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

EDITORIAL NOTICE.

New editions, complete through the data in the 1986 Sept. 18 batch of MPCs, have been prepared of the publications "Catalogue of Orbits of Unnumbered Minor Planets" and "Catalogue of Discoveries and Identifications of Minor Planets", previously issued in 1982. With entries for 7095 objects (including 855 observed at more than one opposition), the new orbit catalogue is almost three times larger than its 1982 counterpart, although much of the increase is due to the inclusion now of orbits for the 2274 unnumbered planets in the Palomar-Leiden survey. The discovery listing in the companion volume contains references to 40 754 provisional designations (plus 145 P-L objects), compared to 29 157 in the 1982 edition. The listing of identifications with numbered minor planets contains 12 580 entries (up from 8550). This volume also includes a listing of the brighter one-opposition planets by nodal longitude (3043 entries). The catalogues, which contain 147 and 141 pages, respectively, are offered to MPC subscribers for the combined price of $7.50, or $5.00 separately. (The corresponding prices to nonsubscribers are $15.00 and $10.00, respectively.)

The 7095 orbits are also being issued on a single 360-kB MS-DOS diskette (5.25-inch IBM-PC 2.0 double-sided, double-density), with the 855 multiple-opposition orbits being included in both low-precision (cf. that of the one-opposition orbits) and high-precision form. The cost of this diskette is $75.00. The files are contained in a condensed form, however, and a program on a companion diskette (provided at no extra charge but not for separate distribution) allows the corresponding ASCII files to be recovered. Use of this program requires the availability of 128 kB of memory, and efficiency is improved if a hard disk or fair-sized RAM disk is available. The companion diskette also contains (again in condensed form) orbital elements for the 3495 numbered minor planets at epoch 1987 July 24.0 ET. These data are mainly (but not precisely) those contained in the 1987 edition of 'Efemeridy Malykh Planet' (EMP), published on behalf of IAU Commission 20 by the Institute for Theoretical Astronomy, Leningrad; users should note in particular that the magnitude parameters H and G given on MPC 11095-11108 have been incorporated. In addition, there are programs to extract specific orbits from the files and to calculate ephemerides.

The availability of a new (1986) edition of the 'Catalogue of Cometary Orbits' in both printed and machine-readable form was announced on MPC 10329. Effective immediately, the cost of the MS-DOS diskette version is being reduced from $100.00 to $75.00. The comet-catalogue diskette and the new diskette version of the minor-planet orbits are being offered for a special combined price of $125.00. (The prices for other versions of the comet catalogue remain unchanged; in particular, MPC subscribers may still purchase the printed edition for $6.00.)

Copies of the printed edition of EMP 1987 have been distributed to the MPC subscribers who regularly receive this publication through the Minor

Planet Center. As noted on MPC 10587, these subscribers are now assessed an additional monthly charge of $0.25 ($3.00 per year; the cost to nonsubscribers to the MPCs is $12.00).

Beginning with the current batch of MPCs, an MS-DOS diskette edition is being issued. The diskette edition consists of the current observations in the format of the complete magnetic-tape edition (see MPC 10781) plus the individual pages of the MPCs that do NOT consist entirely of observations or ephemerides. Subscribers to the printed MPCs can subscribe to the diskette edition for an additional charge of $30.00 (regular, invoiced rate) or $18.00 (special rate) per diskette (i.e., generally per month), payable in advance for from one to ten issues. As with the orbit catalogue the files will generally be in condensed form, so a separate diskette (again at no extra charge and not available separately) containing the program for ASCII file recovery is provided to subscribers when they start this service. The supplementary diskette includes a program that extracts orbital data from the MPC pages in essentially the formats used in the diskette versions of the orbit catalogues (both minor planets and comets). It also contains files with the observations included in the MPCs during 1986 June-September, i.e., the observations required completely to update the latest magnetic-tape edition.

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OBSERVATORY CODES.

The following listing of observatory codes is a revision of that on MPC 7759-7765. The longitudes are measured in degrees eastward from Greenwich, and the parallax constants xy and Z are in units of 0.0000001 AU.

Obs.	Long.	Parallax		
000	0.00	-266	-332	Greenwich
001	0.15	-268	-330	Crowborough (Roberts)
002	0.62	-265	-333	Rayleigh (Van Looy)
003	3.90	-309	-293	Montpellier
004	1.46	-309	-293	Toulouse
005	2.23	-281	-319	Meudon
006	2.13	-320	-281	Fabra Observatory, Barcelona
007	2.34	-281	-319	Paris
008	3.04	-342	-254	Algiers
009	7.45	-292	-310	Berne-Uecht
010	6.93	-309	-293	Caussols (CERGA)
011	8.80	-290	-312	Wetzikon (Locher)
012	4.36	-270	-329	Uccle
013	4.48	-262	-335	Leiden
014	5.39	-311	-291	Marseilles
015	5.13	-263	-335	Utrecht
016	5.99	-290	-312	Besancon
017	6.85	-274	-326	Hoher List
018	6.76	-268	-331	Dusseldorf-Bilk
019	6.96	-291	-310	Neuchatel
020	7.30	-309	-293	Nice
021	8.38	-280	-320	Karlsruhe
022	7.78	-302	-300	Pino Torinese
023	8.26	-274	-325	Wiesbaden (Landgraf)
024	8.72	-278	-322	Heidelberg-Konigstuhl
025	9.20	-281	-319	Stuttgart
026	7.47	-292	-310	Berne-Zimmerwald

027	9.19	-300	-302	Milan
028	9.94	-276	-324	Wurzburg
029	10.24	-254	-341	Hamburg-Bergedorf
030	11.26	-308	-293	Arcetri Observatory, Florence
031	11.19	-272	-327	Sonneberg
032	11.58	-269	-329	Jena
033	11.71	-269	-330	Karl Schwarzschild Observatory, Tautenburg
034	12.45	-318	-283	Monte Mario Observatory, Rome
035	12.58	-241	-351	Copenhagen
036	12.65	-319	-282	Castel Gandolfo
037	13.73	-314	-287	Collurania Observatory, Teramo
038	13.77	-299	-303	Trieste
039	13.19	-241	-351	Lund
040	13.73	-269	-330	Lohrmann Institute, Dresden
041	11.38	-290	-312	Innsbruck
042	13.06	-261	-336	Potsdam
043	11.53	-297	-305	Asiago Astrophysical Observatory, Padua
044	14.26	-323	-277	Capodimonte Observatory, Naples
045	16.34	-285	-316	Vienna (since 1879)
046	14.29	-281	-319	Klet Observatory, Ceske Budejovice
047	16.88	-261	-336	Poznan
048	15.83	-273	-326	Hradec Kralove
049	17.61	-217	-366	Uppsala-Kvistaberg
050	18.06	-218	-365	Stockholm (before 1931)
051	18.48	-354	+237	Cape
052	18.31	-218	-365	Stockholm-Saltsjobaden
053	18.96	-289	-313	Konkoly Observatory, Budapest (since 1934)
054	11.67	-241	-350	Brorfelde
055	19.96	-274	-325	Cracow
056	20.24	-279	-321	Skalnate Pleso
057	20.51	-303	-299	Belgrade
058	20.50	-247	-346	Kaliningrad
059	20.20	-279	-321	Lomnicky Stit
060	21.42	-263	-335	Warsaw-Ostrowik
061	22.30	-282	-318	Uzhgorod
062	22.23	-211	-369	Turku
063	22.44	-211	-369	Turku-Tuorla
064	22.75	-211	-369	Turku-Kevola
065	12.63	-287	-315	Traunstein (Bendel)
066	23.72	-337	-261	Athens
067	24.03	-276	-324	Lvov University Observatory
068	24.02	-276	-324	Lvov Polytechnic Institute
069	24.41	-234	-355	Baldone, near Riga
070	25.25	-247	-346	Vilnius (before 1939)
071	24.72	-319	-282	Smolyan
072	7.17	-268	-330	Scheuren Observatory (Gussow)
073	26.10	-305	-297	Bucharest
074	26.40	-373	+206	Boyden Observatory, Bloemfontein
075	26.72	-224	-362	Tartu
076	27.88	-384	+184	Johannesburg-Hartbeespoort
077	28.03	-383	+187	Yale-Columbia Station, Johannesburg
078	28.08	-383	+187	Johannesburg
079	28.23	-384	+184	Radcliffe Observatory, Pretoria
080	28.97	-322	-278	Istanbul
081	28.07	-383	+187	Leiden Station, Johannesburg
082	15.63	-285	-316	St. Polten (Klauser)
083	30.50	-273	-327	Golosseevo-Kiev
084	30.33	-215	-367	Pulkovo
085	30.50	-272	-327	Kiev

086	30.76	-294	-308	Odessa
087	31.34	-370	-211	Helwan
088	31.82	-370	-213	Kottomia
089	31.98	-291	-310	Nikolaev
090	8.25	-275	-325	Mainz (Riemann, Landgraf)
091	4.21	-300	-302	St. Etienne (Chanal)
092	18.56	-257	-340	Torun-Piwnice
093	20.37	-151	-397	Skibotn
094	34.00	-305	-297	Crimea-Simeis
095	34.02	-303	-299	Crimea-Nauchnij
096	9.40	-298	-304	Merate
097	34.76	-367	-216	Wise Observatory, Mitzpeh Ramon
098	11.60	-298	-304	Cima Ekar
099	25.53	-206	-372	Lahti (Salmi)
101	36.23	-275	-325	Kharkov
102	36.59	-241	-351	Zvenigorod
105	37.57	-240	-351	Moscow
110	39.15	-232	-356	Rostov
114	41.44	-309	-293	Engelhardt Observatory, Zelenchukskaya Station
115	41.44	-309	-293	Zelenchukskaya
119	42.82	-319	-283	Abastuman
123	44.29	-326	-275	Byurakan
125	44.90	-315	-286	Tbilisi
128	46.10	-267	-332	Saratov
129	45.88	-331	-268	Ordubad
135	49.12	-240	-351	Kasan
136	48.82	-240	-351	Engelhardt Observatory, Kasan
168	59.50	-233	-356	Kourovskaya
186	66.88	-331	-268	Kitab
188	67.50	-333	-265	Shokin Majdanak
190	68.68	-334	-264	Gissar
191	68.78	-334	-264	Dushanbe
192	69.29	-321	-280	Tashkent
193	69.22	-335	-263	Sanglok
210	76.96	-311	-290	Alma-Ata
217	77.88	-311	-291	Assah
218	78.45	-407	-127	Hyderabad
219	78.73	-408	-125	Japal-Rangapur
223	80.25	-415	-096	Madras
236	84.95	-236	-354	Tomsk
286	102.79	-387	-179	Yunnan Observatory
292	285.13	-327	-273	Burlington, New Jersey (Handley)
293	285.59	-328	-271	Burlington remote site (Handley)
302	288.88	-422	-064	University of the Andes station
303	289.13	-422	-065	Merida
304	289.30	-373	+206	Las Campanas Observatory
312	112.33	-408	-123	Tsingtao field station, Xisha Islands
323	116.14	-362	+225	Perth Observatory, Bickley
324	116.33	-327	-273	Peking Observatory, Shaho Station
327	117.57	-325	-275	Peking Observatory, Xinglong Station
330	118.82	-362	-225	Purple Mountain Observatory, Nanking
334	120.32	-345	-250	Tsingtao
337	121.19	-365	-219	Zo-Se
363	130.78	-356	-234	Yamada (Otsubo)
370	133.53	-356	-234	Kochi (Seki)
371	133.60	-351	-241	Tokyo-Okayama
372	133.83	-356	-234	Geisei (Seki)
374	134.72	-349	-244	Minami-Oda Observatory (Sugano)
375	134.87	-350	-243	Uzurano (Einaga)

376	139.04	-347	-247	Uenohara (Kawasato)
377	135.79	-350	-243	Kwasan Observatory, Kyoto
378	136.01	-351	-241	Murou (Kumamori)
379	137.77	-351	-241	Hamamatsu (Wakuta)
380	137.03	-350	-242	Ishiki (Kojima)
381	137.63	-346	-248	Tokyo-Kiso
382	137.56	-345	-250	Tokyo-Norikura
383	137.89	-342	-254	Chirorin (Sei)
384	138.18	-350	-242	Shimada
385	138.47	-350	-243	Nihondaira Observatory (Urata)
386	138.32	-346	-249	Yatsugatake-Kobuchizawa
387	139.20	-345	-249	Tokyo-Dodaira
388	139.54	-347	-247	Tokyo-Mitaka
389	139.74	-347	-247	Tokyo (before 1938)
390	139.92	-343	-252	Utsunomiya (Kurosaki)
391	140.78	-335	-263	Sendai Observatory, Ayashi Station
392	141.38	-312	-290	JCPM Sapporo Station
393	140.13	-345	-250	JCPM Sakura Station
394	142.32	-301	-301	JCPM Hamatonbetsu Station
395	142.36	-308	-294	Tokyo-Asahikawa
396	142.42	-308	-293	Asahikawa (Tsuchiya)
397	141.48	-312	-289	Sapporo Science Center
398	139.11	-345	-250	Nagatoro (Kawasato)
399	144.61	-312	-290	Kushiro (Ueda)
413	149.07	-365	+220	Siding Spring Observatory
414	149.00	-348	+245	Mount Stromlo
415	149.06	-348	+246	Kambah, near Canberra (Herald)
416	149.13	-348	+245	Barton, near Canberra (Herald)
419	150.83	-355	+235	Windsor (Tebbutt)
420	151.20	-354	+236	Sydney
425	152.93	-382	+189	Taylor Range Observatory, Brisbane
474	170.46	-307	+295	Mount John Observatory, Lake Tekapo
482	357.18	-237	-353	St. Andrews
483	173.80	-319	+282	Carter Observatory, Black Birch Station
484	174.75	-321	+280	Happy Valley, Wellington (Gilmore)
485	174.76	-321	+280	Carter Observatory, Wellington
486	175.47	-326	+274	Palmerston North (Munford)
487	355.45	-242	-350	Macnairston Observatory
488	358.37	-245	-348	Newcastle-upon-Tyne (D. S. Brown)
489	359.87	-261	-336	Hemingford Abbots (Young)
490	358.00	-270	-329	Wimborne Minster (Swan)
491	356.91	-324	-276	Centro Astronomico de Yebes
492	358.47	-258	-339	Mickleover (Baguley)
493	357.45	-340	-257	Estacion Astronomica de Calar Alto
494	357.84	-261	-336	Stakenbridge (Manning)
495	357.66	-255	-341	Altrincham (Scott)
496	358.69	-269	-330	Bishopstoke (Arbour)
497	359.30	-267	-331	Ascot-Loudwater (Armstrong)
498	359.26	-261	-336	Northampton (Hurst)
499	359.79	-267	-331	Cheam (Birtwhistle)
500	0.00	0	0	Geocentric
501	0.34	-270	-329	Herstmonceux
502	0.85	-263	-334	Colchester (Hendrie)
503	0.10	-262	-335	Cambridge
504	4.44	-292	-309	Le Creusot (Merlin)
505	4.56	-265	-333	Simon Stetin
506	9.96	-255	-340	Bendestorf (Ressel)
507	5.22	-263	-334	Nyenheim (Son)
508	5.29	-263	-334	Zeist (Son)

509	5.87	-312	-290	La Seyne sur Mer
510	8.03	-269	-329	Siegen
511	5.71	-308	-294	Haute Provence
512	4.49	-262	-335	Leiden (before 1860)
513	4.78	-298	-304	Lyons
514	8.43	-278	-322	Mundenheim (1907-1913)
515	7.48	-277	-323	Volkssternwarte Dhaun, near Kirn
516	9.97	-254	-341	Hamburg (before 1909)
517	6.15	-296	-306	Geneva
518	9.97	-254	-341	Marine Observatory, Hamburg
519	8.29	-267	-331	Meschede (Hempel)
520	7.10	-270	-329	Bonn
521	10.89	-275	-325	Bamberg
522	7.77	-283	-318	Strasbourg
523	8.65	-274	-326	Frankfurt
524	8.46	-278	-323	Mannheim
525	8.77	-270	-329	Marburg
526	10.15	-249	-345	Kiel
527	9.94	-254	-341	Altona
528	9.94	-266	-332	Gottingen
529	10.72	-214	-367	Christiania
530	10.69	-252	-343	Lubeck
531	12.48	-318	-283	Collegio Romano, Rome
532	11.61	-285	-316	Munich
533	11.87	-300	-302	Padua
534	12.39	-267	-331	Leipzig (since 1861)
535	13.36	-336	-262	Palermo
536	13.11	-261	-336	Berlin-Babelsberg
537	13.36	-260	-337	Urania Observatory, Berlin
538	13.85	-303	-299	Pola
539	14.13	-286	-316	Kremsmunster
540	14.27	-283	-318	Linz
541	14.40	-274	-325	Prague
542	13.04	-259	-337	Falkensee (Gressmann)
543	11.66	-241	-350	Leipzig (before 1861)
544	13.42	-260	-337	Wilhelm Foerster Observatory, Berlin
545	16.38	-285	-316	Vienna (before 1879)
546	16.35	-285	-316	Oppolzer Observatory, Vienna
547	17.04	-268	-330	Breslau
548	13.40	-260	-337	Berlin (1835-1913)
549	17.63	-215	-367	Uppsala
550	11.42	-253	-342	Schwerin
551	18.19	-287	-315	O'Gyalla
552	11.34	-305	-297	Osservatorio S. Vittore, Bologna
553	18.99	-273	-326	Chorzow
554	8.40	-272	-328	Burgsolms Observatory, Wetzlar
555	19.83	-274	-325	Cracow-Fort Skala
556	11.26	-288	-313	Reintal, near Munich (Seiler)
557	14.78	-275	-325	Ondrejov
558	21.03	-262	-335	Warsaw
559	14.98	-338	-259	Serra La Nave
560	10.93	-300	-302	Madonna di Dossobuono (Luciano)
561	20.02	-286	-315	Piszkesteto
562	15.92	-285	-316	Figl Observatory, Vienna
563	13.60	-286	-315	Seewalchen (Bressler)
564	11.19	-286	-316	Herrsching (Stattmayer).
565	10.13	-301	-301	Brescia
566	203.74	-399	-150	Haleakala
567	12.71	-298	-305	Chions

568	204.53	-401	-144	Mauna Kea
569	24.96	-213	-368	Helsinki
570	25.29	-247	-346	Vilnius (since 1939)
571	10.63	-300	-302	Cavriana
572	6.89	-269	-329	Cologne
573	9.66	-262	-335	Eldagsen (Bonk)
574	10.27	-300	-302	Gottolengo (Mattarozzi)
575	6.81	-291	-311	La Chaux de Fonds (Behrend)
576	0.38	-269	-330	Burwash (Young)
577	7.50	-289	-313	Metzerlen Observatory
578	27.99	-383	+187	Linden Observatory (Hers)
579	8.85	-303	-299	Novi Ligure (Balbi)
580	15.50	-291	-311	Graz (Ornig)
581	22.80	-354	+237	Sedgefield (Hers)
583	30.27	-295	-307	Odessa-Mayaki
584	30.30	-214	-367	Leningrad
585	30.53	-272	-327	Kiev comet station
586	0.14	-313	-289	Pic du Midi
656	236.48	-284	-317	Victoria (Newton)
657	236.68	-283	-318	Climenhaga Observatory, Victoria
660	237.74	-337	-260	Leuschner Observatory, Berkeley
662	238.36	-339	-257	Lick Observatory, Mount Hamilton
669	240.82	-352	-240	Ojai
671	242.00	-353	-239	Stony Ridge
672	241.94	-353	-238	Mount Wilson
673	242.32	-352	-239	Table Mountain Observatory, Wrightwood
674	242.39	-352	-240	Ford Observatory, Wrightwood
675	243.14	-357	-233	Palomar Mountain
680	244.78	-355	-236	Los Angeles (Hutson)
686	249.21	-360	-227	U. of Minn. Infrared Obs., Mt. Lemmon
687	248.35	-349	-244	Northern Arizona University, Flagstaff
688	248.46	-349	-244	Lowell Observatory, Mesa Station
689	248.26	-349	-244	U.S. Naval Observatory, Flagstaff
690	248.34	-349	-245	Lowell Observatory, Flagstaff
691	248.40	-362	-224	Steward Observatory, Kitt Peak
692	249.05	-361	-226	Steward Observatory, Tucson
693	249.28	-360	-227	Catalina Station, Tucson
694	249.00	-361	-226	Tumamoc Hill, Tucson
695	248.40	-362	-224	Kitt Peak
696	249.12	-363	-223	Whipple Observatory (Mt. Hopkins)
702	252.81	-354	-237	Joint Obs. for cometary research, Socorro
704	253.34	-355	-236	Lincoln Laboratory ETS, New Mexico
707	254.56	-330	-270	Chamberlin field station (Everhart)
708	255.05	-329	-271	Chamberlin Observatory, Denver
711	255.98	-367	-216	McDonald Observatory, Fort Davis
724	260.80	-402	-141	National Observatory, Tacubaya
741	266.85	-305	-297	Goodsell Observatory, Northfield
754	271.44	-314	-287	Yerkes Observatory, Williams Bay
756	272.33	-317	-284	Dearborn Observatory, Evanston
760	273.60	-329	-270	Goethe Link Observatory, Brooklyn
765	275.58	-331	-268	Cincinnati
766	275.52	-314	-288	Michigan State University Obs., East Lansing
767	276.27	-316	-285	Ann Arbor
768	277.08	-313	-288	Dearborn (McEldery)
769	276.99	-327	-273	McMillin Observatory, Columbus
773	278.43	-320	-281	Warner and Swasey Observatory, Cleveland
774	278.93	-319	-282	Warner and Swasey Nassau Station, Chardon
777	280.60	-309	-293	Toronto
778	279.98	-325	-275	Allegheny Observatory, Pittsburgh

779	280.58	-308	-294	David Dunlap Observatory, Richmond Hill
784	282.28	-315	-286	Alfred University Observatory
786	282.94	-332	-266	U.S. Naval Obs., Washington (since 1893)
787	282.95	-332	-266	U.S. Naval Obs., Washington (before 1893)
788	284.37	-328	-271	Mount Cuba Observatory, Wilmington
789	284.59	-312	-290	Litchfield Observatory, Clinton
790	284.28	-300	-302	Dominion Observatory, Ottawa
791	284.52	-327	-273	Flower and Cook Observatory, Philadelphia
792	288.30	-321	-280	U. of Rhode Island, Quonochontaug
793	286.22	-314	-287	Dudley Observatory, Albany (before 1893)
794	278.90	-319	-282	Vassar College Observatory, Poughkeepsie
795	286.01	-324	-277	Rutherford
796	286.45	-322	-279	Stamford
797	287.07	-321	-280	Yale Observatory, New Haven
798	287.02	-320	-281	Yale Observatory, Bethany
799	288.86	-315	-286	Winchester (Metcalf)
800	288.45	-409	+119	Harvard Observatory, Arequipa
801	288.44	-315	-287	Oak Ridge Observatory
802	288.87	-315	-286	Harvard Observatory, Cambridge
803	288.92	-318	-283	Taunton (Metcalf)
804	289.31	-356	+235	Santiago-San Bernardo
805	288.97	-358	+231	Santiago-Cerro El Roble
806	289.45	-356	+233	Santiago-Cerro Calan
807	289.19	-369	+213	Cerro Tololo Observatory, La Serena
808	290.67	-363	+223	El Leoncito
809	289.27	-372	+207	European Southern Observatory, La Silla
810	288.52	-314	-287	Wallace Observatory, Westford
811	289.90	-321	-280	Maria Mitchell Observatory, Nantucket
820	295.37	-397	+156	Tarija
821	295.45	-364	+222	Cordoba-Bosque Alegre
822	295.80	-364	+221	Cordoba
839	302.07	-350	+243	La Plata
864	130.70	-359	-230	Kumamoto (Miyamoto)
869	133.42	-356	-234	Tosa (Ike)
870	313.17	-398	+153	Campinas
873	133.77	-351	-241	Kurashiki Observatory (Honda)
874	314.42	-394	+162	Itajuba
878	136.91	-350	-243	Kagiya (Furuta)
879	137.35	-349	-243	Tokai (Furuta)
880	316.78	-393	+165	Rio de Janeiro
881	137.26	-349	-244	Toyota (Suzuki)
882	137.36	-349	-244	JCPM Oi Station
883	138.42	-350	-243	Shizuoka
884	138.08	-349	-244	Kawane (Iwahana)
885	138.46	-350	-243	JCPM Yakiimo Station
886	138.93	-349	-244	Mishima (Akiyama)
887	139.34	-345	-250	Ojima (Niijima)
889	140.15	-342	-253	Karasuyama (Inoda)
890	140.25	-346	-249	JCPM Tone Station
891	140.86	-335	-263	JCPM Kimachi Station
893	140.87	-335	-263	Sendai Municipal Observatory
950	342.12	-374	-204	La Palma
976	358.48	-261	-336	Leamington Spa (Johnstone)
977	351.55	-250	-344	Markree
978	358.25	-249	-345	Conder Brow (Greenwood)
979	358.75	-268	-330	South Wonston (Arbour)
980	357.20	-251	-343	Lancaster (Buczynski)
981	353.35	-249	-345	Armagh
982	353.66	-255	-341	Dunsink Observatory, Dublin

983	353.79	-343	-252	San Fernando
984	357.26	-269	-330	Eastfield (Ridley)
985	357.53	-259	-337	Telford (McAdam)
986	358.75	-266	-332	Ascot (Waterfield)
987	355.37	-250	-344	Archallagan Observatory (Soper)
988	355.71	-240	-351	Glasgow
989	357.69	-256	-340	Wilfred Hall Observatory, Preston
990	356.31	-325	-275	Madrid
991	356.93	-255	-341	Liverpool (since 1867)
992	357.00	-255	-341	Liverpool (before 1867)
993	357.50	-269	-330	Woolston Observatory (Waterfield)
994	359.39	-268	-331	Godalming (Ridley)
995	358.42	-247	-347	Durham
996	358.75	-264	-333	Oxford
997	359.15	-264	-334	Hartwell
998	359.76	-265	-333	London-Mill Hill
999	359.47	-303	-299	Bordeaux-Floirac

* * * * *

IDENTIFICATION CHANGES.

Continuation to MPC 11095.

Object	Date	UT	R. A. (1950)	Decl.	Old desig.	Mag.	N Obs.
1953 XP1 *	1953 12	08.90139	03 31 02.19	+16 26 22.8	1953 VU2	14.8	024
1985 GY1 *	1985 04	14.34641	13 46 47.63	-09 57 27.0	1440	17.0	1 688

Note 1: daily motion 1.0- 2+.

* * * * *

OBSERVATIONS OF COMETS.

Observations are published here for the following observatory codes:

026 Zimmerwald. Observer P. Wild.
046 Klet. Observer A. Mrkos.
293 Burlington remote site. 0.2-m f/4 astrograph. Observer T. Handley.
323 Perth Observatory, Bickley. Observers M. P. Candy, P. Jekabsons, A. Johns, M. Kempin and A. McGrath.
372 Geisei. 0.60-m reflector. Observer T. Seki.
376 Uenohara. 0.20-m reflector. Observer N. Kawasato.
391 Sendai Observatory, Ayashi Station. Observer M. Koishikawa.
392 JCPM Sapporo Station. 0.25-m reflector. Observer H. Kaneda.
397 Sapporo Science Center. 0.60-m reflector. Observer K. Watanabe.
399 Kushiro. 0.16-m reflector. Observer S. Ueda. Measured by H. Kaneda.
474 Mount John University Observatory. 0.6-m f/14 Cassegrain reflector. Observer A. C. Gilmore. Measured by P. M. Kilmartin.
493 Calar Alto. 3.5-m telescope + CCD camera. Observer K. Birkle.
494 Stakenbridge. Observer B. Manning.
568 Mauna Kea. Infrared Telescope Facility encoders. Observer D. J. Tholen.
657 Climenhaga Observatory, Victoria. Observers J. B. Tatum and D. D. Balam.
688 Lowell Observatory, Anderson Mesa Station. Observer B. A. Skiff.
691 University of Arizona, Kitt Peak. 0.91-m reflector, CCD in scanning mode. Observer T. Gehrels. Reduced by J. V. Scotti.
786 U.S. Naval Observatory, Washington. 0.38-m astrograph. Observer

R. E. Schmidt. Measured by R. S. Harrington.
801 Oak Ridge Observatory. Observers R. E. McCrosky, G. Schwartz and C.-Y. Shao.

Object	Date	UT	R. A. (1950)	Decl.	Mag.	N	Obs.
		Periodic Comet Halley					
/1982i	1986	03 22.73253	19 31 05.53	-28 09 57.0			474
/1982i	1986	03 22.73345	19 31 05.22	-28 10 00.4			474
/1982i	1986	03 28.69500	18 54 19.28	-34 25 42.6			474
/1982i	1986	03 28.69622	18 54 18.70	-34 25 47.3			474
/1982i	1986	03 31.59633	18 26 02.67	-38 12 39.8			474
/1982i	1986	03 31.59749	18 26 01.85	-38 12 45.3			474
/1982i	1986	05 06.45987	10 40 46.57	-14 18 43.8			474
/1982i	1986	05 06.46161	10 40 46.32	-14 18 40.1			474
/1982i	1986	05 12.36300	10 32 02.31	-11 21 00.5			474
/1982i	1986	05 12.36462	10 32 02.19	-11 20 58.0			474
/1982i	1986	05 14.40889	10 29 59.94	-10 33 17.8			474
/1982i	1986	06 13.41481	10 26 04.03	-05 26 14.2			474
		Periodic Comet Encke					
/1984 VI	1986	09 25.32557	23 26 15.10	+03 19 25.8	19.2T		691
/1984 VI	1986	09 25.33731	23 26 14.23	+03 19 21.5			691
		Comet Shoemaker (1984 XV)					
/1984 XV	1986	09 25.27163	23 20 26.73	-05 09 49.9		1	691
/1984 XV	1986	09 25.29843	23 20 25.42	-05 09 59.0			691
/1984 XV	1986	09 25.30726	23 20 25.06	-05 10 00.9			691
		Comet Shoemaker (1984s)					
/1984s	1984	12 11.76563	02 36 44.49	-06 31 16.0			026
/1984s	1984	12 12.80903	02 39 08.47	-07 07 39.2			026
		Periodic Comet Whipple					
/1985h	1986	09 26.32501	03 50 03.89	+11 34 28.9	18.9T		691
/1985h	1986	09 26.33634	03 50 03.94	+11 34 25.4			691
/1985h	1986	09 26.34339	03 50 03.94	+11 34 23.9			691
/1985h	1986	09 26.39297	03 50 04.16	+11 34 11.6			691
/1985h	1986	09 27.31808	03 50 08.54	+11 30 22.8			691
/1985h	1986	09 27.33859	03 50 08.60	+11 30 17.6			691
/1985h	1986	09 27.37296	03 50 08.64	+11 30 09.2			691
		Periodic Comet Singer Brewster					
/1986d	1986	05 14.49321	14 45 11.56	-04 50 14.0			474
/1986d	1986	05 14.51149	14 45 11.05	-04 50 04.7			474
		Comet Churyumov-Solodovnikov (1986i)					
/1986i	1986	08 31.11528	19 59 58.85	-37 30 37.9			293
/1986i	1986	08 31.12431	19 59 58.17	-37 30 50.7		2	293
		Periodic Comet Kohoutek					
/1986k	1986	09 25.12041	21 00 12.60	-10 21 13.0			691
/1986k	1986	09 25.12550	21 00 12.57	-10 21 14.1			691
/1986k	1986	09 25.13045	21 00 12.37	-10 21 15.3			691
/1986k	1986	09 25.14721	21 00 11.98	-10 21 14.9		1	691
/1986k	1986	09 25.16615	21 00 11.50	-10 21 19.7			691
/1986k	1986	09 25.17080	21 00 11.40	-10 21 20.9			691
/1986k	1986	09 25.17743	21 00 11.32	-10 21 22.4			691

Comet Wilson (1986l)

/1986l	1986	08	07.87639	22	17	49.51	+24	56	52.7	12.7	T	046
/1986l	1986	08	07.88368	22	17	48.90	+24	56	50.0			046
/1986l	1986	08	13.70556	22	07	06.90	+24	16	29.3			323
/1986l	1986	08	25.54514	21	43	05.54	+22	10	22.8			323
/1986l	1986	08	25.71875	21	42	43.49	+22	08	05.4			323
/1986l	1986	08	25.82453	21	42	29.93	+22	06	34.2	12.0	T	046
/1986l	1986	08	25.82892	21	42	29.40	+22	06	31.1			046
/1986l	1986	08	26.68680	21	40	39.80	+21	54	58.8			323
/1986l	1986	08	26.74861	21	40	31.86	+21	54	06.8			323
/1986l	1986	08	26.81150	21	40	23.91	+21	53	11.1			046
/1986l	1986	08	26.81463	21	40	23.54	+21	53	08.9			046
/1986l	1986	08	27.62639	21	38	39.60	+21	41	49.2	11	T	372
/1986l	1986	08	28.91785	21	35	53.48	+21	23	10.9			494
/1986l	1986	08	28.93086	21	35	51.83	+21	22	59.5			494
/1986l	1986	08	29.52917	21	34	34.84	+21	14	11.1			323
/1986l	1986	08	29.57083	21	34	29.43	+21	13	35.0			323
/1986l	1986	08	29.57674	21	34	28.55	+21	13	25.4			372
/1986l	1986	08	31.18194	21	31	01.11	+20	48	53.6			293
/1986l	1986	09	01.08859	21	29	04.12	+20	34	28.2			801
/1986l	1986	09	01.54389	21	28	05.05	+20	27	07.9			392
/1986l	1986	09	02.82567	21	25	19.51	+20	06	01.0			046
/1986l	1986	09	02.82880	21	25	19.00	+20	05	57.2			046
/1986l	1986	09	03.68507	21	23	28.18	+19	51	29.8			372
/1986l	1986	09	03.91033	21	22	59.31	+19	47	38.5			494
/1986l	1986	09	03.92258	21	22	57.68	+19	47	25.6			494
/1986l	1986	09	04.48021	21	21	45.92	+19	37	52.3			376
/1986l	1986	09	04.49688	21	21	43.79	+19	37	32.5			376
/1986l	1986	09	04.51563	21	21	41.34	+19	37	14.4			376
/1986l	1986	09	04.95937	21	20	44.05	+19	29	28.0			046
/1986l	1986	09	04.96250	21	20	43.62	+19	29	25.9			046
/1986l	1986	09	05.84720	21	18	49.98	+19	13	44.9			046
/1986l	1986	09	05.84963	21	18	49.52	+19	13	41.9			046
/1986l	1986	09	07.17391	21	15	59.72	+18	49	45.2			801
/1986l	1986	09	08.51319	21	13	09.28	+18	24	54.1			399
/1986l	1986	09	08.52025	21	13	08.34	+18	24	46.1			399
/1986l	1986	09	08.81588	21	12	30.87	+18	19	10.2			046
/1986l	1986	09	08.81889	21	12	30.46	+18	19	06.9			046
/1986l	1986	09	10.13385	21	09	44.38	+17	54	02.0			786
/1986l	1986	09	11.25052	21	07	24.40	+17	32	16.0			688
/1986l	1986	09	11.50938	21	06	52.04	+17	27	11.6			392
/1986l	1986	09	12.49867	21	04	49.16	+17	07	31.5			392
/1986l	1986	09	15.58513	20	58	32.05	+16	04	37.8			399
/1986l	1986	09	21.27726	20	47	28.15	+14	03	18.7			657
/1986l	1986	09	22.48194	20	45	13.54	+13	36	56.8	11	T	391
/1986l	1986	09	22.48924	20	45	12.96	+13	36	48.1	10	T	372
/1986l	1986	09	22.49236	20	45	12.43	+13	36	43.0			391
/1986l	1986	09	22.51268	20	45	10.18	+13	36	18.5			372
/1986l	1986	09	22.52671	20	45	08.77	+13	35	58.3			399
/1986l	1986	09	22.61667	20	44	58.61	+13	34	00.5			391
/1986l	1986	09	22.62292	20	44	57.83	+13	33	52.5			391
/1986l	1986	09	23.46146	20	43	26.14	+13	15	22.7	11	T	391
/1986l	1986	09	23.51563	20	43	20.24	+13	14	12.7			391
/1986l	1986	09	23.58160	20	43	13.01	+13	12	45.5			391
/1986l	1986	09	23.58785	20	43	12.18	+13	12	36.3			391
/1986l	1986	09	24.45131	20	41	39.05	+12	53	34.4			399
/1986l	1986	09	24.46701	20	41	37.39	+12	53	12.8	11	T	391
/1986l	1986	09	24.48785	20	41	35.08	+12	52	44.5			391

/1986l	1986	09	24.49479	20 41 34.40	+12 52 37.7				376
/1986l	1986	09	24.50382	20 41 33.37	+12 52 24.1				376
/1986l	1986	09	24.50868	20 41 32.85	+12 52 18.6				391
/1986l	1986	09	24.51215	20 41 32.43	+12 52 13.1				376
/1986l	1986	09	25.43637	20 39 54.07	+12 31 45.4				392
/1986l	1986	09	25.45833	20 39 51.82	+12 31 13.9		11	T	391
/1986l	1986	09	25.47917	20 39 49.58	+12 30 46.7				391
/1986l	1986	09	25.50000	20 39 47.31	+12 30 19.0				391
/1986l	1986	09	26.53505	20 37 58.94	+12 07 17.6				399
/1986l	1986	09	26.54132	20 37 58.34	+12 07 11.7		10.5	T	397
/1986l	1986	09	26.55882	20 37 56.44	+12 06 49.4				397
/1986l	1986	09	27.54861	20 36 14.63	+11 44 42.6		11	T	391
/1986l	1986	09	27.56944	20 36 12.54	+11 44 15.6				391
/1986l	1986	10	01.19035	20 30 15.93	+10 23 19.9				657
/1986l	1986	10	02.42743	20 28 19.72	+09 55 43.4				568

Periodic Comet Grigg-Skjellerup

/1986m	1986	08	12.16108	05 49 51.61	+11 24 17.6		22	N	493
/1986m	1986	08	13.14881	05 51 00.12	+11 20 52.0				493
/1986m	1986	08	13.16026	05 51 00.90	+11 20 49.5				493
/1986m	1986	08	13.16859	05 51 01.48	+11 20 47.6				493
/1986m	1986	08	13.17492	05 51 01.90	+11 20 46.2				493

Note 1: image faint, diffuse, difficult to measure. 2: weak image.

* * * * *

OBSERVATIONS MADE AT CAUSSOLS.

Contact: J.-L. Heudier, CERGA Caussols, F-06460 Saint Vallier de Thiey, France.

Object		Date	UT	R. A. (1950)	Decl.	Obs.
1986 RA		1986 09	30.88611	23 02 36.18	-12 51 13.9	010
1986 RA		1986 09	30.90694	23 02 40.59	-12 52 13.3	010
1986 RA		1986 09	30.91389	23 02 42.46	-12 52 38.8	010
1986 RA		1986 09	30.92083	23 02 43.98	-12 52 57.7	010
1986 SA	*	1986 09	29.97360	00 49 22.3	+50 53 16	010
1986 SA		1986 09	29.99444	00 49 21.0	+50 53 34	010
1986 SA		1986 09	30.00139	00 49 20.1	+50 53 41	010
1986 SA		1986 09	30.00830	00 49 19.7	+50 53 47	010

OBSERVATIONS MADE AT HOHER LIST.

Plates taken by M. Hoffmann with the 0.30-m f/5 astrograph, measured and reduced by M. Geffert using AGK3 reference stars. Contact: M. Goffmann, Astronomisches Institut Munster, Hembrich 6, D-5569 Schalkenmehren, Federal Republic of Germany.

Object	Date	UT	R. A. (1950)	Decl.	Obs.
1986 RJ	1986 09	04.89444	23 15 25.42	+01 35 22.0	017
1986 RJ	1986 09	04.91875	23 15 24.07	+01 35 16.2	017
1986 RJ	1986 09	05.89722	23 14 32.61	+01 30 18.8	017
1986 RJ	1986 09	05.92222	23 14 31.07	+01 30 11.4	017
1986 RJ	1986 09	25.87535	22 58 20.10	-00 25 42.7	017
1986 RJ	1986 09	25.89201	22 58 19.51	-00 25 46.9	017

OBSERVATIONS MADE AT TAUTENBURG BY F. BORNGEN, W. HOGNER, F. JANK AND K. LOCHEL.

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

Object		Date	UT	R. A. (1950)	Decl.	Mag.	Obs.
135		1964 02	13.75937	06 06 18.88	+25 59 55.6	12.8	033
135		1964 02	13.77882	06 06 18.71	+25 59 54.2		033
135		1964 02	13.79688	06 06 18.48	+25 59 53.0		033
135		1964 02	13.81562	06 06 18.28	+25 59 51.9		033
135		1964 02	14.82882	06 06 08.75	+25 58 41.9		033
380		1964 02	13.75937	06 10 54.02	+25 16 06.2	14.5	033
380		1964 02	13.77882	06 10 53.85	+25 16 07.5		033
380		1964 02	13.79688	06 10 53.68	+25 16 08.8		033
380		1964 02	13.81562	06 10 53.49	+25 16 09.9		033
380		1964 02	14.82882	06 10 44.02	+25 17 16.1		033
383		1965 10	29.97431	07 40 45.02	+21 21 59.1	14.7R	033
383		1965 10	30.04375	07 40 46.70	+21 21 57.0		033
408		1964 02	13.75937	06 07 20.89	+25 54 19.4	14.3	033
408		1964 02	13.77882	06 07 20.80	+25 54 16.6		033
408		1964 02	13.79688	06 07 20.69	+25 54 13.8		033
408		1964 02	13.81562	06 07 20.58	+25 54 09.7		033
408		1964 02	14.82882	06 07 16.62	+25 50 58.6		033
512		1967 03	07.11424	12 24 11.28	+11 05 19.2	14.9	033
512		1967 03	07.90972	12 23 30.36	+11 12 03.2		033
512		1967 03	07.99306	12 23 26.43	+11 12 41.6		033
1154		1964 02	13.75937	06 06 52.38	+25 25 17.8	16.5	033
1154		1964 02	13.77882	06 06 52.24	+25 25 18.4		033
1154		1964 02	13.79688	06 06 52.04	+25 25 18.9		033
1154		1964 02	13.81562	06 06 51.78	+25 25 19.6		033
1154		1964 02	14.82882	06 06 41.21	+25 25 40.3		033
1181		1965 10	29.97431	07 42 07.97	+20 32 12.2	15.3R	033
1181		1965 10	30.04375	07 42 10.05	+20 32 00.3		033
2301		1967 05	11.87847	12 30 09.59	+11 55 39.8	14.8R	033
2301		1967 05	11.94097	12 30 08.52	+11 55 30.9		033
1962 SS	*	1962 09	26.03368	03 39 43.84	+23 07 19.4	19.8	033
1962 SS		1962 09	26.08576	03 39 44.21	+23 07 27.8		033
1962 ST	*	1962 09	26.03368	03 44 38.06	+23 04 39.4	18.7	033
1962 ST		1962 09	26.08576	03 44 37.85	+23 04 44.4		033
1964 BE	*	1964 01	18.94132	06 03 26.95	+24 35 32.5	17.4	033
1964 BE		1964 01	18.96424	06 03 26.02	+24 35 32.0		033
1964 BE		1964 01	18.98438	06 03 25.25	+24 35 31.6		033
1964 BE		1964 01	19.82396	06 02 53.73	+24 35 19.5		033
1964 BE		1964 01	19.84306	06 02 52.96	+24 35 19.3		033
1964 BE		1964 01	20.88924	06 02 14.85	+24 35 03.4		033
1964 BE		1964 01	20.90833	06 02 14.20	+24 35 02.5		033
1964 BF	*	1964 01	18.94132	06 09 15.93	+23 04 49.1	17.7	033
1964 BF		1964 01	18.96424	06 09 14.86	+23 04 54.4		033
1964 BF		1964 01	18.98438	06 09 14.02	+23 04 58.2		033
1964 BF		1964 01	19.82396	06 08 38.04	+23 08 09.4		033
1964 BF		1964 01	19.84306	06 08 37.20	+23 08 14.2		033
1964 BF		1964 01	20.88924	06 07 53.99	+23 11 52.5		033
1964 BF		1964 01	20.90833	06 07 53.18	+23 12 12.0		033
1964 BG	*	1964 01	18.94132	06 09 44.36	+25 32 22.9	18.0	033
1964 BG		1964 01	18.96424	06 09 43.37	+25 32 25.8		033
1964 BG		1964 01	18.98438	06 09 42.45	+25 32 28.6		033
1964 BG		1964 01	19.82396	06 09 08.46	+25 34 18.3		033
1964 BG		1964 01	19.84306	06 09 07.66	+25 34 20.8		033
1964 BG		1964 01	20.88924	06 08 26.88	+25 36 33.5		033
1964 BG		1964 01	20.90833	06 08 26.07	+25 36 35.6		033
1964 HB	*	1964 04	16.95347	12 23 52.06	+11 43 33.1	17.0R	033
1964 HB		1964 04	16.99514	12 23 49.94	+11 43 30.6		033
1964 HC	*	1964 04	16.95347	12 30 25.45	+12 51 12.2	16.5R	033
1964 HC		1964 04	16.99514	12 30 23.73	+12 51 21.2		033

1965 UM2	*	1965	10	29.97431	07	29	25.51	+22	07	02.2	15.6R 033
1965 UM2		1965	10	30.04375	07	29	26.46	+22	07	03.5	033
1965 UN2	*	1965	10	29.97431	07	36	19.89	+22	36	49.2	16.4R 033
1965 UN2		1965	10	30.04375	07	36	20.98	+22	36	49.4	033
1967 JX	*	1967	05	11.87847	12	22	02.08	+12	34	26.3	15.0R 033
1967 JX		1967	05	11.94097	12	21	57.64	+12	34	28.9	033
1967 JY	*	1967	05	11.87847	12	24	13.54	+11	26	05.3	15.3R 033
1967 JY		1967	05	11.94097	12	24	11.01	+11	26	05.3	033

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

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

Object	Date	UT	R. A. (1950)	Decl.	Mag.	Obs.
286	1986 09	02.92573	21 06 43.34	-13 36 26.5		046
286	1986 09	02.93991	21 06 42.82	-13 36 33.3		046
305	1986 09	02.92573	21 09 13.49	-10 35 09.0		046
305	1986 09	02.93991	21 09 12.91	-10 35 14.0		046
305	1986 09	04.93264	21 08 00.48	-10 42 56.9		046
305	1986 09	04.94688	21 07 59.98	-10 43 00.4		046
305	1986 09	05.88056	21 07 27.27	-10 46 36.9		046
305	1986 09	05.89479	21 07 26.73	-10 46 39.2		046
314	1986 09	02.99722	22 58 46.50	-03 35 02.4		046
314	1986 09	03.01141	22 58 45.94	-03 35 11.4		046
314	1986 09	05.01042	22 57 30.76	-03 54 45.2		046
314	1986 09	05.02465	22 57 30.12	-03 54 53.6		046
314	1986 09	05.94965	22 56 55.33	-04 03 59.8		046
314	1986 09	05.96389	22 56 54.77	-04 04 08.1		046
342	1986 08	26.82887	21 13 35.00	-04 09 16.8		046
342	1986 08	26.84299	21 13 34.27	-04 09 21.3		046
342	1986 09	02.85449	21 08 14.71	-04 45 51.8		046
342	1986 09	02.86120	21 08 15.33	-04 45 47.1		046
489	1986 09	08.92878	22 41 40.32	-06 18 19.9		046
489	1986 09	08.94308	22 41 39.76	-06 18 26.3		046
791	1986 07	28.92187	19 41 57.53	-16 03 42.1		046
797	1986 08	05.96395	21 08 39.10	-08 48 21.4		046
797	1986 08	05.97743	21 08 38.32	-08 48 25.4		046
1228	1986 09	02.96389	22 40 18.23	-05 32 33.1		046
1228	1986 09	02.97813	22 40 17.71	-05 32 37.0		046
1228	1986 09	04.97778	22 38 37.56	-05 40 52.4		046
1228	1986 09	04.99201	22 38 36.99	-05 40 55.1		046
1228	1986 09	05.91632	22 37 50.99	-05 44 44.0		046
1228	1986 09	05.93056	22 37 50.25	-05 44 46.8		046
1228	1986 09	08.89481	22 35 23.96	-05 57 02.2		046
1228	1986 09	08.90199	22 35 23.19	-05 57 05.6		046
1570	1986 09	02.99722	22 58 47.30	-05 14 18.4	16.7	046
1570	1986 09	03.01141	22 58 46.70	-05 14 22.3		046
1570	1986 09	05.01042	22 57 13.00	-05 25 09.2		046
1570	1986 09	05.02465	22 57 12.26	-05 25 14.8		046
1570	1986 09	05.94965	22 56 28.91	-05 30 13.9		046
1570	1986 09	05.96389	22 56 28.06	-05 30 19.1		046
1613	1986 09	04.97778	22 34 35.62	-04 36 03.3		046
1613	1986 09	04.99201	22 34 34.73	-04 36 05.5		046
1613	1986 09	05.91632	22 33 42.72	-04 38 44.6		046
1613	1986 09	05.93056	22 33 41.99	-04 38 47.5		046
1613	1986 09	08.89481	22 30 55.31	-04 47 26.2		046
1613	1986 09	08.90199	22 30 54.52	-04 47 27.9		046
2366	1986 09	05.98750	23 09 32.12	-04 04 31.4		046
2366	1986 09	06.00174	23 09 31.14	-04 04 36.7		046

2371		1986	09	02.99722	22	49	39.68	-04	21	10.4		046
2371		1986	09	03.01141	22	49	38.83	-04	21	14.8		046
2371		1986	09	05.01042	22	47	51.48	-04	32	42.7		046
2371		1986	09	05.02465	22	47	50.89	-04	32	46.1		046
2371		1986	09	05.94965	22	47	01.33	-04	38	05.3		046
2371		1986	09	05.96389	22	47	00.55	-04	38	09.9		046
2371		1986	09	08.92878	22	44	23.00	-04	55	18.7		046
2371		1986	09	08.94308	22	44	22.23	-04	55	23.7		046
2413		1986	09	02.99722	22	59	39.61	-05	12	06.8		046
2413		1986	09	03.01141	22	59	39.10	-05	12	13.6		046
2413		1986	09	05.01042	22	58	15.98	-05	28	19.5		046
2413		1986	09	05.02465	22	58	15.35	-05	28	26.1		046
2413		1986	09	05.94965	22	57	36.82	-05	35	53.6		046
2413		1986	09	05.96389	22	57	36.10	-05	36	02.3		046
2665		1986	08	03.91111	20	53	09.55	-12	16	52.5		046
2791		1986	09	02.96389	22	33	35.09	-06	14	32.0		046
2791		1986	09	02.97813	22	33	33.81	-06	14	27.1		046
3000		1986	09	05.98750	23	08	39.95	-01	56	03.4	16.0	046
3000		1986	09	06.00174	23	08	39.12	-01	56	09.6		046
3048		1986	09	05.98750	23	09	47.23	-02	49	27.0		046
3048		1986	09	06.00174	23	09	46.55	-02	49	32.0		046
1965	UZ	1986	09	02.99722	22	56	21.08	-05	18	44.4		046
1965	UZ	1986	09	03.01141	22	56	20.38	-05	18	46.7		046
1965	UZ	1986	09	05.01042	22	54	35.72	-05	27	23.5		046
1965	UZ	1986	09	05.02465	22	54	34.71	-05	27	26.3		046
1965	UZ	1986	09	05.94965	22	53	46.47	-05	31	25.2		046
1965	UZ	1986	09	05.96389	22	53	45.55	-05	31	29.7		046
1965	UZ	1986	09	08.92878	22	51	10.50	-05	44	13.7		046
1965	UZ	1986	09	08.94308	22	51	09.86	-05	44	16.7		046
1976	SE1	1986	09	04.97778	22	36	29.79	-05	47	06.2		046
1976	SE1	1986	09	04.99201	22	36	28.97	-05	47	13.9		046
1976	SE1	1986	09	05.91632	22	35	40.45	-05	54	12.3		046
1976	SE1	1986	09	05.93056	22	35	39.59	-05	54	19.0		046
1976	SE1	1986	09	08.89481	22	33	05.74	-06	16	38.5		046
1976	SE1	1986	09	08.90199	22	33	05.16	-06	16	40.5		046
1986	OG	1986	07	30.96848	20	52	20.70	-18	23	10.0		046
1986	PF4	1986	09	04.93264	21	09	33.17	-09	14	58.9	16.4	046
1986	PF4	1986	09	04.94688	21	09	32.72	-09	14	56.7		046
1986	PF4	1986	09	05.88056	21	09	07.82	-09	12	31.1		046
1986	PF4	1986	09	05.89479	21	09	07.46	-09	12	28.2		046
1986	QC *	1986	08	26.82887	21	09	26.72	-05	16	01.7	16.4	046
1986	QC	1986	08	26.84299	21	09	25.87	-05	15	55.6		046
1986	QD *	1986	08	26.82887	21	11	55.90	-03	40	54.5	16.2	046
1986	QD	1986	08	26.84299	21	11	55.12	-03	40	52.3		046
1986	QE *	1986	08	26.82887	21	14	13.35	-04	14	36.6	16.5	046
1986	QE	1986	08	26.84299	21	14	12.67	-04	14	42.2		046
1986	QF *	1986	08	26.82887	21	16	17.03	-06	15	12.1	16.7	046
1986	QF	1986	08	26.84299	21	16	16.27	-06	15	15.6		046
1986	QG *	1986	08	26.82887	21	16	55.70	-05	23	18.3	16.8	046
1986	QG	1986	08	26.84299	21	16	54.93	-05	23	15.9		046
1986	RM	1986	09	05.98750	23	08	22.03	-03	06	47.0	16.0	046
1986	RM	1986	09	06.00174	23	08	21.34	-03	06	48.0		046
1986	RD1 *	1986	09	02.96389	22	27	53.17	-04	04	32.6	16.2	046
1986	RD1	1986	09	02.97813	22	27	52.32	-04	04	33.7		046
1986	RD1	1986	09	04.97778	22	26	03.53	-04	06	13.4		046
1986	RD1	1986	09	04.99201	22	26	02.68	-04	06	15.2		046
1986	RE1 *	1986	09	02.96389	22	31	37.28	-03	45	14.4	16.5	046
1986	RE1	1986	09	02.97813	22	31	36.49	-03	45	21.0		046
1986	RE1	1986	09	04.97778	22	30	18.93	-04	00	14.0		046

1986	RE1		1986	09	04.99201	22	30	18.37	-04	00	19.7	046
1986	RE1		1986	09	05.91632	22	29	43.19	-04	07	19.0	046
1986	RE1		1986	09	05.93056	22	29	42.71	-04	07	25.2	046
1986	RE1		1986	09	08.89481	22	27	52.70	-04	30	03.1	046
1986	RE1		1986	09	08.90199	22	27	52.19	-04	30	07.2	046
1986	RF1	*	1986	09	02.96389	22	34	47.88	-04	15	06.3	17.0 046
1986	RF1		1986	09	02.97813	22	34	47.09	-04	15	11.4	046
1986	RG1	*	1986	09	02.99722	22	50	15.71	-06	02	24.2	16.4 046
1986	RG1		1986	09	03.01141	22	50	15.04	-06	02	26.6	046
1986	RG1		1986	09	05.01042	22	48	41.82	-06	13	39.1	046
1986	RG1		1986	09	05.02465	22	48	41.08	-06	13	43.1	046
1986	RG1		1986	09	05.94965	22	47	58.18	-06	18	52.9	046
1986	RG1		1986	09	05.96389	22	47	57.44	-06	18	57.4	046
1986	RG1		1986	09	08.92878	22	45	40.19	-06	35	31.7	046
1986	RG1		1986	09	08.94308	22	45	39.50	-06	35	36.3	046
1986	RH1	*	1986	09	02.99722	22	53	15.35	-04	26	39.6	16.7 046
1986	RH1		1986	09	03.01141	22	53	14.68	-04	26	43.2	046
1986	RH1		1986	09	05.01042	22	51	21.71	-04	38	12.4	046
1986	RH1		1986	09	05.02465	22	51	20.91	-04	38	16.3	046
1986	RH1		1986	09	05.94965	22	50	29.10	-04	43	32.4	046
1986	RH1		1986	09	05.96389	22	50	28.28	-04	43	38.1	046
1986	RH1		1986	09	08.92878	22	47	44.09	-05	00	29.8	046
1986	RH1		1986	09	08.94308	22	47	43.46	-05	00	34.4	046
1986	RJ1	*	1986	09	02.99722	22	55	57.63	-07	11	43.6	16.8 046
1986	RJ1		1986	09	03.01141	22	55	57.02	-07	11	43.9	046
1986	RJ1		1986	09	05.01042	22	54	09.17	-07	10	43.0	046
1986	RJ1		1986	09	05.02465	22	54	08.46	-07	10	41.1	046
1986	RJ1		1986	09	05.94965	22	53	18.67	-07	10	09.6	046
1986	RJ1		1986	09	05.96389	22	53	17.69	-07	10	10.0	046
1986	RJ1		1986	09	08.92878	22	50	39.09	-07	08	20.1	046
1986	RJ1		1986	09	08.94308	22	50	38.26	-07	08	20.7	046
1986	RK1	*	1986	09	02.99722	22	58	36.25	-06	08	44.0	16.8 046
1986	RK1		1986	09	03.01141	22	58	35.78	-06	08	44.8	046
1986	RK1		1986	09	05.01042	22	57	03.89	-06	22	44.8	046
1986	RK1		1986	09	05.02465	22	57	03.19	-06	22	51.2	046
1986	RK1		1986	09	05.94965	22	56	20.64	-06	29	20.0	046
1986	RK1		1986	09	05.96389	22	56	19.94	-06	29	24.1	046
1986	RL1	*	1986	09	03.01141	22	49	07.10	-04	33	50.1	16.5 046
1986	RL1		1986	09	05.01042	22	47	43.44	-04	44	03.6	046
1986	RL1		1986	09	05.02465	22	47	42.86	-04	44	07.7	046
1986	RL1		1986	09	05.94965	22	47	04.58	-04	48	52.0	046
1986	RL1		1986	09	05.96389	22	47	03.93	-04	48	56.1	046
1986	RL1		1986	09	08.92878	22	45	02.91	-05	04	15.2	046
1986	RL1		1986	09	08.94308	22	45	02.34	-05	04	20.2	046
1986	RM1	*	1986	09	03.01141	22	54	56.98	-05	32	24.9	046
1986	RN1	*	1986	09	04.97778	22	33	06.88	-06	19	49.1	17.0 046
1986	RN1		1986	09	04.99201	22	33	05.93	-06	19	43.0	046
1986	RO1	*	1986	09	04.97778	22	34	01.05	-05	59	39.0	046
1986	RO1		1986	09	04.99201	22	34	00.20	-05	59	43.9	046
1986	RO1		1986	09	05.91632	22	33	05.91	-06	04	36.1	046
1986	RO1		1986	09	05.93056	22	33	05.07	-06	04	42.0	046
1986	RP1	*	1986	09	04.97778	22	37	22.18	-05	05	17.6	16.9 046
1986	RP1		1986	09	04.99201	22	37	21.61	-05	05	20.6	046
1986	RP1		1986	09	05.91632	22	36	38.66	-05	11	24.1	046
1986	RP1		1986	09	05.93056	22	36	38.02	-05	11	28.1	046
1986	RQ1	*	1986	09	05.01042	22	50	52.36	-03	13	35.1	16.1 046
1986	RQ1		1986	09	05.02465	22	50	51.62	-03	13	40.0	046
1986	RR1	*	1986	09	05.01042	22	59	01.97	-06	05	23.8	046
1986	RR1		1986	09	05.02465	22	59	01.02	-06	05	21.1	046

1986	RS1	*	1986	09	05.94965	22	58	53.95	-06	30	16.4	046
1986	RS1		1986	09	05.96389	22	58	53.23	-06	30	26.1	046
1986	RT1	*	1986	09	05.96395	21	06	30.59	-07	24	07.2	046
1986	RT1		1986	09	05.97743	21	06	29.68	-07	24	13.1	046
1986	RU1	*	1986	09	05.98750	23	16	54.50	-04	19	54.3	16.3 046
1986	RU1		1986	09	06.00174	23	16	53.93	-04	20	05.4	046
1986	RV1	*	1986	09	05.98750	23	21	11.88	-04	15	52.3	16.4 046
1986	RV1		1986	09	06.00174	23	21	11.14	-04	16	03.2	046
1986	RW1	*	1986	09	08.92878	22	42	37.20	-05	18	25.3	16.8 046
1986	RW1		1986	09	08.94308	22	42	36.30	-05	18	27.3	046

OBSERVATIONS MADE AT BRORFELDE BY K. AUGUSTESEN AND P. JENSEN.
Plates with the 0.45-m (45/77/150-cm) Schmidt telescope scanned and measured by P. Jensen. Contact: H. J. Fogh Olsen, Copenhagen University Observatory, Brorfelde, DK-4340 Tollose, Denmark.

Object		Date	UT	R. A. (1950)			Decl.			Mag.	Obs.
400		1986	10 03.92907	23	53	30.17	+09	09	55.8		054
400		1986	10 04.94836	23	52	44.48	+09	06	19.9		054
516		1986	09 08.98586	23	06	41.00	+01	07	50.9		054
516		1986	09 11.88100	23	03	51.44	+01	00	42.1		054
635		1986	09 08.98586	23	05	32.22	-00	36	38.6		054
635		1986	09 11.88100	23	03	35.59	-00	59	20.6		054
635		1986	09 12.94182	23	02	53.12	-01	07	42.0		054
1112		1986	09 08.95738	23	04	16.80	+04	53	42.8		054
1112		1986	09 11.90252	23	01	50.48	+04	46	07.2		054
1112		1986	09 12.91890	23	01	00.22	+04	43	18.9		054
1324		1986	09 12.94182	22	50	54.79	-00	48	44.3		054
1683		1986	09 08.95738	23	14	52.92	+04	20	25.9		054
1683		1986	09 11.90252	23	11	55.06	+04	21	32.6		054
1683		1986	09 12.91890	23	10	53.79	+04	21	41.5		054
1721		1986	09 09.01502	23	28	53.27	+12	07	46.5		054
2285		1986	09 11.97475	00	02	18.35	-03	22	09.3		054
2471		1986	09 11.97475	00	17	55.76	-03	27	55.5		054
2519		1986	09 11.97475	00	14	55.60	-02	31	45.1		054
3000		1986	09 08.98586	23	06	15.78	-02	16	43.2		054
3000		1986	09 12.94182	23	03	04.77	-02	44	57.6		054
3065		1986	10 03.92907	23	57	34.31	+06	03	22.9		054
3065		1986	10 04.94836	23	56	44.97	+05	58	17.6		054
3486		1986	09 11.97475	00	12	25.77	-03	36	05.4	16.6	054
A919	SD	1986	09 08.98586	23	03	38.54	-00	35	16.2	14.5	054
A919	SD	1986	09 11.88100	23	00	57.37	-00	41	40.0		054
A919	SD	1986	09 12.94182	22	59	59.22	-00	44	07.7		054
1964	UO	1986	09 11.94766	23	20	13.80	+11	24	26.0	16.5	054
1978	UH2	1986	09 11.92475	23	08	11.91	+13	28	54.2	16.2	054
1981	EG14	1986	09 08.95738	23	02	14.13	+04	01	05.2	17.0	054
1981	EG14	1986	09 11.90252	22	59	40.79	+03	39	06.4		054
1981	RU2	1986	09 09.01502	23	36	04.83	+12	30	40.6	16.6	054
1986	RD	* 1986	09 08.95738	23	06	02.22	+03	49	04.2	16.6	054
1986	RD	1986	09 11.90252	23	03	57.88	+03	25	35.9		054
1986	RE	* 1986	09 08.95738	23	12	39.63	+04	16	08.3	17.5	054
1986	RF	* 1986	09 08.95738	23	14	50.02	+03	59	58.5	16.7	054
1986	RF	1986	09 11.90252	23	12	35.07	+03	29	36.5		054
1986	RG	* 1986	09 08.98586	22	57	40.15	-00	34	17.4	16.8	054
1986	RG	1986	09 12.94182	22	53	30.15	-00	26	34.3	16.8	054
1986	RH	* 1986	09 08.98586	23	00	55.75	-01	01	15.7	16.7	054
1986	RH	1986	09 11.88100	22	58	05.92	-01	14	27.1		054
1986	RJ	* 1986	09 08.98586	23	11	48.62	+01	13	49.1	15.6	054
1986	RJ	1986	09 11.88100	23	09	15.22	+00	57	20.6		054
1986	RK	* 1986	09 11.92475	23	19	42.74	+11	35	01.7	16.3	054

1986	RK		1986	09	11.94766	23	19	41.60	+11	34	49.8		054
1986	RL	*	1986	09	11.92475	23	20	27.66	+12	00	48.6	16.5	054
1986	RL		1986	09	11.94766	23	20	26.72	+12	00	42.3		054
1986	RM	*	1986	09	08.98586	23	05	32.03	-03	14	21.8	15.5	054
1986	RM		1986	09	12.94182	23	01	45.84	-03	24	58.4		054
1986	RN	*	1986	09	09.01502	23	29	52.90	+11	50	04.9	16.7	054
1986	RO	*	1986	09	09.01502	23	35	46.32	+10	44	32.6	16.7	054
1986	RP	*	1986	09	11.90252	23	14	08.30	+04	47	02.1	16.8	054
1986	RP		1986	09	12.91890	23	13	16.50	+04	41	15.2		054
1986	RQ	*	1986	09	11.99627	00	13	00.26	+12	28	51.6	16.3	054
1986	RQ		1986	10	03.92907	23	57	30.52	+08	10	00.3	16.5	054
1986	RG2	*	1986	09	11.97475	00	15	15.11	-05	36	34.5	16.5	054
1986	RH2	*	1986	09	11.97475	00	17	42.28	-01	59	23.1	17.0	054
1986	RJ2	*	1986	09	12.94182	22	51	27.73	-00	59	35.2	17.0	054
1986	TE	*	1986	10	03.92907	23	48	54.78	+08	15	31.7	17.0	054
1986	TE		1986	10	04.94836	23	48	03.58	+08	08	46.5		054
1986	TF	*	1986	10	03.92907	23	51	40.61	+06	00	11.9	17.0	054
1986	TF		1986	10	04.94836	23	51	04.57	+05	55	14.5		054
1986	TG	*	1986	10	03.92907	23	55	47.64	+05	46	56.4	16.2	054
1986	TG		1986	10	04.94836	23	54	48.15	+05	47	57.8		054
1986	TH	*	1986	10	03.92907	00	00	43.37	+09	26	45.9	16.9	054
1986	TH		1986	10	04.94836	23	59	46.44	+09	22	22.9		054
1986	TJ	*	1986	10	03.92907	00	00	45.42	+09	04	50.2	17.0	054
1986	TJ		1986	10	04.94836	00	00	02.88	+08	56	27.5		054
1986	TK	*	1986	10	03.92907	00	02	48.58	+07	27	31.3	17.3	054
1986	TK		1986	10	04.94836	00	02	04.40	+07	18	28.4		054
1986	TL	*	1986	10	03.95414	00	36	37.11	+19	24	25.5	16.2	054
1986	TL		1986	10	04.96850	00	35	46.73	+19	20	48.6		054

OBSERVATIONS MADE AT THE BULGARIAN NATIONAL OBSERVATORY BY E. W. ELST AND V. G. IVANOVA.

Plates taken by E. W. Elst and V. Ivanova, measured by G. Peeters, reduced by Elst. Contact: E. W. Elst, Royal Observatory, B-1180 Brussels, Belgium.

Object	Date	UT	R. A. (1950)	Decl.	Mag.	Obs.
38	1986 08	08.05855	02 15 19.28	+21 46 56.2		071
38	1986 08	08.07778	02 15 20.11	+21 47 04.1		071
173	1986 08	08.03880	21 52 01.24	-09 53 13.4		071
338	1986 09	05.95562	21 48 21.67	-06 23 08.0		071
338	1986 09	05.97340	21 48 20.97	-06 23 10.9		071
676	1986 08	08.03880	22 02 30.31	-09 33 24.0		071
676	1986 08	09.92661	22 01 19.61	-09 49 40.2		071
676	1986 08	09.94520	22 01 18.97	-09 49 48.7		071
678	1986 08	08.07778	02 19 45.56	+21 42 04.4		071
1256	1986 08	08.03880	22 04 17.18	-05 51 30.5		071
1256	1986 09	05.95562	21 46 36.30	-07 27 41.5		071
1256	1986 09	05.97340	21 46 35.86	-07 27 43.3		071
1339	1986 08	08.05855	02 06 31.65	+23 04 30.1		071
1339	1986 08	08.07778	02 06 32.48	+23 04 36.8		071
1466	1986 08	08.03880	21 55 12.46	-07 27 19.2		071
1659	1986 08	08.05855	02 05 34.34	+23 43 03.1		071
1659	1986 08	08.07778	02 05 35.65	+23 43 23.4		071
1659	1986 08	09.07882	02 06 37.54	+24 00 02.5	15	071
1659	1986 08	09.96639	02 07 31.93	+24 14 46.2	15	071
1659	1986 08	09.98771	02 07 33.24	+24 15 08.3	15	071
1737	1986 08	09.92661	22 10 00.94	-11 44 35.7		071
1737	1986 08	09.94520	22 10 00.02	-11 44 37.0		071
2108	1986 08	08.05855	02 03 47.97	+22 03 14.2		071
2108	1986 08	08.07778	02 03 48.80	+22 03 26.6		071

2412		1986	08	09.89113	22	11	20.00	-06	12	26.5	071
2412		1986	08	09.90855	22	11	19.06	-06	12	27.1	071
2412		1986	09	05.95562	21	47	25.03	-06	54	43.4	071
2412		1986	09	05.97340	21	47	24.33	-06	54	43.8	071
2694		1986	08	08.03880	21	58	39.66	-09	29	25.9	071
1986 PW		1986	08	08.03880	22	04	04.94	-07	19	50.3	071
1986 PW		1986	08	09.89113	22	02	17.89	-07	23	45.9	071
1986 PW		1986	08	09.90855	22	02	16.86	-07	23	47.4	071
1986 PX		1986	08	08.03880	22	04	29.19	-06	24	40.9	071
1986 PX		1986	08	08.98102	22	03	51.33	-06	28	56.4	071
1986 PX		1986	08	08.99919	22	03	50.45	-06	29	02.9	071
1986 PX		1986	08	09.01759	22	03	49.65	-06	29	06.4	071
1986 PX		1986	08	09.89113	22	03	13.52	-06	33	11.8	071
1986 PX		1986	08	09.90855	22	03	12.79	-06	33	18.2	071
1986 PY		1986	08	08.03880	22	06	43.82	-09	51	26.9	071
1986 PY		1986	08	09.92661	22	06	03.44	-10	15	56.2	071
1986 PY		1986	08	09.94520	22	06	02.92	-10	16	09.9	071
1986 PX3		1986	08	09.92661	22	04	29.05	-11	19	24.8	071
1986 PX3		1986	08	09.94520	22	04	28.06	-11	19	22.1	071
1986 PM4	*	1986	08	08.98102	22	00	38.02	-03	36	06.8	16 071
1986 PM4		1986	08	08.99919	22	00	37.10	-03	36	03.5	16 071
1986 PM4		1986	08	09.01759	22	00	36.12	-03	36	03.0	16 071
1986 PN4	*	1986	08	08.98102	22	12	28.94	-03	16	23.5	16 071
1986 PN4		1986	08	08.99919	22	12	27.98	-03	16	18.2	16 071
1986 PN4		1986	08	09.01759	22	12	27.04	-03	16	14.8	16 071
1986 PO4	*	1986	08	09.07882	02	02	57.82	+24	24	18.2	17 071
1986 PO4		1986	08	09.96639	02	03	35.61	+24	34	57.2	17 071
1986 PO4		1986	08	09.98771	02	03	36.47	+24	35	13.8	17 071
1986 PP4	*	1986	08	09.07882	02	10	13.94	+24	10	39.0	17 071
1986 PP4		1986	08	09.96639	02	10	45.88	+24	18	40.4	17 071
1986 PP4		1986	08	09.98771	02	10	46.62	+24	18	51.6	17 071
1986 PQ4	*	1986	08	09.89113	22	06	44.92	-06	23	32.5	17 071
1986 PQ4		1986	08	09.90855	22	06	44.26	-06	23	47.5	17 071
1986 PS4	*	1986	08	09.92661	21	59	50.38	-10	27	37.5	071
1986 PS4		1986	08	09.94520	21	59	49.41	-10	27	37.3	071
1986 RR	*	1986	09	05.95562	21	35	38.61	-06	39	28.8	071
1986 RR		1986	09	05.97340	21	35	37.98	-06	39	36.3	071
1986 RS	*	1986	09	05.95562	21	37	16.74	-04	09	09.8	071
1986 RS		1986	09	05.97340	21	37	15.32	-04	09	12.2	071
1986 RT	*	1986	09	05.95562	21	49	31.36	-03	44	06.8	071
1986 RT		1986	09	05.97340	21	49	30.61	-03	44	17.0	071

OBSERVATIONS MADE AT PIWNICE BY M. ANTAL.

Plates taken with the 0.6-m (60/90/180-cm) Schmidt. Contact: M. Antal, Rastislavova 2, C-92101 Piestany, Czechoslovakia.

Object		Date	UT	R. A. (1950)	Decl.	Mag.	Obs.
1986 TD	*	1986	10 05.05144	03 27 16.1	+28 56 06	17.0	092
1986 TD		1986	10 05.11875	03 27 13.2	+28 57 42		092
1986 TD		1986	10 09.01881	03 24 33.4	+30 37 42	16.7	092
1986 TD		1986	10 09.13333	03 24 24.2	+30 40 48		092

OBSERVATIONS MADE AT THE CRIMEAN ASTROPHYSICAL OBSERVATORY BY N. S. CHERNYKH, L. I. CHERNYKH, L. G. KARACHKINA AND L. V. ZHURAVLEVA.

Contact: G. R. Kastel', Institute for Theoretical Astronomy, Naberezhnaya Kutuzova 10, 191187 Leningrad, U.S.S.R.

Object	Date	UT	R. A. (1950)	Decl.	Mag.	Obs.
1986 RB	1986	08 09.94784	23 16 22.31	-08 14 58.6	15.0	095
1986 RB	1986	08 12.95570	23 12 54.38	-07 24 16.8	15.0	095
1986 RB	1986	08 13.96193	23 11 39.68	-07 07 08.0	15.0	095

1986 RB		1986 08 29.92286	22 47 00.08	-02 22 00.2				15.0		095
1986 RB		1986 09 06.90472	22 32 47.66	+00 01 04.0				15.0		095
1986 RC2	*	1986 09 09.85693	22 11 20.32	+12 33 07.0				14.0		095
1986 RC2		1986 09 13.95749	22 08 55.69	+10 22 36.7				14.0		095
1986 RC2		1986 09 14.97236	22 08 23.78	+09 49 42.6				14.0		095
1986 RC2		1986 09 16.03410	22 07 51.94	+09 15 07.7				14.0		095

OBSERVATIONS MADE AT THE BURLINGTON REMOTE SITE BY T. HANDLEY.
Contact: T. Handley, 13 Linden Avenue, Burlington, NJ 08016, U.S.A.

Object	Date	UT	R. A. (1950)	Decl.	Obs.
2132	1986 01	12.29306	07 34 01.11	+26 17 37.5	293
2132	1986 01	12.30625	07 34 00.30	+26 17 41.3	293
3401	1986 01	12.33785	07 51 36.66	+50 21 27.7	293
3401	1986 01	12.34479	07 51 35.62	+50 21 17.7	293
3463	1986 01	12.29306	07 30 07.07	+26 46 54.0	293
3463	1986 01	12.30625	07 30 06.05	+26 46 55.3	293
1983 RD	1986 08	31.14965	19 19 14.24	+00 40 48.1	293
1983 RD	1986 08	31.15799	19 19 14.51	+00 40 36.7	293

OBSERVATIONS MADE AT UENOHARA BY N. KAWASATO.
Films taken with 0.20-m f/6 reflector. Contact: S. Nakano, Smithsonian Astrophysical Observatory, Cambridge, MA 02138, U.S.A.

Object	Date	UT	R. A. (1950)	Decl.	Obs.
A919 SD	1986 08	28.54201	23 14 05.04	-00 18 56.1	376
A919 SD	1986 08	28.57813	23 14 03.35	-00 18 59.7	376

OBSERVATIONS MADE AT SIDING SPRING.
Plates taken by C. Humphries with the 1.2-m U.K. Schmidt. Contact: E. Helin, MS 183-501, Jet Propulsion Laboratory, Pasadena, CA 91109, U.S.A.

Object	Date	UT	R. A. (1950)	Decl.	Obs.
1986 NF1	1986 07	06.58247	19 12 02.01	-22 16 33.6	413
1986 NF1	1986 07	06.63455	19 11 58.93	-22 16 55.9	413
1986 NF1	1986 07	12.57939	19 06 02.53	-23 03 42.5	413
1986 NG1	1986 07	06.58247	19 13 03.82	-24 34 55.6	413
1986 NG1	1986 07	06.63455	19 13 00.88	-24 35 26.3	413
1986 NG1	1986 07	12.57939	19 07 30.86	-25 34 43.3	413
1986 NH1	1986 07	06.58247	19 20 13.85	-24 18 58.8	413
1986 NH1	1986 07	06.63455	19 20 11.00	-24 18 51.7	413

OBSERVATIONS MADE AT MOUNT JOHN UNIVERSITY OBSERVATORY.
Plates taken with the 0.6-m f/14 Cassegrain reflector by A. C. Gilmore, measured by P. M. Kilmartin. Computational support from R. McIntosh and W. M. Kissling. Reductions using field plates from the Carter Observatory, AGK3, SAO Catalog and Cape Photographic Catalogue. Contact: A. C. Gilmore, P.O. Box 57, Lake Tekapo, New Zealand.

Object	Date	UT	R. A. (1950)	Decl.	Mag.	N	Obs.
1566	1986 06	13.57969	20 29 08.36	-27 55 58.8			474
1566	1986 06	13.60596	20 28 58.89	-27 57 08.6			474
1685	1986 05	12.39598	13 38 32.60	-26 04 51.4			474
1685	1986 05	12.40912	13 38 31.39	-26 04 40.6			474
3199	1986 08	30.44265	23 56 18.73	+05 00 15.4	14.1	1	474
3199	1986 08	30.45480	23 56 15.25	+05 01 40.6		1	474
3314	1985 09	17.50676	18 49 30.03	-30 37 02.0			474
3314	1985 09	17.52898	18 49 31.01	-30 36 53.9			474
3314	1985 09	18.47766	18 50 18.02	-30 31 26.8			474
3314	1985 09	18.50273	18 50 19.53	-30 31 16.5			474
1981 RV3	1986 08	30.50399	21 26 06.91	-16 38 08.3	16	1	474
1981 RV3	1986 08	30.55413	21 26 04.93	-16 38 20.1		1	474

1983 EA		1986 05 14.54442	15 31 11.92	-55 36 48.3								474
1983 EA		1986 05 14.57995	15 31 06.77	-55 37 01.8								474
1983 PA		1986 05 14.43719	14 04 38.82	-40 41 01.0								474
1983 PA		1986 05 14.46346	14 04 36.94	-40 40 48.5								474
1983 PB		1986 05 08.57625	15 42 45.01	-15 20 00.8								474
1983 PB		1986 05 08.60791	15 42 42.92	-15 19 59.9								474
1983 PB		1986 05 14.61826	15 36 10.01	-15 18 48.1								474
1983 PB		1986 05 14.65084	15 36 07.78	-15 18 48.2								474
1984 WK		1986 05 12.43348	14 02 46.91	-40 43 12.3								474
1984 WK		1986 05 12.45148	14 02 45.62	-40 42 56.0								474
1984 YC		1986 05 08.65252	18 17 22.40	-45 42 06.4								474
1984 YC		1986 05 08.69222	18 17 20.67	-45 42 05.2								474
1984 YC		1986 06 13.52384	17 37 01.65	-43 35 27.5								474
1986 JK		1986 05 15.39355	15 38 22.23	-16 30 38.7								474
1986 JK		1986 05 15.40669	15 38 24.84	-16 30 56.8								474
1986 QA	*	1986 08 30.50399	21 14 01.40	-16 44 25.3						16	1	474
1986 QA		1986 08 30.55413	21 13 59.34	-16 44 38.3							1	474
1986 QB	*	1986 08 30.50399	21 16 55.76	-17 49 57.5						17	1	474
1986 QB		1986 08 30.55413	21 16 54.53	-17 49 49.9							1	474

Note 1: plates taken with the 0.25-m astrograph.

OBSERVATIONS MADE AT ST. ANDREWS BY F. VINCENT.

Plates taken with the 0.94-m Schmidt Cassegrain. Contact: F. Vincent, Mills Observatory, Balgay Park, Glamis Road, Dundee DD2 2UB, Scotland.

Object	Date	UT	R. A. (1950)	Decl.	Obs.
87	1973 11	23.23062	06 40 00.22	+26 59 30.1	482
87	1973 11	28.05664	06 37 29.58	+27 15 34.0	482
87	1973 12	24.03171	06 17 47.96	+28 34 58.3	482
87	1973 12	26.05188	06 16 02.07	+28 39 57.5	482
87	1973 12	30.06900	06 12 32.25	+28 49 07.8	482
87	1974 01	15.86139	05 59 10.10	+29 16 36.1	482
87	1974 01	17.81998	05 57 50.55	+29 18 42.8	482
107	1973 11	28.03795	06 48 54.40	+09 37 44.0	482
107	1973 12	23.17388	06 33 15.15	+09 18 36.3	482
107	1973 12	26.02902	06 31 04.14	+09 20 30.8	482
107	1973 12	30.05019	06 27 57.55	+09 24 39.4	482
107	1974 01	15.84517	06 15 43.17	+09 58 33.5	482
107	1974 01	17.80139	06 14 28.54	+10 04 03.2	482
334	1972 01	12.03657	05 40 35.55	+19 32 21.7	482
334	1972 01	14.90380	05 38 57.70	+19 34 37.5	482
334	1972 01	14.93427	05 38 56.94	+19 34 38.7	482
334	1972 01	19.98848	05 36 20.96	+19 38 50.0	482
334	1972 01	20.01203	05 36 20.24	+19 38 52.3	482
334	1972 01	20.03800	05 36 19.71	+19 38 54.3	482
334	1972 01	20.96382	05 35 53.62	+19 39 43.0	482
334	1973 02	07.05569	09 17 34.26	+16 27 05.8	482
334	1973 02	27.15968	09 04 59.91	+17 37 36.4	482
334	1973 02	28.15279	09 04 27.37	+17 40 35.3	482
334	1973 03	04.92861	09 02 00.88	+17 54 02.4	482
334	1973 03	08.11640	09 00 32.70	+18 02 09.7	482
414	1973 10	22.91186	04 57 22.47	+12 58 57.6	482
414	1973 10	22.93299	04 57 22.22	+12 58 56.7	482
414	1973 10	26.95876	04 56 12.18	+12 54 01.6	482
414	1973 10	27.00205	04 56 11.27	+12 53 59.7	482
414	1973 10	29.08801	04 55 26.46	+12 51 31.6	482
414	1973 11	23.19046	04 40 18.81	+12 30 59.7	482
414	1973 11	28.01787	04 36 31.69	+12 30 12.3	482
414	1973 12	24.00850	04 17 04.77	+12 52 56.3	482

414		1974	01	15.82336	04	08	07.96	+13	53	40.7	482
909		1971	12	22.05566	08	14	10.72	+06	13	44.1	482
909		1971	12	22.08544	08	14	09.88	+06	13	47.8	482
909		1971	12	22.19979	08	14	06.52	+06	14	03.3	482
909		1971	12	23.09966	08	13	40.19	+06	16	13.5	482
909		1971	12	24.20351	08	13	06.70	+06	19	02.4	482
909		1972	01	20.11037	07	55	31.49	+08	12	27.7	482
909		1972	01	20.14223	07	55	30.24	+08	12	39.0	482
909		1972	01	20.99499	07	54	53.20	+08	17	25.4	482
909		1972	02	10.98866	07	41	04.26	+10	26	18.7	482
909		1972	02	11.91668	07	40	34.06	+10	32	14.6	482
909		1972	02	12.88071	07	40	03.42	+10	38	23.0	482
909		1972	02	12.90356	07	40	02.75	+10	38	32.2	482
909		1972	02	13.86135	07	39	33.20	+10	44	38.3	482
909		1972	02	14.83785	07	39	03.85	+10	50	51.9	482
909		1973	02	07.02591	12	05	05.64	+09	03	35.8	482
909		1973	02	07.07924	12	05	04.58	+09	03	59.5	482
909		1973	02	10.02949	12	04	15.17	+09	23	57.2	482
909		1973	02	28.17704	11	56	28.59	+11	38	42.4	482
909		1973	03	08.13787	11	51	56.58	+12	39	27.6	482
909		1973	03	24.92455	11	41	39.53	+14	35	31.7	482
909		1973	03	24.93840	11	41	38.98	+14	35	36.8	482
909		1973	03	25.94080	11	41	02.96	+14	41	39.9	482
909		1973	03	31.09862	11	38	02.05	+15	10	57.0	482
909		1973	03	31.11316	11	38	01.55	+15	11	03.7	482
909		1973	04	05.09951	11	35	18.39	+15	35	55.8	482
909		1973	04	05.11405	11	35	17.91	+15	35	59.2	482
1574		1972	09	08.01120	00	37	33.74	+21	47	13.9	482
1574		1972	09	08.06247	00	37	32.04	+21	47	07.1	482
1574		1972	09	09.97390	00	36	31.73	+21	43	10.8	482

OBSERVATIONS MADE AT THE OSSERVATORIO S. VITTORE.

Plates taken by C. Vacchi and G. Sassi; blinked by Vacchi; measured by Vacchi, V. Goretti and E. Colombini. Reduced by Colombini from least-squares plate-constants solutions with five or more AGK3 or SAO reference stars. Contact: E. Colombini, Via S. Vittore 44, I-40136 Bologna, Italy.

Object		Date	UT	R. A. (1950)	Decl.	Mag.	N Obs.
872		1986	10 01.87083	00 13 19.91	+03 20 35.5	15.0	552
872		1986	10 01.88958	00 13 19.11	+03 20 26.6		552
1172		1986	06 27.89375	19 04 37.09	-09 26 42.3		552
1172		1986	06 27.92847	19 04 35.80	-09 26 37.7		552
1978	SA3	1986	09 30.90347	00 08 04.60	+03 36 29.8	15.7	552
1978	SA3	1986	09 30.94306	00 08 03.06	+03 36 21.7		552
1986	OA	1986	08 24.84236	20 16 39.06	-02 19 46.2	17.0	552
1986	OA	1986	08 24.85764	20 16 38.39	-02 19 49.7		552
1986	OA	1986	08 25.84792	20 16 00.24	-02 22 38.8	17.0	552
1986	OA	1986	08 25.86944	20 15 59.36	-02 22 44.3		552
1986	OA	1986	08 29.86597	20 13 39.00	-02 34 45.9	17.0	552
1986	OA	1986	08 29.88403	20 13 38.58	-02 34 48.7		552
1986	TA *	1986	10 01.87083	00 14 48.49	+02 50 02.7	15.3	552
1986	TA	1986	10 01.88958	00 14 47.45	+02 49 59.7		552
1986	TA	1986	10 02.84931	00 14 02.54	+02 47 26.8	15.3	552
1986	TA	1986	10 02.86875	00 14 01.60	+02 47 25.0		552
1986	TB *	1986	10 01.90625	00 03 59.80	+03 22 29.4	16.0	552
1986	TB	1986	10 01.92569	00 03 58.18	+03 22 38.0		552
1986	TB	1986	10 02.88403	00 02 45.90	+03 29 40.1	16.0	552
1986	TB	1986	10 02.90139	00 02 44.52	+03 29 48.0		552
1986	TC *	1986	10 01.94028	00 10 31.08	+04 45 48.8	16.3	552
1986	TC	1986	10 01.95556	00 10 30.05	+04 45 46.4		552

1986 TC	1986 10 02.92153	00 09 32.98	+04 43 49.6		16.3	552
1986 TC	1986 10 02.94583	00 09 31.43	+04 43 45.0			1 552

Note 1: position uncertain; out of focus.

OBSERVATIONS MADE AT MAUNA KEA.

Observations made using the encoders at the Infrared Telescope Facility by D. J. Tholen, D. P. Cruikshank, W. K. Hartmann and W. F. Golisch. SAO reference stars. Contact: D. J. Tholen, Institute for Astronomy, 2680 Woodlawn Drive, Honolulu, HI 96822, U.S.A.

Object	Date	UT	R. A. (1950)	Decl.	Obs.
2074	1986 10	04.44618	22 32 33.20	+23 48 02.4	568
1983 RD	1986 10	01.42917	21 19 47.74	-30 01 33.5	568
1983 RD	1986 10	04.23021	21 44 59.39	-33 11 31.2	568

OBSERVATIONS MADE AT ELDAGSEN BY W. BONK.

Contact: W. Bonk, Nordstrasse 33, D-3257 Springe 3, Federal Republic of Germany.

Object	Date	UT	R. A. (1950)	Decl.	Obs.
978	1986 09	04.86875	22 36 13.60	+21 44 33.5	573
978	1986 09	04.87500	22 36 13.39	+21 44 29.3	573
978	1986 09	04.88056	22 36 13.20	+21 44 25.6	573
978	1986 09	04.88681	22 36 12.99	+21 44 21.4	573
978	1986 09	04.89236	22 36 12.81	+21 44 17.6	573

OBSERVATIONS MADE AT THE CLIMENHAGA OBSERVATORY, VICTORIA, BY D. D. BALAM AND J. B. TATUM.

For details see MPC 10595. Contact: J. B. Tatum, Dept. of Physics, University of Victoria, P.O. Box 1700, Victoria, BC, V8W 2Y2, Canada.

Object	Date	UT	R. A. (1950)	Decl.	Obs.
1833	1986 08	09.37090	21 14 48.93	-09 23 19.0	657
1833	1986 08	14.32125	21 10 58.66	-10 07 28.7	657
3199	1986 09	04.32646	23 30 31.34	+15 14 26.3	657
A919 SD	1986 09	04.37090	23 07 57.07	-00 26 39.6	657
1964 TR1	1986 09	05.31882	23 31 47.64	-07 28 08.2	657
1964 TR1	1986 09	05.39521	23 31 44.27	-07 28 33.0	657
1977 QC4	1986 09	04.38340	00 21 44.05	-08 53 33.1	657
1977 QC4	1986 09	04.41812	00 21 42.96	-08 53 59.3	657
1984 AC1	1986 09	05.36049	01 23 53.52	-05 50 36.5	657
1984 AC1	1986 09	05.42368	01 23 53.74	-05 51 04.1	657
1986 RA	1986 10	02.23792	23 07 36.43	-13 58 01.1	657

OBSERVATIONS MADE WITH THE 1.5-m REFLECTOR AND CCD AT PALOMAR BY J. GIBSON.

Coordination with J. G. Williams and with the Minor Planet Center. AGK3 and SAO reference stars, reduction using Palomar Sky Survey prints. Contact: J. Gibson, Jet Propulsion Laboratory, MS 138-307, Pasadena, CA 91109, U.S.A.

Object	Date	UT	R. A. (1950)	Decl.	Mag.	N	Obs.
1986 EB	1986 06	09.18222	09 42 45.62	-15 46 58.7			675
1986 EB	1986 06	09.18750	09 42 45.98	-15 47 03.9			675
1986 EB	1986 06	10.17951	09 43 55.99	-16 03 19.7			675
1986 EB	1986 06	10.18632	09 43 56.45	-16 03 26.6			675
1986 JK	1986 08	16.47174	03 47 37.16	+15 59 03.6		1	675
1986 JK	1986 08	16.48045	03 47 37.53	+15 59 05.7		1	675
1986 PA	1986 08	15.25486	19 14 25.00	-04 16 00.4			675
1986 PA	1986 08	15.25764	19 14 24.32	-04 16 05.9			675
1986 PA	1986 08	16.30336	19 10 39.55	-04 49 35.6			675
1986 PA	1986 08	16.30694	19 10 38.74	-04 49 42.4			675

Note 1: minor planet image on edge of reference star array.

OBSERVATIONS MADE WITH THE 1.2-m SCHMIDT AT PALOMAR.

Plates taken by E. Helin and J. Mould and in part in the course of Palomar Sky Survey II. Measured by S. Singer-Brewster. Contact: E. Helin, Jet Propulsion Laboratory, MS 183-501, Pasadena, CA 91109, U.S.A.

Object		Date	UT	R. A. (1950)	Decl.	Mag.	N	Obs.
1983 AM		1986 09 01.29306		22 45 39.78	+01 58 04.3	16.5		675
1983 AM		1986 09 01.34514		22 45 37.20	+01 57 58.5			675
1986 NF1	*	1986 07 04.33264		19 14 12.38	-21 59 11.0	16.5	1	675
1986 NG1	*	1986 07 04.33264		19 15 04.81	-24 12 22.3	18	1	675
1986 NH1	*	1986 07 04.33264		19 22 19.64	-24 24 01.9	17	1	675
1986 RB		1986 09 06.29931		22 33 52.68	-00 09 34.9	15		675
1986 RB		1986 09 06.32014		22 33 50.43	-00 09 12.8			675
1986 RU		1986 09 01.29306		22 37 32.29	+02 37 47.1	17		675
1986 RU		1986 09 01.34514		22 37 29.63	+02 37 14.7			675
1986 RU		1986 09 02.39722		22 36 38.49	+02 26 00.6			675
1986 RU	*	1986 09 06.29931		22 33 27.62	+01 42 30.6	17	1	675
1986 RU		1986 09 06.32014		22 33 26.54	+01 42 17.8			675
1986 RV		1986 09 01.29306		22 38 25.51	+02 22 02.8	18	6	675
1986 RV		1986 09 01.34514		22 38 23.74	+02 21 44.0			675
1986 RV		1986 09 02.39722		22 37 42.35	+02 13 47.2			675
1986 RV	*	1986 09 06.29931		22 35 09.79	+01 43 25.7	18	1	675
1986 RV		1986 09 06.32014		22 35 09.02	+01 43 17.0			675
1986 RW		1986 09 01.29306		22 41 13.76	+01 29 23.3	16		675
1986 RW		1986 09 01.34514		22 41 10.63	+01 29 22.6			675
1986 RW		1986 09 02.39722		22 40 07.37	+01 29 00.9			675
1986 RW	*	1986 09 06.29931		22 36 11.60	+01 26 16.7	16	1	675
1986 RW		1986 09 06.32014		22 36 10.33	+01 26 16.3			675
1986 RX	*	1986 09 06.29931		22 36 39.60	-00 41 14.3	18	1	675
1986 RX		1986 09 06.32014		22 36 38.46	-00 41 12.7			675
1986 RY		1986 09 01.29306		22 42 56.76	+01 42 31.3	18		675
1986 RY		1986 09 01.34514		22 42 53.65	+01 42 21.1			675
1986 RY		1986 09 02.39722		22 41 48.97	+01 38 28.5			675
1986 RY	*	1986 09 06.29931		22 37 52.55	+01 22 52.4	18	1	675
1986 RY		1986 09 06.32014		22 37 51.38	+01 22 48.0			675
1986 RX1		1986 09 01.29306		22 42 27.01	+01 18 18.4	16.5		675
1986 RX1		1986 09 01.34514		22 42 24.42	+01 18 28.7			675
1986 RX1		1986 09 02.39722		22 41 33.88	+01 22 00.5			675
1986 RX1	*	1986 09 06.29931		22 38 31.46	+01 33 02.8	16.5	1	675
1986 RX1		1986 09 06.32014		22 38 30.43	+01 33 06.3			675
1986 RY1		1986 09 01.29306		22 42 38.09	+02 23 42.7	17.5		675
1986 RY1		1986 09 01.34514		22 42 35.89	+02 23 17.8			675
1986 RY1		1986 09 02.39722		22 41 48.96	+02 14 00.1			675
1986 RY1	*	1986 09 06.29931		22 38 56.74	+01 38 31.6	17.5	1	675
1986 RY1		1986 09 06.32014		22 38 55.99	+01 38 23.0			675
1986 RZ1		1986 09 01.29306		22 43 14.63	+02 48 17.8	17.5		675
1986 RZ1		1986 09 01.34514		22 43 12.96	+02 47 27.1			675
1986 RZ1		1986 09 02.39722		22 42 42.87	+02 28 58.7			675
1986 RZ1	*	1986 09 06.29931		22 40 51.04	+01 17 47.1	17.5	1	675
1986 RZ1		1986 09 06.32014		22 40 50.37	+01 17 26.1			675
1986 RA2	*	1986 09 06.29931		22 41 19.67	+02 40 55.6	18.5	1	675
1986 RA2		1986 09 06.32014		22 41 18.86	+02 40 38.7			675
1986 RB2	*	1986 09 06.29931		22 45 43.83	+02 10 21.4	17.5	1	675
1986 RB2		1986 09 06.32014		22 45 42.64	+02 10 19.6			675
1986 RD2	*	1986 09 05.33681		00 26 35.20	+42 21 41.8	17	1	675
1986 RD2		1986 09 05.39931		00 26 32.55	+42 22 34.8			675
1986 RE2	*	1986 09 05.33681		00 40 24.96	+37 09 15.9	16.5	3	675
1986 RE2		1986 09 05.39931		00 40 22.53	+37 09 45.0		2	675
1986 RE2		1986 09 06.33264		00 39 44.85	+37 17 15.5		2	675
1986 RE2		1986 09 06.39514		00 39 42.06	+37 17 44.7		2	675

1986 RF2	*	1986 09 06.33264	00 48 22.48	+39 07 04.0			17.5	1	675
1986 RF2		1986 09 06.39514	00 48 19.29	+39 08 32.0					675
1986 RK2	*	1986 09 06.33264	00 57 01.63	+39 47 11.9			16.5	1	675
1986 RK2		1986 09 06.39514	00 56 58.41	+39 47 34.7					675
1986 RL2	*	1986 09 06.33264	01 07 51.79	+39 09 02.1			17	5	675
1986 RL2		1986 09 06.39514	01 07 48.14	+39 10 35.5					675
1986 RM2	*	1986 09 06.33264	00 45 21.63	+42 05 28.8			17.2	1	675
1986 RM2		1986 09 06.39514	00 45 18.68	+42 06 29.9					675

Note 1: discoverer E. Helin. 2: at extreme edge of plate. 3 = 1 + 2.
4: at extreme edge of plate; faint star involved at beginning of trail.
5 = 1 + 4. 6: beginning of trail uncertain; faint star involved.

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

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

Object	Date	UT	R. A. (1950)	Decl.	Mag.	Obs.
1707	1985 10	12.40260	02 25 46.58	+17 53 53.8	16	675
1707	1985 10	14.47482	02 24 04.58	+17 54 51.9		675
1980 TN4	1986 05	04.44513	17 53 40.84	-26 21 50.1		675
1980 TN4	1986 05	05.47795	17 53 32.64	-26 25 02.3		675
1986 AK	1986 03	03.14791	07 43 12.62	+64 37 49.6		675
1986 AK	1986 03	04.17204	07 44 34.91	+64 23 55.4		675
1986 EN	1986 04	03.28663	09 52 38.48	+21 04 09.5		675
1986 EN	1986 04	04.21458	09 52 46.53	+21 15 14.2		675

OBSERVATIONS MADE WITH THE 0.33-m PHOTOGRAPHIC TELESCOPE AT THE LOWELL OBSERVATORY'S ANDERSON MESA STATION.

Observations made by B. A. Skiff, measured using a PDS scanning micro-densitometer. See also MPC 9533. Contact: E. Bowell, Lowell Observatory, 1400 W. Mars Hill Road, Flagstaff, AZ 86001, U.S.A.

Object	Date	UT	R. A. (1950)	Decl.	Mag.	N	Obs.
51	1983 10	05.17292	23 13 02.67	-05 15 28.9			688
52	1986 09	06.25972	23 19 46.40	-11 20 24.9			688
52	1986 09	06.31106	23 19 44.16	-11 20 44.1			688
53	1983 10	05.17292	23 25 08.11	-08 40 19.6			688
60	1986 09	06.28206	00 23 36.06	+04 08 25.8			688
60	1986 09	06.33639	00 23 33.98	+04 08 09.0			688
60	1986 09	12.29047	00 19 22.17	+03 32 40.1			688
60	1986 09	12.31395	00 19 21.08	+03 32 31.9			688
116	1986 09	06.25972	23 25 20.67	-09 17 16.3			688
116	1986 09	06.31106	23 25 18.14	-09 17 32.2			688
181	1986 09	04.24398	22 20 57.62	-15 42 18.9			688
181	1986 09	04.32009	22 20 54.31	-15 42 55.2			688
203	1983 10	05.17292	23 24 00.66	-02 53 27.6			688
214	1983 10	05.17292	23 19 36.17	-02 46 56.3			688
251	1983 10	05.17292	23 34 17.76	-08 51 54.9			688
331	1983 10	05.17292	23 27 50.82	-07 43 30.7			688
332	1986 09	06.25972	23 21 07.84	-07 51 10.0			688
332	1986 09	06.31106	23 21 05.21	-07 51 23.8			688
333	1986 09	06.28206	23 58 37.26	-00 13 15.6			688
333	1986 09	06.33639	23 58 35.10	-00 13 23.8			688
339	1986 09	06.28206	00 01 56.88	+00 01 24.0			688
339	1986 09	06.33639	00 01 55.00	+00 00 59.9			688
339	1986 09	12.29047	23 58 13.21	-00 47 35.9			688
339	1986 09	12.31395	23 58 12.32	-00 47 46.7			688
557	1986 07	09.24433	16 17 34.19	-23 21 56.6			688
565	1986 09	05.21684	21 41 02.11	+03 17 09.7			688

639	1986	09	11.32556	23	21	37.04	+10	00	13.6		688
639	1986	09	11.39639	23	21	33.58	+09	59	59.4		688
640	1986	09	11.32556	23	24	49.34	+14	46	06.4		688
640	1986	09	11.39639	23	24	46.26	+14	45	42.3		688
643	1986	09	05.21684	21	26	47.62	+04	09	29.9		688
658	1983	10	05.17292	23	10	36.32	-05	06	59.0		688
798	1986	09	05.21684	21	28	15.17	-01	55	39.3		688
873	1986	09	12.29047	23	57	34.41	-04	05	56.9		688
873	1986	09	12.31395	23	57	33.12	-04	06	08.8		688
1014	1983	10	05.17292	23	14	06.98	-01	27	51.1		688
1156	1983	10	05.17292	23	09	55.60	-07	59	56.2		688
1181	1986	09	05.32326	22	44	16.23	+02	11	03.0		688
1181	1986	09	11.28079	22	39	09.44	+01	41	53.8		688
1181	1986	09	11.34858	22	39	05.91	+01	41	32.6		688
1190	1983	10	05.17292	23	16	58.81	-07	27	40.7		688
1266	1986	09	11.32556	23	23	21.88	+10	25	22.2		688
1266	1986	09	11.39639	23	23	18.39	+10	25	17.5		688
1305	1986	09	04.24398	22	05	50.02	-15	20	22.4		688
1305	1986	09	04.32009	22	05	46.54	-15	20	39.5		688
1386	1986	09	06.25972	23	11	53.70	-06	49	54.3		688
1386	1986	09	06.31106	23	11	52.12	-06	50	49.3		688
1516	1986	09	06.25972	23	22	10.71	-13	19	29.1		688
1516	1986	09	06.31106	23	22	08.00	-13	19	52.9		688
1632	1986	09	05.32326	22	39	25.97	-01	41	51.8		688
1632	1986	09	11.28079	22	35	02.44	-02	27	08.8		688
1632	1986	09	11.34858	22	34	59.38	-02	27	39.6		688
1633	1986	07	09.24433	16	21	06.48	-19	17	57.9		688
1650	1986	09	04.24398	22	02	20.40	-08	22	58.0		688
1650	1986	09	04.32009	22	02	16.54	-08	23	25.7		688
1663	1986	07	09.24433	16	21	46.95	-21	45	22.8		688
1681	1986	07	09.24433	16	29	58.08	-19	21	34.1		688
1687	1986	07	09.24433	16	24	09.66	-20	40	57.7		688
1721	1986	09	11.32556	23	26	55.76	+12	06	20.3		688
1721	1986	09	11.39639	23	26	52.12	+12	06	16.1		688
1782	1986	09	06.28206	23	58	47.47	-00	51	46.0		688
1782	1986	09	06.33639	23	58	45.30	-00	52	02.0		688
1802	1983	10	05.17292	23	34	43.81	-05	21	28.0		688
1934	1986	07	09.24433	16	19	31.03	-18	01	46.2		688
2210	1986	09	04.24398	22	22	23.17	-13	58	57.7		688
2210	1986	09	04.32009	22	22	19.66	-13	59	25.5		688
2231	1986	09	06.28206	00	10	38.13	+04	39	45.5		688
2231	1986	09	06.33639	00	10	35.84	+04	39	52.9		688
2285	1986	09	06.28206	00	05	33.19	-02	23	24.8	16.8	688
2285	1986	09	06.33639	00	05	31.41	-02	23	56.6		688
2285	1986	09	12.29047	00	02	06.63	-03	25	24.6	16.5	688
2285	1986	09	12.31395	00	02	05.69	-03	25	39.3		688
2471	1986	09	12.29047	00	17	40.57	-03	28	34.7		688
2471	1986	09	12.31395	00	17	39.38	-03	28	37.8		688
2492	1983	10	05.17292	23	23	22.82	-04	30	03.0		688
2505	1986	09	06.28206	00	13	08.69	-01	32	29.8	16.8	688
2505	1986	09	06.33639	00	13	06.56	-01	32	43.0		688
2505	1986	09	12.29047	00	08	59.61	-01	59	13.3		688
2505	1986	09	12.31395	00	08	58.58	-01	59	20.3		688
2519	1986	09	06.28206	00	18	39.98	-02	05	09.1	16.2	688
2519	1986	09	06.33639	00	18	37.93	-02	05	23.9		688
2519	1986	09	12.29047	00	14	42.62	-02	33	14.7		688
2519	1986	09	12.31395	00	14	41.56	-02	33	21.5		688
2533	1986	09	04.32009	22	08	35.87	-09	36	10.7		688

2547		1986	09	06.28206	00	04	01.85	+01	26	59.8		688
2547		1986	09	06.33639	00	03	59.11	+01	26	58.4		688
2547		1986	09	12.29047	23	58	39.74	+01	21	08.6		688
2547		1986	09	12.31395	23	58	38.33	+01	21	08.1		688
2616		1986	09	12.29047	00	20	05.87	+00	35	35.6	15.8	688
2616		1986	09	12.31395	00	20	04.65	+00	35	26.6		688
2626		1983	10	05.17292	23	23	24.96	-03	53	22.6		688
2754		1986	09	05.24688	22	30	04.08	+03	55	09.9		688
2754		1986	09	05.32326	22	29	59.91	+03	55	00.3		688
2754		1986	09	11.28079	22	25	05.95	+03	38	51.0		688
2754		1986	09	11.34858	22	25	02.54	+03	38	37.6		688
2823		1986	09	05.32326	22	29	31.12	-01	57	52.2		688
2823		1986	09	11.28079	22	24	26.43	-02	31	52.8	17.0	688
2823		1986	09	11.34858	22	24	23.08	-02	32	16.8		688
2952		1986	09	06.28206	23	59	36.74	+03	23	46.4		688
2952		1986	09	06.33639	23	59	34.25	+03	23	41.3		688
3019		1986	09	04.24398	22	10	43.37	-15	16	06.4		688
3019		1986	09	04.32009	22	10	39.36	-15	16	33.0		688
3049		1986	09	06.25972	23	16	31.83	-08	31	53.5	17.0	688
3049		1986	09	06.31106	23	16	29.56	-08	32	07.2		688
3055		1986	09	06.25972	23	28	53.22	-11	26	45.4		688
3055		1986	09	06.31106	23	28	49.87	-11	26	46.2		688
3078		1986	09	06.25972	23	17	13.76	-12	44	00.8		688
3078		1986	09	06.31106	23	17	11.48	-12	44	13.0		688
3257		1986	09	06.25972	23	19	30.64	-13	25	44.8		688
3257		1986	09	06.31106	23	19	27.28	-13	25	53.3		688
3262		1986	07	09.24433	16	16	41.40	-22	34	04.5		688
3269		1983	10	05.17292	23	09	07.98	-03	35	01.6	17.2	688
3321		1983	10	05.17292	23	31	58.60	-07	45	03.7		688
3415		1983	10	05.17292	23	17	03.38	-02	32	25.7	16.8	688
3486		1986	09	12.29047	00	12	10.26	-03	37	36.3		688
3486		1986	09	12.31395	00	12	08.96	-03	37	42.4		688
1964	TR1	1986	09	06.25972	23	31	07.65	-07	33	08.6	16.5	688
1964	TR1	1986	09	06.31106	23	31	05.45	-07	33	24.8		688
1964	UO	1986	09	11.32556	23	20	39.69	+11	27	40.8	16.5	688
1964	UO	1986	09	11.39639	23	20	36.72	+11	27	17.9		688
1978	SA3	1986	09	06.28206	00	23	23.27	+04	44	38.3	16.8	688
1978	SA3	1986	09	06.33639	00	23	21.71	+04	44	33.5		688
1980	DO5	1986	09	06.25972	23	08	05.59	-09	52	54.2	16.8	688
1980	DO5	1986	09	06.31106	23	08	02.64	-09	53	01.9		688
1981	RU2	1986	09	11.32556	23	34	18.68	+12	23	40.7	16.8	688
1981	RU2	1986	09	11.39639	23	34	15.43	+12	23	26.3		688
1982	UH2	1986	09	04.24398	22	08	45.57	-11	45	32.3	17.0 1	688
1982	UH2	1986	09	04.32009	22	08	41.72	-11	45	49.9		688
1983	AM	1986	09	05.24688	22	42	21.76	+01	49	50.1	16.8	688
1983	AM	1986	09	05.32326	22	42	17.41	+01	49	33.2		688
1983	AM	1986	09	11.28079	22	37	21.38	+01	34	27.6	16.5	688
1983	AM	1986	09	11.34858	22	37	17.95	+01	34	17.0		688
1986	RB	1986	09	05.24688	22	35	45.92	-00	28	07.6	15.0 3	688
1986	RB	1986	09	05.32326	22	35	37.22	-00	26	52.0		688
1986	RB	1986	09	11.28079	22	25	08.73	+01	16	42.6	15.0	688
1986	RB	1986	09	11.34858	22	25	01.21	+01	17	55.1		688
1986	RK	1986	09	11.32556	23	20	10.20	+11	39	49.8	16.5	688
1986	RK	1986	09	11.39639	23	20	06.72	+11	39	16.1		688
1986	RL	1986	09	11.32556	23	20	54.84	+12	03	34.7	16.5	688
1986	RL	1986	09	11.39639	23	20	51.55	+12	03	15.2		688
1986	RO	1986	09	11.32556	23	33	49.12	+10	50	45.0	17.0 1	688
1986	RO	1986	09	11.39639	23	33	45.20	+10	50	54.3		688

1986	RW		1986	09	05.24688	22	37	15.57	+01	27	13.1	16.8	1 688
1986	RW		1986	09	05.32326	22	37	10.68	+01	27	09.3		1 688
1986	RW		1986	09	11.28079	22	31	14.69	+01	20	02.7	16.8	688
1986	RW		1986	09	11.34858	22	31	10.58	+01	19	56.2		688
1986	RX1		1986	09	05.24688	22	39	20.19	+01	30	20.6	16.5	3 688
1986	RX1		1986	09	05.32326	22	39	16.27	+01	30	33.1		1 688
1986	RX1		1986	09	11.28079	22	34	55.58	+01	43	05.4	16.5	688
1986	RX1		1986	09	11.34858	22	34	52.49	+01	43	12.1		688
1986	RN2	*	1986	09	05.24688	22	25	51.29	+00	10	03.7	16.5	6 688
1986	RN2		1986	09	05.32326	22	25	47.81	+00	08	55.3		688
1986	RN2		1986	09	11.28079	22	22	22.15	-01	13	54.5	16.8	688
1986	RN2		1986	09	11.34858	22	22	19.64	-01	14	49.4		688
1986	RO2	*	1986	09	05.24688	22	30	46.75	+04	43	18.4	17.0	5 688
1986	RO2		1986	09	05.32326	22	30	43.10	+04	42	57.6		688
1986	RO2		1986	09	11.28079	22	26	18.14	+04	15	54.0	16.8	688
1986	RO2		1986	09	11.34858	22	26	15.08	+04	15	34.8		688
1986	RP2	*	1986	09	06.25972	23	14	46.94	-13	45	11.1	16.5	4 688
1986	RP2		1986	09	06.31106	23	14	44.84	-13	45	53.2		688
1986	RQ2	*	1986	09	06.25972	23	26	14.83	-12	35	59.1	16.5	4 688
1986	RQ2		1986	09	06.31106	23	26	12.85	-12	36	30.7		688
1986	RR2	*	1986	09	06.28206	00	03	01.97	-01	31	05.1	16.0	4 688
1986	RR2		1986	09	06.33639	00	03	00.44	-01	31	37.5		688
1986	RR2		1986	09	12.29047	00	00	19.90	-02	34	23.5	16.0	688
1986	RR2		1986	09	12.31395	00	00	19.19	-02	34	37.9		688
1986	RS2	*	1986	09	06.28206	00	03	40.24	+01	36	53.1	16.8	4 688
1986	RS2		1986	09	06.33639	00	03	38.56	+01	36	30.4		688
1986	RS2		1986	09	12.29047	00	00	10.59	+00	51	08.6	16.5	688
1986	RS2		1986	09	12.31395	00	00	09.58	+00	50	58.5		688
1986	RT2	*	1986	09	06.28206	00	03	54.44	+01	13	24.5	17.0	4 688
1986	RT2		1986	09	06.33639	00	03	52.01	+01	13	11.5		1 688
1986	RT2		1986	09	12.29047	23	58	45.71	+00	46	20.8	16.8	688
1986	RT2		1986	09	12.31395	23	58	44.30	+00	46	14.4		688
1986	RU2	*	1986	09	06.28206	00	17	13.88	+03	02	54.8	17.5	5 688
1986	RU2		1986	09	06.33639	00	17	11.65	+03	02	48.1		688
1986	RU2		1986	09	12.29047	00	12	36.17	+02	46	55.5	17.0	688
1986	RU2		1986	09	12.31395	00	12	35.00	+02	46	53.3		688
1986	RV2	*	1986	09	06.28206	00	17	14.27	+03	59	46.7	17.0	5 688
1986	RV2		1986	09	06.33639	00	17	12.26	+03	59	21.4		3 688
1986	RV2		1986	09	12.29047	00	12	40.63	+03	11	16.2	17.0	688
1986	RV2		1986	09	12.31395	00	12	39.35	+03	11	03.5		3 688
1986	RW2	*	1986	09	06.28206	00	20	56.40	-00	22	04.1	16.5	4 688
1986	RW2		1986	09	06.33639	00	20	54.38	-00	22	14.6		688
1986	RW2		1986	09	12.29047	00	16	41.44	-00	46	01.7	16.2	688
1986	RW2		1986	09	12.31395	00	16	40.31	-00	46	07.1		688
1986	RX2	*	1986	09	06.28206	00	23	46.99	+03	14	55.6	17.2	5 688
1986	RX2		1986	09	06.33639	00	23	45.10	+03	14	47.2		1 688
1986	RX2		1986	09	12.29047	00	20	07.70	+02	56	44.2	17.2	688
1986	RX2		1986	09	12.31395	00	20	06.35	+02	56	38.3		1 688
1986	RY2	*	1986	09	11.28079	22	19	46.74	+01	51	22.6	17.0	4 688
1986	RY2		1986	09	11.34858	22	19	43.58	+01	51	10.5		688
1986	RZ2	*	1986	09	11.28079	22	30	03.11	+02	42	50.0	17.0	4 688
1986	RZ2		1986	09	11.34858	22	29	59.69	+02	42	34.6		688
1986	RA3	*	1986	09	11.32556	23	28	24.67	+14	40	24.5	17.2	5 688
1986	RA3		1986	09	11.39639	23	28	21.13	+14	40	14.7		1 688
1986	RB3	*	1986	09	11.32556	23	31	24.25	+12	38	36.9	16.5	4 688
1986	RB3		1986	09	11.39639	23	31	21.52	+12	36	57.8		688
1986	RC3	*	1986	09	12.29047	00	04	23.15	-02	59	09.0	17.0	4 688
1986	RC3		1986	09	12.31395	00	04	22.19	-02	59	14.8		688

1986 RD3 *	1986 09 12.29047	00 09 10.87	+01 23 28.6			16.8	4	688
1986 RD3	1986 09 12.31395	00 09 09.78	+01 23 22.5					688

Note 1: right ascension uncertain. 2: declination uncertain. 3 = 1 + 2. 4: discoverer E. Bowell. 5 = 1 + 4. 6 = 2 + 4.

OBSERVATIONS MADE AT THE LOWELL OBSERVATORY.

Plates with the 0.33-m photographic telescope. Observers R. Burnham and C. D. Slaughter. Measured by B. A. Skiff using a PDS scanning microdensitometer. SAO reference stars, global solutions. Contact: E. L. G. Bowell, Lowell Observatory, 1400 West Mars Hill Road, Flagstaff, AZ 86001, U.S.A.

Object	Date	UT	R. A. (1950)	Decl.			N	Obs.
1157	1958 10 10.31944	01 17 48.78	+18 49 22.2					690
1157	1958 10 11.30903	01 16 58.96	+18 46 50.8					690
1958 TO1	1958 10 10.31944	01 24 35.50	+18 34 47.1					690
1958 TO1	1958 10 11.30903	01 23 56.46	+18 21 10.8				1	690

Note 1: position uncertain.

OBSERVATIONS MADE WITH THE SPACEWATCH CAMERA 0.91-m TELESCOPE ON KITT PEAK.

Observations made by T. Gehrels with a CCD in scanning mode. Reduced by J. V. Scotti and C. Lykins using reference stars from the SAO 1984 catalog. For further details see MPC 9198 and 10373. Contact: T. Gehrels, Space Sciences Building, University of Arizona, Tucson, AZ 85721, U.S.A.

Object	Date	UT	R. A. (1950)	Decl.		Mag.	N	Obs.
2202	1986 09 26.49086	07 00 45.61	+12 13 15.3					691
2202	1986 09 26.50024	07 00 47.42	+12 13 09.2					691
2202	1986 09 26.51243	07 00 49.89	+12 12 59.2					691
3199	1986 09 02.47399	23 40 58.02	+11 14 23.9				1	691
3199	1986 09 02.48701	23 40 53.76	+11 16 03.8				1	691
3199	1986 09 02.49984	23 40 49.61	+11 17 39.1				1	691
3199	1986 09 03.48252	23 35 21.96	+13 24 27.6				1	691
3199	1986 09 03.48440	23 35 21.28	+13 24 42.8				1	691
3199	1986 09 03.50390	23 35 14.50	+13 27 14.2				1	691
3362	1986 08 31.40559	01 54 16.67	-00 19 51.3					691
3362	1986 08 31.40853	01 54 16.06	-00 19 60.0					691
3362	1986 08 31.42845	01 54 11.78	-00 21 00.6					691
3362	1986 09 02.38148	01 47 27.11	-02 00 03.7			17.9V		691
3362	1986 09 02.39616	01 47 23.83	-02 00 49.0					691
3362	1986 09 02.40785	01 47 21.24	-02 01 24.3					691
1977 YA	1986 09 02.44319	04 09 03.55	+37 57 05.6			19.3V		691
1977 YA	1986 09 02.45058	04 09 04.09	+37 57 14.0					691
1977 YA	1986 09 02.46284	04 09 05.12	+37 57 26.9					691
1977 YA	1986 09 03.46544	04 10 24.82	+38 16 37.1					691
1977 YA	1986 09 03.47395	04 10 25.46	+38 16 46.2					691
1977 YA	1986 09 25.38116	04 37 00.60	+45 53 14.0			19.6V		691
1977 YA	1986 09 25.39884	04 37 01.72	+45 53 37.6					691
1982 TX	1986 09 01.38620	22 00 40.10	+18 28 28.1			17.7V		691
1982 TX	1986 09 01.39983	22 00 39.35	+18 28 21.6					691
1983 RD	1986 09 01.28898	19 20 17.08	+00 01 30.6				2	691
1983 RD	1986 09 01.29969	19 20 17.58	+00 01 08.2				2	691
1983 RD	1986 09 01.30803	19 20 18.02	+00 00 50.9				2	691
1983 RD	1986 09 03.18698	19 22 24.13	-01 08 26.4				2	691
1983 RD	1986 09 03.19470	19 22 24.60	-01 08 44.6				2	691
1983 RD	1986 09 03.20854	19 22 25.37	-01 09 16.5				2	691
1985 HC	1986 09 27.46438	06 08 07.88	+05 53 58.3			17.7V		691
1985 HC	1986 09 27.47216	06 08 08.13	+05 53 53.1					691
1985 HC	1986 09 27.47986	06 08 08.40	+05 53 47.4					691
1985 JA	1986 09 03.42743	04 14 44.41	+36 45 13.7					691
1985 JA	1986 09 03.43815	04 14 45.35	+36 45 11.0					691
1985 JA	1986 09 03.44442	04 14 45.95	+36 45 10.3					691

1985 JA	1986	09	26.40027	04	45	31.51	+33	58	09.0		691
1985 JA	1986	09	26.42686	04	45	33.06	+33	57	50.6		691
1985 JA	1986	09	26.43222	04	45	33.40	+33	57	47.2		691
1986 JA1	1986	09	02.17544	17	41	32.88	+09	41	00.9	17.0V	691
1986 JA1	1986	09	02.18985	17	41	33.92	+09	40	53.6		691
1986 JA1	1986	09	02.19330	17	41	34.15	+09	40	52.0		691
1986 LA	1986	09	02.20159	17	35	09.33	+31	11	48.8	17.9V	691
1986 LA	1986	09	02.21331	17	35	12.57	+31	11	48.2		691
1986 LA	1986	09	02.22306	17	35	15.27	+31	11	47.9		691
1986 RA	1986	09	25.18331	22	40	29.57	-07	23	51.6	14.9V	691
1986 RA	1986	09	25.20029	22	40	33.79	-07	24	56.2		691
1986 RA	1986	09	25.21336	22	40	36.78	-07	25	45.9		691
1986 RA	1986	09	27.18097	22	48	25.36	-09	26	35.8	15.1V	691
1986 RA	1986	09	27.19578	22	48	28.68	-09	27	28.6		691
1986 RA	1986	09	27.20001	22	48	29.63	-09	27	43.4		691

Note 1: image steaked due to object motion. 2: very crowded star field.

OBSERVATIONS MADE BY W. S. PENHALLOW AT QUONOCHONTAUG OBSERVATORY.

Plates taken with the 0.24-m Schmidt. Contact: W. S. Penhallow, Dept. of Physics, University of Rhode Island, East Hall, Kingston, RI 02881, U.S.A.

Object	Date	UT	R. A. (1950)			Decl.			Obs.
148	1986	09 14.28435	01	46	34.80	-19	32	04.4	792
148	1986	09 14.28713	01	46	34.76	-19	32	06.9	792
148	1986	09 14.28991	01	46	34.71	-19	32	10.3	792
148	1986	09 14.29269	01	46	34.69	-19	32	13.3	792
148	1986	09 14.29546	01	46	34.70	-19	32	17.0	792

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

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

Object	Date	UT	R. A. (1950)			Decl.			Mag.	N	Obs.
1197	1986	09 02.26902	22	22	14.69	+08	58	24.2			801
3199	1986	09 01.28574	23	47	15.36	+08	44	02.3			801
3362	1986	09 01.36830	01	50	58.38	-01	08	37.4		1	801
1941 HJ	1986	08 06.26741	22	59	55.54	-03	46	31.6			801
1941 HJ	1986	09 07.23088	22	37	34.77	-08	04	57.7			801
1964 TR1	1986	09 08.29836	23	29	39.31	-07	43	59.5			801
1964 TN2	1986	08 09.29369	22	51	30.38	+04	48	35.4		2	801
1964 TN2	1986	09 01.19156	22	35	58.44	+04	05	14.2			801
1964 UO	1986	09 08.27689	23	22	45.77	+11	42	19.9			801
1965 UZ	1986	09 07.25741	22	52	37.51	-05	37	00.5			801
1976 SE1	1986	09 07.21336	22	34	32.57	-06	03	57.2			801
1976 YU5	1986	08 05.29262	22	11	29.28	-01	26	38.1			801
1976 YU5	1986	09 01.15623	21	48	39.31	-02	37	27.6			801
1977 QC4	1986	09 01.32442	00	23	10.09	-08	15	35.8			801
1978 UH2	1986	09 08.25830	23	10	48.63	+14	01	44.1			801
1979 QL8	1986	06 09.28115	19	12	48.35	-20	30	54.2			801
1979 QL8	1986	07 08.20370	18	50	11.77	-20	14	36.3			801
1979 QL8	1986	09 02.08010	18	37	02.61	-20	20	12.4			801
1980 DO5	1986	09 08.23304	23	06	18.01	-09	57	51.3			801
1981 EW3	1986	09 08.09386	20	42	33.87	-08	00	49.6			801
1981 EG14	1986	09 07.27918	23	03	40.99	+04	13	03.1			801
1981 ET16	1986	08 10.25394	22	15	40.76	+07	48	42.4			801
1981 ET16	1986	09 02.24443	21	59	57.27	+03	57	03.7			801
1981 EF17	1986	09 08.04871	18	11	43.21	-08	42	29.8			801
1981 EQ19	1986	08 09.20843	21	16	44.25	-11	11	02.4		2	801

1981	EQ19		1986	09	02.16705	20	56	50.58	-13	16	50.1	801
1981	RU2		1986	09	01.30699	23	41	37.69	+12	46	40.7	801
1981	RV3		1986	09	02.18372	21	24	25.83	-16	47	32.5	801
1981	SQ1		1986	08	05.22234	21	23	57.39	-12	22	51.0	801
1981	SQ1		1986	09	08.13832	21	01	27.84	-14	48	00.7	3 801
1981	SW6		1986	08	05.27728	22	00	07.88	-05	31	50.4	801
1981	SW6		1986	09	07.18882	21	38	11.75	-08	51	35.2	801
1981	SW7		1986	08	09.34296	23	10	19.69	+00	10	56.6	801
1981	SW7		1986	09	01.24751	22	55	43.31	-00	14	19.9	801
1981	SX7		1986	08	06.19773	21	06	59.08	-10	15	10.7	801
1981	SX7		1986	09	08.11717	20	46	19.39	-11	45	42.2	801
1981	VW1		1986	09	02.21725	21	54	22.04	-12	56	48.2	801
1982	TX		1986	09	01.11013	22	00	55.06	+18	30	27.0	801
1982	TG1		1986	08	04.33540	22	41	58.68	+10	58	39.1	801
1982	TG1		1986	09	02.26902	22	22	39.55	+09	04	57.5	801
1982	UH2		1986	09	01.17191	22	11	12.22	-11	33	32.1	16.5 801
1983	AM		1986	08	09.31692	23	02	22.01	+02	08	28.1	801
1983	AM		1986	09	01.20546	22	45	44.33	+01	58	14.2	801
1983	RD		1986	09	01.03052	19	20	04.15	+00	10	27.8	801
1984	AC1		1986	09	08.35865	01	24	01.80	-06	15	43.3	801
1984	CO1		1986	09	02.20128	21	39	29.42	-17	55	59.5	801
1984	WB		1986	09	03.14496	20	41	32.27	+23	47	18.7	801
1986	LA		1986	09	01.07182	17	29	46.19	+31	10	55.1	801
1986	PA1		1986	09	02.09999	20	18	19.57	-19	11	25.9	801
1986	PA1		1986	09	07.07276	20	16	58.29	-19	20	30.3	801
1986	RB		1986	10	03.10352	21	55	52.80	+06	39	14.5	801
1986	RB		1986	10	07.06181	21	52	55.54	+07	27	00.8	801
1986	RH		1986	10	03.17918	22	41	57.94	-02	44	55.8	801
1986	RH		1986	10	06.08511	22	40	45.14	-02	53	59.2	801
1986	RZ	*	1986	09	01.13291	21	52	56.89	-01	34	37.2	17 801
1986	RA1	*	1986	09	01.17191	22	11	12.47	-11	36	10.1	17 801
1986	RB1	*	1986	09	01.32442	00	23	06.87	-07	57	03.9	16.5 801
1986	RC1	*	1986	09	01.34684	00	37	11.55	+03	34	23.6	17 801
1986	RC2		1986	10	03.09251	22	04	19.27	+00	11	18.1	801
1986	RC2		1986	10	07.15899	22	05	01.00	-01	45	30.2	801

Note 1: measured in one direction only. 2: poor sky. 3: uncertain image.

OBSERVATIONS MADE AT CERRO EL ROBLE.

Plates taken with the double meniscus Maksutov astrograph and measured by C. Torres with the Zeiss Ascorecord coordinometer at Cerro Calan.

Contact: C. Torres, Departamento de Astronomia, Universidad de Chile, Casilla 36-D, Santiago, Chile.

Object	Date	UT	R. A. (1950)	Decl.	Mag.	N	Obs.
553	1986	06 01.19479	15 24 53.90	-16 44 24.7			805
553	1986	06 01.20868	15 24 53.09	-16 44 24.2			805
553	1986	06 01.22257	15 24 52.27	-16 44 25.7			805
553	1986	06 01.23993	15 24 51.25	-16 44 25.5			805
569	1986	06 01.19479	15 24 06.55	-20 22 13.0			805
569	1986	06 01.20868	15 24 05.86	-20 22 10.8			805
569	1986	06 01.22257	15 24 05.18	-20 22 09.6			805
569	1986	06 01.23993	15 24 04.31	-20 22 07.9			805
846	1986	06 01.19479	15 25 46.72	-18 53 00.1			805
846	1986	06 01.20868	15 25 46.16	-18 52 57.8			805
846	1986	06 01.22257	15 25 45.58	-18 52 57.6			805
846	1986	06 01.23993	15 25 44.84	-18 52 56.6			805
921	1986	05 06.26250	16 26 57.11	-07 31 14.7			805
1388	1986	06 01.19479	15 13 48.20	-19 00 50.1			805
1388	1986	06 01.20868	15 13 47.58	-19 00 51.4			805
1388	1986	06 01.22257	15 13 46.91	-19 00 53.1			805

1388		1986	06	01.23993	15	13	46.08	-19	00	54.7			805
1465		1986	05	06.26250	16	36	25.85	-06	48	29.3			805
1497		1986	06	01.19479	15	20	23.62	-19	52	09.0			805
1497		1986	06	01.20868	15	20	22.98	-19	52	07.2			805
1497		1986	06	01.22257	15	20	22.34	-19	52	05.7			805
1497		1986	06	01.23993	15	20	21.51	-19	52	03.9			805
1761		1986	06	01.19479	15	13	40.05	-16	42	46.9			805
1761		1986	06	01.20868	15	13	39.53	-16	42	45.4			805
1761		1986	06	01.22257	15	13	38.92	-16	42	45.5			805
1761		1986	06	01.23993	15	13	38.28	-16	42	45.3			805
2882		1986	06	01.19479	15	19	18.66	-18	45	57.5			805
2882		1986	06	01.20868	15	19	18.01	-18	45	56.1			805
2882		1986	06	01.22257	15	19	17.44	-18	45	55.6			805
2882		1986	06	01.23993	15	19	16.67	-18	45	54.0			805
3361		1986	05	05.35139	16	38	23.23	-07	17	48.3			805
3361		1986	05	06.26250	16	34	09.81	-07	13	00.1			805
1986	LM1 *	1986	06	01.19479	15	13	41.31	-17	38	27.3	17.3	1	805
1986	LM1	1986	06	01.20868	15	13	40.57	-17	38	29.1		1	805
1986	LM1	1986	06	01.22257	15	13	39.84	-17	38	32.3		1	805
1986	LM1	1986	06	01.23993	15	13	38.97	-17	38	35.3		1	805
1986	LN1 *	1986	06	01.19479	15	13	56.04	-20	29	56.9	17		805
1986	LN1	1986	06	01.20868	15	13	55.30	-20	29	53.5			805
1986	LN1	1986	06	01.22257	15	13	54.61	-20	29	51.1			805
1986	LN1	1986	06	01.23993	15	13	53.71	-20	29	47.5			805
1986	LO1 *	1986	06	01.19479	15	14	51.71	-18	31	07.1	18.2	1	805
1986	LO1	1986	06	01.20868	15	14	51.11	-18	31	01.8		1	805
1986	LO1	1986	06	01.22257	15	14	50.52	-18	30	59.6		1	805
1986	LO1	1986	06	01.23993	15	14	49.85	-18	30	55.5		1	805
1986	LP1 *	1986	06	01.19479	15	22	28.58	-18	23	03.6	16.7		805
1986	LP1	1986	06	01.20868	15	22	27.97	-18	23	01.2			805
1986	LP1	1986	06	01.22257	15	22	27.33	-18	23	00.0			805
1986	LP1	1986	06	01.23993	15	22	26.53	-18	22	57.2			805
1986	LQ1 *	1986	06	01.19479	15	28	35.00	-17	06	57.8	17.3	1	805
1986	LQ1	1986	06	01.20868	15	28	34.39	-17	06	57.1		1	805
1986	LQ1	1986	06	01.22257	15	28	33.72	-17	06	55.9		1	805
1986	LQ1	1986	06	01.23993	15	28	32.87	-17	06	55.3		1	805

Note 1: faint image, difficult to measure.

* * * * *

ORBITAL ELEMENTS OF ONE-OPPOSITION MINOR PLANETS.

The orbit computers and authors of double designations are a = A. Lowe, B = C. M. Bardwell, G = D. W. E. Green, M = B. G. Marsden, N = S. Nakano. For further details see MPC 10375.

Planet	H	Epoch	M	Peri.	Node	Incl.	e	a	Arc	O	N	C
1964 BE	13.0	640106	349.14	110.17	3.52	0.74	0.1906	3.1067	2	7	1	G
1964 BF	14.0	640106	49.40	283.89	105.48	5.92	0.2020	2.3512	2	6	1	G
1964 BG	14.5	640106	40.39	309.66	88.39	4.43	0.2273	2.4294	2	7	1	G
1977 LF1	16.0	770606	339.30	211.53	78.95	5.18	0.2037	2.1582	2	4	3	M
1982 UH8	13.0	821018	54.26	37.11	285.53	5.41	0.1136	2.5467	32	6	2	N
1982 UC11	15.0	821018	14.69	133.48	243.52	3.43	0.2057	2.5194	31	4	2	N
1986 EN	14.5	860311	329.64	49.10	155.15	23.33	0.2143	2.4231	32	4		M
1986 NF1	14.5	860619	319.01	232.36	105.61	6.91	0.2054	2.2403	8	4	1	G
1986 NG1	16.0	860619	337.80	212.66	98.44	8.56	0.2005	2.2813	8	4		G
1986 OA	12.0	860729	95.52	306.45	262.34	13.40	0.0501	2.5587	32	0		G

1986 PW	13.5	860729	272.73	134.67	292.50	4.55	0.1723	2.1650	3	5		G
1986 PX	15.0	860729	345.00	142.87	196.17	2.78	0.1787	2.1658	3	8		G
1986 PY	15.0	860729	345.96	194.34	145.65	8.25	0.2531	2.2362	3	6	1	G
1986 PX3	14.5	860729	317.25	75.58	319.51	4.92	0.3396	2.1835	5	6	1	G
1986 PF4	14.5	860818	355.40	26.94	303.34	6.18	0.2389	2.2243	30	8		G
1986 RB	12.5	860907	343.92	36.69	333.91	24.96	0.2589	2.3444	58	0		B
1986 RM	14.0	860907	332.23	61.41	326.12	3.20	0.2140	2.2327	7	4		M
1986 RU	13.5	860818	303.39	234.94	187.69	12.34	0.2736	2.4900	5	5	1	B
1986 RV	13.0	860818	310.60	215.14	190.36	13.47	0.1876	3.3409	5	5	1	B
1986 RW	14.0	860818	320.62	92.93	303.26	7.58	0.2348	2.4243	10	9		B
1986 RY	15.0	860818	50.38	342.77	288.80	6.01	0.1411	2.2333	5	5		B
1986 RE1	15.0	860818	343.39	162.63	197.49	3.38	0.2614	2.2821	6	8		G
1986 RG1	12.5	860818	351.33	162.28	185.43	1.80	0.1225	2.8238	6	8		G
1986 RH1	13.0	860818	58.62	340.80	267.55	1.47	0.2680	2.5149	6	7	1	G
1986 RJ1	15.5	860818	355.01	359.06	342.62	4.77	0.2418	2.3044	6	8	1	G
1986 RK1	14.5	860818	342.22	195.96	165.99	2.19	0.2048	2.3286	3	6	1	G
1986 RL1	14.5	860818	5.56	98.46	224.67	1.34	0.2765	2.4696	6	7		G
1986 RX1	15.0	860818	8.94	1.38	310.36	7.12	0.3705	2.5769	10	9		B
1986 RY1	13.5	860818	31.78	102.98	194.27	10.48	0.1128	2.6948	5	5		B
1986 RZ1	15.0	860818	337.38	203.46	176.74	16.66	0.3406	2.7068	5	5		B
1986 RC2	12.0	860907	334.30	186.78	183.68	26.70	0.0852	1.9234	27	6		B

Note 1: e assumed. 2: double designations 1977 LF1 = 1977 LJ1 (a); 1982 UH8 = 1982 TM (N); 1982 UC1 = 1982 TO2 (N). 3 = 1 + 2.

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

(1743) Schmidt
Epoch 1986 June 19.0 ET = JDE 2446600.5

M	44.31177	(1950.0)		P	Q
n	0.25373648	Peri.	356.68291	-0.99470277	+0.10125591
a	2.4710457	Node	189.18525	-0.09156782	-0.95111693
e	0.1389369	Incl.	6.36985	-0.04670908	-0.29175989
P	3.88	H	12.31	G 0.25	

From 63 observations at 11 oppositions 1939-1984, mean residual 0".8.

(1766) Slipher
Epoch 1986 June 19.0 ET = JDE 2446600.5

M	81.71037	(1950.0)		P	Q
n	0.21626143	Peri.	169.30453	+0.99910749	+0.04007867
a	2.7488434	Node	188.43276	-0.04223999	+0.94858673
e	0.0859998	Incl.	5.21870	+0.00008090	+0.31396960
P	4.56	H	11.97	G 0.15	

From 34 observations at 5 oppositions 1953-1980, mean residual 1".0.

(2020) Ukko
Epoch 1986 June 19.0 ET = JDE 2446600.5

M	254.91224	(1950.0)		P	Q
n	0.18732556	Peri.	331.69723	-0.50945116	-0.85460528
a	3.0250880	Node	148.62117	+0.82140061	-0.51779298
e	0.0614711	Incl.	11.13366	+0.25643821	-0.03924601
P	5.26	H	11.49	G 0.25	

From 39 observations at 7 oppositions 1936-1983, mean residual 0".9.

(2036) Sheragul
Epoch 1986 June 19.0 ET = JDE 2446600.5

M	343.03791	(1950.0)	P	Q
n	0.29314769	Peri. 305.89144	+0.37157920	+0.92824773
a	2.2442870	Node 345.89233	-0.82786522	+0.32305543
e	0.1853581	Incl. 3.97188	-0.42020005	+0.18436740
P	3.36	H 12.7	G 0.25	

From 26 observations at 7 oppositions 1929-1985, mean residual 1".0.

(2125) Karl-Ontjes
Epoch 1986 June 19.0 ET = JDE 2446600.5

M	220.15311	(1950.0)	P	Q
n	0.21174478	Peri. 15.80098	+0.87871192	+0.47690950
a	2.7877955	Node 315.69628	-0.44106816	+0.79469538
e	0.1047493	Incl. 1.68678	-0.18254930	+0.37552174
P	4.65	H 12.71	G 0.15	

From 65 observations at 6 oppositions 1951-1986, mean residual 0".7.

(2160) Spitzer
Epoch 1986 June 19.0 ET = JDE 2446600.5

M	8.04810	(1950.0)	P	Q
n	0.19962187	Peri. 207.92518	+0.95047842	+0.30871668
a	2.8995502	Node 134.04530	-0.27503267	+0.88921798
e	0.1014540	Incl. 2.85835	-0.14473357	+0.33761723
P	4.94	H 11.96	G 0.25	

From 26 observations at 8 oppositions 1956-1984, mean residual 1".4.

(2185) Guangdong
Epoch 1986 June 19.0 ET = JDE 2446600.5

M	308.05926	(1950.0)	P	Q
n	0.22108570	Peri. 261.65870	+0.77722405	+0.61225104
a	2.7087086	Node 60.46054	-0.49136843	+0.73467441
e	0.1603069	Incl. 9.60458	-0.39303924	+0.29223652
P	4.46	H 11.34	G 0.15	

From 23 observations at 9 oppositions 1929-1985, mean residual 1".3.

(2213) Meeus
Epoch 1986 June 19.0 ET = JDE 2446600.5

M	218.68209	(1950.0)	P	Q
n	0.30238100	Peri. 221.55432	+0.97614700	+0.20383717
a	2.1983646	Node 126.53160	-0.16641874	+0.92359976
e	0.2267003	Incl. 5.33772	-0.13943396	+0.32467506
P	3.26	H 13.8	G 0.25	

From 18 observations at 6 oppositions 1935-1984, mean residual 1".5.

(2220) Hicks
Epoch 1986 June 19.0 ET = JDE 2446600.5

M	345.31207	(1950.0)	P	Q
n	0.17662586	Peri. 277.68331	+0.97597118	-0.21319469
a	3.1460566	Node 94.63431	+0.21345908	+0.89392413
e	0.1745683	Incl. 2.58975	+0.04376626	+0.39426853
P	5.58	H 12.0	G 0.25	

From 25 observations at 5 oppositiions 1975-1982, mean residual 1".1.

(2228) Soyuz-Apollo
Epoch 1986 June 19.0 ET = JDE 2446600.5

M	114.55612	(1950.0)	P	Q
n	0.17711214	Peri. 288.78314	+0.36203684	-0.93189664
a	3.1402954	Node 139.96899	+0.86773940	+0.32817375
e	0.1807527	Incl. 1.98822	+0.34052556	+0.15450125
P	5.57	H 11.85	G 0.15	

From 40 observations at 9 oppositions 1952-1985, mean residual 0".9.

(2288) Karolinum
Epoch 1986 June 19.0 ET = JDE 2446600.5

M	353.96184	(1950.0)	P	Q
n	0.19865643	Peri. 99.19961	-0.96555251	-0.09161833
a	2.9089369	Node 75.82957	-0.02627156	-0.89685685
e	0.1606654	Incl. 14.54787	+0.25887864	-0.43272841
P	4.96	H 11.3	G 0.25	

From 36 observations at 5 oppositions 1952-1984, mean residual 1".0.

(2296) 1975 BA1
Epoch 1986 June 19.0 ET = JDE 2446600.5

M	356.40078	(1950.0)	P	Q
n	0.17343503	Peri. 103.57454	-0.82389441	-0.56655471
a	3.1845263	Node 41.91775	+0.51112055	-0.75393177
e	0.1658306	Incl. 1.25401	+0.24485461	-0.33256975
P	5.68	H 11.4	G 0.25	

From 43 observations at 7 oppositions 1941-1986, mean residual 1".2.

(2336) Xinjiang
Epoch 1986 June 19.0 ET = JDE 2446600.5

M	267.11870	(1950.0)	P	Q
n	0.17156136	Peri. 31.42315	-0.47612958	-0.87803147
a	3.2076704	Node 87.04997	+0.79634197	-0.45395328
e	0.1399068	Incl. 2.78902	+0.37301486	-0.15161517
P	5.75	H 11.44	G 0.15	

From 33 observations at 5 oppositions 1974-1985, mean residual 0".9.

(2341) Aoluta
Epoch 1986 June 19.0 ET = JDE 2446600.5

M	346.99684	(1950.0)	P	Q
n	0.29962714	Peri. 346.89592	+0.66773146	-0.74179276
a	2.2118141	Node 61.17317	+0.68919441	+0.58442617
e	0.1516461	Incl. 4.07625	+0.28132857	+0.32892181
P	3.29	H 12.7	G 0.25	

From 39 observations at 8 oppositions 1933-1984, mean residual 1".1.

(2369) Chekhov
Epoch 1986 June 19.0 ET = JDE 2446600.5

M	342.24941	(1950.0)	P	Q
n	0.21237886	Peri. 243.38890	+0.35869630	+0.93283400
a	2.7822439	Node 47.67425	-0.83918190	+0.33821905
e	0.0441520	Incl. 2.63775	-0.40879175	+0.12421189
P	4.64	H 12.00	G 0.15	

From 25 observations at 6 oppositions 1972-1985, mean residual 0".9.

(2390) Nezarka
Epoch 1986 June 19.0 ET = JDE 2446600.5

M	148.07608		(1950.0)		P		Q
n	0.23251619	Peri.	353.54367		+0.75561271		+0.64705237
a	2.6191915	Node	325.44468		-0.59261928		+0.60908342
e	0.1463239	Incl.	10.34409		-0.27901941		+0.45862906
P	4.24	H	12.33	G	0.15		

From 32 observations at 4 oppositions 1942-1984, mean residual 0".8.

(2400) Derevskaya
Epoch 1986 June 19.0 ET = JDE 2446600.5

M	210.95230		(1950.0)		P		Q
n	0.18934240	Peri.	136.42130		+0.61973354		+0.78438699
a	3.0035680	Node	171.75736		-0.76036394		+0.60825447
e	0.0971027	Incl.	10.38121		-0.19436311		+0.12150534
P	5.21	H	12.43	G	0.25		

From 34 observations at 5 oppositions 1972-1983, mean residual 0".8.

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

(8) Flora
Epoch 1986 June 19.0 ET = JDE 2446600.5

M	173.98516		(1950.0)		P		Q
n	0.30175401	Peri.	284.97363		+0.80950310		-0.57919562
a	2.2014087	Node	110.51019		+0.57035042		+0.73693942
e	0.1563254	Incl.	5.88977		+0.13930229		+0.34850068
P	3.27	H	6.48	G	0.33		

From 485 observations at 37 oppositions 1905-1983, mean residual 1".1.

(9) Metis
Epoch 1986 June 19.0 ET = JDE 2446600.5

M	310.51611		(1950.0)		P		Q
n	0.26727640	Peri.	4.83140		+0.28734904		-0.95353965
a	2.3868712	Node	68.49152		+0.87545252		+0.22312205
e	0.1217627	Incl.	5.58303		+0.38860444		+0.20243191
P	3.69	H	6.32	G	0.29		

From 481 observations at 36 oppositions 1903-1985, mean residual 0".9.

(3496)* 1977 RC

Discovered 1977 Sept. 5 by H.-E. Schuster at the European Southern Observatory.
Epoch 1986 June 19.0 ET = JDE 2446600.5

M	322.67666		(1950.0)		P		Q
n	0.22013188	Peri.	283.08943		+0.51008549		-0.77066917
a	2.7165274	Node	129.42930		+0.84542543		+0.53096732
e	0.4583763	Incl.	29.63581		-0.15833081		+0.35233896
P	4.48	H	15.3	G	0.25		

Residuals in seconds of arc

770905	809	0.3-	0.5-	771013	809	0.0	0.2+	860712	691	0.2+ 0.8+
770906	809	0.3-	0.9+	771112	809	0.1+	0.3-	860712	691	0.4+ 0.5+
770907	809	0.5+	1.3-	771113	809	0.0	0.9-	860712	691	0.4+ 0.7+
770907	809	0.0	1.5-	771203	809	0.5-	2.9-	860712	691	0.7+ 1.2+
770907	809	0.5+	1.4+	780107	809	0.5-	0.2-	860731	691	0.3- 0.7-
770911	809	0.2+	1.1-	780107	809	0.9+	2.5+	860731	691	0.4- 0.7-
771004	809	1.0-	1.3+	830220	675	0.2-	0.8+	860731	691	0.4+ 1.0-
771008	809	0.5+	1.4+	830402	675	0.1+	0.6-	860810	801	0.8- 0.5-
771009	809	0.1+	1.3+	860712	691	0.0	0.7+			

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

(1951) Lick
Epoch 1986 June 19.0 ET = JDE 2446600.5

M	208.67324		(1950.0)		P		Q
n	0.60109727	Peri.	140.35506		+0.11802078		+0.86817746
a	1.3905060	Node	130.15062		-0.99297955		+0.09930975
e	0.0617191	Incl.	39.09587		+0.00791918		-0.48621546
P	1.64	H	14.5	G	0.25		

From 32 observations at 5 oppositions, 1949-1985, mean residual 0".9.

(3014) 1979 TM
Epoch 1986 June 19.0 ET = JDE 2446600.5

M	336.34363		(1950.0)		P		Q
n	0.27127676	Peri.	179.76293		+0.76670155		+0.64190956
a	2.3633479	Node	140.29565		-0.58902624		+0.71014226
e	0.2280829	Incl.	0.98601		-0.25537585		+0.28922324
P	3.63	H	13.18	G	0.25		

From 21 observations at 4 oppositions, 1978-1986, mean residual 1".0.

(3039) Yangel
Epoch 1986 June 19.0 ET = JDE 2446600.5

M	37.04568		(1950.0)		P		Q
n	0.24064045	Peri.	71.59219		-0.14889827		+0.98775394
a	2.5599037	Node	190.18810		-0.97720334		-0.15419273
e	0.1408471	Incl.	15.27478		-0.15133716		+0.02380646
P	4.10	H	12.6	G	0.25		

From 27 observations at 5 oppositions, 1978-1986, mean residual 1".0.

(3178) 1984 WA
Epoch 1986 June 19.0 ET = JDE 2446600.5

M	99.22782		(1950.0)		P		Q
n	0.22049771	Peri.	241.07962		-0.53771783		-0.83659809
a	2.7135219	Node	241.82078		+0.80897807		-0.47696143
e	0.3779724	Incl.	6.82194		+0.23751635		-0.26946510
P	4.47	H	11.9	G	0.25		

From 33 observations at 5 oppositions, 1966-1985, mean residual 1".0.

(3371) 1955 RZ
Epoch 1986 June 19.0 ET = JDE 2446600.5

M	1.95455		(1950.0)		P		Q
n	0.21757022	Peri.	350.19101		+0.23898072		+0.95871593
a	2.7378086	Node	293.50430		-0.87907430		+0.14619231
e	0.0125138	Incl.	9.67509		-0.41245193		+0.24390896
P	4.53	H	11.9	G	0.25		

From 14 observations at 4 oppositions, 1955-1986, mean residual 0".8.

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

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

Periodic Comet Hartley 2 (1986c)
Epoch 1985 June 24.0 ET = JDE 2446240.5
T 1985 June 5.21329 ET

q	0.9508254		(1950.0)		P	Q
n	0.15708237	Peri.	174.86815		+0.75385797	-0.64672413
a	3.4018702	Node	226.13290		+0.59692165	+0.74788173
e	0.7204992	Incl.	9.25563		+0.27455911	+0.14973583
P	6.27					

From 15 observations 1986 Mar. 15-June 7, mean residual 0".5. The orbit given on MPC 11152 was for a non-standard Epoch.

Comet Wilson (1986l)
T 1987 Apr. 20.77867 ET

q	1.1987709		(1950.0)		P	Q
		Peri.	238.33253		-0.47982121	-0.71613750
		Node	110.95353		-0.50051786	+0.69791439
e	1.0	Incl.	147.12800		-0.72059245	-0.00791106

From 160 observations 1986 Aug. 5-Oct. 2.

(3497)* 1941 HJ = 1945 EB = 1985 GV

Discovered 1941 Apr. 19 by L. Oterma at Turku. The key identification 1941 HJ = 1985 GV is by E. Bowell (MPC 9760).
Epoch 1986 June 19.0 ET = JDE 2446600.5

M	82.71569		(1950.0)		P	Q
n	0.22338310	Peri.	61.39319		-0.72359084	+0.68749840
a	2.6901046	Node	161.80978		-0.68178161	-0.69804668
e	0.1504205	Incl.	11.33148		-0.10765746	-0.20019189
P	4.41	H	12.3	G	0.25	

Residuals in seconds of arc

410419	062	1.0-	0.4+	850415	688	0.4+	0.2+	850515 688	0.2- 0.1-
410421	062	0.4+	0.4+	850415	688	1.4-	2.0-	850620 801	0.0 0.2+
410426	062	0.9+	0.6+	850424	688	0.3+	0.2+	860806 801	1.2+ 1.4-
450304	062	1.0-	0.4-	850424	688	0.2+	0.1+	860907 801	1.1- 1.1+
450304	062	1.1+	0.5+	850515	688	0.5+	0.2-		

(3498)* 1981 EG14

Discovered 1981 Mar. 1 by S. J. Bus at Siding Spring in the course of the U.K. Schmidt-Caltech Asteroid Survey.
Epoch 1986 June 19.0 ET = JDE 2446600.5

M	281.76331		(1950.0)		P	Q
n	0.27260527	Peri.	189.98163		+0.60022327	-0.79636774
a	2.3556633	Node	223.18278		+0.74108700	+0.58870456
e	0.1024054	Incl.	6.23875		+0.30086889	+0.13865559
P	3.62	H	13.6	G	0.25	

Residuals in seconds of arc

791018	675	1.4-	0.4-	810312	413	0.4-	1.9+	810501 413	0.2+ 2.1-
791018	675	1.2+	2.3+	810312	413	0.9+	0.3+	810503 413	0.5+ 1.9-
810209	413	0.8-	0.6+	810406	413	0.6-	0.9+	840105 552	1.2- 0.7-
810212	413	0.7+	0.1+	810406	413	0.5-	1.4+	840105 552	1.2- 1.1-
810301	413	1.9+	0.7-	810408	413	1.2-	0.5+	840221 675	2.7+ 1.3+
810306	413	0.8-	0.3+	810408	413	1.3+	1.5-	860907 801	4.3- 1.4-
810308	413	0.7-	0.3+	810409	413	0.9-	0.4+	860908 054	1.9+ 0.7+
810308	413	0.8+	0.1+	810409	413	0.3+	0.3-	860911 054	2.7+ 0.4+

(3499)* 1981 VW1 = 1979 KT

Discovered 1981 Nov. 3 by F. Borngen and K. Kirsch at Tautenburg. The identification is by W. Landgraf (MPC 8895).

Epoch 1986 June 19.0 ET = JDE 2446600.5

M 340.45489		(1950.0)		P	Q
n 0.18042950	Peri.	191.82072		+0.93960516	+0.34164465
a 3.1016850	Node	148.17834		-0.31074512	+0.87668152
e 0.1801560	Incl.	2.23034		-0.14345594	+0.33868635
P 5.46	H	12.4	G	0.25	

Residuals in seconds of arc

790519	809	0.4-	0.3-	810925	095	0.7-	0.3+	850418	801	0.3+	1.1+
790519	809	0.3-	0.7-	811007	095	0.3+	0.6+	850524	801	0.2+	0.8+
790521	809	0.1+	0.1-	811023	330	0.8-	2.6-	860806	801	0.2+	0.4+
790523	809	0.2-	0.5-	811028	330	1.2+	0.5+	860807	033	0.3+	0.8-
790523	809	0.1+	0.3-	811103	033	0.0	0.7+	860808	033	0.2+	0.3-
790524	809	0.1-	0.4-	811103	033	0.1-	0.8+	860902	801	0.4-	0.2-

1981 UE10 = 1953 VU2 = 1986 PA1

The key identification 1981 UE10 = 1986 PA1 is by E. Bowell.

Epoch 1986 June 19.0 ET = JDE 2446600.5 (J-P)

M 331.11785		(1950.0)		P	Q
n 0.17466887	Peri.	194.60685		+0.93024667	+0.36631737
a 3.1695181	Node	143.88158		-0.33291401	+0.86696213
e 0.1805902	Incl.	2.06863		-0.15430295	+0.33791751
P 5.64	H	12.0	G	0.25	

Residuals in seconds of arc

531109	024	0.1+	0.6-	811023	330	1.7+	0.3-	860802	688	0.2-	0.4-
810925	095	0.7-	0.3+	811028	330	1.1-	0.5-	860902	801	0.1-	0.5+
811007	095	0.1-	1.1+	860802	688	0.1-	0.2-	860907	801	0.6+	0.2-

1983 PB

Epoch 1986 June 19.0 ET = JDE 2446600.5 (J-P)

M 314.31131		(1950.0)		P	Q
n 0.29938511	Peri.	242.79647		+0.71192593	+0.69488317
a 2.2130104	Node	72.98860		-0.60087318	+0.67755015
e 0.2315610	Incl.	6.09208		-0.36347336	+0.24096301
P 3.29	H	15.0	G	0.25	

Residuals in seconds of arc

830804	474(14.3+	13.0-)Y		830813	474	0.4-	0.4+	831101	474	1.4-	0.3-
830804	474 (7.8-	3.6+)Y		830813	474(13.6+	0.6+)		860508	474	0.2-	0.5-
830808	474	0.8-	0.4+	830911	474	1.5+	0.4+	860508	474	0.8-	0.2-
830808	474	2.2-	1.0-	830911	474	2.7+	0.4-	860514	474	0.1+	0.7+
830810	474	0.5+	0.3-	830928	474	0.1-	0.4+	860514	474	0.9+	0.1+
830810	474	0.4+	0.1-	830928	474	0.4-	0.5+				

1984 YC

Epoch 1986 June 19.0 ET = JDE 2446600.5 (J-P)

M 109.93198		(1950.0)		P	Q
n 0.21788106	Peri.	200.14965		-0.56251786	-0.65758961
a 2.7352095	Node	287.55177		+0.81215187	-0.32594837
e 0.2540876	Incl.	31.70989		+0.15486446	-0.67921540
P 4.52	H	12.0	G	0.25	

Residuals in seconds of arc

841222	662	0.9-	2.0-	850102	675	0.1-	0.4+	850123	801	1.0-	1.1-
841222	662	1.4+	3.3+	850112	675	0.1-	0.4-	850125	704	2.9-	1.2+
841223	662	1.1-	1.9-	850120	704	1.6+	2.8-	850125	704	0.6+	2.2+
841223	662	1.0+	1.2+	850120	704	1.2+	2.2-	850218	801	0.5-	2.5-
841224	662	0.4+	1.5-	850120	704	0.6+	1.3+	850421	801	1.5+	1.2-
841224	662	0.7+	0.4-	850120	704	1.4+	3.4+	860508	474	1.5+	0.2-
841224	662	0.2-	1.2-	850120	704	1.4-	0.1-	860508	474	1.0+	0.1+
841224	662	0.2+	1.5-	850122	704	0.1+	0.7+	860613	474	2.3-	0.4+
841231	675	0.1-	0.1-	850122	704	1.6-	4.1+				

1985 FA2 = 1949 KN
Epoch 1986 June 19.0 ET = JDE 2446600.5 (J-P)

M 314.10505	(1950.0)	P	Q
n 0.18791012	Peri. 214.71200	+0.79733235	+0.57404062
a 3.0188171	Node 109.18010	-0.49931656	+0.80087557
e 0.1008041	Incl. 11.38126	-0.33903407	+0.17051594
P 5.25	H 11.5	G 0.25	

Residuals in seconds of arc

490529	760	0.1+	0.1-	850414	688	1.5-	0.5-	860604	809	0.8-	0.3+
490529	760	0.5-	1.4-	850423	688	2.8-	0.1+	860606	809	0.5+	0.3-
850322	688	2.6+	0.5-	850423	688	0.9-	1.2+	860606	809	0.6+	0.0
850322	688	1.9+	0.0	860603	809	0.8+	0.5+	860608	809	0.4-	0.8+
850414	688	0.7+	0.2+	860603	809	0.6-	0.1+				

1986 RA
Epoch 1986 Aug. 18.0 ET = JDE 2446660.5

M 357.10411	(1950.0)	P	Q
n 0.15943975	Peri. 161.20160	+0.93047446	+0.36600269
a 3.3682551	Node 177.17156	-0.36380606	+0.92828093
e 0.6340525	Incl. 19.04663	-0.04315593	+0.06585240
P 6.18	H 16.0	G 0.25	

From 26 observations 1986 Aug. 11-Oct. 2.

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ORBITAL ELEMENTS BY S. NAKANO, SMITHSONIAN ASTROPHYSICAL OBSERVATORY.

The identifications are by S. Nakano.

(3500)* A919 SD = 1929 RS = 1932 KD = 1949 PE = 1962 JV = 1966 SB = 1973 YZ = 1980 XG3

Discovered 1919 Sept. 18 by K. Reinmuth at Heidelberg.
Epoch 1986 June 19.0 ET = JDE 2446600.5

M 350.43711	(1950.0)	P	Q
n 0.29411529	Peri. 9.90571	+0.81093836	+0.58271540
a 2.2393621	Node 314.31528	-0.54177501	+0.71345521
e 0.1968406	Incl. 4.25763	-0.22104032	+0.38913291
P 3.35	H 12.8	G 0.25	

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

190918	024	3.0+	0.2-	620506	839	0.0	1.6-	860810	801	0.2+	1.8+
190924	045	(1.1+	11.5-)	620507	839	(17.8+	0.4-)	860814	657	0.1+	0.5-
190925	045	2.1+	1.6-	660919	095	3.8-	3.6-	860828	376	0.9+	1.1+
190927	045	(1.3+	21.5-)	661018	095	0.9-	0.3-	860828	376	(4.9+	1.3-)
190930	045	1.4+	1.0+	731220	095	0.5-	3.6-	860904	657	0.0	0.7+
290901	094	(0.10-	0.00+)X	731221	095	(7.9-	0.2+)	860908	054	(7.0+	2.7+)
290910	094	(57.2-	3.1+)X	801210	095	0.2-	1.4+	860911	054	0.2+	1.6+
320525	078	(10.1-	7.8+)Y	860708	801	1.2+	1.3+	860912	054	0.5+	2.0+
490814	078	6.6-	4.2- Y	860731	657	0.6+	0.4+				
620506	839	1.4+	2.6-	860806	801	0.3+	0.2-				

(3501)* 1971 QU = 1957 WZ = 1962 WS = 1966 PB = 1970 GC2
= 1970 JK = 1970 JQ = 1980 JW = 1985 HO1

Discovered 1971 Aug. 18 by T. M. Smirnova at the Crimean Astrophysical Observatory.

Epoch 1986 June 19.0 ET = JDE 2446600.5

M	354.90569	(1950.0)		P	Q
n	0.19716023	Peri.	70.05179	+0.71826792	+0.69122096
a	2.9236351	Node	246.12787	-0.66639009	+0.65063561
e	0.0883176	Incl.	4.98132	-0.20003862	+0.31446286
P	5.00	H	11.7	G 0.25	

Residuals in seconds of arc

571126	760	0.1-	0.6+	700412	805	0.9-	0.3+	850424	688	2.8+	1.7-
571126	760	0.5+	0.5+	700502	805	0.5+	1.0+	850521	688	0.5+	2.4+
621124	760	1.6-	1.9+	700508	805	0.0	1.1+	850521	688	1.5-	2.5+
621124	760	0.4+	3.4+	710818	095	1.7+	2.0+	860801	657	0.7-	1.2+
660813	095	0.5-	0.6-	710824	095	0.9-	2.4+	860801	657	0.7-	2.3+
700412	805	0.2-	0.9-	800510	095	0.1-	3.7+	860809	657	0.7+	5.3-
700412	805	0.4-	0.9-	850424	688	1.0+	1.2-				

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

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

(3502)* 1964 TR1 = 1957 JE = 1979 HP2 = 1981 TJ2 = 1981 UL15 = 1985 JS1

Discovered 1964 Oct. 9 at the Purple Mountain Observatory. The double designation 1981 TJ2 = 1981 UL15 is by N. S. Chernykh (MPC 10037).

Epoch 1986 June 19.0 ET = JDE 2446600.5

M	5.77147	(1950.0)		P	Q
n	0.17796160	Peri.	214.19331	+0.75173692	+0.65774096
a	3.1302944	Node	104.60505	-0.59347798	+0.70624208
e	0.1802191	Incl.	2.82115	-0.28753346	+0.26191401
P	5.54	H	11.9	G 0.25	

Residuals in seconds of arc

570502	760	0.0	2.0+	790424	095	0.6-	0.4+	860905	657	0.6-	0.6-
570502	760	1.0+	0.9-	811004	095	1.4-	0.7-	860905	657	0.8-	0.9-
641009	330	1.1-	1.6+	811023	095	2.5+	1.9-	860906	688	0.3+	0.1-
641101	330	2.0-	0.1-	850514	675	0.8-	2.4-	860906	688	1.6+	0.3+
641110	330	2.2+	0.7-	850515	675	0.1-	0.7-	860908	801	0.4-	1.4+

(3503)* 1981 EF17 = 1974 TB1 = 1978 SQ1

Discovered 1981 Mar. 1 by S. J. Bus at Siding Spring in the course of the U.K. Schmidt-Caltech Asteroid Survey. The key identification 1981 EF17 = 1978 SQ1 is by W. Landgraf (MPC 8061).

Epoch 1986 June 19.0 ET = JDE 2446600.5

M	341.11414	(1950.0)		P	Q
n	0.23275853	Peri.	112.79310	+0.49183178	+0.87034390
a	2.6173732	Node	186.82369	-0.85525250	+0.47763194
e	0.1814422	Incl.	11.92745	-0.16323194	+0.11987168
P	4.23	H	13.7	G 0.25	

Residuals in seconds of arc

741010	808	0.2-	0.5-		810307	413	0.6+	0.4-		810411	413	0.6+	1.3-
741010	808	0.8+	0.9-		810311	413	0.1-	0.1-		810430	413	0.2+	0.1-
780928	095	0.9-	2.4+		810315	413	2.5-	0.7+		810502	413	0.7+	0.7+
810209	413	0.7+	0.1+		810315	413	0.1-	0.6-		860710	801	0.8+	0.2-
810213	413	0.1-	0.1-		810407	413	1.5+	0.6-		860806	801	0.3+	1.1+
810301	413	0.7-	2.2+		810408	413	1.1-	1.0+		860908	801	1.2-	1.7-
810301	413	0.4+	0.5-		810408	413	0.6+	0.9-					
810307	413	0.2+	0.6+		810411	413	0.5-	0.6+					

(3504)* 1981 RV3 = 1959 TN = 1975 RH2 = 1980 KT1 = 1980 LD1

Discovered 1981 Sept. 3 by N. S. Chernykh at the Crimean Astrophysical Observatory. The double designation 1980 KT1 = 1980 LD1 is by B. G. Marsden (MPC 9203). The identification 1981 RV3 = 1980 KT1 was found independently by K. Hurukawa and L. D. Schmadel; Hurukawa also independently found the identification 1981 RV3 = 1975 RH2 (MPC 10037).

Epoch 1986 June 19.0 ET = JDE 2446600.5

M	14.41250	(1950.0)	P	Q	
n	0.17970333	Peri.	168.13312	+0.28620260	+0.95765455
a	3.1100352	Node	118.49073	-0.88195688	+0.27610387
e	0.1729938	Incl.	2.04729	-0.37448649	+0.08163583
P	5.48	H	11.9	G	0.25

Residuals in seconds of arc

591006	024	1.3-	0.9-		811007	095	2.6-	3.4-		860804	675	2.6-	0.4+
750909	808	1.4+	0.3-		811022	095	2.7+	1.6+		860804	675	3.5-	1.7+
750909	808	0.7+	0.4-		811024	095	3.9+	0.2+		860806	657	1.7+	0.6+
800517	095	1.9+	2.6-		860801	675	(7.1+	0.4-)		860806	657	3.4+	1.9-
800611	675	3.9-	0.5+		860801	675	(8.9+	1.2+)		860830	474	2.2-	1.8+
800612	675	2.2+	0.6-		860802	675	(10.8+	1.4-)		860830	474	1.4-	0.7+
810903	095	0.2+	0.0		860802	675	(11.9+	0.4+)		860902	801	0.5+	0.0

(3505)* 1983 AM = 1934 SA = 1978 EW

Discovered 1983 Jan. 9 by B. A. Skiff at the Anderson Mesa Station of the Lowell Observatory.

Epoch 1986 June 19.0 ET = JDE 2446600.5

M	308.25755	(1950.0)	P	Q	
n	0.18855077	Peri.	86.57936	+0.86448222	-0.48454992
a	3.0119691	Node	302.36200	+0.37490214	+0.79873537
e	0.1175963	Incl.	9.10891	+0.33484157	+0.35669761
P	5.23	H	11.9	G	0.25

Residuals in seconds of arc

340916	094	(15.3- | 21.9+)X		830116	688	0.1-	1.1-		860901	675	(3.2- | 0.7-)
341003	094	(31.9-	56.4-)X		830116	688	0.5+	0.4-		860901	675	1.4-	0.6-
780305	095	1.3-	0.3-		830215	688	1.0+	0.1-		860905	688	(5.8+	5.5+)
780306	095	0.0	2.6-		830215	688	0.5-	0.8-		860905	688	0.1+	0.8-
830109	688	0.2-	0.7-		840403	801	0.2+	1.5+		860911	688	0.3+	0.3-
830109	688	2.1+	0.4+		840506	801	0.7-	1.9-		860911	688	0.1+	0.2+
830112	046	1.2-	2.2+		860809	801	1.9+	0.4-					
830112	046	1.1-	1.4+		860901	801	0.3+	0.2-					

(3506)* 1984 CO1 = 1956 XE = 1966 VL = 1981 QO1 = 1983 AO3

Discovered 1984 Feb. 6 by E. Bowell at the Anderson Mesa Station of the Lowell Observatory. The identifications 1984 CO1 = 1956 XE = 1966 VL = 1981 QO1 were independently found by W. Landgraf (MPC 8795), and the identification 1984 CO1 = 1981 QO1 was also found by T. Furuta (JAM 1598).

Epoch 1986 June 19.0 ET = JDE 2446600.5
M 291.63719 (1950.0) P Q
n 0.18978533 Peri. 48.46447 +0.85175447 -0.52185923
a 2.9988929 Node 342.82747 +0.42120078 +0.73497946
e 0.0999212 Incl. 9.09313 +0.31161551 +0.43297591
P 5.19 H 11.5 G 0.25
Residuals in seconds of arc

561204	760	0.1-	2.6-	810905	095	0.8-	0.8-	840306	688	2.1-	0.2+
561204	760	0.3+	1.8-	810925	095	1.4-	2.7-	840306	688	0.2-	0.3+
661112	095	0.6-	3.3+	810928	095	0.3-	0.3+	840403	688	2.0+	1.7-
810829	704	0.0	2.2-	811006	095	0.9-	2.5-	840403	688	0.1+	3.5-
810829	704	1.7-	0.1+	830114	095	0.3+	0.7+	860802	675	1.8+	2.3+
810830	704	1.0+	1.4-	840206	688	0.5-	0.0	860802	675	4.1+	3.0+
810831	704	1.0+	1.2-	840206	688	0.5-	0.6+	860810	801	1.1-	0.8-
810901	704	0.5+	2.9-	840301	688	2.2-	0.6-	860902	801	0.6-	0.5-
810902	704	2.2+	1.9+	840301	688	1.2-	0.4-				

1964 UP = 1986 RH
Epoch 1986 June 19.0 ET = JDE 2446600.5 (J-P)
M 12.09255 (1950.0) P Q
n 0.30990471 Peri. 357.28203 +0.44471397 +0.89433156
a 2.1626428 Node 299.11884 -0.82066141 +0.38494579
e 0.1469017 Incl. 3.21505 -0.35880961 +0.22800833
P 3.18 H 14.0 G 0.25
Residuals in seconds of arc

641030	330	0.8-	0.7+	860908	054	2.1+	0.6+	861006	801	0.9+	0.5-
641111	330	0.2-	0.8-	860911	054	4.1-	0.9-				
641127	330	0.1-	0.2+	861003	801	0.8-	0.3+				

1976 QX = 1976 SY = 1974 EB = 1981 SB4 = 1986 RD3
The double designation 1976 QX = 1976 SY is by J. G. Williams (MPC 5638).
Epoch 1986 June 19.0 ET = JDE 2446600.5 (J-P)
M 299.46398 (1950.0) P Q
n 0.20167797 Peri. 57.54264 +0.69595229 -0.71806973
a 2.8798151 Node 348.34983 +0.64998662 +0.63296792
e 0.0593836 Incl. 1.45433 +0.30523401 +0.28935701
P 4.89 H 12.0 G 0.25
Residuals in seconds of arc

740313	095	0.7-	1.0-	760830	675	0.3+	1.7-	860912	688	0.4+	0.4+
760826	095	0.4-	1.7-	760924	095	0.9-	0.7+	860912	688	0.3+	0.2+
760828	675	0.6-	0.4-	810925	095	0.3-	2.6-				

1986 EB
Epoch 1986 June 19.0 ET = JDE 2446600.5
M 265.86008 (1950.0) P Q
n 1.02577576 Peri. 359.31743 +0.99897691 +0.04316053
a 0.9737208 Node 358.04879 -0.03938282 +0.68352369
e 0.2803794 Incl. 23.36321 -0.02222913 +0.72865118
P 0.96 H 16.0 G 0.25
From 48 observations 1986 Mar. 4-June 10, mean residual 1".1.

1986 RJ = 1969 EK = 1976 KY
Epoch 1986 June 19.0 ET = JDE 2446600.5 (J-P)
M 0.02372 (1950.0) P Q
n 0.30748646 Peri. 46.62518 +0.64078132 +0.76636052
a 2.1739668 Node 263.28208 -0.71698414 +0.57607593
e 0.1951911 Incl. 2.63894 -0.27446866 +0.28430279
P 3.21 H 13.5 G 0.25

Residuals in seconds of arc

690312	095	0.4-	0.0	860904	017	1.4-	0.2+	860911	054	2.0+	0.8-
760526	095	0.9+	2.8-	860905	017	0.1+	0.2+	860925	017	1.0+	0.2-
760529	095	1.1-	2.0+	860905	017	2.2-	0.5+	860925	017	2.4+	1.3+
860904	017	1.2-	1.3-	860908	054	(6.8+	1.9+)				

* * * * *

ORBITAL ELEMENTS BY T. KOBAYASHI, TOKYO.

1983 CO3 = 1972 AJ
The identification is by T. Kobayashi.
Epoch 1986 June 19.0 ET = JDE 2446600.5

M	212.71824	(1950.0)		P	Q
n	0.18057323	Peri.	223.05960	-0.80609187	-0.54193493
a	3.1000388	Node	282.64768	+0.58722791	-0.68270202
e	0.1593834	Incl.	14.10247	+0.07334356	-0.49012701
P	5.46	H	12.5	G 0.25	

Residuals in seconds of arc

720114	029	0.1-	0.5-	830212	809	0.0	0.1+	830220	809	0.6+	0.3+
720115	029	1.2-	0.1-	830212	809	0.2+	0.3+	830220	809	0.6+	0.2+
720116	029	1.5+	0.7-	830218	809	0.9-	0.6-	830220	809	0.8+	0.1+
720117	029	0.1-	1.3+	830218	809	0.7-	0.3-				
830212	809	0.1-	0.1+	830218	809	0.5-	0.4-				

* * * * *

EPHEMERIDES.

1986 RA a,e,i = 3.37, 0.63, 19 Elements MPC 11238

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1986	10 17	23 54.96	-21 46.9	0.398	1.334	142.3	27.2	15.7
1986	10 27	00 19.95	-23 34.9					
1986	11 06	00 40.69	-23 37.5	0.581	1.441	130.9	31.3	16.8
1986	11 16	00 58.67	-22 32.9					
1986	11 26	01 14.95	-20 47.2	0.809	1.570	121.5	32.4	17.7
1986	12 06	01 30.28	-18 36.6					
1986	12 16	01 45.20	-16 12.4	1.078	1.713	112.3	32.1	18.5
1986	12 26	01 59.96	-13 42.7					
1987	01 05	02 14.77	-11 12.4	1.383	1.864	102.6	31.0	19.2
1987	01 15	02 29.72	-08 45.6					
1987	01 25	02 44.84	-06 24.8	1.718	2.017	92.5	29.2	19.8
1987	02 04	03 00.16	-04 11.7					
1987	02 14	03 15.67	-02 07.6	2.073	2.170	82.1	26.8	20.3
1987	02 24	03 31.34	-00 13.5					
1987	03 06	03 47.15	+01 30.4	2.438	2.322	71.5	23.9	20.8
1987	03 16	04 03.06	+03 03.6					
1987	03 26	04 19.03	+04 26.0	2.799	2.470	60.8	20.6	21.1

Comet Shoemaker (1986b) Elements MPC 10759

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	m2
1986	10 17	09 41.84	+19 00.3	4.451	4.071	61.5	12.4	19.3
1986	10 27	09 39.04	+18 56.0					
1986	11 06	09 34.52	+18 59.3	4.156	4.154	83.0	13.7	19.3
1986	11 16	09 27.94	+19 10.6					
1986	11 26	09 19.05	+19 29.6	3.851	4.241	106.7	12.9	19.2
1986	12 06	09 07.61	+19 55.4					
1986	12 16	08 53.60	+20 26.0	3.602	4.333	133.0	9.6	19.2
1986	12 26	08 37.23	+20 58.1					

1987 01 05	08 19.05	+21 27.7	3.485	4.429	161.4	4.1	19.2
1987 01 15	07 59.94	+21 51.1					
1987 01 25	07 40.99	+22 05.6	3.556	4.527	169.3	2.3	19.3
1987 02 04	07 23.24	+22 10.8					
1987 02 14	07 07.52	+22 07.7	3.817	4.630	141.4	7.7	19.6
1987 02 24	06 54.30	+21 58.7					
1987 03 06	06 43.73	+21 45.8	4.218	4.734	115.8	10.9	19.9
1987 03 16	06 35.74	+21 31.1					
1987 03 26	06 30.08	+21 15.7	4.691	4.842	92.7	11.9	20.2
1987 04 05	06 26.45	+21 00.3					
1987 04 15	06 24.54	+20 45.2	5.173	4.952	71.8	11.1	20.5
1987 04 25	06 24.05	+20 30.4					
1987 05 05	06 24.72	+20 15.6	5.615	5.063	52.4	9.1	20.8

Comet Shoemaker (1984f) Elements MPC 9426

Date ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	m2
1986 11 06	05 19.41	-18 09.5	4.288	4.965	128.4	9.0	16.1
1986 11 16	05 07.60	-18 10.9					
1986 11 26	04 55.21	-17 56.0	4.324	5.113	139.3	7.2	16.3
1986 12 06	04 42.80	-17 23.9					
1986 12 16	04 30.97	-16 35.6	4.493	5.261	137.6	7.3	16.5
1986 12 26	04 20.21	-15 33.3					
1987 01 05	04 10.89	-14 20.2	4.790	5.409	124.6	8.6	16.7
1987 01 15	04 03.22	-12 59.8					
1987 01 25	03 57.25	-11 35.3	5.186	5.557	107.2	9.7	17.0
1987 02 04	03 52.94	-10 09.6					
1987 02 14	03 50.19	-08 44.7	5.638	5.705	88.9	10.0	17.3
1987 02 24	03 48.81	-07 22.4					
1987 03 06	03 48.66	-06 03.8	6.099	5.853	71.1	9.2	17.6
1987 03 16	03 49.54	-04 49.5					
1987 03 26	03 51.28	-03 40.2	6.531	6.001	54.1	7.7	17.9
1987 04 05	03 53.73	-02 36.0					
1987 04 15	03 56.74	-01 37.2	6.902	6.148	38.4	5.8	18.1

1986 EB a,e,i = 0.97, 0.28, 23 Elements MPC 11241

Date ET	R. A. (1950)	Decl.	Delta	r	Variation		V
1986 11 06	12 21.34	+32 17.5	0.637	0.854	+5.84	+18.7	17.3
1986 11 16	12 40.43	+30 14.5					
1986 11 26	12 58.70	+27 46.6	0.718	0.955	+5.40	+32.0	17.4
1986 12 06	13 15.85	+25 09.8					
1986 12 16	13 31.67	+22 32.0	0.726	1.049	+4.42	+40.1	17.5
1986 12 26	13 46.02	+19 56.5					
1987 01 05	13 58.60	+17 24.7	0.671	1.128	+3.36	+48.6	17.3
1987 01 15	14 08.94	+14 55.2					
1987 01 25	14 16.38	+12 23.8	0.568	1.187	+2.04	+60.3	17.0
1987 02 04	14 19.70	+09 44.2					
1987 02 14	14 17.05	+06 43.5	0.437	1.227	-0.32	+78.0	16.3

1964 UP a,e,i = 2.16, 0.15, 3 Elements MPC 11241

Date ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1986 10 17	22 38.77	-03 16.0	1.138	1.986	137.0	20.0	16.6
1986 10 27	22 40.50	-03 18.5					
1986 11 06	22 45.33	-03 03.9	1.345	2.018	118.7	25.5	17.2
1986 11 16	22 52.85	-02 32.8					
1986 11 26	23 02.57	-01 47.2	1.588	2.052	103.1	27.9	17.7
1986 12 06	23 14.09	-00 48.6					
1986 12 16	23 27.07	+00 21.2	1.850	2.086	89.4	28.1	18.0
1986 12 26	23 41.21	+01 40.1					
1987 01 05	23 56.28	+03 06.6	2.116	2.121	76.8	26.8	18.3

1986 RJ a,e,i = 2.17, 0.20, 3 Elements MPC 11241

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1986	10 17	22 51.86	-01 56.0	0.993	1.873	140.5	19.8	15.7
1986	10 27	22 54.10	-02 10.2					
1986	11 06	22 59.49	-02 04.4	1.188	1.912	122.4	26.0	16.3
1986	11 16	23 07.62	-01 39.5					
1986	11 26	23 17.96	-00 57.9	1.422	1.954	107.0	28.9	16.8
1986	12 06	23 30.11	-00 01.7					
1986	12 16	23 43.70	+01 06.6	1.680	1.998	93.5	29.4	17.3
1986	12 26	23 58.42	+02 24.6					
1987	01 05	00 14.05	+03 50.4	1.949	2.044	81.2	28.4	17.6

1983 CO3 a,e,i = 3.10, 0.16, 14 Elements MPC 11242

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1986	10 17	23 28.77	+17 36.3	2.530	3.433	150.6	8.2	17.7
1986	10 27	23 23.99	+16 34.3					
1986	11 06	23 21.11	+15 34.9	2.669	3.412	131.9	12.5	17.9
1986	11 16	23 20.31	+14 42.8					
1986	11 26	23 21.56	+14 01.0	2.881	3.389	112.9	15.6	18.2
1986	12 06	23 24.74	+13 31.5					
1986	12 16	23 29.70	+13 15.1	3.133	3.365	95.0	16.9	18.4
1986	12 26	23 36.22	+13 11.5					
1987	01 05	23 44.11	+13 20.1	3.394	3.341	78.5	16.8	18.6
1987	01 15	23 53.18	+13 40.0					
1987	01 25	00 03.26	+14 10.0	3.639	3.315	63.2	15.4	18.7

1976 QX a,e,i = 2.88, 0.06, 1 Elements MPC 11241

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1986	10 17	23 43.44	-01 05.8	1.821	2.746	152.9	9.5	16.0
1986	10 27	23 38.77	-01 32.6					
1986	11 06	23 36.35	-01 45.5	1.983	2.738	131.1	15.8	16.4
1986	11 16	23 36.36	-01 43.5					
1986	11 26	23 38.72	-01 26.9	2.209	2.732	111.6	19.6	16.8
1986	12 06	23 43.25	-00 56.5					
1986	12 16	23 49.72	-00 13.7	2.469	2.726	94.3	21.1	17.0
1986	12 26	23 57.86	+00 39.8					
1987	01 05	00 07.45	+01 42.6	2.735	2.721	78.8	20.8	17.3
1987	01 15	00 18.27	+02 53.1					
1987	01 25	00 30.13	+04 10.0	2.989	2.716	64.6	19.1	17.4

(3415) 1928 SL a,e,i = 3.97, 0.25, 1 Elements MPC 10610

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	01 05	12 32.54	-04 59.9	4.510	4.685	94.1	12.1	17.9
1987	01 15	12 34.36	-05 14.5					
1987	01 25	12 34.84	-05 20.5	4.225	4.710	113.8	11.0	17.7
1987	02 04	12 33.93	-05 17.5					
1987	02 14	12 31.66	-05 05.5	3.984	4.733	134.9	8.5	17.5
1987	02 24	12 28.13	-04 45.0					
1987	03 06	12 23.55	-04 17.1	3.825	4.755	157.2	4.6	17.3
1987	03 16	12 18.23	-03 43.5					
1987	03 26	12 12.55	-03 06.6	3.779	4.776	178.4	0.3	17.0
1987	04 05	12 06.92	-02 29.0					
1987	04 15	12 01.75	-01 53.6	3.856	4.796	157.1	4.7	17.3
1987	04 25	11 57.37	-01 22.7					
1987	05 05	11 54.06	-00 58.1	4.043	4.815	135.5	8.4	17.6
1987	05 15	11 51.95	-00 41.1					
1987	05 25	11 51.13	-00 32.2	4.311	4.833	115.4	10.9	17.8
1987	06 04	11 51.57	-00 31.6					
1987	06 14	11 53.24	-00 39.0	4.623	4.849	96.8	12.0	18.0

(3462) 1981 UA10 a,e,i = 2.45, 0.21, 6 Elements MPC 10838

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	01 05	12 38.95	+01 32.2	2.679	2.937	95.2	19.5	18.6
1987	01 15	12 43.85	+01 27.3					
1987	01 25	12 46.78	+01 36.7	2.414	2.951	113.7	17.8	18.4
1987	02 04	12 47.51	+02 01.2					
1987	02 14	12 45.89	+02 40.4	2.187	2.962	134.3	13.8	18.1
1987	02 24	12 41.94	+03 32.8					
1987	03 06	12 35.86	+04 35.1	2.033	2.970	156.7	7.6	17.7
1987	03 16	12 28.12	+05 42.0					
1987	03 26	12 19.47	+06 47.2	1.986	2.976	171.5	2.9	17.4
1987	04 05	12 10.76	+07 44.3					
1987	04 15	12 02.90	+08 28.0	2.054	2.978	152.2	9.0	17.8
1987	04 25	11 56.56	+08 55.3					
1987	05 05	11 52.22	+09 05.3	2.221	2.978	130.7	14.9	18.1
1987	05 15	11 50.09	+08 58.5					
1987	05 25	11 50.14	+08 36.8	2.453	2.975	111.4	18.5	18.5
1987	06 04	11 52.27	+08 01.9					
1987	06 14	11 56.25	+07 15.8	2.715	2.969	94.3	19.9	18.7

1985 QS a,e,i = 2.35, 0.18, 7 Elements MPC 10303

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	01 05	12 43.13	-00 41.5	2.139	2.407	93.4	24.1	17.5
1987	01 15	12 49.70	-01 30.2					
1987	01 25	12 53.96	-02 05.8	1.918	2.446	110.7	22.1	17.3
1987	02 04	12 55.58	-02 26.8					
1987	02 14	12 54.33	-02 32.9	1.724	2.484	130.7	17.5	17.0
1987	02 24	12 50.15	-02 24.1					
1987	03 06	12 43.23	-02 01.8	1.592	2.520	153.5	10.1	16.6
1987	03 16	12 34.19	-01 29.5					
1987	03 26	12 23.97	-00 52.4	1.557	2.554	177.8	0.9	16.1
1987	04 05	12 13.72	-00 16.4					
1987	04 15	12 04.60	+00 12.4	1.633	2.586	157.0	8.7	16.6
1987	04 25	11 57.48	+00 29.9					
1987	05 05	11 52.85	+00 33.8	1.806	2.616	134.7	15.9	17.1
1987	05 15	11 50.87	+00 23.5					
1987	05 25	11 51.43	-00 00.3	2.047	2.643	115.3	20.3	17.6
1987	06 04	11 54.29	-00 36.4					
1987	06 14	11 59.18	-01 23.3	2.323	2.668	98.4	22.1	17.9

(3453) 1981 SS5 a,e,i = 2.39, 0.09, 5 Elements MPC 10833

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	01 05	12 31.98	-07 23.1	2.107	2.377	93.3	24.4	16.3
1987	01 15	12 40.09	-08 41.3					
1987	01 25	12 46.24	-09 49.5	1.840	2.358	109.4	23.2	16.0
1987	02 04	12 50.04	-10 45.2					
1987	02 14	12 51.18	-11 26.2	1.599	2.339	127.8	19.5	15.5
1987	02 24	12 49.43	-11 50.0					
1987	03 06	12 44.74	-11 54.1	1.414	2.320	148.8	12.8	15.0
1987	03 16	12 37.50	-11 37.9					
1987	03 26	12 28.50	-11 02.8	1.313	2.302	170.1	4.3	14.5
1987	04 05	12 18.91	-10 13.4					
1987	04 15	12 10.07	-09 17.5	1.314	2.284	160.6	8.4	14.7
1987	04 25	12 03.14	-08 23.8					
1987	05 05	11 58.88	-07 39.6	1.409	2.267	138.8	17.0	15.1
1987	05 15	11 57.64	-07 10.1					
1987	05 25	11 59.37	-06 57.4	1.571	2.252	119.7	23.0	15.5
1987	06 04	12 03.88	-07 02.0					
1987	06 14	12 10.84	-07 23.0	1.771	2.237	103.4	26.2	15.8

(3425) 1929 BD a,e,i = 3.00, 0.09, 9 Elements MPC 10628

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	01 05	12 44.80	-14 21.1	2.935	3.057	87.7	18.7	16.5
1987	01 15	12 50.23	-15 32.3					
1987	01 25	12 53.87	-16 34.9	2.670	3.073	104.9	18.0	16.3
1987	02 04	12 55.49	-17 26.8					
1987	02 14	12 54.94	-18 05.9	2.429	3.089	123.8	15.4	16.0
1987	02 24	12 52.17	-18 30.3					
1987	03 06	12 47.30	-18 37.9	2.245	3.104	144.2	10.8	15.7
1987	03 16	12 40.71	-18 27.6					
1987	03 26	12 33.00	-18 00.1	2.151	3.119	163.2	5.3	15.4
1987	04 05	12 24.95	-17 17.9					
1987	04 15	12 17.40	-16 25.9	2.167	3.133	161.2	5.9	15.5
1987	04 25	12 11.08	-15 29.8					
1987	05 05	12 06.51	-14 35.6	2.290	3.147	142.0	11.4	15.8
1987	05 15	12 04.01	-13 48.1					
1987	05 25	12 03.62	-13 10.8	2.497	3.160	122.6	15.7	16.1
1987	06 04	12 05.29	-12 45.5					
1987	06 14	12 08.86	-12 32.8	2.756	3.172	104.9	18.0	16.4

1985 QQ a,e,i = 2.18, 0.14, 6 Elements MPC 10303

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	01 05	12 51.94	-02 11.8	2.078	2.312	90.8	25.2	17.9
1987	01 15	12 59.90	-03 09.2					
1987	01 25	13 05.67	-03 54.1	1.848	2.338	107.3	23.7	17.7
1987	02 04	13 08.88	-04 25.0					
1987	02 14	13 09.20	-04 40.9	1.639	2.363	126.5	19.6	17.3
1987	02 24	13 06.44	-04 41.2					
1987	03 06	13 00.61	-04 26.2	1.483	2.386	148.7	12.5	16.9
1987	03 16	12 52.13	-03 58.2					
1987	03 26	12 41.84	-03 21.5	1.414	2.407	173.3	2.8	16.4
1987	04 05	12 30.94	-02 41.8					
1987	04 15	12 20.75	-02 06.3	1.453	2.426	161.6	7.5	16.7
1987	04 25	12 12.38	-01 40.5					
1987	05 05	12 06.55	-01 28.4	1.593	2.442	138.6	15.8	17.2
1987	05 15	12 03.58	-01 31.5					
1987	05 25	12 03.42	-01 49.7	1.803	2.456	118.7	21.2	17.6
1987	06 04	12 05.87	-02 21.8					
1987	06 14	12 10.61	-03 06.4	2.051	2.467	101.7	23.8	18.0

7633 P-L a,e,i = 2.84, 0.06, 3 Elements MPC 7374

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	01 05	12 47.16	-01 36.1	2.757	2.961	92.1	19.4	18.9
1987	01 15	12 53.36	-02 00.7					
1987	01 25	12 57.81	-02 12.9	2.471	2.953	109.7	18.3	18.6
1987	02 04	13 00.25	-02 11.6					
1987	02 14	13 00.50	-01 56.5	2.217	2.945	129.4	15.0	18.3
1987	02 24	12 58.47	-01 27.6					
1987	03 06	12 54.24	-00 46.6	2.027	2.936	151.2	9.4	17.9
1987	03 16	12 48.14	+00 03.5					
1987	03 26	12 40.74	+00 58.0	1.934	2.926	173.2	2.3	17.5
1987	04 05	12 32.81	+01 51.1					
1987	04 15	12 25.24	+02 37.1	1.953	2.917	160.2	6.7	17.7
1987	04 25	12 18.81	+03 11.4					
1987	05 05	12 14.11	+03 31.1	2.076	2.906	138.2	13.4	18.1
1987	05 15	12 11.50	+03 35.0					
1987	05 25	12 11.07	+03 23.8	2.274	2.896	118.3	17.9	18.4
1987	06 04	12 12.79	+02 58.3					
1987	06 14	12 16.48	+02 20.4	2.515	2.885	100.9	20.2	18.7

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

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	01 05	12 53.41	-02 45.7	3.514	3.653	90.2	15.6	19.3
1987	01 15	12 57.60	-03 03.6					
1987	01 25	13 00.23	-03 11.2	3.214	3.653	108.8	14.8	19.1
1987	02 04	13 01.14	-03 07.8					
1987	02 14	13 00.24	-02 53.3	2.946	3.651	129.2	12.1	18.8
1987	02 24	12 57.52	-02 28.1					
1987	03 06	12 53.10	-01 53.3	2.747	3.648	151.2	7.5	18.5
1987	03 16	12 47.27	-01 11.5					
1987	03 26	12 40.50	-00 25.8	2.651	3.644	173.7	1.7	18.1
1987	04 05	12 33.35	+00 19.7					
1987	04 15	12 26.47	+01 01.0	2.673	3.638	161.4	5.1	18.3
1987	04 25	12 20.43	+01 34.6					
1987	05 05	12 15.68	+01 58.0	2.806	3.630	139.2	10.5	18.6
1987	05 15	12 12.53	+02 09.8					
1987	05 25	12 11.10	+02 09.8	3.022	3.622	118.9	14.2	18.9
1987	06 04	12 11.41	+01 58.3					
1987	06 14	12 13.37	+01 36.2	3.285	3.611	100.5	16.1	19.1

1981 EF a,e,i = 3.09, 0.23, 16 Elements MPC 10528

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	01 05	13 06.17	-06 59.3	3.026	3.110	85.7	18.4	17.7
1987	01 15	13 11.11	-08 03.2					
1987	01 25	13 14.25	-08 59.0	2.776	3.153	103.4	17.7	17.5
1987	02 04	13 15.36	-09 45.5					
1987	02 14	13 14.29	-10 22.1	2.547	3.196	123.1	15.0	17.3
1987	02 24	13 10.99	-10 47.8					
1987	03 06	13 05.56	-11 02.0	2.376	3.238	144.9	10.2	17.0
1987	03 16	12 58.33	-11 05.0					
1987	03 26	12 49.86	-10 57.8	2.298	3.278	167.5	3.8	16.7
1987	04 05	12 40.88	-10 42.7					
1987	04 15	12 32.21	-10 23.2	2.336	3.318	166.0	4.2	16.8
1987	04 25	12 24.58	-10 03.1					
1987	05 05	12 18.53	-09 46.3	2.487	3.356	144.0	10.2	17.2
1987	05 15	12 14.40	-09 35.7					
1987	05 25	12 12.29	-09 33.1	2.727	3.393	123.5	14.4	17.5
1987	06 04	12 12.18	-09 39.7					
1987	06 14	12 13.92	-09 55.7	3.021	3.428	105.1	16.6	17.9

1982 UO7 a,e,i = 2.21, 0.07, 5 Elements MPC 10762

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	01 05	12 42.89	+01 14.0	1.766	2.084	94.2	28.1	17.4
1987	01 15	12 53.77	+00 36.2					
1987	01 25	13 02.52	+00 14.8	1.548	2.094	109.5	26.3	17.1
1987	02 04	13 08.70	+00 11.7					
1987	02 14	13 11.92	+00 27.8	1.354	2.105	127.5	21.9	16.7
1987	02 24	13 11.87	+01 02.6					
1987	03 06	13 08.44	+01 54.0	1.209	2.118	148.3	14.2	16.3
1987	03 16	13 01.94	+02 56.2					
1987	03 26	12 53.16	+04 01.1	1.145	2.132	169.0	5.1	15.8
1987	04 05	12 43.35	+04 58.7					
1987	04 15	12 34.01	+05 39.9	1.178	2.147	159.7	9.3	16.1
1987	04 25	12 26.42	+05 59.3					
1987	05 05	12 21.44	+05 54.9	1.302	2.163	138.5	18.0	16.6
1987	05 15	12 19.48	+05 28.1					
1987	05 25	12 20.48	+04 42.0	1.490	2.179	119.9	23.8	17.0
1987	06 04	12 24.22	+03 39.9					
1987	06 14	12 30.36	+02 24.9	1.715	2.195	104.0	26.7	17.4

2037 P-L a,e,i = 3.22, 0.15, 18 Elements MPC 8786

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	01 05	13 05.16	-05 32.8	2.925	3.028	86.5	18.9	19.1
1987	01 15	13 11.26	-06 48.4					
1987	01 25	13 15.73	-07 58.3	2.614	3.000	103.5	18.6	18.8
1987	02 04	13 18.28	-09 01.7					
1987	02 14	13 18.66	-09 57.7	2.325	2.972	122.3	16.3	18.5
1987	02 24	13 16.68	-10 45.5					
1987	03 06	13 12.29	-11 23.9	2.090	2.945	143.2	11.6	18.1
1987	03 16	13 05.65	-11 52.2					
1987	03 26	12 57.23	-12 10.3	1.944	2.920	165.3	5.0	17.6
1987	04 05	12 47.74	-12 19.0					
1987	04 15	12 38.14	-12 20.6	1.908	2.895	167.2	4.4	17.6
1987	04 25	12 29.38	-12 18.7					
1987	05 05	12 22.27	-12 17.2	1.983	2.871	145.5	11.5	17.9
1987	05 15	12 17.36	-12 20.0					
1987	05 25	12 14.88	-12 30.0	2.144	2.849	125.0	16.9	18.2
1987	06 04	12 14.87	-12 49.0					
1987	06 14	12 17.19	-13 17.8	2.359	2.828	107.1	20.1	18.5

1931 TW a,e,i = 2.25, 0.09, 4 Elements MPC 11143

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	01 25	13 13.58	-07 47.2	1.810	2.260	104.0	25.0	17.1
1987	02 04	13 18.72	-08 33.5					
1987	02 14	13 21.09	-09 04.9	1.597	2.281	122.1	21.5	16.7
1987	02 24	13 20.43	-09 20.0					
1987	03 06	13 16.60	-09 17.8	1.430	2.302	143.2	15.0	16.3
1987	03 16	13 09.85	-08 58.5					
1987	03 26	13 00.83	-08 24.3	1.339	2.322	166.9	5.6	15.9
1987	04 05	12 50.62	-07 40.1					
1987	04 15	12 40.57	-06 53.0	1.351	2.341	167.8	5.2	15.9
1987	04 25	12 31.93	-06 10.3					
1987	05 05	12 25.62	-05 38.3	1.463	2.359	144.6	14.4	16.4
1987	05 15	12 22.13	-05 21.0					
1987	05 25	12 21.53	-05 19.6	1.653	2.376	124.2	20.6	16.9
1987	06 04	12 23.66	-05 34.0					
1987	06 14	12 28.25	-06 03.0	1.889	2.391	106.9	24.0	17.3
1987	06 24	12 34.94	-06 44.5					
1987	07 04	12 43.46	-07 36.9	2.145	2.405	92.0	25.0	17.6

1980 RU a,e,i = 2.58, 0.14, 15 Elements MPC 7601

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	01 25	13 27.20	-16 13.1	2.646	2.944	97.7	19.3	18.8
1987	02 04	13 30.09	-17 26.5					
1987	02 14	13 30.75	-18 31.7	2.377	2.948	116.1	17.5	18.5
1987	02 24	13 28.96	-19 26.7					
1987	03 06	13 24.62	-20 09.0	2.151	2.949	136.3	13.4	18.2
1987	03 16	13 17.87	-20 36.4					
1987	03 26	13 09.14	-20 47.0	2.005	2.948	156.9	7.6	17.8
1987	04 05	12 59.15	-20 40.2					
1987	04 15	12 48.88	-20 18.2	1.964	2.945	165.4	4.9	17.7
1987	04 25	12 39.35	-19 45.3					
1987	05 05	12 31.41	-19 07.2	2.035	2.941	148.3	10.4	18.0
1987	05 15	12 25.68	-18 30.2					
1987	05 25	12 22.41	-17 59.2	2.198	2.934	128.2	15.7	18.3
1987	06 04	12 21.65	-17 37.8					
1987	06 14	12 23.26	-17 28.0	2.421	2.926	109.8	19.1	18.6
1987	06 24	12 27.02	-17 30.2					
1987	07 04	12 32.68	-17 44.4	2.671	2.915	93.5	20.4	18.8

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

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	01 25	13 23.34	-06 34.0	3.304	3.642	102.2	15.3	18.6
1987	02 04	13 25.21	-06 42.7					
1987	02 14	13 25.30	-06 40.9	3.025	3.646	122.0	13.3	18.4
1987	02 24	13 23.52	-06 28.6					
1987	03 06	13 19.91	-06 06.2	2.803	3.649	143.6	9.3	18.1
1987	03 16	13 14.69	-05 34.9					
1987	03 26	13 08.20	-04 57.2	2.673	3.650	166.5	3.7	17.8
1987	04 05	13 00.96	-04 15.9					
1987	04 15	12 53.61	-03 35.2	2.659	3.650	169.5	2.9	17.7
1987	04 25	12 46.76	-02 58.5					
1987	05 05	12 40.95	-02 29.2	2.761	3.647	146.9	8.7	18.0
1987	05 15	12 36.59	-02 09.6					
1987	05 25	12 33.90	-02 00.8	2.957	3.643	125.8	13.0	18.3
1987	06 04	12 32.95	-02 03.2					
1987	06 14	12 33.74	-02 16.3	3.213	3.638	106.7	15.5	18.6
1987	06 24	12 36.13	-02 39.3					
1987	07 04	12 40.01	-03 11.1	3.495	3.630	89.4	16.3	18.8

1963 RH a,e,i = 2.36, 0.37, 21 Elements MPC 10535

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	01 25	13 46.92	-34 07.4	3.075	3.177	86.8	18.0	17.8
1987	02 04	13 50.61	-35 40.1					
1987	02 14	13 52.07	-37 05.8	2.824	3.199	103.3	17.5	17.6
1987	02 24	13 51.01	-38 21.9					
1987	03 06	13 47.23	-39 24.4	2.596	3.217	120.7	15.4	17.4
1987	03 16	13 40.76	-40 08.8					
1987	03 26	13 31.90	-40 30.3	2.424	3.230	137.5	12.0	17.1
1987	04 05	13 21.29	-40 25.1					
1987	04 15	13 09.95	-39 51.9	2.338	3.240	149.2	9.1	16.9
1987	04 25	12 58.97	-38 53.0					
1987	05 05	12 49.40	-37 33.8	2.355	3.245	146.7	9.8	17.0
1987	05 15	12 41.99	-36 02.8					
1987	05 25	12 37.11	-34 28.3	2.471	3.246	132.9	13.2	17.2
1987	06 04	12 34.89	-32 57.6					
1987	06 14	12 35.20	-31 36.6	2.663	3.243	116.3	16.3	17.5
1987	06 24	12 37.79	-30 28.2					
1987	07 04	12 42.42	-29 34.2	2.900	3.236	100.0	18.0	17.7

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

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	01 25	13 53.00	-28 28.9	2.188	2.362	87.6	24.6	17.6
1987	02 04	13 58.59	-30 51.6					
1987	02 14	14 01.44	-33 07.8	2.007	2.434	103.4	23.2	17.4
1987	02 24	14 01.12	-35 14.4					
1987	03 06	13 57.25	-37 06.7	1.849	2.504	120.6	19.9	17.2
1987	03 16	13 49.73	-38 38.3					
1987	03 26	13 38.89	-39 41.9	1.744	2.570	137.6	15.2	17.0
1987	04 05	13 25.63	-40 11.1					
1987	04 15	13 11.43	-40 03.4	1.722	2.633	149.0	11.3	16.9
1987	04 25	12 57.96	-39 21.9					
1987	05 05	12 46.65	-38 14.9	1.797	2.692	145.9	12.1	17.1
1987	05 15	12 38.44	-36 54.2					
1987	05 25	12 33.63	-35 30.5	1.963	2.747	132.2	15.9	17.4
1987	06 04	12 32.14	-34 12.5					
1987	06 14	12 33.65	-33 06.2	2.196	2.798	116.3	19.0	17.8
1987	06 24	12 37.74	-32 14.1					
1987	07 04	12 44.02	-31 37.2	2.470	2.845	101.0	20.5	18.1

1981 EF26 a,e,i = 3.22, 0.10, 7 Elements MPC 10289

Date	ET	R. A. (1950)	Decl.	Delta	r	Variation		V
1987	01 25	13 30.81	-07 56.8	2.667	2.999	-0.87	+3.1	16.4
1987	02 04	13 35.61	-08 02.1					
1987	02 14	13 38.42	-07 53.8	2.415	3.014	-0.97	+3.5	16.1
1987	02 24	13 39.10	-07 31.6					
1987	03 06	13 37.59	-06 55.7	2.209	3.029	-1.07	+4.0	15.8
1987	03 16	13 34.02	-06 07.5					
1987	03 26	13 28.73	-05 10.0	2.083	3.046	-1.13	+4.4	15.4
1987	04 05	13 22.25	-04 07.5					
1987	04 15	13 15.33	-03 05.6	2.064	3.062	-1.12	+4.6	15.2
1987	04 25	13 08.71	-02 09.5					
1987	05 05	13 03.11	-01 24.1	2.157	3.080	-1.04	+4.4	15.6
1987	05 15	12 59.05	-00 52.4					
1987	05 25	12 56.83	-00 35.7	2.344	3.097	-0.93	+3.9	16.0
1987	06 04	12 56.56	-00 34.0					
1987	06 14	12 58.22	-00 46.3	2.594	3.116	-0.83	+3.4	16.3
1987	06 24	13 01.66	-01 10.7					
1987	07 04	13 06.73	-01 45.8	2.877	3.134	-0.75	+3.1	16.6

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

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	01 25	13 34.31	-08 09.0	3.002	3.304	99.1	17.1	18.8
1987	02 04	13 38.20	-08 15.9					
1987	02 14	13 40.26	-08 11.0	2.723	3.304	118.0	15.3	18.5
1987	02 24	13 40.35	-07 53.8					
1987	03 06	13 38.42	-07 24.5	2.492	3.303	138.8	11.4	18.2
1987	03 16	13 34.59	-06 44.1					
1987	03 26	13 29.15	-05 54.9	2.342	3.302	161.2	5.6	17.8
1987	04 05	13 22.59	-05 00.4					
1987	04 15	13 15.56	-04 05.2	2.301	3.300	173.8	1.9	17.6
1987	04 25	13 08.76	-03 14.0					
1987	05 05	13 02.83	-02 31.1	2.375	3.298	151.7	8.3	18.0
1987	05 15	12 58.31	-01 59.7					
1987	05 25	12 55.50	-01 41.4	2.546	3.296	130.5	13.5	18.3
1987	06 04	12 54.55	-01 36.6					
1987	06 14	12 55.48	-01 44.7	2.782	3.292	111.5	16.7	18.6
1987	06 24	12 58.17	-02 04.7					
1987	07 04	13 02.49	-02 35.1	3.051	3.289	94.4	18.0	18.8

(3397) 1964 XA a,e,i = 2.35, 0.30, 22 Elements MPC 10524

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	01 25	14 00.54	+05 05.4	1.377	1.794	97.5	33.0	17.5
1987	02 04	14 08.65	+03 30.5					
1987	02 14	14 13.30	+02 03.0	1.225	1.850	113.0	29.4	17.2
1987	02 24	14 13.99	+00 41.1					
1987	03 06	14 10.28	-00 36.8	1.096	1.912	132.6	22.4	16.9
1987	03 16	14 02.10	-01 53.1					
1987	03 26	13 49.95	-03 08.8	1.023	1.978	156.4	11.6	16.5
1987	04 05	13 35.08	-04 24.1					
1987	04 15	13 19.42	-05 38.7	1.045	2.046	175.7	2.1	16.2
1987	04 25	13 04.99	-06 51.8					
1987	05 05	12 53.37	-08 03.9	1.173	2.116	151.9	13.0	16.9
1987	05 15	12 45.43	-09 15.9					
1987	05 25	12 41.27	-10 28.9	1.387	2.186	130.6	20.6	17.6
1987	06 04	12 40.64	-11 44.0					
1987	06 14	12 43.09	-13 01.9	1.657	2.256	112.9	24.5	18.2
1987	06 24	12 48.12	-14 22.7					
1987	07 04	12 55.30	-15 46.3	1.957	2.324	97.8	25.7	18.6

1983 AB a,e,i = 2.39, 0.15, 3 Elements MPC 7829

Date	ET	R. A. (1950)	Decl.	Delta	r	Variation		V
1987	01 25	13 27.87	-04 33.9	1.598	2.043	-1.60	+9.6	17.7
1987	02 04	13 37.28	-05 08.0					
1987	02 14	13 44.11	-05 25.6	1.399	2.057	-1.88	+11.1	17.3
1987	02 24	13 47.95	-05 25.8					
1987	03 06	13 48.48	-05 08.7	1.235	2.074	-2.20	+13.0	16.9
1987	03 16	13 45.62	-04 36.1					
1987	03 26	13 39.70	-03 51.8	1.133	2.095	-2.45	+14.7	16.4
1987	04 05	13 31.49	-03 02.0					
1987	04 15	13 22.30	-02 15.2	1.120	2.119	-2.45	+15.1	16.2
1987	04 25	13 13.54	-01 39.2					
1987	05 05	13 06.49	-01 19.9	1.203	2.145	-2.21	+13.8	16.7
1987	05 15	13 02.00	-01 20.4					
1987	05 25	13 00.41	-01 40.2	1.365	2.174	-1.89	+11.8	17.3
1987	06 04	13 01.73	-02 17.7					
1987	06 14	13 05.74	-03 10.2	1.582	2.205	-1.63	+9.9	17.7
1987	06 24	13 12.09	-04 14.7					
1987	07 04	13 20.47	-05 28.5	1.829	2.237	-1.45	+8.3	18.1

1981 SE1 a,e,i = 2.25, 0.17, 4 Elements MPC 10026

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	01 25	13 29.38	-07 37.1	1.935	2.325	100.5	24.6	17.8
1987	02 04	13 37.42	-08 00.8					
1987	02 14	13 43.34	-08 08.6	1.660	2.288	117.3	22.5	17.3
1987	02 24	13 46.76	-07 58.9					
1987	03 06	13 47.32	-07 30.1	1.423	2.250	136.7	17.6	16.8
1987	03 16	13 44.84	-06 42.4					
1987	03 26	13 39.44	-05 37.7	1.252	2.212	158.8	9.4	16.3
1987	04 05	13 31.63	-04 21.0					
1987	04 15	13 22.45	-03 00.6	1.173	2.173	173.5	3.0	15.8
1987	04 25	13 13.19	-01 46.3					
1987	05 05	13 05.22	-00 47.7	1.194	2.134	151.3	13.1	16.2
1987	05 15	12 59.63	-00 11.0					
1987	05 25	12 56.98	+00 01.3	1.295	2.096	130.1	21.7	16.6
1987	06 04	12 57.50	-00 10.3					
1987	06 14	13 01.06	-00 43.4	1.447	2.060	112.3	27.1	16.9
1987	06 24	13 07.39	-01 34.9					
1987	07 04	13 16.19	-02 41.5	1.622	2.025	97.6	29.9	17.2

1983 DE a,e,i = 2.39, 0.19, 3 Elements MPC 11151

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	01 25	13 43.61	-06 32.2	2.068	2.404	97.5	23.9	18.0
1987	02 04	13 50.01	-06 52.2					
1987	02 14	13 53.95	-06 57.3	1.856	2.445	115.2	21.4	17.7
1987	02 24	13 55.16	-06 47.3					
1987	03 06	13 53.46	-06 22.1	1.678	2.485	135.5	16.2	17.4
1987	03 16	13 48.90	-05 43.3					
1987	03 26	13 41.85	-04 54.1	1.570	2.524	158.3	8.4	17.0
1987	04 05	13 33.01	-03 59.5					
1987	04 15	13 23.44	-03 06.0	1.562	2.561	173.7	2.5	16.7
1987	04 25	13 14.25	-02 20.1					
1987	05 05	13 06.43	-01 47.1	1.661	2.596	152.1	10.5	17.3
1987	05 15	13 00.73	-01 30.1					
1987	05 25	12 57.46	-01 29.8	1.852	2.629	130.9	16.9	17.7
1987	06 04	12 56.69	-01 45.5					
1987	06 14	12 58.31	-02 15.4	2.103	2.660	112.3	20.7	18.1
1987	06 24	13 02.06	-02 57.4					
1987	07 04	13 07.70	-03 49.4	2.384	2.689	96.1	22.1	18.5

1981 EJ19 a,e,i = 3.20, 0.12, 1 Elements MPC 10384

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	01 25	13 37.56	-09 35.8	2.532	2.839	97.9	20.1	18.7
1987	02 04	13 43.24	-10 05.0					
1987	02 14	13 46.89	-10 22.2	2.280	2.850	115.7	18.2	18.4
1987	02 24	13 48.33	-10 26.6					
1987	03 06	13 47.41	-10 17.9	2.068	2.863	135.7	14.0	18.1
1987	03 16	13 44.20	-09 56.5					
1987	03 26	13 39.00	-09 23.9	1.928	2.877	157.9	7.5	17.7
1987	04 05	13 32.31	-08 42.9					
1987	04 15	13 24.92	-07 57.9	1.890	2.893	178.3	0.6	17.3
1987	04 25	13 17.68	-07 14.0					
1987	05 05	13 11.39	-06 36.2	1.962	2.910	155.5	8.3	17.8
1987	05 15	13 06.70	-06 08.4					
1987	05 25	13 03.96	-05 53.1	2.130	2.927	134.2	14.4	18.2
1987	06 04	13 03.34	-05 51.2					
1987	06 14	13 04.83	-06 02.5	2.365	2.947	115.3	18.2	18.5
1987	06 24	13 08.26	-06 25.7					
1987	07 04	13 13.47	-06 59.5	2.639	2.966	98.6	19.8	18.8

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

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	01 25	13 44.86	-12 15.1	3.322	3.550	95.2	16.0	19.1
1987	02 04	13 48.35	-12 30.6					
1987	02 14	13 50.09	-12 35.7	3.043	3.563	114.2	14.6	18.9
1987	02 24	13 49.97	-12 29.8					
1987	03 06	13 47.93	-12 12.4	2.804	3.575	134.9	11.3	18.6
1987	03 16	13 44.09	-11 43.8					
1987	03 26	13 38.69	-11 05.1	2.644	3.585	157.4	6.1	18.3
1987	04 05	13 32.17	-10 18.5					
1987	04 15	13 25.10	-09 27.5	2.591	3.594	179.1	0.3	17.9
1987	04 25	13 18.13	-08 35.9					
1987	05 05	13 11.86	-07 47.9	2.656	3.601	156.1	6.5	18.3
1987	05 15	13 06.79	-07 07.3					
1987	05 25	13 03.27	-06 36.4	2.826	3.607	134.3	11.6	18.7
1987	06 04	13 01.45	-06 16.7					
1987	06 14	13 01.40	-06 08.6	3.069	3.612	114.6	14.8	18.9
1987	06 24	13 03.03	-06 11.7					
1987	07 04	13 06.23	-06 25.1	3.352	3.615	96.7	16.2	19.2

1957 HK a,e,i = 2.41, 0.11, 8 Elements MPC 9956

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	01 25	13 25.21	-13 56.9	1.894	2.267	99.0	25.4	16.6
1987	02 04	13 34.03	-14 38.5					
1987	02 14	13 40.70	-15 03.7	1.639	2.247	115.4	23.4	16.2
1987	02 24	13 44.88	-15 10.1					
1987	03 06	13 46.20	-14 55.1	1.420	2.228	134.3	18.6	15.7
1987	03 16	13 44.56	-14 17.0					
1987	03 26	13 40.10	-13 15.6	1.262	2.211	156.1	10.5	15.2
1987	04 05	13 33.36	-11 53.6					
1987	04 15	13 25.41	-10 18.1	1.193	2.196	178.7	0.6	14.6
1987	04 25	13 17.48	-08 38.9					
1987	05 05	13 10.83	-07 07.3	1.225	2.183	155.6	11.0	15.1
1987	05 15	13 06.44	-05 52.6					
1987	05 25	13 04.81	-05 00.0	1.342	2.172	134.1	19.6	15.6
1987	06 04	13 06.09	-04 31.4					
1987	06 14	13 10.16	-04 25.6	1.518	2.164	115.9	25.0	16.0
1987	06 24	13 16.73	-04 39.9					
1987	07 04	13 25.52	-05 11.4	1.725	2.158	100.7	27.6	16.3

(3488) 1980 PM a,e,i = 2.61, 0.18, 14 Elements MPC 11048

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	01 25	13 46.47	+00 51.2	2.728	3.048	99.4	18.6	18.3
1987	02 04	13 51.12	+01 24.6					
1987	02 14	13 53.79	+02 12.9	2.471	3.059	117.8	16.6	18.1
1987	02 24	13 54.30	+03 15.1					
1987	03 06	13 52.54	+04 29.3	2.262	3.068	137.6	12.6	17.8
1987	03 16	13 48.58	+05 51.4					
1987	03 26	13 42.70	+07 16.1	2.134	3.075	156.5	7.4	17.5
1987	04 05	13 35.40	+08 36.7					
1987	04 15	13 27.40	+09 46.1	2.114	3.080	160.9	6.1	17.4
1987	04 25	13 19.50	+10 39.0					
1987	05 05	13 12.47	+11 11.7	2.204	3.082	144.7	10.9	17.7
1987	05 15	13 06.93	+11 23.4					
1987	05 25	13 03.24	+11 15.2	2.382	3.082	125.5	15.5	18.0
1987	06 04	13 01.59	+10 49.3					
1987	06 14	13 01.97	+10 08.7	2.616	3.080	107.6	18.3	18.3
1987	06 24	13 04.27	+09 16.0					
1987	07 04	13 08.32	+08 13.9	2.877	3.076	91.5	19.3	18.5

1978 NN1 a,e,i = 2.85, 0.28, 8 Elements MPC 8148

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	01 25	13 44.45	-04 11.6	2.845	3.140	98.2	18.1	19.6
1987	02 04	13 49.47	-04 07.3					
1987	02 14	13 52.70	-03 50.0	2.521	3.090	116.5	16.6	19.2
1987	02 24	13 53.92	-03 19.3					
1987	03 06	13 52.97	-02 35.4	2.241	3.038	136.5	13.0	18.8
1987	03 16	13 49.81	-01 40.0					
1987	03 26	13 44.60	-00 35.9	2.038	2.985	157.8	7.3	18.4
1987	04 05	13 37.72	+00 32.2					
1987	04 15	13 29.83	+01 38.4	1.939	2.930	169.1	3.7	18.1
1987	04 25	13 21.75	+02 36.4					
1987	05 05	13 14.32	+03 20.9	1.951	2.873	150.6	9.9	18.3
1987	05 15	13 08.30	+03 48.2					
1987	05 25	13 04.19	+03 57.0	2.058	2.816	129.7	16.1	18.6
1987	06 04	13 02.30	+03 47.5					
1987	06 14	13 02.71	+03 21.2	2.226	2.757	110.9	20.1	18.8
1987	06 24	13 05.31	+02 40.4					
1987	07 04	13 09.99	+01 47.1	2.422	2.697	94.4	22.1	19.0

1981 DZ1 a,e,i = 3.22, 0.07, 22 Elements MPC 10614

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	01 25	13 39.36	-17 28.4	2.784	3.026	94.6	18.9	19.0
1987	02 04	13 45.07	-17 31.8					
1987	02 14	13 48.87	-17 20.2	2.514	3.035	112.7	17.5	18.7
1987	02 24	13 50.58	-16 51.9					
1987	03 06	13 50.11	-16 05.6	2.281	3.044	132.9	13.8	18.4
1987	03 16	13 47.51	-15 00.9					
1987	03 26	13 43.05	-13 39.1	2.120	3.054	155.3	7.8	18.0
1987	04 05	13 37.19	-12 03.4					
1987	04 15	13 30.63	-10 19.4	2.062	3.065	178.9	0.4	17.6
1987	04 25	13 24.12	-08 34.1					
1987	05 05	13 18.38	-06 54.9	2.122	3.077	157.2	7.3	18.0
1987	05 15	13 14.03	-05 27.9					
1987	05 25	13 11.41	-04 17.0	2.286	3.088	135.3	13.3	18.4
1987	06 04	13 10.72	-03 24.3					
1987	06 14	13 11.96	-02 49.5	2.523	3.101	115.7	17.2	18.8
1987	06 24	13 15.03	-02 31.4					
1987	07 04	13 19.77	-02 28.1	2.799	3.113	98.3	18.9	19.0

1973 SW4 a,e,i = 2.45, 0.15, 3 Elements MPC 9162

Date ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987 01 25	13 51.87	-14 30.8	2.592	2.818	92.8	20.4	18.5
1987 02 04	13 57.54	-15 15.7					
1987 02 14	14 01.18	-15 50.4	2.317	2.819	110.5	19.2	18.2
1987 02 24	14 02.54	-16 13.7					
1987 03 06	14 01.39	-16 24.1	2.072	2.817	130.3	15.6	17.9
1987 03 16	13 57.68	-16 20.3					
1987 03 26	13 51.59	-16 01.9	1.892	2.814	152.4	9.5	17.5
1987 04 05	13 43.57	-15 29.2					
1987 04 15	13 34.43	-14 45.0	1.808	2.808	174.4	2.0	17.0
1987 04 25	13 25.12	-13 53.6					
1987 05 05	13 16.63	-13 01.0	1.837	2.800	158.7	7.5	17.3
1987 05 15	13 09.81	-12 13.2					
1987 05 25	13 05.17	-11 34.9	1.967	2.790	136.5	14.5	17.7
1987 06 04	13 02.97	-11 09.4					
1987 06 14	13 03.21	-10 57.9	2.168	2.778	116.8	19.0	18.1
1987 06 24	13 05.74	-11 00.3					
1987 07 04	13 10.36	-11 15.7	2.408	2.764	99.5	21.3	18.3

1975 VS5 a,e,i = 2.26, 0.16, 6 Elements MPC 7140

Date ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987 01 25	13 50.73	-08 55.0	2.177	2.467	95.1	23.4	19.1
1987 02 04	13 57.79	-09 05.4					
1987 02 14	14 02.59	-09 00.2	1.941	2.492	112.5	21.5	18.8
1987 02 24	14 04.85	-08 38.6					
1987 03 06	14 04.31	-08 00.0	1.736	2.515	132.5	16.9	18.5
1987 03 16	14 00.93	-07 05.4					
1987 03 26	13 54.94	-05 57.4	1.597	2.536	154.9	9.6	18.1
1987 04 05	13 46.88	-04 40.9					
1987 04 15	13 37.68	-03 23.1	1.554	2.554	173.7	2.5	17.7
1987 04 25	13 28.42	-02 11.8					
1987 05 05	13 20.16	-01 13.9	1.621	2.569	154.7	9.7	18.2
1987 05 15	13 13.77	-00 34.1					
1987 05 25	13 09.71	-00 14.1	1.783	2.582	133.0	16.7	18.6
1987 06 04	13 08.19	-00 13.4					
1987 06 14	13 09.14	-00 30.3	2.007	2.592	114.1	21.0	19.0
1987 06 24	13 12.35	-01 02.0					
1987 07 04	13 17.61	-01 46.3	2.263	2.600	97.5	22.8	19.3

1981 DG3 a,e,i = 3.20, 0.10, 15 Elements MPC 10289

Date ET	R. A. (1950)	Decl.	Delta	r	Variation		V
1987 01 25	13 50.61	-23 57.8	2.766	2.931	-1.26	+5.8	16.4
1987 02 04	13 56.79	-25 35.8					
1987 02 14	14 01.08	-27 08.4	2.490	2.922	-1.48	+6.1	16.2
1987 02 24	14 03.18	-28 34.0					
1987 03 06	14 02.82	-29 50.1	2.244	2.914	-1.75	+6.7	15.9
1987 03 16	13 59.88	-30 53.5					
1987 03 26	13 54.46	-31 40.5	2.055	2.907	-2.05	+7.6	15.5
1987 04 05	13 46.93	-32 07.4					
1987 04 15	13 38.03	-32 12.2	1.952	2.902	-2.29	+8.8	15.2
1987 04 25	13 28.75	-31 55.4					
1987 05 05	13 20.15	-31 20.2	1.950	2.897	-2.33	+9.6	15.3
1987 05 15	13 13.18	-30 32.9					
1987 05 25	13 08.45	-29 40.8	2.046	2.894	-2.15	+9.5	15.5
1987 06 04	13 06.29	-28 50.3					
1987 06 14	13 06.75	-28 06.9	2.220	2.893	-1.87	+8.7	15.8
1987 06 24	13 09.68	-27 33.6					
1987 07 04	13 14.87	-27 11.9	2.443	2.892	-1.62	+7.6	16.1

1983 BH a,e,i = 2.34, 0.20, 7 Elements MPC 7935

Date	ET	R. A. (1950)	Decl.	Delta	r	Variation		V
1987	01 25	13 46.62	-19 33.7	1.786	2.072	-1.64	+5.5	17.3
1987	02 04	13 56.59	-21 02.1					
1987	02 14	14 04.08	-22 17.3	1.599	2.116	-1.87	+5.3	17.1
1987	02 24	14 08.67	-23 17.6					
1987	03 06	14 09.97	-23 59.9	1.431	2.161	-2.19	+5.7	16.8
1987	03 16	14 07.79	-24 21.2					
1987	03 26	14 02.29	-24 18.3	1.310	2.207	-2.56	+7.1	16.4
1987	04 05	13 54.05	-23 49.1					
1987	04 15	13 44.24	-22 55.3	1.267	2.253	-2.79	+8.9	16.1
1987	04 25	13 34.28	-21 42.7					
1987	05 05	13 25.56	-20 20.6	1.323	2.300	-2.66	+9.8	16.3
1987	05 15	13 19.16	-18 59.7					
1987	05 25	13 15.60	-17 48.9	1.474	2.346	-2.26	+9.1	16.9
1987	06 04	13 15.01	-16 53.5					
1987	06 14	13 17.23	-16 16.0	1.695	2.391	-1.85	+7.6	17.3
1987	06 24	13 21.93	-15 56.0					
1987	07 04	13 28.78	-15 52.1	1.960	2.434	-1.53	+6.1	17.8

1981 WG9 a,e,i = 2.38, 0.14, 3 Elements MPC 10942

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	01 25	13 56.15	-09 52.2	2.459	2.704	93.5	21.3	18.5
1987	02 04	14 02.67	-10 14.3					
1987	02 14	14 07.17	-10 23.9	2.189	2.705	111.0	19.9	18.2
1987	02 24	14 09.37	-10 20.1					
1987	03 06	14 09.03	-10 02.1	1.950	2.704	130.8	16.1	17.9
1987	03 16	14 06.06	-09 30.2					
1987	03 26	14 00.61	-08 45.5	1.774	2.701	153.0	9.7	17.5
1987	04 05	13 53.08	-07 50.9					
1987	04 15	13 44.24	-06 51.2	1.695	2.696	175.5	1.7	17.0
1987	04 25	13 35.06	-05 52.4					
1987	05 05	13 26.56	-05 00.8	1.726	2.688	158.1	8.0	17.3
1987	05 15	13 19.62	-04 21.7					
1987	05 25	13 14.82	-03 58.0	1.857	2.679	135.9	15.3	17.7
1987	06 04	13 12.44	-03 50.9					
1987	06 14	13 12.53	-04 00.0	2.057	2.667	116.3	20.0	18.1
1987	06 24	13 14.95	-04 23.7					
1987	07 04	13 19.50	-05 00.1	2.293	2.653	99.2	22.2	18.4

(3423) 1981 CK a,e,i = 3.05, 0.11, 0 Elements MPC 10626

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	01 25	13 51.61	-11 44.3	2.515	2.762	93.9	20.8	17.4
1987	02 04	13 58.34	-12 22.9					
1987	02 14	14 03.09	-12 50.5	2.262	2.775	111.1	19.4	17.1
1987	02 24	14 05.61	-13 06.1					
1987	03 06	14 05.72	-13 09.0	2.042	2.790	130.6	15.7	16.8
1987	03 16	14 03.39	-12 58.9					
1987	03 26	13 58.78	-12 36.4	1.885	2.806	152.3	9.5	16.5
1987	04 05	13 52.33	-12 03.2					
1987	04 15	13 44.75	-11 22.6	1.822	2.823	175.6	1.6	16.0
1987	04 25	13 36.94	-10 39.1					
1987	05 05	13 29.77	-09 58.0	1.869	2.841	161.0	6.6	16.4
1987	05 15	13 24.04	-09 24.1					
1987	05 25	13 20.22	-09 00.9	2.016	2.860	139.1	13.4	16.8
1987	06 04	13 18.58	-08 50.3					
1987	06 14	13 19.17	-08 52.8	2.238	2.880	119.7	17.8	17.2
1987	06 24	13 21.85	-09 07.7					
1987	07 04	13 26.45	-09 33.8	2.504	2.900	102.5	20.0	17.5

1986 AL a,e,i = 3.22, 0.08, 16 Elements MPC 10523

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	01 25	13 54.21	-28 59.7	3.024	3.134	87.2	18.3	17.2
1987	02 04	14 00.57	-30 25.4					
1987	02 14	14 05.13	-31 44.9	2.740	3.119	103.3	17.9	17.0
1987	02 24	14 07.61	-32 56.3					
1987	03 06	14 07.77	-33 57.0	2.480	3.105	120.6	16.0	16.7
1987	03 16	14 05.49	-34 43.8					
1987	03 26	14 00.86	-35 13.1	2.272	3.091	138.5	12.3	16.4
1987	04 05	13 54.18	-35 21.6					
1987	04 15	13 46.13	-35 07.1	2.144	3.077	153.9	8.2	16.1
1987	04 25	13 37.59	-34 29.9					
1987	05 05	13 29.54	-33 33.4	2.117	3.064	155.6	7.8	16.0
1987	05 15	13 22.86	-32 23.5					
1987	05 25	13 18.19	-31 07.5	2.190	3.051	141.8	11.9	16.3
1987	06 04	13 15.87	-29 52.5					
1987	06 14	13 16.01	-28 44.3	2.347	3.039	124.4	16.0	16.5
1987	06 24	13 18.50	-27 46.6					
1987	07 04	13 23.16	-27 01.4	2.560	3.027	107.7	18.7	16.8

(3482) 1975 VY4 a,e,i = 2.78, 0.17, 5 Elements MPC 10949

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	01 25	14 03.41	-07 42.3	3.058	3.254	92.5	17.6	18.1
1987	02 04	14 08.38	-07 50.8					
1987	02 14	14 11.58	-07 48.4	2.770	3.254	110.8	16.5	17.9
1987	02 24	14 12.81	-07 34.9					
1987	03 06	14 11.95	-07 10.3	2.515	3.252	130.9	13.3	17.5
1987	03 16	14 08.96	-06 35.5					
1987	03 26	14 04.01	-05 52.2	2.330	3.248	152.7	8.1	17.2
1987	04 05	13 57.44	-05 03.4					
1987	04 15	13 49.82	-04 13.0	2.245	3.243	172.7	2.2	16.8
1987	04 25	13 41.86	-03 25.5					
1987	05 05	13 34.31	-02 45.4	2.276	3.235	158.4	6.6	17.1
1987	05 15	13 27.86	-02 16.2					
1987	05 25	13 22.98	-01 59.9	2.412	3.226	136.8	12.4	17.4
1987	06 04	13 19.97	-01 57.3					
1987	06 14	13 18.96	-02 08.0	2.624	3.215	117.0	16.4	17.7
1987	06 24	13 19.90	-02 30.7					
1987	07 04	13 22.68	-03 04.2	2.878	3.202	99.2	18.3	18.0

1983 TR2 a,e,i = 3.06, 0.21, 15 Elements MPC 10529

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	01 25	14 07.36	-11 14.4	3.177	3.333	90.4	17.2	18.4
1987	02 04	14 12.12	-12 01.4					
1987	02 14	14 15.18	-12 41.9	2.850	3.297	108.4	16.5	18.1
1987	02 24	14 16.32	-13 15.6					
1987	03 06	14 15.33	-13 41.7	2.553	3.261	128.2	13.8	17.8
1987	03 16	14 12.12	-13 59.9					
1987	03 26	14 06.77	-14 09.8	2.321	3.223	149.9	8.9	17.4
1987	04 05	13 59.54	-14 11.6					
1987	04 15	13 50.98	-14 06.2	2.186	3.184	172.8	2.3	16.9
1987	04 25	13 41.82	-13 55.7					
1987	05 05	13 32.90	-13 42.9	2.167	3.144	162.7	5.5	17.1
1987	05 15	13 25.05	-13 31.5					
1987	05 25	13 18.87	-13 24.7	2.256	3.103	140.3	12.0	17.4
1987	06 04	13 14.77	-13 25.3					
1987	06 14	13 12.92	-13 35.1	2.426	3.062	119.9	16.7	17.6
1987	06 24	13 13.32	-13 54.6					
1987	07 04	13 15.85	-14 24.1	2.642	3.020	101.9	19.2	17.9

1974 MG a,e,i = 2.23, 0.18, 5 Elements MPC 10295

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	01 25	13 51.11	-15 54.5	2.072	2.332	92.5	24.9	18.8
1987	02 04	14 00.36	-17 16.1					
1987	02 14	14 07.75	-18 30.3	1.785	2.292	108.1	24.2	18.5
1987	02 24	14 12.88	-19 35.8					
1987	03 06	14 15.28	-20 30.8	1.524	2.251	125.7	21.0	18.0
1987	03 16	14 14.58	-21 12.8					
1987	03 26	14 10.56	-21 38.8	1.313	2.209	145.7	14.7	17.4
1987	04 05	14 03.35	-21 45.4					
1987	04 15	13 53.65	-21 30.8	1.179	2.166	166.4	6.2	16.9
1987	04 25	13 42.65	-20 56.0					
1987	05 05	13 31.94	-20 06.3	1.140	2.124	162.3	8.3	16.8
1987	05 15	13 23.07	-19 10.7					
1987	05 25	13 17.14	-18 18.7	1.194	2.081	141.0	17.8	17.2
1987	06 04	13 14.73	-17 38.1					
1987	06 14	13 15.93	-17 13.8	1.314	2.040	121.7	25.1	17.6
1987	06 24	13 20.52	-17 07.1					
1987	07 04	13 28.17	-17 17.6	1.469	2.000	105.7	29.3	17.9

1983 DG a,e,i = 2.40, 0.13, 8 Elements MPC 7935

Date	ET	R. A. (1950)	Decl.	Delta	r	Variation		V
1987	01 25	13 49.07	-12 51.1	1.859	2.164	-1.67	+10.1	17.6
1987	02 04	13 59.32	-14 29.3					
1987	02 14	14 07.60	-16 00.9	1.608	2.144	-2.07	+11.1	17.2
1987	02 24	14 13.47	-17 25.3					
1987	03 06	14 16.45	-18 40.9	1.384	2.126	-2.59	+12.6	16.8
1987	03 16	14 16.15	-19 45.8					
1987	03 26	14 12.40	-20 37.2	1.210	2.111	-3.19	+14.8	16.3
1987	04 05	14 05.37	-21 11.9					
1987	04 15	13 55.86	-21 27.8	1.111	2.099	-3.69	+17.4	15.8
1987	04 25	13 45.19	-21 25.0					
1987	05 05	13 34.99	-21 07.7	1.106	2.091	-3.76	+18.9	15.8
1987	05 15	13 26.81	-20 43.4					
1987	05 25	13 21.65	-20 20.0	1.190	2.086	-3.38	+18.1	16.3
1987	06 04	13 20.00	-20 04.5					
1987	06 14	13 21.86	-20 00.8	1.340	2.084	-2.87	+15.7	16.7
1987	06 24	13 26.94	-20 10.3					
1987	07 04	13 34.88	-20 32.8	1.532	2.087	-2.45	+13.1	17.1

1980 FV a,e,i = 2.25, 0.09, 4 Elements MPC 9465

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	01 25	13 54.87	-13 58.2	2.056	2.315	92.3	25.1	17.9
1987	02 04	14 04.10	-15 10.4					
1987	02 14	14 11.36	-16 13.6	1.789	2.296	108.1	24.1	17.6
1987	02 24	14 16.27	-17 06.8					
1987	03 06	14 18.38	-17 48.4	1.546	2.276	126.0	20.6	17.1
1987	03 16	14 17.39	-18 16.5					
1987	03 26	14 13.16	-18 29.1	1.355	2.256	146.7	14.1	16.6
1987	04 05	14 05.89	-18 24.5					
1987	04 15	13 56.36	-18 02.7	1.242	2.235	169.0	4.9	16.1
1987	04 25	13 45.76	-17 26.6					
1987	05 05	13 35.55	-16 41.9	1.228	2.214	163.5	7.4	16.1
1987	05 15	13 27.14	-15 57.0					
1987	05 25	13 21.46	-15 19.2	1.309	2.193	141.4	16.8	16.6
1987	06 04	13 19.01	-14 54.3					
1987	06 14	13 19.84	-14 45.2	1.458	2.173	121.9	23.4	17.0
1987	06 24	13 23.74	-14 52.1					
1987	07 04	13 30.40	-15 14.2	1.646	2.153	105.5	27.1	17.3

1986 AD1 a,e,i = 2.80, 0.05, 8 Elements MPC 10513

Date	ET	R. A. (1950)	Decl.	Delta	r	Variation		V
1987	01 25	14 03.43	-04 34.6	2.685	2.917	-0.82	+4.0	16.8
1987	02 04	14 10.07	-04 36.7					
1987	02 14	14 14.89	-04 26.1	2.406	2.909	-0.92	+4.5	16.6
1987	02 24	14 17.64	-04 02.9					
1987	03 06	14 18.12	-03 27.3	2.160	2.901	-1.02	+5.2	16.2
1987	03 16	14 16.24	-02 40.9					
1987	03 26	14 12.11	-01 46.5	1.980	2.892	-1.11	+5.8	15.8
1987	04 05	14 06.03	-00 48.4					
1987	04 15	13 58.60	+00 08.1	1.895	2.883	-1.14	+6.0	15.5
1987	04 25	13 50.62	+00 57.1					
1987	05 05	13 42.95	+01 33.7	1.919	2.874	-1.09	+5.8	15.7
1987	05 15	13 36.40	+01 54.1					
1987	05 25	13 31.56	+01 57.2	2.042	2.864	-0.99	+5.2	16.0
1987	06 04	13 28.78	+01 43.3					
1987	06 14	13 28.21	+01 13.8	2.238	2.854	-0.89	+4.7	16.4
1987	06 24	13 29.78	+00 31.0					
1987	07 04	13 33.37	-00 23.0	2.474	2.843	-0.82	+4.2	16.6

(3412) 1983 AU2 a,e,i = 2.22, 0.10, 3 Elements MPC 10534

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	01 25	14 03.28	-15 35.8	2.124	2.339	89.9	24.9	18.1
1987	02 04	14 12.12	-16 38.0					
1987	02 14	14 18.83	-17 29.5	1.887	2.358	106.0	23.7	17.8
1987	02 24	14 23.04	-18 09.2					
1987	03 06	14 24.38	-18 35.4	1.670	2.376	124.4	20.1	17.5
1987	03 16	14 22.63	-18 46.4					
1987	03 26	14 17.77	-18 40.7	1.502	2.392	145.6	13.6	17.1
1987	04 05	14 10.13	-18 17.4					
1987	04 15	14 00.55	-17 37.7	1.415	2.406	168.7	4.7	16.6
1987	04 25	13 50.16	-16 45.7					
1987	05 05	13 40.29	-15 47.9	1.432	2.419	164.7	6.3	16.7
1987	05 15	13 32.13	-14 52.3					
1987	05 25	13 26.43	-14 05.5	1.549	2.430	142.2	14.8	17.2
1987	06 04	13 23.59	-13 32.3					
1987	06 14	13 23.62	-13 14.8	1.741	2.439	122.2	20.6	17.6
1987	06 24	13 26.33	-13 12.9					
1987	07 04	13 31.45	-13 25.7	1.976	2.446	105.1	23.7	18.0

1982 BS a,e,i = 2.59, 0.17, 13 Elements MPC 10529

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	01 25	14 10.30	-26 58.0	2.847	2.922	84.5	19.6	18.5
1987	02 04	14 17.06	-28 16.5					
1987	02 14	14 21.88	-29 28.1	2.590	2.942	101.0	19.2	18.3
1987	02 24	14 24.48	-30 31.5					
1987	03 06	14 24.56	-31 24.2	2.351	2.960	118.9	17.1	18.0
1987	03 16	14 21.98	-32 03.4					
1987	03 26	14 16.80	-32 25.8	2.158	2.977	138.1	12.9	17.7
1987	04 05	14 09.32	-32 27.9					
1987	04 15	14 00.23	-32 07.9	2.046	2.991	156.0	7.8	17.4
1987	04 25	13 50.46	-31 26.3					
1987	05 05	13 41.06	-30 26.7	2.037	3.003	159.5	6.8	17.4
1987	05 15	13 32.99	-29 15.5					
1987	05 25	13 26.95	-28 00.2	2.134	3.013	143.9	11.4	17.7
1987	06 04	13 23.32	-26 47.8					
1987	06 14	13 22.19	-25 44.0	2.318	3.020	125.2	15.9	18.0
1987	06 24	13 23.46	-24 51.9					
1987	07 04	13 26.95	-24 13.2	2.559	3.026	107.6	18.7	18.3

(3427) 1938 AD a,e,i = 2.28, 0.13, 3 Elements MPC 10628

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	01 25	14 06.81	-15 28.5	2.397	2.577	89.1	22.5	18.5
1987	02 04	14 14.50	-16 20.8					
1987	02 14	14 20.20	-17 03.1	2.133	2.583	105.8	21.6	18.2
1987	02 24	14 23.58	-17 34.6					
1987	03 06	14 24.33	-17 53.5	1.890	2.586	124.7	18.4	17.9
1987	03 16	14 22.24	-17 58.7					
1987	03 26	14 17.32	-17 48.8	1.699	2.587	146.1	12.4	17.5
1987	04 05	14 09.87	-17 23.2					
1987	04 15	14 00.60	-16 43.4	1.594	2.586	169.3	4.1	17.0
1987	04 25	13 50.53	-15 52.9					
1987	05 05	13 40.81	-14 57.6	1.596	2.583	164.7	5.9	17.1
1987	05 15	13 32.56	-14 04.4					
1987	05 25	13 26.51	-13 19.5	1.702	2.577	142.0	14.0	17.5
1987	06 04	13 23.10	-12 47.1					
1987	06 14	13 22.41	-12 29.6	1.885	2.568	121.7	19.7	17.9
1987	06 24	13 24.32	-12 27.0					
1987	07 04	13 28.61	-12 38.7	2.112	2.558	104.1	22.7	18.2

(3467) 1981 SF2 a,e,i = 2.41, 0.15, 4 Elements MPC 10842

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	01 25	14 06.35	-07 58.3	2.138	2.381	91.8	24.4	17.5
1987	02 04	14 14.93	-08 24.1					
1987	02 14	14 21.33	-08 36.3	1.915	2.414	108.2	22.9	17.3
1987	02 24	14 25.23	-08 34.6					
1987	03 06	14 26.32	-08 18.8	1.716	2.446	127.1	18.9	17.0
1987	03 16	14 24.47	-07 49.8					
1987	03 26	14 19.76	-07 09.4	1.571	2.478	148.6	12.1	16.6
1987	04 05	14 12.58	-06 21.0					
1987	04 15	14 03.72	-05 30.0	1.513	2.508	170.6	3.8	16.2
1987	04 25	13 54.23	-04 42.4					
1987	05 05	13 45.24	-04 04.2	1.562	2.538	161.3	7.3	16.5
1987	05 15	13 37.77	-03 40.1					
1987	05 25	13 32.47	-03 32.2	1.709	2.566	139.6	14.8	16.9
1987	06 04	13 29.68	-03 40.7					
1987	06 14	13 29.43	-04 04.6	1.929	2.593	120.2	19.8	17.4
1987	06 24	13 31.56	-04 41.7					
1987	07 04	13 35.87	-05 30.0	2.191	2.618	103.2	22.2	17.7

1981 EY26 a,e,i = 3.18, 0.10, 5 Elements MPC 11046

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	01 25	14 04.13	-15 57.1	2.800	2.961	89.6	19.4	16.5
1987	02 04	14 11.07	-16 54.2					
1987	02 14	14 16.28	-17 43.4	2.509	2.945	106.5	18.8	16.2
1987	02 24	14 19.49	-18 24.0					
1987	03 06	14 20.47	-18 54.8	2.245	2.931	125.2	16.1	15.9
1987	03 16	14 19.08	-19 14.6					
1987	03 26	14 15.36	-19 22.3	2.038	2.917	145.8	11.1	15.5
1987	04 05	14 09.55	-19 17.2					
1987	04 15	14 02.23	-18 59.7	1.918	2.905	167.4	4.3	15.1
1987	04 25	13 54.16	-18 32.1					
1987	05 05	13 46.25	-17 57.9	1.905	2.894	166.0	4.8	15.1
1987	05 15	13 39.41	-17 22.1					
1987	05 25	13 34.28	-16 49.6	1.998	2.884	144.7	11.7	15.4
1987	06 04	13 31.31	-16 24.5					
1987	06 14	13 30.67	-16 09.7	2.173	2.876	124.8	16.9	15.8
1987	06 24	13 32.31	-16 06.1					
1987	07 04	13 36.13	-16 14.1	2.400	2.868	107.1	19.8	16.1

1979 UY3 a,e,i = 2.93, 0.06, 2 Elements MPC 10942

Date ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987 01 25	14 05.77	-12 33.9	2.600	2.786	90.3	20.7	17.2
1987 02 04	14 13.12	-13 16.9					
1987 02 14	14 18.61	-13 50.2	2.336	2.792	107.2	19.7	16.9
1987 02 24	14 21.97	-14 12.9					
1987 03 06	14 22.97	-14 24.4	2.097	2.800	126.2	16.6	16.6
1987 03 16	14 21.48	-14 24.1					
1987 03 26	14 17.57	-14 12.0	1.916	2.808	147.4	11.0	16.3
1987 04 05	14 11.54	-13 49.0					
1987 04 15	14 04.00	-13 17.3	1.822	2.816	170.5	3.4	15.8
1987 04 25	13 55.78	-12 40.4					
1987 05 05	13 47.82	-12 02.9	1.837	2.826	165.8	5.0	15.9
1987 05 15	13 40.99	-11 29.9					
1987 05 25	13 35.94	-11 05.2	1.956	2.835	143.5	12.3	16.4
1987 06 04	13 33.05	-10 51.6					
1987 06 14	13 32.46	-10 50.4	2.156	2.845	123.5	17.3	16.7
1987 06 24	13 34.11	-11 01.5					
1987 07 04	13 37.85	-11 23.9	2.406	2.856	105.8	20.0	17.1

1969 TB2 a,e,i = 2.90, 0.06, 2 Elements MPC 9476

Date ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987 01 25	14 08.69	-12 42.8	2.784	2.946	89.6	19.5	18.0
1987 02 04	14 15.58	-13 22.7					
1987 02 14	14 20.72	-13 53.4	2.493	2.934	106.7	18.8	17.8
1987 02 24	14 23.85	-14 14.3					
1987 03 06	14 24.74	-14 24.7	2.229	2.922	125.8	16.0	17.4
1987 03 16	14 23.25	-14 24.0					
1987 03 26	14 19.43	-14 12.2	2.022	2.909	147.0	10.8	17.0
1987 04 05	14 13.50	-13 49.7					
1987 04 15	14 06.03	-13 18.7	1.904	2.897	170.0	3.4	16.6
1987 04 25	13 57.78	-12 42.2					
1987 05 05	13 49.64	-12 04.6	1.895	2.884	166.3	4.8	16.6
1987 05 15	13 42.50	-11 30.7					
1987 05 25	13 37.03	-11 04.7	1.992	2.872	143.7	12.0	17.0
1987 06 04	13 33.67	-10 49.4					
1987 06 14	13 32.61	-10 46.5	2.171	2.859	123.5	17.2	17.4
1987 06 24	13 33.81	-10 55.9					
1987 07 04	13 37.17	-11 17.1	2.399	2.847	105.6	20.1	17.7

(3358) 1978 RX a,e,i = 3.20, 0.19, 2 Elements MPC 10377

Date ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987 01 25	14 16.19	-11 48.7	3.487	3.593	88.2	15.9	18.6
1987 02 04	14 20.90	-12 05.7					
1987 02 14	14 23.98	-12 13.9	3.211	3.618	106.5	15.2	18.5
1987 02 24	14 25.29	-12 12.7					
1987 03 06	14 24.70	-12 02.1	2.962	3.641	126.5	12.6	18.2
1987 03 16	14 22.21	-11 42.3					
1987 03 26	14 17.97	-11 14.0	2.776	3.662	148.2	8.2	17.9
1987 04 05	14 12.25	-10 38.9					
1987 04 15	14 05.52	-09 59.3	2.688	3.682	170.9	2.5	17.6
1987 04 25	13 58.35	-09 18.3					
1987 05 05	13 51.35	-08 39.4	2.717	3.701	165.2	4.0	17.7
1987 05 15	13 45.13	-08 05.9					
1987 05 25	13 40.12	-07 40.3	2.858	3.718	143.2	9.4	18.1
1987 06 04	13 36.63	-07 24.4					
1987 06 14	13 34.83	-07 18.8	3.087	3.734	122.7	13.2	18.4
1987 06 24	13 34.73	-07 23.4					
1987 07 04	13 36.27	-07 37.7	3.369	3.749	104.1	15.3	18.6

(3491) 1984 SM4 a,e,i = 2.79, 0.09, 4 Elements MPC 11049

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	01 25	14 12.40	-10 47.6	2.851	3.006	89.4	19.1	17.9
1987	02 04	14 18.93	-11 05.9					
1987	02 14	14 23.65	-11 13.3	2.577	3.016	106.9	18.3	17.7
1987	02 24	14 26.36	-11 09.3					
1987	03 06	14 26.86	-10 53.4	2.330	3.026	126.3	15.3	17.4
1987	03 16	14 25.06	-10 26.0					
1987	03 26	14 21.04	-09 48.1	2.143	3.034	147.8	10.1	17.0
1987	04 05	14 15.10	-09 01.6					
1987	04 15	14 07.77	-08 10.2	2.047	3.041	170.3	3.2	16.6
1987	04 25	13 59.80	-07 18.3					
1987	05 05	13 52.00	-06 30.7	2.064	3.047	164.2	5.2	16.8
1987	05 15	13 45.16	-05 52.0					
1987	05 25	13 39.87	-05 25.1	2.188	3.051	142.1	11.8	17.2
1987	06 04	13 36.49	-05 11.8					
1987	06 14	13 35.21	-05 12.4	2.394	3.055	121.9	16.4	17.5
1987	06 24	13 35.99	-05 25.9					
1987	07 04	13 38.73	-05 51.1	2.648	3.057	104.0	18.8	17.8

1981 QN a,e,i = 2.25, 0.20, 4 Elements MPC 10528

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	02 14	14 29.70	-19 28.8	2.267	2.667	102.9	21.2	18.8
1987	02 24	14 33.82	-19 59.3					
1987	03 06	14 35.45	-20 18.0	1.995	2.650	121.4	18.6	18.5
1987	03 16	14 34.36	-20 23.2					
1987	03 26	14 30.45	-20 13.1	1.770	2.630	142.3	13.4	18.0
1987	04 05	14 23.84	-19 46.3					
1987	04 15	14 15.10	-19 03.1	1.625	2.607	165.2	5.7	17.5
1987	04 25	14 05.11	-18 05.7					
1987	05 05	13 54.99	-16 59.3	1.586	2.581	168.2	4.6	17.4
1987	05 15	13 45.94	-15 51.2					
1987	05 25	13 38.85	-14 48.7	1.654	2.552	145.3	13.1	17.8
1987	06 04	13 34.33	-13 57.8					
1987	06 14	13 32.60	-13 22.1	1.804	2.520	124.4	19.4	18.2
1987	06 24	13 33.61	-13 02.7					
1987	07 04	13 37.19	-12 59.4	2.002	2.486	106.2	23.1	18.4
1987	07 14	13 43.09	-13 10.7					
1987	07 24	13 51.04	-13 34.6	2.219	2.449	90.5	24.5	18.7

1981 QD2 a,e,i = 2.28, 0.17, 4 Elements MPC 10528

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	02 14	14 34.18	-12 54.7	2.253	2.669	103.9	21.0	18.8
1987	02 24	14 37.96	-13 13.4					
1987	03 06	14 39.27	-13 20.9	1.995	2.665	122.7	18.2	18.5
1987	03 16	14 37.87	-13 17.1					
1987	03 26	14 33.70	-13 01.7	1.786	2.659	144.0	12.7	18.0
1987	04 05	14 26.93	-12 35.4					
1987	04 15	14 18.11	-12 00.3	1.661	2.649	167.6	4.7	17.6
1987	04 25	14 08.10	-11 19.9					
1987	05 05	13 57.98	-10 39.2	1.643	2.637	167.6	4.7	17.5
1987	05 15	13 48.88	-10 03.7					
1987	05 25	13 41.65	-09 38.0	1.732	2.622	144.3	13.0	18.0
1987	06 04	13 36.85	-09 25.2					
1987	06 14	13 34.71	-09 26.7	1.902	2.604	123.5	19.0	18.3
1987	06 24	13 35.19	-09 42.0					
1987	07 04	13 38.13	-10 10.3	2.120	2.584	105.4	22.3	18.6
1987	07 14	13 43.29	-10 49.9					
1987	07 24	13 50.42	-11 38.9	2.356	2.561	89.7	23.4	18.9

1983 CZ2 a,e,i = 2.41, 0.18, 6 Elements MPC 8138

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	02 14	14 24.57	-21 30.1	1.600	2.065	103.3	27.7	17.7
1987	02 24	14 32.08	-22 55.3					
1987	03 06	14 36.59	-24 08.3	1.416	2.093	119.7	24.3	17.4
1987	03 16	14 37.69	-25 06.8					
1987	03 26	14 35.19	-25 47.6	1.270	2.124	138.7	18.1	17.0
1987	04 05	14 29.24	-26 06.9					
1987	04 15	14 20.56	-26 02.2	1.191	2.158	159.3	9.5	16.6
1987	04 25	14 10.40	-25 33.9					
1987	05 05	14 00.31	-24 46.4	1.201	2.194	166.4	6.2	16.5
1987	05 15	13 51.82	-23 48.5					
1987	05 25	13 45.94	-22 49.8	1.306	2.232	148.2	13.8	17.0
1987	06 04	13 43.20	-21 58.4					
1987	06 14	13 43.65	-21 19.8	1.488	2.270	129.1	20.3	17.5
1987	06 24	13 47.04	-20 55.9					
1987	07 04	13 53.05	-20 46.9	1.723	2.310	112.3	24.0	18.0
1987	07 14	14 01.30	-20 51.4					
1987	07 24	14 11.44	-21 07.1	1.987	2.349	97.7	25.4	18.4

(3373) 1978 QQ2 a,e,i = 2.25, 0.13, 3 Elements MPC 10394

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	02 14	14 34.62	-13 43.7	1.976	2.408	103.6	23.5	18.1
1987	02 24	14 39.78	-13 51.7					
1987	03 06	14 42.26	-13 45.5	1.755	2.430	121.9	20.3	17.7
1987	03 16	14 41.80	-13 24.5					
1987	03 26	14 38.34	-12 49.0	1.579	2.451	143.0	14.2	17.3
1987	04 05	14 32.08	-12 00.4					
1987	04 15	14 23.65	-11 02.0	1.483	2.469	166.4	5.5	16.9
1987	04 25	14 13.99	-09 59.1					
1987	05 05	14 04.29	-08 58.5	1.490	2.486	168.1	4.8	16.9
1987	05 15	13 55.72	-08 07.0					
1987	05 25	13 49.13	-07 29.5	1.601	2.500	145.1	13.4	17.4
1987	06 04	13 45.06	-07 08.9					
1987	06 14	13 43.67	-07 05.5	1.792	2.512	124.6	19.4	17.8
1987	06 24	13 44.88	-07 18.2					
1987	07 04	13 48.48	-07 45.0	2.031	2.522	106.9	22.7	18.2
1987	07 14	13 54.23	-08 23.5					
1987	07 24	14 01.83	-09 11.4	2.290	2.530	91.5	23.7	18.5

(3398) 1978 PC a,e,i = 2.29, 0.24, 24 Elements MPC 10525

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	02 14	14 55.48	+11 26.3	1.589	2.074	104.8	27.4	17.4
1987	02 24	15 00.15	+11 46.6					
1987	03 06	15 01.27	+12 15.1	1.443	2.129	120.8	23.6	17.1
1987	03 16	14 58.56	+12 46.0					
1987	03 26	14 52.01	+13 11.9	1.335	2.184	138.5	17.6	16.8
1987	04 05	14 41.99	+13 23.8					
1987	04 15	14 29.48	+13 12.7	1.299	2.239	152.9	11.8	16.6
1987	04 25	14 15.88	+12 33.2					
1987	05 05	14 02.77	+11 24.3	1.360	2.294	150.9	12.4	16.8
1987	05 15	13 51.55	+09 49.6					
1987	05 25	13 43.07	+07 56.0	1.516	2.347	135.3	17.7	17.3
1987	06 04	13 37.70	+05 50.2					
1987	06 14	13 35.41	+03 37.8	1.747	2.398	118.0	22.0	17.7
1987	06 24	13 35.93	+01 23.0					
1987	07 04	13 38.93	-00 51.7	2.023	2.447	102.1	24.0	18.2
1987	07 14	13 44.05	-03 04.6					
1987	07 24	13 50.97	-05 14.8	2.321	2.494	87.6	24.0	18.5

1981 UC10 a,e,i = 2.38, 0.17, 2 Elements MPC 10942

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	02 14	14 42.38	-16 43.2	2.412	2.774	100.9	20.5	18.5
1987	02 24	14 46.55	-17 10.0					
1987	03 06	14 48.36	-17 26.8	2.148	2.773	119.4	18.1	18.2
1987	03 16	14 47.58	-17 32.6					
1987	03 26	14 44.13	-17 26.7	1.928	2.770	140.3	13.3	17.8
1987	04 05	14 38.11	-17 08.6					
1987	04 15	14 29.99	-16 39.0	1.788	2.764	163.4	5.9	17.4
1987	04 25	14 20.52	-16 00.0					
1987	05 05	14 10.68	-15 15.5	1.754	2.756	171.9	2.9	17.2
1987	05 15	14 01.56	-14 30.9					
1987	05 25	13 54.04	-13 51.4	1.830	2.745	148.6	11.1	17.6
1987	06 04	13 48.73	-13 21.4					
1987	06 14	13 45.93	-13 03.8	1.994	2.732	127.3	17.2	18.0
1987	06 24	13 45.67	-12 59.4					
1987	07 04	13 47.84	-13 08.2	2.214	2.716	108.7	20.8	18.3
1987	07 14	13 52.23	-13 28.9					
1987	07 24	13 58.59	-13 59.9	2.457	2.698	92.4	22.1	18.5

(3464) 1983 BA a,e,i = 2.24, 0.04, 7 Elements MPC 10838

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	02 14	14 32.76	-21 59.5	1.719	2.145	101.4	26.8	17.5
1987	02 24	14 40.83	-23 25.1					
1987	03 06	14 46.23	-24 41.6	1.496	2.142	117.4	24.3	17.1
1987	03 16	14 48.49	-25 47.0					
1987	03 26	14 47.27	-26 38.5	1.308	2.141	135.9	18.9	16.7
1987	04 05	14 42.45	-27 12.0					
1987	04 15	14 34.43	-27 23.4	1.184	2.140	156.2	10.9	16.2
1987	04 25	14 24.19	-27 10.5					
1987	05 05	14 13.22	-26 34.7	1.146	2.141	167.1	6.0	16.0
1987	05 15	14 03.24	-25 42.4					
1987	05 25	13 55.61	-24 43.2	1.203	2.143	150.5	13.5	16.3
1987	06 04	13 51.21	-23 46.9					
1987	06 14	13 50.34	-23 01.1	1.338	2.146	131.0	20.9	16.8
1987	06 24	13 52.84	-22 29.6					
1987	07 04	13 58.44	-22 13.6	1.526	2.150	114.0	25.6	17.2
1987	07 14	14 06.72	-22 12.4					
1987	07 24	14 17.31	-22 23.8	1.743	2.155	99.4	27.7	17.6

1976 HQ a,e,i = 3.14, 0.06, 7 Elements MPC 10843

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	02 14	14 38.19	-06 46.5	2.528	2.939	104.8	19.0	16.9
1987	02 24	14 42.58	-06 36.9					
1987	03 06	14 44.84	-06 16.4	2.276	2.938	123.1	16.4	16.6
1987	03 16	14 44.82	-05 46.1					
1987	03 26	14 42.50	-05 07.7	2.077	2.937	143.2	11.7	16.3
1987	04 05	14 38.04	-04 24.1					
1987	04 15	14 31.87	-03 39.3	1.963	2.938	163.4	5.6	15.9
1987	04 25	14 24.61	-02 57.9					
1987	05 05	14 17.06	-02 24.4	1.954	2.939	165.0	5.1	15.9
1987	05 15	14 10.06	-02 02.8					
1987	05 25	14 04.31	-01 55.4	2.050	2.942	145.5	11.2	16.2
1987	06 04	14 00.31	-02 02.9					
1987	06 14	13 58.36	-02 24.9	2.232	2.945	125.9	16.2	16.6
1987	06 24	13 58.50	-02 59.6					
1987	07 04	14 00.70	-03 45.4	2.469	2.949	108.2	19.1	16.9
1987	07 14	14 04.81	-04 40.1					
1987	07 24	14 10.65	-05 41.7	2.733	2.954	92.3	20.1	17.1

(3404) 1934 CY a,e,i = 2.67, 0.13, 10 Elements MPC 10531

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	02 14	14 39.77	-27 37.3	2.150	2.487	98.0	23.2	17.5
1987	02 24	14 46.18	-28 54.2					
1987	03 06	14 49.99	-30 01.2	1.931	2.511	114.6	21.0	17.2
1987	03 16	14 50.90	-30 56.3					
1987	03 26	14 48.73	-31 36.2	1.748	2.537	133.2	16.7	16.9
1987	04 05	14 43.55	-31 57.2					
1987	04 15	14 35.85	-31 56.1	1.631	2.563	152.6	10.4	16.6
1987	04 25	14 26.53	-31 31.4					
1987	05 05	14 16.76	-30 44.8	1.606	2.590	163.9	6.2	16.4
1987	05 15	14 07.86	-29 41.9					
1987	05 25	14 00.82	-28 30.8	1.683	2.617	151.3	10.7	16.7
1987	06 04	13 56.32	-27 19.9					
1987	06 14	13 54.62	-26 16.1	1.850	2.644	132.5	16.5	17.1
1987	06 24	13 55.66	-25 23.8					
1987	07 04	13 59.24	-24 45.1	2.080	2.671	114.8	20.2	17.5
1987	07 14	14 05.09	-24 20.2					
1987	07 24	14 12.89	-24 08.0	2.346	2.698	98.9	21.8	17.8

1981 EX4 a,e,i = 3.10, 0.13, 20 Elements MPC 8143

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	02 14	14 38.34	-16 35.9	2.895	3.245	101.9	17.3	18.7
1987	02 24	14 42.28	-16 16.0					
1987	03 06	14 44.27	-15 42.5	2.598	3.222	120.9	15.3	18.4
1987	03 16	14 44.16	-14 54.9					
1987	03 26	14 41.96	-13 53.2	2.353	3.198	141.9	11.1	18.0
1987	04 05	14 37.79	-12 38.5					
1987	04 15	14 32.03	-11 13.6	2.196	3.173	164.3	4.9	17.6
1987	04 25	14 25.23	-09 43.0					
1987	05 05	14 18.09	-08 12.3	2.150	3.148	170.0	3.2	17.4
1987	05 15	14 11.38	-06 47.8					
1987	05 25	14 05.75	-05 34.5	2.219	3.123	147.8	9.9	17.8
1987	06 04	14 01.71	-04 36.3					
1987	06 14	13 59.56	-03 54.9	2.379	3.097	126.9	15.2	18.1
1987	06 24	13 59.40	-03 30.2					
1987	07 04	14 01.23	-03 21.1	2.598	3.071	108.2	18.3	18.3
1987	07 14	14 04.94	-03 25.7					
1987	07 24	14 10.36	-03 41.9	2.843	3.045	91.6	19.5	18.6

1970 OF a,e,i = 2.70, 0.31, 6 Elements MPC 11146

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	02 14	14 51.44	-23 06.6	2.954	3.226	96.9	17.7	19.2
1987	02 24	14 55.40	-23 48.4					
1987	03 06	14 57.34	-24 23.2	2.631	3.182	115.2	16.4	18.9
1987	03 16	14 57.01	-24 49.7					
1987	03 26	14 54.29	-25 06.4	2.348	3.136	135.2	13.0	18.5
1987	04 05	14 49.17	-25 11.1					
1987	04 15	14 41.92	-25 02.4	2.141	3.087	156.6	7.4	18.1
1987	04 25	14 33.08	-24 39.6					
1987	05 05	14 23.45	-24 03.8	2.036	3.035	170.5	3.1	17.7
1987	05 15	14 14.00	-23 18.2					
1987	05 25	14 05.65	-22 27.9	2.044	2.981	152.7	9.0	18.0
1987	06 04	13 59.12	-21 38.3					
1987	06 14	13 54.91	-20 54.9	2.150	2.924	131.6	15.1	18.2
1987	06 24	13 53.18	-20 21.0					
1987	07 04	13 53.94	-19 58.9	2.321	2.865	112.3	19.2	18.5
1987	07 14	13 57.08	-19 49.2					
1987	07 24	14 02.37	-19 51.4	2.523	2.804	95.2	21.1	18.7

1986 AT2 a,e,i = 3.17, 0.15, 19 Elements MPC 10936

Date	ET	R. A. (1950)	Decl.	Delta	r	Variation		V
1987	02 14	14 48.83	+02 34.1	3.001	3.386	-0.60	+2.0	17.3
1987	02 24	14 52.12	+03 32.4					
1987	03 06	14 53.47	+04 41.0	2.772	3.409	-0.65	+2.3	17.1
1987	03 16	14 52.82	+05 57.1					
1987	03 26	14 50.19	+07 17.0	2.603	3.431	-0.68	+2.6	16.8
1987	04 05	14 45.77	+08 35.8					
1987	04 15	14 39.92	+09 47.9	2.523	3.452	-0.70	+2.7	16.7
1987	04 25	14 33.17	+10 47.9					
1987	05 05	14 26.14	+11 31.5	2.548	3.473	-0.70	+2.5	16.7
1987	05 15	14 19.50	+11 55.9					
1987	05 25	14 13.79	+12 00.7	2.675	3.492	-0.67	+2.2	17.0
1987	06 04	14 09.46	+11 46.7					
1987	06 14	14 06.76	+11 16.2	2.883	3.510	-0.62	+1.9	17.2
1987	06 24	14 05.79	+10 32.0					
1987	07 04	14 06.55	+09 37.0	3.141	3.527	-0.57	+1.7	17.5
1987	07 14	14 08.95	+08 33.7					
1987	07 24	14 12.86	+07 24.6	3.423	3.542	-0.52	+1.6	17.7

1984 UQ a,e,i = 2.56, 0.13, 15 Elements MPC 9458

Date	ET	R. A. (1950)	Decl.	Delta	r	Variation		V
1987	02 14	14 35.04	-18 08.2	2.024	2.431	-1.33	+0.7	16.4
1987	02 24	14 42.75	-18 01.8					
1987	03 06	14 48.19	-17 37.2	1.756	2.404	-1.56	+0.7	16.0
1987	03 16	14 51.04	-16 52.7					
1987	03 26	14 51.09	-15 47.3	1.532	2.378	-1.82	+1.1	15.6
1987	04 05	14 48.30	-14 21.0					
1987	04 15	14 43.03	-12 36.8	1.380	2.353	-2.04	+1.7	15.0
1987	04 25	14 35.94	-10 40.7					
1987	05 05	14 28.05	-08 41.8	1.327	2.330	-2.08	+2.0	14.7
1987	05 15	14 20.57	-06 51.0					
1987	05 25	14 14.52	-05 17.5	1.377	2.308	-1.92	+1.6	15.2
1987	06 04	14 10.70	-04 07.4					
1987	06 14	14 09.52	-03 23.0	1.510	2.288	-1.68	+0.8	15.6
1987	06 24	14 11.04	-03 03.1					
1987	07 04	14 15.17	-03 05.1	1.695	2.271	-1.46	+0.3	15.9
1987	07 14	14 21.68	-03 25.1					
1987	07 24	14 30.30	-03 59.6	1.905	2.256	-1.28	+0.0	16.2

1980 RC1 a,e,i = 2.46, 0.20, 3 Elements MPC 10952

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	02 14	14 52.85	-20 01.2	2.566	2.868	97.5	20.0	18.7
1987	02 24	14 57.98	-20 32.9					
1987	03 06	15 00.95	-20 55.6	2.273	2.845	115.5	18.3	18.4
1987	03 16	15 01.49	-21 08.2					
1987	03 26	14 59.42	-21 09.4	2.019	2.819	135.7	14.3	18.0
1987	04 05	14 54.72	-20 58.0					
1987	04 15	14 47.69	-20 33.4	1.837	2.792	157.9	7.8	17.5
1987	04 25	14 38.89	-19 56.0					
1987	05 05	14 29.23	-19 08.4	1.755	2.762	175.2	1.8	17.1
1987	05 15	14 19.77	-18 15.3					
1987	05 25	14 11.51	-17 22.4	1.785	2.729	153.5	9.5	17.5
1987	06 04	14 05.23	-16 35.4					
1987	06 14	14 01.42	-15 58.9	1.909	2.695	131.8	16.3	17.8
1987	06 24	14 00.22	-15 35.4					
1987	07 04	14 01.60	-15 25.6	2.096	2.658	112.6	20.7	18.1
1987	07 14	14 05.40	-15 29.3					
1987	07 24	14 11.38	-15 45.0	2.313	2.620	95.9	22.7	18.4

1979 TZ1 a,e,i = 2.90, 0.02, 1 Elements MPC 10941

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	02 14	14 49.21	-17 18.7	2.523	2.852	99.2	20.0	17.7
1987	02 24	14 54.48	-17 47.6					
1987	03 06	14 57.58	-18 07.1	2.263	2.855	117.1	18.0	17.4
1987	03 16	14 58.29	-18 16.6					
1987	03 26	14 56.52	-18 15.6	2.045	2.859	137.3	13.7	17.0
1987	04 05	14 52.31	-18 03.7					
1987	04 15	14 46.03	-17 41.5	1.901	2.862	159.5	7.1	16.6
1987	04 25	14 38.28	-17 10.6					
1987	05 05	14 29.89	-16 33.8	1.859	2.866	176.5	1.2	16.3
1987	05 15	14 21.85	-15 55.6					
1987	05 25	14 14.97	-15 20.4	1.926	2.870	153.8	9.0	16.7
1987	06 04	14 09.92	-14 52.4					
1987	06 14	14 07.07	-14 34.6	2.087	2.874	132.7	15.1	17.1
1987	06 24	14 06.53	-14 28.1					
1987	07 04	14 08.27	-14 33.2	2.313	2.878	113.9	18.8	17.5
1987	07 14	14 12.13	-14 49.1					
1987	07 24	14 17.90	-15 14.5	2.573	2.882	97.2	20.5	17.7

2563 P-L a,e,i = 3.20, 0.15, 2 Elements MPC 6207

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	02 14	14 48.59	-14 33.7	2.551	2.893	100.1	19.6	17.7
1987	02 24	14 54.43	-14 51.3					
1987	03 06	14 58.26	-14 59.1	2.268	2.869	117.9	17.8	17.4
1987	03 16	14 59.84	-14 56.8					
1987	03 26	14 59.05	-14 44.4	2.029	2.847	137.6	13.7	17.0
1987	04 05	14 55.90	-14 22.2					
1987	04 15	14 50.67	-13 51.8	1.865	2.826	159.5	7.2	16.6
1987	04 25	14 43.88	-13 15.4					
1987	05 05	14 36.28	-12 36.5	1.800	2.807	176.2	1.4	16.2
1987	05 15	14 28.80	-11 59.7					
1987	05 25	14 22.30	-11 29.2	1.842	2.789	154.2	9.1	16.6
1987	06 04	14 17.46	-11 08.6					
1987	06 14	14 14.75	-11 00.2	1.977	2.773	133.2	15.5	16.9
1987	06 24	14 14.33	-11 04.4					
1987	07 04	14 16.22	-11 21.0	2.177	2.759	114.6	19.6	17.3
1987	07 14	14 20.31	-11 48.6					
1987	07 24	14 26.39	-12 25.7	2.411	2.748	98.2	21.5	17.5

1981 EQ9 a,e,i = 3.14, 0.12, 5 Elements MPC 10614

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	02 14	14 53.40	-16 54.7	2.466	2.786	98.3	20.5	19.1
1987	02 24	14 59.83	-17 09.3					
1987	03 06	15 04.12	-17 12.8	2.214	2.793	115.9	18.6	18.8
1987	03 16	15 06.07	-17 04.9					
1987	03 26	15 05.55	-16 45.4	2.001	2.802	135.6	14.4	18.5
1987	04 05	15 02.60	-16 14.6					
1987	04 15	14 57.52	-15 33.8	1.860	2.813	157.5	7.8	18.1
1987	04 25	14 50.86	-14 45.7					
1987	05 05	14 43.40	-13 53.9	1.817	2.825	178.0	0.7	17.7
1987	05 15	14 36.06	-13 03.5					
1987	05 25	14 29.67	-12 19.1	1.883	2.839	156.2	8.3	18.1
1987	06 04	14 24.92	-11 44.9					
1987	06 14	14 22.20	-11 23.1	2.044	2.854	135.0	14.6	18.5
1987	06 24	14 21.69	-11 14.6					
1987	07 04	14 23.37	-11 18.9	2.272	2.871	116.2	18.5	18.9
1987	07 14	14 27.11	-11 34.8					
1987	07 24	14 32.73	-12 00.5	2.540	2.888	99.6	20.3	19.2

1981 QC a,e,i = 2.34, 0.22, 26 Elements MPC 8144

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	02 14	15 18.93	+01 34.1	2.523	2.819	97.0	20.3	18.6
1987	02 24	15 23.02	+01 40.1					
1987	03 06	15 24.79	+01 54.1	2.271	2.830	114.5	18.6	18.4
1987	03 16	15 24.00	+02 13.7					
1987	03 26	15 20.48	+02 36.3	2.057	2.838	133.6	14.7	18.1
1987	04 05	15 14.24	+02 57.9					
1987	04 15	15 05.58	+03 13.8	1.914	2.844	152.8	9.3	17.7
1987	04 25	14 55.10	+03 19.3					
1987	05 05	14 43.67	+03 10.4	1.873	2.846	160.9	6.6	17.6
1987	05 15	14 32.36	+02 44.6					
1987	05 25	14 22.15	+02 01.9	1.945	2.845	146.5	11.3	17.8
1987	06 04	14 13.80	+01 03.5					
1987	06 14	14 07.80	-00 07.9	2.112	2.840	126.9	16.6	18.2
1987	06 24	14 04.30	-01 29.2					
1987	07 04	14 03.28	-02 58.1	2.341	2.833	108.5	19.9	18.5
1987	07 14	14 04.57	-04 32.3					
1987	07 24	14 07.94	-06 09.9	2.600	2.822	91.9	21.1	18.7

(3359) 1978 RA6 a,e,i = 2.26, 0.12, 6 Elements MPC 10378

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	02 14	15 07.85	-17 44.0	2.156	2.445	94.8	23.7	18.7
1987	02 24	15 14.97	-18 31.1					
1987	03 06	15 19.68	-19 10.2	1.915	2.463	111.8	22.0	18.4
1987	03 16	15 21.64	-19 41.1					
1987	03 26	15 20.57	-20 03.0	1.704	2.479	131.3	17.6	18.0
1987	04 05	15 16.35	-20 14.9					
1987	04 15	15 09.18	-20 15.7	1.555	2.492	153.4	10.4	17.6
1987	04 25	14 59.66	-20 05.2					
1987	05 05	14 48.79	-19 44.6	1.497	2.504	176.0	1.6	17.2
1987	05 15	14 37.88	-19 17.4					
1987	05 25	14 28.15	-18 48.5	1.547	2.514	157.7	8.8	17.6
1987	06 04	14 20.60	-18 23.3					
1987	06 14	14 15.80	-18 06.3	1.693	2.521	135.7	16.3	18.0
1987	06 24	14 13.91	-17 59.9					
1987	07 04	14 14.87	-18 05.3	1.904	2.527	116.5	21.1	18.4
1987	07 14	14 18.45	-18 22.0					
1987	07 24	14 24.35	-18 48.6	2.150	2.530	99.8	23.3	18.7

(3442) 1978 TO7 a,e,i = 3.16, 0.13, 12 Elements MPC 10765

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	02 14	15 09.13	-04 40.7	3.278	3.551	97.9	16.0	17.8
1987	02 24	15 12.72	-04 27.2					
1987	03 06	15 14.52	-04 05.8	3.003	3.555	116.2	14.5	17.6
1987	03 16	15 14.41	-03 37.6					
1987	03 26	15 12.34	-03 04.2	2.774	3.558	135.9	11.3	17.3
1987	04 05	15 08.40	-02 28.1					
1987	04 15	15 02.83	-01 52.2	2.623	3.560	155.5	6.7	17.0
1987	04 25	14 56.04	-01 19.8					
1987	05 05	14 48.60	-00 54.4	2.577	3.560	165.0	4.2	16.8
1987	05 15	14 41.14	-00 38.7					
1987	05 25	14 34.29	-00 34.6	2.643	3.560	150.5	8.1	17.1
1987	06 04	14 28.58	-00 43.0					
1987	06 14	14 24.38	-01 03.6	2.808	3.558	131.0	12.4	17.3
1987	06 24	14 21.90	-01 35.2					
1987	07 04	14 21.21	-02 16.5	3.042	3.555	112.3	15.3	17.6
1987	07 14	14 22.29	-03 05.9					
1987	07 24	14 25.02	-04 01.6	3.313	3.551	95.1	16.6	17.8

1964 CG a,e,i = 3.15, 0.18, 3 Elements MPC 10522

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	02 14	15 00.92	-14 11.4	2.400	2.709	97.4	21.2	17.5
1987	02 24	15 07.50	-14 31.0					
1987	03 06	15 11.87	-14 40.8	2.166	2.735	114.8	19.2	17.2
1987	03 16	15 13.82	-14 40.9					
1987	03 26	15 13.22	-14 31.8	1.971	2.762	134.4	15.0	16.9
1987	04 05	15 10.10	-14 13.9					
1987	04 15	15 04.75	-13 49.0	1.844	2.791	156.1	8.4	16.6
1987	04 25	14 57.72	-13 19.3					
1987	05 05	14 49.81	-12 47.9	1.814	2.821	176.6	1.2	16.2
1987	05 15	14 41.96	-12 19.0					
1987	05 25	14 35.03	-11 56.1	1.892	2.853	157.2	7.9	16.7
1987	06 04	14 29.71	-11 42.2					
1987	06 14	14 26.44	-11 39.1	2.066	2.885	136.1	14.1	17.1
1987	06 24	14 25.37	-11 47.1					
1987	07 04	14 26.50	-12 05.7	2.310	2.919	117.2	18.0	17.5
1987	07 14	14 29.72	-12 33.8					
1987	07 24	14 34.81	-13 09.9	2.595	2.953	100.4	19.8	17.8

(3402) 1981 PB a,e,i = 2.13, 0.28, 5 Elements MPC 10526

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	02 14	14 45.72	-18 05.7	1.700	2.105	99.7	27.5	19.3
1987	02 24	14 56.45	-19 22.9					
1987	03 06	15 05.30	-20 34.7	1.413	2.038	114.7	26.3	18.7
1987	03 16	15 11.75	-21 41.0					
1987	03 26	15 15.27	-22 41.1	1.160	1.970	131.7	22.2	18.1
1987	04 05	15 15.25	-23 33.4					
1987	04 15	15 11.37	-24 15.1	0.959	1.902	151.4	14.6	17.4
1987	04 25	15 03.68	-24 42.7					
1987	05 05	14 52.92	-24 52.2	0.832	1.835	170.8	5.1	16.7
1987	05 15	14 40.76	-24 43.3					
1987	05 25	14 29.29	-24 19.8	0.790	1.770	158.1	12.3	16.8
1987	06 04	14 20.59	-23 50.4					
1987	06 14	14 16.08	-23 25.3	0.821	1.710	136.9	24.0	17.1
1987	06 24	14 16.32	-23 11.9					
1987	07 04	14 21.31	-23 13.9	0.901	1.656	119.3	32.4	17.5
1987	07 14	14 30.71	-23 31.5					
1987	07 24	14 44.02	-24 02.1	1.004	1.610	105.7	37.4	17.8

1984 DA a,e,i = 1.92, 0.06, 23 Elements MPC 8779

Date	ET	R. A. (1950)	Decl.	Delta	r	Variation		V
1987	02 14	14 43.75	+00 59.7	1.294	1.824	-1.94	+1.9	17.6
1987	02 24	14 56.76	+03 33.5					
1987	03 06	15 07.01	+06 40.7	1.130	1.832	-2.18	+4.9	17.2
1987	03 16	15 13.98	+10 15.9					
1987	03 26	15 17.23	+14 09.3	1.016	1.842	-2.39	+8.1	16.8
1987	04 05	15 16.50	+18 04.7					
1987	04 15	15 12.01	+21 40.9	0.969	1.853	-2.57	+8.9	16.7
1987	04 25	15 04.53	+24 37.1					
1987	05 05	14 55.36	+26 36.7	0.994	1.866	-2.78	+6.1	16.8
1987	05 15	14 46.21	+27 32.3					
1987	05 25	14 38.61	+27 26.5	1.080	1.879	-2.80	+2.2	17.1
1987	06 04	14 33.62	+26 27.6					
1987	06 14	14 31.80	+24 47.5	1.210	1.893	-2.49	+0.2	17.4
1987	06 24	14 33.16	+22 37.5					
1987	07 04	14 37.50	+20 06.8	1.368	1.907	-2.04	+0.1	17.8
1987	07 14	14 44.50	+17 23.6					
1987	07 24	14 53.78	+14 33.5	1.543	1.922	-1.66	+0.9	18.1

1974 QM2 a,e,i = 2.25, 0.18, 6 Elements MPC 10773

Date ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987 02 14	14 48.94	-20 46.1	1.727	2.108	98.2	27.6	18.4
1987 02 24	14 59.94	-22 13.8					
1987 03 06	15 08.93	-23 35.9	1.467	2.067	113.0	26.2	18.0
1987 03 16	15 15.39	-24 51.6					
1987 03 26	15 18.80	-26 00.0	1.239	2.028	129.8	22.2	17.4
1987 04 05	15 18.67	-26 58.5					
1987 04 15	15 14.79	-27 43.4	1.063	1.991	149.0	15.0	16.9
1987 04 25	15 07.38	-28 10.3					
1987 05 05	14 57.35	-28 15.1	0.960	1.956	167.3	6.5	16.3
1987 05 15	14 46.34	-27 57.7					
1987 05 25	14 36.25	-27 22.7	0.945	1.925	159.2	10.8	16.4
1987 06 04	14 28.80	-26 39.0					
1987 06 14	14 25.09	-25 56.9	1.010	1.899	139.2	20.4	16.8
1987 06 24	14 25.49	-25 23.8					
1987 07 04	14 29.90	-25 03.8	1.132	1.877	121.6	27.5	17.2
1987 07 14	14 37.98	-24 58.0					
1987 07 24	14 49.24	-25 04.6	1.287	1.860	107.1	31.5	17.6

1981 RR3 a,e,i = 2.23, 0.21, 6 Elements MPC 10023

Date ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987 02 14	15 07.48	-13 27.9	2.283	2.580	96.0	22.4	19.3
1987 02 24	15 14.89	-13 29.1					
1987 03 06	15 20.22	-13 18.2	1.992	2.550	113.1	21.0	18.9
1987 03 16	15 23.13	-12 54.8					
1987 03 26	15 23.32	-12 18.8	1.735	2.517	132.4	17.0	18.5
1987 04 05	15 20.61	-11 30.8					
1987 04 15	15 15.07	-10 32.7	1.542	2.481	153.8	10.3	18.0
1987 04 25	15 07.11	-09 27.8					
1987 05 05	14 57.52	-08 21.7	1.441	2.443	171.8	3.4	17.5
1987 05 15	14 47.42	-07 21.0					
1987 05 25	14 38.01	-06 32.2	1.445	2.402	155.0	10.2	17.8
1987 06 04	14 30.37	-06 00.1					
1987 06 14	14 25.24	-05 47.3	1.542	2.359	133.4	18.2	18.1
1987 06 24	14 22.95	-05 53.6					
1987 07 04	14 23.57	-06 17.6	1.699	2.314	114.5	23.6	18.5
1987 07 14	14 26.98	-06 56.6					
1987 07 24	14 32.92	-07 47.7	1.886	2.267	98.2	26.3	18.7

6543 P-L a,e,i = 3.18, 0.17, 2 Elements MPC 9302

Date ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987 02 14	15 10.47	-15 58.4	3.103	3.332	94.7	17.2	18.8
1987 02 24	15 15.54	-16 15.9					
1987 03 06	15 18.81	-16 25.9	2.789	3.302	112.7	16.1	18.5
1987 03 16	15 20.11	-16 28.4					
1987 03 26	15 19.28	-16 23.3	2.513	3.271	132.5	13.0	18.1
1987 04 05	15 16.31	-16 10.6					
1987 04 15	15 11.36	-15 50.9	2.307	3.240	154.2	7.8	17.8
1987 04 25	15 04.78	-15 25.4					
1987 05 05	14 57.15	-14 56.0	2.200	3.208	176.7	1.0	17.3
1987 05 15	14 49.22	-14 25.8					
1987 05 25	14 41.75	-13 57.9	2.206	3.175	159.5	6.4	17.6
1987 06 04	14 35.46	-13 35.7					
1987 06 14	14 30.87	-13 21.7	2.316	3.142	137.7	12.6	17.9
1987 06 24	14 28.29	-13 17.4					
1987 07 04	14 27.84	-13 23.4	2.500	3.109	118.0	16.8	18.1
1987 07 14	14 29.51	-13 39.5					
1987 07 24	14 33.17	-14 04.6	2.727	3.076	100.3	19.0	18.4

1981 WP1 a,e,i = 2.37, 0.15, 8 Elements MPC 6646

Date ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987 02 14	15 12.85	-12 03.7	2.386	2.662	95.1	21.7	18.4
1987 02 24	15 19.60	-12 24.8					
1987 03 06	15 24.24	-12 37.5	2.103	2.644	112.3	20.3	18.1
1987 03 16	15 26.47	-12 42.2					
1987 03 26	15 26.01	-12 39.1	1.853	2.623	131.6	16.5	17.7
1987 04 05	15 22.71	-12 29.0					
1987 04 15	15 16.66	-12 13.1	1.665	2.601	153.4	10.0	17.2
1987 04 25	15 08.29	-11 53.3					
1987 05 05	14 58.34	-11 32.6	1.571	2.577	174.4	2.2	16.8
1987 05 15	14 47.94	-11 14.6					
1987 05 25	14 38.21	-11 03.0	1.585	2.551	157.5	8.7	17.1
1987 06 04	14 30.18	-11 01.2					
1987 06 14	14 24.57	-11 11.2	1.696	2.523	135.5	16.4	17.4
1987 06 24	14 21.69	-11 33.6					
1987 07 04	14 21.62	-12 07.9	1.873	2.493	116.1	21.5	17.8
1987 07 14	14 24.24	-12 52.8					
1987 07 24	14 29.31	-13 46.6	2.084	2.463	99.4	24.0	18.0

1978 VK9 a,e,i = 2.25, 0.16, 5 Elements MPC 8149

Date ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987 02 14	15 11.67	-20 53.7	2.358	2.604	93.1	22.2	18.4
1987 02 24	15 19.13	-21 23.0					
1987 03 06	15 24.43	-21 42.8	2.082	2.596	110.1	21.0	18.1
1987 03 16	15 27.22	-21 52.4					
1987 03 26	15 27.23	-21 50.5	1.834	2.584	129.3	17.4	17.7
1987 04 05	15 24.27	-21 35.9					
1987 04 15	15 18.46	-21 07.6	1.646	2.570	151.1	10.9	17.2
1987 04 25	15 10.21	-20 25.7					
1987 05 05	15 00.36	-19 32.0	1.547	2.553	174.7	2.1	16.7
1987 05 15	14 50.06	-18 30.8					
1987 05 25	14 40.51	-17 28.3	1.557	2.534	160.3	7.7	17.0
1987 06 04	14 32.75	-16 31.0					
1987 06 14	14 27.48	-15 44.7	1.666	2.512	137.7	15.8	17.4
1987 06 24	14 25.01	-15 12.5					
1987 07 04	14 25.39	-14 55.7	1.844	2.487	117.9	21.2	17.7
1987 07 14	14 28.44	-14 53.6					
1987 07 24	14 33.92	-15 04.7	2.058	2.461	100.8	23.9	18.0

1981 YX1 a,e,i = 2.41, 0.05, 6 Elements MPC 10758

Date ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987 02 14	14 59.57	-20 31.4	2.038	2.354	95.9	24.7	16.9
1987 02 24	15 08.88	-21 03.6					
1987 03 06	15 15.99	-21 23.9	1.784	2.344	112.1	23.1	16.6
1987 03 16	15 20.51	-21 31.2					
1987 03 26	15 22.12	-21 24.5	1.560	2.335	130.6	18.9	16.2
1987 04 05	15 20.60	-21 02.4					
1987 04 15	15 16.05	-20 24.5	1.394	2.327	151.9	11.7	15.7
1987 04 25	15 08.95	-19 31.5					
1987 05 05	15 00.18	-18 26.4	1.313	2.319	175.4	2.0	15.1
1987 05 15	14 51.01	-17 15.1					
1987 05 25	14 42.70	-16 05.2	1.333	2.312	160.5	8.4	15.5
1987 06 04	14 36.35	-15 04.2					
1987 06 14	14 32.65	-14 17.8	1.446	2.306	138.4	17.0	15.9
1987 06 24	14 31.85	-13 48.3					
1987 07 04	14 33.95	-13 36.3	1.625	2.301	119.4	22.6	16.3
1987 07 14	14 38.74	-13 40.2					
1987 07 24	14 45.93	-13 57.4	1.841	2.297	103.2	25.5	16.7

(3410) 1978 SZ7 a,e,i = 2.26, 0.10, 5 Elements MPC 10533

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	02 14	15 06.17	-21 26.4	1.850	2.159	94.1	27.1	17.6
1987	02 24	15 16.15	-22 35.4					
1987	03 06	15 23.68	-23 35.9	1.635	2.180	109.7	25.4	17.3
1987	03 16	15 28.32	-24 27.4					
1987	03 26	15 29.65	-25 08.7	1.445	2.202	127.8	21.0	16.9
1987	04 05	15 27.41	-25 37.7					
1987	04 15	15 21.66	-25 51.8	1.306	2.224	148.5	13.6	16.5
1987	04 25	15 12.94	-25 48.8					
1987	05 05	15 02.31	-25 27.9	1.248	2.247	169.5	4.7	16.1
1987	05 15	14 51.29	-24 52.0					
1987	05 25	14 41.39	-24 07.0	1.288	2.269	160.9	8.4	16.3
1987	06 04	14 33.83	-23 20.7					
1987	06 14	14 29.33	-22 40.4	1.420	2.291	139.8	16.6	16.8
1987	06 24	14 28.08	-22 10.7					
1987	07 04	14 29.97	-21 54.0	1.620	2.313	120.9	22.2	17.3
1987	07 14	14 34.71	-21 50.2					
1987	07 24	14 41.92	-21 58.0	1.859	2.334	104.7	24.9	17.7

(3401) 1981 PA a,e,i = 2.37, 0.36, 22 Elements MPC 10526

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	02 14	15 32.21	-41 36.8	2.950	3.006	83.7	19.1	18.6
1987	02 24	15 38.94	-43 11.2					
1987	03 06	15 43.27	-44 42.9	2.722	3.045	99.4	18.7	18.4
1987	03 16	15 44.80	-46 10.1					
1987	03 26	15 43.13	-47 29.9	2.510	3.081	116.0	16.9	18.2
1987	04 05	15 37.99	-48 37.9					
1987	04 15	15 29.46	-49 28.3	2.344	3.112	132.6	13.7	18.0
1987	04 25	15 18.01	-49 55.2					
1987	05 05	15 04.64	-49 53.5	2.254	3.140	145.7	10.4	17.8
1987	05 15	14 50.81	-49 21.9					
1987	05 25	14 37.99	-48 23.2	2.261	3.163	147.5	9.9	17.8
1987	06 04	14 27.41	-47 04.1					
1987	06 14	14 19.82	-45 33.7	2.367	3.182	136.6	12.7	18.0
1987	06 24	14 15.45	-44 00.6					
1987	07 04	14 14.22	-42 32.0	2.553	3.197	120.9	15.8	18.3
1987	07 14	14 15.85	-41 12.7					
1987	07 24	14 19.96	-40 05.2	2.793	3.207	104.8	17.8	18.6

1974 SX1 a,e,i = 2.28, 0.16, 6 Elements MPC 11057

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	02 14	15 18.89	-20 49.3	2.355	2.576	91.5	22.5	19.1
1987	02 24	15 26.87	-21 44.4					
1987	03 06	15 32.81	-22 33.9	2.070	2.556	108.0	21.7	18.7
1987	03 16	15 36.31	-23 17.5					
1987	03 26	15 37.04	-23 54.6	1.810	2.534	126.5	18.4	18.3
1987	04 05	15 34.68	-24 23.7					
1987	04 15	15 29.19	-24 42.9	1.605	2.510	147.5	12.4	17.9
1987	04 25	15 20.85	-24 50.0					
1987	05 05	15 10.36	-24 43.4	1.485	2.483	169.2	4.4	17.4
1987	05 15	14 58.92	-24 23.9					
1987	05 25	14 47.89	-23 54.7	1.469	2.454	162.4	7.2	17.4
1987	06 04	14 38.53	-23 21.6					
1987	06 14	14 31.82	-22 50.8	1.553	2.423	140.3	15.5	17.8
1987	06 24	14 28.19	-22 27.4					
1987	07 04	14 27.77	-22 14.7	1.708	2.391	120.5	21.5	18.2
1987	07 14	14 30.43	-22 14.1					
1987	07 24	14 35.87	-22 24.9	1.903	2.357	103.5	24.8	18.5

1981 EG44 a,e,i = 3.07, 0.05, 10 Elements MPC 9964

Date ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987 02 14	15 27.81	-23 12.6	2.953	3.095	88.9	18.6	19.1
1987 02 24	15 34.22	-24 06.2					
1987 03 06	15 38.72	-24 55.3	2.681	3.105	106.1	17.9	18.9
1987 03 16	15 41.06	-25 39.4					
1987 03 26	15 41.05	-26 17.8	2.435	3.115	125.0	15.2	18.6
1987 04 05	15 38.56	-26 49.2					
1987 04 15	15 33.68	-27 11.9	2.246	3.126	145.5	10.5	18.3
1987 04 25	15 26.73	-27 24.4					
1987 05 05	15 18.29	-27 25.6	2.147	3.135	166.0	4.5	18.0
1987 05 15	15 09.20	-27 16.0					
1987 05 25	15 00.39	-26 57.6	2.157	3.145	164.4	5.0	18.0
1987 06 04	14 52.69	-26 33.9					
1987 06 14	14 46.79	-26 09.1	2.274	3.154	144.1	10.9	18.4
1987 06 24	14 43.07	-25 47.0					
1987 07 04	14 41.68	-25 30.7	2.476	3.163	124.3	15.4	18.7
1987 07 14	14 42.61	-25 21.7					
1987 07 24	14 45.71	-25 20.7	2.731	3.171	106.4	17.9	19.0

1979 FE a,e,i = 2.42, 0.09, 15 Elements MPC 10527

Date ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987 02 14	15 29.81	-01 46.0	2.377	2.630	93.6	22.0	17.4
1987 02 24	15 37.58	-01 18.3					
1987 03 06	15 43.29	-00 39.0	2.127	2.631	109.6	20.8	17.1
1987 03 16	15 46.65	+00 10.3					
1987 03 26	15 47.42	+01 07.2	1.908	2.632	127.0	17.6	16.8
1987 04 05	15 45.43	+02 08.0					
1987 04 15	15 40.76	+03 07.5	1.746	2.630	144.9	12.7	16.5
1987 04 25	15 33.73	+03 59.7					
1987 05 05	15 24.96	+04 37.9	1.669	2.627	157.1	8.6	16.2
1987 05 15	15 15.41	+04 56.5					
1987 05 25	15 06.08	+04 52.4	1.692	2.623	150.9	10.8	16.3
1987 06 04	14 57.97	+04 25.0					
1987 06 14	14 51.81	+03 36.3	1.807	2.617	134.1	16.2	16.6
1987 06 24	14 48.01	+02 30.1					
1987 07 04	14 46.73	+01 10.2	1.991	2.610	116.6	20.4	17.0
1987 07 14	14 47.93	-00 19.3					
1987 07 24	14 51.43	-01 55.2	2.215	2.601	100.6	22.6	17.3

1980 PH a,e,i = 2.49, 0.22, 4 Elements MPC 9210

Date ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987 02 14	15 34.60	-23 18.4	2.883	3.003	87.3	19.2	19.5
1987 02 24	15 41.56	-23 54.8					
1987 03 06	15 46.65	-24 25.4	2.584	2.990	104.4	18.7	19.3
1987 03 16	15 49.57	-24 49.8					
1987 03 26	15 50.08	-25 07.2	2.307	2.975	123.4	16.3	19.0
1987 04 05	15 47.97	-25 16.5					
1987 04 15	15 43.25	-25 16.2	2.083	2.957	144.3	11.4	18.6
1987 04 25	15 36.16	-25 05.0					
1987 05 05	15 27.23	-24 42.4	1.945	2.936	166.6	4.6	18.1
1987 05 15	15 17.33	-24 09.2					
1987 05 25	15 07.46	-23 28.3	1.917	2.912	166.9	4.5	18.1
1987 06 04	14 58.61	-22 44.0					
1987 06 14	14 51.61	-22 01.4	1.996	2.886	144.7	11.7	18.4
1987 06 24	14 46.93	-21 24.9					
1987 07 04	14 44.83	-20 57.7	2.161	2.857	124.0	17.2	18.7
1987 07 14	14 45.29	-20 41.2					
1987 07 24	14 48.16	-20 35.5	2.376	2.826	105.7	20.3	19.0

1983 AK a,e,i = 2.29, 0.15, 7 Elements MPC 9755

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	02 14	15 17.51	-10 00.1	1.652	1.991	94.5	29.6	17.4
1987	02 24	15 29.68	-10 23.2					
1987	03 06	15 39.43	-10 34.6	1.459	2.014	109.1	27.7	17.1
1987	03 16	15 46.32	-10 35.3					
1987	03 26	15 49.94	-10 27.0	1.287	2.041	126.1	23.3	16.8
1987	04 05	15 49.96	-10 11.6					
1987	04 15	15 46.35	-09 52.3	1.161	2.070	146.1	15.7	16.4
1987	04 25	15 39.45	-09 32.5					
1987	05 05	15 30.11	-09 16.6	1.107	2.102	167.0	6.2	16.0
1987	05 15	15 19.69	-09 09.0					
1987	05 25	15 09.69	-09 13.2	1.146	2.135	162.8	8.1	16.1
1987	06 04	15 01.47	-09 31.2					
1987	06 14	14 55.95	-10 03.3	1.276	2.169	142.1	16.7	16.7
1987	06 24	14 53.50	-10 47.9					
1987	07 04	14 54.16	-11 43.2	1.474	2.204	123.5	22.6	17.2
1987	07 14	14 57.73	-12 46.4					
1987	07 24	15 03.87	-13 55.1	1.716	2.240	107.4	25.6	17.7

1981 SU2 a,e,i = 2.27, 0.13, 2 Elements MPC 10528

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	03 06	15 47.49	-22 34.1	2.136	2.573	104.7	21.9	19.1
1987	03 16	15 51.88	-22 57.9					
1987	03 26	15 53.58	-23 13.7	1.888	2.571	123.1	19.0	18.8
1987	04 05	15 52.30	-23 20.5					
1987	04 15	15 47.99	-23 17.2	1.688	2.567	143.9	13.3	18.4
1987	04 25	15 40.86	-23 02.7					
1987	05 05	15 31.50	-22 36.5	1.568	2.561	166.9	5.1	17.9
1987	05 15	15 20.96	-22 00.2					
1987	05 25	15 10.43	-21 17.4	1.553	2.552	167.8	4.8	17.9
1987	06 04	15 01.14	-20 33.4					
1987	06 14	14 54.05	-19 53.9	1.642	2.541	144.9	13.3	18.3
1987	06 24	14 49.66	-19 23.3					
1987	07 04	14 48.19	-19 04.3	1.810	2.527	124.3	19.4	18.7
1987	07 14	14 49.58	-18 57.7					
1987	07 24	14 53.59	-19 02.8	2.027	2.511	106.5	22.8	19.0
1987	08 03	14 59.97	-19 18.2					
1987	08 13	15 08.45	-19 42.1	2.263	2.494	90.9	24.0	19.2

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

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	03 06	15 47.69	-19 24.8	3.345	3.732	105.3	14.9	18.7
1987	03 16	15 49.13	-19 30.2					
1987	03 26	15 48.64	-19 29.8	3.074	3.737	125.0	12.6	18.5
1987	04 05	15 46.19	-19 23.5					
1987	04 15	15 41.89	-19 11.4	2.863	3.740	146.4	8.5	18.2
1987	04 25	15 36.00	-18 53.8					
1987	05 05	15 28.93	-18 31.5	2.746	3.741	169.0	3.0	17.8
1987	05 15	15 21.27	-18 06.3					
1987	05 25	15 13.66	-17 40.3	2.744	3.741	168.0	3.2	17.8
1987	06 04	15 06.72	-17 15.8					
1987	06 14	15 00.98	-16 55.3	2.856	3.739	145.7	8.8	18.2
1987	06 24	14 56.79	-16 40.7					
1987	07 04	14 54.37	-16 33.3	3.058	3.736	125.0	12.9	18.5
1987	07 14	14 53.77	-16 33.5					
1987	07 24	14 54.97	-16 41.3	3.319	3.731	106.1	15.2	18.7
1987	08 03	14 57.86	-16 56.0					
1987	08 13	15 02.31	-17 16.9	3.605	3.725	88.8	15.8	18.9

1984 SB6 a,e,i = 2.44, 0.18, 3 Elements MPC 9826

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	03 06	15 52.82	-17 09.0	2.336	2.759	104.6	20.4	18.8
1987	03 16	15 57.09	-17 14.8					
1987	03 26	15 58.95	-17 13.3	2.058	2.733	123.1	17.8	18.5
1987	04 05	15 58.16	-17 04.6					
1987	04 15	15 54.63	-16 49.0	1.830	2.705	143.8	12.7	18.0
1987	04 25	15 48.50	-16 27.1					
1987	05 05	15 40.19	-16 00.2	1.684	2.675	166.5	5.0	17.5
1987	05 15	15 30.54	-15 30.8					
1987	05 25	15 20.56	-15 01.9	1.643	2.643	168.5	4.4	17.4
1987	06 04	15 11.36	-14 37.5					
1987	06 14	15 03.90	-14 21.3	1.707	2.609	145.6	12.7	17.8
1987	06 24	14 58.81	-14 15.6					
1987	07 04	14 56.41	-14 21.7	1.854	2.574	124.8	18.9	18.1
1987	07 14	14 56.78	-14 39.3					
1987	07 24	14 59.77	-15 07.4	2.049	2.536	106.8	22.5	18.4
1987	08 03	15 05.20	-15 44.3					
1987	08 13	15 12.83	-16 28.3	2.265	2.498	91.0	23.9	18.7

1981 FQ a,e,i = 3.11, 0.16, 0 Elements MPC 10290

Date	ET	R. A. (1950)	Decl.	Delta	r	Variation		V
1987	03 06	15 44.03	-19 49.5	2.185	2.638	-1.37	+3.9	16.7
1987	03 16	15 49.61	-20 08.4					
1987	03 26	15 52.76	-20 19.4	1.941	2.631	-1.56	+4.2	16.4
1987	04 05	15 53.26	-20 22.5					
1987	04 15	15 51.06	-20 17.4	1.748	2.627	-1.77	+4.8	16.0
1987	04 25	15 46.36	-20 04.5					
1987	05 05	15 39.63	-19 44.3	1.634	2.625	-1.94	+5.6	15.5
1987	05 15	15 31.73	-19 18.8					
1987	05 25	15 23.66	-18 51.0	1.621	2.625	-1.96	+6.2	15.4
1987	06 04	15 16.43	-18 24.8					
1987	06 14	15 10.94	-18 04.1	1.710	2.629	-1.83	+6.2	15.9
1987	06 24	15 07.71	-17 51.5					
1987	07 04	15 06.99	-17 48.8	1.881	2.635	-1.62	+5.6	16.3
1987	07 14	15 08.83	-17 56.2					
1987	07 24	15 13.05	-18 12.8	2.108	2.643	-1.42	+4.8	16.6
1987	08 03	15 19.47	-18 37.2					
1987	08 13	15 27.84	-19 07.8	2.364	2.655	-1.26	+3.9	16.9

1982 BE1 a,e,i = 2.56, 0.19, 6 Elements MPC 10529

Date	ET	R. A. (1950)	Decl.	Delta	r	Elong.	Phase	V
1987	03 06	15 58.05	-12 48.3	2.530	2.935	104.2	19.1	18.7
1987	03 16	16 01.17	-12 32.4					
1987	03 26	16 01.96	-12 09.2	2.291	2.955	123.0	16.4	18.4
1987	04 05	16 00.26	-11 39.8					
1987	04 15	15 56.14	-11 05.8	2.106	2.974	143.7	11.5	18.1
1987	04 25	15 49.83	-10 29.3					
1987	05 05	15 41.84	-09 53.0	2.006	2.991	164.7	5.1	17.8
1987	05 15	15 32.92	-09 20.5					
1987	05 25	15 23.93	-08 54.8	2.015	3.005	164.9	5.0	17.8
1987	06 04	15 15.72	-08 38.8					
1987	06 14	15 09.02	-08 34.0	2.132	3.016	144.4	11.3	18.2
1987	06 24	15 04.28	-08 41.0					
1987	07 04	15 01.73	-08 59.3	2.334	3.025	124.2	16.1	18.5
1987	07 14	15 01.42	-09 27.5					
1987	07 24	15 03.24	-10 04.2	2.590	3.032	106.1	18.8	18.8
1987	08 03	15 07.04	-10 47.6					
1987	08 13	15 12.63	-11 36.0	2.868	3.037	89.7	19.5	19.1