	1998 04 22	704	1.0-	0.7-	1999 10 04	704	0.3+	0.4+
1998 03 25	704	0.9+	0.4-	1999 09 05	699	0.0	0.3-	1999 10 06	120	0.9+	0.1-
1998 03 25	704	1.4-	0.3+	1999 09 05	699	0.7-	0.3+	1999 10 06	120	0.1+	0.0
1998 03 25	704	0.5-	1.1+	1999 09 05	699	1.0-	0.8+	1999 10 07	704	1.3+	0.1-
1998 03 25	704	0.2+	0.5-	1999 10 01	120	1.5+	0.0	1999 10 07	704	0.3+	0.4-
1998 03 29	704	1.8+	0.3-	1999 10 01	120	0.2+	0.6-	1999 10 07	704	0.4-	0.3-
1998 03 29	704	(0.5-	2.2+)	1999 10 02	703	0.5-	0.5+	1999 10 07	704	0.5+	0.3-
1998 03 29	704	1.0-	1.8+	1999 10 02	703	0.4-	0.3+	1999 10 07	704	0.1+	0.4-
1998 03 29	704	(0.0	2.8+)	1999 10 02	703	0.4-	0.1-	1999 10 16	120	1.2-	0.3+
1998 03 29	704	(3.8-	1.4-)	1999 10 02	703	0.4-	0.1+	1999 10 16	120	0.9+	0.1-
1998 04 21	704	1.1+	0.0	1999 10 02	120	1.3-	0.5+	1999 10 16	120	0.3+	0.0
1998 04 21	704	0.3+	0.2+	1999 10 02	120	1.2-	0.9-	1999 11 12	704	0.2+	0.1-
1998 04 21	704	0.3-	0.1+	1999 10 04	704	0.1+	0.0	1999 11 12	704	0.3+	0.4+
1998 04 21	704	0.2+	0.1+	1999 10 04	704	0.4+	0.3+	1999 11 12	704	0.1+	0.2+
1998 04 22	704	0.2-	1.6-	1999 10 04	704	0.2+	0.5-	1999 11 12	704	0.0	0.3-
1998 04 22	704	0.5-	0.3-	1999 10 04	704	0.2-	0.6+	1999 11 12	704	0.5-	0.8+

1999 TY = 1998 HX₆₇

Id. A. Doppler

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	67.73579		(2000.0)	P	Q
<i>n</i>	0.23535076	ω	252.44349	+0.06564077	+0.99129467
<i>a</i>	2.5981186	Ω	22.28338	-0.76267567	+0.12359678
<i>e</i>	0.2083911	<i>i</i>	17.51716	-0.64344162	-0.04537305
<i>P</i>	4.19	<i>H</i>	14.2	<i>G</i> 0.15	<i>U</i> 3

Residuals in seconds of arc

1998 03 25	699	0.1+	0.8-	1998 04 22	704	0.1-	0.1+	1999 10 04	704	0.1+	0.6+
1998 03 25	699	0.0	0.5-	1998 04 25	699	0.1+	0.6+	1999 10 04	704	1.3+	0.1-
1998 03 25	699	0.1+	0.1+	1998 04 25	699	0.5+	0.3+	1999 10 06	120	0.2+	0.4+
1998 04 01	704	0.3-	0.3-	1998 04 25	699	0.1+	0.1+	1999 10 06	120	0.0	0.7+
1998 04 01	704	0.1-	0.4+	1998 04 28	566	0.4-	0.2+	1999 10 07	704	0.2-	0.4+
1998 04 01	704	0.0	0.3-	1998 04 28	566	0.6-	0.0	1999 10 07	704	0.0	1.3+
1998 04 01	704	0.2-	1.2-	1998 04 28	566	0.8-	0.2+	1999 10 07	704	0.2-	0.8+
1998 04 01	704	0.5+	0.8-	1998 05 16	704	0.5-	0.1+	1999 10 07	704	0.2+	0.5+
1998 04 04	699	0.3-	1.1+	1998 05 16	704	0.0	0.4-	1999 10 16	120	0.9-	0.7-

1998 04 04	699	0.3-	1.7+	1998 05 16	704	0.2+	0.6-	1999 10 16	120	0.2+	0.6-
1998 04 04	699	1.2+	0.2+	1998 05 16	704	0.8-	1.4+	1999 10 17	120	1.6+	0.9-
1998 04 21	704	0.4-	0.1+	1998 05 16	704	(7.2-	0.1+)	1999 10 17	120	(3.3-	1.8+)
1998 04 21	704	0.1-	0.1-	1999 10 01	120	0.6+	1.1-	1999 11 01	703	0.5-	0.2-
1998 04 21	704	0.6+	0.5-	1999 10 01	120	0.8-	0.6-	1999 11 01	703	0.0	0.0
1998 04 21	704	0.3-	0.1-	1999 10 03	120	0.3+	0.7-	1999 11 01	703	0.4+	0.4-
1998 04 21	704	0.7+	0.4-	1999 10 03	703	0.7-	0.1+	1999 11 01	703	0.0	0.1-
1998 04 22	704	0.2+	0.5-	1999 10 03	703	0.5-	0.3+	1999 11 04	703	0.2-	0.1-
1998 04 22	704	0.2+	0.2-	1999 10 03	703	0.7-	0.0	1999 11 04	703	0.2-	0.1-
1998 04 22	704	0.1-	0.3-	1999 10 03	703	0.4-	0.0	1999 11 04	703	0.3-	0.0
1998 04 22	704	0.3+	0.2-	1999 10 04	704	(2.3-	0.1+)	1999 11 04	703	0.9+	0.2+

1999 TA₁ = 1996 XL₁₈

Id. A. Doppler

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	1.50387		(2000.0)	P	Q
<i>n</i>	0.27135768	ω	177.27967	+0.98929320	+0.14586736
<i>a</i>	2.3628780	Ω	174.32648	-0.13477212	+0.92535233
<i>e</i>	0.2178701	<i>i</i>	2.69902	-0.05599495	+0.34992253
<i>P</i>	3.63	<i>H</i>	16.4	<i>G</i> 0.15	<i>U</i> 4

Residuals in seconds of arc

1996 12 07	691	0.4+	0.4+	1999 10 01	120	0.9+	0.4-	1999 10 07	704	0.3+	0.8-
1996 12 07	691	0.3+	0.4+	1999 10 03	120	0.0	0.8-	1999 10 07	704	0.3-	0.0
1996 12 07	691	0.5+	0.2+	1999 10 03	120	0.2+	1.0+	1999 10 07	704	0.0	0.2-
1996 12 12	691	0.9-	0.3+	1999 10 03	703	0.2+	0.1+	1999 10 07	704	0.4-	0.4+
1996 12 12	691	0.5-	0.8-	1999 10 03	703	0.2-	0.0	1999 10 07	120	0.8-	0.4-
1996 12 12	691	0.0	0.7-	1999 10 03	703	0.5-	0.1-	1999 10 07	120	0.5+	0.4+
1996 12 13	691	0.4-	0.1+	1999 10 03	703	0.5-	0.1+	1999 10 08	120	(3.2-	0.3-)
1996 12 13	691	0.3-	0.1+	1999 10 04	704	0.6+	0.2-	1999 10 08	120	0.9+	0.2-
1996 12 13	691	0.4-	0.1+	1999 10 04	704	0.3+	0.4+	1999 11 01	703	0.1+	0.1+
1996 12 17	691	0.0	0.4-	1999 10 04	704	0.1-	0.3+	1999 11 01	703	0.0	0.4-
1996 12 17	691	0.6+	0.0	1999 10 04	704	0.6+	0.2-	1999 11 01	703	0.9-	0.1-
1996 12 17	691	0.5+	0.2+	1999 10 06	120	0.7+	0.2-	1999 11 01	703	0.8+	0.9+
1999 10 01	120	(2.4+	3.7+)	1999 10 06	120	0.8-	0.2-				
1999 10 01	120	1.3-	0.7-	1999 10 07	704	0.3-	1.2+				

1999 TB₁ = 1988 TB₂

Id. G. V. Williams, A. Doppler

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	339.11855		(2000.0)	P	Q
<i>n</i>	0.27011876	ω	179.37582	+0.88171659	-0.47012269
<i>a</i>	2.3700976	Ω	208.77190	+0.43249277	+0.83890702
<i>e</i>	0.2347966	<i>i</i>	4.70770	+0.18848306	+0.27426204
<i>P</i>	3.65	<i>H</i>	15.2	<i>G</i> 0.15	<i>U</i> 3

Residuals in seconds of arc

1988 10 03	046	0.3-	2.3-	1999 10 04	704	0.2-	0.4+	1999 10 15	327	0.1-	0.0
1988 10 03	046	1.5+	1.7-	1999 10 04	704	0.4+	0.2+	1999 10 15	327	0.3-	0.0
1988 10 04	046	0.2-	1.1-	1999 10 04	704	0.0	0.6+	1999 10 15	327	0.1-	0.1-
1988 10 04	046	1.5+	1.7-	1999 10 04	704	0.1+	0.1+	1999 10 27	327	0.1-	0.0
1988 10 09	046	0.5+	2.2-	1999 10 04	704	0.8-	0.1+	1999 10 27	327	0.6-	0.0
1988 10 09	046	0.5+	1.2-	1999 10 06	704	0.1+	0.1+	1999 10 27	327	0.1-	0.1-
1999 07 23	704	0.5+	0.1+	1999 10 06	704	0.2-	0.2+	1999 10 28	327	(2.4-	0.4+)
1999 07 23	704	0.2+	0.8+	1999 10 06	704	0.3+	0.0	1999 10 28	327	0.2-	0.2+
1999 07 23	704	0.4-	0.4+	1999 10 06	704	0.1-	0.3+	1999 10 28	327	0.2-	0.2+
1999 07 23	704	0.2+	0.8+	1999 10 06	704	0.0	0.2+	1999 10 28	104	0.4+	0.8-
1999 09 05	703	(2.6+	3.1+)	1999 10 07	704	0.0	0.4+	1999 10 28	104	0.1-	0.9-
1999 09 05	703	0.9-	1.5+	1999 10 07	704	0.5+	0.1+	1999 10 28	104	0.2-	0.4+
1999 09 05	703	0.2-	0.1+	1999 10 07	704	0.4+	0.6+	1999 11 01	703	0.4-	0.0
1999 09 05	703	0.4+	0.5+	1999 10 07	704	0.7+	0.2+	1999 11 01	703	0.4-	0.1+
1999 10 01	120	0.1-	0.5+	1999 10 09	120	0.2-	0.3+	1999 11 01	703	0.4-	0.2+
1999 10 01	120	0.2-	0.7+	1999 10 09	120	0.2-	0.4+	1999 11 01	703	0.4-	0.2-
1999 10 02	703	0.5-	0.5+	1999 10 13	327	0.2+	0.5+	1999 11 12	704	0.5+	0.3+
1999 10 02	703	0.5-	0.4+	1999 10 13	327	0.0	0.4+	1999 11 12	704	0.9+	0.3-
1999 10 02	703	0.5-	0.5+	1999 10 13	327	0.3+	0.5+	1999 11 12	704	0.4+	0.1+

M.P.C. 36838

1999 10 02	703	0.5−	0.4+	1999 10 14	327	0.1+	0.3+	1999 11 12	704	0.7+	0.3−
1999 10 02	120	0.5−	0.3+	1999 10 14	327	0.0	0.3+	1999 11 12	704	0.3+	1.1−
1999 10 02	120	0.8−	0.0	1999 10 14	327	0.1+	0.4+				

1999 TE₁ = 1976 US₆ = 1982 XN

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	10.59499	(2000.0)	P		Q	
<i>n</i>	0.17145580	ω	279.23540	+0.98471105	+0.17090657	
<i>a</i>	3.2089867	Ω	70.92967	−0.14253120	+0.90169239	
<i>e</i>	0.1908452	<i>i</i>	2.04289	−0.10014497	+0.39716718	
<i>P</i>	5.75	<i>H</i>	13.8	<i>G</i>	0.15	<i>U</i> 5

Residuals in seconds of arc

1976 10 22	381	0.6+	1.6+	1999 10 03	703	0.1+	0.1−	1999 10 07	120	1.0−	0.2+
1976 10 22	381	1.0−	0.3−	1999 10 03	703	0.1+	0.1+	1999 10 07	120	0.2−	0.4−
1976 10 22	381	0.1−	1.3+	1999 10 03	703	0.1−	0.5−	1999 10 08	120	0.1−	1.2−
1976 10 22	381	0.6−	0.3−	1999 10 04	704	0.1+	0.1−	1999 10 08	120	0.3+	0.3−
1976 10 24	381	0.0	0.3+	1999 10 04	704	0.2+	0.2+	1999 11 01	703	0.0	0.2−
1982 12 13	381	1.2−	0.6−	1999 10 04	704	0.3+	0.1+	1999 11 01	703	0.1+	0.1+
1982 12 13	381	0.9+	0.1−	1999 10 04	704	0.9−	0.9+	1999 11 01	703	0.5+	0.0
1982 12 14	381	1.0+	0.2+	1999 10 04	704	0.2+	0.0	1999 11 01	703	0.2+	0.1−
1982 12 14	381	0.7−	0.4+	1999 10 06	120	0.0	0.4+	1999 11 12	704	0.8+	0.2−
1999 10 01	120	0.2+	0.6−	1999 10 06	120	0.1+	0.1+	1999 11 12	704	0.0	0.2−
1999 10 01	120	0.1+	0.3−	1999 10 07	704	0.2−	0.7+	1999 11 12	704	0.0	0.4−
1999 10 01	120	0.6+	0.1+	1999 10 07	704	0.4−	0.4−	1999 11 12	704	0.2−	0.7−
1999 10 03	120	(2.1+	0.6+)	1999 10 07	704	0.2−	0.0	1999 11 12	704	0.7−	0.2+
1999 10 03	120	1.4+	0.6+	1999 10 07	704	0.3+	0.6−				
1999 10 03	703	0.3−	0.1+	1999 10 07	704	0.0	0.1−				

1999 TN₁ = 1998 KJ₅₄

Id. A. Doppler

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	35.21198	(2000.0)	P		Q	
<i>n</i>	0.17753293	ω	108.81383	+0.68533163	+0.71909933	
<i>a</i>	3.1353313	Ω	205.61831	−0.72708122	+0.66680108	
<i>e</i>	0.2294007	<i>i</i>	15.41985	−0.04090799	+0.19563350	
<i>P</i>	5.55	<i>H</i>	14.2	<i>G</i>	0.15	<i>U</i> 3

Residuals in seconds of arc

1998 05 23	704	0.3+	1.0+	1999 10 01	120	0.9−	0.7+	1999 10 06	120	0.3+	0.3−
1998 05 23	704	0.2+	0.2−	1999 10 02	703	0.2+	0.4−	1999 10 17	120	0.5+	0.4−
1998 05 23	704	0.0	1.8+	1999 10 02	703	0.2−	0.5+	1999 10 17	120	0.6+	0.1+
1998 05 23	704	0.7−	1.2−	1999 10 02	703	0.7−	0.6+	1999 11 01	703	1.0−	0.4−
1998 05 26	704	0.9+	1.3−	1999 10 02	703	0.2−	0.2−	1999 11 01	703	0.4−	0.1+
1998 05 26	704	0.5+	0.1+	1999 10 02	120	1.3−	0.1−	1999 11 01	703	1.5−	0.2−
1998 05 26	704	0.1−	0.3−	1999 10 02	120	0.6−	1.3−	1999 11 01	703	0.3−	0.1−
1998 05 26	704	0.3+	1.0−	1999 10 04	704	0.6−	0.3−	1999 11 12	704	0.1−	0.5−
1998 06 19	704	0.4−	0.5+	1999 10 04	704	0.4+	0.1−	1999 11 12	704	0.3−	0.1+
1998 06 19	704	0.6+	0.5+	1999 10 04	704	0.4+	0.1+	1999 11 12	704	0.4−	0.2−
1998 06 19	704	0.2+	0.3+	1999 10 04	704	0.2+	1.1+	1999 11 12	704	0.1+	0.0
1998 06 19	704	1.8−	0.2−	1999 10 06	704	0.4+	0.0	1999 11 12	704	0.7−	0.7−
1999 09 05	703	0.5−	0.7+	1999 10 06	704	0.3+	0.1−	1999 11 12	120	1.1+	1.3+
1999 09 05	703	0.7−	0.6−	1999 10 06	704	0.8+	0.1−	1999 11 12	120	1.5+	0.5+
1999 09 05	703	1.1+	1.1+	1999 10 06	704	0.3+	0.4−	1999 11 13	120	0.5+	0.2+
1999 09 05	703	0.7+	1.0−	1999 10 06	704	0.5+	0.5−	1999 11 13	120	0.7+	0.1+
1999 10 01	120	0.2−	0.7+	1999 10 06	120	(2.0+	0.2−)				

1999 TP₁ = 1997 GJ₄

Id. G. V. Williams, A. Doppler

1999 NOV. 23

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	327.23899	(2000.0)	P		Q	
<i>n</i>	0.25957091	ω	189.97508	+0.68700242	−0.72639147	
<i>a</i>	2.4338775	Ω	216.63602	+0.66893274	+0.64272142	
<i>e</i>	0.1842464	<i>i</i>	1.87969	+0.28382505	+0.24344325	
<i>P</i>	3.80	<i>H</i>	15.6	<i>G</i>	0.15	<i>U</i> 4

Residuals in seconds of arc

1997 04 07	691	0.3+	0.5−	1999 10 04	704	0.1+	0.1−	1999 10 07	704	0.1−	0.3+
1997 04 07	691	0.4+	0.0	1999 10 04	704	0.3−	0.4+	1999 10 07	704	0.2+	0.1+
1997 04 07	691	0.3+	0.3+	1999 10 04	704	0.5+	0.0	1999 10 30	703	0.9−	0.2−
1997 04 09	691	0.7−	0.2+	1999 10 06	704	0.0	0.4+	1999 10 30	703	0.5−	0.5+
1997 04 09	691	0.4−	0.0	1999 10 06	704	0.1−	0.1+	1999 10 30	703	0.0	0.8+
1997 04 09	691	0.0	0.0	1999 10 06	704	0.0	0.0	1999 10 30	703	0.1+	0.2+
1999 10 01	120	1.2+	0.3−	1999 10 06	704	0.0	0.5−	1999 11 12	704	0.3+	0.1+
1999 10 01	120	0.6−	0.4−	1999 10 06	704	0.2−	0.2−	1999 11 12	704	0.8+	0.1−
1999 10 02	120	0.9−	0.1−	1999 10 06	120	2.0+	0.4+	1999 11 12	704	(0.6−	2.6+)
1999 10 02	120	0.2−	0.0	1999 10 06	120	1.3−	1.0−	1999 11 12	704	0.1−	0.4−
1999 10 04	704	0.1−	0.1+	1999 10 07	704	0.0	0.6+	1999 11 12	704	0.3−	0.6−
1999 10 04	704	0.1+	0.1−	1999 10 07	704	0.3+	0.0				

1999 TZ₁ = 1992 CF₆

Id. DANEOPS

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	9.41491	(2000.0)	P		Q	
<i>n</i>	0.08341169	ω	130.19685	+0.79721160	+0.55446565	
<i>a</i>	5.1878186	Ω	200.27318	−0.48055937	+0.82225597	
<i>e</i>	0.0406572	<i>i</i>	43.56369	+0.36539890	−0.12830809	
<i>P</i>	11.82	<i>H</i>	9.2	<i>G</i>	0.15	<i>U</i> 1

Residuals in seconds of arc

1953 09 16	675	1.4−	1.2−	1999 09 29	699	0.5−	0.4+	1999 10 21	678	0.3−	0.3−
1953 09 16	675	0.5+	0.1+	1999 09 29	699	0.3+	0.5+	1999 10 21	678	1.3−	0.2−
1953 12 07	675	0.7+	0.9−	1999 10 02	678	0.3−	0.7−	1999 10 28	678	0.8−	0.3+
1953 12 07	675	0.2−	0.6+	1999 10 02	678	0.4−	0.7−	1999 10 28	678	0.3−	0.1+
1979 12 22	413	1.0−	0.8−	1999 10 02	678	0.0	0.7−	1999 10 28	678	0.3−	0.3+
1979 12 22	413	0.5+	0.0	1999 10 03	678	0.2+	0.4−	1999 10 31	678	0.5−	0.5−
1980 01 14	413	0.1−	0.2−	1999 10 03	678	0.5+	0.3−	1999 10 31	678	0.8+	0.2+
1980 01 14	413	0.2+	0.5+	1999 10 03	704	0.0	0.1−	1999 10 31	678	0.2+	0.2+
1987 08 27	675	0.5−	0.3−	1999 10 03	704	0.3+	0.0	1999 11 01	719	0.4+	0.0
1987 08 27	675	0.4+	0.1+	1999 10 03	704	0.2+	0.4+	1999 11 01	719	0.3−	0.6+
1992 02 01	413	0.0	0.5+	1999 10 03	704	0.2+	0.3+	1999 11 02	726	0.2+	0.5+
1992 02 01	413	0.6+	0.7+	1999 10 03	704	0.3+	0.2−	1999 11 02	726	0.7−	1.0+
1999 09 18	704	0.0	0.2−	1999 10 15	678	(2.4−	0.8+)	1999 11 03	726	0.5−	0.2−
1999 09 18	704	0.2+	0.0	1999 10 15	678	0.2+	0.0	1999 11 03	719	0.5−	0.4−
1999 09 18	704	0.4+	0.1−	1999 10 19	678	0.1+	0.1+	1999 11 03	719	0.2−	0.4+
1999 09 18	704	0.3+	0.2+	1999 10 19	678	0.2−	1.0+	1999 11 04	704	0.4+	0.4+
1999 09 18	704	0.3+	0.2−	1999 10 19	678	0.2+	0.0	1999 11 04	704	0.3+	0.3−
1999 09 29	699	0.3+	0.6+	1999 10 21	678	0.6+	0.4−	1999 11 04	704	0.5+	0.4+

1999 TB₂ = 1998 JP₄

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	349.86815	(2000.0)	P		Q	
<i>n</i>	0.23137546	ω	272.33222	+0.96602658	−0.10178035	
<i>a</i>	2.6277932	Ω	93.57671	+0.18740977	+0.90882137	
<i>e</i>	0.1969333	<i>i</i>	13.76976	−0.17796132	+0.40457939	
<i>P</i>	4.26	<i>H</i>	13.2	<i>G</i>	0.15	<i>U</i> 3

Residuals in seconds of arc

1998 05 05	699	0.1−	0.4−	1999 09 30	699	0.2−	1.2+	1999 10 10	678	0.6+	0.2−
1998 05 05	699	0.8+	0.4+	1999 09 30	704	0.0	0.7−	1999 10 10	678	0.4−	0.3+
1998 05 05	699	1.4+	1.0+	1999 09 30	704	0.0	0.6−	1999 10 10	678	0.8−	0.0
1998 06 28	699	0.5+	0.5+	1999 09 30	704	0.2−	0.7−	1999 10 14	678	0.5−	0.2+
1998 06 28	699	0.0	0.2+	1999 09 30	704	0.1−	1.1−	1999 10 14	678	0.8−	0.2−
1998 06 28	699	1.8−	0.2+	1999 10 02	678	0.0	0.1−	1999 10 28	678	0.2+	0.0

1999 NOV. 23

1999 09 13	704	0.6+	0.6+	1999 10 02	678	0.2-	0.7-	1999 10 28	678	1.0+	0.4-
1999 09 13	704	0.8+	0.5-	1999 10 03	678	0.1+	0.1-	1999 10 28	678	0.7+	0.2-
1999 09 13	704	0.5-	1.3-	1999 10 03	678	0.4+	0.6-	1999 11 10	704	0.4-	0.8+
1999 09 13	704	0.4+	0.0	1999 10 06	704	0.2+	0.0	1999 11 10	704	0.2-	1.4+
1999 09 30	699	0.2-	1.2+	1999 10 06	704	0.0	0.0	1999 11 10	704	0.2-	1.1+
1999 09 30	699	0.1+	1.2+	1999 10 06	704	0.0	0.1-	1999 11 10	704	0.2-	1.1+
1999 09 30	704	0.1+	0.4-	1999 10 06	704	0.1-	0.3-	1999 11 10	704	0.4-	0.8+

1999 TR₂ = 1998 MJ₃₁

Id. S. Nakano

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

M	52.13036		(2000.0)	P	Q
n	0.17496611	ω	199.47113	+0.62855855	+0.68893656
a	3.1659212	Ω	111.28249	-0.65231986	+0.71969839
e	0.0431716	i	22.79040	-0.42354805	-0.08602704
P	5.63	H	12.4	G 0.15	U 3

Residuals in seconds of arc

1998 06 24	704	0.2-	0.7+	1998 07 26	704	0.3+	1.3+	1999 09 30	699	0.2-	1.5-
1998 06 24	704	1.0+	0.9-	1998 07 26	704	0.3-	0.9-	1999 09 30	704	0.3-	0.7+
1998 06 24	704	1.4-	0.1-	1998 07 26	704	0.4-	0.2+	1999 09 30	704	0.1-	0.6+
1998 06 24	704	0.3-	0.1-	1998 07 26	704	0.5-	0.9-	1999 10 02	678	0.6+	0.7-
1998 06 24	704	0.0	0.0	1998 08 15	704	0.1-	0.3-	1999 10 02	678	0.8-	0.3-
1998 06 26	809	0.0	0.5-	1998 08 15	704	1.2+	0.3+	1999 10 02	678	0.2-	0.4+
1998 06 26	809	0.3-	1.0-	1998 08 15	704	(0.1+	2.9+)	1999 10 03	678	0.8+	0.6-
1998 06 26	809	0.4-	1.1-	1998 08 15	704	(5.1-	1.2+)	1999 10 03	678	0.9-	0.3+
1998 06 26	704	0.4-	0.2+	1999 09 13	699	0.4+	0.3-	1999 10 03	678	0.8+	0.8-
1998 06 26	704	0.6-	0.9+	1999 09 13	699	0.2+	0.1+	1999 10 14	678	0.1+	0.2+
1998 06 26	704	0.2+	1.0+	1999 09 13	699	0.7+	0.3-	1999 10 14	678	0.8-	0.3-
1998 06 26	704	0.8-	1.9+	1999 09 30	699	0.5+	0.0	1999 10 31	678	0.0	0.1+
1998 06 27	809	1.0+	0.3+	1999 09 30	704	0.0	0.2+	1999 10 31	678	0.7-	0.2-
1998 06 27	809	0.9+	0.8-	1999 09 30	704	0.3+	0.4+	1999 10 31	678	0.0	0.3+
1998 06 27	809	0.8+	0.6-	1999 09 30	699	0.1+	0.5+				
1998 07 26	704	0.2+	0.6+	1999 09 30	704	0.3-	1.0+				

1999 TA₃ = 1998 MX₃₅

Id. S. Nakano

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

M	2.16102		(2000.0)	$\mathbf{P}$	$\mathbf{Q}$
n	0.18933195	ω	81.09061	+0.93952165	-0.31467148
a	3.0036785	Ω	297.15380	+0.22271866	+0.86124574
e	0.1185887	i	8.74022	+0.26018353	+0.39904590
P	5.21	H	13.1	G 0.15	U 3

Residuals in seconds of arc

1998 06 24	704	1.3-	2.0+	1998 07 26	704	1.3+	0.1+	1999 10 05	704	0.4+	0.2-
1998 06 24	704	0.6+	0.4+	1998 07 26	704	0.1+	0.5+	1999 10 05	704	0.3-	0.1+
1998 06 24	704	0.3-	1.6-	1998 07 26	704	0.3+	0.0	1999 10 05	704	0.3+	0.9-
1998 06 24	704	0.0	1.0+	1998 07 26	704	0.3+	0.6-	1999 10 05	704	0.7-	0.7-
1998 06 26	704	0.7+	1.1-	1999 06 22	703	1.3+	1.8-	1999 10 14	678	0.3-	0.2+
1998 06 26	704	0.9-	0.5+	1999 06 22	703	0.0	1.6+	1999 10 14	678	1.2+	0.5+
1998 06 26	704	0.2-	0.4-	1999 06 22	703	1.0-	0.3+	1999 10 30	678	1.1-	0.6+
1998 06 26	704	0.4+	1.7+	1999 06 22	703	0.8-	0.9+	1999 10 30	678	0.5-	0.4-
1998 06 28	809	0.2+	1.6-	1999 10 03	678	0.1-	1.3-	1999 10 30	678	0.0	0.9+
1998 06 28	809	1.0-	1.7-	1999 10 03	678	1.1+	0.7-	1999 11 10	703	0.6-	0.5+
1998 06 28	809	0.9-	1.4-	1999 10 03	678	0.9+	0.4+	1999 11 10	703	0.3-	0.1+
1998 07 01	809	0.3-	1.2+	1999 10 04	678	0.3+	0.2-	1999 11 10	703	0.1-	0.3+
1998 07 01	809	0.7+	0.7+	1999 10 04	678	0.5-	0.2+	1999 11 10	703	0.7-	0.6+
1998 07 01	809	0.1+	0.6+	1999 10 05	704	1.4+	0.8-				

1999 TB₃ = 1998 FQ₃₂

Id. A. Doppler

M.P.C. 36839

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

M	107.84132		(2000.0)	P	Q
n	0.31131459	ω	253.19615	-0.54732060	+0.83689564
a	2.1561041	Ω	343.61513	-0.75843127	-0.49939437
e	0.1025712	i	1.37554	-0.35386745	-0.22407800
P	3.17	H	16.3	G 0.15	U 5

Residuals in seconds of arc

1998 03 20	704	0.1+	1.7-	1998 03 29	704	0.6+	0.6+	1999 10 04	704	(0.3+	2.2-)
1998 03 20	704	0.4+	0.1+	1998 03 29	704	0.5+	0.6-	1999 10 05	684	0.0	0.2+
1998 03 20	704	1.2+	0.2+	1998 03 29	704	0.2-	0.5-	1999 10 05	684	0.4+	0.3+
1998 03 20	704	1.1-	1.0+	1998 03 29	704	(2.4-	0.9-)	1999 10 06	704	0.4-	0.3+
1998 03 20	704	0.4+	0.1+	1998 03 29	704	0.0	0.7-	1999 10 06	704	0.5+	0.2-
1998 03 22	704	0.7-	1.6-	1998 04 19	704	0.5+	1.3+	1999 10 06	704	0.3+	0.6-
1998 03 22	704	1.3-	0.8+	1998 04 19	704	(2.5+	0.5-)	1999 10 06	704	0.4+	0.2+
1998 03 22	704	1.2+	0.2+	1998 04 19	704	0.9+	0.6+	1999 10 06	704	0.3-	0.0
1998 03 22	704	0.6-	1.3+	1998 04 19	704	0.7-	0.9-	1999 10 07	703	0.7-	0.8+
1998 03 22	704	0.8-	0.0	1999 10 04	684	1.1-	0.2-	1999 10 07	703	0.5+	0.1+
1998 03 26	566	0.1-	0.0	1999 10 04	684	0.7+	0.5+	1999 10 07	703	0.8-	0.1+
1998 03 26	566	0.3+	0.4+	1999 10 04	704	0.3+	1.4-	1999 10 07	703	0.1-	0.5+
1998 03 26	566	0.2-	0.2+	1999 10 04	704	(0.5-	2.7-)				

1999 TD₃ = 1997 HK₅

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

M	266.63199		(2000.0)	P	Q
n	0.25519706	ω	263.49465	-0.35552853	-0.93404607
a	2.4616083	Ω	207.40789	+0.88409712	-0.32426028
e	0.1576530	i	4.23837	+0.30326844	-0.14971040
P	3.86	H	15.1	G 0.15	U 4

Residuals in seconds of arc

1997 04 28	704	0.7-	0.1-	1999 10 04	684	0.2+	0.0	1999 10 07	704	0.5+	1.9-
1997 04 28	704	1.1-	0.8+	1999 10 04	704	0.2-	0.2-	1999 10 08	684	0.1-	0.2-
1997 04 28	704	0.1-	0.3-	1999 10 04	704	0.2-	0.3+	1999 10 08	684	0.2+	0.0
1997 04 28	704	0.1-	0.5+	1999 10 04	704	0.2-	0.1-	1999 10 08	683	0.8+	0.1+
1997 04 29	704	0.0	0.1+	1999 10 05	683	0.2-	0.2-	1999 10 08	683	1.3+	0.2-
1997 04 29	704	1.2+	0.1+	1999 10 05	683	0.4+	0.4+	1999 10 08	683	0.8+	0.7-
1997 04 29	704	1.0+	0.5-	1999 10 05	684	0.1-	0.2-	1999 10 09	684	0.1+	0.2-
1997 04 29	704	(1.6+	2.3-)	1999 10 05	684	0.1-	0.1-	1999 10 09	684	0.0	0.2-
1999 10 01	703	1.3-	0.2+	1999 10 06	704	0.1+	0.2+	1999 11 03	049	0.5+	0.3+
1999 10 01	703	0.9-	0.1+	1999 10 06	704	0.7-	0.4-	1999 11 03	049	0.4+	0.6+
1999 10 01	703	0.4-	1.2+	1999 10 06	704	0.2+	0.1-	1999 11 03	049	0.5+	0.2+
1999 10 01	703	0.7-	0.0	1999 10 06	704	0.2+	0.2+	1999 11 12	704	0.1-	0.0
1999 10 04	704	0.4-	1.0+	1999 10 06	704	0.0	0.0	1999 11 12	704	0.4-	1.1-
1999 10 04	684	0.2+	0.2-	1999 10 07	704	0.4+	0.7+	1999 11 12	704	0.2-	0.4+
1999 10 04	704	0.5-	0.0	1999 10 07	704	0.2+	1.1+	1999 11 12	704	0.2-	0.1-
1999 10 04	684	0.2+	0.1-	1999 10 07	704	0.2-	0.1+	1999 11 12	704	0.2-	0.3-

1999 TF₄ = 1972 TT₃ = 1979 AC = 1983 YT = 1996 FG₁₉

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

M	313.77862		(2000.0)		$\mathbf{P}$	$\mathbf{Q}$	
n	0.18274850	ω	31.07434		+0.02856288	-0.99905015	
a	3.0753898	Ω	57.30794		+0.90889244	+0.01225432	
e	0.2661375	i	2.24100		+0.41605131	+0.04181670	
P	5.39	H	13.4	G	0.15	U	1

Residuals in seconds of arc

1972 10 05	095	(3.8+	4.3-)	1999 10 01	703	0.2-	0.5+	1999 10 29	703	0.4-	0.4+
1972 10 13	095	(4.3+	0.1-)	1999 10 01	703	0.4-	0.5+	1999 10 29	703	0.4-	0.3+
1979 01 04	330	0.5+	0.3-	1999 10 01	703	0.3-	0.5+	1999 10 29	703	0.5-	0.4+
1983 12 28	033	0.5+	0.9-	1999 10 04	392	(2.1-	0.0)	1999 10 31	691	0.2+	0.2-
1983 12 29	033	0.4+	0.6-	1999 10 05	392	1.5-	0.8-	1999 10 31	691	0.1+	0.2-
1983 12 29	033	0.8-	1.4-	1999 10 05	392	(2.9-	0.0)	1999 10 31	691	0.2+	0.2-
1996 03 15	566	0.1+	0.0	1999 10 07	704	0.6+	0.3-	1999 11 03	703	0.1+	0.6+
1996 03 15	566	0.0	0.1-	1999 10 07	704	0.3-	0.8+	1999 11 03	703	0.1+	0.2-

1996 03 15	566	0.4+	0.1+	1999 10 07	704	0.2+	1.3+	1999 11 03	703	0.0	0.6+
1996 03 24	809	0.2-	1.0+	1999 10 07	704	0.4+	0.8-	1999 11 03	703	0.2-	0.7+
1996 03 24	809	0.1-	0.8+	1999 10 07	704	0.1+	0.4-	1999 11 04	392	1.2-	0.2+
1996 03 24	809	0.9-	0.2+	1999 10 14	392	0.9+	1.0+	1999 11 04	392	0.5+	0.4+
1996 03 26	809	0.7+	0.7+	1999 10 14	392	0.1-	0.9+	1999 11 12	704	0.6+	0.0
1996 03 26	809	(1.9+	2.0+)	1999 10 16	120	0.7+	0.1-	1999 11 12	704	0.3+	0.4-
1996 03 26	809	1.4+	1.9+	1999 10 17	120	0.3+	0.0	1999 11 12	704	0.2+	0.4-
1998 08 17	704	0.2-	1.8-	1999 10 17	120	0.3-	0.3-	1999 11 12	704	0.2+	0.4-
1998 08 17	704	0.0	0.5-	1999 10 17	120	0.0	0.5+	1999 11 12	704	0.0	0.6-
1998 08 17	704	0.3+	0.9+	1999 10 18	392	0.4-	0.7+	1999 11 12	691	0.0	0.1-
1998 08 17	704	0.5+	0.1-	1999 10 18	392	0.9-	0.7+	1999 11 12	691	0.1-	0.2-
1999 10 01	703	0.0	0.3+	1999 10 29	703	0.4-	0.3+	1999 11 12	691	0.1-	0.1-

1999 TJ₄ = 1997 ED₄₈

Id. G. V. Williams, A. Doppler

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	100.45951		(2000.0)	P	Q		
<i>n</i>	0.19079053	ω	43.62868	-0.11372486	+0.99100402		
<i>a</i>	2.9883503	Ω	219.99576	-0.93900454	-0.13041254		
<i>e</i>	0.0730966	<i>i</i>	6.30207	-0.32455683	+0.03005998		
<i>P</i>	5.17	<i>H</i>	13.5	<i>G</i>	0.15	<i>U</i>	3

Residuals in seconds of arc

1997 03 11	809	0.3-	0.4-	1999 09 18	704	0.4+	0.5-	1999 10 04	704	0.4+	0.8+
1997 03 11	809	0.5-	0.9-	1999 09 18	704	0.5+	0.2-	1999 10 04	704	0.4-	1.2+
1997 03 11	809	0.9-	0.8-	1999 10 02	703	0.2+	0.3-	1999 10 06	691	0.2-	0.0
1997 03 12	809	1.1+	1.9+	1999 10 02	703	0.1-	0.8+	1999 10 06	691	0.1-	0.1-
1997 03 12	809	1.1+	1.8+	1999 10 02	703	0.2-	0.3+	1999 10 06	691	0.4-	0.3-
1997 03 12	809	(0.1+	2.2+)	1999 10 02	703	0.4-	0.2-	1999 10 07	704	(2.4-	0.7-)
1998 06 24	704	0.5-	0.7+	1999 10 03	704	0.6+	0.7+	1999 10 07	704	0.7-	1.0-
1998 06 24	704	0.5+	0.2+	1999 10 03	704	0.4+	0.5-	1999 10 07	704	0.3-	0.7-
1998 06 24	704	0.4-	0.3-	1999 10 03	704	0.2+	0.3+	1999 10 07	704	0.4+	1.5+
1998 06 24	704	0.3+	0.0	1999 10 03	704	0.2-	0.3+	1999 10 30	703	0.1+	0.4-
1998 06 24	704	(2.6-	1.4-)	1999 10 03	704	0.2-	0.0	1999 10 30	703	1.5-	0.4+
1999 09 18	704	0.5+	0.2+	1999 10 04	704	0.3-	0.4-	1999 10 30	703	0.2-	0.3+
1999 09 18	704	0.3+	0.0	1999 10 04	704	0.5+	0.1-	1999 10 30	703	0.1-	0.7+
1999 09 18	704	0.4+	0.4-	1999 10 04	704	0.1-	0.7-				

1999 TO₅ = 1998 FY₁₄₄

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	18.85624		(2000.0)	P	Q		
<i>n</i>	0.25849607	ω	309.94011	+0.86797310	+0.49562090		
<i>a</i>	2.4406196	Ω	20.40896	-0.42380741	+0.77215264		
<i>e</i>	0.2134084	<i>i</i>	5.15736	-0.25886286	+0.39766850		
<i>P</i>	3.81	<i>H</i>	15.2	<i>G</i>	0.15	<i>U</i>	4

Residuals in seconds of arc

1998 03 25	704	1.5+	1.1-	1999 10 01	120	0.9+	0.2-	1999 10 07	704	0.3-	0.2+
1998 03 25	704	1.6-	0.5+	1999 10 02	703	0.5-	0.5+	1999 10 07	704	0.5-	0.2+
1998 03 25	704	0.3-	1.5+	1999 10 02	703	0.2+	0.3+	1999 10 07	704	0.4-	0.1+
1998 03 29	704	0.4+	0.6+	1999 10 02	703	0.1-	0.3-	1999 10 07	120	0.2-	0.5-
1998 03 29	704	1.5+	0.6+	1999 10 02	703	0.7-	0.3+	1999 10 07	120	1.3+	0.1-
1998 03 29	704	0.3+	0.6-	1999 10 04	704	0.7-	0.4+	1999 10 09	703	0.3-	0.0
1998 03 29	704	(2.2+	0.7+)	1999 10 04	704	0.4+	0.2+	1999 10 09	703	0.2+	0.3+
1998 03 29	704	(0.1+	2.4+)	1999 10 04	704	0.4-	0.4-	1999 10 09	703	0.1+	0.7+
1998 04 20	704	0.6-	0.4+	1999 10 04	704	1.0-	0.7-	1999 10 09	703	0.0	0.6+
1998 04 20	704	(4.2+	2.0-)	1999 10 06	120	0.4+	0.1-	1999 10 30	703	0.4+	0.0
1998 04 20	704	0.2-	0.1+	1999 10 06	120	0.4+	0.1-	1999 10 30	703	0.3+	0.4+
1998 04 20	704	0.0	0.0	1999 10 07	704	0.2-	0.0	1999 10 30	703	0.1-	0.2+
1999 10 01	120	0.4-	0.1+	1999 10 07	704	0.5-	0.3-	1999 10 30	703	0.7+	0.3-

1999 TQ₅ = 1987 YR₂ = 1991 XQ₅

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	328.25859		(2000.0)	P	Q		
<i>n</i>	0.23655743	ω	206.37340	+0.67734708	-0.73522552		
<i>a</i>	2.5892758	Ω	201.02103	+0.68684596	+0.64438282		
<i>e</i>	0.1722713	<i>i</i>	4.05796	+0.26352144	+0.21027177		
<i>P</i>	4.17	<i>H</i>	14.8	<i>G</i>	0.15	<i>U</i>	3

Residuals in seconds of arc

1987 12 20	010	0.6+	1.0-	1999 10 04	704	0.1+	0.5+	1999 10 09	703	1.8-	0.1+
1987 12 20	010	0.5-	1.2+	1999 10 04	704	0.2+	0.2-	1999 10 09	703	0.1-	0.3+
1991 12 11	033	0.4-	0.4-	1999 10 04	704	0.2-	0.4-	1999 10 09	703	1.0-	1.8-
1991 12 12	033	0.1+	0.1-	1999 10 04	704	0.4-	0.2-	1999 10 09	703	0.5+	0.2-
1991 12 12	033	0.2+	0.5+	1999 10 04	704	0.4-	0.3-	1999 11 01	703	0.6-	0.1-
1995 10 28	327	0.1-	0.1-	1999 10 06	120	1.0-	0.1-	1999 11 01	703	0.2+	0.0
1995 10 28	327	0.2-	0.6-	1999 10 06	120	0.5+	0.0	1999 11 01	703	0.2-	0.4+
1995 10 28	327	0.4+	0.3-	1999 10 07	704	0.3+	0.3+	1999 11 01	703	0.1-	0.1+
1999 10 01	120	0.3+	0.5+	1999 10 07	704	0.3-	0.1-	1999 11 12	704	0.4+	0.6+
1999 10 01	120	1.6+	0.2+	1999 10 07	704	0.1+	0.1+	1999 11 12	704	0.5+	0.4+
1999 10 02	703	0.0	0.4-	1999 10 07	704	0.1+	0.3-	1999 11 12	704	0.2+	0.2+
1999 10 02	703	0.4+	0.2+	1999 10 07	704	0.4-	0.1+	1999 11 12	704	0.3+	0.3+
1999 10 02	703	0.4+	0.5+	1999 10 07	120	0.3+	0.1+	1999 11 12	704	0.3+	0.2-
1999 10 02	703	0.2-	0.4+	1999 10 07	120	0.2-	0.2-				

1999 TR₅ = 1998 KN₂₂

Id. A. Doppler

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	9.78844		(2000.0)	P	Q		
<i>n</i>	0.24160623	ω	323.23996	+0.98519314	+0.15789596		
<i>a</i>	2.5530773	Ω	27.89804	-0.10238036	+0.85437137		
<i>e</i>	0.2100986	<i>i</i>	8.20894	-0.13752362	+0.49509436		
<i>P</i>	4.08	<i>H</i>	14.3	<i>G</i>	0.15	<i>U</i>	4

Residuals in seconds of arc

1998 04 22	704	0.6+	0.9-	1999 09 14	703	0.0	0.1+	1999 10 07	120	0.2-	0.2-
1998 04 22	704	1.3-	1.4+	1999 09 14	703	0.3-	0.2+	1999 10 07	704	0.1+	0.1+
1998 04 22	704	0.7-	1.3+	1999 09 14	703	0.0	0.1+	1999 10 07	704	0.4-	0.7-
1998 04 22	704	0.3+	0.5-	1999 09 14	703	0.2-	0.5+	1999 10 07	704	0.2+	0.2-
1998 04 22	704	1.3+	0.2+	1999 10 02	120	0.1-	0.3-	1999 10 07	704	0.1+	0.3-
1998 05 22	704	0.2-	0.2-	1999 10 02	120	0.2+	0.6-	1999 10 07	704	0.1-	0.2+
1998 05 22	704	0.4+	0.5+	1999 10 03	704	0.7+	0.4-	1999 11 04	704	0.1-	0.0
1998 05 22	704	1.0-	0.9+	1999 10 03	704	0.3+	0.3-	1999 11 04	704	0.0	0.1-
1998 05 22	704	(3.1-	0.6+)	1999 10 03	704	(0.3+	3.1+)	1999 11 04	704	0.0	0.0
1998 05 24	704	0.5+	0.3-	1999 10 03	704	0.1+	2.0+	1999 11 04	704	0.3-	0.2-
1998 05 24	704	0.4-	0.7-	1999 10 03	704	0.2+	0.3+	1999 11 11	703	0.2-	0.1+
1998 05 24	704	1.5+	0.3-	1999 10 03	704	0.6-	1.3+	1999 11 11	703	0.1+	0.2+
1998 05 24	704	0.7-	0.5-	1999 10 03	704	0.2-	1.0-	1999 11 11	703	0.2+	0.3+
1998 05 24	704	0.1-	0.4-	1999 10 05	120	0.0	1.2-	1999 11 11	703	0.3+	0.5+

1999 TJ₆ = 1961 CY = 1982 VC₈ = 1990 FY₄ = 1993 SX₈ = 1996 FS₁₈Id. G. V. Williams (*MPC* 36485), M. E. Sansaturio

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	291.42855		(2000.0)	P	Q		
<i>n</i>	0.17117845	ω	57.00507	-0.28957915	-0.95695419		
<i>a</i>	3.2124521	Ω	49.84026	+0.86941218	-0.27152585		
<i>e</i>	0.1580311	<i>i</i>	1.46657	+0.40033282	-0.10252994		
<i>P</i>	5.76	<i>H</i>	13.5	<i>G</i>	0.15	<i>U</i>	1

Residuals in seconds of arc

1961 02 15	033	0.9+	0.1+	1998 08 17	704	(2.4+	2.8-)	1999 11 04	704	0.7-	0.3-
1961 02 15	033	1.1-	0.4+	1998 08 17	704	(3.4-	1.4-)	1999 11 04	704	0.4-	0.1+
1961 02 17	033	(5.5-	1.5+)	1999 10 02	120	0.1+	0.8+	1999 11 04	704	0.4-	0.1-
1961 02 17	033	1.4+	0.6+	1999 10 02	120	0.1-	0.0	1999 11 04	704	0.2-	0.2+
1982 11 09	095	1.7-	1.9-	1999 10 03	704	0.1+	0.2+	1999 11 04	704	0.2-	0.9-
1990 03 27	675	(0.0	2.7-)	1999 10 03	704	0.2+	0.3-	1999 11 07	120	0.8+	0.5+

1990 03 27	675	(0.9+ 2.6-)	1999 10 03	704	0.5+ 0.8-	1999 11 07	120	0.4- 0.4-
1993 09 17	809	1.3+ 0.6+	1999 10 03	704	0.8+ 0.0	1999 11 07	120	0.2+ 0.1-
1993 09 17	809	0.9- 0.1-	1999 10 03	704	0.1+ 0.4-	1999 11 08	120	0.8- 0.1-
1993 09 17	809	1.2- 0.2-	1999 10 08	120	1.6+ 0.5+	1999 11 08	120	0.9- 0.9-
1993 09 18	809	1.0+ 0.5-	1999 10 08	120	0.6+ 0.2+	1999 11 09	704	0.5- 0.4+
1993 09 18	809	0.6+ 0.4+	1999 10 17	120	0.2- 0.1-	1999 11 09	704	0.1+ 0.1+
1993 09 18	809	0.3- 0.4-	1999 10 17	120	0.5+ 0.1+	1999 11 09	704	0.3- 0.2+
1993 09 18	691	0.2- 0.2-	1999 10 20	120	0.7- 0.0	1999 11 09	704	0.6- 0.4+
1993 09 18	691	0.4- 0.1-	1999 10 20	120	1.4+ 0.2+	1999 11 12	704	0.1+ 0.4+
1993 09 18	691	0.2+ 0.1+	1999 10 27	120	1.2- 0.1-	1999 11 12	704	0.6+ 0.0
1996 03 24	809	1.9+ 0.7+	1999 10 27	120	1.9+ 1.8-	1999 11 12	704	0.5+ 0.2+
1996 03 24	809	1.4- 0.0	1999 10 29	703	0.5- 1.0+	1999 11 12	704	0.1+ 0.3+
1996 03 24	809	0.8- 0.1-	1999 10 29	703	0.6- 0.5+	1999 11 12	704	0.2+ 0.1-
1996 03 26	809	0.1+ 0.4+	1999 10 29	703	0.3- 0.4+	1999 11 16	704	0.2+ 0.3+
1996 03 26	809	0.6- 0.3+	1999 10 29	703	0.4- 0.4+	1999 11 16	704	0.2- 0.6+
1996 03 26	809	0.7+ 0.3+	1999 11 03	703	0.3- 0.8+	1999 11 16	704	0.5+ 0.0
1998 08 17	704	1.7+ 0.4+	1999 11 03	703	(2.3- 0.3-)	1999 11 16	704	0.3- 0.2-
1998 08 17	704	1.3- 0.7+	1999 11 03	703	0.1- 0.4+	1999 11 16	704	0.1+ 0.0
1998 08 17	704	0.0 1.2+	1999 11 03	703	0.5- 0.2+			

1999 TO₆ = 1997 GQ₄₀

Id. A. Doppler

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

				Williams			
<i>M</i>	350.41933	(2000.0)		P	Q		
<i>n</i>	0.17213298	ω	239.37605	+0.92656934	-0.37569966		
<i>a</i>	3.2005651	Ω	142.68322	+0.35438725	+0.85612719		
<i>e</i>	0.1746337	<i>i</i>	1.68835	+0.12601164	+0.35481825		
<i>P</i>	5.73	<i>H</i>	13.8	<i>G</i>	0.15	<i>U</i>	4

Residuals in seconds of arc

1997 04 07	809	0.0 0.0	1999 10 04	704	0.1+ 0.1+	1999 10 08	120	0.1+ 1.1-
1997 04 07	809	0.3- 0.4-	1999 10 04	704	0.2+ 0.2+	1999 10 16	120	0.0 0.2-
1997 04 07	809	0.5- 0.5+	1999 10 04	704	0.1+ 0.0	1999 10 16	120	0.2+ 0.2+
1997 04 08	809	0.5+ 0.4+	1999 10 06	120	0.4- 0.3-	1999 11 01	703	0.7- 0.1-
1997 04 08	809	0.3+ 0.4+	1999 10 06	120	0.5- 0.5-	1999 11 01	703	0.7- 0.4+
1997 04 08	809	0.1+ 0.3-	1999 10 07	704	0.9+ 0.4-	1999 11 01	703	1.0- 0.1+
1999 10 02	703	0.4- 0.3+	1999 10 07	704	0.4+ 0.0	1999 11 01	703	0.4- 0.2-
1999 10 02	703	0.2+ 0.7+	1999 10 07	704	0.3+ 0.2-	1999 11 12	704	0.3+ 0.5-
1999 10 02	703	0.5- 0.6+	1999 10 07	704	1.0+ 0.6-	1999 11 12	704	0.1- 0.2-
1999 10 02	703	0.9- 0.4+	1999 10 07	120	0.3+ 0.2-	1999 11 12	704	0.0 0.4+
1999 10 04	704	0.3- 0.4+	1999 10 07	120	0.5+ 0.3-	1999 11 12	704	0.3- 0.5+
1999 10 04	704	0.7- 0.5+	1999 10 08	120	0.7+ 0.4-	1999 11 12	704	1.3+ 0.7+

1999 TU₆ = 1988 RM₉ = 1998 HD₆₁

Id. S. Nakano

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

				Williams			
<i>M</i>	38.30543	(2000.0)		P	Q		
<i>n</i>	0.27630229	ω	300.08375	+0.71746962	+0.69640174		
<i>a</i>	2.3346031	Ω	15.79650	-0.61689892	+0.64600997		
<i>e</i>	0.1192688	<i>i</i>	3.40857	-0.32353217	+0.31256317		
<i>P</i>	3.57	<i>H</i>	14.8	<i>G</i>	0.15	<i>U</i>	3

Residuals in seconds of arc

1988 09 03	809	0.0 0.4-	1998 04 22	704	0.0 0.6+	1999 10 07	120	0.0 0.3-
1988 09 03	809	0.1+ 0.2-	1998 04 22	704	(3.2+ 0.2+)	1999 10 07	704	(2.1- 0.1+)
1988 09 03	809	0.1+ 0.0	1998 04 22	704	0.2+ 0.4+	1999 10 07	704	0.4- 0.1+
1994 02 12	809	(6.8- 0.2+)	1998 05 16	704	1.2- 0.7-	1999 10 07	704	0.3+ 0.0
1994 02 12	809	(7.9- 0.8+)	1998 05 16	704	1.2- 0.8+	1999 10 07	120	0.6+ 0.3+
1994 02 12	809	(7.9- 1.4-)	1998 05 16	704	0.3+ 0.8+	1999 10 07	120	0.6+ 0.3+
1998 04 01	704	0.3+ 0.4-	1998 05 16	704	1.2- 1.6+	1999 10 08	120	0.6- 0.7-
1998 04 01	704	1.2- 1.0+	1999 10 02	703	0.2- 0.7+	1999 10 08	120	0.3- 1.0+
1998 04 01	704	0.3- 1.3-	1999 10 02	703	0.2- 0.1+	1999 10 30	703	1.5- 0.7+
1998 04 01	704	1.9+ 0.3-	1999 10 02	703	0.2- 1.1+	1999 10 30	703	1.2- 0.3+
1998 04 21	704	1.3+ 0.1-	1999 10 02	703	0.0 0.4+	1999 10 30	703	0.6- 0.6+
1998 04 21	704	0.6+ 0.4-	1999 10 04	704	0.2- 0.8+	1999 10 30	703	1.2- 0.4+
1998 04 21	704	1.0+ 0.1+	1999 10 04	704	0.0 0.5+	1999 11 08	106	0.5+ 1.3-

1998 04 21	704	0.3+ 0.0	1999 10 04	704	0.0 0.4+	1999 11 08	106	0.4- 0.5-
1998 04 21	704	0.4+ 1.3+	1999 10 04	704	1.5+ 0.1+	1999 11 08	106	0.3+ 0.8-
1998 04 22	704	0.0 0.3-	1999 10 06	120	0.8+ 0.5-	1999 11 13	106	1.0- 0.2-
1998 04 22	704	0.1- 0.1+	1999 10 06	120	1.5+ 0.0	1999 11 13	106	0.2+ 0.3-

1999 TD₇ = 1994 RZ₂₈

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

				Doppler			
<i>M</i>	339.69799	(2000.0)		P	Q		
<i>n</i>	0.20637270	ω	211.59295	+0.81994587	-0.57242684		
<i>a</i>	2.8359673	Ω	183.33502	+0.53860075	+0.77384287		
<i>e</i>	0.1913154	<i>i</i>	3.97778	+0.19390204	+0.27109912		
<i>P</i>	4.78	<i>H</i>	14.7	<i>G</i>	0.15	<i>U</i>	5

Residuals in seconds of arc

1994 09 01	033	0.4- 0.2-	1999 10 04	704	0.6+ 0.0	1999 10 07	120	0.2+ 0.2-
1994 09 02	033	0.6- 0.1+	1999 10 04	704	0.8+ 0.4+	1999 10 07	120	0.5- 0.0
1994 09 04	033	0.2- 0.0	1999 10 04	704	0.4+ 0.8-	1999 10 08	120	0.1+ 1.1+
1999 10 02	703	0.2- 0.2+	1999 10 06	120	0.6- 1.0-	1999 10 08	120	0.6+ 0.3-
1999 10 02	703	0.2- 0.4+	1999 10 06	120	0.2- 0.3-	1999 10 09	703	0.4- 0.5+
1999 10 02	703	0.6- 0.3+	1999 10 07	704	0.1+ 0.5-	1999 10 09	703	0.2+ 0.7+
1999 10 02	703	0.2+ 0.8+	1999 10 07	704	0.4- 0.3-	1999 10 09	703	0.5+ 0.7-
1999 10 04	704	0.3+ 0.3-	1999 10 07	704	0.6- 0.0	1999 10 09	703	0.2+ 0.4+
1999 10 04	704	0.0 0.0	1999 10 07	704	0.6- 0.3-			

1999 TH₇ = 1994 JK₈

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

				Williams			
<i>M</i>	239.12050	(2000.0)		P	Q		
<i>n</i>	0.27175580	ω	283.51856	-0.71350432	-0.69847879		
<i>a</i>	2.3605697	Ω	212.22979	+0.67616440	-0.66581546		
<i>e</i>	0.0584052	<i>i</i>	5.93304	+0.18361179	-0.26233024		
<i>P</i>	3.63	<i>H</i>	14.2	<i>G</i>	0.15	<i>U</i>	3

Residuals in seconds of arc

1994 05 04	675	0.2- 0.3+	1999 10 03	704	0.3- 0.3+	1999 10 08	120	0.2+ 0.3+
1994 05 04	675	1.3- 0.3+	1999 10 06	704	0.3+ 0.3-	1999 10 08	120	0.6+ 0.5+
1994 05 05	675	1.2+ 0.1-	1999 10 06	704	0.4+ 0.5-	1999 10 09	703	0.0 0.4+
1994 05 05	675	0.7+ 0.7+	1999 10 06	704	0.0 0.9-	1999 10 09	703	0.3- 0.3+
1998 06 24	704	0.2+ 0.5+	1999 10 06	704	0.2+ 0.9-	1999 10 09	703	0.1+ 0.2+
1998 06 24	704	1.5- 0.8-	1999 10 06	704	0.0 1.2-	1999 10 09	703	0.2+ 0.7+
1998 06 24	704	1.3+ 0.0	1999 10 06	120	0.6+ 0.1+	1999 11 02	703	0.1+ 0.2-
1999 10 02	703	0.5- 0.4+	1999 10 07	120	0.1+ 0.4-	1999 11 02	703	0.3+ 0.1+
1999 10 02	703	0.0 0.7+	1999 10 07	704	0.2+ 0.2-	1999 11 02	703	0.6- 1.1+
1999 10 02	703	0.3- 0.8+	1999 10 07	704	0.1+ 0.0	1999 11 02	703	0.2+ 0.3+
1999 10 02	703	0.1+ 0.6+	1999 10 07	704	0.4- 0.3-	1999 11 12	704	0.3- 0.3-
1999 10 03	704	0.0 0.2-	1999 10 07	704	0.3+ 0.3-	1999 11 12	704	0.3- 0.1-
1999 10 03	704	0.0 0.0	1999 10 07	704	0.0 0.2+	1999 11 12	704	0.1- 0.3-
1999 10 03	704	0.1+ 0.0	1999 10 07	120	0.2- 0.3-	1999 11 12	704	0.3- 0.2+
1999 10 03	704	0.2- 0.2+	1999 10 07	120	0.5- 0.2+			

1999 TO₇ = 1992 AF₄

Id. A. Doppler

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

				Williams			
<i>M</i>	2.13457	(2000.0)		P	Q		
<i>n</i>	0.23118393	ω	325.05575	+0.92316285	-0.32558215		
<i>a</i>	2.6292444	Ω	55.23311	+0.38424365	+0.76595646		
<i>e</i>	0.1773061	<i>i</i>	14.40542	+0.01127701	+0.55435274		
<i>P</i>	4.26	<i>H</i>	13.3	<i>G</i>	0.15	<i>U</i>	3

Residuals in seconds of arc

1992 01 13	303	0.8+ 0.3+	1999 10 08	703	0.1- 0.5+	1999 11 04	704	0.1+ 0.4-
1992 01 14	303	0.8- 0.3-	1999 10 09	120	0.5+ 0.8-	1999 11 05	678	0.6+ 0.2+
1999 10 07	120	0.3- 0.5-	1999 11 04	678	0.2- 0.6+	1999 11 05	678	0.5+ 0.3+
1999 10 07	120	0.4- 0.2-	1999 11 04	678	1.2- 0.3-	1999 11 12	704	0

1999 10 08	703	0.1+	0.3+	1999 11 04	704	0.1+	0.1+	1999 11 12	704	1.1+	0.2−
1999 10 08	703	0.2−	0.6+	1999 11 04	704	0.0	0.2−	1999 11 12	704	1.6−	0.1+
1999 10 08	703	0.1+	0.5+	1999 11 04	704	0.1−	0.4−				

1999 TS₈ = 1998 HQ₇₉Id. T. Urata (*MPC* 36486); 1999 TS₈ = 1977 DG₁₀ (*ibid.*) is invalid

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	20.11312		(2000.0)	P	Q
<i>n</i>	0.24093323	ω	333.73603	+0.87296164	+0.48777540
<i>a</i>	2.5578294	Ω	357.06195	−0.43416989	+0.77359543
<i>e</i>	0.2103475	<i>i</i>	4.05466	−0.22233867	+0.40450620
<i>P</i>	4.09	<i>H</i>	15.0	<i>G</i> 0.15	<i>U</i> 4

Residuals in seconds of arc

1998 04 21	704	1.1−	0.1−	1999 10 08	888	0.3+	0.0	1999 10 30	703	0.1−	0.2+
1998 04 21	704	0.6+	0.1+	1999 10 08	106	0.3+	0.4+	1999 10 30	703	0.2−	0.1+
1998 04 21	704	0.6+	1.0−	1999 10 08	106	0.1+	0.0	1999 10 30	703	0.2−	0.4+
1998 04 21	704	(3.6−	1.4+)	1999 10 08	106	0.4−	0.7+	1999 10 30	703	1.1−	0.1+
1998 04 22	704	0.3+	0.3+	1999 10 09	888	1.0−	0.3−	1999 11 04	704	0.2+	0.1+
1998 04 22	704	0.9−	0.9+	1999 10 09	888	0.5+	0.9+	1999 11 04	704	0.6+	0.3−
1998 04 22	704	0.4+	0.5−	1999 10 09	888	0.1−	0.3−	1999 11 04	704	0.1−	0.5−
1998 04 22	704	(1.0−	2.3−)	1999 10 10	106	1.1+	0.3+	1999 11 04	704	0.0	0.6−
1999 10 05	888	0.3+	1.1−	1999 10 10	106	0.7+	0.0	1999 11 04	704	0.2+	1.0−
1999 10 05	888	0.0	0.1−	1999 10 10	106	0.5+	0.6+	1999 11 04	888	0.2+	0.1−
1999 10 07	704	0.4+	0.6−	1999 10 14	691	0.3−	0.1−	1999 11 04	888	0.2+	0.4−
1999 10 07	704	0.2+	0.0	1999 10 14	691	0.3−	0.1−	1999 11 13	888	0.4+	0.3+
1999 10 07	704	1.0−	0.2+	1999 10 14	691	0.5−	0.2−	1999 11 13	888	0.6−	0.7+
1999 10 07	704	0.1−	0.1+	1999 10 15	628	0.1+	0.1−	1999 11 13	888	0.4−	0.5+
1999 10 07	704	0.0	0.4−	1999 10 15	628	0.5+	0.6+	1999 11 14	704	0.2+	0.6+
1999 10 08	106	1.1+	0.4−	1999 10 15	628	1.1+	0.1+	1999 11 14	704	0.4−	0.5+
1999 10 08	106	0.3+	0.5−	1999 10 15	628	0.3−	0.3−	1999 11 14	704	0.5+	0.3+
1999 10 08	106	1.2−	0.6+	1999 10 15	628	0.9+	0.5+	1999 11 14	704	0.6+	0.2−
1999 10 08	691	0.1+	0.4−	1999 10 18	113	(3.4−	0.7−)	1999 11 14	704	0.6−	1.0−
1999 10 08	691	0.0	0.4−	1999 10 18	113	1.9−	1.4+	1999 11 16	704	0.6+	1.3+
1999 10 08	691	0.1+	0.4−	1999 10 18	113	0.4−	0.0	1999 11 16	704	0.6+	0.8−
1999 10 08	888	0.0	0.0	1999 10 19	113	(3.1−	1.6−)	1999 11 16	704	0.1−	1.5−
1999 10 08	888	0.2−	0.4+	1999 10 19	113	1.0−	0.0	1999 11 16	704	(0.5−	2.3−)

1999 TN₉ = 1998 KC₁₈

Id. A. Doppler

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	99.37459		(2000.0)	P	Q
<i>n</i>	0.27815639	ω	232.73229	−0.14165842	+0.98784418
<i>a</i>	2.3242171	Ω	29.31736	−0.86182093	−0.09125863
<i>e</i>	0.0910889	<i>i</i>	7.51113	−0.48702934	−0.12584016
<i>P</i>	3.54	<i>H</i>	15.2	<i>G</i> 0.15	<i>U</i> 4

Residuals in seconds of arc

1998 04 22	704	0.0	0.3+	1998 05 22	704	0.1−	0.2+	1999 10 07	704	0.1−	0.0
1998 04 22	704	0.6+	0.4−	1998 05 22	704	0.0	0.9+	1999 10 07	120	1.1+	0.3−
1998 04 22	704	0.2−	0.1−	1998 05 24	704	0.2+	0.2−	1999 10 08	120	1.2+	0.8+
1998 04 22	704	(0.4−	2.7+)	1998 05 24	704	0.1−	0.3−	1999 10 08	120	1.1+	0.9−
1998 04 22	704	0.1+	0.1−	1998 05 24	704	0.4−	0.1−	1999 10 09	120	1.5−	1.0−
1998 05 01	704	0.2+	0.8−	1998 05 24	704	0.3+	0.4+	1999 10 09	691	0.1+	0.4−
1998 05 01	704	1.0+	0.1+	1998 05 24	704	1.0−	1.0−	1999 10 09	691	0.1+	0.3−
1998 05 01	704	0.9+	1.3−	1999 09 14	703	0.2−	0.4+	1999 10 09	691	0.1+	0.4−
1998 05 01	704	0.4+	1.1−	1999 09 14	703	0.4−	1.3+	1999 10 10	684	0.3+	0.3−
1998 05 01	704	0.2+	0.7−	1999 09 14	703	0.4+	1.3+	1999 10 10	684	0.0	0.1−
1998 05 03	566	0.0	0.1−	1999 09 14	703	0.7−	0.1−	1999 10 10	684	0.2+	0.1−
1998 05 03	566	0.5−	0.1−	1999 10 02	703	1.2−	0.0	1999 10 11	684	0.2+	0.4−
1998 05 03	566	0.2−	0.2+	1999 10 02	703	0.9−	0.4+	1999 10 11	684	0.3+	0.2−
1998 05 05	699	0.2+	1.4+	1999 10 02	703	1.1−	0.5+	1999 10 11	684	0.1+	0.2−
1998 05 05	699	0.4−	0.5+	1999 10 02	703	0.5+	0.5+	1999 11 04	703	0.4+	0.2+
1998 05 05	699	0.1+	0.1−	1999 10 07	704	0.5+	0.5−	1999 11 04	703	0.9+	0.3−
1998 05 22	704	0.1−	0.5+	1999 10 07	704	0.4−	0.3+	1999 11 04	703	0.3+	0.1+

1998 05 22	704	1.0−	0.2+	1999 10 07	704	0.4−	0.4−	1999 11 04	703	0.0	0.1+
1998 05 22	704	0.6−	0.5+	1999 10 07	704	0.3−	0.6−				

1999 TQ₉ = 1989 YZ₃ = 1997 HX₈

Id. A. Doppler

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	349.07523		(2000.0)	P	Q
<i>n</i>	0.18105153	ω	195.83661	+0.88392153	−0.46762797
<i>a</i>	3.0945767	Ω	192.04484	+0.43039380	+0.81569883
<i>e</i>	0.1983066	<i>i</i>	0.71694	+0.18287678	+0.34052827
<i>P</i>	5.44	<i>H</i>	13.8	<i>G</i> 0.15	<i>U</i> 4

Residuals in seconds of arc

1989 12 30	413	2.3−	0.3+	1999 10 02	703	0.7−	0.3+	1999 10 15	691	0.4+	0.4−
1989 12 30	413	1.2−	0.5+	1999 10 02	703	0.1+	0.2+	1999 10 16	681	0.0	0.7+
1989 12 31	413	2.4+	1.0−	1999 10 02	703	0.7−	0.1+	1999 10 16	681	0.1+	0.6+
1989 12 31	413	1.2+	0.6+	1999 10 03	704	0.3−	0.1+	1999 10 31	691	0.1+	0.3−
1997 04 08	704	0.0	0.9+	1999 10 03	704	(1.2−	2.2+)	1999 10 31	691	0.2+	0.3−
1997 04 08	704	0.2−	1.8+	1999 10 03	704	0.6−	0.8+	1999 10 31	691	0.1+	0.2−
1997 04 30	704	0.6−	0.5−	1999 10 03	704	0.3−	0.9+	1999 11 03	703	0.1+	0.2+
1997 04 30	704	0.1−	0.4+	1999 10 03	704	0.9−	0.8+	1999 11 03	703	0.2+	0.3+
1997 04 30	704	1.2+	0.9+	1999 10 07	704	1.3+	0.2+	1999 11 03	703	0.5+	0.2+
1997 04 30	704	0.3+	0.0	1999 10 07	704	0.1+	0.2−	1999 11 03	703	0.3+	0.5+
1997 05 01	704	0.0	0.4+	1999 10 07	704	0.5+	0.1−	1999 11 04	691	0.5+	0.3−
1997 05 01	704	0.7+	0.6−	1999 10 07	704	0.3−	0.0	1999 11 04	691	0.5+	0.4−
1997 05 01	704	0.2+	0.0	1999 10 07	704	0.2−	0.5−	1999 11 04	691	0.5+	0.4−
1997 05 01	704	0.4−	0.3+	1999 10 08	120	0.2+	0.3−	1999 11 09	723	0.7+	0.0
1997 05 01	704	0.2+	0.0	1999 10 08	120	0.2+	0.3+	1999 11 09	723	(3.8+	0.8−)
1997 05 05	704	0.1−	0.2+	1999 10 08	120	0.5+	0.6−	1999 11 09	723	0.0	0.0
1997 05 05	704	0.3+	0.1−	1999 10 09	120	0.5+	0.1−	1999 11 11	723	0.6−	0.1−
1997 05 05	704	0.2+	0.9−	1999 10 10	681	0.0	0.3+	1999 11 11	723	1.0−	0.2−
1997 05 05	704	0.4−	0.3−	1999 10 10	681	0.0	0.4+	1999 11 11	723	1.7−	0.1−
1997 05 05	704	0.4+	0.1+	1999 10 10	681	0.1−	0.1−	1999 11 12	704	0.2−	0.1+
1997 05 05	704	0.1+	0.2−	1999 10 13	727	0.1−	0.2−	1999 11 12	704	0.0	1.0+
1997 05 05	704	1.1−	0.5−	1999 10 13	727	0.2−	0.7−	1999 11 12	704	0.6−	0.0
1997 05 05	704	0.4+	0.3+	1999 10 13	727	0.6−	0.2−	1999 11 12	704	0.4+	0.8−
1997 05 05	704	0.8−	0.8−	1999 10 15	691	0.4+	0.4−	1999 11 12	704	0.2−	0.1+
1999 10 02	703	0.0	0.5+	1999 10 15	691	0.2+	0.5−				

1999 TR₉ = 1981 TA₃ = 1981 VA₁

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	333.74849		(2000.0)	P	Q
<i>n</i>	0.27454949	ω	22.34715	+0.74954736	−0.66179006
<i>a</i>	2.3445290	Ω	19.11236	+0.60039268	+0.67040045
<i>e</i>	0.2465749	<i>i</i>	2.55285	+0.27876044	+0.33555501
<i>P</i>	3.59	<i>H</i>	15.3	<i>G</i> 0.15	<i>U</i> 4

Residuals in seconds of arc

1981 10 06	095	0.7+	1.5−	1999 10 07	704	0.3−	0.7−	1999 11 03	703	0.2+	0.8+
1981 11 02	688	(3.1+	3.6−)	1999 10 07	704	0.4+	0.5−	1999 11 03	703	0.3−	0.4+
1981 11 02	688	(2.7+	3.7−)	1999 10 07	704	0.0	0.2+	1999 11 04	704	0.3+	0.3−
1999 10 02	703	0.4−	0.5+	1999 10 07	704	1.5−	0.6−	1999 11 04	704	0.5+	0.3−
1999 10 02	703	0.1−	0.3+	1999 10 08	120	0.0	0.2−	1999 11 04	704	0.0	0.2−
1999 10 02	703	0.1+	0.2+	1999 10 08	120	0.2+	0.2+	1999 11 04	703	0.1+	0.1+
1999 10 02	703	0.2−	0.1−	1999 10 08	120	0.1−	0.1+	1999 11 04	704	0.2+	0.2−
1999 10 03	704	1.5+	0.2−	1999 10 09	120	0.3−	0.3−	1999 11 04	703	0.0	0.1+
1999 10 03	704	0.0	1.8+	1999 11 03	691	0.2−	0.1+	1999 11 04	704	0.1+	0.2−
1999 10 03	704	0.3−	0.4+	1999 11 03	691	0.2−	0.0	1999 11 04	703	0.0	0.1+
1999 10 03	704	0.5−	0.3+	1999 11 03	691	0.4−	0.0	1999 11 04	703	0.1−	0.2+
1999 10 03	704	0.8−	0.9+	1999 11 03	703	0.0	0.2+	1999 11 10	120	0.2+	0.6−
1999 10 07	704	1.4+	0.6−	1999 11 03	703	0.1−	0.2+	1999 11 10	120	0.2+	0.3−

1999 NOV. 23

M.P.C. 36843

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	42.67905		(2000.0)	P	Q
<i>n</i>	0.28757213	ω	272.76666	+0.56041246	+0.82659120
<i>a</i>	2.2732028	Ω	31.49585	-0.71500997	+0.51443851
<i>e</i>	0.2069206	<i>i</i>	5.69199	-0.41796964	+0.22825426
<i>P</i>	3.43	<i>H</i>	15.0	<i>G</i> 0.15	<i>U</i> 4

Residuals in seconds of arc

1998 03 20	704	0.5-	0.1+	1998 04 19	704	1.0-	0.7+	1999 11 03	703	0.5-	0.2+
1998 03 20	704	0.1-	1.3-	1998 04 19	704	0.7+	0.1-	1999 11 04	704	0.3-	0.6-
1998 03 20	704	0.2-	1.1-	1998 04 19	704	0.0	1.6+	1999 11 04	704	0.3-	0.6-
1998 03 20	704	1.3+	0.2-	1999 10 07	704	0.3+	0.3+	1999 11 04	704	0.2+	0.5+
1998 03 20	704	0.1-	0.4+	1999 10 07	704	0.9+	0.1-	1999 11 04	703	0.3-	0.3+
1998 03 22	704	0.6-	0.1-	1999 10 07	704	0.5-	0.4-	1999 11 04	704	0.0	0.1-
1998 03 22	704	0.0	0.9+	1999 10 07	704	0.6+	0.3+	1999 11 04	703	0.9-	0.8+
1998 03 22	704	0.4+	0.2-	1999 10 07	704	0.5+	0.8+	1999 11 04	704	0.4-	0.3-
1998 03 22	704	0.3-	0.2-	1999 10 08	120	0.2-	0.1+	1999 11 04	703	0.4-	0.2+
1998 03 22	704	0.3+	0.5-	1999 10 08	120	0.4-	0.1+	1999 11 04	703	0.4+	0.4+
1998 03 26	566	0.2-	0.1-	1999 10 08	120	0.2+	0.2+	1999 11 12	704	0.2+	0.3-
1998 03 26	566	0.1-	0.3+	1999 10 09	120	1.0+	0.1+	1999 11 12	704	0.0	0.3-
1998 03 26	566	0.1+	0.1+	1999 11 03	703	0.5-	0.2-	1999 11 12	704	0.4+	0.2-
1998 04 19	704	0.2+	0.1+	1999 11 03	703	0.8-	0.3+	1999 11 12	704	0.2+	0.2-
1998 04 19	704	0.2+	0.1+	1999 11 03	703	0.1-	0.7-	1999 11 12	704	0.5+	0.0

1999 TY₉ = 1995 WS₃₈

Id. A. Doppler

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	207.52761		(2000.0)	P	Q
<i>n</i>	0.22211898	ω	266.69823	-0.88713660	-0.44731306
<i>a</i>	2.7003016	Ω	246.70434	+0.45710059	-0.81771626
<i>e</i>	0.1538522	<i>i</i>	7.10325	+0.06362157	-0.36228600
<i>P</i>	4.44	<i>H</i>	14.0	<i>G</i> 0.15	<i>U</i> 5

Residuals in seconds of arc

1995 11 23	691	0.1+	0.2-	1999 09 08	704	0.3+	0.5-	1999 10 07	560	0.2+	0.8-
1995 11 23	691	0.2+	0.2-	1999 09 08	704	0.4-	0.1-	1999 10 07	560	1.5-	1.2+
1995 11 23	691	0.1+	0.3-	1999 09 08	704	0.8+	0.2-	1999 10 28	703	0.4+	0.4+
1995 11 30	691	0.2-	0.1-	1999 10 06	560	0.3+	0.3-	1999 10 28	703	0.8+	0.9+
1995 11 30	691	0.2-	0.3+	1999 10 06	560	1.8-	0.1-	1999 10 28	703	0.1-	0.9+
1995 11 30	691	0.0	0.1+	1999 10 06	560	0.6+	1.4-	1999 10 28	703	0.4-	0.8+
1999 09 08	704	0.6+	0.2-	1999 10 07	560	1.6-	0.4-				
1999 09 08	704	1.4+	0.5+	1999 10 07	560	0.2+	0.3-				

1999 TZ₉ = 1997 JW₁₈

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	310.46523		(2000.0)	P	Q
<i>n</i>	0.21007709	ω	18.04672	+0.30486751	-0.95111297
<i>a</i>	2.8025299	Ω	54.23114	+0.86613186	+0.25531232
<i>e</i>	0.1989926	<i>i</i>	3.49022	+0.39606995	+0.17378070
<i>P</i>	4.69	<i>H</i>	15.0	<i>G</i> 0.15	<i>U</i> 5

Residuals in seconds of arc

1997 05 01	704	0.8-	0.2-	1999 10 04	704	0.1-	0.8+	1999 10 09	684	0.0	0.2-
1997 05 01	704	0.5+	0.6+	1999 10 04	704	0.7-	0.5-	1999 10 10	684	0.4+	0.2-
1997 05 01	704	0.0	0.2-	1999 10 04	704	1.1+	0.2-	1999 10 10	684	1.1+	0.1+
1997 05 01	704	0.6-	1.1+	1999 10 04	704	0.3+	1.5-	1999 10 11	684	0.5+	0.0
1997 05 05	704	0.6-	1.0-	1999 10 04	704	0.5+	0.5-	1999 10 11	684	0.3+	0.1-
1997 05 05	704	1.0-	0.4-	1999 10 07	704	0.2+	0.4+	1999 11 01	703	0.4-	0.3+
1997 05 05	704	0.7-	0.4+	1999 10 07	704	0.1-	0.7+	1999 11 01	703	(2.6+ 0.4+)	
1997 05 05	704	2.0+	0.1+	1999 10 07	704	0.0	0.0	1999 11 01	703	0.1-	0.4+
1997 05 05	704	1.0+	0.8-	1999 10 07	704	0.1-	0.0	1999 11 01	703	0.6-	0.2+
1997 05 05	704	0.2+	0.5+	1999 10 07	704	0.5+	0.2-	1999 11 01	684	0.2+	0.4-
1999 10 02	703	0.1-	0.4+	1999 10 07	704	0.5-	0.8+	1999 11 01	684	0.5+	0.3-
1999 10 02	703	1.8-	0.4-	1999 10 07	704	0.5-	0.9+	1999 11 04	684	0.0	0.3-

1999 10 02	703	0.2-	0.1+	1999 10 07	704	0.2-	0.1+	1999 11 04	684	0.2-	0.1-
1999 10 02	703	0.2-	0.1+	1999 10 09	684	0.0	0.2-				

1999 TX₁₀ = 1972 TT₁₀ = 1988 GV₁ = 1992 CV = 1998 MJ₄₇

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	295.84469		(2000.0)	P	Q
<i>n</i>	0.22020362	ω	322.05974	+0.06592084	-0.99663083
<i>a</i>	2.7159373	Ω	124.10971	+0.92929724	+0.04350877
<i>e</i>	0.0079147	<i>i</i>	3.37894	+0.36340210	+0.06952674
<i>P</i>	4.48	<i>H</i>	13.5	<i>G</i> 0.15	<i>U</i> 1

Residuals in seconds of arc

1972 10 09	033	0.7+	0.4-	1998 07 01	809	0.1+	0.1+	1999 10 12	143	0.6+	0.2+
1972 10 09	033	0.8+	0.9-	1998 07 01	809	0.0	0.7+	1999 10 12	143	0.6+	0.1+
1972 10 09	033	0.1+	0.8-	1998 07 01	809	0.4+	0.2+	1999 10 12	143	0.4+	0.1-
1972 10 09	033	0.3-	1.2-	1999 10 02	703	0.4-	0.2+	1999 10 27	143	0.6+	0.5+
1988 04 09	054	0.6-	0.9+	1999 10 02	703	0.4-	0.5+	1999 10 27	143	0.3+	0.3+
1992 02 06	303	1.0+	0.0	1999 10 02	703	0.3-	0.7-	1999 10 27	143	0.0	0.8+
1992 02 07	303	0.1+	0.5+	1999 10 02	703	0.1+	0.5+	1999 10 27	143	0.1-	0.1+
1998 06 24	704	(2.4+ 0.9+)		1999 10 07	143	(6.7- 1.3-)		1999 10 30	703	0.5-	0.3+
1998 06 24	704	(3.1+ 0.4-)		1999 10 07	143	(8.1- 1.5-)		1999 10 30	703	0.8-	0.1-
1998 06 24	704	(2.8- 0.7-)		1999 10 07	143	(8.4- 0.9-)		1999 10 30	703	0.4-	0.1-
1998 06 24	704	0.8-	1.6+	1999 10 09	143	0.0	0.6+	1999 10 30	703	1.5-	0.0
1998 06 28	809	0.4-	0.0	1999 10 09	143	0.1-	0.2+	1999 10 31	143	0.0	0.2+
1998 06 28	809	0.4+	0.3-	1999 10 09	143	0.9-	0.3+	1999 10 31	143	0.1+	0.0
1998 06 28	809	0.4+	0.2-	1999 10 12	143	0.7+	0.3+	1999 10 31	143	0.2+	0.1+

1999 TH₁₁ = 1997 LK₁₂

Id. S. Nakano

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	329.47908		(2000.0)	P	Q
<i>n</i>	0.17210322	ω	185.21790	+0.66091724	-0.73008383
<i>a</i>	3.2009340	Ω	223.56650	+0.69732783	+0.68298465
<i>e</i>	0.0872929	<i>i</i>	14.59643	+0.27734871	+0.02257370
<i>P</i>	5.73	<i>H</i>	12.8	<i>G</i> 0.15	<i>U</i> 4

Residuals in seconds of arc

1997 06 07	809	0.2+	0.8+	1999 10 09	678	0.7+	0.5+	1999 10 28	678	0.9-	1.0-
1997 06 07	809	0.3+	0.0	1999 10 09	678	0.3+	0.4+	1999 11 04	704	0.6+	0.2-
1997 06 07	809	0.0	0.9+	1999 10 10	678	0.5+	1.7+	1999 11 04	704	0.2+	0.0
1997 06 08	809	0.0	0.1-	1999 10 10	678	1.6-	0.6-	1999 11 04	704	0.9+	0.0
1997 06 08	809	0.2-	0.6-	1999 10 10	678	0.6-	0.7-	1999 11 04	703	0.5-	0.6+
1997 06 08	809	0.3-	0.9-	1999 10 16	678	1.1+	0.6+	1999 11 04	704	1.0+	0.5-
1999 10 03	704	0.7+	0.2+	1999 10 16	678	0.4-	0.1-	1999 11 04	703	0.1-	0.5+
1999 10 03	704	0.1+	0.7-	1999 10 19	678	0.0	0.5+	1999 11 04	704	0.5+	0.6-
1999 10 03	704	0.3-	0.1+	1999 10 19	678	0.5+	0.5+	1999 11 04	703	0.2-	0.4+
1999 10 03	704	0.3+	0.1-	1999 10 19	678	0.9+	0.1+	1999 11 04	703	0.5-	0.5+
1999 10 03	704	0.0	0.9-	1999 10 28	678	0.5-	0.2-				
1999 10 09	678	0.7-	0.3-	1999 10 28	678	1.7-	1.1-				

1999 TW₁₁ = 1990 EQ₃

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	281.41713		(2000.0)	P	Q
<i>n</i>	0.27658934	ω	285.96117	-0.36269429	-0.93187844
<i>a</i>	2.3329876	Ω	185.32227	+0.88276938	-0.34099870
<i>e</i>	0.1081603	<i>i</i>	4.60384	+0.29861527	-0.12378395
<i>P</i>	3.56	<i>H</i>	15.1	<i>G</i> 0.15	<i>U</i> 5

Residuals in seconds of arc

1990 02 28	809	0.1-	0.1+	1999 10 10	120	0.2-	0.7-	1999 11 01	703	0.6-	0.0
1990 02 28	809	0.5+	0.2+	1999 10 10	120	0.4+	0.9-	1999 11 04	704	0.1+	0.2-
1990 02 28	809	1.0+	0.3+	1999 10 10	120	1.4-	0.6-	1999 11 04	704	0.8-	0.1-
1990 03 01	809	0.0	0.5-	1999 10 11	120	0.3+	0.5-	1999 11 04	704	0.1+	0.0
1990 03 01	809	0.5+	0.5-	1999 10 11	120	0.2-	0.3+	1999 11 04	704	0.6-	0.3-
1990 03 01	809	0.8+	0.7-	1999 10 13	120	(1.4- 2.8-)		1999 11 04	704	0.3-	0.5+

1990 03 02	809	1.0-	0.5-	1999 10 13	120	0.5-	0.4-	1999 11 10	120	0.2+	0.3-
1990 03 02	809	0.4-	0.9-	1999 10 15	120	1.6+	1.4+	1999 11 10	120	0.4+	0.4+
1990 03 02	809	0.1-	0.7-	1999 10 15	120	0.6+	0.2+	1999 11 12	120	0.4+	0.4+
1990 03 04	809	0.4-	1.5+	1999 11 01	703	0.3-	0.3+	1999 11 12	120	0.1+	0.1+
1990 03 04	809	0.5-	1.2+	1999 11 01	703	0.3+	0.3+	1999 11 13	120	1.0+	0.0
1990 03 04	809	0.3-	0.4+	1999 11 01	703	0.2-	0.1-	1999 11 13	120	0.3-	0.0

1999 TC₁₂ = 1991 ND₅ = 1997 CV₁₃ = 1998 HT₉₁

Id. G. V. Williams, A. Doppler

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

				Williams			
<i>M</i>	13.72927	(2000.0)		P	Q		
<i>n</i>	0.26109811	ω	232.38785	+0.97173752	+0.22970246		
<i>a</i>	2.4243774	Ω	114.27415	-0.19337628	+0.90681951		
<i>e</i>	0.2052192	<i>i</i>	3.42331	-0.13539501	+0.35343338		
<i>P</i>	3.77	<i>H</i>	14.3	<i>G</i>	0.15	<i>U</i>	1

Residuals in seconds of arc

1991 07 10	809	0.4-	0.6-	1998 04 21	704	1.4+	0.3-	1999 10 10	143	0.2+	0.2-
1991 07 10	809	0.1+	0.9-	1998 04 21	704	0.5+	0.5+	1999 10 11	143	0.3-	0.2+
1991 07 10	809	0.3+	1.2-	1998 04 22	704	(2.8+	0.8-)	1999 10 11	143	0.4-	0.7-
1991 07 11	809	0.4-	0.5+	1998 04 22	704	(0.3+	3.1+)	1999 10 12	143	0.5+	0.6+
1991 07 11	809	0.0	0.6+	1998 04 22	704	0.5+	0.4-	1999 10 12	143	0.1+	0.5+
1991 07 11	809	0.5+	0.8+	1998 04 22	704	1.3-	1.1+	1999 10 14	143	0.8-	1.0-
1995 08 29	809	0.0	0.5-	1998 04 22	704	0.5+	0.9+	1999 10 14	143	(1.0-	2.1-)
1995 08 30	809	0.3+	0.7-	1998 05 01	704	0.6+	1.0+	1999 10 27	143	0.6+	0.8+
1997 02 06	566	0.1-	0.2+	1998 05 01	704	1.6-	0.4+	1999 10 27	143	1.3+	0.7+
1997 02 06	566	0.0	0.0	1998 05 01	704	0.6+	0.3+	1999 10 27	143	0.3+	0.9+
1997 02 06	566	0.3+	0.1+	1998 05 01	704	0.3-	0.1-	1999 10 28	143	0.6+	1.2-
1997 02 09	046	0.1+	0.3-	1998 05 22	704	(2.8-	0.0)	1999 10 28	143	0.7-	0.5-
1997 02 09	046	0.0	0.1-	1998 05 22	704	(2.7-	3.3+)	1999 10 28	143	0.6+	0.9-
1997 02 09	046	0.4-	0.5-	1998 05 22	704	0.9-	0.4+	1999 10 30	703	1.6-	0.5+
1997 02 10	046	0.2+	0.3-	1998 05 22	704	(4.8-	2.3+)	1999 10 30	703	0.1-	0.6+
1997 02 10	046	0.7+	0.1-	1999 10 07	704	0.4-	0.2-	1999 10 30	703	0.5-	0.4+
1997 02 10	046	1.1-	0.5-	1999 10 07	704	0.3-	0.2+	1999 10 30	703	0.4-	0.4-
1997 02 10	046	1.0-	0.3-	1999 10 07	704	0.2-	0.3+	1999 10 31	143	0.2+	0.2+
1997 02 10	046	0.6+	0.5-	1999 10 07	704	0.4-	0.1+	1999 10 31	143	0.0	0.2+
1998 04 21	704	0.3+	0.6+	1999 10 10	143	0.0	0.2-	1999 10 31	143	0.2+	0.6+
1998 04 21	704	0.1+	0.6-	1999 10 10	143	0.5+	0.4+	1999 10 31	143	0.1+	0.4+
1998 04 21	704	0.4+	1.6-	1999 10 10	143	0.2+	0.2-				

1999 TF₁₂ = 1997 GJ₁₅

Id. A. Doppler

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

				Williams			
<i>M</i>	32.04019	(2000.0)		P	Q		
<i>n</i>	0.19103930	ω	137.87371	+0.92979414	+0.36232187		
<i>a</i>	2.9857555	Ω	201.15108	-0.36703397	+0.89937479		
<i>e</i>	0.1404962	<i>i</i>	10.35400	-0.02772933	+0.24463822		
<i>P</i>	5.16	<i>H</i>	14.0	<i>G</i>	0.15	<i>U</i>	4

Residuals in seconds of arc

1997 03 11	809	0.9+	0.2-	1999 10 10	143	1.0+	0.3+	1999 10 30	703	0.3-	0.2+
1997 03 11	809	0.2+	0.5+	1999 10 10	143	0.2-	0.5+	1999 10 30	703	0.4-	0.1+
1997 03 11	809	0.4+	0.6-	1999 10 10	143	0.1-	0.6-	1999 10 30	703	1.0-	0.3+
1997 04 03	704	0.5+	0.4+	1999 10 10	143	0.4-	0.5-	1999 10 30	703	0.3+	0.3-
1997 04 03	704	1.1-	0.3+	1999 10 11	143	0.7-	0.8-	1999 11 12	143	0.2-	0.1+
1997 04 07	704	0.1-	0.5-	1999 10 11	143	1.3-	0.4-	1999 11 12	143	0.2-	0.2-
1997 04 07	704	0.6-	0.0	1999 10 26	143	1.4-	1.7-	1999 11 12	143	0.7+	0.7+
1999 10 02	703	0.7-	0.3+	1999 10 26	143	1.2+	0.7-	1999 11 12	143	1.0+	0.0
1999 10 02	703	0.2-	0.5+	1999 10 26	143	1.5+	0.9-	1999 11 13	143	0.4-	0.3+
1999 10 02	703	0.3-	0.3-	1999 10 27	143	0.5+	0.2+	1999 11 13	143	0.1-	0.3+
1999 10 02	703	0.6+	0.3+	1999 10 27	143	0.2-	0.3+	1999 11 13	143	0.2+	0.7+
1999 10 10	143	0.1-	0.4+	1999 10 27	143	0.6+	0.0	1999 11 13	143	0.3+	0.2+
1999 10 10	143	0.6+	1.0+	1999 10 27	143	0.5-	0.1-				

1999 TZ₁₂ = 1992 QG₁ = 1998 HC₈₃

Id. A. Doppler

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

				Williams			
<i>M</i>	9.97798	(2000.0)		P	Q		
<i>n</i>	0.29158158	ω	274.35508	+0.99403816	+0.07306382		
<i>a</i>	2.2523160	Ω	81.46941	-0.03388983	+0.91254016		
<i>e</i>	0.1900230	<i>i</i>	4.69413	-0.10363214	+0.40240793		
<i>P</i>	3.38	<i>H</i>	14.0	<i>G</i>	0.15	<i>U</i>	3

Residuals in seconds of arc

1992 08 23	675	0.2-	0.1-	1998 05 01	704	0.5+	0.3+	1999 10 10	358	0.4+	0.1+
1992 08 23	675	0.8+	0.7-	1998 05 01	704	0.3-	0.4-	1999 10 18	358	0.3-	0.4-
1992 08 28	675	0.6+	0.3-	1998 05 01	704	(2.2-	0.5+)	1999 10 18	358	0.1-	0.2-
1992 08 28	675	0.8+	0.1-	1998 05 16	704	0.2+	1.0-	1999 10 18	358	0.1-	1.7-
1992 10 25	808	0.3-	0.5-	1998 05 16	704	0.5-	0.8+	1999 11 01	703	0.1+	0.4+
1992 10 25	808	1.8-	1.0+	1998 05 16	704	0.7+	0.5+	1999 11 01	703	0.0	0.2+
1998 04 21	704	0.3+	0.5-	1998 05 16	704	0.3+	0.3+	1999 11 01	703	0.1-	0.2+
1998 04 21	704	0.3+	0.1-	1998 05 16	704	0.3+	0.2-	1999 11 01	703	0.0	0.4+
1998 04 21	704	0.0	0.6-	1999 09 16	704	0.3-	1.2+	1999 11 03	358	1.0+	0.5+
1998 04 21	704	1.1-	0.1+	1999 09 16	704	0.4-	0.2+	1999 11 03	358	0.1-	0.1-
1998 04 21	704	0.3+	0.7-	1999 09 16	704	0.6+	0.5+	1999 11 03	358	0.1-	0.9-
1998 04 22	704	0.1-	0.1+	1999 09 16	704	0.6+	0.5+	1999 11 04	704	0.3+	0.1-
1998 04 22	704	0.3-	0.5-	1999 10 08	358	0.3+	0.2+	1999 11 04	704	0.1+	0.4-
1998 04 22	704	0.2+	0.7-	1999 10 08	358	0.1-	0.4+	1999 11 04	704	0.5+	0.6-
1998 04 22	704	0.6-	1.2-	1999 10 08	358	1.0-	0.4-	1999 11 04	704	0.3-	1.1-
1998 04 22	704	0.4-	0.9-	1999 10 09	358	0.6+	0.3-	1999 11 04	704	0.3+	0.9-
1998 05 01	704	0.8-	0.3+	1999 10 09	358	0.2-	0.5-				
1998 05 01	704	0.1-	0.6+	1999 10 10	358	0.5-	0.2+				

1999 TG₁₃ = 1998 HR₆₂

Id. T. Urata, A. Doppler

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

				Williams			
<i>M</i>	27.48132	(2000.0)		P	Q		
<i>n</i>	0.29187809	ω	283.95142	+0.92991892	+0.36161022		
<i>a</i>	2.2507904	Ω	54.89017	-0.29782536	+0.84734902		
<i>e</i>	0.1964960	<i>i</i>	4.69782	-0.21575647	+0.38889289		
<i>P</i>	3.38	<i>H</i>	15.1	<i>G</i>	0.15	<i>U</i>	4

Residuals in seconds of arc

1998 03 29	704	0.0	1.1-	1999 10 11	385	0.1-	0.4-	1999 10 29	385	1.5+	0.1-
1998 03 29	704	1.0+	0.6-	1999 10 11	385	0.4-	0.4-	1999 11 03	704	0.3+	0.2-
1998 03 29	704	0.7+	0.1-	1999 10 12	385	1.1-	0.5+	1999 11 03	704	0.0	0.0
1998 03 29	704	1.5-	0.9+	1999 10 12	385	0.1-	0.3-	1999 11 03	704	0.4+	0.2+
1998 03 29	704	0.7-	0.2+	1999 10 12	888	0.2-	0.0	1999 11 03	704	0.3+	0.3+
1998 04 21	704	1.6+	0.0	1999 10 12	888	0.6+	0.4+	1999 11 08	120	0.0	0.6+
1998 04 21	704	0.9+	0.3-	1999 10 15	385	0.5+	1.3+	1999 11 08	120	0.6-	0.2-
1998 04 21	704	(2.7+	1.1-)	1999 10 17	385	0.9-	0.1+	1999 11 09	120	0.1+	0.1-
1998 04 21	704	(0.1-	3.5-)	1999 10 17	385	0.1+	0.1+	1999 11 09	120	0.9-	0.3+
1998 04 22	704	0.5+	0.8+	1999 10 17	385	0.0	0.0	1999 11 12	704	0.3-	0.2-
1998 04 22	704	0.4-	0.2+	1999 10 18	385	0.0	0.8-	1999 11 12	704	0.7-	0.6-
1998 04 22	704	1.2-	0.8+	1999 10 18	385	0.4+	0.2-	1999 11 12	704	0.5-	0.4-
1998 04 22	704	0.2-	1.2-	1999 10 20	888	0.5-	0.2+	1999 11 12	704	0.3+	0.6-
1998 04 22	704	0.3-	0.7+	1999 10 20	888	0.3+	0.3-	1999 11 18	385	0.0	0.1+
1999 10 10	385	0.2-	0.6+	1999 10 20	385	0.0	0.2+	1999 11 18	385	0.3+	0.0
1999 10 10	385	0.1+	0.2-	1999 10 20	888	0.1-	0.1-	1999 11 18	385	0.7+	0.4+
1999 10 10	385	0.2-	0.1-	1999 10 20	385	0.5-	0.0				
1999 10 11	385	0.2+	0.4-	1999 10 29	385	0.7+	0.7+				

1999 NOV. 23

M.P.C. 36845

1999 TH₁₃ = 1993 FQ₅₄

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>		(2000.0)		P		Q	
<i>n</i>	0.21781834	ω	230.49776	-0.22951024	+0.96828925		
<i>a</i>	2.7357291	Ω	26.73139	-0.81203238	-0.13458986		
<i>e</i>	0.1830830	<i>i</i>	12.67490	-0.53658966	-0.21047921		
<i>P</i>	4.52	<i>H</i>	13.6	<i>G</i>	0.15	<i>U</i>	5
Residuals in seconds of arc							
1993 03 17	809	1.5-	0.6+	1999 10 07	704	0.4-	0.2+
1993 03 18	809	0.7+	0.6-	1999 10 07	704	0.2+	0.3+
1993 03 19	691	0.3+	0.0	1999 10 07	120	0.6-	0.1+
1993 03 19	691	0.3+	0.1-	1999 10 07	120	0.2+	0.5-
1993 03 19	691	0.1+	0.2+	1999 10 11	595	0.2+	0.8-
1999 10 07	704	0.2-	0.5-	1999 10 11	595	0.3-	0.3-
1999 10 07	704	0.6+	0.1+	1999 10 11	595	0.6+	0.2+
1999 10 07	704	0.5-	0.9+	1999 11 12	704	0.5+	0.2-
1993 03 17	809	1.5-	0.6+	1999 11 12	704	0.1-	0.0
1993 03 18	809	0.7+	0.6-	1999 11 12	704	0.1+	0.2-
1993 03 19	691	0.3+	0.0	1999 11 12	704	0.3-	0.5+
1993 03 19	691	0.3+	0.1-	1999 11 12	704	1.2+	0.1+
1993 03 19	691	0.1+	0.2+	1999 11 12	120	0.5-	0.1-
1999 10 07	704	0.2-	0.5-	1999 11 12	120	0.6-	0.0
1999 10 07	704	0.6+	0.1+	1999 11 13	120	0.3+	0.1+
1999 10 07	704	0.5-	0.9+	1999 11 13	120	0.6-	0.2+

1999 TP₁₃ = 1997 EA₄₀

Id. S. Nakano

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>		(2000.0)		P		Q	
<i>n</i>	0.27074800	ω	192.61495	+0.61697474	-0.78669479		
<i>a</i>	2.3664239	Ω	219.29520	+0.72493242	+0.57865197		
<i>e</i>	0.1421826	<i>i</i>	1.92692	+0.30629261	+0.21511207		
<i>P</i>	3.64	<i>H</i>	14.5	<i>G</i>	0.15	<i>U</i>	5
Residuals in seconds of arc							
1997 03 05	704	0.2-	1.0-	1999 10 10	106	0.1+	0.1+
1997 03 05	704	0.1-	0.3+	1999 10 10	106	0.4+	0.4+
1997 03 06	704	0.3-	0.4+	1999 10 10	106	0.4-	0.3+
1997 03 06	704	0.6+	0.3+	1999 10 11	106	1.8-	0.9-
1999 10 06	704	0.3+	0.3-	1999 10 11	106	1.1-	0.1+
1999 10 06	704	0.3+	0.3-	1999 10 11	106	0.2-	0.7+
1999 10 06	704	0.5+	0.3-	1999 10 11	106	0.1-	0.5+
1999 10 06	704	0.5+	0.5-	1999 10 11	106	0.2-	0.1-
1999 10 06	704	0.5+	0.5-	1999 10 14	106	0.3+	0.2-
1999 10 07	704	0.1+	0.1-	1999 10 14	106	0.1-	0.3+
1999 10 07	704	0.2+	0.2-	1999 10 14	106	0.3+	0.4+
1999 10 07	704	0.4+	0.2+	1999 10 17	106	0.0	0.0
1999 10 07	704	0.0	0.2-	1999 10 17	106	0.4-	0.6+
1999 10 07	704	0.6-	0.2-	1999 10 17	106	0.5+	0.2-

1999 TX₁₃ = 1998 MF₈

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>		(2000.0)		P		Q	
<i>n</i>	0.19924108	ω	125.75060	+0.83854973	+0.54056982		
<i>a</i>	2.9032435	Ω	201.77642	-0.54003435	+0.80817900		
<i>e</i>	0.2058543	<i>i</i>	10.55556	-0.07209200	+0.23373269		
<i>P</i>	4.95	<i>H</i>	13.7	<i>G</i>	0.15	<i>U</i>	3
Residuals in seconds of arc							
1998 05 23	704	0.4+	0.4+	1999 09 18	703	0.3-	0.3-
1998 05 23	704	0.5-	0.7+	1999 09 18	703	0.4-	0.1-
1998 05 23	704	1.4+	1.0+	1999 09 18	703	0.3-	0.3-
1998 05 23	704	0.1-	1.1+	1999 10 02	703	0.5+	0.0
1998 06 03	704	(2.4-	1.7-)	1999 10 02	703	0.3-	0.1-
1998 06 03	704	1.0-	0.5-	1999 10 02	703	0.1-	0.8-
1998 06 03	704	0.5-	0.8-	1999 10 02	703	0.2-	0.9-
1998 06 03	704	0.6-	1.7-	1999 10 10	143	0.7-	0.1-
1998 06 19	704	0.4+	1.8-	1999 10 10	143	0.2-	1.9+
1998 06 19	704	0.2+	0.1-	1999 10 10	143	0.4-	1.2+
1998 06 19	704	0.3+	1.1+	1999 10 11	143	0.5-	0.0
1998 06 19	704	0.1+	0.1+	1999 10 11	143	0.0	0.2-
1998 06 19	704	0.2-	1.1+	1999 10 11	143	0.1+	0.5-
1998 05 23	704	0.4+	0.4+	1999 10 27	143	1.5+	0.0
1998 05 23	704	0.5-	0.7+	1999 10 27	143	0.5+	0.9+
1998 05 23	704	1.4+	1.0+	1999 10 31	143	0.2+	0.5-
1998 05 23	704	0.1-	1.1+	1999 10 31	143	0.4+	0.7-
1998 06 03	704	(2.4-	1.7-)	1999 10 31	143	1.2+	0.3+
1998 06 03	704	1.0-	0.5-	1999 11 08	143	0.1+	0.2-
1998 06 03	704	0.5-	0.8-	1999 11 08	143	0.2+	0.2+
1998 06 03	704	0.6-	1.7-	1999 11 08	143	0.1+	0.0
1998 06 19	704	0.4+	1.8-	1999 11 12	143	1.1-	0.3-
1998 06 19	704	0.2+	0.1-	1999 11 12	143	0.8-	0.2+
1998 06 19	704	0.3+	1.1+	1999 11 12	143	0.1+	0.5+
1998 06 19	704	0.1+	0.1+	1999 11 12	143	0.6-	0.6+
1998 06 19	704	0.2-	1.1+	1999 11 13	143	0.2-	0.1-

1998 06 25	704	0.1-	0.5-	1999 10 26	143	0.0	0.7-	1999 11 13	143	0.2-	0.0
1998 06 25	704	0.2+	0.6-	1999 10 26	143	1.8+	0.1+	1999 11 13	143	0.4-	0.0
1998 06 25	704	0.3+	0.5+	1999 10 26	143	0.4-	0.0	1999 11 13	143	0.8-	0.1+
1998 06 25	704	0.4-	0.7+	1999 10 27	143	0.1-	0.0				
1999 09 18	703	0.0	0.0	1999 10 27	143	0.9+	0.1-				

1999 TE₁₄ = 1984 SF₇ = 1991 LR₆ = 1998 HX₂₉

Id. S. Nakano

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>		(2000.0)		P		Q	
<i>n</i>	0.26512053	ω	252.61085	+0.82609145	+0.56272648		
<i>a</i>	2.3997932	Ω	73.13472	-0.50431800	+0.76213199		
<i>e</i>	0.2212649	<i>i</i>	1.80818	-0.25146823	+0.32014643		
<i>P</i>	3.72	<i>H</i>	15.0	<i>G</i>	0.15	<i>U</i>	2
Residuals in seconds of arc							
1984 09 23	071	0.1+	0.0	1998 03 29	704	(4.7-	0.5-)
1984 09 24	071	0.2-	0.3+	1998 04 20	704	1.5-	0.0
1991 06 06	809	0.3+	0.3-	1998 04 20	704	0.4-	1.8+
1991 06 06	809	0.4-	0.2+	1998 04 20	704	0.2+	0.5+
1991 06 06	809	0.1+	0.3+	1998 04 20	704	0.2+	0.9-
1998 03 25	704	0.6+	1.7-	1998 04 20	704	(2.1-	2.0-)
1998 03 25	704	0.7+	1.2+	1998 04 22	704	1.2+	0.1+
1998 03 25	704	0.1+	0.4-	1998 04 22	704	0.2-	0.2+
1998 03 25	704	0.6+	1.0+	1998 04 22	704	0.9-	1.3-
1998 03 29	704	0.2+	1.5-	1998 04 22	704	(1.7-	2.5+)
1998 03 29	704	0.7-	1.0+	1998 04 22	704	0.7-	1.9+
1998 03 29	704	0.6+	1.0-	1999 10 07	704	0.3-	0.1+
1998 03 29	704	0.6+	0.8+	1999 10 07	704	0.5-	0.1-
1998 03 29	704	0.1+	0.0	1999 10 07	704	0.5-	0.0
1998 03 29	704	0.2-	0.3+	1999 10 10	120	(2.4+	0.0)
1998 03 29	704	0.4-	0.2+	1999 10 10	120	1.8+	0.0
1998 03 29	704	0.2+	0.5+	1999 10 11	120	1.8+	0.0
1998 03 29	704	0.2+	0.9-	1999 10 13	120	0.2+	0.0
1998 03 29	704	0.2+	0.9-	1999 10 13	120	0.3-	0.1+
1998 03 29	704	0.7+	1.2+	1999 10 19	120	0.1+	0.4-
1998 03 29	704	0.2-	0.2+	1999 10 19	120	0.8-	0.5+
1998 03 29	704	0.6+	1.0+	1999 11 12	704	0.4+	1.0+
1998 03 29	704	0.2+	1.5-	1999 11 12	704	0.4+	0.0
1998 03 29	704	0.7-	1.0+	1999 11 12	704	0.1-	0.0
1998 03 29	704	0.6+	1.0-	1999 11 12	704	1.0-	0.2-
1998 03 29	704	0.6+	0.8+	1999 10 07	704	0.3-	0.1+
1998 03 29	704	0.6+	0.8+	1999 10 07	704	0.5-	0.1-

1999 TH₁₄ = 1993 QC₆

Id. A. Doppler

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

M	22.14462		(2000.0)		P		Q				
n	0.17485519	ω	236.33211		+0.94002505		+0.33962854				
a	3.1672599	Ω	103.79616		-0.30115480		+0.86998658				
e	0.1748641	i	1.87099		-0.16018329		+0.35745742				
P	5.64	H	13.4		G	0.15	U	4			
Residuals in seconds of arc											
1993 08 20	809	1.4+	0.1+	1999 10 07	704	0.2+	1.0-	1999 10 19	120	0.5+	0.0
1993 08 20	809	1.2+	0.1-	1999 10 07	704	0.0	0.0	1999 11 02	703	0.9-	1.0-
1993 08 20	809	0.7+	0.1+	1999 10 07	704	0.5+	0.1-	1999 11 02	703	0.1+	0.1+
1993 08 24	809	0.8-	0.3+	1999 10 07	704	0.4-	0.4+	1999 11 02	703	0.7-	0.8+
1993 08 24	809	1.1-	0.0	1999 10 10	120	0.5+	0.3-	1999 11 02	703	0.4-	0.0
1993 08 24	809	1.6-	0.3+	1999 10 11	120	0.5-	0.8-	1999 11 12	704	0.2-	0.7+
1997 04 11	704	0.2-	1.6+	1999 10 13	120	0.1+	0.1-	1999 11 12	704	0.3+	0.8+
1997 04 11	704	0.3+	1.2-	1999 10 13	120	0.8+	1.1-	1999 11 12	704	0.1+	1.0+
1999 10 07	704	0.0	0.5-	1999 10 19	120	(2.2-	0.1-)	1999 11 12	704	0.1+	1.1+

1995 12 10	595	(1.5+	2.4-)	1999 10 11	120	0.9+	0.1+	1999 11 04	704	0.7+	0.2-
1995 12 10	595	0.9-	1.0-	1999 10 13	120	0.2+	0.2+	1999 11 04	704	0.9+	0.1+
1998 04 28	566	0.1-	0.1+	1999 10 13	120	0.2-	0.1-	1999 11 04	704	0.0	0.2-
1998 04 28	566	0.2+	0.3+	1999 10 15	120	(3.7-	1.0-)	1999 11 04	704	0.3+	0.5-
1998 04 28	566	0.0	0.0	1999 10 15	120	0.8+	0.7-	1999 11 04	704	0.6+	0.0

1999 TM₁₄ = 1992 OU₃ = 1997 AN₁₃

Id. A. Doppler

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

				Williams			
<i>M</i>	342.38547		(2000.0)	P	Q		
<i>n</i>	0.29720848	ω	220.23154	+0.82935698	-0.55870359		
<i>a</i>	2.2237976	Ω	173.73047	+0.52190283	+0.77202822		
<i>e</i>	0.1696349	<i>i</i>	2.18277	+0.19946036	+0.30302264		
<i>P</i>	3.32	<i>H</i>	16.4	<i>G</i>	0.15	<i>U</i>	3

Residuals in seconds of arc

1992 07 26	809	0.6-	0.4+	1999 10 11	120	0.8-	0.0	1999 11 01	703	0.5-	0.4+
1992 07 26	809	0.5-	0.8+	1999 10 11	120	0.5-	0.5-	1999 11 01	703	0.2-	0.7+
1992 07 26	809	1.2-	0.9+	1999 10 13	120	0.7-	0.1+	1999 11 01	703	0.8-	0.4+
1992 07 30	809	0.1+	1.0-	1999 10 13	120	0.3+	0.5+	1999 11 04	704	0.4+	0.7-
1992 07 30	809	1.0+	0.7-	1999 10 13	120	0.6-	0.4+	1999 11 04	704	0.7+	0.4-
1992 07 30	809	1.2+	0.4-	1999 10 20	120	0.7+	0.6-	1999 11 04	704	0.4+	0.5-
1997 01 10	566	0.3+	0.2+	1999 10 20	120	0.4+	0.8-	1999 11 04	704	0.2+	1.0-
1997 01 10	566	0.2+	0.2+	1999 10 29	703	0.1+	0.5+	1999 11 04	704	0.6+	0.6-
1997 01 10	566	0.4-	0.3+	1999 10 29	703	2.0-	0.7+	1999 11 07	120	0.7+	0.5-
1997 01 12	566	0.6+	0.1-	1999 10 29	703	0.1+	1.1+	1999 11 07	120	0.9+	0.7-
1997 01 12	566	0.9+	0.2-	1999 10 29	703	0.5-	1.0+	1999 11 08	120	0.3+	0.2-
1997 01 12	566	1.6-	0.1+	1999 11 01	703	0.3-	0.5+	1999 11 08	120	0.8+	0.1+

1999 TO₁₄ = 1998 ML₄₈

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

				Williams			
<i>M</i>	26.55988		(2000.0)	P	Q		
<i>n</i>	0.20516804	ω	219.33226	+0.99642997	+0.07694743		
<i>a</i>	2.8470575	Ω	136.21584	-0.05909063	+0.92951231		
<i>e</i>	0.0856952	<i>i</i>	2.87729	-0.06029610	+0.36067432		
<i>P</i>	4.80	<i>H</i>	13.6	<i>G</i>	0.15	<i>U</i>	4

Residuals in seconds of arc

1998 06 24	704	0.9+	0.2-	1999 10 07	704	1.3+	0.9-	1999 10 17	120	0.2-	0.1+
1998 06 24	704	0.9-	0.3+	1999 10 07	704	0.7-	1.2-	1999 10 17	120	0.8-	0.6-
1998 06 24	704	0.7-	0.8+	1999 10 07	704	1.3-	1.9-	1999 11 01	703	0.3-	0.8+
1998 06 24	704	0.5+	0.7+	1999 10 11	120	0.0	0.1-	1999 11 01	703	0.5-	0.6+
1998 06 24	704	(2.8-	1.6+)	1999 10 11	120	0.2+	0.1+	1999 11 01	703	0.5-	0.4+
1998 06 26	704	0.5-	0.7+	1999 10 11	120	1.7+	0.7-	1999 11 01	703	0.1+	0.5+
1998 06 26	704	1.0+	0.2+	1999 10 13	120	0.1-	0.0	1999 11 04	704	0.0	0.3+
1998 06 26	704	0.2-	0.7-	1999 10 13	120	0.1+	0.7-	1999 11 04	704	0.2+	0.6+
1998 06 26	704	0.8+	0.8-	1999 10 13	120	0.6+	0.6+	1999 11 04	704	0.2+	0.6+
1998 07 26	704	0.3-	0.7-	1999 10 15	120	0.3-	0.0	1999 11 04	704	0.8+	0.4+
1998 07 26	704	0.4-	0.4+	1999 10 15	120	0.5-	0.5+	1999 11 04	704	0.0	0.8+
1998 07 26	704	0.1-	0.1+	1999 10 16	120	0.7-	0.3-	1999 11 05	120	0.0	0.2+
1998 07 26	704	0.1-	0.3-	1999 10 16	120	0.2+	0.2+	1999 11 05	120	0.4+	0.5-

1999 TU₁₄ = 1998 ML₁₆

Id. A. Doppler

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

				Williams			
<i>M</i>	249.18583		(2000.0)	P	Q		
<i>n</i>	0.18471879	ω	150.65360	-0.58738995	-0.80926470		
<i>a</i>	3.0534818	Ω	335.31576	+0.73874709	-0.53212723		
<i>e</i>	0.0863163	<i>i</i>	1.09491	+0.33049324	-0.24885991		
<i>P</i>	5.34	<i>H</i>	14.3	<i>G</i>	0.15	<i>U</i>	5

Residuals in seconds of arc

1998 06 27	691	0.4-	0.2-	1999 10 10	688	0.6-	0.2+	1999 10 13	688	0.3-	0.1-
1998 06 27	691	0.1-	0.3-	1999 10 10	688	0.1-	0.1+	1999 10 13	688	0.2-	0.2-
1998 06 27	691	0.2+	0.2-	1999 10 11	688	0.2+	1.4+	1999 10 14	688	0.3-	0.0

1998 06 28	691	0.1-	0.1-	1999 10 11	688	0.8+	1.4+	1999 10 14	688	0.2-	0.1+
1998 06 28	691	0.1+	0.1-	1999 10 11	688	0.7+	1.2+	1999 10 15	688	0.7+	0.4-
1998 06 28	691	0.2+	0.1+	1999 10 11	688	0.3+	1.0+	1999 10 20	688	0.2+	0.2-
1998 07 03	691	0.2-	0.1-	1999 10 12	688	0.4+	1.0-	1999 10 20	688	0.4-	0.4-
1998 07 03	691	0.3+	0.8+	1999 10 12	688	0.9-	0.7-	1999 10 21	688	0.5+	0.2+
1999 10 10	688	0.2+	0.8-	1999 10 12	688	0.9-	0.4+	1999 10 21	688	0.1+	0.4-
1999 10 10	688	0.1+	0.5-	1999 10 12	688	0.2+	0.5-	1999 10 21	688	0.3-	0.0
1999 10 10	688	0.3-	0.6-	1999 10 13	688	0.2+	0.2-				

1999 TV₁₅ = 1978 PL₂ = 1991 JF₆ = 1998 KV₄₄

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

				Williams			
<i>M</i>	135.01619		(2000.0)	P	Q		
<i>n</i>	0.28803822	ω	66.69501	-0.53553466	+0.84443000		
<i>a</i>	2.2707499	Ω	170.89709	-0.79962782	-0.50250488		
<i>e</i>	0.0837387	<i>i</i>	4.29819	-0.27165783	-0.18554465		
<i>P</i>	3.42	<i>H</i>	13.9	<i>G</i>	0.15	<i>U</i>	2

Residuals in seconds of arc

1978 08 08	095	0.6-	1.4+	1998 08 15	704	0.1-	0.0	1999 10 13	143	0.4-	1.0-
1991 05 05	402	0.7-	0.9-	1998 08 15	704	1.0+	1.9-	1999 10 13	143	0.4+	0.1+
1991 05 05	402	0.5+	1.1-	1999 10 02	703	0.2-	0.1+	1999 10 27	143	0.3+	0.1-
1998 05 22	704	0.2+	0.1-	1999 10 02	703	0.6-	0.3+	1999 10 27	143	0.4+	0.2+
1998 05 22	704	0.4-	0.5+	1999 10 02	703	0.2-	0.0	1999 10 27	143	0.4+	0.1-
1998 05 22	704	0.3+	0.1+	1999 10 02	703	0.2+	0.5-	1999 10 27	143	0.3+	0.1+
1998 05 22	704	(1.3-	2.9+)	1999 10 07	704	0.3+	0.2+	1999 10 30	703	0.5-	0.0
1998 05 22	704	0.0	1.0+	1999 10 07	704	0.3+	0.3+	1999 10 30	703	0.6-	0.3-
1998 05 24	704	1.0-	0.1+	1999 10 07	704	1.0+	0.5-	1999 10 30	703	1.0-	0.1-
1998 05 24	704	1.2+	1.4+	1999 10 07	704	0.3-	1.1-	1999 10 30	703	0.7-	0.5+
1998 05 24	704	0.8-	0.6+	1999 10 11	143	0.5+	1.7-	1999 10 31	143	0.0	0.7+
1998 05 24	704	1.1-	0.4-	1999 10 12	143	0.5+	0.6-	1999 10 31	143	0.1+	0.7+
1998 05 24	704	0.2-	0.6-	1999 10 12	143	0.2+	0.5-	1999 10 31	143	0.1-	0.6+
1998 08 15	704	0.1-	1.3-	1999 10 13	143	0.0	0.1+				
1998 08 15	704	1.7+	0.7-	1999 10 13	143	0.4+	0.3+				

1999 TW₁₅ = 1997 EK₅₀

Id. A. Doppler, G. V. Williams

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

				Williams			
<i>M</i>	55.45507		(2000.0)	P	Q		
<i>n</i>	0.18127483	ω	97.18306	+0.54679288	+0.83633768		
<i>a</i>	3.0920348	Ω	206.08473	-0.79923754	+0.50733500		
<i>e</i>	0.1544345	<i>i</i>	5.14839	-0.24947324	+0.20772695		
<i>P</i>	5.44	<i>H</i>	14.5	<i>G</i>	0.15	<i>U</i>	5

Residuals in seconds of arc

1997 03 05	809	1.0-	0.6-	1999 10 06	691	0.6-	0.1-	1999 10 14	120	0.0	1.4-
1997 03 05	809	1.6-	0.3-	1999 10 07	120	0.9+	1.7+	1999 10 14	120	0.4-	0.3-
1997 03 05	809	0.6-	1.0-	1999 10 07	120	0.4-	0.7+	1999 11 02	703	1.5-	0.4-
1997 03 06	809	1.7+	1.1+	1999 10 08	120	1.7-	0.5-	1999 11 02	703	0.1+	0.7-
1997 03 06	809	1.1+	0.2+	1999 10 08	120	0.2-	0.6-	1999 11 02	703	0.1-	1.1+
1997 03 06	809	0.4+	0.6+	1999 10 10	120	0.7-	0.2-	1999 11 02	703	0.9+	0.0
1999 10 06	691	0.4-	0.6-	1999 10 10	120	2.0+	0.5+				
1999 10 06	691	0.4-	0.6-	1999 10 14	120	2.4+	1.5+				

1999 TC₁₆ = 1989 TW₁₀ = 1992 OU₈ = 1998 HQ₄₄

Id. S. Nakano

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

				Williams			
<i>M</i>	1.78839		(2000.0)	P	Q		
<i>n</i>	0.29642437	ω	168.98055	+0.99726477	+0.07379679		
<i>a</i>	2.2277175	Ω	186.79141	-0.07018821	+0.92805830		
<i>e</i>	0.1573286	<i>i</i>	1.99866	-0.02316443	+0.36505043		
<i>P</i>	3.32	<i>H</i>	14.9	<i>G</i>	0.15	<i>U</i>	2

Residuals in seconds of arc

1989 10 08	403	1.6−	0.0	1998 04 20	704	1.0+	0.5−	1999 10 14	595	0.3−	0.2−
1992 07 24	809	0.8−	0.7−	1998 04 20	704	1.5+	1.9+	1999 10 19	595	0.4+	0.5−
1992 07 24	809	0.2−	0.9−	1998 04 20	704	1.6+	1.0−	1999 10 20	595	0.3+	0.7−
1992 07 24	809	0.2+	1.0−	1998 04 20	704	(2.8−	0.3+)	1999 11 02	703	0.0	0.0
1992 07 26	809	0.1−	0.9+	1998 04 21	704	1.5+	0.6−	1999 11 02	703	0.4−	0.5+
1992 07 26	809	0.2+	1.0+	1998 04 21	704	0.0	0.9+	1999 11 02	703	0.5+	0.1+
1992 07 26	809	0.6+	1.3+	1998 04 21	704	0.2+	1.1−	1999 11 02	703	0.2−	0.1+
1998 03 25	704	0.1−	1.7+	1998 04 21	704	1.3−	0.3−	1999 11 08	595	0.7−	0.2+
1998 03 25	704	1.0−	0.6+	1998 04 21	704	0.4+	0.2+	1999 11 08	595	0.1−	0.7+
1998 03 25	704	0.3+	0.6−	1998 04 22	704	1.3−	0.8−	1999 11 12	704	0.5+	1.1+
1998 03 25	704	0.4+	0.2−	1998 04 22	704	0.3+	1.1+	1999 11 12	704	0.2+	0.5+
1998 03 25	704	(5.7−	1.9−)	1998 04 22	704	0.2−	0.1−	1999 11 12	704	0.5+	0.4+
1998 03 29	704	1.5−	0.7−	1998 04 22	704	0.1−	0.5+	1999 11 12	704	0.4+	0.5+
1998 03 29	704	0.0	1.9+	1998 04 22	704	(0.7−	2.4+)	1999 11 12	704	0.0	0.1−
1998 03 29	704	1.7−	0.0	1999 10 14	595	0.9−	0.1+				

1999 TH₁₆ = 1984 BQ₂ = 1998 HX₉₈

Id. A. Doppler

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

M	19.53094		(2000.0)	P	Q
n	0.29826461	ω	266.78957	+0.98445302	+0.17140996
a	2.2185450	Ω	83.33821	−0.14188922	+0.90476113
e	0.1013894	i	2.21290	−0.10353597	+0.38990503
P	3.30	H	15.1	G 0.15	U 2

Residuals in seconds of arc

1984 01 25	675	0.6+	0.3−	1998 05 01	704	0.6+	0.5−	1999 10 11	678	0.2+	1.2−
1984 01 26	675	0.7−	0.1−	1998 05 01	704	0.7+	0.6−	1999 10 12	678	1.3+	0.1+
1996 12 08	327	0.0	0.1−	1998 05 01	704	0.6+	0.7−	1999 10 12	678	1.5+	1.2−
1996 12 08	327	0.1−	0.1−	1998 05 22	704	(2.8−	2.2−)	1999 10 12	678	0.9+	0.0
1996 12 08	327	0.1+	0.0	1998 05 22	704	1.2−	0.7−	1999 10 15	678	(2.6−	0.9−)
1998 04 21	704	0.0	0.3+	1998 05 22	704	0.5−	0.4−	1999 10 15	678	0.7−	0.6−
1998 04 21	704	0.4−	0.4−	1998 05 22	704	0.3−	1.2+	1999 10 19	678	0.5+	1.9+
1998 04 21	704	0.4−	0.1+	1998 05 22	704	1.0−	0.8+	1999 10 19	678	0.0	0.8+
1998 04 21	704	0.0	0.6+	1998 05 22	699	0.8+	0.3−	1999 10 31	678	0.3−	0.2−
1998 04 21	704	0.5−	0.2−	1998 05 22	699	0.1−	0.9+	1999 10 31	678	1.7−	0.0
1998 04 22	704	0.0	0.4+	1998 05 22	699	(0.4+	4.7−)	1999 10 31	678	0.1+	0.2−
1998 04 22	704	0.9+	0.5+	1998 05 24	704	(3.0+	1.1−)	1999 11 04	704	0.4−	0.2−
1998 04 22	704	0.1+	0.5+	1998 05 24	704	0.4−	1.6−	1999 11 04	704	0.2−	0.1−
1998 04 22	704	0.3−	0.4+	1998 05 24	704	0.3+	0.2−	1999 11 04	704	0.6−	0.2+
1998 04 22	704	1.0−	0.6−	1998 05 24	704	0.2+	1.3−	1999 11 04	704	0.2−	0.2−
1998 05 01	704	0.7+	0.5−	1999 10 11	678	0.3+	0.7−	1999 11 04	704	0.3+	0.6−

1999 TB₁₇ = 1994 XP₁

Id. A. Doppler

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	321.89091		(2000.0)	P	Q
<i>n</i>	0.17371305	ω	0.41328	+0.36081010	−0.93132799
<i>a</i>	3.1811276	Ω	68.43735	+0.85552723	+0.30940621
<i>e</i>	0.2009670	<i>i</i>	3.04726	+0.37133438	+0.19208324
<i>P</i>	5.67	<i>H</i>	13.1	<i>G</i> 0.15	<i>U</i> 5

Residuals in seconds of arc

1994 12 06	114	0.5−	0.0	1999 10 02	703	1.1−	0.2−	1999 10 15	120	0.8+	0.3−
1994 12 06	114	0.6−	0.7−	1999 10 02	703	0.5−	0.3+	1999 10 15	120	0.8+	0.0
1994 12 07	114	0.9+	0.1+	1999 10 07	704	0.1+	0.1+	1999 10 16	120	0.0	0.3+
1998 08 17	704	0.9−	0.5+	1999 10 07	704	0.4+	1.7−	1999 10 16	120	0.3+	0.0
1998 08 17	704	0.0	1.2−	1999 10 07	704	0.7−	0.2+	1999 10 17	120	0.4+	0.4+
1998 08 17	704	1.0+	0.0	1999 10 07	704	0.0	1.0−	1999 10 18	120	0.6+	0.4+
1998 08 17	704	(4.5−	1.0+)	1999 10 07	704	1.6−	0.5+	1999 10 18	120	0.7+	0.9+
1999 10 02	703	0.8−	0.2−	1999 10 14	120	0.1−	0.7+	1999 10 19	120	1.5+	0.1−
1999 10 02	703	0.5−	0.2+	1999 10 14	120	0.3−	0.2−	1999 10 19	120	0.4−	0.0

1999 TJ₁₇ = 1994 LN₁

Id. S. Nakano

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

M	244.36691		(2000.0)	P	Q
n	0.26788899	ω	291.13578	−0.60715404	−0.78694948
a	2.3832310	Ω	197.64792	+0.79421732	−0.60524430
e	0.2982188	i	21.25096	−0.02414143	−0.11995771
P	3.68	H	14.5	G 0.15	U 4

Residuals in seconds of arc

1994 06 01	691	0.2−	0.1+	1999 09 29	703	(3.0−	1.9+)	1999 10 16	740	0.3−	0.4+
1994 06 01	691	0.2−	0.1−	1999 09 29	703	0.3−	0.3+	1999 10 17	740	0.6−	0.4−
1994 06 01	691	0.2+	0.1−	1999 10 04	704	0.9−	0.4+	1999 10 17	740	0.1+	0.2+
1994 06 02	691	0.0	0.2+	1999 10 04	704	0.0	0.5+	1999 10 17	740	0.3−	1.1−
1994 06 02	691	0.0	0.1−	1999 10 04	704	1.3+	0.4−	1999 10 17	740	0.6−	0.3−
1994 06 02	691	0.1+	0.0	1999 10 04	704	0.4−	0.6−	1999 10 20	740	0.2−	0.2−
1999 09 07	703	0.3−	0.1−	1999 10 04	704	0.1+	0.5−	1999 10 20	740	0.4+	0.5−
1999 09 07	703	0.4−	0.5+	1999 10 15	740	0.8−	0.4−	1999 10 20	740	0.0	0.5+
1999 09 07	703	0.7−	0.3−	1999 10 15	740	0.7+	0.6−	1999 10 20	740	0.9−	1.2+
1999 09 07	703	0.5−	0.8+	1999 10 15	740	0.4+	1.2−	1999 10 24	740	0.2+	0.4−
1999 09 08	704	0.6+	0.2+	1999 10 15	740	1.2+	1.4+	1999 10 24	740	0.2+	0.7+
1999 09 08	704	1.2+	0.3−	1999 10 15	740	0.9+	1.4+	1999 10 24	740	0.4+	0.4+
1999 09 08	704	0.0	0.3+	1999 10 16	740	0.6+	0.2+	1999 10 24	740	0.2−	1.0+
1999 09 08	704	0.4+	0.1−	1999 10 16	740	(0.8+	2.9+)	1999 10 24	740	1.5−	0.4−
1999 09 29	703	0.6−	0.2−	1999 10 16	740	0.2−	1.7−				
1999 09 29	703	0.3−	0.9−	1999 10 16	740	1.1+	0.6+				

1999 TV₁₇ = 7584 P-L = 1982 YL₃ = 1998 KB₆₃

Id. G. V. Williams, A. Doppler

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

M	98.21541		(2000.0)	P	Q
n	0.27977561	ω	230.83192	−0.01477767	+0.99789709
a	2.3152407	Ω	38.46395	−0.88324840	+0.01655716
e	0.0978208	i	5.82332	−0.46867247	−0.06266782
P	3.52	H	14.9	G 0.15	U 2

Residuals in seconds of arc

1960 10 17	675	0.9−	0.3−	1998 05 24	704	0.1−	0.8−	1999 10 29	327	0.4+	0.2−
1960 10 22	675	0.0	0.0	1998 05 24	704	1.2−	0.5+	1999 10 29	327	1.5+	0.7−
1960 10 25	675	0.1−	0.9+	1999 10 02	327	0.7+	0.6+	1999 11 04	704	0.4−	0.2−
1960 10 26	675	0.2+	1.1+	1999 10 02	327	0.2−	0.0	1999 11 04	704	0.3−	0.1+
1982 12 22	095	0.2+	1.1+	1999 10 02	327	0.5−	0.5+	1999 11 04	704	0.3+	0.5+
1998 05 22	704	0.4+	0.2−	1999 10 07	327	0.1+	0.1+	1999 11 04	704	0.5−	0.2+
1998 05 22	704	0.2−	0.5+	1999 10 07	327	0.1+	0.0	1999 11 04	704	0.0	0.5−
1998 05 22	704	0.2+	0.5−	1999 10 07	327	0.3+	0.0	1999 11 11	703	0.3+	0.5−
1998 05 22	704	0.9+	1.3−	1999 10 28	327	0.2+	0.5−	1999 11 11	703	1.4−	0.0
1998 05 24	704	0.6−	0.0	1999 10 28	327	0.1+	0.3−	1999 11 11	703	1.4−	0.0
1998 05 24	704	0.8+	1.7+	1999 10 28	327	1.3+	0.6+	1999 11 11	703	0.9+	0.8−
1998 05 24	704	0.1−	0.3+	1999 10 29	327	0.7−	0.5−				

1999 TZ₁₇ = 1998 MQ₁₂

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

M	134.06173		(2000.0)	P	Q		
n	0.23349874	ω	24.95915	−0.64070672	+0.76272550		
a	2.6118387	Ω	205.48217	−0.73429810	−0.64220528		
e	0.0564024	i	11.80322	−0.22427928	−0.07630322		
P	4.22	H	14.2	G	0.15	U	3

Residuals in seconds of arc

1998 06 19	704	(0.6+	2.8+)	1999 10 06	704	0.2+	0.1+	1999 10 27	327	0.2−	0.0
1998 06 19	704	(2.2+	0.4+)	1999 10 07	704	0.0	0.4+	1999 10 28	327	0.3−	0.1+
1998 06 19	704	0.7−	0.5+	1999 10 07	704	0.2−	0.3+	1999 10 28	327	0.4−	0.2+
1998 06 19	704	(3.6−	2.6−)	1999 10 07	704	0.6+	0.3−	1999 10 28	327	0.5−	0.1+
1998 06 25	704	0.5+	0.7+	1999 10 07	704	0.2−	0.3+	1999 10 29	327	0.2−	0.2+
1998 06 25	704	0.1+	0.4+	1999 10 07	704	0.6+	0.1−	1999 10 29	327	0.2+	0.2+
1998 06 25	704	0.9+	1.1−	1999 10 10	327	0.5−	0.3+	1999 10 29	327	0.1+	0.0
1998 06 25	704	1.1−	0.8−	1999 10 10	327	0.9−	0.5−	1999 11 01	703	0.2−	0.4+

M.P.C. 36848

1998 06 25	704	0.3+	0.3+	1999 10 10	327	0.1-	0.1-	1999 11 01	703	0.2+	0.8-
1999 09 18	704	0.1+	0.5-	1999 10 14	327	0.0	0.6+	1999 11 01	703	0.7+	0.5+
1999 09 18	704	0.2+	1.0+	1999 10 14	327	0.1-	0.7+	1999 11 01	703	0.9-	0.0
1999 09 18	704	0.3-	0.9-	1999 10 14	327	0.2-	0.3+	1999 11 12	704	0.0	0.0
1999 09 18	704	0.2+	0.6-	1999 10 18	327	0.1-	0.6-	1999 11 12	704	0.3+	0.4-
1999 10 06	704	0.0	0.1+	1999 10 18	327	0.1-	0.4-	1999 11 12	704	0.5+	0.8-
1999 10 06	704	0.5+	0.2-	1999 10 18	327	0.2+	0.2+	1999 11 12	704	0.2+	0.0
1999 10 06	704	0.3+	0.1-	1999 10 27	327	0.6-	0.5+	1999 11 12	704	0.5+	0.6-
1999 10 06	704	0.1+	0.4-	1999 10 27	327	0.5+	0.5+				

1999 TJ₁₈ = 1998 QH₆₆

Id. G. V. Williams, A. Doppler

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	337.73279		(2000.0)	P	Q
<i>n</i>	0.18512357	ω	196.30603	+0.49007962	-0.86166586
<i>a</i>	3.0490291	Ω	224.57809	+0.81924736	+0.50693426
<i>e</i>	0.0509793	<i>i</i>	10.81786	+0.29775112	+0.02344349
<i>P</i>	5.32	<i>H</i>	13.1	<i>G</i>	0.15
				<i>U</i>	4

Residuals in seconds of arc

1998 08 24	704	0.6+	0.2-	1998 08 27	704	0.1+	1.1-	1999 10 28	327	(2.4-	0.3-)
1998 08 24	704	1.0-	0.4+	1999 10 10	327	0.3+	0.2-	1999 10 29	327	0.2+	0.0
1998 08 24	704	0.5-	1.0+	1999 10 10	327	0.2+	0.1-	1999 10 29	327	0.1+	0.0
1998 08 24	704	1.4-	1.5+	1999 10 10	327	0.0	0.2-	1999 10 29	327	0.3-	0.3-
1998 08 24	704	0.6+	0.9-	1999 10 15	327	0.0	0.1+	1999 11 04	704	0.2-	0.4+
1998 08 27	704	0.7+	0.6-	1999 10 15	327	0.1-	0.6+	1999 11 04	704	0.4+	0.3+
1998 08 27	704	0.3-	0.4-	1999 10 15	327	0.3-	0.5+	1999 11 04	704	0.1+	0.4-
1998 08 27	704	0.3+	0.7+	1999 10 28	327	0.3-	0.4-	1999 11 04	704	0.1+	0.2+
1998 08 27	704	0.9+	0.6-	1999 10 28	327	0.2-	0.1-	1999 11 04	704	0.1-	0.4-

1999 TL₁₈ = 1998 HW₉₆

Id. S. Nakano, G. V. Williams

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	5.23858		(2000.0)	P	Q
<i>n</i>	0.27378488	ω	306.07396	+0.98868475	+0.11410892
<i>a</i>	2.3488922	Ω	47.59275	-0.05444202	+0.87781219
<i>e</i>	0.1375163	<i>i</i>	7.57804	-0.13978031	+0.46521491
<i>P</i>	3.60	<i>H</i>	15.1	<i>G</i>	0.15
				<i>U</i>	4

Residuals in seconds of arc

1998 04 21	704	1.2+	0.2+	1998 05 01	699	0.1-	1.4+	1999 10 13	327	0.2-	0.1+
1998 04 21	704	1.5+	1.0+	1998 05 01	704	0.3+	1.7-	1999 10 13	327	0.3+	0.1+
1998 04 21	704	1.3+	1.1+	1998 05 01	704	0.3+	0.2+	1999 10 13	327	0.3-	0.5+
1998 04 21	704	1.6-	1.2+	1999 10 04	703	0.4-	0.3+	1999 10 14	327	0.2-	0.2+
1998 04 22	704	1.6+	1.2-	1999 10 04	703	0.0	0.3+	1999 10 14	327	0.5-	0.0
1998 04 22	704	1.8-	1.2+	1999 10 04	703	0.3-	0.3+	1999 10 14	327	0.6-	0.1+
1998 04 22	704	1.9-	0.1+	1999 10 04	703	0.5-	0.2+	1999 10 15	327	0.2-	0.0
1998 04 28	566	0.3+	0.1-	1999 10 04	327	0.2+	0.1-	1999 10 15	327	0.6-	0.4+
1998 04 28	566	0.4+	0.5-	1999 10 04	327	0.5+	0.2+	1999 10 15	327	0.3-	0.1+
1998 04 28	566	0.5-	0.5-	1999 10 04	327	0.7+	0.4-	1999 11 02	703	0.3-	0.4+
1998 05 01	704	0.0	0.1+	1999 10 07	704	0.1+	0.5-	1999 11 02	703	0.5-	0.2+
1998 05 01	699	0.5-	0.2-	1999 10 07	704	0.6+	0.8-	1999 11 02	703	0.2+	1.0+
1998 05 01	704	0.2+	1.3-	1999 10 07	704	0.4+	0.5-	1999 11 02	703	0.7-	0.2+
1998 05 01	699	0.5+	0.0	1999 10 07	704	0.1+	0.9-	1999 11 12	120	0.4+	0.3+
1998 05 01	704	0.5-	0.4+	1999 10 07	704	0.7+	0.2-	1999 11 12	120	0.8+	0.0

1999 TT₁₈ = 1998 HM₅₃

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	96.89121		(2000.0)	P	Q
<i>n</i>	0.28881059	ω	231.78913	-0.15628222	+0.98488257
<i>a</i>	2.2666996	Ω	29.47962	-0.85212263	-0.09619091
<i>e</i>	0.1703616	<i>i</i>	8.73257	-0.49946260	-0.14406120
<i>P</i>	3.41	<i>H</i>	15.8	<i>G</i>	0.15
				<i>U</i>	4

1999 NOV. 23

Residuals in seconds of arc

1998 03 25	704	0.1+	0.4+	1998 04 21	704	0.2-	0.7-	1999 10 18	734	1.2+	0.1+
1998 03 25	704	0.9+	0.9+	1998 04 22	704	0.1-	0.2-	1999 10 18	734	0.0	0.1-
1998 03 25	704	0.6-	0.8-	1998 04 22	704	0.6-	0.1-	1999 10 18	734	0.1+	0.1+
1998 03 25	704	0.7-	1.0+	1998 04 22	704	0.4-	0.3-	1999 10 18	734	0.4+	0.1-
1998 03 25	704	0.9-	0.9-	1998 04 22	704	0.4-	0.2-	1999 10 29	703	0.0	0.3+
1998 03 29	704	0.2-	1.1-	1998 04 22	704	0.7-	0.5-	1999 10 29	703	0.4-	0.1-
1998 03 29	704	0.7+	0.4-	1998 04 24	699	0.3+	1.0+	1999 10 29	703	1.4-	0.2-
1998 03 29	704	0.1+	0.3+	1998 04 24	699	0.3-	0.2-	1999 10 29	703	0.3-	0.4+
1998 03 29	704	0.7-	1.0+	1998 04 24	699	0.4-	0.1+	1999 11 04	704	0.2-	0.1+
1998 03 29	704	0.4+	0.2-	1998 04 25	699	1.3+	0.2-	1999 11 04	704	0.1-	0.4+
1998 04 21	704	(2.5+	0.9+)	1998 04 25	699	1.0+	1.3+	1999 11 04	704	0.4-	0.1+
1998 04 21	704	0.3+	0.4+	1998 04 25	699	1.7+	0.2-	1999 11 04	704	0.5+	0.1-
1998 04 21	704	0.7-	0.5-	1999 10 15	684	0.0	0.0	1999 11 04	704	0.2+	0.5-
1998 04 21	704	0.1+	0.1+	1999 10 15	684	0.3+	0.2-				

1999 TY₁₈ = 1982 BZ₃ = 1993 BW₇ = 1997 EQ₅₁

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	310.73369		(2000.0)	P	Q
<i>n</i>	0.26707522	ω	229.72749	+0.07699766	-0.99693210
<i>a</i>	2.3880696	Ω	215.86390	+0.92188882	+0.07655932
<i>e</i>	0.1836601	<i>i</i>	1.37541	+0.37972669	+0.01628080
<i>P</i>	3.69	<i>H</i>	14.7	<i>G</i>	0.15
				<i>U</i>	1

Residuals in seconds of arc

1982 01 20	033	0.6+	1.7-	1997 03 05	809	0.2+	0.9+	1999 11 01	703	0.4-	0.3+
1982 01 20	033	0.3-	1.2-	1997 03 06	809	1.0+	0.6+	1999 11 01	703	0.2+	0.4+
1993 01 23	809	1.6-	0.4+	1997 03 06	809	0.4+	0.2-	1999 11 04	704	0.1-	0.5+
1993 01 23	809	0.0	0.3+	1997 03 06	809	0.0	0.1-	1999 11 04	704	0.6+	0.5+
1993 01 23	809	0.1+	0.4+	1999 10 12	106	0.3-	0.2-	1999 11 04	704	0.0	0.4-
1993 01 28	809	0.1-	0.4-	1999 10 12	106	0.2+	0.9+	1999 11 04	704	0.6+	0.2+
1993 01 28	809	0.8-	0.1+	1999 10 12	106	0.4+	0.2+	1999 11 04	704	0.5+	0.3-
1993 01 28	809	0.2-	0.4-	1999 10 17	106	1.0+	0.5+	1999 11 12	704	0.4+	0.3+
1995 09 19	809	(0.4-	2.4-)	1999 10 17	106	0.4-	0.1-	1999 11 12	704	0.3-	0.1-
1995 09 20	809	0.6-	1.5-	1999 10 17	106	0.0	0.2+	1999 11 12	704	0.3-	0.2-
1997 03 05	809	0.7+	0.5+	1999 11 01	703	0.3-	0.1+	1999 11 12	704	0.2-	0.3-
1997 03 05	809	0.1-	0.9+	1999 11 01	703	0.2-	0.5+	1999 11 12	704	0.2-	0.3-

1999 TK₁₉ = 1998 KV₃₆

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	3.40641		(2000.0)	P	Q
<i>n</i>	0.23631343	ω	315.32932	+0.99907732	-0.01242977
<i>a</i>	2.5910579	Ω	45.43124	+0.02907021	+0.90031437
<i>e</i>	0.1449039	<i>i</i>	3.30811	-0.03161389	+0.43506267
<i>P</i>	4.17	<i>H</i>	14.3	<i>G</i>	0.15
				<i>U</i>	4

Residuals in seconds of arc

1998 05 22	704	0.4+	0.1-	1999 10 09	365	0.6+	0.6+	1999 11 08	365	0.6+	0.8-
1998 05 22	704	0.2+	0.6+	1999 10 09	365	0.2+	0.1+	1999 11 08	365	0.8+	0.0
1998 05 22	704	0.3+	0.8-	1999 10 17	365	0.5-	0.3-	1999 11 12	704	0.0	0.1+
1998 05 24	704	1.1+	1.3+	1999 10 17	365	0.1+	0.3-	1999 11 12	704	0.3+	0.1+
1998 05 24	704	0.7+	0.1-	1999 11 02	703	0.4-	0.1-	1999 11 12	704	0.1+	0.2+
1998 05 24	704	1.2-	1.6-	1999 11 02	703	0.5-	0.1+	1999 11 12	704	0.3+	0.2+
1998 05 24	704	0.3+	0.6+	1999 11 02	703	0.8-	0.3-	1999 11 12	704	0.1-	0.3+
1998 05 24	704	1.8-	0.0	1999 11 02	703	0.5-	0.1+				

1999 TO₁₉ = 1988 KT = 1991 ED₈ = 1998 KV₃

Id. G. V. Williams, A. Doppler

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	184.19725		(2000.0)	P	Q
<i>n</i>	0.29698964	ω	328.68125	-0.99430265	-0.10036241
<i>a</i>	2.2248898	Ω	205.63216	+0.10659064	-0.93873742
<i>e</i>	0.0968791	<i>i</i>	4.76185	-0.00081896	-0.32969599
<i>P</i>	3.32	<i>H</i>	14.9	<i>G</i>	0.15
				<i>U</i>	2

Residuals in seconds of arc

1988 05 23	809	0.0	0.1+	1998 05 24	699	0.4+	0.7+	1999 10 06	704	0.4+	0.0
1991 03 13	675	0.3-	1.0-	1998 05 24	699	0.8+	0.7+	1999 10 06	704	0.4+	0.1+
1991 03 13	675	0.1-	0.2-	1998 05 24	699	0.5+	0.1+	1999 10 07	704	0.7+	0.1-
1998 05 01	704	0.4+	0.6-	1998 06 16	704	1.1+	0.4-	1999 10 07	704	0.3+	0.1+
1998 05 01	704	1.3-	0.7+	1998 06 16	704	0.4-	0.7+	1999 10 07	704	0.3+	0.4-
1998 05 01	704	(2.1+	1.1-)	1998 06 16	704	1.7-	1.1-	1999 10 07	704	0.3-	0.4-
1998 05 01	704	(0.8-	2.9+)	1998 06 16	704	(5.8-	0.6-)	1999 10 07	704	0.3-	0.7+
1998 05 01	566	0.5-	0.6-	1999 09 05	699	(0.2+	2.1+)	1999 10 14	595	0.3-	0.2+
1998 05 01	566	0.5-	0.9-	1999 09 05	699	(0.1-	2.2+)	1999 10 14	595	0.3-	0.1-
1998 05 01	566	0.7-	0.4-	1999 09 05	699	1.3+	0.1+	1999 10 19	595	0.2-	1.3-
1998 05 22	704	0.2+	0.4+	1999 09 30	703	0.7-	0.1+	1999 10 19	595	0.1+	0.1-
1998 05 22	704	0.3+	0.4-	1999 09 30	703	0.3-	0.0	1999 10 29	703	1.3-	0.6-
1998 05 22	704	0.1-	0.1-	1999 09 30	703	0.4-	0.4+	1999 10 29	703	0.2-	0.4+
1998 05 22	704	0.3-	0.4-	1999 09 30	703	0.2-	0.6-	1999 10 29	703	1.3-	0.2-
1998 05 22	699	0.0	0.2+	1999 10 04	704	0.2+	0.6-	1999 10 29	703	0.4-	0.5+
1998 05 22	704	0.6-	1.0-	1999 10 04	704	0.3+	0.1+	1999 11 12	704	1.1+	0.0
1998 05 22	699	0.4+	0.4+	1999 10 04	704	0.0	0.1-	1999 11 12	704	0.1+	0.0
1998 05 22	699	0.2+	0.2+	1999 10 04	704	0.1-	0.2+	1999 11 12	704	0.5+	0.1+
1998 05 24	704	0.2+	0.5+	1999 10 04	704	0.2+	0.5+	1999 11 12	704	(2.1+	0.9-)
1998 05 24	704	0.6+	0.1+	1999 10 06	704	0.6+	0.0	1999 11 12	704	0.3-	0.7-
1998 05 24	704	0.6+	0.0	1999 10 06	704	0.4+	0.1-				
1998 05 24	704	(0.9-	3.1-)	1999 10 06	704	0.3+	0.1-				

1999 TH₂₀ = 1998 KL₆₃

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Nakano

<i>M</i>	7.14738		(2000.0)	P	Q
<i>n</i>	0.23557604	ω	236.77353	+0.99756398	-0.02432416
<i>a</i>	2.5964620	Ω	124.53867	+0.04604731	+0.93364157
<i>e</i>	0.2562113	<i>i</i>	4.55226	-0.05239992	+0.35738181
<i>P</i>	4.18	<i>H</i>	14.7	<i>G</i>	0.15
				<i>U</i>	6

Residuals in seconds of arc

1998 05 22	704	0.2+	0.9-	1999 10 11	358	0.8-	1.5-	1999 10 18	358	1.9+	1.1+
1998 05 22	704	0.8-	0.6+	1999 10 11	358	(2.7+	3.4-)	1999 10 18	358	0.6-	0.4-
1998 05 22	704	(2.6+	2.1+)	1999 10 11	358	2.1-	0.1-	1999 11 06	358	0.7-	0.2-
1998 05 22	704	1.0+	0.4+	1999 10 13	358	(4.0-	1.4+)	1999 11 06	358	0.0	0.2+
1998 05 24	704	0.4-	0.3+	1999 10 13	358	0.4-	0.3-	1999 11 06	358	0.9+	0.0
1998 05 24	704	0.9+	0.5+	1999 10 13	358	0.7+	0.7+	1999 11 10	392	0.1+	0.7+
1998 05 24	704	0.7-	0.2+	1999 10 18	358	0.7+	0.2-	1999 11 10	392	0.2-	0.8+

1999 TA₂₁ = 1994 UB₈

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	305.25752		(2000.0)	P	Q
<i>n</i>	0.19500975	ω	90.43060	+0.24467556	-0.96949687
<i>a</i>	2.9450895	Ω	345.38217	+0.86521351	+0.22504940
<i>e</i>	0.0783788	<i>i</i>	3.28930	+0.43765221	+0.09710087
<i>P</i>	5.05	<i>H</i>	14.2	<i>G</i>	0.15
				<i>U</i>	5

Residuals in seconds of arc

1994 10 28	691	0.0	0.0	1999 10 03	704	0.2+	0.7+	1999 11 03	691	0.2-	0.4-
1994 10 28	691	0.0	0.2+	1999 10 03	704	0.8-	0.1+	1999 11 03	691	0.1-	0.4-
1994 10 28	691	0.0	0.2-	1999 10 07	683	1.4+	0.1+	1999 11 03	703	0.2-	0.0
1994 11 05	691	0.2-	0.2+	1999 10 07	704	1.0+	0.3+	1999 11 03	703	0.4+	0.2+
1994 11 05	691	0.0	0.2+	1999 10 07	683	0.6+	0.1-	1999 11 03	703	0.2-	0.4+
1994 11 05	691	0.0	0.1-	1999 10 07	704	0.5-	0.1-	1999 11 03	703	0.0	0.5+
1999 09 12	703	0.7+	0.7+	1999 10 07	704	0.1-	0.1-	1999 11 04	704	0.2-	0.5-
1999 09 12	703	0.7+	0.1-	1999 10 07	683	1.7+	0.9-	1999 11 04	704	0.2+	0.2+
1999 09 12	703	0.3-	0.8-	1999 10 07	704	0.4+	0.1+	1999 11 04	704	0.1-	0.3+
1999 09 12	703	0.6-	0.9-	1999 10 07	704	1.0-	0.4+	1999 11 04	703	0.8+	0.1+
1999 10 02	703	0.6-	0.2+	1999 10 08	683	0.3+	0.6-	1999 11 04	704	0.4-	0.1-
1999 10 02	703	0.1-	0.7+	1999 10 08	683	0.6-	0.6-	1999 11 04	703	0.3+	0.4+
1999 10 02	703	0.0	0.2-	1999 10 08	683	0.5-	0.3-	1999 11 04	704	0.0	0.3-
1999 10 02	703	0.2+	0.1+	1999 11 02	691	0.0	0.4-	1999 11 04	703	0.0	0.2+
1999 10 03	704	0.1+	0.5+	1999 11 02	691	0.0	0.4-	1999 11 04	703	0.4+	0.1+

1999 10 03	704	1.5-	0.5+	1999 11 02	691	0.0	0.4-
1999 10 03	704	0.7-	0.6+	1999 11 03	691	0.2-	0.3-

1999 TB₂₁ = 1997 EN₂₅

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	285.12582		(2000.0)	P	Q
<i>n</i>	0.28111443	ω	101.55493	-0.10985778	-0.99392998
<i>a</i>	2.3078839	Ω	354.74156	+0.88514900	-0.09514442
<i>e</i>	0.1287979	<i>i</i>	3.67222	+0.45215320	-0.05523340
<i>P</i>	3.51	<i>H</i>	15.8	<i>G</i>	0.15
				<i>U</i>	5

Residuals in seconds of arc

1997 03 04	385	0.3+	0.1-	1999 10 08	683	0.9-	0.5+	1999 11 04	704	0.7+	0.4+
1997 03 04	385	0.1-	0.3-	1999 10 08	683	0.4-	0.5+	1999 11 04	704	0.2+	0.1-
1997 03 07	385	1.1-	0.9+	1999 10 08	683	0.2+	0.2+	1999 11 04	704	0.3+	0.0
1997 03 07	385	0.5-	1.7-	1999 11 02	691	0.2-	0.2-	1999 11 04	703	0.0	0.3-
1997 03 08	385	0.1-	1.4+	1999 11 02	691	0.0	0.2-	1999 11 04	704	0.3-	0.3+
1997 03 08	385	1.6+	0.2-	1999 11 02	691	0.1+	0.1-	1999 11 04	703	(2.5+	1.1+)
1999 10 07	683	0.8+	0.6-	1999 11 03	691	0.1+	0.2-	1999 11 04	704	0.7+	0.3+
1999 10 07	683	0.4-	0.4-	1999 11 03	691	0.1-	0.4-	1999 11 04	703	1.3-	0.1+
1999 10 07	683	0.7+	0.1-	1999 11 03	691	0.0	0.1-	1999 11 04	703	0.3-	0.4+

1999 TH₂₄ = 1997 HB₅

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Doppler

<i>M</i>	276.85589		(2000.0)	P	Q
<i>n</i>	0.28505329	ω	288.51525	-0.42575834	-0.90378479
<i>a</i>	2.2865745	Ω	187.15782	+0.90433115	-0.42341388
<i>e</i>	0.3115378	<i>i</i>	20.49283	+0.03024924	-0.06239987
<i>P</i>	3.46	<i>H</i>	15.2	<i>G</i>	0.15
				<i>U</i>	4

Residuals in seconds of arc

1997 04 28	704	0.6-	0.7+	1997 04 29	704	0.5+	0.7-	1999 10 06	691	0.3+	0.0
1997 04 28	704	0.5-	0.4+	1997 04 29	704	0.2+	0.0	1999 10 06	691	0.1+	0.7-
1997 04 28	704	0.9-	0.2+	1997 04 29	704	0.1+	0.4-	1999 10 07	704	0.2-	0.5+
1997 04 28	704	0.4-	0.4+	1999 10 04	691	0.1+	0.0	1999 10 07	704	0.4-	0.2-
1997 04 28	704	(3.0-	0.7+)	1999 10 04	691	0.1+	0.1-	1999 10 07	704	0.0	0.5+
1997 04 29	704	0.7+	0.2-	1999 10 04	691	0.0	0.0	1999 10 07	704	0.2-	0.2-
1997 04 29	704	0.9+	0.5-	1999 10 06	691	0.3+	0.0				

1999 TG₂₅ = 1993 HB₆

Id. A. Doppler

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	75.20654		(2000.0)	P	Q
<i>n</i>	0.21044675	ω	261.64912	+0.09631172	+0.99485514
<i>a</i>	2.7992471	Ω	13.99447	-0.85443203	+0.09882758
<i>e</i>	0.1937454	<i>i</i>	7.46568	-0.51055847	+0.02227907
<i>P</i>	4.68	<i>H</i>	13.4	<i>G</i>	0.15
				<i>U</i>	5

Residuals in seconds of arc

1993 04 26	033	0.2+	0.6+	1999 10 06	704	0.1+	0.1-	1999 11 04	703	0.5-	0.6-
1993 04 26	033	1.0+	0.0	1999 10 06	704	0.3-	0.0	1999 11 04	704	0.5+	0.3+
1993 04 27	033	1.1-	0.5-	1999 10 06	704	0.7+	0.3-	1999 11 04	703	0.4-	0.1-
1999 10 03	704	0.1-	0.5+	1999 10 06	704	0.3-	0.8-	1999 11 04	704	0.1+	0.5+
1999 10 03	704	0.1+	0.2+	1999 10 06	704	0.4-	0.1+	1999 11 04	703	0.9-	0.6-
1999 10 03	704	0.1+	0.1-	1999 11 04	704	0.5+	0.4-	1999 11 04	703	0.2+	0.1-
1999 10 03	704	0.0	0.1-	1999 11 04	704	0.6+	0.1+				
1999 10 03	704	0.0	0.4+	1999 11 04	704	0.0	1.0+				

1999 TM₂₅ = 1998 HY₈₉

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	30.90870		(2000.0)		P		Q				
<i>n</i>	0.23309493	ω	94.70949		+0.76289667		+0.64512173				
<i>a</i>	2.6148543	Ω	225.12356		−0.61440840		+0.70297387				
<i>e</i>	0.2104984	<i>i</i>	3.43872		−0.20122371		+0.29940890				
<i>P</i>	4.23	<i>H</i>	15.0	<i>G</i>	0.15	<i>U</i>	5				
Residuals in seconds of arc											
1998 04 21	704	0.8−	1.2+	1999 10 03	704	0.2−	0.1+	1999 10 06	704	0.1−	0.1+
1998 04 21	704	0.1+	0.8−	1999 10 03	704	1.1+	0.5−	1999 11 03	703	0.3−	0.2−
1998 04 21	704	2.6+	1.5+	1999 10 03	704	0.5+	0.8−	1999 11 03	703	0.3+	0.1−
1998 04 21	704	0.7+	0.6−	1999 10 03	704	0.3−	0.2+	1999 11 03	703	0.2+	1.0+
1998 04 22	704	0.7−	0.6−	1999 10 03	704	0.1+	0.8−	1999 11 03	703	0.4+	0.2−
1998 04 22	704	0.6+	1.5+	1999 10 06	704	0.2−	0.5+	1999 11 04	703	0.2−	0.6−
1998 04 22	704	1.7−	0.6+	1999 10 06	704	0.3−	0.5+	1999 11 04	703	0.0	0.5+
1998 04 22	704	1.0−	0.1+	1999 10 06	704	0.2−	0.3+	1999 11 04	703	0.6−	0.1−
1998 04 22	704	0.5+	1.9−	1999 10 06	704	0.3−	0.3+	1999 11 04	703	0.2−	0.8+

1999 TQ₂₅ = 1998 LA₃

Id. A. Doppler

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	150.14000		(2000.0)		P		Q				
<i>n</i>	0.25722973	ω	7.49302		−0.78004266		+0.62050487				
<i>a</i>	2.4486231	Ω	211.31764		−0.58184258		−0.76671161				
<i>e</i>	0.0768455	<i>i</i>	8.92803		−0.23020134		−0.16470283				
<i>P</i>	3.83	<i>H</i>	14.5		<i>G</i>	0.15	<i>U</i>	4			
Residuals in seconds of arc											
1998 06 01	809	0.1+	0.7+	1999 10 03	704	0.7−	0.1−	1999 11 02	703	1.1−	0.7+
1998 06 01	809	0.2−	0.4+	1999 10 03	704	0.0	0.3−	1999 11 02	703	0.4−	1.0+
1998 06 01	809	0.1−	0.7+	1999 10 03	704	0.1+	0.2−	1999 11 02	703	1.2−	0.5+
1998 06 02	809	0.4−	0.9−	1999 10 03	704	0.4−	0.4+	1999 11 12	704	0.9+	0.5−
1998 06 02	809	0.8+	0.4−	1999 10 06	704	0.6+	0.2−	1999 11 12	704	0.1+	0.6−
1998 06 02	809	0.2−	0.5−	1999 10 06	704	0.5+	0.4−	1999 11 12	704	0.7+	0.2−
1999 10 02	703	0.6+	0.4+	1999 10 06	704	0.4+	0.6−	1999 11 12	704	0.2+	0.4−
1999 10 02	703	0.8−	0.9−	1999 10 06	704	0.4+	0.3−	1999 11 12	704	0.3+	0.6−
1999 10 02	703	0.2+	1.0+	1999 10 06	704	0.3+	0.3−				
1999 10 02	703	0.3−	0.3+	1999 11 02	703	0.4−	1.0+				

1999 TY₂₅ = 3472 T-3

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	16.40501		(2000.0)			P		Q			
<i>n</i>	0.18022182	ω	331.28224			+0.98931667		+0.08277667			
<i>a</i>	3.1040674	Ω	24.85126			+0.00936210		+0.78538584			
<i>e</i>	0.0920362	<i>i</i>	16.59114			−0.14548154		+0.61344690			
<i>P</i>	5.47	<i>H</i>	13.7			<i>G</i>	0.15	<i>U</i>	5		
Residuals in seconds of arc											
1977 10 07	675	0.6−	0.7+	1977 10 22	675	0.3+	0.6+	1999 10 06	704	0.2−	0.3+
1977 10 11	675	0.9−	1.1+	1977 10 22	675	2.9+	0.2−	1999 11 04	703	0.1+	0.1+
1977 10 11	675	0.9−	0.5+	1999 10 03	704	0.9+	0.8+	1999 11 04	703	0.1−	0.4+
1977 10 12	675	0.5+	1.9−	1999 10 03	704	0.1−	0.6−	1999 11 04	703	0.1+	2.5−
1977 10 12	675	1.2+	0.9−	1999 10 03	704	0.7+	0.1−	1999 11 04	703	0.1+	0.0
1977 10 16	675	0.0	1.3−	1999 10 03	704	0.4−	0.2−	1999 11 11	703	0.2−	1.0+
1977 10 16	675	0.8−	0.0	1999 10 03	704	0.1+	0.2−	1999 11 11	703	0.2+	0.2+
1977 10 17	675	0.3−	0.4+	1999 10 06	704	0.1+	0.0	1999 11 11	703	0.1+	0.1+
1977 10 17	675	0.9−	0.4−	1999 10 06	704	0.4−	0.2−	1999 11 11	703	0.4−	0.4+
1977 10 21	675	0.5+	0.0	1999 10 06	704	0.3−	0.2+				
1977 10 21	675	0.9−	1.5+	1999 10 06	704	0.2−	0.2+				

1999 TZ₂₅ = 1998 HV₆₅

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

M	20.83735		(2000.0)		P		Q				
n	0.28655759	ω	321.05264		+0.92157418		+0.38673854				
a	2.2785651	Ω	16.29364		−0.31935817		+0.80460795				
e	0.1312676	i	6.89469		−0.22070655		+0.45059889				
P	3.44	H	15.2		G	0.15	U	5			
Residuals in seconds of arc											
1998 04 21	704	0.9+	0.9−	1999 10 03	704	0.2+	0.7−	1999 10 06	704	0.1−	0.4+
1998 04 21	704	0.2+	1.6−	1999 10 03	704	0.7+	0.2+	1999 11 03	703	0.1+	0.1+
1998 04 21	704	0.7+	0.4−	1999 10 03	704	0.1+	0.4−	1999 11 03	703	0.5−	0.1+
1998 04 21	704	0.4−	0.5−	1999 10 03	704	1.0−	0.8−	1999 11 03	703	0.6+	0.6−
1998 04 22	704	0.6+	0.9+	1999 10 03	704	0.0	0.1−	1999 11 03	703	0.5−	0.7+
1998 04 22	704	0.4−	0.1+	1999 10 06	704	0.0	0.2+	1999 11 04	703	0.0	0.2−
1998 04 22	704	0.3−	0.7−	1999 10 06	704	0.1−	0.2+	1999 11 04	703	0.2−	0.5−
1998 04 22	704	0.4−	0.6+	1999 10 06	704	0.2−	0.2+	1999 11 04	703	0.6+	0.8+
1998 04 22	704	1.3−	1.9+	1999 10 06	704	0.1+	0.4+	1999 11 04	703	0.5+	0.6−

1999 TB₂₆ = 1999 TB₁₁ = 1976 UM₆

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

M	22.11890			(2000.0)			P			Q		
n	0.21452884	ω		324.90582			+0.93858332			+0.34421525		
a	2.7636238	Ω		15.01601			−0.29157191			+0.82841819		
e	0.1644746	i		5.32063			−0.18451873			+0.44185876		
P	4.59	H		14.6	G		0.15	U		4		
Residuals in seconds of arc												
1976 10 22	381	0.5−	0.4−	1999 10 06	704	0.2−	0.1−	1999 11 04	704	0.2+	0.0	
1976 10 22	381	0.1+	0.1+	1999 10 06	704	0.1−	0.3−	1999 11 04	704	0.2−	0.1+	
1976 10 24	381	0.4+	0.3+	1999 10 08	104	0.1+	0.1−	1999 11 04	704	0.1+	0.2+	
1999 10 03	704	0.8−	0.3+	1999 10 08	104	1.4+	0.1+	1999 11 04	703	0.1−	0.6+	
1999 10 03	704	0.9−	0.8+	1999 11 02	691	0.0	0.1+	1999 11 04	704	0.5−	0.3−	
1999 10 03	704	0.4+	0.0	1999 11 02	691	0.1+	0.2−	1999 11 04	703	0.1+	0.4+	
1999 10 03	704	0.0	0.0	1999 11 02	691	0.0	0.1−	1999 11 04	704	0.2+	0.4−	
1999 10 06	704	0.2+	0.4−	1999 11 03	691	0.0	0.2−	1999 11 04	703	0.1−	0.3−	
1999 10 06	704	0.1+	0.0	1999 11 03	691	0.1−	0.2−	1999 11 04	703	0.1−	0.6+	
1999 10 06	704	0.2+	0.2−	1999 11 03	691	0.0	0.2−					

1999 TF₂₆ = 1997 GO₁₇

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	328.16907		(2000.0)		P		Q				
<i>n</i>	0.22247750	ω	193.75092		+0.61925884		−0.78425535				
<i>a</i>	2.6973998	Ω	218.00766		+0.72613893		+0.59053705				
<i>e</i>	0.1186800	<i>i</i>	3.56013		+0.29873190		+0.19028806				
<i>P</i>	4.43	<i>H</i>	14.5	<i>G</i>	0.15	<i>U</i>	4				
Residuals in seconds of arc											
1997 04 03	704	1.0−	0.1+	1999 10 03	704	0.3+	0.0	1999 11 04	704	0.4−	0.6−
1997 04 03	704	0.5−	0.8−	1999 10 06	704	0.1−	0.1+	1999 11 04	704	0.2−	0.4−
1997 04 07	704	0.8+	0.6+	1999 10 06	704	0.3+	0.0	1999 11 04	704	0.0	1.1−
1997 04 07	704	0.8+	0.4+	1999 10 06	704	0.2−	0.2+	1999 11 12	704	0.0	0.1−
1999 10 03	704	0.5+	0.6+	1999 10 06	704	0.1−	0.3+	1999 11 12	704	0.5−	0.6+
1999 10 03	704	0.1−	0.4−	1999 10 06	704	0.2−	0.2+	1999 11 12	704	0.2+	0.3+
1999 10 03	704	0.1−	0.0	1999 11 04	704	0.5+	0.2+	1999 11 12	704	0.4+	0.1+
1999 10 03	704	0.0	0.2−	1999 11 04	704	0.3−	0.4−	1999 11 12	704	0.1−	0.6+

1999 TL₂₆ = 1997 HY₁₃

Id. G. V. Williams, A. Doppler

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	353.00966		(2000.0)	P	Q
<i>n</i>	0.18337593	ω	167.29946	+0.90096385	-0.42067285
<i>a</i>	3.0683707	Ω	218.14666	+0.38152416	+0.88475373
<i>e</i>	0.1449961	<i>i</i>	9.90921	+0.20664813	+0.20061206
<i>P</i>	5.37	<i>H</i>	14.5	<i>G</i> 0.15	<i>U</i> 4

Residuals in seconds of arc

1997 04 30	704	0.7-	0.7-	1997 05 05	704	(2.8-	0.3-)	1999 11 04	704	0.1+	0.3-
1997 04 30	704	1.0-	0.6+	1997 05 05	704	1.6-	0.7+	1999 11 04	704	0.7-	0.3-
1997 04 30	704	(2.3+	0.4+)	1999 10 03	704	0.3+	0.0	1999 11 04	704	0.4-	0.3-
1997 04 30	704	(2.9-	0.6+)	1999 10 03	704	0.9+	1.0-	1999 11 04	704	0.6-	0.4-
1997 05 01	704	0.5-	0.0	1999 10 03	704	0.1+	0.7+	1999 11 04	704	0.6-	0.6-
1997 05 01	704	0.0	1.0-	1999 10 03	704	0.3-	0.2-	1999 11 07	120	0.1-	0.3-
1997 05 01	704	0.4-	0.8+	1999 10 06	704	0.1+	0.4+	1999 11 07	120	0.2+	0.6-
1997 05 01	704	(3.0-	0.6+)	1999 10 06	704	0.1-	0.2+	1999 11 08	120	0.7+	0.4-
1997 05 05	704	1.7+	0.3-	1999 10 06	704	0.1+	0.1+	1999 11 08	120	0.9+	1.1-
1997 05 05	704	0.9+	0.4+	1999 10 06	704	0.2+	0.3+	1999 11 12	704	0.1+	0.1-
1997 05 05	704	0.2-	0.7+	1999 10 06	704	0.1-	0.1+	1999 11 12	704	0.2+	0.5+
1997 05 05	704	0.7+	1.2-	1999 11 03	703	(2.6-	1.3+)	1999 11 12	704	0.1+	0.5+
1997 05 05	704	0.7+	0.1+	1999 11 03	703	0.1-	1.3+	1999 11 12	704	0.1+	0.6+
1997 05 05	704	0.6+	0.3+	1999 11 03	703	0.1-	0.3-	1999 11 12	704	0.1+	0.6+
1997 05 05	704	0.2-	0.9-	1999 11 03	703	1.0-	0.1+				

1999 TC₂₇ = 1992 WD₄

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	269.21048		(2000.0)	P	Q
<i>n</i>	0.27587127	ω	259.02845	-0.53599741	-0.84079419
<i>a</i>	2.3370342	Ω	223.66291	+0.81115999	-0.48798097
<i>e</i>	0.1479561	<i>i</i>	6.31761	+0.23393642	-0.23439217
<i>P</i>	3.57	<i>H</i>	14.3	<i>G</i> 0.15	<i>U</i> 3

Residuals in seconds of arc

1992 11 21	399	(3.0-	0.6-)	1999 10 06	704	0.8+	0.3+	1999 11 03	703	0.0	0.3+
1992 11 21	399	1.3-	0.3-	1999 10 06	704	0.7+	0.1-	1999 11 04	704	0.1-	0.1-
1992 11 27	399	0.7+	0.0	1999 10 06	704	0.2+	0.4+	1999 11 04	704	0.1+	0.4+
1992 11 27	399	0.7+	0.2-	1999 10 06	704	0.4+	0.0	1999 11 04	704	0.2+	0.5+
1997 02 10	327	0.4-	0.1+	1999 10 06	704	0.1+	0.1+	1999 11 04	704	0.6-	0.8+
1997 02 10	327	0.5+	0.1+	1999 10 29	703	0.3-	0.2+	1999 11 04	704	0.7-	0.8+
1997 02 10	327	0.1-	0.1-	1999 10 29	703	0.5+	0.4+	1999 11 12	704	0.5+	0.4-
1999 10 03	704	0.0	0.0	1999 10 29	703	0.1-	0.0	1999 11 12	704	0.0	0.5-
1999 10 03	704	0.4-	0.6-	1999 10 29	703	0.2-	0.1-	1999 11 12	704	0.5+	0.5-
1999 10 03	704	0.3-	0.5-	1999 11 03	703	0.3-	0.1+	1999 11 12	704	0.4+	0.3-
1999 10 03	704	0.3-	0.5-	1999 11 03	703	0.5-	0.3+	1999 11 12	704	0.4+	0.1+
1999 10 03	704	0.8-	0.8-	1999 11 03	703	0.3-	0.1+				

1999 TK₂₇ = 9087 P-L = 1992 UG₅ = 1998 MP₂₁

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	143.26939		(2000.0)	P	Q
<i>n</i>	0.28017438	ω	9.54577	-0.61414403	+0.78548715
<i>a</i>	2.3130433	Ω	222.61652	-0.73131109	-0.60281837
<i>e</i>	0.0788962	<i>i</i>	6.47888	-0.29666681	-0.14007122
<i>P</i>	3.52	<i>H</i>	14.1	<i>G</i> 0.15	<i>U</i> 3

Residuals in seconds of arc

1960 10 22	675	0.1-	0.5-	1998 06 26	704	0.5+	0.1+	1999 10 06	704	0.4-	0.6+
1960 10 24	675	0.8+	0.2-	1998 06 26	704	1.3-	0.3-	1999 10 06	704	0.3-	0.3+
1960 10 26	675	0.2-	0.1-	1998 06 26	704	0.3-	0.3+	1999 11 04	704	0.5+	0.3+
1992 10 21	372	1.2+	3.0-	1998 06 26	704	0.1-	0.4+	1999 11 04	704	0.6+	2.6-
1992 10 21	372	0.5+	0.1+	1999 10 03	704	0.2+	1.1+	1999 11 04	704	0.6+	0.4+
1992 10 25	372	2.5-	2.4-	1999 10 03	704	2.8-	1.3+	1999 11 04	704	0.0	0.3+
1992 10 25	372	0.6+	2.2+	1999 10 03	704	0.4+	0.2+	1999 11 04	704	0.5+	0.3+
1998 06 24	704	0.5+	0.2-	1999 10 03	704	0.3-	0.3+	1999 11 12	704	0.0	0.2+
1998 06 24	704	0.7-	0.1-	1999 10 03	704	0.6-	0.5-	1999 11 12	704	0.1+	0.1+
1998 06 24	704	0.8+	0.1-	1999 10 06	704	0.1+	0.6+	1999 11 12	704	1.5+	0.3-

1998 06 24	704	0.5+	0.6-	1999 10 06	704	0.1-	0.7+	1999 11 12	704	0.6-	0.1-
1998 06 26	704	0.2-	0.4+	1999 10 06	704	0.0	0.5+	1999 11 12	704	0.3+	0.2+

1999 TP₂₇ = 1990 TQ₇

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	302.38031		(2000.0)	P	Q
<i>n</i>	0.21961082	ω	59.84766	+0.08692727	-0.99598877
<i>a</i>	2.7208226	Ω	25.19179	+0.89601140	+0.06885848
<i>e</i>	0.0334629	<i>i</i>	2.85670	+0.43543912	+0.05713909
<i>P</i>	4.49	<i>H</i>	14.3	<i>G</i> 0.15	<i>U</i> 5

Residuals in seconds of arc

1990 10 13	033	0.6+	0.1+	1999 10 06	704	0.8-	0.4-	1999 10 30	691	0.3+	0.1-
1990 10 13	033	0.3-	0.6+	1999 10 16	681	(3.5-	0.8-)	1999 11 04	704	0.8+	0.3-
1990 10 14	033	0.1-	0.4+	1999 10 16	681	0.7-	1.1-	1999 11 04	704	0.5+	0.1-
1990 10 18	033	0.4-	0.6-	1999 10 16	681	0.3+	0.5+	1999 11 04	704	0.1+	0.7-
1999 10 03	704	0.1+	0.2+	1999 10 16	681	0.0	0.0	1999 11 04	704	0.3+	0.0
1999 10 03	704	0.7+	0.2-	1999 10 29	703	0.9-	0.6+	1999 11 11	703	0.4-	0.1+
1999 10 03	704	0.0	0.3+	1999 10 29	703	0.1+	1.1+	1999 11 11	703	0.3-	0.1+
1999 10 06	704	0.5+	0.2-	1999 10 29	703	1.0-	0.4+	1999 11 11	703	0.2-	0.0
1999 10 06	704	0.3+	0.0	1999 10 29	703	0.1+	0.1+	1999 11 11	703	0.0	0.3-
1999 10 06	704	0.0	0.2-	1999 10 30	691	0.3+	0.0				
1999 10 06	704	0.4-	0.3-	1999 10 30	691	0.3+	0.0				

1999 TQ₂₇ = 1989 WC₁ = 1992 UD = 1998 MD₂₆

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	190.51013		(2000.0)	P	Q
<i>n</i>	0.29202974	ω	321.42279	-0.97271163	+0.22563206
<i>a</i>	2.2500111	Ω	231.70298	-0.19210723	-0.91387586
<i>e</i>	0.0739366	<i>i</i>	3.94969	-0.13010342	-0.33752199
<i>P</i>	3.38	<i>H</i>	14.0	<i>G</i> 0.15	<i>U</i> 2

Residuals in seconds of arc

1989 11 21	877	0.6-	0.5+	1998 06 26	704	0.6-	0.5-	1999 10 06	704	0.9-	0.1-
1989 11 21	877	1.7-	0.8-	1998 06 26	704	0.5+	2.2+	1999 11 04	704	0.1-	0.1+
1989 11 25	877	2.7-	0.0	1998 06 26	704	0.2+	0.2+	1999 11 04	704	0.2-	0.2+
1989 11 25	877	4.7+	3.4+	1999 10 03	704	0.8+	0.1-	1999 11 04	704	0.3-	0.2+
1992 10 20	372	0.5+	2.0-	1999 10 03	704	0.0	0.6-	1999 11 04	704	0.2+	0.5+
1992 10 21	372	2.2-	1.0-	1999 10 03	704	1.2-	1.3-	1999 11 04	704	0.3+	0.8+
1992 10 21	372	1.9+	2.1+	1999 10 03	704	0.5+	1.5-	1999 11 12	704	0.5+	0.1+
1998 06 24	704	0.6-	0.2+	1999 10 03	704	0.9-	0.8-	1999 11 12	704	0.5+	0.1+
1998 06 24	704	0.4+	0.4+	1999 10 06	704	0.9+	0.4+	1999 11 12	704	0.1-	0.1+
1998 06 24	704	0.2-	1.4-	1999 10 06	704	0.2+	0.0	1999 11 12	704	0.1+	0.1+
1998 06 26	704	0.6+	0.5+	1999 10 06	704	0.1+	0.2+	1999 11 12	704	0.4-	0.5+
1998 06 26	704	0.4-	0.6+	1999 10 06	704	0.2-	0.0				

1999 TD₂₈ = 1996 XG₂₂

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	19.50179		(2000.0)	P	Q
<i>n</i>	0.27652757	ω	331.47436	+0.92486648	+0.38026194
<i>a</i>	2.3333350	Ω	6.18151	-0.33993339	+0.83228596
<i>e</i>	0.1896612	<i>i</i>	2.54497	-0.17049133	+0.40336205
<i>P</i>	3.56	<i>H</i>	16.2	<i>G</i> 0.15	<i>U</i> 5

Residuals in seconds of arc

1996 12 08	691	0.1-	0.1+	1999 10 06	704	0.3+	0.7+	1999 11 03	703	0.2+	0.0
1996 12 08	691	0.2+	0.0	1999 10 06	704	0.2-	0.1+	1999 11 03	703	0.1-	0.1-
1996 12 08	691	0.4+	0.3+	1999 10 06	704	0.1-	0.1+	1999 11 03	703	0.5-	0.2-
1996 12 13	691	0.4-	0.5+	1999 10 06	704	0.2+	0.2-	1999 11 03	703	0.7+	0.6+
1996 12 13	691	0.2+	0.6-	1999 10 06	704	0.2-	0.2-	1999 11 04	704	0.5+	0.1+
1996 12 13	691	0.3-	0.1-	1999 10 29	703	0.7-	0.8+	1999 11 04	704	0.5+	0.1-
1999 10 03	704	0.6-	0.4-	1999 10 29	703	0.7-	0.9-	1999 11 04	704	0.7+	0.6-
1999 10 03	704	0.7+	0.7-	1999 10 29	703	0.7-	0.7+	1999 11 04	704	0.7+	0.3+
1999 10 03	704	0.0	0.7+	1999 10 29	703	0.9-	0.0	1999 11 04	704	0.3+	0.8-

1999 TW₂₈ = 1976 UE₉ = 1986 WA₄

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>		(2000.0)		P		Q	
<i>n</i>	0.29853181	ω	231.14008	+0.34411206	−0.93882105		
<i>a</i>	2.2172210	Ω	198.74725	+0.87456550	+0.32599346		
<i>e</i>	0.1020095	<i>i</i>	2.53405	+0.34164611	+0.11110037		
<i>P</i>	3.30	<i>H</i>	15.6	<i>G</i>	0.15	<i>U</i>	4

Residuals in seconds of arc

1976 10 22	381	0.2−	0.0	1999 10 04	704	0.2+	0.2+	1999 10 29	703	0.1−	0.2+
1976 10 22	381	0.7+	0.5+	1999 10 04	704	0.9+	0.9−	1999 10 29	703	0.4+	0.5+
1976 10 24	381	0.7−	0.1+	1999 10 06	704	0.1−	0.3+	1999 10 29	703	0.9−	0.9+
1986 11 25	010	4.4+	0.6+	1999 10 06	704	0.1−	0.3+	1999 11 03	703	1.0−	0.2+
1986 11 25	010	4.1−	1.7−	1999 10 06	704	0.1−	0.2−	1999 11 03	703	0.3+	0.5+
1999 10 04	704	0.0	0.5−	1999 10 06	704	0.1+	0.5−	1999 11 03	703	0.1+	0.5+
1999 10 04	704	0.2+	0.8−	1999 10 06	704	0.1+	1.5−	1999 11 03	703	0.8+	0.8+
1999 10 04	704	0.3−	0.1+	1999 10 29	703	0.6−	0.5+				

1999 TF₂₉ = 1980 PG₄ = 1998 HV₇₆

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>		(2000.0)		P		Q	
<i>n</i>	0.26415502	ω	69.49627	+0.11845012	+0.99238494		
<i>a</i>	2.4056372	Ω	207.37359	−0.93621136	+0.10027692		
<i>e</i>	0.0777163	<i>i</i>	4.21433	−0.33087438	+0.07153085		
<i>P</i>	3.73	<i>H</i>	14.2	<i>G</i>	0.15	<i>U</i>	3

Residuals in seconds of arc

1980 08 04	675	1.1−	0.6−	1998 04 22	704	0.1+	0.1−	1999 10 06	704	0.1−	0.1−
1980 08 05	675	1.2+	0.3+	1998 04 22	704	1.5+	0.7+	1999 10 06	704	0.0	0.2−
1998 04 21	704	0.1+	0.8+	1999 10 04	704	0.2+	0.1+	1999 10 29	703	0.6−	0.7−
1998 04 21	704	0.1−	0.5−	1999 10 04	704	0.7+	0.0	1999 10 29	703	0.2−	0.1+
1998 04 21	704	0.1+	0.6+	1999 10 04	704	0.0	0.5+	1999 10 29	703	0.7+	0.2−
1998 04 21	704	0.3+	0.1−	1999 10 04	704	0.2−	0.2+	1999 10 29	703	0.8−	0.3+
1998 04 21	704	0.1+	1.2+	1999 10 04	704	0.7−	0.1−	1999 11 03	703	0.0	0.5+
1998 04 22	704	1.5−	2.7−	1999 10 06	704	0.2−	0.6+	1999 11 03	703	0.1−	0.0
1998 04 22	704	0.8−	0.9+	1999 10 06	704	0.1+	0.1−	1999 11 03	703	0.1+	0.0
1998 04 22	704	0.4+	0.1−	1999 10 06	704	0.4+	0.0	1999 11 03	703	0.5+	0.3−

1999 TO₂₉ = 1995 TA₆

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>		(2000.0)		P		Q	
<i>n</i>	0.24160577	ω	137.03275	+0.92563545	+0.37730884		
<i>a</i>	2.5530806	Ω	200.85347	−0.36548495	+0.87157128		
<i>e</i>	0.2050883	<i>i</i>	4.66179	−0.09808035	+0.31305199		
<i>P</i>	4.08	<i>H</i>	15.7	<i>G</i>	0.15	<i>U</i>	5

Residuals in seconds of arc

1995 10 15	691	0.3+	0.0	1999 10 04	704	0.4−	0.5−	1999 10 29	703	0.2+	1.2+
1995 10 15	691	0.2+	0.3−	1999 10 04	704	0.2−	0.7+	1999 10 29	703	0.0	1.8+
1995 10 15	691	0.3+	0.4−	1999 10 04	704	0.5−	0.8−	1999 10 29	703	0.9−	1.8+
1995 10 21	691	0.6−	0.2+	1999 10 06	704	0.7+	0.2−	1999 10 29	703	0.1−	0.2+
1995 10 21	691	0.1+	0.2+	1999 10 06	704	0.1−	0.4−	1999 11 03	703	0.4+	0.9+
1995 10 21	691	0.3−	0.3+	1999 10 06	704	0.4+	0.3−	1999 11 03	703	0.6+	1.6+
1999 10 04	704	0.4−	0.7+	1999 10 06	704	0.4+	0.4−	1999 11 03	703	0.7+	0.7+
1999 10 04	704	0.3−	0.9+	1999 10 06	704	0.4+	0.6−	1999 11 03	703	(0.9−	7.4−)

1999 TU₃₀ = 1995 OW₆

Id. A. Doppler

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>		(2000.0)		P		Q	
<i>n</i>	0.26248615	ω	70.05838	+0.65560549	−0.75502169		
<i>a</i>	2.4158231	Ω	338.96375	+0.68069323	+0.59731137		
<i>e</i>	0.1738959	<i>i</i>	1.77546	+0.32686109	+0.27048360		
<i>P</i>	3.75	<i>H</i>	16.2	<i>G</i>	0.15	<i>U</i>	3

Residuals in seconds of arc

1995 07 24	691	0.4+	0.1−	1999 09 18	703	0.3−	0.0	1999 10 06	704	0.0	0.1+
1995 07 24	691	0.2−	0.1+	1999 09 18	703	0.1−	0.1−	1999 10 06	704	0.1+	0.1−
1995 07 24	691	0.8+	0.4+	1999 10 01	703	0.1+	0.0	1999 10 06	704	0.3+	0.1+
1995 08 01	691	0.5−	0.1+	1999 10 01	703	0.2+	0.4+	1999 10 06	704	0.3+	0.1−
1995 08 01	691	0.4−	0.1+	1999 10 01	703	1.0−	0.2−	1999 10 06	704	0.0	0.3−
1995 08 01	691	0.3−	0.1+	1999 10 01	703	0.0	0.3+	1999 10 30	703	0.2−	1.4+
1997 02 07	327	0.1+	0.3−	1999 10 04	704	0.4−	0.2−	1999 10 30	703	0.3−	0.3+
1997 02 07	327	0.1−	0.5+	1999 10 04	704	1.0+	0.7−	1999 10 30	703	0.0	0.3+
1997 02 07	327	0.2+	0.3+	1999 10 04	704	0.7+	0.6−	1999 10 30	703	0.3−	0.5−
1999 09 18	703	0.8−	0.1+	1999 10 04	704	0.2+	0.0				
1999 09 18	703	0.2−	0.2+	1999 10 04	704	0.5+	0.3−				

1999 TV₃₀ = 1998 KQ₅₃

Id. A. Doppler

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>		(2000.0)		P		Q	
<i>n</i>	0.22375901	ω	57.36538	−0.25532693	+0.96443274		
<i>a</i>	2.6870909	Ω	198.21923	−0.94409875	−0.26394982		
<i>e</i>	0.1373941	<i>i</i>	12.63570	−0.20853226	+0.01414191		
<i>P</i>	4.40	<i>H</i>	14.1	<i>G</i>	0.15	<i>U</i>	3

Residuals in seconds of arc

1998 05 23	704	0.1−	0.5−	1999 09 18	703	0.3−	0.3−	1999 10 06	704	0.1+	0.1+
1998 05 23	704	0.1−	0.1−	1999 09 18	703	0.1−	0.3−	1999 10 08	683	0.7−	0.2+
1998 05 23	704	0.3−	0.2−	1999 09 18	703	0.5−	0.3+	1999 10 08	683	0.1+	0.7+
1998 05 23	704	0.8+	0.2−	1999 10 01	703	0.2−	0.3−	1999 10 30	703	0.5−	0.6+
1998 05 23	704	0.2+	0.0	1999 10 01	703	1.1−	0.2+	1999 10 30	703	0.1+	0.1−
1998 05 26	704	1.0+	0.8+	1999 10 01	703	0.1−	0.0	1999 10 30	703	0.1−	0.6+
1998 05 26	704	0.8−	0.6+	1999 10 01	703	0.2+	0.1−	1999 10 30	703	1.0−	0.9+
1998 05 26	704	0.4+	0.3−	1999 10 04	704	0.9+	0.5−	1999 11 12	704	0.8+	0.4−
1998 05 26	704	0.4+	0.7+	1999 10 04	704	0.6+	0.8−	1999 11 12	704	0.7+	0.2−
1998 05 26	704	(2.3−	1.8+)	1999 10 04	704	0.6+	0.0	1999 11 12	691	0.1−	0.1−
1998 06 19	704	0.5+	0.2+	1999 10 04	704	0.1+	0.0	1999 11 12	704	0.7−	1.1+
1998 06 19	704	0.3−	0.0	1999 10 04	704	0.3+	0.3+	1999 11 12	704	0.1+	0.2−
1998 06 19	704	0.9−	0.0	1999 10 06	704	0.1+	0.3−	1999 11 12	704	0.1−	0.6−
1998 06 19	704	0.1−	0.2−	1999 10 06	704	0.1+	0.0	1999 11 12	691	0.2−	0.3−
1998 06 19	704	0.7−	0.6−	1999 10 06	704	0.2+	0.0	1999 11 12	691	0.5+	0.0
1999 09 18	703	0.1+	0.3−	1999 10 06	704	0.2+	0.1−				

1999 TX₃₀ = 1996 VM₂₁ = 1998 FG₅₄

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>		(2000.0)		P		Q	
<i>n</i>	0.30086962	ω	43.20175	−0.06024620	+0.99792220		
<i>a</i>	2.2057206	Ω	223.35924	−0.92463596	−0.06441309		
<i>e</i>	0.0925807	<i>i</i>	1.90642	−0.37605681	−0.00149543		
<i>P</i>	3.28	<i>H</i>	15.6	<i>G</i>	0.15	<i>U</i>	3

Residuals in seconds of arc

1996 11 08	691	0.0	0.0	1998 03 20	704	0.4−	0.6+	1999 10 04	704	0.3−	0.1+
1996 11 08	691	0.1+	0.0	1998 03 20	704	0.6+	0.6−	1999 10 04	704	0.7−	0.1+
1996 11 08	691	0.1+	0.1+	1998 03 22	704	0.4+	0.3+	1999 10 04	704	0.0	0.2−
1996 11 09	691	0.1−	0.0	1998 03 22	704	0.6+	0.0	1999 10 06	704	0.1+	0.1+
1996 11 09	691	0.1−	0.2−	1998 03 22	704	1.0+	0.3+	1999 10 06	704	0.0	0.1+
1996 11 09	691	0.1+	0.0	1998 03 22	704	0.3+	0.8+	1999 10 06	704	0.2+	0.0
1998 03 20	704	0.3−	0.4−	1998 03 22	704	1.6−	0.2−	1999 10 06	704	0.3+	0.2+
1998 03 20	704	0.1+	0.7−	1999 10 04	704	0.1−	0.1+	1999 10 06	704	0.3+	0.2+
1998 03 20	704	0.7−	0.0	1999 10 04	704	0.1+	0.8−				

1999 TC₃₁ = 1997 EV₅₇

Id. G. V. Williams, A. Doppler

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>		(2000.0)		P		Q	
<i>n</i>	0.17442603	ω	294.36433	+0.54831348	+0.83549617		
<i>a</i>	3.1724530	Ω	9.14573	-0.66135383	+0.45959461		
<i>e</i>	0.1062384	<i>i</i>	13.10334	-0.51182363	+0.30119585		
<i>P</i>	5.65	<i>H</i>	13.5	<i>G</i>	0.15	<i>U</i>	4

Residuals in seconds of arc

1997 03 10	809	0.6+	0.5-	1999 10 01	703	0.1-	0.5+	1999 10 06	704	0.1+	0.4-
1997 03 10	809	0.4-	0.8-	1999 10 01	703	0.3+	0.1+	1999 10 06	704	0.1-	0.4-
1997 03 10	809	0.2-	1.0-	1999 10 01	703	0.2-	0.4-	1999 10 06	704	0.2-	0.0
1997 03 11	809	0.1+	0.9+	1999 10 01	703	0.9-	0.3+	1999 10 06	704	0.4+	0.2+
1997 03 11	809	0.1-	1.0+	1999 10 04	704	0.6+	0.6+	1999 10 30	703	0.3-	0.1-
1997 03 11	809	0.1-	0.3+	1999 10 04	704	0.6+	0.5-	1999 10 30	703	0.0	0.1-
1999 09 18	703	0.4-	0.3+	1999 10 04	704	0.1-	0.5-	1999 10 30	703	0.5-	0.7+
1999 09 18	703	0.1-	0.5+	1999 10 04	704	0.7+	0.5-	1999 10 30	703	0.3+	0.3+
1999 09 18	703	0.2-	0.3+	1999 10 04	704	0.0	1.0-				
1999 09 18	703	0.1-	0.0	1999 10 06	704	0.0	0.1-				

1999 TE₃₁ = 1997 GJ₃₁

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>		(2000.0)		P		Q	
<i>n</i>	0.22864725	ω	45.19516	+0.57048318	-0.82000132		
<i>a</i>	2.6486550	Ω	10.32200	+0.66151483	+0.42532251		
<i>e</i>	0.1229009	<i>i</i>	14.98614	+0.48677210	+0.38301252		
<i>P</i>	4.31	<i>H</i>	14.1	<i>G</i>	0.15	<i>U</i>	5

Residuals in seconds of arc

1997 04 13	691	0.6+	0.1-	1999 10 04	704	0.2-	0.3+	1999 10 06	704	0.0	0.0
1997 04 13	691	0.1-	0.0	1999 10 04	704	0.1+	0.2-	1999 10 06	704	0.0	0.1+
1997 04 13	691	0.3-	0.0	1999 10 04	704	0.4-	0.5+	1999 10 06	704	0.1+	0.0
1997 04 16	691	0.1-	0.2-	1999 10 04	704	0.2+	0.2-	1999 10 06	704	0.0	0.0
1997 04 16	691	0.0	0.2+	1999 10 04	704	0.1+	0.4-				
1997 04 16	691	0.1-	0.1+	1999 10 06	704	0.1-	0.1+				

1999 TG₃₂ = 1982 XE₃ = 1997 HY

Id. G. V. Williams, A. Doppler

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>		(2000.0)		P		Q	
<i>n</i>	0.22710610	ω	299.76853	-0.82918125	-0.55802500		
<i>a</i>	2.6606241	Ω	206.35337	+0.53489866	-0.77514052		
<i>e</i>	0.1784174	<i>i</i>	4.21906	+0.16230179	-0.29625204		
<i>P</i>	4.34	<i>H</i>	14.0	<i>G</i>	0.15	<i>U</i>	3

Residuals in seconds of arc

1982 12 13	381	(3.4+	14.1+)	1999 10 02	703	0.4-	0.2-	1999 10 19	120	0.8+	0.3-
1982 12 14	381	0.1+	0.3+	1999 10 02	703	0.3-	0.3+	1999 10 19	120	(2.8-	1.1-)
1982 12 14	381	0.1+	0.9-	1999 10 04	704	1.0+	0.6-	1999 10 19	120	0.9-	0.2-
1997 04 28	691	0.2+	0.1+	1999 10 04	704	0.2+	0.0	1999 10 27	327	1.5-	0.3-
1997 04 28	691	0.1+	0.1+	1999 10 04	704	0.7+	0.1-	1999 10 27	327	0.4-	0.6+
1997 04 28	691	0.2+	0.3-	1999 10 04	704	0.1+	0.2-	1999 10 27	327	0.2+	0.1+
1997 04 29	691	0.4-	0.7-	1999 10 06	704	0.2-	0.2-	1999 10 29	120	1.3-	1.1-
1997 04 29	691	0.6-	0.6-	1999 10 06	704	0.4+	0.6-	1999 10 29	120	1.1-	0.6+
1997 04 29	691	0.4-	0.1-	1999 10 06	704	0.4+	0.5-	1999 10 29	120	(2.4+	0.7+)
1997 05 08	691	0.3+	0.1+	1999 10 06	704	0.2-	0.7-	1999 11 12	704	0.7+	0.6+
1997 05 08	691	0.2+	0.1+	1999 10 06	704	0.2+	0.3-	1999 11 12	704	0.2+	0.6+
1997 05 08	691	0.1+	0.3+	1999 10 18	327	0.2-	0.7+	1999 11 12	704	0.6+	0.1-
1999 10 02	703	0.5-	0.6+	1999 10 18	327	0.6+	0.7+	1999 11 12	704	0.3+	0.5+
1999 10 02	703	0.3+	0.1+	1999 10 18	327	0.2-	0.0	1999 11 12	704	0.8+	0.4-

1999 TJ₃₂ = 1996 DG₆

Id. A. Doppler

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>		(2000.0)		P		Q	
<i>n</i>	0.18743118	ω	114.57943	-0.12592743	-0.99198336		
<i>a</i>	3.0239515	Ω	342.64509	+0.89690599	-0.10930058		
<i>e</i>	0.0603132	<i>i</i>	2.02688	+0.42391265	-0.06342241		
<i>P</i>	5.26	<i>H</i>	13.9	<i>G</i>	0.15	<i>U</i>	5

Residuals in seconds of arc

1996 02 16	010	0.8+	0.8-	1999 10 02	703	0.1-	0.6+	1999 10 06	704	0.1+	0.0
1996 02 16	010	0.3+	0.1+	1999 10 02	703	0.1+	0.4+	1999 10 06	704	0.2-	0.1+
1996 02 16	010	1.0+	0.6+	1999 10 04	704	0.1-	0.2-	1999 10 06	704	0.1-	0.2-
1996 02 17	010	0.6-	0.2-	1999 10 04	704	0.5-	0.5-	1999 10 30	703	0.7-	1.1-
1996 02 17	010	0.4-	0.5+	1999 10 04	704	0.1+	0.2+	1999 10 30	703	1.2+	0.3-
1996 02 17	010	1.1-	0.2-	1999 10 04	704	0.8+	1.4-	1999 10 30	703	0.2+	0.9+
1999 10 02	703	0.3+	0.7+	1999 10 06	704	0.1+	0.2-	1999 10 30	703	0.8-	1.1+
1999 10 02	703	0.4-	0.3+	1999 10 06	704	0.1+	0.3-				

1999 TN₃₂ = 1981 UF₁₄ = 1994 GY₅ = 1997 EE₃₃

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>		(2000.0)		P		Q	
<i>n</i>	0.27313348	ω	10.23365	+0.90804693	-0.41819074		
<i>a</i>	2.3526253	Ω	14.55699	+0.37729690	+0.79190532		
<i>e</i>	0.2053428	<i>i</i>	5.43762	+0.18192809	+0.44497468		
<i>P</i>	3.61	<i>H</i>	15.5	<i>G</i>	0.15	<i>U</i>	2

Residuals in seconds of arc

1981 10 23	095	0.0	0.1-	1997 03 06	704	0.1-	0.4+	1999 10 06	704	0.2+	0.1-
1994 04 06	691	0.2-	0.1-	1999 10 04	704	0.2-	0.5+	1999 10 30	703	0.1+	0.1-
1994 04 06	691	0.0	0.1-	1999 10 04	704	0.1-	0.6-	1999 10 30	703	0.0	0.6-
1994 04 06	691	0.1-	0.0	1999 10 04	704	0.0	0.5+	1999 10 30	703	0.6-	0.0
1994 04 07	691	0.2+	0.0	1999 10 04	704	0.3+	1.1+	1999 10 30	703	0.1+	0.2+
1997 03 04	704	0.9-	1.0+	1999 10 04	704	0.4+	0.0	1999 11 04	703	0.3-	0.2-
1997 03 04	704	0.7+	0.6-	1999 10 06	704	0.3+	0.3-	1999 11 04	703	0.6-	0.0
1997 03 05	704	0.4-	0.1-	1999 10 06	704	0.4+	0.1-	1999 11 04	703	0.6-	0.1+
1997 03 05	704	0.8+	0.3-	1999 10 06	704	0.4+	0.1-	1999 11 04	703	0.0	0.0
1997 03 06	704	0.0	0.5-	1999 10 06	704	0.3+	0.2-				

1999 TZ₃₃ = 1996 AQ₉

Id. A. Doppler

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>		(2000.0)		P		Q	
<i>n</i>	0.19963350	ω	173.45451	+0.85348045	-0.52047220		
<i>a</i>	2.8994376	Ω	217.94629	+0.47617956	+0.79922044		
<i>e</i>	0.1328277	<i>i</i>	2.43010	+0.21171713	+0.30059170		
<i>P</i>	4.94	<i>H</i>	14.8	<i>G</i>	0.15	<i>U</i>	4

Residuals in seconds of arc

1996 01 13	691	0.1+	0.0	1999 10 01	703	0.8-	0.1-	1999 10 07	683	0.4-	1.0+
1996 01 13	691	0.4+	0.0	1999 10 01	703	0.2-	0.9-	1999 10 07	683	0.7-	0.8+
1996 01 13	691	0.3+	0.2+	1999 10 01	703	0.9-	1.2+	1999 10 07	683	0.5-	0.7+
1996 01 20	691	0.5-	0.1-	1999 10 04	704	0.6-	0.3-	1999 10 30	703	0.5-	0.8+
1996 01 20	691	0.3-	0.1-	1999 10 04	704	1.0+	1.2-	1999 10 30	703	0.1-	0.5-
1996 01 20	691	0.1-	0.0	1999 10 04	704	(1.1+	2.5-)	1999 10 30	703	0.2+	0.3-
1999 09 18	703	0.1+	0.4-	1999 10 06	704	0.3+	0.4-	1999 10 30	703	0.2+	0.1+
1999 09 18	703	(3.0-	0.6+)	1999 10 06	704	0.5+	0.4-	1999 11 12	704	0.5+	0.3+
1999 09 18	703	0.5+	0.7+	1999 10 06	704	0.5+	0.3-	1999 11 12	704	0.0	0.0
1999 09 18	703	0.5+	0.2-	1999 10 06	704	0.3+	0.4-	1999 11 12	704	0.5+	0.1+
1999 10 01	703	0.1+	0.3+	1999 10 06	704	0.4+	0.4-	1999 11 12	704	0.7-	0.2-

1999 TD₃₄ = 1998 KZ₃₂

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	41.07061		(2000.0)	P		Q					
<i>n</i>	0.24101480	ω	291.81012	+0.87071156	+0.46728769						
<i>a</i>	2.5572522	Ω	40.77006	-0.31777658	+0.77249802						
<i>e</i>	0.2132268	<i>i</i>	13.57790	-0.37533909	+0.42998723						
<i>P</i>	4.09	<i>H</i>	13.4	<i>G</i>	0.15	<i>U</i>	4				
Residuals in seconds of arc											
1998 05 22	704	0.2-	0.4+	1999 10 05	704	0.0	0.9+	1999 11 07	649	0.5+	0.0
1998 05 22	704	1.0-	0.9+	1999 10 06	704	0.0	1.5-	1999 11 07	649	0.5+	0.0
1998 05 22	704	1.0+	0.2+	1999 10 06	704	1.1+	0.7-	1999 11 08	849	0.3-	1.7+
1998 05 22	704	0.3-	0.7+	1999 10 06	704	1.0+	0.1+	1999 11 08	849	0.3+	1.3+
1998 05 22	704	0.4+	1.6+	1999 10 06	704	0.6+	0.7-	1999 11 08	849	0.1-	0.1+
1998 05 24	704	0.5+	0.1+	1999 10 06	704	0.1+	0.6+	1999 11 12	739	0.3-	0.2-
1998 05 24	704	0.1-	0.2-	1999 11 06	739	0.5+	0.1-	1999 11 12	739	0.4-	0.3-
1998 05 24	704	0.4+	0.2-	1999 11 06	739	0.2+	0.1+	1999 11 12	739	0.3-	0.2-
1998 05 24	704	0.3+	1.1-	1999 11 06	739	0.3+	0.0	1999 11 18	903	0.2-	0.0
1998 05 24	704	0.5-	1.4-	1999 11 06	739	0.5-	0.1-	1999 11 18	903	0.6-	0.5-
1999 10 05	704	0.6-	0.8+	1999 11 06	739	0.8+	0.1-	1999 11 18	903	0.9-	0.6+
1999 10 05	704	0.8-	0.2-	1999 11 06	739	0.2+	0.2-	1999 11 19	903	0.4-	0.1-
1999 10 05	704	0.7-	0.7+	1999 11 06	739	0.7+	0.7-	1999 11 19	903	0.2-	1.1-
1999 10 05	704	0.0	0.1+	1999 11 07	649	0.7+	0.1+	1999 11 19	903	1.3-	0.5+

1999 TQ₃₄ = 1998 FQ₈₄

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	44.20704		(2000.0)		P		Q				
<i>n</i>	0.27702776	ω	255.14672		+0.26076466		+0.95836221				
<i>a</i>	2.3305255	Ω	30.74026		-0.77487963		+0.27967721				
<i>e</i>	0.2372562	<i>i</i>	13.16044		-0.57581537		+0.05764143				
<i>P</i>	3.56	<i>H</i>	15.6	<i>G</i>	0.15		<i>U</i>	5			
Residuals in seconds of arc											
1998 03 24	704	0.8+	0.4-	1998 03 25	704	0.3-	0.9-	1999 10 07	704	0.1-	0.3-
1998 03 24	704	0.3+	0.8+	1998 03 25	704	0.1-	0.9+	1999 10 07	704	0.2-	0.4+
1998 03 24	704	0.2-	0.5+	1999 10 02	704	0.2-	0.3+	1999 10 07	704	0.0	0.3-
1998 03 24	704	0.6-	0.8-	1999 10 02	704	0.1+	0.1-	1999 10 07	704	0.0	0.0
1998 03 25	704	0.7-	0.2-	1999 10 02	704	0.2-	0.3-	1999 10 07	704	0.3+	0.4+
1998 03 25	704	0.2+	0.3+	1999 10 02	704	0.0	0.1-				
1998 03 25	704	0.6+	0.2-	1999 10 02	704	0.2+	0.1+				

1999 TU₃₄ = 1998 FZ₅₈

Id. G. V. Williams, A. Doppler

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	325.82654		(2000.0)		P		Q				
<i>n</i>	0.35835881	ω	25.62305		+0.81781113		-0.57300408				
<i>a</i>	1.9630167	Ω	9.87601		+0.45979328		+0.59478332				
<i>e</i>	0.0787274	<i>i</i>	18.13908		+0.34608539		+0.56382544				
<i>P</i>	2.75	<i>H</i>	16.1		<i>G</i>	0.15	<i>U</i>	4			
Residuals in seconds of arc											
1998 03 20	704	0.7-	0.4+	1998 04 19	704	0.8-	0.2-	1999 10 07	704	0.4-	0.1-
1998 03 20	704	0.2+	0.0	1998 04 19	704	1.4+	0.4+	1999 10 07	704	0.1+	0.2-
1998 03 20	704	1.2+	0.5+	1998 04 19	704	0.4-	0.6+	1999 10 07	704	0.1-	0.0
1998 03 20	704	0.2-	1.1+	1998 04 19	704	1.4-	1.5+	1999 10 07	704	0.6-	0.3-
1998 03 20	704	1.0-	0.3+	1999 10 03	704	0.5+	0.6+	1999 11 03	704	0.7-	0.8+
1998 03 22	704	0.2-	0.7-	1999 10 03	704	0.9+	0.8+	1999 11 03	704	0.4-	0.3-
1998 03 22	704	0.3+	1.0-	1999 10 03	704	0.3+	0.3-	1999 11 03	704	0.4-	0.2-
1998 03 22	704	0.6+	1.5-	1999 10 03	704	0.0	0.1-	1999 11 03	704	0.2-	0.7-
1998 03 22	704	1.2+	0.9-	1999 10 03	704	0.8+	0.1+	1999 11 03	704	0.4+	0.5-
1998 04 19	704	0.3-	0.6-	1999 10 07	704	0.1-	0.3+				

1999 TR₃₅ = 1953 GK

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	151.16159		(2000.0)		P		Q				
<i>n</i>	0.26404286	ω	181.41770		-0.89023714		+0.41714411				
<i>a</i>	2.4063184	Ω	25.80442		-0.41366567		-0.57227341				
<i>e</i>	0.1533861	<i>i</i>	24.85172		-0.19067916		-0.70604103				
<i>P</i>	3.73	<i>H</i>	14.0		<i>G</i>	0.15	<i>U</i>	5			
Residuals in seconds of arc											
1953 04 07	024	0.9-	0.5+	1999 10 04	704	1.5+	1.2-	1999 11 01	703	0.3+	0.2-
1953 04 12	024	2.4+	1.0+	1999 10 04	704	0.1+	0.0	1999 11 01	703	0.1+	0.2+
1999 10 02	703	1.1-	0.2-	1999 10 07	704	0.3-	0.3+	1999 11 12	704	0.2+	0.2+
1999 10 02	703	0.7-	0.2+	1999 10 07	704	0.2-	0.3-	1999 11 12	704	0.7-	0.4-
1999 10 02	703	0.7-	0.4-	1999 10 07	704	0.3+	0.0	1999 11 12	704	0.3-	0.2+
1999 10 02	703	1.5-	0.1+	1999 10 07	704	0.0	0.3+	1999 11 12	704	0.1+	0.1+
1999 10 04	704	0.3-	0.6+	1999 10 07	704	0.3-	0.4+	1999 11 12	704	0.0	0.9+
1999 10 04	704	1.3+	0.3-	1999 11 01	703	0.1+	0.5+				
1999 10 04	704	0.3+	0.4+	1999 11 01	703	0.2-	0.6+				

1999 UO = 1997 JS₁

Id. G. V. Williams, A. Doppler

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	347.35300		(2000.0)			P		Q			
<i>n</i>	0.18355308	ω	178.22282			+0.91196379		-0.40216186			
<i>a</i>	3.0663962	Ω	205.96613			+0.37409221		+0.89633972			
<i>e</i>	0.1175215	<i>i</i>	10.68317			+0.16845494		+0.18665732			
<i>P</i>	5.37	<i>H</i>	14.6		<i>G</i>	0.15		<i>U</i>	3		
Residuals in seconds of arc											
1997 05 01	910	0.0	0.0	1999 10 06	704	0.6+	0.1-	1999 10 27	327	0.6-	0.5-
1997 05 01	910	0.6-	0.0	1999 10 06	704	0.7+	0.5+	1999 10 27	327	1.1-	0.2+
1997 05 01	910	0.3+	0.0	1999 10 06	704	0.6+	0.2-	1999 10 27	327	0.4+	0.1+
1997 05 02	910	0.2+	0.1+	1999 10 07	704	0.6+	0.8+	1999 10 28	327	1.2-	0.2-
1997 05 02	910	0.1+	0.7+	1999 10 07	704	1.1-	0.0	1999 10 28	327	0.4-	0.8+
1997 05 03	910	0.1+	0.1-	1999 10 07	704	0.2-	0.8+	1999 10 28	327	0.1-	0.3+
1999 09 05	703	0.8+	1.4-	1999 10 10	327	0.1-	0.2-	1999 10 29	327	0.6-	0.3-
1999 09 05	703	0.3-	0.1+	1999 10 10	327	0.7+	0.5+	1999 10 29	327	0.1+	0.4+
1999 09 05	703	(3.6-	0.1+)	1999 10 10	327	0.4+	0.5-	1999 10 29	327	0.2-	0.2+
1999 09 05	703	0.9-	0.5-	1999 10 14	327	0.4-	0.1+	1999 10 29	327	0.5-	0.3-
1999 09 18	704	0.2-	0.6+	1999 10 14	327	0.8-	0.1-	1999 10 29	120	(2.1-	1.3+)
1999 09 18	704	0.5+	0.5+	1999 10 14	327	1.0-	1.0+	1999 10 29	120	(3.1-	0.0)
1999 09 18	704	0.5-	0.8-	1999 10 16	120	1.0-	1.1+	1999 10 29	120	0.2+	0.9+
1999 09 18	704	0.3-	0.5-	1999 10 16	120	0.7-	0.4+	1999 11 01	703	0.2+	0.9-
1999 10 02	703	0.4+	0.5-	1999 10 17	120	0.3+	1.3+	1999 11 01	703	0.0	0.2+
1999 10 02	703	0.2+	0.1+	1999 10 17	120	1.1-	0.5-	1999 11 01	703	0.2-	0.5-
1999 10 02	703	0.4-	0.5+	1999 10 18	327	0.2+	0.2-	1999 11 01	703	0.1-	0.5-
1999 10 02	703	0.3+	0.2-	1999 10 18	327	0.4+	0.3+	1999 11 10	120	0.7-	1.4+
1999 10 04	704	0.0	0.2-	1999 10 18	327	0.4+	0.0	1999 11 10	120	0.6-	0.4-
1999 10 04	704	0.4-	1.0-	1999 10 18	327	0.3+	0.4+	1999 11 12	704	1.3+	0.0
1999 10 04	704	0.3+	0.0	1999 10 18	327	0.6+	0.3-	1999 11 12	704	1.0+	0.7-
1999 10 04	704	0.5+	1.0-	1999 10 18	327	0.7+	0.4+	1999 11 12	704	0.5+	0.5-
1999 10 06	704	0.5+	1.0+	1999 10 19	120	0.1+	1.4-	1999 11 12	704	0.8+	0.1+
1999 10 06	704	0.3+	0.3+	1999 10 19	120	(6.6+	1.1+)	1999 11 12	704	0.6+	0.8-

1999 UP = 1998 HD₆₇

Id. A. Doppler

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	37.35605	(2000.0)	P		Q		Williams	
<i>n</i>	0.26968161	ω	116.54346	+0.71194454	+0.70131539			
<i>a</i>	2.3726581	Ω	198.99535	-0.67717494	+0.67208700			
<i>e</i>	0.1305353	<i>i</i>	6.33941	-0.18592761	+0.23760426			
<i>P</i>	3.65	<i>H</i>	15.4	<i>G</i>	0.15	<i>U</i>	4	

1999 NOV. 23

M.P.C. 36855

Residuals in seconds of arc

1998 04 21	704	0.7−	1.3−	1999 10 02	703	0.0	0.9+	1999 10 16	120	0.0	0.1+
1998 04 21	704	0.0	1.0−	1999 10 02	703	0.4+	0.1+	1999 10 16	120	0.0	0.6−
1998 04 21	704	1.2−	0.8−	1999 10 02	703	0.0	0.1+	1999 10 17	120	0.0	0.1+
1998 04 21	704	0.4+	1.0+	1999 10 04	704	1.0−	1.4+	1999 10 17	120	0.8+	0.9+
1998 04 22	704	0.5+	0.5+	1999 10 04	704	0.2+	0.3+	1999 10 19	120	1.8+	0.2−
1998 04 22	704	1.0+	0.5+	1999 10 04	704	1.5−	0.3−	1999 10 19	120	0.1−	1.1−
1998 04 22	704	(4.4+	1.7−)	1999 10 04	704	0.8+	1.1−	1999 11 01	703	0.5−	0.1−
1998 04 22	704	0.0	0.5+	1999 10 04	704	0.5−	1.8−	1999 11 01	703	0.1−	0.4+
1998 04 22	704	0.1−	0.5+	1999 10 16	120	0.6−	0.6+	1999 11 01	703	0.5−	0.1+
1999 10 02	703	0.4+	0.9+	1999 10 16	120	0.8+	1.1−	1999 11 01	703	0.0	0.5+

1999 US = 1980 ER₁ = 1985 DR₃ = 1998 RT₂₈Id. G. V. Williams; 1996 TN₄₁ = 1980 ER₁ (*MPC* 33496) is invalid

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	191.76481		(2000.0)		P		Q
<i>n</i>	0.18061076	<i>ω</i>	72.59226		−0.89783355		+0.43828228
<i>a</i>	3.0996094	<i>Ω</i>	133.37840		−0.42292542		−0.83146448
<i>e</i>	0.1058901	<i>i</i>	3.34966		−0.12259288		−0.34143150
<i>P</i>	5.46	<i>H</i>	13.2	<i>G</i>	0.15	<i>U</i>	2

Residuals in seconds of arc

1980 03 15	095	0.1+	0.2+	1998 09 18	704	1.2−	1.3+	1999 11 04	704	0.2+	0.1+
1985 02 20	675	0.5−	0.0	1998 09 18	704	0.6−	0.6+	1999 11 04	704	0.5−	0.2+
1985 02 22	675	0.6+	0.1+	1999 10 16	120	0.7+	0.0	1999 11 04	704	0.2−	0.2+
1998 09 14	704	0.0	1.2−	1999 10 16	120	0.8−	0.1+	1999 11 04	704	0.0	0.2+
1998 09 14	704	0.4+	1.2+	1999 10 17	120	2.0+	1.0−	1999 11 05	120	0.1−	0.4+
1998 09 14	704	0.3−	1.0−	1999 10 17	120	0.2−	0.8−	1999 11 06	120	0.0	0.1−
1998 09 14	704	0.7+	0.4+	1999 10 20	120	1.6−	0.1+	1999 11 07	120	0.8+	0.1+
1998 09 18	704	1.3+	0.9−	1999 10 20	120	(6.1−	1.5−)	1999 11 07	120	0.3+	0.4+
1998 09 18	704	0.2+	1.7−	1999 10 20	120	0.1−	0.1+				
1998 09 18	704	0.6−	1.6+	1999 11 04	704	0.4−	0.0				

1999 UC₁ = 1988 AT₂ = 1998 KB₁₈

Id. S. Nakano

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	15.54699		(2000.0)		P		Q
<i>n</i>	0.23854284	<i>ω</i>	309.55496		+0.95298483		+0.27698443
<i>a</i>	2.5748887	<i>Ω</i>	34.87145		−0.16684345		+0.81815298
<i>e</i>	0.1953067	<i>i</i>	12.41108		−0.25294894		+0.50389019
<i>P</i>	4.13	<i>H</i>	13.5	<i>G</i>	0.15	<i>U</i>	2

Residuals in seconds of arc

1988 01 11	033	0.2−	0.2−	1998 05 24	704	0.4+	0.1−	1999 10 18	392	0.2+	0.1+
1988 01 11	033	0.3+	0.3−	1998 05 24	704	0.0	0.6+	1999 10 29	611	0.3−	0.1−
1998 04 22	704	0.9−	0.7−	1998 06 16	704	1.3+	0.2−	1999 10 29	611	0.2+	0.1−
1998 04 22	704	0.6−	0.0	1998 06 16	704	(1.1+	2.5+)	1999 10 29	611	0.2+	0.2−
1998 04 22	704	0.9−	0.3−	1998 06 16	704	(2.1−	1.8−)	1999 11 03	703	0.5−	0.1+
1998 04 22	704	0.7−	0.0	1998 06 16	704	(2.4−	2.3+)	1999 11 03	703	0.3−	0.6+
1998 04 22	704	0.2−	0.4+	1999 08 22	703	0.0	0.3−	1999 11 03	703	0.2−	0.4+
1998 05 01	704	0.4+	0.9−	1999 08 22	703	0.0	0.1+	1999 11 03	703	0.4−	0.3+
1998 05 01	704	0.3+	1.4−	1999 08 22	703	0.3+	0.4−	1999 11 03	611	0.3−	0.3+
1998 05 01	704	0.2+	0.9−	1999 08 22	703	0.8+	0.3−	1999 11 03	611	0.1−	0.0
1998 05 01	704	0.2+	1.8−	1999 10 01	703	0.3−	0.3+	1999 11 03	611	0.2+	0.2+
1998 05 01	704	(0.0	2.1−)	1999 10 01	703	0.0	0.1+	1999 11 03	611	0.2−	0.3+
1998 05 03	566	0.3−	0.3−	1999 10 01	703	0.2+	0.2+	1999 11 04	704	0.0	0.2−
1998 05 03	566	0.6−	0.1−	1999 10 01	703	0.1+	0.2−	1999 11 04	704	0.2+	0.1−
1998 05 03	566	0.3−	0.3−	1999 10 07	704	0.4+	0.3−	1999 11 04	704	0.0	0.3−
1998 05 05	699	0.3+	0.3+	1999 10 07	704	0.1−	0.0	1999 11 04	704	1.2+	0.4−
1998 05 05	699	0.4+	0.2+	1999 10 07	704	0.0	0.2+	1999 11 04	704	0.1−	0.4−
1998 05 05	699	0.2+	0.2+	1999 10 07	704	0.2−	0.0	1999 11 05	747	0.1−	0.1−
1998 05 22	704	0.0	0.5+	1999 10 07	704	0.2−	0.3+	1999 11 05	747	0.2−	0.2−
1998 05 22	704	0.0	0.1+	1999 10 14	392	0.6+	0.4+	1999 11 05	747	0.3−	0.0
1998 05 22	704	0.7−	1.1+	1999 10 14	392	0.3+	0.5+	1999 11 10	120	0.3+	0.4−
1998 05 22	704	0.7+	0.6−	1999 10 16	120	0.1−	0.1−	1999 11 10	120	0.4+	0.0
1998 05 22	704	1.5−	0.6+	1999 10 16	120	0.4−	0.8−	1999 11 12	120	0.1+	0.4−

1998 05 24	704	0.6+	0.1−	1999 10 17	120	0.3+	0.4−	1999 11 12	120	0.2+	0.5−
1998 05 24	704	0.5+	0.1+	1999 10 17	120	0.1−	0.2−				
1998 05 24	704	0.1+	1.2+	1999 10 18	392	0.3−	0.1+				

1999 UD₁ = 1998 KE₁₅

Id. A. Doppler

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	110.02031		(2000.0)		P		Q
<i>n</i>	0.28237141	<i>ω</i>	207.40040		−0.31595889		+0.94534578
<i>a</i>	2.3010298	<i>Ω</i>	44.31040		−0.84800509		−0.24329660
<i>e</i>	0.1325625	<i>i</i>	6.62312		−0.42550834		−0.21709011
<i>P</i>	3.49	<i>H</i>	15.0	<i>G</i>	0.15	<i>U</i>	4

Residuals in seconds of arc

1998 04 22	704	0.8−	0.4+	1998 05 22	699	0.1−	0.1+	1999 10 17	120	(2.7+	0.1−)
1998 04 22	704	0.1+	0.3+	1998 05 22	566	0.3−	0.0	1999 10 20	120	0.5−	0.6−
1998 04 22	704	0.5−	0.6+	1998 05 22	566	0.3−	0.4+	1999 10 20	120	0.3+	0.3+
1998 04 22	704	0.8+	0.3+	1998 05 22	566	0.8−	0.2+	1999 10 29	703	0.4−	0.1+
1998 04 22	704	0.5−	0.5+	1998 05 24	704	0.0	0.2−	1999 10 29	703	0.7+	0.0
1998 05 01	704	0.4+	1.5−	1998 05 24	704	0.6−	0.4+	1999 10 29	703	0.2−	0.8−
1998 05 01	704	0.5+	0.1−	1998 05 24	704	0.7+	0.4+	1999 10 29	703	0.7+	0.7+
1998 05 01	704	0.6−	0.8−	1998 05 24	704	0.6−	0.5+	1999 10 30	691	0.3+	0.6−
1998 05 01	704	0.4+	0.9−	1998 05 24	704	0.5−	0.4+	1999 10 30	691	0.2+	0.6−
1998 05 01	704	0.2−	1.4−	1999 09 14	703	0.1−	0.5+	1999 10 30	691	0.2+	0.6−
1998 05 02	566	0.1−	0.1+	1999 09 14	703	0.3−	1.1+	1999 11 03	703	0.1−	0.0
1998 05 02	566	0.3−	0.4+	1999 09 14	703	1.9−	0.1+	1999 11 03	703	0.2−	0.4−
1998 05 02	566	0.3+	0.2−	1999 09 14	703	1.2−	0.4+	1999 11 03	703	0.7−	0.3−
1998 05 22	704	0.6+	0.0	1999 10 01	703	1.4+	0.0	1999 11 03	703	0.5+	0.4+
1998 05 22	704	0.7+	0.1−	1999 10 01	703	0.2+	0.0	1999 11 12	704	0.3−	0.2+
1998 05 22	704	0.9+	0.3+	1999 10 01	703	0.1−	0.0	1999 11 12	704	0.2+	0.1+
1998 05 22	704	0.3−	0.7−	1999 10 01	703	0.2+	0.6+	1999 11 12	704	0.2−	0.4−
1998 05 22	704	0.8−	0.7−	1999 10 16	120	0.7+	0.2+	1999 11 12	704	0.2+	0.6−
1998 05 22	699	0.8+	0.4−	1999 10 16	120	0.3+	0.9−	1999 11 12	704	0.0	0.6−
1998 05 22	699	0.4+	0.1−	1999 10 17	120	1.1+	0.2−				

1999 UE₁ = 1998 HS₅₂

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	29.98711		(2000.0)		P		Q
<i>n</i>	0.28830219	<i>ω</i>	262.57077		+0.82250917		+0.56654730
<i>a</i>	2.2693636	<i>Ω</i>	62.90678		−0.49714378		+0.75889291
<i>e</i>	0.1532297	<i>i</i>	3.22142		−0.27627293		+0.32110077
<i>P</i>	3.42	<i>H</i>	15.2	<i>G</i>	0.15	<i>U</i>	4

Residuals in seconds of arc

1998 03 25	704	(0.7−	2.6+)	1998 04 22	704	0.3−	0.3+	1999 10 18	120	1.3+	0.1+
1998 03 25	704	0.1+	0.5−	1998 04 22	704	0.1−	0.4+	1999 10 18	120	0.2+	0.3+
1998 03 25	704	0.6−	0.6+	1998 04 22	704	1.5+	0.5+	1999 10 18	120	1.7+	0.3+
1998 03 25	704	(2.3+	0.2−)	1998 05 16	704	0.6−	0.4−	1999 10 20	120	(2.9−	0.1+)
1998 03 25	704	(2.3−	1.2+)	1998 05 16	704	0.8+	0.5−	1999 10 20	120	0.6−	1.2+
1998 03 29	704	1.0−	0.3+	1998 05 16	704	1.7+	1.2+	1999 10 29	703	0.5−	0.2+
1998 03 29	704	1.4+	0.7−	1998 05 16	704	1.2+	1.0−	1999 10 29	703	0.6−	0.2+
1998 03 29	704	0.0	1.7−	1999 10 01	703	1.4−	0.3−	1999 10 29	703	0.3−	0.1−
1998 03 29	704	0.1+	0.4−	1999 10 01	703	0.8+	1.3−	1999 10 29	703	0.3−	0.3+
1998 03 29	704	1.2−	1.1−	1999 10 01	703	1.4−	0.9−	1999 11 12	704	(2.3−	0.7−)
1998 04 21	704	0.5−	1.8+	1999 10 01	703	0.6−	0.4−	1999 11 12	704	0.3+	0.3+
1998 04 21	704	0.7−	1.3+	1999 10 16	120	0.3+	0.2+	1999 11 12	704	0.2−	0.1−
1998 04 21	704	0.7−	0.1+	1999 10 16	120	1.1+	0.4+	1999 11 12	704	0.5−	0.1+
1998 04 21	704	1.7−	0.1+	1999 10 17	120	(3.1+	2.2−)	1999 11 12	704	0.1−	0.6−
1998 04 22	704	0.7+	1.1+	1999 10 17	120	0.9+	0.6+				
1998 04 22	704	0.8+	0.6−	1999 10 18	120	0.8−	0.4+				

1999 UF₁ = 1977 UY₄

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	318.29776		(2000.0)			P		Q		
<i>n</i>	0.17877753	ω	42.89774			+0.24219479		-0.95611296		
<i>a</i>	3.1207628	Ω	34.08133			+0.79131629		+0.09632221		
<i>e</i>	0.2111075	<i>i</i>	17.11304			+0.56139132		+0.27671294		
<i>P</i>	5.51	<i>H</i>	14.3			<i>G</i>	0.15	<i>U</i>	4	
Residuals in seconds of arc										
1977 10 18	675	0.0	0.3-	1999 10 17	120	1.5-	0.1-	1999 11 03	703	0.1- 0.0
1977 10 19	675	0.3+	0.1-	1999 10 17	120	0.1-	0.1-	1999 11 04	704	1.0+ 0.1+
1999 10 01	703	0.7-	0.5+	1999 10 17	120	0.5+	0.4-	1999 11 04	704	0.0 0.7+
1999 10 01	703	0.2+	0.7+	1999 10 20	120	0.0	0.2-	1999 11 04	704	0.6+ 0.4-
1999 10 01	703	0.9-	0.2+	1999 10 20	120	0.2+	0.2+	1999 11 04	704	0.5+ 0.2-
1999 10 01	703	0.5+	0.0	1999 10 29	703	0.4-	0.3+	1999 11 04	704	0.1+ 0.7-
1999 10 07	704	0.8-	0.8-	1999 10 29	703	0.0	0.2+	1999 11 11	703	0.5- 0.5+
1999 10 07	704	0.3+	0.4-	1999 10 29	703	0.1+	0.2+	1999 11 11	703	0.6- 0.4-
1999 10 07	704	1.2+	0.2+	1999 10 29	703	0.2-	0.6+	1999 11 11	703	0.0 0.6+
1999 10 07	704	0.4+	0.2+	1999 11 03	703	0.7-	0.3-	1999 11 11	703	0.3+ 0.3+
1999 10 07	704	0.1-	0.3-	1999 11 03	703	0.6+	0.2+			
1999 10 16	120	0.2-	0.4-	1999 11 03	703	0.1+	0.6-			

1999 UL₁ = 1988 RU₁

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	326.77695		(2000.0)				P		Q		
<i>n</i>	0.18340573	ω	26.57408				+0.49992714		-0.86587008		
<i>a</i>	3.0680383	Ω	33.43992				+0.78851157		+0.44622512		
<i>e</i>	0.2368678	<i>i</i>	1.92274				+0.35822110		+0.22616838		
<i>P</i>	5.37	<i>H</i>	14.1			<i>G</i>	0.15		<i>U</i>	5	
Residuals in seconds of arc											
1988 09 07	033	0.0	0.9+	1999 10 18	757	0.2+	0.2-	1999 11 09	757	0.5-	0.4-
1988 09 08	033	0.3-	0.2-	1999 10 19	757	1.3-	0.1-	1999 11 12	704	0.1+	0.1-
1988 09 08	033	0.1-	0.8+	1999 10 19	757	0.2+	0.5+	1999 11 12	704	0.2+	0.2+
1988 09 12	675	0.5-	1.9-	1999 10 29	757	0.5-	0.4-	1999 11 12	704	0.1-	0.3+
1988 09 12	675	1.0+	0.3+	1999 10 29	757	0.1+	0.5-	1999 11 12	704	0.4+	0.4+
1999 10 18	757	1.0+	0.6+	1999 11 09	757	0.6+	0.1-	1999 11 12	704	0.4-	0.0

1999 UG₂ = 1998 HN₅₆

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	25.15480		(2000.0)		P		Q				
<i>n</i>	0.27304624		ω	174.78293	+0.90230114		+0.43077933				
<i>a</i>	2.3531264		Ω	159.67437	-0.39725981		+0.84595471				
<i>e</i>	0.2244162		<i>i</i>	2.77014	-0.16744342		+0.31430845				
<i>P</i>	3.61		<i>H</i>	14.8	<i>G</i>	0.15	<i>U</i>	5			
Residuals in seconds of arc											
1998 04 21	704	0.3+	0.8-	1999 10 17	120	0.2-	0.5-	1999 11 05	120	0.4-	0.4-
1998 04 21	704	1.2-	0.8+	1999 10 17	120	1.3+	0.3-	1999 11 05	120	1.0+	0.6-
1998 04 21	704	1.3-	1.9-	1999 10 20	120	0.4-	0.0	1999 11 07	120	0.3+	0.1-
1998 04 21	704	0.4-	0.1+	1999 10 20	120	1.1-	0.7+	1999 11 07	120	0.1+	0.1-
1998 04 21	704	0.3+	0.6+	1999 10 20	120	0.9-	0.3+	1999 11 08	120	0.2-	0.1+
1998 04 22	704	1.7+	0.1-	1999 11 04	704	0.0	0.1+	1999 11 08	120	0.2-	0.1-
1998 04 22	704	0.3+	0.2-	1999 11 04	704	0.1+	0.3+	1999 11 10	120	0.3+	0.1-
1998 04 22	704	0.1-	1.0+	1999 11 04	704	0.0	0.1+	1999 11 10	120	0.4-	0.2-
1998 04 22	704	0.7-	0.6-	1999 11 04	704	0.0	0.7+				
1998 04 22	704	1.0+	1.3+	1999 11 04	704	0.4+	0.4+				

1999 UK₂ = 1980 FJ₁₁ = 1998 KE₂₃

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

M	106.69866		(2000.0)			P		Q			
n	0.27778651	ω	220.49769			-0.24247596		+0.96826881			
a	2.3262798	Ω	35.59052			-0.86108780		-0.18606673			
e	0.1250958	i	5.96745			-0.44691522		-0.16683729			
P	3.55	H	14.2		G	0.15		U	4		
Residuals in seconds of arc											
1980 03 16	095	0.1+	0.3+	1999 10 20	120	0.0	1.1-	1999 11 04	704	0.3+	0.3+
1998 05 22	704	1.7-	0.7+	1999 10 20	120	0.2+	0.1-	1999 11 04	704	0.1-	0.7+
1998 05 22	704	0.1+	0.0	1999 10 29	703	0.7-	0.1+	1999 11 04	691	0.2+	0.2-
1998 05 22	704	0.2-	1.6+	1999 10 29	703	0.5+	0.3+	1999 11 04	704	0.1+	0.8+
1998 05 22	704	0.5+	0.8+	1999 10 29	703	0.2-	0.2+	1999 11 04	691	0.2+	0.1-
1998 05 24	704	0.8+	0.0	1999 10 29	703	0.4+	0.4+	1999 11 04	691	0.1+	0.2-
1998 05 24	704	0.0	0.7-	1999 11 03	703	0.1-	0.5+	1999 11 12	704	0.9-	1.2-
1998 05 24	704	0.4-	0.6+	1999 11 03	703	1.1+	0.9+	1999 11 12	704	0.3+	0.3+
1998 05 24	704	1.1+	1.3-	1999 11 03	703	1.1-	0.1+	1999 11 12	704	0.3-	0.2-
1998 05 24	704	0.0	1.2-	1999 11 03	703	0.5-	0.2+	1999 11 12	704	0.3-	0.6-
1999 10 17	120	0.2+	0.5+	1999 11 04	704	0.0	0.0	1999 11 12	704	0.3+	0.6-
1999 10 17	120	0.0	0.5-	1999 11 04	704	0.0	0.1+				

1999 UU₂ = 1998 FB₉₈

Id. S. Nakano

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	30.88747		(2000.0)			P		Q			
<i>n</i>	0.28192185	<i>ω</i>	351.43475			+0.58996009		+0.80341819			
<i>a</i>	2.3034753	<i>Ω</i>	314.67124			−0.73394470		+0.49208699			
<i>e</i>	0.1524595	<i>i</i>	6.49258			−0.33655946		+0.33521575			
<i>P</i>	3.50	<i>H</i>	14.0	<i>G</i>	0.15	<i>U</i>	2				
Residuals in seconds of arc											
1992 09 28	399	0.6+	1.1+	1999 07 23	704	0.7−	0.3−	1999 10 04	704	0.6+	0.1−
1992 09 28	399	1.5−	0.7+	1999 07 23	704	0.8−	1.7−	1999 10 04	704	0.5+	0.2−
1998 03 31	704	0.6−	0.3−	1999 07 23	704	0.2+	0.5−	1999 10 19	678	0.1−	0.7−
1998 03 31	704	0.8−	0.4−	1999 07 23	704	0.9−	0.2−	1999 10 19	678	1.1+	0.4−
1998 03 31	704	0.4−	1.2−	1999 07 23	704	0.0	0.4−	1999 10 20	678	0.3+	0.8−
1998 03 31	704	0.2−	0.8−	1999 09 08	704	0.8+	0.0	1999 10 20	678	0.9+	0.5−
1998 03 31	704	0.4−	1.4−	1999 09 08	704	0.5+	0.1+	1999 10 20	678	0.1+	0.3−
1998 04 01	704	0.1−	0.8−	1999 09 08	704	0.5+	0.1−	1999 10 21	678	0.5+	0.6−
1998 04 01	704	0.3−	0.1+	1999 09 08	704	0.8+	0.0	1999 10 21	678	0.3−	0.3−
1998 04 01	704	0.3−	0.3−	1999 09 08	704	0.5+	0.0	1999 10 28	678	0.1−	0.5+
1998 04 01	704	0.3+	1.0−	1999 09 29	703	0.1+	0.0	1999 10 28	678	0.1−	0.4+
1998 04 01	704	0.2−	0.8−	1999 09 29	703	0.2+	0.1−	1999 10 28	703	1.5−	0.4+
1998 04 19	704	0.1−	0.1+	1999 09 29	703	0.1+	0.1−	1999 10 28	703	0.7−	0.6−
1998 04 19	704	0.7+	0.5+	1999 09 29	703	0.1−	0.0	1999 10 28	703	(2.4− 0.2−)	
1998 04 19	704	1.0+	0.7+	1999 10 04	704	0.8+	0.4+	1999 10 28	703	1.5−	0.6−
1998 04 19	704	0.2−	0.6+	1999 10 04	704	0.1−	0.0				
1998 04 19	704	0.9−	0.9+	1999 10 04	704	0.6+	0.0				

1999 UV₂ = 1998 KD₂₄

Id. A. Doppler

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

M	85.40222		(2000.0)		$\mathbf{P}$		$\mathbf{Q}$				
n	0.23033162	ω	202.12553		-0.13551497		+0.98479183				
a	2.6357265	Ω	60.23493		-0.88922340		-0.07249614				
e	0.2284836	i	7.19504		-0.43694101		-0.15789035				
P	4.28	H	14.4		G 0.15		U 4				
Residuals in seconds of arc											
1998 04 22	704	0.7+	0.2+	1998 05 24	704	0.1+	0.5-	1999 10 19	678	0.6-	1.4-
1998 04 22	704	0.5-	0.7-	1998 05 24	704	0.8-	0.1+	1999 10 19	678	1.6-	1.4-
1998 04 22	704	0.0	0.4-	1998 05 24	704	0.2+	0.5-	1999 10 20	678	0.5-	1.5-
1998 04 22	704	0.3+	0.7-	1998 05 24	704	0.0	1.2+	1999 10 20	678	1.2+	0.2-
1998 04 22	704	0.2-	0.2+	1998 05 24	704	0.7+	1.1+	1999 10 21	678	1.3-	0.1+

1998 05 01	704	(2.2+ 0.5-)	1998 06 16	704	0.2+ 0.4+	1999 10 21	678	0.1- 1.3+
1998 05 01	704	0.5- 0.4+	1998 06 16	704	0.5+ 0.0	1999 10 21	678	1.0- 0.9+
1998 05 01	704	0.7+ 0.0	1998 06 16	704	0.6+ 1.0-	1999 10 28	678	1.6+ 0.6+
1998 05 01	704	0.6+ 1.5+	1998 06 16	704	0.2+ 1.1-	1999 10 28	678	0.2+ 1.2-
1998 05 22	704	0.1+ 0.5+	1998 06 16	704	(3.5- 0.2+)	1999 11 02	703	0.5- 0.4-
1998 05 22	704	0.2+ 0.1-	1998 07 11	699	0.1+ 0.2+	1999 11 02	703	0.3+ 0.5+
1998 05 22	704	0.6- 0.6-	1998 07 11	699	0.2- 0.4+	1999 11 02	703	0.5+ 0.4+
1998 05 22	704	0.6+ 0.3-	1998 07 11	699	0.5- 0.2-	1999 11 02	703	0.6- 0.8+
1998 05 22	704	1.4- 0.8+	1999 10 04	703	1.0+ 0.0	1999 11 04	678	0.3+ 0.9+
1998 05 22	699	0.2- 0.2-	1999 10 04	703	0.1+ 0.0	1999 11 04	678	0.4+ 1.6+
1998 05 22	699	0.1- 0.0	1999 10 04	703	0.3- 0.0			
1998 05 22	699	0.5- 0.3-	1999 10 04	703	0.8+ 0.1-			

1999 UZ₂ = 1998 KH₁

Id. T. Urata

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	14.37581	(2000.0)	P	Q
<i>n</i>	0.22351467	ω	118.94634	+0.93464929
<i>a</i>	2.6890489	Ω	222.27031	+0.35341187
<i>e</i>	0.2000222	<i>i</i>	11.63460	+0.03912484
<i>P</i>	4.41	<i>H</i>	14.1	<i>G</i> 0.15
				<i>U</i> 4

Residuals in seconds of arc

1998 05 18	699	0.3+ 0.3-	1998 05 24	704	0.7- 0.2+	1999 10 30	703	0.1+ 0.7+
1998 05 18	699	0.7+ 0.4+	1999 10 20	886	0.5- 0.0	1999 10 30	703	0.2+ 0.6+
1998 05 18	699	0.9+ 1.2+	1999 10 20	886	0.6- 0.2-	1999 11 02	886	0.1- 0.5+
1998 05 22	704	0.5- 1.0+	1999 10 20	886	0.6- 0.2+	1999 11 02	886	0.8+ 0.9+
1998 05 22	704	0.8- 1.8+	1999 10 21	886	0.3+ 0.2+	1999 11 04	704	0.4+ 0.0
1998 05 22	704	0.1- 1.2-	1999 10 21	886	0.7- 0.2-	1999 11 04	704	0.4+ 0.1+
1998 05 22	704	0.5- 0.3+	1999 10 22	886	1.5- 1.9-	1999 11 04	704	0.5+ 0.3+
1998 05 22	704	0.5+ 0.5-	1999 10 22	886	1.3- 0.4-	1999 11 04	704	0.5+ 0.5+
1998 05 22	699	0.8+ 1.2-	1999 10 23	385	1.4+ 1.8-	1999 11 04	704	0.7+ 0.6+
1998 05 22	699	0.7+ 0.5-	1999 10 23	385	0.9+ 1.2-	1999 11 05	886	0.4+ 1.1+
1998 05 22	699	0.2- 0.0	1999 10 29	886	0.6+ 0.1+	1999 11 05	886	0.2+ 0.4-
1998 05 23	699	0.2+ 0.5-	1999 10 29	886	1.3+ 1.1+	1999 11 13	888	0.1- 0.2+
1998 05 23	699	0.7+ 1.1-	1999 10 29	886	1.2- 0.5+	1999 11 13	888	0.2- 0.6+
1998 05 23	699	0.6+ 0.3-	1999 10 29	385	0.5+ 0.1+	1999 11 13	888	0.8- 0.2-
1998 05 24	704	0.6- 0.3-	1999 10 29	385	0.1- 0.1+	1999 11 14	886	0.3+ 1.9-
1998 05 24	704	0.4- 0.5+	1999 10 29	385	0.0 0.3+	1999 11 14	886	1.0- 0.9-
1998 05 24	704	0.9- 0.1+	1999 10 30	703	0.2- 0.9+	1999 11 14	886	0.7- 1.5-
1998 05 24	704	0.5- 0.4+	1999 10 30	703	0.0 0.8+			

1999 UC₃ = 1978 WM₉ = 1996 BT₂

Id. S. Nakano

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	335.91182	(2000.0)	P	Q
<i>n</i>	0.23365147	ω	318.79434	+0.67271243
<i>a</i>	2.6107004	Ω	88.75243	+0.69875475
<i>e</i>	0.2939504	<i>i</i>	4.76440	+0.24331006
<i>P</i>	4.22	<i>H</i>	15.0	<i>G</i> 0.15
				<i>U</i> 3

Residuals in seconds of arc

1978 11 29	675	0.9- 0.2-	1999 10 20	886	1.0- 0.3+	1999 10 30	703	0.2- 0.1+
1978 11 30	675	1.1+ 0.5-	1999 10 22	888	0.2+ 0.3+	1999 10 30	703	0.0 0.1+
1996 01 26	817	0.1- 0.1+	1999 10 22	886	1.0+ 1.9-	1999 10 30	888	0.1+ 0.1+
1996 01 26	817	0.1+ 0.0	1999 10 22	888	0.3+ 0.1-	1999 10 30	888	0.2- 0.1+
1996 01 26	817	0.0 0.2+	1999 10 22	888	0.2+ 0.1-	1999 10 30	888	0.1+ 0.2-
1996 01 26	817	0.1- 0.1+	1999 10 22	886	0.4- 0.6-	1999 11 02	886	0.3- 0.5+
1996 01 27	709	0.1- 0.0	1999 10 22	886	0.6- 0.9-	1999 11 02	886	0.5- 0.8+
1996 01 27	709	0.0 0.1-	1999 10 23	888	0.3+ 0.5+	1999 11 04	886	0.3+ 1.0+
1996 01 27	709	0.0 0.0	1999 10 23	888	0.7+ 0.5+	1999 11 04	886	0.4- 1.2-
1996 01 27	709	0.1+ 0.0	1999 10 23	888	0.2+ 0.1+	1999 11 13	888	0.1+ 0.8+
1999 10 20	888	0.0 0.4-	1999 10 29	886	0.4- 0.2+	1999 11 13	888	0.2- 0.5+
1999 10 20	888	0.2- 0.0	1999 10 29	886	0.2+ 0.1-	1999 11 14	886	0.5+ 0.9-
1999 10 20	888	0.1- 0.1-	1999 10 30	703	0.0 0.0	1999 11 14	886	0.2+ 0.3-
1999 10 20	886	0.2+ 1.2+	1999 10 30	703	0.2- 0.2+			

1999 UP₃ = 1972 TN₁₀ = 1990 VU₁₁

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	337.89405	(2000.0)	P	Q
<i>n</i>	0.22079100	ω	3.47170	+0.55333464
<i>a</i>	2.7111183	Ω	52.94399	+0.76218562
<i>e</i>	0.1431495	<i>i</i>	4.82265	+0.33599680
<i>P</i>	4.46	<i>H</i>	13.4	<i>G</i> 0.15
				<i>U</i> 4

Residuals in seconds of arc

1972 10 09	033	0.2- 0.2+	1999 10 28	327	0.5+ 0.5+	1999 11 04	703	0.0 0.5+
1972 10 09	033	0.6+ 0.4+	1999 10 28	327	0.0 0.3-	1999 11 04	703	0.0 0.7+
1972 10 09	033	0.5- 0.0	1999 10 28	327	0.3+ 0.6+	1999 11 12	704	0.0 0.1-
1972 10 09	033	0.2- 0.2+	1999 10 28	327	1.1+ 0.4+	1999 11 12	704	0.0 0.0
1990 11 12	809	0.6+ 0.3-	1999 10 28	327	0.1+ 0.5+	1999 11 12	704	0.2+ 0.0
1990 11 12	809	0.6+ 0.7-	1999 10 28	327	0.6+ 0.3-	1999 11 12	704	0.1+ 0.0
1990 11 12	809	0.1+ 0.7+	1999 10 29	327	0.1- 0.2+	1999 11 12	704	1.4+ 0.8+
1990 11 14	809	0.4- 0.3-	1999 10 29	327	0.1- 0.6+	1999 11 13	732	0.7- 0.6-
1990 11 14	809	0.1+ 0.4-	1999 10 29	327	0.0 0.7+	1999 11 13	732	0.6- 0.7-
1990 11 14	809	0.1- 1.1-	1999 11 03	704	0.1- 0.2-	1999 11 13	732	0.5+ 0.8-
1999 10 18	327	0.2+ 0.2-	1999 11 03	704	0.4- 0.2+	1999 11 14	732	0.4- 0.1+
1999 10 18	327	0.0 0.2-	1999 11 03	704	0.3- 0.1+	1999 11 14	732	0.3- 0.2+
1999 10 18	327	0.1+ 0.4-	1999 11 03	704	0.5- 0.0	1999 11 14	732	0.4- 0.1+
1999 10 22	327	0.1+ 0.6-	1999 11 03	704	0.4- 0.1-	1999 11 15	732	0.1- 0.2+
1999 10 22	327	0.0 0.4-	1999 11 04	703	0.4- 0.4+	1999 11 15	732	0.2+ 0.4+
1999 10 22	327	1.3- 1.9-	1999 11 04	703	0.3- 0.7+	1999 11 15	732	0.1+ 0.4+

1999 US₃ = 1999 TC

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	332.90197	(2000.0)	P	Q
<i>n</i>	0.21500649	ω	181.41237	+0.00758163
<i>a</i>	2.7595292	Ω	268.33012	+0.92214214
<i>e</i>	0.5197169	<i>i</i>	28.99099	+0.38677694
<i>P</i>	4.58	<i>H</i>	13.8	<i>G</i> 0.15
				<i>U</i> 2

Residuals in seconds of arc

1994 07 11	675	0.0	0.6-	1999 10 28	853	0.3-	0.0	1999 10 31	946	0.9-	0.6+
1994 07 11	675	0.6+	0.3-	1999 10 28	853	0.2-	0.1+	1999 10 31	853	0.0	0.2+
1999 10 01	704	0.0	0.2+	1999 10 28	853	0.3-	0.0	1999 10 31	853	0.1-	0.2+
1999 10 01	704	0.5+	0.0	1999 10 28	850	0.3+	0.3-	1999 10 31	853	0.0	0.2+
1999 10 01	704	0.6+	0.1-	1999 10 28	850	0.2+	0.1-	1999 10 31	704	0.2-	0.0
1999 10 01	704	0.9+	0.8-	1999 10 28	850	0.8-	0.2+	1999 10 31	704	0.2-	0.1+
1999 10 01	704	0.9+	0.6-	1999 10 28	850	0.2+	0.4-	1999 10 31	704	0.1+	0.0
1999 10 02	704	0.2+	0.3+	1999 10 28	850	0.4+	0.5-	1999 10 31	704	0.0	0.2-
1999 10 02	704	0.1+	0.1+	1999 10 28	355	0.3+	0.4-	1999 10 31	704	0.0	0.1-
1999 10 02	704	0.1+	0.1+	1999 10 28	355	0.4+	0.2+	1999 10 31	719	0.1-	0.3+
1999 10 02	704	0.3+	0.1-	1999 10 28	355	0.3+	1.1+	1999 10 31	719	0.2-	0.2+
1999 10 02	704	0.2+	0.1+	1999 10 28	046	0.1+	0.2+	1999 10 31	719	0.2-	0.2+
1999 10 26	699	0.4-	0.3+	1999 10 28	046	0.3+	0.2+	1999 10 31	719	0.2-	0.2+
1999 10 26	699	0.4-	0.3+	1999 10 28	046	0.3+	0.3+	1999 10 31	151	0.5-	0.2+
1999 10 26	699	0.3-	0.2+	1999 10 28	046	0.2+	0.3+	1999 10 31	151	0.1+	0.2+
1999 10 26	046	0.3+	0.5+	1999 10 28	046	0.2+	0.1+	1999 10 31	151	0.0	0.2+
1999 10 26	046	0.4+	0.4+	1999 10 29	850	0.3+	0.2-	1999 10 31	151	0.1+	0.3-
1999 10 26	046	0.3+	0.2+	1999 10 29	850	0.0	0.2-	1999 10 31	151	0.7-	0.2+
1999 10 26	046	0.5+	0.6+	1999 10 29	734	0.2+	0.3-	1999 10 31	151	0.1-	0.1+
1999 10 26	046	0.3+	0.2+	1999 10 29	734	0.3+	0.3-	1999 10 31	151	0.0	0.0
1999 10 26	151	1.0-	1.1-	1999 10 29	734	0.2+	0.1-	1999 10 31	151	0.2+	0.1+
1999 10 26	151	1.0-	1.5-	1999 10 29	850	0.1+	0.2-	1999 10 31	108	1.0+	0.7-
1999 10 26	151	0.7-	1.1-	1999 10 29	734	0.3+	0.3-	1999 10 31	587	0.0	0.1+
1999 10 26	151	0.9-	0.9-	1999 10 29	734	0.4+	0.4-	1999 10 31	587	0.2-	0.1+
1999 10 26	151	0.9-	1.1-	1999 10 29	850	0.2+	0.2-	1999 10 31	587	0.3-	0.1+
1999 10 26	151	0.8-	1.1-	1999 10 29	540	0.2+	0.0	1999 10 31	619	0.1-	0.2+
1999 10 26	151	0.9-	1.3-	1999 10 29	540	0.0	0.2+	1999 10 31	619	0.1+	0.1+
1999 10 26	151	0.7-	1.0-	1999 10 29	540	0.1+	0.3+	1999 10 31	619	0.1+	0.3+
1999 10 26	151	0.7-	1.2-	1999 10 29	540	0.1+	0.4+	1999 11 01	113	0.1-	0.4+
1999 10 26	611	0.3+	0.1-	1999 10 29	557	0.0	0.1+	1999 11 01	113	0.1-	0.3+
1999 10 26	611	0.1+	0.0	1999 10 29	557	0.0	0.1+	1999 11 01	113	0.2+	1.1+

1999 10 26	611	0.2+	0.2-	1999 10 29	557	0.1+	0.0	1999 11 01	113	0.3+	1.1+
1999 10 26	611	0.1-	0.3-	1999 10 29	046	0.1+	0.2+	1999 11 01	113	0.3+	0.6+
1999 10 27	713	0.6+	0.1+	1999 10 29	046	0.1+	0.2+	1999 11 01	113	0.3+	1.0+
1999 10 27	713	0.3+	0.4+	1999 10 29	046	0.1+	0.2+	1999 11 01	113	0.4+	0.9+
1999 10 27	713	0.4+	0.3+	1999 10 29	046	0.2+	0.2+	1999 11 01	113	0.4+	0.9+
1999 10 27	713	0.3+	0.1+	1999 10 29	046	0.1+	0.2+	1999 11 03	853	0.3+	0.1+
1999 10 27	046	0.5+	0.1-	1999 10 30	118	0.1+	0.6+	1999 11 03	853	0.1+	0.2+
1999 10 27	046	0.5+	0.0	1999 10 30	118	0.2+	0.5+	1999 11 03	853	0.2+	0.1+
1999 10 27	046	0.4+	0.1+	1999 10 30	118	0.1+	0.5+	1999 11 05	853	0.0	0.1+
1999 10 27	046	0.3+	0.1+	1999 10 30	595	0.0	0.3-	1999 11 05	853	0.0	0.1-
1999 10 27	046	0.4+	0.2+	1999 10 30	595	0.5+	0.1-	1999 11 05	853	0.1-	0.0
1999 10 27	151	0.3-	0.9-	1999 10 30	853	0.1+	0.3+	1999 11 06	151	0.5-	0.1+
1999 10 27	151	1.3-	0.0	1999 10 30	853	0.1+	0.1+	1999 11 06	151	0.4-	0.3+
1999 10 27	151	0.8-	0.8-	1999 10 30	853	0.1+	0.2+	1999 11 07	151	0.6-	0.4+
1999 10 27	151	1.0+	1.0-	1999 10 30	713	0.1-	0.2+	1999 11 09	121	0.0	0.4+
1999 10 27	151	1.7-	0.9+	1999 10 30	713	0.0	0.4+	1999 11 09	121	0.1+	0.3+
1999 10 27	151	1.4-	0.3-	1999 10 30	713	0.1-	0.3+	1999 11 09	121	0.2+	0.2+
1999 10 27	151	0.5-	0.3-	1999 10 30	713	0.0	0.3+	1999 11 09	121	0.2+	0.2+
1999 10 27	151	0.7-	0.2-	1999 10 30	713	0.1+	0.3+	1999 11 09	121	0.1+	0.2+
1999 10 27	151	0.4-	0.5-	1999 10 30	713	0.1+	0.5+	1999 11 09	121	0.1+	0.2+
1999 10 27	611	0.2+	0.0	1999 10 30	704	0.1+	0.0	1999 11 10	121	0.1+	0.5+
1999 10 27	611	0.4+	0.1+	1999 10 30	713	0.0	0.6+	1999 11 10	121	0.1+	0.5+
1999 10 27	118	0.8-	0.4-	1999 10 30	704	0.0	0.0	1999 11 11	121	0.1+	1.3-
1999 10 27	118	0.8-	0.4-	1999 10 30	704	0.0	0.0	1999 11 11	121	0.1-	1.3-
1999 10 28	461	0.5+	0.2+	1999 10 30	704	0.0	0.1+	1999 11 11	121	0.0	1.4-
1999 10 28	461	0.5+	0.2+	1999 10 30	704	0.0	0.1+	1999 11 11	121	0.2-	1.2-
1999 10 28	461	0.5+	0.1+	1999 10 30	557	0.1-	0.2+	1999 11 11	121	0.1-	1.3-
1999 10 28	461	0.4+	0.3+	1999 10 30	557	0.0	0.3+	1999 11 11	121	0.0	1.3-
1999 10 28	461	0.4+	0.2+	1999 10 30	557	0.1+	0.2+	1999 11 15	726	0.1+	0.9-
1999 10 28	461	0.5+	0.2+	1999 10 30	557	0.1+	0.3+	1999 11 15	726	0.2-	0.6-
1999 10 28	461	0.5+	0.3+	1999 10 31	946	0.9-	0.7+	1999 11 15	726	0.0	0.6-
1999 10 28	461	0.4+	0.3+	1999 10 31	946	0.7-	0.7+				

1999 UU₃ = 1982 SN₈ = 1988 XA₅

Id. B. G. Marsden

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

		Williams			
<i>M</i>	4.32821	(2000.0)	P	Q	
<i>n</i>	0.17597152	ω	132.74246	+0.97985550	-0.18845935
<i>a</i>	3.1538506	Ω	238.22228	+0.15287590	+0.92072564
<i>e</i>	0.2093586	<i>i</i>	4.45808	+0.12849967	+0.34168315
<i>P</i>	5.60	<i>H</i>	13.1	<i>G</i>	0.15

Residuals in seconds of arc

1982 09 19	095	0.0	0.0	1999 10 29	046	0.0	0.0	1999 11 04	704	0.2+	0.0
1988 12 05	381	0.6+	0.5-	1999 10 29	046	0.0	0.0	1999 11 04	704	0.3+	0.2-
1988 12 06	381	0.9-	0.1+	1999 10 29	046	0.0	0.0	1999 11 04	704	0.1+	0.1-
1988 12 07	381	0.0	0.1+	1999 10 30	046	0.3-	0.3-	1999 11 05	046	0.2-	0.0
1988 12 08	381	0.3+	0.2+	1999 10 30	046	0.1-	0.1-	1999 11 05	046	0.1-	0.1+
1999 10 29	046	0.2+	0.0	1999 10 30	046	0.1-	0.1-	1999 11 05	046	0.1-	0.2+
1999 10 29	046	0.4+	0.1+	1999 10 30	046	0.0	0.2-	1999 11 05	046	0.2-	0.1+
1999 10 29	046	0.0	0.3+	1999 11 01	046	0.4-	0.1+	1999 11 11	703	0.2-	0.1+
1999 10 29	046	0.5+	0.1-	1999 11 01	046	0.3-	0.1+	1999 11 11	703	0.0	0.2-
1999 10 29	046	0.4+	0.0	1999 11 01	046	0.4-	0.0	1999 11 11	703	0.2-	0.0
1999 10 29	046	0.2+	0.2-	1999 11 01	046	0.4-	0.1+	1999 11 11	703	0.4-	0.6+
1999 10 29	046	0.1-	0.1-	1999 11 04	704	0.4+	0.1+				
1999 10 29	046	0.0	0.1-	1999 11 04	704	0.7+	0.0				

1999 UG₄ = 1992 YO₅

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

		Williams			
<i>M</i>	225.23894	(2000.0)	P	Q	
<i>n</i>	0.26368449	ω	345.44688	-0.95697788	-0.29015645
<i>a</i>	2.4084982	Ω	177.68395	+0.27002515	-0.89257693
<i>e</i>	0.1412890	<i>i</i>	2.27338	+0.10620617	-0.34513136
<i>P</i>	3.74	<i>H</i>	14.2	<i>G</i>	0.15

Residuals in seconds of arc

1992 12 29	033	0.7+	0.2-	1999 11 02	732	0.4-	0.3+	1999 11 04	732	1.4+	1.1+
1992 12 30	033	1.0-	0.6+	1999 11 02	732	1.1-	0.3-	1999 11 04	732	0.8+	0.2+
1993 01 01	033	0.3+	0.3-	1999 11 02	732	0.4-	0.2+	1999 11 04	732	0.3+	0.0
1999 10 31	732	0.3-	0.8-	1999 11 03	732	0.6-	0.2+	1999 11 05	732	0.9-	0.0
1999 10 31	732	1.5-	0.1-	1999 11 03	732	0.7+	0.3+	1999 11 05	732	0.7+	0.2+
1999 10 31	732	1.2+	0.5+	1999 11 03	732	0.3-	1.0+	1999 11 05	732	0.2-	0.5-
1999 10 31	732	0.5+	0.4-	1999 11 03	732	0.4+	0.7-	1999 11 09	732	0.4-	0.1-
1999 11 01	732	0.8+	0.4+	1999 11 03	732	0.6+	0.1+	1999 11 09	732	1.1-	1.6-
1999 11 01	732	(2.3+ 0.2-)		1999 11 03	732	1.3+	1.6-	1999 11 12	704	0.1+	0.2-
1999 11 01	732	0.3-	0.1-	1999 11 03	703	1.3+	0.7+	1999 11 12	704	0.1-	0.2+
1999 11 01	732	1.6-	0.5-	1999 11 03	703	0.1-	0.4-	1999 11 12	704	0.2+	0.2+
1999 11 01	732	0.2+	0.6+	1999 11 03	703	1.4-	0.7+	1999 11 12	704	0.3+	0.1-
1999 11 01	732	0.4-	0.5-	1999 11 03	703	0.4+	0.4+	1999 11 12	704	0.0	0.8+

1999 UO₄ = 1997 EO₃₉

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

		Williams			
<i>M</i>	305.36033	(2000.0)	P	Q	
<i>n</i>	0.28144636	ω	120.71426	+0.16895511	-0.98481907
<i>a</i>	2.3060690	Ω	319.49760	+0.88203152	+0.16910342
<i>e</i>	0.1414955	<i>i</i>	3.51498	+0.43985744	+0.03918466
<i>P</i>	3.50	<i>H</i>	15.6	<i>G</i>	0.15

Residuals in seconds of arc

1997 03 05	704	0.3+	0.8+	1999 11 03	678	1.6+	0.3-	1999 11 04	704	0.1-	0.4-
1997 03 05	704	0.2-	1.2-	1999 11 03	704	0.2-	0.3-	1999 11 04	704	0.3-	0.0
1997 03 06	704	0.2+	0.2+	1999 11 03	678	0.0	0.0	1999 11 05	678	0.3-	0.7-
1997 03 06	704	0.3-	0.2+	1999 11 03	704	0.8-	0.0	1999 11 05	678	0.4-	0.0
1999 10 31	678	0.1+	0.1-	1999 11 03	704	0.2-	0.3-	1999 11 11	703	0.2+	0.0
1999 10 31	678	0.1+	0.0	1999 11 03	704	0.4-	0.1+	1999 11 11	703	0.2+	0.3+
1999 11 01	678	0.0	0.7+	1999 11 04	704	0.0	0.1+	1999 11 11	703	0.1+	0.3+
1999 11 01	678	1.3+	0.3+	1999 11 04	704	0.2-	0.2-	1999 11 11	703	0.1+	0.2+
1999 11 03	704	0.6-	0.3+	1999 11 04	704	0.0	0.0				

1999 UQ₄ = 1993 RV₁₁

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

		Williams			
<i>M</i>	231.60556	(2000.0)	P	Q	
<i>n</i>	0.17601702	ω	343.87701	-0.85854657	-0.51210217
<i>a</i>	3.1533072	Ω	165.23717	+0.48078028	-0.82131287
<i>e</i>	0.0943682	<i>i</i>	5.73843	+0.17818001	-0.25138920
<i>P</i>	5.60	<i>H</i>	14.0	<i>G</i>	0.15

Residuals in seconds of arc

1993 09 14	809	1.2+	0.3+	1999 10 03	703	0.2+	0.1-	1999 11 01	557	0.6+	0.1-
1993 09 14	809	0.8+	0.1-	1999 10 03	703	0.4+	0.1-	1999 11 03	557	0.1+	0.1-
1993 09 14	809	0.6-	0.7-	1999 10 03	703	1.2-	0.2+	1999 11 03	557	0.1-	0.2-
1993 09 19	809	0.7+	0.9+	1999 10 31	557	0.2+	0.3+	1999 11 04	557	0.1-	0.3+
1993 09 19	809	0.5-	0.3-	1999 10 31	557	0.1-	0.2+	1999 11 04	557	0.4-	0.2+
1993 09 19	809	1.6-	0.1-	1999 11 01	557	0.1+	0.0				
1999 10 03	703	0.4+	0.0	1999 11 01	557	0.1-	0.6-				

1999 UR₅ = 1993 TA₁₂

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

		Williams			
<i>M</i>	62.92705	(2000.0)	P	Q	
<i>n</i>	0.16891084	ω	71.59158	+0.54255958	+0.82705762
<i>a</i>	3.2411394	Ω	232.16406	-0.82372170	+0.48952757
<i>e</i>	0.1404181	<i>i</i>	10.72597	-0.16465620	+0.27629414
<i>P</i>	5.84	<i>H</i>	13.0	<i>G</i>	0.15

Residuals in seconds of arc

1999 NOV. 23

M.P.C. 36859

1993 10 15	675	0.2+	0.3−	1999 10 31	703	1.0+	1.3+	1999 11 11	703	0.3+	0.2−
1999 10 29	703	0.5−	0.1−	1999 11 04	704	0.2−	0.2−	1999 11 11	703	0.2+	0.5+
1999 10 29	703	0.3−	0.1−	1999 11 04	704	0.7−	0.6−				

1999 UD₆ = 1994 XR₅

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	346.39882		(2000.0)		P		Q
<i>n</i>	0.20010360	ω	355.07886	+0.67749240			−0.72419912
<i>a</i>	2.8948948	Ω	52.20270	+0.68026751			+0.55044485
<i>e</i>	0.1317407	<i>i</i>	9.36687	+0.27971443			+0.41538670
<i>P</i>	4.93	<i>H</i>	12.5	<i>G</i>	0.15	<i>U</i>	4

Residuals in seconds of arc

1994 11 28	675	0.3−	1.4−	1999 10 22	327	0.1+	0.2+	1999 11 03	704	0.2−	0.2−
1994 11 28	675	(1.6−	3.4−)	1999 10 22	327	0.1+	0.1+	1999 11 03	704	0.4−	0.1+
1994 11 30	691	0.2+	0.4+	1999 10 28	327	0.2−	0.5−	1999 11 12	704	0.1+	0.0
1994 11 30	691	0.2+	1.1+	1999 10 28	327	0.2+	0.0	1999 11 12	704	0.5+	0.1−
1994 11 30	691	0.1+	0.4+	1999 10 28	327	0.2−	0.0	1999 11 12	704	0.0	0.1+
1994 12 03	675	0.5−	0.2−	1999 11 03	704	0.2+	0.0	1999 11 12	704	0.0	0.2+
1994 12 03	675	0.4+	0.3−	1999 11 03	704	0.3−	0.2−	1999 11 12	704	0.1+	0.1+
1999 10 22	327	0.2+	0.2+	1999 11 03	704	0.1−	0.1−				

1999 UW₇ = 1989 UK₄

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	17.32341		(2000.0)		P		Q
<i>n</i>	0.29427775	ω	289.25603	+0.93132641			+0.35890749
<i>a</i>	2.2385378	Ω	49.76154	−0.29630759			+0.84538644
<i>e</i>	0.2339385	<i>i</i>	4.64196	−0.21173789			+0.39560988
<i>P</i>	3.35	<i>H</i>	15.4	<i>G</i>	0.15	<i>U</i>	4

Residuals in seconds of arc

1989 10 23	033	0.3+	0.3+	1999 11 01	703	0.5−	0.3−	1999 11 04	704	0.1+	0.3+
1989 10 23	033	0.1−	0.2−	1999 11 01	703	0.0	0.1−	1999 11 04	704	0.0	0.9+
1989 10 26	033	0.2−	0.1−	1999 11 01	703	0.3+	0.4−	1999 11 04	704	0.1−	0.3+
1999 10 29	703	0.1+	0.1+	1999 11 03	691	0.2+	0.2+	1999 11 12	704	0.1+	0.0
1999 10 29	703	0.7−	0.2−	1999 11 03	691	0.0	0.0	1999 11 12	704	0.1−	0.2−
1999 10 29	703	0.6+	0.1+	1999 11 03	691	0.2+	0.0	1999 11 12	704	0.2+	0.0
1999 10 29	703	0.4−	0.2−	1999 11 04	704	0.2+	0.2−	1999 11 12	704	0.3−	0.1+
1999 11 01	703	0.0	0.0	1999 11 04	704	0.4+	0.0	1999 11 12	704	0.2−	0.3−

1999 UF₉ = 1989 VV₅ = 1991 CU₃ = 1997 GA₂₄

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	343.50366		(2000.0)		P		Q
<i>n</i>	0.19931374	ω	17.91441	+0.69223072			−0.72136310
<i>a</i>	2.9025378	Ω	28.29029	+0.65651591			+0.61722409
<i>e</i>	0.0848292	<i>i</i>	2.57081	+0.29967229			+0.31411735
<i>P</i>	4.95	<i>H</i>	14.1	<i>G</i>	0.15	<i>U</i>	2

Residuals in seconds of arc

1989 11 03	675	0.2−	0.8−	1997 04 07	704	1.1+	0.4+	1999 11 01	703	0.4−	0.5+
1989 11 03	675	0.6+	0.6−	1997 04 11	704	0.1+	1.0−	1999 11 01	703	0.2+	0.4+
1989 11 04	675	0.7+	1.1−	1997 04 11	704	0.3−	1.2+	1999 11 01	703	0.1−	0.4+
1989 11 04	675	1.0+	2.6−	1997 04 11	704	0.5−	0.4−	1999 11 01	703	0.3−	0.1−
1991 02 07	372	0.0	0.7−	1997 04 11	704	0.1+	0.9−	1999 11 04	704	0.4−	0.0
1991 02 07	372	0.4−	0.2−	1999 10 29	703	0.7+	0.6+	1999 11 04	704	0.1+	0.0
1997 04 06	704	0.2+	0.4−	1999 10 29	703	0.6−	0.4+	1999 11 04	704	0.3−	0.1−
1997 04 06	704	0.4−	0.3−	1999 10 29	703	0.3−	0.3+	1999 11 04	704	0.1+	0.3+
1997 04 07	704	0.8−	0.2+	1999 10 29	703	0.2+	1.0+	1999 11 04	704	0.1−	0.3+

1999 UJ₉ = 1998 MO₄₂

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	332.47026		(2000.0)		P		Q
<i>n</i>	0.22653910	ω	192.02157	+0.55378114			−0.83250498
<i>a</i>	2.6650617	Ω	224.35432	+0.76585781			+0.51688297
<i>e</i>	0.0894802	<i>i</i>	1.32650	+0.32678474			+0.19941781
<i>P</i>	4.35	<i>H</i>	14.4	<i>G</i>	0.15	<i>U</i>	5

Residuals in seconds of arc

1998 06 26	809	0.5+	0.0	1999 11 01	703	0.0	0.5+	1999 11 10	120	0.2+	0.6+
1998 06 26	809	0.6−	1.2+	1999 11 01	703	0.6−	0.0	1999 11 12	704	0.1+	0.4−
1998 06 26	809	0.7−	1.0+	1999 11 01	703	0.8−	0.6+	1999 11 12	704	0.1+	0.2−
1998 06 27	809	0.3+	0.0	1999 11 01	703	0.0	0.3−	1999 11 12	704	0.1+	0.3−
1998 06 27	809	0.0	0.9−	1999 11 04	704	0.5+	0.1−	1999 11 12	704	0.1−	0.2−
1998 06 27	809	0.4+	1.3−	1999 11 04	704	0.1+	0.5−	1999 11 12	704	0.0	0.2−
1999 10 29	703	0.7+	0.3−	1999 11 04	704	0.1+	0.1−	1999 11 12	120	0.3+	0.3+
1999 10 29	703	0.1−	0.2+	1999 11 04	704	0.0	0.3+	1999 11 12	120	0.0	0.5+
1999 10 29	703	0.6+	0.3−	1999 11 04	704	0.3+	0.7−				
1999 10 29	703	0.7−	0.5+	1999 11 10	120	0.9−	0.2−				

1999 UM₁₁ = 1990 EY₅

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	309.31706		(2000.0)		P		Q
<i>n</i>	0.17392607	ω	24.15742	+0.07545974			−0.99680998
<i>a</i>	3.1785296	Ω	61.52398	+0.90998484			+0.05818118
<i>e</i>	0.1416755	<i>i</i>	1.69459	+0.40771732			+0.05463350
<i>P</i>	5.67	<i>H</i>	13.4	<i>G</i>	0.15	<i>U</i>	5

Residuals in seconds of arc

1990 03 01	809	0.5−	0.1+	1999 11 04	704	0.3−	0.2−	1999 11 12	704	0.1+	0.1+
1990 03 01	809	0.4−	0.1+	1999 11 04	704	0.1+	0.5−	1999 11 12	704	0.2+	0.2−
1990 03 01	809	0.2−	0.2+	1999 11 04	704	0.2−	1.0−	1999 11 12	704	0.0	0.1−
1990 03 02	809	0.2+	0.1−	1999 11 05	120	0.1−	0.2+	1999 11 12	704	0.3−	0.3−
1990 03 02	809	0.4+	0.2−	1999 11 05	120	0.5−	0.1+	1999 11 12	120	0.1−	0.2+
1990 03 02	809	0.5+	0.1−	1999 11 07	120	0.0	0.7+	1999 11 12	120	1.0+	0.1+
1999 10 27	120	0.0	0.6−	1999 11 07	120	0.3+	0.2+	1999 11 13	120	0.2−	0.1−
1999 10 27	120	0.7+	0.7+	1999 11 07	120	0.5+	0.2+	1999 11 13	120	0.1−	0.2−
1999 11 04	704	0.0	0.7+	1999 11 10	120	1.0−	0.1+	1999 11 13	120	0.1+	0.2−
1999 11 04	704	0.4−	0.2+	1999 11 10	120	0.3+	0.1+				

1999 UN₁₁ = 1994 GP₉

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	178.75733		(2000.0)		P		Q
<i>n</i>	0.27412506	ω	343.50418	−0.93949981			+0.32795869
<i>a</i>	2.3469485	Ω	216.12740	−0.29228098			−0.91806619
<i>e</i>	0.1151065	<i>i</i>	9.65777	−0.17863912			−0.22270512
<i>P</i>	3.60	<i>H</i>	14.1	<i>G</i>	0.15	<i>U</i>	5

Residuals in seconds of arc

1994 04 14	675	0.1+	0.3+	1999 11 04	704	0.3−	0.4−	1999 11 08	120	1.1+	0.1−
1994 04 14	675	0.1−	0.5+	1999 11 04	704	0.2−	0.5−	1999 11 08	120	0.7−	0.7+
1994 04 15	675	0.5+	0.3−	1999 11 04	704	0.5−	0.1−	1999 11 10	120	0.1+	0.3−
1994 04 15	675	0.5−	0.5−	1999 11 04	704	0.5−	0.2+	1999 11 10	120	0.7+	0.3−
1999 10 27	120	0.5−	0.1+	1999 11 04	691	0.1−	0.3−	1999 11 10	120	0.7−	0.3+
1999 10 27	120	1.0+	0.7+	1999 11 04	704	0.1+	0.2−	1999 11 12	704	0.1+	0.3−
1999 11 03	703	0.4+	0.1−	1999 11 04	691	0.1−	0.3−	1999 11 12	704	0.3+	0.1−
1999 11 03	703	0.9+	0.7−	1999 11 04	691	0.0	0.3−	1999 11 12	704	0.1−	0.1−
1999 11 03	703	1.0−	0.2+	1999 11 07	120	0.4+	0.4+	1999 11 12	704	0.0	0.2+
1999 11 03	703	0.0	0.5+	1999 11 07	120	0.5+	0.2−	1999 11 12	704	0.8−	0.7+

1999 UO₁₁ = 1994 RB₁₉

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	357.96135		(2000.0)	P		Q	
<i>n</i>	0.21329725	ω	197.06139	+0.95024790		-0.31149013	
<i>a</i>	2.7742518	Ω	181.09196	+0.29511090		+0.90198425	
<i>e</i>	0.1585681	<i>i</i>	5.06893	+0.09969199		+0.29899550	
<i>P</i>	4.62	<i>H</i>	14.9	<i>G</i>	0.15	<i>U</i>	6

Residuals in seconds of arc

1994 09 05	809	0.1-	0.5+	1999 10 31	143	0.6-	0.1+	1999 11 10	143	0.2+	0.3-
1994 09 05	809	1.2+	0.6-	1999 10 31	143	0.3-	0.7-	1999 11 12	143	0.2+	0.2-
1994 09 05	809	0.6-	1.2-	1999 10 31	143	0.1+	0.0	1999 11 12	143	1.4+	0.6+
1994 09 06	809	0.0	0.3+	1999 11 08	143	0.6+	0.5-	1999 11 13	143	0.3+	0.6-
1994 09 06	809	0.1-	0.6+	1999 11 08	143	0.9+	0.4-	1999 11 13	143	1.1-	0.3+
1994 09 06	809	0.4-	0.4+	1999 11 10	143	0.9-	1.8+	1999 11 13	143	0.8-	0.1+

1999 UL₁₆ = 1991 RG₁₈ = 1998 HY₆₀

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	48.86301		(2000.0)	P		Q	
<i>n</i>	0.25516014	ω	321.70319	+0.56669423		+0.82387250	
<i>a</i>	2.4618457	Ω	342.81014	-0.74772487		+0.50936413	
<i>e</i>	0.2024738	<i>i</i>	1.85733	-0.34607104		+0.24856044	
<i>P</i>	3.86	<i>H</i>	15.3	<i>G</i>	0.15	<i>U</i>	3

Residuals in seconds of arc

1991 09 13	675	0.1+	0.1+	1998 04 22	704	1.1+	1.1-	1999 11 04	704	0.8+	0.2+
1991 09 13	675	0.3-	0.6+	1998 04 22	704	1.2+	0.6-	1999 11 04	704	0.2+	0.2-
1991 09 16	675	0.7-	0.1-	1998 04 22	704	0.4+	0.5-	1999 11 04	704	1.3+	0.1+
1991 09 16	675	0.8+	0.6-	1999 10 29	703	0.2+	1.1+	1999 11 04	704	0.9+	0.4+
1998 04 21	704	1.3-	1.0+	1999 10 29	703	0.7+	0.3-	1999 11 04	704	0.6+	0.4+
1998 04 21	704	0.9+	0.4+	1999 10 29	703	0.2-	0.1+	1999 11 11	703	0.2-	0.3+
1998 04 21	704	1.0-	0.4+	1999 10 29	703	0.8-	0.5-	1999 11 11	703	1.2-	0.0
1998 04 21	704	0.8-	0.5+	1999 11 03	703	0.5-	0.5+	1999 11 11	703	0.8-	0.9-
1998 04 21	704	0.5-	0.8+	1999 11 03	703	1.7-	0.3-	1999 11 11	703	0.5+	0.0
1998 04 22	704	0.0	0.2-	1999 11 03	703	0.3-	0.1-				
1998 04 22	704	0.2+	0.6-	1999 11 03	703	0.4+	0.6-				

1999 UL₂₄ = 1990 SS₁₁

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	35.11177		(2000.0)	P		Q	
<i>n</i>	0.22400928	ω	65.13134	+0.69927283		+0.69860494	
<i>a</i>	2.6850892	Ω	250.13810	-0.70015806		+0.62655893	
<i>e</i>	0.2170405	<i>i</i>	9.27305	-0.14420887		+0.34550695	
<i>P</i>	4.40	<i>H</i>	14.9	<i>G</i>	0.15	<i>U</i>	6

Residuals in seconds of arc

1990 09 17	675	0.2-	0.1-	1999 11 03	704	0.2+	0.0	1999 11 04	704	1.0+	0.2-
1990 09 17	675	0.0	0.3-	1999 11 03	704	0.4+	0.9-	1999 11 04	704	0.8+	0.1-
1990 09 19	675	0.3+	0.4+	1999 11 03	704	0.4-	0.8-	1999 11 04	703	0.1+	0.4-
1999 10 28	703	0.1+	0.7+	1999 11 03	704	0.8-	1.2+	1999 11 04	704	0.1+	0.2-
1999 10 28	703	0.4-	0.1-	1999 11 03	704	1.5-	0.4-	1999 11 04	703	0.1+	1.1+
1999 10 28	703	0.1-	0.8-	1999 11 04	704	0.2+	0.3-	1999 11 04	703	0.5-	0.9+
1999 10 28	703	0.7+	0.2+	1999 11 04	704	0.9+	0.3+	1999 11 04	703	1.0-	0.1-

1999 VQ = 1988 VW₅ = 1990 DT₁ = 1993 RL₉

Id. G. V. Williams, K. Ichikawa

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	342.39581		(2000.0)	P		Q	
<i>n</i>	0.17990020	ω	249.19944	+0.54171528		-0.84055037	
<i>a</i>	3.1077659	Ω	167.99707	+0.77890756		+0.49999215	
<i>e</i>	0.1851609	<i>i</i>	1.22097	+0.31598665		+0.20852561	
<i>P</i>	5.48	<i>H</i>	12.9	<i>G</i>	0.15	<i>U</i>	1

Residuals in seconds of arc

1988 11 04	046	(2.7-	2.9-)	1993 09 19	809	0.3+	0.6-	1999 11 06	678	0.1-	0.3+
1988 11 04	046	(2.8-	2.5-)	1993 09 19	809	0.4-	1.3-	1999 11 06	678	0.6-	0.1+
1988 11 05	046	(3.0+	1.3-)	1993 09 19	809	1.2-	0.3-	1999 11 07	120	0.3-	0.7+
1988 11 05	046	1.0+	1.5-	1999 11 01	678	1.7-	0.6-	1999 11 08	120	0.2+	0.2+
1988 11 06	675	(5.1+	1.5+)	1999 11 01	678	0.6+	0.6+	1999 11 08	120	0.2+	0.0
1988 11 06	675	(5.2+	1.3+)	1999 11 03	678	0.0	0.4+	1999 11 08	120	0.2+	0.1+
1988 11 11	046	(3.5-	1.4+)	1999 11 03	678	0.5-	0.1-	1999 11 10	120	0.0	0.2-
1988 11 12	046	(2.8-	0.3+)	1999 11 03	678	0.4-	0.5+	1999 11 10	120	0.1-	0.2-
1988 11 12	046	0.6-	0.0	1999 11 04	678	0.6+	0.5+	1999 11 12	704	0.3+	0.1+
1990 02 23	046	0.4+	1.4+	1999 11 04	678	0.7+	0.3+	1999 11 12	704	0.4+	0.4-
1990 02 23	046	0.4+	0.9-	1999 11 04	704	0.2+	0.4+	1999 11 12	704	0.2+	0.5-
1990 02 24	046	(3.1+	0.7+)	1999 11 04	704	0.2-	0.1+	1999 11 12	704	0.0	0.5-
1990 02 24	046	0.5-	0.1+	1999 11 04	704	0.5-	0.1+	1999 11 12	704	0.1-	0.5-
1993 09 14	809	1.2+	1.2+	1999 11 04	704	0.5-	0.1-	1999 11 12	120	0.6+	0.1-
1993 09 14	809	0.2+	1.3+	1999 11 04	704	0.3-	0.0	1999 11 12	120	0.5+	0.5-
1993 09 14	809	0.5-	0.6+	1999 11 06	678	0.4+	0.5+				

1999 VV = 1979 WC

Id. S. Nakano

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	65.21457		(2000.0)	P		Q	
<i>n</i>	0.64078248	ω	19.67578	-0.29890423		+0.59892712	
<i>a</i>	1.3324849	Ω	241.11133	-0.94902249		-0.26819704	
<i>e</i>	0.4230441	<i>i</i>	58.05082	-0.10006287		+0.75455725	
<i>P</i>	1.54	<i>H</i>	16.2	<i>G</i>	0.15	<i>U</i>	6

Residuals in seconds of arc

1979 11 26	675	1.2-	1.0-	1999 11 02	704	0.4-	2.6-	1999 11 04	413	0.1+	0.1+
1979 11 26	675	1.4+	4.3+	1999 11 02	704	0.3-	0.2-	1999 11 05	402	0.1+	0.1-
1979 11 27	675	2.5-	4.6-	1999 11 02	046	0.1+	0.3+	1999 11 05	402	0.0	0.2-
1979 11 27	675	2.7+	1.7+	1999 11 02	046	0.3-	0.4+	1999 11 05	402	0.2+	0.3+
1999 11 01	704	3.1+	1.0-	1999 11 02	046	0.4+	0.4+	1999 11 09	595	0.5-	0.8+
1999 11 01	704	0.3-	0.7-	1999 11 02	046	0.2+	0.0	1999 11 09	595	0.0	0.3+
1999 11 01	704	0.1+	0.4-	1999 11 03	853	0.2-	0.3+	1999 11 13	402	0.1+	0.5-
1999 11 01	704	0.5+	1.3-	1999 11 03	853	0.0	0.6+	1999 11 13	402	0.0	0.0
1999 11 01	704	0.4-	1.2-	1999 11 03	853	0.4-	0.4+	1999 11 13	402	0.1-	0.5-
1999 11 02	046	0.5-	0.6+	1999 11 03	711	0.1+	0.2+	1999 11 15	118	0.3-	0.0
1999 11 02	046	0.2-	0.4+	1999 11 03	711	0.4+	0.1+	1999 11 15	118	0.4-	0.0
1999 11 02	046	0.2-	0.5+	1999 11 03	711	0.2+	0.0	1999 11 16	118	0.1-	0.0
1999 11 02	046	0.2+	0.2+	1999 11 04	611	0.3+	0.5+	1999 11 16	360	0.1+	0.1-
1999 11 02	557	0.1-	0.3+	1999 11 04	611	0.0	0.4+	1999 11 16	360	0.1-	0.1+
1999 11 02	557	0.3-	0.1+	1999 11 04	853	0.5-	0.0	1999 11 16	360	0.0	0.1+
1999 11 02	557	0.1-	0.2-	1999 11 04	853	0.3-	0.3+	1999 11 18	888	0.1-	0.4+
1999 11 02	853	0.1-	0.1+	1999 11 04	853	0.4-	0.1+	1999 11 18	888	0.2-	0.2-
1999 11 02	853	0.1+	0.3+	1999 11 04	711	0.1+	0.4-	1999 11 18	888	0.1-	0.3+
1999 11 02	853	0.0	0.4+	1999 11 04	711	0.1+	0.2-	1999 11 19	402	0.4+	0.3-
1999 11 02	704	0.5-	0.3+	1999 11 04	711	0.2-	0.1-	1999 11 19	402	0.3+	0.6-
1999 11 02	704	0.2+	0.1+	1999 11 04	413	0.0	0.8+	1999 11 19	402	0.3+	0.4-
1999 11 02	704	0.1-	0.1+	1999 11 04	413	0.0	0.1+				

1999 VK₁ = 1993 FD₁₇

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	319.25204		(2000.0)	P		Q	
<i>n</i>	0.24103553	ω	13.81797	+0.44219399		-0.89516458	
<i>a</i>	2.5571056	Ω	49.96945	+0.81579299		+0.37542592	
<i>e</i>	0.0718166	<i>i</i>	4.20003	+0.37275499		+0.24028267	
<i>P</i>	4.09	<i>H</i>	14.8	<i>G</i>	0.15	<i>U</i>	5

Residuals in seconds of arc

1993 03 19	809	1.8-	1.9-	1999 11 04	704	0.1+	0.3-	1999 11 10	747	0.3-	0.3+
1993 03 20	809	0.7+	0.3-	1999 11 04	704	0.3+	0.4+	1999 11 10	747	0.2-	0.4+
1993 03 23	809	0.7+	1.4+	1999 11 05	747	0.0	0.1+	1999 11 10	747	0.3-	0.6+
1993 03 24	691	0.2+	0.2+	1999 11 05	747	0.0	0.2+	1999 11 12	704	0.6+	0.3-
1993 03 24	691	0.1+	0.3+	1999 11 05	747	0.2+	0.3+	1999 11 12	704	0.2+	0.3-
1993 03 24	691	0.1+	0.3+	1999 11 08	747	0.2-	0.1+	1999 11 12	704	0.5-	0.3-

1999 11 03	747	0.3+	0.1−	1999 11 08	747	0.0	0.1+	1999 11 12	704	0.1−	0.7−
1999 11 03	747	0.4+	0.2−	1999 11 08	747	0.0	0.1+	1999 11 12	704	0.1−	0.2+
1999 11 03	747	0.2+	0.2−	1999 11 09	747	0.2+	0.5+	1999 11 12	120	0.3−	0.4−
1999 11 04	704	0.4−	0.5−	1999 11 09	747	0.0	0.3+	1999 11 12	120	0.7+	0.4−
1999 11 04	704	0.1−	0.4−	1999 11 09	747	0.4−	0.5+	1999 11 15	611	0.5−	0.6+
1999 11 04	704	0.3+	0.5−	1999 11 09	747	0.3−	0.7+	1999 11 15	611	0.3+	0.8−

1999 VN₁ = 1998 KX₃₂

Id. B. G. Marsden

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

				Williams			
<i>M</i> 118.60509 (2000.0)				P		Q	
<i>n</i>	0.30763029	ω	257.62486	−0.13396876		+0.99097212	
<i>a</i>	2.1732848	Ω	4.68536	−0.88290706		−0.11699200	
<i>e</i>	0.0590424	<i>i</i>	3.62134	−0.45003054		−0.06547610	
<i>P</i>	3.20	<i>H</i>	15.5	<i>G</i>	0.15	<i>U</i>	5

Residuals in seconds of arc

1998 05 22	704	0.3+	0.1+	1999 11 01	012	1.1−	0.7+	1999 11 04	703	0.3−	0.4+
1998 05 22	704	0.4+	0.4+	1999 11 03	012	(2.4−	0.4+)	1999 11 10	012	0.4+	0.1−
1998 05 22	704	0.0	0.1−	1999 11 03	012	0.5−	0.8+	1999 11 10	012	0.3−	0.7−
1998 05 22	704	(0.7+	2.5−)	1999 11 03	704	1.2+	1.2−	1999 11 11	012	0.3−	0.4+
1998 05 22	704	0.5−	0.5−	1999 11 03	704	0.3+	0.7−	1999 11 11	012	1.1+	0.3+
1998 05 24	704	0.2+	0.3−	1999 11 03	704	1.1+	0.3−	1999 11 12	699	1.2+	0.4−
1998 05 24	704	0.2−	0.2−	1999 11 03	704	0.8+	0.2−	1999 11 12	699	0.7+	0.0
1998 05 24	704	0.3−	0.9+	1999 11 03	704	0.4+	0.1−	1999 11 12	699	1.5−	0.9+
1998 05 24	704	0.8+	1.1+	1999 11 04	703	(2.3+	1.9−)	1999 11 14	012	0.9−	0.2−
1998 05 24	704	0.6−	1.5−	1999 11 04	703	0.6−	0.3+	1999 11 15	012	0.2−	0.2−
1999 11 01	012	1.6−	0.0	1999 11 04	703	0.1+	0.2+				

1999 VS₁ = 1985 QR₁

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

				Williams			
<i>M</i> 355.03250 (2000.0)				P		Q	
<i>n</i>	0.22037059	ω	164.12668	+0.84621704		−0.52454809	
<i>a</i>	2.7145653	Ω	227.89588	+0.47411340		+0.82143021	
<i>e</i>	0.1752490	<i>i</i>	7.24973	+0.24317320		+0.22383411	
<i>P</i>	4.47	<i>H</i>	14.6	<i>G</i>	0.15	<i>U</i>	6

Residuals in seconds of arc

1985 08 16	675	2.3−	0.1−	1999 11 04	704	0.6+	0.3+	1999 11 12	704	0.5+	0.5−
1985 08 16	675	0.9+	0.4+	1999 11 04	704	0.6−	0.8−	1999 11 12	704	0.1+	0.3−
1985 08 17	675	0.9−	1.2−	1999 11 04	704	0.4+	0.6−	1999 11 12	704	0.7+	1.8+
1985 08 17	675	2.2+	0.9+	1999 11 05	678	0.7−	0.7+	1999 11 12	704	1.6−	0.2−
1999 11 04	678	0.4−	0.2+	1999 11 05	678	1.2+	0.4−	1999 11 12	704	0.5+	0.6−
1999 11 04	678	0.3−	0.2+	1999 11 06	678	0.6−	0.0				
1999 11 04	704	0.0	0.5+	1999 11 06	678	0.1+	0.4−				

1999 VT₁ = 1995 AZ₄ = 1998 QG₆₆

Id. T. Urata

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

				Williams			
<i>M</i> 358.73631 (2000.0)				P		Q	
<i>n</i>	0.18900843	ω	195.30592	+0.76598652		−0.63873686	
<i>a</i>	3.0071051	Ω	204.84794	+0.60647766		+0.75549279	
<i>e</i>	0.0434723	<i>i</i>	9.95760	+0.21318888		+0.14575964	
<i>P</i>	5.21	<i>H</i>	13.0	<i>G</i>	0.15	<i>U</i>	3

Residuals in seconds of arc

1995 01 06	399	0.6−	1.4−	1998 08 27	704	1.4+	0.8−	1999 11 05	385	0.5+	0.7+
1995 01 06	399	0.6+	1.3+	1999 11 04	704	0.3−	0.2−	1999 11 06	385	0.3+	0.7+
1998 08 24	704	0.3−	0.6+	1999 11 04	704	0.3−	0.1−	1999 11 06	385	0.5+	0.9+
1998 08 24	704	0.1+	0.9+	1999 11 04	704	0.2−	0.4−	1999 11 06	385	0.5+	0.3+
1998 08 24	704	0.4−	0.8+	1999 11 04	704	0.4+	0.2−	1999 11 07	385	0.3−	1.1−
1998 08 24	704	0.3−	1.4−	1999 11 04	704	0.4+	0.7−	1999 11 07	385	0.1−	0.7−
1998 08 24	704	0.1+	0.3−	1999 11 04	385	0.1+	0.2+	1999 11 12	385	0.6−	0.3−
1998 08 27	704	0.6−	0.9+	1999 11 04	385	0.2−	0.3−	1999 11 12	385	0.3−	0.0

1998 08 27	704	1.1−	0.5−	1999 11 05	385	0.5+	0.6+	1999 11 14	886	0.8−	0.0
1998 08 27	704	1.1+	0.4−	1999 11 05	385	0.3−	0.5+	1999 11 14	886	0.2+	0.2+

1999 VV₁ = 1998 MO₉

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Nakano

				(2000.0)				P		Q	
<i>M</i>	56.26825										
<i>n</i>	0.23216150	ω	112.76335	+0.65648915		+0.75043985					
<i>a</i>	2.6218585	Ω	198.91486	−0.74924841		+0.63692676					
<i>e</i>	0.1055674	<i>i</i>	13.66177	−0.08745754		+0.17653424					
<i>P</i>	4.25	<i>H</i>	13.4	<i>G</i>	0.15	<i>U</i>	5				

Residuals in seconds of arc

1998 06 19	704	0.8−	0.2−	1998 06 25	704	0.9−	0.2+	1999 11 06	888	0.2+	0.0
1998 06 19	704	0.2+	0.1+	1999 11 04	888	0.2+	0.0	1999 11 06	888	0.5−	0.0
1998 06 19	704	0.8+	0.5+	1999 11 04	888	0.2−	0.1−	1999 11 08	888	0.1−	0.0
1998 06 19	704	0.5+	0.1−	1999 11 04	888	0.1−	0.1+	1999 11 08	888	0.2−	0.0
1998 06 19	704	1.0+	0.6−	1999 11 05	888	0.4+	0.1−	1999 11 08	888	0.5−	0.1−
1998 06 25	704	0.5−	0.6−	1999 11 05	888	0.1−	0.4−	1999 11 13	888	0.5+	0.3+
1998 06 25	704	0.8−	0.4+	1999 11 05	888	0.1+	0.3−	1999 11 13	888	0.2+	0.3+
1998 06 25	704	0.4+	0.3+	1999 11 06	888	0.0	0.1+				

1999 VF₂ = 1994 JK₁ = 1998 HJ₁₂₀

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

				(2000.0)				P		Q	
<i>M</i>	82.10934										
<i>n</i>	0.23444959	ω	150.12447	−0.31713736		+0.91536104					
<i>a</i>	2.6047721	Ω	100.42595	−0.91242912		−0.22315637					
<i>e</i>	0.1319154	<i>i</i>	14.60970	−0.25864453		−0.33513492					
<i>P</i>	4.20	<i>H</i>	13.6	<i>G</i>	0.15	<i>U</i>	3				

Residuals in seconds of arc

1994 05 08	675	(3.0−	1.0−)	1998 04 24	704	0.1−	0.5+	1999 11 08	678	0.5−	1.1+
1994 05 09	675	0.0	0.1−	1998 04 24	704	0.0	0.1+	1999 11 10	715	0.6+	0.3−
1994 05 09	675	(2.6+	4.1+)	1998 04 24	704	1.3+	0.8+	1999 11 10	715	1.2+	0.0
1998 04 23	704	0.2+	0.4+	1999 11 05	715	0.1+	0.1−	1999 11 10	715	0.6+	0.2+
1998 04 23	704	0.2−	0.3−	1999 11 05	715	0.2−	0.0	1999 11 13	715	0.9−	0.2+
1998 04 23	704	0.0	0.3+	1999 11 05	715	1.4−	0.5−	1999 11 13	715	1.4+	0.2−
1998 04 23	704	1.2+	0.4−	1999 11 06	715	0.6−	0.2−	1999 11 13	715	0.1−	1.0+
1998 04 23	704	0.1+	1.1+	1999 11 06	715	0.0	0.3−	1999 11 15	715	0.3+	1.0+
1998 04 24	704	1.7−	1.7−	1999 11 06	715	0.0	0.1+	1999 11 15	715	0.6−	1.9−
1998 04 24	704	0.8−	0.5−	1999 11 08	678	(0.8+	2.8+)	1999 11 15	715	(2.8+	1.4−)

1999 VY₂ = 1998 ME₃₁

Id. S. Nakano

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

				(2000.0)				P		Q	
<i>M</i>	0.82520										
<i>n</i>	0.20884122	ω	120.97221	+0.82924553		−0.54201906					
<i>a</i>	2.8135755	Ω	272.17709	+0.45491364		+0.79624164					
<i>e</i>	0.1710670	<i>i</i>	7.83727	+0.32466203		+0.26872774					
<i>P</i>	4.72	<i>H</i>	13.9	<i>G</i>	0.15	<i>U</i>	5				

Residuals in seconds of arc

1998 06 24	704	1.4+	0.2+	1998 06 26	704	(0.3−	2.6+)	1999 11 07	385	0.4−	0.4−
1998 06 24	704	0.1+	0.8−	1998 06 26	704	1.2−	1.8+	1999 11 10	385	0.6+	0.1+
1998 06 24	704	0.8−	0.7−	1998 06 26	704	0.0	0.9+	1999 11 10	385	0.0	1.3+
1998 06 24	704	0.7+	1.3−	1999 11 04	905	0.1+	0.0	1999 11 14	385	0.2+	0.4−
1998 06 24	704	1.0−	0.6+	1999 11 04	905	0.5+	0.1−	1999 11 14	886	0.1−	0.2+
1998 06 26	809	(3.0+	2.3+)	1999 11 05	905	0.0	0.1+	1999 11 14	385	0.1+	0.2−
1998 06 26	809	(3.6+	2.4+)	1999 11 05	905	0.7−	0.0	1999 11 14	886	0.1−	0.4−
1998 06 26	809	(3.6+	2.1+)	1999 11 07	385	0.6−	0.6−				
1998 06 26	704	0.9+	0.7−	1999 11 07	385	0.4+	0.4+				

1999 VB₅ = 1997 HP

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

M	357.55422		(2000.0)	P	Q
n	0.19676543	ω	341.31580	+0.91093039	-0.41148082
a	2.9275446	Ω	43.02093	+0.38386833	+0.81887600
e	0.1065956	i	2.50521	+0.15116522	+0.40015701
P	5.01	H	14.6	G 0.15	U 5

Residuals in seconds of arc

1997 04 28	691	0.1+	0.1+	1999 11 04	704	0.0	1.2+	1999 11 11	703	0.1-	0.1-
1997 04 28	691	0.4-	0.1-	1999 11 04	704	0.3+	0.4+	1999 11 11	703	0.6-	0.4+
1997 04 28	691	0.3-	0.4-	1999 11 04	704	0.3+	0.4-	1999 11 11	703	0.8-	0.4+
1997 04 29	691	0.3-	0.9+	1999 11 05	120	0.2-	0.4+	1999 11 12	704	0.2+	0.0
1997 04 29	691	0.5-	0.2-	1999 11 05	120	1.1+	1.1+	1999 11 12	704	0.2+	0.1+
1997 04 29	691	0.3+	0.2-	1999 11 07	120	0.2+	0.1-	1999 11 12	704	0.1-	0.2-
1997 05 08	691	0.8+	0.1+	1999 11 07	120	0.1+	0.1-	1999 11 12	704	0.2+	0.2-
1997 05 08	691	0.5+	0.2+	1999 11 10	120	0.0	0.9-	1999 11 12	120	0.4-	0.1-
1999 11 04	704	0.1-	0.1-	1999 11 10	120	0.1+	0.6-	1999 11 12	120	0.1-	0.6-
1999 11 04	704	0.1-	0.4-	1999 11 11	703	0.4-	0.0				

1999 VJ₅ = 1998 HT₆₈

Id. T. Urata

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

M	15.43415		(2000.0)	P	Q		
n	0.29751809	ω	6.56451	+0.99668394	+0.08034732		
a	2.2222545	Ω	348.80261	-0.07734369	+0.88634811		
e	0.2167327	i	3.79761	-0.02527979	+0.45599489		
P	3.31	H	14.6	G	0.15	U	5

Residuals in seconds of arc

1998 04 21	704	0.9-	0.9+	1998 04 22	704	1.1-	0.7-	1999 11 08	385	0.7-	0.3+
1998 04 21	704	0.9+	0.3+	1998 04 22	704	0.9-	0.1+	1999 11 12	385	0.4-	0.1-
1998 04 21	704	0.7+	0.9-	1998 04 22	704	0.6-	1.1+	1999 11 12	385	0.2-	0.2+
1998 04 21	704	0.9+	1.2-	1999 11 04	905	0.1+	0.0	1999 11 14	886	0.9+	0.4-
1998 04 21	704	1.3+	0.3+	1999 11 04	905	0.0	0.5+	1999 11 14	886	0.2-	0.2-
1998 04 22	704	0.7+	0.0	1999 11 05	905	0.1+	0.3+				
1998 04 22	704	0.9-	0.1+	1999 11 05	905	0.4+	0.4-				

1999 VT₅ = 1997 GP₁₇

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Urata

M	22.04292		(2000.0)	P	Q		
n	0.21766559	ω	4.67984	+0.99392628	-0.11002000		
a	2.7370088	Ω	1.64280	+0.09795209	+0.87418451		
e	0.1666152	i	4.96204	+0.05015914	+0.47296621		
P	4.53	H	15.0	G	0.15	U	6

Residuals in seconds of arc

1997 04 03	704	1.2+	0.1-	1999 11 04	905	0.9-	1.2+	1999 11 18	385	0.7+	0.2+
1997 04 03	704	0.9-	0.6-	1999 11 08	385	1.4-	0.8-	1999 11 18	385	0.3+	0.6-
1997 04 07	704	0.1-	0.2+	1999 11 08	385	0.8-	0.9-	1999 11 18	385	0.3+	1.1-
1997 04 07	704	0.1-	0.6+	1999 11 10	385	(0.9+	3.6+)				
1999 11 04	905	0.1-	0.4+	1999 11 10	385	2.0+	1.9+				

1999 VA₆ = 1990 WS₆

Id. S. Nakano

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

M	319.85586		(2000.0)	P	Q		
n	0.21830505	ω	223.65721	-0.04995297	-0.98485022		
a	2.7316614	Ω	229.92845	+0.96555891	-0.00511302		
e	0.2241195	i	12.53282	+0.25534425	-0.17333179		
P	4.51	H	14.6	G	0.15	U	5

Residuals in seconds of arc

1990 11 21	809	0.6+	0.3-	1999 11 04	704	0.1+	0.2+	1999 11 05	411	0.6-	0.6+
1990 11 21	809	0.4-	0.1+	1999 11 04	704	0.0	0.1-	1999 11 08	411	0.5-	0.9-
1990 11 21	809	0.6-	0.0	1999 11 04	704	0.3-	0.0	1999 11 08	411	0.2+	0.7-
1990 11 22	809	0.7+	0.0	1999 11 04	704	0.3+	0.4+	1999 11 13	411	0.6-	0.8+
1990 11 22	809	0.2-	0.2-	1999 11 04	704	0.1+	0.3+	1999 11 13	411	0.8+	0.3+
1990 11 22	809	0.0	0.2+	1999 11 05	411	0.4+	0.6-				

1999 VB₆ = 1981 TB₁ = 1997 CV₁₇

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Nakano

M	357.62109		(2000.0)	P	Q
n	0.27776429	ω	275.79656	+0.89901005	-0.43677595
a	2.3264039	Ω	110.10525	+0.41398234	+0.82397563
e	0.1952630	i	1.93721	+0.14282703	+0.36095834
P	3.55	H	15.0	G 0.15	U 4

Residuals in seconds of arc

1981 10 05	688	(5.0-	2.6-)	1997 02 11	691	0.0	0.1-	1999 11 05	411	0.6+	0.6+
1981 10 05	688	0.0	0.0	1999 11 03	704	0.1+	0.1+	1999 11 08	411	0.1+	0.1+
1997 02 03	691	0.1+	0.2+	1999 11 03	704	0.1+	0.9+	1999 11 08	411	0.9+	1.0-
1997 02 03	691	0.2-	0.2-	1999 11 03	704	0.7-	0.0	1999 11 13	411	1.2-	0.1+
1997 02 03	691	0.1+	0.2+	1999 11 03	704	0.2-	0.2-	1999 11 13	411	0.7+	0.8-
1997 02 11	691	0.1+	0.1+	1999 11 03	704	0.6-	0.1-				
1997 02 11	691	0.2-	0.1-	1999 11 05	411	0.3+	0.3+				

1999 VF₆ = 1998 MA₂₂

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Nakano

M	347.91529		(2000.0)	P	Q
n	0.28791024	ω	192.55788	+0.74795623	-0.66321667
a	2.2714228	Ω	209.04211	+0.61360997	+0.70615703
e	0.1516315	i	3.13562	+0.25306971	+0.24796350
P	3.42	H	14.6	G 0.15	U 6

Residuals in seconds of arc

1998 06 24	704	0.2-	0.7-	1998 06 26	704	1.4-	1.4-	1999 11 05	411	0.1+	0.0
1998 06 24	704	0.1-	0.8+	1999 11 03	704	0.2+	0.7+	1999 11 05	411	1.2-	0.1-
1998 06 24	704	0.8-	0.3+	1999 11 03	704	0.0	0.1+	1999 11 08	411	0.4+	0.8-
1998 06 26	704	0.2+	0.3-	1999 11 03	704	0.0	0.6-	1999 11 08	411	0.1+	0.6+
1998 06 26	704	1.0+	0.4+	1999 11 03	704	0.2-	0.5-	1999 11 13	411	0.5+	0.1+
1998 06 26	704	1.3+	1.1+	1999 11 03	704	0.1+	0.0	1999 11 13	411	0.1-	0.8+

1999 VK₆ = 1992 LD₂ = 1998 QR₈₀

Id. S. Nakano

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

M	55.82060		(2000.0)	P	Q
n	0.18977083	ω	101.87688	+0.92641862	+0.31711239
a	2.9990456	Ω	239.93453	-0.36512759	+0.88819919
e	0.1013530	i	13.56216	+0.09181708	+0.33247847
P	5.19	H	12.9	G 0.15	U 4

Residuals in seconds of arc

1992 06 03	809	0.2+	0.8-	1999 11 03	704	0.1+	0.1+	1999 11 10	903	0.2-	0.6-
1992 06 03	809	0.3+	0.7-	1999 11 03	704	0.2+	0.0	1999 11 10	903	0.1+	0.3-
1992 06 03	809	0.4-	0.6-	1999 11 03	704	0.2+	0.8+	1999 11 10	903	0.7-	0.1-
1998 08 24	704	0.5+	0.3+	1999 11 03	704	0.3+	0.6+	1999 11 10	903	0.3-	0.1+
1998 08 24	704	0.2-	0.0	1999 11 03	704	0.5-	0.6-	1999 11 13	411	0.9+	0.3-
1998 08 24	704	0.2-	1.4-	1999 11 05	411	0.6-	0.3-	1999 11 13	411	1.2+	0.5-
1998 08 24	704	0.5-	1.5+	1999 11 05	411	0.1+	1.6-	1999 11 13	903	0.1+	0.0
1998 08 27	704	0.2+	0.4+	1999 11 08	411	0.2+	1.6+	1999 11 13	903	0.2-	0.4-
1998 08 27	704	0.1+	0.6+	1999 11 08	411	0.4+	0.5+	1999 11 13	903	0.1+	0.1-
1998 08 27	704	0.1+	0.2-	1999 11 10	903	0.5-	0.3-	1999 11 13	903	0.3-	0.3+
1998 08 27	704	0.1+	0.7-	1999 11 10	903	0.9-	0.7-				
1998 08 27	704	0.1-	0.5-	1999 11 10	903	0.1-	0.4-				

1999 VM₆ = 1995 AJ₂

Id. T. Urata

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

				Williams					
<i>M</i>	26.47610		(2000.0)	P		Q			
<i>n</i>	0.17384374	ω	241.30119	+0.99610574		-0.00586871			
<i>a</i>	3.1795331	Ω	118.91314	+0.03652700		+0.93559377			
<i>e</i>	0.1709593	<i>i</i>	5.76784	-0.08024422		+0.35302953			
<i>P</i>	5.67	<i>H</i>	14.1	<i>G</i>	0.15	<i>U</i>	6		

Residuals in seconds of arc

1995 01 08	691	0.0	0.0	1995 01 09	691	0.2+	0.3+	1999 11 07	385	0.4-	0.5-
1995 01 08	691	0.1+	0.1-	1995 01 09	691	0.4+	0.2+	1999 11 07	385	1.2-	0.2-
1995 01 08	691	0.4-	0.1+	1999 11 04	704	0.3-	1.0+	1999 11 08	385	0.7-	0.5-
1995 01 08	691	0.0	0.4-	1999 11 04	704	0.2+	0.7-	1999 11 08	385	1.0-	0.2-
1995 01 08	691	0.2-	0.2-	1999 11 04	704	0.6+	0.5+	1999 11 10	385	1.6+	0.8+
1995 01 08	691	0.2-	0.5-	1999 11 04	704	1.0+	1.2-	1999 11 12	385	0.2+	1.0+
1995 01 09	691	0.1+	0.5+	1999 11 04	704	0.1+	0.0				

1999 VJ₇ = 1988 VY₅

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

				Williams					
<i>M</i>	332.39505		(2000.0)	P		Q			
<i>n</i>	0.17844115	ω	11.06944	+0.49921163		-0.85783027			
<i>a</i>	3.1246835	Ω	49.10869	+0.78213213		+0.38545888			
<i>e</i>	0.1586151	<i>i</i>	9.29708	+0.37290359		+0.33992452			
<i>P</i>	5.52	<i>H</i>	12.9	<i>G</i>	0.15	<i>U</i>	5		

Residuals in seconds of arc

1988 11 02	399	0.9+	0.6+	1988 11 11	046	0.2-	1.5-	1999 11 11	703	0.2-	0.5+
1988 11 02	399	0.8-	1.6+	1988 11 11	046	2.0+	0.9-	1999 11 11	703	0.5-	0.5+
1988 11 02	399	2.2-	1.3+	1999 11 04	704	0.4+	0.3-	1999 11 12	704	0.1+	0.1-
1988 11 04	046	0.8-	1.0-	1999 11 04	704	0.2+	0.3-	1999 11 12	704	0.1-	0.0
1988 11 04	046	1.3+	1.4-	1999 11 04	704	0.1+	0.8-	1999 11 12	704	0.3-	0.0
1988 11 05	046	1.4+	1.8-	1999 11 04	704	0.2+	0.4-	1999 11 12	704	0.3-	0.2+
1988 11 05	046	0.6+	0.8+	1999 11 04	704	0.1-	0.9-	1999 11 12	704	0.3-	0.0
1988 11 08	399	1.1+	1.0+	1999 11 07	120	0.2+	0.3+	1999 11 12	120	0.1+	0.1+
1988 11 08	399	0.4-	0.6+	1999 11 07	120	0.3+	0.3+	1999 11 12	120	0.1-	0.0
1988 11 08	399	1.5-	0.1-	1999 11 08	120	0.5+	0.7+	1999 11 13	120	0.3+	0.3-
1988 11 11	399	1.0+	0.2-	1999 11 08	120	0.6+	0.3+	1999 11 13	120	0.1-	0.0
1988 11 11	399	1.4-	0.1-	1999 11 11	703	0.4-	0.3+				
1988 11 11	399	0.9-	1.0+	1999 11 11	703	0.6-	0.1+				

1999 VN₉ = 1998 MT₂₅

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

				Williams					
<i>M</i>	136.14910		(2000.0)	P		Q			
<i>n</i>	0.29509475	ω	7.81699	-0.32511722		+0.94405155			
<i>a</i>	2.2344042	Ω	243.22449	-0.87095933		-0.32172597			
<i>e</i>	0.1184219	<i>i</i>	3.55555	-0.36841368		-0.07251951			
<i>P</i>	3.34	<i>H</i>	13.9	<i>G</i>	0.15	<i>U</i>	5		

Residuals in seconds of arc

1998 06 24	704	0.3+	1.4-	1999 11 03	704	0.0	0.3+	1999 11 10	120	1.1+	0.6-
1998 06 24	704	1.6-	0.2-	1999 11 03	704	0.1-	0.5+	1999 11 10	120	0.1+	0.1-
1998 06 24	704	0.1+	0.4+	1999 11 03	704	0.1+	0.2+	1999 11 12	704	0.1-	0.2-
1998 06 24	704	0.4+	0.2-	1999 11 03	704	0.3+	0.5+	1999 11 12	704	0.1+	0.2-
1998 06 26	704	1.0-	1.3+	1999 11 08	120	0.6-	0.2+	1999 11 12	704	0.0	0.1+
1998 06 26	704	0.3+	1.0+	1999 11 09	120	0.7-	0.6-	1999 11 12	704	0.0	0.0
1998 06 26	704	1.4+	0.9-	1999 11 10	120	0.0	0.2-	1999 11 12	704	0.2+	0.2+
1999 11 03	704	0.1+	0.0	1999 11 10	120	0.3-	0.1-				

1999 VO₉ = 1998 KC₃₀

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

				Williams					
<i>M</i>	16.65896		(2000.0)	P		Q			
<i>n</i>	0.26393640	ω	147.98017	+0.99958649		+0.02825660			
<i>a</i>	2.4069655	Ω	210.40199	-0.02810139		+0.92063164			
<i>e</i>	0.1908198	<i>i</i>	0.60353	-0.00609615		+0.38940846			
<i>P</i>	3.73	<i>H</i>	13.9	<i>G</i>	0.15	<i>U</i>	5		

Residuals in seconds of arc

1998 05 22	704	1.1-	0.6+	1999 10 22	292	0.4+	0.2+	1999 11 10	704	0.2-	0.1-
1998 05 22	704	0.0	0.5-	1999 10 22	292	0.1-	0.5-	1999 11 10	704	0.3-	0.2+
1998 05 22	704	1.1+	1.9-	1999 10 22	292	0.2-	0.4-	1999 11 10	704	0.0	0.3+
1998 05 22	704	1.8+	0.9-	1999 11 03	704	0.9+	0.2-	1999 11 10	704	0.0	0.5+
1998 05 22	704	0.9+	0.5+	1999 11 03	704	1.0-	0.5-	1999 11 10	704	0.0	0.5+
1998 05 24	704	0.2+	0.2+	1999 11 03	704	0.0	0.7-	1999 11 10	120	0.1+	0.2-
1998 05 24	704	0.9-	0.9-	1999 11 03	704	0.3-	0.2-	1999 11 10	120	0.0	0.3-
1998 05 24	704	1.3-	0.9+	1999 11 03	704	0.2-	0.8-	1999 11 12	704	0.3+	0.1-
1998 05 24	704	0.8-	1.0+	1999 11 08	120	0.5-	0.3+	1999 11 12	704	0.3+	0.1-
1999 10 19	292	0.0	0.3+	1999 11 09	120	0.1-	0.3+	1999 11 12	704	0.3+	0.2-
1999 10 19	292	0.3+	0.8+	1999 11 09	120	0.2+	0.3-	1999 11 12	704	0.4+	0.2-
1999 10 19	292	0.0	0.3+	1999 11 10	120	0.1-	0.0				

1999 VK₁₀ = 1998 KJ₂₂

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

				Williams					
<i>M</i>	38.37755		(2000.0)	P		Q			
<i>n</i>	0.24238121	ω	114.07725	+0.88269348		+0.45408018			
<i>a</i>	2.5476324	Ω	219.22359	-0.46976631		+0.84536808			
<i>e</i>	0.2782411	<i>i</i>	11.04014	-0.01310834		+0.28136096			
<i>P</i>	4.07	<i>H</i>	13.8	<i>G</i>	0.15	<i>U</i>	5		

Residuals in seconds of arc

1998 05 22	704	0.3-	0.6-	1998 05 24	704	0.7+	0.2-	1999 11 09	411	1.0-	0.5-
1998 05 22	704	0.8+	0.5+	1998 05 24	704	0.3-	0.1-	1999 11 09	411	0.5+	1.9-
1998 05 22	704	0.4+	0.4+	1999 11 04	704	0.3+	0.2+	1999 11 10	411	0.1-	0.6+
1998 05 22	704	0.7-	0.9+	1999 11 04	704	0.2+	0.5+	1999 11 10	411	0.3-	0.3+
1998 05 22	704	0.7-	0.5+	1999 11 04	704	0.5+	0.2-	1999 11 18	411	0.7-	0.2+
1998 05 24	704	0.1+	0.5-	1999 11 04	704	0.6+	0.7+	1999 11 18	411	0.6-	0.0
1998 05 24	704	0.0	0.7-	1999 11 04	704	0.6+	0.1+				

1999 VL₁₀ = 1998 HT₁₄₄

Id. S. Nakano

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

				Williams					
<i>M</i>	16.29835		(2000.0)	P		Q			
<i>n</i>	0.27920591	ω	134.75199	+0.99303139		+0.06918734			
<i>a</i>	2.3183890	Ω	221.55949	-0.09458031		+0.95083150			
<i>e</i>	0.2555325	<i>i</i>	8.26838	+0.07030813		+0.30188173			
<i>P</i>	3.53	<i>H</i>	14.1	<i>G</i>	0.15	<i>U</i>	6		

Residuals in seconds of arc

1998 04 21	704	0.3-	0.6-	1999 11 04	704	0.1-	0.3+	1999 11 09	358	0.3+	1.8-
1998 04 21	704	0.6+	0.4-	1999 11 04	704	0.0	0.4-	1999 11 09	411	0.1+	0.4-
1998 04 21	704	0.6-	0.2+	1999 11 04	704	0.1+	0.4-	1999 11 09	358	0.3+	0.5+
1998 04 21	704	1.2+	0.9+	1999 11 04	358	(0.5-	2.5-)	1999 11 09	358	0.7-	0.0
1998 04 21	704	0.7+	1.4+	1999 11 04	358	0.7+	1.2+	1999 11 10	411	0.2+	0.3+
1998 04 22	704	0.2-	1.1-	1999 11 04	358	0.6-	0.0	1999 11 10	411	0.2+	1.0+
1998 04 22	704	1.4-	0.3-	1999 11 06	358	(0.7-	3.1-)	1999 11 18	411	0.7-	0.0
1998 04 22	704	(1.9-	3.3-)	1999 11 06	358	(2.2-	4.7-)	1999 11 18	411	0.5+	0.0
1999 11 04	704	0.1-	0.1-	1999 11 06	358	(3.3-	3.9-)				
1999 11 04	704	0.1-	0.2-	1999 11 09	411	0.1-	0.3+				

1999 VN₁₀ = 1980 VC₃ = 1993 OU₁₂
 Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>		(2000.0)		P		Q	
<i>n</i>	0.21118929	ω	102.28360	+0.98495732	-0.14662085		
<i>a</i>	2.7926818	Ω	266.19930	+0.09997298	+0.91514575		
<i>e</i>	0.0450466	<i>i</i>	5.25809	+0.14094141	+0.37551375		
<i>P</i>	4.67	<i>H</i>	13.3	<i>G</i>	0.15	<i>U</i>	4

Residuals in seconds of arc

1980 11 01	675	0.0	0.2+	1993 07 12	809	1.4+	0.0	1999 11 09	411	0.0	0.7+
1980 11 02	675	0.1+	0.5-	1993 07 19	809	0.5-	0.2+	1999 11 09	411	0.0	0.5+
1993 07 12	809	0.6-	0.5+	1993 07 19	809	0.7-	0.4-	1999 11 10	411	0.2+	0.4-
1993 07 12	809	0.4+	0.3+	1993 07 19	809	1.4-	0.1-	1999 11 10	411	0.3+	0.5-
1993 07 12	809	1.4-	0.8+	1993 07 19	809	(3.0+ 0.3-)		1999 11 18	411	0.1-	0.3+
1993 07 12	809	1.4+	1.1-	1993 07 19	809	(2.5+ 0.4-)		1999 11 18	411	0.4-	0.4-
1993 07 12	809	1.5+	0.0	1993 07 19	809	(2.9+ 0.8-)					

1999 VQ₁₀ = 1998 VD₁₈
 Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>		(2000.0)		P		Q	
<i>n</i>	0.08366180	ω	183.12769	+0.14286303	-0.97921859		
<i>a</i>	5.1774737	Ω	258.69231	+0.91122722	+0.18690233		
<i>e</i>	0.0397521	<i>i</i>	8.44141	+0.38633548	-0.07873043		
<i>P</i>	11.78	<i>H</i>	10.1	<i>G</i>	0.15	<i>U</i>	5

Residuals in seconds of arc

1998 11 10	704	0.1+	0.2-	1998 11 11	704	1.2+	0.7-	1999 11 10	411	0.8+	0.1+
1998 11 10	704	0.5-	0.2+	1998 11 11	704	0.7+	0.3-	1999 11 10	411	0.2-	0.0
1998 11 10	704	1.1-	0.0	1998 11 11	704	0.3+	0.2-	1999 11 18	411	0.2+	0.4+
1998 11 10	704	0.7-	0.0	1998 11 11	704	0.1+	0.2+	1999 11 18	411	0.6-	0.4-
1998 11 10	704	0.7-	0.4+	1999 11 09	411	0.1-	0.1-				
1998 11 11	704	0.5+	0.5+	1999 11 09	411	0.1-	0.0				

1999 VV₁₀ = 1998 HS₂₅
 Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>		(2000.0)		P		Q	
<i>n</i>	0.39351079	ω	321.52114	+0.84080157	-0.40576360		
<i>a</i>	1.8443002	Ω	66.06283	+0.54042087	+0.66777747		
<i>e</i>	0.0703208	<i>i</i>	23.08289	-0.03159113	+0.62404259		
<i>P</i>	2.50	<i>H</i>	15.1	<i>G</i>	0.15	<i>U</i>	4

Residuals in seconds of arc

1998 04 28	704	0.0	1.3-	1999 11 04	704	0.3+	0.1+	1999 11 17	704	0.3+	0.2-
1998 04 28	704	0.7-	0.0	1999 11 04	704	0.8+	0.1-	1999 11 17	704	0.1-	0.4-
1998 04 28	704	0.4-	0.1-	1999 11 04	704	1.8-	0.1-	1999 11 17	704	0.2+	0.1+
1998 04 28	704	0.1-	1.2-	1999 11 04	704	0.1-	0.0	1999 11 17	704	1.2+	0.2+
1998 04 28	704	0.2+	0.5+	1999 11 04	704	0.1-	0.2-	1999 11 17	704	0.1-	0.0
1998 04 30	704	0.9+	0.3-	1999 11 09	411	0.1-	0.1-	1999 11 18	411	0.3-	0.2+
1998 04 30	704	0.4+	0.8+	1999 11 09	411	0.5+	0.0	1999 11 18	411	0.3+	0.1+
1998 04 30	704	0.6-	0.8+	1999 11 10	411	0.6-	0.8+				
1998 04 30	704	0.4+	0.9+	1999 11 10	411	0.4-	0.3-				

1999 VJ₁₁ = 1995 WF₇
 Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>		(2000.0)		P		Q	
<i>n</i>	0.24396591	ω	324.26325	+0.95542332	-0.28156783		
<i>a</i>	2.5365881	Ω	52.33289	+0.29018520	+0.84016668		
<i>e</i>	0.1329708	<i>i</i>	6.44125	+0.05439504	+0.46350782		
<i>P</i>	4.04	<i>H</i>	13.9	<i>G</i>	0.15	<i>U</i>	5

Residuals in seconds of arc

1995 11 21	358	0.7+	0.6+	1999 10 13	292	0.6+	0.2+	1999 11 03	704	0.5+	0.6+
1995 11 21	358	2.0+	2.1+	1999 10 13	292	0.1-	0.1+	1999 11 03	704	0.6+	0.3+
1995 11 22	358	2.5-	1.0-	1999 10 13	292	0.3+	0.0	1999 11 03	704	0.4+	0.4+

1995 11 22	358	1.0+	1.4-	1999 10 15	292	0.6+	0.2+	1999 11 03	704	0.3+	0.3-
1995 11 30	896	0.6-	0.1-	1999 10 15	292	0.1+	0.8-	1999 11 03	704	0.9+	0.5+
1995 11 30	896	0.8-	0.1+	1999 10 15	292	0.8-	0.4-	1999 11 10	120	0.7-	0.7-
1999 10 12	292	0.2-	0.2+	1999 10 19	292	1.1-	0.1+	1999 11 10	120	0.2+	0.4-
1999 10 12	292	0.2+	1.5+	1999 10 19	292	0.6-	0.0	1999 11 10	120	0.1-	1.1-
1999 10 12	292	0.3+	1.1-	1999 10 19	292	0.7-	0.1-	1999 11 10	120	0.5-	0.6+

1999 VU₂₀ = 1982 VB₉ = 1992 UV₇

Id. T. Urata

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>		(2000.0)		P		Q	
<i>n</i>	0.29177687	ω	106.46271	-0.90234455	-0.42771242		
<i>a</i>	2.2513109	Ω	48.24900	+0.36319682	-0.82107075		
<i>e</i>	0.0819248	<i>i</i>	4.09365	+0.23208271	-0.37802767		
<i>P</i>	3.38	<i>H</i>	14.6	<i>G</i>	0.15	<i>U</i>	6

Residuals in seconds of arc

1982 11 09	095	0.6-	1.7+	1992 11 03	010	1.0-	0.5+	1999 11 12	704	0.5+	0.6-
1992 10 23	010	(3.2+ 1.5+)		1992 11 03	010	1.1-	0.9+	1999 11 12	704	0.1-	0.5-
1992 10 23	010	1.4+	0.2+	1999 11 09	905	0.6+	2.0+	1999 11 12	385	0.1+	0.2+
1992 11 02	010	0.7+	1.3-	1999 11 09	905	0.1-	0.3+	1999 11 12	385	0.3-	0.0
1992 11 02	010	0.7-	0.4-	1999 11 12	704	0.1-	0.4-	1999 11 12	385	0.8-	1.2-
1992 11 02	010	0.5+	0.9-	1999 11 12	704	0.0	0.0	1999 11 14	886	1.1+	0.5+
1992 11 03	010	0.6+	0.1+	1999 11 12	704	0.2-	0.4-	1999 11 14	886	0.4-	0.9-

1999 VA₂₁ = 1993 KE₃

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>		(2000.0)		P		Q	
<i>n</i>	0.37104363	ω	63.84626	+0.45605074	+0.84282514		
<i>a</i>	1.9180182	Ω	236.25391	-0.88860251	+0.41355602		
<i>e</i>	0.0596208	<i>i</i>	20.10093	-0.04902349	+0.34440849		
<i>P</i>	2.66	<i>H</i>	15.3	<i>G</i>	0.15	<i>U</i>	6

Residuals in seconds of arc

1993 05 27	010	0.8-	1.1+	1999 11 12	704	0.2+	0.3-	1999 11 16	704	0.4-	0.2+
1993 05 27	010	0.6+	0.3-	1999 11 12	704	0.1-	0.4-	1999 11 16	704	0.2-	0.2-
1993 05 28	010	0.7+	1.1+	1999 11 12	704	0.2-	0.4-	1999 11 17	704	0.2-	0.1-
1993 05 29	010	0.3-	0.6-	1999 11 12	704	0.4-	0.8-	1999 11 17	704	0.1-	0.1+
1993 05 29	010	0.3-	1.1-	1999 11 13	402	0.4+	0.2+	1999 11 17	704	0.2-	0.1-
1993 05 29	010	(2.3- 0.0)		1999 11 13	402	0.5+	0.4-	1999 11 17	704	0.2-	0.2+
1999 11 09	402	0.3+	0.4+	1999 11 13	402	0.5+	0.2+	1999 11 17	704	0.4-	0.2-
1999 11 09	402	0.1+	0.8+	1999 11 16	704	0.8-	0.5+	1999 11 19	402	0.4+	0.4+
1999 11 09	402	0.1-	0.2+	1999 11 16	704	0.1-	0.2-	1999 11 19	402	0.6+	0.4-
1999 11 12	704	0.2+	0.3-	1999 11 16	704	0.3-	0.3+	1999 11 19	402	0.5+	0.4+

1999 VR₂₁ = 1995 WU₁₃

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>		(2000.0)		P		Q	
<i>n</i>	0.24118136	ω	328.63670	-0.95813429	-0.28487427		
<i>a</i>	2.5560748	Ω	194.89415	+0.28035323	-0.91305934		
<i>e</i>	0.1351396	<i>i</i>	6.41733	+0.05814419	-0.29183780		
<i>P</i>	4.09	<i>H</i>	14.5	<i>G</i>	0.15	<i>U</i>	6

Residuals in seconds of arc

1995 11 16	691	0.1+	0.1+	1999 11 04	704	0.4-	0.3+	1999 11 13	120	0.0	0.0
1995 11 16	691	0.3+	0.1+	1999 11 04	704	0.3-	0.2-	1999 11 14	732	0.8+	0.3+
1995 11 16	691	0.1+	0.1-	1999 11 04	704	0.4+	1.0-	1999 11 14	732	1.5+	1.3+
1995 11 21	691	0.1-	0.1+	1999 11 04	704	0.2-	0.6-	1999 11 14	732	0.3+	0.6+
1995 11 21	691	0.2-	0.2+	1999 11 12	120	0.5+	0.5-	1999 11 15	732	1.5-	0.0
1995 11 21	691	0.2-	0.3-	1999 11 12	120	0.1+	0.5-	1999 11 15	732	0.4-	0.4-
1999 11 04	704	0.2-	1.6+	1999 11 13	120	0.9-	0.7-	1999 11 15	732	0.1+	0.2-

1999 VR₂₂ = 1971 OY = 1971 QC₂ = 1985 QN₄ = 1990 UC₃
= 1990 WC₁₃ = 1996 BD₁₃

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	354.41673		(2000.0)			P		Q			
<i>n</i>	0.21601552	ω	93.03045			+0.94372789		-0.32377204			
<i>a</i>	2.7509292	Ω	285.86833			+0.26869979		+0.86952992			
<i>e</i>	0.0755733	<i>i</i>	4.02093			+0.19281621		+0.37294689			
<i>P</i>	4.56	<i>H</i>	12.7			<i>G</i>	0.15	<i>U</i>	2		
Residuals in seconds of arc											
1971 07 27	095	0.2+	0.3+	1990 11 24	402	0.1-	0.5-	1999 11 04	703	1.5-	0.3+
1971 08 19	808	0.1+	1.2-	1996 01 16	098	1.0+	0.2+	1999 11 04	703	0.9-	0.5+
1985 08 16	095	(9.7-	4.5+)	1996 01 16	098	0.6-	0.0	1999 11 04	703	0.7-	0.1-
1990 10 19	402	1.4+	0.5+	1996 01 17	098	0.1-	0.2-	1999 11 04	703	0.8-	0.2-
1990 10 19	402	(1.0+	2.7+)	1996 01 19	098	0.7+	0.2+	1999 11 13	678	0.7+	0.5+
1990 10 20	402	(1.3+	2.4+)	1996 01 19	098	1.1-	0.6-	1999 11 13	678	1.4+	0.0
1990 10 20	402	(1.1+	2.5+)	1999 10 28	703	(3.1-	1.2+)	1999 11 14	678	0.7+	0.6+
1990 10 22	675	1.3-	0.1+	1999 10 28	703	(0.3+	3.0+)	1999 11 14	678	1.0+	0.6+
1990 10 22	675	0.5-	0.6-	1999 10 28	703	0.1-	0.1-				
1990 11 24	402	1.0+	1.0-	1999 10 28	703	0.3-	0.2-				

1999 VY₂₂ = 1975 VG₄ = 1995 UE₄₉ = 1998 LV

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	352.63064		(2000.0)			P		Q			
<i>n</i>	0.24686456	ω	244.33198			+0.91573305		-0.40091939			
<i>a</i>	2.5166929	Ω	139.28921			+0.38161865		+0.84733597			
<i>e</i>	0.1977996	<i>i</i>	2.31917			+0.12569879		+0.34826053			
<i>P</i>	3.99	<i>H</i>	15.1		<i>G</i>	0.15		<i>U</i>	4		
Residuals in seconds of arc											
1975 11 02	095	1.2+	3.0-	1998 06 02	809	0.5-	1.1+	1999 11 04	704	1.2-	0.9+
1995 10 23	033	0.0	1.4-	1998 06 02	809	0.3-	0.3+	1999 11 13	757	0.1+	1.6+
1995 10 24	033	0.2-	0.5-	1998 06 02	809	0.6-	0.4-	1999 11 13	757	0.1-	0.8+
1995 10 24	033	0.5-	0.8-	1999 11 04	704	0.5+	0.1-	1999 11 14	757	0.9-	0.0
1998 06 01	809	0.8+	0.8+	1999 11 04	704	0.5+	0.0	1999 11 14	757	0.7-	1.8+
1998 06 01	809	0.3+	0.8+	1999 11 04	704	0.5+	0.5+	1999 11 16	757	0.2+	0.5+
1998 06 01	809	0.7+	0.0	1999 11 04	704	0.7+	1.0+	1999 11 16	757	0.6-	0.5+

1999 VZ₂₂ = 1995 ML = 1998 KT₃₉

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	3.15393			(2000.0)				P			Q <td></td>	
<i>n</i>	0.28745744	ω		273.82326				+0.95070879			-0.30069729	
<i>a</i>	2.2738074	Ω		103.68807				+0.30633852			+0.87294054	
<i>e</i>	0.1070644	<i>i</i>		4.46995				+0.04805727			+0.38413014	
<i>P</i>	3.43	<i>H</i>		14.8			<i>G</i>	0.15		<i>U</i>	3	
Residuals in seconds of arc												
1995 06 26	327	0.1-	0.0	1998 05 24	704	0.4+	0.6+	1999 11 08	143	0.6+	0.9+	
1995 06 26	327	0.5+	0.2-	1998 05 24	704	0.9+	0.8-	1999 11 09	143	0.4+	0.1-	
1995 06 26	327	0.2+	0.2-	1998 05 24	704	0.2-	0.4+	1999 11 12	143	0.3-	0.2-	
1995 06 26	327	0.3+	0.1-	1998 05 24	704	0.0	0.6-	1999 11 12	143	0.1-	0.0	
1995 06 27	327	0.6-	0.1+	1999 11 04	704	0.3+	0.3-	1999 11 12	143	0.2-	0.1-	
1995 06 27	327	0.2-	0.5+	1999 11 04	704	0.3-	0.3-	1999 11 12	143	0.1-	0.0	
1998 05 22	704	1.2-	0.0	1999 11 04	704	0.1+	0.1-	1999 11 13	143	0.0	0.0	
1998 05 22	704	0.6-	1.0+	1999 11 04	704	0.0	0.0	1999 11 13	143	0.2-	0.2-	
1998 05 22	704	0.7+	0.6+	1999 11 04	704	0.1+	0.1+	1999 11 13	143	0.3-	0.0	
1998 05 22	704	0.1+	1.2-	1999 11 08	143	0.1-	0.4+	1999 11 13	143	0.0	0.0	

1999 VY₂₄ = 1972 HB₁ = 1988 AU₁ = 1998 RW₂₆

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	259.65083		(2000.0)		P		Q				
<i>n</i>	0.23984781	ω	197.50556		-0.97090348		-0.23778192				
<i>a</i>	2.5655405	Ω	328.69510		+0.22573070		-0.86915355				
<i>e</i>	0.1470834	<i>i</i>	3.13253		+0.07995050		-0.43362641				
<i>P</i>	4.11	<i>H</i>	14.3		<i>G</i>	0.15	<i>U</i>	4			
Residuals in seconds of arc											
1972 04 19	805	0.4+	0.8+	1988 01 20	046	0.5+	0.0	1998 09 18	704	0.9-	0.2+
1972 04 19	805	1.3+	1.5+	1998 09 14	704	0.2-	1.1+	1999 11 13	411	1.6+	0.6+
1988 01 13	046	(3.0-	0.7+)	1998 09 14	704	1.2+	0.6-	1999 11 13	411	0.1+	0.3+
1988 01 14	046	1.4-	0.8+	1998 09 14	704	0.5+	0.1+	1999 11 16	411	0.7+	0.9+
1988 01 14	046	0.4-	0.0	1998 09 14	704	1.1-	1.5-	1999 11 16	411	0.3-	0.3+
1988 01 14	046	(2.3+	1.8+)	1998 09 14	704	0.8-	0.9-	1999 11 18	411	1.2-	0.7+
1988 01 15	046	0.5-	1.4-	1998 09 18	704	0.5+	0.7+	1999 11 18	411	0.5+	0.8+
1988 01 15	046	0.7+	0.9-	1998 09 18	704	0.1+	1.3+				
1988 01 20	046	0.8-	0.0	1998 09 18	704	(3.3-	0.4+)				

1999 VM₂₅ = 1985 TU₁ = 1990 YS = 1998 MV₂₉

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

M	349.50973		(2000.0)	P			Q				
n	0.21615207	ω	151.77210	+0.58737045			-0.79123181				
a	2.7497706	Ω	261.76233	+0.70643348			+0.60382290				
e	0.2528355	i	9.89920	+0.39490214			+0.09669604				
P	4.56 <th>H</th> <td>13.4<th>G</th><td>0.15<th>U</th><td colspan="3">2</td></td></td>	H	13.4 <th>G</th> <td>0.15<th>U</th><td colspan="3">2</td></td>	G	0.15 <th>U</th> <td colspan="3">2</td>	U	2				
Residuals in seconds of arc											
1985 10 15	688	0.2+	0.3+	1990 12 25	399	1.3-	1.1-	1998 06 26	704	0.4+	0.7-
1985 10 15	688	0.5-	0.3+	1998 06 24	704	1.2+	1.3-	1999 11 13	411	0.7-	0.2-
1990 12 20	399	0.9+	0.2+	1998 06 24	704	0.6+	1.7+	1999 11 13	411	1.1-	1.3-
1990 12 20	399	0.9+	1.1+	1998 06 24	704	0.1-	0.1+	1999 11 16	411	0.1+	0.2-
1990 12 25	399	0.4+	1.4+	1998 06 24	704	0.7-	0.8+	1999 11 16	411	0.1-	0.4-
1990 12 25	399	0.7-	1.3-	1998 06 26	704	0.5-	1.5-	1999 11 18	411	0.9+	0.3+
1990 12 25	399	0.2+	0.7+	1998 06 26	704	0.8-	0.7+	1999 11 18	411	0.6+	0.4+

1999 VO₂₆ = 1990 VQ₂ = 1992 EB₉

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

M	359.44316		(2000.0)	P				Q			
n	0.22168639	ω	332.86809			+0.82677232			-0.55963694		
a	2.7038133	Ω	61.27696			+0.52719908			+0.73546748		
e	0.0970763	i	3.72961			+0.19623622			+0.38196085		
P	4.45	H	14.4	G	0.15	U	5				
Residuals in seconds of arc											
1990 11 11	372	0.2+	1.4+	1999 11 03	704	0.8+	0.2-	1999 11 10	704	0.1-	0.1+
1990 11 13	372	1.4-	1.7+	1999 11 03	704	0.4-	0.7-	1999 11 10	704	0.2-	0.0
1992 03 02	809	0.8-	0.7+	1999 11 03	704	1.0+	0.1-	1999 11 10	704	0.1-	0.1+
1992 03 05	809	0.4-	0.8+	1999 11 03	704	1.3-	2.4-	1999 11 20	739	1.1-	1.2+
1992 03 07	809	1.4+	0.9-	1999 11 10	704	0.3-	0.6-	1999 11 20	739	2.4+	2.1-
1999 11 03	704	0.3+	0.4+	1999 11 10	704	0.1-	0.3-	1999 11 20	739	0.2-	1.4+

1999 VW₃₉ = 1993 FA₁₄

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

M	2.44872			(2000.0)		P		Q			
n	0.22423815	ω		318.68398		+0.98118449		+0.15515526			
a	2.6832618	Ω		32.92499		-0.06687593		+0.83142697			
e	0.2012151	i		12.20479		-0.18112043		+0.53353166			
P	4.40	H		14.8	G	0.15		U		4	
Residuals in seconds of arc											
1993 03 17	809	0.1-	0.1+	1999 10 30	691	0.1+	0.0	1999 11 11	691	0.1+	0.2+
1993 03 18	809	0.7-	0.7+	1999 11 04	691	0.0	0.1-	1999 11 11	691	0.2+	0.2+
1993 03 23	809	0.7+	0.9-	1999 11 04	691	0.1+	0.1-	1999 11 12	691	0.3-	0.0

1999 10 30 691 0.1- 0.0 1999 11 04 691 0.1+ 0.0 1999 11 12 691 0.3- 0.2-
 1999 10 30 691 0.1+ 0.0 1999 11 11 691 0.1+ 0.1+ 1999 11 12 691 0.2- 0.1-

2230 P-L = 1999 CB₁₂₉

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Doppler

<i>M</i>	185.52915		(2000.0)	P	Q
<i>n</i>	0.23859033	ω	126.04036	+0.83309521	+0.55015871
<i>a</i>	2.5745470	Ω	200.76934	-0.54507880	+0.79896473
<i>e</i>	0.0589547	<i>i</i>	9.29114	-0.09402904	+0.24285953
<i>P</i>	4.13	<i>H</i>	16.9	<i>G</i> 0.15	<i>U</i> 6

Residuals in seconds of arc

1960 09 24	675	0.8-	0.1-	1960 09 28	675	0.9+	0.2+	1999 02 06	568	0.0	0.5+
1960 09 24	675	0.1+	0.0	1960 09 28	675	0.6-	0.3+	1999 02 07	568	0.2-	0.4-
1960 09 26	675	0.9+	0.3+	1960 09 29	675	0.3-	0.3-				
1960 09 26	675	0.5+	0.2-	1999 02 06	568	0.2+	0.0				

2556 P-L = 1988 SU₃

Id. E. Bowell (1999 observations), G. V. Williams

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	312.50890		(2000.0)	P	Q
<i>n</i>	0.17654104	ω	21.82099	+0.70868145	-0.70167603
<i>a</i>	3.1470642	Ω	23.25993	+0.61661117	+0.56526718
<i>e</i>	0.2314281	<i>i</i>	10.74571	+0.34287209	+0.43373236
<i>P</i>	5.58	<i>H</i>	13.2	<i>G</i> 0.15	<i>U</i> 3

Residuals in seconds of arc

1960 09 24	675	0.4+	0.6-	1988 09 16	095	0.1+	1.0-	1999 09 30	704	0.5+	1.1+
1960 09 26	675	0.5+	0.5-	1999 09 07	699	0.5+	1.0-	1999 09 30	704	0.0	0.9+
1960 09 28	675	0.1-	0.4-	1999 09 07	699	0.2+	0.3-	1999 09 30	704	0.2-	0.3+
1960 09 29	675	0.5+	0.1-	1999 09 07	699	0.2+	0.8-	1999 09 30	704	0.7-	0.1-
1960 10 17	675	0.3-	0.1+	1999 09 13	704	0.4-	0.4+	1999 09 30	704	0.3+	0.5+
1960 10 22	675	1.0-	0.3+	1999 09 13	704	0.2-	0.0	1999 11 10	704	0.2-	0.3-
1960 10 25	675	0.6+	1.2+	1999 09 13	704	0.1-	0.1-	1999 11 10	704	0.1-	0.4-
1960 10 26	675	0.4-	0.1-	1999 09 13	704	0.4-	0.4+	1999 11 10	704	0.2+	0.6-
1988 09 16	095	0.3-	1.2+	1999 09 13	704	0.1-	0.2+	1999 11 10	704	0.7+	0.4-

2596 P-L = 1999 TS₁₀

Id. A. Doppler

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	321.41927		(2000.0)	P	Q
<i>n</i>	0.17725702	ω	359.62745	+0.39189822	-0.91952033
<i>a</i>	3.1385840	Ω	67.29969	+0.84417537	+0.34645391
<i>e</i>	0.2115174	<i>i</i>	1.86161	+0.36576459	+0.18561263
<i>P</i>	5.56	<i>H</i>	14.7	<i>G</i> 0.15	<i>U</i> 5

Residuals in seconds of arc

1960 09 24	675	0.1+	0.1-	1960 10 26	675	0.0	0.1+	1999 11 02	703	(3.1-	1.8+)
1960 09 26	675	0.0	0.5+	1999 10 08	120	0.6+	0.3-	1999 11 02	703	0.1-	0.1-
1960 09 28	675	0.3+	0.4+	1999 10 08	120	0.2-	1.4+	1999 11 12	704	0.4+	0.6+
1960 09 29	675	0.3-	0.6-	1999 10 09	120	0.4+	1.0-	1999 11 12	704	0.2+	0.1-
1960 10 17	675	1.0-	0.4+	1999 10 10	120	0.6+	1.0-	1999 11 12	704	0.2+	0.4-
1960 10 22	675	0.2-	0.1-	1999 11 02	703	0.4-	1.3+	1999 11 12	704	0.1-	0.3-
1960 10 25	675	1.1+	0.3-	1999 11 02	703	1.9-	0.3+	1999 11 12	704	0.5+	0.7-

2819 P-L = 1992 EH₃₆ = 1994 PW₂₂ = 1999 RB₁₈₂

Id. A. Doppler

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	168.97687		(2000.0)	P	Q
<i>n</i>	0.20140092	ω	0.47375	-0.99940531	-0.03445135
<i>a</i>	2.8824498	Ω	177.55051	+0.03152340	-0.92999975
<i>e</i>	0.0041410	<i>i</i>	1.95924	+0.01397517	-0.36594204
<i>P</i>	4.89	<i>H</i>	14.6	<i>G</i> 0.15	<i>U</i> 2

Residuals in seconds of arc

1960 09 24	675	1.1-	0.5+	1994 08 12	809	0.2+	0.2-	1994 09 06	809	1.0+	0.8-
1960 09 24	675	0.0	0.5-	1994 08 12	809	0.5-	0.3+	1999 09 09	704	0.3+	1.3-
1960 09 26	675	0.6-	0.9+	1994 08 12	809	0.8-	0.2+	1999 09 09	704	0.1+	0.4+
1960 09 26	675	0.3+	0.1-	1994 08 13	809	0.7-	1.6+	1999 09 09	704	1.3-	0.6+
1960 09 27	675	0.6-	0.3-	1994 08 13	809	0.1+	0.9+	1999 09 14	704	0.0	0.3-
1960 09 27	675	0.7+	0.9+	1994 08 13	809	0.2-	1.2+	1999 09 14	704	0.7-	0.3-
1960 09 28	675	1.1+	0.8-	1994 09 05	809	0.0	1.1-	1999 09 14	704	0.3-	1.4+
1992 03 07	809	0.9-	0.2-	1994 09 05	809	0.2+	1.7-	1999 09 30	691	0.4+	0.0
1992 03 11	691	0.9+	0.1-	1994 09 05	809	(1.2-	2.8-)	1999 09 30	691	0.6+	0.4+
1992 03 11	691	0.5+	0.8+	1994 09 06	809	0.8+	0.9+	1999 09 30	691	0.4+	0.3-
1992 03 11	691	0.0	0.6+	1994 09 06	809	0.0	1.1-				

3519 P-L = 1999 RA₁₂₇

Id. A. Doppler

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	333.77132		(2000.0)	P	Q
<i>n</i>	0.30220036	ω	110.30027	+0.99225563	-0.04665831
<i>a</i>	2.1992405	Ω	252.51279	+0.00189035	+0.93233365
<i>e</i>	0.1784643	<i>i</i>	6.93218	+0.12419821	+0.35857631
<i>P</i>	3.26	<i>H</i>	15.8	<i>G</i> 0.15	<i>U</i> 2

Residuals in seconds of arc

1960 10 17	675	0.8+	1.0-	1996 12 17	566	0.1-	0.3-	1999 09 14	704	0.1-	0.9-
1960 10 17	675	0.3+	0.3-	1999 09 08	704	0.1-	0.0	1999 09 14	704	0.1-	0.2-
1960 10 22	675	0.5-	0.2-	1999 09 08	704	0.2-	0.4-	1999 09 14	704	0.3+	0.5-
1960 10 22	675	1.2-	0.2-	1999 09 08	704	0.1+	0.2-	1999 09 14	704	0.1+	0.0
1960 10 22	675	0.4-	0.7+	1999 09 08	704	0.6-	0.2-	1999 09 19	699	0.2-	0.5+
1960 10 24	675	1.0+	0.8+	1999 09 08	704	(2.7+	0.1-)	1999 09 19	699	0.3+	0.1+
1960 10 25	675	0.7-	0.0	1999 09 09	704	0.1-	0.3+	1999 09 19	699	0.9+	1.8+
1960 10 25	675	0.4+	0.5+	1999 09 09	704	0.1+	0.1+	1999 10 02	704	0.4-	0.5+
1960 10 26	675	0.5+	0.7-	1999 09 09	704	0.1-	0.0	1999 10 02	704	0.0	0.4-
1960 10 26	675	0.4-	1.0+	1999 09 09	704	0.3-	0.0	1999 10 02	704	0.6+	0.7-
1996 12 17	566	0.1+	0.1-	1999 09 09	704	0.1-	0.0	1999 10 02	704	0.0	0.5-
1996 12 17	566	0.1+	0.0	1999 09 14	704	0.4+	0.7+	1999 10 02	704	0.1-	0.5-

3543 P-L = 1999 RE₁₉₉

Id. A. Doppler

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	316.91523		(2000.0)	P	Q
<i>n</i>	0.22620239	ω	150.52603	+0.86587207	-0.46825849
<i>a</i>	2.6677057	Ω	238.43846	+0.40896454	+0.86525685
<i>e</i>	0.1706307	<i>i</i>	11.92506	+0.28812073	+0.17906583
<i>P</i>	4.36	<i>H</i>	14.6	<i>G</i> 0.15	<i>U</i> 5

Residuals in seconds of arc

1960 10 17	675	0.1-	0.7+	1999 09 16	704	0.5-	0.4+	1999 10 04	704	0.4+	1.7+
1960 10 22	675	0.3+	0.7-	1999 09 16	704	0.6+	0.4-	1999 10 04	704	0.2-	0.5-
1960 10 25	675	0.2+	1.2+	1999 09 16	704	0.1-	0.3-	1999 10 04	704	0.7+	0.0
1960 10 26	675	0.4-	1.4-	1999 09 30	703	1.1-	0.4-	1999 10 04	704	0.5-	0.2+
1999 09 10	704	0.5+	0.2-	1999 09 30	703	0.6+	0.3-	1999 10 04	704	0.0	0.3+
1999 09 10	704	0.5+	0.2+	1999 09 30	703	0.0	0.4-				
1999 09 10	704	1.0-	0.1-	1999 09 30	703	0.1-	0.1+				

4083 P-L = 1999 UB₂₆

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	170.85415		(2000.0)	P	Q
<i>n</i>	0.27902899	ω	214.90307	-0.96005314	+0.27886428
<i>a</i>	2.3193689	Ω	341.24877	-0.23760449	-0.85600619
<i>e</i>	0.0913307	<i>i</i>	4.11722	-0.14779063	-0.43530233
<i>P</i>	3.53	<i>H</i>	14.7	<i>G</i> 0.15	<i>U</i> 5

Residuals in seconds of arc

1960 09 24	675	0.2+	0.2+	1960 10 17	675	0.7-	0.6-	1999 10 30	703	0.3-	0.1-
1960 09 24	675	0.2+	0.6+	1960 10 22	675	0.3-	1.0+	1999 10 30	703	0.2+	0.0

1960 09 25	675	0.1−	0.3+	1960 10 22	675	1.0−	0.7−	1999 11 04	703	0.3+	0.0
1960 09 25	675	0.7+	0.1−	1960 10 24	675	1.0+	0.2−	1999 11 04	703	0.1+	0.6−
1960 09 26	675	0.1+	0.5−	1960 10 26	675	0.3+	0.1−	1999 11 04	703	0.7+	0.2+
1960 09 26	675	0.4+	0.4+	1999 10 30	703	0.7−	0.3−	1999 11 04	703	0.1−	0.4+
1960 09 28	675	0.8−	0.4−	1999 10 30	703	0.2−	0.4+				

4565 P-L = 1999 RX₃₉

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

				Doppler			
				P		Q	
<i>M</i>	351.97160		(2000.0)				
<i>n</i>	0.17756656	ω	14.54813	+0.92477429	−0.37982466		
<i>a</i>	3.1349354	Ω	7.89036	+0.33029890	+0.77135303		
<i>e</i>	0.0404102	<i>i</i>	9.61500	+0.18893162	+0.51063464		
<i>P</i>	5.55	<i>H</i>	13.6	<i>G</i>	0.15	<i>U</i>	5

Residuals in seconds of arc

1960 09 24	675	1.2−	0.6−	1960 09 28	675	0.9+	1.4+	1999 09 14	703	0.3+	0.1−
1960 09 24	675	0.3+	0.6−	1960 09 28	675	0.7+	0.5+	1999 09 14	703	0.1+	0.3+
1960 09 26	675	0.8−	0.5−	1999 09 12	703	0.2+	0.9−	1999 09 14	703	0.1−	0.1−
1960 09 26	675	0.9−	0.9−	1999 09 12	703	0.0	0.9+	1999 09 14	703	0.8−	0.6−
1960 09 27	675	0.9+	0.4+	1999 09 12	703	0.6+	0.2−				
1960 09 27	675	0.1−	0.2+	1999 09 12	703	0.3−	0.6+				

6191 P-L = 1999 RF₆₁

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

				Doppler			
				P		Q	
<i>M</i>	358.54855		(2000.0)				
<i>n</i>	0.17659152	ω	108.52058	+0.87210951	+0.48632375		
<i>a</i>	3.1464644	Ω	222.42524	−0.47368512	+0.81144768		
<i>e</i>	0.1808716	<i>i</i>	4.58970	−0.12266790	+0.32410165		
<i>P</i>	5.58	<i>H</i>	15.7	<i>G</i>	0.15	<i>U</i>	5

Residuals in seconds of arc

1960 09 24	675	0.5−	0.9−	1960 10 26	675	0.3+	0.1+	1999 09 14	704	0.8+	1.2−
1960 09 25	675	1.3+	0.1−	1999 09 07	704	0.5−	1.6+	1999 09 14	704	0.5+	0.6−
1960 09 26	675	0.4−	0.7−	1999 09 07	704	0.5−	0.0	1999 09 14	704	0.8−	0.1+
1960 09 28	675	0.8−	0.1−	1999 09 07	704	0.5+	0.1+	1999 09 14	704	0.0	0.4−
1960 10 17	675	0.2−	1.5+	1999 09 14	704	0.0	0.5+				

6246 P-L = 1984 WY₂ = 1992 EG₁₃ = 1997 AN₆

Id. M. E. Sansaturio

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

				Williams			
				P		Q	
<i>M</i>	216.95476		(2000.0)				
<i>n</i>	0.16984723	ω	85.95198	+0.86395416	−0.50084615		
<i>a</i>	3.2292158	Ω	304.09628	+0.43332105	+0.79232972		
<i>e</i>	0.1699843	<i>i</i>	3.62174	+0.25654646	+0.34837731		
<i>P</i>	5.80	<i>H</i>	13.5	<i>G</i>	0.15	<i>U</i>	3

Residuals in seconds of arc

1960 09 24	675	0.0	0.2+	1984 11 28	010	0.1+	0.4−	1997 01 04	327	0.3−	0.7−
1960 09 25	675	0.6+	0.0	1992 03 02	809	0.3+	1.3+	1997 01 04	327	1.1−	0.5−
1960 09 26	675	0.4−	0.5−	1992 03 05	809	0.8+	0.4+	1997 01 08	327	0.3+	0.3−
1960 09 28	675	0.3+	0.9−	1992 03 09	809	1.0−	1.6−	1997 01 08	327	0.6−	0.1−
1984 11 27	010	0.3−	2.6+	1997 01 04	327	0.5+	0.4−	1997 01 08	327	0.7+	0.1−

6250 P-L = 1999 VC₅₆

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

				Williams			
				P		Q	
<i>M</i>	351.75405		(2000.0)				
<i>n</i>	0.30459889	ω	171.21274	+0.94767826	−0.31776729		
<i>a</i>	2.1876802	Ω	207.37568	+0.28870775	+0.89391661		
<i>e</i>	0.0668831	<i>i</i>	3.80242	+0.13621214	+0.31612820		
<i>P</i>	3.24	<i>H</i>	16.1	<i>G</i>	0.15	<i>U</i>	5

Residuals in seconds of arc

1960 09 24	675	0.2−	0.0	1999 11 04	704	0.8+	0.3+	1999 11 12	704	0.5+	0.2+
1960 09 25	675	0.4+	0.3−	1999 11 04	704	0.4−	0.4+	1999 11 12	704	0.0	0.5+

1960 09 26	675	0.1−	0.5+	1999 11 04	704	0.1−	0.2−	1999 11 12	704	0.1−	0.2−
1960 09 28	675	0.1−	0.2−	1999 11 04	704	0.2−	0.4−	1999 11 12	704	0.1−	0.6−
1960 10 22	675	0.0	0.1−	1999 11 12	704	0.3−	0.1+				

6735 P-L = 1988 VE₁₄

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

				Doppler			
				P		Q	
<i>M</i>	342.77487		(2000.0)				
<i>n</i>	0.17841544	ω	27.35311	+0.76973038	−0.63807968		
<i>a</i>	3.1249837	Ω	12.35287	+0.56804459	+0.67088533		
<i>e</i>	0.1635166	<i>i</i>	5.15495	+0.29127391	+0.37784547		
<i>P</i>	5.52	<i>H</i>	14.2	<i>G</i>	0.15	<i>U</i>	5

Residuals in seconds of arc

1960 09 24	675	0.7−	0.2−	1960 09 28	675	0.5+	0.1+	1988 11 04	327	0.3−	0.1−
1960 09 26	675	0.2−	0.2−	1960 10 17	675	0.1−	0.1−	1988 11 04	327	0.3+	0.1+
1960 09 27	675	0.5+	0.3+	1960 10 22	675	0.0	0.1+				

1043 T-1 = 1993 BZ₆ = 1999 TF₂₇

Id. A. Doppler

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

				Williams			
				P		Q	
<i>M</i>	307.04274		(2000.0)				
<i>n</i>	0.26522349	ω	220.63958	+0.11343771	−0.99320809		
<i>a</i>	2.3991721	Ω	222.86539	+0.92113080	+0.11489486		
<i>e</i>	0.1840400	<i>i</i>	2.17991	+0.37235728	+0.01835348		
<i>P</i>	3.72	<i>H</i>	14.7	<i>G</i>	0.15	<i>U</i>	2

Residuals in seconds of arc

1971 03 24	675	0.9−	2.1−	1999 10 03	704	1.4+	1.1+	1999 10 29	703	0.1+	0.0
1971 03 25	675	0.9−	0.1−	1999 10 03	704	0.6+	0.7+	1999 10 29	703	0.3−	0.3+
1971 03 25	675	1.4−	0.4+	1999 10 03	704	0.3+	0.5+	1999 11 04	704	0.2−	0.3−
1971 03 26	675	1.1+	0.4−	1999 10 03	704	0.1−	1.7−	1999 11 04	704	0.1−	0.2−
1971 03 27	675	1.2+	0.3−	1999 10 03	704	0.7−	0.6−	1999 11 04	704	0.2−	0.2−
1993 01 23	809	0.2+	1.4+	1999 10 06	704	0.9+	0.0	1999 11 04	704	0.1−	0.0
1993 01 23	809	0.1−	1.0+	1999 10 06	704	0.6+	0.2−	1999 11 04	704	0.4−	0.0
1993 01 23	809	1.0−	0.6+	1999 10 06	704	0.2+	0.4−	1999 11 12	704	0.1+	0.1+
1993 01 28	809	0.7+	0.3−	1999 10 06	704	0.2+	0.4−	1999 11 12	704	0.0	0.2−
1993 01 28	809	0.0	0.4−	1999 10 06	704	0.6−	0.4−	1999 11 12	704	0.1−	0.0
1993 01 28	809	0.3+	1.5−	1999 10 29	703	0.6−	0.1+	1999 11 12	704	0.2+	0.2+
1995 09 17	809	0.0	0.5−	1999 10 29	703	0.2−	0.0	1999 11 12	704	0.1−	0.0

1194 T-1 = 1999 NG₆₂

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

				Doppler			
				P		Q	
<i>M</i>	247.16052		(2000.0)				
<i>n</i>	0.18882786	ω	246.87858	+0.27369153	−0.96147410		
<i>a</i>	3.0090219	Ω	187.37962	+0.93934700	+0.27294399		
<i>e</i>	0.1344642	<i>i</i>	11.54222	+0.20668857	+0.03269747		
<i>P</i>	5.22	<i>H</i>	14.6	<i>G</i>	0.15	<i>U</i>	6

Residuals in seconds of arc

1971 03 24	675	0.9+	0.5+	1971 04 02	675	0.1+	0.3+	1999 07 13	704	0.5+	0.1−
1971 03 25	675	1.4−	0.6+	1999 07 13	704	0.2−	0.1−	1999 07 22	704	0.5+	1.0+
1971 03 25	675	(2.6−	1.9+)	1999 07 13	704	0.0	0.2−	1999 07 22	704	0.1+	0.3−
1971 03 26	675	1.1+	0.3−	1999 07 13	704	1.8−	1.0−	1999 07 22	704	0.1−	0.5+
1971 03 27	675	0.7−	1.1−	1999 07 13	704	0.4+	0.1+	1999 07 22	704	0.6+	0.2+

2072 T-1 = 1995 SY₃₉

Id. G. V. Williams, A. Doppler

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

				Doppler			
				P		Q	
<i>M</i>	42.75264		(2000.0)				
<i>n</i>	0.17804336	ω	11.45373	−0.99548979	+0.09485924		
<i>a</i>	3.1293360	Ω	173.98900	−0.08802413	−0.91828239		
<i>e</i>	0.1330065	<i>i</i>	0.73642	−0.03538136	−0.38439456		
<i>P</i>	5.54	<i>H</i>	15.0	<i>G</i>	0.15	<i>U</i>	7

Residuals in seconds of arc

1971 03 24	675	0.2+	1.0-	1971 03 27	675	0.8-	1.1+	1995 10 01	691	0.0	0.0
1971 03 25	675	0.1+	0.3-	1995 09 25	691	0.0	0.1+	1995 10 01	691	0.0	0.3-
1971 03 25	675	0.2+	0.4+	1995 09 25	691	0.2+	0.1+	1995 10 01	691	0.1+	0.0
1971 03 26	675	0.3+	0.2-	1995 09 25	691	0.2-	0.1+				

2135 T-1 = 1999 RU₅₇

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

M	273.38924		(2000.0)	$\mathbf{P}$	$\mathbf{Q}$
n	0.25801914	ω	0.04680	+0.52646502	-0.84910291
a	2.4436261	Ω	58.18634	+0.78002382	+0.46221666
e	0.0360543	i	2.90824	+0.33822688	+0.25569514
P	3.82	H	15.8	G 0.15	U 6

Residuals in seconds of arc

1971 03 25	675	1.0-	0.3-	1999 09 07	704	0.8-	0.2-	1999 09 13	704	0.8-	0.3-
1971 03 25	675	0.6+	0.8-	1999 09 07	699	0.3-	1.3-	1999 09 13	704	0.4-	0.3+
1971 03 26	675	0.4+	1.2+	1999 09 07	704	0.6+	0.3+	1999 09 13	704	0.5+	0.4+
1971 03 27	675	(1.8+	4.0+)	1999 09 07	704	0.4-	0.3-	1999 09 13	704	0.5+	0.1-
1999 09 07	699	0.4+	0.3+	1999 09 07	704	0.7+	0.2-				
1999 09 07	699	0.4-	0.1-	1999 09 07	704	0.4+	1.1+				

2171 T-1 = 1991 VF₉

Id. M. E. Sansaturio

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

M	78.75890		(2000.0)	P	Q
n	0.17418886	ω	358.76881	-0.22163999	-0.97402246
a	3.1753320	Ω	104.03516	+0.89507153	-0.22210756
e	0.0431845	i	2.74329	+0.38694014	-0.04414165
P	5.66	H	15.9	G 0.15	U 7

Residuals in seconds of arc

1971 03 24	675	2.3+	2.2+	1991 11 05	691	0.1+	0.1+	1991 11 07	691	0.0	0.1+
1971 03 25	675	1.6+	1.5+	1991 11 05	691	0.3-	0.2+	1991 11 08	691	0.1+	0.6+
1971 03 25	675	0.9+	0.8+	1991 11 05	691	0.3-	0.2+	1991 11 08	691	0.0	0.0
1971 03 26	675	1.3-	1.0+	1991 11 07	691	0.5+	0.9+	1991 11 08	691	0.5+	0.3-
1971 03 27	675	(3.7-	5.6-)	1991 11 07	691	0.0	0.4+	1991 11 08	691	0.3+	0.6-
1991 11 04	691	0.2-	0.5-	1991 11 07	691	0.1-	0.3+	1991 11 08	691	0.8+	0.5-
1991 11 04	691	0.4-	1.1-	1991 11 07	691	1.0-	0.3+	1991 11 08	691	0.7+	0.2-
1991 11 04	691	0.0	0.4-	1991 11 07	691	0.7-	0.3+				

3106 T-1 = 1975 PB = 1999 RV₁₄₅

Id. A. Doppler

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

M	14.94848		(2000.0)	P	Q
n	0.28846177	ω	61.33061	+0.56909959	+0.82099303
a	2.2685266	Ω	243.42857	-0.77115623	+0.51357189
e	0.2084026	i	2.93425	-0.28538346	+0.24942804
P	3.42	H	14.8	G 0.15	U 3

Residuals in seconds of arc

1971 03 24	675	(2.7+	3.7+)	1975 08 15	805	(3.8-	2.8-)	1999 09 14	704	0.1+	0.3-
1971 03 25	675	2.3+	0.1+	1975 08 16	805	0.5-	0.8-	1999 09 14	704	0.5-	0.1-
1971 03 26	675	0.7+	1.5-	1999 09 09	704	0.1+	0.1-	1999 09 14	704	0.7-	0.4-
1971 03 26	675	0.7+	0.6-	1999 09 09	704	0.5+	0.1-	1999 09 14	704	0.5-	0.6-
1971 03 27	675	2.4-	1.3+	1999 09 09	704	0.5+	0.2+	1999 11 04	703	0.2-	0.1-
1971 04 02	675	(3.0-	1.9+)	1999 09 09	704	0.2+	0.3+	1999 11 04	703	0.2+	0.0
1971 04 02	675	1.1-	0.8+	1999 09 09	704	0.2+	0.9+	1999 11 04	703	0.7+	0.7+
1975 08 14	805	0.5+	0.8+	1999 09 14	704	0.2+	0.1-	1999 11 04	703	0.8-	0.0

1100 T-2 = 1999 RX₁₆₁

Id. A. Doppler

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

M	143.52417		(2000.0)	P	Q		
n	0.22542729	ω	359.66652	-0.99158857	+0.12754218		
a	2.6738172	Ω	187.76548	-0.11836907	-0.96245456		
e	0.0852309	i	9.38135	-0.05235335	-0.23961263		
P	4.37	H	14.8	G	0.15	U	4

Residuals in seconds of arc

1973 09 19	675	2.4-	0.9-	1973 10 05	675	0.9-	1.3+	1999 09 07	704	0.4-	0.6-
1973 09 19	675	0.6-	0.1+	1998 05 23	704	1.5+	0.4+	1999 09 09	704	0.3-	0.3+
1973 09 24	675	0.8+	1.7-	1998 05 23	704	1.5-	0.3-	1999 09 09	704	0.5+	1.1+
1973 09 25	675	1.2-	0.2+	1998 05 23	704	0.1+	0.7-	1999 09 09	704	0.3+	0.1+
1973 09 29	675	1.5+	0.5+	1998 05 23	704	1.5+	0.4-	1999 09 14	704	0.2+	0.6+
1973 09 29	675	1.1+	0.2-	1998 05 23	704	1.6-	0.8+	1999 09 14	704	0.4-	1.2+
1973 09 30	675	0.0	2.2+	1999 09 07	704	0.4-	0.3-	1999 09 14	704	0.2+	0.5-
1973 09 30	675	1.4+	1.6-	1999 09 07	704	0.1-	0.5-				
1973 10 05	675	0.3+	0.6-	1999 09 07	704	0.2+	0.6-				

1174 T-2 = 1999 RV₆₈

Id. A. Doppler, E. Bowell

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

M	40.78866		(2000.0)	P	Q
n	0.18788689	ω	283.58789	+0.35666372	+0.93402597
a	3.0190599	Ω	7.39757	-0.78722168	+0.31180359
e	0.0501100	i	8.78265	-0.50306363	+0.17428139
P	5.25	H	15.1	G 0.15	U 6

Residuals in seconds of arc

1973 09 19	675	0.0	0.2+	1973 09 30	675	0.2-	0.7+	1999 09 07	704	0.6+	0.6-
1973 09 19	675	0.4+	0.1-	1973 09 30	675	0.8-	0.9+	1999 09 07	704	0.0	0.5-
1973 09 20	675	1.0-	0.3-	1973 10 04	675	1.3-	0.4+	1999 09 07	704	0.0	0.4-
1973 09 24	675	0.1+	0.2-	1973 10 04	675	0.7+	1.0-	1999 09 07	699	0.4+	1.1+
1973 09 24	675	(2.3-	1.6-)	1973 10 05	675	0.5-	1.3+	1999 09 07	704	0.5+	0.3-
1973 09 25	675	(3.1-	1.7-)	1973 10 05	675	1.6+	0.9-	1999 09 09	704	0.4+	0.3-
1973 09 25	675	0.4+	0.1+	1999 09 07	699	0.2-	0.3-	1999 09 09	704	0.0	0.2-
1973 09 29	675	0.9+	0.8-	1999 09 07	704	0.1+	0.1-	1999 09 09	704	1.6-	0.8+
1973 09 29	675	0.4-	0.4-	1999 09 07	699	0.3-	0.8+				

1198 T-2 = 1999 TW₅

Id. A. Doppler

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

M	335.09601		(2000.0)	P	Q
n	0.22837591	ω	86.98774	+0.85961615	-0.51071433
a	2.6507526	Ω	303.72320	+0.46122166	+0.78842321
e	0.0588955	i	1.04694	+0.21985143	+0.34286982
P	4.32	H	15.0	G 0.15	U 6

Residuals in seconds of arc

1973 09 19	675	1.9-	0.3-	1999 10 01	104	0.1+	0.4+	1999 10 07	704	0.2+	0.1+
1973 09 19	675	1.2-	0.6-	1999 10 02	104	0.8-	0.1-	1999 10 07	104	0.1-	1.4-
1973 09 20	675	0.5+	0.4+	1999 10 02	104	0.2-	0.1-	1999 10 07	104	0.5+	0.5-
1973 09 24	675	2.3-	0.3-	1999 10 04	704	1.0+	0.7+	1999 10 10	104	0.4+	0.5-
1973 09 24	675	1.0-	1.2+	1999 10 04	704	0.4+	0.4+	1999 10 10	104	0.6+	0.4-
1973 09 25	675	1.3-	0.4-	1999 10 04	704	0.4-	0.3+	1999 10 10	104	0.5+	0.3-
1973 09 25	675	0.8-	0.0	1999 10 04	704	(2.0-	0.0)	1999 10 10	104	0.8+	0.4-
1973 09 29	675	0.9+	0.3-	1999 10 06	704	0.5-	0.0	1999 10 16	104	0.1-	0.3-
1973 09 29	675	0.4+	0.5+	1999 10 06	704	0.2-	0.2+	1999 10 16	104	0.2-	0.2+
1973 09 30	675	0.5+	1.4+	1999 10 06	704	0.4-	0.3+	1999 10 16	104	0.9+	0.9+
1973 09 30	675	0.5+	1.7+	1999 10 06	704	0.4-	0.1+	1999 11 01	703	0.5-	0.9+
1973 10 04	675	2.0+	1.7-	1999 10 06	704	0.4-	0.0	1999 11 01	703	1.2-	0.0
1973 10 04	675	1.9+	1.0-	1999 10 06	104	(2.3-	1.3+)	1999 11 01	703	0.8-	0.6+
1973 10 05	675	2.1+	0.6-	1999 10 06	104	(2.7-	0.5+)	1999 11 01	703	0.4-	0.1-
1973 10 05	675	0.7+	1.4-	1999 10 06	104	(2.7-	0.3-)	1999 11 01	104	0.5+	0.5-
1999 10 01	703	0.4-	0.8+	1999 10 07	704	0.1+	0.6-	1999 11 01	104	0.4+	0.6-
1999 10 01	703	0.4+	0.8+	1999 10 07	704	0.1+	0.3+	1999 11 01	104	0.3+	0.6-

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1999 10 01 703 0.0 0.5+ 1999 10 07 704 0.7+ 0.7-
 1999 10 01 703 0.9- 1.4+ 1999 10 07 704 0.5- 0.4-

1247 T-2 = 1999 UH₁

Id. A. Doppler

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	322.00548		(2000.0)	P	Q				
<i>n</i>	0.26616502	ω	212.97835	+0.65378183	-0.75658004				
<i>a</i>	2.3935108	Ω	196.20582	+0.70357171	+0.61388425				
<i>e</i>	0.1700714	<i>i</i>	2.56459	+0.27848906	+0.22523936				
<i>P</i>	3.70	<i>H</i>	17.0	<i>G</i>	0.15	<i>U</i>	6		

Residuals in seconds of arc

1973 09 19	675	1.5-	2.2-	1973 09 30	675	0.1-	0.7+	1999 10 17	557	0.5+	0.2+
1973 09 19	675	0.5+	0.1-	1973 09 30	675	0.7-	1.2+	1999 10 17	557	0.2+	0.2-
1973 09 20	675	1.4-	1.1+	1973 10 04	675	0.9+	1.1-	1999 10 17	557	0.2+	0.0
1973 09 24	675	0.4+	1.3-	1973 10 04	675	0.5+	0.3-	1999 10 17	557	0.1+	0.1+
1973 09 24	675	1.2-	0.6+	1973 10 05	675	0.8+	0.3+	1999 10 19	557	0.1+	0.2+
1973 09 25	675	(0.1+	3.1-)	1973 10 05	675	0.5-	0.1+	1999 10 19	557	0.1-	0.4+
1973 09 25	675	0.8-	1.2+	1999 10 16	557	0.3+	0.2+	1999 10 29	557	0.3-	0.0
1973 09 29	675	1.6+	0.9+	1999 10 16	557	0.1-	0.2+	1999 10 30	557	0.6-	0.7-
1973 09 29	675	1.5+	1.1-	1999 10 16	557	0.8+	0.6+	1999 10 30	557	1.3-	0.8-

1263 T-2 = 1999 RB₁₃₇

Id. A. Doppler

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	314.42408		(2000.0)	P	Q				
<i>n</i>	0.30201952	ω	207.92295	+0.86054822	-0.50936321				
<i>a</i>	2.2001183	Ω	182.70215	+0.47640004	+0.80652586				
<i>e</i>	0.1770189	<i>i</i>	2.95003	+0.18027692	+0.30010858				
<i>P</i>	3.26	<i>H</i>	16.2	<i>G</i>	0.15	<i>U</i>	5		

Residuals in seconds of arc

1973 09 19	675	0.3+	2.4-	1973 10 04	675	0.9+	1.8+	1999 09 09	704	1.4+	0.0
1973 09 19	675	(0.4-	3.7-)	1973 10 04	675	0.3+	0.2+	1999 09 13	704	0.3-	0.7-
1973 09 20	675	1.7-	1.1-	1973 10 05	675	1.5+	0.5-	1999 09 13	704	0.7+	0.8+
1973 09 24	675	0.2-	0.8-	1973 10 05	675	0.0	0.5-	1999 09 13	704	0.6-	0.5-
1973 09 24	675	0.1+	0.8+	1999 09 07	704	0.6+	0.4+	1999 09 13	704	0.1-	0.1+
1973 09 24	675	0.2-	0.4-	1999 09 07	704	0.6+	1.5-	1999 09 13	704	0.7-	0.9+
1973 09 24	675	0.6+	0.7+	1999 09 07	704	0.6-	1.3-	1999 09 30	704	0.4+	1.8+
1973 09 25	675	0.3+	1.5-	1999 09 07	704	0.6-	0.3-	1999 09 30	704	0.5-	1.1+
1973 09 25	675	1.0-	0.2+	1999 09 07	704	0.1-	0.5-	1999 09 30	704	0.4-	0.3+
1973 09 29	675	0.1+	0.3-	1999 09 09	704	0.4+	0.5-	1999 09 30	704	0.0	1.8+
1973 09 29	675	1.1+	0.4-	1999 09 09	704	0.2-	0.3-	1999 09 30	704	1.3-	1.9+
1973 09 30	675	0.3-	1.0+	1999 09 09	704	0.3-	0.3-				
1973 09 30	675	0.9-	0.6+	1999 09 09	704	0.7+	0.1+				

1329 T-2 = 1999 UO₁₅

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	322.46399		(2000.0)	P	Q				
<i>n</i>	0.19110591	ω	208.95673	+0.38147512	-0.92414585				
<i>a</i>	2.9850616	Ω	218.62855	+0.85437834	+0.36107308				
<i>e</i>	0.1860235	<i>i</i>	1.90615	+0.35286597	+0.12482255				
<i>P</i>	5.16	<i>H</i>	14.1	<i>G</i>	0.15	<i>U</i>	5		

Residuals in seconds of arc

1973 09 19	675	1.3-	1.1+	1973 10 04	675	0.0	1.4-	1999 11 04	704	0.1+	0.2-
1973 09 19	675	0.9-	1.4+	1973 10 05	675	0.4+	0.3+	1999 11 04	704	0.3+	0.2+
1973 09 20	675	1.8+	1.0-	1973 10 05	675	0.7+	1.7-	1999 11 04	704	0.5+	0.1+
1973 09 24	675	1.2+	0.5+	1999 10 29	703	0.3-	0.2+	1999 11 04	691	0.3+	0.3-
1973 09 24	675	1.1+	0.8-	1999 10 29	703	0.1+	0.1+	1999 11 04	704	0.6+	0.2+
1973 09 25	675	0.3-	1.7-	1999 10 29	703	0.4-	0.1-	1999 11 04	691	0.3+	0.4-
1973 09 25	675	0.0	1.6-	1999 10 29	703	0.0	0.1+	1999 11 04	691	0.3+	0.3-
1973 09 29	675	1.1-	1.5+	1999 11 03	703	0.3-	0.0	1999 11 12	704	0.2-	0.4+
1973 09 29	675	0.5+	0.1+	1999 11 03	703	0.1-	0.3+	1999 11 12	704	0.1-	0.0

1973 09 30 675 1.0- 1.3+ 1999 11 03 703 1.3- 0.3+ 1999 11 12 704 0.0 0.1+
 1973 09 30 675 2.2- 1.9+ 1999 11 03 703 0.8+ 0.2- 1999 11 12 704 0.3- 0.1-
 1973 10 04 675 1.2+ 0.0 1999 11 04 704 0.1+ 0.1- 1999 11 12 704 0.2- 0.1-

2031 T-2 = 1999 TL₂₀

Id. A. Doppler

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	313.57028		(2000.0)	P	Q				
<i>n</i>	0.26594811	ω	52.22552	+0.50486848	-0.86314472				
<i>a</i>	2.3948121	Ω	7.46984	+0.76739889	+0.44380700				
<i>e</i>	0.1877791	<i>i</i>	4.16171	+0.39523000	+0.24086623				
<i>P</i>	3.71	<i>H</i>	16.5	<i>G</i>	0.15	<i>U</i>	6		

Residuals in seconds of arc

1973 09 19	675	1.8+	0.2-	1973 10 05	675	1.2-	0.8+	1999 10 06	704	0.2-	0.0
1973 09 19	675	1.6-	0.7-	1973 10 05	675	0.5-	0.4+	1999 10 06	704	0.1-	0.0
1973 09 20	675	0.5+	0.7+	1973 10 05	675	1.3-	1.0+	1999 10 06	704	0.2-	0.2-
1973 09 24	675	0.8-	0.1-	1999 10 01	703	0.4+	0.7+	1999 10 06	704	0.2-	0.2-
1973 09 25	675	0.9-	1.5-	1999 10 01	703	1.4-	1.6+	1999 10 06	704	0.3-	0.1+
1973 09 29	675	0.6+	0.6-	1999 10 01	703	0.1+	0.4+	1999 10 07	683	0.0	0.5+
1973 09 29	675	0.2-	1.1-	1999 10 01	703	(2.7-	0.8+)	1999 10 07	683	0.3+	0.0
1973 09 30	675	2.1+	0.5-	1999 10 04	704	(2.2-	0.9-)	1999 10 08	683	0.0	0.1-
1973 09 30	675	2.0+	1.0+	1999 10 04	704	0.5-	0.3-	1999 10 08	683	0.7+	0.2-
1973 10 04	675	1.9+	0.3-	1999 10 04	704	0.1-	0.8-	1999 10 08	683	(2.4-	0.8-)
1973 10 04	675	0.8-	0.4+	1999 10 05	683	0.1+	0.3+	1999 10 08	683	0.3-	1.6-
1973 10 04	675	1.3-	1.3+	1999 10 05	683	0.0	0.3+	1999 10 08	683	0.5+	0.9-
1973 10 05	675	0.6-	0.4-	1999 10 05	683	1.3+	1.0+	1999 10 08	683	0.1+	1.0-

2064 T-2 = 1999 RC₁₅₅

Id. A. Doppler

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	316.38955		(2000.0)	P	Q				
<i>n</i>	0.22590588	ω	190.22059	+0.90378685	-0.42719801				
<i>a</i>	2.6700395	Ω	195.14959	+0.39933170	+0.86351265				
<i>e</i>	0.0530834	<i>i</i>	5.68923	+0.15395949	+0.26804434				
<i>P</i>	4.36	<i>H</i>	15.2	<i>G</i>	0.15	<i>U</i>	5		

Residuals in seconds of arc

1973 09 19	675	1.2+	0.4+	1973 09 30	675	0.4+	0.4+	1999 09 09	704	0.1+	0.1+
1973 09 19	675	0.1+	0.8+	1973 10 04	675	0.6+	0.6+	1999 09 09	704	0.8-	0.5-
1973 09 20	675	0.5-	0.5-	1973 10 04	675	0.2+	0.1+	1999 09 09	704	0.1+	0.2-
1973 09 24	675	1.6+	0.5+	1973 10 05	675	0.2-	1.4-	1999 09 09	704	0.7-	0.2+
1973 09 24	675	0.6+	0.4-	1973 10 05	675	1.3-	0.9-	1999 09 09	704	0.4+	1.0-
1973 09 25	675	1.4-	0.7-	1999 09 07	704	0.2-	0.3+	1999 09 14	704	0.8+	1.0+
1973 09 25	675	1.0-	0.1-	1999 09 07	704	0.4-	0.8+	1999 09 14	704	0.3-	0.1+
1973 09 29	675	(1.3+	3.1+)	1999 09 07	704	0.5+	0.0	1999 09 14	704	0.1-	0.2-
1973 09 29	675	0.1+	0.6+	1999 09 07	704	0.3+	1.3-				
1973 09 30	675	0.4-	0.7+	1999 09 07	704	0.4+	0.6+				

3355 T-2 = 1998 EU₁₇ = 4200 T-1

Id. A. Doppler

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	204.90238		(2000.0)	P	Q				
<i>n</i>	0.21584172	ω	245.10296	+0.69130574	-0.72021576				
<i>a</i>	2.7524057	Ω	160.78934	+0.71020098	+0.66244071				
<i>e</i>	0.1499091	<i>i</i>	10.18546	+0.13308247	+0.20606202				
<i>P</i>	4.57	<i>H</i>	14.1	<i>G</i>	0.15	<i>U</i>	2		

Residuals in seconds of arc

1971 03 24	675	(3.8+	2.1-)	1973 09 24	675	0.1+	0.1+	1998 03 04	809	0.9+	0.9-
1971 03 26	675	0.4+	0.1+	1973 09 25	675	1.7+	0.5-	1998 03 04	809	0.3-	0.3-
1971 03 26	675	0.5+	1.0+	1973 09 25	675	0.7+	1.0-	1998 03 04	809	0.4-	1.3-
1971 03 27	675	0.4-	0.7+	1973 09 29	675	0.2-	2.4+	1999 05 12	704	0.5+	1.3+
1973 09 19	675	0.5-	1.4-	1973 09 29	675	0.8-	2.1+	1999 05 12	704	0.9-	1.8-

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1973 09 19	675	1.9−	0.5−	1998 03 03	809	(1.5+ 2.3+)	1999 05 12	704	0.1−	0.4−
1973 09 20	675	0.5+	0.4+	1998 03 03	809	0.0 1.6+	1999 05 12	704	0.5+	0.9+
1973 09 24	675	0.0	0.1+	1998 03 03	809	0.0 0.9+				

4184 T-2 = 1999 TM₆

Id. A. Doppler

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i> 325.63732			(2000.0)			P		Q	
<i>n</i>	0.26615613	ω	338.99541	+0.69662624	−0.71678295				
<i>a</i>	2.3935641	Ω	66.83309	+0.66288211	+0.62677813				
<i>e</i>	0.1661235	<i>i</i>	1.90506	+0.27440698	+0.30556731				
<i>P</i>	3.70	<i>H</i>	15.5	<i>G</i>	0.15	<i>U</i>	5		

Residuals in seconds of arc

1973 09 19	675	0.4+	0.3+	1973 10 05	675	0.4−	2.0−	1999 10 07	120	1.0+	0.4+
1973 09 19	675	2.2−	0.8+	1973 10 05	675	0.3+	0.2−	1999 10 08	120	0.2+	0.2−
1973 09 20	675	1.1−	0.4+	1999 10 04	704	0.0	1.1−	1999 10 08	120	0.1−	0.2+
1973 09 24	675	0.4−	0.3+	1999 10 04	704	0.5−	0.3+	1999 11 01	703	0.6−	0.5+
1973 09 24	675	0.9−	0.5−	1999 10 04	704	0.4−	0.5+	1999 11 01	703	0.1−	0.1+
1973 09 25	675	0.3+	1.3−	1999 10 06	120	0.1−	0.3+	1999 11 01	703	0.0	0.7+
1973 09 25	675	1.0+	0.0	1999 10 06	120	0.6−	0.1+	1999 11 01	703	0.1−	0.6+
1973 09 29	675	1.4+	2.2−	1999 10 07	704	0.0	0.6−	1999 11 12	704	0.6+	0.2−
1973 09 29	675	(0.6+ 2.9−)		1999 10 07	704	0.6−	0.1−	1999 11 12	704	0.3+	0.2+
1973 09 30	675	1.7+	1.5+	1999 10 07	704	0.1+	0.6+	1999 11 12	704	0.3−	1.3−
1973 09 30	675	0.3+	0.5+	1999 10 07	704	0.2−	0.3−	1999 11 12	704	0.1+	0.2−
1973 10 04	675	0.6+	1.4+	1999 10 07	704	0.4+	0.5+	1999 11 12	704	0.4−	0.6−
1973 10 04	675	0.7−	0.0	1999 10 07	120	1.0+	0.2+				

4634 T-2 = 1999 RR₁₈₃

Id. A. Doppler, E. Bowell

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i> 39.94625			(2000.0)			P		Q	
<i>n</i>	0.26454500	ω	139.86622	+0.41562386	+0.90800833				
<i>a</i>	2.4032725	Ω	154.56067	−0.86278129	+0.41193549				
<i>e</i>	0.1054720	<i>i</i>	7.04760	−0.28786326	+0.07635462				
<i>P</i>	3.73	<i>H</i>	15.6	<i>G</i>	0.15	<i>U</i>	3		

Residuals in seconds of arc

1973 09 19	675	(0.1+ 6.3−)	1998 03 24	704	(0.8− 2.8−)	1999 09 07	704	0.3+	1.1−
1973 09 20	675	1.2− 0.6−	1998 03 24	704	(3.2− 1.3+)	1999 09 09	704	1.2+	0.0
1973 09 24	675	1.4− 0.8+	1998 04 19	704	1.1− 0.4−	1999 09 09	704	0.5+	0.2+
1973 09 24	675	0.7− 0.0	1998 04 19	704	1.0+ 1.0+	1999 09 09	704	0.6− 0.6+	
1973 09 25	675	1.8− 0.7+	1998 04 19	704	1.7− 1.0+	1999 09 09	704	0.1+ 0.4+	
1973 09 30	675	0.6+ 0.2+	1998 04 19	704	1.2+ 0.5−	1999 09 09	704	0.2+ 1.0+	
1973 09 30	675	0.5+ 0.4+	1998 04 24	704	0.1+ 0.3−	1999 09 14	704	0.5− 0.2−	
1973 10 04	675	1.2+ 0.5−	1998 04 24	704	(2.2+ 1.2+)	1999 09 14	704	0.1− 0.3+	
1973 10 04	675	1.3+ 1.9−	1998 04 24	704	0.8+ 0.3+	1999 09 14	704	0.3− 0.3−	
1973 10 05	675	0.3+ 0.0	1998 04 24	704	1.0− 0.7−	1999 09 14	704	0.2− 0.3+	
1973 10 05	675	1.1+ 1.4+	1998 04 24	704	(4.9− 0.5+)	1999 09 14	704	0.8− 0.2+	
1998 03 24	704	0.7+ 1.0−	1999 09 07	704	0.1+ 1.0−				
1998 03 24	704	0.0 0.9+	1999 09 07	704	0.2+ 0.4−				

5068 T-2 = 1999 RR₂₁₁

Id. A. Doppler

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i> 87.81631			(2000.0)			P		Q	
<i>n</i>	0.22893196	ω	291.06470	−0.20974528	+0.97157299				
<i>a</i>	2.6464586	Ω	326.22846	−0.80768306	−0.23544715				
<i>e</i>	0.2357839	<i>i</i>	11.39065	−0.55104899	−0.02470955				
<i>P</i>	4.31	<i>H</i>	14.1	<i>G</i>	0.15	<i>U</i>	4		

Residuals in seconds of arc

1973 09 20	675	0.1+	1.2−	1973 09 30	675	1.2−	0.1+	1999 09 08	704	0.1+	1.8−
1973 09 20	675	1.4+	0.1−	1973 09 30	675	0.2−	0.0	1999 09 18	704	0.2−	0.3+

1999 NOV. 23

1973 09 24	675	0.7−	1.4+	1973 10 04	675	0.0	2.2−	1999 09 18	704	0.9−	1.1+
1973 09 24	675	0.1−	1.4+	1973 10 04	675	(0.9− 3.4−)		1999 09 18	704	0.5+	0.4+
1973 09 25	675	0.8−	0.1−	1999 09 08	704	0.0	0.1−	1999 11 03	704	0.4+	0.3−
1973 09 25	675	0.6−	0.1+	1999 09 08	704	0.1+	1.1+	1999 11 03	704	0.5−	0.3+
1973 09 29	675	0.8+	0.1−	1999 09 08	704	0.1−	0.6−	1999 11 03	704	0.6+	0.3+
1973 09 29	675	1.3+	0.4+	1999 09 08	704	0.1+	0.1−	1999 11 03	704	0.2−	0.4−

1033 T-3 = 1999 RR₁₇₀

Id. A. Doppler

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i> 34.55842			(2000.0)			P		Q	
<i>n</i>	0.17663579	ω	311.74700	+0.55054910	+0.83371835				
<i>a</i>	3.1459387	Ω	351.34403	−0.65719780	+0.40143589				
<i>e</i>	0.0773373	<i>i</i>	16.41761	−0.51476862	+0.37916083				
<i>P</i>	5.58	<i>H</i>	14.1	<i>G</i>	0.15	<i>U</i>	5		

Residuals in seconds of arc

1977 10 11	675	0.6+	0.1+	1977 10 22	675	0.2−	2.5−	1999 09 09	704	0.2−	0.5−
1977 10 11	675	0.5+	1.0+	1977 10 22	675	0.4−	1.9+	1999 09 09	704	0.0	0.9+
1977 10 12	675	0.2+	0.4−	1999 09 07	704	0.0	0.2−	1999 09 09	704	1.6+	0.9+
1977 10 12	675	0.3+	0.1+	1999 09 07	704	0.3−	0.2+	1999 09 14	704	0.3−	0.1+
1977 10 16	675	1.3−	1.6−	1999 09 07	704	0.1+	0.1+	1999 09 14	704	0.1−	0.1−
1977 10 16	675	1.7−	0.1−	1999 09 07	704	0.6−	0.5−	1999 09 14	704	0.1+	0.2−
1977 10 17	675	0.3+	0.1+	1999 09 07	704	0.4−	0.5−	1999 09 14	704	0.1+	0.3−
1977 10 17	675	1.7+	1.3+	1999 09 09	704	0.0	0.1+				

1050 T-3 = 1995 YP₂₄

Id. G. V. Williams, M. E. Sansaturio

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i> 45.66287			(2000.0)			P		Q	
<i>n</i>	0.17499575	ω	7.80633	+0.24314474	+0.95866226				
<i>a</i>	3.1655637	Ω	276.35458	−0.89779061	+0.16472942				
<i>e</i>	0.0272654	<i>i</i>	8.55288	−0.36722289	+0.23201485				
<i>P</i>	5.63	<i>H</i>	13.9	<i>G</i>	0.15	<i>U</i>	4		

Residuals in seconds of arc

1977 10 07	675	0.9+	0.1−	1977 10 17	675	0.7−	0.5+	1999 09 04	703	0.8−	0.2+
1977 10 11	675	1.6+	0.4−	1995 12 24	566	0.2+	0.3+	1999 09 04	703	0.8−	0.4+
1977 10 11	675	1.2+	0.4−	1995 12 24	566	0.1+	0.1+	1999 09 04	703	(2.3− 0.5+)	
1977 10 12	675	0.7−	0.5+	1995 12 24	566	0.6−	0.0	1999 09 14	704	1.0+	0.4−
1977 10 12	675	1.0−	0.4+	1995 12 25	566	0.4+	0.4−	1999 09 14	704	0.1+	0.5+
1977 10 16	675	(1.9− 3.6−)		1995 12 25	566	0.1−	0.3−	1999 09 14	704	0.0	0.7−
1977 10 16	675	1.6−	1.4−	1995 12 25	566	0.0	0.2+	1999 09 14	704	1.2+	0.1−
1977 10 17	675	0.3+	0.9+	1999 09 04	703	0.6−	0.5−	1999 09 14	704	0.1−	0.7+

1055 T-3 = 1992 GJ

Id. M. E. Sansaturio

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i> 273.31041			(2000.0)			P		Q	
<i>n</i>	0.24104066	ω	260.27542	−0.76010126	+0.63878900				
<i>a</i>	2.5570694	Ω	319.28826	−0.50123018	−0.69305343				
<i>e</i>	0.1642996	<i>i</i>	10.52481	−0.41353886	−0.33410411				
<i>P</i>	4.09	<i>H</i>	15.3	<i>G</i>	0.15	<i>U</i>	6		

Residuals in seconds of arc

1977 10 12	675	0.1−	0.2+	1977 10 17	675	1.9+	1.1+	1992 04 10	413	0.6−	0.4−
1977 10 12	675	0.5−	0.7+	1977 10 17	675	0.1−	1.8+	1992 04 11	413	0.3+	0.5−
1977 10 16	675	0.2+	2.5−	1992 04 09	413	0.4−	0.8+				
1977 10 16	675	1.5−	1.3−	1992 04 09	413	0.8+	0.1+				

2061 T-3 = 1998 LW

Id. A. Doppler

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	89.55604	(2000.0)	P	Q
<i>n</i>	0.27503971	ω	69.44938	+0.45403876
<i>a</i>	2.3417424	Ω	227.65339	+0.84034625
<i>e</i>	0.2209848	<i>i</i>	3.83437	+0.29608612
<i>P</i>	3.58	<i>H</i>	16.0	<i>U</i> 5

Residuals in seconds of arc

1977 10 07	675	0.4+	0.1−	1977 10 21	675	1.2+	1.6−	1998 06 02	809	(0.5+	3.6+)
1977 10 11	675	0.2−	0.9+	1998 05 22	704	(0.8+	2.4−)	1998 06 02	809	(0.4+	3.3+)
1977 10 11	675	0.9−	0.0	1998 05 22	704	0.4+	0.9+	1998 06 03	704	1.9−	0.1+
1977 10 12	675	0.1−	0.3+	1998 05 22	704	1.9−	1.7−	1998 06 03	704	0.1−	0.9+
1977 10 12	675	0.7−	1.0−	1998 05 22	704	0.8+	1.7−	1998 06 03	704	2.0−	0.7+
1977 10 16	675	0.3−	0.7+	1998 05 22	704	(4.0−	1.2−)	1998 06 03	704	0.3−	1.0−
1977 10 16	675	0.1+	0.7−	1998 06 01	809	1.6+	0.9+	1998 06 24	704	1.5+	1.5−
1977 10 17	675	1.4−	0.6+	1998 06 01	809	1.6+	1.8+	1998 06 24	704	1.0−	0.8−
1977 10 17	675	1.0+	1.6+	1998 06 01	809	1.2+	0.8+	1998 06 24	704	0.1−	0.5+
1977 10 21	675	0.9+	0.6−	1998 06 02	809	(1.8+	2.3+)	1998 06 24	704	(0.9+	3.1−)

2139 T-3 = 1999 VE₃₆

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	261.87814	(2000.0)	P	Q
<i>n</i>	0.22914071	ω	255.66394	−0.86324476
<i>a</i>	2.6448510	Ω	254.22567	+0.48384026
<i>e</i>	0.0582423	<i>i</i>	3.57631	+0.14389955
<i>P</i>	4.30	<i>H</i>	13.1	<i>U</i> 6

Residuals in seconds of arc

1977 10 07	675	1.1+	1.0−	1977 10 17	675	2.3−	0.7−	1999 11 03	704	0.0	0.4−
1977 10 11	675	0.0	0.3−	1977 10 17	675	0.0	0.4+	1999 11 03	704	0.8−	0.1−
1977 10 11	675	0.1+	0.6+	1977 10 21	675	0.6+	0.3+	1999 11 03	704	0.2−	1.0+
1977 10 12	675	0.1−	1.9+	1977 10 21	675	1.7+	1.6−	1999 11 12	704	0.5+	0.1−
1977 10 12	675	1.0−	0.2−	1977 10 22	675	0.5−	2.2+	1999 11 12	704	0.6−	0.1+
1977 10 16	675	0.5+	1.0−	1977 10 22	675	0.9+	0.1+	1999 11 12	704	0.3+	0.2−
1977 10 16	675	0.9−	0.5−	1999 11 03	704	0.8+	0.5−				

2248 T-3 = 1999 RS₂₀₇

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Doppler

<i>M</i>	8.52073	(2000.0)	P	Q
<i>n</i>	0.17823090	ω	124.22168	+0.97335352
<i>a</i>	3.1271404	Ω	225.08188	−0.22010619
<i>e</i>	0.0596254	<i>i</i>	10.20942	+0.06431318
<i>P</i>	5.53	<i>H</i>	14.8	<i>U</i> 5

Residuals in seconds of arc

1977 10 11	675	1.0−	0.6+	1977 10 21	675	1.4+	1.3+	1999 09 18	703	0.3−	0.4+
1977 10 11	675	1.1−	0.0	1977 10 21	675	0.6−	1.1−	1999 09 18	704	0.5+	0.1+
1977 10 12	675	1.8−	0.5+	1977 10 22	675	0.2+	0.5−	1999 09 18	703	0.5+	0.4−
1977 10 12	675	0.9−	0.3−	1977 10 22	675	0.8+	1.6+	1999 09 18	704	0.9+	0.2−
1977 10 16	675	1.5+	1.7−	1999 09 08	704	0.0	1.2+	1999 09 18	703	0.6−	0.3−
1977 10 16	675	0.3−	1.7−	1999 09 08	704	0.1−	0.2−	1999 09 18	704	0.4+	0.3−
1977 10 17	675	0.7+	0.9+	1999 09 08	704	0.4−	0.4−	1999 09 18	703	0.7−	0.0
1977 10 17	675	1.0+	0.4+	1999 09 18	704	0.2−	0.9−				

2336 T-3 = 1999 VZ₅₀

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	7.91251	(2000.0)	P	Q
<i>n</i>	0.26963419	ω	17.18383	+0.98875386
<i>a</i>	2.3729363	Ω	334.29051	−0.14288361
<i>e</i>	0.2247924	<i>i</i>	3.16663	−0.04415978
<i>P</i>	3.66	<i>H</i>	16.8	<i>U</i> 6

Residuals in seconds of arc

1977 10 07	675	1.3+	0.3+	1977 10 17	675	1.2−	0.5+	1999 11 03	704	0.8−	0.6+
1977 10 11	675	1.6−	1.4+	1977 10 17	675	1.7−	0.3+	1999 11 03	704	0.7+	0.4−
1977 10 11	675	0.6+	2.0+	1977 10 21	675	1.6+	0.4+	1999 11 03	704	1.0−	1.8+
1977 10 12	675	1.7−	0.2+	1977 10 21	675	1.1+	0.5−	1999 11 04	704	0.4+	0.9+
1977 10 12	675	0.3−	0.1+	1977 10 22	675	0.6+	1.1−	1999 11 04	704	1.0+	0.3+
1977 10 16	675	1.2−	1.9−	1977 10 22	675	1.3+	1.4−	1999 11 04	704	0.1+	1.0−
1977 10 16	675	1.5+	1.3−	1999 11 03	704	0.9−	1.1−				

2612 T-3 = 1999 RJ₆₆

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Doppler

<i>M</i>	298.87004	(2000.0)	P	Q
<i>n</i>	0.17608584	ω	65.43887	+0.56452925
<i>a</i>	3.1524855	Ω	350.07424	+0.69443502
<i>e</i>	0.1784027	<i>i</i>	8.41633	+0.44616895
<i>P</i>	5.60	<i>H</i>	15.4	<i>U</i> 6

Residuals in seconds of arc

1977 10 16	675	1.5−	1.0−	1977 10 22	675	(0.9+	3.2+)	1999 09 07	704	0.3−	0.2+
1977 10 16	675	0.6−	0.1−	1977 10 22	675	0.0	2.0+	1999 09 07	704	0.4−	0.1+
1977 10 17	675	0.6+	0.6−	1999 09 07	704	1.2−	0.5+	1999 09 09	704	0.1+	0.8−
1977 10 17	675	0.3−	0.0	1999 09 07	704	0.0	0.4+	1999 09 09	704	0.9+	0.8−
1977 10 21	675	1.8+	0.3−	1999 09 07	704	0.0	0.8+	1999 09 09	704	0.9+	0.4−

2634 T-3 = 1999 VY₃₈

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	201.61773	(2000.0)	P	Q
<i>n</i>	0.22861409	ω	329.91211	−0.92631238
<i>a</i>	2.6489111	Ω	232.16097	−0.33617777
<i>e</i>	0.0781233	<i>i</i>	2.55275	−0.17008787
<i>P</i>	4.31	<i>H</i>	15.0	<i>U</i> 7

Residuals in seconds of arc

1977 10 12	675	0.0	0.6+	1977 10 17	675	0.6−	1.5−	1999 11 10	704	1.7−	0.4+
1977 10 12	675	1.2−	0.5+	1977 10 17	675	0.2−	0.4+	1999 11 12	704	0.5+	0.4−
1977 10 16	675	0.7+	0.4−	1977 10 17	675	0.2−	0.8+	1999 11 12	704	0.4+	0.2+
1977 10 16	675	0.7−	0.4+	1977 10 21	675	1.9+	0.3+	1999 11 12	704	0.8+	0.2−
1977 10 16	675	0.8+	0.9−	1999 11 10	704	0.7−	0.6−	1999 11 12	704	0.2+	0.1+
1977 10 16	675	0.4−	1.4−	1999 11 10	704	0.0	0.1+	1999 11 12	704	0.8+	0.1+
1977 10 17	675	0.0	1.1+	1999 11 10	704	0.4−	0.3+				

3191 T-3 = 1999 VL₅₀

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

Williams

<i>M</i>	330.27188	(2000.0)	P	Q
<i>n</i>	0.27113672	ω	20.20415	+0.50617177
<i>a</i>	2.3641616	Ω	39.50790	+0.77254211
<i>e</i>	0.1133398	<i>i</i>	7.39153	+0.38336512
<i>P</i>	3.64	<i>H</i>	15.4	<i>U</i> 6

Residuals in seconds of arc

1977 10 07	675	0.8+	0.7−	1977 10 16	675	0.6−	0.2+	1999 11 03	704	0.1−	0.2−
1977 10 11	675	1.2−	0.2−	1977 10 17	675	1.1−	0.1−	1999 11 03	704	0.2−	0.9−
1977 10 11	675	2.8+	0.3+	1977 10 17	675	0.4+	1.0+	1999 11 03	704	0.3−	0.0
1977 10 11	675	1.0−	0.4+	1977 10 17	675	0.2−	0.4−	1999 11 03	704	0.4−	0.3−
1977 10 11	675	2.4+	0.3+	1977 10 17	675	0.1−	1.1+	1999 11 03	704	0.6+	0.2−
1977 10 12	675	2.2−	0.9+	1977 10 21	675	1.6+	0.4−	1999 11 04	704	0.5+	0.4+
1977 10 12	675	0.1−	0.2−	1977 10 21	675	1.1−	1.9+	1999 11 04	704	0.2−	0.6+
1977 10 12	675	1.1−	0.1−	1977 10 21	675	1.5+	2.7−	1999 11 04	704	0.1−	0.4+
1977 10 12	675	1.6−	1.9−	1977 10 21	675	1.9−	1.7+	1999 11 04	704	0.2−	0.3+
1977 10 16	675	0.2−	0.2−	1977 10 22	675	0.2−	0.1−	1999 11 04	704	0.3+	0.1−
1977 10 16	675	0.4+	1.1+	1977 10 22	675	0.3+	2.1−				
1977 10 16	675	1.5+	0.0	1977 10 22	675	1.1+	0.1+				

3252 T-3 = 1999 CJ₉₉

Id. M. E. Sansaturio

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	91.82521	(2000.0)	<i>P</i>	<i>Q</i>	Williams				
<i>n</i>	0.28925658	ω	245.73167	-0.08527032	-0.99635597				
<i>a</i>	2.2643691	Ω	209.16010	+0.91557487	-0.07759037				
<i>e</i>	0.1843961	<i>i</i>	0.22760	+0.39300334	-0.03541903				
<i>P</i>	3.41	<i>H</i>	16.5	<i>G</i>	0.15	<i>U</i>	7		

Residuals in seconds of arc

1977 10 07	675	1.3+	0.8+	1977 10 17	675	0.1-	1.2+	1999 02 12	699	1.0+	0.7+
1977 10 11	675	0.8-	0.1+	1977 10 21	675	0.8+	0.5-	1999 02 12	699	1.3+	1.9+
1977 10 11	675	1.3-	0.7-	1977 10 21	675	0.6-	1.2-	1999 02 13	704	1.8-	1.0-
1977 10 12	675	0.8+	0.7-	1999 02 10	704	0.9+	0.4+	1999 02 13	704	1.5-	0.9-
1977 10 12	675	0.0	0.2+	1999 02 10	704	0.0	0.4-	1999 02 13	704	0.2-	0.9-
1977 10 16	675	0.2+	0.2-	1999 02 10	704	0.0	0.9+	1999 02 13	704	1.5-	0.9-
1977 10 16	675	0.7-	0.2-	1999 02 10	704	0.5+	0.5+	1999 02 13	704	0.9+	0.8-
1977 10 17	675	0.4+	1.1+	1999 02 12	699	0.6+	0.5+				

Residuals in seconds of arc

1977 10 07	675	0.4-	0.5-	1977 10 22	675	0.7+	1.1+	1999 09 09	704	0.1-	0.1-
1977 10 11	675	(2.8-	1.8+)	1999 08 08	699	0.1+	0.8-	1999 09 13	704	0.1-	0.2+
1977 10 11	675	1.4-	0.9+	1999 08 08	699	0.3-	0.4-	1999 09 13	704	0.3+	0.7-

Object	<i>H</i>	<i>G</i>	Epoch	<i>M</i>	ω	Ω	<i>i</i>	<i>e</i>	<i>a</i>	Obs.	Opp. & Arc	rms Perts <i>U</i>	Computer	<i>MPC</i>	Object
(3159)	13.0	0.15	19990810	292.76460	57.41502	223.33362	14.60783	0.1092377	2.5700497	46	6 1976-1999	0.72 M-v 2	Williams	24887	(3159)
(3430)	12.4	0.15	19990810	80.79472	277.42801	43.50872	4.43948	0.0981110	2.7595080	71	9 1974-1999	0.77 M-v 1	Williams	24372	(3430)
(3528)	12.9	0.15	19990810	84.36202	32.75355	277.01176	7.44956	0.1589345	2.5358146	63	8 1979-1999	0.92 M-v 1	Williams	28565	(3528)
(3537)	13.1	0.15	19990810	76.31833	278.28894	44.34920	15.17281	0.1570484	2.5888370	23	8 1982-1999	0.75 M-v 1	Williams	22388	(3537)
(3851)	13.6	0.15	19990810	321.16731	96.59694	344.86663	4.63075	0.0642829	2.1751323	80	12 1950-1999	0.92 M-v 1	Williams	15862	(3851)
(4459)	13.7	0.15	19990810	341.13590	282.34964	157.42780	2.78884	0.1179494	2.2546820	52	12 1924-1999	0.72 M-v 1	Williams	21542	(4459)
(5100)	13.3	0.15	19990810	299.92022	36.87918	101.70529	7.72951	0.1325332	2.4709190	47	10 1978-1999	0.61 M-v 1	Williams	19833	(5100)
(5760)	12.7	0.15	19990810	89.09282	104.18857	210.61592	9.57227	0.0981459	2.9697668	69	9 1978-1999	0.73 M-v 1	Williams	22800	(5760)
(11307)	13.2	0.15	19990810	4.19092	29.31953	19.46955	4.69349	0.1040200	2.4624105	34	6 1987-1999	0.59 M-v 1	Williams	35567	(11307)
1934 JP	15.7	0.15	19990810	269.72101	16.25978	138.61580	1.57893	0.2276418	2.3066529	26	5 1934-1999	0.87 M-v 3	Williams	25437	1934 JP
1955 RE ₁	14.2	0.15	19990810	357.43162	22.33846	319.77427	7.25300	0.2546059	2.3778261	76	3 1955-1999	0.59 M-v 2	Williams	36499	1955 RE ₁
1970 JB	13.9	0.15	19990810	123.39501	281.32798	289.17502	20.63738	0.2812994	2.3173394	44	4 1970-1999	0.66 M-v 2	Williams	36499	1970 JB
1971 QO ₁	12.4	0.15	19990810	113.71853	32.54895	321.75201	9.45369	0.1091313	3.0172823	43	6 1971-1999	0.79 M-v 1	Williams	35676	1971 QO ₁
1971 UR	12.8	0.15	19990810	299.06911	52.69488	47.00907	5.90331	0.1033962	3.1581094	76	5 1971-1999	0.66 M-v 2	Williams	36499	1971 UR
1973 UK ₅	14.5	0.15	19990810	257.51672	44.40758	46.89132	3.01684	0.1573554	2.4187487	42	5 1973-1999	0.70 M-v 2	Williams	36499	1973 UK ₅
1975 NC	13.7	0.15	19990810	132.39157	357.44316	270.05485	5.76471	0.1563526	2.7482712	59	6 1953-1999	0.67 M-v 2	Williams	33332	1975 NC
1975 SX	14.4	0.15	19990810	356.73893	158.39401	201.29979	1.51942	0.1439084	3.3133507	55	3 1975-1999	0.77 M-v 4	Williams	36499	1975 SX
1975 SZ ₁	15.7	0.15	19990810	313.14733	248.01049	173.48708	2.93714	0.1725358	2.2729687	58	4 1975-1999	0.48 M-v 1	Williams	36499	1975 SZ ₁
1975 TU ₃	13.2	0.15	19990810	318.72296	10.60439	44.90826	8.81294	0.0508747	2.2706821	75	4 1975-1999	0.55 M-v 2	Williams	36499	1975 TU ₃
1976 DA ₁	14.8	0.15	19990810	231.93968	59.81749	134.58987	4.86927	0.1168893	2.2891898	52	7 1976-1999	0.79 M-v 2	Williams	35056	1976 DA ₁
1976 QK ₁	14.2	0.15	19990810	18.78597	123.63753	200.18373	2.44505	0.2017914	2.4432248	94	4 1976-1999	0.67 M-v 2	Williams	36499	1976 QK ₁
1976 YN ₇	13.4	0.15	19990810	98.76147	272.97854	100.42772	13.53176	0.1880656	2.6950634	24	4 1976-1999	0.76 M-v 1	Williams	35275	1976 YN ₇
1977 DG ₃	14.4	0.15	19990810	273.42396	44.85030	145.39292	6.20248	0.0877914	2.4504408	43	4 1977-1999	0.70 M-v 3	Williams	35676	1977 DG ₃
1977 DL ₄	14.6	0.15	19990810	124.50968	213.44917	356.39683	4.46437	0.2353666	2.5722340	60	4 1977-1999	0.71 M-v 4	Williams	36499	1977 DL ₄
1977 JA	15.5	0.15	19990810	125.26089	0.92922	239.18786	23.78142	0.2007151	2.3093453	22	4 1977-1999	0.91 M-v 4	Williams	36499	1977 JA

1977 10 12	675	1.7+	0.7+	1999 08 08	699	0.5-	0.7+	1999 09 13	704	0.1+	0.3-
1977 10 12	675	0.5+	0.1-	1999 09 07	704	0.3-	0.5+	1999 09 13	704	0.4+	0.3-
1977 10 16	675	0.8+	1.2-	1999 09 07	704	0.4-	0.5-	1999 09 13	704	0.5-	0.6-
1977 10 16	675	1.2+	1.6-	1999 09 07	704	0.1+	0.5+	1999 09 30	704	0.7+	0.5-
1977 10 17	675	0.3-	0.5+	1999 09 07	704	0.0	0.5-	1999 09 30	704	0.5+	1.6+
1977 10 17	675	1.0-	0.6+	1999 09 07	704	0.1+	0.5+	1999 09 30	704	0.2+	1.3+
1977 10 21	675	0.0	0.7-	1999 09 09	704	0.1+	0.7+	1999 11 12	704	0.3-	0.0
1977 10 21	675	1.3-	0.4+	1999 09 09	704	0.1+	0.6-	1999 11 12	704	0.3-	0.3+
1977 10 22	675	0.2-	0.5-	1999 09 09	704	0.4+	0.2-	1999 11 12	704	0.4-	0.5-

4366 T-3 = 1997 EA₃₄

Id. A. Doppler

Epoch 1999 Aug. 10.0 TT = JDT 2451400.5

<i>M</i>	301.21686	(2000.0)	<i>P</i>	<i>Q</i>	Williams				
<i>n</i>	0.26730091	ω	328.73195	+0.45850443	-0.88689770				
<i>a</i>	2.3867252	Ω	93.92391	+0.82659521	+0.40227986				
<i>e</i>	0.1792361	<i>i</i>	3.24345	+0.32636489	+0.22711977				
<i>P</i>	3.69	<i>H</i>	16.1	<i>G</i>	0.15	<i>U</i>	3		

Residuals in seconds of arc

1977 10 16	675	0.6+	0.9+	1997 02 08	566	1.7-	1.0-	1999 08 22	703	0.9+	0.8-
1977 10 16	675	0.9-	1.0+	1997 03 04	704	0.1-	0.6+	1999 09 07	704	1.2-	1.0+
1977 10 17	675	0.4-	1.8-	1997 03 04	704	1.6+	0.2+	1999 09 07	704	0.4-	1.2-
1977 10 17	675	0.4-	0.6-	1997 03 05	704	(2.4+	1.2+)	1999 09 07	704	0.5+	1.0-
1977 10 21	675	0.2-	0.7-	1997 03 05	704	1.3+	1.0+	1999 09 14	704	1.0+	0.7+
1977 10 21	675	0.5-	0.6+	1997 03 06	704	1.1+	1.2+	1999 09 14	704	0.3+	0.1+
1977 10 22	675	(2.5-	3.1-)	1997 03 06	704	(0.3+	2.3+)	1999 09 14	704	0.9+	0.4-
1977 10 22	675	1.3+	1.9+	1999 08 22	703	1.2-	0.1+	1999 09 14	704	0.9+	1.1-
1997 02 08	566	1.0-	1.0-	1999 08 22	703	0.5-	1.5+				
1997 02 08	566	1.0-	1.2-	1999 08 22	703	0.9-	0.1-				

1977 PB	13.4	0.15	19990810	99.28812	110.80765	132.62382	13.50924	0.1342984	2.6483232	60	4	1977–1999	0.71	M-v	2	Williams	36499	1977 PB
1977 QN ₁	12.9	0.15	19990810	103.96415	308.94894	343.61414	12.92257	0.1808111	2.6193217	38	3	1977–1999	0.65	M-v	3	Williams	36499	1977 QN ₁
1977 TU ₃	12.7	0.15	19990810	40.56425	174.79813	215.23338	14.75665	0.1973245	3.0442940	61	3	1977–1999	0.70	M-v	2	Williams	36499	1977 TU ₃
1977 TQ ₆	13.2	0.15	19990810	17.92342	297.75639	53.46549	13.05485	0.1924629	2.6731084	70	4	1977–1999	0.59	M-v	2	Williams	36499	1977 TQ ₆
1978 CK	12.5	0.15	19990810	324.17431	142.22212	310.01631	20.67097	0.0534408	3.1838961	59	5	1978–1999	0.57	M-v	1	Williams	36499	1978 CK
1978 NC	14.1	0.15	19990810	48.23678	190.94141	114.65958	27.56681	0.1964038	2.5606338	18	5	1978–1999	0.68	M-v	2	Williams	32297	1978 NC
1978 NF	14.1	0.15	19990810	56.10272	194.11613	111.79325	14.35660	0.1653359	2.5539215	56	3	1978–1999	0.57	M-v	2	Williams	36499	1978 NF
1978 QF ₁	14.7	0.15	19990810	317.48853	199.87148	187.18895	4.97460	0.2144071	2.3102171	64	4	1978–1999	0.62	M-v	2	Williams	36500	1978 QF ₁
1978 RD ₂	14.3	0.15	19990810	4.42154	328.95337	34.48955	4.76584	0.2309071	2.5869342	78	3	1978–1999	0.59	M-v	3	Williams	36500	1978 RD ₂
1978 RT ₆	15.4	0.15	19990810	75.86705	111.07895	165.65020	5.92600	0.1700877	2.2800877	54	3	1978–1999	0.58	M-v	3	Williams	36500	1978 RT ₆
1978 RG ₉	14.3	0.15	19990810	74.13268	295.42906	341.00902	10.73668	0.1474459	2.5749426	36	2	1978–1999	0.72	M-v	4	Williams	36324	1978 RG ₉
1978 RQ ₉	14.3	0.15	19990810	96.41489	231.94429	350.02457	6.74724	0.0588258	2.3108739	87	5	1978–1999	0.58	M-v	2	Williams	36500	1978 RQ ₉
1978 RA ₁₀	15.3	0.15	19990810	288.28511	75.06456	358.64089	1.55198	0.2128014	2.3016612	76	3	1978–1999	0.67	M-v	4	Williams	36500	1978 RA ₁₀
1978 SF ₅	15.0	0.15	19990810	49.54348	307.74257	32.34632	6.49038	0.1986678	2.2767122	23	3	1978–1999	0.76	M-v	2	Williams	36500	1978 SF ₅
1978 SS ₅	13.9	0.15	19990810	23.12873	166.86069	193.50529	2.76155	0.1605194	2.5835588	32	5	1978–1999	0.82	M-v	2	Williams	23535	1978 SS ₅
1978 ST ₇	13.9	0.15	19990810	278.12830	136.62840	322.16822	5.65224	0.1266383	2.3043145	75	5	1978–1999	0.60	M-v	2	Marsden	36500	1978 ST ₇
1978 UJ ₅	15.9	0.15	19990810	327.83713	103.13524	303.90168	1.69128	0.1253168	2.3001877	15	3	1978–1999	0.75	M-v	4	Williams	20806	1978 UJ ₅
1978 VW ₂	14.4	0.15	19990810	195.57992	355.88589	134.78042	1.73550	0.1560060	3.1654279	20	5	1978–1999	0.76	M-v	1	Williams	30684	1978 VW ₂
1978 VB ₃	12.6	0.15	19990810	355.24805	296.02338	58.15380	13.19259	0.0831705	3.0923003	27	3	1978–1999	0.56	M-v	3	Williams	36500	1978 VB ₃
1978 VP ₃	13.6	0.15	19990810	342.76340	18.90923	84.32144	4.04343	0.0667286	2.9736201	44	4	1978–1999	0.82	M-v	1	Williams	36500	1978 VP ₃
1978 VX ₄	15.0	0.15	19990810	9.02878	269.70293	66.06020	4.27191	0.1470634	2.3310382	62	4	1978–1999	0.72	M-v	3	Williams	36500	1978 VX ₄
1978 VH ₅	13.4	0.15	19990810	323.16444	194.85256	249.06022	8.93607	0.0146593	3.0272929	42	3	1978–1999	0.70	M-v	4	Williams	32738	1978 VH ₅
1978 VE ₇	14.7	0.15	19990810	339.05491	172.10657	176.47625	0.75574	0.2202809	2.3384597	79	5	1978–1999	0.61	M-v	2	Williams	36500	1978 VE ₇
1978 VP ₉	15.1	0.15	19990810	24.62475	83.77176	237.50215	6.36547	0.1345797	2.3332409	64	3	1978–1999	0.72	M-v	3	Williams	36500	1978 VP ₉
1978 VQ ₉	13.9	0.15	19990810	105.45625	250.58835	67.95495	13.26982	0.2087782	2.5608847	23	3	1978–1999	0.77	M-v	4	Williams	33738	1978 VQ ₉
1978 VM ₁₁	14.5	0.15	19990810	290.95548	94.06045	74.36344	5.61409	0.2110865	2.5705264	18	4	1978–1999	0.59	M-v	2	Williams	36500	1978 VM ₁₁
1978 XW	13.0	0.15	19990810	292.57043	1.55715	105.90152	1.85616	0.1854318	3.0492118	61	6	1975–1999	0.60	M-v	1	Williams	36500	1978 XW
1979 MX ₁	14.0	0.15	19990810	199.69019	298.65702	269.24489	3.50660	0.0447829	2.7834492	41	4	1979–1999	0.65	M-v	1	Williams	35677	1979 MX ₁
1979 MO ₂	15.6	0.15	19990810	86.03274	66.64828	226.42404	4.04209	0.1828207	2.1808414	34	3	1979–1999	0.68	M-v	4	Williams	32208	1979 MO ₂
1979 MM ₃	13.9	0.15	19990810	343.15401	254.41559	120.05932	17.68968	0.1163795	2.8664758	32	4	1979–1999	0.82	M-v	2	Williams	36500	1979 MM ₃
1979 MY ₅	13.2	0.15	19990810	212.54425	347.03707	278.04329	11.78011	0.1103003	2.7025912	42	6	1979–1999	0.73	M-v	2	Williams	33539	1979 MY ₅
1979 MD ₈	13.8	0.15	19990810	303.27610	231.32066	257.55983	7.67286	0.1025368	2.7616296	49	4	1979–1999	0.68	M-v	3	Williams	36500	1979 MD ₈
1979 MX ₈	14.4	0.15	19990810	53.24751	80.98391	218.30838	1.17756	0.0559087	2.8619820	30	3	1979–1999	0.60	M-v	4	Williams	36324	1979 MX ₈
1979 OH ₁	12.5	0.15	19990810	229.21958	114.92178	137.40939	12.29351	0.0662260	3.1834682	30	4	1979–1999	0.68	M-v	2	Williams	35677	1979 OH ₁
1979 QF ₂	13.3	0.15	19990810	22.52495	212.19194	158.87471	2.46639	0.0807833	2.8441236	20	3	1979–1999	0.37	M-v	3	Williams	35677	1979 QF ₂
1980 CJ	13.0	0.15	19990810	165.76601	211.04747	317.00577	13.58034	0.0291239	3.1399777	18	3	1980–1999	0.83	M-v	3	Williams	36324	1980 CJ
1980 FU	13.9	0.15	19990810	171.22034	241.82222	344.15726	6.83227	0.1139567	2.2928979	31	8	1966–1999	0.86	M-v	2	Williams	32509	1980 FU
1980 FZ ₂	13.5	0.15	19990810	79.55284	103.66267	177.80090	16.14186	0.1366088	3.1526733	49	4	1980–1999	0.66	M-v	1	Williams	36500	1980 FZ ₂
1980 RC	14.2	0.15	19990810	313.55576	240.82270	170.75380	11.03219	0.2652451	2.4289973	55	2	1980–1999	0.72	M-v	4	Williams	36324	1980 RC
1980 RL ₂	14.1	0.15	19990810	57.83149	8.23418	311.14380	1.73339	0.2124300	2.3993930	45	4	1980–1999	0.65	M-v	1	Williams	32298	1980 RL ₂
1980 TZ ₅	12.0	0.15	19990810	333.23549	0.74314	13.29033	13.34530	0.1535921	2.8463838	32	3	1980–1999	0.68	M-v	3	Williams	36324	1980 TZ ₅
1981 DT	13.5	0.15	19990810	160.29417	185.63133	329.35299	14.85859	0.0628350	3.0964475	44	3	1981–1999	0.77	M-v	3	Williams	36062	1981 DT
1981 DD ₁	14.8	0.15	19990810	273.32119	126.83310	332.42662	14.54507	0.1213941	2.5337366	39	2	1981–1999	0.79	M-v	4	Williams	36500	1981 DD ₁
1981 DS ₂	14.0	0.15	19990810	21.99573	28.61958	290.87146	10.33581	0.0758822	2.5860251	59	2	1981–1999	0.57	M-v	4	Williams	36500	1981 DS ₂
1981 DN ₃	15.4	0.15	19990810	28.56449	72.88143	254.60527	5.21903	0.2193316	2.2556467	64	3	1981–1999	0.63	M-v	3	Williams	36501	1981 DN ₃
1981 EO ₂	13.3	0.15	19990810	132.40502	15.64506	237.31399	8.39263	0.0296975	2.9895631	92	3	1981–1999	0.62	M-v	3	Williams	36501	1981 EO ₂
1981 EP ₂	13.0	0.15	19990810	16.75909	125.77673	214.95304	15.27695	0.1175189	3.0302789	76	3	1981–1999	0.72	M-v	2	Williams	36501	1981 EP ₂
1981 EA ₃	15.6	0.15	19990810	106.22513	352.64960	275.88774	5.76338	0.0876369	2.2320857	28	4	1981–1999	0.70	M-v	2	Williams	36501	1981 EA ₃
1981 EN ₃	15.6	0.15	19990810	259.23524	309.33450	208.26514	12.30027	0.1965998	2.4921741	20	3	1981–1999	0.83	M-v	3	Williams	26165	1981 EN ₃
1981 EO ₃	14.3	0.15	19990810	30.59754	342.88763	324.77397	15.15010	0.2016250	2.6017632	46	2	1981–1999	0.64	M-v	4	Williams	36501	1981 EO ₃
1981 EO ₄	14.4	0.15	19990810	31.63083	56.39873	293.38871	9.49439	0.1201191	2.9953272	36	4	1981–1999	0.73	M-v	1	Williams	36501	1981 EO ₄
1981 EU ₄	12.7	0.15	19990810	99.31047	31.32118	261.37168	9.00248	0.0738024	2.9879312	65	3	1981–1999	0.68	M-v	3	Williams	36501	1981 EU ₄
1981 ET ₅	14.7	0.15	19990810	341.36955	143.71578	213.26414	10.79751	0.0541051	2.5754996	48	3	1981–1999	0.75	M-v	3	Williams	36501	1981 ET ₅

1981 EW ₅	13.9	0.15	19990810	293.67021	189.36824	223.84765	12.62115	0.1508323	2.5520941	79	3	1981–1999	0.69	M-v	3	Williams	36501	1981 EW ₅
1981 EM ₆	14.1	0.15	19990810	346.69886	131.82708	214.76586	13.08299	0.1278426	2.5906902	61	3	1981–1999	0.73	M-v	3	Williams	36501	1981 EM ₆
1981 EN ₇	13.6	0.15	19990810	21.42786	27.82782	329.07127	9.29320	0.0997402	2.9889519	40	3	1981–1999	0.86	M-v	2	Williams	36501	1981 EN ₇
1981 EB ₈	14.9	0.15	19990810	0.87304	113.59448	319.78708	7.63973	0.1614720	2.4606554	28	3	1981–1999	0.89	M-v	4	Williams	32739	1981 EB ₈
1981 EU ₉	15.0	0.15	19990810	57.34888	87.93039	214.17736	4.49117	0.1836477	2.2498984	124	3	1981–1999	0.67	M-v	2	Williams	36501	1981 EU ₉
1981 EV ₉	16.1	0.15	19990810	272.71759	205.74843	286.51001	4.31816	0.0689170	2.1986587	22	4	1979–1999	0.94	M-v	2	Williams	25536	1981 EV ₉
1981 EE ₁₀	15.6	0.15	19990810	73.44879	3.48825	297.17780	2.96602	0.1203144	2.2340321	51	3	1981–1999	0.65	M-v	3	Williams	36501	1981 EE ₁₀
1981 EE ₁₁	15.4	0.15	19990810	104.75399	316.17621	320.16995	2.90512	0.1579061	2.2339359	50	5	1979–1999	0.77	M-v	2	Williams	36501	1981 EE ₁₁
1981 EG ₁₂	14.5	0.15	19990810	126.67744	7.50078	220.51650	7.29938	0.1436131	2.5759627	62	4	1981–1999	0.91	M-v	4	Williams	36501	1981 EG ₁₂
1981 EN ₁₃	14.8	0.15	19990810	206.00108	270.64804	261.20294	4.36061	0.0814880	2.2240505	44	2	1981–1999	0.69	M-v	4	Williams	36325	1981 EN ₁₃
1981 EF ₁₆	14.6	0.15	19990810	317.04815	217.06040	197.35582	10.85836	0.1995730	2.5277073	66	4	1955–1999	0.72	M-v	3	Williams	36501	1981 EF ₁₆
1981 EG ₁₆	14.3	0.15	19990810	170.30203	240.06218	343.33838	12.72576	0.1544915	2.5367116	33	5	1981–1999	0.72	M-v	1	Williams	35677	1981 EG ₁₆
1981 EO ₁₆	15.4	0.15	19990810	327.81045	140.80484	217.90494	7.96964	0.1959342	2.2630731	45	3	1981–1999	0.68	M-v	2	Williams	36501	1981 EO ₁₆
1981 ES ₁₆	15.8	0.15	19990810	112.89466	291.61114	316.79908	3.11153	0.1414507	2.5724208	22	3	1981–1999	0.68	M-v	3	Williams	29093	1981 ES ₁₆
1981 EL ₁₈	14.9	0.15	19990810	155.85218	25.02366	210.14595	3.34283	0.1452417	2.5347812	49	4	1981–1999	0.82	M-v	2	Williams	36501	1981 EL ₁₈
1981 EA ₁₉	14.6	0.15	19990810	322.82136	44.90903	7.51030	2.60846	0.1587260	2.5192110	88	4	1981–1999	0.61	M-v	3	Williams	36501	1981 EA ₁₉
1981 EZ ₁₉	15.2	0.15	19990810	80.36493	316.51757	342.48186	3.67855	0.0893116	2.5428574	32	3	1981–1999	0.66	M-v	3	Williams	29094	1981 EZ ₁₉
1981 EQ ₂₀	14.6	0.15	19990810	80.79342	123.30703	176.89093	2.46370	0.1213809	2.5445287	35	4	1981–1999	0.67	M-v	2	Williams	29940	1981 EQ ₂₀
1981 EK ₂₂	14.3	0.15	19990810	255.45184	259.47176	268.73686	0.74000	0.0566285	2.9202565	42	7	1981–1999	1.01	M-v	2	Williams	32739	1981 EK ₂₂
1981 ET ₂₃	15.3	0.15	19990810	347.43357	356.61051	6.42820	6.23415	0.1980705	2.2393217	101	4	1981–1999	0.66	M-v	2	Williams	36501	1981 ET ₂₃
1981 ER ₂₄	15.2	0.15	19990810	105.78026	81.93597	205.93376	1.76291	0.0940677	2.2186767	16	3	1978–1999	0.95	M-v	4	Williams	22697	1981 ER ₂₄
1981 EH ₂₇	14.5	0.15	19990810	194.30699	165.02537	358.35995	13.88517	0.1017000	2.5573880	61	4	1981–1999	0.73	M-v	3	Williams	36501	1981 EH ₂₇
1981 EK ₂₇	14.6	0.15	19990810	296.66680	73.78693	354.26146	5.39866	0.0843004	2.2267806	105	3	1981–1999	0.75	M-v	3	Williams	36501	1981 EK ₂₇
1981 ET ₂₇	14.3	0.15	19990810	160.34835	85.72059	167.84540	2.21365	0.0298771	2.9461612	32	8	1978–1999	0.82	M-v	1	Williams	32739	1981 ET ₂₇
1981 EV ₂₈	14.2	0.15	19990810	60.54081	116.72602	210.77403	10.18309	0.1040038	2.9839839	33	5	1978–1999	0.73	M-v	1	Williams	36501	1981 EV ₂₈
1981 EQ ₃₀	14.0	0.15	19990810	30.95664	316.98537	1.70998	12.65946	0.2644125	2.5916435	49	3	1981–1999	0.68	M-v	2	Williams	36501	1981 EQ ₃₀
1981 EO ₃₅	15.5	0.15	19990810	8.11805	72.44614	266.80206	5.14341	0.1347766	2.2499604	55	4	1979–1999	0.66	M-v	3	Williams	36502	1981 EO ₃₅
1981 EB ₃₆	15.5	0.15	19990810	326.81579	108.79313	3.95515	2.12836	0.1624316	2.4583064	27	3	1977–1999	0.80	M-v	4	Williams	21967	1981 EB ₃₆
1981 ET ₃₇	16.0	0.15	19990810	73.46631	60.49678	219.33176	3.59437	0.2442204	2.2628073	38	3	1981–1999	0.90	M-v	4	Williams	36502	1981 ET ₃₇
1981 EO ₃₈	14.3	0.15	19990810	45.67583	132.07762	189.46112	12.32026	0.0936599	2.5592271	46	3	1981–1999	0.73	M-v	2	Williams	36502	1981 EO ₃₈
1981 EU ₃₈	14.6	0.15	19990810	107.95355	43.59155	204.24802	3.17116	0.1338651	2.2521175	105	3	1981–1999	0.70	M-v	3	Williams	36502	1981 EU ₃₈
1981 EB ₄₃	15.7	0.15	19990810	147.94749	243.50444	9.21313	1.98301	0.0521247	2.5224717	20	4	1981–1999	0.69	M-v	4	Williams	29653	1981 EB ₄₃
1981 EE ₄₆	14.3	0.15	19990810	16.58766	7.54139	313.69147	4.76884	0.1460958	3.0676680	56	3	1978–1999	0.67	M-v	3	Williams	36502	1981 EE ₄₆
1981 ER ₄₇	14.1	0.15	19990810	14.03119	343.81674	36.19072	2.48130	0.1758957	2.5152373	45	6	1951–1999	0.65	M-v	3	Williams	36502	1981 ER ₄₇
1981 JR ₂	15.0	0.15	19990810	244.04786	169.85072	34.23225	3.51983	0.0714314	2.1919610	36	5	1981–1999	0.85	M-v	2	Williams	32739	1981 JR ₂
1981 QJ ₂	14.3	0.15	19990810	71.19792	210.67153	152.46219	5.76524	0.1888851	2.2730140	32	3	1981–1999	0.84	M-v	2	Williams	35678	1981 QJ ₂
1981 SE ₇	12.7	0.15	19990810	60.32835	270.61086	67.54694	6.55278	0.1195645	2.6742905	16	3	1981–1999	0.51	M-v	4	Williams	20922	1981 SE ₇
1981 UB ₂₃	13.5	0.15	19990810	358.09031	264.24721	129.74216	3.12045	0.1926313	2.7138077	36	4	1963–1999	0.66	M-v	4	Williams	36502	1981 UB ₂₃
1981 UL ₂₉	14.5	0.15	19990810	5.15004	130.85384	214.43818	14.08614	0.2266470	2.7336296	74	4	1981–1999	0.55	M-v	2	Williams	36502	1981 UL ₂₉
1981 VL	14.3	0.15	19990810	11.25775	4.34677	24.36289	3.76321	0.1567093	2.3266783	33	5	1981–1999	0.96	M-v	2	Williams	36502	1981 VL
1982 BJ ₁₃	13.9	0.15	19990810	112.34406	342.75852	300.62285	5.03241	0.0859402	2.3990736	26	4	1982–1999	0.61	M-v	2	Williams	32739	1982 BJ ₁₃
1982 RR	13.9	0.15	19990810	19.16209	186.66392	174.11142	14.26604	0.3018246	2.5872118	44	5	1982–1999	0.89	M-v	2	Williams	32299	1982 RR
1982 SQ ₇	12.7	0.15	19990810	105.30026	303.72944	353.03066	12.41450	0.1743982	3.0473194	52	4	1982–1999	0.69	M-v	1	Williams	33220	1982 SQ ₇
1982 ST ₇	14.5	0.15	19990810	17.56401	57.20172	332.42157	3.99885	0.2902912	2.5700664	23	4	1982–1999	0.60	M-v	2	Williams	36502	1982 ST ₇
1982 UA ₆	15.1	0.15	19990810	344.33363	35.53544	341.10888	3.91714	0.2932681	2.6316517	60	4	1982–1999	0.58	M-v	1	Williams	36502	1982 UA ₆
1982 UO ₆	12.9	0.15	19990810	134.92698	98.16385	238.31240	9.13713	0.1205307	3.0074703	23	4	1982–1999	0.84	M-v	2	Williams	34826	1982 UO ₆
1982 UH ₉	14.1	0.15	19990810	5.68290	343.86559	9.36887	7.88309	0.3413211	2.6221384	50	3	1982–1999	0.61	M-v	2	Williams	36325	1982 UH ₉
1982 UE ₁₂	13.4	0.15	19990810	44.97102	84.49353	328.66394	9.79373	0.0210447	2.5166693	80	8	1982–1999	0.69	M-v	2	Williams	33739	1982 UE ₁₂
1982 VU ₂	12.7	0.15	19990810	108.50825	209.24937	54.99749	14.30584	0.1405226	2.6361050	54	3	1982–1999	0.48	M-v	4	Williams	36502	1982 VU ₂
1982 VC ₃	14.3	0.15	19990810	42.22823	261.05892	75.71873	5.90281	0.2749866	2.6025206	39	5	1982–1999	0.87	M-v	1	Williams	32299	1982 VC ₃
1982 VY ₃	13.8	0.15	19990810	76.35830	198.04544	67.41888	6.53243	0.1354052	2.2913777	47	3	1982–1999	0.58	M-v	2	Williams	36502	1982 VY ₃
1983 AA	13.9	0.15	19990810	260.51393	202.52397	295.61284	24.18677	0.2416574	2.2975897	30	3	1983–1999	0.87	M-v	3	Williams	36502	1983 AA
1983 AC ₁	13.5	0.15	19990810	293.61035	357.63515	129.36320	28.49969	0.2013314	2.2750466	43	5	1983–1999	0.67	M-v	1	Williams	32510	1983 AC ₁

1983 RL	14.7	0.15	19990810	335.26562	29.01963	339.93533	19.07147	0.1177804	1.9192634	135	4	1983–1999	0.58	M-v	2	Williams	36502	1983 RL
1983 RL ₃	14.8	0.15	19990810	337.59487	67.28644	295.14411	3.06726	0.1426990	2.1698527	116	4	1976–1999	0.69	M-v	2	Williams	36502	1983 RL ₃
1983 RP ₃	14.3	0.15	19990810	98.68739	196.19252	130.75746	3.09982	0.0630905	2.4124527	71	4	1983–1999	0.64	M-v	2	Williams	35678	1983 RP ₃
1983 XE	14.1	0.15	19990810	327.39806	192.52373	237.56078	6.24290	0.1813387	2.5251575	65	6	1951–1999	0.71	M-v	3	Williams	36502	1983 XE
1984 CE	14.3	0.15	19990810	352.41497	292.76710	107.33692	13.31204	0.2440169	2.5662614	21	3	1984–1999	0.63	M-v	3	Williams	36502	1984 CE
1984 DQ	13.8	0.15	19990810	233.98894	251.06392	330.79643	11.07001	0.2270919	2.5500377	69	9	1980–1999	0.61	M-v	1	Williams	33333	1984 DQ
1984 EQ	12.5	0.15	19990810	10.31427	96.37593	346.58505	13.66763	0.1857248	3.0717572	23	3	1984–1999	0.88	M-v	2	Williams	34574	1984 EQ
1984 SE ₆	13.6	0.15	19990810	71.09071	318.05925	6.42831	3.28359	0.2041750	2.3493304	54	6	1984–1999	0.82	M-v	1	Williams	36502	1984 SE ₆
1985 PC	13.9	0.15	19990810	104.33205	86.86365	184.73228	3.22510	0.1102810	2.2429382	88	3	1985–1999	0.53	M-v	3	Williams	36502	1985 PC
1985 PH	13.8	0.15	19990810	349.30674	67.86801	316.67939	12.49712	0.2820937	2.7496429	27	3	1985–1999	0.64	M-v	3	Williams	36326	1985 PH
1985 RP	14.5	0.15	19990810	337.61885	226.03023	166.92810	8.00978	0.2301059	2.2930602	47	5	1978–1999	0.66	M-v	3	Williams	36502	1985 RP
1985 TS	14.2	0.15	19990810	4.78084	359.48890	5.41028	3.78911	0.1247792	2.2945705	84	5	1978–1999	0.57	M-v	3	Williams	36502	1985 TS
1985 UJ ₃	14.5	0.15	19990810	4.30569	222.22884	107.86075	1.26899	0.2413385	2.3174507	126	5	1978–1999	0.72	M-v	2	Williams	36503	1985 UJ ₃
1985 VE	13.5	0.15	19990810	229.04919	340.75960	164.63694	4.83176	0.1012102	2.3274579	69	7	1985–1999	0.54	M-v	1	Williams	36503	1985 VE
1986 PY	14.9	0.15	19990810	353.52717	195.44644	146.20020	7.97704	0.2470707	2.1886924	102	3	1986–1999	0.64	M-v	2	Williams	36503	1986 PY
1986 PL ₁	12.8	0.15	19990810	100.26100	183.64696	128.33555	6.30121	0.1515385	3.2112923	63	3	1986–1999	0.81	M-v	4	Williams	33066	1986 PL ₁
1986 TR	13.7	0.15	19990810	357.64024	89.67824	251.54510	9.76459	0.3055678	2.6712550	109	3	1986–1999	0.51	M-v	2	Williams	36503	1986 TR
1986 TV ₆	13.5	0.15	19990810	106.59087	355.97006	325.85394	7.44340	0.1904715	2.5568729	83	4	1986–1999	0.66	M-v	2	Williams	36503	1986 TV ₆
1986 TT ₁₁	13.4	0.15	19990810	78.39237	329.07833	4.84585	13.93400	0.1904714	2.5660808	44	6	1986–1999	0.74	M-v	2	Williams	33541	1986 TT ₁₁
1986 WZ	13.7	0.15	19990810	345.92862	129.64019	256.16272	5.66077	0.1174225	2.6928225	36	3	1986–1999	0.76	M-v	4	Williams	36503	1986 WZ
1987 BF	14.3	0.15	19990810	139.01809	301.74443	293.41517	2.06856	0.1280127	2.2803113	34	3	1987–1999	0.83	M-v	4	Williams	36503	1987 BF
1987 CH	14.3	0.15	19990810	309.06775	351.67403	147.31758	5.43044	0.0747102	2.2030180	53	4	1987–1999	0.80	M-v	2	Williams	36503	1987 CH
1987 OO	14.3	0.15	19990810	345.81682	80.88654	243.38070	10.67858	0.2296412	2.5402310	30	2	1987–1999	0.65	M-v	3	Williams	35679	1987 OO
1987 SL ₃	12.6	0.15	19990810	349.46799	88.10307	317.85705	9.96412	0.0923310	3.1711107	56	4	1982–1999	0.57	M-v	2	Williams	36503	1987 SL ₃
1987 SP ₁₂	13.3	0.15	19990810	50.77940	187.26811	186.43580	2.72358	0.2661947	3.1065355	85	4	1976–1999	0.70	M-v	2	Williams	36503	1987 SP ₁₂
1987 XC	13.7	0.15	19990810	359.54362	285.18104	55.51570	16.52254	0.2655351	2.5576052	61	6	1987–1999	0.80	M-v	2	Williams	36503	1987 XC
1987 YS ₁	13.0	0.15	19990810	301.50284	304.98666	149.40780	13.02729	0.1219310	2.5572692	36	6	1954–1999	0.62	M-v	1	Williams	36503	1987 YS ₁
1988 BO ₃	13.9	0.15	19990810	297.05655	263.78259	195.05939	8.30583	0.1260789	2.5775439	41	2	1988–1999	0.62	M-v	5	Williams	36326	1988 BO ₃
1988 BY ₃	14.1	0.15	19990810	342.45794	297.84329	164.22027	6.98963	0.1095598	2.5156116	65	7	1978–1999	0.74	M-v	3	Williams	36503	1988 BY ₃
1988 BM ₄	14.2	0.15	19990810	294.97259	182.23450	249.46050	4.10021	0.2034650	2.6195399	66	2	1988–1999	0.52	M-v	4	Williams	36503	1988 BM ₄
1988 BF ₅	13.9	0.15	19990810	186.94537	329.88016	243.99417	10.68598	0.1356685	2.6654312	37	3	1988–1999	0.75	M-v	3	Williams	32443	1988 BF ₅
1988 BG ₅	14.2	0.15	19990810	127.42560	36.00482	240.70353	12.56496	0.1460303	2.6678288	35	3	1988–1999	0.67	M-v	3	Williams	32740	1988 BG ₅
1988 BH ₅	13.4	0.15	19990810	265.57716	268.38298	264.91506	11.61752	0.1161102	2.5801276	36	7	1984–1999	0.86	M-v	2	Williams	36503	1988 BH ₅
1988 BJ ₅	13.4	0.15	19990810	217.10042	226.38168	281.20196	12.04087	0.0643163	2.7122399	49	2	1988–1999	0.52	M-v	3	Williams	36503	1988 BJ ₅
1988 CO ₇	15.1	0.15	19990810	1.82189	288.63678	88.73478	1.06177	0.0672432	2.1212772	74	4	1988–1999	0.66	M-v	3	Williams	36503	1988 CO ₇
1988 DE	13.2	0.15	19990810	263.99017	174.10253	352.92407	13.27884	0.0968303	2.5814483	60	4	1988–1999	0.71	M-v	2	Williams	34486	1988 DE
1988 FD ₃	14.3	0.15	19990810	139.59000	269.33976	327.94407	4.22232	0.0989734	2.1924705	54	3	1988–1999	0.64	M-v	3	Williams	36503	1988 FD ₃
1988 FE ₃	13.4	0.15	19990810	151.84764	316.80165	248.73648	1.48544	0.1011539	2.7902245	58	3	1988–1999	0.58	M-v	4	Williams	36503	1988 FE ₃
1988 PR	14.6	0.15	19990810	55.90071	110.87412	170.69255	6.83489	0.0403155	2.3568033	84	3	1988–1999	0.64	M-v	2	Williams	36503	1988 PR
1988 PW ₂	13.9	0.15	19990810	117.72319	80.66280	176.17565	10.59271	0.0302596	2.9928000	33	3	1988–1999	0.67	M-v	3	Williams	36503	1988 PW ₂
1988 QF	15.2	0.15	19990810	314.42926	229.59736	156.71036	23.87579	0.0945996	1.9615378	93	3	1988–1999	0.50	M-v	2	Williams	36326	1988 QF
1988 QZ	15.4	0.15	19990810	349.04823	9.00140	336.06944	12.54645	0.3403462	2.3867977	72	2	1988–1999	0.57	M-v	2	Williams	36503	1988 QZ
1988 RO ₂	13.3	0.15	19990810	18.71326	54.42079	318.69619	9.78172	0.1205200	3.0181456	38	4	1988–1999	0.72	M-v	2	Williams	36503	1988 RO ₂
1988 RJ ₃	15.0	0.15	19990810	27.92236	292.70728	357.21646	2.33208	0.1559875	2.3994605	112	3	1988–1999	0.66	M-v	3	Williams	36504	1988 RJ ₃
1988 RT ₃	15.7	0.15	19990810	333.13464	11.20506	7.67303	2.46067	0.2304344	2.3836280	56	3	1988–1999	0.66	M-v	3	Williams	36504	1988 RT ₃
1988 RP ₄	13.8	0.15	19990810	285.41989	96.16274	333.91464	5.20558	0.1213759	2.3661738	88	3	1988–1999	0.68	M-v	3	Williams	36504	1988 RP ₄
1988 RZ ₅	14.3	0.15	19990810	2.29631	166.15773	170.80282	3.37013	0.1137765	2.3636679	162	4	1988–1999	0.71	M-v	2	Williams	36504	1988 RZ ₅
1988 RH ₆	14.4	0.15	19990810	63.40336	52.23633	318.79444	7.00598	0.1306134	2.2449612	48	6	1958–1999	0.90	M-v	2	Williams	34004	1988 RH ₆
1988 RJ ₆	15.3	0.15	19990810	318.10005	70.14807	326.49455	4.20288	0.2385905	2.3809530	99	3	1988–1999	0.65	M-v	2	Williams	36504	1988 RJ ₆
1988 RL ₆	14.4	0.15	19990810	347.04519	180.40254	160.01429	7.33159	0.1485561	2.3925114	105	3	1988–1999	0.60	M-v	2	Williams	36504	1988 RL ₆
1988 RO ₆	14.2	0.15	19990810	327.25835	32.53106	350.02267	6.21088	0.1343954	2.3586116	114	2	1988–1999	0.53	M-v	3	Williams	36504	1988 RO ₆
1988 RU ₉	13.2	0.15	19990810	297.58297	244.50194	167.69701	15.62328	0.0880986	3.1112164	72	2	1988–1999	0.53	M-v	4	Williams	36504	1988 RU ₉
1988 RW ₁₀	14.7	0.15	19990810	347.26105	35.00991	335.85452	0.46228	0.1528974	3.0755355	67	3	1988–1999	0.59	M-v	4	Williams	36504	1988 RW ₁₀

1988 RL ₁₂	14.4	0.15	19990810	336.44013	195.97534	203.62593	0.38232	0.1820567	3.0765960	55	2	1988–1999	0.63	M-v	4	Williams	36327	1988 RL ₁₂
1988 SB ₂	14.0	0.15	19990810	65.14936	248.80385	111.60482	6.70935	0.1334770	2.2629405	45	3	1988–1999	0.68	M-v	3	Williams	36504	1988 SB ₂
1988 TR ₂	12.9	0.15	19990810	350.29687	38.30289	26.47829	15.61101	0.2706053	3.0456275	47	3	1988–1999	0.85	M-v	3	Marsden	36504	1988 TR ₂
1988 VA	14.2	0.15	19990810	301.27644	182.33229	219.03231	11.83420	0.1966872	2.4309287	59	3	1988–1999	0.73	M-v	3	Williams	36504	1988 VA
1988 VV	14.5	0.15	19990810	355.81498	177.96001	225.20431	4.17941	0.1469109	2.3477705	52	3	1988–1999	0.82	M-v	2	Williams	36504	1988 VV
1988 VA ₁	15.6	0.15	19990810	322.94723	125.31874	267.02661	10.15348	0.2674310	2.4055402	34	2	1988–1999	0.63	M-v	4	Williams	36504	1988 VA ₁
1988 VC ₂	13.2	0.15	19990810	343.84059	341.51443	46.56138	6.06329	0.1818261	3.1542666	81	3	1988–1999	0.60	M-v	3	Williams	36504	1988 VC ₂
1988 VH ₂	13.8	0.15	19990810	343.90050	289.88422	75.51092	9.55975	0.2157620	2.4161966	44	3	1988–1999	0.74	M-v	3	Williams	36504	1988 VH ₂
1988 VL ₂	13.2	0.15	19990810	268.75577	222.04856	236.29527	10.45066	0.0962836	2.4236167	94	4	1988–1999	0.75	M-v	2	Williams	36504	1988 VL ₂
1988 VX ₂	12.4	0.15	19990810	51.47684	87.59633	223.15112	14.17705	0.0819033	3.1700414	73	4	1988–1999	0.59	M-v	2	Williams	36504	1988 VX ₂
1988 XT ₁	12.4	0.15	19990810	19.28533	6.77382	41.76547	18.03085	0.3018202	3.0511941	31	4	1988–1999	0.69	M-v	1	Williams	33542	1988 XT ₁
1989 AF ₃	14.4	0.15	19990810	339.80189	29.12111	110.75014	6.73245	0.1851363	2.3256348	36	5	1988–1999	0.78	M-v	2	Williams	33067	1989 AF ₃
1989 BV ₁	14.2	0.15	19990810	272.19115	182.28108	336.82022	1.90968	0.1359229	2.4132087	56	5	1989–1999	0.82	M-v	2	Williams	33334	1989 BV ₁
1989 CX	13.9	0.15	19990810	348.89139	145.98432	328.26484	24.36374	0.2294822	2.3459786	71	4	1989–1999	0.72	M-v	2	Williams	33542	1989 CX
1989 CP ₂	13.9	0.15	19990810	114.86057	336.81934	273.66814	8.77714	0.1609456	2.5486935	45	3	1989–1999	0.55	M-v	4	Williams	36504	1989 CP ₂
1989 DB	13.7	0.15	19990810	288.02756	150.81095	35.40422	3.33373	0.1737543	2.3727263	64	4	1978–1999	0.82	M-v	3	Williams	33334	1989 DB
1989 DK	12.7	0.15	19990810	206.82564	175.13556	298.60293	11.89320	0.1024686	2.6042915	56	3	1989–1999	0.53	M-v	3	Williams	36064	1989 DK
1989 EJ ₆	13.8	0.15	19990810	295.15913	348.73566	136.04362	0.47506	0.0918207	3.2550344	55	5	1984–1999	0.78	M-v	2	Williams	35059	1989 EJ ₆
1989 GR ₃	14.5	0.15	19990810	131.12035	14.29454	256.96559	3.89060	0.2483424	2.5707472	52	5	1952–1999	0.66	M-v	1	Williams	33067	1989 GR ₃
1989 GJ ₄	13.8	0.15	19990810	217.33783	286.21476	237.23816	3.74668	0.1140928	2.5565625	97	4	1989–1999	0.58	M-v	1	Williams	36504	1989 GJ ₄
1989 GQ ₆	13.0	0.15	19990810	144.47617	207.19987	118.72577	13.12475	0.2164290	2.4833307	29	5	1989–1999	0.63	M-v	2	Williams	35680	1989 GQ ₆
1989 HA	13.2	0.15	19990810	139.69833	124.99428	142.97029	15.08077	0.1641168	2.5813103	48	4	1989–1999	0.63	M-v	2	Williams	36504	1989 HA
1989 PF	13.4	0.15	19990810	70.10962	190.73726	147.51845	18.70694	0.2410820	2.7433862	41	4	1984–1999	0.77	M-v	2	Williams	33543	1989 PF
1989 RX	12.8	0.15	19990810	68.65374	131.51775	237.14768	7.16980	0.2003484	2.6889589	55	3	1989–1999	0.67	M-v	2	Williams	35681	1989 RX
1989 SD	14.3	0.15	19990810	40.51941	343.44619	30.22946	2.35926	0.1492010	2.1520066	31	4	1989–1999	0.61	M-v	2	Williams	36504	1989 SD
1989 SR	12.8	0.15	19990810	326.31514	130.50895	240.15851	8.88494	0.0985064	2.9874341	82	4	1989–1999	0.71	M-v	3	Williams	36504	1989 SR
1989 SB ₁	14.1	0.15	19990810	251.74102	120.35288	355.40007	6.40034	0.0910817	2.2419112	84	2	1989–1999	0.63	M-v	4	Williams	36504	1989 SB ₁
1989 SF ₁	13.3	0.15	19990810	184.39589	128.84577	160.49600	8.00078	0.1437426	2.6208436	38	6	1989–1999	0.92	M-v	2	Williams	33741	1989 SF ₁
1989 SZ ₄	14.5	0.15	19990810	327.19583	22.80848	55.25561	3.70827	0.0710016	2.1834997	32	3	1989–1999	0.58	M-v	2	Williams	30091	1989 SZ ₄
1989 TR ₂	12.2	0.15	19990810	313.49968	29.08400	51.95871	13.83893	0.1298926	2.9053226	43	2	1989–1999	0.30	M-v	3	Williams	36327	1989 TR ₂
1989 TN ₁₅	15.3	0.15	19990810	327.08405	32.62071	345.78713	2.98535	0.1538286	2.2470082	67	3	1989–1999	0.55	M-v	3	Williams	36327	1989 TN ₁₅
1989 TN ₁₆	14.5	0.15	19990810	211.12527	325.50123	190.63814	2.28683	0.0812572	2.2228038	91	4	1989–1999	0.53	M-v	1	Williams	36505	1989 TN ₁₆
1989 UN	14.0	0.15	19990810	38.51252	6.31928	13.12536	3.48004	0.1241405	2.1634952	39	3	1989–1999	0.79	M-v	4	Williams	36505	1989 UN
1989 UA ₁	14.5	0.15	19990810	9.39049	0.51164	4.44118	5.26801	0.1863498	2.2075621	34	3	1989–1999	0.80	M-v	3	Williams	36505	1989 UA ₁
1989 US ₄	13.3	0.15	19990810	47.54509	184.36294	223.22753	1.23200	0.0989364	2.7361457	74	4	1989–1999	0.68	M-v	1	Williams	35681	1989 US ₄
1989 VA	17.8	0.15	19990810	57.98270	2.78548	225.65174	28.78875	0.5947751	0.7286615	164	6	1989–1999	0.60	M-v	3	Williams	36505	1989 VA
1989 WB ₃	13.4	0.15	19990810	29.70903	279.93520	67.99300	10.45728	0.0564966	2.9925501	64	4	1989–1999	0.64	M-v	3	Williams	36505	1989 WB ₃
1989 YC ₆	14.9	0.15	19990810	348.02926	223.24964	160.34763	5.65433	0.1711109	2.2804434	55	4	1989–1999	0.60	M-v	2	Williams	36505	1989 YC ₆
1989 YE ₆	14.2	0.15	19990810	315.37888	193.30151	256.27803	7.36983	0.0778200	2.2563206	38	3	1989–1999	0.69	M-v	3	Williams	36505	1989 YE ₆
1990 BO	11.5	0.15	19990810	329.48487	89.57535	305.17765	15.69731	0.1055707	3.1853398	106	3	1990–1999	0.60	M-v	3	Williams	36505	1990 BO
1990 BA ₂	12.7	0.15	19990810	291.30357	189.92405	302.24085	10.52444	0.1464290	3.0441473	53	3	1990–1999	0.83	M-v	3	Williams	36505	1990 BA ₂
1990 BC ₂	13.9	0.15	19990810	159.87915	313.70528	203.80615	5.98111	0.0693160	2.4280035	111	4	1990–1999	0.61	M-v	2	Williams	36505	1990 BC ₂
1990 CE	15.1	0.15	19990810	274.85887	334.78576	160.27044	5.38012	0.0952228	2.2795641	20	4	1990–1999	0.57	M-v	2	Williams	32512	1990 CE
1990 DW	12.8	0.15	19990810	285.45155	98.47637	331.71485	6.39496	0.0589442	2.3895609	49	2	1990–1999	0.62	M-v	4	Williams	36327	1990 DW
1990 DZ	13.1	0.15	19990810	290.59155	218.78557	338.00437	9.58971	0.1723178	2.9374067	13	4	1990–1999	0.55	M-v	3	Williams	25440	1990 DZ
1990 DD ₂	14.5	0.15	19990810	169.52798	49.18936	180.78720	3.13567	0.1565487	2.3373988	27	6	1976–1999	0.55	M-v	1	Williams	32512	1990 DD ₂
1990 DU ₄	14.3	0.15	19990810	287.28584	269.65697	186.80495	2.63700	0.1443174	2.3390071	16	3	1990–1999	0.78	M-v	4	Williams	29096	1990 DU ₄
1990 EN ₄	13.4	0.15	19990810	341.94999	147.64261	337.36608	7.98122	0.0338043	2.9818453	34	5	1990–1999	0.78	M-v	2	Williams	34005	1990 EN ₄
1990 ES ₄	14.8	0.15	19990810	121.15750	344.63510	258.67381	1.45633	0.1593392	2.4311611	48	3	1990–1999	0.75	M-v	5	Williams	36505	1990 ES ₄
1990 EU ₄	15.1	0.15	19990810	253.52021	178.37206	337.95551	3.94361	0.0787275	2.3198577	30	4	1981–1999	0.71	M-v	3	Williams	29942	1990 EU ₄
1990 FH	14.2	0.15	19990810	239.13417	145.67714	50.60431	24.53837	0.2273092	2.3058894	36	4	1990–1999	0.55	M-v	2	Williams	30289	1990 FH
1990 FK ₁	12.3	0.15	19990810	196.93062	68.36227	175.24583	11.45628	0.1700306	3.1776551	49	5	1984–1999	0.64	M-v	1	Williams	36505	1990 FK ₁
1990 FD ₃	12.1	0.15	19990810	155.29427	99.12910	158.50322	15.67729	0.0357286	3.1467443	40	3	1990–1999	0.69	M-v	3	Williams	36505	1990 FD ₃

1990 GD	14.4	0.15	19990810	102.51308	252.95838	351.20797	7.49764	0.1042065	2.4492279	66	3	1990–1999	0.49	M-v	2	Williams	36505	1990 GD
1990 GN	14.9	0.15	19990810	230.10999	174.40441	357.57043	1.70878	0.1619101	2.3358174	67	6	1976–1999	0.65	M-v	4	Williams	36505	1990 GN
1990 HE	14.5	0.15	19990810	86.18181	255.89977	35.61342	24.80312	0.1150774	1.9412336	40	3	1990–1999	0.71	M-v	2	Williams	36505	1990 HE
1990 HP	14.9	0.15	19990810	157.40234	188.07474	32.22903	21.55668	0.0504845	1.9410854	73	5	1980–1999	0.62	M-v	2	Williams	36505	1990 HP
1990 KR	14.4	0.15	19990810	82.02826	83.52024	182.07219	11.70143	0.2277675	2.5448543	64	3	1990–1999	0.66	M-v	3	Williams	36505	1990 KR
1990 OZ	14.0	0.15	19990810	43.58113	94.12229	182.22405	12.81911	0.1584624	2.6804306	94	3	1990–1999	0.63	M-v	2	Williams	36505	1990 OZ
1990 OB ₄	13.6	0.15	19990810	11.91820	84.96016	271.66015	11.47738	0.2474735	2.6478370	45	4	1990–1999	0.59	M-v	1	Williams	36505	1990 OB ₄
1990 OG ₄	14.1	0.15	19990810	346.85156	84.34214	266.85090	11.05331	0.2850637	2.6965407	94	2	1990–1999	0.62	M-v	3	Williams	36505	1990 OG ₄
1990 OS ₄	13.1	0.15	19990810	236.28884	235.05238	269.45400	14.03691	0.0540271	2.5605486	48	4	1989–1999	0.60	M-v	1	Williams	36505	1990 OS ₄
1990 OB ₅	13.1	0.15	19990810	0.39819	66.96767	259.68994	11.75733	0.1884791	2.6872376	99	3	1990–1999	0.50	M-v	2	Williams	36505	1990 OB ₅
1990 QE ₄	13.9	0.15	19990810	53.81706	181.20205	157.42475	14.34600	0.2822326	2.5860974	30	3	1990–1999	0.65	M-v	2	Williams	32444	1990 QE ₄
1990 QT ₄	13.3	0.15	19990810	1.60251	47.20462	1.74147	15.22031	0.0963380	2.5738876	28	7	1986–1999	0.48	M-v	1	Williams	30289	1990 QT ₄
1990 QY ₅	13.9	0.15	19990810	358.45582	26.27704	332.80612	12.53906	0.1882983	2.6826374	56	2	1990–1999	0.62	M-v	3	Williams	36505	1990 QY ₅
1990 QE ₆	14.4	0.15	19990810	39.47952	319.43593	352.96249	18.93477	0.2220546	2.6665679	26	3	1977–1999	0.46	M-v	3	Williams	36505	1990 QE ₆
1990 QE ₇	14.1	0.15	19990810	333.43987	319.38907	142.95774	2.13642	0.1209932	2.5343338	84	5	1990–1999	0.71	M-v	2	Williams	36505	1990 QE ₇
1990 QP ₈	14.5	0.15	19990810	3.52190	75.20338	335.04653	0.65736	0.0948656	2.5623517	33	4	1978–1999	0.44	M-v	2	Williams	32742	1990 QP ₈
1990 RT ₂	13.1	0.15	19990810	352.61327	15.42431	356.85341	12.02702	0.1724197	2.7001425	66	5	1981–1999	0.55	M-v	2	Williams	36506	1990 RT ₂
1990 RJ ₅	14.2	0.15	19990810	359.96880	184.14140	267.41888	2.80561	0.1477506	2.5278201	51	6	1990–1999	0.63	M-v	2	Williams	36065	1990 RJ ₅
1990 RN ₈	14.4	0.15	19990810	323.64622	220.68331	168.38573	3.09450	0.0898433	2.7099494	69	3	1990–1999	0.60	M-v	2	Williams	36506	1990 RN ₈
1990 RF ₁₇	13.3	0.15	19990810	12.89227	225.87578	193.21243	13.44721	0.1607155	2.5745408	46	4	1986–1999	0.71	M-v	2	Williams	36506	1990 RF ₁₇
1990 SS ₃	13.6	0.15	19990810	353.98930	34.80289	2.56427	11.36503	0.3119880	2.6762807	27	4	1933–1999	0.76	M-v	2	Williams	36327	1990 SS ₃
1990 SX ₃	13.4	0.15	19990810	49.34746	60.17944	308.31471	12.31874	0.2180980	2.5849564	44	3	1990–1999	0.49	M-v	2	Williams	36506	1990 SX ₃
1990 SY ₃	12.8	0.15	19990810	19.90079	85.58653	275.20013	11.10192	0.2007863	2.6675624	20	3	1990–1999	0.51	M-v	3	Williams	36065	1990 SY ₃
1990 SE ₅	12.8	0.15	19990810	55.74821	291.53961	52.37184	4.49218	0.1751493	3.9920058	46	3	1990–1999	0.61	M-v	4	Williams	32922	1990 SE ₅
1990 SR ₆	14.3	0.15	19990810	54.46382	309.98135	69.55725	2.14367	0.1726414	2.5488615	81	8	1978–1999	0.66	M-v	2	Williams	33544	1990 SR ₆
1990 SN ₈	13.4	0.15	19990810	177.44737	143.06893	59.94443	4.13581	0.0380809	2.6519824	43	3	1990–1999	0.45	M-v	3	Williams	36506	1990 SN ₈
1990 SQ ₈	15.1	0.15	19990810	6.58762	305.96187	116.94669	5.43131	0.2913381	2.6000402	25	5	1990–1999	0.53	M-v	1	Williams	36065	1990 SQ ₈
1990 SW ₈	13.8	0.15	19990810	321.20718	206.02238	160.69067	12.06225	0.1358813	2.7885336	63	3	1990–1999	0.65	M-v	3	Williams	36327	1990 SW ₈
1990 SX ₈	12.8	0.15	19990810	256.45692	282.19996	168.51670	17.26185	0.1058845	2.7696083	64	4	1985–1999	0.60	M-v	2	Williams	36506	1990 SX ₈
1990 ST ₁₄	14.2	0.15	19990810	1.74185	342.30376	50.71406	6.82257	0.2393318	2.6652426	33	3	1990–1999	0.44	M-v	3	Williams	36506	1990 ST ₁₄
1990 SU ₁₅	14.1	0.15	19990810	13.29311	142.56318	179.14586	12.52228	0.2194817	2.7031128	109	3	1990–1999	0.68	M-v	2	Williams	36506	1990 SU ₁₅
1990 SL ₂₈	13.5	0.15	19990810	63.62144	0.22986	320.90616	1.24899	0.1949603	2.6409554	64	10	1964–1999	0.61	M-v	1	Williams	32302	1990 SL ₂₈
1990 TJ	13.6	0.15	19990810	48.21502	349.78735	56.33147	4.89454	0.0651716	2.5295113	88	7	1978–1999	0.68	M-v	2	Williams	33742	1990 TJ
1990 TT	13.6	0.15	19990810	319.64250	24.01134	12.46661	8.50859	0.0587343	2.7678489	49	4	1986–1999	0.67	M-v	2	Williams	36328	1990 TT
1990 TE ₁	13.9	0.15	19990810	37.57723	343.13446	19.23438	13.54888	0.2993706	2.6413893	34	5	1971–1999	0.86	M-v	2	Williams	29942	1990 TE ₁
1990 TZ ₁	13.7	0.15	19990810	350.87546	95.65043	279.28745	2.27812	0.0884211	2.7219754	109	3	1990–1999	0.53	M-v	3	Williams	36506	1990 TZ ₁
1990 TF ₆	15.1	0.15	19990810	319.64405	87.47978	328.59883	8.79325	0.3429066	2.7201744	24	2	1990–1999	0.54	M-v	4	Williams	36328	1990 TF ₆
1990 TD ₁₂	14.5	0.15	19990810	329.81834	172.03646	252.29248	2.89956	0.1998827	2.6846134	54	4	1985–1999	0.45	M-v	1	Williams	36506	1990 TD ₁₂
1990 TW ₁₂	13.5	0.15	19990810	357.26900	15.87514	39.08257	13.73569	0.1721725	2.6876843	19	4	1990–1999	0.68	M-v	2	Williams	30654	1990 TW ₁₂
1990 TJ ₁₅	13.4	0.15	19990810	332.89403	69.94069	307.65920	8.07887	0.1776850	2.7749522	58	2	1990–1999	0.66	M-v	4	Williams	36506	1990 TJ ₁₅
1990 UA ₁	12.3	0.15	19990810	321.07043	220.26198	236.76163	12.07922	0.1276713	2.6735316	57	4	1981–1999	0.75	M-v	3	Williams	36506	1990 UA ₁
1990 UB ₄	13.8	0.15	19990810	323.02943	240.20169	185.87170	10.14650	0.1298809	2.7313665	42	6	1987–1999	0.84	M-v	1	Williams	36506	1990 UB ₄
1990 UO ₄	14.0	0.15	19990810	24.52162	133.79332	188.79664	12.08770	0.1420559	2.7745017	80	3	1990–1999	0.63	M-v	2	Williams	36506	1990 UO ₄
1990 VE	12.9	0.15	19990810	325.99543	345.26850	70.57445	6.92955	0.1813241	2.7635042	50	2	1990–1999	0.59	M-v	4	Williams	36328	1990 VE
1990 VQ ₅	13.5	0.15	19990810	249.48428	74.73820	133.36340	8.74007	0.0629760	2.5906016	49	5	1990–1999	0.80	M-v	2	Williams	36506	1990 VQ ₅
1990 VF ₈	13.6	0.15	19990810	11.57631	328.22296	25.08185	8.33247	0.1813203	2.7376895	82	4	1990–1999	0.52	M-v	1	Williams	36506	1990 VF ₈
1990 WZ	13.9	0.15	19990810	296.20621	244.90274	190.63195	8.91562	0.0579217	2.7934115	71	4	1990–1999	0.45	M-v	2	Williams	36506	1990 WZ
1990 WP ₁	14.2	0.15	19990810	353.63834	255.15471	101.25815	10.19857	0.1700701	2.7982657	37	3	1990–1999	0.84	M-v	3	Williams	36506	1990 WP ₁
1990 WS ₁	13.4	0.15	19990810	253.01133	324.44907	206.18424	12.48807	0.1185346	2.6855833	48	3	1990–1999	0.61	M-v	3	Williams	36506	1990 WS ₁
1990 WU ₁	14.4	0.15	19990810	335.82854	193.74648	183.36704	8.45025	0.2335641	2.7941609	74	4	1985–1999	0.43	M-v	1	Williams	36506	1990 WU ₁
1990 WO ₄	14.8	0.15	19990810	324.68214	270.79554	202.15763	4.62415	0.2362061	2.6853404	26	3	1990–1999	0.63	M-v	3	Williams	36506	1990 WO ₄
1991 AG ₂	13.9	0.15	19990810	355.23787	242.88815	153.98533	14.76181	0.3027973	2.7153889	29	4	1981–1999	0.91	M-v	3	Williams	36506	1991 AG ₂
1991 BB	16.0	0.15	19990810	113.96785	322.81783	295.04040	38.48082	0.2723380	1.1863076	135	5	1991–1999	0.65	M-v	2	Williams	28316	1991 BB

1991 BZ	13.8	0.15	19990810	335.05226	126.79576	289.00223	5.99176	0.2458934	2.8088926	45	3	1980–1999	0.73	M-v	3	Williams	36506	1991 BZ
1991 CL	12.4	0.15	19990810	277.22008	50.38228	128.66244	13.92916	0.1573643	2.7648920	37	5	1989–1999	0.74	M-v	2	Williams	36506	1991 CL
1991 CM	12.4	0.15	19990810	108.45178	115.25423	128.17656	16.97485	0.1118218	3.1235805	51	3	1991–1999	0.77	M-v	3	Williams	36506	1991 CM
1991 DG ₁	13.3	0.15	19990810	253.36327	272.01845	174.35957	4.96320	0.1619411	3.0908796	32	3	1962–1999	0.57	M-v	2	Williams	36506	1991 DG ₁
1991 EJ	10.4	0.15	19990810	52.18870	95.33724	280.61695	22.85023	0.1232980	5.2146250	41	5	1953–1999	0.57	M-v	0	Williams	35682	1991 EJ
1991 EM	13.3	0.15	19990810	53.39018	28.13715	280.79047	20.14977	0.1331685	3.2044749	37	3	1991–1999	0.70	M-v	3	Williams	36506	1991 EM
1991 EF ₂	14.1	0.15	19990810	184.40024	17.97061	175.93261	5.42428	0.0559743	2.1977435	82	3	1991–1999	0.54	M-v	3	Williams	36506	1991 EF ₂
1991 EY ₃	13.8	0.15	19990810	229.01279	240.17699	317.09151	1.33499	0.1330540	2.8610539	60	5	1991–1999	0.68	M-v	1	Williams	33069	1991 EY ₃
1991 EK ₄	15.1	0.15	19990810	188.70208	37.69863	185.89001	2.83467	0.0797382	2.1489312	31	3	1991–1999	0.65	M-v	3	Williams	36506	1991 EK ₄
1991 FG	13.7	0.15	19990810	304.56547	325.99913	204.41892	13.57996	0.3427768	2.7504711	43	5	1987–1999	0.80	M-v	2	Williams	36506	1991 FG
1991 FH	12.6	0.15	19990810	180.45502	331.48686	207.28075	19.44678	0.1410329	3.1720868	36	3	1991–1999	0.68	M-v	3	Williams	36507	1991 FH
1991 FL ₂	13.2	0.15	19990810	48.37150	46.83207	347.70301	11.07463	0.0920672	2.8124734	74	5	1984–1999	0.60	M-v	1	Williams	35683	1991 FL ₂
1991 GW ₁	13.8	0.15	19990810	169.26045	335.13487	219.57620	24.54998	0.1929995	2.2733399	49	4	1987–1999	0.79	M-v	3	Williams	36507	1991 GW ₁
1991 GA ₂	13.9	0.15	19990810	18.02921	115.61284	186.18589	22.55535	0.2535742	2.4312608	58	2	1991–1999	0.50	M-v	3	Williams	36507	1991 GA ₂
1991 GE ₂	13.6	0.15	19990810	25.66387	182.45115	101.22002	14.18726	0.1939483	2.4276409	51	4	1991–1999	0.84	M-v	2	Williams	36507	1991 GE ₂
1991 GR ₂	14.2	0.15	19990810	43.77345	295.15254	18.57450	2.21281	0.1881102	2.3012992	124	5	1971–1999	0.59	M-v	2	Williams	36507	1991 GR ₂
1991 GV ₃	14.6	0.15	19990810	69.58608	270.30078	32.32930	5.64113	0.1724825	2.2772492	68	3	1991–1999	0.65	M-v	3	Williams	36507	1991 GV ₃
1991 GT ₄	14.6	0.15	19990810	43.12544	135.00709	190.67722	4.97395	0.1968997	2.2867071	43	3	1991–1999	0.61	M-v	3	Williams	36507	1991 GT ₄
1991 GU ₄	13.1	0.15	19990810	255.69838	122.97406	16.52249	9.15878	0.0774082	3.0628816	74	3	1991–1999	0.69	M-v	3	Williams	36507	1991 GU ₄
1991 GR ₇	14.4	0.15	19990810	209.10685	282.92232	230.98934	5.00856	0.0689449	2.2578130	76	3	1991–1999	0.60	M-v	3	Williams	36507	1991 GR ₇
1991 GY ₇	15.4	0.15	19990810	41.28753	299.11142	319.63769	1.74562	0.1435744	2.4079452	42	4	1991–1999	0.82	M-v	2	Williams	36507	1991 GY ₇
1991 GD ₈	13.5	0.15	19990810	336.80046	208.43428	218.93608	9.29891	0.0457564	3.0573229	55	4	1991–1999	0.60	M-v	1	Williams	36507	1991 GD ₈
1991 GF ₉	15.0	0.15	19990810	91.40367	89.31093	172.51492	4.43540	0.1215234	2.2936541	68	4	1977–1999	0.65	M-v	3	Williams	36507	1991 GF ₉
1991 HK	14.9	0.15	19990810	180.05049	54.65967	168.17895	5.22587	0.1640156	2.2168158	36	4	1991–1999	0.78	M-v	2	Williams	32743	1991 HK
1991 JC	14.7	0.15	19990810	80.24613	193.14350	70.44255	3.64740	0.1902804	2.3459886	63	3	1991–1999	0.61	M-v	3	Williams	36507	1991 JC
1991 JD	14.5	0.15	19990810	68.01160	239.91407	39.26473	2.93167	0.2067867	2.3512273	87	3	1991–1999	0.46	M-v	3	Williams	36507	1991 JD
1991 LR	14.2	0.15	19990810	47.25534	189.29733	116.22049	14.96078	0.2327415	2.3816199	60	3	1991–1999	0.71	M-v	2	Williams	36507	1991 LR
1991 LF ₁	14.3	0.15	19990810	53.33146	268.38517	88.22902	4.53695	0.1730738	2.2706652	33	4	1991–1999	0.56	M-v	1	Williams	36507	1991 LF ₁
1991 LP ₂	14.7	0.15	19990810	94.54154	194.11746	99.16285	1.99506	0.1491950	2.2987389	55	4	1991–1999	0.67	M-v	2	Williams	32743	1991 LP ₂
1991 NB ₁	14.0	0.15	19990810	20.90466	71.50383	238.05092	7.65385	0.2440209	2.4725470	85	3	1991–1999	0.58	M-v	2	Williams	36507	1991 NB ₁
1991 NU ₃	13.7	0.15	19990810	346.10290	96.03820	286.55434	5.72046	0.1796959	2.4297758	62	4	1991–1999	0.57	M-v	2	Williams	36507	1991 NU ₃
1991 NG ₅	14.6	0.15	19990810	71.63299	359.00631	292.84746	4.34243	0.2259912	2.3827161	43	3	1991–1999	0.63	M-v	3	Williams	36507	1991 NG ₅
1991 PG ₁	14.5	0.15	19990810	39.67781	194.51436	127.72959	12.44519	0.2754434	2.4295062	40	3	1991–1999	0.80	M-v	2	Williams	36507	1991 PG ₁
1991 PT ₁	14.6	0.15	19990810	172.64763	38.60288	191.38535	3.33947	0.1456802	2.3110023	49	7	1987–1999	0.70	M-v	1	Williams	32513	1991 PT ₁
1991 PE ₂	15.6	0.15	19990810	23.97268	328.16661	12.77969	2.04988	0.2342907	2.4283828	47	5	1991–1999	0.59	M-v	2	Williams	36507	1991 PE ₂
1991 PL ₂	15.3	0.15	19990810	44.13107	312.95851	338.95918	4.08430	0.1933205	2.4520893	83	4	1991–1999	0.74	M-v	3	Williams	36507	1991 PL ₂
1991 PF ₅	14.8	0.15	19990810	197.96651	295.90566	312.43597	4.62204	0.1214648	2.2336701	55	3	1991–1999	0.80	M-v	3	Williams	35683	1991 PF ₅
1991 PL ₅	15.1	0.15	19990810	66.55634	348.45780	301.09932	1.22637	0.1873234	2.4147739	66	3	1991–1999	0.64	M-v	3	Williams	36507	1991 PL ₅
1991 PX ₆	15.2	0.15	19990810	81.94697	250.62642	41.47330	1.85532	0.1830252	2.3855935	47	3	1991–1999	0.70	M-v	4	Williams	32303	1991 PX ₆
1991 PG ₇	11.8	0.15	19990810	295.79430	65.94249	345.39355	9.27206	0.2095078	3.9998992	38	2	1991–1999	0.63	M-v	4	Williams	36507	1991 PG ₇
1991 PT ₁₀	15.2	0.15	19990810	342.65700	68.83759	282.18652	3.09335	0.2638418	2.5404188	66	5	1987–1999	0.59	M-v	2	Williams	36507	1991 PT ₁₀
1991 PW ₁₁	14.0	0.15	19990810	65.07768	101.32677	187.72399	7.26704	0.1866280	2.4385069	59	3	1991–1999	0.62	M-v	2	Williams	36507	1991 PW ₁₁
1991 PF ₁₂	14.5	0.15	19990810	61.11728	37.74055	281.55895	6.94868	0.2368235	2.4041177	31	4	1991–1999	0.80	M-v	2	Williams	36507	1991 PF ₁₂
1991 PM ₁₃	14.7	0.15	19990810	138.11666	278.76915	357.64939	4.06639	0.2064343	2.3030832	68	5	1977–1999	0.75	M-v	2	Williams	33743	1991 PM ₁₃
1991 PZ ₁₄	13.4	0.15	19990810	44.70162	70.87261	195.88004	6.55823	0.1575398	2.5253736	86	4	1991–1999	0.65	M-v	2	Williams	36508	1991 PZ ₁₄
1991 PH ₁₈	14.2	0.15	19990810	52.29426	150.35431	156.20258	12.35730	0.2138069	2.4426321	42	3	1991–1999	0.66	M-v	1	Williams	36508	1991 PH ₁₈
1991 PO ₁₈	14.0	0.15	19990810	169.11196	290.70897	345.34013	5.66243	0.2136030	2.2486704	37	3	1991–1999	0.57	M-v	3	Williams	34287	1991 PO ₁₈
1991 PY ₁₈	15.1	0.15	19990810	44.53582	26.31597	323.33434	3.58517	0.2094424	2.3877534	20	4	1991–1999	0.62	M-v	3	Williams	29614	1991 PY ₁₈
1991 PB ₂₀	14.2	0.15	19990810	348.06374	344.65593	118.16283	5.90329	0.0859741	2.2720212	45	4	1991–1999	0.89	M-v	2	Williams	35683	1991 PB ₂₀
1991 RA	15.0	0.15	19990810	95.98619	310.59563	356.88435	21.12312	0.0410768	1.8534522	25	3	1991–1999	0.54	M-v	3	Williams	29943	1991 RA
1991 RP ₁	13.5	0.15	19990810	12.67453	337.68477	349.28193	15.19585	0.1286560	2.5397404	97	5	1987–1999	0.52	M-v	2	Williams	36508	1991 RP ₁
1991 RC ₂	14.3	0.15	19990810	30.27829	82.91413	333.26436	7.38257	0.1267615	2.3197611	44	3	1991–1999	0.65	M-v	2	Williams	33069	1991 RC ₂
1991 RV ₂	14.2	0.15	19990810	16.24334	10.18055	276.57444	3.87321	0.2542742	2.5762245	70	3	1991–1999	0.57	M-v	2	Williams	36508	1991 RV ₂

1991 RA ₄	14.0	0.15	19990810	125.10551	28.10582	214.12238	7.71876	0.1152977	2.4733729	95	4	1991–1999	0.65	M-v	3	Williams	36508	1991 RA ₄
1991 RF ₄	15.0	0.15	19990810	75.94363	48.92256	258.76505	2.22767	0.1805203	2.4222319	38	6	1979–1999	0.58	M-v	2	Williams	34837	1991 RF ₄
1991 RN ₄	14.2	0.15	19990810	29.90741	226.73090	159.20632	6.27893	0.2320337	2.3808522	34	3	1991–1999	0.74	M-v	3	Williams	36508	1991 RN ₄
1991 RQ ₄	14.3	0.15	19990810	301.84489	119.26479	318.63613	3.83438	0.0666300	2.4895450	21	3	1991–1999	0.83	M-v	4	Williams	29915	1991 RQ ₄
1991 RC ₆	14.0	0.15	19990810	337.64385	339.41994	20.79928	13.66213	0.1953417	2.5556107	38	3	1991–1999	0.61	M-v	3	Williams	36508	1991 RC ₆
1991 RS ₈	14.3	0.15	19990810	38.95645	55.05174	352.51807	8.28388	0.1063376	2.3369608	68	5	1982–1999	0.64	M-v	2	Williams	33545	1991 RS ₈
1991 RU ₈	14.2	0.15	19990810	87.17117	299.82703	4.03325	1.90352	0.1943570	2.3970656	34	5	1991–1999	0.70	M-v	1	Williams	32743	1991 RU ₈
1991 RQ ₉	14.7	0.15	19990810	60.17158	4.36198	314.84996	1.66293	0.2230740	2.4207810	39	3	1991–1999	0.60	M-v	3	Williams	32303	1991 RQ ₉
1991 RZ ₁₁	13.8	0.15	19990810	134.58909	322.23694	8.58920	1.26441	0.1809282	3.1952060	34	4	1991–1999	0.94	M-v	2	Williams	33744	1991 RZ ₁₁
1991 RW ₁₂	13.9	0.15	19990810	95.51112	104.18367	187.99529	3.73096	0.0478304	2.4228686	46	4	1953–1999	0.64	M-v	2	Williams	36508	1991 RW ₁₂
1991 RG ₁₄	14.6	0.15	19990810	322.40271	37.66836	341.90511	13.05519	0.1896480	2.5496833	56	4	1991–1999	0.64	M-v	2	Williams	36328	1991 RG ₁₄
1991 RH ₁₄	14.5	0.15	19990810	352.87783	121.10761	326.35850	6.56185	0.0735222	2.3386490	41	3	1991–1999	0.67	M-v	4	Williams	32744	1991 RH ₁₄
1991 RE ₁₅	13.8	0.15	19990810	143.35983	330.31860	343.22007	7.93916	0.2213947	2.2608103	52	5	1981–1999	0.73	M-v	2	Williams	33744	1991 RE ₁₅
1991 RK ₁₅	14.0	0.15	19990810	101.20888	334.52406	3.86150	5.18470	0.1560894	2.3107977	73	7	1963–1999	0.77	M-v	2	Williams	33546	1991 RK ₁₅
1991 RG ₁₇	14.7	0.15	19990810	76.12730	233.42490	127.75629	3.40940	0.1179028	2.3343438	53	3	1991–1999	0.71	M-v	3	Williams	32744	1991 RG ₁₇
1991 RX ₁₇	14.1	0.15	19990810	104.89639	148.20091	177.73831	4.36075	0.1438270	2.3168526	72	3	1991–1999	0.84	M-v	3	Williams	36508	1991 RX ₁₇
1991 RB ₁₉	14.3	0.15	19990810	318.85563	45.64920	334.91331	10.56795	0.1095758	2.5434621	79	5	1987–1999	0.76	M-v	3	Williams	36508	1991 RB ₁₉
1991 RW ₂₁	14.5	0.15	19990810	353.61234	71.45643	341.13166	9.86977	0.2553141	2.4236319	22	3	1991–1999	0.52	M-v	3	Williams	27444	1991 RW ₂₁
1991 RT ₂₆	13.1	0.15	19990810	323.99052	161.67234	194.70363	13.20334	0.1670579	2.6176385	86	4	1991–1999	0.63	M-v	3	Williams	36508	1991 RT ₂₆
1991 RM ₂₉	13.6	0.15	19990810	281.43079	166.56517	266.60876	12.23507	0.2400127	2.6009057	41	2	1991–1999	0.65	M-v	4	Williams	36508	1991 RM ₂₉
1991 SB	13.8	0.15	19990810	9.60943	179.71161	216.63329	2.48476	0.1331726	2.4214633	37	4	1984–1999	0.67	M-v	2	Williams	36508	1991 SB
1991 SZ	14.0	0.15	19990810	70.52946	261.97607	52.94506	7.23535	0.1507604	2.3988524	36	3	1991–1999	0.61	M-v	3	Williams	32303	1991 SZ
1991 TK	14.2	0.15	19990810	267.91411	46.32435	107.83690	5.12387	0.0629384	2.3924837	59	4	1991–1999	0.78	M-v	3	Williams	36508	1991 TK
1991 TN	14.3	0.15	19990810	223.72018	113.30461	96.86252	5.59908	0.1098519	2.3502570	39	5	1991–1999	0.66	M-v	1	Williams	33546	1991 TN
1991 TX	13.4	0.15	19990810	43.57894	284.43219	76.97310	24.16912	0.2821129	2.4065040	19	3	1991–1999	0.67	M-v	3	Williams	36508	1991 TX
1991 TV ₁	13.7	0.15	19990810	335.84553	329.77164	52.33014	8.40565	0.3094054	2.5425841	66	6	1987–1999	0.69	M-v	2	Williams	36508	1991 TV ₁
1991 TC ₂	14.7	0.15	19990810	277.45352	55.26574	26.93596	24.97693	0.1199935	1.9211361	43	3	1991–1999	0.59	M-v	2	Williams	36508	1991 TC ₂
1991 TG ₂	14.0	0.15	19990810	309.13194	1.78399	45.70953	6.01521	0.3075990	2.5719419	18	3	1991–1999	0.53	M-v	4	Williams	23518	1991 TG ₂
1991 TQ ₂	15.2	0.15	19990810	349.43642	164.74623	270.63563	2.76150	0.2187625	2.4179101	43	4	1991–1999	0.47	M-v	2	Williams	36508	1991 TQ ₂
1991 TH ₃	15.3	0.15	19990810	317.28149	192.99712	213.14932	7.50507	0.2872681	2.5367029	62	4	1991–1999	0.56	M-v	2	Williams	36508	1991 TH ₃
1991 TB ₆	13.4	0.15	19990810	345.77675	303.27819	37.75052	16.02887	0.1562401	2.5858588	68	4	1987–1999	0.65	M-v	3	Williams	36508	1991 TB ₆
1991 TU ₁₃	15.0	0.15	19990810	297.95036	73.25876	334.13676	7.99937	0.1191215	2.6420958	43	3	1991–1999	0.63	M-v	3	Williams	36329	1991 TU ₁₃
1991 TF ₁₄	14.2	0.15	19990810	279.53286	47.13431	25.70512	5.51978	0.1175801	2.5494907	81	4	1977–1999	0.55	M-v	1	Williams	36508	1991 TF ₁₄
1991 UN ₁	14.3	0.15	19990810	42.75902	83.88179	312.99271	5.75812	0.1212065	2.3711973	42	4	1989–1999	0.69	M-v	2	Williams	33546	1991 UN ₁
1991 UE ₂	13.6	0.15	19990810	271.15647	52.76561	47.25604	3.67264	0.0883079	2.5595352	102	4	1987–1999	0.51	M-v	2	Williams	36508	1991 UE ₂
1991 UJ ₂	14.0	0.15	19990810	164.68981	264.80206	31.52583	5.33657	0.1579581	2.3048974	57	3	1991–1999	0.59	M-v	3	Williams	33337	1991 UJ ₂
1991 UQ ₂	15.0	0.15	19990810	342.33762	319.93270	38.06674	13.20611	0.3091399	2.5679303	31	4	1991–1999	0.60	M-v	2	Williams	36508	1991 UQ ₂
1991 UD ₃	14.3	0.15	19990810	303.59303	226.39185	209.48834	7.13594	0.2390829	2.5551543	109	6	1983–1999	0.61	M-v	2	Williams	36508	1991 UD ₃
1991 UF ₃	13.4	0.15	19990810	351.17151	50.61600	40.11275	13.36453	0.1899500	2.4171511	23	6	1970–1999	0.57	M-v	1	Williams	32744	1991 UF ₃
1991 US ₃	13.1	0.15	19990810	5.54707	273.55403	65.07959	15.56660	0.1624944	2.5789020	69	3	1991–1999	0.53	M-v	2	Williams	36508	1991 US ₃
1991 UY ₃	15.1	0.15	19990810	0.55106	178.66654	212.08628	3.50608	0.2485639	2.4808284	35	4	1987–1999	0.66	M-v	3	Williams	36508	1991 UY ₃
1991 VT	13.2	0.15	19990810	332.06156	301.32024	66.49234	15.58203	0.1931047	2.6000573	50	3	1991–1999	0.71	M-v	3	Williams	36508	1991 VT
1991 VY	13.6	0.15	19990810	351.13350	356.97978	68.48092	5.85310	0.0925254	2.4539905	42	4	1991–1999	0.73	M-v	3	Williams	36508	1991 VY
1991 VD ₁	13.7	0.15	19990810	339.65765	3.60145	32.44940	16.03701	0.0938669	2.5323752	100	5	1987–1999	0.48	M-v	3	Williams	36508	1991 VD ₁
1991 VJ ₁	14.9	0.15	19990810	325.69856	275.49302	107.87400	2.42942	0.3157766	2.5665369	90	4	1991–1999	0.62	M-v	2	Williams	36508	1991 VJ ₁
1991 VE ₂	13.0	0.15	19990810	306.64023	210.21954	228.37914	14.70673	0.0997610	2.5510486	76	4	1991–1999	0.54	M-v	3	Williams	36508	1991 VE ₂
1991 VA ₃	13.0	0.15	19990810	337.52537	115.01123	254.41598	11.44982	0.2168075	2.6006734	110	3	1991–1999	0.54	M-v	2	Williams	36508	1991 VA ₃
1991 VE ₃	14.4	0.15	19990810	328.61106	296.89486	118.51903	4.52550	0.2892170	2.5436241	62	3	1991–1999	0.47	M-v	3	Williams	36509	1991 VE ₃
1991 VN ₃	14.7	0.15	19990810	309.70788	358.68944	57.43265	6.81798	0.3232222	2.5877440	29	2	1991–1999	0.71	M-v	3	Williams	36509	1991 VN ₃
1991 VO ₃	14.6	0.15	19990810	357.32465	36.42047	59.65394	4.17246	0.1510646	2.3836704	33	3	1991–1999	0.67	M-v	4	Williams	32744	1991 VO ₃
1991 VT ₃	13.3	0.15	19990810	0.57173	114.65330	238.09776	12.68729	0.1851107	2.5767344	102	5	1983–1999	0.64	M-v	2	Williams	36509	1991 VT ₃
1991 VW ₄	13.6	0.15	19990810	103.17325	235.90061	98.74197	7.54921	0.1551550	2.3737834	55	5	1991–1999	0.74	M-v	1	Williams	32744	1991 VW ₄
1991 VY ₄	14.1	0.15	19990810	345.25467	334.11132	98.59199	3.73416	0.1505029	2.4603553	29	3	1991–1999	0.52	M-v	4	Williams	30290	1991 VY ₄

1991 VM ₅	13.9	0.15	19990810	112.85684	267.27870	70.06979	6.34633	0.2114618	2.3237077	58	4	1977–1999	0.66	M-v	3	Williams	34287	1991 VM ₅
1991 VT ₅	14.6	0.15	19990810	356.49468	205.94309	155.22767	6.79192	0.0708257	2.5843865	58	3	1991–1999	0.84	M-v	3	Williams	36509	1991 VT ₅
1991 VU ₅	14.4	0.15	19990810	335.95140	165.63273	197.06088	11.13250	0.1921067	2.6084653	95	3	1991–1999	0.57	M-v	3	Williams	36509	1991 VU ₅
1991 VH ₆	14.5	0.15	19990810	37.19133	187.42534	172.28102	7.80765	0.1573695	2.4761899	34	4	1991–1999	0.74	M-v	1	Williams	36509	1991 VH ₆
1991 VP ₁₂	14.9	0.15	19990810	61.49495	239.31117	73.54560	5.50283	0.1256620	2.5493863	71	3	1991–1999	0.55	M-v	3	Williams	36509	1991 VP ₁₂
1991 WD	13.5	0.15	19990810	258.28719	35.40903	89.53723	13.84841	0.2176458	2.6184558	30	4	1991–1999	0.57	M-v	1	Williams	36067	1991 WD
1991 XD	14.0	0.15	19990810	308.42571	11.34976	65.45075	22.70781	0.1015288	1.9376265	62	3	1991–1999	0.61	M-v	2	Williams	36509	1991 XD
1991 YC	13.5	0.15	19990810	285.88208	24.57225	109.17271	14.93448	0.2110740	2.5797759	37	5	1988–1999	0.67	M-v	2	Williams	36509	1991 YC
1991 YT	13.7	0.15	19990810	298.24757	140.21800	266.16540	11.68896	0.1785273	2.6990583	53	5	1988–1999	0.63	M-v	2	Williams	36509	1991 YT
1991 YU	13.2	0.15	19990810	225.92555	323.30073	138.41775	6.61613	0.1432677	2.7986299	44	4	1990–1999	0.68	M-v	1	Williams	36509	1991 YU
1991 YE ₁	12.8	0.15	19990810	311.98450	294.45756	97.83287	14.25675	0.1929050	2.6749148	24	3	1991–1999	0.61	M-v	4	Williams	35421	1991 YE ₁
1992 AL	13.3	0.15	19990810	355.43481	273.31775	143.26278	13.31085	0.2851780	2.5435035	28	4	1978–1999	0.83	M-v	2	Williams	36509	1992 AL
1992 AJ ₁	13.2	0.15	19990810	236.15827	306.34669	272.81466	5.06673	0.1069291	2.5215612	57	4	1992–1999	0.72	M-v	3	Williams	36509	1992 AJ ₁
1992 AV ₁	14.1	0.15	19990810	310.61483	328.96375	110.66212	24.76602	0.0734801	1.9467114	36	3	1992–1999	0.60	M-v	2	Williams	36509	1992 AV ₁
1992 AO ₂	14.2	0.15	19990810	296.54063	72.31611	118.12734	8.56509	0.1418905	2.4381572	30	5	1992–1999	0.84	M-v	2	Williams	33547	1992 AO ₂
1992 BD	15.2	0.15	19990810	304.48820	21.08393	79.16975	28.98655	0.0652204	1.8968754	46	4	1975–1999	0.52	M-v	2	Williams	36509	1992 BD
1992 BP ₂	14.5	0.15	19990810	352.61933	244.22155	217.12093	5.53779	0.0866949	2.4765726	39	4	1992–1999	0.66	M-v	2	Williams	34578	1992 BP ₂
1992 BQ ₂	14.0	0.15	19990810	297.30663	283.51360	236.52847	4.34721	0.0640810	2.4887695	20	4	1992–1999	0.61	M-v	3	Williams	33338	1992 BQ ₂
1992 BT ₂	12.6	0.15	19990810	293.56426	305.45802	146.73398	13.87643	0.1374148	2.6494211	70	3	1992–1999	0.61	M-v	3	Williams	36509	1992 BT ₂
1992 CH	13.2	0.15	19990810	302.03387	168.52692	311.82369	12.62005	0.1099636	2.6310952	57	5	1992–1999	0.65	M-v	2	Williams	36509	1992 CH
1992 DU ₇	13.7	0.15	19990810	25.49791	270.83193	42.44950	2.43923	0.0885456	2.9516434	49	3	1992–1999	0.58	M-v	3	Williams	36509	1992 DU ₇
1992 DY ₇	14.1	0.15	19990810	144.71071	185.25184	75.39671	3.09883	0.0319333	2.7187216	49	4	1992–1999	0.65	M-v	1	Williams	32744	1992 DY ₇
1992 EO	12.4	0.15	19990810	66.21804	252.14016	10.34774	14.30166	0.2719765	3.0944358	86	4	1976–1999	0.58	M-v	1	Williams	36509	1992 EO
1992 ES ₆	14.3	0.15	19990810	326.95952	302.94277	113.26606	7.04400	0.2147430	2.6954115	37	4	1992–1999	0.49	M-v	3	Williams	36509	1992 ES ₆
1992 EZ ₇	14.3	0.15	19990810	330.32836	274.24782	163.11981	12.33822	0.1991151	2.6213853	29	4	1988–1999	0.44	M-v	1	Williams	36509	1992 EZ ₇
1992 EX ₈	12.4	0.15	19990810	342.68015	318.62745	144.00505	15.69077	0.0511564	2.5690687	52	5	1977–1999	0.71	M-v	2	Williams	36509	1992 EX ₈
1992 EX ₉	14.2	0.15	19990810	358.33094	240.81189	181.81868	3.71958	0.1905759	2.5844807	33	5	1992–1999	0.70	M-v	1	Williams	36509	1992 EX ₉
1992 EZ ₁₁	13.6	0.15	19990810	81.42761	191.56412	133.44057	5.49760	0.1412400	2.7073044	49	3	1992–1999	0.72	M-v	3	Williams	33547	1992 EZ ₁₁
1992 EN ₁₂	14.1	0.15	19990810	325.27342	28.84661	97.89952	3.08568	0.0726696	2.5553985	38	3	1992–1999	0.81	M-v	4	Williams	33230	1992 EN ₁₂
1992 ET ₁₄	14.0	0.15	19990810	315.31543	200.84688	223.61605	2.76253	0.0874019	2.7598028	43	4	1992–1999	0.51	M-v	1	Williams	36329	1992 ET ₁₄
1992 EW ₁₆	13.6	0.15	19990810	161.29960	333.20859	327.24330	4.06564	0.1217800	2.5817887	27	4	1992–1999	0.75	M-v	4	Williams	35685	1992 EW ₁₆
1992 EA ₂₆	14.8	0.15	19990810	300.03960	157.32920	346.90320	10.50043	0.1538990	2.5776137	23	3	1992–1999	0.83	M-v	5	Williams	34497	1992 EA ₂₆
1992 EU ₃₀	14.1	0.15	19990810	266.68461	257.19970	244.19438	2.59028	0.0365343	2.6946552	32	4	1992–1999	0.57	M-v	1	Williams	35685	1992 EU ₃₀
1992 EE ₃₂	14.7	0.15	19990810	288.82079	310.99886	193.61237	4.34392	0.1888342	2.6019088	23	5	1982–1999	0.69	M-v	2	Williams	36509	1992 EE ₃₂
1992 EV ₃₂	14.2	0.15	19990810	332.91595	194.46625	209.35428	3.43000	0.1106070	2.7589348	23	3	1992–1999	0.54	M-v	4	Williams	36509	1992 EV ₃₂
1992 GA	13.8	0.15	19990810	260.77358	248.06902	309.95470	11.66771	0.1196195	2.6346762	50	5	1992–1999	0.63	M-v	2	Williams	36509	1992 GA
1992 GM ₂	14.9	0.15	19990810	60.15954	343.62908	301.52303	0.98390	0.0933839	2.1302764	95	3	1992–1999	0.51	M-v	3	Williams	36509	1992 GM ₂
1992 JE	16.0	0.15	19990810	54.92612	109.52151	193.92921	5.86423	0.4631796	2.1898992	87	7	1979–1999	0.79	M-v	1	Williams	35685	1992 JE
1992 JU ₂	14.8	0.15	19990810	7.90616	125.64624	211.71521	5.19177	0.2300404	2.1858187	112	3	1992–1999	0.72	M-v	2	Williams	36509	1992 JU ₂
1992 OJ ₁	13.6	0.15	19990810	50.47667	305.50487	320.44596	23.56085	0.1801295	2.2812430	102	3	1992–1999	0.57	M-v	2	Williams	36510	1992 OJ ₁
1992 OB ₃	15.2	0.15	19990810	69.06465	323.63306	305.63711	5.82674	0.1051388	2.2450381	51	4	1992–1999	0.59	M-v	1	Williams	36510	1992 OB ₃
1992 OL ₃	13.9	0.15	19990810	74.58227	167.88904	153.30911	2.14314	0.1436193	3.2183364	37	3	1992–1999	0.73	M-v	4	Williams	35685	1992 OL ₃
1992 OM ₆	15.3	0.15	19990810	54.82719	136.92619	160.89118	3.63546	0.1349514	2.2300972	54	3	1992–1999	0.66	M-v	3	Williams	36510	1992 OM ₆
1992 PF	14.9	0.15	19990810	38.38372	135.77909	181.35090	2.34563	0.2044225	2.2277516	97	3	1992–1999	0.59	M-v	3	Williams	36510	1992 PF
1992 PK ₁	15.2	0.15	19990810	322.65582	66.14120	314.30514	6.74264	0.1468470	2.2831654	52	2	1992–1999	0.68	M-v	4	Williams	36330	1992 PK ₁
1992 PA ₂	15.2	0.15	19990810	0.49672	42.19816	307.23019	5.67734	0.2170573	2.2614869	65	3	1992–1999	0.53	M-v	3	Williams	36510	1992 PA ₂
1992 PK ₂	13.1	0.15	19990810	161.66455	6.04631	235.94546	5.88174	0.1455755	3.1149412	73	3	1992–1999	0.66	M-v	4	Williams	36510	1992 PK ₂
1992 PL ₂	12.1	0.15	19990810	200.88673	264.92791	295.98256	20.41043	0.0564610	3.1927519	52	5	1981–1999	0.64	M-v	1	Williams	36510	1992 PL ₂
1992 PM ₂	15.5	0.15	19990810	14.02449	72.47650	244.12629	4.70556	0.1870462	2.2816302	60	3	1992–1999	0.62	M-v	2	Williams	36510	1992 PM ₂
1992 PO ₂	14.4	0.15	19990810	341.45394	149.19042	209.00209	6.10384	0.1429575	2.2932869	123	3	1992–1999	0.57	M-v	3	Williams	36510	1992 PO ₂
1992 PV ₂	12.9	0.15	19990810	118.97735	57.55252	272.56671	8.97923	0.1237085	3.0044875	45	4	1987–1999	0.70	M-v	2	Williams	35686	1992 PV ₂
1992 PC ₃	12.2	0.15	19990810	108.40934	61.50510	273.48628	11.60760	0.1613569	3.0482438	51	3	1992–1999	0.72	M-v	3	Williams	36510	1992 PC ₃
1992 PE ₃	14.7	0.15	19990810	8.63283	112.56928	238.93693	5.51930	0.1960336	2.2504620	96	3	1992–1999	0.58	M-v	3	Williams	36510	1992 PE ₃

1992 QT	14.1	0.15	19990810	34.55427	304.64221	338.20895	26.44002	0.1850281	2.3117250	51	3	1992–1999	0.54	M-v	2	Williams	36330	1992 QT
1992 RN	13.4	0.15	19990810	24.72253	299.27171	338.20102	8.15475	0.2311716	2.3421031	67	4	1980–1999	0.60	M-v	2	Williams	36510	1992 RN
1992 RU	15.4	0.15	19990810	330.33427	226.93318	150.86789	3.93020	0.2562265	2.3221728	64	3	1953–1999	0.64	M-v	2	Williams	36510	1992 RU
1992 RW ₂	15.0	0.15	19990810	17.20708	0.12324	328.68178	6.06608	0.1409154	2.2759938	69	3	1992–1999	0.61	M-v	3	Williams	36510	1992 RW ₂
1992 RL ₃	16.4	0.15	19990810	50.63904	140.39462	169.48585	5.07355	0.2005785	2.2313976	44	3	1992–1999	0.68	M-v	3	Williams	36510	1992 RL ₃
1992 RV ₃	16.3	0.15	19990810	348.43919	34.25281	320.97081	3.43851	0.1857881	2.2971178	33	2	1992–1999	0.70	M-v	4	Williams	36330	1992 RV ₃
1992 SO	14.4	0.15	19990810	18.80935	79.20189	244.52932	5.75450	0.1645876	2.3198062	97	3	1992–1999	0.58	M-v	2	Williams	36510	1992 SO
1992 SQ	14.5	0.15	19990810	38.43121	108.80367	269.50699	3.09319	0.1310311	2.1961904	31	5	1976–1999	0.76	M-v	1	Williams	36510	1992 SQ
1992 SQ ₁	15.0	0.15	19990810	349.88272	148.11380	190.98453	5.33070	0.2231635	2.3404600	55	3	1992–1999	0.66	M-v	2	Williams	36330	1992 SQ ₁
1992 ST ₂	14.1	0.15	19990810	299.10645	196.35406	195.08358	24.24656	0.1335428	2.3622725	56	3	1992–1999	0.72	M-v	3	Williams	36510	1992 ST ₂
1992 SY ₁₂	14.3	0.15	19990810	326.11873	24.64828	5.17938	9.83437	0.2103404	2.3222563	86	3	1992–1999	0.45	M-v	2	Williams	36510	1992 SY ₁₂
1992 SB ₁₃	13.7	0.15	19990810	250.76159	84.65420	47.09695	3.57588	0.0942592	2.2858183	65	3	1992–1999	0.51	M-v	4	Williams	36510	1992 SB ₁₃
1992 SG ₁₃	14.9	0.15	19990810	337.79963	355.57465	18.52351	5.66395	0.2541360	2.3377654	89	3	1992–1999	0.50	M-v	2	Williams	36510	1992 SG ₁₃
1992 SW ₁₄	14.1	0.15	19990810	327.75586	31.46535	345.13642	25.58360	0.2501366	2.3420933	70	2	1992–1999	0.46	M-v	3	Williams	36330	1992 SW ₁₄
1992 SS ₁₆	15.0	0.15	19990810	80.67096	133.63720	207.54842	0.61477	0.0500227	2.1541382	47	5	1992–1999	0.77	M-v	2	Williams	36510	1992 SS ₁₆
1992 SA ₁₇	15.1	0.15	19990810	256.21256	249.93432	223.77431	0.68923	0.0787910	2.2786341	80	2	1992–1999	0.53	M-v	4	Williams	36510	1992 SA ₁₇
1992 SY ₁₇	14.2	0.15	19990810	28.04890	71.51958	239.91598	8.41629	0.2806688	2.2897581	61	4	1985–1999	0.63	M-v	3	Williams	36510	1992 SY ₁₇
1992 SQ ₂₃	14.6	0.15	19990810	21.02568	101.50858	219.98870	7.82356	0.3102960	2.3073163	117	4	1981–1999	0.49	M-v	2	Williams	36510	1992 SQ ₂₃
1992 SM ₂₆	15.4	0.15	19990810	337.63114	349.74775	41.90961	7.21283	0.1219126	2.3055197	17	2	1992–1999	0.41	M-v	4	Williams	36331	1992 SM ₂₆
1992 UH ₁	14.6	0.15	19990810	351.07020	61.08474	0.55261	3.56755	0.1607638	2.2391185	26	4	1972–1999	0.50	M-v	2	Williams	29300	1992 UH ₁
1992 US ₁	14.5	0.15	19990810	6.69927	317.54848	46.88468	7.81803	0.1346623	2.2857559	111	4	1964–1999	0.59	M-v	3	Williams	36510	1992 US ₁
1992 UL ₂	14.3	0.15	19990810	40.70060	65.54869	316.04279	2.96963	0.1749081	2.1918977	25	5	1979–1999	0.65	M-v	2	Williams	32305	1992 UL ₂
1992 UR ₂	13.8	0.15	19990810	282.35696	49.13124	46.82284	23.22295	0.2466189	2.3222852	37	2	1992–1999	0.58	M-v	4	Williams	36331	1992 UR ₂
1992 UT ₂	14.2	0.15	19990810	26.99525	260.25363	71.52146	6.92882	0.2106223	2.2767162	85	4	1978–1999	0.59	M-v	2	Williams	36510	1992 UT ₂
1992 UW ₂	14.3	0.15	19990810	23.64827	284.84823	54.05716	5.93465	0.2153519	2.2812041	96	3	1992–1999	0.55	M-v	3	Williams	36510	1992 UW ₂
1992 UJ ₅	15.0	0.15	19990810	347.35801	190.00966	234.81758	0.52299	0.1998028	2.2515861	37	4	1992–1999	0.62	M-v	2	Williams	36510	1992 UJ ₅
1992 UU ₅	14.2	0.15	19990810	322.57193	346.79792	71.34005	3.24562	0.2280697	2.3176984	65	3	1985–1999	0.69	M-v	3	Williams	36510	1992 UU ₅
1992 UA ₆	14.2	0.15	19990810	327.84415	102.61927	282.74661	2.76991	0.1103511	2.3672884	72	3	1992–1999	0.67	M-v	3	Williams	36511	1992 UA ₆
1992 UE ₆	13.9	0.15	19990810	356.40155	354.06093	64.12735	8.01717	0.1403467	2.2510019	48	3	1992–1999	0.82	M-v	3	Williams	36511	1992 UE ₆
1992 UK ₈	14.6	0.15	19990810	355.55546	133.07426	239.95782	3.84969	0.1638073	2.3014866	81	6	1964–1999	0.54	M-v	2	Williams	36511	1992 UK ₈
1992 WR	14.7	0.15	19990810	303.41638	33.84375	56.00646	5.65948	0.1365940	2.3109464	70	3	1978–1999	0.43	M-v	3	Williams	36511	1992 WR
1992 WZ	14.1	0.15	19990810	353.06813	352.04607	58.44370	5.84698	0.1318783	2.2726115	54	4	1985–1999	0.66	M-v	3	Williams	36511	1992 WZ
1992 WD ₁	15.1	0.15	19990810	309.18486	304.01529	100.36299	3.15052	0.1915144	2.3741278	51	4	1981–1999	0.60	M-v	2	Williams	36511	1992 WD ₁
1992 WY ₁	14.3	0.15	19990810	294.23397	95.57207	0.59200	3.28492	0.0868021	2.3113769	64	5	1988–1999	0.54	M-v	1	Williams	36511	1992 WY ₁
1992 WC ₉	13.9	0.15	19990810	290.19903	32.14406	56.45132	7.25100	0.0900228	2.3386995	63	3	1992–1999	0.51	M-v	2	Williams	36511	1992 WC ₉
1992 XK	14.5	0.15	19990810	311.59080	118.10041	283.24294	1.16656	0.2112853	2.3995255	77	3	1992–1999	0.62	M-v	3	Williams	36332	1992 XK
1992 YK	13.1	0.15	19990810	297.73816	81.87204	9.89759	6.94140	0.0671311	2.3703243	38	2	1992–1999	0.56	M-v	4	Williams	36332	1992 YK
1992 YR ₂	14.3	0.15	19990810	151.77984	170.54215	69.32464	5.14390	0.0597602	2.3762564	26	3	1992–1999	0.87	M-v	4	Williams	32453	1992 YR ₂
1993 BP ₃	13.8	0.15	19990810	309.27290	136.04190	327.82457	24.16562	0.1897127	2.3737932	41	5	1951–1999	0.64	M-v	1	Williams	36511	1993 BP ₃
1993 BE ₅	12.4	0.15	19990810	69.49151	87.88171	311.70399	2.26616	0.0269295	3.6477051	49	7	1989–1999	0.91	M-v	1	Williams	33548	1993 BE ₅
1993 CB	14.0	0.15	19990810	251.64710	69.64369	135.01416	5.43028	0.1313095	2.3391809	48	4	1993–1999	0.72	M-v	2	Williams	35686	1993 CB
1993 CK ₁	13.9	0.15	19990810	177.35704	155.78277	29.27696	8.57572	0.1255191	2.5836643	73	4	1956–1999	0.61	M-v	2	Williams	36511	1993 CK ₁
1993 DM	14.1	0.15	19990810	176.18070	273.03879	277.75594	4.19614	0.0750229	2.5656432	53	3	1993–1999	0.58	M-v	3	Williams	36511	1993 DM
1993 EU	13.4	0.15	19990810	242.76728	135.97518	82.94110	3.14609	0.1674525	2.3726789	55	4	1993–1999	0.69	M-v	2	Williams	36511	1993 EU
1993 FQ ₂	12.9	0.15	19990810	151.92440	141.63491	25.66581	9.91125	0.1728550	2.7612159	34	5	1991–1999	0.68	M-v	3	Williams	36511	1993 FQ ₂
1993 FR ₅	14.6	0.15	19990810	7.27771	276.01223	75.16475	2.78342	0.0384411	2.6478095	33	2	1993–1999	0.44	M-v	4	Williams	36332	1993 FR ₅
1993 FM ₆	14.5	0.15	19990810	113.84375	235.76192	93.16400	2.47208	0.0885108	2.4094930	51	4	1991–1999	0.70	M-v	2	Williams	36069	1993 FM ₆
1993 FO ₇	13.6	0.15	19990810	333.24773	11.51687	77.58839	3.43981	0.1712273	2.3968235	33	4	1956–1999	0.56	M-v	3	Williams	36511	1993 FO ₇
1993 FT ₇	14.8	0.15	19990810	75.54587	215.36874	155.85040	6.41850	0.1180480	2.3803816	60	5	1991–1999	0.78	M-v	2	Williams	35687	1993 FT ₇
1993 FB ₁₀	14.3	0.15	19990810	54.56631	250.50098	119.04568	3.49101	0.1917273	2.4447702	39	6	1993–1999	0.58	M-v	1	Williams	32515	1993 FB ₁₀
1993 FP ₁₀	14.8	0.15	19990810	345.19773	304.27568	134.36472	3.22588	0.1448686	2.4105889	21	4	1993–1999	0.35	M-v	1	Williams	32306	1993 FP ₁₀
1993 FU ₁₁	13.8	0.15	19990810	99.41219	155.06189	123.89970	3.99097	0.0779289	2.6167163	23	3	1990–1999	0.55	M-v	2	Williams	36511	1993 FU ₁₁
1993 FV ₁₁	13.9	0.15	19990810	285.49583	334.77010	100.80886	3.65916	0.1707288	2.5818301	48	4	1958–1999	0.44	M-v	1	Williams	36511	1993 FV ₁₁

1993 FE ₁₂	14.6	0.15	19990810	322.15794	345.14965	101.02283	3.66893	0.1534757	2.4500069	34	4	1991–1999	0.63	M-v	3	Williams	36511	1993 FE ₁₂
1993 FR ₁₂	14.3	0.15	19990810	263.34652	49.68933	99.44149	3.58792	0.1304667	2.4642459	32	4	1993–1999	0.46	M-v	1	Williams	35687	1993 FR ₁₂
1993 FY ₁₂	12.8	0.15	19990810	80.36790	66.87967	164.74079	9.45751	0.0747519	2.8468774	96	4	1990–1999	0.64	M-v	2	Williams	36511	1993 FY ₁₂
1993 FR ₁₃	15.0	0.15	19990810	334.50366	46.58878	50.66809	6.16006	0.1200854	2.3926539	20	3	1993–1999	0.68	M-v	5	Williams	30092	1993 FR ₁₃
1993 FL ₁₄	14.1	0.15	19990810	118.09383	172.36526	108.77009	4.57989	0.0812585	2.5503572	42	3	1993–1999	0.66	M-v	4	Williams	32745	1993 FL ₁₄
1993 FQ ₂₀	14.1	0.15	19990810	283.09209	317.50425	134.75796	4.21354	0.1877434	2.5406469	43	2	1993–1999	0.63	M-v	4	Williams	36511	1993 FQ ₂₀
1993 FZ ₂₁	14.6	0.15	19990810	239.59368	143.30561	1.49554	3.06812	0.0993046	2.5636040	69	3	1993–1999	0.52	M-v	3	Williams	36511	1993 FZ ₂₁
1993 FS ₂₂	14.8	0.15	19990810	294.19596	197.45380	242.75763	2.73710	0.1201877	2.5767738	73	4	1993–1999	0.57	M-v	2	Williams	36512	1993 FS ₂₂
1993 FO ₂₃	14.0	0.15	19990810	150.55977	16.33275	200.93955	11.99518	0.1121455	2.6594703	33	2	1993–1999	0.64	M-v	4	Williams	36333	1993 FO ₂₃
1993 FQ ₂₄	13.7	0.15	19990810	327.72775	151.96291	201.87099	7.90197	0.1229771	2.8073658	41	4	1985–1999	0.54	M-v	2	Williams	36069	1993 FQ ₂₄
1993 FS ₂₄	14.8	0.15	19990810	170.11592	208.83123	353.28552	4.51959	0.0826483	2.6234791	54	4	1993–1999	0.56	M-v	2	Williams	36512	1993 FS ₂₄
1993 FJ ₂₅	14.5	0.15	19990810	276.63066	93.64524	349.44229	3.72469	0.0375948	2.6474281	18	2	1993–1999	0.65	M-v	5	Williams	36333	1993 FJ ₂₅
1993 FS ₂₆	13.6	0.15	19990810	237.14572	287.99143	285.80387	2.60511	0.0852668	2.3973183	62	4	1993–1999	0.74	M-v	3	Williams	36512	1993 FS ₂₆
1993 FS ₂₇	13.8	0.15	19990810	325.82457	156.16701	211.61686	6.03639	0.0780388	2.7354201	73	4	1993–1999	0.53	M-v	2	Williams	36512	1993 FS ₂₇
1993 FM ₂₈	15.2	0.15	19990810	293.69929	179.67477	293.51974	1.68311	0.1522627	2.4585597	31	3	1993–1999	0.56	M-v	4	Williams	36512	1993 FM ₂₈
1993 FK ₂₉	14.6	0.15	19990810	310.73999	199.65528	200.86417	14.27275	0.1199365	2.6430725	36	3	1993–1999	0.66	M-v	3	Williams	36333	1993 FK ₂₉
1993 FP ₂₉	13.1	0.15	19990810	178.19637	3.46620	202.52430	13.18222	0.1136084	2.5811455	26	2	1993–1999	0.51	M-v	4	Williams	36333	1993 FP ₂₉
1993 FJ ₃₂	14.7	0.15	19990810	163.02205	311.35083	286.36829	4.49538	0.1295168	2.5494919	30	4	1993–1999	0.72	M-v	1	Williams	32745	1993 FJ ₃₂
1993 FR ₃₅	15.2	0.15	19990810	308.59724	313.91510	160.87054	3.28122	0.1260624	2.4300183	28	6	1989–1999	0.68	M-v	1	Williams	32746	1993 FR ₃₅
1993 FA ₃₇	13.9	0.15	19990810	278.68051	283.50152	142.82580	3.65338	0.1566728	2.6532569	67	4	1993–1999	0.56	M-v	3	Williams	36512	1993 FA ₃₇
1993 FX ₃₇	13.6	0.15	19990810	47.85814	271.59116	43.30591	2.84157	0.0807551	2.6863675	44	3	1981–1999	0.47	M-v	4	Williams	36512	1993 FX ₃₇
1993 FZ ₄₁	14.2	0.15	19990810	229.97673	129.09250	6.97036	14.00166	0.1095486	2.6012580	103	3	1993–1999	0.60	M-v	3	Williams	36512	1993 FZ ₄₁
1993 FU ₄₉	14.6	0.15	19990810	285.00995	209.30798	237.33672	1.56508	0.0671501	2.5784044	45	2	1993–1999	0.48	M-v	4	Williams	36333	1993 FU ₄₉
1993 FU ₆₄	14.8	0.15	19990810	334.88786	107.14208	260.51393	4.07059	0.1006593	2.7015581	30	3	1993–1999	0.55	M-v	3	Williams	36333	1993 FU ₆₄
1993 FG ₇₆	14.5	0.15	19990810	43.72119	125.22616	192.99253	8.72222	0.2019355	2.7309975	37	3	1993–1999	0.62	M-v	3	Williams	36512	1993 FG ₇₆
1993 FV ₈₀	14.6	0.15	19990810	31.56933	282.15632	45.69587	2.58856	0.1815949	2.6821999	40	3	1993–1999	0.74	M-v	3	Williams	31962	1993 FV ₈₀
1993 GC	13.2	0.15	19990810	139.73637	20.27771	200.46689	12.30239	0.1078610	2.6939043	52	2	1993–1999	0.59	M-v	4	Williams	36334	1993 GC
1993 GK ₁	14.8	0.15	19990810	270.38750	211.28216	324.74455	1.93573	0.1619662	2.4015073	35	4	1993–1999	0.74	M-v	3	Williams	35424	1993 GK ₁
1993 HX	13.7	0.15	19990810	182.19160	145.32640	133.71152	3.05103	0.0458736	2.4076914	48	3	1993–1999	0.81	M-v	3	Williams	33339	1993 HX
1993 HY ₅	15.0	0.15	19990810	41.31636	128.96015	170.76808	23.93617	0.0354540	1.9325905	42	3	1993–1999	0.48	M-v	2	Williams	36512	1993 HY ₅
1993 HZ ₅	15.1	0.15	19990810	249.66256	67.93467	68.12988	26.22835	0.1015889	1.8524037	51	3	1993–1999	0.70	M-v	2	Williams	36512	1993 HZ ₅
1993 KW ₁	15.1	0.15	19990810	98.98166	41.07288	210.87411	20.68589	0.0455995	1.9468336	63	3	1993–1999	0.51	M-v	2	Williams	36512	1993 KW ₁
1993 LO ₁	14.0	0.15	19990810	156.98343	291.22742	312.60244	10.69532	0.2633299	2.6242784	29	3	1993–1999	0.68	M-v	3	Williams	33485	1993 LO ₁
1993 LS ₁	13.5	0.15	19990810	111.74347	24.35047	301.39648	12.82319	0.1777624	2.5467115	35	5	1982–1999	0.68	M-v	1	Williams	35688	1993 LS ₁
1993 LF ₂	12.7	0.15	19990810	54.47028	237.68968	94.45912	10.30097	0.1577462	2.7759880	41	5	1962–1999	0.65	M-v	1	Williams	32515	1993 LF ₂
1993 MZ	13.8	0.15	19990810	59.90679	352.27830	345.89838	13.00924	0.1913069	2.6932983	21	5	1985–1999	0.75	M-v	2	Williams	36512	1993 MZ
1993 NZ ₁	12.8	0.15	19990810	300.58016	118.72296	292.93497	9.19569	0.1310073	3.0749507	74	3	1993–1999	0.55	M-v	2	Williams	36512	1993 NZ ₁
1993 OM ₈	13.7	0.15	19990810	12.96599	136.44371	203.19893	1.90017	0.1262173	3.0575848	59	2	1993–1999	0.59	M-v	4	Williams	36334	1993 OM ₈
1993 OY ₉	13.3	0.15	19990810	300.13343	126.48101	300.20489	9.24608	0.0953432	2.9868374	53	3	1993–1999	0.42	M-v	3	Williams	36512	1993 OY ₉
1993 OX ₁₁	12.8	0.15	19990810	283.66748	113.81659	297.95298	2.88700	0.1498669	3.1520405	73	3	1993–1999	0.73	M-v	2	Williams	36512	1993 OX ₁₁
1993 PA ₃	12.3	0.15	19990810	114.53789	257.23460	307.34000	17.95262	0.1174245	3.2245367	27	3	1991–1999	0.62	M-v	3	Williams	36334	1993 PA ₃
1993 PV ₅	12.7	0.15	19990810	14.73063	48.24067	317.72374	9.71094	0.1245854	3.0698910	42	4	1988–1999	0.54	M-v	1	Williams	36512	1993 PV ₅
1993 QE ₁	12.6	0.15	19990810	150.14726	191.61382	124.38540	14.60720	0.1635022	2.6385859	44	5	1979–1999	0.58	M-v	1	Williams	33746	1993 QE ₁
1993 QN ₃	13.5	0.15	19990810	167.72903	133.89670	159.88545	4.62779	0.0577365	2.6989867	31	3	1993–1999	0.88	M-v	3	Williams	35688	1993 QN ₃
1993 QP ₃	14.2	0.15	19990810	28.78282	203.20788	177.91997	2.02401	0.1629172	2.9858158	38	3	1993–1999	0.72	M-v	3	Williams	32746	1993 QP ₃
1993 QH ₈	13.8	0.15	19990810	69.17101	193.91169	82.20550	2.74132	0.1262714	3.2073292	47	4	1992–1999	0.54	M-v	1	Williams	36512	1993 QH ₈
1993 RA ₈	12.6	0.15	19990810	3.80584	155.81150	192.05814	8.07768	0.0256037	3.3489166	122	4	1993–1999	0.52	M-v	1	Williams	36512	1993 RA ₈
1993 SB	7.6	0.15	19990810	327.11307	77.99978	354.82965	1.93443	0.3252385	39.7739412	43	7	1993–1999	0.67	M-v	3	Williams	33072	1993 SB
1993 SC	6.8	0.15	19990810	39.52884	319.09705	354.62563	5.14562	0.1899991	39.8925751	87	7	1993–1999	0.56	M-v	3	Williams	33072	1993 SC
1993 SM ₃	13.6	0.15	19990810	15.59778	246.84393	138.93206	1.81825	0.1897098	3.1301029	43	5	1987–1999	0.75	M-v	1	Williams	32746	1993 SM ₃
1993 ST ₅	15.1	0.15	19990810	20.13957	94.54726	193.97972	1.60757	0.1489137	2.1316300	65	6	1971–1999	0.68	M-v	2	Williams	36512	1993 ST ₅
1993 TJ	12.9	0.15	19990810	242.41222	315.53012	205.83829	9.65534	0.0481281	3.0232365	68	3	1993–1999	0.61	M-v	3	Williams	36512	1993 TJ
1993 TL ₁₈	12.9	0.15	19990810	252.12433	98.82758	40.97379	4.81301	0.0807795	3.2279261	72	6	1987–1999	0.48	M-v	1	Williams	36512	1993 TL ₁₈

1993 TX ₂₃	13.8	0.15	19990810	101.17068	198.44389	96.85659	4.11315	0.1366520	3.0624068	21	3	1993–1999	0.84	M-v	4	Williams	35689	1993 TX ₂₃
1993 TN ₂₄	13.0	0.15	19990810	178.62938	82.68183	122.19986	1.78877	0.0997250	3.2435587	45	3	1992–1999	0.72	M-v	5	Williams	36513	1993 TN ₂₄
1993 TX ₂₆	13.8	0.15	19990810	69.38164	155.25916	184.24311	9.89077	0.1022865	3.0495058	66	5	1980–1999	0.67	M-v	1	Williams	36513	1993 TX ₂₆
1993 TJ ₃₁	13.7	0.15	19990810	47.36509	250.16377	115.51062	5.19477	0.0528964	3.0673184	33	3	1993–1999	0.65	M-v	3	Williams	36513	1993 TJ ₃₁
1993 TM ₃₁	13.9	0.15	19990810	18.87325	316.62166	115.19913	3.04339	0.0335813	2.9069803	38	3	1993–1999	0.90	M-v	4	Williams	33339	1993 TM ₃₁
1993 TD ₃₇	13.5	0.15	19990810	1.69558	231.72872	163.15216	8.26953	0.0403400	3.1933319	28	3	1993–1999	0.85	M-v	4	Williams	36513	1993 TD ₃₇
1993 TP ₃₈	13.4	0.15	19990810	199.59780	21.48148	191.10067	18.49089	0.0508080	3.1066399	45	5	1991–1999	0.73	M-v	1	Williams	34010	1993 TP ₃₈
1993 TX ₃₈	13.6	0.15	19990810	95.56114	212.47117	105.97253	6.99266	0.0567737	3.0608504	18	3	1993–1999	0.80	M-v	5	Williams	33072	1993 TX ₃₈
1993 UK	12.8	0.15	19990810	124.04380	254.90137	80.70487	3.32548	0.0669607	2.8530811	49	3	1993–1999	0.72	M-v	3	Williams	35689	1993 UK
1993 UX ₄	12.8	0.15	19990810	154.95695	200.25341	72.09835	11.54832	0.0800892	2.9853332	34	4	1978–1999	0.62	M-v	1	Williams	36513	1993 UX ₄
1993 UZ ₇	13.3	0.15	19990810	1.08569	264.45365	144.18076	7.32434	0.1425191	3.1629032	60	3	1993–1999	0.70	M-v	3	Williams	36513	1993 UZ ₇
1993 VA ₃	12.3	0.15	19990810	95.57554	283.29031	54.11919	10.39331	0.1259618	3.0169788	54	4	1993–1999	0.60	M-v	1	Williams	36513	1993 VA ₃
1993 VV ₄	12.6	0.15	19990810	31.68321	339.53742	83.67828	9.72293	0.0459144	3.0369920	70	4	1993–1999	0.73	M-v	1	Williams	36513	1993 VV ₄
1994 AC	14.4	0.15	19990810	302.84198	160.73809	255.34773	3.15342	0.0931662	2.1782593	101	4	1991–1999	0.53	M-v	2	Williams	36513	1994 AC
1994 AS	13.1	0.15	19990810	255.04885	202.04155	31.78470	1.80833	0.1632053	3.1088943	46	9	1981–1999	0.79	M-v	1	Williams	33550	1994 AS
1994 AT	15.8	0.15	19990810	288.16202	341.28795	91.22462	1.28131	0.1568674	2.1845627	53	2	1994–1999	0.72	M-v	4	Williams	36513	1994 AT
1994 AG ₁₀	16.3	0.15	19990810	143.71942	195.81173	3.36757	2.50573	0.1453798	2.3302624	34	3	1994–1999	0.55	M-v	4	Williams	36070	1994 AG ₁₀
1994 AV ₁₀	15.2	0.15	19990810	297.63675	67.21932	341.24521	4.32120	0.1334391	2.2444672	34	3	1994–1999	0.70	M-v	3	Williams	36335	1994 AV ₁₀
1994 AY ₁₀	15.7	0.15	19990810	91.62715	234.63278	45.40998	3.13917	0.2073229	2.2538869	50	3	1994–1999	0.53	M-v	3	Williams	32307	1994 AY ₁₀
1994 BD ₁	15.0	0.15	19990810	315.33387	45.25759	7.66594	6.47074	0.1454519	2.1985318	45	2	1994–1999	0.73	M-v	4	Williams	36335	1994 BD ₁
1994 BG ₄	14.2	0.15	19990810	97.06933	305.76967	271.58209	6.01201	0.0706348	2.3793397	44	3	1994–1999	0.73	M-v	3	Williams	36513	1994 BG ₄
1994 CG ₁	14.7	0.15	19990810	85.17409	286.30823	11.20316	5.00641	0.1984047	2.2533994	36	3	1994–1999	0.54	M-v	3	Williams	36070	1994 CG ₁
1994 CO ₁	15.0	0.15	19990810	131.37996	54.07462	181.54810	3.57481	0.1110259	2.2885623	57	3	1994–1999	0.54	M-v	3	Williams	36513	1994 CO ₁
1994 CY ₁	13.9	0.15	19990810	112.54588	299.85587	300.83751	7.97353	0.0848937	2.3296394	56	4	1982–1999	0.59	M-v	2	Williams	36513	1994 CY ₁
1994 CV ₉	15.0	0.15	19990810	99.84598	121.74239	142.07909	6.59748	0.1149886	2.3252374	55	4	1994–1999	0.61	M-v	1	Williams	36513	1994 CV ₉
1994 CU ₁₀	14.9	0.15	19990810	266.65248	323.70451	127.75711	6.31060	0.0300888	2.2957522	49	3	1994–1999	0.63	M-v	3	Williams	36513	1994 CU ₁₀
1994 CG ₁₂	14.6	0.15	19990810	62.18051	215.60950	58.84791	3.28182	0.1528520	2.4168603	70	4	1992–1999	0.70	M-v	2	Williams	36513	1994 CG ₁₂
1994 CN ₁₃	14.5	0.15	19990810	355.74037	260.66988	65.07877	3.63699	0.1875937	2.4536353	37	3	1994–1999	0.75	M-v	3	Williams	36070	1994 CN ₁₃
1994 CD ₁₈	14.2	0.15	19990810	11.42738	20.62944	358.39326	8.13664	0.1917599	2.1927773	18	3	1989–1999	0.74	M-v	4	Williams	34192	1994 CD ₁₈
1994 EL	15.3	0.15	19990810	145.93479	1.09000	210.27647	2.38103	0.1562358	2.3228152	39	3	1994–1999	0.59	M-v	4	Williams	36513	1994 EL
1994 ET	15.8	0.15	19990810	337.80283	59.02859	328.26843	7.56888	0.1358104	2.2199875	50	2	1994–1999	0.65	M-v	3	Williams	36335	1994 ET
1994 EQ ₁	13.7	0.15	19990810	272.55032	295.65006	173.86264	3.80918	0.1100664	2.2665589	66	5	1982–1999	0.56	M-v	1	Williams	36513	1994 EQ ₁
1994 EA ₂	15.5	0.15	19990810	245.71468	326.25178	184.01275	7.98717	0.2998545	2.2056410	51	3	1994–1999	0.63	M-v	2	Williams	36513	1994 EA ₂
1994 EC ₂	13.7	0.15	19990810	302.25001	39.16557	13.67606	25.24270	0.2550716	2.2913816	23	3	1968–1999	0.79	M-v	2	Williams	36335	1994 EC ₂
1994 EC ₅	14.5	0.15	19990810	16.32279	328.86705	345.75993	6.14286	0.0602127	2.4145557	103	3	1994–1999	0.65	M-v	3	Williams	36513	1994 EC ₅
1994 EZ ₆	14.7	0.15	19990810	50.23785	222.57887	97.18698	5.96003	0.1521357	2.3112039	56	3	1994–1999	0.59	M-v	2	Williams	36513	1994 EZ ₆
1994 FB	15.0	0.15	19990810	293.31578	258.89276	193.59047	2.28039	0.0510001	2.2444525	82	5	1991–1999	0.68	M-v	2	Williams	36513	1994 FB
1994 FF	13.9	0.15	19990810	194.57910	79.66916	129.10667	6.02867	0.1352091	2.2607545	45	4	1994–1999	0.56	M-v	2	Williams	36513	1994 FF
1994 FY	13.8	0.15	19990810	185.53159	136.64947	41.50298	12.04933	0.1076515	2.3654651	33	4	1976–1999	0.55	M-v	2	Williams	36513	1994 FY
1994 GF	14.7	0.15	19990810	228.74834	101.65134	107.02436	3.64710	0.0583618	2.1888273	79	5	1992–1999	0.80	M-v	2	Williams	36513	1994 GF
1994 GN	14.2	0.15	19990810	131.29089	203.54915	71.99037	5.54890	0.1404326	2.2689594	39	4	1994–1999	0.61	M-v	3	Williams	36514	1994 GN
1994 GA ₁	14.2	0.15	19990810	139.05215	206.86269	85.78949	4.82043	0.1639351	2.2406060	34	6	1974–1999	0.77	M-v	2	Williams	33072	1994 GA ₁
1994 GU ₉	13.4	0.15	19990810	135.40167	124.37529	125.74259	21.95870	0.1215261	2.3012208	35	4	1990–1999	0.56	M-v	2	Williams	36514	1994 GU ₉
1994 JR	13.4	0.15	19990810	67.34811	168.01837	82.85560	15.08432	0.1197995	2.5858526	64	5	1992–1999	0.57	M-v	1	Williams	32307	1994 JR
1994 JU ₈	13.7	0.15	19990810	60.41378	58.49948	231.28322	15.78310	0.1222878	2.5232451	79	3	1994–1999	0.70	M-v	2	Williams	36514	1994 JU ₈
1994 LC	14.2	0.15	19990810	114.11757	108.44324	128.92813	9.85873	0.1779929	2.5327977	51	3	1994–1999	0.67	M-v	3	Williams	36514	1994 LC
1994 LC ₁	16.4	0.15	19990810	17.03362	316.23256	15.71326	12.37506	0.5253197	2.8169662	92	3	1994–1999	0.58	M-v	1	Williams	31964	1994 LC ₁
1994 NA	14.6	0.15	19990810	136.10683	154.87880	113.34968	7.20236	0.1095857	2.4479757	48	3	1994–1999	0.62	M-v	3	Williams	32747	1994 NA
1994 NB	13.2	0.15	19990810	164.48271	95.12539	126.99070	23.76086	0.2748524	2.3677388	39	3	1994–1999	0.72	M-v	2	Williams	36514	1994 NB
1994 NF ₁	13.9	0.15	19990810	186.40259	199.03054	99.24114	8.19695	0.1398703	2.2168780	37	5	1994–1999	0.66	M-v	2	Williams	33747	1994 NF ₁
1994 PS	13.7	0.15	19990810	286.22700	32.16759	154.47976	11.21377	0.1075843	2.3482597	36	5	1994–1999	0.59	M-v	1	Williams	34582	1994 PS
1994 PJ ₁	14.5	0.15	19990810	116.36365	136.91511	142.12107	13.93759	0.1360541	2.5514569	40	3	1994–1999	0.68	M-v	3	Williams	32747	1994 PJ ₁
1994 PK ₅	13.3	0.15	19990810	283.11140	128.25220	328.21020	9.15556	0.0068056	2.6872182	43	4	1986–1999	0.80	M-v	2	Williams	36514	1994 PK ₅

1994 PN ₅	14.4	0.15	19990810	311.19391	275.72143	150.56048	2.86623	0.0713699	2.7303630	38	3	1994–1999	0.68	M-v	4	Williams	36514	1994 PN ₅
1994 PJ ₇	14.5	0.15	19990810	34.23409	168.05988	152.15361	3.25656	0.0687503	2.7939779	32	2	1994–1999	0.72	M-v	5	Williams	36336	1994 PJ ₇
1994 PS ₇	14.7	0.15	19990810	347.96987	142.24716	231.41114	1.70599	0.0975222	2.8039310	39	2	1994–1999	0.68	M-v	4	Williams	36336	1994 PS ₇
1994 PJ ₁₀	13.7	0.15	19990810	359.87125	92.47398	285.78877	1.47013	0.0931161	2.7297896	27	4	1990–1999	0.73	M-v	1	Williams	30900	1994 PJ ₁₀
1994 PX ₁₁	14.1	0.15	19990810	345.95297	49.25685	302.60646	1.07646	0.0694883	2.9081023	61	5	1979–1999	0.69	M-v	2	Williams	36514	1994 PX ₁₁
1994 PA ₁₄	15.0	0.15	19990810	336.07340	173.97115	201.57972	1.51878	0.0812255	2.8615162	87	3	1992–1999	0.54	M-v	3	Williams	36514	1994 PA ₁₄
1994 PF ₁₄	14.5	0.15	19990810	67.48517	138.71641	173.35631	5.22660	0.0234686	2.6985246	31	3	1994–1999	0.78	M-v	4	Williams	36514	1994 PF ₁₄
1994 PR ₁₄	16.5	0.15	19990810	102.73857	101.18339	181.58708	4.18898	0.0765996	2.6469653	28	3	1994–1999	0.51	M-v	4	Williams	36514	1994 PR ₁₄
1994 PG ₁₈	13.9	0.15	19990810	282.79479	2.69694	157.19384	6.42802	0.0657897	2.4541094	64	3	1994–1999	0.62	M-v	3	Williams	36514	1994 PG ₁₈
1994 PK ₁₈	14.8	0.15	19990810	28.73406	340.55187	333.92511	4.62939	0.1594088	2.8478031	56	4	1994–1999	0.71	M-v	1	Williams	36337	1994 PK ₁₈
1994 PU ₁₈	15.5	0.15	19990810	55.29019	326.12105	2.48770	1.88742	0.0874132	2.6802045	32	3	1994–1999	0.48	M-v	4	Williams	29620	1994 PU ₁₈
1994 PG ₂₂	14.0	0.15	19990810	99.39723	273.45615	341.44811	12.42058	0.1054227	2.7808382	47	2	1994–1999	0.68	M-v	4	Williams	36514	1994 PG ₂₂
1994 PH ₂₂	14.9	0.15	19990810	356.79480	241.24471	165.49448	2.43572	0.2046477	2.6999970	30	4	1981–1999	0.79	M-v	1	Williams	36514	1994 PH ₂₂
1994 PN ₂₂	13.8	0.15	19990810	295.79527	54.02729	358.97314	1.65548	0.0961612	2.9229090	205	4	1992–1999	0.50	M-v	3	Williams	36514	1994 PN ₂₂
1994 PX ₂₂	14.8	0.15	19990810	318.83105	327.04992	135.72176	3.73131	0.2400495	2.6507932	34	4	1994–1999	0.65	M-v	2	Williams	36514	1994 PX ₂₂
1994 PL ₂₃	14.6	0.15	19990810	344.20885	59.41260	36.24294	1.22692	0.1489135	2.5364000	43	5	1988–1999	0.89	M-v	2	Williams	36514	1994 PL ₂₃
1994 PC ₂₉	14.2	0.15	19990810	66.21708	160.64018	134.82579	8.00624	0.0955463	2.7383459	54	4	1993–1999	0.70	M-v	1	Williams	36514	1994 PC ₂₉
1994 PH ₂₉	14.0	0.15	19990810	114.18553	159.41888	93.49114	3.22384	0.0416601	2.7219473	35	2	1994–1999	0.65	M-v	5	Williams	36337	1994 PH ₂₉
1994 PW ₂₉	13.9	0.15	19990810	310.06572	210.93761	184.09476	10.55976	0.1326660	2.9299673	62	3	1994–1999	0.64	M-v	3	Williams	36514	1994 PW ₂₉
1994 PT ₃₁	14.5	0.15	19990810	152.25786	44.03619	210.95933	3.56365	0.0535401	2.5620862	49	4	1994–1999	0.70	M-v	1	Williams	32747	1994 PT ₃₁
1994 PL ₃₄	14.6	0.15	19990810	338.51471	202.93868	216.58212	3.12987	0.1197910	2.6489031	19	4	1977–1999	0.56	M-v	1	Williams	32237	1994 PL ₃₄
1994 QA ₁	14.5	0.15	19990810	323.77237	304.34256	151.44212	3.71814	0.1817445	2.5956104	43	4	1994–1999	0.72	M-v	2	Williams	36515	1994 QA ₁
1994 RV	13.8	0.15	19990810	148.29872	348.94843	331.47688	5.31869	0.1343574	2.3783905	48	5	1993–1999	0.62	M-v	2	Williams	33340	1994 RV
1994 RY ₁	13.6	0.15	19990810	49.07328	180.75630	169.77248	16.42653	0.2895955	2.6272673	38	3	1994–1999	0.76	M-v	2	Williams	32237	1994 RY ₁
1994 RL ₇	14.1	0.15	19990810	273.48035	169.80401	323.02335	1.87569	0.2053134	2.7628005	83	3	1994–1999	0.44	M-v	4	Williams	36515	1994 RL ₇
1994 RN ₇	14.3	0.15	19990810	280.90271	122.78830	343.20937	3.32058	0.0457835	2.7824144	47	3	1992–1999	0.41	M-v	3	Williams	36515	1994 RN ₇
1994 RR ₁₁	13.9	0.15	19990810	359.79640	157.59908	238.79393	7.62564	0.1662422	2.7382627	43	5	1983–1999	0.59	M-v	1	Williams	36515	1994 RR ₁₁
1994 SH ₉	13.8	0.15	19990810	92.75659	231.26510	27.64849	2.32133	0.0482164	2.9345599	65	2	1994–1999	0.50	M-v	4	Williams	36515	1994 SH ₉
1994 TB	7.1	0.15	19990810	332.69408	98.18392	317.36064	12.12495	0.3233998	39.9207453	85	5	1994–1999	0.75	M-v	3	Marsden	36071	1994 TB
1994 TZ	12.9	0.15	19990810	252.78255	281.78089	176.25042	10.02866	0.0688926	3.0602166	53	3	1994–1999	0.52	M-v	3	Williams	36515	1994 TZ
1994 UZ ₁	12.6	0.15	19990810	313.51908	28.61562	51.32750	13.28019	0.0761409	2.9080342	62	3	1989–1999	0.70	M-v	4	Williams	36515	1994 UZ ₁
1994 VM ₁	13.9	0.15	19990810	315.30282	239.76778	180.70681	4.69304	0.1969660	3.0617169	74	3	1994–1999	0.59	M-v	3	Williams	36515	1994 VM ₁
1994 VS ₁	14.1	0.15	19990810	319.00321	19.16043	39.13154	5.03222	0.1784052	3.0783159	73	2	1994–1999	0.52	M-v	4	Williams	36515	1994 VS ₁
1994 VX ₁	13.8	0.15	19990810	357.66119	274.74056	98.46992	3.52151	0.0760235	2.9922422	55	2	1994–1999	0.51	M-v	4	Williams	36338	1994 VX ₁
1994 VW ₂	13.7	0.15	19990810	41.44432	312.60856	78.09790	5.14894	0.2961163	2.6875457	31	4	1994–1999	0.78	M-v	2	Williams	34582	1994 VW ₂
1994 VD ₇	12.4	0.15	19990810	39.84501	72.58595	234.96707	20.76798	0.1059537	3.1657787	47	3	1994–1999	0.63	M-v	2	Williams	36515	1994 VD ₇
1994 WF ₁	13.8	0.15	19990810	38.88476	97.26919	268.16426	0.96401	0.0930625	2.9006869	38	3	1994–1999	0.59	M-v	3	Williams	36515	1994 WF ₁
1994 WW ₂	13.6	0.15	19990810	132.34259	305.41356	14.55846	3.16142	0.0610959	2.6957959	52	4	1994–1999	0.57	M-v	1	Williams	35692	1994 WW ₂
1994 XM	14.2	0.15	19990810	309.72736	21.68994	41.74349	1.23970	0.1811061	3.1270370	64	3	1994–1999	0.52	M-v	4	Williams	36515	1994 XM
1994 XM ₂	12.6	0.15	19990810	12.37655	261.92528	84.77441	8.47240	0.0360788	3.1441912	46	2	1994–1999	0.32	M-v	4	Williams	36515	1994 XM ₂
1994 XY ₄	15.1	0.15	19990810	302.08501	317.11105	85.69726	24.39504	0.1337166	1.8733588	18	5	1989–1999	0.91	M-v	2	Williams	36515	1994 XY ₄
1994 YG	14.5	0.15	19990810	320.65040	34.72100	31.40421	0.98498	0.2485473	3.0518063	80	3	1978–1999	0.56	M-v	2	Williams	36515	1994 YG
1994 YA ₁	13.9	0.15	19990810	14.54212	315.05048	118.54651	4.71978	0.1831778	2.8090832	73	4	1994–1999	0.67	M-v	1	Williams	33074	1994 YA ₁
1995 AF	12.5	0.15	19990810	140.77075	27.94687	294.33508	11.53384	0.1681209	2.6652998	62	6	1967–1999	0.67	M-v	2	Williams	33749	1995 AF
1995 BD	12.1	0.15	19990810	98.44534	182.56133	91.91579	10.01857	0.1128575	3.4230922	58	4	1995–1999	0.58	M-v	1	Williams	36515	1995 BD
1995 BL	14.6	0.15	19990810	244.58775	177.67912	309.68952	17.98551	0.0657084	1.9452610	34	2	1995–1999	0.59	M-v	4	Williams	36515	1995 BL
1995 BT	13.1	0.15	19990810	357.64676	87.49926	316.70796	21.08308	0.1143586	3.2308559	47	3	1995–1999	0.56	M-v	2	Williams	36071	1995 BT
1995 BX	13.8	0.15	19990810	2.58832	19.30319	34.29089	1.47812	0.1930643	3.0620110	48	3	1995–1999	0.69	M-v	3	Williams	36515	1995 BX
1995 CG	14.5	0.15	19990810	81.75414	163.22111	137.75786	24.48423	0.0752734	1.9611162	32	3	1995–1999	0.56	M-v	2	Williams	36515	1995 CG
1995 DG	12.6	0.15	19990810	348.45733	291.77576	148.97164	17.00477	0.2127983	3.1308196	50	3	1995–1999	0.69	M-v	3	Williams	33553	1995 DG
1995 DA ₃	15.9	0.15	19990810	124.85262	42.07360	227.35254	20.44208	0.0403848	1.9463194	32	3	1995–1999	0.70	M-v	3	Williams	36516	1995 DA ₃
1995 DZ ₁₁	13.5	0.15	19990810	12.49476	311.86281	140.87424	2.83733	0.0362234	2.9419156	40	5	1990–1999	0.71	M-v	1	Williams	33553	1995 DZ ₁₁
1995 EA ₈	14.4	0.15	19990810	7.43110	283.99050	163.18504	0.65067	0.2030640	2.9947371	64	4	1995–1999	0.59	M-v	1	Williams	36516	1995 EA ₈

1995 ED ₉	12.9	0.15	19990810	18.73967	263.25431	161.77559	6.55207	0.1322709	3.1409301	56	5	1984–1999	0.63	M-v	1	Williams	36516	1995 ED ₉
1995 FS	13.1	0.15	19990810	284.41752	154.60892	357.23265	17.27421	0.1452637	3.1241236	65	4	1993–1999	0.62	M-v	2	Williams	36071	1995 FS
1995 FM ₁₁	15.8	0.15	19990810	51.70882	104.56378	184.66531	3.75718	0.1381492	2.1550136	62	4	1992–1999	0.52	M-v	3	Williams	36516	1995 FM ₁₁
1995 KM ₁	15.4	0.15	19990810	38.62850	182.52637	117.85715	4.00292	0.2212545	2.3043630	89	3	1995–1999	0.60	M-v	3	Williams	36516	1995 KM ₁
1995 LK	14.2	0.15	19990810	46.81114	20.28940	301.73087	25.97515	0.2184953	2.3178713	41	3	1995–1999	0.51	M-v	2	Williams	36338	1995 LK
1995 MB	12.5	0.15	19990810	29.91865	11.00060	280.07123	26.26834	0.2207111	2.4128174	90	2	1995–1999	0.55	M-v	2	Williams	36516	1995 MB
1995 OB	15.1	0.15	19990810	60.34372	37.89000	260.80650	4.83429	0.1795750	2.2910103	68	3	1995–1999	0.64	M-v	2	Williams	36516	1995 OB
1995 OF	16.0	0.15	19990810	36.62340	68.81594	264.34446	6.09688	0.1341856	2.3034864	50	3	1995–1999	0.78	M-v	3	Williams	32239	1995 OF
1995 OR	15.1	0.15	19990810	41.91541	268.59292	63.61906	4.82533	0.2230412	2.2876801	43	3	1995–1999	0.54	M-v	3	Williams	32749	1995 OR
1995 OS ₁	14.7	0.15	19990810	283.70114	67.37159	338.93411	2.83035	0.0738003	2.4743000	79	4	1994–1999	0.60	M-v	2	Williams	36516	1995 OS ₁
1995 ON ₄	14.4	0.15	19990810	65.87503	104.65564	135.97933	2.77660	0.1113353	2.5648760	68	3	1995–1999	0.62	M-v	2	Williams	36516	1995 ON ₄
1995 OC ₈	15.7	0.15	19990810	76.60121	109.50179	193.17315	3.93232	0.1919292	2.2470200	56	3	1995–1999	0.65	M-v	3	Williams	32308	1995 OC ₈
1995 QK	15.0	0.15	19990810	22.19826	132.71906	231.18363	3.31167	0.1721866	2.3153829	32	5	1988–1999	0.64	M-v	1	Williams	36516	1995 QK
1995 QS	14.4	0.15	19990810	102.69095	213.84361	59.21636	5.18089	0.1584709	2.2508453	110	3	1995–1999	0.63	M-v	3	Williams	36516	1995 QS
1995 QB ₂	14.9	0.15	19990810	34.79762	77.50290	302.74306	3.55558	0.1841109	2.2377383	28	4	1955–1999	0.78	M-v	2	Williams	36516	1995 QB ₂
1995 QN ₂	15.0	0.15	19990810	339.48130	254.03743	150.64804	6.78526	0.1005476	2.3282497	55	3	1995–1999	0.57	M-v	4	Williams	36516	1995 QN ₂
1995 QE ₃	14.6	0.15	19990810	38.15076	11.61557	324.01225	1.74128	0.2298964	2.3739262	76	4	1995–1999	0.64	M-v	1	Williams	32308	1995 QE ₃
1995 QY ₉	7.5	0.15	19990810	350.43515	25.07683	342.06804	4.82780	0.2711788	40.0849164	66	5	1995–1999	0.63	M-v	4	Marsden	33074	1995 QY ₉
1995 QC ₁₀	15.5	0.15	19990810	40.42887	80.62815	226.80814	5.64949	0.1351520	2.4333717	48	3	1995–1999	0.62	M-v	3	Williams	36516	1995 QC ₁₀
1995 RC	14.4	0.15	19990810	50.11484	58.49364	331.82312	5.52630	0.1672324	2.2091066	100	4	1995–1999	0.60	M-v	2	Williams	33342	1995 RC
1995 SP	15.0	0.15	19990810	8.18991	37.45600	13.38185	9.24869	0.1900659	2.3231675	62	3	1995–1999	0.50	M-v	2	Williams	36516	1995 SP
1995 SR	14.4	0.15	19990810	10.82445	70.70118	217.39159	26.52426	0.3098414	2.5886084	42	2	1995–1999	0.48	M-v	2	Williams	35693	1995 SR
1995 SB ₁	14.3	0.15	19990810	352.26906	167.71234	231.79600	24.33298	0.2543245	2.3953088	41	4	1995–1999	0.63	M-v	2	Williams	36516	1995 SB ₁
1995 SJ ₁	15.0	0.15	19990810	322.01464	62.54457	351.86751	4.07373	0.2009153	2.4807205	113	3	1995–1999	0.42	M-v	2	Williams	36516	1995 SJ ₁
1995 SQ ₁	13.9	0.15	19990810	331.19741	121.86721	313.79470	23.71416	0.2224816	2.3679887	30	3	1991–1999	0.62	M-v	3	Williams	36516	1995 SQ ₁
1995 SK ₂	15.1	0.15	19990810	9.22787	355.64028	349.62490	3.12359	0.1953124	2.4324212	110	3	1995–1999	0.65	M-v	3	Williams	36516	1995 SK ₂
1995 SO ₂	15.8	0.15	19990810	6.90445	83.02141	232.97636	4.11428	0.2934076	2.5724242	69	2	1995–1999	0.50	M-v	3	Williams	36516	1995 SO ₂
1995 SX ₂	14.2	0.15	19990810	33.22956	280.76879	42.10378	3.50814	0.1922290	2.4251958	100	3	1995–1999	0.57	M-v	2	Williams	36516	1995 SX ₂
1995 SK ₃	14.6	0.15	19990810	74.39052	178.00094	94.66273	3.56732	0.1632367	2.4621822	69	4	1991–1999	0.54	M-v	3	Williams	36516	1995 SK ₃
1995 SR ₃	13.9	0.15	19990810	62.82200	17.07520	328.86661	6.24958	0.1781212	2.2566818	35	4	1978–1999	0.51	M-v	2	Williams	36516	1995 SR ₃
1995 SO ₅	13.9	0.15	19990810	10.08148	257.05077	54.66289	14.06960	0.1987045	2.5324969	30	4	1987–1999	0.66	M-v	2	Williams	36517	1995 SO ₅
1995 SM ₁₅	14.7	0.15	19990810	345.82936	359.64871	349.45300	8.87446	0.0585087	2.5586037	51	2	1995–1999	0.52	M-v	3	Williams	36517	1995 SM ₁₅
1995 SF ₁₇	15.2	0.15	19990810	304.38499	240.13630	172.09777	4.57077	0.2244740	2.5607166	28	2	1995–1999	0.62	M-v	5	Williams	36339	1995 SF ₁₇
1995 SW ₂₅	15.8	0.15	19990810	336.51557	11.95736	358.08933	2.69175	0.2186905	2.5851311	48	2	1995–1999	0.61	M-v	3	Williams	36517	1995 SW ₂₅
1995 SH ₂₆	14.8	0.15	19990810	41.51412	311.13332	354.22990	1.74760	0.1283779	2.5309815	85	4	1991–1999	0.62	M-v	3	Williams	36517	1995 SH ₂₆
1995 ST ₅₃	13.8	0.15	19990810	32.80545	261.73049	40.99322	13.61726	0.2939796	2.6195470	32	2	1995–1999	0.36	M-v	3	Williams	36339	1995 ST ₅₃
1995 SO ₅₄	14.6	0.15	19990810	22.65895	268.93509	127.65126	3.43678	0.1751226	2.2924809	18	4	1988–1999	0.59	M-v	3	Williams	35068	1995 SO ₅₄
1995 SM ₅₅	4.9	0.15	19990810	311.13349	66.07492	21.01149	26.96489	0.1022899	42.0757300	32	2	1995–1999	0.55	M-v	4	Marsden	36517	1995 SM ₅₅
1995 TR	13.9	0.15	19990810	88.18643	84.39481	219.02868	5.48685	0.1155916	2.3800108	39	5	1983–1999	0.57	M-v	1	Williams	34860	1995 TR
1995 TX	13.4	0.15	19990810	209.54767	263.93494	304.82491	23.30177	0.1581369	2.3176908	56	4	1995–1999	0.55	M-v	1	Williams	36517	1995 TX
1995 TA ₁	15.1	0.15	19990810	210.50961	4.48998	177.37545	1.84714	0.0678253	2.4222088	49	3	1995–1999	0.53	M-v	3	Williams	36517	1995 TA ₁
1995 TZ ₁	14.6	0.15	19990810	98.49055	199.45577	43.04040	7.68315	0.2400568	2.6302355	58	3	1995–1999	0.61	M-v	3	Williams	36517	1995 TZ ₁
1995 TY ₂	16.6	0.15	19990810	351.51594	343.89440	8.47628	10.69368	0.2003358	2.5474018	26	2	1995–1999	0.33	M-v	3	Williams	36517	1995 TY ₂
1995 TQ ₆	14.5	0.15	19990810	299.25950	135.33815	19.53233	3.33496	0.0461006	2.2175558	38	4	1995–1999	0.59	M-v	1	Williams	32749	1995 TQ ₆
1995 TB ₈	14.0	0.15	19990810	166.83021	303.16296	257.81616	1.55696	0.0607660	2.5888583	91	4	1989–1999	0.55	M-v	4	Williams	36517	1995 TB ₈
1995 UG	15.3	0.15	19990810	327.69924	141.80631	242.32119	3.71486	0.3203899	2.6011381	67	3	1995–1999	0.52	M-v	2	Williams	36517	1995 UG
1995 UK	16.1	0.15	19990810	342.46551	131.49471	238.93359	4.15062	0.3042548	2.5651806	62	2	1995–1999	0.55	M-v	3	Williams	36339	1995 UK
1995 UQ ₁	14.7	0.15	19990810	15.06380	182.50778	214.24178	4.57827	0.2318045	2.3612062	46	3	1995–1999	0.41	M-v	2	Marsden	36517	1995 UQ ₁
1995 UJ ₂	14.6	0.15	19990810	24.84947	3.27810	12.22684	3.35665	0.2189605	2.3671579	51	3	1995–1999	0.36	M-v	2	Marsden	36517	1995 UJ ₂
1995 UT ₂	14.9	0.15	19990810	152.69148	139.72110	100.18031	4.34091	0.0810115	2.3977360	53	5	1979–1999	0.62	M-v	1	Williams	34512	1995 UT ₂
1995 UW ₂	14.8	0.15	19990810	357.76187	130.84530	261.02237	1.48800	0.1961441	2.4412517	77	4	1991–1999	0.44	M-v	2	Williams	36517	1995 UW ₂
1995 UQ ₃	14.2	0.15	19990810	199.29774	12.10717	242.95067	2.14680	0.0729734	2.1821030	76	3	1995–1999	0.61	M-v	2	Williams	33553	1995 UQ ₃
1995 UN ₄	13.8	0.15	19990810	47.01591	95.41819	239.57227	5.42116	0.1668050	2.4723769	51	4	1987–1999	0.51	M-v	2	Williams	32309	1995 UN ₄

1995 UO ₅	17.3	0.15	19990810	232.55311	150.95420	38.76537	36.17055	0.6437785	1.5603425	71	4	1995–1999	0.60	M-v	3	Williams	36517	1995 UO ₅
1995 UG ₆	14.5	0.15	19990810	354.61015	14.83620	7.85859	2.72685	0.1681485	2.5207553	56	3	1995–1999	0.54	M-v	4	Williams	36517	1995 UG ₆
1995 UL ₆	14.8	0.15	19990810	50.78673	353.99908	340.22574	2.21687	0.1893066	2.4255676	36	8	1971–1999	0.75	M-v	1	Williams	32053	1995 UL ₆
1995 UP ₇	13.4	0.15	19990810	317.05587	250.11676	175.85100	5.49055	0.1150079	2.5616682	56	4	1993–1999	0.56	M-v	3	Williams	36517	1995 UP ₇
1995 UB ₈	14.3	0.15	19990810	336.72343	27.34723	65.54006	4.14730	0.1226709	2.3336005	48	3	1995–1999	0.65	M-v	3	Williams	36517	1995 UB ₈
1995 UL ₈	15.3	0.15	19990810	345.69769	43.99930	41.97823	2.82964	0.1719464	2.3572332	40	3	1995–1999	0.56	M-v	4	Williams	30473	1995 UL ₈
1995 UR ₈	16.0	0.15	19990810	16.20373	288.15419	32.73185	4.71449	0.2355137	2.5592697	70	4	1991–1999	0.66	M-v	3	Williams	36517	1995 UR ₈
1995 UV ₈	14.1	0.15	19990810	313.44893	7.14954	68.55656	3.09257	0.2543647	2.5593728	52	2	1995–1999	0.58	M-v	3	Williams	36340	1995 UV ₈
1995 UQ ₁₁	14.0	0.15	19990810	70.02488	258.00392	10.24194	14.75908	0.0810764	2.5691494	51	3	1995–1999	0.41	M-v	2	Williams	36340	1995 UQ ₁₁
1995 UB ₁₃	15.7	0.15	19990810	113.04326	237.12297	21.85509	9.12064	0.1895579	2.4080828	24	5	1979–1999	0.43	M-v	1	Williams	26760	1995 UB ₁₃
1995 UU ₁₄	16.0	0.15	19990810	247.21964	221.97687	309.54894	1.54801	0.1349054	2.3862636	34	3	1995–1999	0.54	M-v	4	Williams	30784	1995 UU ₁₄
1995 UB ₁₅	15.1	0.15	19990810	231.32383	142.69190	14.46442	3.92272	0.1641002	2.5619070	41	3	1995–1999	0.48	M-v	3	Williams	36518	1995 UB ₁₅
1995 UV ₁₆	14.8	0.15	19990810	60.57858	212.05226	76.38835	5.96835	0.2095026	2.5967240	55	3	1995–1999	0.65	M-v	2	Williams	36518	1995 UV ₁₆
1995 UB ₂₁	14.5	0.15	19990810	96.04462	58.99748	208.60408	7.59720	0.1503942	2.4613188	83	4	1991–1999	0.55	M-v	3	Williams	36518	1995 UB ₂₁
1995 UK ₂₈	14.1	0.15	19990810	31.46241	294.05037	40.50205	5.70433	0.1430332	2.4468156	104	3	1995–1999	0.58	M-v	3	Williams	36518	1995 UK ₂₈
1995 UB ₃₂	15.9	0.15	19990810	359.93245	243.37973	109.76604	3.54229	0.1855919	2.5548527	15	1	84 days	0.61	M-v	5	Williams	26570	1995 UB ₃₂
1995 UK ₄₄	13.9	0.15	19990810	49.54589	92.93097	255.08212	5.76768	0.1467178	2.3548205	34	5	1976–1999	0.61	M-v	2	Williams	36518	1995 UK ₄₄
1995 UQ ₄₄	13.7	0.15	19990810	21.52447	303.74450	17.29317	12.98518	0.1690679	2.5781186	98	3	1995–1999	0.63	M-v	2	Williams	36518	1995 UQ ₄₄
1995 UY ₄₄	14.6	0.15	19990810	11.67644	332.55783	34.97109	10.02602	0.2068252	2.4890359	80	4	1991–1999	0.55	M-v	3	Marsden	36518	1995 UY ₄₄
1995 UC ₄₇	14.7	0.15	19990810	331.30627	355.98531	30.32083	5.64245	0.3056670	2.5894304	58	3	1993–1999	0.54	M-v	2	Williams	36518	1995 UC ₄₇
1995 UX ₄₈	14.9	0.15	19990810	16.12314	58.66868	6.72781	0.85624	0.1202704	2.2760472	30	3	1995–1999	0.76	M-v	4	Williams	32749	1995 UX ₄₈
1995 VF	14.7	0.15	19990810	68.09506	114.17240	253.29152	6.14147	0.1336938	2.2993550	28	4	1991–1999	0.54	M-v	1	Williams	33074	1995 VF
1995 VJ	14.6	0.15	19990810	290.12569	52.45120	42.57172	3.07113	0.1331721	2.5771849	59	3	1995–1999	0.58	M-v	3	Williams	36518	1995 VJ
1995 VN	15.1	0.15	19990810	17.20929	197.66491	179.93229	2.15931	0.2118165	2.4397903	22	4	1991–1999	0.54	M-v	3	Williams	29319	1995 VN
1995 VT	12.1	0.15	19990810	154.09422	283.12720	231.82644	8.76367	0.0445480	3.0533166	61	3	1995–1999	0.70	M-v	3	Williams	36518	1995 VT
1995 VC ₁	13.6	0.15	19990810	307.44445	12.69350	36.19874	12.86827	0.2288272	2.6695461	33	4	1973–1999	0.56	M-v	1	Williams	36518	1995 VC ₁
1995 VP ₁	14.1	0.15	19990810	66.08198	275.99399	89.36190	5.93920	0.2179472	2.2736749	20	4	1988–1999	0.69	M-v	2	Williams	32518	1995 VP ₁
1995 VA ₂	13.9	0.15	19990810	181.40378	139.14449	59.89903	10.09697	0.0576137	2.5557644	62	5	1989–1999	0.54	M-v	2	Williams	36518	1995 VA ₂
1995 VJ ₂	14.1	0.15	19990810	357.91122	334.21218	67.47533	15.38181	0.1150867	2.4703487	63	3	1995–1999	0.63	M-v	3	Williams	36518	1995 VJ ₂
1995 VX ₂	16.2	0.15	19990810	70.48365	103.90337	201.88196	1.80772	0.1816077	2.4028412	31	5	1991–1999	0.42	M-v	1	Williams	36518	1995 VX ₂
1995 VX ₄	15.9	0.15	19990810	114.78466	141.26187	125.13378	3.84344	0.1642900	2.4205222	22	4	1994–1999	0.29	M-v	1	Williams	29319	1995 VX ₄
1995 WE	13.8	0.15	19990810	341.02527	52.41434	68.95756	6.81834	0.1541899	2.2843337	46	5	1988–1999	0.59	M-v	2	Williams	33553	1995 WE
1995 WF	15.6	0.15	19990810	9.09787	162.92055	246.41852	10.58955	0.2063581	2.3852198	53	4	1995–1999	0.50	M-v	1	Williams	32310	1995 WF
1995 WQ	14.7	0.15	19990810	333.53452	27.82949	26.30981	3.26624	0.2286400	2.5611299	63	3	1995–1999	0.52	M-v	3	Williams	36518	1995 WQ
1995 WD ₁	14.0	0.15	19990810	283.42646	216.19705	196.20155	2.46934	0.1404980	2.8476135	41	3	1995–1999	0.58	M-v	3	Williams	36518	1995 WD ₁
1995 WK ₁	14.0	0.15	19990810	291.98999	53.26734	43.39921	4.87911	0.1336558	2.6231080	48	2	1995–1999	0.51	M-v	4	Williams	36341	1995 WK ₁
1995 WS ₁	14.0	0.15	19990810	81.87111	316.85496	44.00894	3.87383	0.1893963	2.2334208	71	4	1985–1999	0.79	M-v	2	Williams	33553	1995 WS ₁
1995 WG ₂	13.4	0.15	19990810	244.57641	257.82912	247.67098	10.67091	0.1092699	2.6681480	46	5	1985–1999	0.55	M-v	2	Williams	36518	1995 WG ₂
1995 WF ₃	14.0	0.15	19990810	266.97216	68.84647	57.53032	11.53356	0.2281342	2.6589501	25	4	1992–1999	0.68	M-v	2	Williams	36518	1995 WF ₃
1995 WS ₃	15.3	0.15	19990810	347.03368	68.68821	296.73817	2.91447	0.2550655	2.5766600	107	3	1995–1999	0.52	M-v	2	Williams	36518	1995 WS ₃
1995 WL ₄	14.9	0.15	19990810	333.10736	305.99668	137.41909	3.30358	0.1508600	2.4660068	32	5	1993–1999	0.75	M-v	2	Williams	36518	1995 WL ₄
1995 WM ₄	14.1	0.15	19990810	34.00188	236.28728	100.24143	4.26631	0.1583713	2.5902007	56	3	1995–1999	0.51	M-v	2	Williams	36518	1995 WM ₄
1995 WN ₄	15.6	0.15	19990810	338.21119	284.72075	114.53077	4.49626	0.1814636	2.6005164	33	2	1995–1999	0.63	M-v	4	Williams	36341	1995 WN ₄
1995 WX ₄	14.6	0.15	19990810	11.64037	177.33813	225.58673	4.04972	0.1928759	2.4191038	20	5	1976–1999	0.63	M-v	2	Williams	30473	1995 WX ₄
1995 WZ ₄	14.2	0.15	19990810	309.60083	9.63611	104.89110	3.63516	0.1383338	2.4373182	44	5	1985–1999	0.62	M-v	1	Williams	36518	1995 WZ ₄
1995 WB ₅	14.0	0.15	19990810	12.27030	96.80533	253.78257	12.78420	0.1553425	2.6330187	68	3	1995–1999	0.60	M-v	3	Williams	36518	1995 WB ₅
1995 WC ₅	13.9	0.15	19990810	277.18604	232.48823	226.04149	3.35221	0.0707401	2.6830721	71	5	1986–1999	0.49	M-v	1	Williams	36341	1995 WC ₅
1995 WF ₅	13.9	0.15	19990810	294.58752	287.39194	149.92636	4.37807	0.1539403	2.6469749	47	4	1991–1999	0.64	M-v	2	Williams	36518	1995 WF ₅
1995 WE ₆	14.9	0.15	19990810	353.59964	15.89545	21.98036	2.25287	0.2086109	2.3968463	63	4	1991–1999	0.57	M-v	2	Williams	36518	1995 WE ₆
1995 WF ₆	14.8	0.15	19990810	46.35777	231.13286	118.73188	1.65558	0.1384234	2.4375169	60	5	1994–1999	0.52	M-v	1	Williams	32310	1995 WF ₆
1995 WD ₇	14.5	0.15	19990810	329.98596	115.43255	257.69128	7.89762	0.1608629	2.7594840	46	2	1995–1999	0.57	M-v	4	Williams	36518	1995 WD ₇
1995 WQ ₇	13.9	0.15	19990810	17.18780	44.51468	1.78340	0.88689	0.1836470	2.3949859	30	5	1980–1999	0.54	M-v	1	Williams	36518	1995 WQ ₇
1995 WV ₇	13.1	0.15	19990810	304.58820	31.27601	73.93357	11.43125	0.1083306	2.5429481	43	3	1991–1999	0.49	M-v	3	Williams	36518	1995 WV ₇

1995 WB ₉	13.5	0.15	19990810	282.67548	244.10575	228.93541	26.32004	0.1353331	2.6292222	75	2	1995–1999	0.45	M-v	3	Williams	36341	1995 WB ₉
1995 WL ₁₃	13.6	0.15	19990810	352.30930	274.99098	134.92729	4.15825	0.0787634	2.4667646	40	3	1995–1999	0.52	M-v	3	Williams	36518	1995 WL ₁₃
1995 WP ₁₇	15.0	0.15	19990810	5.17954	317.43238	18.06725	3.97750	0.2979819	2.5719772	80	3	1995–1999	0.43	M-v	2	Williams	36518	1995 WP ₁₇
1995 WE ₂₇	13.8	0.15	19990810	60.76233	359.84149	300.00241	14.19656	0.1810449	3.2110775	34	3	1995–1999	0.74	M-v	3	Williams	32749	1995 WE ₂₇
1995 WD ₃₂	14.1	0.15	19990810	255.52675	351.82354	134.88713	3.50952	0.1068062	2.9831053	41	4	1995–1999	0.58	M-v	2	Williams	36518	1995 WD ₃₂
1995 WN ₃₃	14.1	0.15	19990810	256.27596	270.09339	208.00963	12.58545	0.1214102	2.5996213	77	4	1991–1999	0.65	M-v	2	Williams	36518	1995 WN ₃₃
1995 WY ₄₁	14.7	0.15	19990810	30.28540	123.76055	278.27292	3.71475	0.2085970	2.3246413	22	5	1970–1999	0.91	M-v	2	Williams	32518	1995 WY ₄₁
1995 WZ ₄₁	13.8	0.15	19990810	37.37699	148.95366	237.10536	23.42370	0.2821118	2.3398656	30	3	1995–1999	0.88	M-v	2	Williams	32518	1995 WZ ₄₁
1995 WA ₄₂	15.0	0.15	19990810	8.75980	213.47635	207.10890	4.39093	0.0590094	2.3345657	24	4	1995–1999	0.72	M-v	1	Williams	34013	1995 WA ₄₂
1995 WL ₄₂	14.0	0.15	19990810	221.24188	46.28217	137.33171	1.06656	0.1222371	2.8990318	46	3	1995–1999	0.63	M-v	3	Williams	36518	1995 WL ₄₂
1995 WX ₄₂	13.7	0.15	19990810	338.04542	316.07337	97.21449	14.68569	0.1379146	2.5582727	22	4	1987–1999	0.58	M-v	4	Williams	26572	1995 WX ₄₂
1995 XC	12.6	0.15	19990810	150.49588	283.59443	250.46626	11.73463	0.1604209	3.1675830	66	2	1995–1999	0.57	M-v	3	Williams	36518	1995 XC
1995 XD	14.0	0.15	19990810	8.38573	350.87022	64.03772	7.33621	0.1228926	2.4699278	28	7	1983–1999	0.75	M-v	2	Williams	31588	1995 XD
1995 XW	13.1	0.15	19990810	122.11545	224.19733	54.78388	15.75848	0.0957886	2.6312298	47	4	1995–1999	0.61	M-v	1	Williams	36518	1995 XW
1995 XD ₁	14.5	0.15	19990810	334.76696	39.12440	64.91169	3.62210	0.1478059	2.4164234	34	4	1995–1999	0.67	M-v	1	Williams	36519	1995 XD ₁
1995 XG ₁	14.1	0.15	19990810	196.45244	303.20445	276.44687	12.77518	0.1318131	2.5564651	43	3	1995–1999	0.74	M-v	3	Williams	32750	1995 XG ₁
1995 XK ₁	14.1	0.15	19990810	347.53639	116.41065	270.85143	11.59520	0.1882853	2.6365820	46	2	1995–1999	0.75	M-v	3	Williams	36519	1995 XK ₁
1995 XS ₁	14.4	0.15	19990810	26.48204	173.00228	233.92081	1.42307	0.2099394	2.4044875	27	7	1976–1999	0.75	M-v	1	Williams	32518	1995 XS ₁
1995 XU ₁	14.9	0.15	19990810	24.30921	126.69799	186.78829	1.99738	0.1900247	2.4253683	95	3	1995–1999	0.54	M-v	2	Williams	36519	1995 XU ₁
1995 XH ₃	16.0	0.15	19990810	247.66045	317.47307	184.99513	4.55808	0.0829129	2.6082261	24	4	1980–1999	0.53	M-v	2	Williams	29924	1995 XH ₃
1995 XC ₅	15.3	0.15	19990810	348.61206	186.04590	180.89077	3.55039	0.1596590	2.6611601	62	3	1993–1999	0.56	M-v	3	Williams	36519	1995 XC ₅
1995 YB	13.8	0.15	19990810	25.41084	239.41461	96.95150	13.05474	0.2367832	2.6510206	63	3	1995–1999	0.54	M-v	2	Williams	36519	1995 YB
1995 YH	12.8	0.15	19990810	338.74684	94.63911	252.58936	8.82762	0.1268599	2.9851551	84	3	1995–1999	0.57	M-v	2	Williams	36519	1995 YH
1995 YK	13.3	0.15	19990810	301.20575	297.69311	101.46763	10.95624	0.1811912	2.9726600	48	4	1995–1999	0.70	M-v	2	Williams	36073	1995 YK
1995 YL	14.4	0.15	19990810	283.50392	178.42160	275.20789	7.18540	0.1897642	2.7932644	52	2	1995–1999	0.67	M-v	4	Williams	36519	1995 YL
1995 YR	13.6	0.15	19990810	244.91294	138.05796	66.69931	9.45975	0.0770266	2.2967286	27	4	1995–1999	0.60	M-v	2	Williams	33075	1995 YR
1995 YF ₁	13.4	0.15	19990810	128.86672	356.58627	267.92268	8.16134	0.1133804	2.7836188	41	3	1995–1999	0.64	M-v	3	Williams	36519	1995 YF ₁
1995 YJ ₁	13.3	0.15	19990810	357.37734	236.01715	128.96343	2.96045	0.0890121	2.8945947	58	5	1977–1999	0.62	M-v	2	Williams	36519	1995 YJ ₁
1995 YP ₁	13.2	0.15	19990810	110.17267	12.32033	265.34493	5.50631	0.0174444	2.7973106	59	3	1995–1999	0.59	M-v	3	Williams	36519	1995 YP ₁
1995 YJ ₃	14.1	0.15	19990810	277.82187	26.88640	132.01738	5.33670	0.1934621	2.5845075	41	4	1992–1999	0.58	M-v	2	Williams	36519	1995 YJ ₃
1995 YV ₃	14.1	0.15	19990810	328.94145	276.33983	119.25142	29.80036	0.4414006	2.7892735	111	3	1995–1999	0.51	M-v	2	Marsden	36519	1995 YV ₃
1995 YM ₉	14.6	0.15	19990810	315.22200	203.52009	198.21999	1.49933	0.1128410	2.9848017	37	3	1995–1999	0.56	M-v	4	Williams	36341	1995 YM ₉
1995 YS ₂₁	13.5	0.15	19990810	43.20664	240.02470	107.48877	4.83056	0.1029599	2.7345007	39	4	1992–1999	0.73	M-v	3	Williams	32518	1995 YS ₂₁
1995 YL ₂₃	13.9	0.15	19990810	142.08650	207.03722	61.89040	6.06040	0.1540311	2.4094227	31	5	1971–1999	0.50	M-v	2	Williams	35694	1995 YL ₂₃
1996 AN	13.9	0.15	19990810	4.96119	6.94670	73.28485	3.08200	0.1715957	2.4293168	53	4	1993–1999	0.67	M-v	2	Williams	32750	1996 AN
1996 AW	14.7	0.15	19990810	345.49787	341.20629	100.46497	2.55461	0.0829409	2.5551044	36	5	1994–1999	0.75	M-v	1	Williams	36519	1996 AW
1996 AE ₁	12.7	0.15	19990810	172.36224	255.34839	291.83546	15.07807	0.0479104	3.1071543	63	3	1995–1999	0.63	M-v	2	Williams	36519	1996 AE ₁
1996 AX ₁	16.2	0.15	19990810	345.74124	149.22816	268.49586	10.66656	0.04318845	2.4594516	56	2	1996–1999	0.60	M-v	3	Williams	36342	1996 AX ₁
1996 AG ₂	12.4	0.15	19990810	280.06468	104.55659	311.78770	12.89190	0.0919209	3.1598301	56	3	1985–1999	0.66	M-v	2	Williams	36519	1996 AG ₂
1996 AR ₂	13.6	0.15	19990810	15.42016	67.18689	315.31340	12.00271	0.2061392	2.6920277	16	3	1994–1999	0.61	M-v	4	Williams	26749	1996 AR ₂
1996 AP ₃	13.4	0.15	19990810	111.02444	65.72422	273.59816	6.82878	0.1933740	2.2869268	64	4	1988–1999	0.51	M-v	2	Williams	34583	1996 AP ₃
1996 AU ₆	14.6	0.15	19990810	347.00714	349.68727	65.80566	3.47722	0.0684249	2.7203448	26	3	1996–1999	0.45	M-v	4	Williams	29925	1996 AU ₆
1996 AH ₉	14.4	0.15	19990810	225.69653	317.73824	229.04970	1.67006	0.1047129	2.7644899	36	5	1992–1999	0.43	M-v	1	Williams	35694	1996 AH ₉
1996 BB	12.9	0.15	19990810	65.84968	213.86359	119.64449	10.19760	0.1604158	2.7825115	48	5	1980–1999	0.59	M-v	1	Williams	36519	1996 BB
1996 BB ₁	14.6	0.15	19990810	10.47697	164.39249	236.48166	3.81005	0.1847978	2.5598362	46	3	1996–1999	0.60	M-v	2	Williams	36519	1996 BB ₁
1996 BO ₁	13.1	0.15	19990810	41.15559	9.14641	310.30971	8.50994	0.0771329	3.0738737	50	3	1996–1999	0.49	M-v	2	Williams	36342	1996 BO ₁
1996 BG ₂	12.8	0.15	19990810	300.84013	126.73661	329.52807	21.45187	0.0580367	2.6740294	42	4	1992–1999	0.75	M-v	3	Williams	36073	1996 BG ₂
1996 BH ₂	13.3	0.15	19990810	14.72075	105.80392	320.84093	8.36205	0.0369838	2.5971760	63	3	1996–1999	0.62	M-v	2	Williams	36519	1996 BH ₂
1996 BJ ₂	12.8	0.15	19990810	267.75995	145.71124	301.64574	9.08387	0.0563603	3.0528701	59	3	1996–1999	0.58	M-v	3	Williams	36519	1996 BJ ₂
1996 BY ₂	14.1	0.15	19990810	356.97749	287.47847	158.19743	4.09992	0.1914952	2.4795263	59	3	1996–1999	0.69	M-v	3	Williams	33342	1996 BY ₂
1996 BM ₃	12.8	0.15	19990810	238.95289	311.13662	150.36613	0.94531	0.1552602	3.1913671	59	3	1994–1999	0.60	M-v	3	Williams	36519	1996 BM ₃
1996 BP ₃	13.4	0.15	19990810	302.76742	84.33498	349.70131	9.65183	0.0996520	3.0052363	56	3	1994–1999	0.53	M-v	3	Williams	36519	1996 BP ₃
1996 BM ₁₇	14.5	0.15	19990810	345.35450	50.06163	43.76711	4.92830	0.1307678	2.5207262	48	3	1996–1999	0.70	M-v	3	Williams	36519	1996 BM ₁₇

1996 CK ₁	13.8	0.15	19990810	323.52617	67.61775	25.60584	5.11137	0.1714070	2.7167467	25	3	1992–1999	0.72	M-v	3	Williams	36519	1996 CK ₁
1996 CO ₂	12.8	0.15	19990810	97.45656	164.90350	128.12182	10.84521	0.0661621	2.9981521	53	3	1996–1999	0.61	M-v	3	Williams	36519	1996 CO ₂
1996 CU ₈	13.7	0.15	19990810	268.30279	155.00253	356.74173	9.02794	0.0899887	2.7824127	51	3	1996–1999	0.74	M-v	4	Williams	36519	1996 CU ₈
1996 CM ₉	12.1	0.15	19990810	111.64919	273.79227	328.35151	14.28353	0.0634664	3.3995615	48	3	1996–1999	0.61	M-v	3	Williams	36342	1996 CM ₉
1996 DO	14.3	0.15	19990810	311.48872	146.33508	350.30960	3.47222	0.1162608	2.6289754	40	3	1996–1999	0.62	M-v	4	Williams	32948	1996 DO
1996 DT	13.2	0.15	19990810	173.89634	83.90316	151.75547	10.62450	0.0519102	2.9956884	43	3	1996–1999	0.80	M-v	3	Williams	36519	1996 DT
1996 DD ₁	14.7	0.15	19990810	307.09734	343.56273	115.46748	22.79276	0.0660464	2.6752800	46	3	1996–1999	0.46	M-v	2	Marsden	30093	1996 DD ₁
1996 DQ ₁	13.5	0.15	19990810	252.25643	116.06307	359.41733	6.26930	0.1787651	3.0805452	72	3	1991–1999	0.50	M-v	3	Williams	36519	1996 DQ ₁
1996 DL ₂	13.3	0.15	19990810	126.05691	195.86058	97.48952	3.44372	0.0089171	2.8997612	63	4	1993–1999	0.70	M-v	1	Williams	33075	1996 DL ₂
1996 DM ₂	13.7	0.15	19990810	221.20653	117.52288	106.41077	5.81565	0.0524823	2.7372050	36	3	1996–1999	0.64	M-v	3	Williams	34293	1996 DM ₂
1996 DY ₂	13.3	0.15	19990810	5.13546	333.10217	70.42859	3.07636	0.0738951	2.8877680	43	3	1996–1999	0.65	M-v	3	Williams	32750	1996 DY ₂
1996 DB ₃	14.3	0.15	19990810	268.75893	198.93128	320.89200	13.88454	0.0780188	2.5828508	39	3	1996–1999	0.74	M-v	3	Williams	32751	1996 DB ₃
1996 EG	13.5	0.15	19990810	340.93527	175.23773	205.92219	9.42522	0.1055352	3.1724331	101	2	1996–1999	0.56	M-v	3	Williams	36519	1996 EG
1996 EB ₁	13.9	0.15	19990810	32.34461	40.14349	2.51716	3.77277	0.1009232	2.7622326	85	3	1996–1999	0.75	M-v	2	Williams	36519	1996 EB ₁
1996 ES ₁	13.4	0.15	19990810	153.46266	82.30919	175.53870	3.13205	0.1874888	3.1939842	56	4	1992–1999	0.64	M-v	1	Williams	35695	1996 ES ₁
1996 EJ ₁₄	14.1	0.15	19990810	40.73657	2.19553	349.16364	15.79408	0.0969109	3.0299096	23	3	1993–1999	0.42	M-v	4	Williams	36520	1996 EJ ₁₄
1996 GU ₈	13.7	0.15	19990810	160.68940	228.12080	77.62733	3.85274	0.0594997	2.7378480	76	6	1982–1999	0.66	M-v	1	Williams	35695	1996 GU ₈
1996 HE ₁	12.3	0.15	19990810	229.72771	128.06012	57.44719	18.68110	0.1293784	3.2062687	77	3	1996–1999	0.47	M-v	3	Williams	36520	1996 HE ₁
1996 HR ₁₀	13.3	0.15	19990810	57.46041	343.36097	38.84236	0.44963	0.2173084	3.1468214	54	5	1976–1999	0.69	M-v	1	Williams	35695	1996 HR ₁₀
1996 HS ₁₁	13.5	0.15	19990810	148.34504	290.32596	26.94176	2.35674	0.0678726	2.9085312	43	4	1988–1999	0.79	M-v	1	Williams	34513	1996 HS ₁₁
1996 HF ₁₈	13.3	0.15	19990810	308.26678	245.19414	225.45377	3.43416	0.1508776	3.1341685	33	3	1977–1999	0.58	M-v	4	Williams	27720	1996 HF ₁₈
1996 HV ₁₉	13.3	0.15	19990810	345.90928	218.84677	217.78321	6.99586	0.1177109	3.1957064	33	4	1976–1999	0.75	M-v	1	Williams	36520	1996 HV ₁₉
1996 JN ₆	13.2	0.15	19990810	87.90091	251.86651	117.41389	2.96225	0.0492643	2.9261835	42	5	1978–1999	0.66	M-v	2	Williams	33555	1996 JN ₆
1996 KA	13.0	0.15	19990810	274.05550	265.85067	241.51190	11.75392	0.2342901	3.2019824	93	3	1996–1999	0.54	M-v	3	Williams	36520	1996 KA
1996 RG ₁	14.3	0.15	19990810	328.11662	18.16476	9.13627	5.75521	0.1654446	2.1810214	115	5	1991–1999	0.51	M-v	2	Williams	36520	1996 RG ₁
1996 SH ₆	14.1	0.15	19990810	127.74192	355.27341	195.17936	7.94687	0.0638505	2.2960352	82	3	1996–1999	0.61	M-v	3	Williams	36520	1996 SH ₆
1996 TF	15.8	0.15	19990810	11.77969	49.25102	272.48904	2.91798	0.1372759	2.1389174	78	3	1996–1999	0.59	M-v	3	Williams	36520	1996 TF
1996 TS ₅	13.5	0.15	19990810	182.67629	216.38627	297.63001	23.62123	0.1891700	2.2744373	50	3	1991–1999	0.53	M-v	2	Williams	36520	1996 TS ₅
1996 TG ₆	14.6	0.15	19990810	139.98319	221.31636	350.63223	5.73815	0.1285865	2.2702494	84	4	1994–1999	0.63	M-v	3	Williams	36520	1996 TG ₆
1996 TJ ₆	14.7	0.15	19990810	33.61383	32.56946	244.12614	8.55672	0.1918545	2.3763261	49	3	1996–1999	0.54	M-v	2	Williams	36520	1996 TJ ₆
1996 TJ ₁₀	14.8	0.15	19990810	65.64945	307.85841	12.35208	19.01469	0.0806100	1.9576904	43	3	1996–1999	0.70	M-v	2	Williams	36520	1996 TJ ₁₀
1996 TS ₁₀	14.7	0.15	19990810	300.12813	356.91504	38.83553	5.67317	0.1420422	2.2015956	67	3	1996–1999	0.75	M-v	3	Williams	36520	1996 TS ₁₀
1996 TL ₁₁	15.6	0.15	19990810	23.38580	267.81890	32.72365	4.51468	0.1392703	2.1888454	37	4	1995–1999	0.51	M-v	2	Williams	36343	1996 TL ₁₁
1996 TT ₁₄	14.5	0.15	19990810	332.04218	239.01262	121.46445	3.39098	0.1955031	2.1876220	89	3	1996–1999	0.66	M-v	2	Williams	36520	1996 TT ₁₄
1996 TB ₁₅	15.2	0.15	19990810	267.70078	138.26256	347.25854	19.90557	0.0514877	1.9235832	20	4	1977–1999	0.68	M-v	3	Williams	34866	1996 TB ₁₅
1996 TD ₁₅	13.4	0.15	19990810	252.23560	258.86454	200.81879	21.87469	0.2069689	2.3025234	57	3	1996–1999	0.46	M-v	3	Williams	36520	1996 TD ₁₅
1996 TL ₆₆	5.2	0.15	19990810	359.19207	184.45213	217.76381	23.92076	0.5895258	85.3565056	151	4	1996–1999	0.49	M-v	3	Williams	33752	1996 TL ₆₆
1996 TO ₆₆	4.3	0.15	19990810	112.52643	243.06923	355.20144	27.33861	0.1139932	43.5829238	101	4	1996–1999	0.62	M-v	4	Marsden	36074	1996 TO ₆₆
1996 TP ₆₆	6.7	0.15	19990810	359.00964	75.17730	316.74002	5.68843	0.3390767	39.9005528	57	4	1996–1999	0.58	M-v	3	Marsden	36074	1996 TP ₆₆
1996 TQ ₆₆	7.0	0.15	19990810	0.85852	19.67745	10.67704	14.62488	0.1300670	39.7854042	42	4	1996–1999	0.33	M-v	4	Williams	33752	1996 TQ ₆₆
1996 TS ₆₆	6.4	0.15	19990810	341.29340	138.62505	285.92041	7.34306	0.1343207	44.3234779	29	4	1996–1999	0.31	M-v	4	Marsden	33076	1996 TS ₆₆
1996 UM	14.7	0.15	19990810	7.20270	200.32468	190.56071	21.97818	0.0830464	1.9480064	32	4	1985–1999	0.56	M-v	2	Williams	32311	1996 UM
1996 UZ	14.4	0.15	19990810	237.16869	249.71655	219.31180	3.91423	0.1095840	2.2962079	85	3	1996–1999	0.76	M-v	3	Williams	36520	1996 UZ
1996 UB ₁	14.7	0.15	19990810	315.39081	354.64851	45.44673	6.01414	0.1396492	2.1827034	75	3	1996–1999	0.58	M-v	3	Williams	36520	1996 UB ₁
1996 VN ₆	13.9	0.15	19990810	23.43718	359.93980	346.94940	15.49447	0.1476246	2.5250488	32	3	1996–1999	0.53	M-v	2	Williams	36520	1996 VN ₆
1996 VZ ₈	15.2	0.15	19990810	320.69483	223.65311	144.17414	1.97977	0.1612482	2.2661048	79	4	1994–1999	0.71	M-v	2	Williams	36520	1996 VZ ₈
1996 VU ₁₇	15.9	0.15	19990810	49.34841	209.73019	87.19660	1.53863	0.0922233	2.1778834	69	3	1996–1999	0.52	M-v	3	Williams	36520	1996 VU ₁₇
1996 VX ₂₉	14.5	0.15	19990810	214.97330	79.84772	60.76641	6.18772	0.0357781	2.1785938	58	3	1996–1999	0.69	M-v	3	Williams	36520	1996 VX ₂₉
1996 VL ₃₀	15.2	0.15	19990810	320.79194	150.86209	240.05258	5.84795	0.1872867	2.1867160	61	3	1996–1999	0.57	M-v	3	Williams	36520	1996 VL ₃₀
1996 WA ₁	14.4	0.15	19990810	252.55060	188.74550	286.20819	2.48529	0.0856957	2.2667025	92	3	1996–1999	0.63	M-v	3	Williams	36520	1996 WA ₁
1996 WE ₃	14.7	0.15	19990810	102.18395	11.96711	238.85538	5.37674	0.0902988	2.2861672	111	3	1996–1999	0.62	M-v	3	Williams	36521	1996 WE ₃
1996 XK	15.9	0.15	19990810	29.39096	287.46352	8.21459	6.42458	0.2135039	2.2304964	76	3	1995–1999	0.53	M-v	2	Williams	36343	1996 XK
1996 XU	15.2	0.15	19990810	16.12112	62.03897	250.46225	4.22066	0.1068570	2.3239089	71	3	1996–1999	0.64	M-v	3	Williams	36521	1996 XU

1996 XD ₁	14.7	0.15	19990810	76.09309	217.80634	93.75728	3.28262	0.1683554	2.1398785	58	4	1977–1999	0.49	M-v	2	Williams	32056	1996 XD ₁
1996 XJ ₁	14.3	0.15	19990810	358.17676	249.94661	79.10722	3.61712	0.1898196	2.4497098	45	3	1996–1999	0.57	M-v	3	Williams	36075	1996 XJ ₁
1996 XB ₂	13.5	0.15	19990810	285.26484	158.29143	264.15815	24.36118	0.2385759	2.3492200	52	3	1985–1999	0.53	M-v	2	Williams	36075	1996 XB ₂
1996 XM ₂	14.4	0.15	19990810	24.37316	248.98879	82.75312	5.00979	0.2404856	2.2124028	104	3	1996–1999	0.47	M-v	2	Williams	36521	1996 XM ₂
1996 XD ₃	14.9	0.15	19990810	174.18794	76.85123	131.15528	2.21667	0.0662886	2.2711641	55	4	1991–1999	0.58	M-v	2	Williams	36521	1996 XD ₃
1996 XM ₅	13.9	0.15	19990810	162.01445	291.56733	293.06159	3.89675	0.1091622	2.2646166	50	3	1996–1999	0.48	M-v	4	Williams	36521	1996 XM ₅
1996 XN ₅	15.2	0.15	19990810	265.47399	19.34352	68.65603	3.13501	0.1757451	2.3728483	32	2	1996–1999	0.61	M-v	4	Marsden	36521	1996 XN ₅
1996 XP ₅	14.9	0.15	19990810	318.59080	326.92354	46.93837	2.97499	0.2222873	2.3691128	23	2	1996–1999	0.53	M-v	4	Williams	36521	1996 XP ₅
1996 XQ ₅	14.6	0.15	19990810	273.53284	39.24196	75.42428	2.68100	0.1005318	2.2019587	68	3	1991–1999	0.56	M-v	4	Williams	36521	1996 XQ ₅
1996 XF ₁₄	15.1	0.15	19990810	109.55016	76.45803	204.05500	1.73831	0.2184132	2.3286818	30	4	1995–1999	0.45	M-v	2	Williams	32311	1996 XF ₁₄
1996 XY ₁₄	14.2	0.15	19990810	123.86590	344.13917	285.94486	5.57817	0.1639412	2.2096566	26	3	1996–1999	0.51	M-v	4	Williams	32246	1996 XY ₁₄
1996 XC ₁₅	14.1	0.15	19990810	235.76412	78.69332	69.32294	0.90213	0.1142053	2.2865884	65	3	1987–1999	0.52	M-v	4	Williams	36344	1996 XC ₁₅
1996 XY ₁₇	14.8	0.15	19990810	299.12688	164.24985	252.23346	5.71253	0.1004429	2.2142591	79	3	1996–1999	0.52	M-v	3	Williams	36521	1996 XY ₁₇
1996 XG ₁₉	14.6	0.15	19990810	245.88090	345.42144	153.28139	3.31492	0.1073013	2.2488136	59	4	1992–1999	0.47	M-v	2	Williams	36521	1996 XG ₁₉
1996 XT ₁₉	14.8	0.15	19990810	245.84095	260.66259	244.44915	2.04669	0.0549928	2.1985456	61	3	1992–1999	0.59	M-v	4	Williams	36521	1996 XT ₁₉
1996 XU ₁₉	14.9	0.15	19990810	232.12038	238.78782	248.27578	1.18456	0.1593283	2.4169888	42	2	1996–1999	0.44	M-v	4	Williams	36521	1996 XU ₁₉
1996 XU ₂₆	14.6	0.15	19990810	277.58089	75.70978	334.03323	7.23044	0.0880313	2.2301181	75	3	1996–1999	0.58	M-v	2	Williams	36521	1996 XU ₂₆
1996 XX ₂₆	14.7	0.15	19990810	172.52313	119.06304	105.44654	11.67898	0.2205639	2.4391750	21	1	38 days	0.47	M-v	6	Williams		1996 XX ₂₆
1996 XZ ₃₀	14.2	0.15	19990810	304.07590	122.21351	269.98249	5.47225	0.1437315	2.4407391	60	3	1996–1999	0.55	M-v	3	Williams	36521	1996 XZ ₃₀
1996 XE ₃₁	14.3	0.15	19990810	156.82269	303.53891	272.14260	10.87894	0.1273524	2.4195010	38	3	1996–1999	0.63	M-v	3	Williams	36521	1996 XE ₃₁
1996 XX ₃₁	13.4	0.15	19990810	68.67130	296.41912	349.67637	12.33567	0.1439511	2.3783966	62	4	1995–1999	0.44	M-v	1	Williams	36521	1996 XX ₃₁
1996 XZ ₃₁	14.8	0.15	19990810	164.11912	137.06429	91.03994	7.11709	0.0899174	2.2215389	29	3	1996–1999	0.67	M-v	4	Williams	36521	1996 XZ ₃₁
1996 YR	15.5	0.15	19990810	333.18979	298.07591	100.29178	7.05138	0.1678154	2.2382449	40	4	1989–1999	0.49	M-v	2	Williams	36521	1996 YR
1996 YX	14.3	0.15	19990810	306.55583	148.10676	276.15165	6.99371	0.0808445	2.3105170	53	2	1996–1999	0.49	M-v	3	Williams	36521	1996 YX
1996 YC ₁	14.4	0.15	19990810	166.24368	288.51347	273.36158	6.37809	0.1490524	2.4838698	30	3	1995–1999	0.58	M-v	4	Williams	36521	1996 YC ₁
1996 YG ₁	14.7	0.15	19990810	87.89329	189.38179	77.19443	12.85256	0.1195433	2.4860922	111	3	1996–1999	0.62	M-v	2	Williams	36521	1996 YG ₁
1996 YR ₁	15.2	0.15	19990810	258.98680	165.10485	304.86104	6.34723	0.0893419	2.4512417	38	2	1996–1999	0.71	M-v	4	Williams	36344	1996 YR ₁
1996 YL ₂	14.3	0.15	19990810	146.00872	94.71475	97.10267	7.14305	0.0639861	2.4024054	70	3	1996–1999	0.60	M-v	3	Williams	36521	1996 YL ₂
1997 AD	13.6	0.15	19990810	186.51689	236.77707	294.75843	11.87433	0.1563434	2.5288571	60	2	1997–1999	0.50	M-v	4	Williams	36521	1997 AD
1997 AE	13.3	0.15	19990810	7.00869	356.60278	311.79993	7.46060	0.1233022	2.7186402	90	3	1997–1999	0.52	M-v	2	Williams	36521	1997 AE
1997 AG	14.7	0.15	19990810	313.21069	99.23227	315.81701	3.98159	0.0785959	2.3188409	65	3	1989–1999	0.45	M-v	2	Marsden	36521	1997 AG
1997 AP	14.4	0.15	19990810	54.84976	30.66130	293.98611	2.64383	0.1679387	2.2882684	53	4	1994–1999	0.55	M-v	2	Williams	32312	1997 AP
1997 AQ	15.0	0.15	19990810	322.33896	300.27604	118.38189	7.92156	0.1232664	2.2571112	40	3	1996–1999	0.40	M-v	3	Williams	36521	1997 AQ
1997 AS	14.3	0.15	19990810	79.28573	174.86156	114.25339	5.68267	0.1923260	2.4486313	76	3	1997–1999	0.59	M-v	3	Williams	36521	1997 AS
1997 AT	13.2	0.15	19990810	335.93929	250.07750	110.06727	8.56161	0.2358913	2.4532815	64	3	1997–1999	0.57	M-v	2	Williams	36521	1997 AT
1997 AV	14.7	0.15	19990810	296.64381	126.63851	319.29592	3.93491	0.1241843	2.2707914	53	2	1997–1999	0.63	M-v	4	Williams	36521	1997 AV
1997 AB ₁	15.4	0.15	19990810	316.08539	311.35472	84.92356	4.09272	0.2565258	2.3027333	38	3	1994–1999	0.60	M-v	3	Williams	36522	1997 AB ₁
1997 AA ₂	13.4	0.15	19990810	177.38626	133.13169	28.77776	2.82873	0.1426669	2.6820946	68	4	1984–1999	0.65	M-v	2	Williams	36522	1997 AA ₂
1997 AZ ₂	14.5	0.15	19990810	338.77199	38.97044	330.01541	9.29203	0.2335568	2.3612032	84	2	1997–1999	0.49	M-v	3	Williams	36522	1997 AZ ₂
1997 AC ₃	13.4	0.15	19990810	133.19338	226.86346	327.70647	11.70847	0.0822446	2.7917062	49	2	1997–1999	0.61	M-v	3	Williams	36522	1997 AC ₃
1997 AF ₃	14.9	0.15	19990810	242.34588	102.07214	34.81421	5.15510	0.1294458	2.3681223	56	5	1981–1999	0.58	M-v	1	Williams	36522	1997 AF ₃
1997 AW ₃	14.0	0.15	19990810	275.94237	342.23468	131.56463	5.54064	0.0528364	2.2779627	38	4	1980–1999	0.52	M-v	1	Williams	36522	1997 AW ₃
1997 AB ₄	15.3	0.15	19990810	316.79168	76.90816	321.35831	2.68051	0.12138394	2.3705351	49	2	1997–1999	0.46	M-v	4	Williams	36522	1997 AB ₄
1997 AJ ₄	14.4	0.15	19990810	190.10071	307.20895	279.69015	5.94648	0.2106759	2.2185120	57	3	1996–1999	0.57	M-v	2	Williams	36522	1997 AJ ₄
1997 AP ₄	13.9	0.15	19990810	227.34143	308.63118	198.55396	1.50235	0.1530462	2.4274477	87	4	1988–1999	0.51	M-v	2	Williams	36522	1997 AP ₄
1997 AE ₅	14.3	0.15	19990810	339.67085	54.22918	310.32315	13.20727	0.1468484	2.4605561	35	2	1997–1999	0.57	M-v	3	Williams	36522	1997 AE ₅
1997 AX ₅	15.4	0.15	19990810	321.53387	121.17479	299.91465	5.27665	0.1781401	2.2463987	36	2	1997–1999	0.43	M-v	3	Williams	36344	1997 AX ₅
1997 AZ ₅	15.0	0.15	19990810	271.29186	157.73944	275.35540	5.70341	0.0943920	2.2876965	49	2	1996–1999	0.43	M-v	3	Williams	36522	1997 AZ ₅
1997 AB ₆	14.9	0.15	19990810	237.95102	181.15666	293.07975	3.51060	0.0641695	2.2634590	65	3	1996–1999	0.55	M-v	3	Williams	36522	1997 AB ₆
1997 AQ ₆	14.4	0.15	19990810	3.85948	7.18763	68.27577	24.38285	0.0297132	1.8251503	38	3	1997–1999	0.66	M-v	3	Williams	36522	1997 AQ ₆
1997 AR ₆	15.2	0.15	19990810	269.65802	197.01087	271.07571	7.85765	0.1187755	2.1992323	32	3	1986–1999	0.70	M-v	4	Williams	36345	1997 AR ₆
1997 AW ₆	14.4	0.15	19990810	20.63730	330.38722	355.49308	4.45842	0.0951566	2.5831467	86	3	1997–1999	0.49	M-v	3	Williams	36522	1997 AW ₆
1997 AB ₇	15.0	0.15	19990810	185.44806	94.90093	107.69091	2.77815	0.0963504	2.4094003	49	3	1997–1999	0.86	M-v	4	Williams	36522	1997 AB ₇

1997 AJ ₇	15.1	0.15	19990810	217.27751	264.89865	275.54367	1.30276	0.1486737	2.3580502	42	4	1995–1999	0.61	M-v	2	Williams	36522	1997 AJ ₇
1997 AM ₇	15.7	0.15	19990810	226.18789	208.70676	328.61874	3.46736	0.0921582	2.2916519	25	3	1989–1999	0.62	M-v	4	Williams	31144	1997 AM ₇
1997 AG ₈	14.5	0.15	19990810	156.33877	332.72986	279.83056	3.66427	0.1170791	2.2691970	36	3	1997–1999	0.51	M-v	3	Williams	32472	1997 AG ₈
1997 AU ₉	14.6	0.15	19990810	175.66382	87.58272	150.33692	3.68513	0.1340848	2.2617393	46	4	1989–1999	0.62	M-v	1	Williams	36522	1997 AU ₉
1997 AA ₁₀	15.6	0.15	19990810	38.04884	114.84706	203.42845	1.41138	0.1147033	2.5439896	39	2	1997–1999	0.57	M-v	4	Williams	36345	1997 AA ₁₀
1997 AP ₁₀	17.0	0.15	19990810	19.55762	356.02641	293.23839	6.65058	0.6431647	1.4429189	97	3	1997–1999	0.70	M-v	3	Williams	36076	1997 AP ₁₀
1997 AM ₁₁	16.4	0.15	19990810	322.03300	149.98418	251.06332	1.28128	0.2035855	2.3383080	34	2	1997–1999	0.50	M-v	4	Williams	36345	1997 AM ₁₁
1997 AB ₁₃	14.3	0.15	19990810	351.26446	340.19747	64.84950	3.19130	0.0165015	2.2495822	50	6	1982–1999	0.57	M-v	1	Williams	36522	1997 AB ₁₃
1997 AC ₁₃	14.7	0.15	19990810	290.72702	147.67788	293.95721	3.03728	0.1228347	2.2881285	70	2	1997–1999	0.50	M-v	3	Williams	36522	1997 AC ₁₃
1997 AD ₁₃	13.1	0.15	19990810	155.18285	124.35755	93.83558	12.09467	0.2489902	2.5986161	39	4	1977–1999	0.73	M-v	2	Williams	36522	1997 AD ₁₃
1997 AF ₁₃	13.7	0.15	19990810	166.92012	148.64742	94.42570	10.39960	0.1782962	2.2918491	22	4	1980–1999	0.65	M-v	2	Williams	32751	1997 AF ₁₃
1997 AG ₁₃	14.5	0.15	19990810	247.15241	66.30145	69.36992	6.50987	0.1210752	2.3503960	56	2	1997–1999	0.50	M-v	4	Williams	36522	1997 AG ₁₃
1997 AJ ₁₃	14.5	0.15	19990810	295.82857	76.87928	349.01013	8.22087	0.0896860	2.4146937	84	4	1969–1999	0.48	M-v	1	Williams	36522	1997 AJ ₁₃
1997 AT ₁₃	15.5	0.15	19990810	323.11459	345.05121	36.60203	2.87290	0.2156980	2.3818987	50	3	1996–1999	0.49	M-v	3	Williams	36522	1997 AT ₁₃
1997 AQ ₁₅	15.2	0.15	19990810	18.13143	286.99585	67.27479	3.99161	0.2107778	2.2364268	65	3	1996–1999	0.63	M-v	3	Williams	36522	1997 AQ ₁₅
1997 AR ₁₆	12.7	0.15	19990810	155.62712	192.27628	359.27820	18.31025	0.1550093	2.9882316	167	3	1997–1999	0.68	M-v	2	Williams	36522	1997 AR ₁₆
1997 AN ₁₇	13.4	0.15	19990810	319.81589	88.05106	285.74728	22.25193	0.2883115	2.3378407	110	3	1985–1999	0.39	M-v	1	Williams	36522	1997 AN ₁₇
1997 AR ₁₇	15.0	0.15	19990810	174.80817	321.18464	262.05818	1.92380	0.1220760	2.2603575	37	3	1997–1999	0.64	M-v	3	Williams	32519	1997 AR ₁₇
1997 AU ₁₇	15.5	0.15	19990810	39.38030	211.27571	109.72498	5.00384	0.1407951	2.3525863	44	4	1995–1999	0.66	M-v	1	Williams	36522	1997 AU ₁₇
1997 AW ₁₇	15.5	0.15	19990810	200.19186	111.60472	78.27840	2.13843	0.1259823	2.3976697	59	3	1997–1999	0.46	M-v	3	Williams	36522	1997 AW ₁₇
1997 AY ₁₇	15.6	0.15	19990810	295.86174	54.22861	21.63804	3.19239	0.2269412	2.3179771	51	2	1997–1999	0.62	M-v	4	Williams	36523	1997 AY ₁₇
1997 AZ ₁₇	13.8	0.15	19990810	264.00841	77.53647	55.49676	2.98735	0.1072247	2.2931904	91	3	1997–1999	0.51	M-v	3	Williams	36523	1997 AZ ₁₇
1997 AB ₁₈	14.1	0.15	19990810	291.44848	93.88473	350.73126	6.59596	0.0758379	2.3927051	53	2	1997–1999	0.49	M-v	4	Williams	36523	1997 AB ₁₈
1997 AT ₂₀	14.5	0.15	19990810	350.83525	58.36101	295.83746	4.30621	0.0962003	2.5928141	60	3	1997–1999	0.58	M-v	3	Williams	36523	1997 AT ₂₀
1997 AR ₂₂	14.5	0.15	19990810	342.57395	5.49478	33.28411	5.51699	0.1241995	2.2906955	61	4	1985–1999	0.50	M-v	3	Williams	36523	1997 AR ₂₂
1997 BZ	13.5	0.15	19990810	95.21180	307.72903	299.36817	10.46971	0.1603131	2.6642570	47	2	1996–1999	0.47	M-v	3	Williams	36523	1997 BZ
1997 BP ₁	14.9	0.15	19990810	331.90454	6.54017	30.79083	1.90949	0.2009520	2.3393286	83	4	1981–1999	0.54	M-v	2	Williams	36523	1997 BP ₁
1997 BX ₂	15.4	0.15	19990810	273.71581	352.84614	116.12047	8.36023	0.0688556	2.3830768	34	3	1994–1999	0.49	M-v	4	Williams	36523	1997 BX ₂
1997 BZ ₂	14.4	0.15	19990810	145.07668	82.94629	148.84934	4.06434	0.1683417	2.5954504	35	5	1982–1999	0.69	M-v	1	Williams	36523	1997 BZ ₂
1997 BA ₃	14.7	0.15	19990810	285.55028	104.36790	336.30410	1.62942	0.1837641	2.4032026	91	3	1973–1999	0.64	M-v	2	Williams	36523	1997 BA ₃
1997 BC ₃	14.4	0.15	19990810	211.05010	189.57019	351.55167	6.45365	0.0440326	2.3662705	34	3	1991–1999	0.69	M-v	4	Williams	36523	1997 BC ₃
1997 BO ₃	13.5	0.15	19990810	240.17973	44.15849	83.14927	3.64169	0.0782430	2.5287190	48	4	1989–1999	0.41	M-v	3	Williams	36523	1997 BO ₃
1997 BP ₃	14.3	0.15	19990810	291.51101	339.18545	138.13598	7.04968	0.0552332	2.2931548	22	4	1976–1999	0.58	M-v	1	Williams	36523	1997 BP ₃
1997 BS ₆	14.6	0.15	19990810	295.26413	344.18552	126.82577	7.70883	0.1109747	2.2322151	41	4	1987–1999	0.49	M-v	1	Williams	36523	1997 BS ₆
1997 BN ₉	13.9	0.15	19990810	293.83807	215.48500	201.80300	9.67724	0.0820290	2.9730214	78	3	1997–1999	0.56	M-v	3	Williams	36523	1997 BN ₉
1997 CW	14.4	0.15	19990810	222.34249	144.91017	41.03565	4.21348	0.1111300	2.3338291	44	4	1990–1999	0.41	M-v	1	Williams	32519	1997 CW
1997 CG ₁	14.0	0.15	19990810	303.53142	311.61447	95.83613	6.16812	0.1431805	2.5873014	44	3	1997–1999	0.54	M-v	4	Williams	36523	1997 CG ₁
1997 CH ₁	13.7	0.15	19990810	127.21699	278.08713	306.66315	4.80890	0.0461959	2.7254366	64	2	1997–1999	0.58	M-v	3	Williams	36523	1997 CH ₁
1997 CK ₁	14.5	0.15	19990810	187.28584	99.09289	94.64054	4.36336	0.1713721	2.5717691	19	4	1989–1999	0.44	M-v	1	Williams	32251	1997 CK ₁
1997 CW ₁	14.9	0.15	19990810	232.83508	31.51589	114.20514	7.97951	0.0832996	2.4254203	41	2	1997–1999	0.41	M-v	4	Williams	36346	1997 CW ₁
1997 CX ₂	14.1	0.15	19990810	314.58555	39.68260	354.10339	5.83996	0.0422800	2.7242342	67	2	1997–1999	0.46	M-v	3	Williams	36523	1997 CX ₂
1997 CV ₄	15.4	0.15	19990810	303.35083	91.46712	316.98578	13.24396	0.2033087	2.4345138	36	2	1997–1999	0.41	M-v	4	Williams	36346	1997 CV ₄
1997 CT ₅	14.4	0.15	19990810	290.94604	130.74795	325.17751	6.95706	0.0556948	2.2736110	49	2	1997–1999	0.26	M-v	2	Williams	36523	1997 CT ₅
1997 CZ ₅	13.6	0.15	19990810	264.93921	169.00082	288.15376	24.94012	0.3989637	2.2916892	269	2	1997–1999	0.46	M-v	2	Williams	36076	1997 CZ ₅
1997 CG ₆	13.5	0.15	19990810	250.67356	147.01793	55.66955	8.10561	0.1225354	2.2176506	44	4	1954–1999	0.53	M-v	2	Williams	36523	1997 CG ₆
1997 CE ₈	13.8	0.15	19990810	28.34932	203.26054	153.92270	5.97646	0.1384938	2.3030037	24	4	1981–1999	0.78	M-v	2	Williams	36523	1997 CE ₈
1997 CF ₉	15.1	0.15	19990810	315.13881	70.11980	333.65048	6.55190	0.2357484	2.4293197	67	2	1997–1999	0.42	M-v	4	Williams	36346	1997 CF ₉
1997 CN ₁₃	14.4	0.15	19990810	92.68830	163.36368	135.43577	7.81326	0.1276069	2.3221987	66	4	1977–1999	0.47	M-v	1	Williams	36523	1997 CN ₁₃
1997 CZ ₁₄	16.0	0.15	19990810	3.14209	335.18253	36.30735	2.72794	0.2331609	2.2747577	40	5	1992–1999	0.34	M-v	1	Williams	36523	1997 CZ ₁₄
1997 CP ₁₉	13.6	0.15	19990810	277.64924	293.04160	139.14490	13.24501	0.1594818	2.5577228	59	3	1997–1999	0.61	M-v	3	Williams	36524	1997 CP ₁₉
1997 CV ₁₉	14.0	0.15	19990810	149.01555	133.71371	126.98284	6.69298	0.0913551	2.3909713	41	3	1997–1999	0.52	M-v	3	Williams	36524	1997 CV ₁₉
1997 CR ₂₁	15.3	0.15	19990810	212.33898	53.46135	119.78254	2.02212	0.1344590	2.4242694	40	3	1995–1999	0.64	M-v	4	Williams	29667	1997 CR ₂₁
1997 CA ₂₂	14.9	0.15	19990810	253.67123	28.03925	156.38889	1.51985	0.0683611	2.1869478	74	4	1995–1999	0.68	M-v	2	Williams	33344	1997 CA ₂₂

1997 CB ₂₆	14.1	0.15	19990810	315.80087	112.20165	321.07405	5.94915	0.0681527	2.3543451	36	2	1997–1999	0.53	M-v	4	Williams	36347	1997 CB ₂₆
1997 CK ₂₆	14.5	0.15	19990810	203.10684	139.78770	62.98551	6.45974	0.0544524	2.3719688	34	3	1995–1999	0.39	M-v	3	Williams	29667	1997 CK ₂₆
1997 CB ₂₇	16.0	0.15	19990810	244.50032	142.37064	25.13103	6.92329	0.2180501	2.4114819	24	3	1995–1999	0.45	M-v	3	Williams	29642	1997 CB ₂₇
1997 CY ₂₇	12.8	0.15	19990810	135.24772	234.18437	320.59907	16.10120	0.0311987	2.8549179	26	2	1997–1999	0.62	M-v	4	Williams	36347	1997 CY ₂₇
1997 CF ₂₉	14.2	0.15	19990810	257.48679	15.26343	170.13678	2.29963	0.1319826	2.2972510	41	3	1997–1999	0.53	M-v	3	Williams	36524	1997 CF ₂₉
1997 CK ₂₉	14.9	0.15	19990810	294.39732	123.60236	332.03822	1.17690	0.2069767	2.3034540	74	4	1990–1999	0.62	M-v	2	Williams	36524	1997 CK ₂₉
1997 DL	15.6	0.15	19990810	279.69156	157.62598	326.87075	4.96731	0.1588205	2.2562853	45	3	1997–1999	0.42	M-v	3	Williams	36524	1997 DL
1997 DQ	15.0	0.15	19990810	284.99775	100.44100	2.38918	8.31131	0.1485991	2.3644863	46	2	1997–1999	0.65	M-v	4	Williams	36347	1997 DQ
1997 EJ	12.8	0.15	19990810	161.84723	166.33468	8.45125	10.02360	0.0371875	3.0063132	64	2	1997–1999	0.51	M-v	3	Williams	36524	1997 EJ
1997 EK	13.0	0.15	19990810	174.68979	159.24078	9.90026	12.73578	0.0801522	2.9094305	57	4	1992–1999	0.56	M-v	3	Williams	36524	1997 EK
1997 EL	12.2	0.15	19990810	330.34163	215.54807	148.49644	10.95878	0.1209809	3.0019066	120	3	1997–1999	0.55	M-v	3	Williams	36524	1997 EL
1997 EP	14.5	0.15	19990810	23.26836	319.89014	330.94270	11.26226	0.0592038	3.1253123	31	2	1997–1999	0.52	M-v	3	Williams	36347	1997 EP
1997 EV	15.5	0.15	19990810	298.20793	66.28518	18.48209	23.52977	0.2391889	2.3420725	67	2	1997–1999	0.60	M-v	3	Williams	36347	1997 EV
1997 EQ ₂	14.6	0.15	19990810	12.37054	277.99064	127.41868	5.95260	0.1063055	2.3014605	32	3	1997–1999	0.68	M-v	2	Williams	36524	1997 EQ ₂
1997 ER ₂	13.8	0.15	19990810	350.62495	5.33908	55.96802	4.54985	0.0563742	2.3346760	36	4	1988–1999	0.56	M-v	1	Williams	36524	1997 ER ₂
1997 EZ ₃	14.5	0.15	19990810	97.22957	244.78286	359.74050	4.21042	0.0920973	3.1847495	24	2	1997–1999	0.52	M-v	4	Williams	36347	1997 EZ ₃
1997 EN ₄	14.5	0.15	19990810	65.94033	328.17044	2.39702	12.08936	0.1987243	2.6358198	23	3	1997–1999	0.40	M-v	3	Williams	32474	1997 EN ₄
1997 EK ₆	13.7	0.15	19990810	347.96714	277.61320	85.47370	15.56442	0.1694453	2.5948629	75	3	1997–1999	0.56	M-v	2	Williams	36524	1997 EK ₆
1997 EG ₇	15.8	0.15	19990810	327.75792	64.77333	317.73470	15.95096	0.2175938	2.5924700	49	2	1997–1999	0.54	M-v	4	Williams	36348	1997 EG ₇
1997 EO ₇	12.9	0.15	19990810	28.92350	321.22137	330.21495	9.20805	0.1709718	3.1608885	99	3	1997–1999	0.58	M-v	2	Williams	36524	1997 EO ₇
1997 EX ₇	14.6	0.15	19990810	325.71602	50.67512	352.76085	3.93384	0.1414180	2.5520495	86	2	1997–1999	0.57	M-v	4	Williams	36524	1997 EX ₇
1997 EL ₁₁	13.0	0.15	19990810	65.67994	270.81370	55.29741	15.43873	0.1496422	2.6116584	48	3	1986–1999	0.48	M-v	2	Williams	36524	1997 EL ₁₁
1997 EX ₁₃	15.2	0.15	19990810	335.54902	97.02293	308.53898	2.14441	0.1591393	2.3763939	57	2	1997–1999	0.47	M-v	4	Williams	36348	1997 EX ₁₃
1997 EE ₂₃	13.8	0.15	19990810	316.38853	0.40203	99.36222	7.82295	0.0731825	2.3921373	53	3	1997–1999	0.52	M-v	3	Williams	36524	1997 EE ₂₃
1997 ER ₂₆	13.9	0.15	19990810	342.87460	194.41272	167.42705	1.88440	0.2073733	3.0571566	62	4	1994–1999	0.52	M-v	2	Williams	36524	1997 ER ₂₆
1997 EL ₂₈	14.9	0.15	19990810	330.68919	23.44898	4.21006	9.43305	0.1913197	2.7725977	89	2	1997–1999	0.56	M-v	3	Williams	36524	1997 EL ₂₈
1997 EQ ₃₀	13.9	0.15	19990810	154.18229	111.39735	103.11171	11.51331	0.1440624	2.6903684	59	3	1997–1999	0.71	M-v	3	Williams	36524	1997 EQ ₃₀
1997 ER ₃₁	13.8	0.15	19990810	52.68794	271.63558	24.86800	0.96161	0.1526346	3.2243551	72	3	1993–1999	0.64	M-v	4	Williams	36524	1997 ER ₃₁
1997 EN ₃₂	14.7	0.15	19990810	290.09519	68.67119	6.44425	4.04515	0.0916194	2.7217490	73	3	1992–1999	0.58	M-v	3	Williams	36524	1997 EN ₃₂
1997 EK ₃₅	14.8	0.15	19990810	74.80580	189.99837	134.98819	5.88377	0.1904884	2.2696033	38	4	1988–1999	0.67	M-v	2	Williams	36524	1997 EK ₃₅
1997 EA ₃₆	14.8	0.15	19990810	218.75989	28.76761	119.54179	2.26409	0.0929322	2.5228868	48	5	1977–1999	0.65	M-v	4	Williams	36524	1997 EA ₃₆
1997 EM ₃₆	15.3	0.15	19990810	281.42343	318.50589	148.56999	6.02228	0.1856647	2.2914316	37	2	1997–1999	0.62	M-v	4	Williams	36349	1997 EM ₃₆
1997 EY ₄₅	14.1	0.15	19990810	281.31929	43.42890	81.84133	3.24438	0.1521146	2.3887236	36	3	1995–1999	0.47	M-v	3	Williams	35072	1997 EY ₄₅
1997 EH ₄₆	14.2	0.15	19990810	352.33819	25.44219	326.40240	12.56364	0.3205263	2.5988158	79	2	1997–1999	0.38	M-v	2	Williams	36524	1997 EH ₄₆
1997 FU ₂	12.8	0.15	19990810	20.55323	341.50715	358.85879	10.78025	0.0971164	3.0497194	36	3	1988–1999	0.65	M-v	3	Williams	36524	1997 FU ₂
1997 FB ₃	14.1	0.15	19990810	144.33689	6.46346	198.14979	10.58089	0.0223789	3.1104694	27	2	1997–1999	0.61	M-v	4	Williams	36349	1997 FB ₃
1997 FC ₃	14.0	0.15	19990810	349.19989	155.60439	218.24224	0.85880	0.1344588	2.9298975	66	4	1992–1999	0.63	M-v	3	Williams	36349	1997 FC ₃
1997 FG ₃	14.5	0.15	19990810	299.67913	247.43542	187.85917	4.91557	0.0758133	2.7154182	45	2	1997–1999	0.67	M-v	4	Williams	36349	1997 FG ₃
1997 FK ₃	14.8	0.15	19990810	347.07016	201.89469	185.86557	12.15361	0.1135127	2.7539643	40	4	1992–1999	0.57	M-v	2	Williams	36350	1997 FK ₃
1997 FZ ₃	13.9	0.15	19990810	26.45948	148.46248	194.90689	1.57421	0.1244957	2.9475605	27	3	1996–1999	0.64	M-v	4	Williams	30461	1997 FZ ₃
1997 FB ₄	13.8	0.15	19990810	80.21412	268.61805	18.18333	10.16346	0.0779098	2.9904904	84	3	1992–1999	0.59	M-v	2	Williams	36525	1997 FB ₄
1997 FJ ₄	14.2	0.15	19990810	102.28489	306.14020	320.79318	1.14028	0.0048760	2.8806849	47	4	1994–1999	0.84	M-v	1	Williams	36350	1997 FJ ₄
1997 FA ₅	16.0	0.15	19990810	178.91989	24.37970	187.84059	4.52255	0.1661352	2.6796829	20	4	1984–1999	0.89	M-v	2	Williams	34873	1997 FA ₅
1997 FC ₅	14.8	0.15	19990810	13.53312	194.48206	175.32260	6.15341	0.0662036	2.7089289	14	3	1994–1999	0.86	M-v	4	Williams	30672	1997 FC ₅
1997 GH ₁	14.9	0.15	19990810	31.15755	179.50115	181.32027	2.98579	0.1835741	2.5828443	21	3	1993–1999	0.38	M-v	5	Williams	29647	1997 GH ₁
1997 GR ₄	16.2	0.15	19990810	218.40440	147.36906	25.90932	1.97334	0.1107315	2.5543704	20	3	1993–1999	0.45	M-v	4	Williams	36525	1997 GR ₄
1997 GR ₅	14.3	0.15	19990810	228.04083	82.74680	110.73725	5.36080	0.1383112	2.3465991	71	5	1983–1999	0.75	M-v	1	Williams	36077	1997 GR ₅
1997 GZ ₆	16.0	0.15	19990810	268.62247	128.06637	44.71777	3.46362	0.0987353	2.3329153	28	4	1995–1999	0.48	M-v	1	Williams	32752	1997 GZ ₆
1997 GB ₇	14.8	0.15	19990810	209.91921	186.57768	47.22851	3.30957	0.0123253	2.3756021	55	3	1997–1999	0.70	M-v	4	Williams	33076	1997 GB ₇
1997 GQ ₇	12.6	0.15	19990810	344.08772	2.53089	46.35240	15.94363	0.1592893	2.7748067	77	4	1985–1999	0.57	M-v	2	Williams	36525	1997 GQ ₇
1997 GZ ₇	13.9	0.15	19990810	28.45252	298.52581	41.40285	13.85118	0.0262272	3.1693105	40	3	1988–1999	0.66	M-v	3	Williams	30094	1997 GZ ₇
1997 GB ₈	16.0	0.15	19990810	232.94351	9.13231	164.85280	1.07596	0.1773172	2.5587639	38	3	1995–1999	0.56	M-v	4	Williams	30094	1997 GB ₈
1997 GD ₈	14.9	0.15	19990810	243.49673	174.07113	28.96114	0.29517	0.1608400	2.3247337	52	4	1995–1999	0.65	M-v	2	Williams	36525	1997 GD ₈

1997 GK ₈	14.1	0.15	19990810	159.33593	213.86727	355.23329	1.39116	0.1027256	3.1185540	53	2	1997–1999	0.57	M-v	5	Williams	36350	1997 GK ₈
1997 GF ₉	15.0	0.15	19990810	256.52542	282.87047	203.32474	13.36914	0.1019073	2.6261962	39	2	1997–1999	0.57	M-v	4	Williams	36351	1997 GF ₉
1997 GM ₁₁	14.4	0.15	19990810	32.02041	319.18978	4.72395	9.03327	0.0505447	3.0907739	29	2	1997–1999	0.70	M-v	4	Williams	36351	1997 GM ₁₁
1997 GM ₁₃	14.3	0.15	19990810	162.61441	27.91130	197.00936	17.66484	0.1068651	2.7383685	41	4	1994–1999	0.60	M-v	1	Williams	32520	1997 GM ₁₃
1997 GK ₁₆	14.0	0.15	19990810	35.68212	225.41654	120.73940	1.50391	0.2072334	2.8882725	35	4	1989–1999	0.49	M-v	1	Williams	35699	1997 GK ₁₆
1997 GF ₁₇	14.5	0.15	19990810	230.14091	9.14835	213.87068	5.24228	0.1349877	2.2492166	40	3	1997–1999	0.55	M-v	3	Williams	36525	1997 GF ₁₇
1997 GL ₁₇	14.7	0.15	19990810	228.27934	219.55576	331.34436	2.01096	0.1457037	2.4219902	46	3	1997–1999	0.74	M-v	4	Williams	32752	1997 GL ₁₇
1997 GX ₁₈	15.3	0.15	19990810	271.29732	209.14431	265.23891	1.66209	0.1569015	2.5667465	43	3	1995–1999	0.55	M-v	3	Williams	36525	1997 GX ₁₈
1997 GN ₁₉	13.7	0.15	19990810	322.08553	179.76233	198.36222	22.49448	0.1235063	3.2129916	38	2	1997–1999	0.68	M-v	3	Williams	36525	1997 GN ₁₉
1997 GE ₂₀	14.2	0.15	19990810	267.62366	281.09615	169.16558	2.27062	0.0634863	2.9334259	36	3	1992–1999	0.55	M-v	3	Williams	36351	1997 GE ₂₀
1997 GL ₂₁	13.8	0.15	19990810	299.88640	81.61886	359.09640	1.48641	0.0236058	2.9500583	62	3	1997–1999	0.55	M-v	3	Williams	36351	1997 GL ₂₁
1997 GX ₂₁	13.3	0.15	19990810	30.21121	262.34112	99.16076	3.65478	0.0743845	2.8996894	29	3	1997–1999	0.67	M-v	4	Williams	32679	1997 GX ₂₁
1997 GC ₂₂	14.4	0.15	19990810	14.94824	216.90541	163.61599	2.03733	0.1019073	2.8480023	31	3	1960–1999	0.64	M-v	4	Williams	33259	1997 GC ₂₂
1997 GL ₂₂	14.3	0.15	19990810	58.84513	312.63786	25.74717	3.35735	0.2286361	3.0950760	49	3	1997–1999	0.66	M-v	3	Williams	33344	1997 GL ₂₂
1997 GN ₂₂	14.3	0.15	19990810	210.29511	235.14263	296.73584	0.74468	0.0212501	2.9438270	54	3	1997–1999	0.57	M-v	4	Williams	36351	1997 GN ₂₂
1997 GQ ₂₂	13.2	0.15	19990810	28.69744	131.54494	218.29015	12.91469	0.1470524	3.2114106	81	4	1987–1999	0.50	M-v	2	Williams	36525	1997 GQ ₂₂
1997 GT ₂₂	13.1	0.15	19990810	105.48872	240.39731	40.99249	10.78304	0.0725843	2.9894185	71	2	1997–1999	0.45	M-v	3	Williams	36351	1997 GT ₂₂
1997 GB ₂₃	14.9	0.15	19990810	283.45798	39.79686	67.75568	4.74521	0.2233523	2.5973806	65	3	1995–1999	0.53	M-v	3	Williams	36525	1997 GB ₂₃
1997 GQ ₂₃	13.7	0.15	19990810	106.27216	330.67070	329.69917	2.02114	0.0632240	2.7598268	65	4	1995–1999	0.58	M-v	1	Williams	35699	1997 GQ ₂₃
1997 GR ₂₄	13.9	0.15	19990810	111.78915	126.28305	195.27113	12.18651	0.1922971	2.6904351	92	3	1997–1999	0.51	M-v	2	Williams	34296	1997 GR ₂₄
1997 GH ₂₇	14.7	0.15	19990810	280.04727	90.07251	20.62085	3.07077	0.1226065	2.4786384	92	5	1989–1999	0.54	M-v	1	Williams	36525	1997 GH ₂₇
1997 GO ₂₇	18.4	0.15	19990810	20.38024	139.25269	188.92572	17.89606	0.0709937	1.4214211	81	2	1997–1999	0.48	M-v	3	Williams	36525	1997 GO ₂₇
1997 GK ₃₃	13.1	0.15	19990810	297.82272	214.02061	199.71572	7.98068	0.0912138	3.0329018	91	3	1997–1999	0.68	M-v	3	Williams	36525	1997 GK ₃₃
1997 GP ₃₃	14.5	0.15	19990810	301.62682	254.39843	185.64179	2.88754	0.0702901	2.6896780	60	3	1994–1999	0.62	M-v	3	Williams	36525	1997 GP ₃₃
1997 GB ₃₅	12.9	0.15	19990810	274.85067	62.42681	7.64044	12.87671	0.0367449	3.1798613	56	3	1975–1999	0.58	M-v	2	Williams	36525	1997 GB ₃₅
1997 GP ₃₆	13.2	0.15	19990810	218.61146	323.34084	215.93624	12.25269	0.2108597	2.6521350	83	3	1997–1999	0.56	M-v	3	Williams	36525	1997 GP ₃₆
1997 GQ ₄₁	14.4	0.15	19990810	308.45318	35.48944	88.60411	2.55276	0.1242809	2.3235320	38	5	1988–1999	0.77	M-v	1	Williams	36525	1997 GQ ₄₁
1997 HQ	14.2	0.15	19990810	353.84080	217.01868	210.86689	5.93306	0.0938837	2.4643649	28	3	1997–1999	0.52	M-v	3	Williams	36525	1997 HQ
1997 HO ₁	15.0	0.15	19990810	310.70110	194.72424	231.54224	1.10428	0.1539369	2.6155387	69	3	1995–1999	0.57	M-v	4	Williams	36525	1997 HO ₁
1997 HS ₃	15.2	0.15	19990810	246.90368	349.19457	148.06467	3.36422	0.0923025	2.9052006	24	3	1995–1999	0.70	M-v	3	Williams	30474	1997 HS ₃
1997 HY ₆	13.3	0.15	19990810	92.48740	226.16804	52.79169	10.17160	0.0226419	3.0895803	42	2	1997–1999	0.52	M-v	3	Williams	36352	1997 HY ₆
1997 HP ₈	14.9	0.15	19990810	2.15721	217.26747	187.80542	3.71862	0.0963147	2.6615379	41	4	1992–1999	0.69	M-v	1	Williams	35700	1997 HP ₈
1997 HP ₁₁	13.9	0.15	19990810	309.45578	103.98669	327.85113	1.46202	0.0823964	2.9255564	68	2	1997–1999	0.41	M-v	4	Williams	36352	1997 HP ₁₁
1997 HK ₁₆	13.8	0.15	19990810	346.07136	16.73216	356.73249	1.23679	0.1110268	2.9523671	73	3	1992–1999	0.57	M-v	3	Williams	36352	1997 HK ₁₆
1997 JU ₃	14.8	0.15	19990810	185.57176	154.65816	56.52248	8.92757	0.1500901	2.8168121	42	3	1997–1999	0.70	M-v	3	Williams	32753	1997 JU ₃
1997 JE ₁₀	12.6	0.15	19990810	233.66107	75.61817	75.24805	11.51598	0.0523681	2.9938035	76	5	1979–1999	0.50	M-v	1	Williams	36525	1997 JE ₁₀
1997 JA ₁₁	13.2	0.15	19990810	29.74971	233.24308	149.91175	14.97147	0.3091718	3.1382707	55	3	1997–1999	0.66	M-v	2	Williams	36525	1997 JA ₁₁
1997 JN ₁₂	12.5	0.15	19990810	108.33851	221.86232	55.73157	10.73187	0.0615850	3.0192176	75	2	1997–1999	0.58	M-v	3	Williams	36352	1997 JN ₁₂
1997 JD ₁₄	13.7	0.15	19990810	63.88801	163.25480	208.71566	14.04623	0.0160052	2.5452619	44	3	1997–1999	0.60	M-v	3	Williams	36525	1997 JD ₁₄
1997 JB ₁₅	14.3	0.15	19990810	288.20001	93.14145	80.35166	3.72690	0.0910728	2.2498230	55	4	1995–1999	0.73	M-v	2	Williams	35700	1997 JB ₁₅
1997 JM ₁₅	14.2	0.15	19990810	155.79589	154.05828	95.01531	2.97106	0.0180545	2.7967492	37	4	1994–1999	0.72	M-v	1	Williams	32753	1997 JM ₁₅
1997 JT ₁₅	12.9	0.15	19990810	73.25214	208.72287	116.05979	3.09810	0.0351186	2.9179124	57	3	1997–1999	0.46	M-v	3	Williams	36525	1997 JT ₁₅
1997 JT ₁₆	13.1	0.15	19990810	30.67087	269.61391	97.60440	10.98304	0.1456324	3.0823286	28	4	1994–1999	0.36	M-v	1	Williams	32753	1997 JT ₁₆
1997 KU ₂	13.7	0.15	19990810	261.55616	27.34517	130.58791	13.79901	0.1106917	2.5987738	44	3	1997–1999	0.68	M-v	4	Williams	35700	1997 KU ₂
1997 KH ₄	14.1	0.15	19990810	290.35557	73.23933	103.47035	6.32246	0.0793377	2.2602759	26	3	1997–1999	0.43	M-v	4	Williams	32967	1997 KH ₄
1997 LU ₁	13.3	0.15	19990810	207.51441	344.14268	199.55666	12.78639	0.0515844	3.0042029	55	3	1997–1999	0.51	M-v	3	Williams	36525	1997 LU ₁
1997 LH ₄	14.4	0.15	19990810	260.61436	352.25946	185.51456	14.89589	0.0287378	2.5946343	43	4	1992–1999	0.47	M-v	1	Williams	36077	1997 LH ₄
1997 LE ₁₀	13.2	0.15	19990810	276.33777	336.69595	139.36074	11.25898	0.0530217	3.0274319	12	1	35 days	0.70	M-v	6	Williams		1997 LE ₁₀
1997 MR	13.9	0.15	19990810	42.82283	142.72951	209.17893	7.62830	0.0462939	3.0441530	53	5	1993–1999	0.69	M-v	1	Williams	36077	1997 MR
1997 MG ₁	13.2	0.15	19990810	7.64468	206.74512	189.86943	10.56398	0.1116974	3.0013566	44	3	1997–1999	0.41	M-v	3	Williams	36525	1997 MG ₁
1997 MC ₃	13.4	0.15	19990810	226.58867	252.69474	337.64180	4.07625	0.0940343	2.5643659	45	5	1992–1999	0.58	M-v	1	Williams	36525	1997 MC ₃
1997 NQ ₂	13.3	0.15	19990810	272.55751	255.44514	281.59777	29.79276	0.1330968	2.7897835	58	4	1991–1999	0.77	M-v	1	Williams	36525	1997 NQ ₂
1997 PL ₅	12.8	0.15	19990810	40.67088	94.96943	323.56056	6.54602	0.0121543	3.1597737	50	5	1975–1999	0.76	M-v	1	Williams	36525	1997 PL ₅

1997 QU ₁	14.2	0.15	19990810	299.27485	7.49765	162.72336	2.46655	0.0642741	2.9166524	34	5	1995–1999	0.55	M-v	1	Williams	34586	1997 QU ₁
1997 QD ₂	11.8	0.15	19990810	234.08009	95.65075	143.10682	10.92266	0.0705275	3.0030488	64	4	1949–1999	0.59	M-v	1	Williams	34016	1997 QD ₂
1997 QJ ₄	7.4	0.15	19990810	315.35745	80.91120	346.81307	16.52752	0.2346681	39.7966779	27	3	1997–1999	0.41	M-v	4	Williams	32520	1997 QJ ₄
1997 RT ₅	7.2	0.15	19990810	171.84035	10.43630	163.74833	12.69498	0.0183181	41.5743437	32	3	1997–1999	0.36	M-v	6	Marsden	31988	1997 RT ₅
1997 SR ₈	13.4	0.15	19990810	290.61953	182.08170	357.13522	5.24792	0.0967897	3.1602777	41	5	1989–1999	0.76	M-v	2	Williams	34586	1997 SR ₈
1997 SJ ₂₅	12.8	0.15	19990810	177.15206	213.81631	79.85719	2.99857	0.1682413	3.1553067	39	6	1991–1999	0.83	M-v	1	Williams	33557	1997 SJ ₂₅
1997 UF ₉	16.2	0.15	19990810	261.31157	157.82638	37.25556	25.89789	0.6042965	1.4424454	181	3	1997–1999	0.54	M-v	2	Williams	36526	1997 UF ₉
1997 US ₉	17.3	0.15	19990810	60.44493	357.21289	212.29814	20.01916	0.2816845	1.0520764	243	3	1997–1999	0.58	M-v	3	Williams	36526	1997 US ₉
1997 UC ₂₂	12.0	0.15	19990810	118.92234	51.41283	292.74216	17.63811	0.1539361	3.2069966	44	3	1997–1999	0.65	M-v	3	Williams	35702	1997 UC ₂₂
1997 VB ₁	11.6	0.15	19990810	316.40155	165.26300	343.01410	3.85114	0.0748902	5.1985292	62	4	1978–1999	0.59	M-v	1	Marsden	36526	1997 VB ₁
1997 VG ₁	11.3	0.15	19990810	343.46201	37.16401	53.83491	4.32980	0.0639620	5.0639175	42	3	1997–1999	0.73	M-v	3	Williams	35702	1997 VG ₁
1997 WU ₂₂	15.4	0.15	19990810	188.80659	334.13778	260.90746	15.97964	0.4422655	1.4676152	97	3	1990–1999	0.51	M-v	3	Williams	36526	1997 WU ₂₂
1997 XH	14.5	0.15	19990810	87.12530	272.88178	319.43651	5.62026	0.1424685	2.2278204	64	2	1997–1999	0.62	M-v	4	Williams	36526	1997 XH
1998 AK ₈	16.5	0.15	19990810	228.32866	11.57391	126.85425	48.22604	0.1817574	1.7979451	157	3	1977–1999	0.43	M-v	2	Williams	36526	1998 AK ₈
1998 AV ₉	14.9	0.15	19990810	198.92823	209.65199	312.11288	0.50969	0.0650649	2.1729025	104	3	1993–1999	0.51	M-v	2	Williams	36526	1998 AV ₉
1998 BP ₈	14.4	0.15	19990810	12.09454	301.29234	2.15890	5.15245	0.1639989	2.2407217	67	4	1979–1999	0.54	M-v	2	Williams	36526	1998 BP ₈
1998 BH ₂₆	14.2	0.15	19990810	57.43250	277.13148	356.41719	15.71343	0.1889674	2.5300338	139	3	1991–1999	0.63	M-v	1	Williams	36526	1998 BH ₂₆
1998 BQ ₃₃	14.5	0.15	19990810	16.99077	224.00906	79.37266	5.02742	0.1559522	2.3334881	53	2	1998–1999	0.69	M-v	3	Williams	36354	1998 BQ ₃₃
1998 BL ₃₉	14.7	0.15	19990810	15.83189	334.71385	313.17038	7.18902	0.1660661	2.2527327	53	2	1998–1999	0.45	M-v	3	Williams	36526	1998 BL ₃₉
1998 CE ₂	15.3	0.15	19990810	63.42485	323.47505	294.07465	4.74847	0.2472834	2.2525737	33	2	1998–1999	0.48	M-v	5	Williams	36354	1998 CE ₂
1998 CC ₃	14.8	0.15	19990810	344.85176	1.22970	335.37676	3.66556	0.0667691	2.1495086	82	4	1993–1999	0.71	M-v	3	Williams	36526	1998 CC ₃
1998 CK ₃	14.3	0.15	19990810	67.07140	239.24813	1.39398	2.36043	0.1401621	2.4595389	53	3	1990–1999	0.72	M-v	2	Williams	36526	1998 CK ₃
1998 CO ₃	14.2	0.15	19990810	22.30457	313.83866	350.07959	4.18291	0.2107268	2.2554331	90	4	1972–1999	0.63	M-v	2	Williams	36354	1998 CO ₃
1998 DU	15.0	0.15	19990810	276.20677	110.57035	309.71033	18.07883	0.0923593	1.9522946	50	3	1980–1999	0.78	M-v	2	Williams	36078	1998 DU
1998 DR ₅	13.3	0.15	19990810	28.75482	318.77252	310.38469	14.71818	0.1755101	2.6241201	67	3	1995–1999	0.54	M-v	2	Williams	36526	1998 DR ₅
1998 DT ₇	14.6	0.15	19990810	80.84799	296.32502	301.27191	3.84099	0.1504451	2.2826897	46	3	1992–1999	0.59	M-v	2	Williams	36355	1998 DT ₇
1998 DT ₉	15.1	0.15	19990810	10.09694	346.09571	345.03073	2.03529	0.1185530	2.1311195	103	5	1990–1999	0.53	M-v	2	Williams	36526	1998 DT ₉
1998 DD ₁₀	14.1	0.15	19990810	224.00338	183.93668	265.51910	5.63755	0.0459973	2.2318479	43	4	1986–1999	0.63	M-v	2	Williams	36526	1998 DD ₁₀
1998 DQ ₁₀	15.1	0.15	19990810	39.53013	139.64622	163.58535	6.29103	0.1694245	2.3093531	34	1	56 days	0.49	M-v	5	Williams		1998 DQ ₁₀
1998 DM ₁₃	13.7	0.15	19990810	5.62444	73.20076	235.14745	12.97483	0.0893444	2.5888418	57	3	1991–1999	0.63	M-v	2	Williams	36526	1998 DM ₁₃
1998 DZ ₁₃	15.3	0.15	19990810	64.24731	183.86497	103.17325	1.59163	0.1852800	2.2852827	80	4	1981–1999	0.66	M-v	2	Williams	36526	1998 DZ ₁₃
1998 DD ₁₈	15.6	0.15	19990810	37.19644	165.92766	141.50390	6.20906	0.1907580	2.2661976	30	3	1995–1999	0.44	M-v	3	Williams	36527	1998 DD ₁₈
1998 DG ₂₀	14.0	0.15	19990810	75.45890	157.73861	95.76583	8.53189	0.0968634	2.4814490	78	2	1998–1999	0.53	M-v	3	Williams	36527	1998 DG ₂₀
1998 DJ ₂₀	15.0	0.15	19990810	47.20046	282.16717	357.04173	5.87484	0.1217849	2.2366325	83	2	1998–1999	0.69	M-v	4	Williams	36527	1998 DJ ₂₀
1998 DB ₂₄	14.7	0.15	19990810	100.58712	298.92012	314.16553	17.21619	0.0554312	1.9626041	68	2	1998–1999	0.51	M-v	3	Williams	36527	1998 DB ₂₄
1998 DB ₃₄	14.6	0.15	19990810	88.56216	103.50791	150.19363	4.76885	0.2937896	2.3659109	71	3	1995–1999	0.68	M-v	2	Williams	36527	1998 DB ₃₄
1998 DT ₃₄	15.0	0.15	19990810	18.26174	302.36028	16.22570	5.36877	0.1833486	2.2215084	82	3	1989–1999	0.57	M-v	3	Williams	36527	1998 DT ₃₄
1998 DC ₃₅	14.4	0.15	19990810	157.21921	359.80038	156.30736	4.83076	0.0731530	2.3248204	72	2	1998–1999	0.60	M-v	3	Williams	36527	1998 DC ₃₅
1998 DB ₃₆	14.0	0.15	19990810	35.56582	288.46078	7.24229	11.47437	0.2168912	2.3395620	107	3	1991–1999	0.65	M-v	2	Williams	36527	1998 DB ₃₆
1998 ED	13.8	0.15	19990810	18.43589	266.64888	33.23674	13.44282	0.1851660	2.5548763	45	2	1998–1999	0.70	M-v	3	Williams	36356	1998 ED
1998 EJ ₂	14.9	0.15	19990810	6.64483	136.13231	188.73087	12.03193	0.1855140	2.6872266	44	2	1998–1999	0.67	M-v	3	Williams	36356	1998 EJ ₂
1998 EQ ₂	16.0	0.15	19990810	135.42419	196.95737	10.54625	6.31922	0.0932529	2.2928235	32	3	1996–1999	0.74	M-v	3	Williams	35705	1998 EQ ₂
1998 EW ₂	14.5	0.15	19990810	35.93825	278.14109	19.45685	9.90601	0.0881522	2.5575138	57	2	1998–1999	0.61	M-v	3	Williams	36527	1998 EW ₂
1998 EP ₃	13.5	0.15	19990810	16.18307	300.65714	6.83403	9.42112	0.1761829	2.6516581	85	3	1996–1999	0.51	M-v	2	Williams	36527	1998 EP ₃
1998 EB ₈	15.8	0.15	19990810	97.53279	182.84628	65.33854	1.51859	0.1160795	2.1996684	66	3	1996–1999	0.53	M-v	3	Williams	36527	1998 EB ₈
1998 EJ ₈	14.4	0.15	19990810	15.15580	128.04040	171.11289	6.67842	0.1521045	2.5356475	85	2	1998–1999	0.68	M-v	3	Williams	36527	1998 EJ ₈
1998 EK ₈	14.0	0.15	19990810	91.49190	301.00788	276.66404	5.80729	0.0675889	2.3592377	81	2	1998–1999	0.58	M-v	3	Williams	36527	1998 EK ₈
1998 EP ₈	18.2	0.15	19990810	332.45323	221.01137	169.31250	24.52935	0.2726328	1.7514343	58	2	1998–1999	0.61	M-v	3	Williams	36356	1998 EP ₈
1998 EA ₉	14.7	0.15	19990810	67.69509	158.14053	111.74504	9.02900	0.2352241	2.5673021	59	2	1998–1999	0.54	M-v	4	Williams	36356	1998 EA ₉
1998 EC ₉	14.4	0.15	19990810	49.95988	176.02371	86.46854	6.30014	0.2564240	2.5500700	52	3	1991–1999	0.52	M-v	2	Williams	36527	1998 EC ₉
1998 EB ₁₀	14.8	0.15	19990810	16.55976	16.64026	292.37278	4.35295	0.2265156	2.3082072	61	4	1992–1999	0.47	M-v	2	Williams	36527	1998 EB ₁₀
1998 EE ₁₀	14.1	0.15	19990810	52.22468	269.02320	22.71081	4.51371	0.1510942	2.2639311	109	3	1981–1999	0.58	M-v	3	Williams	36527	1998 EE ₁₀
1998 ET ₁₁	14.6	0.15	19990810	21.51525	288.07799	23.87234	7.40241	0.2085795	2.2911788	66	2	1998–1999	0.57	M-v	4	Williams	36527	1998 ET ₁₁

1998 EY ₁₁	14.4	0.15	19990810	46.01848	267.46355	17.90047	8.65639	0.1986485	2.3726972	87	2	1998–1999	0.65	M-v	4	Williams	36527	1998 EY ₁₁
1998 ED ₁₂	15.1	0.15	19990810	56.27413	233.20791	38.44879	6.94686	0.1027583	2.2958076	50	2	1998–1999	0.69	M-v	4	Williams	36527	1998 ED ₁₂
1998 EW ₁₂	15.1	0.15	19990810	51.65510	290.54466	3.60642	5.57918	0.1740480	2.2157893	65	2	1998–1999	0.55	M-v	4	Williams	36357	1998 EW ₁₂
1998 FK ₂	14.8	0.15	19990810	1.82991	177.26608	182.46655	22.18447	0.0823824	1.9314733	68	3	1990–1999	0.70	M-v	3	Williams	36527	1998 FK ₂
1998 FO ₂	16.1	0.15	19990810	224.36396	136.82764	4.75633	24.21016	0.1168547	1.8900751	94	3	1960–1999	0.65	M-v	2	Williams	36527	1998 FO ₂
1998 FB ₅	15.7	0.15	19990810	250.17434	275.84873	196.06122	22.37570	0.0942696	1.9568679	90	2	1998–1999	0.60	M-v	3	Williams	36527	1998 FB ₅
1998 FQ ₅	14.7	0.15	19990810	67.90462	234.97180	41.21811	11.31574	0.2067927	2.4455292	105	2	1998–1999	0.57	M-v	3	Williams	36527	1998 FQ ₅
1998 FS ₅	15.5	0.15	19990810	46.30127	249.24955	53.53389	3.46268	0.2760220	2.5669789	61	3	1995–1999	0.52	M-v	2	Williams	36527	1998 FS ₅
1998 FM ₈	15.2	0.15	19990810	352.40882	318.37408	28.01896	6.10300	0.2097641	2.2761858	51	2	1998–1999	0.46	M-v	3	Williams	36357	1998 FM ₈
1998 FV ₈	15.4	0.15	19990810	79.47932	185.10657	81.87289	2.38260	0.1588831	2.4016106	57	5	1991–1999	0.70	M-v	1	Williams	36527	1998 FV ₈
1998 FW ₉	15.8	0.15	19990810	85.31560	62.56957	194.87451	12.68983	0.1804474	2.3227180	73	3	1991–1999	0.78	M-v	3	Williams	36527	1998 FW ₉
1998 FF ₁₀	15.1	0.15	19990810	128.74922	6.01593	204.52023	5.19017	0.1438954	2.2393234	87	3	1996–1999	0.57	M-v	3	Williams	36528	1998 FF ₁₀
1998 FP ₁₀	15.5	0.15	19990810	50.43793	274.53939	357.55827	12.63893	0.2113984	2.6815373	48	2	1998–1999	0.77	M-v	4	Williams	36358	1998 FP ₁₀
1998 FU ₁₀	13.9	0.15	19990810	14.29059	297.57234	357.38056	8.65477	0.1369056	2.7819798	72	3	1990–1999	0.66	M-v	2	Williams	36528	1998 FU ₁₀
1998 FV ₁₀	14.9	0.15	19990810	16.96071	42.44677	277.39144	1.43059	0.1023031	2.3126115	133	2	1998–1999	0.60	M-v	3	Williams	36528	1998 FV ₁₀
1998 FG ₁₁	13.1	0.15	19990810	20.49600	274.17729	34.38797	15.08448	0.1147719	2.5907612	69	4	1987–1999	0.70	M-v	2	Williams	36528	1998 FG ₁₁
1998 FM ₁₂	14.3	0.15	19990810	26.77682	138.76992	159.40243	3.98624	0.2100974	2.5669885	82	3	1995–1999	0.55	M-v	2	Williams	36528	1998 FM ₁₂
1998 FB ₁₄	13.9	0.15	19990810	16.51193	127.79557	167.74539	12.21766	0.2068537	2.7103418	99	3	1990–1999	0.59	M-v	2	Williams	36528	1998 FB ₁₄
1998 FW ₁₄	15.1	0.15	19990810	40.87478	89.33200	205.17493	6.24808	0.1070890	2.3573729	91	3	1992–1999	0.59	M-v	2	Williams	36528	1998 FW ₁₄
1998 FD ₁₅	14.0	0.15	19990810	100.99628	24.36484	215.49857	2.30462	0.1656792	2.3070108	104	5	1977–1999	0.62	M-v	3	Williams	36528	1998 FD ₁₅
1998 FV ₁₅	14.9	0.15	19990810	1.14755	336.51096	5.34262	4.74270	0.1210792	2.2147122	132	3	1996–1999	0.55	M-v	2	Williams	36528	1998 FV ₁₅
1998 FF ₁₆	14.6	0.15	19990810	75.05269	106.46599	161.21181	2.47982	0.1855146	2.3956408	122	3	1995–1999	0.61	M-v	3	Williams	36528	1998 FF ₁₆
1998 FM ₂₉	14.6	0.15	19990810	49.53611	91.08868	177.92054	14.84940	0.2009259	2.5569532	76	2	1998–1999	0.54	M-v	4	Williams	36528	1998 FM ₂₉
1998 FZ ₂₉	14.9	0.15	19990810	85.42660	46.32955	211.37620	4.89035	0.1630947	2.2356658	91	3	1995–1999	0.55	M-v	3	Williams	36528	1998 FZ ₂₉
1998 FR ₃₀	14.4	0.15	19990810	27.31038	91.12772	209.31271	1.91906	0.1872562	2.4078767	106	3	1997–1999	0.56	M-v	2	Williams	36528	1998 FR ₃₀
1998 FW ₃₀	14.5	0.15	19990810	57.78996	115.35409	164.13081	6.46568	0.1446670	2.2709815	66	4	1989–1999	0.59	M-v	1	Williams	36528	1998 FW ₃₀
1998 FO ₃₂	14.2	0.15	19990810	37.26963	299.82009	348.48360	11.02056	0.2648059	2.6143746	77	2	1998–1999	0.54	M-v	4	Williams	36528	1998 FO ₃₂
1998 FF ₃₄	14.3	0.15	19990810	54.10263	340.88642	301.37632	1.58594	0.1981027	2.3848774	91	3	1996–1999	0.50	M-v	3	Williams	36528	1998 FF ₃₄
1998 FY ₃₅	14.7	0.15	19990810	68.65895	269.60401	13.34350	5.80427	0.1800508	2.2006410	104	3	1989–1999	0.52	M-v	2	Williams	36528	1998 FY ₃₅
1998 FH ₄₁	15.3	0.15	19990810	67.23527	81.85820	189.14644	2.18650	0.1904733	2.3716766	71	3	1991–1999	0.65	M-v	3	Williams	36528	1998 FH ₄₁
1998 FN ₄₁	15.2	0.15	19990810	48.72113	294.02039	357.50797	2.48014	0.2179127	2.3827580	67	2	1998–1999	0.70	M-v	4	Williams	36359	1998 FN ₄₁
1998 FY ₄₁	15.2	0.15	19990810	3.91679	353.11198	339.60492	5.26027	0.1886785	2.2725326	86	2	1998–1999	0.56	M-v	3	Williams	36359	1998 FY ₄₁
1998 FC ₄₂	13.5	0.15	19990810	21.10902	96.01725	186.11148	21.20862	0.3205300	3.2094091	62	2	1998–1999	0.62	M-v	3	Williams	36359	1998 FC ₄₂
1998 FN ₄₃	15.1	0.15	19990810	349.96066	352.04664	356.64602	6.78109	0.1927428	2.2116339	88	3	1986–1999	0.59	M-v	2	Williams	36528	1998 FN ₄₃
1998 FK ₄₄	14.3	0.15	19990810	20.04748	285.84410	7.07668	4.27224	0.2751726	2.9048219	58	2	1998–1999	0.69	M-v	4	Williams	36528	1998 FK ₄₄
1998 FK ₄₆	15.7	0.15	19990810	128.39164	195.83830	13.75253	2.49741	0.1205382	2.2210960	41	2	1998–1999	0.53	M-v	4	Williams	35957	1998 FK ₄₆
1998 FZ ₄₆	15.8	0.15	19990810	79.15345	280.87467	352.72076	3.96518	0.1260298	2.1675034	69	2	1998–1999	0.60	M-v	4	Williams	36359	1998 FZ ₄₆
1998 FK ₄₇	14.6	0.15	19990810	26.16325	315.42447	352.55534	7.37528	0.1261937	2.3299055	100	2	1998–1999	0.53	M-v	3	Williams	36528	1998 FK ₄₇
1998 FX ₄₇	14.4	0.15	19990810	17.42927	110.50790	203.60045	5.73186	0.1945386	2.4259440	113	3	1991–1999	0.54	M-v	2	Williams	36528	1998 FX ₄₇
1998 FZ ₄₇	14.8	0.15	19990810	135.54570	208.86752	341.47821	5.58162	0.0845281	2.3015024	71	3	1977–1999	0.63	M-v	3	Williams	36528	1998 FZ ₄₇
1998 FE ₄₉	14.8	0.15	19990810	48.20777	100.37418	190.74004	7.74431	0.1972236	2.3969597	69	2	1998–1999	0.63	M-v	4	Williams	36359	1998 FE ₄₉
1998 FL ₄₉	14.6	0.15	19990810	54.46946	312.72005	345.10571	2.01514	0.1466546	2.1959913	126	3	1976–1999	0.46	M-v	2	Williams	36528	1998 FL ₄₉
1998 FM ₄₉	14.4	0.15	19990810	31.37677	109.70920	186.29685	12.52172	0.1942579	2.5519571	74	2	1998–1999	0.52	M-v	3	Williams	36360	1998 FM ₄₉
1998 FO ₄₉	14.2	0.15	19990810	298.50277	25.12371	358.08609	7.83522	0.1040711	2.3047384	72	4	1982–1999	0.61	M-v	2	Williams	36529	1998 FO ₄₉
1998 FQ ₄₉	14.3	0.15	19990810	2.13554	355.70536	332.88204	1.66535	0.2112555	2.4388409	106	3	1976–1999	0.59	M-v	2	Williams	36529	1998 FQ ₄₉
1998 FN ₅₃	14.8	0.15	19990810	287.84408	183.94959	223.42435	3.05178	0.0858761	2.1467768	79	2	1998–1999	0.58	M-v	4	Williams	36529	1998 FN ₅₃
1998 FM ₅₄	14.2	0.15	19990810	14.44757	329.71974	351.22675	5.29646	0.1994530	2.4138531	120	4	1969–1999	0.58	M-v	2	Williams	36529	1998 FM ₅₄
1998 FL ₅₇	16.2	0.15	19990810	81.42572	301.57738	342.72504	0.58526	0.2187161	2.1755019	54	3	1973–1999	0.91	M-v	4	Williams	32685	1998 FL ₅₇
1998 FT ₅₇	14.9	0.15	19990810	21.87709	105.18263	208.68307	7.10893	0.1298632	2.3829812	73	2	1998–1999	0.67	M-v	3	Williams	36529	1998 FT ₅₇
1998 FC ₅₈	15.1	0.15	19990810	43.23975	303.14653	350.87220	2.12159	0.1739264	2.4374710	65	4	1994–1999	0.69	M-v	2	Williams	36360	1998 FC ₅₈
1998 FG ₅₈	14.7	0.15	19990810	23.31872	312.59883	0.93544	7.12122	0.1208471	2.3580660	107	2	1997–1999	0.64	M-v	3	Williams	36529	1998 FG ₅₈
1998 FN ₅₈	15.2	0.15	19990810	43.00556	279.19618	12.41583	3.36146	0.1469116	2.4338154	73	3	1994–1999	0.73	M-v	3	Williams	36529	1998 FN ₅₈
1998 FH ₆₀	15.3	0.15	19990810	315.58662	205.16882	174.75683	3.82108	0.1950982	2.1952936	79	4	1983–1999	0.68	M-v	2	Williams	36529	1998 FH ₆₀

1998 FD ₆₁	14.4	0.15	19990810	118.29866	48.00877	185.99825	4.87442	0.1216999	2.1712695	111	3	1996–1999	0.56	M-v	3	Williams	36529	1998 FD ₆₁
1998 FT ₆₁	14.8	0.15	19990810	82.51811	2.89071	254.79808	1.47162	0.1809564	2.4067056	95	4	1991–1999	0.58	M-v	3	Williams	36529	1998 FT ₆₁
1998 FR ₆₂	15.2	0.15	19990810	56.88716	54.73652	231.47607	1.73501	0.1544072	2.3897834	59	3	1996–1999	0.59	M-v	2	Williams	36360	1998 FR ₆₂
1998 FS ₆₂	15.3	0.15	19990810	85.94574	46.25389	200.31181	6.07491	0.1128367	2.4234466	62	2	1998–1999	0.57	M-v	3	Williams	36529	1998 FS ₆₂
1998 FS ₆₃	14.9	0.15	19990810	343.10747	330.42023	29.58739	7.60935	0.1480804	2.2004787	59	4	1986–1999	0.53	M-v	2	Williams	36529	1998 FS ₆₃
1998 FQ ₆₄	14.3	0.15	19990810	38.74979	289.05458	15.72539	6.45503	0.1237257	2.3212287	116	3	1991–1999	0.53	M-v	3	Williams	36529	1998 FQ ₆₄
1998 FZ ₆₄	14.5	0.15	19990810	88.22250	254.61681	5.61433	7.03131	0.1146412	2.2620223	69	3	1994–1999	0.58	M-v	3	Williams	36360	1998 FZ ₆₄
1998 FC ₆₅	15.1	0.15	19990810	106.88419	44.11637	193.72840	5.56650	0.1227364	2.2769972	87	4	1974–1999	0.54	M-v	2	Williams	36529	1998 FC ₆₅
1998 FH ₆₅	14.8	0.15	19990810	81.75813	46.53287	221.09040	1.74545	0.1293898	2.2809532	132	4	1991–1999	0.60	M-v	2	Williams	36529	1998 FH ₆₅
1998 FP ₆₅	14.1	0.15	19990810	42.97165	64.27852	212.45595	7.65417	0.1608866	2.7352984	69	3	1990–1999	0.68	M-v	2	Williams	36529	1998 FP ₆₅
1998 FR ₆₅	14.7	0.15	19990810	194.60081	213.94419	291.88586	2.61480	0.0586888	2.1879074	88	2	1998–1999	0.65	M-v	4	Williams	36529	1998 FR ₆₅
1998 FS ₆₅	15.3	0.15	19990810	127.58935	317.35020	253.91589	2.36004	0.1090871	2.2875260	105	2	1998–1999	0.59	M-v	3	Williams	36529	1998 FS ₆₅
1998 FT ₆₅	14.9	0.15	19990810	76.14583	288.12906	355.51773	6.27995	0.1517196	2.2104061	85	3	1992–1999	0.66	M-v	3	Williams	36529	1998 FT ₆₅
1998 FC ₆₆	13.7	0.15	19990810	34.20581	121.64959	196.72053	10.32641	0.2222591	2.3583986	117	4	1973–1999	0.54	M-v	2	Williams	36529	1998 FC ₆₆
1998 FJ ₆₇	14.9	0.15	19990810	278.13113	335.35740	89.89927	3.37921	0.0385764	2.1476913	81	3	1995–1999	0.60	M-v	2	Williams	36529	1998 FJ ₆₇
1998 FM ₆₈	15.0	0.15	19990810	85.35740	41.09962	206.06001	5.67388	0.1038735	2.4396039	90	3	1992–1999	0.59	M-v	3	Williams	36529	1998 FM ₆₈
1998 FS ₆₈	14.5	0.15	19990810	65.96431	36.46151	250.13091	3.13360	0.1144019	2.2596051	144	3	1994–1999	0.58	M-v	2	Williams	36529	1998 FS ₆₈
1998 FQ ₆₉	14.0	0.15	19990810	331.70489	179.05358	182.41559	11.82123	0.2513604	2.4142613	97	3	1994–1999	0.58	M-v	2	Williams	36529	1998 FQ ₆₉
1998 FM ₇₀	14.2	0.15	19990810	25.66708	271.54984	50.11417	2.66081	0.2108649	2.4119399	96	3	1969–1999	0.56	M-v	3	Williams	36529	1998 FM ₇₀
1998 FN ₇₀	14.7	0.15	19990810	16.41743	292.72506	30.94237	6.52127	0.1515737	2.4140185	89	3	1984–1999	0.62	M-v	3	Williams	36530	1998 FN ₇₀
1998 FV ₇₀	15.0	0.15	19990810	146.98092	14.13007	169.41430	2.69494	0.0960082	2.3394382	89	4	1980–1999	0.56	M-v	2	Williams	36530	1998 FV ₇₀
1998 FG ₇₁	15.3	0.15	19990810	130.52622	219.12168	354.55094	6.16081	0.1284097	2.2623738	69	3	1992–1999	0.65	M-v	3	Williams	36361	1998 FG ₇₁
1998 FK ₇₁	15.6	0.15	19990810	102.20807	355.89645	246.61445	1.37031	0.1163628	2.3209062	36	3	1994–1999	0.82	M-v	4	Williams	36361	1998 FK ₇₁
1998 FZ ₇₁	15.1	0.15	19990810	60.49019	315.85091	324.09915	2.01364	0.1753994	2.3892272	46	2	1998–1999	0.55	M-v	4	Williams	36361	1998 FZ ₇₁
1998 FQ ₇₂	14.3	0.15	19990810	348.38079	317.52057	30.82626	3.26421	0.1958354	2.4413108	95	3	1980–1999	0.66	M-v	2	Williams	36530	1998 FQ ₇₂
1998 FA ₇₃	15.2	0.15	19990810	245.33809	67.70167	21.82658	7.23171	0.0599244	2.3305218	41	3	1996–1999	0.74	M-v	3	Williams	35964	1998 FA ₇₃
1998 FF ₇₃	15.7	0.15	19990810	6.00461	359.08919	5.30270	19.56757	0.0880242	1.9394407	54	3	1971–1999	0.77	M-v	3	Williams	36530	1998 FF ₇₃
1998 FC ₇₄	14.3	0.15	19990810	321.79784	278.89447	103.82189	3.67520	0.1439594	2.1780875	93	4	1994–1999	0.60	M-v	2	Williams	36530	1998 FC ₇₄
1998 FL ₇₄	15.5	0.15	19990810	37.49093	299.43698	349.56304	5.77655	0.1847285	2.2825788	121	3	1996–1999	0.62	M-v	2	Williams	36530	1998 FL ₇₄
1998 FG ₇₅	15.0	0.15	19990810	28.44118	129.15726	189.98048	6.04470	0.1339508	2.3626729	111	2	1998–1999	0.70	M-v	3	Williams	36530	1998 FG ₇₅
1998 FH ₇₅	14.8	0.15	19990810	324.13579	220.21414	165.35382	2.09873	0.1282820	2.1719872	110	3	1992–1999	0.66	M-v	3	Williams	36530	1998 FH ₇₅
1998 FL ₇₅	14.9	0.15	19990810	45.02448	276.50975	41.26464	3.19771	0.1800267	2.2372429	99	3	1992–1999	0.69	M-v	3	Williams	36530	1998 FL ₇₅
1998 FL ₇₆	14.6	0.15	19990810	95.21883	179.89226	69.63754	5.93508	0.1352982	2.3064415	57	4	1994–1999	0.54	M-v	2	Williams	36530	1998 FL ₇₆
1998 FF ₇₇	15.6	0.15	19990810	58.42056	169.94493	124.22706	5.94243	0.1375312	2.2657384	33	2	1998–1999	0.64	M-v	4	Williams	36362	1998 FF ₇₇
1998 FG ₇₇	14.1	0.15	19990810	23.92375	245.53443	76.46132	6.86960	0.1804037	2.3671364	60	2	1998–1999	0.60	M-v	4	Williams	36530	1998 FG ₇₇
1998 FS ₇₇	14.3	0.15	19990810	63.67336	102.35261	164.51075	8.04327	0.1444223	2.5623014	81	2	1998–1999	0.71	M-v	3	Williams	36530	1998 FS ₇₇
1998 FV ₇₇	14.3	0.15	19990810	9.88079	144.82328	175.98679	13.83270	0.1798381	2.6333401	80	2	1998–1999	0.73	M-v	3	Williams	36530	1998 FV ₇₇
1998 FJ ₇₈	14.8	0.15	19990810	303.11366	303.06354	92.82611	4.18052	0.1590462	2.2059263	46	4	1986–1999	0.77	M-v	2	Williams	36080	1998 FJ ₇₈
1998 FS ₇₈	14.9	0.15	19990810	322.44742	262.20248	114.65185	4.64380	0.1540888	2.3126897	29	2	1998–1999	0.89	M-v	4	Williams	36362	1998 FS ₇₈
1998 FP ₇₉	14.0	0.15	19990810	346.09307	289.64303	59.06227	6.80061	0.1070349	2.4573418	51	2	1998–1999	0.57	M-v	3	Williams	36362	1998 FP ₇₉
1998 FR ₉₀	14.5	0.15	19990810	2.85566	218.20673	104.58282	4.50941	0.1258239	2.2951357	40	2	1998–1999	0.65	M-v	4	Williams	36362	1998 FR ₉₀
1998 FZ ₉₇	13.3	0.15	19990810	27.28720	64.95797	232.25043	6.04866	0.2219680	2.5588183	81	4	1983–1999	0.56	M-v	2	Williams	36530	1998 FZ ₉₇
1998 FY ₉₉	14.0	0.15	19990810	112.35769	249.77360	325.13204	7.63835	0.0753289	2.3219753	100	3	1980–1999	0.67	M-v	3	Williams	36530	1998 FY ₉₉
1998 FZ ₉₉	14.1	0.15	19990810	72.31899	291.36538	321.98110	7.84242	0.0658378	2.3722362	80	2	1998–1999	0.53	M-v	3	Williams	36530	1998 FZ ₉₉
1998 FU ₁₀₂	14.8	0.15	19990810	105.74561	324.98426	263.23760	5.84086	0.0770999	2.3009108	55	3	1995–1999	0.62	M-v	3	Williams	36530	1998 FU ₁₀₂
1998 FW ₁₀₂	14.3	0.15	19990810	132.06139	306.65543	254.53334	5.11496	0.0907153	2.2662929	82	3	1993–1999	0.60	M-v	3	Williams	36530	1998 FW ₁₀₂
1998 FJ ₁₀₃	14.5	0.15	19990810	45.94747	76.07148	215.72463	7.89449	0.2018843	2.4446957	82	3	1995–1999	0.48	M-v	2	Williams	36530	1998 FJ ₁₀₃
1998 FD ₁₀₄	14.4	0.15	19990810	55.77853	58.23159	207.05379	16.12866	0.2325785	2.7280480	63	3	1971–1999	0.63	M-v	2	Williams	36530	1998 FD ₁₀₄
1998 FG ₁₀₄	15.3	0.15	19990810	86.25096	289.36168	326.71729	9.23818	0.1325919	2.3040864	66	3	1994–1999	0.55	M-v	2	Williams	36530	1998 FG ₁₀₄
1998 FH ₁₀₄	14.7	0.15	19990810	14.45624	33.91574	279.99630	6.45827	0.0992652	2.4125908	50	2	1998–1999	0.63	M-v	3	Williams	36363	1998 FH ₁₀₄
1998 FJ ₁₀₅	14.2	0.15	19990810	48.14187	43.35782	225.08786	8.81680	0.1739904	2.7362163	62	3	1990–1999	0.52	M-v	2	Williams	36530	1998 FJ ₁₀₅
1998 FK ₁₀₆	14.6	0.15	19990810	70.11697	45.40290	226.32107	6.91599	0.1265261	2.3330328	122	3	1991–1999	0.55	M-v	2	Williams	36530	1998 FK ₁₀₆
1998 FG ₁₀₇	14.9	0.15	19990810	355.39265	69.87910	266.57278	6.00242	0.1372465	2.3875425	60	3	1988–1999	0.61	M-v	3	Williams	36530	1998 FG ₁₀₇

1998 FX ₁₀₈	15.1	0.15	19990810	69.46835	30.50239	239.73325	5.28988	0.0835835	2.3115010	54	2	1998–1999	0.68	M-v	4	Williams	36530	1998 FX ₁₀₈
1998 FT ₁₁₀	14.7	0.15	19990810	9.06406	86.99964	231.34602	10.50532	0.2016215	2.6318774	41	2	1998–1999	0.70	M-v	3	Williams	36364	1998 FT ₁₁₀
1998 FB ₁₁₁	13.2	0.15	19990810	48.22837	328.98380	293.89056	7.15743	0.1874890	3.1076880	69	4	1984–1999	0.51	M-v	1	Williams	36531	1998 FB ₁₁₁
1998 FE ₁₁₂	12.8	0.15	19990810	263.41136	177.12531	230.47615	13.85371	0.0508123	2.5639907	49	2	1998–1999	0.55	M-v	4	Williams	35328	1998 FE ₁₁₂
1998 FR ₁₁₃	15.0	0.15	19990810	75.82623	18.42866	248.57341	6.19186	0.1101378	2.3410598	57	3	1978–1999	0.68	M-v	2	Williams	36531	1998 FR ₁₁₃
1998 FA ₁₁₄	13.8	0.15	19990810	98.65272	318.93498	262.43915	5.49438	0.1357615	2.5684626	60	2	1998–1999	0.52	M-v	3	Williams	36531	1998 FA ₁₁₄
1998 FB ₁₁₄	14.5	0.15	19990810	54.28470	50.10751	216.86333	14.67883	0.1169716	2.6391098	49	2	1998–1999	0.68	M-v	3	Williams	36531	1998 FB ₁₁₄
1998 FD ₁₁₄	14.2	0.15	19990810	272.82401	140.41963	275.75759	5.94940	0.1062920	2.2918703	87	3	1993–1999	0.55	M-v	3	Williams	36531	1998 FD ₁₁₄
1998 FJ ₁₁₄	14.7	0.15	19990810	64.98383	22.26548	260.56055	5.81665	0.1032815	2.3139153	62	2	1998–1999	0.53	M-v	3	Williams	36531	1998 FJ ₁₁₄
1998 FX ₁₁₄	14.2	0.15	19990810	80.43318	18.23417	229.99342	11.07515	0.1194155	2.5549055	55	2	1998–1999	0.62	M-v	3	Williams	36531	1998 FX ₁₁₄
1998 FK ₁₁₅	14.2	0.15	19990810	337.54553	123.59677	248.08816	5.93132	0.1484238	2.2952958	61	2	1998–1999	0.47	M-v	3	Williams	36531	1998 FK ₁₁₅
1998 FB ₁₁₆	13.6	0.15	19990810	327.02030	123.93593	242.27065	12.99372	0.1917295	2.5981877	58	2	1998–1999	0.51	M-v	3	Williams	36531	1998 FB ₁₁₆
1998 FG ₁₁₆	15.0	0.15	19990810	254.19314	213.10466	223.05874	6.56538	0.0765064	2.2335216	58	3	1997–1999	0.60	M-v	3	Williams	36531	1998 FG ₁₁₆
1998 FB ₁₁₇	14.8	0.15	19990810	245.32271	162.33882	295.56352	3.41076	0.0518083	2.1677477	82	2	1998–1999	0.60	M-v	4	Williams	36531	1998 FB ₁₁₇
1998 FC ₁₁₇	14.6	0.15	19990810	23.43796	92.39986	234.21786	5.68916	0.1340036	2.2928042	98	2	1998–1999	0.67	M-v	3	Williams	36531	1998 FC ₁₁₇
1998 FD ₁₁₇	13.9	0.15	19990810	314.67032	160.27543	216.81897	11.39309	0.2478424	2.3293576	55	3	1992–1999	0.67	M-v	3	Williams	36531	1998 FD ₁₁₇
1998 FG ₁₁₇	13.7	0.15	19990810	0.54714	114.25629	211.53013	12.37686	0.1874809	2.6366448	101	3	1994–1999	0.59	M-v	2	Williams	36531	1998 FG ₁₁₇
1998 FC ₁₁₈	14.5	0.15	19990810	332.54636	136.53657	240.33077	6.13034	0.1752125	2.2547302	94	4	1986–1999	0.62	M-v	2	Williams	36531	1998 FC ₁₁₈
1998 FE ₁₁₈	12.7	0.15	19990810	118.37001	326.50837	223.61585	9.15120	0.0555925	2.7642612	90	4	1991–1999	0.51	M-v	2	Williams	36531	1998 FE ₁₁₈
1998 FN ₁₁₈	14.3	0.15	19990810	341.95401	140.53651	206.15949	22.04565	0.0413228	2.4217087	66	2	1998–1999	0.69	M-v	3	Williams	36531	1998 FN ₁₁₈
1998 FT ₁₂₁	14.9	0.15	19990810	88.07462	76.08349	185.46048	5.02530	0.1475745	2.2631179	52	2	1998–1999	0.66	M-v	4	Williams	36364	1998 FT ₁₂₁
1998 FN ₁₂₂	15.4	0.15	19990810	83.74632	56.04765	194.20078	5.08748	0.1288428	2.4394782	60	3	1992–1999	0.67	M-v	3	Williams	36531	1998 FN ₁₂₂
1998 FH ₁₂₃	15.9	0.15	19990810	103.04110	297.72087	284.34070	1.81516	0.2603744	2.5909817	49	3	1995–1999	0.68	M-v	3	Williams	36531	1998 FH ₁₂₃
1998 FE ₁₂₅	14.1	0.15	19990810	79.01027	74.76475	169.49565	11.60252	0.1467319	2.6291513	98	3	1989–1999	0.69	M-v	2	Williams	36531	1998 FE ₁₂₅
1998 FX ₁₂₅	14.7	0.15	19990810	171.26408	243.88853	278.65402	5.85826	0.0511436	2.2651500	59	3	1991–1999	0.56	M-v	3	Williams	36531	1998 FX ₁₂₅
1998 FC ₁₂₇	15.0	0.15	19990810	56.65828	220.34155	58.50233	7.29086	0.0921892	2.3142668	72	2	1998–1999	0.66	M-v	4	Williams	36531	1998 FC ₁₂₇
1998 FQ ₁₃₃	15.0	0.15	19990810	353.91667	10.09893	327.44771	4.15047	0.1731131	2.2981338	74	2	1998–1999	0.78	M-v	3	Williams	36531	1998 FQ ₁₃₃
1998 FC ₁₄₄	14.3	0.15	19990810	53.61893	52.62732	238.63121	5.12516	0.1458051	2.4851755	86	3	1991–1999	0.66	M-v	1	Williams	36531	1998 FC ₁₄₄
1998 GF	14.9	0.15	19990810	211.37251	121.71796	35.27011	22.40649	0.0315653	1.9407060	65	3	1990–1999	0.56	M-v	3	Williams	36531	1998 GF
1998 GK	15.0	0.15	19990810	143.53956	211.93771	33.90030	24.78473	0.1584955	1.9333925	54	3	1980–1999	0.59	M-v	2	Williams	36531	1998 GK
1998 GO ₁	14.4	0.15	19990810	136.94680	73.10705	146.71115	8.76748	0.1416249	2.2994866	82	2	1998–1999	0.38	M-v	3	Williams	36532	1998 GO ₁
1998 GE ₇	13.1	0.15	19990810	53.53378	177.32901	90.97408	14.90204	0.1417977	2.6125143	47	2	1998–1999	0.61	M-v	4	Williams	36365	1998 GE ₇
1998 GH ₈	12.8	0.15	19990810	355.85052	234.94514	89.75384	14.10556	0.1811583	2.7741709	46	3	1976–1999	0.55	M-v	2	Williams	35331	1998 GH ₈
1998 GE ₉	13.5	0.15	19990810	59.57333	118.48674	150.94835	15.18207	0.1157520	2.6290534	69	2	1998–1999	0.56	M-v	3	Williams	36532	1998 GE ₉
1998 GO ₁₀	14.6	0.15	19990810	56.08968	316.88895	325.69615	1.43520	0.1853844	2.5695389	61	3	1995–1999	0.58	M-v	3	Williams	36365	1998 GO ₁₀
1998 HN ₁	16.2	0.15	19990810	233.81381	286.47725	208.43984	21.21500	0.0813561	1.9438134	59	2	1998–1999	0.68	M-v	4	Williams	36365	1998 HN ₁
1998 HX ₂	15.3	0.15	19990810	283.76416	245.14482	202.08423	21.22947	0.1515832	1.9470780	73	2	1998–1999	0.48	M-v	3	Williams	36365	1998 HX ₂
1998 HF ₃	14.0	0.15	19990810	22.80880	112.36765	194.08742	12.98303	0.1579505	3.0488383	82	2	1998–1999	0.54	M-v	3	Williams	36532	1998 HF ₃
1998 HH ₄	15.0	0.15	19990810	9.00026	276.10172	75.42488	7.56532	0.1293314	2.4189405	43	2	1998–1999	0.69	M-v	4	Williams	36366	1998 HH ₄
1998 HO ₅	15.2	0.15	19990810	273.34391	277.97200	162.76833	5.19363	0.1220799	2.2642006	43	2	1998–1999	0.59	M-v	4	Williams	36366	1998 HO ₅
1998 HD ₈	15.3	0.15	19990810	159.70170	38.07364	162.12027	4.29024	0.0589340	2.2042899	69	2	1998–1999	0.70	M-v	4	Williams	36366	1998 HD ₈
1998 HE ₈	13.9	0.15	19990810	94.21256	36.78056	210.98770	6.80756	0.0734499	2.4417957	94	4	1991–1999	0.62	M-v	2	Williams	36532	1998 HE ₈
1998 HA ₁₃	15.1	0.15	19990810	61.06201	82.75604	236.58981	5.22902	0.2975999	2.3746144	44	4	1991–1999	0.61	M-v	2	Williams	35332	1998 HA ₁₃
1998 HW ₁₃	13.9	0.15	19990810	23.45835	311.16446	347.81127	13.25749	0.2352927	2.6581253	111	3	1986–1999	0.58	M-v	2	Williams	36532	1998 HW ₁₃
1998 HR ₁₈	15.9	0.15	19990810	80.90032	276.92190	350.17954	4.39828	0.2115466	2.3931381	64	4	1994–1999	0.79	M-v	1	Williams	36532	1998 HR ₁₈
1998 HX ₁₈	15.4	0.15	19990810	87.78897	249.32287	11.96922	7.16090	0.0905481	2.2487128	71	3	1996–1999	0.60	M-v	3	Williams	36366	1998 HX ₁₈
1998 HQ ₁₉	14.6	0.15	19990810	25.80949	113.92658	210.36156	7.41588	0.1745877	2.2699131	128	3	1992–1999	0.55	M-v	2	Williams	36532	1998 HQ ₁₉
1998 HS ₁₉	14.3	0.15	19990810	242.75288	328.06342	118.85101	6.30480	0.1227617	2.4421352	57	2	1998–1999	0.57	M-v	3	Williams	36532	1998 HS ₁₉
1998 HE ₂₀	13.1	0.15	19990810	323.76001	194.93069	176.81760	2.21514	0.1060962	2.9050549	83	3	1992–1999	0.61	M-v	3	Williams	36532	1998 HE ₂₀
1998 HE ₂₁	15.6	0.15	19990810	88.40689	75.99562	179.65730	4.09803	0.1234671	2.2977970	83	5	1977–1999	0.64	M-v	2	Williams	36532	1998 HE ₂₁
1998 HN ₂₁	16.0	0.15	19990810	25.49806	121.43172	201.50476	4.84404	0.0533079	2.1822509	43	2	1998–1999	0.86	M-v	4	Williams	36367	1998 HN ₂₁
1998 HG ₂₃	15.9	0.15	19990810	344.23436	289.20820	77.25914	2.60410	0.0458547	2.1301900	69	3	1996–1999	0.73	M-v	3	Williams	36532	1998 HG ₂₃
1998 HQ ₂₃	15.2	0.15	19990810	73.77972	61.34411	229.97339	22.25644	0.1102417	2.4098364	51	2	1998–1999	0.65	M-v	3	Williams	36367	1998 HQ ₂₃

1998 HS ₂₃	14.8	0.15	19990810	293.65799	320.91389	108.76212	0.69518	0.0723024	2.2793788	79	3	1996–1999	0.48	M-v	4	Williams	36532	1998 HS ₂₃
1998 HT ₂₃	15.2	0.15	19990810	14.73208	313.00161	3.81502	12.73304	0.1863343	2.5481954	59	3	1991–1999	0.65	M-v	3	Williams	36532	1998 HT ₂₃
1998 HL ₂₇	14.8	0.15	19990810	133.49825	94.31026	124.90813	3.87848	0.0702842	2.3588554	25	1	34 days	0.43	M-v	6	Williams		1998 HL ₂₇
1998 HQ ₂₇	14.3	0.15	19990810	25.18473	94.14151	234.01996	4.94048	0.2295503	2.2844116	85	3	1992–1999	0.52	M-v	3	Williams	36367	1998 HQ ₂₇
1998 HR ₂₇	15.5	0.15	19990810	1.76252	23.87087	319.55905	3.32870	0.1774072	2.2731322	82	3	1994–1999	0.55	M-v	3	Williams	36532	1998 HR ₂₇
1998 HF ₃₀	15.2	0.15	19990810	26.55207	196.55843	125.75243	3.42149	0.2115018	2.3767272	42	3	1994–1999	0.62	M-v	3	Williams	36367	1998 HF ₃₀
1998 HY ₃₁	15.3	0.15	19990810	80.45831	32.86648	242.34262	2.60934	0.1257995	2.2328862	130	3	1997–1999	0.62	M-v	3	Williams	36532	1998 HY ₃₁
1998 HS ₃₂	14.5	0.15	19990810	15.01780	122.02442	197.29797	2.20719	0.1745265	2.5620003	104	4	1992–1999	0.62	M-v	2	Williams	36532	1998 HS ₃₂
1998 HU ₃₂	15.0	0.15	19990810	60.07675	253.92079	40.17161	2.54993	0.1608993	2.3119906	76	2	1998–1999	0.63	M-v	4	Williams	36367	1998 HU ₃₂
1998 HK ₃₃	15.0	0.15	19990810	29.50529	319.06838	1.00353	6.37976	0.1399676	2.3310883	68	3	1981–1999	0.64	M-v	3	Williams	36532	1998 HK ₃₃
1998 HO ₃₃	14.0	0.15	19990810	25.08731	116.58349	211.22852	23.43094	0.1935020	2.3283794	100	2	1998–1999	0.58	M-v	3	Williams	36532	1998 HO ₃₃
1998 HY ₃₅	14.7	0.15	19990810	71.23405	214.76654	66.66193	2.90502	0.1315289	2.2901599	62	2	1998–1999	0.55	M-v	4	Williams	36368	1998 HY ₃₅
1998 HK ₃₆	14.3	0.15	19990810	19.25319	287.43117	50.16253	4.03051	0.2066350	2.2867987	94	4	1978–1999	0.61	M-v	3	Williams	36532	1998 HK ₃₆
1998 HB ₃₈	14.9	0.15	19990810	73.84892	331.89343	294.96554	2.45963	0.2278413	2.5742070	69	3	1978–1999	0.67	M-v	3	Williams	36532	1998 HB ₃₈
1998 HE ₃₈	14.4	0.15	19990810	69.97898	52.86914	234.81834	3.65922	0.1552424	2.3009606	80	2	1998–1999	0.51	M-v	4	Williams	36368	1998 HE ₃₈
1998 HN ₃₈	14.3	0.15	19990810	103.79365	245.90169	12.83095	2.81680	0.1618920	2.2152638	106	3	1982–1999	0.62	M-v	3	Williams	36532	1998 HN ₃₈
1998 HO ₃₈	15.5	0.15	19990810	53.44445	76.96365	237.70040	1.89361	0.0966010	2.1292001	77	3	1993–1999	0.63	M-v	3	Williams	36532	1998 HO ₃₈
1998 HS ₄₂	13.9	0.15	19990810	71.77798	106.31953	155.04669	8.34556	0.2702224	2.7808848	74	3	1994–1999	0.61	M-v	2	Williams	36532	1998 HS ₄₂
1998 HT ₄₂	14.3	0.15	19990810	73.83484	101.77270	181.60144	4.01474	0.0420286	2.3092607	93	4	1984–1999	0.56	M-v	2	Williams	36533	1998 HT ₄₂
1998 HU ₄₃	13.9	0.15	19990810	284.96958	17.05135	38.00900	7.22537	0.1380103	2.1944329	65	4	1978–1999	0.61	M-v	3	Williams	36533	1998 HU ₄₃
1998 HW ₄₄	14.9	0.15	19990810	346.82797	331.64940	17.82280	3.20483	0.1054896	2.4468890	77	3	1971–1999	0.70	M-v	3	Williams	36533	1998 HW ₄₄
1998 HK ₄₅	14.4	0.15	19990810	48.87310	293.40484	8.60434	9.88796	0.1868206	2.4457738	84	3	1971–1999	0.64	M-v	2	Williams	36533	1998 HK ₄₅
1998 HA ₄₈	14.8	0.15	19990810	13.33824	158.75639	164.48022	5.78534	0.1463542	2.5416931	50	2	1998–1999	0.68	M-v	3	Williams	36368	1998 HA ₄₈
1998 HN ₄₉	15.1	0.15	19990810	113.73472	35.73012	215.77067	3.45999	0.1148324	2.3047152	92	2	1998–1999	0.49	M-v	3	Williams	36369	1998 HN ₄₉
1998 HE ₅₁	15.0	0.15	19990810	64.64207	105.28393	213.40942	3.88956	0.1760922	2.1715073	59	3	1973–1999	0.83	M-v	3	Williams	32267	1998 HE ₅₁
1998 HF ₅₁	14.5	0.15	19990810	289.22319	6.09113	51.33577	3.83410	0.0410386	2.3571764	76	2	1998–1999	0.68	M-v	4	Williams	36533	1998 HF ₅₁
1998 HH ₅₁	14.6	0.15	19990810	206.85430	70.61955	66.97471	3.95362	0.1179437	2.2784834	99	4	1989–1999	0.61	M-v	1	Williams	36533	1998 HH ₅₁
1998 HJ ₅₁	14.2	0.15	19990810	359.15925	251.94554	103.49532	6.59260	0.1443088	2.3844929	66	3	1997–1999	0.58	M-v	3	Williams	36533	1998 HJ ₅₁
1998 HN ₅₁	14.8	0.15	19990810	243.24399	284.86106	173.92201	4.63040	0.0677050	2.3286733	89	3	1992–1999	0.67	M-v	2	Williams	36533	1998 HN ₅₁
1998 HB ₅₂	13.8	0.15	19990810	27.27527	70.40522	215.86848	21.39833	0.1680294	3.1917896	47	2	1998–1999	0.55	M-v	3	Williams	36533	1998 HB ₅₂
1998 HL ₅₂	13.4	0.15	19990810	79.29783	199.27924	62.49118	14.43033	0.0190228	2.5746038	74	3	1992–1999	0.58	M-v	2	Williams	36533	1998 HL ₅₂
1998 HP ₅₂	15.4	0.15	19990810	111.35357	131.60593	123.07106	2.26475	0.2035742	2.2848144	50	4	1993–1999	0.55	M-v	3	Williams	36533	1998 HP ₅₂
1998 HG ₅₃	14.4	0.15	19990810	59.09606	69.18010	229.57002	2.43819	0.2024883	2.3666483	71	2	1998–1999	0.51	M-v	4	Williams	36369	1998 HG ₅₃
1998 HJ ₅₄	14.4	0.15	19990810	29.14899	77.28758	216.40283	8.28321	0.1226684	2.7485374	60	3	1996–1999	0.67	M-v	3	Williams	36533	1998 HJ ₅₄
1998 HS ₆₀	14.3	0.15	19990810	254.16864	120.54253	330.95731	2.17095	0.0596804	2.2072952	94	3	1983–1999	0.64	M-v	2	Williams	36533	1998 HS ₆₀
1998 HQ ₆₈	14.5	0.15	19990810	331.95302	137.91206	236.66187	6.24908	0.1232763	2.3507850	58	2	1998–1999	0.48	M-v	3	Williams	36533	1998 HQ ₆₈
1998 HX ₇₈	14.6	0.15	19990810	45.42892	52.58983	251.57881	4.89372	0.1091269	2.4232748	81	3	1980–1999	0.55	M-v	2	Williams	36533	1998 HX ₇₈
1998 HL ₇₉	15.6	0.15	19990810	237.82907	231.82612	243.41405	4.84182	0.0251375	2.2070808	40	2	1998–1999	0.45	M-v	5	Williams	36369	1998 HL ₇₉
1998 HH ₈₀	14.2	0.15	19990810	2.48887	339.43173	20.66818	5.88756	0.1889322	2.2943232	88	4	1971–1999	0.49	M-v	3	Williams	36533	1998 HH ₈₀
1998 HL ₈₀	15.6	0.15	19990810	80.63162	59.04031	220.16334	4.10055	0.1368299	2.3048813	66	3	1995–1999	0.65	M-v	3	Williams	36533	1998 HL ₈₀
1998 HP ₈₃	14.5	0.15	19990810	195.65640	71.51470	75.17739	6.03172	0.0699307	2.2692302	64	3	1989–1999	0.68	M-v	3	Williams	36533	1998 HP ₈₃
1998 HL ₈₄	15.0	0.15	19990810	53.15670	119.35556	179.65593	6.15404	0.1318672	2.4350632	70	3	1995–1999	0.64	M-v	2	Williams	36533	1998 HL ₈₄
1998 HR ₈₄	14.3	0.15	19990810	59.87416	69.42054	202.28723	14.49202	0.0687954	2.6180099	57	2	1998–1999	0.69	M-v	3	Williams	36533	1998 HR ₈₄
1998 HL ₈₆	15.3	0.15	19990810	338.56218	342.46454	24.84584	8.17130	0.1009423	2.4056125	46	3	1994–1999	0.63	M-v	3	Williams	36533	1998 HL ₈₆
1998 HH ₈₇	15.1	0.15	19990810	17.07120	89.30357	244.58874	4.98292	0.1473783	2.4729950	49	2	1998–1999	0.64	M-v	4	Williams	36533	1998 HH ₈₇
1998 HV ₈₇	13.7	0.15	19990810	8.61856	84.51831	231.42707	11.85603	0.1722208	3.0170737	61	2	1998–1999	0.63	M-v	3	Williams	36533	1998 HV ₈₇
1998 HB ₈₈	14.4	0.15	19990810	73.81477	55.44321	234.38710	8.27666	0.2523310	2.4522869	78	3	1995–1999	0.46	M-v	2	Williams	36533	1998 HB ₈₈
1998 HD ₈₈	15.2	0.15	19990810	172.41832	296.29861	237.09282	5.76774	0.1012487	2.2546173	55	2	1998–1999	0.71	M-v	4	Williams	36533	1998 HD ₈₈
1998 HH ₈₈	14.8	0.15	19990810	93.72938	49.23282	225.85763	5.72563	0.2016538	2.2856611	72	3	1978–1999	0.57	M-v	3	Williams	36533	1998 HH ₈₈
1998 HL ₉₁	14.5	0.15	19990810	47.09218	136.83834	177.31230	6.85585	0.1352432	2.3490538	26	1	36 days	0.47	M-v	6	Williams		1998 HL ₉₁
1998 HX ₉₁	14.4	0.15	19990810	303.97812	228.35405	168.78158	5.09527	0.0775066	2.4166659	59	3	1997–1999	0.63	M-v	4	Williams	36533	1998 HX ₉₁
1998 HZ ₉₂	15.5	0.15	19990810	45.42797	329.09027	343.25655	1.29802	0.0400717	2.2676220	48	2	1998–1999	0.69	M-v	4	Williams	36370	1998 HZ ₉₂
1998 HA ₉₃	14.7	0.15	19990810	23.28391	329.76011	9.34297	2.13658	0.2093141	2.4268560	80	3	1995–1999	0.57	M-v	3	Williams	36533	1998 HA ₉₃

1998 HH ₉₃	13.9	0.15	19990810	285.68500	75.45786	355.72221	2.41795	0.0712574	2.1843961	100	5	1965–1999	0.50	M-v	2	Marsden	36533	1998 HH ₉₃
1998 HX ₉₃	14.8	0.15	19990810	111.12442	0.57861	232.24928	7.26872	0.0597636	2.4048902	44	3	1994–1999	0.63	M-v	3	Williams	36533	1998 HX ₉₃
1998 HY ₉₃	13.2	0.15	19990810	27.88291	275.83502	7.23522	5.04669	0.1071013	3.1863108	59	2	1998–1999	0.53	M-v	3	Williams	36533	1998 HY ₉₃
1998 HK ₉₄	14.9	0.15	19990810	9.65490	102.77845	247.64510	1.71404	0.1783672	2.3927223	57	2	1998–1999	0.55	M-v	4	Williams	36370	1998 HK ₉₄
1998 HR ₉₄	13.1	0.15	19990810	61.08640	59.51545	216.89364	12.24113	0.1495460	2.6792144	85	2	1998–1999	0.53	M-v	3	Williams	36533	1998 HR ₉₄
1998 HC ₉₆	14.7	0.15	19990810	278.13592	243.75154	183.64104	8.09769	0.1257551	2.2736779	75	3	1994–1999	0.57	M-v	3	Williams	36533	1998 HC ₉₆
1998 HF ₉₆	14.2	0.15	19990810	40.40041	188.32979	149.24338	5.59857	0.2139546	2.2466081	45	4	1985–1999	0.46	M-v	2	Williams	36533	1998 HF ₉₆
1998 HD ₉₇	14.4	0.15	19990810	60.96967	217.67739	55.50429	3.34738	0.1049240	2.6769044	68	3	1997–1999	0.59	M-v	3	Williams	36533	1998 HD ₉₇
1998 HQ ₉₇	13.6	0.15	19990810	326.42709	344.91389	9.41506	2.03508	0.0759747	2.9015688	63	4	1993–1999	0.67	M-v	1	Williams	36533	1998 HQ ₉₇
1998 HV ₉₇	14.2	0.15	19990810	18.59927	23.52453	316.75918	3.89275	0.2659473	2.6103467	40	3	1997–1999	0.75	M-v	3	Williams	36533	1998 HV ₉₇
1998 HA ₉₈	14.3	0.15	19990810	33.10610	298.45726	19.79201	11.65442	0.1983368	2.6420580	62	2	1998–1999	0.60	M-v	3	Williams	36370	1998 HA ₉₈
1998 HB ₉₉	15.4	0.15	19990810	89.92266	72.74948	200.75852	6.27143	0.1082674	2.2798461	53	4	1984–1999	0.74	M-v	3	Williams	36534	1998 HB ₉₉
1998 HH ₉₉	14.6	0.15	19990810	46.81731	232.81097	90.87982	3.21833	0.1300456	2.2572432	83	3	1996–1999	0.46	M-v	2	Williams	36534	1998 HH ₉₉
1998 HQ ₁₀₀	14.8	0.15	19990810	107.41345	173.20342	85.57743	2.60063	0.0417672	2.1831476	74	3	1973–1999	0.62	M-v	3	Williams	36534	1998 HQ ₁₀₀
1998 HJ ₁₀₁	15.6	0.15	19990810	53.85495	138.07577	182.61079	3.22228	0.2422702	2.3682500	47	4	1984–1999	0.71	M-v	1	Williams	32329	1998 HJ ₁₀₁
1998 HV ₁₀₁	15.0	0.15	19990810	56.46054	32.84085	265.79681	5.43138	0.1740282	2.6453535	62	3	1973–1999	0.66	M-v	2	Williams	36534	1998 HV ₁₀₁
1998 HW ₁₀₁	14.4	0.15	19990810	151.20313	180.70791	31.62923	6.49345	0.0542716	2.2153608	128	4	1976–1999	0.51	M-v	2	Williams	36534	1998 HW ₁₀₁
1998 HO ₁₀₂	15.1	0.15	19990810	127.73156	22.87032	216.17417	4.19196	0.1297693	2.2516612	33	3	1994–1999	0.61	M-v	4	Williams	35988	1998 HO ₁₀₂
1998 HS ₁₀₂	14.5	0.15	19990810	21.55299	301.86016	18.23951	2.31225	0.2078317	3.0454290	42	2	1998–1999	0.44	M-v	3	Williams	36370	1998 HS ₁₀₂
1998 HT ₁₀₇	15.0	0.15	19990810	76.97223	201.27222	72.02833	6.78430	0.0532557	2.2735318	55	3	1996–1999	0.64	M-v	3	Williams	36534	1998 HT ₁₀₇
1998 HH ₁₁₄	14.4	0.15	19990810	78.75091	140.94554	132.73173	6.77814	0.0959645	2.3395701	66	3	1991–1999	0.63	M-v	2	Williams	36534	1998 HH ₁₁₄
1998 HO ₁₁₇	14.3	0.15	19990810	342.33137	282.88511	93.74637	7.21320	0.1789239	2.2785997	42	3	1992–1999	0.60	M-v	3	Williams	36534	1998 HO ₁₁₇
1998 HC ₁₁₈	13.8	0.15	19990810	21.21945	170.74513	137.99135	10.30751	0.0408958	2.5969081	51	2	1998–1999	0.59	M-v	3	Williams	36534	1998 HC ₁₁₈
1998 HW ₁₁₈	14.0	0.15	19990810	11.39612	188.26878	131.58177	11.91107	0.2138672	2.9713068	46	3	1992–1999	0.76	M-v	2	Williams	36534	1998 HW ₁₁₈
1998 HN ₁₁₉	14.4	0.15	19990810	46.29147	112.43485	185.46501	11.62296	0.1610952	2.6369140	80	2	1998–1999	0.58	M-v	3	Williams	36534	1998 HN ₁₁₉
1998 HF ₁₂₁	14.3	0.15	19990810	135.33885	91.66554	122.46306	6.45787	0.0692483	2.3211835	58	3	1987–1999	0.74	M-v	3	Williams	36534	1998 HF ₁₂₁
1998 HE ₁₂₃	14.7	0.15	19990810	63.70718	213.30197	80.78599	7.84413	0.1142828	2.4033723	36	2	1998–1999	0.58	M-v	4	Williams	36371	1998 HE ₁₂₃
1998 HK ₁₂₄	14.6	0.15	19990810	352.21095	250.58063	126.99841	6.20678	0.1192207	2.2147037	55	3	1984–1999	0.53	M-v	3	Williams	36534	1998 HK ₁₂₄
1998 HG ₁₂₅	14.0	0.15	19990810	57.63493	117.25509	177.47745	14.57470	0.1695803	2.6057871	54	2	1998–1999	0.60	M-v	3	Williams	36534	1998 HG ₁₂₅
1998 HD ₁₂₉	14.5	0.15	19990810	18.20458	313.43881	356.07461	12.61296	0.1690411	2.5349651	90	5	1991–1999	0.64	M-v	2	Williams	36534	1998 HD ₁₂₉
1998 HQ ₁₃₂	14.9	0.15	19990810	81.48049	141.67421	112.34997	3.33045	0.1711943	2.3900412	28	1	40 days	0.58	M-v	6	Williams		1998 HQ ₁₃₂
1998 HV ₁₄₃	14.7	0.15	19990810	332.28582	344.06930	29.61712	7.52430	0.1209073	2.4110263	54	2	1998–1999	0.56	M-v	3	Williams	36534	1998 HV ₁₄₃
1998 HH ₁₄₇	15.3	0.15	19990810	122.76180	97.73164	141.62713	6.62035	0.0501183	2.2446529	37	4	1992–1999	0.72	M-v	2	Williams	32755	1998 HH ₁₄₇
1998 HO ₁₄₈	15.3	0.15	19990810	94.21294	263.31486	31.02356	2.29857	0.1047632	2.1381047	47	3	1983–1999	0.66	M-v	4	Williams	32331	1998 HO ₁₄₈
1998 HV ₁₄₈	14.2	0.15	19990810	15.59765	289.16316	39.99024	3.07896	0.1816147	2.9892887	68	3	1994–1999	0.69	M-v	3	Williams	36534	1998 HV ₁₄₈
1998 HU ₁₄₉	15.1	0.15	19990810	82.37611	282.47447	20.61022	3.31500	0.1796604	2.2730658	41	5	1994–1999	0.75	M-v	1	Williams	32331	1998 HU ₁₄₉
1998 HT ₁₅₀	15.4	0.15	19990810	139.43191	94.22549	121.14827	4.46637	0.0442833	2.1900578	46	3	1973–1999	0.62	M-v	3	Williams	36534	1998 HT ₁₅₀
1998 JQ	14.2	0.15	19990810	49.50823	306.33871	7.51850	7.44786	0.1421976	2.3218186	55	3	1994–1999	0.53	M-v	2	Williams	36534	1998 JQ
1998 JT	14.6	0.15	19990810	39.03064	86.10329	251.32711	6.11599	0.2205239	2.2548593	51	3	1985–1999	0.56	M-v	2	Williams	36534	1998 JT
1998 JW	14.3	0.15	19990810	40.95649	66.97892	220.21923	11.69376	0.0839762	2.7188894	84	3	1995–1999	0.69	M-v	2	Williams	36535	1998 JW
1998 JH ₁	14.4	0.15	19990810	70.39814	18.76132	258.58453	8.02089	0.0487592	2.4507328	63	2	1998–1999	0.49	M-v	3	Williams	36535	1998 JH ₁
1998 JJ ₁	15.5	0.15	19990810	317.43603	201.27031	229.27838	19.89354	0.0931852	1.9333453	50	2	1998–1999	0.44	M-v	3	Williams	36371	1998 JJ ₁
1998 JL ₁	15.9	0.15	19990810	144.69431	183.10257	14.32070	2.64264	0.1293014	2.3830243	41	3	1994–1999	0.67	M-v	4	Williams	36083	1998 JL ₁
1998 JQ ₁	14.9	0.15	19990810	139.05190	355.73180	217.16495	9.71601	0.0958537	2.3135658	91	3	1993–1999	0.54	M-v	3	Williams	36535	1998 JQ ₁
1998 JV ₁	13.1	0.15	19990810	60.24316	127.12078	122.43445	7.39207	0.0893221	3.1683480	74	3	1997–1999	0.63	M-v	3	Williams	36083	1998 JV ₁
1998 JY ₁	13.7	0.15	19990810	328.99683	74.88342	303.35723	6.08763	0.1252776	2.6386719	69	3	1984–1999	0.59	M-v	3	Williams	36535	1998 JY ₁
1998 JZ ₁	15.3	0.15	19990810	110.46414	246.61423	41.34761	5.81838	0.2910169	2.1562493	40	3	1976–1999	0.76	M-v	3	Williams	32275	1998 JZ ₁
1998 JA ₂	14.5	0.15	19990810	105.47335	207.40259	42.73687	3.01928	0.1276610	2.4247377	97	4	1979–1999	0.59	M-v	1	Williams	36535	1998 JA ₂
1998 JD ₂	15.3	0.15	19990810	93.55068	96.55852	186.93024	4.60806	0.1846447	2.2902775	51	4	1988–1999	0.56	M-v	2	Williams	32331	1998 JD ₂
1998 JO ₂	14.7	0.15	19990810	181.96610	87.58998	81.24652	9.62008	0.0638605	2.2884812	60	3	1996–1999	0.60	M-v	3	Williams	36535	1998 JO ₂
1998 JQ ₂	14.1	0.15	19990810	32.81547	164.95635	154.99820	8.16781	0.1970896	2.6866714	42	3	1990–1999	0.63	M-v	2	Williams	36535	1998 JQ ₂
1998 JF ₃	14.4	0.15	19990810	321.06898	216.45512	171.91836	8.00085	0.0587262	2.4620019	72	2	1998–1999	0.62	M-v	3	Williams	36535	1998 JF ₃
1998 JH ₃	13.4	0.15	19990810	321.83691	295.01431	92.12953	10.01271	0.1331547	2.5235136	39	3	1987–1999	0.68	M-v	3	Williams	36535	1998 JH ₃

1998 JK ₃	13.4	0.15	19990810	352.89351	214.86352	123.26826	6.33884	0.1580131	3.1227979	56	3	1992–1999	0.62	M-v	3	Williams	36535	1998 JK ₃
1998 JC ₄	12.8	0.15	19990810	243.62612	217.02735	214.07294	8.95009	0.0847891	3.0626439	73	3	1992–1999	0.56	M-v	3	Williams	36083	1998 JC ₄
1998 JK ₄	14.4	0.15	19990810	83.28922	72.29548	221.27497	3.52580	0.1549381	2.2666195	72	3	1991–1999	0.65	M-v	4	Williams	36535	1998 JK ₄
1998 KB	15.3	0.15	19990810	37.05404	129.40538	194.75594	0.99221	0.1309269	2.5420994	47	2	1998–1999	0.52	M-v	3	Williams	36371	1998 KB
1998 KN	15.3	0.15	19990810	75.64663	206.46838	106.79165	2.84228	0.2516492	2.3329719	61	4	1995–1999	0.47	M-v	2	Williams	32332	1998 KN
1998 KZ	15.3	0.15	19990810	45.95841	306.47806	49.03569	22.94256	0.0667010	1.9465268	36	3	1996–1999	0.67	M-v	2	Williams	35994	1998 KZ
1998 KJ ₁	14.9	0.15	19990810	109.18323	351.14241	236.14226	1.09917	0.1523467	2.6108575	69	4	1993–1999	0.58	M-v	2	Williams	36535	1998 KJ ₁
1998 KK ₁	14.8	0.15	19990810	24.31573	306.12852	47.33664	3.42297	0.1782541	2.2888521	46	4	1978–1999	0.62	M-v	1	Williams	32332	1998 KK ₁
1998 KR ₁	13.0	0.15	19990810	30.25517	270.96995	51.31037	13.25432	0.2020243	2.6967033	67	3	1968–1999	0.53	M-v	2	Williams	36371	1998 KR ₁
1998 KS ₁	14.9	0.15	19990810	62.20392	83.96322	233.69896	4.71153	0.1713260	2.2277873	57	3	1992–1999	0.61	M-v	3	Williams	32332	1998 KS ₁
1998 KG ₂	14.6	0.15	19990810	92.54890	4.88987	253.70213	15.05966	0.2598147	2.6104795	44	3	1977–1999	0.62	M-v	3	Williams	36535	1998 KG ₂
1998 KQ ₂	14.2	0.15	19990810	126.17286	359.01824	249.47215	22.92485	0.1086791	2.2703882	40	3	1989–1999	0.70	M-v	3	Williams	36535	1998 KQ ₂
1998 KU ₂	16.6	0.15	19990810	99.83753	119.14143	206.66938	4.88905	0.5538594	2.2506001	381	1	237 days	0.54	M-v	3	Williams	36083	1998 KU ₂
1998 KE ₃	15.5	0.15	19990810	169.85214	130.37959	63.02018	47.88710	0.2534455	2.0494264	165	2	1998–1999	0.64	M-v	3	Williams	36535	1998 KE ₃
1998 KP ₃	15.0	0.15	19990810	49.46501	104.77061	228.81116	5.81589	0.1370182	2.3573008	41	3	1995–1999	0.56	M-v	2	Williams	32332	1998 KP ₃
1998 KC ₄	12.5	0.15	19990810	38.17087	219.66823	65.15891	10.43550	0.0520894	3.0649019	55	4	1979–1999	0.52	M-v	1	Williams	36535	1998 KC ₄
1998 KS ₄	14.1	0.15	19990810	352.07522	294.91969	79.25744	7.98373	0.1234637	2.4468394	65	3	1993–1999	0.61	M-v	3	Williams	36372	1998 KS ₄
1998 KW ₄	15.5	0.15	19990810	139.16945	12.17030	213.20517	4.56485	0.1408859	2.2855460	45	3	1996–1999	0.55	M-v	4	Williams	36535	1998 KW ₄
1998 KB ₅	15.7	0.15	19990810	105.10108	31.38441	253.08943	4.99202	0.1492485	2.1706753	61	3	1991–1999	0.51	M-v	3	Williams	32332	1998 KB ₅
1998 KC ₅	13.0	0.15	19990810	319.76713	243.27233	137.74813	2.74614	0.1268059	2.9310871	107	6	1974–1999	0.51	M-v	3	Williams	36535	1998 KC ₅
1998 KD ₅	12.9	0.15	19990810	58.52753	275.45683	42.38262	10.12805	0.0883863	3.0750261	82	4	1981–1999	0.45	M-v	1	Williams	36535	1998 KD ₅
1998 KE ₅	12.7	0.15	19990810	23.16466	183.99831	176.15461	14.75940	0.2133417	3.1441985	39	3	1993–1999	0.55	M-v	2	Williams	35708	1998 KE ₅
1998 KZ ₅	14.3	0.15	19990810	53.54745	132.85532	200.70176	2.55257	0.2620406	3.2322988	30	3	1997–1999	0.70	M-v	3	Williams	32484	1998 KZ ₅
1998 KP ₆	14.2	0.15	19990810	61.86117	66.27985	212.05249	7.29243	0.0815752	2.7314482	67	2	1998–1999	0.62	M-v	3	Williams	36535	1998 KP ₆
1998 KT ₆	15.7	0.15	19990810	80.13504	207.79608	92.42863	6.24370	0.1481639	2.2892030	34	3	1996–1999	0.59	M-v	3	Williams	32522	1998 KT ₆
1998 KX ₆	15.3	0.15	19990810	56.78421	203.98728	131.85636	2.95009	0.1912141	2.2567710	38	3	1997–1999	0.62	M-v	3	Williams	32333	1998 KX ₆
1998 KW ₇	12.7	0.15	19990810	165.81584	290.70635	220.81281	8.97919	0.0469228	3.0327503	72	3	1995–1999	0.60	M-v	3	Williams	36535	1998 KW ₇
1998 KC ₈	15.3	0.15	19990810	236.89927	218.40214	261.80868	5.58618	0.0727503	2.3147560	28	3	1978–1999	0.65	M-v	3	Williams	32687	1998 KC ₈
1998 KK ₈	13.5	0.15	19990810	35.92875	91.00144	202.03417	10.31636	0.0750207	2.9994161	72	2	1998–1999	0.55	M-v	3	Williams	36535	1998 KK ₈
1998 KM ₈	13.8	0.15	19990810	58.22876	93.73062	195.33610	8.90977	0.2042590	2.8488404	76	3	1979–1999	0.50	M-v	3	Williams	36535	1998 KM ₈
1998 KP ₈	13.5	0.15	19990810	333.56649	236.28064	140.86986	9.40105	0.1860035	2.7458618	49	3	1988–1999	0.66	M-v	3	Williams	36372	1998 KP ₈
1998 KZ ₈	12.9	0.15	19990810	287.17296	321.96234	96.53584	15.90917	0.0706890	2.5503772	41	3	1975–1999	0.63	M-v	3	Williams	36535	1998 KZ ₈
1998 KB ₉	14.5	0.15	19990810	29.42961	206.14858	116.11634	3.67593	0.1202597	2.6035037	29	1	36 days	0.72	M-v	6	Williams		1998 KB ₉
1998 KN ₉	13.7	0.15	19990810	123.88021	31.87633	227.50871	16.15546	0.0699977	2.5711052	68	2	1998–1999	0.62	M-v	3	Williams	36373	1998 KN ₉
1998 KW ₉	13.1	0.15	19990810	14.19785	36.36882	286.35637	9.18729	0.2106447	3.1586722	70	2	1998–1999	0.44	M-v	3	Williams	36535	1998 KW ₉
1998 KS ₁₉	13.3	0.15	19990810	279.91353	216.98462	194.33022	9.10115	0.0700668	2.6490436	65	2	1998–1999	0.59	M-v	3	Williams	36535	1998 KS ₁₉
1998 KZ ₂₆	15.2	0.15	19990810	11.09839	304.72013	43.76447	9.56567	0.1333447	2.5590946	42	3	1995–1999	0.65	M-v	3	Williams	36373	1998 KZ ₂₆
1998 KR ₂₉	12.9	0.15	19990810	292.87180	270.60898	132.25038	6.48063	0.0782442	2.7607280	57	3	1949–1999	0.55	M-v	3	Williams	36535	1998 KR ₂₉
1998 KE ₃₀	14.1	0.15	19990810	31.59268	59.62088	250.43237	6.19968	0.0691318	2.7552681	58	3	1981–1999	0.62	M-v	2	Williams	36535	1998 KE ₃₀
1998 KH ₃₀	14.7	0.15	19990810	175.65261	258.82611	282.71328	7.18706	0.0826576	2.3084092	86	3	1987–1999	0.58	M-v	3	Williams	36535	1998 KH ₃₀
1998 KZ ₃₀	15.0	0.15	19990810	93.62623	59.82572	209.52455	1.89211	0.1546677	2.4292193	60	4	1994–1999	0.55	M-v	2	Williams	36535	1998 KZ ₃₀
1998 KH ₃₂	14.6	0.15	19990810	30.12454	101.44135	238.92501	1.96945	0.1941424	2.5366674	60	3	1995–1999	0.55	M-v	3	Williams	36373	1998 KH ₃₂
1998 KT ₃₂	14.4	0.15	19990810	77.76700	247.95891	42.21258	4.77507	0.1267308	2.4138049	81	4	1995–1999	0.55	M-v	1	Williams	36535	1998 KT ₃₂
1998 KV ₃₂	14.6	0.15	19990810	84.18455	31.50090	261.95870	6.28710	0.1859189	2.3548824	66	3	1995–1999	0.71	M-v	3	Williams	36535	1998 KV ₃₂
1998 KW ₃₃	14.8	0.15	19990810	359.76215	215.17412	144.55110	0.92729	0.1201219	2.5764433	39	4	1994–1999	0.64	M-v	1	Williams	36535	1998 KW ₃₃
1998 KW ₃₄	15.6	0.15	19990810	72.60316	108.24560	183.15030	5.08723	0.1868402	2.5468377	38	4	1995–1999	0.72	M-v	1	Williams	36535	1998 KW ₃₄
1998 KF ₃₅	13.5	0.15	19990810	28.73972	272.08915	71.98426	7.02008	0.1540821	2.4492162	75	5	1953–1999	0.59	M-v	1	Williams	36536	1998 KF ₃₅
1998 KL ₃₅	14.8	0.15	19990810	290.87123	4.01131	70.34090	5.98468	0.1129198	2.2812900	46	3	1982–1999	0.55	M-v	4	Williams	36536	1998 KL ₃₅
1998 KM ₃₅	13.9	0.15	19990810	73.71705	202.72684	64.13265	16.35406	0.2422861	2.8918971	46	3	1993–1999	0.66	M-v	3	Williams	36536	1998 KM ₃₅
1998 KS ₃₅	14.4	0.15	19990810	149.20354	107.98199	102.24023	0.75724	0.1458790	2.2972412	66	4	1993–1999	0.56	M-v	3	Williams	36536	1998 KS ₃₅
1998 KF ₃₆	14.2	0.15	19990810	25.60799	19.66413	304.59822	2.53144	0.0966343	2.7520156	28	3	1997–1999	0.82	M-v	4	Williams	32033	1998 KF ₃₆
1998 KT ₃₆	14.5	0.15	19990810	153.34268	315.00349	256.64173	3.69468	0.1041885	2.2711724	78	3	1996–1999	0.56	M-v	4	Williams	36536	1998 KT ₃₆
1998 KE ₃₇	14.5	0.15	19990810	121.22974	41.59246	216.57001	3.57507	0.1188743	2.2040580	40	2	1998–1999	0.67	M-v	4	Williams	36374	1998 KE ₃₇

1998 KL ₃₇	14.1	0.15	19990810	279.42987	239.11706	206.46405	5.91858	0.0703611	2.2905757	88	3	1992–1999	0.55	M-v	3	Williams	36536	1998 KL ₃₇
1998 KM ₃₇	14.5	0.15	19990810	76.63457	167.38553	115.44362	3.84794	0.2428820	2.6510681	55	3	1990–1999	0.60	M-v	3	Williams	36536	1998 KM ₃₇
1998 KV ₃₇	15.0	0.15	19990810	64.32984	196.37178	109.98716	6.74727	0.2060942	2.5423847	39	4	1995–1999	0.67	M-v	2	Williams	36536	1998 KV ₃₇
1998 KK ₃₈	12.5	0.15	19990810	311.34709	145.60798	239.77255	8.74483	0.1006239	2.9929381	35	3	1984–1999	0.48	M-v	3	Williams	36374	1998 KK ₃₈
1998 KZ ₃₈	13.3	0.15	19990810	87.77156	5.97517	261.99188	13.26172	0.1396707	2.5745302	60	2	1998–1999	0.60	M-v	3	Williams	36536	1998 KZ ₃₈
1998 KM ₃₉	15.3	0.15	19990810	121.93155	54.60522	204.65256	0.69398	0.1522400	2.2098390	40	4	1992–1999	0.49	M-v	2	Williams	32755	1998 KM ₃₉
1998 KE ₄₀	14.1	0.15	19990810	295.64453	307.54890	126.55355	4.41364	0.1268321	2.2658977	53	3	1982–1999	0.76	M-v	4	Williams	36536	1998 KE ₄₀
1998 KF ₄₀	12.8	0.15	19990810	201.61837	268.35358	226.03627	12.49031	0.1150243	2.6076885	52	2	1998–1999	0.48	M-v	3	Williams	36536	1998 KF ₄₀
1998 KM ₄₁	14.1	0.15	19990810	217.13539	92.39841	56.92762	7.30310	0.0644605	2.2743635	28	3	1975–1999	0.61	M-v	3	Williams	36536	1998 KM ₄₁
1998 KP ₄₁	15.6	0.15	19990810	148.07820	269.81711	317.61995	3.64227	0.0873749	2.2160877	47	3	1994–1999	0.71	M-v	3	Williams	36536	1998 KP ₄₁
1998 KR ₄₂	14.0	0.15	19990810	151.95491	350.06802	190.18514	12.95959	0.0996163	2.7242612	54	3	1977–1999	0.82	M-v	3	Williams	36536	1998 KR ₄₂
1998 KD ₄₄	14.8	0.15	19990810	125.37848	344.41762	250.10923	5.71088	0.0661524	2.4430045	58	2	1998–1999	0.71	M-v	4	Williams	36536	1998 KD ₄₄
1998 KQ ₄₄	15.0	0.15	19990810	128.38959	13.46172	218.77231	5.51064	0.1026596	2.4026619	41	2	1998–1999	0.64	M-v	4	Williams	36374	1998 KQ ₄₄
1998 KR ₄₄	14.7	0.15	19990810	70.53550	181.88853	131.54375	3.32951	0.2124803	2.4024064	34	4	1991–1999	0.59	M-v	2	Williams	35709	1998 KR ₄₄
1998 KT ₄₄	14.3	0.15	19990810	35.05153	132.47760	199.36071	6.90728	0.1917390	2.6891714	67	4	1992–1999	0.63	M-v	2	Williams	36536	1998 KT ₄₄
1998 KH ₄₅	15.5	0.15	19990810	86.53639	189.47867	96.46031	4.24037	0.1719999	2.4438386	32	3	1995–1999	0.66	M-v	3	Williams	36536	1998 KH ₄₅
1998 KM ₄₆	14.1	0.15	19990810	300.15836	242.97039	190.80891	6.16287	0.0764498	2.2924469	68	4	1992–1999	0.47	M-v	2	Williams	36536	1998 KM ₄₆
1998 KW ₄₆	12.7	0.15	19990810	20.01154	74.29655	245.14273	11.53266	0.0833968	3.1004527	69	3	1978–1999	0.57	M-v	2	Williams	36536	1998 KW ₄₆
1998 KX ₄₆	14.5	0.15	19990810	163.10996	329.07006	227.85202	1.40167	0.1361838	2.3349238	47	2	1998–1999	0.84	M-v	5	Williams	36374	1998 KX ₄₆
1998 KZ ₄₆	13.0	0.15	19990810	326.81057	136.80265	258.77199	13.97429	0.1173654	2.6034330	90	3	1991–1999	0.58	M-v	3	Williams	36536	1998 KZ ₄₆
1998 KH ₄₇	12.9	0.15	19990810	151.75736	300.19543	236.30194	12.30355	0.0434873	3.0546982	65	2	1998–1999	0.59	M-v	3	Williams	36536	1998 KH ₄₇
1998 KJ ₄₇	14.4	0.15	19990810	113.21546	29.65913	207.05544	4.28516	0.1257212	2.6182074	63	2	1998–1999	0.62	M-v	4	Williams	36375	1998 KJ ₄₇
1998 KR ₄₇	14.3	0.15	19990810	54.09688	101.13394	223.34777	10.05382	0.2733548	2.6765481	40	3	1990–1999	0.72	M-v	3	Williams	36536	1998 KR ₄₇
1998 KV ₄₇	14.2	0.15	19990810	266.40826	238.75106	218.97930	5.05132	0.1009582	2.3857126	81	3	1977–1999	0.68	M-v	3	Williams	36536	1998 KV ₄₇
1998 KW ₄₇	13.1	0.15	19990810	115.85137	33.46234	208.09756	2.75188	0.1386038	2.5249508	98	3	1995–1999	0.53	M-v	3	Williams	36536	1998 KW ₄₇
1998 KX ₄₇	14.1	0.15	19990810	171.89106	123.49802	71.29882	8.66080	0.0538478	2.3638926	47	3	1981–1999	0.74	M-v	4	Williams	36536	1998 KX ₄₇
1998 KZ ₄₇	14.2	0.15	19990810	100.69302	176.21943	107.51868	7.62251	0.1179152	2.2886254	37	4	1995–1999	0.70	M-v	2	Williams	36536	1998 KZ ₄₇
1998 KE ₄₈	14.7	0.15	19990810	128.71055	125.25576	125.89920	2.93009	0.0954432	2.2700415	65	5	1977–1999	0.70	M-v	2	Williams	36536	1998 KE ₄₈
1998 KV ₅₀	14.2	0.15	19990810	78.12572	82.17893	194.25948	13.02573	0.1514346	2.6060961	38	2	1998–1999	0.63	M-v	4	Williams	36375	1998 KV ₅₀
1998 KB ₅₁	13.4	0.15	19990810	112.19405	60.20256	179.00758	8.51659	0.1067197	2.5180761	87	6	1982–1999	0.47	M-v	3	Williams	36536	1998 KB ₅₁
1998 KF ₅₁	13.8	0.15	19990810	192.49378	291.95588	214.23372	14.86853	0.1178224	2.5314287	53	2	1998–1999	0.60	M-v	4	Williams	36536	1998 KF ₅₁
1998 KG ₅₁	14.7	0.15	19990810	33.59756	183.81383	163.03131	6.05202	0.1369088	2.3375960	42	3	1981–1999	0.49	M-v	2	Williams	36536	1998 KG ₅₁
1998 KS ₅₁	14.2	0.15	19990810	52.34149	139.49725	178.71029	10.96589	0.1887716	2.5451021	45	3	1978–1999	0.65	M-v	2	Williams	36536	1998 KS ₅₁
1998 KW ₅₁	13.5	0.15	19990810	328.73860	266.37219	123.47307	13.68220	0.1696322	2.5765800	60	3	1978–1999	0.70	M-v	3	Williams	36375	1998 KW ₅₁
1998 KL ₅₂	14.2	0.15	19990810	75.70021	57.66881	209.49703	12.25336	0.1130597	2.7997137	38	2	1998–1999	0.68	M-v	3	Williams	36375	1998 KL ₅₂
1998 KA ₅₄	13.5	0.15	19990810	174.75272	323.04046	210.83934	13.89740	0.0560499	2.5599650	53	2	1998–1999	0.50	M-v	3	Williams	36536	1998 KA ₅₄
1998 KP ₅₄	13.6	0.15	19990810	28.95220	232.98348	97.67183	13.86963	0.1530675	2.7773180	47	3	1990–1999	0.52	M-v	2	Williams	36536	1998 KP ₅₄
1998 KR ₅₄	14.0	0.15	19990810	341.49199	288.43087	104.47539	14.03919	0.1212123	2.3980098	44	3	1982–1999	0.77	M-v	3	Williams	36537	1998 KR ₅₄
1998 KB ₅₅	13.8	0.15	19990810	351.89424	207.27465	165.14038	8.97786	0.1411417	2.6942296	56	4	1985–1999	0.62	M-v	2	Williams	36537	1998 KB ₅₅
1998 KU ₅₅	13.4	0.15	19990810	330.81456	264.07129	138.37901	8.12390	0.1732618	2.5591645	62	4	1983–1999	0.66	M-v	3	Williams	36537	1998 KU ₅₅
1998 KC ₅₆	13.6	0.15	19990810	288.15420	273.92198	172.62211	12.29623	0.1323224	2.3482520	39	2	1998–1999	0.47	M-v	3	Williams	36537	1998 KC ₅₆
1998 KM ₆₁	15.7	0.15	19990810	137.39401	100.52139	145.59105	5.27313	0.1329700	2.1859224	37	3	1992–1999	0.62	M-v	3	Williams	32755	1998 KM ₆₁
1998 KL ₆₅	14.4	0.15	19990810	100.33028	228.78112	44.80356	2.92196	0.1849255	2.4176010	65	4	1995–1999	0.60	M-v	2	Williams	36537	1998 KL ₆₅
1998 LK ₂	14.0	0.15	19990810	63.93921	176.66533	163.53686	6.36084	0.2108667	2.3190687	36	5	1959–1999	0.63	M-v	1	Williams	36537	1998 LK ₂
1998 LN ₂	14.3	0.15	19990810	335.94625	205.75073	174.06982	9.48235	0.1511378	3.1539854	39	2	1998–1999	0.67	M-v	3	Williams	36376	1998 LN ₂
1998 MC	14.4	0.15	19990810	150.44275	156.58922	49.26607	6.12315	0.0939699	2.5879329	40	3	1991–1999	0.42	M-v	4	Williams	36376	1998 MC
1998 MF ₃	15.4	0.15	19990810	239.48406	169.71617	359.90057	3.03619	0.0655890	2.1518032	42	4	1991–1999	0.51	M-v	2	Williams	36537	1998 MF ₃
1998 MH ₃	14.3	0.15	19990810	292.60561	173.74332	236.95423	27.62530	0.0331257	2.6419658	33	3	1978–1999	0.79	M-v	3	Williams	36537	1998 MH ₃
1998 MA ₅	15.5	0.15	19990810	37.26759	67.32767	292.83951	4.22398	0.0636577	2.6534117	30	3	1977–1999	0.69	M-v	3	Williams	32486	1998 MA ₅
1998 MA ₈	12.7	0.15	19990810	82.95214	54.00845	253.15636	15.89519	0.0970044	2.8982523	29	3	1977–1999	0.62	M-v	3	Williams	36537	1998 MA ₈
1998 MN ₁₆	13.9	0.15	19990810	27.41216	271.83087	115.30282	14.21284	0.1759763	2.5905760	49	3	1995–1999	0.72	M-v	1	Williams	36537	1998 MN ₁₆
1998 MZ ₂₃	13.3	0.15	19990810	44.79333	79.73545	293.53067	5.55508	0.1495689	2.4681084	49	3	1994–1999	0.62	M-v	2	Williams	36537	1998 MZ ₂₃
1998 MS ₂₉	13.1	0.15	19990810	99.07750	133.70346	119.22357	6.41323	0.1196906	3.1653108	38	2	1998–1999	0.65	M-v	4	Williams	36537	1998 MS ₂₉

1998 MY ₂₉	12.2	0.15	19990810	137.16787	311.70635	272.77490	13.70428	0.1030628	2.8585397	71	3	1996–1999	0.50	M-v	3	Williams	36537	1998 MY ₂₉
1998 MK ₃₀	15.8	0.15	19990810	81.18747	154.49717	203.74086	5.41270	0.4345806	2.4669758	346	1	201 days	0.56	M-v	3	Williams	35078	1998 MK ₃₀
1998 MC ₃₂	14.5	0.15	19990810	81.07296	36.86787	298.24032	7.24231	0.2118551	2.3153528	32	4	1977–1999	0.79	M-v	2	Williams	32287	1998 MC ₃₂
1998 MF ₃₂	13.0	0.15	19990810	286.53737	352.46738	98.58045	10.15238	0.0097790	2.7650108	49	3	1995–1999	0.60	M-v	4	Williams	36537	1998 MF ₃₂
1998 MT ₃₂	14.3	0.15	19990810	155.76111	356.03950	243.78552	4.17035	0.0996111	2.2925501	48	3	1994–1999	0.70	M-v	4	Williams	36537	1998 MT ₃₂
1998 MR ₃₃	13.4	0.15	19990810	78.57462	184.24097	96.57863	5.86483	0.1929643	3.1339421	42	3	1992–1999	0.59	M-v	3	Williams	36377	1998 MR ₃₃
1998 MW ₃₄	14.3	0.15	19990810	141.91657	52.86148	203.80739	3.58081	0.1108270	2.3069206	43	5	1980–1999	0.56	M-v	1	Williams	36537	1998 MW ₃₄
1998 MR ₃₅	13.3	0.15	19990810	41.28411	285.63282	54.01893	3.06242	0.0832946	2.8986925	36	3	1989–1999	0.65	M-v	4	Williams	32288	1998 MR ₃₅
1998 MF ₃₇	13.3	0.15	19990810	64.24028	187.27927	133.23700	13.50045	0.1833081	2.8817471	45	3	1995–1999	0.58	M-v	2	Williams	36537	1998 MF ₃₇
1998 MK ₃₇	13.9	0.15	19990810	111.97650	358.18305	276.56382	7.15243	0.1722104	2.5773549	37	4	1990–1999	0.67	M-v	1	Williams	36537	1998 MK ₃₇
1998 ML ₃₇	14.2	0.15	19990810	27.59819	296.00961	112.76789	5.31892	0.1717830	2.2699450	41	5	1971–1999	0.84	M-v	2	Williams	32756	1998 ML ₃₇
1998 MT ₃₇	14.3	0.15	19990810	22.01687	340.72321	47.93847	3.12428	0.2193097	2.7696144	27	4	1992–1999	0.57	M-v	1	Williams	36537	1998 MT ₃₇
1998 MZ ₃₇	15.0	0.15	19990810	90.67167	211.49116	103.92355	6.47962	0.1148613	2.3631402	23	3	1997–1999	0.75	M-v	4	Williams	35709	1998 MZ ₃₇
1998 MB ₃₈	13.7	0.15	19990810	134.96479	318.74416	301.32630	10.73502	0.0587919	2.7288810	49	4	1972–1999	0.65	M-v	3	Williams	33078	1998 MB ₃₈
1998 MC ₄₅	13.4	0.15	19990810	343.32262	186.59638	208.48045	13.30662	0.1639516	2.6097753	83	3	1995–1999	0.45	M-v	2	Williams	36537	1998 MC ₄₅
1998 NA	13.3	0.15	19990810	69.26225	37.77458	334.09161	9.18667	0.1774582	2.5776213	84	3	1992–1999	0.67	M-v	2	Williams	34301	1998 NA
1998 OJ	15.0	0.15	19990810	174.27635	358.18135	240.24312	3.94918	0.1325672	2.2302699	39	4	1991–1999	0.62	M-v	2	Williams	32756	1998 OJ
1998 OQ	15.3	0.15	19990810	292.25775	230.84960	235.94904	4.25684	0.1337057	2.5339292	56	4	1993–1999	0.45	M-v	1	Williams	36537	1998 OQ
1998 ON ₁	14.3	0.15	19990810	45.72549	164.08047	198.13162	7.73842	0.2335900	2.7634811	66	4	1994–1999	0.40	M-v	1	Williams	36537	1998 ON ₁
1998 OZ ₄	14.1	0.15	19990810	352.84511	209.60668	206.67162	10.18120	0.1372346	3.1359608	43	3	1993–1999	0.61	M-v	3	Williams	36537	1998 OZ ₄
1998 OW ₅	12.8	0.15	19990810	241.67748	3.62389	142.64748	14.97564	0.1009117	3.1692408	41	2	1998–1999	0.57	M-v	4	Williams	36377	1998 OW ₅
1998 OZ ₅	14.1	0.15	19990810	129.91856	56.96411	213.33107	3.21822	0.1376798	2.2582823	42	6	1988–1999	0.46	M-v	1	Williams	34921	1998 OZ ₅
1998 OH ₆	12.7	0.15	19990810	212.98496	353.76702	165.96361	6.27876	0.0991559	3.1640277	94	5	1985–1999	0.70	M-v	2	Williams	36537	1998 OH ₆
1998 OZ ₆	14.2	0.15	19990810	59.20296	104.81653	264.89986	4.33854	0.2384385	2.6296214	63	3	1997–1999	0.61	M-v	2	Williams	33559	1998 OZ ₆
1998 OE ₇	14.1	0.15	19990810	40.79281	87.21940	310.76630	12.05782	0.2067991	2.5361913	56	4	1986–1999	0.59	M-v	2	Williams	33559	1998 OE ₇
1998 OW ₁₁	14.3	0.15	19990810	318.08528	327.37057	93.58812	11.65195	0.0940674	2.9783817	20	2	1998–1999	0.50	M-v	4	Williams	36377	1998 OW ₁₁
1998 OG ₁₂	14.2	0.15	19990810	141.82523	261.63792	343.37759	9.16118	0.0898312	2.6313394	59	4	1986–1999	0.67	M-v	2	Williams	36538	1998 OG ₁₂
1998 OV ₁₂	13.5	0.15	19990810	80.04201	177.98294	145.04759	4.99420	0.0667969	2.7884533	51	3	1995–1999	0.67	M-v	3	Williams	35709	1998 OV ₁₂
1998 ON ₁₃	14.1	0.15	19990810	81.23485	35.71573	318.18511	9.52810	0.0682708	2.2635243	62	3	1981–1999	0.71	M-v	2	Williams	36538	1998 ON ₁₃
1998 OB ₁₄	14.2	0.15	19990810	188.79810	243.00888	326.01636	18.21889	0.0870880	2.7508753	51	5	1983–1999	0.73	M-v	1	Williams	34922	1998 OB ₁₄
1998 OZ ₁₄	13.8	0.15	19990810	54.69587	238.68857	140.46152	12.00073	0.1523790	2.4522841	63	4	1981–1999	0.75	M-v	2	Williams	36538	1998 OZ ₁₄
1998 PF	14.9	0.15	19990810	210.12284	53.53920	152.48596	41.95834	0.2874820	2.0084903	106	2	1998–1999	0.58	M-v	3	Williams	36538	1998 PF
1998 PG	17.1	0.15	19990810	102.19795	155.73127	222.91705	6.48695	0.3919258	2.0152285	476	2	1978–1999	0.54	M-v	1	Williams	34922	1998 PG
1998 PQ	13.9	0.15	19990810	146.58163	79.99301	160.90554	1.16675	0.1293704	3.0903630	37	3	1996–1999	0.67	M-v	4	Williams	36538	1998 PQ
1998 PA ₁	13.6	0.15	19990810	330.67027	196.19155	238.69348	5.63516	0.1293562	3.0477345	74	4	1991–1999	0.55	M-v	1	Williams	36538	1998 PA ₁
1998 PO ₁	13.1	0.15	19990810	307.95003	146.17456	275.46931	13.61077	0.0635567	2.5810912	65	2	1998–1999	0.55	M-v	3	Williams	36538	1998 PO ₁
1998 QR	14.7	0.15	19990810	254.13365	340.13265	176.63964	4.17880	0.0988141	2.3334110	33	3	1981–1999	0.53	M-v	4	Marsden	32758	1998 QR
1998 QT	15.0	0.15	19990810	152.17889	293.08695	327.06711	4.62599	0.1768287	2.2425457	48	5	1984–1999	0.69	M-v	2	Williams	34923	1998 QT
1998 QW	13.8	0.15	19990810	87.09792	109.63192	212.38906	14.41396	0.1527075	2.6032926	47	3	1990–1999	0.65	M-v	2	Williams	36538	1998 QW
1998 QN ₁	13.5	0.15	19990810	61.83588	104.04677	232.40451	1.14576	0.1246159	3.0739196	56	3	1993–1999	0.68	M-v	4	Williams	33347	1998 QN ₁
1998 QR ₁	14.6	0.15	19990810	240.20817	290.86242	261.08128	5.50440	0.0871985	2.4565918	50	3	1995–1999	0.62	M-v	3	Williams	36538	1998 QR ₁
1998 QA ₂	14.4	0.15	19990810	17.42961	196.25707	216.88414	3.08657	0.1997520	2.6830076	41	4	1985–1999	0.69	M-v	1	Williams	36538	1998 QA ₂
1998 QU ₂	13.7	0.15	19990810	57.81918	202.73064	162.72982	15.62743	0.2107984	2.5649459	43	3	1994–1999	0.61	M-v	2	Williams	33559	1998 QU ₂
1998 QO ₄	13.5	0.15	19990810	32.82657	67.83153	301.55618	13.19793	0.0341540	3.1810176	62	3	1995–1999	0.64	M-v	2	Williams	36085	1998 QO ₄
1998 QT ₅	13.7	0.15	19990810	326.50532	110.82291	340.69424	9.94276	0.0927315	2.9556664	37	3	1993–1999	0.62	M-v	4	Williams	35629	1998 QT ₅
1998 QN ₇	12.2	0.15	19990810	52.87018	349.55549	324.22324	17.04221	0.1086810	3.4077736	52	3	1996–1999	0.63	M-v	3	Williams	36538	1998 QN ₇
1998 QV ₇	14.5	0.15	19990810	107.88749	146.21717	145.17302	3.11019	0.1669647	2.4701360	43	4	1991–1999	0.69	M-v	2	Williams	35629	1998 QV ₇
1998 QQ ₈	13.3	0.15	19990810	40.24232	232.32915	121.32515	6.86074	0.0745318	2.8016251	31	3	1997–1999	0.65	M-v	4	Williams	36538	1998 QQ ₈
1998 QT ₈	13.4	0.15	19990810	54.32067	283.25452	64.45423	4.81396	0.1177042	2.6883805	22	4	1981–1999	0.64	M-v	1	Williams	32691	1998 QT ₈
1998 QM ₉	14.1	0.15	19990810	49.13791	117.52959	224.17170	4.95674	0.1570503	3.0545138	39	3	1997–1999	0.55	M-v	4	Williams	36538	1998 QM ₉
1998 QR ₁₀	13.6	0.15	19990810	54.73490	34.83142	302.56139	0.97554	0.0870908	2.9282388	73	4	1996–1999	0.48	M-v	1	Williams	36538	1998 QR ₁₀
1998 QS ₁₁	14.7	0.15	19990810	269.07445	237.38676	273.27504	4.30857	0.0643226	2.3168278	28	3	1995–1999	0.70	M-v	3	Williams	36538	1998 QS ₁₁
1998 QZ ₁₁	14.3	0.15	19990810	25.96631	105.52935	297.03109	10.77504	0.1848636	2.5701885	26	3	1990–1999	0.52	M-v	2	Williams	36538	1998 QZ ₁₁

1998 QT ₁₂	14.7	0.15	19990810	149.41125	330.65144	290.30076	5.97942	0.0929648	2.3722971	28	5	1980–1999	0.61	M-v	1	Williams	32760	1998 QT ₁₂
1998 QU ₁₃	14.8	0.15	19990810	41.70413	78.55451	320.80975	5.83327	0.1406075	2.2671419	27	4	1981–1999	0.62	M-v	2	Williams	35710	1998 QU ₁₃
1998 QR ₁₅	18.0	0.15	19990810	64.44795	54.08640	322.56250	9.69504	0.5651380	2.7547083	233	1	128 days	0.51	M-v	3	Williams	33559	1998 QR ₁₅
1998 QJ ₁₆	12.9	0.15	19990810	322.43355	173.13766	284.14834	7.21322	0.1859610	2.7931786	38	4	1949–1999	0.55	M-v	3	Williams	36538	1998 QJ ₁₆
1998 QM ₁₆	13.9	0.15	19990810	104.48900	112.25093	191.77474	4.42834	0.1502656	2.5287689	28	4	1990–1999	0.49	M-v	1	Williams	32693	1998 QM ₁₆
1998 QP ₁₆	14.0	0.15	19990810	94.19646	129.66956	170.05777	9.52331	0.0458377	2.9666051	33	3	1971–1999	0.70	M-v	4	Williams	36538	1998 QP ₁₆
1998 QT ₁₆	15.1	0.15	19990810	52.29935	33.31326	341.88307	3.28755	0.2031689	2.5483296	30	4	1986–1999	0.54	M-v	2	Williams	35710	1998 QT ₁₆
1998 QF ₁₇	13.8	0.15	19990810	143.50991	146.38836	122.46394	6.32557	0.1022805	2.3773106	47	4	1991–1999	0.51	M-v	2	Williams	36538	1998 QF ₁₇
1998 QL ₁₈	13.9	0.15	19990810	359.42162	68.25394	340.76032	4.38080	0.1660654	3.1570554	40	4	1993–1999	0.58	M-v	1	Williams	36538	1998 QL ₁₈
1998 QN ₁₈	13.2	0.15	19990810	190.81595	223.01229	335.18077	10.20062	0.0506880	3.0077747	44	5	1991–1999	0.68	M-v	1	Williams	36538	1998 QN ₁₈
1998 QV ₁₉	13.9	0.15	19990810	114.87699	127.43407	163.25195	4.95557	0.1135121	2.6006262	51	3	1997–1999	0.67	M-v	3	Williams	36538	1998 QV ₁₉
1998 QY ₁₉	14.9	0.15	19990810	336.89447	302.06489	162.92092	7.84970	0.1292651	2.3058341	24	3	1993–1999	0.81	M-v	4	Williams	32974	1998 QY ₁₉
1998 QM ₂₀	12.6	0.15	19990810	265.55654	324.10273	169.67542	11.66348	0.0360132	3.0311595	78	3	1996–1999	0.49	M-v	3	Williams	36538	1998 QM ₂₀
1998 QX ₂₁	14.2	0.15	19990810	160.27207	298.67044	317.48230	5.40776	0.1096423	2.3594098	40	4	1951–1999	0.55	M-v	2	Williams	32974	1998 QX ₂₁
1998 QV ₂₂	13.0	0.15	19990810	320.39168	66.82186	15.73812	1.94312	0.0870976	3.1132782	63	3	1993–1999	0.70	M-v	4	Williams	36538	1998 QV ₂₂
1998 QW ₂₂	14.4	0.15	19990810	353.66312	70.25954	14.26112	3.87138	0.0903234	2.2999961	40	3	1997–1999	0.72	M-v	3	Williams	36538	1998 QW ₂₂
1998 QE ₂₃	14.2	0.15	19990810	352.07872	30.14260	59.05994	3.25992	0.1695865	2.4038352	31	3	1980–1999	0.82	M-v	4	Williams	32696	1998 QE ₂₃
1998 QP ₂₃	14.8	0.15	19990810	16.09382	75.96301	349.69049	4.30344	0.1275525	2.3480918	45	4	1973–1999	0.82	M-v	2	Williams	35710	1998 QP ₂₃
1998 QM ₂₅	14.4	0.15	19990810	56.78780	321.56569	32.32363	2.81322	0.0076762	2.6749189	41	5	1992–1999	0.75	M-v	1	Williams	35710	1998 QM ₂₅
1998 QN ₂₅	14.2	0.15	19990810	96.86778	335.78355	338.25084	13.40475	0.1479611	2.5648164	39	4	1990–1999	0.56	M-v	3	Williams	33559	1998 QN ₂₅
1998 QA ₂₆	13.5	0.15	19990810	42.12855	218.37433	154.66617	5.67826	0.0865890	3.0289181	47	4	1994–1999	0.70	M-v	1	Williams	36538	1998 QA ₂₆
1998 QF ₂₆	14.5	0.15	19990810	164.79891	100.96934	156.94336	2.53938	0.2072230	2.3607494	49	3	1997–1999	0.70	M-v	4	Williams	35710	1998 QF ₂₆
1998 QK ₂₆	14.3	0.15	19990810	14.98976	186.72714	205.95725	0.40881	0.2153689	3.1360963	33	3	1982–1999	0.47	M-v	2	Williams	36538	1998 QK ₂₆
1998 QL ₃₀	14.4	0.15	19990810	76.12527	233.63979	129.92822	4.96776	0.1372101	2.3362001	61	5	1986–1999	0.58	M-v	2	Williams	35710	1998 QL ₃₀
1998 QY ₃₀	13.8	0.15	19990810	65.77493	19.27275	321.49934	1.47117	0.0861510	2.8621148	50	4	1992–1999	0.66	M-v	2	Williams	36538	1998 QY ₃₀
1998 QS ₃₁	12.6	0.15	19990810	97.47866	298.28954	347.72637	13.89395	0.1101299	3.2147926	61	4	1981–1999	0.60	M-v	1	Williams	36539	1998 QS ₃₁
1998 QV ₃₂	13.6	0.15	19990810	53.78727	46.20257	302.65385	3.71526	0.1727486	3.0986268	44	4	1987–1999	0.69	M-v	2	Williams	35710	1998 QV ₃₂
1998 QL ₃₃	13.9	0.15	19990810	161.89534	292.36992	316.77959	11.35525	0.1009792	2.5299491	42	4	1986–1999	0.78	M-v	3	Williams	33082	1998 QL ₃₃
1998 QL ₃₄	12.9	0.15	19990810	1.81523	295.18054	115.91759	2.43761	0.1626539	3.1843420	52	4	1987–1999	0.52	M-v	1	Williams	36539	1998 QL ₃₄
1998 QM ₃₄	13.7	0.15	19990810	169.88156	85.48696	136.75179	8.05985	0.1414716	2.8051236	50	4	1992–1999	0.68	M-v	1	Williams	36539	1998 QM ₃₄
1998 QV ₃₄	14.5	0.15	19990810	187.50585	305.89555	286.49049	5.50409	0.0803830	2.4101499	29	5	1979–1999	0.70	M-v	1	Williams	35710	1998 QV ₃₄
1998 QW ₃₄	13.0	0.15	19990810	94.96135	130.36866	175.59579	14.82981	0.2004088	2.7721433	45	3	1992–1999	0.69	M-v	3	Williams	36539	1998 QW ₃₄
1998 QB ₃₅	14.5	0.15	19990810	312.76851	163.14787	317.42786	13.10389	0.1193798	2.5346801	25	3	1988–1999	0.83	M-v	4	Williams	36002	1998 QB ₃₅
1998 QX ₃₅	14.1	0.15	19990810	311.41389	89.87096	10.32380	2.04702	0.0350249	2.8513972	36	4	1991–1999	0.62	M-v	2	Williams	33347	1998 QX ₃₅
1998 QL ₃₇	14.7	0.15	19990810	242.24797	345.60535	206.32176	4.29945	0.0897351	2.2576176	34	4	1978–1999	0.89	M-v	2	Williams	35710	1998 QL ₃₇
1998 QW ₃₇	14.6	0.15	19990810	266.63937	203.05066	330.77120	4.68043	0.1025762	2.1941819	43	6	1969–1999	0.70	M-v	2	Williams	36539	1998 QW ₃₇
1998 QK ₃₈	13.3	0.15	19990810	96.93170	328.41398	324.53011	0.32917	0.1310414	3.1777775	67	4	1988–1999	0.57	M-v	1	Williams	36539	1998 QK ₃₈
1998 QQ ₃₈	14.8	0.15	19990810	164.13533	355.37519	250.76981	2.73700	0.1728620	2.4536691	29	3	1990–1999	0.82	M-v	5	Williams	32703	1998 QQ ₃₈
1998 QT ₃₉	14.0	0.15	19990810	41.61495	255.43253	142.94437	7.69206	0.1934254	2.5523308	49	5	1992–1999	0.57	M-v	1	Williams	35710	1998 QT ₃₉
1998 QD ₄₀	14.2	0.15	19990810	122.27644	344.20222	304.02928	3.34638	0.0361152	2.7893650	32	3	1996–1999	0.82	M-v	4	Williams	32705	1998 QD ₄₀
1998 QP ₄₀	13.2	0.15	19990810	329.02321	147.57590	319.88448	12.43190	0.1136428	2.6073227	47	5	1975–1999	0.60	M-v	2	Williams	35711	1998 QP ₄₀
1998 QV ₄₀	13.1	0.15	19990810	68.29342	124.72228	223.97823	4.08801	0.0461256	2.7752752	59	4	1978–1999	0.52	M-v	2	Williams	36539	1998 QV ₄₀
1998 QS ₄₁	13.8	0.15	19990810	131.31643	195.79665	84.79749	1.68150	0.0462802	2.7165593	52	3	1997–1999	0.75	M-v	3	Williams	33083	1998 QS ₄₁
1998 QL ₄₂	14.5	0.15	19990810	20.74919	182.35179	214.93861	1.73789	0.0585880	2.8773953	34	3	1996–1999	0.72	M-v	3	Williams	32707	1998 QL ₄₂
1998 QR ₄₂	12.9	0.15	19990810	239.01354	348.41940	177.86339	15.75199	0.1269794	3.1484106	45	5	1955–1999	0.77	M-v	1	Williams	36539	1998 QR ₄₂
1998 QW ₄₂	12.8	0.15	19990810	183.99278	6.01265	205.65509	1.57213	0.1140659	3.1281742	73	4	1990–1999	0.67	M-v	1	Williams	36539	1998 QW ₄₂
1998 QG ₄₃	13.1	0.15	19990810	21.10103	234.98221	148.36204	11.89202	0.0052157	3.0851380	49	4	1990–1999	0.70	M-v	1	Williams	36539	1998 QG ₄₃
1998 QP ₄₃	12.9	0.15	19990810	301.25643	111.07142	356.86570	16.92655	0.0984168	3.1588427	40	3	1993–1999	0.74	M-v	3	Williams	36539	1998 QP ₄₃
1998 QB ₄₆	15.0	0.15	19990810	165.86296	277.93971	324.82395	3.59505	0.1364418	2.6111284	24	3	1977–1999	0.90	M-v	5	Williams	32711	1998 QB ₄₆
1998 QF ₄₉	13.8	0.15	19990810	22.70773	270.36110	148.24857	8.72029	0.2283891	2.7648289	41	3	1977–1999	0.50	M-v	1	Williams	33755	1998 QF ₄₉
1998 QO ₅₀	13.6	0.15	19990810	63.81199	201.39927	145.35105	9.99340	0.0791855	2.9724955	30	3	1997–1999	0.49	M-v	3	Williams	36539	1998 QO ₅₀
1998 QU ₅₀	13.1	0.15	19990810	126.38581	284.95830	348.79540	21.28771	0.0370888	3.2081850	39	5	1979–1999	0.69	M-v	1	Williams	36539	1998 QU ₅₀
1998 QE ₅₂	12.9	0.15	19990810	346.19518	209.50668	244.60318	5.78399	0.1418256	2.7809331	59	4	1992–1999	0.72	M-v	1	Williams	36539	1998 QE ₅₂

1998 QH ₅₂	13.7	0.15	19990810	291.98502	190.13563	319.20013	7.55469	0.0546723	2.4549834	50	3	1994–1999	0.75	M-v	3	Williams	33560	1998 QH ₅₂
1998 QS ₅₂	14.3	0.15	19990810	51.54919	242.10575	261.33106	17.70116	0.8587837	2.1994922	348	3	1983–1999	0.58	M-v	2	Williams	36085	1998 QS ₅₂
1998 QK ₅₃	13.6	0.15	19990810	218.17346	264.61465	326.18616	6.26823	0.0726471	2.3603220	63	4	1986–1999	0.60	M-v	2	Williams	36539	1998 QK ₅₃
1998 QW ₅₃	13.8	0.15	19990810	147.48902	116.64600	176.38065	6.40784	0.1178744	2.3275069	87	4	1993–1999	0.63	M-v	2	Williams	35711	1998 QW ₅₃
1998 QE ₅₄	13.8	0.15	19990810	243.69989	254.27051	311.73282	5.32082	0.1282582	2.3195396	65	5	1972–1999	0.98	M-v	3	Williams	36539	1998 QE ₅₄
1998 QY ₅₄	14.2	0.15	19990810	53.15760	167.41085	220.71619	4.16340	0.1658958	2.7684932	41	4	1979–1999	0.71	M-v	2	Williams	35711	1998 QY ₅₄
1998 QS ₅₅	14.0	0.15	19990810	85.71660	181.48207	185.78200	2.32412	0.0691467	2.8277776	43	5	1983–1999	0.70	M-v	2	Williams	35711	1998 QS ₅₅
1998 QJ ₆₉	13.3	0.15	19990810	160.71130	22.04736	210.58993	15.44001	0.0358546	3.1534453	64	3	1993–1999	0.73	M-v	3	Williams	36539	1998 QJ ₆₉
1998 QR ₆₉	12.9	0.15	19990810	129.33423	18.48334	229.11824	15.48374	0.1986556	3.1585184	62	3	1997–1999	0.53	M-v	3	Williams	36539	1998 QR ₆₉
1998 QC ₇₀	13.7	0.15	19990810	353.38207	179.57888	240.25207	10.02355	0.0796408	3.0115753	26	3	1978–1999	0.73	M-v	4	Williams	35712	1998 QC ₇₀
1998 QF ₇₀	12.8	0.15	19990810	316.56009	239.63826	212.89592	15.67520	0.0953265	3.1967903	56	3	1996–1999	0.67	M-v	3	Williams	36539	1998 QF ₇₀
1998 QX ₇₂	14.2	0.15	19990810	63.60851	155.72230	184.18756	15.54670	0.0792968	3.0772694	38	3	1997–1999	0.89	M-v	3	Williams	36539	1998 QX ₇₂
1998 QG ₇₃	12.3	0.15	19990810	309.57474	217.24609	246.96783	8.39378	0.0462272	3.0161700	61	4	1978–1999	0.66	M-v	3	Williams	35712	1998 QG ₇₃
1998 QN ₇₃	13.1	0.15	19990810	92.93862	49.74953	269.64344	10.64310	0.2048233	2.6883371	55	4	1954–1999	0.76	M-v	1	Williams	36539	1998 QN ₇₃
1998 QV ₇₃	13.3	0.15	19990810	327.39371	214.54091	260.51709	14.23817	0.1793485	2.6498525	33	3	1990–1999	0.85	M-v	3	Williams	36539	1998 QV ₇₃
1998 QK ₇₅	12.6	0.15	19990810	27.29964	150.53314	244.60705	9.10567	0.1101210	2.9960036	48	4	1978–1999	0.73	M-v	2	Williams	36539	1998 QK ₇₅
1998 QM ₇₆	12.9	0.15	19990810	253.16486	291.39984	245.04712	9.91932	0.1339248	2.6413302	59	4	1986–1999	0.66	M-v	2	Williams	36539	1998 QM ₇₆
1998 QW ₇₇	12.4	0.15	19990810	163.30732	286.90039	323.94913	11.94412	0.1631573	2.6746535	53	3	1992–1999	0.69	M-v	3	Williams	36539	1998 QW ₇₇
1998 QQ ₈₄	13.5	0.15	19990810	327.58765	214.06700	236.96588	12.98290	0.1286447	3.0926703	47	3	1996–1999	0.77	M-v	3	Williams	36539	1998 QQ ₈₄
1998 QW ₈₅	14.3	0.15	19990810	101.77480	100.08765	230.27731	6.60692	0.1406155	2.3915096	41	3	1987–1999	0.53	M-v	3	Williams	35712	1998 QW ₈₅
1998 QG ₈₆	13.6	0.15	19990810	347.96616	169.38673	286.43351	12.14129	0.1916524	2.7726189	51	3	1997–1999	0.72	M-v	3	Williams	36539	1998 QG ₈₆
1998 QN ₈₆	13.3	0.15	19990810	30.86127	118.43134	286.27381	8.08348	0.1598085	2.7591601	52	3	1989–1999	0.78	M-v	2	Williams	36540	1998 QN ₈₆
1998 QU ₉₀	14.0	0.15	19990810	355.69175	53.92338	52.78915	5.96718	0.0770999	2.2660486	65	4	1993–1999	0.74	M-v	2	Williams	33562	1998 QU ₉₀
1998 QW ₉₅	14.2	0.15	19990810	133.01499	42.72291	222.59806	7.78799	0.1555931	2.7872300	28	3	1994–1999	0.76	M-v	4	Williams	32986	1998 QW ₉₅
1998 QB ₉₆	13.8	0.15	19990810	193.04315	9.30168	207.50722	13.05058	0.1491712	2.6609145	33	3	1997–1999	0.73	M-v	4	Williams	35713	1998 QB ₉₆
1998 QA ₉₈	13.5	0.15	19990810	327.49524	187.31434	310.93283	6.59400	0.1617098	2.4513017	62	3	1997–1999	0.67	M-v	3	Williams	34021	1998 QA ₉₈
1998 QE ₉₉	13.3	0.15	19990810	352.00800	77.57362	356.32240	16.55717	0.1735903	3.3714300	39	3	1992–1999	0.75	M-v	3	Williams	35713	1998 QE ₉₉
1998 QO ₉₉	14.6	0.15	19990810	284.64597	37.63312	128.76491	6.11345	0.1040921	2.2381244	50	4	1991–1999	0.96	M-v	2	Williams	36540	1998 QO ₉₉
1998 QQ ₁₀₁	12.9	0.15	19990810	43.16608	213.09511	165.12902	16.84620	0.1917506	3.0864099	52	3	1971–1999	0.64	M-v	2	Williams	35713	1998 QQ ₁₀₁
1998 QV ₁₀₂	12.5	0.15	19990810	34.54320	322.55428	47.15888	6.34693	0.2918114	3.9518754	66	5	1975–1999	0.78	M-v	1	Williams	36540	1998 QV ₁₀₂
1998 QZ ₁₀₂	13.3	0.15	19990810	106.24058	165.99897	131.35068	6.19479	0.2254609	2.8543388	59	5	1977–1999	0.75	M-v	2	Williams	35713	1998 QZ ₁₀₂
1998 QF ₁₀₄	13.5	0.15	19990810	141.14420	272.36190	13.21861	14.94438	0.1003434	2.5360295	59	5	1978–1999	0.71	M-v	3	Williams	35713	1998 QF ₁₀₄
1998 QO ₁₀₄	14.0	0.15	19990810	311.13555	63.94162	69.65354	5.79672	0.0336120	2.4631173	37	4	1950–1999	0.67	M-v	2	Williams	35340	1998 QO ₁₀₄
1998 QO ₁₀₅	14.1	0.15	19990810	244.70469	148.82740	48.90769	5.74002	0.0982088	2.2574662	62	4	1995–1999	0.58	M-v	1	Williams	35713	1998 QO ₁₀₅
1998 QM ₁₀₆	14.1	0.15	19990810	78.19855	326.15825	14.31492	11.33210	0.1657208	2.7471270	35	3	1989–1999	0.76	M-v	3	Williams	33563	1998 QM ₁₀₆
1998 RE	12.6	0.15	19990810	301.71846	127.57471	58.31748	13.67371	0.0922768	3.1436973	43	6	1939–1999	0.65	M-v	2	Williams	35713	1998 RE
1998 RM	13.2	0.15	19990810	283.34631	270.89518	207.24385	16.60457	0.0891955	2.8058053	76	3	1992–1999	0.46	M-v	2	Williams	36377	1998 RM
1998 RP ₅	13.7	0.15	19990810	257.31644	1.26731	185.59879	13.99215	0.1111106	2.5617876	42	3	1988–1999	0.63	M-v	4	Williams	35713	1998 RP ₅
1998 RY ₅	14.6	0.15	19990810	291.79230	135.34254	22.60652	3.97756	0.0878412	2.2170606	50	5	1987–1999	0.57	M-v	2	Williams	35713	1998 RY ₅
1998 RK ₆	13.3	0.15	19990810	84.82883	155.88786	151.25637	6.37612	0.1428656	3.1842763	50	4	1996–1999	0.61	M-v	1	Williams	36540	1998 RK ₆
1998 RX ₁₂	13.5	0.15	19990810	244.29850	4.28719	179.43994	0.67416	0.1109287	3.1634284	37	3	1995–1999	0.66	M-v	6	Williams	34926	1998 RX ₁₂
1998 RN ₁₃	14.4	0.15	19990810	241.42311	56.85960	114.16762	3.23070	0.1212589	2.4041467	55	5	1991–1999	0.56	M-v	1	Williams	35713	1998 RN ₁₃
1998 RU ₁₅	13.9	0.15	19990810	197.53089	78.38074	175.74743	5.05212	0.1149003	2.2979763	61	4	1983–1999	0.68	M-v	2	Williams	35713	1998 RU ₁₅
1998 RP ₂₈	14.0	0.15	19990810	116.95026	121.74369	151.52290	2.94527	0.1427789	3.1540218	41	4	1991–1999	0.70	M-v	1	Williams	35714	1998 RP ₂₈
1998 RO ₃₁	14.5	0.15	19990810	320.03759	223.60161	268.12001	4.83431	0.0801873	2.2652731	40	4	1978–1999	0.63	M-v	2	Williams	35714	1998 RO ₃₁
1998 RX ₃₂	14.3	0.15	19990810	11.08877	294.54772	144.35144	2.25002	0.1920405	2.5737590	36	5	1986–1999	0.72	M-v	1	Williams	35714	1998 RX ₃₂
1998 RN ₃₅	14.0	0.15	19990810	86.57585	328.43201	359.56302	1.72167	0.0549386	2.8799933	33	4	1993–1999	0.56	M-v	3	Williams	36540	1998 RN ₃₅
1998 RO ₃₈	14.1	0.15	19990810	180.82470	247.72164	6.75784	3.78862	0.1265719	2.2106602	39	3	1988–1999	0.88	M-v	3	Williams	36540	1998 RO ₃₈
1998 RK ₄₇	14.3	0.15	19990810	133.13626	351.64361	311.70595	6.22198	0.1365326	2.3330056	61	3	1987–1999	0.87	M-v	3	Williams	35714	1998 RK ₄₇
1998 RJ ₅₀	13.9	0.15	19990810	24.55912	283.06914	126.40448	1.82854	0.2106661	3.0584246	32	4	1973–1999	0.74	M-v	1	Williams	34021	1998 RJ ₅₀
1998 RD ₅₁	13.5	0.15	19990810	156.03157	36.92139	234.23579	5.10632	0.0562274	2.6495169	65	4	1981–1999	0.56	M-v	2	Williams	36540	1998 RD ₅₁
1998 RA ₅₉	14.3	0.15	19990810	221.94319	13.19506	210.41787	4.35135	0.0786765	2.3105793	58	4	1990–1999	0.65	M-v	1	Williams	35715	1998 RA ₅₉
1998 RB ₆₅	13.1	0.15	19990810	168.93892	154.57691	84.27646	0.08554	0.1191019	3.2234457	62	5	1990–1999	0.65	M-v	1	Williams	35715	1998 RB ₆₅

1998 RK ₆₈	13.8	0.15	19990810	346.04445	271.73252	195.30942	4.69326	0.0853227	2.5835649	58	4	1973–1999	0.74	M-v	2	Williams	35715	1998 RK ₆₈
1998 RU ₆₈	13.9	0.15	19990810	15.13008	50.31048	11.18498	4.86548	0.1439333	3.1429944	39	4	1976–1999	0.65	M-v	1	Williams	35715	1998 RU ₆₈
1998 RP ₇₀	13.0	0.15	19990810	226.48931	126.32582	58.87665	7.64403	0.1110283	3.3947806	60	3	1996–1999	0.63	M-v	4	Williams	36540	1998 RP ₇₀
1998 RH ₇₁	13.4	0.15	19990810	66.24358	324.82835	40.15140	4.80696	0.2173237	2.7979816	54	4	1984–1999	0.65	M-v	2	Williams	35715	1998 RH ₇₁
1998 RJ ₇₂	12.9	0.15	19990810	147.34589	171.83502	88.59189	2.44132	0.1317914	3.2011267	62	4	1979–1999	0.57	M-v	1	Williams	33352	1998 RJ ₇₂
1998 RW ₇₅	13.4	0.15	19990810	276.23504	78.40066	80.41136	2.56756	0.1242151	3.0454415	38	3	1996–1999	0.68	M-v	4	Williams	34592	1998 RW ₇₅
1998 RH ₇₆	13.2	0.15	19990810	30.74442	335.79570	68.02815	3.23753	0.1044853	2.9445871	56	3	1989–1999	0.66	M-v	2	Williams	36540	1998 RH ₇₆
1998 RB ₇₇	13.3	0.15	19990810	29.21694	282.37423	130.16775	4.70317	0.0916092	2.7550254	49	4	1989–1999	0.68	M-v	1	Williams	36540	1998 RB ₇₇
1998 RQ ₇₇	12.6	0.15	19990810	47.28209	315.54215	40.71422	7.14389	0.2034702	3.9860260	54	6	1979–1999	0.66	M-v	1	Williams	34927	1998 RQ ₇₇
1998 RM ₇₈	13.7	0.15	19990810	289.10413	121.81309	40.58936	7.14458	0.0812531	2.4644172	35	3	1985–1999	0.62	M-v	4	Williams	33275	1998 RM ₇₈
1998 RV ₇₉	13.4	0.15	19990810	181.38251	138.15652	107.19845	3.48493	0.1601136	2.6488540	61	5	1971–1999	0.73	M-v	1	Williams	34022	1998 RV ₇₉
1998 RZ ₇₉	13.1	0.15	19990810	355.26074	357.17168	92.50146	4.97538	0.0637238	2.7888133	68	3	1997–1999	0.54	M-v	3	Williams	36540	1998 RZ ₇₉
1998 RB ₈₀	13.2	0.15	19990810	210.66727	125.71747	95.92707	6.08357	0.1033449	2.7368785	42	3	1989–1999	0.83	M-v	4	Williams	33276	1998 RB ₈₀
1998 SK ₁	13.6	0.15	19990810	355.97654	36.15295	64.03569	1.60255	0.1372275	3.1365943	47	3	1992–1999	0.67	M-v	2	Williams	34303	1998 SK ₁
1998 SH ₄	13.6	0.15	19990810	149.56536	107.90501	137.44147	2.17647	0.1232269	3.1878670	37	3	1996–1999	0.53	M-v	4	Williams	35716	1998 SH ₄
1998 SG ₅	13.3	0.15	19990810	68.74618	179.48546	183.27369	12.77903	0.1727901	2.6691034	91	3	1979–1999	0.63	M-v	2	Williams	36540	1998 SG ₅
1998 SQ ₆	14.6	0.15	19990810	92.61234	134.21942	177.44157	1.97724	0.0655529	2.9150125	34	3	1993–1999	0.72	M-v	5	Williams	36003	1998 SQ ₆
1998 SG ₁₀	13.8	0.15	19990810	276.85999	118.81422	60.64153	6.62296	0.1399673	2.3173984	67	4	1977–1999	0.71	M-v	2	Williams	36540	1998 SG ₁₀
1998 SF ₁₃	13.4	0.15	19990810	65.24239	240.27313	112.30581	5.34430	0.0916547	3.2008514	43	3	1993–1999	0.73	M-v	5	Williams	33017	1998 SF ₁₃
1998 SV ₁₄	14.0	0.15	19990810	226.33039	147.06240	93.73232	4.89996	0.0784853	2.2211322	64	3	1997–1999	0.61	M-v	3	Williams	35716	1998 SV ₁₄
1998 SY ₁₆	15.6	0.15	19980924	9.58735	275.84980	74.30836	0.82252	0.2166206	2.4708494	33	1	37 days	0.49			Williams		1998 SY ₁₆
1998 SN ₂₂	13.5	0.15	19990810	309.13313	309.68234	191.44913	13.05722	0.0992309	2.6852633	62	4	1992–1999	0.62	M-v	3	Williams	35716	1998 SN ₂₂
1998 SH ₂₃	13.1	0.15	19990810	88.84157	168.65105	142.74154	5.68966	0.2108163	3.1460332	122	4	1981–1999	0.67	M-v	2	Williams	35717	1998 SH ₂₃
1998 SH ₂₅	13.0	0.15	19990810	166.35222	207.99574	71.88547	6.33505	0.0210632	2.7412575	84	3	1997–1999	0.62	M-v	3	Williams	36540	1998 SH ₂₅
1998 SN ₂₅	13.6	0.15	19990810	353.75608	319.46322	140.00565	5.51580	0.0781482	2.7817031	37	3	1993–1999	0.58	M-v	3	Williams	33355	1998 SN ₂₅
1998 SG ₄₃	13.9	0.15	19990810	85.63696	288.53812	84.02032	3.60975	0.0293917	2.3244363	55	4	1991–1999	0.64	M-v	2	Williams	35717	1998 SG ₄₃
1998 SW ₄₃	12.6	0.15	19990810	28.09294	137.64280	240.75845	5.25803	0.1759413	3.9522375	64	3	1990–1999	0.61	M-v	3	Williams	35717	1998 SW ₄₃
1998 SN ₅₇	13.6	0.15	19990810	50.88420	327.99784	56.33495	2.18675	0.1609359	2.7775067	59	3	1975–1999	0.61	M-v	2	Williams	36540	1998 SN ₅₇
1998 SD ₅₈	12.8	0.15	19990810	331.86914	278.50369	178.79540	9.68798	0.0442966	3.0181510	73	3	1993–1999	0.67	M-v	3	Williams	36540	1998 SD ₅₈
1998 SE ₅₈	13.7	0.15	19990810	200.91517	227.39313	358.15107	2.19993	0.1273938	2.6586896	52	3	1990–1999	0.62	M-v	3	Williams	36540	1998 SE ₅₈
1998 SK ₅₈	14.2	0.15	19990810	316.95046	126.07336	9.23121	2.65900	0.1131239	2.5577215	40	7	1978–1999	0.66	M-v	2	Williams	34928	1998 SK ₅₈
1998 SP ₅₉	14.4	0.15	19990810	333.96744	1.10488	115.98749	3.01354	0.0536494	2.6027127	37	4	1971–1999	0.66	M-v	2	Williams	35718	1998 SP ₅₉
1998 SQ ₅₉	12.9	0.15	19990810	137.63527	177.85259	96.94758	2.43238	0.1546215	3.0979887	56	5	1976–1999	0.78	M-v	1	Williams	35718	1998 SQ ₅₉
1998 SG ₆₀	13.2	0.15	19990810	8.77233	333.34621	94.39266	2.52505	0.1677814	3.1991925	32	3	1981–1999	0.57	M-v	4	Williams	33034	1998 SG ₆₀
1998 SR ₆₀	13.0	0.15	19990810	154.24969	144.89943	109.89794	2.69668	0.1275572	3.1759493	70	6	1990–1999	0.68	M-v	1	Williams	34592	1998 SR ₆₀
1998 SK ₆₁	13.5	0.15	19990810	59.38358	42.62853	344.54780	11.75398	0.1344433	2.7234903	50	5	1980–1999	0.75	M-v	2	Williams	33758	1998 SK ₆₁
1998 SB ₆₃	12.7	0.15	19990810	9.19101	59.37552	23.00507	22.40354	0.0478456	2.6519835	77	4	1981–1999	0.73	M-v	1	Williams	34303	1998 SB ₆₃
1998 SM ₆₃	14.1	0.15	19990810	17.39268	116.71100	324.53815	5.68027	0.0617864	2.3037173	62	3	1991–1999	0.63	M-v	2	Williams	34303	1998 SM ₆₃
1998 SV ₆₅	13.5	0.15	19990810	250.90721	25.46185	187.20954	12.43302	0.1306708	2.4370776	44	4	1985–1999	0.64	M-v	3	Williams	34304	1998 SV ₆₅
1998 SK ₇₅	14.1	0.15	19990810	274.48215	57.32905	131.97860	4.96446	0.0739371	2.4570142	39	3	1996–1999	0.79	M-v	4	Williams	35718	1998 SK ₇₅
1998 SH ₇₉	14.2	0.15	19990810	110.47161	254.80853	76.60887	4.73198	0.1517237	2.2884245	37	3	1991–1999	0.64	M-v	3	Williams	35718	1998 SH ₇₉
1998 SM ₁₀₇	13.7	0.15	19990810	110.31036	356.05136	333.78249	2.67137	0.0968008	2.5721291	38	3	1994–1999	0.56	M-v	3	Williams	36540	1998 SM ₁₀₇
1998 SR ₁₁₁	13.5	0.15	19990810	333.33733	104.03977	16.98147	13.42930	0.1006200	2.6740527	56	3	1996–1999	0.62	M-v	3	Williams	34023	1998 SR ₁₁₁
1998 SN ₁₁₄	13.8	0.15	19990810	58.96862	260.35193	117.47871	3.66616	0.1764878	2.8779571	41	4	1978–1999	0.52	M-v	2	Williams	35719	1998 SN ₁₁₄
1998 SZ ₁₁₄	13.6	0.15	19990810	99.92035	250.36353	88.50098	1.43355	0.0626922	2.7326868	51	5	1992–1999	0.76	M-v	2	Williams	36540	1998 SZ ₁₁₄
1998 SM ₁₁₅	13.5	0.15	19990810	4.67313	110.69993	335.79616	0.39295	0.1870575	3.1391316	37	4	1976–1999	0.67	M-v	4	Williams	33285	1998 SM ₁₁₅
1998 SK ₁₁₉	13.0	0.15	19990810	353.83538	78.71448	22.42992	9.34899	0.1179817	2.7747603	51	5	1989–1999	0.79	M-v	1	Williams	35719	1998 SK ₁₁₉
1998 SY ₁₂₇	13.7	0.15	19990810	23.81364	268.59203	155.58689	5.75893	0.0555405	2.7689240	47	6	1989–1999	0.68	M-v	1	Williams	34929	1998 SY ₁₂₇
1998 SO ₁₂₉	13.4	0.15	19990810	58.86881	336.36069	45.27439	2.60907	0.0555740	2.9377451	56	3	1996–1999	0.63	M-v	3	Williams	36541	1998 SO ₁₂₉
1998 SR ₁₃₀	13.4	0.15	19990810	129.91566	97.52716	213.75432	5.63033	0.0519045	2.7763461	65	4	1975–1999	0.59	M-v	1	Williams	36541	1998 SR ₁₃₀
1998 SS ₁₃₀	14.5	0.15	19990810	214.88246	262.16874	344.34802	2.55102	0.1306445	2.2049691	26	3	1991–1999	0.58	M-v	4	Williams	34024	1998 SS ₁₃₀
1998 SG ₁₃₂	13.8	0.15	19990810	230.18621	255.59226	338.89736	5.42460	0.1293812	2.2469651	49	4	1990–1999	0.61	M-v	3	Williams	33362	1998 SG ₁₃₂
1998 SK ₁₃₂	13.8	0.15	19990810	294.82629	215.32091	315.73929	4.24345	0.0948977	2.5233858	37	3	1992–1999	0.85	M-v	4	Williams	33291	1998 SK ₁₃₂

1998 SF ₁₃₈	12.5	0.15	19990810	156.65273	233.48854	32.90890	1.23617	0.1385088	3.1573601	55	4	1995–1999	0.67	M-v	1	Williams	35720	1998 SF ₁₃₈
1998 SZ ₁₄₀	13.2	0.15	19990810	140.80659	82.30744	223.28392	1.74986	0.0086569	2.8571074	58	3	1993–1999	0.69	M-v	3	Williams	36541	1998 SZ ₁₄₀
1998 SF ₁₄₁	14.0	0.15	19990810	162.52840	260.64867	27.28041	1.65066	0.0624144	2.5690776	51	4	1992–1999	0.64	M-v	2	Williams	35720	1998 SF ₁₄₁
1998 SN ₁₄₅	15.1	0.15	19981014	45.82362	126.48655	190.17945	1.84316	0.2385628	2.3978874	22	1	52 days	0.81		D	Williams		1998 SN ₁₄₅
1998 SQ ₁₄₅	13.4	0.15	19990810	253.27328	17.49373	201.28446	6.37983	0.1206753	2.2490799	43	6	1981–1999	0.76	M-v	2	Williams	34536	1998 SQ ₁₄₅
1998 SE ₁₄₇	13.9	0.15	19990810	13.08082	9.27311	73.51835	1.40947	0.1294657	3.0850636	29	3	1989–1999	0.86	M-v	2	Williams	35720	1998 SE ₁₄₇
1998 SK ₁₅₇	13.7	0.15	19990810	151.36853	132.84508	131.27163	2.57052	0.1579187	3.0904960	22	3	1997–1999	0.66	M-v	5	Williams	36003	1998 SK ₁₅₇
1998 SZ ₁₆₃	13.5	0.15	19990810	317.40284	101.56823	55.37547	13.82815	0.1107674	2.5854166	39	4	1977–1999	0.78	M-v	2	Williams	35720	1998 SZ ₁₆₃
1998 SK ₁₆₄	12.9	0.15	19990810	283.72617	83.32669	104.08082	7.54791	0.1445134	2.6632241	29	3	1994–1999	0.72	M-v	4	Williams	33570	1998 SK ₁₆₄
1998 SM ₁₆₅	5.6	0.15	19990810	25.72098	129.20003	183.10680	13.45956	0.4049788	49.4771086	24	2	1998–1999	0.48	M-v	5	Williams	36379	1998 SM ₁₆₅
1998 TT ₅	12.8	0.15	19990810	328.27641	82.51845	62.30937	11.93157	0.2064806	3.1805328	29	3	1995–1999	0.58	M-v	3	Williams	33302	1998 TT ₅
1998 TV ₆	12.6	0.15	19990810	232.53367	3.17625	214.82035	15.59969	0.0459710	3.1854227	54	3	1981–1999	0.60	M-v	3	Williams	36541	1998 TV ₆
1998 TL ₁₅	11.6	0.15	19990810	340.45995	221.69428	219.69876	26.27042	0.0241966	5.2696089	42	4	1986–1999	0.65	M-v	1	Williams	36541	1998 TL ₁₅
1998 TG ₁₆	11.6	0.15	19990810	358.72957	227.35562	204.52827	11.79310	0.0937933	5.2720907	45	7	1951–1999	0.82	M-v	1	Williams	36085	1998 TG ₁₆
1998 TN ₃₃	13.7	0.15	19990810	69.59894	293.68781	89.97120	3.16659	0.0720124	2.8891755	28	3	1995–1999	0.51	M-v	4	Williams	34593	1998 TN ₃₃
1998 UE	13.9	0.15	19990810	327.33747	182.95397	319.82238	25.22546	0.1559798	2.3267980	20	3	1982–1999	0.72	M-v	3	Williams	33049	1998 UE
1998 UL	13.5	0.15	19990810	162.39742	329.60178	284.16831	9.32425	0.0681862	2.9661508	35	2	1998–1999	0.56	M-v	3	Williams	36004	1998 UL
1998 UP ₆	13.2	0.15	19990810	125.76385	299.87361	23.74429	17.56211	0.2554631	2.6024847	61	4	1981–1999	0.71	M-v	2	Williams	35722	1998 UP ₆
1998 UD ₈	12.9	0.15	19990810	169.39962	212.35982	77.50497	3.10328	0.0428629	2.8898567	53	4	1996–1999	0.69	M-v	1	Williams	35722	1998 UD ₈
1998 UF ₂₁	12.1	0.15	19990810	189.68849	223.49425	46.56989	11.40042	0.0656921	2.9993687	54	6	1982–1999	0.82	M-v	2	Williams	35636	1998 UF ₂₁
1998 UN ₂₃	13.1	0.15	19990810	37.17278	330.40683	99.93669	2.12535	0.1371363	3.1975852	57	5	1975–1999	0.65	M-v	1	Williams	35723	1998 UN ₂₃
1998 UA ₂₇	14.1	0.15	19990810	233.15547	133.71651	110.83625	4.66060	0.1414943	2.2261366	27	3	1991–1999	0.85	M-v	5	Williams	33574	1998 UA ₂₇
1998 VQ ₇	13.5	0.15	19990810	169.11255	212.61912	70.10293	7.36453	0.1031272	2.3749115	40	3	1990–1999	0.50	M-v	2	Williams	34308	1998 VQ ₇
1998 VD ₉	13.0	0.15	19990810	90.06857	138.43084	211.63786	16.40515	0.1259906	2.8889899	31	3	1993–1999	0.65	M-v	3	Williams	34595	1998 VD ₉
1998 VT ₁₀	13.5	0.15	19990810	208.75174	208.00192	53.18738	4.04109	0.1330340	2.1932141	40	7	1971–1999	0.53	M-v	1	Williams	35724	1998 VT ₁₀
1998 VM ₁₅	11.1	0.15	19990810	100.70947	88.57910	221.14475	6.33150	0.2029315	3.9918242	49	8	1957–1999	0.62	M-v	1	Williams	35724	1998 VM ₁₅
1998 VH ₂₆	13.6	0.15	19990810	250.17937	234.46639	337.61356	1.20351	0.0528238	2.9241598	34	4	1995–1999	0.79	M-v	2	Williams	36541	1998 VH ₂₆
1998 VL ₂₇	11.8	0.15	19990810	11.36523	130.08067	291.05447	3.35233	0.0523137	5.0945141	23	3	1996–1999	0.78	M-v	3	Williams	34596	1998 VL ₂₇
1998 VD ₃₀	10.6	0.15	19990810	345.89427	233.49623	225.43184	24.92381	0.1008565	5.2229854	34	3	1986–1999	0.71	M-v	4	Williams	35724	1998 VD ₃₀
1998 VO ₃₂	12.8	0.15	19990810	157.58857	3.50506	304.82592	9.55468	0.1470884	2.6443805	49	6	1970–1999	0.46	M-v	1	Williams	35638	1998 VO ₃₂
1998 VN ₃₃	13.0	0.15	19990810	3.86744	12.66325	109.98573	4.29498	0.0548010	3.0750475	47	5	1989–1999	0.72	M-v	1	Williams	33518	1998 VN ₃₃
1998 VP ₄₄	14.4	0.15	19990810	307.71986	75.49618	103.45414	10.16063	0.0777168	2.7523979	21	5	1950–1999	0.72	M-v	2	Williams	36004	1998 VP ₄₄
1998 WT	17.5	0.15	19990810	265.93153	324.33842	307.78988	3.20760	0.5696205	1.2181581	71	1	34 days	0.59	M-v	6	Williams	33577	1998 WT
1998 WX ₉	11.4	0.15	19990810	14.96695	336.16007	89.54300	4.91830	0.0666271	5.1411472	53	5	1992–1999	0.71	M-v	1	Williams	35726	1998 WX ₉
1998 WS ₁₆	13.6	0.15	19990810	166.35339	242.91849	59.36966	2.82022	0.0493138	2.8566938	41	3	1996–1999	0.71	M-v	3	Williams	35442	1998 WS ₁₆
1998 WA ₁₈	13.1	0.15	19990810	46.64702	129.25935	293.72666	4.90311	0.0682044	3.1075528	27	4	1992–1999	0.81	M-v	2	Williams	35726	1998 WA ₁₈
1998 WW ₁₉	13.4	0.15	19990810	95.57705	266.65178	96.50908	7.86077	0.0635659	3.1802003	51	6	1975–1999	0.55	M-v	1	Williams	35727	1998 WW ₁₉
1998 WX ₂₄	6.6	0.15	19990810	184.28022	169.76629	60.79767	0.91979	0.0347594	43.6083014	16	2	1998–1999	0.37	M-v	E	Marsden	36379	1998 WX ₂₄
1998 XS ₁₅	13.3	0.15	19990810	15.03342	32.75857	92.17012	4.58778	0.0827867	3.0256223	59	4	1991–1999	0.57	M-v	1	Williams	35728	1998 XS ₁₅
1998 XS ₁₆	16.4	0.15	19990810	5.28654	358.16927	273.06891	26.54915	0.4965344	1.2123574	145	3	1998–1999	0.56	M-v	3	Williams	36541	1998 XS ₁₆
1998 XZ ₄₃	13.6	0.15	19981213	347.19741	33.69299	68.98552	13.62459	0.0810470	2.8791227	37	1	36 days	0.86			Williams		1998 XZ ₄₃
1998 XK ₄₅	14.6	0.15	19981213	19.58993	97.07867	319.51272	3.79389	0.2515350	2.5828405	13	1	4 days	0.43			Williams		1998 XK ₄₅
1998 XC ₇₇	13.4	0.15	19981213	35.35122	175.53473	227.87714	2.36847	0.2218751	3.0178057	13	1	4 days	0.58			Williams		1998 XC ₇₇
1998 XG ₈₀	12.6	0.15	19990810	112.17085	232.21466	117.33546	15.55632	0.1523595	3.1619129	37	4	1991–1999	0.52	M-v	1	Williams	34312	1998 XG ₈₀
1998 XS ₉₆	17.1	0.15	19981213	27.62829	303.52704	110.52091	2.27044	0.2767411	2.1718330	10	1	35 days	0.21		D	Williams		1998 XS ₉₆
1998 XZ ₉₆	13.5	0.15	19990810	144.24897	253.91651	115.82605	13.63234	0.1090568	2.8685761	16	1	64 days	0.98	M-v	6 D	Williams		1998 XZ ₉₆
1998 YL ₁	12.3	0.15	19981123	160.43867	301.21089	320.42444	11.78004	0.1592481	2.6643038	70	1	39 days	1.02			Williams		1998 YL ₁
1998 YR ₂₂	15.8	0.15	19981213	35.69199	54.42971	333.51732	4.01374	0.2543506	2.3755371	19	1	3 days	0.85		E	Williams		1998 YR ₂₂
1998 YA ₂₇	14.3	0.15	19981213	76.28950	329.44135	28.84778	0.90617	0.0982617	2.5223311	11	1	3 days	0.96		E	Williams		1998 YA ₂₇
1999 CU ₃	16.9	0.15	19990810	356.40722	305.46245	339.28193	11.39989	0.5240963	1.5766094	141	2	1999–1999	0.54	M-v	3	Williams	36541	1999 CU ₃
1999 CF ₉	17.9	0.15	19990810	39.89276	89.49456	157.65314	5.54557	0.5986353	1.7732426	231	2	1999–1999	0.50	M-v	4	Williams	36541	1999 CF ₉
1999 DK ₃	17.3	0.15	19990810	14.91288	102.92949	149.97196	43.10527	0.4437409	2.1154590	97	1	259 days	0.61	M-v	3	Williams	36541	1999 DK ₃
1999 FQ ₃	13.0	0.15	19990810	84.97081	250.32089	148.73821	13.26948	0.1753814	2.5813976	47	4	1981–1999	0.62	M-v	2	Williams	35445	1999 FQ ₃

1999 GK ₄	16.1	0.15	19990810	352.03992	146.61029	168.46825	5.28137	0.4920438	1.9609840	293	3	1955–1999	0.57	M-v	1	Williams	36541	1999 GK ₄
1999 HX ₂	15.2	0.15	19990810	3.40189	148.90357	141.81784	16.45990	0.5543712	3.1771955	362	1	205 days	0.57	M-v	3	Williams	36542	1999 HX ₂
1999 JM ₈	15.1	0.15	19990810	3.72500	165.97269	134.13039	13.69299	0.6436756	2.7236138	388	3	1990–1999	0.59	M-v	0	Williams	36542	1999 JM ₈
1999 JN ₁₇	14.0	0.15	19990810	10.76711	79.14653	216.08389	4.27102	0.2080545	2.2359899	71	1	180 days	0.61	M-v	3	Williams	36542	1999 JN ₁₇
1999 JH ₈₁	13.3	0.15	19990810	11.42869	47.40290	238.70003	12.93124	0.1386897	2.5978166	40	1	177 days	0.68	M-v	3	Williams	36087	1999 JH ₈₁
1999 JK ₈₁	13.4	0.15	19990810	9.84815	132.25443	160.51284	8.87205	0.2395098	2.8061520	70	3	1990–1999	0.60	M-v	2	Williams	36543	1999 JK ₈₁
1999 JL ₈₁	14.0	0.15	19990810	337.91737	111.84614	247.51513	10.57447	0.3395538	2.5527207	71	3	1979–1999	0.65	M-v	3	Williams	36543	1999 JL ₈₁
1999 JM ₈₁	13.4	0.15	19990810	336.33801	70.02164	282.99909	12.22647	0.1911449	2.5937674	57	3	1987–1999	0.66	M-v	3	Williams	36543	1999 JM ₈₁
1999 KK ₁	18.2	0.15	19990810	352.85816	229.91888	76.93286	7.10855	0.4597838	2.1166326	36	1	171 days	0.58	M-v	4	Williams	36543	1999 KK ₁
1999 KF ₄	11.2	0.15	19990810	6.12635	54.08627	247.74263	23.45261	0.2866149	3.0917035	80	2	1972–1999	0.53	M-v	2	Williams	36543	1999 KF ₄
1999 KG ₄	14.1	0.15	19990810	10.38623	152.37593	146.26649	7.90576	0.2330264	2.3515762	82	3	1981–1999	0.69	M-v	2	Williams	36543	1999 KG ₄
1999 KQ ₄	13.4	0.15	19990810	350.54915	82.22697	261.43438	28.23760	0.3838127	2.7822009	88	1	172 days	0.52	M-v	3	Williams	36543	1999 KQ ₄
1999 KR ₄	14.3	0.15	19990810	0.04700	114.87141	209.51859	8.69849	0.2598116	2.3952018	87	5	1988–1999	0.53	M-v	1	Williams	36543	1999 KR ₄
1999 KX ₄	16.9	0.15	19990810	97.89817	76.23782	105.05718	16.57068	0.2929212	1.4574398	63	1	168 days	0.52	M-v	4	Williams	36543	1999 KX ₄
1999 KK ₆	13.7	0.15	19990810	326.23493	134.92247	220.00206	23.86564	0.0620060	1.8921546	66	4	1991–1999	0.52	M-v	2	Williams	36543	1999 KK ₆
1999 KL ₆	12.5	0.15	19990810	4.92456	92.32622	201.23671	21.08817	0.2854161	2.3694847	75	2	1992–1999	0.57	M-v	2	Williams	36543	1999 KL ₆
1999 KS ₇	12.9	0.15	19990810	52.42093	20.70115	242.46120	11.30106	0.0502398	2.5528682	79	2	1998–1999	0.59	M-v	3	Williams	36543	1999 KS ₇
1999 KM ₁₅	13.2	0.15	19990810	52.72637	5.26370	248.74124	11.03019	0.1173870	2.6056023	74	4	1985–1999	0.59	M-v	1	Williams	36543	1999 KM ₁₅
1999 LB ₆	14.5	0.15	19990810	261.70347	219.62875	190.59817	23.48168	0.0606822	1.8625066	43	2	1984–1999	0.54	M-v	4	Williams	35737	1999 LB ₆
1999 LF ₆	18.1	0.15	19990810	340.53178	140.61569	208.64258	18.93148	0.2804244	1.4086988	323	2	1979–1999	0.50	M-v	0	Williams	36380	1999 LF ₆
1999 LO ₇	14.5	0.15	19990810	335.59879	208.10008	140.99209	4.82766	0.2314867	2.2900612	68	2	1998–1999	0.73	M-v	3	Williams	36543	1999 LO ₇
1999 LU ₇	18.6	0.15	19990810	349.00451	146.77338	207.35867	10.73709	0.6279805	2.1018252	52	1	148 days	0.64	M-v	4	Williams	36088	1999 LU ₇
1999 LQ ₂₈	19.1	0.15	19990810	256.84657	320.42633	95.07854	21.77057	0.1201961	1.1985480	77	1	143 days	0.47	M-v	4	Williams	36544	1999 LQ ₂₈
1999 ML	17.6	0.15	19990810	2.68571	110.95175	211.78132	2.50798	0.4540097	2.2660244	244	1	141 days	0.56	M-v	3	Williams	36544	1999 ML
1999 MM	19.6	0.15	19990810	351.42686	268.43530	111.27757	4.76428	0.6108245	1.6235541	78	1	121 days	0.63	M-v	5	Williams	35474	1999 MM
1999 MV	16.0	0.15	19990810	329.26077	56.29754	296.96472	22.85521	0.1283866	1.8911370	33	2	1997–1999	0.58	M-v	3	Williams	35394	1999 MV
1999 MK ₁	14.6	0.15	19990810	353.10748	21.20139	308.31427	14.28680	0.1264081	2.5630973	45	1	140 days	0.51	M-v	3	Williams	36544	1999 MK ₁
1999 ML ₁	14.1	0.15	19990810	3.52199	11.18739	302.11335	12.89779	0.3112473	2.5806550	52	1	139 days	0.53	M-v	3	Williams	36544	1999 ML ₁
1999 MN ₁	14.9	0.15	19990810	348.11104	346.84835	353.06852	2.72515	0.2218062	2.4135617	74	1	141 days	0.52	M-v	4	Williams	36544	1999 MN ₁
1999 MV ₁	16.4	0.15	19990810	348.93211	254.83313	89.86895	1.44228	0.3003437	2.1778068	74	1	148 days	0.55	M-v	4	Williams	36544	1999 MV ₁
1999 NT	13.7	0.15	19990810	344.21706	35.78255	302.82577	8.43827	0.1973638	2.3946353	79	2	1998–1999	0.64	M-v	3	Williams	36544	1999 NT
1999 NT ₁	13.7	0.15	19990810	334.73302	90.79593	282.39417	21.36333	0.3189716	2.3054173	62	1	171 days	0.46	M-v	3	Williams	36544	1999 NT ₁
1999 NV ₁	15.1	0.15	19990810	15.48803	25.12124	291.49719	22.25519	0.1227774	2.3347455	26	1	114 days	0.55	M-v	4	Williams	36544	1999 NV ₁
1999 NW ₁	14.2	0.15	19990810	359.72670	23.43572	308.52196	24.56203	0.2328817	2.3486252	26	1	114 days	0.42	M-v	4	Williams	36544	1999 NW ₁
1999 NN ₂	14.2	0.15	19990810	324.16944	133.15636	260.99966	15.67167	0.2317079	3.1071785	31	1	116 days	0.48	M-v	4	Williams	36544	1999 NN ₂
1999 NO ₂	16.2	0.15	19990810	9.36635	40.11313	276.66577	7.03238	0.1819402	2.2484354	43	1	117 days	0.62	M-v	4	Williams	36544	1999 NO ₂
1999 NP ₂	14.8	0.15	19990810	3.70317	124.56107	200.44817	5.23305	0.1809692	2.2536931	86	2	1998–1999	0.66	M-v	3	Williams	36544	1999 NP ₂
1999 ND ₄	15.6	0.15	19990810	317.51476	322.40084	53.12636	0.23073	0.1981374	2.4164389	39	3	1977–1999	0.62	M-v	3	Williams	36544	1999 ND ₄
1999 NR ₄	13.3	0.15	19990810	335.00269	51.59170	286.89802	9.05892	0.1113642	2.9914047	60	3	1984–1999	0.54	M-v	2	Marsden	36381	1999 NR ₄
1999 NS ₄	14.9	0.15	19990810	26.54802	148.56387	148.47375	2.86841	0.1801306	2.4444623	74	2	1998–1999	0.65	M-v	4	Williams	36544	1999 NS ₄
1999 NT ₄	14.3	0.15	19990810	270.14915	97.07811	338.43647	2.20552	0.0794152	2.3762684	194	3	1976–1999	0.51	M-v	2	Williams	36544	1999 NT ₄
1999 NX ₄	14.9	0.15	19990810	339.71276	205.61510	154.38733	16.21533	0.2850029	2.8701996	66	1	118 days	0.61	M-v	3	Williams	36544	1999 NX ₄
1999 NZ ₄	17.5	0.15	19990810	0.71985	19.46195	297.76045	19.61129	0.4961874	2.8546777	127	1	97 days	0.44	M-v	3	Marsden	36544	1999 NZ ₄
1999 NV ₆	16.2	0.15	19990810	2.14192	63.64574	246.30516	0.48467	0.1795676	2.3976967	17	1	151 days	0.50	M-v	6	Williams		1999 NV ₆
1999 NJ ₇	13.9	0.15	19990810	264.79191	286.13103	129.82584	5.43173	0.0658358	2.5755149	50	3	1989–1999	0.64	M-v	3	Williams	36544	1999 NJ ₇
1999 NR ₈	14.3	0.15	19990810	330.50494	222.51483	136.30748	8.10651	0.1727221	2.4573908	50	2	1998–1999	0.57	M-v	3	Williams	36545	1999 NR ₈
1999 NT ₈	15.4	0.15	19990810	92.42208	40.17607	180.12251	1.20244	0.0305372	2.1920946	46	3	1996–1999	0.67	M-v	2	Williams	36545	1999 NT ₈
1999 ND ₉	13.7	0.15	19990810	260.28166	299.09117	118.31567	4.97214	0.0076229	2.3278206	46	4	1985–1999	0.69	M-v	2	Williams	36545	1999 ND ₉
1999 NM ₉	14.8	0.15	19990810	117.44386	353.59459	201.65334	1.20538	0.0526684	2.1902175	50	2	1996–1999	0.53	M-v	4	Williams	36545	1999 NM ₉
1999 NS ₉	13.3	0.15	19990810	69.98669	92.94150	145.23155	9.63230	0.1008875	2.7936054	64	3	1993–1999	0.62	M-v	2	Williams	36545	1999 NS ₉
1999 NA ₁₀	13.8	0.15	19990810	247.44831	137.05555	301.17739	0.98706	0.0583145	2.8503660	54	3	1995–1999	0.53	M-v	3	Williams	36545	1999 NA ₁₀
1999 NB ₁₀	14.6	0.15	19990810	326.88526	62.37220	309.75990	15.88381	0.2479920	2.6164804	51	2	1984–1999	0.47	M-v	3	Williams	36545	1999 NB ₁₀
1999 NR ₁₀	12.8	0.15	19990810	341.81120	34.33959	308.64672	8.51457	0.0929377	3.0631536	46	1	118 days	0.47	M-v	4	Williams	36545	1999 NR ₁₀

1999 NA ₁₁	13.5	0.15	19990810	287.07468	91.32490	320.91657	11.78719	0.1680902	2.6373014	58	1	118 days	0.60	M-v	4	Williams	36545	1999 NA ₁₁
1999 NG ₁₁	13.4	0.15	19990810	347.73631	276.23548	59.45202	2.93638	0.0601813	2.9171618	46	3	1995–1999	0.72	M-v	3	Williams	36545	1999 NG ₁₁
1999 NK ₁₁	15.1	0.15	19990810	21.27338	171.23259	121.94884	3.45526	0.1425905	2.3289976	35	1	143 days	0.52	M-v	4	Williams	36545	1999 NK ₁₁
1999 NR ₁₁	14.3	0.15	19990810	354.37902	37.71481	295.64861	5.91903	0.2821300	2.3833452	41	1	117 days	0.46	M-v	3	Williams	36545	1999 NR ₁₁
1999 NS ₁₁	15.1	0.15	19990810	330.13006	232.59910	147.00075	7.09061	0.3080224	2.3000266	61	4	1978–1999	0.62	M-v	2	Williams	36545	1999 NS ₁₁
1999 NV ₁₁	15.3	0.15	19990810	341.62283	52.54465	302.75941	4.50701	0.2641363	2.2948311	66	2	1992–1999	0.65	M-v	3	Williams	36545	1999 NV ₁₁
1999 NL ₃₁	14.4	0.15	19990810	30.10224	308.82986	314.70046	6.13853	0.2108102	2.3100859	59	4	1992–1999	0.60	M-v	2	Williams	36545	1999 NL ₃₁
1999 NW ₃₇	14.8	0.15	19990810	352.39436	245.23216	76.85108	2.92126	0.1182356	2.4021003	32	1	141 days	0.58	M-v	4	Williams	36545	1999 NW ₃₇
1999 NZ ₃₇	15.1	0.15	19990810	335.32536	41.61570	313.44707	9.89539	0.2536361	2.3359004	46	1	137 days	0.62	M-v	4	Williams	36545	1999 NZ ₃₇
1999 NB ₃₈	10.6	0.15	19990810	357.69284	356.44862	317.99887	25.25171	0.0827654	5.1560359	32	1	120 days	0.48	M-v	4	Williams	36545	1999 NB ₃₈
1999 NG ₃₈	14.5	0.15	19990810	26.05972	284.59452	353.87900	4.80258	0.1384013	2.3173071	32	1	119 days	0.52	M-v	4	Williams	36545	1999 NG ₃₈
1999 NL ₃₉	15.2	0.15	19990810	43.71507	284.56091	332.99346	4.09584	0.1429560	2.3115655	47	3	1996–1999	0.53	M-v	2	Williams	36546	1999 NL ₃₉
1999 NN ₃₉	14.4	0.15	19990810	260.18289	89.29502	339.11215	4.91692	0.1398058	2.3891544	37	2	1998–1999	0.67	M-v	4	Williams	36546	1999 NN ₃₉
1999 NP ₃₉	15.1	0.15	19990810	314.58973	35.63915	349.92986	4.70749	0.2581591	2.4294580	27	1	119 days	0.51	M-v	4	Williams		1999 NP ₃₉
1999 NX ₃₉	14.4	0.15	19990810	287.25378	51.19851	356.52702	5.82384	0.1800821	2.2773692	57	4	1977–1999	0.67	M-v	1	Williams	36546	1999 NX ₃₉
1999 NG ₄₁	14.8	0.15	19990810	311.61411	315.45515	74.00370	3.35326	0.2171332	2.3988938	46	2	1998–1999	0.67	M-v	3	Williams	36015	1999 NG ₄₁
1999 NJ ₄₁	13.9	0.15	19990810	311.72678	55.75488	330.00304	13.51885	0.1852658	2.6317995	72	1	119 days	0.52	M-v	4	Williams	36546	1999 NJ ₄₁
1999 NK ₄₁	14.6	0.15	19990810	336.63179	14.06400	337.17501	7.93479	0.1743365	2.3088724	58	5	1978–1999	0.74	M-v	3	Williams	36381	1999 NK ₄₁
1999 NV ₄₁	12.8	0.15	19990810	232.24020	104.70114	356.50857	7.78115	0.1394721	2.5333437	49	1	122 days	0.58	M-v	4	Williams	36546	1999 NV ₄₁
1999 NY ₄₁	13.3	0.15	19990810	324.17538	37.56573	334.33656	17.98798	0.1601587	3.1677335	58	1	117 days	0.51	M-v	4	Williams	36546	1999 NY ₄₁
1999 NC ₄₂	13.8	0.15	19990810	309.80949	276.30568	119.17685	13.55784	0.1893299	2.5806659	24	1	122 days	0.62	M-v	5	Williams	36546	1999 NC ₄₂
1999 NX ₄₂	15.1	0.15	19990810	316.31742	28.11133	342.26829	7.68287	0.1334352	2.4126533	64	2	1998–1999	0.66	M-v	3	Williams	36546	1999 NX ₄₂
1999 NC ₄₃	15.9	0.15	19990810	292.72755	120.27465	312.04170	7.11409	0.5795654	1.7592477	61	1	152 days	0.49	M-v	4	Williams	36546	1999 NC ₄₃
1999 ND ₄₃	19.1	0.15	19990810	326.39866	51.70697	332.34107	5.56062	0.3144505	1.5236263	390	1	110 days	0.53	M-v	4	Williams	36546	1999 ND ₄₃
1999 NF ₄₉	14.4	0.15	19990810	322.86547	80.73339	295.70083	20.90845	0.2942614	2.4553796	24	1	146 days	0.42	M-v	3	Williams	36091	1999 NF ₄₉
1999 NK ₄₉	14.5	0.15	19990810	341.44889	138.52162	199.46852	5.66476	0.1610710	2.4116525	28	1	118 days	0.38	M-v	4	Williams	36546	1999 NK ₄₉
1999 NZ ₅₂	12.4	0.15	19990810	289.93690	160.19228	236.91937	16.37383	0.1292048	3.1474014	49	2	1998–1999	0.50	M-v	3	Williams	36546	1999 NZ ₅₂
1999 NG ₅₃	14.1	0.15	19990810	4.48827	57.57504	250.99279	12.46751	0.1824923	2.5927527	38	1	171 days	0.58	M-v	3	Williams	36546	1999 NG ₅₃
1999 NJ ₅₄	14.0	0.15	19990810	297.23304	195.91244	205.90174	13.28805	0.1759274	2.6620928	52	4	1993–1999	0.66	M-v	3	Williams	36546	1999 NJ ₅₄
1999 NX ₅₄	12.9	0.15	19990810	334.92320	187.23053	159.00697	25.12036	0.0264365	2.7147605	60	1	174 days	0.49	M-v	3	Williams	36546	1999 NX ₅₄
1999 NC ₅₅	12.8	0.15	19990810	354.09993	89.88947	241.71670	13.15280	0.1684054	3.2026725	66	2	1998–1999	0.61	M-v	3	Williams	36546	1999 NC ₅₅
1999 NE ₅₅	13.3	0.15	19990810	319.31591	106.58964	268.00954	20.54515	0.0913032	3.1579043	31	1	116 days	0.44	M-v	4	Williams	36546	1999 NE ₅₅
1999 NF ₅₅	13.8	0.15	19990810	309.58665	128.31311	259.00048	14.06129	0.1327622	2.5273359	40	3	1989–1999	0.47	M-v	3	Williams	36546	1999 NF ₅₅
1999 NG ₅₅	14.1	0.15	19990810	311.63643	128.35902	256.75178	13.76123	0.1342581	2.6411545	29	1	117 days	0.54	M-v	4	Williams	36547	1999 NG ₅₅
1999 NK ₅₅	13.0	0.15	19990810	313.93226	93.85141	299.67536	27.70800	0.2164355	3.2057963	28	1	116 days	0.41	M-v	5	Williams	36092	1999 NK ₅₅
1999 NL ₅₅	13.7	0.15	19990810	46.91694	359.41612	264.95084	14.36779	0.1364545	3.0986863	26	1	117 days	0.51	M-v	4	Williams	36547	1999 NL ₅₅
1999 NN ₅₅	14.2	0.15	19990810	36.20553	39.76418	243.99764	13.20178	0.0589727	2.5722426	30	1	117 days	0.55	M-v	4	Williams	36547	1999 NN ₅₅
1999 NU ₅₅	14.0	0.15	19990810	299.29035	150.39839	256.45655	10.77342	0.1835043	2.6946510	32	1	117 days	0.40	M-v	4	Williams	36547	1999 NU ₅₅
1999 NW ₅₅	14.5	0.15	19990810	15.41198	40.65296	264.40060	11.76649	0.1335525	2.6317978	29	1	117 days	0.41	M-v	4	Williams	36092	1999 NW ₅₅
1999 NA ₅₆	14.5	0.15	19990810	311.09613	164.82289	229.53029	12.53921	0.1920339	2.6178253	34	1	117 days	0.50	M-v	4	Williams	36547	1999 NA ₅₆
1999 ND ₅₆	13.7	0.15	19990810	22.34467	69.52740	224.61065	15.47822	0.1990051	3.0452925	45	2	1998–1999	0.58	M-v	3	Williams	36547	1999 ND ₅₆
1999 NE ₅₆	14.8	0.15	19990810	325.58575	106.61385	270.00476	12.19255	0.1970725	2.6067103	28	1	117 days	0.37	M-v	4	Williams	36547	1999 NE ₅₆
1999 NF ₅₆	13.7	0.15	19990810	332.81603	88.19918	272.13257	13.11892	0.1053089	2.6172732	31	1	117 days	0.43	M-v	4	Williams	36547	1999 NF ₅₆
1999 NK ₅₆	12.6	0.15	19990810	48.00038	2.51509	264.70249	12.06220	0.1336533	2.6398765	66	3	1989–1999	0.65	M-v	2	Williams	36547	1999 NK ₅₆
1999 NM ₅₆	14.5	0.15	19990810	324.67429	118.14866	265.05933	12.36501	0.2175120	2.7155321	39	1	117 days	0.45	M-v	4	Williams	36547	1999 NM ₅₆
1999 NR ₅₆	14.0	0.15	19990810	2.61997	59.38072	268.29861	11.17427	0.1495860	3.1332134	36	1	117 days	0.63	M-v	3	Williams	36547	1999 NR ₅₆
1999 NS ₅₆	13.7	0.15	19990810	337.92034	119.03594	243.00589	13.77333	0.1316443	2.6136098	36	1	116 days	0.40	M-v	3	Williams	36547	1999 NS ₅₆
1999 NT ₅₆	15.2	0.15	19990810	1.91366	88.30995	241.52158	12.04202	0.1894808	2.6185748	43	1	109 days	0.55	M-v	3	Williams	36547	1999 NT ₅₆
1999 NU ₅₆	13.8	0.15	19990810	25.03231	56.49734	244.21720	12.10209	0.1380597	2.6641902	49	3	1978–1999	0.62	M-v	2	Williams	36547	1999 NU ₅₆
1999 NV ₅₆	15.4	0.15	19990810	342.28111	98.61132	262.24003	9.52797	0.2299344	2.7956633	34	1	117 days	0.68	M-v	4	Williams	36547	1999 NV ₅₆
1999 NW ₅₆	14.8	0.15	19990810	318.83549	114.56250	276.24410	11.11117	0.1872518	2.6483233	34	1	117 days	0.53	M-v	4	Williams	36547	1999 NW ₅₆
1999 NX ₅₆	14.4	0.15	19990810	50.29300	346.67442	282.66385	13.39846	0.1370877	2.5466961	40	1	117 days	0.55	M-v	4	Williams	36547	1999 NX ₅₆
1999 NY ₅₆	14.6	0.15	19990810	348.66467	119.97587	229.28633	10.49143	0.1544653	2.7111285	52	2	1998–1999	0.59	M-v	3	Williams	36547	1999 NY ₅₆

1999 NZ ₅₆	14.7	0.15	19990810	355.01334	132.33906	209.40904	14.43826	0.2180859	2.6406803	25	1	117 days	0.44	M-v	3	Williams	36547	1999 NZ ₅₆
1999 NA ₅₇	14.5	0.15	19990810	49.93563	35.96258	236.70340	13.13638	0.1331588	2.5833125	60	2	1998–1999	0.53	M-v	3	Williams	36547	1999 NA ₅₇
1999 NB ₅₇	14.2	0.15	19990810	284.40434	177.40460	261.09250	11.51467	0.2297139	2.5999898	36	1	123 days	0.63	M-v	4	Williams	36547	1999 NB ₅₇
1999 NC ₅₇	12.6	0.15	19990810	324.34164	116.83683	262.89877	10.35897	0.1056929	3.0313219	66	3	1984–1999	0.69	M-v	3	Williams	36547	1999 NC ₅₇
1999 ND ₅₇	13.9	0.15	19990810	338.31124	116.00263	244.60432	10.74159	0.0329795	2.6788104	59	3	1976–1999	0.63	M-v	3	Williams	36547	1999 ND ₅₇
1999 NF ₅₇	14.1	0.15	19990810	59.41722	14.93419	240.69209	11.32775	0.2055510	2.6650798	70	2	1998–1999	0.63	M-v	3	Williams	36547	1999 NF ₅₇
1999 NH ₅₇	15.0	0.15	19990810	341.99074	85.41605	276.17911	11.53773	0.1653455	2.6520370	27	1	116 days	0.55	M-v	4	Williams	36547	1999 NH ₅₇
1999 NR ₅₉	13.0	0.15	19990810	322.92128	83.13916	278.50736	20.42547	0.1041036	3.1788368	36	1	169 days	0.62	M-v	4	Williams	36092	1999 NR ₅₉
1999 NJ ₆₂	13.9	0.15	19990810	344.71619	102.04459	231.86682	8.37063	0.2068578	2.7354151	44	3	1995–1999	0.58	M-v	3	Williams	36547	1999 NJ ₆₂
1999 OB	14.6	0.15	19990810	330.97385	189.82372	164.86937	4.41217	0.1364916	2.2823561	97	2	1998–1999	0.67	M-v	3	Williams	36547	1999 OB
1999 OC	14.1	0.15	19990810	340.95284	195.12524	146.09196	11.43655	0.1226957	2.6397644	79	2	1998–1999	0.60	M-v	3	Williams	36547	1999 OC
1999 OF	15.9	0.15	19990810	70.42370	293.34655	291.65439	1.49415	0.1625514	2.3780915	28	2	1997–1999	0.64	M-v	4	Williams	35667	1999 OF
1999 OL	14.1	0.15	19990810	344.87938	354.06058	346.22624	7.03217	0.1505191	2.7345703	69	3	1997–1999	0.55	M-v	3	Williams	36547	1999 OL
1999 OO	13.9	0.15	19990810	7.92315	18.91459	275.84371	5.87471	0.1180080	2.3859320	49	2	1998–1999	0.46	M-v	3	Williams	36547	1999 OO
1999 OW	15.0	0.15	19990810	347.44884	172.60184	163.09468	6.49939	0.3149337	2.5791604	82	2	1995–1999	0.55	M-v	2	Williams	36547	1999 OW
1999 OB ₁	15.0	0.15	19990810	34.07887	49.81887	233.01971	6.07482	0.1221621	2.3003291	51	3	1992–1999	0.56	M-v	2	Williams	36547	1999 OB ₁
1999 OB ₂	14.9	0.15	19990810	20.64542	79.68788	236.41011	14.15966	0.2609086	2.8690126	31	1	105 days	0.52	M-v	4	Williams	36548	1999 OB ₂
1999 OD ₂	14.0	0.15	19990810	14.63947	96.43365	235.25888	14.85838	0.2427095	3.0636903	41	1	105 days	0.38	M-v	4	Williams	36548	1999 OD ₂
1999 OE ₂	12.7	0.15	19990810	126.34590	342.81691	247.15439	15.27987	0.0554927	3.1875309	36	1	113 days	0.49	M-v	4	Williams	36548	1999 OE ₂
1999 OJ ₂	12.8	0.15	19990810	213.46194	255.94970	259.29998	12.40579	0.1054401	2.5898867	60	3	1987–1999	0.47	M-v	2	Williams	36548	1999 OJ ₂
1999 OL ₂	13.6	0.15	19990810	298.01576	139.96897	314.92402	23.53526	0.2831965	2.3712509	27	1	102 days	0.47	M-v	4	Williams	36548	1999 OL ₂
1999 OM ₂	14.0	0.15	19990810	141.39886	291.27174	281.87808	17.99007	0.0590547	1.9419426	27	1	85 days	0.50	M-v	4	Williams	36548	1999 OM ₂
1999 OW ₂	12.4	0.15	19990810	325.71759	100.04855	313.50949	21.17370	0.1535560	2.6160618	47	3	1986–1999	0.51	M-v	2	Williams	36381	1999 OW ₂
1999 OY ₂	14.6	0.15	19990810	13.46437	109.62191	223.95955	24.07503	0.3715652	3.1335133	17	1	105 days	0.56	M-v	5	Williams		1999 OY ₂
1999 OB ₃	12.3	0.15	19990810	18.58565	93.23803	256.46500	12.25487	0.0980310	2.9892959	46	3	1989–1999	0.66	M-v	2	Williams	36382	1999 OB ₃
1999 OK ₃	14.0	0.15	19990810	46.89810	311.27570	315.56531	8.87978	0.1393258	2.6389391	52	2	1998–1999	0.61	M-v	3	Williams	36093	1999 OK ₃
1999 OO ₃	14.7	0.15	19990810	351.06579	128.86838	232.76905	11.93733	0.2211816	2.5280718	47	1	113 days	0.47	M-v	3	Williams	36548	1999 OO ₃
1999 OP ₃	14.4	0.15	19990810	41.65230	271.09125	311.82745	27.57498	0.6112306	2.7093721	135	2	1990–1999	0.56	M-v	3	Marsden	36548	1999 OP ₃
1999 OQ ₃	19.9	0.15	19990810	4.98630	164.24594	148.09925	9.14903	0.4239256	1.8969744	48	1	86 days	0.51	M-v	4	Williams	36548	1999 OQ ₃
1999 OR ₃	17.8	0.15	19990810	26.27466	27.19059	200.43356	9.52010	0.5792662	2.0322358	123	1	70 days	0.56	M-v	4	Marsden	36548	1999 OR ₃
1999 OS ₃	15.0	0.15	19990810	17.84400	281.98403	6.27098	5.60186	0.1913085	2.2848964	55	1	172 days	0.58	M-v	4	Williams	36548	1999 OS ₃
1999 OW ₃	14.6	0.15	19990810	67.65435	34.93554	196.88435	35.52792	0.7792393	2.0885700	48	1	118 days	0.52	M-v	4	Williams	36548	1999 OW ₃
1999 OY ₃	6.8	0.15	19990810	0.07637	0.94555	301.81590	23.77114	0.1233798	44.2167072	9	1	52 days	0.26		E	Marsden		1999 OY ₃
1999 OG ₄	7.8	0.15	19990721	179.95298	17.24164	116.76180	1.84917	0.0378428	45.6658281	7	1	20 days	0.17		E	Marsden		1999 OG ₄
1999 OH ₄	8.1	0.15	19990721	0.00926	179.06618	124.25132	26.36511	0.1357046	44.5455671	6	1	24 days	0.10		E	Marsden		1999 OH ₄
1999 OJ ₄	7.2	0.15	19990721	0.00971	187.78511	127.05723	3.77398	0.1010221	42.1116679	5	1	24 days	0.04		E	Marsden		1999 OJ ₄
1999 OK ₄	7.7	0.15	19990721	0.00000	180.87865	122.33977	28.41863	0.0000000	44.8581633	9	1	21 days	0.10		E	Marsden		1999 OK ₄
1999 OL ₄	7.9	0.15	19990721	0.00000	6.70911	295.73945	8.21583	0.0000000	41.6082201	6	1	23 days	0.17		E	Marsden		1999 OL ₄
1999 OM ₄	7.2	0.15	19990721	0.00000	201.39601	114.60499	2.16239	0.0000000	43.7304275	5	1	23 days	0.10		E	Marsden		1999 OM ₄
1999 ON ₄	7.9	0.15	19990721	0.00547	182.17175	133.00053	3.09442	0.1072471	45.5408574	6	1	23 days	0.13		E	Marsden		1999 ON ₄
1999 OO ₄	8.0	0.15	19990721	359.99959	9.52210	294.55611	6.46513	0.1113346	44.6805456	6	1	19 days	0.10		E	Marsden		1999 OO ₄
1999 PE	15.8	0.15	19990810	328.75972	230.59376	142.76566	6.94587	0.1244088	2.2977855	40	1	97 days	0.51	M-v	4	Williams	36548	1999 PE
1999 PF	16.2	0.15	19990810	343.05061	220.64261	137.32123	6.79105	0.1978397	2.2453523	41	1	98 days	0.50	M-v	4	Williams	36548	1999 PF
1999 PL	15.5	0.15	19990810	327.87015	135.62019	262.89690	14.79483	0.2938995	2.5878382	78	1	92 days	0.59	M-v	4	Williams	36548	1999 PL
1999 PV	13.4	0.15	19990810	167.25104	352.45465	158.62377	14.13918	0.1115288	2.5706690	98	2	1998–1999	0.55	M-v	3	Williams	36548	1999 PV
1999 PY	14.4	0.15	19990810	26.19259	292.87266	49.03061	6.30161	0.1246574	2.2345159	115	2	1998–1999	0.55	M-v	4	Williams	36548	1999 PY
1999 PZ	14.3	0.15	19990810	348.17581	176.37621	157.28362	7.23809	0.2381217	2.3075962	63	1	173 days	0.55	M-v	3	Williams	36548	1999 PZ
1999 PB ₁	15.5	0.15	19990810	5.37821	209.57816	139.24723	3.92315	0.2306146	2.5637055	40	1	90 days	0.42	M-v	4	Williams	36548	1999 PB ₁
1999 PC ₁	13.3	0.15	19990810	79.72108	7.33781	293.61774	13.38041	0.1774675	2.6463069	39	2	1998–1999	0.55	M-v	4	Williams	36548	1999 PC ₁
1999 PP ₁	14.0	0.15	19990810	305.45675	40.92544	9.50923	9.97545	0.1088747	3.0592953	46	1	84 days	0.46	M-v	4	Williams		1999 PP ₁
1999 PR ₁	14.9	0.15	19990810	333.15936	353.61881	11.05575	2.18079	0.0745793	2.4383863	87	2	1998–1999	0.55	M-v	4	Williams	36548	1999 PR ₁
1999 PU ₁	14.2	0.15	19990810	298.71622	57.46001	346.45527	9.73781	0.0626690	3.0072796	43	1	80 days	0.56	M-v	5	Williams	36548	1999 PU ₁
1999 PX ₁	14.5	0.15	19990810	0.70313	204.78039	130.48203	9.24165	0.2242202	2.7106472	56	4	1990–1999	0.69	M-v	2	Williams	36548	1999 PX ₁

1999 PA ₂	16.1	0.15	19990810	52.17157	260.77402	4.22705	2.52976	0.1540016	2.1566337	55	4	1992–1999	0.46	M-v	1	Williams	36548	1999 PA ₂
1999 PH ₃	16.0	0.15	19990810	346.37966	65.40265	286.74699	6.04390	0.2885918	2.7580176	36	1	81 days	0.53	M-v	4	Williams	36549	1999 PH ₃
1999 PN ₃	14.3	0.15	19990810	9.65605	36.63039	264.61122	9.10203	0.2043733	2.3503234	60	1	199 days	0.62	M-v	3	Williams	36549	1999 PN ₃
1999 PB ₄	14.6	0.15	19990810	350.46909	247.90843	107.68954	3.04151	0.2164128	3.1556579	60	2	1993–1999	0.59	M-v	3	Williams	36549	1999 PB ₄
1999 PD ₄	14.6	0.15	19990810	322.19207	262.90743	124.80036	5.81958	0.0997520	2.7681649	34	1	91 days	0.51	M-v	4	Williams		1999 PD ₄
1999 PE ₄	15.7	0.15	19990810	343.84452	231.35915	137.59203	8.12456	0.2722970	3.0102025	26	1	91 days	0.66	M-v	4	Williams		1999 PE ₄
1999 PH ₄	15.0	0.15	19990810	342.82099	238.53677	129.64670	5.56769	0.2000520	3.1148341	38	1	91 days	0.60	M-v	4	Williams		1999 PH ₄
1999 PK ₄	14.0	0.15	19990810	12.29858	188.02839	126.09078	10.90500	0.1571385	3.0800607	39	1	79 days	0.79	M-v	4	Williams		1999 PK ₄
1999 PO ₄	14.6	0.15	19990810	342.47994	20.47891	349.35270	19.23660	0.3055984	2.5648301	86	1	86 days	0.37	M-v	3	Williams		1999 PO ₄
1999 PP ₄	13.1	0.15	19990810	13.02053	296.91113	33.05103	6.57743	0.0778316	3.1895073	41	1	75 days	0.45	M-v	4	Williams		1999 PP ₄
1999 PT ₄	13.9	0.15	19990810	222.77439	216.10261	263.96296	2.62879	0.0109958	2.3887467	91	3	1981–1999	0.62	M-v	2	Williams	36549	1999 PT ₄
1999 PB ₅	13.5	0.15	19990810	350.23919	354.88002	24.56708	11.47894	0.0804227	3.2364230	57	1	94 days	0.49	M-v	4	Williams	36549	1999 PB ₅
1999 PS ₅	15.6	0.15	19990810	328.60557	235.11210	159.01948	6.81464	0.3445731	2.5981994	62	2	1978–1999	0.72	M-v	4	Williams	36382	1999 PS ₅
1999 QA	14.8	0.15	19990810	36.13900	130.14582	168.78548	7.18675	0.1063644	2.3980752	80	1	95 days	0.62	M-v	4	Williams	36549	1999 QA
1999 QC	15.3	0.15	19990810	26.12356	142.19376	141.67003	10.00175	0.2387129	2.3456372	40	1	117 days	0.55	M-v	4	Williams	36549	1999 QC
1999 QH	14.8	0.15	19990810	15.69623	283.48168	23.08503	5.80187	0.1491265	2.2357028	41	1	78 days	0.45	M-v	4	Nakano		1999 QH
1999 QJ	17.4	0.15	19990810	346.48194	14.98757	344.29892	32.05511	0.4404638	2.4274262	181	1	77 days	0.53	M-v	4	Williams	36549	1999 QJ
1999 QT ₁	14.2	0.15	19990810	280.74439	130.89969	316.16615	11.81574	0.1435256	2.6314707	53	1	105 days	0.58	M-v	4	Williams	36549	1999 QT ₁
1999 QU ₁	15.5	0.15	19990810	339.27919	80.45565	297.01461	5.40166	0.2691443	2.3772685	49	1	105 days	0.48	M-v	3	Williams	36549	1999 QU ₁
1999 QV ₁	15.9	0.15	19990810	343.88200	207.95628	167.80871	6.97286	0.3652270	2.6045671	91	1	107 days	0.50	M-v	3	Williams	36549	1999 QV ₁
1999 QZ ₁	14.5	0.15	19990810	298.77951	238.29828	192.38178	4.78336	0.0438973	2.7371962	76	3	1994–1999	0.67	M-v	3	Williams	36382	1999 QZ ₁
1999 QA ₂	14.1	0.15	19990810	320.65357	271.43046	125.62973	13.28035	0.1874531	3.0355347	31	3	1994–1999	0.43	M-v	3	Williams	36549	1999 QA ₂
1999 QB ₂	13.8	0.15	19990810	353.13126	43.63720	305.69589	6.75507	0.2339105	2.7960632	68	1	106 days	0.50	M-v	3	Williams	36549	1999 QB ₂
1999 QJ ₂	14.6	0.15	19990810	34.97090	123.18207	164.67436	13.93865	0.2379844	2.6730390	64	1	76 days	0.59	M-v	4	Williams	36549	1999 QJ ₂
1999 QL ₂	16.0	0.15	19990919	355.16781	173.48020	168.63929	11.36192	0.1742212	2.6403020	29	1	45 days	0.45			Williams		1999 QL ₂
1999 QM ₂	15.4	0.15	19990810	279.44116	78.90040	355.38153	4.47957	0.1597721	2.4392146	45	1	61 days	0.38	M-v	5	Williams		1999 QM ₂
1999 QQ ₂	14.4	0.15	19990810	313.84096	56.99930	345.11509	13.20234	0.2055019	2.5907810	204	1	111 days	0.39	M-v	3	Williams	36549	1999 QQ ₂
1999 RA	15.0	0.15	19990810	348.21356	166.49367	166.25466	5.61533	0.2493172	2.3601885	93	1	173 days	0.54	M-v	3	Williams	36550	1999 RA
1999 RB	13.7	0.15	19990810	293.71845	263.65371	159.54062	12.27010	0.1857477	2.8559879	85	2	1998–1999	0.52	M-v	3	Williams	36550	1999 RB
1999 RC	13.9	0.15	19990810	7.14931	356.08481	344.81477	13.04680	0.1695208	2.5449066	77	4	1993–1999	0.50	M-v	2	Williams	36550	1999 RC
1999 RE	15.5	0.15	19990810	15.21951	300.97195	23.88701	12.08345	0.3080444	2.6453728	42	1	62 days	0.50	M-v	4	Williams		1999 RE
1999 RG	15.8	0.15	19990919	327.29147	269.29004	113.79130	4.82266	0.2099155	2.2917305	28	1	58 days	0.39			Marsden		1999 RG
1999 RL	14.8	0.15	19990919	295.24758	352.08647	66.69387	3.25890	0.0820654	2.9116932	33	1	59 days	0.60			Marsden		1999 RL
1999 RM	13.8	0.15	19990810	28.93460	148.82325	171.22189	9.28768	0.1312925	3.0598686	66	2	1998–1999	0.61	M-v	3	Williams	36550	1999 RM
1999 RN	15.8	0.15	19990810	298.09899	68.71137	351.62478	3.71479	0.1198616	2.3346735	56	1	69 days	0.50	M-v	4	Williams		1999 RN
1999 RR	14.3	0.15	19990919	306.87236	334.86066	85.64634	6.99561	0.1769693	3.1341255	26	1	58 days	0.67			Williams		1999 RR
1999 RS	13.6	0.15	19990919	299.53365	282.43301	162.22502	9.73911	0.0691980	3.1769968	31	1	59 days	0.60			Williams		1999 RS
1999 RU	16.1	0.15	19990810	337.74272	209.95255	153.68652	4.84209	0.1863530	2.3229960	58	1	82 days	0.61	M-v	4	Williams		1999 RU
1999 RE ₁	13.6	0.15	19990810	116.05291	285.82794	305.01146	14.16451	0.0783380	2.6055870	80	5	1990–1999	0.54	M-v	1	Williams	36550	1999 RE ₁
1999 RG ₁	14.5	0.15	19990919	271.90528	69.87943	29.97641	9.58928	0.2066378	2.6160266	32	1	57 days	0.47			Williams		1999 RG ₁
1999 RK ₁	17.5	0.15	19990919	343.73955	44.50261	358.99057	28.44367	0.2967050	2.2281253	28	1	57 days	0.45			Williams		1999 RK ₁
1999 RL ₁	17.7	0.15	19990919	2.56666	23.65631	342.73171	5.54539	0.3400574	2.4571561	23	1	59 days	0.80			Williams		1999 RL ₁
1999 RN ₁	16.0	0.15	19990810	309.73254	132.90134	278.90835	1.44646	0.1990579	2.4319606	49	1	69 days	0.61	M-v	5	Williams		1999 RN ₁
1999 RR ₁	15.5	0.15	19990810	96.24845	287.06758	309.47111	2.86986	0.1253493	2.2720374	28	2	1984–1999	0.42	M-v	5	Williams	36383	1999 RR ₁
1999 RS ₁	15.2	0.15	19990810	274.80181	103.94163	341.26503	3.87720	0.1235607	2.2568616	71	1	94 days	0.56	M-v	4	Williams	36550	1999 RS ₁
1999 RT ₁	13.6	0.15	19990810	346.65765	11.68191	351.57502	15.11777	0.1799255	2.5957464	81	3	1995–1999	0.46	M-v	2	Marsden	36550	1999 RT ₁
1999 RU ₁	16.3	0.15	19990810	345.47137	225.67830	137.40106	0.49124	0.2215009	2.3538941	43	2	1997–1999	0.69	M-v	4	Williams	36383	1999 RU ₁
1999 RV ₁	15.7	0.15	19990919	339.29056	221.51549	171.19256	10.53976	0.2585567	2.7751237	38	1	33 days	1.00			Williams		1999 RV ₁
1999 RW ₁	14.6	0.15	19990810	342.37058	5.02488	6.50515	1.95629	0.2240161	2.6912824	94	3	1990–1999	0.57	M-v	2	Williams	36384	1999 RW ₁
1999 RX ₁	15.8	0.15	19990810	8.62573	346.99253	347.27382	2.12040	0.2096008	2.4396997	59	1	82 days	0.52	M-v	4	Williams		1999 RX ₁
1999 RZ ₁	15.3	0.15	19990810	336.59360	18.81759	5.29328	0.91924	0.1982636	2.4188988	79	3	1995–1999	0.55	M-v	3	Williams	36550	1999 RZ ₁
1999 RA ₂	15.9	0.15	19990810	5.17362	167.95742	170.39831	3.32910	0.1780339	2.1769498	86	2	1998–1999	0.63	M-v	4	Williams	36550	1999 RA ₂
1999 RC ₂	16.3	0.15	19990810	8.96245	347.69632	331.01429	24.51722	0.1484872	1.6192491	59	1	74 days	0.48	M-v	4	Marsden	36550	1999 RC ₂

1999 RD ₂	12.3	0.15	19990810	278.52320	113.17313	23.52254	32.71616	0.3194498	2.7977515	64	1	66 days	0.39	M-v	4	Williams	1999 RD ₂
1999 RE ₂	14.8	0.15	19990810	331.98191	215.91941	192.47598	8.47007	0.2444780	2.3785417	36	1	69 days	0.57	M-v	4	Williams	1999 RE ₂
1999 RR ₂	12.5	0.15	19990810	292.05874	173.65868	259.52052	17.32511	0.1700331	3.1389585	31	1	66 days	0.34	M-v	4	Williams	1999 RR ₂
1999 RU ₂	20.0	0.15	19990810	345.23767	202.72889	179.69852	5.44928	0.5599273	2.8066105	125	1	61 days	0.54	M-v	5	Williams	36550 1999 RU ₂
1999 RV ₂	18.6	0.15	19990810	345.36788	42.84398	335.61713	4.85742	0.5091786	2.4380709	150	1	64 days	0.53	M-v	5	Williams	36550 1999 RV ₂
1999 RZ ₂	14.2	0.15	19990810	306.66261	98.15173	319.58356	0.97626	0.0796094	2.8682681	58	2	1997–1999	0.59	M-v	4	Williams	36384 1999 RZ ₂
1999 RA ₃	15.5	0.15	19990919	310.40428	238.51064	191.10747	2.39781	0.1575700	2.4192884	44	1	58 days	0.64			Williams	1999 RA ₃
1999 RB ₃	15.0	0.15	19990810	162.80036	197.56839	352.68678	4.46623	0.0517023	2.2546514	78	4	1984–1999	0.63	M-v	3	Williams	36384 1999 RB ₃
1999 RC ₃	14.0	0.15	19990919	306.21478	71.83558	4.05131	10.87108	0.1456298	3.2188637	51	1	58 days	0.71			Williams	1999 RC ₃
1999 RD ₃	14.9	0.15	19990810	302.82547	219.33824	196.38093	2.44375	0.1358295	2.2820762	68	3	1982–1999	0.53	M-v	3	Williams	36385 1999 RD ₃
1999 RH ₃	16.5	0.15	19990810	334.98969	41.64606	320.12990	1.62502	0.2466510	2.3457223	58	1	85 days	0.44	M-v	4	Williams	1999 RH ₃
1999 RJ ₃	14.7	0.15	19990810	304.20874	295.04108	135.94711	2.64978	0.0774082	3.0051400	26	3	1994–1999	0.67	M-v	4	Williams	36385 1999 RJ ₃
1999 RK ₃	15.7	0.15	19990810	245.75331	75.38513	44.24402	7.28516	0.0408819	2.2254345	35	1	67 days	0.69	M-v	5	Williams	1999 RK ₃
1999 RL ₃	13.3	0.15	19990919	322.71014	69.60912	36.21585	15.39550	0.0786397	2.5872212	27	1	56 days	0.23			Williams	1999 RL ₃
1999 RM ₃	14.2	0.15	19990810	60.75292	356.03612	256.60709	3.98272	0.1229312	2.2876084	42	1	141 days	0.43	M-v	4	Williams	36551 1999 RM ₃
1999 RH ₄	13.0	0.15	19990810	39.71383	345.53122	290.78040	8.57479	0.0562498	3.0608246	49	1	118 days	0.42	M-v	4	Williams	36096 1999 RH ₄
1999 RL ₆	15.5	0.15	19990810	310.70013	56.50566	352.19876	3.96269	0.1999478	2.5624835	57	2	1995–1999	0.57	M-v	4	Williams	36551 1999 RL ₆
1999 RK ₇	15.4	0.15	19990810	4.06541	318.08918	16.15486	2.07567	0.2439674	2.1737252	65	1	123 days	0.50	M-v	4	Williams	36551 1999 RK ₇
1999 RX ₇	16.7	0.15	19990810	351.04839	351.03491	8.18007	6.49565	0.1452487	2.2258798	34	1	61 days	0.63	M-v	5	Williams	1999 RX ₇
1999 RA ₈	15.8	0.15	19990810	16.57775	168.66200	162.27803	4.52545	0.1389330	2.6482735	36	1	61 days	0.60	M-v	5	Williams	1999 RA ₈
1999 RK ₉	15.3	0.15	19990810	324.05313	32.71890	352.39967	2.67331	0.1635039	2.1930472	83	2	1998–1999	0.51	M-v	3	Williams	36551 1999 RK ₉
1999 RA ₁₀	14.5	0.15	19990919	108.35545	68.26225	178.87274	0.66146	0.0800854	2.8460713	31	1	57 days	0.60			Williams	1999 RA ₁₀
1999 RD ₁₀	14.0	0.15	19990810	315.84546	194.36845	185.49004	6.99721	0.2024229	2.5333104	64	4	1991–1999	0.68	M-v	3	Williams	36551 1999 RD ₁₀
1999 RG ₁₀	14.6	0.15	19990810	297.09727	84.81557	334.68970	22.36271	0.3283598	2.2718798	30	1	62 days	0.53	M-v	5	Williams	1999 RG ₁₀
1999 RS ₁₀	13.8	0.15	19990810	287.96754	246.21962	158.27567	14.73396	0.0663323	2.442581	78	2	1998–1999	0.57	M-v	3	Williams	36386 1999 RS ₁₀
1999 RU ₁₀	14.5	0.15	19990810	148.13076	201.53320	332.16367	20.59380	0.0577637	1.9221099	43	1	77 days	0.37	M-v	4	Williams	1999 RU ₁₀
1999 RY ₁₀	14.2	0.15	19990810	300.19803	77.62869	327.21780	6.43151	0.1788048	2.3078575	60	2	1994–1999	0.36	M-v	3	Williams	36386 1999 RY ₁₀
1999 RD ₁₁	14.9	0.15	19990810	326.44459	332.09543	35.10338	2.56400	0.1255044	2.2715885	49	3	1996–1999	0.55	M-v	3	Williams	36551 1999 RD ₁₁
1999 RG ₁₁	12.7	0.15	19990810	257.29129	297.99692	138.03649	15.45000	0.0584944	2.7927918	73	3	1996–1999	0.64	M-v	3	Williams	36551 1999 RG ₁₁
1999 RT ₁₁	13.8	0.15	19990810	273.14097	117.66313	308.45312	3.10235	0.0882004	2.4410137	60	3	1988–1999	0.53	M-v	3	Williams	36387 1999 RT ₁₁
1999 RV ₁₁	14.4	0.15	19990810	308.65481	72.86747	334.86413	22.51869	0.2624806	2.3325407	48	1	90 days	0.50	M-v	4	Williams	36551 1999 RV ₁₁
1999 RH ₁₂	14.7	0.15	19990810	357.43756	16.87245	318.59638	4.03072	0.1956844	2.5972181	53	1	98 days	0.65	M-v	3	Williams	36551 1999 RH ₁₂
1999 RV ₁₂	16.1	0.15	19990810	330.57625	168.66765	202.67543	5.45814	0.1677922	2.2225255	52	1	122 days	0.55	M-v	4	Williams	36551 1999 RV ₁₂
1999 RZ ₁₂	13.5	0.15	19990810	322.14032	199.24806	180.35386	9.39871	0.0857818	2.9759391	56	1	82 days	0.56	M-v	5	Williams	1999 RZ ₁₂
1999 RF ₁₄	14.4	0.15	19990810	289.81110	90.94959	345.30223	20.82532	0.2831834	2.2959021	98	1	87 days	0.46	M-v	4	Williams	36552 1999 RF ₁₄
1999 RK ₁₄	14.6	0.15	19990810	311.51955	235.80814	166.54432	8.10417	0.1926303	2.5543461	75	4	1991–1999	0.52	M-v	2	Williams	36552 1999 RK ₁₄
1999 RO ₁₄	14.7	0.15	19990810	216.99114	301.31445	179.39189	4.54578	0.0249508	2.4363631	51	2	1998–1999	0.62	M-v	4	Williams	36388 1999 RO ₁₄
1999 RQ ₁₄	15.7	0.15	19990810	333.88003	39.34062	327.30407	3.73561	0.1209260	2.3106924	56	2	1994–1999	0.56	M-v	4	Williams	36388 1999 RQ ₁₄
1999 RU ₁₄	14.0	0.15	19990810	350.58921	8.66464	340.45629	9.44374	0.1023232	2.9803903	37	1	60 days	0.34	M-v	4	Williams	1999 RU ₁₄
1999 RJ ₁₅	14.8	0.15	19990810	6.42811	305.74534	19.79244	4.12381	0.1141687	2.6134407	43	3	1991–1999	0.63	M-v	3	Williams	36388 1999 RJ ₁₅
1999 RU ₁₅	15.7	0.15	19990810	319.30869	226.13322	168.06205	2.26403	0.2127877	2.3557867	136	1	66 days	0.36	M-v	5	Williams	1999 RU ₁₅
1999 RD ₁₆	13.7	0.15	19990810	264.77233	287.66185	169.16309	30.46572	0.2008492	2.7208530	38	1	80 days	0.45	M-v	5	Williams	1999 RD ₁₆
1999 RK ₁₆	15.7	0.15	19990919	331.11674	55.88525	347.45817	4.56675	0.3078869	2.5797949	59	1	58 days	0.52			Williams	1999 RK ₁₆
1999 RV ₁₆	15.3	0.15	19990810	333.19171	154.49708	220.34024	1.83495	0.1847144	2.4045000	65	2	1977–1999	0.47	M-v	4	Williams	36389 1999 RV ₁₆
1999 RE ₁₇	15.5	0.15	19990810	315.31459	172.78662	224.62119	3.90436	0.1505161	2.3301791	46	2	1978–1999	0.65	M-v	4	Williams	36389 1999 RE ₁₇
1999 RJ ₁₇	16.2	0.15	19990810	7.64469	141.76602	180.16557	9.70539	0.2331178	2.3803213	40	2	1977–1999	0.52	M-v	4	Williams	36389 1999 RJ ₁₇
1999 RK ₁₇	15.6	0.15	19990810	293.59012	166.78429	244.10114	2.68849	0.0485388	2.3040619	50	2	1998–1999	0.63	M-v	4	Williams	36552 1999 RK ₁₇
1999 RX ₁₇	15.6	0.15	19990810	292.05747	205.37223	224.30310	1.75217	0.1999316	2.3475466	53	2	1998–1999	0.54	M-v	4	Williams	36390 1999 RX ₁₇
1999 RY ₁₇	14.9	0.15	19990810	335.88670	63.82969	311.55516	2.36712	0.2314846	2.5649731	82	4	1991–1999	0.49	M-v	2	Williams	36390 1999 RY ₁₇
1999 RC ₁₈	15.8	0.15	19990810	320.50232	210.54575	184.49840	2.23457	0.2086810	2.4212624	34	1	66 days	0.41	M-v	5	Williams	1999 RC ₁₈
1999 RG ₁₈	14.1	0.15	19990810	324.93551	229.70593	153.94421	15.57219	0.1372107	2.6218309	61	3	1997–1999	0.61	M-v	3	Williams	36390 1999 RG ₁₈
1999 RJ ₁₈	15.4	0.15	19990810	334.48367	260.69178	114.09799	3.36016	0.2055562	2.4448655	60	3	1997–1999	0.54	M-v	3	Williams	36391 1999 RJ ₁₈
1999 RN ₁₈	14.9	0.15	19990810	351.93228	154.71218	194.72511	6.21441	0.1570164	2.3401098	85	3	1992–1999	0.61	M-v	3	Williams	36391 1999 RN ₁₈

1999 RP ₁₈	15.2	0.15	19990810	19.00056	123.59878	182.15029	12.85857	0.2680771	2.6813934	51	1	75 days	0.46	M-v	4	Williams	1999 RP ₁₈
1999 RR ₁₈	14.7	0.15	19990810	26.17416	115.49830	185.67739	4.91405	0.1681124	2.2323486	72	2	1989–1999	0.50	M-v	4	Williams	36391 1999 RR ₁₈
1999 RT ₁₈	14.0	0.15	19990810	347.36370	24.24476	339.17944	9.03724	0.2839872	3.1185839	68	1	113 days	0.38	M-v	3	Williams	36552 1999 RT ₁₈
1999 RU ₁₈	16.5	0.15	19990810	331.09964	129.08927	249.07630	1.11166	0.1896196	2.1532158	70	2	1977–1999	0.53	M-v	4	Williams	36391 1999 RU ₁₈
1999 RY ₁₈	15.7	0.15	19990810	10.52290	333.53265	349.69139	19.47441	0.0844176	1.9221123	79	2	1991–1999	0.34	M-v	3	Williams	36392 1999 RY ₁₈
1999 RO ₁₉	14.4	0.15	19990810	18.38168	311.80470	2.70826	2.50164	0.1747188	2.7376075	79	2	1998–1999	0.50	M-v	3	Williams	36552 1999 RO ₁₉
1999 RS ₁₉	14.2	0.15	19990810	1.42573	174.30910	166.92757	10.15218	0.1291441	2.9832965	49	3	1997–1999	0.69	M-v	3	Williams	36392 1999 RS ₁₉
1999 RN ₂₀	15.0	0.15	19990810	339.02769	198.60813	173.52099	27.09142	0.2688783	2.1517386	84	1	114 days	0.39	M-v	3	Williams	36552 1999 RN ₂₀
1999 RO ₂₀	15.5	0.15	19990810	13.93969	128.75076	195.99786	5.72092	0.1348929	2.3310871	42	2	1998–1999	0.48	M-v	4	Williams	36393 1999 RO ₂₀
1999 RU ₂₀	15.9	0.15	19990810	354.09130	147.32527	203.12387	3.14968	0.1932078	2.3830375	63	1	75 days	0.45	M-v	5	Williams	1999 RU ₂₀
1999 RH ₂₁	16.4	0.15	19990919	1.28433	347.69028	7.08576	7.95253	0.2040844	2.6251418	48	1	57 days	0.58			Williams	1999 RH ₂₁
1999 RK ₂₁	15.4	0.15	19990810	11.13946	299.35739	24.19084	2.75743	0.1696896	2.1559989	84	4	1992–1999	0.59	M-v	2	Williams	36393 1999 RK ₂₁
1999 RL ₂₁	15.6	0.15	19990810	357.76710	209.95623	132.87842	3.00618	0.2266903	2.3605824	61	3	1994–1999	0.49	M-v	2	Williams	36553 1999 RL ₂₁
1999 RU ₂₁	15.4	0.15	19990810	16.76417	314.60747	4.18975	11.93683	0.1954406	2.5842048	30	1	73 days	0.54	M-v	4	Williams	1999 RU ₂₁
1999 RA ₂₂	16.4	0.15	19990810	325.11886	18.25866	14.72481	5.12781	0.2027910	2.2532205	41	1	71 days	0.70	M-v	4	Williams	1999 RA ₂₂
1999 RC ₂₂	13.7	0.15	19990830	258.80812	305.75400	164.12049	9.94888	0.1219314	2.7668027	46	1	46 days	0.46			Williams	1999 RC ₂₂
1999 RF ₂₂	15.9	0.15	19990810	341.60499	15.39369	2.77986	3.05162	0.2725519	2.9739660	36	1	66 days	0.50	M-v	4	Williams	1999 RF ₂₂
1999 RG ₂₂	15.6	0.15	19990810	306.48688	75.14726	355.67902	22.39824	0.2986132	2.3389332	69	1	90 days	0.47	M-v	4	Williams	36553 1999 RG ₂₂
1999 RK ₂₂	14.1	0.15	19990810	261.97507	63.33287	46.43279	1.50464	0.1744289	3.0024026	34	3	1973–1999	0.65	M-v	4	Williams	36393 1999 RK ₂₂
1999 RL ₂₂	14.9	0.15	19990810	307.60597	46.99368	359.76530	8.06992	0.0852523	2.2830564	60	1	60 days	0.47	M-v	5	Williams	1999 RL ₂₂
1999 RQ ₂₂	15.8	0.15	19990810	334.50031	201.74364	179.48569	23.03188	0.2229836	2.2792664	56	1	111 days	0.55	M-v	4	Williams	36553 1999 RQ ₂₂
1999 RS ₂₂	15.7	0.15	19990810	1.61190	9.86116	329.35249	5.16997	0.2220521	2.3452721	44	1	84 days	0.48	M-v	4	Williams	1999 RS ₂₂
1999 RT ₂₂	13.5	0.15	19990810	359.38545	154.16612	198.89154	8.82259	0.0901712	3.1674607	29	2	1997–1999	0.63	M-v	4	Williams	36394 1999 RT ₂₂
1999 RC ₂₃	15.5	0.15	19990830	3.14105	180.94662	168.59191	5.58687	0.1118269	2.5905125	45	1	46 days	0.50			Williams	1999 RC ₂₃
1999 RF ₂₃	15.2	0.15	19990810	11.03506	171.41893	155.72975	3.33652	0.1969153	2.4573366	68	3	1976–1999	0.62	M-v	3	Williams	36394 1999 RF ₂₃
1999 RG ₂₃	15.8	0.15	19990810	354.95446	343.06507	11.49981	5.05164	0.1214443	2.6778431	22	1	69 days	0.64	M-v	5	Williams	1999 RG ₂₃
1999 RH ₂₃	14.0	0.15	19990830	342.18167	338.12770	38.35843	2.47512	0.0860975	2.8880893	43	1	46 days	0.47			Williams	1999 RH ₂₃
1999 RR ₂₃	14.8	0.15	19990810	275.39261	75.21874	15.89171	7.14536	0.1657399	2.3331209	42	1	82 days	0.44	M-v	4	Williams	1999 RR ₂₃
1999 RW ₂₃	15.8	0.15	19990810	346.76743	339.43830	21.35353	6.00357	0.2333590	2.2956189	41	1	68 days	0.47	M-v	4	Williams	1999 RW ₂₃
1999 RX ₂₃	15.7	0.15	19990810	30.36931	260.28905	33.88496	5.32368	0.2263719	2.2372238	48	1	122 days	0.66	M-v	4	Williams	36553 1999 RX ₂₃
1999 RB ₂₄	14.3	0.15	19990810	356.24411	322.91689	25.26587	6.38422	0.1650921	2.3734556	102	2	1998–1999	0.64	M-v	3	Williams	36553 1999 RB ₂₄
1999 RK ₂₄	16.3	0.15	19990919	14.56412	340.08679	359.73577	11.25422	0.1691489	2.6021794	39	1	58 days	0.64			Williams	1999 RK ₂₄
1999 RS ₂₄	15.7	0.15	19990919	29.83248	118.90711	193.35410	10.28858	0.2539434	2.3888497	31	1	57 days	0.37			Williams	1999 RS ₂₄
1999 RT ₂₄	16.3	0.15	19990919	317.36635	87.24753	328.97319	5.38831	0.1376894	2.2148387	17	1	58 days	0.38			Williams	1999 RT ₂₄
1999 RV ₂₄	15.6	0.15	19990810	20.93245	136.86975	178.76849	26.48599	0.1068426	1.8878505	48	1	114 days	0.48	M-v	4	Williams	36553 1999 RV ₂₄
1999 RY ₂₄	17.0	0.15	19990919	357.59918	163.72463	200.83829	5.39047	0.1131743	2.3365198	22	1	29 days	0.58			Williams	1999 RY ₂₄
1999 RE ₂₅	14.6	0.15	19990810	254.56358	195.77768	274.90524	1.81359	0.1241277	2.4111811	29	3	1977–1999	0.51	M-v	3	Williams	36395 1999 RE ₂₅
1999 RG ₂₅	15.3	0.15	19990919	330.71620	59.53866	346.34278	8.52562	0.2004931	2.7321237	20	1	58 days	0.56			Williams	1999 RG ₂₅
1999 RN ₂₅	15.7	0.15	19990810	11.45411	324.32830	8.05200	6.86721	0.1095172	2.1727372	55	2	1998–1999	0.54	M-v	4	Williams	36395 1999 RN ₂₅
1999 RT ₂₅	17.1	0.15	19990919	16.19695	134.67004	199.70992	4.32661	0.2637886	2.5818587	21	1	29 days	0.43			Williams	1999 RT ₂₅
1999 RU ₂₅	16.0	0.15	19990919	348.09293	41.92847	340.86180	3.58578	0.2449822	2.5860030	39	1	59 days	0.44			Williams	1999 RU ₂₅
1999 RV ₂₅	14.2	0.15	19990919	336.19064	53.88231	345.39958	4.55241	0.1859954	3.1792395	17	1	57 days	0.33			Williams	1999 RV ₂₅
1999 RX ₂₅	15.3	0.15	19990810	7.80697	319.13066	13.01876	4.59722	0.1817929	2.1572033	58	4	1980–1999	0.68	M-v	2	Williams	36395 1999 RX ₂₅
1999 RG ₂₆	16.6	0.15	19990810	339.13212	353.86614	24.97524	4.41966	0.2724157	2.2993921	82	1	69 days	0.39	M-v	4	Williams	1999 RG ₂₆
1999 RJ ₂₆	15.8	0.15	19990830	35.97251	170.08958	134.87688	4.52613	0.1742301	2.3281108	35	1	46 days	0.55			Williams	1999 RJ ₂₆
1999 RN ₂₆	15.1	0.15	19990919	340.85181	11.17382	18.91761	10.98294	0.1419808	2.9423402	38	1	52 days	0.57			Williams	1999 RN ₂₆
1999 RO ₂₆	16.3	0.15	19990919	62.78665	266.81805	3.87570	23.08953	0.2619480	2.2763770	28	1	30 days	0.55			Williams	1999 RO ₂₆
1999 RQ ₂₆	13.5	0.15	19990810	128.60045	53.35430	171.55119	9.34342	0.0852771	3.0727592	41	3	1992–1999	0.66	M-v	4	Williams	36395 1999 RQ ₂₆
1999 RF ₂₇	13.0	0.15	19990810	139.90064	69.58851	141.25399	8.43400	0.2548785	2.6098394	47	4	1951–1999	0.61	M-v	1	Williams	36396 1999 RF ₂₇
1999 RG ₂₇	16.9	0.15	19990919	345.38953	23.01412	4.63653	22.65945	0.1746865	1.9116220	33	1	56 days	0.58			Williams	1999 RG ₂₇
1999 RH ₂₇	16.5	0.15	19990810	334.22295	95.35368	343.91317	4.39675	0.5766081	2.8838341	219	1	76 days	0.46	M-v	4	Williams	36554 1999 RH ₂₇
1999 RK ₂₇	14.4	0.15	19990810	334.64963	213.21515	162.58577	7.61759	0.1530220	2.5460195	103	4	1991–1999	0.60	M-v	2	Williams	36554 1999 RK ₂₇
1999 RL ₂₇	12.5	0.15	19990810	68.95329	262.51146	32.48659	13.37854	0.1706072	2.6007137	49	1	65 days	0.33	M-v	5	Williams	1999 RL ₂₇

1999 RP ₂₇	15.6	0.15	19990810	4.94022	189.54726	141.54202	1.11826	0.1777691	2.1980385	51	1	82 days	0.63	M-v	4	Williams		1999 RP ₂₇
1999 RQ ₂₇	13.5	0.15	19990810	40.94057	301.09410	358.87852	9.46337	0.0927786	3.2538582	86	2	1997–1999	0.75	M-v	3	Williams	36554	1999 RQ ₂₇
1999 RR ₂₇	14.9	0.15	19990919	339.36169	45.56100	350.77981	10.36795	0.3068449	3.0311325	63	1	58 days	0.50			Williams		1999 RR ₂₇
1999 RT ₂₇	15.2	0.15	19990810	282.87441	278.41833	162.53207	2.87358	0.1645556	2.3701331	49	2	1981–1999	0.69	M-v	4	Williams	36396	1999 RT ₂₇
1999 RU ₂₇	13.3	0.15	19990810	283.19240	81.59275	356.76716	15.29182	0.1109080	3.2254095	53	1	71 days	0.60	M-v	5	Williams		1999 RU ₂₇
1999 RV ₂₇	14.1	0.15	19990810	330.60085	218.98029	172.84880	5.34619	0.2218623	3.0889893	67	1	122 days	0.57	M-v	4	Williams	36554	1999 RV ₂₇
1999 RW ₂₇	12.7	0.15	19990810	331.66751	41.76917	21.69924	14.06232	0.2859045	2.6076923	39	2	1978–1999	0.41	M-v	3	Williams	36396	1999 RW ₂₇
1999 RX ₂₇	14.8	0.15	19990919	17.83549	125.18447	200.47281	16.58351	0.2295121	3.0544642	83	1	55 days	0.52			Williams		1999 RX ₂₇
1999 RY ₂₇	13.1	0.15	19990810	102.21147	227.69397	353.37789	12.59489	0.1231616	2.6374391	91	3	1987–1999	0.52	M-v	3	Williams	36554	1999 RY ₂₇
1999 RB ₂₈	13.2	0.15	19990810	6.69131	141.33016	165.06765	15.60773	0.0394241	2.6571324	108	3	1995–1999	0.53	M-v	2	Williams	36554	1999 RB ₂₈
1999 RD ₂₈	15.3	0.15	19990810	19.30526	131.02677	167.38354	2.77613	0.1988379	2.2189907	44	3	1976–1999	0.61	M-v	3	Williams	36396	1999 RD ₂₈
1999 RE ₂₈	16.2	0.15	19990810	337.10344	39.74819	348.12394	5.18259	0.3504342	2.5629494	66	1	74 days	0.52	M-v	4	Williams		1999 RE ₂₈
1999 RM ₂₈	16.7	0.15	19990810	291.18308	301.70371	136.20184	30.53643	0.3240675	1.8169261	30	1	62 days	0.48	M-v	5	Williams	36554	1999 RM ₂₈
1999 RQ ₂₈	20.6	0.15	19990810	329.95494	269.46868	124.48794	3.55658	0.4243079	1.9082324	89	1	64 days	0.57	M-v	4	Williams	36554	1999 RQ ₂₈
1999 RR ₂₈	18.3	0.15	19990810	308.86321	283.78817	178.85688	7.12233	0.6542908	1.8762141	95	1	58 days	0.46	M-v	5	Williams	36554	1999 RR ₂₈
1999 RS ₂₈	15.4	0.15	19990810	333.38828	193.73700	193.21329	17.47008	0.2198957	3.1295520	56	2	1977–1999	0.73	M-v	4	Williams	36397	1999 RS ₂₈
1999 RT ₂₈	15.8	0.15	19990919	348.32417	13.36129	8.19035	14.20156	0.1813727	2.5774659	47	1	55 days	0.58			Williams		1999 RT ₂₈
1999 RW ₂₉	14.5	0.15	19990810	6.11475	2.45870	322.34138	16.07115	0.2984045	2.6742010	53	1	118 days	0.42	M-v	3	Williams	36554	1999 RW ₂₉
1999 RG ₃₀	14.2	0.15	19990810	21.73487	351.54146	329.34455	21.49461	0.0496376	2.5722657	23	1	73 days	0.50	M-v	4	Williams	36554	1999 RG ₃₀
1999 RL ₃₀	15.9	0.15	19990810	272.59777	88.89811	339.48016	19.77357	0.0960103	1.9148905	35	1	64 days	0.49	M-v	5	Williams		1999 RL ₃₀
1999 RS ₃₀	15.3	0.15	19990919	323.42546	80.30109	345.11270	25.07542	0.2783182	2.7553383	44	1	57 days	0.36			Williams		1999 RS ₃₀
1999 RZ ₃₀	14.8	0.15	19990810	120.25557	254.02043	333.44021	17.94100	0.0593121	1.9238046	58	2	1998–1999	0.40	M-v	2	Williams	36397	1999 RZ ₃₀
1999 RA ₃₁	15.6	0.15	19990919	327.52780	73.63350	350.29161	23.13925	0.3075127	2.3048671	25	1	57 days	0.42			Williams		1999 RA ₃₁
1999 RC ₃₁	16.4	0.15	19990810	325.60603	91.91565	345.18203	26.23598	0.4647334	2.5765886	15	1	54 days	0.38	M-v	6	Williams		1999 RC ₃₁
1999 RJ ₃₁	14.5	0.15	19990810	56.71962	285.95694	342.62056	7.51483	0.0983139	2.3115302	68	4	1985–1999	0.57	M-v	2	Williams	36397	1999 RJ ₃₁
1999 RK ₃₁	16.3	0.15	19990919	352.03371	14.50901	1.42085	4.82180	0.1622754	2.3531419	52	1	59 days	0.64			Williams		1999 RK ₃₁
1999 RL ₃₁	14.4	0.15	19990810	328.59483	25.77915	5.30615	7.56474	0.1443091	2.2549077	62	3	1982–1999	0.51	M-v	2	Williams	36397	1999 RL ₃₁
1999 RM ₃₁	14.7	0.15	19990919	357.41659	2.40644	6.78117	14.60787	0.1009728	2.7092001	58	1	56 days	0.55			Williams		1999 RM ₃₁
1999 RP ₃₁	14.8	0.15	19990919	17.56243	311.71090	13.31409	1.95882	0.0723286	2.9019730	31	1	56 days	0.56			Williams		1999 RP ₃₁
1999 RQ ₃₁	17.9	0.15	19990919	9.22709	213.49415	140.58502	4.92380	0.2558081	2.3622708	20	1	56 days	0.72			Williams		1999 RQ ₃₁
1999 RR ₃₁	15.2	0.15	19990810	15.59702	306.13553	23.01264	5.35727	0.2033173	2.2453356	76	2	1998–1999	0.42	M-v	4	Williams	36554	1999 RR ₃₁
1999 RT ₃₁	16.0	0.15	19990810	36.74252	27.43824	264.10414	0.30753	0.1835261	2.4442141	46	1	71 days	0.40	M-v	5	Williams		1999 RT ₃₁
1999 RU ₃₁	15.7	0.15	19990919	60.39111	81.89566	220.72946	7.79256	0.0231429	2.4218232	58	1	56 days	0.60			Williams		1999 RU ₃₁
1999 RV ₃₁	13.7	0.15	19990810	74.33997	251.85669	12.88229	2.43742	0.0244746	2.7879439	59	3	1981–1999	0.73	M-v	3	Williams	36398	1999 RV ₃₁
1999 RX ₃₁	15.9	0.15	19990810	333.84251	0.00344	16.43715	20.27285	0.0745654	1.9678570	105	2	1998–1999	0.53	M-v	3	Williams	36555	1999 RX ₃₁
1999 RB ₃₂	19.8	0.15	19990810	347.41973	39.27378	330.28950	3.94867	0.5729525	2.4308641	188	1	69 days	0.53	M-v	5	Marsden	36555	1999 RB ₃₂
1999 RC ₃₂	18.4	0.15	19990810	315.46048	82.67531	352.51781	30.96845	0.4319204	1.8390075	113	1	53 days	0.55	M-v	5	Williams	36555	1999 RC ₃₂
1999 RD ₃₂	16.3	0.15	19990810	12.01252	294.66560	315.02414	6.63638	0.7782884	2.6166226	207	1	57 days	0.53	M-v	5	Williams	36555	1999 RD ₃₂
1999 RJ ₃₂	12.7	0.15	19990810	354.29720	0.93779	357.15741	8.14168	0.0811397	3.1669526	68	1	113 days	0.41	M-v	3	Williams	36555	1999 RJ ₃₂
1999 RO ₃₂	13.3	0.15	19990810	297.38712	88.79675	358.70276	12.96124	0.2914002	3.1240000	79	2	1988–1999	0.46	M-v	4	Williams	36555	1999 RO ₃₂
1999 RP ₃₂	16.5	0.15	19990810	6.95731	332.81226	354.31383	2.22303	0.1982366	2.1994006	59	1	82 days	0.58	M-v	4	Williams		1999 RP ₃₂
1999 RS ₃₂	16.3	0.15	19990919	19.86414	2.08618	339.14325	6.30666	0.1349149	2.2603421	32	1	49 days	0.82			Williams		1999 RS ₃₂
1999 RU ₃₂	15.2	0.15	19990810	126.28407	44.22797	176.47968	3.35168	0.0314752	2.7791217	24	1	61 days	0.51	M-v	5	Williams		1999 RU ₃₂
1999 RW ₃₂	13.4	0.15	19990810	330.40143	101.92511	309.42533	8.56138	0.0967349	3.0610335	46	1	68 days	0.41	M-v	4	Williams		1999 RW ₃₂
1999 RZ ₃₂	14.3	0.15	19990919	18.55829	320.71587	17.93561	3.54165	0.1791116	3.1947363	73	1	52 days	0.53			Williams		1999 RZ ₃₂
1999 RA ₃₃	15.1	0.15	19990919	0.94659	337.86567	29.35720	1.17946	0.1334839	2.4185784	58	1	59 days	0.57			Williams		1999 RA ₃₃
1999 RC ₃₃	13.6	0.15	19990810	100.58452	69.70876	153.56167	11.23096	0.1401026	2.6115126	64	2	1998–1999	0.57	M-v	3	Williams	36399	1999 RC ₃₃
1999 RG ₃₃	12.2	0.15	19990810	12.48848	274.46192	23.83080	35.14384	0.7750454	9.6289951	105	1	67 days	0.39	M-v	4	Williams	36555	1999 RG ₃₃
1999 RJ ₃₃	14.5	0.15	19990919	310.50641	52.26226	348.68097	10.39844	0.0340610	2.9875861	28	1	33 days	0.68			Williams		1999 RJ ₃₃
1999 RS ₃₃	15.0	0.15	19990810	1.62439	282.54208	41.59238	4.92262	0.2007523	2.2549872	51	4	1989–1999	0.57	M-v	2	Williams	36400	1999 RS ₃₃
1999 RA ₃₄	15.7	0.15	19990810	14.25569	117.55957	191.10801	22.24030	0.1004441	1.9254206	56	1	136 days	0.45	M-v	3	Williams	36555	1999 RA ₃₄
1999 RB ₃₄	15.3	0.15	19990810	15.43221	103.63677	184.50851	27.72332	0.3856396	2.6262187	46	1	108 days	0.42	M-v	3	Williams	36555	1999 RB ₃₄
1999 RC ₃₄	14.9	0.15	19990919	8.60005	151.52671	196.93489	2.73511	0.0717423	2.5565228	58	1	58 days	0.49			Williams		1999 RC ₃₄

1999 RD ₃₄	14.1	0.15	19990810	343.70420	5.49785	4.18952	3.22664	0.1263260	3.0592316	75	3	1995–1999	0.56	M-v	3	Williams	36555	1999 RD ₃₄
1999 RK ₃₄	15.0	0.15	19990810	355.29528	170.58187	185.26500	7.09158	0.1315029	2.4160524	69	3	1995–1999	0.63	M-v	2	Williams	36401	1999 RK ₃₄
1999 RM ₃₄	15.4	0.15	19990810	352.80164	353.22776	6.52196	7.04321	0.1367391	2.2398871	57	2	1998–1999	0.71	M-v	3	Williams	36401	1999 RM ₃₄
1999 RO ₃₄	13.1	0.15	19990810	204.71634	338.47644	177.11927	9.64713	0.0334773	3.0607902	54	3	1986–1999	0.48	M-v	2	Williams	36401	1999 RO ₃₄
1999 RP ₃₄	13.7	0.15	19990810	119.71460	86.29836	148.90724	2.37720	0.0244175	2.8803690	62	3	1992–1999	0.56	M-v	4	Williams	36555	1999 RP ₃₄
1999 RS ₃₄	14.5	0.15	19990810	204.32790	134.86339	33.72994	12.88757	0.0640804	2.8131222	26	1	62 days	0.51	M-v	5	Williams		1999 RS ₃₄
1999 RU ₃₄	14.6	0.15	19990810	335.48953	202.33709	193.07285	9.92560	0.1036091	3.0367868	30	1	62 days	0.59	M-v	5	Williams		1999 RU ₃₄
1999 RV ₃₄	16.5	0.15	19990810	24.96268	307.78206	6.98696	4.13273	0.2358005	2.4021837	35	1	66 days	0.36	M-v	4	Williams		1999 RV ₃₄
1999 RW ₃₄	15.2	0.15	19990810	6.65072	154.88607	187.06383	6.89020	0.2581732	2.5442290	70	3	1995–1999	0.51	M-v	2	Williams	36555	1999 RW ₃₄
1999 RZ ₃₄	13.4	0.15	19990810	21.50982	314.31884	34.99441	22.61958	0.1342611	2.4314138	55	1	64 days	0.46	M-v	4	Williams		1999 RZ ₃₄
1999 RA ₃₅	15.1	0.15	19990810	355.46591	48.93639	285.96359	12.01248	0.2076171	2.5704486	41	1	140 days	0.54	M-v	3	Williams	36555	1999 RA ₃₅
1999 RB ₃₅	14.1	0.15	19990810	285.88632	136.60785	291.28108	21.26678	0.0407153	2.6497484	100	1	119 days	0.67	M-v	4	Williams	36555	1999 RB ₃₅
1999 RD ₃₅	15.0	0.15	19990810	330.68779	199.58303	205.11413	24.35693	0.2164645	2.3364052	78	1	112 days	0.42	M-v	3	Williams	36555	1999 RD ₃₅
1999 RE ₃₅	15.0	0.15	19990919	113.59677	163.51375	61.19792	3.44407	0.0434344	2.6602086	31	1	55 days	0.44			Marsden		1999 RE ₃₅
1999 RH ₃₅	14.7	0.15	19990810	28.02199	138.61498	173.56013	3.13540	0.1913082	2.2817147	84	2	1998–1999	0.59	M-v	4	Williams	36555	1999 RH ₃₅
1999 RJ ₃₅	14.7	0.15	19990810	48.98887	316.81120	320.67700	14.48485	0.2470976	2.5562907	45	3	1966–1999	0.70	M-v	2	Williams	36402	1999 RJ ₃₅
1999 RK ₃₅			19990919	220.61061	214.84842	296.35798	11.86994	0.1091853	2.7377288	16	1	50 days	1.10			Williams		1999 RK ₃₅
1999 RL ₃₅	14.5	0.15	19990810	342.06157	119.38641	250.83486	0.99239	0.0735965	2.8943240	78	4	1979–1999	0.57	M-v	3	Williams	36555	1999 RL ₃₅
1999 RM ₃₅	13.7	0.15	19990810	69.29682	84.56989	192.33720	2.99186	0.1198483	3.0527063	53	1	68 days	0.60	M-v	5	Williams		1999 RM ₃₅
1999 RN ₃₅	15.4	0.15	19990810	339.64521	186.94711	182.53468	6.46676	0.1317667	2.3012975	72	2	1998–1999	0.56	M-v	3	Williams	36555	1999 RN ₃₅
1999 RO ₃₅	15.2	0.15	19990810	357.50764	275.66790	72.92745	1.15480	0.2972641	2.5761973	79	3	1996–1999	0.49	M-v	2	Williams	36555	1999 RO ₃₅
1999 RP ₃₅	16.4	0.15	19990919	349.86250	15.64427	6.46556	5.95467	0.2729547	2.5402925	62	1	57 days	0.63			Williams		1999 RP ₃₅
1999 RR ₃₅	14.0	0.15	19990810	136.61819	195.40183	21.92227	4.01252	0.0212585	2.7403512	36	1	60 days	0.43	M-v	5	Williams		1999 RR ₃₅
1999 RT ₃₅	15.3	0.15	19990810	12.03749	325.57709	6.81303	8.22052	0.1386573	2.3684629	61	3	1994–1999	0.65	M-v	3	Williams	36402	1999 RT ₃₅
1999 RW ₃₅	15.0	0.15	19990810	14.33826	338.90133	8.71963	2.14806	0.0779688	2.8462635	46	1	65 days	0.49	M-v	5	Williams		1999 RW ₃₅
1999 RC ₃₆	13.1	0.15	19990810	38.99180	328.09183	8.09052	10.65533	0.1061726	3.2134666	56	2	1993–1999	0.55	M-v	4	Williams	36402	1999 RC ₃₆
1999 RD ₃₆	17.2	0.15	19990919	348.33928	193.73973	180.31881	7.24553	0.3710294	2.6224091	51	1	54 days	0.51			Marsden		1999 RD ₃₆
1999 RG ₃₆	13.6	0.15	19990810	306.30081	246.06364	205.22993	13.95057	0.1297464	2.6157289	58	3	1992–1999	0.59	M-v	3	Williams	36556	1999 RG ₃₆
1999 RH ₃₆	13.3	0.15	19990810	15.36007	322.66361	43.37626	11.83697	0.1536172	3.0358635	51	3	1976–1999	0.47	M-v	3	Williams	36403	1999 RH ₃₆
1999 RN ₃₆	13.3	0.15	19990810	5.09103	152.89300	217.14113	12.84998	0.1885215	2.5726873	49	2	1998–1999	0.54	M-v	4	Williams	36403	1999 RN ₃₆
1999 RO ₃₆	20.7	0.15	19990810	347.61863	196.97801	168.24820	3.28766	0.4856061	2.3824016	133	1	62 days	0.57	M-v	5	Williams	36556	1999 RO ₃₆
1999 RP ₃₆	18.7	0.15	19990810	340.62059	321.22739	58.13110	5.47820	0.4166582	2.2275116	124	1	67 days	0.44	M-v	4	Williams	36556	1999 RP ₃₆
1999 RR ₃₆	14.2	0.15	19990810	304.04867	62.67726	0.90469	1.72322	0.0507828	2.9523746	29	1	62 days	0.54	M-v	5	Williams		1999 RR ₃₆
1999 RS ₃₆	15.9	0.15	19990919	323.87386	221.83527	189.47585	4.92673	0.1411035	2.3398634	43	1	57 days	0.74			Williams		1999 RS ₃₆
1999 RT ₃₆	15.6	0.15	19990810	311.51629	67.51361	0.41549	12.89874	0.2534972	2.6349142	30	1	60 days	0.65	M-v	5	Williams		1999 RT ₃₆
1999 RA ₃₇	16.4	0.15	19990810	352.60595	1.40902	346.79633	1.82163	0.1835439	2.4288410	48	2	1996–1999	0.46	M-v	5	Williams	36403	1999 RA ₃₇
1999 RC ₃₇	15.5	0.15	19990810	15.27520	310.11089	3.61352	4.29135	0.2446026	2.5502052	59	2	1995–1999	0.58	M-v	4	Williams	36404	1999 RC ₃₇
1999 RE ₃₇	15.9	0.15	19990810	325.90496	310.98148	78.61381	2.08032	0.1926229	2.1986995	24	2	1996–1999	0.85	M-v	5	Williams	36404	1999 RE ₃₇
1999 RJ ₃₇	15.3	0.15	19990810	359.63937	122.21261	201.52940	14.61986	0.3246471	2.5383565	68	1	146 days	0.47	M-v	3	Williams	36556	1999 RJ ₃₇
1999 RK ₃₇	13.2	0.15	19991009	323.00847	45.14885	329.34293	25.50016	0.0753705	1.9223742	25	1	58 days	0.49			Williams		1999 RK ₃₇
1999 RX ₃₇	14.4	0.15	19990919	284.53014	266.25689	187.31775	9.40901	0.0582957	3.0585797	27	1	47 days	0.70			Williams		1999 RX ₃₇
1999 RY ₃₇	15.5	0.15	19990810	318.76479	36.48620	9.98794	4.80739	0.1431044	2.2445216	43	2	1994–1999	0.68	M-v	4	Williams	36404	1999 RY ₃₇
1999 RZ ₃₇	15.6	0.15	19990810	306.27210	249.86113	184.00823	5.45162	0.2143169	2.5585299	35	2	1997–1999	0.48	M-v	4	Williams	36404	1999 RZ ₃₇
1999 RA ₃₈	14.7	0.15	19990919	312.62180	30.64917	38.88522	3.10804	0.1442122	2.4074883	32	1	48 days	0.41			Williams		1999 RA ₃₈
1999 RC ₃₈	12.5	0.15	19990810	256.33235	289.18262	190.32236	13.40090	0.1205126	2.6288281	44	3	1933–1999	0.71	M-v	3	Williams	36405	1999 RC ₃₈
1999 RF ₃₈	15.3	0.15	19990919	343.03690	33.21857	9.11761	16.22277	0.3103668	3.0499926	37	1	55 days	0.57			Williams		1999 RF ₃₈
1999 RG ₃₈	15.0	0.15	19990919	28.66560	311.36654	16.78613	4.65386	0.1988180	2.9789813	30	1	47 days	0.78			Williams		1999 RG ₃₈
1999 RH ₃₈	15.7	0.15	19990919	355.20263	355.09934	19.13159	5.92684	0.1533123	2.3453169	28	1	47 days	0.42			Williams		1999 RH ₃₈
1999 RL ₃₈	15.0	0.15	19990810	29.34959	162.05256	149.94301	3.25046	0.1898833	2.4077224	61	3	1994–1999	0.47	M-v	3	Williams	36556	1999 RL ₃₈
1999 RM ₃₈	13.1	0.15	19990810	53.31478	110.12257	195.78306	9.14533	0.0587406	3.1732820	65	3	1994–1999	0.55	M-v	3	Williams	36405	1999 RM ₃₈
1999 RN ₃₈	14.5	0.15	19990810	5.24715	222.78886	123.02790	1.52671	0.1362943	2.3056294	56	2	1998–1999	0.55	M-v	4	Williams	36405	1999 RN ₃₈
1999 RO ₃₈	15.3	0.15	19990810	315.75547	232.35390	186.07842	5.97120	0.2273218	2.2718961	50	3	1975–1999	0.49	M-v	4	Williams	36405	1999 RO ₃₈
1999 RP ₃₈	15.5	0.15	19990810	353.24825	118.63890	239.31603	4.66603	0.1606470	2.3333716	77	3	1994–1999	0.47	M-v	2	Williams	36405	1999 RP ₃₈

1999 RT ₃₈	14.8	0.15	19990810	342.89897	342.27348	54.50262	4.03015	0.1597004	2.2093308	61	4	1994–1999	0.56	M-v	2	Williams	36406	1999 RT ₃₈
1999 RU ₃₈	13.8	0.15	19990810	291.59793	254.36497	163.55738	9.22698	0.1802432	2.5916038	58	3	1962–1999	0.46	M-v	2	Williams	36406	1999 RU ₃₈
1999 RX ₃₈	15.0	0.15	19990810	10.29370	275.36057	44.80798	7.09599	0.1270342	2.3225187	29	1	60 days	0.35	M-v	4	Williams		1999 RX ₃₈
1999 RY ₃₈	14.1	0.15	19990810	313.06154	278.70098	121.74662	9.73421	0.1703323	2.7700220	52	4	1990–1999	0.53	M-v	1	Williams	36556	1999 RY ₃₈
1999 RZ ₃₈	14.6	0.15	19990810	290.67510	344.63256	91.38151	6.98746	0.2562450	2.5422852	36	2	1993–1999	0.57	M-v	4	Williams	36406	1999 RZ ₃₈
1999 RG ₃₉	15.9	0.15	19990919	342.37093	78.00733	323.44623	11.97891	0.2758109	2.6568288	35	1	58 days	0.60			Williams		1999 RG ₃₉
1999 RL ₃₉	15.8	0.15	19990810	13.34788	252.06390	88.12214	7.64039	0.2405797	2.1782180	12	1	68 days	0.58	M-v	7	Williams		1999 RL ₃₉
1999 RO ₃₉	15.1	0.15	19990810	345.10776	337.11328	25.38712	6.69936	0.1712312	2.2270012	73	3	1989–1999	0.66	M-v	3	Williams	36406	1999 RO ₃₉
1999 RP ₃₉	13.8	0.15	19990810	351.00999	329.89239	32.09818	8.10842	0.2005273	3.1775614	60	1	72 days	0.52	M-v	4	Williams		1999 RP ₃₉
1999 RU ₃₉	14.7	0.15	19990810	332.99829	105.30180	265.71268	6.37787	0.2434049	2.3590644	57	1	139 days	0.40	M-v	4	Williams	36556	1999 RU ₃₉
1999 RV ₃₉	15.4	0.15	19990810	358.06468	9.22451	354.74700	7.95476	0.1648238	2.4232986	22	1	60 days	0.38	M-v	4	Williams		1999 RV ₃₉
1999 RY ₃₉	14.6	0.15	19990810	22.34142	128.53848	208.22791	8.37239	0.1645493	2.7674505	41	1	61 days	0.43	M-v	5	Williams		1999 RY ₃₉
1999 RC ₄₀	14.2	0.15	19990810	328.18920	39.77726	17.55494	16.89564	0.1357225	3.2125985	34	1	60 days	0.58	M-v	4	Williams		1999 RC ₄₀
1999 RH ₄₀	16.0	0.15	19990919	28.31753	21.57411	285.72185	8.01271	0.1436545	2.4389826	36	1	58 days	0.44			Williams		1999 RH ₄₀
1999 RK ₄₀	14.5	0.15	19990810	126.48669	48.33306	167.04170	11.66144	0.0259468	2.4337396	44	2	1998–1999	0.58	M-v	3	Williams	36407	1999 RK ₄₀
1999 RV ₄₀	14.3	0.15	19990810	128.34124	208.83033	357.32519	23.82240	0.2021181	2.3747406	32	1	71 days	0.56	M-v	5	Williams		1999 RV ₄₀
1999 RG ₄₁	17.7	0.15	19991009	28.06504	308.06222	9.10222	24.68048	0.2654733	2.3157458	23	1	56 days	0.42			Marsden		1999 RG ₄₁
1999 RJ ₄₁	17.3	0.15	19991009	330.81625	34.61192	9.00938	24.76837	0.1336248	1.8378917	39	1	54 days	0.73			Williams		1999 RJ ₄₁
1999 RU ₄₁	15.8	0.15	19990919	6.76656	180.20289	175.04655	4.69072	0.2610565	2.5853215	31	1	49 days	0.64			Williams		1999 RU ₄₁
1999 RV ₄₁	14.4	0.15	19990810	348.31196	330.73862	45.78426	1.98396	0.1887071	3.0776833	38	1	68 days	0.58	M-v	4	Williams		1999 RV ₄₁
1999 RW ₄₁	13.6	0.15	19990810	354.27685	325.74031	20.25771	2.13425	0.0687011	2.8393733	96	2	1998–1999	0.49	M-v	3	Williams	36557	1999 RW ₄₁
1999 RY ₄₁	13.4	0.15	19990810	344.50248	170.19106	217.40227	6.19835	0.3416502	3.9656445	114	1	106 days	0.47	M-v	3	Williams	36557	1999 RY ₄₁
1999 RZ ₄₁	12.5	0.15	19990810	40.01782	107.90365	204.19425	8.48368	0.0672960	3.1898231	93	3	1982–1999	0.51	M-v	3	Williams	36557	1999 RZ ₄₁
1999 RC ₄₂	14.0	0.15	19990810	347.34722	33.45315	332.98610	4.83850	0.0839276	2.4307690	76	3	1995–1999	0.55	M-v	3	Williams	36557	1999 RC ₄₂
1999 RF ₄₂	16.0	0.15	19991009	0.64621	57.55363	334.89758	3.72073	0.1466226	2.6835674	34	1	58 days	0.41			Williams		1999 RF ₄₂
1999 RG ₄₂	15.2	0.15	19990919	30.64067	248.64947	83.82024	5.37718	0.1800430	3.1856380	22	1	48 days	0.51			Williams		1999 RG ₄₂
1999 RH ₄₂	14.5	0.15	19990810	323.92887	112.60091	3.84732	9.60270	0.0695470	3.0043172	31	2	1998–1999	0.44	M-v	4	Williams	36407	1999 RH ₄₂
1999 RJ ₄₂	12.8	0.15	19990810	352.25771	145.46344	241.39957	8.35448	0.1662420	2.7799426	71	2	1962–1999	0.52	M-v	4	Williams	36408	1999 RJ ₄₂
1999 RK ₄₂	14.9	0.15	19991009	330.36851	234.93540	208.29854	22.46399	0.1990358	2.3256872	52	1	54 days	1.20			Williams		1999 RK ₄₂
1999 RL ₄₂	14.1	0.15	19991009	34.43445	309.00973	41.67423	4.54884	0.2126567	2.8050946	27	1	52 days	0.53			Williams		1999 RL ₄₂
1999 RM ₄₂	14.3	0.15	19990810	265.07521	74.02413	46.68682	14.54068	0.1419461	2.5671449	43	2	1997–1999	0.63	M-v	4	Williams	36408	1999 RM ₄₂
1999 RO ₄₂	16.1	0.15	19991009	47.79463	197.35569	113.93871	5.48575	0.2277796	2.1349406	26	1	56 days	0.54			Williams		1999 RO ₄₂
1999 RP ₄₂	15.9	0.15	19991009	335.55792	11.12844	51.45974	9.40420	0.2360452	2.3497451	27	1	49 days	0.53			Williams		1999 RP ₄₂
1999 RQ ₄₂	13.5	0.15	19991009	320.45280	265.84925	173.21230	12.78605	0.1589608	2.5891298	22	1	56 days	0.60			Williams		1999 RQ ₄₂
1999 RR ₄₂	13.4	0.15	19990810	358.29848	212.11370	163.60519	10.06546	0.1093156	3.0633036	24	1	78 days	0.58	M-v	4	Williams		1999 RR ₄₂
1999 RT ₄₂	13.0	0.15	19990810	17.37768	354.04017	309.22326	18.01466	0.0941373	3.2385033	28	1	107 days	0.50	M-v	4	Williams	36105	1999 RT ₄₂
1999 RW ₄₂	12.3	0.15	19990810	314.86913	261.27091	136.77014	8.16804	0.2183439	3.9727201	35	1	94 days	0.52	M-v	5	Williams		1999 RW ₄₂
1999 RX ₄₂	14.0	0.15	19990810	7.35022	148.21795	179.76772	12.98445	0.2612699	2.4444321	56	3	1980–1999	0.71	M-v	2	Williams	36408	1999 RX ₄₂
1999 RC ₄₃	14.1	0.15	19990810	33.52946	262.51109	6.45535	22.66579	0.2582508	2.2705662	31	1	60 days	0.39	M-v	4	Williams		1999 RC ₄₃
1999 RD ₄₃	17.7	0.15	19991009	17.77559	264.08967	81.44440	8.15346	0.3538278	2.1750646	27	1	54 days	0.63			Williams		1999 RD ₄₃
1999 RL ₄₃	14.3	0.15	19990810	284.25397	205.13933	235.00861	8.33933	0.0614707	2.9790261	37	1	69 days	0.48	M-v	5	Williams		1999 RL ₄₃
1999 RM ₄₃	14.3	0.15	19990810	127.22847	26.85237	198.10028	3.49403	0.2058671	2.5953005	38	2	1994–1999	0.63	M-v	5	Williams	36408	1999 RM ₄₃
1999 RQ ₄₃	15.8	0.15	19990810	13.14215	134.07709	184.78977	4.18893	0.3005354	2.1402109	62	2	1998–1999	0.50	M-v	4	Williams	36409	1999 RQ ₄₃
1999 RS ₄₃	15.4	0.15	19990810	6.38549	180.86372	182.15440	4.39482	0.1641418	2.1766441	42	2	1998–1999	0.60	M-v	4	Williams	36409	1999 RS ₄₃
1999 RT ₄₃	14.0	0.15	19990810	327.07517	300.25545	134.04509	2.46872	0.1690220	3.1012354	31	1	62 days	0.57	M-v	5	Williams		1999 RT ₄₃
1999 RV ₄₃	15.0	0.15	19991009	16.09720	194.51379	169.48387	9.66975	0.1400215	2.5656288	21	1	59 days	0.93			Williams		1999 RV ₄₃
1999 RW ₄₃	14.1	0.15	19991009	359.50830	216.37172	171.25208	10.11263	0.1087555	3.0604905	36	1	55 days	0.69			Williams		1999 RW ₄₃
1999 RZ ₄₃	14.2	0.15	19990810	350.58342	296.89354	89.03451	6.24819	0.1458916	3.1750019	32	1	85 days	0.41	M-v	4	Williams		1999 RZ ₄₃
1999 RD ₄₄	14.6	0.15	19990919	146.41176	221.54718	358.53764	14.84998	0.0332380	2.5884046	36	1	44 days	0.73			Williams		1999 RD ₄₄
1999 RE ₄₄	15.3	0.15	19990810	14.16037	31.25163	303.31617	2.45042	0.1810549	2.7793303	41	2	1997–1999	0.62	M-v	4	Williams	36409	1999 RE ₄₄
1999 RF ₄₄	15.7	0.15	19991009	333.79980	266.64546	138.13543	15.49165	0.1354168	2.6268288	22	1	58 days	0.33			Williams		1999 RF ₄₄
1999 RG ₄₄	15.2	0.15	19990810	4.06554	187.80031	141.36449	10.27073	0.2518839	3.0809496	35	1	89 days	0.62	M-v	4	Williams		1999 RG ₄₄
1999 RH ₄₄	14.5	0.15	19990810	348.67443	324.90165	29.31207	7.20571	0.1453181	2.4328562	61	3	1982–1999	0.56	M-v	3	Williams	36409	1999 RH ₄₄

1999 RK ₄₄	14.7	0.15	19990919	296.90052	250.78590	192.48173	5.50237	0.2207843	2.7871281	56	1	54 days	0.63		Williams		1999 RK ₄₄
1999 RL ₄₄	15.6	0.15	19990810	344.17942	24.80806	348.00114	13.87377	0.3040074	2.5975672	32	1	74 days	0.53	M-v	4	Williams	1999 RL ₄₄
1999 RM ₄₄	14.3	0.15	19990810	356.26426	150.31382	196.12904	17.87020	0.2312844	2.5949226	65	2	1998–1999	0.47	M-v	3	Williams	36409 1999 RM ₄₄
1999 RN ₄₄	15.4	0.15	19990830	15.26612	126.68186	194.02397	12.63116	0.2918821	2.3307857	22	1	57 days	0.36			Williams	1999 RN ₄₄
1999 RR ₄₄	14.4	0.15	19990810	32.01821	138.60081	180.74057	8.13864	0.1448475	3.0959393	26	2	1977–1999	0.73	M-v	5	Williams	36410 1999 RR ₄₄
1999 RS ₄₄	14.9	0.15	19990810	348.05241	321.99379	57.11340	5.80221	0.2715648	2.5347178	56	3	1991–1999	0.56	M-v	3	Williams	36410 1999 RS ₄₄
1999 RT ₄₄	13.6	0.15	19990810	323.54057	48.62562	331.21208	13.08659	0.2162644	2.5819796	64	2	1997–1999	0.44	M-v	3	Williams	36557 1999 RT ₄₄
1999 RU ₄₄	14.2	0.15	19990919	5.07427	162.66483	173.09163	13.40658	0.1935983	2.5639071	44	1	54 days	0.45			Williams	1999 RU ₄₄
1999 RB ₄₅	15.8	0.15	19990919	345.60489	40.25719	347.70332	1.91877	0.2133080	2.3721947	27	1	55 days	0.63			Williams	1999 RB ₄₅
1999 RC ₄₅	15.9	0.15	19990810	307.28464	258.59817	148.24980	8.90445	0.1735379	2.3701440	50	1	64 days	0.54	M-v	5	Williams	1999 RC ₄₅
1999 RG ₄₅	12.8	0.15	19990810	23.36290	330.74498	329.10325	6.47264	0.1650815	3.1885125	77	3	1981–1999	0.66	M-v	3	Williams	36410 1999 RG ₄₅
1999 RL ₄₅	18.6	0.15	19990810	314.03251	234.01594	172.11734	22.45448	0.3748472	1.8263569	52	1	51 days	0.52	M-v	5	Williams	36557 1999 RL ₄₅
1999 RM ₄₅	19.3	0.15	19990810	16.79442	88.16192	163.36154	10.89159	0.6438132	1.6814262	67	1	51 days	0.46	M-v	5	Williams	36557 1999 RM ₄₅
1999 RQ ₄₅	15.4	0.15	19990810	348.22354	180.22653	177.06957	6.71307	0.1392579	2.3227676	46	1	115 days	0.53	M-v	4	Williams	36557 1999 RQ ₄₅
1999 RR ₄₅	16.0	0.15	19990919	196.61118	174.40202	349.28930	5.93186	0.1274225	2.3748505	28	1	53 days	0.44			Williams	1999 RR ₄₅
1999 RS ₄₅	17.0	0.15	19990919	343.85863	34.67987	348.15200	5.42318	0.2292000	2.6356865	26	1	54 days	0.41			Marsden	1999 RS ₄₅
1999 RU ₄₅	15.2	0.15	19990919	314.40949	212.79361	200.54853	6.01695	0.0685353	2.7207091	40	1	54 days	0.48			Marsden	1999 RU ₄₅
1999 RW ₄₅	15.0	0.15	19990810	351.15968	288.17855	68.87922	1.44365	0.3104529	3.0727198	42	1	122 days	0.55	M-v	4	Williams	36557 1999 RW ₄₅
1999 RA ₄₆	14.4	0.15	19990810	319.72512	209.34003	161.37520	13.99031	0.1865485	2.5325585	44	1	110 days	0.56	M-v	4	Williams	36557 1999 RA ₄₆
1999 RW ₄₆	15.2	0.15	19990810	354.74661	12.58652	311.43862	2.76683	0.3465193	2.6356863	50	1	148 days	0.50	M-v	4	Williams	36557 1999 RW ₄₆
1999 RF ₄₇	14.5	0.15	19990810	321.33850	347.91661	23.94674	2.61191	0.2085811	2.4462155	30	4	1971–1999	0.88	M-v	2	Williams	36411 1999 RF ₄₇
1999 RN ₄₇	14.2	0.15	19990810	317.86382	144.66594	233.47715	3.56378	0.2143173	2.4747445	24	2	1998–1999	0.67	M-v	4	Williams	36411 1999 RN ₄₇
1999 RN ₄₈	15.5	0.15	19990810	342.85393	36.01186	315.00682	3.84494	0.3186829	2.6221276	35	1	93 days	0.55	M-v	4	Williams	36558 1999 RN ₄₈
1999 RD ₄₉	13.0	0.15	19990810	275.28882	78.64637	331.87856	8.26642	0.0767114	3.0883441	25	1	119 days	0.49	M-v	5	Williams	1999 RD ₄₉
1999 RG ₄₉	14.9	0.15	19990810	354.50866	213.19067	112.69704	3.32837	0.2167144	2.4426718	20	1	68 days	0.53	M-v	6	Williams	1999 RG ₄₉
1999 RN ₅₀	15.6	0.15	19990810	356.86153	344.39772	338.84285	10.00947	0.2463733	2.3792791	40	1	82 days	0.57	M-v	4	Williams	36558 1999 RN ₅₀
1999 RC ₅₂	15.0	0.15	19990810	351.05828	312.99486	20.43046	3.54526	0.1835308	2.3100356	49	4	1971–1999	0.67	M-v	3	Williams	36558 1999 RC ₅₂
1999 RH ₅₂	14.6	0.15	19990810	325.45089	291.03187	79.22326	3.36648	0.1906951	2.3977135	35	2	1998–1999	0.75	M-v	4	Williams	36412 1999 RH ₅₂
1999 RX ₅₂	13.9	0.15	19990810	333.06440	27.64898	335.05552	14.42216	0.2116279	2.6545040	45	1	122 days	0.63	M-v	4	Williams	36558 1999 RX ₅₂
1999 RY ₅₅	13.3	0.15	19990810	279.55788	59.99404	355.86451	10.58235	0.0974734	3.1237473	36	2	1994–1999	0.51	M-v	4	Williams	36413 1999 RY ₅₅
1999 RQ ₅₇	13.4	0.15	19990810	23.39364	310.35751	346.11825	14.95320	0.1128210	2.6017468	55	2	1998–1999	0.47	M-v	3	Williams	36413 1999 RQ ₅₇
1999 RF ₆₂	13.3	0.15	19990810	209.59851	111.55986	13.49113	6.57053	0.1177760	2.4276576	39	5	1975–1999	0.77	M-v	1	Williams	36414 1999 RF ₆₂
1999 RO ₆₃	13.6	0.15	19990810	288.72848	212.53083	202.08488	2.85113	0.0881630	2.5953406	104	3	1962–1999	0.70	M-v	3	Williams	36558 1999 RO ₆₃
1999 RW ₇₀	12.6	0.15	19990919	355.89704	26.42744	326.02992	4.30685	0.0941796	5.3377527	20	1	31 days	0.43			Williams	1999 RW ₇₀
1999 RA ₇₁	15.6	0.15	19990810	330.09096	54.66355	323.83639	0.75229	0.1781593	2.5304319	61	2	1995–1999	0.53	M-v	4	Williams	36414 1999 RA ₇₁
1999 RG ₇₁	13.2	0.15	19990810	247.51778	104.33542	353.54320	9.23839	0.0532757	2.9850504	50	2	1997–1999	0.51	M-v	3	Williams	36414 1999 RG ₇₁
1999 RR ₇₁	15.7	0.15	19990810	349.45172	343.81399	5.53013	4.71096	0.1832901	2.4143666	43	1	92 days	0.53	M-v	4	Williams	1999 RR ₇₁
1999 RF ₇₂	15.3	0.15	19990810	332.93709	238.44273	134.81038	5.78689	0.1792650	2.3739209	49	1	64 days	0.32	M-v	5	Williams	1999 RF ₇₂
1999 RO ₇₂	14.1	0.15	19990810	46.05371	173.91828	112.79229	3.14267	0.0796091	2.9237270	77	4	1977–1999	0.59	M-v	1	Williams	36415 1999 RO ₇₂
1999 RA ₇₃	15.5	0.15	19990810	216.90899	196.73960	290.96151	1.53250	0.0845542	2.2210509	72	3	1979–1999	0.61	M-v	3	Williams	36415 1999 RA ₇₃
1999 RL ₇₃	15.3	0.15	19990810	334.19029	54.03749	330.12446	11.08771	0.3003235	2.5834367	54	1	117 days	0.51	M-v	3	Williams	36558 1999 RL ₇₃
1999 RR ₇₄	14.7	0.15	19990810	296.96750	289.20842	127.48987	5.39406	0.1507815	2.4049710	62	1	90 days	0.40	M-v	4	Williams	1999 RR ₇₄
1999 RV ₇₄	15.0	0.15	19990810	150.49847	78.21647	104.60567	4.43807	0.1156354	2.2505614	71	3	1991–1999	0.63	M-v	3	Williams	36416 1999 RV ₇₄
1999 RR ₇₅	15.1	0.15	19990810	250.29277	208.87656	248.62819	4.65213	0.0651504	2.2256459	59	3	1993–1999	0.52	M-v	3	Williams	36558 1999 RR ₇₅
1999 RV ₇₅	14.2	0.15	19990919	308.31439	231.68475	187.15503	15.00351	0.1397899	2.5936018	37	1	55 days	0.47			Williams	1999 RV ₇₅
1999 RM ₇₆	16.3	0.15	19990830	348.88742	191.99377	171.34861	5.37340	0.2562279	2.3565172	48	1	46 days	0.55			Williams	1999 RM ₇₆
1999 RF ₈₁	15.2	0.15	19990810	49.61945	147.85611	127.34014	2.96947	0.1589538	2.2793334	54	3	1984–1999	0.68	M-v	3	Williams	36417 1999 RF ₈₁
1999 RS ₈₁	16.3	0.15	19990810	7.21043	350.20047	336.16916	7.03935	0.1832793	2.2054937	37	1	69 days	0.51	M-v	4	Williams	1999 RS ₈₁
1999 RU ₈₁	14.7	0.15	19990810	321.89321	213.75883	186.97021	7.97076	0.2278497	2.7864426	37	2	1997–1999	0.42	M-v	3	Williams	36418 1999 RU ₈₁
1999 RA ₈₃	15.5	0.15	19990810	15.21452	350.86973	325.89348	1.68086	0.1946662	2.4095617	53	2	1998–1999	0.65	M-v	4	Williams	36418 1999 RA ₈₃
1999 RH ₈₃	15.5	0.15	19990810	312.47084	246.70590	162.56554	13.08268	0.2005077	2.5485843	31	1	66 days	0.47	M-v	5	Williams	1999 RH ₈₃
1999 RJ ₈₃	15.6	0.15	19990810	1.47891	300.65341	33.82592	2.67378	0.2237493	2.3757605	29	1	83 days	0.45	M-v	5	Williams	1999 RJ ₈₃
1999 RB ₈₄	13.6	0.15	19990810	151.33929	193.99889	359.37177	10.53588	0.0729446	2.9466665	54	1	84 days	0.67	M-v	4	Williams	36559 1999 RB ₈₄

1999 RN ₈₄	14.1	0.15	19990810	34.58437	30.46361	258.30076	2.54805	0.2264935	2.3068968	79	5	1981–1999	0.49	M-v	1	Williams	36559	1999 RN ₈₄
1999 RP ₈₄	14.3	0.15	19990810	169.97466	264.59405	272.80761	3.58124	0.1702689	2.3770510	37	3	1991–1999	0.61	M-v	4	Williams	36419	1999 RP ₈₄
1999 RS ₈₄	15.2	0.15	19990810	37.89257	90.39852	199.34268	5.25402	0.1827690	2.2977142	23	1	75 days	0.28	M-v	5	Williams		1999 RS ₈₄
1999 RC ₈₅	16.7	0.15	19990810	335.58025	182.99678	199.35121	1.22410	0.2323361	2.7785391	15	1	66 days	0.47	M-v	5	Williams		1999 RC ₈₅
1999 RD ₈₅	14.9	0.15	19990810	257.77109	145.24110	309.90474	0.32539	0.0341774	2.9808301	21	2	1992–1999	0.56	M-v	4	Williams	36419	1999 RD ₈₅
1999 RA ₈₆	14.8	0.15	19990810	350.48871	251.95214	104.88169	3.23643	0.0968030	2.6865771	43	4	1993–1999	0.57	M-v	3	Williams	36419	1999 RA ₈₆
1999 RS ₈₆	15.2	0.15	19990810	0.82665	325.77725	11.68443	6.37980	0.2803058	2.5645537	46	1	121 days	0.45	M-v	3	Williams	36559	1999 RS ₈₆
1999 RW ₈₆	13.4	0.15	19990810	357.74231	328.55546	22.52403	6.40904	0.1643848	3.1834416	31	2	1997–1999	0.57	M-v	4	Williams	36420	1999 RW ₈₆
1999 RF ₈₇	16.0	0.15	19990810	334.38576	29.96972	352.85431	12.66790	0.2266242	2.5775808	32	1	83 days	0.56	M-v	4	Marsden		1999 RF ₈₇
1999 RJ ₈₇	14.3	0.15	19990810	280.52192	264.75278	181.84802	9.23424	0.1422667	3.0894393	27	2	1980–1999	0.59	M-v	4	Williams	36420	1999 RJ ₈₇
1999 RM ₈₇	13.8	0.15	19990810	271.43390	219.89637	236.86236	0.25627	0.1436050	3.1843168	36	1	71 days	0.65	M-v	5	Williams		1999 RM ₈₇
1999 RT ₈₇	15.4	0.15	19990830	324.45352	242.54453	156.56836	5.36387	0.1530216	2.5592575	33	1	46 days	0.62			Williams		1999 RT ₈₇
1999 RX ₈₇	14.8	0.15	19990919	318.60501	36.37164	9.33910	4.36360	0.0707371	2.7772705	28	1	58 days	0.54			Williams		1999 RX ₈₇
1999 RY ₈₇	16.1	0.15	19990810	40.85260	285.56791	3.02539	5.80062	0.1643769	2.2668272	44	2	1998–1999	0.55	M-v	4	Williams	36420	1999 RY ₈₇
1999 RK ₈₈	14.2	0.15	19990810	59.95500	9.02973	280.32885	0.86690	0.0307455	2.9080535	50	2	1992–1999	0.56	M-v	4	Williams	36559	1999 RK ₈₈
1999 RP ₈₈	15.0	0.15	19990810	341.98013	92.27361	277.76430	1.64550	0.1006988	2.6495987	25	2	1997–1999	0.60	M-v	4	Williams	36421	1999 RP ₈₈
1999 RW ₈₈	15.6	0.15	19990810	300.95762	209.65745	207.07199	2.44231	0.1224099	2.1643533	34	1	66 days	0.38	M-v	5	Williams		1999 RW ₈₈
1999 RX ₈₈	15.0	0.15	19990810	282.37114	161.56277	284.33826	1.48936	0.1738882	2.3786355	36	2	1997–1999	0.41	M-v	4	Williams	36421	1999 RX ₈₈
1999 RB ₈₉	13.5	0.15	19990810	285.58024	259.90485	183.05845	13.58909	0.1428605	2.8856553	39	1	107 days	0.51	M-v	4	Williams	36559	1999 RB ₈₉
1999 RE ₈₉	14.5	0.15	19990810	26.66515	113.34194	205.14570	2.41353	0.1030559	2.7995374	30	3	1997–1999	0.68	M-v	4	Williams	36421	1999 RE ₈₉
1999 RL ₈₉	15.1	0.15	19990919	177.15000	178.60875	4.08595	2.55196	0.1173491	2.4408582	29	1	54 days	0.47			Williams		1999 RL ₈₉
1999 RY ₈₉	13.9	0.15	19990810	319.88569	310.98805	84.71900	3.33918	0.0868693	2.8428843	30	2	1992–1999	0.61	M-v	4	Williams	36421	1999 RY ₈₉
1999 RN ₉₁	16.2	0.15	19990919	326.94793	264.17593	144.88636	2.65076	0.2051312	2.3809262	28	1	42 days	0.64			Williams		1999 RN ₉₁
1999 RT ₉₁	16.4	0.15	19990810	321.44859	49.57702	351.26831	2.06016	0.2121991	2.2373690	36	1	70 days	0.51	M-v	5	Williams		1999 RT ₉₁
1999 RV ₉₁	13.6	0.15	19990810	22.96612	324.30139	357.97670	9.12017	0.1109847	2.7303547	40	6	1972–1999	0.50	M-v	1	Williams	36422	1999 RV ₉₁
1999 RB ₉₂	16.5	0.15	19990919	332.51201	39.09042	353.06151	4.30792	0.0653251	2.1514598	25	1	29 days	0.51			Williams		1999 RB ₉₂
1999 RC ₉₂	15.2	0.15	19990810	339.40923	27.02706	353.06579	6.21570	0.2628080	2.5366495	42	1	123 days	0.46	M-v	3	Williams	36559	1999 RC ₉₂
1999 RF ₉₂	14.3	0.15	19990810	321.92796	225.57949	183.03004	12.34355	0.1974388	3.0308260	52	2	1997–1999	0.49	M-v	3	Williams	36422	1999 RF ₉₂
1999 RJ ₉₂	16.7	0.15	19990919	301.59109	76.65717	356.56742	7.37805	0.1271286	2.2012323	25	1	58 days	0.63			Williams		1999 RJ ₉₂
1999 RK ₉₂	14.2	0.15	19990810	216.66248	144.21711	357.18744	6.07332	0.0914481	2.2598053	42	4	1974–1999	0.54	M-v	3	Williams	36423	1999 RK ₉₂
1999 RL ₉₂	14.9	0.15	19990810	357.30801	170.35393	186.34537	1.77827	0.1179127	2.9450002	41	2	1997–1999	0.42	M-v	4	Williams	36423	1999 RL ₉₂
1999 RP ₉₂	15.4	0.15	19990919	314.09182	53.62482	8.46954	5.87664	0.1545339	2.3356885	36	1	39 days	0.35			Williams		1999 RP ₉₂
1999 RQ ₉₂	16.0	0.15	19990810	5.29130	330.42048	1.74226	7.51190	0.2292014	2.2251702	38	1	111 days	0.38	M-v	3	Williams		1999 RQ ₉₂
1999 RB ₉₃	14.2	0.15	19990810	341.23579	324.00301	54.56258	2.92310	0.1948516	3.0640874	35	2	1978–1999	0.60	M-v	4	Williams	36423	1999 RB ₉₃
1999 RH ₉₃	15.8	0.15	19990810	356.59239	327.17541	23.48430	4.36055	0.2391555	2.5807522	50	2	1995–1999	0.56	M-v	3	Williams	36423	1999 RH ₉₃
1999 RQ ₉₃	16.3	0.15	19990810	348.77682	307.87073	53.15597	2.84969	0.2263889	2.3823603	38	2	1977–1999	0.61	M-v	3	Williams	36424	1999 RQ ₉₃
1999 RT ₉₃	14.4	0.15	19990810	23.48531	218.07546	85.16158	3.49584	0.3083037	2.9926034	44	2	1998–1999	0.65	M-v	4	Williams	36424	1999 RT ₉₃
1999 RF ₉₄	15.0	0.15	19990919	61.82050	159.83719	122.47609	4.58520	0.1562525	2.1929688	18	1	54 days	0.46			Marsden		1999 RF ₉₄
1999 RK ₉₄	13.9	0.15	19990810	324.27191	25.53160	13.36382	15.59957	0.1309038	2.9753064	61	3	1971–1999	0.61	M-v	3	Williams	36425	1999 RK ₉₄
1999 RP ₉₄	15.2	0.15	19990919	7.24423	253.64441	98.50869	3.07067	0.1925746	3.1674109	23	1	33 days	0.57			Williams		1999 RP ₉₄
1999 RY ₉₄	16.5	0.15	19990810	358.45907	356.52345	350.69600	1.19989	0.1757442	2.2637940	35	2	1992–1999	0.55	M-v	4	Williams	36425	1999 RY ₉₄
1999 RE ₉₅	14.2	0.15	19990810	149.48407	6.51922	192.84450	11.42898	0.1728548	2.4700605	48	4	1991–1999	0.66	M-v	2	Williams	36425	1999 RE ₉₅
1999 RF ₉₅	16.6	0.15	19990919	311.62138	213.11516	208.84822	2.73405	0.1146870	2.1973287	32	1	52 days	0.54			Williams		1999 RF ₉₅
1999 RG ₉₅	14.3	0.15	19990810	350.81155	11.16969	353.74294	8.91206	0.1678209	2.7980930	46	2	1992–1999	0.42	M-v	3	Williams	36425	1999 RG ₉₅
1999 RM ₉₅	13.0	0.15	19990810	178.23737	166.82165	13.59545	18.29110	0.1146851	3.2169746	14	1	66 days	0.71	M-v	6	Williams		1999 RM ₉₅
1999 RM ₉₆	14.3	0.15	19990919	352.38291	274.59079	102.53799	2.27588	0.1886436	3.1388127	36	1	57 days	0.57			Williams		1999 RM ₉₆
1999 RH ₉₇	14.9	0.15	19990919	206.79796	321.43693	195.64692	3.88889	0.0975571	2.5757093	22	1	55 days	0.48			Williams		1999 RH ₉₇
1999 RY ₉₇	15.5	0.15	19990810	341.79559	206.02768	169.27076	4.17824	0.1126083	2.8021060	17	1	61 days	0.63	M-v	5	Williams		1999 RY ₉₇
1999 RZ ₉₇	15.6	0.15	19990919	359.51585	0.56927	2.97271	1.01880	0.1131813	2.4970051	11	1	52 days	0.85			Williams		1999 RZ ₉₇
1999 RH ₉₈	14.6	0.15	19990919	13.00814	259.90270	86.05910	2.59424	0.2003353	3.2003967	31	1	57 days	0.68			Williams		1999 RH ₉₈
1999 RS ₉₈	14.6	0.15	19990810	66.44641	261.05865	20.28315	7.84647	0.0964522	2.5630427	11	1	66 days	0.43	M-v	8	Williams		1999 RS ₉₈
1999 RY ₉₈	15.4	0.15	19990919	11.34318	338.94273	14.42860	25.88345	0.1196074	2.6870044	39	1	57 days	0.59			Williams		1999 RY ₉₈
1999 RZ ₉₈	12.5	0.15	19990810	33.25502	310.04616	21.15089	21.88931	0.0206820	3.2263835	75	4	1982–1999	0.51	M-v	1	Williams	36426	1999 RZ ₉₈

1999 RC ₉₉	14.7	0.15	19990810	49.91906	211.15758	69.55638	5.86040	0.2599599	2.4396192	28	2	1998–1999	0.71	M-v	5	Williams	36426	1999 RC ₉₉
1999 RW ₁₀₀	13.4	0.15	19990810	4.76954	40.26031	279.39882	11.33625	0.3107217	3.0975883	37	1	123 days	0.54	M-v	4	Williams	36560	1999 RW ₁₀₀
1999 RD ₁₀₂	13.1	0.15	19990810	47.47625	28.21355	247.59596	10.85037	0.1248107	3.0306007	69	3	1994–1999	0.74	M-v	2	Williams	36560	1999 RD ₁₀₂
1999 RE ₁₀₂	12.8	0.15	19990810	336.70876	164.44566	199.63751	16.41639	0.1360639	3.0978430	72	3	1983–1999	0.56	M-v	3	Williams	36560	1999 RE ₁₀₂
1999 RF ₁₀₂	12.6	0.15	19990810	255.34883	159.36985	293.41230	14.26133	0.1047826	3.0198281	46	1	117 days	0.54	M-v	4	Williams	36560	1999 RF ₁₀₂
1999 RK ₁₀₂	14.6	0.15	19990810	0.93833	30.54596	298.05502	11.86649	0.1643666	2.7166935	44	2	1997–1999	0.55	M-v	3	Williams	36427	1999 RK ₁₀₂
1999 RN ₁₀₂	14.7	0.15	19990810	353.00419	106.08486	236.32658	7.02469	0.2714000	2.6900746	51	1	117 days	0.56	M-v	3	Williams	36560	1999 RN ₁₀₂
1999 RQ ₁₀₂	14.5	0.15	19990810	326.32595	66.17595	307.67263	12.55000	0.0817650	2.6617243	36	1	117 days	0.53	M-v	4	Williams	36560	1999 RQ ₁₀₂
1999 RR ₁₀₂	13.9	0.15	19990810	309.71289	114.12331	279.34213	8.42717	0.0840604	2.9871484	41	1	117 days	0.55	M-v	4	Williams	36560	1999 RR ₁₀₂
1999 RS ₁₀₂	13.9	0.15	19990810	350.38335	77.07803	269.76901	8.90578	0.0905968	3.0919507	47	1	117 days	0.51	M-v	3	Williams	36560	1999 RS ₁₀₂
1999 RT ₁₀₂	14.5	0.15	19990810	38.54457	36.74156	242.13825	6.84377	0.1698149	2.2376169	56	1	117 days	0.46	M-v	4	Williams	36560	1999 RT ₁₀₂
1999 RY ₁₀₂	14.3	0.15	19990810	1.43165	142.44806	187.45037	12.95041	0.2013647	2.7289063	56	2	1998–1999	0.49	M-v	3	Williams	36427	1999 RY ₁₀₂
1999 RZ ₁₀₂	15.1	0.15	19990810	323.87663	89.55509	298.25966	7.27766	0.2319302	2.3568516	49	1	90 days	0.49	M-v	4	Williams	36560	1999 RZ ₁₀₂
1999 RA ₁₀₃	12.6	0.15	19990810	348.46926	98.95430	251.62741	6.77314	0.1112742	3.2352727	51	3	1982–1999	0.60	M-v	3	Williams	36428	1999 RA ₁₀₃
1999 RF ₁₀₃	15.7	0.15	19990810	351.11489	52.56662	296.00466	11.55761	0.2721704	2.5711756	35	1	123 days	0.57	M-v	3	Williams	36560	1999 RF ₁₀₃
1999 RG ₁₀₃	14.3	0.15	19990810	335.26389	150.47882	218.71755	12.71949	0.1777286	2.5524537	38	1	107 days	0.45	M-v	3	Williams	36560	1999 RG ₁₀₃
1999 RH ₁₀₃	14.8	0.15	19990810	319.65639	179.78957	214.65857	12.22627	0.2195865	2.4308404	43	1	127 days	0.42	M-v	4	Williams	36560	1999 RH ₁₀₃
1999 RL ₁₀₃	14.5	0.15	19990810	23.83418	56.96333	248.42317	6.00631	0.1107358	2.4131547	44	2	1998–1999	0.53	M-v	4	Williams	36560	1999 RL ₁₀₃
1999 RM ₁₀₃	15.2	0.15	19990919	340.16908	86.36138	287.55172	6.08204	0.1306240	2.3425655	34	1	51 days	0.49			Williams		1999 RM ₁₀₃
1999 RQ ₁₀₃	15.0	0.15	19990810	342.54459	57.65887	297.96540	6.02926	0.1342051	2.3191488	51	2	1998–1999	0.67	M-v	3	Williams	36428	1999 RQ ₁₀₃
1999 RT ₁₀₃	14.6	0.15	19990810	329.23933	199.72553	185.79548	13.39254	0.2478037	2.5739185	66	1	126 days	0.53	M-v	4	Williams	36561	1999 RT ₁₀₃
1999 RV ₁₀₃	14.0	0.15	19990810	41.55764	11.37941	275.66279	5.73709	0.1136571	2.3699482	50	2	1998–1999	0.49	M-v	4	Williams	36561	1999 RV ₁₀₃
1999 RZ ₁₀₃	13.3	0.15	19990810	355.64144	75.33418	270.23590	8.80778	0.1122222	3.0237349	45	3	1984–1999	0.60	M-v	3	Williams	36428	1999 RZ ₁₀₃
1999 RF ₁₀₄	16.1	0.15	19990810	347.67178	165.23995	192.87211	6.63921	0.1557020	2.4268089	30	1	64 days	0.42	M-v	4	Williams		1999 RF ₁₀₄
1999 RJ ₁₀₄	14.8	0.15	19990810	2.93019	35.41293	300.54234	6.25325	0.1448713	2.3541852	61	2	1998–1999	0.54	M-v	3	Williams	36561	1999 RJ ₁₀₄
1999 RK ₁₀₄	13.0	0.15	19990810	15.61203	31.29669	281.31770	12.10672	0.1711953	2.6787632	38	3	1982–1999	0.61	M-v	3	Williams	36428	1999 RK ₁₀₄
1999 RQ ₁₀₄	13.3	0.15	19990810	344.91044	150.23760	205.68901	10.27025	0.0557574	3.1162996	47	3	1994–1999	0.62	M-v	3	Williams	36428	1999 RQ ₁₀₄
1999 RX ₁₀₄	15.1	0.15	19990810	352.38879	38.10416	307.43863	12.62797	0.1936317	2.5313740	21	1	68 days	0.39	M-v	4	Williams		1999 RX ₁₀₄
1999 RZ ₁₀₄	14.8	0.15	19990810	16.44318	88.22168	241.65492	1.71667	0.1758595	2.4283593	60	2	1998–1999	0.59	M-v	4	Williams	36428	1999 RZ ₁₀₄
1999 RE ₁₀₅	17.0	0.15	19990919	4.79950	341.30883	21.04959	5.57133	0.1628534	2.2791476	22	1	57 days	0.48			Williams		1999 RE ₁₀₅
1999 RH ₁₀₅	14.8	0.15	19990919	31.96163	289.59129	46.77478	3.27877	0.0708214	2.7158602	43	1	54 days	0.81			Williams		1999 RH ₁₀₅
1999 RJ ₁₀₅	15.7	0.15	19990919	354.12405	359.55818	18.72809	8.21282	0.1216876	2.3812756	51	1	57 days	0.41			Williams		1999 RJ ₁₀₅
1999 RM ₁₀₅	15.6	0.15	19990810	352.03121	237.15890	130.53490	2.16901	0.1087806	2.3871007	13	1	64 days	0.59	M-v	7	Williams		1999 RM ₁₀₅
1999 RO ₁₀₅	14.7	0.15	19990810	91.57949	357.85298	256.48586	5.41996	0.0875727	2.3932052	45	1	105 days	0.52	M-v	4	Williams	36561	1999 RO ₁₀₅
1999 RU ₁₀₅	14.4	0.15	19990919	325.45040	113.30772	285.25356	12.94873	0.0968343	2.5959014	25	1	57 days	0.40			Williams		1999 RU ₁₀₅
1999 RY ₁₀₅	12.7	0.15	19990810	183.50831	242.16939	288.54434	14.30728	0.0372925	3.1627035	40	3	1995–1999	0.63	M-v	3	Williams	36429	1999 RY ₁₀₅
1999 RE ₁₀₆	14.1	0.15	19990810	345.08913	157.93479	205.29384	8.60067	0.1669682	2.8051119	52	1	116 days	0.44	M-v	3	Williams	36561	1999 RE ₁₀₆
1999 RL ₁₀₆	17.0	0.15	19990919	0.31252	70.94819	286.20499	5.64347	0.2229013	2.2898040	18	1	57 days	0.63			Williams		1999 RL ₁₀₆
1999 RU ₁₀₆	14.7	0.15	19990810	46.43377	330.39629	316.50533	13.83608	0.1856595	2.6398491	29	1	81 days	0.58	M-v	4	Williams		1999 RU ₁₀₆
1999 RA ₁₀₇	16.7	0.15	19990919	21.83024	310.17770	13.03278	7.07758	0.2266108	2.9607459	13	1	54 days	1.21			Williams		1999 RA ₁₀₇
1999 RG ₁₀₇	16.0	0.15	19990919	301.35181	132.72225	306.34006	1.79255	0.1591645	2.4673749	25	1	31 days	0.45			Williams		1999 RG ₁₀₇
1999 RL ₁₀₇	14.0	0.15	19990810	6.21808	155.58405	200.24419	9.38025	0.0862538	3.1891173	39	1	65 days	0.55	M-v	5	Williams		1999 RL ₁₀₇
1999 RO ₁₀₇	13.9	0.15	19990919	334.76096	145.39232	247.76867	8.45542	0.0969224	3.1641816	26	1	57 days	0.68			Williams		1999 RO ₁₀₇
1999 RX ₁₀₈	14.7	0.15	19990810	0.49270	115.11682	233.05476	11.50188	0.1377660	2.6347617	40	1	101 days	0.48	M-v	4	Williams		1999 RX ₁₀₈
1999 RD ₁₀₉	16.1	0.15	19990810	1.20349	157.26408	191.53916	8.00056	0.3048452	2.7524212	40	1	106 days	0.62	M-v	4	Williams	36561	1999 RD ₁₀₉
1999 RH ₁₀₉	14.8	0.15	19990919	14.39485	124.72349	219.17123	8.81609	0.0998888	3.0733895	21	1	57 days	0.46			Williams		1999 RH ₁₀₉
1999 RJ ₁₀₉	14.9	0.15	19990810	1.81487	12.30032	329.34326	9.06354	0.1966745	2.3623434	46	1	119 days	0.45	M-v	3	Williams	36561	1999 RJ ₁₀₉
1999 RL ₁₀₉	13.2	0.15	19990810	238.38453	274.18634	216.99377	10.59662	0.1558639	3.0452895	45	2	1997–1999	0.70	M-v	4	Williams	36429	1999 RL ₁₀₉
1999 RO ₁₀₉	14.6	0.15	19990810	16.66465	355.44625	331.22371	12.77317	0.1666451	2.6315973	45	2	1997–1999	0.40	M-v	3	Williams	36429	1999 RO ₁₀₉
1999 RQ ₁₀₉	14.6	0.15	19990810	0.21160	30.89864	318.61893	12.15599	0.2481820	2.6059245	40	1	103 days	0.46	M-v	3	Williams		1999 RQ ₁₀₉
1999 RR ₁₀₉	14.5	0.15	19990810	336.48203	52.68858	334.88764	10.59378	0.1843067	2.7522923	48	1	104 days	0.42	M-v	3	Williams	36561	1999 RR ₁₀₉
1999 RU ₁₀₉	16.5	0.15	19990919	334.05692	169.96442	227.05254	5.87605	0.1118253	2.3738730	35	1	56 days	0.56			Williams		1999 RU ₁₀₉
1999 RY ₁₀₉	14.4	0.15	19990919	344.99526	89.11078	301.39716	9.62166	0.1056032	3.1494978	30	1	57 days	0.55			Williams		1999 RY ₁₀₉

1999 RZ ₁₀₉	16.1	0.15	19990919	0.45346	96.75979	270.02922	6.42494	0.1352627	2.1990061	33	1	59 days	0.72		Williams	1999 RZ ₁₀₉
1999 RC ₁₁₀	16.3	0.15	19990919	352.72565	59.37309	321.39959	10.55968	0.1984076	2.6438148	27	1	56 days	0.64		Williams	1999 RC ₁₁₀
1999 RF ₁₁₀	13.9	0.15	19990810	306.78624	127.44699	298.32602	8.34694	0.0754806	3.0323134	34	1	112 days	0.53	M-v 4	Williams	1999 RF ₁₁₀
1999 RH ₁₁₀	13.4	0.15	19990810	306.92340	170.87295	255.47422	8.90019	0.0864304	3.0062384	38	3	1989–1999	0.68	M-v 4	Williams	36430 1999 RH ₁₁₀
1999 RP ₁₁₀	13.8	0.15	19990919	313.34226	119.45582	314.34785	9.76069	0.1118269	3.0104619	22	1	56 days	0.50		Williams	1999 RP ₁₁₀
1999 RR ₁₁₀	15.7	0.15	19990810	356.05311	68.51892	294.57382	6.54591	0.1366957	2.3286945	34	2	1997–1999	0.65	M-v 4	Williams	36430 1999 RR ₁₁₀
1999 RX ₁₁₀	14.1	0.15	19990810	56.24272	7.37225	295.14231	5.79508	0.0703079	2.5219397	59	4	1989–1999	0.52	M-v 1	Williams	36430 1999 RX ₁₁₀
1999 RZ ₁₁₀	15.0	0.15	19990810	3.84809	24.37353	333.48076	8.29139	0.1337841	2.6242486	38	2	1997–1999	0.57	M-v 4	Williams	36430 1999 RZ ₁₁₀
1999 RB ₁₁₁	14.3	0.15	19990919	227.68863	284.90548	220.81029	8.26401	0.1502518	2.4040267	25	1	57 days	0.67		Williams	1999 RB ₁₁₁
1999 RG ₁₁₅	15.4	0.15	19990810	354.34220	188.87277	147.09606	5.52422	0.2923330	2.6194838	64	3	1997–1999	0.47	M-v 2	Williams	36561 1999 RG ₁₁₅
1999 RJ ₁₁₅	14.5	0.15	19990810	16.56152	157.47850	149.71612	6.91488	0.0859209	2.4820483	54	2	1998–1999	0.50	M-v 3	Williams	36561 1999 RJ ₁₁₅
1999 RX ₁₁₅	15.9	0.15	19990810	3.82328	149.55682	163.65329	4.15824	0.1910582	2.2861318	43	1	75 days	0.50	M-v 4	Williams	36562 1999 RX ₁₁₅
1999 RY ₁₁₅	13.2	0.15	19990810	319.49938	218.91441	154.13236	12.05232	0.1474413	3.0512221	51	2	1998–1999	0.54	M-v 3	Williams	36431 1999 RY ₁₁₅
1999 RA ₁₁₆	14.2	0.15	19990810	1.69795	160.17891	155.60038	14.40645	0.1999293	2.6598744	55	1	173 days	0.61	M-v 3	Williams	36562 1999 RA ₁₁₆
1999 RX ₁₁₆	14.8	0.15	19990810	340.65492	194.35420	151.93874	14.30303	0.1884791	2.5441324	50	1	120 days	0.53	M-v 3	Williams	36562 1999 RX ₁₁₆
1999 RT ₁₁₇	14.1	0.15	19990919	344.84835	72.09327	282.56995	13.56864	0.1256014	2.6703980	20	1	50 days	0.35		Williams	1999 RT ₁₁₇
1999 RE ₁₁₈	15.0	0.15	19990810	6.67808	78.55981	231.97807	4.05001	0.1921834	2.3077331	60	2	1992–1999	0.62	M-v 3	Williams	36562 1999 RE ₁₁₈
1999 RF ₁₁₈	14.2	0.15	19990810	37.91215	115.82608	156.89692	13.58250	0.1258470	2.7107693	48	2	1998–1999	0.58	M-v 3	Williams	36432 1999 RF ₁₁₈
1999 RX ₁₁₈	13.4	0.15	19990810	310.97691	201.87125	196.17216	12.05958	0.2509281	2.6926457	42	4	1955–1999	0.64	M-v 2	Williams	36432 1999 RX ₁₁₈
1999 RL ₁₁₉	14.5	0.15	19990810	324.18964	65.24574	314.07034	14.05664	0.2336315	2.7145823	36	1	135 days	0.61	M-v 4	Williams	36562 1999 RL ₁₁₉
1999 RW ₁₁₉	13.9	0.15	19990810	22.20131	320.50764	327.33353	12.16310	0.1818849	2.6703258	68	3	1997–1999	0.62	M-v 2	Williams	36433 1999 RW ₁₁₉
1999 RP ₁₂₀	15.0	0.15	19990810	346.86543	24.98979	320.74851	13.20760	0.2501539	2.6589822	34	1	114 days	0.52	M-v 3	Williams	36562 1999 RP ₁₂₀
1999 RV ₁₂₀	13.8	0.15	19990810	353.05342	161.22539	172.01172	13.54693	0.2044376	2.4035669	88	3	1988–1999	0.53	M-v 2	Williams	36433 1999 RV ₁₂₀
1999 RV ₁₂₂	14.2	0.15	19990810	24.11206	187.73098	118.78315	6.28861	0.1166150	3.0484627	51	2	1998–1999	0.71	M-v 3	Williams	36434 1999 RV ₁₂₂
1999 RE ₁₂₃	13.8	0.15	19990810	82.03997	322.51638	287.42975	6.25336	0.0764490	2.3527347	54	2	1998–1999	0.49	M-v 3	Williams	36562 1999 RE ₁₂₃
1999 RG ₁₂₃	15.2	0.15	19990810	301.14494	163.95451	245.16993	6.37493	0.0965857	2.3732049	43	2	1992–1999	0.53	M-v 4	Williams	36562 1999 RG ₁₂₃
1999 RK ₁₂₃	15.3	0.15	19990810	303.69544	168.07335	239.93201	6.15366	0.1167193	2.2904645	37	3	1982–1999	0.44	M-v 3	Williams	36434 1999 RK ₁₂₃
1999 RQ ₁₂₃	15.8	0.15	19990919	350.34118	151.42680	223.56775	8.17752	0.3255173	2.7240063	37	1	53 days	0.37		Williams	1999 RQ ₁₂₃
1999 RR ₁₂₃	13.0	0.15	19990919	180.16862	305.22664	229.55373	10.73250	0.0702012	3.1691945	40	1	53 days	0.45		Williams	1999 RR ₁₂₃
1999 RZ ₁₂₃	13.5	0.15	19990810	142.41251	289.21959	269.95944	12.46784	0.1610034	2.7040567	57	2	1998–1999	0.61	M-v 4	Williams	36562 1999 RZ ₁₂₃
1999 RA ₁₂₄	14.4	0.15	19990810	358.31109	65.10409	279.76795	6.16748	0.2256934	2.7752805	44	2	1994–1999	0.43	M-v 3	Williams	36435 1999 RA ₁₂₄
1999 RB ₁₂₄	14.7	0.15	19990810	51.25355	49.81346	220.58927	7.94594	0.1957869	2.2342581	60	2	1996–1999	0.50	M-v 4	Williams	36562 1999 RB ₁₂₄
1999 RE ₁₂₄	14.8	0.15	19990810	4.49654	142.55980	195.27854	13.79327	0.1141827	2.5935173	61	3	1995–1999	0.48	M-v 2	Williams	36435 1999 RE ₁₂₄
1999 RG ₁₂₄	14.4	0.15	19990810	345.68319	58.22687	306.51371	8.98959	0.1326203	2.5824658	35	1	112 days	0.54	M-v 3	Williams	1999 RG ₁₂₄
1999 RJ ₁₂₄	15.3	0.15	19990919	262.02942	204.61879	258.73283	6.59111	0.0652207	2.2576762	26	1	52 days	0.66		Williams	1999 RJ ₁₂₄
1999 RL ₁₂₄	13.7	0.15	19990810	337.21052	52.24349	327.80911	12.35905	0.2022372	2.6395512	61	1	115 days	0.42	M-v 3	Williams	36562 1999 RL ₁₂₄
1999 RQ ₁₂₄	15.1	0.15	19990810	351.39629	41.34326	318.84540	12.22760	0.1687431	2.6569304	41	1	97 days	0.49	M-v 3	Williams	1999 RQ ₁₂₄
1999 RL ₁₂₅	13.8	0.15	19990919	9.47847	359.32440	333.08729	15.91376	0.0854607	3.1490563	35	1	58 days	0.61		Williams	1999 RL ₁₂₅
1999 RV ₁₂₅	14.1	0.15	19990810	48.80333	310.69546	320.45127	7.65927	0.1152575	2.3904514	53	3	1994–1999	0.67	M-v 2	Williams	36436 1999 RV ₁₂₅
1999 RF ₁₂₆	13.9	0.15	19990810	352.34705	15.62797	322.60175	13.41437	0.0982417	2.5403016	55	2	1991–1999	0.48	M-v 3	Williams	36436 1999 RF ₁₂₆
1999 RT ₁₂₈	14.0	0.15	19990810	354.12658	152.28784	183.41860	6.91821	0.2768436	2.7598115	67	3	1981–1999	0.72	M-v 2	Williams	36562 1999 RT ₁₂₈
1999 RB ₁₂₉	12.9	0.15	19990810	1.91265	168.74401	156.42997	23.20856	0.0822502	3.1654420	47	1	80 days	0.37	M-v 3	Williams	1999 RB ₁₂₉
1999 RC ₁₂₉	12.8	0.15	19990810	218.48372	153.45183	325.79190	12.45237	0.1414540	3.0271040	39	1	82 days	0.49	M-v 4	Williams	1999 RC ₁₂₉
1999 RM ₁₂₉	15.5	0.15	19990810	327.15690	35.10912	340.42368	5.00123	0.2203240	2.3433633	36	1	92 days	0.51	M-v 4	Williams	1999 RM ₁₂₉
1999 RS ₁₂₉	14.7	0.15	19990810	5.83349	328.79972	346.11603	7.14221	0.1891983	2.2932218	56	5	1977–1999	0.54	M-v 2	Williams	36438 1999 RS ₁₂₉
1999 RC ₁₃₀	15.1	0.15	19990810	47.16242	118.38898	150.81301	6.93895	0.1156125	2.4307164	49	3	1994–1999	0.60	M-v 2	Williams	36562 1999 RC ₁₃₀
1999 RE ₁₃₀	13.6	0.15	19990810	291.60917	87.00683	339.54153	8.60057	0.2578852	3.0448364	38	2	1996–1999	0.50	M-v 4	Williams	36438 1999 RE ₁₃₀
1999 RS ₁₃₀	14.9	0.15	19990810	348.24612	151.54620	193.77197	3.99715	0.2297066	2.6150776	51	2	1995–1999	0.56	M-v 3	Williams	36439 1999 RS ₁₃₀
1999 RA ₁₃₂	14.9	0.15	19990810	332.40070	150.88480	212.12957	5.73815	0.1261265	2.3275800	77	5	1985–1999	0.70	M-v 2	Williams	36439 1999 RA ₁₃₂
1999 RG ₁₃₂	14.4	0.15	19990810	33.76924	356.84770	289.81059	6.34105	0.1130030	2.2921831	28	3	1992–1999	0.44	M-v 3	Williams	36439 1999 RG ₁₃₂
1999 RP ₁₃₂	12.6	0.15	19990810	304.38360	100.06029	312.51423	12.87544	0.2329359	3.1677586	40	3	1984–1999	0.52	M-v 2	Williams	36440 1999 RP ₁₃₂
1999 RA ₁₃₃	13.3	0.15	19990810	28.29197	343.70859	300.77803	9.83057	0.2403219	2.8088017	46	4	1985–1999	0.61	M-v 1	Williams	36440 1999 RA ₁₃₃
1999 RW ₁₃₃	15.2	0.15	19990810	9.70354	92.80797	223.34213	5.42024	0.1393006	2.3159257	40	1	125 days	0.46	M-v 3	Williams	36563 1999 RW ₁₃₃

1999 RT ₁₃₄	13.6	0.15	19990810	311.97039	199.15098	203.07738	3.93273	0.2377982	3.0789008	34	2	1994–1999	0.53	M-v	4	Williams	36441	1999 RT ₁₃₄
1999 RD ₁₃₅	13.3	0.15	19990810	330.35126	205.96913	161.00402	11.35825	0.1165036	2.9892651	40	1	67 days	0.38	M-v	5	Williams		1999 RD ₁₃₅
1999 RF ₁₃₅	13.9	0.15	19990810	315.57511	230.59429	158.52734	21.65136	0.1573057	3.1584596	42	1	80 days	0.52	M-v	4	Williams		1999 RF ₁₃₅
1999 RO ₁₃₅	15.6	0.15	19990919	356.57081	0.54365	346.16204	13.37421	0.1892422	2.5616836	36	1	58 days	0.48			Williams		1999 RO ₁₃₅
1999 RY ₁₃₅	15.0	0.15	19990810	298.52758	271.72275	139.10652	7.30863	0.1784977	2.3271879	34	4	1990–1999	0.66	M-v	2	Williams	36441	1999 RY ₁₃₅
1999 RA ₁₃₇	15.2	0.15	19990810	4.67074	141.72113	177.41950	4.02790	0.2530217	2.5833940	30	1	82 days	0.48	M-v	4	Williams		1999 RA ₁₃₇
1999 RE ₁₃₇	15.1	0.15	19990810	36.93588	333.78965	318.17815	5.38525	0.0243277	2.3522164	49	3	1996–1999	0.67	M-v	3	Williams	36442	1999 RE ₁₃₇
1999 RT ₁₃₇	13.2	0.15	19990810	299.82947	67.03428	333.83701	9.02201	0.0872104	2.9914780	52	1	93 days	0.64	M-v	5	Williams	36563	1999 RT ₁₃₇
1999 RN ₁₃₈	14.3	0.15	19990810	45.71637	345.82086	289.90575	12.78121	0.2137711	2.4691287	41	1	112 days	0.46	M-v	4	Williams	36563	1999 RN ₁₃₈
1999 RY ₁₄₁	16.0	0.15	19990810	314.80254	194.32247	203.94849	2.18155	0.1154357	2.2122712	61	2	1998–1999	0.56	M-v	4	Williams	36443	1999 RY ₁₄₁
1999 RL ₁₄₂	13.8	0.15	19990810	188.62002	133.79870	28.43406	6.45068	0.0773995	2.4607395	53	5	1970–1999	0.63	M-v	3	Williams	36443	1999 RL ₁₄₂
1999 RN ₁₄₃	15.7	0.15	19990810	337.92700	206.93460	175.79333	8.62111	0.3113279	2.4039816	48	2	1997–1999	0.48	M-v	3	Williams	36444	1999 RN ₁₄₃
1999 RT ₁₄₃	15.1	0.15	19990810	334.79754	186.70532	188.44628	6.50211	0.1248956	2.3534977	61	3	1994–1999	0.51	M-v	3	Williams	36444	1999 RT ₁₄₃
1999 RW ₁₄₃	15.9	0.15	19990810	21.99213	78.27371	227.43571	2.28088	0.2051854	2.2446481	43	1	112 days	0.52	M-v	4	Williams		1999 RW ₁₄₃
1999 RS ₁₄₄	13.2	0.15	19990810	64.26873	354.70089	271.85075	8.82649	0.0447250	2.9929167	55	3	1989–1999	0.56	M-v	3	Williams	36563	1999 RS ₁₄₄
1999 RA ₁₄₅	15.3	0.15	19990810	349.09989	162.76383	185.37767	12.57146	0.2593886	2.6315164	38	2	1998–1999	0.44	M-v	3	Williams	36445	1999 RA ₁₄₅
1999 RB ₁₄₅	12.8	0.15	19990810	289.18416	107.70747	323.49975	20.98623	0.2138412	3.1079802	42	3	1988–1999	0.42	M-v	1	Williams	36445	1999 RB ₁₄₅
1999 RH ₁₄₅	15.4	0.15	19990810	1.52770	92.88954	233.31774	4.05509	0.2180487	2.3147670	45	2	1978–1999	0.52	M-v	3	Williams	36445	1999 RH ₁₄₅
1999 RP ₁₄₅	12.5	0.15	19990810	22.14393	343.01499	322.53345	13.61388	0.1206162	3.2135113	61	5	1989–1999	0.55	M-v	1	Williams	36445	1999 RP ₁₄₅
1999 RF ₁₄₆	14.7	0.15	19990810	289.81423	141.53287	272.50329	3.09314	0.1083413	2.1913986	81	3	1997–1999	0.57	M-v	3	Williams	36446	1999 RF ₁₄₆
1999 RM ₁₄₆	13.5	0.15	19990810	319.01096	201.36331	182.99159	10.57410	0.1106010	2.9744788	54	1	94 days	0.61	M-v	4	Williams		1999 RM ₁₄₆
1999 RA ₁₄₈	13.6	0.15	19990810	314.33513	85.74450	314.31211	7.40500	0.1931454	3.0808173	48	2	1996–1999	0.51	M-v	4	Williams	36446	1999 RA ₁₄₈
1999 RH ₁₄₈	14.2	0.15	19990810	40.55307	315.69509	327.40745	10.19552	0.1162044	2.6180311	46	2	1998–1999	0.53	M-v	3	Williams	36447	1999 RH ₁₄₈
1999 RM ₁₄₈	13.8	0.15	19990810	268.79576	245.46311	184.17529	4.52727	0.0519184	2.7768673	50	4	1994–1999	0.72	M-v	1	Williams	36447	1999 RM ₁₄₈
1999 RA ₁₄₉	15.1	0.15	19990810	344.75246	84.91664	266.86241	0.48395	0.1967338	2.4020704	43	1	66 days	0.54	M-v	5	Williams		1999 RA ₁₄₉
1999 RW ₁₄₉	14.3	0.15	19990810	11.75213	355.22666	316.71172	2.31999	0.1872095	2.3208108	71	3	1992–1999	0.61	M-v	3	Williams	36448	1999 RW ₁₄₉
1999 RX ₁₄₉	13.4	0.15	19990810	241.43383	298.42700	166.02656	13.67953	0.1296810	2.5994364	49	3	1991–1999	0.56	M-v	3	Williams	36448	1999 RX ₁₄₉
1999 RB ₁₅₀	14.2	0.15	19990810	87.73516	291.16824	311.90779	2.19904	0.0269421	2.6475251	63	3	1991–1999	0.70	M-v	3	Williams	36449	1999 RB ₁₅₀
1999 RC ₁₅₀	15.4	0.15	19990810	285.58714	102.02729	321.61581	2.29015	0.1447094	2.2238740	41	1	97 days	0.62	M-v	5	Williams	36564	1999 RC ₁₅₀
1999 RP ₁₅₀	14.5	0.15	19990919	5.95046	348.13244	346.90991	13.71808	0.1799432	2.6884732	37	1	58 days	0.51			Williams		1999 RP ₁₅₀
1999 RB ₁₅₁	13.3	0.15	19990810	267.92903	314.27053	124.61062	6.75162	0.1250100	3.1493063	29	1	94 days	0.52	M-v	5	Williams		1999 RB ₁₅₁
1999 RF ₁₅₁	14.5	0.15	19990810	353.26569	192.12531	147.60470	14.72431	0.1096123	2.6116398	25	1	94 days	0.58	M-v	4	Williams		1999 RF ₁₅₁
1999 RN ₁₅₁	15.4	0.15	19990810	318.26022	39.25108	1.69594	5.24814	0.2833979	2.6194211	38	2	1997–1999	0.46	M-v	3	Williams	36449	1999 RN ₁₅₁
1999 RX ₁₅₁	13.1	0.15	19990810	195.85981	13.29347	128.19458	4.48312	0.0647339	2.9999584	36	4	1982–1999	0.75	M-v	2	Williams	36450	1999 RX ₁₅₁
1999 RF ₁₅₂	14.8	0.15	19990810	0.21051	355.52910	336.29292	7.56985	0.2194652	2.7812110	44	1	60 days	0.63	M-v	4	Williams		1999 RF ₁₅₂
1999 RG ₁₅₂	16.0	0.15	19990810	357.68733	33.48440	301.36382	1.13540	0.0939150	2.2740433	42	4	1994–1999	0.59	M-v	2	Williams	36450	1999 RG ₁₅₂
1999 RM ₁₅₂	14.9	0.15	19990919	9.98289	353.70853	334.71054	5.50155	0.2706261	2.9853086	26	1	58 days	0.53			Williams		1999 RM ₁₅₂
1999 RR ₁₅₂	16.0	0.15	19990810	335.56197	186.21000	191.36328	4.61441	0.3188465	2.5480017	40	1	82 days	0.54	M-v	4	Williams		1999 RR ₁₅₂
1999 RX ₁₅₂	15.0	0.15	19990810	330.54017	198.38022	182.12266	9.98598	0.2330711	2.7822932	45	3	1976–1999	0.68	M-v	3	Williams	36451	1999 RX ₁₅₂
1999 RB ₁₅₃	15.0	0.15	19990810	24.95269	93.98222	205.65467	5.56985	0.1441076	2.3233067	62	3	1996–1999	0.73	M-v	3	Williams	36564	1999 RB ₁₅₃
1999 RE ₁₅₄	13.8	0.15	19990810	349.76673	13.43717	334.91832	14.21310	0.1218852	2.6399168	41	1	83 days	0.43	M-v	4	Williams		1999 RE ₁₅₄
1999 RG ₁₅₄	13.9	0.15	19990810	214.66130	271.35858	213.04171	3.47093	0.0247525	2.7424075	65	2	1998–1999	0.65	M-v	4	Williams	36564	1999 RG ₁₅₄
1999 RK ₁₅₄	15.4	0.15	19990830	316.20910	92.62023	308.37145	3.18085	0.1849772	2.6033248	32	1	45 days	0.52			Williams		1999 RK ₁₅₄
1999 RM ₁₅₄	15.0	0.15	19990810	54.20571	333.72752	290.59719	2.05616	0.1533742	2.4307890	58	2	1998–1999	0.63	M-v	4	Williams	36564	1999 RM ₁₅₄
1999 RE ₁₅₅	15.1	0.15	19990810	19.13906	95.07599	218.08824	4.18477	0.0947390	2.6066343	29	2	1998–1999	0.68	M-v	4	Williams	36451	1999 RE ₁₅₅
1999 RY ₁₅₅	16.2	0.15	19990810	344.01147	50.32790	306.42561	4.26241	0.1979496	2.2224864	50	2	1994–1999	0.58	M-v	4	Williams	36451	1999 RY ₁₅₅
1999 RZ ₁₅₅	15.8	0.15	19990810	352.95040	141.86794	203.76792	5.04441	0.2893327	2.5590817	62	1	127 days	0.61	M-v	3	Williams	36564	1999 RZ ₁₅₅
1999 RD ₁₅₆	14.7	0.15	19990919	17.14753	59.03054	266.18470	3.70280	0.1364835	3.1619005	26	1	58 days	0.43			Williams		1999 RD ₁₅₆
1999 RL ₁₅₆	14.8	0.15	19990810	339.55480	169.54792	198.65834	3.60772	0.2470250	2.6332470	42	1	82 days	0.60	M-v	4	Williams		1999 RL ₁₅₆
1999 RK ₁₅₇	14.5	0.15	19990810	58.62565	119.06673	136.61564	6.25862	0.1750796	2.4277979	37	3	1995–1999	0.63	M-v	2	Williams	36452	1999 RK ₁₅₇
1999 RR ₁₅₇	14.7	0.15	19990810	343.37201	347.70995	10.17114	8.29585	0.2311696	2.7921285	31	2	1990–1999	0.63	M-v	3	Williams	36452	1999 RR ₁₅₇
1999 RZ ₁₅₇	15.8	0.15	19990810	321.50753	332.22695	51.71716	3.42695	0.1552371	2.3197097	34	2	1998–1999	0.63	M-v	4	Williams	36452	1999 RZ ₁₅₇
1999 RB ₁₅₈	12.5	0.15	19990810	32.18068	302.48029	355.36453	16.55951	0.0876309	3.1724577	55	2	1997–1999	0.53	M-v	3	Williams	36452	1999 RB ₁₅₈

1999 RR ₁₅₈	13.6	0.15	19990810	23.75721	308.09008	348.18620	14.50310	0.2498073	3.1805758	47	3	1997–1999	0.57	M-v	2	Williams	36453	1999 RR ₁₅₈
1999 RP ₁₅₉	14.4	0.15	19990810	356.65381	237.46235	102.92941	3.10135	0.0995737	2.9214396	46	5	1987–1999	0.61	M-v	2	Williams	36453	1999 RP ₁₅₉
1999 RR ₁₅₉	14.7	0.15	19990810	334.05401	14.26834	358.18268	11.93797	0.1990076	2.6652515	43	3	1973–1999	0.62	M-v	3	Williams	36564	1999 RR ₁₅₉
1999 RY ₁₅₉	15.1	0.15	19990810	312.17146	259.25909	138.09683	7.57719	0.1560277	2.4259167	35	1	90 days	0.49	M-v	5	Williams		1999 RY ₁₅₉
1999 RC ₁₆₀	14.8	0.15	19990810	335.21495	9.49651	2.25794	14.01259	0.2267680	2.7329405	41	1	66 days	0.63	M-v	4	Williams		1999 RC ₁₆₀
1999 RD ₁₆₀	14.7	0.15	19990810	29.63301	267.82438	22.22143	7.47997	0.1827750	2.2990823	44	2	1998–1999	0.50	M-v	4	Williams	36454	1999 RD ₁₆₀
1999 RF ₁₆₀	14.6	0.15	19990810	338.63975	312.28127	56.04406	4.91709	0.2355751	2.6833909	42	2	1993–1999	0.50	M-v	3	Williams	36454	1999 RF ₁₆₀
1999 RN ₁₆₀	13.3	0.15	19990810	299.96607	40.63333	13.41563	9.34159	0.1563824	2.8042513	45	4	1990–1999	0.60	M-v	3	Williams	36454	1999 RN ₁₆₀
1999 RO ₁₆₀	13.0	0.15	19990810	80.63829	237.84934	13.73465	9.97926	0.0531919	2.9810558	31	2	1989–1999	0.55	M-v	5	Williams	36455	1999 RO ₁₆₀
1999 RA ₁₆₁	17.1	0.15	19990919	53.58279	293.15814	2.59919	6.46676	0.1115303	2.3589165	21	1	57 days	0.57			Williams		1999 RA ₁₆₁
1999 RC ₁₆₁	14.5	0.15	19990919	21.65244	116.31428	212.14494	3.73227	0.1239352	3.1039574	24	1	53 days	0.71			Williams		1999 RC ₁₆₁
1999 RM ₁₆₁	14.7	0.15	19990810	305.79106	73.73040	327.74843	13.97583	0.1200834	2.6069091	45	2	1997–1999	0.51	M-v	3	Williams	36455	1999 RM ₁₆₁
1999 RO ₁₆₁	13.1	0.15	19990810	9.19788	184.03520	134.76973	1.84923	0.1641489	3.1286662	60	2	1998–1999	0.54	M-v	3	Williams	36455	1999 RO ₁₆₁
1999 RN ₁₆₂	13.4	0.15	19990810	334.26717	4.78844	27.48760	13.93104	0.1317711	2.8666718	63	3	1991–1999	0.48	M-v	3	Williams	36456	1999 RN ₁₆₂
1999 RT ₁₆₂	16.7	0.15	19990919	16.81218	51.36920	277.02706	3.76797	0.2000822	2.2769460	37	1	58 days	0.43			Williams		1999 RT ₁₆₂
1999 RP ₁₆₃	14.8	0.15	19990810	38.15042	81.38583	192.08726	5.25248	0.2604906	2.3127236	47	1	82 days	0.42	M-v	4 D	Williams		1999 RP ₁₆₃
1999 RU ₁₆₃	14.8	0.15	19990810	3.83088	8.97169	323.61907	4.29935	0.1619218	2.7698129	55	3	1993–1999	0.75	M-v	3	Williams	36456	1999 RU ₁₆₃
1999 RY ₁₆₃	15.4	0.15	19990810	295.45572	186.94060	237.42898	1.36394	0.2082343	2.3470059	26	1	68 days	0.37	M-v	5	Williams		1999 RY ₁₆₃
1999 RV ₁₆₄	14.7	0.15	19990810	208.01972	188.04141	310.45655	5.20353	0.1026829	2.2456034	55	4	1978–1999	0.65	M-v	3	Williams	36456	1999 RV ₁₆₄
1999 RF ₁₆₅	16.1	0.15	19990810	410.47278	186.29208	213.72238	3.54691	0.1283153	2.2435542	39	2	1998–1999	0.57	M-v	4	Williams	36457	1999 RF ₁₆₅
1999 RY ₁₆₆	14.6	0.15	19990810	49.85672	230.27758	41.01194	6.18928	0.1373405	2.2373540	15	1	62 days	0.74	M-v	6	Williams		1999 RY ₁₆₆
1999 RH ₁₆₇	16.2	0.15	19990810	338.05469	327.51631	45.17948	3.50584	0.3081213	2.3635076	38	1	122 days	0.61	M-v	4	Williams	36565	1999 RH ₁₆₇
1999 RJ ₁₆₇	14.5	0.15	19990810	33.88957	256.78063	30.05467	5.39491	0.1814353	2.2452740	56	2	1998–1999	0.45	M-v	3	Williams	36457	1999 RJ ₁₆₇
1999 RO ₁₆₇	13.6	0.15	19990810	298.96053	36.42799	16.10366	9.84928	0.1085415	2.9795475	39	2	1997–1999	0.54	M-v	3	Williams	36457	1999 RO ₁₆₇
1999 RA ₁₆₈	14.7	0.15	19990810	331.51635	11.05242	4.13713	4.96588	0.1671484	2.2849334	49	1	119 days	0.53	M-v	4	Williams	36565	1999 RA ₁₆₈
1999 RK ₁₆₈	14.3	0.15	19990810	352.39150	344.46575	5.18008	4.55859	0.1736566	2.7020361	53	2	1998–1999	0.50	M-v	3	Williams	36458	1999 RK ₁₆₈
1999 RN ₁₆₈	14.2	0.15	19990810	290.00770	80.11126	348.01314	14.42513	0.1417293	2.8611314	42	3	1982–1999	0.50	M-v	2	Williams	36458	1999 RN ₁₆₈
1999 RU ₁₆₈	14.8	0.15	19990810	16.56700	146.09209	169.73827	2.89557	0.1299961	2.2451570	38	2	1998–1999	0.42	M-v	4	Williams	36459	1999 RU ₁₆₈
1999 RX ₁₆₈	14.8	0.15	19990810	241.97175	132.22419	335.31885	4.42763	0.0668454	2.6110746	33	3	1996–1999	0.77	M-v	3	Williams	36459	1999 RX ₁₆₈
1999 RZ ₁₆₈	15.4	0.15	19990810	343.13703	26.43364	333.75059	2.31555	0.1514287	2.2877757	49	2	1998–1999	0.61	M-v	4	Williams	36459	1999 RZ ₁₆₈
1999 RC ₁₆₉	15.4	0.15	19990810	4.65768	146.63798	183.88672	2.82153	0.1890428	2.4347687	33	1	119 days	0.55	M-v	4	Williams	36565	1999 RC ₁₆₉
1999 RD ₁₆₉	15.4	0.15	19990810	337.21569	62.38790	315.29549	2.38790	0.2893073	2.6200148	39	1	71 days	0.67	M-v	5	Williams		1999 RD ₁₆₉
1999 RH ₁₆₉	15.2	0.15	19990810	30.47969	107.68421	190.94794	5.19854	0.1361445	2.2835793	60	2	1998–1999	0.54	M-v	4	Williams	36460	1999 RH ₁₆₉
1999 RV ₁₆₉	16.4	0.15	19990810	325.36943	92.59745	297.05958	2.24441	0.2134178	2.2810316	34	1	71 days	0.49	M-v	4	Williams		1999 RV ₁₆₉
1999 RY ₁₆₉	15.6	0.15	19990919	55.83945	333.31760	305.07854	1.78521	0.1745515	2.4183694	24	1	29 days	0.51			Williams		1999 RY ₁₆₉
1999 RH ₁₇₀	15.4	0.15	19990810	28.29329	319.67531	336.92693	3.46039	0.1868759	2.2267527	64	3	1989–1999	0.46	M-v	2	Williams	36460	1999 RH ₁₇₀
1999 RJ ₁₇₀	16.1	0.15	19990810	338.41229	26.81187	342.26481	2.30128	0.1803900	2.3612650	44	3	1981–1999	0.57	M-v	2	Williams	36460	1999 RJ ₁₇₀
1999 RX ₁₇₁	15.3	0.15	19990810	354.26350	315.50555	27.74570	2.66565	0.1337241	2.1940334	47	2	1998–1999	0.60	M-v	3	Williams	36461	1999 RX ₁₇₁
1999 RM ₁₇₂	13.9	0.15	19990810	324.35661	257.39704	137.74036	6.11914	0.2567950	2.5587190	39	1	115 days	0.46	M-v	4	Williams	36565	1999 RM ₁₇₂
1999 RR ₁₇₃	13.3	0.15	19990810	335.81322	231.27392	141.89897	11.78936	0.1341070	3.0329268	25	1	64 days	0.42	M-v	5	Williams		1999 RR ₁₇₃
1999 RV ₁₇₃	15.1	0.15	19990810	359.71032	331.29087	7.64886	11.08225	0.1422404	2.5583336	39	1	64 days	0.52	M-v	4	Williams		1999 RV ₁₇₃
1999 RP ₁₇₄	13.5	0.15	19990810	107.43021	137.93845	87.24683	2.78560	0.1196670	3.0363240	28	3	1989–1999	0.63	M-v	5	Williams	36461	1999 RP ₁₇₄
1999 RK ₁₇₅	14.4	0.15	19990810	356.25503	155.15335	194.22590	1.46386	0.1731331	3.1900550	51	1	66 days	0.48	M-v	4	Williams		1999 RK ₁₇₅
1999 RT ₁₇₅	17.2	0.15	19990810	332.65097	180.92282	199.50961	3.30612	0.2183564	2.3666905	20	1	66 days	0.43	M-v	5	Williams		1999 RT ₁₇₅
1999 RV ₁₇₅	15.0	0.15	19990810	19.34483	113.36462	188.97769	4.62840	0.2932832	2.5773759	62	5	1982–1999	0.51	M-v	1	Williams	36462	1999 RV ₁₇₅
1999 RZ ₁₇₅	14.5	0.15	19990810	331.42761	201.40315	182.52632	12.12546	0.1690652	3.0589019	45	2	1998–1999	0.49	M-v	3	Williams	36462	1999 RZ ₁₇₅
1999 RG ₁₇₆	15.9	0.15	19990810	5.68927	21.32116	306.96614	2.18732	0.1902816	2.1585701	65	1	123 days	0.49	M-v	4	Williams	36566	1999 RG ₁₇₆
1999 RH ₁₇₆	15.8	0.15	19990810	30.06354	101.77276	196.54849	4.75577	0.1826266	2.4277852	36	1	65 days	0.38	M-v	5	Williams		1999 RH ₁₇₆
1999 RN ₁₇₆	15.1	0.15	19990810	338.48895	176.67867	198.86784	3.82402	0.1685399	3.0847339	31	1	66 days	0.53	M-v	5	Williams		1999 RN ₁₇₆
1999 RQ ₁₇₆	15.4	0.15	19990810	254.90063	262.44950	199.10617	4.25147	0.1130474	2.2523779	33	1	68 days	0.51	M-v	5	Williams		1999 RQ ₁₇₆
1999 RC ₁₇₇	14.7	0.15	19990810	78.41133	279.88959	340.47147	3.58114	0.0551983	2.6024360	43	3	1996–1999	0.65	M-v	3	Williams	36463	1999 RC ₁₇₇
1999 RG ₁₇₇	14.6	0.15	19990810	5.98437	63.69779	274.56961	0.59351	0.0247460	2.5403910	63	3	1997–1999	0.57	M-v	3	Williams	36463	1999 RG ₁₇₇
1999 RJ ₁₇₇	13.8	0.15	19990810	10.42890	339.19586	355.02570	11.65259	0.0626455	3.0327581	40	1	81 days	0.54	M-v	4	Williams		1999 RJ ₁₇₇

1999 RO ₁₇₇	15.6	0.15	19990810	337.76357	206.49817	164.46342	4.58787	0.1652233	2.3967560	39	2	1998–1999	0.74	M-v	4	Williams	36464	1999 RO ₁₇₇
1999 RT ₁₇₇	14.7	0.15	19990810	256.11586	87.03181	10.85691	3.53425	0.1046999	2.2929229	56	4	1992–1999	0.65	M-v	1	Williams	36464	1999 RT ₁₇₇
1999 RN ₁₇₈	15.8	0.15	19990810	343.63593	222.37462	149.57785	5.30264	0.3825888	2.6611110	29	1	81 days	0.57	M-v	4	Williams		1999 RN ₁₇₈
1999 RS ₁₇₈	15.4	0.15	19990810	338.96225	216.79108	153.96916	12.61626	0.1988914	2.7008710	26	1	90 days	0.56	M-v	4	Williams		1999 RS ₁₇₈
1999 RU ₁₇₈	15.1	0.15	19990810	24.31882	153.86883	147.96020	9.15408	0.2048110	2.5479002	25	1	64 days	0.40	M-v	5	Williams		1999 RU ₁₇₈
1999 RC ₁₇₉	14.4	0.15	19990810	260.27279	50.36048	44.57347	5.15613	0.1248343	2.3877475	29	1	122 days	0.49	M-v	4	Williams	36566	1999 RC ₁₇₉
1999 RW ₁₇₉	15.3	0.15	19990810	356.76735	202.93785	139.59858	10.44038	0.1613817	2.4254365	24	1	64 days	0.53	M-v	4	Williams		1999 RW ₁₇₉
1999 RH ₁₈₀	15.2	0.15	19990810	308.69581	306.25976	99.04220	7.48416	0.1434848	2.3686159	18	1	62 days	0.53	M-v	5	Williams		1999 RH ₁₈₀
1999 RY ₁₈₀	13.6	0.15	19990919	26.97240	312.50338	359.74353	16.62286	0.2102071	3.1188415	31	1	55 days	0.33			Williams		1999 RY ₁₈₀
1999 RK ₁₈₁	14.8	0.15	19990810	273.51854	74.97825	9.42038	5.74355	0.1197076	2.4488101	35	1	81 days	0.66	M-v	5	Williams		1999 RK ₁₈₁
1999 RT ₁₈₁	14.5	0.15	19990810	13.32020	175.21359	153.91455	4.89003	0.0977969	2.7782548	45	4	1995–1999	0.69	M-v	1	Williams	36465	1999 RT ₁₈₁
1999 RF ₁₈₂	15.4	0.15	19990810	20.31635	320.98125	350.44437	4.49859	0.1859100	2.4446841	57	3	1994–1999	0.57	M-v	3	Williams	36466	1999 RF ₁₈₂
1999 RG ₁₈₂	15.4	0.15	19990810	8.69600	151.60401	176.27855	2.66144	0.1788825	2.4178161	50	3	1994–1999	0.65	M-v	3	Williams	36466	1999 RG ₁₈₂
1999 RS ₁₈₂	16.4	0.15	19990830	353.58990	95.71278	262.32540	1.04508	0.2245075	2.4080817	35	1	45 days	0.49			Williams		1999 RS ₁₈₂
1999 RT ₁₈₂	14.9	0.15	19990810	307.06600	225.79001	193.33823	5.20013	0.1712064	3.0842148	17	1	68 days	0.49	M-v	6	Williams		1999 RT ₁₈₂
1999 RV ₁₈₂	15.4	0.15	19990810	158.55391	209.79769	335.03492	1.98020	0.1298855	2.3990954	30	2	1998–1999	0.63	M-v	5	Williams	36466	1999 RV ₁₈₂
1999 RX ₁₈₂	15.1	0.15	19990810	302.04940	232.70247	187.54061	2.83026	0.1567075	2.5671523	51	1	82 days	0.61	M-v	5	Williams		1999 RX ₁₈₂
1999 RA ₁₈₃	13.0	0.15	19990810	347.54433	4.75378	357.27481	21.44054	0.0296053	3.2212234	55	1	81 days	0.53	M-v	4	Williams	36566	1999 RA ₁₈₃
1999 RM ₁₈₃	15.2	0.15	19990810	336.90863	7.67094	3.57503	6.55556	0.1337069	2.3953632	53	1	94 days	0.52	M-v	4	Williams	36566	1999 RM ₁₈₃
1999 RM ₁₈₅	15.3	0.15	19990919	7.79513	57.41511	281.50229	1.47207	0.0858589	2.7870190	19	1	31 days	0.52			Williams		1999 RM ₁₈₅
1999 RR ₁₈₇	14.6	0.15	19990810	359.74190	290.29724	52.70565	2.49475	0.0902828	2.9110282	21	2	1992–1999	0.42	M-v	4	Williams	36468	1999 RR ₁₈₇
1999 RX ₁₈₇	14.1	0.15	19990810	212.06302	216.41360	286.83055	1.07633	0.1305524	2.7967899	34	2	1994–1999	0.70	M-v	5	Williams	36468	1999 RX ₁₈₇
1999 RY ₁₈₈	17.4	0.15	19990919	4.29755	345.66984	2.47477	4.79209	0.2311270	2.2398868	26	1	55 days	0.52			Williams		1999 RY ₁₈₈
1999 RC ₁₈₉	16.8	0.15	19990919	6.93679	149.62255	194.90585	1.58969	0.2129774	2.6740837	16	1	56 days	0.45			Williams		1999 RC ₁₈₉
1999 RV ₁₈₉	16.3	0.15	19990810	327.62752	268.25849	125.22432	5.85905	0.3158476	2.5874075	19	1	64 days	0.56	M-v	6	Williams		1999 RV ₁₈₉
1999 RE ₁₉₀	13.5	0.15	19990810	260.81531	232.42002	235.14293	7.14883	0.2054592	2.5362850	46	2	1987–1999	0.52	M-v	4	Williams	36469	1999 RE ₁₉₀
1999 RF ₁₉₀	16.4	0.15	19990919	338.46713	21.59885	0.75262	4.64529	0.1107890	2.2024016	23	1	55 days	0.68			Williams		1999 RF ₁₉₀
1999 RK ₁₉₀	15.9	0.15	19990830	241.08277	128.27394	339.63678	5.37913	0.0562939	2.2164963	56	1	51 days	0.34			Williams		1999 RK ₁₉₀
1999 RO ₁₉₀	15.4	0.15	19990810	327.00655	28.75058	13.09029	6.46824	0.1413354	2.4587512	48	1	71 days	0.48	M-v	4	Williams		1999 RO ₁₉₀
1999 RP ₁₉₀	15.1	0.15	19990810	306.24704	25.72778	26.36703	4.47503	0.1928848	2.6354363	62	3	1978–1999	0.61	M-v	3	Williams	36469	1999 RP ₁₉₀
1999 RZ ₁₉₀	15.8	0.15	19990810	5.18592	250.12432	68.67902	3.08355	0.3266775	2.6337437	22	2	1998–1999	0.46	M-v	5	Williams	36469	1999 RZ ₁₉₀
1999 RA ₁₉₂	13.6	0.15	19990810	81.93001	296.36605	332.39190	12.80211	0.1504616	2.5950233	33	2	1990–1999	0.43	M-v	4	Williams	36470	1999 RA ₁₉₂
1999 RD ₁₉₂	13.4	0.15	19990810	54.65588	180.16527	85.55526	5.28651	0.1421006	2.6162358	55	2	1998–1999	0.48	M-v	4	Williams	36470	1999 RD ₁₉₂
1999 RG ₁₉₃	12.8	0.15	19990810	245.75799	10.07887	106.17727	10.84882	0.0628273	3.0886369	34	2	1998–1999	0.69	M-v	5	Williams	36470	1999 RG ₁₉₃
1999 RO ₁₉₃	12.7	0.15	19990810	329.25549	39.47440	353.28045	12.84273	0.1748655	2.6863269	68	4	1982–1999	0.56	M-v	2	Williams	36567	1999 RO ₁₉₃
1999 RR ₁₉₃	13.3	0.15	19991009	325.31019	263.09244	167.64146	10.29868	0.0715580	3.5199164	18	1	49 days	0.39			Williams		1999 RR ₁₉₃
1999 RU ₁₉₃	14.1	0.15	19990810	0.11387	12.18793	333.65010	13.07722	0.1480314	3.1400672	39	2	1960–1999	0.57	M-v	4	Williams	36471	1999 RU ₁₉₃
1999 RX ₁₉₃	15.2	0.15	19990810	5.03152	8.21397	323.74432	6.99486	0.1939653	2.3021179	35	1	115 days	0.44	M-v	4	Marsden	36567	1999 RX ₁₉₃
1999 RY ₁₉₃	13.5	0.15	19990810	345.50107	94.29620	272.74904	4.82910	0.1470277	3.1214022	44	1	116 days	0.44	M-v	3	Williams	36567	1999 RY ₁₉₃
1999 RA ₁₉₄	14.2	0.15	19990810	326.08273	132.34092	263.07145	3.77985	0.1758722	3.0781932	29	2	1996–1999	0.55	M-v	4	Williams	36471	1999 RA ₁₉₄
1999 RB ₁₉₄	15.3	0.15	19990830	312.40793	144.66274	277.55991	3.37775	0.2255102	2.5977219	25	1	56 days	0.47			Williams		1999 RB ₁₉₄
1999 RD ₁₉₄	14.7	0.15	19990810	114.54531	4.38131	216.64195	5.51975	0.1069478	2.2199831	57	3	1995–1999	0.62	M-v	3	Williams	36471	1999 RD ₁₉₄
1999 RG ₁₉₄	14.8	0.15	19990810	13.16270	114.04378	202.43687	6.67735	0.3101486	2.8696653	32	2	1993–1999	0.42	M-v	4	Williams	36472	1999 RG ₁₉₄
1999 RH ₁₉₄	14.4	0.15	19990810	15.64148	34.90330	291.44476	3.86075	0.1137872	2.6039965	26	1	76 days	0.50	M-v	5	Williams		1999 RH ₁₉₄
1999 RN ₁₉₄	15.0	0.15	19990810	294.09465	184.15699	251.35077	3.45213	0.1982463	2.3502641	33	2	1990–1999	0.68	M-v	4	Williams	36472	1999 RN ₁₉₄
1999 RO ₁₉₄	13.8	0.15	19990810	2.64102	131.89128	214.38691	3.33364	0.1089080	2.8006235	47	3	1994–1999	0.38	M-v	2	Williams	36472	1999 RO ₁₉₄
1999 RQ ₁₉₄	12.8	0.15	19990810	323.18374	66.42973	343.52496	16.20096	0.2548736	2.9947504	49	1	112 days	0.54	M-v	4	Williams	36567	1999 RQ ₁₉₄
1999 RR ₁₉₄	15.4	0.15	19990919	17.91660	58.58113	275.05034	3.44556	0.1966939	2.4095018	33	1	58 days	0.55			Williams		1999 RR ₁₉₄
1999 RS ₁₉₄	12.6	0.15	19990810	330.48339	157.70026	231.55160	5.19595	0.1512369	3.1356816	26	2	1960–1999	0.36	M-v	4	Williams	36472	1999 RS ₁₉₄
1999 RW ₁₉₄	13.7	0.15	19990810	241.53925	225.72066	237.82399	12.29159	0.1576781	2.6805582	30	3	1991–1999	0.83	M-v	4	Williams	36472	1999 RW ₁₉₄
1999 RC ₁₉₅	13.9	0.15	19990919	329.38706	139.88383	250.66135	7.86667	0.1457211	3.1135937	29	1	58 days	0.51			Williams		1999 RC ₁₉₅
1999 RZ ₁₉₅	15.4	0.15	19990810	344.78143	115.05253	240.90350	5.80104	0.1509620	2.2818894	43	2	1998–1999	0.64	M-v	4	Williams	36473	1999 RZ ₁₉₅
1999 RG ₁₉₇	14.7	0.15	19990810	7.20145	137.38405	198.51255	12.30687	0.0950256	2.4638723	59	2	1998–1999	0.55	M-v	3	Williams	36473	1999 RG ₁₉₇

1999 RK ₁₉₇	14.3	0.15	19990810	216.64151	226.59531	272.01029	4.68461	0.1088481	2.3968856	34	1	99 days	0.57	M-v	4	Williams		1999 RK ₁₉₇
1999 RO ₁₉₇	14.4	0.15	19990810	271.82995	150.58627	296.09086	5.99995	0.0806559	2.2749150	43	1	105 days	0.51	M-v	4	Williams	36567	1999 RO ₁₉₇
1999 RV ₁₉₇	14.7	0.15	19990810	320.88458	162.08645	227.76694	7.56133	0.1178669	2.2986466	14	1	63 days	0.48	M-v	5	Williams		1999 RV ₁₉₇
1999 RX ₁₉₇	13.6	0.15	19990919	326.70114	135.11761	261.02705	8.23759	0.0973003	3.1658937	39	1	53 days	0.56			Williams		1999 RX ₁₉₇
1999 RZ ₁₉₇	14.1	0.15	19990919	279.26106	138.37368	309.03072	9.15343	0.0728959	3.0674106	18	1	50 days	0.78			Williams		1999 RZ ₁₉₇
1999 RC ₁₉₈	12.1	0.15	19990810	299.50063	106.85365	333.37247	14.31048	0.2145947	3.1285192	45	1	105 days	0.44	M-v	4	Williams	36567	1999 RC ₁₉₈
1999 RR ₁₉₈	14.3	0.15	19990810	342.56311	164.76632	202.00708	5.02365	0.2126037	2.4306541	65	2	1998–1999	0.45	M-v	3	Williams	36474	1999 RR ₁₉₈
1999 RX ₁₉₈	14.7	0.15	19990810	334.07257	122.19095	248.20331	12.17642	0.1901390	2.5480507	39	1	113 days	0.44	M-v	4	Williams	36567	1999 RX ₁₉₈
1999 RN ₁₉₉	15.6	0.15	19990810	337.65461	112.62875	268.86315	4.09167	0.1650346	2.3352570	35	2	1992–1999	0.43	M-v	4	Williams	36474	1999 RN ₁₉₉
1999 RO ₁₉₉	14.3	0.15	19990919	308.25642	212.83662	228.75023	7.94061	0.2213491	2.7274581	22	1	56 days	0.31			Williams		1999 RO ₁₉₉
1999 RP ₁₉₉	13.0	0.15	19990810	66.60672	340.98947	293.54366	7.09456	0.1331161	2.7284440	55	3	1997–1999	0.55	M-v	3	Williams	36474	1999 RP ₁₉₉
1999 RY ₁₉₉	13.8	0.15	19990919	154.83189	275.02876	284.73403	14.20249	0.0787427	2.6189437	19	1	57 days	0.41			Williams		1999 RY ₁₉₉
1999 RL ₂₀₀	14.6	0.15	19990810	325.18858	143.39225	246.53109	12.93954	0.1243443	2.5945387	26	2	1998–1999	0.38	M-v	3	Williams	36474	1999 RL ₂₀₀
1999 RY ₂₀₀	15.0	0.15	19990919	335.87461	166.05665	223.78150	15.87706	0.1331267	2.6547492	27	1	55 days	0.82			Williams		1999 RY ₂₀₀
1999 RK ₂₀₁	14.4	0.15	19990919	312.46747	168.66565	248.44701	9.34236	0.0846953	3.0376793	28	1	50 days	0.45			Williams		1999 RK ₂₀₁
1999 RQ ₂₀₁	15.1	0.15	19990919	312.59362	194.99134	226.43559	12.61207	0.1301409	2.5977007	23	1	57 days	0.76			Williams		1999 RQ ₂₀₁
1999 RR ₂₀₁	12.9	0.15	19990810	326.96209	101.52945	294.58306	11.67002	0.1640055	2.7831575	44	1	104 days	0.38	M-v	3	Williams	36568	1999 RR ₂₀₁
1999 RS ₂₀₁	14.1	0.15	19990919	299.66289	199.58469	242.46401	13.42710	0.1777130	3.1589818	32	1	57 days	0.47			Williams		1999 RS ₂₀₁
1999 RT ₂₀₁	14.9	0.15	19990810	24.37344	43.22415	266.68754	10.47198	0.2221517	2.6152997	46	1	105 days	0.52	M-v	4	Williams	36568	1999 RT ₂₀₁
1999 RE ₂₀₂	13.4	0.15	19990810	302.69261	145.85680	280.64893	9.62950	0.1307875	2.9506322	30	1	65 days	0.53	M-v	5	Williams		1999 RE ₂₀₂
1999 RF ₂₀₂	13.8	0.15	19990810	37.94527	50.11917	258.40652	9.36161	0.1075370	2.9971034	47	2	1998–1999	0.64	M-v	3	Williams	36474	1999 RF ₂₀₂
1999 RM ₂₀₂	15.2	0.15	19990919	2.35056	32.65473	329.28579	11.58821	0.0875400	2.7714507	25	1	50 days	0.71			Williams		1999 RM ₂₀₂
1999 RN ₂₀₂	16.3	0.15	19990919	15.51118	76.91927	265.60845	5.59423	0.1447270	2.4608775	29	1	50 days	0.78			Williams		1999 RN ₂₀₂
1999 RQ ₂₀₂	14.7	0.15	19990810	359.11326	41.68406	310.28618	8.22622	0.1694305	2.7359002	33	1	105 days	0.47	M-v	3	Williams	36568	1999 RQ ₂₀₂
1999 RS ₂₀₂	13.7	0.15	19990810	37.70634	70.43832	238.12464	8.77965	0.1135873	3.0270172	40	2	1998–1999	0.51	M-v	3	Williams	36474	1999 RS ₂₀₂
1999 RA ₂₀₄	14.2	0.15	19990919	291.61753	111.38218	347.55667	28.06828	0.2303348	2.6474625	37	1	57 days	0.42			Williams		1999 RA ₂₀₄
1999 RQ ₂₀₄	13.0	0.15	19990810	300.06023	146.69333	277.31456	9.58061	0.0567920	3.0624424	41	3	1978–1999	0.51	M-v	2	Williams	36475	1999 RQ ₂₀₄
1999 RY ₂₀₄	14.0	0.15	19990919	344.70594	78.16327	308.31506	15.17672	0.1540183	3.0384609	20	1	56 days	0.39			Williams		1999 RY ₂₀₄
1999 RZ ₂₀₄	16.0	0.15	19990919	339.78133	153.80982	245.90365	11.77956	0.2900998	2.6420184	17	1	57 days	0.54			Williams		1999 RZ ₂₀₄
1999 RK ₂₀₅	13.7	0.15	19990810	21.35495	73.76925	253.09839	13.40324	0.1680990	3.2144476	27	1	65 days	0.55	M-v	4	Williams		1999 RK ₂₀₅
1999 RM ₂₀₅	14.4	0.15	19990919	346.10813	118.20829	264.62730	12.19964	0.0801932	3.1400469	25	1	57 days	0.75			Williams		1999 RM ₂₀₅
1999 RP ₂₀₅	14.9	0.15	19990810	333.18049	180.07990	209.13442	16.98573	0.1820237	2.6217063	64	1	117 days	0.55	M-v	4	Williams	36568	1999 RP ₂₀₅
1999 RR ₂₀₅	13.2	0.15	19990810	314.37398	165.64846	247.52603	10.39093	0.1075446	3.0582521	36	1	115 days	0.44	M-v	4	Williams	36568	1999 RR ₂₀₅
1999 RA ₂₀₆	15.2	0.15	19990810	12.97825	22.48480	308.56227	7.41856	0.2133863	2.7348919	31	1	105 days	0.61	M-v	4	Williams	36568	1999 RA ₂₀₆
1999 RB ₂₀₆	16.1	0.15	19990919	332.89470	97.86293	299.84567	6.24120	0.1048493	2.2865133	31	1	57 days	0.76			Williams		1999 RB ₂₀₆
1999 RC ₂₀₆	16.6	0.15	19990919	346.32833	71.97909	313.80115	7.06443	0.2137144	2.4468661	30	1	50 days	0.62			Williams		1999 RC ₂₀₆
1999 RL ₂₀₆	16.5	0.15	19990919	2.53929	159.36118	199.18498	23.84950	0.1689092	2.2638014	52	1	56 days	0.44			Williams		1999 RL ₂₀₆
1999 RN ₂₀₆	15.1	0.15	19990810	357.60526	128.47022	227.27143	13.96020	0.1221208	2.6048049	31	1	65 days	0.40	M-v	4	Williams		1999 RN ₂₀₆
1999 RT ₂₀₆	12.3	0.15	19990810	358.12970	76.86551	284.41038	13.18051	0.1177383	3.1403209	40	1	104 days	0.41	M-v	3	Williams		1999 RT ₂₀₆
1999 RC ₂₀₇	14.2	0.15	19990810	318.28553	170.98651	244.05011	11.93432	0.1570882	3.0986462	32	1	65 days	0.47	M-v	4	Williams		1999 RC ₂₀₇
1999 RP ₂₀₇	16.2	0.15	19990919	341.92134	69.33201	321.25496	8.77017	0.1655741	2.2628348	19	1	57 days	0.41			Williams		1999 RP ₂₀₇
1999 RQ ₂₀₇	15.4	0.15	19990919	11.07240	47.95175	300.04211	6.68090	0.2325765	2.8051403	39	1	57 days	0.54			Williams		1999 RQ ₂₀₇
1999 RW ₂₀₇	17.2	0.15	19990919	350.70450	111.93510	268.52799	4.66668	0.2457275	2.2581837	26	1	51 days	0.44			Williams		1999 RW ₂₀₇
1999 RY ₂₀₇	14.9	0.15	19990810	336.41548	180.85900	208.80672	13.89360	0.2655423	2.5209433	54	1	113 days	0.33	M-v	3	Williams	36568	1999 RY ₂₀₇
1999 RG ₂₀₈	15.7	0.15	19990919	2.16091	43.89196	323.86888	13.66419	0.1238258	2.6342558	20	1	53 days	0.68			Williams		1999 RG ₂₀₈
1999 RL ₂₀₈	16.2	0.15	19990919	353.36932	75.38831	300.96375	6.49329	0.1286677	2.3076422	24	1	57 days	0.47			Williams		1999 RL ₂₀₈
1999 RS ₂₀₈	15.4	0.15	19990810	16.45756	95.32919	231.80109	7.25099	0.2216183	2.6439545	42	3	1995–1999	0.53	M-v	3	Williams	36475	1999 RS ₂₀₈
1999 RW ₂₀₈	13.3	0.15	19990810	322.74668	177.40585	233.79782	6.48046	0.2199327	2.7092760	42	1	116 days	0.59	M-v	4	Williams	36568	1999 RW ₂₀₈
1999 RB ₂₀₉	13.4	0.15	19990810	343.72524	63.22441	319.98541	7.61907	0.1656776	3.1499753	40	1	104 days	0.51	M-v	3	Williams		1999 RB ₂₀₉
1999 RC ₂₀₉	15.8	0.15	19990919	348.12656	107.86807	274.71944	4.68261	0.1106008	2.3768661	31	1	53 days	0.82			Williams		1999 RC ₂₀₉
1999 RE ₂₀₉	16.8	0.15	19990919	5.57622	53.19778	306.59512	5.28586	0.1538078	2.3896353	30	1	57 days	0.81			Williams		1999 RE ₂₀₉
1999 RQ ₂₀₉	13.2	0.15	19990810	341.67688	108.48824	278.03701	9.40134	0.1132247	2.9754973	38	2	1993–1999	0.60	M-v	3	Williams	36475	1999 RQ ₂₀₉
1999 RV ₂₀₉	14.2	0.15	19990810	346.91693	55.77380	323.18514	9.89896	0.1152448	2.9619722	30	1	67 days	0.63	M-v	4	Williams		1999 RV ₂₀₉

1999 RD ₂₁₀	14.8	0.15	19990810	333.31710	74.00935	321.44800	6.09478	0.2279208	2.4361798	32	1	112 days	0.35	M-v	3	Williams	1999 RD ₂₁₀
1999 RO ₂₁₀	15.7	0.15	19990810	353.05132	97.99890	263.79712	5.77608	0.1711891	2.2157611	27	1	99 days	0.47	M-v	4	Williams	1999 RO ₂₁₀
1999 RW ₂₁₀	14.1	0.15	19990919	328.94801	98.72590	315.87031	9.89964	0.1142857	3.1119723	17	1	53 days	0.85			Williams	1999 RW ₂₁₀
1999 RX ₂₁₀	13.1	0.15	19990810	60.17422	331.57498	330.33992	11.95549	0.0550216	2.8914788	41	2	1994–1999	0.53	M-v	4	Williams	36475 1999 RX ₂₁₀
1999 RB ₂₁₁	15.0	0.15	19990810	71.34548	24.35297	241.14287	7.72167	0.2239094	2.3993111	39	2	1998–1999	0.64	M-v	4	Williams	36475 1999 RB ₂₁₁
1999 RH ₂₁₁	14.9	0.15	19990919	345.30024	119.80284	267.53441	4.19714	0.0333703	2.2735708	14	1	52 days	0.89			Williams	1999 RH ₂₁₁
1999 RJ ₂₁₁	13.9	0.15	19990810	221.71767	164.30721	349.26392	12.90630	0.1019223	2.6910523	29	2	1977–1999	0.67	M-v	5	Williams	36476 1999 RJ ₂₁₁
1999 RM ₂₁₁	13.7	0.15	19990919	194.20302	215.59436	327.14737	9.46029	0.0128505	2.8024747	20	1	57 days	0.50			Williams	1999 RM ₂₁₁
1999 RN ₂₁₁	16.9	0.15	19990810	354.67046	54.57116	306.12390	5.11906	0.3567649	2.5935062	22	1	64 days	0.64	M-v	5	Williams	1999 RN ₂₁₁
1999 RO ₂₁₁	13.6	0.15	19990810	337.23365	190.19108	206.92279	27.45817	0.1642381	3.1757510	77	1	118 days	0.56	M-v	3	Williams	36569 1999 RO ₂₁₁
1999 RQ ₂₁₁	13.9	0.15	19990919	359.98655	42.61396	331.60437	9.98726	0.2118531	2.7355203	20	1	56 days	0.43			Williams	1999 RQ ₂₁₁
1999 RC ₂₁₂	15.4	0.15	19990810	356.61162	55.37965	306.76585	6.08775	0.2296350	2.4015218	24	1	64 days	0.43	M-v	4	Williams	1999 RC ₂₁₂
1999 RE ₂₁₂	17.1	0.15	19990919	350.00152	182.22757	201.07696	17.41913	0.3397269	2.6160941	17	1	56 days	0.59			Williams	1999 RE ₂₁₂
1999 RP ₂₁₂	16.4	0.15	19990810	357.39314	18.27332	339.74392	13.79676	0.2670709	2.6895610	25	2	1990–1999	0.68	M-v	4	Williams	36476 1999 RP ₂₁₂
1999 RQ ₂₁₂	14.5	0.15	19990919	189.80857	230.49466	316.80497	12.25941	0.1088371	2.5867380	25	1	56 days	0.79			Williams	1999 RQ ₂₁₂
1999 RU ₂₁₂	16.2	0.15	19990919	13.04967	74.74469	273.70855	5.41354	0.2151968	2.3868122	18	1	57 days	0.68			Williams	1999 RU ₂₁₂
1999 RC ₂₁₃	15.5	0.15	19990810	354.45867	54.54441	310.83515	9.09923	0.1177307	2.6293429	25	2	1997–1999	0.45	M-v	4	Williams	36476 1999 RC ₂₁₃
1999 RH ₂₁₃	16.5	0.15	19990919	327.93274	51.62110	343.67617	1.24015	0.0911794	2.9160793	26	1	50 days	0.47			Williams	1999 RH ₂₁₃
1999 RM ₂₁₃	16.5	0.15	19990810	22.83447	16.91298	311.31452	4.06954	0.2432781	3.0214848	26	1	61 days	0.25	M-v	4	Williams	1999 RM ₂₁₃
1999 RN ₂₁₃	16.2	0.15	19990919	354.84414	9.98335	355.00708	18.24366	0.2031092	3.0836130	27	1	48 days	0.35			Williams	1999 RN ₂₁₃
1999 RP ₂₁₃	16.2	0.15	19990810	288.61584	129.33655	323.44123	6.65649	0.2421276	2.3510983	40	1	68 days	0.53	M-v	5	Williams	1999 RP ₂₁₃
1999 RD ₂₁₄	16.2	0.15	19990810	355.71079	146.06912	205.91628	1.43773	0.0977614	2.8487020	35	2	1994–1999	0.48	M-v	4	Williams	36476 1999 RD ₂₁₄
1999 RH ₂₁₄	17.0	0.15	19991009	0.98321	85.20700	279.18816	4.99410	0.1925959	2.3593300	24	1	58 days	0.35			Marsden	1999 RH ₂₁₄
1999 RM ₂₁₄	13.6	0.15	19990810	27.04461	298.84267	29.79404	8.86325	0.1235780	3.0792423	55	3	1992–1999	0.53	M-v	3	Williams	36476 1999 RM ₂₁₄
1999 RN ₂₁₄	13.5	0.15	19990810	315.88340	246.81482	162.92400	5.51284	0.0598311	2.7446537	43	4	1981–1999	0.56	M-v	3	Williams	36476 1999 RN ₂₁₄
1999 RO ₂₁₄	13.6	0.15	19990810	289.03545	85.27146	356.29830	10.83444	0.1238830	3.0253064	33	1	60 days	0.57	M-v	5	Williams	1999 RO ₂₁₄
1999 SE	14.3	0.15	19990810	354.43475	174.27442	195.25654	12.01569	0.2027239	3.1956320	51	1	115 days	0.52	M-v	3	Williams	36569 1999 SE
1999 SG	14.6	0.15	19990810	251.98828	112.07303	8.18658	5.32493	0.1148027	2.3019921	42	1	80 days	0.54	M-v	5	Williams	1999 SG
1999 SH	15.7	0.15	19991009	10.37459	339.75002	17.99843	4.31905	0.2847117	2.6906740	34	1	48 days	0.37			Williams	1999 SH
1999 SJ	15.4	0.15	19990810	37.61646	130.24881	169.64605	2.20786	0.2103531	2.3456728	48	2	1998–1999	0.64	M-v	4	Williams	36476 1999 SJ
1999 SL	13.8	0.15	19991009	348.01679	11.04968	30.71573	8.68783	0.2289779	2.8013195	57	1	58 days	0.45			Williams	1999 SL
1999 SY	16.0	0.15	19990919	290.90797	288.53382	166.33225	2.44908	0.1851707	2.3845665	30	1	57 days	0.61			Williams	1999 SY
1999 SE ₁	16.0	0.15	19990919	320.90383	341.58462	75.34085	3.21241	0.1907385	2.5868029	23	1	23 days	0.44			Williams	1999 SE ₁
1999 SH ₁	15.6	0.15	19990919	353.25225	173.40173	191.98144	9.05981	0.2385849	2.4333675	37	1	58 days	0.52			Williams	1999 SH ₁
1999 SN ₁	13.3	0.15	19991009	186.52310	183.82393	39.41881	14.36492	0.1281831	2.6226728	34	1	48 days	0.71			Williams	1999 SN ₁
1999 SO ₁	13.5	0.15	19990810	299.21011	44.32196	28.05065	6.44265	0.0881929	2.7119445	82	3	1990–1999	0.47	M-v	3	Williams	36477 1999 SO ₁
1999 SQ ₁	16.5	0.15	19991009	15.91610	338.44088	14.12344	2.52060	0.2297428	2.6248639	31	1	57 days	0.46		D	Williams	1999 SQ ₁
1999 SR ₁	16.9	0.15	19991009	50.64300	264.00944	44.06166	7.61571	0.1907432	2.2119049	22	1	53 days	0.57			Williams	1999 SR ₁
1999 ST ₁	13.8	0.15	19990810	197.11412	189.52824	328.18831	4.83948	0.0987050	2.2949095	37	3	1980–1999	0.54	M-v	4	Williams	36477 1999 ST ₁
1999 SU ₁	13.2	0.15	19991009	4.79027	29.60559	352.96074	12.54907	0.1395284	2.7232667	46	1	50 days	0.38			Williams	1999 SU ₁
1999 SW ₁	12.5	0.15	19990810	303.48227	156.70224	255.86398	16.61042	0.1283322	3.1907765	36	3	1977–1999	0.57	M-v	3	Williams	36477 1999 SW ₁
1999 SA ₂	16.3	0.15	19991009	352.81349	168.61757	204.51910	22.05550	0.0827514	1.9221594	21	1	57 days	0.44			Williams	1999 SA ₂
1999 SB ₂	13.7	0.15	19990810	332.93891	118.89849	267.84240	12.59405	0.1991980	2.6402915	44	1	117 days	0.42	M-v	3	Williams	36569 1999 SB ₂
1999 SC ₂	14.4	0.15	19991009	337.90219	196.15654	206.18838	24.11724	0.2477729	2.3709138	40	1	59 days	0.31			Williams	1999 SC ₂
1999 SD ₂	15.6	0.15	19991009	265.30860	255.72083	209.38085	23.22970	0.1474585	1.8629218	32	1	51 days	0.43			Williams	1999 SD ₂
1999 SE ₂	14.6	0.15	19991009	341.62056	73.56114	324.28088	25.70496	0.3098343	2.6740168	33	1	46 days	0.32			Williams	1999 SE ₂
1999 SF ₂	14.9	0.15	19990810	332.24175	270.49693	133.65376	3.35973	0.1832904	2.4287402	42	4	1991–1999	0.60	M-v	2	Williams	36478 1999 SF ₂
1999 SG ₂	14.5	0.15	19991009	234.63279	109.98400	51.39250	9.45882	0.1000577	2.4354751	22	1	52 days	0.62			Williams	1999 SG ₂
1999 SJ ₂	14.2	0.15	19990810	334.45997	37.71250	353.95777	13.63106	0.2753492	2.5397477	56	1	91 days	0.51	M-v	4	Williams	36569 1999 SJ ₂
1999 SM ₂	16.3	0.15	19991009	302.49719	247.70956	195.96467	2.29750	0.2236016	2.8343851	13	1	45 days	0.37			Williams	1999 SM ₂
1999 SO ₂	14.9	0.15	19990810	328.33715	92.37775	336.09157	21.89608	0.3676486	2.5532221	37	1	101 days	0.60	M-v	4	Williams	1999 SO ₂
1999 SP ₂	15.5	0.15	19991009	30.98388	359.17571	345.78717	25.68174	0.2237438	2.3513506	21	1	39 days	0.35			Williams	1999 SP ₂
1999 SU ₂	14.7	0.15	19990810	355.41095	174.50864	195.58554	4.89554	0.1731299	3.1681445	48	2	1993–1999	0.69	M-v	4	Williams	36478 1999 SU ₂

1999 SV ₂	14.6	0.15	19991009	348.59269	37.89684	10.68289	9.26905	0.0613264	2.9686176	30	1	50 days	0.59		Williams		1999 SV ₂
1999 SW ₂	13.7	0.15	19990810	205.71716	153.05701	14.06421	1.40623	0.0883200	2.9497075	65	3	1976–1999	0.44	M-v 4	Williams	36478	1999 SW ₂
1999 SY ₂	16.4	0.15	19991009	10.27341	119.89658	229.22865	23.18057	0.3002311	2.2656420	47	1	42 days	0.51		Williams		1999 SY ₂
1999 SB ₃	13.4	0.15	19991009	353.97815	60.07001	354.49359	32.10496	0.3393763	2.7659507	52	1	38 days	0.60		Williams		1999 SB ₃
1999 SC ₃	15.2	0.15	19990810	3.59950	50.74749	316.63957	23.14866	0.0629869	1.8661445	36	1	100 days	0.60	M-v 4	Williams		1999 SC ₃
1999 SD ₃	14.6	0.15	19991009	330.57889	117.25409	327.94257	29.96412	0.3180862	2.6477972	26	1	36 days	0.46		Williams		1999 SD ₃
1999 SN ₃	13.5	0.15	19991009	53.83531	48.61908	258.59497	23.52397	0.2079094	2.2789503	22	1	38 days	0.44		Williams		1999 SN ₃
1999 SX ₃	15.5	0.15	19990810	2.65754	137.49448	211.99163	1.77851	0.0244541	2.2568422	43	2	1998–1999	0.54	M-v 4	Williams	36478	1999 SX ₃
1999 SY ₃	13.7	0.15	19990810	65.24799	291.70302	351.77907	0.51614	0.1051761	3.2444596	48	2	1997–1999	0.74	M-v 4	Williams	36478	1999 SY ₃
1999 SZ ₃	13.4	0.15	19990810	171.59621	211.66603	336.60239	1.13419	0.0496648	2.9217006	53	2	1997–1999	0.64	M-v 5	Williams	36479	1999 SZ ₃
1999 SC ₄	14.8	0.15	19991009	29.98115	319.96479	5.74241	9.37156	0.2228217	3.0948003	42	1	35 days	0.53		Williams		1999 SC ₄
1999 SG ₄	13.3	0.15	19991009	232.36942	108.99820	54.41150	14.28334	0.1180108	2.5792791	18	1	43 days	0.35		Williams		1999 SG ₄
1999 SH ₄	16.1	0.15	19990919	48.07470	0.66706	293.82957	2.22201	0.2051795	2.3643139	38	1	58 days	1.33		Williams		1999 SH ₄
1999 SK ₄	14.9	0.15	19990810	6.61869	154.85133	188.03199	6.68342	0.1158365	2.3806960	63	2	1998–1999	0.52	M-v 3	Williams	36479	1999 SK ₄
1999 SM ₄	15.7	0.15	19991009	33.23103	321.25424	6.87151	15.17724	0.1503486	2.5594455	26	1	29 days	0.82		Williams		1999 SM ₄
1999 SO ₄	14.5	0.15	19990810	283.22571	66.95549	18.12498	4.93911	0.0543107	2.3571569	35	1	61 days	0.37	M-v 5	Williams		1999 SO ₄
1999 SQ ₄	13.0	0.15	19990810	37.03714	131.16678	201.16194	15.52875	0.0065401	3.1023721	40	2	1997–1999	0.53	M-v 3	Williams	36479	1999 SQ ₄
1999 SR ₄	12.6	0.15	19990810	150.22740	17.12942	198.50803	8.91227	0.0855795	2.8045862	71	5	1985–1999	0.57	M-v 2	Williams	36479	1999 SR ₄
1999 SS ₄	15.8	0.15	19991009	30.54531	287.74334	43.69524	0.68857	0.2254054	2.3434753	30	1	43 days	0.93		Williams		1999 SS ₄
1999 SX ₄	15.3	0.15	19991009	338.73444	259.01382	145.59290	3.93173	0.2005969	2.7401322	55	1	38 days	0.66		Williams		1999 SX ₄
1999 SZ ₄	16.2	0.15	19991009	9.38894	342.25474	354.82575	12.34400	0.2764826	2.3524746	29	1	46 days	0.50		Williams		1999 SZ ₄
1999 SD ₅	13.6	0.15	19990919	333.76284	262.28446	137.74609	18.92101	0.2125183	3.1759202	24	1	25 days	0.42		Williams		1999 SD ₅
1999 SL ₅	17.1	0.15	19990810	6.71857	42.99745	239.35970	22.82259	0.5376173	1.9222275	128	1	34 days	0.38	M-v 5	Williams		1999 SL ₅
1999 SM ₅	19.1	0.15	19990810	0.14111	318.49237	328.39208	5.17120	0.6928533	2.3013133	247	1	33 days	0.54	M-v 6	Williams	36570	1999 SM ₅
1999 SO ₅	21.0	0.15	19990810	119.48003	359.64271	196.21330	13.36724	0.0648012	1.0852184	62	1	36 days	0.65	M-v 5	Williams		1999 SO ₅
1999 SU ₅	15.9	0.15	19990810	7.11345	308.18407	29.62320	21.68769	0.0702307	1.9011893	41	2	1986–1999	0.59	M-v 4	Williams	36479	1999 SU ₅
1999 SZ ₅	13.9	0.15	19990810	339.07413	239.46765	161.48100	22.63278	0.3179881	2.4292897	45	3	1989–1999	0.60	M-v 2	Williams	36480	1999 SZ ₅
1999 SU ₆	14.0	0.15	19991009	54.00767	1.38479	322.66913	0.89455	0.0776624	2.9054799	49	1	39 days	0.46		Williams		1999 SU ₆
1999 SV ₆	14.8	0.15	19990810	16.79533	71.61838	256.31053	3.73996	0.2085052	2.2544349	68	2	1998–1999	0.59	M-v 4	Williams	36480	1999 SV ₆
1999 SW ₆	15.7	0.15	19991009	22.17491	124.69918	219.29283	1.47256	0.2282026	2.4107958	42	1	43 days	0.70		Williams		1999 SW ₆
1999 SL ₈	14.7	0.15	19990810	321.82866	342.64263	46.41411	11.15875	0.2471521	2.2867876	31	3	1975–1999	0.67	M-v 3	Williams	36480	1999 SL ₈
1999 SN ₉	15.1	0.15	19990810	313.79754	81.59720	337.34504	1.84527	0.1921967	2.3816914	58	4	1988–1999	0.50	M-v 1	Williams	36480	1999 SN ₉
1999 SP ₉	14.8	0.15	19990810	72.25233	50.73644	218.10666	12.32045	0.1294069	2.6641599	58	3	1995–1999	0.66	M-v 3	Williams	36480	1999 SP ₉
1999 SR ₉	15.0	0.15	19990810	35.47913	139.00127	169.69940	5.86181	0.2257034	2.2344644	48	2	1998–1999	0.57	M-v 4	Williams	36481	1999 SR ₉
1999 ST ₉	14.7	0.15	19991009	5.85189	13.41932	358.54051	6.02736	0.1889547	3.1664196	34	1	40 days	0.62		Williams		1999 ST ₉
1999 SV ₉	14.1	0.15	19990810	32.77609	125.45861	201.70455	14.13639	0.0744612	2.6766450	69	3	1993–1999	0.59	M-v 2	Williams	36481	1999 SV ₉
1999 SX ₉	16.6	0.15	19990810	351.34448	326.60593	34.03929	5.20630	0.1541710	2.2538239	40	1	60 days	0.56	M-v 5	Williams		1999 SX ₉
1999 SA ₁₀	17.1	0.15	19991009	340.01744	1.75645	45.10091	14.87635	0.2455293	2.6544346	15	1	50 days	0.65		Williams		1999 SA ₁₀
1999 SC ₁₀	14.7	0.15	19991009	324.48051	196.53745	235.88651	16.71863	0.1949839	3.1205782	27	1	40 days	0.81		Williams		1999 SC ₁₀
1999 SD ₁₀	17.2	0.15	19990810	358.25719	228.13651	91.38204	6.00755	0.5356369	3.0813911	50	1	33 days	0.50	M-v 7	Williams		1999 SD ₁₀
1999 SE ₁₀	20.1	0.15	19990810	346.21234	349.49417	40.40984	6.89714	0.6208688	3.2099701	77	1	46 days	0.59	M-v 5	Williams		1999 SE ₁₀
1999 SK ₁₀	19.4	0.15	19990810	298.82873	268.76132	198.14613	6.96188	0.4410095	1.7640613	74	1	47 days	0.41	M-v 5	Williams		1999 SK ₁₀
1999 SN ₁₀	13.5	0.15	19991009	300.03196	352.59547	58.09212	11.23431	0.0966243	2.9672242	15	1	37 days	1.12		Williams		1999 SN ₁₀
1999 SS ₁₀	17.0	0.15	19990919	359.64306	33.85827	329.10430	3.51999	0.2455625	2.3665131	25	1	30 days	0.63		Williams		1999 SS ₁₀
1999 SJ ₁₁	14.5	0.15	19991009	265.50255	35.45989	92.19007	6.23388	0.0624343	2.6691768	12	1	41 days	0.45		Williams		1999 SJ ₁₁
1999 SP ₁₁	16.9	0.15	19991009	19.60925	229.78812	120.17754	3.26236	0.2631188	2.2596185	17	1	34 days	0.43		Williams		1999 SP ₁₁
1999 SQ ₁₁	14.8	0.15	19991009	12.64437	294.47373	76.95338	5.82866	0.1259858	2.7460617	17	1	29 days	0.37		Williams		1999 SQ ₁₁
1999 SS ₁₁	14.4	0.15	19990810	14.33447	248.33484	94.30092	4.44147	0.2243994	2.6075749	45	2	1998–1999	0.64	M-v 4	Williams	36481	1999 SS ₁₁
1999 SU ₁₁	16.0	0.15	19991009	334.69716	257.76052	161.76070	6.38750	0.1195885	2.3538956	16	1	34 days	0.68		Williams		1999 SU ₁₁
1999 SV ₁₁	15.7	0.15	19991009	4.16659	294.19613	84.95135	5.14720	0.2414675	2.5370362	12	1	34 days	0.27		Williams		1999 SV ₁₁
1999 TA	15.2	0.15	19990919	123.26168	222.80810	12.91997	7.06477	0.1611174	2.2619094	16	1	6 days	0.38		Williams		1999 TA
1999 TD	13.7	0.15	19991009	308.77293	252.70231	201.91612	22.43068	0.2359349	3.1386788	43	1	44 days	0.59		Williams		1999 TD
1999 TE	16.7	0.15	19991009	359.52302	148.21786	230.90499	2.76857	0.2384235	2.2568524	24	1	34 days	0.40		Williams		1999 TE

1999 TG	16.6	0.15	19990919	39.99840	308.37265	359.72933	0.87057	0.1838056	2.3484826	18	1	7 days	0.40		Williams	1999 TG
1999 TK	14.9	0.15	19991009	329.97465	346.11242	76.33701	2.18537	0.2038490	3.1135130	37	1	41 days	0.45		Williams	1999 TK
1999 TL	14.7	0.15	19991009	296.77218	6.50689	90.01043	2.15942	0.1398772	3.1024449	37	1	41 days	0.47		Williams	1999 TL
1999 TM	14.8	0.15	19990810	314.09082	204.03375	212.75269	5.18868	0.1282852	2.3147669	82	4	1978–1999	0.50	M-v 3	Williams	36481 1999 TM
1999 TN	15.2	0.15	19990810	335.29525	183.19804	209.29604	7.10078	0.1976529	2.3948302	59	1	116 days	0.43	M-v 3	Williams	1999 TN
1999 TP	13.6	0.15	19990810	4.52752	156.62772	198.10173	17.01776	0.1292456	3.0773751	84	3	1997–1999	0.51	M-v 2	Williams	36481 1999 TP
1999 TQ	16.3	0.15	19991009	350.54023	192.44364	209.32493	1.68820	0.2319502	2.3991295	36	1	41 days	0.56		Williams	1999 TQ
1999 TS	15.1	0.15	19991009	28.69791	133.15443	202.47707	8.53181	0.1699940	2.8010445	36	1	42 days	0.47		Williams	1999 TS
1999 TU	14.8	0.15	19990810	38.02279	278.48188	28.97087	2.17182	0.1684848	2.5723577	48	2	1998–1999	0.56	M-v 4	Williams	36482 1999 TU
1999 TV	16.1	0.15	19991009	7.34593	145.76421	219.84576	2.31054	0.3013237	2.4303483	35	1	28 days	0.61		Williams	1999 TV
1999 TW	14.7	0.15	19990810	24.61664	101.85941	214.56510	3.36693	0.2190960	2.1847867	90	2	1998–1999	0.52	M-v 4	Williams	36482 1999 TW
1999 TZ	15.5	0.15	19990810	352.41711	177.61798	188.33822	4.70242	0.2970472	2.5366576	31	1	101 days	0.40	M-v 4	Williams	1999 TZ
1999 TD ₁	14.4	0.15	19991009	36.28627	131.38791	199.81259	23.09655	0.1776795	3.1172611	22	1	30 days	0.57		Williams	1999 TD ₁
1999 TF ₁	14.8	0.15	19991009	331.78339	205.03597	224.03462	2.81780	0.2510347	3.0618357	36	1	28 days	0.84		Williams	1999 TF ₁
1999 TG ₁	14.4	0.15	19991009	1.49445	71.91538	308.72888	0.96880	0.1390374	2.9289285	32	1	43 days	0.56		Williams	1999 TG ₁
1999 TH ₁	15.6	0.15	19991009	250.03208	288.70934	211.39698	4.67938	0.0770758	2.2750441	32	1	41 days	0.77		Williams	1999 TH ₁
1999 TJ ₁	14.3	0.15	19991009	323.13828	46.60446	15.51947	6.33092	0.0483351	2.4490152	39	1	28 days	0.48		Williams	1999 TJ ₁
1999 TL ₁	15.7	0.15	19991009	355.16452	191.43974	196.80670	6.32231	0.2004752	2.5294705	27	1	30 days	0.57		Williams	1999 TL ₁
1999 TM ₁	14.5	0.15	19990810	300.29598	46.66743	20.91643	8.42160	0.0568831	2.2263599	61	3	1989–1999	0.53	M-v 3	Williams	36482 1999 TM ₁
1999 TO ₁	15.3	0.15	19991009	11.08920	350.01844	16.18470	11.28679	0.1685143	2.4165203	46	1	33 days	0.48		Williams	1999 TO ₁
1999 TQ ₁	15.8	0.15	19991009	20.01312	327.23497	16.22840	12.98069	0.3017379	2.6432960	49	1	33 days	0.52		Williams	1999 TQ ₁
1999 TR ₁	15.3	0.15	19990810	305.94479	226.11808	199.79156	6.24645	0.0852317	2.3382954	49	3	1994–1999	0.51	M-v 2	Williams	36482 1999 TR ₁
1999 TS ₁	15.2	0.15	19990810	38.42998	113.09304	199.17997	2.03674	0.1360097	2.2910541	88	2	1998–1999	0.60	M-v 4	Williams	36482 1999 TS ₁
1999 TT ₁	13.7	0.15	19991009	26.49026	323.78894	18.32232	10.63635	0.2246040	3.1478516	36	1	33 days	0.52		Williams	1999 TT ₁
1999 TU ₁	13.0	0.15	19991009	136.22912	211.36669	33.66596	6.61216	0.0301200	3.0480310	37	1	42 days	0.57		Williams	1999 TU ₁
1999 TV ₁	15.7	0.15	19991009	21.12529	174.96224	170.79138	2.65374	0.2450368	2.3462155	30	1	38 days	0.41		Williams	1999 TV ₁
1999 TW ₁	15.2	0.15	19991009	66.82961	119.62121	183.47330	4.54108	0.1098675	2.3549440	30	1	30 days	0.91		Williams	1999 TW ₁
1999 TY ₁	14.6	0.15	19990810	350.61488	336.67582	50.76974	15.21198	0.3158313	2.5465636	47	1	61 days	0.46	M-v 4	Williams	1999 TY ₁
1999 TA ₂	13.9	0.15	19990810	358.14528	34.40930	309.73174	16.27771	0.3642709	2.9156666	43	1	103 days	0.35	M-v 3	Williams	1999 TA ₂
1999 TC ₂	14.2	0.15	19991009	7.70818	272.84278	87.21606	13.71566	0.2107329	2.6983055	29	1	58 days	0.55		Williams	1999 TC ₂
1999 TD ₂	15.4	0.15	19990810	288.68208	31.96406	40.34733	21.65955	0.0919134	1.9301354	53	2	1998–1999	0.56	M-v 4	Williams	36482 1999 TD ₂
1999 TE ₂	15.4	0.15	19990810	22.64049	291.41833	42.96799	4.81546	0.1595867	2.3069335	52	3	1992–1999	0.60	M-v 3	Williams	36483 1999 TE ₂
1999 TF ₂	16.0	0.15	19991009	352.82762	172.90765	217.01372	5.63997	0.2588259	2.2788734	38	1	55 days	0.65		Williams	1999 TF ₂
1999 TG ₂	12.5	0.15	19990810	187.96633	182.41706	359.17224	8.96659	0.0825665	2.7934065	46	2	1997–1999	0.40	M-v 4	Williams	36483 1999 TG ₂
1999 TH ₂	15.2	0.15	19990810	0.10720	115.80044	242.51842	3.23281	0.1788057	2.6706424	38	3	1993–1999	0.65	M-v 3	Williams	36483 1999 TH ₂
1999 TJ ₂	16.4	0.15	19991009	26.36558	139.67489	196.99242	2.85862	0.2215391	2.3547267	38	1	41 days	0.65		Williams	1999 TJ ₂
1999 TN ₂	14.0	0.15	19990810	333.58414	286.08426	106.90873	13.93582	0.1956457	2.6591011	29	2	1994–1999	0.48	M-v 4	Williams	36483 1999 TN ₂
1999 TO ₂	14.5	0.15	19991009	11.68491	260.86146	94.13697	13.59377	0.2182980	2.6183625	29	1	58 days	0.60		Williams	1999 TO ₂
1999 TP ₂	14.8	0.15	19990810	50.83955	207.65802	83.69369	12.60716	0.1603027	2.3533640	36	3	1993–1999	0.71	M-v 2	Williams	36483 1999 TP ₂
1999 TQ ₂	14.2	0.15	19990919	343.86977	260.52351	141.16257	21.44321	0.3086054	3.0362292	24	1	48 days	0.62		Williams	1999 TQ ₂
1999 TS ₂	12.6	0.15	19990919	28.11910	256.35768	76.66007	23.69681	0.1170390	3.2312548	27	1	50 days	0.72		Williams	1999 TS ₂
1999 TX ₂	18.1	0.15	19990810	33.93463	53.56827	180.00069	61.39862	0.4628745	1.2808236	49	1	35 days	0.56	M-v 6	Williams	1999 TX ₂
1999 TZ ₂	16.4	0.15	19991009	37.27746	227.96357	107.12034	4.30972	0.1990868	2.1620334	14	1	35 days	0.23		Nakano	1999 TZ ₂
1999 TK ₃	14.2	0.15	19990919	279.02011	239.93008	223.61152	2.08893	0.0565761	3.1568917	17	1	3 days	0.59	E	Williams	1999 TK ₃
1999 TL ₃	17.0	0.15	19991009	345.45018	31.30360	13.49395	11.20237	0.2787501	2.5358641	29	1	31 days	0.55		Williams	1999 TL ₃
1999 TM ₃	16.0	0.15	19991009	73.52807	205.73934	86.08912	4.21740	0.1417153	2.3188362	21	1	32 days	0.87		Williams	1999 TM ₃
1999 TN ₃	14.3	0.15	19990810	309.55836	65.32769	28.54310	24.27691	0.3584094	2.7445574	80	1	63 days	0.37	M-v 4	Williams	1999 TN ₃
1999 TO ₃	15.4	0.15	19990810	16.39569	58.79328	277.32205	0.96582	0.1728057	2.4183625	51	2	1998–1999	0.65	M-v 4	Williams	36483 1999 TO ₃
1999 TP ₃	13.5	0.15	19991009	358.79761	11.75239	18.22906	10.81068	0.1083949	3.0458443	49	1	58 days	0.60		Williams	1999 TP ₃
1999 TR ₃	16.3	0.15	19991009	73.71234	81.18147	203.57068	4.74057	0.1687997	2.2824190	22	1	46 days	0.45		Williams	1999 TR ₃
1999 TS ₃	15.9	0.15	19991009	67.39490	336.71387	324.03942	0.77479	0.0919973	2.6440628	18	1	30 days	0.41		Williams	1999 TS ₃
1999 TT ₃	17.1	0.15	19991009	1.87999	357.39043	17.16850	3.42160	0.2643862	2.6458238	18	1	30 days	0.26		Williams	1999 TT ₃
1999 TU ₃	13.7	0.15	19991009	254.44273	114.04448	16.20173	9.98376	0.0528174	2.9693135	48	1	34 days	0.48		Williams	1999 TU ₃

1999 TV ₃	17.5	0.15	19991009	3.60856	225.85428	146.75699	4.43935	0.2299081	2.4260860	15	1	30 days	0.34		Williams		1999 TV ₃
1999 TW ₃	14.2	0.15	19990810	298.83180	6.52552	65.68223	5.37437	0.0931541	2.3936218	67	4	1992–1999	0.52	M-v 3	Williams	36483	1999 TW ₃
1999 TX ₃	16.0	0.15	19991009	25.45668	329.35478	13.75224	4.25805	0.1601483	2.3165726	40	1	41 days	0.30		Williams		1999 TX ₃
1999 TY ₃	15.7	0.15	19991009	286.99313	83.89387	24.88613	3.61890	0.1537483	2.3307908	40	1	45 days	0.50		Williams		1999 TY ₃
1999 TA ₄	13.5	0.15	19991009	109.63808	38.21686	231.21170	12.45355	0.1651751	2.7449936	30	1	48 days	0.29		Williams		1999 TA ₄
1999 TB ₄	15.4	0.15	19991009	320.64459	102.11476	340.59678	4.44671	0.0935250	3.0680058	16	1	30 days	0.36		Williams		1999 TB ₄
1999 TD ₄	14.9	0.15	19990810	101.68870	280.52804	307.91321	5.32439	0.2353730	2.2539666	48	1	64 days	0.46	M-v 5	Williams		1999 TD ₄
1999 TL ₄	14.9	0.15	19991009	325.36622	50.89747	15.32869	5.96481	0.1049659	2.4052086	37	1	33 days	0.74		Williams		1999 TL ₄
1999 TM ₄	14.3	0.15	19991009	52.80082	89.81866	242.26287	4.40081	0.1243669	2.8546077	26	1	39 days	0.70		Williams		1999 TM ₄
1999 TO ₄	16.5	0.15	19990810	290.20130	56.21843	9.70570	21.13240	0.0865582	1.9097503	45	2	1998–1999	0.62	M-v 4	Williams	36484	1999 TO ₄
1999 TP ₄	17.3	0.15	19991009	352.56733	190.07874	205.74402	22.37809	0.0953610	1.9763488	37	1	34 days	0.53		Williams		1999 TP ₄
1999 TQ ₄	17.6	0.15	19991009	5.65227	176.73960	202.89091	22.01476	0.0646405	1.9128811	30	1	34 days	0.60		Williams		1999 TQ ₄
1999 TT ₄	15.6	0.15	19991009	333.42476	52.38905	17.26549	27.27422	0.3444032	3.0958066	56	1	59 days	0.62		Williams		1999 TT ₄
1999 TW ₄	14.7	0.15	19991009	16.61631	334.69015	22.06089	17.91991	0.2134555	2.5237217	51	1	31 days	0.42		Williams		1999 TW ₄
1999 TZ ₄	19.5	0.15	19990810	284.64708	61.56520	15.16332	31.98856	0.1567803	1.5138249	62	1	33 days	0.55	M-v 6	Williams		1999 TZ ₄
1999 TA ₅	20.6	0.15	19990810	342.17967	82.52068	298.47601	4.24159	0.4883001	2.3958203	50	1	40 days	0.49	M-v 5	Williams		1999 TA ₅
1999 TB ₅	18.8	0.15	19990810	313.98415	238.56094	195.78637	30.45935	0.3928713	1.9678841	88	1	33 days	0.47	M-v 6	Williams		1999 TB ₅
1999 TC ₅	18.5	0.15	19990810	306.63507	282.53965	192.61821	29.09765	0.5477770	2.0160186	48	1	31 days	0.55	M-v 6	Williams		1999 TC ₅
1999 TD ₅	19.3	0.15	19990810	336.28711	309.50572	105.32410	4.14676	0.5273824	2.4684594	80	1	45 days	0.46	M-v 5	Williams		1999 TD ₅
1999 TE ₅	19.9	0.15	19990810	346.61009	354.81297	12.62276	6.60739	0.4839942	2.2390879	55	1	36 days	0.49	M-v 6	Nakano		1999 TE ₅
1999 TF ₅	18.3	0.15	19990810	10.99544	63.60918	199.70489	26.87242	0.6366529	2.0240029	53	1	32 days	0.51	M-v 6	Williams		1999 TF ₅
1999 TH ₅	15.9	0.15	19991009	44.24423	149.04638	178.59237	12.44929	0.0867544	2.5744541	35	1	42 days	0.84		Williams		1999 TH ₅
1999 TJ ₅	15.2	0.15	19990810	7.43686	6.60054	347.38542	3.86112	0.1721164	2.1915673	51	2	1998–1999	0.61	M-v 4	Williams	36484	1999 TJ ₅
1999 TK ₅	14.0	0.15	19990810	37.74302	98.00194	212.65929	12.10690	0.2111264	2.5539383	70	2	1998–1999	0.45	M-v 4	Williams	36484	1999 TK ₅
1999 TM ₅	15.9	0.15	19991009	302.97282	70.46792	27.83538	5.90870	0.1917508	2.3428001	38	1	38 days	0.83		Williams		1999 TM ₅
1999 TN ₅	15.7	0.15	19991009	6.66874	198.87015	173.80270	2.27268	0.0899238	2.3791860	29	1	30 days	0.68		Williams		1999 TN ₅
1999 TP ₅	15.9	0.15	19991009	19.81101	249.95743	111.33719	1.73037	0.0073020	2.1771631	25	1	30 days	0.54		Williams		1999 TP ₅
1999 TS ₅	15.5	0.15	19991009	12.00238	24.67628	337.48837	3.70646	0.1793159	2.2003242	34	1	34 days	0.52		Williams		1999 TS ₅
1999 TT ₅	15.2	0.15	19991009	345.65113	185.18596	220.52103	5.12077	0.1994362	2.4373770	50	1	41 days	0.44		Williams		1999 TT ₅
1999 TU ₅	14.1	0.15	19991009	336.08783	351.48886	72.00771	5.47461	0.1009079	2.8146517	12	1	31 days	0.70		Williams		1999 TU ₅
1999 TV ₅	13.7	0.15	19990810	14.95162	137.00551	221.97191	11.21955	0.2080070	2.5761112	57	3	1974–1999	0.56	M-v 2	Williams	36484	1999 TV ₅
1999 TZ ₅	15.5	0.15	19990810	61.58760	258.69940	21.39444	5.99759	0.1911748	2.1962197	53	2	1998–1999	0.66	M-v 4	Williams	36484	1999 TZ ₅
1999 TA ₆	14.6	0.15	19990810	326.31389	30.46640	355.38411	9.52650	0.0643405	3.4656892	29	1	65 days	0.72	M-v 5	Williams		1999 TA ₆
1999 TB ₆	16.2	0.15	19991009	37.89073	237.06872	96.74603	3.85237	0.0886349	2.2823370	29	1	41 days	0.61		Williams		1999 TB ₆
1999 TC ₆	15.0	0.15	19990810	53.23062	161.62663	133.67271	7.28393	0.1163129	2.4106940	42	2	1998–1999	0.65	M-v 4	Williams	36485	1999 TC ₆
1999 TD ₆	14.5	0.15	19991009	354.58494	264.74612	122.46905	4.50408	0.1062516	2.6514623	29	1	29 days	0.66		Williams		1999 TD ₆
1999 TE ₆	14.6	0.15	19990810	282.96202	254.80598	186.59758	8.64415	0.0185919	2.5904189	78	3	1997–1999	0.52	M-v 3	Williams	36485	1999 TE ₆
1999 TF ₆	15.1	0.15	19991009	356.13435	354.08515	27.83532	7.27520	0.1649065	3.1368175	53	1	30 days	0.66		Williams		1999 TF ₆
1999 TH ₆	15.3	0.15	19990810	149.72211	165.41099	36.81719	6.47302	0.1042343	2.2633874	75	2	1998–1999	0.61	M-v 4	Williams	36485	1999 TH ₆
1999 TK ₆	16.3	0.15	19991009	352.42402	192.96909	199.16513	3.78564	0.2212484	2.5770334	33	1	41 days	0.62		Williams		1999 TK ₆
1999 TP ₆	14.3	0.15	19991009	355.01407	297.29977	92.96236	2.62949	0.2203273	3.0893933	24	1	36 days	0.49		Williams		1999 TP ₆
1999 TR ₆	13.3	0.15	19991009	42.12026	294.46508	41.32610	11.00032	0.0691778	3.0288202	22	1	40 days	0.57		Williams		1999 TR ₆
1999 TV ₆	13.8	0.15	19990810	307.04183	232.43925	198.59174	3.57005	0.1462182	2.3701098	60	5	1977–1999	0.56	M-v 1	Williams	36485	1999 TV ₆
1999 TW ₆	15.5	0.15	19991009	37.13287	309.03845	23.12404	14.68848	0.1718202	2.7111408	28	1	28 days	0.84		Williams		1999 TW ₆
1999 TX ₆	14.1	0.15	19990810	309.77517	49.54359	24.41329	13.59622	0.1708036	2.6616029	50	2	1997–1999	0.48	M-v 5	Williams	36486	1999 TX ₆
1999 TY ₆	15.0	0.15	19991009	92.11757	254.24945	14.32168	3.74067	0.1702890	2.2926542	50	1	39 days	0.66		Williams		1999 TY ₆
1999 TC ₇	14.2	0.15	19991009	191.32413	160.03921	33.11229	7.41219	0.0647624	2.3290131	26	1	41 days	0.48		Williams		1999 TC ₇
1999 TF ₇	14.9	0.15	19991009	2.47819	325.53265	54.51609	3.96928	0.1393637	3.0521136	26	1	40 days	0.62		Williams		1999 TF ₇
1999 TK ₇	16.3	0.15	19991009	331.39258	51.00485	11.40527	2.74986	0.2106397	2.4033084	29	1	28 days	0.31		Williams		1999 TK ₇
1999 TM ₇	16.1	0.15	19991009	13.48833	330.11321	33.61375	4.14637	0.1557900	2.2400988	19	1	23 days	0.64		Williams		1999 TM ₇
1999 TN ₇	16.4	0.15	19991009	314.11734	20.13102	67.21600	2.59764	0.1955181	2.3845158	16	1	28 days	1.22		Williams		1999 TN ₇
1999 TP ₇	14.8	0.15	19990810	31.71432	46.60932	264.44221	12.05545	0.2428601	2.3845518	86	1	119 days	0.63	M-v 4	Williams	36573	1999 TP ₇
1999 TS ₇	17.1	0.15	19991009	10.98374	323.87470	28.66753	16.18212	0.2543170	2.6078273	19	1	41 days	0.52		Williams		1999 TS ₇

1999 TT ₇	16.7	0.15	19991009	354.30992	353.56668	29.37327	17.21127	0.3196018	2.7660386	17	1	41 days	0.47		Williams		1999 TT ₇
1999 TZ ₇	15.2	0.15	19990810	144.01743	110.95942	96.98600	3.84025	0.0484095	2.2371342	46	2	1998–1999	0.73	M-v 4	Williams	36486	1999 TZ ₇
1999 TA ₈	15.3	0.15	19991009	8.97282	225.71773	138.72408	5.00171	0.2719947	2.7385632	22	1	30 days	0.43		Williams		1999 TA ₈
1999 TB ₈	15.0	0.15	19990810	334.94310	14.10930	32.41720	14.50770	0.2728013	2.6763897	55	1	81 days	0.39	M-v 3	Williams		1999 TB ₈
1999 TC ₈	14.5	0.15	19991009	11.77679	262.37494	98.32438	3.82241	0.2626625	3.9723963	24	1	34 days	0.46		Williams		1999 TC ₈
1999 TD ₈	15.6	0.15	19991009	349.77730	358.26740	37.46798	0.84988	0.2053719	2.3292305	41	1	41 days	0.52		Williams		1999 TD ₈
1999 TE ₈	16.0	0.15	19991009	11.27017	168.56448	195.68582	6.38198	0.1549449	2.2437495	28	1	30 days	0.52		Williams		1999 TE ₈
1999 TF ₈	14.6	0.15	19991009	19.64865	48.84706	303.61402	7.82436	0.2336929	2.7211062	25	1	37 days	0.63		Williams		1999 TF ₈
1999 TG ₈	13.9	0.15	19991009	327.54521	86.73093	341.99442	6.38779	0.1343407	2.2915387	27	1	39 days	0.53		Williams		1999 TG ₈
1999 TH ₈	15.2	0.15	19991009	338.43018	139.23775	279.45219	3.95902	0.2121912	2.3598742	26	1	39 days	0.56		Williams		1999 TH ₈
1999 TJ ₈	16.0	0.15	19991009	325.14223	34.49226	36.07147	3.16832	0.1910387	2.4261312	30	1	40 days	0.74		Williams		1999 TJ ₈
1999 TK ₈	16.0	0.15	19991009	71.31152	212.25668	71.75192	1.33999	0.2231533	2.3971726	25	1	41 days	1.11		Williams		1999 TK ₈
1999 TL ₈	15.7	0.15	19990919	0.72428	342.48971	29.99579	9.95762	0.1868010	2.4395593	26	1	27 days	0.42		Williams		1999 TL ₈
1999 TM ₈	15.1	0.15	19991009	348.66583	318.78853	77.63875	3.14404	0.1021526	2.9011323	16	1	28 days	0.78		Williams		1999 TM ₈
1999 TN ₈	14.8	0.15	19991009	341.17089	235.95610	172.23460	3.99006	0.1477295	3.0333021	18	1	30 days	0.67		Williams		1999 TN ₈
1999 TO ₈	14.1	0.15	19991009	65.82999	149.32275	161.13464	2.31118	0.0727002	2.8731357	22	1	39 days	0.65		Williams		1999 TO ₈
1999 TP ₈	15.3	0.15	19990810	32.16379	259.50415	69.32573	2.57509	0.0624728	2.3700619	45	2	1998–1999	0.76	M-v 4	Williams	36486	1999 TP ₈
1999 TQ ₈	14.1	0.15	19991009	114.64406	58.04120	212.02492	9.47815	0.0141532	2.9839085	38	1	59 days	0.42		Williams		1999 TQ ₈
1999 TT ₈	13.6	0.15	19991009	26.07798	130.66260	216.96918	8.02269	0.1575486	3.0454943	55	1	43 days	0.43		Williams		1999 TT ₈
1999 TU ₈	12.6	0.15	19990810	273.89314	25.36252	89.18153	2.75851	0.1130596	3.2304797	46	2	1982–1999	0.63	M-v 5	Williams	36487	1999 TU ₈
1999 TW ₈	15.9	0.15	19991009	44.36230	321.87578	353.76578	11.83672	0.0292709	2.6793517	21	1	30 days	0.49		Marsden		1999 TW ₈
1999 TX ₈	16.2	0.15	19990810	348.44736	37.50746	320.62943	1.69991	0.2046285	2.3600142	67	1	83 days	0.48	M-v 4	Williams		1999 TX ₈
1999 TY ₈	16.0	0.15	19990919	9.87866	164.93398	177.45648	3.01434	0.2223193	3.0852714	30	1	32 days	0.49		Williams		1999 TY ₈
1999 TA ₉	15.9	0.15	19991009	337.48914	24.45654	31.63077	4.14957	0.2251609	2.7086437	42	1	40 days	1.05		Williams		1999 TA ₉
1999 TB ₉	15.3	0.15	19991009	25.49689	143.25549	204.11041	12.89916	0.1678317	2.7010720	29	1	30 days	0.53		Williams		1999 TB ₉
1999 TC ₉	14.8	0.15	19991009	9.70064	358.74924	11.23919	3.88430	0.1814975	2.5815327	48	1	39 days	0.39		Williams		1999 TC ₉
1999 TD ₉	14.8	0.15	19991009	323.05783	256.76894	182.67990	7.94349	0.2265019	3.1909947	19	1	29 days	0.63		Williams		1999 TD ₉
1999 TE ₉	15.9	0.15	19991009	11.00013	344.96661	21.88759	5.94533	0.1864708	2.2882491	30	1	35 days	0.49		Williams		1999 TE ₉
1999 TG ₉	16.5	0.15	19991009	23.44712	323.19615	22.33871	5.40520	0.2323097	2.2492733	34	1	34 days	0.48		Williams		1999 TG ₉
1999 TJ ₉	12.5	0.15	19991009	287.45092	252.81768	210.04633	11.21939	0.0237439	3.1788513	35	1	43 days	0.40		Williams		1999 TJ ₉
1999 TK ₉	14.6	0.15	19991009	351.99955	24.16247	15.93694	4.48675	0.2470202	3.1088066	46	1	33 days	0.48		Williams		1999 TK ₉
1999 TL ₉	15.3	0.15	19991009	357.18773	7.74348	22.21089	9.73914	0.1892289	2.6047540	57	1	58 days	0.41		Williams		1999 TL ₉
1999 TM ₉	16.7	0.15	19991009	4.89414	352.48812	21.91310	8.42194	0.2724570	2.3056531	27	1	35 days	0.74		Williams		1999 TM ₉
1999 TO ₉	17.1	0.15	19991009	359.86997	4.05064	20.75809	5.38392	0.2343102	2.3407305	39	1	39 days	0.66		Williams		1999 TO ₉
1999 TP ₉	15.8	0.15	19991009	19.30326	335.61055	18.97337	2.30800	0.2211336	2.3599206	44	1	39 days	0.97		Williams		1999 TP ₉
1999 TT ₉	16.4	0.15	19991009	342.54519	204.72323	205.32171	2.91496	0.2199622	2.4662510	24	1	37 days	0.62		Williams		1999 TT ₉
1999 TW ₉	15.8	0.15	19990810	4.27590	23.98158	330.38571	1.89799	0.2134128	2.3912311	95	3	1973–1999	0.70	M-v 3	Williams	36487	1999 TW ₉
1999 TX ₉	14.0	0.15	19991009	0.33765	12.92309	50.08055	26.38756	0.2737482	2.3054715	31	1	24 days	0.69		Williams		1999 TX ₉
1999 TA ₁₀	17.8	0.15	19990810	21.84038	84.64237	214.78610	20.83842	0.2414252	1.5056401	188	1	32 days	0.52	M-v 5	Williams		1999 TA ₁₀
1999 TB ₁₀	18.4	0.15	19991009	251.39069	137.23252	2.01362	15.95348	0.2314030	1.3631114	46	1	28 days	0.47		Williams		1999 TB ₁₀
1999 TC ₁₀	19.0	0.15	19991009	344.51791	57.69820	28.58828	19.31749	0.5860430	2.3252757	76	1	24 days	0.57		Marsden		1999 TC ₁₀
1999 TD ₁₀	8.6	0.15	19991009	0.48766	141.14872	184.23028	6.28148	0.9247644	154.6480229	42	1	27 days	0.45		Williams		1999 TD ₁₀
1999 TE ₁₀	16.1	0.15	19991009	303.49936	169.31489	270.77855	2.72758	0.1905701	2.5994574	8	1	24 days	0.28		Marsden		1999 TE ₁₀
1999 TG ₁₀	14.4	0.15	19990810	226.62994	159.26131	350.67581	2.27135	0.1359381	2.4588279	44	2	1997–1999	0.53	M-v 4	Williams	36487	1999 TG ₁₀
1999 TH ₁₀	14.9	0.15	19991009	326.06544	244.87095	184.13854	8.15507	0.2036366	3.0539724	31	1	33 days	0.48		Williams		1999 TH ₁₀
1999 TK ₁₀	14.2	0.15	19991009	344.46071	220.97098	180.84266	7.75937	0.1782295	3.9874490	14	1	25 days	0.28		Marsden		1999 TK ₁₀
1999 TN ₁₀	16.2	0.15	19991009	35.34898	119.74487	204.79182	4.83400	0.2884291	2.5616129	18	1	27 days	0.52		Williams		1999 TN ₁₀
1999 TO ₁₀	16.6	0.15	19991009	3.86539	175.01623	204.97199	3.87793	0.1949034	2.5244221	13	1	29 days	0.34		Williams		1999 TO ₁₀
1999 TR ₁₀	13.2	0.15	19991009	9.11263	356.37481	20.51033	10.48479	0.0566595	3.0694008	49	1	33 days	0.31		Williams		1999 TR ₁₀
1999 TT ₁₀	13.0	0.15	19991009	72.75496	276.39800	31.55141	11.19164	0.0886122	3.0314202	29	1	41 days	0.30		Williams		1999 TT ₁₀
1999 TW ₁₀	16.0	0.15	19991009	317.84750	41.47436	45.30020	8.78948	0.1453061	2.3787564	35	1	41 days	0.69		Williams		1999 TW ₁₀
1999 TY ₁₀	15.3	0.15	19991009	113.80441	117.03693	161.85977	4.66117	0.0103177	2.5490357	19	1	24 days	1.07		Williams		1999 TY ₁₀
1999 TZ ₁₀	16.7	0.15	19991009	0.71769	103.72502	268.55639	6.81280	0.1119993	2.3804843	27	1	37 days	0.95		Williams		1999 TZ ₁₀

1999 TA ₁₁	15.8	0.15	19991009	288.13554	286.98093	184.36717	7.68654	0.0639067	2.2800616	28	1	29 days	0.78		Williams	1999 TA ₁₁
1999 TF ₁₁	14.1	0.15	19991009	3.99196	157.00673	220.21084	16.60788	0.2141419	3.1745715	30	1	32 days	0.55		Williams	1999 TF ₁₁
1999 TG ₁₁	14.7	0.15	19990810	3.79359	344.61214	9.93085	16.48044	0.2390282	2.6589663	51	1	65 days	0.50	M-v 4	Williams	1999 TG ₁₁
1999 TK ₁₁	13.5	0.15	19990810	272.42124	105.48044	356.98056	6.36959	0.0848586	2.4361686	56	4	1984–1999	0.42	M-v 1	Williams	36487 1999 TK ₁₁
1999 TL ₁₁	14.5	0.15	19990810	328.20097	202.72259	208.25678	13.73682	0.1339431	2.4422451	60	3	1994–1999	0.58	M-v 3	Williams	36487 1999 TL ₁₁
1999 TM ₁₁	14.5	0.15	19990810	86.38906	136.26450	109.27618	24.45469	0.2167415	2.2932263	35	2	1998–1999	0.66	M-v 4	Williams	36487 1999 TM ₁₁
1999 TN ₁₁	15.4	0.15	19991009	14.58189	248.03736	99.60202	22.98999	0.2952178	2.3680912	13	1	26 days	0.42		Williams	1999 TN ₁₁
1999 TO ₁₁	18.4	0.15	19991009	10.44848	341.88424	23.62654	4.71625	0.3274356	2.3271331	47	1	34 days	0.41		Williams	1999 TO ₁₁
1999 TP ₁₁	15.1	0.15	19991009	352.24282	330.75140	71.11777	7.31684	0.0954013	2.2521979	24	1	39 days	0.21		Marsden	1999 TP ₁₁
1999 TQ ₁₁	12.9	0.15	19990810	353.42439	294.34652	96.84736	6.41480	0.1534031	3.1933511	34	2	1997–1999	0.61	M-v 4	Williams	36488 1999 TQ ₁₁
1999 TR ₁₁	8.4	0.15	19991009	359.99836	359.66972	54.70646	17.07247	0.2459204	39.6463619	11	1	36 days	0.17		E Marsden	1999 TR ₁₁
1999 TS ₁₁	12.9	0.15	19990810	10.27879	23.49115	326.68397	12.61802	0.1910198	2.6449546	82	2	1990–1999	0.41	M-v 3	Williams	36488 1999 TS ₁₁
1999 TU ₁₁	12.7	0.15	19990810	49.86160	106.86056	209.17317	13.60457	0.2256489	3.1811315	34	2	1997–1999	0.45	M-v 4	Williams	36488 1999 TU ₁₁
1999 TX ₁₁	15.5	0.15	19991009	269.36057	118.80030	15.85747	11.92593	0.1298262	2.6178575	27	1	33 days	0.67		Williams	1999 TX ₁₁
1999 TZ ₁₁	15.7	0.15	19991009	53.91159	102.34694	204.21171	3.52093	0.1687052	2.2300893	30	1	29 days	0.36		Williams	1999 TZ ₁₁
1999 TA ₁₂	16.0	0.15	19991009	24.62409	129.97411	208.39658	1.88928	0.2318781	2.3373401	29	1	31 days	0.56		Williams	1999 TA ₁₂
1999 TB ₁₂	13.4	0.15	19990810	253.90762	87.84181	48.95704	14.18995	0.1020408	2.5662708	57	4	1987–1999	0.48	M-v 2	Williams	36488 1999 TB ₁₂
1999 TD ₁₂	15.9	0.15	19991009	22.75425	245.25940	111.33001	3.30483	0.1974291	2.4175934	30	1	29 days	0.38		Williams	1999 TD ₁₂
1999 TE ₁₂	15.8	0.15	19991009	303.29747	44.48035	59.80956	8.95551	0.1354729	2.6912862	15	1	34 days	0.79		Williams	1999 TE ₁₂
1999 TG ₁₂	16.4	0.15	19991009	1.36492	237.05501	151.26880	2.85487	0.1925286	2.3814538	37	1	48 days	0.56		Williams	1999 TG ₁₂
1999 TK ₁₂	18.0	0.15	19991029	315.01167	111.97832	359.25201	24.48802	0.3931329	1.6830667	67	1	29 days	0.63		Nakano	1999 TK ₁₂
1999 TL ₁₂	18.6	0.15	19991009	191.17706	346.68007	202.42956	17.31979	0.4364405	1.0814171	27	1	25 days	0.55		Williams	1999 TL ₁₂
1999 TN ₁₂	17.7	0.15	19991009	14.88218	150.18284	212.44870	37.25922	0.3917494	1.8869874	47	1	22 days	0.58		Marsden	1999 TN ₁₂
1999 TO ₁₂	16.7	0.15	19991009	21.72680	176.39295	167.98794	4.68733	0.2525182	2.6190859	18	1	29 days	0.75		Williams	1999 TO ₁₂
1999 TP ₁₂	13.7	0.15	19990810	15.41286	303.51114	34.37902	13.28209	0.1950911	2.6096372	59	2	1998–1999	0.49	M-v 3	Williams	36488 1999 TP ₁₂
1999 TQ ₁₂	15.7	0.15	19990810	356.37249	293.31055	66.87140	3.34694	0.1722031	2.2229700	33	1	78 days	0.64	M-v 5	Williams	1999 TQ ₁₂
1999 TR ₁₂	17.8	0.15	19991009	19.25188	356.44476	2.78155	1.47088	0.1978921	2.3629983	17	1	29 days	0.48		Williams	1999 TR ₁₂
1999 TS ₁₂	15.9	0.15	19991009	9.44029	350.47427	27.34727	9.93354	0.1504729	2.7781622	31	1	36 days	0.64		Williams	1999 TS ₁₂
1999 TT ₁₂	15.5	0.15	19991009	8.25250	324.52629	29.96574	15.81743	0.2162933	2.5961775	27	1	19 days	0.40		Marsden	1999 TT ₁₂
1999 TU ₁₂	15.8	0.15	19990919	346.67409	214.06431	178.61290	6.86248	0.2091293	2.3206133	33	1	57 days	0.55		Williams	1999 TU ₁₂
1999 TW ₁₂	13.8	0.15	19991009	313.54952	57.36718	36.17150	17.29511	0.2448656	3.0992987	30	1	28 days	0.62		Williams	1999 TW ₁₂
1999 TX ₁₂	12.8	0.15	19990810	307.48087	2.05976	67.69611	5.64598	0.0748173	3.0043817	50	2	1997–1999	0.54	M-v 4	Williams	36489 1999 TX ₁₂
1999 TY ₁₂	13.3	0.15	19991009	355.53318	322.74660	55.67515	4.48638	0.1994925	4.0067971	51	1	56 days	0.51		Williams	1999 TY ₁₂
1999 TB ₁₃	13.7	0.15	19991029	23.27300	71.23001	292.20514	7.91260	0.2217848	2.7298334	13	1	34 days	0.31		Nakano	1999 TB ₁₃
1999 TC ₁₃	14.4	0.15	19991009	38.75147	288.37401	55.14554	2.09494	0.1996485	3.1698490	38	1	41 days	0.40		Williams	1999 TC ₁₃
1999 TD ₁₃	17.0	0.15	19991009	356.70403	187.69148	211.29057	5.43710	0.3177057	2.5651272	32	1	41 days	0.65		Williams	1999 TD ₁₃
1999 TF ₁₃	14.4	0.15	19991029	253.05350	113.16341	52.70478	15.64733	0.0538666	2.6237969	36	1	39 days	0.68		Nakano	1999 TF ₁₃
1999 TJ ₁₃	13.6	0.15	19990810	173.35615	247.28449	293.49765	11.10732	0.1241126	2.6920204	47	1	66 days	0.46	M-v 4	Williams	1999 TJ ₁₃
1999 TK ₁₃	14.6	0.15	19990919	8.09932	290.99284	86.03670	7.07563	0.2399175	3.0618359	19	1	50 days	0.65		Williams	1999 TK ₁₃
1999 TL ₁₃	16.1	0.15	19991009	23.06752	306.21398	38.47683	5.68077	0.2345668	2.2225391	35	1	39 days	0.67		Williams	1999 TL ₁₃
1999 TQ ₁₃	14.1	0.15	19991009	354.94423	123.86907	262.49180	2.26453	0.1614212	3.0656944	26	1	34 days	0.63		Williams	1999 TQ ₁₃
1999 TR ₁₃	13.8	0.15	19990810	283.22056	87.69522	14.06518	13.93809	0.1372117	2.5981119	48	2	1997–1999	0.52	M-v 4	Williams	36489 1999 TR ₁₃
1999 TS ₁₃	16.3	0.15	19991009	5.17390	285.60817	85.76116	4.39583	0.2348322	2.3921107	21	1	30 days	0.48		Williams	1999 TS ₁₃
1999 TT ₁₃	13.7	0.15	19991009	48.70994	289.32274	40.23248	5.24260	0.0956830	2.6999390	26	1	27 days	0.79		Williams	1999 TT ₁₃
1999 TU ₁₃	14.8	0.15	19990810	9.93288	312.80557	36.35165	6.58053	0.1448387	2.2728550	29	2	1998–1999	0.58	M-v 4	Williams	36489 1999 TU ₁₃
1999 TY ₁₃	15.7	0.15	19991009	354.32871	264.49533	135.82685	3.03265	0.1055713	2.6379291	22	1	25 days	0.61		Williams	1999 TY ₁₃
1999 TA ₁₄	17.4	0.15	19991009	10.95530	117.86643	252.70535	4.47763	0.1695594	2.2377799	21	1	34 days	0.61		Williams	1999 TA ₁₄
1999 TB ₁₄	16.5	0.15	19991009	353.18769	207.54445	183.88509	8.22712	0.1890158	2.5680683	19	1	29 days	0.35		Williams	1999 TB ₁₄
1999 TC ₁₄	17.1	0.15	19991009	348.01228	258.22264	140.63965	2.75499	0.1996641	2.3601750	10	1	19 days	0.31		Williams	1999 TC ₁₄
1999 TD ₁₄	16.2	0.15	19991009	24.01893	139.86427	217.18346	5.70995	0.1376397	2.2677657	47	1	40 days	0.53		Williams	1999 TD ₁₄
1999 TF ₁₄	14.5	0.15	19990810	350.72974	322.51793	51.27261	3.43889	0.1795493	2.4231519	48	2	1998–1999	0.57	M-v 4	Williams	36489 1999 TF ₁₄
1999 TG ₁₄	14.5	0.15	19990810	10.56726	306.21387	42.29998	7.30782	0.1324158	2.3854667	46	2	1998–1999	0.63	M-v 4	Williams	36489 1999 TG ₁₄
1999 TK ₁₄	15.0	0.15	19991009	339.82276	265.96278	147.85657	2.45683	0.1961534	2.3791527	17	1	26 days	0.21		Williams	1999 TK ₁₄

1999 TN ₁₄	14.3	0.15	19991009	13.47775	166.82402	208.48435	9.42925	0.2675630	3.0790552	34	1	41 days	0.52	Williams	1999 TN ₁₄
1999 TP ₁₄	17.6	0.15	19991009	26.09021	25.17410	322.52891	2.84509	0.2432171	2.3673019	10	1	27 days	0.27	Williams	1999 TP ₁₄
1999 TQ ₁₄	17.2	0.15	19991009	7.08069	353.76582	14.94017	1.25853	0.1210724	2.2031888	19	1	42 days	0.37	Williams	1999 TQ ₁₄
1999 TS ₁₄	14.9	0.15	19991009	347.88656	188.47445	207.04200	2.06319	0.1627315	3.0373524	35	1	42 days	0.59	Williams	1999 TS ₁₄
1999 TW ₁₄	13.8	0.15	19991009	68.64774	258.80552	57.84639	7.33475	0.1138336	2.5457506	25	1	32 days	0.83	Williams	1999 TW ₁₄
1999 TX ₁₄	15.9	0.15	19991009	1.37192	340.28766	39.34405	9.34979	0.3205700	2.6543500	30	1	39 days	0.58	Williams	1999 TX ₁₄
1999 TY ₁₄	15.9	0.15	19991009	3.99953	278.90310	94.32050	2.90373	0.3483625	2.6668766	23	1	29 days	0.59	Williams	1999 TY ₁₄
1999 TZ ₁₄	14.9	0.15	19990810	10.04982	156.62859	182.56136	7.70667	0.2318721	2.2450610	46	2	1998–1999	0.57	M-v 4 Williams	36489 1999 TZ ₁₄
1999 TA ₁₅	15.2	0.15	19991009	9.69113	197.20708	173.49638	6.59565	0.1445219	2.3090991	22	1	32 days	0.55	Williams	1999 TA ₁₅
1999 TD ₁₅	14.6	0.15	19990810	296.63896	231.54647	213.65300	22.73718	0.2970579	2.3556698	46	1	115 days	0.42	M-v 4 Williams	1999 TD ₁₅
1999 TE ₁₅	15.1	0.15	19990810	300.78026	242.73483	189.13472	10.83343	0.1063343	2.6695387	48	2	1997–1999	0.63	M-v 4 Williams	36490 1999 TE ₁₅
1999 TG ₁₅	15.5	0.15	19991009	324.18865	225.41449	203.87405	7.75218	0.1891616	2.7500978	34	1	46 days	0.45	Williams	1999 TG ₁₅
1999 TP ₁₅	14.2	0.15	19991009	357.83032	8.66138	21.09558	10.29451	0.0778725	3.1922537	27	1	29 days	0.39	Williams	1999 TP ₁₅
1999 TR ₁₅	15.5	0.15	19991009	12.47202	357.88787	11.88621	4.26185	0.1212397	2.6886873	31	1	37 days	0.57	Williams	1999 TR ₁₅
1999 TS ₁₅	15.3	0.15	19991009	88.99296	253.89921	38.32227	3.56398	0.1231621	2.6062487	34	1	35 days	0.69	Williams	1999 TS ₁₅
1999 TT ₁₅	14.9	0.15	19991029	341.62105	215.34629	241.98146	13.10451	0.1343065	2.6510399	19	1	33 days	0.29	Williams	1999 TT ₁₅
1999 TY ₁₅	14.1	0.15	19990810	326.74896	203.85718	199.66019	5.70008	0.1454939	2.5651696	38	1	112 days	0.52	M-v 4 Williams	1999 TY ₁₅
1999 TA ₁₆	15.4	0.15	19991009	31.21720	125.36788	224.65910	1.72152	0.1295723	3.0783961	27	1	37 days	0.77	Williams	1999 TA ₁₆
1999 TB ₁₆	14.1	0.15	19991009	110.63943	224.02330	24.66929	17.24732	0.1621511	3.1158972	25	1	41 days	0.57	Williams	1999 TB ₁₆
1999 TD ₁₆	13.8	0.15	19990810	330.93249	23.22479	15.49877	6.67850	0.1445494	3.2047926	45	1	70 days	0.60	M-v 4 Williams	1999 TD ₁₆
1999 TE ₁₆	14.7	0.15	19991009	314.90986	71.98208	16.39365	12.66535	0.2421867	2.6843940	25	1	31 days	0.52	Williams	1999 TE ₁₆
1999 TF ₁₆	14.1	0.15	19991009	140.74721	92.41665	143.44323	3.50677	0.0249833	2.7283903	32	1	33 days	0.72	Williams	1999 TF ₁₆
1999 TG ₁₆	15.5	0.15	19991009	338.63709	199.91107	210.69701	2.68622	0.1793698	2.7329917	32	1	37 days	0.55	Williams	1999 TG ₁₆
1999 TJ ₁₆	15.3	0.15	19991009	1.80840	301.65846	78.68929	3.62419	0.1804394	2.3794793	21	1	32 days	0.47	Williams	1999 TJ ₁₆
1999 TK ₁₆	16.1	0.15	19990919	335.92433	350.78837	55.39892	3.18508	0.2044680	2.8805210	28	1	56 days	0.77	Williams	1999 TK ₁₆
1999 TM ₁₆	15.4	0.15	19991009	21.07869	136.11378	238.13771	10.36699	0.0181527	3.0588861	12	1	21 days	0.85	Williams	1999 TM ₁₆
1999 TN ₁₆	15.4	0.15	19991009	292.23738	129.93104	326.76585	0.89914	0.0917277	2.9472143	17	1	41 days	0.64	Williams	1999 TN ₁₆
1999 TO ₁₆	14.0	0.15	19990810	103.10748	143.09510	109.89142	0.46230	0.1199436	3.1105883	20	2	1997–1999	0.44	M-v 5 Williams	36490 1999 TO ₁₆
1999 TP ₁₆	14.4	0.15	19990810	355.66856	177.99632	191.82146	1.51864	0.1336772	3.0851179	40	1	68 days	0.37	M-v 4 Williams	1999 TP ₁₆
1999 TQ ₁₆	15.6	0.15	19991009	67.69259	291.60805	21.22010	15.20747	0.1279987	2.6187924	11	1	20 days	0.37	Williams	1999 TQ ₁₆
1999 TR ₁₆	17.4	0.15	19991029	316.16022	101.09469	351.34364	4.97549	0.1130417	2.2143439	12	1	33 days	0.40	Williams	1999 TR ₁₆
1999 TS ₁₆	16.6	0.15	19991009	344.18869	200.91469	211.39663	5.35412	0.1484509	2.2431718	31	1	44 days	0.36	Williams	1999 TS ₁₆
1999 TT ₁₆	19.6	0.15	19991009	328.12286	148.20972	328.53161	2.00002	0.6633330	2.1671151	39	1	24 days	0.88	Williams	1999 TT ₁₆
1999 TU ₁₆	22.1	0.15	19991009	0.21896	175.30991	202.66993	18.81525	0.5048568	2.5703652	28	1	19 days	0.49	Williams	1999 TU ₁₆
1999 TW ₁₆	19.5	0.15	19991009	315.53743	134.64753	28.37718	34.60700	0.7355017	1.4241242	86	1	18 days	0.62	Williams	1999 TW ₁₆
1999 TX ₁₆	15.6	0.15	19990810	355.39986	311.06948	54.72997	38.19839	0.3327584	1.5503038	63	1	34 days	0.45	M-v 6 Williams	1999 TX ₁₆
1999 TY ₁₆	16.5	0.15	19991009	6.89325	156.45866	241.90754	60.33201	0.4008889	2.0786363	61	1	19 days	0.59	Marsden	1999 TY ₁₆
1999 TZ ₁₆	15.0	0.15	19990919	347.72529	312.69317	74.10469	3.84704	0.2564463	2.9746385	23	1	39 days	0.72	Williams	1999 TZ ₁₆
1999 TA ₁₇	15.5	0.15	19991009	338.72517	274.05949	143.26011	2.51737	0.2003547	2.9729968	13	1	31 days	0.82	Williams	1999 TA ₁₇
1999 TC ₁₇	14.1	0.15	19991029	33.61065	300.83067	57.11922	2.52981	0.0283252	2.9030908	13	1	28 days	0.46	Williams	1999 TC ₁₇
1999 TE ₁₇	15.9	0.15	19991029	4.06790	350.69317	48.39151	7.27352	0.1007669	2.2759369	30	1	30 days	0.54	Williams	1999 TE ₁₇
1999 TF ₁₇	15.2	0.15	19991009	327.63217	322.65011	117.18521	1.58066	0.1318247	2.4156168	28	1	55 days	0.70	Williams	1999 TF ₁₇
1999 TG ₁₇	14.1	0.15	19991029	38.19424	299.97983	68.42211	9.28144	0.1857135	2.6044881	22	1	28 days	0.47	Williams	1999 TG ₁₇
1999 TH ₁₇	13.9	0.15	19991009	22.38099	268.71951	92.08194	3.20209	0.1035521	2.9189257	17	1	38 days	0.54	Williams	1999 TH ₁₇
1999 TK ₁₇	15.5	0.15	19991009	272.41619	149.94299	323.01303	1.61185	0.1673290	2.3907273	20	1	19 days	0.69	Williams	1999 TK ₁₇
1999 TL ₁₇	15.7	0.15	19990919	22.08553	179.97183	168.48952	14.86042	0.1006633	2.5463032	26	1	48 days	0.46	Williams	1999 TL ₁₇
1999 TM ₁₇	13.4	0.15	19991029	295.54079	8.09324	92.28870	11.97489	0.0828962	3.0588284	22	1	33 days	0.26	Marsden	1999 TM ₁₇
1999 TN ₁₇	15.9	0.15	19991009	346.92561	260.94089	140.07423	8.86315	0.1912382	2.3139986	26	1	44 days	0.32	Marsden	1999 TN ₁₇
1999 TO ₁₇	15.3	0.15	19991009	348.67236	19.01238	30.96842	20.92097	0.1123190	1.9787426	27	1	30 days	0.42	Williams	1999 TO ₁₇
1999 TQ ₁₇	16.5	0.15	19991009	288.95387	166.71681	299.24500	0.41784	0.1499897	2.3886902	20	1	41 days	0.56	Williams	1999 TQ ₁₇
1999 TR ₁₇	14.6	0.15	19991029	304.63827	188.11650	255.83685	0.27891	0.0647074	3.1742503	22	1	31 days	0.42	Williams	1999 TR ₁₇
1999 TS ₁₇	16.1	0.15	19991009	326.06100	218.97816	202.93041	4.28635	0.1310973	2.3898195	35	1	39 days	0.40	Williams	1999 TS ₁₇
1999 TU ₁₇	14.6	0.15	19991009	16.87139	76.41623	255.63124	11.30408	0.3753956	2.6762280	51	1	55 days	0.69	Williams	1999 TU ₁₇

1999 TW ₁₇	16.4	0.15	19991009	12.66013	252.65000	108.80633	3.17014	0.2226148	2.3515331	28	1	29 days	0.44	Williams	1999 TW ₁₇
1999 TX ₁₇	16.7	0.15	19991009	13.83888	176.06591	183.33354	10.30851	0.2355570	2.3701563	17	1	29 days	0.36	Williams	1999 TX ₁₇
1999 TY ₁₇	15.4	0.15	19991009	9.97259	335.13783	50.21399	4.55341	0.1894639	2.3473527	20	1	36 days	0.42	Williams	1999 TY ₁₇
1999 TA ₁₈	15.5	0.15	19991009	2.10972	140.54793	237.98445	1.16632	0.1419495	2.8506861	38	1	41 days	0.58	Williams	1999 TA ₁₈
1999 TB ₁₈	15.1	0.15	19991009	304.72088	69.42303	13.14955	3.98678	0.0526921	2.7093341	45	1	28 days	0.44	Williams	1999 TB ₁₈
1999 TC ₁₈	15.8	0.15	19991009	12.44080	177.67969	187.08175	12.96908	0.2045924	3.0789411	13	1	22 days	0.51	Williams	1999 TC ₁₈
1999 TE ₁₈	15.5	0.15	19991009	355.88987	202.88369	187.96292	12.19755	0.2538167	3.1422905	21	1	29 days	0.37	Williams	1999 TE ₁₈
1999 TF ₁₈	15.9	0.15	19991009	33.32817	122.41868	226.57260	0.53713	0.2054620	2.1552699	41	1	33 days	0.61	Williams	1999 TF ₁₈
1999 TM ₁₈	16.3	0.15	19991009	261.46328	259.57713	231.39926	2.14223	0.0937375	2.3995988	23	1	37 days	0.67	Williams	1999 TM ₁₈
1999 TN ₁₈	17.3	0.15	19991009	347.51043	38.72791	0.81521	2.36203	0.1915714	2.3998056	19	1	28 days	0.43	Williams	1999 TN ₁₈
1999 TO ₁₈	15.2	0.15	19991009	25.53743	137.34983	206.36813	20.20496	0.2026945	3.1315825	21	1	25 days	0.36	Williams	1999 TO ₁₈
1999 TP ₁₈	14.9	0.15	19991009	33.21832	133.41917	209.13970	8.88759	0.0992803	3.1774423	30	1	41 days	0.64	Williams	1999 TP ₁₈
1999 TQ ₁₈	15.1	0.15	19990810	29.31923	300.60800	16.94119	4.25294	0.2170741	2.5955546	64	3	1997–1999	0.60	M-v 3 Williams	36490 1999 TQ ₁₈
1999 TR ₁₈	14.0	0.15	19991009	342.53174	35.73583	8.55108	1.80252	0.1096872	2.9236450	34	1	28 days	0.45	Williams	1999 TR ₁₈
1999 TU ₁₈	14.4	0.15	19990810	2.90520	326.80511	20.75666	25.41939	0.2452814	2.3912779	66	3	1988–1999	0.68	M-v 3 Williams	36490 1999 TU ₁₈
1999 TV ₁₈	14.0	0.15	19991009	309.49764	236.14927	215.41287	9.58609	0.1436289	3.0400841	16	1	27 days	0.42	Williams	1999 TV ₁₈
1999 TZ ₁₈	15.3	0.15	19991009	334.72467	253.39990	164.32944	2.44828	0.1362719	2.2870189	18	1	26 days	0.45	Williams	1999 TZ ₁₈
1999 TB ₁₉	15.2	0.15	19991009	341.85557	208.47442	205.85216	4.91217	0.1594205	2.9445396	26	1	40 days	0.64	Williams	1999 TB ₁₉
1999 TC ₁₉	15.5	0.15	19991029	38.70257	129.43492	208.48427	11.89650	0.2036770	2.6630585	19	1	29 days	0.91	Williams	1999 TC ₁₉
1999 TE ₁₉	16.6	0.15	19991009	283.70985	167.61529	282.01224	5.95723	0.0804694	2.3261191	15	1	32 days	0.38	Marsden	1999 TE ₁₉
1999 TF ₁₉	15.4	0.15	19990810	4.91630	294.83871	56.77466	13.34435	0.1720164	2.6890790	27	1	60 days	0.41	M-v 4 Marsden	1999 TF ₁₉
1999 TG ₁₉	14.0	0.15	19990810	72.19554	353.24233	300.78322	3.66487	0.0152623	2.6966240	50	3	1991–1999	0.57	M-v 4 Williams	36490 1999 TG ₁₉
1999 TH ₁₉	14.9	0.15	19991009	29.13178	316.51220	30.81677	15.06110	0.1991098	2.5772593	38	1	39 days	0.46	Williams	1999 TH ₁₉
1999 TJ ₁₉	15.6	0.15	19991009	20.17300	337.86642	24.90626	3.07702	0.2130132	2.5703376	37	1	39 days	0.49	Williams	1999 TJ ₁₉
1999 TM ₁₉	15.0	0.15	19991009	11.40795	324.60768	38.44203	5.94839	0.2886975	3.0582223	6	1	30 days	0.73	Nakano	1999 TM ₁₉
1999 TP ₁₉	15.3	0.15	19991029	68.12263	279.52239	22.88161	7.61475	0.1790954	2.5863239	12	1	30 days	0.35	Williams	1999 TP ₁₉
1999 TR ₁₉	14.4	0.15	19991009	338.55561	297.91623	101.08787	27.11052	0.1963639	2.6844001	11	1	20 days	0.36	Williams	1999 TR ₁₉
1999 TS ₁₉	14.8	0.15	19991009	333.65373	310.75049	102.66502	25.34450	0.2699507	2.4578528	9	1	18 days	0.22	Williams	1999 TS ₁₉
1999 TT ₁₉	14.5	0.15	19991009	3.95305	274.28562	85.80205	28.36301	0.1612250	2.5695404	9	1	19 days	0.73	Williams	1999 TT ₁₉
1999 TX ₁₉	16.8	0.15	19991009	318.08096	64.63511	8.72850	1.94170	0.1150012	2.5408964	15	1	16 days	0.37	Williams	1999 TX ₁₉
1999 TY ₁₉	14.5	0.15	19991009	303.51290	77.85288	6.81335	2.00829	0.0578956	2.9399084	14	1	23 days	0.42	Williams	1999 TY ₁₉
1999 TZ ₁₉	16.1	0.15	19991009	48.92712	189.08552	126.04792	3.13858	0.1846497	2.4323366	15	1	29 days	0.43	Williams	1999 TZ ₁₉
1999 TA ₂₀	15.0	0.15	19991009	126.78112	122.54031	131.28159	4.44781	0.0422648	2.8031577	17	1	29 days	0.67	Williams	1999 TA ₂₀
1999 TC ₂₀	14.5	0.15	19991009	42.71362	202.17439	133.44837	4.60828	0.0776883	3.0412799	14	1	29 days	0.45	Williams	1999 TC ₂₀
1999 TG ₂₀	13.9	0.15	19990810	334.59270	349.14840	61.86344	2.99832	0.0318615	2.9465244	47	2	1997–1999	0.57	M-v 5 Williams	36490 1999 TG ₂₀
1999 TK ₂₀	16.5	0.15	19991009	14.08704	358.96627	353.89972	1.95661	0.2213460	2.3920214	40	1	35 days	0.47	Williams	1999 TK ₂₀
1999 TM ₂₀	15.2	0.15	19990919	53.76852	296.10228	6.84425	3.76712	0.1383088	2.6150798	23	1	7 days	0.74	Williams	1999 TM ₂₀
1999 TO ₂₀	14.7	0.15	19990919	37.02981	110.07483	212.20937	1.02512	0.1482741	2.7678243	16	1	4 days	0.46	E Williams	1999 TO ₂₀
1999 TP ₂₀	15.0	0.15	19991009	349.90581	8.44953	22.21891	2.50168	0.1210466	2.9635645	23	1	41 days	0.49	Williams	1999 TP ₂₀
1999 TQ ₂₀	17.5	0.15	19991009	21.66487	319.37844	25.07912	2.06047	0.2040385	2.1571295	8	1	15 days	0.31	Williams	1999 TQ ₂₀
1999 TR ₂₀	14.9	0.15	19990919	351.16517	13.07505	10.58835	3.66442	0.1494621	3.1762688	23	1	7 days	0.76	E Williams	1999 TR ₂₀
1999 TT ₂₀	13.7	0.15	19990919	245.05501	267.53764	229.28660	2.24181	0.1054808	3.0095858	19	1	4 days	0.62	E Williams	1999 TT ₂₀
1999 TU ₂₀	17.4	0.15	19991009	3.97653	171.72433	197.59494	10.16811	0.2180501	2.4447433	26	1	34 days	0.39	Williams	1999 TU ₂₀
1999 TV ₂₀	17.1	0.15	19991009	6.42985	165.47905	197.36241	9.72971	0.3185746	2.6959938	23	1	34 days	0.47	Williams	1999 TV ₂₀
1999 TC ₂₁	16.3	0.15	19991009	20.63314	126.45463	225.98870	5.69646	0.2069503	2.8407172	16	1	28 days	0.67	Williams	1999 TC ₂₁
1999 TG ₂₁	15.0	0.15	19991009	342.79944	37.04751	36.18404	25.40129	0.3108996	2.3175666	20	1	30 days	0.35	Williams	1999 TG ₂₁
1999 TL ₂₁	14.9	0.15	19991009	240.33504	303.17782	187.70601	0.23014	0.1275953	3.1738128	30	1	22 days	0.40	Williams	1999 TL ₂₁
1999 TM ₂₁	16.4	0.15	19991009	271.15761	93.91602	2.06307	14.90261	0.0496748	2.6055729	12	1	19 days	0.26	Williams	1999 TM ₂₁
1999 TP ₂₁	14.8	0.15	19991009	7.49483	339.84212	48.28254	14.57357	0.2449576	3.1836513	16	1	41 days	0.35	Williams	1999 TP ₂₁
1999 TQ ₂₁	14.5	0.15	19991009	325.71760	26.71135	56.28285	11.14102	0.0737571	2.9999795	19	1	41 days	0.37	Williams	1999 TQ ₂₁
1999 TR ₂₁	15.9	0.15	19991009	344.54068	2.16373	56.00294	7.52377	0.0929408	2.3541647	15	1	41 days	0.60	Williams	1999 TR ₂₁
1999 TU ₂₁	15.8	0.15	19991009	19.85486	319.72042	51.11697	13.78712	0.2088054	2.6016280	15	1	41 days	0.28	Williams	1999 TU ₂₁
1999 TJ ₂₅	15.0	0.15	19991009	27.93376	136.32493	210.46240	6.19348	0.1377736	2.3736521	19	1	42 days	0.36	Williams	1999 TJ ₂₅

1999 TN ₂₅	14.2	0.15	19991009	306.33095	84.63292	6.91702	3.36927	0.1112699	2.7635223	23	1	32 days	0.24	Williams	1999 TN ₂₅
1999 TO ₂₅	15.8	0.15	19991009	43.20991	90.67228	228.39841	3.07678	0.2400867	2.5615095	18	1	32 days	0.59	Williams	1999 TO ₂₅
1999 TR ₂₅	16.0	0.15	19991009	283.54171	101.61507	14.73728	4.05415	0.1221310	2.4251294	17	1	32 days	0.42	Williams	1999 TR ₂₅
1999 TT ₂₅	16.2	0.15	19991009	12.43983	352.25351	14.01594	5.65328	0.1664673	2.1836918	18	1	39 days	0.40	Williams	1999 TT ₂₅
1999 TU ₂₅	17.0	0.15	19991009	22.43078	340.80258	9.43721	1.33733	0.2067791	2.3855008	17	1	32 days	0.65	Williams	1999 TU ₂₅
1999 TV ₂₅	15.3	0.15	19991009	16.58844	150.80330	219.32883	1.31929	0.0302351	2.9157826	14	1	32 days	0.36	Williams	1999 TV ₂₅
1999 TD ₂₆	14.7	0.15	19991009	271.11144	254.15992	236.54855	1.11934	0.1174926	2.4903483	19	1	40 days	0.64	Williams	1999 TD ₂₆
1999 TE ₂₆	15.7	0.15	19991009	344.69726	24.65664	21.25248	10.85353	0.1037889	2.3408520	18	1	39 days	0.33	Williams	1999 TE ₂₆
1999 TH ₂₆	15.4	0.15	19991009	278.97113	277.82627	215.31805	10.04838	0.1984323	2.3863783	23	1	40 days	0.59	Williams	1999 TH ₂₆
1999 TJ ₂₆	15.9	0.15	19991009	353.59202	175.79166	220.81954	3.72199	0.1552212	2.3802661	18	1	32 days	0.70	Williams	1999 TJ ₂₆
1999 TP ₂₆	13.8	0.15	19991009	41.85417	124.26295	217.53065	9.38361	0.0793453	3.0902916	18	1	40 days	0.51	Williams	1999 TP ₂₆
1999 TS ₂₆	16.5	0.15	19991009	54.16078	51.87611	258.54344	1.39161	0.2087922	2.4098255	14	1	32 days	0.44	D Williams	1999 TS ₂₆
1999 TU ₂₆	14.0	0.15	19991009	338.17175	202.01982	219.49230	12.79054	0.1554908	3.0128373	34	1	40 days	0.64	Williams	1999 TU ₂₆
1999 TV ₂₆	16.7	0.15	19991009	5.04525	43.42141	336.69162	1.53278	0.2077108	2.3847796	23	1	39 days	0.31	Williams	1999 TV ₂₆
1999 TX ₂₆	15.2	0.15	19991009	19.78171	45.09237	323.53734	1.18022	0.0859190	2.8694961	21	1	32 days	0.37	Williams	1999 TX ₂₆
1999 TY ₂₆	16.0	0.15	19991009	350.75764	182.04362	218.01527	4.04703	0.1075047	2.2854354	18	1	40 days	0.44	Williams	1999 TY ₂₆
1999 TZ ₂₆	16.3	0.15	19991009	342.32145	28.87389	23.61422	6.68340	0.1490174	2.3841554	35	1	58 days	0.53	Williams	1999 TZ ₂₆
1999 TE ₂₇	14.5	0.15	19991009	15.81673	340.85990	26.98111	14.13699	0.1892646	2.5808385	20	1	32 days	0.21	Williams	1999 TE ₂₇
1999 TH ₂₇	15.6	0.15	19991009	10.13647	354.43576	21.62226	7.01429	0.2362030	2.8016874	19	1	42 days	0.32	Williams	1999 TH ₂₇
1999 TL ₂₇	14.8	0.15	19991009	336.44598	100.58644	323.39816	1.12443	0.0773525	2.9297999	29	1	39 days	0.46	Williams	1999 TL ₂₇
1999 TN ₂₇	13.8	0.15	19991009	317.43034	228.35125	225.32182	4.48705	0.1558665	3.1479413	22	1	40 days	0.52	Williams	1999 TN ₂₇
1999 TS ₂₇	12.4	0.15	19991009	230.24967	145.92045	32.13862	11.16119	0.0669933	2.9548327	13	1	45 days	0.57	Williams	1999 TS ₂₇
1999 TV ₂₈	15.4	0.15	19991009	350.97070	169.29396	210.65389	1.46496	0.0937121	2.7546115	18	1	30 days	0.57	Williams	1999 TV ₂₈
1999 TX ₂₈	16.1	0.15	19991009	346.76309	29.45872	359.03344	6.66793	0.1477500	2.3059839	21	1	35 days	0.42	Williams	1999 TX ₂₈
1999 TG ₂₉	15.0	0.15	19991009	327.66982	216.13243	195.46235	11.42539	0.1312867	2.7601188	21	1	39 days	0.60	Williams	1999 TG ₂₉
1999 TN ₂₉	17.0	0.15	19991009	359.53480	174.11892	198.66002	4.73456	0.2340199	2.3537424	21	1	39 days	0.56	Williams	1999 TN ₂₉
1999 TP ₂₉	15.8	0.15	19991009	2.02554	155.62625	212.16647	1.60602	0.1209504	2.5315878	17	1	29 days	0.59	Williams	1999 TP ₂₉
1999 TD ₃₀	16.9	0.15	19991009	325.34683	80.82914	337.63921	1.66114	0.1487226	2.1783102	17	1	30 days	0.60	Williams	1999 TD ₃₀
1999 TE ₃₀	15.6	0.15	19991009	281.73732	111.07165	353.32056	3.28716	0.1213651	2.2656714	13	1	30 days	0.51	Williams	1999 TE ₃₀
1999 TF ₃₀	15.5	0.15	19991009	306.34660	117.09322	325.54322	1.63377	0.1631865	2.4075985	18	1	30 days	0.31	Williams	1999 TF ₃₀
1999 TL ₃₀	14.6	0.15	19991009	76.35582	57.25018	230.90340	1.47944	0.0781430	2.6285393	12	1	31 days	0.31	Williams	1999 TL ₃₀
1999 TK ₃₁	14.5	0.15	19991009	339.18881	37.77957	7.89183	5.16011	0.1667988	3.1186010	18	1	29 days	0.40	Williams	1999 TK ₃₁
1999 TR ₃₁	17.0	0.15	19991009	349.59950	177.73265	215.42171	2.49591	0.1811672	2.4185292	17	1	31 days	0.39	Williams	1999 TR ₃₁
1999 TW ₃₁	15.3	0.15	19991009	52.39352	98.59182	224.60533	1.35832	0.0458111	2.8788831	12	1	31 days	0.55	Williams	1999 TW ₃₁
1999 TD ₃₂	16.5	0.15	19991009	7.82997	160.71028	207.81935	7.75895	0.2053295	2.7931395	24	1	29 days	0.83	Williams	1999 TD ₃₂
1999 TF ₃₂	14.7	0.15	19991009	332.85525	35.19319	16.44061	10.66465	0.0574380	3.0904416	21	1	33 days	0.63	Williams	1999 TF ₃₂
1999 TH ₃₂	15.7	0.15	19991009	279.11139	108.56454	4.31202	5.39928	0.0887293	2.2656356	17	1	31 days	0.49	Williams	1999 TH ₃₂
1999 TX ₃₂	13.9	0.15	19991009	120.98703	9.91310	236.59558	1.02621	0.0684466	3.1706681	22	1	45 days	0.89	Williams	1999 TX ₃₂
1999 TJ ₃₃	15.0	0.15	19991009	354.12908	15.10145	9.99544	9.70462	0.1033374	3.0790736	13	1	31 days	0.61	Williams	1999 TJ ₃₃
1999 TP ₃₃	14.4	0.15	19991009	24.24069	138.25073	202.10924	16.41403	0.2344912	3.1291467	15	1	39 days	0.66	Williams	1999 TP ₃₃
1999 TR ₃₃	15.4	0.15	19991009	354.64619	180.75126	206.76123	9.92781	0.1445246	2.9622082	19	1	34 days	0.61	Williams	1999 TR ₃₃
1999 TU ₃₃	15.3	0.15	19991009	13.30488	153.27878	205.68697	9.93114	0.2318366	3.1406313	21	1	43 days	0.36	Williams	1999 TU ₃₃
1999 TB ₃₅	14.9	0.15	19991009	289.27477	91.03569	18.71397	20.22670	0.1047494	1.9572970	20	1	32 days	0.29	Williams	1999 TB ₃₅
1999 TH ₃₅	14.7	0.15	19991009	259.21660	137.27717	3.52820	24.13716	0.2719234	2.3377419	18	1	39 days	0.48	Williams	1999 TH ₃₅
1999 TL ₃₅	16.0	0.15	19991009	47.75318	310.94113	8.89781	19.61548	0.0613093	1.9387708	18	1	31 days	0.29	Williams	1999 TL ₃₅
1999 TX ₃₅	17.0	0.15	19991009	11.29757	348.10512	19.47372	13.19302	0.1684403	2.3392776	17	1	29 days	0.41	Williams	1999 TX ₃₅
1999 TY ₃₅	16.7	0.15	19991009	340.26671	202.99182	206.39128	2.60842	0.1915642	2.2946590	21	1	41 days	0.47	Williams	1999 TY ₃₅
1999 UA	16.5	0.15	19991009	11.20078	125.05035	245.57150	4.44008	0.2395845	2.3205045	23	1	39 days	0.39	Williams	1999 UA
1999 UB	16.5	0.15	19991029	297.39586	99.75585	11.19322	7.40528	0.0856389	2.2749139	18	1	26 days	0.39	Williams	1999 UB
1999 UC	16.7	0.15	19991009	311.66686	53.97026	36.68871	6.98424	0.0986791	2.3973899	9	1	14 days	0.56	Williams	1999 UC
1999 UD	14.8	0.15	19990810	32.26618	104.62611	198.28883	7.18080	0.1985899	2.2554081	68	4	1982–1999	0.57	M-v 1 Williams	36490 1999 UD
1999 UE	14.0	0.15	19990919	18.21883	354.75544	345.65179	0.85529	0.1889886	3.1482508	32	1	55 days	0.73	Williams	1999 UE
1999 UF	13.3	0.15	19991009	269.78975	102.63890	18.63295	4.94064	0.0992136	3.2012895	27	1	39 days	0.68	Williams	1999 UF

1999 UG	16.1	0.15	19991009	359.02929	351.78327	28.49617	1.92183	0.1943596	2.3961062	33	1	41 days	0.49		Williams	1999 UG
1999 UK	15.5	0.15	19991009	347.03710	139.12586	259.96392	1.22081	0.1698435	2.5457836	20	1	18 days	0.30		Williams	1999 UK
1999 UM	16.0	0.15	19991009	299.52257	92.00174	5.45441	2.48883	0.1469138	2.4277219	25	1	28 days	0.68		Williams	1999 UM
1999 UN	15.2	0.15	19991009	39.79573	290.36723	20.05588	7.67836	0.3184198	3.0731421	26	1	23 days	0.55		Williams	1999 UN
1999 UQ	21.9	0.15	19991009	157.31024	7.37201	211.39701	24.78085	0.0164040	1.0937541	62	1	16 days	0.64		Marsden	1999 UQ
1999 UR	21.5	0.15	19990810	320.83474	17.75633	50.89941	3.58813	0.5029198	1.8944225	56	1	19 days	0.56	M-v 6	Williams	1999 UR
1999 UT	14.1	0.15	19991029	350.97433	213.18089	203.58034	5.43863	0.0521909	2.8652100	19	1	26 days	0.42		Williams	1999 UT
1999 UV	15.5	0.15	19991009	338.72176	18.33142	29.61880	6.65612	0.1266469	2.4099002	36	1	40 days	0.53		Williams	1999 UV
1999 UW	15.2	0.15	19991009	353.62152	215.68594	173.95782	1.98854	0.0933992	2.7603035	23	1	41 days	0.68		Williams	1999 UW
1999 UA ₁	15.6	0.15	19991029	38.17979	298.58236	34.17098	7.55455	0.2531304	2.4318634	21	1	27 days	0.43		Williams	1999 UA ₁
1999 UG ₁	16.4	0.15	19991029	35.51827	295.51220	48.78188	5.85247	0.1826056	2.3112745	19	1	26 days	0.41		Williams	1999 UG ₁
1999 UJ ₁	16.0	0.15	19991009	94.13246	263.66245	22.02424	21.84088	0.0676666	1.9323037	32	1	39 days	0.49		Williams	1999 UJ ₁
1999 UM ₁	14.5	0.15	19991009	99.72440	179.32283	70.62944	5.58974	0.1589879	2.3562535	14	1	13 days	0.35		Marsden	1999 UM ₁
1999 UN ₁	15.6	0.15	19991029	309.75805	84.79250	17.34470	3.42683	0.1313912	2.4325831	32	1	28 days	0.31		Williams	1999 UN ₁
1999 UP ₁	16.2	0.15	19991009	359.29106	340.15094	39.12934	8.98866	0.2521087	2.7934926	39	1	59 days	0.61		Williams	1999 UP ₁
1999 UQ ₁	15.0	0.15	19991029	348.36144	11.93291	52.61671	7.38328	0.0892078	2.3235229	26	1	28 days	0.65		Williams	1999 UQ ₁
1999 UR ₁	16.0	0.15	19991029	54.06534	117.58055	218.69921	3.21963	0.1868223	2.2344306	18	1	32 days	0.49		Williams	1999 UR ₁
1999 UV ₁	13.5	0.15	19991009	196.57223	315.08538	248.41389	6.75750	0.1446661	2.5695688	32	1	42 days	0.40		Williams	1999 UV ₁
1999 UY ₁	14.1	0.15	19990810	32.41439	121.61981	218.10876	7.58230	0.1087832	2.2805851	55	3	1994–1999	0.49	M-v 2	Williams	36491 1999 UY ₁
1999 UA ₂	14.9	0.15	19991009	35.68345	98.84975	228.57786	2.48875	0.2954134	2.5982917	59	1	47 days	1.01		Williams	1999 UA ₂
1999 UB ₂	15.2	0.15	19991009	14.75155	277.84886	89.07545	6.59452	0.0892487	2.7263329	32	1	40 days	0.91		Williams	1999 UB ₂
1999 UC ₂	14.9	0.15	19991009	36.36639	314.36329	24.32323	2.39676	0.0749003	2.9300310	25	1	39 days	0.64		Williams	1999 UC ₂
1999 UE ₂	14.7	0.15	19991029	41.73197	286.13458	72.89119	6.52658	0.2032193	2.2677170	17	1	27 days	0.36		Williams	1999 UE ₂
1999 UF ₂	14.7	0.15	19991029	6.43817	245.63076	140.10702	2.79591	0.1090282	2.2713004	14	1	27 days	0.37		Williams	1999 UF ₂
1999 UH ₂	16.2	0.15	19991029	28.19419	148.95691	208.85347	6.76314	0.1417459	2.2931654	14	1	27 days	0.48		Williams	1999 UH ₂
1999 UP ₂	16.2	0.15	19991009	353.08019	339.75434	54.98607	17.98496	0.2736431	2.6339536	9	1	19 days	0.68		Williams	1999 UP ₂
1999 UR ₂	14.6	0.15	19991029	92.17300	53.24651	250.09273	7.40361	0.0394338	3.0995609	19	1	23 days	0.69		Williams	1999 UR ₂
1999 UT ₂	14.6	0.15	19991029	287.49321	83.56258	40.79817	11.41912	0.1019684	3.0800452	23	1	27 days	0.58		Williams	1999 UT ₂
1999 UW ₂	13.8	0.15	19991009	260.38525	120.75369	28.77864	14.28787	0.0947352	2.5711259	24	1	32 days	0.46		Williams	1999 UW ₂
1999 UX ₂	14.6	0.15	19990810	337.63754	355.65630	34.39736	15.61670	0.0917881	2.6445202	36	1	65 days	0.39	M-v 4	Williams	1999 UX ₂
1999 UY ₂	16.7	0.15	19991009	341.83668	212.80264	190.34948	4.36586	0.1556902	2.1941630	29	1	41 days	0.37		Williams	1999 UY ₂
1999 UK ₃	12.9	0.15	19991029	315.52321	352.94851	98.04306	3.26572	0.1502058	2.9641258	8	1	23 days	0.54		Williams	1999 UK ₃
1999 UL ₃	14.7	0.15	19990810	325.53290	65.86228	2.57406	7.99293	0.2240119	2.7679840	34	1	61 days	0.54	M-v 4	Nakano	1999 UL ₃
1999 UM ₃	16.3	0.15	19991009	335.85335	36.54189	113.79957	10.66641	0.6647815	2.3590983	51	1	22 days	0.39		Nakano	1999 UM ₃
1999 UO ₃	15.2	0.15	19991009	28.01347	161.40922	202.14215	5.80133	0.1344380	2.4281592	15	1	23 days	0.34		Williams	1999 UO ₃
1999 UR ₃	16.2	0.15	19991029	289.52037	22.35915	89.21750	26.93536	0.0708422	1.8718758	11	1	25 days	0.96		Williams	1999 UR ₃
1999 UT ₃	14.6	0.15	19991029	348.69467	176.25075	228.63961	11.55694	0.2220692	2.4188256	23	1	14 days	0.58		Marsden	1999 UT ₃
1999 UV ₃	15.8	0.15	19991029	3.15914	151.42821	222.41006	4.82127	0.2110055	2.6181637	22	1	6 days	0.49		Marsden	1999 UV ₃
1999 UZ ₃	16.2	0.15	19991029	359.75390	161.70713	232.89625	10.62995	0.2623495	3.1234651	32	1	18 days	0.90		Williams	1999 UZ ₃
1999 UA ₄	13.1	0.15	19991029	23.37631	179.49784	192.92439	9.70161	0.0680655	3.0707933	18	1	12 days	0.40		Williams	1999 UA ₄
1999 UB ₄	16.0	0.15	19991029	337.72532	38.27875	27.89507	2.78280	0.1713781	2.3865987	19	1	16 days	0.61		Williams	1999 UB ₄
1999 UC ₄	15.7	0.15	19991029	45.14531	288.63008	33.95987	8.34901	0.1518146	2.4822092	13	1	19 days	0.39		Williams	1999 UC ₄
1999 UD ₄	15.4	0.15	19991029	21.95373	324.61549	41.12011	6.72971	0.1576085	2.3845525	29	1	15 days	0.34		Williams	1999 UD ₄
1999 UE ₄	14.6	0.15	19991029	54.63599	285.77733	39.30294	4.60715	0.1698081	2.3326410	20	1	15 days	0.72		Williams	1999 UE ₄
1999 UF ₄	16.2	0.15	19991029	19.22482	250.88837	116.20573	2.80556	0.1861034	2.6635770	33	1	10 days	0.30		Williams	1999 UF ₄
1999 UH ₄	14.9	0.15	19991029	5.00853	194.66752	196.92168	9.29231	0.2078215	2.7825290	21	1	13 days	0.54		Williams	1999 UH ₄
1999 UJ ₄	15.2	0.15	19991029	2.66608	197.98909	184.11360	8.95850	0.1955990	2.4153535	17	1	6 days	0.74		Williams	1999 UJ ₄
1999 UK ₄	15.6	0.15	19991029	15.99803	29.63501	348.87174	3.91651	0.1390022	3.0956894	7	1	5 days	0.31		Williams	1999 UK ₄
1999 UL ₄	12.9	0.15	19991029	116.23886	23.11475	251.85782	8.79546	0.0695296	3.0701614	18	1	11 days	0.48		Williams	1999 UL ₄
1999 UM ₄	14.8	0.15	19991029	132.46092	51.88806	232.75109	15.05897	0.1952908	2.5062136	9	1	4 days	0.19		Williams	1999 UM ₄
1999 UN ₄	13.6	0.15	19991029	312.97327	74.52495	24.45885	14.94129	0.1397069	2.5917256	23	1	11 days	0.32		Williams	1999 UN ₄
1999 UP ₄	16.5	0.15	19991029	2.31249	6.42131	16.46714	2.60381	0.2160244	2.3651608	11	1	3 days	0.18		Williams	1999 UP ₄
1999 UR ₄	14.9	0.15	19991029	114.56068	90.25458	171.85026	5.90930	0.0984235	2.6189208	9	1	4 days	0.26	E	Williams	1999 UR ₄

1999 US ₄	15.3	0.15	19991029	315.25989	338.36514	112.31277	3.30159	0.1997586	2.8488180	8	1	4 days	0.39	E	Williams	1999 US ₄
1999 UU ₄	15.6	0.15	19991029	343.03872	170.41969	243.91503	1.79407	0.1947961	2.6118705	16	1	15 days	0.42		Marsden	1999 UU ₄
1999 UV ₄	12.4	0.15	19991029	71.82526	143.24495	164.30414	10.17821	0.0453055	3.5014915	14	1	15 days	0.28		Marsden	1999 UV ₄
1999 UW ₄	17.0	0.15	19991029	359.98091	2.34398	345.86093	2.94731	0.2679245	2.2812939	12	1	4 days	0.22	E	Williams	1999 UW ₄
1999 UA ₅	16.3	0.15	19991029	324.47356	83.95305	24.76189	5.76702	0.4699443	2.6871295	46	1	16 days	0.58		Williams	1999 UA ₅
1999 UB ₅	16.1	0.15	19991029	328.18573	179.94228	251.98417	6.30988	0.1400256	2.5449249	16	1	14 days	0.70		Williams	1999 UB ₅
1999 UC ₅	15.5	0.15	19991009	12.01715	174.92226	198.31737	1.51867	0.1841173	2.4430447	41	1	42 days	0.46		Williams	1999 UC ₅
1999 UD ₅	14.7	0.15	19991029	310.16247	34.35993	67.16993	3.10780	0.1094345	2.5322120	13	1	14 days	0.30		Williams	1999 UD ₅
1999 UE ₅	15.1	0.15	19991029	344.80801	94.44357	348.19032	22.87408	0.3003724	2.3848319	20	1	3 days	0.32		Williams	1999 UE ₅
1999 UF ₅	16.4	0.15	19991029	8.02296	63.72281	336.92806	19.18046	0.1960490	1.9168931	18	1	3 days	0.33		Williams	1999 UF ₅
1999 UG ₅	10.1	0.15	19991029	10.29580	282.22944	86.79901	5.65590	0.4046865	12.4796208	73	1	16 days	0.48		Williams	1999 UG ₅
1999 UO ₅	14.9	0.15	19991029	37.99804	349.90426	338.02011	14.98290	0.1106092	2.6403746	12	1	7 days	0.69	E	Williams	1999 UO ₅
1999 UP ₅	16.8	0.15	19991029	19.77612	109.74539	260.24119	2.90223	0.1362940	2.1633236	12	1	6 days	0.46		Williams	1999 UP ₅
1999 UQ ₅	14.7	0.15	19991029	326.43497	174.13027	258.89448	4.04932	0.0463264	2.7663475	16	1	13 days	0.41		Williams	1999 UQ ₅
1999 UT ₅	15.3	0.15	19991029	51.55925	81.44762	247.55273	4.52815	0.1558875	2.2541866	13	1	6 days	0.27		Williams	1999 UT ₅
1999 UW ₅	14.5	0.15	19991029	324.08189	72.05953	8.09420	11.40218	0.0795803	3.1513523	16	1	13 days	0.71		Williams	1999 UW ₅
1999 UX ₅	14.7	0.15	19991029	59.96570	53.01110	259.91680	4.88716	0.2158519	2.1879378	16	1	13 days	0.28		Williams	1999 UX ₅
1999 UY ₅	15.4	0.15	19991029	155.48375	326.62111	272.22617	5.82634	0.0724307	2.4072190	17	1	13 days	0.61		Williams	1999 UY ₅
1999 UZ ₅	21.8	0.15	19991029	11.81464	64.73878	228.63535	10.43731	0.7989640	2.6405221	32	1	4 days	0.78		Williams	1999 UZ ₅
1999 UE ₆	14.9	0.15	19991029	51.05141	46.79278	261.69151	1.88240	0.1571189	2.6622690	13	1	7 days	0.84	E	Williams	1999 UE ₆
1999 UH ₆	14.7	0.15	19991029	50.72420	111.89105	217.88654	3.58897	0.1708397	2.5316738	10	1	7 days	0.28	E	Williams	1999 UH ₆
1999 UJ ₆	15.4	0.15	19991029	2.00673	168.34738	226.31781	1.13122	0.2317438	3.0121227	15	1	15 days	0.47		Williams	1999 UJ ₆
1999 UK ₆	13.3	0.15	19991029	19.33104	338.31651	38.95348	7.39502	0.0709873	3.1643538	15	1	14 days	0.24		Williams	1999 UK ₆
1999 UL ₆	16.4	0.15	19991029	10.02104	173.25278	206.95653	3.71006	0.2563793	2.5217541	12	1	7 days	0.26		Williams	1999 UL ₆
1999 UN ₆	14.2	0.15	19991009	3.47404	339.41978	52.61397	10.18798	0.3176676	2.7549369	25	1	40 days	0.45		Williams	1999 UN ₆
1999 UO ₆	16.0	0.15	19991029	14.08230	181.60677	206.98631	1.64597	0.0982139	2.1647955	17	1	15 days	0.40		Williams	1999 UO ₆
1999 US ₆	15.7	0.15	19991029	54.81204	105.08523	212.64867	1.46179	0.1544080	2.6104089	11	1	14 days	0.35		Williams	1999 US ₆
1999 UO ₇	14.2	0.15	19991029	20.70120	320.27904	38.14926	11.67871	0.0913336	2.6327521	11	1	4 days	0.43		Williams	1999 UO ₇
1999 UR ₇	15.6	0.15	19991029	22.40161	158.48643	213.11374	8.95760	0.1548006	2.8121982	13	1	6 days	0.56		Williams	1999 UR ₇
1999 US ₇	14.0	0.15	19991029	27.07649	311.41687	55.28998	7.33592	0.1366315	2.7558819	22	1	14 days	0.24		Williams	1999 US ₇
1999 UU ₇	17.0	0.15	19991029	6.06985	169.43636	220.07866	16.33337	0.3203290	2.9150051	18	1	17 days	0.56		Williams	1999 UU ₇
1999 UV ₇	15.7	0.15	19991029	2.34565	214.34221	183.80893	1.96651	0.2014130	2.4482067	13	1	6 days	0.28		Williams	1999 UV ₇
1999 UX ₇	16.1	0.15	19991029	74.92312	274.75045	50.34986	5.82182	0.0288349	2.3743948	21	1	14 days	0.84	E	Williams	1999 UX ₇
1999 UY ₇	16.5	0.15	19991029	349.76699	6.62978	48.94694	7.00242	0.1142222	2.3936859	21	1	14 days	0.49		Williams	1999 UY ₇
1999 UZ ₇	15.6	0.15	19991029	341.42023	9.62092	55.25942	5.50718	0.0825584	2.4441779	18	1	14 days	0.95		Williams	1999 UZ ₇
1999 UA ₈	15.2	0.15	19991029	340.38973	202.60741	228.00607	16.26870	0.1547172	3.1359649	18	1	14 days	0.44		Williams	1999 UA ₈
1999 UB ₈	15.8	0.15	19991029	33.93892	306.30096	40.32343	2.52533	0.2583268	2.6387786	13	1	6 days	0.31		Williams	1999 UB ₈
1999 UD ₈	15.8	0.15	19991029	24.14993	94.56536	267.64007	0.72769	0.2579563	3.0110456	13	1	6 days	0.36	E	Williams	1999 UD ₈
1999 UE ₈	15.5	0.15	19991029	345.84510	102.42215	318.49278	1.31439	0.0934624	2.8026308	15	1	7 days	0.70	E	Williams	1999 UE ₈
1999 UF ₈	16.2	0.15	19991029	350.88876	29.89818	27.24973	0.98545	0.2055410	2.9382673	12	1	6 days	0.70	E	Williams	1999 UF ₈
1999 UG ₈	16.9	0.15	19991029	32.34021	78.72084	270.12826	1.22482	0.2551251	2.3537104	13	1	6 days	0.54		Williams	1999 UG ₈
1999 UH ₈	16.0	0.15	19991029	27.37230	323.44659	41.19578	12.05575	0.1737834	2.7115470	13	1	6 days	0.45		Williams	1999 UH ₈
1999 UJ ₈	14.6	0.15	19991029	21.04620	350.89758	24.26787	1.84775	0.1519741	2.9123905	13	1	6 days	0.36		Williams	1999 UJ ₈
1999 UK ₈	14.5	0.15	19991029	38.00355	322.46565	36.08204	9.03604	0.1055057	3.1282183	17	1	7 days	0.77		Williams	1999 UK ₈
1999 UL ₈	15.3	0.15	19991029	13.46232	154.18935	227.44391	12.50512	0.2105871	2.5671953	17	1	14 days	0.58		Williams	1999 UL ₈
1999 UM ₈	16.3	0.15	19991029	321.45234	54.30211	43.90409	0.83862	0.1956366	2.3704447	13	1	6 days	0.30	E	Williams	1999 UM ₈
1999 UN ₈	15.1	0.15	19991029	67.39527	278.81236	41.41672	13.17439	0.1484412	2.6198305	18	1	18 days	0.46		Williams	1999 UN ₈
1999 UO ₈	15.4	0.15	19991029	64.72302	101.61121	227.91486	1.98683	0.0872049	2.4084771	13	1	6 days	0.45	E	Williams	1999 UO ₈
1999 UP ₈	16.9	0.15	19991029	354.65997	35.16659	15.30732	2.02714	0.2025740	2.3067578	13	1	5 days	0.42		Williams	1999 UP ₈
1999 UQ ₈	14.5	0.15	19991029	32.16985	116.57373	236.50022	5.77892	0.2444768	3.3524631	13	1	6 days	0.22		Williams	1999 UQ ₈
1999 UR ₈	15.1	0.15	19991029	279.36247	254.44427	245.39927	3.23843	0.1251705	2.6662082	12	1	6 days	0.45	E	Williams	1999 UR ₈
1999 US ₈	15.3	0.15	19991029	307.22035	72.38352	40.92305	14.84819	0.1545005	2.7178793	13	1	5 days	0.56		Williams	1999 US ₈
1999 UT ₈	14.6	0.15	19991029	281.29822	279.54745	228.75438	23.42256	0.2142443	2.6815570	23	1	18 days	0.37		Williams	1999 UT ₈

1999 UU ₈	14.3	0.15	19991029	39.26906	101.73617	244.11289	3.63344	0.2214889	2.8561211	13	1	5 days	0.48	E	Williams	1999 UU ₈
1999 UV ₈	17.1	0.15	19991029	354.72111	342.71044	66.52601	2.60157	0.1761216	2.1838899	18	1	14 days	0.51		Williams	1999 UV ₈
1999 UW ₈	15.6	0.15	19991029	359.00241	194.11391	209.92903	7.83829	0.1626300	2.3375245	12	1	6 days	0.31		Williams	1999 UW ₈
1999 UX ₈	13.5	0.15	19991029	217.75839	339.89880	215.76381	9.44501	0.1209491	2.9563540	13	1	6 days	0.22		Williams	1999 UX ₈
1999 UY ₈	15.4	0.15	19991029	158.30549	27.73429	213.39423	6.78869	0.1533268	2.3112160	12	1	6 days	0.51		Williams	1999 UY ₈
1999 UA ₉	14.8	0.15	19991029	67.88263	273.84476	53.05551	13.25875	0.0968184	3.0393439	11	1	6 days	0.80	E	Williams	1999 UA ₉
1999 UB ₉	14.9	0.15	19991029	243.26283	109.44941	55.50776	5.34159	0.0226131	2.8004502	18	1	14 days	0.63		Williams	1999 UB ₉
1999 UC ₉	15.8	0.15	19991029	32.35037	333.52953	33.84740	3.82562	0.0642444	2.2925839	12	1	6 days	0.45		Williams	1999 UC ₉
1999 UD ₉	15.1	0.15	19991029	60.07674	286.71725	45.90991	7.15323	0.1166822	2.7582031	13	1	6 days	0.63	E	Williams	1999 UD ₉
1999 UE ₉	14.0	0.15	19991029	345.25574	210.61300	212.62213	1.34855	0.0984009	2.9320024	18	1	14 days	0.24		Williams	1999 UE ₉
1999 UG ₉	14.2	0.15	19991029	321.82582	223.01468	225.35901	8.48672	0.0524127	3.1765221	16	1	14 days	0.38		Williams	1999 UG ₉
1999 UH ₉	15.6	0.15	19991029	346.31672	193.37221	230.03237	1.74861	0.1791337	2.3996069	24	1	16 days	0.48		Williams	1999 UH ₉
1999 UK ₉	14.0	0.15	19991029	333.89899	219.95809	220.83578	4.55363	0.1430656	3.1703054	18	1	14 days	0.32		Williams	1999 UK ₉
1999 UL ₉	15.3	0.15	19991029	57.27401	291.99474	38.08054	4.79003	0.1729779	2.5833205	11	1	5 days	0.35	E	Williams	1999 UL ₉
1999 UN ₉	16.5	0.15	19991029	344.67103	113.00571	316.12830	0.28021	0.2334479	2.4508274	18	1	14 days	0.45		Williams	1999 UN ₉
1999 UH ₁₁	15.6	0.15	19991029	164.48255	284.43860	316.31395	3.35976	0.2311824	2.7207848	11	1	4 days	0.57	E	Williams	1999 UH ₁₁
1999 UJ ₁₁	16.6	0.15	19991009	14.24154	330.83116	41.14995	17.67232	0.2819045	2.5575985	34	1	33 days	0.37		Williams	1999 UJ ₁₁
1999 UK ₁₁	18.6	0.15	19991029	343.00715	34.85607	11.28965	10.41683	0.2872170	2.5348238	9	1	4 days	0.22		Williams	1999 UK ₁₁
1999 UR ₁₁	17.3	0.15	19991029	24.29536	317.83904	48.37853	6.85068	0.1991094	2.7139091	14	1	14 days	0.28		Williams	1999 UR ₁₁
1999 UT ₁₁	16.8	0.15	19991029	258.71377	319.69652	200.21084	1.60621	0.1408108	2.3681659	11	1	14 days	0.39		Williams	1999 UT ₁₁
1999 UU ₁₁	16.1	0.15	19991029	40.21845	136.65793	215.20576	4.21247	0.1437299	3.1774548	15	1	14 days	0.50		Williams	1999 UU ₁₁
1999 UV ₁₁	16.8	0.15	19991029	185.25121	144.64412	74.65049	1.48215	0.0688305	2.4891898	11	1	14 days	0.16		Williams	1999 UV ₁₁
1999 UW ₁₁	16.0	0.15	19991029	11.70210	341.07708	47.87884	11.22333	0.1181716	2.9718828	18	1	14 days	0.42		Williams	1999 UW ₁₁
1999 UX ₁₁	16.8	0.15	19991029	236.94762	135.63335	51.24576	8.07456	0.2313941	2.7677368	9	1	14 days	0.27		Williams	1999 UX ₁₁
1999 UZ ₁₁	16.2	0.15	19991029	67.45395	103.42082	223.11897	12.18213	0.0948657	3.1417267	10	1	14 days	0.41		Williams	1999 UZ ₁₁
1999 UB ₁₂	17.4	0.15	19991029	355.78400	355.74062	53.32672	4.00657	0.1156792	2.7580167	9	1	14 days	0.08		Williams	1999 UB ₁₂
1999 UJ ₁₂	17.1	0.15	19991029	22.12176	300.47661	49.39806	3.93886	0.2125803	2.4171837	15	1	12 days	0.23		Williams	1999 UJ ₁₂
1999 UN ₁₂	15.9	0.15	19991029	328.58113	150.67734	290.71390	3.38930	0.2284121	2.5835467	21	1	14 days	0.38		Williams	1999 UN ₁₂
1999 UT ₁₂	15.7	0.15	19991029	355.42496	173.60019	209.71184	7.30961	0.2165281	2.7979113	12	1	14 days	0.44		Williams	1999 UT ₁₂
1999 UY ₁₂	16.9	0.15	19991029	342.18301	202.33121	207.90966	9.43330	0.2814741	2.6999643	12	1	14 days	0.61		Williams	1999 UY ₁₂
1999 UA ₁₅	15.8	0.15	19991029	343.05547	17.29871	43.11253	8.77185	0.2016814	2.8072890	13	1	14 days	0.33		Williams	1999 UA ₁₅
1999 UB ₁₅	15.9	0.15	19991029	1.22963	343.62500	49.81913	5.08147	0.0830317	2.5590666	13	1	14 days	0.50		Williams	1999 UB ₁₅
1999 UC ₁₅	16.1	0.15	19991029	345.69746	3.92334	48.50348	6.78664	0.1027751	2.3894980	13	1	14 days	0.45		Williams	1999 UC ₁₅
1999 UE ₁₅	16.0	0.15	19991029	33.46412	293.06321	45.61560	6.98375	0.2705976	2.6247506	11	1	6 days	0.49		Williams	1999 UE ₁₅
1999 UF ₁₅	13.1	0.15	19991029	35.84550	305.60844	42.17223	14.38789	0.1457500	2.9749010	17	1	18 days	0.40		Williams	1999 UF ₁₅
1999 UM ₁₅	15.1	0.15	19991029	169.50609	193.09562	30.33862	6.91798	0.1162332	2.2748614	21	1	15 days	0.65		Williams	1999 UM ₁₅
1999 UN ₁₅	14.6	0.15	19991029	143.61537	63.27273	185.33776	1.88001	0.0389329	2.8281660	19	1	14 days	0.45		Williams	1999 UN ₁₅
1999 US ₁₅	16.4	0.15	19991029	329.85686	34.07909	47.76008	13.72925	0.2257161	2.6115973	10	1	5 days	0.56		Williams	1999 US ₁₅
1999 UC ₁₆	14.5	0.15	19991029	191.30691	0.78319	206.69172	4.15152	0.0888943	2.2443245	21	1	14 days	0.41	E	Williams	1999 UC ₁₆
1999 UD ₁₆	17.8	0.15	19991029	29.25079	80.71071	264.15711	1.67390	0.2808035	2.3293222	13	1	6 days	0.38		Williams	1999 UD ₁₆
1999 UE ₁₆	16.6	0.15	19991029	339.07955	169.47225	257.87660	1.39969	0.1964660	2.7078838	17	1	13 days	0.57		Williams	1999 UE ₁₆
1999 UF ₁₆	16.1	0.15	19991029	310.20903	71.26214	23.20071	6.77197	0.0858782	2.3510220	13	1	6 days	0.31		Williams	1999 UF ₁₆
1999 UG ₁₆	13.5	0.15	19991029	157.35374	205.49510	30.86645	11.04790	0.0739129	2.9938571	17	1	13 days	0.31		Williams	1999 UG ₁₆
1999 UH ₁₆	15.9	0.15	19991029	27.92286	316.41473	30.87815	8.20146	0.2831121	2.9302772	13	1	6 days	0.60	E	Williams	1999 UH ₁₆
1999 UJ ₁₆	16.8	0.15	19991029	20.62513	143.06757	221.44336	12.98201	0.2144441	2.7489351	16	1	14 days	0.84		Williams	1999 UJ ₁₆
1999 UK ₁₆	16.7	0.15	19991029	44.62192	292.65186	31.17599	6.47874	0.2754712	2.3849770	17	1	13 days	0.57		Williams	1999 UK ₁₆
1999 UN ₁₆	16.7	0.15	19991029	23.85918	341.52775	20.32672	3.85339	0.1871510	2.3225455	17	1	13 days	0.36		Williams	1999 UN ₁₆
1999 UO ₁₆	15.9	0.15	19991029	340.85179	77.55089	349.54707	1.34895	0.2225057	2.8073592	17	1	13 days	0.61		Williams	1999 UO ₁₆
1999 UP ₁₆	16.8	0.15	19991029	356.70110	175.39805	225.63252	6.22775	0.1282640	2.3498571	13	1	6 days	0.38		Williams	1999 UP ₁₆
1999 UQ ₁₆	16.5	0.15	19991029	354.04789	184.64558	222.62319	10.13724	0.2638552	2.7119331	18	1	14 days	0.42		Williams	1999 UQ ₁₆
1999 UR ₁₆	15.2	0.15	19991029	353.08679	148.08318	257.78097	2.20622	0.0999799	2.7837305	20	1	13 days	0.43		Williams	1999 UR ₁₆
1999 US ₁₆	15.2	0.15	19991029	329.70402	207.13506	228.36255	11.86494	0.1309571	3.0968122	17	1	13 days	0.62		Williams	1999 US ₁₆
1999 UT ₁₆	16.0	0.15	19991029	349.05323	169.82287	240.98268	4.43928	0.1014046	2.7368269	13	1	6 days	0.73		Williams	1999 UT ₁₆

1999 UU ₁₆	15.7	0.15	19991029	300.95935	82.30245	30.42070	6.68264	0.1526710	2.6063517	17	1	13 days	0.56	Williams	1999 UU ₁₆
1999 UV ₁₆	16.6	0.15	19991029	15.92840	343.00944	26.31060	4.75422	0.2603826	2.4039847	13	1	6 days	0.21	Williams	1999 UV ₁₆
1999 UW ₁₆	17.6	0.15	19991029	340.47855	58.71216	8.14627	2.01486	0.2028768	2.2326528	13	1	6 days	0.45	Williams	1999 UW ₁₆
1999 UF ₁₇	15.1	0.15	19991029	256.71487	282.38129	227.71735	12.94705	0.1014777	2.6105487	16	1	11 days	0.58	Williams	1999 UF ₁₇
1999 UQ ₂₅	14.4	0.15	19991029	359.40190	163.71635	243.38503	4.18327	0.1290638	2.7544134	23	1	6 days	0.98	Williams	1999 UQ ₂₅
1999 UR ₂₅	16.2	0.15	19991029	358.33157	19.00817	28.26692	2.80924	0.1829226	2.4560677	23	1	6 days	0.39	E Williams	1999 UR ₂₅
1999 UT ₂₅	15.7	0.15	19991029	86.24473	331.02605	330.01803	1.91199	0.1756534	2.3793270	18	1	6 days	0.53	E Williams	1999 UT ₂₅
1999 VA	15.2	0.15	19991029	338.21319	3.99564	73.92073	7.60355	0.0273260	2.3555278	27	1	5 days	0.33	E Williams	1999 VA
1999 VB	14.9	0.15	19991029	48.35233	278.74833	83.79674	5.13313	0.0487850	2.3960013	32	1	5 days	0.37	E Williams	1999 VB
1999 VD	16.1	0.15	19991029	48.39746	176.08865	162.66509	5.49094	0.1638991	2.6427257	8	1	6 days	1.56	Williams	1999 VD
1999 VE	15.6	0.15	19991029	335.64700	200.09838	232.11027	1.73927	0.1893255	2.4109661	21	1	13 days	1.13	Williams	1999 VE
1999 VF	15.2	0.15	19991029	321.10734	244.66152	220.14543	10.87795	0.3028309	2.5873982	29	1	11 days	1.17	Williams	1999 VF
1999 VG	14.2	0.15	19991029	15.05158	174.91269	195.95946	3.61523	0.2365933	2.7000603	37	1	15 days	0.44	Williams	1999 VG
1999 VH	18.2	0.15	19991029	333.65016	311.78784	125.36297	2.16864	0.2320216	2.1620584	9	1	2 days	0.48	Williams	1999 VH
1999 VJ	14.6	0.15	19991029	48.15758	334.21147	54.64475	15.74172	0.1361915	2.6365460	10	1	14 days	0.23	Williams	1999 VJ
1999 VK	15.4	0.15	19991029	31.58434	314.00449	79.85705	3.47473	0.1499024	2.2207794	14	1	14 days	0.22	Williams	1999 VK
1999 VL	15.7	0.15	19991029	355.98509	334.56257	66.94061	2.38716	0.1870746	2.3921948	23	1	11 days	0.79	Williams	1999 VL
1999 VM	14.8	0.15	19991029	14.05865	206.76432	172.32763	2.06999	0.0842563	2.6798524	16	1	10 days	0.63	Williams	1999 VM
1999 VN	14.0	0.15	19991029	345.71057	13.78524	50.12119	2.90689	0.0877927	2.8837787	25	1	14 days	0.34	Williams	1999 VN
1999 VP	13.8	0.15	19991029	94.17850	310.30269	352.87549	5.65960	0.0100660	2.5623632	23	1	10 days	0.34	E Williams	1999 VP
1999 VR	14.1	0.15	19991029	26.25039	329.23494	44.34049	1.80559	0.1977820	3.0564930	31	1	12 days	0.69	Williams	1999 VR
1999 VS	16.5	0.15	19991029	356.28858	236.03755	161.92030	6.21527	0.1269323	2.3129140	25	1	8 days	0.84	E Williams	1999 VS
1999 VT	19.8	0.15	19991029	18.89617	297.12793	38.48239	14.34771	0.4864580	2.0039465	82	1	13 days	0.52	Williams	1999 VT
1999 VU	16.9	0.15	19991029	283.93563	202.94870	333.68344	9.27926	0.5536093	1.3881218	65	1	18 days	0.31	Nakano	1999 VU
1999 VW	13.3	0.15	19991009	40.86550	303.44862	52.53659	10.36694	0.1105449	2.9764008	38	1	32 days	0.55	Williams	1999 VW
1999 VY	16.0	0.15	19991029	330.85121	49.44787	18.72604	7.58896	0.1991370	2.5738333	13	1	14 days	0.30	Williams	1999 VY
1999 VZ	13.3	0.15	19991029	288.99202	100.14753	54.10673	23.09958	0.2661435	2.3280263	51	1	13 days	0.59	Williams	1999 VZ
1999 VA ₁	18.8	0.15	19991029	342.38082	102.04976	324.67585	3.19518	0.2588716	2.3339606	14	1	3 days	1.65	Williams	1999 VA ₁
1999 VB ₁	16.6	0.15	19991029	346.19652	359.40843	57.24964	13.07774	0.2639315	2.6725669	20	1	12 days	0.50	Williams	1999 VB ₁
1999 VC ₁	17.8	0.15	19991029	0.57670	234.23898	152.77991	2.73071	0.3831346	2.6017445	36	1	4 days	0.47	Williams	1999 VC ₁
1999 VE ₁	14.8	0.15	19991029	357.32310	20.29920	18.86703	10.21127	0.1132967	2.3246720	25	1	14 days	0.91	Williams	1999 VE ₁
1999 VF ₁	15.3	0.15	19991029	18.35724	128.01800	248.07886	6.32043	0.2487620	2.4146116	24	1	14 days	0.21	Williams	1999 VF ₁
1999 VG ₁	14.6	0.15	19991029	355.29096	358.05565	48.96262	2.03225	0.2628216	3.1327559	31	1	16 days	0.44	Williams	1999 VG ₁
1999 VH ₁	16.7	0.15	19991029	39.20118	121.46089	215.22549	8.88430	0.2463761	2.6540953	14	1	5 days	0.42	Williams	1999 VH ₁
1999 VJ ₁	14.9	0.15	19991029	28.62572	148.43087	215.86824	9.22736	0.1062071	3.1956220	18	1	9 days	0.48	E Williams	1999 VJ ₁
1999 VL ₁	20.1	0.15	19991029	356.51941	353.00994	47.45109	23.08898	0.2196422	1.7424264	43	1	5 days	0.57	Williams	1999 VL ₁
1999 VM ₁	16.5	0.15	19991029	344.60060	193.37922	240.99741	11.50435	0.2650442	2.6446388	17	1	14 days	0.73	Williams	1999 VM ₁
1999 VO ₁	16.9	0.15	19991029	279.55187	213.55674	283.12173	3.32306	0.0667017	2.1591024	8	1	14 days	0.76	Marsden	1999 VO ₁
1999 VP ₁	16.8	0.15	19991029	27.03652	313.36168	34.08690	7.41158	0.1345139	2.3667628	11	1	8 days	0.52	Williams	1999 VP ₁
1999 VQ ₁	14.5	0.15	19991029	49.25969	305.54124	33.56932	13.18654	0.0666188	3.1039161	10	1	8 days	0.56	E Williams	1999 VQ ₁
1999 VW ₁	13.1	0.15	19991118	328.17058	191.36955	273.64755	9.25272	0.1221697	2.5737947	15	1	14 days	0.16	Nakano	1999 VW ₁
1999 VY ₁	14.8	0.15	19991029	1.66403	0.06035	38.76963	3.78615	0.1085582	2.5247801	18	1	13 days	1.12	Williams	1999 VY ₁
1999 VZ ₁	15.6	0.15	19991029	314.04783	212.87644	242.30314	1.03088	0.0963562	2.2054218	22	1	14 days	0.75	Williams	1999 VZ ₁
1999 VA ₂	15.2	0.15	19991029	28.79833	122.63839	232.94354	23.89395	0.2905848	2.2714352	54	1	16 days	0.55	Williams	1999 VA ₂
1999 VB ₂	13.4	0.15	19991029	238.78811	79.67018	89.08390	25.42459	0.2628339	3.1468643	19	1	7 days	0.64	Williams	1999 VB ₂
1999 VC ₂	14.0	0.15	19991029	255.56605	116.21604	64.79622	7.51567	0.1786563	2.3140046	14	1	8 days	0.44	Williams	1999 VC ₂
1999 VD ₂	13.2	0.15	19991029	56.19333	283.64474	65.83818	11.57035	0.1403873	3.0131916	14	1	8 days	0.29	Williams	1999 VD ₂
1999 VE ₂	14.4	0.15	19991029	45.99470	138.41325	196.80397	6.60494	0.1910974	2.8612761	6	1	3 days	0.48	E Williams	1999 VE ₂
1999 VG ₂	13.5	0.15	19991029	13.86194	302.73565	74.30267	11.20773	0.1076016	2.9803803	24	1	15 days	0.35	Williams	1999 VG ₂
1999 VH ₂	13.3	0.15	19991029	3.71887	78.68479	320.62945	2.80136	0.1567580	2.6168103	11	1	3 days	0.23	Williams	1999 VH ₂
1999 VJ ₂	14.3	0.15	19991029	12.03397	90.87570	293.68113	8.70574	0.1347889	2.9724976	13	1	8 days	0.51	Williams	1999 VJ ₂
1999 VM ₂	12.1	0.15	19991029	299.43686	249.12209	241.80182	23.60051	0.0863719	2.5793427	16	1	14 days	0.34	Williams	1999 VM ₂
1999 VS ₂	16.0	0.15	19991029	96.17535	255.79541	37.51749	14.11209	0.1864203	2.6080300	12	1	4 days	0.28	Williams	1999 VS ₂

1999 VU ₂	15.5	0.15	19991029	74.71349	312.83019	12.56216	4.18317	0.0661901	2.2133839	18	1	2 days	0.44	E Williams	1999 VU ₂
1999 VV ₂	16.4	0.15	19991029	15.18285	114.65543	266.96854	3.92606	0.2384495	2.6793656	19	1	2 days	0.39	Williams	1999 VV ₂
1999 VX ₂	14.7	0.15	19991118	7.19280	148.79452	264.26528	6.27362	0.0829340	2.2889506	18	1	15 days	0.73	Nakano	1999 VX ₂
1999 VZ ₂	14.7	0.15	19991029	299.69317	96.76019	5.88464	7.26534	0.0662185	2.4012593	30	1	9 days	0.77	Williams	1999 VZ ₂
1999 VB ₃	16.3	0.15	19991029	13.34314	270.92630	112.17164	1.88467	0.2854874	3.2362493	10	1	3 days	0.31	E Williams	1999 VB ₃
1999 VG ₃	14.5	0.15	19991029	5.44950	253.09491	147.94598	1.82245	0.1777988	3.1859182	11	1	3 days	0.17	E Williams	1999 VG ₃
1999 VM ₃	14.6	0.15	19991029	48.96373	227.21702	108.98297	2.24987	0.2384668	3.3227574	11	1	3 days	0.28	E Williams	1999 VM ₃
1999 VR ₃	18.7	0.15	19991029	115.31549	180.64160	94.22966	2.57065	0.1956577	2.1032933	15	1	6 days	1.31	Williams	1999 VR ₃
1999 VR ₄	15.5	0.15	19991029	344.04313	356.80916	66.94208	12.68520	0.1512204	2.6454563	6	1	7 days	0.13	Williams	1999 VR ₄
1999 VS ₄	15.7	0.15	19991029	2.71377	342.85811	50.71854	2.54574	0.1588000	2.5432680	19	1	10 days	0.76	Williams	1999 VS ₄
1999 VT ₄	15.3	0.15	19991029	24.40451	323.34102	33.56961	0.21036	0.2508767	2.6947397	15	1	9 days	0.64	E Williams	1999 VT ₄
1999 VU ₄	13.8	0.15	19991029	109.54411	235.96286	40.19897	6.63223	0.1248171	2.7474644	16	1	9 days	0.51	Williams	1999 VU ₄
1999 VV ₄	15.8	0.15	19991029	9.16867	340.03475	44.98816	3.25673	0.1816972	2.3751445	24	1	15 days	0.46	Williams	1999 VV ₄
1999 VW ₄	14.7	0.15	19991029	32.80064	307.34028	46.87784	4.18257	0.1721908	2.5993011	27	1	16 days	0.53	Williams	1999 VW ₄
1999 VX ₄	14.3	0.15	19991029	122.44017	64.05761	207.25650	1.16857	0.0763181	2.5790232	18	1	9 days	0.98	E Williams	1999 VX ₄
1999 VY ₄	14.1	0.15	19991029	136.91972	195.09652	64.80211	1.20160	0.0610984	3.1481191	19	1	8 days	0.68	E Williams	1999 VY ₄
1999 VZ ₄	15.9	0.15	19991029	3.21552	179.20267	216.14719	2.53761	0.1798993	2.4353980	24	1	9 days	0.38	Williams	1999 VZ ₄
1999 VA ₅	14.2	0.15	19991029	10.63612	338.18742	45.97784	3.79085	0.2175515	3.1182617	20	1	8 days	0.31	Williams	1999 VA ₅
1999 VC ₅	16.0	0.15	19991029	338.22402	30.65511	42.89766	4.09132	0.2094813	2.5312781	22	1	8 days	0.41	Williams	1999 VC ₅
1999 VD ₅	15.8	0.15	19991029	10.59897	332.05826	52.33868	3.36011	0.1917193	2.3877129	18	1	8 days	0.39	Williams	1999 VD ₅
1999 VE ₅	14.5	0.15	19991029	341.76952	6.91812	60.45567	14.30874	0.1366689	2.6222159	9	1	7 days	0.28	Williams	1999 VE ₅
1999 VF ₅	14.5	0.15	19991029	41.26571	198.11719	160.73324	2.31388	0.0727165	2.5698466	13	1	7 days	0.19	Williams	1999 VF ₅
1999 VG ₅	16.5	0.15	19991029	10.84007	155.96505	225.40600	0.13559	0.2461239	2.2705845	22	1	10 days	0.25	Williams	1999 VG ₅
1999 VH ₅	13.5	0.15	19991029	93.20104	225.76375	63.88593	14.08840	0.1303600	2.9283680	6	1	3 days	0.56	E Williams	1999 VH ₅
1999 VK ₅	15.9	0.15	19991118	32.65529	345.29860	29.66373	2.68540	0.1119285	2.5804709	17	1	8 days	0.26	Nakano	1999 VK ₅
1999 VL ₅	15.8	0.15	19991029	2.91038	160.25839	233.14763	11.81984	0.2275144	2.4465731	15	1	8 days	0.38	Williams	1999 VL ₅
1999 VM ₅	15.5	0.15	19991029	11.29557	49.37944	332.12100	2.49619	0.1965407	2.4030294	20	1	11 days	0.60	Williams	1999 VM ₅
1999 VN ₅	14.5	0.15	19991029	358.29366	183.41490	226.91977	7.61600	0.1830524	2.6189747	13	1	8 days	0.39	Williams	1999 VN ₅
1999 VO ₅	15.0	0.15	19991029	331.71978	219.23963	221.08071	4.24045	0.0500941	2.5232750	17	1	8 days	0.50	E Williams	1999 VO ₅
1999 VP ₅	14.6	0.15	19991029	309.52166	28.75294	82.05755	1.28833	0.1136040	2.6162725	16	1	8 days	0.54	Williams	1999 VP ₅
1999 VQ ₅	19.4	0.15	19991029	350.99071	18.93790	41.78600	39.14463	0.4257306	2.3876835	78	1	10 days	0.61	Williams	1999 VQ ₅
1999 VR ₅	19.1	0.15	19991029	15.69392	113.14977	242.24113	4.58245	0.3840445	2.1833967	50	1	4 days	0.68	Williams	1999 VR ₅
1999 VS ₅	17.1	0.15	19991029	55.82955	159.37778	149.36406	1.13817	0.3768867	2.3466441	46	1	10 days	0.63	Williams	1999 VS ₅
1999 VU ₅	13.8	0.15	19991029	33.78762	304.56447	68.39844	10.72135	0.1185529	2.3939848	10	1	9 days	0.39	Williams	1999 VU ₅
1999 VV ₅	13.0	0.15	19991029	312.39879	43.41898	72.35568	12.45807	0.0953065	2.9905357	13	1	9 days	0.66	Williams	1999 VV ₅
1999 VW ₅	15.1	0.15	19991118	12.45356	350.30124	53.50559	2.18310	0.1835355	2.3932243	13	1	14 days	0.56	Nakano	1999 VW ₅
1999 VX ₅	12.8	0.15	19991029	47.40483	284.49352	78.43186	8.98620	0.1099375	3.0929288	11	1	9 days	0.44	E Williams	1999 VX ₅
1999 VY ₅	15.7	0.15	19991118	11.49935	340.43769	66.41403	8.56035	0.1433849	2.2519932	10	1	10 days	0.62	Nakano	1999 VY ₅
1999 VZ ₅	12.9	0.15	19991029	295.76022	60.88699	79.31114	13.16980	0.1424634	2.9809210	11	1	9 days	0.44	Williams	1999 VZ ₅
1999 VC ₆	14.3	0.15	19991118	26.36629	180.52755	207.84110	2.22540	0.1429924	2.1769862	11	1	10 days	0.43	Nakano	1999 VC ₆
1999 VD ₆	13.3	0.15	19991118	322.20590	16.26014	101.09457	2.24764	0.1602166	2.9889088	10	1	10 days	0.65	E Nakano	1999 VD ₆
1999 VE ₆	14.1	0.15	19991029	350.00325	345.62906	90.17684	5.96390	0.2536567	2.9544215	11	1	9 days	0.34	Williams	1999 VE ₆
1999 VG ₆	14.0	0.15	19991029	22.61622	141.41195	234.72626	2.94160	0.2803715	2.5546189	15	1	10 days	0.57	Williams	1999 VG ₆
1999 VH ₆	12.6	0.15	19991029	69.78881	129.11924	213.88224	7.22076	0.0880613	2.7204646	11	1	9 days	0.35	Williams	1999 VH ₆
1999 VJ ₆	14.0	0.15	19991029	334.92745	14.68227	74.10600	5.41587	0.1041436	2.2794868	15	1	10 days	0.30	Williams	1999 VJ ₆
1999 VN ₆	19.6	0.15	19991118	338.21536	43.40229	58.19764	19.40418	0.3674972	1.7255432	69	1	14 days	0.43	Nakano	1999 VN ₆
1999 VO ₆	17.0	0.15	19991029	303.07749	302.47476	206.81671	40.33827	0.7397703	1.1393088	53	1	8 days	0.52	Nakano	1999 VO ₆
1999 VP ₆	20.0	0.15	19991029	28.86147	107.33794	227.79732	12.16342	0.2805174	1.3292948	41	1	9 days	0.75	Nakano	1999 VP ₆
1999 VQ ₆	18.8	0.15	19991029	340.87137	254.44853	203.66949	27.59929	0.5085326	2.5992122	24	1	3 days	0.98	Williams	1999 VQ ₆
1999 VR ₆	21.2	0.15	19991029	340.76005	293.82746	213.30376	8.63234	0.7647790	2.2456991	68	1	7 days	0.53	Williams	1999 VR ₆
1999 VS ₆	19.0	0.15	19991029	291.03235	89.16814	35.37477	28.01319	0.2233793	1.1985760	78	1	15 days	0.86	Marsden	1999 VS ₆
1999 VT ₆	13.1	0.15	19991029	103.31211	4.37331	275.74824	4.41447	0.1944479	3.0828931	12	1	6 days	0.33	Williams	1999 VT ₆
1999 VU ₆	15.3	0.15	19991029	208.42386	139.93691	56.10273	2.39960	0.1039687	2.2976628	23	1	12 days	0.33	Williams	1999 VU ₆

1999 VV ₆	15.0	0.15	19991029	29.92895	295.70250	68.51371	3.46304	0.2021471	2.4408559	21	1	11 days	0.27		Williams	1999 VV ₆
1999 VB ₇	11.4	0.15	19991029	249.51730	36.09129	137.13255	23.20401	0.1716791	3.1781802	9	1	2 days	0.49	E	Williams	1999 VB ₇
1999 VC ₇	15.2	0.15	19991029	346.69473	12.47218	41.44294	12.29927	0.1458577	2.3097640	17	1	9 days	0.34		Williams	1999 VC ₇
1999 VD ₇	13.7	0.15	19991029	78.18291	207.29370	85.89872	0.49408	0.2424983	2.9962788	17	1	8 days	0.44		Williams	1999 VD ₇
1999 VE ₇	14.2	0.15	19991029	57.72485	277.92558	47.60377	2.41645	0.1197684	3.0666113	16	1	8 days	0.82		Williams	1999 VE ₇
1999 VF ₇	15.1	0.15	19991029	140.68683	190.07306	58.12069	3.58735	0.1627949	2.3170334	21	1	15 days	0.89		Williams	1999 VF ₇
1999 VG ₇	14.9	0.15	19991029	323.91547	28.49481	63.45709	0.64039	0.2042747	2.9006487	11	1	4 days	0.75	E	Williams	1999 VG ₇
1999 VH ₇	15.6	0.15	19991029	351.09929	195.73705	216.89674	3.71647	0.1420550	2.3174089	17	1	6 days	0.28		Williams	1999 VH ₇
1999 VK ₇	15.5	0.15	19991029	319.37813	31.82788	65.35527	4.83240	0.1436825	2.4944071	15	1	8 days	0.55		Williams	1999 VK ₇
1999 VL ₇	16.1	0.15	19991029	51.88497	114.54040	213.58480	5.81843	0.2287601	2.3432344	19	1	10 days	0.65		Williams	1999 VL ₇
1999 VN ₇	15.7	0.15	19991029	323.80227	0.76222	90.64840	3.68302	0.1422102	2.4176773	10	1	7 days	0.37		Williams	1999 VN ₇
1999 VO ₇	15.0	0.15	19991029	323.25270	301.87956	152.27290	2.74623	0.1649555	2.4281007	11	1	7 days	0.27		Williams	1999 VO ₇
1999 VP ₇	14.8	0.15	19991029	42.29290	123.68359	218.47945	10.50490	0.2228017	2.5442024	11	1	7 days	0.39		Williams	1999 VP ₇
1999 VQ ₇	14.4	0.15	19991029	65.24793	203.06786	123.32896	2.54628	0.1382007	2.8795675	13	1	7 days	0.46		Williams	1999 VQ ₇
1999 VR ₇	13.0	0.15	19991029	157.09430	196.95173	59.00336	15.03325	0.0333120	3.2186875	18	1	10 days	0.31	E	Williams	1999 VR ₇
1999 VS ₇	14.2	0.15	19991029	289.82456	267.60897	227.02306	13.96338	0.1094607	2.6322794	16	1	9 days	0.40		Williams	1999 VS ₇
1999 VT ₇	13.2	0.15	19991029	34.58987	306.66282	59.57252	15.39471	0.1353586	2.6072586	11	1	7 days	0.17		Williams	1999 VT ₇
1999 VU ₇	16.0	0.15	19991029	350.59881	345.87950	77.69622	3.55961	0.1648465	2.6044989	14	1	7 days	0.65	E	Williams	1999 VU ₇
1999 VW ₇	15.7	0.15	19991029	358.40408	348.37460	63.51963	5.95163	0.2329401	2.5749415	21	1	8 days	0.43		Williams	1999 VW ₇
1999 VY ₇	13.8	0.15	19991029	0.39995	355.21710	68.99469	22.69339	0.0407980	2.6887934	15	1	9 days	0.56		Williams	1999 VY ₇
1999 VZ ₇	14.7	0.15	19991029	36.38106	134.87508	241.76114	4.99926	0.1240179	2.4814785	13	1	9 days	0.56		Williams	1999 VZ ₇
1999 VB ₈	15.5	0.15	19991029	344.23869	290.48839	151.96579	2.28025	0.1840131	2.3937369	15	1	9 days	0.80		Williams	1999 VB ₈
1999 VC ₈	14.8	0.15	19991029	37.05396	292.82683	77.82745	7.15977	0.1628226	2.4517041	7	1	2 days	0.94	E	Williams	1999 VC ₈
1999 VF ₈	13.1	0.15	19991029	17.99700	323.87417	92.92697	12.25235	0.2221106	3.0801629	11	1	5 days	0.37		Williams	1999 VF ₈
1999 VG ₈	14.2	0.15	19991029	317.59473	0.08129	137.93488	1.33718	0.1576525	2.3760174	8	1	2 days	0.57	E	Williams	1999 VG ₈
1999 VJ ₈	12.7	0.15	19991029	72.35615	78.87166	292.26004	11.85618	0.2599606	2.6462051	8	1	2 days	0.42	E	Williams	1999 VJ ₈
1999 VK ₈	14.9	0.15	19991029	33.81759	289.45724	63.30643	1.12037	0.1869987	3.1136517	24	1	10 days	0.60		Williams	1999 VK ₈
1999 VN ₈	16.6	0.15	19991118	25.83081	170.11726	202.42393	8.54759	0.1647261	2.7802512	12	1	9 days	0.28		Nakano	1999 VN ₈
1999 VO ₈	15.6	0.15	19991029	332.02367	250.61858	193.84054	5.88719	0.1141697	2.3894423	23	1	13 days	0.37		Williams	1999 VO ₈
1999 VP ₈	15.6	0.15	19991029	305.41423	24.80841	81.74658	6.06624	0.1329565	2.3670971	14	1	6 days	0.64		Williams	1999 VP ₈
1999 VQ ₈	14.5	0.15	19991029	20.77984	308.58543	66.29901	12.42308	0.2989798	2.6250768	11	1	9 days	0.38		Williams	1999 VQ ₈
1999 VR ₈	14.9	0.15	19991029	30.77324	291.34641	87.38866	7.14399	0.1291604	2.2483953	21	1	14 days	0.73		Williams	1999 VR ₈
1999 VU ₈	14.1	0.15	19991029	24.14817	246.08447	139.67567	13.75510	0.1317907	2.7724896	6	1	4 days	0.37		Williams	1999 VU ₈
1999 VV ₈	15.9	0.15	19991029	57.38211	270.40493	53.45687	5.18133	0.2667969	2.2893911	23	1	10 days	0.65		Williams	1999 VV ₈
1999 VW ₈	17.0	0.15	19991029	19.37686	146.92902	219.57035	9.41429	0.2416986	2.5879219	27	1	15 days	0.55		Williams	1999 VW ₈
1999 VE ₉	14.3	0.15	19991029	7.85620	352.04218	97.45843	1.33421	0.2263200	2.4791209	10	1	8 days	0.54	E	Williams	1999 VE ₉
1999 VF ₉	13.3	0.15	19991029	56.75388	283.66485	50.27112	12.96416	0.2011929	2.7100603	11	1	10 days	0.29		Williams	1999 VF ₉
1999 VG ₉	15.2	0.15	19991029	18.20292	160.41980	222.20074	9.92307	0.2252051	3.1517041	14	1	9 days	0.37		Williams	1999 VG ₉
1999 VH ₉	15.3	0.15	19991029	8.20583	353.60575	43.28857	5.45925	0.1897604	2.4364607	9	1	7 days	0.35	E	Williams	1999 VH ₉
1999 VK ₉	14.9	0.15	19991029	60.25114	104.91568	233.68731	5.08938	0.1102689	2.2550036	17	1	11 days	0.47		Williams	1999 VK ₉
1999 VL ₉	13.1	0.15	19991029	191.93023	349.36016	237.24820	18.40065	0.1304085	2.7553974	16	1	10 days	0.36		Williams	1999 VL ₉
1999 VM ₉	16.0	0.15	19991029	8.59774	342.72999	52.22533	4.30379	0.2342612	2.3250985	16	1	10 days	0.25		Williams	1999 VM ₉
1999 VQ ₉	15.1	0.15	19991029	356.72177	202.44254	222.94927	4.16882	0.2651038	2.6132348	11	1	10 days	0.48		Williams	1999 VQ ₉
1999 VR ₉	14.6	0.15	19991029	19.74258	303.50287	100.79152	6.56344	0.2509417	2.4046918	8	1	4 days	0.69		Williams	1999 VR ₉
1999 VA ₁₀	14.7	0.15	19991029	353.49311	35.56981	19.63501	12.39481	0.2745484	2.5937294	9	1	6 days	0.30	E	Williams	1999 VA ₁₀
1999 VD ₁₀	14.4	0.15	19991029	354.92319	334.92360	59.34463	8.22500	0.1221457	2.5376920	8	1	4 days	0.69		Williams	1999 VD ₁₀
1999 VF ₁₀	13.8	0.15	19991029	21.06327	289.94645	87.53037	12.36035	0.3040042	2.6671823	11	1	14 days	0.58		Williams	1999 VF ₁₀
1999 VH ₁₀	12.7	0.15	19991118	232.01098	75.77146	125.19238	2.08394	0.0463462	2.8120965	6	1	9 days	0.20		Nakano	1999 VH ₁₀
1999 VJ ₁₀	13.0	0.15	19991118	356.24865	348.27546	87.23502	0.22379	0.1608162	3.1811679	11	1	9 days	0.47	E	Nakano	1999 VJ ₁₀
1999 VO ₁₀	13.1	0.15	19991118	46.71552	111.76217	260.37772	6.17792	0.1068446	2.3492832	6	1	9 days	0.58		Nakano	1999 VO ₁₀
1999 VP ₁₀	12.5	0.15	19991029	103.27542	187.51233	113.89924	9.21744	0.2085918	2.8186729	11	1	14 days	0.55		Williams	1999 VP ₁₀
1999 VR ₁₀	11.3	0.15	19991118	33.42881	293.57627	82.52394	10.25971	0.2385517	3.1606749	6	1	9 days	0.28		Nakano	1999 VR ₁₀
1999 VS ₁₀	12.9	0.15	19991029	10.79225	299.00178	107.94186	7.42463	0.1065469	2.3611506	11	1	14 days	0.35		Williams	1999 VS ₁₀

1999 VT ₁₀	13.9	0.15	19991029	311.11138	313.44203	166.33528	3.91306	0.1049000	2.2750556	11	1	14 days	0.44	Williams	1999 VT ₁₀
1999 VW ₁₀	13.3	0.15	19991118	255.04353	66.84729	114.65401	8.17144	0.0746987	2.2446276	6	1	9 days	0.40	Nakano	1999 VW ₁₀
1999 VY ₁₀	15.5	0.15	19991029	284.33289	28.80616	112.64376	4.80590	0.1388163	2.3365587	12	1	5 days	0.50	Williams	1999 VY ₁₀
1999 VZ ₁₀	17.7	0.15	19991029	358.12331	294.86697	114.48617	3.39195	0.2197461	2.2650581	15	1	10 days	0.80	Williams	1999 VZ ₁₀
1999 VA ₁₁	15.7	0.15	19991029	3.66941	137.46116	250.98686	4.75945	0.2265153	2.6482445	35	1	10 days	0.75	Williams	1999 VA ₁₁
1999 VB ₁₁	14.6	0.15	19991029	4.80221	126.31960	261.65456	4.54872	0.1243881	2.9804486	20	1	10 days	0.42	Williams	1999 VB ₁₁
1999 VD ₁₁	16.1	0.15	19991029	352.63143	189.14952	219.87772	2.91252	0.1225723	2.2745101	23	1	9 days	0.54	Williams	1999 VD ₁₁
1999 VF ₁₁	15.3	0.15	19991029	42.98671	120.50829	221.79001	12.67472	0.2068492	2.5924407	18	1	10 days	0.35	Williams	1999 VF ₁₁
1999 VG ₁₁	14.1	0.15	19991029	177.58205	159.44900	70.96260	7.20792	0.0734753	2.3756144	12	1	10 days	0.24	Williams	1999 VG ₁₁
1999 VH ₁₁	14.1	0.15	19991029	36.37449	140.29151	229.30999	4.23118	0.1149605	2.7323958	17	1	24 days	0.44	Williams	1999 VH ₁₁
1999 VK ₁₁	15.3	0.15	19991029	56.39641	96.05410	244.29919	1.27832	0.1561956	2.3145997	14	1	9 days	0.45	Williams	1999 VK ₁₁
1999 VL ₁₁	18.2	0.15	19991029	27.78724	302.07077	58.21765	34.99229	0.2124612	1.7917166	36	1	5 days	0.37	Williams	1999 VL ₁₁
1999 VM ₁₁	20.9	0.15	19991029	339.75042	206.20666	218.14978	17.02832	0.2780588	1.5921856	25	1	8 days	0.47	Williams	1999 VM ₁₁
1999 VN ₁₁	20.4	0.15	19991029	348.47078	32.67388	44.43791	31.02325	0.5448646	2.4337230	73	1	8 days	0.59	Williams	1999 VN ₁₁
1999 VO ₁₁	18.4	0.15	19991118	337.39844	71.50391	68.29755	15.81061	0.6340938	2.2549011	66	1	12 days	0.47	Nakano	1999 VO ₁₁
1999 VP ₁₁	18.8	0.15	19991029	74.98718	61.47391	208.25349	17.28725	0.5830054	1.0841469	67	1	13 days	0.58	Williams	1999 VP ₁₁
1999 VQ ₁₁	17.8	0.15	19991118	3.51200	352.99393	26.93730	7.94921	0.5968313	2.8206527	45	1	11 days	0.56	Nakano	1999 VQ ₁₁
1999 VR ₁₁	14.9	0.15	19991029	47.04795	255.34960	92.90201	3.14092	0.0855905	2.9008813	28	1	8 days	0.70	Williams	1999 VR ₁₁
1999 VS ₁₁	16.3	0.15	19991029	329.47934	42.80102	52.74118	5.96766	0.2035466	2.3700023	22	1	10 days	0.57	Williams	1999 VS ₁₁
1999 VT ₁₁	15.2	0.15	19991029	347.83490	211.06624	204.86502	7.47971	0.2213629	2.9307972	6	1	3 days	0.34	E Williams	1999 VT ₁₁
1999 VU ₁₁	14.8	0.15	19991029	2.55952	92.36171	291.42206	8.66254	0.1659414	3.1215185	11	1	7 days	0.57	Williams	1999 VU ₁₁
1999 VV ₁₁	15.0	0.15	19991029	2.73159	3.92717	40.09856	5.84203	0.1329478	3.1223752	30	1	9 days	0.67	Williams	1999 VV ₁₁
1999 VY ₁₁	13.8	0.15	19991029	9.08232	87.30025	281.62004	9.15576	0.3772299	3.0580356	15	1	8 days	0.19	Williams	1999 VY ₁₁
1999 VC ₁₂	14.9	0.15	19991029	7.21266	110.86465	268.63870	4.99296	0.4181304	2.7455917	9	1	8 days	0.22	Williams	1999 VC ₁₂
1999 VD ₁₂	12.6	0.15	19991029	341.25239	191.21670	241.44271	14.42250	0.2081239	3.1929704	9	1	8 days	0.39	Williams	1999 VD ₁₂
1999 VE ₁₂	12.1	0.15	19991029	295.02056	90.86150	29.11645	9.67946	0.0872849	3.0637793	9	1	8 days	0.36	E Williams	1999 VE ₁₂
1999 VF ₁₂	17.4	0.15	19991029	239.78730	126.50183	40.49729	23.72322	0.0821423	1.9319684	15	1	10 days	0.38	Williams	1999 VF ₁₂
1999 VH ₁₂	15.6	0.15	19991029	29.33932	288.33643	59.26947	11.62003	0.3090845	2.5824548	13	1	5 days	0.53	Williams	1999 VH ₁₂
1999 VJ ₁₂	16.5	0.15	19991029	49.26989	353.69632	346.86116	4.34819	0.2006598	2.1446224	20	1	3 days	0.38	Williams	1999 VJ ₁₂
1999 VK ₁₂	23.7	0.15	19991029	341.29021	102.73599	48.95252	9.49099	0.7744123	2.2285431	16	1	3 days	0.31	Williams	1999 VK ₁₂
1999 VL ₁₂	17.3	0.15	19991029	117.68101	39.43307	234.60907	20.59611	0.2384689	1.5953462	43	1	8 days	0.49	Williams	1999 VL ₁₂
1999 VM ₁₂	14.2	0.15	19991029	314.00145	53.23194	66.58056	4.84906	0.2512261	2.9183620	11	1	8 days	0.43	E Williams	1999 VM ₁₂
1999 VN ₁₂	14.3	0.15	19991029	27.22132	270.10817	99.29445	2.79243	0.1949815	2.3957271	11	1	8 days	0.22	Williams	1999 VN ₁₂
1999 VO ₁₂	12.7	0.15	19991029	28.88855	244.99739	126.82263	3.13227	0.1771281	2.7081442	10	1	8 days	0.29	Williams	1999 VO ₁₂
1999 VS ₁₂	14.0	0.15	19991029	31.78738	292.54159	65.19469	9.24213	0.2654328	2.3685449	9	1	6 days	0.28	Williams	1999 VS ₁₂
1999 VT ₁₂	14.6	0.15	19991029	4.68590	343.85427	62.67230	6.63489	0.1381880	2.2584893	13	1	3 days	0.42	E Williams	1999 VT ₁₂
1999 VU ₁₂	13.6	0.15	19991029	12.31969	335.23433	65.73626	9.82928	0.1038913	2.7185611	19	1	7 days	0.33	Williams	1999 VU ₁₂
1999 VW ₁₂	15.8	0.15	19991029	15.89770	60.31479	324.65121	2.47663	0.1654538	2.3319809	10	1	11 days	0.39	Williams	1999 VW ₁₂
1999 VL ₁₃	16.6	0.15	19991029	352.93627	155.25394	242.34618	18.95796	0.0805739	1.9801981	14	1	8 days	0.52	Williams	1999 VL ₁₃
1999 VN ₁₃	16.8	0.15	19991029	20.27534	126.69865	240.21568	21.17927	0.1276386	1.9151307	14	1	2 days	0.43	Williams	1999 VN ₁₃
1999 VS ₁₃	15.7	0.15	19991029	342.22463	45.29777	29.24157	30.38567	0.2594222	2.4723238	20	1	2 days	0.58	Williams	1999 VS ₁₃
1999 VX ₁₃	15.9	0.15	19991029	321.26590	207.79123	240.92393	23.13299	0.1724769	2.5957385	13	1	8 days	0.41	Williams	1999 VX ₁₃
1999 VY ₁₃	17.1	0.15	19991029	78.02355	60.23921	247.82495	18.05612	0.0982069	1.9539280	13	1	8 days	0.34	Williams	1999 VY ₁₃
1999 VM ₁₄	15.0	0.15	19991029	335.78143	302.46899	82.98057	28.93322	0.1240846	2.3094279	16	1	3 days	0.58	E Williams	1999 VM ₁₄
1999 VQ ₁₅	16.5	0.15	19991029	32.79537	23.62029	318.98914	2.27051	0.1995820	2.3833620	11	1	2 days	0.26	E Williams	1999 VQ ₁₅
1999 VR ₁₅	16.4	0.15	19991029	81.00287	351.10278	306.51839	2.19476	0.1058338	2.1534667	11	1	2 days	0.20	E Williams	1999 VR ₁₅
1999 VX ₁₅	18.9	0.15	19991029	328.85243	267.80996	222.76682	12.27391	0.5999816	3.0157888	11	1	14 days	0.25	Williams	1999 VX ₁₅
1999 VF ₁₆	15.0	0.15	19991029	78.99245	324.14151	329.86115	2.77493	0.1537251	2.8345519	11	1	2 days	0.51	E Williams	1999 VF ₁₆
1999 VJ ₁₆	14.8	0.15	19991029	11.66956	152.86329	224.12410	10.86038	0.0836312	2.7187333	15	1	2 days	0.22	E Williams	1999 VJ ₁₆
1999 VW ₁₆	14.6	0.15	19991029	54.32834	39.20756	287.04773	2.03367	0.1122858	2.7385694	15	1	2 days	0.20	E Williams	1999 VW ₁₆
1999 VK ₁₇	16.0	0.15	19991029	257.03638	172.09145	334.98257	2.01698	0.1105163	2.5566859	9	1	2 days	0.26	E Williams	1999 VK ₁₇
1999 VM ₁₇	17.8	0.15	19991029	359.83175	82.21688	311.29968	1.23609	0.2204297	2.2335761	14	1	2 days	0.52	Williams	1999 VM ₁₇
1999 VT ₁₇	15.7	0.15	19991029	144.69830	223.08482	12.66614	4.44572	0.2371292	2.3927408	10	1	2 days	0.44	E Williams	1999 VT ₁₇

1999 VU ₁₇	15.4	0.15	19991029	346.89404	185.99995	223.70854	6.92349	0.1011832	3.1253669	15	1	2 days	0.65	E Williams	1999 VU ₁₇
1999 VV ₁₇	14.1	0.15	19991029	57.33799	58.06287	245.73069	4.86417	0.2591161	2.7665323	15	1	2 days	0.32	E Williams	1999 VV ₁₇
1999 VB ₁₈	18.0	0.15	19991029	22.15583	342.23660	21.83175	6.61018	0.1422086	2.3670518	9	1	9 days	0.08	Williams	1999 VB ₁₈
1999 VD ₁₈	16.1	0.15	19991029	124.19477	230.79517	25.61603	13.11934	0.1487611	2.7054546	9	1	9 days	0.13	E Williams	1999 VD ₁₈
1999 VF ₁₈	17.8	0.15	19991029	344.55977	43.37721	15.47996	3.88629	0.2346193	2.5671921	10	1	2 days	0.37	Williams	1999 VF ₁₈
1999 VG ₁₈	17.4	0.15	19991029	342.47643	133.38006	288.77189	1.35388	0.2338530	2.5141643	15	1	2 days	1.10	E Williams	1999 VG ₁₈
1999 VH ₁₈	15.0	0.15	19991029	282.95621	101.77890	25.09784	11.48021	0.1457654	3.2026142	10	1	2 days	0.28	E Williams	1999 VH ₁₈
1999 VL ₁₈	14.8	0.15	19991029	52.81727	89.93262	226.51877	8.20456	0.2260238	2.8620532	15	1	2 days	0.35	E Williams	1999 VL ₁₈
1999 VN ₁₈	16.2	0.15	19991029	70.20855	43.27042	270.09059	1.62799	0.0907424	2.4104768	15	1	2 days	0.43	E Williams	1999 VN ₁₈
1999 VO ₁₈	15.0	0.15	19991029	140.16354	305.91679	305.80114	1.71289	0.0242865	2.6814999	15	1	2 days	0.25	E Williams	1999 VO ₁₈
1999 VZ ₁₈	18.6	0.15	19991029	285.30064	83.26671	33.44555	19.21924	0.0658397	1.8208222	9	1	2 days	0.40	Williams	1999 VZ ₁₈
1999 VA ₁₉	13.8	0.15	19991029	27.06513	148.61018	237.47075	32.55190	0.0322440	3.2757714	13	1	2 days	0.59	E Williams	1999 VA ₁₉
1999 VB ₁₉	16.7	0.15	19991029	48.67285	93.63524	256.90426	6.41165	0.2402717	2.4534147	19	1	2 days	0.33	Williams	1999 VB ₁₉
1999 VC ₁₉	15.9	0.15	19991029	67.98807	79.22221	260.41305	5.39221	0.1622026	2.4548585	19	1	2 days	0.42	E Williams	1999 VC ₁₉
1999 VD ₁₉	15.8	0.15	19991029	23.04043	314.27696	57.04565	5.50315	0.2392348	2.4727542	16	1	10 days	0.44	Williams	1999 VD ₁₉
1999 VE ₁₉	14.4	0.15	19991029	281.19080	78.29730	57.33697	6.79307	0.0554836	2.2094001	16	1	10 days	0.32	Williams	1999 VE ₁₉
1999 VF ₁₉	14.7	0.15	19991029	8.04681	168.01675	233.69553	3.35201	0.1560692	2.7047842	9	1	4 days	0.70	E Williams	1999 VF ₁₉
1999 VJ ₁₉	14.9	0.15	19991029	51.15666	272.49664	79.49018	4.78943	0.1680158	2.2278350	12	1	5 days	0.36	Williams	1999 VJ ₁₉
1999 VK ₁₉	14.8	0.15	19991029	10.24983	170.64190	237.51646	11.70752	0.1714644	2.6121094	6	1	4 days	0.46	E Williams	1999 VK ₁₉
1999 VL ₁₉	15.8	0.15	19991029	15.51131	132.81485	237.95999	1.73628	0.1878944	2.5714575	10	1	12 days	0.24	Williams	1999 VL ₁₉
1999 VM ₁₉	14.9	0.15	19991029	37.91606	211.44261	137.70167	3.21369	0.1894673	2.4651266	7	1	3 days	0.28	Williams	1999 VM ₁₉
1999 VN ₁₉	15.0	0.15	19991029	341.22702	272.04602	153.37971	3.61167	0.0630151	2.5792042	7	1	3 days	0.64	E Williams	1999 VN ₁₉
1999 VO ₁₉	15.8	0.15	19991029	36.26248	276.44246	67.05053	9.58141	0.2616429	2.5647880	7	1	3 days	0.57	Williams	1999 VO ₁₉
1999 VP ₁₉	16.3	0.15	19991029	28.37775	314.56866	46.52414	5.81936	0.2022385	2.2628565	14	1	9 days	0.40	Williams	1999 VP ₁₉
1999 VR ₁₉	15.5	0.15	19991029	23.11203	174.38044	205.69997	2.80337	0.1556071	2.2382892	17	1	14 days	0.28	Williams	1999 VR ₁₉
1999 VS ₁₉	13.0	0.15	19991029	0.45576	184.81542	230.54401	11.55624	0.1464730	3.1375925	22	1	34 days	0.22	Williams	1999 VS ₁₉
1999 VT ₁₉	15.3	0.15	19991029	1.00809	97.52346	291.42703	11.62648	0.3324737	3.1550991	30	1	8 days	0.86	Williams	1999 VT ₁₉
1999 VU ₁₉	14.9	0.15	19991029	213.51221	137.61707	52.44825	5.95185	0.0715464	2.3169296	22	1	12 days	0.61	E Williams	1999 VU ₁₉
1999 VV ₁₉	14.7	0.15	19991029	56.06746	216.95818	112.29533	3.72847	0.1872244	2.4158668	19	1	12 days	0.59	Williams	1999 VV ₁₉
1999 VW ₁₉	14.1	0.15	19991029	328.58687	323.78099	112.54676	2.21298	0.1185340	3.1602165	6	1	5 days	0.69	Williams	1999 VW ₁₉
1999 VX ₁₉	13.6	0.15	19991029	60.07915	223.46445	91.94172	3.65545	0.2951739	3.1288512	11	1	10 days	0.58	Williams	1999 VX ₁₉
1999 VY ₁₉	15.6	0.15	19991029	50.35930	283.00760	59.43051	3.12332	0.1866062	2.3412437	11	1	4 days	0.60	E Williams	1999 VY ₁₉
1999 VZ ₁₉	16.4	0.15	19991029	48.95517	291.08885	33.41550	5.54372	0.2020687	2.2585818	18	1	9 days	0.53	Williams	1999 VZ ₁₉
1999 VA ₂₀	15.7	0.15	19991029	358.41882	345.36934	60.84684	7.46761	0.1131390	2.5426042	6	1	3 days	0.39	E Williams	1999 VA ₂₀
1999 VB ₂₀	14.5	0.15	19991029	335.61428	335.21818	101.75851	2.23166	0.1280866	3.0383683	20	1	10 days	0.48	Williams	1999 VB ₂₀
1999 VD ₂₀	14.5	0.15	19991029	33.66251	320.75066	42.26080	2.32276	0.1252006	3.0345096	15	1	10 days	0.39	E Williams	1999 VD ₂₀
1999 VE ₂₀	18.3	0.15	19991029	340.96444	342.33452	90.51351	2.06200	0.2309955	1.8806835	12	1	10 days	0.72	Williams	1999 VE ₂₀
1999 VJ ₂₀	14.0	0.15	19991029	357.08360	63.62961	330.05540	11.77474	0.1794499	2.6348820	9	1	3 days	0.20	Williams	1999 VJ ₂₀
1999 VK ₂₀	13.3	0.15	19991029	343.47406	74.51602	342.21905	16.11075	0.2041636	3.1418074	8	1	3 days	0.44	E Williams	1999 VK ₂₀
1999 VL ₂₀	14.6	0.15	19991029	352.65635	93.17063	310.50532	10.94659	0.2052275	2.4726030	8	1	3 days	0.29	Williams	1999 VL ₂₀
1999 VM ₂₀	12.7	0.15	19991029	293.08789	151.01423	320.12439	13.01609	0.1015163	2.6833006	8	1	3 days	0.19	Williams	1999 VM ₂₀
1999 VP ₂₀	13.7	0.15	19991029	308.10765	166.24303	306.83101	9.98470	0.2438818	2.7357178	8	1	3 days	0.42	Williams	1999 VP ₂₀
1999 VQ ₂₀	14.5	0.15	19991029	32.53650	350.31990	354.19606	11.29058	0.2455469	2.4426731	9	1	3 days	0.23	Williams	1999 VQ ₂₀
1999 VR ₂₀	14.1	0.15	19991029	191.81657	0.52064	223.21103	14.42371	0.0803176	2.5906828	15	1	10 days	0.28	Williams	1999 VR ₂₀
1999 VS ₂₀	16.6	0.15	19991029	82.89397	264.02585	50.85354	22.03413	0.0746202	1.9789177	30	1	13 days	0.33	Williams	1999 VS ₂₀
1999 VT ₂₀	15.7	0.15	19991118	324.41039	107.85650	2.09640	3.62922	0.1351486	2.2598945	10	1	14 days	0.43	Nakano	1999 VT ₂₀
1999 VV ₂₀	14.4	0.15	19991118	337.47123	37.98954	56.27474	15.64430	0.1107766	2.8373290	8	1	9 days	0.44	Nakano	1999 VV ₂₀
1999 VW ₂₀	15.1	0.15	19991029	353.60234	139.73385	257.67079	10.04743	0.1512473	2.3584002	12	1	3 days	0.31	Williams	1999 VW ₂₀
1999 VY ₂₀	17.3	0.15	19991029	1.18211	351.46998	45.65715	26.08394	0.2034944	2.1732584	28	1	6 days	0.54	Williams	1999 VY ₂₀
1999 VZ ₂₀	15.0	0.15	19991029	6.00426	331.43835	71.63817	10.61358	0.0532683	2.5784448	24	1	16 days	0.28	Williams	1999 VZ ₂₀
1999 VB ₂₁	14.4	0.15	19991029	295.07965	58.24212	84.92739	7.90170	0.1268952	2.3377554	15	1	14 days	0.50	Williams	1999 VB ₂₁
1999 VC ₂₁	14.7	0.15	19991029	303.35837	62.86401	76.67653	2.56410	0.2713186	2.8172161	10	1	2 days	0.23	E Williams	1999 VC ₂₁
1999 VE ₂₁	13.5	0.15	19991029	60.15213	109.63427	209.39171	17.70698	0.2003317	3.1866392	15	1	4 days	0.77	E Williams	1999 VE ₂₁

1999 VM ₂₁	16.6	0.15	19991029	339.44128	222.71871	207.66857	0.59433	0.1890345	2.3445379	12	1	10 days	0.57	Williams	1999 VM ₂₁
1999 VN ₂₁	14.4	0.15	19991029	352.27267	3.70217	48.44117	5.83044	0.1622805	2.6337691	18	1	10 days	0.27	Williams	1999 VN ₂₁
1999 VP ₂₁	13.0	0.15	19991029	359.66959	354.31415	47.98313	18.92540	0.1250987	3.1978454	18	1	10 days	0.75	Williams	1999 VP ₂₁
1999 VQ ₂₁	15.4	0.15	19991029	66.99143	275.88200	46.01392	2.50096	0.1457902	2.4327642	17	1	10 days	0.51	E Williams	1999 VQ ₂₁
1999 VS ₂₁	13.1	0.15	19991029	90.20571	200.76004	90.75316	6.52217	0.2292615	3.0413743	17	1	3 days	0.66	Williams	1999 VS ₂₁
1999 VT ₂₁	15.5	0.15	19991029	28.52618	244.38134	109.57730	3.67018	0.2842941	2.5639085	13	1	3 days	0.71	Williams	1999 VT ₂₁
1999 VU ₂₁	13.8	0.15	19991029	221.60617	114.05344	79.30693	7.80774	0.1269875	2.4147103	16	1	3 days	1.14	Williams	1999 VU ₂₁
1999 VV ₂₁	14.9	0.15	19991029	285.13134	277.40305	231.76889	6.31488	0.1923477	2.6035940	9	1	2 days	0.45	E Williams	1999 VV ₂₁
1999 VW ₂₁	16.5	0.15	19991029	331.06832	28.24817	66.37657	0.81593	0.2347373	2.3502913	7	1	2 days	0.55	E Williams	1999 VW ₂₁
1999 VX ₂₁	17.7	0.15	19991029	21.64913	162.18366	208.59327	3.42305	0.2475209	2.1536376	7	1	3 days	0.22	Williams	1999 VX ₂₁
1999 VY ₂₁	14.7	0.15	19991029	256.36616	13.93825	179.07720	2.63403	0.3817015	2.3495427	7	1	3 days	0.54	Williams	1999 VY ₂₁
1999 VZ ₂₁	16.1	0.15	19991029	38.20803	151.50092	193.78915	1.70886	0.2808540	2.4012092	7	1	10 days	0.45	Williams	1999 VZ ₂₁
1999 VA ₂₂	16.2	0.15	19991029	355.14760	271.54499	144.20017	1.03644	0.0944638	2.1896111	9	1	2 days	0.86	E Williams	1999 VA ₂₂
1999 VB ₂₂	15.5	0.15	19991029	82.52017	101.67988	210.42526	0.83130	0.0625662	2.4953567	18	1	10 days	0.37	E Williams	1999 VB ₂₂
1999 VF ₂₂	20.5	0.15	19991029	28.91107	271.08493	4.01526	3.91295	0.7385024	1.3132301	56	1	4 days	0.59	Nakano	1999 VF ₂₂
1999 VG ₂₂	18.8	0.15	19991029	301.37039	222.46794	271.49723	2.85443	0.3299420	1.6474164	43	1	14 days	0.56	Williams	1999 VG ₂₂
1999 VH ₂₂	13.2	0.15	19991029	297.62858	58.72451	42.87476	14.55990	0.1909799	3.1351506	15	1	6 days	0.52	Williams	1999 VH ₂₂
1999 VJ ₂₂	15.7	0.15	19991029	161.25452	132.41981	107.23868	10.54362	0.0931242	2.3536323	10	1	2 days	0.70	E Williams	1999 VJ ₂₂
1999 VK ₂₂	16.1	0.15	19991029	7.96209	131.97459	243.56146	7.63304	0.3203019	2.4333634	16	1	17 days	0.33	Williams	1999 VK ₂₂
1999 VL ₂₂	12.3	0.15	19991029	98.76611	22.31959	261.56144	8.57851	0.0686373	3.0695974	22	1	17 days	0.31	Williams	1999 VL ₂₂
1999 VM ₂₂	13.6	0.15	19991029	23.93567	356.04159	7.16261	6.90915	0.0881595	2.7698947	16	1	11 days	0.45	Williams	1999 VM ₂₂
1999 VN ₂₂	15.5	0.15	19991029	349.68728	132.20290	277.59112	3.01115	0.2427875	2.3562979	21	1	10 days	0.39	Williams	1999 VN ₂₂
1999 VO ₂₂	13.4	0.15	19991029	30.91435	304.97453	13.49626	11.22800	0.4363165	3.7516078	12	1	11 days	0.47	Williams	1999 VO ₂₂
1999 VP ₂₂	15.6	0.15	19991029	348.61401	86.78266	326.02579	3.29592	0.2570871	2.3133883	12	1	10 days	0.31	Williams	1999 VP ₂₂
1999 VQ ₂₂	13.8	0.15	19991029	309.08197	222.61913	234.85020	11.88540	0.1429198	2.5460366	12	1	17 days	0.26	Williams	1999 VQ ₂₂
1999 VS ₂₂	14.4	0.15	19991029	11.43506	134.77300	245.61348	6.04852	0.1524532	2.3354459	8	1	3 days	0.16	E Williams	1999 VS ₂₂
1999 VT ₂₂	13.4	0.15	19991029	320.12340	129.50377	327.59646	8.51037	0.1729680	2.6977032	8	1	4 days	0.20	Williams	1999 VT ₂₂
1999 VW ₂₂	13.9	0.15	19991029	289.06400	334.48396	129.32564	15.49343	0.0240413	2.6916918	10	1	4 days	0.65	Williams	1999 VW ₂₂
1999 VX ₂₂	16.9	0.15	19991118	339.82044	279.80498	145.08338	2.85464	0.0473367	2.2461539	9	1	6 days	0.24	Nakano	1999 VX ₂₂
1999 VB ₂₃	15.4	0.15	19991029	145.64378	4.72315	238.92751	8.66964	0.0830429	2.5991284	9	1	10 days	0.59	E Williams	1999 VB ₂₃
1999 VC ₂₃	16.0	0.15	19991029	2.16297	333.06715	71.24756	11.96161	0.2131546	2.5351882	13	1	4 days	0.14	Williams	1999 VC ₂₃
1999 VG ₂₃	16.2	0.15	19991029	36.52382	83.71030	258.82006	4.44836	0.2410890	2.3619495	10	1	5 days	1.23	Williams	1999 VG ₂₃
1999 VJ ₂₃	16.1	0.15	19991029	339.73906	74.72485	354.07828	3.43234	0.1606810	2.4565932	10	1	5 days	0.27	Williams	1999 VJ ₂₃
1999 VL ₂₃	15.1	0.15	19991029	340.43842	211.79228	222.16720	23.03769	0.2592688	2.2270388	26	1	13 days	0.37	Williams	1999 VL ₂₃
1999 VN ₂₃	16.2	0.15	19991118	34.21760	309.03917	60.01503	7.63783	0.2802658	2.2036955	11	1	3 days	1.14	E Nakano	1999 VN ₂₃
1999 VO ₂₃	14.0	0.15	19991029	337.94298	233.34625	202.48611	10.39584	0.2720294	2.4672506	8	1	2 days	0.50	E Williams	1999 VO ₂₃
1999 VX ₂₃	16.1	0.15	19991118	20.75997	95.22725	281.30194	4.60953	0.3768082	2.7936156	9	1	9 days	0.39	Nakano	1999 VX ₂₃
1999 VY ₂₃	13.5	0.15	19991029	65.46177	292.37631	51.74890	5.96778	0.0660779	2.6095997	9	1	2 days	0.33	E Williams	1999 VY ₂₃
1999 VA ₂₄	16.7	0.15	19991029	357.28578	144.86125	257.72766	4.07154	0.1249352	2.1661994	11	1	5 days	0.54	Williams	1999 VA ₂₄
1999 VB ₂₄	16.1	0.15	19991029	346.83826	175.99324	245.20128	6.83552	0.2410155	2.7634327	10	1	5 days	0.43	Williams	1999 VB ₂₄
1999 VC ₂₄	14.2	0.15	19991029	352.07784	142.10823	270.72284	4.36079	0.1710105	3.1391879	10	1	5 days	0.68	Williams	1999 VC ₂₄
1999 VD ₂₄	14.5	0.15	19991029	48.57102	76.96880	260.47079	4.84652	0.1560462	2.4856325	9	1	5 days	0.18	Williams	1999 VD ₂₄
1999 VE ₂₄	14.0	0.15	19991029	13.69129	334.61819	50.70840	12.11927	0.2043442	3.1213269	18	1	14 days	0.30	Williams	1999 VE ₂₄
1999 VF ₂₄	12.6	0.15	19991029	5.36277	94.67395	275.25548	12.73822	0.1289375	2.5215729	9	1	12 days	0.23	Williams	1999 VF ₂₄
1999 VG ₂₄	12.7	0.15	19991029	351.28263	339.71425	62.29312	0.70131	0.1447453	3.1046666	9	1	4 days	0.29	E Williams	1999 VG ₂₄
1999 VO ₂₄	13.2	0.15	19991029	3.23995	164.59877	228.90061	11.23405	0.1879888	2.6641400	12	1	5 days	0.21	Williams	1999 VO ₂₄
1999 VQ ₂₄	11.0	0.15	19991118	83.42219	271.49424	96.44497	13.57488	0.0545130	5.1446118	16	1	6 days	0.31	E Williams	1999 VQ ₂₄
1999 VR ₂₄	16.4	0.15	19991029	32.89825	145.08845	230.56092	1.18983	0.1249126	2.3983555	13	1	7 days	0.25	Williams	1999 VR ₂₄
1999 VS ₂₄	14.1	0.15	19991118	309.13404	101.45361	43.60240	3.18577	0.2254587	2.4513595	6	1	5 days	0.43	Nakano	1999 VS ₂₄
1999 VT ₂₄	13.8	0.15	19991118	25.24260	253.22220	130.28460	2.58094	0.2859358	2.5662182	6	1	5 days	0.18	Nakano	1999 VT ₂₄
1999 VU ₂₄	14.4	0.15	19991118	1.60237	357.58297	67.69393	25.15223	0.2161072	2.2618036	6	1	5 days	0.44	Nakano	1999 VU ₂₄
1999 VV ₂₄	13.2	0.15	19991118	42.54418	103.72143	252.40875	8.61736	0.3053732	2.3985236	6	1	5 days	0.21	Nakano	1999 VV ₂₄
1999 VW ₂₄	10.5	0.15	19991118	40.88841	127.68982	258.66622	18.13527	0.0888086	3.2397709	6	1	5 days	0.19	Nakano	1999 VW ₂₄

1999 VX ₂₄	14.2	0.15	19991118	18.63244	185.30532	211.58978	3.71856	0.2533275	2.3737762	6	1	5 days	0.27		Nakano	1999 VX ₂₄
1999 VZ ₂₄	12.6	0.15	19991118	345.91027	14.35764	77.18830	10.52520	0.1351375	2.7731450	6	1	5 days	0.14		Nakano	1999 VZ ₂₄
1999 VA ₂₅	14.0	0.15	19991118	24.16943	327.41924	66.86425	5.72450	0.1898209	2.2524559	6	1	5 days	0.39		Nakano	1999 VA ₂₅
1999 VB ₂₅	13.3	0.15	19991118	20.93495	312.54746	90.72952	14.07659	0.1488586	2.6579808	6	1	5 days	0.36		Nakano	1999 VB ₂₅
1999 VC ₂₅	14.2	0.15	19991118	19.54411	284.32639	106.51750	5.37840	0.3250589	2.7541155	6	1	5 days	0.23		Nakano	1999 VC ₂₅
1999 VD ₂₅	12.1	0.15	19991118	247.88681	132.99082	76.36700	19.96367	0.2395164	2.5699512	6	1	5 days	0.32		Nakano	1999 VD ₂₅
1999 VF ₂₅	14.5	0.15	19991118	76.70538	99.38718	250.27695	11.57438	0.0653472	2.4836935	6	1	5 days	0.61		Nakano	1999 VF ₂₅
1999 VG ₂₅	13.0	0.15	19991118	19.60771	12.94618	35.54034	3.98290	0.1033723	2.4453783	6	1	5 days	0.33		Nakano	1999 VG ₂₅
1999 VH ₂₅	14.2	0.15	19991118	23.96070	12.43455	22.12050	3.24436	0.2095145	2.3996185	6	1	5 days	0.35		Nakano	1999 VH ₂₅
1999 VJ ₂₅	12.5	0.15	19991118	266.64661	288.93505	272.59448	5.03232	0.3218824	2.1604913	6	1	5 days	0.60	E	Nakano	1999 VJ ₂₅
1999 VK ₂₅	13.8	0.15	19991118	111.40341	39.96865	271.41006	6.32471	0.1203156	2.3903979	6	1	5 days	0.50	E	Nakano	1999 VK ₂₅
1999 VN ₂₅	13.0	0.15	19991118	275.01316	230.82647	310.91433	3.60270	0.2075979	2.1558644	6	1	5 days	0.67		Nakano	1999 VN ₂₅
1999 VQ ₂₅	14.6	0.15	19991029	69.34025	73.92391	247.11669	4.34788	0.0790867	2.7642838	25	1	13 days	0.39		Williams	1999 VQ ₂₅
1999 VT ₂₅	21.5	0.15	19991029	276.83085	318.97365	222.38586	5.33958	0.5356522	1.1717254	31	1	4 days	0.63		Williams	1999 VT ₂₅
1999 VU ₂₅	24.0	0.15	19991029	1.15185	161.04654	229.88687	5.96484	0.4771074	2.0167385	13	1	4 days	0.66		Williams	1999 VU ₂₅
1999 VV ₂₅	25.0	0.15	19991029	349.29730	204.27916	232.05545	7.48811	0.5602338	2.2387892	28	1	3 days	0.87		Williams	1999 VV ₂₅
1999 VW ₂₅	25.3	0.15	19991029	167.27427	354.73235	232.37893	10.77472	0.1121654	0.9286697	31	1	3 days	0.90		Williams	1999 VW ₂₅
1999 VX ₂₅	26.7	0.15	19990810	98.15659	152.87813	55.83931	1.68667	0.1398675	0.8978432	40	1	5 days	0.46	M-v 7	Williams	1999 VX ₂₅
1999 VY ₂₅	15.5	0.15	19991029	30.19028	289.13268	92.70631	10.35197	0.2920108	2.7092148	12	1	3 days	0.27		Williams	1999 VY ₂₅
1999 VA ₂₆	14.9	0.15	19991118	311.12472	56.19217	64.10581	12.80273	0.2353105	3.0995250	9	1	5 days	0.15		Nakano	1999 VA ₂₆
1999 VQ ₂₇	15.0	0.15	19991029	10.45878	36.98741	342.47990	1.75296	0.1883418	2.3957253	14	1	14 days	0.20		Williams	1999 VQ ₂₇
1999 VW ₂₇	14.6	0.15	19991029	233.13472	320.00500	234.40347	3.64053	0.1646524	2.5554389	21	1	15 days	0.33		Williams	1999 VW ₂₇
1999 VX ₂₇	16.5	0.15	19991029	301.70301	74.54297	59.99470	3.60600	0.2177365	2.5705608	11	1	4 days	0.83	E	Williams	1999 VX ₂₇
1999 VY ₂₇	14.3	0.15	19991118	65.44266	26.07200	301.43857	15.53079	0.0938358	2.4405400	11	1	5 days	0.25		Marsden	1999 VY ₂₇
1999 VX ₂₉	15.8	0.15	19991118	9.93401	149.88663	252.25915	2.34657	0.2232299	2.6096788	16	1	16 days	0.38		Nakano	1999 VX ₂₉
1999 VE ₃₈	14.8	0.15	19991029	28.68095	129.39329	219.80876	9.25651	0.2104495	3.2076009	16	1	11 days	0.29		Williams	1999 VE ₃₈
1999 VF ₃₈	16.5	0.15	19991029	211.93840	324.30694	222.26218	5.91604	0.0904936	2.1855268	14	1	11 days	0.47		Williams	1999 VF ₃₈
1999 VK ₃₈	16.3	0.15	19991029	50.11258	284.60421	39.23671	3.80735	0.1942970	2.4108155	14	1	12 days	0.40		Williams	1999 VK ₃₈
1999 VC ₄₀	16.9	0.15	19991029	1.72895	350.98922	44.55958	5.03860	0.1455252	2.7249234	9	1	3 days	0.24	E	Williams	1999 VC ₄₀
1999 VO ₄₀	16.2	0.15	19991029	77.57775	268.64661	28.81944	6.38428	0.2104501	2.2587603	9	1	4 days	0.45	E	Williams	1999 VO ₄₀
1999 VC ₄₁	16.9	0.15	19991029	9.73051	159.89486	220.23224	7.73419	0.1590850	2.5607793	15	1	11 days	0.47		Williams	1999 VC ₄₁
1999 WA	14.9	0.15	19991029	18.04390	313.59916	68.15027	3.59427	0.2141013	2.3819056	24	1	16 days	0.63		Williams	1999 WA
1999 WB	13.7	0.15	19991029	33.54698	131.79000	232.18150	12.59000	0.1988815	2.6815303	10	1	5 days	0.30		Williams	1999 WB
1999 WC	14.1	0.15	19991029	92.31071	303.37298	350.25481	13.25379	0.1959746	2.5781598	12	1	3 days	0.46		Williams	1999 WC
1999 WD	13.4	0.15	19991029	347.44252	340.18576	87.34958	1.72900	0.0207363	2.7857447	20	1	17 days	0.66		Williams	1999 WD
1999 WE	16.5	0.15	19991118	9.46701	176.12315	233.88811	17.39832	0.0983718	1.9007704	7	1	2 days	0.39		Williams	1999 WE
1999 WF	12.8	0.15	19991029	339.62320	257.87940	185.80212	0.83944	0.1090480	3.2175380	15	1	15 days	0.30		Williams	1999 WF
1999 WP	14.3	0.15	19991118	7.85035	261.23519	151.97172	1.26813	0.1988308	2.3639097	7	1	10 days	0.51		Nakano	1999 WP
1999 WR	14.0	0.15	19991029	142.67532	22.85814	221.55384	5.03019	0.2283157	2.4785223	17	1	16 days	0.57		Williams	1999 WR
1999 WY	14.6	0.15	19991118	30.44093	95.57358	286.11124	26.00340	0.4393656	2.6752212	30	1	4 days	0.62		Williams	1999 WY
2040 P-L	16.8	0.15	19990810	357.83524	342.97404	1.03303	4.81935	0.2442831	2.1944166	82	3	1960–1999	0.74	M-v 4	Williams	36578 2040 P-L
2054 P-L	14.4	0.15	19990810	176.26822	329.36660	227.19626	4.75107	0.1434638	2.3209974	72	3	1960–1999	0.55	M-v 4	Williams	36578 2054 P-L
2095 P-L	15.4	0.15	19990810	325.79001	117.32742	330.18923	2.53004	0.1256495	2.6374229	24	6	1960–1999	0.75	M-v 2	Williams	32785 2095 P-L
2100 P-L	14.3	0.15	19990810	107.69772	75.62695	193.30067	16.80640	0.0735061	2.8618571	46	3	1960–1999	0.67	M-v 3	Williams	36578 2100 P-L
2113 P-L	15.2	0.15	19990810	323.90116	166.19272	222.45366	3.52812	0.0891647	2.6626628	55	4	1960–1999	0.80	M-v 3	Williams	36578 2113 P-L
2129 P-L	15.0	0.15	19990810	244.77190	278.55241	201.53457	5.53471	0.0874279	2.4799588	45	3	1960–1999	0.72	M-v 4	Williams	36578 2129 P-L
2221 P-L	16.8	0.15	19990810	72.62783	72.68126	236.76340	3.57785	0.1234665	2.1819235	24	4	1960–1999	0.74	M-v 2	Williams	32343 2221 P-L
2506 P-L	15.0	0.15	19990810	7.18703	315.80607	7.51894	11.99267	0.2081292	2.6644449	72	5	1960–1999	0.83	M-v 2	Williams	36578 2506 P-L
2508 P-L	15.1	0.15	19990810	333.60562	351.01736	10.19530	6.37739	0.2501766	2.3312579	49	5	1951–1999	0.74	M-v 2	Williams	36578 2508 P-L
2514 P-L	15.7	0.15	19990810	13.27746	322.43322	9.02787	11.89099	0.1819574	2.6591134	45	3	1960–1999	0.94	M-v 4	Williams	36578 2514 P-L
2588 P-L	15.1	0.15	19990810	272.31828	93.81762	18.10026	6.18362	0.1725718	2.3218347	44	2	1960–1999	0.48	M-v 4	Williams	36491 2588 P-L
2589 P-L	13.6	0.15	19990810	303.68605	18.91291	145.38119	3.23259	0.1522968	2.5999516	46	3	1960–1999	0.69	M-v 5	Williams	33383 2589 P-L
2613 P-L	14.5	0.15	19990810	332.54654	220.08691	192.88450	4.51632	0.1480333	3.1324122	64	4	1960–1999	0.55	M-v 2	Williams	36578 2613 P-L

2665 P-L	16.3	0.15	19990810	13.25781	160.44677	171.15348	3.95756	0.2583294	2.4752108	49	3	1960-1999	0.72	M-v	4	Williams	36578	2665 P-L
2806 P-L	16.3	0.15	19990810	18.47556	332.76869	11.07046	7.60377	0.1826498	2.4721170	22	3	1960-1999	0.42	M-v	4	Williams	36579	2806 P-L
3063 P-L	12.8	0.15	19990810	297.24954	247.51309	291.27356	6.92430	0.0159271	3.3564539	34	5	1960-1999	0.60	M-v	1	Williams	33784	3063 P-L
3087 P-L	12.4	0.15	19990810	104.56233	86.95697	261.44216	8.31242	0.1054490	3.0613820	59	4	1960-1999	0.61	M-v	1	Williams	34616	3087 P-L
3090 P-L	13.1	0.15	19990810	280.88648	198.06807	231.49117	14.20750	0.2318834	3.1633641	65	3	1960-1999	0.62	M-v	3	Williams	36579	3090 P-L
3092 P-L	14.4	0.15	19990810	55.98075	2.70137	295.17264	7.37489	0.2381307	2.6496027	38	3	1960-1999	0.58	M-v	4	Williams	36579	3092 P-L
3093 P-L	13.4	0.15	19990810	83.80401	305.21820	300.79762	12.32213	0.0840381	2.8871591	31	3	1960-1999	0.54	M-v	2	Williams	36491	3093 P-L
3503 P-L	14.1	0.15	19990810	70.91487	57.16728	244.68125	11.37604	0.1521703	2.6435918	52	3	1960-1999	0.62	M-v	3	Williams	36579	3503 P-L
3504 P-L	14.9	0.15	19990810	336.93667	40.29014	331.13086	11.49290	0.1979335	2.6632468	56	2	1960-1999	0.49	M-v	4	Williams	36491	3504 P-L
3563 P-L	14.0	0.15	19990810	314.22283	87.70918	342.97710	16.15348	0.2081920	3.1447767	31	2	1960-1999	0.49	M-v	4	Williams	36492	3563 P-L
4026 P-L	13.2	0.15	19990810	152.45648	249.29345	359.74022	13.27625	0.1255082	2.6259240	48	5	1960-1999	0.74	M-v	2	Williams	36579	4026 P-L
4037 P-L	14.3	0.15	19990810	282.45748	97.30717	358.02861	6.85064	0.0865621	2.3198095	61	4	1960-1999	0.47	M-v	3	Williams	36579	4037 P-L
4060 P-L	14.1	0.15	19990810	196.34568	289.25323	241.86787	1.60339	0.0337042	2.6530287	79	4	1960-1999	0.75	M-v	4	Williams	36579	4060 P-L
4104 P-L	15.8	0.15	19990810	343.74564	172.05120	209.25866	6.09297	0.1231902	2.3219222	38	2	1960-1999	0.52	M-v	4	Williams	36492	4104 P-L
4206 P-L	14.5	0.15	19990810	51.82606	328.55663	350.20653	11.77258	0.1719089	2.3134688	54	6	1960-1999	0.68	M-v	2	Williams	29141	4206 P-L
4214 P-L	14.1	0.15	19990810	241.48616	255.47219	232.02532	4.61901	0.0759491	3.1471900	49	4	1960-1999	0.72	M-v	2	Williams	36579	4214 P-L
4315 P-L	14.9	0.15	19990810	93.19170	59.05014	211.21244	1.45149	0.0220405	2.8721210	18	3	1960-1999	0.60	M-v	4	Williams	30466	4315 P-L
4526 P-L	13.6	0.15	19990810	328.05731	136.71007	358.30057	2.34486	0.1419915	2.4346981	68	5	1960-1999	0.62	M-v	2	Williams	33129	4526 P-L
4588 P-L	15.2	0.15	19990810	48.14768	143.51963	188.13384	5.67060	0.1762858	2.3102722	44	5	1960-1999	0.61	M-v	1	Williams	36579	4588 P-L
4638 P-L	15.0	0.15	19990810	51.53240	199.84513	137.58321	1.67159	0.0858681	2.6380696	33	4	1960-1999	0.68	M-v	1	Williams	29948	4638 P-L
4646 P-L	12.7	0.15	19990810	329.53014	288.91067	186.07994	10.83189	0.1208316	3.0854047	89	3	1960-1999	0.66	M-v	3	Williams	36579	4646 P-L
4647 P-L	15.3	0.15	19990810	110.58487	76.59601	194.58019	1.51228	0.1238832	2.1790389	43	3	1960-1999	0.61	M-v	4	Williams	32343	4647 P-L
4764 P-L	14.1	0.15	19990810	144.85713	44.99655	152.21325	2.24531	0.0324718	2.8830641	53	4	1960-1999	0.70	M-v	2	Williams	36579	4764 P-L
4893 P-L	14.6	0.15	19990810	266.75478	61.18992	25.46925	2.27897	0.0280094	2.8795339	26	2	1960-1999	0.66	M-v	5	Williams	36579	4893 P-L
6054 P-L	13.9	0.15	19990810	13.00488	181.90805	205.17824	3.86484	0.2058059	3.1064391	39	5	1955-1999	0.72	M-v	1	Williams	32536	6054 P-L
6056 P-L	15.2	0.15	19990810	325.33132	198.01808	199.03720	8.53310	0.1395669	2.4753058	46	3	1960-1999	0.58	M-v	3	Williams	36492	6056 P-L
6077 P-L	13.9	0.15	19990810	16.03871	59.94498	343.26156	3.21837	0.0787602	3.0946123	55	4	1960-1999	0.61	M-v	1	Williams	32785	6077 P-L
6193 P-L	15.3	0.15	19990810	30.84869	138.07195	191.64901	12.39293	0.1217834	2.6496875	42	4	1960-1999	0.74	M-v	3	Williams	36579	6193 P-L
6326 P-L	13.9	0.15	19990810	286.73985	203.07537	236.66318	1.13841	0.1231698	3.1448040	39	2	1960-1999	0.45	M-v	4	Williams	36579	6326 P-L
6529 P-L	14.0	0.15	19990810	51.67930	203.30132	126.50303	2.23396	0.1563560	3.1075676	41	3	1960-1999	0.52	M-v	3	Williams	36121	6529 P-L
6602 P-L	16.1	0.15	19990810	338.42686	2.60206	11.68951	6.56860	0.1373632	2.1931562	88	3	1960-1999	0.69	M-v	4	Williams	36579	6602 P-L
6617 P-L	14.7	0.15	19990810	275.70627	87.52849	18.72495	6.48484	0.1077633	2.4690539	44	2	1960-1999	0.49	M-v	4	Williams	36492	6617 P-L
6622 P-L	14.8	0.15	19990810	213.53227	0.32097	160.04035	3.04431	0.1099620	2.3177957	39	2	1960-1999	0.58	M-v	4	Williams	36492	6622 P-L
6626 P-L	15.3	0.15	19990810	178.91774	220.78857	1.73371	2.57868	0.0618694	2.3033664	28	6	1960-1999	0.59	M-v	1	Williams	32343	6626 P-L
6634 P-L	13.5	0.15	19990810	319.60303	20.37998	80.61864	3.65518	0.1210489	3.1061259	36	4	1960-1999	0.55	M-v	2	Williams	32786	6634 P-L
6670 P-L	14.3	0.15	19990810	296.28462	119.90245	10.44625	3.95397	0.1300204	2.6230189	28	6	1960-1999	0.76	M-v	2	Williams	32786	6670 P-L
6745 P-L	13.9	0.15	19990810	315.44468	324.02596	139.58174	2.02628	0.1467043	3.1139242	35	4	1960-1999	0.78	M-v	1	Williams	32786	6745 P-L
7569 P-L	15.1	0.15	19990810	277.78183	32.82203	38.98994	4.17328	0.1091766	2.3292569	64	3	1960-1999	0.51	M-v	3	Williams	36580	7569 P-L
7590 P-L	16.1	0.15	19990810	326.26907	11.55660	35.17673	6.96699	0.2914093	2.6559587	33	3	1960-1999	0.84	M-v	3	Williams	36580	7590 P-L
7606 P-L	16.1	0.15	19990810	7.23400	249.42083	83.43394	3.04349	0.2616302	2.3235318	37	3	1960-1999	0.59	M-v	4	Williams	36580	7606 P-L
9509 P-L	14.6	0.15	19990810	31.29887	124.86127	187.93553	10.89634	0.2553425	2.6512391	73	4	1960-1999	0.64	M-v	2	Williams	36580	9509 P-L
9547 P-L	14.3	0.15	19990810	330.53993	164.98285	189.91652	7.56050	0.2124870	2.4866929	48	3	1960-1999	0.63	M-v	3	Williams	36580	9547 P-L
9609 P-L	15.5	0.15	19990810	67.67007	122.62985	187.91289	3.36128	0.1840138	2.1802791	34	3	1960-1999	0.71	M-v	3	Williams	36122	9609 P-L
1056 T-1	14.5	0.15	19990810	199.24519	217.34818	346.26103	11.57131	0.1337309	2.6466491	28	5	1971-1999	0.80	M-v	2	Williams	36122	1056 T-1
1182 T-1	13.3	0.15	19990810	319.11268	208.26453	188.63423	12.98387	0.1637380	2.6675164	113	3	1971-1999	0.62	M-v	2	Williams	36580	1182 T-1
1222 T-1	14.3	0.15	19990810	19.27450	354.82951	347.17989	11.29011	0.2339111	2.4389716	40	4	1971-1999	0.64	M-v	2	Williams	36580	1222 T-1
1285 T-1	15.6	0.15	19990810	265.02533	173.79001	277.55053	1.43334	0.1061398	2.4260984	74	3	1971-1999	0.58	M-v	3	Williams	36580	1285 T-1
2024 T-1	15.0	0.15	19990810	327.25595	205.28251	182.09499	12.91403	0.1222947	2.6706307	78	3	1971-1999	0.54	M-v	3	Williams	36580	2024 T-1
2183 T-1	15.2	0.15	19990810	304.50234	28.13690	67.84071	2.24634	0.1496103	2.3968025	37	3	1971-1999	0.52	M-v	4	Williams	27926	2183 T-1
2208 T-1	14.3	0.15	19990810	91.63624	232.58905	14.73416	8.47203	0.1888070	2.4549136	116	3	1971-1999	0.67	M-v	2	Williams	36580	2208 T-1
3041 T-1	14.1	0.15	19990810	52.61765	338.30012	333.03221	5.42860	0.1990738	2.6915212	33	3	1971-1999	0.50	M-v	3	Williams	36580	3041 T-1
3195 T-1	14.8	0.15	19990810	280.72107	99.92908	338.89354	4.75595	0.1210368	2.2312337	96	3	1971-1999	0.61	M-v	3	Williams	36580	3195 T-1
3243 T-1	15.2	0.15	19990810	355.09745	347.90810	357.79418	3.92067	0.1423113	2.2504422	94	4	1971-1999	0.78	M-v	3	Williams	36580	3243 T-1

3770 T-1	15.4	0.15	19990810	134.74915	28.86937	191.20417	6.23518	0.1289192	2.2451095	87	3	1971-1999	0.64	M-v	3	Williams	36580	3770 T-1
4206 T-1	14.6	0.15	19990810	277.94545	37.74033	140.55597	2.75189	0.1756519	2.3734696	27	5	1971-1999	0.74	M-v	2	Williams	32786	4206 T-1
4214 T-1	14.6	0.15	19990810	313.36984	332.06783	153.97139	4.36981	0.1207111	2.6082035	20	5	1971-1999	0.72	M-v	2	Williams	32786	4214 T-1
4273 T-1	14.5	0.15	19990810	315.04947	312.59667	135.64343	5.69243	0.1141541	2.9399917	37	4	1971-1999	0.82	M-v	2	Williams	36580	4273 T-1
4321 T-1	14.0	0.15	19990810	284.58719	76.39818	59.63300	2.55178	0.1489882	2.6236256	40	6	1971-1999	0.76	M-v	2	Williams	32786	4321 T-1
4406 T-1	14.4	0.15	19990810	256.89564	156.00781	18.76953	15.06315	0.0088137	2.6223616	37	4	1971-1999	0.93	M-v	2	Williams	34338	4406 T-1
1005 T-2	13.7	0.15	19990810	308.96491	171.06073	207.63933	2.19374	0.0966195	3.0277567	41	3	1973-1999	0.71	M-v	3	Williams	36122	1005 T-2
1038 T-2	17.0	0.15	19990810	319.63920	183.76542	210.96614	1.58683	0.1440982	2.1946625	44	3	1960-1999	0.66	M-v	5	Williams	36580	1038 T-2
1041 T-2	13.8	0.15	19990810	60.81407	160.98701	175.96473	2.05152	0.1195825	2.9445998	92	6	1973-1999	0.76	M-v	1	Williams	33130	1041 T-2
1043 T-2	15.4	0.15	19990810	253.41414	163.79041	306.65956	2.03588	0.1729234	2.4015169	34	3	1973-1999	0.92	M-v	4	Williams	36580	1043 T-2
1059 T-2	14.3	0.15	19990810	66.48638	52.19725	209.43084	3.85988	0.0427488	2.4089723	101	3	1973-1999	0.69	M-v	2	Williams	36580	1059 T-2
1083 T-2	14.5	0.15	19990810	318.68202	119.41197	0.17260	2.99140	0.1927916	2.6069660	66	5	1971-1999	0.74	M-v	1	Williams	32786	1083 T-2
1102 T-2	14.6	0.15	19990810	115.47469	79.21077	198.87627	1.59173	0.0753800	2.9506014	46	5	1973-1999	0.84	M-v	1	Williams	36580	1102 T-2
1108 T-2	14.6	0.15	19990810	34.53896	313.39878	353.24370	6.35846	0.1308708	2.3966805	111	3	1973-1999	0.71	M-v	3	Williams	36580	1108 T-2
1114 T-2	16.8	0.15	19990810	334.21428	77.71544	301.70012	0.39646	0.1942886	2.3992801	71	3	1973-1999	0.54	M-v	3	Williams	36580	1114 T-2
1131 T-2	16.4	0.15	19990810	100.14691	306.70904	311.34391	1.92917	0.1746211	2.3828245	32	4	1973-1999	0.74	M-v	2	Williams	36123	1131 T-2
1150 T-2	15.5	0.15	19990810	69.59802	259.40978	44.87207	1.21955	0.1973048	2.3723097	42	4	1973-1999	1.11	M-v	2	Williams	32786	1150 T-2
1171 T-2	13.9	0.15	19990810	74.22749	292.43198	0.19238	9.69355	0.0849091	2.9817252	29	3	1973-1999	1.37	M-v	4	Williams	31269	1171 T-2
1173 T-2	14.1	0.15	19990810	332.74611	46.25332	1.22779	9.39309	0.0682348	2.9810032	51	3	1973-1999	0.80	M-v	3	Williams	36580	1173 T-2
1236 T-2	15.1	0.15	19990810	331.66813	17.71826	347.34216	1.79833	0.1406375	2.4072926	82	4	1973-1999	0.87	M-v	3	Williams	36580	1236 T-2
1242 T-2	14.1	0.15	19990810	186.17206	33.80347	184.14186	13.87809	0.1952320	2.6057672	44	4	1973-1999	0.88	M-v	3	Williams	36123	1242 T-2
1259 T-2	13.5	0.15	19990810	337.12606	91.45681	31.98072	2.35957	0.0445779	2.8918945	42	3	1973-1999	0.94	M-v	4	Williams	33589	1259 T-2
1260 T-2	14.3	0.15	19990810	248.18024	303.80596	179.70035	7.86716	0.1176877	2.6549014	57	4	1960-1999	0.79	M-v	3	Williams	36580	1260 T-2
1264 T-2	14.0	0.15	19990810	10.35994	38.15401	355.42012	2.17911	0.1257773	2.6226472	41	5	1973-1999	0.80	M-v	1	Williams	36580	1264 T-2
1278 T-2	14.3	0.15	19990810	338.79704	231.09237	182.15132	10.56358	0.1089018	2.9725150	60	3	1973-1999	0.82	M-v	3	Williams	36580	1278 T-2
1474 T-2	15.4	0.15	19990810	61.03986	67.75464	224.66174	2.63211	0.1666023	2.1843496	94	3	1973-1999	0.83	M-v	3	Williams	36581	1474 T-2
1503 T-2	16.1	0.15	19990810	293.29494	229.61361	216.40941	2.14185	0.1528527	2.3924860	55	3	1973-1999	0.77	M-v	2	Williams	36581	1503 T-2
2040 T-2	14.1	0.15	19990810	26.71856	201.18907	188.21478	7.29508	0.0162794	2.9377014	69	8	1971-1999	0.99	M-v	1	Williams	32786	2040 T-2
2085 T-2	14.2	0.15	19990810	263.99229	149.89042	349.60399	4.50620	0.1288745	2.6323756	34	3	1973-1999	0.95	M-v	5	Williams	24764	2085 T-2
2092 T-2	14.5	0.15	19990810	215.48353	337.47758	181.53174	5.29867	0.0988407	2.6496491	61	5	1960-1999	0.99	M-v	2	Williams	36581	2092 T-2
2097 T-2	15.2	0.15	19990810	219.31551	161.17470	350.96095	6.75405	0.0548177	2.3913356	53	4	1973-1999	0.91	M-v	2	Williams	36581	2097 T-2
2162 T-2	15.1	0.15	19990810	106.01587	85.21720	193.12422	4.45139	0.0787294	2.6297672	46	4	1973-1999	0.82	M-v	1	Williams	36581	2162 T-2
2232 T-2	14.7	0.15	19990810	38.99207	178.86116	174.91711	3.88737	0.0950873	2.3731700	50	6	1951-1999	0.85	M-v	1	Williams	29669	2232 T-2
2258 T-2	14.7	0.15	19990810	52.05598	188.86207	155.17833	2.09006	0.0854953	2.6237453	42	5	1973-1999	0.90	M-v	1	Williams	32537	2258 T-2
2276 T-2	14.7	0.15	19990810	99.29937	247.34522	30.21475	2.39160	0.0643882	2.6383517	31	4	1973-1999	1.05	M-v	1	Williams	32344	2276 T-2
2638 T-2	11.3	0.15	19990810	325.08513	41.48172	52.70398	2.33073	0.0315537	5.1963525	42	3	1973-1999	0.94	M-v	4	Williams	36123	2638 T-2
3086 T-2	14.1	0.15	19990810	24.49279	285.34035	62.57487	4.17343	0.0777234	2.6393781	64	5	1973-1999	0.60	M-v	2	Williams	36581	3086 T-2
3156 T-2	12.1	0.15	19990810	343.92689	27.89291	49.17991	2.40469	0.0483604	5.1599403	29	3	1973-1999	0.65	M-v	4	Williams	34272	3156 T-2
3240 T-2	14.6	0.15	19990810	356.32288	253.68344	106.05585	1.80359	0.1046340	2.9970186	61	2	1973-1999	0.81	M-v	4	Williams	36581	3240 T-2
3270 T-2	14.7	0.15	19990810	240.12300	65.00744	72.65679	3.34598	0.1354042	2.3905016	65	4	1973-1999	0.61	M-v	2	Williams	36581	3270 T-2
4072 T-2	16.5	0.15	19990810	38.18069	284.51362	34.40962	4.65966	0.1891859	2.1835829	38	3	1973-1999	0.71	M-v	3	Williams	36581	4072 T-2
4091 T-2	14.3	0.15	19990810	34.39174	205.48412	109.41296	3.43280	0.1956807	2.6496385	61	3	1973-1999	0.75	M-v	3	Williams	36494	4091 T-2
4262 T-2	15.5	0.15	19990810	153.80425	167.75158	77.97405	3.50765	0.1339622	2.1638013	36	6	1973-1999	0.93	M-v	2	Williams	32344	4262 T-2
4297 T-2	12.8	0.15	19990810	292.59958	57.37680	76.09427	3.43076	0.0377334	3.3822704	51	4	1973-1999	0.73	M-v	2	Williams	36124	4297 T-2
5036 T-2	13.7	0.15	19990810	305.99560	181.35264	262.21199	8.46746	0.0373111	2.6351409	39	3	1973-1999	0.47	M-v	4	Williams	36581	5036 T-2
5161 T-2	13.8	0.15	19990810	280.74329	87.50096	338.42543	12.28093	0.1705038	2.6784104	76	3	1973-1999	0.58	M-v	2	Williams	36581	5161 T-2
5178 T-2	13.5	0.15	19990810	271.88872	196.07921	246.09122	8.71248	0.0666567	3.0143119	45	2	1973-1999	0.59	M-v	4	Williams	36581	5178 T-2
5485 T-2	13.3	0.15	19990810	314.49465	133.06482	298.65810	5.69152	0.0891594	2.3854091	50	7	1954-1999	0.82	M-v	1	Williams	36581	5485 T-2
1039 T-3	14.5	0.15	19990810	69.18550	323.05720	346.41597	12.80422	0.1298181	2.6601120	28	4	1977-1999	0.68	M-v	2	Williams	29142	1039 T-3
1068 T-3	13.3	0.15	19990810	268.02817	114.90152	2.76817	21.80380	0.1919100	3.1356671	57	3	1977-1999	0.60	M-v	3	Williams	36581	1068 T-3
1071 T-3	14.1	0.15	19990810	12.98395	0.16959	324.90253	5.94879	0.1478660	2.3856131	86	4	1977-1999	0.60	M-v	2	Williams	36581	1071 T-3
1079 T-3	14.3	0.15	19990810	37.55303	57.74133	243.79472	11.78848	0.1637762	2.6935861	36	2	1977-1999	0.68	M-v	4	Williams	36581	1079 T-3
1080 T-3	13.1	0.15	19990810	212.04426	257.31924	332.54505	11.16220	0.1095654	2.6037964	46	5	1977-1999	0.80	M-v	2	Williams	34618	1080 T-3

1102 T-3	13.4	0.15	19990810	245.80179	266.82953	248.39296	11.56661	0.1478745	3.1030333	48	4	1977–1999	0.62	M-v	1	Williams	36581	1102 T-3
1158 T-3	13.0	0.15	19990810	172.99619	327.05665	259.67498	10.01170	0.1065069	3.0690001	43	3	1977–1999	0.73	M-v	4	Williams	36581	1158 T-3
1168 T-3	14.4	0.15	19990810	328.60101	49.71679	355.94270	13.32872	0.1623223	2.6853422	72	3	1977–1999	0.63	M-v	3	Williams	36581	1168 T-3
1177 T-3	12.6	0.15	19990810	216.56559	244.22428	284.69783	7.53700	0.1632851	3.1303957	68	3	1977–1999	0.71	M-v	3	Williams	36581	1177 T-3
2065 T-3	16.0	0.15	19990810	9.44855	355.86295	329.80257	4.59856	0.0145975	2.1592974	43	3	1977–1999	0.85	M-v	4	Williams	36582	2065 T-3
2239 T-3	14.5	0.15	19990810	232.60641	190.26869	322.99689	5.00343	0.1138285	2.6792547	47	3	1977–1999	0.76	M-v	4	Williams	36582	2239 T-3
2315 T-3	15.5	0.15	19990810	310.13387	194.79928	221.46426	1.94613	0.1437751	2.3814980	68	3	1977–1999	0.73	M-v	3	Williams	36582	2315 T-3
2416 T-3	13.9	0.15	19990810	270.63061	197.04690	274.43185	1.40156	0.1664266	2.3792398	71	3	1977–1999	0.61	M-v	4	Williams	36582	2416 T-3
3093 T-3	14.7	0.15	19990810	346.81836	156.11155	195.11236	5.88982	0.1397888	2.3914106	88	3	1977–1999	0.81	M-v	3	Williams	36582	3093 T-3
3105 T-3	14.9	0.15	19990810	349.60691	172.52394	170.90024	2.71295	0.1809438	2.3917277	102	5	1977–1999	0.69	M-v	2	Williams	36582	3105 T-3
3261 T-3	13.9	0.15	19990810	144.53627	200.11343	71.90417	1.30011	0.0699224	3.0353823	42	4	1977–1999	0.89	M-v	1	Williams	36125	3261 T-3
3283 T-3	15.0	0.15	19990810	264.10480	309.31708	169.63078	3.57735	0.0360478	2.6744417	33	5	1977–1999	0.75	M-v	1	Williams	36582	3283 T-3
3482 T-3	14.6	0.15	19990810	345.11030	73.34466	336.69521	0.34258	0.1773043	3.0942906	56	4	1977–1999	0.66	M-v	1	Williams	36582	3482 T-3
3517 T-3	14.4	0.15	19990810	44.37254	353.14577	34.41616	2.05489	0.1102529	2.6204302	46	4	1977–1999	0.84	M-v	2	Williams	36125	3517 T-3
3574 T-3	13.8	0.15	19990810	352.67691	231.30445	185.43105	10.34248	0.0734741	3.0671266	33	4	1977–1999	0.73	M-v	2	Williams	36582	3574 T-3
4039 T-3	15.1	0.15	19990810	79.49345	148.65139	120.16308	2.63025	0.0989652	2.1460492	84	3	1977–1999	0.66	M-v	3	Williams	36582	4039 T-3
4054 T-3	13.1	0.15	19990810	63.42838	271.73701	42.14598	10.60773	0.1031819	3.0881668	84	4	1964–1999	0.61	M-v	1	Williams	36582	4054 T-3
4072 T-3	13.7	0.15	19990810	316.22836	293.60687	159.44460	5.86319	0.1303501	3.0866087	45	3	1977–1999	0.79	M-v	4	Williams	36582	4072 T-3
4220 T-3	13.4	0.15	19990810	282.28462	47.68182	30.96586	22.21577	0.1301192	3.1465873	47	3	1977–1999	0.77	M-v	3	Williams	36582	4220 T-3
4340 T-3	14.7	0.15	19990810	358.45778	287.43501	56.59476	7.13320	0.1378688	2.3870287	26	3	1977–1999	0.74	M-v	3	Williams	34277	4340 T-3
5078 T-3	12.5	0.15	19990810	79.28280	222.01127	67.61960	10.76200	0.0468968	3.1124878	28	3	1977–1999	0.86	M-v	3	Williams	30294	5078 T-3
5122 T-3	15.0	0.15	19990810	60.05872	192.66252	112.37005	6.94656	0.2478145	2.3575071	50	4	1977–1999	0.96	M-v	2	Williams	32344	5122 T-3
5124 T-3	15.1	0.15	19990810	226.70831	58.30274	102.96671	7.18148	0.0594008	2.3650738	31	3	1977–1999	0.72	M-v	4	Williams	29321	5124 T-3

1999 SN₁₄₅ = 1998 UY₃₈ (A. Doppler)

1998 XS₉₆ = 1999 AA₁₆ (M. E. Sansaturio)

1998 XZ₉₆ = 1999 CC₈₅ (M. E. Sansaturio)

1999 RP₁₆₃ = 1999 TV₂₄ (G. V. Williams)

1999 SQ₁ = 1999 RQ₂₁₃ (G. V. Williams)

1999 TS₂₆ = 1999 TA₃₆ (G. V. Williams)

NEW NAMES OF MINOR PLANETS

(4238) Audrey = 1980 GF

Discovered 1980 Apr. 13 by A. Mrkos at Kleť.

Brought up in wartime Holland, Audrey Hepburn (1929–1993) became a highly acclaimed film actress. After her 1951 debut on Broadway in *Gigi*, her film successes included *Roman Holiday*, *Funny Face*, *Breakfast at Tiffany's*, *Charade*, *My Fair Lady* and *Wait Until Dark*. She later worked to improve the lot of children in Africa.

(4423) Golden = 1949 GH

Discovered 1949 Apr. 4 at the Goethe Link Observatory, Indiana University.

William T. Golden (b. 1909), author-editor of books on science policy, has served as treasurer of the American Association for the Advancement of Science for more than 30 years. Original architect of the office of science advisor to the U.S. president, he also played a key role in establishing the National Science Foundation.

(4661) Yebes = 1982 WM

Discovered 1982 Nov. 17 by M. de Pascual at Yebes.

The village of Yebes, in the Alcarria region, is beautifully described by the Spanish Nobel laureate Camilo José Cela in one of his early books. This was the first minor planet discovered at the Centro Astronómico de Yebes, an optical and radio observatory located 70 km from Madrid.

(4767) Sutoku = 1987 GC

Discovered 1987 Apr. 4 by T. Nijima and T. Urata at Ojima.

Sutoku (1119–1164), the 75th emperor of Japan, succeeded to the throne in 1123. After his abdication, he was defeated in the war of Hogen against his brother, emperor Goshirakawa, and exiled for life.

(5578) Takakura = 1987 BC

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

Takakura (1161–1181), the 80th emperor of Japan, succeeded to the throne in 1168. He was the seventh son of emperor Goshirakawa and an expert at playing the Japanese flute.

(5650) Mochihito-o = 1990 XK

Discovered 1990 Dec. 10 by A. Natori and T. Urata at the JCPM Yakiimo Station.

Prince Mochihito-o (1151–1180) was the third son of emperor Goshirakawa. He was a fount of knowledge, known for his poetry and for playing the Japanese flute. With Minamoto Yorimasa, he fought against the Heike without success.

(5683) Bifukumonin = 1990 UD

Discovered 1990 Oct. 19 by T. Urata at the Nihondaira Observatory.

Bifukumon-in Tokushi (1117–1160) was the empress of emperor Toba. Her interference in the succession of emperor Goshirakawa became a cause of the war of Hogen.

(5684) Kogo = 1990 UB₂

Discovered 1990 Oct. 21 by T. Urata at the Nihondaira Observatory.

Kogo-no-Tsubone was the lover of emperor Takakura. She is the most well-known heroine in the story of Heike. She excelled at playing Koto, the Japanese lyre, but she was ostracized from the palace and went to live in seclusion.

(5719) Křižík = 1983 RX

Discovered 1983 Sept. 7 by A. Mrkos at Kleť.

Czech electrical engineer and inventor František Křižík (1847–1941), constructed an arc lamp with a regulating gear in 1881 and the first electric street car in Prague in 1891. He contributed significantly in the electrification of Bohemia. The name was suggested by Z. Moravec and M. Tichý.

(5894) Telč = 1982 RM₁

Discovered 1982 Sept. 14 by A. Mrkos at Kleť.

Telč, a small town on the border of southern Bohemia and Moravia, was founded in the twelfth century. The historic center of Telč has been listed on the UNESCO World Heritage roster of cultural and natural sites since 1992. The name was suggested by M. Tichý.

(6139) Naomi = 1992 AD₁

Discovered 1992 Jan. 10 by A. Sugie at the Dync Astronomical Observatory. Naomi Sugie (b. 1966) is the wife of the discoverer.

(6199) Yoshiokayayoi = 1992 BK₁

Discovered 1992 Jan. 26 by A. Sugie at the Dync Astronomical Observatory.

Yayoi Yoshioka (1871–1959) was the 27th licenced female physician in Japan and entered the medical profession in 1892, when it was difficult for women to be doctors. In 1900, she and her husband Arata founded the Tokyo Women's Medical School, the first in Japan to accept female students.

(6211) Tsubame = 1991 DO

Discovered 1991 Feb. 19 by S. Inoda and T. Urata at the Karasuyama Astronomical Observatory.

Tsubame, Japanese for a swallow, is the nickname of an express train that was a star of Japan's rail transportation system during the 1950s. In 1954 Tsubame achieved the Japanese record of 129 km per hour for steam locomotion. In the 1930s an earlier Tsubame did the Tokyo-Kobe run in 8½ hours.

(6236) Mallard = 1988 WF

Discovered 1988 Nov. 29 at the Nihondaira Observatory.

In 1938 the British steam locomotive "Mallard" set the world's speed record of 203 km per hour for steam locomotion. The name was suggested by B. G. Marsden.

(6275) Kiryu = 1993 VQ

Discovered 1993 Nov. 14 by T. Kobayashi at Oizumi.

The city of Kiryu, in the eastern part of Gunma prefecture, is famous for its textile industry and baseball. The Kiryu-Daiichi junior high school won the eighty-first National High School baseball tournament.

(6276) Kurohone = 1994 AB

Discovered 1994 Jan. 1 by T. Kobayashi at Oizumi.

Kurohone is a small village, with population less than 3000, in the eastern part of Gunma prefecture. It is known for its beautiful parks, clear streams and dark skies.

(6346) Syukumeguri = 1995 AY

Discovered 1995 Jan. 6 by T. Kobayashi at Oizumi.

Syukumeguri is a district in the southern part of the village of Kurohone, Gunma prefecture. The discoverer is constructing there a new search system for comets and minor planets.

(6414) Mizunuma = 1993 UX

Discovered 1993 Oct. 24 by T. Kobayashi at Oizumi.

Mizunuma, a district in the village of Kurohone, in Gunma prefecture, is famous for the hot spring in its railroad station.

(6418) Hanamigahara = 1993 XJ

Discovered 1993 Dec. 8 by T. Kobayashi at Oizumi.

Hanamigahara is beautiful forest park in the northern part of Kurohone village, Gunma prefecture.

(6420) Riheiyyaya = 1993 XG₁

Discovered 1993 Dec. 14 by T. Kobayashi at Oizumi.

Riheiyyaya is a beautiful forest park in the western part of Kurohone village, Gunma prefecture.

(6481) Tenzing = 1988 RH₂

Discovered 1988 Sept. 9 by A. Mrkos at Kleť.

Tenzing Norgay (1914–1986) was a Nepalese mountain climber of the Sherpa tribe. On 1953 May 29, as members of a British party, Tenzing Norgay and the New Zealand mountaineer Edmund Hillary became the first to scale the summit of Mount Everest—and return. The name was suggested by M. Tichý.

(6528) Boden = 1993 FL₂₄

Discovered 1993 Mar. 21 at the European Southern Observatory in the course of the Uppsala-ESO Survey of Asteroids and Comets.

Boden, a city in the province of Norrbotten in northern Sweden, is the birthplace of Mats Lindgren, one of the discoverers of this object. The Boden fortress, located inside the gently sloping wooded hills surrounding the city, was in the early 1900s a part of Sweden's northern line of defense.

(6542) Jacquescousteau = 1985 CH₁

Discovered 1985 Feb. 15 by A. Mrkos at Kleť.

Jacques Yves Cousteau (1910–1997) was a French marine explorer, author and documentary filmmaker. The name was suggested by M. Tichý and Z. Moravec.

(6550) Parlér = 1988 VO₅

Discovered 1988 Nov. 4 by A. Mrkos at Kleť.

Beginning in 1356, the German-born master builder Petr Parlér (*c.* 1333–1399) led the construction of the Gothic St. Vitus cathedral in Prague. The works created by members of the Parlér family are known in both Czech and German medieval architecture. The name was suggested by J. Tichá and M. Tichý.

(6701) Warhol = 1988 AW₁

Discovered 1988 Jan. 14 by A. Mrkos at Kleť.

The American painter and film-maker Andy Warhol (Andrew Warhola, 1928–1987) was a leader of the Pop Art movement. In the 1960s he attracted attention with exhibition of prints of startlingly ordinary images. Warhol worked also on experimental underground films.

(6824) Mallory = 1988 RE₂

Discovered 1988 Sept. 8 by A. Mrkos at Kleť.

George Herbert Leigh Mallory (1886–1924) was a British mountain climber whose 1924 expedition to conquer Everest culminated in a bold and possibly successful drive with Irvine toward the summit. Just 75 years later Mallory's body was recovered 600 meters below the summit after what had been a precipitous fall.

(6825) Irvine = 1988 TJ₂

Discovered 1988 Oct. 4 by A. Mrkos at Kleť.

The British mountaineer Andrew Irvine (1901–1924) was George Mallory's partner for a final bid for the summit of Everest. The two disappeared from the view of their colleagues less than 200 meters from their goal.

(7016) Conandoyle = 1991 YG

Discovered 1991 Dec. 30 by T. Urata at the Nihondaira Observatory.

Educated as a physician, Scots-born Arthur Conan Doyle (1859–1930) became famous for his *Adventures of Sherlock Holmes* and the detective-story genre. His other best-known works include *A Study in Scarlet* (1886), *The Lost World* (1912) and *The Poison Belt* (1913).

(7032) Hitchcock = 1994 VC₂

Discovered 1994 Nov. 3 by Y. Shimizu and T. Urata at the Nachi-Katsuura Observatory.

The British-born American movie director and producer Alfred Joseph Hitchcock (1899–1980) was known as “a master of suspense” and “god of the thriller”. His work includes *North by Northwest* (1959), *Psycho* (1960) and *The Birds* (1963).

(7037) Davidlean = 1995 BK₃

Discovered 1995 Jan. 29 by Y. Shimizu and T. Urata at the Nachi-Katsuura Observatory.

British film director David Lean (1908–1991) was considered a master of both epics and small literary classics. He won Oscars for *The Bridge over the River Kwai* (1957) and *Lawrence of Arabia* (1962).

(7131) Longtom = 1992 YL

Discovered 1992 Dec. 23 by A. Natori and T. Urata at the JCPM Yakiimo Station.

Longtom, the nine-pound cannon in *Treasure Island*, is the nickname of the Nikon 10-cm refractor used regularly by Hoei Nojiri (1885–1977), who ordered the telescope and translated Stevenson's novel into Japanese in 1928. The telescope was at one time also used by Tokyo astronomer Koichiro Tomita.

(7258) Pettarin = 1994 EF

Discovered 1994 Mar. 5 at Santa Lucia Stroncone.

Enrico Pettarin (b. 1970), Italian amateur astronomer, has been for many years the “factotum” at the CCAF (Circolo Culturale Astronomico di Farra d'Isonzo) observatory in Farra d'Isonzo. He likes software, maintains the telescopes and has participated in almost all of the more than 200 new discoveries at this site.

(7838) Feliceierman = 1993 WA

Discovered 1993 Nov. 16 at Farra d'Isonzo.

Felice Ierman (1922–1996), father of this minor planet's co-discoverer Giovanni Ierman, was a strong believer in science and technology who inspired his son's passion for astronomy. He also contributed morally and materially to the construction of the first Farra d'Isonzo observatory.

(8021) Walter = 1990 UO₂

Discovered 1990 Oct. 22 by C. S. Shoemaker and D. H. Levy at Palomar.

Walter Anderson (b. 1944) is a long-time editor of *Parade*, a magazine that reaches more than 80 million readers weekly. For many years he has focused the magazine's positive and uplifting stories. He is also known for his commitment to many causes, including improving literacy in the United States.

(8089) Yugar = 1990 TW₇

Discovered 1990 Oct. 13 by L. D. Schmadel and F. Börngen at Tautenburg.

Yuriy Vasil'evich Karachkin (b. 1940) is a teacher of physics at the school of the Crimean Astrophysical Observatory at Nauchnyj. Many of his pupils entered a university education. ‘Yugar’ is the husband of Lyudmila Karachkina, discoverer of more than 100 minor planets and dear friend of the first discoverer.

(8249) Gershwin = 1980 GG

Discovered 1980 Apr. 13 by A. Mrkos at Kleť.

American composer George Gershwin (1898–1937) was also an accomplished pianist. In his compositions the techniques and forms of art music are blended in varying degrees with the stylistic nuances and techniques of popular music and jazz. The name was suggested by J. Tichá and M. Tichý.

(8358) Rickblakley = 1989 VN₅

Discovered 1989 Nov. 4 by C. S. Shoemaker and D. H. Levy at Palomar.

Since building his first telescope at age 8, Rick Blakley (b. 1949) has become a mostly self-taught mechanical, structural and optical engineer. He has designed instrumentation for several large telescopes, including every detail of the beautiful new stereomicroscope now in use for the Shoemaker-Levy Double Cometograph.

(8373) Stephengould = 1992 AB

Discovered 1992 Jan. 1 by C. S. Shoemaker and E. M. Shoemaker at Palomar.

Stephen Jay Gould (b. 1941) is a biologist, geologist and historian of science at Harvard, but he may be best known for his long-running series of reflective articles in *Natural History* in which he has articulated his view of evolution. In 1972, working with Niles Eldredge, he developed his idea of “punctuated equilibrium”.

(8530) Korbokkur = 1992 UK₅

Discovered 1992 Oct. 25 by M. Hirasawa and S. Suzuki at Nyukasa.

According to the legend of the Ainu people of northern Japan, the members of the Korbokkur tribe were only 3 to 6 cm tall and moved so swiftly they were difficult to see. Satoru Sato began publishing Korbokkur tales in 1959. They are very popular in Japan, and not only for children.

(8551) Daitarabochi = 1994 VC₇

Discovered 1994 Nov. 11 by M. Hirasawa and S. Suzuki at Nyukasa.

According to myth, the giant Daitarabochi built Mt. Fuji using nearby soil. The area from which he dug became Lake Biwa, the largest lake in Japan. The myth also claims that the many lakes in Japan were the footsteps of Daitarabochi.

(8651) Alineraynal = 1989 YU₅

Discovered 1989 Dec. 29 by E. W. Elst at Haute Provence.

Aline Raynal-Roques (b. 1937), professor of botany at the Muséum National d'Histoire Naturelle de Paris, is known for her investigations on taxonomy of tropical plants, mostly parasitic and aquatic, and research in the Sahel desert. Her work was honored in 1995 by the Institut de France.

(8677) Charlier = 1992 ES₅

Discovered 1992 Mar. 2 at the European Southern Observatory in the course of the Uppsala-ESO Survey of Asteroids and Comets.

Carl Vilhelm Ludvig Charlier (1862–1934), professor of astronomy at Uppsala during 1890–1897 and later at Lund, worked in several fields of astronomy, including celestial mechanics and photometry. He was one of the leading founders of stellar statistics, applying mathematical statistics to astronomical problems.

(8678) Bäl = 1992 ER₆

Discovered 1992 Mar. 1 at the European Southern Observatory in the course of the Uppsala-ESO Survey of Asteroids and Comets.

Bäl is a small and typical country parish on the Swedish island of Gotland, often associated on Gotland with the well-known song “Farewell to Bäl”.

(8679) Tingstäde = 1992 EG₈

Discovered 1992 Mar. 2 at the European Southern Observatory in the course of the Uppsala-ESO Survey of Asteroids and Comets.

Tingstäde is a parish on Gotland. In Tingstäde Träsk, a swamp that is the second largest lake on the island, the remains of a timber construction involving some 10 000 logs, probably from the sixth century, is still visible on the lake floor.

(8719) Vesmír = 1995 VR

Discovered 1995 Nov. 11 at Kleť.

The Czech monthly journal of science *Vesmír* was founded in 1871. *Vesmír* describes new findings from the whole spectrum of science including astronomy, biology, chemistry, cybernetics, genetics, geology, medicine and physics, as well as their interdisciplinary connections.

(8723) Azumayama = 1996 SL₇

Discovered 1996 Sept. 23 by T. Okuni at Nanyo.

Azumayama is the volcanic mountain range that forms the border between Fukushima and Yamagata prefectures in the northern part of mainland Japan. It was designated a national park in 1950.

(8730) Iidesan = 1996 VT₃₀

Discovered 1996 Nov. 10 by T. Okuni at Nanyo.

The Iidesan range forms the borders between Fukushima, Niigata and Yamagata prefectures in the northern part of mainland Japan and was designated as a national park in 1950. Mt. Iidesan itself has a height of 2105 meters.

(8747) Asahi = 1998 FS₇₃

Discovered 1998 Mar. 24 by T. Okuni at Nanyo.

Asahi is the mountain range forming the border between Niigata and Yamagata prefectures in the northern part of mainland Japan. Meaning “morning sun”, the name is also that of several Japanese towns and villages, as well as of another mountain range.

(8868) Hjorter = 1992 EE₇

Discovered 1992 Mar. 1 at the European Southern Observatory in the course of the Uppsala-ESO Survey of Asteroids and Comets.

Olof Petrus Hjorter (1696–1750), Uppsala professor of astronomy in 1732–1737 and after 1746, independently discovered comet C/1743 X1 five days after Klinkenberg. With Celsius, he discovered the magnetic nature of aurorae. He donated his library to the Uppsala Observatory, and it is still the rarest part of that collection.

(9070) Ensab = 1993 OZ₂

Discovered 1993 July 23 by C. S. Shoemaker and D. H. Levy at Palomar.

Leo Enright (b.1943) and Denise Sabatini (b.1950) of Ontario are one of the foremost couples in Canadian amateur astronomy. Leo is an accomplished solar and auroral observer and has written the *Beginner's Observing Guide*. Denise's interests center on archaeoastronomy and in providing access to astronomy for the disabled.

(9083) Ramboehm = 1994 WC₄

Discovered 1994 Nov. 28 by C. S. Shoemaker and D. H. Levy at Palomar.

Jeff Ramos (b.1962) and Art Boehm (b.1944) are friends of the discoverers. Their humanitarian efforts have helped take care of numerous families in Vail, Arizona.

(9111) Matarazzo = 1997 BD₂

Discovered 1997 Jan. 28 by P. Sicoli and F. Manca at Sormano.

The Sicilian amateur astronomer Giuseppe “Corrado” Matarazzo (b.1946) is an experienced mathematician whose interests include orbital computations. In 1995 he co-authored *Elementi di Calcolo delle Orbite*.

(9165) Raup = 1987 SJ₃

Discovered 1987 Sept. 27 by C. S. Shoemaker and E. M. Shoemaker at Palomar.

David M. Raup (b.1933), paleontologist and biological historian at the University of Chicago, is a master of quantitative approaches to the fossil record. With his colleague Jack Sepkowski, he has suggested new imaginative theories for the development and disappearance of life.

(9172) Abhramu = 1989 OB

Discovered 1989 July 29 by C. S. Shoemaker and E. M. Shoemaker at Palomar.

Abhramu, the “cloud-knitter”, was the original female elephant who was a supernatural winged being who could change her shape at will, like the clouds that resemble her children. According to Indian legend, Abhramu's tribe lost its wings and magic by mischance.

(9258) Johnpauljones = 2137 T-2

Discovered 1973 Sept. 29 by C. J. van Houten and I. van Houten-Groeneveld on Palomar Schmidt plates taken by T. Gehrels.

Born in Scotland, John Paul Jones (1747–1792) was an American Revolutionary War hero. The “Father of the United States Navy”, he was a courageous seaman, leader and tactician. Commander of several ships in action against the British, he notably defeated the H.M.S. Serapis aboard the Bonhomme Richard in 1779.

(9259) Janvanparadijs = 2189 T-2

Discovered 1973 Sept. 29 by C. J. van Houten and I. van Houten-Groeneveld on Palomar Schmidt plates taken by T. Gehrels.

Jan van Paradijs (1946–1999), professor at the universities of Amsterdam and Alabama, was a pioneer researcher on issues of high-energy astrophysics. His recognition of the first optical counterpart to a γ -ray burst led to improved understanding of the physics of these events, their source environment and typical distances.

(9273) Schloerb = 1979 QW₃

Discovered 1979 Aug. 22 by C.-I. Lagerkvist at the European Southern Observatory.

University of Massachusetts astronomer Frederick Peter Schloerb (b.1952) is known for his comparative research on the interstellar medium and the origin of the solar system. The name was suggested by J. S. V. Lagerros.

(9274) Amylovell = 1980 FF₃

Discovered 1980 Mar. 16 by C.-I. Lagerkvist at the European Southern Observatory.

University of Massachusetts astronomer Amy Jean Lovell (b.1969) is known for her contribution to the study of comets and minor planets at millimeter wavelengths. The name was suggested by J. S. V. Lagerros.

(9275) Persson = 1980 FS₃

Discovered 1980 Mar. 16 by C.-I. Lagerkvist at the European Southern Observatory.

Jøran Persson (1530–1568) worked for Swedish king Erik XIV as counselor and prosecutor. Although he was at first seen as having a very large and bad influence on the king, later research has shown that he was a very efficient tool for the king's demands. He was tortured and beheaded after the king had been put into custody.

(9397) Lombardi = 1994 RJ

Discovered 1994 Sept. 6 at Santa Lucia Stroncone.

Giuseppe Lombardi (b.1939) is an Italian amateur astronomer at the CCAF observatory in Farra d'Isonzo. Now retired, he spends most of his sleepless nights at the observatory, where he shows the beauties of the sky to visitors and participates in almost all of the discoveries at this site.

(9553) Colas = 1985 UG₂

Discovered 1985 Oct. 17 at Caussols.

François Colas (b.1959) is an expert on modern solar-system astrometry at the Institut de Mécanique Celeste in Paris. He has contributed to numerous research papers in observational planetary astronomy. A strong supporter of the Pic du Midi Observatory, he has many fruitful relations with the amateur community.

(9564) Jeffwynn = 1987 SG₃

Discovered 1987 Sept. 26 by C. S. Shoemaker and E. M. Shoemaker at Palomar.

Jeffrey C. Wynn, a humorous, curious, inventive, adventurous geophysicist with the U.S. Geological Survey has studied the Wabar Craters of Saudi Arabia with Gene Shoemaker, mapped the seafloor, analyzed mineral resources on land, studied aquifers and archaeological sites—and observed with the Shoemaker-Levy team.

(9665) Inastronoviny = 1996 LA

Discovered 1996 June 5 at Kleť.

IAN, or *Instantní astronomické noviny*, is a Czech Internet Astronomical Newspaper founded by Jiří Dušek and Rudolf Novák in Brno in 1997. The webpages of the *IAN* report the latest reliable astronomical information to the Czech public.

(9720) Ulfbirgitta = 1980 FH₁

Discovered 1980 Mar. 16 by C.-I. Lagerkvist at the European Southern Observatory.

Ulf and Birgitta Heyman are old friends of the discoverer and his wife. This naming is to celebrate Ulf's fiftieth birthday.

(10100) Bürgel = 1991 XH₁

Discovered 1991 Dec. 10 by F. Börngen at Tautenburg.

As detailed in his autobiography, *Vom Arbeiter zum Astronomen*, Bruno H. Bürgel (1875–1948), first employed as a shoemaker, became an assistant at the Urania Sternwarte in Berlin, and later the best known German popular astronomical writer of his time.

(10162) Issunboushi = 1995 AL

Discovered 1995 Jan. 2 by T. Nijima and T. Urata at Ojima.

The extraordinarily small character Issunboushi—Issun means about 3 cm in old Japanese—was the hero of many old Japanese tales. Born the size of a bean, he defeated ogres, succeeded in a stratagem that got him a beautiful bride, and shook a mallet that instantly transformed him into a normal young man.

(10185) Gaudi = 1996 HD₂₁

Discovered 1996 Apr. 18 by E. W. Elst at the European Southern Observatory.

The work of Spanish architect Antoni Gaudi (1852–1926) was strongly influenced by “Art Nouveau” ornamental elements, Neo-Gothic style and the Moors, this last with its mixture of cheap stone and colorful tiles. Gaudi's creations are mainly concentrated in Barcelona, site of the Sagrada Familia cathedral.

(10186) Albéniz = 1996 HD₂₄

Discovered 1996 Apr. 20 by E. W. Elst at the European Southern Observatory.

A child prodigy, the Spanish composer and pianist Isaac Albéniz (1860–1909) studied at the conservatories of Leipzig and Brussels. In Paris he was influenced by Vincent d'Indy and Paul Dukas. His fame rests chiefly on his piano music, notably the suite *Iberia*, which was colored by the spirit of Spanish folk music.

(10211) La Spezia = 1997 RG₃

Discovered 1997 Sept. 6 at Monte Viseggi.

La Spezia is a town near the Monte Viseggi Observatory. It is famous for its “Poets' Gulf”, in honor of the nineteenth-century English poets Byron and Shelley, who lived, loved and died in Italy, the country of their adoption.

(10223) Zashikiwarashi = 1997 UD₁₁

Discovered 1997 Oct. 31 by T. Urata at the Nihondaira Observatory.

Taking the form of a child with bobbed hair, Zashikiwarashi is a traditional spirit of the people of the Tohoku district. It haunts the Japanese-style rooms of old families. It is said that a family would be wealthy while the spirit lives and become poor when it leaves.

(10234) Sixtygarden = 1997 YB₈

Discovered 1997 Dec. 27 by J. Tichá and M. Tichý at Kleť.

60 Garden Street is the street address of the Harvard-Smithsonian Center for Astrophysics. Observers of minor planets and comets know it as the seat of the Minor Planet Center and the Central Bureau for Astronomical Telegrams, which communicate fast-breaking news of astronomical discoveries to the international community.

(10303) Fréret = 1989 RD₂

Discovered 1989 Sept. 2 by E. W. Elst at Haute Provence.

The famous French historian Nicolas Fréret (1688–1749), well known for his atheistic treatise *Lettre de Thrasybule à Leucippe* (1720), was imprisoned in the Bastille for alleging—correctly—that the Franks were evolved from German tribes.

(10310) Delacroix = 1990 QZ₈

Discovered 1990 Aug. 16 by E. W. Elst at the European Southern Observatory.

Best known for his painting “Liberty leading the people”, Eugène Delacroix (1798–1863) was inspired by contemporary events. His “Dante and Virgil in Hell” is one of the landmarks of French nineteenth-century romantic painting. Delacroix's choice of colors later influenced the impressionist painters.

(10311) Fantin-Latour = 1990 QL₉

Discovered 1990 Aug. 16 by E. W. Elst at the European Southern Observatory.

Henri Fantin-Latour (1836–1904) was known for his still-life paintings with flowers and later for his lithographs. Famous also for his portrait groups, which he arranged in rows of heads, he immortalized many contemporary French celebrities.

(10316) Williamturner = 1990 SF₉

Discovered 1990 Sept. 22 by E. W. Elst at the European Southern Observatory.

The “Father of English Botany”, William Turner (1508–1568), is best known for his book *A New Herball*.

(10325) Bexa = 1990 WB₂

Discovered 1990 Nov. 18 by E. W. Elst at the European Southern Observatory.

The iceberg B10A, which measures some 80 km by 40 km, broke off from the Thwaites glacier in Antarctica in 1992. Having taken hundreds of thousands of years to form, B10A now drifts in the South Atlantic driven by marine currents and wind.

(10332) Défi = 1991 JT₁

Discovered 1991 May 13 by C. S. Shoemaker and D. H. Levy at Palomar.

Défi Corporatif Canderel is a fundraising event for cancer research programs at universities in Montreal. Founded by Jonathan Wener, the event has been directed by Gerald Levy since its inception in 1990. It features a costumed run through the streets of Montreal and has raised more than three million dollars.

(10346) Triathlon = 1992 GA₁

Discovered 1992 Apr. 2 by C. S. Shoemaker and D. H. Levy at Palomar.

Since Pam Truty founded the Burn Lake Triathlon in Las Cruces, New Mexico, in 1984, the relay team of Wendee Wallach-Levy, Laura Wright and Barbara Pardo has won medals every year, including 14 golds. Laura has also done more than 30 years volunteer work for the American Red Cross.

(10348) Poelchau = 1992 HL₄

Discovered 1992 Apr. 29 by F. Börngen at Tautenburg.

As a chaplain at the penitentiaries of Tegel, Plötzensee and Brandenburg-Görden in Berlin during 1933–1945, protestant theologian Harald Poelchau (1903–1972) comforted more than a thousand people condemned to death by the nazi regime.

(10523) D’Haveloose = 1990 SM₆

Discovered 1990 Sept. 22 by E. W. Elst at the European Southern Observatory.

José D’Haveloose (1922–1996) was a surgeon in the West Flanders town of Tielt. He was magnificent in his efforts to relieve suffering, but his own neck injuries finally made him unable to operate any more. In his later days he developed a great love for astronomy.

(10529) Giessenburg = 1990 WQ₄

Discovered 1990 Nov. 16 by E. W. Elst at the European Southern Observatory.

The Dutch writer, freemason and editor Rudolf Charles d’Ablaing van Giessenburg (1826–1904) will always be remembered for the first complete edition (1864) of *Le Testament de Jean Meslier, Curé d’Etrépy* (1727).

(10543) Klee = 1992 DL₄

Discovered 1992 Feb. 27 by F. Börngen at Tautenburg.

One of the most self-willed of the expressionists, Swiss painter and graphic artist Paul Klee (1879–1940) was a master at the Bauhäuser in Weimar and Dessau and professor at Düsseldorf until his dismissal by the nazi regime.

(10563) Izhdubar = 1993 WD

Discovered 1993 Nov. 19 by C. S. Shoemaker and E. M. Shoemaker at Palomar.

Izhdubar was an ancient Chaldean sun-god. He was responsible for slaying the dreaded dragon Tiamat, which personified primeval chaos and was hostile to gods and men. The exploits of Izhdubar are thought to represent the sun’s annual passage through the twelve signs of the zodiac.

(10573) Piani = 1994 WU₁

Discovered 1994 Nov. 29 at Santa Lucia Stroncone.

Franco Piani (b. 1955), Italian amateur astronomer, is the most experienced and agreeable proponent of astronomy at the CCAF observatory in Farra d’Isonzo. He takes care of all mechanical aspects of the instruments and has participated in most of the new discoveries of this site.

(10579) Diluca = 1995 OE

Discovered 1995 July 20 at Osservatorio San Vittore.

Roberto Di Luca (b. 1959), amateur observer of lunar and asteroidal occultations, is network manager at the Astronomical Observatory of the University of Bologna. As a member of the Associazione Astrofili Bolognesi, he often collaborates with the group at the Osservatorio San Vittore in Bologna.

(10617) Takumi = 1997 UK₂₄

Discovered 1997 Oct. 25 by M. Hirasawa and S. Suzuki at Nyukasa.

Amateur astronomer Takumi Takahata (b. 1941) has created many computer programs that are used for astronomical calculations. The “measurescope” Takumi lent to the discoverers was used to determine the coordinates of this minor planet.

(10712) Malashchuk = 1982 UE₆

Discovered 1982 Oct. 20 by L. G. Karachkina at the Crimean Astrophysical Observatory.

Valentina Mikhailovna Malashchuk (b. 1947) is accountant general of the Crimean Astrophysical Observatory.

(10713) Limorenko = 1982 UZ₉

Discovered 1982 Oct. 22 by L. G. Karachkina at the Crimean Astrophysical Observatory.

Leonid Pavlovich Limorenko (b. 1951) is assistant director of the Crimean Astrophysical Observatory.

(10721) Tuterov = 1986 QO₄

Discovered 1986 Aug. 17 by L. G. Karachkina at the Crimean Astrophysical Observatory.

Vladimir Lukich Tuterov (b. 1960), a splendid builder, is a friend of the discoverer’s family.

(10722) Monari = 1986 TB

Discovered 1986 Oct. 1 at Osservatorio San Vittore.

Elementary-school teacher Luisa Monari (b. 1961) is the wife of Ermes Colombini, one of the codiscoverers of this minor planet.

(10740) Fallersleben = 1988 RX₂

Discovered 1988 Sept. 8 by F. Börngen at Tautenburg.

For his “Unpolitische Lieder”, liberal patriotic songs, the poet, writer, librarian and literary historian August Heinrich Hoffmann von Fallersleben (1798–1874) was ousted from his professorship of the German language in Breslau. He wrote the text of “Lied der Deutschen”, the German national anthem.

(10749) Musäus = 1989 GH₈

Discovered 1989 Apr. 6 by F. Börngen at Tautenburg.

Johann Carl August Musäus (1735–1787), a private tutor at the court of Weimar, was the satiric author of the five-volume *Volksmärchen der Deutschen*, which brought him the reputation as a precursor to the brothers Grimm.

(10753) van der Velde = 1989 WU₄

Discovered 1989 Nov. 28 by F. Börngen at Tautenburg.

The Belgian architect and painter Henry Clemens van de Velde (1863–1957), who worked at the court of Weimar during 1900–1914, founded and directed the Arts and Crafts School, later changed into the Bauhaus. To his regret, critics labeled “Der Neue Stil” of his art as “Jugendstil”.

(10764) Rübezahl = 1990 TK₁₃

Discovered 1990 Oct. 12 by F. Börngen and L. D. Schmadel at Tautenburg.

The Silesian mountain goblin Rübezahl is master of the Riesengebirge. He teases the wanderer, gives presents to the poor and guards the treasures within the mountains. The first Rübezahl legends were collected in 1662 by J. Praetorius in his *Daemonologia Rubinzalii Silesii*.

(10778) Marcks = 1991 GN₁₀

Discovered 1991 Apr. 9 by F. Börngen at Tautenburg.

Sculptor and graphic artist Gerhard Marcks (1889–1981) was master of the potter's shop in Dornburg, a teacher at the Bauhaus in Weimar and until 1933 director of the Arts and Crafts School in Halle-Giebichenstein. Until 1945 his representations of animals, figurines, drawings and woodcuts were regarded as degenerate.

(10785) Dejaiffe = 1991 RD₁₂

Discovered 1991 Sept. 4 by E. W. Elst at the European Southern Observatory.

René Dejaiffe (b. 1940), of the Royal Belgian Observatory, has presided over national and international societies and organized more than 1400 conferences on astronomy and space science. Since 1997 he has been general secretary of the Société Royale Belge d'Astronomie, de Météorologie et de Physique du Globe.

(10914) Tucker = 1997 YQ₁₄

Discovered 1997 Dec. 31 by P. G. Comba at Prescott.

Roy Tucker (b. 1951), an instrumentalist at Kitt Peak National Observatory, is owner and chief observer of southern Arizona's Goodricke-Pigott Observatory, where he has discovered two Atens, one Apollo and a comet.

(10927) Vacluse = 1998 BB₄₂

Discovered 1998 Jan. 29 by R. Roy at Blauvac.

Vacluse is a French *département*. This minor planet was discovered by a member of AUDE (Association des Utilisateurs de Détecteurs Electroniques) based in the little Vacluse village of Saint-Estève in the commune of Blauvac.

(11100) Lai = 1995 KC

Discovered 1995 May 22 at Osservatorio San Vittore.

Luciano Lai (b. 1948) has been an active observer and discoverer of minor planets at Madonna di Dossobuono since 1983. He is interested in the design and construction of astronomical telescopes and optics, and he designed the focal reducer used by many Italian amateur astrometrists.

(11102) Bertorighini = 1995 SZ₄

Discovered 1995 Sept. 26 by L. Tesi at San Marcello Pistoiese.

Alberto Righini (b. 1942) is a professor of astronomy at the University of Florence and Arcetri Observatory. His main field of interest is solar physics, and he has observed several eclipses around the world. He is also very active in the field of popularizing astronomy.

(11126) Doleček = 1996 TC₁₅

Discovered 1996 Oct. 15 by P. Pravec at Ondřejov.

Josef (“Jožka”) Doleček (b. 1912) had a principal role in building the public observatory of Valašské Meziříčí and was its first director. His work gave a basis for the observatory's success in astronomy popularization in the Czech Republic. The name was suggested by L. Lenža.

(11134) České Budějovice = 1996 XO₂

Discovered 1996 Dec. 4 by M. Tichý and Z. Moravec at Kleť.

České Budějovice is the historic, cultural, educational, industrial and administrative center of south Bohemia. Originally known as Budiwoyz or Budoywiz, the German form of which is Budweis, the city is famous for its beer. There is an observatory in the city, and the Kleť Observatory is situated on nearby Kleť mountain.

(11156) Al-Khwarismi = 1997 YP₁₄

Discovered 1997 Dec. 31 by P. G. Comba at Prescott.

Muhammad ibn Musa al-Khwarismi (*fl.* c. 825) was an Arab mathematician and astronomer whose books, translated into Latin, were the main source through which Indian numerals and Arabic algebra came into Western Europe.

(11167) Kunžak = 1998 FD₃

Discovered 1998 Mar. 23 by P. Pravec at Ondřejov.

Kunžak is a picturesque village in South Bohemia. In this village there is a small observatory, named “Na jitrech” (or “On Early Mornings”), mainly devoted to meteor astronomy. The name was suggested by P. Špurný.

(11269) Knyr = 1987 QG₁₀

Discovered 1987 Aug. 26 by L. G. Karachkina at the Crimean Astrophysical Observatory.

Engineer Igor' Ivanovich Knyr (b. 1963) is a specialist on the introduction of new techniques in industry and a friend of the discoverer's family.

(11325) Slavický = 1995 SG

Discovered 1995 Sept. 17 by L. Šarounová at Ondřejov.

Klement Slavický (1910–1999) was an outstanding Czech composer, whose personal musical expression was rooted in the folk-music culture of Moravia. He was also appreciated for his life-long high moral standards. In 1985 Slavický was awarded with the Golden Medal of the United Nations for his fourth Symphonietta.

(11326) Ladislavschmied = 1995 SL

Discovered 1995 Sept. 17 by L. Šarounová at Ondřejov.

The Czech amateur astronomer Ladislav Schmied (b. 1927) is well known for his systematic observations of the sun. He has made more than 10 000 plots of the solar photosphere during the last 50 years. The name was suggested by P. Špurný.

(11333) Forman = 1996 HU

Discovered 1996 Apr. 20 by P. Pravec and L. Šarounová at Ondřejov.

Early films of director Miloš Forman (b. 1932), such as *Černý Petr* (“Black Peter”) and *Hoří, má panenko* (“Firemen's Ball”), show deep insight into the lives of ordinary Czech people. *One Flew Over the Cuckoo's Nest*, *Hair* and *Ragtime* deal with human freedom, while *Amadeus* describes Mozart's fight with mediocrity.

(11341) Babbage = 1996 XE₂

Discovered 1996 Dec. 3 by P. G. Comba at Prescott.

Intending to automate complex arithmetical calculations, British mathematician Charles Babbage (1791–1871) developed plans for the analytical engine, a device controlled by punched cards, containing a “mill” to execute instructions and a memory unit to store partial results—the conceptual forerunner of modern computers.

(11421) Cardano = 1999 LW₂

Discovered 1999 June 10 by P. G. Comba at Prescott.

Gerolamo Cardano (1501–1576), prototypical Renaissance man, physician, mathematician, astrologer, inventor and gambler, was the first to publish the solution of the cubic and quartic equations and to give a systematic calculation of probabilities in connection with games of chance.

(11498) Julgeerts = 1989 GS₄

Discovered 1989 Apr. 3 by E. W. Elst at the European Southern Observatory.

Julien Armand Geerts (b.1909) is a well-known commercial artist in Belgium. He was for many years a good friend of the discoverer's parents. The naming is on the occasion of Geerts' ninetieth birthday.

(11547) Griesser = 1992 UP₈

Discovered 1992 Oct. 31 by F. Börngen at Tautenburg.

Swiss amateur astronomer Markus Griesser (b.1949) is cofounder of the Eschenberg Observatory in Winterthur. A passionate science writer and popularizer of astronomy, he is also a diligent observer of near-earth objects. This minor planet was numbered as a result of observations made by him in Sept. 1999.

(11548) JerryLewis = 1992 WD₈

Discovered 1992 Nov. 25 by C. S. Shoemaker and D. H. Levy at Palomar.

The devotion of U.S. actor-comedian Jerry Lewis (b.1926) to the Muscular Dystrophy Association has helped it raise upwards of 50 million dollars per year in its efforts to combat neuromuscular diseases. The M.D.A. funds medical research, treatment and quality-of-life programs like summer camps.

(11569) Virgilsmith = 1993 KB₂

Discovered 1993 May 27 by C. S. Shoemaker and D. H. Levy at Palomar.

The design and construction abilities of Virgil Smith (b.1941), of Corona, Arizona, have resulted in the successful completion of the Jarnac Observatory, located at the home of the second discoverer.

(11598) Kubík = 1995 OJ

Discovered 1995 July 22 by L. Šarounová at Ondřejov.

The discoverer's brother, Jakub Šaroun (b.1974), is a talented amateur musician and photographer. This minor planet is being named on the occasion of his 25th birthday.

(11665) Dirichlet = 1997 GL₂₈

Discovered 1997 Apr. 14 by P. G. Comba at Prescott.

Peter Gustav Lejeune Dirichlet (1805–1859) was the successor of Gauss and the predecessor of Riemann at Göttingen. He made important contributions in both pure and applied mathematics and gave the first rigorous proof of the convergence of Fourier series.

(11678) Brevard = 1998 DT₁₀

Discovered 1998 Feb. 25 by I. P. Griffin at Cocoa.

Brevard County, Florida, is the location of the Astronaut Memorial Planetarium and Observatory, from where this object was discovered. Brevard County is also home to the Kennedy Space Center, the launch site of Galileo, NEAR and many other manned and unmanned missions of space exploration.

(11709) Eudoxos = 1998 HF₂₀

Discovered 1998 Apr. 27 by P. G. Comba at Prescott.

Eudoxos of Knidos (c.408–355 B.C.) was the prime mover behind two major developments in Greek mathematical thought: the theory of proportions that overcame the crisis caused by the discovery of irrational numbers, and the method of exhaustion for the calculation of areas and volumes.

EPHEMERIDES

C/1999 F2 (Dalcanton)						Elements MPC 35553				
Date	TT	α_{2000}	δ_{2000}	Δ	r	ϵ	ϕ	m_1	m_2	
1999 11 18		16 11.95	+10 35.7	6.695	5.873	31.3	5.0	16.8		
1999 11 28		16 20.45	+10 46.4	6.731	5.918	32.0	5.1	16.9		
1999 12 08		16 28.94	+11 04.3	6.750	5.963	34.4	5.4	16.9		
1999 12 18		16 37.30	+11 29.9	6.751	6.009	38.2	5.8	16.9		
1999 12 28		16 45.44	+12 03.3	6.737	6.055	43.0	6.4	17.0		
2000 01 07		16 53.26	+12 44.9	6.708	6.101	48.5	6.9	17.0		
2000 01 17		17 00.66	+13 34.5	6.667	6.148	54.5	7.5	17.0		
2000 01 27		17 07.52	+14 32.1	6.614	6.196	60.9	8.0	17.0		
2000 02 06		17 13.75	+15 37.3	6.554	6.244	67.5	8.4	17.0		
2000 02 16		17 19.23	+16 49.4	6.487	6.292	74.3	8.7	17.0		
2000 02 26		17 23.87	+18 07.6	6.418	6.341	81.1	8.9	17.1		
2000 03 07		17 27.59	+19 30.7	6.349	6.390	87.9	8.9	17.1		
2000 03 17		17 30.28	+20 57.1	6.283	6.439	94.6	8.9	17.1		
2000 03 27		17 31.91	+22 25.1	6.223	6.489	101.1	8.7	17.1		
2000 04 06		17 32.44	+23 52.5	6.172	6.539	107.2	8.4	17.1		
2000 04 16		17 31.87	+25 17.0	6.134	6.589	112.9	8.1	17.1		
2000 04 26		17 30.25	+26 36.1	6.109	6.640	117.9	7.7	17.2		
2000 05 06		17 27.68	+27 47.3	6.101	6.691	122.0	7.3	17.2		
2000 05 16		17 24.32	+28 48.5	6.111	6.742	125.0	7.1	17.2		
2000 05 26		17 20.38	+29 37.9	6.140	6.793	126.7	6.9	17.3		
2000 06 05		17 16.09	+30 14.2	6.187	6.845	126.9	6.8	17.3		
2000 06 15		17 11.73	+30 36.8	6.253	6.897	125.8	6.9	17.4		
2000 06 25		17 07.56	+30 45.8	6.337	6.949	123.4	7.0	17.4		
2000 07 05		17 03.82	+30 42.2	6.438	7.001	119.9	7.2	17.5		
2000 07 15		17 00.73	+30 27.2	6.553	7.054	115.7	7.5	17.6		
2000 07 25		16 58.43	+30 02.6	6.682	7.106	110.8	7.7	17.6		
2000 08 04		16 57.04	+29 30.2	6.820	7.159	105.6	7.8	17.7		
2000 08 14		16 56.62	+28 52.3	6.967	7.213	100.0	7.9	17.8		
2000 08 24		16 57.17	+28 10.7	7.119	7.266	94.4	8.0	17.9		
2000 09 03		16 58.67	+27 27.2	7.273	7.319	88.6	7.9	18.0		
2000 09 13		17 01.09	+26 43.7	7.429	7.373	82.9	7.8	18.0		
2000 09 23		17 04.35	+26 01.6	7.582	7.427	77.4	7.6	18.1		
2000 10 03		17 08.37	+25 22.2	7.730	7.481	71.9	7.3	18.2		
2000 10 13		17 13.08	+24 46.6	7.873	7.535	66.7	7.0	18.3		
2000 10 23		17 18.38	+24 15.9	8.007	7.589	61.9	6.6	18.3		
2000 11 02		17 24.18	+23 50.8	8.131	7.643	57.5	6.3	18.4		
2000 11 12		17 30.39	+23 32.1	8.243	7.698	53.7	5.9	18.4		
2000 11 22		17 36.91	+23 20.1	8.342	7.752	50.5	5.6	18.5		

C/1999 U4 (Catalina-Skiff)						Elements MPC 36654				
Date	TT	α_{2000}	δ_{2000}	Δ	r	ϵ	ϕ	m_1	m_2	
1999 11 18		01 59.45	+20 24.4	6.297	7.225	158.3	2.9	17.1		
1999 11 28		01 54.70	+20 28.0	6.322	7.174	147.6	4.2	17.1		

1999 12 08	01 50.62	+20 32.4	6.373	7.124	136.8	5.4	17.0
1999 12 18	01 47.38	+20 38.6	6.448	7.073	126.2	6.4	17.0
1999 12 28	01 45.12	+20 47.7	6.541	7.023	115.7	7.2	17.0
2000 01 07	01 43.88	+21 00.5	6.646	6.973	105.5	7.8	17.0
2000 01 17	01 43.70	+21 17.7	6.760	6.924	95.5	8.1	17.1
2000 01 27	01 44.54	+21 39.5	6.876	6.874	85.8	8.2	17.1
2000 02 06	01 46.34	+22 06.1	6.990	6.825	76.3	8.1	17.1
2000 02 16	01 49.05	+22 37.6	7.098	6.776	67.2	7.7	17.1
2000 02 26	01 52.57	+23 13.6	7.194	6.728	58.3	7.2	17.1
2000 03 07	01 56.81	+23 54.1	7.277	6.679	49.8	6.5	17.1
2000 03 17	02 01.69	+24 38.6	7.344	6.631	41.5	5.7	17.0
2000 03 27	02 07.12	+25 26.8	7.391	6.584	33.6	4.8	17.0

P/1999 U3 (LINEAR)

Elements MPC 36654

Date	TT	α_{2000}	δ_{2000}	Δ	r	ϵ	ϕ	m_1	m_2
1999 11 18	03 21.53	+58 11.7	0.971	1.847	140.8	19.8	16.1		
1999 11 28	03 18.31	+56 44.4	0.963	1.849	143.0	18.7	16.1		
1999 12 08	03 17.67	+54 26.0	0.971	1.857	143.2	18.5	16.1		
1999 12 18	03 20.84	+51 31.5	0.998	1.869	141.1	19.3	16.2		
1999 12 28	03 27.95	+48 19.0	1.044	1.887	137.1	20.8	16.4		
2000 01 07	03 38.49	+45 04.5	1.109	1.910	131.8	22.6	16.5		
2000 01 17	03 51.80	+41 59.8	1.191	1.938	125.7	24.3	16.8		
2000 01 27	04 07.15	+39 11.6	1.290	1.969	119.3	25.8	17.0		
2000 02 06	04 23.95	+36 41.8	1.403	2.005	112.9	26.9	17.3		
2000 02 16	04 41.77	+34 30.0	1.529	2.044	106.6	27.6	17.5		
2000 02 26	05 00.22	+32 33.5	1.667	2.087	100.4	27.8	17.8		
2000 03 07	05 19.05	+30 49.3	1.813	2.132	94.4	27.7	18.1		
2000 03 17	05 38.06	+29 14.4	1.966	2.180	88.5	27.1	18.4		
2000 03 27	05 57.08	+27 45.8	2.125	2.230	82.7	26.3	18.6		
2000 04 06	06 16.00	+26 21.2	2.287	2.283	77.1	25.3	18.9		
2000 04 16	06 34.73	+24 58.7	2.452	2.337	71.6	24.0	19.1		
2000 04 26	06 53.18	+23 36.9	2.616	2.393	66.1	22.6	19.4		
2000 05 06	07 11.30	+22 14.5	2.780	2.450	60.7	21.0	19.6		
2000 05 16	07 29.07	+20 50.8	2.941	2.508	55.3	19.4	19.8		
2000 05 26	07 46.42	+19 25.4	3.098	2.567	50.0	17.6	20.0		
2000 06 05	08 03.35	+17 57.9	3.250	2.626	44.6	15.7	20.3		
2000 06 15	08 19.85	+16 28.2	3.395	2.687	39.3	13.8	20.4		
2000 06 25	08 35.89	+14 56.3	3.532	2.748	33.9	11.9	20.6		

C/1999 U1 (Ferris)

Elements MPC 36654

Date	TT	α_{2000}	δ_{2000}	Δ	r	ϵ	ϕ	m_1	m_2
1999 11 18	04 08.29	+10 01.3	4.532	5.501	167.3	2.3	17.2		
1999 11 28	03 57.46	+10 36.6	4.582	5.553	168.7	2.0	17.3		
1999 12 08	03 47.01	+11 13.6	4.671	5.605	159.8	3.5	17.3		
1999 12 18	03 37.39	+11 52.2	4.796	5.658	148.5	5.2	17.4		
1999 12 28	03 28.95	+12 32.3	4.954	5.712	136.9	6.8	17.5		
2000 01 07	03 21.93	+13 13.8	5.140	5.766	125.4	8.0	17.7		
2000 01 17	03 16.42	+13 56.7	5.347	5.820	114.2	8.9	17.8		
2000 01 27	03 12.44	+14 41.0	5.569	5.874	103.3	9.4	17.9		
2000 02 06	03 09.89	+15 26.5	5.799	5.929	92.8	9.6	18.0		
2000 02 16	03 08.68	+16 13.2	6.031	5.984	82.6	9.4	18.2		
2000 02 26	03 08.65	+17 00.8	6.259	6.040	72.7	9.0	18.3		
2000 03 07	03 09.64	+17 49.1	6.479	6.096	63.2	8.4	18.4		
2000 03 17	03 11.51	+18 38.0	6.687	6.152	53.8	7.5	18.5		

2000 03 27	03 14.10	+19 27.3	6.877	6.208	44.7	6.5	18.6
2000 04 06	03 17.27	+20 16.8	7.049	6.265	35.8	5.4	18.7

P/1999 V1 (Catalina)

Elements MPC 36654

Date	TT	α_{2000}	δ_{2000}	Δ	r	ϵ	ϕ	m_1	m_2
1999 11 18	09 48.09	+09 32.5	2.812	2.968	89.2	19.5	17.0		
1999 11 28	09 54.93	+08 00.3	2.686	2.975	97.2	19.2	16.9		
1999 12 08	09 59.95	+06 32.3	2.563	2.983	105.6	18.5	16.8		
1999 12 18	10 02.94	+05 10.4	2.448	2.993	114.5	17.4	16.7		
1999 12 28	10 03.81	+03 56.4	2.344	3.005	123.9	15.8	16.6		
2000 01 07	10 02.50	+02 52.0	2.255	3.019	133.7	13.6	16.6		
2000 01 17	09 59.13	+01 59.1	2.184	3.035	143.8	11.0	16.5		
2000 01 27	09 54.04	+01 18.8	2.137	3.052	154.0	8.1	16.5		
2000 02 06	09 47.75	+00 51.5	2.115	3.071	163.0	5.4	16.5		
2000 02 16	09 41.00	+00 36.4	2.121	3.092	167.4	4.0	16.5		
2000 02 26	09 34.57	+00 31.1	2.155	3.115	163.0	5.3	16.6		
2000 03 07	09 29.16	+00 32.8	2.216	3.139	154.1	7.9	16.7		
2000 03 17	09 25.35	+00 38.1	2.302	3.164	144.4	10.6	16.8		
2000 03 27	09 23.44	+00 43.4	2.410	3.191	134.7	12.9	16.9		
2000 04 06	09 23.54	+00 46.1	2.536	3.220	125.3	14.7	17.1		
2000 04 16	09 25.62	+00 44.1	2.676	3.249	116.4	16.1	17.3		
2000 04 26	09 29.50	+00 36.0	2.827	3.280	107.9	17.0	17.4		
2000 05 06	09 34.97	+00 21.0	2.986	3.312	99.9	17.5	17.6		
2000 05 16	09 41.83	-00 01.2	3.150	3.346	92.2	17.6	17.7		
2000 05 26	09 49.83	-00 30.8	3.316	3.380	84.9	17.4	17.9		
2000 06 05	09 58.79	-01 07.6	3.481	3.415	77.9	16.9	18.0		
2000 06 15	10 08.52	-01 51.1	3.645	3.451	71.1	16.2	18.2		
2000 06 25	10 18.86	-02 41.0	3.804	3.489	64.5	15.2	18.3		
2000 07 05	10 29.70	-03 36.6	3.958	3.527	58.0	14.2	18.5		
2000 07 15	10 40.92	-04 37.6	4.104	3.565	51.7	12.9	18.6		
2000 07 25	10 52.42	-05 43.3	4.243	3.605	45.6	11.6	18.7		
2000 08 04	11 04.13	-06 53.1	4.371	3.645	39.5	10.2	18.8		
2000 08 14	11 15.99	-08 06.5	4.488	3.686	33.5	8.7	18.9		

119P/Parker-Hartley

Elements MPC 25513

Date	TT	α_{2000}	δ_{2000}	Δ	r	ϵ	ϕ	m_1	m_2
1999 12 18	15 02.91	-19 00.6	6.125	5.371	37.0	6.3	22.0	22.1	
1999 12 28	15 10.34	-19 29.2	6.027	5.381	45.3	7.5	22.0	22.1	
2000 01 07	15 17.22	-19 54.7	5.912	5.391	53.8	8.5	22.0	22.1	
2000 01 17	15 23.42	-20 17.0	5.783	5.400	62.5	9.3	22.0	22.1	
2000 01 27	15 28.81	-20 35.7	5.642	5.409	71.4	9.9	21.9	22.1	
2000 02 06	15 33.26	-20 50.6	5.493	5.417	80.5	10.3	21.9	22.0	
2000 02 16	15 36.65	-21 01.5	5.339	5.426	89.8	10.5	21.8	22.0	
2000 02 26	15 38.86	-21 08.3	5.185	5.434	99.3	10.4	21.8	21.9	
2000 03 07	15 39.80	-21 10.7	5.035	5.442	109.1	9.9	21.7	21.8	
2000 03 17	15 39.42	-21 08.5	4.895	5.449	119.2	9.2	21.7	21.7	
2000 03 27	15 37.74	-21 01.6	4.767	5.457	129.5	8.1	21.6	21.6	
2000 04 06	15 34.81	-20 50.0	4.658	5.464	140.1	6.7		21.5	
2000 04 16	15 30.80	-20 33.8	4.572	5.470	150.9	5.1		21.4	
2000 04 26	15 25.94	-20 13.6	4.512	5.477	161.8	3.3		21.3	
2000 05 06	15 20.53	-19 50.2	4.481	5.483	172.7	1.3		21.1	
2000 05 16	15 14.94	-19 24.8	4.480	5.489	175.9	0.8		21.1	
2000 05 26	15 09.52	-18 58.8	4.510	5.495	165.1	2.7		21.3	
2000 06 05	15 04.61	-18 33.8	4.568	5.500	154.3	4.6		21.4	

2000 06 15	15 00.51	-18 11.4	4.654	5.505	143.7	6.3		21.5
2000 06 25	14 57.41	-17 52.8	4.762	5.510	133.4	7.7		21.6
2000 07 05	14 55.44	-17 38.8	4.890	5.514	123.3	8.9		21.8
2000 07 15	14 54.68	-17 30.0	5.033	5.519	113.6	9.7	21.8	21.9
2000 07 25	14 55.11	-17 26.6	5.187	5.523	104.1	10.3	21.9	21.9
2000 08 04	14 56.71	-17 28.4	5.346	5.526	94.9	10.5	22.0	22.0
2000 08 14	14 59.40	-17 35.1	5.508	5.530	86.0	10.5	22.1	22.1
2000 08 24	15 03.11	-17 46.0	5.667	5.533	77.2	10.3	22.1	22.1
2000 09 03	15 07.74	-18 00.7	5.822	5.536	68.7	9.8		22.2
2000 09 13	15 13.20	-18 18.4	5.967	5.538	60.3	9.1		22.2
2000 09 23	15 19.38	-18 38.4	6.100	5.540	52.1	8.2		22.2
2000 10 03	15 26.21	-19 00.2	6.220	5.542	43.9	7.2		22.2
2000 10 13	15 33.58	-19 22.9	6.322	5.544	35.8	6.0		22.2

P/1999 DN ₃ (Korlević-Jurić)				Elements MPC 34734				
Date	TT	α_{2000}	δ_{2000}	Δ	r	ϵ	ϕ	m_1 m_2
1999 12 18		15 04.53	-27 37.0	4.903	4.140	35.4	7.9	19.1
1999 12 28		15 15.30	-28 46.1	4.818	4.149	42.7	9.3	19.1
2000 01 07		15 25.60	-29 53.7	4.718	4.159	50.3	10.5	19.1
2000 01 17		15 35.27	-30 59.9	4.606	4.169	58.0	11.5	19.1
2000 01 27		15 44.16	-32 04.7	4.483	4.178	65.9	12.4	19.1
2000 02 06		15 52.08	-33 08.3	4.352	4.188	73.9	13.1	19.1
2000 02 16		15 58.83	-34 10.6	4.216	4.198	82.2	13.5	19.0
2000 02 26		16 04.22	-35 11.5	4.077	4.208	90.7	13.6	19.0
2000 03 07		16 08.02	-36 10.9	3.940	4.218	99.5	13.4	18.9
2000 03 17		16 10.06	-37 07.8	3.807	4.229	108.4	12.9	18.8
2000 03 27		16 10.18	-38 01.3	3.684	4.239	117.6	12.0	18.7
2000 04 06		16 08.30	-38 49.8	3.573	4.250	126.9	10.9	18.6
2000 04 16		16 04.47	-39 31.0	3.479	4.260	136.1	9.4	18.5
2000 04 26		15 58.89	-40 02.8	3.407	4.271	145.1	7.8	18.4
2000 05 06		15 51.93	-40 23.2	3.358	4.281	153.0	6.1	18.3
2000 05 16		15 44.14	-40 30.9	3.335	4.292	158.5	5.0	18.2
2000 05 26		15 36.18	-40 26.0	3.340	4.303	159.2	4.8	18.2
2000 06 05		15 28.72	-40 09.9	3.373	4.313	154.9	5.7	18.3
2000 06 15		15 22.36	-39 45.2	3.432	4.324	147.6	7.2	18.4
2000 06 25		15 17.52	-39 15.4	3.515	4.335	139.1	8.8	18.5
2000 07 05		15 14.48	-38 43.8	3.619	4.346	130.3	10.3	18.6
2000 07 15		15 13.34	-38 13.3	3.740	4.357	121.4	11.5	18.8
2000 07 25		15 14.09	-37 46.3	3.876	4.368	112.6	12.4	18.9
2000 08 04		15 16.63	-37 24.0	4.021	4.379	104.1	13.0	19.0
2000 08 14		15 20.83	-37 07.4	4.172	4.390	95.7	13.3	19.1
2000 08 24		15 26.53	-36 56.5	4.325	4.401	87.6	13.3	19.2
2000 09 03		15 33.57	-36 50.9	4.479	4.412	79.7	13.0	19.2
2000 09 13		15 41.81	-36 50.4	4.629	4.423	72.0	12.5	19.3
2000 09 23		15 51.10	-36 53.9	4.773	4.434	64.5	11.8	19.3
2000 10 03		16 01.32	-37 00.9	4.908	4.445	57.1	10.9	19.4
2000 10 13		16 12.34	-37 10.5	5.032	4.456	49.9	9.9	19.4
2000 10 23		16 24.04	-37 21.8	5.144	4.467	42.9	8.7	19.4
2000 11 02		16 36.33	-37 34.3	5.242	4.478	36.1	7.5	19.4

44P/Reinmuth 2				Elements MPC 31663				
Date	TT	α_{2000}	δ_{2000}	Δ	r	ϵ	ϕ	m_1 m_2
1999 12 18		15 15.73	-23 44.0	4.328	3.545	33.2	8.7	19.7 22.5
1999 12 28		15 28.63	-24 34.1	4.196	3.503	40.2	10.4	19.6 22.5

2000 01 07	15 41.39	-25 21.2	4.050	3.459	47.3	12.1	19.4	22.5
2000 01 17	15 53.90	-26 05.2	3.891	3.416	54.5	13.6	19.3	22.4
2000 01 27	16 06.01	-26 45.8	3.722	3.372	61.9	14.9	19.1	22.3
2000 02 06	16 17.58	-27 23.0	3.545	3.327	69.3	16.1	18.9	22.2
2000 02 16	16 28.41	-27 56.9	3.361	3.282	76.9	17.0	18.7	22.1
2000 02 26	16 38.29	-28 27.5	3.174	3.237	84.7	17.7	18.5	22.0
2000 03 07	16 46.98	-28 55.2	2.986	3.191	92.7	18.1	18.2	21.8
2000 03 17	16 54.21	-29 19.9	2.799	3.144	101.0	18.1	18.0	21.7
2000 03 27	16 59.70	-29 41.8	2.617	3.098	109.6	17.7	17.8	21.5
2000 04 06	17 03.14	-30 00.7	2.442	3.051	118.6	16.7	17.5	21.3
2000 04 16	17 04.24	-30 15.9	2.279	3.004	128.0	15.3	17.3	21.0
2000 04 26	17 02.80	-30 26.2	2.131	2.956	137.9	13.2	17.0	20.8
2000 05 06	16 58.72	-30 29.7	2.002	2.908	148.2	10.5	16.8	20.5
2000 05 16	16 52.20	-30 24.2	1.895	2.861	158.7	7.4	16.5	20.2
2000 05 26	16 43.73	-30 07.8	1.812	2.813	168.6	4.1	16.3	19.9
2000 06 05	16 34.12	-29 39.4	1.757	2.765	171.7	3.0	16.1	19.7
2000 06 15	16 24.48	-29 00.4	1.728	2.717	163.3	6.2	16.0	19.8
2000 06 25	16 15.93	-28 14.1	1.725	2.669	152.5	10.1	15.9	20.0
2000 07 05	16 09.42	-27 25.3	1.745	2.621	141.8	13.9	15.8	20.1
2000 07 15	16 05.62	-26 38.9	1.785	2.573	131.5	17.2	15.7	20.2
2000 07 25	16 04.82	-25 58.6	1.839	2.526	121.7	20.0	15.7	20.3
2000 08 04	16 07.08	-25 26.4	1.905	2.479	112.6	22.2	15.6	20.4
2000 08 14	16 12.28	-25 02.8	1.978	2.433	104.2	23.8	15.6	20.5
2000 08 24	16 20.21	-24 46.9	2.055	2.387	96.3	24.9	15.5	20.6
2000 09 03	16 30.64	-24 37.0	2.133	2.343	89.0	25.5	15.5	20.7
2000 09 13	16 43.33	-24 30.9	2.210	2.299	82.1	25.7	15.4	20.7
2000 09 23	16 58.04	-24 26.0	2.285	2.257	75.7	25.5	15.4	20.7
2000 10 03	17 14.58	-24 19.9	2.356	2.215	69.6	25.0	15.3	20.7
2000 10 13	17 32.74	-24 10.0	2.423	2.176	63.8	24.3	15.3	20.7
2000 10 23	17 52.32	-23 53.9	2.484	2.137	58.4	23.3	15.2	20.7
2000 11 02	18 13.16	-23 29.5	2.541	2.101	53.1	22.2	15.2	20.7
2000 11 12	18 35.05	-22 54.7	2.592	2.067	48.2	20.9	15.1	20.7
2000 11 22	18 57.79	-22 08.0	2.637	2.036	43.4	19.5	15.0	20.6
2000 12 02	19 21.23	-21 08.2	2.678	2.007	38.8	17.9	15.0	20.6
2000 12 12	19 45.16	-19 54.5	2.713	1.980	34.4	16.3	14.9	20.5
2000 12 22	20 09.40	-18 26.7	2.745	1.957	30.1	14.6	14.9	20.5

73P/Schwassmann-Wachmann 3				Elements MPC 31663				
Date	TT	α_{2000}	δ_{2000}	Δ	r	ϵ	ϕ	m_1 m_2
1999 12 28		09 01.66	+28 57.0	2.953	3.798	144.6	8.6	22.3
2000 01 07		08 54.29	+29 56.1	2.829	3.746	155.4	6.3	22.1
2000 01 17		08 44.98	+30 54.8	2.735	3.692	164.6	4.1	21.9
2000 01 27		08 34.29	+31 47.7	2.672	3.638	166.9	3.5	21.8
2000 02 06		08 23.04	+32 30.2	2.642	3.582	159.5	5.5	21.8
2000 02 16		08 12.18	+32 58.9	2.642	3.525	148.9	8.3	21.9
2000 02 26		08 02.65	+33 13.0	2.670	3.466	137.7	11.1	22.0
2000 03 07		07 55.14	+33 13.5	2.720	3.407	126.6	13.5	22.1
2000 03 17		07 50.13	+33 02.7	2.787	3.345	116.0	15.5	22.1
2000 03 27		07 47.78	+32 43.0	2.866	3.283	105.9	17.0	22.0
2000 04 06		07 48.04	+32 16.5	2.950	3.219	96.4	18.0	22.0
2000 04 16		07 50.76	+31 44.8	3.035	3.153	87.4	18.5	21.9
2000 04 26		07 55.69	+31 08.8	3.117	3.087	79.0	18.7	21.8
2000 05 06		08 02.59	+30 28.6	3.192	3.018	71.0	18.4	21.7

2000 05 16	08 11.22	+29 44.4	3.258	2.948	63.4	17.9	21.6	22.3
2000 05 26	08 21.34	+28 55.9	3.313	2.877	56.3	17.0	21.5	22.3
2000 06 05	08 32.77	+28 02.5	3.354	2.804	49.5	16.0	21.3	22.2
2000 06 15	08 45.36	+27 03.9	3.382	2.729	43.0	14.7	21.2	22.1
2000 06 25	08 58.94	+25 59.6	3.394	2.652	36.9	13.3	21.0	22.0
2000 07 05	09 13.44	+24 48.9	3.392	2.574	31.0	11.7	20.8	21.9

140P/Bowell-Skiff

Date	TT	α_{2000}	δ_{2000}	Δ	r	Elements <i>MPC</i> 34126		
						ϵ	ϕ	m_1 m_2
1999 12 28		16 10.01	-23 56.7	3.735	2.935	30.9	9.9	21.4 21.8
2000 01 07		16 25.68	-24 40.6	3.720	2.999	37.4	11.5	21.5 21.9
2000 01 17		16 40.48	-25 17.6	3.691	3.064	44.2	12.9	21.6 22.0
2000 01 27		16 54.27	-25 48.6	3.650	3.129	51.2	14.2	21.7 22.1
2000 02 06		17 06.91	-26 14.3	3.597	3.193	58.5	15.3	21.8 22.1
2000 02 16		17 18.23	-26 35.8	3.533	3.259	66.0	16.1	21.9 22.2
2000 02 26		17 28.07	-26 53.8	3.460	3.324	73.9	16.6	22.0 22.2
2000 03 07		17 36.27	-27 09.4	3.381	3.389	82.0	16.9	22.1 22.2
2000 03 17		17 42.64	-27 23.3	3.298	3.454	90.6	16.7	22.2 22.2
2000 03 27		17 47.02	-27 36.1	3.214	3.519	99.5	16.2	22.1 22.1
2000 04 06		17 49.30	-27 48.2	3.134	3.584	108.8	15.3	22.1 22.1
2000 04 16		17 49.38	-27 59.5	3.061	3.649	118.6	14.0	22.0 22.0
2000 04 26		17 47.29	-28 09.4	3.000	3.713	128.7	12.2	22.0 22.0
2000 05 06		17 43.16	-28 17.0	2.955	3.778	139.3	10.0	21.9 21.9
2000 05 16		17 37.29	-28 21.3	2.932	3.842	150.1	7.5	21.8 21.8
2000 05 26		17 30.14	-28 21.3	2.934	3.906	161.0	4.8	21.7 21.7
2000 06 05		17 22.30	-28 16.5	2.963	3.969	171.3	2.2	21.6 21.6
2000 06 15		17 14.42	-28 07.1	3.022	4.032	173.4	1.7	21.6 21.6
2000 06 25		17 07.13	-27 54.0	3.109	4.095	163.8	4.0	21.9 21.9
2000 07 05		17 00.94	-27 38.8	3.225	4.158	153.2	6.3	22.1 22.1
2000 07 15		16 56.23	-27 23.1	3.366	4.220	142.8	8.4	22.3 22.3
2000 07 25		16 53.19	-27 08.4	3.529	4.282	132.6	10.1	22.5 22.5

49P/Arend-Rigaux

Date	TT	α_{2000}	δ_{2000}	Δ	r	Elements <i>CCO</i> 13		
						ϵ	ϕ	m_1 m_2
1999 12 28		16 18.26	-07 04.9	5.105	4.331	34.5	7.4	21.3 21.3
2000 01 07		16 27.06	-07 15.6	5.055	4.373	41.9	8.6	21.3 21.3
2000 01 17		16 35.23	-07 19.9	4.988	4.414	49.5	9.8	21.4 21.4
2000 01 27		16 42.64	-07 18.0	4.905	4.454	57.5	10.7	21.4 21.4
2000 02 06		16 49.16	-07 10.2	4.809	4.494	65.7	11.5	21.4 21.4
2000 02 16		16 54.65	-06 56.8	4.703	4.533	74.1	12.1	21.4 21.4
2000 02 26		16 58.98	-06 38.4	4.589	4.571	82.8	12.4	21.3 21.3
2000 03 07		17 02.02	-06 15.6	4.471	4.608	91.7	12.4	21.3 21.3
2000 03 17		17 03.65	-05 49.2	4.353	4.645	100.9	12.1	21.3 21.3
2000 03 27		17 03.80	-05 20.5	4.241	4.681	110.3	11.5	21.2 21.2
2000 04 06		17 02.43	-04 50.5	4.137	4.716	119.9	10.6	21.1 21.1
2000 04 16		16 59.56	-04 20.9	4.047	4.751	129.6	9.4	21.0 21.0
2000 04 26		16 55.31	-03 53.3	3.977	4.785	139.3	7.9	21.0 21.0
2000 05 06		16 49.87	-03 29.3	3.929	4.818	148.5	6.3	20.9 20.9
2000 05 16		16 43.55	-03 10.6	3.907	4.850	156.4	4.8	20.8 20.8
2000 05 26		16 36.73	-02 58.7	3.914	4.882	160.9	3.9	20.8 20.8
2000 06 05		16 29.81	-02 54.5	3.950	4.913	159.5	4.1	20.8 20.8
2000 06 15		16 23.23	-02 58.5	4.015	4.944	153.3	5.3	20.9 20.9
2000 06 25		16 17.35	-03 10.4	4.108	4.974	144.9	6.8	21.1 21.1
2000 07 05		16 12.45	-03 29.8	4.225	5.003	135.6	8.2	21.2 21.2

2000 07 15	16 08.75	-03 55.7	4.363	5.031	126.2	9.4	21.3 21.3
2000 07 25	16 06.35	-04 26.9	4.518	5.059	116.9	10.3	21.5 21.5
2000 08 04	16 05.27	-05 02.2	4.686	5.086	107.6	11.0	21.6 21.6
2000 08 14	16 05.51	-05 40.5	4.861	5.112	98.6	11.3	21.7 21.7
2000 08 24	16 06.98	-06 20.6	5.041	5.138	89.8	11.3	21.8 21.8
2000 09 03	16 09.60	-07 01.5	5.221	5.164	81.2	11.1	21.8 21.8
2000 09 13	16 13.26	-07 42.5	5.396	5.188	72.8	10.7	21.9 21.9
2000 09 23	16 17.85	-08 22.7	5.565	5.212	64.5	10.0	22.0 22.0
2000 10 03	16 23.25	-09 01.4	5.723	5.235	56.4	9.2	22.0 22.0
2000 10 13	16 29.36	-09 38.1	5.868	5.258	48.3	8.2	22.0 22.0
2000 10 23	16 36.06	-10 12.3	5.997	5.280	40.5	7.0	22.0 22.0
2000 11 02	16 43.26	-10 43.5	6.109	5.302	32.7	5.8	22.0 22.0

C/1998 K1 (Mueller)

Date	TT	α_{2000}	δ_{2000}	Δ	r	ϵ	ϕ	m_1 m_2	Elements <i>MPC</i> 33451	
1999 12 28		16 51.25	-48 53.8	6.187	5.374	31.6	5.5	18.8 18.8		
2000 01 07		17 04.16	-49 41.4	6.193	5.436	36.6	6.2	18.8 18.8		
2000 01 17		17 16.66	-50 29.8	6.182	5.497	42.5	6.9	18.9 18.9		
2000 01 27		17 28.61	-51 19.3	6.156	5.559	48.9	7.7	18.9 18.9		
2000 02 06		17 39.87	-52 10.2	6.116	5.620	55.7	8.3	18.9 18.9		
2000 02 16		17 50.27	-53 03.0	6.065	5.682	62.8	8.9	19.0 19.0		
2000 02 26		17 59.65	-53 57.7	6.005	5.745	70.1	9.3	19.0 19.0		
2000 03 07		18 07.81	-54 54.7	5.939	5.807	77.6	9.6	19.0 19.0		
2000 03 17		18 14.57	-55 53.8	5.868	5.869	85.2	9.7	19.0 19.0		
2000 03 27		18 19.73	-56 54.7	5.798	5.932	92.8	9.7	19.0 19.0		
2000 04 06		18 23.08	-57 56.6	5.731	5.994	100.5	9.4	19.1 19.1		
2000 04 16		18 24.46	-58 58.3	5.670	6.057	108.1	9.1	19.1 19.1		
2000 04 26		18 23.73	-59 58.1	5.619	6.120	115.5	8.5	19.1 19.1		
2000 05 06		18 20.84	-60 53.8	5.582	6.183	122.5	7.9	19.1 19.1		
2000 05 16		18 15.86	-61 42.9	5.562	6.246	128.8	7.2	19.2 19.2		
2000 05 26		18 09.03	-62 22.8	5.560	6.308	134.2	6.6	19.2 19.2		
2000 06 05		18 00.79	-62 51.2	5.580	6.371	138.1	6.1	19.3 19.3		
2000 06 15		17 51.75	-63 06.6	5.622	6.434	140.1	5.8	19.3 19.3		
2000 06 25		17 42.61	-63 08.6	5.687	6.498	139.8	5.8	19.4 19.4		
2000 07 05		17 34.10	-62 57.8	5.776	6.561	137.4	6.0	19.5 19.5		
2000 07 15		17 26.82	-62 35.9	5.886	6.624	133.2	6.4	19.6 19.6		
2000 07 25		17 21.20	-62 05.3	6.016	6.687	127.8	6.9	19.6 19.6		
2000 08 04		17 17.49	-61 28.5	6.165	6.750	121.4	7.4	19.7 19.7		
2000 08 14		17 15.78	-60 48.0	6.329	6.813	114.6	7.8	19.8 19.8		
2000 08 24		17 15.99	-60 06.0	6.505	6.876	107.5	8.1	19.9 19.9		
2000 09 03		17 18.02	-59 24.1	6.690	6.939	100.1	8.2	20.0 20.0		
2000 09 13		17 21.69	-58 43.8	6.881	7.002	92.8	8.3	20.1 20.1		

OPPOSITION DATA

Planet	Opposition	α_{2000}	δ_{2000}	V	$\dot{\alpha}$	$\dot{\delta}$	ϕ_{MIN}	MPC
1992 PT ₁	1999 10 23.0	01 48.40	+00 22.7	19.5	-1.02	- 6.5	4.2/20.0	31382
1998 QZ ₈₅	1999 10 23.0	01 48.40	+55 49.9	19.0	-1.40	- 0.6	10.8/06.6	35712
(8837)	1999 10 23.0	01 48.51	+04 12.8	18.2	-0.98	- 7.0	2.6/21.0	31908
1994 EK ₁	1999 10 23.0	01 48.73	+12 07.2	17.6	-1.07	- 2.6	0.4/23.3	36791
1998 HY ₃₅	1999 10 23.0	01 48.85	+07 52.7	17.4	-1.03	- 4.5	1.3/22.2	36897
(11649)	1999 10 23.1	01 48.80	+19 25.8	16.1	-1.05	- 3.1	3.8/25.3	35871
1992 SY ₁₇	1999 10 23.1	01 48.83	+19 55.9	16.1	-0.97	-11.7	3.9/26.1	36881
(11811)	1999 10 23.1	01 48.89	+14 03.2	17.9	-1.07	- 4.5	1.1/23.9	36222

1988 CX ₄	1999 10 23.1	01 49.10 +07 11.1 18.3	-0.81 - 7.9	1.4/21.9	15889	(12380)	1999 10 24.2	01 53.05 +06 08.7 16.9	-0.83 - 6.1	1.8/22.6	36707
(9093)	1999 10 23.2	01 49.26 +19 28.7 16.7	-0.84 -10.5	2.9/26.1	32195	1998 KG ₂	1999 10 24.2	01 53.38 +27 09.9 18.9	-0.94 - 7.9	4.7/29.4	36899
1997 HY ₆	1999 10 23.2	01 49.34 +04 26.1 17.6	-0.84 - 1.9	2.1/21.4	36892	(12049)	1999 10 24.3	01 53.33 +13 08.1 16.5	-0.85 - 4.2	0.5/24.7	36286
1997 HP ₁₁	1999 10 23.2	01 49.35 +13 25.7 17.4	-0.84 - 4.3	0.7/23.9	36892	1999 TZ ₂₅	1999 10 24.3	01 53.41 +15 15.6 17.2	-1.13 - 1.4	1.7/25.2	36850
1998 OS	1999 10 23.3	01 49.57 +19 27.5 19.4	-0.86 - 5.8	2.7/25.8	36815	1992 ET ₁₄	1999 10 24.3	01 53.52 +12 43.5 17.1	-0.84 - 5.8	0.4/24.7	36880
1998 OX ₅	1999 10 23.3	01 49.69 +29 19.7 17.6	-0.93 - 5.5	5.8/29.0	32489	1998 HZ ₁₀₁	1999 10 24.3	01 53.64 +15 09.1 18.8	-0.96 - 7.9	1.3/25.4	36810
1999 TQ ₂₅	1999 10 23.3	01 49.73 +11 45.8 17.7	-0.88 - 8.4	0.2/23.5	36850	(8669)	1999 10 24.3	01 53.67 +04 27.7 16.7	-0.90 - 7.4	2.8/22.2	31679
1999 TR ₂	1999 10 23.3	01 49.94 -23 42.6 17.3	-0.79 - 1.7	10.0/12.4	36839	(11785)	1999 10 24.4	01 53.72 +04 04.3 16.1	-0.89 - 2.7	2.5/22.4	36215
1998 HK ₄₅	1999 10 23.4	01 49.99 +18 20.3 17.2	-1.14 - 1.6	2.8/25.1	36897	1998 KW ₄	1999 10 24.4	01 53.80 +12 01.5 18.6	-0.97 - 7.2	0.1/24.5	36899
(8738)	1999 10 23.4	01 50.00 +10 29.5 15.5	-0.85 - 4.6	0.4/23.2	31696	(11783)	1999 10 24.4	01 53.89 +10 43.7 15.9	-0.76 - 4.8	0.4/24.2	36214
1998 KV ₅₀	1999 10 23.4	01 50.07 +05 52.5 17.8	-0.82 - 9.2	1.8/21.7	36900	1173 T-2	1999 10 24.4	01 54.05 +19 48.9 17.9	-0.93 - 1.8	2.7/26.6	36943
1985 PH	1999 10 23.4	01 50.27 +36 56.9 16.1	-0.98 - 0.9	11.8/31.5	36875	(12451)	1999 10 24.4	01 54.05 +02 46.2 16.4	-1.04 - 2.9	4.1/22.2	36726
(12641)	1999 10 23.5	01 50.50 +10 06.1 16.5	-0.92 - 3.3	0.6/23.2	36780	(9394)	1999 10 24.4	01 54.07 +15 22.3 17.4	-0.90 - 4.1	1.2/25.5	36499
(8604)	1999 10 23.5	01 50.58 +02 21.3 15.2	-0.77 - 6.7	4.7/20.7	31664	1998 FS ₅₇	1999 10 24.4	01 54.20 +22 47.2 17.4	-1.13 - 2.6	4.7/28.0	36804
1996 XE ₃₁	1999 10 23.6	01 50.68 +27 00.5 18.2	-0.99 - 6.6	5.2/28.5	36889	1998 FF ₅₇	1999 10 24.5	01 54.31 +09 30.8 18.2	-1.02 - 6.3	0.9/23.9	36529
1999 VR ₂₂	1999 10 23.6	01 50.68 +18 10.5 16.0	-0.88 - 5.2	2.5/25.6	36865	(9100)	1999 10 24.5	01 54.44 -00 12.8 17.3	-0.95 - 3.9	4.0/21.3	32196
1999 RM ₄₂	1999 10 23.6	01 50.69 +03 01.5 17.6	-1.08 0.0	3.1/21.7	36914	1999 TN ₉	1999 10 24.7	01 55.00 +12 09.9 18.0	-1.09 - 2.4	0.1/24.8	36842
1998 DQ ₂₃	1999 10 23.6	01 50.73 +30 41.9 17.9	-1.92 + 9.4	10.1/25.7	36802	1999 TZ ₁₄	1999 10 24.7	01 55.21 +03 42.8 16.3	-0.81 -10.4	4.0/22.1	36929
1981 EG ₈	1999 10 23.6	01 50.83 +16 34.4 20.8	-0.91 - 5.1	1.5/25.1	26916	5078 T-3	1999 10 24.7	01 55.23 +01 05.2 17.0	-0.82 - 1.9	3.2/22.0	36944
(11504)	1999 10 23.6	01 50.84 +25 15.6 15.9	-1.09 - 2.0	6.6/27.2	35834	1998 HV ₁₀₁	1999 10 24.7	01 55.27 +19 19.9 18.4	-0.92 - 6.3	2.7/27.1	36898
(12200)	1999 10 23.6	01 50.89 +13 30.4 16.4	-0.89 - 7.6	0.8/24.3	36659	(8897)	1999 10 24.7	01 55.27 +08 39.7 16.6	-0.88 - 8.5	1.3/23.8	36498
(12635)	1999 10 23.6	01 50.92 +03 37.7 17.2	-0.74 - 7.0	2.4/21.2	36778	1992 SM ₂₆	1999 10 24.8	01 55.38 +08 47.2 17.2	-1.09 - 0.3	1.4/24.2	36881
1992 UR ₈	1999 10 23.6	01 50.93 +13 10.2 16.8	-1.09 - 2.6	0.7/24.1	36790	1998 EW ₆	1999 10 24.8	01 55.48 +28 19.8 18.0	-1.79 + 6.2	8.0/27.1	36802
1995 UB ₁₅	1999 10 23.6	01 50.98 +13 11.3 18.7	-0.96 - 3.9	0.6/24.1	36886	1998 HH ₄	1999 10 24.8	01 55.52 +00 58.3 17.4	-1.00 - 1.4	4.8/22.2	36896
1999 TW ₁₅	1999 10 23.6	01 51.09 +10 54.0 18.4	-0.77 - 5.9	0.2/23.5	36846	1994 PX ₂₁	1999 10 24.8	01 55.55 +17 42.0 18.6	-0.91 - 4.0	2.1/26.5	36792
(11865)	1999 10 23.6	01 51.10 +19 25.4 16.5	-1.21 - 3.4	3.5/25.7	36237	1999 TY ₂₅	1999 10 24.8	01 55.55 +15 10.8 17.5	-0.99 + 0.5	1.1/25.6	36850
1997 HS ₃	1999 10 23.7	01 51.07 +06 42.3 19.2	-0.80 - 5.0	1.5/22.3	36892	1998 HY ₃₁	1999 10 24.9	01 55.82 +14 20.5 17.9	-1.03 - 6.8	1.0/25.7	36897
1981 EL ₂₃	1999 10 23.7	01 51.08 +06 30.9 18.1	-0.88 - 6.2	2.0/22.2	26919	1998 KH ₃₄	1999 10 24.9	01 56.05 +03 42.5 18.8	-0.97 - 5.6	3.0/22.7	32334
1998 KM ₄₆	1999 10 23.7	01 51.31 +07 35.5 16.3	-0.90 - 8.9	1.6/22.5	36900	4266 T-1	1999 10 25.0	01 56.45 +08 14.9 20.1	-0.94 - 5.4	1.2/24.1	32092
(9077)	1999 10 23.7	01 51.32 -03 45.2 15.8	-0.73 - 9.2	6.1/18.4	32191	1993 FZ ₂₁	1999 10 25.1	01 56.62 +14 34.8 17.9	-0.96 - 4.1	0.9/25.9	36882
2814 P-L	1999 10 23.7	01 51.34 +15 58.4 19.9	-0.83 - 3.0	1.3/25.0	33324	1997 CK ₂₉	1999 10 25.1	01 56.68 +14 03.8 16.6	-1.01 - 4.9	1.0/25.7	36891
(12532)	1999 10 23.7	01 51.42 +01 46.2 16.6	-0.71 - 9.4	3.2/20.5	36750	(11867)	1999 10 25.1	01 56.70 +21 50.8 16.1	-0.97 - 6.4	4.8/28.2	36237
(11987)	1999 10 23.7	01 51.46 -04 26.4 16.6	-0.94 - 1.6	5.2/19.7	36269	1997 DQ	1999 10 25.1	01 56.78 +20 10.3 17.5	-1.14 - 1.1	3.6/27.1	36891
1999 TH ₁₄	1999 10 23.7	01 51.47 +08 26.5 17.0	-0.79 - 4.1	1.0/22.9	36845	5727 T-3	1999 10 25.1	01 56.81 -02 47.3 18.9	-0.94 - 1.5	4.6/21.5	34000
1981 EA ₃₂	1999 10 23.8	01 51.50 +18 57.2 18.4	-0.77 - 8.0	2.6/26.3	36786	1990 KR	1999 10 25.2	01 56.78 +02 56.3 18.2	-0.86 - 7.9	3.0/22.4	36877
1994 PN ₅	1999 10 23.8	01 51.53 +07 12.3 17.6	-0.84 - 5.3	1.5/22.6	36884	1998 FB ₁₁₈	1999 10 25.2	01 56.81 +19 50.1 17.7	-1.12 - 3.5	3.2/27.3	36806
1995 VJ	1999 10 23.8	01 51.55 +10 12.8 17.3	-0.95 - 3.7	0.5/23.5	36886	1991 JD	1999 10 25.2	01 56.85 +11 12.4 17.3	-1.05 - 4.3	0.3/25.0	36878
(12514)	1999 10 23.8	01 51.60 +06 01.0 16.8	-0.83 - 7.3	2.3/22.2	36745	(8925)	1999 10 25.2	01 57.13 +13 21.1 17.1	-1.02 - 6.3	0.5/25.7	31929
1999 UV ₂	1999 10 23.8	01 51.77 +05 18.6 18.3	-0.94 - 3.1	2.0/22.3	36856	1999 SH ₁₁	1999 10 25.4	01 57.76 +02 05.3 17.4	-0.93 - 2.0	3.5/23.0	36836
1999 OY ₂	1999 10 23.9	01 51.89 +21 33.5 17.3	-0.71 -18.8	3.8/28.1	36908	(12608)	1999 10 25.4	01 57.78 +16 20.7 17.2	-0.93 - 7.1	1.9/26.8	36771
1992 EV ₃₂	1999 10 23.9	01 51.98 +11 25.7 17.0	-0.82 - 6.3	0.0/23.9	36880	1999 TB ₂₆	1999 10 25.4	01 57.96 +14 52.6 17.5	-0.95 - 2.6	1.1/26.2	36850
(12003)	1999 10 23.9	01 52.25 +16 56.2 16.6	-0.83 - 1.8	1.6/25.4	36273	1998 QU ₁₀	1999 10 25.4	01 57.97 +20 04.6 18.0	-0.79 - 3.6	2.3/27.8	36815
1999 RC ₄₀	1999 10 24.0	01 52.19 +18 33.3 18.0	-1.00 + 1.0	2.4/25.6	36914	(12632)	1999 10 25.5	01 57.91 +15 06.0 18.0	-0.98 - 4.9	1.1/26.3	36778
(11850)	1999 10 24.0	01 52.28 +19 46.8 16.8	-1.04 - 1.1	2.8/26.0	36233	1999 TU ₁₃	1999 10 25.5	01 57.92 +10 50.8 16.5	-1.11 - 0.7	0.6/25.2	36928
6193 P-L	1999 10 24.0	01 52.39 +04 54.2 18.4	-0.79 - 9.9	2.4/21.8	36942	1998 KD ₅₈	1999 10 25.5	01 57.95 +15 19.2 17.8	-0.80 -13.2	1.3/26.7	36813
(9227)	1999 10 24.0	01 52.42 +16 08.8 17.3	-0.81 - 3.8	1.4/25.4	32430	(12285)	1999 10 25.5	01 58.15 +07 16.2 17.6	-0.78 - 5.0	1.5/24.1	36682
1999 RD ₂	1999 10 24.0	01 52.69 +21 02.8 16.0	-1.44 + 4.5	3.4/25.6	36910	1998 DB ₃₄	1999 10 25.5	01 58.33 +05 11.3 18.3	-0.98 - 5.8	2.3/23.7	36893
(12347)	1999 10 24.1	01 52.89 +03 32.2 17.9	-0.82 - 8.0	2.6/21.6	36698	1999 TW ₉	1999 10 25.5	01 58.36 +15 43.1 17.4	-0.95 - 4.4	1.7/26.6	36927
(9467)	1999 10 24.1	01 52.92 +09 16.9 17.3	-0.77 - 6.0	0.7/23.5	36499	1992 OM ₆	1999 10 25.6	01 58.45 +06 42.0 17.7	-1.00 - 6.6	2.3/24.1	36880
1990 DU ₄	1999 10 24.1	01 53.03 +09 33.2 16.5	-0.94 - 6.9	0.9/23.6	36876	1998 FL ₄₉	1999 10 25.6	01 58.53 +15 00.2 16.8	-1.09 - 5.1	1.2/26.4	36894
1996 YG ₁	1999 10 24.2	01 52.95 -05 34.4 18.3	-1.00 - 1.3	6.2/20.0	36889	1997 AG ₁₃	1999 10 25.6	01 58.75 +04 37.8 17.4	-1.04 - 3.2	2.9/23.8	36890

(11507)	1999 10 25.7	01 58.70 +26 44.2 16.4	-0.84 -11.7	6.1/31.1	35835	(12307)	1999 10 27.2	02 04.57 +15 06.9 16.7	-0.70 - 3.1	0.8/28.0	36688
1998 HG ₁₂₅	1999 10 25.7	01 58.74 -01 16.3 17.5	-0.82 - 8.9	4.7/21.4	36898	1978 UJ ₅	1999 10 27.2	02 04.88 +16 12.5 17.7	-0.98 - 5.1	1.6/28.3	36873
1998 HF ₃₀	1999 10 25.7	01 58.93 +05 16.0 17.4	-0.96 - 4.9	3.0/23.9	36897	1997 AO ₁₇	1999 10 27.3	02 04.81 -04 13.0 19.3	-1.01 - 3.3	6.4/22.8	30786
1988 TS ₁	1999 10 25.7	01 58.99 +10 25.2 16.4	-0.76 - 4.8	0.7/25.3	36504	1976 DC	1999 10 27.3	02 04.81 +48 46.7 19.8	-1.49 - 1.5	11.8/05.7	29092
1980 FZ ₂	1999 10 25.8	01 59.19 -00 51.3 18.2	-0.70 - 7.0	3.7/21.7	36873	1981 EN ₁₃	1999 10 27.3	02 04.82 +18 30.0 17.6	-1.04 - 6.8	2.3/29.0	36874
1998 KS ₄	1999 10 25.8	01 59.29 +00 09.9 16.6	-0.99 - 1.3	5.3/22.9	36899	1994 EQ ₁	1999 10 27.3	02 04.91 +08 01.1 16.0	-0.97 - 7.1	2.0/26.0	36883
(11873)	1999 10 25.8	01 59.34 -03 04.8 15.8	-0.97 - 3.6	7.1/21.7	36239	1989 CP ₂	1999 10 27.4	02 05.23 +24 44.2 17.9	-0.96 - 6.2	3.9/31.0	36876
1998 KR ₁	1999 10 25.9	01 59.46 +03 24.3 16.0	-1.06 + 1.1	3.5/24.1	36899	1998 MR ₁₆	1999 10 27.4	02 05.32 +27 32.8 20.1	-0.87 - 3.9	4.8/31.7	32973
1995 XK ₁	1999 10 25.9	01 59.66 +30 59.7 16.7	-0.86 - 8.0	7.9/01.4	36887	1997 GL ₂₁	1999 10 27.4	02 05.52 +14 05.6 17.6	-0.84 - 4.0	0.4/27.9	36892
1994 PC ₂₉	1999 10 25.9	01 59.68 -00 40.4 18.0	-0.83 - 4.8	4.4/22.3	36884	1999 SR ₉	1999 10 27.5	02 05.72 +04 38.3 17.1	-0.98 - 7.5	3.6/25.2	36924
(9339)	1999 10 26.0	01 59.96 +11 17.0 18.5	-0.74 - 4.1	0.2/25.8	32615	1993 FH ₃₄	1999 10 27.5	02 05.75 +11 35.0 18.0	-0.97 - 2.6	0.4/27.2	36791
(8935)	1999 10 26.1	02 00.49 +07 10.5 16.4	-0.87 - 7.8	2.5/24.6	36498	(11918)	1999 10 27.5	02 05.98 +04 53.1 16.0	-0.79 - 9.1	3.8/25.0	36251
(12340)	1999 10 26.1	02 00.51 -01 05.9 16.2	-0.97 - 1.8	6.1/22.8	36696	1990 VF ₈	1999 10 27.5	02 06.02 +15 13.4 16.2	-1.01 - 0.6	1.0/28.2	36877
1997 EM ₃₆	1999 10 26.1	02 00.57 +01 40.7 17.6	-0.95 - 7.2	4.6/23.0	36891	(12097)	1999 10 27.6	02 06.05 +00 57.7 16.4	-0.91 - 5.0	5.1/24.4	36300
1998 OP ₁₂	1999 10 26.1	02 00.62 +10 30.7 19.8	-0.76 - 4.0	0.4/25.7	32757	1131 T-2	1999 10 27.6	02 06.14 +16 02.2 19.8	-1.01 - 5.2	1.2/28.5	36943
1990 VE	1999 10 26.2	02 00.66 +03 56.5 15.6	-0.91 - 1.7	3.4/24.1	36877	1992 DH ₃	1999 10 27.6	02 06.21 +21 20.3 19.1	-0.89 - 3.5	2.5/30.0	36509
1998 JQ ₂	1999 10 26.2	02 00.72 +00 14.5 17.2	-0.83 - 6.1	4.6/22.7	36898	1988 PW ₂	1999 10 27.6	02 06.23 +03 04.2 18.2	-0.75 - 6.3	2.9/24.7	36875
1997 EQ ₃₀	1999 10 26.3	02 01.08 -05 04.3 18.4	-0.86 - 3.2	5.3/21.6	36891	1999 RZ ₄₃	1999 10 27.6	02 06.26 +03 59.2 17.9	-0.80 - 2.7	3.0/25.3	36914
1978 VO ₂	1999 10 26.3	02 01.16 +18 37.9 16.7	-0.88 - 7.3	2.3/28.3	36785	(11861)	1999 10 27.7	02 06.56 +01 52.9 14.9	-0.86 - 0.7	3.5/25.1	36236
(11795)	1999 10 26.3	02 01.22 +11 45.9 16.7	-0.84 - 4.9	0.2/26.2	36217	1995 QZ ₄	1999 10 27.7	02 06.77 +22 14.0 20.4	-1.07 - 6.1	3.4/30.4	25733
1999 RD ₃₅	1999 10 26.3	02 01.33 +05 45.0 16.3	-0.63 -28.0	2.9/23.5	36913	1998 HO ₃₃	1999 10 27.7	02 06.80 +10 48.1 15.9	-0.84 -20.9	0.8/27.0	36897
(9192)	1999 10 26.3	02 01.42 +22 29.4 17.6	-0.93 - 4.9	3.2/29.3	32422	1999 SS ₉	1999 10 27.8	02 06.85 +06 35.0 17.1	-0.97 - 1.6	2.9/26.3	36835
(9029)	1999 10 26.4	02 01.50 -16 06.4 18.3	-0.88 - 2.6	9.0/18.5	32180	1999 RR ₄₂	1999 10 27.8	02 06.89 +00 25.3 17.2	-0.73 - 6.2	4.2/24.0	36914
1999 TB ₁₇	1999 10 26.4	02 01.62 +09 16.2 16.4	-0.81 - 3.3	1.1/25.6	36847	1981 DX ₂	1999 10 27.8	02 07.18 +22 28.6 18.3	-0.82 - 5.4	2.8/30.8	36500
1999 TS ₉	1999 10 26.4	02 01.68 +12 36.1 17.1	-1.14 - 2.5	0.1/26.5	36842	1992 UU ₅	1999 10 27.9	02 07.26 +08 11.9 15.4	-0.93 - 2.2	2.4/26.8	36881
(12035)	1999 10 26.4	02 01.72 +14 31.1 17.7	-0.98 - 5.0	0.8/27.1	36282	1991 RA ₄	1999 10 27.9	02 07.33 +12 53.6 17.4	-0.90 - 7.6	8.7/17.0	36879
(8885)	1999 10 26.5	02 01.81 -04 12.1 16.9	-0.86 - 8.5	6.5/21.2	31919	1997 CK ₁	1999 10 27.9	02 07.50 +06 45.6 18.6	-0.91 - 4.2	1.9/26.3	36890
(11941)	1999 10 26.5	02 01.95 -29 10.6 16.6	-1.52 + 8.8	19.6/20.7	36257	1999 RQ ₁₉₃	1999 10 27.9	02 07.50 +02 37.0 18.0	-0.99 - 5.1	4.1/25.3	36831
1991 RQ ₄	1999 10 26.5	02 02.21 +19 14.1 17.2	-0.98 - 4.4	2.7/28.5	36879	1998 KB	1999 10 27.9	02 07.59 +12 18.5 18.0	-0.93 - 5.3	9.8/17.0	36899
1999 TB ₈	1999 10 26.5	02 02.23 +12 36.1 16.4	-1.18 + 6.8	0.1/26.6	36927	1996 XC ₁₅	1999 10 28.0	02 07.52 +11 56.4 16.7	-1.03 - 5.1	0.4/27.8	36889
1981 EQ ₃₀	1999 10 26.6	02 02.13 +25 44.4 16.8	-1.21 - 0.4	5.5/29.8	36874	1997 GP ₃₃	1999 10 28.0	02 07.66 +10 32.9 17.6	-0.86 - 5.7	0.9/27.4	36892
1999 TQ ₉	1999 10 26.6	02 02.13 +11 58.4 16.7	-0.78 - 4.5	0.2/26.5	36842	1998 HE ₁₂₃	1999 10 28.0	02 07.88 +02 16.3 17.8	-1.02 - 2.3	4.2/25.5	36898
(12312)	1999 10 26.6	02 02.21 -00 08.0 17.1	-0.85 - 3.5	4.9/23.2	36689	1991 VE ₃	1999 10 28.1	02 08.12 +02 34.3 15.8	-0.78 - 3.8	5.3/25.2	36879
1998 HR ₅₁	1999 10 26.6	02 02.38 +08 21.7 18.2	-1.08 - 4.8	1.6/25.6	36808	1995 WG ₂	1999 10 28.1	02 08.28 +22 17.1 17.1	-0.89 - 7.5	3.1/31.0	36886
(12533)	1999 10 26.6	02 02.40 +04 26.2 18.8	-0.90 - 4.6	2.5/24.5	36750	1995 WK ₁	1999 10 28.2	02 08.61 +11 34.2 16.8	-0.97 - 2.7	0.6/27.9	36886
(9004)	1999 10 26.6	02 02.46 -00 01.1 17.2	-0.69 - 8.5	3.5/22.5	32175	1998 GF	1999 10 28.2	02 08.75 +12 05.6 16.4	-1.74 + 8.1	0.4/28.2	36896
(12496)	1999 10 26.6	02 02.51 +06 46.8 17.0	-0.99 - 3.6	2.4/25.2	36738	1990 ES ₄	1999 10 28.3	02 08.78 +14 41.0 18.3	-0.97 - 5.4	0.6/28.8	36876
1999 RS ₄₄	1999 10 26.6	02 02.55 +06 46.9 16.2	-0.91 + 0.9	2.9/25.4	36915	1997 FK ₃	1999 10 28.3	02 09.02 +03 10.8 17.9	-0.76 - 9.2	3.7/25.2	36891
1999 TR ₉	1999 10 26.7	02 02.52 +13 57.0 16.1	-0.89 - 1.8	0.8/27.1	36842	1999 TE ₂	1999 10 28.3	02 09.04 +11 32.3 17.3	-1.08 - 2.1	0.7/28.0	36925
1998 OW ₁₁	1999 10 26.7	02 02.52 -05 04.3 18.2	-0.84 - 2.0	6.0/22.0	36901	(12475)	1999 10 28.3	02 09.11 +06 37.9 18.2	-0.85 - 4.5	2.0/26.6	36733
1994 PK ₅	1999 10 26.8	02 02.91 +26 47.3 17.0	-1.00 - 3.2	5.0/30.7	36883	1981 EE ₇	1999 10 28.4	02 09.05 +23 40.3 18.9	-1.11 - 5.3	3.9/31.3	31708
(8671)	1999 10 26.8	02 03.08 +18 00.7 16.9	-0.97 - 6.6	2.3/28.5	31680	1998 JL ₄	1999 10 28.4	02 09.08 +08 40.4 20.3	-0.98 - 6.2	1.6/27.2	32755
1997 CW ₁	1999 10 26.8	02 03.23 -01 26.2 18.2	-0.95 - 4.4	5.2/23.0	36890	1999 UC ₁	1999 10 28.4	02 09.34 +12 54.9 15.6	-1.14 + 2.0	0.1/28.4	36855
(12174)	1999 10 26.8	02 03.27 +06 04.8 16.3	-0.76 -10.6	2.4/24.7	36322	1999 ST ₁₁	1999 10 28.4	02 09.34 +06 56.9 16.8	-1.08 - 0.5	2.8/27.1	36836
1998 FF ₇₇	1999 10 26.9	02 03.35 +01 18.1 18.3	-1.00 - 4.8	4.6/24.0	36895	1999 UE ₁	1999 10 28.4	02 09.35 +09 55.0 17.2	-1.06 - 3.4	1.4/27.7	36855
1997 AV	1999 10 27.0	02 03.72 +20 19.0 16.8	-1.05 - 4.4	3.5/29.1	36889	1981 DN ₁	1999 10 28.4	02 09.42 +32 45.5 16.3	-1.02 - 4.5	8.6/03.5	36500
1995 UV ₁₆	1999 10 27.0	02 03.77 +05 20.0 18.2	-0.96 - 3.1	2.6/25.2	36886	6735 P-L	1999 10 28.4	02 09.43 +16 30.8 17.5	-0.86 - 2.3	1.2/29.4	36867
(12167)	1999 10 27.0	02 04.01 +17 40.7 16.5	-1.19 - 0.6	2.2/28.2	36320	1991 VD ₁	1999 10 28.4	02 09.46 +14 20.9 16.2	-1.21 + 2.9	0.5/28.7	36879
1998 HK ₉₄	1999 10 27.0	02 04.09 +14 34.8 16.7	-0.93 - 6.1	0.9/28.0	36898	1999 SW ₁₀	1999 10 28.4	02 09.47 +01 57.9 17.2	-1.03 + 2.3	4.3/26.4	36836
1999 TF ₂₆	1999 10 27.1	02 04.16 +13 07.7 17.2	-0.84 - 6.4	0.2/27.3	36850	1999 TR ₅	1999 10 28.4	02 09.47 +15 05.6 16.3	-1.07 + 0.2	0.9/28.9	36840
1992 WC ₉	1999 10 27.1	02 04.39 +06 50.7 16.3	-1.07 - 1.6	2.5/25.8	36881	1992 BT ₂	1999 10 28.5	02 09.43 -08 57.5 16.0	-0.82 - 6.4	8.2/21.4	36880

1999 UD ₁	1999 10 28.5	02 09.77 +11 03.8	18.1	-1.08	- 2.9	0.8/28.1	36855	(8670)	1999 10 29.9	02 15.13 +16 07.9	16.8	-1.02	- 5.3	0.9/30.6	31680
1998 HQ ₁₀₀	1999 10 28.5	02 09.87 +09 13.3	17.3	-1.07	- 4.6	1.6/27.6	36898	(12025)	1999 10 30.0	02 15.30 +18 38.9	17.5	-1.06	- 4.5	1.9/31.3	36279
1992 SB ₁₃	1999 10 28.5	02 09.88 +11 37.8	16.2	-1.07	- 3.7	0.6/28.2	36881	1999 TT ₁₈	1999 10 30.0	02 15.32 +15 27.8	18.8	-1.16	- 2.2	0.7/30.4	36848
1998 FY ₃₅	1999 10 28.6	02 09.85 +17 13.2	17.3	-1.18	- 3.3	1.7/29.6	36894	(11818)	1999 10 30.0	02 15.38 +14 48.1	17.3	-0.83	- 4.4	0.4/30.4	36224
(12609)	1999 10 28.6	02 09.88 +14 32.8	17.4	-0.82	- 4.3	0.5/29.0	36772	(12627)	1999 10 30.0	02 15.42 +17 15.9	18.2	-1.08	- 5.1	1.4/31.0	36776
1992 ES ₆	1999 10 28.6	02 10.07 -00 32.0	16.8	-0.84	- 3.4	5.9/24.9	36880	1998 HN ₄₉	1999 10 30.1	02 15.78 +13 33.6	18.0	-1.00	- 6.6	0.0/30.1	36897
(9226)	1999 10 28.7	02 10.21 +07 49.9	16.8	-0.84	- 4.2	1.8/27.3	32429	1997 CR ₂₁	1999 10 30.1	02 15.94 +10 12.6	18.7	-0.97	- 4.9	1.2/29.3	36890
1998 HS ₁₄₈	1999 10 28.7	02 10.50 +13 48.2	18.3	-0.96	- 4.7	0.2/28.9	36811	1975 TU ₃	1999 10 30.1	02 16.05 +10 52.6	15.4	-1.15	- 0.2	1.2/29.6	36872
(12296)	1999 10 28.7	02 10.64 +15 35.0	17.2	-0.98	- 5.7	1.0/29.5	36685	(12500)	1999 10 30.2	02 16.03 +17 31.2	17.2	-1.11	- 5.3	1.7/31.2	36740
(8904)	1999 10 28.8	02 10.69 +07 57.9	14.9	-0.89	- 1.6	2.5/27.6	31924	1990 KD	1999 10 30.3	02 16.43 -07 25.0	18.3	-0.96	- 1.9	7.1/25.3	36505
1999 UF ₁	1999 10 28.9	02 11.14 +13 47.5	17.4	-1.05	+ 2.4	0.2/29.0	36856	1978 XW	1999 10 30.3	02 16.75 +10 49.1	16.6	-0.83	- 4.0	1.0/29.6	36873
1989 SM ₁	1999 10 28.9	02 11.22 +07 00.7	17.7	-0.81	- 4.5	2.4/27.2	36787	1998 KP ₅₄	1999 10 30.3	02 16.76 -08 11.1	17.2	-0.91	- 0.5	8.1/25.3	36900
(12369)	1999 10 28.9	02 11.27 +04 29.4	17.2	-0.99	- 5.0	3.3/26.6	36704	(12364)	1999 10 30.3	02 16.79 +12 47.2	16.5	-1.02	- 6.7	0.4/30.1	36703
1329 T-2	1999 10 28.9	02 11.27 +13 25.7	17.0	-0.81	- 5.1	0.1/29.0	36869	1999 TD ₂₈	1999 10 30.4	02 16.86 +16 22.6	18.1	-1.05	- 3.8	1.2/31.1	36851
1999 SS ₁₁	1999 10 28.9	02 11.31 +05 39.8	16.8	-0.92	- 2.8	3.3/27.1	36924	1999 UG ₄	1999 10 30.4	02 16.86 +11 16.3	17.4	-0.97	- 5.7	0.9/29.8	36858
1999 SF ₂	1999 10 28.9	02 11.37 +06 13.4	16.7	-0.87	- 4.9	3.3/27.0	36923	1999 UN ₁₁	1999 10 30.4	02 16.90 +13 35.4	17.2	-0.94	- 8.6	0.0/30.4	36859
1999 UK ₂	1999 10 29.0	02 11.37 +13 08.7	17.2	-1.08	- 3.0	0.0/29.0	36856	(12199)	1999 10 30.5	02 17.18 +15 27.9	16.0	-0.89	- 8.7	0.7/31.0	36659
1998 HU ₃₂	1999 10 29.0	02 11.38 +12 48.6	17.5	-1.06	- 4.1	0.2/28.9	36897	1997 FZ ₃	1999 10 30.5	02 17.50 +12 47.1	17.3	-0.83	- 4.8	0.3/30.3	36891
(11999)	1999 10 29.0	02 11.45 +26 53.8	17.7	-1.05	- 2.4	4.8/01.4	36272	(9132)	1999 10 30.5	02 17.50 +09 54.1	17.5	-0.78	- 3.8	1.1/29.5	32204
(11971)	1999 10 29.0	02 11.53 +03 36.5	16.0	-0.97	+ 1.4	3.7/27.0	36265	1991 RY ₂	1999 10 30.5	02 17.61 +20 09.8	17.7	-0.97	- 5.9	2.6/01.4	36789
(12427)	1999 10 29.0	02 11.62 +11 43.1	17.7	-0.93	- 4.1	0.6/28.7	36720	1989 EZ	1999 10 30.6	02 17.70 +17 12.5	16.1	-1.04	- 2.8	1.2/31.5	36786
1999 SW ₁₁	1999 10 29.1	02 12.00 +06 45.8	16.6	-1.05	- 1.2	2.9/27.7	36836	1998 HO ₁₀₂	1999 10 30.6	02 17.91 +13 42.8	18.0	-1.01	- 6.9	0.0/30.7	36898
1978 RT ₆	1999 10 29.1	02 12.07 +05 19.0	18.4	-0.99	- 6.6	3.1/27.0	36873	1993 TL ₁₈	1999 10 30.6	02 17.99 +13 14.8	17.3	-0.80	- 2.8	0.2/30.5	36882
1989 CR	1999 10 29.2	02 12.36 -24 12.8	18.6	-0.94	- 1.4	10.6/19.0	36504	1999 OH ₃	1999 10 30.7	02 18.00 +28 18.6	16.6	-0.85	-13.0	5.4/05.0	36822
(11511)	1999 10 29.2	02 12.40 +35 16.4	15.9	-0.95	- 5.5	8.9/05.1	35836	1996 YR	1999 10 30.7	02 18.06 -00 39.1	17.1	-0.97	- 1.4	7.3/27.3	36889
1985 RP	1999 10 29.2	02 12.51 -00 39.4	15.8	-0.70	- 9.1	7.2/24.5	36875	1991 RQ ₅	1999 10 30.7	02 18.26 +16 12.8	17.7	-1.04	- 2.8	0.9/31.3	36789
1994 CO ₁	1999 10 29.2	02 12.51 +09 54.5	18.1	-0.99	- 6.3	1.3/28.3	36883	1999 UL ₁₆	1999 10 30.7	02 18.27 +16 33.9	18.1	-1.02	- 4.7	1.1/31.5	36860
(8928)	1999 10 29.2	02 12.60 +10 24.6	16.1	-1.01	- 2.4	1.3/28.6	31929	1998 HH ₈₀	1999 10 30.7	02 18.33 +17 33.4	15.7	-1.11	- 0.6	1.9/31.6	36897
1998 OW ₅	1999 10 29.3	02 12.96 -07 38.8	17.7	-0.73	- 4.5	5.9/23.0	36901	1993 NW ₁	1999 10 30.8	02 18.35 +13 46.0	17.5	-0.83	- 4.7	0.0/30.8	36791
(12223)	1999 10 29.4	02 13.01 +06 54.6	16.7	-0.74	- 7.6	2.2/27.4	36666	1998 QE ₁₁	1999 10 30.8	02 18.39 +46 19.0	17.8	-1.13	- 1.3	9.3/09.5	36816
1993 TN ₂₄	1999 10 29.4	02 13.07 +10 45.0	17.9	-0.74	- 3.8	0.7/28.7	36883	1977 JA	1999 10 30.9	02 18.87 +27 34.9	19.3	-1.03	-12.1	4.5/04.4	36872
1999 TF ₄	1999 10 29.4	02 13.25 +11 54.0	16.3	-0.85	- 3.4	0.6/29.1	36839	1995 WN ₄	1999 10 30.9	02 19.17 +05 10.0	17.9	-0.87	- 3.6	3.8/28.7	36886
1999 UR ₅	1999 10 29.4	02 13.31 +17 51.9	17.4	-0.75	- 6.7	1.3/30.9	36858	1998 MR ₃₃	1999 10 31.0	02 19.32 +06 06.6	18.0	-0.80	- 3.1	2.2/29.0	36901
1981 EO	1999 10 29.5	02 13.46 +31 57.3	18.4	-1.14	- 1.6	5.8/03.2	27302	1998 FU ₁₂₀	1999 10 31.0	02 19.33 +14 41.8	16.6	-1.06	- 6.3	0.4/31.3	36806
(12502)	1999 10 29.5	02 13.52 +16 33.4	17.3	-1.04	- 5.1	1.2/30.4	36741	1997 BF ₁	1999 10 31.0	02 19.42 +22 50.6	19.4	-1.08	- 4.8	3.3/02.0	30690
2613 P-L	1999 10 29.5	02 13.61 +10 33.0	17.9	-0.76	- 5.7	1.0/28.7	36941	2336 T-3	1999 10 31.1	02 19.57 +20 02.6	18.5	-1.01	- 4.0	2.9/02.0	36871
(11787)	1999 10 29.6	02 13.74 +30 12.8	15.4	-1.17	- 0.2	6.7/02.6	36215	(12454)	1999 10 31.1	02 19.59 +16 04.0	18.0	-0.98	- 5.2	0.7/31.7	36727
1991 RD ₁₈	1999 10 29.6	02 13.79 +07 44.7	17.7	-0.93	- 5.7	2.1/28.1	36789	(12211)	1999 10 31.1	02 19.66 +14 30.2	16.7	-0.93	- 0.4	0.2/31.3	36662
1999 TJ ₆	1999 10 29.6	02 13.81 +12 52.1	17.4	-0.80	- 3.7	0.2/29.5	36840	(12399)	1999 10 31.2	02 19.96 +16 16.8	17.5	-1.04	- 5.0	0.9/31.8	36712
(12348)	1999 10 29.6	02 13.95 +01 49.8	18.3	-0.81	- 7.7	3.8/26.1	36698	1998 MR ₃₂	1999 10 31.2	02 20.16 +14 13.5	17.4	-0.83	- 4.9	0.1/31.3	36814
1998 DZ ₁₃	1999 10 29.6	02 14.00 +10 44.6	18.0	-1.05	- 5.0	1.1/29.0	36893	1999 RC ₃₆	1999 10 31.2	02 20.18 +22 43.2	17.4	-0.91	- 1.5	2.7/02.4	36913
1993 FV ₁₃	1999 10 29.6	02 14.08 +20 06.5	16.6	-1.19	+ 2.3	2.8/30.9	36790	1996 XG ₁₉	1999 10 31.2	02 20.32 +08 26.9	17.2	-1.02	- 6.0	2.3/29.8	36889
(12214)	1999 10 29.7	02 14.37 +26 21.3	16.7	-0.79	- 6.5	3.5/02.8	36663	(12141)	1999 10 31.2	02 20.37 +16 41.7	17.1	-0.93	- 4.2	1.0/32.0	36312
(12511)	1999 10 29.7	02 14.41 +13 41.2	16.9	-1.05	- 5.5	0.1/29.8	36744	1998 HL ₈₀	1999 10 31.3	02 20.32 +14 20.1	18.3	-1.00	- 7.0	0.1/31.4	36897
1999 TL ₂₆	1999 10 29.8	02 14.46 +14 07.2	17.7	-0.74	- 8.1	0.2/30.0	36850	1474 T-2	1999 10 31.3	02 20.40 +14 37.3	17.6	-1.07	- 6.9	0.3/31.5	36943
1997 GN ₂₂	1999 10 29.8	02 14.66 +14 40.8	18.3	-0.83	- 4.3	0.4/30.2	36892	1991 VY ₅	1999 10 31.4	02 20.69 +03 55.3	17.1	-0.85	- 3.6	4.8/28.7	36329
1997 ED ₇	1999 10 29.8	02 14.75 +20 43.9	18.1	-0.92	- 7.4	3.1/01.0	36799	(12461)	1999 10 31.4	02 20.84 +16 09.3	17.1	-1.08	- 3.7	0.8/31.9	36729
1993 FV ₈₀	1999 10 29.8	02 14.78 +12 43.6	17.4	-0.94	- 3.5	0.3/29.7	36882	1999 TL ₁₁	1999 10 31.4	02 21.09 +09 53.8	16.6	-0.80	-13.5	1.8/30.1	36928
(12175)	1999 10 29.8	02 14.90 +10 36.0	15.8	-0.82	- 3.0	1.1/29.1	36322	1991 VE ₂	1999 10 31.5	02 21.13 +18 46.3	15.8	-0.85	-11.9	1.8/02.0	36879
(12423)	1999 10 29.9	02 14.91 +07 13.5	17.4	-0.95	- 3.5	2.2/28.3	36719	1991 PW ₁₁	1999 10 31.5	02 21.28 +07 55.1	17.1	-0.93	- 7.2	2.3/29.8	36878
1998 BK ₂₆	1999 10 29.9	02 14.92 +04 46.0	18.3	-1.00	- 6.5	3.5/27.6	32314	2806 P-L	1999 10 31.5	02 21.52 +21 02.9	18.6	-1.11	- 1.1	3.1/02.2	36942

1999 UO ₄	1999 10 31.6	02 21.48 +21 11.0 17.6	-1.04 - 4.2	3.3/02.4	36858	1995 YX ₃	1999 11 01.8	02 26.43 -08 03.6 17.0	-0.89 - 0.7	8.7/27.6	36795
1998 HJ ₁₂₄	1999 10 31.6	02 21.60 +06 04.7 19.5	-0.94 - 6.4	2.6/29.5	32330	3123 T-3	1999 11 01.8	02 26.46 +08 45.6 18.3	-0.75 - 5.5	1.7/31.2	24238
1999 OJ ₃	1999 10 31.6	02 21.76 +21 15.8 16.7	-0.87 -21.5	2.7/03.4	36823	1994 RN ₇	1999 11 01.8	02 26.54 +19 06.6 17.9	-0.92 - 3.7	1.6/03.1	36884
3092 P-L	1999 10 31.7	02 22.17 +26 11.0 18.0	-1.01 - 5.6	4.2/04.2	36942	1981 EO ₃₈	1999 11 01.9	02 26.67 +04 22.3 17.5	-0.84 - 8.8	3.8/29.9	36874
1998 MF ₃₂	1999 10 31.7	02 22.23 -00 52.5 16.9	-0.88 - 2.4	5.1/28.0	36901	1998 ER ₁₄	1999 11 01.9	02 26.70 +06 37.7 17.1	-1.12 - 3.0	3.6/31.2	32316
1999 TC ₂₇	1999 10 31.7	02 22.33 +15 19.1 16.7	-0.97 - 8.4	0.5/01.1	36851	(11798)	1999 11 01.9	02 26.86 +33 32.7 16.1	-1.21 + 1.4	8.1/05.8	36218
1997 JE ₁₀	1999 10 31.8	02 22.28 +02 32.1 17.0	-0.86 - 1.5	3.6/29.0	36892	(12136)	1999 11 01.9	02 26.94 +34 48.4 16.7	-1.13 - 2.8	7.2/07.4	36311
1998 HH ₁₄₈	1999 10 31.8	02 22.42 +15 02.6 19.3	-1.03 - 4.8	0.3/01.1	32331	1997 AD ₁₃	1999 11 02.0	02 27.00 -01 04.8 17.8	-0.90 - 2.6	4.5/29.2	36890
(12308)	1999 10 31.8	02 22.48 +03 52.3 16.1	-0.78 -11.9	4.1/28.4	36688	(11855)	1999 11 02.0	02 27.15 +09 37.4 16.4	-0.89 - 5.1	2.5/31.8	36234
(11475)	1999 10 31.8	02 22.58 +10 29.4 16.0	-1.16 - 0.4	1.6/31.1	35826	(8530)	1999 11 02.0	02 27.41 +12 04.6 15.8	-1.14 - 2.5	1.1/01.6	31503
(12368)	1999 10 31.8	02 22.72 +14 05.9 17.7	-1.02 - 4.4	0.0/31.9	36704	(12521)	1999 11 02.1	02 27.40 +08 27.6 16.4	-0.99 - 4.1	2.3/31.6	36747
1998 HE ₃₈	1999 10 31.9	02 22.76 +16 04.5 17.1	-1.02 - 6.8	0.7/01.4	36897	1981 EZ ₃₂	1999 11 02.1	02 27.55 +07 27.6 18.4	-0.77 - 6.8	2.3/31.1	22271
(12410)	1999 11 01.0	02 23.02 +26 22.4 17.4	-1.14 - 2.1	4.9/03.8	36716	1994 CV ₉	1999 11 02.1	02 27.56 +03 26.8 18.3	-0.98 - 5.1	4.2/30.3	36883
1992 SQ ₂₃	1999 11 01.0	02 23.13 +14 44.9 16.0	-0.96 -11.4	12.3/22.0	36881	1998 FB ₆	1999 11 02.1	02 27.73 +08 20.5 18.8	-1.04 - 5.6	2.4/31.6	36527
(9446)	1999 11 01.0	02 23.14 +12 26.4 18.3	-0.76 - 4.0	0.5/31.5	32640	(11859)	1999 11 02.1	02 27.79 +00 18.8 17.1	-1.00 - 2.8	6.2/29.9	36235
1995 UP ₇	1999 11 01.0	02 23.27 +07 31.3 16.1	-0.86 - 6.7	2.7/30.1	36886	1997 AH ₁	1999 11 02.2	02 27.85 +02 43.8 18.5	-0.94 - 3.1	4.0/30.4	30786
1999 TA ₃	1999 11 01.1	02 23.45 +28 27.2 16.8	-0.89 - 4.7	4.9/05.2	36839	1997 GV ₁₀	1999 11 02.2	02 27.91 +12 51.4 18.6	-0.96 - 5.7	0.7/01.8	36801
(12325)	1999 11 01.1	02 23.54 +14 44.8 16.5	-1.12 - 2.5	0.2/01.2	36693	(9228)	1999 11 02.2	02 28.02 +15 49.9 16.5	-0.85 - 2.5	0.4/02.6	32430
(11977)	1999 11 01.1	02 23.81 +24 11.0 16.4	-1.01 - 6.8	4.3/04.0	36267	1997 AX ₅	1999 11 02.3	02 28.16 +26 15.1 17.0	-1.00 - 5.0	5.8/05.4	36889
1995 SX ₂	1999 11 01.2	02 23.96 +13 50.7 16.5	-1.05 - 3.0	0.2/01.1	36885	(11838)	1999 11 02.3	02 28.16 +07 31.5 18.5	-0.96 - 4.4	2.4/31.6	36229
6250 P-L	1999 11 01.2	02 23.99 +12 50.6 17.9	-0.99 - 7.6	0.7/31.8	36867	1995 UB ₂₁	1999 11 02.3	02 28.25 +12 20.1 17.9	-0.93 - 7.3	0.8/01.7	36886
1981 EQ ₇	1999 11 01.3	02 24.26 +27 14.0 19.3	-0.89 - 4.0	4.0/04.9	26916	(8855)	1999 11 02.3	02 28.28 +10 21.9 18.4	-0.99 - 6.6	1.5/01.2	31912
(12647)	1999 11 01.3	02 24.27 +19 43.6 18.3	-0.81 - 7.1	1.7/02.9	36782	1989 YO ₃	1999 11 02.3	02 28.36 +13 21.0 17.3	-1.02 - 4.5	0.5/02.0	36787
(12453)	1999 11 01.3	02 24.36 +28 42.4 17.7	-1.00 - 5.4	4.3/05.4	36727	(12389)	1999 11 02.3	02 28.55 +25 01.0 17.5	-0.80 - 5.8	2.7/05.4	36710
(9109)	1999 11 01.3	02 24.47 +01 31.9 16.5	-0.91 - 6.2	5.6/28.8	32198	1992 PE ₃	1999 11 02.4	02 28.57 +18 34.3 16.2	-0.94 - 9.4	1.9/03.6	36880
1997 GH ₂₇	1999 11 01.3	02 24.56 +16 05.7 17.4	-1.02 - 3.4	0.7/01.8	36892	(12001)	1999 11 02.4	02 28.58 -04 07.4 18.1	-0.73 - 5.1	5.7/28.0	36273
(11810)	1999 11 01.3	02 24.59 +13 04.1 18.3	-0.79 - 5.1	0.4/01.0	36221	(12322)	1999 11 02.4	02 28.59 +22 04.4 16.8	-1.17 - 1.6	3.6/04.1	36692
1998 NF	1999 11 01.3	02 24.59 +10 40.7 18.5	-0.99 - 3.9	1.3/31.5	36814	(12409)	1999 11 02.4	02 28.67 +15 12.7 18.4	-1.01 - 5.2	0.2/02.6	36715
(9347)	1999 11 01.4	02 24.59 +09 25.8 17.3	-0.97 - 4.3	1.7/31.2	32617	1998 QC ₇	1999 11 02.4	02 28.76 -01 24.8 18.1	-0.77 - 4.2	4.8/29.1	32529
1998 HB ₉₉	1999 11 01.4	02 24.69 +11 00.8 18.2	-0.98 - 7.7	1.3/31.5	36898	(12424)	1999 11 02.4	02 28.84 +05 04.0 17.1	-1.00 - 0.6	3.1/31.4	36719
(12501)	1999 11 01.4	02 24.72 +14 48.0 16.9	-1.06 - 4.9	10.0/22.0	36740	1998 FT ₆₅	1999 11 02.5	02 29.11 +22 58.5 17.7	-1.20 - 3.4	3.4/04.5	36895
(8812)	1999 11 01.4	02 24.80 +15 25.7 15.9	-1.05 - 1.2	10.3/22.0	31902	1998 KZ ₃₀	1999 11 02.5	02 29.13 +14 09.5 18.2	-0.98 - 5.5	0.2/02.4	36899
1999 TJ ₅	1999 11 01.4	02 24.83 +21 06.5 16.7	-1.10 - 3.4	3.4/03.1	36926	(12275)	1999 11 02.5	02 29.14 -01 56.1 16.0	-0.90 - 1.1	6.7/29.6	36680
1998 HQ ₁₁₇	1999 11 01.4	02 24.86 +05 16.0 19.1	-1.04 - 5.2	3.5/30.2	32329	1997 GP ₃₆	1999 11 02.5	02 29.19 +13 31.9 17.2	-0.86 - 7.6	0.4/02.2	36892
3283 T-3	1999 11 01.5	02 25.14 +09 54.0 18.4	-0.87 - 5.3	1.6/31.3	36944	(12021)	1999 11 02.5	02 29.28 +07 02.2 16.5	-1.02 - 3.0	3.7/31.8	36279
1999 UM ₁₁	1999 11 01.5	02 25.19 +13 18.9 17.1	-0.81 - 3.5	0.4/01.3	36859	1043 T-1	1999 11 02.6	02 29.43 +14 58.7 16.4	-0.94 - 6.2	0.1/02.7	36867
1102 T-3	1999 11 01.5	02 25.24 +22 42.4 18.0	-0.80 - 6.2	2.4/04.0	36944	(9137)	1999 11 02.6	02 29.65 +10 59.7 16.5	-0.98 - 6.3	1.5/01.7	32205
(12630)	1999 11 01.5	02 25.26 +20 45.0 17.0	-1.09 - 2.7	2.5/03.1	36777	1992 UK ₈	1999 11 02.6	02 29.68 +17 32.8 16.2	-0.93 - 7.6	1.3/03.5	36881
1981 EN ₇	1999 11 01.5	02 25.31 +28 57.2 17.5	-0.95 - 3.0	4.9/05.4	36874	1998 HY ₁₀₀	1999 11 02.7	02 29.69 +13 22.0 18.1	-1.09 - 3.8	0.5/02.4	36809
(11944)	1999 11 01.5	02 25.32 +09 39.2 16.9	-0.83 - 4.1	1.5/31.3	36258	1992 HD ₁	1999 11 02.8	02 30.21 +13 04.7 20.0	-0.80 - 3.5	0.4/02.4	35685
(12405)	1999 11 01.5	02 25.43 +19 04.0 17.9	-0.99 - 7.2	1.8/02.9	36714	1994 SP ₉	1999 11 02.8	02 30.52 +03 09.0 19.4	-0.79 - 6.8	3.5/30.5	30080
(9327)	1999 11 01.5	02 25.44 +08 09.8 17.6	-0.84 - 3.2	1.8/31.0	32612	1994 PJ ₁₀	1999 11 02.9	02 30.53 +17 10.0 16.7	-0.90 - 4.6	0.9/03.5	36884
1994 PA ₄	1999 11 01.6	02 25.49 +10 23.6 18.7	-0.86 - 5.5	1.5/31.5	31239	(8988)	1999 11 02.9	02 30.64 +11 33.9 17.1	-0.74 - 4.6	1.0/02.0	32171
1991 PL ₅	1999 11 01.6	02 25.62 +16 33.8 18.1	-1.02 - 5.1	0.8/02.2	36878	1981 EE ₁₆	1999 11 02.9	02 30.84 +18 28.7 20.6	-0.94 - 5.1	1.1/03.9	30779
1998 QN ₁₈	1999 11 01.7	02 25.77 +28 52.4 17.8	-0.93 - 2.8	4.3/05.4	36902	1998 HN ₃₈	1999 11 02.9	02 30.86 +17 09.5 17.3	-1.12 - 4.3	0.9/03.5	36897
1997 JF ₁₂	1999 11 01.7	02 25.86 +13 53.4 19.0	-0.80 - 4.2	0.2/01.6	32753	1999 TV ₁₇	1999 11 02.9	02 30.90 +15 09.7 17.7	-1.10 - 2.6	0.1/03.1	36847
1996 VN ₆	1999 11 01.7	02 25.98 +38 16.8 17.0	-1.29 0.0	9.7/07.5	36888	(9053)	1999 11 02.9	02 30.95 +00 47.6 17.5	-0.96 - 2.5	5.0/30.8	32186
1998 HQ ₂₃	1999 11 01.7	02 26.08 +21 28.1 18.3	-0.95 -14.4	2.5/04.1	36896	1998 MC ₄₅	1999 11 03.0	02 30.91 +09 57.4 15.7	-0.77 -12.3	2.0/01.4	36901
3086 T-2	1999 11 01.7	02 26.16 +11 28.1 17.2	-0.95 - 2.8	1.1/01.1	36943	1995 VA ₂	1999 11 03.0	02 31.02 +08 47.6 17.5	-1.01 - 1.3	2.1/01.7	36886
1998 KP ₁	1999 11 01.8	02 26.20 +13 28.5 17.4	-0.96 - 5.2	9.8/22.0	36811	1979 MQ ₂	1999 11 03.0	02 31.14 +08 01.0 19.3	-0.93 - 5.3	2.3/01.3	30778
1990 SN ₈	1999 11 01.8	02 26.34 +11 58.9 17.0	-0.94 - 3.2	0.9/01.2	36877	(8442)	1999 11 03.1	02 31.45 +07 58.3 17.6	-1.03 - 3.5	2.8/01.5	36498

(9054)	1999 11 03.1	02 31.49 -10 16.3 16.2	-0.94 + 1.2	10.8/28.9	36060
1999 UU ₃	1999 11 03.2	02 31.65 +17 13.5 16.2	-0.79 - 5.8	0.8/03.9	36858
(11657)	1999 11 03.2	02 31.70 +11 42.4 16.3	-0.98 - 6.1	1.5/02.4	35873
(9293)	1999 11 03.2	02 31.74 +12 32.5 17.7	-0.75 - 3.8	0.6/02.6	32604
1997 LE ₄	1999 11 03.2	02 31.91 +23 58.4 17.8	-0.77 - 9.4	2.7/06.2	36802
1996 XZ ₂₆	1999 11 03.2	02 32.09 +17 33.4 18.7	-1.05 - 4.0	1.0/03.9	30786
1991 GU ₄	1999 11 03.3	02 32.12 +21 03.5 17.4	-0.91 - 1.7	1.9/04.7	36878
(11901)	1999 11 03.3	02 32.12 -05 02.8 17.6	-0.91 - 5.0	6.7/29.0	36246
1998 QZ ₂₄	1999 11 03.3	02 32.13 +05 15.2 17.7	-0.76 - 4.5	2.9/31.7	33347
(12189)	1999 11 03.3	02 32.16 +07 31.2 16.8	-0.97 - 6.9	3.2/01.4	36656
2206 T-1	1999 11 03.4	02 32.45 +18 12.1 18.5	-1.13 - 3.4	1.2/04.1	32290
1999 TB ₁₂	1999 11 03.4	02 32.48 +11 01.4 16.6	-1.10 + 0.6	1.5/02.6	36928
(12155)	1999 11 03.4	02 32.63 +08 28.0 15.8	-0.90 - 3.7	3.2/01.8	36316
(8857)	1999 11 03.4	02 32.68 +18 15.7 17.6	-1.05 - 4.4	1.3/04.3	31913
1994 RL ₇	1999 11 03.4	02 32.70 +18 04.9 17.5	-0.94 - 4.2	1.1/04.2	36884
1999 UL ₃	1999 11 03.4	02 32.89 +24 51.4 17.2	-1.02 - 0.1	4.3/05.6	36932
1981 EV ₂	1999 11 03.5	02 32.86 +21 56.8 17.6	-0.82 - 6.4	2.2/05.5	26915
(9203)	1999 11 03.5	02 33.07 +12 19.7 17.5	-0.78 - 3.3	0.7/02.9	32425
1995 BD	1999 11 03.5	02 33.09 +03 15.0 17.3	-0.74 - 2.1	3.1/31.7	36884
(9237)	1999 11 03.6	02 33.36 +12 45.8 17.3	-0.92 - 4.0	0.8/03.1	36498
1987 BF	1999 11 03.6	02 33.51 +23 17.2 17.7	-1.08 - 5.5	3.0/05.8	36875
1990 EV ₁	1999 11 03.6	02 33.62 +06 55.1 17.3	-0.94 - 8.1	3.1/01.4	36787
1997 AU ₁₇	1999 11 03.6	02 33.65 +06 11.4 18.1	-1.01 - 3.4	3.8/01.6	36890
1992 EJ ₆	1999 11 03.6	02 33.65 +04 57.7 18.2	-0.87 - 3.6	3.5/01.2	32226
1999 VK ₁	1999 11 03.7	02 33.83 +13 51.7 17.5	-0.99 - 2.6	0.5/03.5	36860
1998 HU ₁₀₁	1999 11 03.7	02 33.85 +18 31.8 20.5	-1.02 - 6.9	1.2/04.7	32522
1999 SC ₃	1999 11 03.7	02 33.89 +64 42.4 17.5	-2.22 - 0.1	23.7/23.7	36924
1998 HL ₃₄	1999 11 03.7	02 34.05 +13 25.3 17.7	-1.12 - 2.8	0.7/03.4	36808
1993 FD ₃₇	1999 11 03.7	02 34.05 +11 11.1 16.8	-0.93 - 5.5	1.5/02.8	32515
1989 WB ₃	1999 11 03.8	02 34.06 +06 59.1 17.4	-0.89 - 1.0	2.7/02.0	36876
1998 KP ₄₁	1999 11 03.8	02 34.07 +21 35.3 18.6	-1.12 - 4.9	2.5/05.4	36900
1999 VV ₁	1999 11 03.8	02 34.17 +06 50.6 16.8	-0.84 - 9.1	2.9/01.4	36861
1998 FK ₂	1999 11 03.8	02 34.25 -14 00.1 16.6	-0.89 -17.1	13.7/23.5	36894
1999 RJ ₄₂	1999 11 03.8	02 34.42 +20 16.5 15.5	-0.83 - 8.3	2.0/05.4	36914
1995 WB ₉	1999 11 03.8	02 34.48 +21 03.0 16.6	-0.90 -15.9	2.1/05.9	36887
1999 RE ₂	1999 11 03.9	02 34.51 +06 01.8 16.1	-0.69 -11.4	4.6/31.9	36910
1999 TC ₁₂	1999 11 04.0	02 34.90 +08 31.7 16.4	-0.97 - 3.5	3.0/02.5	36844
1999 UC ₃	1999 11 04.0	02 35.13 +07 04.1 16.4	-0.83 - 0.5	4.2/02.2	36857
(12283)	1999 11 04.0	02 35.23 +23 16.3 16.6	-1.00 - 2.0	2.8/05.9	36681
1997 BX ₂	1999 11 04.1	02 35.34 +00 17.8 18.4	-0.98 - 3.4	6.0/31.5	36890
1995 OE ₆	1999 11 04.1	02 35.35 +08 15.6 19.5	-1.01 - 4.9	3.0/02.4	36516
1998 QC ₉₅	1999 11 04.1	02 35.42 +34 20.1 17.8	-1.03 - 4.2	5.6/09.2	36817
1997 AL ₃	1999 11 04.1	02 35.48 -01 44.8 19.9	-0.92 - 3.0	5.3/31.1	32248
1995 XY ₄	1999 11 04.1	02 35.60 +08 19.2 19.5	-0.90 - 4.8	2.5/02.4	30082
(9043)	1999 11 04.1	02 35.60 +21 27.6 16.7	-0.84 - 3.8	1.8/05.8	32184
1989 WA ₁	1999 11 04.2	02 35.66 +05 53.2 16.3	-1.14 - 0.5	4.0/02.4	36787
1999 TK ₂₇	1999 11 04.2	02 35.66 +15 28.8 17.0	-0.99 - 7.5	0.1/04.3	36851
1998 HK ₃₆	1999 11 04.2	02 35.72 +13 55.3 16.0	-1.10 - 2.0	0.6/03.9	36897
1985 TS	1999 11 04.2	02 35.91 +19 51.5 16.2	-1.09 - 2.8	2.1/05.3	36875
1999 TV ₁₅	1999 11 04.3	02 36.15 +09 30.1 16.9	-1.01 - 5.9	2.2/02.9	36846
1999 TX ₁₀	1999 11 04.3	02 36.25 +09 42.3 17.1	-0.89 - 4.0	1.9/03.0	36843

(11962)	1999 11 04.3	02 36.33 -04 53.3 16.7	-0.80 - 5.4	7.5/29.8	36263
(12523)	1999 11 04.3	02 36.36 +07 47.9 15.3	-1.01 - 0.7	3.5/02.9	36747
1998 HL ₉₁	1999 11 04.3	02 36.36 +06 39.4 17.2	-0.95 - 6.9	3.5/02.1	36897
1994 ER ₅	1999 11 04.3	02 36.38 +16 00.1 18.1	-1.10 - 3.5	0.3/04.5	36791
(12450)	1999 11 04.3	02 36.40 +15 06.4 16.2	-1.09 - 3.7	0.1/04.3	36726
(9048)	1999 11 04.3	02 36.45 +05 53.3 17.8	-0.97 - 4.0	3.4/02.1	32184
1998 FC ₆₆	1999 11 04.4	02 36.65 +07 18.2 16.1	-0.93 - 9.7	3.4/02.2	36895
1998 HQ ₂₇	1999 11 04.5	02 36.90 +17 27.1 16.1	-1.01 - 8.5	1.0/05.1	36897
(11853)	1999 11 04.5	02 37.00 +19 49.5 16.3	-1.10 - 2.6	1.9/05.5	36233
1993 HE	1999 11 04.5	02 37.01 -03 56.7 17.2	-0.93 - 1.6	6.0/31.1	36512
1993 PV ₅	1999 11 04.5	02 37.10 +31 11.0 16.6	-0.93 - 3.5	5.4/08.8	36882
(9356)	1999 11 04.6	02 37.24 -07 22.8 16.5	-0.93 - 1.7	8.4/30.1	32619
(12258)	1999 11 04.6	02 37.27 +17 34.6 18.1	-0.93 - 5.0	0.7/05.2	36675
1995 XH ₃	1999 11 04.6	02 37.32 +10 51.4 19.4	-0.90 - 5.7	1.6/03.4	36887
1997 AM ₁₃	1999 11 04.6	02 37.36 +12 22.6 17.3	-1.09 - 1.7	1.2/04.0	36798
1997 GX ₁₆	1999 11 04.7	02 37.66 +25 33.5 19.7	-1.06 - 1.5	3.3/07.0	30767
1995 YO ₇	1999 11 04.7	02 37.85 +21 36.4 17.2	-0.84 -11.8	2.6/06.8	36796
1999 UO ₁₁	1999 11 04.7	02 37.85 +09 31.8 17.7	-0.83 - 5.9	2.3/03.2	36860
1999 TX ₁₃	1999 11 04.7	02 37.91 +09 33.6 17.1	-0.81 - 7.7	2.1/03.1	36845
(12435)	1999 11 04.7	02 38.03 +11 26.8 17.4	-0.86 - 3.3	1.3/03.8	36722
1998 FL ₁₂	1999 11 04.7	02 38.09 +33 43.3 17.8	-1.87 + 6.6	8.7/06.9	36803
1993 FP ₂₉	1999 11 04.8	02 38.41 +08 45.2 17.0	-0.86 - 8.0	2.2/03.0	36882
1998 FS ₅	1999 11 04.8	02 38.44 +14 12.9 18.4	-1.04 - 3.3	0.5/04.6	36894
(12388)	1999 11 04.9	02 38.36 +12 36.1 16.7	-0.87 - 2.9	1.0/04.2	36709
1999 TF ₁₂	1999 11 04.9	02 38.39 +09 38.7 17.7	-0.78 - 7.2	2.0/03.3	36844
(12354)	1999 11 04.9	02 38.47 +02 18.2 17.7	-0.76 - 5.1	4.1/01.3	36700
1996 XJ ₁₂	1999 11 04.9	02 38.47 +14 04.1 19.0	-1.06 - 3.8	0.5/04.6	36797
(12373)	1999 11 04.9	02 38.55 +04 16.9 17.5	-0.96 - 3.6	4.0/02.3	36705
(12457)	1999 11 04.9	02 38.55 +07 41.7 16.4	-1.06 - 2.7	3.4/03.2	36728
(9117)	1999 11 04.9	02 38.62 +01 09.7 15.5	-1.04 - 1.9	5.6/01.7	36498
(12526)	1999 11 05.0	02 39.08 +15 03.5 18.5	-1.03 - 4.5	0.2/05.0	36748
1998 JQ	1999 11 05.0	02 39.19 +23 41.5 16.9	-1.18 - 2.1	3.4/07.0	36898
1995 YN ₁₁	1999 11 05.1	02 39.39 +11 25.1 19.2	-0.82 - 4.3	1.3/04.1	31545
1998 KD ₅	1999 11 05.1	02 39.54 +15 30.7 16.9	-0.91 - 1.1	0.0/05.2	36899
2100 P-L	1999 11 05.2	02 39.62 +03 30.0 18.6	-0.78 - 7.8	3.7/01.7	36941
1994 SZ ₉	1999 11 05.2	02 39.68 +16 39.5 19.7	-0.91 - 3.3	0.4/05.5	36515
(9118)	1999 11 05.2	02 39.87 +14 03.4 15.5	-0.84 - 3.5	0.6/04.9	32200
1997 GR ₄	1999 11 05.2	02 39.90 +16 30.0 19.6	-0.98 - 3.8	0.3/05.5	36891
1999 TG ₂₀	1999 11 05.2	02 39.90 +13 55.8 17.6	-0.87 - 3.0	0.5/04.9	36930
1981 EX ₃₃	1999 11 05.2	02 39.97 +26 27.4 19.0	-0.90 - 4.1	3.6/08.1	26921
1992 EH ₇	1999 11 05.3	02 40.10 +06 39.2 19.4	-0.88 - 3.5	3.0/03.2	32744
(9138)	1999 11 05.3	02 40.20 +11 25.3 17.1	-1.05 - 6.2	1.8/04.3	32205
1222 T-1	1999 11 05.3	02 40.26 +34 37.2 16.8	-1.26 - 1.4	8.5/09.9	36942
(12061)	1999 11 05.3	02 40.27 +17 58.6 16.9	-1.15 - 3.3	1.0/05.9	36289
(12618)	1999 11 05.4	02 40.52 +05 56.0 18.2	-0.72 - 6.4	2.6/02.7	36774
(12613)	1999 11 05.4	02 40.63 +20 17.2 17.0	-0.95 - 5.0	1.8/06.7	36773
(9591)	1999 11 05.4	02 40.64 +16 35.5 17.8	-0.84 - 4.0	0.3/05.7	32887
1998 DO ₂₃	1999 11 05.4	02 40.69 +43 37.5 17.4	-2.07 +11.0	15.3/07.8	36527
1999 RL ₂₇	1999 11 05.4	02 40.69 +19 55.9 16.0	-1.12 - 0.2	1.5/06.3	36911
1997 BZ ₂	1999 11 05.5	02 40.81 +09 34.9 18.6	-0.90 - 4.5	1.9/04.0	36890
(9316)	1999 11 05.5	02 40.94 +04 47.2 16.7	-0.76 - 6.4	3.6/02.5	32609

1981 EG ₄₆	1999 11 05.5	02 40.97 +22 25.5 20.2	-0.99	- 3.7	2.1/07.2	32214	(8898)	1999 11 07.0	02 47.16 +12 36.6 17.6	-0.99	- 5.5	1.4/06.2	31922
(12515)	1999 11 05.5	02 41.05 +07 54.0 16.9	-0.95	- 5.5	3.2/03.6	36745	1997 EX ₁₃	1999 11 07.0	02 47.18 +20 32.5 17.0	-0.98	- 4.5	2.1/08.2	36891
1999 VB ₅	1999 11 05.5	02 41.05 +15 37.7 17.8	-0.88	- 3.0	0.0/05.6	36862	5485 T-2	1999 11 07.1	02 47.10 +26 28.3 15.8	-1.05	- 5.2	4.4/09.7	36943
(8527)	1999 11 05.5	02 41.21 +23 54.9 17.1	-1.22	- 2.6	3.3/07.4	31502	1999 VJ ₇	1999 11 07.1	02 47.12 +14 42.4 16.2	-0.92	- 0.2	0.5/06.8	36863
(12164)	1999 11 05.6	02 41.15 +11 35.5 17.1	-1.08	- 5.0	1.7/04.6	36319	1998 RD ₂₄	1999 11 07.1	02 47.24 +13 50.1 18.9	-0.76	- 3.6	0.6/06.6	35714
(12650)	1999 11 05.6	02 41.24 +22 26.8 18.2	-1.07	- 5.1	2.4/07.3	36783	1998 HR ₆₇	1999 11 07.1	02 47.37 +21 40.3 17.6	-1.21	- 2.3	2.2/08.3	36809
(12509)	1999 11 05.6	02 41.34 +20 50.3 17.5	-1.07	- 6.4	2.1/07.0	36743	1998 HY ₃₃	1999 11 07.2	02 47.71 +13 08.0 19.0	-1.00	- 7.3	1.0/06.5	32327
(9092)	1999 11 05.6	02 41.45 -00 28.7 16.5	-0.80	- 2.6	4.9/01.7	32195	1992 DT ₈	1999 11 07.2	02 47.71 +36 25.8 19.2	-1.04	- 2.8	5.9/12.3	32744
1991 EF ₂	1999 11 05.7	02 41.54 +08 32.8 16.8	-1.02	- 6.7	2.9/03.9	36878	1981 DC ₁	1999 11 07.2	02 47.82 +12 10.0 19.4	-0.89	- 7.5	1.3/06.2	26914
1994 PF ₁₄	1999 11 05.7	02 41.76 +09 14.0 18.1	-0.87	- 5.3	2.3/04.1	36884	1989 YC ₆	1999 11 07.2	02 47.82 +05 16.3 16.6	-0.90	- 5.8	5.4/04.5	36876
1998 QR ₆₉	1999 11 05.7	02 41.89 +17 58.9 18.0	-0.75	- 6.3	0.6/06.4	36903	1993 FJ ₂₆	1999 11 07.3	02 48.01 +22 53.8 18.2	-0.96	- 4.3	2.2/09.0	36790
(12606)	1999 11 05.8	02 41.94 +23 23.4 18.2	-1.12	- 3.7	2.8/07.6	36771	(12194)	1999 11 07.3	02 48.04 +24 11.1 17.7	-1.04	- 6.4	2.7/09.4	36658
(9395)	1999 11 05.8	02 42.00 +17 53.8 17.2	-0.93	- 4.9	0.7/06.4	32628	1997 CU ₅	1999 11 07.3	02 48.04 +06 41.8 18.8	-1.00	- 4.6	3.7/05.1	36799
2276 T-2	1999 11 05.9	02 42.47 +16 38.9 18.2	-0.96	- 3.5	0.3/06.1	36943	1998 KQ ₂	1999 11 07.3	02 48.23 +31 50.3 17.6	-1.11	-12.9	5.6/12.3	36899
(12306)	1999 11 05.9	02 42.52 +09 47.4 17.5	-0.97	- 4.2	2.1/04.5	36688	1998 QF	1999 11 07.4	02 48.47 +27 24.7 18.3	-0.86	- 2.8	3.1/10.2	36377
1991 BZ	1999 11 05.9	02 42.66 +26 20.8 16.1	-0.86	- 5.3	4.6/08.8	36878	(9475)	1999 11 07.5	02 48.78 +11 40.5 17.9	-0.79	- 3.1	1.3/06.4	32647
(12363)	1999 11 05.9	02 42.67 +12 34.1 18.0	-0.77	- 3.3	0.9/05.2	36702	(12232)	1999 11 07.5	02 48.84 +25 08.3 17.2	-1.07	- 2.1	2.9/09.5	36668
1998 JX	1999 11 05.9	02 42.73 +16 11.2 18.7	-1.04	- 6.8	0.1/06.1	36811	(11863)	1999 11 07.5	02 48.90 -02 26.8 17.5	-0.90	- 3.8	6.1/02.9	36236
1998 HK ₁₂₄	1999 11 06.0	02 42.76 +02 47.0 16.5	-0.99	- 3.5	6.2/03.0	36898	(11902)	1999 11 07.5	02 48.96 +27 06.9 16.3	-1.05	- 3.8	4.8/10.1	36247
(12622)	1999 11 06.0	02 42.86 +11 17.2 17.6	-0.92	- 3.9	1.6/05.0	36775	(9462)	1999 11 07.5	02 49.11 +19 13.8 16.5	-1.08	- 4.7	1.3/08.3	36499
1981 EU ₂₇	1999 11 06.0	02 43.06 +07 45.9 19.3	-1.03	- 5.9	2.9/04.1	36501	(11826)	1999 11 07.5	02 49.13 +17 36.4 16.7	-0.84	- 3.0	0.5/07.9	36226
1998 HV ₉₇	1999 11 06.0	02 43.07 +23 17.6 16.6	-1.01	- 4.7	3.2/08.0	36898	1998 KE ₅₄	1999 11 07.6	02 49.24 -08 43.7 18.0	-0.88	- 4.0	8.6/01.5	32336
1995 UK ₂₈	1999 11 06.1	02 43.33 +16 21.3 16.5	-1.08	- 1.7	0.2/06.3	36886	1982 UH ₉	1999 11 07.6	02 49.25 +26 28.4 15.8	-1.12	+ 0.2	5.1/09.7	36874
(8927)	1999 11 06.1	02 43.47 +16 23.7 17.8	-1.06	- 3.4	0.2/06.3	31929	1981 ET ₃₇	1999 11 07.6	02 49.31 +15 41.5 18.9	-1.08	- 6.3	0.2/07.5	36874
1998 FF ₇₃	1999 11 06.2	02 43.75 +45 53.7 17.6	-2.02	+ 7.5	15.7/10.4	36895	(12045)	1999 11 07.6	02 49.34 +34 44.4 16.6	-1.20	- 1.7	6.8/12.0	36285
1981 EO ₂	1999 11 06.2	02 43.87 +18 52.8 17.5	-0.82	- 6.0	0.9/07.1	36873	(12314)	1999 11 07.6	02 49.49 +13 58.8 17.9	-0.87	- 5.0	0.8/07.1	36690
(12495)	1999 11 06.2	02 43.90 +17 37.7 17.8	-1.13	- 5.5	0.7/07.0	36738	(12162)	1999 11 07.7	02 49.52 +01 55.3 16.9	-0.78	- 9.6	5.9/03.4	36318
(12247)	1999 11 06.4	02 44.32 +16 43.2 16.7	-0.86	- 3.3	0.3/06.6	36672	1988 PE	1999 11 07.7	02 49.67 +31 46.7 17.3	-1.28	- 3.9	6.2/12.0	36503
1991 GR ₂	1999 11 06.4	02 44.64 +17 43.0 16.5	-1.11	- 3.9	0.8/07.0	36878	1990 UB ₄	1999 11 07.7	02 49.94 +05 21.9 16.9	-0.81	- 7.6	4.2/04.7	36877
(12559)	1999 11 06.4	02 44.75 +35 52.1 16.2	-0.90	- 4.1	5.6/11.9	36757	1989 TR ₂	1999 11 07.7	02 49.96 +13 09.0 15.5	-1.02	+ 1.4	1.2/07.2	36876
1978 RD ₂	1999 11 06.5	02 44.74 +17 29.5 16.2	-1.01	- 1.1	0.7/07.0	36873	(12584)	1999 11 07.8	02 49.90 +17 31.7 16.8	-1.14	- 0.6	0.5/08.0	36765
(12289)	1999 11 06.5	02 44.97 +20 42.7 16.0	-1.08	- 4.3	2.2/07.7	36683	1995 UM	1999 11 07.8	02 50.17 +17 33.6 18.5	-0.92	- 7.5	0.5/08.2	36794
(11942)	1999 11 06.5	02 45.06 +16 24.7 17.3	-0.87	- 4.1	0.1/06.7	36257	1998 HK ₁₄₈	1999 11 07.8	02 50.21 +14 25.0 18.8	-1.08	- 3.4	0.7/07.4	32331
(11845)	1999 11 06.5	02 45.11 +12 37.9 16.8	-0.82	- 3.5	1.2/05.8	36231	(12522)	1999 11 07.8	02 50.24 +10 30.1 16.7	-0.99	- 5.1	2.7/06.5	36747
(12529)	1999 11 06.7	02 45.54 +13 33.7 16.5	-1.07	- 3.7	1.1/06.2	36749	1999 TQ ₂₇	1999 11 07.9	02 50.38 +17 09.4 16.7	-1.05	- 6.5	0.3/08.1	36851
1993 TB ₂₃	1999 11 06.7	02 45.57 +12 22.3 17.4	-0.76	- 3.8	1.0/05.8	31538	1997 EX ₄₅	1999 11 07.9	02 50.64 +11 08.2 16.6	-0.97	- 3.7	2.0/06.8	29646
1995 SD ₅₃	1999 11 06.7	02 45.76 +08 28.4 17.6	-0.88	- 6.7	3.4/04.8	30093	(12005)	1999 11 08.0	02 50.74 +00 30.2 17.9	-0.75	- 3.0	4.3/04.2	36274
1981 EO ₂₃	1999 11 06.7	02 45.81 +16 55.8 17.6	-1.03	- 5.3	12.0/18.0	26919	1998 KT ₃₂	1999 11 08.0	02 50.92 +16 49.9 17.4	-1.07	- 2.6	0.2/08.1	36899
(11851)	1999 11 06.7	02 45.89 -21 47.7 16.6	-0.79	-10.3	16.8/23.8	36233	1988 FD ₃	1999 11 08.0	02 51.04 +23 45.0 17.3	-1.16	- 4.5	2.9/09.7	36875
1999 RZ ₃₄	1999 11 06.7	02 45.89 +23 59.5 15.9	-1.49	+ 6.6	3.5/07.7	36913	(11881)	1999 11 08.1	02 51.17 -05 13.3 17.5	-0.85	- 5.0	8.3/02.6	36241
1995 OB	1999 11 06.7	02 45.91 +21 12.3 17.8	-1.08	- 6.9	2.1/08.1	36885	4054 T-3	1999 11 08.1	02 51.17 +17 21.8 17.2	-0.92	- 0.9	0.3/08.3	36944
(9391)	1999 11 06.7	02 45.95 -03 37.2 17.9	-0.92	- 3.0	6.9/02.4	32627	1981 DN ₃	1999 11 08.1	02 51.18 +21 27.5 17.4	-1.07	- 8.2	2.3/09.5	36873
(11834)	1999 11 06.8	02 45.97 +01 26.2 18.3	-0.87	- 4.9	4.7/03.2	36228	1998 HG ₅₃	1999 11 08.1	02 51.34 +16 44.7 17.1	-1.05	- 5.8	0.1/08.2	36897
(9175)	1999 11 06.8	02 46.02 +41 06.9 16.0	-1.22	- 2.6	9.2/13.4	32418	3041 T-1	1999 11 08.1	02 51.37 +25 08.8 17.6	-1.02	- 3.8	3.1/10.2	36942
1997 GH ₃₆	1999 11 06.8	02 46.12 +18 48.4 17.2	-1.08	+ 0.4	1.0/07.4	36801	(12539)	1999 11 08.1	02 51.39 +22 01.2 17.5	-0.93	- 4.3	1.8/09.5	36752
(12382)	1999 11 06.9	02 46.62 +14 28.1 18.2	-0.89	- 4.0	0.5/06.6	36708	1999 TQ ₁₁	1999 11 08.1	02 51.47 +07 58.9 16.6	-0.82	- 1.9	3.0/06.3	36928
(8887)	1999 11 06.9	02 46.75 -10 50.0 16.8	-0.92	- 2.1	9.9/31.8	31920	1996 XQ ₅	1999 11 08.1	02 51.53 +13 44.9 16.6	-1.11	- 3.4	1.2/07.6	36889
(12333)	1999 11 07.0	02 46.75 +14 16.5 16.2	-1.14	- 0.8	0.8/06.7	36695	(12634)	1999 11 08.1	02 51.55 +18 13.1 18.7	-1.03	- 3.7	0.6/08.6	36778
1998 HS ₅₁	1999 11 07.0	02 46.78 +15 25.1 17.1	-1.16	- 1.7	0.3/06.9	32328	(8649)	1999 11 08.2	02 51.55 +05 56.2 18.1	-1.05	- 4.8	4.3/05.8	31675
1998 KR ₅₄	1999 11 07.0	02 46.92 -08 29.6 16.7	-1.01	+ 1.2	11.0/02.2	36900	1998 FK ₆₅	1999 11 08.2	02 51.63 +15 07.4 18.0	-1.06	- 6.9	0.5/07.9	36804
1999 TP ₂₇	1999 11 07.0	02 47.13 +17 41.6 17.6	-0.95	- 3.1	0.6/07.5	36851	1998 QS ₃₁	1999 11 08.2	02 51.73 +34 28.4 17.6	-0.95	- 1.8	5.0/12.6	36902

1997 LU ₁	1999 11 08.2	02 51.86 +08 19.3	17.7	-0.77	- 6.6	2.4/06.1	36892	(8858)	1999 11 09.9	02 58.72 +19 08.4	18.1	-1.07	- 3.8	0.8/10.5	31913
1997 AW ₁₇	1999 11 08.2	02 51.89 +14 29.9	18.8	-1.02	- 3.8	0.7/07.8	36890	1997 LE ₁₀	1999 11 09.9	02 58.75 -00 27.8	17.5	-0.80	- 3.4	5.5/05.8	36892
1993 FG ₇₆	1999 11 08.3	02 51.91 +08 48.2	17.9	-0.87	- 6.6	2.8/06.3	36882	(8715)	1999 11 10.0	02 59.05 +12 23.3	16.6	-1.13	- 1.2	2.0/09.2	31690
1971 UR	1999 11 08.3	02 52.25 +16 14.2	16.6	-0.87	- 1.8	0.1/08.3	36872	1998 KM ₃₇	1999 11 10.0	02 59.11 +11 15.8	18.4	-0.95	- 3.5	1.9/08.8	36900
(12269)	1999 11 08.4	02 52.36 -01 20.4	17.0	-0.87	- 5.8	6.1/03.9	36678	1977 TQ ₆	1999 11 10.0	02 59.17 +14 09.8	15.8	-1.12	+ 2.5	1.2/09.7	36873
1995 WT ₇	1999 11 08.4	02 52.39 +05 45.3	17.5	-0.98	- 0.9	3.6/06.2	36795	1995 UB ₁₃	1999 11 10.0	02 59.18 +23 38.2	19.4	-1.13	- 2.0	2.3/11.4	36886
(12287)	1999 11 08.4	02 52.71 +15 09.9	18.4	-0.78	- 4.4	0.4/08.1	36683	1997 FA ₅	1999 11 10.0	02 59.20 +12 40.2	20.3	-0.88	- 4.7	1.3/09.1	36891
(8842)	1999 11 08.5	02 52.87 -04 50.1	16.1	-0.88	- 3.1	9.5/03.6	36060	(12472)	1999 11 10.1	02 59.21 +19 07.2	18.9	-1.07	- 2.8	0.9/10.6	36732
1997 AU ₁₂	1999 11 08.5	02 53.12 +28 00.7	16.8	-1.14	- 3.9	4.8/11.2	36798	(12107)	1999 11 10.1	02 59.26 +15 04.6	16.7	-1.05	- 7.5	0.8/09.7	36303
1981 EV ₁₁	1999 11 08.6	02 53.24 +13 41.6	18.8	-1.00	- 8.6	1.2/07.9	26917	5036 T-2	1999 11 10.1	02 59.30 +24 59.5	17.0	-0.95	- 6.8	2.9/12.2	36943
1998 HP ₅₂	1999 11 08.6	02 53.41 +12 53.4	18.8	-1.05	- 4.4	1.3/07.8	36897	(12652)	1999 11 10.1	02 59.50 +16 47.6	18.9	-0.78	- 5.3	0.1/10.1	36783
(12437)	1999 11 08.6	02 53.47 +13 34.1	17.7	-0.88	- 2.6	1.0/08.0	36722	(9062)	1999 11 10.1	02 59.58 +10 59.7	16.6	-1.04	- 2.9	2.5/08.9	32188
1981 ER ₄	1999 11 08.6	02 53.48 +12 45.3	17.3	-0.80	- 7.4	1.3/07.6	36785	(9410)	1999 11 10.2	02 59.97 +14 19.9	16.6	-0.81	- 3.0	0.8/09.7	32632
1982 VU ₂	1999 11 08.6	02 53.56 +12 35.1	16.6	-1.04	- 0.1	1.3/07.9	36874	(12394)	1999 11 10.3	03 00.14 +14 54.1	16.7	-0.82	- 3.4	0.8/09.8	36711
4072 T-2	1999 11 08.7	02 53.66 +18 28.9	18.4	-1.21	- 2.2	0.9/09.1	36943	(12482)	1999 11 10.3	03 00.43 +02 25.8	17.7	-0.98	- 4.1	5.4/07.0	36734
(11904)	1999 11 08.7	02 53.91 +14 58.9	15.3	-0.98	-25.3	0.8/08.2	36247	1998 QJ ₁₃	1999 11 10.4	03 00.74 +06 18.0	18.1	-0.82	- 3.1	3.1/08.0	36538
1999 RX ₃₄	1999 11 08.7	02 53.97 +14 11.0	16.8	-1.16	- 3.8	1.1/08.3	36824	1999 VY ₂₂	1999 11 10.4	03 00.75 +12 25.3	17.0	-0.92	- 3.8	2.2/09.4	36865
(9270)	1999 11 08.7	02 53.97 +13 07.8	17.4	-0.83	- 3.4	1.1/08.0	36499	1994 LS	1999 11 10.5	03 00.78 -20 00.1	18.9	-1.01	- 1.3	11.9/01.4	25532
1996 BG ₂	1999 11 08.8	02 53.91 +51 50.2	16.7	-1.40	- 0.8	12.5/17.7	36887	(12328)	1999 11 10.5	03 00.85 +26 37.9	16.3	-1.07	- 5.3	4.6/12.8	36693
1997 AN ₇	1999 11 08.8	02 53.92 +16 23.1	16.5	-1.04	- 6.0	0.1/08.7	36798	1981 EU ₉	1999 11 10.5	03 00.94 +15 13.2	17.5	-1.07	- 6.7	0.8/10.1	36874
1989 TA ₆	1999 11 08.8	02 54.12 +11 36.7	17.7	-0.87	- 3.4	1.7/07.7	34489	1994 UZ ₁	1999 11 10.6	03 01.18 +15 38.7	16.1	-1.01	+ 0.9	0.5/10.3	36884
1999 RL ₃₉	1999 11 08.8	02 54.24 +04 49.8	17.3	-1.14	+ 1.7	6.1/07.1	36914	(12582)	1999 11 10.6	03 01.38 +15 09.7	15.9	-1.11	- 3.2	0.9/10.2	36764
(11782)	1999 11 08.8	02 54.29 +18 17.8	15.7	-1.01	- 2.5	0.8/09.2	36214	1981 EA ₃	1999 11 10.6	03 01.43 +24 39.4	18.5	-1.12	- 6.4	3.0/12.5	36873
1992 PF	1999 11 08.9	02 54.61 +13 27.5	17.0	-1.08	- 5.6	1.4/08.2	36880	(12620)	1999 11 10.6	03 01.48 +16 10.6	18.4	-0.80	- 3.5	0.3/10.4	36774
1995 SY ₃₀	1999 11 08.9	02 54.69 +04 50.2	18.3	-0.96	- 5.8	4.9/06.0	35693	1998 OB ₁₄	1999 11 10.6	03 01.56 +45 09.3	18.7	-1.20	- 2.4	8.7/17.5	36901
1981 EO ₄₇	1999 11 08.9	02 54.70 +10 14.1	18.3	-0.96	- 4.8	2.4/07.5	30780	1998 KW ₃₄	1999 11 10.6	03 01.58 +11 20.5	19.1	-0.95	- 5.2	2.1/09.3	36899
1999 UW ₇	1999 11 08.9	02 54.71 +16 01.0	16.8	-1.16	- 1.0	0.3/08.9	36859	(11877)	1999 11 10.7	03 01.64 +23 19.6	16.5	-1.09	- 3.3	2.4/12.0	36240
(12244)	1999 11 09.0	02 55.00 +08 18.0	17.2	-0.78	- 5.8	2.8/06.9	36671	1999 TL ₁₄	1999 11 10.7	03 01.94 +13 56.7	17.5	-1.05	- 1.2	1.4/10.2	36845
1995 UG ₆	1999 11 09.0	02 55.06 +20 02.5	16.6	-1.00	- 2.8	1.5/09.8	36886	1998 HT ₅₁	1999 11 10.7	03 01.99 +14 54.4	17.1	-1.12	- 2.5	1.0/10.3	36808
(12517)	1999 11 09.0	02 55.12 +15 39.4	19.1	-1.05	- 4.6	0.4/08.8	36746	(9163)	1999 11 10.8	03 02.06 +16 02.1	17.9	-0.83	- 3.8	0.4/10.6	32415
(9074)	1999 11 09.0	02 55.15 +09 08.0	17.6	-1.01	- 3.3	2.6/07.4	32190	(11857)	1999 11 10.8	03 02.07 -04 52.7	17.6	-0.81	- 3.2	7.2/05.7	36235
1995 WQ	1999 11 09.2	02 55.59 +19 06.7	16.3	-0.95	- 1.4	1.2/09.7	36886	1978 NF	1999 11 10.8	03 02.25 -05 15.1	17.7	-0.98	- 0.4	8.4/06.7	36873
1997 CT ₅	1999 11 09.2	02 55.91 +29 52.7	17.0	-1.17	- 3.7	5.7/12.2	36890	(9377)	1999 11 10.9	03 02.42 +20 29.0	17.7	-0.87	- 3.4	1.0/11.7	36499
(12038)	1999 11 09.3	02 56.18 +08 16.2	16.9	-0.96	- 2.2	3.6/07.6	36283	(12449)	1999 11 10.9	03 02.59 +10 29.2	17.2	-1.02	- 4.3	2.5/09.5	36726
1999 TH ₁₆	1999 11 09.4	02 56.48 +14 07.7	17.0	-1.09	- 3.3	1.2/08.9	36847	1995 YP ₁	1999 11 10.9	03 02.68 +22 27.5	17.0	-0.91	- 5.2	1.7/12.2	36887
(8843)	1999 11 09.4	02 56.57 +12 39.8	16.0	-0.81	-12.9	1.8/08.2	35675	1999 PY	1999 11 10.9	03 02.76 +17 01.6	16.3	-1.18	- 0.6	0.1/10.9	36908
(12205)	1999 11 09.4	02 56.74 +18 10.0	18.0	-0.98	- 4.6	0.5/09.8	36661	1992 YK	1999 11 11.0	03 02.83 +25 28.3	15.7	-1.16	- 1.3	3.5/12.6	36881
1998 HA ₉₃	1999 11 09.5	02 57.11 +19 22.1	16.9	-1.06	- 3.5	1.1/10.1	36897	1998 OG ₁₂	1999 11 11.1	03 03.34 +30 42.1	18.3	-1.07	- 2.7	4.4/14.1	36901
(12420)	1999 11 09.5	02 57.17 +14 04.7	16.2	-1.16	+ 2.5	1.1/09.2	36718	1998 MR ₃₅	1999 11 11.1	03 03.47 +16 47.1	16.9	-0.91	- 2.6	0.2/11.1	36901
1999 RU ₄₃	1999 11 09.5	02 57.17 +22 05.0	15.9	-1.33	+ 3.4	2.0/10.3	36825	1997 AB ₇	1999 11 11.1	03 03.53 +13 15.4	18.3	-1.01	- 3.7	1.5/10.3	36889
1996 XD ₃	1999 11 09.6	02 57.18 +12 56.3	17.8	-1.05	- 4.4	1.5/08.7	36889	1998 PQ	1999 11 11.1	03 03.55 +15 43.6	18.7	-0.80	- 3.4	0.4/10.8	36901
(11974)	1999 11 09.6	02 57.58 +12 52.4	15.8	-0.83	- 3.1	1.5/08.8	36266	1997 GQ ₂₂	1999 11 11.2	03 03.60 +13 53.9	17.1	-0.77	- 7.4	1.1/10.3	36892
(12268)	1999 11 09.7	02 57.64 +12 37.3	17.0	-0.99	- 2.4	1.5/08.8	36678	1998 QW ₄₂	1999 11 11.2	03 03.70 +16 25.4	17.5	-0.80	- 3.6	0.2/11.0	36902
1981 ES ₃₃	1999 11 09.7	02 57.77 +28 27.1	17.4	-1.07	- 4.3	4.6/12.5	36502	1999 UF ₉	1999 11 11.2	03 03.87 +18 47.9	17.4	-0.91	- 2.7	0.5/11.6	36859
1997 AQ	1999 11 09.7	02 57.87 +01 12.0	17.1	-1.00	- 2.0	7.5/06.4	36889	1998 FV ₇₈	1999 11 11.3	03 04.17 +12 16.0	17.3	-1.13	- 2.4	2.1/10.4	32070
(11840)	1999 11 09.7	02 57.93 -09 02.8	16.1	-0.81	- 2.1	12.3/03.9	36230	1988 BO ₃	1999 11 11.3	03 04.23 +09 22.1	16.8	-0.88	- 7.4	3.2/09.3	36875
(9015)	1999 11 09.7	02 58.01 +08 16.6	15.9	-0.92	- 1.3	3.4/08.0	32177	1993 FU ₁₁	1999 11 11.3	03 04.28 +11 00.8	17.5	-0.94	- 3.5	2.2/10.0	36881
(12343)	1999 11 09.8	02 57.99 +14 42.8	19.0	-0.92	- 4.6	0.7/09.3	36697	(12441)	1999 11 11.3	03 04.32 +00 48.9	18.3	-0.75	- 3.7	4.7/07.4	36723
(12471)	1999 11 09.8	02 58.05 +13 30.1	16.9	-0.98	- 5.1	1.5/09.0	36732	1981 EO ₄	1999 11 11.4	03 04.40 +30 53.4	18.3	-0.93	- 5.0	4.5/14.8	36873
1992 US ₁	1999 11 09.8	02 58.38 +16 57.9	16.2	-1.18	+ 0.9	0.0/09.9	36881	(9195)	1999 11 11.4	03 04.70 +14 10.7	17.8	-0.79	- 2.9	0.9/10.7	32423
1990 HP	1999 11 09.9	02 58.41 +30 02.2	17.1	-1.82	+ 7.2	6.3/11.1	36877	1999 TU ₁₁	1999 11 11.4	03 04.85 +10 42.7	16.9	-0.78	- 6.9	2.1/09.8	36928

1999 RW ₂₇	1999 11 11.4	03 04.91 +32 29.4 14.4	-1.27	+	8.1	7.9/13.0	36912	1994 FB	1999 11 12.9	03 10.83 +15 12.1 17.2	-1.05	-	5.4	1.1/12.4	36883
1997 GM ₁₃	1999 11 11.5	03 04.85 +03 49.4 18.7	-0.82	-	7.5	4.2/07.9	36892	1997 FC ₅	1999 11 13.0	03 10.89 +09 26.1 18.2	-0.88	-	4.9	3.1/11.1	36891
(12527)	1999 11 11.5	03 04.88 +08 48.1 17.2	-0.98	-	6.1	3.3/09.5	36749	1995 BQ ₂	1999 11 13.0	03 11.01 +15 21.8 16.9	-0.81	-13.0	0.8/12.3	36793	
(11790)	1999 11 11.5	03 04.90 +21 26.3 17.5	-1.05	-	3.2	1.4/12.4	36216	1998 KN ₉	1999 11 13.0	03 11.01 +16 37.5 17.2	-0.92	-	9.4	0.4/12.7	36899
1999 TW ₁₁	1999 11 11.5	03 04.99 +11 30.5 17.5	-0.99	-	6.2	2.5/10.1	36843	(12321)	1999 11 13.0	03 11.32 +09 55.2 17.4	-1.08	-	5.4	3.5/11.4	36691
1997 HS ₁₂	1999 11 11.5	03 05.00 +17 36.5 18.4	-0.92	-	4.1	0.1/11.6	36801	(9110)	1999 11 13.1	03 11.30 +12 05.6 16.6	-1.04	-	4.2	2.3/11.9	32199
(9384)	1999 11 11.5	03 05.02 +12 43.7 17.9	-0.79	-	3.1	1.3/10.5	36499	(12266)	1999 11 13.1	03 11.69 -15 57.7 18.4	-0.93	-	5.3	10.8/04.1	36677
1998 QQ ₂₄	1999 11 11.5	03 05.18 +29 59.0 19.3	-0.86	-	3.5	3.6/14.6	32696	(9510)	1999 11 13.2	03 11.86 +02 38.1 18.4	-0.79	-	3.1	4.6/09.8	32656
1995 VG ₁₀	1999 11 11.5	03 05.21 +16 15.6 20.6	-1.00	-	4.3	0.4/11.3	30784	1994 WO	1999 11 13.2	03 11.94 +18 13.8 16.9	-0.98	+	0.1	0.2/13.3	36793
(12198)	1999 11 11.6	03 05.33 +26 32.2 15.5	-0.82	-	7.5	5.2/14.2	36659	1997 GZ ₃₂	1999 11 13.2	03 12.10 +19 42.9 19.5	-0.90	-	3.7	0.5/13.7	35700
1999 UJ ₉	1999 11 11.6	03 05.54 +17 14.8 17.1	-0.93	-	4.5	0.1/11.6	36859	2245 T-2	1999 11 13.2	03 12.14 +15 02.4 18.8	-1.03	-	4.7	1.0/12.7	36123
1998 HO ₃₈	1999 11 11.6	03 05.55 +17 59.6 17.5	-1.13	-	5.8	11.4/02.0	36897	1996 KA	1999 11 13.2	03 12.19 +21 09.9 17.3	-0.83	-	6.4	1.0/14.1	36888
1990 OB ₄	1999 11 11.6	03 05.62 +31 45.7 16.2	-0.97	-	6.6	6.0/15.9	36877	(8557)	1999 11 13.3	03 12.41 +05 11.8 17.9	-1.04	-	2.4	5.5/11.0	31509
1978 NC	1999 11 11.6	03 05.69 -26 20.9 18.1	-1.05	+	3.5	15.8/05.3	36873	1999 TZ ₁₂	1999 11 13.3	03 12.51 +12 42.6 15.7	-1.10	-	0.7	2.6/12.5	36844
1997 EM	1999 11 11.6	03 05.69 +15 11.8 17.7	-0.93	-	2.8	0.7/11.2	36799	1998 HR ₇	1999 11 13.4	03 12.65 +02 17.3 19.0	-0.89	-	9.8	4.7/09.3	32326
5124 T-3	1999 11 11.8	03 06.16 +07 02.0 18.2	-1.04	-	2.3	4.1/09.7	36944	1992 BM ₄	1999 11 13.4	03 12.68 +19 37.8 18.4	-0.99	-	2.7	0.6/13.8	36790
1998 KH ₅₄	1999 11 11.8	03 06.44 +02 54.1 17.8	-0.95	-	4.2	5.1/08.7	32336	(11945)	1999 11 13.4	03 12.77 +03 49.5 17.3	-0.79	-	4.4	4.6/10.2	36258
(8984)	1999 11 11.8	03 06.51 +29 45.8 17.1	-1.17	-	1.2	4.7/14.4	32170	(9140)	1999 11 13.4	03 12.84 +01 40.1 17.4	-0.94	-	7.1	5.9/09.5	32206
1992 UT ₂	1999 11 11.9	03 06.72 +12 03.5 16.2	-1.16	+	0.1	2.5/11.1	36881	1999 US	1999 11 13.4	03 12.87 +13 02.6 18.0	-0.80	-	3.1	1.4/12.4	36855
1992 WY ₁	1999 11 11.9	03 06.75 +22 16.4 16.6	-1.11	-	2.9	2.1/12.9	36881	1998 KG ₆₄	1999 11 13.4	03 12.88 +14 06.9 18.3	-1.05	-	4.1	1.4/12.7	36813
1997 AS ₁₉	1999 11 11.9	03 06.85 +19 41.6 19.9	-1.04	-	4.8	0.8/12.5	34518	1995 OF	1999 11 13.4	03 12.91 +24 09.1 18.4	-1.07	-	7.3	2.7/15.0	36885
1999 TM ₁₄	1999 11 11.9	03 06.89 +13 32.5 17.7	-0.96	-	5.0	2.0/11.1	36846	1990 TD ₁₂	1999 11 13.4	03 12.95 +19 56.8 16.7	-0.89	-	5.3	0.9/14.0	36877
(12206)	1999 11 11.9	03 06.90 +20 57.1 18.4	-0.87	-	3.5	1.0/12.8	36661	1997 JU ₃	1999 11 13.5	03 13.03 +16 29.6 19.2	-0.93	-	1.5	0.4/13.2	36892
1997 AJ ₇	1999 11 12.0	03 07.13 +19 07.6 18.2	-1.06	-	4.6	0.6/12.4	36890	(12248)	1999 11 13.5	03 13.14 +08 53.4 16.9	-0.80	-	5.9	3.1/11.3	36672
1998 KT ₄₄	1999 11 12.1	03 07.25 +11 44.6 17.4	-0.90	-	6.2	2.2/10.7	36900	1987 SL ₃	1999 11 13.5	03 13.15 +33 31.1 16.7	-0.94	-	3.3	5.1/17.1	36875
1994 PW ₂₆	1999 11 12.1	03 07.28 -00 37.5 16.3	-0.78	-	3.1	8.3/07.8	29138	(12440)	1999 11 13.5	03 13.40 +00 12.1 17.2	-0.80	-	2.1	5.3/09.9	36723
(12228)	1999 11 12.1	03 07.42 +26 39.5 16.8	-1.16	-	5.2	3.6/14.2	36667	(11949)	1999 11 13.6	03 13.66 +17 12.6 15.3	-0.82	-	6.1	0.3/13.5	36259
(9274)	1999 11 12.1	03 07.45 +26 37.7 18.7	-1.02	-	2.9	2.8/14.1	32599	(12628)	1999 11 13.6	03 13.67 +13 28.6 18.5	-1.00	-	3.9	1.6/12.7	36777
2085 T-2	1999 11 12.1	03 07.57 +24 11.3 17.6	-1.03	-	2.9	2.4/13.5	36943	1999 VR ₂₁	1999 11 13.6	03 13.76 +11 53.1 18.0	-0.94	-	5.8	2.2/12.3	36864
(12297)	1999 11 12.1	03 07.58 +12 40.1 17.2	-1.01	-	4.2	1.9/11.1	36685	1997 AR ₂₂	1999 11 13.6	03 13.77 +21 27.8 16.3	-1.14	-	0.3	1.7/14.3	36890
1981 EG ₁₆	1999 11 12.2	03 07.73 +36 12.3 18.6	-1.16	-	2.2	6.0/16.2	36874	1995 WM ₄	1999 11 13.7	03 13.85 +12 13.2 17.1	-0.99	-	2.3	2.3/12.6	36886
1997 AO ₆	1999 11 12.2	03 07.90 +12 29.1 18.3	-1.12	-	2.7	2.3/11.3	36798	1997 AP ₁₅	1999 11 13.7	03 13.94 +29 31.9 18.9	-1.12	-	4.0	3.9/16.2	36522
(12028)	1999 11 12.3	03 08.15 -05 24.3 18.1	-0.92	-	2.2	7.9/07.6	36280	1997 CB ₂₆	1999 11 13.7	03 14.16 +29 08.9 16.7	-1.12	-	3.9	4.8/16.2	36891
(12240)	1999 11 12.3	03 08.34 +10 52.4 16.7	-0.91	-	3.1	3.5/10.9	36670	1997 GT ₂₂	1999 11 13.8	03 14.23 +21 01.9 17.4	-0.95	-	0.7	0.9/14.4	36892
1981 ED ₉	1999 11 12.4	03 08.46 +21 35.2 17.8	-1.05	-	7.1	1.9/13.4	26916	(9393)	1999 11 13.8	03 14.37 +11 44.7 17.6	-0.92	-	4.2	2.1/12.5	32628
1997 JN ₁₂	1999 11 12.4	03 08.52 +15 45.7 16.8	-0.91	-	0.7	0.6/12.1	36892	1998 QR ₄₂	1999 11 13.8	03 14.45 +00 06.2 17.8	-0.75	-	5.2	5.1/09.4	36902
1991 LR	1999 11 12.4	03 08.68 -07 22.2 17.4	-1.06	+	0.5	10.1/08.5	36878	1998 HU ₁₂₉	1999 11 13.8	03 14.49 +23 13.8 19.3	-1.21	-	3.6	2.1/14.9	32273
1999 UG ₂	1999 11 12.4	03 08.80 +12 34.7 16.9	-1.04	-	4.5	2.3/11.4	36856	1991 PH ₁₈	1999 11 13.8	03 14.63 -02 14.2 17.6	-0.96	-	4.0	7.8/09.7	36878
(12421)	1999 11 12.4	03 08.82 +18 17.1 16.6	-1.09	-	1.5	0.3/12.6	36718	1997 BK ₃	1999 11 13.9	03 14.73 +18 03.2 18.2	-1.09	-	3.6	0.0/13.9	36798
(12208)	1999 11 12.4	03 08.93 +12 06.8 18.3	-0.95	-	4.6	2.2/11.3	36661	1997 GP ₂₄	1999 11 13.9	03 14.80 +18 15.5 18.3	-0.94	-	0.5	0.1/14.0	36801
(12259)	1999 11 12.5	03 08.97 +10 53.2 17.7	-1.08	-	4.8	2.6/11.1	36675	1998 HF ₁₀₂	1999 11 13.9	03 14.84 +20 08.3 18.1	-1.15	-	5.0	0.8/14.4	36810
1997 EK ₁₅	1999 11 12.5	03 09.24 +29 39.0 21.2	-1.10	-	2.2	3.8/15.0	29929	1997 GK ₂₃	1999 11 13.9	03 14.93 +15 24.1 18.5	-0.86	-	3.8	0.9/13.4	30094
1999 RH ₃₆	1999 11 12.6	03 09.56 +20 03.2 16.7	-1.00	+	0.8	0.9/13.1	36913	1998 QJ ₆₉	1999 11 13.9	03 14.96 +10 22.0 17.9	-0.76	-	6.6	2.2/12.0	36903
1997 GZ ₃₁	1999 11 12.6	03 09.67 +06 34.6 19.0	-0.79	-	1.9	2.7/10.4	32679	1990 GN	1999 11 14.0	03 15.23 +20 27.3 17.9	-1.10	-	3.7	0.9/14.5	36877
(12469)	1999 11 12.7	03 09.69 +27 53.3 17.5	-1.16	-	3.9	4.1/14.8	36731	1999 RN ₃₆	1999 11 14.0	03 15.26 +12 22.6 15.6	-0.85	-11.2	2.4/12.5	36913	
1998 KQ ₃₅	1999 11 12.7	03 09.73 +19 43.6 18.0	-1.02	-	6.8	0.8/13.2	36812	(11936)	1999 11 14.0	03 15.33 +14 56.4 16.8	-1.01	-	2.6	1.2/13.5	36255
(12209)	1999 11 12.7	03 09.82 +37 22.6 16.4	-1.27	-	0.5	7.0/16.6	36662	1998 MF ₂₄	1999 11 14.0	03 15.35 +11 08.4 20.5	-0.92	-	3.3	2.3/12.6	32286
1998 HV ₉₅	1999 11 12.7	03 09.98 +11 22.5 17.0	-1.08	-	0.9	3.0/11.7	36809	1992 PL ₂	1999 11 14.0	03 15.41 +44 00.4 17.2	-1.00	-	4.6	7.1/20.8	36880
1999 TO ₁₄	1999 11 12.8	03 10.11 +13 01.0 17.1	-0.88	-	3.4	1.7/11.8	36846	1995 YB	1999 11 14.1	03 15.59 +00 32.4 16.8	-1.02	+	1.9	7.3/11.7	36887
1998 OQ	1999 11 12.8	03 10.39 +18 32.1 17.8	-0.96	-	6.1	0.3/13.0	36901	(12536)	1999 11 14.1	03 15.66 +01 16.4 16.1	-0.81	-	1.9	6.5/10.7	36751
1119 T-1	1999 11 12.8	03 10.54 +22 37.4 19.0	-1.15	-	3.6	2.0/13.9	34566	1997 AW	1999 11 14.1	03 15.78 +20 06.3 18.7	-1.06	-	3.7	0.6/14.6	30084

3503 P-L	1999 11 14.2	03 15.80 +22 12.0 17.7	-0.95 - 7.7	1.4/15.2	36942	(9135)	1999 11 15.8	03 22.66 +19 56.2 18.1	-1.15 - 1.6	0.5/16.1	32205
1992 WR	1999 11 14.2	03 15.81 +17 09.8 16.5	-1.12 - 0.2	0.4/14.0	36881	(12476)	1999 11 15.9	03 23.05 +14 25.7 17.5	-1.06 - 3.0	1.7/15.2	36733
(12237)	1999 11 14.2	03 15.86 -14 12.5 17.8	-0.97 - 7.2	11.2/05.0	36669	1997 GS ₂₂	1999 11 15.9	03 23.11 +19 06.0 18.2	-0.95 - 2.2	0.2/16.1	36801
(12366)	1999 11 14.2	03 15.94 +17 00.3 17.0	-1.05 - 5.4	0.4/14.0	36703	1999 SH ₂	1999 11 15.9	03 23.12 +13 25.8 16.9	-0.93 - 3.5	2.5/14.9	36834
1981 EZ ₁₉	1999 11 14.2	03 16.03 +23 52.3 18.6	-1.04 - 3.4	2.1/15.4	36874	1998 QP ₄₃	1999 11 15.9	03 23.20 +41 21.0 17.3	-1.12 + 0.1	7.3/20.2	36902
1039 T-3	1999 11 14.2	03 16.07 +37 24.0 18.4	-1.17 - 2.0	6.7/18.3	36943	1992 UW ₂	1999 11 16.0	03 23.33 +18 23.9 16.0	-1.19 - 0.1	0.1/16.0	36881
1995 WP ₂₂	1999 11 14.3	03 16.20 +19 08.7 18.3	-1.03 - 4.5	0.3/14.5	36795	1997 AD ₂	1999 11 16.0	03 23.50 +21 34.4 17.1	-1.14 - 2.0	1.2/16.6	36797
1278 T-2	1999 11 14.3	03 16.44 +05 18.6 17.9	-0.79 - 5.8	4.6/11.2	36943	1998 FM ₇₈	1999 11 16.0	03 23.51 +15 59.9 17.3	-1.19 - 1.7	1.2/15.6	36805
(9294)	1999 11 14.3	03 16.66 +21 56.1 16.8	-0.98 - 2.7	1.3/15.1	32604	(12625)	1999 11 16.0	03 23.63 +25 54.9 16.4	-0.93 - 1.8	2.5/17.5	36776
1999 UY ₁	1999 11 14.4	03 16.67 +14 54.3 16.4	-1.00 - 8.3	1.4/13.6	36932	1998 KE ₄₇	1999 11 16.1	03 23.62 +18 09.4 18.4	-1.07 - 5.2	0.2/16.0	36813
1999 TY ₁₈	1999 11 14.4	03 16.96 +17 25.2 16.3	-0.98 - 4.8	0.4/14.3	36848	1999 RT ₄₃	1999 11 16.1	03 24.07 +14 33.7 17.3	-0.84 - 3.0	1.5/15.4	36914
1998 FL ₇₅	1999 11 14.5	03 17.27 +19 18.7 17.1	-1.18 - 2.7	0.5/14.8	36895	1995 WL ₄₂	1999 11 16.2	03 24.23 +17 01.5 18.2	-0.88 - 3.2	0.5/15.9	36887
1996 XM ₂	1999 11 14.6	03 17.61 +12 49.0 16.2	-1.18 - 0.8	2.6/13.8	36889	(11920)	1999 11 16.3	03 24.57 +14 12.8 16.4	-1.00 - 6.6	2.0/15.3	36251
1993 BV ₅	1999 11 14.6	03 17.75 +29 10.1 18.1	-1.11 - 3.6	4.3/17.0	31233	(12254)	1999 11 16.3	03 24.57 +10 51.0 16.8	-0.90 + 0.7	2.5/15.1	36674
1996 XM ₅	1999 11 14.6	03 17.75 +24 00.9 17.1	-1.12 - 4.9	2.2/15.9	36889	1992 DD ₄	1999 11 16.4	03 25.18 +11 53.7 18.8	-0.91 - 3.8	2.5/15.1	31381
1998 DS ₉	1999 11 14.6	03 17.76 -19 59.8 17.1	-0.96 - 3.6	14.4/06.0	32315	1987 YS ₁	1999 11 16.5	03 25.35 -04 07.9 16.1	-0.90 - 3.7	9.2/11.4	36875
1998 FA ₁₆	1999 11 14.7	03 17.88 +09 38.9 19.4	-1.02 - 4.3	3.2/12.9	32317	(12320)	1999 11 16.5	03 25.38 +25 42.3 18.0	-1.19 - 4.9	2.8/18.0	36691
(12279)	1999 11 14.7	03 17.95 +08 25.1 16.8	-0.92 - 1.2	3.1/12.9	36680	1999 RS ₄₃	1999 11 16.5	03 25.42 +11 27.6 17.0	-1.02 - 5.7	3.6/15.0	36914
1995 TA ₁	1999 11 14.7	03 18.11 +15 42.2 18.2	-1.01 - 4.4	1.0/14.2	36885	1999 VN ₁	1999 11 16.5	03 25.55 +23 44.7 18.1	-1.20 - 3.0	2.1/17.5	36861
(9059)	1999 11 14.7	03 18.25 +21 27.6 17.6	-1.14 - 5.4	1.3/15.5	32187	(9317)	1999 11 16.5	03 25.60 +01 43.7 17.0	-0.80 - 4.1	6.1/12.8	36499
1998 HE ₃₂	1999 11 14.8	03 18.36 +18 37.4 17.5	-1.13 - 5.1	0.1/14.9	36807	1992 RL ₃	1999 11 16.5	03 25.65 +10 22.5 19.0	-1.09 - 4.8	3.6/15.0	36881
(8817)	1999 11 14.8	03 18.59 +12 37.1 17.3	-1.13 - 2.4	2.3/13.8	31903	(12286)	1999 11 16.6	03 25.66 +18 22.9 17.2	-1.13 - 3.1	0.1/16.5	36682
(12542)	1999 11 14.9	03 18.67 +20 41.4 18.1	-0.88 - 1.9	0.8/15.4	36753	1985 PC	1999 11 16.6	03 25.75 +14 31.2 16.8	-1.08 - 4.8	1.7/15.8	36875
1997 GB ₈	1999 11 14.9	03 18.73 +16 41.2 19.5	-0.99 - 3.9	0.6/14.6	36891	(11780)	1999 11 16.6	03 25.96 -00 29.5 14.9	-0.84 - 2.3	9.4/13.0	36213
1998 QM ₃₄	1999 11 15.0	03 19.20 +06 17.9 18.3	-0.85 - 3.0	3.6/12.5	36902	1997 AN ₅	1999 11 16.6	03 25.98 +17 00.2 16.3	-1.13 + 0.5	0.9/16.4	36797
1981 EU ₁₀	1999 11 15.0	03 19.20 +25 46.4 20.3	-1.16 - 4.6	2.8/16.6	26916	1998 EL ₂	1999 11 16.7	03 26.51 +13 58.9 17.6	-1.09 - 4.1	2.0/15.9	32316
1999 RA ₄₄	1999 11 15.0	03 19.33 +18 10.2 16.4	-1.18 - 0.1	0.1/15.0	36825	(12252)	1999 11 16.8	03 26.53 +01 05.3 16.1	-0.74 - 6.1	7.0/12.4	36673
(12370)	1999 11 15.0	03 19.43 +14 55.9 17.5	-1.05 - 4.6	1.3/14.4	36704	(12466)	1999 11 16.8	03 26.73 +06 23.5 17.8	-0.99 - 1.9	4.1/14.6	36730
1997 CB ₂₇	1999 11 15.0	03 19.50 +23 53.1 19.2	-1.17 - 1.5	2.1/16.0	36891	1998 RM	1999 11 16.9	03 27.07 +07 05.3 16.9	-0.83 - 8.7	4.1/13.9	36903
1999 RG ₃₆	1999 11 15.1	03 19.60 +07 27.8 16.5	-0.85 - 9.9	4.3/12.2	36913	1999 RB ₄₄	1999 11 16.9	03 27.28 +24 44.3 16.3	-1.18 + 3.6	2.8/17.7	36825
(12182)	1999 11 15.1	03 19.82 +15 59.0 16.9	-1.00 - 4.7	1.1/14.7	36654	1992 LQ	1999 11 17.0	03 27.48 +12 09.3 16.8	-0.90 - 0.3	2.1/15.9	25441
1998 FA ₆₉	1999 11 15.1	03 19.88 +22 50.1 17.4	-1.19 - 3.8	1.8/16.1	36804	1998 HH ₈₈	1999 11 17.0	03 27.73 +17 28.7 18.0	-1.07 - 6.0	0.5/16.8	36897
1999 TH ₂₀	1999 11 15.1	03 19.89 +09 47.3 16.9	-0.94 - 2.0	4.0/13.6	36849	(12439)	1999 11 17.1	03 28.12 +17 26.5 17.1	-0.81 - 2.5	0.4/16.9	36723
(12288)	1999 11 15.2	03 20.07 +25 08.1 15.9	-1.23 + 0.9	3.3/16.3	36683	(11808)	1999 11 17.2	03 28.12 +11 06.7 16.2	-0.92 - 6.9	3.4/15.4	36221
1998 QU ₅₀	1999 11 15.2	03 20.25 +47 29.0 18.2	-1.16 - 0.5	8.1/21.5	36902	3482 T-3	1999 11 17.2	03 28.29 +19 26.6 17.7	-0.86 - 3.1	0.2/17.3	36944
1999 RC ₄₄	1999 11 15.2	03 20.27 +21 20.2 15.7	-1.15 + 2.6	1.3/15.7	36825	1999 RT ₃₈	1999 11 17.2	03 28.30 +18 52.0 15.9	-1.11 - 0.1	0.0/17.2	36914
(8875)	1999 11 15.3	03 20.29 +13 40.2 16.4	-1.02 + 0.1	2.5/14.5	31917	1997 AW ₃	1999 11 17.2	03 28.30 +08 47.7 16.6	-1.05 - 3.1	4.4/15.3	36889
1998 KE ₄₈	1999 11 15.3	03 20.78 +13 34.0 17.8	-1.07 - 3.7	1.9/14.4	36900	2162 T-2	1999 11 17.3	03 28.82 +14 15.3 18.8	-0.93 - 4.5	1.6/16.4	36943
1998 FG ₁₅	1999 11 15.4	03 20.80 +45 40.0 18.7	-1.99 + 5.4	12.9/18.5	36803	(11739)	1999 11 17.3	03 28.89 +29 15.4 16.6	-0.77 - 5.8	3.2/19.9	35895
(12265)	1999 11 15.5	03 21.23 +64 37.4 16.7	-2.86 + 6.8	22.0/22.9	36677	(11889)	1999 11 17.3	03 28.94 -11 00.0 16.2	-0.93 + 1.4	11.0/12.9	36243
1991 NG ₅	1999 11 15.5	03 21.25 +24 43.2 17.9	-1.11 - 5.1	2.3/17.0	36878	(12295)	1999 11 17.3	03 29.00 +13 00.4 15.9	-0.95 - 1.6	3.0/16.3	36685
1999 OG ₃	1999 11 15.5	03 21.59 +18 53.5 15.6	-0.90 -23.5	0.2/15.7	36822	1996 XT ₁₉	1999 11 17.4	03 29.14 +19 34.8 17.0	-1.11 - 5.2	0.3/17.6	36889
1997 BC ₃	1999 11 15.6	03 21.72 +28 28.7 17.5	-1.16 - 2.5	3.9/17.5	36890	1998 FN ₁₂₆	1999 11 17.4	03 29.23 +23 06.3 17.6	-1.19 - 5.0	1.7/18.3	36806
(12455)	1999 11 15.6	03 21.77 +21 23.8 18.1	-1.05 - 4.2	1.0/16.2	36727	1998 FR ₇₂	1999 11 17.4	03 29.25 +21 31.9 17.5	-1.18 - 3.1	1.1/17.9	36805
(9210)	1999 11 15.6	03 22.03 +29 45.3 15.8	-0.96 - 1.3	4.5/17.9	32426	(12549)	1999 11 17.4	03 29.27 +16 24.0 16.8	-0.81 - 4.4	0.8/16.9	36755
1997 AZ ₁₇	1999 11 15.7	03 21.97 +18 14.3 16.0	-1.12 - 2.4	0.1/15.7	36890	1998 KL ₆₅	1999 11 17.4	03 29.38 +19 45.9 17.9	-1.07 - 2.8	0.3/17.6	36900
1056 T-1	1999 11 15.7	03 22.41 +35 22.0 18.8	-1.12 - 2.0	5.5/19.1	36942	(10778)	1999 11 17.5	03 29.67 +11 58.6 16.7	-1.10 - 1.2	3.3/16.4	34764
(12309)	1999 11 15.8	03 22.48 +19 43.1 17.4	-0.95 - 3.5	0.4/16.1	36688	1996 PF ₃	1999 11 17.6	03 30.10 -28 48.9 18.2	-1.05 - 1.7	23.2/02.1	36796
4765 P-L	1999 11 15.8	03 22.54 +19 41.3 19.9	-1.00 - 3.3	0.4/16.1	32729	1998 HH ₉₉	1999 11 17.6	03 30.15 +15 26.0 17.0	-1.12 - 2.4	1.5/17.1	36898
(12163)	1999 11 15.8	03 22.55 +11 23.5 17.1	-0.92 - 4.1	2.8/14.3	36319	(12337)	1999 11 17.6	03 30.18 +26 12.8 16.0	-1.16 - 1.1	3.3/18.9	36696
1991 VP ₁₂	1999 11 15.8	03 22.61 +15 12.1 18.1	-1.03 - 1.6	1.3/15.3	36880	(12403)	1999 11 17.7	03 30.20 +23 02.6 15.5	-0.99 - 3.6	2.0/18.5	36714

(12326)	1999 11 17.8	03 30.68 +29 02.3	16.1 -1.17 - 1.0	5.1/19.5	36693	1997 DL	1999 11 19.3	03 37.10 +29 07.9	17.8 -1.19 - 3.3	4.5/21.1	36891
1991 PE ₂	1999 11 17.8	03 30.88 +21 40.2	17.8 -1.11 - 3.0	1.2/18.3	36878	(10414)	1999 11 19.3	03 37.22 +09 01.9	18.0 -0.77 - 4.0	3.0/17.2	36499
(12170)	1999 11 17.8	03 30.94 +20 01.0	18.1 -0.90 - 4.0	0.3/18.1	36321	1999 TO ₇	1999 11 19.3	03 37.23 +20 04.3	15.6 -1.19 + 4.7	0.3/19.4	36841
(12464)	1999 11 17.8	03 31.06 +05 38.5	17.1 -1.03 - 2.8	5.8/15.4	36730	(11939)	1999 11 19.4	03 37.44 +05 23.2	15.5 -0.87 - 5.6	6.1/16.4	36256
(11893)	1999 11 17.8	03 31.07 +10 58.3	17.8 -0.81 - 3.8	2.5/16.2	36244	(9019)	1999 11 19.4	03 37.44 +10 23.1	17.6 -1.01 - 2.8	3.5/17.9	32178
1998 KF ₃₅	1999 11 17.8	03 31.10 +15 11.7	16.0 -1.10 0.0	1.6/17.3	36899	(12294)	1999 11 19.4	03 37.60 +21 40.5	17.5 -1.10 - 3.1	0.9/19.9	36684
1997 AS	1999 11 17.8	03 31.11 +10 55.7	17.8 -1.03 - 2.4	2.9/16.5	36889	(9385)	1999 11 19.4	03 37.65 +04 16.5	18.6 -0.78 - 4.5	4.3/16.4	32626
(11650)	1999 11 17.9	03 31.16 +29 53.5	14.8 -1.11 - 6.3	4.9/20.4	35871	1999 UP ₃	1999 11 19.5	03 37.79 +20 00.7	15.9 -1.00 - 0.7	0.2/19.6	36857
1995 QN ₂	1999 11 17.9	03 31.42 +06 00.9	17.3 -0.98 - 3.6	5.9/15.4	36885	1998 QV ₂₂	1999 11 19.5	03 38.16 +21 27.9	16.8 -0.88 - 2.4	0.7/20.0	36902
4206 P-L	1999 11 17.9	03 31.48 +38 29.5	17.6 -1.36 - 1.9	8.0/22.0	36942	1998 QD ₁₁	1999 11 19.6	03 38.26 -07 04.0	18.3 -0.91 - 0.7	8.0/15.2	32530
1981 EW ₁₅	1999 11 18.0	03 31.65 +36 11.6	19.1 -1.13 - 1.2	6.4/20.9	26918	1988 BF ₅	1999 11 19.6	03 38.57 +21 26.2	17.9 -0.94 - 6.1	0.6/20.1	36875
1158 T-3	1999 11 18.0	03 31.82 +24 55.1	17.8 -0.85 - 4.9	1.6/19.4	36944	1998 HU ₁₄₈	1999 11 19.7	03 38.57 +19 45.5	18.3 -1.02 - 4.4	0.1/19.8	36811
(12540)	1999 11 18.0	03 31.86 +19 42.2	16.8 -0.90 - 3.4	0.2/18.2	36752	1998 OB ₁₃	1999 11 19.7	03 38.66 -02 56.2	17.4 -0.78 - 2.5	7.1/15.2	35709
1998 MN ₇	1999 11 18.1	03 32.10 +19 37.4	17.6 -0.88 - 2.8	0.2/18.3	36814	1993 HZ ₅	1999 11 19.7	03 38.82 +05 39.2	16.5 -1.91 +16.6	7.5/20.0	36882
1999 SZ ₅	1999 11 18.1	03 32.14 -29 00.4	15.8 -0.54 - 3.0	24.9/02.0	36924	1996 EJ ₁₄	1999 11 19.7	03 38.86 +42 35.7	18.4 -1.14 - 1.1	7.5/24.2	36888
1997 GQ ₇	1999 11 18.2	03 32.43 +24 04.2	15.3 -1.18 + 4.6	2.1/18.8	36891	(9441)	1999 11 19.7	03 38.95 +22 59.7	18.2 -0.89 - 1.7	1.1/20.4	32639
4161 P-L	1999 11 18.2	03 32.61 +31 09.6	17.4 -1.09 - 2.4	4.6/20.5	36579	1998 HU ₅₁	1999 11 19.7	03 38.98 +19 07.3	16.9 -1.15 - 1.5	0.1/19.7	36808
(12204)	1999 11 18.3	03 32.70 +14 46.6	18.5 -0.97 - 3.7	1.5/17.5	36661	(12359)	1999 11 19.8	03 39.01 +18 09.4	16.0 -0.84 - 3.0	0.5/19.6	36701
1998 KH ₃₂	1999 11 18.3	03 32.97 +19 21.7	17.1 -1.01 - 4.6	0.1/18.4	36899	1999 TV ₅	1999 11 19.8	03 39.39 +14 16.5	16.1 -0.92 - 9.4	2.2/18.6	36926
(12465)	1999 11 18.3	03 33.10 +11 29.6	17.3 -1.03 - 3.2	3.3/17.0	36730	(12561)	1999 11 19.9	03 39.33 +19 47.0	17.1 -0.84 - 2.6	0.1/20.0	36758
1998 SH ₄	1999 11 18.3	03 33.13 +16 05.6	18.6 -0.80 - 2.7	0.8/17.8	36904	(12386)	1999 11 19.9	03 39.49 +19 51.8	16.1 -0.95 - 1.6	0.1/20.0	36709
1998 HB ₈₈	1999 11 18.3	03 33.15 +18 53.6	17.7 -1.03 - 6.5	0.1/18.3	36897	1994 EZ ₆	1999 11 19.9	03 39.50 +12 28.4	17.4 -1.11 - 1.1	3.0/18.9	36883
1999 UD ₆	1999 11 18.4	03 33.14 +20 09.5	15.5 -1.01 + 0.9	0.4/18.6	36859	1992 PU ₁	1999 11 19.9	03 39.54 +14 19.6	18.5 -0.79 - 3.0	1.4/18.9	27445
1998 KE ₃₇	1999 11 18.4	03 33.20 +17 10.5	17.4 -1.10 - 5.3	0.8/18.0	36899	1999 TY ₁	1999 11 19.9	03 39.55 +23 43.4	15.7 -1.30 +11.8	2.3/20.0	36925
(12191)	1999 11 18.4	03 33.30 +19 04.6	16.1 -1.10 - 1.1	0.0/18.4	36657	(8424)	1999 11 19.9	03 39.73 +12 25.8	15.8 -1.00 - 3.5	3.3/18.7	31370
(12430)	1999 11 18.4	03 33.34 +19 45.8	16.4 -1.09 - 2.7	0.2/18.6	36721	1981 EU ₃	1999 11 19.9	03 39.75 +17 16.0	18.8 -0.97 - 6.8	0.8/19.5	26915
(12323)	1999 11 18.5	03 33.50 +23 06.0	17.1 -1.19 - 2.6	1.5/19.2	36692	1990 GE	1999 11 19.9	03 39.75 +29 10.9	17.7 -1.20 - 2.2	3.6/21.6	36505
(12114)	1999 11 18.5	03 33.61 -04 50.8	16.8 -0.78 - 1.7	8.6/13.7	36305	1993 FV ₁₂	1999 11 20.0	03 39.86 +02 16.0	19.7 -0.87 - 3.6	5.1/16.7	32515
1998 HY ₁₄₇	1999 11 18.5	03 33.68 +19 41.3	18.1 -1.18 - 3.4	0.2/18.6	36810	(12543)	1999 11 20.0	03 40.05 +11 55.3	17.1 -1.02 - 5.4	2.9/18.6	36753
1980 EF	1999 11 18.5	03 33.83 +33 04.2	17.9 -1.29 - 1.3	5.3/20.8	18804	1998 RP ₇₀	1999 11 20.0	03 40.07 +19 14.5	17.9 -0.81 - 1.1	0.1/20.0	36904
1998 KH ₄₅	1999 11 18.5	03 33.85 +14 36.7	19.0 -1.04 - 2.4	1.7/17.8	36900	4041 T-2	1999 11 20.0	03 40.15 +21 32.1	19.0 -1.01 - 2.4	0.8/20.4	29651
1998 MX ₃₄	1999 11 18.5	03 33.87 +31 38.1	18.6 -1.05 - 6.5	4.1/21.4	32287	1995 QS	1999 11 20.1	03 40.17 +19 15.9	17.4 -1.16 - 1.7	0.1/20.1	36885
1981 EL ₁₈	1999 11 18.5	03 33.95 +16 58.9	18.8 -0.97 - 4.3	0.7/18.1	36874	1998 RS ₁₈	1999 11 20.1	03 40.23 +26 17.0	19.8 -0.89 - 2.5	1.9/21.4	35714
3099 T-1	1999 11 18.5	03 33.97 +30 11.9	16.3 -1.19 - 2.8	5.3/20.6	36580	1999 VS ₁	1999 11 20.1	03 40.41 +17 27.6	17.1 -0.88 - 7.1	0.9/19.7	36861
1997 GT ₁	1999 11 18.6	03 34.17 +17 39.5	18.5 -0.97 - 4.0	0.6/18.3	36800	1999 TG ₁₃	1999 11 20.1	03 40.62 +19 59.6	16.9 -1.20 - 0.8	0.2/20.2	36844
(9136)	1999 11 18.7	03 34.58 +24 21.5	17.2 -1.15 - 1.2	2.0/19.6	32205	1998 FL ₅₇	1999 11 20.2	03 40.65 +20 33.8	19.0 -1.19 - 3.9	0.4/20.4	36894
1998 MM ₃₇	1999 11 18.7	03 34.61 +04 35.7	17.8 -0.84 - 1.4	4.7/16.2	32524	1981 UQ ₂₂	1999 11 20.2	03 40.95 +13 31.7	17.4 -1.06 - 2.9	2.4/19.2	32441
3191 T-3	1999 11 18.8	03 34.83 +23 29.8	17.5 -1.17 + 1.0	2.0/19.4	36871	1999 TJ ₁₈	1999 11 20.3	03 40.99 +15 56.7	17.0 -0.82 - 6.2	1.2/19.5	36848
1994 PR ₁₄	1999 11 18.8	03 34.99 +13 52.8	20.2 -0.93 - 4.0	1.9/17.8	36884	1995 WE ₃	1999 11 20.3	03 40.99 +18 34.7	17.7 -1.03 - 1.8	0.4/20.1	36795
1994 NB	1999 11 18.9	03 35.25 -15 23.5	17.9 -0.99 - 0.7	10.5/12.4	36883	1993 TD ₃₇	1999 11 20.3	03 41.05 +07 41.9	17.9 -0.79 - 3.2	3.7/18.0	36883
1994 PU ₁₈	1999 11 18.9	03 35.44 +21 48.1	18.9 -0.99 - 2.9	0.9/19.4	36884	1977 QO ₃	1999 11 20.3	03 41.24 +21 05.2	15.5 -1.03 - 4.2	0.7/20.6	36785
1988 CO ₇	1999 11 18.9	03 35.49 +18 08.1	16.8 -1.15 - 3.2	0.6/18.8	36875	(12643)	1999 11 20.3	03 41.37 +15 23.1	17.8 -0.87 - 2.4	1.3/19.6	36781
(8714)	1999 11 18.9	03 35.58 +22 11.1	17.0 -1.19 - 2.3	1.2/19.5	31690	4078 T-1	1999 11 20.4	03 41.40 +09 53.2	17.4 -1.01 - 3.1	4.9/18.7	24115
1981 EE ₁₀	1999 11 18.9	03 35.61 +23 55.1	18.3 -1.16 - 4.7	1.9/19.9	36874	(12480)	1999 11 20.4	03 41.84 +12 22.4	18.0 -1.00 - 1.8	2.4/19.3	36734
(11922)	1999 11 18.9	03 35.65 +18 46.5	15.4 -1.14 + 1.0	0.3/18.9	36252	1994 EJ ₆	1999 11 20.5	03 41.90 +16 51.6	17.3 -1.15 - 0.7	1.3/20.1	36792
1981 EN ₂₂	1999 11 19.0	03 35.74 +26 26.8	18.4 -1.07 - 3.0	2.7/20.3	31224	1987 KF ₁	1999 11 20.5	03 42.19 +03 09.9	19.7 -0.98 - 3.8	5.4/17.6	32300
1998 QM ₂₀	1999 11 19.0	03 35.82 +03 17.9	17.0 -0.79 - 4.0	5.0/15.7	36902	(12213)	1999 11 20.6	03 42.25 +16 38.9	17.5 -0.85 - 2.6	1.0/20.1	36663
(8805)	1999 11 19.0	03 35.91 +15 05.4	16.4 -1.01 - 4.6	2.0/18.2	36060	(9330)	1999 11 20.6	03 42.27 +16 53.1	17.7 -0.80 - 2.5	0.7/20.1	32613
1996 JX ₇	1999 11 19.1	03 36.02 +16 07.3	18.2 -0.88 - 2.6	1.0/18.5	27452	(12463)	1999 11 20.6	03 42.30 +12 37.3	17.0 -1.02 - 3.4	2.6/19.4	36730
1997 FG ₄	1999 11 19.2	03 36.77 +14 38.2	17.9 -0.92 - 4.4	1.7/18.3	36800	1998 KF ₆₄	1999 11 20.6	03 42.69 +11 03.7	19.7 -1.02 - 4.3	3.3/19.1	32486
(12202)	1999 11 19.3	03 36.84 +18 49.7	17.8 -1.10 - 6.3	0.2/19.2	36660	(12292)	1999 11 20.7	03 42.70 +17 25.4	17.7 -0.86 - 1.3	0.7/20.3	36684

(9114)	1999 11 20.7	03 42.85 +13 13.1 16.6	-1.06 - 2.1	2.9/19.7	32199
1990 QW ₉	1999 11 20.7	03 42.97 +04 19.4 18.7	-0.92 - 3.7	4.8/17.9	36505
(12458)	1999 11 20.8	03 43.13 +17 49.5 17.8	-1.05 - 2.4	0.7/20.5	36728
1998 HK ₄₃	1999 11 20.8	03 43.53 +11 37.8 19.8	-1.06 - 4.4	2.8/19.4	32328
1981 EU ₄	1999 11 20.9	03 43.72 +24 57.2 17.0	-0.89 - 5.1	1.6/22.0	36873
1998 MB ₃₈	1999 11 21.0	03 43.91 +34 23.4 17.8	-1.05 - 4.5	4.8/24.0	36901
1995 UY ₈	1999 11 21.0	03 44.02 +18 47.2 16.2	-1.05 - 0.3	0.5/20.9	36794
6529 P-L	1999 11 21.0	03 44.12 +16 36.1 18.1	-0.86 - 2.5	1.0/20.5	36942
(12494)	1999 11 21.0	03 44.33 -27 28.9 17.7	-1.18 + 2.3	21.7/13.3	36738
(12270)	1999 11 21.0	03 44.40 +13 21.3 17.8	-0.96 - 2.9	2.6/20.0	36678
2183 T-1	1999 11 21.1	03 44.44 +19 04.1 17.1	-1.06 - 1.9	0.3/21.0	36942
4290 T-1	1999 11 21.1	03 44.44 +30 05.1 17.4	-0.88 - 0.8	2.6/22.9	36580
(12616)	1999 11 21.1	03 44.60 +20 12.1 17.3	-1.01 - 1.5	0.2/21.2	36774
(12621)	1999 11 21.1	03 44.61 +16 00.6 17.6	-0.86 - 2.7	1.3/20.5	36775
(12335)	1999 11 21.1	03 44.68 +11 03.3 17.3	-1.03 - 4.4	3.4/19.5	36695
(9305)	1999 11 21.1	03 44.71 +15 00.2 16.8	-1.18 - 1.9	2.2/20.5	32607
(12484)	1999 11 21.1	03 44.83 +14 46.5 18.7	-0.90 - 3.2	1.6/20.3	36735
(9115)	1999 11 21.1	03 44.84 +23 54.0 17.0	-1.07 - 5.1	1.5/22.0	36498
1996 HL ₂₀	1999 11 21.2	03 44.92 +19 03.7 17.7	-0.84 - 2.1	0.2/21.1	36796
(12249)	1999 11 21.2	03 44.97 +05 49.1 16.8	-0.88 - 0.3	4.6/19.1	36672
1997 AU ₁₀	1999 11 21.2	03 45.09 +31 16.5 17.9	-1.20 - 3.1	4.5/23.2	36522
(12360)	1999 11 21.2	03 45.16 +19 31.6 16.2	-0.87 - 1.8	0.1/21.2	36702
(12400)	1999 11 21.2	03 45.23 +17 25.1 16.7	-1.05 - 6.4	1.0/20.8	36713
1993 TJ	1999 11 21.3	03 45.18 +12 07.9 17.2	-0.82 - 5.0	2.4/19.7	36882
4273 T-1	1999 11 21.3	03 45.18 +10 43.3 18.0	-0.87 - 2.3	3.3/19.7	36943
(9145)	1999 11 21.3	03 45.61 +27 38.6 16.8	-1.13 + 0.5	2.6/22.5	32411
1999 VZ ₂₂	1999 11 21.4	03 45.92 +13 37.2 16.9	-1.09 - 1.1	2.9/20.5	36865
1997 CG ₂₆	1999 11 21.4	03 45.95 +21 32.2 17.5	-1.12 - 1.5	0.6/21.7	36799
1996 DB	1999 11 21.5	03 46.06 +51 40.7 20.0	-1.18 - 1.0	7.1/27.6	34861
1997 EQ ₁₆	1999 11 21.5	03 46.08 +07 41.4 20.3	-0.88 - 4.0	3.7/19.2	29929
1998 KM ₆₁	1999 11 21.5	03 46.27 +10 54.9 18.9	-1.10 - 3.3	3.5/20.0	36900
(12413)	1999 11 21.5	03 46.32 +22 06.3 17.2	-1.13 - 1.7	0.9/22.0	36716
(12541)	1999 11 21.6	03 46.44 +05 07.6 18.0	-0.80 - 3.5	4.3/18.8	36753
(9207)	1999 11 21.6	03 46.56 +18 55.8 17.7	-0.96 - 2.6	0.3/21.5	32425
1999 VA ₂₁	1999 11 21.6	03 46.63 +18 05.9 16.9	-1.23 -18.8	0.8/21.1	36864
(12280)	1999 11 21.6	03 46.66 +14 54.1 16.4	-0.92 - 3.1	1.9/20.8	36681
1998 RO ₄₄	1999 11 21.6	03 46.76 +19 32.7 17.3	-0.87 - 1.2	0.1/21.6	36818
1988 RO ₂	1999 11 21.7	03 47.12 +35 07.7 17.2	-1.00 - 3.5	5.2/24.8	36875
1999 VQ	1999 11 21.7	03 47.32 +18 00.6 16.0	-0.86 - 2.9	0.7/21.4	36860
(12221)	1999 11 21.8	03 47.35 +17 31.8 17.0	-0.99 - 2.6	0.9/21.4	36665
1998 KS ₅₁	1999 11 21.8	03 47.66 +04 20.4 17.7	-0.94 - 4.6	5.9/19.0	36900
1993 FL ₁₉	1999 11 21.8	03 47.67 +03 28.5 19.2	-0.90 - 3.3	5.4/18.9	29300
1995 VX ₄	1999 11 21.8	03 47.75 +14 19.7 19.6	-1.03 - 2.7	2.0/21.0	36886
1994 WS ₁	1999 11 21.9	03 47.75 +29 44.8 16.3	-0.92 - 5.6	3.7/24.0	24574
(9166)	1999 11 21.9	03 47.82 +18 18.1 17.1	-0.84 - 2.7	0.5/21.6	32416
(12434)	1999 11 21.9	03 47.90 +24 21.0 17.5	-0.99 - 3.2	1.6/22.7	36722
1998 KM ₃₉	1999 11 21.9	03 47.93 +19 19.0 18.3	-1.14 - 3.8	9.7/12.0	36900
1998 FA ₇₀	1999 11 21.9	03 48.08 +19 29.3 17.6	-1.19 - 1.6	10.3/12.0	36804
(12219)	1999 11 21.9	03 48.11 +25 42.3 16.9	-1.22 - 3.4	2.4/23.0	36665
(9660)	1999 11 21.9	03 48.14 +19 39.7 17.7	-0.83 - 2.2	6.5/02.0	32903
1994 AY ₁₀	1999 11 21.9	03 48.17 +21 15.3 18.8	-1.17 - 2.5	0.5/22.2	36883

1998 QA ₂₂	1999 11 22.0	03 48.22 -01 58.7 17.8	-0.76 - 2.8	6.4/17.9	33081
(9173)	1999 11 22.0	03 48.45 +31 51.4 17.4	-1.03 - 2.0	3.7/24.1	32418
1996 CO ₂	1999 11 22.0	03 48.60 +04 38.5 17.3	-0.84 - 1.4	4.8/19.6	36888
1998 RP ₂₈	1999 11 22.1	03 48.54 +15 48.9 18.9	-0.81 - 2.6	1.2/21.4	36903
1993 FN ₄₉	1999 11 22.1	03 48.84 +21 16.3 18.0	-1.02 - 2.9	0.4/22.4	36791
1998 ON ₁₁	1999 11 22.1	03 49.03 +19 58.8 16.8	-0.90 - 3.2	0.0/22.2	36815
1981 EQ ₂₀	1999 11 22.2	03 49.14 +16 29.8 18.0	-0.99 - 3.5	1.3/21.6	36874
1992 EQ ₁₃	1999 11 22.2	03 49.22 +24 31.1 17.2	-0.97 - 4.3	1.7/23.1	32453
1997 MR	1999 11 22.2	03 49.28 +14 16.8 18.0	-0.83 - 4.6	1.9/21.1	36892
(9625)	1999 11 22.3	03 49.37 +20 17.6 16.7	-0.99 - 6.3	0.1/22.4	32895
(12396)	1999 11 22.3	03 49.42 +12 15.0 16.7	-1.03 + 2.6	2.6/21.4	36711
1997 EY ₄₅	1999 11 22.3	03 49.60 +17 45.0 16.4	-1.09 - 1.6	1.0/22.0	36891
1102 T-2	1999 11 22.4	03 50.21 +18 32.6 18.8	-0.88 - 3.0	0.5/22.2	36943
1997 LN ₄	1999 11 22.4	03 50.28 +14 24.1 19.2	-0.94 - 3.6	1.9/21.5	33949
2839 P-L	1999 11 22.5	03 50.46 +24 35.0 18.9	-1.01 - 2.6	1.5/23.3	30797
1998 HH ₄₃	1999 11 22.5	03 50.50 +11 43.7 19.2	-1.07 - 2.1	3.0/21.3	32328
(12344)	1999 11 22.5	03 50.69 +18 40.1 16.8	-1.03 - 0.7	0.5/22.4	36697
1988 CK ₄	1999 11 22.5	03 50.69 +34 04.9 17.9	-1.06 - 5.0	4.4/25.4	36503
1998 KW ₂₅	1999 11 22.5	03 50.70 +14 06.4 17.8	-1.06 - 1.9	2.7/21.7	32277
1997 EF	1999 11 22.6	03 50.83 +18 42.5 17.7	-1.07 - 1.9	0.5/22.4	36799
1991 PX ₆	1999 11 22.6	03 50.86 +21 06.2 18.4	-1.11 - 2.7	0.4/22.8	36878
1996 XX ₂₆	1999 11 22.6	03 50.89 +06 52.4 18.9	-1.01 - 0.9	4.3/20.7	36889
(8894)	1999 11 22.6	03 50.93 +33 22.9 17.3	-1.28 - 3.0	5.3/25.0	31921
1997 EE ₂₉	1999 11 22.7	03 51.10 +20 53.9 18.0	-1.07 - 3.3	0.3/22.8	36800
1998 OR ₈	1999 11 22.7	03 51.11 +17 56.6 17.5	-0.74 - 2.8	0.7/22.3	36815
1995 CE ₁	1999 11 22.7	03 51.11 +28 39.2 18.0	-0.93 - 2.0	2.8/24.1	36515
1994 TJ ₁₁	1999 11 22.7	03 51.21 +12 38.3 19.0	-0.84 - 6.2	3.2/21.1	33245
1981 EP ₂₁	1999 11 22.7	03 51.35 +35 29.9 20.6	-1.16 - 1.8	4.7/25.3	26919
2184 T-1	1999 11 22.7	03 51.49 +08 52.1 19.0	-0.99 - 4.1	4.6/20.7	29650
(12243)	1999 11 22.7	03 51.54 +34 58.9 16.6	-1.01 - 3.4	5.0/25.6	36671
1996 HE ₁	1999 11 22.8	03 51.47 +21 31.5 17.0	-0.95 + 1.3	0.4/23.0	36888
1991 GV ₃	1999 11 22.8	03 51.55 +24 49.0 17.5	-1.22 - 1.5	1.9/23.5	36878
1992 YR ₂	1999 11 22.8	03 51.61 +18 44.6 17.3	-1.10 - 1.2	0.5/22.6	36881
1983 XE	1999 11 22.8	03 51.70 +19 38.8 15.9	-0.92 - 7.4	0.2/22.7	36875
1991 RW ₁₂	1999 11 22.8	03 51.85 +15 13.8 17.0	-1.02 - 4.1	1.9/22.0	36879
(12183)	1999 11 22.9	03 52.16 +18 15.7 17.8	-0.81 - 2.6	0.5/22.6	36655
1997 GX ₂₁	1999 11 23.0	03 52.38 +16 31.2 17.0	-0.92 - 1.7	1.3/22.4	36892
(9131)	1999 11 23.0	03 52.77 +19 54.0 17.3	-1.11 - 4.1	0.1/23.0	32204
1998 QC ₇₅	1999 11 23.1	03 52.90 +19 44.9 17.9	-0.77 - 4.2	0.1/23.0	36817
1995 BT	1999 11 23.1	03 52.97 +50 54.5 17.5	-1.18 - 3.7	9.8/30.1	36884
(9490)	1999 11 23.1	03 53.17 +25 33.4 17.5	-0.93 - 2.7	1.6/24.1	32651
1997 AS ₂	1999 11 23.2	03 53.43 +62 25.1 17.6	-1.81 -10.3	18.3/09.1	36797
(11027)	1999 11 23.2	03 53.50 +22 28.4 16.6	-1.17 - 3.7	1.0/23.6	35219
1998 QP ₁₆	1999 11 23.2	03 53.56 +06 51.0 18.4	-0.83 - 3.3	4.2/20.9	36902
(12552)	1999 11 23.3	03 53.72 +40 08.1 16.9	-1.03 - 2.7	6.0/27.0	36755
(9433)	1999 11 23.3	03 53.81 +11 12.3 18.2	-1.02 - 3.6	3.4/21.8	32637
1998 KV ₃₇	1999 11 23.3	03 53.83 +11 47.2 18.5	-1.03 - 1.2	3.1/22.1	36900
(9176)	1999 11 23.4	03 54.06 +14 42.9 15.8	-0.92 - 3.5	2.2/22.4	32418
1994 PN ₁	1999 11 23.4	03 54.42 -14 55.8 16.3	-1.02 + 6.8	14.7/20.9	32235
1998 QK ₃₈	1999 11 23.4	03 54.46 +20 46.9 17.9	-0.84 - 2.5	0.1/23.6	36902
1993 FM ₂₈	1999 11 23.5	03 54.42 +22 47.3 17.5	-1.05 - 3.6	1.1/23.9	36882

1998 NS	1999 11 23.5	03 54.47 +32 54.8	19.7	-1.13	-	4.9	4.0/25.9	32525	2634 T-3	1999 11 24.9	04 00.43 +19 54.3	18.6	-0.97	-	3.6	0.2/24.8	36871
1995 YF ₁	1999 11 23.5	03 54.52 +25 48.4	17.6	-0.95	-	4.7	1.7/24.6	36887	1998 HL ₉₃	1999 11 24.9	04 00.43 +21 15.2	17.7	-1.14	-	4.8	0.3/25.0	36809
1993 FX ₂₁	1999 11 23.5	03 54.59 +17 06.8	18.4	-0.98	-	3.8	1.2/23.0	36069	1999 VO ₂₆	1999 11 24.9	04 00.43 +20 42.1	17.2	-1.00	-	1.1	0.0/24.9	36865
1995 WX ₄₂	1999 11 23.5	03 54.72 +03 22.6	16.4	-1.06	+	4.2	7.4/22.0	36887	1997 EP ₂₅	1999 11 24.9	04 00.55 +24 36.9	16.8	-1.15	-	2.6	1.8/25.5	36800
1981 EV ₂₈	1999 11 23.5	03 54.74 +12 42.8	18.3	-0.84	-	5.1	2.5/22.1	36874	(12612)	1999 11 24.9	04 00.58 +12 55.9	17.7	-0.99	-	3.6	2.8/23.7	36772
1995 QT ₃	1999 11 23.6	03 54.88 +25 16.8	19.1	-1.19	-	3.7	1.9/24.4	36516	1999 PC ₁	1999 11 24.9	04 00.67 +36 31.5	17.4	-1.12	-	5.5	5.3/28.2	36908
(12357)	1999 11 23.6	03 54.96 +04 28.4	17.0	-0.79	-	3.6	5.3/20.7	36701	4647 P-L	1999 11 25.0	04 00.76 +18 41.3	18.1	-1.15	-	3.7	0.8/24.7	36942
(12488)	1999 11 23.6	03 55.00 +21 26.8	17.5	-0.97	-	3.4	0.4/23.8	36736	(9340)	1999 11 25.0	04 01.07 +18 30.3	18.1	-0.81	-	2.0	0.6/24.7	32615
(12303)	1999 11 23.6	03 55.15 +13 55.8	18.3	-1.05	-	2.8	2.3/22.7	36687	1989 UA ₁	1999 11 25.1	04 01.32 +29 58.4	16.3	-1.25	-	1.5	4.7/27.0	36876
1999 VN ₉	1999 11 23.6	03 55.35 +20 35.6	16.8	-1.12	-	4.8	0.1/23.7	36863	1998 QO ₄	1999 11 25.1	04 01.35 +37 08.7	18.1	-0.97	-	4.2	5.0/28.3	36901
(9111)	1999 11 23.7	03 55.29 +01 22.9	15.6	-1.01	+	0.6	9.2/21.3	32199	1996 XZ ₃₁	1999 11 25.1	04 01.61 +14 37.7	17.8	-1.16	-	0.5	2.4/24.4	36889
4737 P-L	1999 11 23.7	03 55.34 +42 45.5	18.8	-1.25	+	1.7	8.7/26.7	34265	1999 VM ₆	1999 11 25.2	04 02.01 +13 06.2	18.0	-0.86	-	1.2	2.6/24.2	36863
1979 DF	1999 11 23.7	03 55.68 +31 10.6	16.6	-1.21	+	2.0	4.0/24.9	36500	(9432)	1999 11 25.2	04 02.01 +08 23.1	17.8	-1.03	-	2.5	4.9/23.4	32637
1242 T-2	1999 11 23.8	03 55.70 +03 19.5	18.6	-0.89	-	4.6	5.3/20.5	36943	(10638)	1999 11 25.2	04 02.09 +12 14.7	18.3	-0.79	-	2.6	2.3/23.9	34473
(12505)	1999 11 23.8	03 55.82 +10 18.5	16.2	-1.14	-	1.7	4.8/22.5	36742	(12414)	1999 11 25.3	04 02.05 +20 24.8	17.1	-1.12	-	1.9	0.1/25.3	36717
1999 VJ ₁₁	1999 11 23.8	03 56.06 +22 12.7	16.4	-1.10	+	0.4	0.8/24.1	36864	(9229)	1999 11 25.3	04 02.15 +21 42.8	16.9	-0.92	-	2.9	0.4/25.5	32430
(12478)	1999 11 23.8	03 56.18 +15 24.0	17.3	-1.07	-	2.9	2.2/23.1	36733	1998 PA ₁	1999 11 25.3	04 02.18 +20 04.2	16.9	-0.87	-	4.7	0.2/25.2	36901
1999 VO ₉	1999 11 23.9	03 56.47 +19 49.4	15.9	-1.06	-	3.4	0.3/23.9	36863	1998 GK	1999 11 25.4	04 02.73 +45 01.1	18.0	-2.04	+	6.4	10.4/26.8	36896
1995 UT ₂	1999 11 24.0	03 56.57 +15 51.4	18.2	-1.06	-	1.8	1.7/23.3	36885	1998 QO ₃₃	1999 11 25.4	04 02.73 +10 20.2	17.7	-0.82	-	3.8	3.3/23.6	36377
1990 HE	1999 11 24.0	03 56.77 +43 56.4	17.1	-2.10	+	8.2	10.9/25.2	36877	(10612)	1999 11 25.4	04 02.85 +17 12.5	17.4	-0.89	-	2.6	1.2/24.9	34466
1998 PP ₁	1999 11 24.0	03 56.90 +31 07.0	16.7	-0.90	-	4.3	3.4/26.1	35709	4072 T-3	1999 11 25.4	04 02.86 +11 27.5	17.4	-0.84	-	2.7	3.3/24.0	36944
1996 LF	1999 11 24.0	03 56.91 +13 12.8	17.7	-0.90	+	1.0	2.1/23.2	36796	(12113)	1999 11 25.4	04 02.89 +09 10.4	17.8	-0.90	+	0.6	3.8/24.1	36305
1993 TX ₁₄	1999 11 24.0	03 56.95 +18 13.3	17.6	-0.87	-	2.4	0.8/23.7	27106	1991 GT ₄	1999 11 25.4	04 02.92 +13 39.9	17.2	-1.09	-	4.4	3.0/24.4	36878
1997 ER ₄₀	1999 11 24.0	03 56.95 +01 42.7	19.7	-0.87	-	4.6	6.2/20.5	30786	(9714)	1999 11 25.4	04 02.94 +39 42.7	17.2	-1.14	+	1.4	5.7/27.9	36061
(12617)	1999 11 24.1	03 57.16 +27 38.1	16.7	-1.11	-	0.1	2.8/25.1	36774	1992 PK ₂	1999 11 25.5	04 03.01 +19 44.9	18.0	-0.82	-	3.5	0.3/25.4	36880
1995 QC ₃	1999 11 24.1	03 57.31 +30 44.6	17.7	-1.31	-	4.1	4.4/27.0	36516	1998 FG ₄	1999 11 25.6	04 03.29 +08 35.4	17.5	-1.09	+	0.6	5.4/24.3	32316
1999 VT ₁	1999 11 24.1	03 57.38 +11 27.5	17.0	-0.83	-	5.0	3.0/22.5	36861	(12226)	1999 11 25.6	04 03.30 +26 59.0	16.4	-1.17	-	0.1	3.1/26.4	36666
1996 GE ₆	1999 11 24.2	03 57.41 +20 14.7	16.8	-0.94	+	0.1	0.1/24.2	36796	(12631)	1999 11 25.6	04 03.55 +08 01.0	17.9	-0.83	-	3.7	3.8/23.5	36777
(9064)	1999 11 24.2	03 57.58 +09 09.8	17.7	-1.01	-	1.6	4.0/22.6	36498	1998 JK ₄	1999 11 25.7	04 03.79 +18 33.3	17.3	-1.11	-	4.5	0.9/25.4	36899
1998 MA ₈	1999 11 24.2	03 57.76 +25 12.4	16.8	-0.93	-	7.2	1.5/25.3	36900	1997 AK ₅	1999 11 25.7	04 03.80 +30 16.1	19.1	-1.21	-	2.8	3.8/27.1	32472
(12629)	1999 11 24.3	03 57.97 +02 33.8	16.8	-0.94	-	5.4	7.6/21.0	36777	3039 T-3	1999 11 25.7	04 03.99 +15 06.6	17.4	-0.96	-	2.4	2.3/24.9	26417
1981 EN ₃	1999 11 24.3	03 58.10 +09 16.3	18.8	-0.98	-	7.8	4.3/22.0	36873	1998 QR ₁₀	1999 11 25.7	04 04.14 +22 04.3	17.4	-0.93	-	2.7	0.4/26.0	36901
(9544)	1999 11 24.3	03 58.11 +21 11.7	17.0	-0.88	-	1.0	0.2/24.5	36061	5122 T-3	1999 11 25.8	04 04.35 +11 45.7	18.2	-1.12	-	0.8	3.5/24.7	36944
(9005)	1999 11 24.3	03 58.18 +23 38.3	17.1	-1.01	-	4.1	1.1/24.9	32175	1998 QF ₇₀	1999 11 25.8	04 04.49 +09 00.9	16.9	-0.79	-	6.6	3.8/23.4	36903
(8854)	1999 11 24.3	03 58.23 +16 51.8	17.9	-1.13	-	1.6	1.4/23.9	31912	1995 UY ₄₄	1999 11 25.8	04 04.55 +30 03.7	17.0	-1.24	+	2.2	4.2/27.0	36886
1995 SB ₃₁	1999 11 24.4	03 58.29 +29 01.2	18.0	-1.23	-	2.4	3.3/25.7	36517	1995 PA	1999 11 25.9	04 04.61 +21 12.5	17.4	-1.11	-	0.2	0.2/26.0	36793
1998 OA ₁	1999 11 24.4	03 58.31 +27 57.7	18.9	-0.92	-	4.2	2.3/25.8	35709	(12645)	1999 11 25.9	04 04.76 +18 03.1	16.3	-1.03	-	0.0	1.4/25.6	36781
1998 QL ₅₉	1999 11 24.4	03 58.42 +30 31.1	19.9	-1.01	-	1.9	2.9/26.0	35711	1998 KK ₉	1999 11 25.9	04 04.77 +17 11.1	18.5	-1.11	-	1.8	1.4/25.4	32333
1980 FU	1999 11 24.4	03 58.74 +31 41.0	17.3	-1.23	-	2.5	4.2/26.2	36873	1981 EE ₁₁	1999 11 25.9	04 04.84 +25 32.4	18.5	-1.19	-	3.5	1.8/26.7	36874
(10635)	1999 11 24.5	03 58.92 +02 32.2	18.0	-0.81	-	2.9	5.8/21.5	34472	(12546)	1999 11 25.9	04 04.89 +19 20.3	17.8	-0.87	-	2.3	0.4/25.7	36754
(9155)	1999 11 24.5	03 58.98 +22 40.3	16.8	-0.89	-	2.0	0.7/24.9	32413	1979 QF ₂	1999 11 25.9	04 04.91 +16 51.8	16.8	-0.92	-	2.6	1.4/25.4	36873
1994 PC ₉	1999 11 24.5	03 58.99 +20 09.7	17.1	-0.98	-	2.9	0.1/24.5	36792	(12639)	1999 11 25.9	04 04.93 +16 53.0	17.2	-0.98	-	3.4	1.6/25.3	36780
1995 LK	1999 11 24.6	03 59.18 +57 48.6	17.7	-1.79	-	9.3	14.1/06.0	36885	1998 MK ₃₇	1999 11 25.9	04 05.05 +26 44.4	17.9	-1.03	-	4.5	1.9/27.0	36901
(12371)	1999 11 24.6	03 59.22 +18 48.0	17.4	-1.09	-	4.7	0.7/24.3	36705	(9191)	1999 11 26.0	04 05.21 +33 59.9	16.6	-1.10	-	5.4	4.6/28.5	32422
1991 XD	1999 11 24.7	03 59.52 +16 49.5	14.9	-1.82	+	18.9	2.1/24.9	36880	1994 WE ₄	1999 11 26.2	04 05.94 +20 04.3	16.3	-0.97	+	0.8	0.3/26.1	36793
1998 RZ ₅₀	1999 11 24.7	03 59.62 +03 14.7	18.9	-0.75	-	3.9	4.5/21.5	34021	1993 LO ₁	1999 11 26.2	04 05.99 +35 07.4	18.8	-1.08	-	3.3	4.1/28.6	36882
(9675)	1999 11 24.7	03 59.74 +01 39.1	18.2	-0.77	-	2.8	5.4/21.5	32907	(12654)	1999 11 26.2	04 06.34 +04 51.6	18.0	-0.81	-	3.5	5.2/23.6	36784
1995 SU	1999 11 24.7	03 59.96 +28 46.8	17.5	-1.17	-	3.6	3.1/26.1	36516	3276 T-2	1999 11 26.3	04 06.30 +13 06.5	18.6	-0.97	-	1.6	2.9/25.2	34568
1999 TD ₃₄	1999 11 24.7	04 00.00 +29 31.2	16.5	-1.26	+	2.0	3.6/25.8	36854	(12267)	1999 11 26.3	04 06.52 +18 31.2	17.0	-1.23	-	19.7	1.2/25.7	36677
(12492)	1999 11 24.8	03 59.99 +16 25.8	17.0	-0.91	-	1.9	1.3/24.2	36737	1997 AM ₇	1999 11 26.3	04 06.76 +26 55.7	18.5	-1.18	-	3.1	2.5/27.3	36890
(12390)	1999 11 24.8	04 00.26 +12 06.2	16.2	-1.87	+	15.0	4.5/25.0	36710	1997 CF ₂₀	1999 11 26.4	04 06.93 +31 42.6	17.9	-1.20	-	2.0	4.5/28.0	29928

1998 JD ₂	1999 11 26.5	04 07.20 +14 35.8 18.6	-1.08 - 3.8	2.4/25.6	36898	(11259)	1999 11 28.0	04 13.97 +23 12.2 18.1	-1.02 - 2.8	0.7/28.4	35556
1990 SY ₃	1999 11 26.5	04 07.50 +30 48.7 15.7	-1.05 - 7.8	4.0/28.7	36877	1998 HE ₁₀₃	1999 11 28.0	04 14.00 +25 43.4 18.1	-1.25 - 0.8	1.7/28.6	36810
(9646)	1999 11 26.6	04 07.78 +20 28.5 17.2	-0.84 - 1.7	0.1/26.6	32900	(12404)	1999 11 28.1	04 14.46 +21 17.6 16.8	-1.14 -14.0	0.0/28.2	36714
1998 FD ₇₈	1999 11 26.7	04 08.10 +06 54.0 19.4	-1.10 - 2.8	5.4/24.8	32070	1996 AH ₉	1999 11 28.2	04 14.48 +20 30.0 18.2	-0.95 - 2.9	0.2/28.1	36887
1997 AR ₁₇	1999 11 26.7	04 08.22 +21 57.0 18.0	-1.14 - 3.7	0.4/26.9	36890	(12255)	1999 11 28.2	04 14.66 +17 09.9 15.6	-1.12 + 1.8	1.9/27.9	36674
1997 JT ₁₅	1999 11 26.7	04 08.22 +17 11.1 16.9	-0.91 - 1.8	1.2/26.2	36892	1997 CZ ₁₄	1999 11 28.3	04 15.00 +24 06.1 17.4	-1.15 - 0.9	1.5/28.7	36890
4638 P-L	1999 11 26.7	04 08.33 +18 19.8 18.3	-0.99 - 2.4	1.0/26.4	36942	1998 MT ₃₂	1999 11 28.3	04 15.24 +21 01.9 17.3	-1.11 - 4.5	0.1/28.3	36901
5104 T-2	1999 11 26.7	04 08.43 +22 42.9 18.6	-0.90 - 4.8	0.6/27.1	22701	(12201)	1999 11 28.4	04 15.25 +08 24.9 17.8	-0.96 - 5.7	4.8/26.1	36660
1994 PL ₃₄	1999 11 26.8	04 08.45 +18 26.3 17.2	-0.95 - 4.0	1.0/26.4	36884	6111 P-L	1999 11 28.4	04 15.36 +35 16.8 19.0	-1.02 - 1.6	4.4/30.5	32785
(12350)	1999 11 26.8	04 08.58 +24 31.7 17.5	-1.07 - 1.0	1.2/27.3	36699	1993 FA ₃₃	1999 11 28.4	04 15.53 +14 33.9 18.3	-0.99 - 2.3	2.3/27.5	26903
1150 T-2	1999 11 26.9	04 08.88 +21 39.7 18.5	-1.13 - 2.5	9.3/17.0	36943	(12216)	1999 11 28.4	04 15.55 +14 10.3 17.2	-1.05 - 5.1	3.1/27.3	36664
1996 TB ₁₅	1999 11 26.9	04 09.01 +60 49.2 17.5	-2.24 + 2.1	19.6/02.1	36888	1981 EA ₄₅	1999 11 28.4	04 15.66 +28 19.0 18.8	-1.21 - 4.1	2.7/29.6	32214
(12442)	1999 11 27.0	04 09.35 +31 43.0 17.3	-0.93 - 3.7	3.0/28.9	36724	(12459)	1999 11 28.4	04 15.74 +15 04.1 17.9	-1.11 - 1.3	2.5/27.7	36729
1997 ED ₂₃	1999 11 27.0	04 09.36 +24 52.2 19.5	-1.05 - 2.4	1.3/27.6	30473	(12257)	1999 11 28.5	04 16.03 +07 47.2 18.1	-0.94 - 5.4	4.5/26.2	36675
(12554)	1999 11 27.0	04 09.54 +13 14.1 17.8	-0.83 - 1.3	2.2/26.0	36756	1998 OA ₄	1999 11 28.6	04 16.09 +19 12.2 19.9	-0.96 - 3.2	0.7/28.3	35709
(12477)	1999 11 27.0	04 09.58 +18 33.4 17.7	-1.04 - 3.2	0.9/26.7	36733	1993 TO ₂₀	1999 11 28.6	04 16.16 +14 48.4 18.9	-0.85 - 2.2	2.2/27.7	35689
(12349)	1999 11 27.0	04 09.59 +23 36.0 17.0	-1.14 + 1.3	0.9/27.3	36699	(12185)	1999 11 28.6	04 16.17 +28 37.0 17.2	-1.05 - 0.9	2.8/29.5	36655
4026 P-L	1999 11 27.0	04 09.60 +39 35.2 17.5	-1.21 - 0.9	6.0/29.7	36942	1978 SS ₅	1999 11 28.6	04 16.25 +17 29.9 16.7	-1.00 - 3.2	1.6/28.1	36873
(9042)	1999 11 27.0	04 09.69 +19 38.7 15.7	-0.91 - 2.8	0.5/26.9	32183	(12512)	1999 11 28.6	04 16.56 +18 10.5 17.4	-1.13 - 4.9	1.3/28.2	36744
(12633)	1999 11 27.0	04 09.73 +21 22.6 17.7	-1.08 - 3.6	0.1/27.1	36778	1995 LJ	1999 11 28.7	04 16.89 +32 10.7 18.9	-1.30 - 4.2	4.1/30.5	31789
1981 EP ₁₄	1999 11 27.1	04 09.76 +18 37.9 17.6	-1.12 - 5.0	0.9/26.7	36785	(12623)	1999 11 28.8	04 17.20 +13 11.3 17.5	-1.01 - 2.7	3.2/27.7	36775
1995 YT ₂	1999 11 27.1	04 09.80 +18 06.5 16.1	-0.94 + 2.7	1.5/26.9	26907	1998 QB ₄₂	1999 11 28.8	04 17.34 +33 10.1 18.6	-0.98 - 1.1	3.6/30.5	32707
1991 GD ₈	1999 11 27.1	04 09.91 +15 00.3 17.5	-0.84 - 4.9	2.0/26.1	36878	1998 KZ ₄₇	1999 11 28.8	04 17.46 +12 42.9 17.4	-1.12 - 0.2	3.4/28.0	36900
(8782)	1999 11 27.1	04 10.03 +25 03.5 16.6	-1.12 - 3.2	1.8/27.8	31895	(12446)	1999 11 28.8	04 17.48 +00 59.3 16.7	-1.61 +16.3	10.7/30.2	36725
(12281)	1999 11 27.1	04 10.15 +12 46.0 16.9	-0.94 - 1.2	2.9/26.1	36681	(12361)	1999 11 28.9	04 17.44 +18 53.2 17.2	-0.90 - 1.3	0.9/28.6	36702
1999 VJ ₅	1999 11 27.1	04 10.19 +28 32.9 16.4	-1.24 - 2.9	3.7/28.3	36862	1997 AY ₇	1999 11 28.9	04 17.49 +30 10.7 17.3	-1.19 - 4.9	3.6/30.4	30786
1997 GJ	1999 11 27.2	04 10.16 +21 55.6 18.0	-1.05 - 2.1	0.3/27.3	30691	(8937)	1999 11 28.9	04 17.53 +15 47.8 16.8	-1.11 - 2.8	2.3/28.2	31931
(12619)	1999 11 27.2	04 10.20 +17 19.0 17.4	-1.02 - 5.1	1.5/26.6	36774	(12272)	1999 11 28.9	04 17.56 +38 18.1 15.9	-1.11 - 6.3	7.1/02.3	36679
1998 KE ₅	1999 11 27.2	04 10.45 -00 13.8 16.7	-0.80 - 3.4	7.4/23.8	36899	1998 QQ ₈	1999 11 29.0	04 18.09 +12 19.8 17.0	-0.93 - 0.7	3.2/28.0	36901
3109 T-1	1999 11 27.2	04 10.54 +21 14.9 18.9	-1.06 - 3.8	0.1/27.3	24115	1998 QN ₅₃	1999 11 29.1	04 18.35 +13 46.8 17.7	-0.79 - 3.6	2.0/27.9	35711
1998 QE ₁₄	1999 11 27.2	04 10.57 +03 47.1 18.6	-0.82 - 2.3	5.3/24.7	32760	1994 GK ₉	1999 11 29.1	04 18.44 +18 05.4 16.8	-1.11 - 5.2	1.3/28.6	36792
1997 GX ₂₇	1999 11 27.3	04 10.61 +45 29.8 21.3	-1.88 + 6.2	9.0/28.1	30788	1988 CF	1999 11 29.1	04 18.70 +30 17.1 17.0	-1.16 - 1.2	3.7/30.2	36503
(12428)	1999 11 27.3	04 10.67 +25 12.6 16.4	-1.02 - 5.4	1.4/28.1	36720	3195 T-3	1999 11 29.2	04 18.65 +07 24.9 19.3	-0.91 - 3.6	4.4/27.1	36125
1993 FJ ₃₂	1999 11 27.3	04 10.77 +25 39.3 18.6	-1.04 - 3.6	1.5/28.1	36882	1997 GC ₂₂	1999 11 29.2	04 18.77 +18 07.4 17.8	-0.93 - 2.3	1.2/28.8	36892
(10235)	1999 11 27.3	04 10.91 +22 53.3 17.2	-0.88 - 2.8	0.5/27.7	33915	1993 QO ₄	1999 11 29.2	04 18.92 +18 35.4 17.6	-0.91 - 2.0	1.0/28.9	35688
1998 KV ₃₂	1999 11 27.4	04 11.24 +24 05.8 17.9	-1.12 - 5.2	1.1/28.0	36899	1998 RN ₆₂	1999 11 29.2	04 19.00 +19 22.0 18.3	-0.85 - 2.0	0.6/29.0	36818
1994 GU ₉	1999 11 27.4	04 11.42 -11 05.3 17.3	-1.07 + 1.8	11.7/24.1	36883	1998 QB ₉₆	1999 11 29.2	04 19.01 +09 14.7 18.1	-0.91 - 5.1	3.9/27.2	36903
(12310)	1999 11 27.5	04 11.39 +18 14.0 17.0	-0.97 - 2.2	1.2/27.1	36689	1993 FR ₁₂	1999 11 29.2	04 19.09 +18 00.8 17.1	-1.07 - 1.2	1.4/28.9	36882
(9259)	1999 11 27.5	04 11.47 +21 59.5 17.9	-1.00 - 2.9	0.3/27.7	32437	1994 FF	1999 11 29.2	04 19.10 +12 21.9 17.1	-1.11 - 1.7	3.5/28.2	36883
1990 EP ₃	1999 11 27.5	04 11.60 +28 53.0 18.5	-0.89 - 2.2	2.2/28.7	32922	(12513)	1999 11 29.3	04 19.27 +24 20.7 16.6	-1.22 - 1.6	1.5/29.7	36744
1998 RB ₆₅	1999 11 27.5	04 11.83 +21 04.5 18.0	-0.82 - 2.1	0.0/27.6	36903	1998 KA ₄	1999 11 29.3	04 19.39 +18 04.5 18.5	-1.19 + 0.4	1.3/29.0	32332
1995 VX ₂	1999 11 27.5	04 11.86 +19 04.7 19.3	-1.08 - 3.3	0.8/27.3	36886	(12481)	1999 11 29.3	04 19.57 +11 16.0 18.0	-0.88 - 3.5	3.1/27.9	36734
1991 PG ₁	1999 11 27.6	04 11.82 +01 34.3 17.7	-1.08 + 1.2	8.0/25.9	36878	1999 VY ₂	1999 11 29.4	04 19.68 +27 09.2 16.8	-0.97 - 6.0	2.3/30.4	36861
1291 T-1	1999 11 27.6	04 11.93 +08 30.8 19.7	-0.91 - 4.8	4.1/25.4	31268	2638 T-2	1999 11 29.4	04 19.96 +22 10.3 17.9	-0.58 - 1.1	0.1/29.6	36943
1981 ER ₁₆	1999 11 27.8	04 12.90 +39 53.0 19.9	-1.24 - 1.9	6.6/30.5	26918	(12393)	1999 11 29.4	04 19.98 +21 25.9 17.1	-0.90 - 2.0	0.0/29.5	36711
1990 DD ₂	1999 11 27.8	04 12.93 +16 38.5 18.0	-1.07 - 3.2	1.6/27.2	36876	(12614)	1999 11 29.5	04 20.16 +14 36.5 17.2	-1.16 - 3.9	3.1/28.6	36773
1994 TA ₁	1999 11 27.8	04 13.25 +68 15.9 17.8	-2.75 + 5.2	15.8/04.5	36515	3256 T-2	1999 11 29.7	04 20.81 +23 20.2 19.1	-1.14 - 1.6	0.7/29.9	29130
(9383)	1999 11 27.9	04 13.09 +18 23.0 18.6	-0.86 - 2.0	0.8/27.5	32626	1998 OG ₉	1999 11 29.7	04 21.09 +17 37.3 18.2	-0.91 - 2.1	1.4/29.2	34921
(9661)	1999 11 27.9	04 13.53 +23 59.0 16.4	-0.83 + 0.7	0.8/28.3	32903	1995 YS ₂₁	1999 11 29.7	04 21.25 +16 23.3 17.0	-0.98 - 0.8	1.9/29.2	36887
(12560)	1999 11 27.9	04 13.54 +18 50.2 18.0	-0.83 - 2.0	0.6/27.6	36758	1997 CX ₁₃	1999 11 29.8	04 21.34 +14 16.8 20.0	-1.06 - 1.2	2.7/29.0	29321
(12489)	1999 11 28.0	04 13.95 +19 36.2 16.3	-1.03 + 1.3	0.7/27.9	36736	1998 RV	1999 11 29.8	04 21.39 +35 13.6 17.7	-1.06 - 0.7	4.7/01.6	36540

(9804)	1999 11 29.8	04 21.54 +04 11.1 17.2	-0.95	0.0	5.8/27.9	33212
1997 CW	1999 11 29.8	04 21.55 +24 43.0 17.3	-1.18	- 0.9	1.3/30.2	36890
1997 GK ₁₆	1999 11 29.9	04 21.74 +19 34.4 17.4	-0.96	- 1.9	0.7/29.7	36892
(12385)	1999 11 29.9	04 22.14 +17 12.5 17.0	-0.92	- 1.9	1.6/29.4	36708
1997 AQ ₁₅	1999 11 30.0	04 22.21 +21 32.9 16.8	-1.21	+ 0.1	0.0/30.0	36890
1998 QG ₄₃	1999 11 30.0	04 22.28 +04 01.6 17.6	-0.82	- 1.3	5.5/27.8	36902
1998 KT ₆	1999 11 30.0	04 22.40 +16 58.7 18.7	-1.15	- 0.2	1.8/29.6	36899
1998 KG ₅₁	1999 11 30.0	04 22.61 +10 41.9 17.4	-1.05	- 2.4	4.7/28.8	36900
1998 RU ₂₂	1999 11 30.1	04 22.65 +24 26.3 18.2	-0.79	- 1.3	0.8/30.5	36085
1997 GF ₆	1999 11 30.1	04 22.97 -00 56.1 20.2	-0.78	- 5.1	5.9/26.4	35699
1993 TJ ₂	1999 11 30.1	04 23.00 +23 49.0 16.8	-0.91	- 1.2	0.8/30.5	32456
(9373)	1999 11 30.1	04 23.00 +25 10.4 18.0	-1.05	- 2.2	1.2/30.7	32623
1998 RK ₆	1999 11 30.2	04 23.01 +12 27.9 18.1	-0.82	- 1.7	2.6/29.0	36903
1995 UN ₁₅	1999 11 30.2	04 23.19 +22 11.0 19.7	-1.13	- 0.2	0.2/30.3	30784
1978 VH ₅	1999 11 30.2	04 23.28 +21 55.3 17.3	-0.89	- 4.8	0.1/30.3	36873
1994 PC ₁₅	1999 11 30.2	04 23.37 +01 13.3 18.8	-0.93	- 2.2	6.7/27.5	33072
(12351)	1999 11 30.4	04 24.27 +13 50.3 17.1	-0.95	- 5.8	2.6/29.2	36699
1998 OX ₆	1999 11 30.5	04 24.53 +36 42.5 17.3	-1.06	- 3.9	4.8/02.9	33078
1979 MX ₁	1999 11 30.5	04 24.66 +23 35.0 17.8	-0.97	- 3.2	0.7/30.9	36873
(9045)	1999 11 30.5	04 24.69 +19 54.3 17.1	-1.11	- 1.7	0.8/30.4	32184
(12545)	1999 11 30.5	04 24.72 +13 12.1 17.9	-0.91	- 2.3	2.8/29.5	36754
1084 T-2	1999 11 30.5	04 24.75 +20 42.3 19.7	-1.14	- 3.1	0.4/30.5	25970
1999 VU ₂₀	1999 11 30.6	04 24.81 +24 10.8 17.0	-1.21	- 0.5	1.1/30.9	36864
1998 RE ₁	1999 11 30.6	04 24.81 +45 26.9 19.6	-1.18	- 0.9	7.0/04.0	33563
1991 YC	1999 11 30.6	04 24.88 +03 29.9 16.5	-1.06	+ 3.0	7.7/29.1	36880
(9251)	1999 11 30.6	04 25.09 +18 44.1 17.9	-0.90	- 1.4	1.0/30.3	32435
1999 VT ₅	1999 11 30.6	04 25.13 +29 20.8 18.1	-1.07	- 1.5	3.0/02.0	36862
(12610)	1999 11 30.7	04 25.39 +23 27.8 17.3	-0.97	- 1.8	0.6/31.0	36772
(9146)	1999 11 30.8	04 25.65 +24 33.2 16.6	-1.14	+ 0.3	1.1/01.1	32411
1998 SQ	1999 11 30.8	04 25.94 +20 37.8 17.2	-0.59	- 1.4	0.2/30.7	36819
1993 UE ₁	1999 11 30.9	04 25.97 +30 01.8 17.4	-1.06	+ 2.1	2.8/01.6	36513
1998 QG ₅₇	1999 11 30.9	04 26.22 +14 58.4 20.3	-0.98	- 2.8	2.2/30.1	35711
(9472)	1999 12 01.0	04 26.58 +20 16.1 17.9	-0.89	- 2.1	0.4/30.9	32646
(12241)	1999 12 01.0	04 26.77 +20 34.8 17.4	-1.18	- 1.7	0.5/30.9	36670
1996 HF ₁₈	1999 12 01.1	04 26.88 +19 37.0 16.9	-0.87	- 3.2	0.7/30.8	36888
(12473)	1999 12 01.1	04 27.03 +16 53.0 17.9	-1.04	+ 1.7	1.6/30.8	36732
1981 UB ₂₃	1999 12 01.1	04 27.03 +16 46.6 16.0	-0.96	- 1.1	2.1/30.6	36874
1998 QT ₅₀	1999 12 01.1	04 27.12 +07 52.5 18.8	-0.81	- 1.3	3.6/29.5	35711
1998 QW ₉₅	1999 12 01.1	04 27.28 +16 49.0 18.6	-0.90	- 3.7	1.5/30.5	36903
1997 CX ₁₉	1999 12 01.2	04 27.26 +29 40.5 17.6	-1.23	- 1.3	3.4/02.0	29948
1993 FJ ₃₃	1999 12 01.2	04 27.33 +24 13.5 16.8	-1.08	- 0.6	1.0/01.5	36791
1991 HK	1999 12 01.2	04 27.35 +13 13.8 18.2	-1.11	- 2.9	3.3/30.1	36878
1998 QW ₅	1999 12 01.2	04 27.39 +20 48.3 19.4	-0.90	- 3.7	0.3/01.1	33080
1998 QB ₄₄	1999 12 01.3	04 27.69 +35 40.5 17.9	-1.02	- 1.2	4.2/03.1	33560
1985 CD ₂	1999 12 01.3	04 27.73 +22 10.6 18.6	-0.89	- 2.0	0.1/01.4	32918
1981 EB ₄₃	1999 12 01.3	04 27.78 +24 30.4 19.1	-1.07	- 1.9	1.0/01.7	36874
(12220)	1999 12 01.3	04 28.21 +27 23.4 16.0	-1.14	- 3.8	2.8/02.2	36665
(9694)	1999 12 01.4	04 28.50 +27 49.5 17.3	-0.61	- 1.1	1.2/02.3	32912
1995 QV ₉	1999 12 01.4	04 28.51 +32 24.8 19.9	-1.25	- 1.6	4.1/02.7	31141
1998 QS ₄₄	1999 12 01.5	04 28.65 +31 00.8 17.4	-1.04	- 2.3	3.1/02.7	34301
1998 KK ₁	1999 12 01.5	04 29.06 +24 11.8 16.9	-1.20	- 0.6	1.1/02.0	36899

1991 PT ₁	1999 12 01.6	04 29.10 +17 15.0 18.0	-1.09	- 3.1	1.7/01.0	36878
1999 VB ₆	1999 12 01.6	04 29.21 +19 11.5 16.6	-1.07	- 1.0	1.3/01.4	36862
1997 JM ₁₅	1999 12 01.7	04 29.52 +19 47.0 17.9	-0.96	- 1.2	0.7/01.5	36892
1995 SU ₅	1999 12 01.7	04 29.57 +13 36.2 19.3	-1.04	- 4.0	2.9/30.6	36517
1998 RN ₁₃	1999 12 01.7	04 29.77 +17 54.2 17.3	-1.09	- 1.4	1.6/01.3	36903
4080 P-L	1999 12 01.7	04 29.85 +18 13.0 18.2	-0.84	- 2.5	1.0/01.3	33053
1998 OM	1999 12 01.8	04 29.87 +19 29.4 17.8	-0.99	- 5.9	0.8/01.4	36815
3541 P-L	1999 12 01.8	04 29.92 +32 52.1 16.6	-1.04	- 3.9	3.8/03.5	36120
1996 AU ₆	1999 12 01.9	04 30.32 +22 11.4 17.6	-1.01	- 0.6	9.3/22.0	36887
1998 SC	1999 12 01.9	04 30.44 +27 41.0 18.0	-1.04	+ 0.1	1.8/02.5	35716
1999 VA ₆	1999 12 02.0	04 30.72 +14 13.6 17.0	-0.89	- 9.8	3.4/30.5	36862
(12491)	1999 12 02.0	04 31.17 +17 44.2 17.4	-0.91	- 1.7	1.4/01.6	36737
1998 QE ₇₈	1999 12 02.1	04 31.31 +31 33.3 18.1	-1.06	- 3.9	2.9/03.5	32983
1998 KD ₄₇	1999 12 02.1	04 31.58 +19 37.2 18.2	-1.14	- 3.9	0.9/01.9	36812
(8384)	1999 12 02.2	04 31.57 +10 15.7 16.6	-1.04	- 0.8	5.3/01.0	31362
1992 EU ₃₀	1999 12 02.2	04 31.92 +21 30.4 17.4	-0.99	- 3.1	0.1/02.2	36880
1998 JJ ₁	1999 12 02.3	04 31.99 +06 16.5 16.8	-1.14	-21.1	8.1/28.0	36898
1993 SA ₆	1999 12 02.3	04 31.99 +19 04.9 16.9	-0.90	- 1.8	1.0/02.0	34010
1995 TN ₇	1999 12 02.3	04 32.16 +23 09.8 17.9	-1.02	- 3.0	0.6/02.5	36794
3156 T-2	1999 12 02.4	04 32.69 +23 00.1 18.6	-0.60	- 1.0	0.2/02.6	36943
6626 P-L	1999 12 02.5	04 33.14 +26 01.4 18.2	-1.18	- 1.9	1.6/03.0	36942
1993 TX ₂₃	1999 12 02.5	04 33.19 +19 14.0 18.4	-0.88	- 1.0	0.8/02.3	36883
1998 MA ₅	1999 12 02.6	04 33.31 +26 36.3 18.8	-1.04	- 3.4	1.7/03.2	36900
1998 TL ₁₅	1999 12 02.6	04 33.42 +05 31.5 18.6	-0.54	- 3.5	3.1/30.0	36905
2221 P-L	1999 12 02.6	04 33.43 +20 30.5 19.3	-1.18	- 4.2	0.6/02.4	36941
1998 QW ₁₁	1999 12 02.6	04 33.63 +06 24.4 18.6	-0.86	- 1.8	5.3/30.8	32496
1991 PX ₅	1999 12 02.6	04 33.65 +31 43.6 18.0	-1.21	- 2.3	4.0/03.8	29299
1990 BA ₂	1999 12 02.6	04 33.76 +34 46.0 16.6	-1.02	- 3.9	4.4/04.5	36876
(11606)	1999 12 02.7	04 33.78 +32 31.4 19.5	-1.19	- 2.8	4.6/04.1	35860
1998 QM ₉	1999 12 02.7	04 33.90 +18 42.9 18.1	-0.89	- 3.2	1.1/02.3	36901
1995 UY ₄₀	1999 12 02.7	04 34.02 +17 36.8 18.4	-1.03	- 5.0	2.1/02.1	27110
(12378)	1999 12 02.7	04 34.03 +22 05.7 16.9	-1.24	+ 4.6	0.1/02.8	36707
(9046)	1999 12 02.7	04 34.05 +37 52.5 17.6	-1.28	- 4.3	5.6/05.0	32184
(9478)	1999 12 02.7	04 34.21 +28 04.1 19.0	-0.92	- 1.4	1.7/03.5	32648
(12291)	1999 12 02.8	04 34.20 +18 21.1 17.1	-0.86	- 0.1	1.1/02.4	36684
1993 LF ₂	1999 12 02.8	04 34.44 +15 06.8 16.4	-1.00	+ 1.3	2.4/02.3	36882
1993 TP ₃₈	1999 12 02.8	04 34.54 -00 31.5 18.3	-0.79	- 3.8	6.6/29.5	36883
1998 HU ₆	1999 12 02.8	04 34.56 +18 37.1 18.3	-1.15	+ 0.7	1.4/02.6	32326
1979 MO ₂	1999 12 02.9	04 34.60 +19 14.1 18.5	-1.18	- 3.9	1.1/02.6	36873
1998 KP ₃	1999 12 02.9	04 34.66 +18 19.6 17.7	-1.09	- 4.8	1.5/02.4	36899
(12274)	1999 12 03.0	04 35.07 +12 36.8 16.2	-0.91	- 8.7	4.0/01.3	36679
1995 ST	1999 12 03.0	04 35.18 +34 14.7 17.2	-1.27	- 2.3	4.8/04.4	36516
(12537)	1999 12 03.0	04 35.24 +20 19.3 17.6	-1.12	- 4.3	0.6/02.8	36751
(8979)	1999 12 03.0	04 35.28 +20 54.9 16.8	-1.22	- 1.5	0.5/02.9	31941
1975 NC	1999 12 03.0	04 35.40 +24 49.9 18.0	-0.97	- 3.3	0.9/03.4	36872
1995 UN ₄	1999 12 03.0	04 35.43 +20 18.3 16.7	-1.07	- 4.5	0.7/02.8	36885
1999 VF ₆	1999 12 03.0	04 35.44 +17 49.5 16.2	-1.05	- 3.9	2.1/02.5	36862
(8425)	1999 12 03.1	04 35.68 +15 32.9 16.1	-1.11	- 2.2	2.8/02.4	31371
(12408)	1999 12 03.1	04 35.68 +19 15.5 17.7	-1.16	+ 1.8	1.2/03.0	36715
1998 QP ₁₇	1999 12 03.2	04 36.06 +22 09.6 19.9	-1.09	- 2.2	0.0/03.2	36002
1998 RJ ₇₂	1999 12 03.2	04 36.09 +20 59.1 17.9	-0.84	- 1.2	0.3/03.1	36904

(9013)	1999 12 03.2	04 36.21 +05 32.5 18.0	-0.92 - 1.8	5.1/01.5	32177	1997 CK ₂₆	1999 12 04.9	04 43.49 +24 04.7 17.4	-1.17 + 0.7	0.7/05.1	36891
1998 SR ₆₀	1999 12 03.2	04 36.25 +19 39.1 18.0	-0.84 - 1.3	0.7/03.0	36904	(9171)	1999 12 04.9	04 43.60 +37 07.6 16.8	-1.27 + 1.7	5.2/06.0	32417
1999 VV ₁₀	1999 12 03.3	04 36.43 +26 54.1 16.0	-1.97 +19.8	2.7/02.9	36864	1999 VL ₁₀	1999 12 04.9	04 43.79 +14 07.8 16.1	-1.09 - 6.3	3.9/03.9	36863
(9480)	1999 12 03.3	04 36.46 +22 59.0 16.5	-0.91 - 1.7	0.3/03.4	32648	(12448)	1999 12 05.0	04 43.84 +13 10.7 17.4	-1.13 + 0.6	3.7/04.4	36726
1997 EQ ₄₀	1999 12 03.3	04 36.60 +05 13.5 19.0	-0.96 - 1.2	5.8/01.6	32520	1994 TO ₂	1999 12 05.0	04 43.87 +32 39.5 16.4	-1.14 + 0.7	3.9/05.9	36515
1998 QF ₇₁	1999 12 03.3	04 36.64 +13 56.1 18.8	-0.86 - 3.5	2.5/02.3	32980	1992 WM	1999 12 05.0	04 43.97 +27 33.4 16.4	-1.25 + 2.3	2.4/05.3	36790
1994 PN ₁₄	1999 12 03.3	04 36.83 +31 12.6 19.7	-1.11 - 2.5	3.0/04.5	32747	1999 VK ₁₀	1999 12 05.0	04 44.11 +12 15.3 17.0	-1.04 - 5.4	4.0/03.8	36863
1997 AB ₁₃	1999 12 03.4	04 36.77 +22 40.0 16.5	-1.18 - 0.5	0.3/03.5	36890	1998 QB ₄₆	1999 12 05.1	04 44.17 +27 27.5 19.1	-1.05 - 2.1	1.7/05.7	36902
(9891)	1999 12 03.4	04 37.19 +21 22.7 16.6	-1.09 + 1.9	0.2/03.4	33467	1995 OC ₈	1999 12 05.1	04 44.28 +16 38.6 18.8	-1.14 - 2.8	2.2/04.5	36885
1981 DO	1999 12 03.4	04 37.19 +11 10.3 18.5	-0.97 - 5.2	3.7/01.9	36500	(9085)	1999 12 05.1	04 44.32 +27 48.5 17.5	-1.27 + 0.6	2.3/05.6	32193
(9590)	1999 12 03.5	04 37.55 +27 38.5 18.9	-0.60 - 0.6	1.0/04.2	32886	1989 GM ₁	1999 12 05.1	04 44.35 +11 35.0 16.1	-0.99 - 5.9	4.3/03.7	36787
(12452)	1999 12 03.7	04 38.08 +22 10.8 16.5	-1.14 - 3.8	0.0/03.7	36727	1991 RF ₄	1999 12 05.1	04 44.36 +22 41.5 18.2	-1.11 - 2.8	0.1/05.2	36879
1998 QE ₇₃	1999 12 03.7	04 38.50 +30 53.4 17.2	-0.97 - 3.5	2.7/05.0	36085	4718 P-L	1999 12 05.1	04 44.52 +27 15.8 19.4	-1.09 - 1.5	1.7/05.7	25223
1998 MF ₃₇	1999 12 03.7	04 38.54 +03 50.0 17.6	-0.90 + 0.5	6.0/02.3	36901	1998 QR	1999 12 05.2	04 44.72 +15 09.7 17.4	-1.08 - 2.6	3.0/04.5	36901
1995 QE ₃	1999 12 03.8	04 38.58 +25 03.3 17.2	-1.19 - 2.7	1.2/04.2	36885	(9284)	1999 12 05.2	04 44.81 +08 01.2 18.5	-0.86 - 1.8	4.8/03.7	32601
1999 VK ₆	1999 12 03.8	04 38.93 +18 10.0 16.9	-0.89 - 5.7	1.3/03.3	36862	1998 HC ₉₉	1999 12 05.2	04 44.88 +23 21.0 17.3	-1.24 + 0.1	0.4/05.3	36809
1998 OD ₁₂	1999 12 03.8	04 39.01 +31 47.5 18.3	-1.20 - 1.6	3.7/04.9	33079	(9664)	1999 12 05.2	04 44.99 +20 05.3 17.7	-0.85 - 1.2	0.6/05.1	32904
1997 AP	1999 12 03.9	04 39.11 +25 15.1 17.1	-1.19 - 3.3	1.3/04.3	36889	(12246)	1999 12 05.3	04 45.11 +11 57.5 16.5	-1.06 - 2.8	4.6/04.2	36672
1989 EJ ₆	1999 12 03.9	04 39.23 +21 30.1 17.9	-0.87 - 1.6	0.2/03.9	36876	1989 QH	1999 12 05.3	04 45.16 +26 29.4 17.3	-1.26 - 3.3	1.9/05.8	32301
1998 QZ ₉₄	1999 12 03.9	04 39.39 +04 47.6 18.4	-0.92 - 3.1	5.6/01.8	34926	1934 JP	1999 12 05.3	04 45.21 +19 36.7 17.8	-1.16 - 1.9	1.3/05.1	36872
(12374)	1999 12 03.9	04 39.43 +10 08.9 17.3	-1.08 + 0.8	4.7/03.2	36706	1993 FL ₁₄	1999 12 05.4	04 45.45 +18 02.9 17.7	-1.03 - 0.5	1.5/05.0	36882
1994 RR ₁₁	1999 12 04.0	04 39.46 +19 17.2 16.6	-0.95 - 5.7	1.2/03.6	36884	1998 QW ₄₈	1999 12 05.4	04 45.69 +04 04.0 18.6	-0.90 - 1.6	5.7/03.5	33560
(12460)	1999 12 04.0	04 39.77 +16 13.2 17.5	-1.18 + 1.5	2.6/03.7	36729	1981 EX ₃₇	1999 12 05.4	04 45.92 +17 24.8 19.8	-1.14 - 3.2	2.0/05.0	26922
(12550)	1999 12 04.0	04 39.78 +02 47.8 16.7	-0.92 - 3.4	6.8/01.5	36755	1998 MW ₃₄	1999 12 05.4	04 45.96 +17 56.4 17.5	-1.10 - 2.9	1.7/05.0	36901
(12311)	1999 12 04.1	04 39.81 +25 30.7 16.7	-1.05 + 1.4	1.5/04.4	36689	(9130)	1999 12 05.5	04 46.05 +21 23.9 17.8	-1.13 - 2.5	0.3/05.4	32203
(9236)	1999 12 04.1	04 39.91 +11 24.7 18.7	-1.03 - 2.3	4.1/02.9	32432	1998 SU ₅₂	1999 12 05.6	04 46.58 +23 55.1 17.5	-0.62 - 1.4	0.3/05.8	35717
1992 DY ₇	1999 12 04.1	04 39.99 +21 50.2 17.7	-1.00 - 0.9	0.1/04.1	36880	1981 EB ₃₀	1999 12 05.6	04 46.60 +46 43.3 19.9	-1.39 - 1.9	8.7/08.6	26920
(12293)	1999 12 04.1	04 40.06 +22 30.8 16.0	-1.08 - 6.0	0.2/04.2	36684	3465 T-3	1999 12 05.6	04 46.71 +34 59.0 18.4	-1.04 0.0	3.8/07.0	36125
1982 BJ ₁₃	1999 12 04.1	04 40.18 +28 21.0 17.2	-1.15 - 3.4	2.3/04.9	36874	(9381)	1999 12 05.7	04 46.90 +24 05.6 16.8	-0.94 - 1.5	0.6/05.9	32625
(8959)	1999 12 04.2	04 40.42 +23 01.3 18.6	-1.16 - 1.5	0.3/04.3	31936	1998 SP ₇	1999 12 05.8	04 47.39 +19 23.2 20.1	-1.01 - 1.9	1.0/05.5	33015
1980 RL ₂	1999 12 04.2	04 40.45 +24 40.1 17.1	-1.16 - 2.6	1.0/04.5	36873	1995 OR	1999 12 05.8	04 47.45 +23 50.8 17.5	-1.25 + 0.3	0.6/06.0	36885
1998 RQ ₅₂	1999 12 04.2	04 40.59 +08 13.1 18.8	-0.93 - 1.4	4.5/02.8	33272	1991 LP ₂	1999 12 05.8	04 47.65 +20 57.4 17.8	-1.15 - 1.3	0.6/05.8	36878
1996 DT	1999 12 04.3	04 40.78 +06 49.1 17.8	-0.84 - 1.1	4.7/02.7	36888	1996 TJ ₁₀	1999 12 05.8	04 47.67 +54 46.9 17.4	-2.10 + 3.2	15.1/08.1	36888
1995 WV ₇	1999 12 04.3	04 41.12 +21 24.1 15.6	-1.14 + 4.0	0.3/04.4	36886	2072 P-L	1999 12 05.9	04 47.81 +35 13.8 18.1	-1.25 - 0.7	6.2/07.0	30094
(12263)	1999 12 04.3	04 41.13 +22 17.2 16.6	-1.16 - 2.4	0.0/04.4	36676	(9273)	1999 12 05.9	04 47.94 +20 58.0 18.2	-1.08 - 1.9	0.5/05.8	32598
1995 XW	1999 12 04.3	04 41.18 +29 43.9 17.0	-1.17 + 2.6	2.6/04.9	36887	1998 QW ₇₀	1999 12 05.9	04 47.95 +17 26.0 18.2	-0.85 - 3.8	1.5/05.3	36817
3159 T-2	1999 12 04.4	04 41.13 +02 28.0 17.3	-0.92 - 2.0	7.9/02.3	17653	1998 QG ₇₃	1999 12 05.9	04 48.05 +20 59.6 16.1	-0.90 - 4.3	0.5/05.8	36903
1993 FD ₈₂	1999 12 04.5	04 41.62 +16 12.0 18.6	-1.00 - 1.9	2.0/03.9	34501	(9233)	1999 12 05.9	04 48.11 +11 55.3 18.4	-0.97 - 1.0	3.3/05.1	35414
1980 TA ₄	1999 12 04.5	04 41.73 +31 17.4 16.3	-1.21 - 0.1	3.9/05.3	36500	1990 EU ₄	1999 12 06.0	04 48.15 +29 21.5 17.8	-1.20 - 2.0	3.0/06.7	36876
1992 OL ₃	1999 12 04.5	04 41.76 +19 10.7 18.5	-0.85 - 1.5	0.9/04.2	36880	(12250)	1999 12 06.0	04 48.22 +37 40.9 17.2	-1.08 - 0.6	4.9/07.5	36673
2139 T-3	1999 12 04.6	04 42.07 +22 27.3 16.3	-1.01 - 3.3	0.1/04.6	36871	(9065)	1999 12 06.0	04 48.30 +09 31.9 17.2	-0.96 - 0.8	4.2/05.0	32188
1991 SZ	1999 12 04.6	04 42.15 +26 14.0 17.1	-1.19 + 0.6	1.6/05.0	36879	1990 SL ₂₈	1999 12 06.0	04 48.34 +24 13.7 17.0	-1.06 - 2.0	0.6/06.2	36877
1998 QO ₃₇	1999 12 04.6	04 42.30 +13 18.5 19.3	-0.97 - 2.4	2.8/03.7	33082	1996 DD ₁	1999 12 06.0	04 48.49 -04 01.5 18.4	-1.02 + 5.3	10.0/05.4	36888
1993 FR ₃₀	1999 12 04.6	04 42.45 +21 38.6 19.2	-1.00 - 2.6	0.2/04.6	32745	2258 T-2	1999 12 06.1	04 48.52 +19 04.1 18.0	-1.01 - 1.6	1.3/05.8	36943
(11976)	1999 12 04.7	04 42.41 +50 53.7 16.4	-2.14 +11.3	14.6/03.7	36266	(9187)	1999 12 06.1	04 48.61 +18 10.2 18.9	-1.07 - 2.8	1.5/05.7	32421
6745 P-L	1999 12 04.8	04 42.94 +19 17.3 17.4	-0.89 - 1.4	1.1/04.5	36942	1995 UW ₂	1999 12 06.1	04 48.67 +22 48.2 16.5	-1.06 - 2.9	0.2/06.2	36885
(9256)	1999 12 04.8	04 43.00 +28 32.3 17.5	-1.19 - 1.0	2.3/05.4	32436	(9657)	1999 12 06.1	04 48.96 +21 17.4 17.9	-0.84 - 1.4	0.3/06.1	32902
1981 DR ₁	1999 12 04.8	04 43.24 +12 42.0 18.5	-0.98 - 5.0	3.2/03.6	26914	4321 T-1	1999 12 06.1	04 49.01 +23 29.7 16.7	-1.06 - 0.5	0.4/06.3	36943
1981 EP ₃₆	1999 12 04.8	04 43.29 +21 26.2 18.1	-0.92 - 4.5	0.3/04.8	36786	1998 QW ₁₀₄	1999 12 06.2	04 48.94 +08 57.8 18.9	-0.81 - 0.7	3.8/05.0	33270
(9427)	1999 12 04.8	04 43.31 +07 03.4 17.8	-0.85 - 0.5	4.7/03.5	32636	1998 MZ ₄₁	1999 12 06.2	04 48.95 +18 37.5 18.1	-1.13 + 3.7	1.5/06.1	36814
1998 QZ ₃₀	1999 12 04.9	04 43.36 +22 12.0 19.3	-0.90 - 1.7	0.0/04.9	33081	1991 GW ₁₀	1999 12 06.2	04 49.00 +36 16.0 19.8	-1.06 0.0	4.2/07.4	27711

1988 UF	1999 12 06.2	04 49.01 +35 12.6 16.7	-1.07 + 0.5	4.2/07.3	36504	1997 BJ ₂	1999 12 07.3	04 54.17 +14 38.5 18.7	-1.11 + 0.1	3.1/06.8	32519
1998 QE ₇₁	1999 12 06.2	04 49.13 +17 11.4 18.3	-1.04 - 3.5	1.7/05.6	34302	1998 FC ₁₂	1999 12 07.4	04 54.17 +14 41.9 17.4	-1.26 - 1.3	3.4/06.8	32482
1998 KS ₁	1999 12 06.2	04 49.29 +19 39.8 17.6	-1.17 - 4.0	1.2/06.0	36899	1999 VN ₁₀	1999 12 07.4	04 54.30 +24 11.7 16.8	-0.98 - 3.4	0.6/07.6	36864
(9338)	1999 12 06.2	04 49.37 +04 34.4 17.8	-0.79 - 2.0	4.8/04.4	32615	(9583)	1999 12 07.4	04 54.44 +14 11.5 18.8	-1.06 - 7.0	2.7/06.3	32885
1998 OV ₁₄	1999 12 06.3	04 49.54 +45 15.4 16.9	-1.29 - 2.4	8.5/08.9	33079	1997 MG ₁	1999 12 07.4	04 54.61 +07 40.3 17.0	-0.85 - 2.8	5.3/05.9	36892
4588 P-L	1999 12 06.3	04 49.58 +13 28.4 18.0	-1.10 - 2.7	3.8/05.5	36942	1981 EX ₈	1999 12 07.5	04 54.64 +26 03.7 18.7	-1.08 - 2.6	1.2/07.9	26916
(9063)	1999 12 06.3	04 49.64 +16 18.0 16.4	-1.13 + 0.6	2.8/06.0	32188	(12412)	1999 12 07.5	04 54.86 +10 12.6 16.2	-1.05 - 0.3	5.5/06.7	36716
1320 T-2	1999 12 06.3	04 49.70 +36 32.4 19.1	-1.07 - 0.9	4.5/07.7	36123	(12256)	1999 12 07.5	04 55.01 +09 51.2 17.6	-1.02 - 0.9	4.5/06.5	36674
1998 QZ ₃₉	1999 12 06.3	04 49.79 +31 24.5 18.7	-1.04 - 1.9	2.9/07.3	35710	(9499)	1999 12 07.5	04 55.02 +23 32.2 17.6	-0.94 - 1.7	0.3/07.7	32653
9609 P-L	1999 12 06.4	04 49.89 +17 08.5 18.3	-1.19 - 2.5	2.2/05.9	36942	1041 T-2	1999 12 07.5	04 55.03 +19 33.6 17.8	-0.93 - 1.5	1.0/07.3	36943
4262 T-2	1999 12 06.4	04 49.94 +22 02.0 18.3	-1.23 - 0.6	0.2/06.4	36943	1997 CE ₈	1999 12 07.6	04 55.15 +11 53.9 16.3	-1.09 - 0.6	4.8/06.9	36890
1994 CG ₁	1999 12 06.4	04 50.23 +29 50.0 18.0	-1.27 - 1.3	2.8/07.1	36883	1998 RO ₄₀	1999 12 07.6	04 55.21 +22 33.3 17.7	-0.90 + 0.1	0.0/07.6	36818
1998 QX ₃₅	1999 12 06.4	04 50.24 +25 20.8 17.7	-0.99 - 1.3	1.0/06.8	36902	1998 RK ₃₃	1999 12 07.6	04 55.27 +41 41.3 18.4	-1.26 - 0.4	6.2/09.2	35714
1998 HO ₁₄₈	1999 12 06.5	04 50.30 +25 14.5 17.9	-1.27 - 1.3	1.2/06.7	36898	4229 T-1	1999 12 07.6	04 55.28 +14 33.7 19.4	-1.04 - 1.6	2.8/06.9	32504
(9313)	1999 12 06.5	04 50.34 +34 09.4 18.0	-1.11 - 4.4	3.8/08.0	32609	1996 XY ₁₄	1999 12 07.6	04 55.33 +27 15.5 17.4	-1.23 - 3.7	1.8/08.1	36889
(8785)	1999 12 06.5	04 50.38 +16 54.9 18.0	-1.15 - 1.4	2.2/06.1	31896	1997 EL ₁₁	1999 12 07.6	04 55.35 +31 18.9 16.6	-1.22 + 3.2	3.2/08.0	36891
1996 ES ₁	1999 12 06.5	04 50.47 +18 18.5 18.7	-0.81 - 1.5	1.1/06.1	36888	(8936)	1999 12 07.6	04 55.39 +18 56.3 17.0	-1.19 - 0.2	1.6/07.4	31931
1994 PJ ₁	1999 12 06.6	04 50.74 +02 30.1 18.7	-0.96 + 0.2	6.8/05.1	36883	2156 P-L	1999 12 07.6	04 55.49 +05 52.5 18.3	-0.83 - 2.9	5.5/05.9	36119
1990 SE ₅	1999 12 06.6	04 50.76 +24 44.9 18.2	-0.77 - 0.5	0.6/07.0	36877	1995 UU ₁₄	1999 12 07.6	04 55.51 +24 46.3 18.7	-1.15 - 2.1	0.9/07.9	36886
(12411)	1999 12 06.6	04 50.92 +26 27.2 15.9	-1.14 - 5.1	1.8/07.1	36716	(12644)	1999 12 07.6	04 55.53 +25 00.6 16.2	-1.16 + 0.7	1.2/07.8	36781
4012 T-3	1999 12 06.6	04 51.05 +31 16.4 17.8	-1.01 + 0.8	2.8/07.3	36582	(9644)	1999 12 07.7	04 55.51 +09 50.9 16.6	-0.89 - 1.3	4.3/06.6	36499
1998 SL ₇	1999 12 06.7	04 51.17 +24 13.7 19.3	-0.98 - 1.6	0.5/06.9	32726	1991 RQ ₉	1999 12 07.7	04 55.56 +24 57.8 17.9	-1.16 - 2.2	0.9/07.9	36879
1998 FJ ₁₄	1999 12 06.7	04 51.24 -15 10.8 19.5	-1.18 - 3.0	16.9/02.2	34217	(12300)	1999 12 07.7	04 55.68 +43 23.1 17.4	-1.39 - 0.4	8.3/09.6	36686
1196 T-2	1999 12 06.7	04 51.25 +29 48.6 18.6	-1.09 - 1.2	2.4/07.4	33130	1997 CM ₄	1999 12 07.7	04 55.81 +31 50.1 17.7	-1.25 - 1.1	4.4/08.5	36798
1981 EV ₉	1999 12 06.7	04 51.36 +26 50.2 18.2	-1.21 - 4.2	2.0/07.2	36874	(9470)	1999 12 07.7	04 55.82 +19 37.1 18.5	-0.89 - 1.3	0.9/07.5	32646
(12416)	1999 12 06.7	04 51.40 +23 33.9 16.6	-1.13 - 1.8	10.5/27.0	36717	1998 QB ₃₂	1999 12 07.8	04 56.12 +38 37.0 17.5	-0.94 - 1.4	5.0/09.5	33755
1998 HJ ₁₀₁	1999 12 06.8	04 51.58 +17 23.5 18.7	-1.13 - 2.1	2.0/06.4	36898	1997 JT ₁₆	1999 12 07.8	04 56.14 +16 01.7 17.0	-0.93 + 2.1	2.3/07.5	36892
1996 CU ₈	1999 12 06.8	04 51.62 +36 28.0 17.5	-1.13 - 0.7	5.0/08.0	36888	1988 QR	1999 12 07.8	04 56.17 +24 08.2 18.3	-0.94 - 2.4	0.5/08.0	32741
(12655)	1999 12 06.9	04 52.04 +06 09.2 17.7	-0.82 - 0.7	4.8/05.5	36784	1997 FD	1999 12 07.8	04 56.26 +13 30.3 19.4	-1.08 - 1.6	3.5/07.1	29948
3574 T-3	1999 12 06.9	04 52.10 +07 50.4 17.9	-0.84 - 2.5	5.0/05.3	36944	4770 P-L	1999 12 07.9	04 56.38 +34 01.4 19.1	-0.99 - 0.2	3.3/08.8	36121
1998 QN ₁	1999 12 06.9	04 52.24 +21 53.6 17.6	-0.91 - 1.8	7.5/27.0	36901	(9089)	1999 12 07.9	04 56.41 +17 47.6 16.7	-1.09 + 0.7	1.8/07.6	32194
1997 GL ₁₇	1999 12 06.9	04 52.28 +25 45.0 17.8	-1.14 - 1.9	1.3/07.0	36892	1998 OZ ₄	1999 12 07.9	04 56.57 +10 43.4 17.9	-0.84 - 3.7	4.2/06.6	36901
(8780)	1999 12 06.9	04 52.43 +27 09.8 18.1	-1.24 - 3.0	1.8/07.5	31894	1998 SV ₈	1999 12 07.9	04 56.68 +21 22.7 19.4	-0.85 - 1.2	0.4/07.9	33511
1995 TR	1999 12 06.9	04 52.44 +17 20.9 17.1	-1.08 - 3.5	2.0/06.4	36885	1995 XG ₁	1999 12 07.9	04 56.79 +29 40.7 17.9	-1.11 - 5.3	2.4/08.9	36887
1998 QL ₇₃	1999 12 06.9	04 52.49 +18 17.2 17.4	-0.88 - 4.4	1.4/06.5	36817	(12362)	1999 12 08.0	04 56.80 +04 59.3 17.4	-0.82 - 3.2	5.7/06.1	36702
(9235)	1999 12 07.0	04 52.51 +20 27.5 19.7	-1.08 - 0.5	0.7/06.9	32431	1998 QX ₇₂	1999 12 08.0	04 56.88 +01 13.6 18.8	-0.81 - 2.3	6.7/05.9	36903
(9164)	1999 12 07.0	04 52.58 +27 58.3 16.7	-0.94 - 2.0	1.9/07.6	32416	1978 CK	1999 12 08.0	04 57.11 +47 15.3 17.1	-1.17 - 4.5	7.7/11.4	36873
1998 QW ₅₇	1999 12 07.0	04 52.84 +07 29.3 18.8	-0.82 - 1.7	4.4/05.6	35711	(8827)	1999 12 08.0	04 57.14 +13 37.7 17.9	-1.11 - 0.6	3.9/07.4	31905
(8335)	1999 12 07.0	04 52.88 +27 44.9 17.8	-1.23 - 2.3	2.1/07.6	32297	1992 OB	1999 12 08.1	04 57.38 +34 00.4 19.0	-1.02 + 1.4	3.0/08.8	35602
(10938)	1999 12 07.1	04 52.99 +51 00.7 16.9	-1.26 + 0.7	8.0/09.6	34807	1997 BS ₆	1999 12 08.2	04 57.81 +10 49.7 16.7	-1.11 + 1.7	5.7/07.6	36890
(9332)	1999 12 07.1	04 53.04 +42 28.0 17.1	-1.28 - 1.2	7.1/08.9	32613	1998 QS ₃₃	1999 12 08.2	04 58.16 +21 30.5 17.6	-0.90 - 3.0	0.4/08.2	36816
1998 SQ ₆	1999 12 07.1	04 53.07 +19 40.0 18.7	-0.92 - 1.6	0.9/06.9	36904	1993 FE ₃₈	1999 12 08.2	04 58.20 +15 10.3 18.6	-1.00 - 1.5	2.6/07.7	35687
1998 KA ₆	1999 12 07.1	04 53.23 +15 25.5 18.7	-0.90 - 0.9	2.3/06.6	32755	1998 KB ₅	1999 12 08.3	04 58.19 +22 17.4 18.5	-1.21 - 3.9	0.2/08.3	36899
1993 TU ₁₅	1999 12 07.2	04 53.56 +20 48.0 17.0	-0.90 - 1.7	0.6/07.1	31537	1981 ER ₂₄	1999 12 08.3	04 58.23 +20 22.8 18.0	-1.17 - 2.2	0.9/08.1	36874
1998 QL ₆₆	1999 12 07.2	04 53.69 +20 13.6 17.8	-0.99 - 4.9	0.8/07.0	36816	(10637)	1999 12 08.4	04 58.57 +38 35.2 17.2	-1.07 + 1.0	4.9/09.4	36499
1998 RW ₅₂	1999 12 07.2	04 53.69 +35 17.5 17.0	-1.04 - 0.1	4.1/08.3	36540	(12234)	1999 12 08.4	04 58.64 +03 04.2 16.8	-0.99 + 1.5	7.9/07.6	36668
1981 EA ₃₇	1999 12 07.2	04 53.73 +35 03.3 19.7	-1.21 - 1.5	5.0/08.4	26921	1996 XF ₁₄	1999 12 08.4	04 58.65 +20 33.7 18.7	-1.12 - 2.0	0.8/08.2	36889
(12562)	1999 12 07.3	04 53.77 +38 20.1 16.8	-1.03 0.0	4.5/08.6	36758	1990 CE	1999 12 08.4	04 58.89 +12 48.2 17.5	-1.09 - 1.5	4.5/07.6	36876
(9024)	1999 12 07.3	04 53.81 +20 58.2 18.3	-1.16 - 1.0	0.6/07.2	32179	1998 MS ₂₄	1999 12 08.4	04 58.91 +02 04.6 19.2	-0.94 + 0.1	6.1/07.2	35709
1996 RN ₂	1999 12 07.3	04 53.83 +39 58.7 16.5	-1.61 -14.0	8.4/10.8	28864	1998 KJ ₃₃	1999 12 08.5	04 59.05 +22 07.9 18.4	-1.16 - 4.0	0.2/08.5	36812
(12196)	1999 12 07.3	04 54.08 +16 39.8 17.7	-1.06 - 1.9	2.3/06.8	36658	2579 P-L	1999 12 08.5	04 59.32 +32 21.0 18.2	-1.27 + 0.1	3.5/09.2	18130

3040 P-L	1999 12 08.6	04 59.66 +29 44.3	17.2	-1.13	-	4.7	2.7/09.5	32091	1993 FE ₁₂	1999 12 09.9	05 05.20 +20 00.8	16.6	-1.06	+	1.0	1.3/09.8	36882
(9044)	1999 12 08.6	04 59.79 +18 42.5	16.6	-1.17	-	0.0	1.6/08.4	32184	1998 JT	1999 12 09.9	05 05.20 +21 41.3	16.9	-1.21	-	4.8	0.5/09.8	36898
1993 BP ₃	1999 12 08.7	04 59.90 +65 38.9	16.5	-2.03	-	4.6	19.8/15.9	36881	6634 P-L	1999 12 10.0	05 05.60 +22 32.1	17.0	-0.93	+	0.1	0.1/10.0	36942
1998 KU ₄	1999 12 08.7	04 59.91 +22 56.0	16.8	-1.23	+	2.5	0.1/08.7	36812	1995 CG	1999 12 10.0	05 05.61 -17 13.1	17.4	-1.24	+	6.5	18.0/11.1	36884
(12222)	1999 12 08.7	05 00.10 +22 03.6	15.8	-1.01	-	8.2	0.3/08.6	36665	(12302)	1999 12 10.0	05 05.79 +26 08.4	17.5	-1.18	-	2.0	1.4/10.3	36686
(9436)	1999 12 08.7	05 00.12 +19 21.5	17.3	-1.07	-	0.6	1.2/08.5	32638	1998 QQ ₃₈	1999 12 10.0	05 05.82 +22 21.8	18.5	-1.08	-	2.2	0.2/10.0	36902
1992 EZ ₇	1999 12 08.7	05 00.16 -00 12.3	16.9	-0.88	-	0.6	10.5/06.9	36880	4172 T-1	1999 12 10.0	05 05.84 +20 42.8	19.0	-1.09	-	1.1	0.8/09.9	33129
(9487)	1999 12 08.7	05 00.27 +20 00.2	17.4	-0.96	-	0.5	0.9/08.6	32650	1999 VQ ₁₀	1999 12 10.0	05 05.85 +23 04.1	16.6	-0.60	-	1.8	0.0/10.1	36864
1998 HU ₁₄₉	1999 12 08.8	05 00.38 +27 16.5	18.2	-1.23	-	1.1	1.8/09.2	36898	1998 RG ₇₈	1999 12 10.0	05 05.89 +09 56.3	19.2	-0.83	-	0.8	3.5/09.1	33011
1995 XT ₁	1999 12 08.8	05 00.51 +25 37.0	16.9	-0.97	-	4.4	1.4/09.2	36795	1998 QQ ₈₄	1999 12 10.0	05 06.00 +15 41.6	17.1	-0.88	-	5.8	2.6/09.2	36903
1998 QC ₂₀	1999 12 08.8	05 00.56 -00 38.5	19.6	-0.82	-	0.8	6.4/07.2	33559	1995 VZ ₆	1999 12 10.1	05 06.21 +20 39.0	17.8	-1.01	-	2.3	1.1/10.0	30784
1991 TW ₈	1999 12 08.9	05 00.73 +29 31.8	19.3	-1.18	-	0.6	2.4/09.4	32744	2102 P-L	1999 12 10.1	05 06.23 +29 05.9	18.8	-1.23	-	1.9	2.4/10.6	32342
1990 FD ₃	1999 12 08.9	05 00.78 +00 30.0	17.0	-0.80	-	0.5	6.5/07.2	36876	1979 SG ₂	1999 12 10.1	05 06.27 +30 14.7	17.0	-1.28	-	4.9	3.5/11.0	36500
1994 PT ₃₁	1999 12 08.9	05 00.87 +18 44.6	18.0	-1.02	-	2.3	1.4/08.6	36884	1995 WL ₁₃	1999 12 10.1	05 06.28 +16 40.9	16.3	-1.05	-	0.1	2.6/09.8	36887
1998 QV ₁	1999 12 08.9	05 00.99 +14 16.5	18.7	-0.87	-	0.3	2.7/08.4	35709	1990 WS ₁	1999 12 10.1	05 06.33 +07 30.3	17.1	-0.94	-	4.3	5.6/08.4	36877
1998 OV ₁₂	1999 12 08.9	05 01.01 +15 35.1	17.4	-0.94	-	0.7	2.5/08.4	36901	(9429)	1999 12 10.1	05 06.52 +25 05.7	17.3	-0.94	-	1.3	0.7/10.4	32636
2232 T-2	1999 12 08.9	05 01.14 +16 03.3	17.5	-1.08	-	1.7	2.8/08.4	36943	1997 KU ₂	1999 12 10.2	05 06.49 +04 33.6	17.2	-0.99	+	1.9	7.0/09.4	36892
1973 SR ₁	1999 12 09.0	05 01.18 +29 24.9	19.2	-0.64	0.0	1.3/09.5	33538	1981 ET ₂₇	1999 12 10.2	05 06.53 +19 34.8	18.4	-0.91	-	1.2	1.1/10.0	36874	
(12210)	1999 12 09.0	05 01.32 +08 08.9	17.6	-1.07	-	1.7	7.0/07.9	36662	(12315)	1999 12 10.2	05 06.57 +23 31.8	15.9	-1.03	+	1.2	0.2/10.3	36690
1998 MW ₁₅	1999 12 09.0	05 01.62 -04 18.7	19.4	-0.92	+	3.8	8.0/08.8	32756	1996 DY ₂	1999 12 10.2	05 06.67 +23 29.6	16.7	-0.98	-	0.1	0.2/10.3	36888
(9245)	1999 12 09.0	05 01.68 +18 15.1	18.2	-1.15	-	0.5	1.7/08.8	32434	1988 BG ₅	1999 12 10.2	05 06.96 +17 25.4	18.4	-0.97	-	4.4	1.8/09.7	36875
(12332)	1999 12 09.1	05 01.67 +12 23.5	16.1	-1.03	-	4.3	5.2/08.0	36694	1992 AV ₁	1999 12 10.3	05 06.94 -08 00.4	16.0	-1.42	+16.2	16.1/13.9	36880	
(12422)	1999 12 09.1	05 01.67 +25 14.8	16.2	-1.20	+	2.9	0.9/09.2	36719	1998 QQ ₁₀₄	1999 12 10.3	05 07.08 +24 04.1	19.2	-0.93	+	0.4	0.4/10.4	33270
1998 OB ₁₅	1999 12 09.1	05 01.81 +25 35.6	18.5	-0.98	-	1.4	1.0/09.4	35709	1997 GQ ₂₃	1999 12 10.3	05 07.17 +25 48.6	17.5	-1.01	-	1.5	1.0/10.6	36892
(9473)	1999 12 09.1	05 01.84 +16 49.6	17.9	-0.96	-	0.6	2.2/08.7	32647	(8895)	1999 12 10.4	05 07.62 +16 29.4	17.5	-1.14	-	1.1	2.5/10.0	31922
1995 QA ₃	1999 12 09.1	05 01.90 +35 21.4	16.6	-1.30	-	2.2	5.1/10.3	26176	1998 QL ₁₈	1999 12 10.4	05 07.79 +29 46.8	17.5	-0.96	-	1.4	2.5/11.0	36902
1977 QN ₁	1999 12 09.2	05 02.49 +41 58.7	17.3	-1.25	-	1.7	6.2/11.1	36873	(9213)	1999 12 10.5	05 08.07 +30 02.8	16.4	-1.17	-	4.2	3.1/11.3	32427
1997 CN ₁₃	1999 12 09.4	05 02.95 +11 44.2	17.7	-1.09	+	0.3	4.3/08.8	36890	1981 DP ₃	1999 12 10.5	05 08.12 +13 54.6	19.0	-0.85	-	2.7	2.5/09.8	30779
(12565)	1999 12 09.4	05 03.14 +15 25.1	17.3	-0.85	-	2.5	2.5/08.7	36759	(8972)	1999 12 10.6	05 08.45 +20 16.2	17.5	-1.21	-	2.3	1.2/10.4	31940
1998 RX ₁₂	1999 12 09.4	05 03.22 +21 50.8	17.9	-0.88	-	1.2	0.3/09.4	36903	(9497)	1999 12 10.6	05 08.55 +19 23.7	16.7	-0.93	-	1.3	1.3/10.4	36499
(12651)	1999 12 09.4	05 03.26 +14 33.6	17.5	-0.87	-	4.1	2.9/08.6	36783	(9414)	1999 12 10.6	05 08.58 +30 10.8	16.2	-1.22	+	2.4	2.6/10.9	32633
(9238)	1999 12 09.4	05 03.30 +20 10.3	17.6	-0.94	-	1.4	0.9/09.3	32432	1998 QV ₉	1999 12 10.6	05 08.67 +36 06.9	19.2	-1.18	-	2.1	4.4/12.0	35710
(11376)	1999 12 09.5	05 03.37 +21 09.6	18.2	-1.09	-	1.6	0.6/09.4	35584	1998 OX ₁₄	1999 12 10.6	05 08.72 +40 23.7	17.9	-1.23	-	2.6	5.8/12.3	34301
1997 CE ₁	1999 12 09.5	05 03.45 +35 46.9	15.6	-1.30	-	0.3	6.4/10.5	36523	(9091)	1999 12 10.6	05 08.72 +19 06.0	17.5	-1.10	-	1.4	1.5/10.4	32194
1995 WE ₆	1999 12 09.5	05 03.59 +26 30.9	16.6	-1.11	-	0.6	1.8/09.8	36886	1998 SW ₄₃	1999 12 10.7	05 08.79 +20 43.8	17.5	-0.76	-	2.1	0.6/10.5	36904
1982 SQ ₇	1999 12 09.5	05 03.72 +40 10.0	17.8	-1.07	-	1.0	4.9/11.1	36874	1998 QV ₄₇	1999 12 10.7	05 09.02 +12 38.9	19.2	-0.85	-	1.2	3.0/10.0	32712
1991 EY ₃	1999 12 09.6	05 03.91 +24 32.3	17.8	-0.98	-	1.5	0.6/09.8	36878	1998 KZ ₅	1999 12 10.8	05 09.25 +19 49.1	18.7	-0.89	-	1.4	0.9/10.6	36899
1995 VJ ₂	1999 12 09.6	05 03.91 +27 40.0	16.6	-1.27	+	7.0	2.1/09.6	36886	1991 TU ₅	1999 12 10.8	05 09.40 +28 50.9	18.4	-1.14	-	1.4	2.6/11.3	29915
(8931)	1999 12 09.6	05 04.01 +26 24.9	17.3	-1.20	-	1.7	1.4/09.9	31930	1998 QU ₁₇	1999 12 10.8	05 09.49 +27 56.5	19.1	-0.94	-	2.5	1.6/11.3	32694
1998 KR ₄₇	1999 12 09.6	05 04.07 +14 10.5	18.1	-1.01	-	3.8	3.0/08.8	36900	1999 VY ₂₄	1999 12 10.9	05 09.56 +27 48.8	17.4	-1.11	-	1.6	1.9/11.3	36865
1984 CE	1999 12 09.7	05 04.31 +09 19.4	16.4	-1.05	+	8.0	6.5/10.1	36875	1998 QW ₇₇	1999 12 10.9	05 09.63 +38 45.1	16.9	-1.16	-	2.4	4.9/12.3	36903
(9240)	1999 12 09.7	05 04.34 +16 23.6	16.0	-0.92	+	1.5	2.4/09.4	32433	1194 T-3	1999 12 10.9	05 09.68 +31 14.0	16.8	-1.23	-	3.1	3.3/11.7	36581
(9498)	1999 12 09.7	05 04.39 +20 58.5	19.2	-1.11	-	1.9	0.6/09.6	32653	1998 QD ₄₀	1999 12 10.9	05 09.87 +26 34.6	18.1	-1.01	-	1.9	1.2/11.3	36902
1997 BO ₉	1999 12 09.7	05 04.41 +15 28.0	17.7	-1.12	-	0.8	3.1/09.2	30786	(9009)	1999 12 10.9	05 10.02 +22 40.4	17.4	-1.18	-	0.3	0.1/11.0	32176
1996 ED ₄	1999 12 09.7	05 04.51 +37 22.0	18.0	-1.06	-	0.7	4.5/10.9	36520	1998 PH	1999 12 11.0	05 10.11 +31 24.9	15.9	-1.12	-	8.6	3.7/12.0	36085
(11738)	1999 12 09.7	05 04.55 +20 54.6	17.7	-0.85	-	0.8	0.5/09.6	35895	1998 QT ₄₆	1999 12 11.0	05 10.27 +17 38.1	17.8	-0.87	-	1.8	1.7/10.6	33755
1990 SS ₃	1999 12 09.7	05 04.65 +44 43.3	15.8	-1.24	-	0.2	10.8/12.0	36877	1991 PF ₁₂	1999 12 11.0	05 10.39 +27 20.7	17.8	-1.19	-	4.0	1.7/12.0	36878
(9209)	1999 12 09.7	05 04.70 +30 17.0	17.7	-1.07	-	1.0	2.3/10.4	32426	1995 UL ₆	1999 12 11.0	05 10.50 +26 37.5	17.8	-1.17	-	1.6	1.5/11.4	36886
1998 RP ₄₇	1999 12 09.7	05 04.77 +34 35.7	17.9	-1.00	-	2.0	3.5/10.9	35714	(12336)	1999 12 11.1	05 10.47 -05 34.9	15.2	-0.89	-18.9	14.9/02.8	36695	
(12377)	1999 12 09.8	05 05.0 +71 22.8	16.2	-2.66	-10.2	18.4/25.9	36706	1998 MW ₇	1999 12 11.1	05 10.63 +10 04.4	19.8	-0.97	-	0.4	4.0/10.4	35709	
1996 RR ₂	1999 12 09.8	05 05.23 +56 16.8	17.0	-2.13	-	9.4	15.5/15.6	30785	1998 KR ₄								

2061 T-3	1999 12 11.1	05 10.88 +19 50.8 19.5	-1.12	- 2.4	1.1/11.0	36870	1998 TC ₃₁	1999 12 12.6	05 17.21 +05 32.9 18.2	-0.59	- 3.4	3.7/10.9	33571
1997 FP ₄	1999 12 11.2	05 11.03 +25 27.0 19.0	-1.07	- 1.7	0.9/11.4	35699	1993 TW ₁₆	1999 12 12.6	05 17.35 +19 19.1 19.5	-0.89	- 0.6	1.1/12.5	35689
1998 QL ₃₃	1999 12 11.2	05 11.30 +37 46.6 17.8	-1.22	- 3.1	5.2/12.6	36902	2095 P-L	1999 12 12.6	05 17.43 +27 13.8 18.0	-1.06	- 1.5	1.8/12.9	36941
4093 T-3	1999 12 11.4	05 11.71 +28 47.7 18.6	-1.23	+ 1.4	2.3/11.6	26186	(12433)	1999 12 12.7	05 17.53 +14 40.6 16.8	-0.90	- 4.3	4.1/11.9	36721
1994 WF ₁	1999 12 11.4	05 11.97 +23 13.2 17.4	-0.96	- 1.4	0.1/11.5	36884	(9267)	1999 12 12.7	05 17.61 +19 36.2 18.1	-0.94	- 0.4	1.2/12.6	32597
(12187)	1999 12 11.4	05 12.13 +01 12.9 16.4	-0.91	- 3.3	9.7/09.7	36656	1994 PU ₂₆	1999 12 12.7	05 17.69 +20 11.0 19.3	-1.04	- 0.3	1.0/12.6	32517
1995 TX	1999 12 11.4	05 12.16 +50 04.3 17.1	-1.64	- 6.6	10.1/14.8	36885	1998 QJ ₂₈	1999 12 12.7	05 17.77 +27 34.5 17.8	-1.16	- 9.3	1.4/13.4	35710
1995 SM ₂₁	1999 12 11.4	05 12.18 +35 42.4 18.2	-1.31	- 1.6	5.6/12.4	29664	1998 HE ₅₁	1999 12 12.7	05 17.96 +18 09.3 17.7	-1.20	- 2.3	2.1/12.5	36897
1994 NA	1999 12 11.4	05 12.19 +16 30.2 18.2	-1.07	+ 0.8	2.3/11.2	36883	1998 MF ₃	1999 12 12.8	05 17.97 +28 38.7 17.6	-1.29	- 0.8	2.5/13.1	36900
1996 RE ₁₁	1999 12 11.5	05 12.52 +27 16.3 20.1	-0.61	- 0.5	0.8/11.9	33255	1997 KW ₁	1999 12 12.8	05 18.09 +03 18.1 19.5	-0.85	- 0.5	6.3/11.8	32681
1998 QA ₈₄	1999 12 11.6	05 12.66 +08 47.8 19.3	-0.84	- 3.6	4.1/10.3	35712	(12207)	1999 12 12.9	05 18.81 +27 13.8 17.4	-1.26	- 2.8	1.7/13.3	36661
1995 QK	1999 12 11.6	05 12.88 +20 08.2 17.2	-1.14	- 3.0	1.3/11.4	36885	(9128)	1999 12 13.0	05 19.03 +19 54.5 17.2	-1.21	+ 0.1	1.3/12.9	32203
1995 DA ₃	1999 12 11.6	05 13.03 +02 09.2 18.2	-1.25	-12.3	9.7/08.2	36884	(9611)	1999 12 13.0	05 19.22 +27 39.0 17.6	-0.91	0.0	1.3/13.3	32891
1989 GR ₃	1999 12 11.7	05 13.08 +22 46.8 18.8	-1.02	- 2.0	0.1/11.7	36876	(9364)	1999 12 13.1	05 19.29 +26 50.9 17.3	-1.01	- 0.7	1.2/13.3	32621
1998 UL	1999 12 11.7	05 13.13 +28 41.9 17.9	-0.97	- 3.2	1.8/12.2	36905	1998 HC ₉₈	1999 12 13.1	05 19.43 +31 22.4 18.8	-1.34	- 1.0	3.2/13.6	32329
1998 QR ₇₁	1999 12 11.7	05 13.13 +24 46.3 17.6	-0.92	- 4.0	0.6/12.0	36817	1990 EJ	1999 12 13.1	05 19.58 +35 42.8 17.2	-1.02	- 0.9	3.8/13.9	36505
1998 QM ₂₅	1999 12 11.7	05 13.14 +26 16.4 17.8	-1.05	- 0.4	1.2/11.9	36902	1998 QO ₃₅	1999 12 13.2	05 19.77 +21 17.5 17.8	-0.96	0.0	0.6/13.1	33347
1997 AF ₁₃	1999 12 11.7	05 13.42 +18 35.1 17.2	-1.16	+ 2.0	1.6/11.6	36890	1998 RK ₁₇	1999 12 13.2	05 19.88 +11 38.5 18.2	-0.96	- 1.2	4.4/12.6	35714
(11053)	1999 12 11.7	05 13.45 +20 14.4 16.2	-0.95	- 1.2	1.0/11.6	35225	1998 QL ₃₆	1999 12 13.2	05 20.17 +21 32.8 17.3	-0.97	- 1.9	0.5/13.2	32701
(12372)	1999 12 11.7	05 13.45 +15 41.7 17.3	-1.12	- 1.3	3.1/11.3	36705	(12524)	1999 12 13.3	05 20.16 +22 39.6 17.5	-1.19	- 0.8	0.2/13.3	36748
(9536)	1999 12 11.7	05 13.53 +41 55.9 16.8	-1.26	+ 0.7	6.4/12.6	32872	1998 QJ ₁₆	1999 12 13.3	05 20.22 +28 07.3 15.5	-1.02	- 4.6	2.1/13.8	36902
1980 FH ₄	1999 12 11.8	05 13.74 +21 27.0 19.4	-1.14	- 1.3	0.6/11.8	32738	1998 QR ₃₈	1999 12 13.3	05 20.44 +34 30.2 17.9	-1.01	- 2.4	3.7/14.2	34301
1998 HF ₉₆	1999 12 11.8	05 13.83 +13 35.6 16.8	-1.17	+ 0.2	4.1/12.0	36898	1990 ST ₁₄	1999 12 13.3	05 20.53 +29 29.1 16.5	-1.12	+ 2.5	2.9/13.5	36877
1998 QT ₅	1999 12 11.9	05 14.12 +38 27.6 17.5	-1.10	- 1.6	5.6/13.1	36901	1995 SB ₁	1999 12 13.4	05 20.64 -01 35.9 16.3	-1.07	-16.5	12.2/08.4	36885
(12547)	1999 12 11.9	05 14.18 +27 11.4 17.3	-0.93	- 3.2	1.4/12.3	36754	(9504)	1999 12 13.4	05 20.90 +25 26.9 17.5	-0.97	- 0.3	0.8/13.6	36499
1998 QC ₇₀	1999 12 11.9	05 14.33 +17 55.6 17.4	-0.91	- 4.3	1.8/11.5	36903	1997 GR ₅	1999 12 13.5	05 21.01 +18 37.9 17.3	-1.14	+ 0.9	1.8/13.4	36891
6054 P-L	1999 12 12.0	05 14.64 +18 01.4 17.3	-0.90	- 1.8	1.9/11.7	36942	1991 RU ₈	1999 12 13.5	05 21.17 +26 04.3 17.7	-1.16	- 1.0	1.1/13.7	36879
1989 YE ₆	1999 12 12.0	05 14.73 +22 14.0 16.1	-1.14	- 6.2	0.4/12.0	36876	(9178)	1999 12 13.5	05 21.44 +25 52.7 16.9	-0.99	- 0.4	1.0/13.7	32419
1998 OZ ₁₃	1999 12 12.1	05 14.83 +05 31.9 18.9	-0.95	+ 0.8	5.7/11.4	32758	1981 ED ₆	1999 12 13.5	05 21.44 +12 01.3 20.6	-0.97	- 2.7	3.4/12.8	32509
1998 OZ ₅	1999 12 12.1	05 15.18 +19 15.5 17.3	-1.14	- 2.1	1.4/11.9	36901	1990 SE ₉	1999 12 13.6	05 21.45 +26 00.4 19.7	-1.10	+ 1.0	1.1/13.7	32445
1988 XV ₁	1999 12 12.1	05 15.21 +26 46.0 14.8	-1.11	+ 6.1	1.4/12.1	36786	1992 DZ ₅	1999 12 13.6	05 21.59 +17 11.5 17.2	-0.98	0.0	2.7/13.4	30687
(9248)	1999 12 12.1	05 15.22 +19 32.1 17.4	-0.96	- 1.0	1.3/12.0	32434	(9389)	1999 12 13.6	05 21.83 +18 34.7 17.8	-1.16	+ 0.6	1.8/13.5	32627
1996 CK ₁	1999 12 12.2	05 15.25 +30 25.5 16.4	-1.07	+ 0.7	3.2/12.5	36888	(9275)	1999 12 13.7	05 21.94 +36 45.4 18.0	-1.05	- 0.9	4.4/14.5	32599
1998 MU ₂₄	1999 12 12.2	05 15.29 -02 08.3 19.7	-0.95	- 0.6	7.7/11.0	32286	1991 AG ₂	1999 12 13.8	05 22.61 -03 50.1 16.4	-0.88	+ 4.2	12.8/14.7	36877
1993 SM ₃	1999 12 12.2	05 15.30 +20 34.8 17.1	-0.91	- 0.6	0.9/12.1	36882	1998 RQ ₇₇	1999 12 13.8	05 22.77 +29 32.4 17.9	-0.82	+ 0.3	1.7/14.2	36904
1993 UZ ₇	1999 12 12.2	05 15.34 +12 42.6 17.1	-0.86	+ 0.3	3.7/11.7	36883	1998 QS ₄₁	1999 12 13.8	05 22.77 +23 00.6 17.4	-1.01	- 0.4	0.1/13.9	36902
1998 QC ₄₁	1999 12 12.2	05 15.51 +36 18.2 18.5	-1.13	- 2.0	4.3/13.3	34020	1991 FY ₃	1999 12 13.9	05 22.74 +45 19.3 17.3	-1.16	+ 0.4	6.1/15.1	36507
1998 SK ₁₅₇	1999 12 12.3	05 15.69 +20 15.6 18.7	-0.86	- 0.6	0.8/12.1	36905	(11381)	1999 12 13.9	05 22.86 +19 23.7 17.9	-0.84	- 1.5	1.1/13.7	35585
1993 TD ₂₈	1999 12 12.3	05 15.75 +17 21.9 18.4	-0.88	- 1.0	1.8/12.0	32746	1998 QE ₄	1999 12 13.9	05 23.03 +14 38.7 18.2	-0.91	+ 1.8	2.7/13.8	36815
1995 DX ₂	1999 12 12.3	05 15.91 +09 48.1 18.9	-1.32	-14.9	6.5/10.0	32749	(12225)	1999 12 13.9	05 23.03 +15 54.3 17.7	-1.14	- 0.5	2.7/13.6	36666
(12656)	1999 12 12.4	05 16.21 +06 22.4 17.3	-0.97	- 0.2	6.1/11.4	36784	1995 VP ₁₇	1999 12 13.9	05 23.09 +25 28.0 19.2	-1.12	- 0.1	1.0/14.1	29627
1982 VC ₃	1999 12 12.4	05 16.29 +23 46.4 17.4	-1.14	+ 1.1	0.3/12.5	36874	1997 BP ₃	1999 12 13.9	05 23.27 +12 25.7 16.8	-1.09	+ 1.2	4.8/13.7	36890
1998 RP ₇₂	1999 12 12.4	05 16.33 +11 01.3 19.5	-0.71	- 0.9	3.1/11.7	35441	3261 T-3	1999 12 14.0	05 23.23 +23 29.0 18.3	-0.91	- 0.5	0.1/14.0	36944
1981 SE ₇	1999 12 12.4	05 16.40 +25 18.6 16.2	-1.07	+ 1.2	0.8/12.5	36874	(11736)	1999 12 14.0	05 23.38 +23 57.0 16.6	-1.15	+ 0.6	0.3/14.1	35894
1999 SS ₃	1999 12 12.4	05 16.42 +55 11.8 16.4	-1.39	- 0.1	10.5/14.6	36834	1998 FA ₁₁	1999 12 14.0	05 23.48 +14 04.3 18.4	-1.16	+ 0.9	4.1/13.8	32063
(12535)	1999 12 12.4	05 16.65 +08 17.9 16.7	-0.98	+ 1.3	6.0/12.1	36751	1973 SY ₁	1999 12 14.0	05 23.57 +30 17.6 18.6	-0.64	- 0.5	1.4/14.5	34572
1979 MU ₄	1999 12 12.5	05 16.68 +19 45.7 18.6	-1.08	- 0.9	1.2/12.3	36500	1994 PE ₉	1999 12 14.0	05 23.58 +11 48.2 19.7	-1.03	- 0.1	3.7/13.6	32235
3024 P-L	1999 12 12.5	05 16.87 +32 05.0 17.0	-1.16	- 4.4	3.3/13.4	36579	(8930)	1999 12 14.0	05 23.64 +25 53.9 16.1	-1.24	- 4.0	1.3/14.3	31930
1998 RC ₁₈	1999 12 12.5	05 16.96 +39 58.3 19.2	-1.10	- 0.7	4.8/13.8	35632	1981 ER ₄₇	1999 12 14.1	05 24.15 +26 20.5 16.6	-1.12	- 0.1	1.4/14.3	36874
1998 SQ ₅₉	1999 12 12.5	05 16.98 +22 05.3 17.8	-0.87	- 0.4	0.3/12.5	36904	1998 MV ₄₂	1999 12 14.2	05 24.39 +25 10.5 16.0	-1.14	- 3.9	1.0/14.4	36814
1995 SH ₁	1999 12 12.6	05 17.08 +29 53.9 19.1	-1.25	- 3.5	2.9/13.2	35693	(9334)	1999 12 14.3	05 24.56 +06 26.7 18.0	-0.93	- 1.6	5.4/13.4	32614

1992 EX	1999 12 14.4	05 24.99 +09 38.2 17.5	-0.97 + 1.3	5.1/14.0	36509	(9440)	1999 12 15.6	05 30.40 +23 46.2 17.6	-1.15 - 0.8	0.2/15.6	32639
1996 EH ₁	1999 12 14.4	05 25.06 +05 07.7 18.2	-0.78 - 1.9	4.8/13.2	33343	1998 OJ ₁₂	1999 12 15.6	05 30.43 +28 32.3 19.3	-1.10 - 0.3	1.8/15.8	32491
1990 FH	1999 12 14.4	05 25.07 +46 11.7 17.5	-1.76 + 8.8	9.3/12.9	36876	1998 SH ₂₃	1999 12 15.6	05 30.72 +16 25.1 18.1	-0.85 + 0.1	1.9/15.5	36904
1990 SY	1999 12 14.4	05 25.19 +35 06.2 17.4	-1.17 - 2.0	4.0/15.2	36506	(9103)	1999 12 15.6	05 30.73 +23 04.1 17.1	-1.23 - 2.6	0.1/15.7	32197
(9713)	1999 12 14.4	05 25.23 +18 12.2 17.7	-0.58 - 0.4	1.0/14.2	33190	1993 TX ₃₈	1999 12 15.7	05 30.78 +19 18.3 18.0	-0.90 + 1.1	1.2/15.6	36883
1998 QY ₃₀	1999 12 14.4	05 25.27 +25 07.4 17.6	-0.99 - 1.1	0.7/14.6	36902	1995 FS	1999 12 15.7	05 30.86 +49 02.2 17.5	-1.25 + 0.1	8.5/16.5	36885
(8999)	1999 12 14.4	05 25.28 +19 42.6 16.8	-1.19 - 0.8	1.6/14.3	32174	(9326)	1999 12 15.7	05 30.99 +17 32.3 17.8	-0.96 + 0.5	1.9/15.6	36499
(8985)	1999 12 14.5	05 25.50 +25 12.8 17.6	-1.22 - 2.5	0.8/14.6	32170	1998 QE ₈₃	1999 12 15.8	05 31.20 +06 11.0 18.9	-0.85 - 2.2	5.2/14.9	35712
1998 QV ₇	1999 12 14.5	05 25.89 +18 55.7 18.3	-1.06 - 0.4	1.5/14.4	36901	(9557)	1999 12 15.8	05 31.25 +28 05.2 17.5	-0.89 - 0.7	1.3/16.0	32878
1989 HA	1999 12 14.6	05 25.84 +03 29.4 17.6	-0.95 + 1.3	6.4/14.1	36876	(9049)	1999 12 15.9	05 31.80 +19 48.6 17.8	-1.13 + 0.9	1.3/15.9	32185
1990 VD ₈	1999 12 14.6	05 25.88 +26 05.9 16.5	-1.09 - 2.8	1.3/14.8	36788	1998 QM ₇₆	1999 12 15.9	05 31.84 +18 13.9 16.3	-1.02 - 4.5	1.9/15.5	36903
(8328)	1999 12 14.6	05 26.06 +15 03.0 17.7	-1.12 + 0.7	3.4/14.4	31349	1998 OJ	1999 12 15.9	05 31.84 +20 42.2 18.0	-1.18 - 2.3	1.0/15.8	36901
1981 EK ₂₂	1999 12 14.6	05 26.19 +23 20.4 18.0	-0.96 - 1.0	0.0/14.7	36874	(9252)	1999 12 15.9	05 32.05 +23 29.8 17.6	-0.93 - 1.6	0.1/16.0	32435
(9426)	1999 12 14.7	05 26.30 +24 27.3 17.2	-0.98 + 0.1	0.4/14.8	32636	1994 YF ₁	1999 12 15.9	05 32.05 +29 30.9 17.6	-0.99 - 3.1	2.1/16.4	36515
(11252)	1999 12 14.7	05 26.38 +23 42.4 17.3	-0.60 + 0.2	0.1/14.7	35555	1998 HH ₅₂	1999 12 15.9	05 32.12 +33 53.9 16.5	-1.42 + 1.8	5.3/17.0	36533
(9653)	1999 12 14.7	05 26.50 +14 23.7 17.1	-1.01 + 2.8	2.9/14.7	32901	(12319)	1999 12 16.0	05 32.07 +14 59.5 17.2	-1.18 - 1.4	3.9/15.7	36691
(9055)	1999 12 14.7	05 26.57 +12 58.2 18.6	-0.93 - 1.3	3.2/14.3	32186	1996 XD ₁	1999 12 16.0	05 32.25 +22 17.0 17.3	-1.26 + 0.7	0.4/16.0	36889
1998 PE	1999 12 14.7	05 26.63 +00 30.5 19.4	-0.91 - 0.6	7.2/13.9	33346	1997 AU ₉	1999 12 16.0	05 32.29 +17 43.9 17.8	-1.14 - 0.2	2.2/15.9	36890
1997 AN ₄	1999 12 14.7	05 26.65 +23 51.6 18.6	-1.18 - 1.3	0.2/14.8	32751	1982 RR	1999 12 16.1	05 32.57 -01 31.3 17.0	-1.00 + 1.1	10.5/17.0	36874
1999 VM ₂₅	1999 12 14.7	05 26.79 +23 02.4 15.3	-0.98 - 7.7	0.1/14.8	36865	1990 UA ₁	1999 12 16.1	05 32.59 +13 49.9 15.2	-0.98 - 6.3	3.9/15.2	36877
1998 QZ ₆₉	1999 12 14.8	05 26.97 +13 05.6 18.3	-0.89 - 2.4	3.4/14.2	35712	1973 SS ₁	1999 12 16.1	05 32.84 +32 48.7 18.7	-0.65 + 0.2	1.8/16.5	34280
1998 QV ₁₉	1999 12 14.8	05 26.98 +15 44.5 17.8	-0.99 - 0.5	2.6/14.5	36902	(12227)	1999 12 16.1	05 32.87 +25 30.3 16.7	-1.23 - 4.2	1.0/16.3	36667
1993 TJ ₃₁	1999 12 14.8	05 27.05 +18 59.0 17.8	-0.90 + 0.6	1.4/14.7	36883	(9431)	1999 12 16.1	05 32.94 -00 09.8 17.4	-0.55 - 1.4	4.6/14.9	32637
1997 GR ₂₃	1999 12 14.8	05 27.15 +30 19.3 19.4	-0.97 + 0.1	2.0/15.2	32752	1995 SA ₁	1999 12 16.1	05 32.98 +24 42.9 16.3	-1.32 -16.9	0.7/16.4	26568
1995 YK ₂₀	1999 12 14.9	05 27.40 +26 12.2 18.5	-1.03 - 2.4	1.0/15.1	35428	1997 CV ₁₉	1999 12 16.1	05 32.99 +15 53.3 17.4	-1.08 + 1.1	2.8/16.1	36890
1998 SQ ₅₈	1999 12 14.9	05 27.44 +02 35.6 19.5	-0.79 - 0.8	5.9/14.0	33280	1973 SQ	1999 12 16.2	05 32.96 +28 44.5 18.5	-0.66 + 0.3	1.2/16.4	35676
(11375)	1999 12 14.9	05 27.45 +14 28.5 17.2	-0.88 - 2.7	2.8/14.4	36499	1997 GD ₁₇	1999 12 16.2	05 33.36 +24 02.2 16.7	-1.06 - 2.0	0.4/16.3	36525
1997 HP ₈	1999 12 14.9	05 27.60 +17 14.1 17.9	-0.99 - 1.2	2.4/14.7	36892	(8994)	1999 12 16.3	05 33.67 +34 15.6 16.2	-1.15 - 2.9	4.1/17.1	32173
(9448)	1999 12 15.0	05 27.59 +17 55.5 17.5	-0.98 - 0.1	2.0/14.8	32641	1992 EX ₇	1999 12 16.4	05 33.92 +32 29.8 19.1	-1.17 - 1.2	4.0/16.8	25639
1998 RD ₅₃	1999 12 15.0	05 27.69 +37 59.2 17.4	-1.08 - 0.4	5.0/15.7	35714	1995 SU ₃	1999 12 16.4	05 34.06 +32 56.5 17.2	-1.29 - 1.8	3.6/17.0	36517
1997 GH ₁	1999 12 15.0	05 27.70 +18 16.2 17.9	-1.05 - 0.9	2.0/14.8	36891	1994 PY ₂₅	1999 12 16.5	05 34.34 +22 06.7 18.3	-1.05 - 0.2	0.4/16.5	32517
(8874)	1999 12 15.0	05 27.76 +30 36.1 16.8	-1.31 + 0.3	3.2/15.3	31917	1997 FT ₁	1999 12 16.5	05 34.42 +12 04.4 17.0	-1.02 + 5.3	4.8/17.0	36524
1991 TS	1999 12 15.0	05 28.01 +15 27.7 17.7	-1.08 + 1.0	3.0/14.9	32225	(11309)	1999 12 16.5	05 34.46 +12 48.3 17.1	-0.90 + 0.3	3.8/16.3	35568
1994 PG ₃₁	1999 12 15.1	05 28.39 +22 59.8 20.2	-1.05 - 1.8	0.1/15.2	35691	1998 QT ₈	1999 12 16.5	05 34.53 +25 53.0 16.9	-1.06 + 1.0	0.9/16.6	36901
2040 T-2	1999 12 15.2	05 28.48 +12 38.4 18.2	-0.89 - 1.3	3.6/14.7	36943	(12436)	1999 12 16.5	05 34.66 +37 17.8 16.5	-1.16 - 1.6	5.3/17.3	36722
1998 OY ₁₃	1999 12 15.2	05 28.63 +32 24.8 18.3	-1.26 - 2.2	3.5/15.7	32757	1264 T-2	1999 12 16.5	05 34.75 +27 01.1 16.8	-1.08 - 0.7	1.5/16.7	36943
1994 PX ₂₂	1999 12 15.2	05 28.63 +17 28.2 16.8	-0.95 + 0.9	2.8/15.1	36884	1995 XE	1999 12 16.6	05 34.75 +28 51.4 16.6	-1.14 - 5.8	2.1/17.0	36518
1979 MA ₇	1999 12 15.2	05 28.96 +21 13.4 18.8	-0.97 - 1.7	0.7/15.2	30779	1998 OT ₆	1999 12 16.6	05 34.77 +26 14.0 19.0	-1.14 - 0.7	1.0/16.7	33346
1998 RK	1999 12 15.3	05 28.99 -06 49.5 19.2	-0.78 + 0.6	8.4/14.5	32989	1973 SX	1999 12 16.6	05 34.94 +33 16.5 18.1	-0.67 - 0.4	2.0/17.0	35676
1998 TU ₁₂	1999 12 15.3	05 29.05 +36 28.8 17.8	-0.73 + 1.2	2.8/15.7	36541	1991 UY ₃	1999 12 16.6	05 35.00 +17 56.5 17.0	-1.04 - 1.9	2.6/17.0	36879
1998 TG ₁₆	1999 12 15.3	05 29.06 +10 38.4 18.2	-0.56 - 1.2	2.6/14.6	36905	1991 NA	1999 12 16.7	05 35.30 +27 47.4 18.4	-1.27 - 4.9	1.7/17.1	30781
1993 QS ₉	1999 12 15.3	05 29.09 +06 54.9 18.3	-0.87 + 0.6	5.3/14.9	32746	1991 PD ₁₀	1999 12 16.7	05 35.32 +35 07.6 16.5	-1.25 - 2.1	5.1/17.3	36507
(9266)	1999 12 15.3	05 29.24 +19 59.5 17.2	-0.94 - 0.6	1.2/15.2	32597	(11849)	1999 12 16.7	05 35.50 +15 54.8 16.7	-1.03 - 3.5	3.0/16.3	36232
4297 T-2	1999 12 15.3	05 29.32 +23 50.2 17.3	-0.86 + 0.2	0.2/15.4	36943	1997 FB ₅	1999 12 16.7	05 35.65 +26 55.3 18.1	-1.10 - 0.4	1.4/17.0	30690
1997 AG ₈	1999 12 15.3	05 29.39 +24 59.7 17.6	-1.19 - 2.2	0.7/15.5	36890	3314 T-1	1999 12 16.8	05 35.71 +05 46.9 18.8	-0.93 - 1.7	5.6/16.0	36122
1997 GB	1999 12 15.4	05 29.66 +32 29.8 17.8	-1.25 + 1.3	3.9/15.6	32678	1998 QT ₁₂	1999 12 16.8	05 35.81 +27 31.6 18.0	-1.17 - 2.7	1.6/17.1	36902
1981 ET ₃₂	1999 12 15.5	05 29.81 +26 50.1 19.2	-0.98 - 3.3	1.2/15.8	32739	1979 MV ₈	1999 12 16.8	05 35.97 +15 16.6 20.3	-1.05 + 0.2	2.8/16.7	32509
(9413)	1999 12 15.5	05 29.98 +24 13.8 17.9	-1.20 + 0.9	0.4/15.6	32633	(12298)	1999 12 16.8	05 35.98 +33 40.9 16.7	-1.25 - 5.3	4.8/17.8	36686
1995 EN ₅	1999 12 15.5	05 30.05 -03 47.1 19.3	-0.81 - 0.1	8.7/14.2	34857	(9633)	1999 12 16.9	05 36.14 +08 32.8 17.4	-0.83 - 0.3	4.2/16.5	32897
(9818)	1999 12 15.5	05 30.09 +31 35.0 18.0	-0.63 - 0.1	1.6/15.9	33215	2657 P-L	1999 12 16.9	05 36.18 +27 57.5 18.8	-1.15 + 0.3	1.8/17.0	30681
1998 QV ₈₉	1999 12 15.5	05 30.19 +31 29.7 17.2	-0.98 - 2.6	2.5/16.1	35712	1993 TX ₂₆	1999 12 16.9	05 36.28 +09 06.2 18.3	-0.85 - 0.8	4.5/16.5	36883

2039 T-2	1999 12 16.9	05 36.33 +34 28.3 16.7	-1.26 - 0.3	4.6/17.3	36581	1998 QS ₂₂	1999 12 18.2	05 41.79 +25 47.0 17.2	-1.06 + 0.9	0.8/18.2	33081
1998 QC ₁₂	1999 12 17.0	05 36.46 +28 45.1 17.5	-1.13 - 3.4	2.0/17.3	32760	1995 WF ₆	1999 12 18.2	05 42.22 +21 51.8 17.6	-1.12 + 0.2	0.6/18.3	36886
1988 VV	1999 12 17.0	05 36.64 +18 16.6 16.5	-1.08 - 2.7	2.4/16.8	36876	1996 DL ₂	1999 12 18.3	05 42.28 +22 20.0 17.1	-0.96 + 0.6	0.4/18.3	36888
(12276)	1999 12 17.0	05 36.65 +12 24.5 17.1	-0.97 + 0.9	4.4/16.9	36680	1998 SA ₁₅₄	1999 12 18.3	05 42.30 +23 04.4 20.1	-0.94 + 0.6	0.1/18.3	33708
1992 DZ ₆	1999 12 17.0	05 36.73 +40 38.9 18.5	-1.20 - 0.6	5.5/17.6	32927	(11372)	1999 12 18.3	05 42.36 +26 14.1 17.9	-1.00 - 0.3	1.0/18.4	35583
(11249)	1999 12 17.0	05 36.80 +41 30.4 18.0	-0.86 - 0.2	3.9/17.7	35554	(9208)	1999 12 18.3	05 42.46 +08 58.9 16.4	-0.93 - 2.7	5.6/17.7	32426
1993 TH ₁₉	1999 12 17.0	05 36.84 +22 51.7 18.6	-0.92 - 0.4	0.1/17.1	35689	1998 QW ₃₄	1999 12 18.3	05 42.49 +01 58.4 17.7	-0.89 - 0.1	6.6/18.1	36902
1997 ER ₁₇	1999 12 17.0	05 36.86 +24 28.6 19.9	-1.15 - 1.3	0.4/17.1	32957	1994 TK ₁₅	1999 12 18.3	05 42.60 +27 28.9 19.2	-1.06 - 0.1	1.3/18.5	25220
1991 EL	1999 12 17.0	05 36.89 +30 59.9 18.7	-0.63 - 2.3	1.4/17.5	18437	1998 RW ₇₅	1999 12 18.3	05 42.72 +23 45.6 17.2	-0.94 + 0.4	0.1/18.4	36904
1998 QL ₃₄	1999 12 17.1	05 36.90 +21 21.1 16.4	-0.90 + 0.3	0.7/17.1	36902	1998 SF ₁₃₈	1999 12 18.4	05 42.68 +24 44.5 17.4	-0.88 - 0.2	0.4/18.4	36905
1997 VG ₁	1999 12 17.1	05 37.01 +26 09.1 17.7	-0.64 + 0.1	0.6/17.2	36893	1988 RN ₃	1999 12 18.4	05 42.79 +16 18.9 18.6	-1.12 - 0.2	3.1/18.3	31416
1998 VM ₁₅	1999 12 17.1	05 37.04 +17 44.5 17.2	-0.69 - 0.9	1.2/16.9	36905	1998 QV ₃₂	1999 12 18.4	05 42.92 +26 38.3 17.8	-0.95 - 1.3	1.0/18.6	36902
1990 RR ₇	1999 12 17.1	05 37.07 +13 43.6 18.5	-1.00 - 0.1	3.3/16.9	33068	(12518)	1999 12 18.4	05 43.01 +23 28.6 16.7	-1.23 + 2.0	0.0/18.5	36746
3247 T-3	1999 12 17.1	05 37.29 +18 23.1 19.8	-1.13 - 0.4	1.9/17.0	29131	1981 EF ₄₇	1999 12 18.4	05 43.03 +28 21.7 19.1	-1.01 - 0.1	1.8/18.6	18421
1998 RF ₅₃	1999 12 17.2	05 37.37 +20 07.4 18.1	-0.93 - 0.4	1.0/17.1	35714	1998 RE ₅₉	1999 12 18.4	05 43.08 +21 02.0 18.2	-0.90 - 0.9	0.7/18.4	34927
1995 UX ₃	1999 12 17.3	05 37.88 +34 07.5 16.7	-1.25 + 0.5	4.6/17.6	36517	3254 T-1	1999 12 18.4	05 43.11 +06 05.4 17.9	-0.94 - 1.5	7.4/17.8	26416
1993 TT ₁₉	1999 12 17.3	05 37.91 +25 30.0 18.3	-0.95 + 0.2	0.7/17.4	27715	1989 SZ ₄	1999 12 18.4	05 43.12 +27 04.8 16.4	-1.23 + 1.8	1.8/18.5	36876
(12330)	1999 12 17.3	05 38.08 +14 59.8 17.6	-1.17 - 2.0	3.5/17.0	36694	1995 YL ₂₃	1999 12 18.4	05 43.19 +27 15.2 17.6	-1.15 + 1.3	1.4/18.5	36887
1990 SF ₄	1999 12 17.4	05 38.22 +14 27.7 18.4	-1.00 - 2.6	2.8/17.0	33544	1998 VL ₂₇	1999 12 18.5	05 43.12 +25 09.3 18.2	-0.62 - 0.6	0.4/18.6	36905
1979 MD ₅	1999 12 17.4	05 38.65 +15 23.5 18.8	-0.95 + 1.8	2.5/17.4	30778	3340 T-3	1999 12 18.5	05 43.44 +19 23.6 18.9	-1.01 - 0.3	1.3/18.5	30915
1997 HM ₁₁	1999 12 17.4	05 38.66 +26 20.9 18.9	-1.07 - 0.7	1.0/17.6	35700	1998 QZ ₁₀₂	1999 12 18.6	05 43.64 +17 09.1 18.0	-0.92 + 0.6	1.8/18.6	36903
1994 PT ₁₆	1999 12 17.4	05 38.75 +23 17.0 18.4	-1.07 - 1.3	0.0/17.5	32747	(12557)	1999 12 18.6	05 43.91 +19 03.9 17.0	-0.87 - 1.4	1.4/18.5	36757
(11429)	1999 12 17.5	05 38.70 +43 58.7 17.1	-0.74 + 0.1	3.9/18.1	35598	1992 CH	1999 12 18.7	05 44.18 +38 40.2 16.3	-1.22 - 4.5	6.2/19.7	36880
1993 OC ₂	1999 12 17.5	05 38.74 +56 23.1 16.4	-2.08 - 4.2	15.7/19.9	36512	1998 MC ₃₄	1999 12 18.8	05 44.42 +25 55.1 18.3	-1.25 + 1.0	1.0/18.8	32487
1998 RP ₅₈	1999 12 17.5	05 38.79 +06 30.6 18.7	-0.83 - 0.9	5.1/17.0	35715	1991 RQ ₁₉	1999 12 18.8	05 44.45 +26 59.8 18.5	-1.21 - 1.7	1.4/18.9	32048
1998 OC ₁₂	1999 12 17.5	05 38.80 +27 20.9 19.7	-1.12 + 0.1	1.4/17.6	32757	1992 EB ₄	1999 12 18.8	05 44.71 +09 24.8 17.0	-0.97 + 2.6	5.6/19.0	34840
1998 RF ₇₇	1999 12 17.5	05 38.99 +31 17.0 18.1	-0.95 + 0.5	2.3/17.7	35716	1993 FT ₃₉	1999 12 18.8	05 44.81 +31 06.8 18.3	-1.19 + 0.7	3.4/18.9	35687
1997 JH ₁₃	1999 12 17.5	05 39.19 +31 03.0 19.1	-1.06 + 1.5	2.4/17.7	33949	1989 RY ₁	1999 12 18.9	05 44.89 +02 52.5 18.7	-0.90 + 1.1	6.1/19.0	34575
1996 RH ₁₀	1999 12 17.6	05 39.21 +02 14.8 19.3	-0.55 + 0.3	4.1/17.1	31545	1998 OH ₂	1999 12 18.9	05 45.03 +21 00.1 18.6	-1.08 - 0.2	0.9/18.9	35709
2184 T-2	1999 12 17.6	05 39.21 +26 42.0 19.5	-1.20 - 0.1	1.3/17.7	36581	1998 RN ₃₅	1999 12 18.9	05 45.05 +25 58.5 18.0	-0.98 - 0.3	0.9/19.0	36903
1998 QO ₅₀	1999 12 17.6	05 39.26 +10 23.8 17.9	-0.88 + 1.1	4.2/17.5	36902	(12184)	1999 12 18.9	05 45.12 +09 19.9 17.8	-1.09 - 1.0	6.4/18.7	36655
(12638)	1999 12 17.6	05 39.62 +20 00.5 16.7	-1.04 - 1.1	1.7/17.6	36779	1997 AJ ₄	1999 12 18.9	05 45.41 +25 40.5 17.2	-1.24 - 3.0	0.9/19.1	36889
1998 QB ₁₅	1999 12 17.7	05 39.65 +09 43.4 18.1	-0.94 + 1.1	4.6/17.6	32760	1998 HA ₁₃	1999 12 19.0	05 45.39 +19 13.4 18.5	-1.16 - 1.8	1.6/18.9	36896
(9183)	1999 12 17.7	05 39.66 +26 02.5 18.4	-1.18 - 2.3	1.0/17.8	32420	1998 SU ₁₂₉	1999 12 19.0	05 45.60 +21 49.6 17.6	-0.87 0.0	0.4/19.0	33759
1994 AN ₁₀	1999 12 17.7	05 39.75 +20 10.1 19.6	-1.23 + 2.1	1.3/17.7	32746	1998 SX ₁₄₆	1999 12 19.0	05 45.76 +19 16.4 18.5	-0.81 - 0.2	1.0/19.0	34305
1996 HA ₂	1999 12 17.7	05 39.95 +11 59.8 18.9	-0.81 - 0.6	3.0/17.4	33254	1998 SS ₈	1999 12 19.1	05 45.88 +29 04.4 18.0	-1.01 + 0.2	1.9/19.2	33015
1996 BB	1999 12 17.7	05 39.97 +14 32.1 16.9	-0.97 + 2.3	3.0/17.8	36887	4255 T-1	1999 12 19.1	05 45.89 +18 19.6 19.9	-1.10 - 0.2	1.9/19.0	29938
1995 RA	1999 12 17.7	05 39.99 +49 23.7 15.9	-1.73 -12.2	11.3/22.3	36516	4165 T-2	1999 12 19.1	05 46.10 +15 16.6 17.6	-0.99 0.0	3.3/19.1	36581
1998 QY ₁₃	1999 12 17.8	05 40.19 +18 20.2 19.5	-1.07 - 0.6	1.8/17.7	35710	1991 EK ₄	1999 12 19.2	05 46.38 +18 27.6 17.7	-1.20 - 0.7	2.1/19.1	36878
1997 EB ₁	1999 12 17.8	05 40.39 +25 21.8 18.7	-1.16 - 2.8	0.8/18.0	32520	1998 QZ ₁₉	1999 12 19.2	05 46.43 +15 42.0 18.8	-0.96 - 0.6	2.7/19.1	35710
1994 UE ₈	1999 12 17.8	05 40.41 +23 05.7 19.1	-1.02 - 1.3	0.1/17.9	32942	1998 UG ₄	1999 12 19.2	05 46.47 +36 03.9 18.5	-1.04 + 2.1	4.1/19.2	35721
1987 RG ₁	1999 12 17.8	05 40.47 +25 22.6 16.5	-1.16 - 0.7	0.8/17.9	32300	1997 GL ₂₂	1999 12 19.2	05 46.69 +27 40.5 18.7	-0.97 0.0	1.3/19.4	36892
1994 PH ₂₂	1999 12 17.9	05 40.45 +19 04.2 17.4	-0.99 - 0.1	1.9/17.8	36884	(12566)	1999 12 19.2	05 46.70 +16 25.0 17.4	-0.86 - 1.0	2.4/19.1	36760
1998 SX ₉₅	1999 12 17.9	05 40.61 +28 41.0 19.1	-1.12 + 1.1	1.8/18.0	33707	1997 GE ₈	1999 12 19.3	05 47.08 +23 15.7 17.5	-1.09 - 0.6	0.1/19.4	30473
1998 QC ₁₇	1999 12 17.9	05 40.63 +15 28.5 17.0	-1.08 + 1.8	3.2/17.9	36538	1998 QS ₅₃	1999 12 19.3	05 47.10 +10 58.6 18.3	-0.87 - 1.4	4.0/19.0	33084
1997 EO ₃₂	1999 12 17.9	05 40.97 +22 03.0 20.0	-1.02 - 0.4	0.4/18.0	32752	(12341)	1999 12 19.4	05 47.08 +20 13.2 16.7	-1.12 + 1.8	1.5/19.4	36697
1994 PK ₁₄	1999 12 18.0	05 40.87 +33 00.1 18.4	-1.14 - 2.8	3.9/18.5	27448	1981 EH ₆	1999 12 19.4	05 47.10 +22 49.3 17.3	-0.98 - 3.4	0.3/19.4	26915
1997 GX ₅	1999 12 18.0	05 41.20 +22 13.8 18.7	-1.12 + 0.5	0.5/18.0	29931	1998 SM ₈₇	1999 12 19.4	05 47.11 +14 01.0 18.2	-0.85 - 1.5	2.8/19.1	33039
1992 EG ₁₁	1999 12 18.0	05 41.33 +05 08.4 18.5	-0.90 + 0.5	5.6/17.8	35685	1998 QE ₂₂	1999 12 19.4	05 47.17 +21 55.5 19.2	-1.04 - 0.9	0.5/19.4	32761
(9018)	1999 12 18.1	05 41.68 +20 07.5 17.7	-1.14 - 2.8	1.3/18.0	32178	1991 PC ₆	1999 12 19.4	05 47.25 +14 44.6 17.1	-1.08 + 3.6	4.0/19.7	36507
1998 SE ₅₈	1999 12 18.1	05 41.85 +26 42.2 17.6	-1.05 - 0.4	1.1/18.3	36904	1998 SA ₁₃₇	1999 12 19.4	05 47.42 +39 19.5 18.0	-1.22 + 2.1	5.0/19.3	35720

1998 QH ₁₁	1999 12 19.5	05 47.64 +22 39.6	17.7	-1.05	+	1.0	0.3/19.5	36538	1998 QF ₁₇	1999 12 20.7	05 53.09 +17 44.3	17.2	-1.09	+	1.8	2.1/20.8	36902
1993 FR ₁₁	1999 12 19.5	05 47.65 +02 47.8	18.1	-0.95	+	0.3	6.9/19.4	33548	1996 GR ₂₀	1999 12 20.7	05 53.22 +24 03.4	18.6	-0.86	+	0.4	0.2/20.8	33751
1290 T-1	1999 12 19.5	05 47.71 +13 00.3	17.7	-1.05	-	1.4	4.5/19.2	36580	1979 MP ₁	1999 12 20.8	05 53.32 +20 45.3	18.2	-1.10		0.0	1.0/20.8	32298
(9471)	1999 12 19.5	05 47.85 +26 07.0	16.7	-1.02	-	1.0	1.0/19.6	32646	1991 VH ₆	1999 12 20.8	05 53.83 +10 21.8	17.6	-1.03	+	0.6	5.3/21.0	36880
(9674)	1999 12 19.5	05 47.93 +09 31.0	17.1	-0.99	+	0.3	5.6/19.4	32907	1995 YJ ₃	1999 12 20.9	05 54.01 +17 05.4	16.9	-1.04	+	1.6	2.7/21.0	36887
1994 GN	1999 12 19.6	05 47.97 +25 46.8	17.4	-1.21	+	1.6	0.9/19.6	36883	1998 OU ₁₄	1999 12 20.9	05 54.03 +24 00.7	18.4	-1.17	-	0.2	0.2/21.0	33346
(12342)	1999 12 19.6	05 48.04 +25 10.0	16.4	-1.11	+	2.8	0.9/19.6	36697	6818 P-L	1999 12 20.9	05 54.17 +25 04.5	18.6	-1.05	+	0.7	0.5/21.0	36121
(9665)	1999 12 19.6	05 48.28 +15 29.3	17.2	-0.88	-	1.8	2.5/19.4	32904	1998 QC ₃₁	1999 12 21.0	05 54.19 +08 15.4	18.7	-0.85	+	1.6	4.8/21.3	33081
1998 QW ₃₂	1999 12 19.6	05 48.32 +06 16.6	18.1	-0.89	+	0.9	5.9/19.7	35710	1994 QA ₁	1999 12 21.0	05 54.48 +17 17.2	16.7	-0.98	+	1.0	2.8/21.1	36884
(9469)	1999 12 19.6	05 48.35 +19 57.7	19.0	-1.11	-	0.8	1.3/19.6	32646	1981 EB ₂₅	1999 12 21.0	05 54.70 +07 09.5	18.5	-0.85	+	0.1	4.7/21.1	33065
(9299)	1999 12 19.7	05 48.50 +28 50.7	17.2	-1.12	+	0.7	1.9/19.7	32605	1993 MR	1999 12 21.1	05 54.66 +15 30.7	20.2	-0.94	-	0.6	2.3/21.0	33072
1998 QM ₇₄	1999 12 19.7	05 48.76 +21 51.7	18.3	-0.92	-	2.3	0.5/19.7	35712	(9423)	1999 12 21.1	05 54.83 +19 18.4	16.0	-1.01	+	2.6	1.4/21.2	32635
1998 QS ₃₄	1999 12 19.8	05 48.90 +14 32.4	18.3	-0.99	-	0.8	3.1/19.6	35710	4845 P-L	1999 12 21.1	05 54.83 +06 44.1	18.0	-0.84	+	0.5	5.8/21.2	32785
1994 PE ₂	1999 12 19.8	05 48.94 +31 26.5	17.8	-1.18	-	1.5	3.1/20.1	26744	(10937)	1999 12 21.1	05 54.90 +17 35.8	17.1	-0.85	-	0.7	1.8/21.1	34807
(9186)	1999 12 19.8	05 49.24 -11 14.9	18.5	-1.01	-	1.1	11.7/18.9	32421	1990 QT ₄	1999 12 21.1	05 54.99 +48 53.7	16.6	-1.42	-	0.1	10.3/21.5	36877
1996 HV ₁₉	1999 12 19.9	05 49.37 +15 13.7	17.2	-0.86	-	1.8	2.8/19.7	36888	1981 EA ₁₆	1999 12 21.1	05 55.01 +33 17.3	18.2	-1.32	-	1.3	3.9/21.3	32509
1994 PW ₁₀	1999 12 19.9	05 49.49 +18 23.3	20.0	-1.03	+	0.1	1.7/19.9	32458	(12251)	1999 12 21.1	05 55.10 +22 20.3	16.6	-0.93	+	1.2	0.5/21.2	36673
(9484)	1999 12 19.9	05 49.62 +23 18.8	18.2	-0.92	+	0.3	0.0/20.0	32649	1998 RC ₂	1999 12 21.2	05 55.13 +42 38.2	18.3	-1.12	-	0.1	6.5/21.5	35713
1998 TD ₁₈	1999 12 20.0	05 49.96 +12 28.2	18.7	-0.81	-	1.9	2.8/19.7	34930	1998 RX ₆₃	1999 12 21.2	05 55.27 +21 50.8	18.5	-0.89	+	0.6	0.5/21.2	35715
(9188)	1999 12 20.0	05 49.99 +25 37.2	17.9	-1.17	-	0.9	0.8/20.1	32421	1998 KN	1999 12 21.2	05 55.39 +22 03.0	18.7	-1.17	+	0.8	0.5/21.3	36899
1996 GA ₁	1999 12 20.0	05 50.17 +24 48.7	20.4	-0.89	+	0.1	0.4/20.1	32951	1983 AC ₁	1999 12 21.2	05 55.47 -14 41.2	15.9	-1.16	+13.8	18.4/27.0	36874	
1992 EE ₃₂	1999 12 20.0	05 50.18 +16 04.3	17.4	-1.01	-	1.1	3.2/19.9	36880	(12637)	1999 12 21.3	05 55.55 +21 45.8	16.3	-1.02	-	0.2	0.8/21.3	36779
1997 CA ₁	1999 12 20.0	05 50.21 +33 13.0	17.7	-1.28	-	2.0	3.9/20.4	32751	1997 ER ₁₁	1999 12 21.3	05 55.67 +25 29.0	18.9	-1.18		0.0	0.8/21.3	33076
1998 MP ₃₂	1999 12 20.1	05 50.70 +19 26.2	18.2	-1.18	+	1.4	1.5/20.2	32756	1989 VM ₁	1999 12 21.3	05 55.74 +14 26.9	19.1	-1.15	+	2.8	4.3/22.0	28843
1996 AR ₂	1999 12 20.1	05 50.71 +38 31.0	16.7	-1.23	-	4.8	6.2/21.3	36887	1998 RV ₇₉	1999 12 21.3	05 55.75 +21 49.3	17.5	-1.01	+	0.8	0.5/21.4	36904
6670 P-L	1999 12 20.2	05 50.68 +30 02.9	17.1	-1.11	+	0.3	2.8/20.2	36942	1991 GP ₃	1999 12 21.3	05 55.77 +20 48.7	18.1	-0.86	-	0.3	0.7/21.3	33743
(12387)	1999 12 20.2	05 50.73 +06 57.8	16.2	-0.96	-	5.7	6.2/19.0	36709	1993 QL ₇	1999 12 21.3	05 55.90 +19 33.3	18.4	-0.94	+	0.5	1.3/21.4	34189
5193 T-3	1999 12 20.2	05 50.80 +07 45.1	18.1	-0.84	+	0.8	4.4/20.2	22702	1994 PD ₃₄	1999 12 21.4	05 56.15 +21 30.5	19.6	-1.06	-	0.3	0.7/21.4	32517
(9291)	1999 12 20.2	05 50.93 +08 50.6	17.6	-0.86	+	0.9	4.9/20.3	32603	(12544)	1999 12 21.4	05 56.18 +19 29.6	17.4	-0.93	+	1.8	1.4/21.5	36753
(12611)	1999 12 20.3	05 51.16 +19 37.3	17.5	-0.93	-	0.3	1.4/20.3	36772	1998 QM ₄	1999 12 21.5	05 56.53 +38 54.2	18.7	-1.24	+	3.1	5.1/21.1	33080
1996 RA ₃₃	1999 12 20.3	05 51.19 +33 16.6	18.0	-0.65	+	0.4	1.9/20.4	35696	1998 QV ₃₄	1999 12 21.6	05 57.32 +26 04.8	17.7	-1.15	-	2.1	1.0/21.8	36902
1994 SE ₁₂	1999 12 20.3	05 51.20 +20 38.0	20.5	-1.02		0.0	1.0/20.3	32668	2614 P-L	1999 12 21.7	05 57.47 +18 19.6	19.4	-1.02		0.0	1.9/22.0	32536
1998 QW ₅₉	1999 12 20.3	05 51.36 +17 22.2	21.1	-0.89	+	0.1	1.8/20.3	32718	1998 KM ₄₈	1999 12 21.7	05 57.73 +13 28.0	19.3	-1.10	-	1.3	3.6/21.7	32282
1998 OK	1999 12 20.3	05 51.46 +12 59.5	18.1	-1.05	-	0.5	3.9/20.2	33078	1997 HR ₇	1999 12 21.8	05 57.87 +28 02.9	19.2	-1.05	-	0.2	1.6/21.9	35700
1998 QT	1999 12 20.3	05 51.47 +29 45.1	18.5	-1.25	-	1.1	2.4/20.5	36901	(12468)	1999 12 21.8	05 58.05 +29 36.5	17.9	-1.27	-	2.0	2.4/22.0	36731
(9808)	1999 12 20.4	05 51.52 +11 59.7	16.9	-1.01	-	5.2	4.6/19.6	33213	1993 BJ ₂	1999 12 21.8	05 58.16 +17 27.2	16.6	-1.08	+	1.9	2.2/22.0	33548
1993 TY ₂₂	1999 12 20.4	05 51.52 +09 32.9	18.2	-0.85	-	0.5	4.3/20.2	35689	1993 TZ ₁₃	1999 12 21.9	05 58.19 +07 25.3	19.5	-0.87		0.0	5.6/22.0	32933
1998 QH ₃₇	1999 12 20.4	05 51.58 +20 21.4	18.8	-1.12	-	1.4	1.1/20.3	35710	2734 P-L	1999 12 21.9	05 58.36 +22 31.5	18.9	-0.94	+	0.7	8.0/11.0	34264
1997 GW ₃₂	1999 12 20.4	05 51.81 +25 57.8	18.9	-1.06	-	0.4	0.9/20.5	33344	1998 QK ₈	1999 12 21.9	05 58.45 +05 20.3	18.0	-0.97	+	3.0	6.3/22.6	32760
2646 P-L	1999 12 20.4	05 51.86 +32 02.3	17.7	-1.13	+	0.6	3.6/20.5	36578	1991 RO ₂	1999 12 21.9	05 58.52 +15 11.7	18.0	-1.12	-	0.6	3.2/22.0	36508
(9246)	1999 12 20.4	05 51.94 +22 23.5	17.1	-1.19	+	0.4	0.4/20.5	32434	1993 MZ	1999 12 22.0	05 58.79 +42 48.1	17.9	-1.28	-	1.5	6.7/22.6	36882
1998 QZ ₁₅	1999 12 20.5	05 51.99 +29 49.1	17.0	-1.14	-	3.8	2.2/20.8	36538	1997 KG	1999 12 22.0	05 58.83 +22 55.3	17.6	-0.97	+	1.1	0.2/22.0	32753
1995 WS ₃₃	1999 12 20.5	05 52.09 +16 01.7	19.0	-1.10	-	0.2	2.8/20.5	32466	1998 RR ₇₃	1999 12 22.0	05 58.96 +05 15.3	18.0	-0.92	-	1.3	5.8/21.8	33352
9104 P-L	1999 12 20.5	05 52.27 +04 52.6	19.5	-0.83	-	0.2	5.5/20.5	33384	1993 FP ₄₀	1999 12 22.1	05 59.23 +27 05.1	17.8	-1.09	+	1.5	1.8/22.1	32230
1998 QR ₇₇	1999 12 20.6	05 52.43 +07 21.0	17.4	-0.96	-	3.2	6.0/19.8	36539	1998 QX ₂₁	1999 12 22.1	05 59.30 +29 51.4	17.6	-1.21	-	1.4	2.4/22.2	36902
1986 PL ₁	1999 12 20.6	05 52.46 +17 47.0	17.8	-0.84	+	0.9	1.6/20.6	36875	(9167)	1999 12 22.1	05 59.37 +33 15.3	17.5	-0.98	-	0.1	2.9/22.2	32416
(9076)	1999 12 20.6	05 52.62 +10 18.3	18.1	-1.07	+	0.5	5.9/20.6	32191	6077 P-L	1999 12 22.1	05 59.44 +28 05.4	17.9	-0.96	-	0.3	1.6/22.2	36942
(9271)	1999 12 20.6	05 52.64 +19 10.3	17.6	-0.91	-	1.2	1.4/20.6	32598	1992 RJ ₇	1999 12 22.1	05 59.44 +16 21.6	18.6	-0.83	+	0.4	1.9/22.2	32929
1997 EN ₄	1999 12 20.6	05 52.69 +41 54.1	18.5	-1.28	-	0.3	6.4/21.1	36891	(9772)	1999 12 22.1	05 59.46 +05 53.5	18.2	-0.91	-	1.3	5.4/21.9	33204
1997 FY ₁	1999 12 20.6	05 52.89 +42 00.9	19.1	-1.21	+	0.4	5.7/20.9	32958	1998 QA ₂₆	1999 12 22.1	05 59.53 +15 44.0	17.6	-0.89	+	0.8	2.6/22.3	36902
1981 EN ₄₂	1999 12 20.6	05 52.94 +21 53.1	18.1	-1.19	-	0.4	0.6/20.7										

1998 QF ₁₁	1999 12 22.2	05 59.72 +13 06.5 16.0	-1.11 + 6.5	4.6/22.9	36538	(9061)	1999 12 23.6	06 05.75 +25 13.8 16.1	-1.24 + 3.1	0.8/23.5	32188
(12317)	1999 12 22.2	06 00.02 +18 28.1 16.7	-0.96 - 0.8	1.8/22.3	36690	1997 CJ ₁	1999 12 23.6	06 05.92 +24 41.7 18.8	-1.17 + 1.2	0.5/23.6	33343
1991 PN ₁₇	1999 12 22.4	06 00.56 +25 11.9 19.5	-1.17 - 0.8	0.6/22.4	35286	1991 PX ₁₄	1999 12 23.6	06 06.11 +21 46.7 17.5	-1.15 - 2.0	0.6/23.6	29659
1998 MY ₄₅	1999 12 22.4	06 00.57 +20 37.3 18.6	-1.10 - 1.0	1.0/22.4	32289	(9799)	1999 12 23.7	06 06.60 +14 47.2 16.8	-0.62 - 3.0	1.6/23.5	33211
1996 HQ ₁₉	1999 12 22.4	06 00.81 +22 39.7 18.5	-0.86 + 0.1	0.2/22.5	33751	1998 QS ₁₁	1999 12 23.8	06 06.68 +23 40.0 17.0	-1.17 - 2.2	0.1/23.8	36901
(12520)	1999 12 22.4	06 00.93 +20 46.8 16.5	-1.27 - 2.6	1.2/22.4	36747	(12229)	1999 12 23.8	06 06.68 +29 19.6 16.7	-1.26 + 1.2	2.3/23.7	36667
1998 QW ₄₁	1999 12 22.5	06 00.84 +49 00.6 18.5	-1.26 - 1.7	8.0/23.3	33083	(9297)	1999 12 23.8	06 06.74 +09 55.7 16.8	-0.94 - 2.1	4.3/23.6	32605
1990 VT ₆	1999 12 22.5	06 01.10 +17 28.6 17.6	-1.00 + 0.3	2.4/22.6	25649	1993 UQ ₂	1999 12 23.8	06 06.77 +09 11.8 17.8	-0.85 + 0.3	4.5/24.1	36513
3424 T-3	1999 12 22.5	06 01.34 +20 14.0 18.7	-1.02 + 0.4	1.2/22.6	33385	(9677)	1999 12 23.8	06 06.85 +11 35.8 18.7	-0.85 + 0.1	3.3/24.0	32908
1993 BJ ₅	1999 12 22.6	06 01.30 +30 55.3 17.6	-0.78 - 0.8	1.7/22.7	30658	1998 QC ₄₂	1999 12 23.8	06 06.90 +33 28.7 19.5	-1.21 + 0.5	3.4/23.7	33755
1981 DR	1999 12 22.6	06 01.51 +32 59.5 17.9	-1.06 - 3.0	3.3/23.0	32738	1998 SF ₅₉	1999 12 23.8	06 06.92 +07 57.2 18.1	-0.86 + 0.4	4.9/24.1	35718
2026 T-3	1999 12 22.6	06 01.58 +26 07.9 18.7	-1.10 - 1.0	1.0/22.7	25437	(9411)	1999 12 23.8	06 07.11 +19 57.9 16.7	-0.90 + 2.4	1.2/24.0	32632
1992 EZ ₁₁	1999 12 22.6	06 01.80 +17 44.5 17.5	-0.98 + 1.3	1.9/22.8	36880	(9319)	1999 12 23.8	06 07.14 +18 52.7 18.8	-1.15 + 0.5	1.7/24.0	32610
1991 PP ₁₆	1999 12 22.7	06 01.83 +15 33.8 16.6	-1.09 + 1.4	3.1/22.9	36508	1991 NC ₁	1999 12 23.9	06 07.13 +18 24.7 18.5	-1.13 + 1.6	1.8/24.0	33336
1998 QL ₄₂	1999 12 22.7	06 02.13 +21 13.0 18.1	-0.96 - 0.3	0.8/22.8	36902	1998 QK ₇₆	1999 12 23.9	06 07.41 +09 01.7 18.7	-0.93 - 1.8	4.4/23.9	35712
(9668)	1999 12 22.7	06 02.19 +14 14.0 17.8	-0.94 + 0.7	3.3/22.9	32905	6074 P-L	1999 12 23.9	06 07.59 +24 30.5 19.1	-1.25 + 0.1	0.5/24.0	32091
1978 SF ₅	1999 12 22.8	06 02.30 +32 54.2 17.9	-1.32 + 1.3	3.9/22.7	36873	(12624)	1999 12 24.0	06 07.71 +17 52.5 17.4	-1.14 + 1.8	2.3/24.2	36776
1997 DC	1999 12 22.8	06 02.39 +19 45.9 17.6	-1.10 + 0.3	1.3/22.9	33076	1998 SF ₁₃	1999 12 24.0	06 07.71 +20 43.4 17.8	-0.87 + 1.5	0.8/24.1	36904
1997 FM	1999 12 22.8	06 02.40 +13 19.3 17.8	-0.97 + 3.3	3.3/23.2	33076	1998 QO ₇₃	1999 12 24.0	06 07.73 +03 59.3 19.1	-0.94 - 1.0	6.1/24.1	35712
1998 SZ ₁₂₂	1999 12 22.8	06 02.42 +25 12.3 18.9	-0.88 + 0.1	0.5/22.8	33361	1991 RG ₄	1999 12 24.0	06 07.90 +23 45.6 18.8	-1.16 - 0.4	0.1/24.1	35062
1997 GO ₁₈	1999 12 22.8	06 02.65 +06 06.8 19.7	-0.95 - 0.3	5.7/22.9	35699	1997 GD ₂₄	1999 12 24.0	06 07.94 +12 39.9 18.4	-1.04 - 0.5	4.3/24.1	30767
(12345)	1999 12 22.9	06 02.79 +21 41.9 15.8	-1.07 + 2.3	0.8/23.0	36698	1988 TR ₂	1999 12 24.0	06 08.01 +48 00.0 16.0	-1.23 + 3.1	10.3/23.2	36876
1998 RZ ₅₂	1999 12 22.9	06 02.93 +12 34.6 17.9	-0.87 + 0.8	3.6/23.1	35714	1976 DA ₁	1999 12 24.1	06 08.05 +17 41.1 17.5	-1.14 + 1.9	2.4/24.3	36872
1995 SQ ₁	1999 12 22.9	06 02.95 +57 32.7 16.0	-1.87 -14.8	16.9/29.6	36885	1997 GJ ₂₂	1999 12 24.1	06 08.10 +17 09.6 19.5	-1.04 - 1.0	2.3/24.1	32679
(9380)	1999 12 22.9	06 03.08 +20 14.1 17.3	-0.95 + 0.2	1.1/23.0	32625	1998 QM ₁₆	1999 12 24.1	06 08.24 +16 44.8 17.8	-1.02 0.0	2.3/24.2	36902
1998 KL ₄₈	1999 12 22.9	06 03.08 +17 54.6 17.4	-1.16 + 3.8	2.4/23.2	36536	1997 GP ₂₃	1999 12 24.1	06 08.42 +30 47.6 18.9	-1.05 + 0.5	2.3/24.1	35699
1994 SF ₉	1999 12 22.9	06 03.13 +19 28.2 19.9	-1.01 + 0.2	1.5/23.0	26744	(12264)	1999 12 24.2	06 08.40 +25 52.0 16.8	-1.21 - 1.9	1.0/24.2	36677
1992 EY ₁₀	1999 12 23.0	06 03.28 +44 15.1 18.1	-1.29 - 1.5	7.1/23.5	35422	1994 CD ₁₈	1999 12 24.2	06 08.77 +39 16.1 16.3	-1.42 - 1.1	7.7/24.5	36883
(9087)	1999 12 23.0	06 03.39 +30 18.6 18.1	-1.24 - 0.6	2.6/23.1	32194	1992 WZ	1999 12 24.2	06 08.78 +29 40.8 16.1	-1.22 + 3.6	3.0/24.0	36881
(12640)	1999 12 23.0	06 03.56 +26 18.3 17.5	-0.98 + 0.2	1.0/23.1	36780	(12551)	1999 12 24.2	06 08.85 +32 04.9 16.7	-1.20 + 0.5	3.2/24.2	36755
1996 HU ₁₈	1999 12 23.1	06 03.78 +21 44.0 18.4	-0.89 + 0.1	0.5/23.2	35696	1998 SE ₇	1999 12 24.3	06 08.89 +22 46.8 20.3	-1.12 + 0.2	0.2/24.3	35716
1998 QK ₂₆	1999 12 23.1	06 03.78 +22 51.1 17.7	-0.94 0.0	0.2/23.2	36902	(12006)	1999 12 24.3	06 08.93 +14 48.9 18.2	-0.69 - 1.0	2.0/24.3	36274
(12555)	1999 12 23.1	06 03.94 +20 06.5 16.5	-0.95 + 0.5	1.1/23.2	36756	1998 XA ₇	1999 12 24.3	06 09.05 +21 34.7 19.4	-0.58 + 0.2	0.4/24.4	35727
1998 QV ₄₀	1999 12 23.2	06 04.05 +18 49.5 16.8	-0.97 - 0.8	1.6/23.2	36902	1998 JZ ₁	1999 12 24.4	06 09.71 +30 27.0 19.0	-1.31 + 1.3	2.5/24.3	36898
1998 MF ₄₈	1999 12 23.2	06 04.24 +22 16.6 19.1	-1.12 + 1.1	0.4/23.3	32756	1998 SZ ₅₄	1999 12 24.4	06 09.75 +25 22.4 18.5	-0.92 + 0.4	0.6/24.5	33029
1998 WR ₂₁	1999 12 23.3	06 04.54 +14 09.6 17.0	-0.57 - 1.4	1.8/23.2	35727	(9211)	1999 12 24.4	06 09.75 +27 12.5 18.1	-1.22 + 0.5	1.4/24.4	32426
1998 QD ₂₃	1999 12 23.3	06 04.62 +32 14.1 17.3	-1.20 + 0.8	3.4/23.2	36538	1998 RT ₅₀	1999 12 24.5	06 09.71 +35 50.9 17.7	-1.27 - 0.2	4.5/24.4	35714
1997 EE ₂₃	1999 12 23.3	06 04.71 +21 23.6 16.1	-1.12 + 4.6	0.9/23.5	36891	1991 TK	1999 12 24.5	06 09.81 +21 01.3 16.8	-1.11 + 2.8	1.0/24.6	36879
(9001)	1999 12 23.3	06 04.88 +12 32.8 17.9	-1.13 + 2.0	4.3/23.7	32174	(9225)	1999 12 24.5	06 09.87 +10 34.1 16.9	-1.00 + 5.4	4.5/25.5	32429
1998 OQ ₄	1999 12 23.3	06 04.90 +23 05.3 18.5	-1.18 - 0.6	0.1/23.4	32756	1998 UF ₃₇	1999 12 24.5	06 10.03 +25 00.7 18.3	-0.89 + 0.3	0.4/24.5	35723
(9466)	1999 12 23.4	06 04.83 +14 04.4 17.0	-1.12 - 0.5	4.2/23.5	36499	(8825)	1999 12 24.5	06 10.12 +05 34.7 15.6	-1.50 +21.4	9.2/28.0	31905
1997 BU ₅	1999 12 23.4	06 04.85 +24 18.2 18.1	-1.18 0.0	0.3/23.4	32751	1998 VD ₃₀	1999 12 24.5	06 10.20 -00 14.4 17.3	-0.58 - 2.0	4.8/24.3	36905
4742 T-2	1999 12 23.4	06 04.97 +14 36.2 18.3	-0.59 + 0.4	1.9/23.5	34273	6020 P-L	1999 12 24.6	06 10.31 +21 46.6 18.6	-0.55 + 0.1	0.3/24.7	36492
1995 UK ₄₄	1999 12 23.4	06 04.98 +20 42.6 16.7	-1.15 - 2.4	1.1/23.4	36886	1987 VG	1999 12 24.6	06 10.35 +32 12.6 16.7	-1.21 - 0.7	3.8/24.6	30447
(9640)	1999 12 23.4	06 05.09 +27 29.8 18.0	-1.15 + 0.5	1.5/23.4	32898	6105 P-L	1999 12 24.7	06 10.62 +06 01.8 18.7	-0.90 - 0.6	5.9/24.9	33383
(9328)	1999 12 23.4	06 05.16 +34 15.3 17.4	-1.25 - 0.3	3.8/23.4	32612	1998 QM ₁₀₃	1999 12 24.7	06 10.62 +23 29.3 17.8	-0.96 + 1.2	0.0/24.7	32988
(9817)	1999 12 23.5	06 05.32 +33 51.6 17.9	-0.65 + 0.5	2.0/23.4	33215	1993 GB	1999 12 24.7	06 10.66 +38 22.4 17.1	-1.32 + 2.3	5.9/24.0	35687
1998 QK ₄₂	1999 12 23.5	06 05.38 +20 18.7 18.5	-1.08 + 0.1	1.1/23.5	35711	1998 RB ₈₀	1999 12 24.7	06 10.68 +22 51.4 17.0	-1.01 + 2.1	0.2/24.7	36904
2197 T-2	1999 12 23.5	06 05.53 +29 01.5 19.7	-1.07 + 0.4	1.7/23.5	36123	1991 VN ₉	1999 12 24.7	06 10.78 +14 03.8 19.3	-1.05 - 0.5	3.6/24.8	29915
1997 FA	1999 12 23.5	06 05.66 +21 49.5 19.5	-1.18 + 0.2	0.6/23.6	32957	6586 P-L	1999 12 24.7	06 10.82 +05 43.5 19.1	-0.96 + 1.2	6.0/25.3	32537
1997 GM ₃₃	1999 12 23.5	06 05.79 +03 56.2 18.5	-0.95 - 0.8	6.7/23.6	36525	1993 TZ ₁₅	1999 12 24.7	06 10.86 +21 50.6 19.5	-0.93 + 0.4	0.5/24.8	35688